

Company: HP Inc

Test of: 0960-4025 and 0960-4034

To: FCC CFR 47 Part 15 Subpart E 15.407 & RSS-247

Report No.: MARS11-U9 Rev B WiFi/BT Module

**COMPLETE TEST REPORT**



# COMPLETE TEST REPORT



Test of: HP Inc 0960-4025 and 0960-4034

to

To: FCC CFR 47 Part 15 Subpart E 15.407 & RSS-247

Test Report Serial No.: MARS11-U9 Rev B WiFi/BT Module

This report supersedes: MARS11-U9 Rev A

Applicant: HP Inc  
1115 SE 164th Ave., Suite 210,  
Vancouver,  
Washington 98683,  
USA

Product Function 802.11 a/b/g/n SDIO dual band  
with BT/BLE

Issue Date: 27th October 2017

## **This Test Report is Issued Under the Authority of:**

**MiCOM Labs, Inc.**  
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**MiCOM Labs is an ISO 17025 Accredited Testing Laboratory**



**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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## **1. ACCREDITATION, LISTINGS & RECOGNITION**

### **1.1. TESTING ACCREDITATION**

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2005. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-01.pdf>



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## 1.2. RECOGNITION

MiCOM Labs, Inc has widely recognized wireless testing capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA countries. MiCOM Labs test reports are accepted globally.

| Country   | Recognition Body                                                                                 | Status | Phase      | Identification No.                      |
|-----------|--------------------------------------------------------------------------------------------------|--------|------------|-----------------------------------------|
| USA       | Federal Communications Commission (FCC)                                                          | TCB    | -          | US0159<br>Listing #: 102167             |
| Canada    | Industry Canada (IC)                                                                             | FCB    | APEC MRA 2 | US0159<br>Listing #: 4143A-2<br>4143A-3 |
| Japan     | MIC (Ministry of Internal Affairs and Communication)                                             | CAB    | APEC MRA 2 | RCB 210                                 |
|           | VCCI                                                                                             | --     | --         | A-0012                                  |
| Europe    | European Commission                                                                              | NB     | EU MRA     | NB 2280                                 |
| Australia | Australian Communications and Media Authority (ACMA)                                             | CAB    | APEC MRA 1 | US0159                                  |
| Hong Kong | Office of the Telecommunication Authority (OFTA)                                                 | CAB    | APEC MRA 1 |                                         |
| Korea     | Ministry of Information and Communication Radio Research Laboratory (RRL)                        | CAB    | APEC MRA 1 |                                         |
| Singapore | Infocomm Development Authority (IDA)                                                             | CAB    | APEC MRA 1 |                                         |
| Taiwan    | National Communications Commission (NCC)<br>Bureau of Standards, Metrology and Inspection (BSMI) | CAB    | APEC MRA 1 |                                         |
| Vietnam   | Ministry of Communication (MIC)                                                                  | CAB    | APEC MRA 1 |                                         |

EU MRA – European Union Mutual Recognition Agreement.

NB – Notified Body

APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement. Recognition agreement under which test lab is accredited to regulatory standards of the APEC member countries.

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

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### 1.3. PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. The company is accredited by the American Association for Laboratory Accreditation (A2LA) [www.a2la.org](http://www.a2la.org) test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-02.pdf>



United States of America – Telecommunication Certification Body (TCB)  
Industry Canada – Certification Body, CAB Identifier – US0159  
Europe – Notified Body (NB), NB Identifier - 2280  
Japan – Recognized Certification Body (RCB), RCB Identifier - 210



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## 2. DOCUMENT HISTORY

| Document History |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Revision         | Date                          | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Draft            | 28th August 2017              | Draft report for client review.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Draft 2          | 18th September 2017           | 5300 MHz, 5320 MHz, 5500 MHz, 5720 MHz and 5785 MHz Transmitter Spurious emissions data for Integral antenna updated as a result of complete retest of radiated emissions. No other changes required to the report as a result of retest.                                                                                                                                                                                                                                                          |
| Draft 3          | 9th October 2017              | The following test results were updated in this report as a result of retest of the product;-<br>5500 MHz, 5580 MHz Transmitter Spurious emissions data for Integral antenna updated ;<br>5310 MHz HT40 Band Edge results for external antenna updated as a result of complete retest of radiated emissions; 5310 MHz HT40 conducted power and power spectral density results updated as a result of conducted power retest.<br><br>No other changes required to the report as a result of retest. |
| Rev A            | 11 <sup>th</sup> October 2017 | Initial release.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Rev B            | 27 <sup>th</sup> October 2017 | Removed module photographs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| .                |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| .                |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

In the above table the latest report revision will replace all earlier versions.

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### 3. TEST RESULT CERTIFICATE

|                                                                                                         |                                                                                               |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Manufacturer:</b> HP Inc<br>1115 SE 164th Ave., Suite 210,<br>Vancouver,<br>Washington 98683,<br>USA | <b>Tested By:</b> MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton<br>California 94566 USA |
| <b>Model:</b> HP Part # 0960-4025 and<br>HP Part # 0960-4034                                            | <b>Telephone:</b> +1 925 462 0304                                                             |
| <b>Type Of Equipment:</b> WLAN BT Radio module                                                          | <b>Fax:</b> +1 925 462 0306                                                                   |
| <b>S/N's:</b> D80F99748D64, D80F99748D68                                                                |                                                                                               |
| <b>Test Date(s):</b> 7 - 26 July 2017, 14 September<br>2017, 5 <sup>th</sup> October 2017               | <b>Website:</b> www.micomlabs.com                                                             |

| STANDARD(S)                                   | TEST RESULTS       |
|-----------------------------------------------|--------------------|
| FCC CFR 47 Part 15 Subpart E 15.407 & RSS-247 | EQUIPMENT COMPLIES |

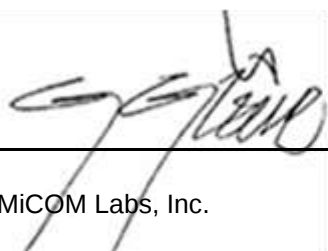
MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

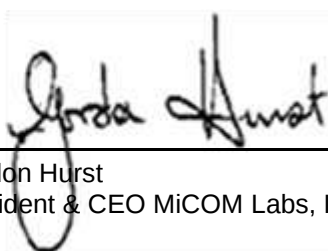
#### Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

**Approved & Released for MiCOM Labs, Inc. by:**



  
\_\_\_\_\_  
Graeme Grieve  
Quality Manager MiCOM Labs, Inc.

  
\_\_\_\_\_  
Gordon Hurst  
President & CEO MiCOM Labs, Inc.

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## 4. REFERENCES AND MEASUREMENT UNCERTAINTY

### 4.1. Normative References

| REF.  | PUBLICATION            | YEAR               | TITLE                                                                                                                                                                                                 |
|-------|------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I     | KDB 662911 D01 & D02   | Oct 31 2013        | Guidance for measurement of output emission of devices that employ single transmitter with multiple outputs or systems with multiple transmitters operating simultaneously in the same frequency band |
| II    | KDB 905462 D07 v02     | 22nd August 2016   | Test guidance to demonstrate compliance for U-NII devices subject to DFS requirements.                                                                                                                |
| III   | KDB 926956 D01 v02     | 22nd August 2016   | U-NII Device Transition Plan                                                                                                                                                                          |
| IV    | KDB 789033 D02 v01r04  | 2nd May 2017       | Guidelines for compliance testing of Unlicensed National Information Infrastructure (U-NII) Devices (Part 15, Subpart E)                                                                              |
| V     | A2LA                   | June 2015          | R105 - Requirement's When Making Reference to A2LA Accreditation Status                                                                                                                               |
| VI    | ANSI C63.10            | 2013               | American National Standard for Testing Unlicensed Wireless Devices                                                                                                                                    |
| VII   | ANSI C63.4             | 2014               | American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz                                  |
| VIII  | CISPR 32               | 2012               | Electromagnetic compatibility of multimedia equipment - Emission requirements                                                                                                                         |
| IX    | ETSI TR 100 028        | 2001-12            | Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics                                              |
| X     | FCC 06-96              | Jun 30 2006        | Memorandum Opinion and Order                                                                                                                                                                          |
| XI    | FCC 47 CFR Part 15.407 | 2016               | Radio Frequency Devices; Subpart E –Unlicensed National Information Infrastructure Devices                                                                                                            |
| XII   | ICES-003               | Issue 6 Jan 2016   | Spectrum Management and Telecommunications; Interference-Causing Equipment Standard. Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement.              |
| XIII  | M 3003                 | Edition 3 Nov.2012 | Expression of Uncertainty and Confidence in Measurements                                                                                                                                              |
| XIV   | RSS-247 Issue 2        | Feb 2017           | Digital Transmission Systems (DTSSs), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices                                                                          |
| XV    | RSS-Gen Issue 4        | November 2014      | General Requirements and Information for the Certification of Radiocommunication Equipment                                                                                                            |
| XVI   | KDB 644545 D03 v01     | 14th August 2014   | Guidance for IEEE 802.11ac New Rules                                                                                                                                                                  |
| XVII  | FCC 47 CFR Part 2.1033 | 2016               | FCC requirements and rules regarding photographs and test setup diagrams.                                                                                                                             |
| XVIII | KDB 905462 D02 v02     | April 8 2016       | Compliance Measurement Procedures for Unlicensed National Information Infrastructure devices operating in the 5250 to 5350 MHz and 5470 to 5725 MHz bands incorporating Dynamic Frequency Selection.  |

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## **4.2. Test and Uncertainty Procedure**

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.



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## 5. PRODUCT DETAILS AND TEST CONFIGURATIONS

### 5.1. Technical Details

| Details                          | Description                                                                                    |
|----------------------------------|------------------------------------------------------------------------------------------------|
| Purpose:                         | Test of the HP Inc 0960-4025 and 0960-4034 to FCC CFR 47 Part 15 Subpart E 15.407 and RSS-247. |
| Applicant:                       | HP Inc<br>1115 SE 164th Ave., Suite 210,<br>Vancouver,<br>Washington 98683,<br>USA             |
| Manufacturer:                    | HP Inc                                                                                         |
| Laboratory performing the tests: | MiCOM Labs, Inc.<br>575 Boulder Court<br>Pleasanton California 94566 USA                       |
| Test report reference number:    | MARS11-U9 Rev B WiFi/BT Module                                                                 |
| Date EUT received:               | 12 <sup>th</sup> June 2017                                                                     |
| Standard(s) applied:             | FCC CFR 47 Part 15 Subpart E 15.407                                                            |
| Dates of test (from - to):       | 7 - 25 July 2017, 14 September 2017                                                            |
| No of Units Tested:              | 2                                                                                              |
| Product Family Name:             | VCVRA-1712                                                                                     |
| Model(s):                        | Model: HP Inc.'s VCVRA-1712<br>Part numbers: 0960-4025 and 0960-4034                           |
| Location for use:                | Indoors                                                                                        |
| Declared Frequency Range(s):     | 5150 - 5250 MHz; 5250 - 5350 MHz; 5470 - 5725 MHz; 5725 - 5850 MHz;                            |
| Type of Modulation:              | OFDM                                                                                           |
| EUT Modes of Operation:          | 802.11a; 802.11n; HT-20; HT-40                                                                 |
| Declared Nominal Output Power:   | +15dBm                                                                                         |
| Transmit/Receive Operation:      | Transceiver - Full Duplex                                                                      |
| Rated Input Voltage and Current: | 3.3V+/-10%, 1A                                                                                 |
| Operating Temperature Range:     | Declared Range 0°C to 70°C                                                                     |
| ITU Emission Designator:         | 802.11a: 28M9D1D<br>802.11n - HT20: 33M0D1D<br>802.11n - HT40: 64M4D1D                         |
| Equipment Dimensions:            | 37mm x 40mm                                                                                    |
| Weight:                          | 0.3 oz                                                                                         |
| Hardware Rev:                    | V4                                                                                             |
| Software Rev:                    | P130                                                                                           |

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## **5.2. Scope Of Test Program**

### **HP Inc 0960-4025 and 0960-4034**

The scope of the test program was to test the HP Inc 0960-4025 and 0960-4034 in the frequency ranges 5150 - 5250 MHz; 5250 - 5350 MHz; 5470 - 5725 MHz; 5725 - 5850 MHz; for compliance against the following specifications:

### **FCC CFR 47 Part 15 Subpart E 15.407**

Compliance Measurement Procedures for Unlicensed National Information Infrastructure devices operating in the 5150 - 5250 MHz; 5725 - 5850 MHz bands and 5250 to 5350 MHz and 5470 to 5725 MHz bands incorporating Dynamic Frequency Selection.

### **Industry Canada RSS-247**

Digital Transmission Systems (DTSS), Frequency Hopping System (FHSs) and Licence-Exempt Local Area Network (LE-LEN) Devices

The product is available as 2 model variants;-

0960-4025 has U.FL connectors to enable connection to external antennas.

0960-4034 has integral antennas only.

### **PCB Manufacturing Variation**

Testing commenced on Rev 3.1 of the wireless device using VCVRA-1712 pcb's.

For manufacturability, HP agreed to remove an extra set of holes on the digital interface connector. This is designated as the Rev 4 design.

**Differences:** All traces and pads remained however holes are not drilled on the two extra connections, and thus the connector cannot be loaded into the wrong location.

**Verification:** The differences between Revision 3.1 and Revision 4 of the VCVRA-1712 radio were reviewed, tested and judged to have no significant effect on device compliance.



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### 5.3. Equipment Model(s) and Serial Number(s)

| Type    | Description                                              | Manufacturer | Model                                                                | Serial no.                             | Delivery Date              |
|---------|----------------------------------------------------------|--------------|----------------------------------------------------------------------|----------------------------------------|----------------------------|
| EUT     | 802.11 a/b/g/n SDIO dual band 2.4G/5GHz WLAN with BT/BLE | HP Inc       | Model: HP Inc.'s VCVRA-1712<br>Part numbers: 0960-4025 and 0960-4034 | D8:0F:99:74:8D:68<br>D8:0F:99:74:8D:64 | 12 <sup>th</sup> June 2017 |
| Support | Latitude Laptop, Linux                                   | Dell         | E6410                                                                | 654C3Q1                                | 12 <sup>th</sup> June 2017 |
| Support | STYX SD Adapter Board                                    | HP Inc       | AB_W8977_STYX_ADAPTER_V1                                             | -                                      | 12 <sup>th</sup> June 2017 |

The product is available as 2 model variants;-

0960-4025 has U.FL connectors to enable connection to external antennas.

0960-4034 has integral antennas only.

### 5.4. Antenna Details

| Type     | Manufacturer | Model             | Family | Gain (dBi) | BF Gain | Dir BW | X-Pol | Frequency Band (MHz) |
|----------|--------------|-------------------|--------|------------|---------|--------|-------|----------------------|
| integral | HP           | integral          | 5      | 3.8        | -       | 360    | -     | 5150 - 5250          |
| integral | HP           | integral          | 5      | 3.8        | -       | 360    | -     | 5250 - 5350          |
| integral | HP           | integral          | 5      | 3.8        | -       | 360    | -     | 5470 - 5725          |
| integral | HP           | integral          | 5      | 3.8        | -       | 360    | -     | 5725 - 5850          |
| external | YAGEO        | ANTX300P002B24553 | 5      | 2.3        | -       | 360    | -     | 5150 - 5250          |
| external | YAGEO        | ANTX300P002B24553 | 5      | 1.9        | -       | 360    | -     | 5250 - 5350          |
| external | YAGEO        | ANTX300P002B24553 | 5      | 1.0        | -       | 360    | -     | 5470 - 5725          |
| external | YAGEO        | ANTX300P002B24553 | 5      | 0.5        | -       | 360    | -     | 5725 - 5850          |

BF Gain - Beamforming Gain  
Dir BW - Directional BeamWidth  
X-Pol - Cross Polarization

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### 5.5. Cabling and I/O Ports

| Port Type | Max Cable Length | # of Ports | Screened | Conn Type | Data Type | Bit Rate |
|-----------|------------------|------------|----------|-----------|-----------|----------|
| 24        | 5                | 1          | --       | SD        | Data      | 10/100   |

### 5.6. Test Configurations

Results for the following configurations are provided in this report:

| Operational Mode(s)<br>(802.11a/b/g/n/ac) | Data Rate with Highest Power<br>MBit/s | Channel Frequency (MHz) |          |          |
|-------------------------------------------|----------------------------------------|-------------------------|----------|----------|
|                                           |                                        | Low                     | Mid      | High     |
| 5150 - 5250 MHz                           |                                        |                         |          |          |
| a                                         | 6                                      | 5,180.00                | 5,200.00 | 5,240.00 |
| HT-20                                     | 6.5                                    | 5,180.00                | 5,200.00 | 5,240.00 |
| HT-40                                     | 13.5                                   | 5,190.00                | --       | 5,230.00 |
| 5250 - 5350 MHz                           |                                        |                         |          |          |
| a                                         | 6                                      | 5,260.00                | 5,300.00 | 5,320.00 |
| HT-20                                     | 6.5                                    | 5,260.00                | 5,300.00 | 5,320.00 |
| HT-40                                     | 13.5                                   | 5,270.00                | --       | 5,310.00 |
| 5470 - 5725 MHz                           |                                        |                         |          |          |
| a                                         | 6                                      | 5,500.00                | 5,580.00 | 5,720.00 |
| HT-20                                     | 6.5                                    | 5,500.00                | 5,580.00 | 5,720.00 |
| HT-40                                     | 13.5                                   | 5,510.00                | 5,550.00 | 5,710.00 |
| 5725 - 5850 MHz                           |                                        |                         |          |          |
| a                                         | 6                                      | 5,745.00                | 5,785.00 | 5,825.00 |
| HT-20                                     | 6.5                                    | 5,745.00                | 5,785.00 | 5,825.00 |
| HT-40                                     | 13.5                                   | 5,755.00                | --       | 5,795.00 |

### 5.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:

1. NONE

### 5.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:

1. NONE

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## 6. TEST SUMMARY

### List of Measurements

| Test Header                             | Result         | Data Link                 |
|-----------------------------------------|----------------|---------------------------|
| Peak Transmit Power                     | Complies       | <a href="#">View Data</a> |
| 26 dB & 99% Bandwidth                   | Complies       | <a href="#">View Data</a> |
| 6 dB & 99% Bandwidth                    | Complies       | <a href="#">View Data</a> |
| Power Spectral Density                  | Complies       | <a href="#">View Data</a> |
| Dynamic Frequency Selection (DFS)       | Complies       | -                         |
| Channel Close / Transmission Time       | Complies       | <a href="#">View Data</a> |
| Non-Occupancy Period                    | Complies       | <a href="#">View Data</a> |
| Radiated                                | Complies       | -                         |
| TX Spurious & Restricted Band Emissions | Complies       | -                         |
| Integral                                | Complies       | <a href="#">View Data</a> |
| YAGEO ANT X300P002B24553                | Complies       | <a href="#">View Data</a> |
| Restricted Edge & Band-Edge Emissions   | Complies       | -                         |
| Integral                                | Complies       | <a href="#">View Data</a> |
| YAGEO ANT X300P002B24553                | Complies       | <a href="#">View Data</a> |
| Digital Emissions                       | Complies       | <a href="#">View Data</a> |
| AC Wireline                             | Not Applicable | See Note 1                |

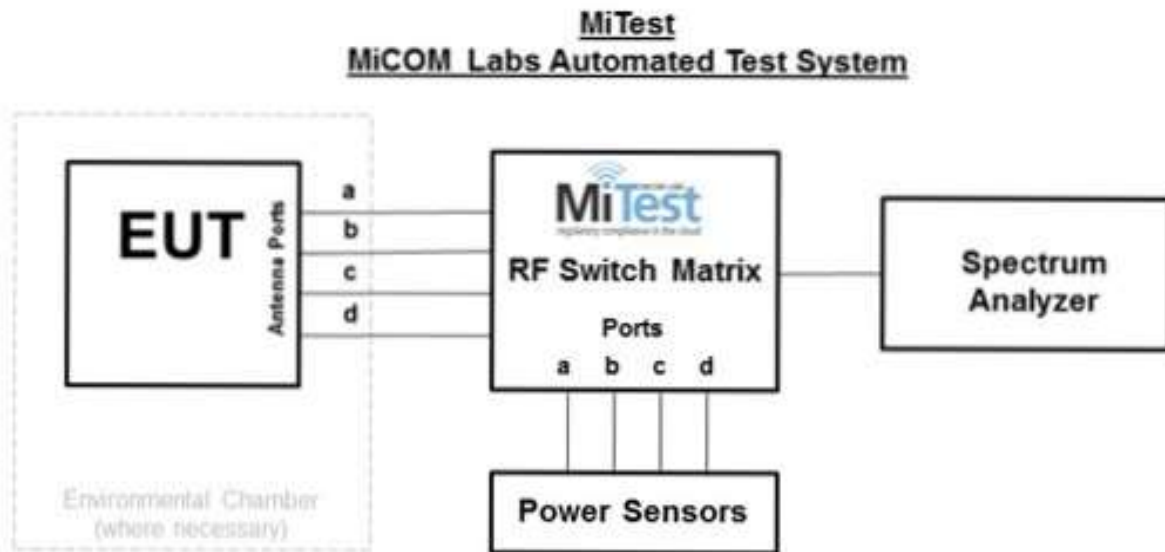
Note 1: EUT is powered by DC

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## 7. TEST EQUIPMENT CONFIGURATION(S)

### 7.1. Conducted

Conducted RF Emission Test Set-up(s) The following tests were performed using the conducted test set-up shown in the diagram below.



### Conducted Test Measurement Setup

A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.

| Asset# | Description                                    | Manufacturer    | Model#    | Serial#    | Calibration Due Date |
|--------|------------------------------------------------|-----------------|-----------|------------|----------------------|
| 127    | Power Supply                                   | HP              | 6674A     | US36370530 | Cal when used        |
| 158    | Barometer/Thermometer                          | Control Company | 4196      | E2846      | 30 Nov 2017          |
| 248    | Resistance Thermometer                         | Thermotronics   | GR2105-02 | 9340 #1    | 21 Oct 2017          |
| 287    | Rohde & Schwarz 40 GHz Receiver                | Rhode & Schwarz | ESIB40    | 100201     | 2 May 2018           |
| 376    | USB 10MHz - 18GHz Average Power Sensor         | Agilent         | U2000A    | MY51440005 | 23 Oct 2017          |
| 378    | Rohde & Schwarz 40 GHz Receiver with Generator | Rhode & Schwarz | ESIB40    | 100107/040 | 4 Nov 2017           |
| 381    | 4x4 RF Switch Box                              | MiCOM Labs      | MiTest RF | MIC002     | 2 Oct 2017           |

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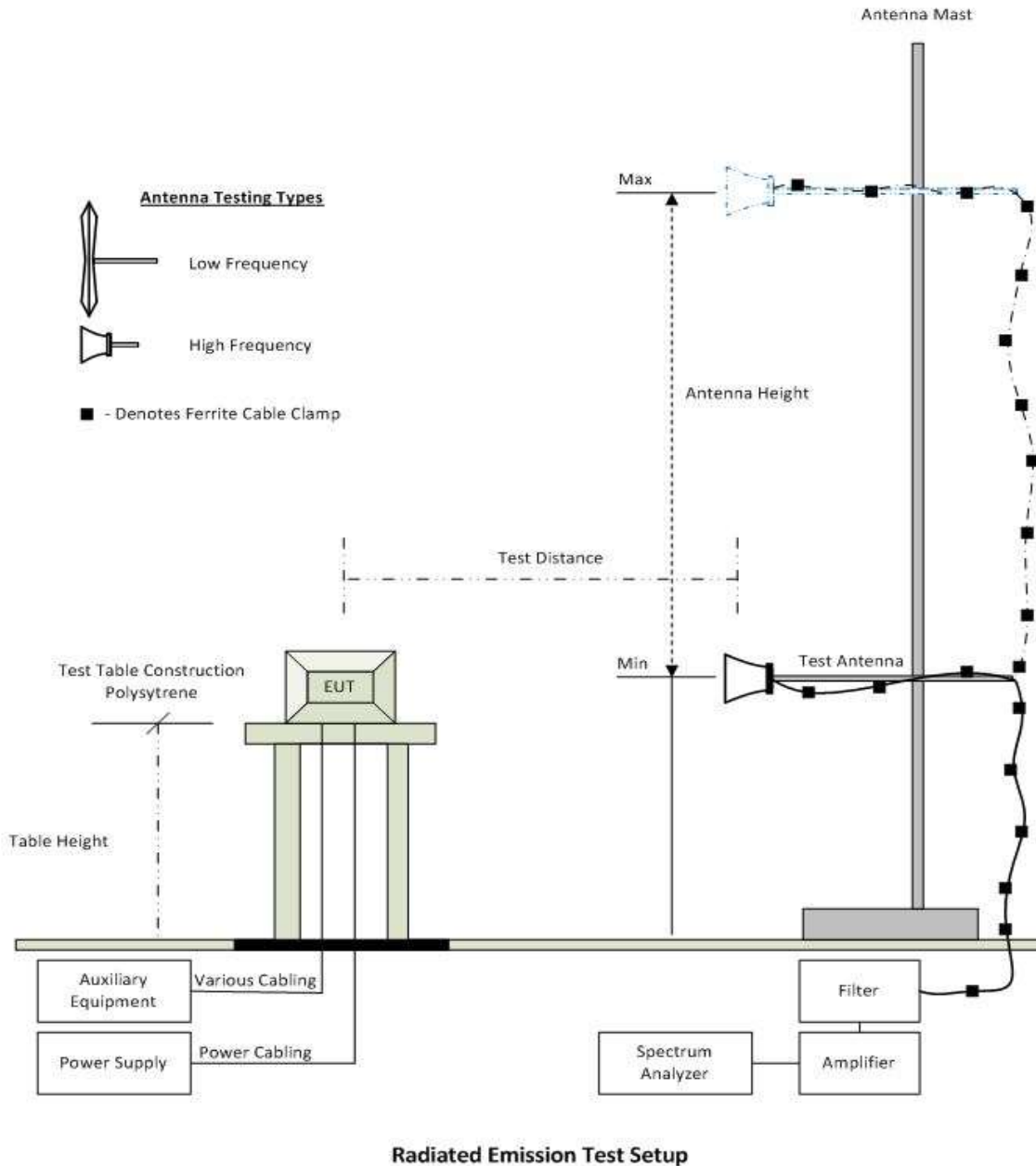
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|             |                                                       |                      |                 |               |              |
|-------------|-------------------------------------------------------|----------------------|-----------------|---------------|--------------|
|             |                                                       |                      | Switch Box      |               |              |
| 398         | MiTest RF Conducted Test Software                     | MiCOM                | MiTest ATS      | Version 4.1   | Not Required |
| 419         | Laptop with Labview Software                          | Lenova               | W520            | TS02          | Not Required |
| 420         | USB to GPIB Interface                                 | National Instruments | GPIB-USB HS     | 1346738       | Not Required |
| 440         | USB Wideband Power Sensor                             | Boonton              | 55006           | 9178          | 25 Sep 2017  |
| 442         | USB Wideband Power Sensor                             | Boonton              | 55006           | 9181          | 6 Oct 2017   |
| 445         | PoE Injector                                          | D-Link               | DPE-101GL       | QTAH1E2000625 | Not Required |
| 460         | Dell Computer with installation of MiTest executable. | Dell                 | Optiplex330     | BC944G1       | Not Required |
| 461         | Spectrum Analyzer                                     | Agilent              | E4440A          | MY46185537    | 13 Nov 2017  |
| 493         | USB Wideband Power Sensor                             | Boonton              | 55006           | 9634          | 10 Mar 2018  |
| 494         | USB Wideband Power Sensor                             | Boonton              | 55006           | 9726          | 10 Mar 2018  |
| 74          | Environmental Chamber Chamber 3                       | Tenney               | TTC             | 12808-1       | 29 Sep 2017  |
| RF#2 GPIB#1 | GPIB cable to Power Supply                            | HP                   | GPIB            | None          | Not Required |
| RF#2 SMA#1  | EUT to Mitest box port 1                              | Flexco               | SMA Cable port1 | None          | 2 Oct 2017   |
| RF#2 SMA#2  | EUT to Mitest box port 2                              | Flexco               | SMA Cable port2 | None          | 2 Oct 2017   |
| RF#2 SMA#3  | EUT to Mitest box port 3                              | Flexco               | SMA Cable port3 | None          | 2 Oct 2017   |
| RF#2 SMA#4  | EUT to Mitest box port 4                              | Flexco               | SMA Cable port4 | None          | 2 Oct 2017   |
| RF#2 SMA#SA | Mitest box to SA                                      | Flexco               | SMA Cable SA    | None          | 2 Oct 2017   |
| RF#2 USB#1  | USB Cable to Mitest Box                               | Dynex                | USB Cable       | None          | Not Required |

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## 7.2. Radiated Emissions - 3m Chamber

The following tests were performed using the radiated test set-up shown in the diagram below.  
Radiated emissions below 1GHz. Radiated Emissions above 1GHz.



A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.



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| Asset# | Description                                       | Manufacturer         | Model#               | Serial#    | Calibration Due Date |
|--------|---------------------------------------------------|----------------------|----------------------|------------|----------------------|
| 158    | Barometer/Thermometer                             | Control Company      | 4196                 | E2846      | 30 Nov 2017          |
| 170    | Video System Controller for Semi Anechoic Chamber | Panasonic            | WV-CU101             | 04R08507   | Not Required         |
| 287    | Rohde & Schwarz 40 GHz Receiver                   | Rhode & Schwarz      | ESIB40               | 100201     | 2 May 2018           |
| 301    | 5470 to 5725 MHz Notch Filter                     | Microtronics         | RBC50704             | 001        | 30 Oct 2017          |
| 302    | 5150 to 5350 MHz Notch Filter                     | Microtronics         | BRC50703             | 002        | 30 Oct 2017          |
| 303    | 5725 to 5875 MHz Notch filter                     | Microtronics         | BRC50705             | 003        | 30 Oct 2017          |
| 330    | Variac 0-280 Vac                                  | Staco Energy Co      | 3PN1020B             | 0546       | Cal when used        |
| 338    | Sunol 30 to 3000 MHz Antenna                      | Sunol                | JB3                  | A052907    | 30 Oct 2017          |
| 341    | 900MHz Notch Filter                               | EWT                  | EWT-14-0199          | H1         | 30 Oct 2017          |
| 342    | 2.4 GHz Notch Filter                              | EWT                  | EWT-14-0203          | H1         | 30 Oct 2017          |
| 343    | 5.15 GHz Notch Filter                             | EWT                  | EWT-14-0200          | H1         | 30 Oct 2017          |
| 344    | 5.35 GHz Notch Filter                             | EWT                  | EWT-14-0201          | H1         | 30 Oct 2017          |
| 345    | 5.46 GHz Notch Filter                             | EWT                  | EWT-14-0202          | H1         | 30 Oct 2017          |
| 373    | 26III RMS Multimeter                              | Fluke                | Fluke 26 series III  | 76080720   | 26 Oct 2017          |
| 378    | Rohde & Schwarz 40 GHz Receiver with Generator    | Rhode & Schwarz      | ESIB40               | 100107/040 | 4 Nov 2017           |
| 393    | DC - 1050 MHz Low Pass Filter                     | Microcircuits        | VLFX-1050            | N/A        | 30 Oct 2017          |
| 396    | 2.4 GHz Notch Filter                              | Microtronics         | BRM50701             | 001        | 30 Oct 2017          |
| 397    | Amp 10 - 2500MHz                                  | MiCOM Labs           | Amp 10 - 2500 MHz    | NA         | 9 Oct 2017           |
| 399    | ETS 1-18 GHz Horn Antenna                         | ETS                  | 3117                 | 00154575   | 10 Oct 2017          |
| 406    | Amplifier for Radiated Emissions                  | MiCOM Labs           | 40dB 1 to 18GHz Amp  | 0406       | 9 Oct 2017           |
| 410    | Desktop Computer                                  | Dell                 | Inspiron 620         | WS38       | Not Required         |
| 411    | Mast/Turntable Controller                         | Sunol Sciences       | SC98V                | 060199-1D  | Not Required         |
| 412    | USB to GPIB Interface                             | National Instruments | GPIB-USB HS          | 11B8DC2    | Not Required         |
| 413    | Mast Controller                                   | Sunol Science        | TWR95-4              | 030801-3   | Not Required         |
| 414    | DC Power Supply 0-60V                             | HP                   | 6274                 | 1029A01285 | Cal when used        |
| 415    | Turntable Controller                              | Sunol Sciences       | Turntable Controller | None       | Not Required         |

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|          |                                               |                 |                                         |             |               |
|----------|-----------------------------------------------|-----------------|-----------------------------------------|-------------|---------------|
| 416      | Gigabit ethernet filter                       | ETS-Lingren     | Gigafoil 260366                         | None        | Not Required  |
| 447      | MiTest Rad Emissions Test Software            | MiCOM           | Rad Emissions Test Software Version 1.0 | 447         | Not Required  |
| 462      | Schwarzbeck cable from Antenna to Amplifier.  | Schwarzbeck     | AK 9513                                 | 462         | 30 Oct 2017   |
| 463      | Schwarzbeck cable from Amplifier to Bulkhead. | Schwarzbeck     | AK 9513                                 | 463         | 30 Oct 2017   |
| 464      | Schwarzbeck cable from Bulkhead to Receiver   | Schwarzbeck     | AK 9513                                 | 464         | 30 Oct 2017   |
| 480      | Cable - Bulkhead to Amp                       | SRC Haverhill   | 157-3050360                             | 480         | 30 Oct 2017   |
| 481      | Cable - Bulkhead to Receiver                  | SRC Haverhill   | 151-3050787                             | 481         | 30 Oct 2017   |
| 482      | Cable - Amp to Antenna                        | SRC Haverhill   | 157-3051574                             | 482         | 30 Oct 2017   |
| 87       | Uninterruptible Power Supply                  | Falcon Electric | ED2000-1/2LC                            | F3471 02/01 | Cal when used |
| VLF-1700 | Low pass filter DC-1700 MHz                   | Mini Circuits   | VLF-1700                                | None        | 30 Oct 2017   |

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### **7.3. DFS - Conducted**

**EUT Type:** Client without radar detection

**Frequency band(s):** 5,250 - 5,350 MHz and 5,470 – 5,725 MHz

**Uniform Loading:** For the above frequency band(s) the manufacturer declared that the device provides an aggregate uniform loading of the spectrum across all devices by selecting an operating channel among the available channels using a random algorithm.

**Test Environment:** Conducted

**Antenna Gain used for Testing:** 3.8 dBi

**802.11a:** Transmit Power: 18 dBm Data Rate: 6 Mbit/s Duty Cycle: 17%

**802.11n HT-40:** Transmit Power: 18 dBm Data Rate: 18 Mbit/s Duty Cycle: 17%

**Number of Antenna Chains:** 1

#### **Test Communication Throughput Methodology**

The requisite MPEG video file ("TestFile.mpg" available on the NTIA website at the following link <http://ntiacsd.ntia.doc.gov/dfs/>) is used during this video stream.

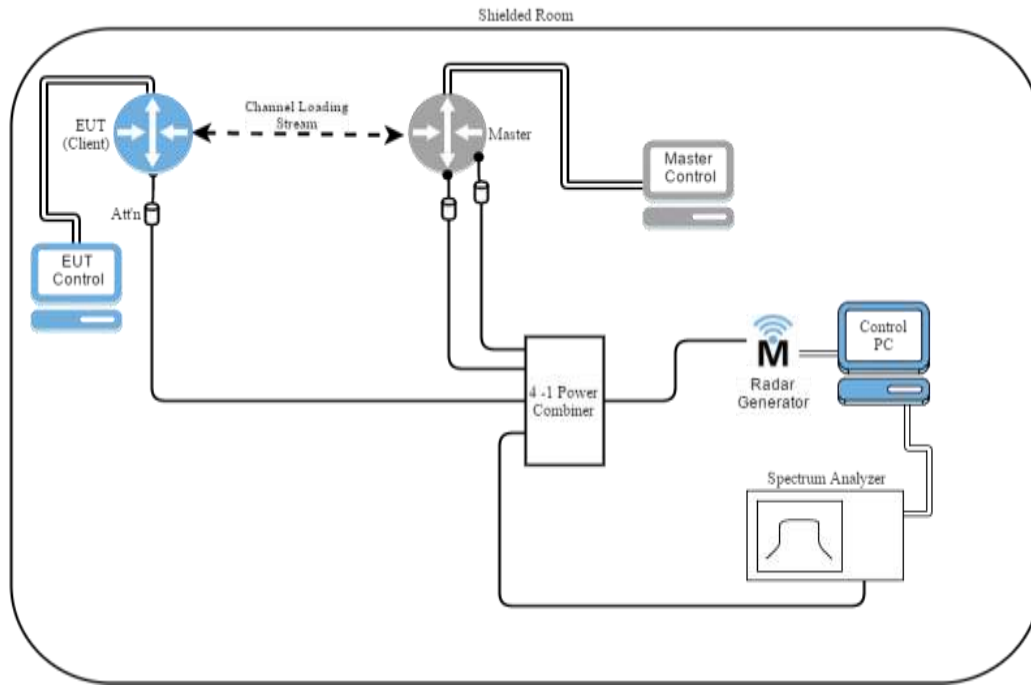
**EUT Software Version:** SD8977-16.68.1.p130-C3X16C248-GPL-(FP68)

#### **Test Environmental Conditions - Ambient:**

Temperature: 17 to 23 °C

Relative humidity: 31 to 57%

Pressure: 999 to 1012 mbar



A full system calibration was performed on the test station and any resulting system losses (or gains) were taken into account in the production of all final measurement data.

| Asset#     | Description                      | Manufacturer         | Model#            | Serial#    | Calibration Due Date |
|------------|----------------------------------|----------------------|-------------------|------------|----------------------|
| 158        | Barometer/Thermometer            | Control Company      | 4196              | E2846      | 30 Nov 2017          |
| 299        | Test Software DFS Test System    | Aeroflex             | DFS test Software | V2.7.0     | Not Required         |
| 359        | DFS System                       | Aeroflex             | PXI-1042          | 300001/004 | 10 Jan 2018          |
| 417        | Laptop for DFS with DFS software | Lenova               | W520              | DFS        | Not Required         |
| 418        | PCI-e interface card             | National Instruments | Express 8360      | 174AAC5    | Not Required         |
| 422        | Splitter/Combiner                | Pasternack           | PE 2031           | 001        | Cal when used        |
| 495        | RF Power Divider                 | Micon Precise Corp   | 91002             | 495        | Cal when used        |
| 71         | Spectrum Analyzer 9KHz-50GHz     | HP                   | 8565E             | 3425A00181 | 6 Aug 2018           |
| DFS PCIe#1 | PCIe cable for Aeroflex          | National Instruments | PCIe cable        | None       | Not Required         |
| DFS SMA#1  | SMA Cable for DFS                | Megaphase            | SMA Cable         | None       | Cal when used        |
| DFS SMA#2  | SMA Cable for DFS                | Megaphase            | SMA Cable         | None       | Cal when used        |
| DFS SMA#3  | SMA Cable for DFS                | Megaphase            | SMA Cable         | None       | Cal when used        |

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## 8. MEASUREMENT AND PRESENTATION OF TEST DATA

The measurement and graphical data presented in this test report was generated automatically using state-of-the-art technology creating an easy to read report structure. Numerical measurement data is separated from supporting graphical data (plots) through hyperlinks. Numerical measurement data can be reviewed without scrolling through numerous graphical pages to arrive at the next data matrix.

Plots have been relegated into the Appendix 'Graphical Data'.

Test and report automation was performed by [MiTest](#). [MiTest](#) is an automated test system developed by MiCOM Labs. [MiTest](#) is the first cloud based modular test system enabling end-to-end automation of regulatory compliance testing for conducted RF testing.



The MiCOM Labs “MiTest” Automated Test System“ (Patent Pending)

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## 9. TEST RESULTS

### 9.1. Peak Transmit Power

| Conducted Test Conditions for Maximum Conducted Output Power |                                |                            |             |
|--------------------------------------------------------------|--------------------------------|----------------------------|-------------|
| <b>Standard:</b>                                             | FCC CFR 47:15.407              | <b>Ambient Temp. (°C):</b> | 24.0 - 27.5 |
| <b>Test Heading:</b>                                         | Maximum Conducted Output Power | <b>Rel. Humidity (%):</b>  | 32 - 45     |
| <b>Standard Section(s):</b>                                  | 15.407 (a)                     | <b>Pressure (mBars):</b>   | 999 - 1001  |
| <b>Reference Document(s):</b>                                | See Normative References       |                            |             |

#### Test Procedure for Maximum Conducted Output Power Measurement

Method PM (Measurement using an RF average power meter). KDB 789033 defines a methodology using an average wideband power meter. Measurements were made while the EUT was operating in a continuous transmission mode (100% duty cycle) at the appropriate center frequency. All operational modes and frequency bands were measured independently and the resultant calculated. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured and reported separately. A summation ( $\Sigma$ ) of each antenna port output power is provided which includes any offset due to Duty Cycle Correction Factor (DCCF). Testing was performed under ambient conditions at nominal voltage.

Test configuration and setup used for the measurement was per the Conducted Test Set-up section specified in this document.

Supporting Information

Calculated Power =  $A + G + Y + 10 \log (1/x)$  dBm

$A$  = Total Power [ $10 \cdot \log_{10} (10^{a/10} + 10^{b/10} + 10^{c/10} + 10^{d/10})$ ]

$G$  = Antenna Gain

$Y$  = Beamforming Gain

$x$  = Duty Cycle (average power measurements only)

#### Limits Maximum Conducted Output Power

##### Operating Frequency Band 5150-5250 MHz

###### 15.407 (a)(1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.



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(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **Operating Frequency Band 5250-5350 and 5470 – 5725 MHz**

##### **15. 407 (a)(2)**

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **Operating Frequency Band 5725 – 5850 MHz**

##### **15. 407 (a)(3)**

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.



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#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 2.30           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5180.0         | 14.60                                 |   |   |   | 14.60                  | --                      | 24.0  | -9.4   |                   |
| 5200.0         | 15.90                                 |   |   |   | 15.90                  | --                      | 24.0  | -8.1   |                   |
| 5240.0         | 14.50                                 |   |   |   | 14.50                  | --                      | 24.0  | -9.5   |                   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 2.30           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5180.0         | 14.56                                 |   |   |   | 14.56                  | --                      | 24.0  | -9.44  |                   |
| 5200.0         | 16.58                                 |   |   |   | 16.58                  | --                      | 24.0  | -7.42  |                   |
| 5240.0         | 14.16                                 |   |   |   | 14.16                  | --                      | 24.0  | -9.84  |                   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 2.30           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5190.0         | 11.29                                 |   |   |   | 11.29                  | --                      | 24.0  | -12.71 |                   |
| 5230.0         | 14.83                                 |   |   |   | 14.83                  | --                      | 24.0  | -9.17  |                   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.90           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5260.0         | 16.23                                 |   |   |   | 16.23                  | 43.788                  | 24.00 | -7.77  |                   |
| 5300.0         | 16.01                                 |   |   |   | 16.01                  | 44.790                  | 24.00 | -7.99  |                   |
| 5320.0         | 14.80                                 |   |   |   | 14.80                  | 43.788                  | 24.00 | -9.20  |                   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.90           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5260.0         | 16.13                                 |   |   |   | 16.13                  | 43.888                  | 24.00 | -7.87  |                   |
| 5300.0         | 15.93                                 |   |   |   | 15.93                  | 44.589                  | 24.00 | -8.07  |                   |
| 5320.0         | 13.05                                 |   |   |   | 13.05                  | 43.487                  | 24.00 | -10.95 |                   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 1.90           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5270.0         | 15.19                                 |   |   |   | 15.19                  | 97.655                  | 24.00 | -8.81  |                   |
| 5310.0         | 11.57                                 |   |   |   | 11.57                  | 98.317                  | 24.00 | -12.43 |                   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

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#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.00           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5500.0         | 14.51                                 |   |   |   | 14.51                  | 43.186                  | 24.00 | -9.49  |                   |
| 5580.0         | 15.41                                 |   |   |   | 15.41                  | 44.389                  | 24.00 | -8.59  |                   |
| 5720.0         | 15.55                                 |   |   |   | 15.55                  | 44.188                  | 24.00 | -8.45  |                   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.00           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5500.0         | 14.45                                 |   |   |   | 14.45                  | 43.687                  | 24.00 | -9.55  |                   |
| 5580.0         | 17.28                                 |   |   |   | 17.28                  | 44.489                  | 24.00 | -6.72  |                   |
| 5720.0         | 17.66                                 |   |   |   | 17.66                  | 44.188                  | 24.00 | -6.34  |                   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

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#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 1.00           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5510.0         | 11.69                                 |   |   |   | 11.69                  | 44.820                  | 24.00 | -12.31 | 14.00             |
| 5550.0         | 17.28                                 |   |   |   | 17.28                  | 44.820                  | 24.00 | -6.72  | 22.00             |
| 5710.0         | 16.95                                 |   |   |   | 16.95                  | 39.840                  | 24.00 | -7.05  | 22.00             |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

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#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 0.50           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5745.0         | 17.48                                 |   |   |   | 17.48                  | --                      | 30.00 | -12.52 | 22.00             |
| 5785.0         | 17.45                                 |   |   |   | 17.45                  | --                      | 30.00 | -12.55 | 22.00             |
| 5825.0         | 17.48                                 |   |   |   | 17.48                  | --                      | 30.00 | -12.52 | 22.00             |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 0.50           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5745.0         | 16.44                                 |   |   |   | 16.44                  | --                      | 30.00 | -13.56 | 21.00             |
| 5785.0         | 17.41                                 |   |   |   | 17.41                  | --                      | 30.00 | -12.59 | 22.00             |
| 5825.0         | 17.55                                 |   |   |   | 17.55                  | --                      | 30.00 | -12.45 | 22.00             |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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#### Equipment Configuration for Peak Transmit Power

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 0.50           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Conducted Output Power (dBm) |   |   |   | Calculated Total Power | Minimum 26 dB Bandwidth | Limit | Margin | EUT Power Setting |
|----------------|---------------------------------------|---|---|---|------------------------|-------------------------|-------|--------|-------------------|
|                | Port(s)                               |   |   |   |                        |                         |       |        |                   |
| MHz            | a                                     | b | c | d | Σ Port(s) dBm          | MHz                     | dBm   | dB     |                   |
| 5755.0         | 16.57                                 |   |   |   | 16.57                  | --                      | 30.00 | -13.43 |                   |
| 5795.0         | 16.73                                 |   |   |   | 16.73                  | --                      | 30.00 | -13.27 |                   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                 |
|--------------------------|---------------------------------|
| Work Instruction:        | WI-01 MEASURING RF OUTPUT POWER |
| Measurement Uncertainty: | ±1.33 dB                        |

The above measurements are true pulse readings and therefore a Duty Cycling correction factor is not required.

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## 9.2. 26 dB & 99% Bandwidth

| Conducted Test Conditions for 26 dB and 99% Bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                          |                     |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------|-------------|
| Standard:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | FCC CFR 47:15.407        | Ambient Temp. (°C): | 24.0 - 27.5 |
| Test Heading:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 26 dB and 99 % Bandwidth | Rel. Humidity (%):  | 32 - 45     |
| Standard Section(s):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15.407 (a)               | Pressure (mBars):   | 999 - 1001  |
| Reference Document(s):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | See Normative References |                     |             |
| <b>Test Procedure for 26 dB and 99% Bandwidth Measurement</b><br>The bandwidth at 26 dB and 99 % is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency. The Resolution Bandwidth was set to approximately 1% of the emission bandwidth.<br>Testing was performed under ambient conditions at nominal voltage. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured and reported.<br><br>Test configuration and setup used for the measurement was per the Conducted Test Set-up section specified in this document. |                          |                     |             |

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#### Equipment Configuration for 26 dB & 99% Occupied Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 2.30           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 26 dB Bandwidth (MHz) |   |   |   | 26 dB Bandwidth (MHz) |        |  |  |
|----------------|--------------------------------|---|---|---|-----------------------|--------|--|--|
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5180.0         | <a href="#">47.295</a>         |   |   |   | 47.295                | 47.295 |  |  |
| 5200.0         | <a href="#">43.988</a>         |   |   |   | 43.988                | 43.988 |  |  |
| 5240.0         | <a href="#">47.194</a>         |   |   |   | 47.194                | 47.194 |  |  |
|                |                                |   |   |   |                       |        |  |  |
| Test Frequency | Measured 99% Bandwidth (MHz)   |   |   |   | 99% Bandwidth (MHz)   |        |  |  |
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5180.0         | <a href="#">33.567</a>         |   |   |   | 33.567                | 33.567 |  |  |
| 5200.0         | <a href="#">28.858</a>         |   |   |   | 28.858                | 28.858 |  |  |
| 5240.0         | <a href="#">33.267</a>         |   |   |   | 33.267                | 33.267 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

Note: click the links in the above matrix to view the graphical image (plot).

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#### Equipment Configuration for 26 dB & 99% Occupied Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 2.30           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 26 dB Bandwidth (MHz) |   |   |   | 26 dB Bandwidth (MHz) |        |  |  |
|----------------|--------------------------------|---|---|---|-----------------------|--------|--|--|
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5180.0         | <a href="#">48.196</a>         |   |   |   | 48.196                | 48.196 |  |  |
| 5200.0         | <a href="#">48.196</a>         |   |   |   | 48.196                | 48.196 |  |  |
| 5240.0         | <a href="#">46.493</a>         |   |   |   | 46.493                | 46.493 |  |  |
| Test Frequency | Measured 99% Bandwidth (MHz)   |   |   |   | 99% Bandwidth (MHz)   |        |  |  |
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5180.0         | <a href="#">33.467</a>         |   |   |   | 33.467                | 33.467 |  |  |
| 5200.0         | <a href="#">32.966</a>         |   |   |   | 32.966                | 32.966 |  |  |
| 5240.0         | <a href="#">33.367</a>         |   |   |   | 33.367                | 33.367 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

Note: click the links in the above matrix to view the graphical image (plot).

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**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
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#### Equipment Configuration for 26 dB & 99% Occupied Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 2.30           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 26 dB Bandwidth (MHz) |   |   |   | 26 dB Bandwidth (MHz) |        |  |  |
|----------------|--------------------------------|---|---|---|-----------------------|--------|--|--|
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5190.0         | <a href="#">98.317</a>         |   |   |   | 98.317                | 98.317 |  |  |
| 5230.0         | <a href="#">96.994</a>         |   |   |   | 96.994                | 96.994 |  |  |

| Test Frequency | Measured 99% Bandwidth (MHz) |   |   |   | 99% Bandwidth (MHz) |        |  |  |
|----------------|------------------------------|---|---|---|---------------------|--------|--|--|
|                | Port(s)                      |   |   |   |                     |        |  |  |
| MHz            | a                            | b | c | d | Highest             | Lowest |  |  |
| 5190.0         | <a href="#">64.369</a>       |   |   |   | 64.369              | 64.369 |  |  |
| 5230.0         | <a href="#">65.251</a>       |   |   |   | 65.251              | 65.251 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

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#### Equipment Configuration for 26 dB & 99% Occupied Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.90           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 26 dB Bandwidth (MHz) |   |   |   | 26 dB Bandwidth (MHz) |        |  |  |
|----------------|--------------------------------|---|---|---|-----------------------|--------|--|--|
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5260.0         | <a href="#">43.788</a>         |   |   |   | 43.788                | 43.788 |  |  |
| 5300.0         | <a href="#">44.790</a>         |   |   |   | 44.790                | 44.790 |  |  |
| 5320.0         | <a href="#">43.788</a>         |   |   |   | 43.788                | 43.788 |  |  |
| Test Frequency | Measured 99% Bandwidth (MHz)   |   |   |   | 99% Bandwidth (MHz)   |        |  |  |
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5260.0         | <a href="#">28.657</a>         |   |   |   | 28.657                | 28.657 |  |  |
| 5300.0         | <a href="#">30.060</a>         |   |   |   | 30.060                | 30.060 |  |  |
| 5320.0         | <a href="#">29.359</a>         |   |   |   | 29.359                | 29.359 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

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#### Equipment Configuration for 26 dB & 99% Occupied Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.90           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 26 dB Bandwidth (MHz) |   |   |   | 26 dB Bandwidth (MHz) |        |  |  |
|----------------|--------------------------------|---|---|---|-----------------------|--------|--|--|
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5260.0         | <a href="#">43.888</a>         |   |   |   | 43.888                | 43.888 |  |  |
| 5300.0         | <a href="#">44.589</a>         |   |   |   | 44.589                | 44.589 |  |  |
| 5320.0         | <a href="#">43.487</a>         |   |   |   | 43.487                | 43.487 |  |  |
| Test Frequency | Measured 99% Bandwidth (MHz)   |   |   |   | 99% Bandwidth (MHz)   |        |  |  |
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5260.0         | <a href="#">28.557</a>         |   |   |   | 28.557                | 28.557 |  |  |
| 5300.0         | <a href="#">29.960</a>         |   |   |   | 29.960                | 29.960 |  |  |
| 5320.0         | <a href="#">29.359</a>         |   |   |   | 29.359                | 29.359 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

Note: click the links in the above matrix to view the graphical image (plot).

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#### Equipment Configuration for 26 dB & 99% Occupied Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 1.90           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 26 dB Bandwidth (MHz) |   |   |   | 26 dB Bandwidth (MHz) |        |  |  |
|----------------|--------------------------------|---|---|---|-----------------------|--------|--|--|
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5270.0         | <a href="#">97.655</a>         |   |   |   | 97.655                | 97.655 |  |  |
| 5310.0         | <a href="#">98.317</a>         |   |   |   | 98.317                | 98.317 |  |  |
|                |                                |   |   |   |                       |        |  |  |
| Test Frequency | Measured 99% Bandwidth (MHz)   |   |   |   | 99% Bandwidth (MHz)   |        |  |  |
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5270.0         | <a href="#">62.605</a>         |   |   |   | 62.605                | 62.605 |  |  |
| 5310.0         | <a href="#">65.912</a>         |   |   |   | 65.912                | 65.912 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

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#### Equipment Configuration for 26 dB & 99% Occupied Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.00           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 26 dB Bandwidth (MHz) |   |   |   | 26 dB Bandwidth (MHz) |        |  |  |
|----------------|--------------------------------|---|---|---|-----------------------|--------|--|--|
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5500.0         | <a href="#">43.186</a>         |   |   |   | 43.186                | 43.186 |  |  |
| 5580.0         | <a href="#">44.389</a>         |   |   |   | 44.389                | 44.389 |  |  |
| 5720.0         | <a href="#">44.188</a>         |   |   |   | 44.188                | 44.188 |  |  |
|                |                                |   |   |   |                       |        |  |  |
| Test Frequency | Measured 99% Bandwidth (MHz)   |   |   |   | 99% Bandwidth (MHz)   |        |  |  |
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5500.0         | <a href="#">27.856</a>         |   |   |   | 27.856                | 27.856 |  |  |
| 5580.0         | <a href="#">29.359</a>         |   |   |   | 29.359                | 29.359 |  |  |
| 5720.0         | <a href="#">28.457</a>         |   |   |   | 28.457                | 28.457 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

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#### Equipment Configuration for 26 dB & 99% Occupied Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.00           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 26 dB Bandwidth (MHz) |   |   |   | 26 dB Bandwidth (MHz) |        |  |  |
|----------------|--------------------------------|---|---|---|-----------------------|--------|--|--|
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5500.0         | <a href="#">43.687</a>         |   |   |   | 43.687                | 43.687 |  |  |
| 5580.0         | <a href="#">44.489</a>         |   |   |   | 44.489                | 44.489 |  |  |
| 5720.0         | <a href="#">44.188</a>         |   |   |   | 44.188                | 44.188 |  |  |

| Test Frequency | Measured 99% Bandwidth (MHz) |   |   |   | 99% Bandwidth (MHz) |        |  |  |
|----------------|------------------------------|---|---|---|---------------------|--------|--|--|
|                | Port(s)                      |   |   |   |                     |        |  |  |
| MHz            | a                            | b | c | d | Highest             | Lowest |  |  |
| 5500.0         | <a href="#">27.655</a>       |   |   |   | 27.655              | 27.655 |  |  |
| 5580.0         | <a href="#">29.158</a>       |   |   |   | 29.158              | 29.158 |  |  |
| 5720.0         | <a href="#">28.457</a>       |   |   |   | 28.457              | 28.457 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

Note: click the links in the above matrix to view the graphical image (plot).

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#### Equipment Configuration for 26 dB & 99% Occupied Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 1.00           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 26 dB Bandwidth (MHz) |   |   |   | 26 dB Bandwidth (MHz) |        |  |  |
|----------------|--------------------------------|---|---|---|-----------------------|--------|--|--|
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5510.0         | <a href="#">44.820</a>         |   |   |   | 44.820                | 44.820 |  |  |
| 5550.0         | <a href="#">44.820</a>         |   |   |   | 44.820                | 44.820 |  |  |
| 5710.0         | <a href="#">39.840</a>         |   |   |   | 39.840                | 39.840 |  |  |
|                |                                |   |   |   |                       |        |  |  |
| Test Frequency | Measured 99% Bandwidth (MHz)   |   |   |   | 99% Bandwidth (MHz)   |        |  |  |
|                | Port(s)                        |   |   |   |                       |        |  |  |
| MHz            | a                              | b | c | d | Highest               | Lowest |  |  |
| 5510.0         | <a href="#">56.453</a>         |   |   |   | 56.453                | 56.453 |  |  |
| 5550.0         | <a href="#">58.257</a>         |   |   |   | 58.257                | 58.257 |  |  |
| 5710.0         | <a href="#">55.631</a>         |   |   |   | 55.631                | 55.631 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

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### 9.3. 6 dB & 99% Bandwidth

| Conducted Test Conditions for 6 dB and 99% Bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                          |                     |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------|-------------|
| Standard:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | FCC CFR 47:15.407        | Ambient Temp. (°C): | 24.0 - 27.5 |
| Test Heading:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 6 dB and 99 % Bandwidth  | Rel. Humidity (%):  | 32 - 45     |
| Standard Section(s):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 15.407 (a)               | Pressure (mBars):   | 999 - 1001  |
| Reference Document(s):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | See Normative References |                     |             |
| <b>Test Procedure for 6 dB and 99% Bandwidth Measurement</b><br>The bandwidth at 6 dB and 99 % is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency. The Resolution Bandwidth was set to 100 kHz. Testing was performed under ambient conditions at nominal voltage. Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured and reported.<br><br>Test configuration and setup used for the measurement was per the Conducted Test Set-up section specified in this document. |                          |                     |             |

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#### Equipment Configuration for 6 dB & 99% Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 0.50           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 6 dB Bandwidth (MHz) |   |   |   | 6 dB Bandwidth (MHz) |        |  |  |
|----------------|-------------------------------|---|---|---|----------------------|--------|--|--|
|                | Port(s)                       |   |   |   |                      |        |  |  |
| MHz            | a                             | b | c | d | Highest              | Lowest |  |  |
| 5745.0         | <a href="#">16.353</a>        |   |   |   | 16.353               | 16.353 |  |  |
| 5785.0         | <a href="#">16.353</a>        |   |   |   | 16.353               | 16.353 |  |  |
| 5825.0         | <a href="#">16.353</a>        |   |   |   | 16.353               | 16.353 |  |  |
| Test Frequency | Measured 99% Bandwidth (MHz)  |   |   |   | 99% Bandwidth (MHz)  |        |  |  |
|                | Port(s)                       |   |   |   |                      |        |  |  |
| MHz            | a                             | b | c | d | Highest              | Lowest |  |  |
| 5745.0         | <a href="#">24.609</a>        |   |   |   | 24.609               | 24.609 |  |  |
| 5785.0         | <a href="#">23.968</a>        |   |   |   | 23.968               | 23.968 |  |  |
| 5825.0         | <a href="#">23.727</a>        |   |   |   | 23.727               | 23.727 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

Note: click the links in the above matrix to view the graphical image (plot).

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#### Equipment Configuration for 6 dB & 99% Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 0.50           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 6 dB Bandwidth (MHz) |   |   |   | 6 dB Bandwidth (MHz) |        |  |  |
|----------------|-------------------------------|---|---|---|----------------------|--------|--|--|
|                | Port(s)                       |   |   |   |                      |        |  |  |
| MHz            | a                             | b | c | d | Highest              | Lowest |  |  |
| 5745.0         | <a href="#">16.353</a>        |   |   |   | 16.353               | 16.353 |  |  |
| 5785.0         | <a href="#">16.353</a>        |   |   |   | 16.353               | 16.353 |  |  |
| 5825.0         | <a href="#">16.353</a>        |   |   |   | 16.353               | 16.353 |  |  |
|                |                               |   |   |   |                      |        |  |  |
| Test Frequency | Measured 99% Bandwidth (MHz)  |   |   |   | 99% Bandwidth (MHz)  |        |  |  |
|                | Port(s)                       |   |   |   |                      |        |  |  |
| MHz            | a                             | b | c | d | Highest              | Lowest |  |  |
| 5745.0         | <a href="#">24.689</a>        |   |   |   | 24.689               | 24.689 |  |  |
| 5785.0         | <a href="#">23.888</a>        |   |   |   | 23.888               | 23.888 |  |  |
| 5825.0         | <a href="#">23.647</a>        |   |   |   | 23.647               | 23.647 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

Note: click the links in the above matrix to view the graphical image (plot).

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#### Equipment Configuration for 6 dB & 99% Bandwidth

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 0.50           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured 6 dB Bandwidth (MHz) |   |   |   | 6 dB Bandwidth (MHz) |        |  |  |
|----------------|-------------------------------|---|---|---|----------------------|--------|--|--|
|                | Port(s)                       |   |   |   |                      |        |  |  |
| MHz            | a                             | b | c | d | Highest              | Lowest |  |  |
| 5755.0         | <a href="#">36.393</a>        |   |   |   | 36.393               | 36.393 |  |  |
| 5795.0         | <a href="#">36.072</a>        |   |   |   | 36.072               | 36.072 |  |  |

| Test Frequency | Measured 99% Bandwidth (MHz) |   |   |   | 99% Bandwidth (MHz) |        |  |  |
|----------------|------------------------------|---|---|---|---------------------|--------|--|--|
|                | Port(s)                      |   |   |   |                     |        |  |  |
| MHz            | a                            | b | c | d | Highest             | Lowest |  |  |
| 5755.0         | <a href="#">52.265</a>       |   |   |   | 52.265              | 52.265 |  |  |
| 5795.0         | <a href="#">47.615</a>       |   |   |   | 47.615              | 47.615 |  |  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

Note: click the links in the above matrix to view the graphical image (plot).

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## 9.4. Power Spectral Density

| Conducted Test Conditions for Power Spectral Density |                          |                            |             |
|------------------------------------------------------|--------------------------|----------------------------|-------------|
| <b>Standard:</b>                                     | FCC CFR 47:15.407        | <b>Ambient Temp. (°C):</b> | 24.0 - 27.5 |
| <b>Test Heading:</b>                                 | Power Spectral Density   | <b>Rel. Humidity (%):</b>  | 32 - 45     |
| <b>Standard Section(s):</b>                          | 15.407 (a)               | <b>Pressure (mBars):</b>   | 999 - 1001  |
| <b>Reference Document(s):</b>                        | See Normative References |                            |             |

### Test Procedure for Power Spectral Density

The in-band power spectral density was measured using the test technique specified in KDB 789033. A 1 MHz measurement bandwidth was implemented for the analyzer sweep. Once the sweep is complete the analyzer trace data is downloaded and used for post processing purposes.

Where the device operated with multiple antenna ports i.e. MIMO device, each port was measured separately. The Peak Power Spectral Density is the highest level found across the emission bandwidth. With multiple antenna port measurements the numerical analyzer data from each port is summed (Σ) and a link to this additional graphic is provided.

Test configuration and setup used for the measurement was per the Conducted Test Set-up section specified in this document.

Measure and sum the spectra across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The individual spectra are then summed mathematically in linear power units. Unlike in-band power measurements, in which the sum involves a single measured value (output power) from each output, measurements for compliance with PSD limits involve summing entire spectra across corresponding frequency bins on the various outputs. Consistency is maintained for any device with multiple transmitter outputs to be certain the individual outputs are all aligned with the same span and same number of points. In this instance, the linear power spectrum value within the first spectral bin of output 0 is summed with that in the first spectral bin of output 1, and the first spectral bin of output 2, and so on up to the Nth output to obtain the true value for the first frequency bin of the summed spectrum. The summed spectrum value for each frequency bin is computed in this fashion. These summed spectral values were post processed and the resulting numerical and graphical data presented.

NOTE: It may be observed that spectrum in some plots break the limit line however this in itself does NOT constitute a failure. In all cases a spectrum summation plot is provided in order to prove compliance. A failure occurs only after the summation of all spectrum plots have been summed and are found to be greater than the limit line.

### Supporting Information

Calculated Power =  $A + 10 \log (1/x) \text{ dBm}$

$A = \text{Total Power Spectral Density } [10 \cdot \log_{10} (10^{a/10} + 10^{b/10} + 10^{c/10} + 10^{d/10})]$

$x = \text{Duty Cycle}$

### Limits Power Spectral Density

#### Operating Frequency Band 5150-5250 MHz

##### 15.407 (a)(1)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the



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frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **Operating Frequency Band 5250-5350 and 5470 – 5725 MHz**

##### **15. 407 (a)(2)**

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **Operating Frequency Band 5725 – 5850 MHz**

##### **15. 407 (a)(3)**

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.



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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 2.30           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.04 dB) | Limit   | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|---------|--------|
|                | Port(s) (dBm/MHz)               |   |   |   |                                         |         |        |
| MHz            | a                               | b | c | d | dBm/MHz                                 | dBm/MHz | dB     |
| 5180.0         | <a href="#">4.066</a>           |   |   |   | <a href="#">4.110</a>                   | 11.0    | -6.9   |
| 5200.0         | <a href="#">3.925</a>           |   |   |   | <a href="#">3.969</a>                   | 11.0    | -7.0   |
| 5240.0         | <a href="#">3.112</a>           |   |   |   | <a href="#">3.156</a>                   | 11.0    | -7.8   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

Note: click the links in the above matrix to view the graphical image (plot).

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 2.30           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.04 dB) | Limit   | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|---------|--------|
|                | Port(s) (dBm/MHz)               |   |   |   |                                         |         |        |
| MHz            | a                               | b | c | d | dBm/MHz                                 | dBm/MHz | dB     |
| 5180.0         | <a href="#">3.837</a>           |   |   |   | <a href="#">3.881</a>                   | 11.0    | -7.1   |
| 5200.0         | <a href="#">4.652</a>           |   |   |   | <a href="#">4.696</a>                   | 11.0    | -6.3   |
| 5240.0         | <a href="#">2.808</a>           |   |   |   | <a href="#">2.852</a>                   | 11.0    | -8.1   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 2.30           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.76 dB) | Limit   | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|---------|--------|
|                | Port(s) (dBm/MHz)               |   |   |   |                                         |         |        |
| MHz            | a                               | b | c | d | dBm/MHz                                 | dBm/MHz | dB     |
| 5190.0         | <a href="#">-2.497</a>          |   |   |   | <a href="#">-1.740</a>                  | 11.0    | -12.7  |
| 5230.0         | <a href="#">-0.071</a>          |   |   |   | <a href="#">0.686</a>                   | 11.0    | -10.3  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.90           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.04 dB) | Limit   | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|---------|--------|
|                | Port(s) (dBm/MHz)               |   |   |   |                                         |         |        |
| MHz            | a                               | b | c | d | dBm/MHz                                 | dBm/MHz | dB     |
| 5260.0         | <a href="#">5.263</a>           |   |   |   | <a href="#">5.307</a>                   | 11.0    | -5.7   |
| 5300.0         | <a href="#">4.139</a>           |   |   |   | <a href="#">4.183</a>                   | 11.0    | -6.8   |
| 5320.0         | <a href="#">3.550</a>           |   |   |   | <a href="#">3.594</a>                   | 11.0    | -7.4   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.90           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.04 dB) | Limit   | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|---------|--------|
|                | Port(s) (dBm/MHz)               |   |   |   |                                         |         |        |
| MHz            | a                               | b | c | d | dBm/MHz                                 | dBm/MHz | dB     |
| 5260.0         | <a href="#">5.184</a>           |   |   |   | <a href="#">5.228</a>                   | 11.0    | -5.8   |
| 5300.0         | <a href="#">4.017</a>           |   |   |   | <a href="#">4.061</a>                   | 11.0    | -6.9   |
| 5320.0         | <a href="#">1.817</a>           |   |   |   | <a href="#">1.861</a>                   | 11.0    | -9.1   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 1.90           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.76 dB) | Limit   | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|---------|--------|
|                | Port(s) (dBm/MHz)               |   |   |   |                                         |         |        |
| MHz            | a                               | b | c | d | dBm/MHz                                 | dBm/MHz | dB     |
| 5270.0         | -0.937                          |   |   |   | -0.180                                  | 11.0    | -11.2  |
| 5310.0         | -2.282                          |   |   |   | -1.522                                  | 11.0    | -12.5  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.00           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.04 dB) | Limit   | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|---------|--------|
|                | Port(s) (dBm/MHz)               |   |   |   |                                         |         |        |
| MHz            | a                               | b | c | d | dBm/MHz                                 | dBm/MHz | dB     |
| 5500.0         | <a href="#">3.768</a>           |   |   |   | <a href="#">3.812</a>                   | 11.0    | -7.2   |
| 5580.0         | <a href="#">3.515</a>           |   |   |   | <a href="#">3.559</a>                   | 11.0    | -7.4   |
| 5720.0         | <a href="#">3.581</a>           |   |   |   | <a href="#">3.625</a>                   | 11.0    | -7.4   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 1.00           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.04 dB) | Limit   | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|---------|--------|
|                | Port(s) (dBm/MHz)               |   |   |   |                                         |         |        |
| MHz            | a                               | b | c | d | dBm/MHz                                 | dBm/MHz | dB     |
| 5500.0         | <a href="#">3.700</a>           |   |   |   | <a href="#">3.744</a>                   | 11.0    | -7.3   |
| 5580.0         | <a href="#">5.577</a>           |   |   |   | <a href="#">5.621</a>                   | 11.0    | -5.4   |
| 5720.0         | <a href="#">5.991</a>           |   |   |   | <a href="#">6.035</a>                   | 11.0    | -5.0   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

Note: click the links in the above matrix to view the graphical image (plot).

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 1.00           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.76 dB) | Limit   | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|---------|--------|
|                | Port(s) (dBm/MHz)               |   |   |   |                                         |         |        |
| MHz            | a                               | b | c | d | dBm/MHz                                 | dBm/MHz | dB     |
| 5510.0         | <a href="#">-2.174</a>          |   |   |   | <a href="#">-1.417</a>                  | 11.0    | -12.4  |
| 5550.0         | <a href="#">0.994</a>           |   |   |   | <a href="#">1.751</a>                   | 11.0    | -9.2   |
| 5710.0         | <a href="#">0.863</a>           |   |   |   | <a href="#">1.620</a>                   | 11.0    | -9.4   |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

Note: click the links in the above matrix to view the graphical image (plot).

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11a        | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.00 MBit/s    | <b>Antenna Gain (dBi):</b>        | 0.50           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.04 dB) | Limit       | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|-------------|--------|
|                | Port(s) (dBm/500 KHz)           |   |   |   |                                         |             |        |
| MHz            | a                               | b | c | d | dBm/500 KHz                             | dBm/500 KHz | dB     |
| 5745.0         | <a href="#">1.445</a>           |   |   |   | <a href="#">4.990</a>                   | 30.0        | -25.0  |
| 5785.0         | <a href="#">3.397</a>           |   |   |   | <a href="#">3.441</a>                   | 30.0        | -26.6  |
| 5825.0         | <a href="#">2.888</a>           |   |   |   | <a href="#">2.932</a>                   | 30.0        | -27.1  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-20  | <b>Duty Cycle (%):</b>            | 99.0           |
| <b>Data Rate:</b>              | 6.50 MBit/s    | <b>Antenna Gain (dBi):</b>        | 0.50           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.04 dB) | Limit       | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|-------------|--------|
|                | Port(s) (dBm/500 KHz)           |   |   |   |                                         |             |        |
| MHz            | a                               | b | c | d | dBm/500 KHz                             | dBm/500 KHz | dB     |
| 5745.0         | <a href="#">1.494</a>           |   |   |   | <a href="#">1.538</a>                   | 30.0        | -28.5  |
| 5785.0         | <a href="#">3.369</a>           |   |   |   | <a href="#">3.413</a>                   | 30.0        | -26.6  |
| 5825.0         | <a href="#">3.046</a>           |   |   |   | <a href="#">3.090</a>                   | 30.0        | -26.9  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

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#### Equipment Configuration for Power Spectral Density

|                                |                |                                   |                |
|--------------------------------|----------------|-----------------------------------|----------------|
| <b>Variant:</b>                | 802.11n HT-40  | <b>Duty Cycle (%):</b>            | 84.0           |
| <b>Data Rate:</b>              | 13.50 MBit/s   | <b>Antenna Gain (dBi):</b>        | 0.50           |
| <b>Modulation:</b>             | OFDM           | <b>Beam Forming Gain (Y)(dB):</b> | Not Applicable |
| <b>TPC:</b>                    | Not Applicable | <b>Tested By:</b>                 | SB             |
| <b>Engineering Test Notes:</b> |                |                                   |                |

#### Test Measurement Results

| Test Frequency | Measured Power Spectral Density |   |   |   | Summation Peak Marker + DCCF (+0.76 dB) | Limit       | Margin |
|----------------|---------------------------------|---|---|---|-----------------------------------------|-------------|--------|
|                | Port(s) (dBm/500 KHz)           |   |   |   |                                         |             |        |
| MHz            | a                               | b | c | d | dBm/500 KHz                             | dBm/500 KHz | dB     |
| 5755.0         | <a href="#">-3.169</a>          |   |   |   | <a href="#">-2.412</a>                  | 30.0        | -32.4  |
| 5795.0         | <a href="#">-1.760</a>          |   |   |   | <a href="#">-1.003</a>                  | 30.0        | -31.0  |

#### Traceability to Industry Recognized Test Methodologies

|                          |                                  |
|--------------------------|----------------------------------|
| Work Instruction:        | WI-03 MEASURING RF SPECTRUM MASK |
| Measurement Uncertainty: | ±2.81 dB                         |

DCCF - Duty Cycle Correction Factor

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## 9.5. Dynamic Frequency Selection (DFS)

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands. Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode. The following tables summarize the requirements.

The HP Inc 0960-4025 and 0960-4034 is a client device without radar detection.

| Requirement                       | Master Device or Client with Radar Detection | Client without Radar Detection |
|-----------------------------------|----------------------------------------------|--------------------------------|
|                                   | Operational Mode                             |                                |
| DFS Detection Threshold           | Yes                                          | Not Required                   |
| Channel Closing Transmission Time | Yes                                          | Yes                            |
| Channel Move Time                 | Yes                                          | Yes                            |
| U-NII Detection Bandwidth         | Yes                                          | Not Required                   |

| Additional requirements for devices with multiple bandwidth modes | Master Device or Client with Radar Detection | Client without Radar Detection                       |
|-------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------|
| U-NII Detection Bandwidth and Statistical Performance Check       | All BW modes must be tested                  | Not required                                         |
| Channel Move Time and Channel Closing Transmission Time           | Test using widest BW mode available          | Test using the widest BW mode available for the link |
| All other tests                                                   | Any single BW mode                           | Not required                                         |

**NOTE:** Frequencies selected for statistical performance check should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.



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The operational behavior and individual DFS requirements associated with these modes are as follows:

**9.5.1. Master Devices**

- a) The Master Device will use DFS in order to detect Radar Waveforms with received signal strength above the DFS Detection Threshold in the 5250 – 5350 MHz and 5470 – 5725 MHz bands. DFS is not required in the 5150 – 5250 MHz or 5725 – 5850 MHz bands.
- b) Before initiating a network on a Channel, the Master Device will perform a Channel Availability Check for a specified time duration (Channel Availability Check Time) to ensure that there is no radar system operating on the Channel, using DFS described under subsection a) above.
- c) The Master Device initiates a U-NII network by transmitting control signals that will enable other U-NII devices to Associate with the Master Device.
- d) During normal operation, the Master Device will monitor the Channel (In-Service Monitoring) to ensure that there is no radar system operating on the Channel, using DFS described under a).
- e) If the Master Device has detected a Radar Waveform during In-Service Monitoring as described under d), the Operating Channel of the U-NII network is no longer an Available Channel. The Master Device will instruct all associated Client Device(s) to stop transmitting on this Channel within the Channel Move Time. The transmissions during the Channel Move Time will be limited to the Channel Closing Transmission Time.
- f) Once the Master Device has detected a Radar Waveform it will not utilize the Channel for the duration of the Non-Occupancy Period.
- g) If the Master Device delegates the In-Service Monitoring to a Client Device, then the combination will be tested to the requirements described under d) through f) above.

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### **9.5.2. Client Devices**

- a) A Client Device will not transmit before having received appropriate control signals from a Master Device.
- b) A Client Device will stop all its transmissions whenever instructed by a Master Device to which it is associated and will meet the Channel Move Time and Channel Closing Transmission Time requirements. The Client Device will not resume any transmissions until it has again received control signals from a Master Device.
- c) If a Client Device is performing In-Service Monitoring and detects a Radar Waveform above the DFS Detection Threshold, it will inform the Master Device. This is equivalent to the Master Device detecting the Radar Waveform and d) through f) of section 5.1.1 apply.
- d) Irrespective of Client Device or Master Device detection the Channel Move Time and Channel Closing Transmission Time requirements remain the same.
- e) The client test frequency must be monitored to ensure no transmission of any type has occurred for 30 minutes. Note: If the client moves with the master, the device is considered compliant if nothing appears in the client non-occupancy period test. For devices that shutdown (rather than moving channels), no beacons should appear.

### **9.5.3. DFS Detection Thresholds**

The table below provides the DFS Detection Thresholds for Master Devices as well as Client Devices incorporating In-Service Monitoring.

#### **DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection**

| <b>Maximum Transmit Power</b>                                              | <b>Value (see Notes 1, 2 and 3)</b> |
|----------------------------------------------------------------------------|-------------------------------------|
| EIRP $\geq$ 200 milliwatt                                                  | -64 dBm                             |
| EIRP 200 milliwatt and power density +10 dBm/MHz                           | -62 dBm                             |
| EIRP 200 milliwatt that do not meet the power spectral density requirement | -64 dBm                             |

**NOTE 1:** This is the level at the input of the receiver assuming a 0 dBi receive antenna

**NOTE 2:** Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

**NOTE 3:** EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.



#### **9.1.4. Response Requirements**

The following table provides the response requirements for Master and Client Devices incorporating DFS.

##### **DFS Response Requirement Values**

| <b>Parameter</b>                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Value</b>                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Non-Occupancy Period                                                                                                                                                                                                                                                                                                                                                                                             | Minimum 30 minutes                                                                                    |
| Channel Availability Check Time                                                                                                                                                                                                                                                                                                                                                                                  | 60 seconds                                                                                            |
| Channel Move Time                                                                                                                                                                                                                                                                                                                                                                                                | 10 seconds, see NOTE 1                                                                                |
| Channel Closing Transmission Time                                                                                                                                                                                                                                                                                                                                                                                | 200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period, see NOTES 1 and 2 |
| U-NII Detection Bandwidth                                                                                                                                                                                                                                                                                                                                                                                        | Minimum 100% of the U-NII 99% transmission power bandwidth, see NOTE 3                                |
| <b>NOTE 1:</b> Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.                                                                                                                                                                                                                            |                                                                                                       |
| <b>NOTE 2:</b> The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. |                                                                                                       |
| <b>NOTE 3:</b> During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.                                                                                                                                                                                     |                                                                                                       |



### 9.1.5. Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

#### 9.1.5.1. Short Radar Pulses

##### Short Pulse Radar Test Waveforms

| Radar Type                  | Pulse Width (μS) | PRI (μS)                                                                                                                                           | Number of Pulses                                                                                     | Minimum Percentage of Successful Detection | Minimum Number of Trials |
|-----------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------|
| 0                           | 1                | 1428                                                                                                                                               | 18                                                                                                   | See Note 1                                 | See Note 1               |
| 1                           | 1                | Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a                                                          | $\text{Roundup} \left( \frac{1}{360} \cdot \frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right)$ | 60%                                        | 30                       |
|                             |                  | Test B: 15 unique PRI values randomly selected in the range 518-3066 μS, with a minimum increment of 1 μS, excluding PRI values selected in Test A |                                                                                                      |                                            |                          |
| 2                           | 1-5              | 150-230                                                                                                                                            | 23-29                                                                                                | 60%                                        | 30                       |
| 3                           | 6-10             | 200-500                                                                                                                                            | 16-18                                                                                                | 60%                                        | 30                       |
| 4                           | 11-20            | 200-500                                                                                                                                            | 12-16                                                                                                | 60%                                        | 30                       |
| Aggregate (Radar Types 1-4) |                  |                                                                                                                                                    |                                                                                                      | 80%                                        | 120                      |

Note 1: Short Radar Pulse Type 0 should be used for the Detection Bandwidth test, Channel Move Time and Channel Closing Time tests

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.



### 9.1.5.2. Long Radar Pulse Test

#### Long Pulse Radar Test Waveforms

| Radar Type | Pulse Width (µsec) | Chirp Width (MHz) | PRI (µsec) | Number of Pulses per Burst | Number of Bursts | Minimum Percentage of Successful Detection | Minimum Trials |
|------------|--------------------|-------------------|------------|----------------------------|------------------|--------------------------------------------|----------------|
| 5          | 50-100             | 5-20              | 1000-2000  | 1-3                        | 8-20             | 80%                                        | 30             |

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse radar test signal. If more than 30 waveforms are used for the Long Pulse radar test signal, then each additional waveform must also be unique and not repeated from the previous waveforms.

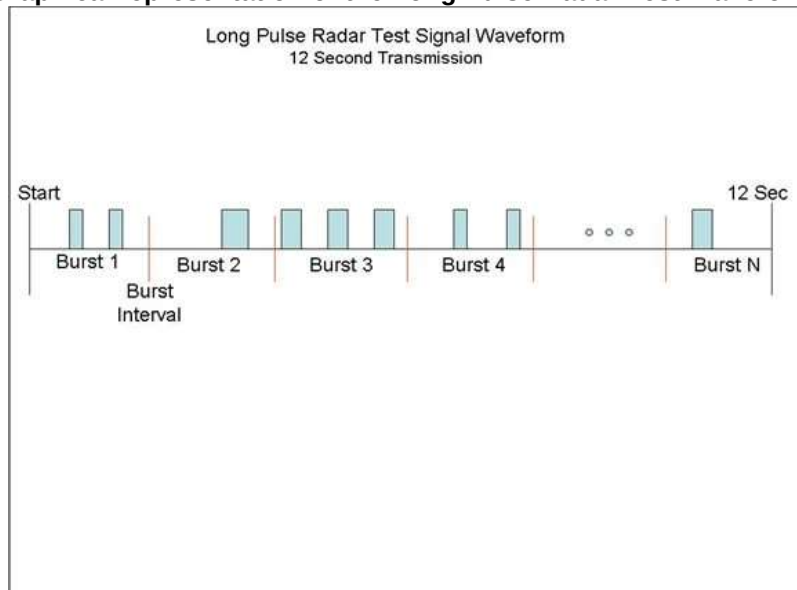
Each waveform is defined as follows:

1. The transmission period for the Long Pulse Radar test signal is 12 seconds.
2. There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst Count.
3. Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
4. The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
5. Each pulse has a linear frequency modulated chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a transmission period will have the same chirp width. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz
6. If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
7. The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst\_Count. Each interval is of length  $(12,000,000 / \text{Burst\_Count})$  microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and  $[(12,000,000 / \text{Burst\_Count}) - (\text{Total Burst Length}) + (\text{One Random PRI Interval})]$  microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

**A representative example of a Long Pulse radar test waveform:**

1. The total test signal length is 12 seconds.
2. 8 Bursts are randomly generated for the Burst\_Count
3. Burst 1 has 2 randomly generated pulses.
4. The pulse width (for both pulses) is randomly selected to be 75 microseconds.
5. The PRI is randomly selected to be at 1213 microseconds.
6. Bursts 2 through 8 are generated using steps 3 – 5.
7. Each Burst is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, Burst 1 is randomly generated (1 to 1,500,000 minus the total Burst 1 length + 1 random PRI interval) at the 325,001 microsecond step. Bursts 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. Burst 2 falls in the 1,500,001 – 3,000,000 microsecond range).

**Graphical representation of the Long Pulse Radar Test Waveform.**





#### 9.1.5.3. Frequency Hopping Radar Test Waveform

| Radar Type | Pulse Width (μsec) | PRI (μsec) | Pulses per Hop | Hopping Rate (kHz) | Hopping Sequence Length (msec) | Minimum Percentage of Successful Detection | Minimum Trials |
|------------|--------------------|------------|----------------|--------------------|--------------------------------|--------------------------------------------|----------------|
| 6          | 1                  | 333        | 9              | .333               | 300                            | 70%                                        | 30             |

For the Frequency Hopping Radar Type, the same Burst parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

#### 9.1.6. Radar Waveform Calibration

The following equipment setup was used to calibrate the Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process, there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 1 MHz.

The signal generator amplitude was set so that the power level measured at the spectrum analyzer was equal to the DFS detection threshold +1dB (Ref Section 9.2).



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#### **9.5.7. Channel Close / Transmission Time**

The steps below define the procedure to determine the above-mentioned parameters when a radar Burst with a level equal to the DFS Detection Threshold is generated on the Operating Channel of the U-NII device.

The EUT will be associated with a support U-NII device in order to setup an appropriate transmission media in accordance with the FCC requirements.

The EUT was monitored on a frequency that contained control beacons.

#### **Channel Closing Transmission Time and Channel Move Time - Measurement**

The test system was set-up to capture all transmission data for access point events above a threshold level of -50 dBm. The test equipment time stamps all captured events.

A Type 0 waveform was introduced to the EUT, from which a 12 second transmission record was digitally captured. The start of the Type 0 radar waveform is indicated in the test result plot as "Start Waveform", the end of the waveform is indicated as "End waveform".

Channel Closing Transmission Time, and the Channel Move Time start immediately after the last radar pulse is transmitted.

The aggregate of all pulses seen after the end of the radar injection are measured as the "Channel Closing Transmission time".

The last EUT activity after the end of the radar pulse is identified and used to determine the "Channel Move Time"



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## Frequency 5510 MHz Channel 104 Monitored 5500 MHz

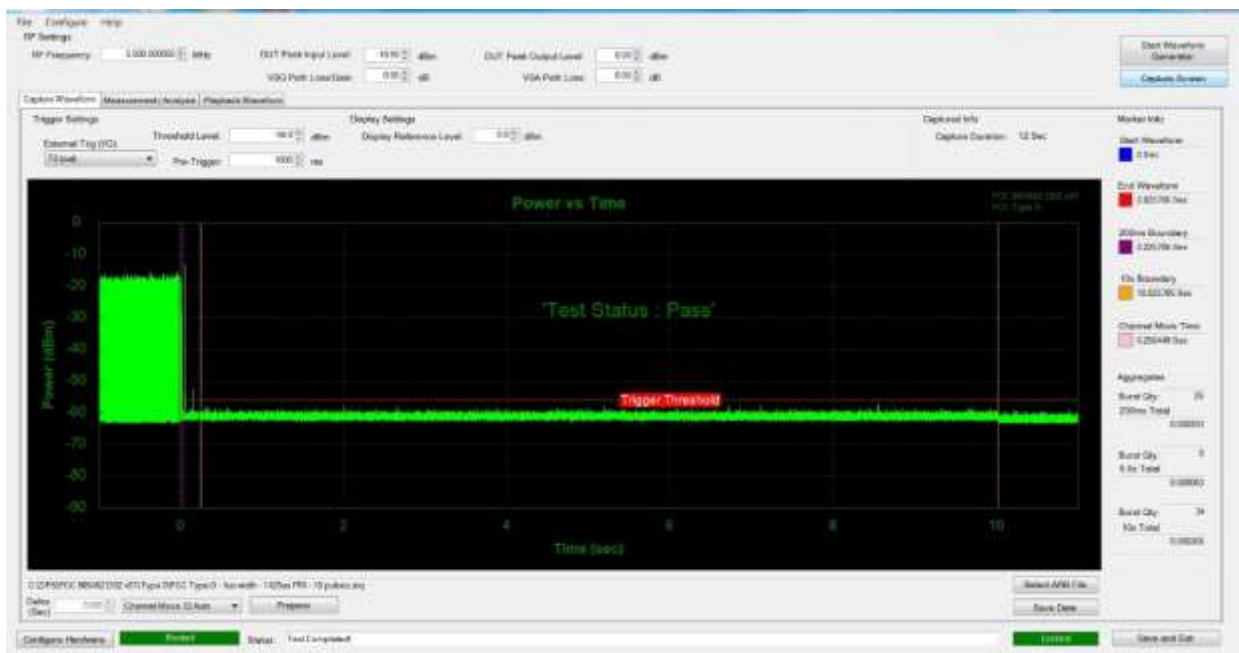
The PXI system measures and aggregates the pulses occurring after the end of the radar pulse to determine; -

- 1) Channel Closing Transmission Time (limit is 260 millisecond)
- 2) Channel Move Time (limit is 10 seconds)

**1) Channel Closing Transmission Time = 0.266 mSecs**

**2) Channel Move Time = 0.256449 Secs**

**Channel Move Time, Channel Closing Transmission Time for Type Radar  
Captured by the Test System - 0-12 Seconds**



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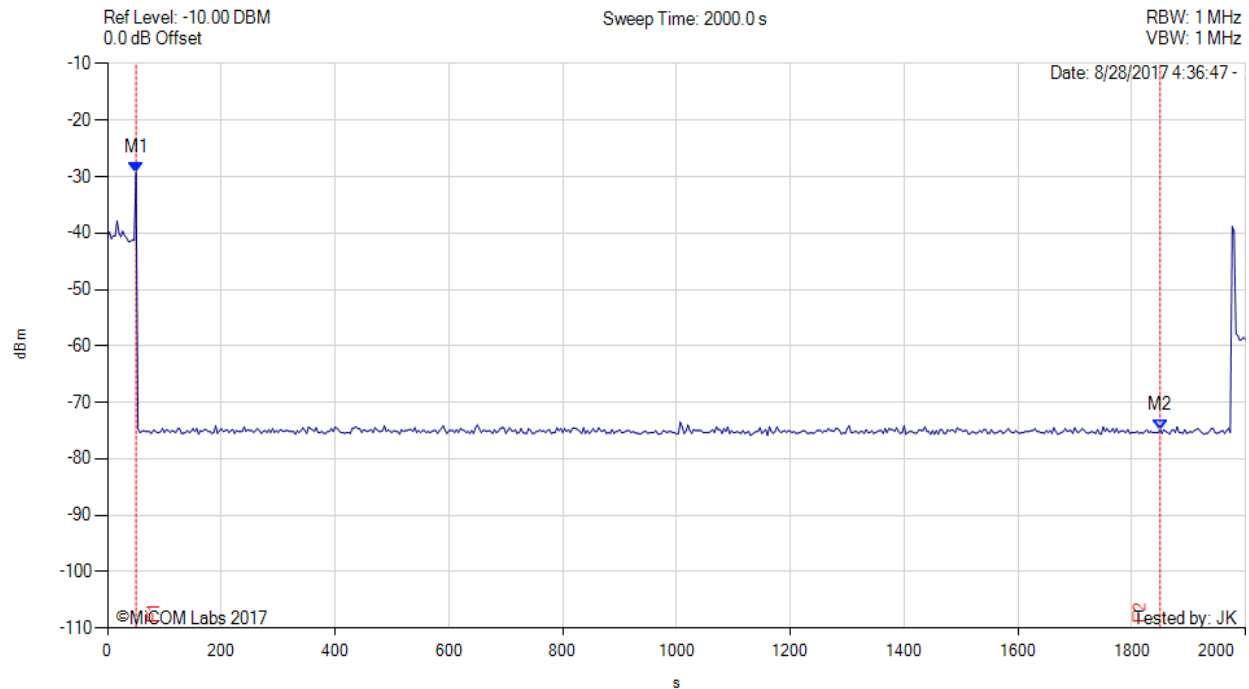
### 9.5.8. Non-Occupancy Period

The EUT is monitored for more than 30 minutes following the channel close/move time to verify no transmissions resume on this Channel. There should be no transmissions on the frequency of interest during the non-occupancy period.



#### NON-OCCUPANCY PERIOD

Variant: 802.11n HT40, Channel: 5510.00 MHz, Data Rate: 18 Mbit/s, Duty Cycle : 18.00%, Antenna Gain: 2.30 dBi



| Analyzer Setup                                                              | Marker:Time:Amplitude                                        | Test Results                   |
|-----------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------|
| Detector = POS<br>Sweep Count = View<br>RF Atten (dB) = 0<br>Trace Mode = 0 | M1 : 50.000 s : -29.330 dBm<br>M2 : 1850.000 s : -74.830 dBm | Channel Frequency: 5510.00 MHz |

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## 9.6. Radiated

| Radiated Test Conditions for Radiated Spurious and Band-Edge Emissions |                                           |                            |             |
|------------------------------------------------------------------------|-------------------------------------------|----------------------------|-------------|
| <b>Standard:</b>                                                       | FCC CFR 47:15.407                         | <b>Ambient Temp. (°C):</b> | 20.0 - 24.5 |
| <b>Test Heading:</b>                                                   | Radiated Spurious and Band-Edge Emissions | <b>Rel. Humidity (%):</b>  | 32 - 45     |
| <b>Standard Section(s):</b>                                            | 15.407 (b), 15.205, 15.209                | <b>Pressure (mBars):</b>   | 999 - 1001  |
| <b>Reference Document(s):</b>                                          | See Normative References                  |                            |             |

### Test Procedure for Radiated Spurious and Band-Edge Emissions

Radiated emissions for restricted bands above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.

Measurements on any restricted band frequency or frequencies above 1 GHz are based on the use of measurement instrumentation employing peak and average detectors. All measurements were performed using a resolution bandwidth of 1 MHz.

Test configuration and setup for Undesirable Measurement were per the Radiated Test Set-up specified in this document.

15.407 (b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.
- (8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.

### Limits for Restricted Bands (15.205, 15.209)

**Peak emission: 74 dBuV/m**

**Average emission: 54 dBuV/m**

### Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

where:

**FS = Field Strength**

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**R = Measured Spectrum analyzer Input Amplitude**

**AF = Antenna Factor**

**CORR = Correction Factor = CL – AG + NFL**

**CL = Cable Loss**

**AG = Amplifier Gain**

**FO = Distance Falloff Factor**

**NFL = Notch Filter Loss**

**Example:**

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength (dBμV/m);

$$E = 1000000 \times \sqrt[3]{30P} / 3 \text{ } \mu\text{V/m}$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz equates to 68.23 dBuV/m

Conversion between dBmV/m (or dBmV) and mV/m (or mV) are as follows:

Level (dBmV/m) = 20 \* Log (level (mV/m))

40 dBmV/m = 100 mV/m

48 dBmV/m = 250 mV/m

**Restricted Bands of Operation (15.205)**

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| Frequency Band    |                     |               |             |
|-------------------|---------------------|---------------|-------------|
| MHz               | MHz                 | MHz           | GHz         |
| 0.090-0.110       | 16.42-16.423        | 399.9-410     | 4.5-5.15    |
| 0.495-0.505       | 16.69475-16.69525   | 608-614       | 5.35-5.46   |
| 2.1735-2.1905     | 16.80425-16.80475   | 960-1240      | 7.25-7.75   |
| 4.125-4.128       | 25.5-25.67          | 1300-1427     | 8.025-8.5   |
| 4.17725-4.17775   | 37.5-38.25          | 1435-1626.5   | 9.0-9.2     |
| 4.20725-4.20775   | 73-74.6             | 1645.5-1646.5 | 9.3-9.5     |
| 6.215-6.218       | 74.8-75.2           | 1660-1710     | 10.6-12.7   |
| 6.26775-6.26825   | 108-121.94          | 1718.8-1722.2 | 13.25-13.4  |
| 6.31175-6.31225   | 123-138             | 2200-2300     | 14.47-14.5  |
| 8.291-8.294       | 149.9-150.05        | 2310-2390     | 15.35-16.2  |
| 8.362-8.366       | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4   |
| 8.37625-8.38675   | 156.7-156.9         | 2690-2900     | 22.01-23.12 |
| 8.41425-8.41475   | 162.0125-167.17     | 3260-3267     | 23.6-24.0   |
| 12.29-12.293      | 167.72-173.2        | 3332-3339     | 31.2-31.8   |
| 12.51975-12.52025 | 240-285             | 3345.8-3358   | 36.43-36.5  |
| 12.57675-12.57725 | 322-335.4           | 3600-4400     | Above 38.6  |
| 13.36-13.41       |                     |               |             |

(b) Except as provided in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency

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bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

(c) Except as provided in paragraphs (d) and (e) of this section, regardless of the field strength limits specified elsewhere in this subpart, the provisions of this section apply to emissions from any intentional radiator.

(d) The following devices are exempt from the requirements of this section:

(1) Swept frequency field disturbance sensors operating between 1.705 and 37 MHz provided their emissions only sweep through the bands listed in paragraph (a) of this section, the sweep is never stopped with the fundamental emission within the bands listed in paragraph (a) of this section, and the fundamental emission is outside of the bands listed in paragraph (a) of this section more than 99% of the time the device is actively transmitting, without compensation for duty cycle.

(2) Transmitters used to detect buried electronic markers at 101.4 kHz which are employed by telephone companies.

(3) Cable locating equipment operated pursuant to §15.213.

(4) Any equipment operated under the provisions of §15.253, 15.255, and 15.256 in the frequency band 75-85 GHz, or §15.257 of this part.

(5) Biomedical telemetry devices operating under the provisions of §15.242 of this part are not subject to the restricted band 608-614 MHz but are subject to compliance within the other restricted bands.

(6) Transmitters operating under the provisions of subparts D or F of this part.

(7) Devices operated pursuant to §15.225 are exempt from complying with this section for the 13.36-13.41 MHz band only.

(8) Devices operated in the 24.075-24.175 GHz band under §15.245 are exempt from complying with the requirements of this section for the 48.15-48.35 GHz and 72.225-72.525 GHz bands only, and shall not exceed the limits specified in §15.245(b).

(9) Devices operated in the 24.0-24.25 GHz band under §15.249 are exempt from complying with the requirements of this section for the 48.0-48.5 GHz and 72.0-72.75 GHz bands only, and shall not exceed the limits specified in §15.249(a).

(e) Harmonic emissions appearing in the restricted bands above 17.7 GHz from field disturbance sensors operating under the provisions of §15.245 shall not exceed the limits specified in §15.245(b).



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### 9.6.1. TX Spurious & Restricted Band Emissions

#### 9.6.1.1. Integral

##### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5180.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 17             | <b>Tested By:</b>      | jMH         |

##### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |        |               |        |          |                  |            |        |         |          |           |            |
|------------------------|---------------|--------|---------------|--------|----------|------------------|------------|--------|---------|----------|-----------|------------|
| Num                    | Frequency MHz | Raw dB | Cable Loss dB | AF dB  | Level dB | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dB | Margin dB | Pass /Fail |
| #1                     | 4616.68       | 62.01  | 3.53          | -11.34 | 54.20    | Max Peak         | Horizontal | 98     | 5       | 74.0     | -19.8     | Pass       |
| #2                     | 4616.68       | 47.39  | 3.53          | -11.34 | 39.58    | Max Avg          | Horizontal | 98     | 5       | 54.0     | -14.4     | Pass       |
| #3                     | 5176.98       | 69.53  | 3.69          | -11.51 | 61.71    | Fundamental      | Horizontal | 100    | 0       | --       | --        |            |
| #4                     | 6906.74       | 71.30  | 4.11          | -7.54  | 67.87    | Peak (NRB)       | Horizontal | 100    | 0       | --       | --        | Pass       |
| #5                     | 7770.36       | 53.88  | 4.42          | -6.71  | 51.59    | Peak (NRB)       | Horizontal | 100    | 0       | --       | --        | Pass       |
| #6                     | 10360.64      | 56.37  | 5.57          | -5.26  | 56.68    | Peak (NRB)       | Vertical   | 100    | 0       | --       | --        | Pass       |
| #7                     | 15544.55      | 57.28  | 5.97          | -0.55  | 62.70    | Max Peak         | Horizontal | 197    | 335     | 74.0     | -11.3     | Pass       |
| #8                     | 15544.55      | 43.30  | 5.97          | -0.55  | 48.72    | Max Avg          | Horizontal | 197    | 335     | 54.0     | -5.3      | Pass       |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5200.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 3466.74       | 56.72    | 3.11          | -11.25 | 48.58        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| #2                     | 4621.31       | 63.07    | 3.55          | -11.34 | 55.28        | Max Peak         | Horizontal | 131    | 349     | 74.0         | -18.7     | Pass       |
| #3                     | 4621.31       | 49.31    | 3.55          | -11.34 | 41.52        | Max Avg          | Horizontal | 131    | 349     | 54.0         | -12.5     | Pass       |
| #4                     | 5204.76       | 75.23    | 3.65          | -11.45 | 67.43        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #5                     | 6927.81       | 71.28    | 4.11          | -7.35  | 69.04        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #6                     | 7798.81       | 57.28    | 4.46          | -6.71  | 55.03        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #7                     | 10400.22      | 64.30    | 5.41          | -5.03  | 64.68        | Peak (NRB)       | Horizontal | 100    | 27      | --           | --        | Pass       |
| #8                     | 15607.50      | 58.09    | 6.01          | -0.20  | 63.90        | Max Peak         | Horizontal | 190    | 342     | 74.0         | -10.1     | Pass       |
| #9                     | 15607.50      | 44.22    | 6.01          | -0.20  | 50.03        | Max Avg          | Horizontal | 190    | 342     | 54.0         | -4.0      | Pass       |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5240.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1309.98       | 64.61    | 2.21          | -14.83 | 51.99        | Max Peak         | Vertical   | 98     | 111     | 74.0         | -22.0     | Pass       |
| #2                     | 1309.98       | 62.58    | 2.21          | -14.83 | 49.96        | Max Avg          | Vertical   | 98     | 111     | 54.0         | -4.0      | Pass       |
| #3                     | 3493.31       | 59.60    | 3.11          | -11.26 | 51.45        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| #4                     | 4511.17       | 62.64    | 3.53          | -11.56 | 54.61        | Max Peak         | Horizontal | 120    | 356     | 74.0         | -19.4     | Pass       |
| #5                     | 4511.17       | 48.92    | 3.53          | -11.56 | 40.89        | Max Avg          | Horizontal | 120    | 356     | 54.0         | -13.1     | Pass       |
| #6                     | 5236.96       | 79.51    | 3.63          | -11.37 | 71.77        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #7                     | 6986.68       | 74.69    | 4.13          | -7.45  | 71.37        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #8                     | 7856.68       | 61.01    | 4.48          | -6.75  | 58.74        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #9                     | 10476.73      | 63.56    | 5.44          | -4.48  | 64.52        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #10                    | 15717.00      | 56.99    | 6.05          | 0.18   | 63.22        | Max Peak         | Horizontal | 197    | 342     | 74.0         | -10.8     | Pass       |
| #11                    | 15717.00      | 43.38    | 6.05          | 0.18   | 49.61        | Max Avg          | Horizontal | 197    | 342     | 54.0         | -4.4      | Pass       |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5260.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB  | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                     | 1314.86       | 64.89    | 2.22          | -14.88 | 52.23        | Max Peak         | Vertical   | 98     | 108     | 74.0         | -21.8     | Pass       |
| #2                     | 1314.86       | 63.11    | 2.22          | -14.88 | 50.45        | Max Avg          | Vertical   | 98     | 108     | 54.0         | -3.6      | Pass       |
| #3                     | 3506.75       | 59.11    | 3.11          | -11.25 | 50.97        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| #4                     | 4590.11       | 62.78    | 3.55          | -11.39 | 54.94        | Max Peak         | Horizontal | 129    | 347     | 74.0         | -19.1     | Pass       |
| #5                     | 4590.11       | 49.00    | 3.55          | -11.39 | 41.16        | Max Avg          | Horizontal | 129    | 347     | 54.0         | -12.8     | Pass       |
| #6                     | 5261.22       | 76.72    | 3.66          | -11.29 | 69.09        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #7                     | 7013.35       | 74.98    | 4.18          | -7.42  | 71.74        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #8                     | 7886.89       | 58.12    | 4.54          | -6.79  | 55.87        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| #9                     | 10518.18      | 65.99    | 5.44          | -4.21  | 67.22        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #10                    | 15772.73      | 56.46    | 5.97          | 0.11   | 62.54        | Max Peak         | Horizontal | 197    | 342     | 74.0         | -11.5     | Pass       |
| #11                    | 15772.73      | 42.47    | 5.97          | 0.11   | 48.55        | Max Avg          | Horizontal | 197    | 342     | 54.0         | -5.5      | Pass       |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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#### Equipment Configuration for Restricted Band Spurious Emissions

|                                 |                |                        |          |
|---------------------------------|----------------|------------------------|----------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a  |
| <b>Antenna Gain (dBi):</b>      | 3.8            | <b>Modulation:</b>     | OFDM     |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99       |
| <b>Channel Frequency (MHz):</b> | 5300.00        | <b>Data Rate:</b>      | 6 MBit/s |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH      |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB  | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                     | 1324.97       | 64.99    | 2.24          | -14.97 | 52.26        | Max Peak         | Vertical   | 111    | 71      | 74.0         | -21.7     | Pass       |
| #2                     | 1324.97       | 63.14    | 2.24          | -14.97 | 50.41        | Max Avg          | Vertical   | 111    | 71      | 54.0         | -3.6      | Pass       |
| #3                     | 3533.60       | 65.95    | 3.13          | -11.25 | 57.83        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| #4                     | 5297.93       | 74.69    | 3.81          | -11.10 | 67.40        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #5                     | 7066.57       | 63.63    | 4.18          | -7.34  | 60.47        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #6                     | 10600.44      | 59.86    | 5.58          | -3.93  | 61.51        | Max Peak         | Vertical   | 101    | 340     | 74.0         | -12.5     | Pass       |
| #7                     | 10600.44      | 45.35    | 5.58          | -3.93  | 47.00        | Max Avg          | Vertical   | 101    | 340     | 54.0         | -7.0      | Pass       |

Test Notes: EUT connected to laptop inside chamber and powered by 5V. Short shielded interface cable.

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**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### Equipment Configuration for Restricted Band Spurious Emissions

|                                 |                |                        |          |
|---------------------------------|----------------|------------------------|----------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a  |
| <b>Antenna Gain (dBi):</b>      | 3.8            | <b>Modulation:</b>     | OFDM     |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99       |
| <b>Channel Frequency (MHz):</b> | 5320.00        | <b>Data Rate:</b>      | 6 MBit/s |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH      |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz                                                                                                                 |               |          |               |        |              |                  |            |        |         |              |           |            |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                                                    | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB  | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                                                                                                                                     | 1330.03       | 62.94    | 2.24          | -15.02 | 50.16        | Max Peak         | Horizontal | 134    | 238     | 74.0         | -23.8     | Pass       |
| #2                                                                                                                                     | 1330.03       | 61.05    | 2.24          | -15.02 | 48.27        | Max Avg          | Horizontal | 134    | 238     | 54.0         | -5.7      | Pass       |
| #3                                                                                                                                     | 3546.87       | 63.30    | 3.14          | -11.24 | 55.20        | Peak (NRB)       | Vertical   | 100    | 31      | --           | --        | Pass       |
| #4                                                                                                                                     | 5327.26       | 70.25    | 3.71          | -11.05 | 62.91        | Fundamental      | Horizontal | 100    | 0       | --           | --        | Pass       |
| #5                                                                                                                                     | 7093.29       | 59.85    | 4.24          | -7.34  | 56.75        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #6                                                                                                                                     | 10640.29      | 58.96    | 5.39          | -3.89  | 60.46        | Max Peak         | Vertical   | 110    | 338     | 74.0         | -13.5     | Pass       |
| #7                                                                                                                                     | 10640.29      | 44.78    | 5.39          | -3.89  | 46.28        | Max Avg          | Vertical   | 110    | 338     | 54.0         | -7.7      | Pass       |
| Test Notes: EUT connected to laptop inside chamber and powered by 5V. Short shielded interface cable. In 1 channel to try higher power |               |          |               |        |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for Restricted Band Spurious Emissions

|                                 |                |                        |          |
|---------------------------------|----------------|------------------------|----------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a  |
| <b>Antenna Gain (dBi):</b>      | 3.8            | <b>Modulation:</b>     | OFDM     |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99       |
| <b>Channel Frequency (MHz):</b> | 5500.00        | <b>Data Rate:</b>      | 6 MBit/s |
| <b>Power Setting:</b>           | 15             | <b>Tested By:</b>      | JMH      |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1375.04       | 67.48    | 2.26          | -18.20 | 51.54        | Max Peak         | Horizontal | 143    | 233     | 74.0         | -22.5     | Pass       |
| #2                     | 1375.04       | 65.10    | 2.26          | -18.20 | 49.16        | Max Avg          | Horizontal | 143    | 233     | 54.0         | -4.8      | Pass       |
| #3                     | 3667.06       | 73.35    | 3.17          | -10.83 | 65.69        | Max Peak         | Vertical   | 190    | 61      | 74.0         | -8.3      | Pass       |
| #4                     | 3667.06       | 59.07    | 3.17          | -10.83 | 51.41        | Max Avg          | Vertical   | 190    | 61      | 54.0         | -2.6      | Pass       |
| #5                     | 5506.95       | 58.68    | 3.75          | -9.42  | 53.01        | Fundamental      | Vertical   | 151    | 0       | --           | --        |            |
| #6                     | 7333.32       | 61.66    | 4.28          | -5.21  | 60.73        | Max Peak         | Vertical   | 164    | 72      | 74.0         | -13.3     | Pass       |
| #7                     | 7333.32       | 54.18    | 4.28          | -5.21  | 53.25        | Max Avg          | Vertical   | 164    | 72      | 54.0         | -0.8      | Pass       |
| #8                     | 11000.95      | 48.11    | 5.59          | -1.06  | 52.64        | Max Peak         | Horizontal | 128    | 355     | 74.0         | -21.4     | Pass       |
| #9                     | 11000.95      | 34.23    | 5.59          | -1.06  | 38.76        | Max Avg          | Horizontal | 128    | 355     | 54.0         | -15.2     | Pass       |
| #10                    | 16499.71      | 47.62    | 6.02          | 0.99   | 54.63        | Peak (NRB)       | Vertical   | 151    | 44      | --           | --        | Pass       |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Host PCB shielded with silver tape. Transmitter module connected to host PCB with shielded ribbon cable instead of directly to board

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#### Equipment Configuration for Restricted Band Spurious Emissions

|                                 |                |                        |          |
|---------------------------------|----------------|------------------------|----------|
| <b>Antenna:</b>                 | Not Applicable | <b>Variant:</b>        | 802.11a  |
| <b>Antenna Gain (dBi):</b>      | Not Applicable | <b>Modulation:</b>     | OFDM     |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99       |
| <b>Channel Frequency (MHz):</b> | 5580.00        | <b>Data Rate:</b>      | 6 MBit/s |
| <b>Power Setting:</b>           | 15             | <b>Tested By:</b>      | JMH      |

#### Test Measurement Results

##### 1000.00 - 18000.00 MHz

| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
|-----|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| #1  | 1394.99       | 69.06    | 2.25          | -18.09 | 53.22        | Max Peak         | Horizontal | 139    | 239     | 74.0         | -20.8     | Pass       |
| #2  | 1394.99       | 67.56    | 2.25          | -18.09 | 51.72        | Max Avg          | Horizontal | 139    | 239     | 54.0         | -2.3      | Pass       |
| #3  | 3720.26       | 71.56    | 3.21          | -10.67 | 64.10        | Max Peak         | Vertical   | 138    | 76      | 74.0         | -9.9      | Pass       |
| #4  | 3720.26       | 59.52    | 3.21          | -10.67 | 52.06        | Max Avg          | Vertical   | 138    | 76      | 54.0         | -1.9      | Pass       |
| #5  | 5577.09       | 65.62    | 3.81          | -9.24  | 60.19        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| #6  | 7439.98       | 60.33    | 4.30          | -4.97  | 59.66        | Max Peak         | Vertical   | 103    | 200     | 74.0         | -14.3     | Pass       |
| #7  | 7439.98       | 52.67    | 4.30          | -4.97  | 52.00        | Max Avg          | Vertical   | 103    | 200     | 54.0         | -2.0      | Pass       |
| #8  | 16739.07      | 51.58    | 6.08          | 1.07   | 58.73        | Peak (NRB)       | Vertical   | 150    | 177     | --           | --        | Pass       |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Host PCB shielded with silver tape. Transmitter module connected to host PCB with shielded ribbon cable instead of directly to board

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#### Equipment Configuration for Restricted Band Spurious Emissions

|                                 |                |                        |          |
|---------------------------------|----------------|------------------------|----------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a  |
| <b>Antenna Gain (dBi):</b>      | 3.8            | <b>Modulation:</b>     | OFDM     |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99       |
| <b>Channel Frequency (MHz):</b> | 5720.00        | <b>Data Rate:</b>      | 6 MBit/s |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH      |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB  | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                     | 1429.98       | 62.31    | 2.29          | -15.74 | 48.86        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #2                     | 3813.17       | 69.66    | 3.24          | -10.85 | 62.05        | Max Peak         | Horizontal | 98     | 338     | 74.0         | -12.0     | Pass       |
| #3                     | 3813.17       | 58.06    | 3.24          | -10.85 | 50.45        | Max Avg          | Horizontal | 98     | 338     | 54.0         | -3.6      | Pass       |
| #4                     | 5712.49       | 60.32    | 3.83          | -10.77 | 53.38        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #5                     | 7626.76       | 62.83    | 4.38          | -6.97  | 60.24        | Max Peak         | Vertical   | 141    | 250     | 74.0         | -13.8     | Pass       |
| #6                     | 7626.76       | 55.72    | 4.38          | -6.97  | 53.13        | Max Avg          | Vertical   | 141    | 250     | 54.0         | -0.9      | Pass       |
| #7                     | 11440.71      | 59.41    | 5.36          | -4.92  | 59.85        | Max Peak         | Vertical   | 105    | 338     | 74.0         | -14.2     | Pass       |
| #8                     | 11440.71      | 45.53    | 5.36          | -4.92  | 45.97        | Max Avg          | Vertical   | 105    | 338     | 54.0         | -8.0      | Pass       |
| #9                     | 17151.09      | 50.95    | 6.34          | 0.39   | 57.68        | Peak (NRB)       | Horizontal | 100    | 182     | --           | --        | Pass       |

Test Notes: EUT connected to laptop inside chamber and powered by 5V. Short shielded interface cable.

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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5745.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1436.32       | 64.36    | 2.28          | -15.77 | 50.87        | Max Peak         | Horizontal | 177    | 133     | 74.0         | -23.1     | Pass       |
| #2                     | 1436.32       | 62.46    | 2.28          | -15.77 | 48.97        | Max Avg          | Horizontal | 177    | 133     | 54.0         | -5.0      | Pass       |
| #3                     | 4309.29       | 59.25    | 3.39          | -11.48 | 51.16        | Max Peak         | Horizontal | 98     | 343     | 74.0         | -22.8     | Pass       |
| #4                     | 4309.29       | 45.08    | 3.39          | -11.48 | 36.99        | Max Avg          | Horizontal | 98     | 343     | 54.0         | -17.0     | Pass       |
| #5                     | 5737.40       | 52.84    | 3.82          | -10.67 | 45.99        | Fundamental      | Horizontal | 151    | 0       | --           | --        |            |
| #6                     | 6273.11       | 57.69    | 3.92          | -8.50  | 53.11        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| #7                     | 7660.08       | 61.87    | 4.38          | -6.95  | 59.30        | Max Peak         | Vertical   | 128    | 231     | 74.0         | -14.7     | Pass       |
| #8                     | 7660.08       | 54.45    | 4.38          | -6.95  | 51.88        | Max Avg          | Vertical   | 128    | 231     | 54.0         | -2.1      | Pass       |
| #9                     | 9578.01       | 46.72    | 5.26          | -5.98  | 46.00        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| #10                    | 11490.62      | 62.16    | 5.45          | -4.84  | 62.77        | Max Peak         | Horizontal | 184    | 26      | 74.0         | -11.2     | Pass       |
| #11                    | 11490.62      | 47.90    | 5.45          | -4.84  | 48.51        | Max Avg          | Horizontal | 184    | 26      | 54.0         | -5.5      | Pass       |
| #12                    | 17240.75      | 52.10    | 6.47          | 0.34   | 58.91        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power reduced to meet TX Spurious Limit.

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#### Equipment Configuration for Restricted Band Spurious Emissions

|                                 |                |                        |          |
|---------------------------------|----------------|------------------------|----------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a  |
| <b>Antenna Gain (dBi):</b>      | 3.8            | <b>Modulation:</b>     | OFDM     |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99       |
| <b>Channel Frequency (MHz):</b> | 5785.00        | <b>Data Rate:</b>      | 6 MBit/s |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH      |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB  | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                     | 1446.24       | 66.04    | 2.28          | -15.83 | 52.49        | Max Peak         | Horizontal | 122    | 230     | 74.0         | -21.5     | Pass       |
| #2                     | 1446.24       | 64.73    | 2.28          | -15.83 | 51.18        | Max Avg          | Horizontal | 122    | 230     | 54.0         | -2.8      | Pass       |
| #3                     | 3856.60       | 67.17    | 3.23          | -10.81 | 59.59        | Max Peak         | Horizontal | 118    | 339     | 74.0         | -14.4     | Pass       |
| #4                     | 3856.60       | 54.03    | 3.23          | -10.81 | 46.45        | Max Avg          | Horizontal | 118    | 339     | 54.0         | -7.6      | Pass       |
| #5                     | 5792.96       | 50.71    | 3.78          | -10.40 | 44.09        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #6                     | 6352.61       | 54.70    | 3.95          | -8.18  | 50.47        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #7                     | 7713.38       | 62.72    | 4.41          | -6.85  | 60.28        | Max Peak         | Horizontal | 130    | 346     | 74.0         | -13.7     | Pass       |
| #8                     | 7713.38       | 55.75    | 4.41          | -6.85  | 53.31        | Max Avg          | Horizontal | 130    | 346     | 54.0         | -0.7      | Pass       |
| #9                     | 11569.50      | 57.47    | 5.46          | -4.64  | 58.29        | Max Peak         | Vertical   | 110    | 334     | 74.0         | -15.7     | Pass       |
| #10                    | 11569.50      | 43.15    | 5.46          | -4.64  | 43.97        | Max Avg          | Vertical   | 110    | 334     | 54.0         | -10.0     | Pass       |
| #11                    | 17358.34      | 49.92    | 6.28          | -0.04  | 56.16        | Peak (NRB)       | Horizontal | 100    | 360     | --           | --        | Pass       |

Test Notes: EUT connected to laptop inside chamber and powered by 5V. Short shielded interface cable.

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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5825.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 19             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1456.28       | 63.73    | 2.29          | -15.91 | 50.11        | Max Peak         | Horizontal | 112    | 208     | 74.0         | -23.9     | Pass       |
| #2                     | 1456.28       | 62.19    | 2.29          | -15.91 | 48.57        | Max Avg          | Horizontal | 112    | 208     | 54.0         | -5.4      | Pass       |
| #3                     | 4560.67       | 59.60    | 3.45          | -11.39 | 51.66        | Max Peak         | Horizontal | 138    | 346     | 74.0         | -22.3     | Pass       |
| #4                     | 4560.67       | 45.61    | 3.45          | -11.39 | 37.67        | Max Avg          | Horizontal | 138    | 346     | 54.0         | -16.3     | Pass       |
| #5                     | 5831.89       | 56.14    | 3.84          | -10.22 | 49.76        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #6                     | 6316.23       | 59.09    | 3.93          | -8.34  | 54.68        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #7                     | 6388.56       | 57.77    | 3.99          | -8.08  | 53.68        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #8                     | 7766.70       | 63.78    | 4.43          | -6.71  | 61.50        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #9                     | 9714.99       | 53.14    | 5.41          | -6.24  | 52.31        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #10                    | 11650.60      | 65.01    | 5.46          | -4.47  | 66.00        | Max Peak         | Horizontal | 196    | 310     | 74.0         | -8.0      | Pass       |
| #11                    | 11650.60      | 50.82    | 5.46          | -4.47  | 51.81        | Max Avg          | Horizontal | 196    | 310     | 54.0         | -2.2      | Pass       |
| #12                    | 17472.83      | 49.44    | 6.23          | -0.57  | 55.10        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power reduced to meet TX Spurious Limit.

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### 9.6.1.2. YAGEO ANT300P002B24553

#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 2.30                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5180.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB  | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                     | 1149.33       | 64.43    | 2.12          | -16.82 | 49.73        | Max Peak         | Horizontal | 156    | 197     | 74.0         | -24.3     | Pass       |
| #2                     | 1149.33       | 47.49    | 2.12          | -16.82 | 32.79        | Max Avg          | Horizontal | 156    | 197     | 54.0         | -21.2     | Pass       |
| #3                     | 3453.45       | 53.48    | 3.09          | -11.25 | 45.32        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| #4                     | 4560.01       | 60.64    | 3.45          | -11.39 | 52.70        | Max Peak         | Vertical   | 178    | 61      | 74.0         | -21.3     | Pass       |
| #5                     | 4560.01       | 44.04    | 3.45          | -11.39 | 36.10        | Max Avg          | Vertical   | 178    | 61      | 54.0         | -17.9     | Pass       |
| #6                     | 5176.98       | 62.56    | 3.69          | -11.51 | 54.74        | Fundamental      | Horizontal | 151    | 0       | --           | --        |            |
| #7                     | 6906.70       | 51.27    | 4.11          | -7.54  | 47.84        | Peak (NRB)       | Vertical   | 150    | 360     | --           | --        | Pass       |
| #8                     | 15541.70      | 52.01    | 5.96          | -0.57  | 57.40        | Max Peak         | Horizontal | 174    | 309     | 74.0         | -16.6     | Pass       |
| #9                     | 15541.70      | 38.59    | 5.96          | -0.57  | 43.98        | Max Avg          | Horizontal | 174    | 309     | 54.0         | -10.0     | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 2.30                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5200.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1147.02       | 66.97    | 2.12          | -16.83 | 52.26        | Max Peak         | Horizontal | 101    | 129     | 74.0         | -21.7     | Pass       |
| #2                     | 1147.02       | 53.91    | 2.12          | -16.83 | 39.20        | Max Avg          | Horizontal | 101    | 129     | 54.0         | -14.8     | Pass       |
| #3                     | 3464.42       | 60.41    | 3.10          | -11.25 | 52.26        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #4                     | 4517.23       | 61.42    | 3.52          | -11.53 | 53.41        | Max Peak         | Horizontal | 121    | 192     | 74.0         | -20.6     | Pass       |
| #5                     | 4517.23       | 44.93    | 3.52          | -11.53 | 36.92        | Max Avg          | Horizontal | 121    | 192     | 54.0         | -17.1     | Pass       |
| #6                     | 5202.34       | 67.46    | 3.66          | -11.46 | 59.66        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #7                     | 6933.40       | 57.57    | 4.11          | -7.49  | 54.19        | Peak (NRB)       | Vertical   | 151    | 360     | --           | --        | Pass       |
| #8                     | 10400.55      | 49.42    | 5.41          | -5.03  | 49.80        | Peak (NRB)       | Vertical   | 151    | 330     | --           | --        | Pass       |
| #9                     | 15599.96      | 52.28    | 6.04          | -0.25  | 58.07        | Max Peak         | Horizontal | 191    | 182     | 74.0         | -15.9     | Pass       |
| #10                    | 15599.96      | 39.17    | 6.04          | -0.25  | 44.96        | Max Avg          | Horizontal | 191    | 182     | 54.0         | -9.0      | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 2.30                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5240.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1145.36       | 66.95    | 2.12          | -16.83 | 52.24        | Max Peak         | Horizontal | 98     | 131     | 74.0         | -21.8     | Pass       |
| #2                     | 1145.36       | 53.15    | 2.12          | -16.83 | 38.44        | Max Avg          | Horizontal | 98     | 131     | 54.0         | -15.6     | Pass       |
| #3                     | 3493.75       | 60.16    | 3.11          | -11.26 | 52.01        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #4                     | 4459.67       | 57.66    | 3.52          | -11.60 | 49.58        | Peak (NRB)       | Horizontal | 100    | 173     | --           | --        | Pass       |
| #5                     | 5237.73       | 71.30    | 3.63          | -11.37 | 63.56        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #6                     | 6986.64       | 60.35    | 4.13          | -7.45  | 57.03        | Peak (NRB)       | Horizontal | 100    | 173     | --           | --        | Pass       |
| #7                     | 10479.15      | 47.31    | 5.42          | -4.46  | 48.27        | Peak (NRB)       | Vertical   | 100    | 173     | --           | --        | Pass       |
| #8                     | 15716.49      | 51.71    | 6.04          | 0.18   | 57.93        | Max Peak         | Horizontal | 194    | 187     | 74.0         | -16.1     | Pass       |
| #9                     | 15716.49      | 37.49    | 6.04          | 0.18   | 43.71        | Max Avg          | Horizontal | 194    | 187     | 54.0         | -10.3     | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 1.90                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5260.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB  | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                     | 1145.14       | 66.83    | 2.12          | -16.83 | 52.12        | Max Peak         | Horizontal | 104    | 130     | 74.0         | -21.9     | Pass       |
| #2                     | 1145.14       | 51.79    | 2.12          | -16.83 | 37.08        | Max Avg          | Horizontal | 104    | 130     | 54.0         | -16.9     | Pass       |
| #3                     | 3506.99       | 61.95    | 3.11          | -11.25 | 53.81        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #4                     | 4512.11       | 59.80    | 3.53          | -11.55 | 51.78        | Max Peak         | Vertical   | 164    | 185     | 74.0         | -22.2     | Pass       |
| #5                     | 4512.11       | 46.07    | 3.53          | -11.55 | 38.05        | Max Avg          | Vertical   | 164    | 185     | 54.0         | -16.0     | Pass       |
| #6                     | 5267.50       | 69.70    | 3.68          | -11.25 | 62.13        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #7                     | 7013.46       | 65.07    | 4.18          | -7.42  | 61.83        | Peak (NRB)       | Vertical   | 151    | 188     | --           | --        | Pass       |
| #8                     | 7029.07       | 51.59    | 4.17          | -7.39  | 48.37        | Peak (NRB)       | Vertical   | 151    | 0       | --           | --        | Pass       |
| #9                     | 10520.51      | 47.92    | 5.43          | -4.21  | 49.14        | Peak (NRB)       | Vertical   | 151    | 309     | --           | --        | Pass       |
| #10                    | 15774.71      | 49.48    | 5.98          | 0.10   | 55.56        | Max Peak         | Horizontal | 185    | 164     | 74.0         | -18.4     | Pass       |
| #11                    | 15774.71      | 35.95    | 5.98          | 0.10   | 42.03        | Max Avg          | Horizontal | 185    | 164     | 54.0         | -12.0     | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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**Title:** HP Inc. 0960-4025 and 0960-4034  
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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 1.90                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5300.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1146.69       | 66.72    | 2.12          | -16.83 | 52.01        | Max Peak         | Horizontal | 98     | 136     | 74.0         | -22.0     | Pass       |
| #2                     | 1146.69       | 53.66    | 2.12          | -16.83 | 38.95        | Max Avg          | Horizontal | 98     | 136     | 54.0         | -15.1     | Pass       |
| #3                     | 3533.88       | 61.96    | 3.13          | -11.25 | 53.84        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| #4                     | 4517.51       | 57.92    | 3.52          | -11.53 | 49.91        | Max Peak         | Vertical   | 98     | 230     | 74.0         | -24.1     | Pass       |
| #5                     | 4517.51       | 43.81    | 3.52          | -11.53 | 35.80        | Max Avg          | Vertical   | 98     | 230     | 54.0         | -18.2     | Pass       |
| #6                     | 4557.14       | 59.24    | 3.44          | -11.40 | 51.28        | Max Peak         | Vertical   | 115    | 207     | 74.0         | -22.7     | Pass       |
| #7                     | 4557.14       | 44.36    | 3.44          | -11.40 | 36.40        | Max Avg          | Vertical   | 115    | 207     | 54.0         | -17.6     | Pass       |
| #8                     | 5297.38       | 69.29    | 3.80          | -11.11 | 61.98        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #9                     | 7066.61       | 61.10    | 4.18          | -7.34  | 57.94        | Peak (NRB)       | Horizontal | 100    | 191     | --           | --        | Pass       |
| #10                    | 10600.49      | 53.46    | 5.58          | -3.93  | 55.11        | Max Peak         | Vertical   | 119    | 293     | 74.0         | -18.9     | Pass       |
| #11                    | 10600.49      | 39.68    | 5.58          | -3.93  | 41.33        | Max Avg          | Vertical   | 119    | 293     | 54.0         | -12.7     | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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**Title:** HP Inc. 0960-4025 and 0960-4034  
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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 1.90                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5320.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1145.20       | 64.53    | 2.12          | -16.83 | 49.82        | Max Peak         | Horizontal | 147    | 199     | 74.0         | -24.2     | Pass       |
| #2                     | 1145.20       | 49.77    | 2.12          | -16.83 | 35.06        | Max Avg          | Horizontal | 147    | 199     | 54.0         | -18.9     | Pass       |
| #3                     | 3547.66       | 60.47    | 3.14          | -11.24 | 52.37        | Peak (NRB)       | Horizontal | 100    | 189     | --           | --        | Pass       |
| #4                     | 4528.71       | 57.95    | 3.47          | -11.48 | 49.94        | Max Peak         | Vertical   | 146    | 288     | 74.0         | -24.1     | Pass       |
| #5                     | 4528.71       | 43.08    | 3.47          | -11.48 | 35.07        | Max Avg          | Vertical   | 146    | 288     | 54.0         | -18.9     | Pass       |
| #6                     | 5316.57       | 62.60    | 3.76          | -11.07 | 55.29        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #7                     | 7093.41       | 58.24    | 4.24          | -7.34  | 55.14        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| #8                     | 10640.67      | 51.73    | 5.39          | -3.89  | 53.23        | Max Peak         | Horizontal | 164    | 184     | 74.0         | -20.8     | Pass       |
| #9                     | 10640.67      | 37.40    | 5.39          | -3.89  | 38.90        | Max Avg          | Horizontal | 164    | 184     | 54.0         | -15.1     | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 1.00                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5500.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 17                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1145.80       | 66.33    | 2.12          | -16.83 | 51.62        | Max Peak         | Horizontal | 103    | 133     | 74.0         | -22.4     | Pass       |
| #2                     | 1145.80       | 53.06    | 2.12          | -16.83 | 38.35        | Max Avg          | Horizontal | 103    | 133     | 54.0         | -15.7     | Pass       |
| #3                     | 3667.07       | 75.62    | 3.17          | -11.02 | 67.77        | Max Peak         | Horizontal | 113    | 180     | 74.0         | -6.2      | Pass       |
| #4                     | 3667.07       | 59.26    | 3.17          | -11.02 | 51.41        | Max Avg          | Horizontal | 113    | 180     | 54.0         | -2.6      | Pass       |
| #5                     | 4558.36       | 57.96    | 3.45          | -11.39 | 50.02        | Max Peak         | Horizontal | 129    | 182     | 74.0         | -24.0     | Pass       |
| #6                     | 4558.36       | 43.34    | 3.45          | -11.39 | 35.40        | Max Avg          | Horizontal | 129    | 182     | 54.0         | -18.6     | Pass       |
| #7                     | 5496.61       | 57.34    | 3.73          | -11.17 | 49.90        | Fundamental      | Horizontal | 100    | 27      | --           | --        |            |
| #8                     | 6334.64       | 51.52    | 3.95          | -8.26  | 47.21        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| #9                     | 7333.44       | 63.88    | 4.28          | -7.24  | 60.92        | Max Peak         | Horizontal | 106    | 217     | 74.0         | -13.1     | Pass       |
| #10                    | 7333.44       | 55.92    | 4.28          | -7.24  | 52.96        | Max Avg          | Horizontal | 106    | 217     | 54.0         | -1.0      | Pass       |
| #11                    | 11000.10      | 54.83    | 5.59          | -4.24  | 56.18        | Max Peak         | Horizontal | 133    | 323     | 74.0         | -17.8     | Pass       |
| #12                    | 11000.10      | 41.01    | 5.59          | -4.24  | 42.36        | Max Avg          | Horizontal | 133    | 323     | 54.0         | -11.6     | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 1.00                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5580.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1145.58       | 65.95    | 2.12          | -16.83 | 51.24        | Max Peak         | Vertical   | 98     | 251     | 74.0         | -22.8     | Pass       |
| #2                     | 1145.58       | 52.52    | 2.12          | -16.83 | 37.81        | Max Avg          | Vertical   | 98     | 251     | 54.0         | -16.2     | Pass       |
| #3                     | 3720.33       | 73.08    | 3.21          | -10.90 | 65.39        | Max Peak         | Horizontal | 115    | 177     | 74.0         | -8.6      | Pass       |
| #4                     | 3720.33       | 58.13    | 3.21          | -10.90 | 50.44        | Max Avg          | Horizontal | 115    | 177     | 54.0         | -3.6      | Pass       |
| #5                     | 4558.25       | 59.72    | 3.45          | -11.39 | 51.78        | Max Peak         | Horizontal | 142    | 181     | 74.0         | -22.2     | Pass       |
| #6                     | 4558.25       | 44.68    | 3.45          | -11.39 | 36.74        | Max Avg          | Horizontal | 142    | 181     | 54.0         | -17.3     | Pass       |
| #7                     | 5587.45       | 64.23    | 3.78          | -11.19 | 56.82        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| #8                     | 6335.97       | 53.29    | 3.95          | -8.25  | 48.99        | Peak (NRB)       | Vertical   | 100    | 275     | --           | --        | Pass       |
| #9                     | 7440.00       | 60.54    | 4.30          | -7.13  | 57.71        | Max Peak         | Vertical   | 108    | 5       | 74.0         | -16.3     | Pass       |
| #10                    | 7440.00       | 53.47    | 4.30          | -7.13  | 50.64        | Max Avg          | Vertical   | 108    | 5       | 54.0         | -3.4      | Pass       |
| #11                    | 11160.73      | 53.17    | 5.81          | -4.07  | 54.91        | Max Peak         | Vertical   | 104    | 294     | 74.0         | -19.1     | Pass       |
| #12                    | 11160.73      | 39.19    | 5.81          | -4.07  | 40.93        | Max Avg          | Vertical   | 104    | 294     | 54.0         | -13.1     | Pass       |
| #13                    | 16742.84      | 44.65    | 6.07          | 1.50   | 52.22        | Peak (NRB)       | Horizontal | 100    | 275     | --           | --        | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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**To:** FCC CFR 47 Part 15.407 & RSS-247  
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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 1.00                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5720.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 18                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1145.47       | 63.24    | 2.12          | -16.83 | 48.53        | Max Peak         | Vertical   | 101    | 259     | 74.0         | -25.5     | Pass       |
| #2                     | 1145.47       | 49.49    | 2.12          | -16.83 | 34.78        | Max Avg          | Vertical   | 101    | 259     | 54.0         | -19.2     | Pass       |
| #3                     | 3814.14       | 66.43    | 3.24          | -10.85 | 58.82        | Max Peak         | Vertical   | 115    | 208     | 74.0         | -15.2     | Pass       |
| #4                     | 3814.14       | 52.29    | 3.24          | -10.85 | 44.68        | Max Avg          | Vertical   | 115    | 208     | 54.0         | -9.3      | Pass       |
| #5                     | 4448.76       | 58.52    | 3.46          | -11.59 | 50.39        | Peak (NRB)       | Horizontal | 151    | 207     | --           | --        | Pass       |
| #6                     | 5712.23       | 55.18    | 3.83          | -10.77 | 48.24        | Fundamental      | Horizontal | 100    | 21      | --           | --        |            |
| #7                     | 6284.47       | 57.29    | 3.92          | -8.47  | 52.74        | Peak (NRB)       | Vertical   | 151    | 324     | --           | --        | Pass       |
| #8                     | 7626.62       | 60.91    | 4.38          | -6.97  | 58.32        | Max Peak         | Vertical   | 145    | 179     | 74.0         | -15.7     | Pass       |
| #9                     | 7626.62       | 53.62    | 4.38          | -6.97  | 51.03        | Max Avg          | Vertical   | 145    | 179     | 54.0         | -3.0      | Pass       |
| #10                    | 11440.13      | 51.94    | 5.36          | -4.92  | 52.38        | Max Peak         | Horizontal | 187    | 309     | 74.0         | -21.6     | Pass       |
| #11                    | 11440.13      | 38.16    | 5.36          | -4.92  | 38.60        | Max Avg          | Horizontal | 187    | 309     | 54.0         | -15.4     | Pass       |
| #12                    | 17159.05      | 56.86    | 6.35          | 0.39   | 63.60        | Peak (NRB)       | Horizontal | 151    | 224     | --           | --        | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 0.50                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5745.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 20                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1145.03       | 63.37    | 2.12          | -16.83 | 48.66        | Max Peak         | Vertical   | 98     | 243     | 74.0         | -25.3     | Pass       |
| #2                     | 1145.03       | 47.51    | 2.12          | -16.83 | 32.80        | Max Avg          | Vertical   | 98     | 243     | 54.0         | -21.2     | Pass       |
| #3                     | 3830.69       | 71.02    | 3.21          | -10.83 | 63.40        | Max Peak         | Horizontal | 98     | 185     | 74.0         | -10.6     | Pass       |
| #4                     | 3830.69       | 56.90    | 3.21          | -10.83 | 49.28        | Max Avg          | Horizontal | 98     | 185     | 54.0         | -4.7      | Pass       |
| #5                     | 4507.64       | 59.46    | 3.51          | -11.57 | 51.40        | Max Peak         | Horizontal | 98     | 180     | 74.0         | -22.6     | Pass       |
| #6                     | 4507.64       | 44.60    | 3.51          | -11.57 | 36.54        | Max Avg          | Horizontal | 98     | 180     | 54.0         | -17.5     | Pass       |
| #7                     | 5737.51       | 51.63    | 3.82          | -10.67 | 44.78        | Fundamental      | Horizontal | 100    | 45      | --           | --        |            |
| #8                     | 6315.02       | 57.08    | 3.93          | -8.34  | 52.67        | Peak (NRB)       | Horizontal | 100    | 149     | --           | --        | Pass       |
| #9                     | 7659.94       | 63.35    | 4.37          | -6.95  | 60.77        | Max Peak         | Vertical   | 114    | 199     | 74.0         | -13.2     | Pass       |
| #10                    | 7659.94       | 55.48    | 4.37          | -6.95  | 52.09        | Max Avg          | Vertical   | 114    | 199     | 54.0         | -1.0      | Pass       |
| #11                    | 11490.62      | 53.66    | 5.45          | -4.84  | 54.27        | Max Peak         | Horizontal | 110    | 225     | 74.0         | -19.7     | Pass       |
| #12                    | 11490.62      | 39.11    | 5.45          | -4.84  | 39.72        | Max Avg          | Horizontal | 110    | 225     | 54.0         | -14.3     | Pass       |
| #13                    | 17237.88      | 49.41    | 6.47          | 0.34   | 56.22        | Peak (NRB)       | Vertical   | 100    | 244     | --           | --        | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 0.50                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5785.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 21                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1147.79       | 63.39    | 2.12          | -16.83 | 48.68        | Max Peak         | Vertical   | 98     | 253     | 74.0         | -25.3     | Pass       |
| #2                     | 1147.79       | 50.00    | 2.12          | -16.83 | 35.29        | Max Avg          | Vertical   | 98     | 253     | 54.0         | -18.7     | Pass       |
| #3                     | 3857.15       | 65.92    | 3.23          | -10.81 | 58.34        | Max Peak         | Horizontal | 106    | 186     | 74.0         | -15.7     | Pass       |
| #4                     | 3857.15       | 52.24    | 3.23          | -10.81 | 44.66        | Max Avg          | Horizontal | 106    | 186     | 54.0         | -9.3      | Pass       |
| #5                     | 5792.55       | 53.94    | 3.78          | -10.40 | 47.32        | Fundamental      | Vertical   | 100    | 306     | --           | --        |            |
| #6                     | 6081.05       | 56.35    | 3.86          | -9.57  | 50.64        | Peak (NRB)       | Vertical   | 100    | 303     | --           | --        | Pass       |
| #7                     | 7713.34       | 58.61    | 4.41          | -6.85  | 56.17        | Max Peak         | Vertical   | 113    | 200     | 74.0         | -17.8     | Pass       |
| #8                     | 7713.34       | 52.53    | 4.41          | -6.85  | 50.09        | Max Avg          | Vertical   | 113    | 200     | 54.0         | -3.9      | Pass       |
| #9                     | 11571.43      | 55.53    | 5.42          | -4.63  | 56.32        | Max Peak         | Vertical   | 128    | 273     | 74.0         | -17.7     | Pass       |
| #10                    | 11571.43      | 42.23    | 5.42          | -4.63  | 43.02        | Max Avg          | Vertical   | 128    | 273     | 54.0         | -11.0     | Pass       |
| #11                    | 17358.01      | 51.18    | 6.28          | -0.04  | 57.42        | Peak (NRB)       | Horizontal | 100    | 151     | --           | --        | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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#### Equipment Configuration for TX Spurious & Restricted Band Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 0.50                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5825.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                     | 1146.58       | 63.38    | 2.12          | -16.83 | 48.67        | Max Peak         | Vertical   | 98     | 250     | 74.0         | -25.3     | Pass       |
| #2                     | 1146.58       | 50.19    | 2.12          | -16.83 | 35.48        | Max Avg          | Vertical   | 98     | 250     | 54.0         | -18.5     | Pass       |
| #3                     | 3882.50       | 66.68    | 3.25          | -10.76 | 59.17        | Max Peak         | Horizontal | 112    | 185     | 74.0         | -14.8     | Pass       |
| #4                     | 3882.50       | 52.57    | 3.25          | -10.76 | 45.06        | Max Avg          | Horizontal | 112    | 185     | 54.0         | -8.9      | Pass       |
| #5                     | 5832.66       | 54.07    | 3.84          | -10.21 | 47.70        | Fundamental      | Vertical   | 100    | 195     | --           | --        |            |
| #6                     | 6315.46       | 57.75    | 3.93          | -8.34  | 53.34        | Peak (NRB)       | Vertical   | 100    | 239     | --           | --        | Pass       |
| #7                     | 7766.72       | 55.14    | 4.43          | -6.71  | 52.86        | Peak (NRB)       | Vertical   | 100    | 167     | --           | --        | Pass       |
| #8                     | 11650.50      | 56.57    | 5.46          | -4.47  | 57.56        | Max Peak         | Vertical   | 122    | 267     | 74.0         | -16.4     | Pass       |
| #9                     | 11650.50      | 42.28    | 5.46          | -4.47  | 43.27        | Max Avg          | Vertical   | 122    | 267     | 54.0         | -10.7     | Pass       |
| #10                    | 17484.29      | 52.99    | 6.41          | -0.63  | 58.77        | Peak (NRB)       | Horizontal | 100    | 185     | --           | --        | Pass       |

Test Notes: EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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## 9.6.2. Restricted Edge & Band-Edge Emissions

### 9.6.2.3. Integral

#### RESULTS SUMMARY FOR RADIATED BAND-EDGE EMISSIONS

##### 5150 - 5250 MHz

| Integral         |                           | Band-Edge Freq | Limit 74.0dBµV/m | Limit 54.0dBµV/m | Power Setting |
|------------------|---------------------------|----------------|------------------|------------------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz            | dBµV/m           | dBµV/m           |               |
| 802.11a          | 5180.00                   | 5150.00        | 70.61            | 53.05            | 17            |
| 802.11n HT-20    | 5180.00                   | 5150.00        | 71.31            | 51.29            | 16            |
| 802.11n HT-40    | 5190.00                   | 5150.00        | 70.75            | 52.64            | 14            |

##### 5470 - 5725 MHz

| Integral         |                           | Restricted-Edge Freq | Limit 74.0dBµV/m | Limit 54.0dBµV/m | Power Setting |
|------------------|---------------------------|----------------------|------------------|------------------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz                  | dBµV/m           | dBµV/m           |               |
| 802.11a          | 5500.00                   | 5460.00              | 70.79            | 51.65            | 17            |
| 802.11n HT-20    | 5500.00                   | 5460.00              | 72.12            | 52.78            | 17            |
| 802.11n HT-40    | 5510.00                   | 5460.00              | 70.34            | 51.77            | 15            |

| Integral         |                           | Band-Edge Freq | Limit 68.23dBµV/m | Power Setting |
|------------------|---------------------------|----------------|-------------------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz            | dBµV/m            |               |
| 802.11a          | 5500.00                   | 5470.00        | 56.99             | 17            |
| 802.11n HT-20    | 5500.00                   | 5470.00        | 58.26             | 17            |
| 802.11n HT-40    | 5510.00                   | 5470.00        | 54.43             | 15            |

##### 5250 - 5350 MHz

| Integral         |                           | Band-Edge Freq | Limit 74.0dBµV/m | Limit 54.0dBµV/m | Power Setting |
|------------------|---------------------------|----------------|------------------|------------------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz            | dBµV/m           | dBµV/m           |               |
| 802.11a          | 5320.00                   | 5350.00        | 73.66            | 52.44            | 16            |
| 802.11n HT-20    | 5320.00                   | 5350.00        | 71.98            | 50.72            | 15            |
| 802.11n HT-40    | 5310.00                   | 5350.00        | 72.66            | 48.92            | 14            |

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#### 5725 MHz Radiated Lower Band-Edge Emissions

| Integral         |                           | Band-Edge Freq | dBµV/m | dBµV/m | Power Setting |
|------------------|---------------------------|----------------|--------|--------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz            |        |        |               |
| 802.11a          | 5725.00                   | 5725.00        | 76.24  | 68.84  | 22            |
| 802.11n HT-20    | 5725.00                   | 5725.00        | 78.24  | 67.85  | 22            |
| 802.11n HT-40    | 5725.00                   | 5725.00        | 80.14  | 78.36  | 22            |

#### 5850 MHz Radiated Higher Band-Edge Emissions

| Integral         |                           | Band-Edge Freq | dBµV/m | dBµV/m | Power Setting |
|------------------|---------------------------|----------------|--------|--------|---------------|
| Operational Mode | Operating Frequency (MHz) | MHz            |        |        |               |
| 802.11a          | 5850.00                   | 5850.00        | 72.58  | 68.93  | 22            |
| 802.11n HT-20    | 5850.00                   | 5850.00        | 74.32  | 69.76  | 22            |
| 802.11n HT-40    | 5850.00                   | 5850.00        | 69.91  | 68.02  | 22            |

Click on the links to view the data.

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5180.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 17             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 4500.00 - 5250.00 MHz                                                                                     |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                       | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                                                                                                        | 5150.00       | 15.27    | 3.67          | 34.11 | 53.05        | Max Avg          | Horizontal | 102    | 158     | 54.0         | -1.0      | Pass       |
| #2                                                                                                        | 5150.00       | 32.83    | 3.67          | 34.11 | 70.61        | Max Peak         | Horizontal | 102    | 158     | 74.0         | -3.4      | Pass       |
| #3                                                                                                        | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits |               |          |               |       |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5180.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 4500.00 - 5250.00 MHz                                                                                     |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                       | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                                                                                                        | 5150.00       | 13.51    | 3.67          | 34.11 | 51.29        | Max Avg          | Horizontal | 102    | 158     | 54.0         | -2.7      | Pass       |
| #2                                                                                                        | 5150.00       | 33.53    | 3.67          | 34.11 | 71.31        | Max Peak         | Horizontal | 102    | 158     | 74.0         | -2.7      | Pass       |
| #3                                                                                                        | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits |               |          |               |       |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5190.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 14             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 4500.00 - 5250.00 MHz                                                                                     |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                       | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                                                                                                        | 5150.00       | 14.86    | 3.67          | 34.11 | 52.64        | Max Avg          | Horizontal | 102    | 158     | 54.0         | -1.4      | Pass       |
| #2                                                                                                        | 5150.00       | 32.97    | 3.67          | 34.11 | 70.75        | Max Peak         | Horizontal | 102    | 158     | 74.0         | -3.3      | Pass       |
| #3                                                                                                        | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits |               |          |               |       |              |                  |            |        |         |              |           |            |

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**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5500.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 17             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                    | 5459.40       | 32.69    | 3.79          | 34.31 | 70.79        | Max Peak         | Horizontal | 111    | 353     | 74.0         | -3.2      | Pass       |
| #2                    | 5460.00       | 13.55    | 3.79          | 34.31 | 51.65        | Max Avg          | Horizontal | 111    | 353     | 54.0         | -2.4      | Pass       |
| #4                    | 5470.00       | 18.91    | 3.76          | 34.32 | 56.99        | Max Avg          | Horizontal | 111    | 353     | 68.2         | -11.2     | Pass       |
| #3                    | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| #5                    | 5470.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5500.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 17             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                    | 5459.40       | 34.02    | 3.79          | 34.31 | 72.12        | Max Peak         | Horizontal | 111    | 353     | 74.0         | -1.9      | Pass       |
| #2                    | 5460.00       | 14.68    | 3.79          | 34.31 | 52.78        | Max Avg          | Horizontal | 111    | 353     | 54.0         | -1.2      | Pass       |
| #4                    | 5470.00       | 20.18    | 3.76          | 34.32 | 58.26        | Max Avg          | Horizontal | 111    | 353     | 68.2         | -9.9      | Pass       |
| #3                    | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| #5                    | 5470.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5510.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 15             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                    | 5460.00       | 13.67    | 3.79          | 34.31 | 51.77        | Max Avg          | Horizontal | 111    | 353     | 54.0         | -2.2      | Pass       |
| #2                    | 5460.00       | 32.24    | 3.79          | 34.31 | 70.34        | Max Peak         | Horizontal | 111    | 353     | 74.0         | -3.7      | Pass       |
| #4                    | 5470.00       | 16.35    | 3.76          | 34.32 | 54.43        | Max Avg          | Horizontal | 111    | 353     | 68.2         | -13.8     | Pass       |
| #3                    | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| #5                    | 5470.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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#### Equipment Configuration for Restricted Upper Band-Edge Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5320.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 16             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 5300.00 - 5460.00 MHz                                                                                     |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                       | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                                                                                                        | 5350.00       | 14.23    | 3.70          | 34.51 | 52.44        | Max Avg          | Horizontal | 140    | 337     | 54.0         | -1.6      | Pass       |
| #3                                                                                                        | 5352.57       | 35.45    | 3.71          | 34.50 | 73.66        | Max Peak         | Horizontal | 140    | 337     | 74.0         | -0.3      | Pass       |
| #2                                                                                                        | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits |               |          |               |       |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for Restricted Upper Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5320.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 15             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5300.00 - 5460.00 MHz                                                                                     |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                       | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                                                                                                        | 5350.00       | 12.51    | 3.70          | 34.51 | 50.72        | Max Avg          | Horizontal | 140    | 337     | 54.0         | -3.3      | Pass       |
| #2                                                                                                        | 5350.00       | 33.77    | 3.70          | 34.51 | 71.98        | Max Peak         | Horizontal | 140    | 337     | 74.0         | -2.0      | Pass       |
| #3                                                                                                        | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits |               |          |               |       |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for Restricted Upper Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5310.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 14             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5300.00 - 5460.00 MHz                                                                                     |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                       | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                                                                                                        | 5350.00       | 10.71    | 3.70          | 34.51 | 48.92        | Max Avg          | Horizontal | 140    | 337     | 54.0         | -5.1      | Pass       |
| #3                                                                                                        | 5350.32       | 34.45    | 3.70          | 34.51 | 72.66        | Max Peak         | Horizontal | 140    | 337     | 74.0         | -1.3      | Pass       |
| #2                                                                                                        | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits |               |          |               |       |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5745.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

##### 5600.00 - 5780.00 MHz

| Num | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
|-----|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| #1  | 5715.00       | 28.69    | 3.81          | 34.34 | 66.84        | Max Avg          | Horizontal | 119    | 6       | 109.4        | -42.6     | Pass       |
| #2  | 5725.00       | 38.10    | 3.79          | 34.35 | 76.24        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -46.0     | Pass       |
| #3  | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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#### Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5745.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

##### 5600.00 - 5780.00 MHz

| Num | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
|-----|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| #1  | 5715.00       | 29.70    | 3.81          | 34.34 | 67.85        | Max Avg          | Horizontal | 119    | 6       | 109.4        | -41.6     | Pass       |
| #2  | 5725.00       | 40.14    | 3.79          | 34.35 | 78.28        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -43.9     | Pass       |
| #3  | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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#### Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5755.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

##### 5600.00 - 5780.00 MHz

| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
|-----|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| #1  | 5717.53       | 40.21    | 3.81          | 34.34 | 78.36        | Max Avg          | Horizontal | 119    | 6       | 110.2        | -31.9     | Pass       |
| #2  | 5725.00       | 42.00    | 3.79          | 34.35 | 80.14        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -42.1     | Pass       |
| #3  | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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#### Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5825.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

##### 5770.00 - 6000.00 MHz

| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
|-----|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| #1  | 5850.00       | 34.14    | 3.81          | 34.63 | 72.58        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -49.6     | Pass       |
| #3  | 5860.00       | 30.42    | 3.86          | 34.65 | 68.93        | Max Avg          | Horizontal | 119    | 6       | 109.4        | -40.5     | Pass       |
| #2  | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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#### Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5825.00        | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

##### 5770.00 - 6000.00 MHz

| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
|-----|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| #1  | 5850.00       | 35.88    | 3.81          | 34.63 | 74.32        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -47.9     | Pass       |
| #3  | 5860.00       | 31.25    | 3.86          | 34.65 | 69.76        | Max Avg          | Horizontal | 119    | 6       | 109.4        | -39.6     | Pass       |
| #2  | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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#### Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

|                                 |                |                        |               |
|---------------------------------|----------------|------------------------|---------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5795.00        | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

##### 5770.00 - 6000.00 MHz

| Num | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
|-----|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| #1  | 5850.00       | 31.47    | 3.81          | 34.63 | 69.91        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -52.3     | Pass       |
| #3  | 5869.22       | 29.52    | 3.82          | 34.68 | 68.02        | Max Avg          | Horizontal | 119    | 6       | 106.9        | -38.9     | Pass       |
| #2  | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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#### 9.6.2.4. YAGEO ANT300P002B24553

##### RESULTS SUMMARY FOR RADIATED BAND-EDGE EMISSIONS

###### 5150 - 5250 MHz

| YAGEO ANT300P002B24553 |                           | Band-Edge Freq | Limit 74.0dBµV/m | Limit 54.0dBµV/m | Power Setting |
|------------------------|---------------------------|----------------|------------------|------------------|---------------|
| Operational Mode       | Operating Frequency (MHz) | MHz            | dBµV/m           | dBµV/m           |               |
| 802.11a                | 5180.00                   | 5150.00        | 68.67            | 52.85            | 17            |
| 802.11n HT-20          | 5180.00                   | 5150.00        | 68.50            | 53.05            | 17            |
| 802.11n HT-40          | 5190.00                   | 5150.00        | 71.74            | 52.33            | 14            |

###### 5470 - 5725 MHz

| YAGEO ANT300P002B24553 |                           | Restricted-Edge Freq | Limit 74.0dBµV/m | Limit 54.0dBµV/m | Power Setting |
|------------------------|---------------------------|----------------------|------------------|------------------|---------------|
| Operational Mode       | Operating Frequency (MHz) | MHz                  | dBµV/m           | dBµV/m           |               |
| 802.11a                | 5500.00                   | 5460.00              | 69.15            | 50.49            | 16            |
| 802.11n HT-20          | 5500.00                   | 5460.00              | 73.28            | 52.57            | 16            |
| 802.11n HT-40          | 5510.00                   | 5460.00              | 69.15            | 53.88            | 14            |

| YAGEO ANT300P002B24553 |                           | Band-Edge Freq | Limit 68.23dBµV/m | Power Setting |
|------------------------|---------------------------|----------------|-------------------|---------------|
| Operational Mode       | Operating Frequency (MHz) | MHz            | dBµV/m            |               |
| 802.11a                | 5500.00                   | 5470.00        | 56.79             | 16            |
| 802.11n HT-20          | 5500.00                   | 5470.00        | 58.49             | 16            |
| 802.11n HT-40          | 5510.00                   | 5470.00        | 57.00             | 14            |

###### 5250 - 5350 MHz

| YAGEO ANT300P002B24553 |                           | Band-Edge Freq | Limit 74.0dBµV/m | Limit 54.0dBµV/m | Power Setting |
|------------------------|---------------------------|----------------|------------------|------------------|---------------|
| Operational Mode       | Operating Frequency (MHz) | MHz            | dBµV/m           | dBµV/m           |               |
| 802.11a                | 5320.00                   | 5350.00        | 71.38            | 53.39            | 16            |
| 802.11n HT-20          | 5320.00                   | 5350.00        | 70.09            | 52.44            | 15            |
| 802.11n HT-40          | 5310.00                   | 5350.00        | 73.16            | 53.58            | 14            |

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#### 5725 MHz Radiated Lower Band-Edge Emissions

| YAGEO ANT300P002B24553 |                           | Band-Edge Freq | Limit 68.2dBµV/m | Limit 68.2dBµV/m | Power Setting |
|------------------------|---------------------------|----------------|------------------|------------------|---------------|
| Operational Mode       | Operating Frequency (MHz) | MHz            | dBµV/m           | dBµV/m           |               |
| 802.11a                | 5725.00                   | 0.00           | 75.30            | 53.45            | 20            |
| 802.11n HT-20          | 5725.00                   | 0.00           | 75.95            | 53.98            | 20            |
| 802.11n HT-40          | 5725.00                   | 0.00           | 74.30            | 57.67            | 20            |

#### 5850 MHz Radiated Higher Band-Edge Emissions

| YAGEO ANT300P002B24553 |                           | Band-Edge Freq | Limit 122.2dBµV/m | Limit 110.8dBµV/m | Power Setting |
|------------------------|---------------------------|----------------|-------------------|-------------------|---------------|
| Operational Mode       | Operating Frequency (MHz) | MHz            | dBµV/m            | dBµV/m            |               |
| 802.11a                | 5850.00                   | 5850.00        | 75.53             | 55.20             | 22            |
| 802.11n HT-20          | 5850.00                   | 5850.00        | 76.23             | 55.66             | 22            |
| 802.11n HT-40          | 5850.00                   | 5850.00        | 73.61             | 61.45             | 22            |

Click on the links to view the data.

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 2.30                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5180.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 17                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 4500.00 - 5250.00 MHz                                                                                             |               |          |               |       |              |                  |          |        |         |              |           |            |
|-------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                                                                                                               | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                                                                                                                | 5150.00       | 15.07    | 3.67          | 34.11 | 52.85        | Max Avg          | Vertical | 179    | 178     | 54.0         | -1.2      | Pass       |
| #2                                                                                                                | 5150.00       | 30.89    | 3.67          | 34.11 | 68.67        | Max Peak         | Vertical | 179    | 178     | 74.0         | -5.3      | Pass       |
| #3                                                                                                                | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit. |               |          |               |       |              |                  |          |        |         |              |           |            |

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                        |                        |               |
|---------------------------------|------------------------|------------------------|---------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 2,30                   | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5180.00                | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 17                     | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 4500.00 - 5250.00 MHz                                                                                             |               |          |               |       |              |                  |            |        |         |              |           |            |
|-------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                               | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                                                                                                                | 5148.50       | 30.71    | 3.68          | 34.11 | 68.50        | Max Peak         | Horizontal | 179    | 178     | 74.0         | -5.5      | Pass       |
| #2                                                                                                                | 5150.00       | 15.27    | 3.67          | 34.11 | 53.05        | Max Avg          | Horizontal | 179    | 178     | 54.0         | -1.0      | Pass       |
| #3                                                                                                                | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit. |               |          |               |       |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                        |                        |               |
|---------------------------------|------------------------|------------------------|---------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 2.30                   | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5190.00                | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 14                     | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 4500.00 - 5250.00 MHz                                                                                             |               |          |               |       |              |                  |            |        |         |              |           |            |
|-------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                               | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                                                                                                                | 5148.50       | 33.95    | 3.68          | 34.11 | 71.74        | Max Peak         | Horizontal | 179    | 178     | 74.0         | -2.3      | Pass       |
| #2                                                                                                                | 5150.00       | 14.55    | 3.67          | 34.11 | 52.33        | Max Avg          | Horizontal | 179    | 178     | 54.0         | -1.7      | Pass       |
| #3                                                                                                                | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit. |               |          |               |       |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 1.0                    | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5500.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 16                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |          |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                    | 5458.50       | 31.05    | 3.80          | 34.30 | 69.15        | Max Peak         | Vertical | 191    | 180     | 74.0         | -4.9      | Pass       |
| #2                    | 5460.00       | 12.39    | 3.79          | 34.31 | 50.49        | Max Avg          | Vertical | 191    | 180     | 54.0         | -3.5      | Pass       |
| #4                    | 5470.00       | 18.71    | 3.76          | 34.32 | 56.79        | Max Avg          | Vertical | 191    | 180     | 68.2         | -11.4     | Pass       |
| #3                    | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| #5                    | 5470.00       | --       | --            | --    | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                        |                        |               |
|---------------------------------|------------------------|------------------------|---------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 1.0                    | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5500.00                | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 16                     | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |          |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                    | 5456.69       | 35.18    | 3.80          | 34.30 | 73.28        | Max Peak         | Vertical | 191    | 180     | 74.0         | -0.7      | Pass       |
| #2                    | 5460.00       | 14.47    | 3.79          | 34.31 | 52.57        | Max Avg          | Vertical | 191    | 180     | 54.0         | -1.4      | Pass       |
| #4                    | 5470.00       | 20.41    | 3.76          | 34.32 | 58.49        | Max Avg          | Vertical | 191    | 180     | 68.2         | -9.7      | Pass       |
| #3                    | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| #5                    | 5470.00       | --       | --            | --    | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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#### Equipment Configuration for Restricted Lower Band-Edge Emissions

|                                 |                        |                        |               |
|---------------------------------|------------------------|------------------------|---------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 1.0                    | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5510.00                | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 14                     | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |          |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                    | 5460.00       | 15.78    | 3.79          | 34.31 | 53.88        | Max Avg          | Vertical | 191    | 180     | 54.0         | -0.1      | Pass       |
| #2                    | 5460.00       | 31.05    | 3.79          | 34.31 | 69.15        | Max Peak         | Vertical | 191    | 180     | 74.0         | -4.9      | Pass       |
| #3                    | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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#### Equipment Configuration for Restricted Upper Band-Edge Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 1.90                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5320.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 16                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 5300.00 - 5460.00 MHz                                                                                             |               |          |               |       |              |                  |            |        |         |              |           |            |
|-------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                               | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                                                                                                                | 5350.00       | 15.18    | 3.70          | 34.51 | 53.39        | Max Avg          | Horizontal | 199    | 181     | 54.0         | -0.6      | Pass       |
| #2                                                                                                                | 5350.00       | 33.17    | 3.70          | 34.51 | 71.38        | Max Peak         | Horizontal | 199    | 181     | 74.0         | -2.6      | Pass       |
| #3                                                                                                                | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit. |               |          |               |       |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for Restricted Upper Band-Edge Emissions

|                                 |                         |                        |               |
|---------------------------------|-------------------------|------------------------|---------------|
| <b>Antenna:</b>                 | YAGEO ANTX300P002B24553 | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 1.90                    | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable          | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5320.00                 | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 15                      | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5300.00 - 5460.00 MHz                                                                                             |               |          |               |       |              |                  |            |        |         |              |           |            |
|-------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                               | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                                                                                                                | 5350.00       | 14.23    | 3.70          | 34.51 | 52.44        | Max Avg          | Horizontal | 199    | 181     | 54.0         | -1.6      | Pass       |
| #3                                                                                                                | 5351.28       | 31.87    | 3.71          | 34.51 | 70.09        | Max Peak         | Horizontal | 199    | 181     | 74.0         | -3.9      | Pass       |
| #2                                                                                                                | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit. |               |          |               |       |              |                  |            |        |         |              |           |            |

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#### Equipment Configuration for 5350 MHz Radiated Band-Edge Emissions

|                                 |                          |                        |              |
|---------------------------------|--------------------------|------------------------|--------------|
| <b>Antenna:</b>                 | YAGEO ANT-X300P002B24553 | <b>Variant:</b>        | 802.11n HT40 |
| <b>Antenna Gain (dBi):</b>      | 1.90                     | <b>Modulation:</b>     | OFDM         |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable           | <b>Duty Cycle (%):</b> | 99           |
| <b>Channel Frequency (MHz):</b> | 5310.00                  | <b>Data Rate:</b>      | 13.50 MBit/s |
| <b>Power Setting:</b>           | 14                       | <b>Tested By:</b>      | JMH          |

#### Test Measurement Results

##### 5300.00 - 5460.00 MHz

| Num | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
|-----|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| #1  | 5350.00       | 14.08    | 3.70          | 35.80 | 53.58        | Max Avg          | Vertical | 158    | 291     | 54.0         | -0.4      | Pass       |
| #3  | 5355.45       | 33.65    | 3.71          | 35.80 | 73.16        | Max Peak         | Vertical | 158    | 291     | 74.0         | -0.8      | Pass       |
| #2  | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot.

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**To:** FCC CFR 47 Part 15.407 & RSS-247  
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#### Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 0.5                    | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5745.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 20                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 5600.00 - 5780.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                    | 5650.00       | 15.52    | 3.75          | 34.18 | 53.45        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -14.8     | Pass       |
| #2                    | 5725.00       | 37.16    | 3.79          | 34.35 | 75.30        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -46.9     | Pass       |
| #3                    | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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#### Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

|                                 |                        |                        |               |
|---------------------------------|------------------------|------------------------|---------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 0.5                    | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5745.00                | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 20                     | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5600.00 - 5780.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                    | 5650.00       | 16.05    | 3.75          | 34.18 | 53.98        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -14.3     | Pass       |
| #2                    | 5725.00       | 37.81    | 3.79          | 34.35 | 75.95        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -46.3     | Pass       |
| #3                    | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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#### Equipment Configuration for 5725 MHz Radiated Band-Edge Emissions

|                                 |                        |                        |               |
|---------------------------------|------------------------|------------------------|---------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 0.5                    | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5755.00                | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 20                     | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5600.00 - 5780.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                    | 5650.00       | 19.74    | 3.75          | 34.18 | 57.67        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -10.6     | Pass       |
| #2                    | 5725.00       | 36.16    | 3.79          | 34.35 | 74.30        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -47.9     | Pass       |
| #3                    | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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#### Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 0.5                    | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5825.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 5770.00 - 6000.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                    | 5850.00       | 37.09    | 3.81          | 34.63 | 75.53        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -46.7     | Pass       |
| #3                    | 5925.92       | 16.54    | 3.84          | 34.82 | 55.20        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -13.0     | Pass       |
| #2                    | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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#### Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

|                                 |                        |                        |               |
|---------------------------------|------------------------|------------------------|---------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11n HT-20 |
| <b>Antenna Gain (dBi):</b>      | 0.5                    | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5825.00                | <b>Data Rate:</b>      | 6.50 MBit/s   |
| <b>Power Setting:</b>           | 22                     | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5770.00 - 6000.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                    | 5850.00       | 37.79    | 3.81          | 34.63 | 76.23        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -46.0     | Pass       |
| #3                    | 5925.00       | 17.00    | 3.84          | 34.82 | 55.66        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -12.6     | Pass       |
| #2                    | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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#### Equipment Configuration for 5850 MHz Radiated Band-Edge Emissions

|                                 |                        |                        |               |
|---------------------------------|------------------------|------------------------|---------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11n HT-40 |
| <b>Antenna Gain (dBi):</b>      | 0.5                    | <b>Modulation:</b>     | OFDM          |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99            |
| <b>Channel Frequency (MHz):</b> | 5795.00                | <b>Data Rate:</b>      | 13.50 MBit/s  |
| <b>Power Setting:</b>           | 22                     | <b>Tested By:</b>      | JMH           |

#### Test Measurement Results

| 5770.00 - 6000.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                    | 5850.00       | 35.17    | 3.81          | 34.63 | 73.61        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -48.6     | Pass       |
| #3                    | 5925.00       | 22.79    | 3.84          | 34.82 | 61.45        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -6.8      | Pass       |
| #2                    | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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### 9.6.3. Digital Emissions

| Radiated Test Conditions for Radiated Digital Emissions (0.03 – 1 GHz) |                          |                            |             |
|------------------------------------------------------------------------|--------------------------|----------------------------|-------------|
| <b>Standard:</b>                                                       | FCC CFR 47:15.247        | <b>Ambient Temp. (°C):</b> | 20.0 - 24.5 |
| <b>Test Heading:</b>                                                   | Digital Emissions        | <b>Rel. Humidity (%):</b>  | 32 - 45     |
| <b>Standard Section(s):</b>                                            | 15.209                   | <b>Pressure (mBars):</b>   | 999 - 1001  |
| <b>Reference Document(s):</b>                                          | See Normative References |                            |             |

#### Test Procedure for Radiated Digital Emissions (0.03 – 1 GHz)

Testing 30M-1 GHz was performed in a 3-meter anechoic chamber using a CISPR compliant receiver. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. To further maximize emissions the receive antenna was varied between 1 and 4 meters. The emissions are recorded with receiver in peak hold mode. Emissions closest to the limits are measured in the quasi-peak mode with the tuned receiver using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed.

Test configuration and setup for Radiated Spurious and Band-Edge Measurement were per the Radiated Test Set-up specified in this document.

#### Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. In this test facility, the Antenna Factor, Cable Loss, and Amplifier Gains are loaded into the Rohde & Schwarz Receiver and the corrected field strength can be read directly on the receiver.

$$FS = R + AF + CORR$$

where:

FS = Field Strength

R = Measured Receiver Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

For example:

Given a Receiver input reading of 51.5dBmV; Antenna Factor of 8.5dB; Cable Loss of 1.3dB; Falloff Factor of 0dB, an Amplifier Gain of 26dB and Notch Filter Loss of 1dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3\text{dBmV/m}$$

Conversion between dBmV/m (or dBmV) and mV/m (or mV) are done as:

$$\text{Level (dBmV/m)} = 20 * \text{Log (level (mV/m))}$$

$$40 \text{ dBmV/m} = 100\text{mV/m}$$

$$48 \text{ dBmV/m} = 250\text{mV/m}$$

Limits for Radiated Digital Emissions (0.03 – 1 GHz) (15.209)

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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| Frequency (MHz) | Field Strength                     |                                                   | Measurement Distance (m) |
|-----------------|------------------------------------|---------------------------------------------------|--------------------------|
|                 | $\mu\text{V/m}$ (microvolts/meter) | $\text{dB}\mu\text{V/m}$<br>(dB microvolts/meter) |                          |
| 0.009-0.490     | 2400/F(kHz)                        | --                                                | 300                      |
| 0.490-1.705     | 24000/F(kHz)                       | --                                                | 30                       |
| 1.705-30.0      | 30                                 | 29.5                                              | 30                       |
| 30-88           | 100**                              | 40                                                | 3                        |
| 88-216          | 150**                              | 43.5                                              | 3                        |
| 216-960         | 200**                              | 46.0                                              | 3                        |
| Above 960       | 500                                | 54.0                                              | 3                        |

\*\*Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

(b) In the emission table above, the tighter limit applies at the band edges. (c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. (d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. (e) The provisions in §§15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part. (f) In accordance with §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in §15.109 that are applicable to the incorporated digital device. (g) Perimeter protection systems may operate in the 54-72 MHz and 76-88 MHz bands under the provisions of this section. The use of such perimeter protection systems is limited to industrial, business and commercial applications.

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#### Equipment Configuration for Digital Emissions

|                                 |                |                        |             |
|---------------------------------|----------------|------------------------|-------------|
| <b>Antenna:</b>                 | Integral       | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 3.80           | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5745.00        | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22             | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 30.00 - 1000.00 MHz                                                                                                                                          |               |          |               |        |              |                  |          |        |         |              |           |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|--------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                                                                                                                                                          | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB  | Level dBµV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| #1                                                                                                                                                           | 37.10         | 43.16    | 3.48          | -16.06 | 30.58        | MaxQP            | Vertical | 107    | 189     | 40.0         | -9.4      | Pass       |
| #2                                                                                                                                                           | 55.44         | 53.35    | 3.61          | -24.13 | 32.83        | MaxQP            | Vertical | 101    | 281     | 40.0         | -7.2      | Pass       |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Laptop put into suspend mode to limit 50 MHz harmonics from support equipment. TX on 5745 |               |          |               |        |              |                  |          |        |         |              |           |            |

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#### Equipment Configuration for Digital Emissions

|                                 |                        |                        |             |
|---------------------------------|------------------------|------------------------|-------------|
| <b>Antenna:</b>                 | YAGEO ANT300P002B24553 | <b>Variant:</b>        | 802.11a     |
| <b>Antenna Gain (dBi):</b>      | 0.50                   | <b>Modulation:</b>     | OFDM        |
| <b>Beam Forming Gain (Y):</b>   | Not Applicable         | <b>Duty Cycle (%):</b> | 99          |
| <b>Channel Frequency (MHz):</b> | 5745.00                | <b>Data Rate:</b>      | 6.00 MBit/s |
| <b>Power Setting:</b>           | 22                     | <b>Tested By:</b>      | JMH         |

#### Test Measurement Results

| 30.00 - 1000.00 MHz                                                                                                                                          |               |          |               |        |              |                  |          |        |         |              |           |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|--------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                                                                                                                                                          | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| #1                                                                                                                                                           | 37.29         | 45.69    | 3.48          | -16.06 | 33.11        | MaxQP            | Vertical | 98     | 215     | 40.0         | -6.9      | Pass       |
| #2                                                                                                                                                           | 55.00         | 54.26    | 3.61          | -24.13 | 33.74        | MaxQP            | Vertical | 100    | 287     | 40.0         | -6.3      | Pass       |
| Test Notes: EUT powered by 5V ps, connected to Laptop via SD slot. Laptop put into suspend mode to limit 50 MHz harmonics from support equipment. TX on 5745 |               |          |               |        |              |                  |          |        |         |              |           |            |

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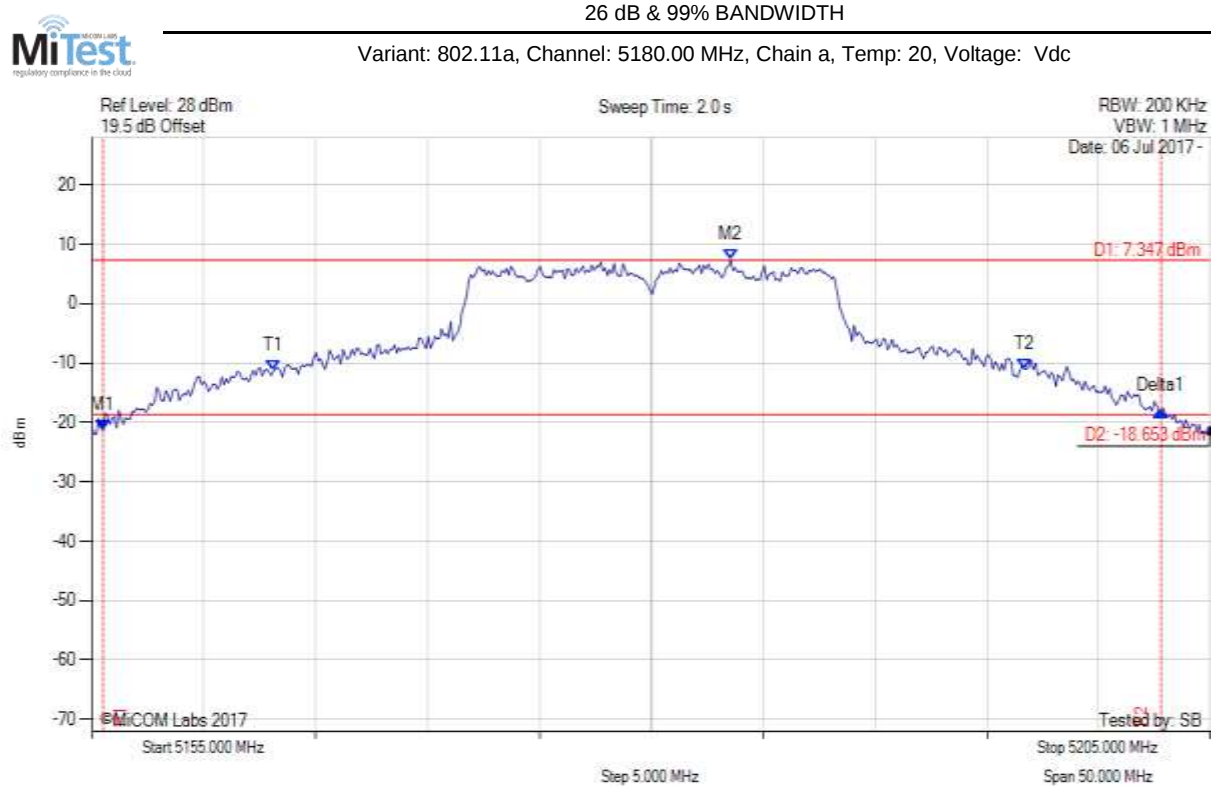
---

## **A. APPENDIX - GRAPHICAL IMAGES**

---

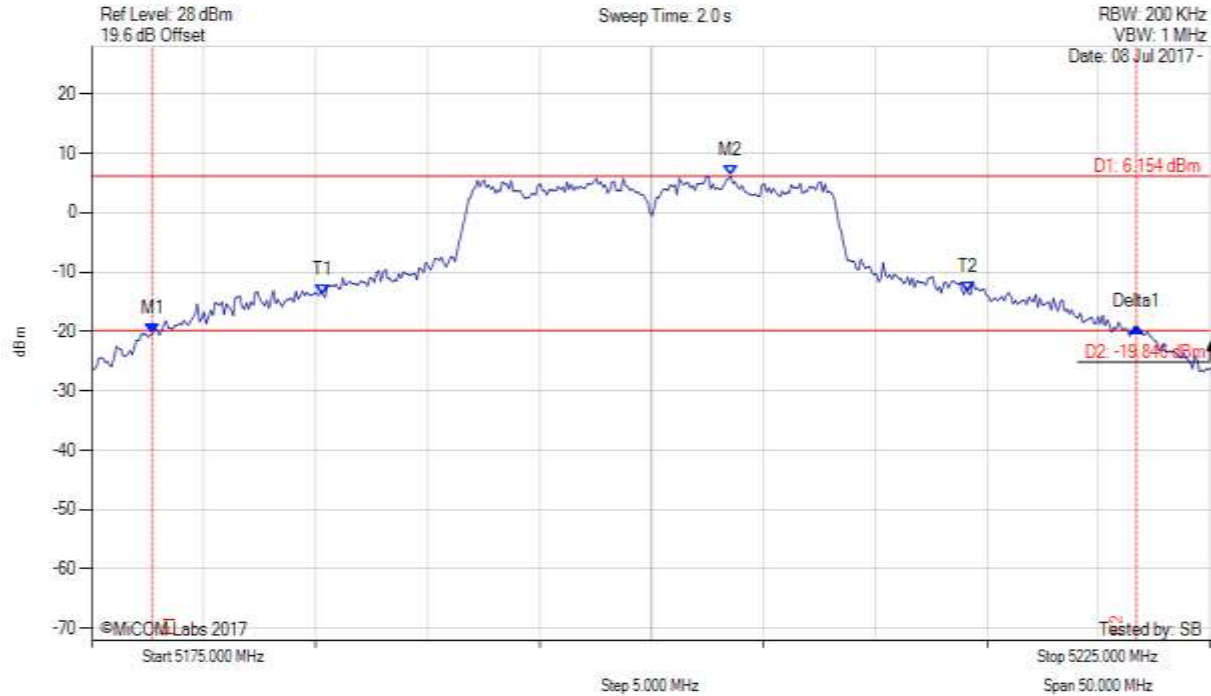
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## A.1. 26 dB & 99% Bandwidth



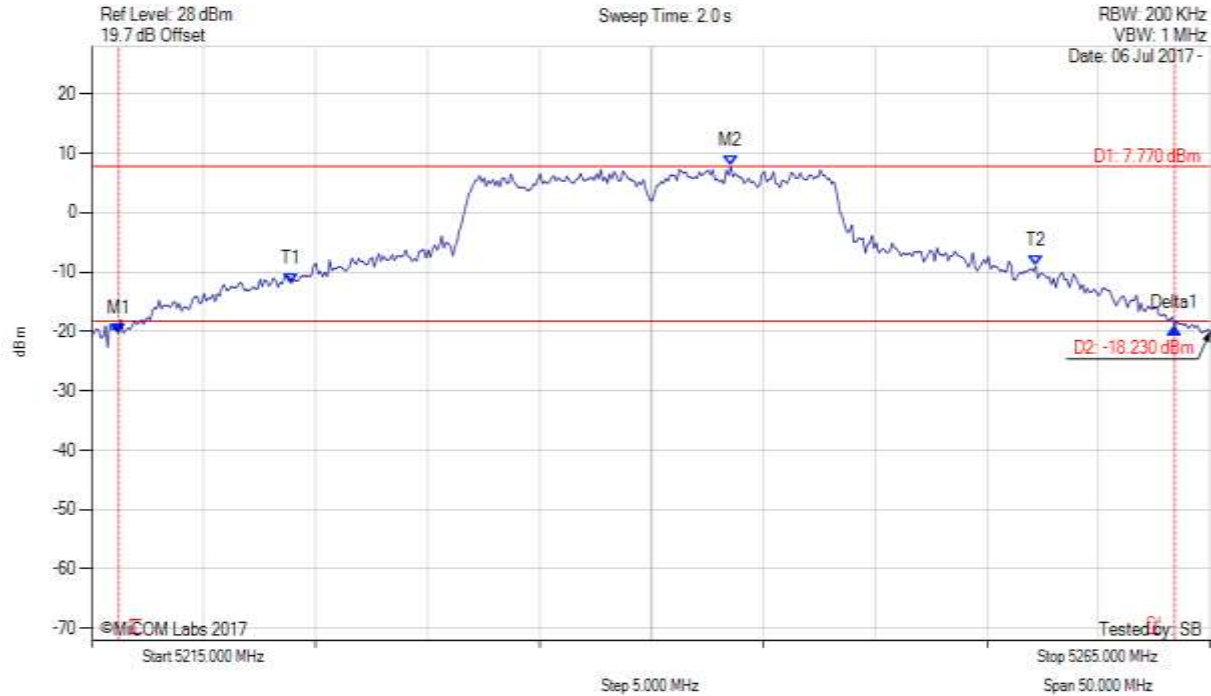
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5155.501 MHz : -21.406 dBm<br>M2 : 5183.557 MHz : 7.347 dBm<br>Delta1 : 47.295 MHz : 3.356 dB<br>T1 : 5163.116 MHz : -11.379 dBm<br>T2 : 5196.683 MHz : -10.981 dBm<br>OBW : 33.567 MHz | Measured 26 dB Bandwidth: 47.295 MHz<br>Measured 99% Bandwidth: 33.567 MHz |

[back to matrix](#)



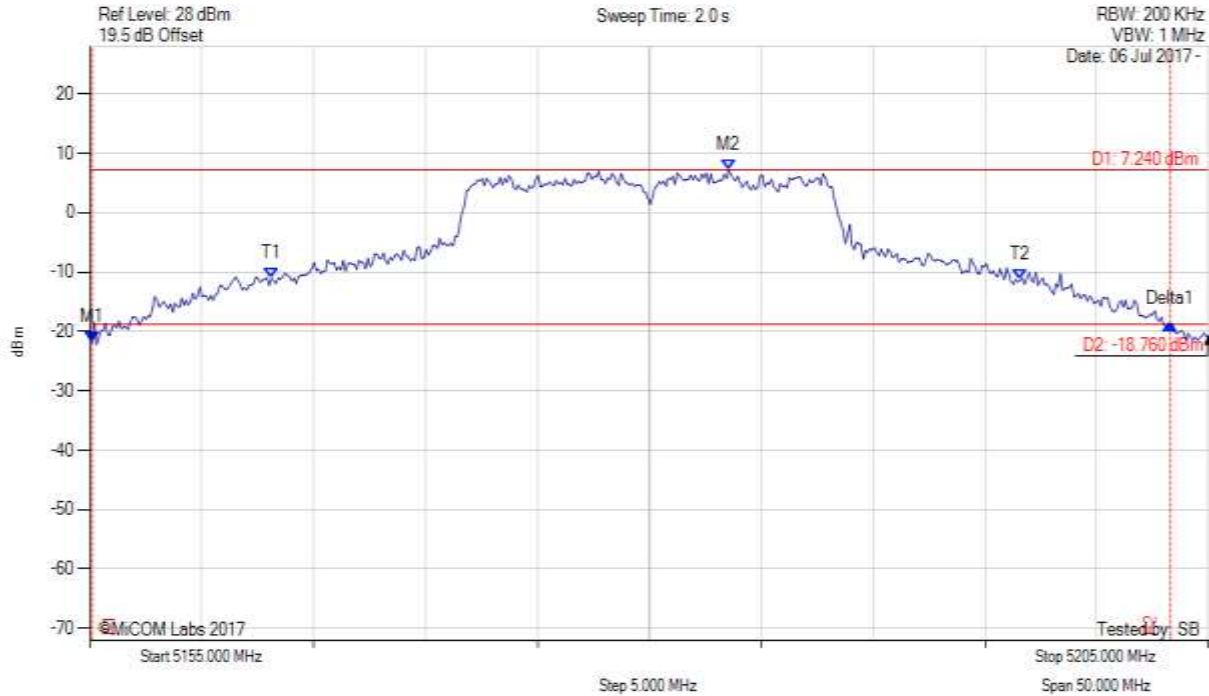
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5177.705 MHz : -20.472 dBm<br>M2 : 5203.557 MHz : 6.154 dBm<br>Delta1 : 43.988 MHz : 1.171 dB<br>T1 : 5185.321 MHz : -13.771 dBm<br>T2 : 5214.178 MHz : -13.464 dBm<br>OBW : 28.858 MHz | Measured 26 dB Bandwidth: 43.988 MHz<br>Measured 99% Bandwidth: 28.858 MHz |

[back to matrix](#)



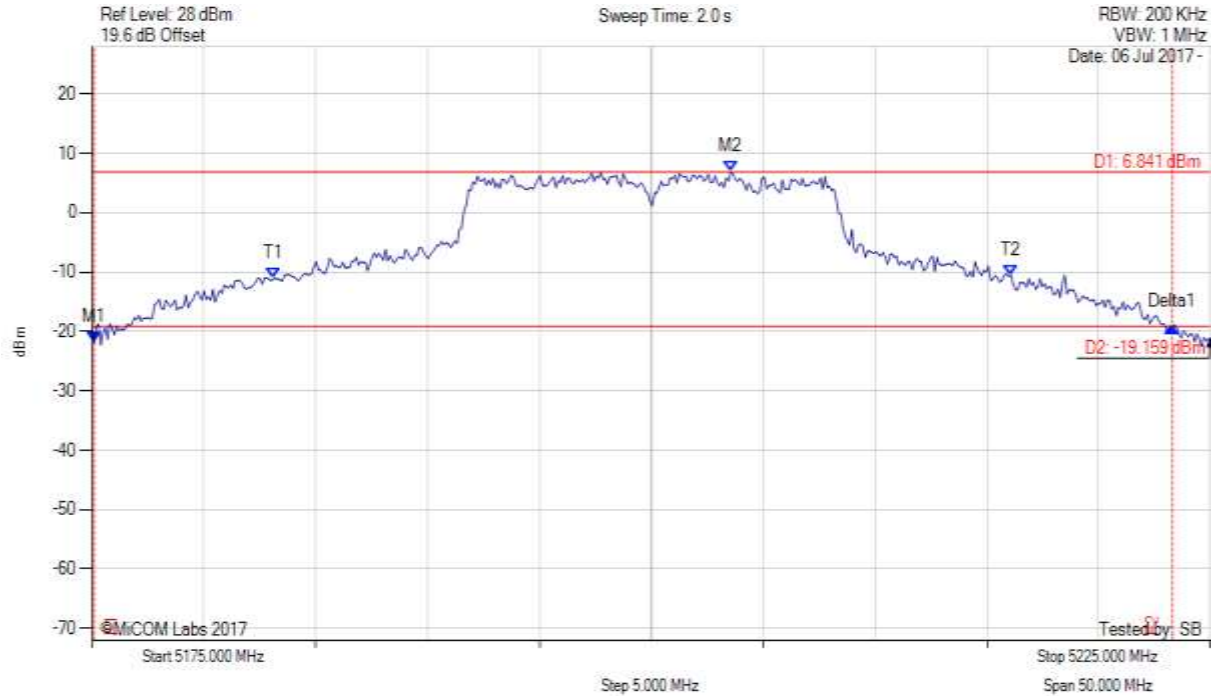
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                               |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5216.202 MHz : -20.448 dBm<br>M2 : 5243.557 MHz : 7.770 dBm<br>Delta1 : 47.194 MHz : 0.948 dB<br>T1 : 5223.918 MHz : -11.906 dBm<br>T2 : 5257.184 MHz : -8.976 dBm<br>OBW : 33.267 MHz | Measured 26 dB Bandwidth: 47.194 MHz<br>Measured 99% Bandwidth: 33.267 MHz |

[back to matrix](#)



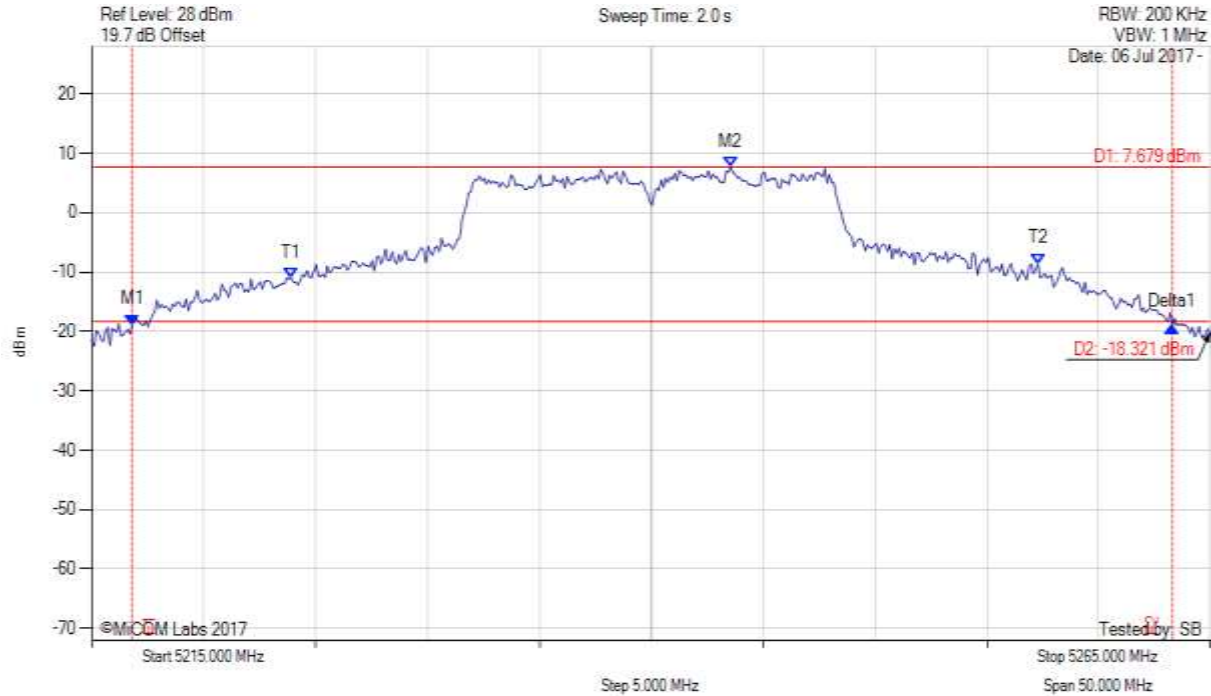
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5155.100 MHz : -21.867 dBm<br>M2 : 5183.557 MHz : 7.240 dBm<br>Delta1 : 48.196 MHz : 3.134 dB<br>T1 : 5163.116 MHz : -11.015 dBm<br>T2 : 5196.583 MHz : -11.355 dBm<br>OBW : 33.467 MHz | Measured 26 dB Bandwidth: 48.196 MHz<br>Measured 99% Bandwidth: 33.467 MHz |

[back to matrix](#)



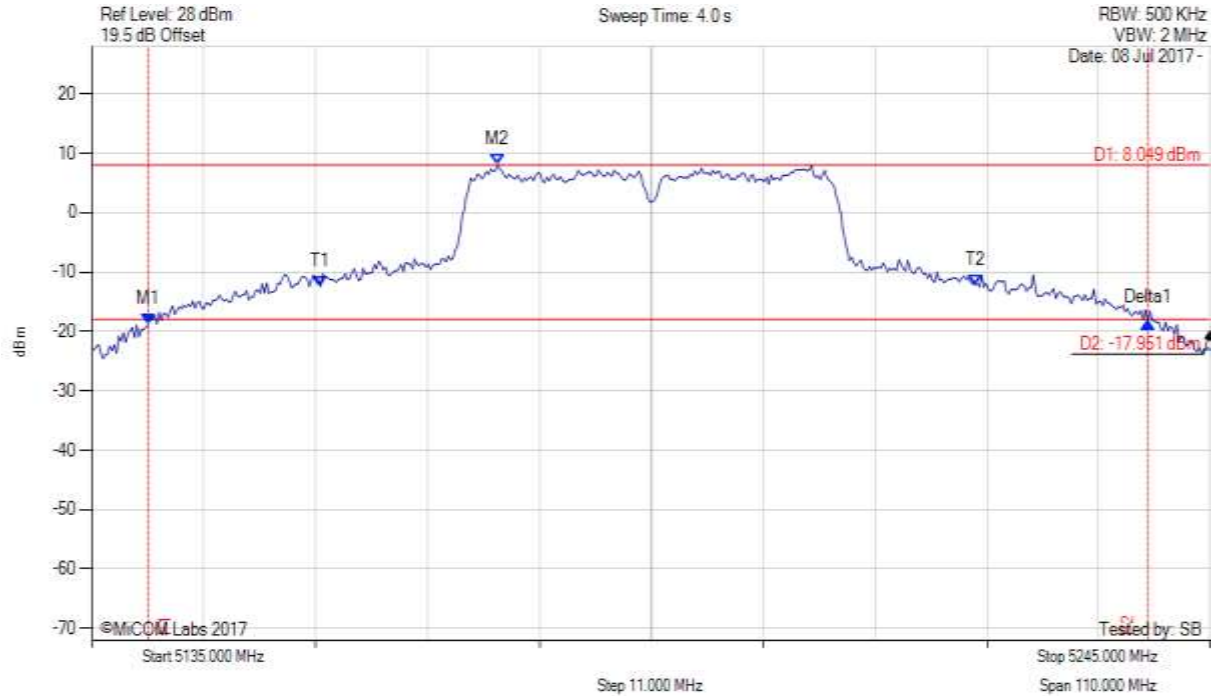
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5175.100 MHz : -21.894 dBm<br>M2 : 5203.557 MHz : 6.841 dBm<br>Delta1 : 48.196 MHz : 2.725 dB<br>T1 : 5183.116 MHz : -11.135 dBm<br>T2 : 5216.082 MHz : -10.539 dBm<br>OBW : 32.966 MHz | Measured 26 dB Bandwidth: 48.196 MHz<br>Measured 99% Bandwidth: 32.966 MHz |

[back to matrix](#)



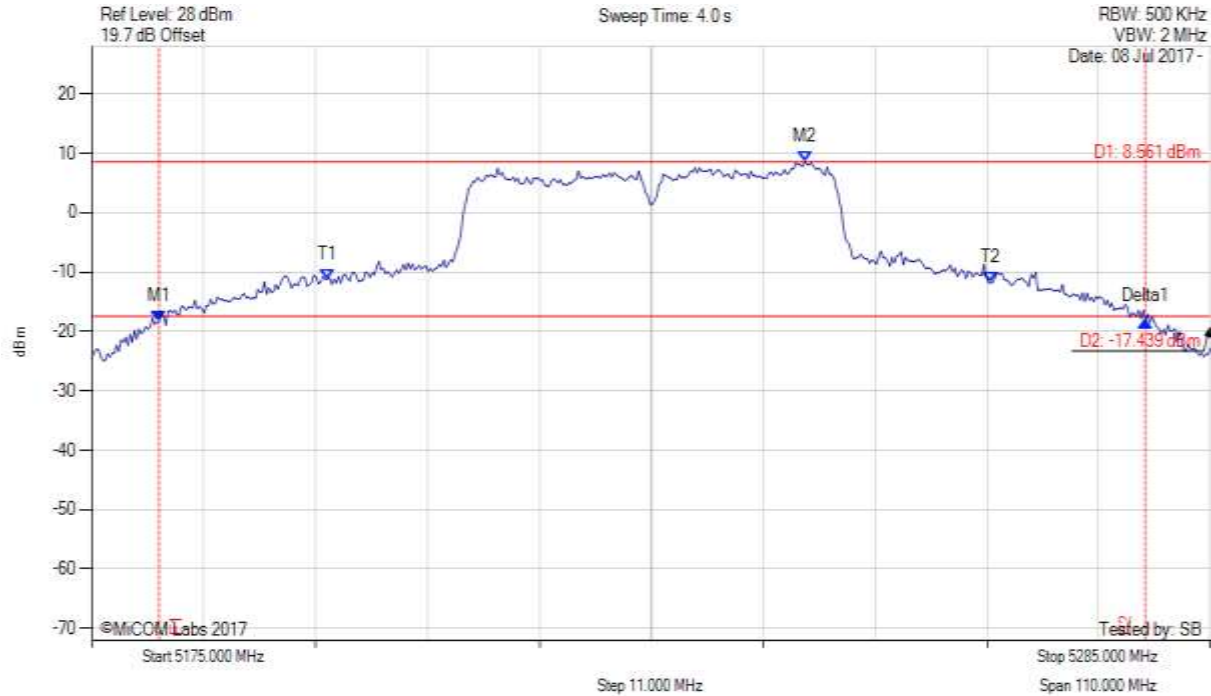
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5216.804 MHz : -18.888 dBm<br>M2 : 5243.557 MHz : 7.679 dBm<br>Delta1 : 46.493 MHz : -0.409 dB<br>T1 : 5223.918 MHz : -10.991 dBm<br>T2 : 5257.285 MHz : -8.599 dBm<br>OBW : 33.367 MHz | Measured 26 dB Bandwidth: 46.493 MHz<br>Measured 99% Bandwidth: 33.367 MHz |

[back to matrix](#)



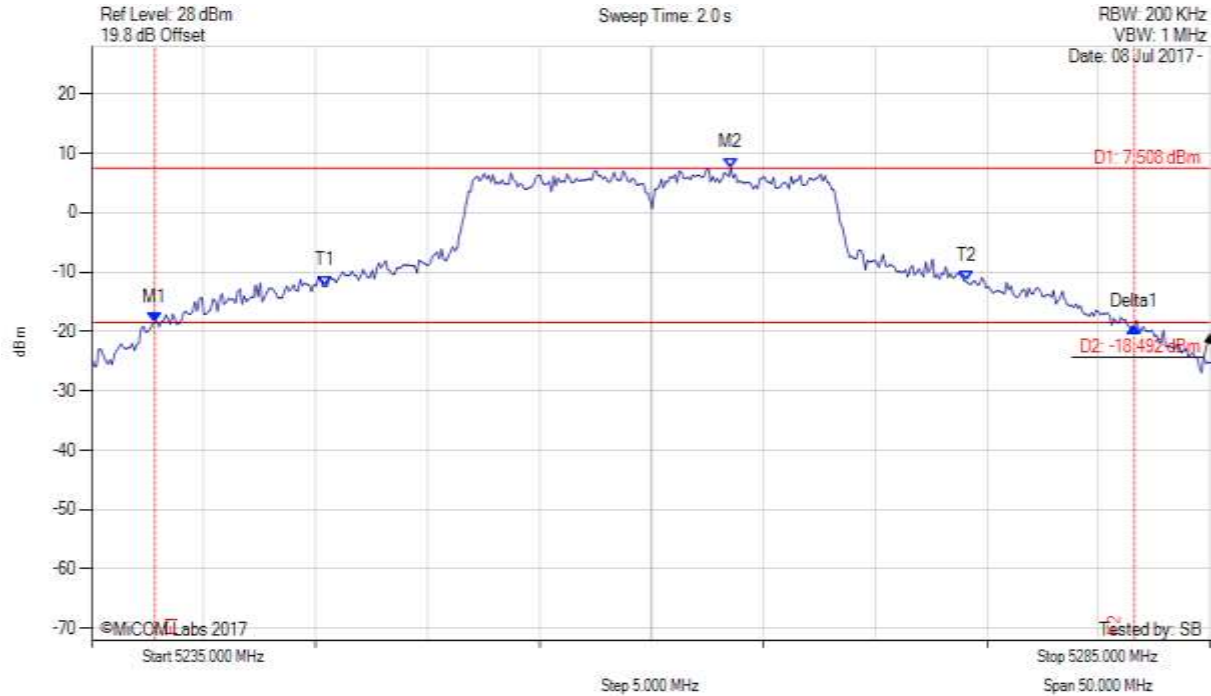
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5140.511 MHz : -18.827 dBm<br>M2 : 5174.900 MHz : 8.049 dBm<br>Delta1 : 98.317 MHz : 0.340 dB<br>T1 : 5157.485 MHz : -12.467 dBm<br>T2 : 5221.854 MHz : -12.136 dBm<br>OBW : 64.369 MHz | Measured 26 dB Bandwidth: 98.317 MHz<br>Measured 99% Bandwidth: 64.369 MHz |

[back to matrix](#)



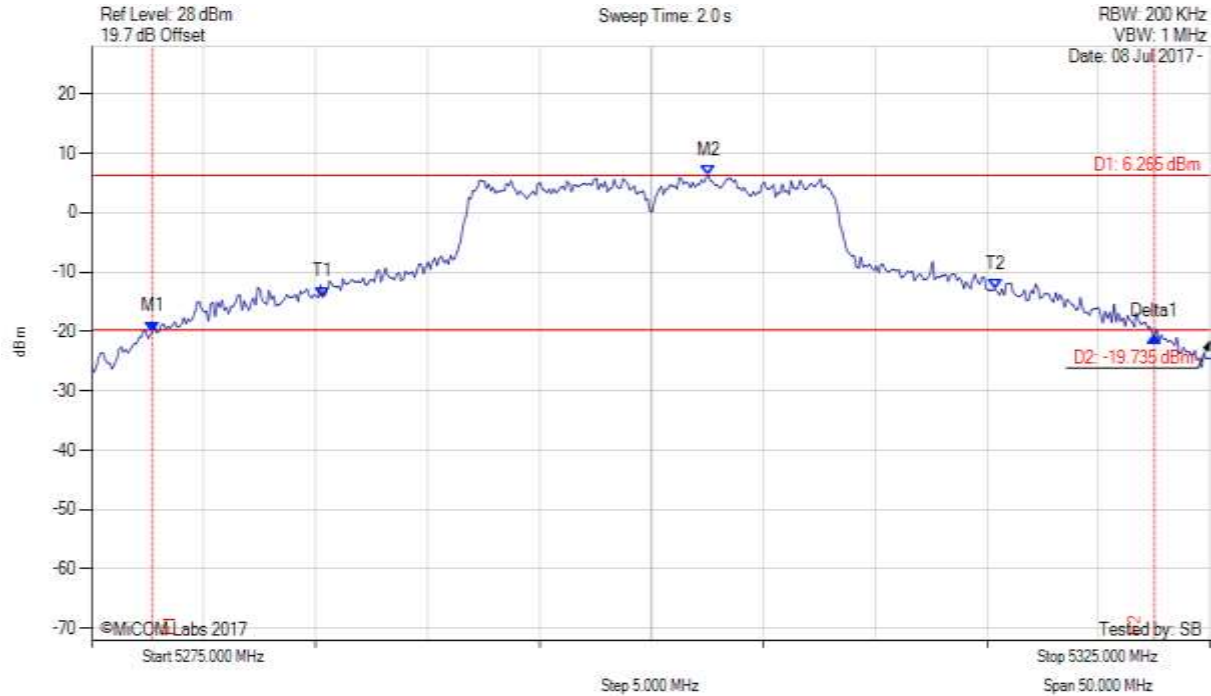
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5181.613 MHz : -18.343 dBm<br>M2 : 5245.100 MHz : 8.561 dBm<br>Delta1 : 96.994 MHz : 0.128 dB<br>T1 : 5198.146 MHz : -11.215 dBm<br>T2 : 5263.397 MHz : -11.853 dBm<br>OBW : 65.251 MHz | Measured 26 dB Bandwidth: 96.994 MHz<br>Measured 99% Bandwidth: 65.251 MHz |

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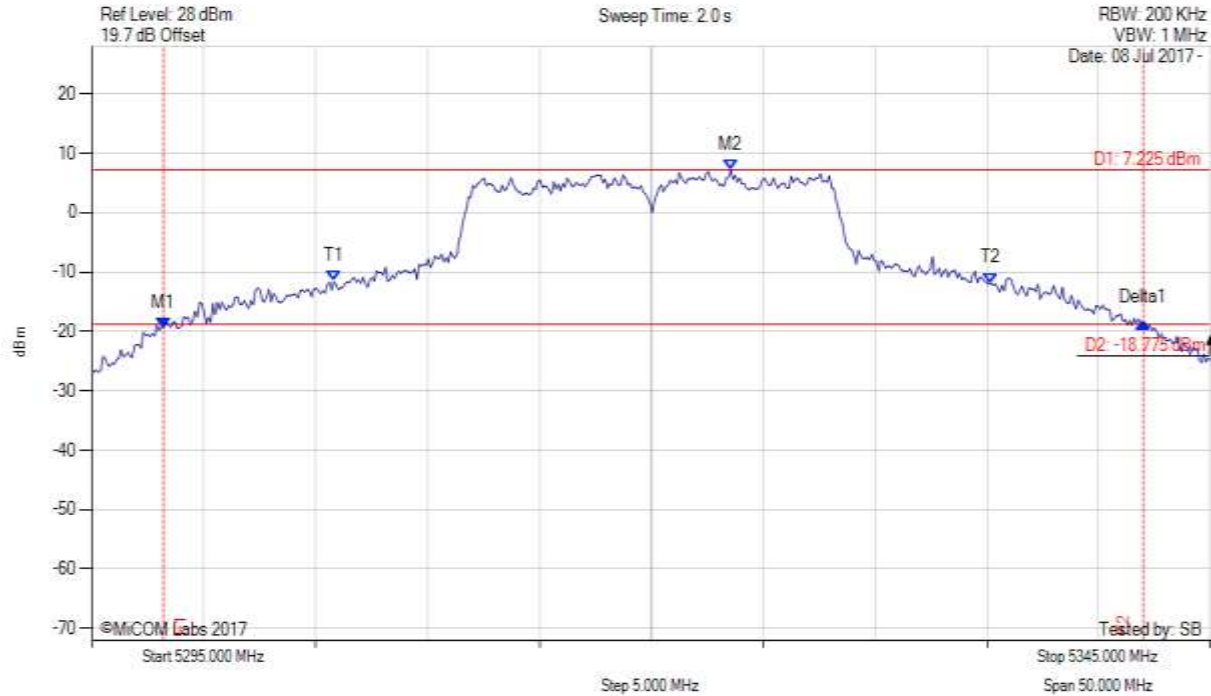
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                    | Test Results                                                               |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5237.806 MHz : -18.561 dBm<br>M2 : 5263.557 MHz : 7.508 dBm<br>Delta1 : 43.788 MHz : -0.696 dB<br>T1 : 5245.421 MHz : -12.356 dBm<br>T2 : 5274.078 MHz : -11.605 dBm<br>OBW : 28.657 MHz | Measured 26 dB Bandwidth: 43.788 MHz<br>Measured 99% Bandwidth: 28.657 MHz |

[back to matrix](#)



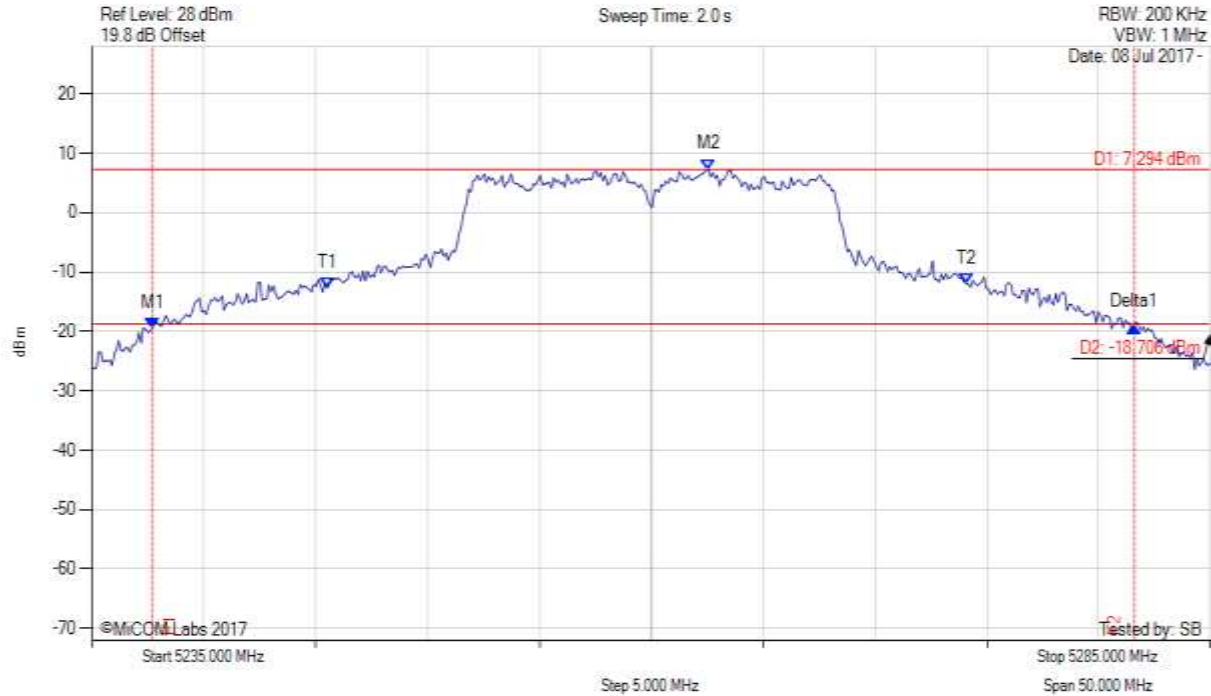
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                    | Test Results                                                               |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5277.705 MHz : -20.059 dBm<br>M2 : 5302.555 MHz : 6.265 dBm<br>Delta1 : 44.790 MHz : -0.893 dB<br>T1 : 5285.321 MHz : -14.219 dBm<br>T2 : 5315.381 MHz : -12.864 dBm<br>OBW : 30.060 MHz | Measured 26 dB Bandwidth: 44.790 MHz<br>Measured 99% Bandwidth: 30.060 MHz |

[back to matrix](#)



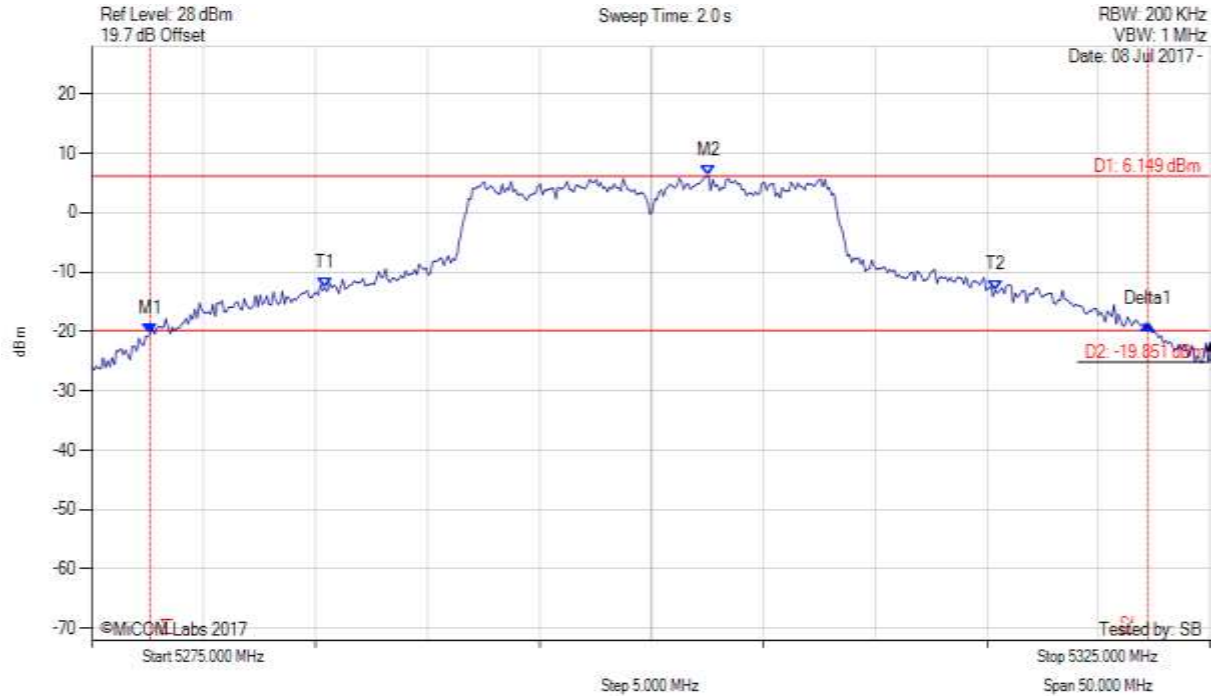
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5298.206 MHz : -19.384 dBm<br>M2 : 5323.557 MHz : 7.225 dBm<br>Delta1 : 43.788 MHz : 0.822 dB<br>T1 : 5305.822 MHz : -11.599 dBm<br>T2 : 5335.180 MHz : -11.888 dBm<br>OBW : 29.359 MHz | Measured 26 dB Bandwidth: 43.788 MHz<br>Measured 99% Bandwidth: 29.359 MHz |

[back to matrix](#)



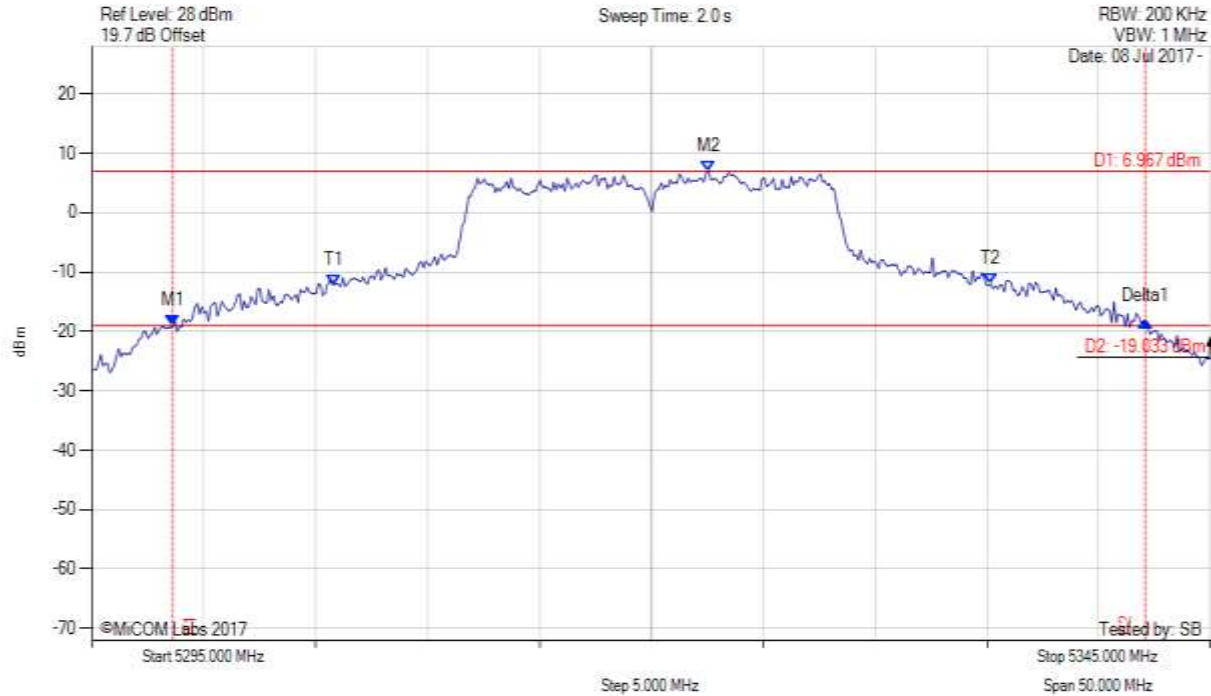
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5237.705 MHz : -19.455 dBm<br>M2 : 5262.555 MHz : 7.294 dBm<br>Delta1 : 43.888 MHz : 0.305 dB<br>T1 : 5245.521 MHz : -12.687 dBm<br>T2 : 5274.078 MHz : -11.971 dBm<br>OBW : 28.557 MHz | Measured 26 dB Bandwidth: 43.888 MHz<br>Measured 99% Bandwidth: 28.557 MHz |

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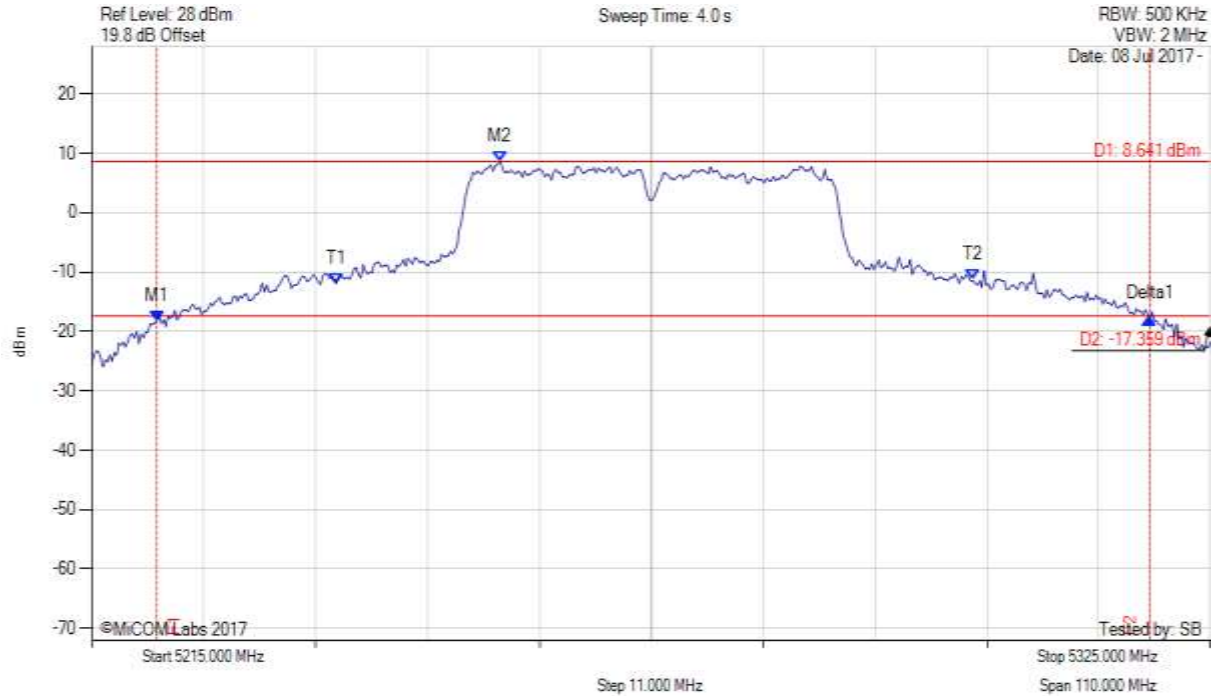
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5277.605 MHz : -20.446 dBm<br>M2 : 5302.555 MHz : 6.149 dBm<br>Delta1 : 44.589 MHz : 1.603 dB<br>T1 : 5285.421 MHz : -12.673 dBm<br>T2 : 5315.381 MHz : -13.047 dBm<br>OBW : 29.960 MHz | Measured 26 dB Bandwidth: 44.589 MHz<br>Measured 99% Bandwidth: 29.960 MHz |

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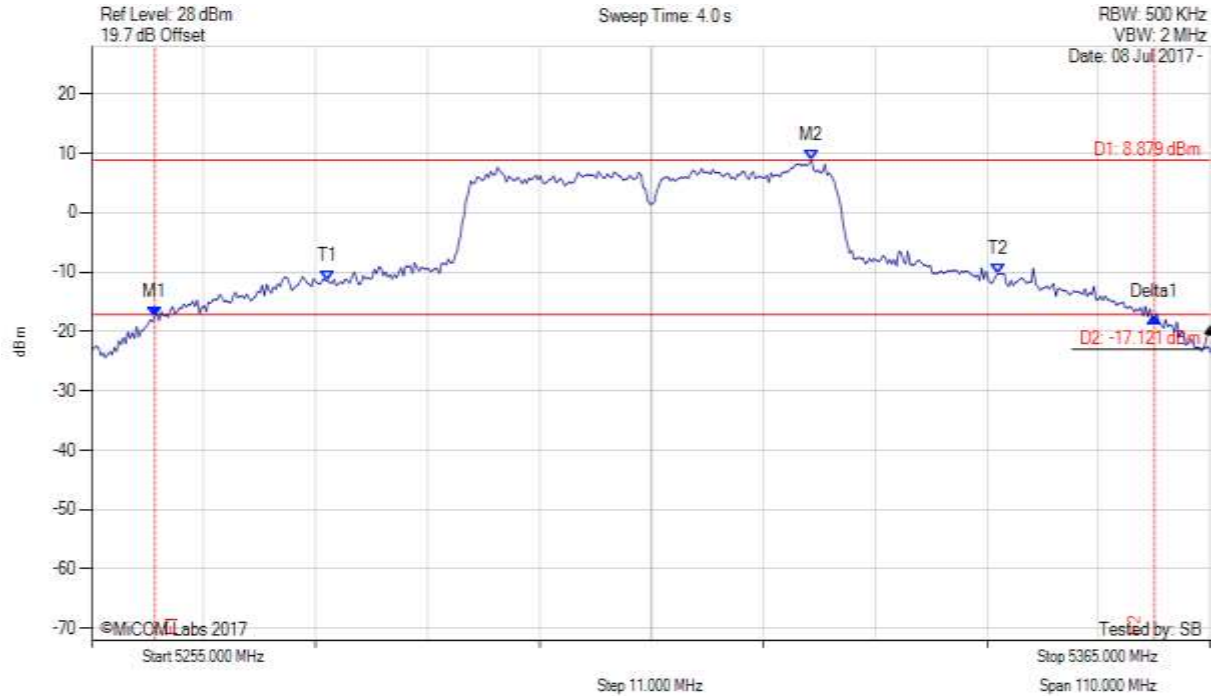
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5298.607 MHz : -19.091 dBm<br>M2 : 5322.555 MHz : 6.967 dBm<br>Delta1 : 43.487 MHz : 0.736 dB<br>T1 : 5305.822 MHz : -12.138 dBm<br>T2 : 5335.180 MHz : -11.977 dBm<br>OBW : 29.359 MHz | Measured 26 dB Bandwidth: 43.487 MHz<br>Measured 99% Bandwidth: 29.359 MHz |

[back to matrix](#)



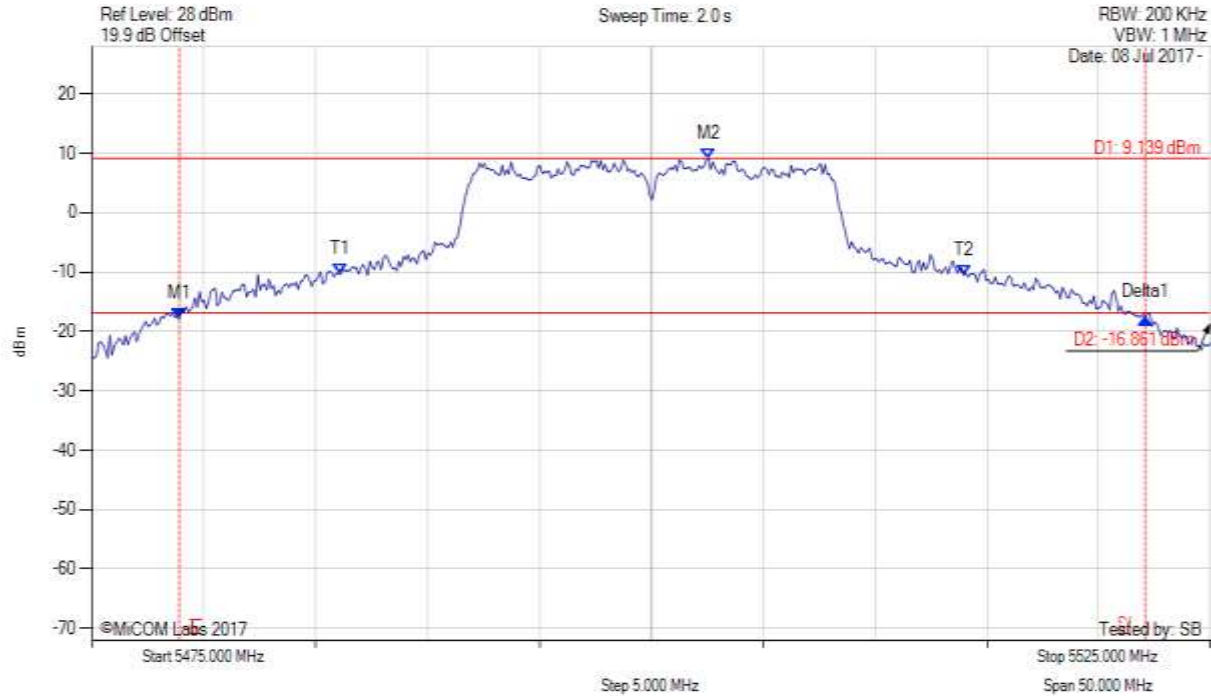
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5221.393 MHz : -18.207 dBm<br>M2 : 5255.120 MHz : 8.641 dBm<br>Delta1 : 97.655 MHz : 0.270 dB<br>T1 : 5239.028 MHz : -11.939 dBm<br>T2 : 5301.633 MHz : -11.381 dBm<br>OBW : 62.605 MHz | Measured 26 dB Bandwidth: 97.655 MHz<br>Measured 99% Bandwidth: 62.605 MHz |

[back to matrix](#)



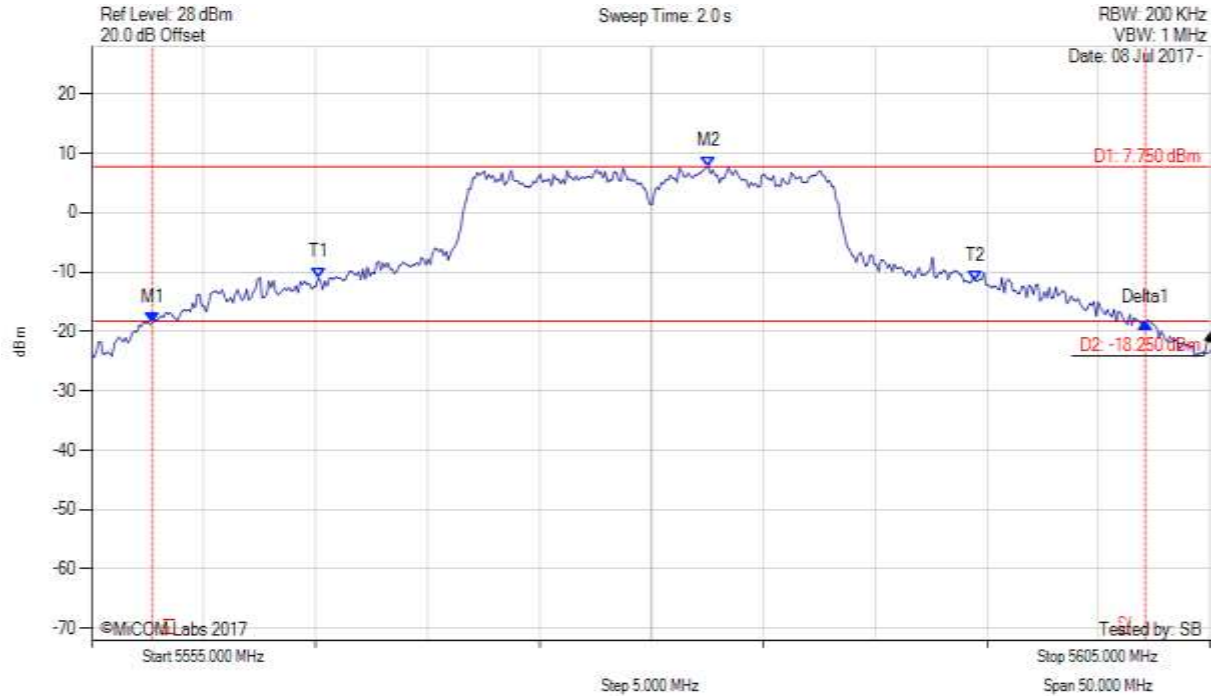
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                    | Test Results                                                               |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5261.172 MHz : -17.517 dBm<br>M2 : 5325.762 MHz : 8.879 dBm<br>Delta1 : 98.317 MHz : -0.169 dB<br>T1 : 5278.146 MHz : -11.432 dBm<br>T2 : 5344.058 MHz : -10.308 dBm<br>OBW : 65.912 MHz | Measured 26 dB Bandwidth: 98.317 MHz<br>Measured 99% Bandwidth: 65.912 MHz |

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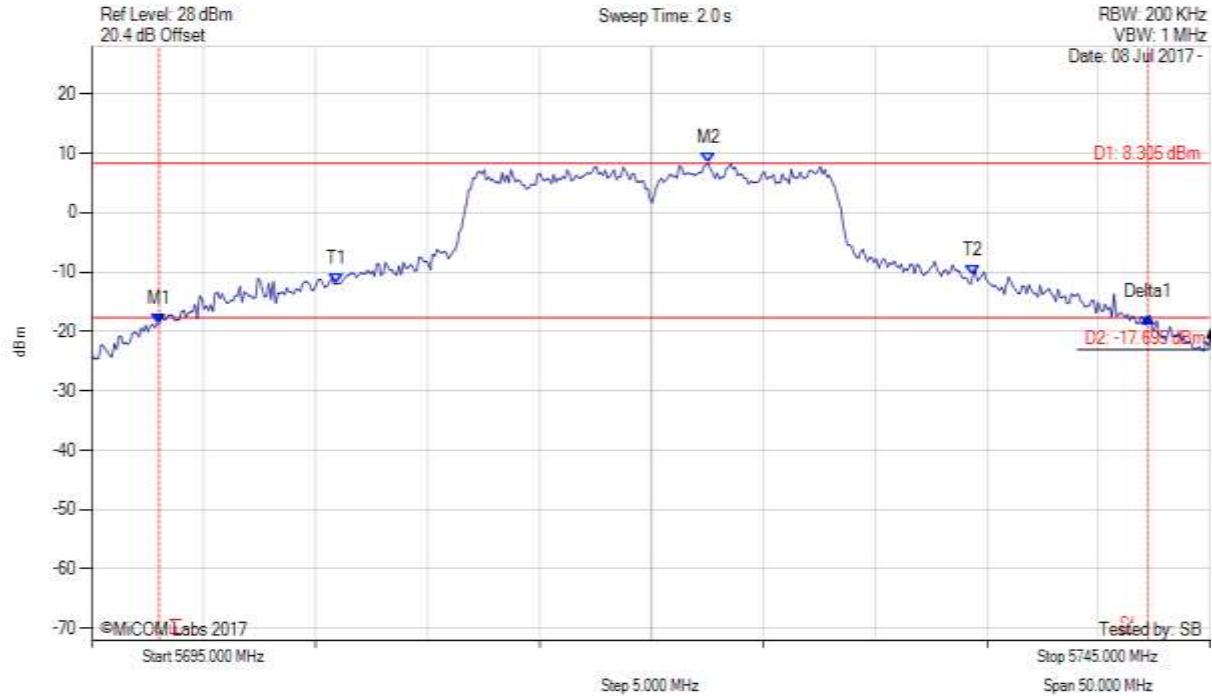
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5478.908 MHz : -17.910 dBm<br>M2 : 5502.555 MHz : 9.139 dBm<br>Delta1 : 43.186 MHz : 0.193 dB<br>T1 : 5486.122 MHz : -10.389 dBm<br>T2 : 5513.978 MHz : -10.489 dBm<br>OBW : 27.856 MHz | Measured 26 dB Bandwidth: 43.186 MHz<br>Measured 99% Bandwidth: 27.856 MHz |

[back to matrix](#)



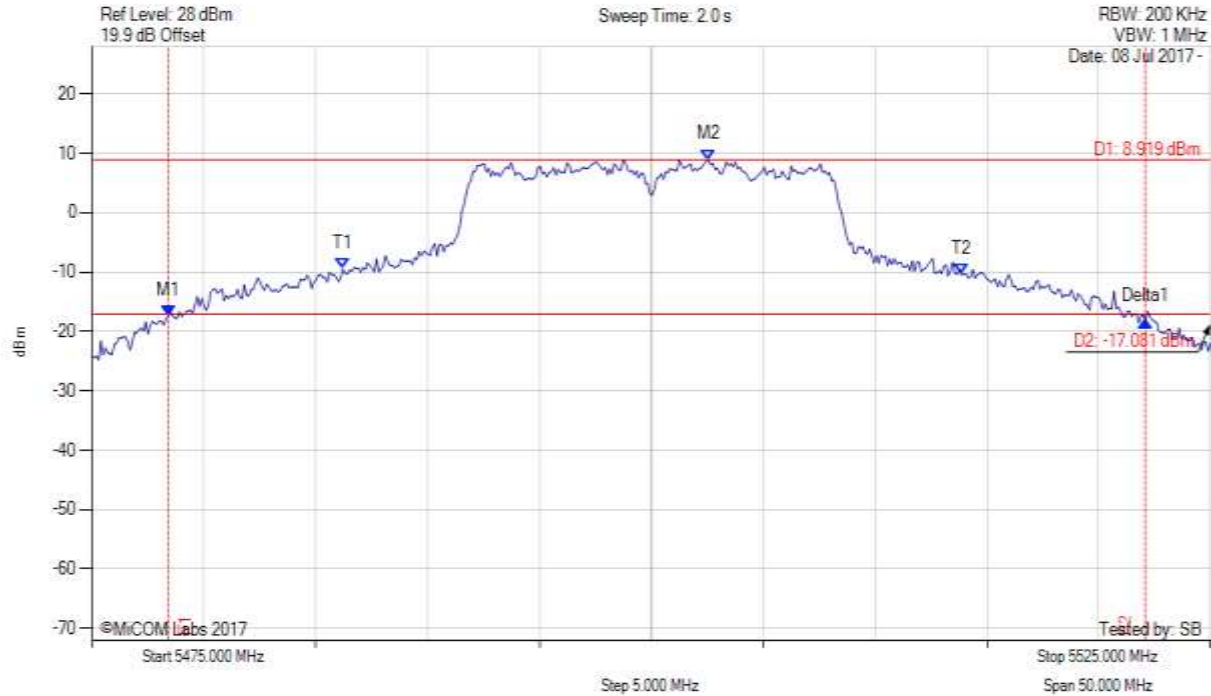
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                    | Test Results                                                               |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5557.705 MHz : -18.495 dBm<br>M2 : 5582.555 MHz : 7.750 dBm<br>Delta1 : 44.389 MHz : -0.035 dB<br>T1 : 5565.120 MHz : -10.938 dBm<br>T2 : 5594.479 MHz : -11.438 dBm<br>OBW : 29.359 MHz | Measured 26 dB Bandwidth: 44.389 MHz<br>Measured 99% Bandwidth: 29.359 MHz |

[back to matrix](#)



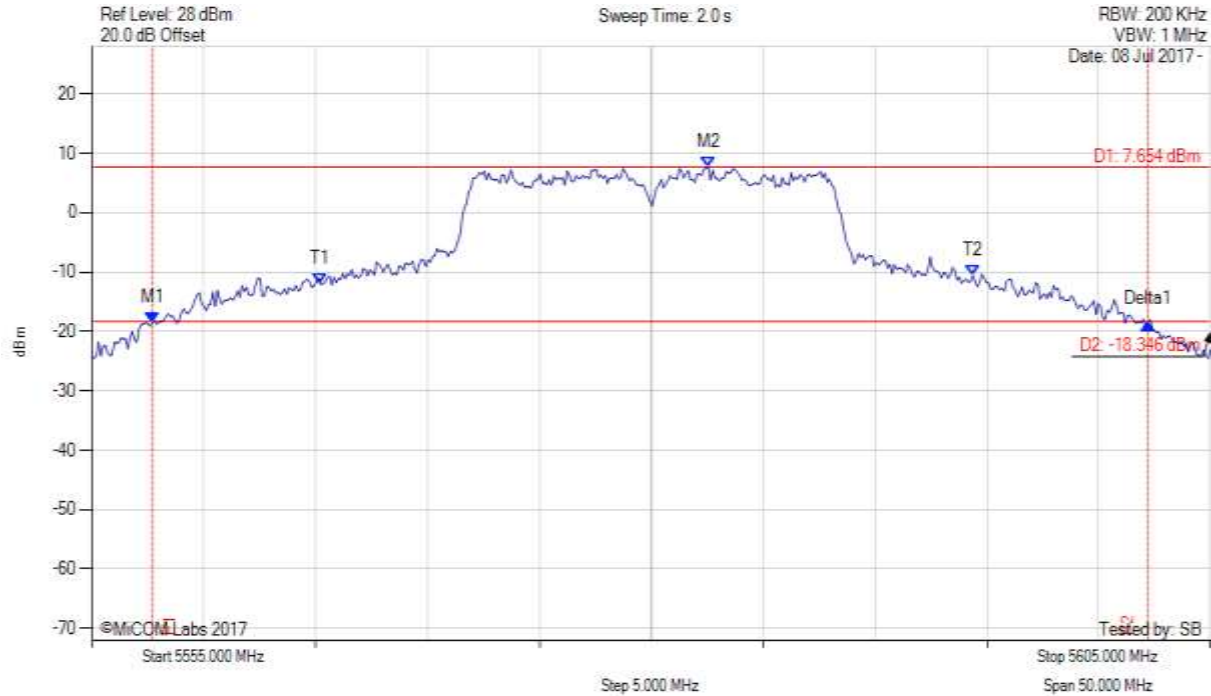
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5698.006 MHz : -18.827 dBm<br>M2 : 5722.555 MHz : 8.305 dBm<br>Delta1 : 44.188 MHz : 1.275 dB<br>T1 : 5705.922 MHz : -11.965 dBm<br>T2 : 5734.379 MHz : -10.692 dBm<br>OBW : 28.457 MHz | Measured 26 dB Bandwidth: 44.188 MHz<br>Measured 99% Bandwidth: 28.457 MHz |

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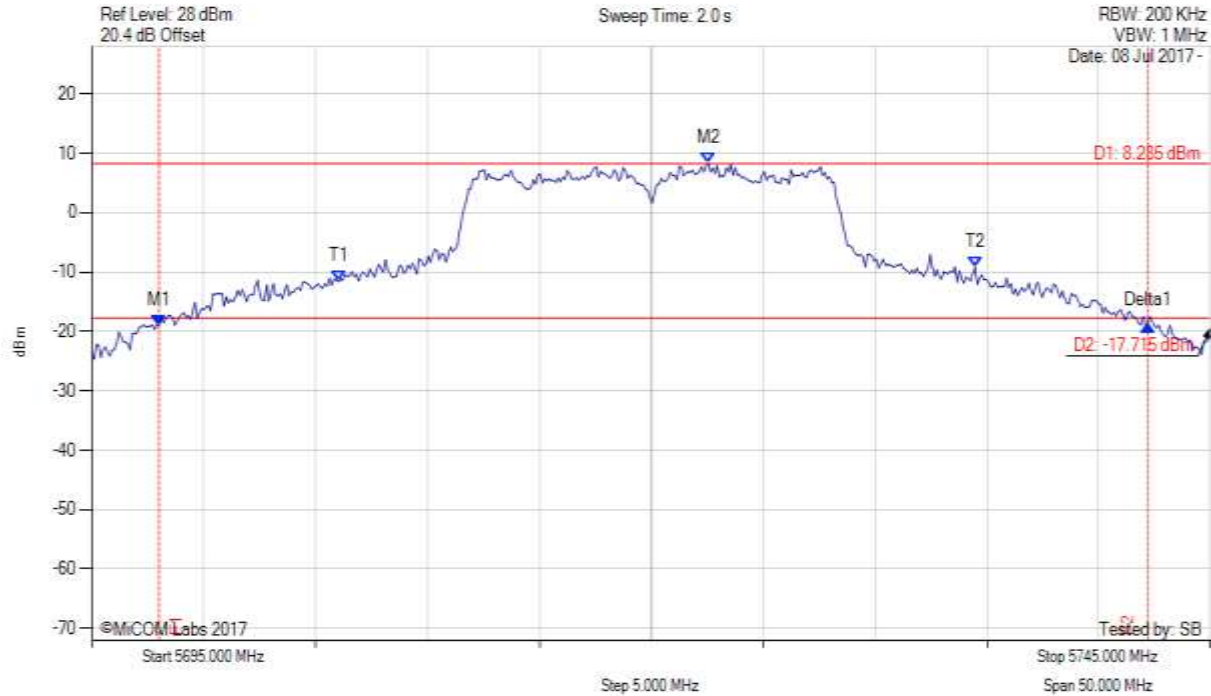
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                   | Test Results                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5478.407 MHz : -17.397 dBm<br>M2 : 5502.555 MHz : 8.919 dBm<br>Delta1 : 43.687 MHz : -0.879 dB<br>T1 : 5486.222 MHz : -9.423 dBm<br>T2 : 5513.878 MHz : -10.452 dBm<br>OBW : 27.655 MHz | Measured 26 dB Bandwidth: 43.687 MHz<br>Measured 99% Bandwidth: 27.655 MHz |

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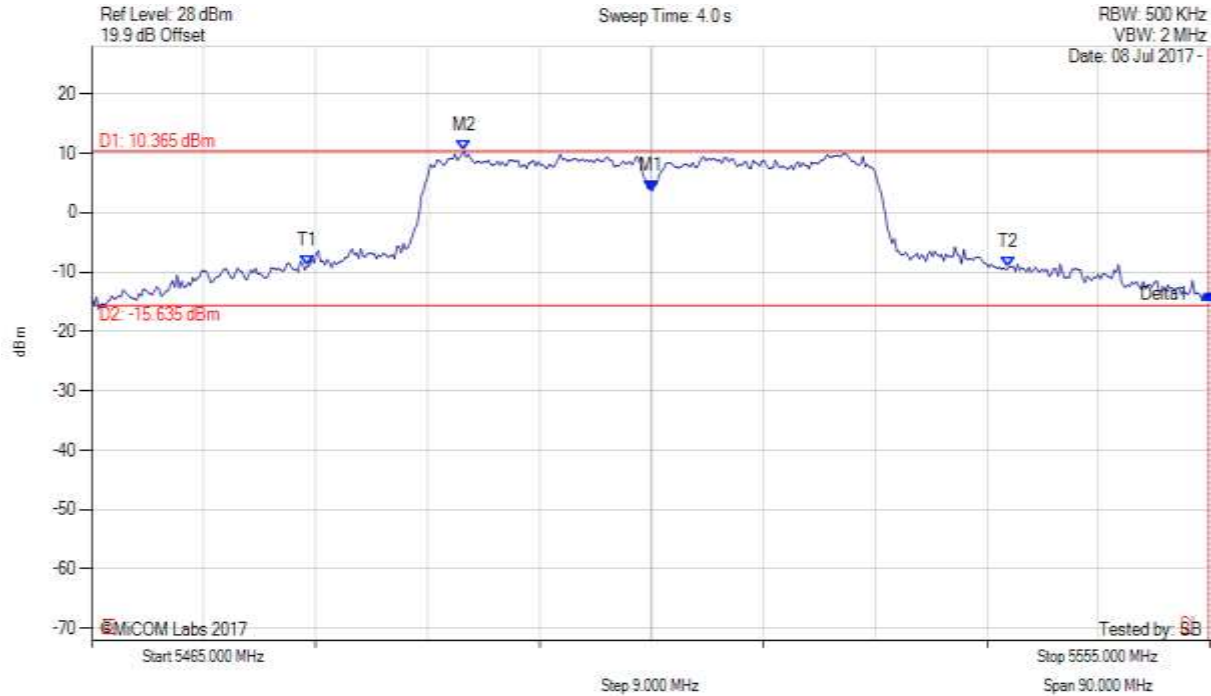
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                    | Test Results                                                               |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5557.705 MHz : -18.467 dBm<br>M2 : 5582.555 MHz : 7.654 dBm<br>Delta1 : 44.489 MHz : -0.222 dB<br>T1 : 5565.220 MHz : -12.038 dBm<br>T2 : 5594.379 MHz : -10.596 dBm<br>OBW : 29.158 MHz | Measured 26 dB Bandwidth: 44.489 MHz<br>Measured 99% Bandwidth: 29.158 MHz |

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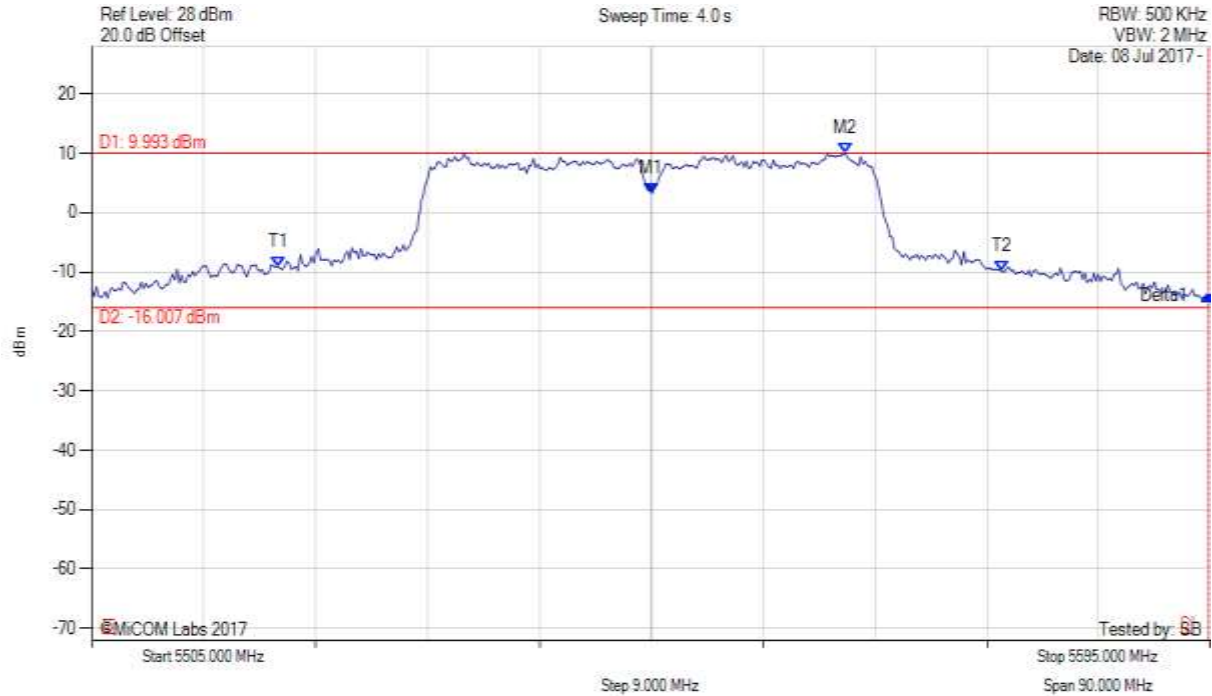
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                               |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5698.006 MHz : -19.020 dBm<br>M2 : 5722.555 MHz : 8.285 dBm<br>Delta1 : 44.188 MHz : 0.035 dB<br>T1 : 5706.022 MHz : -11.571 dBm<br>T2 : 5734.479 MHz : -9.165 dBm<br>OBW : 28.457 MHz | Measured 26 dB Bandwidth: 44.188 MHz<br>Measured 99% Bandwidth: 28.457 MHz |

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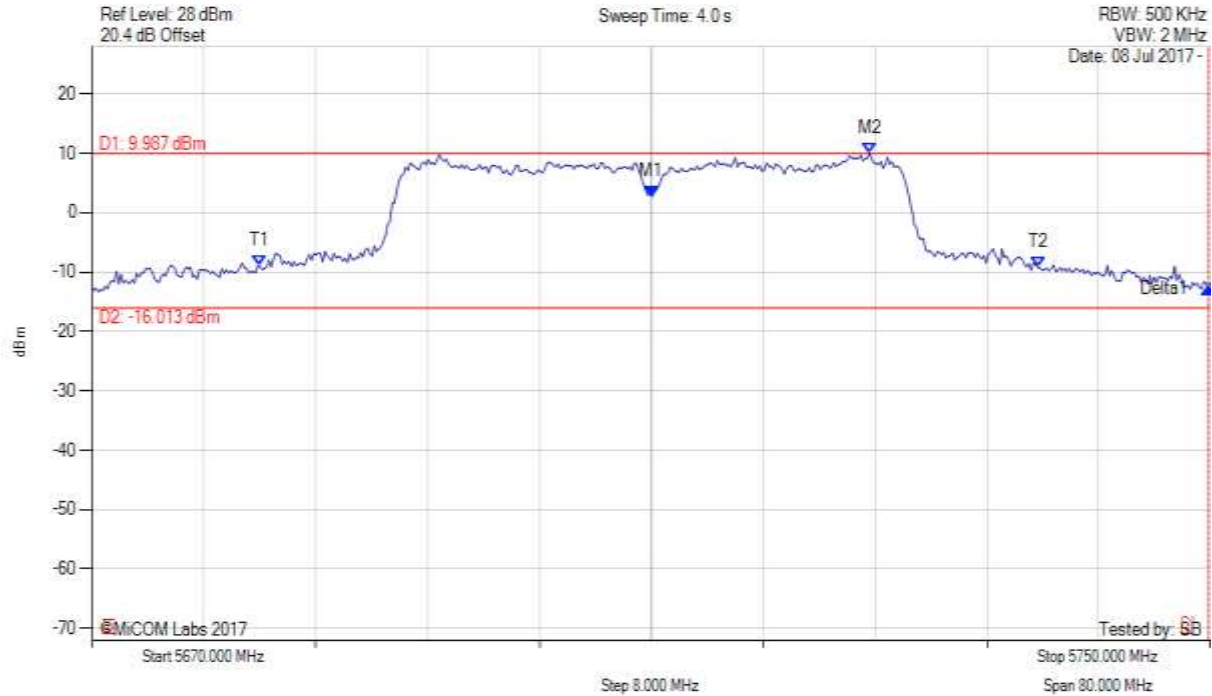
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                               |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5510.000 MHz : 3.652 dBm<br>M2 : 5494.940 MHz : 10.365 dBm<br>Delta1 : 44.820 MHz : -17.328 dB<br>T1 : 5482.315 MHz : -8.996 dBm<br>T2 : 5538.768 MHz : -9.169 dBm<br>OBW : 56.453 MHz | Measured 26 dB Bandwidth: 44.820 MHz<br>Measured 99% Bandwidth: 56.453 MHz |

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| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                 | Test Results                                                               |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5550.000 MHz : 3.239 dBm<br>M2 : 5565.601 MHz : 9.993 dBm<br>Delta1 : 44.820 MHz : -17.126 dB<br>T1 : 5519.970 MHz : -9.163 dBm<br>T2 : 5578.226 MHz : -9.795 dBm<br>OBW : 58.257 MHz | Measured 26 dB Bandwidth: 44.820 MHz<br>Measured 99% Bandwidth: 58.257 MHz |

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| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                 | Test Results                                                               |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5710.000 MHz : 2.702 dBm<br>M2 : 5725.631 MHz : 9.987 dBm<br>Delta1 : 39.840 MHz : -15.406 dB<br>T1 : 5682.024 MHz : -9.045 dBm<br>T2 : 5737.655 MHz : -9.222 dBm<br>OBW : 55.631 MHz | Measured 26 dB Bandwidth: 39.840 MHz<br>Measured 99% Bandwidth: 55.631 MHz |

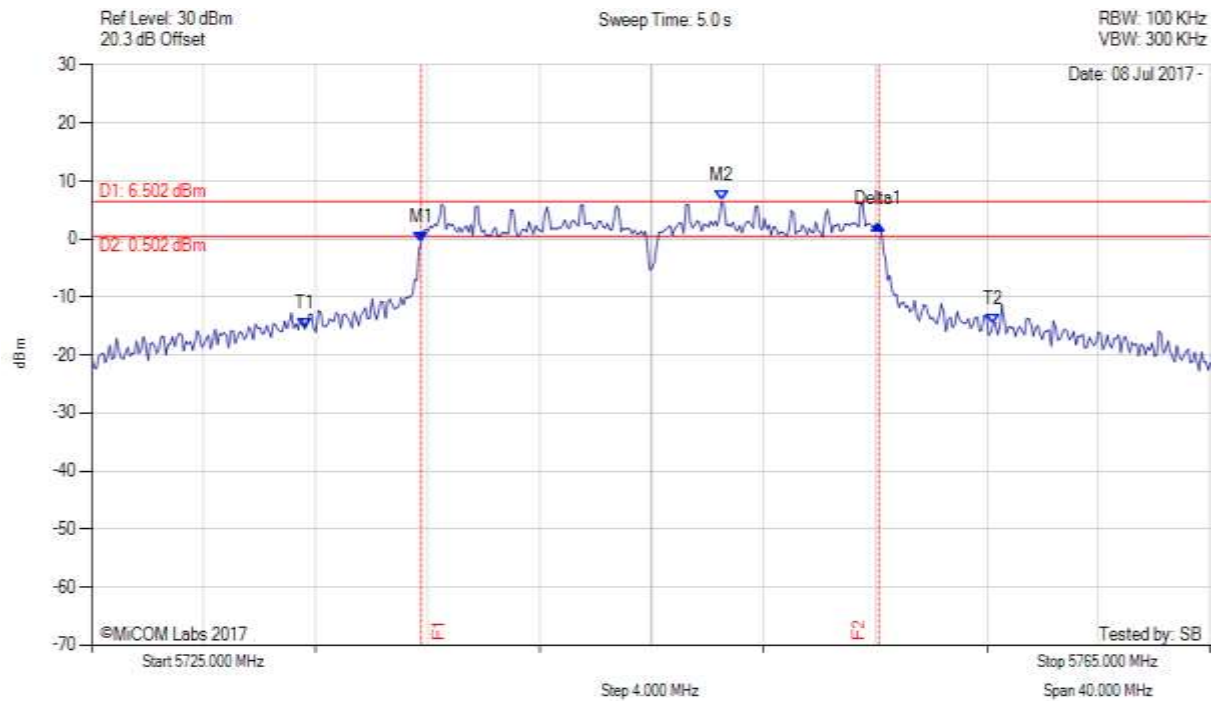
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## A.2. 6 dB & 99% Bandwidth



### 6 dB & 99% BANDWIDTH

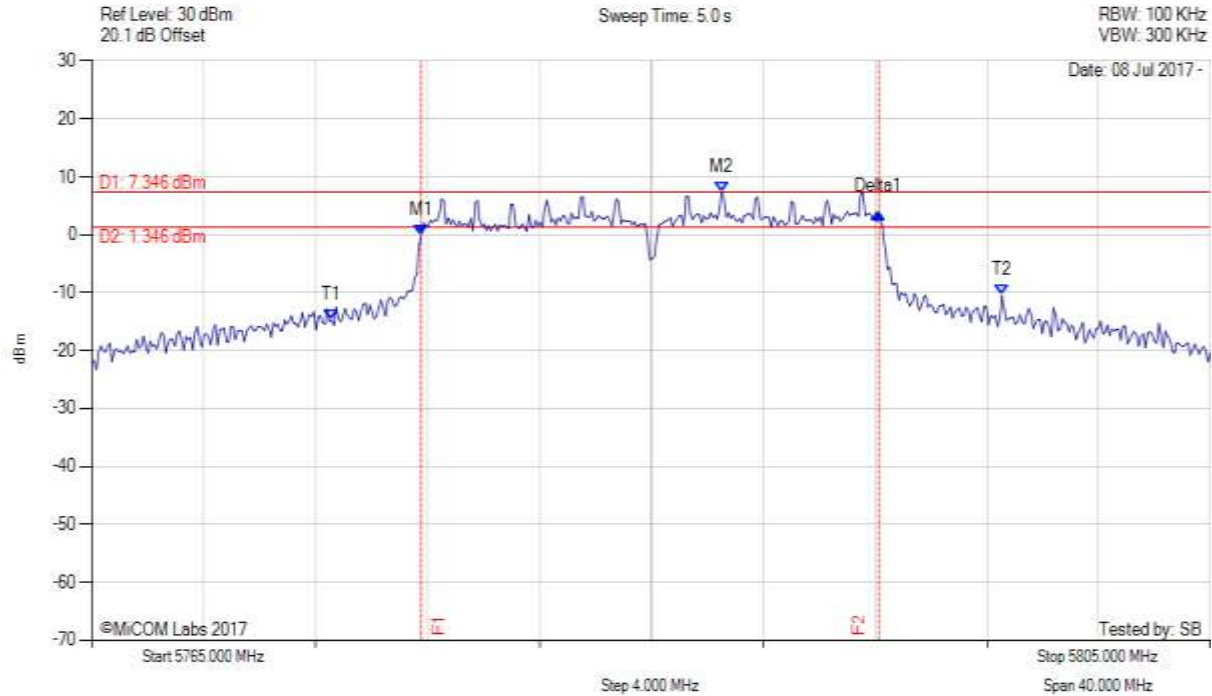
Variant: 802.11a, Channel: 5745.00 MHz, Chain a, Temp: 20, Voltage: Vdc



| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                              |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5736.784 MHz : -0.555 dBm<br>M2 : 5747.525 MHz : 6.502 dBm<br>Delta1 : 16.353 MHz : 3.160 dB<br>T1 : 5732.615 MHz : -15.513 dBm<br>T2 : 5757.224 MHz : -14.799 dBm<br>OBW : 24.609 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Measured 99% Bandwidth: 24.609 MHz |

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| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                              |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5776.784 MHz : -0.187 dBm<br>M2 : 5787.525 MHz : 7.346 dBm<br>Delta1 : 16.353 MHz : 4.031 dB<br>T1 : 5773.577 MHz : -14.736 dBm<br>T2 : 5797.545 MHz : -10.490 dBm<br>OBW : 23.968 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Measured 99% Bandwidth: 23.968 MHz |

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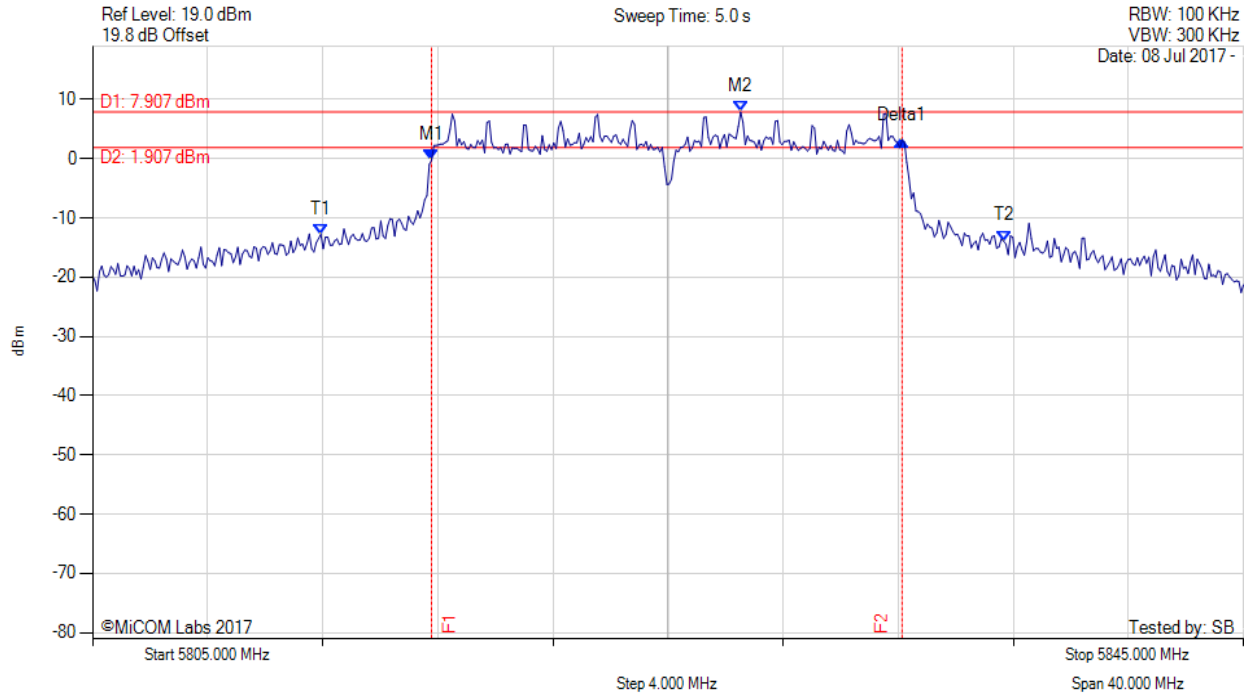


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
**Page:** 168 of 298



6 dB & 99% BANDWIDTH

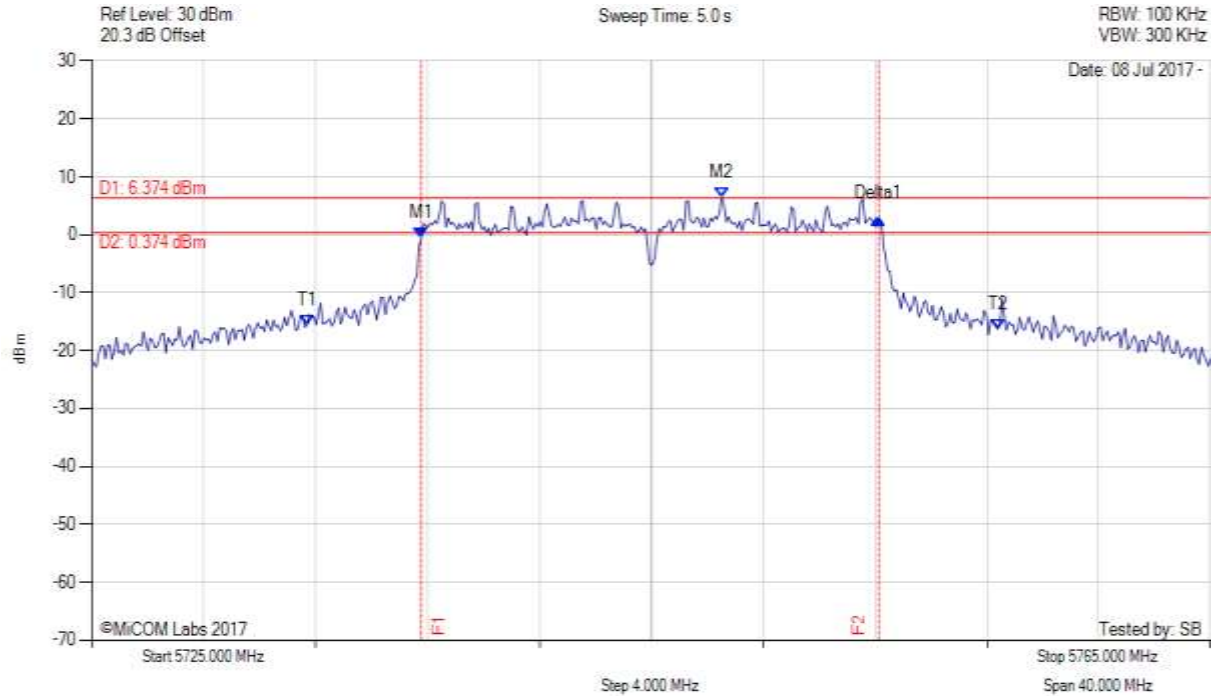
Variant: 802.11a, Channel: 5825.00 MHz, Chain a, Temp: 20, Voltage: Vdc



| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                              |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5816.784 MHz : -0.251 dBm<br>M2 : 5827.525 MHz : 7.907 dBm<br>Delta1 : 16.353 MHz : 3.380 dB<br>T1 : 5812.936 MHz : -12.742 dBm<br>T2 : 5836.663 MHz : -13.861 dBm<br>OBW : 23.727 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Measured 99% Bandwidth: 23.727 MHz |

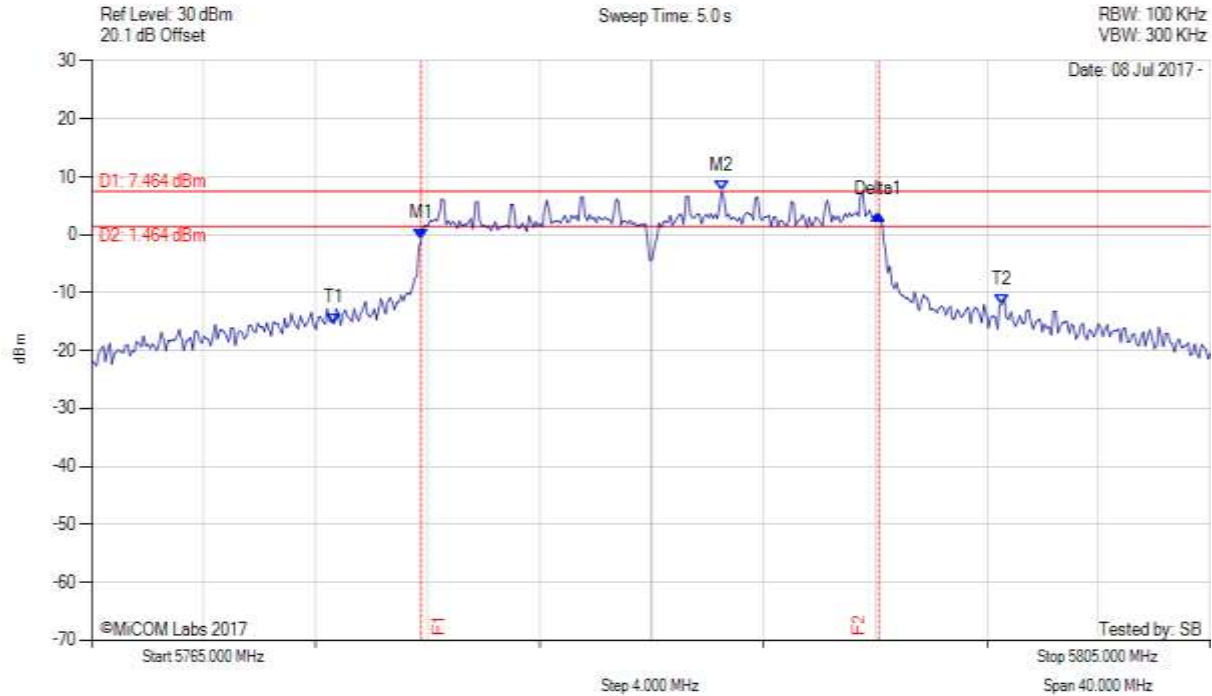
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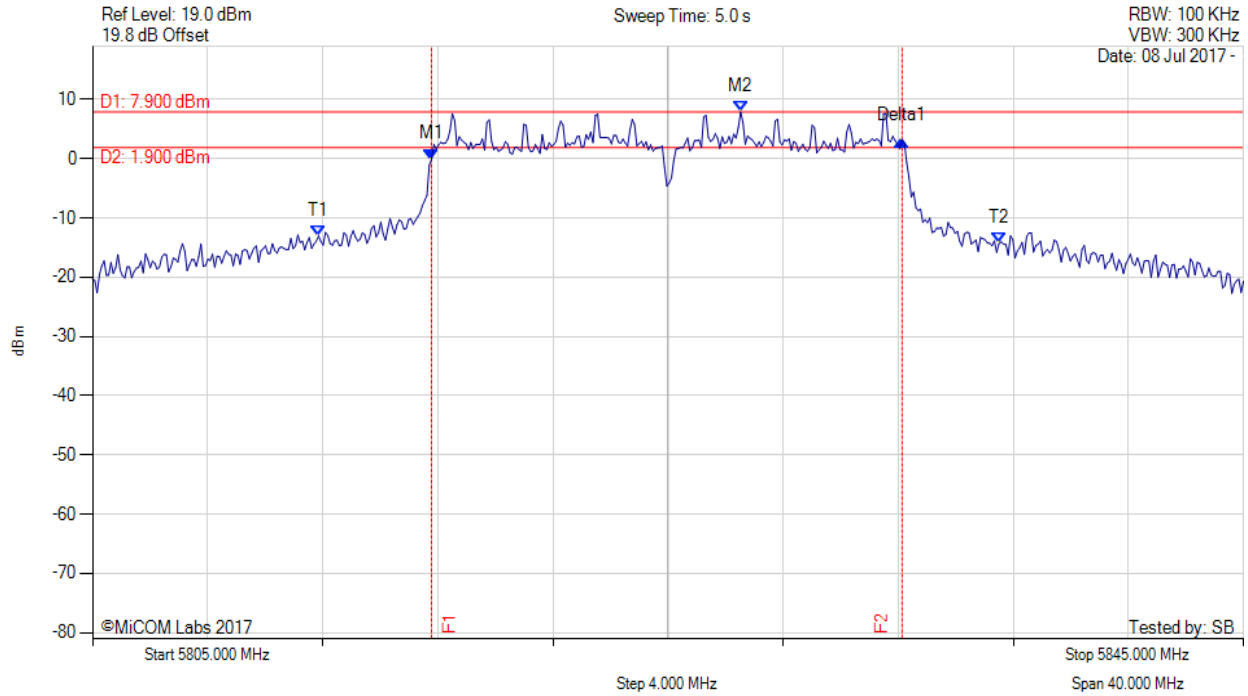
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                              |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5736.784 MHz : -0.571 dBm<br>M2 : 5747.525 MHz : 6.374 dBm<br>Delta1 : 16.353 MHz : 3.272 dB<br>T1 : 5732.695 MHz : -15.588 dBm<br>T2 : 5757.385 MHz : -16.288 dBm<br>OBW : 24.689 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Measured 99% Bandwidth: 24.689 MHz |

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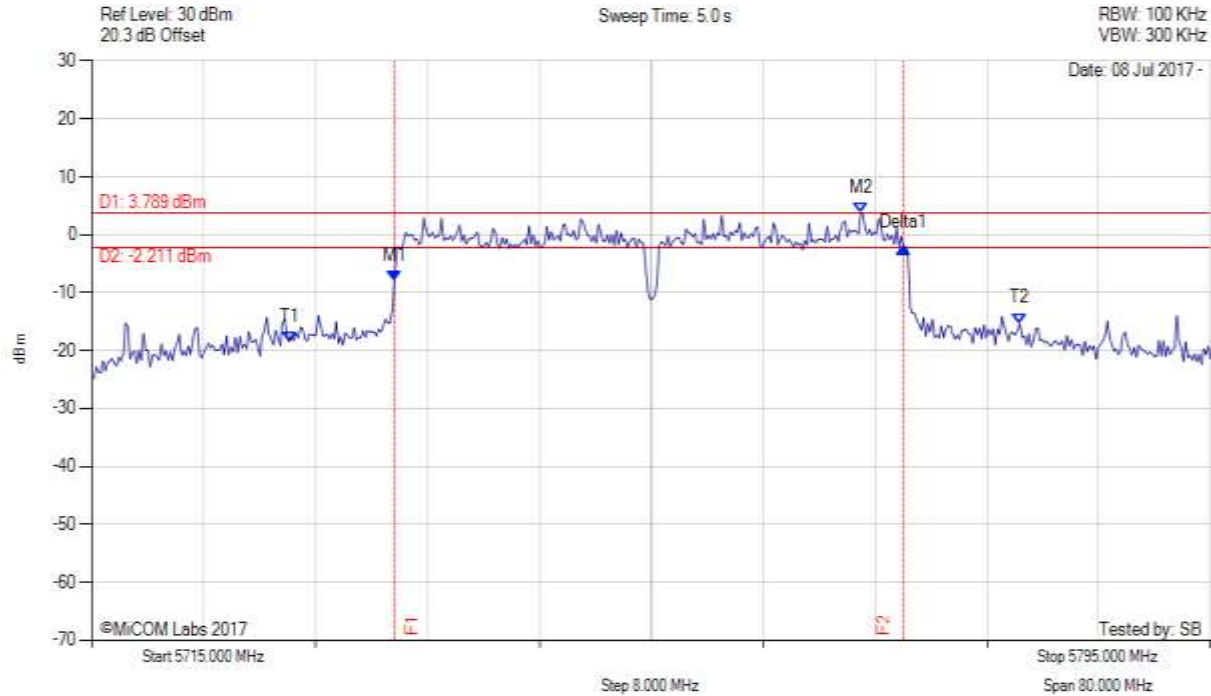
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                              |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5776.784 MHz : -0.699 dBm<br>M2 : 5787.525 MHz : 7.464 dBm<br>Delta1 : 16.353 MHz : 4.263 dB<br>T1 : 5773.657 MHz : -15.324 dBm<br>T2 : 5797.545 MHz : -11.983 dBm<br>OBW : 23.888 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Measured 99% Bandwidth: 23.888 MHz |

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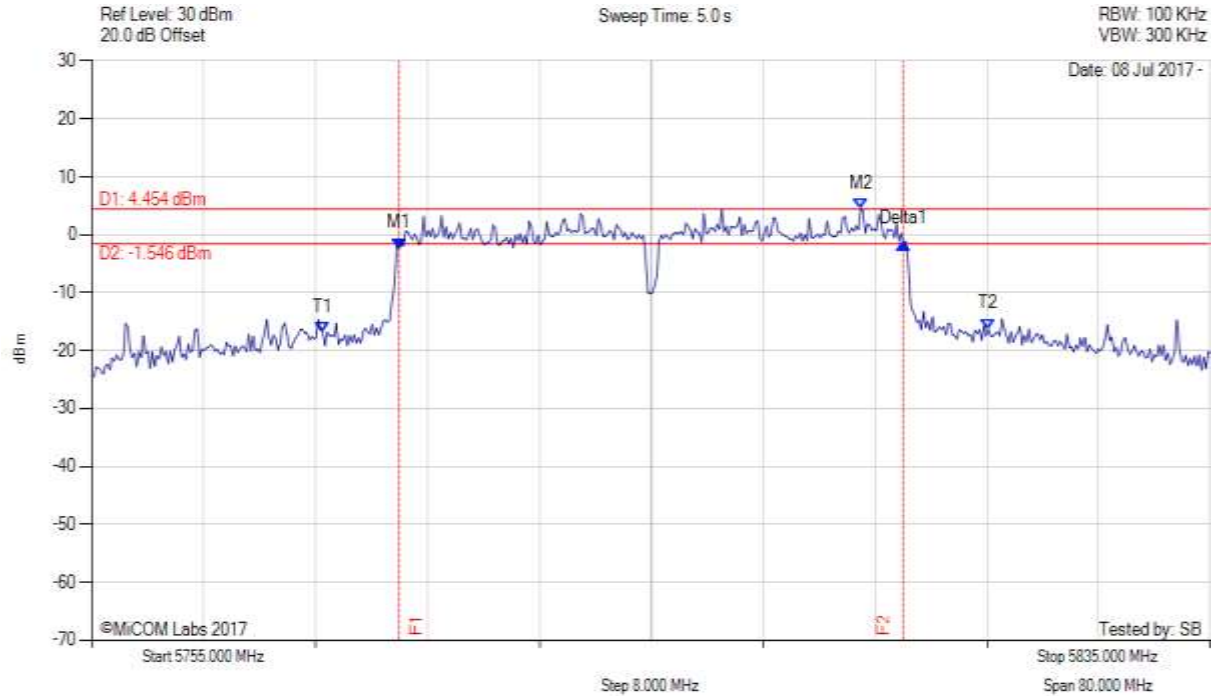
| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                              |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5816.784 MHz : -0.072 dBm<br>M2 : 5827.525 MHz : 7.900 dBm<br>Delta1 : 16.353 MHz : 3.230 dB<br>T1 : 5812.856 MHz : -13.039 dBm<br>T2 : 5836.503 MHz : -14.318 dBm<br>OBW : 23.647 MHz | Measured 6 dB Bandwidth: 16.353 MHz<br>Measured 99% Bandwidth: 23.647 MHz |

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| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                              |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5736.643 MHz : -7.996 dBm<br>M2 : 5769.990 MHz : 3.789 dBm<br>Delta1 : 36.393 MHz : 5.664 dB<br>T1 : 5729.108 MHz : -18.466 dBm<br>T2 : 5781.373 MHz : -15.326 dBm<br>OBW : 52.265 MHz | Measured 6 dB Bandwidth: 36.393 MHz<br>Measured 99% Bandwidth: 52.265 MHz |

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| Analyzer Setup                                                                        | Marker:Frequency:Amplitude                                                                                                                                                                  | Test Results                                                              |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Detector = MAX PEAK<br>Sweep Count = 0<br>RF Atten (dB) = 20<br>Trace Mode = MAX HOLD | M1 : 5776.964 MHz : -2.391 dBm<br>M2 : 5809.990 MHz : 4.454 dBm<br>Delta1 : 36.072 MHz : 0.901 dB<br>T1 : 5771.513 MHz : -16.866 dBm<br>T2 : 5819.128 MHz : -16.266 dBm<br>OBW : 47.615 MHz | Measured 6 dB Bandwidth: 36.072 MHz<br>Measured 99% Bandwidth: 47.615 MHz |

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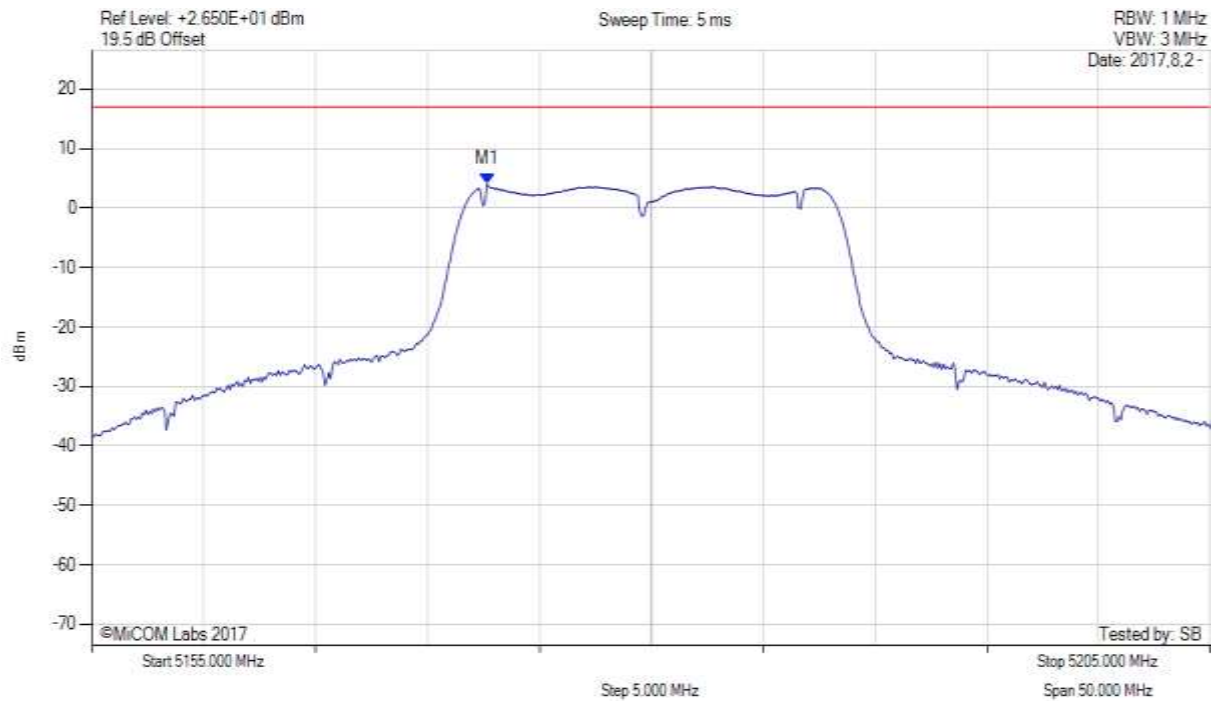
**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
**Page:** 174 of 298

### A.3. Power Spectral Density



#### POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5180.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



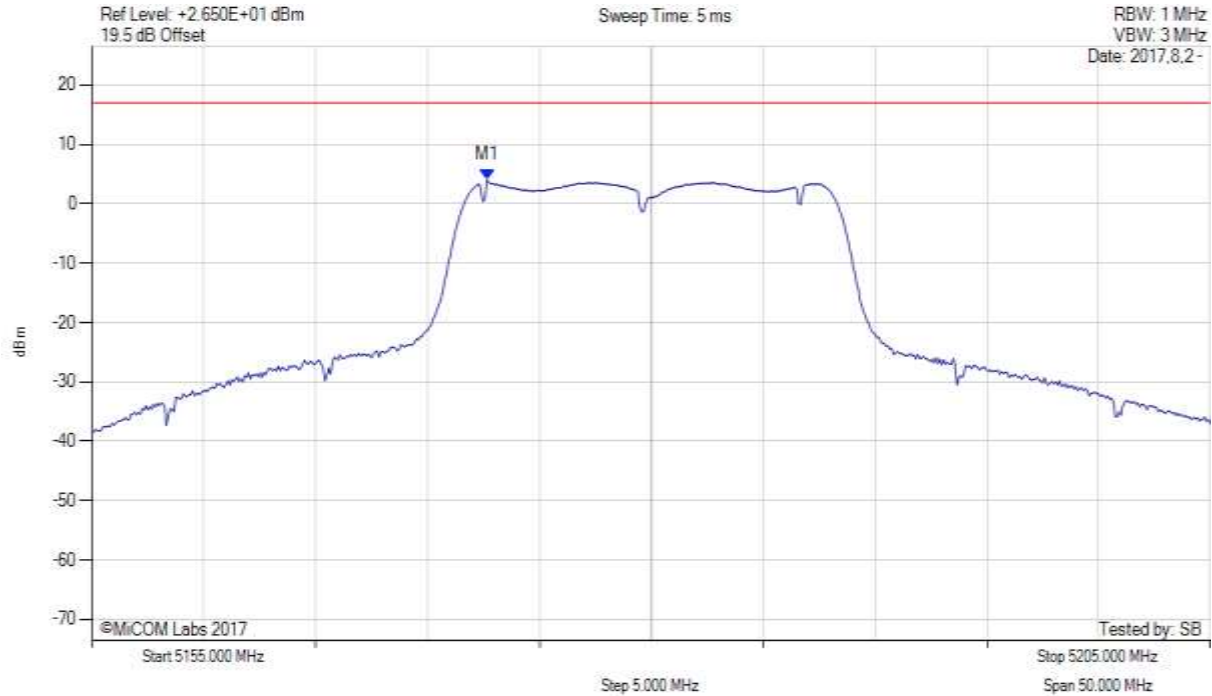
| Analyzer Setup                                                                   | Marker:Frequency:Amplitude    | Test Results             |
|----------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5172.670 MHz : 4.066 dBm | Limit: $\leq 17.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5180.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

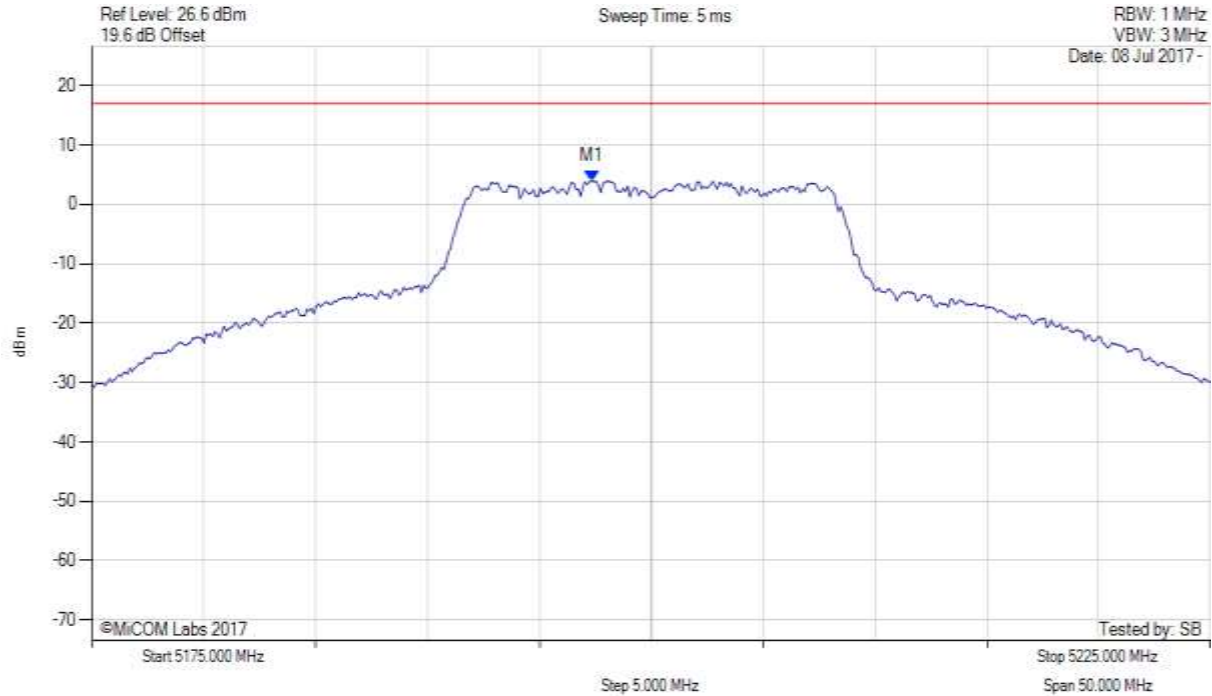


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5172.700 MHz : 4.066 dBm<br>M1 + DCCF : 5172.700 MHz : 4.110 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 17.0$ dBm<br>Margin: -12.9 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5200.00 MHz, Chain a, Temp: 20, Voltage: Vdc

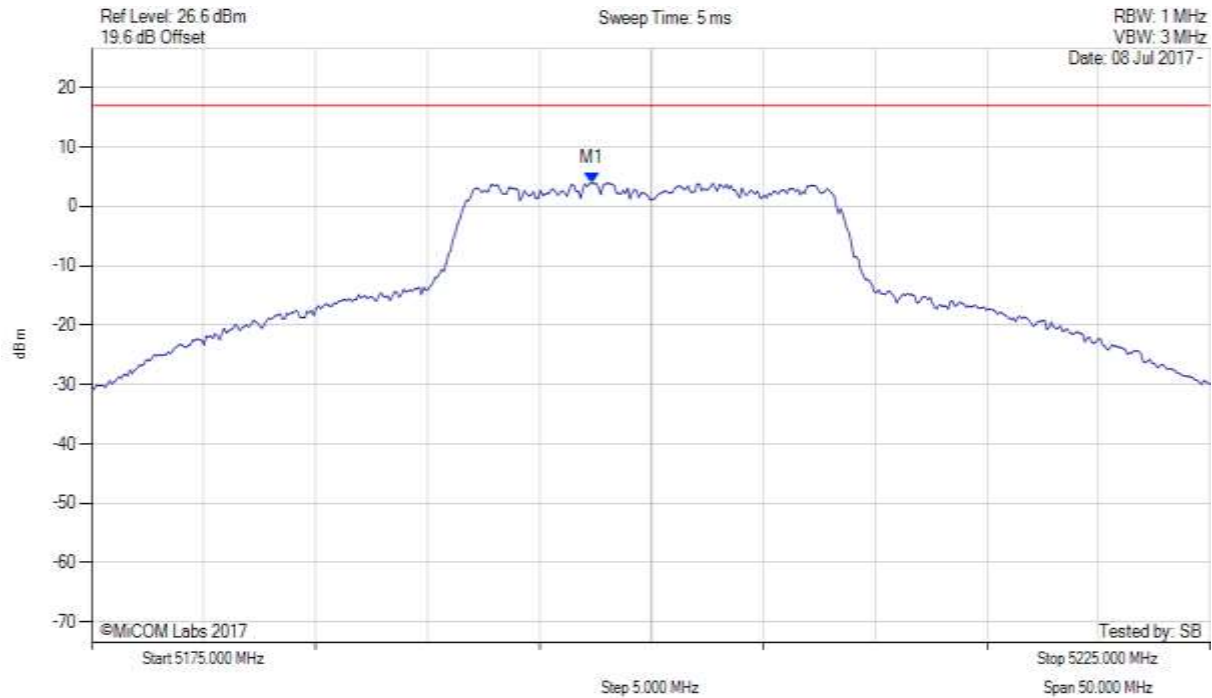


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5197.345 MHz : 3.925 dBm | Limit: $\leq 17.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5200.00 MHz, SUM, Temp: 20, Voltage: Vdc

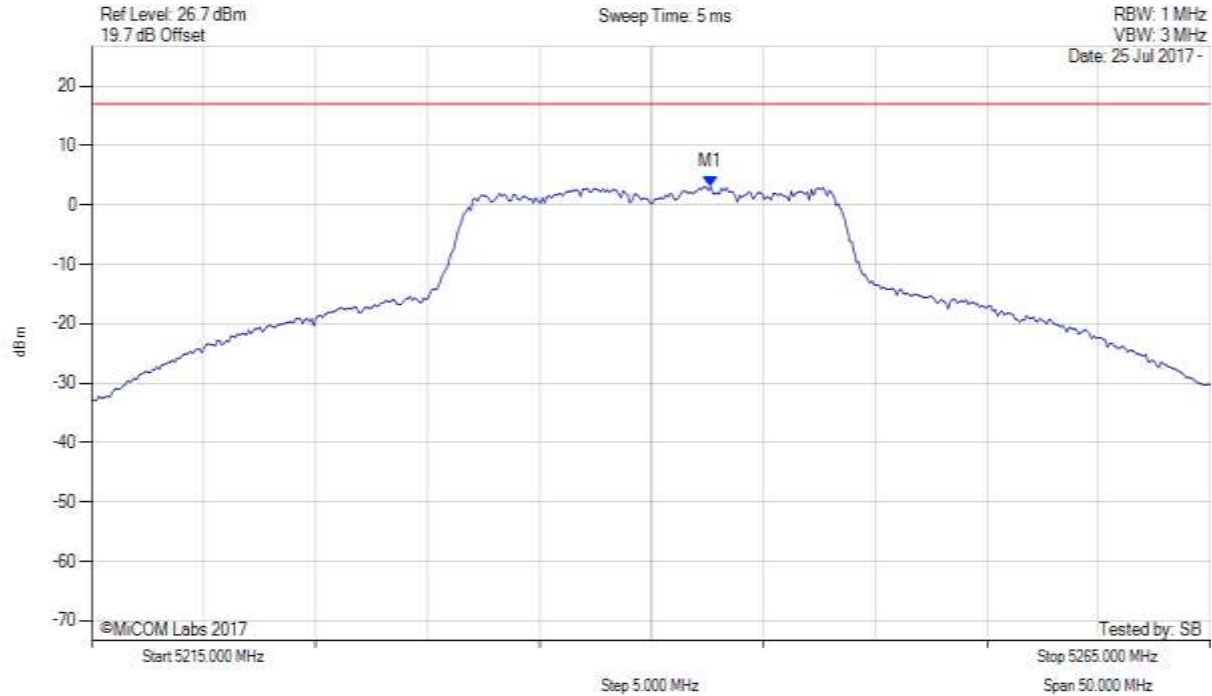


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5197.300 MHz : 3.925 dBm<br>M1 + DCCF : 5197.300 MHz : 3.969 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 17.0$ dBm<br>Margin: -13.0 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5240.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

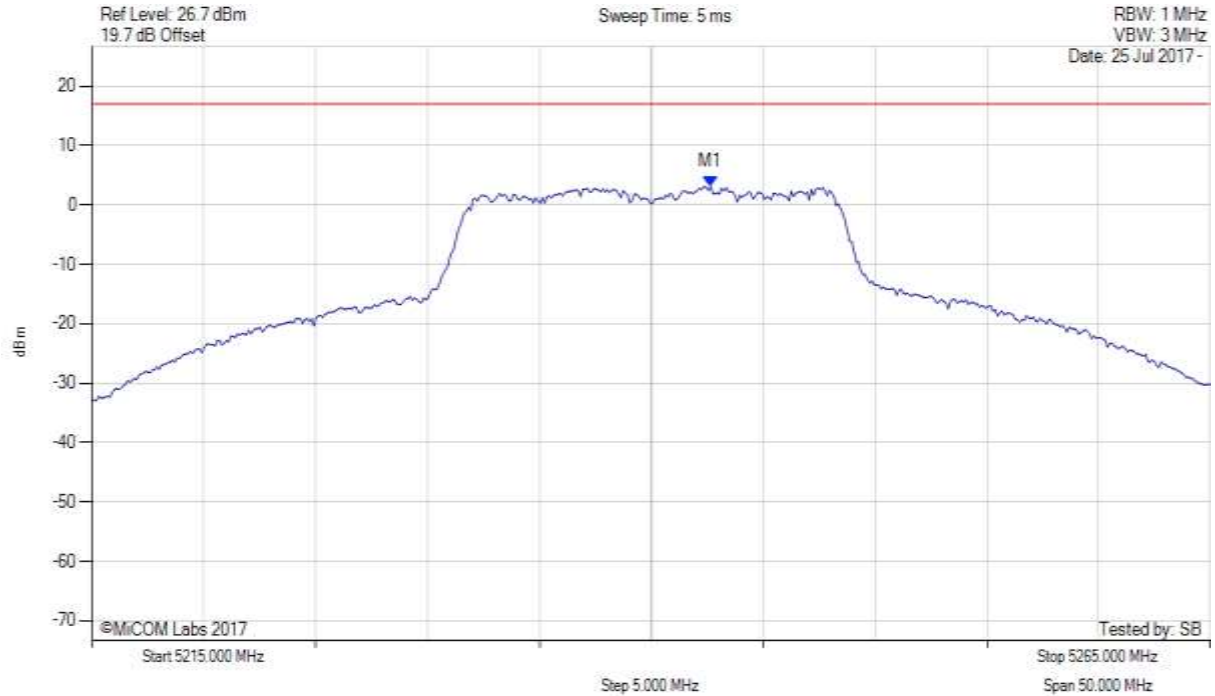


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results        |
|--------------------------------------------------------------------------------|-------------------------------|---------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5242.655 MHz : 3.112 dBm | Limit: ≤ 17.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5240.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

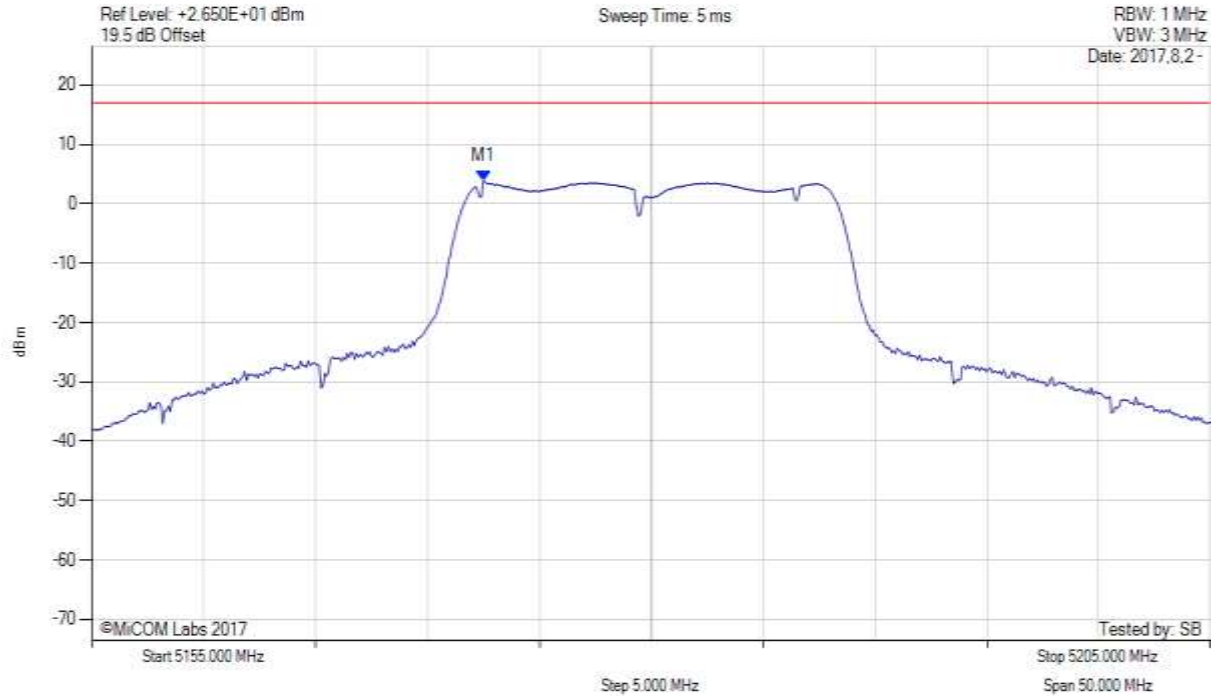


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5242.700 MHz : 3.112 dBm<br>M1 + DCCF : 5242.700 MHz : 3.156 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 17.0$ dBm<br>Margin: -13.8 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5180.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

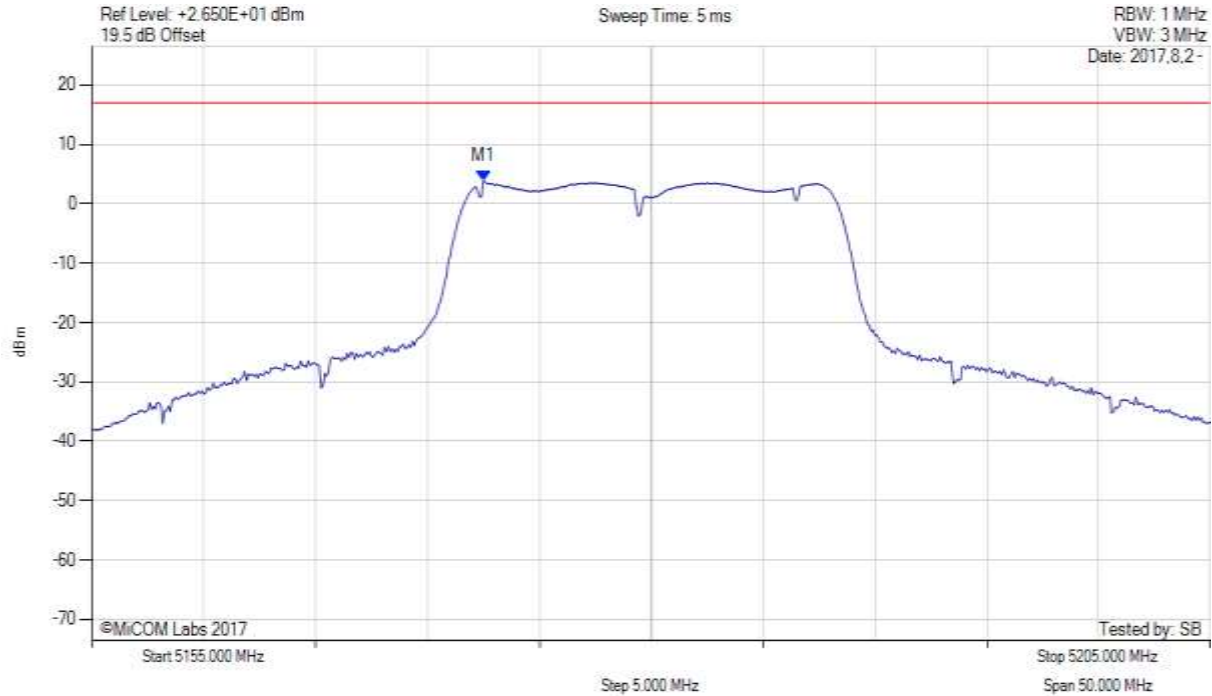


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude    | Test Results        |
|----------------------------------------------------------------------------------|-------------------------------|---------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5172.500 MHz : 3.837 dBm | Limit: ≤ 17.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5180.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

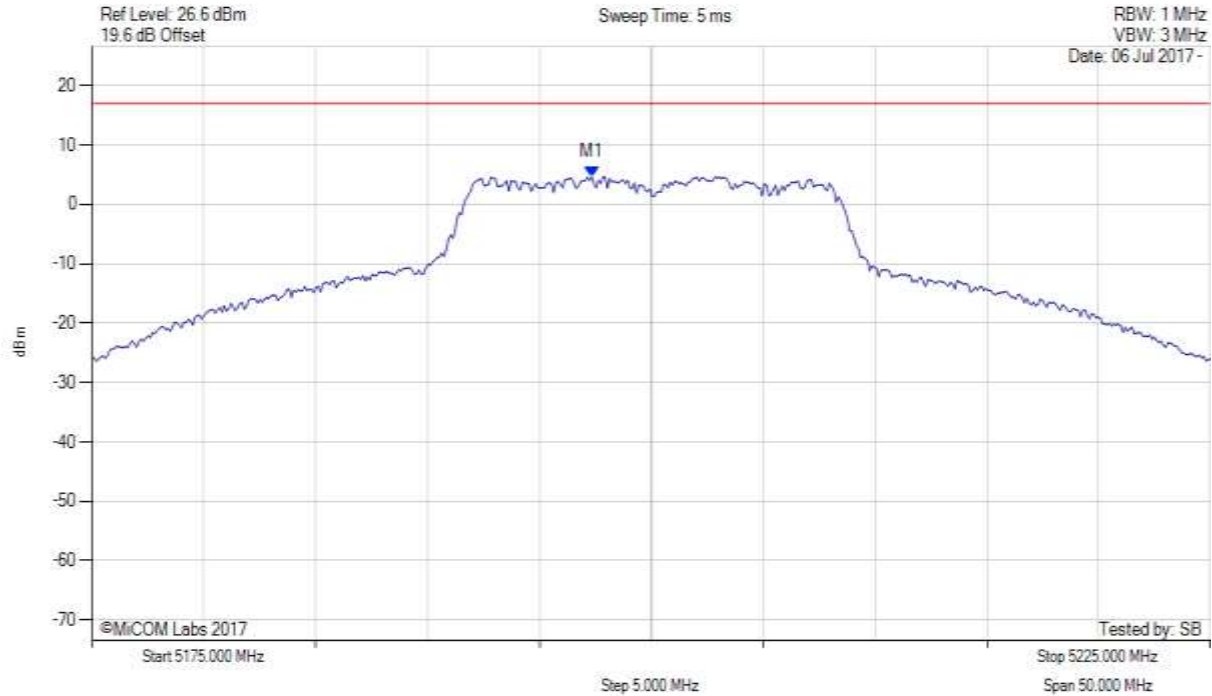


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5172.500 MHz : 3.837 dBm<br>M1 + DCCF : 5172.500 MHz : 3.881 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 17.0$ dBm<br>Margin: -13.1 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5200.00 MHz, Chain a, Temp: 20, Voltage: Vdc

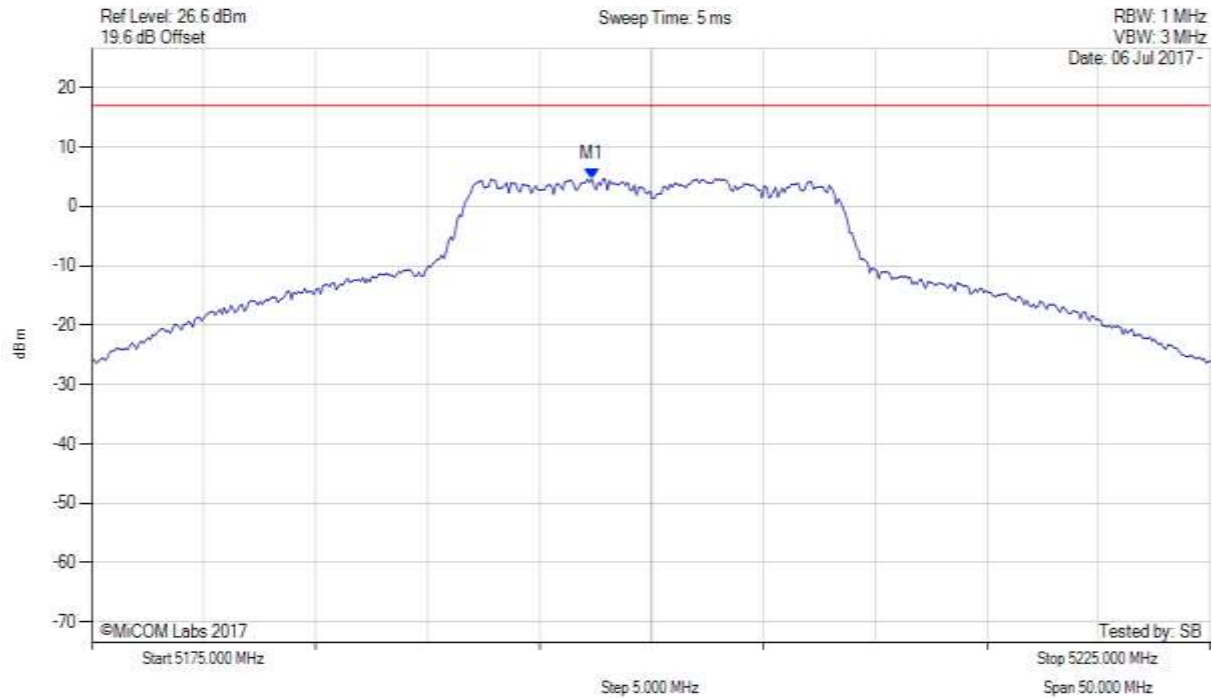


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results        |
|--------------------------------------------------------------------------------|-------------------------------|---------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5197.345 MHz : 4.652 dBm | Limit: ≤ 17.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5200.00 MHz, SUM, Temp: 20, Voltage: Vdc

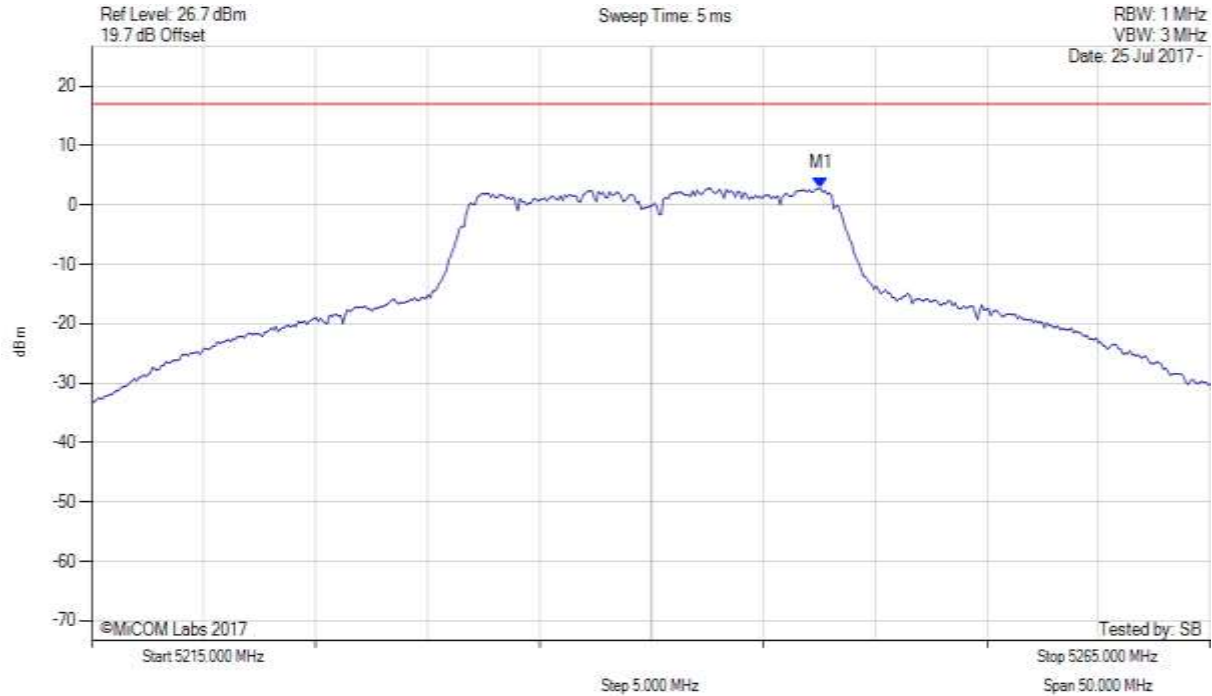


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5197.300 MHz : 4.652 dBm<br>M1 + DCCF : 5197.300 MHz : 4.696 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 17.0$ dBm<br>Margin: -12.3 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5240.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

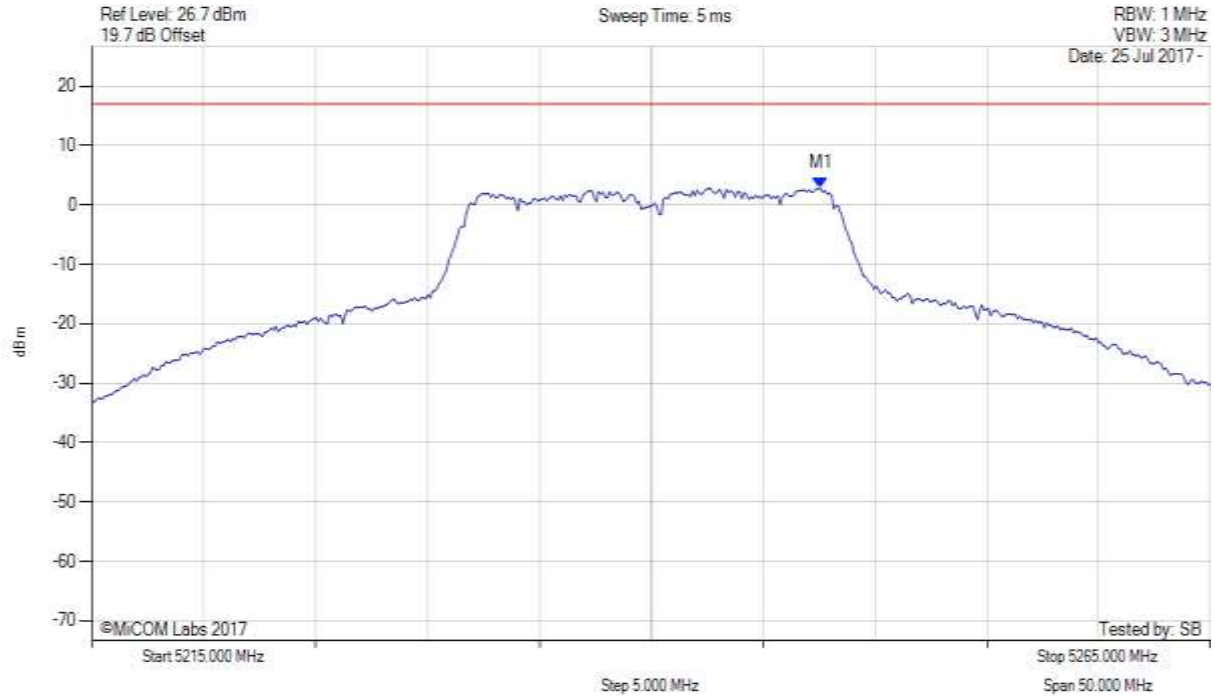


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5247.565 MHz : 2.808 dBm | Limit: $\leq 17.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5240.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

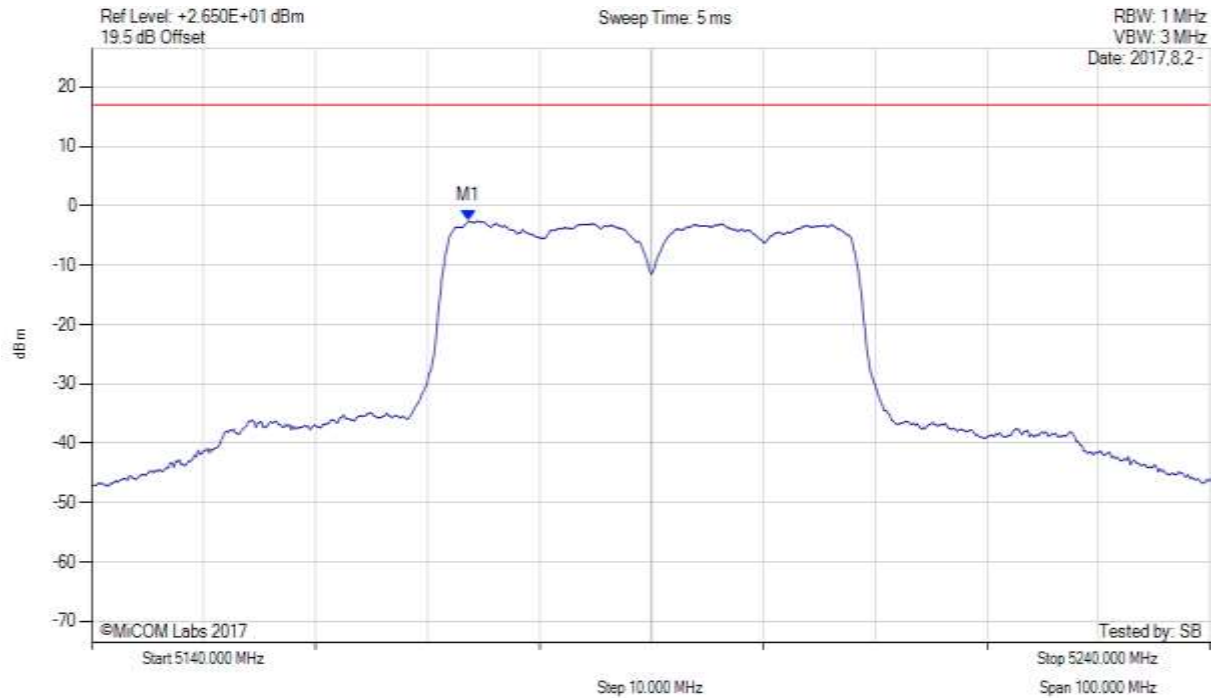


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5247.600 MHz : 2.808 dBm<br>M1 + DCCF : 5247.600 MHz : 2.852 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 17.0$ dBm<br>Margin: -14.1 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5190.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

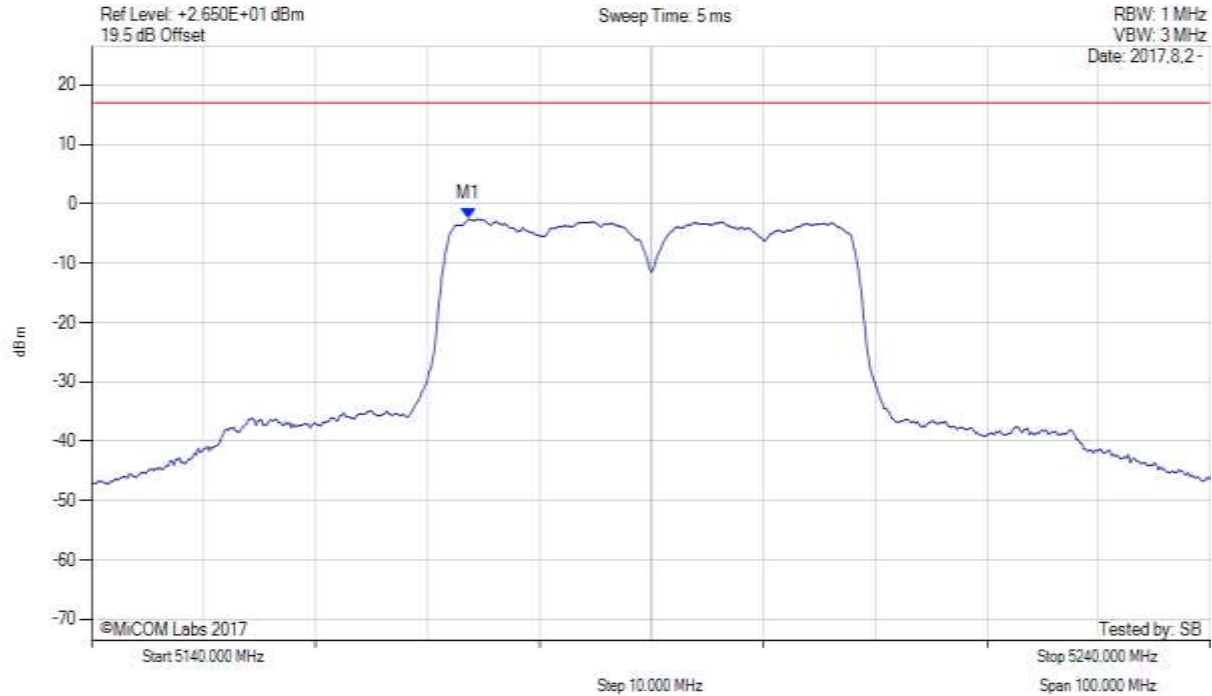


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude     | Test Results        |
|----------------------------------------------------------------------------------|--------------------------------|---------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5173.670 MHz : -2.497 dBm | Limit: ≤ 17.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5190.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

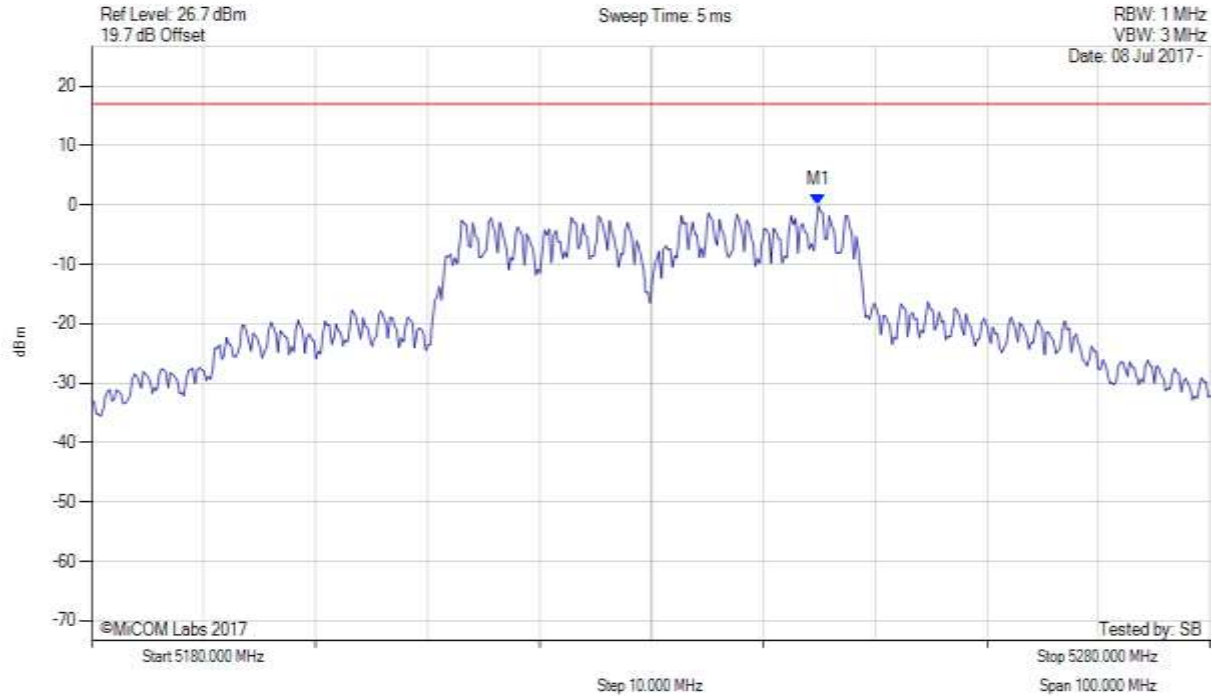


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude                                                                                         | Test Results                               |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5173.700 MHz : -2.497 dBm<br>M1 + DCCF : 5173.700 MHz : -1.740 dBm<br>Duty Cycle Correction Factor : +0.76 dB | Limit: $\leq 17.0$ dBm<br>Margin: -18.7 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5230.00 MHz, Chain a, Temp: 20, Voltage: Vdc

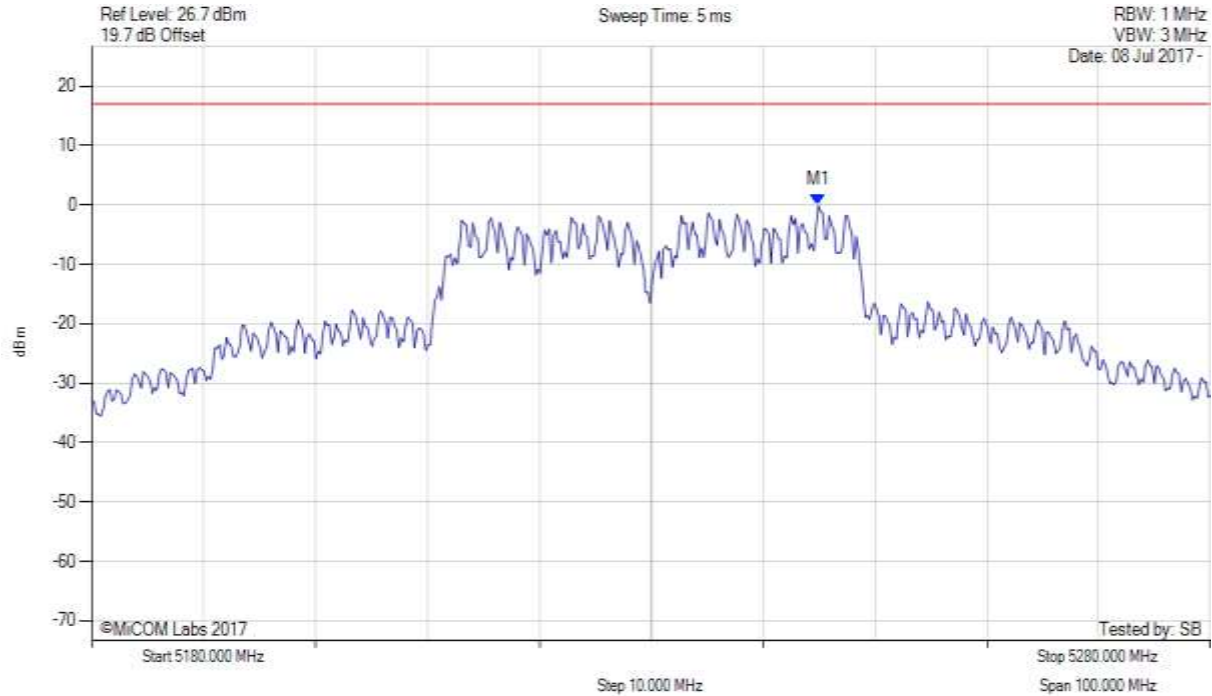


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude     | Test Results        |
|--------------------------------------------------------------------------------|--------------------------------|---------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5244.930 MHz : -0.071 dBm | Limit: ≤ 17.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5230.00 MHz, SUM, Temp: 20, Voltage: Vdc

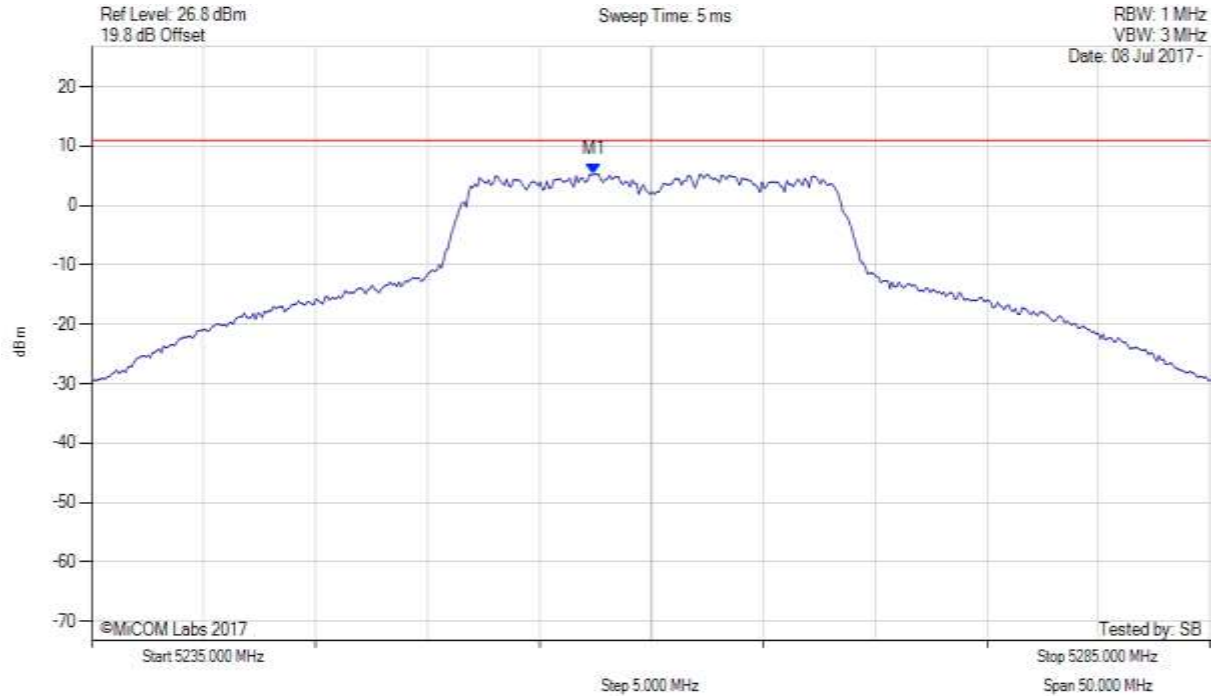


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                        | Test Results                               |
|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5244.900 MHz : -0.071 dBm<br>M1 + DCCF : 5244.900 MHz : 0.686 dBm<br>Duty Cycle Correction Factor : +0.76 dB | Limit: $\leq 17.0$ dBm<br>Margin: -16.3 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5260.00 MHz, Chain a, Temp: 20, Voltage: Vdc



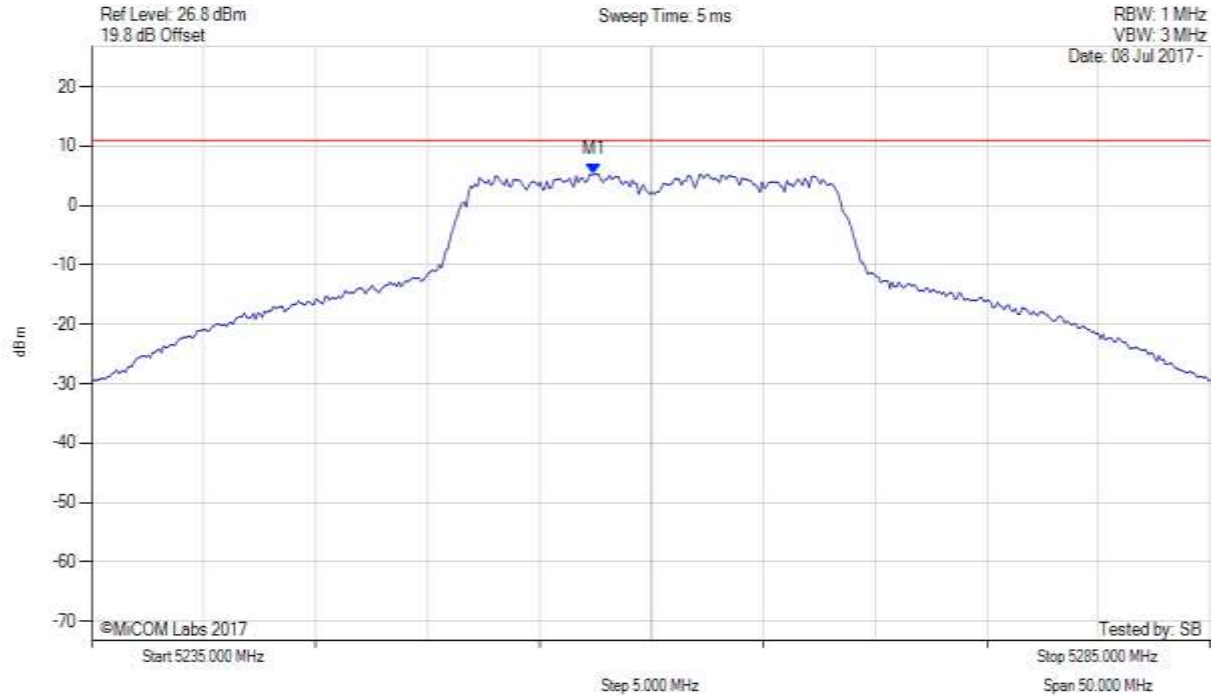
| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5257.445 MHz : 5.263 dBm | Limit: $\leq 11.000$ dBm |

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POWER SPECTRAL DENSITY



Variant: 802.11a, Channel: 5260.00 MHz, SUM, Temp: 20, Voltage: Vdc



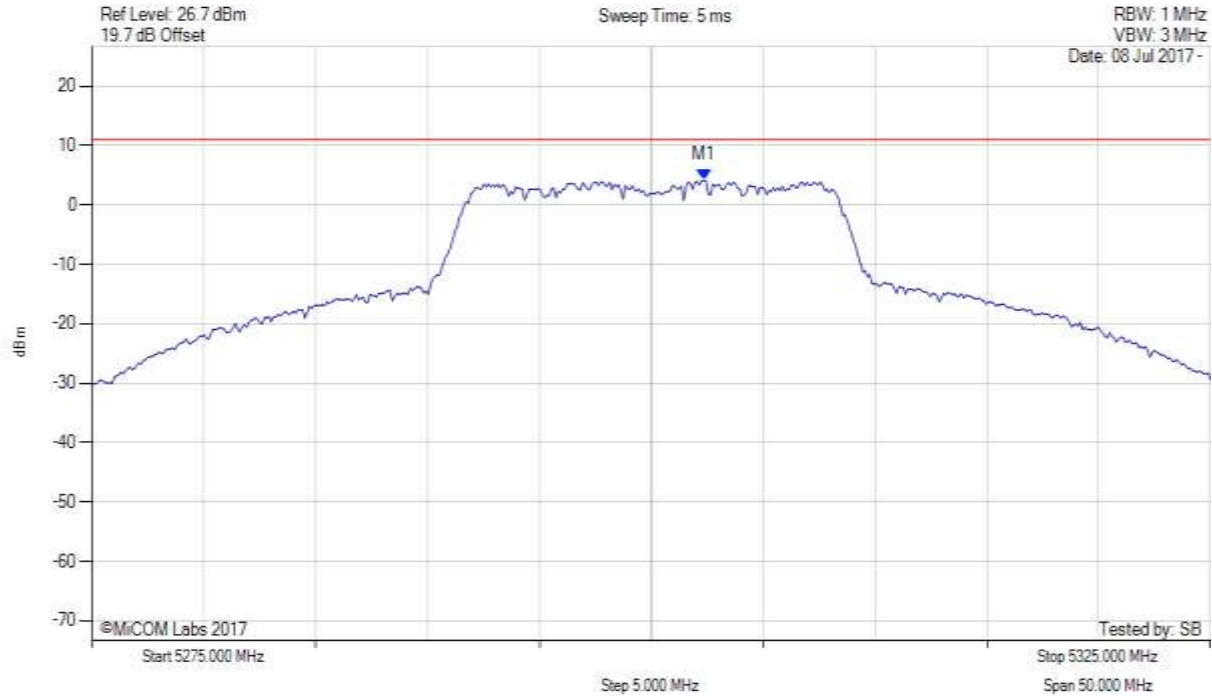
| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5257.400 MHz : 5.263 dBm<br>M1 + DCCF : 5257.400 MHz : 5.307 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -5.7 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5300.00 MHz, Chain a, Temp: 20, Voltage: Vdc



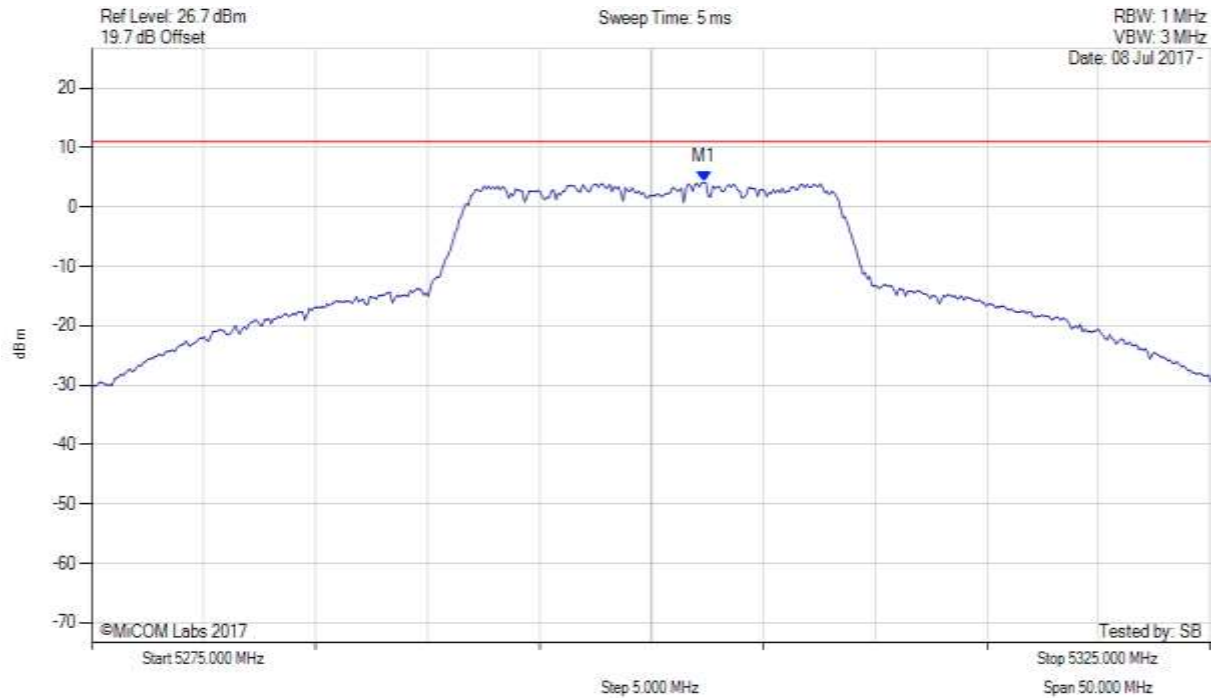
| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5302.355 MHz : 4.139 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY



Variant: 802.11a, Channel: 5300.00 MHz, SUM, Temp: 20, Voltage: Vdc



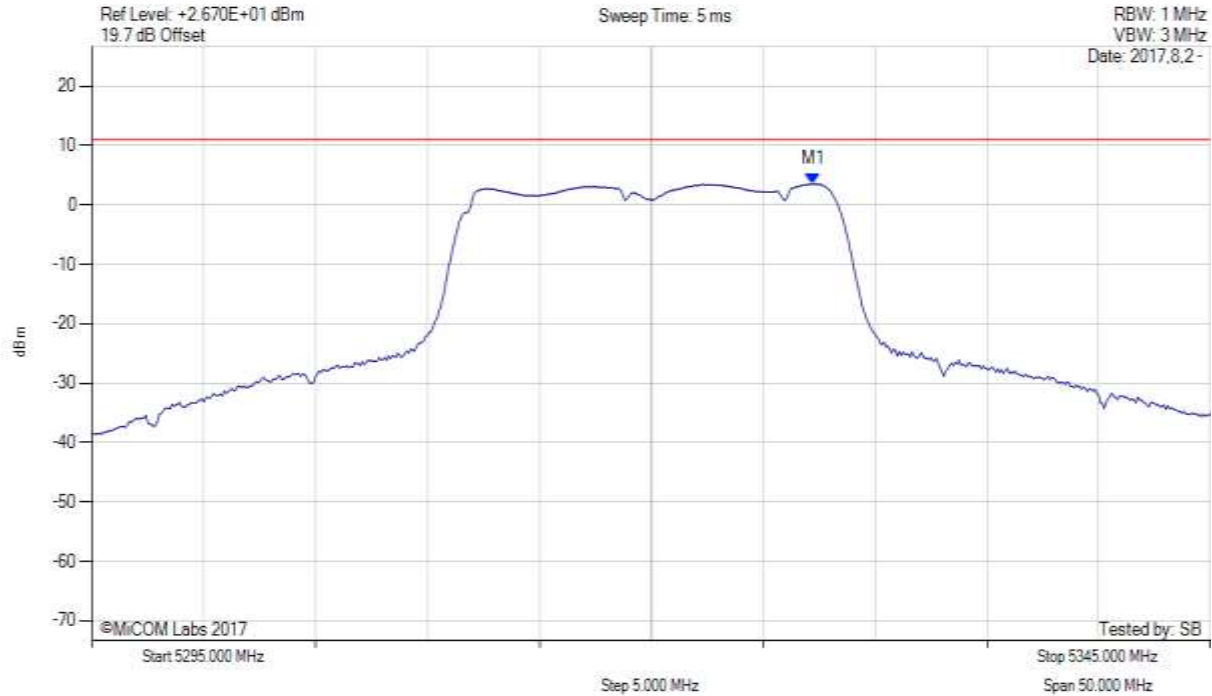
| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5302.400 MHz : 4.139 dBm<br>M1 + DCCF : 5302.400 MHz : 4.183 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -6.8 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5320.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

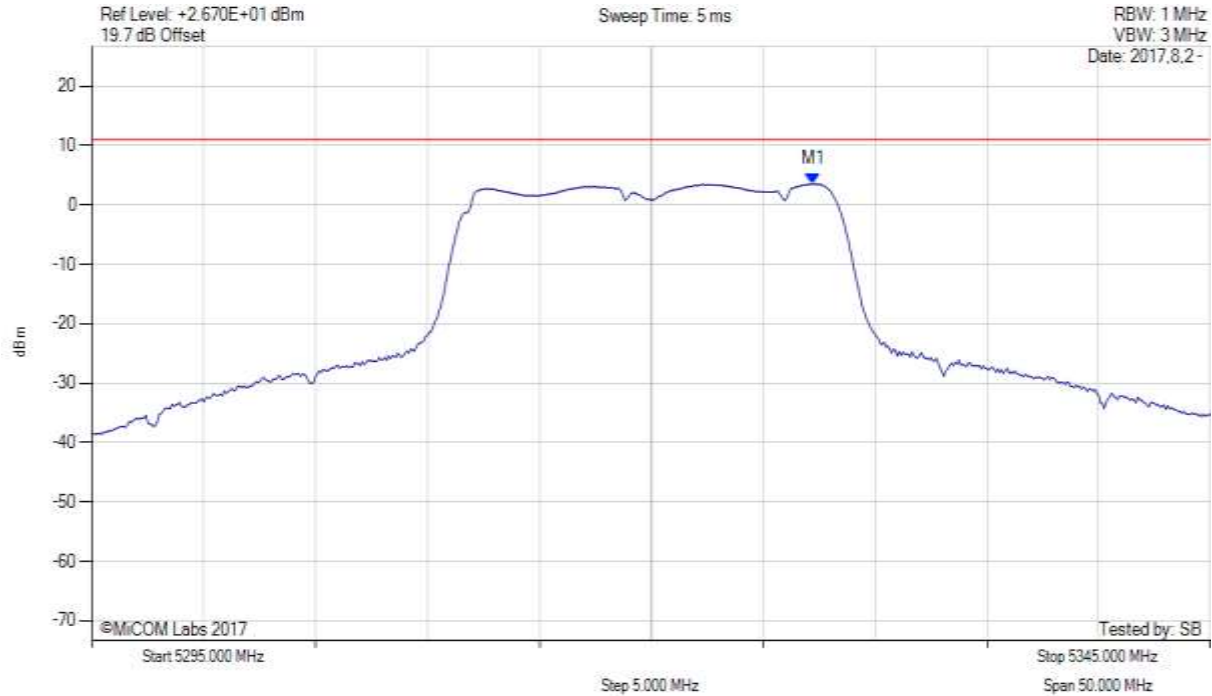


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude    | Test Results             |
|----------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5327.250 MHz : 3.550 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5320.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

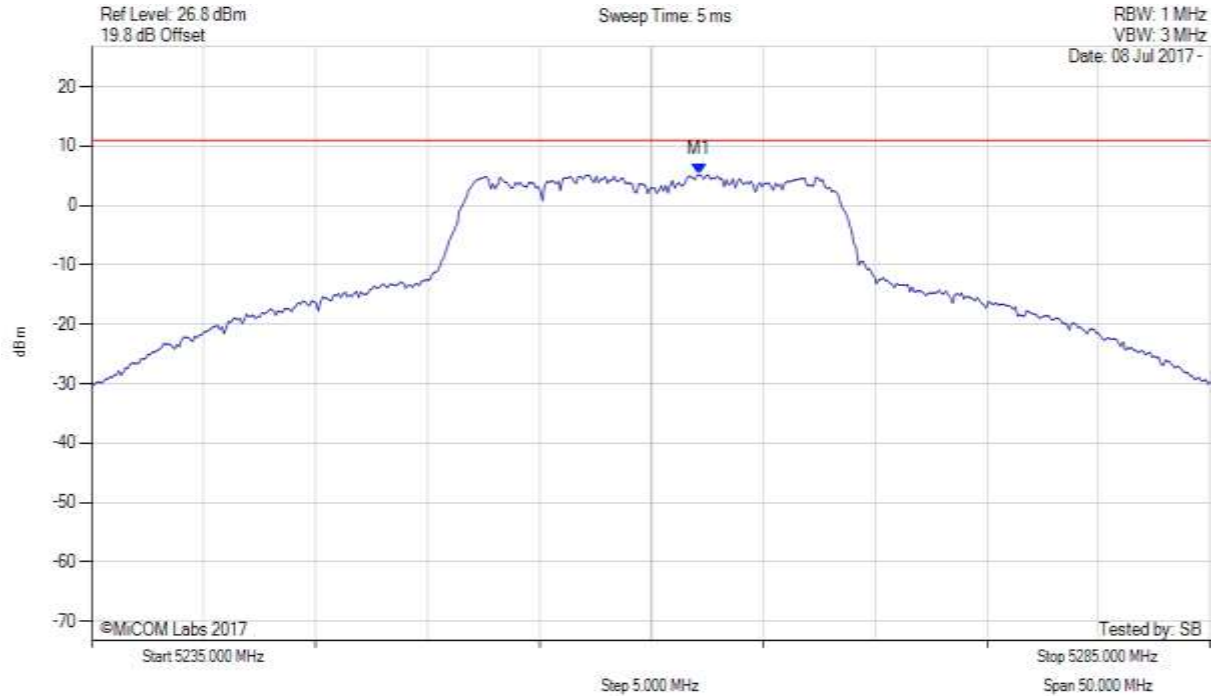


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5327.300 MHz : 3.550 dBm<br>M1 + DCCF : 5327.300 MHz : 3.594 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -7.4 dB |

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5260.00 MHz, Chain a, Temp: 20, Voltage: Vdc

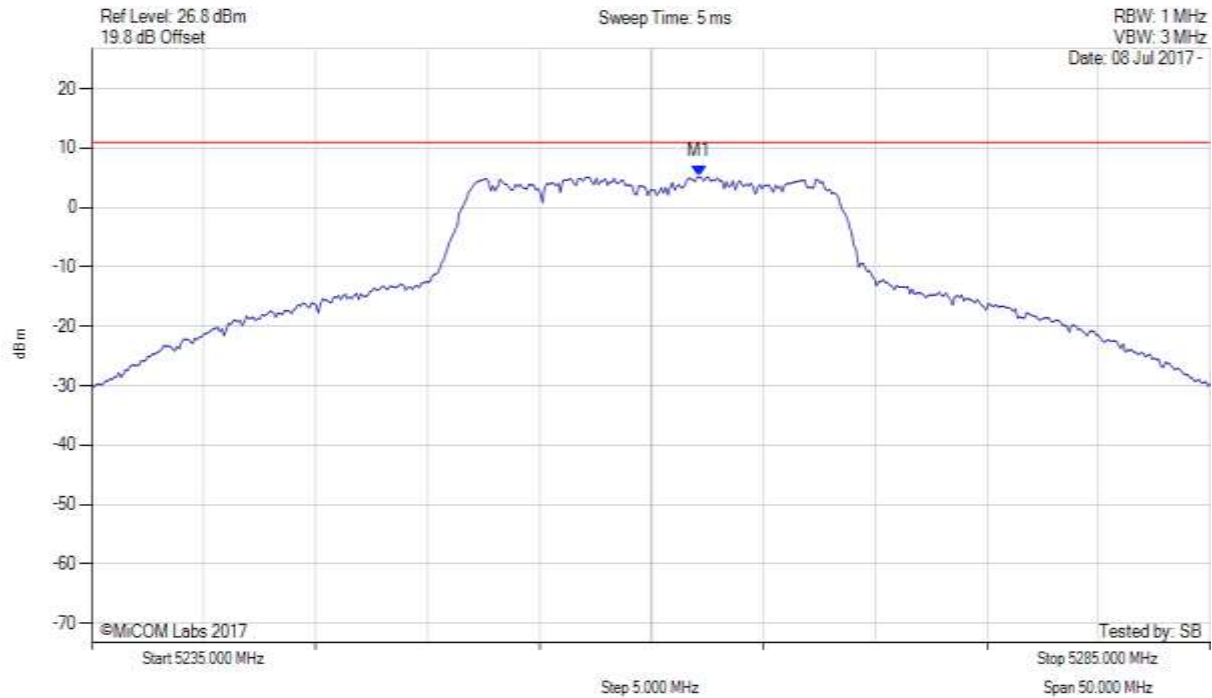


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5262.154 MHz : 5.184 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5260.00 MHz, SUM, Temp: 20, Voltage: Vdc

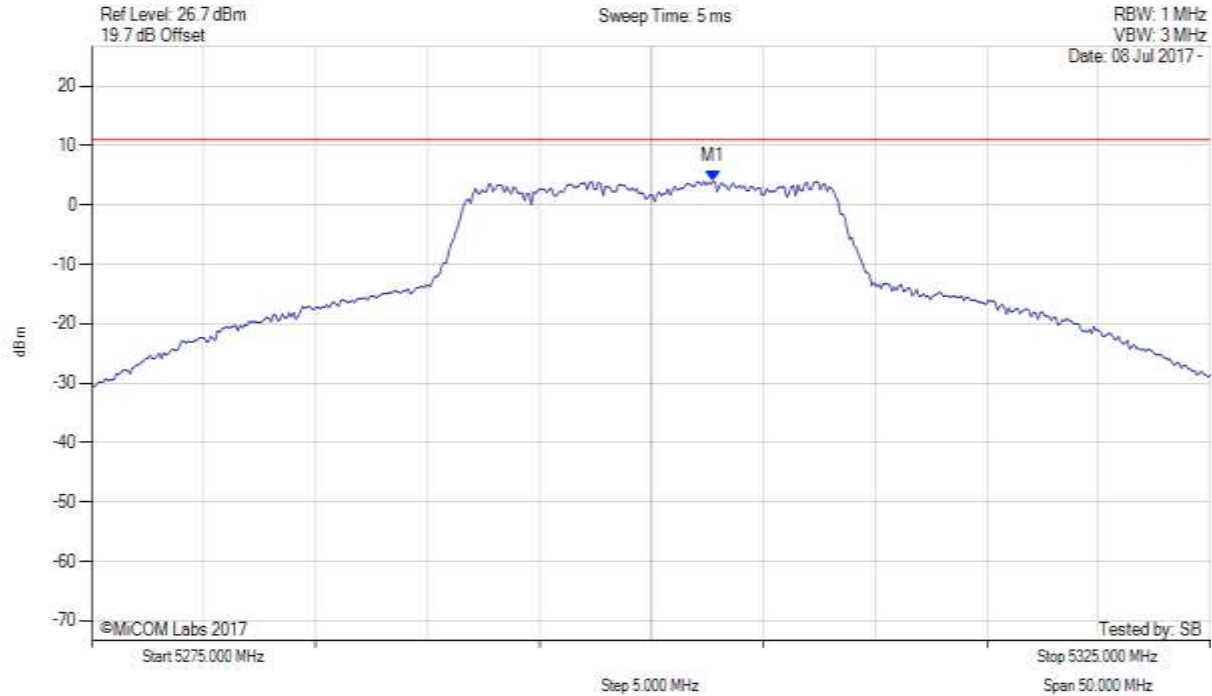


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5262.200 MHz : 5.184 dBm<br>M1 + DCCF : 5262.200 MHz : 5.228 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -5.8 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5300.00 MHz, Chain a, Temp: 20, Voltage: Vdc

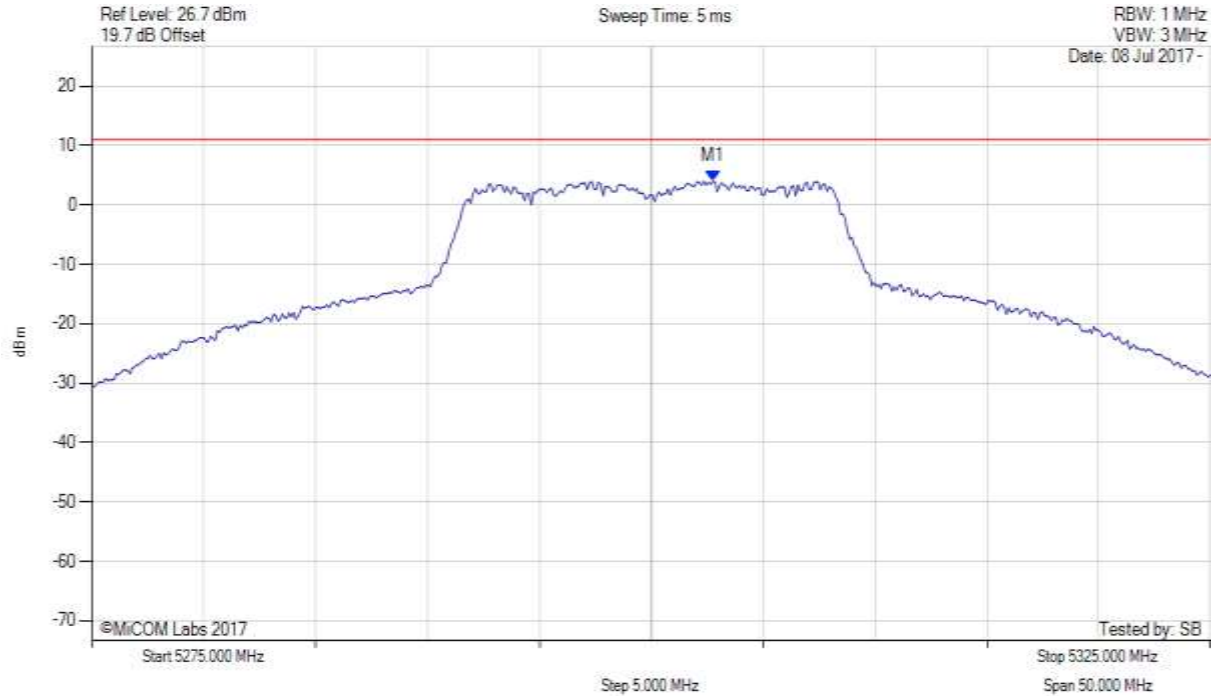


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5302.756 MHz : 4.017 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5300.00 MHz, SUM, Temp: 20, Voltage: Vdc

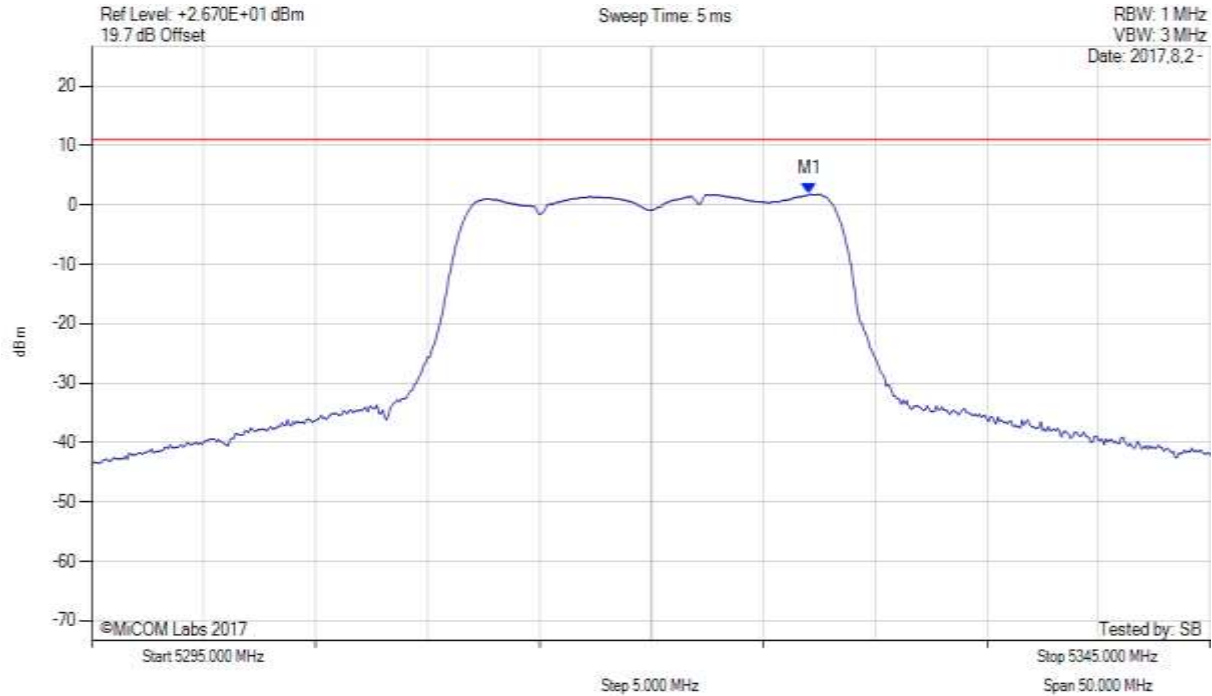


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5302.800 MHz : 4.017 dBm<br>M1 + DCCF : 5302.800 MHz : 4.061 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -6.9 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5320.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

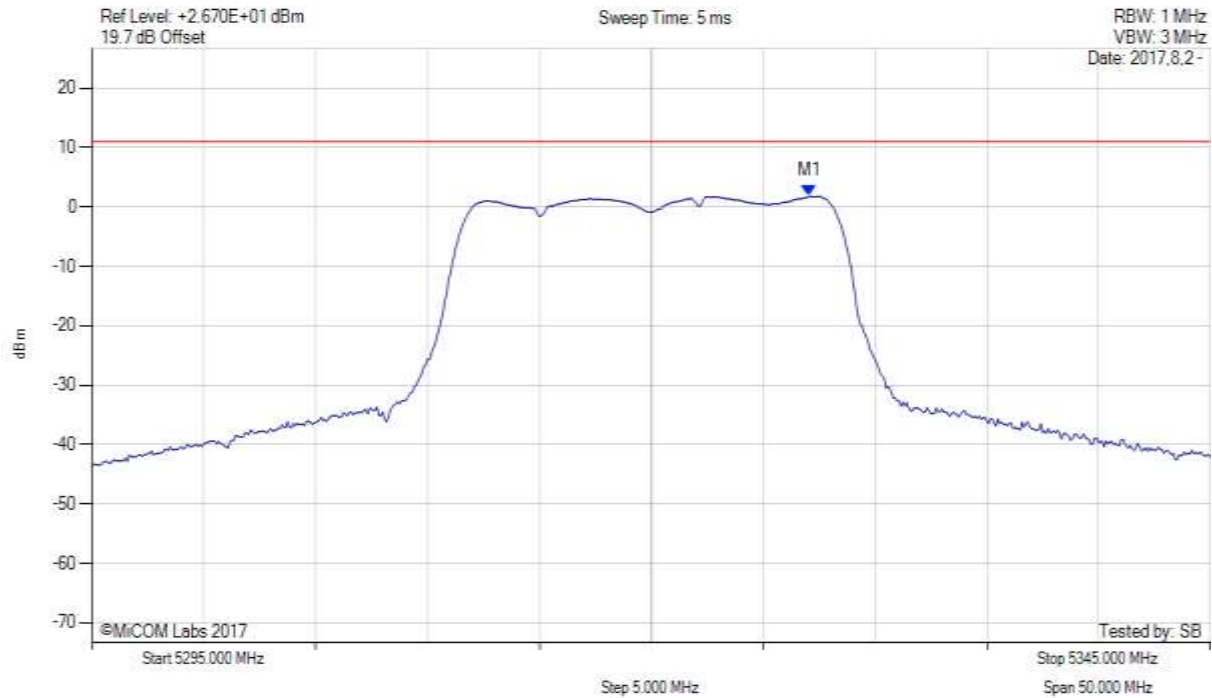


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude    | Test Results        |
|----------------------------------------------------------------------------------|-------------------------------|---------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5327.080 MHz : 1.817 dBm | Limit: ≤ 11.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5320.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

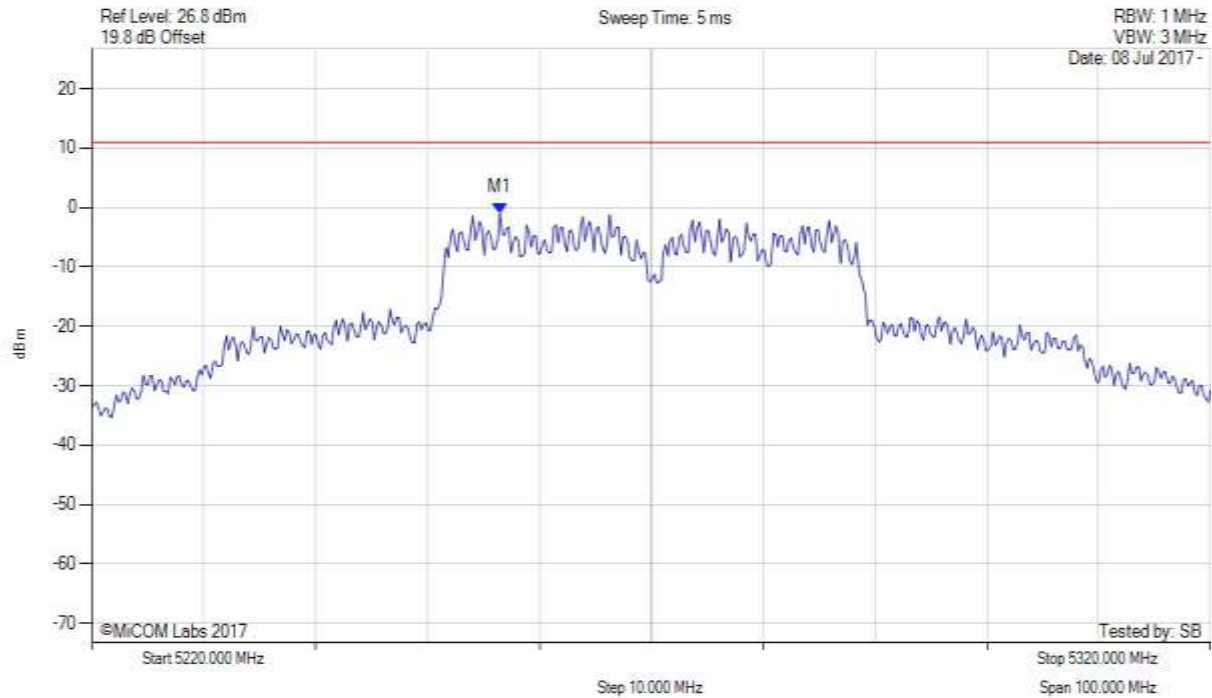


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5327.100 MHz : 1.817 dBm<br>M1 + DCCF : 5327.100 MHz : 1.861 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -9.1 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5270.00 MHz, Chain a, Temp: 20, Voltage: Vdc

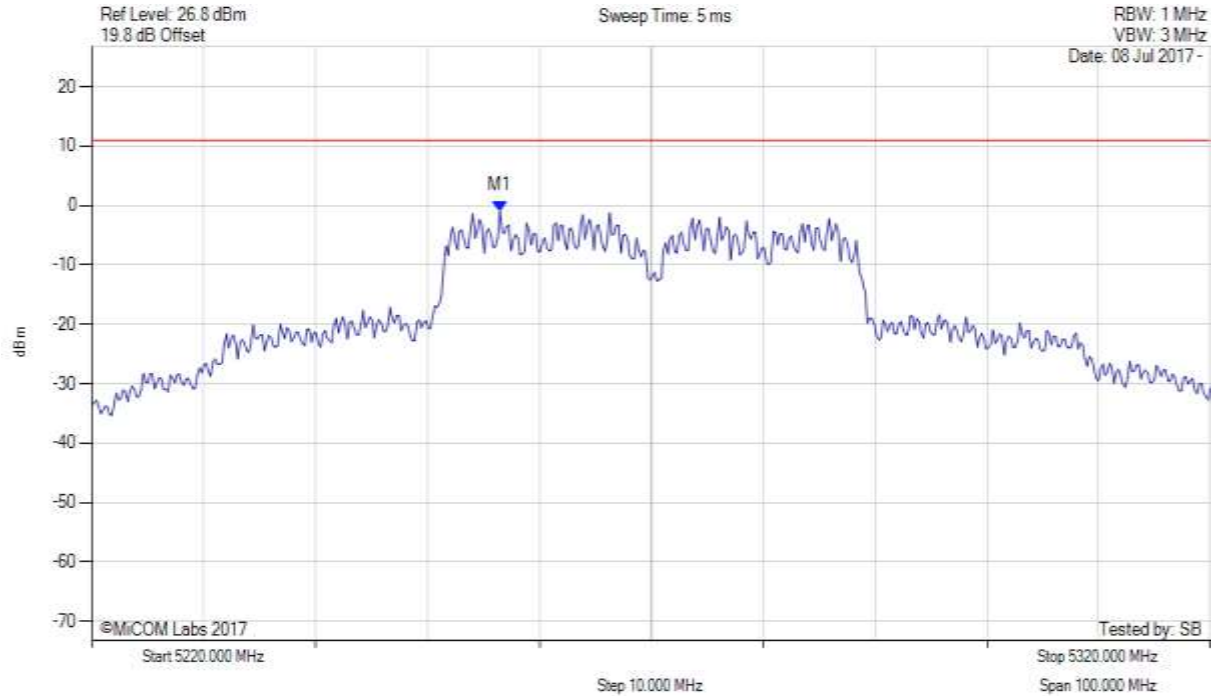


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude     | Test Results             |
|--------------------------------------------------------------------------------|--------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5256.473 MHz : -0.937 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5270.00 MHz, SUM, Temp: 20, Voltage: Vdc



| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                         | Test Results                               |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5256.500 MHz : -0.937 dBm<br>M1 + DCCF : 5256.500 MHz : -0.180 dBm<br>Duty Cycle Correction Factor : +0.76 dB | Limit: $\leq 11.0$ dBm<br>Margin: -11.2 dB |

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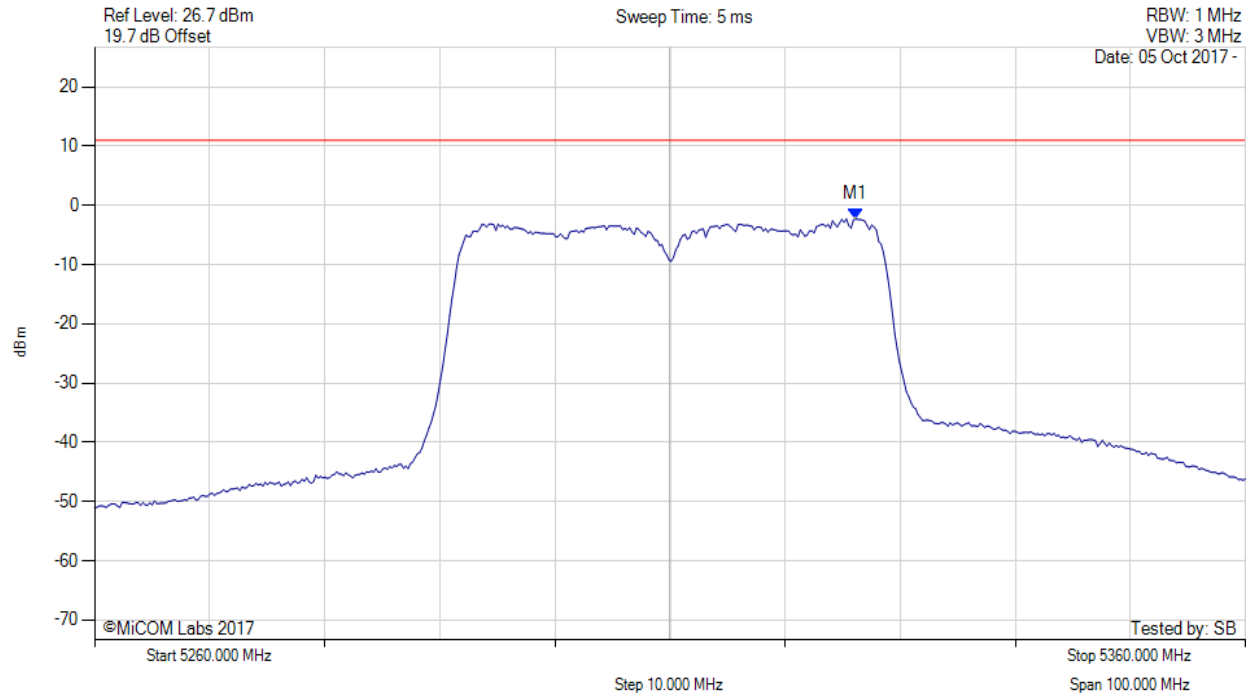


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5310.00 MHz, , Temp: 20, Voltage: 3.3 Vdc



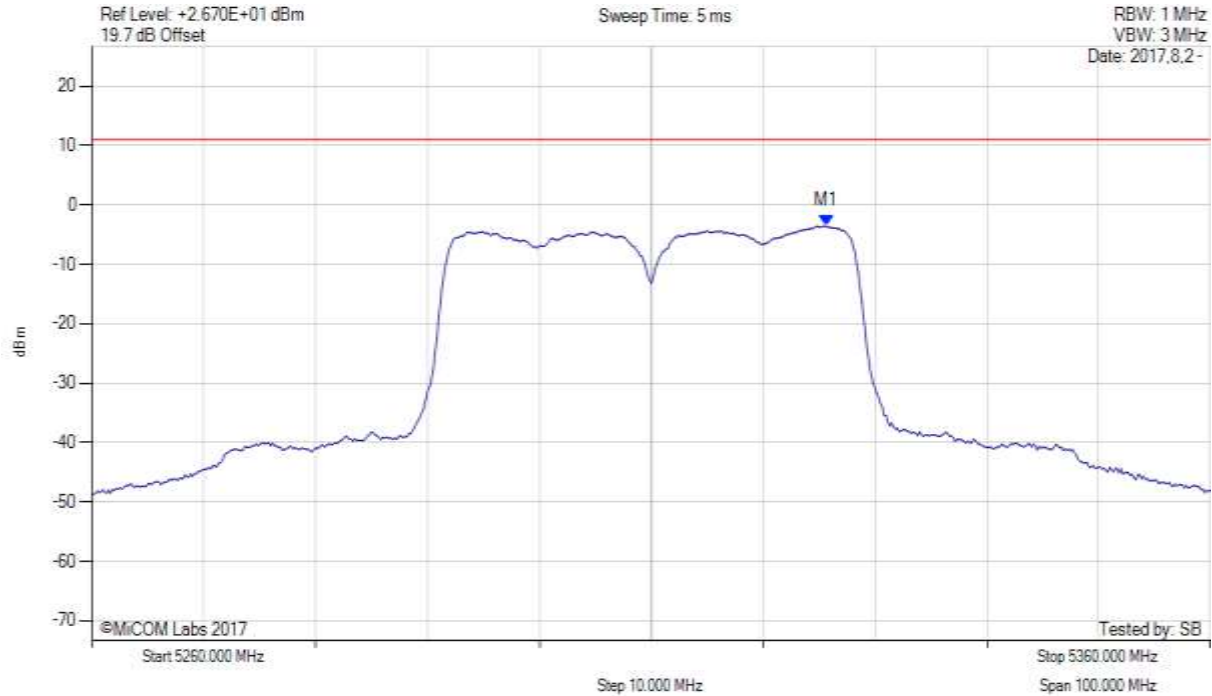
| Analyzer Setup                                                                 | Marker:Frequency:Amplitude     | Test Results                   |
|--------------------------------------------------------------------------------|--------------------------------|--------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5326.132 MHz : -2.282 dBm | Channel Frequency: 5310.00 MHz |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5310.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

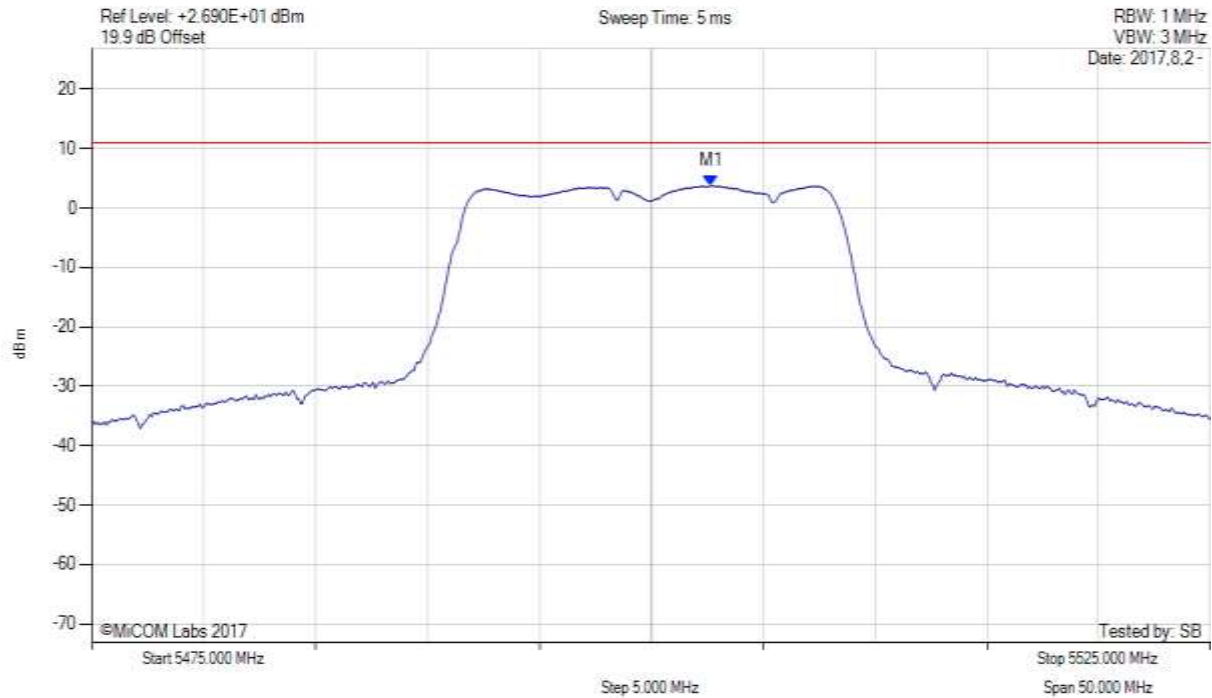


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude                                                                                         | Test Results                               |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5325.700 MHz : -3.534 dBm<br>M1 + DCCF : 5325.700 MHz : -2.777 dBm<br>Duty Cycle Correction Factor : +0.76 dB | Limit: $\leq 11.0$ dBm<br>Margin: -13.8 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5500.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

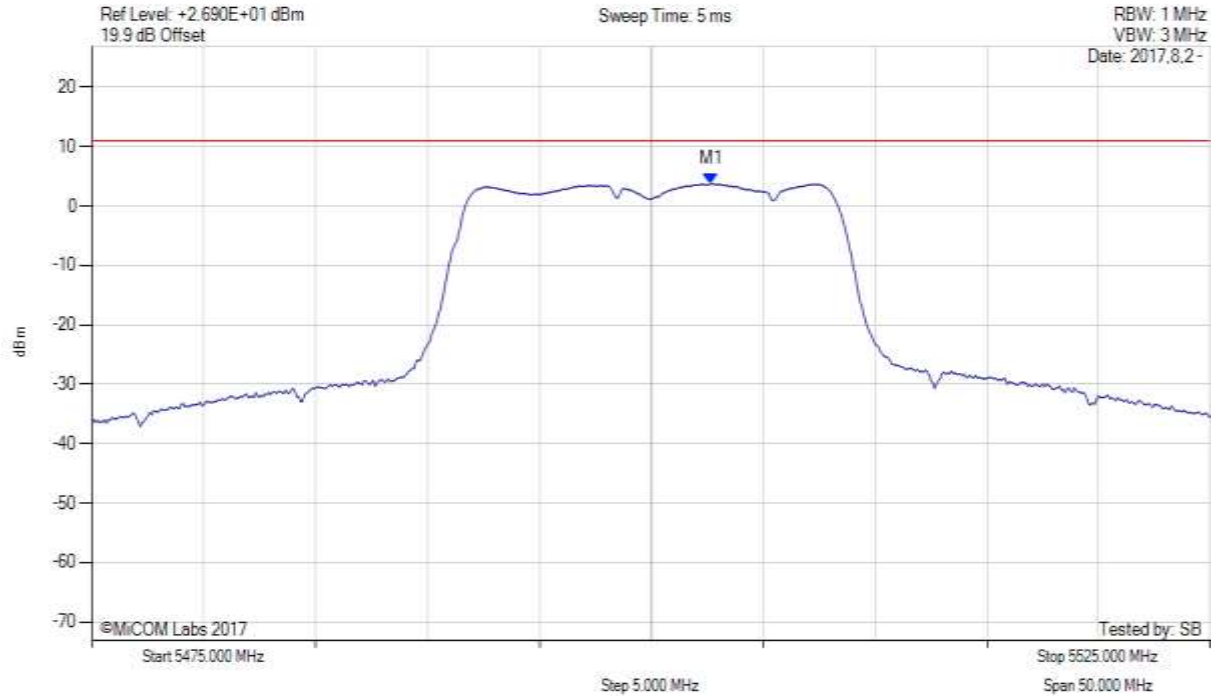


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude    | Test Results        |
|----------------------------------------------------------------------------------|-------------------------------|---------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5502.670 MHz : 3.768 dBm | Limit: ≤ 11.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5500.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

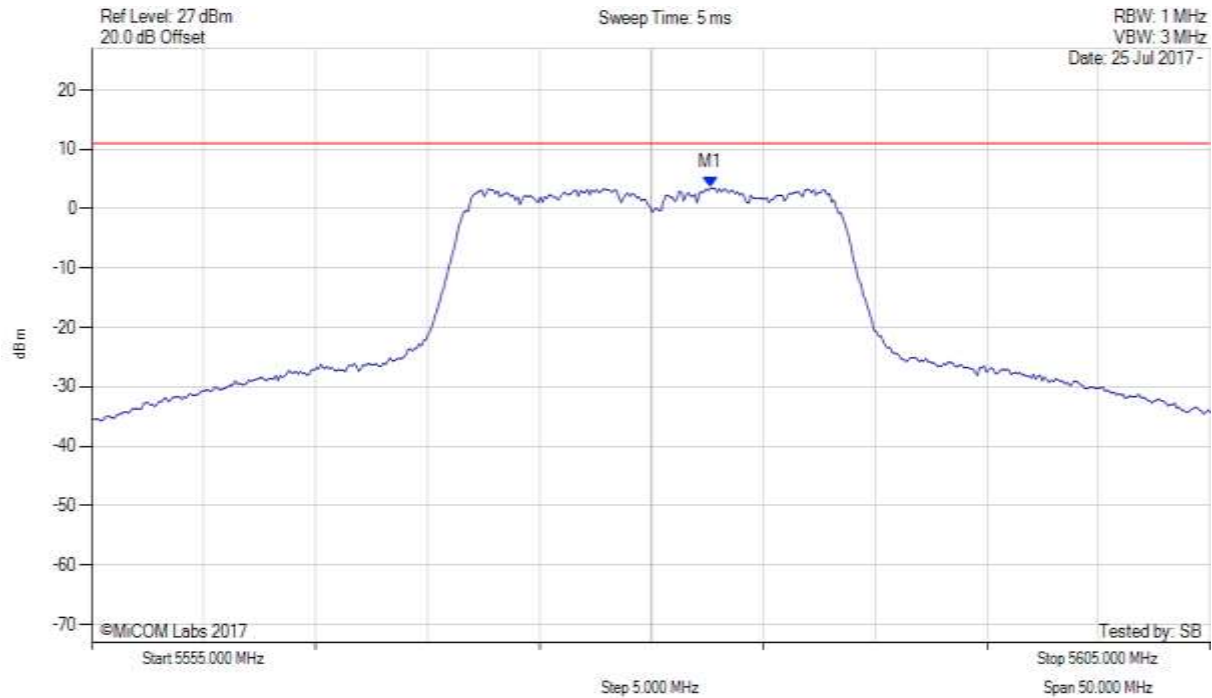


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5502.700 MHz : 3.768 dBm<br>M1 + DCCF : 5502.700 MHz : 3.812 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -7.2 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5580.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

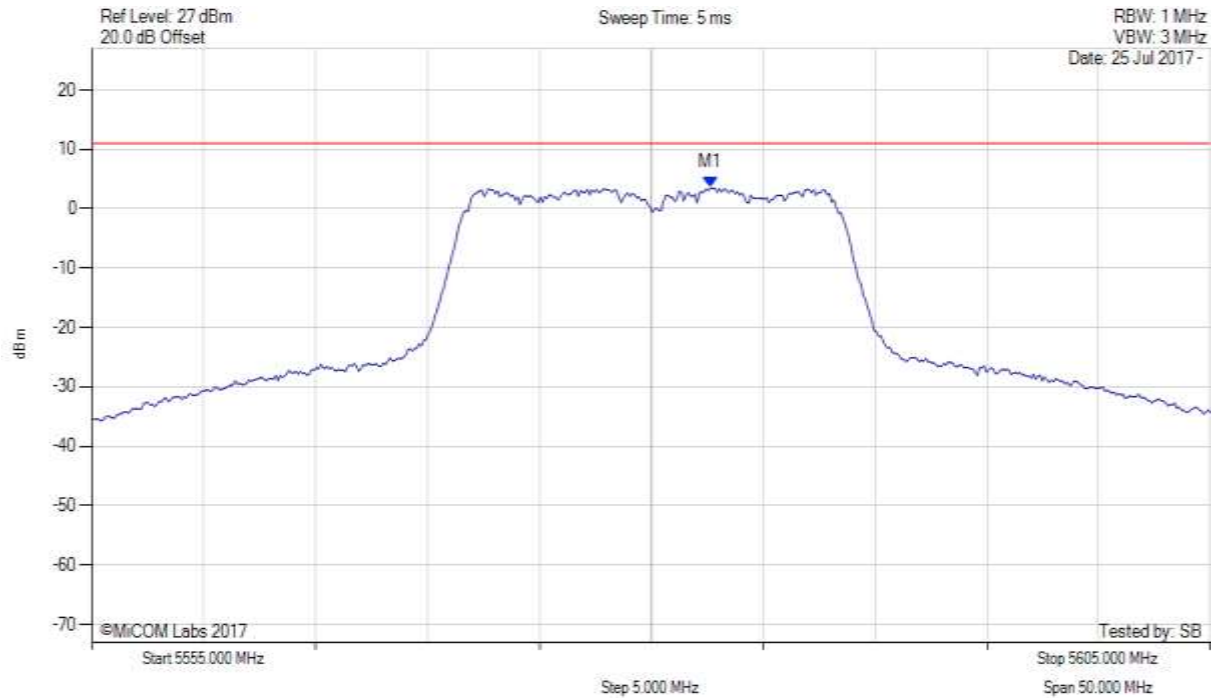


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5582.655 MHz : 3.515 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5580.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc



| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5582.700 MHz : 3.515 dBm<br>M1 + DCCF : 5582.700 MHz : 3.559 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -7.4 dB |

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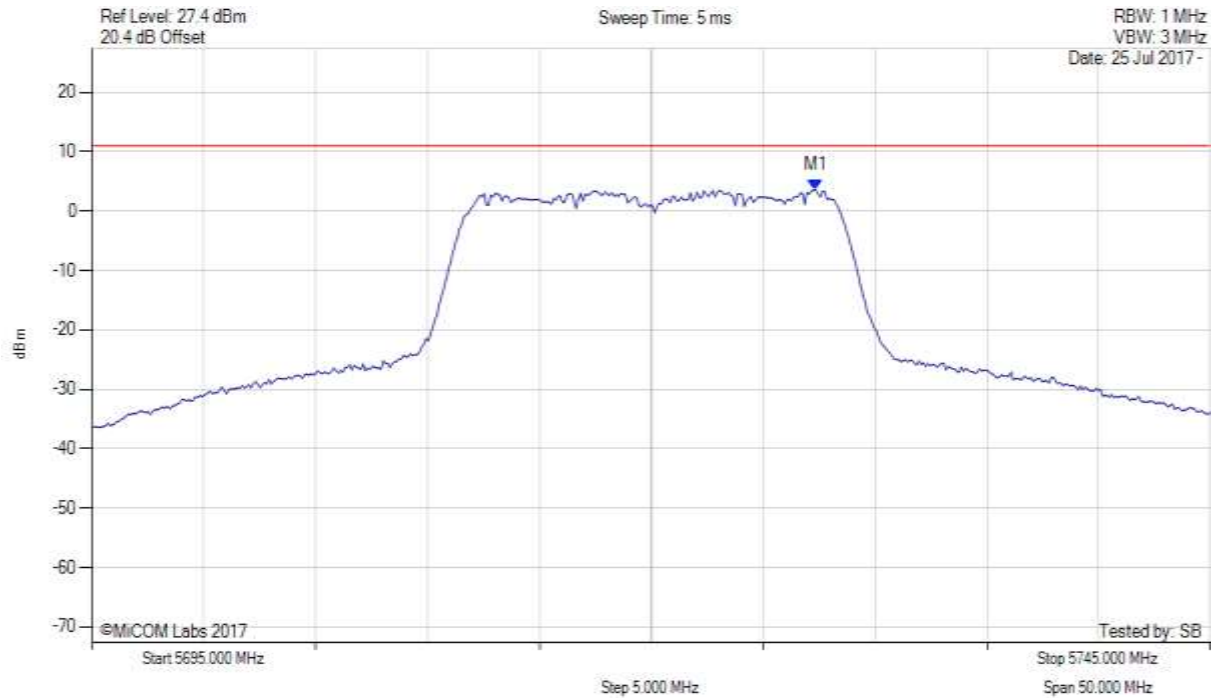


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5720.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



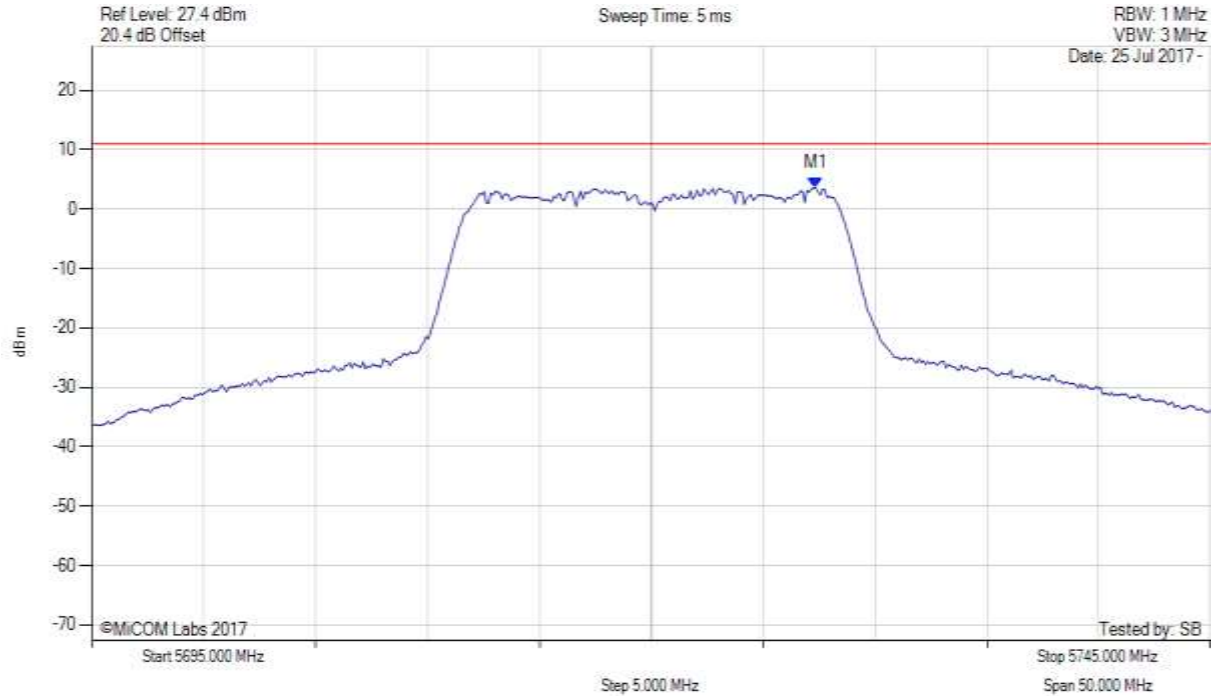
| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5727.365 MHz : 3.581 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5720.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

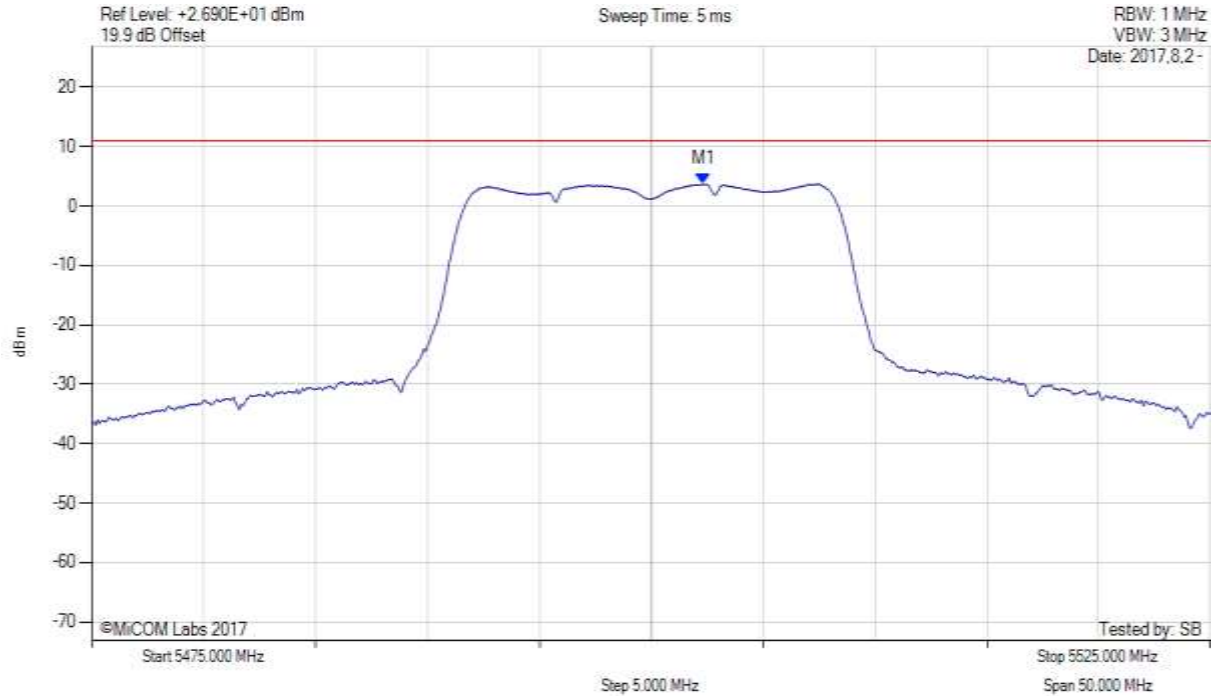


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5727.400 MHz : 3.581 dBm<br>M1 + DCCF : 5727.400 MHz : 3.625 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -7.4 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5500.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

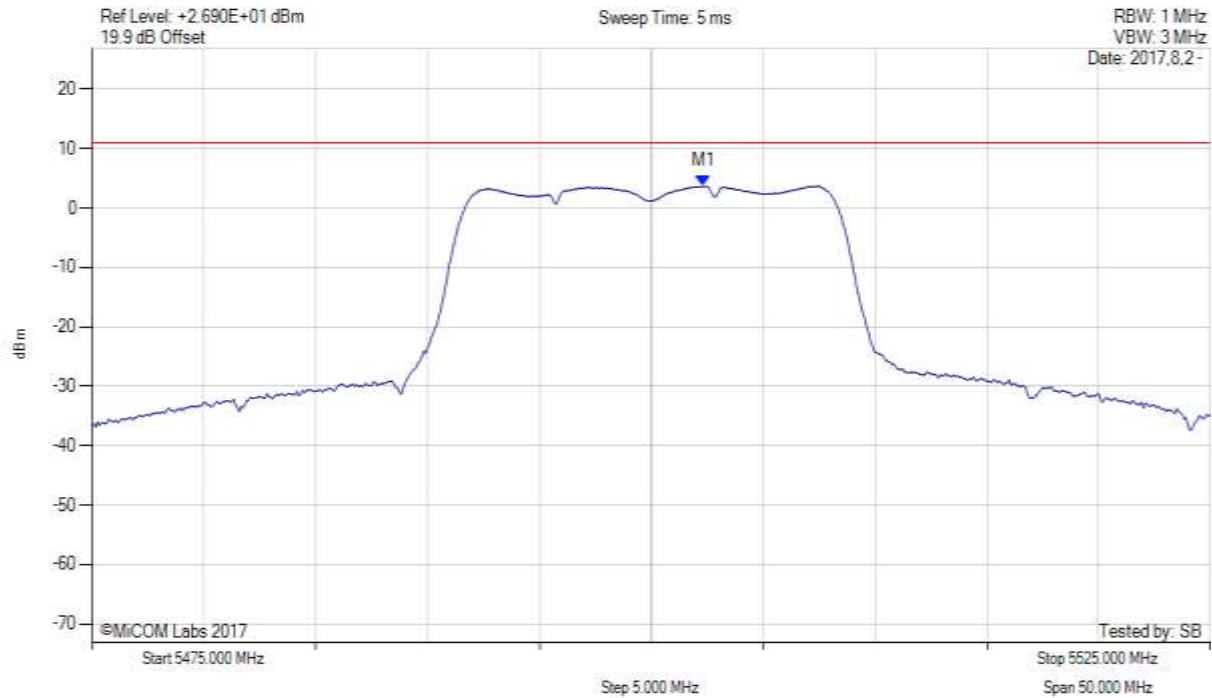


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude    | Test Results        |
|----------------------------------------------------------------------------------|-------------------------------|---------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5502.330 MHz : 3.700 dBm | Limit: ≤ 11.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5500.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

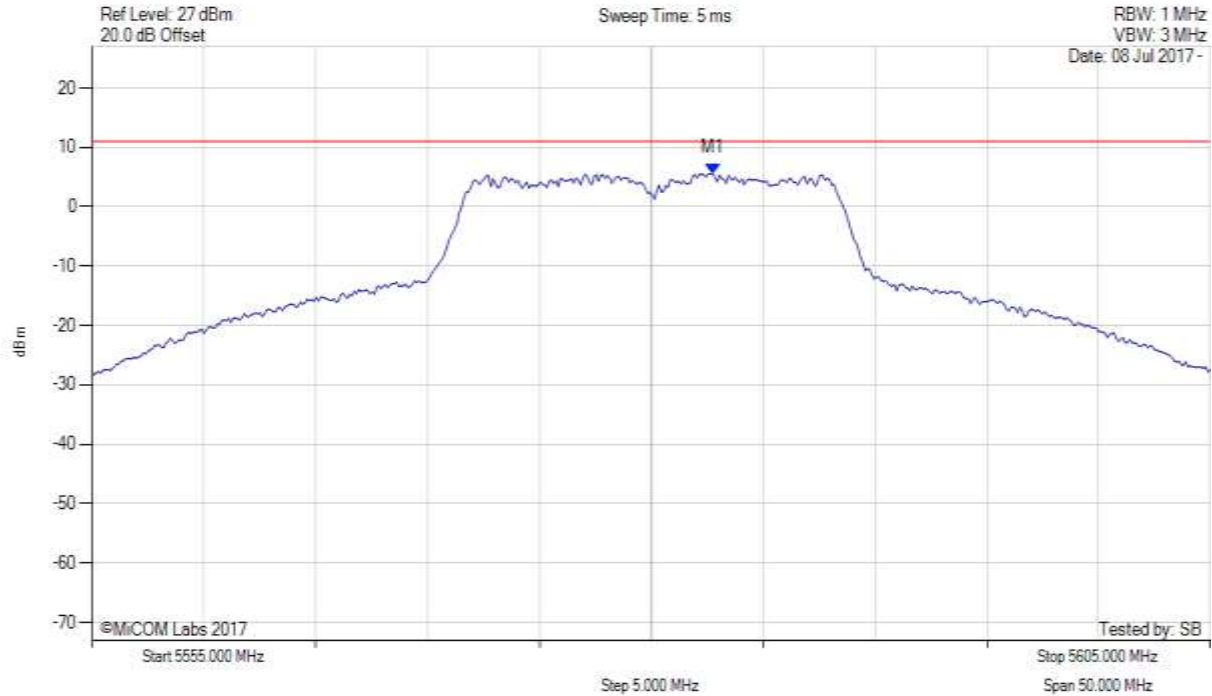


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5502.300 MHz : 3.700 dBm<br>M1 + DCCF : 5502.300 MHz : 3.744 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -7.3 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5580.00 MHz, Chain a, Temp: 20, Voltage: Vdc

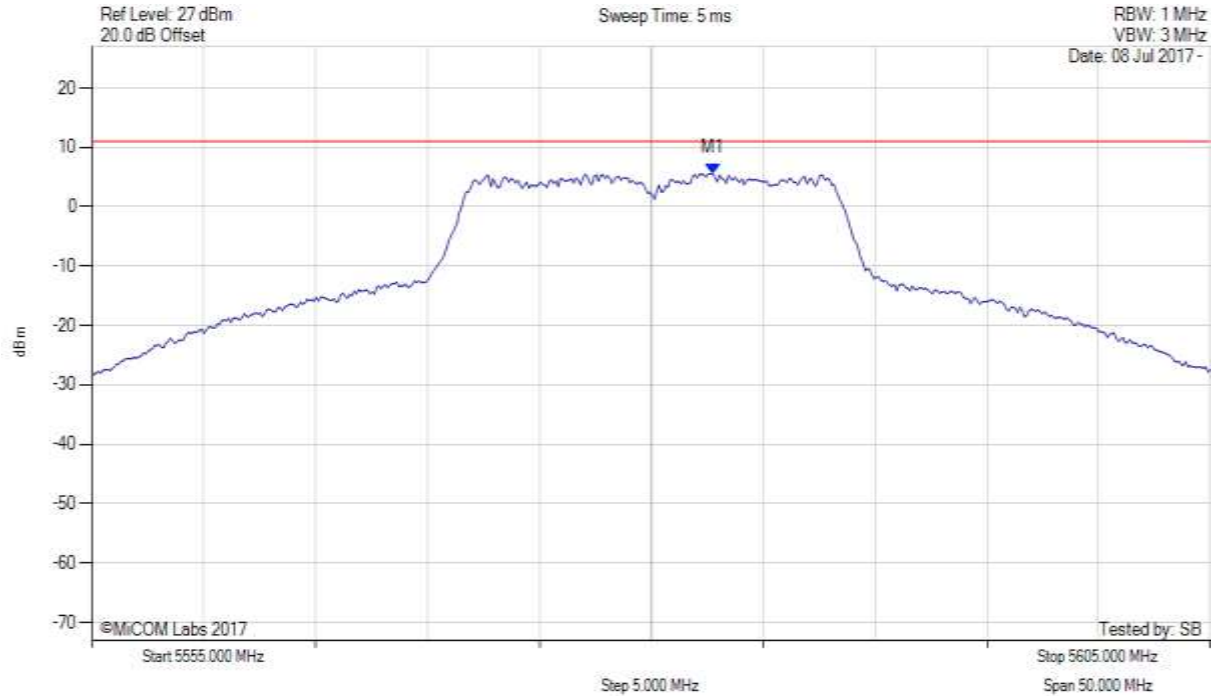


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5582.756 MHz : 5.577 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5580.00 MHz, SUM, Temp: 20, Voltage: Vdc

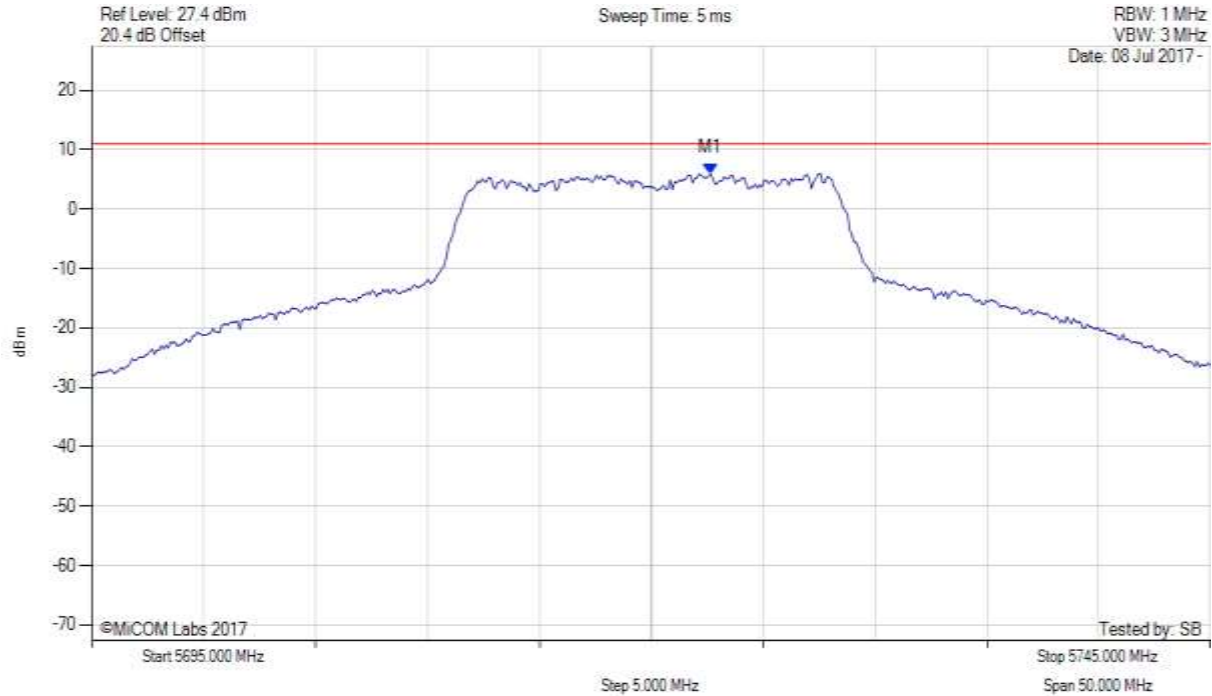


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5582.800 MHz : 5.577 dBm<br>M1 + DCCF : 5582.800 MHz : 5.621 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -5.4 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5720.00 MHz, Chain a, Temp: 20, Voltage: Vdc

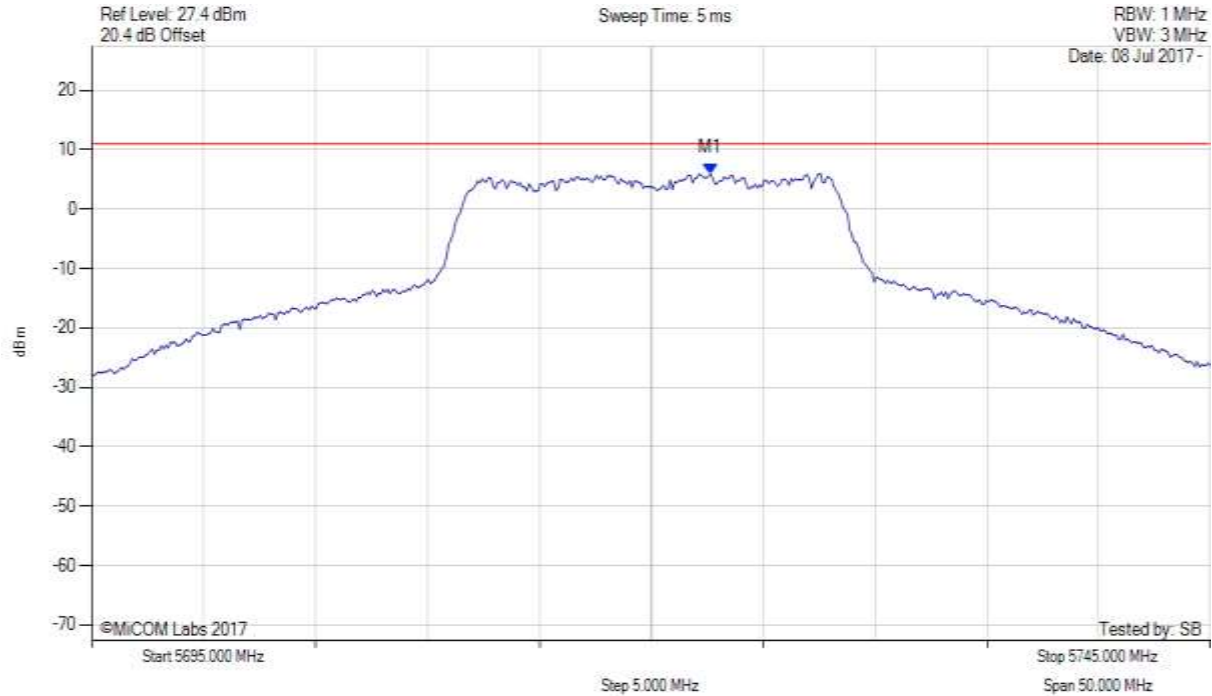


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5722.655 MHz : 5.991 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5720.00 MHz, SUM, Temp: 20, Voltage: Vdc

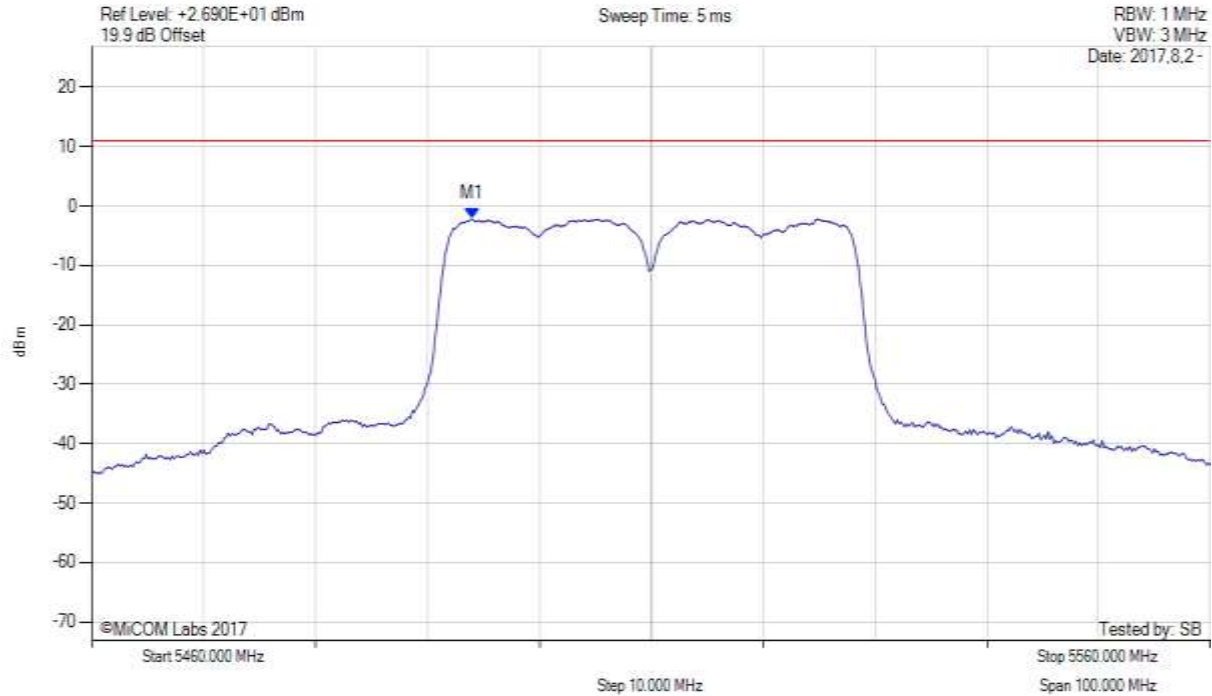


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5722.700 MHz : 5.991 dBm<br>M1 + DCCF : 5722.700 MHz : 6.035 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 11.0$ dBm<br>Margin: -5.0 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5510.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

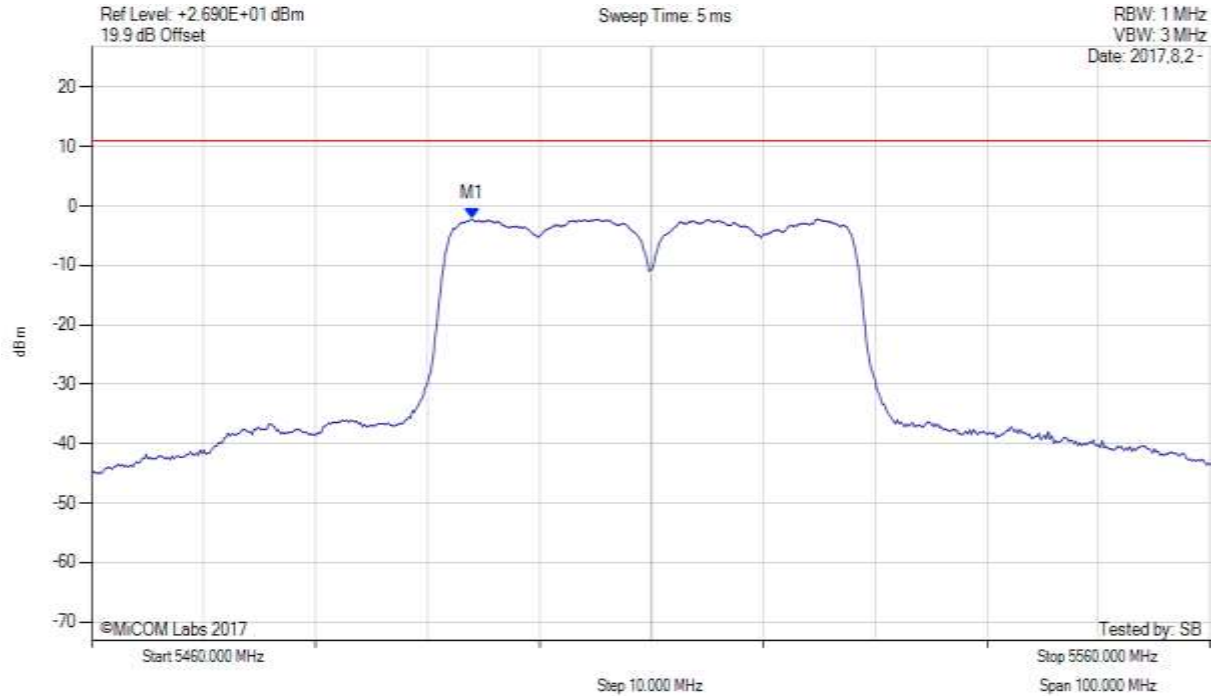


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude     | Test Results        |
|----------------------------------------------------------------------------------|--------------------------------|---------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5494.000 MHz : -2.174 dBm | Limit: ≤ 11.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5510.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

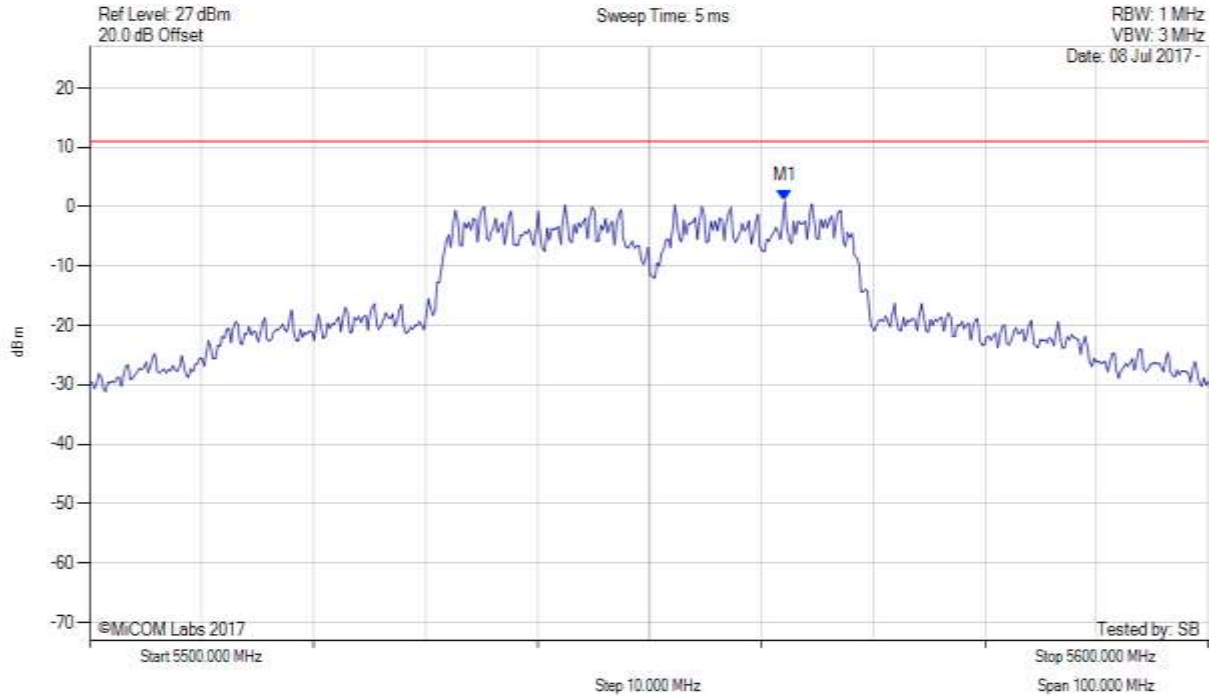


| Analyzer Setup                                                                   | Marker:Frequency:Amplitude                                                                                         | Test Results                               |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = AVER<br>Sweep Count = +100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5494.000 MHz : -2.174 dBm<br>M1 + DCCF : 5494.000 MHz : -1.417 dBm<br>Duty Cycle Correction Factor : +0.76 dB | Limit: $\leq 11.0$ dBm<br>Margin: -12.4 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5550.00 MHz, Chain a, Temp: 20, Voltage: Vdc

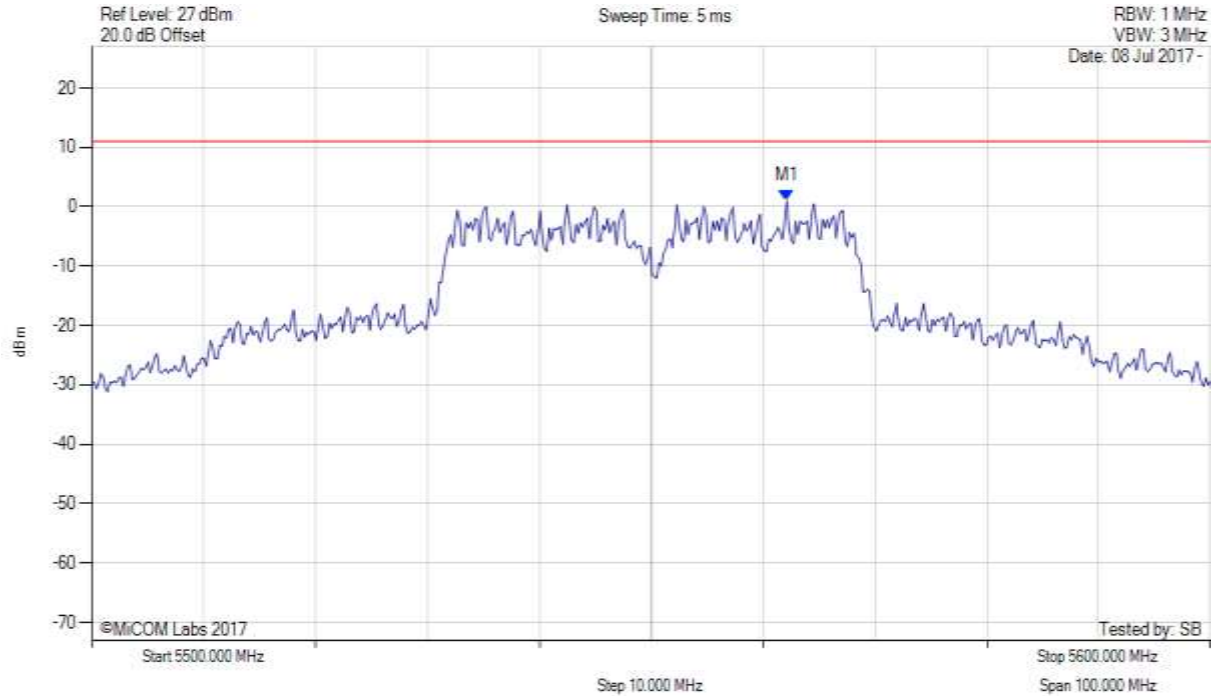


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5562.124 MHz : 0.994 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5550.00 MHz, SUM, Temp: 20, Voltage: Vdc

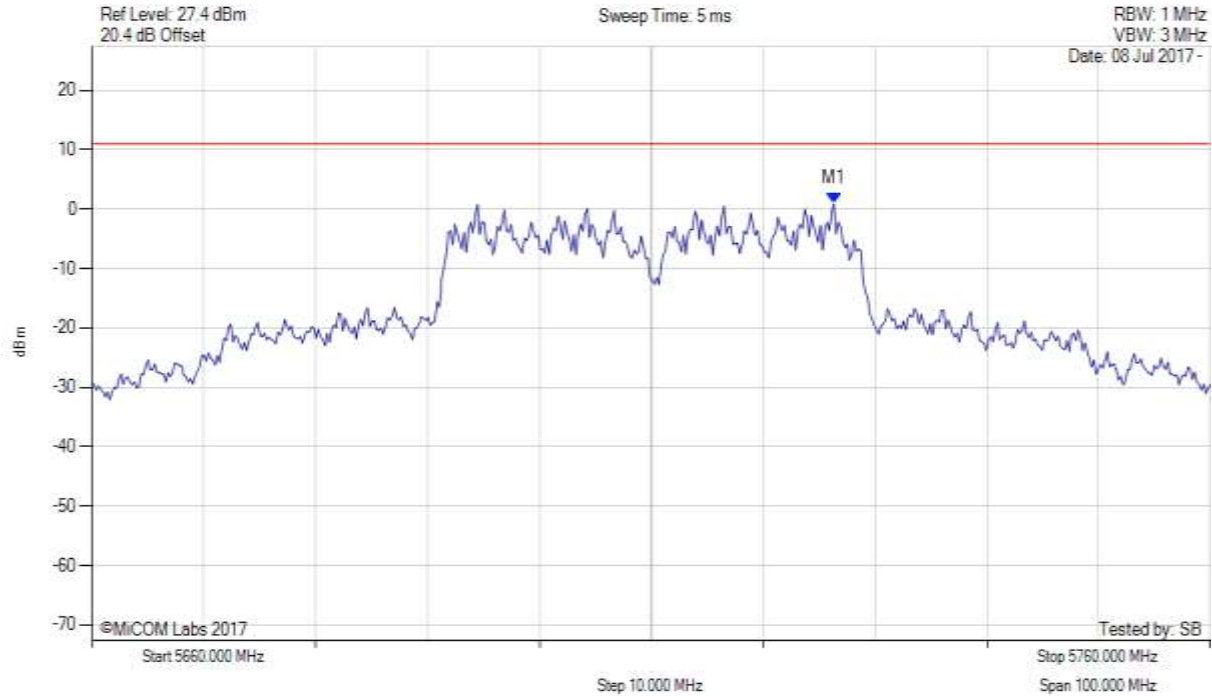


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5562.100 MHz : 0.994 dBm<br>M1 + DCCF : 5562.100 MHz : 1.751 dBm<br>Duty Cycle Correction Factor : +0.76 dB | Limit: $\leq 11.0$ dBm<br>Margin: -9.2 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5710.00 MHz, Chain a, Temp: 20, Voltage: Vdc

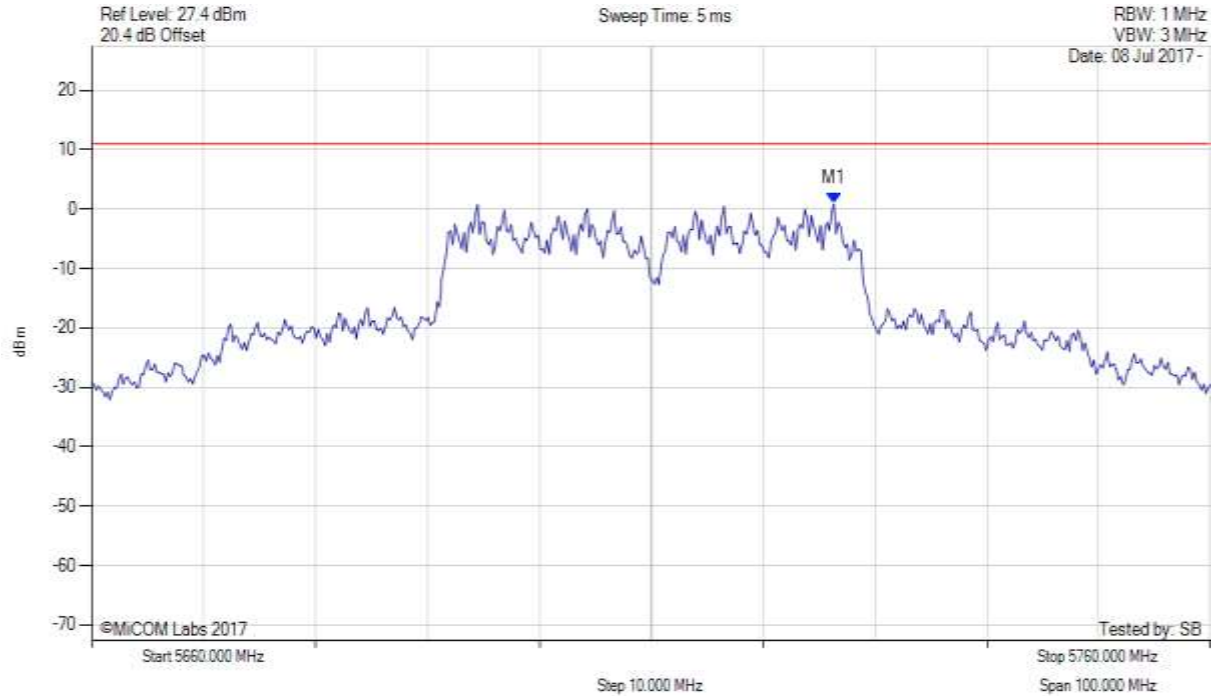


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5726.333 MHz : 0.863 dBm | Limit: $\leq 11.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5710.00 MHz, SUM, Temp: 20, Voltage: Vdc



| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                              |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5726.300 MHz : 0.863 dBm<br>M1 + DCCF : 5726.300 MHz : 1.620 dBm<br>Duty Cycle Correction Factor : +0.76 dB | Limit: $\leq 11.0$ dBm<br>Margin: -9.4 dB |

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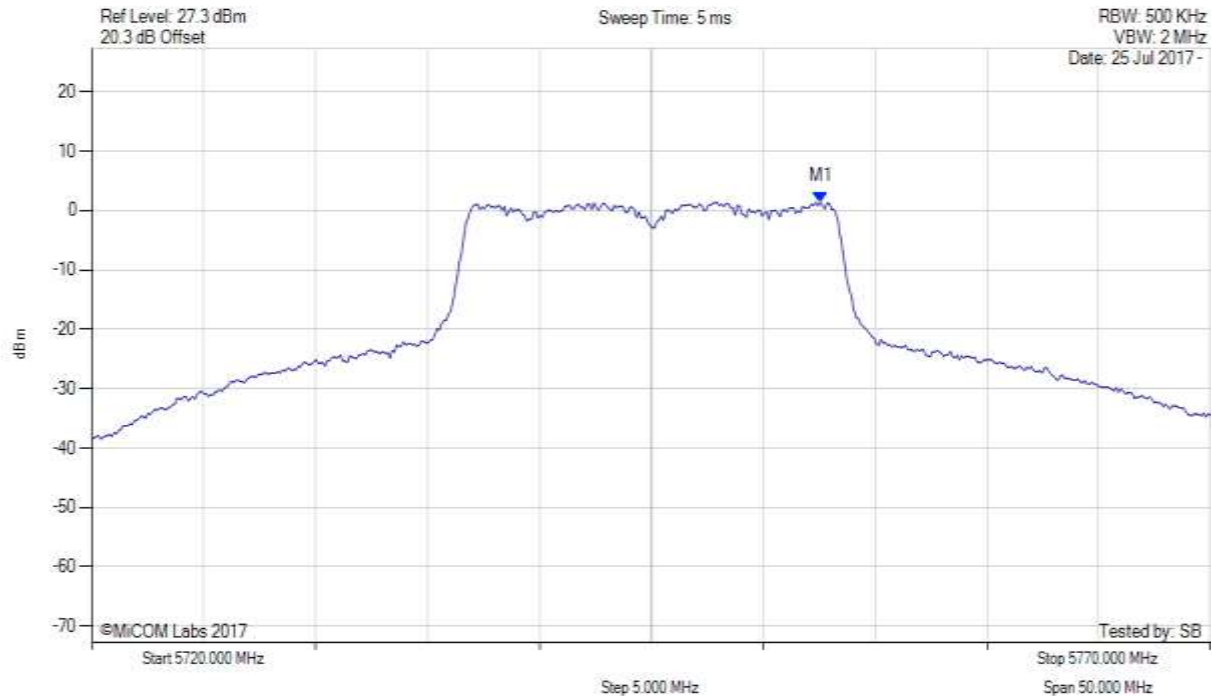


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5745.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc



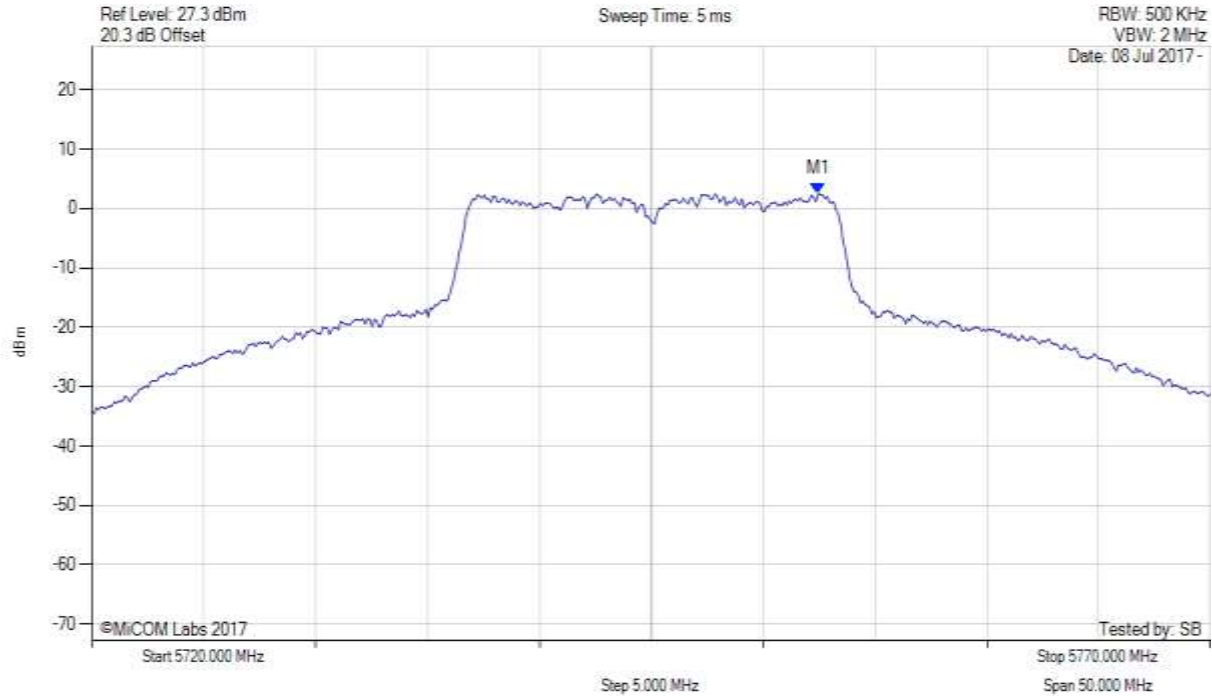
| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5752.565 MHz : 1.445 dBm | Limit: $\leq 30.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5745.00 MHz, Chain a, Temp: 20, Voltage: Vdc

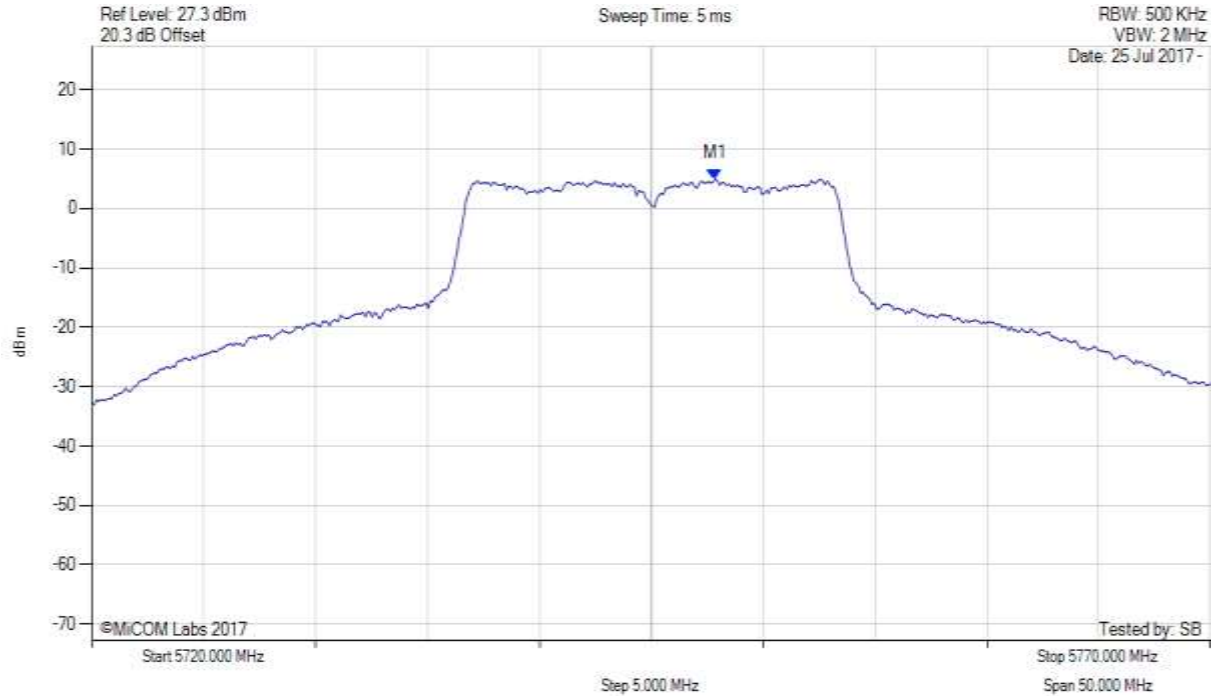


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results                   |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5752.465 MHz : 2.518 dBm | Channel Frequency: 5745.00 MHz |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5745.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

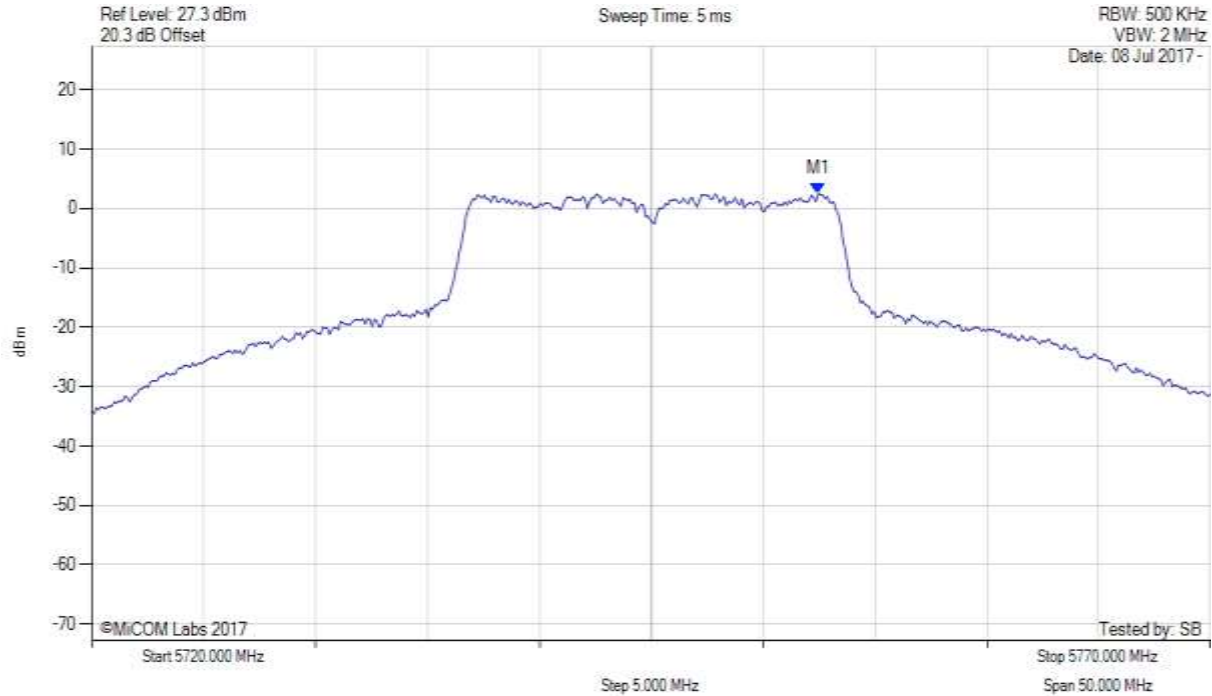


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5747.900 MHz : 4.946 dBm<br>M1 + DCCF : 5747.900 MHz : 4.990 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 30.0$ dBm<br>Margin: -25.0 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5745.00 MHz, SUM, Temp: 20, Voltage: Vdc

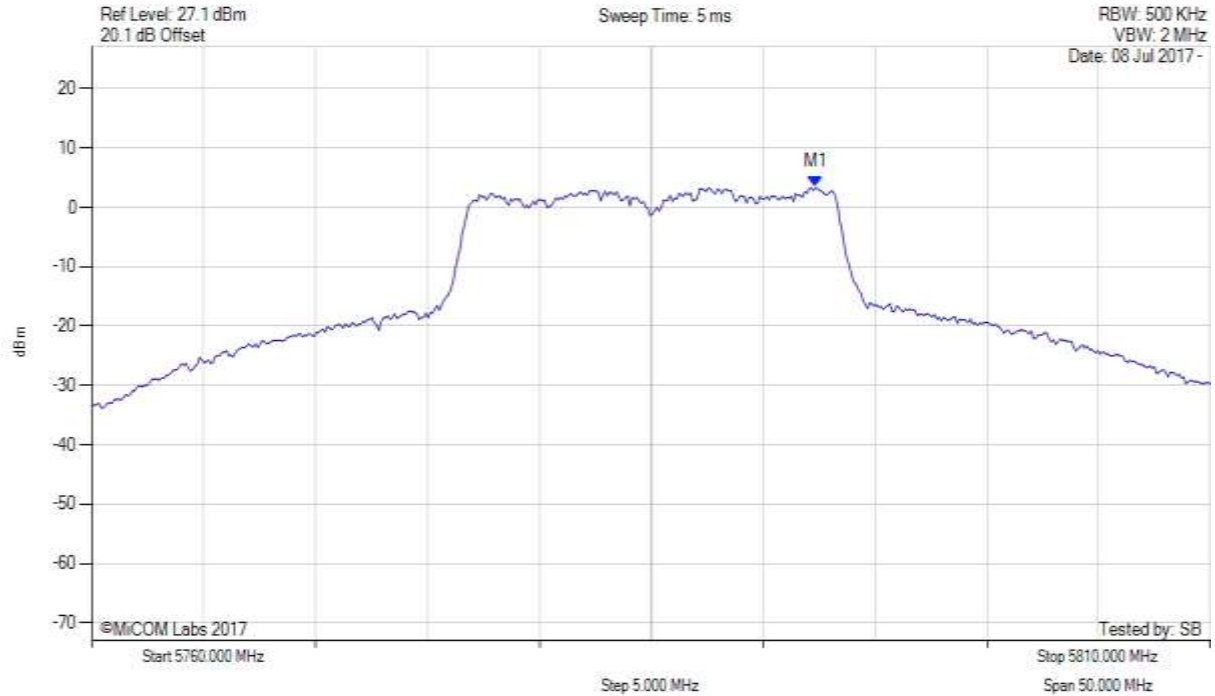


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5752.500 MHz : 2.518 dBm<br>M1 + DCCF : 5752.500 MHz : 2.562 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 30.0$ dBm<br>Margin: -27.4 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5785.00 MHz, Chain a, Temp: 20, Voltage: Vdc

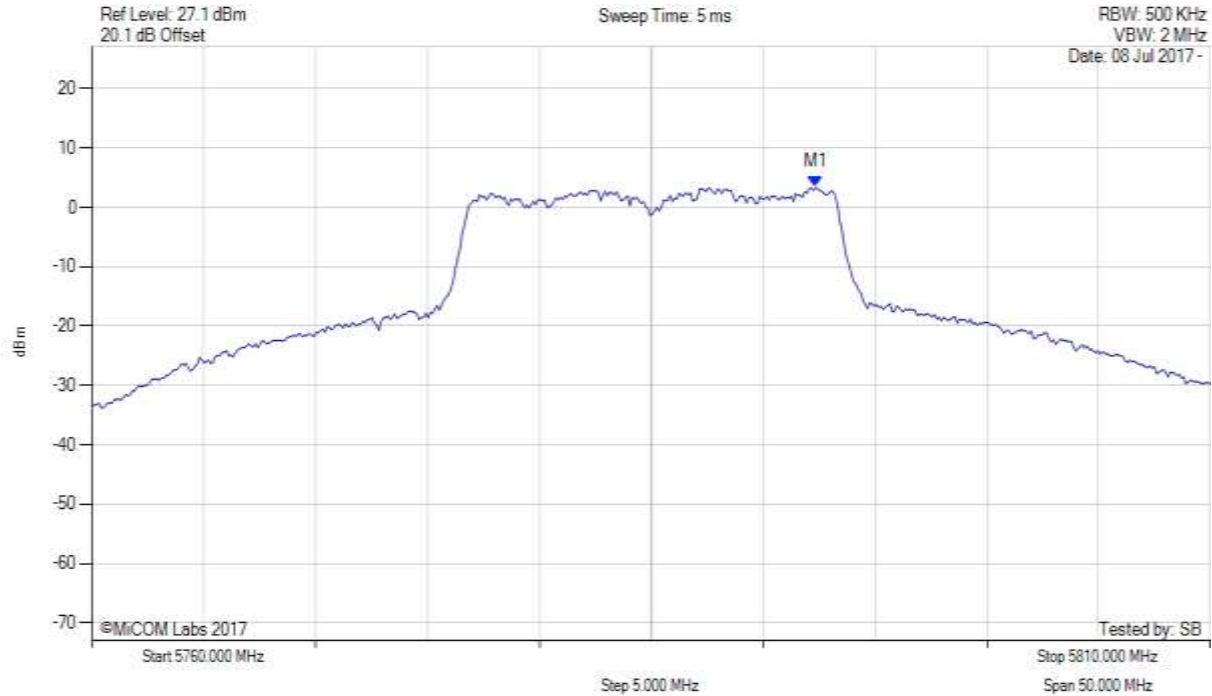


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results        |
|--------------------------------------------------------------------------------|-------------------------------|---------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5792.365 MHz : 3.397 dBm | Limit: ≤ 30.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5785.00 MHz, SUM, Temp: 20, Voltage: Vdc

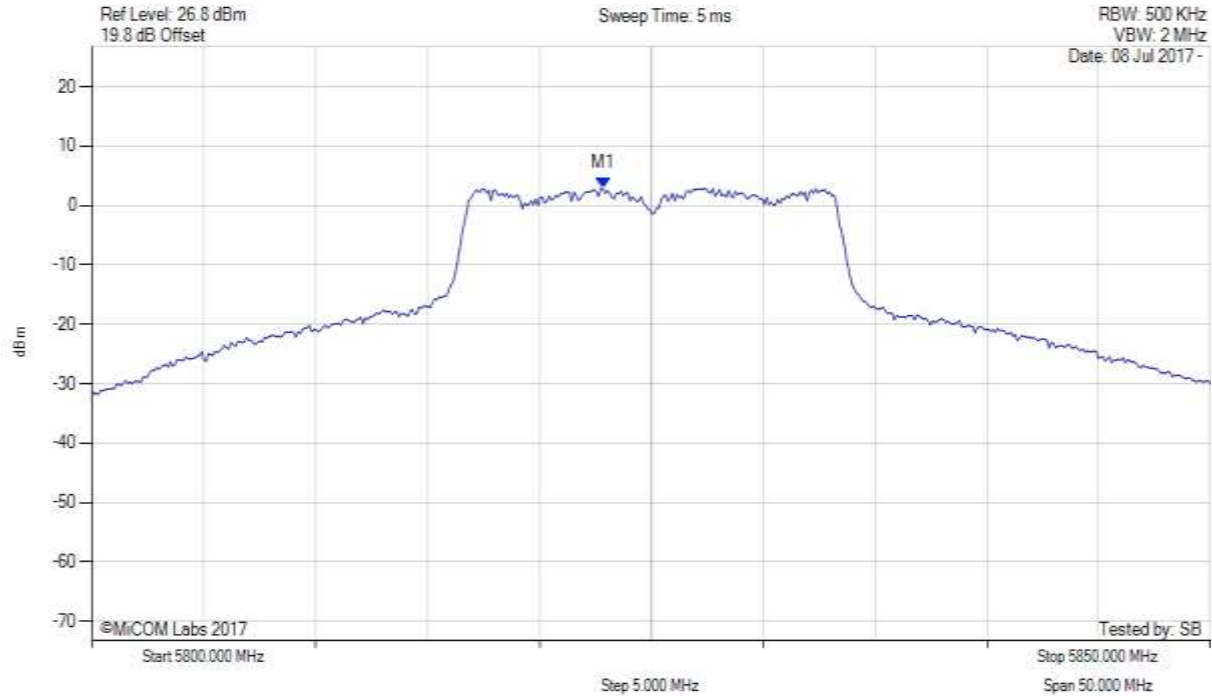


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5792.400 MHz : 3.397 dBm<br>M1 + DCCF : 5792.400 MHz : 3.441 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 30.0$ dBm<br>Margin: -26.6 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5825.00 MHz, Chain a, Temp: 20, Voltage: Vdc

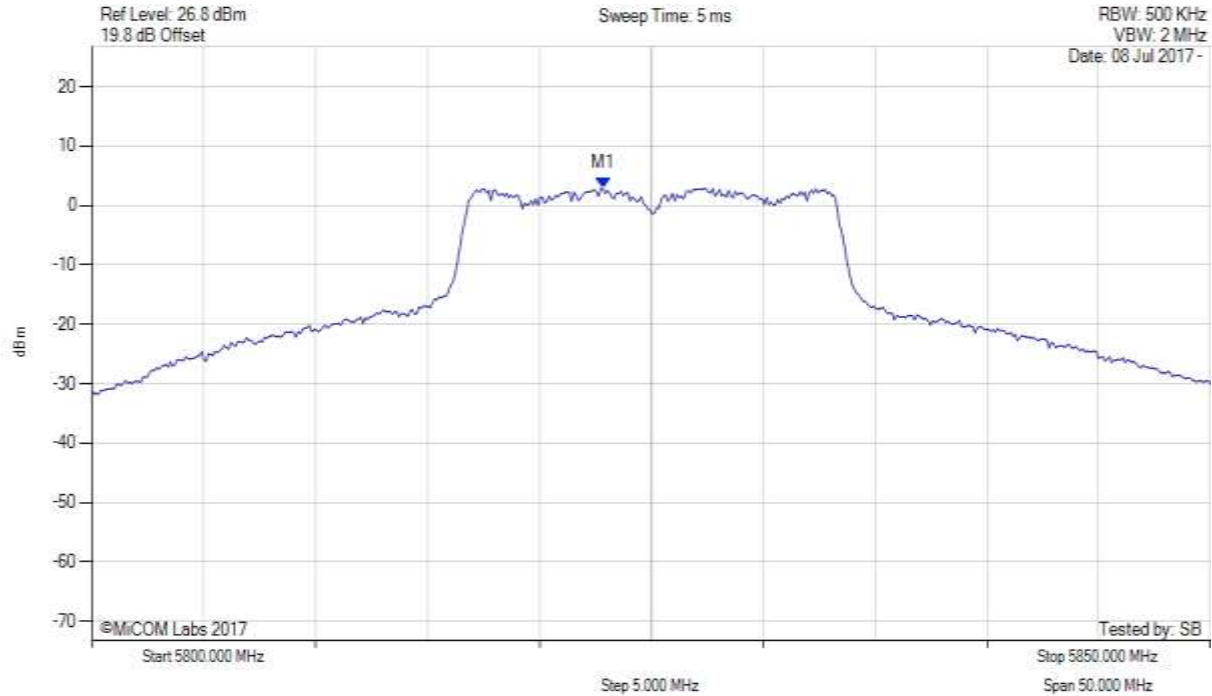


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results        |
|--------------------------------------------------------------------------------|-------------------------------|---------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5822.846 MHz : 2.888 dBm | Limit: ≤ 30.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11a, Channel: 5825.00 MHz, SUM, Temp: 20, Voltage: Vdc

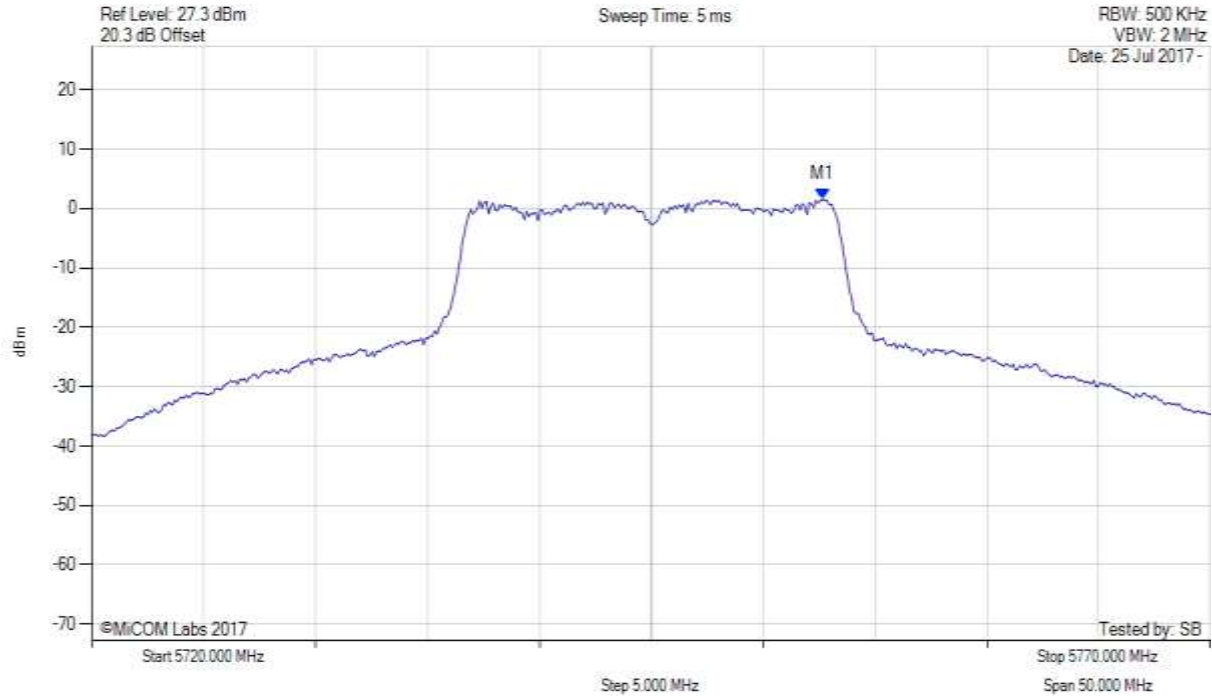


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5822.800 MHz : 2.888 dBm<br>M1 + DCCF : 5822.800 MHz : 2.932 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 30.0$ dBm<br>Margin: -27.1 dB |

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POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5745.00 MHz, Chain a, Temp: 20, Voltage: 3.3 Vdc

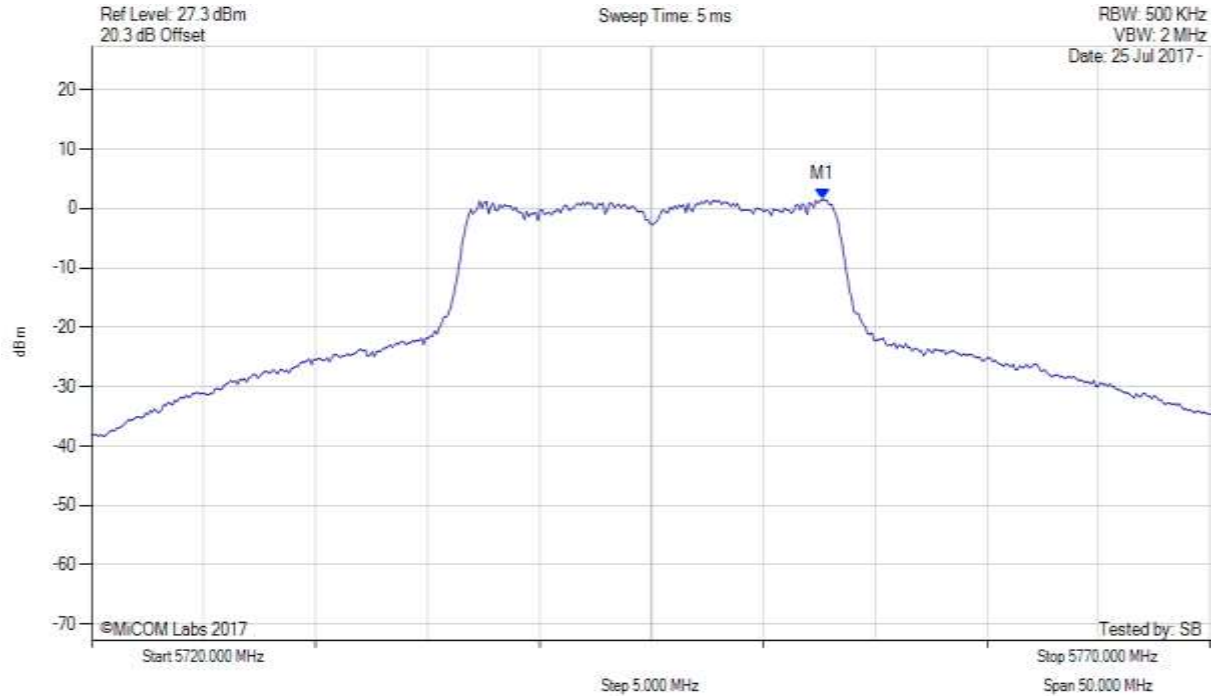


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5752.665 MHz : 1.494 dBm | Limit: $\leq 30.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5745.00 MHz, SUM, Temp: 20, Voltage: 3.3 Vdc

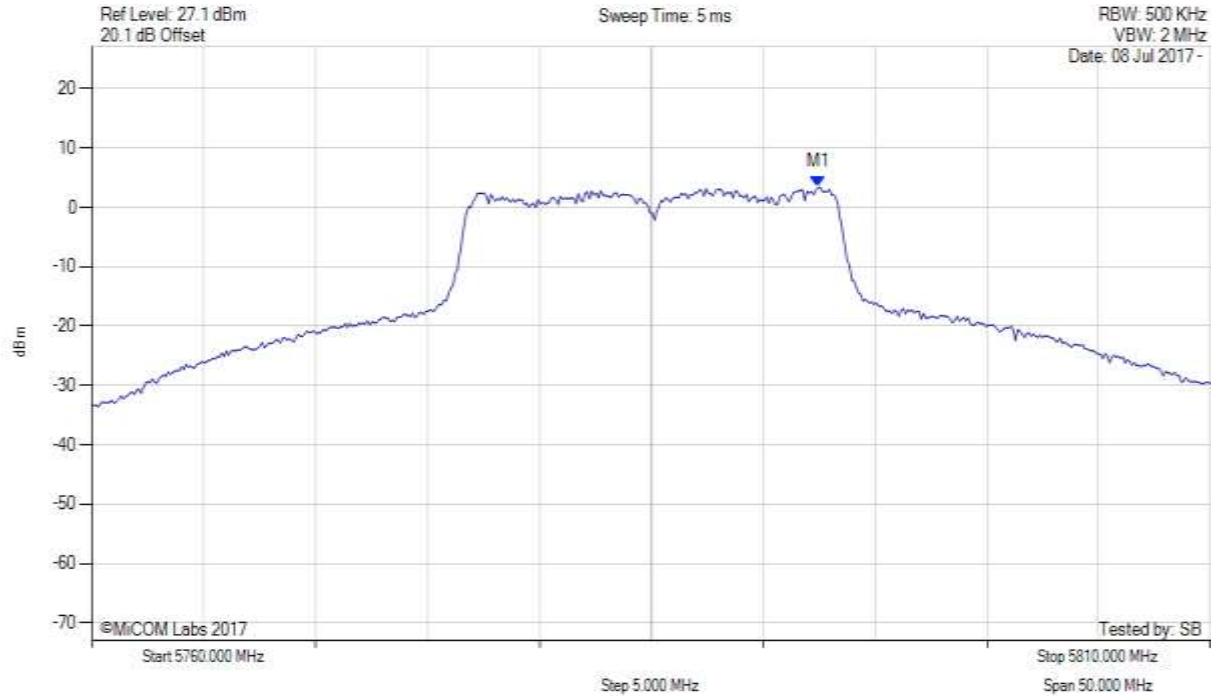


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5752.700 MHz : 1.494 dBm<br>M1 + DCCF : 5752.700 MHz : 1.538 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 30.0$ dBm<br>Margin: -28.5 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5785.00 MHz, Chain a, Temp: 20, Voltage: Vdc

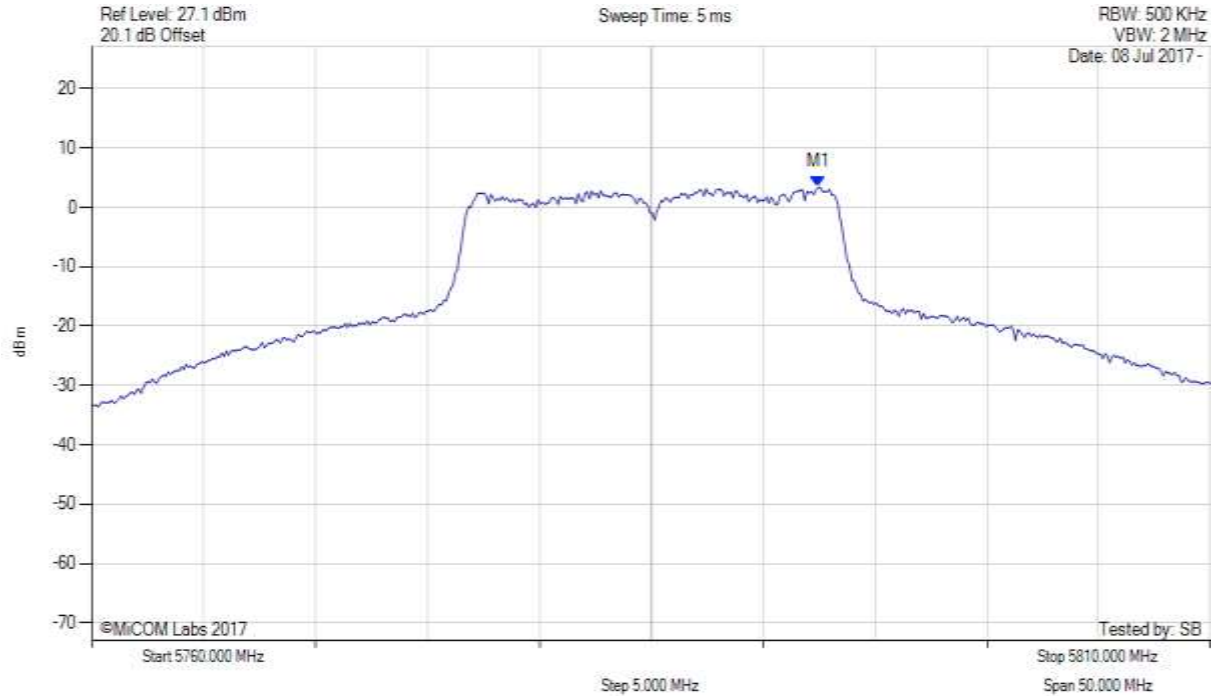


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results        |
|--------------------------------------------------------------------------------|-------------------------------|---------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5792.465 MHz : 3.369 dBm | Limit: ≤ 30.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5785.00 MHz, SUM, Temp: 20, Voltage: Vdc

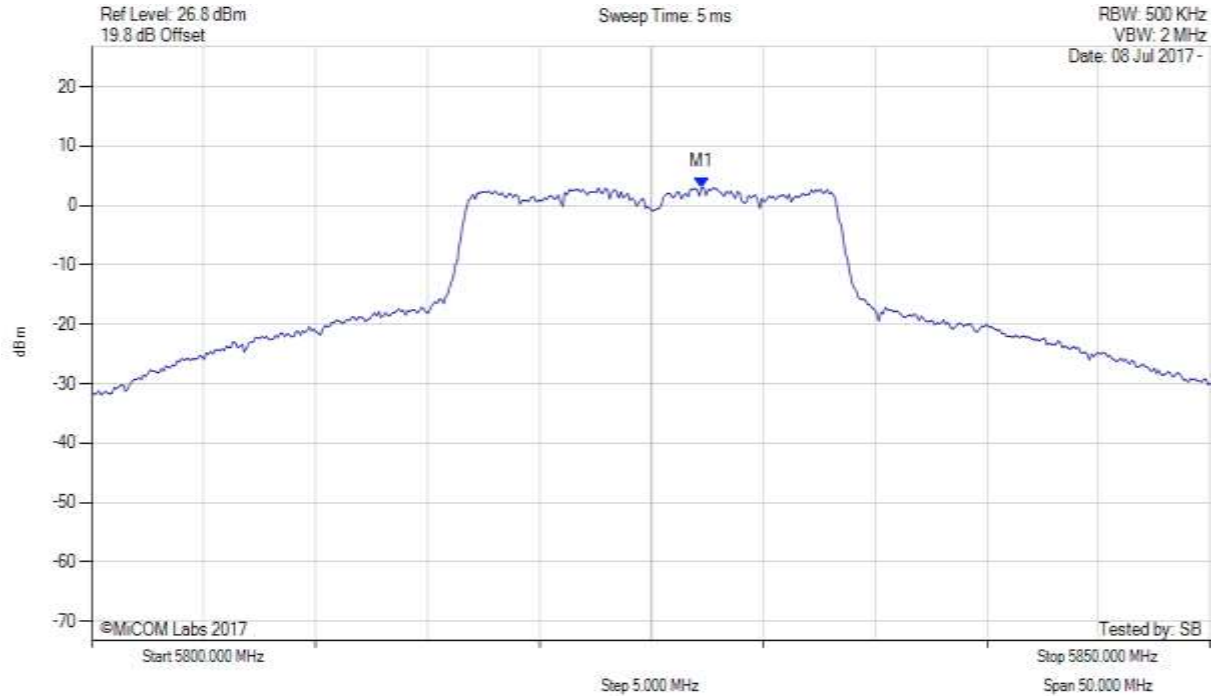


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5792.500 MHz : 3.369 dBm<br>M1 + DCCF : 5792.500 MHz : 3.413 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 30.0$ dBm<br>Margin: -26.6 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5825.00 MHz, Chain a, Temp: 20, Voltage: Vdc

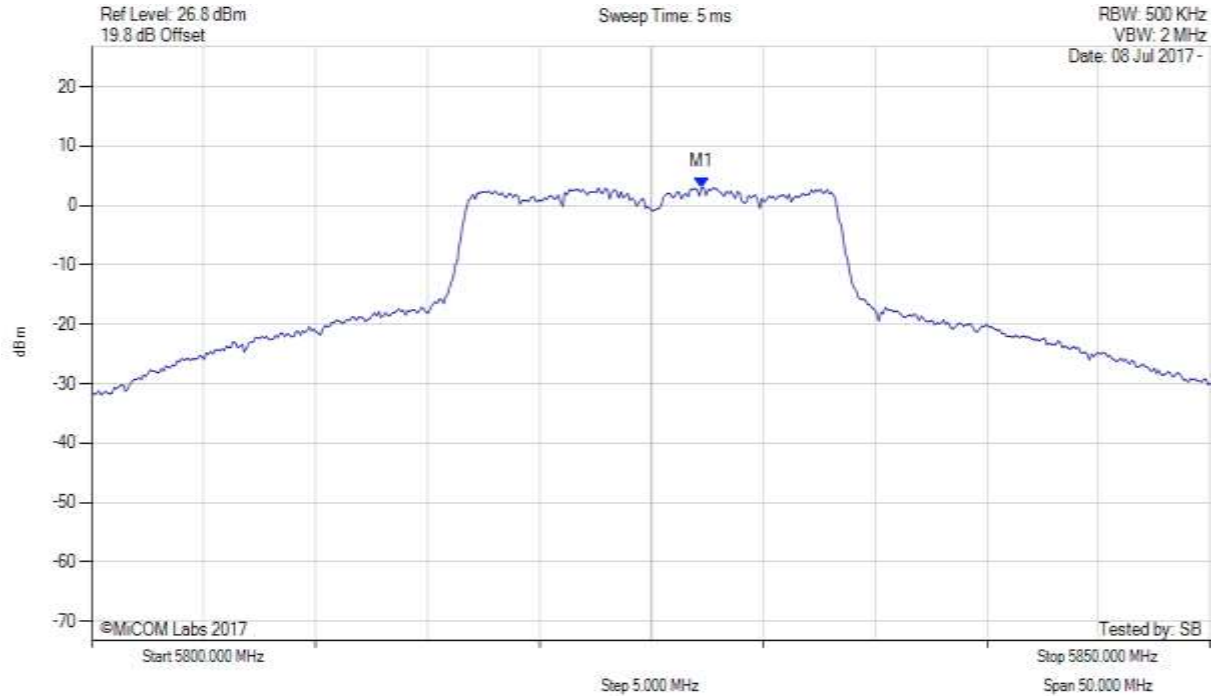


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude    | Test Results             |
|--------------------------------------------------------------------------------|-------------------------------|--------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5827.255 MHz : 3.046 dBm | Limit: $\leq 30.000$ dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-20, Channel: 5825.00 MHz, SUM, Temp: 20, Voltage: Vdc

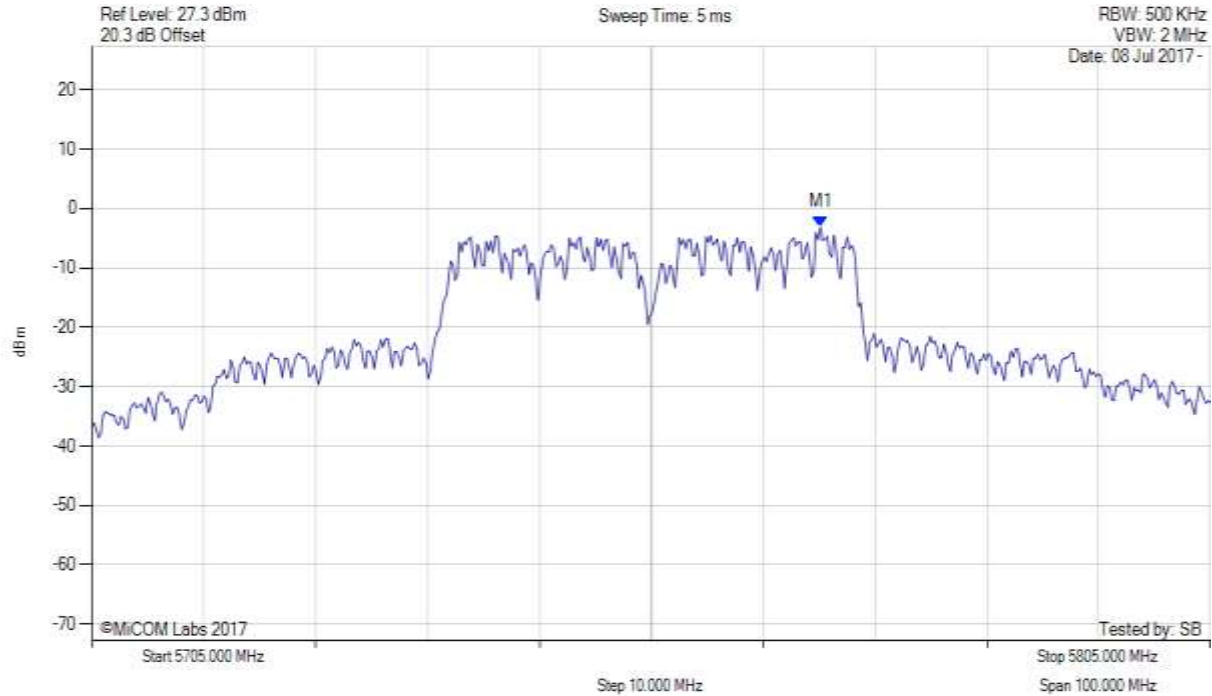


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                       | Test Results                               |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5827.300 MHz : 3.046 dBm<br>M1 + DCCF : 5827.300 MHz : 3.090 dBm<br>Duty Cycle Correction Factor : +0.04 dB | Limit: $\leq 30.0$ dBm<br>Margin: -26.9 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5755.00 MHz, Chain a, Temp: 20, Voltage: Vdc

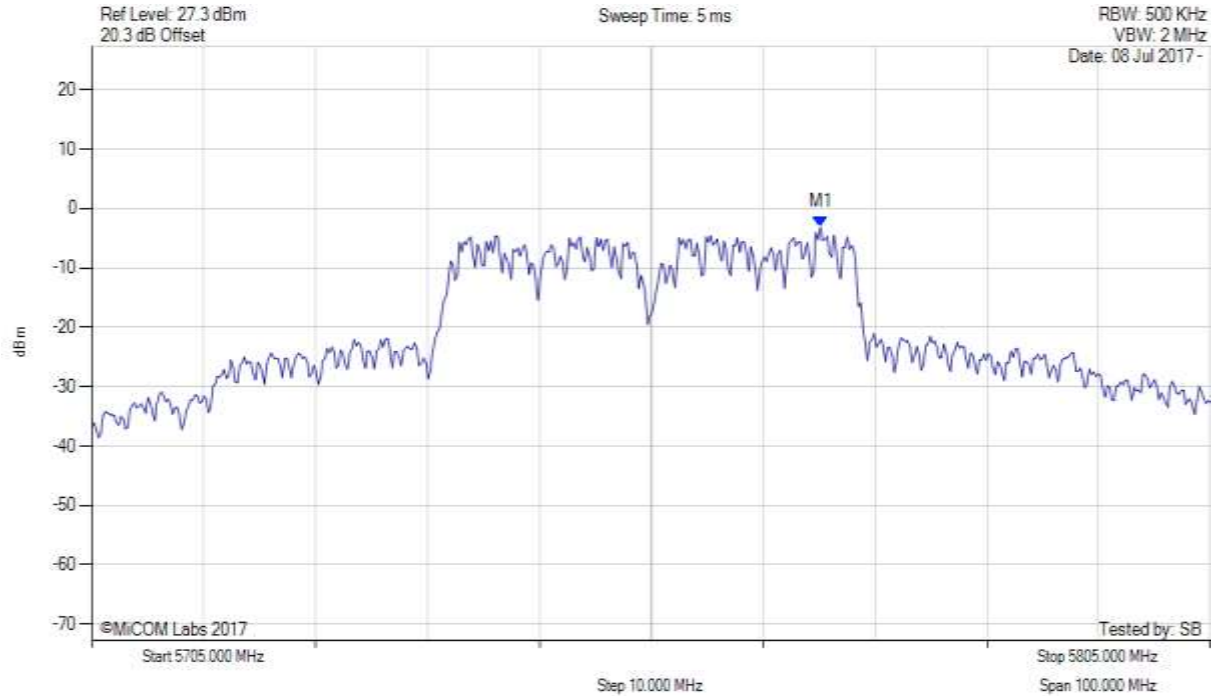


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude     | Test Results        |
|--------------------------------------------------------------------------------|--------------------------------|---------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5770.130 MHz : -3.169 dBm | Limit: ≤ 30.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5755.00 MHz, SUM, Temp: 20, Voltage: Vdc

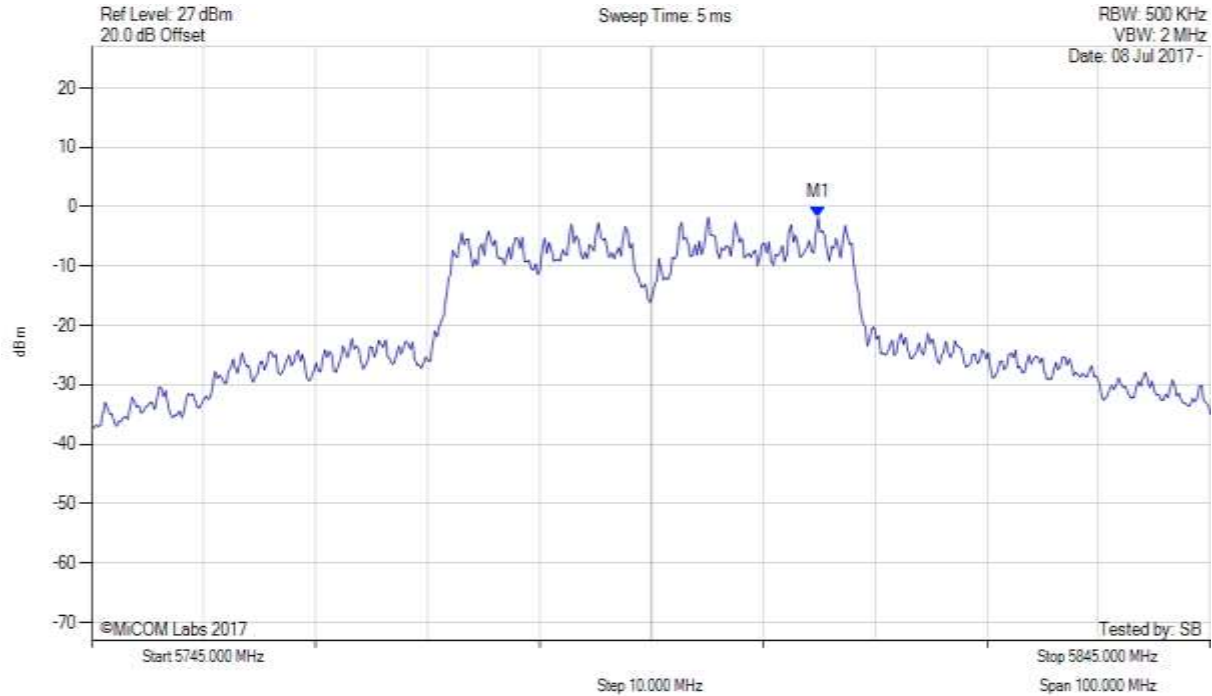


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                         | Test Results                               |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5770.100 MHz : -3.169 dBm<br>M1 + DCCF : 5770.100 MHz : -2.412 dBm<br>Duty Cycle Correction Factor : +0.76 dB | Limit: $\leq 30.0$ dBm<br>Margin: -32.4 dB |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5795.00 MHz, Chain a, Temp: 20, Voltage: Vdc

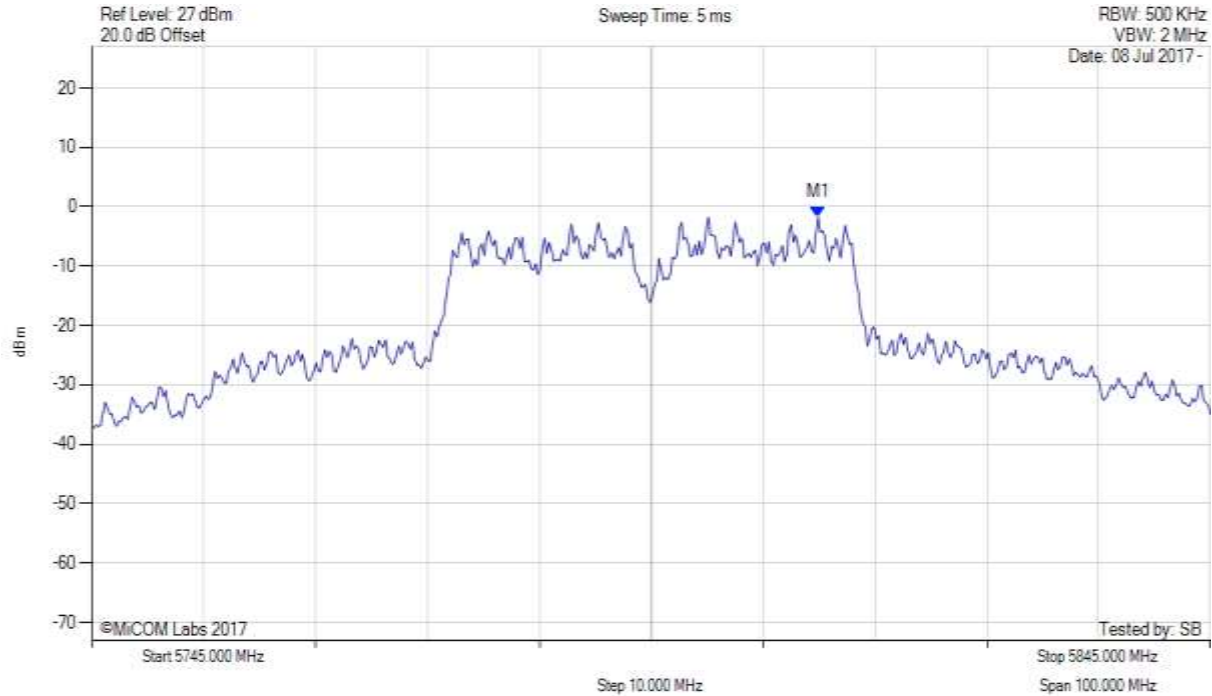


| Analyzer Setup                                                                 | Marker:Frequency:Amplitude     | Test Results        |
|--------------------------------------------------------------------------------|--------------------------------|---------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5809.930 MHz : -1.760 dBm | Limit: ≤ 30.000 dBm |

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# POWER SPECTRAL DENSITY

Variant: 802.11n HT-40, Channel: 5795.00 MHz, SUM, Temp: 20, Voltage: Vdc



| Analyzer Setup                                                                 | Marker:Frequency:Amplitude                                                                                         | Test Results                               |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Detector = RMS<br>Sweep Count = 100<br>RF Atten (dB) = 20<br>Trace Mode = VIEW | M1 : 5809.900 MHz : -1.760 dBm<br>M1 + DCCF : 5809.900 MHz : -1.003 dBm<br>Duty Cycle Correction Factor : +0.76 dB | Limit: $\leq 30.0$ dBm<br>Margin: -31.0 dB |

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## A.4. Radiated

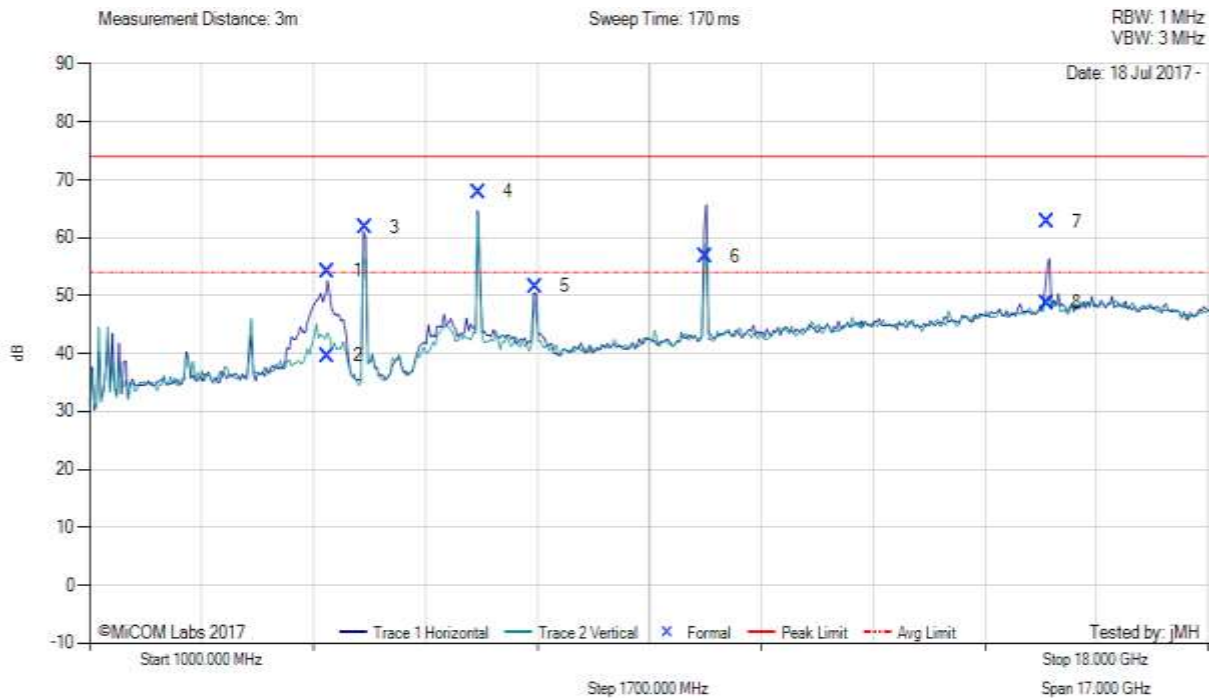
### A.4.1. TX Spurious & Restricted Band Emissions

#### A.4.1.1. Integral



#### TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5180.00 MHz, Antenna: Integral, Power Setting: 17, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |        |               |        |          |                  |            |        |         |          |           |            |
|------------------------|---------------|--------|---------------|--------|----------|------------------|------------|--------|---------|----------|-----------|------------|
| Num                    | Frequency MHz | Raw dB | Cable Loss dB | AF dB  | Level dB | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dB | Margin dB | Pass /Fail |
| 1                      | 4616.68       | 62.01  | 3.53          | -11.34 | 54.20    | Max Peak         | Horizontal | 98     | 5       | 74.0     | -19.8     | Pass       |
| 2                      | 4616.68       | 47.39  | 3.53          | -11.34 | 39.58    | Max Avg          | Horizontal | 98     | 5       | 54.0     | -14.4     | Pass       |
| 3                      | 5176.98       | 69.53  | 3.69          | -11.51 | 61.71    | Fundamental      | Horizontal | 100    | 0       | --       | --        |            |
| 4                      | 6906.74       | 71.30  | 4.11          | -7.54  | 67.87    | Peak (NRB)       | Horizontal | 100    | 0       | --       | --        | Pass       |
| 5                      | 7770.36       | 53.88  | 4.42          | -6.71  | 51.59    | Peak (NRB)       | Horizontal | 100    | 0       | --       | --        | Pass       |
| 6                      | 10360.64      | 56.37  | 5.57          | -5.26  | 56.68    | Peak (NRB)       | Vertical   | 100    | 0       | --       | --        | Pass       |
| 7                      | 15544.55      | 57.28  | 5.97          | -0.55  | 62.70    | Max Peak         | Horizontal | 197    | 335     | 74.0     | -11.3     | Pass       |
| 8                      | 15544.55      | 43.30  | 5.97          | -0.55  | 48.72    | Max Avg          | Horizontal | 197    | 335     | 54.0     | -5.3      | Pass       |

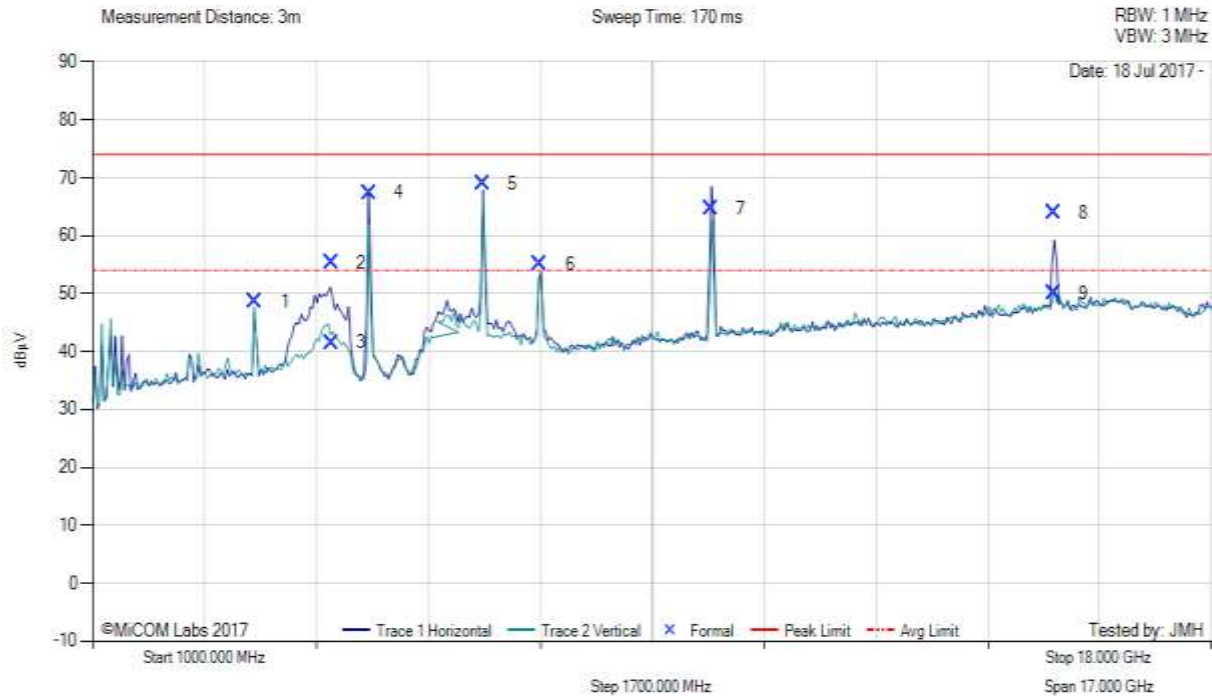
**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5200.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



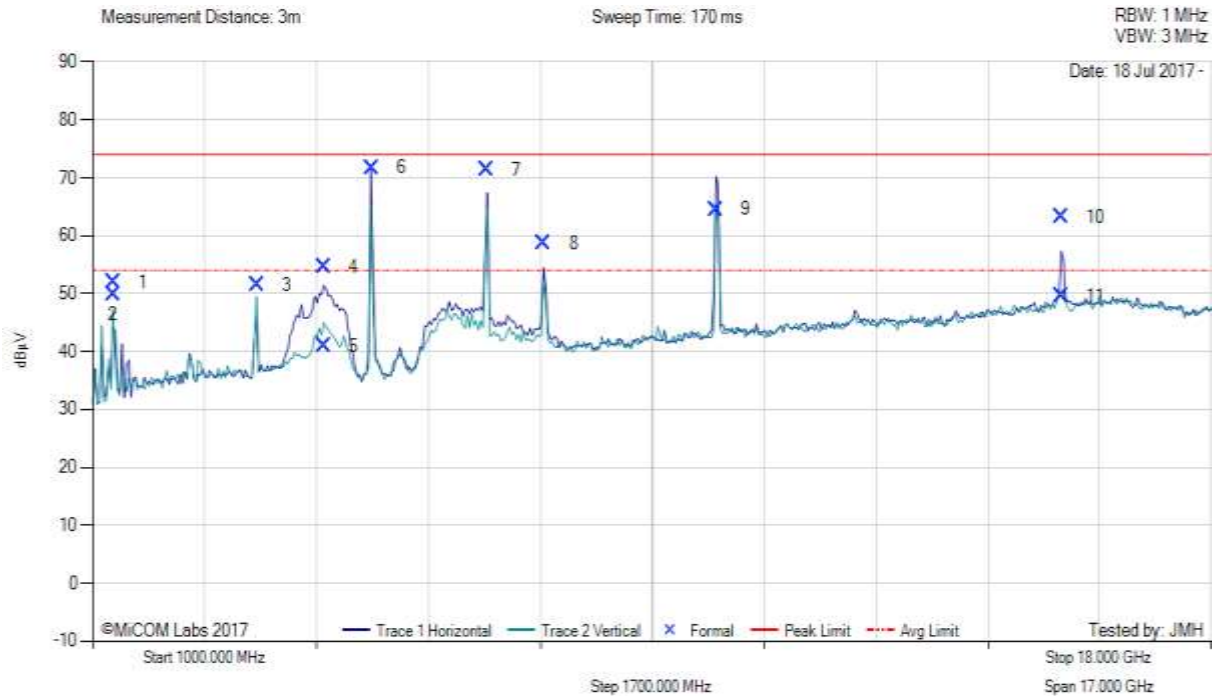
| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 3466.74       | 56.72    | 3.11          | -11.25 | 48.58        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| 2                      | 4621.31       | 63.07    | 3.55          | -11.34 | 55.28        | Max Peak         | Horizontal | 131    | 349     | 74.0         | -18.7     | Pass       |
| 3                      | 4621.31       | 49.31    | 3.55          | -11.34 | 41.52        | Max Avg          | Horizontal | 131    | 349     | 54.0         | -12.5     | Pass       |
| 4                      | 5204.76       | 75.23    | 3.65          | -11.45 | 67.43        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 5                      | 6927.81       | 71.28    | 4.11          | -7.35  | 69.04        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 6                      | 7798.81       | 57.28    | 4.46          | -6.71  | 55.03        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 7                      | 10400.22      | 64.30    | 5.41          | -5.03  | 64.68        | Peak (NRB)       | Horizontal | 100    | 27      | --           | --        | Pass       |
| 8                      | 15607.50      | 58.09    | 6.01          | -0.20  | 63.90        | Max Peak         | Horizontal | 190    | 342     | 74.0         | -10.1     | Pass       |
| 9                      | 15607.50      | 44.22    | 6.01          | -0.20  | 50.03        | Max Avg          | Horizontal | 190    | 342     | 54.0         | -4.0      | Pass       |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5240.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



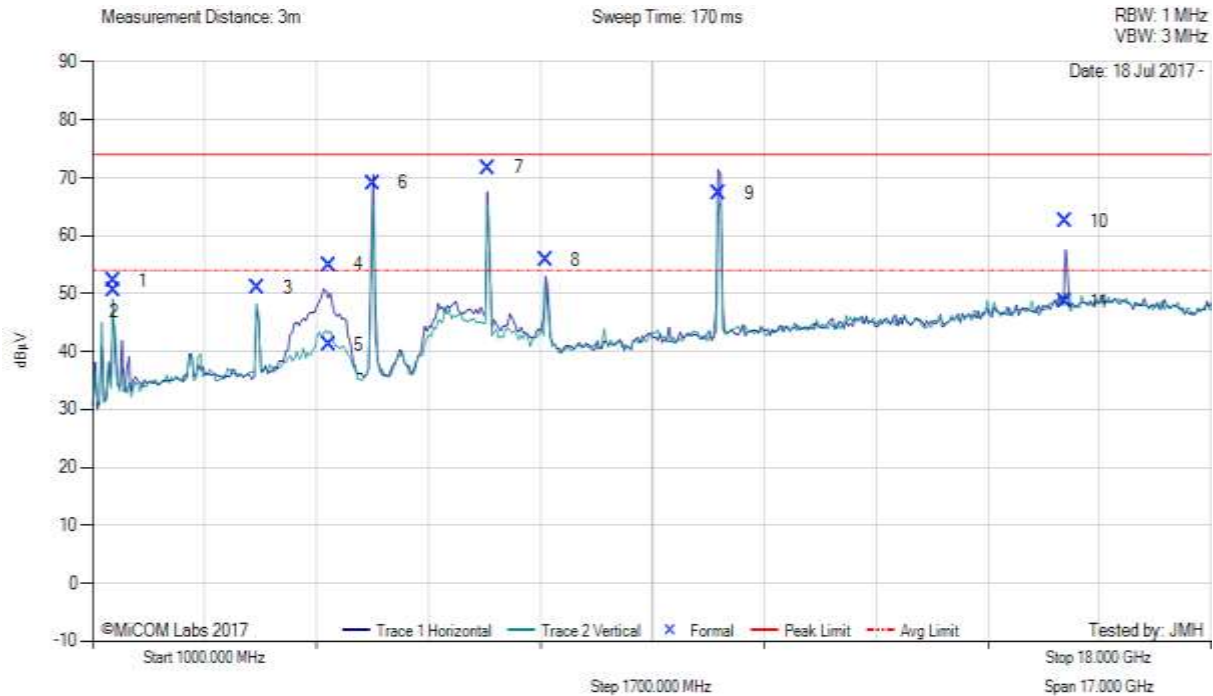
| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1309.98       | 64.61    | 2.21          | -14.83 | 51.99        | Max Peak         | Vertical   | 98     | 111     | 74.0         | -22.0     | Pass       |
| 2                      | 1309.98       | 62.58    | 2.21          | -14.83 | 49.96        | Max Avg          | Vertical   | 98     | 111     | 54.0         | -4.0      | Pass       |
| 3                      | 3493.31       | 59.60    | 3.11          | -11.26 | 51.45        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| 4                      | 4511.17       | 62.64    | 3.53          | -11.56 | 54.61        | Max Peak         | Horizontal | 120    | 356     | 74.0         | -19.4     | Pass       |
| 5                      | 4511.17       | 48.92    | 3.53          | -11.56 | 40.89        | Max Avg          | Horizontal | 120    | 356     | 54.0         | -13.1     | Pass       |
| 6                      | 5236.96       | 79.51    | 3.63          | -11.37 | 71.77        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 7                      | 6986.68       | 74.69    | 4.13          | -7.45  | 71.37        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 8                      | 7856.68       | 61.01    | 4.48          | -6.75  | 58.74        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 9                      | 10476.73      | 63.56    | 5.44          | -4.48  | 64.52        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 10                     | 15717.00      | 56.99    | 6.05          | 0.18   | 63.22        | Max Peak         | Horizontal | 197    | 342     | 74.0         | -10.8     | Pass       |
| 11                     | 15717.00      | 43.38    | 6.05          | 0.18   | 49.61        | Max Avg          | Horizontal | 197    | 342     | 54.0         | -4.4      | Pass       |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5260.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1314.86       | 64.89    | 2.22          | -14.88 | 52.23        | Max Peak         | Vertical   | 98     | 108     | 74.0         | -21.8     | Pass       |
| 2                      | 1314.86       | 63.11    | 2.22          | -14.88 | 50.45        | Max Avg          | Vertical   | 98     | 108     | 54.0         | -3.6      | Pass       |
| 3                      | 3506.75       | 59.11    | 3.11          | -11.25 | 50.97        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| 4                      | 4590.11       | 62.78    | 3.55          | -11.39 | 54.94        | Max Peak         | Horizontal | 129    | 347     | 74.0         | -19.1     | Pass       |
| 5                      | 4590.11       | 49.00    | 3.55          | -11.39 | 41.16        | Max Avg          | Horizontal | 129    | 347     | 54.0         | -12.8     | Pass       |
| 6                      | 5261.22       | 76.72    | 3.66          | -11.29 | 69.09        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 7                      | 7013.35       | 74.98    | 4.18          | -7.42  | 71.74        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 8                      | 7886.89       | 58.12    | 4.54          | -6.79  | 55.87        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| 9                      | 10518.18      | 65.99    | 5.44          | -4.21  | 67.22        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 10                     | 15772.73      | 56.46    | 5.97          | 0.11   | 62.54        | Max Peak         | Horizontal | 197    | 342     | 74.0         | -11.5     | Pass       |
| 11                     | 15772.73      | 42.47    | 5.97          | 0.11   | 48.55        | Max Avg          | Horizontal | 197    | 342     | 54.0         | -5.5      | Pass       |

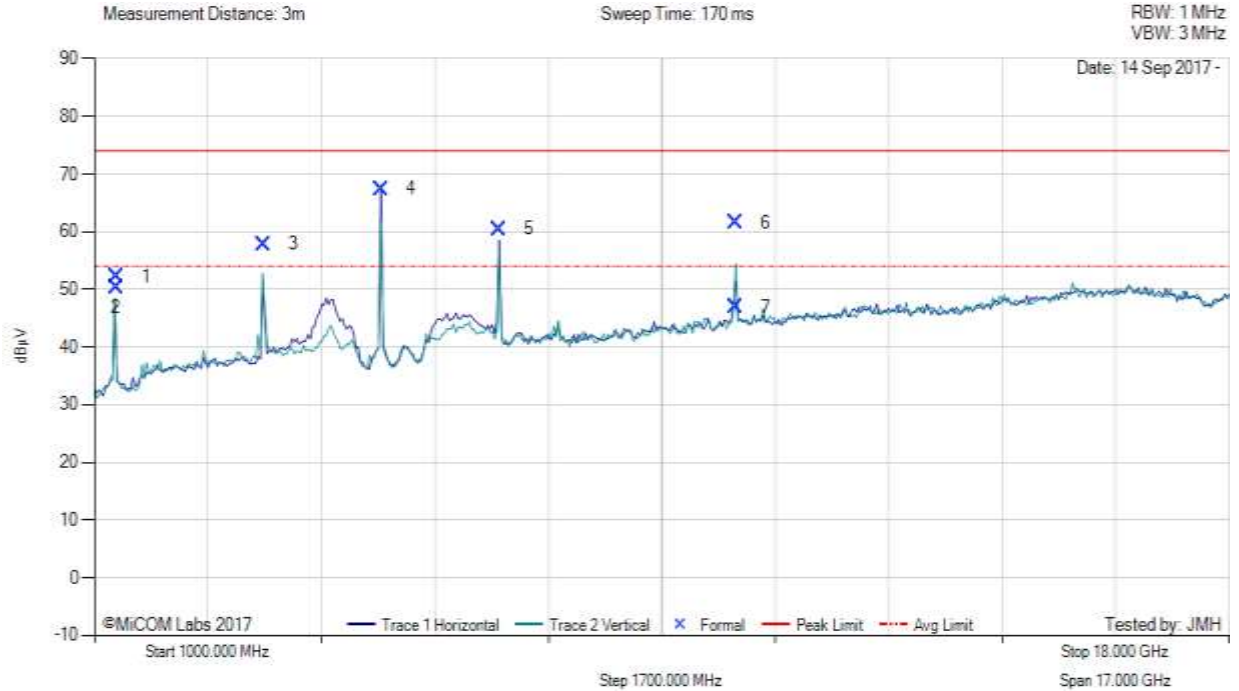
**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5300.00 MHz, Antenna: Integral, Power Setting: 16, Duty Cycle (%): 99



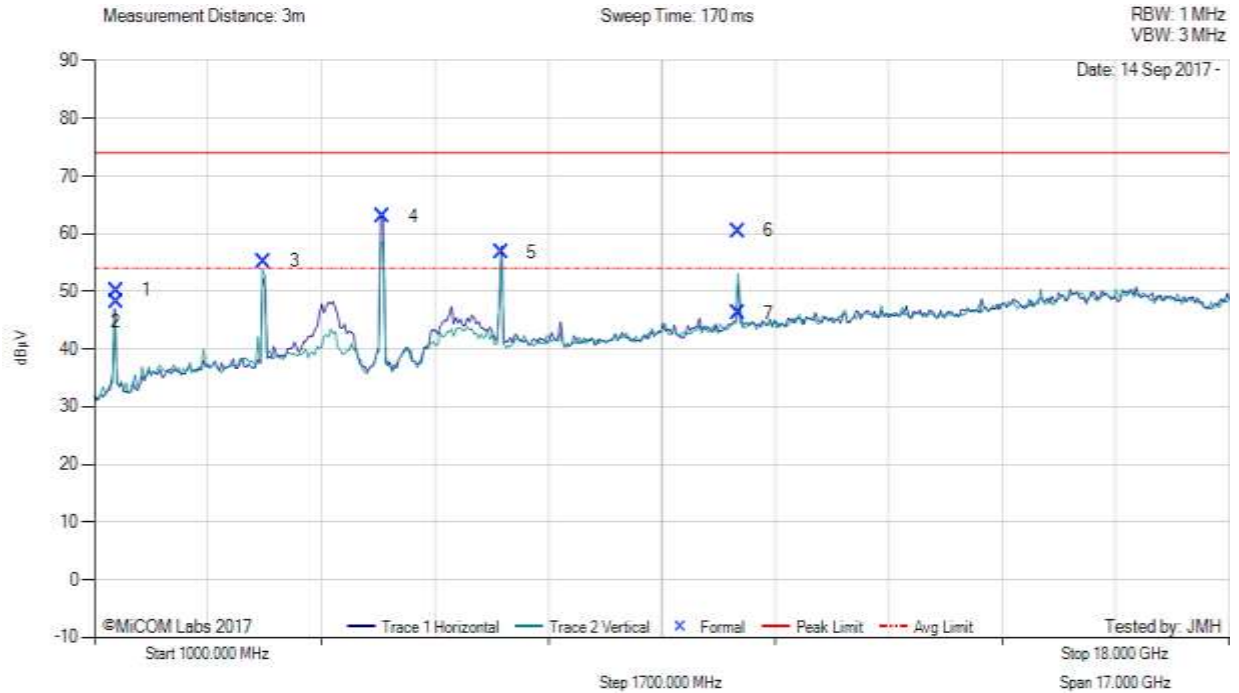
| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1324.97       | 64.99    | 2.24          | -14.97 | 52.26        | Max Peak         | Vertical   | 111    | 71      | 74.0         | -21.7     | Pass       |
| 2                      | 1324.97       | 63.14    | 2.24          | -14.97 | 50.41        | Max Avg          | Vertical   | 111    | 71      | 54.0         | -3.6      | Pass       |
| 3                      | 3533.60       | 65.95    | 3.13          | -11.25 | 57.83        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| 4                      | 5297.93       | 74.69    | 3.81          | -11.10 | 67.40        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 5                      | 7066.57       | 63.63    | 4.18          | -7.34  | 60.47        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 6                      | 10600.44      | 59.86    | 5.58          | -3.93  | 61.51        | Max Peak         | Vertical   | 101    | 340     | 74.0         | -12.5     | Pass       |
| 7                      | 10600.44      | 45.35    | 5.58          | -3.93  | 47.00        | Max Avg          | Vertical   | 101    | 340     | 54.0         | -7.0      | Pass       |

**Test Notes:** EUT connected to laptop inside chamber and powered by 5V. Short shielded interface cable.

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

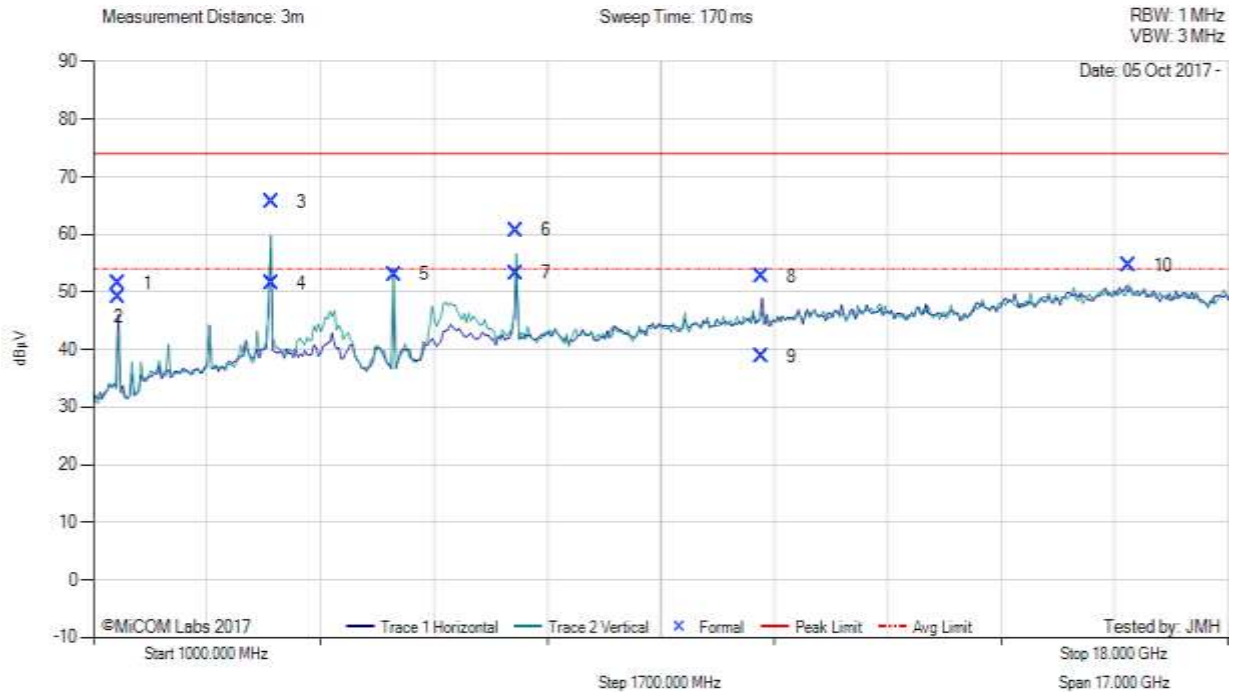
Variant: 802.11a, Test Freq: 5320.00 MHz, Antenna: Integral, Power Setting: 16, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1330.03       | 62.94    | 2.24          | -15.02 | 50.16        | Max Peak         | Horizontal | 134    | 238     | 74.0         | -23.8     | Pass       |
| 2                      | 1330.03       | 61.05    | 2.24          | -15.02 | 48.27        | Max Avg          | Horizontal | 134    | 238     | 54.0         | -5.7      | Pass       |
| 3                      | 3546.87       | 63.30    | 3.14          | -11.24 | 55.20        | Peak (NRB)       | Vertical   | 100    | 31      | --           | --        | Pass       |
| 4                      | 5327.26       | 70.25    | 3.71          | -11.05 | 62.91        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 5                      | 7093.29       | 59.85    | 4.24          | -7.34  | 56.75        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 6                      | 10640.29      | 58.96    | 5.39          | -3.89  | 60.46        | Max Peak         | Vertical   | 110    | 338     | 74.0         | -13.5     | Pass       |
| 7                      | 10640.29      | 44.78    | 5.39          | -3.89  | 46.28        | Max Avg          | Vertical   | 110    | 338     | 54.0         | -7.7      | Pass       |

**Test Notes:** EUT connected to laptop inside chamber and powered by 5V. Short shielded interface cable. In 1 channel to try higher power

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| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1375.04       | 67.48    | 2.26          | -18.20 | 51.54        | Max Peak         | Horizontal | 143    | 233     | 74.0         | -22.5     | Pass       |
| 2                      | 1375.04       | 65.10    | 2.26          | -18.20 | 49.16        | Max Avg          | Horizontal | 143    | 233     | 54.0         | -4.8      | Pass       |
| 3                      | 3667.06       | 73.35    | 3.17          | -10.83 | 65.69        | Max Peak         | Vertical   | 190    | 61      | 74.0         | -8.3      | Pass       |
| 4                      | 3667.06       | 59.07    | 3.17          | -10.83 | 51.41        | Max Avg          | Vertical   | 190    | 61      | 54.0         | -2.6      | Pass       |
| 5                      | 5506.95       | 58.68    | 3.75          | -9.42  | 53.01        | Fundamental      | Vertical   | 151    | 0       | --           | --        |            |
| 6                      | 7333.32       | 61.66    | 4.28          | -5.21  | 60.73        | Max Peak         | Vertical   | 164    | 72      | 74.0         | -13.3     | Pass       |
| 7                      | 7333.32       | 54.18    | 4.28          | -5.21  | 53.25        | Max Avg          | Vertical   | 164    | 72      | 54.0         | -0.8      | Pass       |
| 8                      | 11000.95      | 48.11    | 5.59          | -1.06  | 52.64        | Max Peak         | Horizontal | 128    | 355     | 74.0         | -21.4     | Pass       |
| 9                      | 11000.95      | 34.23    | 5.59          | -1.06  | 38.76        | Max Avg          | Horizontal | 128    | 355     | 54.0         | -15.2     | Pass       |
| 10                     | 16499.71      | 47.62    | 6.02          | 0.99   | 54.63        | Peak (NRB)       | Vertical   | 151    | 44      | --           | --        | Pass       |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Host PCB shielded with silver tape. Transmitter module connected to host PCB with shielded ribbon cable instead of directly to board

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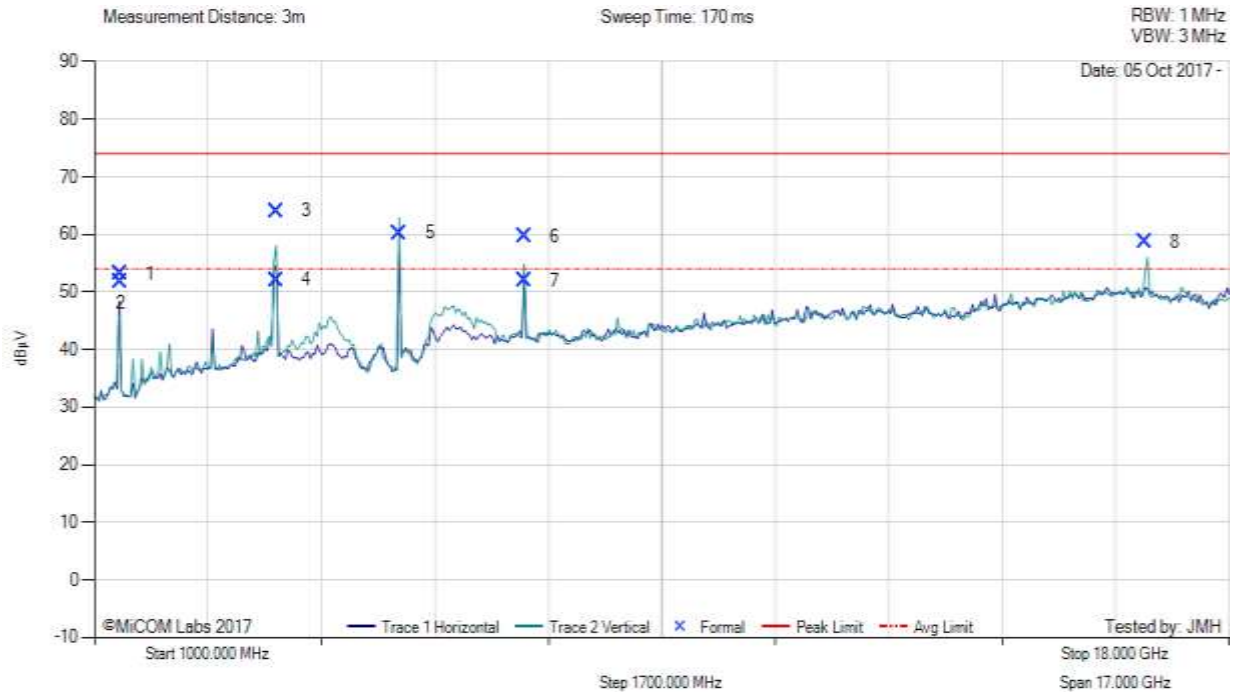
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**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
**Page:** 249 of 298



Variant: 802.11a, Test Freq: 5580.00 MHz, Power Setting: 15, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1394.99       | 69.06    | 2.25          | -18.09 | 53.22        | Max Peak         | Horizontal | 139    | 239     | 74.0         | -20.8     | Pass       |
| 2                      | 1394.99       | 67.56    | 2.25          | -18.09 | 51.72        | Max Avg          | Horizontal | 139    | 239     | 54.0         | -2.3      | Pass       |
| 3                      | 3720.26       | 71.56    | 3.21          | -10.67 | 64.10        | Max Peak         | Vertical   | 138    | 76      | 74.0         | -9.9      | Pass       |
| 4                      | 3720.26       | 59.52    | 3.21          | -10.67 | 52.06        | Max Avg          | Vertical   | 138    | 76      | 54.0         | -1.9      | Pass       |
| 5                      | 5577.09       | 65.62    | 3.81          | -9.24  | 60.19        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| 6                      | 7439.98       | 60.33    | 4.30          | -4.97  | 59.66        | Max Peak         | Vertical   | 103    | 200     | 74.0         | -14.3     | Pass       |
| 7                      | 7439.98       | 52.67    | 4.30          | -4.97  | 52.00        | Max Avg          | Vertical   | 103    | 200     | 54.0         | -2.0      | Pass       |
| 8                      | 16739.07      | 51.58    | 6.08          | 1.07   | 58.73        | Peak (NRB)       | Vertical   | 150    | 177     | --           | --        | Pass       |

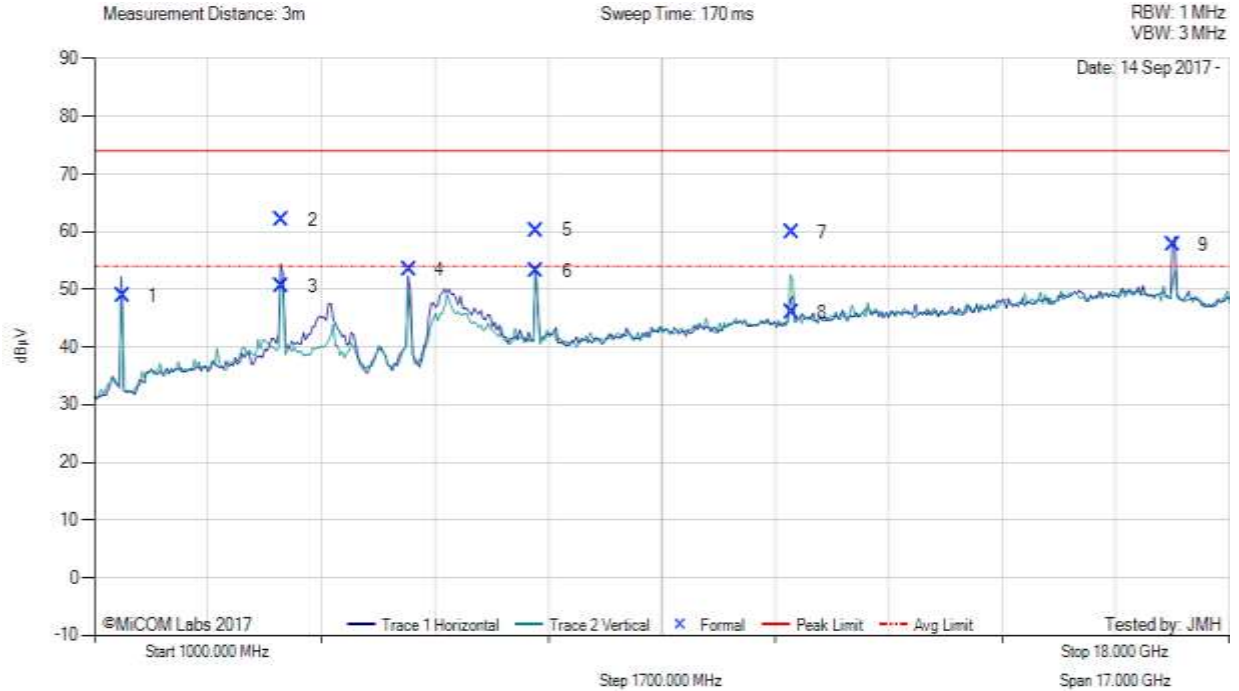
**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Host PCB shielded with silver tape. Transmitter module connected to host PCB with shielded ribbon cable instead of directly to board

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5720.00 MHz, Antenna: Integral, Power Setting: 16, Duty Cycle (%): 99



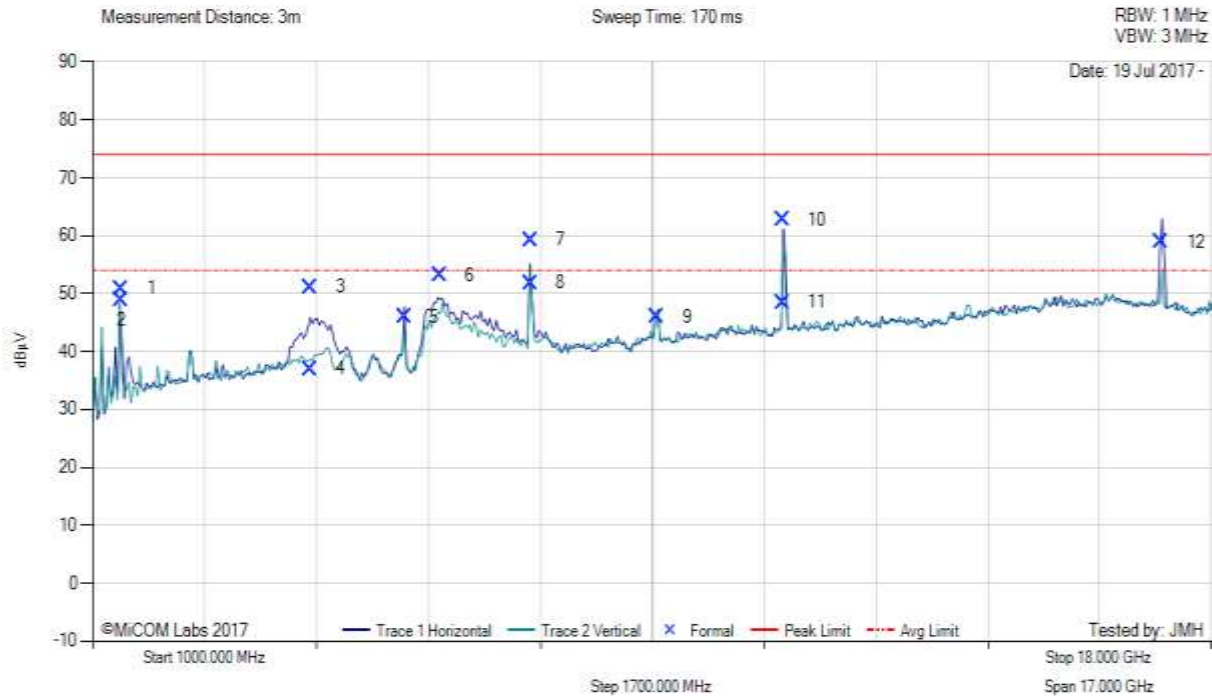
| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB  | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| 1                      | 1429.98       | 62.31    | 2.29          | -15.74 | 48.86        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 2                      | 3813.17       | 69.66    | 3.24          | -10.85 | 62.05        | Max Peak         | Horizontal | 98     | 338     | 74.0         | -12.0     | Pass       |
| 3                      | 3813.17       | 58.06    | 3.24          | -10.85 | 50.45        | Max Avg          | Horizontal | 98     | 338     | 54.0         | -3.6      | Pass       |
| 4                      | 5712.49       | 60.32    | 3.83          | -10.77 | 53.38        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 5                      | 7626.76       | 62.83    | 4.38          | -6.97  | 60.24        | Max Peak         | Vertical   | 141    | 250     | 74.0         | -13.8     | Pass       |
| 6                      | 7626.76       | 55.72    | 4.38          | -6.97  | 53.13        | Max Avg          | Vertical   | 141    | 250     | 54.0         | -0.9      | Pass       |
| 7                      | 11440.71      | 59.41    | 5.36          | -4.92  | 59.85        | Max Peak         | Vertical   | 105    | 338     | 74.0         | -14.2     | Pass       |
| 8                      | 11440.71      | 45.53    | 5.36          | -4.92  | 45.97        | Max Avg          | Vertical   | 105    | 338     | 54.0         | -8.0      | Pass       |
| 9                      | 17151.09      | 50.95    | 6.34          | 0.39   | 57.68        | Peak (NRB)       | Horizontal | 100    | 182     | --           | --        | Pass       |

**Test Notes:** EUT connected to laptop inside chamber and powered by 5V. Short shielded interface cable.

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5745.00 MHz, Antenna: Integral, Power Setting: 16, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1436.32       | 64.36    | 2.28          | -15.77 | 50.87        | Max Peak         | Horizontal | 177    | 133     | 74.0         | -23.1     | Pass       |
| 2                      | 1436.32       | 62.46    | 2.28          | -15.77 | 48.97        | Max Avg          | Horizontal | 177    | 133     | 54.0         | -5.0      | Pass       |
| 3                      | 4309.29       | 59.25    | 3.39          | -11.48 | 51.16        | Max Peak         | Horizontal | 98     | 343     | 74.0         | -22.8     | Pass       |
| 4                      | 4309.29       | 45.08    | 3.39          | -11.48 | 36.99        | Max Avg          | Horizontal | 98     | 343     | 54.0         | -17.0     | Pass       |
| 5                      | 5737.40       | 52.84    | 3.82          | -10.67 | 45.99        | Fundamental      | Horizontal | 151    | 0       | --           | --        |            |
| 6                      | 6273.11       | 57.69    | 3.92          | -8.50  | 53.11        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| 7                      | 7660.08       | 61.87    | 4.38          | -6.95  | 59.30        | Max Peak         | Vertical   | 128    | 231     | 74.0         | -14.7     | Pass       |
| 8                      | 7660.08       | 54.45    | 4.38          | -6.95  | 51.88        | Max Avg          | Vertical   | 128    | 231     | 54.0         | -2.1      | Pass       |
| 9                      | 9578.01       | 46.72    | 5.26          | -5.98  | 46.00        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| 10                     | 11490.62      | 62.16    | 5.45          | -4.84  | 62.77        | Max Peak         | Horizontal | 184    | 26      | 74.0         | -11.2     | Pass       |
| 11                     | 11490.62      | 47.90    | 5.45          | -4.84  | 48.51        | Max Avg          | Horizontal | 184    | 26      | 54.0         | -5.5      | Pass       |
| 12                     | 17240.75      | 52.10    | 6.47          | 0.34   | 58.91        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |

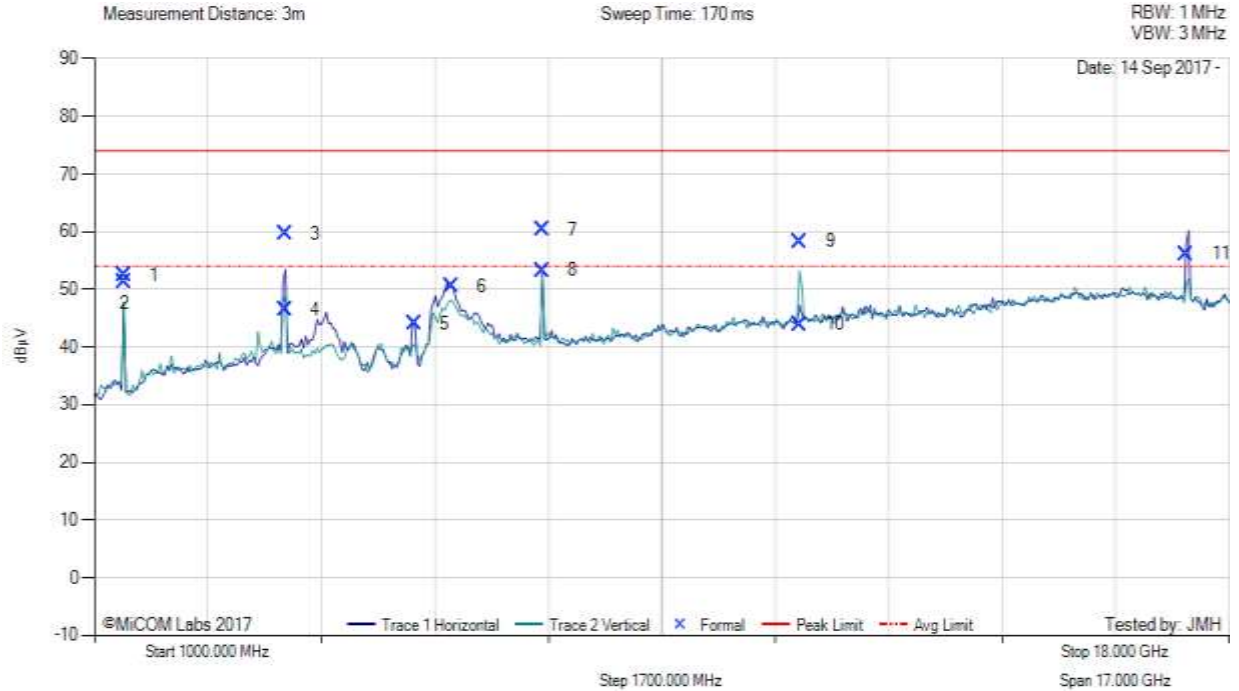
**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power reduced to meet TX Spurious Limit.

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5785.00 MHz, Antenna: Integral, Power Setting: 16, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1446.24       | 66.04    | 2.28          | -15.83 | 52.49        | Max Peak         | Horizontal | 122    | 230     | 74.0         | -21.5     | Pass       |
| 2                      | 1446.24       | 64.73    | 2.28          | -15.83 | 51.18        | Max Avg          | Horizontal | 122    | 230     | 54.0         | -2.8      | Pass       |
| 3                      | 3856.60       | 67.17    | 3.23          | -10.81 | 59.59        | Max Peak         | Horizontal | 118    | 339     | 74.0         | -14.4     | Pass       |
| 4                      | 3856.60       | 54.03    | 3.23          | -10.81 | 46.45        | Max Avg          | Horizontal | 118    | 339     | 54.0         | -7.6      | Pass       |
| 5                      | 5792.96       | 50.71    | 3.78          | -10.40 | 44.09        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 6                      | 6352.61       | 54.70    | 3.95          | -8.18  | 50.47        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 7                      | 7713.38       | 62.72    | 4.41          | -6.85  | 60.28        | Max Peak         | Horizontal | 130    | 346     | 74.0         | -13.7     | Pass       |
| 8                      | 7713.38       | 55.75    | 4.41          | -6.85  | 53.31        | Max Avg          | Horizontal | 130    | 346     | 54.0         | -0.7      | Pass       |
| 9                      | 11569.50      | 57.47    | 5.46          | -4.64  | 58.29        | Max Peak         | Vertical   | 110    | 334     | 74.0         | -15.7     | Pass       |
| 10                     | 11569.50      | 43.15    | 5.46          | -4.64  | 43.97        | Max Avg          | Vertical   | 110    | 334     | 54.0         | -10.0     | Pass       |
| 11                     | 17358.34      | 49.92    | 6.28          | -0.04  | 56.16        | Peak (NRB)       | Horizontal | 100    | 360     | --           | --        | Pass       |

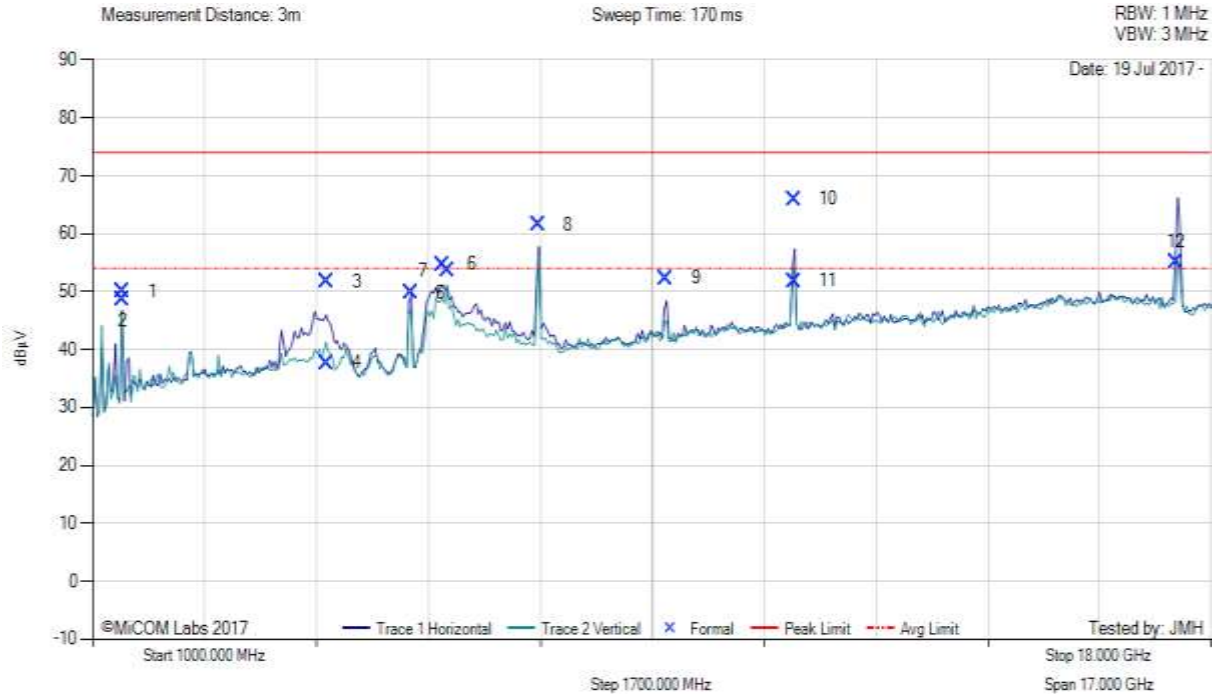
**Test Notes:** EUT connected to laptop inside chamber and powered by 5V. Short shielded interface cable.

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5825.00 MHz, Antenna: Integral, Power Setting: 19, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1456.28       | 63.73    | 2.29          | -15.91 | 50.11        | Max Peak         | Horizontal | 112    | 208     | 74.0         | -23.9     | Pass       |
| 2                      | 1456.28       | 62.19    | 2.29          | -15.91 | 48.57        | Max Avg          | Horizontal | 112    | 208     | 54.0         | -5.4      | Pass       |
| 3                      | 4560.67       | 59.60    | 3.45          | -11.39 | 51.66        | Max Peak         | Horizontal | 138    | 346     | 74.0         | -22.3     | Pass       |
| 4                      | 4560.67       | 45.61    | 3.45          | -11.39 | 37.67        | Max Avg          | Horizontal | 138    | 346     | 54.0         | -16.3     | Pass       |
| 5                      | 5831.89       | 56.14    | 3.84          | -10.22 | 49.76        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 6                      | 6316.23       | 59.09    | 3.93          | -8.34  | 54.68        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 7                      | 6388.56       | 57.77    | 3.99          | -8.08  | 53.68        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 8                      | 7766.70       | 63.78    | 4.43          | -6.71  | 61.50        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 9                      | 9714.99       | 53.14    | 5.41          | -6.24  | 52.31        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 10                     | 11650.60      | 65.01    | 5.46          | -4.47  | 66.00        | Max Peak         | Horizontal | 196    | 310     | 74.0         | -8.0      | Pass       |
| 11                     | 11650.60      | 50.82    | 5.46          | -4.47  | 51.81        | Max Avg          | Horizontal | 196    | 310     | 54.0         | -2.2      | Pass       |
| 12                     | 17472.83      | 49.44    | 6.23          | -0.57  | 55.10        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power reduced to meet TX Spurious Limit.

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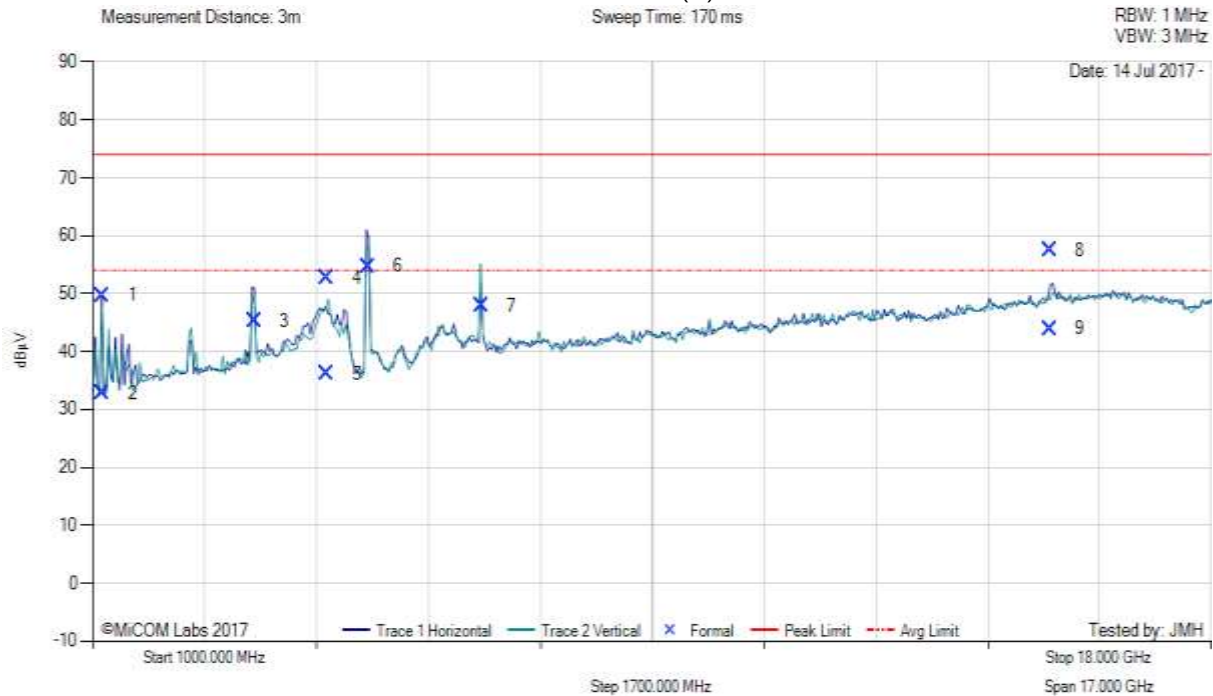
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#### A.4.1.2. YAGEO ANT300P002B24553



#### TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5180.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 18, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1149.33       | 64.43    | 2.12          | -16.82 | 49.73        | Max Peak         | Horizontal | 156    | 197     | 74.0         | -24.3     | Pass       |
| 2                      | 1149.33       | 47.49    | 2.12          | -16.82 | 32.79        | Max Avg          | Horizontal | 156    | 197     | 54.0         | -21.2     | Pass       |
| 3                      | 3453.45       | 53.48    | 3.09          | -11.25 | 45.32        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| 4                      | 4560.01       | 60.64    | 3.45          | -11.39 | 52.70        | Max Peak         | Vertical   | 178    | 61      | 74.0         | -21.3     | Pass       |
| 5                      | 4560.01       | 44.04    | 3.45          | -11.39 | 36.10        | Max Avg          | Vertical   | 178    | 61      | 54.0         | -17.9     | Pass       |
| 6                      | 5176.98       | 62.56    | 3.69          | -11.51 | 54.74        | Fundamental      | Horizontal | 151    | 0       | --           | --        |            |
| 7                      | 6906.70       | 51.27    | 4.11          | -7.54  | 47.84        | Peak (NRB)       | Vertical   | 150    | 360     | --           | --        | Pass       |
| 8                      | 15541.70      | 52.01    | 5.96          | -0.57  | 57.40        | Max Peak         | Horizontal | 174    | 309     | 74.0         | -16.6     | Pass       |
| 9                      | 15541.70      | 38.59    | 5.96          | -0.57  | 43.98        | Max Avg          | Horizontal | 174    | 309     | 54.0         | -10.0     | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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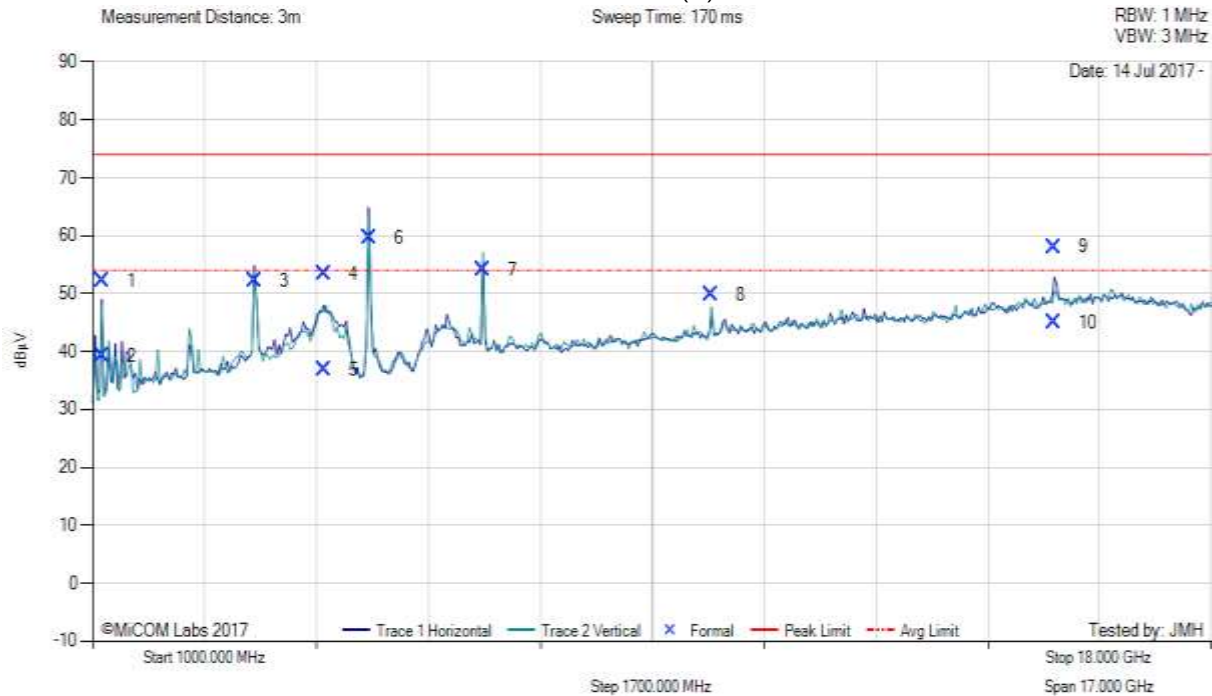


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
**Page:** 255 of 298



#### TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5200.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 22, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1147.02       | 66.97    | 2.12          | -16.83 | 52.26        | Max Peak         | Horizontal | 101    | 129     | 74.0         | -21.7     | Pass       |
| 2                      | 1147.02       | 53.91    | 2.12          | -16.83 | 39.20        | Max Avg          | Horizontal | 101    | 129     | 54.0         | -14.8     | Pass       |
| 3                      | 3464.42       | 60.41    | 3.10          | -11.25 | 52.26        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 4                      | 4517.23       | 61.42    | 3.52          | -11.53 | 53.41        | Max Peak         | Horizontal | 121    | 192     | 74.0         | -20.6     | Pass       |
| 5                      | 4517.23       | 44.93    | 3.52          | -11.53 | 36.92        | Max Avg          | Horizontal | 121    | 192     | 54.0         | -17.1     | Pass       |
| 6                      | 5202.34       | 67.46    | 3.66          | -11.46 | 59.66        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 7                      | 6933.40       | 57.57    | 4.11          | -7.49  | 54.19        | Peak (NRB)       | Vertical   | 151    | 360     | --           | --        | Pass       |
| 8                      | 10400.55      | 49.42    | 5.41          | -5.03  | 49.80        | Peak (NRB)       | Vertical   | 151    | 330     | --           | --        | Pass       |
| 9                      | 15599.96      | 52.28    | 6.04          | -0.25  | 58.07        | Max Peak         | Horizontal | 191    | 182     | 74.0         | -15.9     | Pass       |
| 10                     | 15599.96      | 39.17    | 6.04          | -0.25  | 44.96        | Max Avg          | Horizontal | 191    | 182     | 54.0         | -9.0      | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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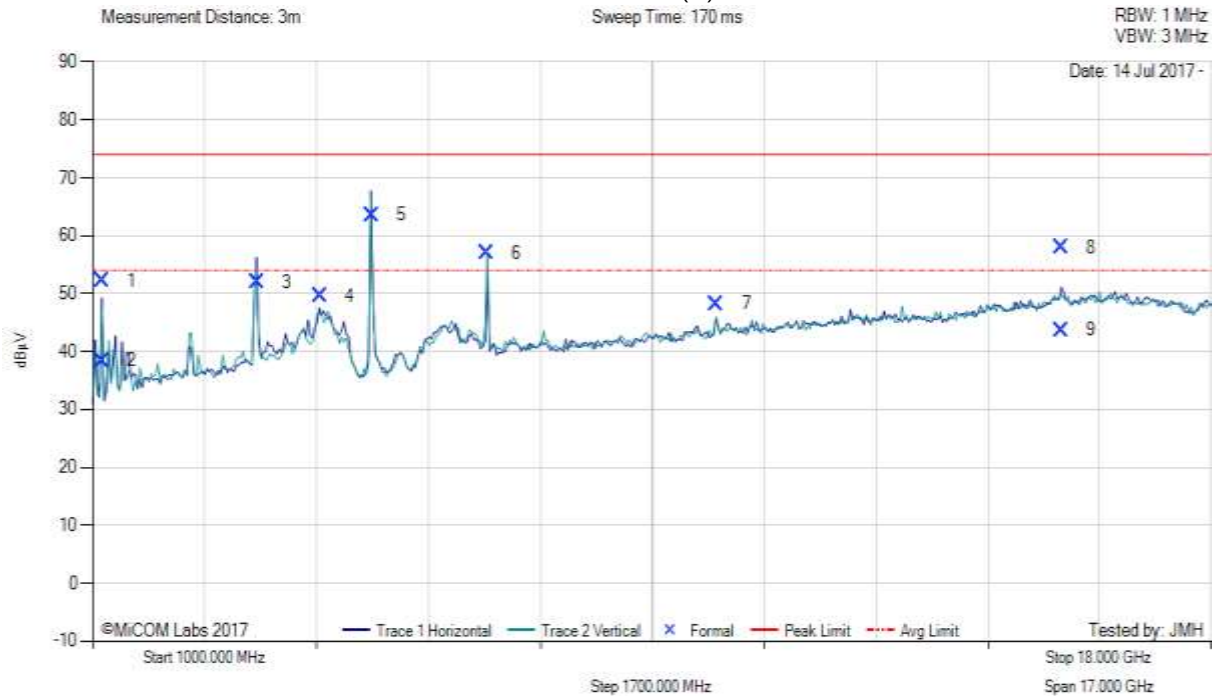


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5240.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 22, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1145.36       | 66.95    | 2.12          | -16.83 | 52.24        | Max Peak         | Horizontal | 98     | 131     | 74.0         | -21.8     | Pass       |
| 2                      | 1145.36       | 53.15    | 2.12          | -16.83 | 38.44        | Max Avg          | Horizontal | 98     | 131     | 54.0         | -15.6     | Pass       |
| 3                      | 3493.75       | 60.16    | 3.11          | -11.26 | 52.01        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 4                      | 4459.67       | 57.66    | 3.52          | -11.60 | 49.58        | Peak (NRB)       | Horizontal | 100    | 173     | --           | --        | Pass       |
| 5                      | 5237.73       | 71.30    | 3.63          | -11.37 | 63.56        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 6                      | 6986.64       | 60.35    | 4.13          | -7.45  | 57.03        | Peak (NRB)       | Horizontal | 100    | 173     | --           | --        | Pass       |
| 7                      | 10479.15      | 47.31    | 5.42          | -4.46  | 48.27        | Peak (NRB)       | Vertical   | 100    | 173     | --           | --        | Pass       |
| 8                      | 15716.49      | 51.71    | 6.04          | 0.18   | 57.93        | Max Peak         | Horizontal | 194    | 187     | 74.0         | -16.1     | Pass       |
| 9                      | 15716.49      | 37.49    | 6.04          | 0.18   | 43.71        | Max Avg          | Horizontal | 194    | 187     | 54.0         | -10.3     | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

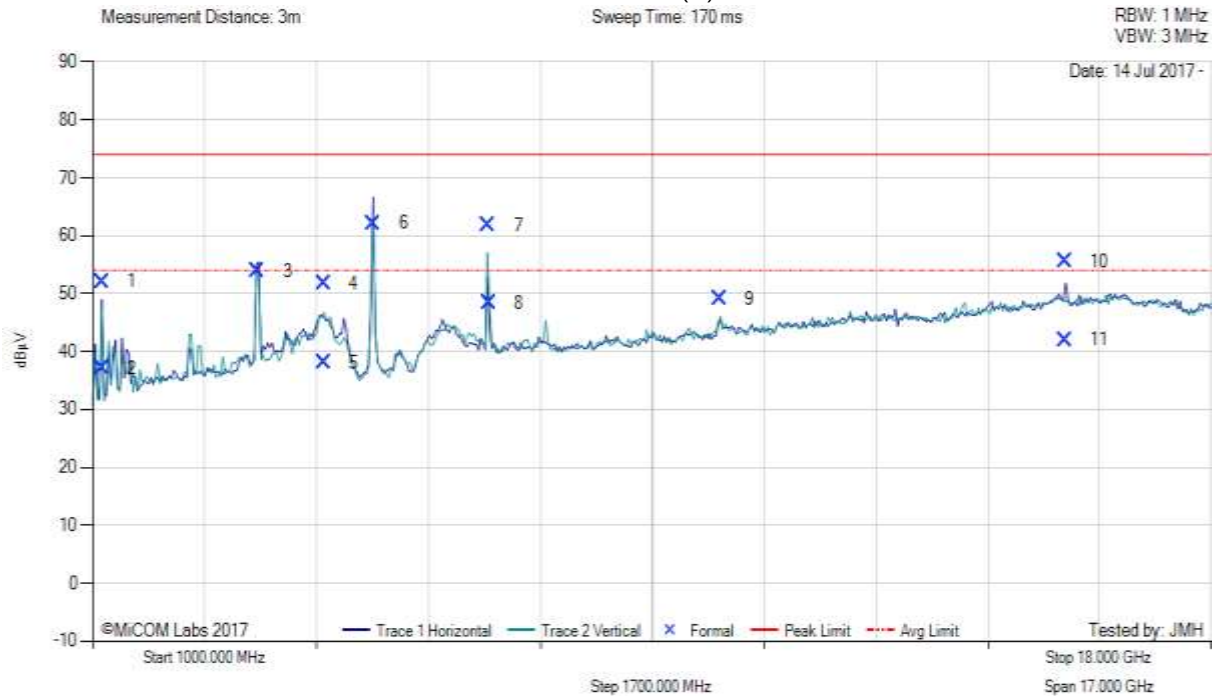
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### TX SPURIOUS & RESTRICTED BAND EMISSIONS



Variant: 802.11a, Test Freq: 5260.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 22, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1145.14       | 66.83    | 2.12          | -16.83 | 52.12        | Max Peak         | Horizontal | 104    | 130     | 74.0         | -21.9     | Pass       |
| 2                      | 1145.14       | 51.79    | 2.12          | -16.83 | 37.08        | Max Avg          | Horizontal | 104    | 130     | 54.0         | -16.9     | Pass       |
| 3                      | 3506.99       | 61.95    | 3.11          | -11.25 | 53.81        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 4                      | 4512.11       | 59.80    | 3.53          | -11.55 | 51.78        | Max Peak         | Vertical   | 164    | 185     | 74.0         | -22.2     | Pass       |
| 5                      | 4512.11       | 46.07    | 3.53          | -11.55 | 38.05        | Max Avg          | Vertical   | 164    | 185     | 54.0         | -16.0     | Pass       |
| 6                      | 5267.50       | 69.70    | 3.68          | -11.25 | 62.13        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 7                      | 7013.46       | 65.07    | 4.18          | -7.42  | 61.83        | Peak (NRB)       | Vertical   | 151    | 188     | --           | --        | Pass       |
| 8                      | 7029.07       | 51.59    | 4.17          | -7.39  | 48.37        | Peak (NRB)       | Vertical   | 151    | 0       | --           | --        | Pass       |
| 9                      | 10520.51      | 47.92    | 5.43          | -4.21  | 49.14        | Peak (NRB)       | Vertical   | 151    | 309     | --           | --        | Pass       |
| 10                     | 15774.71      | 49.48    | 5.98          | 0.10   | 55.56        | Max Peak         | Horizontal | 185    | 164     | 74.0         | -18.4     | Pass       |
| 11                     | 15774.71      | 35.95    | 5.98          | 0.10   | 42.03        | Max Avg          | Horizontal | 185    | 164     | 54.0         | -12.0     | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

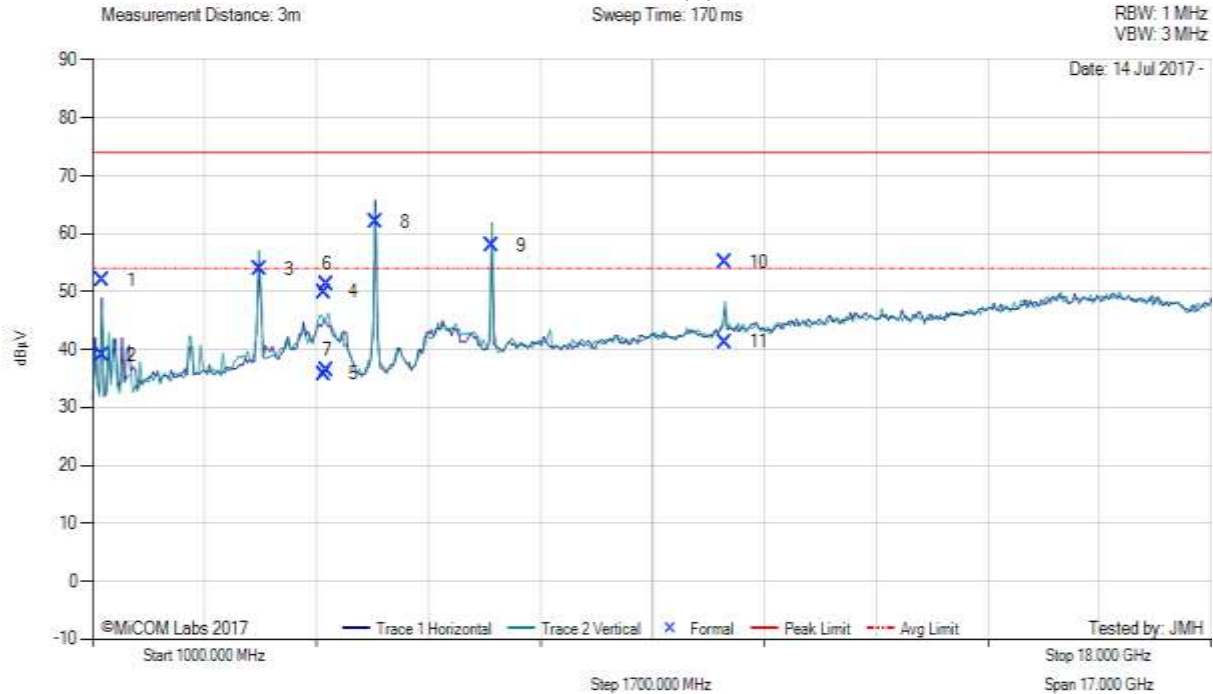
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### TX SPURIOUS & RESTRICTED BAND EMISSIONS



Variant: 802.11a, Test Freq: 5300.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 22, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1146.69       | 66.72    | 2.12          | -16.83 | 52.01        | Max Peak         | Horizontal | 98     | 136     | 74.0         | -22.0     | Pass       |
| 2                      | 1146.69       | 53.66    | 2.12          | -16.83 | 38.95        | Max Avg          | Horizontal | 98     | 136     | 54.0         | -15.1     | Pass       |
| 3                      | 3533.88       | 61.96    | 3.13          | -11.25 | 53.84        | Peak (NRB)       | Horizontal | 100    | 0       | --           | --        | Pass       |
| 4                      | 4517.51       | 57.92    | 3.52          | -11.53 | 49.91        | Max Peak         | Vertical   | 98     | 230     | 74.0         | -24.1     | Pass       |
| 5                      | 4517.51       | 43.81    | 3.52          | -11.53 | 35.80        | Max Avg          | Vertical   | 98     | 230     | 54.0         | -18.2     | Pass       |
| 6                      | 4557.14       | 59.24    | 3.44          | -11.40 | 51.28        | Max Peak         | Vertical   | 115    | 207     | 74.0         | -22.7     | Pass       |
| 7                      | 4557.14       | 44.36    | 3.44          | -11.40 | 36.40        | Max Avg          | Vertical   | 115    | 207     | 54.0         | -17.6     | Pass       |
| 8                      | 5297.38       | 69.29    | 3.80          | -11.11 | 61.98        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 9                      | 7066.61       | 61.10    | 4.18          | -7.34  | 57.94        | Peak (NRB)       | Horizontal | 100    | 191     | --           | --        | Pass       |
| 10                     | 10600.49      | 53.46    | 5.58          | -3.93  | 55.11        | Max Peak         | Vertical   | 119    | 293     | 74.0         | -18.9     | Pass       |
| 11                     | 10600.49      | 39.68    | 5.58          | -3.93  | 41.33        | Max Avg          | Vertical   | 119    | 293     | 54.0         | -12.7     | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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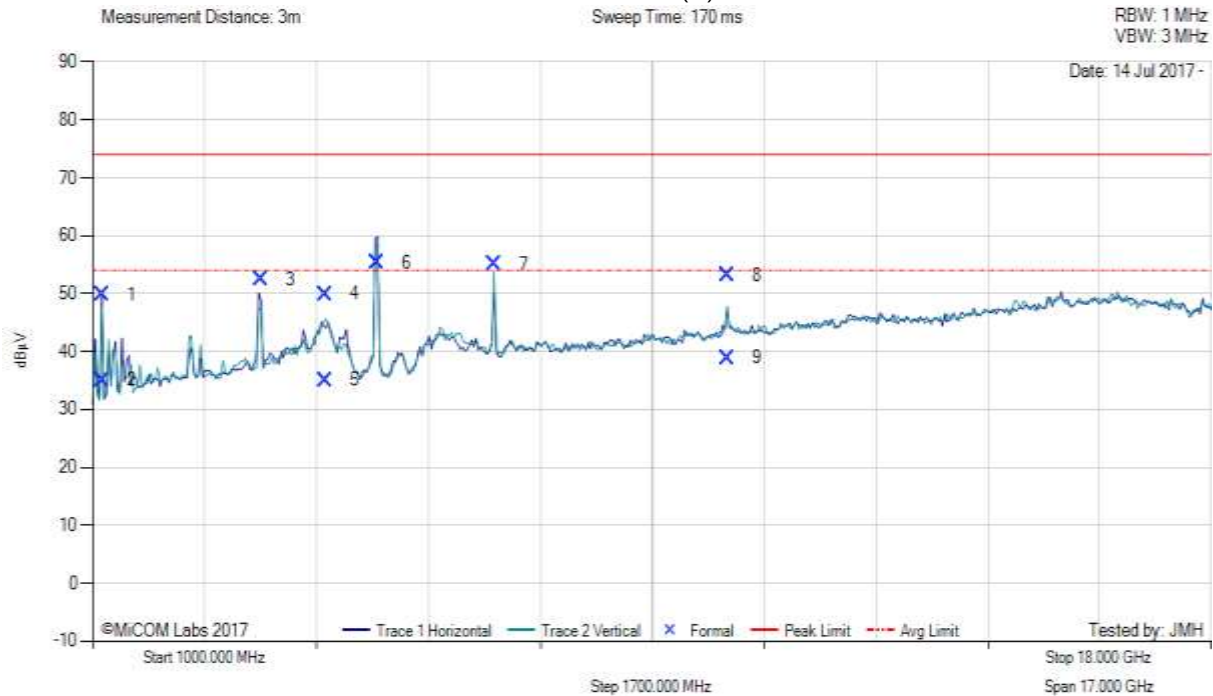


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
**Page:** 259 of 298



#### TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5320.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 18, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1145.20       | 64.53    | 2.12          | -16.83 | 49.82        | Max Peak         | Horizontal | 147    | 199     | 74.0         | -24.2     | Pass       |
| 2                      | 1145.20       | 49.77    | 2.12          | -16.83 | 35.06        | Max Avg          | Horizontal | 147    | 199     | 54.0         | -18.9     | Pass       |
| 3                      | 3547.66       | 60.47    | 3.14          | -11.24 | 52.37        | Peak (NRB)       | Horizontal | 100    | 189     | --           | --        | Pass       |
| 4                      | 4528.71       | 57.95    | 3.47          | -11.48 | 49.94        | Max Peak         | Vertical   | 146    | 288     | 74.0         | -24.1     | Pass       |
| 5                      | 4528.71       | 43.08    | 3.47          | -11.48 | 35.07        | Max Avg          | Vertical   | 146    | 288     | 54.0         | -18.9     | Pass       |
| 6                      | 5316.57       | 62.60    | 3.76          | -11.07 | 55.29        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 7                      | 7093.41       | 58.24    | 4.24          | -7.34  | 55.14        | Peak (NRB)       | Horizontal | 151    | 0       | --           | --        | Pass       |
| 8                      | 10640.67      | 51.73    | 5.39          | -3.89  | 53.23        | Max Peak         | Horizontal | 164    | 184     | 74.0         | -20.8     | Pass       |
| 9                      | 10640.67      | 37.40    | 5.39          | -3.89  | 38.90        | Max Avg          | Horizontal | 164    | 184     | 54.0         | -15.1     | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

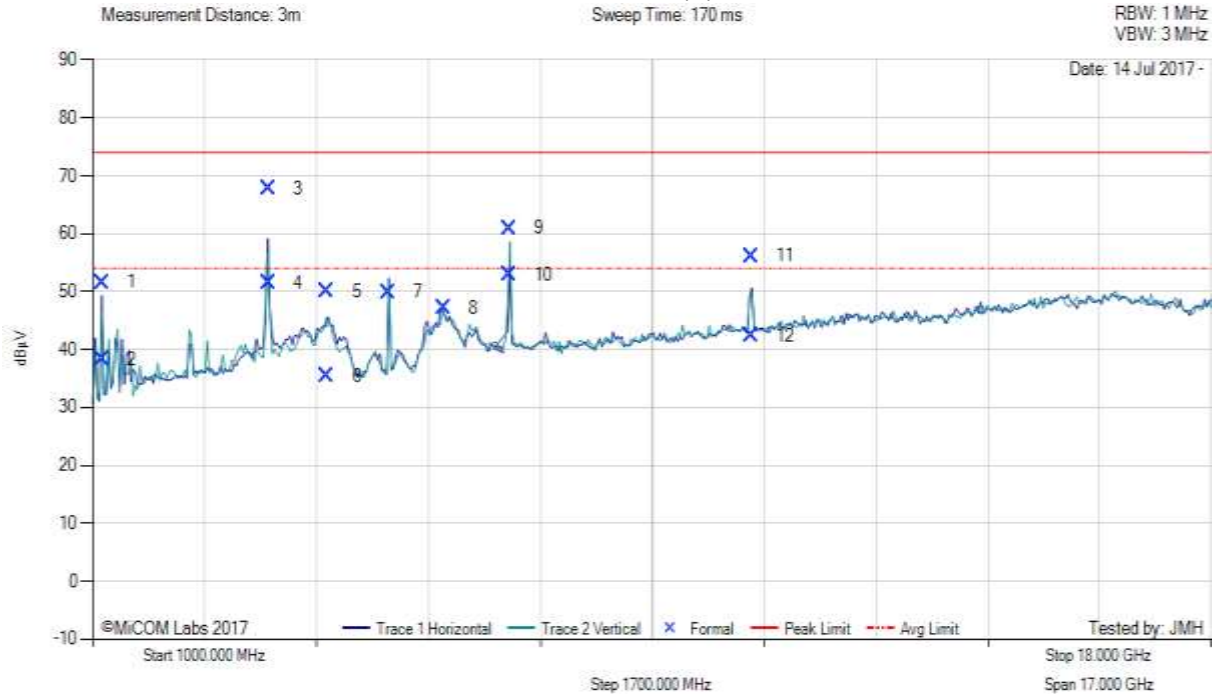
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### TX SPURIOUS & RESTRICTED BAND EMISSIONS



Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 17, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1145.80       | 66.33    | 2.12          | -16.83 | 51.62        | Max Peak         | Horizontal | 103    | 133     | 74.0         | -22.4     | Pass       |
| 2                      | 1145.80       | 53.06    | 2.12          | -16.83 | 38.35        | Max Avg          | Horizontal | 103    | 133     | 54.0         | -15.7     | Pass       |
| 3                      | 3667.07       | 75.62    | 3.17          | -11.02 | 67.77        | Max Peak         | Horizontal | 113    | 180     | 74.0         | -6.2      | Pass       |
| 4                      | 3667.07       | 59.26    | 3.17          | -11.02 | 51.41        | Max Avg          | Horizontal | 113    | 180     | 54.0         | -2.6      | Pass       |
| 5                      | 4558.36       | 57.96    | 3.45          | -11.39 | 50.02        | Max Peak         | Horizontal | 129    | 182     | 74.0         | -24.0     | Pass       |
| 6                      | 4558.36       | 43.34    | 3.45          | -11.39 | 35.40        | Max Avg          | Horizontal | 129    | 182     | 54.0         | -18.6     | Pass       |
| 7                      | 5496.61       | 57.34    | 3.73          | -11.17 | 49.90        | Fundamental      | Horizontal | 100    | 27      | --           | --        |            |
| 8                      | 6334.64       | 51.52    | 3.95          | -8.26  | 47.21        | Peak (NRB)       | Vertical   | 100    | 0       | --           | --        | Pass       |
| 9                      | 7333.44       | 63.88    | 4.28          | -7.24  | 60.92        | Max Peak         | Horizontal | 106    | 217     | 74.0         | -13.1     | Pass       |
| 10                     | 7333.44       | 55.92    | 4.28          | -7.24  | 52.96        | Max Avg          | Horizontal | 106    | 217     | 54.0         | -1.0      | Pass       |
| 11                     | 11000.10      | 54.83    | 5.59          | -4.24  | 56.18        | Max Peak         | Horizontal | 133    | 323     | 74.0         | -17.8     | Pass       |
| 12                     | 11000.10      | 41.01    | 5.59          | -4.24  | 42.36        | Max Avg          | Horizontal | 133    | 323     | 54.0         | -11.6     | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

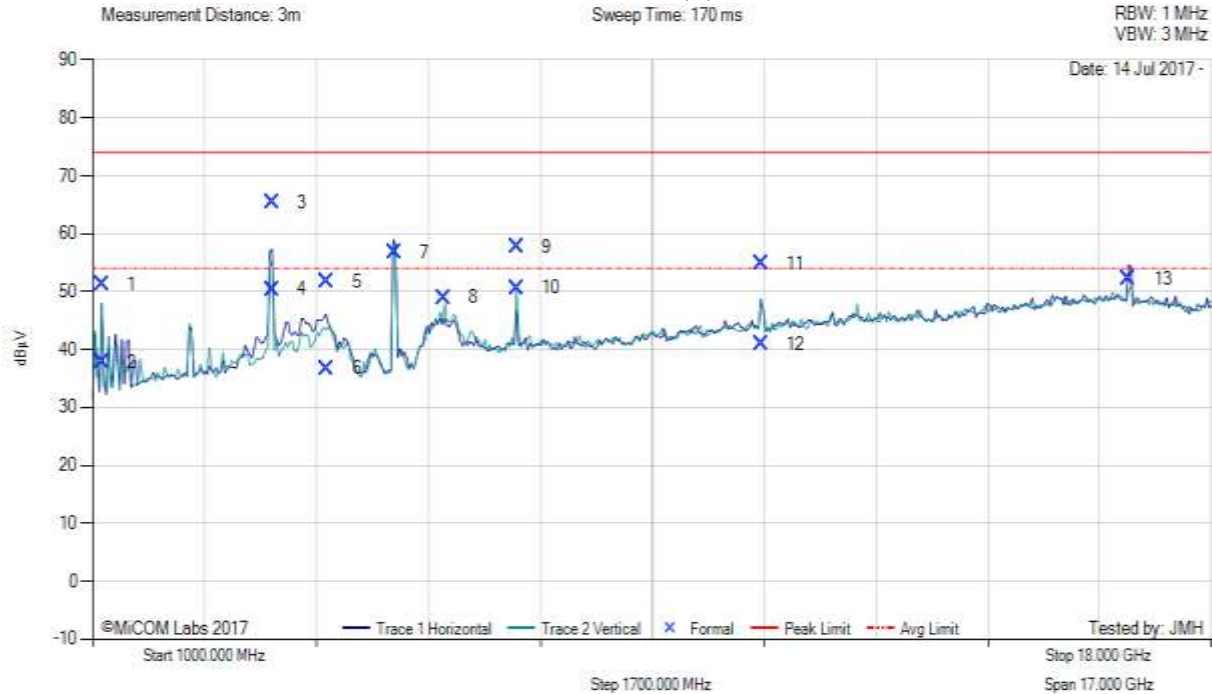
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### TX SPURIOUS & RESTRICTED BAND EMISSIONS



Variant: 802.11a, Test Freq: 5580.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 18, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1145.58       | 65.95    | 2.12          | -16.83 | 51.24        | Max Peak         | Vertical   | 98     | 251     | 74.0         | -22.8     | Pass       |
| 2                      | 1145.58       | 52.52    | 2.12          | -16.83 | 37.81        | Max Avg          | Vertical   | 98     | 251     | 54.0         | -16.2     | Pass       |
| 3                      | 3720.33       | 73.08    | 3.21          | -10.90 | 65.39        | Max Peak         | Horizontal | 115    | 177     | 74.0         | -8.6      | Pass       |
| 4                      | 3720.33       | 58.13    | 3.21          | -10.90 | 50.44        | Max Avg          | Horizontal | 115    | 177     | 54.0         | -3.6      | Pass       |
| 5                      | 4558.25       | 59.72    | 3.45          | -11.39 | 51.78        | Max Peak         | Horizontal | 142    | 181     | 74.0         | -22.2     | Pass       |
| 6                      | 4558.25       | 44.68    | 3.45          | -11.39 | 36.74        | Max Avg          | Horizontal | 142    | 181     | 54.0         | -17.3     | Pass       |
| 7                      | 5587.45       | 64.23    | 3.78          | -11.19 | 56.82        | Fundamental      | Horizontal | 100    | 0       | --           | --        |            |
| 8                      | 6335.97       | 53.29    | 3.95          | -8.25  | 48.99        | Peak (NRB)       | Vertical   | 100    | 275     | --           | --        | Pass       |
| 9                      | 7440.00       | 60.54    | 4.30          | -7.13  | 57.71        | Max Peak         | Vertical   | 108    | 5       | 74.0         | -16.3     | Pass       |
| 10                     | 7440.00       | 53.47    | 4.30          | -7.13  | 50.64        | Max Avg          | Vertical   | 108    | 5       | 54.0         | -3.4      | Pass       |
| 11                     | 11160.73      | 53.17    | 5.81          | -4.07  | 54.91        | Max Peak         | Vertical   | 104    | 294     | 74.0         | -19.1     | Pass       |
| 12                     | 11160.73      | 39.19    | 5.81          | -4.07  | 40.93        | Max Avg          | Vertical   | 104    | 294     | 54.0         | -13.1     | Pass       |
| 13                     | 16742.84      | 44.65    | 6.07          | 1.50   | 52.22        | Peak (NRB)       | Horizontal | 100    | 275     | --           | --        | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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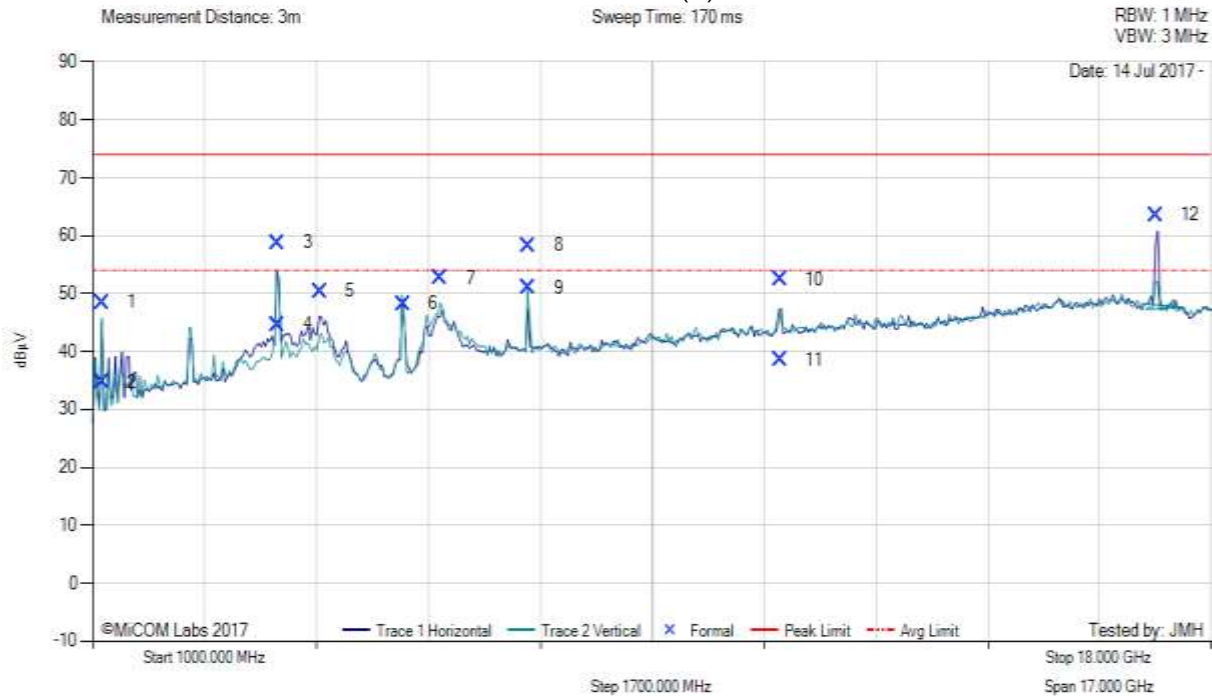


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5720.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 18, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1145.47       | 63.24    | 2.12          | -16.83 | 48.53        | Max Peak         | Vertical   | 101    | 259     | 74.0         | -25.5     | Pass       |
| 2                      | 1145.47       | 49.49    | 2.12          | -16.83 | 34.78        | Max Avg          | Vertical   | 101    | 259     | 54.0         | -19.2     | Pass       |
| 3                      | 3814.14       | 66.43    | 3.24          | -10.85 | 58.82        | Max Peak         | Vertical   | 115    | 208     | 74.0         | -15.2     | Pass       |
| 4                      | 3814.14       | 52.29    | 3.24          | -10.85 | 44.68        | Max Avg          | Vertical   | 115    | 208     | 54.0         | -9.3      | Pass       |
| 5                      | 4448.76       | 58.52    | 3.46          | -11.59 | 50.39        | Peak (NRB)       | Horizontal | 151    | 207     | --           | --        | Pass       |
| 6                      | 5712.23       | 55.18    | 3.83          | -10.77 | 48.24        | Fundamental      | Horizontal | 100    | 21      | --           | --        |            |
| 7                      | 6284.47       | 57.29    | 3.92          | -8.47  | 52.74        | Peak (NRB)       | Vertical   | 151    | 324     | --           | --        | Pass       |
| 8                      | 7626.62       | 60.91    | 4.38          | -6.97  | 58.32        | Max Peak         | Vertical   | 145    | 179     | 74.0         | -15.7     | Pass       |
| 9                      | 7626.62       | 53.62    | 4.38          | -6.97  | 51.03        | Max Avg          | Vertical   | 145    | 179     | 54.0         | -3.0      | Pass       |
| 10                     | 11440.13      | 51.94    | 5.36          | -4.92  | 52.38        | Max Peak         | Horizontal | 187    | 309     | 74.0         | -21.6     | Pass       |
| 11                     | 11440.13      | 38.16    | 5.36          | -4.92  | 38.60        | Max Avg          | Horizontal | 187    | 309     | 54.0         | -15.4     | Pass       |
| 12                     | 17159.05      | 56.86    | 6.35          | 0.39   | 63.60        | Peak (NRB)       | Horizontal | 151    | 224     | --           | --        | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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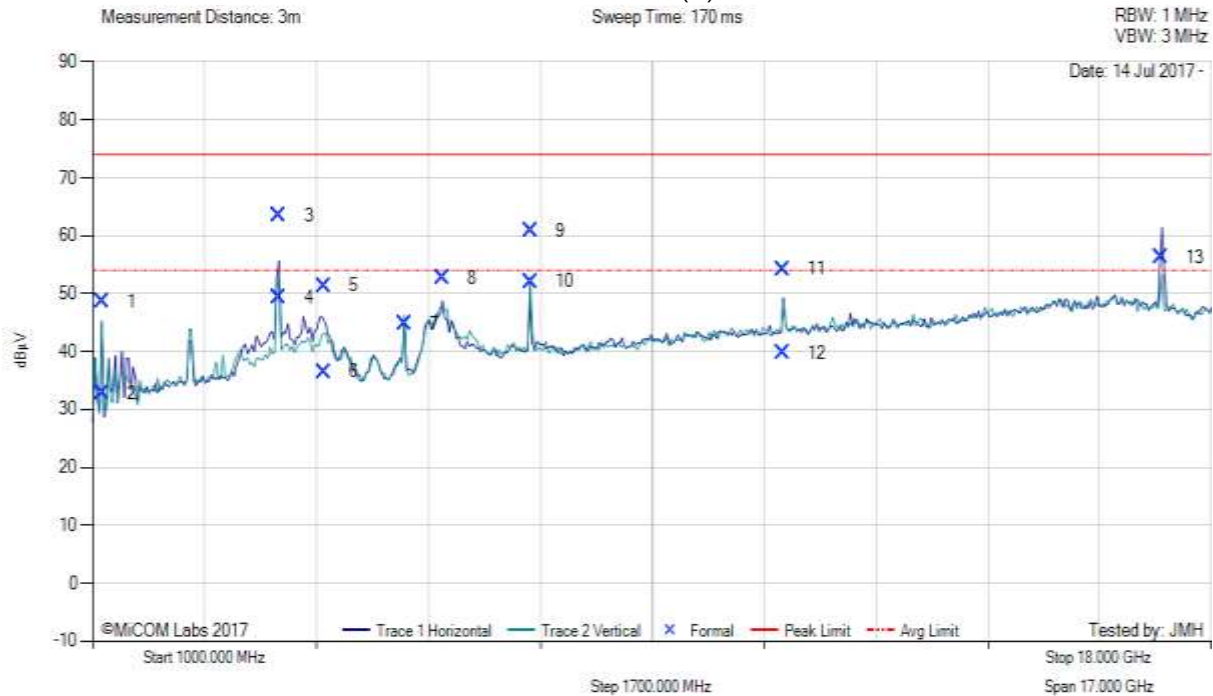


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5745.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 20, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1145.03       | 63.37    | 2.12          | -16.83 | 48.66        | Max Peak         | Vertical   | 98     | 243     | 74.0         | -25.3     | Pass       |
| 2                      | 1145.03       | 47.51    | 2.12          | -16.83 | 32.80        | Max Avg          | Vertical   | 98     | 243     | 54.0         | -21.2     | Pass       |
| 3                      | 3830.69       | 71.02    | 3.21          | -10.83 | 63.40        | Max Peak         | Horizontal | 98     | 185     | 74.0         | -10.6     | Pass       |
| 4                      | 3830.69       | 56.90    | 3.21          | -10.83 | 49.28        | Max Avg          | Horizontal | 98     | 185     | 54.0         | -4.7      | Pass       |
| 5                      | 4507.64       | 59.46    | 3.51          | -11.57 | 51.40        | Max Peak         | Horizontal | 98     | 180     | 74.0         | -22.6     | Pass       |
| 6                      | 4507.64       | 44.60    | 3.51          | -11.57 | 36.54        | Max Avg          | Horizontal | 98     | 180     | 54.0         | -17.5     | Pass       |
| 7                      | 5737.51       | 51.63    | 3.82          | -10.67 | 44.78        | Fundamental      | Horizontal | 100    | 45      | --           | --        |            |
| 8                      | 6315.02       | 57.08    | 3.93          | -8.34  | 52.67        | Peak (NRB)       | Horizontal | 100    | 149     | --           | --        | Pass       |
| 9                      | 7659.94       | 63.35    | 4.37          | -6.95  | 60.77        | Max Peak         | Vertical   | 114    | 199     | 74.0         | -13.2     | Pass       |
| 10                     | 7659.94       | 55.48    | 4.37          | -6.95  | 52.09        | Max Avg          | Vertical   | 114    | 199     | 54.0         | -1.0      | Pass       |
| 11                     | 11490.62      | 53.66    | 5.45          | -4.84  | 54.27        | Max Peak         | Horizontal | 110    | 225     | 74.0         | -19.7     | Pass       |
| 12                     | 11490.62      | 39.11    | 5.45          | -4.84  | 39.72        | Max Avg          | Horizontal | 110    | 225     | 54.0         | -14.3     | Pass       |
| 13                     | 17237.88      | 49.41    | 6.47          | 0.34   | 56.22        | Peak (NRB)       | Vertical   | 100    | 244     | --           | --        | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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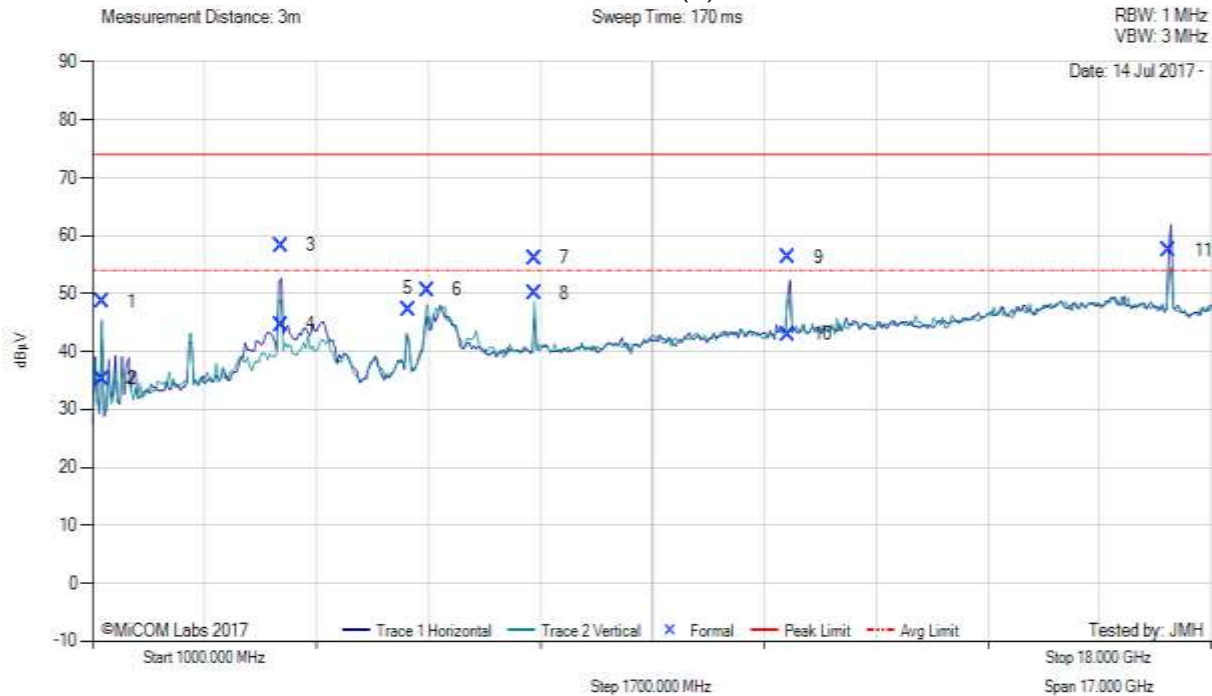


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
**Page:** 264 of 298



#### TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5785.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 21, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1147.79       | 63.39    | 2.12          | -16.83 | 48.68        | Max Peak         | Vertical   | 98     | 253     | 74.0         | -25.3     | Pass       |
| 2                      | 1147.79       | 50.00    | 2.12          | -16.83 | 35.29        | Max Avg          | Vertical   | 98     | 253     | 54.0         | -18.7     | Pass       |
| 3                      | 3857.15       | 65.92    | 3.23          | -10.81 | 58.34        | Max Peak         | Horizontal | 106    | 186     | 74.0         | -15.7     | Pass       |
| 4                      | 3857.15       | 52.24    | 3.23          | -10.81 | 44.66        | Max Avg          | Horizontal | 106    | 186     | 54.0         | -9.3      | Pass       |
| 5                      | 5792.55       | 53.94    | 3.78          | -10.40 | 47.32        | Fundamental      | Vertical   | 100    | 306     | --           | --        |            |
| 6                      | 6081.05       | 56.35    | 3.86          | -9.57  | 50.64        | Peak (NRB)       | Vertical   | 100    | 303     | --           | --        | Pass       |
| 7                      | 7713.34       | 58.61    | 4.41          | -6.85  | 56.17        | Max Peak         | Vertical   | 113    | 200     | 74.0         | -17.8     | Pass       |
| 8                      | 7713.34       | 52.53    | 4.41          | -6.85  | 50.09        | Max Avg          | Vertical   | 113    | 200     | 54.0         | -3.9      | Pass       |
| 9                      | 11571.43      | 55.53    | 5.42          | -4.63  | 56.32        | Max Peak         | Vertical   | 128    | 273     | 74.0         | -17.7     | Pass       |
| 10                     | 11571.43      | 42.23    | 5.42          | -4.63  | 43.02        | Max Avg          | Vertical   | 128    | 273     | 54.0         | -11.0     | Pass       |
| 11                     | 17358.01      | 51.18    | 6.28          | -0.04  | 57.42        | Peak (NRB)       | Horizontal | 100    | 151     | --           | --        | Pass       |

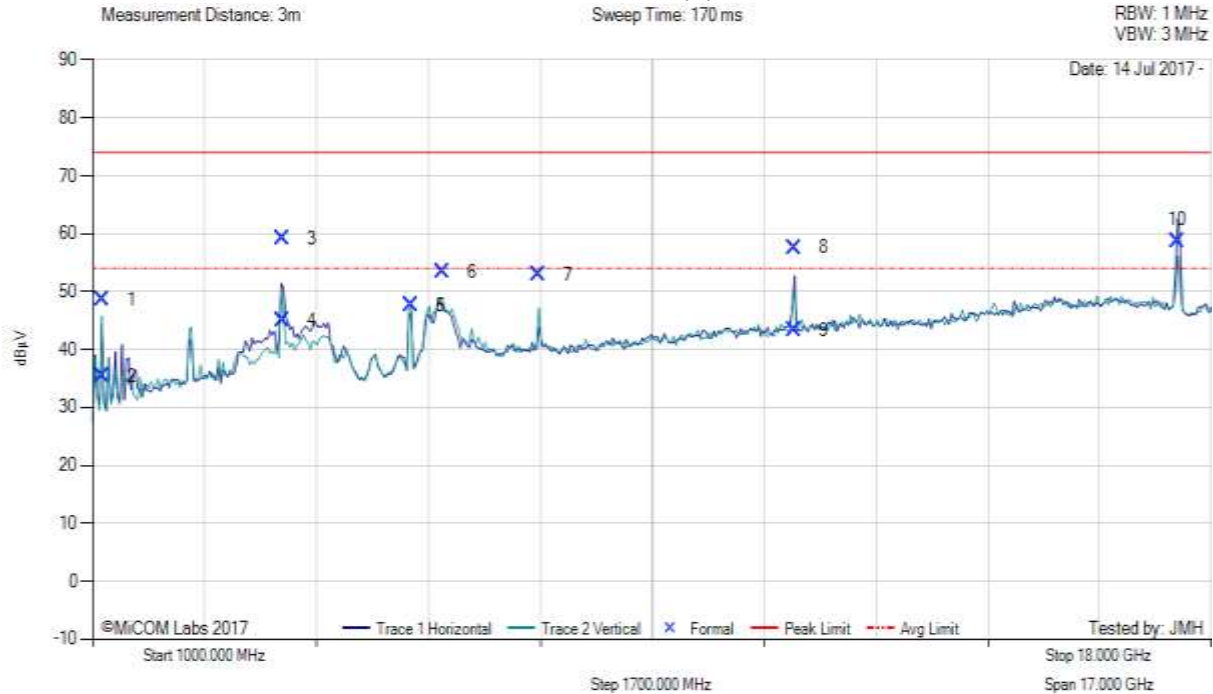
**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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# TX SPURIOUS & RESTRICTED BAND EMISSIONS

Variant: 802.11a, Test Freq: 5825.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 22, Duty Cycle (%): 99



| 1000.00 - 18000.00 MHz |               |          |               |        |              |                  |            |        |         |              |           |            |
|------------------------|---------------|----------|---------------|--------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                    | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                      | 1146.58       | 63.38    | 2.12          | -16.83 | 48.67        | Max Peak         | Vertical   | 98     | 250     | 74.0         | -25.3     | Pass       |
| 2                      | 1146.58       | 50.19    | 2.12          | -16.83 | 35.48        | Max Avg          | Vertical   | 98     | 250     | 54.0         | -18.5     | Pass       |
| 3                      | 3882.50       | 66.68    | 3.25          | -10.76 | 59.17        | Max Peak         | Horizontal | 112    | 185     | 74.0         | -14.8     | Pass       |
| 4                      | 3882.50       | 52.57    | 3.25          | -10.76 | 45.06        | Max Avg          | Horizontal | 112    | 185     | 54.0         | -8.9      | Pass       |
| 5                      | 5832.66       | 54.07    | 3.84          | -10.21 | 47.70        | Fundamental      | Vertical   | 100    | 195     | --           | --        |            |
| 6                      | 6315.46       | 57.75    | 3.93          | -8.34  | 53.34        | Peak (NRB)       | Vertical   | 100    | 239     | --           | --        | Pass       |
| 7                      | 7766.72       | 55.14    | 4.43          | -6.71  | 52.86        | Peak (NRB)       | Vertical   | 100    | 167     | --           | --        | Pass       |
| 8                      | 11650.50      | 56.57    | 5.46          | -4.47  | 57.56        | Max Peak         | Vertical   | 122    | 267     | 74.0         | -16.4     | Pass       |
| 9                      | 11650.50      | 42.28    | 5.46          | -4.47  | 43.27        | Max Avg          | Vertical   | 122    | 267     | 54.0         | -10.7     | Pass       |
| 10                     | 17484.29      | 52.99    | 6.41          | -0.63  | 58.77        | Peak (NRB)       | Horizontal | 100    | 185     | --           | --        | Pass       |

**Test Notes:** EUT powered by 5V supply and connected to laptop via SD slot. Antenna Port B

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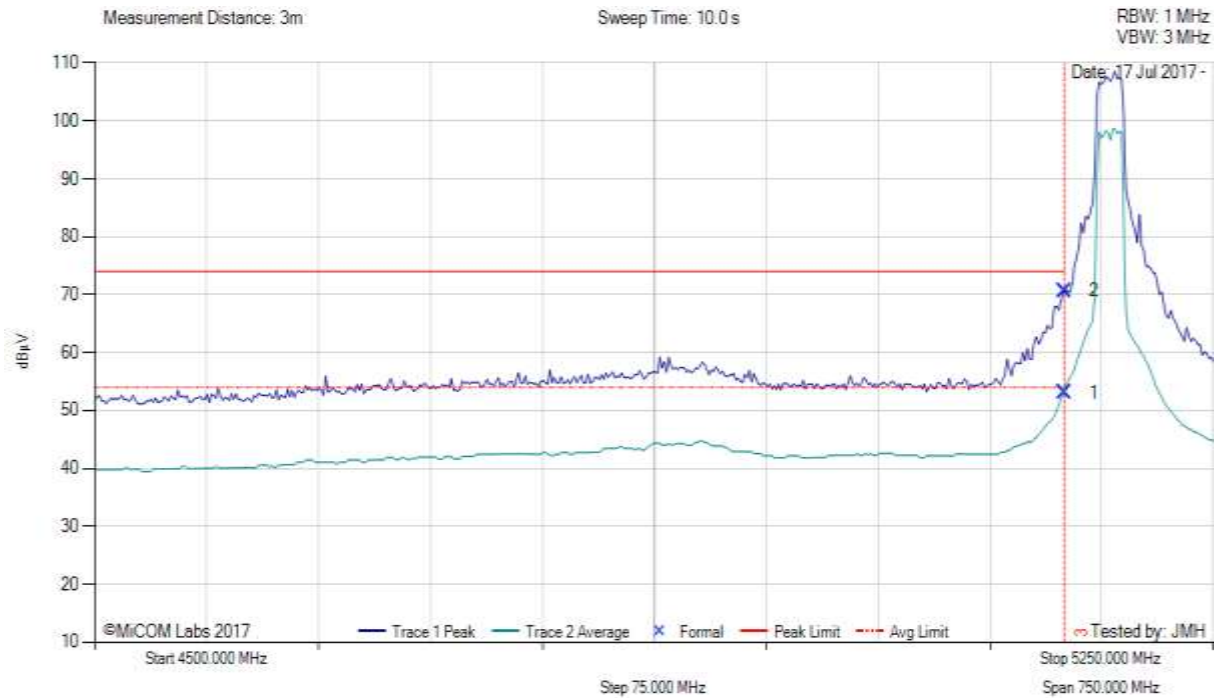
## A.4.2. Restricted Edge & Band-Edge Emissions

### A.4.2.3. Integral



#### RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5180.00 MHz, Antenna: Integral, Power Setting: 17, Duty Cycle (%): 99



| 4500.00 - 5250.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5150.00       | 15.27    | 3.67          | 34.11 | 53.05        | Max Avg          | Horizontal | 102    | 158     | 54.0         | -1.0      | Pass       |
| 2                     | 5150.00       | 32.83    | 3.67          | 34.11 | 70.61        | Max Peak         | Horizontal | 102    | 158     | 74.0         | -3.4      | Pass       |
| 3                     | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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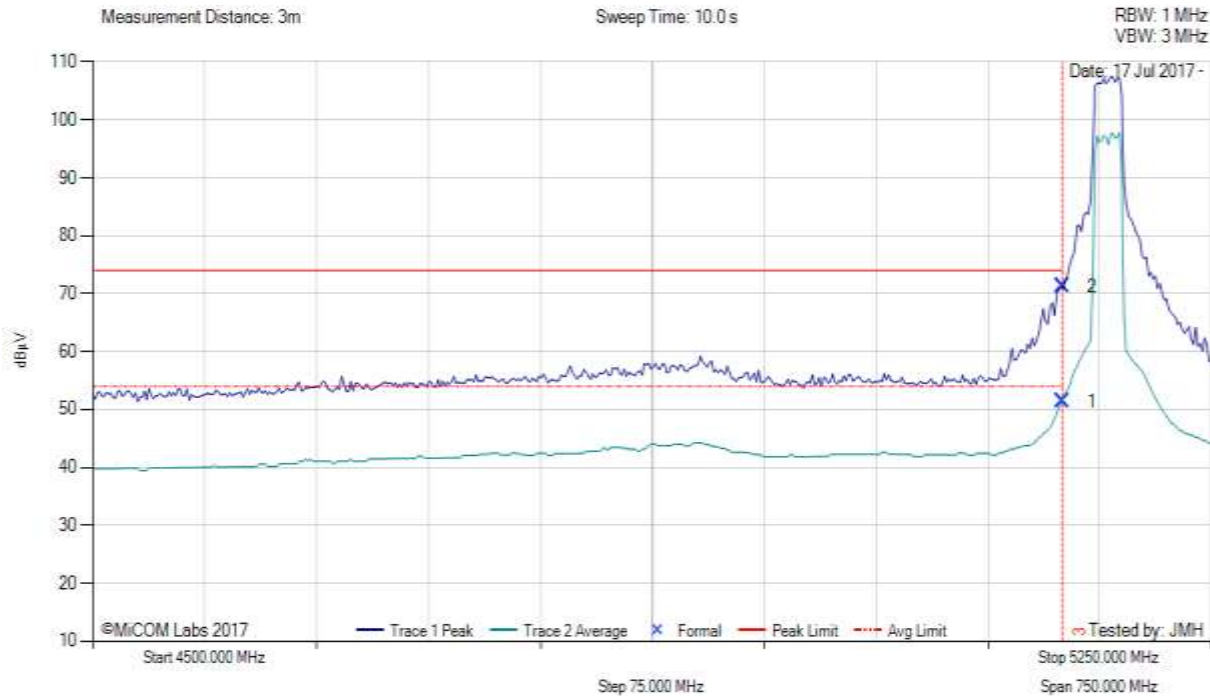


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
**Page:** 267 of 298



#### RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5180.00 MHz, Antenna: Integral, Power Setting: 16, Duty Cycle (%): 99



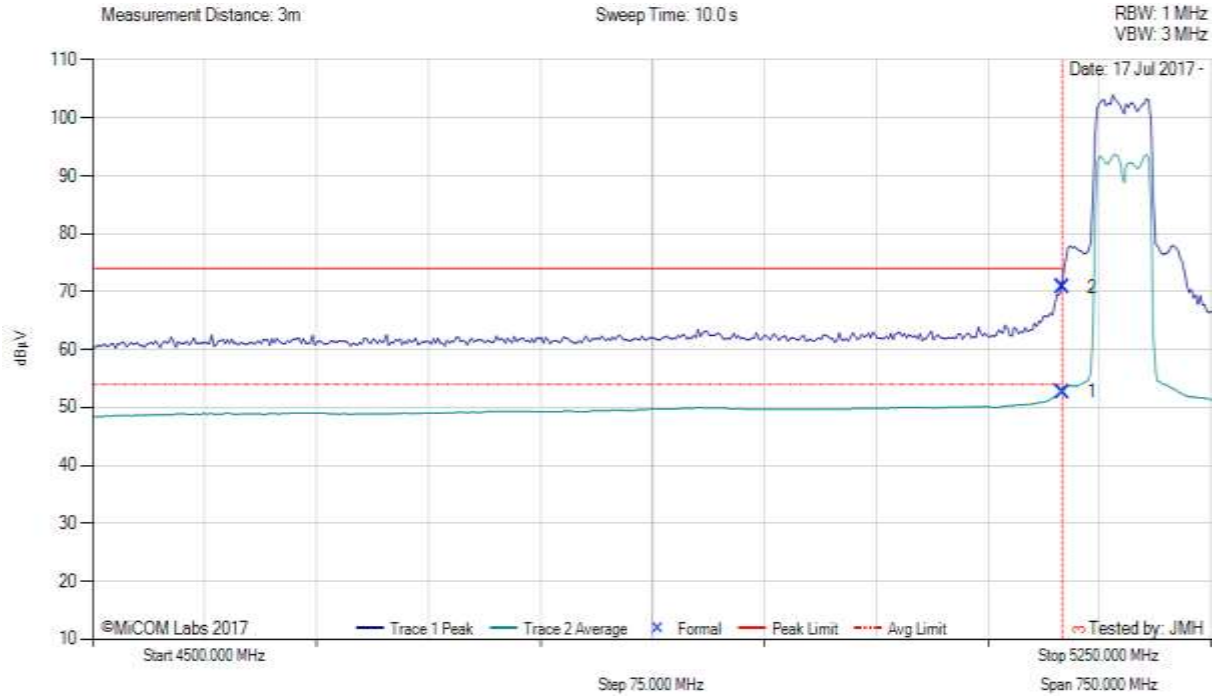
| 4500.00 - 5250.00 MHz                                                                                            |               |          |               |       |              |                  |            |        |         |              |           |            |
|------------------------------------------------------------------------------------------------------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                                                                                                              | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                                                                                                                | 5150.00       | 13.51    | 3.67          | 34.11 | 51.29        | Max Avg          | Horizontal | 102    | 158     | 54.0         | -2.7      | Pass       |
| 2                                                                                                                | 5150.00       | 33.53    | 3.67          | 34.11 | 71.31        | Max Peak         | Horizontal | 102    | 158     | 74.0         | -2.7      | Pass       |
| 3                                                                                                                | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| <b>Test Notes:</b> EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits |               |          |               |       |              |                  |            |        |         |              |           |            |

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# RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5190.00 MHz, Antenna: Integral, Power Setting: 14, Duty Cycle (%): 99



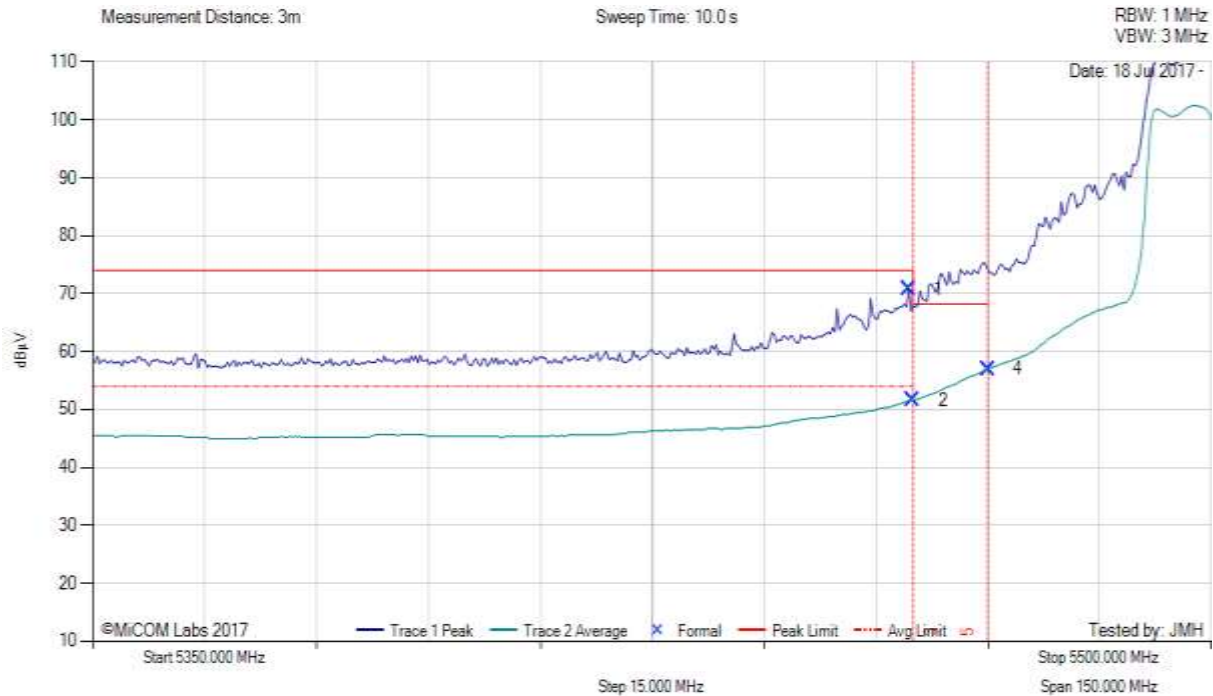
| 4500.00 - 5250.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5150.00       | 14.86    | 3.67          | 34.11 | 52.64        | Max Avg          | Horizontal | 102    | 158     | 54.0         | -1.4      | Pass       |
| 2                     | 5150.00       | 32.97    | 3.67          | 34.11 | 70.75        | Max Peak         | Horizontal | 102    | 158     | 74.0         | -3.3      | Pass       |
| 3                     | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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# RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: Integral, Power Setting: 17, Duty Cycle (%): 99



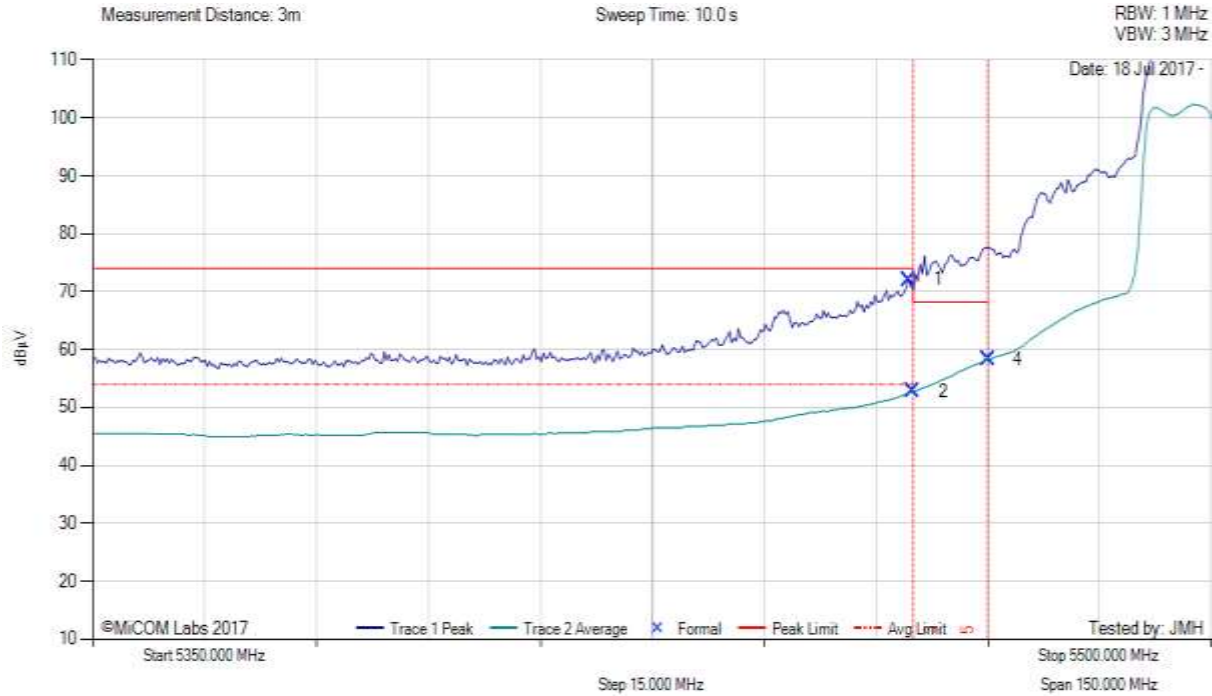
| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5459.40       | 32.69    | 3.79          | 34.31 | 70.79        | Max Peak         | Horizontal | 111    | 353     | 74.0         | -3.2      | Pass       |
| 2                     | 5460.00       | 13.55    | 3.79          | 34.31 | 51.65        | Max Avg          | Horizontal | 111    | 353     | 54.0         | -2.4      | Pass       |
| 4                     | 5470.00       | 18.91    | 3.76          | 34.32 | 56.99        | Max Avg          | Horizontal | 111    | 353     | 68.2         | -11.2     | Pass       |
| 3                     | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| 5                     | 5470.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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# RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5500.00 MHz, Antenna: Integral, Power Setting: 17, Duty Cycle (%): 99



| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5459.40       | 34.02    | 3.79          | 34.31 | 72.12        | Max Peak         | Horizontal | 111    | 353     | 74.0         | -1.9      | Pass       |
| 2                     | 5460.00       | 14.68    | 3.79          | 34.31 | 52.78        | Max Avg          | Horizontal | 111    | 353     | 54.0         | -1.2      | Pass       |
| 4                     | 5470.00       | 20.18    | 3.76          | 34.32 | 58.26        | Max Avg          | Horizontal | 111    | 353     | 68.2         | -9.9      | Pass       |
| 3                     | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| 5                     | 5470.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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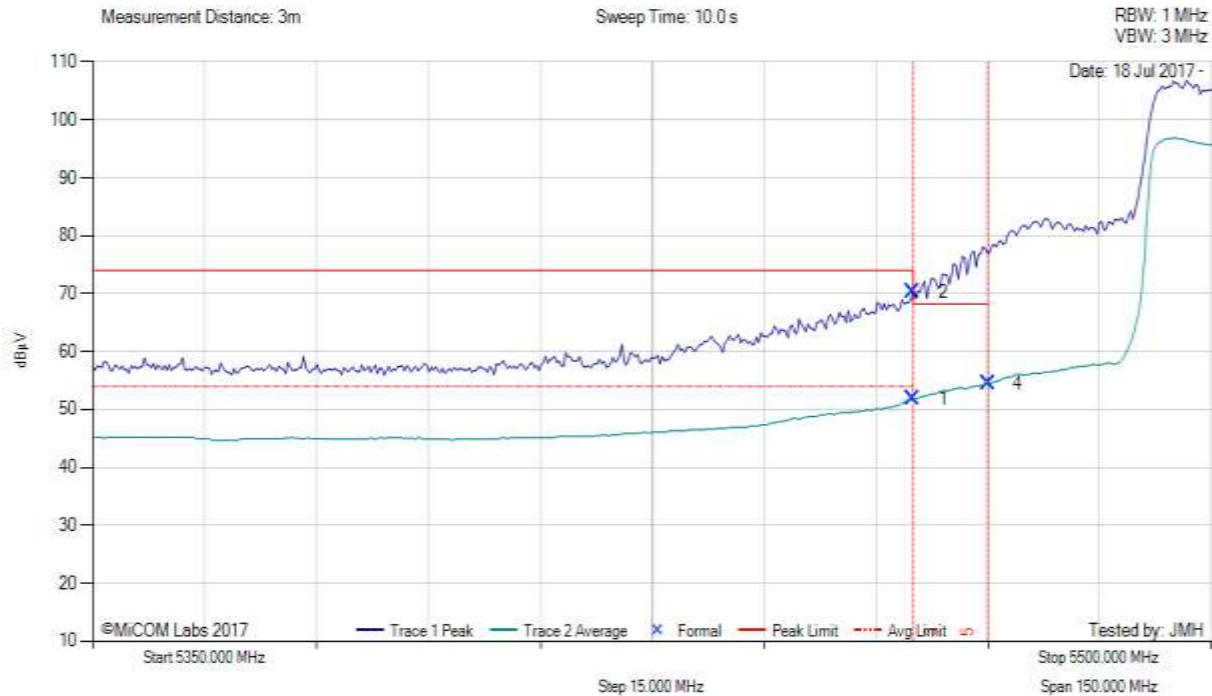


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
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#### RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5510.00 MHz, Antenna: Integral, Power Setting: 15, Duty Cycle (%): 99



| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5460.00       | 13.67    | 3.79          | 34.31 | 51.77        | Max Avg          | Horizontal | 111    | 353     | 54.0         | -2.2      | Pass       |
| 2                     | 5460.00       | 32.24    | 3.79          | 34.31 | 70.34        | Max Peak         | Horizontal | 111    | 353     | 74.0         | -3.7      | Pass       |
| 4                     | 5470.00       | 16.35    | 3.76          | 34.32 | 54.43        | Max Avg          | Horizontal | 111    | 353     | 68.2         | -13.8     | Pass       |
| 3                     | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |
| 5                     | 5470.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

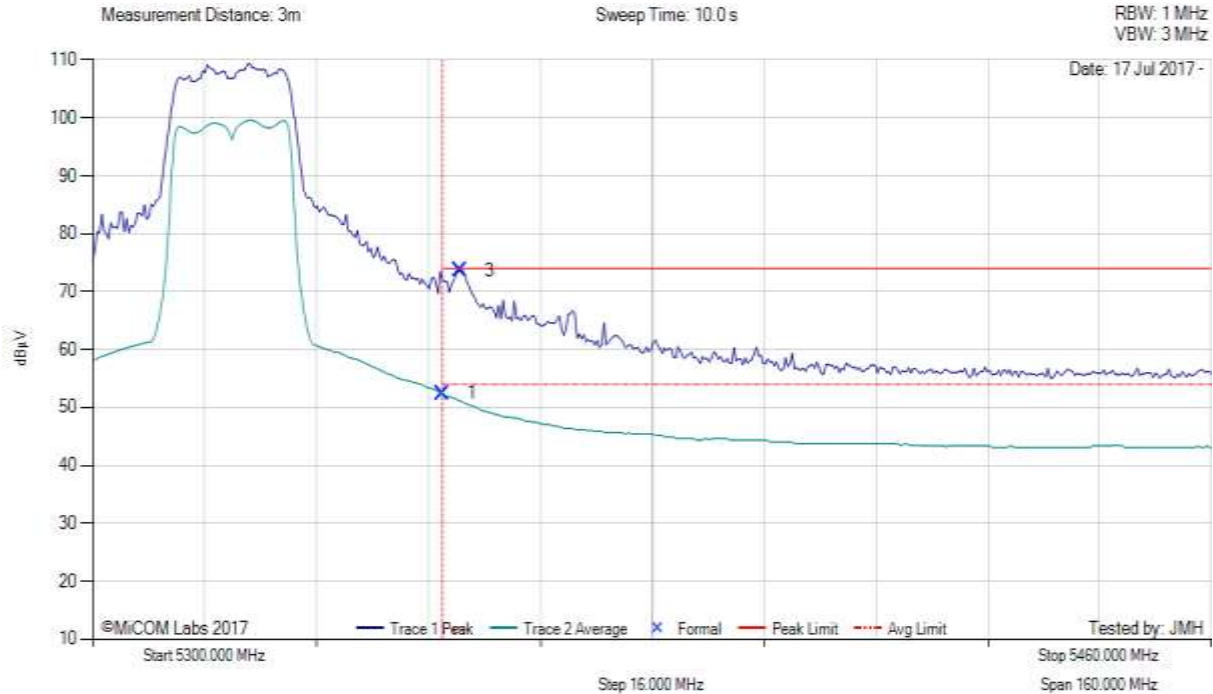
**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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# RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5320.00 MHz, Antenna: Integral, Power Setting: 16, Duty Cycle (%): 99



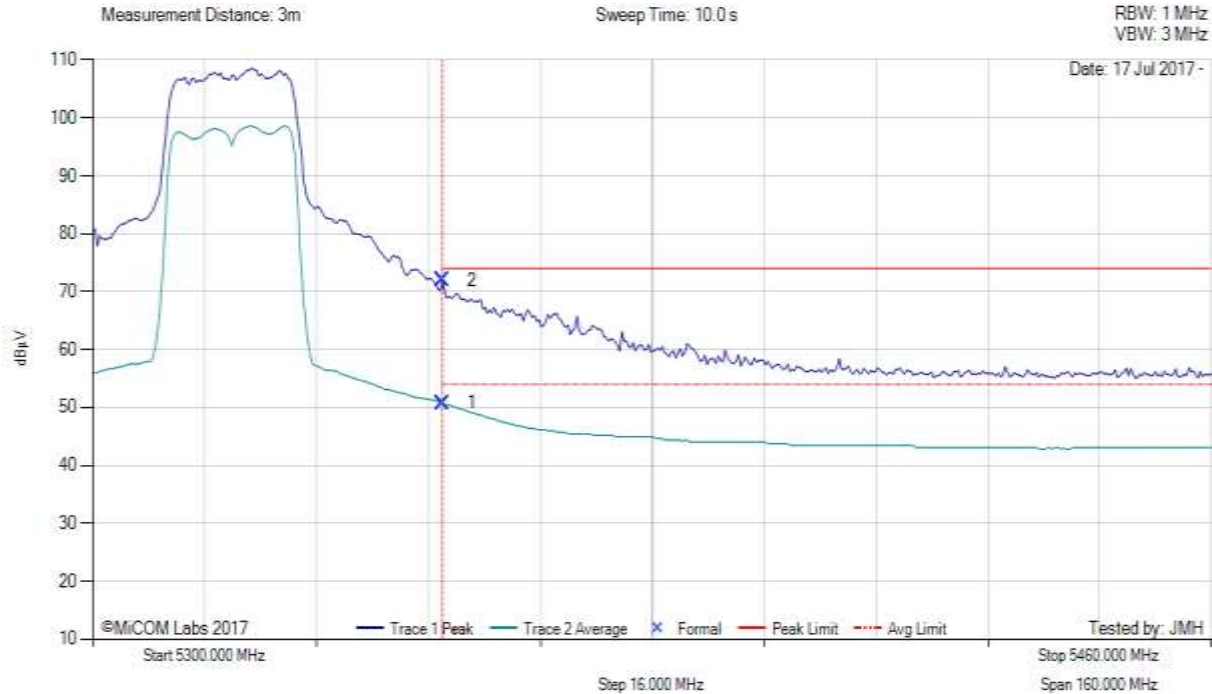
| 5300.00 - 5460.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5350.00       | 14.23    | 3.70          | 34.51 | 52.44        | Max Avg          | Horizontal | 140    | 337     | 54.0         | -1.6      | Pass       |
| 3                     | 5352.57       | 35.45    | 3.71          | 34.50 | 73.66        | Max Peak         | Horizontal | 140    | 337     | 74.0         | -0.3      | Pass       |
| 2                     | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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# RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5320.00 MHz, Antenna: Integral, Power Setting: 15, Duty Cycle (%): 99



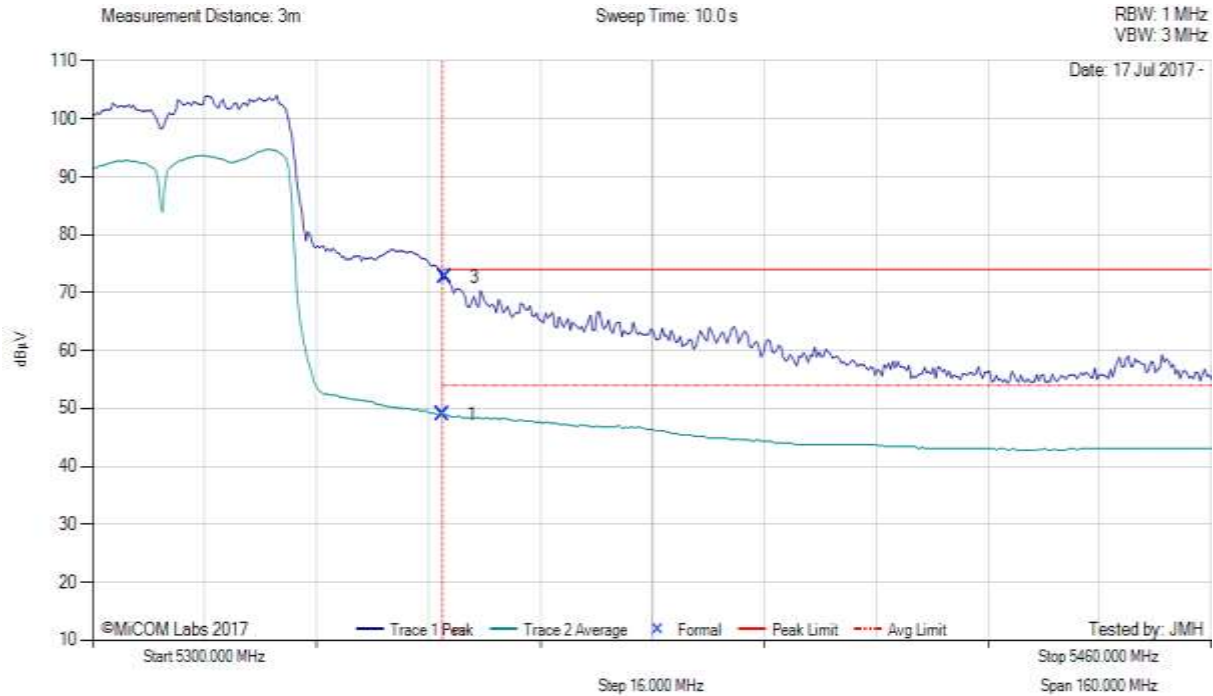
| 5300.00 - 5460.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5350.00       | 12.51    | 3.70          | 34.51 | 50.72        | Max Avg          | Horizontal | 140    | 337     | 54.0         | -3.3      | Pass       |
| 2                     | 5350.00       | 33.77    | 3.70          | 34.51 | 71.98        | Max Peak         | Horizontal | 140    | 337     | 74.0         | -2.0      | Pass       |
| 3                     | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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# RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5310.00 MHz, Antenna: Integral, Power Setting: 14, Duty Cycle (%): 99



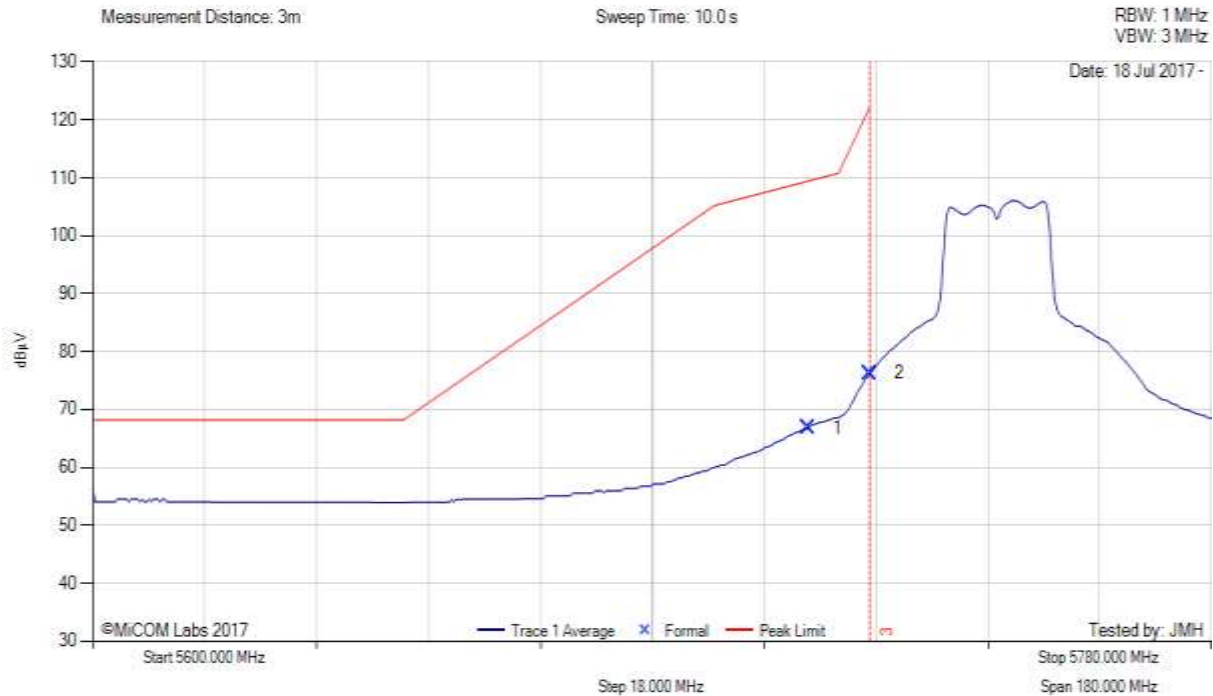
| 5300.00 - 5460.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBµV | Cable Loss dB | AF dB | Level dBµV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBµV/m | Margin dB | Pass /Fail |
| 1                     | 5350.00       | 10.71    | 3.70          | 34.51 | 48.92        | Max Avg          | Horizontal | 140    | 337     | 54.0         | -5.1      | Pass       |
| 3                     | 5350.32       | 34.45    | 3.70          | 34.51 | 72.66        | Max Peak         | Horizontal | 140    | 337     | 74.0         | -1.3      | Pass       |
| 2                     | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Power Reduced to meet Band Edge limits

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### 5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5745.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



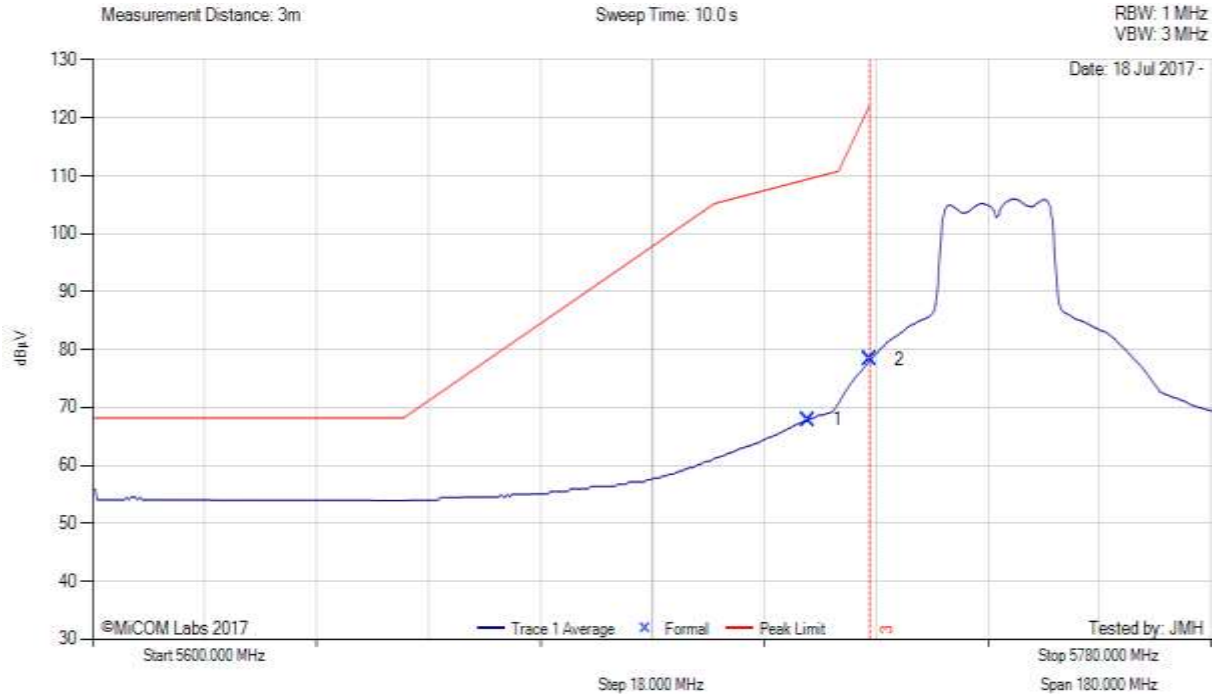
| 5600.00 - 5780.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5715.00       | 28.69    | 3.81          | 34.34 | 66.84        | Max Avg          | Horizontal | 119    | 6       | 109.4        | -42.6     | Pass       |
| 2                     | 5725.00       | 38.10    | 3.79          | 34.35 | 76.24        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -46.0     | Pass       |
| 3                     | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

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### 5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5745.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



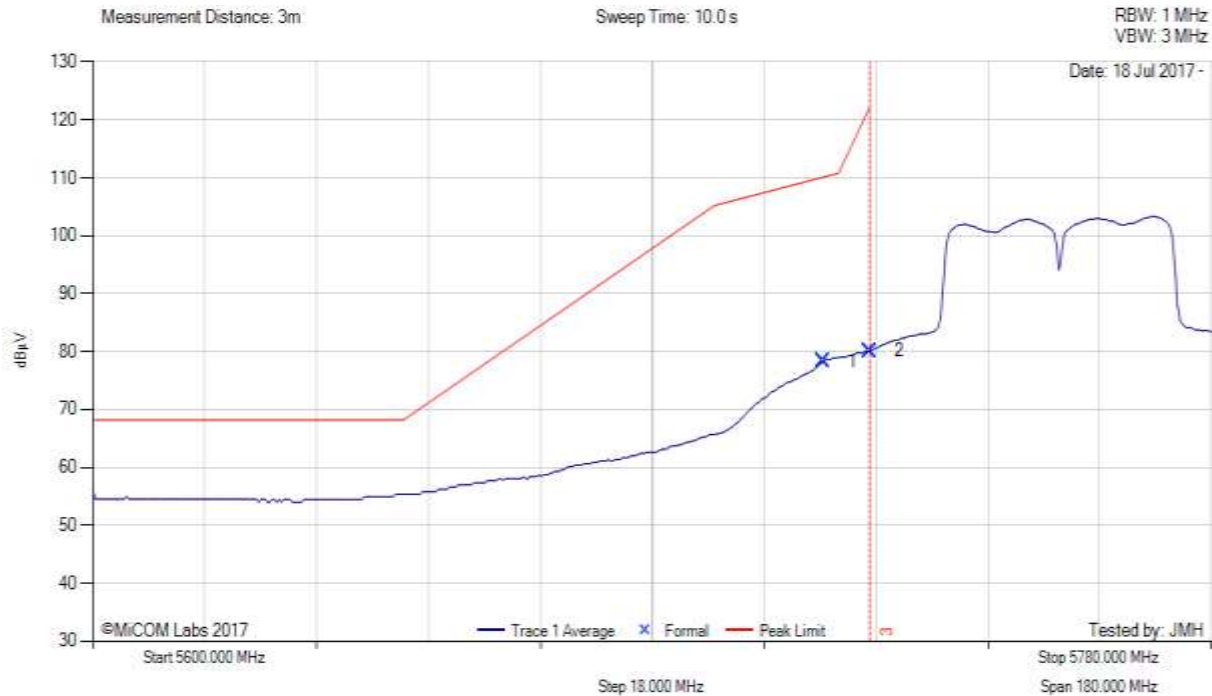
| 5600.00 - 5780.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5715.00       | 29.70    | 3.81          | 34.34 | 67.85        | Max Avg          | Horizontal | 119    | 6       | 109.4        | -41.6     | Pass       |
| 2                     | 5725.00       | 40.14    | 3.79          | 34.35 | 78.28        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -43.9     | Pass       |
| 3                     | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

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### 5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5755.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



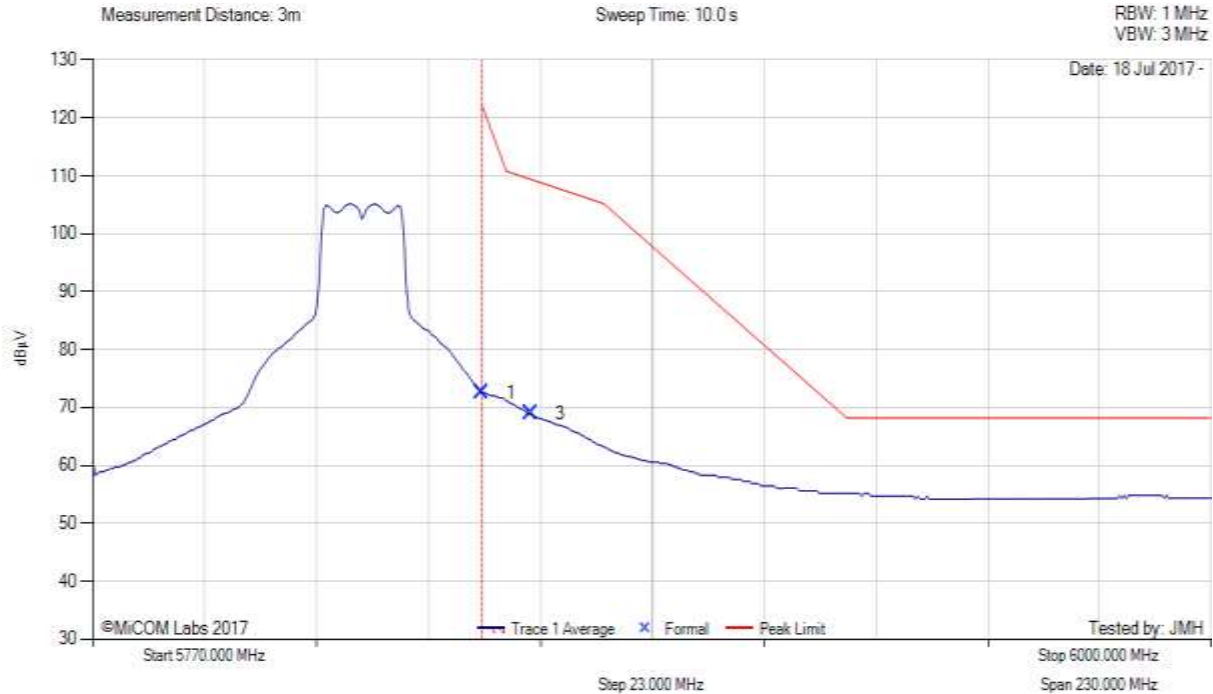
| 5600.00 - 5780.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5717.53       | 40.21    | 3.81          | 34.34 | 78.36        | Max Avg          | Horizontal | 119    | 6       | 110.2        | -31.9     | Pass       |
| 2                     | 5725.00       | 42.00    | 3.79          | 34.35 | 80.14        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -42.1     | Pass       |
| 3                     | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

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### 5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5825.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



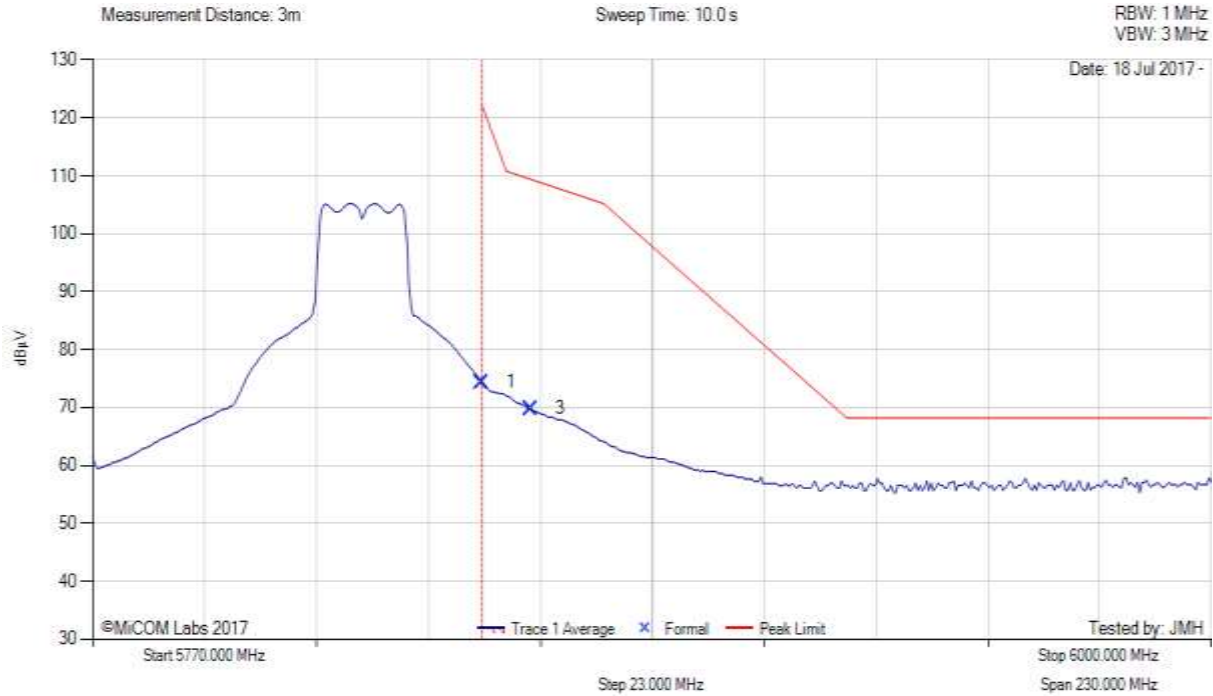
| 5770.00 - 6000.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5850.00       | 34.14    | 3.81          | 34.63 | 72.58        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -49.6     | Pass       |
| 3                     | 5860.00       | 30.42    | 3.86          | 34.65 | 68.93        | Max Avg          | Horizontal | 119    | 6       | 109.4        | -40.5     | Pass       |
| 2                     | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

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### 5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5825.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



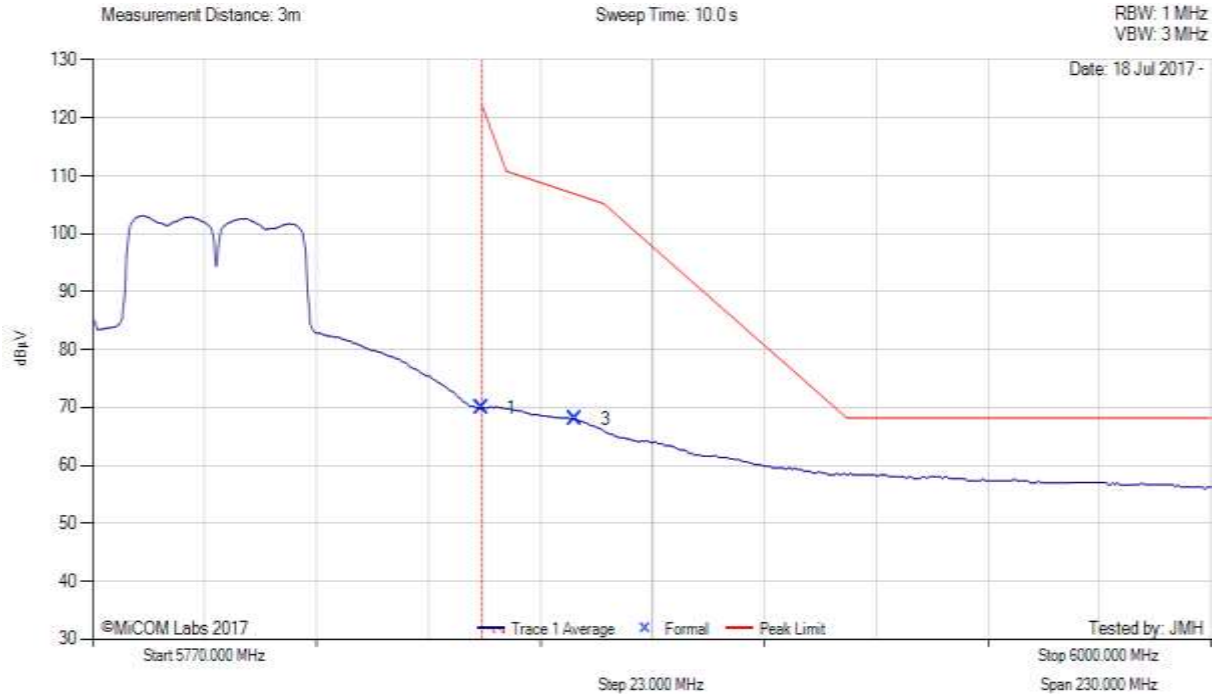
| 5770.00 - 6000.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5850.00       | 35.88    | 3.81          | 34.63 | 74.32        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -47.9     | Pass       |
| 3                     | 5860.00       | 31.25    | 3.86          | 34.65 | 69.76        | Max Avg          | Horizontal | 119    | 6       | 109.4        | -39.6     | Pass       |
| 2                     | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

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### 5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5795.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



| 5770.00 - 6000.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5850.00       | 31.47    | 3.81          | 34.63 | 69.91        | Max Avg          | Horizontal | 119    | 6       | 122.2        | -52.3     | Pass       |
| 3                     | 5869.22       | 29.52    | 3.82          | 34.68 | 68.02        | Max Avg          | Horizontal | 119    | 6       | 106.9        | -38.9     | Pass       |
| 2                     | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

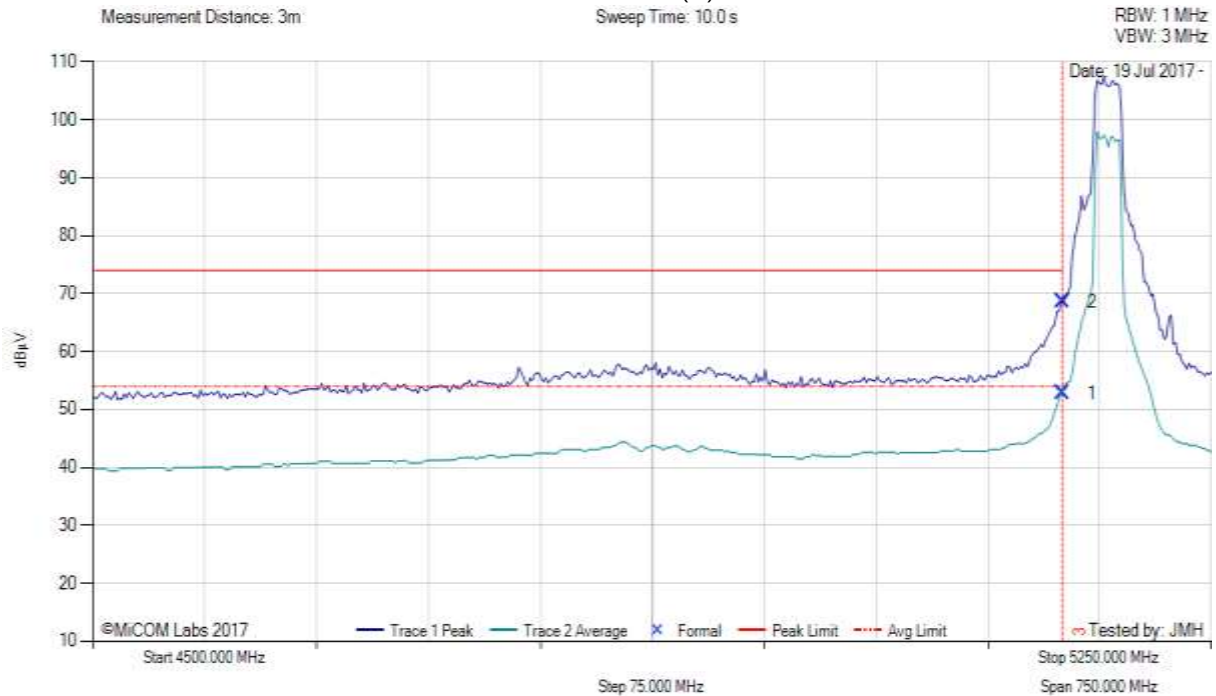
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#### A.4.2.4. YAGEO ANT300P002B24553



#### RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5180.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 17, Duty Cycle (%): 99



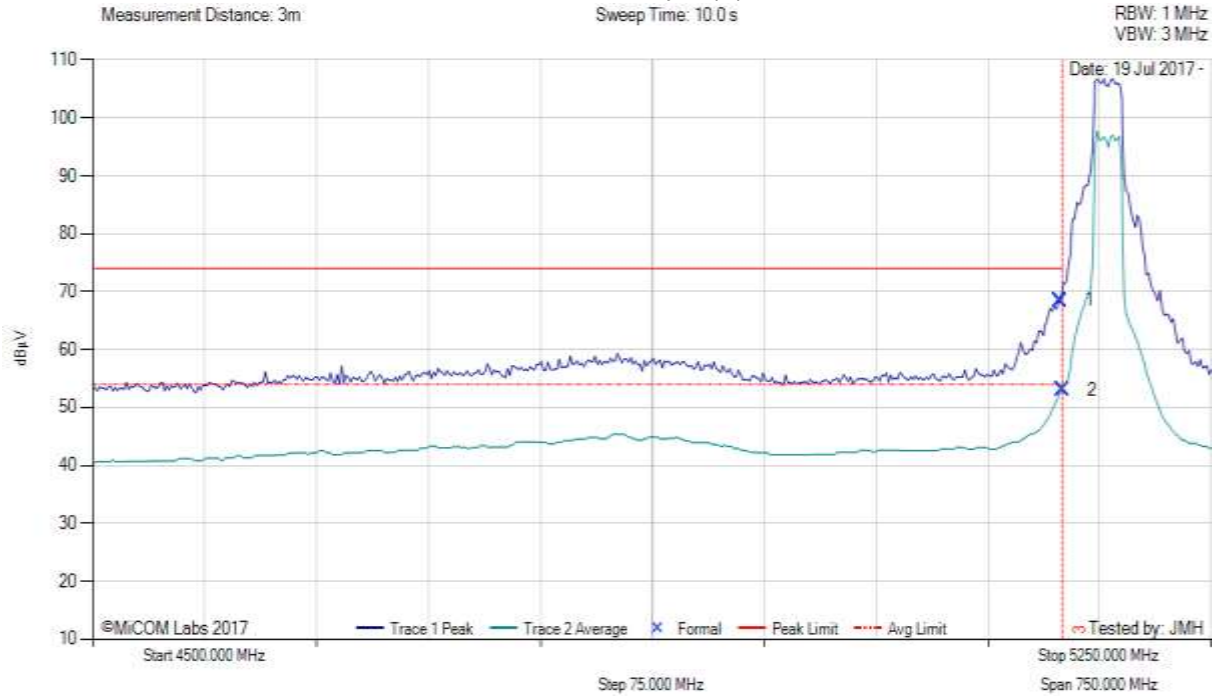
| 4500.00 - 5250.00 MHz |               |          |               |       |              |                  |          |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5150.00       | 15.07    | 3.67          | 34.11 | 52.85        | Max Avg          | Vertical | 179    | 178     | 54.0         | -1.2      | Pass       |
| 2                     | 5150.00       | 30.89    | 3.67          | 34.11 | 68.67        | Max Peak         | Vertical | 179    | 178     | 74.0         | -5.3      | Pass       |
| 3                     | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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# RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5180.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 17, Duty Cycle (%): 99



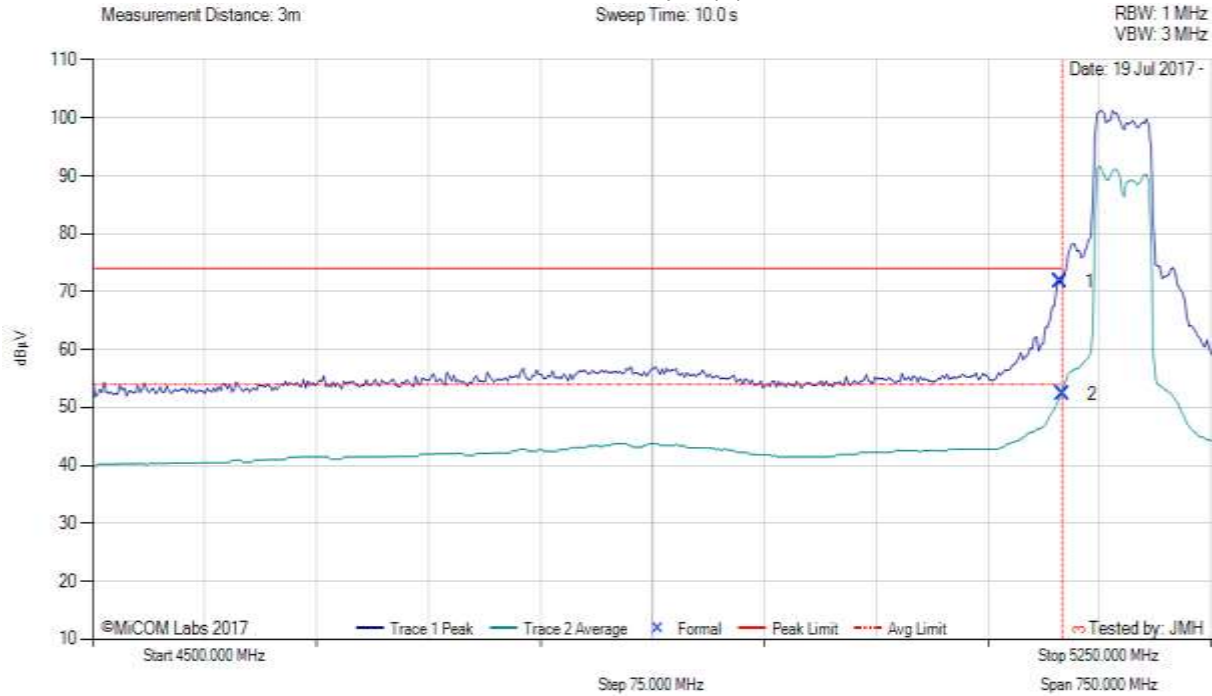
| 4500.00 - 5250.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5148.50       | 30.71    | 3.68          | 34.11 | 68.50        | Max Peak         | Horizontal | 179    | 178     | 74.0         | -5.5      | Pass       |
| 2                     | 5150.00       | 15.27    | 3.67          | 34.11 | 53.05        | Max Avg          | Horizontal | 179    | 178     | 54.0         | -1.0      | Pass       |
| 3                     | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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# RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5190.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 14, Duty Cycle (%): 99



| 4500.00 - 5250.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5148.50       | 33.95    | 3.68          | 34.11 | 71.74        | Max Peak         | Horizontal | 179    | 178     | 74.0         | -2.3      | Pass       |
| 2                     | 5150.00       | 14.55    | 3.67          | 34.11 | 52.33        | Max Avg          | Horizontal | 179    | 178     | 54.0         | -1.7      | Pass       |
| 3                     | 5150.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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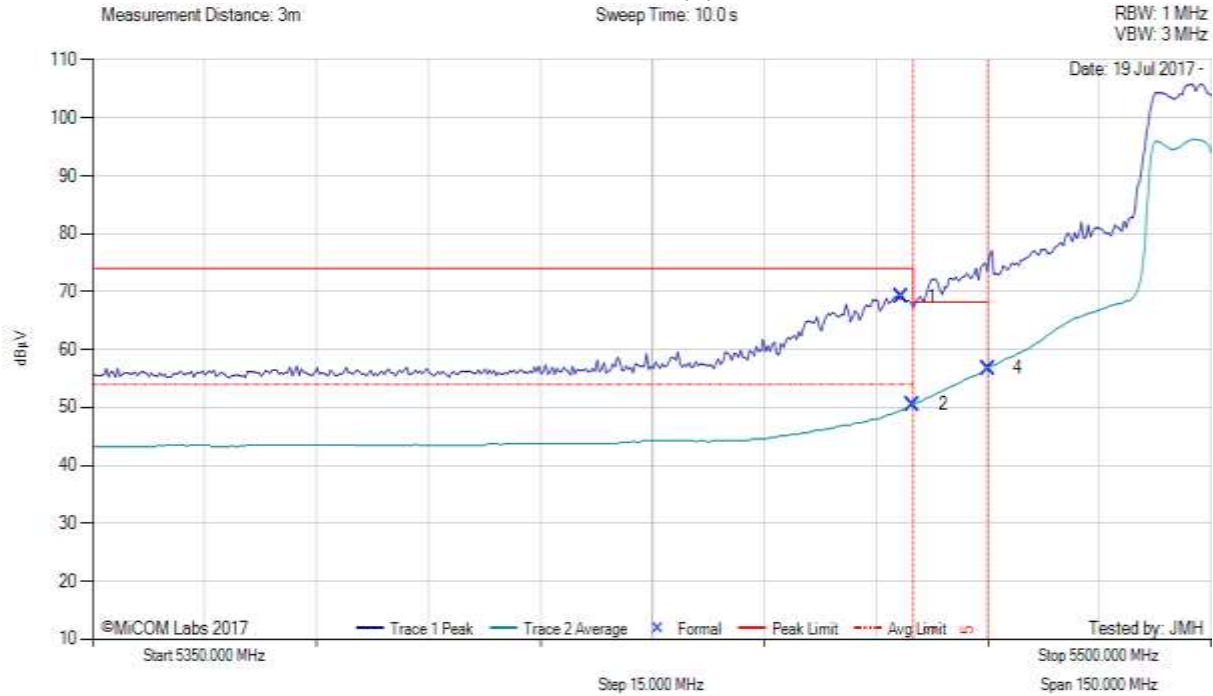


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
**Page:** 284 of 298



#### RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5500.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 16, Duty Cycle (%): 99



| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |          |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5458.50       | 31.05    | 3.80          | 34.30 | 69.15        | Max Peak         | Vertical | 191    | 180     | 74.0         | -4.9      | Pass       |
| 2                     | 5460.00       | 12.39    | 3.79          | 34.31 | 50.49        | Max Avg          | Vertical | 191    | 180     | 54.0         | -3.5      | Pass       |
| 4                     | 5470.00       | 18.71    | 3.76          | 34.32 | 56.79        | Max Avg          | Vertical | 191    | 180     | 68.2         | -11.4     | Pass       |
| 3                     | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| 5                     | 5470.00       | --       | --            | --    | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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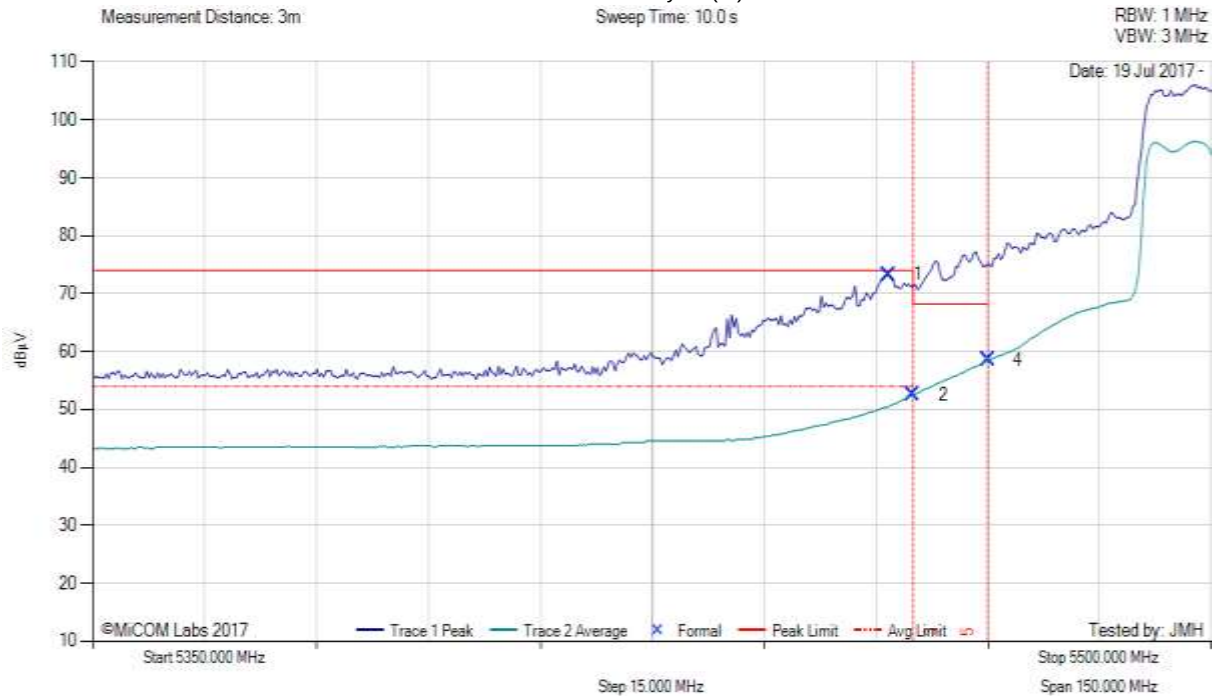


**Title:** HP Inc. 0960-4025 and 0960-4034  
**To:** FCC CFR 47 Part 15.407 & RSS-247  
**Serial #:** MARS11-U9 Rev B WiFi/BT Module  
**Issue Date:** 27th October 2017  
**Page:** 285 of 298



#### RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5500.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 16, Duty Cycle (%): 99



| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |          |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5456.69       | 35.18    | 3.80          | 34.30 | 73.28        | Max Peak         | Vertical | 191    | 180     | 74.0         | -0.7      | Pass       |
| 2                     | 5460.00       | 14.47    | 3.79          | 34.31 | 52.57        | Max Avg          | Vertical | 191    | 180     | 54.0         | -1.4      | Pass       |
| 4                     | 5470.00       | 20.41    | 3.76          | 34.32 | 58.49        | Max Avg          | Vertical | 191    | 180     | 68.2         | -9.7      | Pass       |
| 3                     | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| 5                     | 5470.00       | --       | --            | --    | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

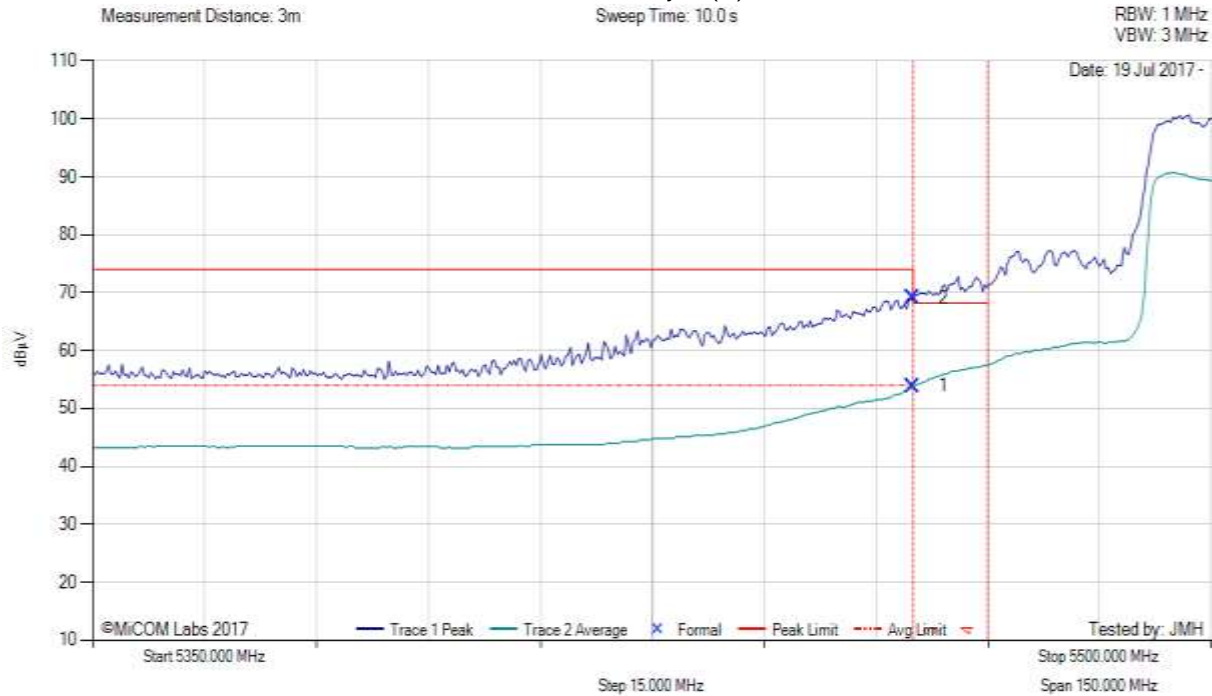
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# RESTRICTED LOWER BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5510.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 14, Duty Cycle (%): 99



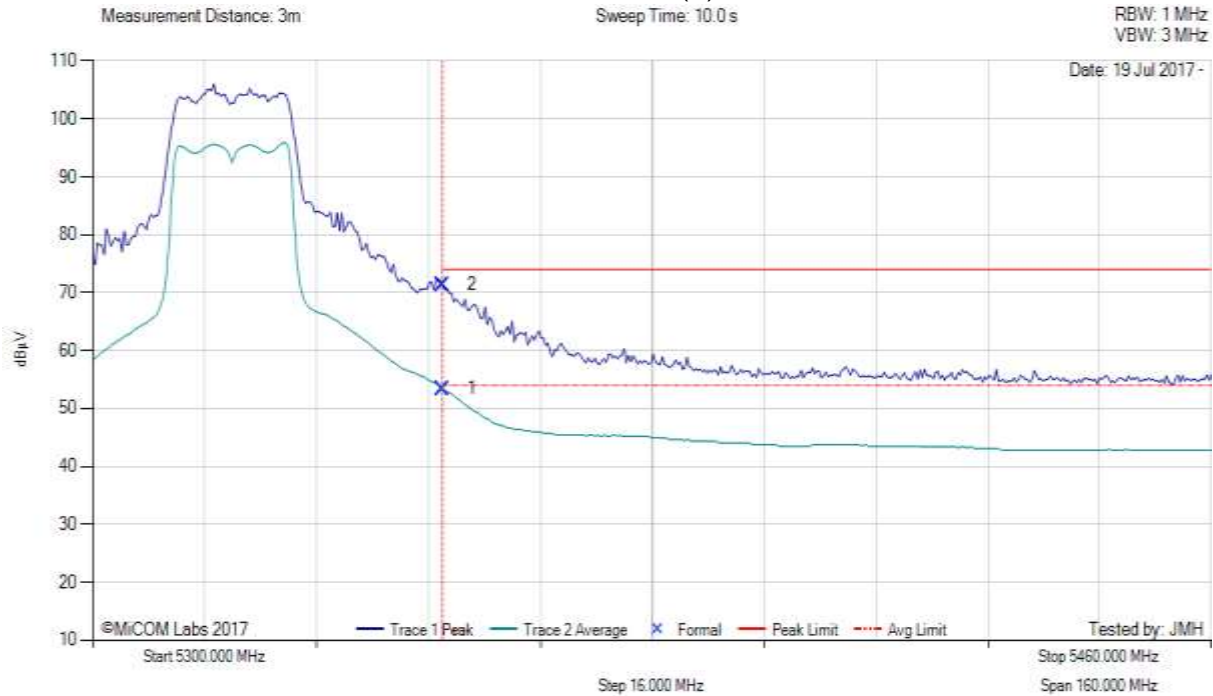
| 5350.00 - 5500.00 MHz |               |          |               |       |              |                  |          |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5460.00       | 15.78    | 3.79          | 34.31 | 53.88        | Max Avg          | Vertical | 191    | 180     | 54.0         | -0.1      | Pass       |
| 2                     | 5460.00       | 31.05    | 3.79          | 34.31 | 69.15        | Max Peak         | Vertical | 191    | 180     | 74.0         | -4.9      | Pass       |
| 3                     | 5460.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |
| 4                     | 5470.00       | --       | --            | --    | --           | Band-Edge        | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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# RESTRICTED UPPER BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5320.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 16, Duty Cycle (%): 99



| 5300.00 - 5460.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5350.00       | 15.18    | 3.70          | 34.51 | 53.39        | Max Avg          | Horizontal | 199    | 181     | 54.0         | -0.6      | Pass       |
| 2                     | 5350.00       | 33.17    | 3.70          | 34.51 | 71.38        | Max Peak         | Horizontal | 199    | 181     | 74.0         | -2.6      | Pass       |
| 3                     | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |

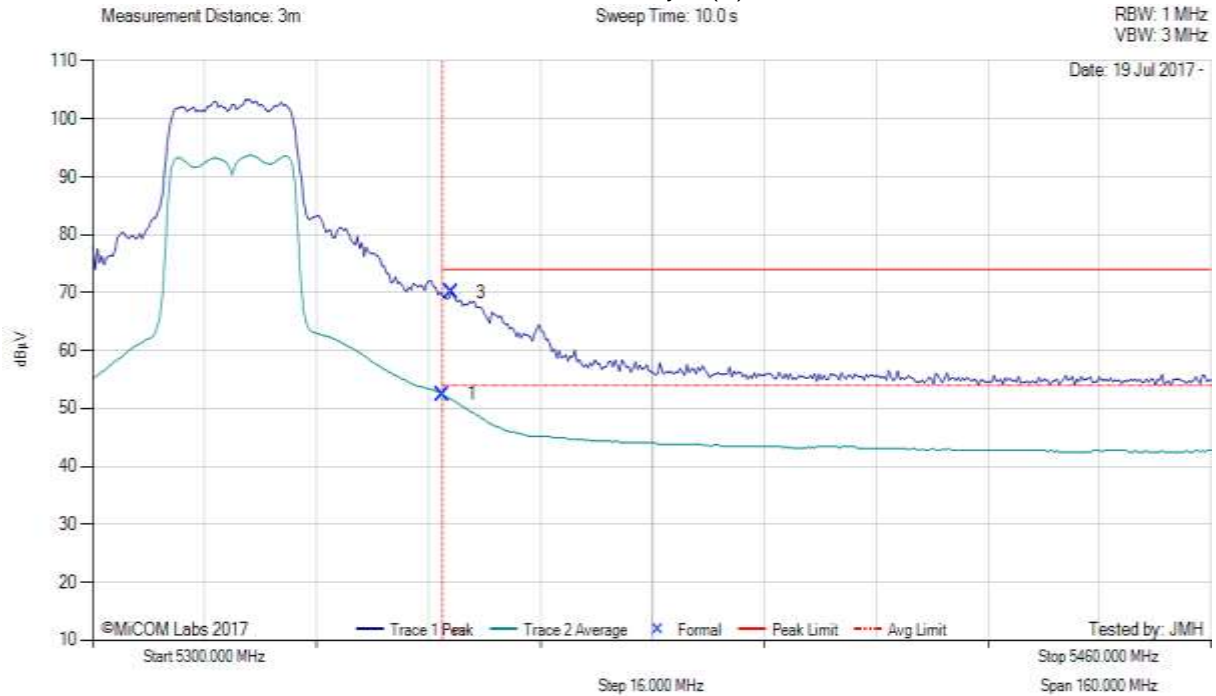
**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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# RESTRICTED UPPER BAND-EDGE EMISSIONS

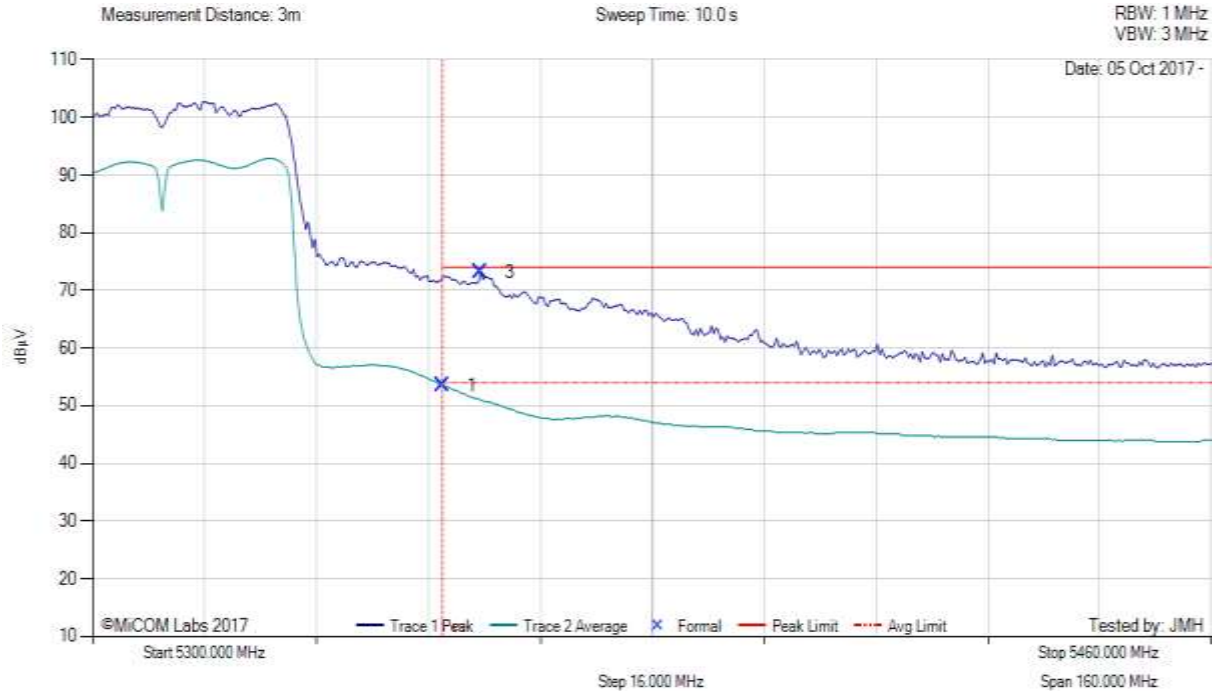
Variant: 802.11n HT-20, Test Freq: 5320.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 15, Duty Cycle (%): 99



| 5300.00 - 5460.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5350.00       | 14.23    | 3.70          | 34.51 | 52.44        | Max Avg          | Horizontal | 199    | 181     | 54.0         | -1.6      | Pass       |
| 3                     | 5351.28       | 31.87    | 3.71          | 34.51 | 70.09        | Max Peak         | Horizontal | 199    | 181     | 74.0         | -3.9      | Pass       |
| 2                     | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B. Power reduced to meet Band Edge Limit.

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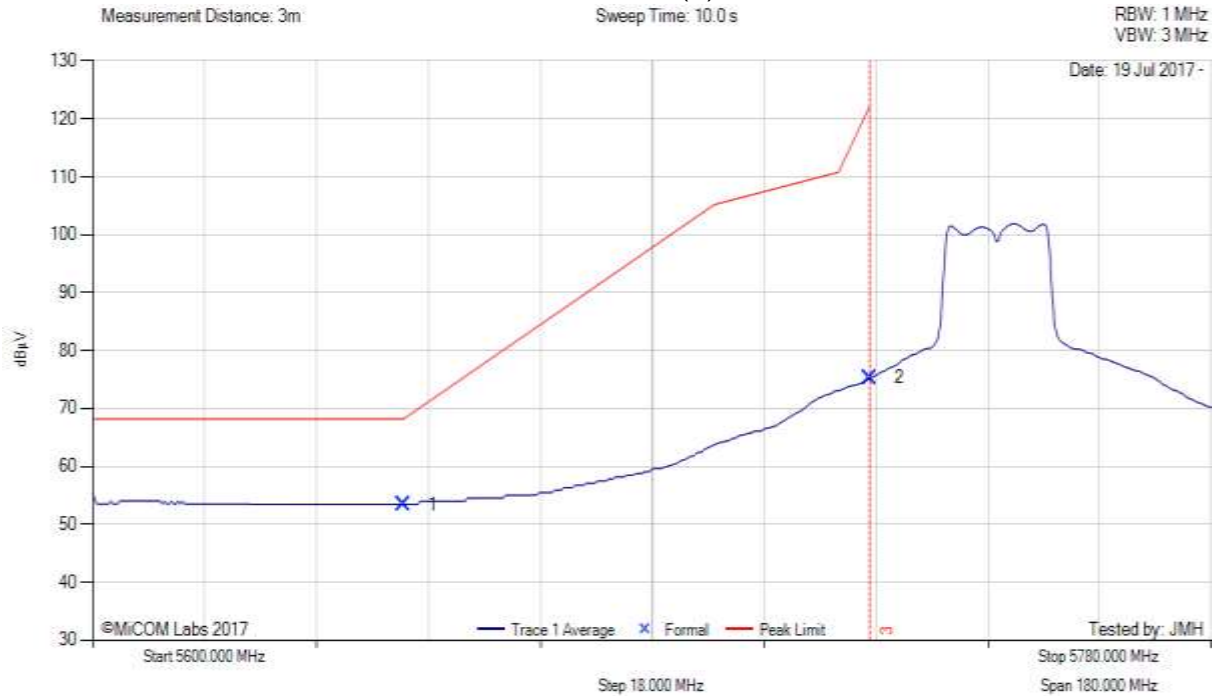
| 5300.00 - 5460.00 MHz |               |          |               |       |              |                  |          |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5350.00       | 14.08    | 3.70          | 35.80 | 53.58        | Max Avg          | Vertical | 158    | 291     | 54.0         | -0.4      | Pass       |
| 3                     | 5355.45       | 33.65    | 3.71          | 35.80 | 73.16        | Max Peak         | Vertical | 158    | 291     | 74.0         | -0.8      | Pass       |
| 2                     | 5350.00       | --       | --            | --    | --           | Restricted-Band  | --       | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot.

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### 5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5745.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 20, Duty Cycle (%): 99



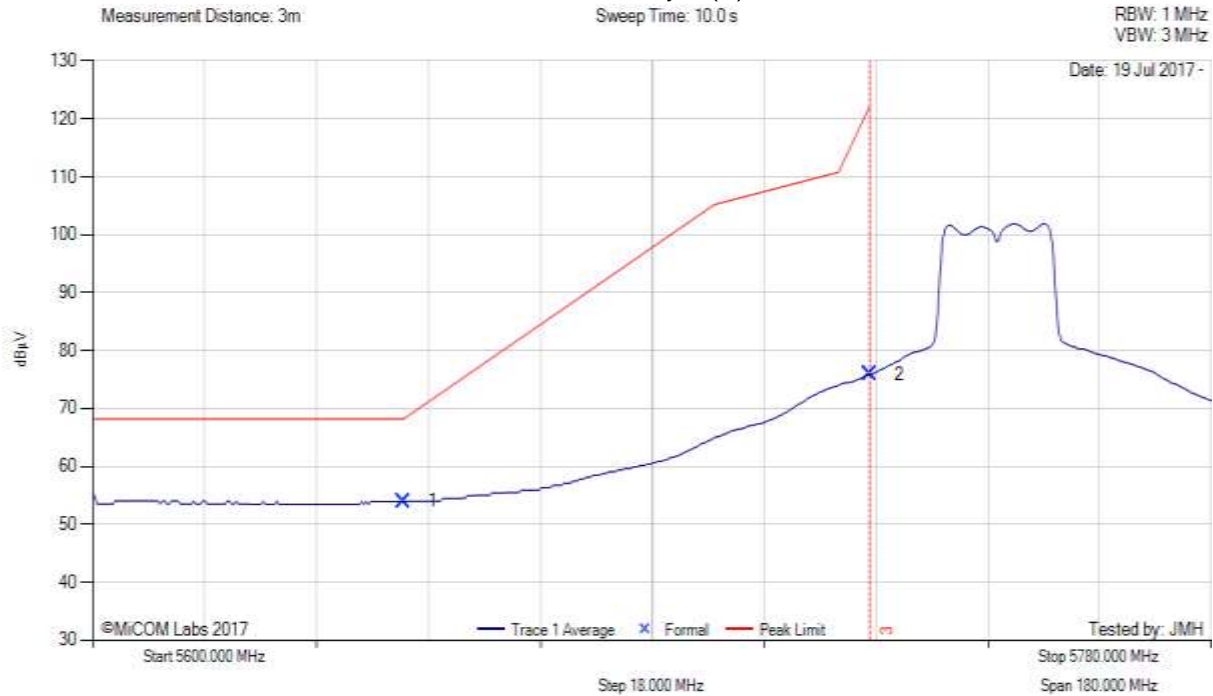
| 5600.00 - 5780.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5650.00       | 15.52    | 3.75          | 34.18 | 53.45        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -14.8     | Pass       |
| 2                     | 5725.00       | 37.16    | 3.79          | 34.35 | 75.30        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -46.9     | Pass       |
| 3                     | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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### 5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5745.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 20, Duty Cycle (%): 99



| 5600.00 - 5780.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5650.00       | 16.05    | 3.75          | 34.18 | 53.98        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -14.3     | Pass       |
| 2                     | 5725.00       | 37.81    | 3.79          | 34.35 | 75.95        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -46.3     | Pass       |
| 3                     | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

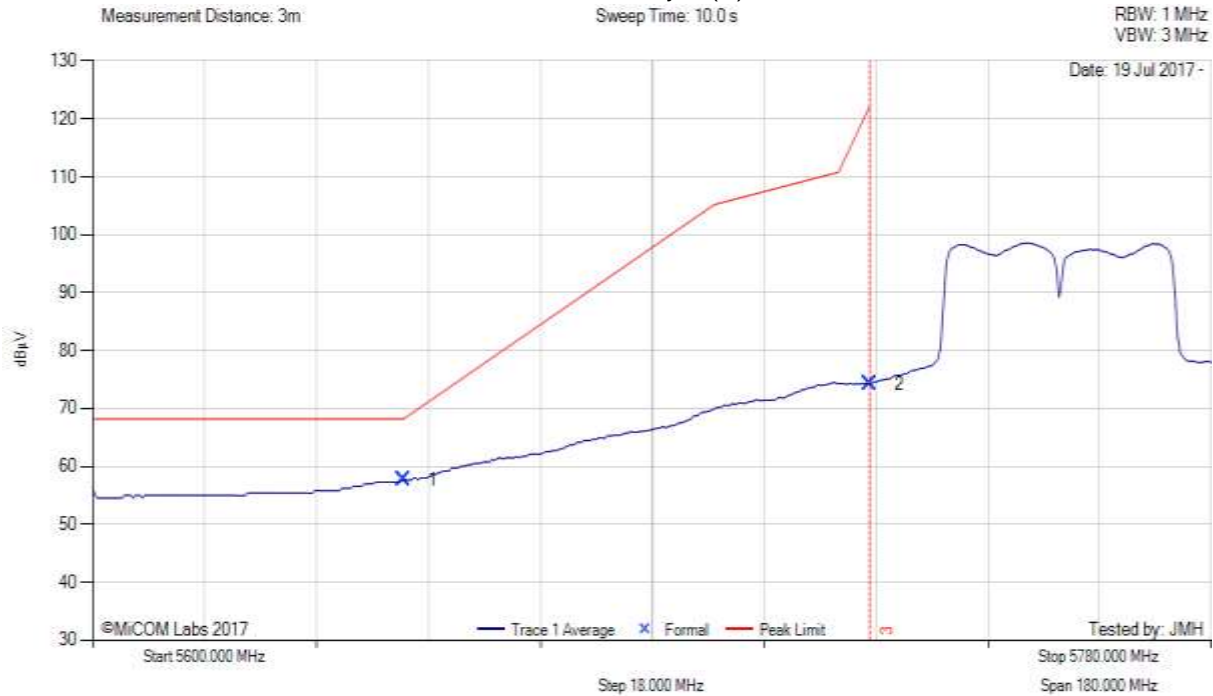
**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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### 5725 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5755.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 20, Duty Cycle (%): 99



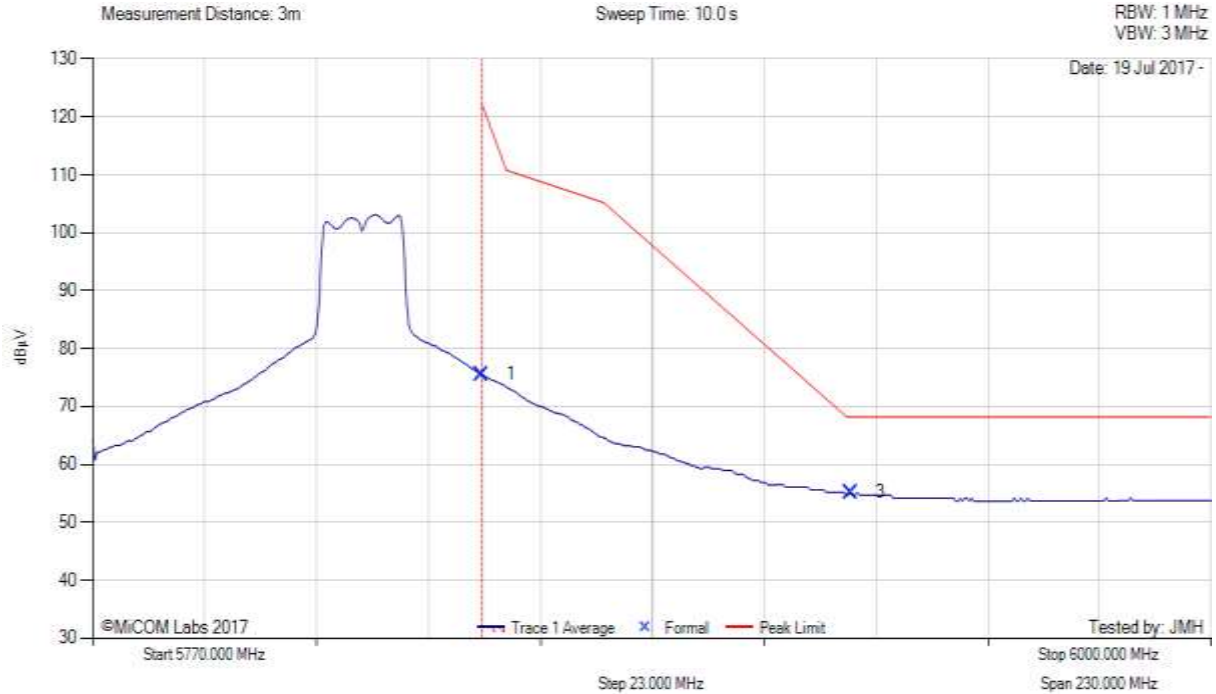
| 5600.00 - 5780.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5650.00       | 19.74    | 3.75          | 34.18 | 57.67        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -10.6     | Pass       |
| 2                     | 5725.00       | 36.16    | 3.79          | 34.35 | 74.30        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -47.9     | Pass       |
| 3                     | 5725.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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### 5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11a, Test Freq: 5825.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 22, Duty Cycle (%): 99



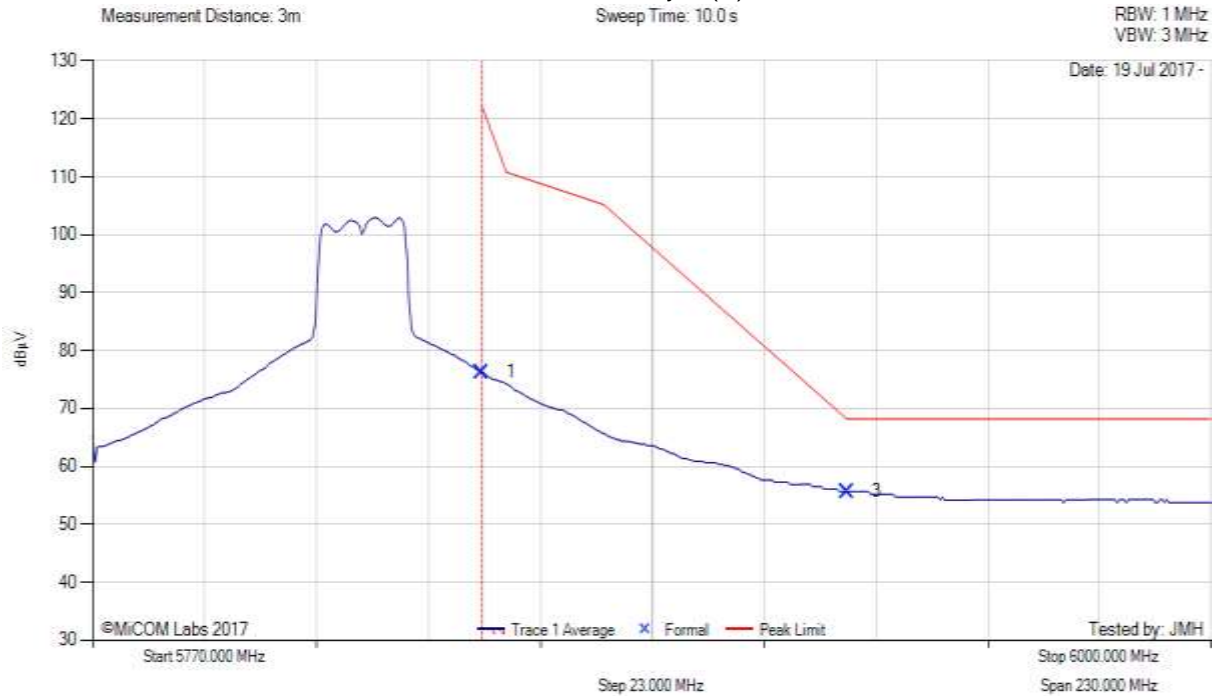
| 5770.00 - 6000.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5850.00       | 37.09    | 3.81          | 34.63 | 75.53        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -46.7     | Pass       |
| 3                     | 5925.92       | 16.54    | 3.84          | 34.82 | 55.20        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -13.0     | Pass       |
| 2                     | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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### 5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-20, Test Freq: 5825.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 22, Duty Cycle (%): 99



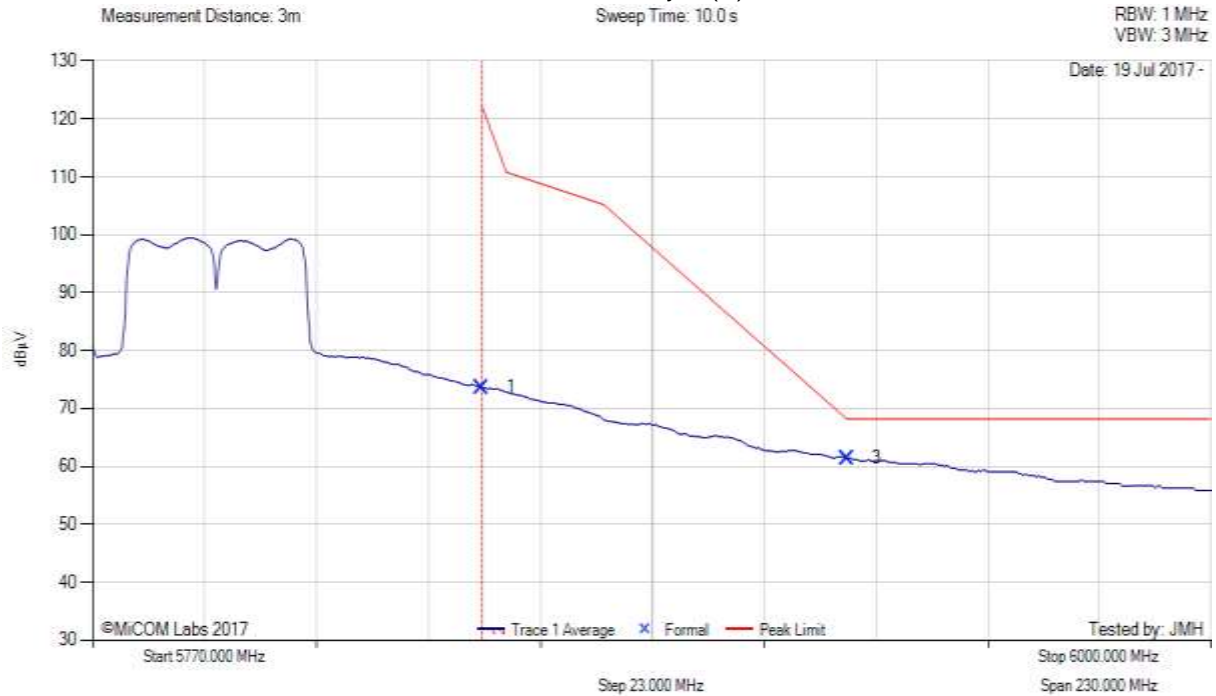
| 5770.00 - 6000.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5850.00       | 37.79    | 3.81          | 34.63 | 76.23        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -46.0     | Pass       |
| 3                     | 5925.00       | 17.00    | 3.84          | 34.82 | 55.66        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -12.6     | Pass       |
| 2                     | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

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### 5850 MHz RADIATED BAND-EDGE EMISSIONS

Variant: 802.11n HT-40, Test Freq: 5795.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 22, Duty Cycle (%): 99



| 5770.00 - 6000.00 MHz |               |          |               |       |              |                  |            |        |         |              |           |            |
|-----------------------|---------------|----------|---------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| Num                   | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB | Level dBμV/m | Measurement Type | Pol        | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                     | 5850.00       | 35.17    | 3.81          | 34.63 | 73.61        | Max Avg          | Horizontal | 122    | 179     | 122.2        | -48.6     | Pass       |
| 3                     | 5925.00       | 22.79    | 3.84          | 34.82 | 61.45        | Max Avg          | Horizontal | 122    | 179     | 68.2         | -6.8      | Pass       |
| 2                     | 5850.00       | --       | --            | --    | --           | Band-Edge        | --         | --     | --      | --           | --        | --         |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Port B.

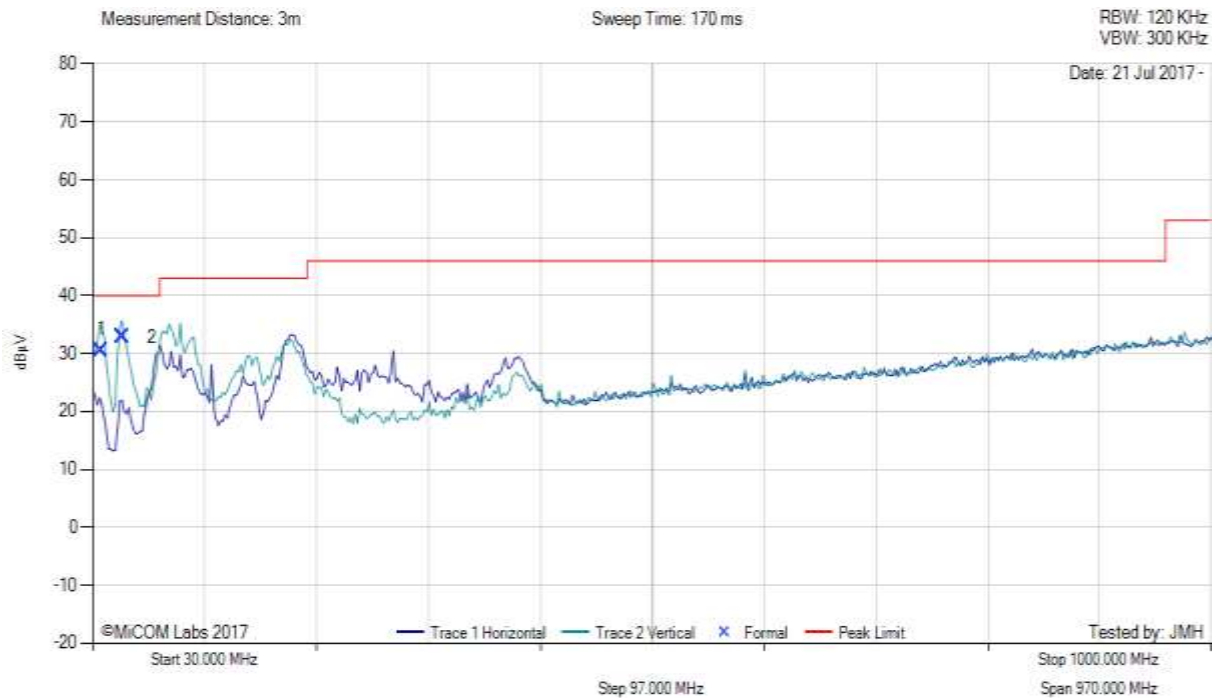
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### A.4.3. Digital Emissions



#### DIGITAL EMISSIONS

Variant: 802.11a, Test Freq: 5745.00 MHz, Antenna: Integral, Power Setting: 22, Duty Cycle (%): 99



| 30.00 - 1000.00 MHz |               |          |               |        |              |                  |          |        |         |              |           |            |
|---------------------|---------------|----------|---------------|--------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                 | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                   | 37.10         | 43.16    | 3.48          | -16.06 | 30.58        | MaxQP            | Vertical | 107    | 189     | 40.0         | -9.4      | Pass       |
| 2                   | 55.44         | 53.35    | 3.61          | -24.13 | 32.83        | MaxQP            | Vertical | 101    | 281     | 40.0         | -7.2      | Pass       |

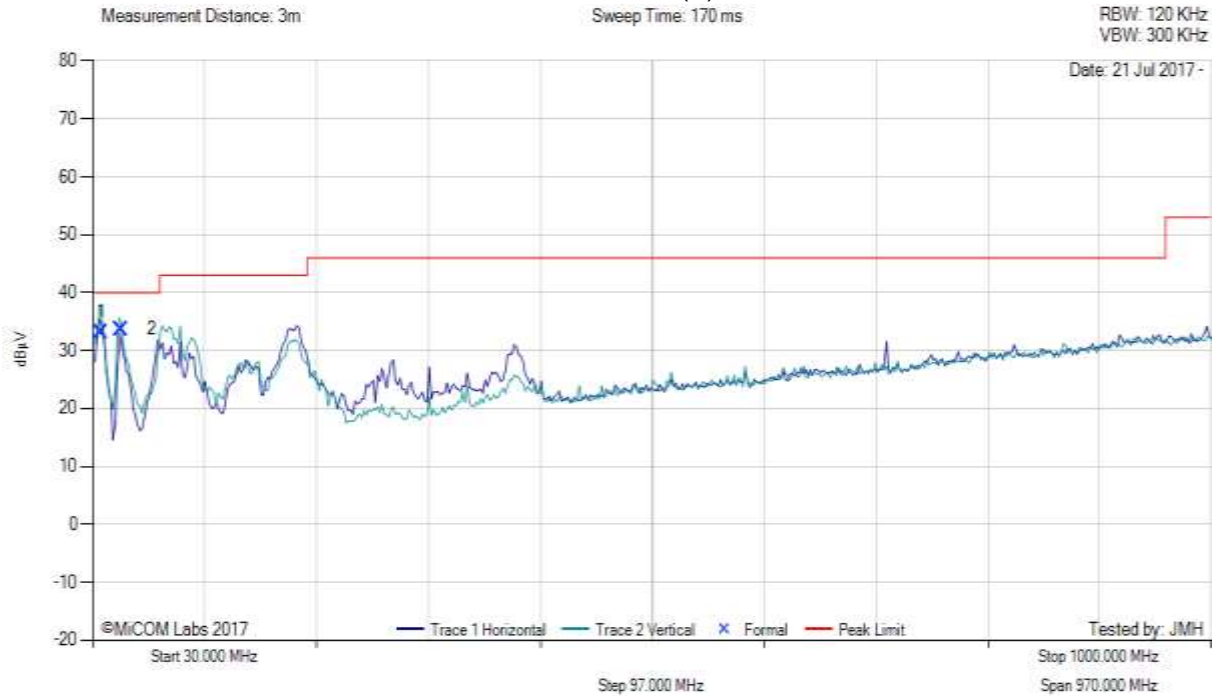
**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Laptop put into suspend mode to limit 50 MHz harmonics from support equipment. TX on 5745

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#### DIGITAL EMISSIONS

Variant: 802.11a, Test Freq: 5745.00 MHz, Antenna: YAGEO ANT300P002B24553, Power Setting: 22, Duty Cycle (%): 99



| 30.00 - 1000.00 MHz |               |          |               |        |              |                  |          |        |         |              |           |            |
|---------------------|---------------|----------|---------------|--------|--------------|------------------|----------|--------|---------|--------------|-----------|------------|
| Num                 | Frequency MHz | Raw dBμV | Cable Loss dB | AF dB  | Level dBμV/m | Measurement Type | Pol      | Hgt cm | Azt Deg | Limit dBμV/m | Margin dB | Pass /Fail |
| 1                   | 37.29         | 45.69    | 3.48          | -16.06 | 33.11        | MaxQP            | Vertical | 98     | 215     | 40.0         | -6.9      | Pass       |
| 2                   | 55.00         | 54.26    | 3.61          | -24.13 | 33.74        | MaxQP            | Vertical | 100    | 287     | 40.0         | -6.3      | Pass       |

**Test Notes:** EUT powered by 5V ps, connected to Laptop via SD slot. Laptop put into suspend mode to limit 50 MHz harmonics from support equipment. TX on 5745

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