



**FCC 47 CFR PART 15 SUBPART E  
ISED RSS-247 ISSUE 2**

**CERTIFICATION TEST REPORT**

*For*

**WIFI+BT module  
MODEL NUMBER: WCT0LR2201J**

**FCC ID: 2AC23-WCT0LR2201J  
IC: 12290A-WCT0LR2201J**

**REPORT NUMBER: 4788196596.1-4**

**ISSUE DATE: November 30, 2017**

*Prepared for*

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Revision History

| Rev. | Issue Date | Revisions     | Revised By |
|------|------------|---------------|------------|
| --   | 9/30/2017  | Initial Issue |            |

| Summary of Test Results |                                           |                                                                                        |              |
|-------------------------|-------------------------------------------|----------------------------------------------------------------------------------------|--------------|
| Clause                  | Test Items                                | FCC/IC Rules                                                                           | Test Results |
| 1                       | 6/26db Bandwidth                          | FCC 15.407 (a)&(e)<br>RSS-247 Clause 6.2                                               | PASS         |
| 2                       | 99% Bandwidth                             | RSS-Gen Clause 6.6                                                                     | PASS         |
| 3                       | Maximum Conducted Output Power            | FCC 15.407 (a)<br>RSS-247 Clause 6.2                                                   | PASS         |
| 4                       | Power Spectral Density                    | FCC 15.407 (a)<br>RSS-247 Clause 6.2                                                   | PASS         |
| 5                       | Antenna Conducted Spurious Emission       | FCC 15.407 (b)<br>RSS-247 Clause 6.2                                                   | PASS         |
| 6                       | Radiated Bandedge and Spurious Emission   | FCC 15.407 (a)<br>FCC 15.209<br>FCC 15.205<br>RSS-247 Clause 6.2<br>RSS-GEN Clause 8.9 | PASS         |
| 7                       | Conducted Emission Test For AC Power Port | FCC 15.207<br>RSS-GEN Clause 8.8                                                       | PASS         |
| 8                       | Antenna Requirement                       | FCC 15.203<br>RSS-GEN Clause 8.3                                                       | PASS         |
| 9                       | Frequency Stability                       | FCC 15.407 (g)                                                                         | PASS         |

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## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: Hui Zhou Gaoshengda Technology Co.,LTD  
Address: HuaXing RD,NO 2,ZhongKai High Technology Development Area,Huizhou,Guangdong, China

### Manufacturer Information

Company Name: Hui Zhou Gaoshengda Technology Co.,LTD  
Address: HuaXing RD,NO 2,ZhongKai High Technology Development Area,Huizhou,Guangdong, China

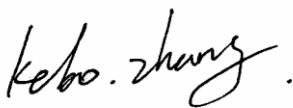
### EUT Description

Product Name: WIFI+BT module  
Brand Name: GSD  
Model Name: WCT0LR2201J  
Sample ID: 1220986  
Sample Status: Good  
Sample Received date: October 20, 2017  
Date Tested: October 23~November 27, 2017

| APPLICABLE STANDARDS     |              |
|--------------------------|--------------|
| STANDARD                 | TEST RESULTS |
| CFR 47 Part 15 Subpart E | Pass         |
| ISED RSS-247 Issue 2     | Pass         |
| ISED RSS-GEN Issue 4     | Pass         |

Tested By:

Checked By:



Kebo Zhang  
Engineer  
Approved By:

Shawn Wen  
Laboratory Leader



Stephen Guo  
Laboratory Manager

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 789033 D02 v02r01, KDB 662911 D01 v02r01, RSS-GEN Issue 4, RSS-247 Issue 2 and KDB414788 D01 Radiated Test Site v01.

## 3. FACILITIES AND ACCREDITATIO

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Location             | UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Address                   | Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Accreditation Certificate | UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. The Certificate Registration Number is 4102.01.<br>UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission).<br>The Designation Number is CN1187.<br>UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. EMC Laboratory has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320. |

Note: The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognize national standards.

### 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Test Item                                                                                                                                     | Uncertainty         |
|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Uncertainty for Conduction emission test                                                                                                      | 2.90dB              |
| Uncertainty for Radiation Emission test(include Fundamental emission)<br>(9KHz-30MHz)                                                         | 2.2dB               |
| Uncertainty for Radiation Emission test(include Fundamental emission)<br>(30MHz-1GHz)                                                         | 4.52dB              |
| Uncertainty for Radiation Emission test<br>(1GHz to 26GHz)( include Fundamental emission)                                                     | 5.04dB(1-6GHz)      |
|                                                                                                                                               | 5.30dB (6GHz-18Gz)  |
|                                                                                                                                               | 5.23dB (18GHz-26Gz) |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. |                     |



## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

|                  |                |
|------------------|----------------|
| Equipment        | WIFI+BT module |
| Model Name       | WCT0LR2201J    |
| Power Supply     | AC120V/60Hz    |
| Hardware Version | V1.0           |
| Software Version | V1.2           |

### 5.2. MAXIMUM OUTPUT POWER

| Frequency Range (MHz) | IEE Std. 802.11 | Frequency (MHz) | Max Power (dBm) | Max EIRP (dBm) |
|-----------------------|-----------------|-----------------|-----------------|----------------|
| UNII-1                | a               | 5150-5250       | 13.95           | 17.69          |
| UNII-3                | a               | 5725-5850       | 14.08           | N/A            |
| UNII-1                | n(HT20)         | 5150-5250       | 15.92           | 19.66          |
| UNII-3                | n(HT20)         | 5725-5850       | 16.02           | N/A            |
| UNII-1                | n(HT40)         | 5150-5250       | 15.87           | 19.61          |
| UNII-3                | n(HT40)         | 5725-5850       | 16.03           | N/A            |
| UNII-1                | ac(HT20)        | 5150-5250       | 13.02           | 16.76          |
| UNII-3                | ac(HT20)        | 5725-5850       | 13.04           | N/A            |
| UNII-1                | ac(HT40)        | 5150-5250       | 12.97           | 16.71          |
| UNII-3                | ac(HT40)        | 5725-5850       | 13.17           | N/A            |
| UNII-1                | ac(HT80)        | 5150-5250       | 13.11           | 16.85          |
| UNII-3                | ac(HT80)        | 5725-5850       | 12.13           | N/A            |

### 5.3. CHANNEL LIST

| UNII-1  |                 | UNII-1  |                 | UNII-1  |                 |
|---------|-----------------|---------|-----------------|---------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 36      | 5180            | 38      | 5190            | 42      | 5210            |
| 40      | 5200            | 46      | 5230            |         |                 |
| 44      | 5220            |         |                 |         |                 |
| 48      | 5240            |         |                 |         |                 |

| UNII-3  |                 | UNII-3  |                 | UNII-3  |                 |
|---------|-----------------|---------|-----------------|---------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 149     | 5745            | 151     | 5755            | 155     | 5775            |
| 153     | 5765            | 159     | 5795            |         |                 |
| 157     | 5785            |         |                 |         |                 |
| 161     | 5805            |         |                 |         |                 |
| 165     | 5825            |         |                 |         |                 |

### 5.4. TEST CHANNEL CONFIGURATION

| Pretest Test Mode | Description                                 |
|-------------------|---------------------------------------------|
| Mode 1            | TX A Mode / CH36, CH40, CH48 (UNII-1)       |
| Mode 2            | TX N20 Mode / CH36, CH40, CH48 (UNII-1)     |
| Mode 3            | TX N40 Mode / CH38, CH46 (UNII-1)           |
| Mode 4            | TX AC20 Mode / CH36, CH40, CH48 (UNII-1)    |
| Mode 5            | TX AC40 Mode / CH38, CH46 (UNII-1)          |
| Mode 6            | TX AC80 Mode / CH42 (UNII-1)                |
| Mode 7            | TX A Mode / CH149, CH157, CH165 (UNII-3)    |
| Mode 8            | TX N20 Mode / CH149, CH157, CH165 (UNII-3)  |
| Mode 9            | TX N40 Mode / CH151, CH159 (UNII-3)         |
| Mode 10           | TX AC20 Mode / CH149, CH157, CH165 (UNII-3) |
| Mode 11           | TX AC40 Mode / CH151, CH159 (UNII-3)        |
| Mode 12           | TX AC80 Mode / CH155 (UNII-3)               |

## 5.5. THE WORSE CASE POWER SETTING PARAMETER

| The Worst Case Power Setting Parameter under UNII-1 and UNII-3 Band |  |         |  |  |  |
|---------------------------------------------------------------------|--|---------|--|--|--|
| Test Software                                                       |  | REALTEK |  |  |  |

| Band   | Mode | Rate | Channel | Antenna1 | Antenna2 |
|--------|------|------|---------|----------|----------|
| UNII-1 | 11a  | 6M   | 36      | 52       | 50       |
|        |      |      | 40      | 52       | 53       |
|        |      |      | 48      | 52       | 54       |
| UNII-3 | 11a  |      | 149     | 42       | 44       |
|        |      |      | 157     | 42       | 47       |
|        |      |      | 165     | 43       | 48       |

| Band   | Mode      | Rate | Channel | Antenna1 | Antenna2 |
|--------|-----------|------|---------|----------|----------|
| UNII-1 | 11n (20M) | MCS0 | 36      | 53       | 56       |
|        |           |      | 40      | 53       | 56       |
|        |           |      | 48      | 53       | 57       |
|        | 11n(40M)  |      | 38      | 42       | 45       |
|        |           |      | 46      | 53       | 56       |
| UNII-3 | 11n (20M) |      | 149     | 37       | 37       |
|        |           |      | 157     | 36       | 40       |
|        |           |      | 165     | 36       | 42       |
|        | 11n(40M)  |      | 151     | 36       | 37       |
|        |           |      | 159     | 36       | 40       |

| Band       | Mode       | Rate | Channel | Soft set value | Soft set value |
|------------|------------|------|---------|----------------|----------------|
| UNII-1     | 11ac (20M) | MCS0 | 36      | 48             | 49             |
|            |            |      | 40      | 48             | 49             |
|            |            |      | 48      | 48             | 49             |
|            | 11ac (40M) |      | 38      | 45             | 46             |
|            |            |      | 46      | 47             | 49             |
|            |            |      | 42      | 48             | 50             |
| UNII-3     | 11ac (20M) |      | 149     | 37             | 38             |
|            |            |      | 157     | 36             | 41             |
|            |            |      | 165     | 36             | 42             |
|            | 11ac (40M) |      | 151     | 35             | 37             |
|            |            |      | 159     | 35             | 40             |
|            |            |      | 155     | 36             | 39             |
| 11ac (80M) |            |      |         |                |                |

## 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

| Antenna No. | Frequency (MHz) | Antenna Type     | Antenna Gain (dBi) |
|-------------|-----------------|------------------|--------------------|
| ANT 2       | 5150-5250       | External Antenna | 3.73               |
|             | 5725-5850       |                  | 4.97               |
| Antenna 2   | 5150-5250       |                  | 3.73               |
|             | 5725-5850       |                  | 4.97               |

| IEE Std. 802.11                                                                                                                       | Transmit and Receive Mode | Description                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------------|
| a                                                                                                                                     | ☒2TX, 2RX                 | ANT 2 and ANTENNA 2 can be used as transmitting/receiving antenna. |
| n(MCS0-15)                                                                                                                            | ☒2TX, 2RX                 | ANT 2 and ANTENNA 2 can be used as transmitting/receiving antenna. |
| ac(MCS0-9)                                                                                                                            | ☒2TX, 2RX                 | ANT 2 and ANTENNA 2 can be used as transmitting/receiving antenna. |
| Note: 1. The EUT supports the diversity function for WLAN.<br>2. All the modes had been tested but only the worst data in the report. |                           |                                                                    |

## 5.7. TEST ENVIRONMENT

| Environment Parameter | Selected Values During Tests |              |
|-----------------------|------------------------------|--------------|
| Relative Humidity     | 55 ~ 65%                     |              |
| Atmospheric Pressure: | 1025Pa                       |              |
| Temperature           | TN                           | 23 ~ 28°C    |
| Voltage :             | VL                           | N/A          |
|                       | VN                           | AC 120V/60Hz |
|                       | VH                           | N/A          |

Note: VL= Lower Extreme Test Voltage  
VN= Nominal Voltage  
VH= Upper Extreme Test Voltage  
TN= Normal Temperature

## 5.8. WORST-CASE CONFIGURATIONS

| IEE Std.<br>802.11 | Modulation<br>Technology | Modulation Type             | Data Rate<br>(Mbps)   | Worst<br>Case<br>(Mbps) |
|--------------------|--------------------------|-----------------------------|-----------------------|-------------------------|
| a                  | OFDM                     | BPSK, QPSK, 16QAM,<br>64QAM | 54/48/36/24/18/12/9/6 | 6                       |

| 802.11n HT20/HT40 |     |            |                      |          |                      |          |                      |
|-------------------|-----|------------|----------------------|----------|----------------------|----------|----------------------|
| Antenna           | MCS | Modulation | HT20 Data Rate(Mbps) |          | HT40 Data Rate(Mbps) |          | Worst Case<br>(Mbps) |
|                   |     |            | GI=800ns             | GI=400ns | GI=800ns             | GI=400ns |                      |
| 2x2               | 8   | BPSK       | 13                   | 14.4     | 27                   | 30       | MCS8                 |
|                   | 9   | QPSK       | 26                   | 28.9     | 54                   | 60       | MCS8                 |
|                   | 10  | QPSK       | 39                   | 43.3     | 81                   | 90       | MCS8                 |
|                   | 11  | 16-QAM     | 52                   | 57.8     | 108                  | 120      | MCS8                 |
|                   | 12  | 16-QAM     | 78                   | 86.7     | 162                  | 180      | MCS8                 |
|                   | 13  | 64-QAM     | 104                  | 115.6    | 216                  | 240      | MCS8                 |
|                   | 14  | 64-QAM     | 117                  | 130      | 243                  | 270      | MCS8                 |
|                   | 15  | 64-QAM     | 130                  | 144.4    | 270                  | 300      | MCS8                 |

| 802.11ac HT20/HT40/HT80 |     |            |                          |          |                          |          |                          |          |                         |
|-------------------------|-----|------------|--------------------------|----------|--------------------------|----------|--------------------------|----------|-------------------------|
| Antenna                 | MCS | Modulation | HT20 Data Rate<br>(Mbps) |          | HT40 Data Rate<br>(Mbps) |          | HT80 Data Rate<br>(Mbps) |          | Worst<br>Case<br>(Mbps) |
|                         |     |            | GI=800ns                 | GI=400ns | GI=800ns                 | GI=400ns | GI=800ns                 | GI=400ns |                         |
| 2x2                     | 0   | BPSK       | 13                       | 14.4     | 27                       | 30       | 58.5                     | 65       | MCS0                    |
|                         | 1   | QPSK       | 26                       | 28.9     | 54                       | 60       | 117                      | 130      | MCS0                    |
|                         | 2   | QPSK       | 39                       | 43.3     | 81                       | 90       | 175.5                    | 195      | MCS0                    |
|                         | 3   | 16-QAM     | 52                       | 57.8     | 108                      | 120      | 234                      | 260      | MCS0                    |
|                         | 4   | 16-QAM     | 78                       | 86.7     | 162                      | 180      | 351                      | 390      | MCS0                    |
|                         | 5   | 64-QAM     | 104                      | 115.6    | 216                      | 240      | 468                      | 520      | MCS0                    |
|                         | 6   | 64-QAM     | 117                      | 130.3    | 243                      | 270      | 526.5                    | 585      | MCS0                    |
|                         | 7   | 64-QAM     | 130                      | 144.4    | 270                      | 300      | 585                      | 650      | MCS0                    |
|                         | 8   | 256-QAM    | 156                      | 173.3    | 324                      | 360      | 702                      | 780      | MCS0                    |
|                         | 9   | 256-QAM    | N/A                      | N/A      | 360                      | 400      | 780                      | 866.7    | MCS0                    |

## 5.9. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Item | Equipment | Brand Name | Model Name  | P/N      |
|------|-----------|------------|-------------|----------|
| 1    | PC        | Dell       | Vostro 3902 | 8KNDDDB2 |
| 2    | Debug     | N/A        | N/A         | N/A      |

### I/O CABLES

| Cable No | Port  | Connector Type | Cable Type | Cable Length(m) | Remarks |
|----------|-------|----------------|------------|-----------------|---------|
| 1        | PCIEX | N/A            | N/A        | 0.1             | N/A     |

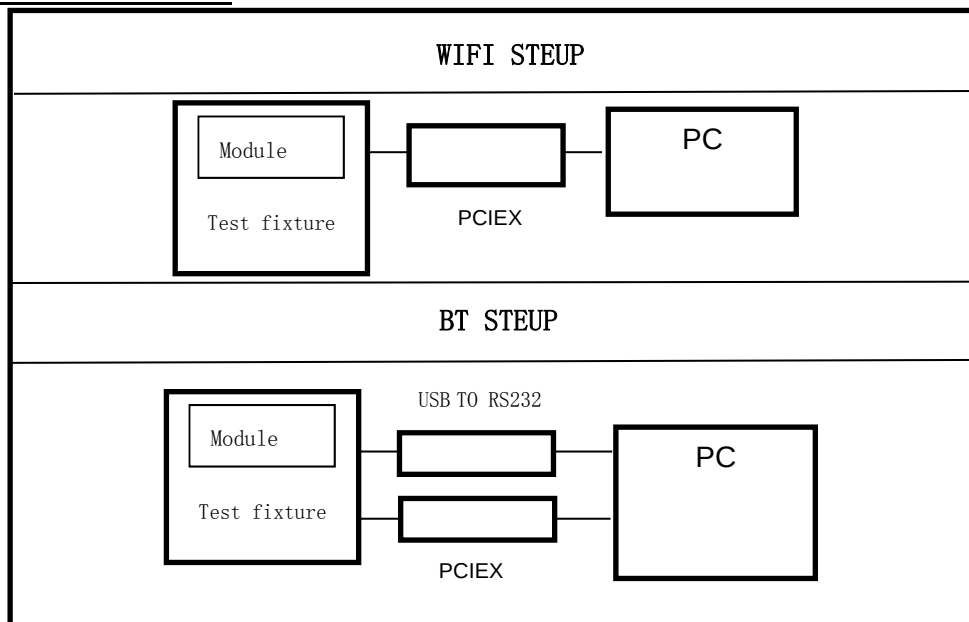
### ACCESSORY

| Item | Accessory | Brand Name | Model Name | Description |
|------|-----------|------------|------------|-------------|
| 1    | N/A       | N/A        | N/A        | N/A         |

### TEST SETUP

The EUT can work in engineering mode with a software through a PC.

### SETUP DIAGRAM FOR TEST



### 5.10. MEASURING INSTRUMENT AND SOFTWARE USED

| Conducted Emissions                 |                                         |              |              |               |               |               |
|-------------------------------------|-----------------------------------------|--------------|--------------|---------------|---------------|---------------|
| Used                                | Equipment                               | Manufacturer | Model No.    | Serial No.    | Last Cal.     | Next Cal.     |
| <input checked="" type="checkbox"/> | EMI Test Receiver                       | R&S          | ESR3         | 101961        | Dec.20, 2016  | Dec.19, 2017  |
| <input checked="" type="checkbox"/> | Two-Line V-Network                      | R&S          | ENV216       | 101983        | Dec.20, 2016  | Dec.19, 2017  |
| <input checked="" type="checkbox"/> | Artificial Mains Networks               | Schwarzbeck  | NSLK 8126    | 8126465       | Feb.10, 2017  | Feb.10, 2018  |
| Software                            |                                         |              |              |               |               |               |
| Used                                | Description                             |              | Manufacturer | Name          |               | Version       |
| <input checked="" type="checkbox"/> | Test Software for Conducted disturbance |              | UL           | Antenna port  |               | Ver. 7.2      |
| Radiated Emissions                  |                                         |              |              |               |               |               |
| Used                                | Equipment                               | Manufacturer | Model No.    | Serial No.    | Last Cal.     | Next Cal.     |
| <input checked="" type="checkbox"/> | MXE EMI Receiver                        | KESIGHT      | N9038A       | MY56400036    | Feb. 24, 2017 | Feb. 24, 2018 |
| <input checked="" type="checkbox"/> | Hybrid Log Periodic Antenna             | TDK          | HLP-3003C    | 130960        | Jan.09, 2016  | Jan.09, 2019  |
| <input checked="" type="checkbox"/> | Preamplifier                            | HP           | 8447D        | 2944A09099    | Feb. 13, 2017 | Feb. 13, 2018 |
| <input checked="" type="checkbox"/> | EMI Measurement Receiver                | R&S          | ESR26        | 101377        | Dec. 20, 2016 | Dec. 20, 2017 |
| <input checked="" type="checkbox"/> | Horn Antenna                            | TDK          | HRN-0118     | 130939        | Jan. 09, 2016 | Jan. 09, 2019 |
| <input checked="" type="checkbox"/> | High Gain Horn Antenna                  | Schwarzbeck  | BBHA-9170    | 691           | Jan.06, 2016  | Jan.06, 2019  |
| <input checked="" type="checkbox"/> | Preamplifier                            | TDK          | PA-02-0118   | TRS-305-00066 | Jan. 14, 2017 | Jan. 14, 2018 |
| <input checked="" type="checkbox"/> | Preamplifier                            | TDK          | PA-02-2      | TRS-307-00003 | Dec. 20, 2016 | Dec. 20, 2017 |
| <input checked="" type="checkbox"/> | Loop antenna                            | Schwarzbeck  | 1519B        | 00008         | Mar. 26, 2016 | Mar. 26, 2019 |
| Software                            |                                         |              |              |               |               |               |
| Used                                | Description                             |              | Manufacturer | Name          |               | Version       |
| <input checked="" type="checkbox"/> | Test Software for Radiated disturbance  |              | Farad        | EZ-EMC        |               | Ver. UL-3A1   |
| Other instruments                   |                                         |              |              |               |               |               |
| Used                                | Equipment                               | Manufacturer | Model No.    | Serial No.    | Last Cal.     | Next Cal.     |
| <input checked="" type="checkbox"/> | Spectrum Analyzer                       | Keysight     | N9030A       | MY55410512    | Dec. 20, 2016 | Dec. 20, 2017 |
| <input checked="" type="checkbox"/> | Power Meter                             | Keysight     | N9031A       | MY55416024    | Feb. 13, 2017 | Feb. 13, 2018 |
| <input checked="" type="checkbox"/> | Power Sensor                            | Keysight     | N9323A       | MY55440013    | Feb. 13, 2017 | Feb. 13, 2018 |
| <input checked="" type="checkbox"/> | Power Sensor                            | Keysight     | U2021XA      | MY57030004    | Feb. 13, 2017 | Feb. 13, 2018 |

## 6. ANTENNA PORT TEST RESULTS

### 6.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

#### RESULTS

#### ANTENNA1

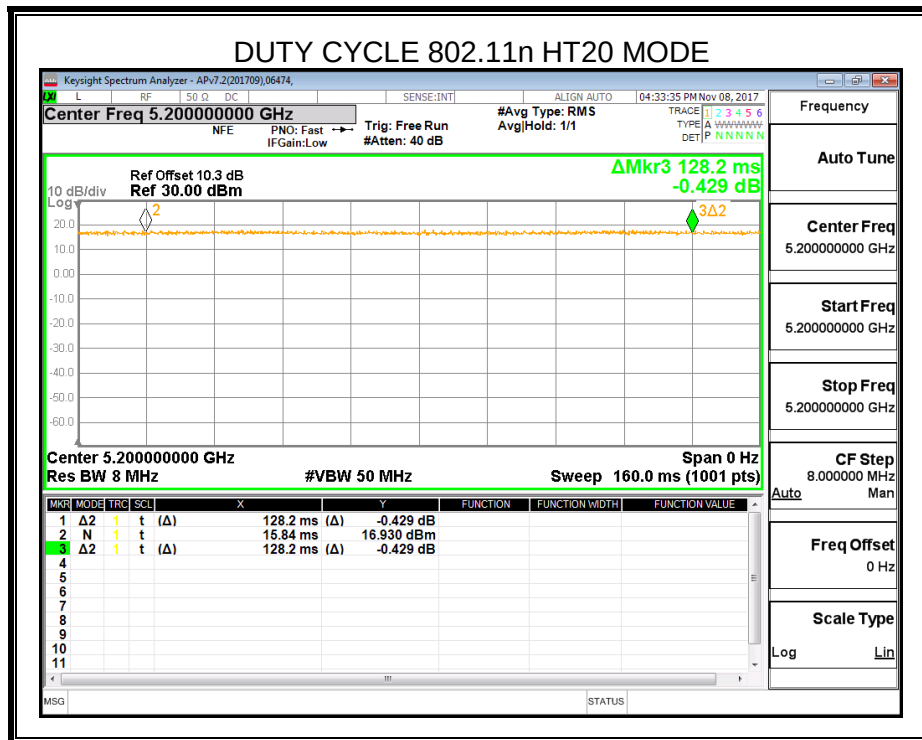
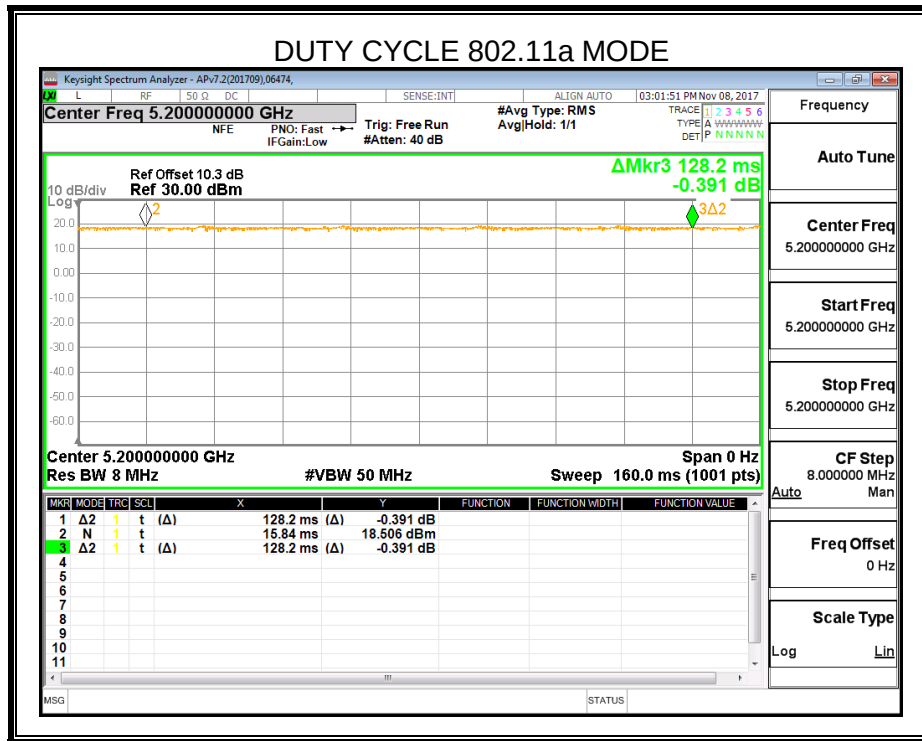
| Mode          | ON Time (ms) | Period (ms) | Duty Cycle x (Linear) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | 1/B Minimum VBW (KHz) |
|---------------|--------------|-------------|-----------------------|----------------|-----------------------------------|-----------------------|
| 11a 1TX       | 100          | 100         | 1                     | 100%           | 0                                 | 0.01                  |
| 11n HT20 CDD  | 100          | 100         | 1                     | 100%           | 0                                 | 0.01                  |
| 11n HT40 CDD  | 100          | 100         | 1                     | 100%           | 0                                 | 0.01                  |
| 11ac HT20 CDD | 100          | 100         | 1                     | 100%           | 0                                 | 0.01                  |
| 11ac HT40 CDD | 100          | 100         | 1                     | 100%           | 0                                 | 0.01                  |
| 11ac HT80 CDD | 100          | 100         | 1                     | 100%           | 0                                 | 0.01                  |

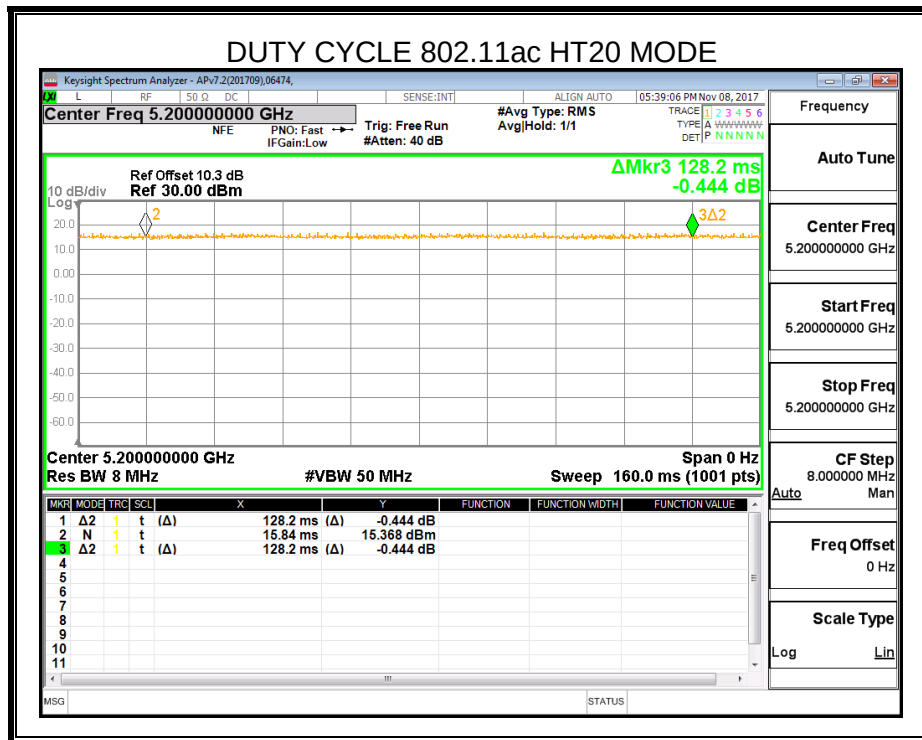
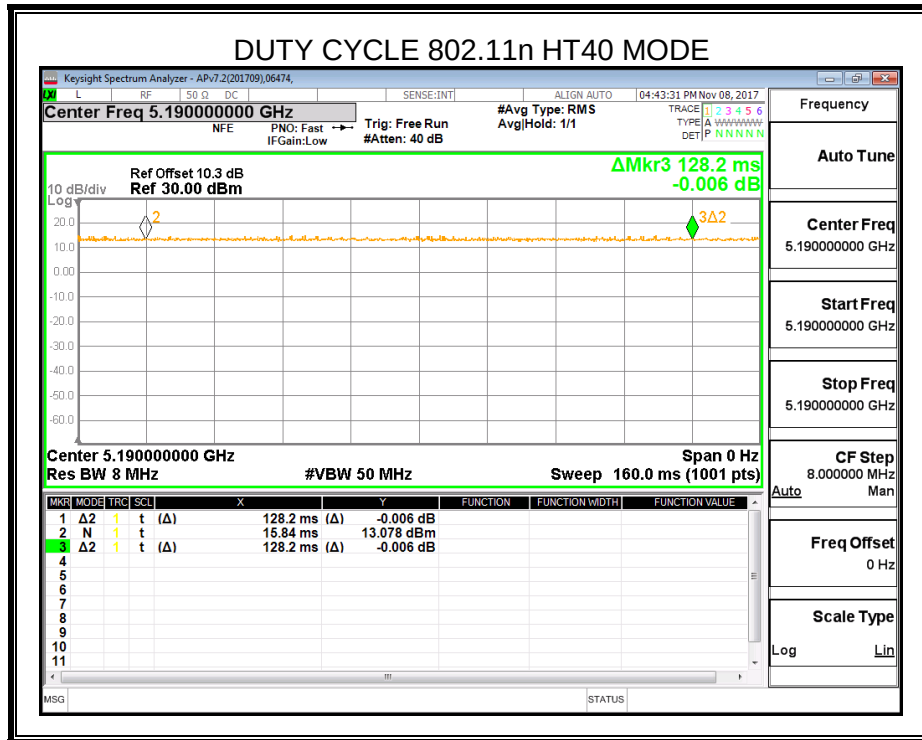
Note: Duty Cycle Correction Factor= $10\log(1/x)$ .

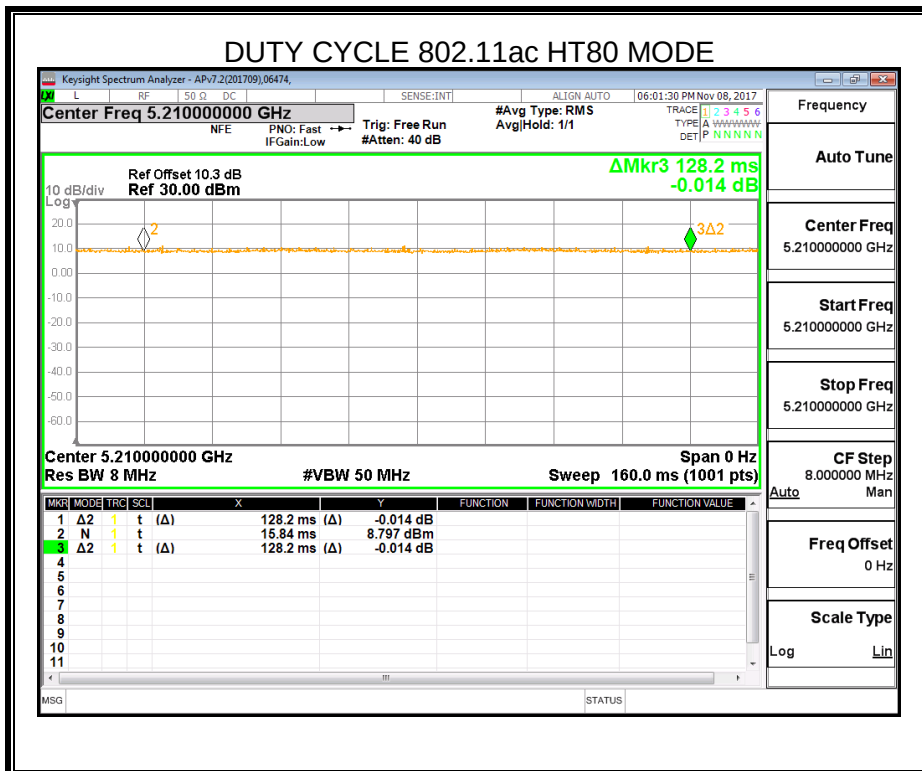
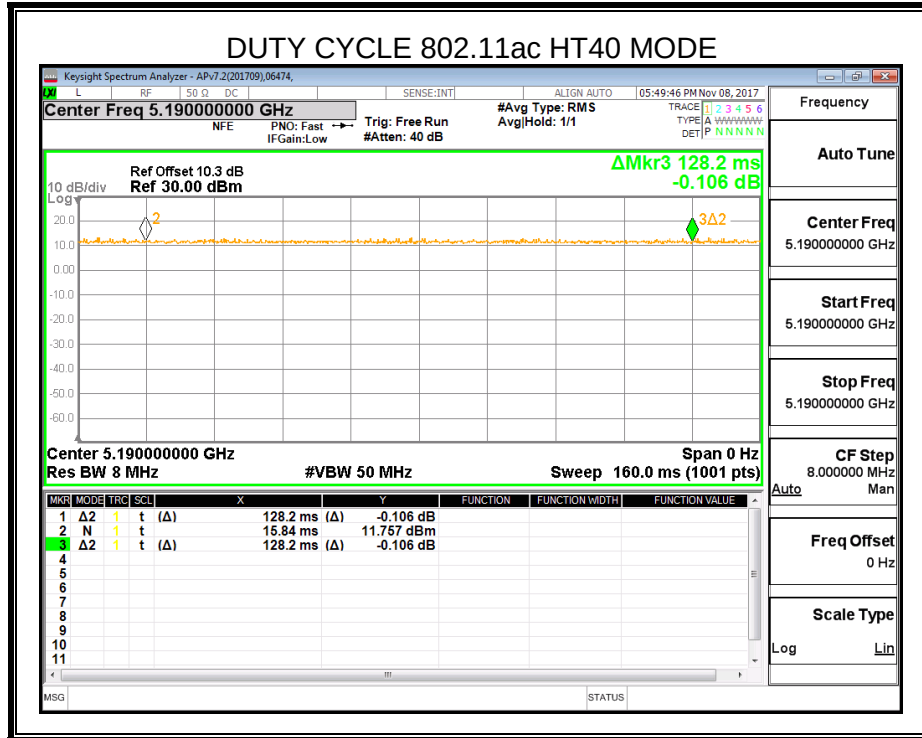
Where: x is Duty Cycle(Linear)

ANT 2 and Antenna 2 has the same duty cycle, only ANT 2 data show here.









## 6.2. 6/26/99% dB BANDWIDTH

### LIMITS

| FCC Part15, Subpart E/ RSS-247 |                              |                                                    |
|--------------------------------|------------------------------|----------------------------------------------------|
| Test Item                      | Limit                        | Frequency Range (MHz)                              |
| Bandwidth                      | 26 dB Bandwidth              | 5150-5250                                          |
|                                | 26 dB Bandwidth              | 5250-5350                                          |
|                                | 26 dB Bandwidth              | For FCC:5470-5725<br>For IC:5470-5600<br>5650-5725 |
|                                | Minimum 500kHz 6dB Bandwidth | 5725-5850                                          |

| RSS-247 ISSUE 2    |               |                              |             |
|--------------------|---------------|------------------------------|-------------|
| RSS-Gen Clause 6.6 | 99% Bandwidth | For reporting purposes only. | 2400-2483.5 |

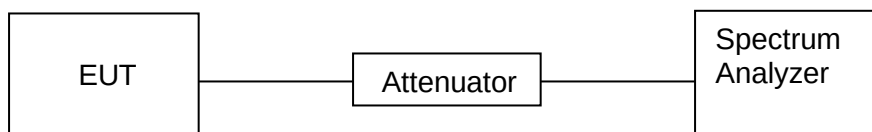
### TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

|                  |                                                                                                                                                                        |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Center Frequency | The center frequency of the channel under test                                                                                                                         |
| Detector         | Peak                                                                                                                                                                   |
| RBW              | For 6dB Bandwidth: RBW=100kHz<br>For 26dB Bandwidth: approximately 1% of the emission bandwidth.<br>For 99dB Bandwidth: approximately 1%~5% of the emission bandwidth. |
| VBW              | For 6dB Bandwidth : VBW=300kHz<br>For 26dB Bandwidth : >3RBW<br>For 99%dB Bandwidth : >3RBW                                                                            |
| Trace            | Max hold                                                                                                                                                               |
| Sweep            | Auto couple                                                                                                                                                            |

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6/26/99% dB relative to the maximum level measured in the fundamental emission.

### TEST SETUP



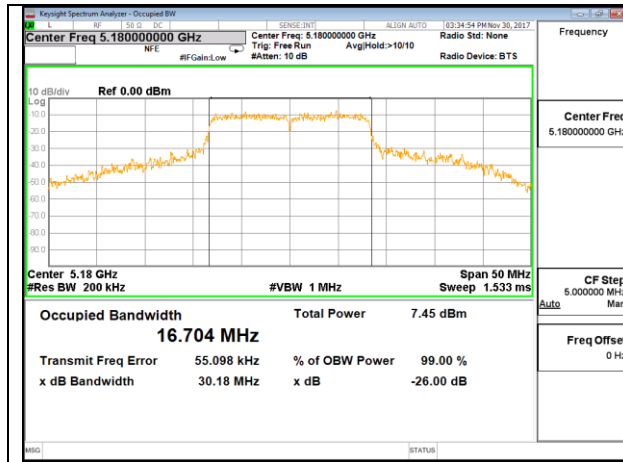
### RESULTS

## 6.2.1. 802.11a SISO MODE

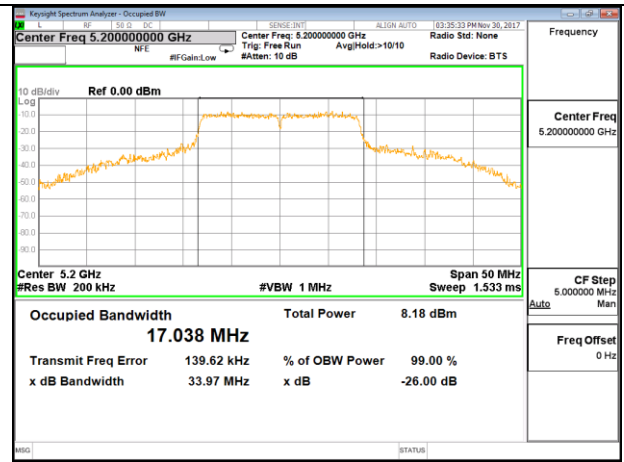
### 6.2.1.1. UNII-1 BAND

| Channel | Frequency (MHz) | 26 dB BW ANT1 (MHz) | 26 dB BW ANT2 (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low     | 5180            | 30.18               | 20.13               |
| Mid     | 5200            | 33.97               | 20.18               |
| High    | 5240            | 33.95               | 20.13               |

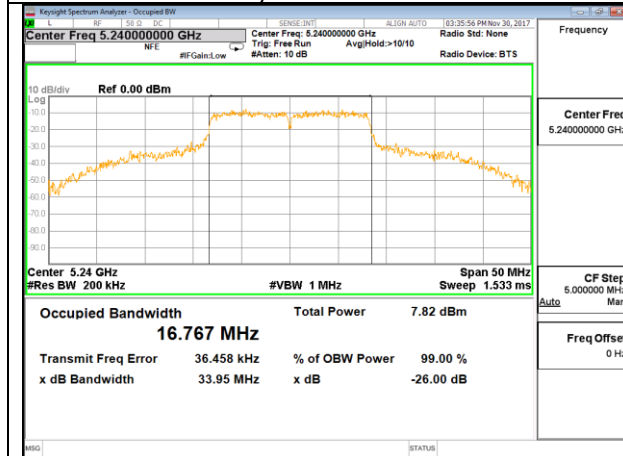
| Channel | Frequency (MHz) | 99% BW ANT1 (MHz) | 99% BW ANT2 (MHz) |
|---------|-----------------|-------------------|-------------------|
| Low     | 5180            | 16.704            | 16.454            |
| Mid     | 5200            | 17.038            | 16.448            |
| High    | 5240            | 16.767            | 16.426            |



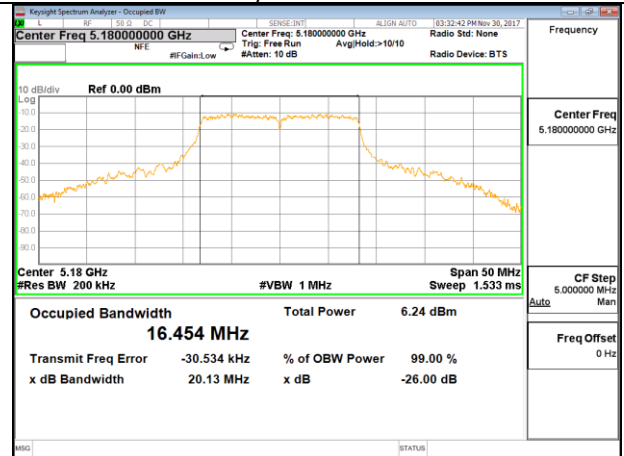
ANT 1, LOW CHANNEL



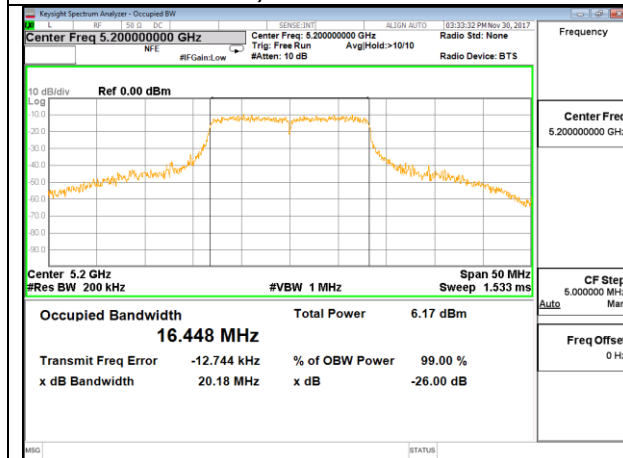
ANT 1, MID CHANNEL



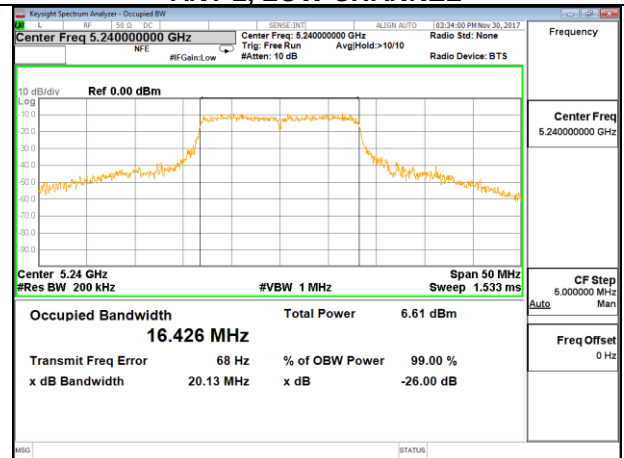
ANT 1, HIGH CHANNEL



ANT 2, LOW CHANNEL



ANT 2, MID CHANNEL

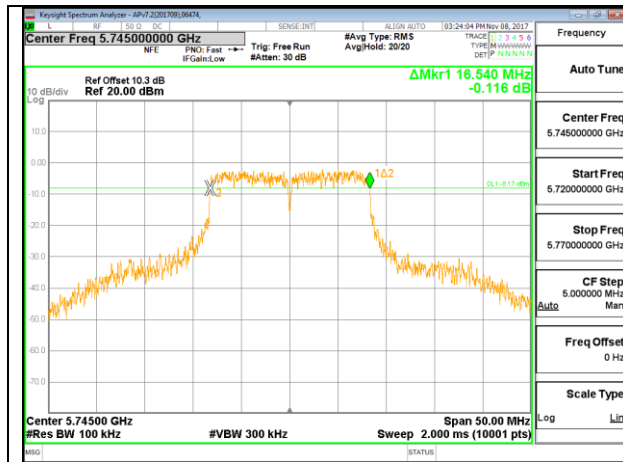


ANT 2, HIGH CHANNEL

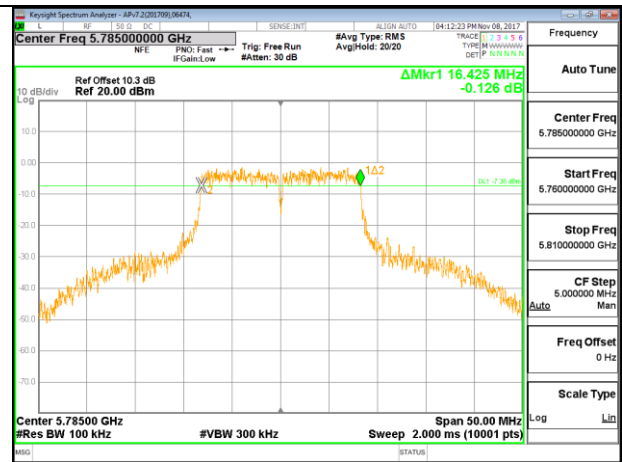
**6.2.1.2. UNII-3 BAND**

| Channel | Frequency (MHz) | 6 dB BW ANT1 (MHz) | 6 dB BW ANT2 (MHz) | Limit (KHz) | Result |
|---------|-----------------|--------------------|--------------------|-------------|--------|
| Low     | 5745            | 16.540             | 16.420             | 500         | PASS   |
| Mid     | 5785            | 16.425             | 16.460             | 500         | PASS   |
| High    | 5825            | 16.505             | 16.400             | 500         | PASS   |

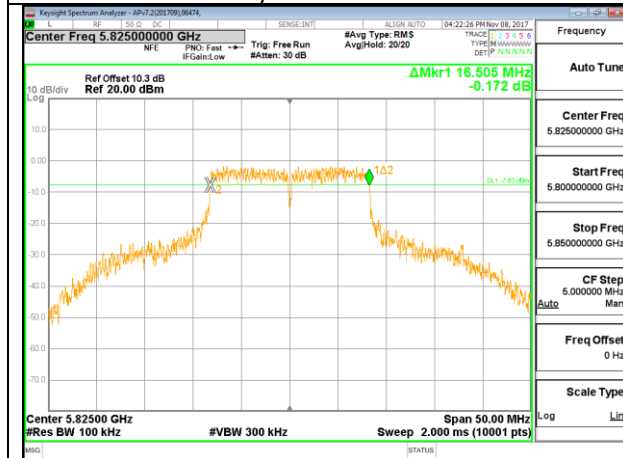
| Channel | Frequency (MHz) | 99% BW ANT1 (MHz) | 99% BW ANT2 (MHz) |
|---------|-----------------|-------------------|-------------------|
| Low     | 5745            | 16.587            | 16.474            |
| Mid     | 5785            | 16.682            | 16.521            |
| High    | 5825            | 16.660            | 16.570            |



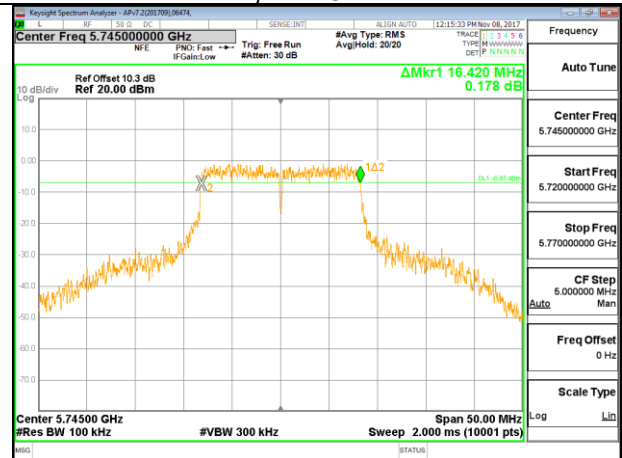
ANT 1, LOW CHANNEL



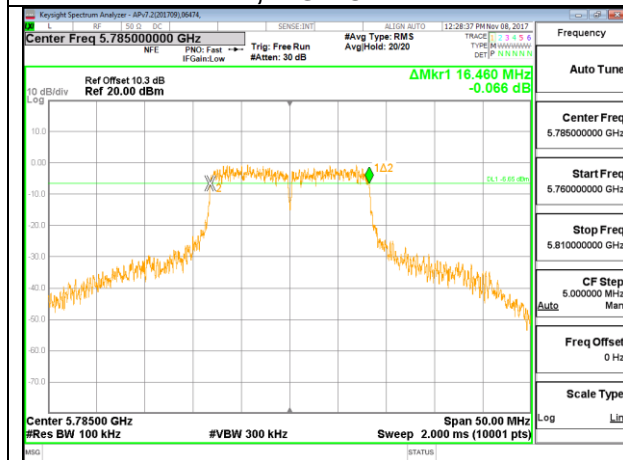
ANT 1, MID CHANNEL



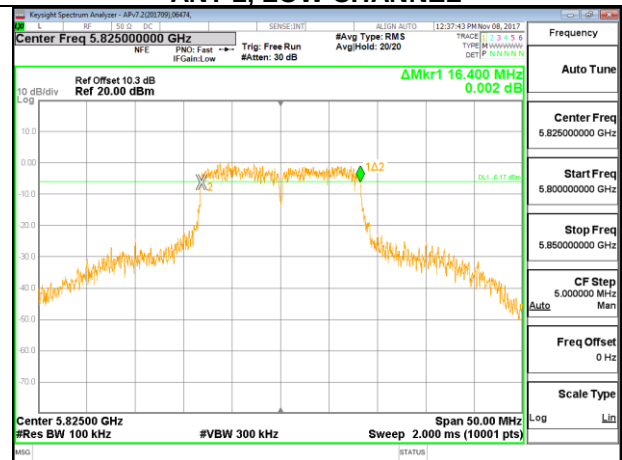
ANT 1, HIGH CHANNEL



ANT 2, LOW CHANNEL



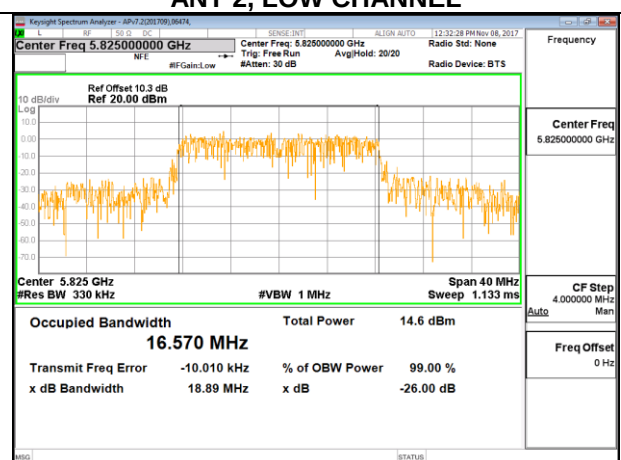
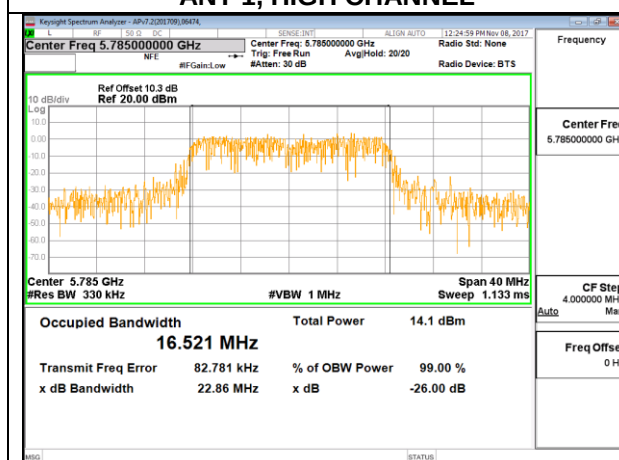
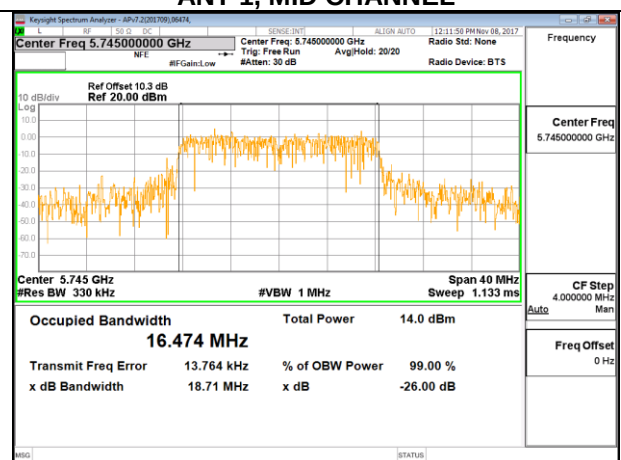
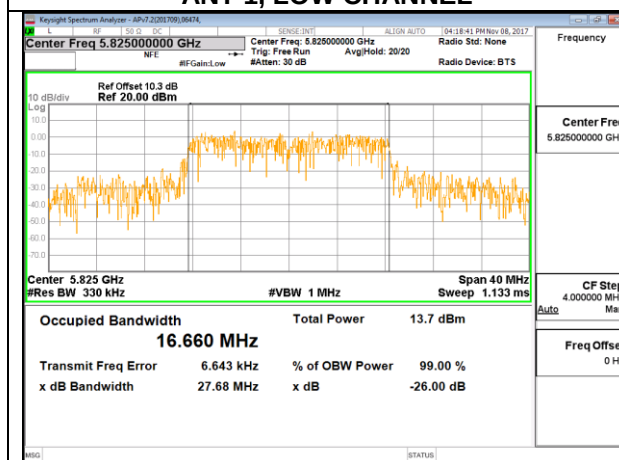
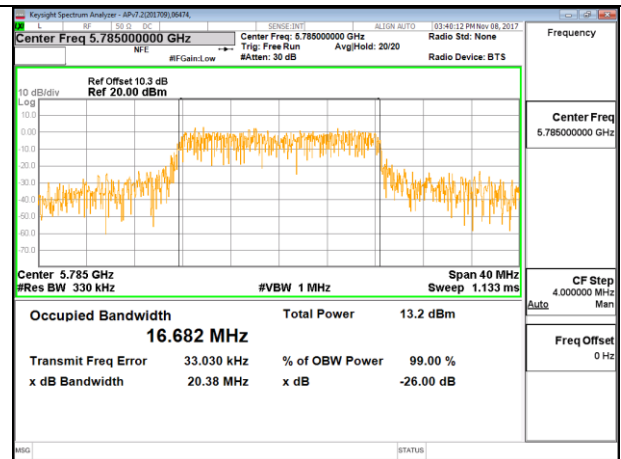
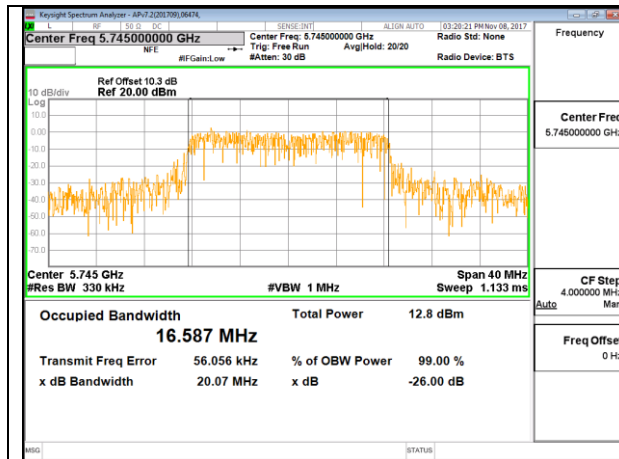
ANT 2, MID CHANNEL



ANT 2, HIGH CHANNEL



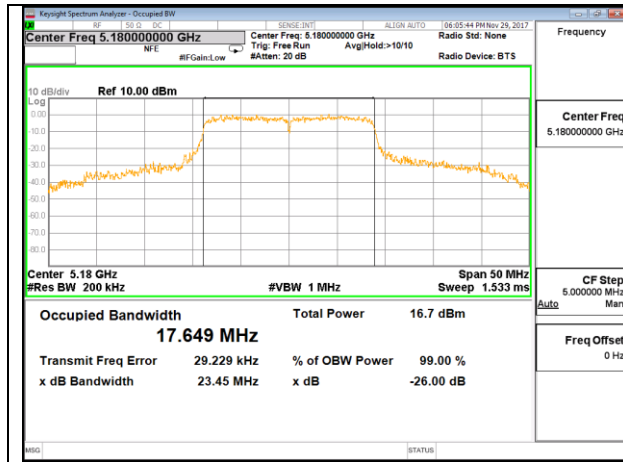
| Channel | Frequency (MHz) | 99% BW ANT1 (MHz) | 99% BW ANT2 (MHz) |
|---------|-----------------|-------------------|-------------------|
| Low     | 5745            | 16.587            | 16.474            |
| Mid     | 5785            | 16.682            | 16.521            |
| High    | 5825            | 16.660            | 16.570            |



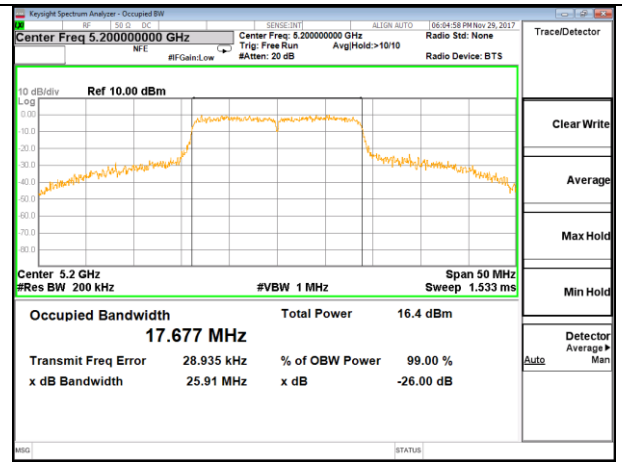
**6.2.2. 802.11n HT20 CDD MODE****6.2.2.1. UNII-1 BAND**

| Channel | Frequency (MHz) | 26 dB BW ANT1 (MHz) | 26 dB BW ANT2 (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low     | 5180            | 23.45               | 20.83               |
| Mid     | 5200            | 25.91               | 21.25               |
| High    | 5240            | 20.67               | 20.29               |

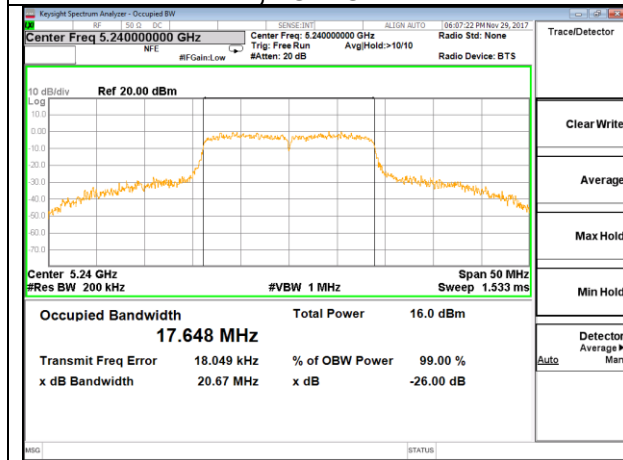
| Channel | Frequency (MHz) | 99% dB BW ANT1 (MHz) | 99% dB BW ANT2 (MHz) |
|---------|-----------------|----------------------|----------------------|
| Low     | 5180            | 17.649               | 17.556               |
| Mid     | 5200            | 17.677               | 17.552               |
| High    | 5240            | 17.648               | 17.563               |



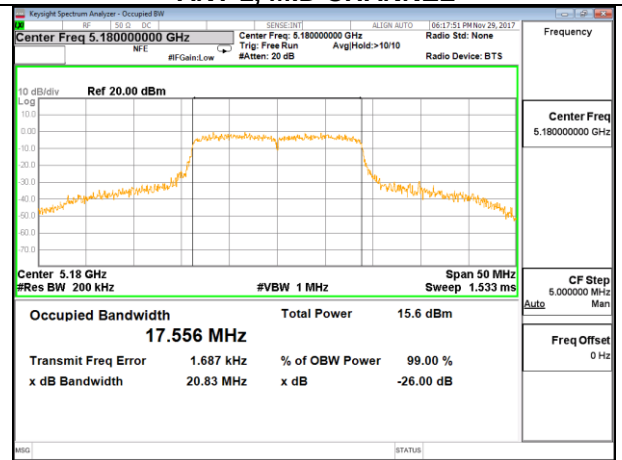
ANT 1, LOW CHANNEL



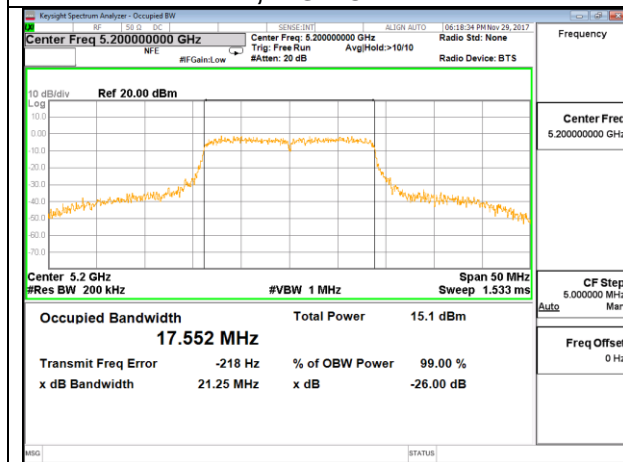
ANT 1, MID CHANNEL



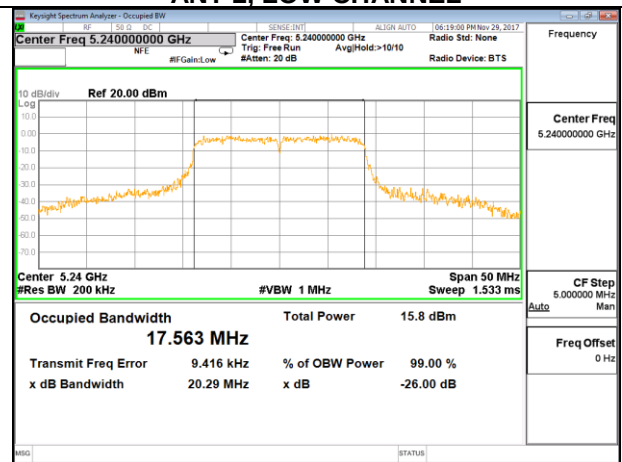
ANT 1, HIGH CHANNEL



ANT 2, LOW CHANNEL



ANT 2, MID CHANNEL

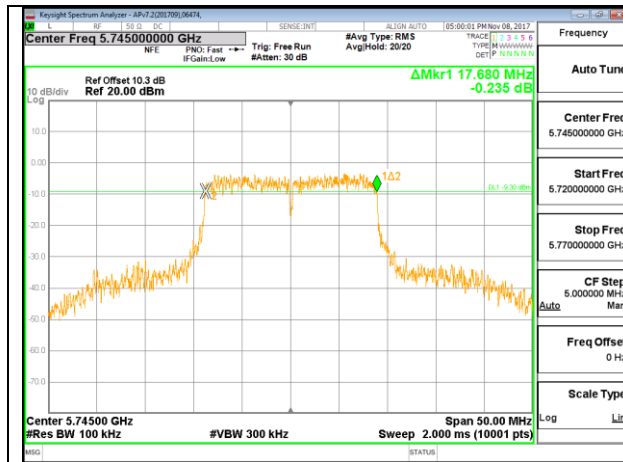


ANT 2, HIGH CHANNEL

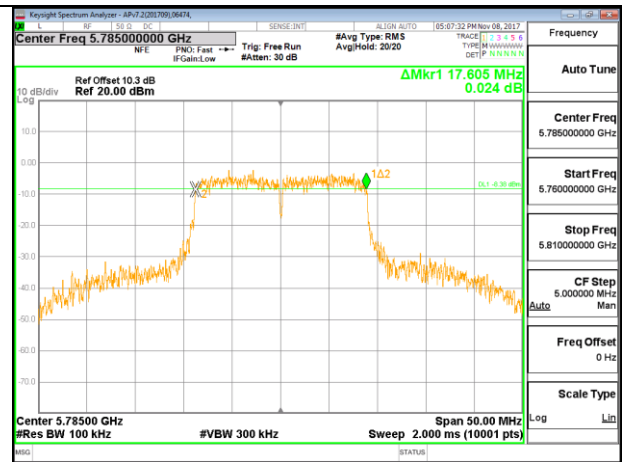
**6.2.2.2. UNII-3 BAND**

| Channel | Frequency (MHz) | 6 dB BW ANT1 (MHz) | 6 dB BW ANT2 (MHz) | Limit (KHz) | Result |
|---------|-----------------|--------------------|--------------------|-------------|--------|
| Low     | 5745            | 17.680             | 17.590             | 500         | PASS   |
| Mid     | 5785            | 17.605             | 17.630             | 500         | PASS   |
| High    | 5825            | 17.630             | 17.600             | 500         | PASS   |

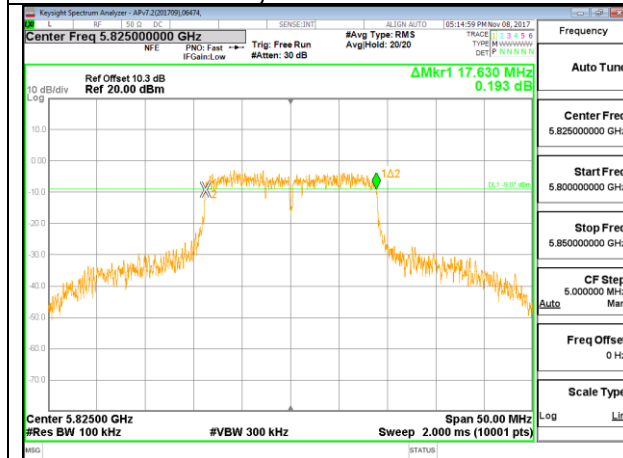
| Channel | Frequency (MHz) | 99% dB BW ANT1 (MHz) | 99% dB BW ANT2 (MHz) |
|---------|-----------------|----------------------|----------------------|
| Low     | 5745            | 17.700               | 17.598               |
| Mid     | 5785            | 17.720               | 17.657               |
| High    | 5825            | 17.718               | 17.604               |



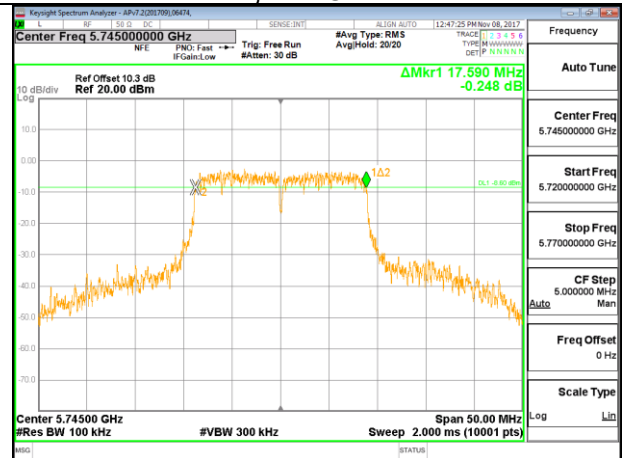
ANT 1, LOW CHANNEL



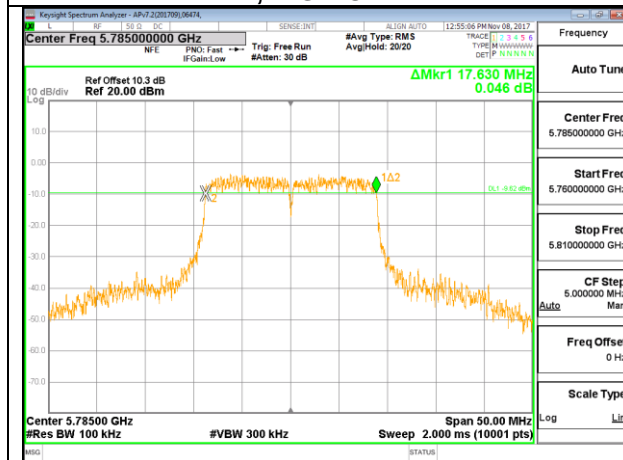
ANT 1, MID CHANNEL



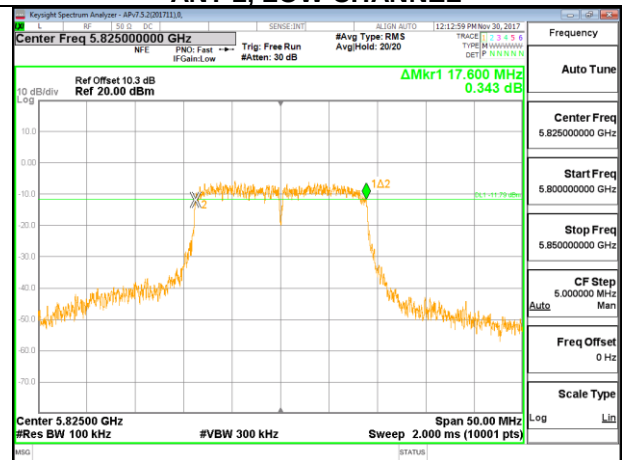
ANT 1, HIGH CHANNEL



ANT 2, LOW CHANNEL

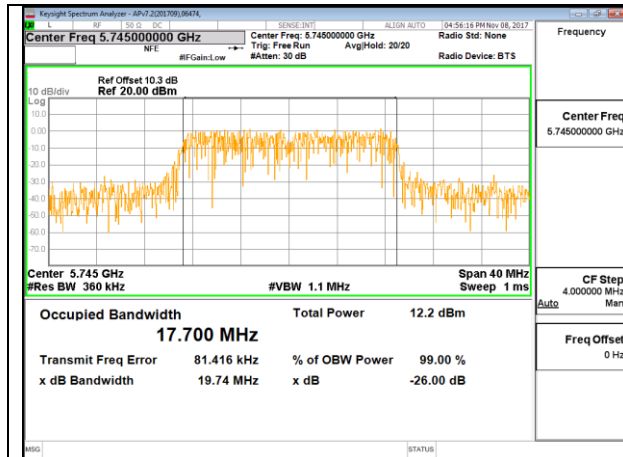


ANT 2, MID CHANNEL

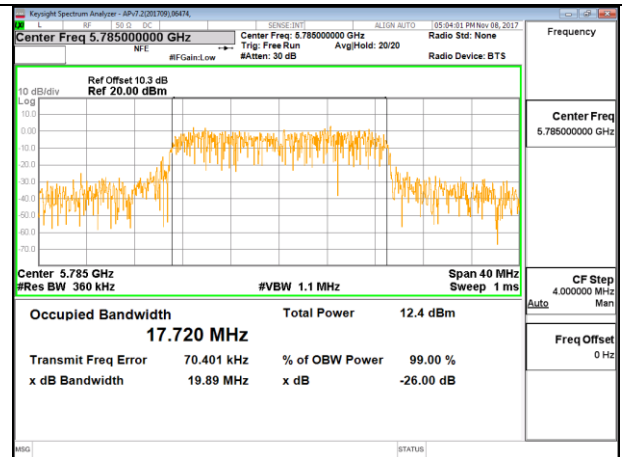


ANT 2, HIGH CHANNEL

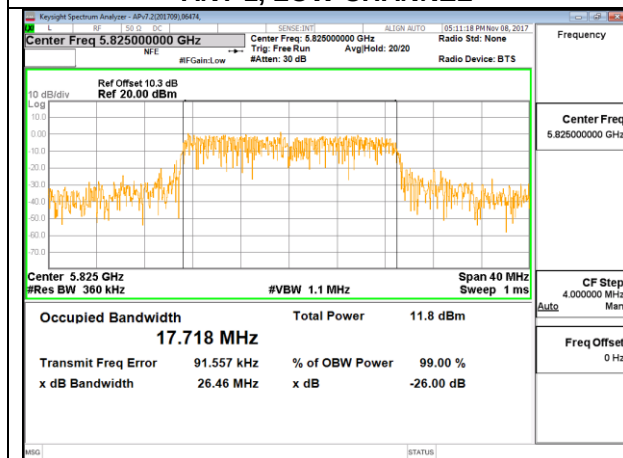
| Channel | Frequency<br>(MHz) | 99% dB BW<br>ANT1<br>(MHz) | 99% dB BW<br>ANT2<br>(MHz) |
|---------|--------------------|----------------------------|----------------------------|
| Low     | 5745               | 17.700                     | 17.598                     |
| Mid     | 5785               | 17.720                     | 17.657                     |
| High    | 5825               | 17.718                     | 17.604                     |



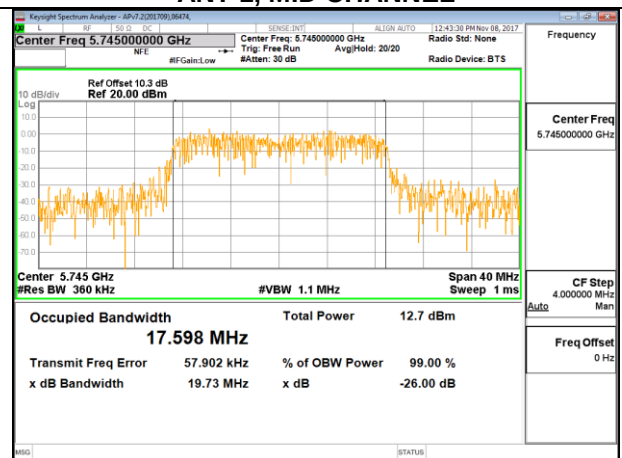
## ANT 1, LOW CHANNEL



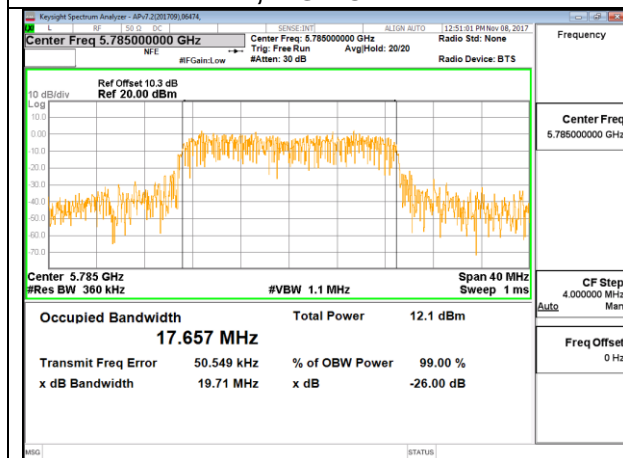
## ANT 1, MID CHANNEL



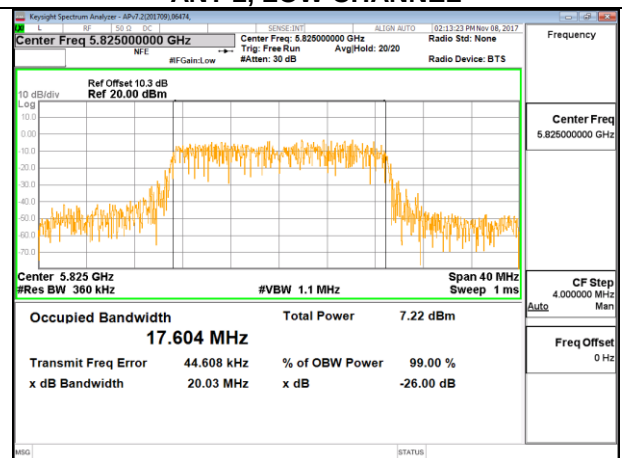
## ANT 1, HIGH CHANNEL



## ANT 2, LOW CHANNEL



**ANT 2, MID CHANNEL**



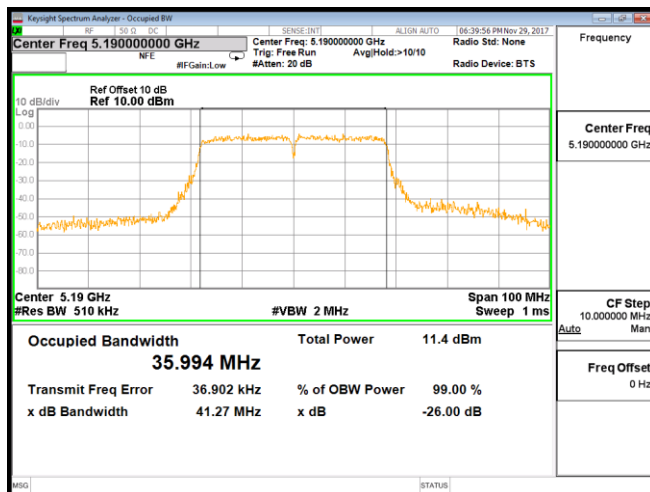
## ANT 2. HIGH CHANNEL

## 6.2.3. 802.11n HT40 CDD MODE

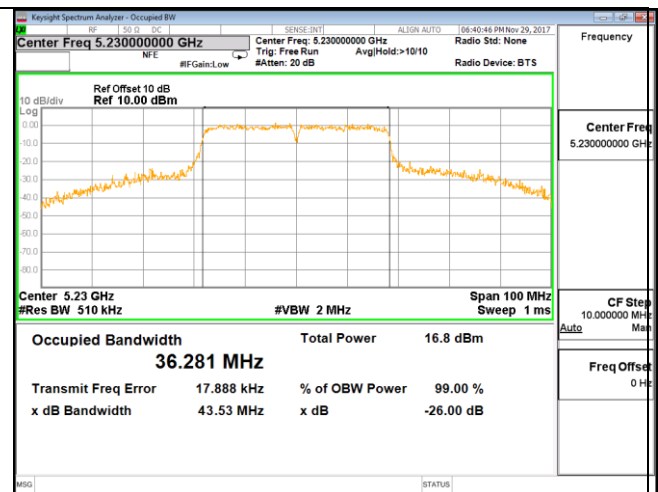
### 6.2.3.1. UNII-1 BAND

| Channel | Frequency (MHz) | 26 dB BW ANT1 (MHz) | 26 dB BW ANT2 (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low     | 5190            | 41.27               | 41.46               |
| High    | 5230            | 43.53               | 41.51               |

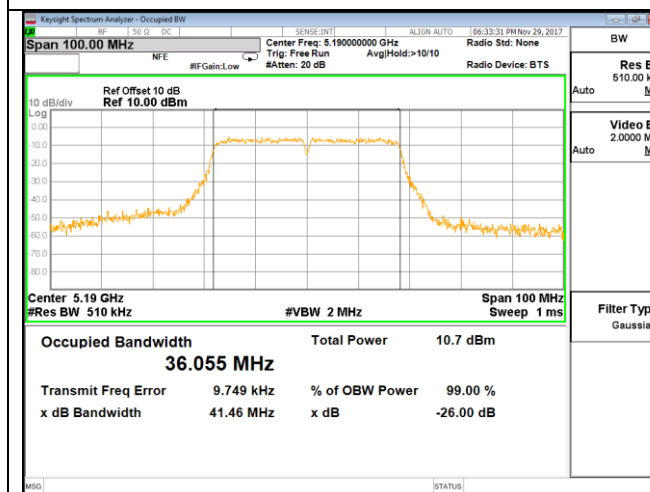
| Channel | Frequency (MHz) | 99% dB BW ANT1 (MHz) | 99% dB BW ANT2 (MHz) |
|---------|-----------------|----------------------|----------------------|
| Low     | 5190            | 35.994               | 36.055               |
| High    | 5230            | 36.281               | 36.037               |



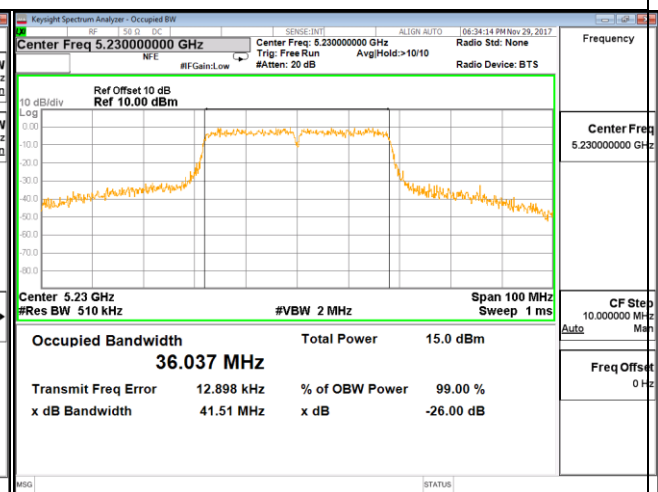
ANT 1, LOW CHANNEL



ANT 1, HIGH CHANNEL



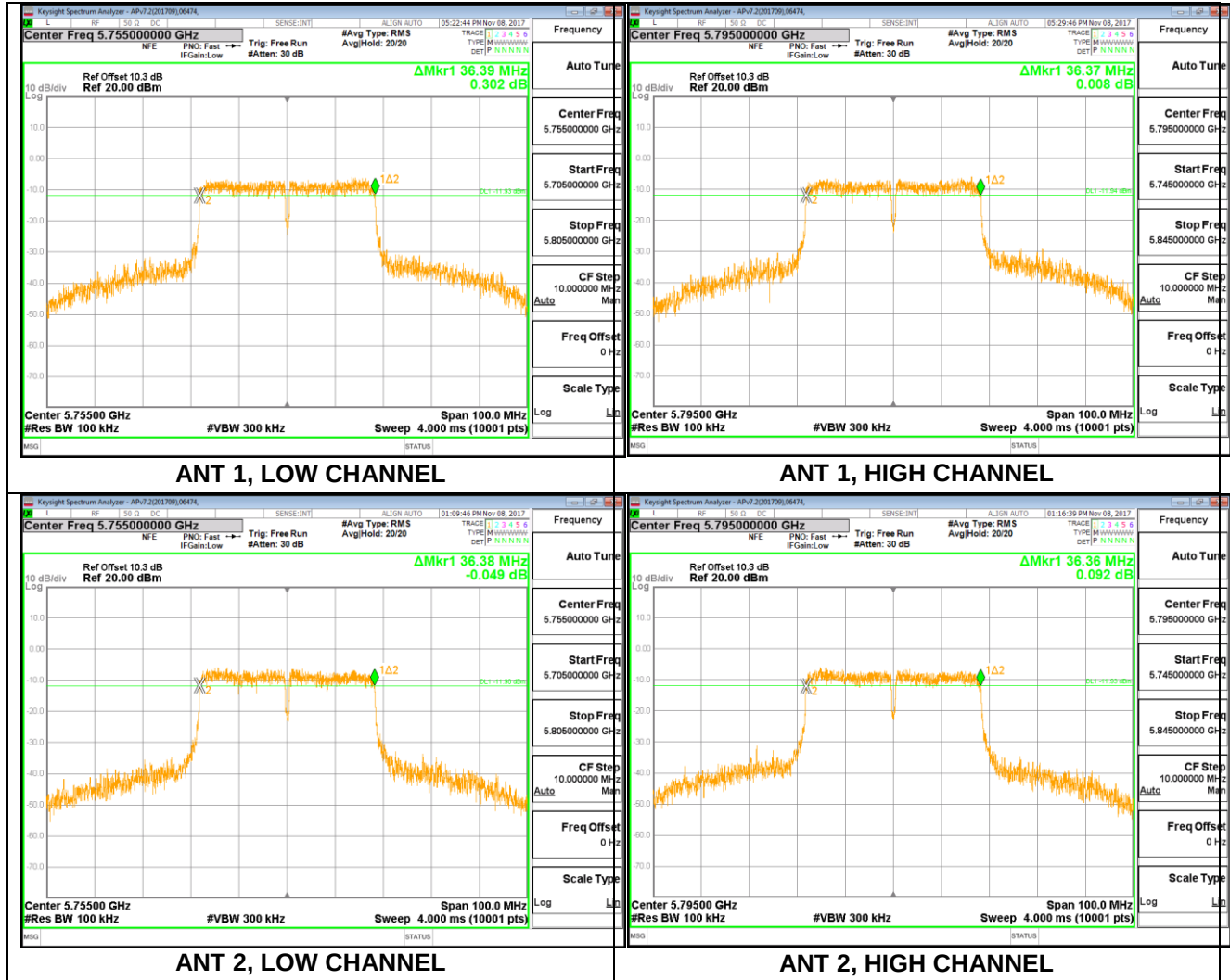
ANT 2, LOW CHANNEL



ANT 2, HIGH CHANNEL

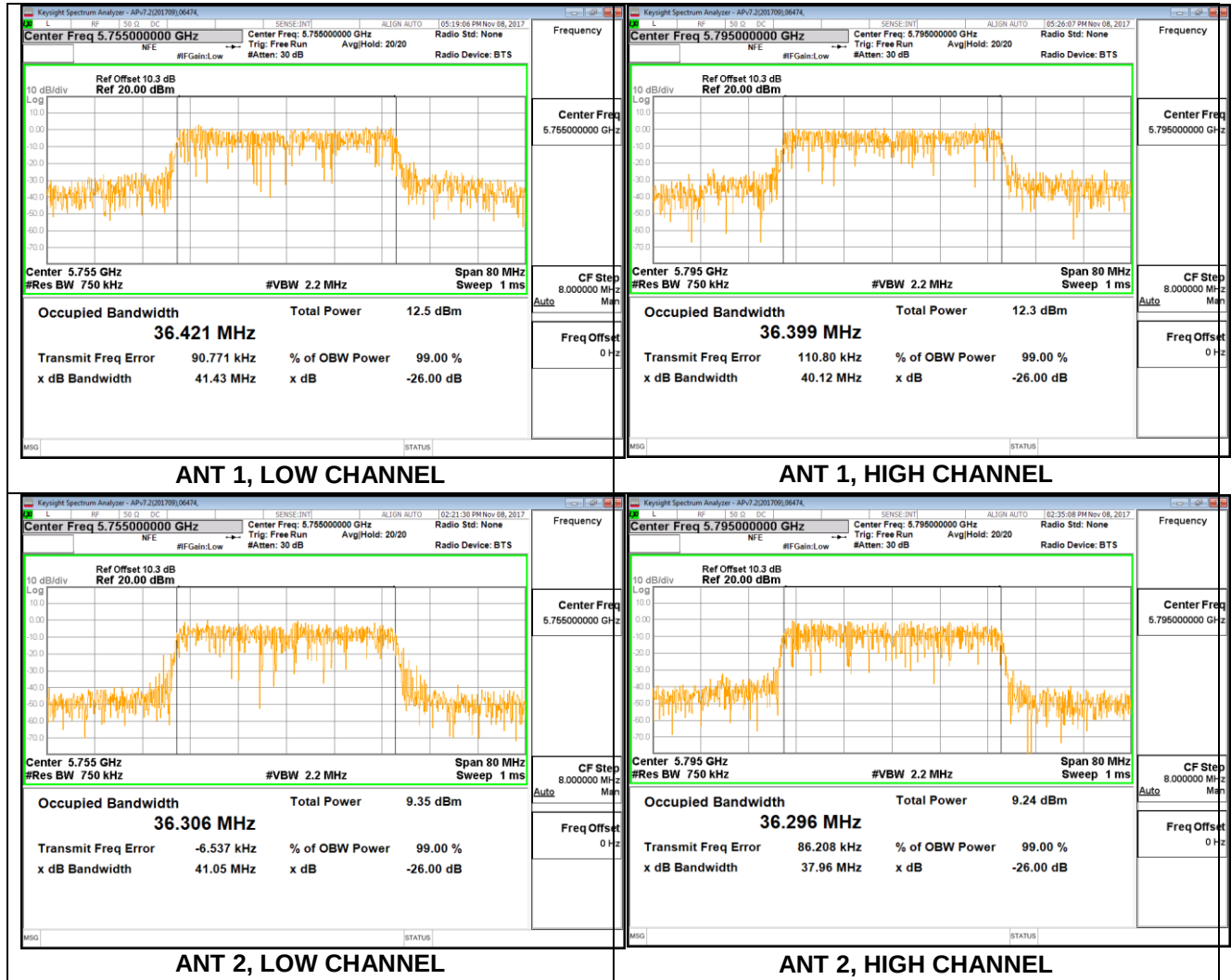
### 6.2.3.2. UNII-3 BAND

| Channel | Frequency (MHz) | 6 dB BW ANT1 (MHz) | 6 dB BW ANT2 (MHz) | Limit (KHz) | Result |
|---------|-----------------|--------------------|--------------------|-------------|--------|
| Low     | 5755            | 36.39              | 36.38              | 500         | PASS   |
| High    | 5795            | 36.37              | 36.36              | 500         | PASS   |





| Channel | Frequency (MHz) | 99% dB BW ANT1 (MHz) | 99% dB BW ANT2 (MHz) |
|---------|-----------------|----------------------|----------------------|
| Low     | 5755            | 36.421               | 36.306               |
| High    | 5795            | 36.399               | 36.296               |

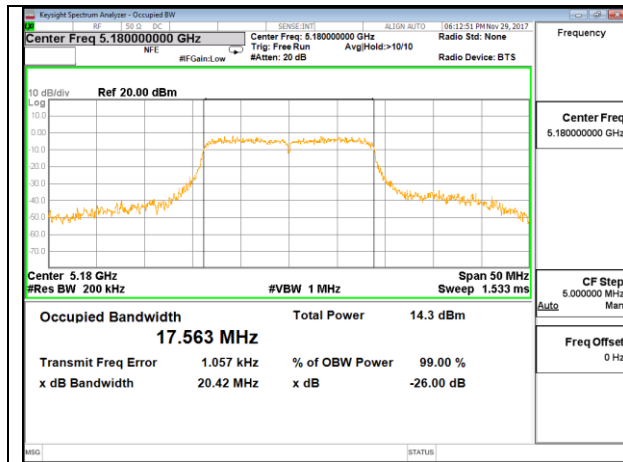


#### 6.2.4. 802.11ac HT20 CDD MODE

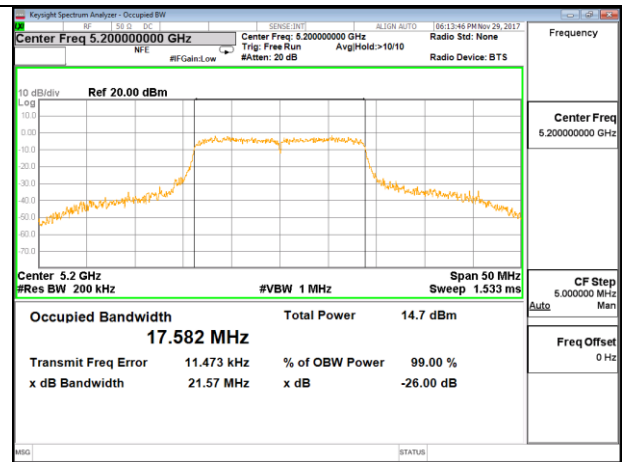
##### 6.2.4.1. UNII-1 BAND

| Channel | Frequency (MHz) | 26 dB BW ANT1 (MHz) | 26 dB BW ANT2 (MHz) |
|---------|-----------------|---------------------|---------------------|
| Low     | 5180            | 20.42               | 20.27               |
| Mid     | 5200            | 21.57               | 20.34               |
| High    | 5240            | 20.35               | 20.54               |

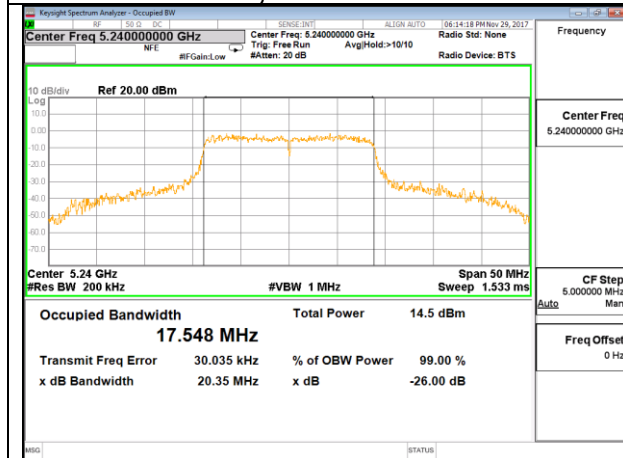
| Channel | Frequency (MHz) | 99% dB BW ANT1 (MHz) | 99% dB BW ANT2 (MHz) |
|---------|-----------------|----------------------|----------------------|
| Low     | 5180            | 17.563               | 17.583               |
| Mid     | 5200            | 17.582               | 17.559               |
| High    | 5240            | 17.548               | 17.532               |



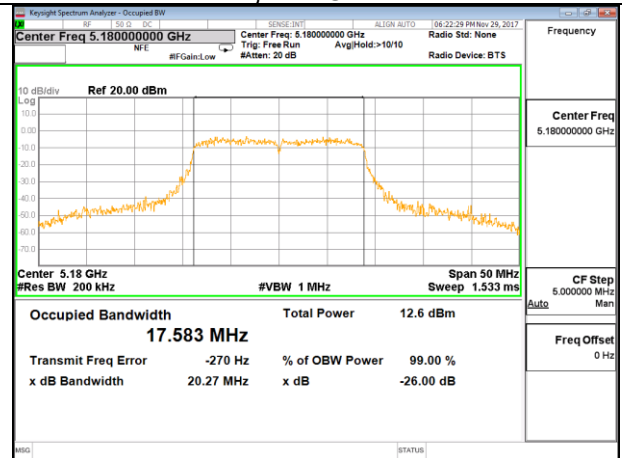
ANT 1, LOW CHANNEL



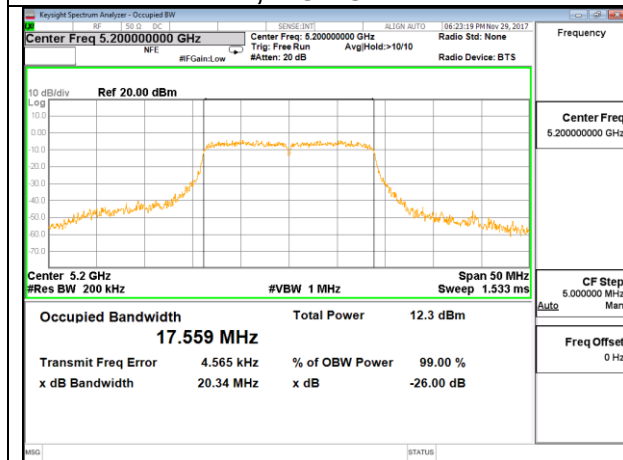
ANT 1, MID CHANNEL



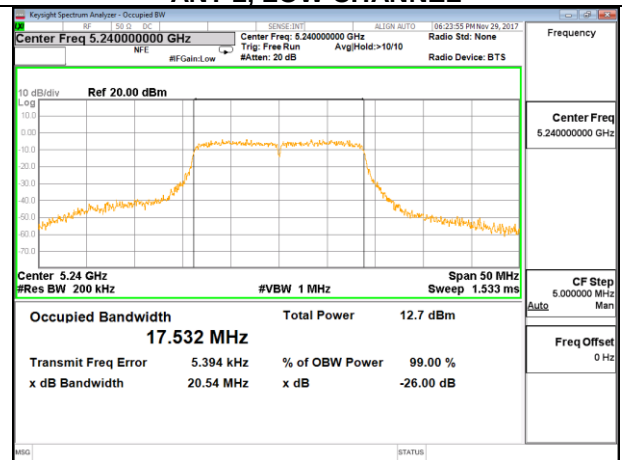
ANT 1, HIGH CHANNEL



ANT 2, LOW CHANNEL



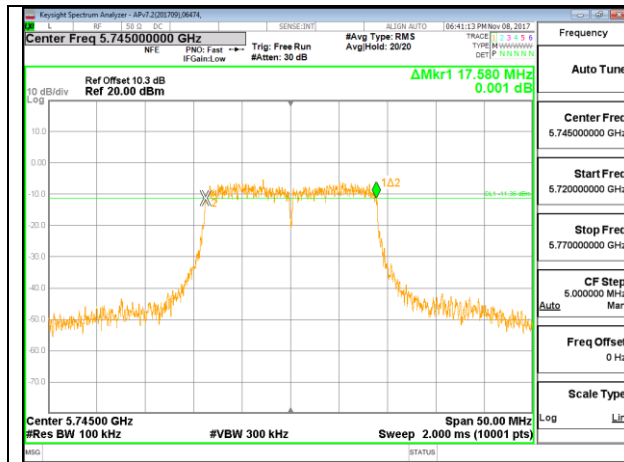
ANT 2, MID CHANNEL



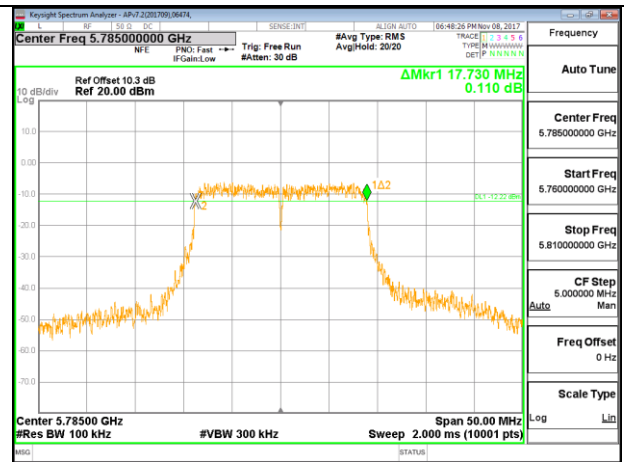
ANT 2, HIGH CHANNEL

**6.2.4.2. UNII-3 BAND**

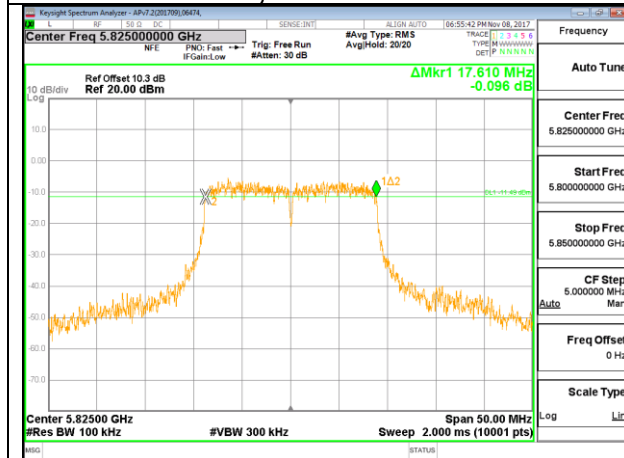
| Channel | Frequency<br>(MHz) | 6 dB BW<br>ANT1<br>(MHz) | 6 dB BW<br>ANT2<br>(MHz) | Limit<br>(KHz) | Result |
|---------|--------------------|--------------------------|--------------------------|----------------|--------|
| Low     | 5745               | 17.580                   | 17.610                   | 500            | PASS   |
| Mid     | 5785               | 17.730                   | 17.580                   | 500            | PASS   |
| High    | 5825               | 17.610                   | 17.590                   | 500            | PASS   |



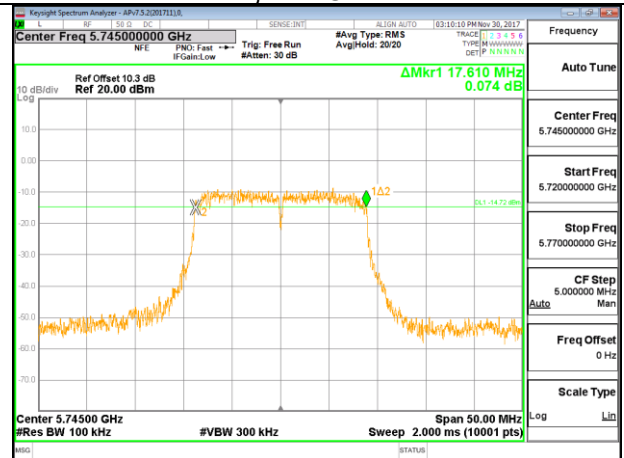
ANT 1, LOW CHANNEL



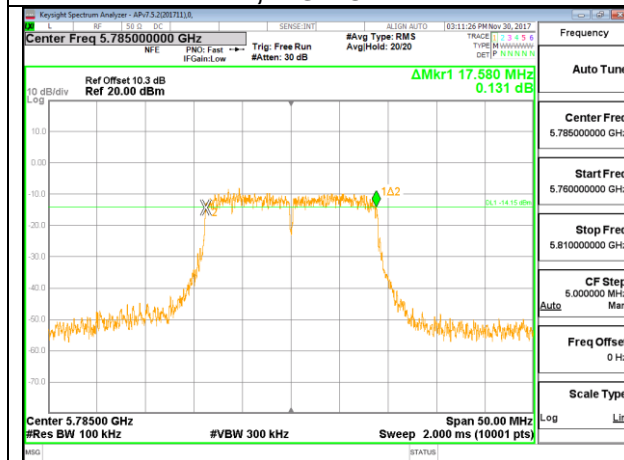
ANT 1, MID CHANNEL



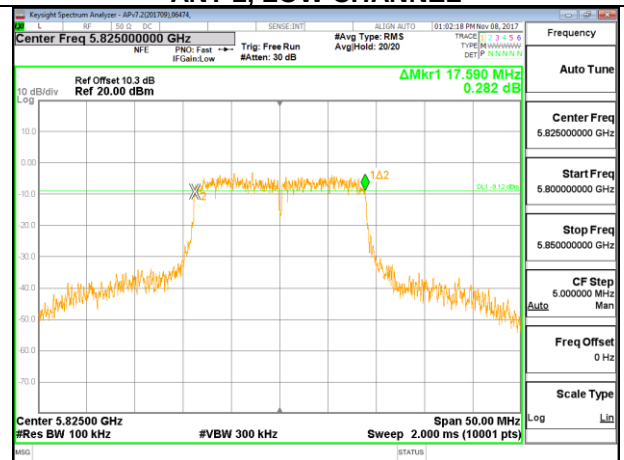
ANT 1, HIGH CHANNEL



ANT 2, LOW CHANNEL



ANT 2, MID CHANNEL



ANT 2, HIGH CHANNEL