



## FCC Part 15.247

## TEST REPORT

For

### AAEON Technology Inc.

5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist., New Taipei City 23145, Taiwan, R.O.C

FCC ID: OHBRTC700RKWBG

|                                                                                                                                                                                                                                 |                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Report Type<br>Original Report                                                                                                                                                                                                  | Product Type:<br>Rugged Tablet Computer |
| Report Producer :                                                                                                                                                                                                               | Himiko Chen <i>Himiko Chen</i>          |
| Report Number :                                                                                                                                                                                                                 | RLK1803004-00B                          |
| Report Date :                                                                                                                                                                                                                   | 2018-05-21                              |
| Reviewed By:                                                                                                                                                                                                                    | Jerry Chang <i>Jerry Chang</i>          |
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**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Taiwan)

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## Revision History

| Revision | Report Number  | Issue Date | Description     | Author/Revised by |
|----------|----------------|------------|-----------------|-------------------|
| 1.0      | RLK1803004-00B | 2018.05.21 | Original Report | Himiko Chen       |

## TABLE OF CONTENTS

|           |                                                                        |           |
|-----------|------------------------------------------------------------------------|-----------|
| <b>1</b>  | <b>GENERAL INFORMATION.....</b>                                        | <b>5</b>  |
| 1.1       | PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....                | 5         |
| 1.2       | OPERATION CONDITION OF EUT .....                                       | 6         |
| 1.3       | OBJECTIVE AND TEST METHODOLOGY .....                                   | 6         |
| 1.4       | MEASUREMENT UNCERTAINTY.....                                           | 7         |
| 1.5       | TEST FACILITY .....                                                    | 7         |
| <b>2</b>  | <b>SYSTEM TEST CONFIGURATION.....</b>                                  | <b>8</b>  |
| 2.1       | DESCRIPTION OF TEST CONFIGURATION.....                                 | 8         |
| 2.2       | DESCRIPTION OF WORST TEST CONFIGURATION.....                           | 9         |
| 2.3       | SUPPORT EQUIPMENT LIST AND DETAILS.....                                | 9         |
| 2.4       | EXTERNAL CABLE LIST AND DETAILS.....                                   | 9         |
| 2.5       | BLOCK DIAGRAM OF TEST SETUP.....                                       | 9         |
| 2.6       | DUTY CYCLE.....                                                        | 11        |
| <b>3</b>  | <b>SUMMARY OF TEST RESULTS.....</b>                                    | <b>14</b> |
| <b>4</b>  | <b>FCC §15.247(I), § 2.1093 - RF EXPOSURE .....</b>                    | <b>15</b> |
| 4.1       | APPLICABLE STANDARD .....                                              | 15        |
| 4.2       | RF EXPOSURE EVALUATION RESULT .....                                    | 15        |
| <b>5</b>  | <b>FCC §15.203 – ANTENNA REQUIREMENTS.....</b>                         | <b>16</b> |
| 5.1       | APPLICABLE STANDARD .....                                              | 16        |
| 5.2       | ANTENNA LIST AND DETAILS .....                                         | 16        |
| <b>6</b>  | <b>FCC §15.207 - AC LINE CONDUCTED EMISSIONS .....</b>                 | <b>17</b> |
| 6.1       | APPLICABLE STANDARD .....                                              | 17        |
| 6.2       | EUT SETUP.....                                                         | 17        |
| 6.3       | EMI TEST RECEIVER SETUP.....                                           | 18        |
| 6.4       | TEST PROCEDURE .....                                                   | 18        |
| 6.5       | TEST EQUIPMENT LIST AND DETAILS .....                                  | 18        |
| 6.6       | TEST ENVIRONMENTAL CONDITIONS.....                                     | 18        |
| 6.7       | AC LINE CONDUCTED EMISSION TEST PLOT AND DATA.....                     | 19        |
| <b>7</b>  | <b>FCC §15.209, §15.205, §15.247(D) – SPURIOUS EMISSIONS.....</b>      | <b>23</b> |
| 7.1       | APPLICABLE STANDARD .....                                              | 23        |
| 7.2       | EUT SETUP.....                                                         | 24        |
| 7.3       | EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP.....                       | 24        |
| 7.4       | TEST PROCEDURE.....                                                    | 25        |
| 7.5       | TEST EQUIPMENT LIST AND DETAILS .....                                  | 25        |
| 7.6       | TEST ENVIRONMENTAL CONDITIONS.....                                     | 25        |
| 7.7       | RADIATED EMISSION TEST PLOT AND DATA.....                              | 26        |
| <b>8</b>  | <b>FCC §15.247(A)(2) – 6 DB EMISSION BANDWIDTH .....</b>               | <b>47</b> |
| 8.1       | APPLICABLE STANDARD .....                                              | 47        |
| 8.2       | TEST PROCEDURE.....                                                    | 47        |
| 8.3       | TEST EQUIPMENT LIST AND DETAILS .....                                  | 47        |
| 8.4       | TEST ENVIRONMENTAL CONDITIONS.....                                     | 47        |
| 8.5       | TEST RESULTS .....                                                     | 48        |
| <b>9</b>  | <b>FCC §15.247(B)(3) – MAXIMUM OUTPUT POWER.....</b>                   | <b>61</b> |
| 9.1       | APPLICABLE STANDARD .....                                              | 61        |
| 9.2       | TEST PROCEDURE .....                                                   | 61        |
| 9.3       | TEST EQUIPMENT LIST AND DETAILS .....                                  | 61        |
| 9.4       | TEST ENVIRONMENTAL CONDITIONS.....                                     | 61        |
| 9.5       | TEST RESULTS .....                                                     | 62        |
| <b>10</b> | <b>FCC §15.247(D) – 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE .....</b> | <b>64</b> |

|           |                                                      |           |
|-----------|------------------------------------------------------|-----------|
| 10.1      | APPLICABLE STANDARD .....                            | 64        |
| 10.2      | TEST PROCEDURE .....                                 | 64        |
| 10.3      | TEST EQUIPMENT LIST AND DETAILS .....                | 64        |
| 10.4      | TEST ENVIRONMENTAL CONDITIONS.....                   | 64        |
| 10.5      | TEST RESULTS .....                                   | 65        |
| <b>11</b> | <b>FCC §15.247(E) – POWER SPECTRAL DENSITY .....</b> | <b>70</b> |
| 11.1      | APPLICABLE STANDARD .....                            | 70        |
| 11.2      | TEST PROCEDURE .....                                 | 70        |
| 11.3      | TEST EQUIPMENT LIST AND DETAILS .....                | 70        |
| 11.4      | TEST ENVIRONMENTAL CONDITIONS.....                   | 70        |
| 11.5      | TEST RESULTS .....                                   | 71        |

# 1 General Information

## 1.1 Product Description for Equipment under Test (EUT)

|                                      |                                                                                                                                                                 |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant</b>                     | <b>AAEON Technology Inc.</b><br>5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist., New Taipei City 23145, Taiwan, R.O.C                                     |
| <b>Manufacturer</b>                  | <b>AAEON Technology Inc.</b><br>5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist., New Taipei City 23145, Taiwan, R.O.C                                     |
| <b>Brand(Trade) Name</b>             | <br>an ASUS assoc. co.                                                         |
| <b>Product (Equipment)</b>           | Rugged Tablet Computer                                                                                                                                          |
| <b>Model Name</b>                    | RTC-700RK-TAD-WBGR-6102                                                                                                                                         |
| <b>Series Model</b>                  | xRTC-700RKx (x - Where x may be any combination of alphanumeric characters or "-" or blank.)                                                                    |
| <b>Model Discrepancy</b>             | For marketing purpose                                                                                                                                           |
| <b>EUT Function</b>                  | IEEE 802.11 bgn + BT4.1                                                                                                                                         |
| <b>Frequency Range</b>               | IEEE 802.11 b/g/n HT20 mode: 2412 ~ 2462 MHz<br>BLE mode : 2402 ~ 2480 MHz                                                                                      |
| <b>Number of Channels</b>            | IEEE 802.11 b/g/n HT20 mode: 11 Channels<br>BLE mode : 40 Channels                                                                                              |
| <b>Output Power</b>                  | IEEE 802.11b mode: 15.19 dBm (0.033 W)<br>IEEE 802.11g mode: 20.73 dBm (0.118 W)<br>IEEE 802.11n HT20 mode: 20.59 dBm (0.115 W)<br>BLE mode: 5.48 dBm (0.0035W) |
| <b>Received Date</b>                 | Mar 01, 2018.                                                                                                                                                   |
| <b>Date of Test</b>                  | Mar 02, 2018 ~ May 21, 2018                                                                                                                                     |
| <b>Related Submittal(s)/Grant(s)</b> | FCC Part 15.225 DXX with FCC ID : OHBRTC700RKWBG<br>FCC Part 15.247 DSS with FCC ID : OHBRTC700RKWBG                                                            |
| <b>Modulation Type</b>               | IEEE 802.11b mode: CCK<br>IEEE 802.11g/n HT 20 mode: OFDM<br>BLE mode : GFSK 1Mbps                                                                              |

*\*All measurement and test data in this report was gathered from production sample serial number: 1803004  
(Assigned by BACL, Taiwan).*

## 1.2 Operation Condition of EUT

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power Operation<br/>(Voltage Range)</b> | <input checked="" type="checkbox"/> AC 120V/60Hz<br><input checked="" type="checkbox"/> Adapter<br><i>Brand Name: FSP</i><br><i>Model: FSP036-RBBN2</i><br><i>I/P: 100-240Vac, 1.2A</i><br><i>O/P: 12Vdc, 3A</i><br><input type="checkbox"/> By Power Core                                                                                                                                                                                                                                                    |
|                                            | <input type="checkbox"/> DC Type<br><input type="checkbox"/> DC Power Supply<br><input checked="" type="checkbox"/> Battery :<br>(1) <i>Rechargeable Li-polymer Battery</i><br><i>Brand Name: AAEON</i><br><i>Model: RTC600S</i><br><i>7.4V = 1530mAh, 11.322Wh</i><br>(2) <i>Rechargeable Li-polymer Battery</i><br><i>Brand Name: AAEON</i><br><i>Model: RTC600H</i><br><i>7.4V = 1530mAh, 11.322Wh</i><br><input type="checkbox"/> External from USB Cable<br><input type="checkbox"/> External DC Adapter |
|                                            | <input type="checkbox"/> Host System                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

*\*The worst was Adapter mode*

## 1.3 Objective and Test Methodology

**The Objective of this Test Report was to document the compliance of the AAEON Technology Inc. Displays (Model: RTC-700RK-TAD-WBGR-6102, xRTC-700RKx (x - Where x may be any combination of alphanumeric characters or "-" or blank.)) to the requirements of the following Standards:**

*Part 2, Subpart J, Part 15 Subparts A and Part 15 Subparts C of the Federal Communication Commission's rules.*

*The objective is to determine compliance with FCC Part 15.247 rules and all measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices*

## 1.4 Measurement Uncertainty

| Parameter                        | Expanded Measurement uncertainty |
|----------------------------------|----------------------------------|
| RF output power with Power Meter | $\pm 0.55$ dB                    |
| Occupied Channel Bandwidth       | $\pm 4.45$ %                     |
| RF Conducted test with Spectrum  | $\pm 1.45$ dB                    |
| AC Power Line Conducted Emission | $\pm 4.64$ dB                    |
| Radiated Below 1G                | $\pm 5.83$ dB                    |
| Radiated Above 1G-18G            | $\pm 5.35$ dB                    |
| Radiated Above 18G-40G           | $\pm 4.49$ dB                    |

## 1.5 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Taiwan) to collect test data is located on

☒ 70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

☒ 68-3, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

## 2 System Test Configuration

### 2.1 Description of Test Configuration

The system was configured for testing in testing mode which was provided by manufacturer.

No special accessory, No modification was made to the EUT and No special equipment used during test.

**For Wi-Fi 2.4G mode, there are totally 11 channels.**

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 1       | 2412            | 8       | 2447            |
| 2       | 2417            | 9       | 2452            |
| 3       | 2422            | 10      | 2457            |
| 4       | 2427            | 11      | 2462            |
| 5       | 2432            | -       | -               |
| 6       | 2437            | -       | -               |
| 7       | 2442            | -       | -               |

*For 802.11b/g/n HT20 modes: Channel 1, 6 and 11 were tested.*

**For BLE mode, there are totally 40 channels.**

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 0       | 2402            | 20      | 2442            |
| 1       | 2404            | --      | --              |
| 2       | 2406            | --      | --              |
| 3       | 2408            | 37      | 2476            |
| --      | --              | 38      | 2478            |
| 19      | 2440            | 39      | 2480            |

*For BLE mode: Channel 0, 19 and 39 were tested.*

The worst-case data rates are determined to be as follows for each mode based upon investigation by measuring the average power and PSD across all data rates bandwidths, and modulations.

Radiated below 1G were tested worst output power mode.

## 2.2 Description of Worst Test Configuration

| Modulation Used for Conformance Test |     |                 |                 |
|--------------------------------------|-----|-----------------|-----------------|
| Configuration                        | NTX | Data Rate       | Worst Data Rate |
| 802.11b mode                         | 1   | 1-11 Mbps       | 1 Mbps          |
| 802.11g mode                         | 1   | 6-54 Mbps       | 6 Mbps          |
| 802.11n HT 20 mode                   | 1   | MCS 0-7         | MCS 0           |
| BLE mode                             | 1   | 125 kbps-1 Mbps | 1 Mbps          |

| Worst Case of Power Setting |     |            |         |         |
|-----------------------------|-----|------------|---------|---------|
| EUT Exercise Software       |     | RFTestTool |         |         |
| Configuration               | NTX | Low CH     | Mid CH  | High CH |
| 802.11b mode                | 1   | 0          | 0       | 0       |
| 802.11g mode                | 1   | 0          | 0       | 0       |
| 802.11n HT 20 mode          | 1   | 0          | 0       | 0       |
| BLE mode                    | 1   | Default    | Default | Default |

## 2.3 Support Equipment List and Details

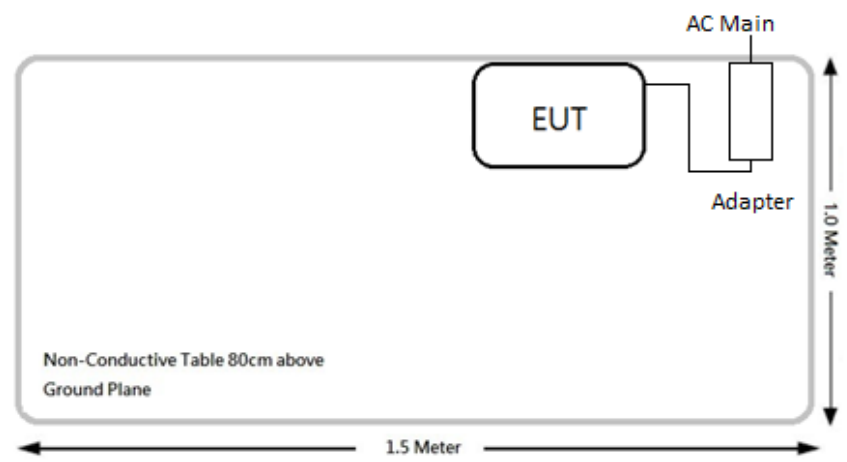
| No. | Description | Manufacturer | Model Number | BSMI | FCC ID/DoC |
|-----|-------------|--------------|--------------|------|------------|
| A   | N/A         | N/A          | N/A          | N/A  | N/A        |

## 2.4 External Cable List and Details

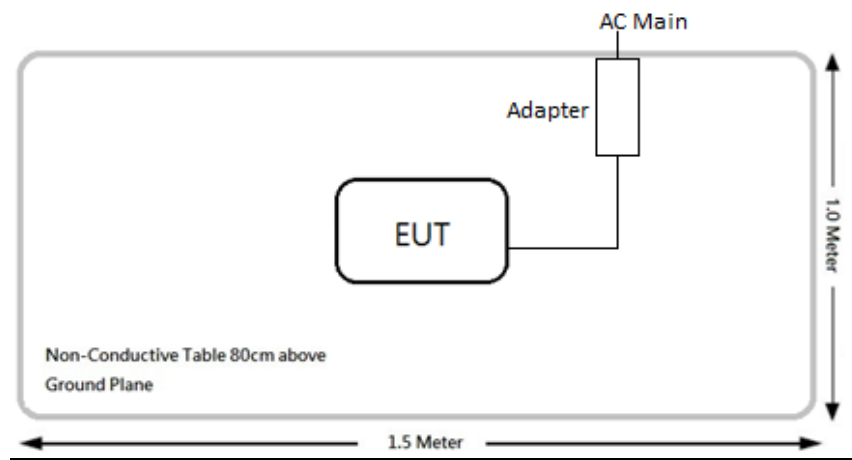
| No. | Cable Description | Length (m) | From | To  |
|-----|-------------------|------------|------|-----|
| 1   | N/A               | N/A        | N/A  | N/A |

## 2.5 Block Diagram of Test Setup

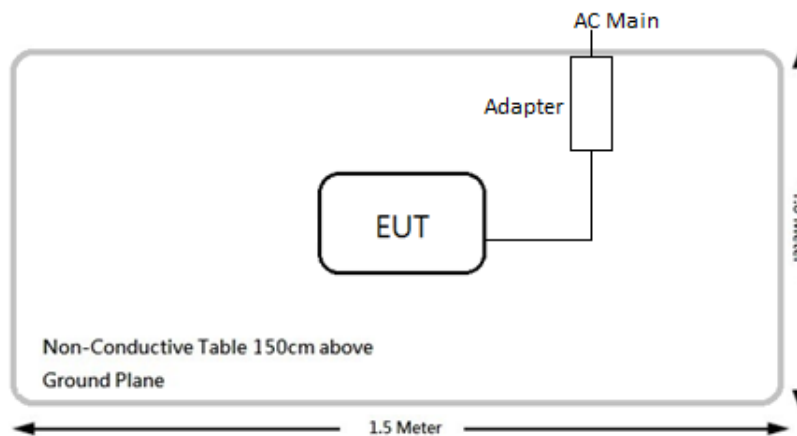
### Conduction



### Radiation below 1G



### Radiation Above 1G



## 2.6 Duty Cycle

According to KDB 558074 D01 DTS Meas Guidance v04 section 6.0:

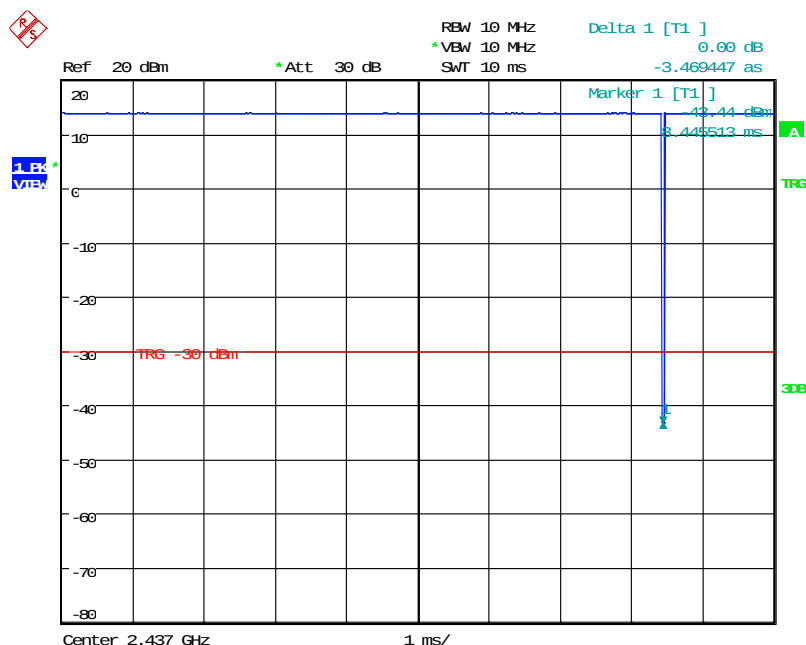
All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum power transmission duration, T, are required for each tested mode of operation.

| Configuration      | On Time (ms) | Period (ms) | Duty Cycle (%) | Duty Factor (dB) |
|--------------------|--------------|-------------|----------------|------------------|
| 802.11b mode       | 16.91        | 16.91       | 100.00         | 0.00             |
| 802.11g mode       | 1.44         | 1.44        | 100.00         | 0.00             |
| 802.11n HT 20 mode | 1.34         | 1.34        | 100.00         | 0.00             |
| BLE mode           | 0.43         | 0.62        | 69.35          | 1.59             |

Note: Duty Factor =  $10 \cdot \log(1/\text{Duty cycle})$

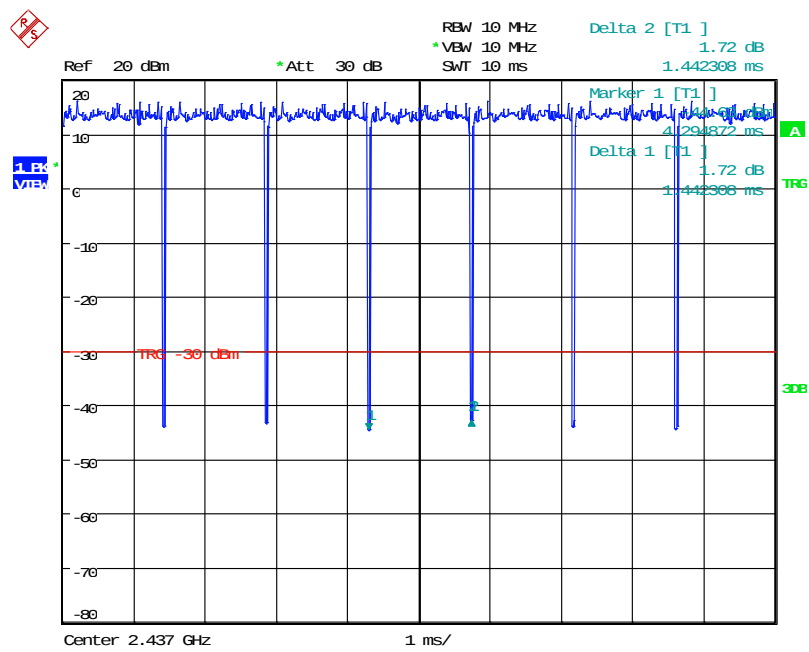
Please refer to the following plots.

### B mode



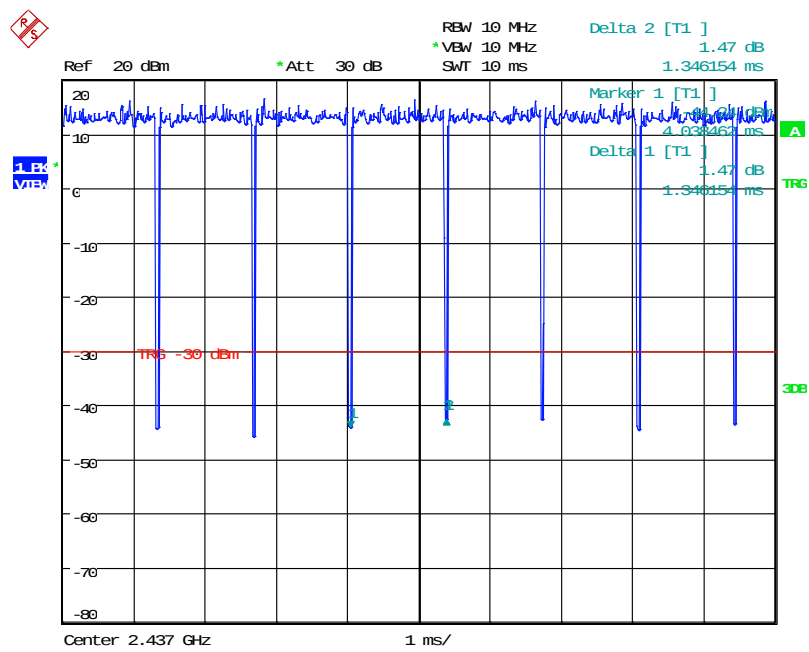
Date: 21.MAY.2018 13:12:29

G mode



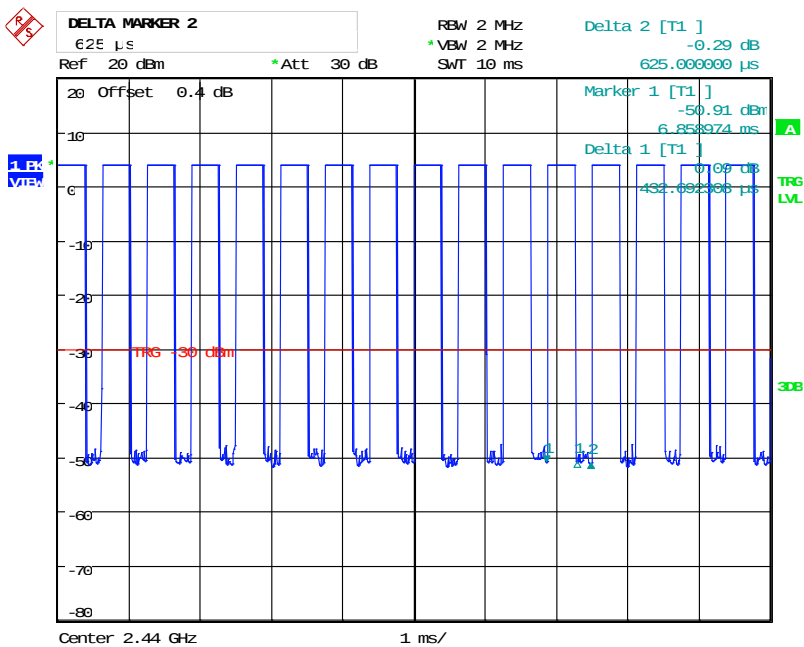
Date: 21.MAY.2018 13:11:09

N 20 mod



Date: 21.MAY.2018 13:11:42

BLE mode



Date: 21.MAR.2018 00:50:37

### 3 Summary of Test Results

| FCC Rules                    | Description of Test                      | Result     |
|------------------------------|------------------------------------------|------------|
| FCC §15.247(i), § 2.1093     | RF Exposure                              | Compliance |
| §15.203                      | Antenna Requirement                      | Compliance |
| §15.207(a)                   | AC Line Conducted Emissions              | Compliance |
| §15.205, §15.209, §15.247(d) | Spurious Emissions                       | Compliance |
| §15.247(a)(2)                | 6 dB Emission Bandwidth                  | Compliance |
| §15.247(b)(3)                | Maximum Peak Output Power                | Compliance |
| §15.247(d)                   | 100 kHz Bandwidth of Frequency Band Edge | Compliance |
| §15.247(e)                   | Power Spectral Density                   | Compliance |

## 4 FCC §15.247(i), § 2.1093 - RF Exposure

---

### 4.1 Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance v06

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot$

$[\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

1.  $f(\text{GHz})$  is the RF channel transmit frequency in GHz.

2. Power and distance are rounded to the nearest mW and mm before calculation.

3. The result is rounded to one decimal place for comparison.

4. 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum *test separation distance* is  $\leq 50$  mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is  $< 5$  mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

### 4.2 RF Exposure Evaluation Result

#### For Wi-Fi and BLE Mode:

Please refer to the SAR report, report No.: RLK1803004-20A

## 5 FCC §15.203 – Antenna Requirements

### 5.1 Applicable Standard

According to § 15.203,

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna does not exceed 6 dBi

### 5.2 Antenna List and Details

| Manufacturer | Model              | Antenna Type | Antenna Gain | Result     |
|--------------|--------------------|--------------|--------------|------------|
| Aristotle    | RFA-25-JP19-70B-50 | PIFA Antenna | 3.89 dBi     | Compliance |

*The EUT has an internal detachable antenna arrangement, fulfill the requirement of this section.*

## 6 FCC §15.207 - AC Line Conducted Emissions

### 6.1 Applicable Standard

According to FCC §15.207

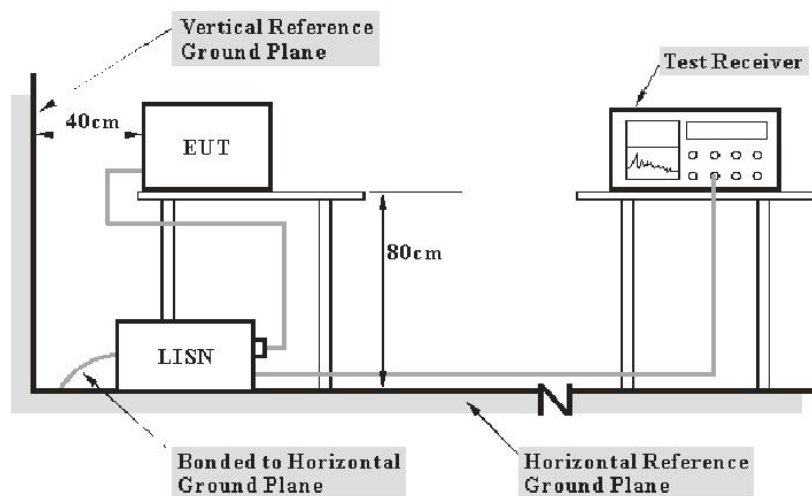
For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

| Frequency of Emission (MHz) | Conducted Limit (dBuV)     |                            |
|-----------------------------|----------------------------|----------------------------|
|                             | Quasi-Peak                 | Average                    |
| 0.15-0.5                    | 66 to 56 <sup>Note 1</sup> | 56 to 46 <sup>Note 2</sup> |
| 0.5-5                       | 56                         | 46                         |
| 5-30                        | 60                         | 50                         |

*Note 1: Decreases with the logarithm of the frequency.*

*Note 2: A linear average detector is required*

### 6.2 EUT Setup



**Note:** 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

### 6.3 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz. During the conducted emission test, the EMI test receiver was set with the following configurations

| Frequency Range  | Receiver RBW |
|------------------|--------------|
| 150 kHz - 30 MHz | 9 kHz        |

### 6.4 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN. Maximizing procedure was performed on the six (6) highest emissions of the EUT. All data was recorded in the Quasi-peak and average detection mode.

### 6.5 Test Equipment List and Details

| Manufacturers     | Descriptions    | Models  | Serial Numbers | Calibration Date | Calibration Due Date |
|-------------------|-----------------|---------|----------------|------------------|----------------------|
| LISN              | EMCO            | 3816/2  | 00075848       | 2017/08/02       | 2018/08/01           |
| LISN              | Rohde & Schwarz | ENV216  | 101248         | 2017/07/20       | 2018/07/19           |
| EMI Test Receiver | Rohde & Schwarz | ESR7    | 101419         | 2017/11/06       | 2018/11/05           |
| Pulse Limiter     | Rohde & Schwarz | ESH3Z2  | TXZEM104       | 2017/08/10       | 2018/08/09           |
| RF Cable          | EMEC            | EM-CB5D | 001            | 2017/07/10       | 2018/07/09           |
| Software          | AUDIX           | E3      | V9.150826k     | N.C.R            | N.C.R                |

**\*Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

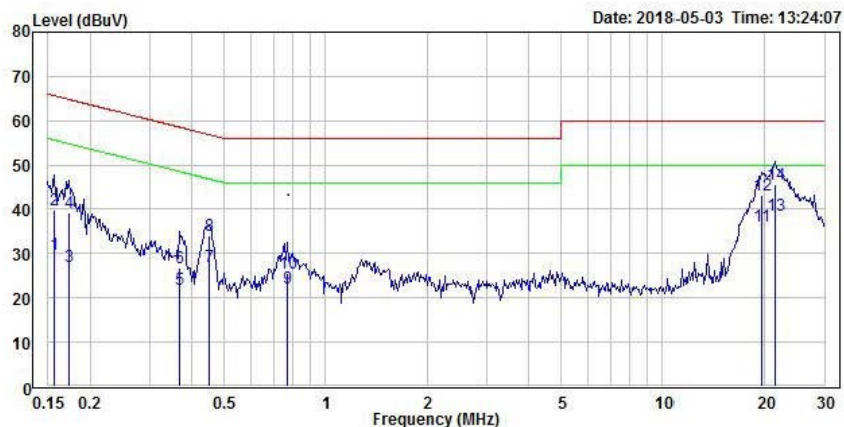
### 6.6 Test Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 25 °C    |
| Relative Humidity: | 58 %     |
| ATM Pressure:      | 1010 hPa |

The testing was performed by Ian on 2018-05-03

## 6.7 AC Line Conducted Emission Test Plot and Data

Mode: AC 120V/60 Hz, Wi-Fi mode, Line



Condition: limit\FCC\FCC Conduction Clsaa-B QP.csv Line

EUT : Rugged Tablet Computer

Model : RTC-700RK-TAD-WBGR-6102

Note : WiFi MODE

Power : 120V/60Hz

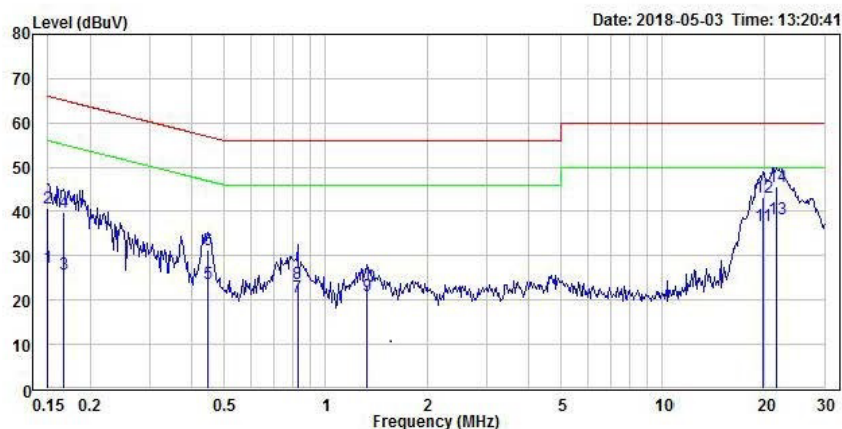
|    | Freq   | Level | Limit | Over   |        | Read  |         |           |
|----|--------|-------|-------|--------|--------|-------|---------|-----------|
|    | MHz    | dBuV  | Line  | Limit  | Factor | Level | Remark  | Pol/Phase |
|    | MHz    | dBuV  | dBuV  | dB     | dB     | dBuV  |         |           |
| 1  | 0.156  | 29.68 | 55.67 | -25.99 | 19.50  | 10.18 | Average | Line      |
| 2  | 0.156  | 39.97 | 65.67 | -25.70 | 19.50  | 20.47 | QP      | Line      |
| 3  | 0.173  | 27.02 | 54.81 | -27.79 | 19.50  | 7.52  | Average | Line      |
| 4  | 0.173  | 39.39 | 64.81 | -25.42 | 19.50  | 19.89 | QP      | Line      |
| 5  | 0.369  | 21.99 | 48.52 | -26.53 | 19.51  | 2.48  | Average | Line      |
| 6  | 0.369  | 26.90 | 58.52 | -31.62 | 19.51  | 7.39  | QP      | Line      |
| 7  | 0.450  | 27.17 | 46.87 | -19.70 | 19.51  | 7.66  | Average | Line      |
| 8  | 0.450  | 34.20 | 56.87 | -22.67 | 19.51  | 14.69 | QP      | Line      |
| 9  | 0.768  | 22.19 | 46.00 | -23.81 | 19.52  | 2.67  | Average | Line      |
| 10 | 0.768  | 25.63 | 56.00 | -30.37 | 19.52  | 6.11  | QP      | Line      |
| 11 | 19.511 | 36.22 | 50.00 | -13.78 | 19.84  | 16.38 | Average | Line      |
| 12 | 19.511 | 43.08 | 60.00 | -16.92 | 19.84  | 23.24 | QP      | Line      |
| 13 | 21.468 | 38.60 | 50.00 | -11.40 | 19.85  | 18.75 | Average | Line      |
| 14 | 21.468 | 45.48 | 60.00 | -14.52 | 19.85  | 25.63 | QP      | Line      |

Note:

Level = Read Level + Factor

Over Limit (Margin) = Level – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

**Mode: AC 120V/60 Hz, Wi-Fi mode, Neutral**

Condition: limit\FCC\FCC Conduction Clsaa-B QP.csv Neutral  
 EUT : Rugged Tablet Computer  
 Model : RTC-700RK-TAD-WBGR-6102  
 Note : WiFi MODE  
 Power : 120V/60Hz

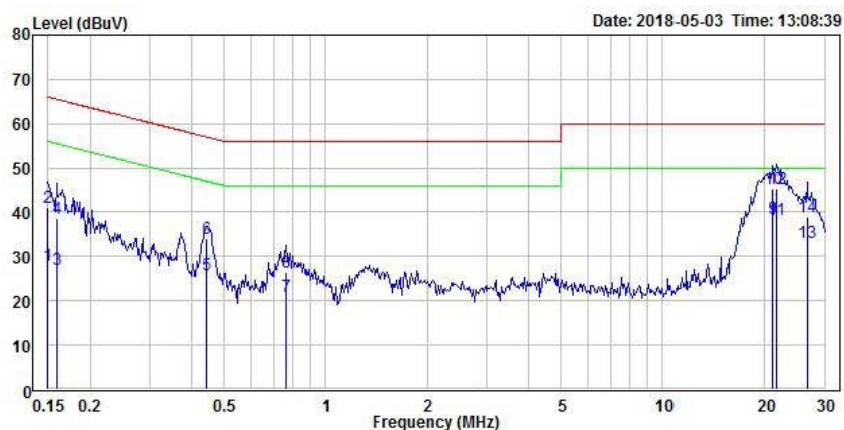
|    | Freq   | Level | Limit | Over   |        | Read  |         |           |
|----|--------|-------|-------|--------|--------|-------|---------|-----------|
|    | MHz    | dBuV  | Line  | Limit  | Factor | Level | Remark  | Pol/Phase |
|    |        |       | dBuV  | dB     | dB     | dBuV  |         |           |
| 1  | 0.150  | 27.50 | 56.00 | -28.50 | 19.63  | 7.87  | Average | Neutral   |
| 2  | 0.150  | 40.80 | 66.00 | -25.20 | 19.63  | 21.17 | QP      | Neutral   |
| 3  | 0.166  | 25.83 | 55.14 | -29.31 | 19.63  | 6.20  | Average | Neutral   |
| 4  | 0.166  | 39.96 | 65.14 | -25.18 | 19.63  | 20.33 | QP      | Neutral   |
| 5  | 0.447  | 23.67 | 46.93 | -23.26 | 19.64  | 4.03  | Average | Neutral   |
| 6  | 0.447  | 31.32 | 56.93 | -25.61 | 19.64  | 11.68 | QP      | Neutral   |
| 7  | 0.825  | 20.77 | 46.00 | -25.23 | 19.66  | 1.11  | Average | Neutral   |
| 8  | 0.825  | 23.72 | 56.00 | -32.28 | 19.66  | 4.06  | QP      | Neutral   |
| 9  | 1.320  | 20.95 | 46.00 | -25.05 | 19.68  | 1.27  | Average | Neutral   |
| 10 | 1.320  | 23.12 | 56.00 | -32.88 | 19.68  | 3.44  | QP      | Neutral   |
| 11 | 19.667 | 36.81 | 50.00 | -13.19 | 20.04  | 16.77 | Average | Neutral   |
| 12 | 19.667 | 43.07 | 60.00 | -16.93 | 20.04  | 23.03 | QP      | Neutral   |
| 13 | 21.640 | 38.37 | 50.00 | -11.63 | 20.06  | 18.31 | Average | Neutral   |
| 14 | 21.640 | 45.75 | 60.00 | -14.25 | 20.06  | 25.69 | QP      | Neutral   |

Note:

Level = Read Level + Factor

Over Limit (Margin) = Level – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

**Mode: AC 120V/60 Hz, BLE mode, Line**

Condition: limit\FCC\FCC Conduction Clsaa-B QP.csv Line

EUT : Rugged Tablet Computer

Model : RTC-700RK-TAD-WBGR-6102

Note : BLE MODE

Power : 120V/60Hz

|    | Freq   | Level | Limit | Over   | Read   |       |              |
|----|--------|-------|-------|--------|--------|-------|--------------|
|    | MHz    | dBuV  | Line  | Limit  | Factor | Level | Remark       |
|    |        |       | dBuV  | dB     | dB     | dBuV  | Pol/Phase    |
| 1  | 0.150  | 27.96 | 56.00 | -28.04 | 19.50  | 8.46  | Average Line |
| 2  | 0.150  | 40.98 | 66.00 | -25.02 | 19.50  | 21.48 | QP Line      |
| 3  | 0.159  | 27.18 | 55.54 | -28.36 | 19.50  | 7.68  | Average Line |
| 4  | 0.159  | 38.77 | 65.54 | -26.77 | 19.50  | 19.27 | QP Line      |
| 5  | 0.443  | 25.98 | 47.00 | -21.02 | 19.51  | 6.47  | Average Line |
| 6  | 0.443  | 34.19 | 57.00 | -22.81 | 19.51  | 14.68 | QP Line      |
| 7  | 0.762  | 20.97 | 46.00 | -25.03 | 19.52  | 1.45  | Average Line |
| 8  | 0.762  | 26.52 | 56.00 | -29.48 | 19.52  | 7.00  | QP Line      |
| 9  | 21.129 | 38.72 | 50.00 | -11.28 | 19.84  | 18.88 | Average Line |
| 10 | 21.129 | 45.20 | 60.00 | -14.80 | 19.84  | 25.36 | QP Line      |
| 11 | 21.640 | 38.35 | 50.00 | -11.65 | 19.85  | 18.50 | Average Line |
| 12 | 21.640 | 45.22 | 60.00 | -14.78 | 19.85  | 25.37 | QP Line      |
| 13 | 26.621 | 33.29 | 50.00 | -16.71 | 19.87  | 13.42 | Average Line |
| 14 | 26.621 | 38.85 | 60.00 | -21.15 | 19.87  | 18.98 | QP Line      |

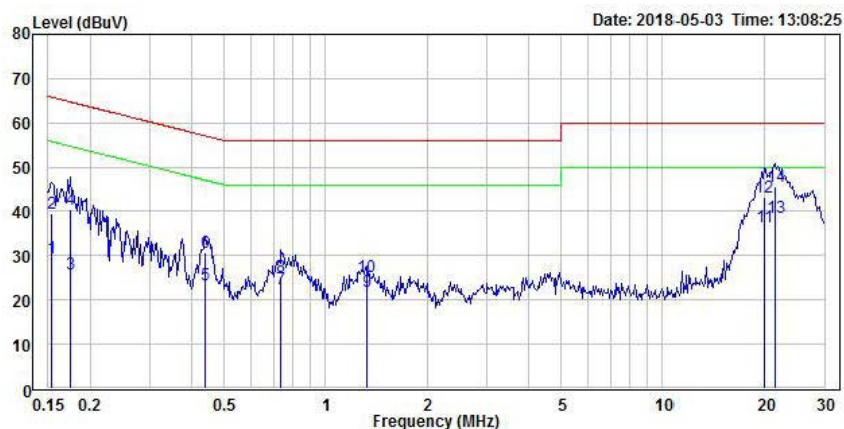
Note:

Level = Read Level + Factor

Over Limit (Margin) = Level – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Mode: AC 120V/60 Hz, BLE mode, Neutral



Condition: limit\FCC\FCC Conduction Clsaa-B QP.csv Neutral

EUT : Rugged Tablet Computer

Model : RTC-700RK-TAD-WBGR-6102

Note : BLE MODE

Power : 120V/60Hz

|    | Freq   | Level | Limit | Over   | Read   |       |                 |
|----|--------|-------|-------|--------|--------|-------|-----------------|
|    | MHz    | dBuV  | Line  | Limit  | Factor | Level | Remark          |
|    | MHz    | dBuV  | dBuV  | dB     | dB     | dBuV  | Pol/Phase       |
| 1  | 0.154  | 29.58 | 55.80 | -26.22 | 19.63  | 9.95  | Average Neutral |
| 2  | 0.154  | 39.53 | 65.80 | -26.27 | 19.63  | 19.90 | QP Neutral      |
| 3  | 0.175  | 25.82 | 54.74 | -28.92 | 19.63  | 6.19  | Average Neutral |
| 4  | 0.175  | 40.41 | 64.74 | -24.33 | 19.63  | 20.78 | QP Neutral      |
| 5  | 0.440  | 23.30 | 47.07 | -23.77 | 19.64  | 3.66  | Average Neutral |
| 6  | 0.440  | 30.81 | 57.07 | -26.26 | 19.64  | 11.17 | QP Neutral      |
| 7  | 0.738  | 22.45 | 46.00 | -23.55 | 19.66  | 2.79  | Average Neutral |
| 8  | 0.738  | 25.28 | 56.00 | -30.72 | 19.66  | 5.62  | QP Neutral      |
| 9  | 1.320  | 21.88 | 46.00 | -24.12 | 19.68  | 2.20  | Average Neutral |
| 10 | 1.320  | 25.29 | 56.00 | -30.71 | 19.68  | 5.61  | QP Neutral      |
| 11 | 19.824 | 36.38 | 50.00 | -13.62 | 20.04  | 16.34 | Average Neutral |
| 12 | 19.824 | 43.19 | 60.00 | -16.81 | 20.04  | 23.15 | QP Neutral      |
| 13 | 21.468 | 38.70 | 50.00 | -11.30 | 20.06  | 18.64 | Average Neutral |
| 14 | 21.468 | 45.61 | 60.00 | -14.39 | 20.06  | 25.55 | QP Neutral      |

Note:

Level = Read Level + Factor

Over Limit (Margin) = Level – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

## 7 FCC §15.209, §15.205, §15.247(d) – Spurious Emissions

### 7.1 Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As Per FCC §15.205(a) and RSS-Gen except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                 | MHz                   | MHz             | GHz           |
|---------------------|-----------------------|-----------------|---------------|
| 0.090 – 0.110       | 16.42 – 16.423        | 960 – 1240      | 4.5 – 5.15    |
| 0.495 – 0.505       | 16.69475 – 16.69525   | 1300 – 1427     | 5.35 – 5.46   |
| 2.1735 – 2.1905     | 25.5 – 25.67          | 1435 – 1626.5   | 7.25 – 7.75   |
| 4.125 – 4.128       | 37.5 – 38.25          | 1645.5 – 1646.5 | 8.025 – 8.5   |
| 4.17725 – 4.17775   | 73 – 74.6             | 1660 – 1710     | 9.0 – 9.2     |
| 4.20725 – 4.20775   | 74.8 – 75.2           | 1718.8 – 1722.2 | 9.3 – 9.5     |
| 6.215 – 6.218       | 108 – 121.94          | 2200 – 2300     | 10.6 – 12.7   |
| 6.26775 – 6.26825   | 123 – 138             | 2310 – 2390     | 13.25 – 13.4  |
| 6.31175 – 6.31225   | 149.9 – 150.05        | 2483.5 – 2500   | 14.47 – 14.5  |
| 8.291 – 8.294       | 156.52475 – 156.52525 | 2690 – 2900     | 15.35 – 16.2  |
| 8.362 – 8.366       | 156.7 – 156.9         | 3260 – 3267     | 17.7 – 21.4   |
| 8.37625 – 8.38675   | 162.0125 – 167.17     | 3.332 – 3.339   | 22.01 – 23.12 |
| 8.41425 – 8.41475   | 167.72 – 173.2        | 3.3458 – 3.358  | 23.6 – 24.0   |
| 12.29 – 12.293      | 240 – 285             | 3.600 – 4.400   | 31.2 – 31.8   |
| 12.51975 – 12.52025 | 322 – 335.4           |                 | 36.43 – 36.5  |
| 12.57675 – 12.57725 | 399.9 – 410           |                 | Above 38.6    |
| 13.36 – 13.41       | 608 – 614             |                 |               |

As per FCC §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:

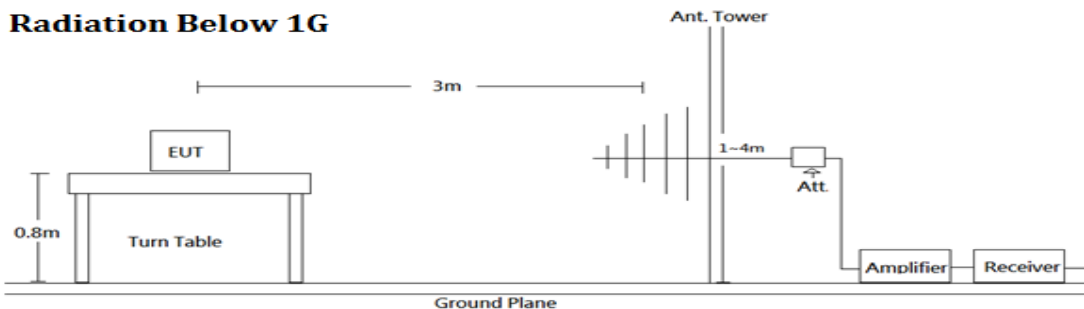
| Frequency (MHz) | Field Strength (micro volts/meter) | Measurement Distance (meters) |
|-----------------|------------------------------------|-------------------------------|
| 0.009 - 0.490   | 2400/F(kHz)                        | 300                           |
| 0.490 - 1.705   | 24000/F(kHz)                       | 30                            |
| 1.705 - 30.0    | 30                                 | 30                            |
| 30 - 88         | 100**                              | 3                             |
| 88 - 216        | 150**                              | 3                             |
| 216 - 960       | 200**                              | 3                             |
| Above 960       | 500                                | 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., Sections 15.231 and 15.241.

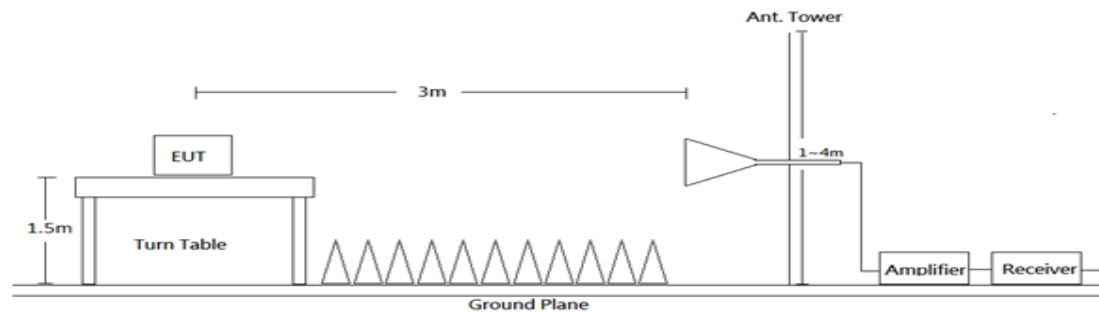
As per FCC §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

## 7.2 EUT Setup

### Radiation Below 1G



### Radiation Above 1G



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 and FCC 15.247 Limits.

## 7.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 26.5 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

| Frequency Range | RBW     | VBW   | Detector | Duty cycle | Measurement method |
|-----------------|---------|-------|----------|------------|--------------------|
| 30-1000 MHz     | 120 kHz | /     | QP       |            | QP                 |
| Above 1 GHz     | 1 MHz   | 3 MHz | PK       |            | PK                 |
|                 | 1 MHz   | 3 MHz | RMS      | >98%       | Ave                |
|                 | 1 MHz   | 1/T   | PK       | <98%       | Ave                |

## 7.4 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

## 7.5 Test Equipment List and Details

| Description       | Manufacturer          | Model                    | Serial Number       | Calibration Date | Calibration Due Date |
|-------------------|-----------------------|--------------------------|---------------------|------------------|----------------------|
| 966A Room         |                       |                          |                     |                  |                      |
| Bilog Antenna     | Sunol & Mini-Circuits | JB6/UNAT-6+              | A050115 / 15542_01  | 2017/12/20       | 2018/12/19           |
| Horn Antenna      | EMCO                  | 3115                     | 9311-4158           | 2017/05/31       | 2018/05/30           |
| Horn Antenna      | ETS-Lindgren          | 3116                     | 00062638            | 2017/09/02       | 2018/09/01           |
| Preamplifier      | Sonoma                | 310N                     | 130602              | 2017/07/03       | 2018/07/02           |
| Preamplifier      | EMEC                  | EM01G18G                 | 060697              | 2017/04/14       | 2018/04/13           |
| Preamplifier      | EMEC                  | EM18G40G                 | 060656              | 2018/01/15       | 2019/01/14           |
| EMI Test Receiver | R & S                 | ESR7                     | 101419              | 2017/11/06       | 2018/11/05           |
| Spectrum Analyzer | Rohde & Schwarz       | FSV40                    | 101203              | 2017/07/13       | 2018/07/12           |
| Microflex Cable   | UTIFLEX               | UFB311A-Q-1440-300300    | 220490-006          | 2017/10/31       | 2018/10/30           |
| Microflex Cable   | UTIFLEX               | UFA210A-1-3149-300300    | MFR64639 226389-001 | 2017/11/10       | 2018/11/09           |
| Microflex Cable   | ROSNOL                | K1K50-UP0264-K1K50-450CM | 160309-1            | 2018/03/05       | 2019/03/04           |
| Microflex Cable   | ROSNOL                | K1K50-UP0264-K1K50-80CM  | 160309-2            | 2018/01/29       | 2019/01/28           |
| 20 dB Attenuator  | NCL                   | BW-S20W5+                | NA                  | Each Use         | /                    |
| Turn Table        | Champro               | TT-2000                  | 060772-T            | N.C.R            | N.C.R                |
| Antenna Tower     | Champro               | AM-BS-4500-B             | 060772-A            | N.C.R            | N.C.R                |
| Controller        | Champro               | EM1000                   | 060772              | N.C.R            | N.C.R                |
| Software          | Farad                 | EZ EMC                   | BACL-03A1           | N.C.R            | N.C.R                |
| Conducted Room    |                       |                          |                     |                  |                      |
| Spectrum Analyzer | Rohde & Schwarz       | FSU26                    | 200268              | 2017/05/08       | 2018/05/07           |
| Cable             | WOKEN                 | SFL402                   | S02-160323-07       | 2018/02/21       | 2019/02/20           |

**\*Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

## 7.6 Test Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 23.5 °C  |
| Relative Humidity: | 55.4 %   |
| ATM Pressure:      | 1015 hPa |

The testing was performed by Ian from 2018-03-20 to 2018-04-10

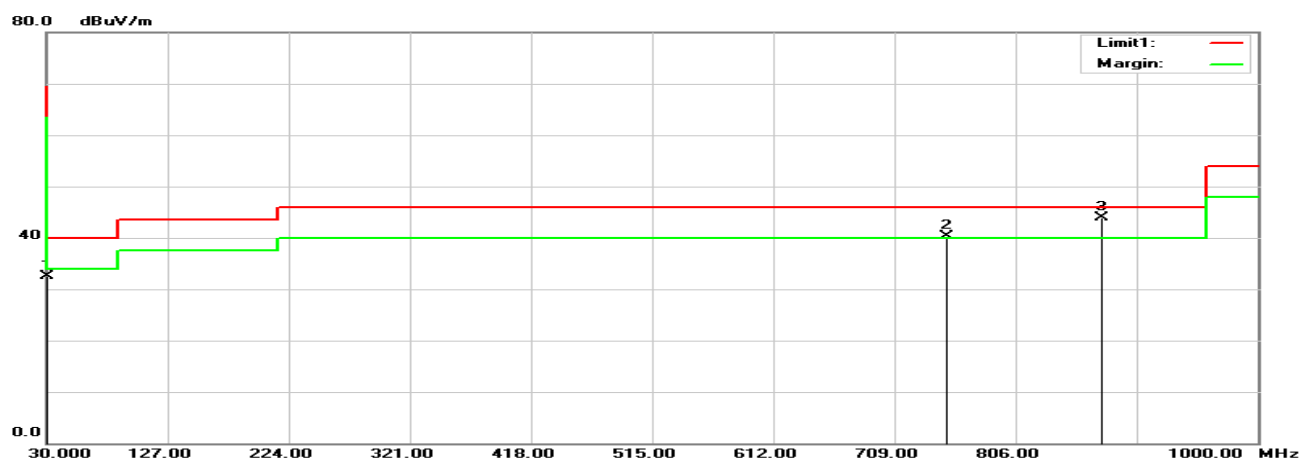
## 7.7 Radiated Emission Test Plot and Data

**Wi-Fi Mode:** Transmitting Mode (Pre-scan with three orthogonal axis, and worse case as X axis)

**Below 1G (30 MHz-1 GHz) test the output power worst mode:**

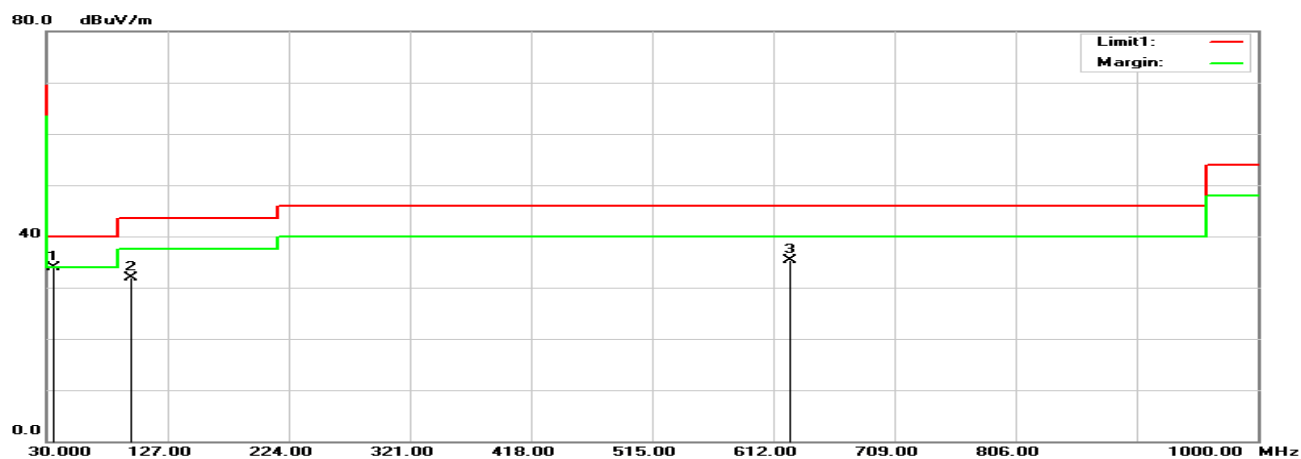
Wi-Fi mode: Worst case is 802.11g mode Middle Channel

### Horizontal



| Frequency (MHz) | Reading (dBuV) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Height (cm) | Degree (°) | Remark |
|-----------------|----------------|----------------------|-----------------|----------------|-------------|-------------|------------|--------|
| 30.9700         | 36.47          | -3.93                | 32.54           | 40.00          | -7.46       | 100         | 288        | peak   |
| 750.7100        | 42.48          | -2.09                | 40.39           | 46.00          | -5.61       | 100         | 208        | peak   |
| 874.8700        | 43.32          | 0.60                 | 43.92           | 46.00          | -2.08       | 100         | 111        | QP     |

### Vertical

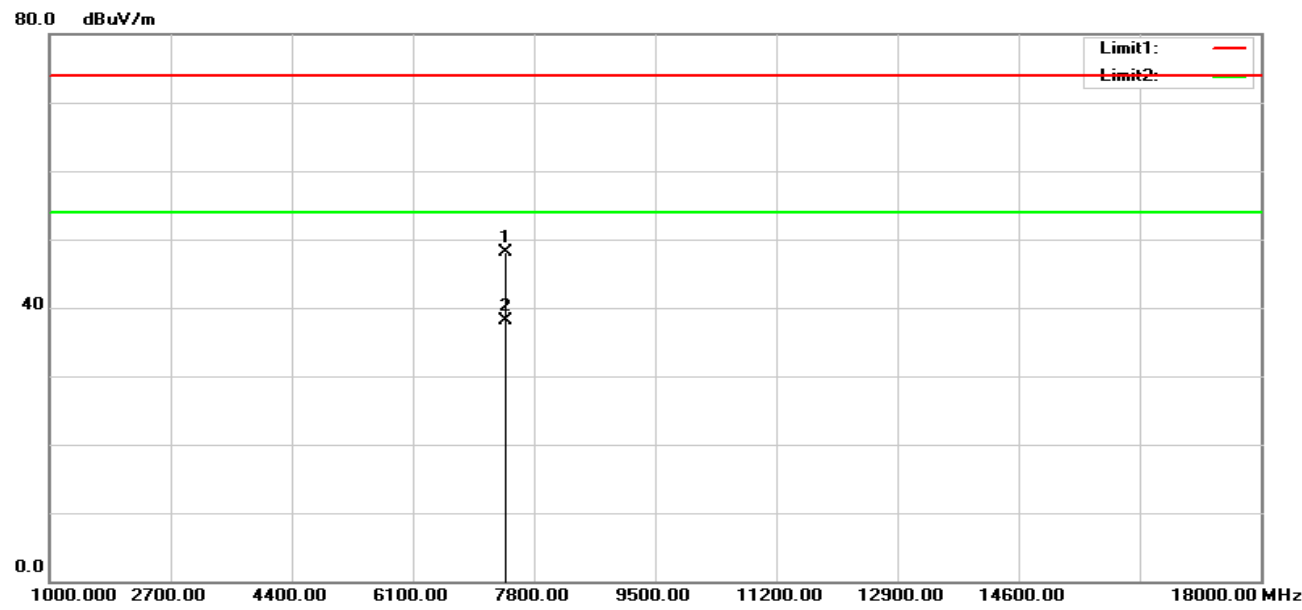


| Frequency (MHz) | Reading (dBuV) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Height (cm) | Degree (°) | Remark |
|-----------------|----------------|----------------------|-----------------|----------------|-------------|-------------|------------|--------|
| 35.8200         | 41.33          | -7.35                | 33.98           | 40.00          | -6.02       | 100         | 119        | peak   |
| 97.9000         | 46.86          | -15.01               | 31.85           | 43.50          | -11.65      | 100         | 1          | peak   |
| 625.5800        | 39.16          | -3.81                | 35.35           | 46.00          | -10.65      | 100         | 328        | peak   |

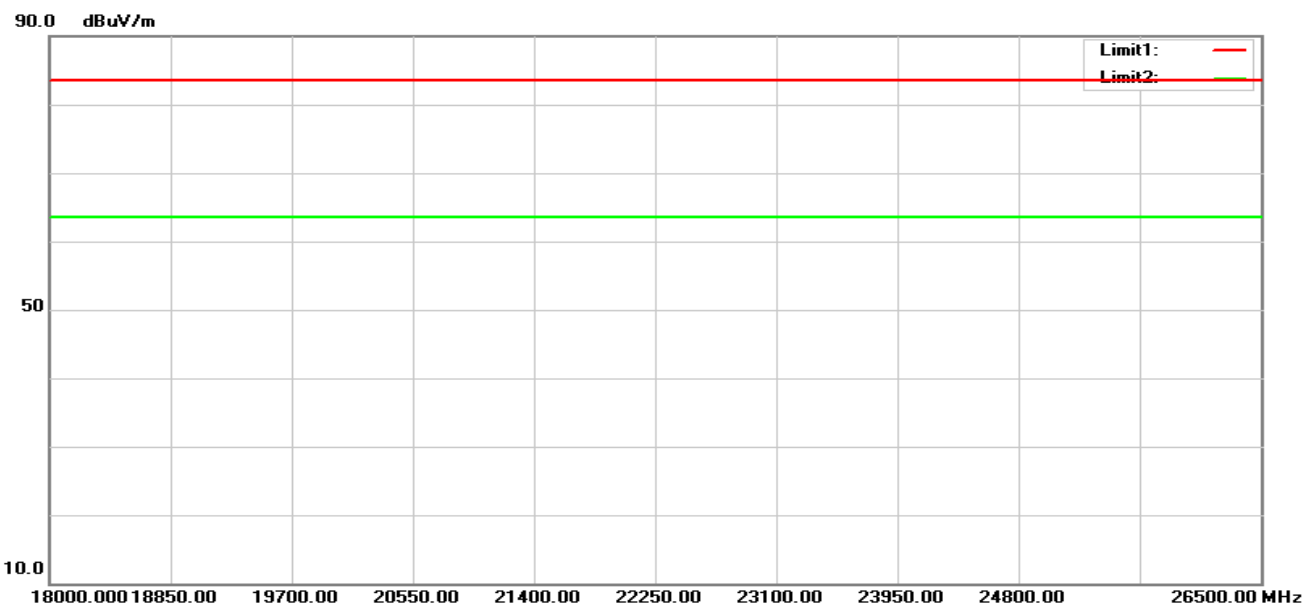
Above 1G (1 GHz-26.5 GHz): the output power Worst case is 802.11g mode High channel

**Horizontal**

1GHz-18GHz:

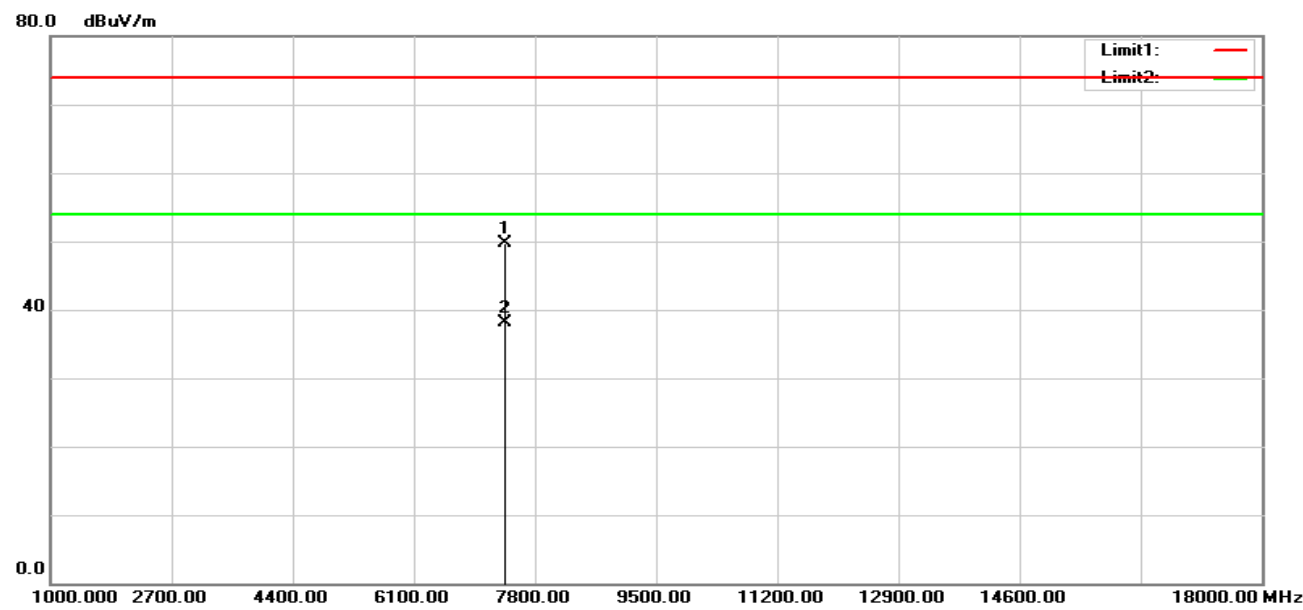


18GHz-26.5GHz:

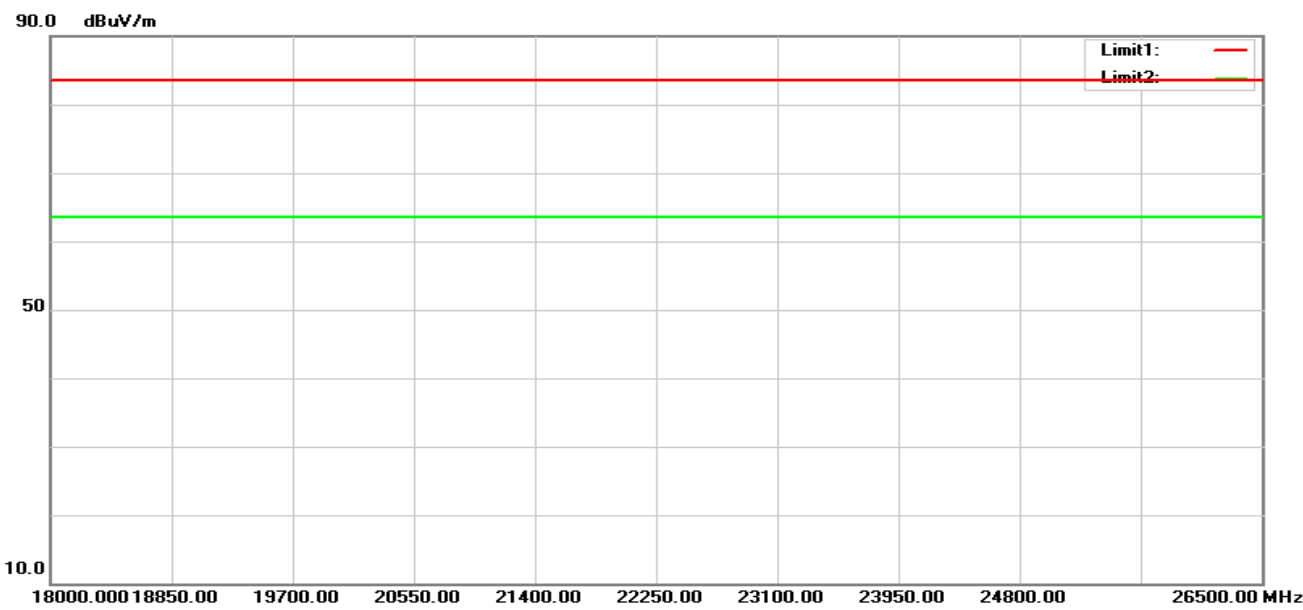


**Vertical**

**1GHz-18GHz:**



**18GHz-26.5GHz:**



**Wi-Fi B mode****Horizontal**

| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>(°) | Remark |
|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|---------------|--------|
| Low Channel        |                   |                         |                    |                   |                |                |               |        |
| 2373.480           | 62.28             | -4.92                   | 57.36              | 74.00             | -16.64         | 150            | 304           | peak   |
| 2373.480           | 48.43             | -4.92                   | 43.51              | 54.00             | -10.49         | 150            | 304           | AVG    |
| 2410.855           | 105.61            | -4.84                   | 100.77             | N/A               | N/A            | 150            | 197           | peak   |
| 2410.855           | 102.82            | -4.84                   | 97.98              | N/A               | N/A            | 150            | 197           | AVG    |
| 7239.000           | 40.65             | 6.69                    | 47.34              | 74.00             | -26.66         | 150            | 141           | peak   |
| 7239.000           | 35.14             | 6.69                    | 41.83              | 54.00             | -12.17         | 150            | 141           | AVG    |
| Mid Channel        |                   |                         |                    |                   |                |                |               |        |
| 2360.730           | 62.22             | -4.95                   | 57.27              | 74.00             | -16.73         | 150            | 190           | peak   |
| 2360.730           | 48.15             | -4.95                   | 43.20              | 54.00             | -10.80         | 150            | 190           | AVG    |
| 2438.060           | 104.76            | -4.78                   | 99.98              | N/A               | N/A            | 150            | 187           | peak   |
| 2438.060           | 102.41            | -4.78                   | 97.63              | N/A               | N/A            | 150            | 187           | AVG    |
| 2489.740           | 62.14             | -4.67                   | 57.47              | 74.00             | -16.53         | 150            | 106           | peak   |
| 2489.740           | 48.27             | -4.67                   | 43.60              | 54.00             | -10.40         | 150            | 106           | AVG    |
| 7307.000           | 41.90             | 6.97                    | 48.87              | 74.00             | -25.13         | 150            | 137           | peak   |
| 7307.000           | 36.38             | 6.97                    | 43.35              | 54.00             | -10.65         | 150            | 137           | AVG    |
| High Channel       |                   |                         |                    |                   |                |                |               |        |
| 2463.050           | 104.53            | -4.72                   | 99.81              | N/A               | N/A            | 150            | 187           | peak   |
| 2463.050           | 101.93            | -4.72                   | 97.21              | N/A               | N/A            | 150            | 187           | AVG    |
| 2495.800           | 62.43             | -4.65                   | 57.78              | 74.00             | -16.22         | 150            | 35            | peak   |
| 2495.800           | 48.41             | -4.65                   | 43.76              | 54.00             | -10.24         | 150            | 35            | AVG    |
| 7375.000           | 43.18             | 7.23                    | 50.41              | 74.00             | -23.59         | 150            | 133           | peak   |
| 7375.000           | 38.34             | 7.23                    | 45.57              | 54.00             | -8.43          | 150            | 133           | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

**Vertical**

| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>( ° ) | Remark |
|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|-----------------|--------|
| Low Channel        |                   |                         |                    |                   |                |                |                 |        |
| 2310.000           | 62.47             | -5.06                   | 57.41              | 74.00             | -16.59         | 150            | 206             | peak   |
| 2310.000           | 48.38             | -5.06                   | 43.32              | 54.00             | -10.68         | 150            | 206             | AVG    |
| 2413.155           | 85.31             | -4.84                   | 80.47              | N/A               | N/A            | 150            | 319             | peak   |
| 2413.155           | 83.57             | -4.84                   | 78.73              | N/A               | N/A            | 150            | 319             | AVG    |
| 7239.000           | 40.23             | 6.69                    | 46.92              | 74.00             | -27.08         | 150            | 289             | peak   |
| 7239.000           | 33.23             | 6.69                    | 39.92              | 54.00             | -14.08         | 150            | 289             | AVG    |
| Mid Channel        |                   |                         |                    |                   |                |                |                 |        |
| 2379.350           | 62.03             | -4.91                   | 57.12              | 74.00             | -16.88         | 150            | 98              | peak   |
| 2379.350           | 48.13             | -4.91                   | 43.22              | 54.00             | -10.78         | 150            | 98              | AVG    |
| 2438.250           | 87.87             | -4.78                   | 83.09              | N/A               | N/A            | 150            | 55              | peak   |
| 2438.250           | 85.41             | -4.78                   | 80.63              | N/A               | N/A            | 150            | 55              | AVG    |
| 2488.030           | 61.73             | -4.67                   | 57.06              | 74.00             | -16.94         | 150            | 250             | peak   |
| 2488.030           | 48.22             | -4.67                   | 43.55              | 54.00             | -10.45         | 150            | 250             | AVG    |
| 7307.000           | 41.14             | 6.97                    | 48.11              | 74.00             | -25.89         | 150            | 294             | peak   |
| 7307.000           | 36.98             | 6.97                    | 43.95              | 54.00             | -10.05         | 150            | 294             | AVG    |
| High Channel       |                   |                         |                    |                   |                |                |                 |        |
| 2463.100           | 86.63             | -4.72                   | 81.91              | N/A               | N/A            | 150            | 293             | peak   |
| 2463.100           | 84.92             | -4.72                   | 80.20              | N/A               | N/A            | 150            | 293             | AVG    |
| 2496.150           | 62.34             | -4.65                   | 57.69              | 74.00             | -16.31         | 150            | 164             | peak   |
| 2496.150           | 48.51             | -4.65                   | 43.86              | 54.00             | -10.14         | 150            | 164             | AVG    |
| 7375.000           | 41.51             | 7.23                    | 48.74              | 74.00             | -25.26         | 150            | 264             | peak   |
| 7375.000           | 37.58             | 7.23                    | 44.81              | 54.00             | -9.19          | 150            | 264             | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

**Wi-Fi G mode****Horizontal**

| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>(°) | Remark |
|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|---------------|--------|
| Low Channel        |                   |                         |                    |                   |                |                |               |        |
| 2389.925           | 73.61             | -4.89                   | 68.72              | 74.00             | -5.28          | 150            | 199           | peak   |
| 2389.925           | 56.28             | -4.89                   | 51.39              | 54.00             | -2.61          | 150            | 199           | AVG    |
| 2407.980           | 106.86            | -4.84                   | 102.02             | N/A               | N/A            | 150            | 196           | peak   |
| 2407.980           | 97.53             | -4.84                   | 92.69              | N/A               | N/A            | 150            | 196           | AVG    |
| 7239.000           | 39.73             | 6.69                    | 46.42              | 74.00             | -27.58         | 150            | 140           | peak   |
| 7239.000           | 30.49             | 6.69                    | 37.18              | 54.00             | -16.82         | 150            | 140           | AVG    |
| Mid Channel        |                   |                         |                    |                   |                |                |               |        |
| 2362.630           | 62.01             | -4.95                   | 57.06              | 74.00             | -16.94         | 150            | 182           | peak   |
| 2362.630           | 48.67             | -4.95                   | 43.72              | 54.00             | -10.28         | 150            | 182           | AVG    |
| 2439.770           | 106.15            | -4.78                   | 101.37             | N/A               | N/A            | 150            | 189           | peak   |
| 2439.770           | 96.31             | -4.78                   | 91.53              | N/A               | N/A            | 150            | 189           | AVG    |
| 2498.670           | 62.37             | -4.64                   | 57.73              | 74.00             | -16.27         | 150            | 297           | peak   |
| 2498.670           | 48.32             | -4.64                   | 43.68              | 54.00             | -10.32         | 150            | 297           | AVG    |
| 7307.000           | 40.36             | 6.97                    | 47.33              | 74.00             | -26.67         | 150            | 129           | peak   |
| 7307.000           | 29.52             | 6.97                    | 36.49              | 54.00             | -17.51         | 150            | 129           | AVG    |
| High Channel       |                   |                         |                    |                   |                |                |               |        |
| 2457.750           | 105.99            | -4.74                   | 101.25             | N/A               | N/A            | 150            | 189           | peak   |
| 2457.750           | 96.21             | -4.74                   | 91.47              | N/A               | N/A            | 150            | 189           | AVG    |
| 2483.550           | 72.04             | -4.69                   | 67.35              | 74.00             | -6.65          | 150            | 188           | peak   |
| 2483.550           | 53.57             | -4.69                   | 48.88              | 54.00             | -5.12          | 150            | 188           | AVG    |
| 7392.000           | 40.80             | 7.29                    | 48.09              | 74.00             | -25.91         | 150            | 129           | peak   |
| 7392.000           | 30.81             | 7.29                    | 38.10              | 54.00             | -15.90         | 150            | 129           | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

**Vertical**

| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>( ° ) | Remark |
|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|-----------------|--------|
| Low Channel        |                   |                         |                    |                   |                |                |                 |        |
| 2348.410           | 61.96             | -4.98                   | 56.98              | 74.00             | -17.02         | 150            | 123             | peak   |
| 2348.410           | 48.53             | -4.98                   | 43.55              | 54.00             | -10.45         | 150            | 123             | AVG    |
| 2419.250           | 86.54             | -4.82                   | 81.72              | N/A               | N/A            | 150            | 145             | peak   |
| 2419.250           | 78.97             | -4.82                   | 74.15              | N/A               | N/A            | 150            | 145             | AVG    |
| 7239.000           | 40.07             | 6.69                    | 46.76              | 74.00             | -27.24         | 150            | 262             | peak   |
| 7239.000           | 30.11             | 6.69                    | 36.80              | 54.00             | -17.20         | 150            | 262             | AVG    |
| Mid Channel        |                   |                         |                    |                   |                |                |                 |        |
| 2344.010           | 61.90             | -4.99                   | 56.91              | 74.00             | -17.09         | 150            | 129             | peak   |
| 2344.010           | 48.73             | -4.99                   | 43.74              | 54.00             | -10.26         | 150            | 129             | AVG    |
| 2441.100           | 88.80             | -4.76                   | 84.04              | N/A               | N/A            | 150            | 56              | peak   |
| 2441.100           | 80.92             | -4.76                   | 76.16              | N/A               | N/A            | 150            | 56              | AVG    |
| 2492.780           | 61.44             | -4.66                   | 56.78              | 74.00             | -17.22         | 150            | 81              | peak   |
| 2492.780           | 48.46             | -4.66                   | 43.80              | 54.00             | -10.20         | 150            | 81              | AVG    |
| 7307.000           | 40.29             | 6.97                    | 47.26              | 74.00             | -26.74         | 150            | 295             | peak   |
| 7307.000           | 30.68             | 6.97                    | 37.65              | 74.00             | -36.35         | 150            | 295             | peak   |
| High Channel       |                   |                         |                    |                   |                |                |                 |        |
| 2464.650           | 87.83             | -4.72                   | 83.11              | N/A               | N/A            | 150            | 292             | peak   |
| 2464.650           | 83.43             | -4.72                   | 78.71              | N/A               | N/A            | 150            | 292             | AVG    |
| 2490.750           | 62.35             | -4.66                   | 57.69              | 74.00             | -16.31         | 150            | 189             | peak   |
| 2490.750           | 48.20             | -4.66                   | 43.54              | 54.00             | -10.46         | 150            | 189             | AVG    |
| 7375.000           | 42.56             | 7.23                    | 49.79              | 74.00             | -24.21         | 150            | 288             | peak   |
| 7375.000           | 30.93             | 7.23                    | 38.16              | 54.00             | -15.84         | 150            | 288             | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

**Wi-Fi N20 mode****Horizontal**

| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>(°) | Remark |
|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|---------------|--------|
| Low Channel        |                   |                         |                    |                   |                |                |               |        |
| 2388.775           | 77.31             | -4.89                   | 72.42              | 74.00             | -1.58          | 150            | 184           | peak   |
| 2388.775           | 57.88             | -4.89                   | 52.99              | 54.00             | -1.01          | 150            | 184           | AVG    |
| 2405.565           | 107.79            | -4.85                   | 102.94             | N/A               | N/A            | 150            | 189           | peak   |
| 2405.565           | 97.04             | -4.85                   | 92.19              | N/A               | N/A            | 150            | 189           | AVG    |
| 7239.000           | 43.09             | 6.69                    | 49.78              | 74.00             | -24.22         | 150            | 134           | peak   |
| 7239.000           | 30.48             | 6.69                    | 37.17              | 54.00             | -16.83         | 150            | 134           | AVG    |
| Mid Channel        |                   |                         |                    |                   |                |                |               |        |
| 2386.190           | 62.03             | -4.89                   | 57.14              | 74.00             | -16.86         | 150            | 79            | peak   |
| 2386.190           | 48.25             | -4.89                   | 43.36              | 54.00             | -10.64         | 150            | 79            | AVG    |
| 2431.790           | 107.20            | -4.79                   | 102.41             | N/A               | N/A            | 150            | 207           | peak   |
| 2431.790           | 95.64             | -4.79                   | 90.85              | N/A               | N/A            | 150            | 207           | AVG    |
| 2484.800           | 62.95             | -4.67                   | 58.28              | 74.00             | -15.72         | 150            | 206           | peak   |
| 2484.800           | 48.49             | -4.67                   | 43.82              | 54.00             | -10.18         | 150            | 206           | AVG    |
| 7307.000           | 42.61             | 6.97                    | 49.58              | 74.00             | -24.42         | 150            | 144           | peak   |
| 7307.000           | 29.82             | 6.97                    | 36.79              | 54.00             | -17.21         | 150            | 144           | AVG    |
| High Channel       |                   |                         |                    |                   |                |                |               |        |
| 2464.300           | 106.57            | -4.72                   | 101.85             | N/A               | N/A            | 150            | 190           | peak   |
| 2464.300           | 95.78             | -4.72                   | 91.06              | N/A               | N/A            | 150            | 190           | AVG    |
| 2483.650           | 77.69             | -4.69                   | 73.00              | 74.00             | -1.00          | 150            | 179           | peak   |
| 2483.650           | 53.46             | -4.69                   | 48.77              | 54.00             | -5.23          | 150            | 179           | AVG    |
| 7375.000           | 42.34             | 7.23                    | 49.57              | 74.00             | -24.43         | 150            | 135           | peak   |
| 7375.000           | 31.97             | 7.23                    | 39.20              | 54.00             | -14.80         | 150            | 135           | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

**Vertical**

| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>( ° ) | Remark |
|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|-----------------|--------|
| Low Channel        |                   |                         |                    |                   |                |                |                 |        |
| 2325.295           | 62.29             | -5.03                   | 57.26              | 74.00             | -16.74         | 150            | 299             | peak   |
| 2325.295           | 48.33             | -5.03                   | 43.30              | 54.00             | -10.70         | 150            | 299             | AVG    |
| 2419.020           | 86.79             | -4.82                   | 81.97              | N/A               | N/A            | 150            | 145             | peak   |
| 2419.020           | 78.75             | -4.82                   | 73.93              | N/A               | N/A            | 150            | 145             | AVG    |
| 7222.000           | 40.11             | 6.63                    | 46.74              | 74.00             | -27.26         | 150            | 287             | peak   |
| 7222.000           | 28.50             | 6.63                    | 35.13              | 54.00             | -18.87         | 150            | 287             | AVG    |
| Mid Channel        |                   |                         |                    |                   |                |                |                 |        |
| 2338.500           | 62.26             | -5.00                   | 57.26              | 74.00             | -16.74         | 150            | 236             | peak   |
| 2338.500           | 48.36             | -5.00                   | 43.36              | 54.00             | -10.64         | 150            | 236             | AVG    |
| 2440.720           | 89.12             | -4.76                   | 84.36              | N/A               | N/A            | 150            | 53              | peak   |
| 2440.720           | 80.85             | -4.76                   | 76.09              | N/A               | N/A            | 150            | 53              | AVG    |
| 2484.800           | 61.87             | -4.67                   | 57.20              | 74.00             | -16.80         | 150            | 0               | peak   |
| 2484.800           | 48.51             | -4.67                   | 43.84              | 54.00             | -10.16         | 150            | 0               | AVG    |
| 7307.000           | 40.79             | 6.97                    | 47.76              | 74.00             | -26.24         | 150            | 290             | peak   |
| 7307.000           | 30.41             | 6.97                    | 37.38              | 54.00             | -16.62         | 150            | 290             | AVG    |
| High Channel       |                   |                         |                    |                   |                |                |                 |        |
| 2460.000           | 87.83             | -4.73                   | 83.10              | N/A               | N/A            | 150            | 307             | peak   |
| 2460.000           | 80.92             | -4.73                   | 76.19              | N/A               | N/A            | 150            | 307             | AVG    |
| 2498.500           | 63.43             | -4.64                   | 58.79              | 74.00             | -15.21         | 150            | 152             | peak   |
| 2498.500           | 48.57             | -4.64                   | 43.93              | 54.00             | -10.07         | 150            | 152             | AVG    |
| 7392.000           | 40.64             | 7.29                    | 47.93              | 74.00             | -26.07         | 150            | 306             | peak   |
| 7392.000           | 31.16             | 7.29                    | 38.45              | 54.00             | -15.55         | 150            | 306             | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

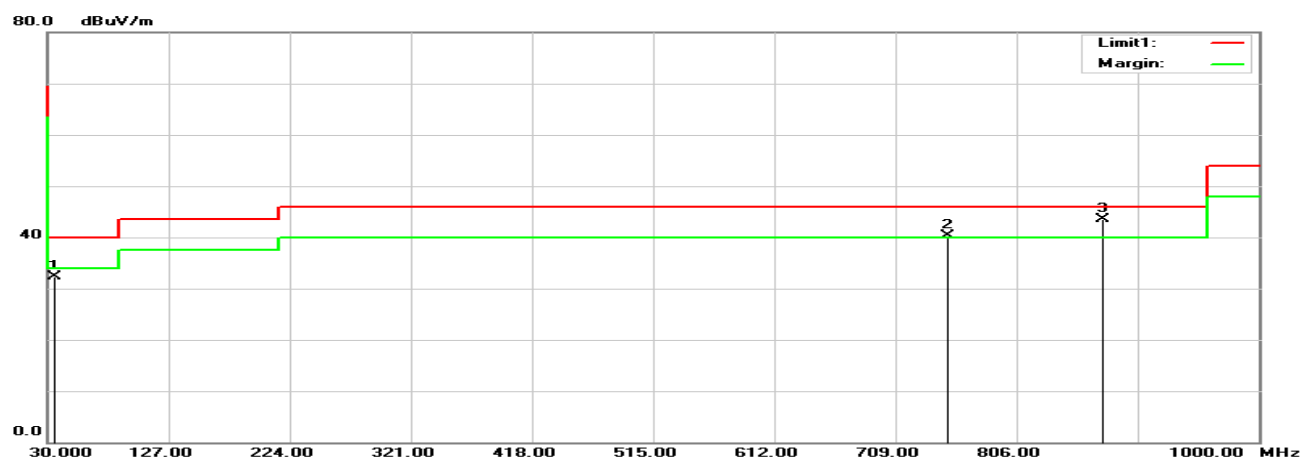
Spurious emissions more than 20 dB below the limit were not reported

**BLE Mode (C1 HomeSystem):** Transmitting Mode (Pre-scan with three orthogonal axis, and worse case as X axis)

**Below 1G (30 MHz-1 GHz) test the output power worst mode:**

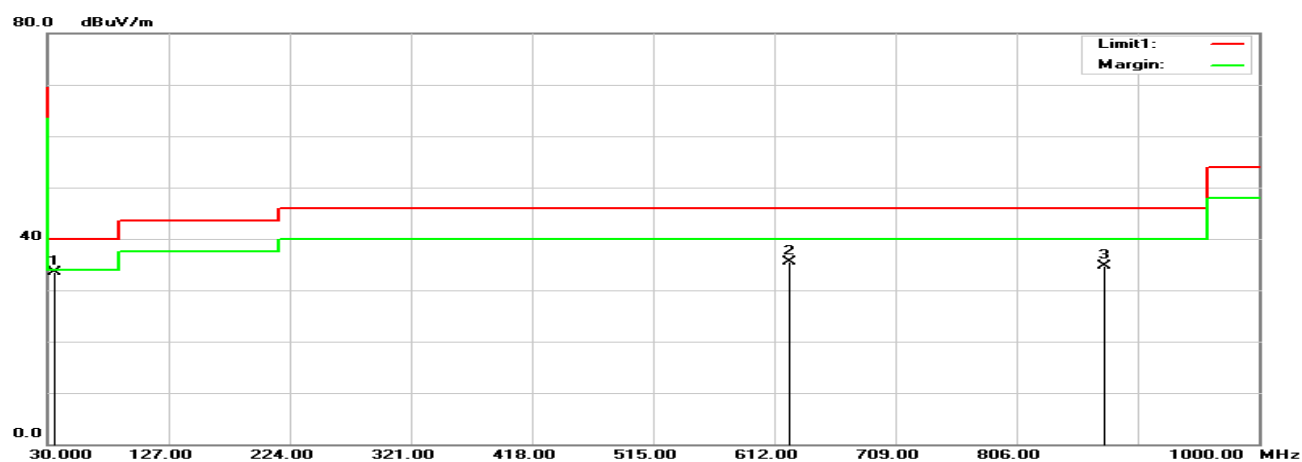
BLE mode: Worst case is BLE High Channel

### Horizontal



| Frequency (MHz) | Reading (dBuV) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Height (cm) | Degree (°) | Remark |
|-----------------|----------------|----------------------|-----------------|----------------|-------------|-------------|------------|--------|
| 35.8200         | 39.62          | -7.35                | 32.27           | 40.00          | -7.73       | 100         | 211        | peak   |
| 750.7100        | 42.35          | -2.09                | 40.26           | 46.00          | -5.74       | 100         | 204        | peak   |
| 874.8700        | 42.85          | 0.60                 | 43.45           | 46.00          | -2.55       | 100         | 102        | QP     |

### Vertical

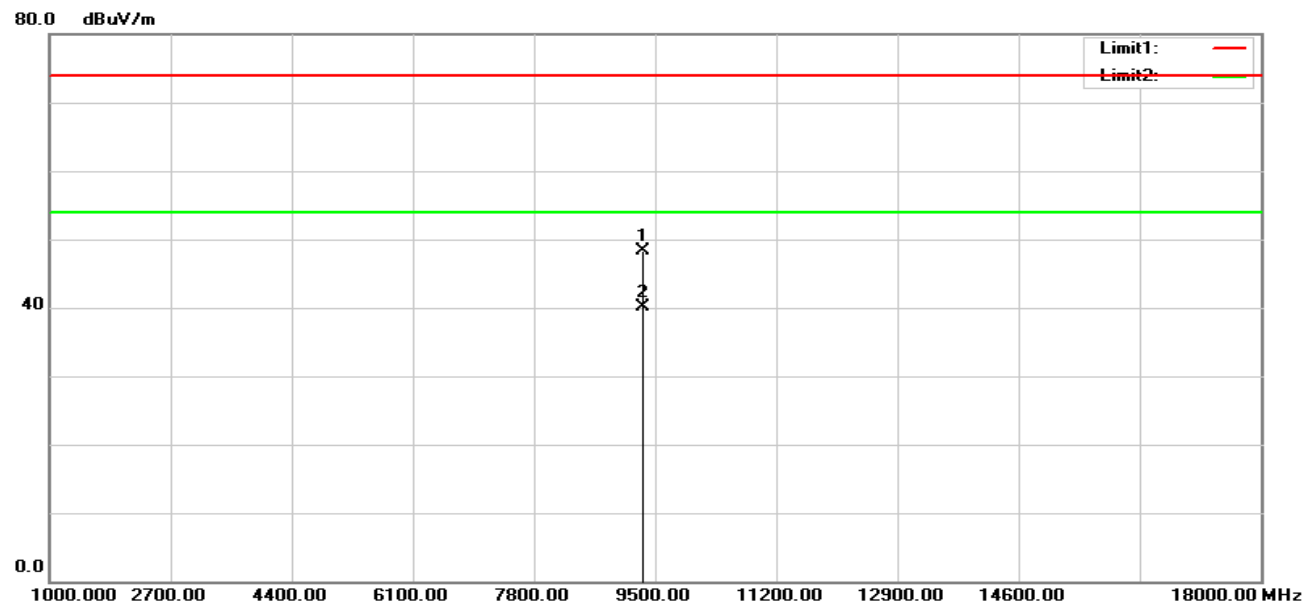


| Frequency (MHz) | Reading (dBuV) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Height (cm) | Degree (°) | Remark |
|-----------------|----------------|----------------------|-----------------|----------------|-------------|-------------|------------|--------|
| 35.8200         | 40.92          | -7.35                | 33.57           | 40.00          | -6.43       | 100         | 13         | peak   |
| 624.6100        | 39.40          | -3.82                | 35.58           | 46.00          | -10.42      | 100         | 328        | peak   |
| 875.8400        | 34.09          | 0.62                 | 34.71           | 46.00          | -11.29      | 100         | 38         | peak   |

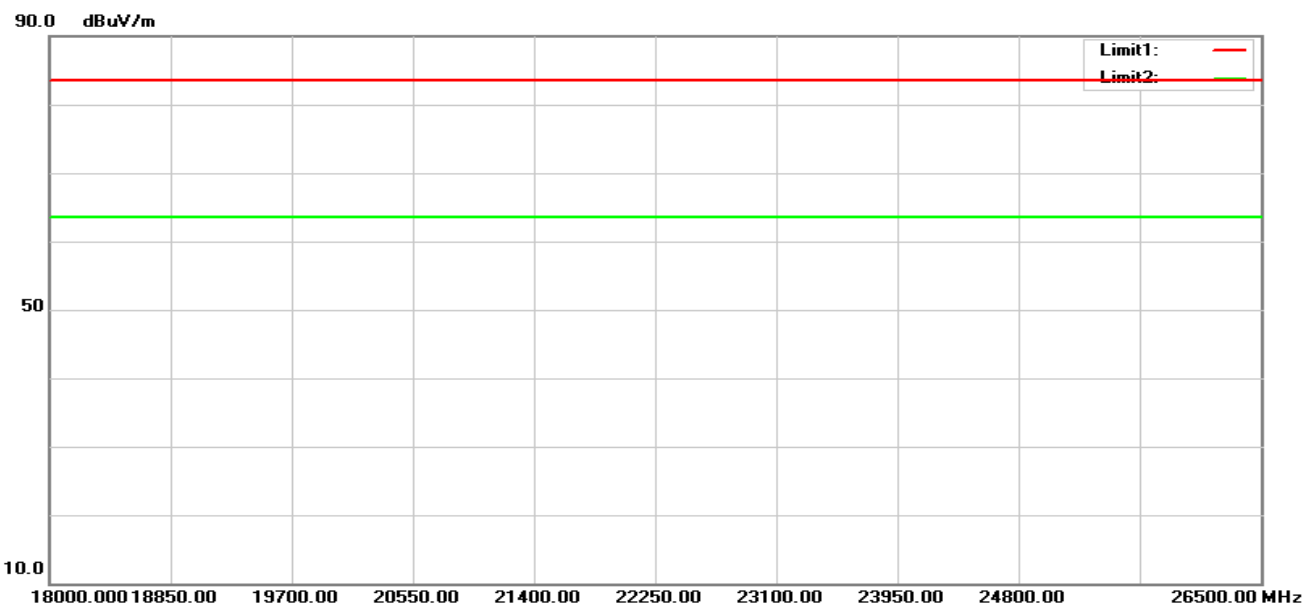
Above 1G (1 GHz-26.5 GHz) the output power Worst case is BLE mode High channel

**Horizontal**

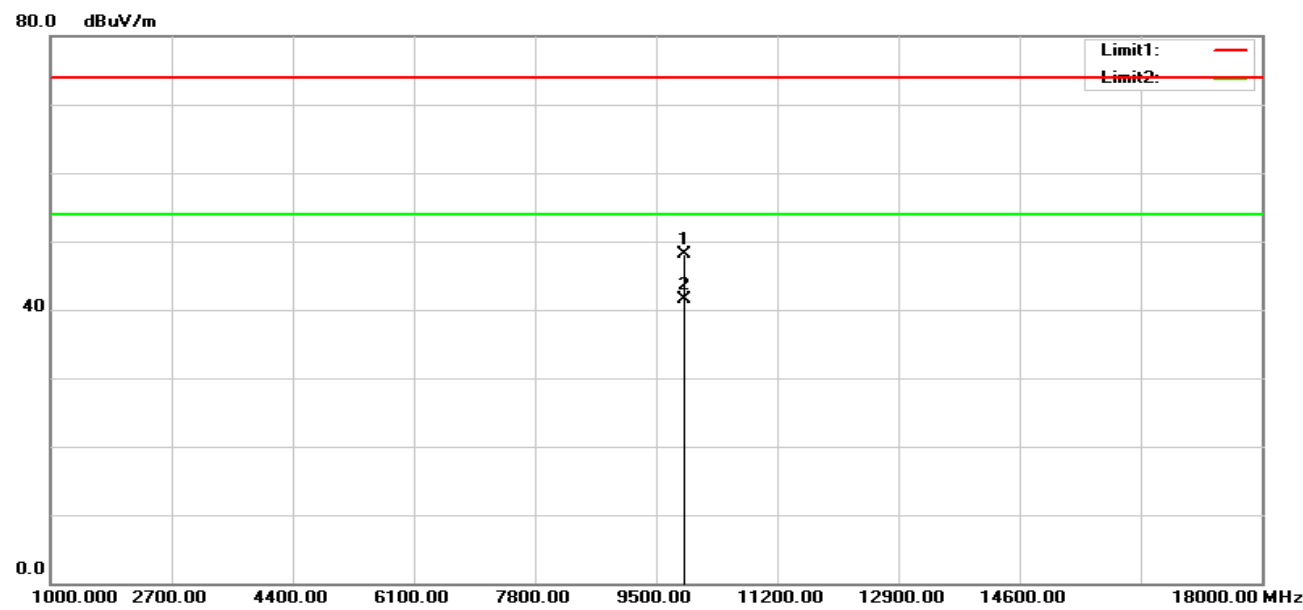
**1GHz-18GHz:**



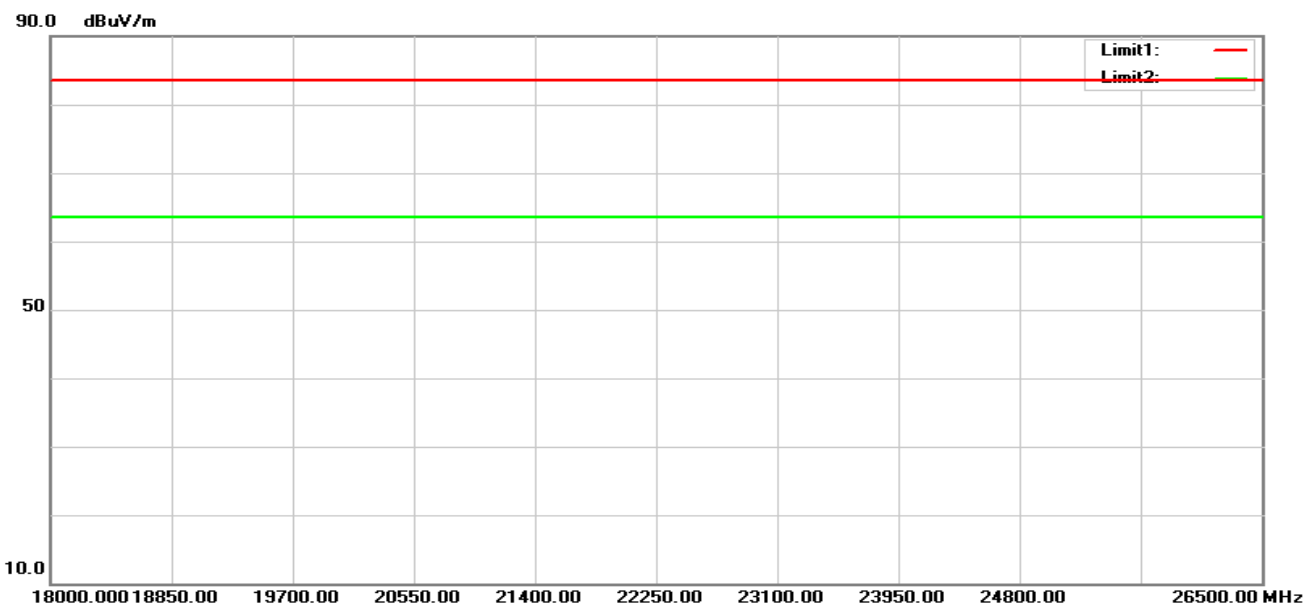
**18GHz-26.5GHz:**



**Vertical**  
**1GHz-18GHz:**



**18GHz-26.5GHz:**



**BLE mode****Horizontal**

| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>(°) | Remark |
|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|---------------|--------|
| Low Channel        |                   |                         |                    |                   |                |                |               |        |
| 2319.595           | 59.93             | -5.05                   | 54.88              | 74.00             | -19.12         | 150            | 209           | peak   |
| 2319.595           | 46.75             | -5.05                   | 41.70              | 54.00             | -12.30         | 150            | 209           | AVG    |
| 2402.340           | 102.37            | -4.86                   | 97.51              | N/A               | N/A            | 150            | 194           | peak   |
| 2402.340           | 101.55            | -4.86                   | 96.69              | N/A               | N/A            | 150            | 194           | AVG    |
| 7290.000           | 37.84             | 6.90                    | 44.74              | 74.00             | -29.26         | 150            | 62            | peak   |
| 7290.000           | 30.13             | 6.90                    | 37.03              | 54.00             | -16.97         | 150            | 62            | AVG    |
| Mid Channel        |                   |                         |                    |                   |                |                |               |        |
| 2326.720           | 59.81             | -5.03                   | 54.78              | 74.00             | -19.22         | 150            | 65            | peak   |
| 2326.720           | 46.97             | -5.03                   | 41.94              | 54.00             | -12.06         | 150            | 65            | AVG    |
| 2440.340           | 102.29            | -4.77                   | 97.52              | N/A               | N/A            | 150            | 192           | peak   |
| 2440.340           | 101.52            | -4.77                   | 96.75              | N/A               | N/A            | 150            | 192           | AVG    |
| 2497.720           | 59.64             | -4.64                   | 55.00              | 74.00             | -19.00         | 150            | 168           | peak   |
| 2497.720           | 46.52             | -4.64                   | 41.88              | 54.00             | -12.12         | 150            | 168           | AVG    |
| 6814.000           | 38.91             | 5.23                    | 44.14              | 74.00             | -29.86         | 150            | 1             | peak   |
| 6814.000           | 29.36             | 5.23                    | 34.59              | 54.00             | -19.41         | 150            | 1             | AVG    |
| High Channel       |                   |                         |                    |                   |                |                |               |        |
| 2479.780           | 102.10            | -4.68                   | 97.42              | N/A               | N/A            | 150            | 185           | peak   |
| 2479.780           | 101.38            | -4.68                   | 96.70              | N/A               | N/A            | 150            | 185           | AVG    |
| 2488.030           | 59.99             | -4.67                   | 55.32              | 74.00             | -18.68         | 150            | 101           | peak   |
| 2488.030           | 47.06             | -4.67                   | 42.39              | 54.00             | -11.61         | 150            | 101           | AVG    |
| 9330.000           | 37.58             | 10.76                   | 48.34              | 74.00             | -25.66         | 150            | 89            | peak   |
| 9330.000           | 29.26             | 10.76                   | 40.02              | 54.00             | -13.98         | 150            | 89            | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

**Vertical**

| Frequency<br>(MHz) | Reading<br>(dBuV) | Correct<br>Factor(dB/m) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Height<br>(cm) | Degree<br>(°) | Remark |
|--------------------|-------------------|-------------------------|--------------------|-------------------|----------------|----------------|---------------|--------|
| Low Channel        |                   |                         |                    |                   |                |                |               |        |
| 2345.720           | 59.68             | -4.99                   | 54.69              | 74.00             | -19.31         | 150            | 344           | peak   |
| 2345.720           | 46.76             | -4.99                   | 41.77              | 54.00             | -12.23         | 150            | 344           | AVG    |
| 2401.865           | 83.68             | -4.86                   | 78.82              | N/A               | N/A            | 150            | 77            | peak   |
| 2401.865           | 83.17             | -4.86                   | 78.31              | N/A               | N/A            | 150            | 77            | AVG    |
| 7562.000           | 37.48             | 7.79                    | 45.27              | 74.00             | -28.73         | 150            | 211           | peak   |
| 7562.000           | 29.52             | 7.79                    | 37.31              | 54.00             | -16.69         | 150            | 211           | AVG    |
| Mid Channel        |                   |                         |                    |                   |                |                |               |        |
| 2348.950           | 59.72             | -4.98                   | 54.74              | 74.00             | -19.26         | 150            | 139           | peak   |
| 2348.950           | 46.74             | -4.98                   | 41.76              | 54.00             | -12.24         | 150            | 139           | AVG    |
| 2440.340           | 84.07             | -4.77                   | 79.30              | N/A               | N/A            | 150            | 59            | peak   |
| 2440.340           | 83.36             | -4.77                   | 78.59              | N/A               | N/A            | 150            | 59            | AVG    |
| 2488.790           | 59.54             | -4.67                   | 54.87              | 74.00             | -19.13         | 150            | 229           | peak   |
| 2488.790           | 46.38             | -4.67                   | 41.71              | 54.00             | -12.29         | 150            | 229           | AVG    |
| 7239.000           | 38.75             | 6.69                    | 45.44              | 74.00             | -28.56         | 150            | 19            | peak   |
| 7239.000           | 29.91             | 6.69                    | 36.60              | 54.00             | -17.40         | 150            | 19            | AVG    |
| High Channel       |                   |                         |                    |                   |                |                |               |        |
| 2479.780           | 84.63             | -4.68                   | 79.95              | N/A               | N/A            | 150            | 72            | peak   |
| 2479.780           | 83.90             | -4.68                   | 79.22              | N/A               | N/A            | 150            | 72            | AVG    |
| 2488.450           | 53.93             | -4.67                   | 49.26              | 74.00             | -24.74         | 150            | 249           | peak   |
| 2488.450           | 40.76             | -4.67                   | 36.09              | 54.00             | -17.91         | 150            | 249           | AVG    |
| 9891.000           | 36.16             | 11.86                   | 48.02              | 74.00             | -25.98         | 150            | 209           | peak   |
| 9891.000           | 29.58             | 11.86                   | 41.44              | 54.00             | -12.56         | 150            | 209           | AVG    |

Result = Reading + Correct Factor

Margin = Result – Limit

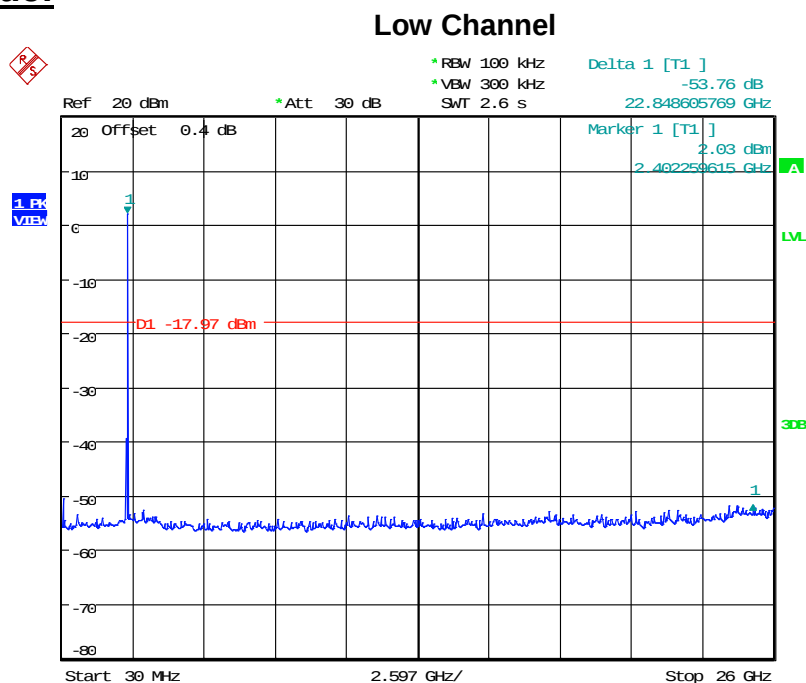
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported

**Conducted Spurious Emissions:**

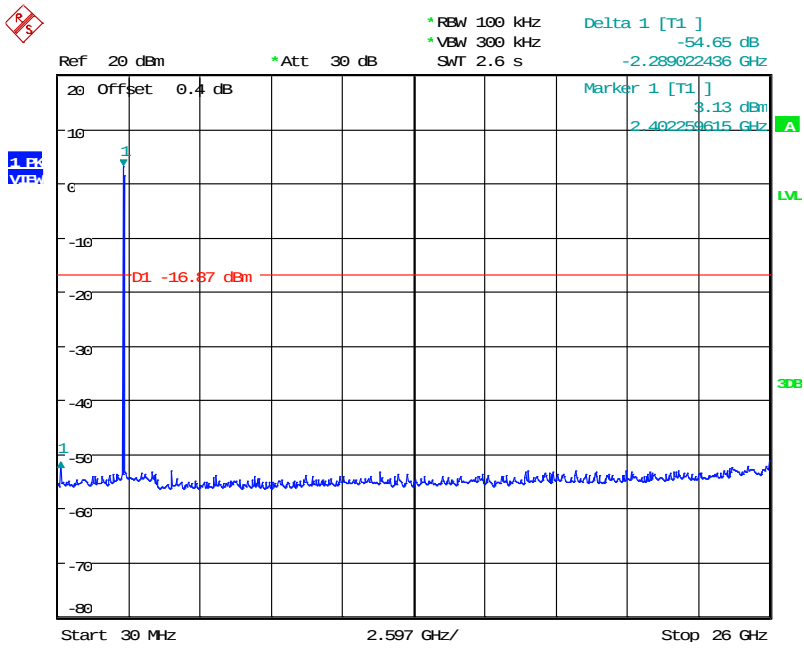
| Channel         | Frequency (MHz) | Delta Peak to Band Emission (dBc) | Limit (dBc) | Result     |
|-----------------|-----------------|-----------------------------------|-------------|------------|
| <b>B mode</b>   |                 |                                   |             |            |
| Low             | 2412            | 53.76                             | $\geq 20$   | Compliance |
| Mid             | 2437            | 54.65                             | $\geq 20$   | Compliance |
| High            | 2462            | 53.85                             | $\geq 20$   | Compliance |
| <b>G mode</b>   |                 |                                   |             |            |
| Low             | 2412            | 50.80                             | $\geq 20$   | Compliance |
| Mid             | 2437            | 50.53                             | $\geq 20$   | Compliance |
| High            | 2462            | 49.83                             | $\geq 20$   | Compliance |
| <b>N20 mode</b> |                 |                                   |             |            |
| Low             | 2412            | 50.47                             | $\geq 20$   | Compliance |
| Mid             | 2437            | 51.18                             | $\geq 20$   | Compliance |
| High            | 2462            | 47.53                             | $\geq 20$   | Compliance |
| <b>BLE mode</b> |                 |                                   |             |            |
| Low             | 2402            | 52.92                             | $\geq 20$   | Compliance |
| Mid             | 2440            | 54.39                             | $\geq 20$   | Compliance |
| High            | 2480            | 54.48                             | $\geq 20$   | Compliance |

Please refer to the following plots

**Wi-Fi B mode:**

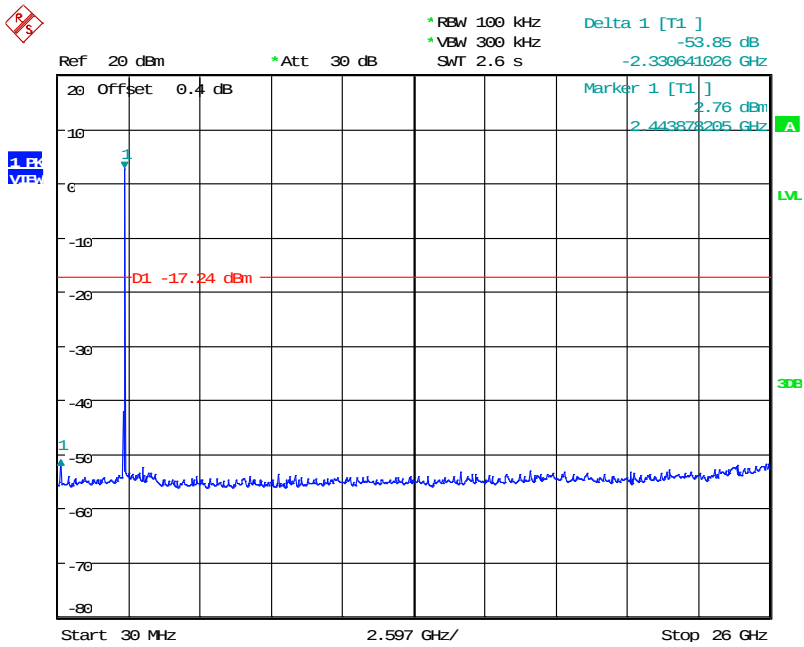
Date: 20.MAR.2018 00:14:41

Middle Channel



Date: 20.MAR.2018 00:59:11

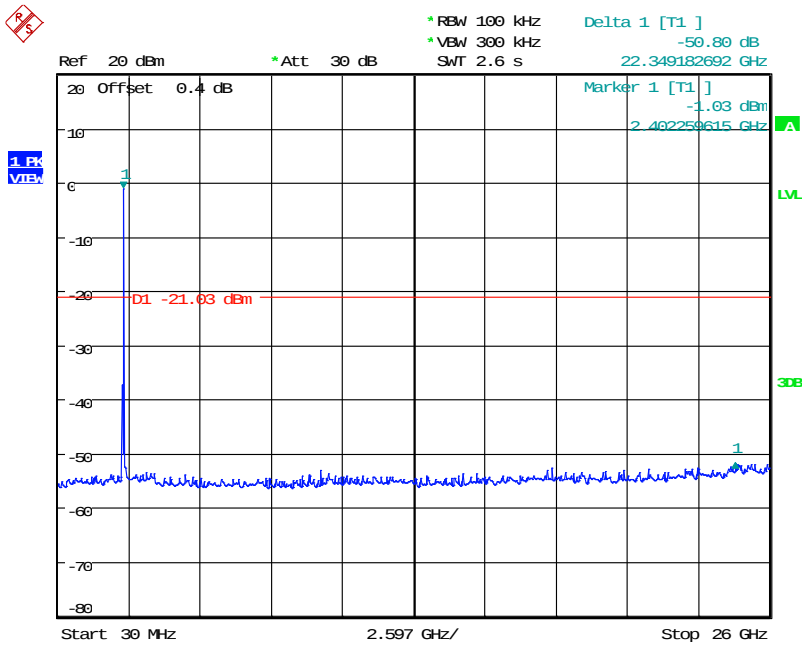
High Channel



Date: 20.MAR.2018 00:53:00

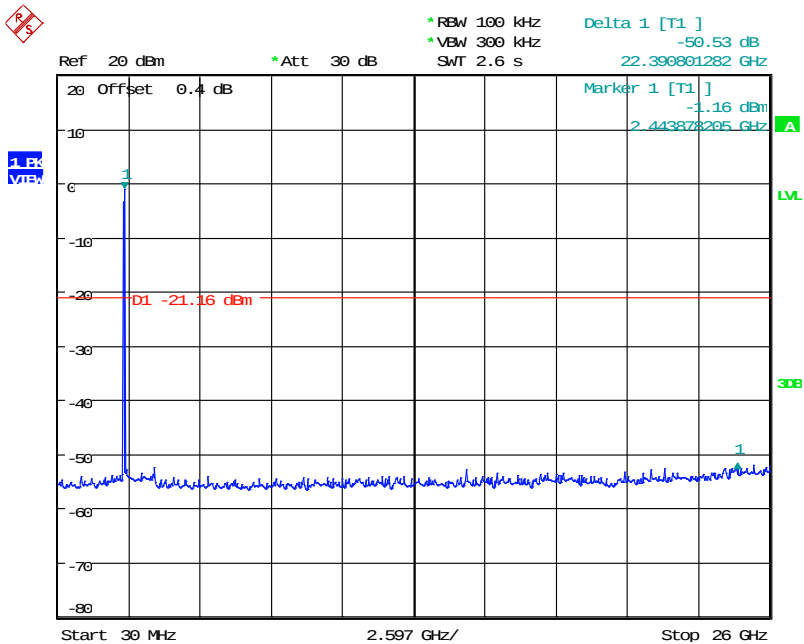
Wi-Fi G mode:

Low Channel



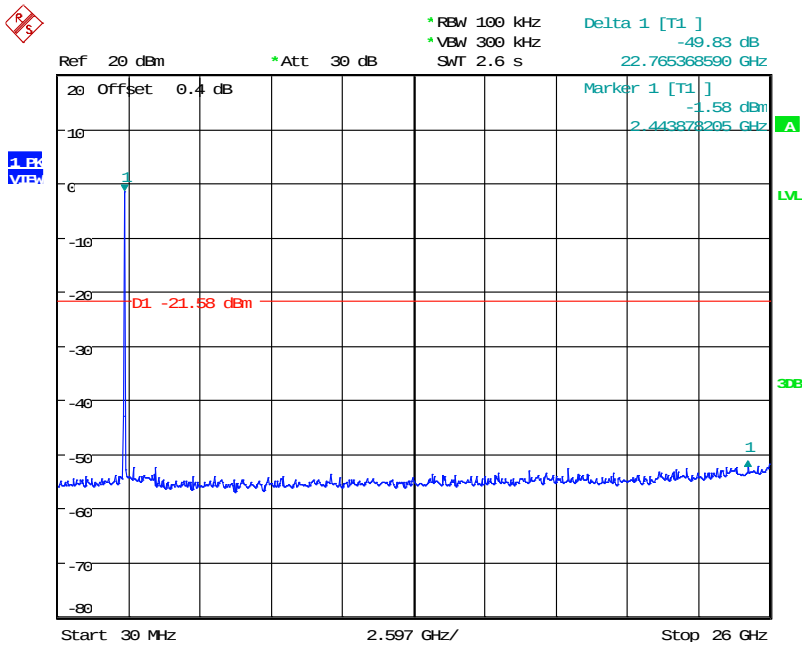
Date: 20.MAR.2018 01:08:54

Middle Channel



Date: 20.MAR.2018 01:15:26

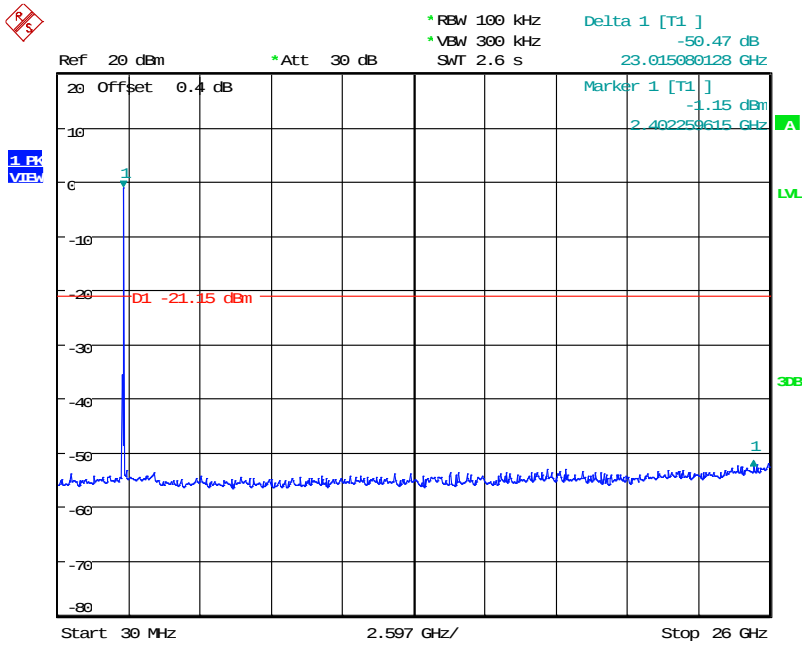
High Channel



Date: 20.MAR.2018 01:24:01

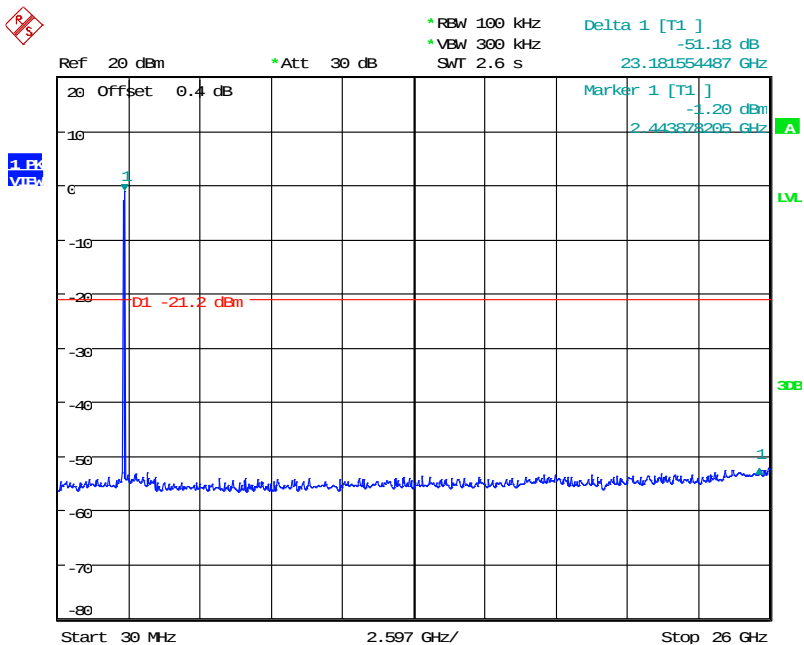
Wi-Fi N20 mode:

Low Channel



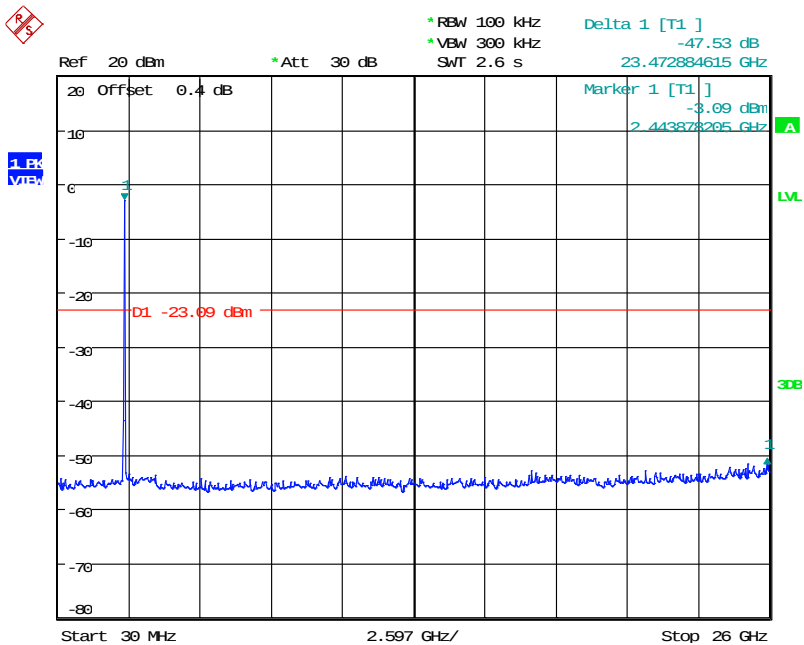
Date: 20.MAR.2018 01:33:19

Middle Channel



Date: 20.MAR.2018 01:41:52

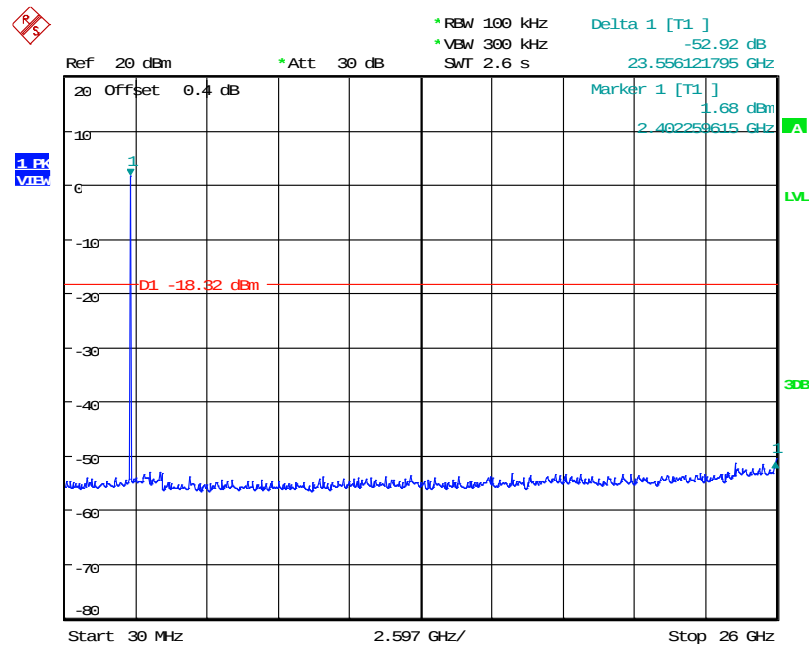
High Channel



Date: 20.MAR.2018 01:53:44

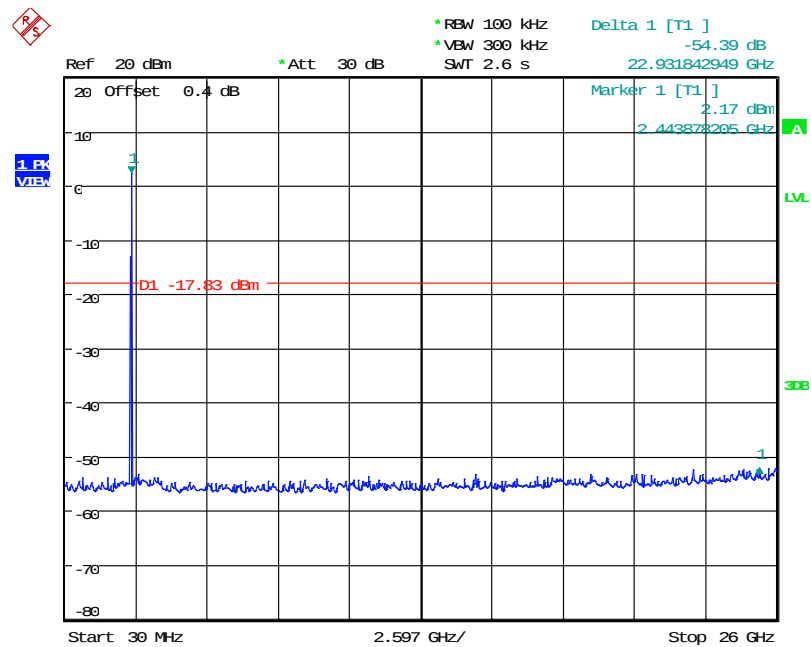
BLE mode:

Low Channel



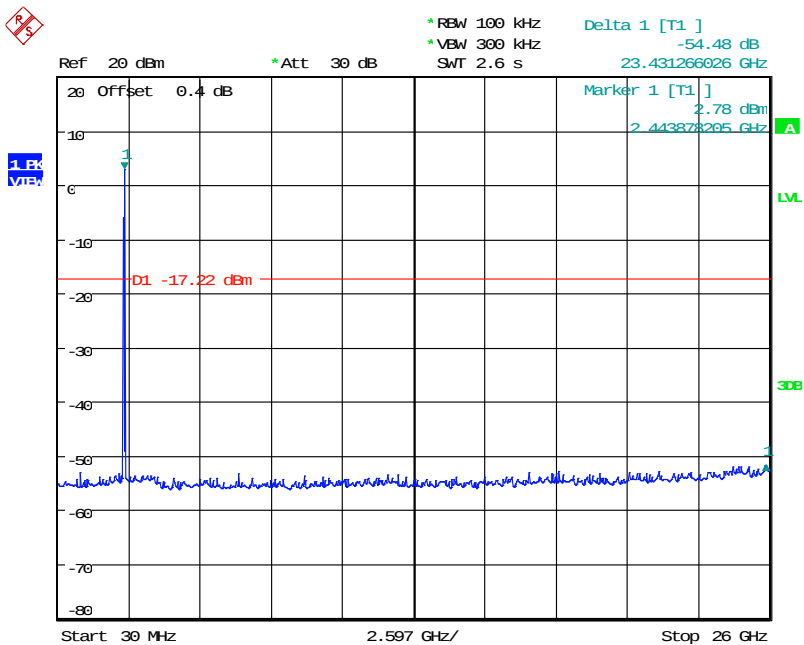
Date: 21.MAR.2018 00:34:31

Middle Channel



Date: 21.MAR.2018 00:29:19

High Channel



Date: 21.MAR.2018 00:45:46

## 8 FCC §15.247(a)(2) – 6 dB Emission Bandwidth

### 8.1 Applicable Standard

According to FCC §15.247(a) (2).

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

### 8.2 Test Procedure

According to ANSI C63.10-2013

#### 6 dB Emission Bandwidth

The steps for the first option are as follows:

- Set RBW = 100 kHz.
- Set the VBW  $\geq [3 \times \text{RBW}]$ .
- Detector = peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- 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 dB relative to the maximum level measured in the fundamental emission.

### 8.3 Test Equipment List and Details

| Descriptions      | Manufacturers   | Models | Serial Numbers | Calibration Date | Calibration Due Date |
|-------------------|-----------------|--------|----------------|------------------|----------------------|
| Spectrum Analyzer | Rohde & Schwarz | FSU26  | 101140         | 2017/11/15       | 2018/11/14           |
| Cable             | WOKEN           | SFL402 | S02-160323-07  | 2018/02/21       | 2019/02/20           |

**\*Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

### 8.4 Test Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 23.5 °C  |
| Relative Humidity: | 55.4 %   |
| ATM Pressure:      | 1015 hPa |

The testing was performed by Ian from 2018-03-20 to 2018-03-21

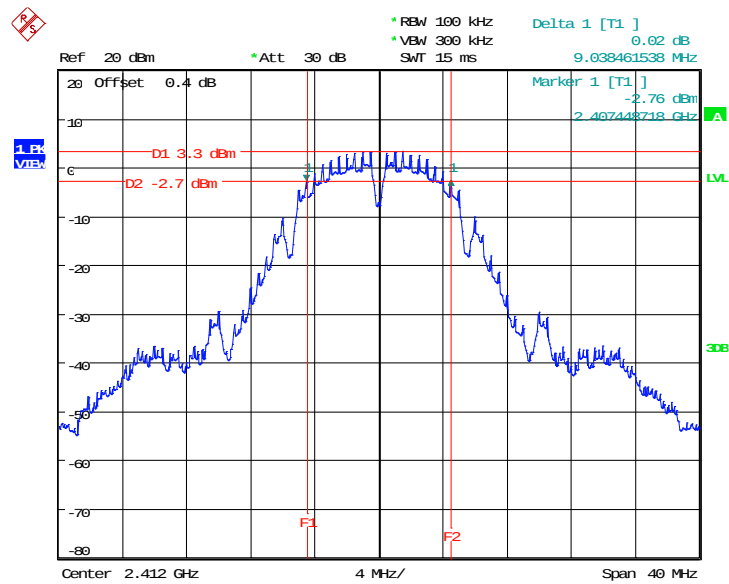
## 8.5 Test Results

| Channel         | Frequency (MHz) | 99% Bandwidth (MHz) | 6 dB OBW (MHz) | 6dB Limit (MHz) | Result     |
|-----------------|-----------------|---------------------|----------------|-----------------|------------|
| <b>B mode</b>   |                 |                     |                |                 |            |
| Low             | 2412            | 11.86               | 9.04           | > 0.5           | Compliance |
| Middle          | 2437            | 11.86               | 8.59           | > 0.5           | Compliance |
| High            | 2462            | 11.69               | 8.53           | > 0.5           | Compliance |
| <b>G mode</b>   |                 |                     |                |                 |            |
| Low             | 2412            | 18.03               | 16.35          | > 0.5           | Compliance |
| Middle          | 2437            | 18.03               | 16.35          | > 0.5           | Compliance |
| High            | 2462            | 18.03               | 16.35          | > 0.5           | Compliance |
| <b>N20 mode</b> |                 |                     |                |                 |            |
| Low             | 2412            | 18.99               | 17.63          | > 0.5           | Compliance |
| Middle          | 2437            | 19.07               | 17.63          | > 0.5           | Compliance |
| High            | 2462            | 19.15               | 17.63          | > 0.5           | Compliance |
| <b>BLE mode</b> |                 |                     |                |                 |            |
| Low             | 2402            | 1.0577              | 0.716          | > 0.5           | Compliance |
| Middle          | 2440            | 1.0577              | 0.721          | > 0.5           | Compliance |
| High            | 2480            | 1.0577              | 0.726          | > 0.5           | Compliance |

Please refer to the following plots

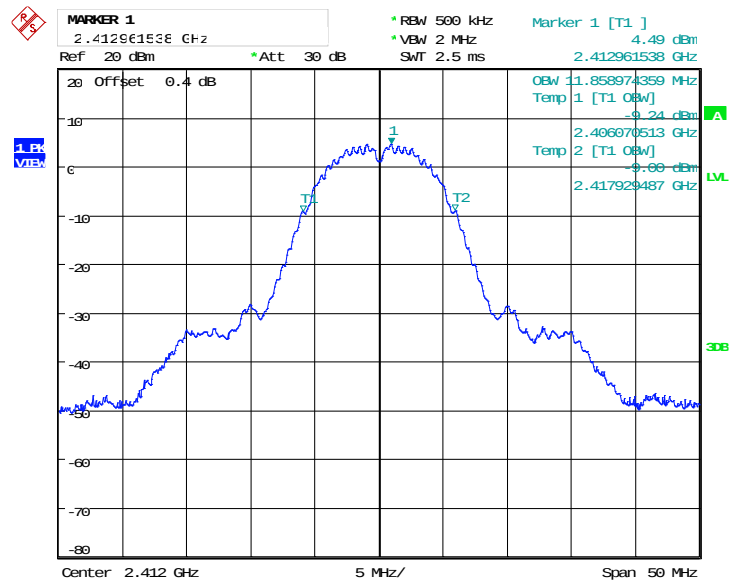
Wi-Fi B mode Low CH:

6 dB Emission Bandwidth



Date: 19.MAR.2018 23:58:22

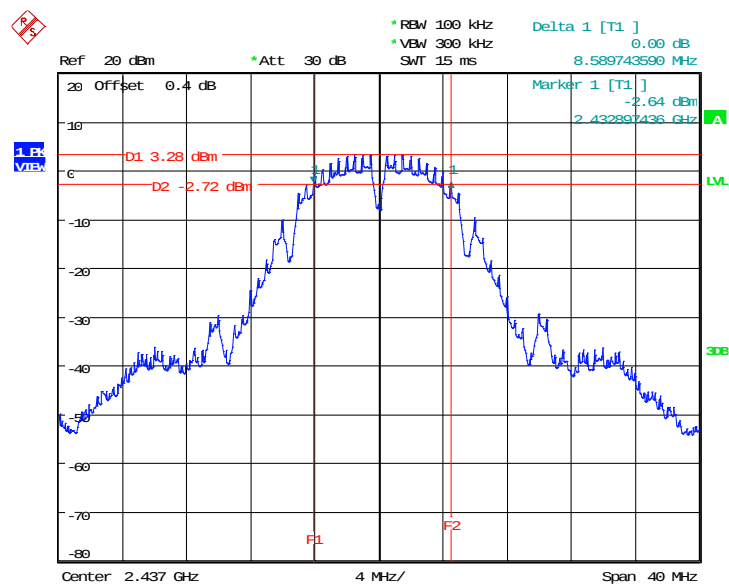
Occupied Bandwidth (99%)



Date: 20.MAR.2018 00:05:52

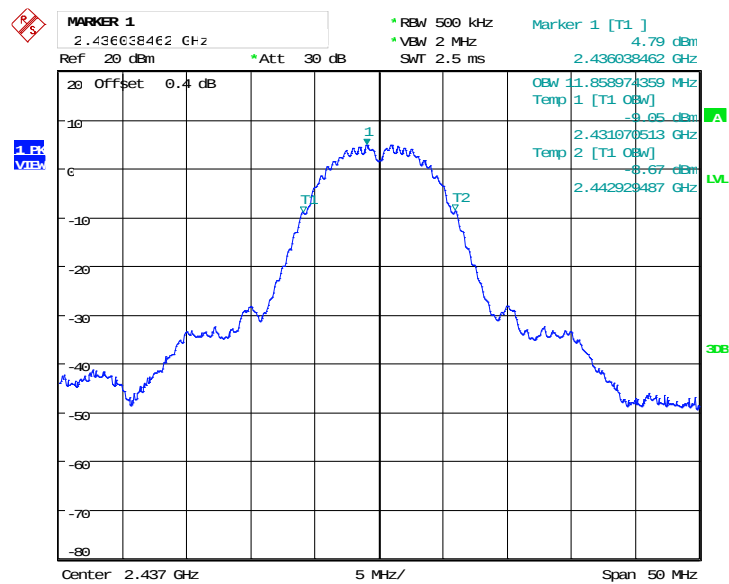
Wi-Fi B mode Middle CH:

6 dB Emission Bandwidth



Date: 20.MAR.2018 00:36:16

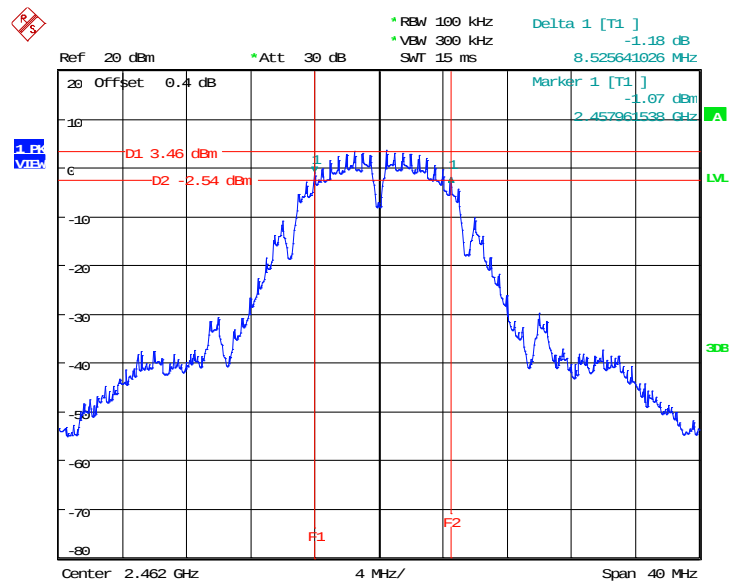
Occupied Bandwidth (99%)



Date: 20.MAR.2018 00:37:29

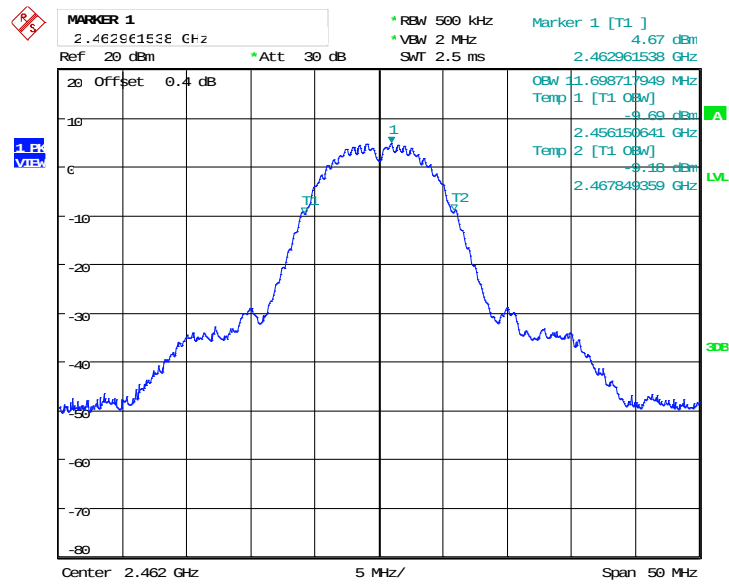
Wi-Fi B mode High CH:

6 dB Emission Bandwidth



Date: 20.MAR.2018 00:43:54

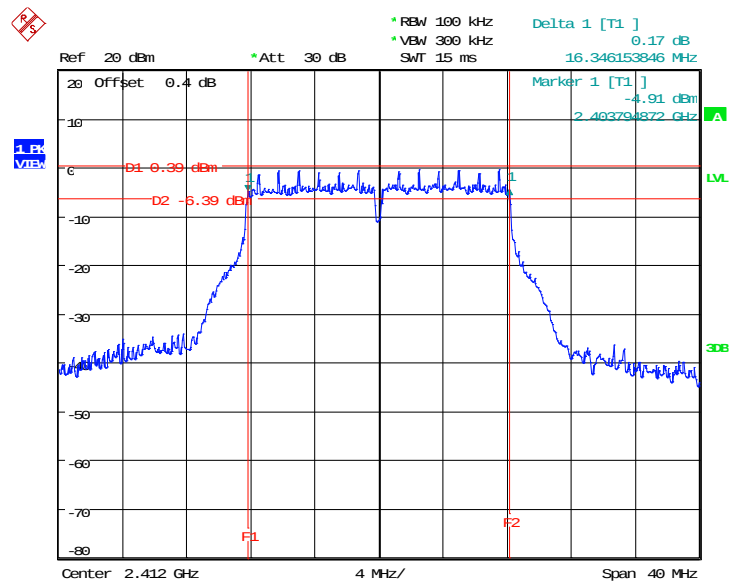
Occupied Bandwidth (99%)



Date: 20.MAR.2018 00:47:01

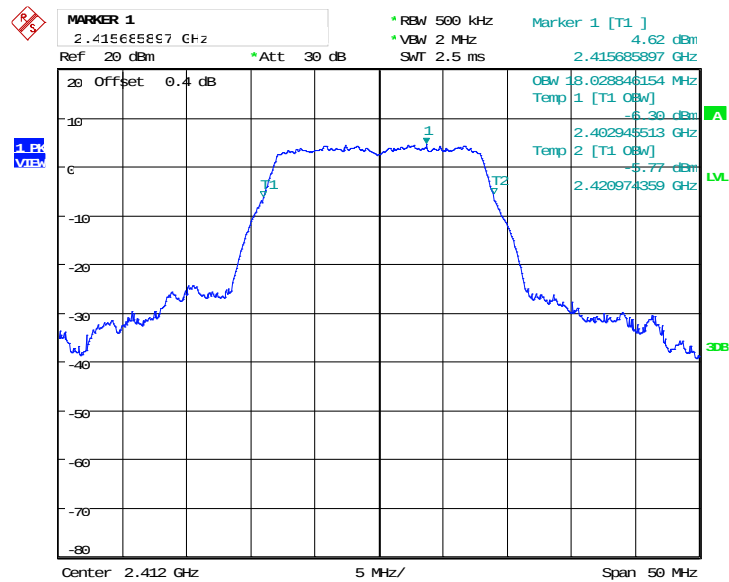
Wi-Fi G mode Low CH:

6 dB Emission Bandwidth



Date: 20.MAR.2018 01:03:10

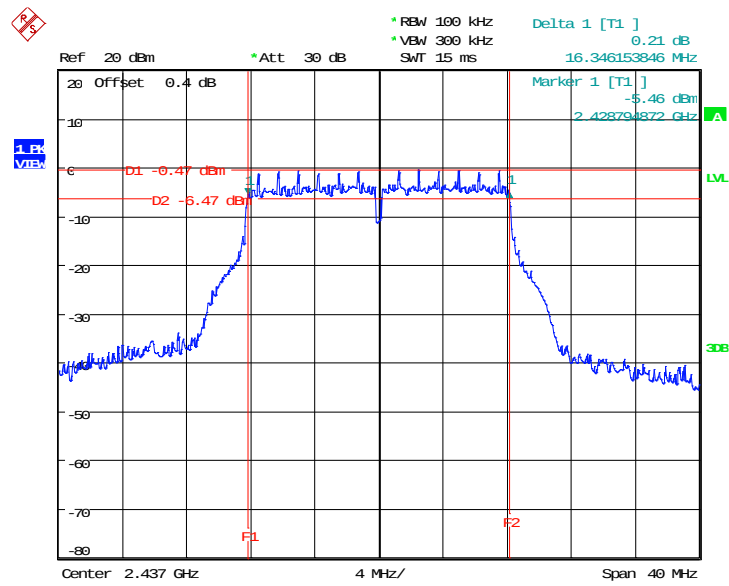
Occupied Bandwidth (99%)



Date: 20.MAR.2018 01:05:28

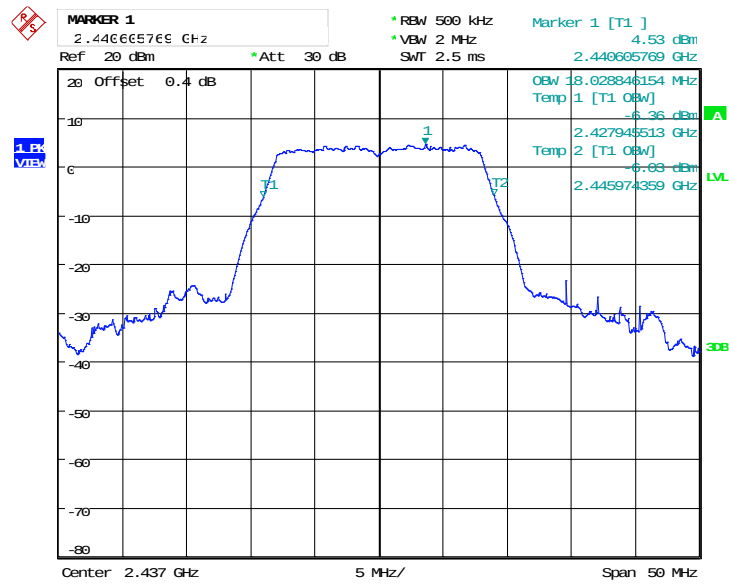
Wi-Fi G mode Middle CH:

6 dB Emission Bandwidth



Date: 20.MAR.2018 01:12:41

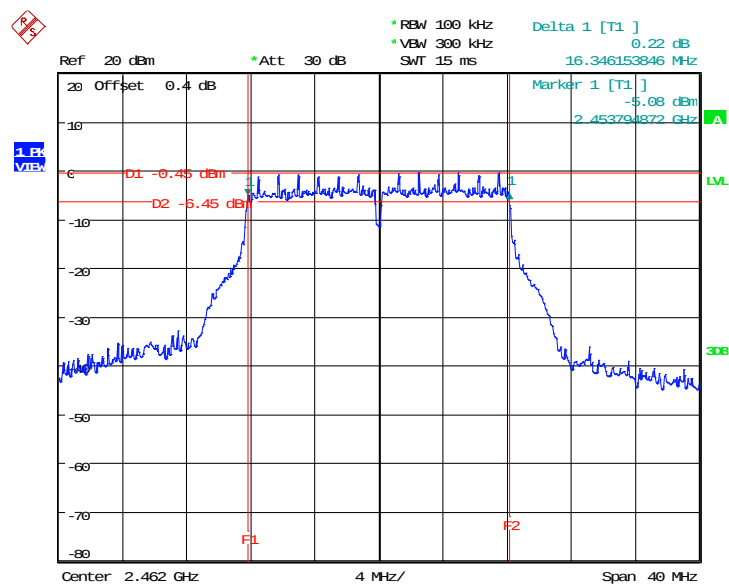
Occupied Bandwidth (99%)



Date: 20.MAR.2018 01:13:52

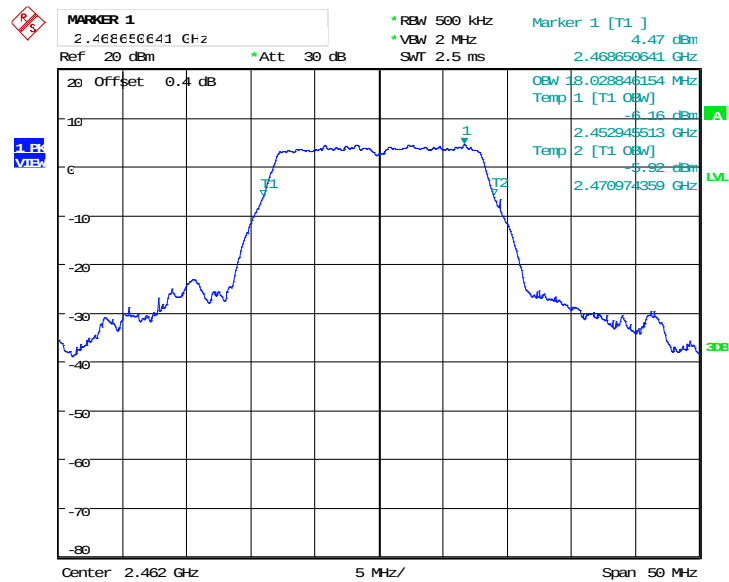
Wi-Fi G mode High CH:

6 dB Emission Bandwidth



Date: 20.MAR.2018 01:19:38

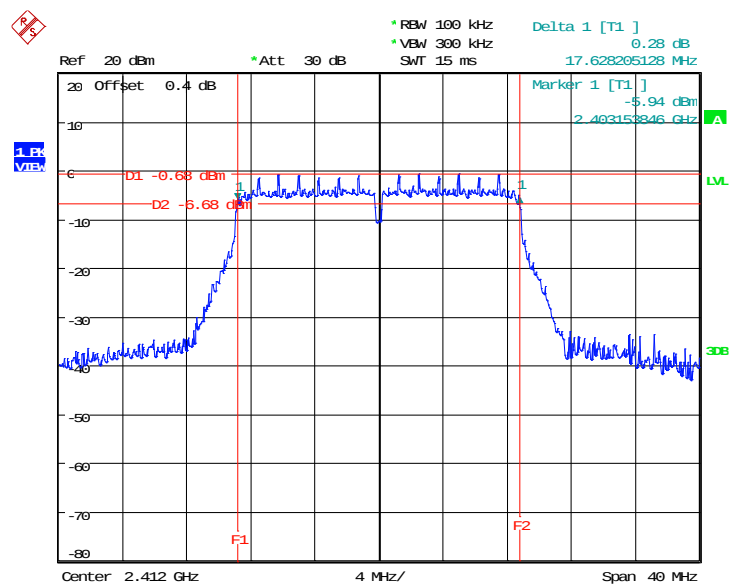
Occupied Bandwidth (99%)



Date: 20.MAR.2018 01:20:44

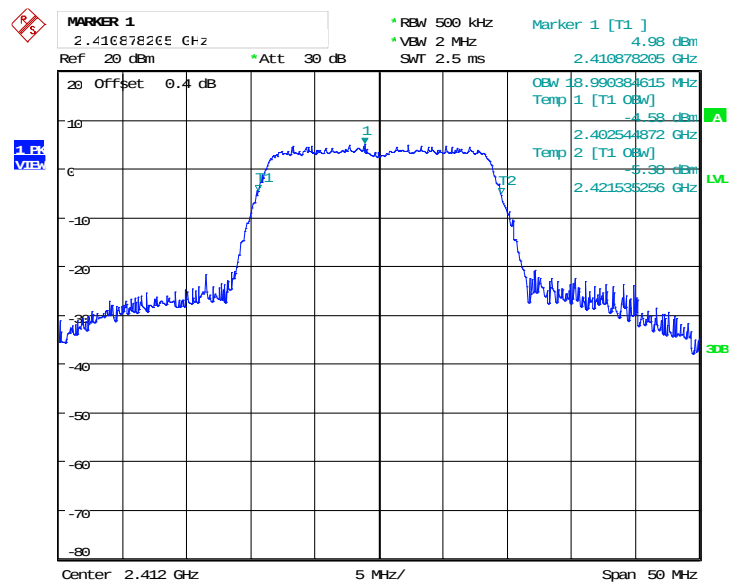
Wi-Fi HT N20 mode Low CH:

6 dB Emission Bandwidth



Date: 20.MAR.2018 01:29:28

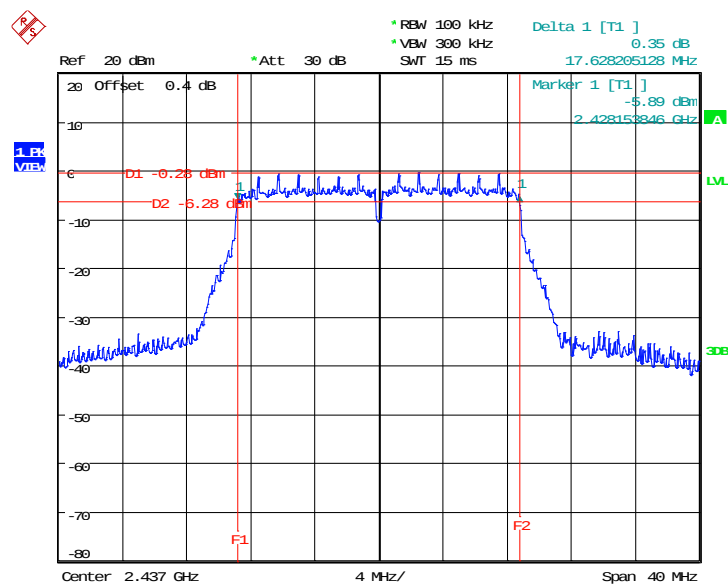
Occupied Bandwidth (99%)



Date: 20.MAR.2018 01:30:28

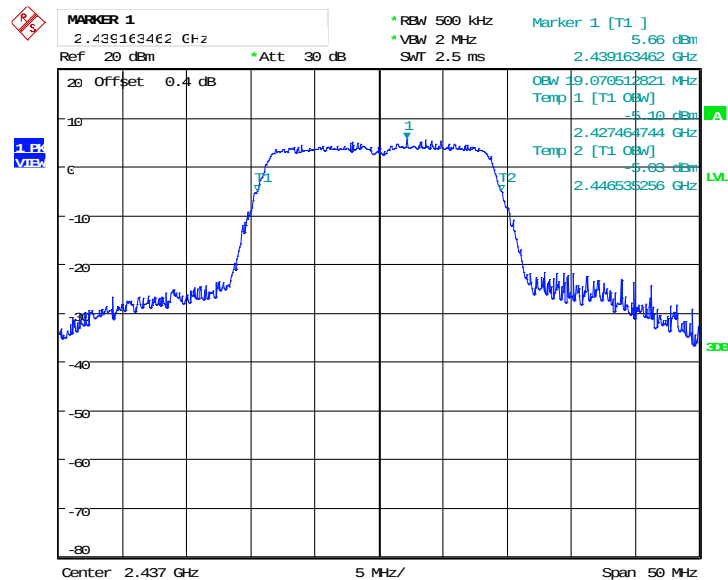
**Wi-Fi HT N20 mode Middle CH:**

**6 dB Emission Bandwidth**



Date: 20.MAR.2018 01:38:53

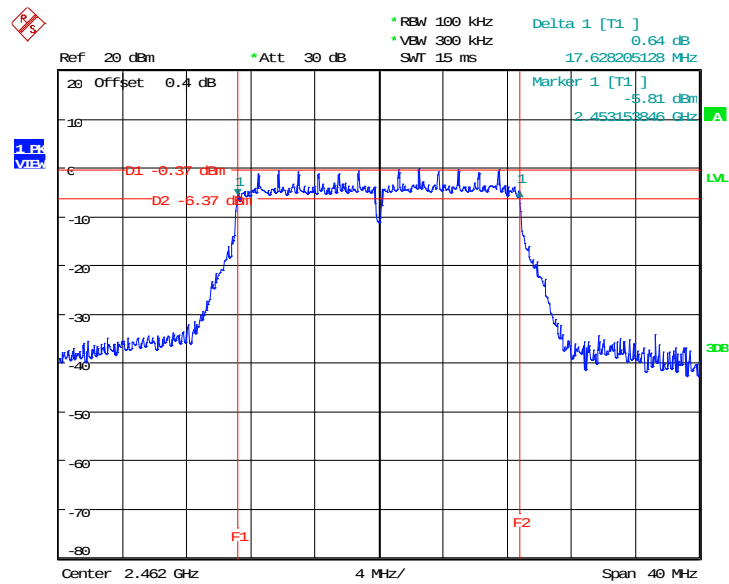
**Occupied Bandwidth (99%)**



Date: 20.MAR.2018 01:40:30

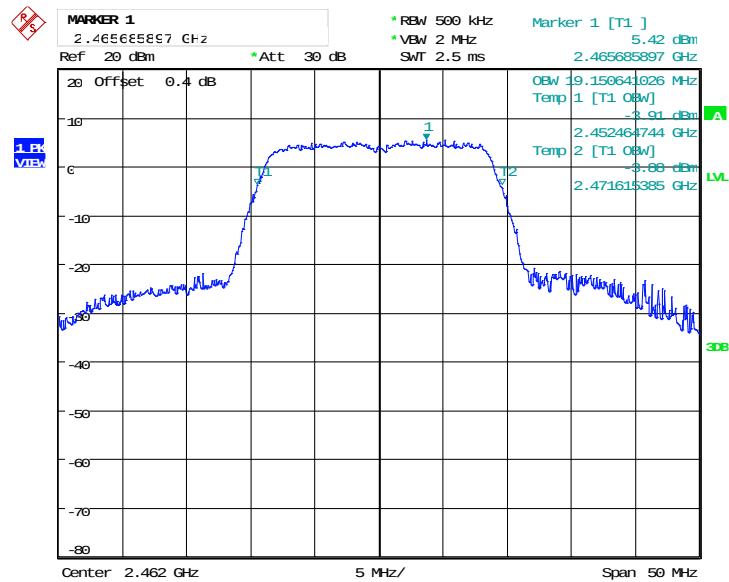
Wi-Fi HT 20 mode High CH:

6 dB Emission Bandwidth



Date: 20.MAR.2018 01:46:13

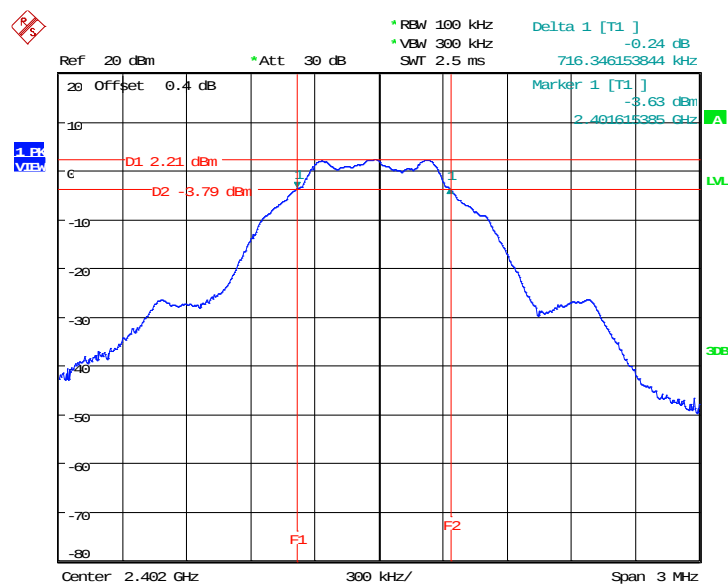
Occupied Bandwidth (99%)



Date: 20.MAR.2018 01:49:39

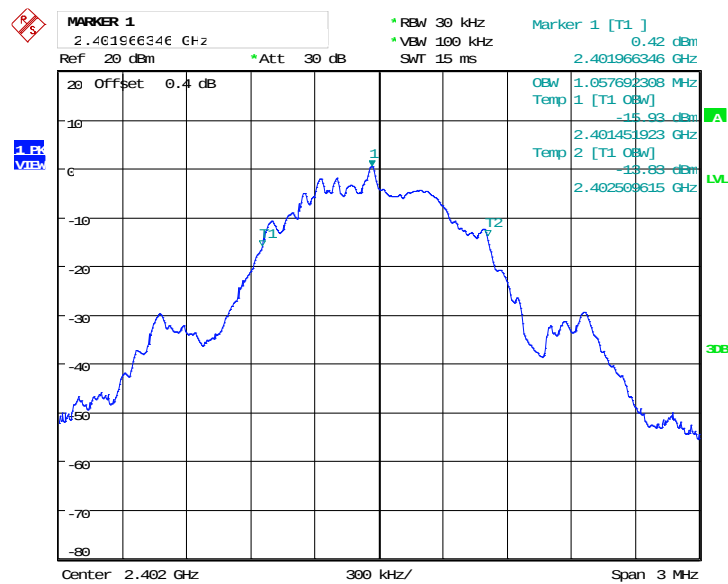
**BLE mode Low CH:**

**6 dB Emission Bandwidth**



Date: 21.MAR.2018 00:19:01

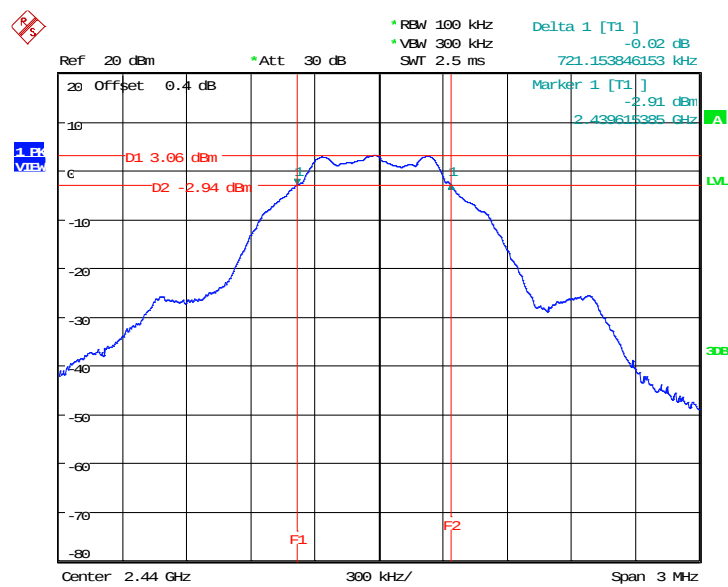
**Occupied Bandwidth (99%)**



Date: 21.MAR.2018 00:20:20

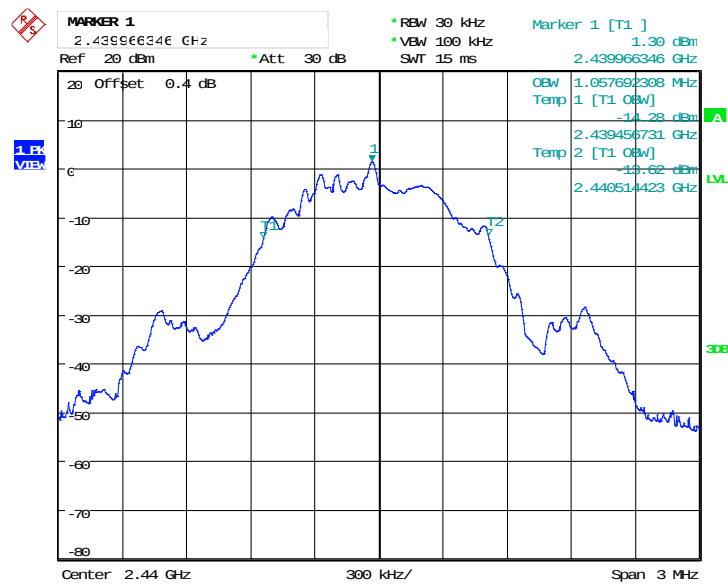
**BLE mode Middle CH:**

**6 dB Emission Bandwidth**



Date: 21.MAR.2018 00:27:14

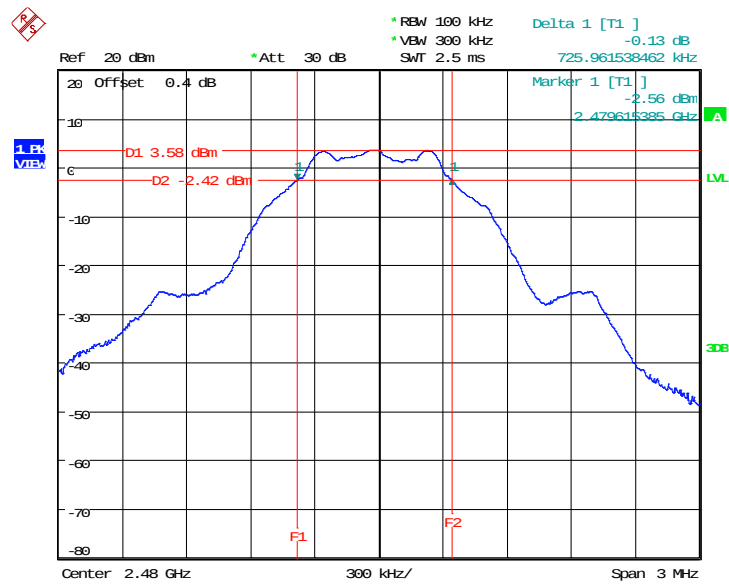
**Occupied Bandwidth (99%)**



Date: 21.MAR.2018 00:28:03

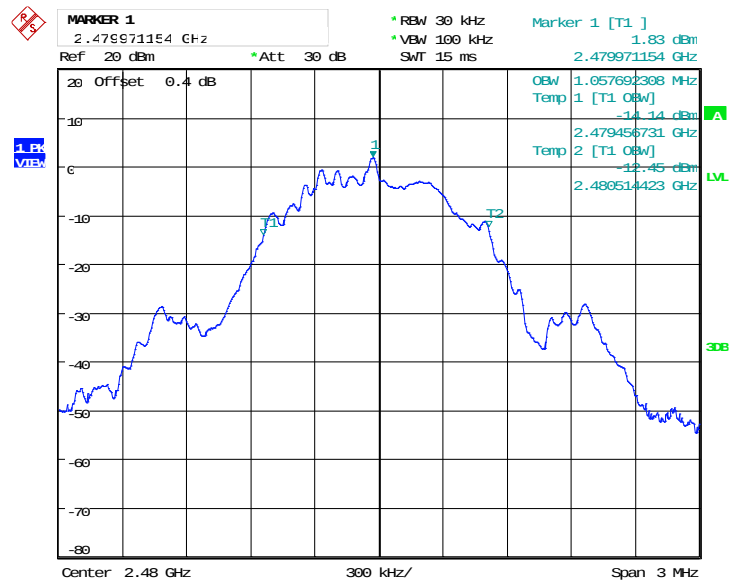
**BLE mode High CH:**

**6 dB Emission Bandwidth**



Date: 21.MAR.2018 00:37:51

**Occupied Bandwidth (99%)**



Date: 21.MAR.2018 00:39:35

## 9 FCC §15.247(b)(3) – Maximum Output Power

### 9.1 Applicable Standard

According to FCC §15.247(b) (3).

Systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

### 9.2 Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to measuring equipment.
3. Add a correction factor to the display.

### 9.3 Test Equipment List and Details

| Descriptions | Manufacturers | Models  | Serial Numbers | Calibration Date | Calibration Due Date |
|--------------|---------------|---------|----------------|------------------|----------------------|
| Power Sensor | KEYSIGHT      | U2021XA | MY54080018     | 2018/03/07       | 2019/03/06           |
| Cable        | WOKEN         | SFL402  | S02-160323-07  | 2018/02/21       | 2019/02/20           |

**\*Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

### 9.4 Test Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 23.5 °C  |
| Relative Humidity: | 55.4 %   |
| ATM Pressure:      | 1015 hPa |

The testing was performed by Ian on 2018-03-20

## 9.5 Test Results

| Channel         | Frequency (MHz) | Maximum peak Conducted Output Power (dBm) | Limit (dBm) | Result     |
|-----------------|-----------------|-------------------------------------------|-------------|------------|
| <b>B mode</b>   |                 |                                           |             |            |
| Low             | 2412            | 15.05                                     | 30          | Compliance |
| Middle          | 2437            | 15.09                                     | 30          | Compliance |
| High            | 2462            | 15.19                                     | 30          | Compliance |
| <b>G mode</b>   |                 |                                           |             |            |
| Low             | 2412            | 20.14                                     | 30          | Compliance |
| Middle          | 2437            | 20.51                                     | 30          | Compliance |
| High            | 2462            | 20.73                                     | 30          | Compliance |
| <b>N20 mode</b> |                 |                                           |             |            |
| Low             | 2412            | 20.04                                     | 30          | Compliance |
| Middle          | 2437            | 20.35                                     | 30          | Compliance |
| High            | 2462            | 20.59                                     | 30          | Compliance |
| <b>BLE mode</b> |                 |                                           |             |            |
| Low             | 2402            | 3.46                                      | 30          | Compliance |
| Middle          | 2440            | 4.38                                      | 30          | Compliance |
| High            | 2480            | 5.48                                      | 30          | Compliance |

| Channel         | Frequency (MHz) | Average Output Power (dBm) | Duty Factor | Total Average Output Power (dBm) | Limit (dBm) | Result     |
|-----------------|-----------------|----------------------------|-------------|----------------------------------|-------------|------------|
| <b>B mode</b>   |                 |                            |             |                                  |             |            |
| Low             | 2412            | 12.18                      | 0.00        | 12.18                            | 30          | Compliance |
| Middle          | 2437            | 12.15                      | 0.00        | 12.15                            | 30          | Compliance |
| High            | 2462            | 12.30                      | 0.00        | 12.30                            | 30          | Compliance |
| <b>G mode</b>   |                 |                            |             |                                  |             |            |
| Low             | 2412            | 10.91                      | 0.00        | 10.91                            | 30          | Compliance |
| Middle          | 2437            | 11.13                      | 0.00        | 11.13                            | 30          | Compliance |
| High            | 2462            | 11.28                      | 0.00        | 11.28                            | 30          | Compliance |
| <b>N20 mode</b> |                 |                            |             |                                  |             |            |
| Low             | 2412            | 10.89                      | 0.00        | 10.89                            | 30          | Compliance |
| Middle          | 2437            | 11.05                      | 0.00        | 11.05                            | 30          | Compliance |
| High            | 2462            | 11.21                      | 0.00        | 11.21                            | 30          | Compliance |
| <b>BLE mode</b> |                 |                            |             |                                  |             |            |
| Low             | 2402            | 1.75                       | 1.59        | 3.34                             | 30          | Compliance |
| Middle          | 2440            | 2.61                       | 1.59        | 4.20                             | 30          | Compliance |
| High            | 2480            | 3.76                       | 1.59        | 5.35                             | 30          | Compliance |

## 10 FCC §15.247(d) – 100 kHz Bandwidth of Frequency Band Edge

### 10.1 Applicable Standard

According to FCC §15.247(d).

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### 10.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### 10.3 Test Equipment List and Details

| Descriptions      | Manufacturers   | Models | Serial Numbers | Calibration Date | Calibration Due Date |
|-------------------|-----------------|--------|----------------|------------------|----------------------|
| Spectrum Analyzer | Rohde & Schwarz | FSU26  | 101140         | 2017/11/15       | 2018/11/14           |
| Cable             | WOKEN           | SFL402 | S02-160323-07  | 2018/02/21       | 2019/02/20           |

**\*Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

### 10.4 Test Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 23.5 °C  |
| Relative Humidity: | 55.4 %   |
| ATM Pressure:      | 1015 hPa |

The testing was performed by Ian from 2018-03-20 to 2018-03-21

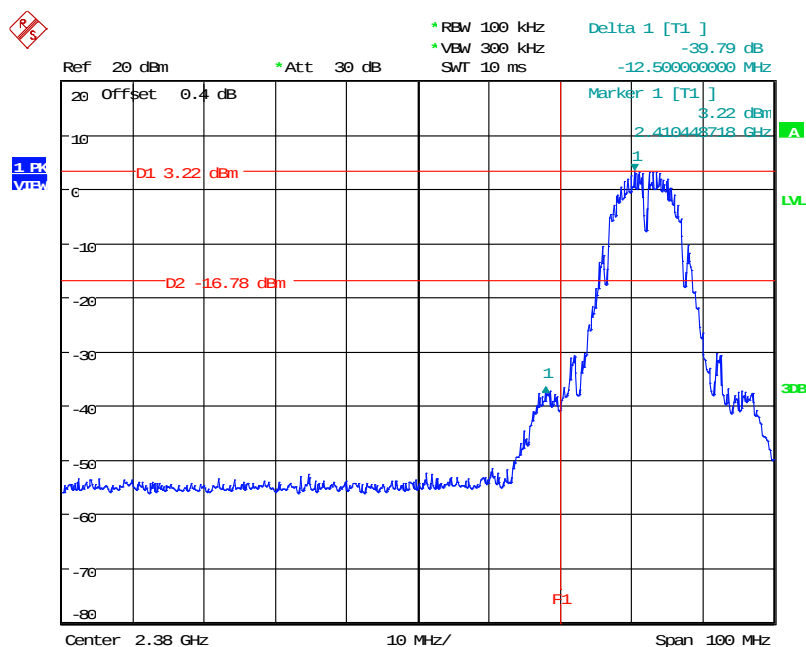
## 10.5 Test Results

| Channel         | Frequency (MHz) | Delta Peak to Band Emission (dBc) | Limit (dBc) | RESULT |
|-----------------|-----------------|-----------------------------------|-------------|--------|
| <b>B mode</b>   |                 |                                   |             |        |
| Low             | 2412            | 39.79                             | $\geq 20$   | PASS   |
| High            | 2462            | 54.54                             | $\geq 20$   | PASS   |
| <b>G mode</b>   |                 |                                   |             |        |
| Low             | 2412            | 33.42                             | $\geq 20$   | PASS   |
| High            | 2462            | 43.42                             | $\geq 20$   | PASS   |
| <b>N20 mode</b> |                 |                                   |             |        |
| Low             | 2412            | 32.61                             | $\geq 20$   | PASS   |
| High            | 2462            | 40.02                             | $\geq 20$   | PASS   |
| <b>BLE mode</b> |                 |                                   |             |        |
| Low             | 2402            | 54.70                             | $\geq 20$   | PASS   |
| High            | 2480            | 47.16                             | $\geq 20$   | PASS   |

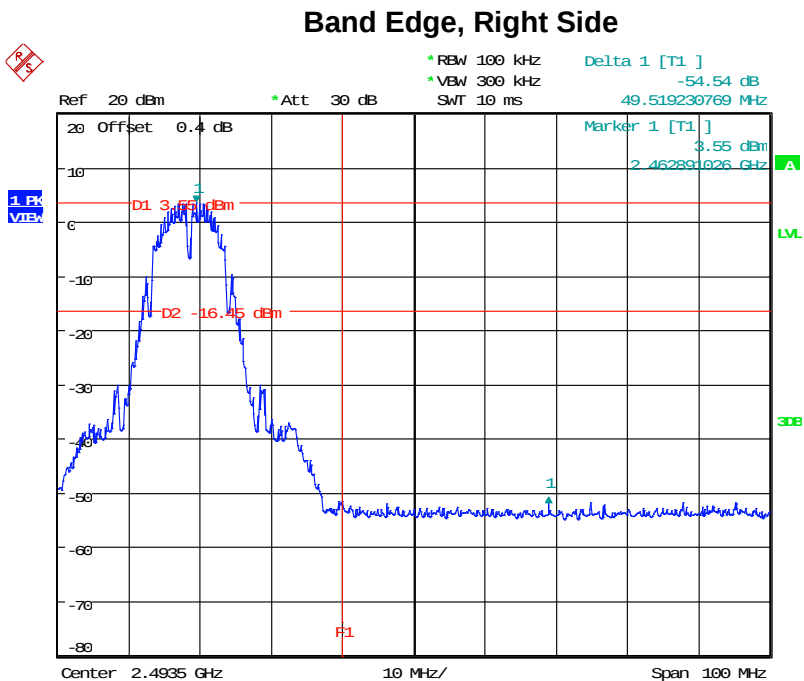
Please refer to the following plots

### Wi-Fi B mode:

#### Band Edge, Left Side

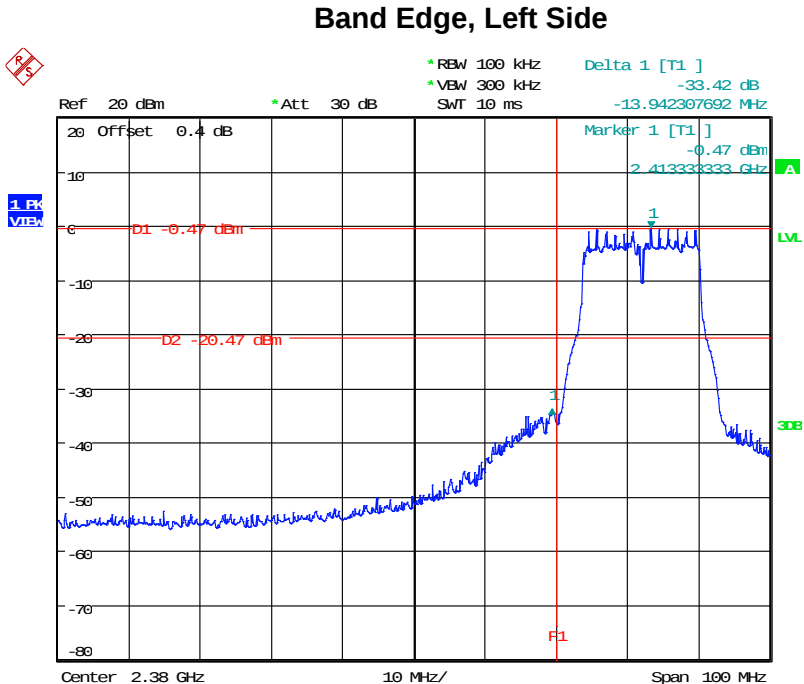


Date: 20.MAR.2018 00:09:09

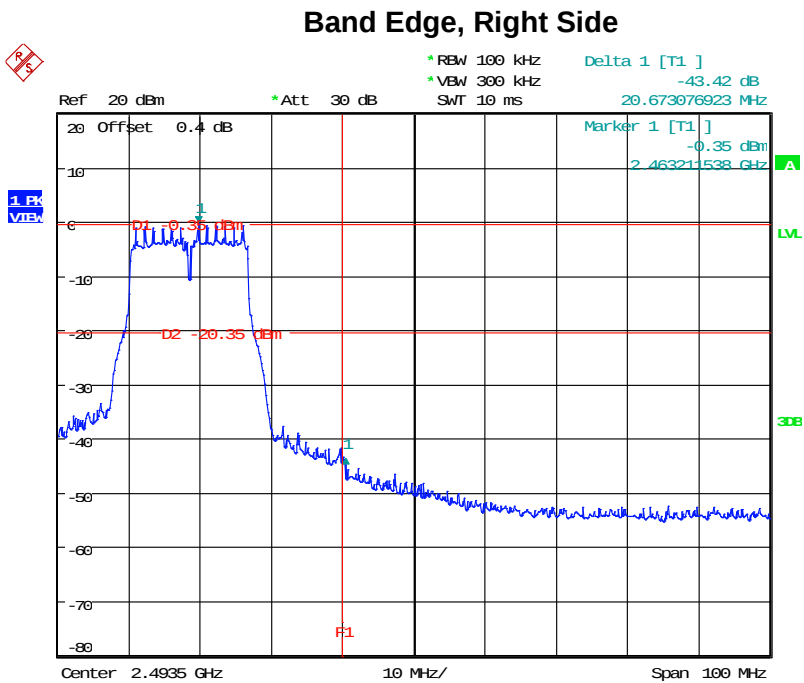


Date: 20.MAR.2018 00:49:56

**Wi-Fi G mode:**

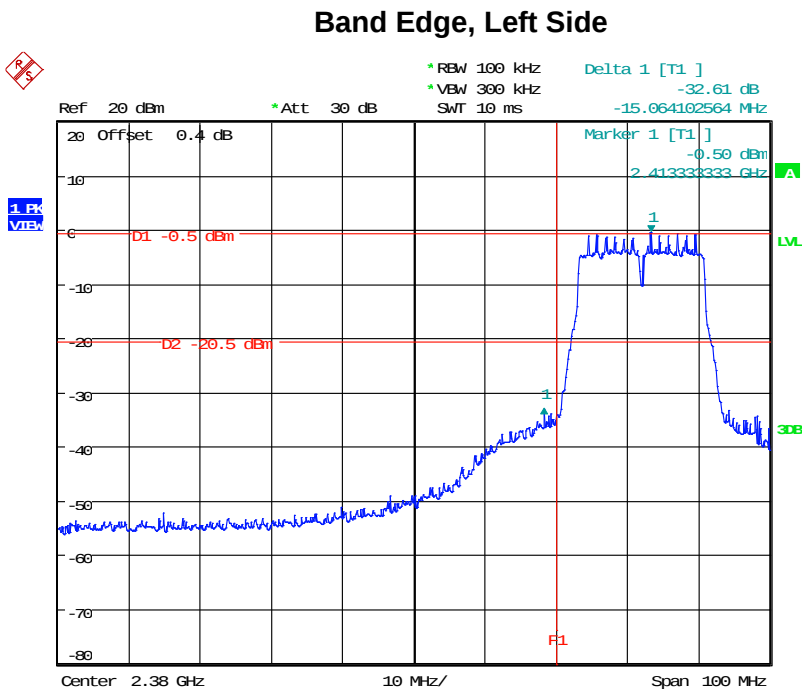


Date: 20.MAR.2018 01:07:05

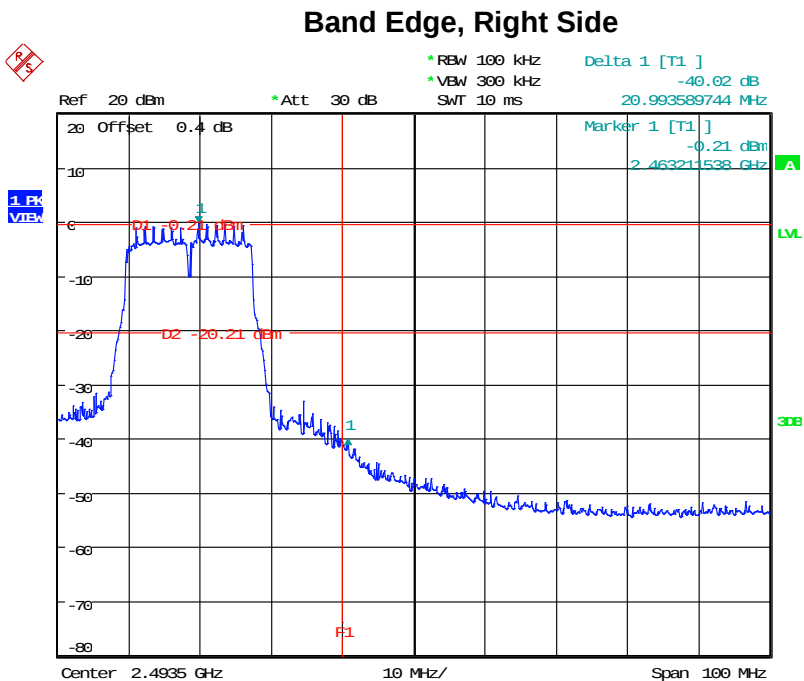


Date: 20.MAR.2018 01:22:06

**Wi-Fi N20 mode:**

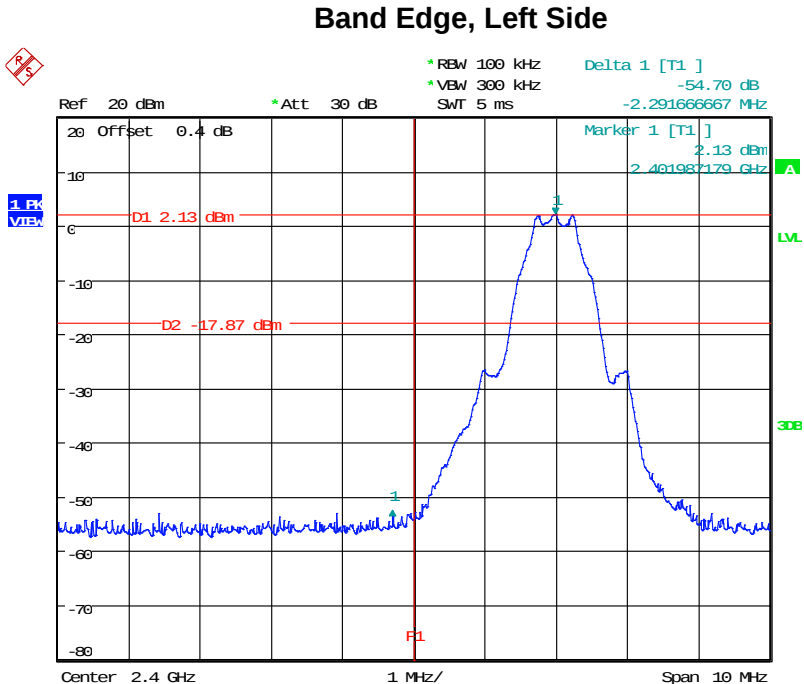


Date: 20.MAR.2018 01:31:58

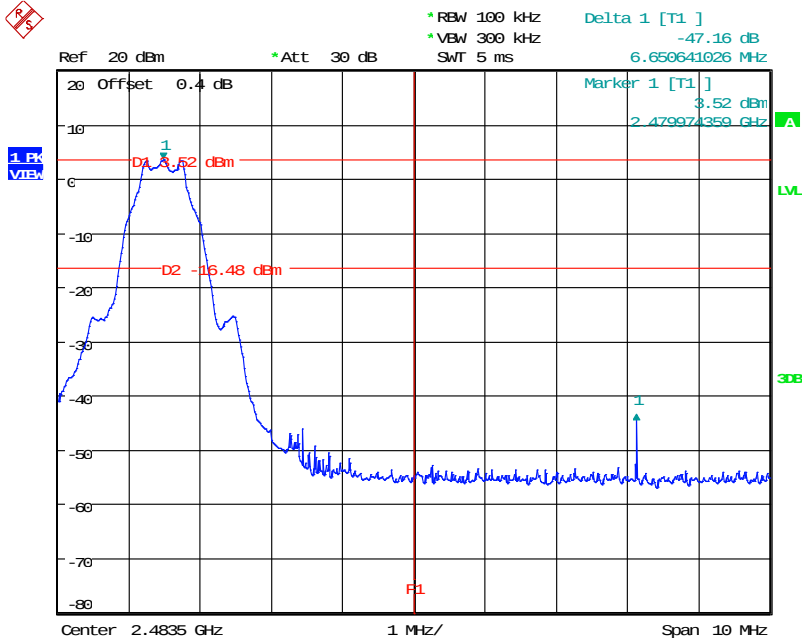


Date: 20.MAR.2018 01:52:38

**BLE mode:**



Date: 21.MAR.2018 00:21:47



Date: 21.MAR.2018 00:41:24

## 11 FCC §15.247(e) – Power Spectral Density

### 11.1 Applicable Standard

According to FCC §15.247(e).

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

### 11.2 Test Procedure

According to ANSI C63.10-2013

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- Set the VBW  $\geq [3 \times \text{RBW}]$ .
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat

### 11.3 Test Equipment List and Details

| Descriptions      | Manufacturers   | Models | Serial Numbers | Calibration Date | Calibration Due Date |
|-------------------|-----------------|--------|----------------|------------------|----------------------|
| Spectrum Analyzer | Rohde & Schwarz | FSU26  | 101140         | 2017/11/15       | 2018/11/14           |
| Cable             | WOKEN           | SFL402 | S02-160323-07  | 2018/02/21       | 2019/02/20           |

**\*Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

### 11.4 Test Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 23.5 °C  |
| Relative Humidity: | 55.4 %   |
| ATM Pressure:      | 1015 hPa |

The testing was performed by Ian from 2018-03-20 to 2018-03-21

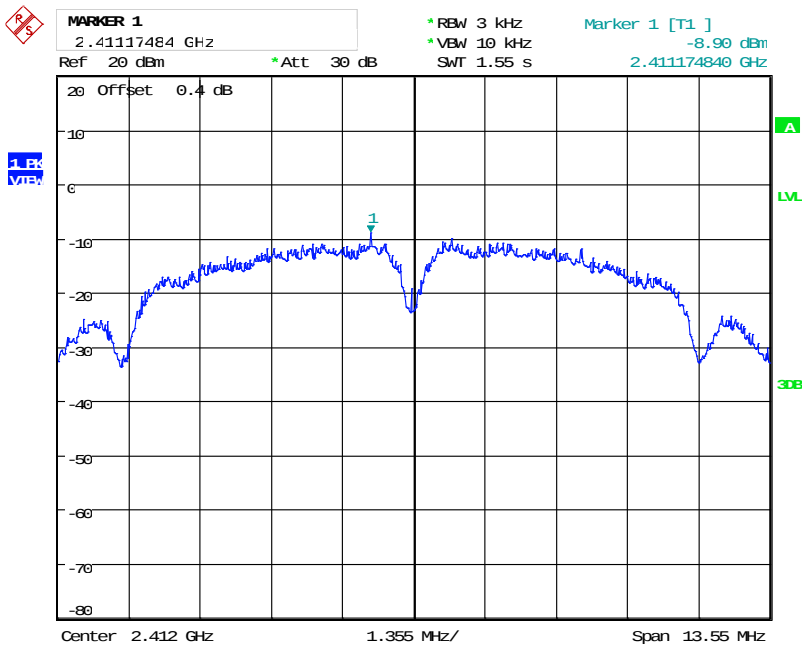
## 11.5 Test Results

| Channel         | Frequency (MHz) | PSD (dBm/3 kHz) | Limit (dBm/3 kHz) | Result     |
|-----------------|-----------------|-----------------|-------------------|------------|
| <b>B mode</b>   |                 |                 |                   |            |
| Low             | 2412            | -8.90           | 8                 | Compliance |
| Middle          | 2437            | -9.95           | 8                 | Compliance |
| High            | 2462            | -10.19          | 8                 | Compliance |
| <b>G mode</b>   |                 |                 |                   |            |
| Low             | 2412            | -13.71          | 8                 | Compliance |
| Middle          | 2437            | -13.75          | 8                 | Compliance |
| High            | 2462            | -13.50          | 8                 | Compliance |
| <b>N20 mode</b> |                 |                 |                   |            |
| Low             | 2412            | -14.16          | 8                 | Compliance |
| Middle          | 2437            | -14.42          | 8                 | Compliance |
| High            | 2462            | -13.05          | 8                 | Compliance |
| <b>BLE mode</b> |                 |                 |                   |            |
| Low             | 2402            | -11.48          | 8                 | Compliance |
| Middle          | 2440            | -10.50          | 8                 | Compliance |
| High            | 2480            | -9.97           | 8                 | Compliance |

Please refer to the following plots

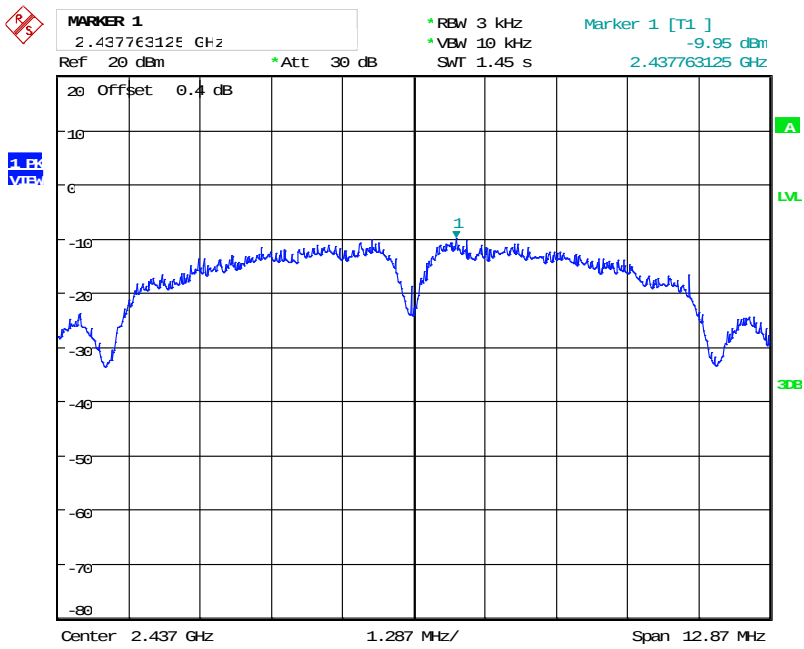
Wi-Fi B mode:

Low Channel



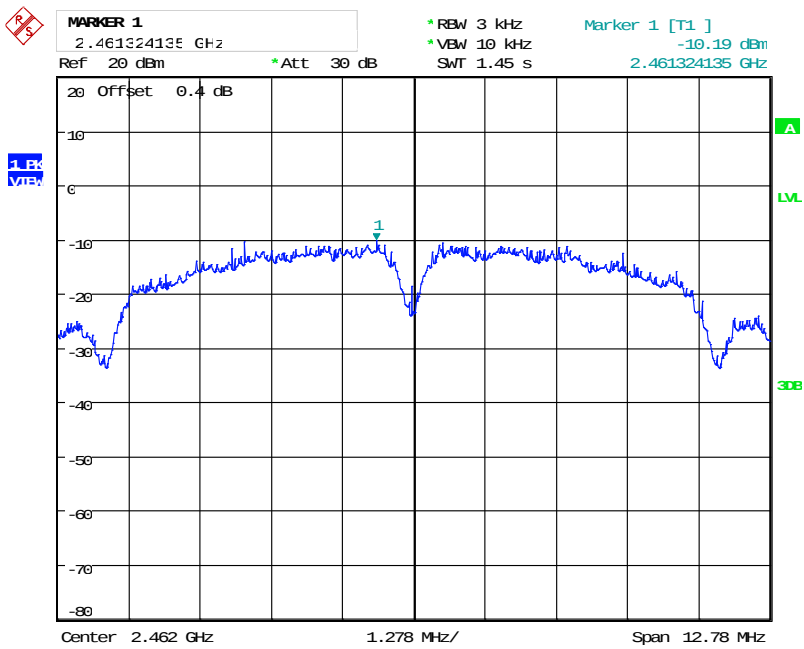
Date: 20.MAR.2018 00:31:46

Middle Channel



Date: 20.MAR.2018 00:41:53

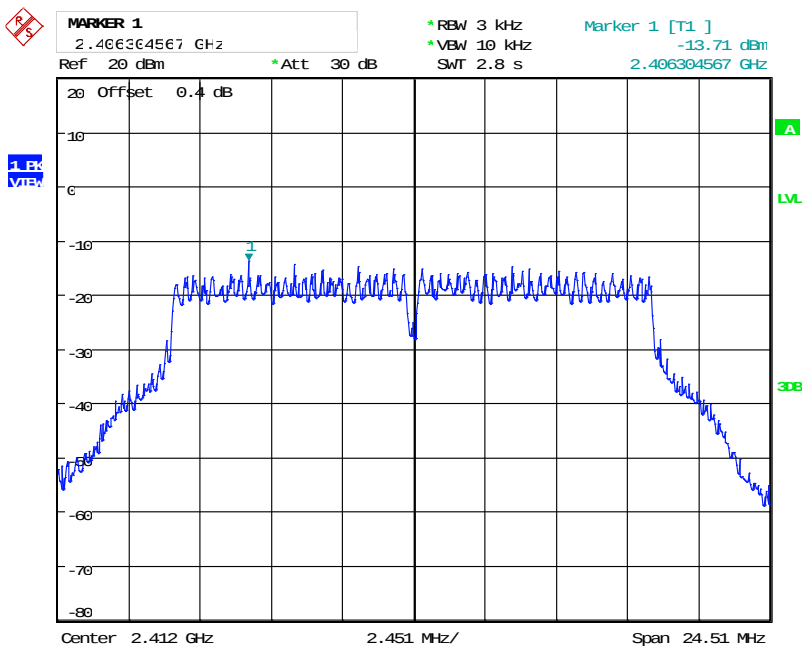
High Channel



Date: 20.MAR.2018 00:56:19

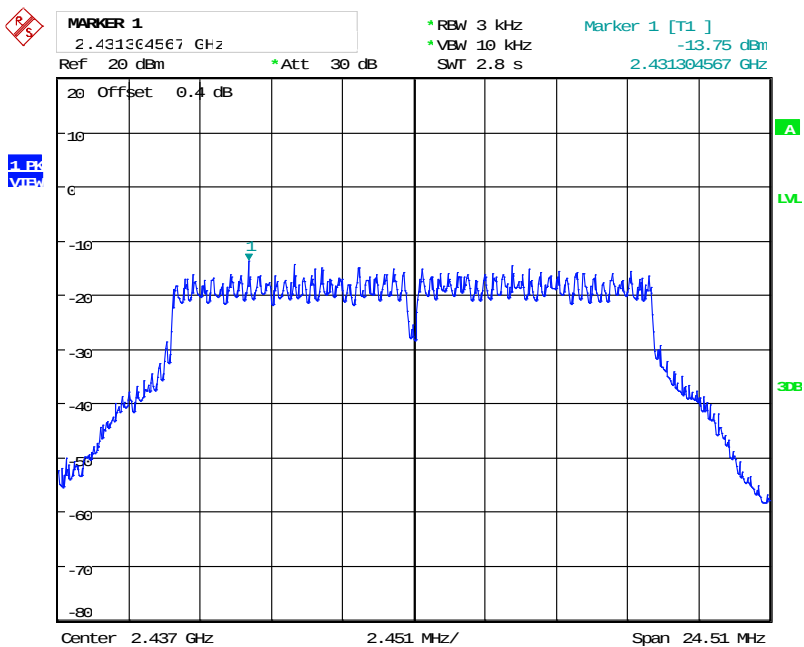
Wi-Fi G mode:

Low Channel



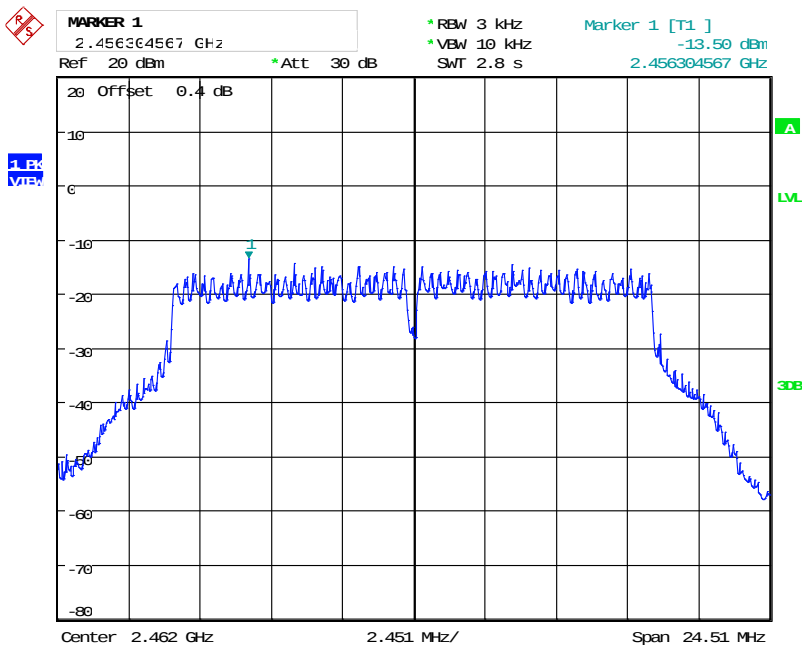
Date: 20.MAR.2018 01:10:54

Middle Channel



Date: 20.MAR.2018 01:17:42

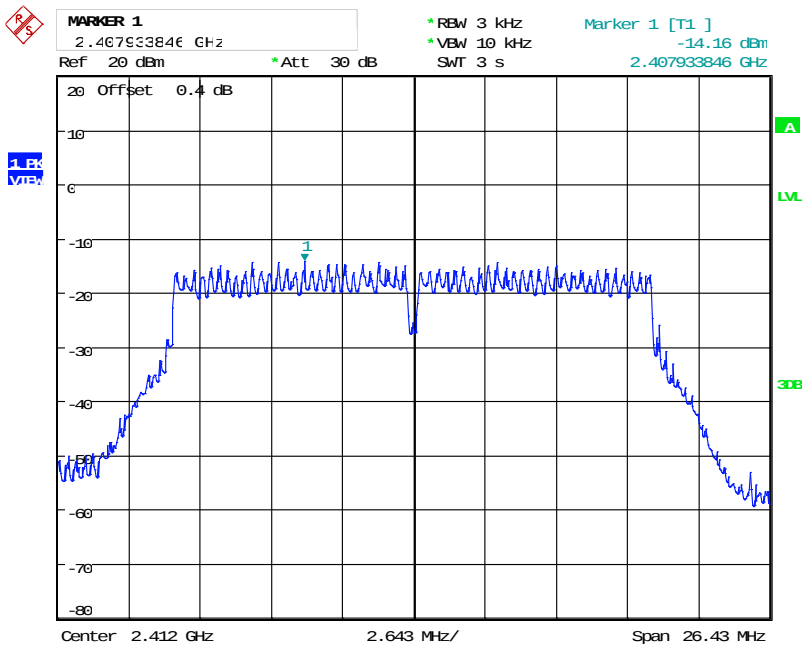
High Channel



Date: 20.MAR.2018 01:27:14

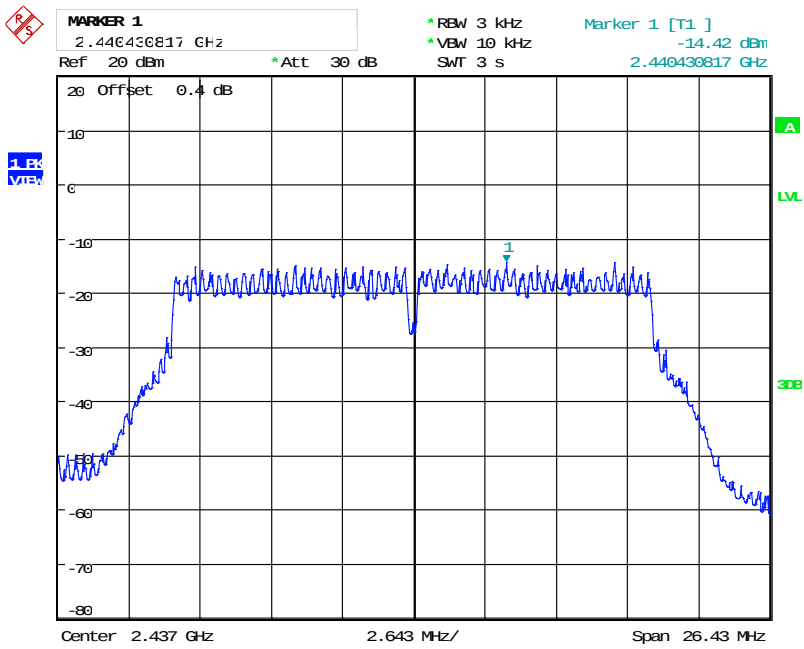
Wi-Fi N20 mode:

Low Channel



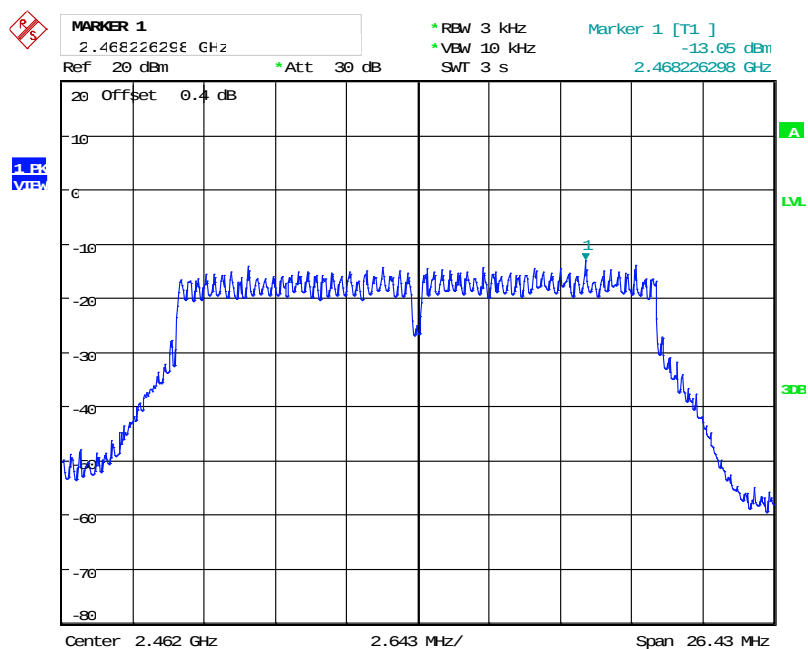
Date: 20.MAR.2018 01:36:11

Middle Channel



Date: 20.MAR.2018 01:44:19

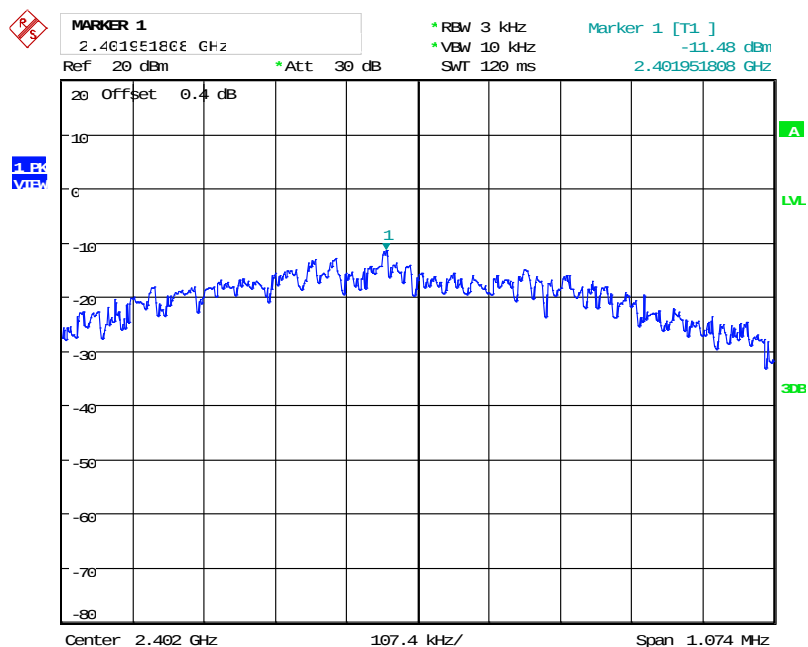
## High Channel



Date: 20.MAR.2018 01:57:16

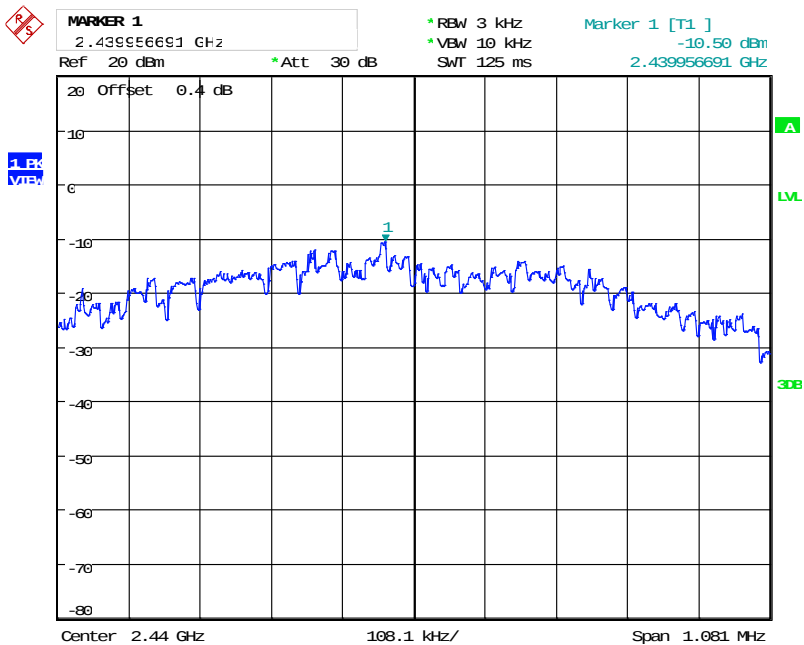
**BLE mode:**

## Low Channel



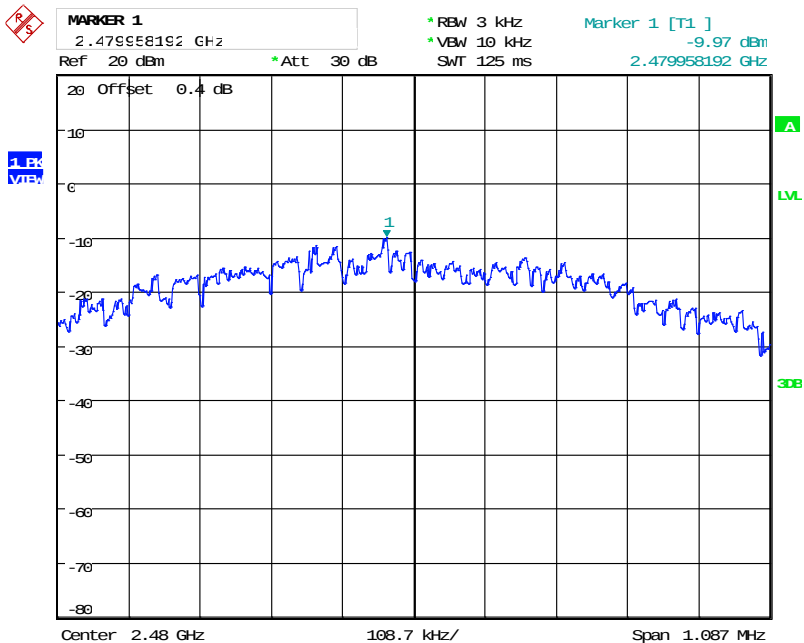
Date: 21.MAR.2018 00:25:18

Middle Channel



Date: 21.MAR.2018 00:31:24

High Channel



Date: 21.MAR.2018 00:43:00

----- END OF REPORT -----