# FCC 47 CFR PART 15 SUBPART C

# CERTIFICATION TEST REPORT

*For*

**Turtle Bluetooth Speaker ATA**

**MODEL NUMBER: BT SPEAKER-AC6905B**

**FCC ID: 2AM7LTURTLE-SP-ATA**

**REPORT NUMBER: 4788040307-1**

**ISSUE DATE: August 21, 2017**

*Prepared for*

**Creata (USA) Inc.**
**1801 South Meyers Road, Suite 400, Oakbrook Terrace, Illinois, 60181, United States**

*Prepared by*

**UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch**
**Room 101, Building 10, Innovation Technology Park,**
**Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China**
**Tel: +86 769 33817100**
**Fax: +86 769 33244054**
**Website: www.ul.com**

**The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.**

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| -- | 08/21/2017 | Initial Issue | |


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| Summary of Test Results | | | |
|---|---|---|---|
| **Clause** | **Test Items** | **FCC/IC Rules** | **Test Results** |
| 1 | 20dB Bandwidth | FCC 15.247 (a) (1) | Complied |
| 2 | Peak Conducted Output Power | FCC 15.247 (b) (1) | Complied |
| 3 | Carrier Hopping Channel Separation | FCC 15.247 (a) (1) | Complied |
| 4 | Number of Hopping Frequency | 15.247 (a) (1) III | Complied |
| 5 | Time of Occupancy (Dwell Time) | 15.247 (a) (1) III | Complied |
| 6 | Conducted Bandedge | FCC 15.247 (d) | Complied |
| 7 | Radiated Bandedge and Spurious | FCC 15.247 (d)<br>FCC 15.209<br>FCC 15.205 | Complied |
| 8 | Conducted Emission Test For AC Power Port | FCC 15.207 | Complied |
| 9 | Antenna Requirement | FCC 15.203 | Complied |


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# 1. ATTESTATION OF TEST RESULTS

**Applicant Information**

| | |
|---|---|
| Company Name: | Creata (USA) Inc. |
| Address: | 1801 South Meyers Road, Suite 400, Oakbrook Terrace, Illinois, 60181, United States |

**Manufacturer Information**

| | |
|---|---|
| Company Name: | Fuzhou Lexinda Electronic Co.,Ltd. |
| Address: | Xing Li Ke Ji Gong Ye Yuan,Han Jiang ,Putian ,Fujian ,China |

**Factory Information**

| | |
|---|---|
| Company Name: | N/A |
| Address: | N/A |

**EUT Description**

| | |
|---|---|
| Product Name | Turtle Bluetooth Speaker ATA |
| Brand Name | N/A |
| Model Name | BT SPEAKER-AC6905B |
| Date Tested | August 2, 2017 ~ August 16, 2017 |

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 15 Subpart C | PASS |

Tested By:

Kebo Zhang
Engineer

Check By:

Shawn Wen
Laboratory Leader

Approved By:

Stephen Guo

Laboratory Manager


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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with DA 00-705, KDB414788 D01 Radiated Test Site v01, ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15.

# 3. FACILITIES AND ACCREDITATION

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

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


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# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

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

## 4.2. MEASUREMENT UNCERTAINTY

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

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


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# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

| | | | |
|---|---|---|---|
| Equipment | Turtle Bluetooth Speaker ATA | | |
| Model Name | BT SPEAKER-AC6905B | | |
| Product Description (Bluetooth) | Operation Frequency | 2402 MHz ~ 2480 MHz | |
| | Modulation Type | | Data Rate |
| | GFSK | | 1Mbps |
| | ∏/4-DQPSK | | 2Mbps |
| Rated Input | DC 5V/100-120mA | | |
| Battery | 3.7V 500mAh Lithium | | |
| Bluetooth Version | BT V4.2+EDR | | |

Note: The Bluetooth Chip only support 1Mbps and 2Mbps.

## 5.2. MAXIMUM OUTPUT POWER

| Frequency Range (MHz) | Number of Transmit Chains (NTX) | Bluetooth Mode | Frequency (MHz) | Channel Number | Max Output Power (dBm) |
|---|---|---|---|---|---|
| 2400-2483.5 | 1 | GFSK | 2402-2480 | 0-78[79] | -5.314 |
| 2400-2483.5 | 1 | ∏/4-DQPSK | 2402-2480 | 0-78[79] | -4.283 |

## 5.3. PACKET TYPE CONFIGURATION

| Test Mode | Packet Type | Setting |
|---|---|---|
| GFSK | DH1 | 27 |
| | DH3 | 183 |
| | DH5 | 339 |
| ∏/4-DQPSK | 2-DH1 | 54 |
| | 2-DH3 | 367 |
| | 2-DH5 | 679 |


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## 5.4. CHANNEL LIST

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|---|---|
| 00 | 2402 | 20 | 2422 | 40 | 2442 | 60 | 2462 |
| 01 | 2403 | 21 | 2423 | 41 | 2443 | 61 | 2463 |
| 02 | 2404 | 22 | 2424 | 42 | 2444 | 62 | 2464 |
| 03 | 2405 | 23 | 2425 | 43 | 2445 | 63 | 2465 |
| 04 | 2406 | 24 | 2426 | 44 | 2446 | 64 | 2466 |
| 05 | 2407 | 25 | 2427 | 45 | 2447 | 65 | 2467 |
| 06 | 2408 | 26 | 2428 | 46 | 2448 | 66 | 2468 |
| 07 | 2409 | 27 | 2429 | 47 | 2449 | 67 | 2469 |
| 08 | 2410 | 28 | 2430 | 48 | 2450 | 68 | 2470 |
| 09 | 2411 | 29 | 2431 | 49 | 2451 | 69 | 2471 |
| 10 | 2412 | 30 | 2432 | 50 | 2452 | 70 | 2472 |
| 11 | 2413 | 31 | 2433 | 51 | 2453 | 71 | 2473 |
| 12 | 2414 | 32 | 2434 | 52 | 2454 | 72 | 2474 |
| 13 | 2415 | 33 | 2435 | 53 | 2455 | 73 | 2475 |
| 14 | 2416 | 34 | 2436 | 54 | 2456 | 74 | 2476 |
| 15 | 2417 | 35 | 2437 | 55 | 2457 | 75 | 2477 |
| 16 | 2418 | 36 | 2438 | 56 | 2458 | 76 | 2478 |
| 17 | 2419 | 37 | 2439 | 57 | 2459 | 77 | 2479 |
| 18 | 2420 | 38 | 2440 | 58 | 2460 | 78 | 2480 |
| 19 | 2421 | 39 | 2441 | 59 | 2461 | | |

## 5.5. TEST CHANNEL CONFIGURATION

| Test Mode | Test Channel Number | Test Channel |
|---|---|---|
| GFSK | CH 00, CH 39, CH 78 | Low, Middle, High |
| ∏/4-DQPSK | CH 00, CH 39, CH 78 | Low, Middle, High |

## 5.6. THE WORSE CASE POWER SETTING PARAMETER

| The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band | | | | |
|---|---|---|---|---|
| Test Software | | FCCAssist | | |
| Modulation Type | Transmit Antenna Number | Test Channel | | |
| | | CH 00 | CH 39 | CH 78 |
| GFSK | 1 | 7 | 7 | 7 |
| ∏/4-DQPSK | 1 | 7 | 7 | 7 |


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## 5.7. DESCRIPTION OF AVAILABLE ANTENNAS

| Ant. | Frequency (MHz) | Antenna Type | Antenna Gain (dBi) |
|---|---|---|---|
| 1 | 2402-2480 | PCB Antenna | 3.0 |

| Test Mode | Transmit and Receive Mode | Description |
|---|---|---|
| GFSK | ☒1TX, 1RX | Chain 1 can be used as transmitting/receiving antenna. |
| ∏/4-DQPSK | ☒1TX, 1RX | Chain 1 can be used as transmitting/receiving antenna. |

## 5.8. WORST-CASE CONFIGURATIONS

| Bluetooth Mode | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|
| BR | FHSS | GFSK | 1Mbit/s |
| EDR | FHSS | ∏/4-DQPSK | 2Mbit/s |

Note: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

## 5.9. TEST ENVIRONMENT

| Environment Parameter | Selected Values During Tests | |
|---|---|---|
| Relative Humidity | 55 ~ 65% | |
| Atmospheric Pressure: | 1025Pa | |
| Temperature | TN | 23 ~ 28 °C |
| Voltage : | VL | N/A |
| | VN | DC 3.7V/DC 5V |
| | VH | N/A |

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage, DC 5V from USB port, DC 3.7V from battery.
VH= Upper Extreme Test Voltage
TN= Normal Temperature


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## 5.10. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Item | Equipment | Brand Name | Model Name | Remarks |
|---|---|---|---|---|
| 1 | Laptop | Lenovo | ThinkPad T460s | N/A |

**I/O CABLES**

| Cable No | Port | Connector Type | Cable Type | Cable Length(m) | Remarks |
|---|---|---|---|---|---|
| 1 | DC In | USB | Unshielded | 0.12 | N/A |

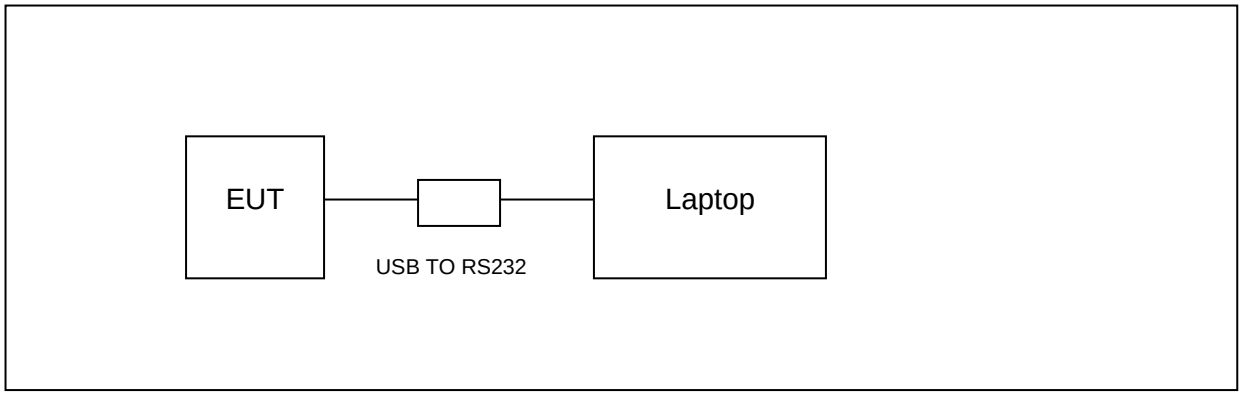
**ACCESSORY**

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

**TEST SETUP**

The EUT can work in an engineer mode with a software through a Laptop.

**SETUP DIAGRAM FOR TESTS**





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## 5.11. MEASURING INSTRUMENT AND SOFTWARE USED

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


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# 6. ANTENNA PORT TEST RESULTS

## 6.1. ON TIME AND DUTY CYCLE

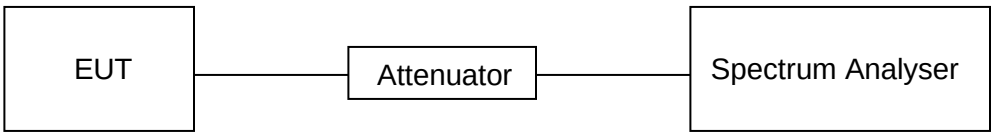
**LIMITS**

None; for reporting purposes only

**PROCEDURE**

KDB 558074 Zero-Span Spectrum Analyzer Method

**TEST SETUP**




**RESULTS**

| Mode | On Time (msec) | Period (msec) | Duty Cycle x (Linear) | Duty Cycle (%) | Duty Cycle Correction Factor (db) | 1/T Minimum VBW (KHz) |
|---|---|---|---|---|---|---|
| GFSK | 2.90 | 3.74 | 0.775 | 78 | 1.11 | 0.345 |
| ∏/4-DQPSK | 2.92 | 3.76 | 0.777 | 78 | 1.10 | 0.343 |

Note: Duty Cycle Correction Factor=10log(1/x).
Where: x is Duty Cycle(Linear)
Where: T is On Time (transmit duration)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DH5 ON TIME AND DUTY CYCLE MID CH

2DH5 ON TIME AND DUTY CYCLE MID CH

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## 6.2. 20 dB BANDWIDTH

**LIMITS**

| FCC Part15 (15.247) Subpart C | | | |
|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) |
| FCC 15.247 (a) (1) | 20dB Bandwidth | 500KHz | 2400-2483.5 |

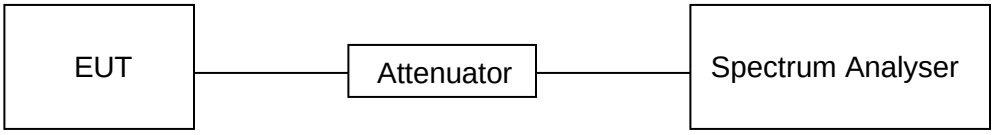
**TEST PROCEDURE**

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

| | |
|---|---|
| Center Frequency | The centre frequency of the channel under test |
| Detector | Peak |
| RBW | 1% of the 20 dB bandwidth |
| VBW | ≥ RBW |
| Span | approximately 2 to 3 times the 20 dB bandwidth |
| Trace | Max hold |
| Sweep | Auto couple |

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

**TEST SETUP**





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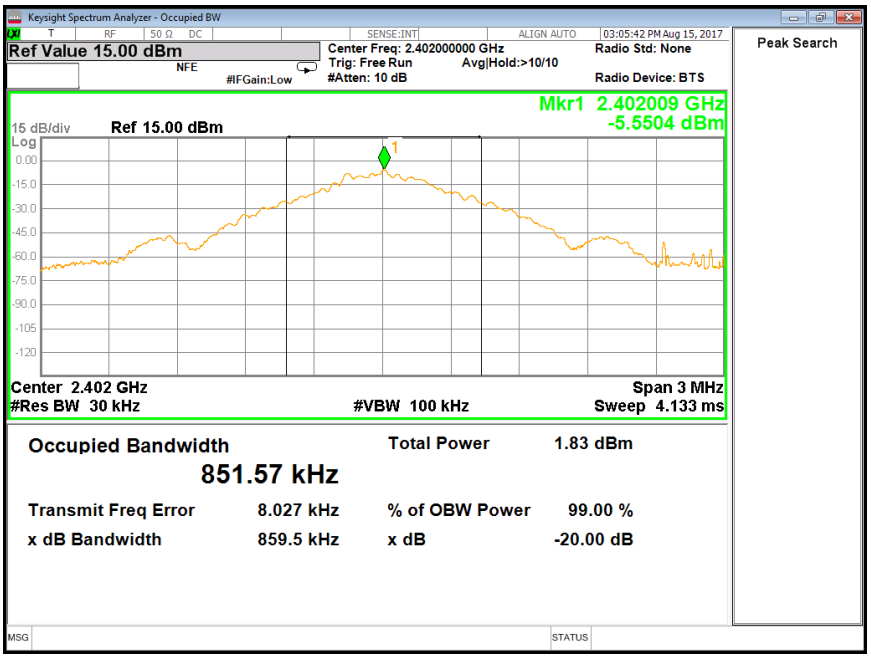
**RESULTS**

### 6.2.1. GFSK MODE

| Channel | Frequency (MHz) | 20dB bandwidth (MHz) | Result |
|---|---|---|---|
| Low | 2402 | 0.860 | PASS |
| Middle | 2441 | 0.857 | PASS |
| High | 2480 | 0.855 | PASS |

**Test Graph**

20 dB BANDWIDTH LOW CH





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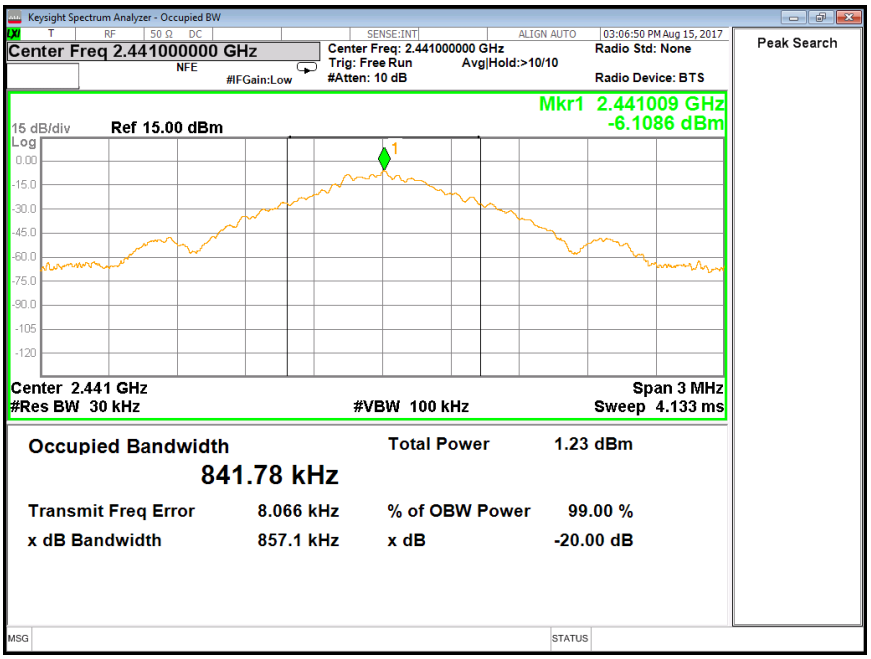
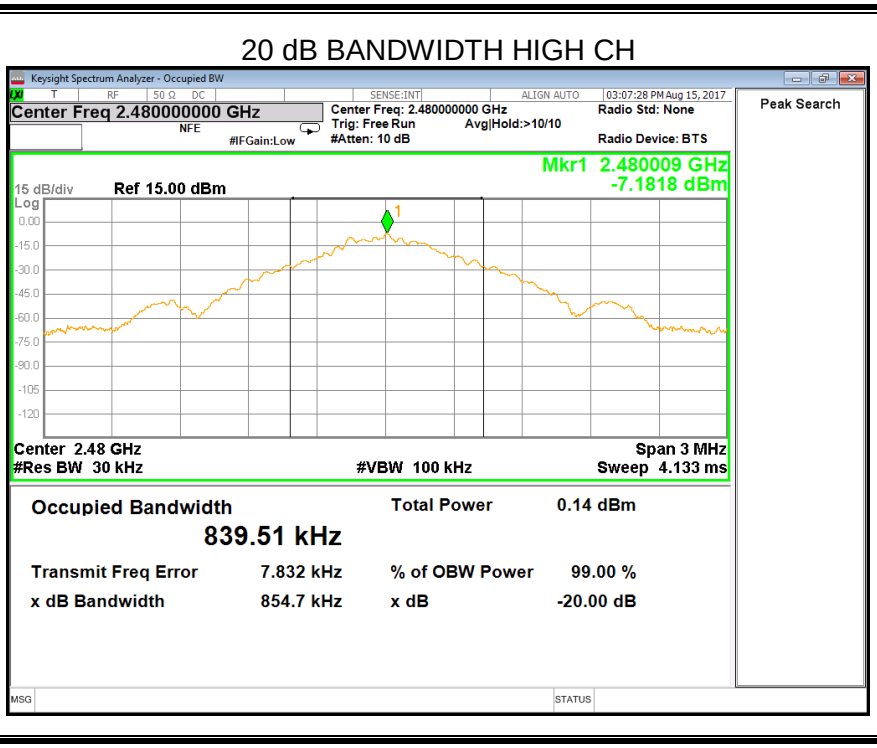
20 dB BANDWIDTH MID CH




20 dB BANDWIDTH HIGH CH





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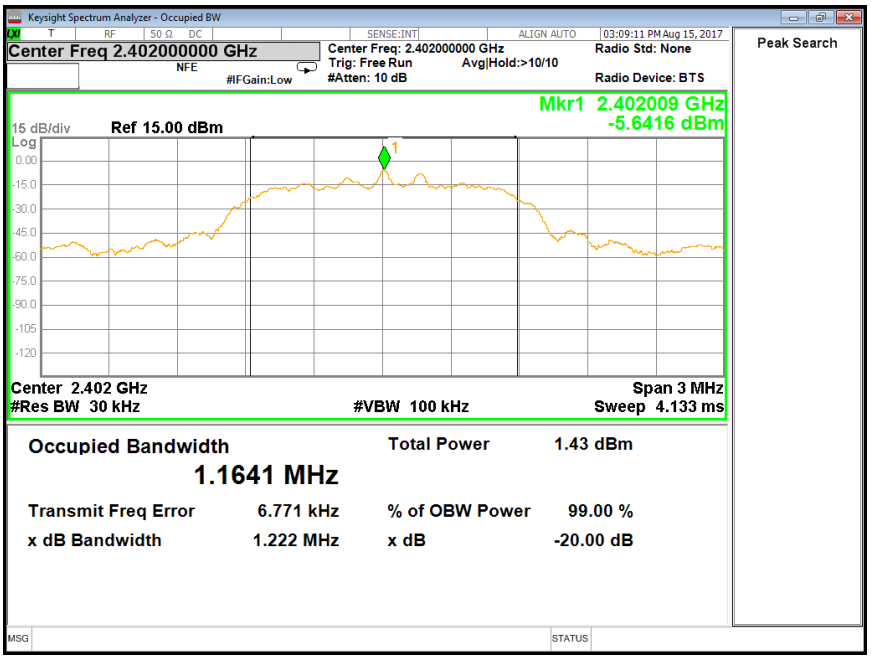
### 6.2.2. ∏/4-DQPSK MODE

| Channel | Frequency (MHz) | 20dB bandwidth (MHz) | Result |
|---|---|---|---|
| Low | 2402 | 1.222 | Pass |
| Middle | 2441 | 1.221 | Pass |
| High | 2480 | 1.223 | Pass |

20 dB BANDWIDTH LOW CH





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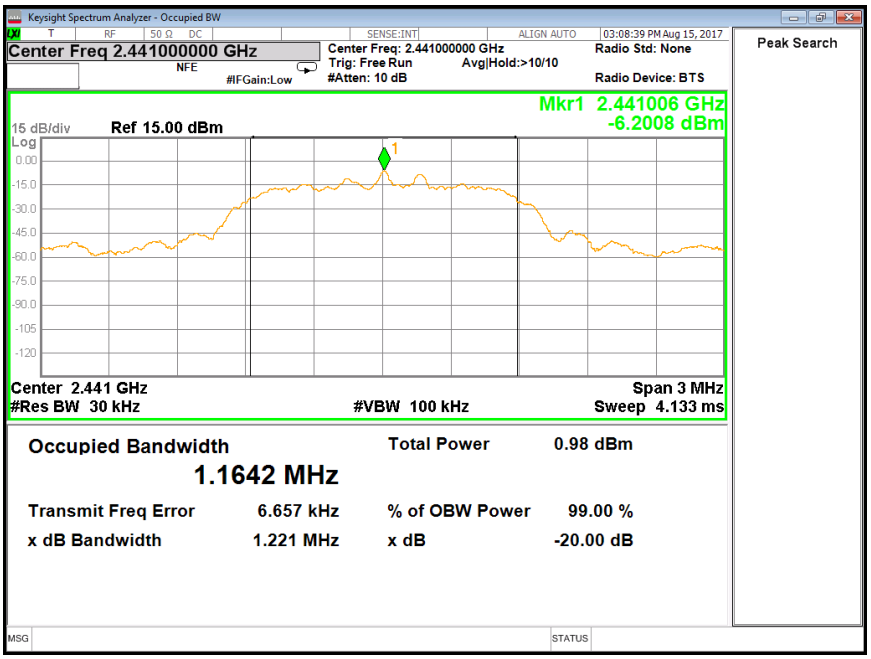
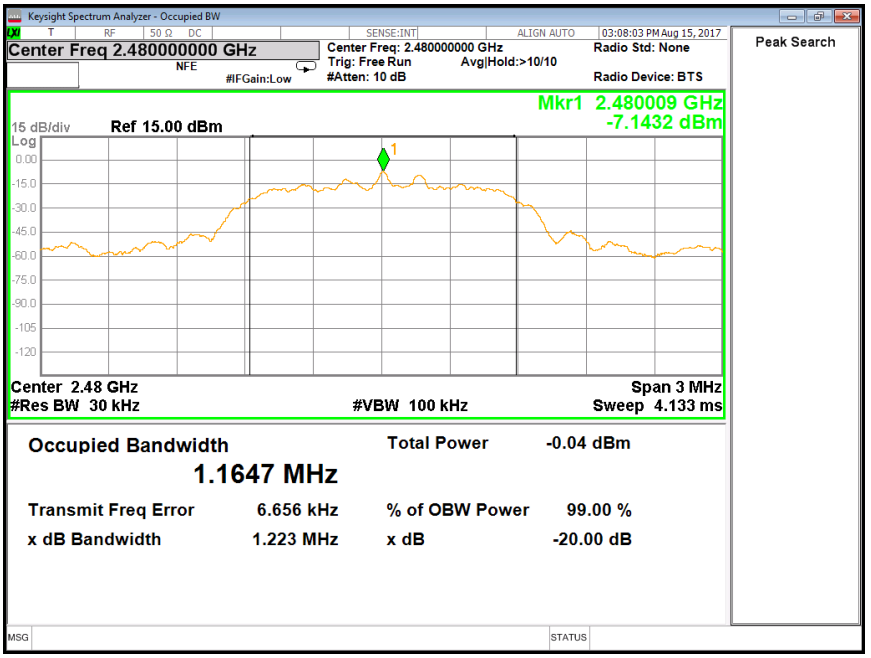
20 dB BANDWIDTH MID CH




20 dB BANDWIDTH HIGH CH





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## 6.3. PEAK CONDUCTED OUTPUT POWER

**LIMITS**

| FCC Part15 (15.247) , Subpart C | | | |
|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) |
| FCC 15.247 (b) (1) | Peak Conducted Output Power | 1 watt or 30dBm | 2400-2483.5 |

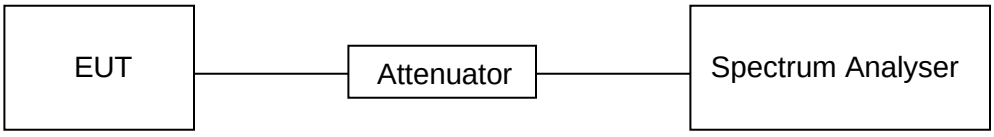
**TEST PROCEDURE**

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

| | |
|---|---|
| Center Frequency | The centre frequency of the channel under test |
| Detector | Peak |
| RBW | ≥ 20 dB bandwidth |
| VBW | ≥RBW |
| Span | Approximately five times the 20 dB bandwidth |
| Trace | Max hold |
| Sweep time | Auto couple |

Allow trace to fully stabilize and use peak marker function to determine the peak amplitude level.

**TEST SETUP**





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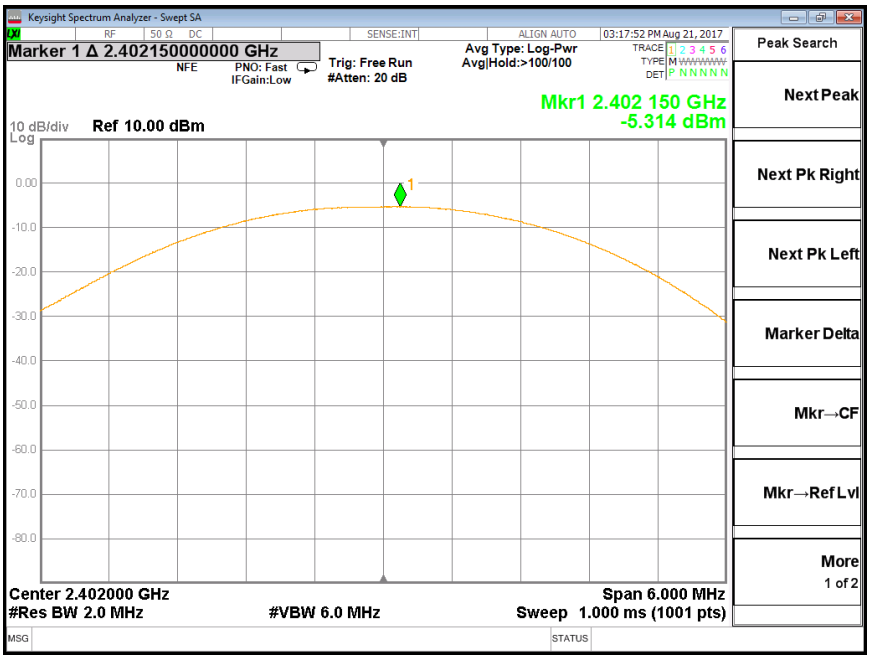
**RESULTS**

### 6.3.1. GFSK MODE

| Channel | Frequency | Maximum Conducted Output Power(PK) | Result |
|---|---|---|---|
| | (MHz) | (dBm) | |
| Low | 2402 | -5.314 | Pass |
| Middle | 2441 | -5.778 | Pass |
| High | 2480 | -6.706 | Pass |

OUTPUT POWER LOW CH





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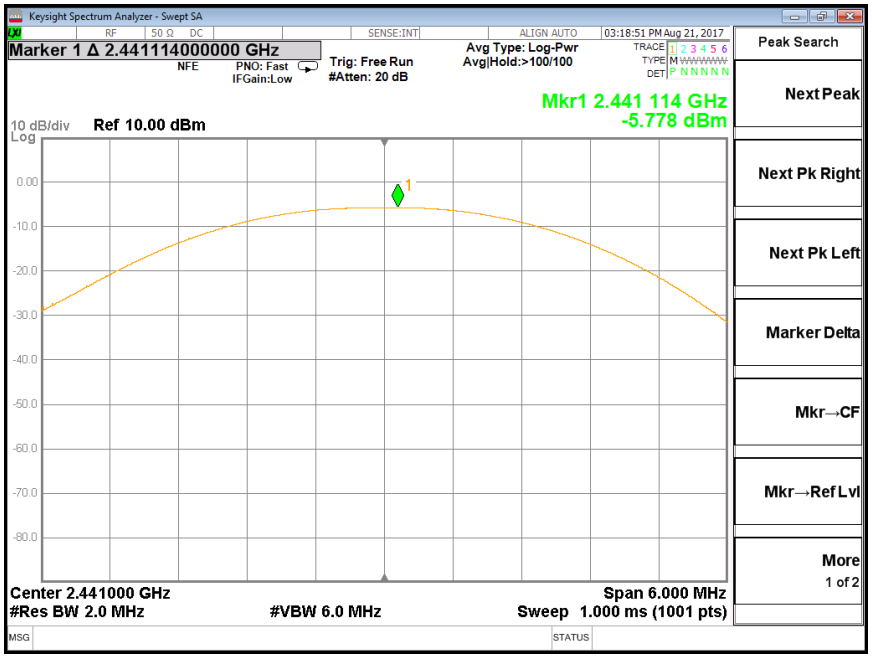
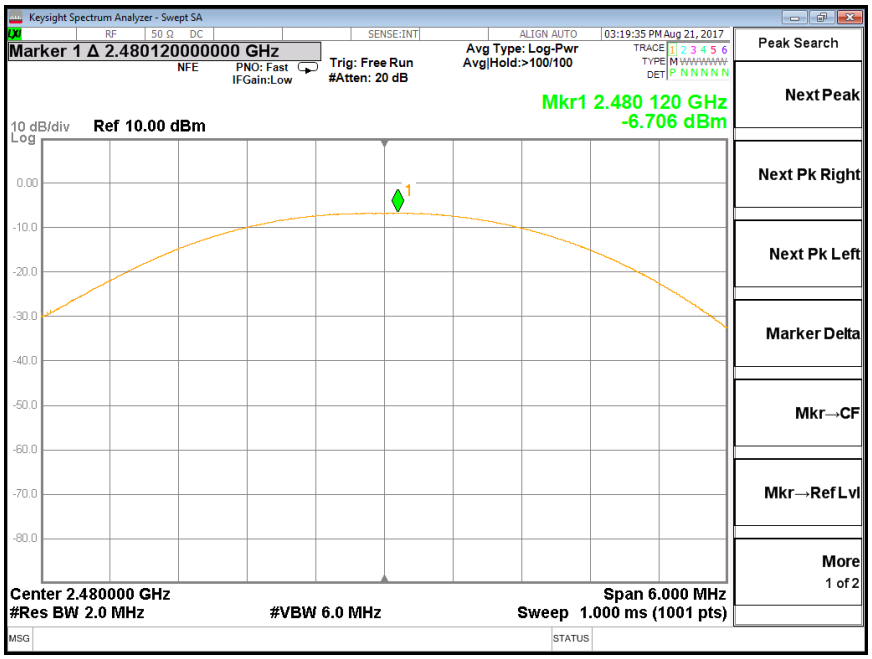
OUTPUT POWER MID CH




OUTPUT POWER HIGH CH





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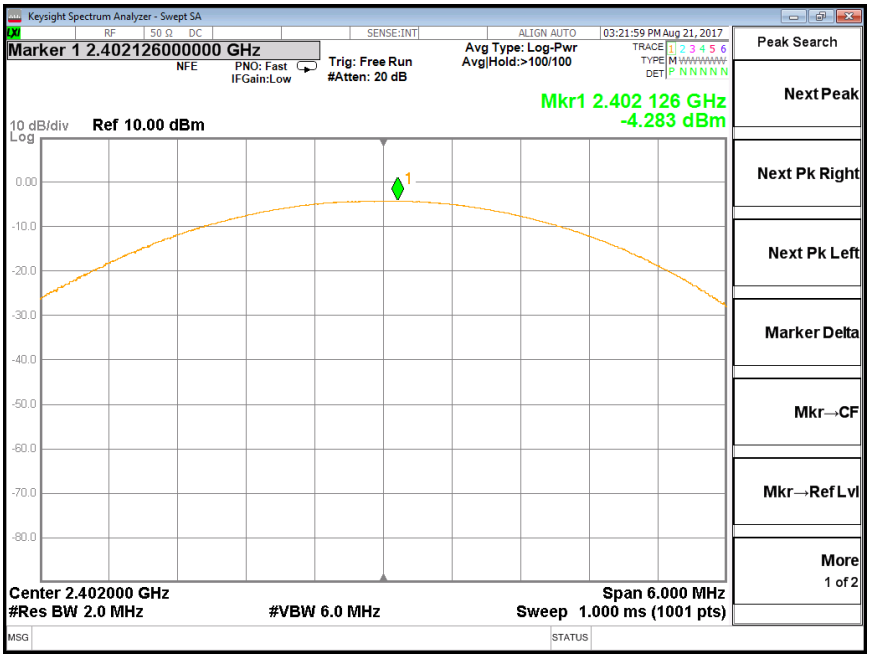
### 6.3.2. ∏/4-DQPSK MODE

| Channel | Frequency | Maximum Conducted Output Power(PK) | Result |
|---|---|---|---|
| | (MHz) | (dBm) | |
| Low | 2402 | -4.283 | Pass |
| Middle | 2441 | -4.590 | Pass |
| High | 2480 | -5.615 | Pass |

OUTPUT POWER LOW CH





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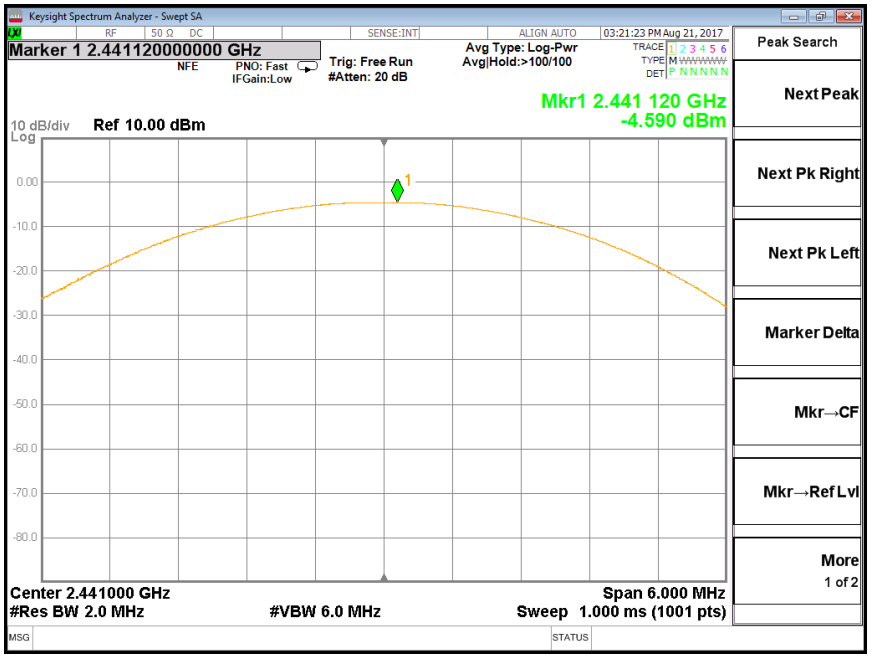
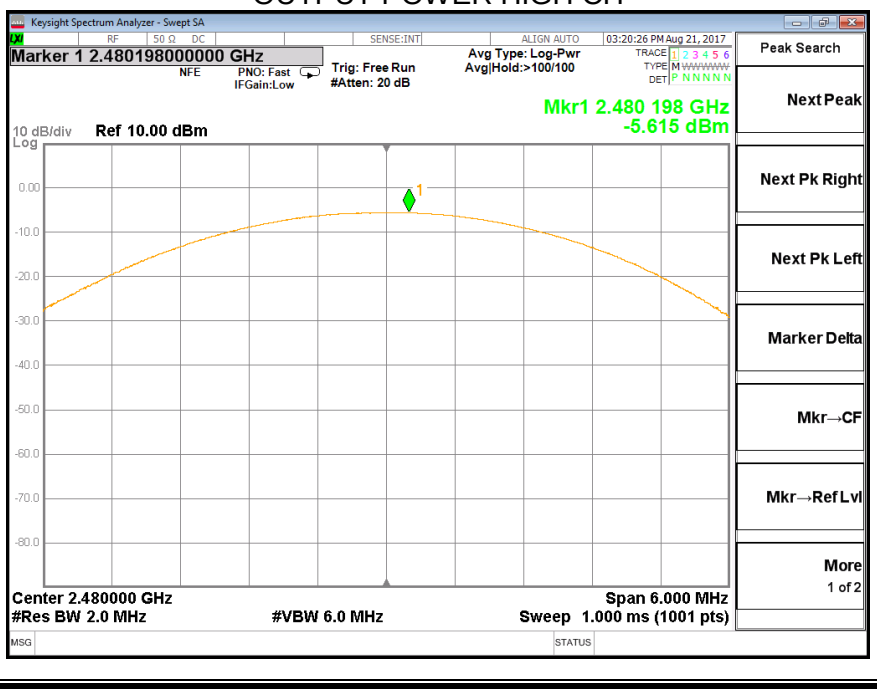
OUTPUT POWER MID CH




OUTPUT POWER HIGH CH





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## 6.4. CARRIER HOPPING CHANNEL SEPARATION

**LIMITS**

| FCC Part15 (15.247) , Subpart C | | | |
|---|---|---|---|
| Section | Test Item | Limit | Frequency Range (MHz) |
| FCC 15.247 (a) (1) | Carrier Hopping Channel Separation | 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater. | 2400-2483.5 |

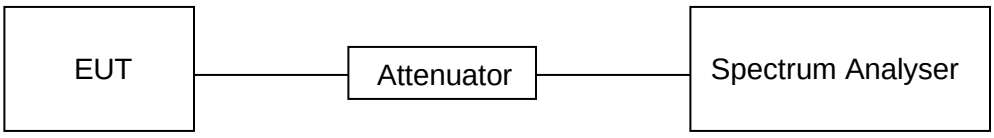
**TEST PROCEDURE**

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

| | |
|---|---|
| Center Frequency | The centre frequency of the channel under test |
| Span | wide enough to capture the peaks of two adjacent channels |
| Detector | Peak |
| RBW | ≥ 1% of the span |
| VBW | ≥RBW |
| Trace | Max hold |
| Sweep time | Auto couple |

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

**TEST SETUP**





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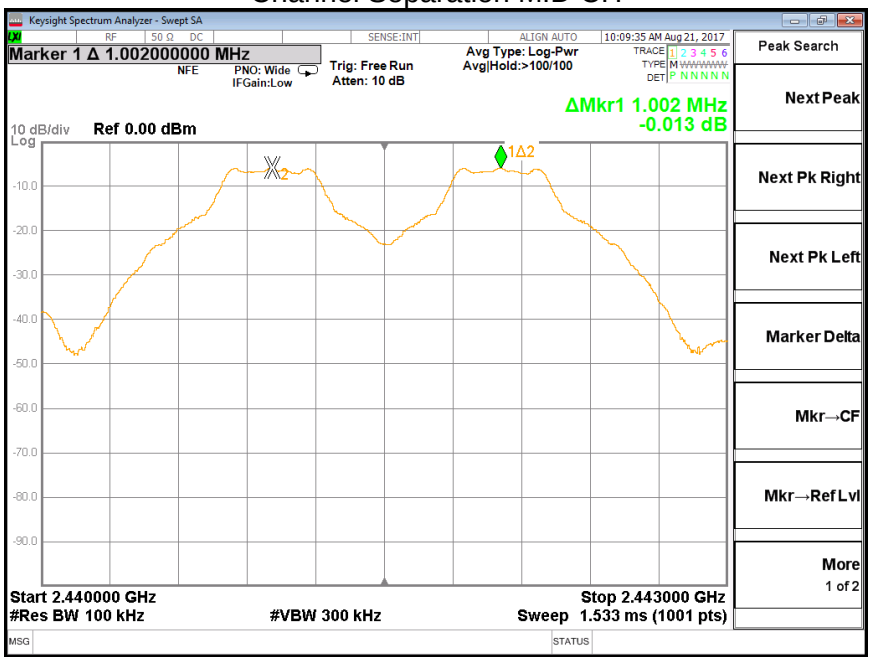
**RESULTS**

### 6.4.1. GFSK MODE

| Channel | Carrier Hopping Channel Separation (MHz) | Limit (MHz) | Result |
|---|---|---|---|
| Middle | 1.002 | ≥ two-thirds of the 20 dB Bandwidth Of The Hopping Channel | PASS |

Channel Separation MID CH




Note: For 20 dB Bandwidth of The Hopping Channel, please refer to clause 6.2.1.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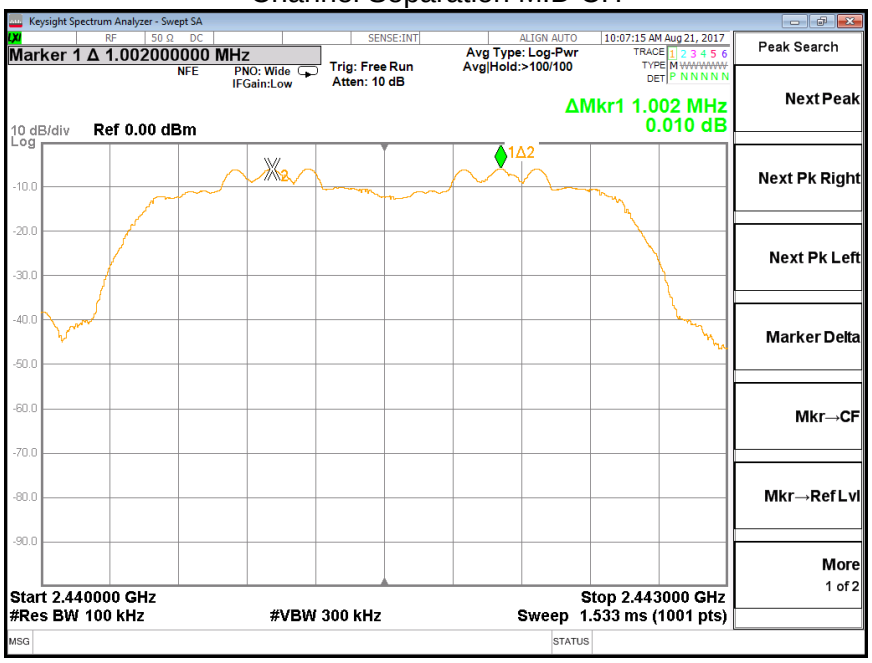
### 6.4.2. ∏/4-DQPSK MODE

| Channel | Carrier Hopping Channel Separation (MHz) | Limit (MHz) | Result |
|---|---|---|---|
| Middle | 1.002 | ≥ two-thirds of the 20 dB Bandwidth Of The Hopping Channel | PASS |

Channel Separation MID CH




Note: For 20 dB Bandwidth of The Hopping Channel, please refer to clause 6.2.2.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## 6.5. NUMBER OF HOPPING FREQUENCY

**LIMITS**

| FCC Part15 (15.247) , Subpart C | | |
|---|---|---|
| Section | Test Item | Limit |
| 15.247 (a) (1) III | Number of Hopping Frequency | at least 15 hopping channels |

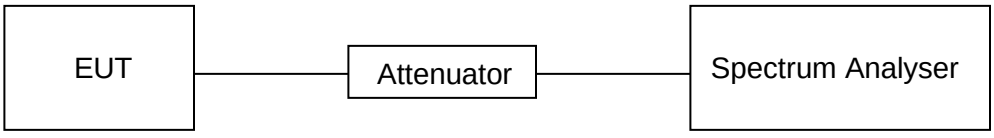
**TEST PROCEDURE**

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

| | |
|---|---|
| Detector | Peak |
| RBW | 1% of the span |
| VBW | ≥RBW |
| Span | The frequency band of operation |
| Trace | Max hold |
| Sweep time | Auto couple |

Set EUT to transmit maximum output power and switch on frequency hopping function. then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.
Count the quantity of peaks to get the number of hopping channels.
Normal Mode: 79 Channels observed.
AFH Mode: 20 Channels declared.

**TEST SETUP**




**RESULTS**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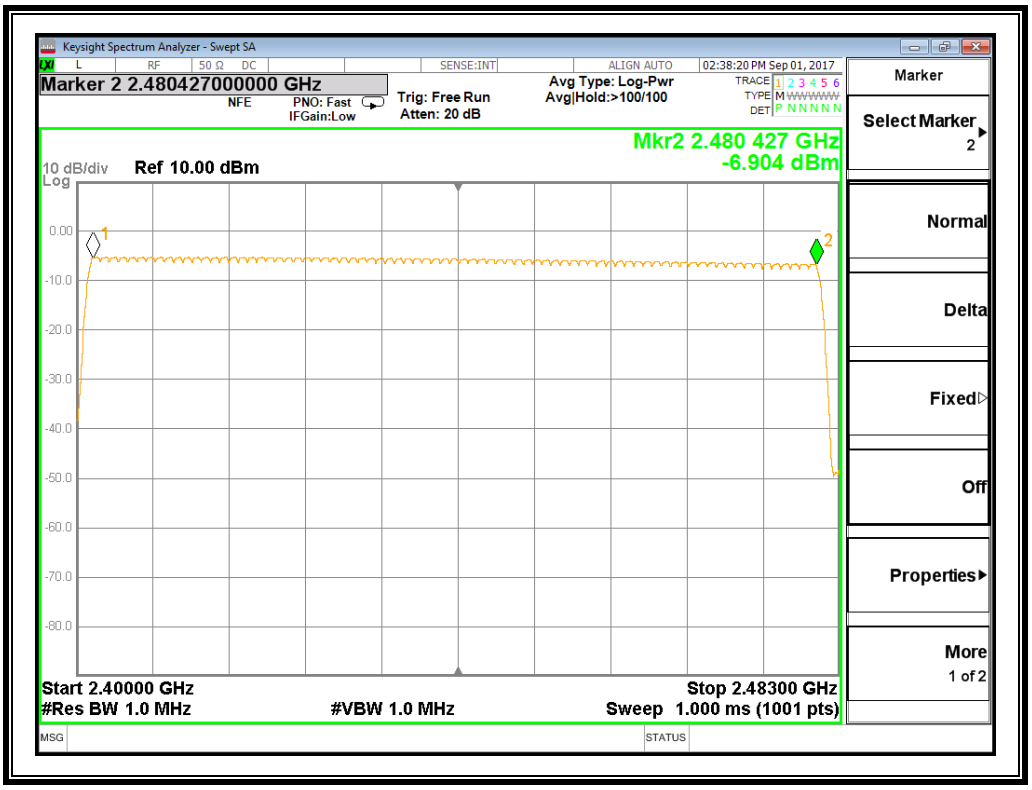
### 6.5.1. GFSK MODE

| Hopping numbers | Limit | Results |
|---|---|---|
| 79 | >15 | Pass |





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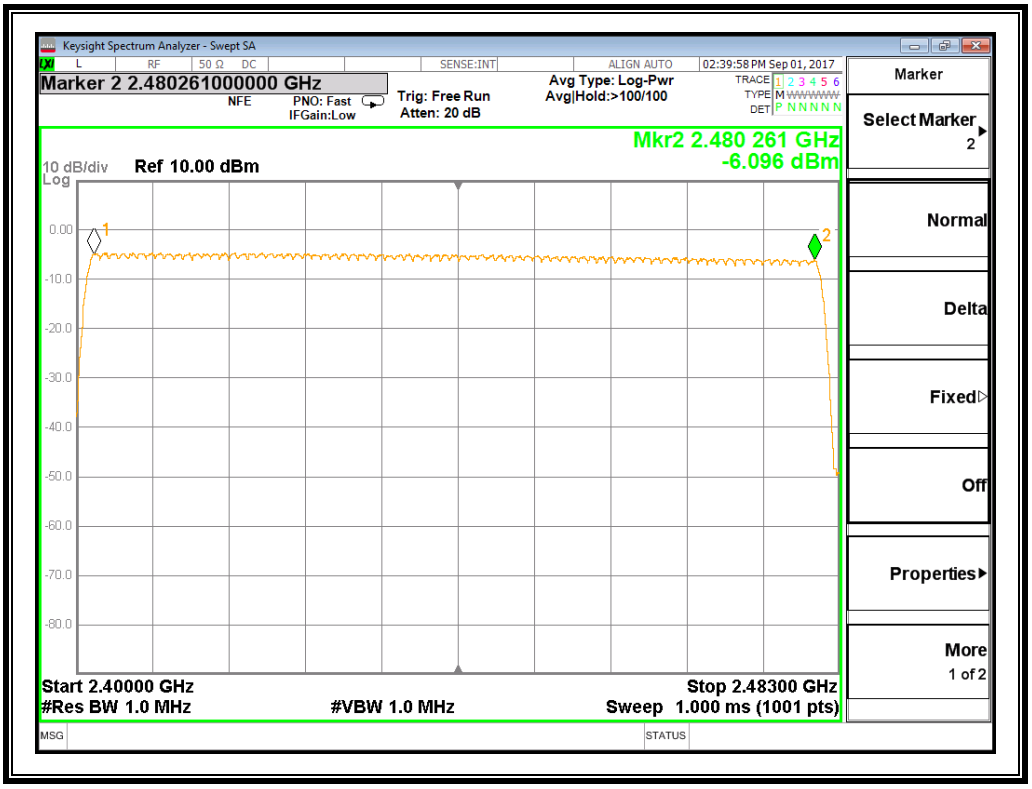
### 6.5.2. ∏/4-DQPSK MODE

| Hopping numbers | Limit | Results |
|---|---|---|
| 79 | >15 | Pass |





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## 6.6. TIME OF OCCUPANCY (DWELL TIME)

**LIMITS**

| FCC Part15 (15.247) , Subpart C | | |
|---|---|---|
| Section | Test Item | Limit |
| 15.247 (a) (1) III | Time of Occupancy (Dwell Time) | The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed. |

**TEST PROCEDURE**

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

| | |
|---|---|
| Center Frequency | The centre frequency of the channel under test |
| Detector | Peak |
| RBW | 1 MHz |
| VBW | ≥RBW |
| Span | zero span |
| Trace | Max hold |
| Sweep time | As necessary to capture the entire dwell time per hopping channel |

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
h. Measure the maximum time duration of one single pulse.
A Period Time = (channel number)*0.4

For Normal Mode (79 Channel):
DH1 Time Slot: Reading * (1600/2)*31.6/(channel number)
DH3 Time Slot: Reading * (1600/4)*31.6/(channel number)
DH5 Time Slot: Reading * (1600/6)*31.6/(channel number)

For AFH Mode (20 Channel):
DH1 Time Slot: Reading * (1600/2)*8/(channel number)
DH3 Time Slot: Reading * (1600/4)*8/(channel number)
DH5 Time Slot: Reading * (1600/6)*8/(channel number)


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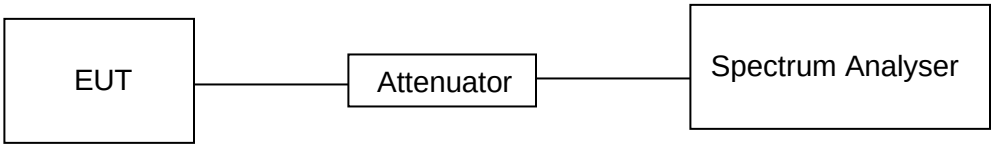
**TEST SETUP**



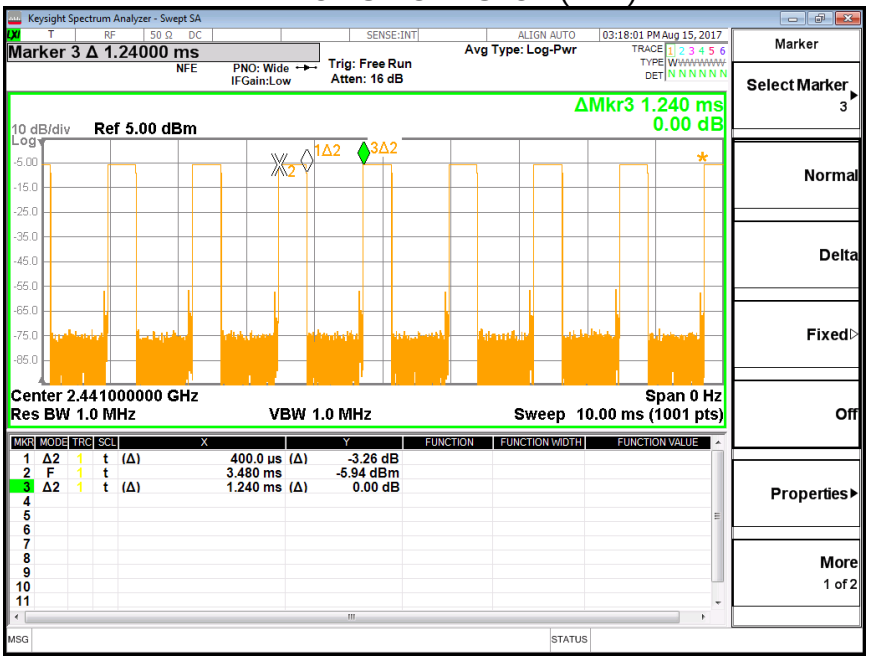

**RESULTS**

### 6.6.1. GFSK MODE

| Normal Mode | | | | | |
|---|---|---|---|---|---|
| **Packet** | **Channel** | **Burst Width [ms/hop/ch]** | **Dwell Time [ms]** | **Duty Cycle [%]** | **Results** |
| DH1 | MCH | 0.40 | 0.128 | 0.32 | PASS |
| DH3 | MCH | 1.68 | 0.269 | 0.67 | PASS |
| DH5 | MCH | 2.90 | 0.309 | 0.77 | PASS |
| **AFH Mode** | | | | | |
| DH1 | MCH | 0.40 | 0.128 | 0.32 | PASS |
| DH3 | MCH | 1.68 | 0.269 | 0.67 | PASS |
| DH5 | MCH | 2.90 | 0.309 | 0.77 | PASS |

**Test Graph**

TIME OF SINGLE SLOT (DH1)





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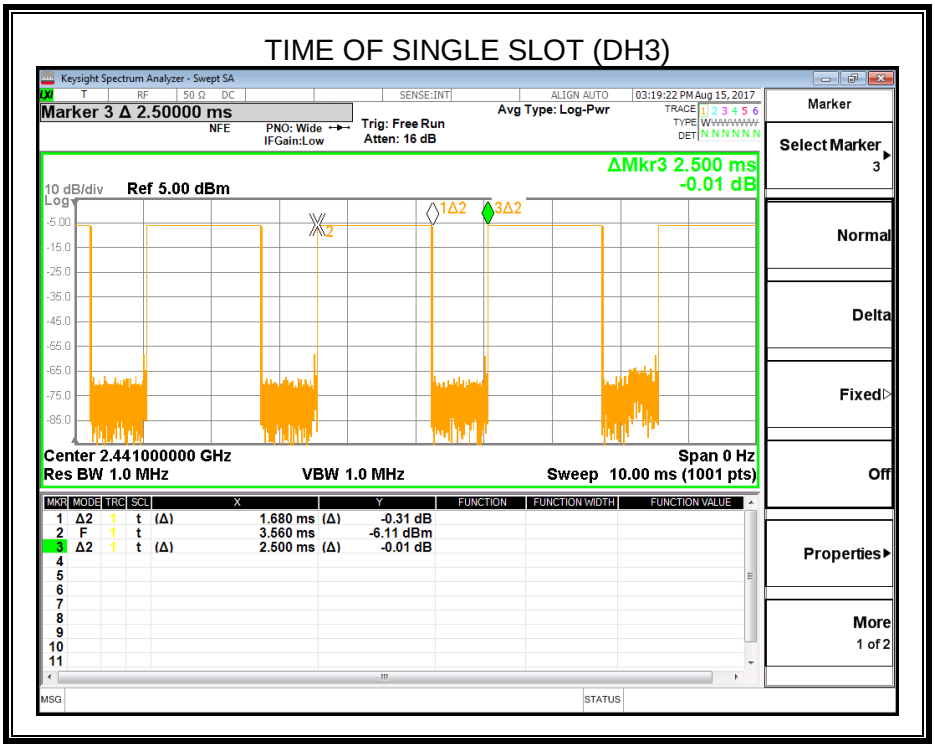
TIME OF SINGLE SLOT (DH3)




TIME OF SINGLE SLOT (DH5)

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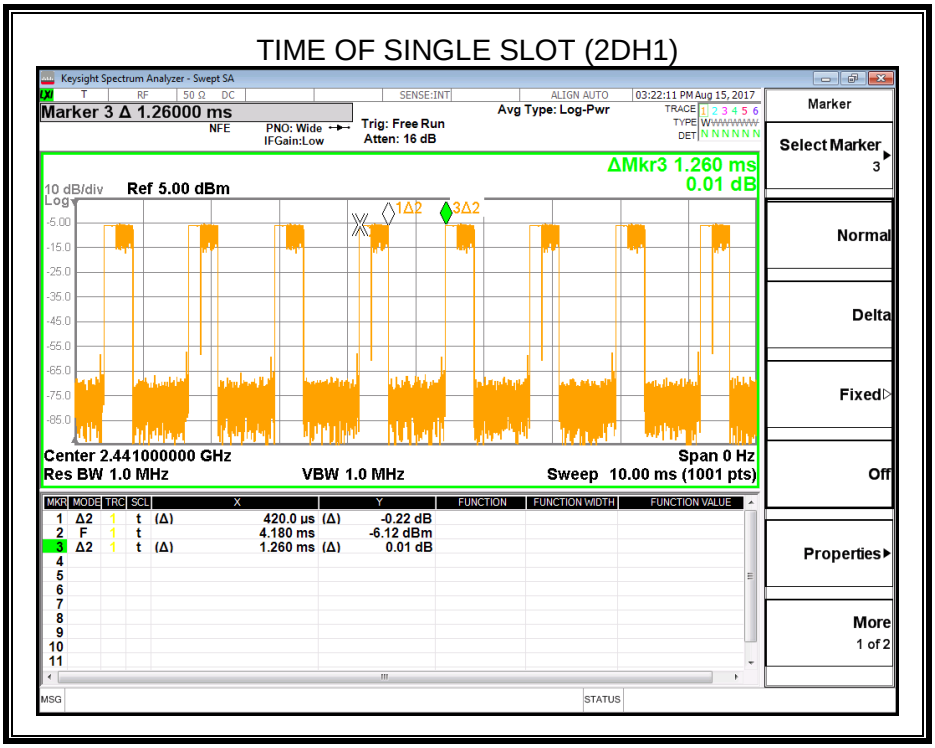
### 6.6.2. ∏/4-DQPSK MODE

| Normal Mode | | | | | |
|---|---|---|---|---|---|
| **Packet** | **Channel** | **Burst Width [ms/hop/ch]** | **Dwell Time [ms]** | **Duty Cycle [%]** | **Results** |
| 2DH1 | MCH | 0.42 | 0.135 | 0.33 | PASS |
| 2DH3 | MCH | 1.66 | 0.266 | 0.66 | PASS |
| 2DH5 | MCH | 2.92 | 0.311 | 0.77 | PASS |
| **AFH Mode** | | | | | |
| 2DH1 | MCH | 0.42 | 0.135 | 0.32 | PASS |
| 2DH3 | MCH | 1.66 | 0.266 | 0.66 | PASS |
| 2DH5 | MCH | 2.92 | 0.311 | 0.77 | PASS |

**Test Graph**

TIME OF SINGLE SLOT (2DH1)





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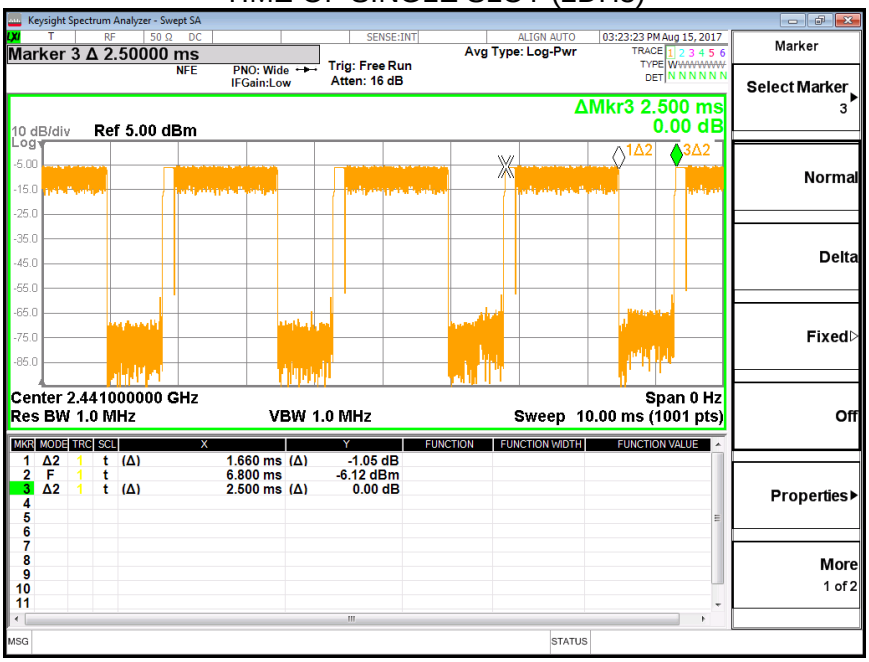
TIME OF SINGLE SLOT (2DH3)




TIME OF SINGLE SLOT (2DH5)

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## 6.7. CONDUCTED SPURIOUS EMISSION AND BANDEDGE

**LIMITS**

| FCC Part15 (15.247) , Subpart C | | |
|---|---|---|
| Section | Test Item | Limit |
| FCC §15.247 (d) | Conducted Spurious Emission | at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power |

**TEST PROCEDURE**

For Bandedge use the following settings:

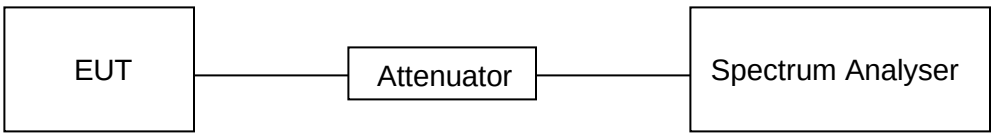
| | |
|---|---|
| Detector | Peak |
| RBW | RBW ≥ 1% of the span |
| VBW | ≥RBW |
| Span | wide enough to fully capture the emission being measured |
| Trace | Max hold |
| Sweep time | Auto couple. |

For Spurious Emission use the following settings:

| | |
|---|---|
| Detector | Peak |
| RBW | 100K |
| VBW | ≥ RBW |
| Span | wide enough to fully capture the emission being measured |
| Trace | Max hold |
| Sweep time | Auto couple. |

Use the peak marker function to determine the maximum amplitude level**.**

**TEST SETUP**





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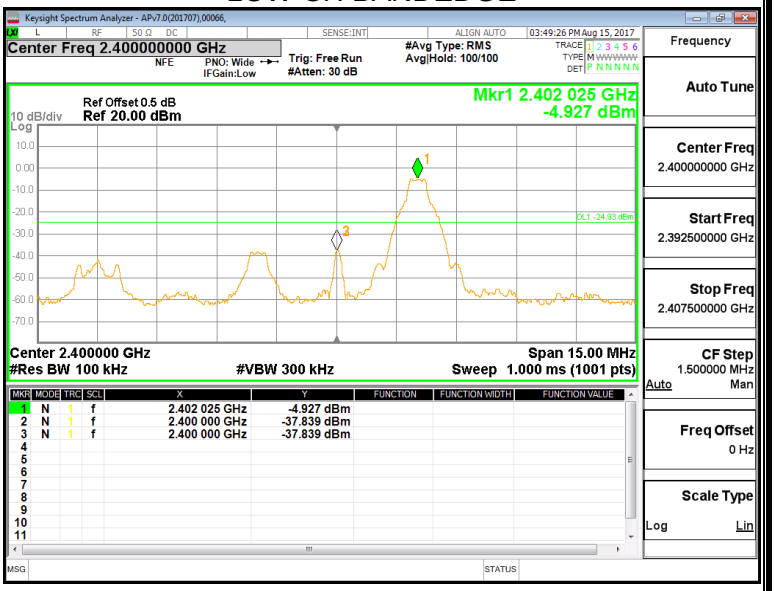
**RESULTS**

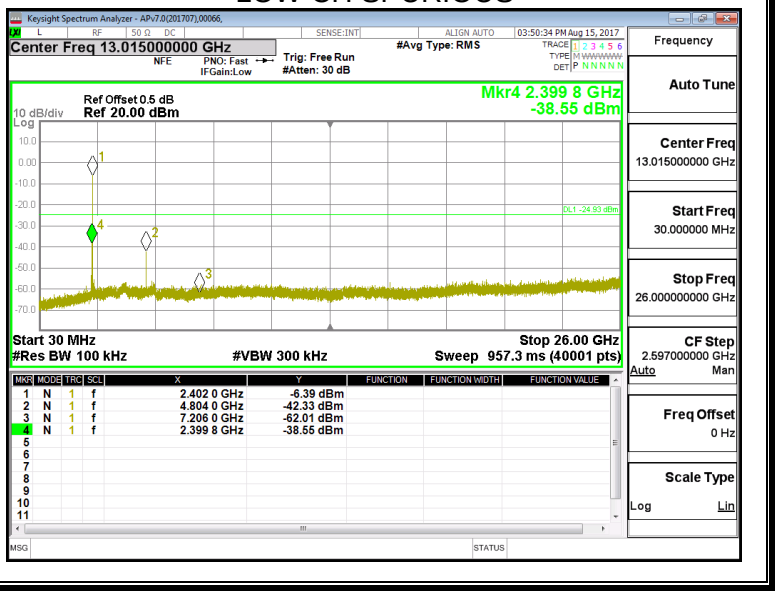
## 6.7.1. GFSK MODE

**SPURIOUS EMISSIONS, LOW CHANNEL**

LOW CH BANDEDGE




LOW CH SPURIOUS



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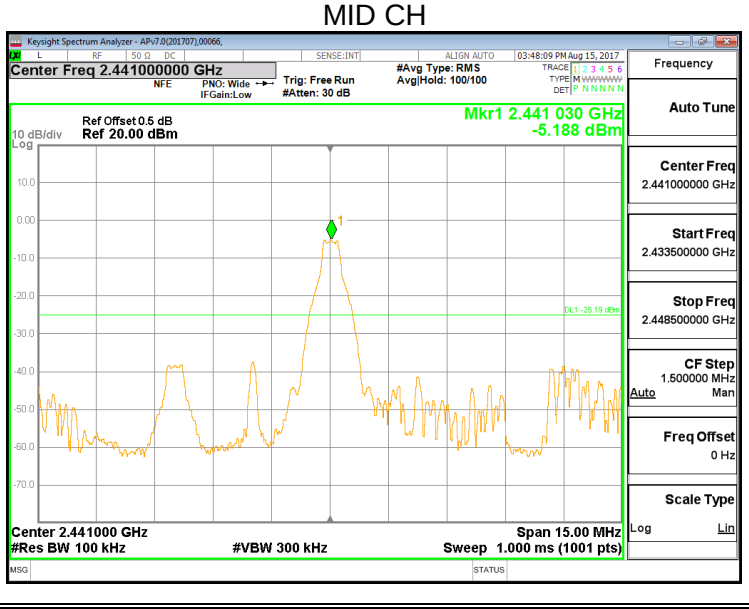
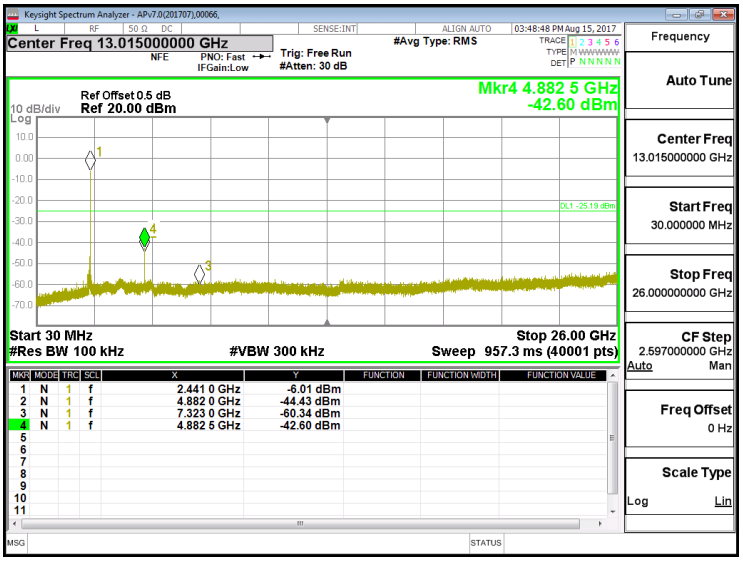
**SPURIOUS EMISSIONS, MID CHANNEL**

MID CH




MID CH SPURIOUS





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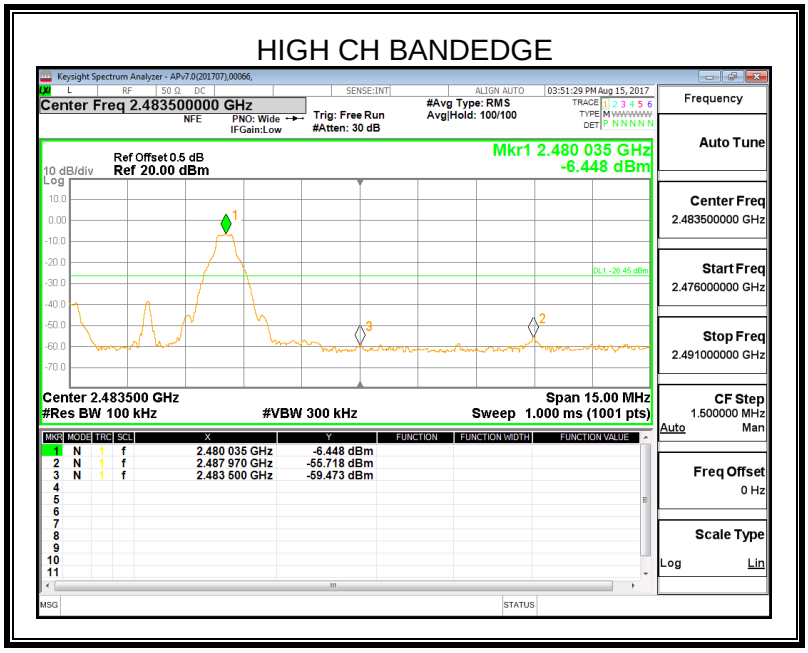
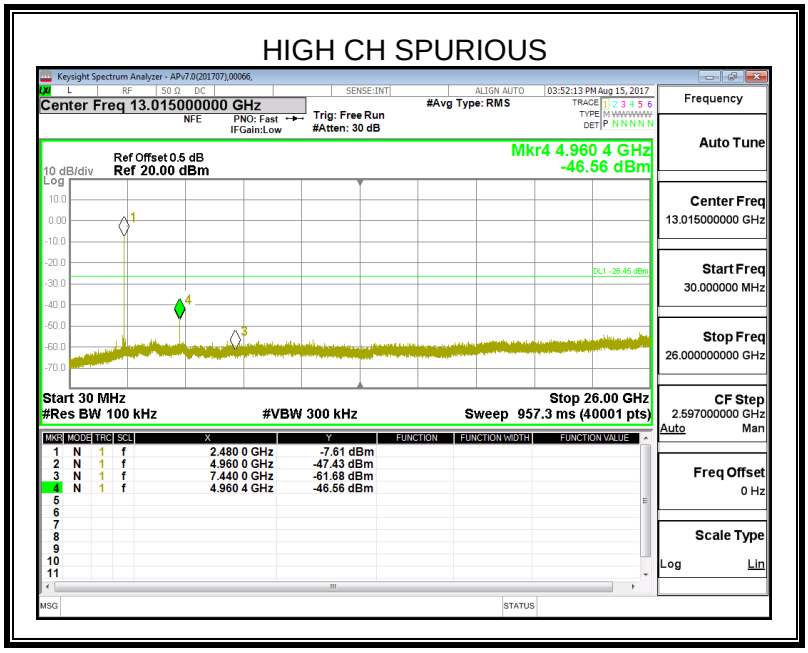
**SPURIOUS EMISSIONS, HIGH CHANNEL**

HIGH CH BANDEDGE




HIGH CH SPURIOUS



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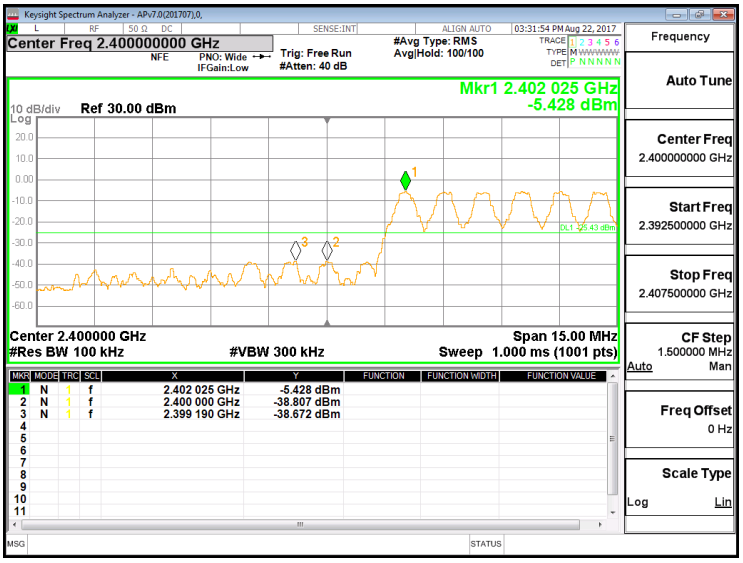
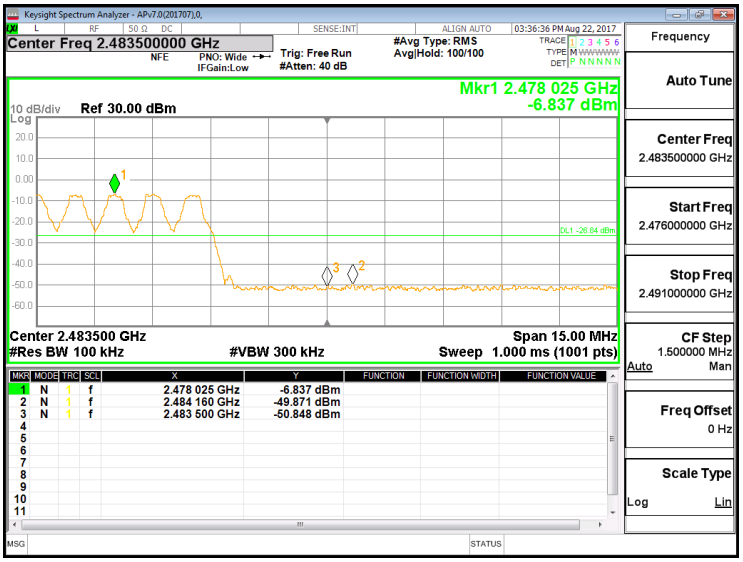
**SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON**

LOW CH BANDEDGE WITH HOPPING ON




HIGH CH SPURIOUS WITH HOPPING ON





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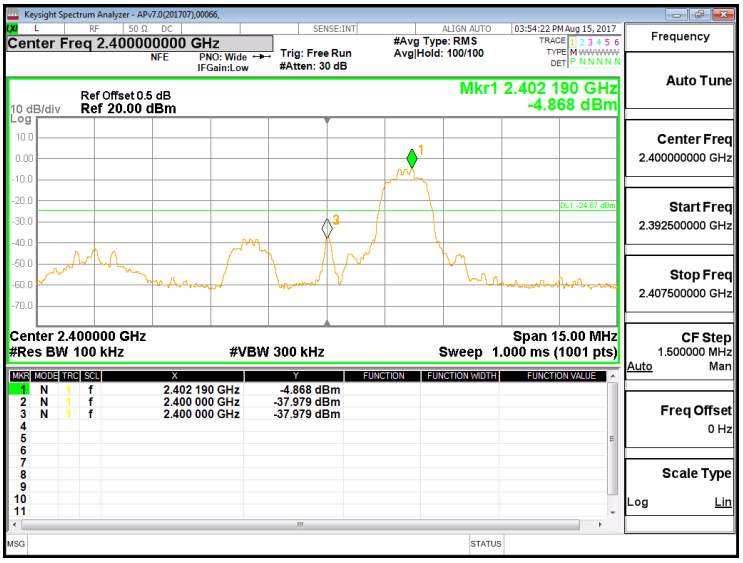
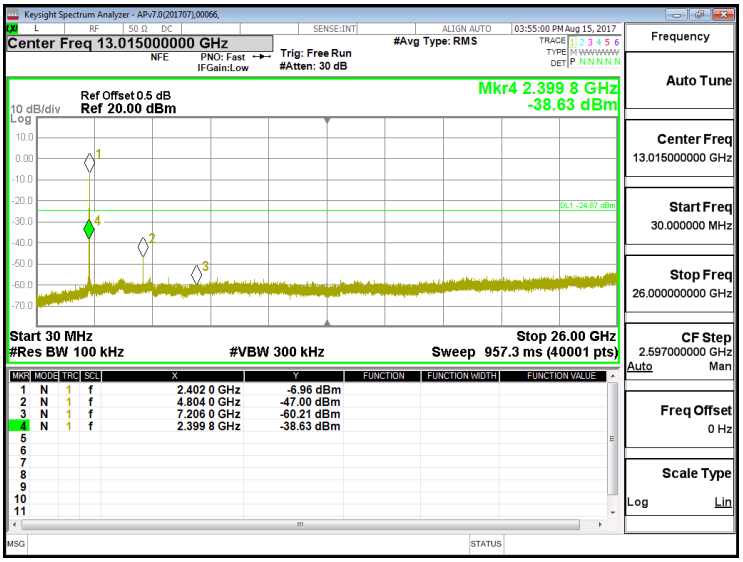
## 6.7.2. ∏/4-DQPSK MODE

**SPURIOUS EMISSIONS, LOW CHANNEL**

LOW CH BANDEDGE




LOW CH SPURIOUS





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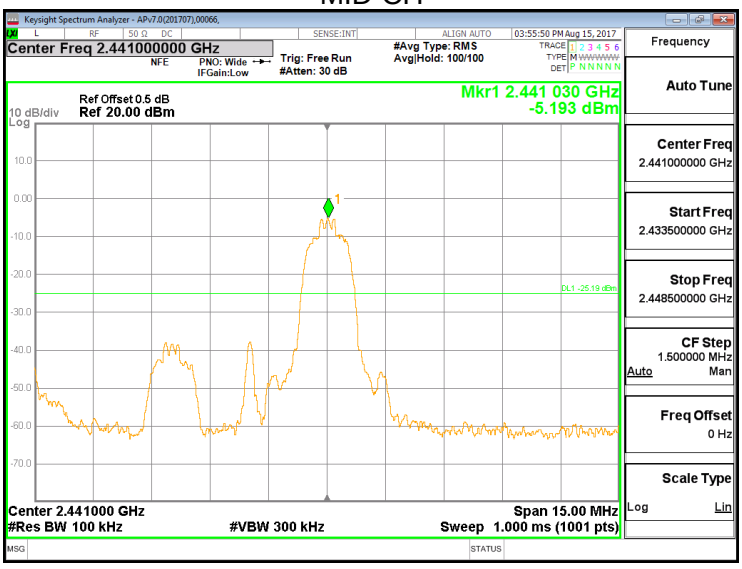
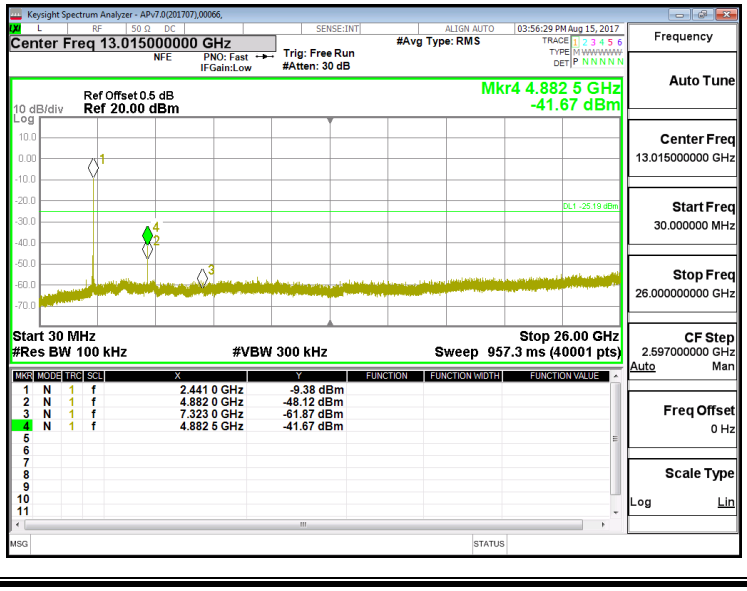
**SPURIOUS EMISSIONS, MID CHANNEL**

MID CH




MID CH SPURIOUS





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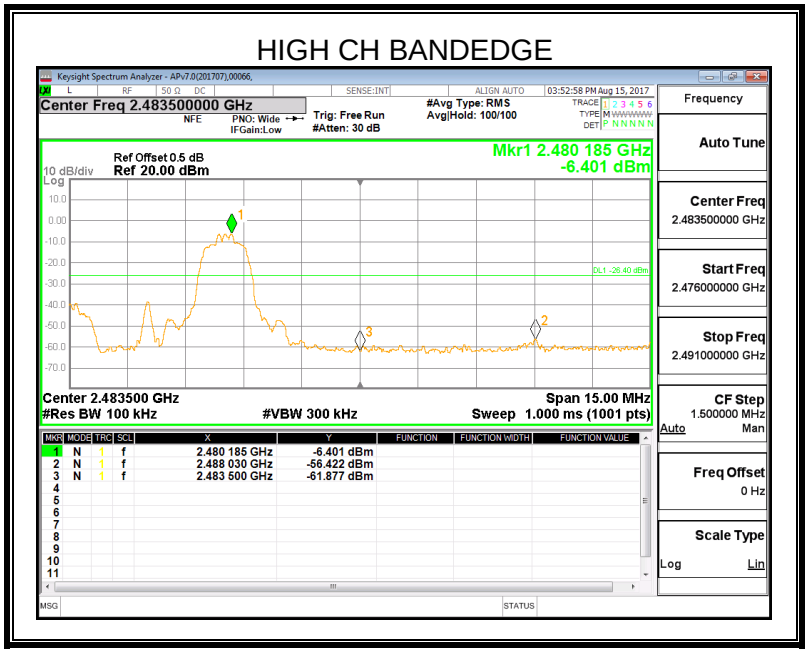
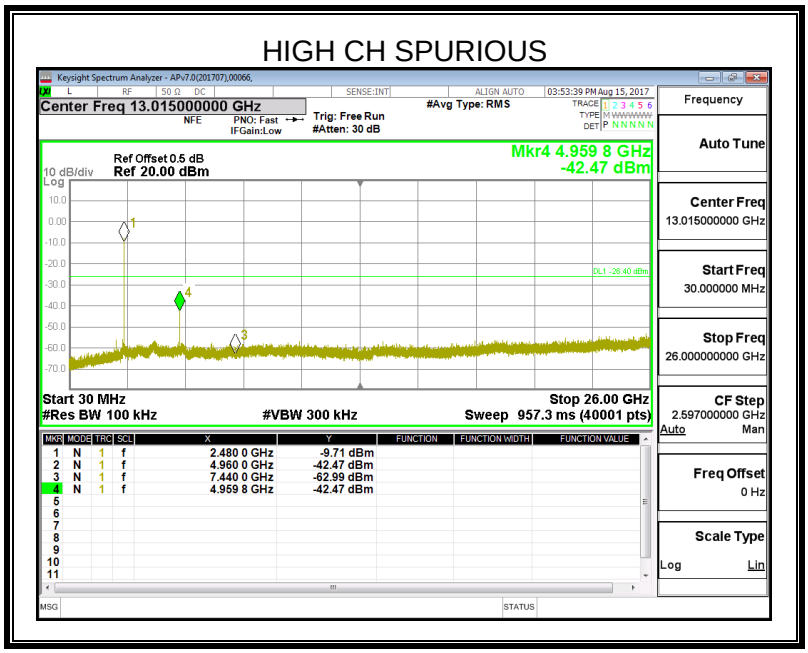
**SPURIOUS EMISSIONS, HIGH CHANNEL**

HIGH CH BANDEDGE




HIGH CH SPURIOUS





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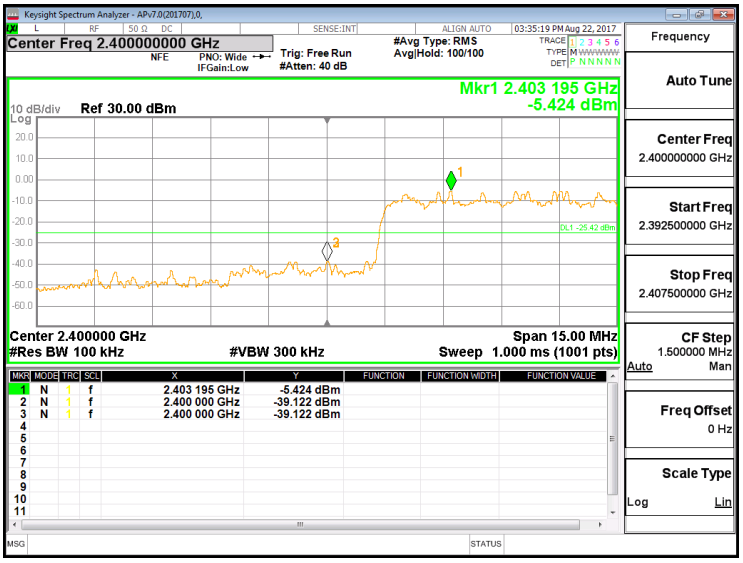
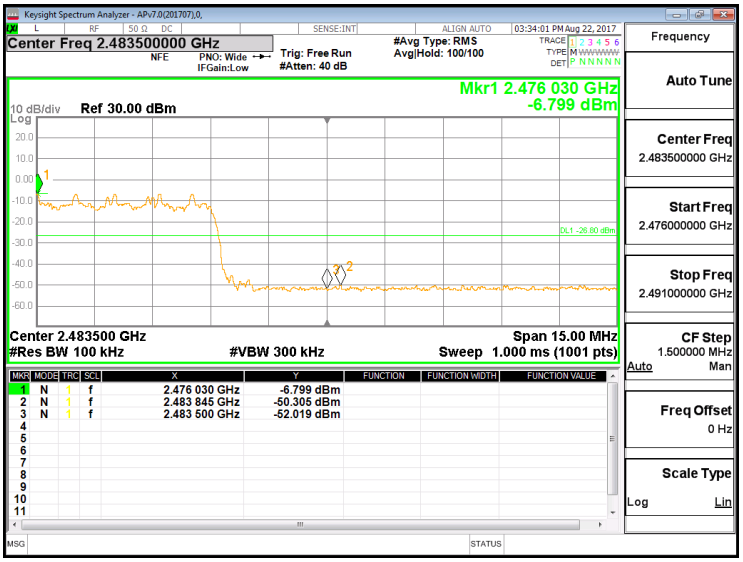
**SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON**

LOW CH BANDEDGE WITH HOPPING ON




HIGH CH SPURIOUS WITH HOPPING ON





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# 7. RADIATED TEST RESULTS

## 7.1. LIMITS AND PROCEDURE

**LIMITS**

Please refer to FCC §15.205 and §15.209

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

| Frequency (MHz) | Field Strength (microvolts/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 |
| 960~1000 | 500 | 3 |

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.


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Radiation Disturbance Test Limit for FCC (Above 1G)

| Frequency (MHz) | dB(uV/m) (at 3 meters) | |
|---|---|---|
| | Peak | Average |
| Above 1000 | 74 | 54 |

Restricted bands of operation

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| [1]0.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 108-121.94 | 1718.8-1722.2 | 13.25-13.4 |
| 6.31175-6.31225 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | ([2]) |
| 13.36-13.41 | | | |

Note: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c


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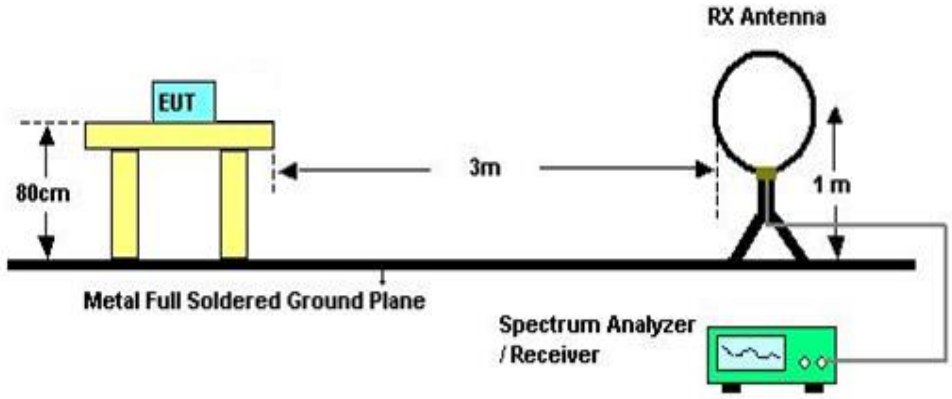
**TEST SETUP AND PROCEDURE**

Below 30MHz




The setting of the spectrum analyser

| | |
|---|---|
| RBW | 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz) |
| VBW | 200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz) |
| Sweep | Auto |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013

2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 0.8m meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)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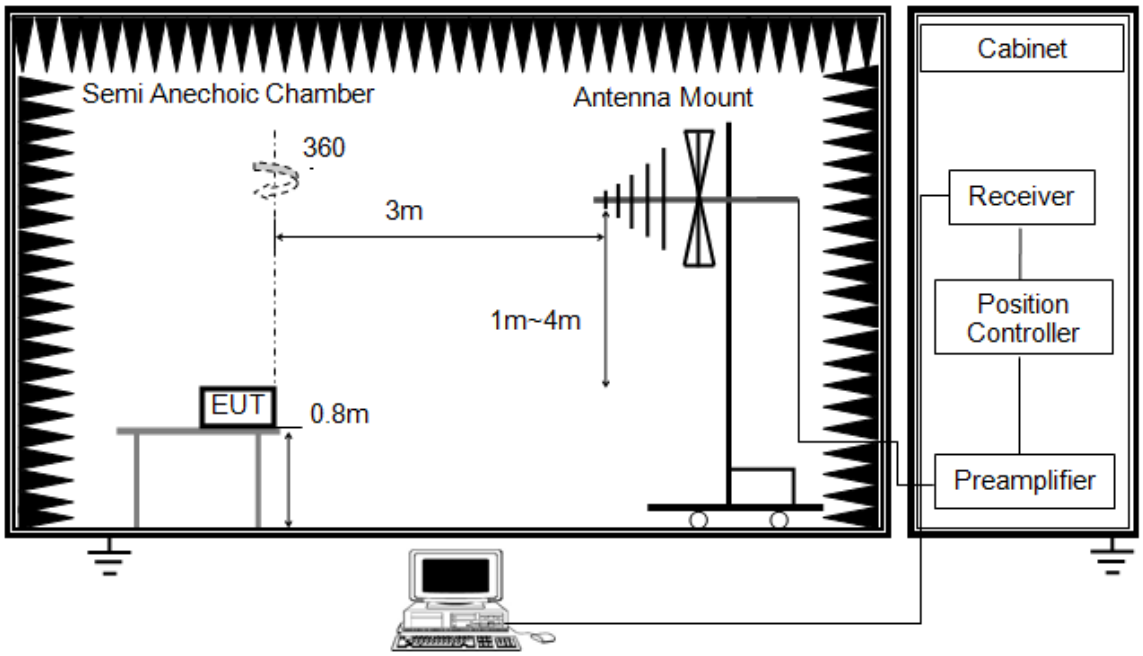
Below 1G and above 30MHz




The setting of the spectrum analyser

| | |
|---|---|
| RBW | 120K |
| VBW | 300K |
| Sweep | Auto |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 0.8m above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

7. For the actual test configuration, please refer to the related Item in this test report.
Above 1G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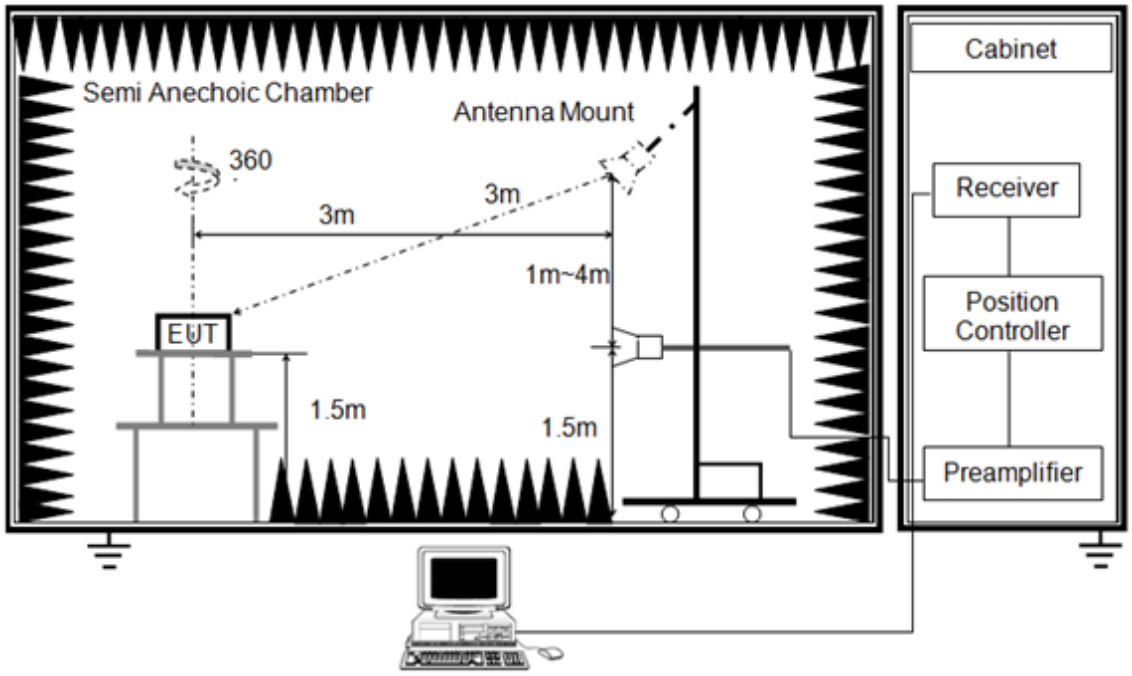


| | |
|---|---|
| RBW | 1M |
| VBW | 3M and 10Hz for AVG(Note 6) |
| Sweep | Auto |
| Detector | Peak |
| Trace | Max hold |

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 1.5m above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For average power measurement, set the VBW to 10 Hz, while maintaining all of the other instrument settings, if the duty cycle of the EUT is less than 98%, the Duty Cycle Correction Factor shall be added to the measured emission levels. For the Duty Cycle and Correction Factor please refer to clause 6.1.ON TIME AND DUTY CYCLE

8. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)


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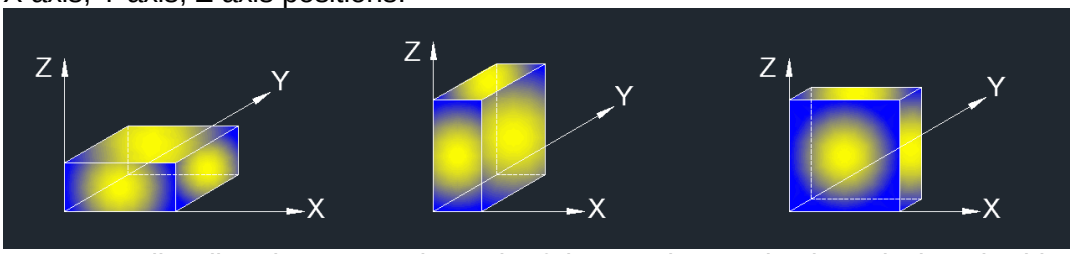
X axis, Y axis, Z axis positions:

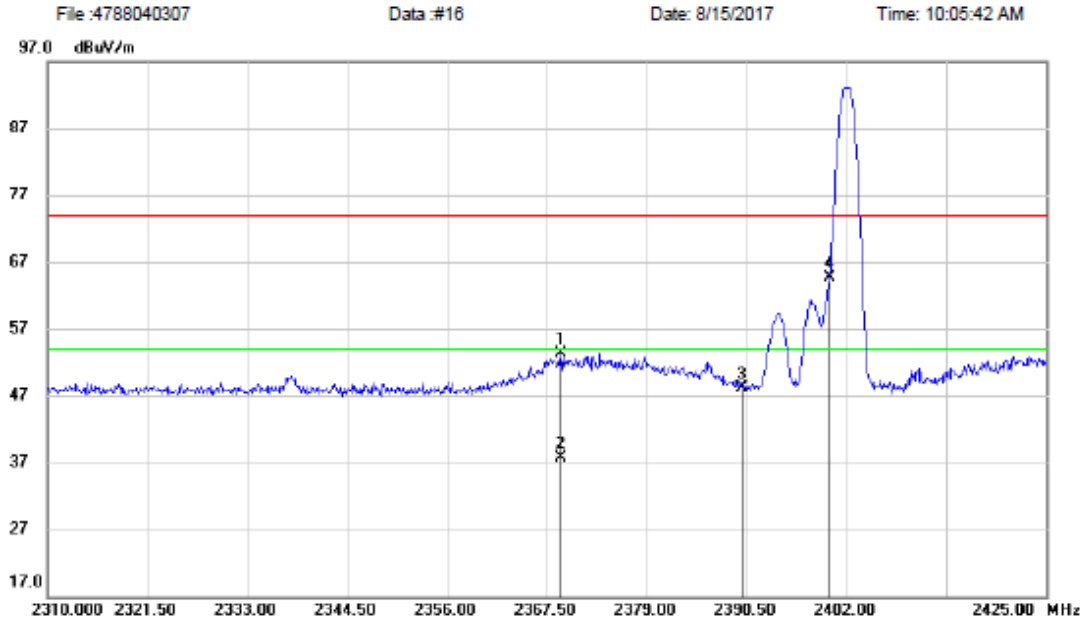



Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

## 7.2. RESTRICTED BANDEDGE

### 7.2.1. GFSK MODE

**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2369.110 | 20.10 | 33.30 | 53.40 | 74.00 | -20.60 | peak | | | |
| 2 | | 2369.110 | 4.38 | 33.30 | 37.68 | 54.00 | -16.32 | AVG | 100 | 284 | |
| 3 | | 2390.000 | 15.04 | 33.14 | 48.18 | 74.00 | -25.82 | peak | | | |
| 4 | * | 2400.000 | 31.55 | 33.07 | 64.62 | 74.00 | -9.38 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Duty cycle factor was taking into account.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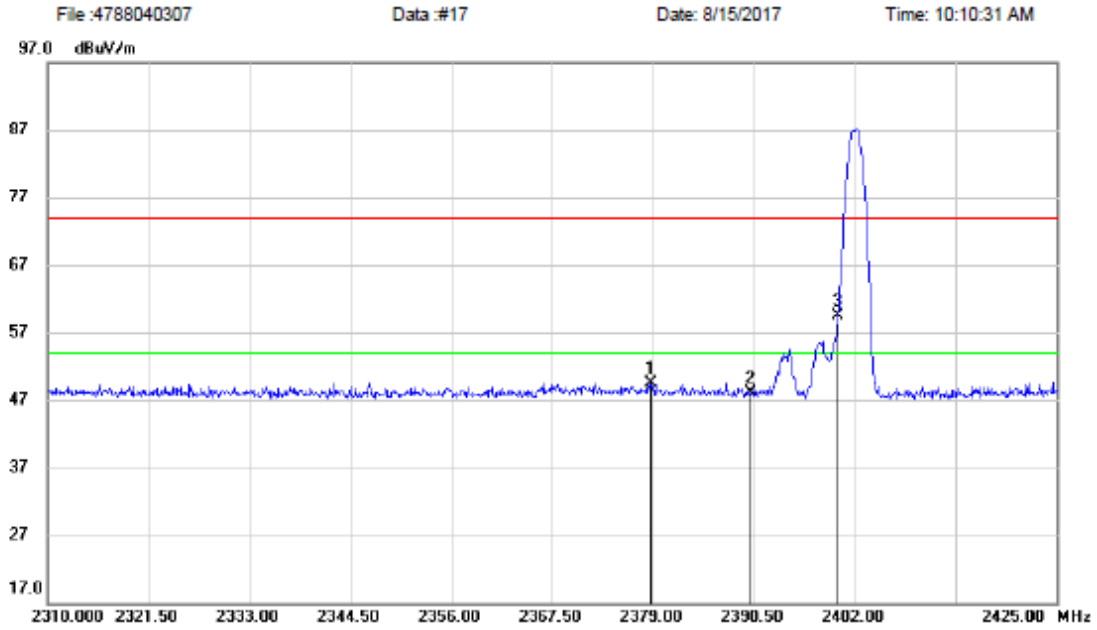
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2378.770 | 16.26 | 33.32 | 49.58 | 74.00 | -24.42 | peak | | | |
| 2 | | 2390.000 | 14.92 | 33.24 | 48.16 | 74.00 | -25.84 | peak | | | |
| 3 | * | 2400.000 | 26.32 | 33.17 | 59.49 | 74.00 | -14.51 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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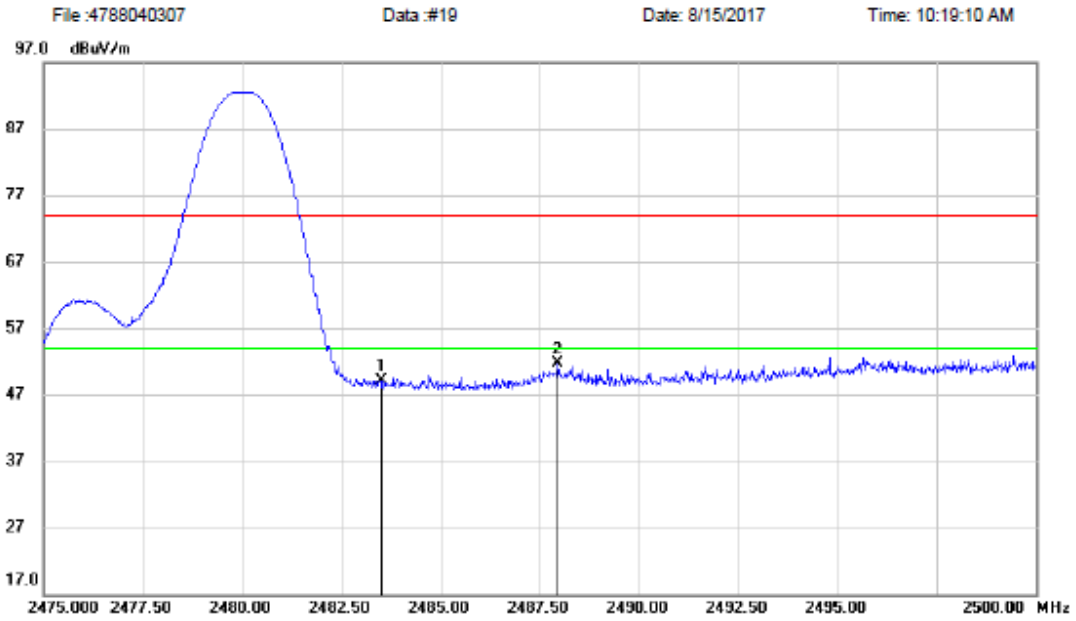
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2483.500 | 16.23 | 32.78 | 49.01 | 74.00 | -24.99 | peak | | | |
| 2 | * | 2487.950 | 18.96 | 32.78 | 51.74 | 74.00 | -22.26 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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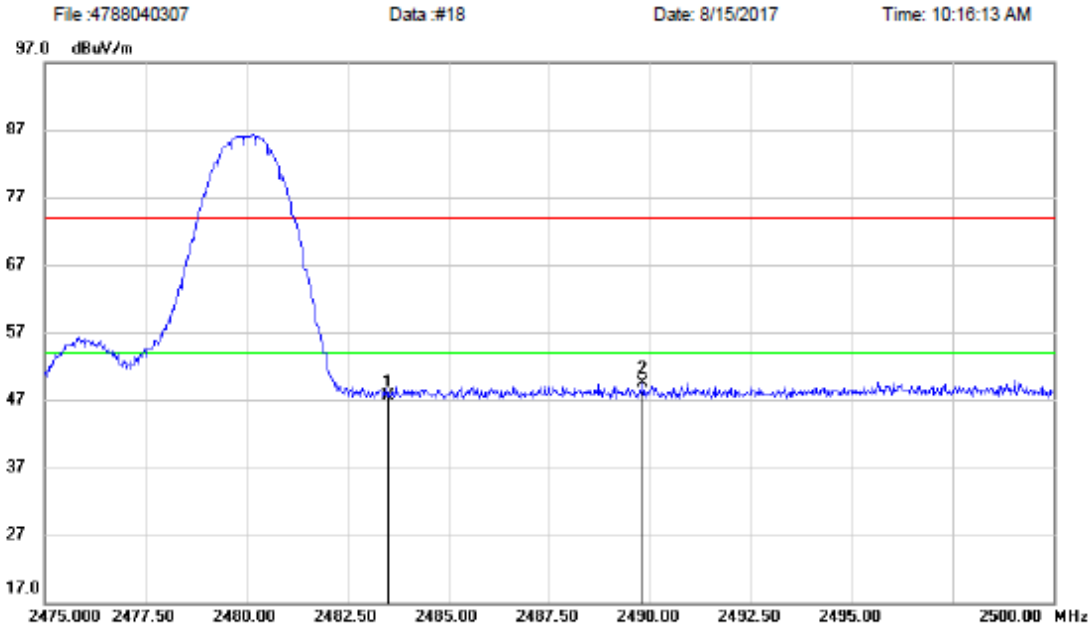
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2483.500 | 14.65 | 32.88 | 47.53 | 74.00 | -26.47 | peak | | | |
| 2 | * | 2489.825 | 16.55 | 32.88 | 49.43 | 74.00 | -24.57 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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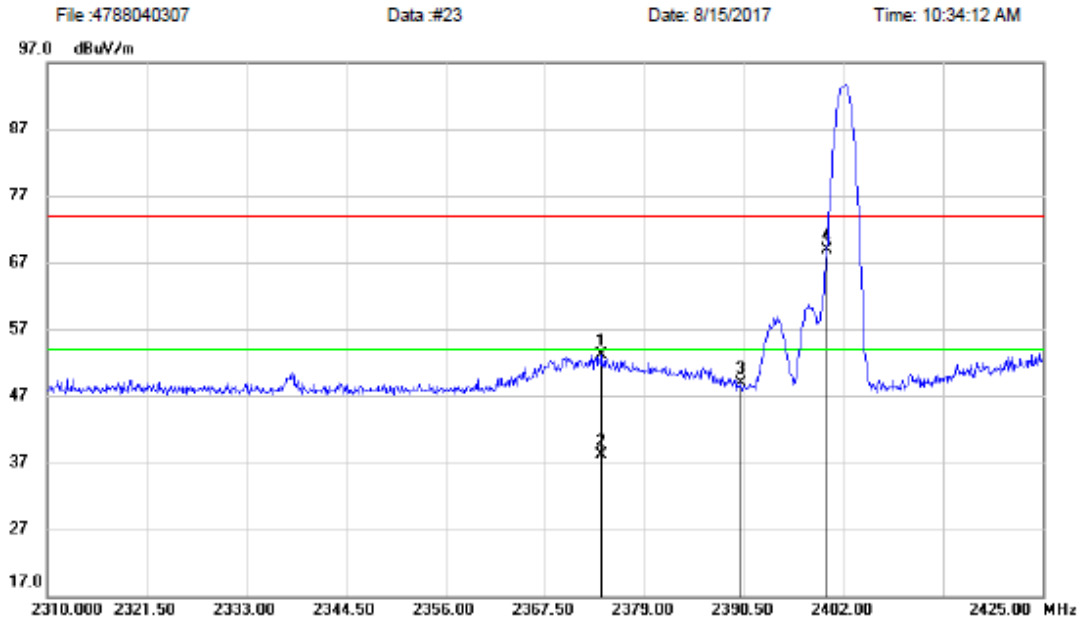
### 7.2.2. ∏/4-DQPSK MODE

**RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2374.055 | 19.81 | 33.26 | 53.07 | 74.00 | -20.93 | peak | | | |
| 2 | | 2374.055 | 4.75 | 33.26 | 38.01 | 54.00 | -15.99 | AVG | 100 | 284 | |
| 3 | | 2390.000 | 15.76 | 33.14 | 48.90 | 74.00 | -25.10 | peak | | | |
| 4 | * | 2400.000 | 35.76 | 33.07 | 68.83 | 74.00 | -5.17 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Duty cycle factor was taking into account.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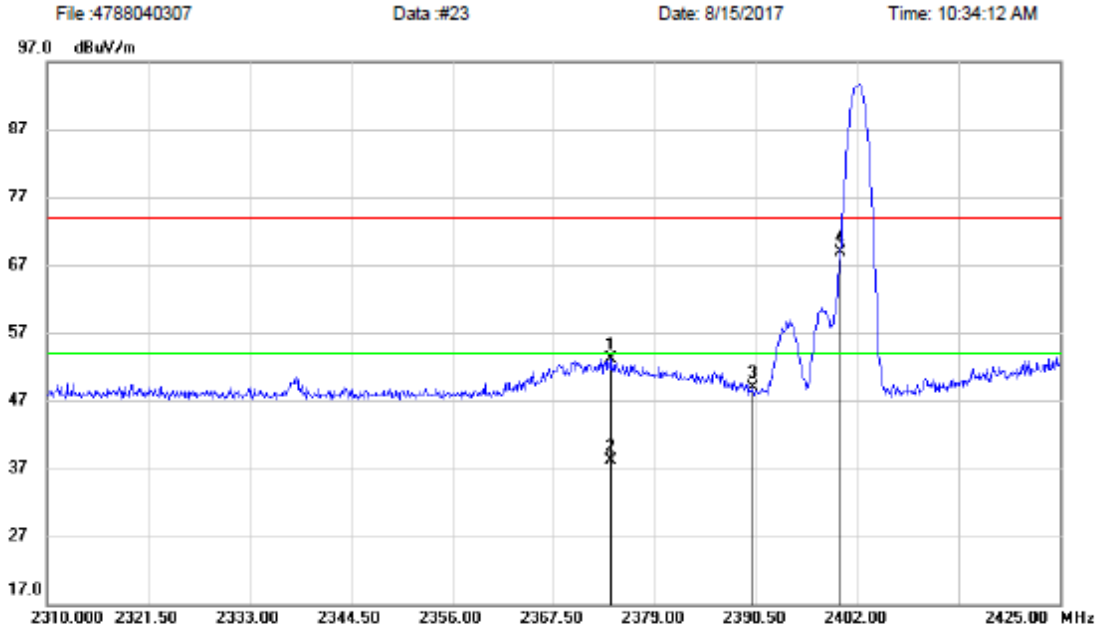
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2374.055 | 19.81 | 33.26 | 53.07 | 74.00 | -20.93 | peak | | | |
| 2 | | 2374.055 | 4.75 | 33.26 | 38.01 | 54.00 | -15.99 | AVG | 100 | 284 | |
| 3 | | 2390.000 | 15.76 | 33.14 | 48.90 | 74.00 | -25.10 | peak | | | |
| 4 | * | 2400.000 | 35.76 | 33.07 | 68.83 | 74.00 | -5.17 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Duty cycle factor was taking into account.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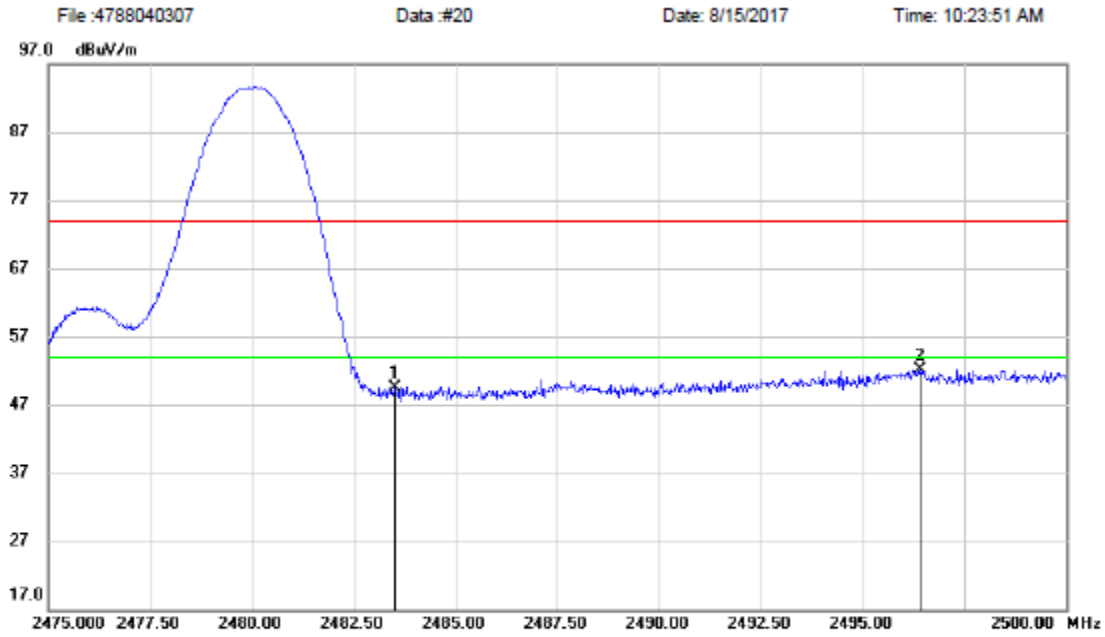
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2483.500 | 16.67 | 32.78 | 49.45 | 74.00 | -24.55 | peak | | | |
| 2 | * | 2496.400 | 19.39 | 32.78 | 52.17 | 74.00 | -21.83 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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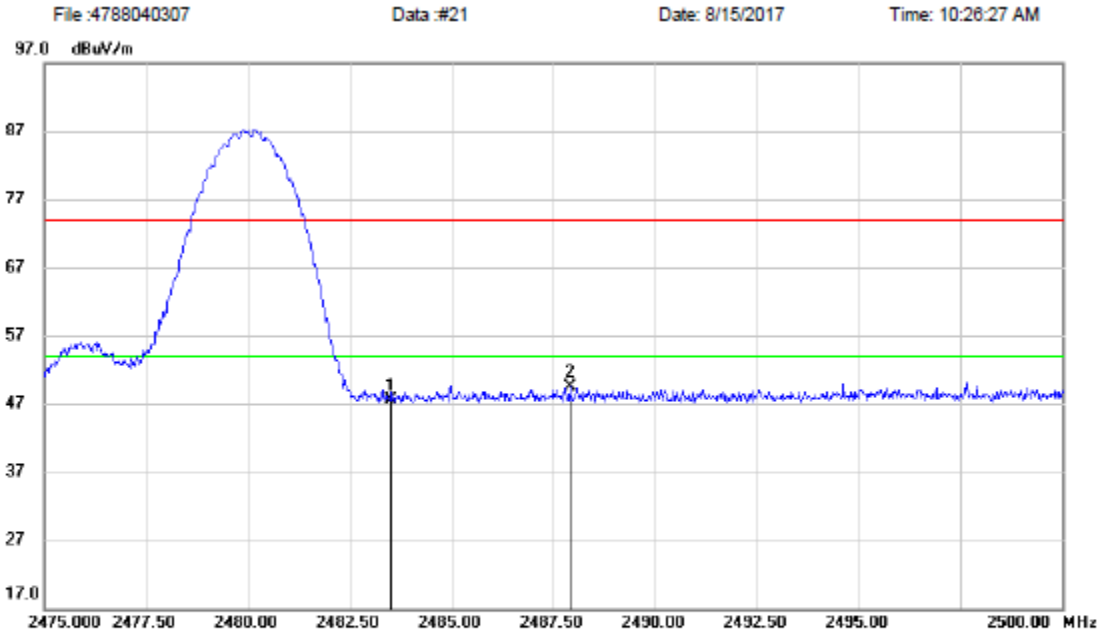
**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2483.500 | 14.66 | 32.88 | 47.54 | 74.00 | -26.46 | peak | | | |
| 2 | * | 2487.900 | 16.72 | 32.88 | 49.60 | 74.00 | -24.40 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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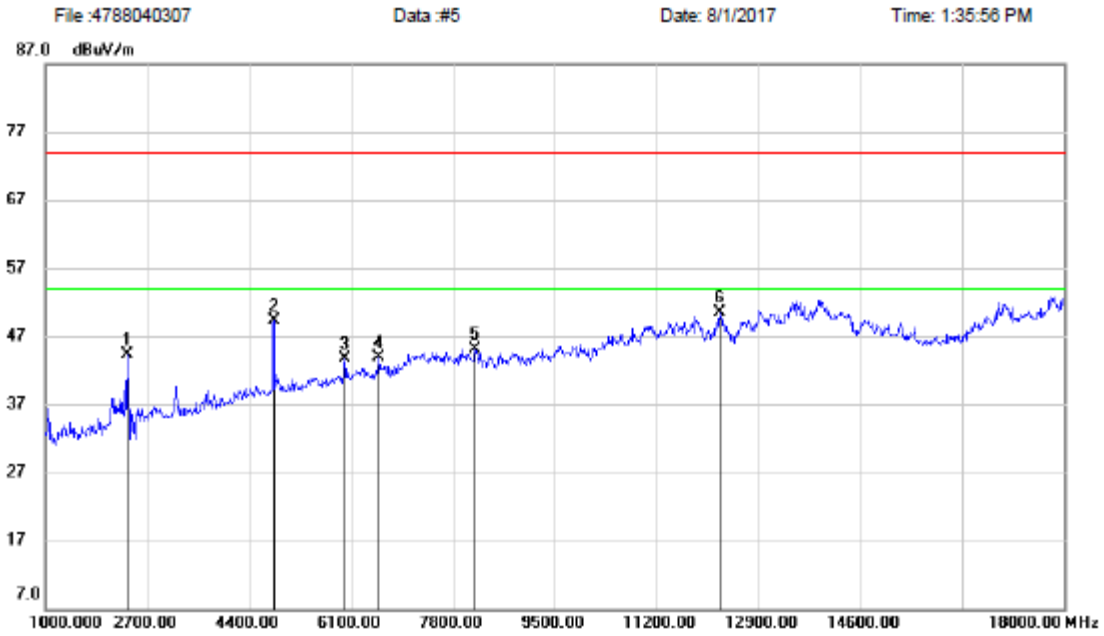
## 7.3. SPURIOUS EMISSIONS (1~18GHz)

### 7.3.1. GFSK MODE

**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2360.000 | 53.06 | -8.72 | 44.34 | 74.00 | -29.66 | peak | | | |
| 2 | | 4808.000 | 51.06 | -1.73 | 49.33 | 74.00 | -24.67 | peak | | | |
| 3 | | 5998.000 | 41.65 | 1.99 | 43.64 | 74.00 | -30.36 | peak | | | |
| 4 | | 6559.000 | 40.30 | 3.61 | 43.91 | 74.00 | -30.09 | peak | | | |
| 5 | | 8174.000 | 38.18 | 6.96 | 45.14 | 74.00 | -28.86 | peak | | | |
| 6 | * | 12254.00 | 35.64 | 14.77 | 50.41 | 74.00 | -23.59 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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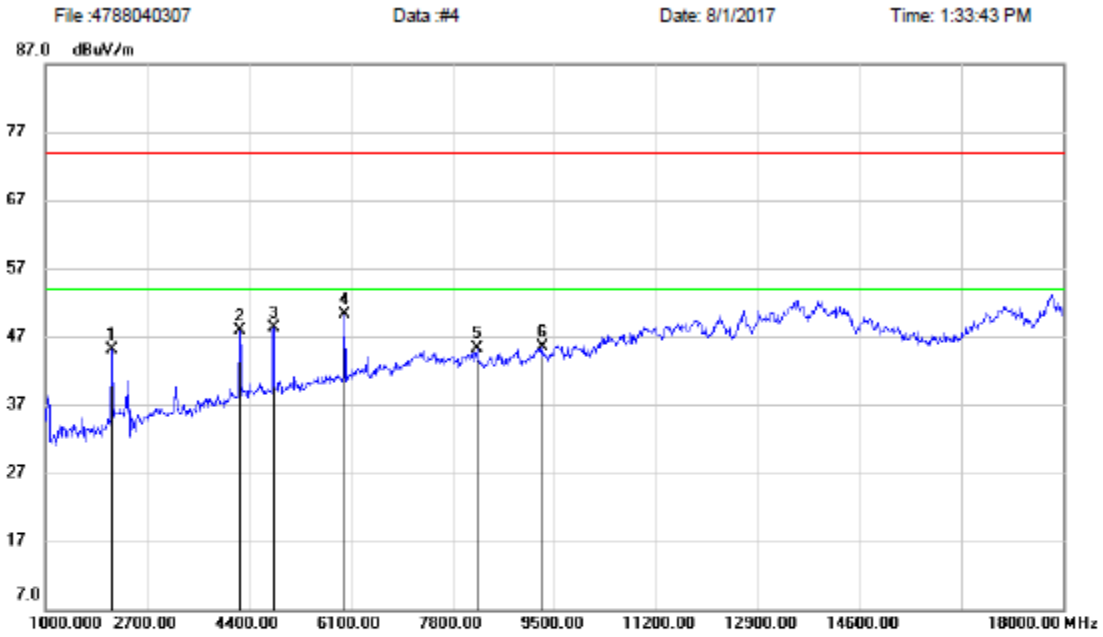
**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2122.000 | 55.15 | -10.03 | 45.12 | 74.00 | -28.88 | peak | | | |
| 2 | | 4247.000 | 51.16 | -3.26 | 47.90 | 74.00 | -26.10 | peak | | | |
| 3 | | 4808.000 | 50.04 | -1.64 | 48.40 | 74.00 | -25.60 | peak | | | |
| 4 | * | 5998.000 | 48.29 | 2.09 | 50.38 | 74.00 | -23.62 | peak | | | |
| 5 | | 8208.000 | 38.31 | 7.08 | 45.39 | 74.00 | -28.61 | peak | | | |
| 6 | | 9296.000 | 36.62 | 8.83 | 45.45 | 74.00 | -28.55 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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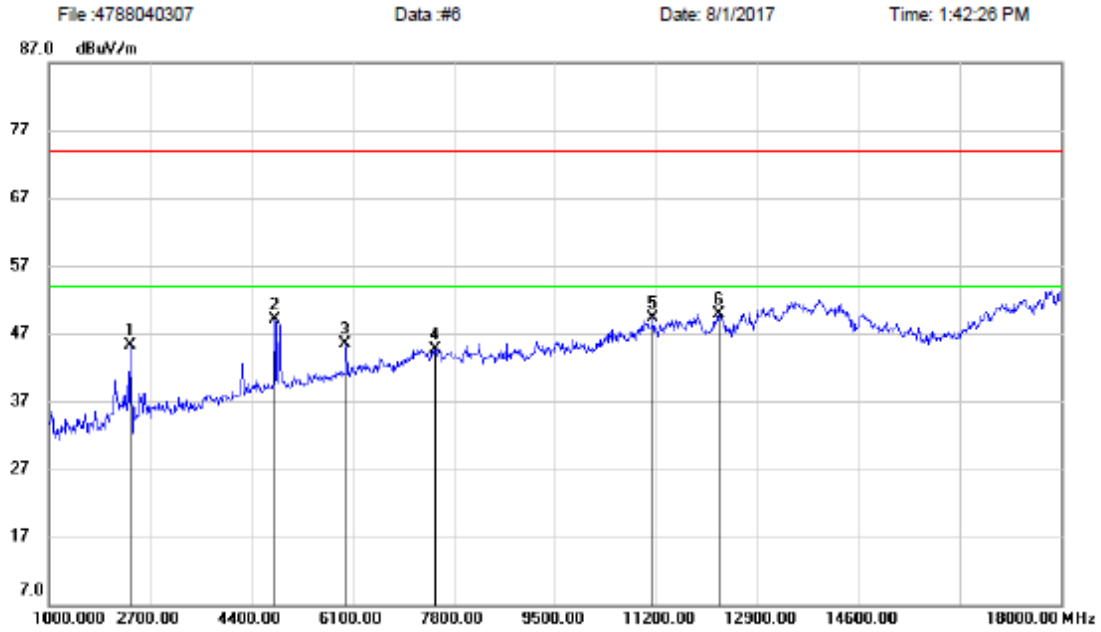
**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2360.000 | 54.05 | -8.72 | 45.33 | 74.00 | -28.67 | peak | | | |
| 2 | | 4791.000 | 51.01 | -1.84 | 49.17 | 74.00 | -24.83 | peak | | | |
| 3 | | 5981.000 | 43.67 | 1.89 | 45.56 | 74.00 | -28.44 | peak | | | |
| 4 | | 7494.000 | 38.47 | 6.32 | 44.79 | 74.00 | -29.21 | peak | | | |
| 5 | | 11149.00 | 35.93 | 13.44 | 49.37 | 74.00 | -24.63 | peak | | | |
| 6 | * | 12254.00 | 35.20 | 14.77 | 49.97 | 74.00 | -24.03 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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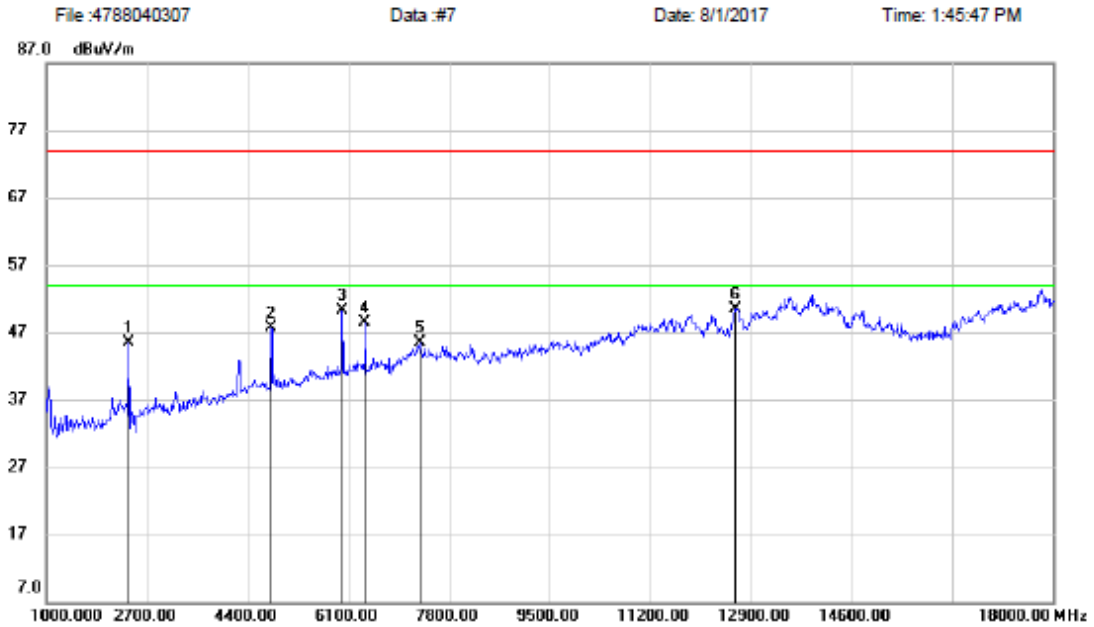
**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2394.000 | 54.27 | -8.84 | 45.43 | 74.00 | -28.57 | peak | | | |
| 2 | | 4791.000 | 49.48 | -1.74 | 47.74 | 74.00 | -26.26 | peak | | | |
| 3 | | 5998.000 | 48.30 | 2.09 | 50.39 | 74.00 | -23.61 | peak | | | |
| 4 | | 6389.000 | 45.40 | 3.11 | 48.51 | 74.00 | -25.49 | peak | | | |
| 5 | | 7307.000 | 39.54 | 5.93 | 45.47 | 74.00 | -28.53 | peak | | | |
| 6 | * | 12645.00 | 34.43 | 16.07 | 50.50 | 74.00 | -23.50 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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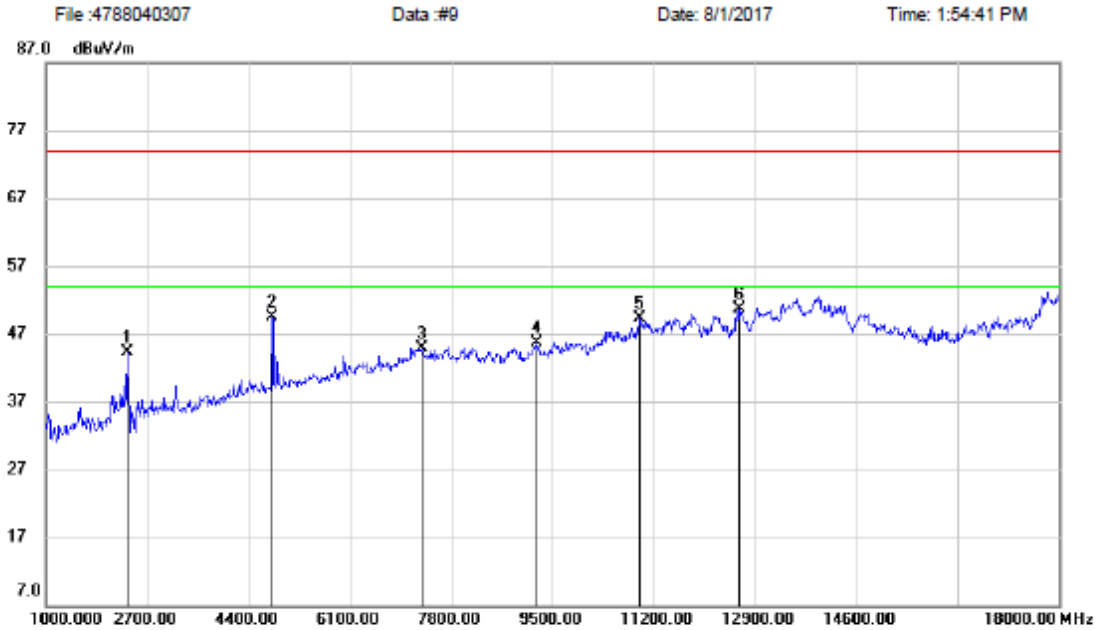
**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2360.000 | 53.11 | -8.72 | 44.39 | 74.00 | -29.61 | peak | | | |
| 2 | | 4791.000 | 51.34 | -1.84 | 49.50 | 74.00 | -24.50 | peak | | | |
| 3 | | 7307.000 | 39.05 | 5.91 | 44.96 | 74.00 | -29.04 | peak | | | |
| 4 | | 9245.000 | 37.25 | 8.46 | 45.71 | 74.00 | -28.29 | peak | | | |
| 5 | | 10962.00 | 36.63 | 12.71 | 49.34 | 74.00 | -24.66 | peak | | | |
| 6 | * | 12645.00 | 34.88 | 15.86 | 50.74 | 74.00 | -23.26 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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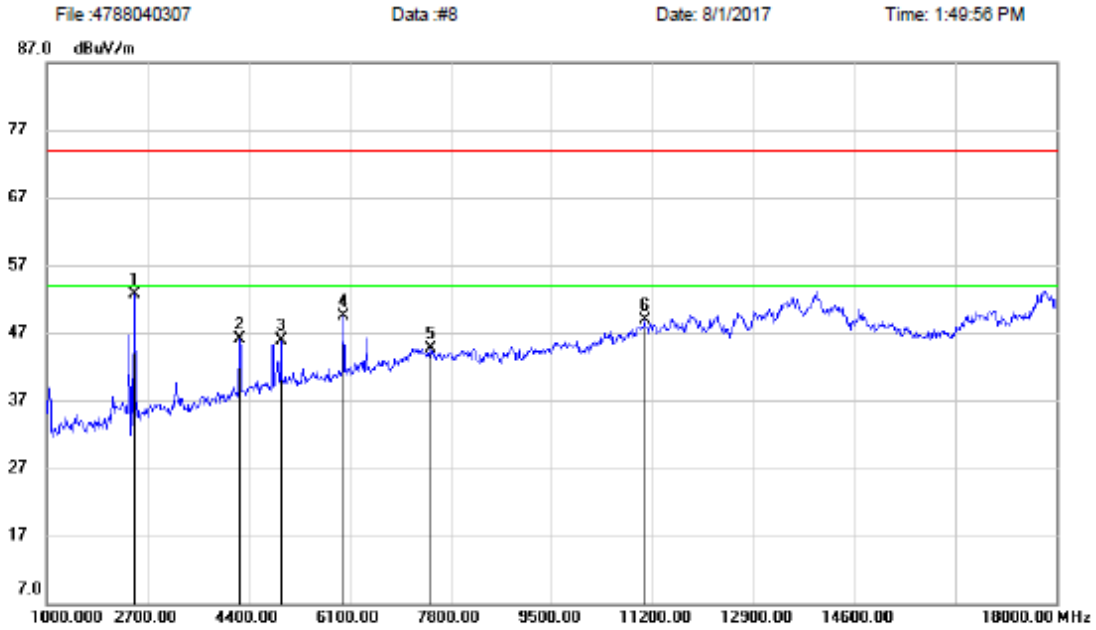
**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | * | 2479.000 | 61.78 | -9.11 | 52.67 | 74.00 | -21.33 | peak | | | |
| 2 | | 4247.000 | 49.35 | -3.26 | 46.09 | 74.00 | -27.91 | peak | | | |
| 3 | | 4944.000 | 46.62 | -0.76 | 45.86 | 74.00 | -28.14 | peak | | | |
| 4 | | 5998.000 | 47.39 | 2.09 | 49.48 | 74.00 | -24.52 | peak | | | |
| 5 | | 7460.000 | 38.81 | 5.98 | 44.79 | 74.00 | -29.21 | peak | | | |
| 6 | | 11064.00 | 35.78 | 13.11 | 48.89 | 74.00 | -25.11 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

Note 2: All the channels had been tested, but only the worst data recorded in the report.

Note 3: EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.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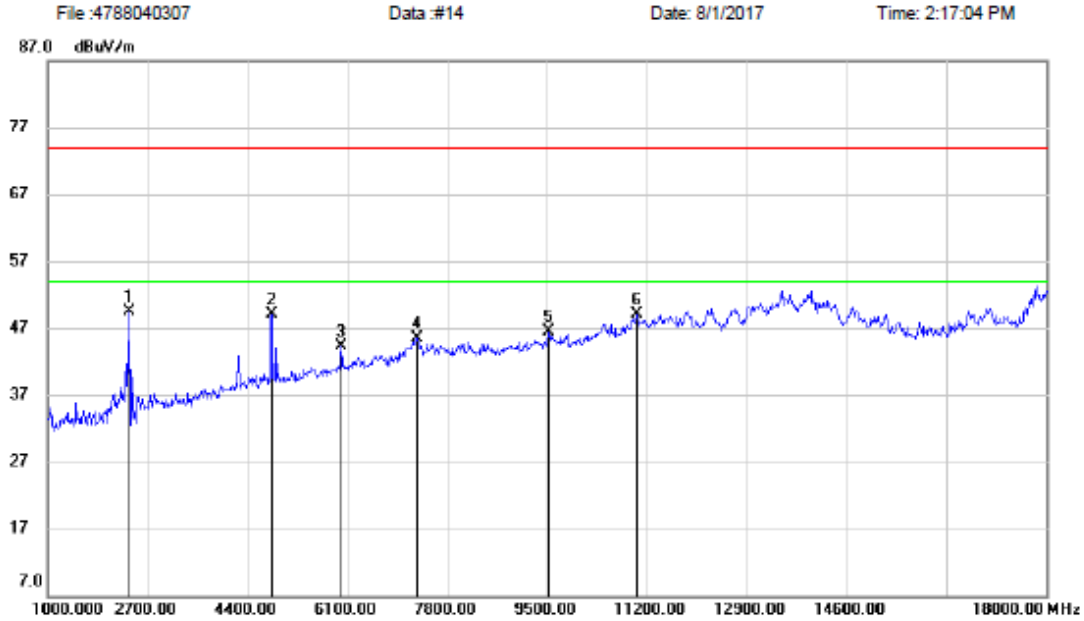
### 7.3.2. ∏/4-DQPSK MODE

**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | * | 2394.000 | 58.40 | -8.94 | 49.46 | 74.00 | -24.54 | peak | | | |
| 2 | | 4808.000 | 50.78 | -1.73 | 49.05 | 74.00 | -24.95 | peak | | | |
| 3 | | 5998.000 | 42.36 | 1.99 | 44.35 | 74.00 | -29.65 | peak | | | |
| 4 | | 7290.000 | 39.56 | 5.98 | 45.54 | 74.00 | -28.46 | peak | | | |
| 5 | | 9534.000 | 37.39 | 9.14 | 46.53 | 74.00 | -27.47 | peak | | | |
| 6 | | 11030.00 | 36.08 | 13.01 | 49.09 | 74.00 | -24.91 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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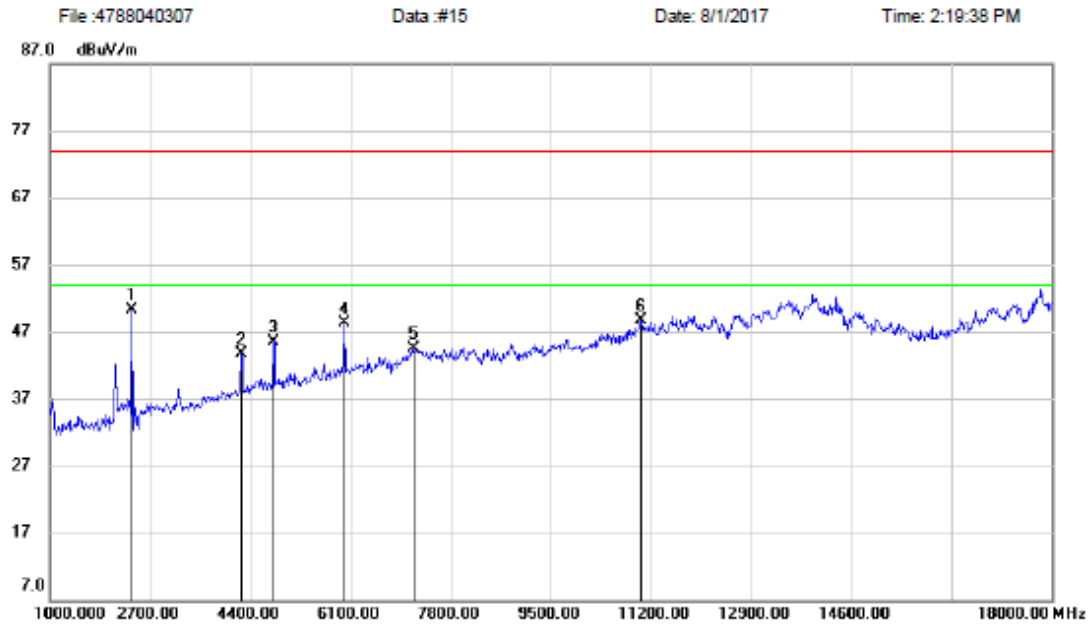
**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | * | 2394.000 | 59.22 | -8.84 | 50.38 | 74.00 | -23.62 | peak | | | |
| 2 | | 4247.000 | 46.98 | -3.26 | 43.72 | 74.00 | -30.28 | peak | | | |
| 3 | | 4791.000 | 47.30 | -1.74 | 45.56 | 74.00 | -28.44 | peak | | | |
| 4 | | 5998.000 | 46.25 | 2.09 | 48.34 | 74.00 | -25.66 | peak | | | |
| 5 | | 7171.000 | 38.50 | 5.91 | 44.41 | 74.00 | -29.59 | peak | | | |
| 6 | | 11030.00 | 35.65 | 13.09 | 48.74 | 74.00 | -25.26 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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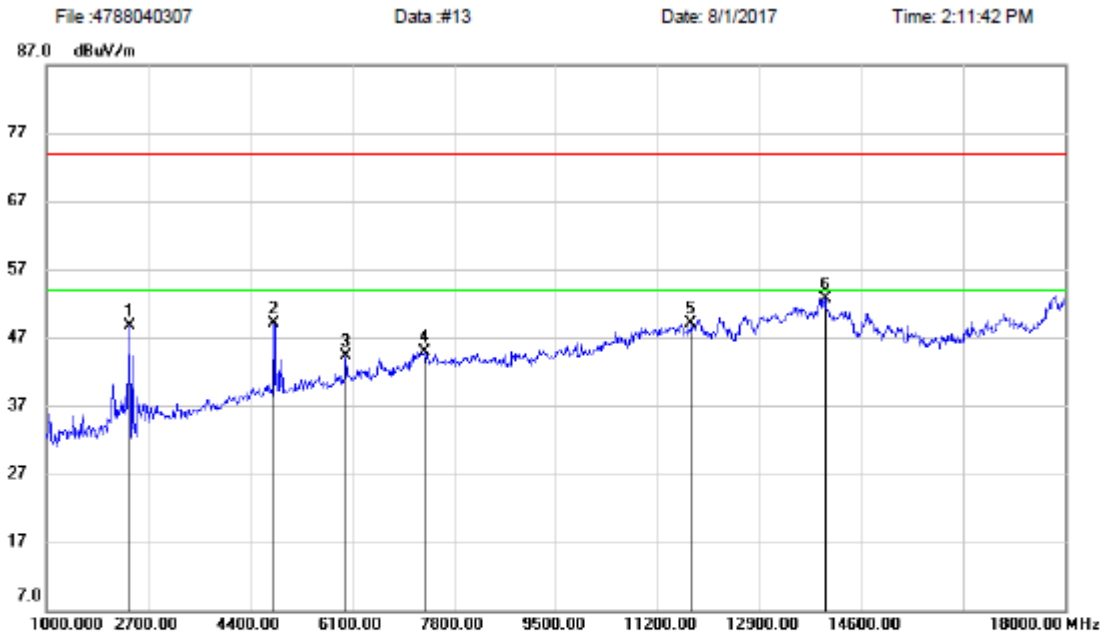
**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2394.000 | 57.72 | -8.94 | 48.78 | 74.00 | -25.22 | peak | | | |
| 2 | | 4791.000 | 50.93 | -1.84 | 49.09 | 74.00 | -24.91 | peak | | | |
| 3 | | 5998.000 | 42.39 | 1.99 | 44.38 | 74.00 | -29.62 | peak | | | |
| 4 | | 7307.000 | 38.97 | 5.91 | 44.88 | 74.00 | -29.12 | peak | | | |
| 5 | | 11761.00 | 34.39 | 14.74 | 49.13 | 74.00 | -24.87 | peak | | | |
| 6 | * | 13988.00 | 33.87 | 18.89 | 52.76 | 74.00 | -21.24 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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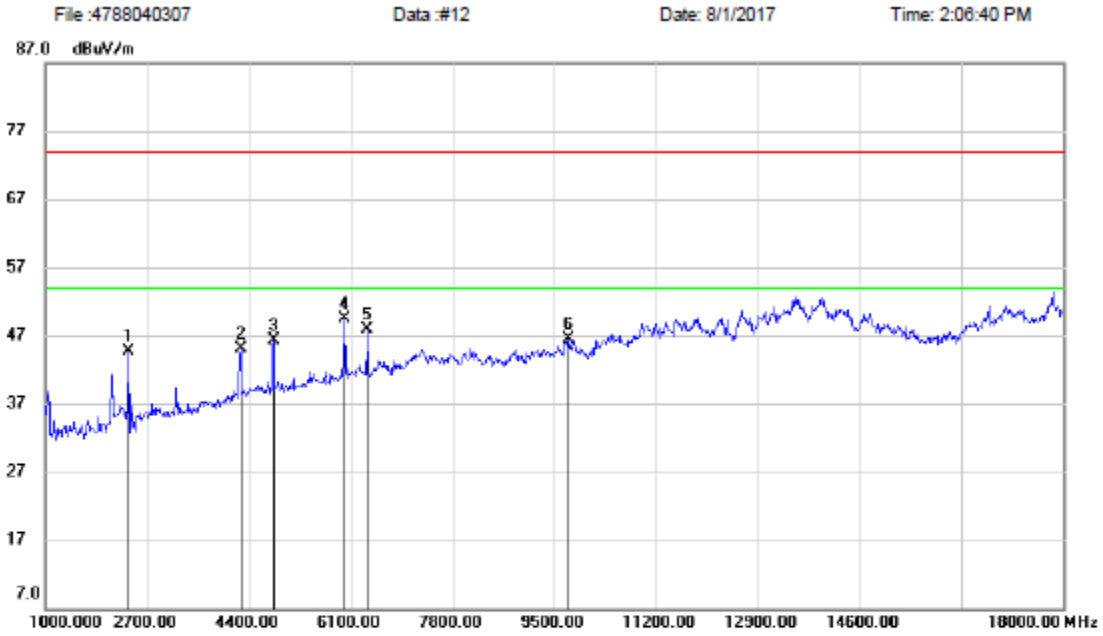
**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2394.000 | 53.47 | -8.84 | 44.63 | 74.00 | -29.37 | peak | | | |
| 2 | | 4264.000 | 48.19 | -3.15 | 45.04 | 74.00 | -28.96 | peak | | | |
| 3 | | 4808.000 | 47.88 | -1.64 | 46.24 | 74.00 | -27.76 | peak | | | |
| 4 | * | 5998.000 | 47.40 | 2.09 | 49.49 | 74.00 | -24.51 | peak | | | |
| 5 | | 6389.000 | 44.71 | 3.11 | 47.82 | 74.00 | -26.18 | peak | | | |
| 6 | | 9738.000 | 37.07 | 9.43 | 46.50 | 74.00 | -27.50 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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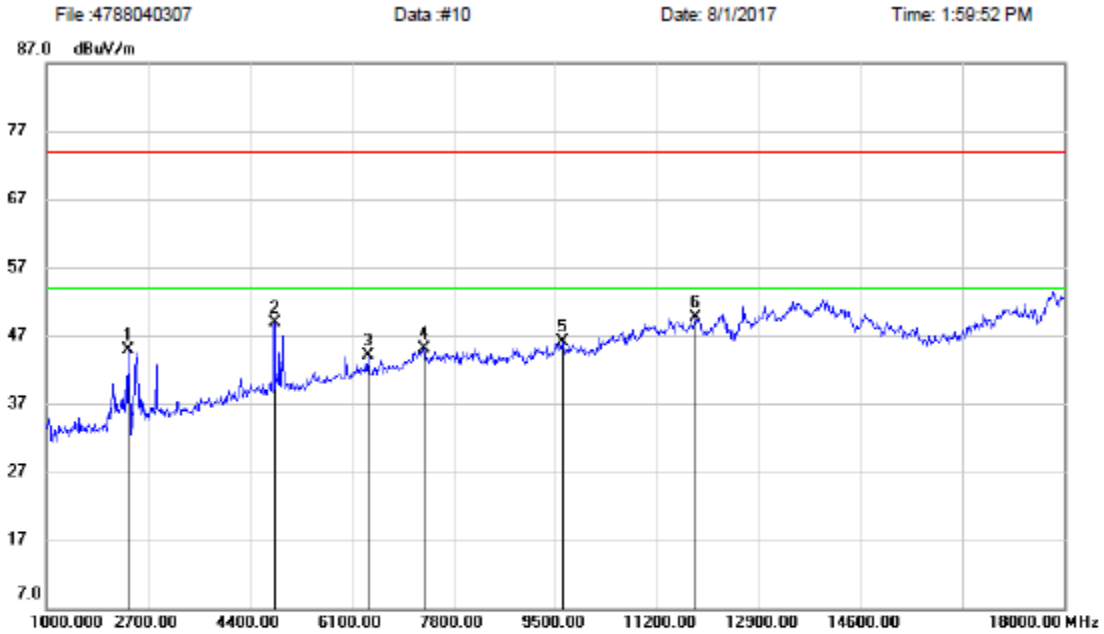
**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2360.000 | 53.61 | -8.72 | 44.89 | 74.00 | -29.11 | peak | | | |
| 2 | | 4808.000 | 50.66 | -1.73 | 48.93 | 74.00 | -25.07 | peak | | | |
| 3 | | 6372.000 | 40.98 | 3.03 | 44.01 | 74.00 | -29.99 | peak | | | |
| 4 | | 7307.000 | 39.28 | 5.91 | 45.19 | 74.00 | -28.81 | peak | | | |
| 5 | | 9619.000 | 37.00 | 9.07 | 46.07 | 74.00 | -27.93 | peak | | | |
| 6 | * | 11846.00 | 35.14 | 14.52 | 49.66 | 74.00 | -24.34 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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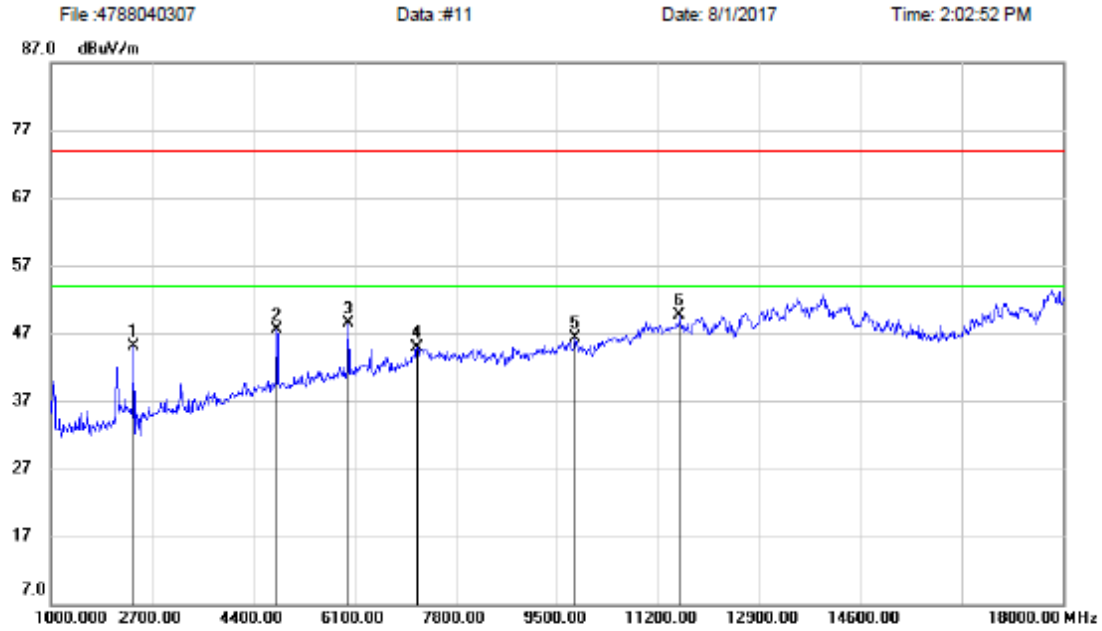
**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 2394.000 | 53.89 | -8.84 | 45.05 | 74.00 | -28.95 | peak | | | |
| 2 | | 4791.000 | 49.16 | -1.74 | 47.42 | 74.00 | -26.58 | peak | | | |
| 3 | | 5998.000 | 46.37 | 2.09 | 48.46 | 74.00 | -25.54 | peak | | | |
| 4 | | 7154.000 | 38.99 | 5.92 | 44.91 | 74.00 | -29.09 | peak | | | |
| 5 | | 9806.000 | 36.50 | 9.74 | 46.24 | 74.00 | -27.76 | peak | | | |
| 6 | * | 11557.00 | 35.14 | 14.49 | 49.63 | 74.00 | -24.37 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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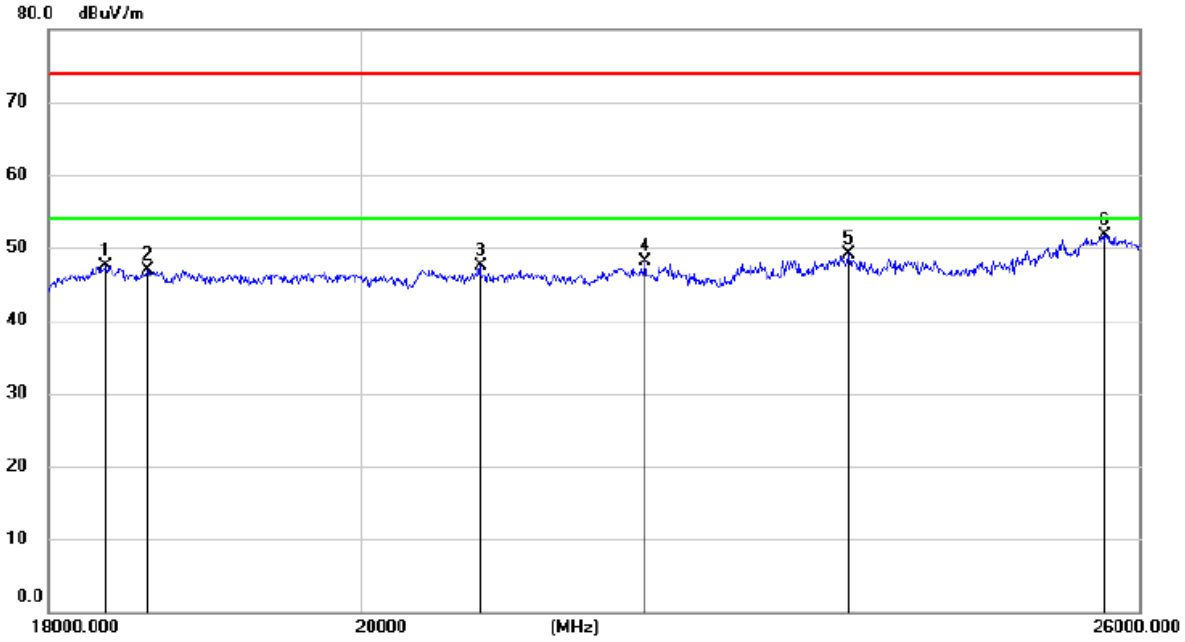
## 7.4. SPURIOUS EMISSIONS 18G ~ 26GHz

### 7.4.1. GFSK MODE

**SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 18354.25 | 52.93 | -5.43 | 47.50 | 74.00 | -26.50 | peak | | | |
| 2 | | 18612.52 | 52.24 | -5.34 | 46.90 | 74.00 | -27.10 | peak | | | |
| 3 | | 20821.59 | 52.47 | -5.04 | 47.43 | 74.00 | -26.57 | peak | | | |
| 4 | | 22010.44 | 52.66 | -4.47 | 48.19 | 74.00 | -25.81 | peak | | | |
| 5 | | 23577.23 | 52.19 | -3.16 | 49.03 | 74.00 | -24.97 | peak | | | |
| 6 | * | 25705.29 | 52.47 | -0.82 | 51.65 | 74.00 | -22.35 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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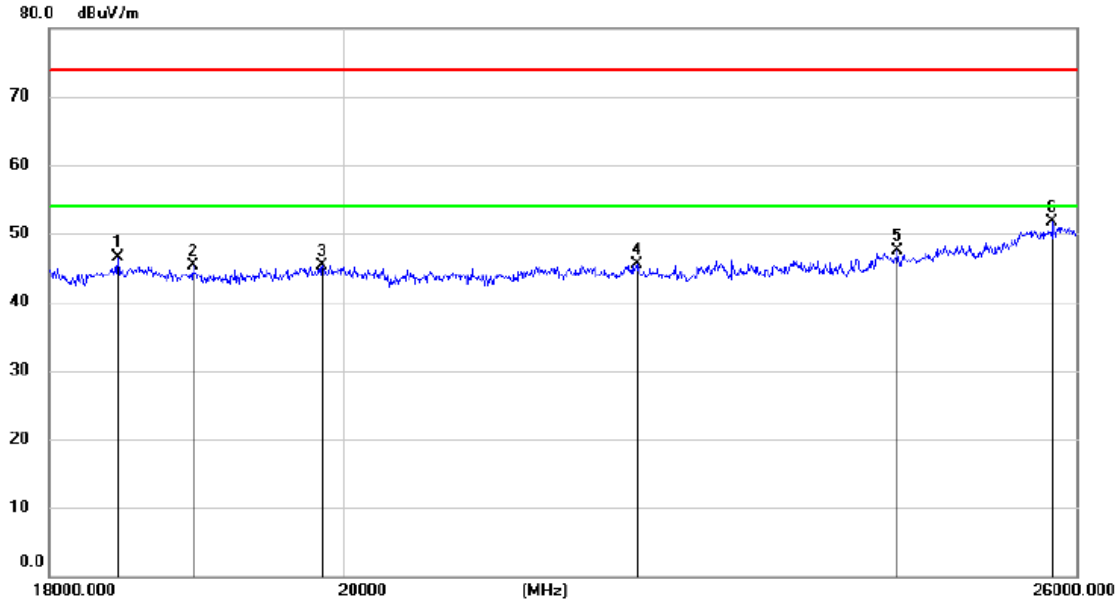
**SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 18448.98 | 51.77 | -5.32 | 46.45 | 74.00 | -27.55 | peak | | | |
| 2 | | 18950.93 | 50.49 | -5.26 | 45.23 | 74.00 | -28.77 | peak | | | |
| 3 | | 19849.65 | 50.59 | -5.33 | 45.26 | 74.00 | -28.74 | peak | | | |
| 4 | | 22221.89 | 49.84 | -4.26 | 45.58 | 74.00 | -28.42 | peak | | | |
| 5 | | 24388.51 | 50.05 | -2.55 | 47.50 | 74.00 | -26.50 | peak | | | |
| 6 | * | 25781.02 | 52.35 | -0.66 | 51.69 | 74.00 | -22.31 | peak | | | |

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.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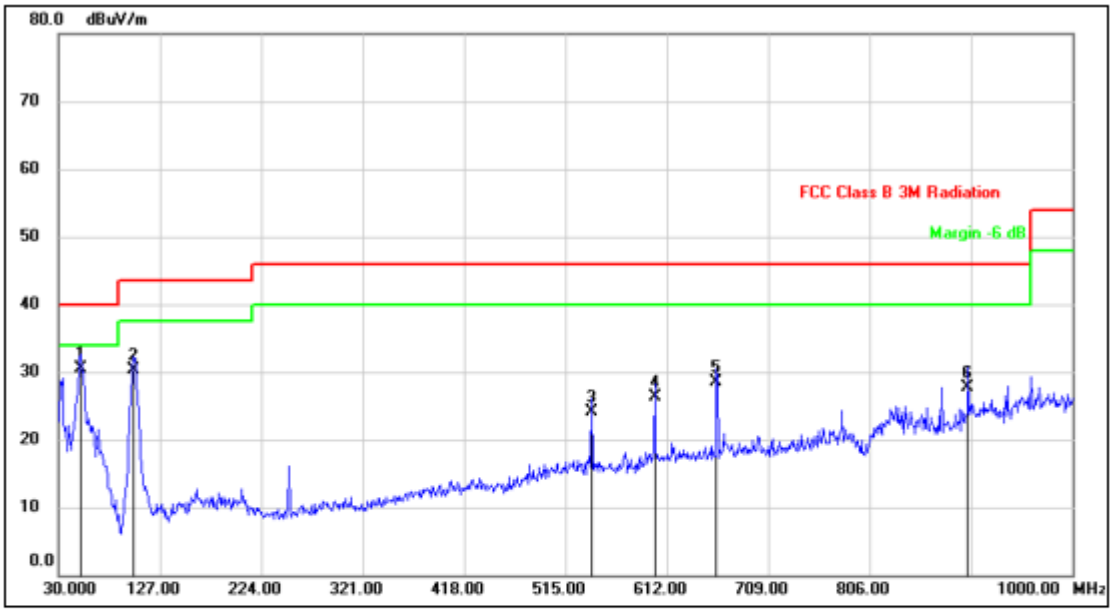
## 7.5. SPURIOUS EMISSIONS 30M ~ 1 GHz

### 7.5.1. GFSK MODE

**SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)**




| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 51.3400 | 46.98 | -16.38 | 30.60 | 40.00 | -9.40 | QP |
| 2 | 101.7800 | 48.14 | -17.88 | 30.26 | 43.50 | -13.24 | QP |
| 3 | 540.2199 | 31.37 | -7.35 | 24.02 | 46.00 | -21.98 | QP |
| 4 | 600.3600 | 32.24 | -5.88 | 26.36 | 46.00 | -19.64 | QP |
| 5 | 659.5300 | 34.79 | -6.32 | 28.47 | 46.00 | -17.53 | QP |
| 6 | 900.0900 | 2.30 | 25.31 | 27.61 | 46.00 | -18.39 | QP |

Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.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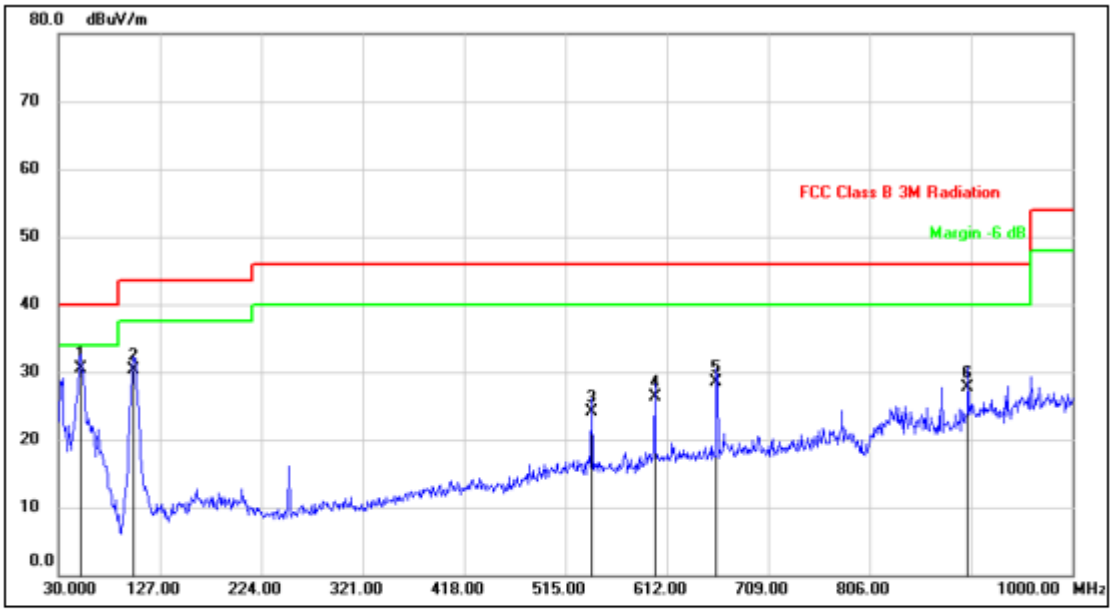
**SPURIOUS EMISSIONS (MID CHANNEL , WORST-CASE CONFIGURATION, VERTICAL)**




| No. | Frequency (MHz) | Reading (dBuV/m) | Correct dB/m | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 51.3400 | 46.98 | -16.38 | 30.60 | 40.00 | -9.40 | QP |
| 2 | 101.7800 | 48.14 | -17.88 | 30.26 | 43.50 | -13.24 | QP |
| 3 | 540.2199 | 31.37 | -7.35 | 24.02 | 46.00 | -21.98 | QP |
| 4 | 600.3600 | 32.24 | -5.88 | 26.36 | 46.00 | -19.64 | QP |
| 5 | 659.5300 | 34.79 | -6.32 | 28.47 | 46.00 | -17.53 | QP |
| 6 | 900.0900 | 2.30 | 25.31 | 27.61 | 46.00 | -18.39 | QP |

Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto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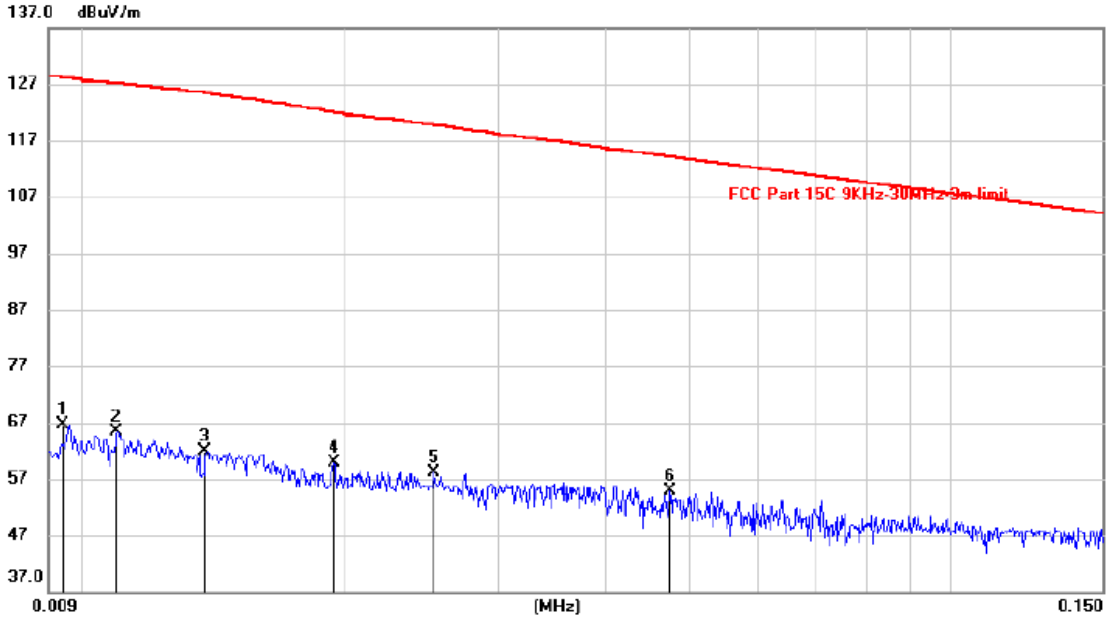
## 7.6. SPURIOUS EMISSIONS BELOW 30M

### 7.6.1. GFSK MODE

**SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)**

**0.09KHz~ 150KHz**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 0.0094 | 46.40 | 20.26 | 66.66 | 128.1 | -61.44 | peak | | | |
| 2 | | 0.0108 | 45.24 | 20.22 | 65.46 | 127.1 | -61.66 | peak | | | |
| 3 | | 0.0137 | 41.67 | 20.25 | 61.92 | 125.3 | -63.45 | peak | | | |
| 4 | | 0.0193 | 39.46 | 20.30 | 59.76 | 122.0 | -62.24 | peak | | | |
| 5 | | 0.0252 | 37.79 | 20.31 | 58.10 | 119.7 | -61.65 | peak | | | |
| 6 | * | 0.0473 | 34.53 | 20.31 | 54.84 | 114.1 | -59.30 | peak | | | |

Note: Measurement = Reading Level + Correct Factor.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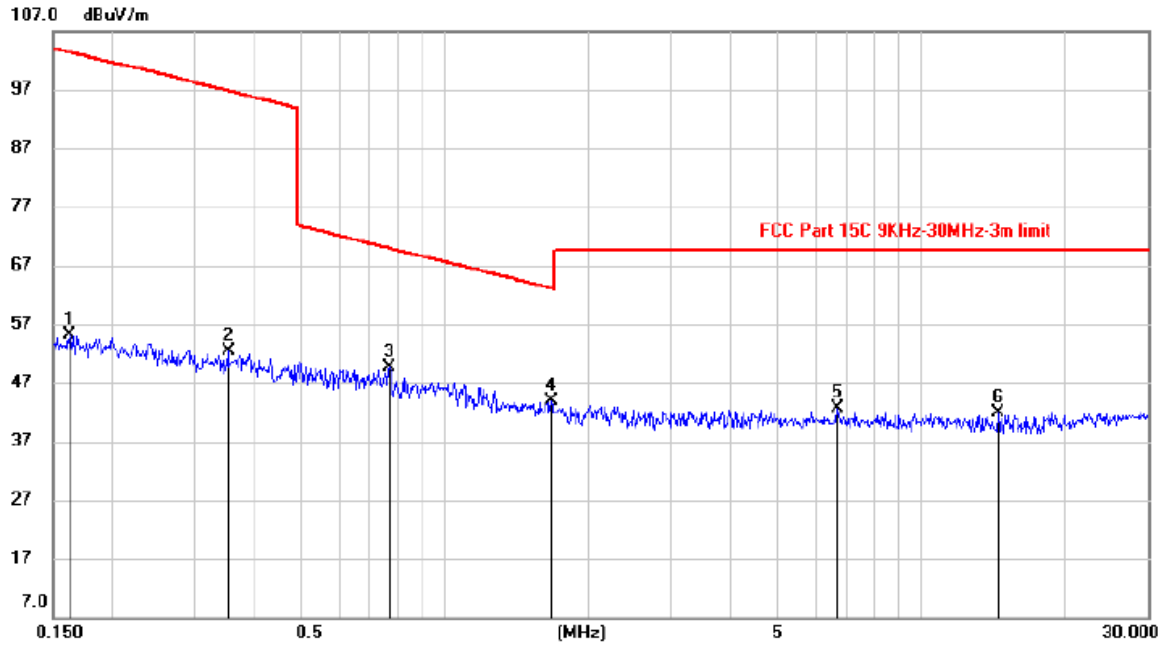
**150KHz ~ 30M**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 0.1621 | 34.61 | 20.41 | 55.02 | 103.4 | -48.39 | peak | | | |
| 2 | | 0.3502 | 31.98 | 20.29 | 52.27 | 96.81 | -44.54 | peak | | | |
| 3 | | 0.7630 | 29.16 | 20.36 | 49.52 | 69.97 | -20.45 | peak | | | |
| 4 | * | 1.6713 | 23.23 | 20.61 | 43.84 | 63.15 | -19.31 | peak | | | |
| 5 | | 6.6977 | 21.71 | 20.90 | 42.61 | 69.54 | -26.93 | peak | | | |
| 6 | | 14.5168 | 21.00 | 20.94 | 41.94 | 69.54 | -27.60 | peak | | | |

Note: Measurement = Reading Level + Correct Factor.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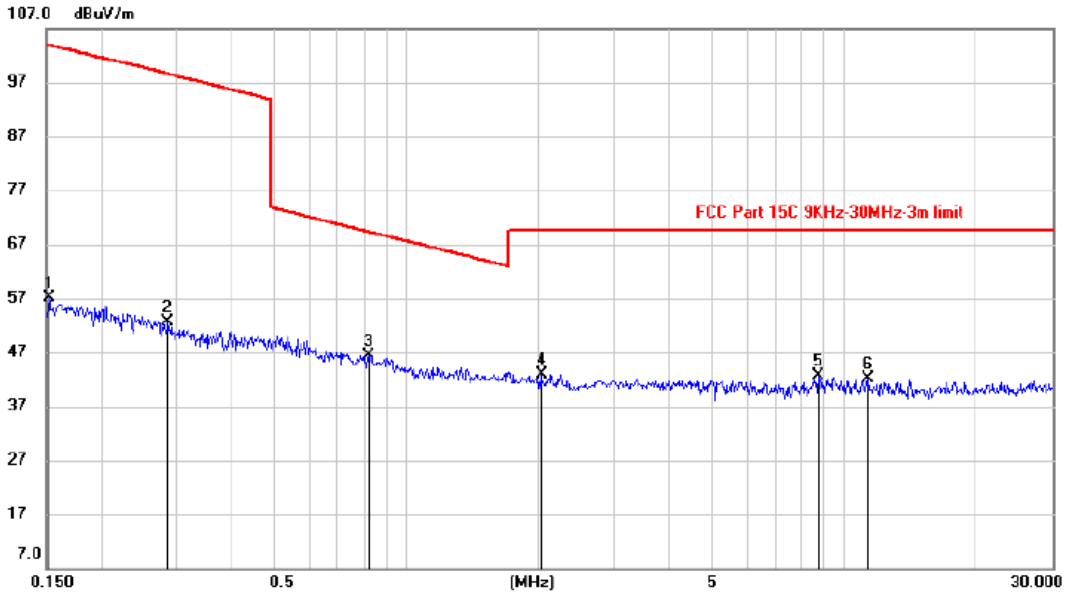
**SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)**

**0.09KHz~ 150KHz**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | | Antenna Height | Table Degree | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | Detector | cm | degree | Comment |
| 1 | | 0.1524 | 36.66 | 20.42 | 57.08 | 103.9 | -46.87 | peak | | | |
| 2 | | 0.2862 | 32.23 | 20.32 | 52.55 | 98.55 | -46.00 | peak | | | |
| 3 | * | 0.8215 | 26.13 | 20.36 | 46.49 | 69.32 | -22.83 | peak | | | |
| 4 | | 2.0440 | 22.17 | 20.74 | 42.91 | 69.54 | -26.63 | peak | | | |
| 5 | | 8.7293 | 21.52 | 20.99 | 42.51 | 69.54 | -27.03 | peak | | | |
| 6 | | 11.3771 | 21.15 | 21.02 | 42.17 | 69.54 | -27.37 | peak | | | |

Note: Measurement = Reading Level + Correct Factor.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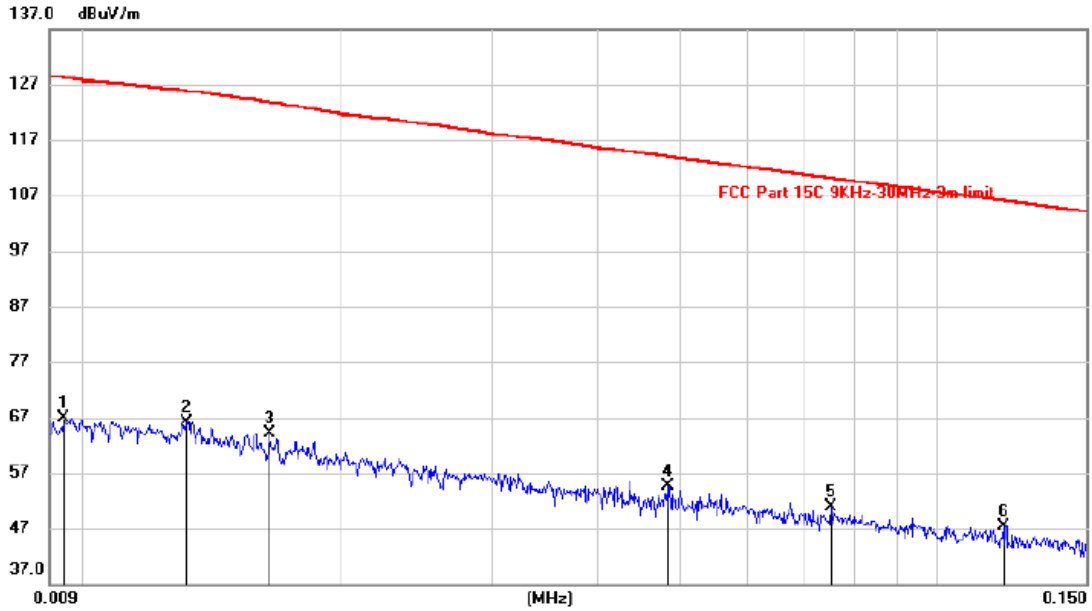
**150KHz ~ 30M**




| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Margin | Detector | Antenna Height | Table Degree | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | | cm | degree | |
| 1 | | 0.0094 | 46.50 | 20.26 | 66.76 | 128.1 | -61.34 | peak | | | |
| 2 | | 0.0131 | 45.96 | 20.24 | 66.20 | 125.7 | -59.53 | peak | | | |
| 3 | | 0.0161 | 43.87 | 20.27 | 64.14 | 123.9 | -59.79 | peak | | | |
| 4 | | 0.0483 | 34.40 | 20.31 | 54.71 | 113.9 | -59.24 | peak | | | |
| 5 | | 0.0752 | 30.48 | 20.31 | 50.79 | 110.1 | -59.31 | peak | | | |
| 6 | * | 0.1198 | 27.03 | 20.30 | 47.33 | 106.0 | -58.71 | peak | | | |

Note: Measurement = Reading Level + Correct Factor.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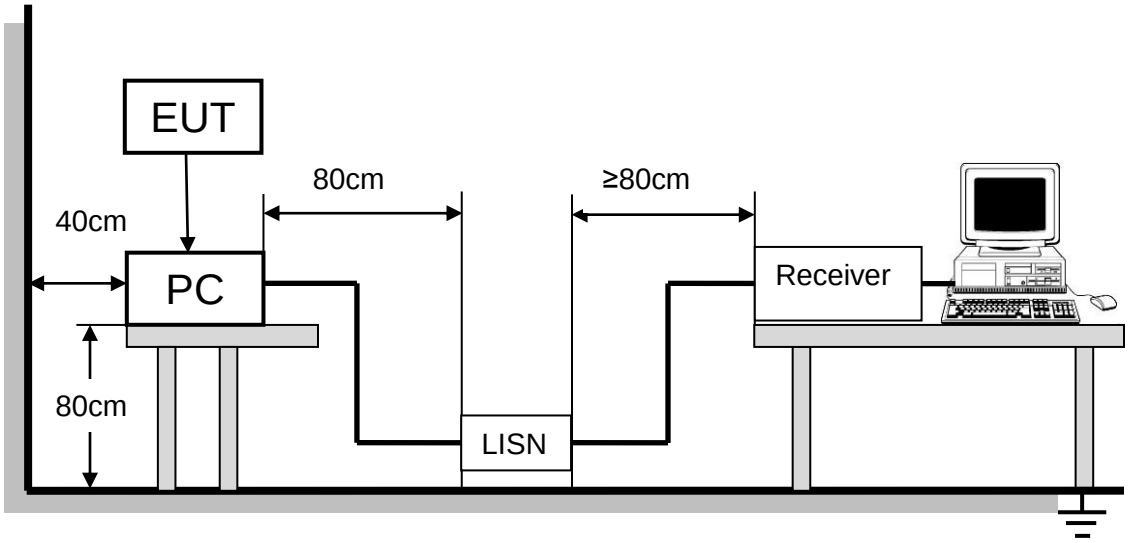
# 8. AC POWER LINE CONDUCTED EMISSIONS

**LIMITS**

Please refer to FCC §15.207 (a)

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | |
|---|---|---|---|---|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 73.00 | 60.00 | 56.00 | 46.00 |
| 5.0 -30.0 | 73.00 | 60.00 | 60.00 | 50.00 |

**TEST SETUP AND PROCEDURE**




The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4-2014.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.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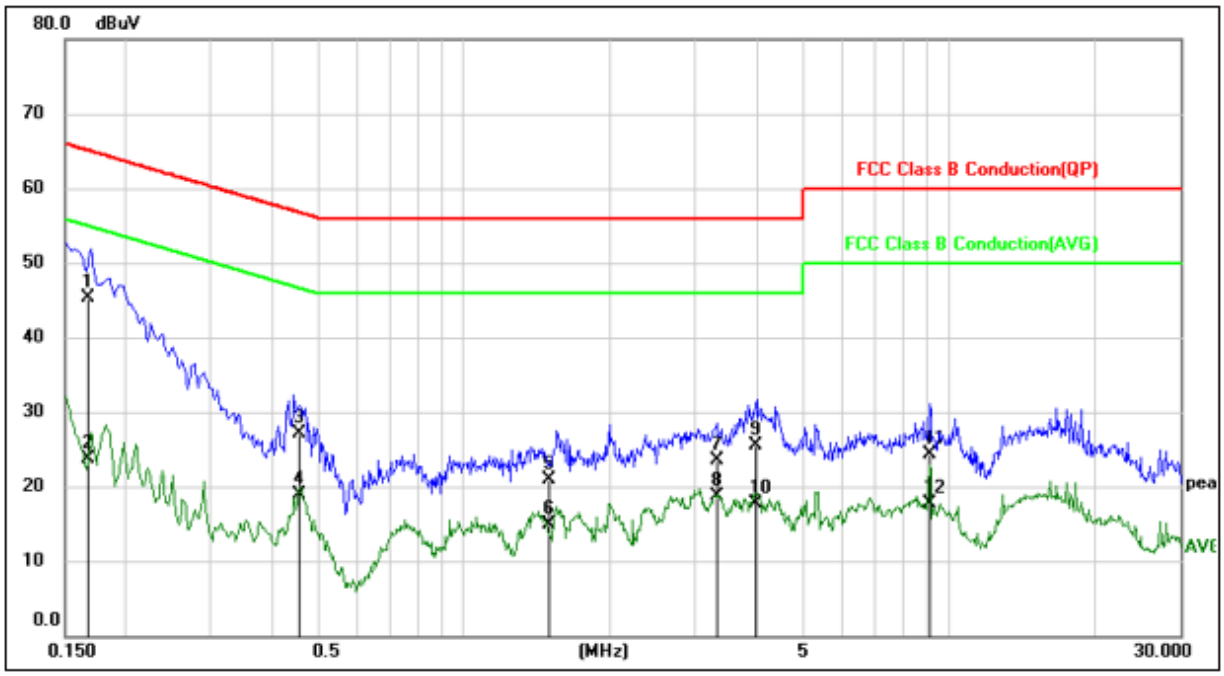
### 8.1.1. GFSK MODE

**TEST RESULTS (MID CHANNEL, WORST-CASE CONFIGURATION)**
**LINE N RESULTS**




| No. | Frequency (MHz) | Reading (dBuV) | Correct dB | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|
| 1 | 0.1664 | 35.61 | 9.64 | 45.25 | 65.14 | -19.89 | QP |
| 2 | 0.1664 | 14.04 | 9.64 | 23.68 | 55.14 | -31.46 | AVG |
| 3 | 0.4569 | 17.39 | 9.65 | 27.04 | 56.75 | -29.71 | QP |
| 4 | 0.4569 | 9.35 | 9.65 | 19.00 | 46.75 | -27.75 | AVG |
| 5 | 1.5094 | 11.22 | 9.68 | 20.90 | 56.00 | -35.10 | QP |
| 6 | 1.5094 | 5.22 | 9.68 | 14.90 | 46.00 | -31.10 | AVG |
| 7 | 3.3172 | 13.74 | 9.70 | 23.44 | 56.00 | -32.56 | QP |
| 8 | 3.3172 | 8.98 | 9.70 | 18.68 | 46.00 | -27.32 | AVG |
| 9 | 3.9795 | 15.78 | 9.70 | 25.48 | 56.00 | -30.52 | QP |
| 10 | 3.9795 | 8.06 | 9.70 | 17.76 | 46.00 | -28.24 | AVG |
| 11 | 9.1168 | 14.58 | 9.77 | 24.35 | 60.00 | -35.65 | QP |
| 12 | 9.1168 | 7.92 | 9.77 | 17.69 | 50.00 | -32.31 | AVG |

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.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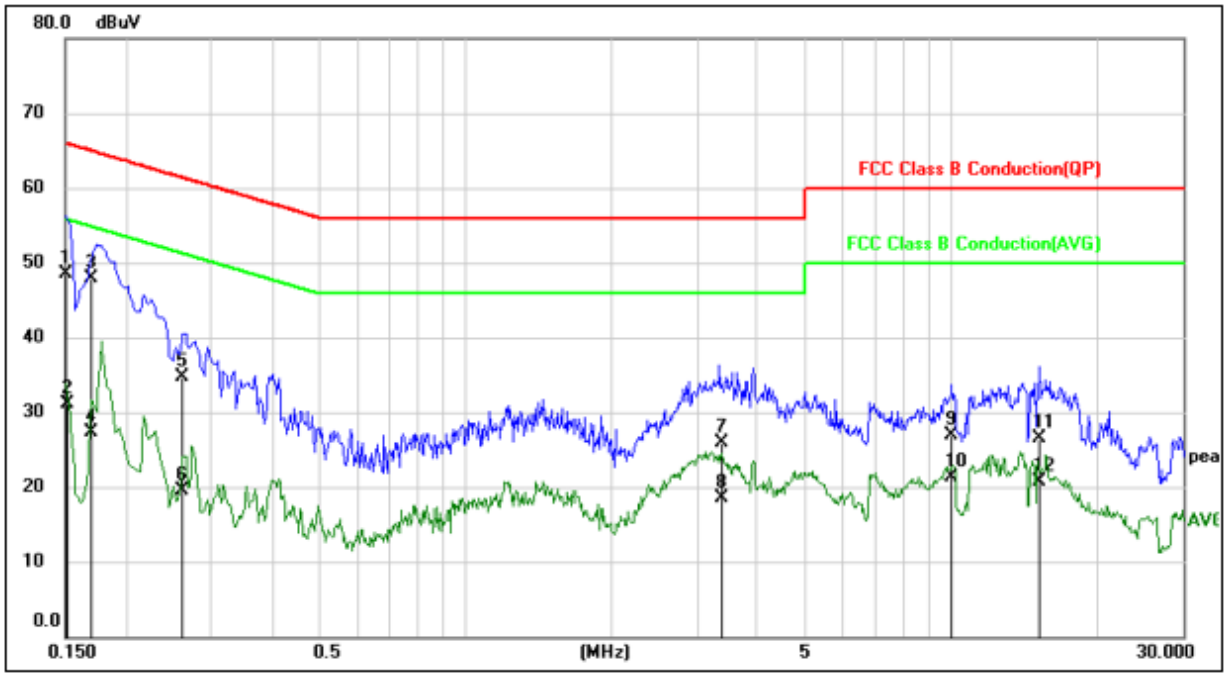
**LINE L RESULTS**




| No. | Frequency | Reading | Correct | Result | Limit | Margin | Remark |
|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | dB | (dBuV) | (dBuV) | (dB) | |
| 1 | 0.1500 | 38.86 | 9.66 | 48.52 | 66.00 | -17.48 | QP |
| 2 | 0.1516 | 21.39 | 9.66 | 31.05 | 55.91 | -24.86 | AVG |
| 3 | 0.1699 | 38.16 | 9.66 | 47.82 | 64.97 | -17.15 | QP |
| 4 | 0.1699 | 17.55 | 9.66 | 27.21 | 54.97 | -27.76 | AVG |
| 5 | 0.2611 | 25.10 | 9.65 | 34.75 | 61.40 | -26.65 | QP |
| 6 | 0.2611 | 9.82 | 9.65 | 19.47 | 51.40 | -31.93 | AVG |
| 7 | 3.3544 | 16.17 | 9.70 | 25.87 | 56.00 | -30.13 | QP |
| 8 | 3.3544 | 8.76 | 9.70 | 18.46 | 46.00 | -27.54 | AVG |
| 9 | 10.0604 | 17.06 | 9.79 | 26.85 | 60.00 | -33.15 | QP |
| 10 | 10.0604 | 11.49 | 9.79 | 21.28 | 50.00 | -28.72 | AVG |
| 11 | 15.1883 | 16.70 | 9.82 | 26.52 | 60.00 | -33.48 | QP |
| 12 | 15.1883 | 10.93 | 9.82 | 20.75 | 50.00 | -29.25 | AVG |

Note: 1. Result = Reading +Correct Factor.
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).
4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

Note: All the modulation and channels had been tested, but only the worst data recorded in the report.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# 9. ANTENNA REQUIREMENTS

**APPLICABLE REQUIREMENTS**

Please refer to FCC §15.203
If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. 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 FCC rule.

**ANTENNA CONNECTOR**

EUT has a PCB antenna without antenna connector.

**ANTENNA GAIN**

The antenna gain of EUT is less than 6 dBi.

## END OF REPORT


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