



## SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

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Report No.: SHEM130600114101  
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# FCC Part 15C TEST REPORT

|   |  |
|---|--|
| Application No. :   | SHEM1306001141RF                           |
| Applicant:  | Loctek Visual Technology Corp.             |
| FCC ID:   | 2AALVBT115                                 |
| Equipment Under Test (EUT):<br>NOTE: The following sample(s) submitted was/were identified on behalf of the client as |  |
| Product Name:   | Bluetooth headset                          |
| Brand Name:   | N/A  |
| Model:  | BT110                                      |
| Add Model No.:  | BT111, BT112, BT113, BT114, BT115, BT116   |
| Standards:  | FCC PART 15 SUBPART C, Section 15.247:2012 |
| Date of Receipt:  | June 21, 2013                              |
| Date of Test:   | June 28, 2013 to July 01, 2013             |
| Date of Issue:  | August 01, 2013                            |
| Test Result:  | <b>PASS *</b>                              |

\* In the configuration tested, the EUT (Equipment under test) complied with the standards specified above.



Tony Wu

E&E Section Manager

SGS-CSTC (Shanghai) Co., Ltd.

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.



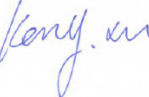
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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## 2 Version

| Revision Record |         |               |          |          |
|-----------------|---------|---------------|----------|----------|
| Version         | Chapter | Date          | Modifier | Remark   |
| 00              | /       | July 03, 2013 | /        | Original |
|                 |         |               |          |          |
|                 |         |               |          |          |
|                 |         |               |          |          |
|                 |         |               |          |          |

|                          |  |                                     |  |
|--------------------------|--|-------------------------------------|--|
| Authorized for issue by: |  |                                     |  |
| Engineer                 |  | Zenger Zhang<br>_____<br>Print Name | <br>_____<br>Print Name  |
| Clerk                    |  | Susie Liu<br>_____<br>Print Name    | <br>_____<br>Print Name |
| Reviewer                 |  | Kenx Xu<br>_____<br>Print Name      | <br>_____<br>Print Name |



### 3 Test Summary

| Test Item                        | FCC Test Requirement                                     | Test method                          | Result |
|----------------------------------|--|--------------------------------------|--------|
| Antenna Requirement              | FCC Part 15, Subpart C Section 15.203/15.247 (c)         | ---                                  | PASS   |
| AC Power Line Conducted Emission | FCC Part 15, Subpart C Section 15.207                    | ANSI C63.10 (2009)<br>Section 6.2    | PASS   |
| 20dB Occupied Bandwidth          | FCC Part 15, Subpart C Section 15.247 (a)(1)             | ANSI C63.10 (2009)<br>Section 6.9.1  | PASS   |
| Conducted Peak Output Power      | FCC Part 15, Subpart C Section 15.247 (b)(1)             | ANSI C63.10 (2009)<br>Section 6.10.1 | PASS   |
| Carrier Frequencies Separation   | FCC Part 15, Subpart C Section 15.247 (a)(1)             | ANSI C63.10 (2009)<br>Section 7.7.2  | PASS   |
| Hopping Channel Number           | FCC Part 15, Subpart C Section 15.247 (b)                | ANSI C63.10 (2009)<br>Section 7.7.3  | PASS   |
| Dwell Time                       | FCC Part 15, Subpart C Section 15.247 (a)(1)             | ANSI C63.10 (2009)<br>Section 7.7.4  | PASS   |
| RF Conducted Spurious Emissions  | FCC Part 15, Subpart C Section 15.247(d)                 | ANSI C63.10 (2009)<br>Section 7.7.10 | PASS   |
| Radiated Spurious emissions      | FCC Part 15, Subpart C Section 15.209 and Section 15.205 | ANSI C63.10 (2009)<br>Section 6.12   | PASS   |
| Radiated Band-edge               | FCC Part 15, Subpart C Section 15.205                    | ANSI C63.10 (2009)<br>Section 6.5    | PASS   |

Note: There are 6 models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model BT011 was tested since their differences were the model number, trade name and appearance deviation.



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## 5 General Information

### 5.1 Client Information

|                                 |   |
|---------------------------------|---|
| <b>Applicant:</b>               | Loctek Visual Technology Corp.  |
| <b>Address of Applicant:</b>    | 588 QIHANG SOUTH RD BINHAI INDUSTRIAL ZONE YINZHOU DISTRICT NINGBO, ZHEJIANG 315145 CHINA |
| <b>Manufacturer:</b>            | Loctek Visual Technology Corp.  |
| <b>Address of Manufacturer:</b> | 588 QIHANG SOUTH RD BINHAI INDUSTRIAL ZONE YINZHOU DISTRICT NINGBO, ZHEJIANG 315145 CHINA |

### 5.2 General Description of E.U.T.

|                       |  |
|-----------------------|--|
| <b>Product Name</b>   | Bluetooth headset                        |
| <b>Brand Name:</b>    | N/A                                      |
| <b>Model No:</b>      | BT110                                    |
| <b>Add Model No.:</b> | BT111, BT112, BT113, BT114, BT115, BT116 |

### 5.3 Technical Specifications:

|                              |                            |
|------------------------------|----------------------------|
| <b>Operation Frequency:</b>  | 2402MHz~2480MHz            |
| <b>Modulation Technique:</b> | 3.0+EDR                    |
| <b>Modulation Type:</b>      | GFSK, $\pi/4$ DQPSK, 8DPSK |
| <b>Number of Channel:</b>    | 79                         |
| <b>Power Supply:</b>         | DC 3.7V                    |
| <b>Antenna Type</b>          | Integral                   |
| <b>Antenna Gain</b>          | 2.0dBi                     |



## 5.4 Support Software for Testing

The EUT has been tested with associated equipment below.

| Description | Manufacturer | Model No. | Supplied by |
|-------------|--------------|-----------|-------------|
| Laptop      | Lenovo       | L420      | SGS         |

## 5.5 Details of Test Mode

| Test Mode            | Description of Test Mode                          |
|----------------------|---|
| BT Transmitting mode | Keep the EUT on continue transmitting mode by BT. |

## 5.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.  
No.588 West Jindu Road, Songjiang District, Shanghai, China.201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

## 5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.



## 6 Equipments Used during Test

### Conducted Emission

| Item | Test Equipment                       | Manufacturer    | Model No. | Serial No. | Cal. Date  | Cal.Due date |
|------|--------------------------------------|-----------------|-----------|------------|------------|--------------|
| 1    | EMI test receiver                    | Rohde & Schwarz | ESCS30    | 100086     | 2013-02-23 | 2014-02-22   |
| 2    | Line impedance stabilization network | SCHWARZBECK     | NSLK8127  | 8127-490   | 2013-02-23 | 2014-02-22   |
| 3    | Line impedance stabilization network | ETS             | 3816/2    | 00034161   | 2013-02-23 | 2014-02-22   |

### ☒ RF Test

| Item | Test Equipment            | Manufacturer                          | Model No.  | Serial No.   | Cal. Date  | Cal. Due date |
|------|---------------------------|---------------------------------------|------------|--------------|------------|---------------|
| 1    | EMI test receiver         | Rohde & Schwarz                       | ESU40      | 100109       | 2013-02-23 | 2014-02-22    |
| 2    | Horn Antenna              | SCHWARZBECK                           | BBHA9120 D | 9120D-679    | 2013-03-07 | 2014-03-06    |
| 3    | Horn Antenna              | Rohde & Schwarz                       | HF906      | 100284       | 2013-06-03 | 2014-06-01    |
| 4    | ANTENNA                   | SCHWARZBECK                           | VULB9168   | 9168-313     | 2013-03-07 | 2014-03-06    |
| 5    | Horn Antenna              | SCHWARZBECK                           | BBHA 9170  | BBHA9170 373 | 2013-03-07 | 2014-03-06    |
| 6    | Ultra broadband antenna   | Rohde & Schwarz                       | HL562      | 100227       | 2012-10-09 | 2013-10-08    |
| 7    | Atmosphere pressure meter | Shanghai ZhongXuan Electronic Co.,Ltd | BY 2009P   | --           | 2012-10-09 | 2013-10-08    |
| 8    | CLAMP METER               | FLUKE                                 | 316        | 86080010     | 2013-06-03 | 2014-06-01    |
| 9    | Thermo-Hygrometer         | ZHICHEN                               | ZC1-2      | 01050033     | 2012-10-09 | 2013-10-08    |



|    |                      |                             |   |          |            |            |
|----|----------------------|-----------------------------|---|----------|------------|------------|
| 10 | Tunable Notch Filter | Wainwright instruments GmbH | WRCT180<br>0.0/<br>2000.0-<br>0.2/40-<br>5SSK | 11       | 2013-06-03 | 2014-06-01 |
| 11 | Tunable Notch Filter | Wainwright instruments GmbH | WRCT800.<br>0/880.0-<br>0.2/40-<br>5SSK       | 9        | 2013-06-03 | 2014-06-01 |
| 12 | High pass Filter     | FSCW                        | HP<br>12/2800-<br>5AA2                        | 19A45-02 | 2013-06-03 | 2014-06-01 |
| 13 | Low noise amplifier  | TESEQ                       | LNA6900                                       | 70133    | 2013-02-23 | 2014-02-22 |





## 7 Test Results

### 7.1 E.U.T. test conditions

**Test Power:** DC 3.7V

**Requirements:** 15.31(e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

**Operating Environment:**

**Temperature:** 20.0 -25.0 °C

**Humidity:** 35-75 % RH

**Atmospheric Pressure:** 992 -102.0 kPa

**Test frequencies:** According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

| Frequency range over which device operates | Number of frequencies | Location in the range of operation          |
|--|-----------------------|---|
| 1 MHz or less                              | 1                     | Middle                                      |
| 1 to 10 MHz                                | 2                     | 1 near top and 1 near bottom                |
| More than 10 MHz                           | 3                     | 1 near top, 1 near middle and 1 near bottom |

Pursuant to Part 15.31(c) For swept frequency equipment, measurements shall be made with the frequency sweep stopped at those frequencies chosen for the measurements to be reported.

Test frequency is the lowest channel: 0 channel (2402MHz), middle channel: 39 channel (2441MHz) and highest channel: 78 channel (2480MHz) with fixed at channel.



## **7.2 Antenna Requirement**

### **Standard requirement**

15.203 requirement:

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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **EUT Antenna**

The antenna is integrated on the main PCB and no consideration of replacement. The gain of the antenna is less than 2.0 dBi.



### 7.3 Conducted Emission Test

**Test Requirement:** FCC Part15C 15.207

**Test date:** June 28, 2013

**Standard Applicable** According to section 15.207, frequency 150KHz to 30MHz shall not exceed the limit table as below.

| Frequency of Emission (MHz) | Conducted Limit (dBuV) |            |
|-----------------------------|------------------------|------------|
|                             | Quasi-peak             | Average    |
| 0.15-0.5                    | 66 to 56 *             | 56 to 46 * |
| 0.5-5                       | 56                     | 46         |
| 5-30                        | 60                     | 50         |

#### EUT Setup

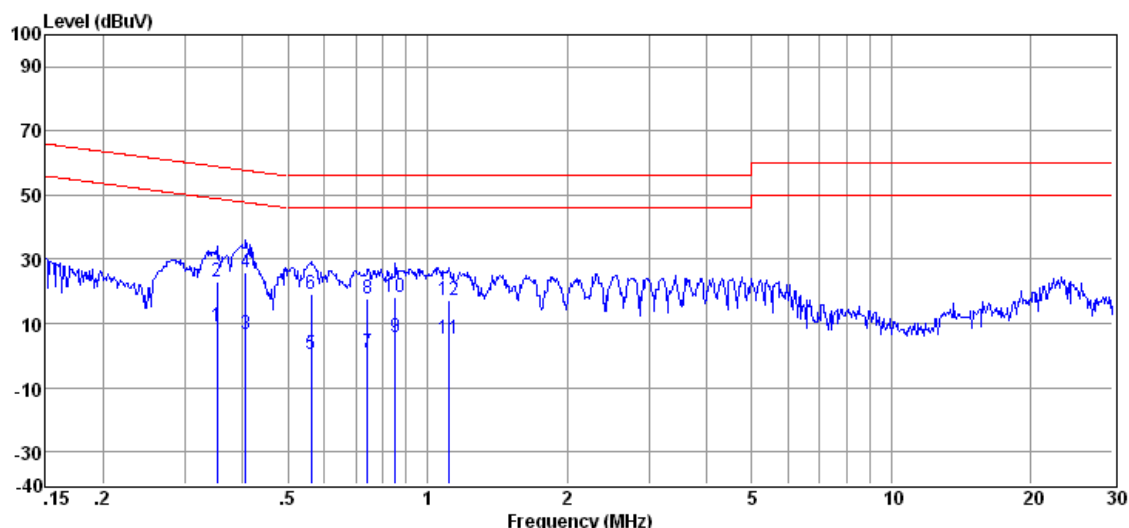
- 1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.10-2009.
- 2.EUT is charged with PC.The AC Power adaptor of PC was plug-in LISN.The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3.The LISN was connected with 120V AC/60Hz power source (For AC Charger port).

#### Measurement Result

Operation mode: the EUT on continue transmitting mode.

Note:All test modes have been tested, below show the worst plots.

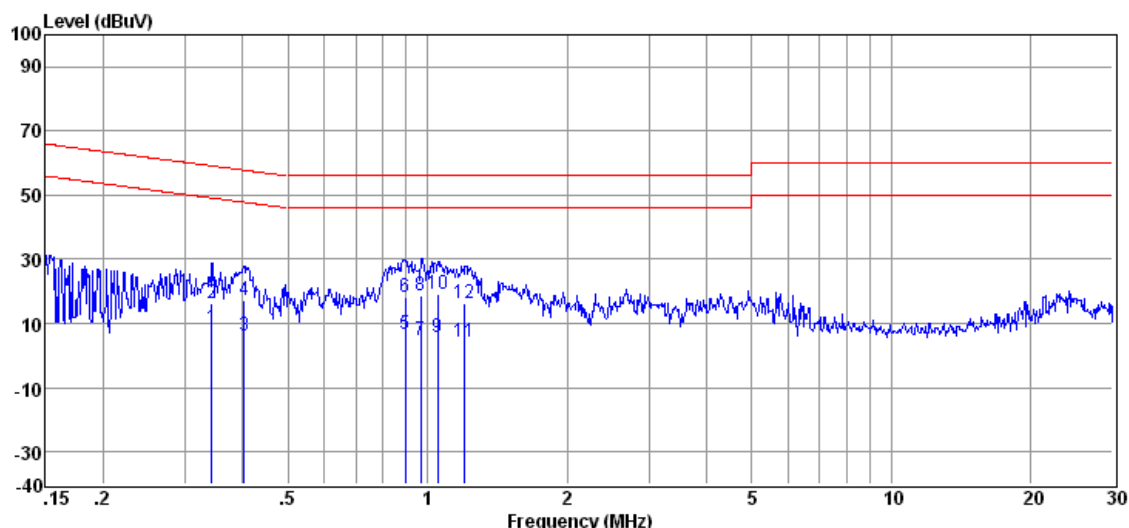
L line:



| Item   | Freq. | Read Level | LISN Factor | Cable Loss | Level  | Limit Line | Over Limit | Detector |
|--------|-------|------------|-------------|------------|--------|------------|------------|----------|
| (Mark) | (MHz) | (dBμV)     | (dB)        | (dB)       | (dBμV) | (dBμV)     | (dB)       |          |
| 1      | 0.352 | 8.74       | 0.15        | 0.10       | 8.99   | 48.91      | -39.92     | Average  |
| 2      | 0.352 | 22.84      | 0.15        | 0.10       | 23.09  | 58.91      | -35.82     | QP       |
| 3      | 0.406 | 6.43       | 0.17        | 0.10       | 6.70   | 47.73      | -41.03     | Average  |
| 4      | 0.406 | 25.52      | 0.17        | 0.10       | 25.79  | 57.73      | -31.94     | QP       |
| 5      | 0.561 | 0.30       | 0.20        | 0.10       | 0.60   | 46.00      | -45.40     | Average  |
| 6      | 0.561 | 18.94      | 0.20        | 0.10       | 19.24  | 56.00      | -36.76     | QP       |
| 7      | 0.743 | 0.82       | 0.20        | 0.10       | 1.12   | 46.00      | -44.88     | Average  |
| 8      | 0.743 | 17.29      | 0.20        | 0.10       | 17.59  | 56.00      | -38.41     | QP       |
| 9      | 0.853 | 5.51       | 0.20        | 0.10       | 5.81   | 46.00      | -40.19     | Average  |
| 10     | 0.853 | 17.68      | 0.20        | 0.10       | 17.98  | 56.00      | -38.02     | QP       |
| 11     | 1.111 | 5.01       | 0.21        | 0.10       | 5.32   | 46.00      | -40.68     | Average  |
| 12     | 1.111 | 16.94      | 0.21        | 0.10       | 17.25  | 56.00      | -38.75     | QP       |



N Line:



| Item   | Freq. | Read Level | LISN Factor | Cable Loss | Level  | Limit Line | Over Limit | Detector |
|--------|-------|------------|-------------|------------|--------|------------|------------|----------|
| (Mark) | (MHz) | (dBμV)     | (dB)        | (dB)       | (dBμV) | (dBμV)     | (dB)       |          |
| 1      | 0.343 | 8.30       | 0.10        | 0.10       | 8.50   | 49.13      | -40.63     | Average  |
| 2      | 0.343 | 16.14      | 0.10        | 0.10       | 16.34  | 59.13      | -42.79     | QP       |
| 3      | 0.402 | 6.13       | 0.10        | 0.10       | 6.33   | 47.81      | -41.48     | Average  |
| 4      | 0.402 | 17.24      | 0.10        | 0.10       | 17.44  | 57.81      | -40.37     | QP       |
| 5      | 0.894 | 6.39       | 0.20        | 0.10       | 6.69   | 46.00      | -39.31     | Average  |
| 6      | 0.894 | 18.09      | 0.20        | 0.10       | 18.39  | 56.00      | -37.61     | QP       |
| 7      | 0.968 | 4.60       | 0.20        | 0.10       | 4.90   | 46.00      | -41.10     | Average  |
| 8      | 0.968 | 18.20      | 0.20        | 0.10       | 18.50  | 56.00      | -37.50     | QP       |
| 9      | 1.054 | 5.29       | 0.21        | 0.10       | 5.60   | 46.00      | -40.40     | Average  |
| 10     | 1.054 | 19.01      | 0.21        | 0.10       | 19.32  | 56.00      | -36.68     | QP       |
| 11     | 1.203 | 3.74       | 0.23        | 0.10       | 4.07   | 46.00      | -41.93     | Average  |
| 12     | 1.203 | 16.15      | 0.23        | 0.10       | 16.48  | 56.00      | -39.52     | QP       |



## 7.4 20dB Occupied Bandwidth

**Test Requirement:** FCC Part 15 C Section 15.247 (a)(1)

**Test Method:** ANSI C63.10:2009 Clause 6.9.1

**Test Date:** June 28, 2013

**Final Test Mode:** BT Transmitting mode

**Test Procedure:**

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centered on the hopping channel;
3. Set the spectrum analyzer: RBW  $\geq$  1% of the 20dB bandwidth (set 100kHz). VBW  $\geq$  RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -20dB points.

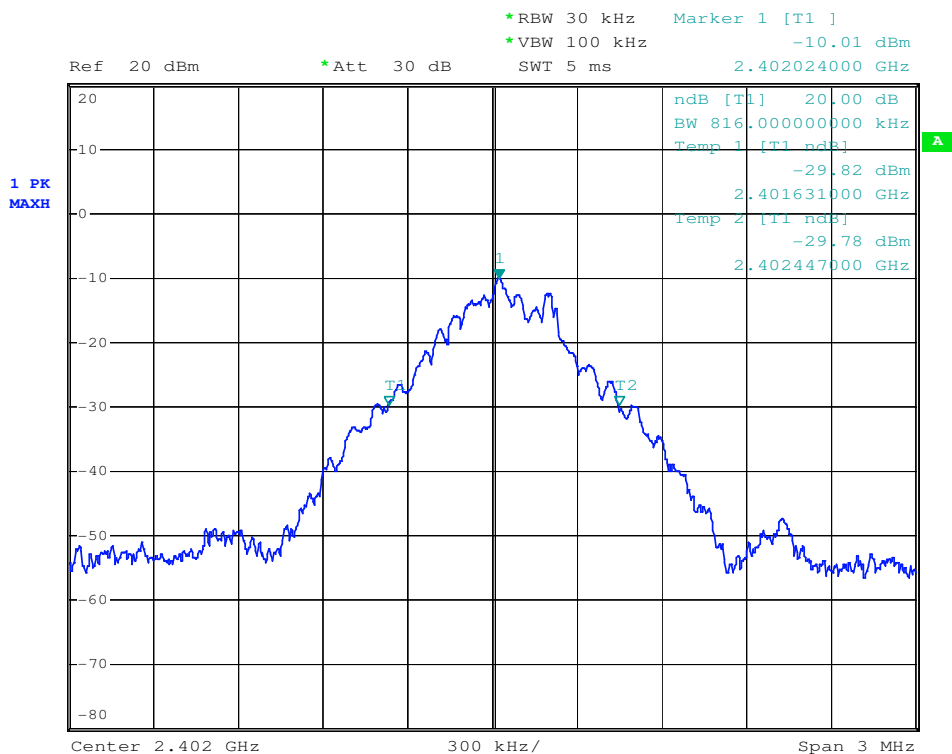
**Test date**

| Test Channel | Channel Frequency (MHz) | Modulation    | Bandwidth(MHz) |
|--------------|-------------------------|---------------|----------------|
| Low          | 2402                    | GFSK          | 0.816          |
| Middle       | 2441                    | GFSK          | 0.810          |
| High         | 2480                    | GFSK          | 0.834          |
| Low          | 2402                    | $\pi/4$ DQPSK | 1.239          |
| Middle       | 2441                    | $\pi/4$ DQPSK | 1.218          |
| High         | 2480                    | $\pi/4$ DQPSK | 1.248          |
| Low          | 2402                    | 8DPSK         | 1.215          |
| Middle       | 2441                    | 8DPSK         | 1.215          |
| High         | 2480                    | 8DPSK         | 1.212          |

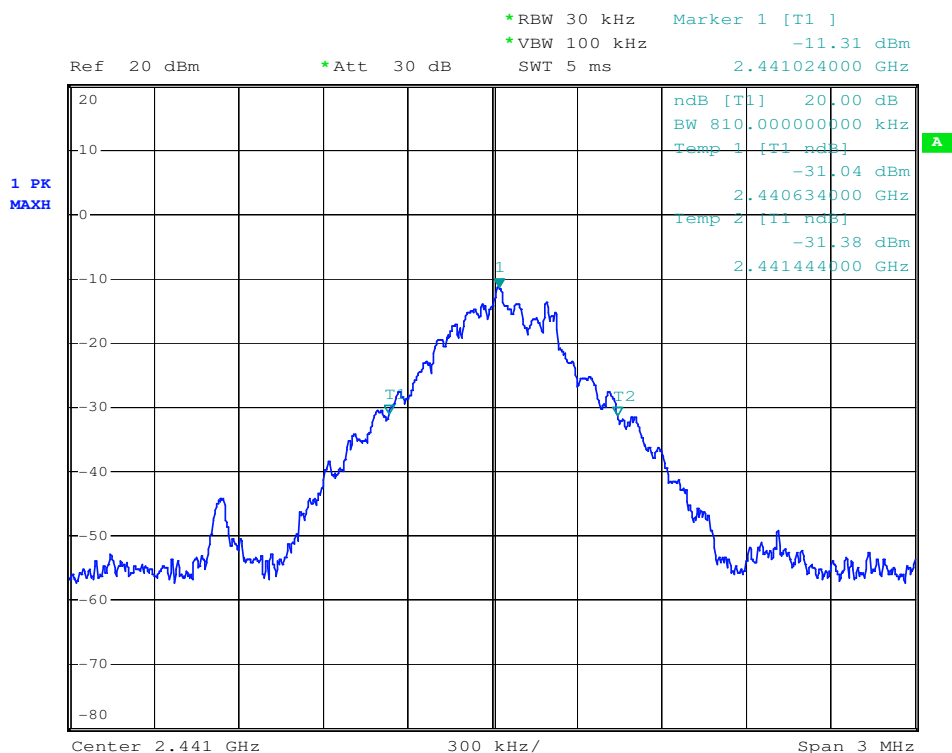


Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|

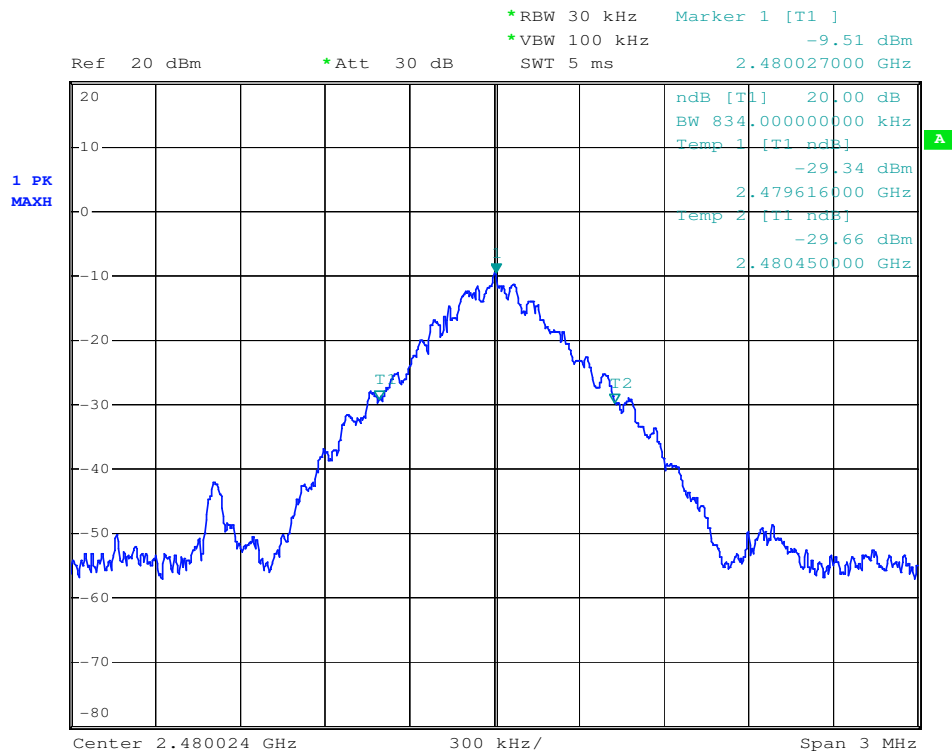


|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|

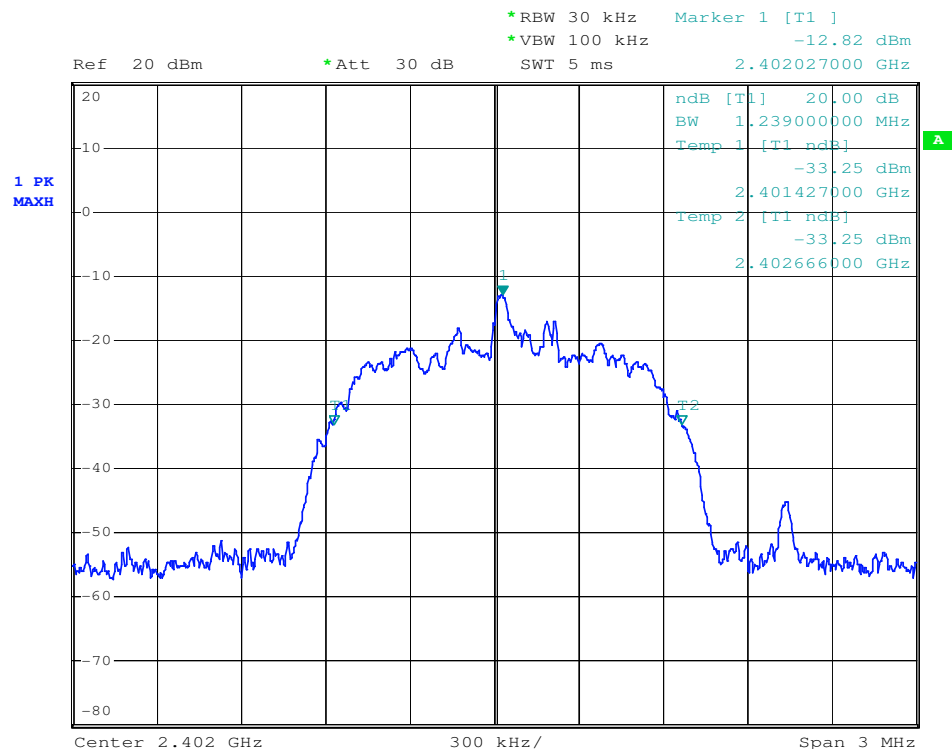




|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|



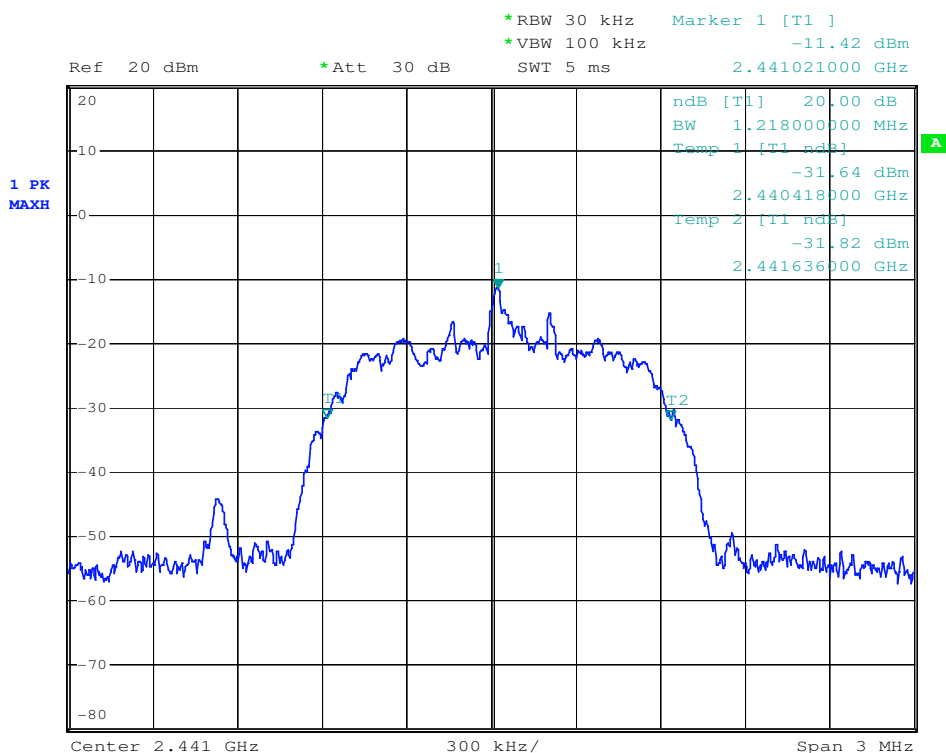
|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Lowest |
|------------|---------------|---------------|--------|



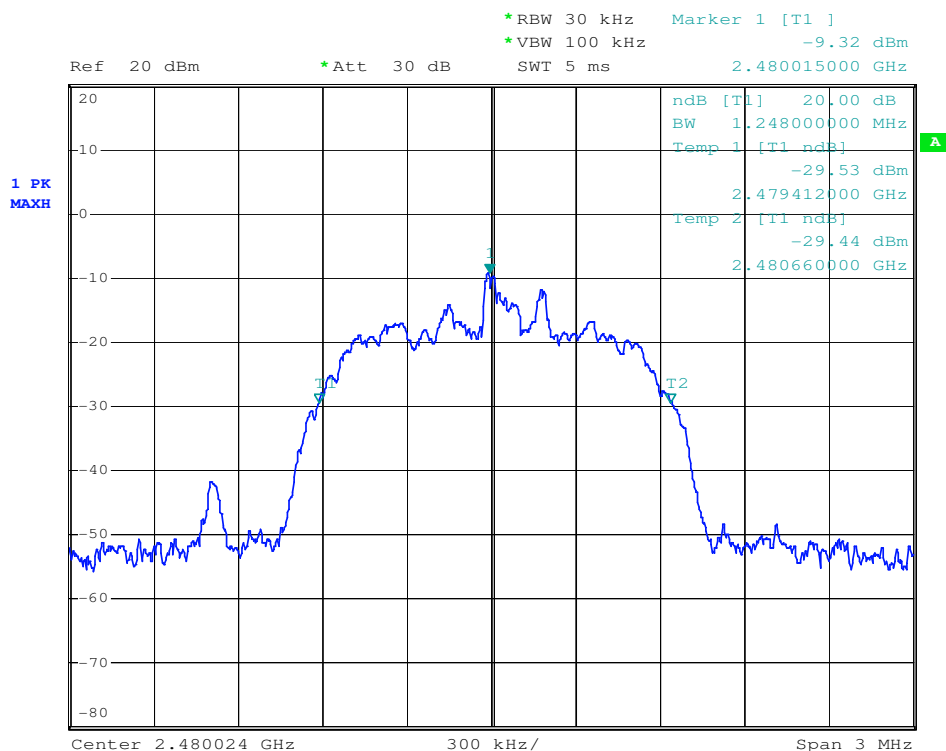




|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Middle |
|------------|---------------|---------------|--------|

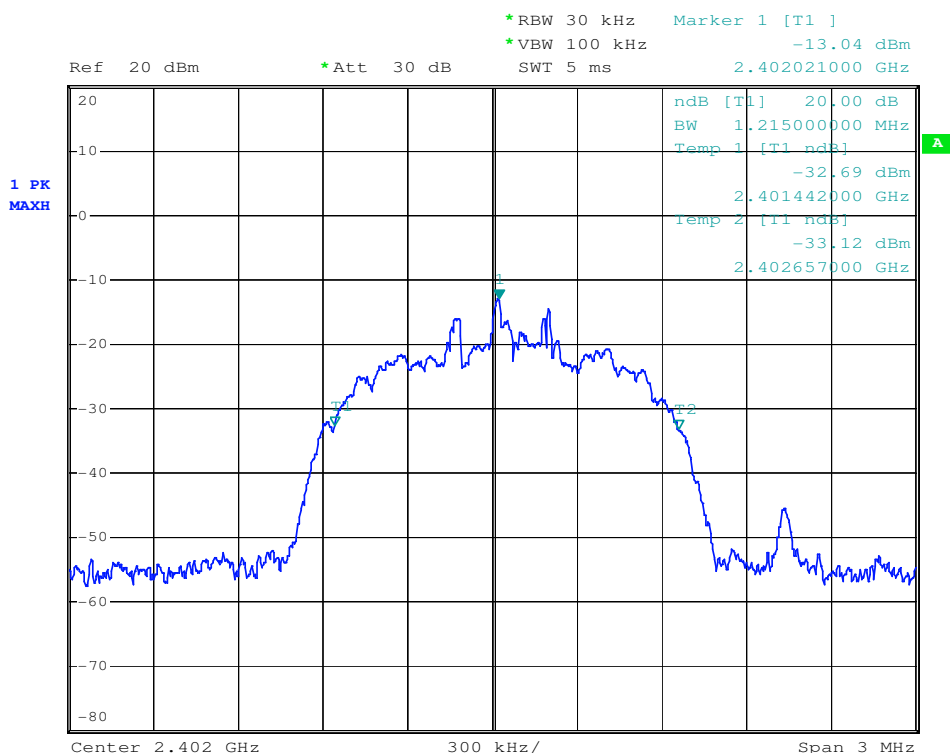


|            |               |               |         |
|------------|---------------|---------------|---------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Highest |
|------------|---------------|---------------|---------|

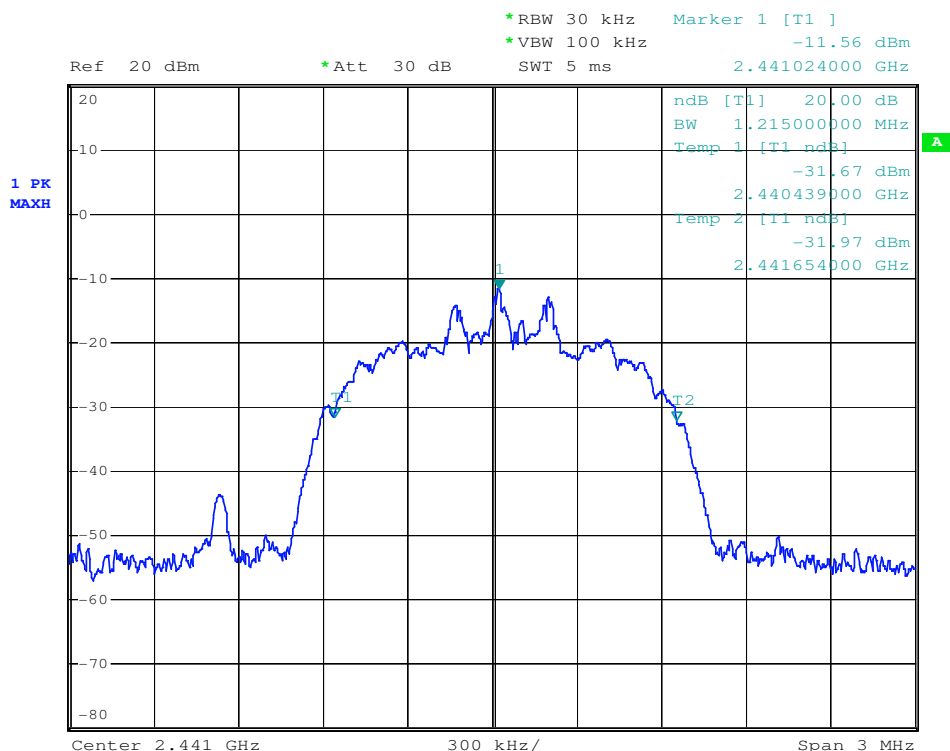




|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Lowest |
|------------|-------|---------------|--------|

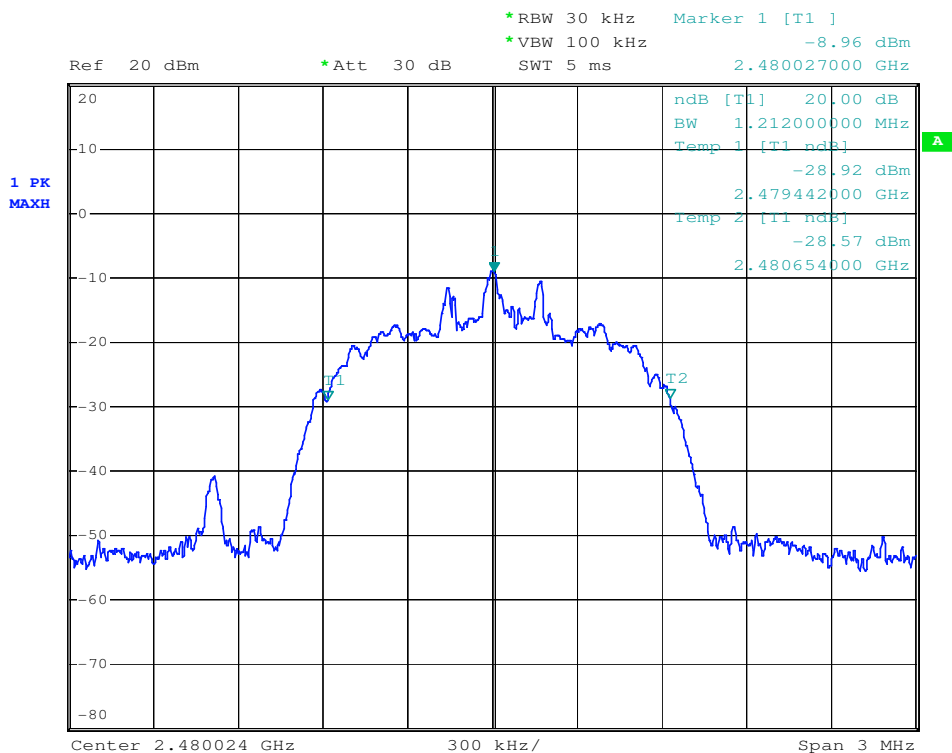


|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Middle |
|------------|-------|---------------|--------|



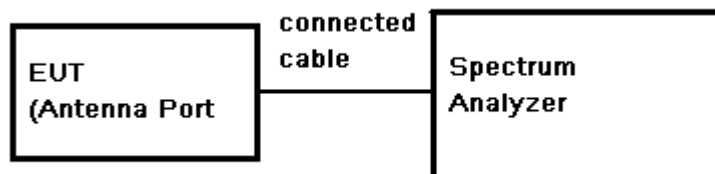


|            |       |               |         |
|------------|-------|---------------|---------|
| Test mode: | 8DPSK | Test channel: | Highest |
|------------|-------|---------------|---------|



## 7.5 Conducted Peak Output Power

|                            |   |
|----------------------------|---|
| <b>Test Requirement:</b>   | FCC Part 15.247 Section 15.247(b)(1)  |
| <b>Test Method:</b>        | ANSI C64.10:2009 Section 6.10.1   |
| <b>Test Date:</b>          | June 28, 2013   |
| <b>Test Result:</b>        | Pass  |
| <b>Test Limit:</b>         | Regulation 15.247 (b)(1) For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.<br>Refer to the result "Hopping channel number" of this document. The 0.125 watt (20.0dBm) limit applies. |
| <b>Final Test Mode:</b>    | BT Transmitting mode  |
| <b>Test Configuration:</b> |   |



### Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3 MHz, VBW = 10 MHz, Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, middle and highest channel individually. Record the max value.



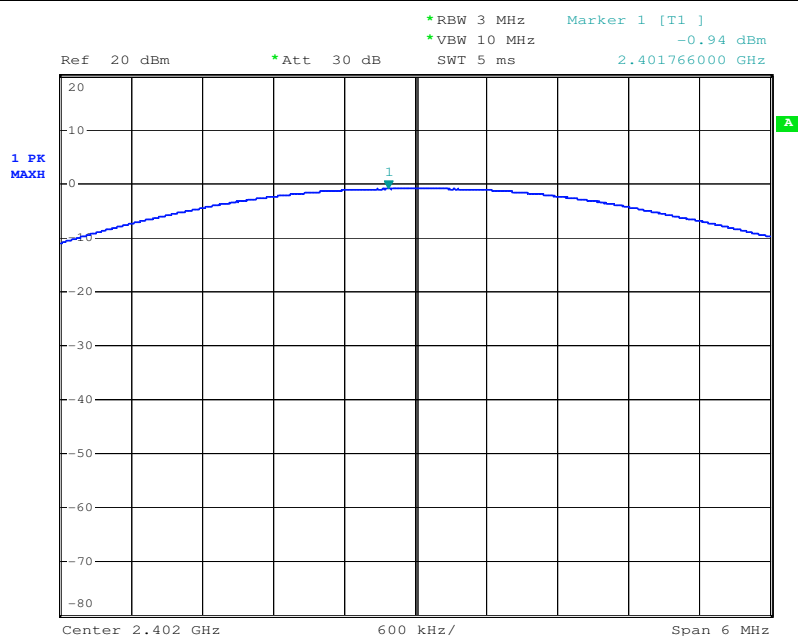
**Test Results record:**

| Test Channel | Modulation    | Fundamental Frequency (MHz) | Reading Power (dBm) | Cable Loss (dB) | Output Peak Power(dBm) | Limit (dBm) | Margin (dB) |
|--------------|---------------|-----------------------------|---------------------|-----------------|------------------------|-------------|-------------|
| Lowest       | GFSK          | 2402                        | -0.94               | 1.5             | 0.56                   | 20          | 19.44       |
| Middle       | GFSK          | 2441                        | -2.89               | 1.5             | -1.39                  | 20          | 21.39       |
| Highest      | GFSK          | 2480                        | -3.87               | 1.5             | -2.37                  | 20          | 22.37       |
| Lowest       | $\pi/4$ DQPSK | 2402                        | -0.88               | 1.5             | 0.62                   | 20          | 19.38       |
| Middle       | $\pi/4$ DQPSK | 2441                        | -1.97               | 1.5             | -0.47                  | 20          | 20.47       |
| Highest      | $\pi/4$ DQPSK | 2480                        | -2.92               | 1.5             | -1.42                  | 20          | 21.42       |
| Lowest       | 8DPSK         | 2402                        | -0.85               | 1.5             | 0.65                   | 20          | 19.35       |
| Middle       | 8DPSK         | 2441                        | -1.91               | 1.5             | -0.41                  | 20          | 20.41       |
| Highest      | 8DPSK         | 2480                        | -2.83               | 1.5             | -1.33                  | 20          | 21.33       |

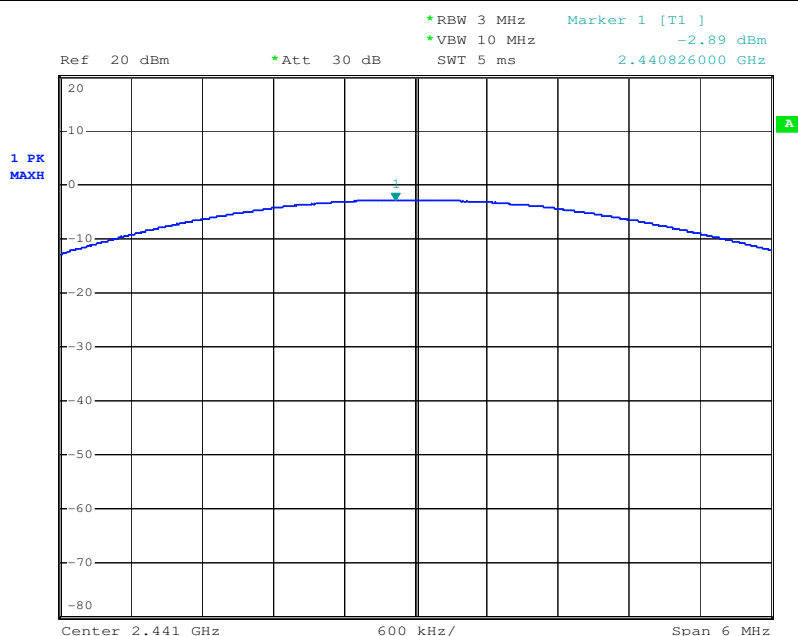


Test result plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|

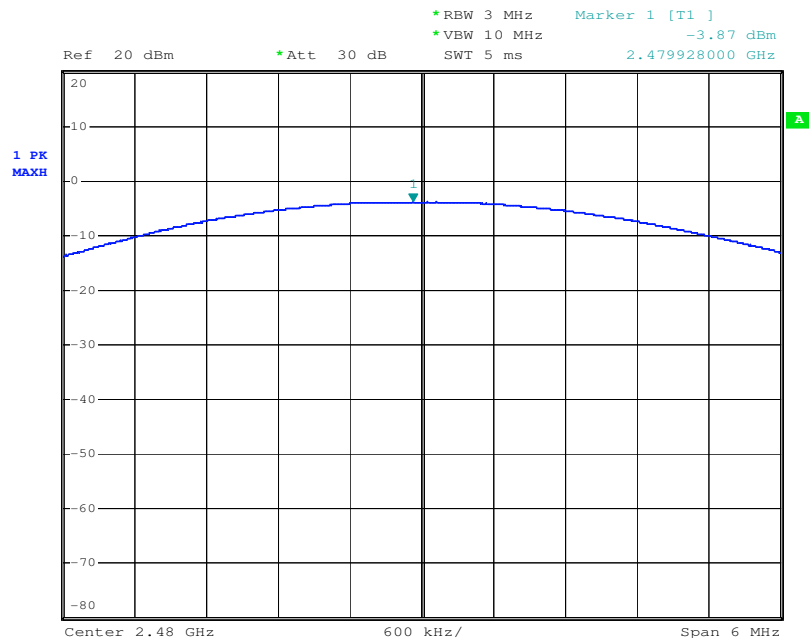


|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|

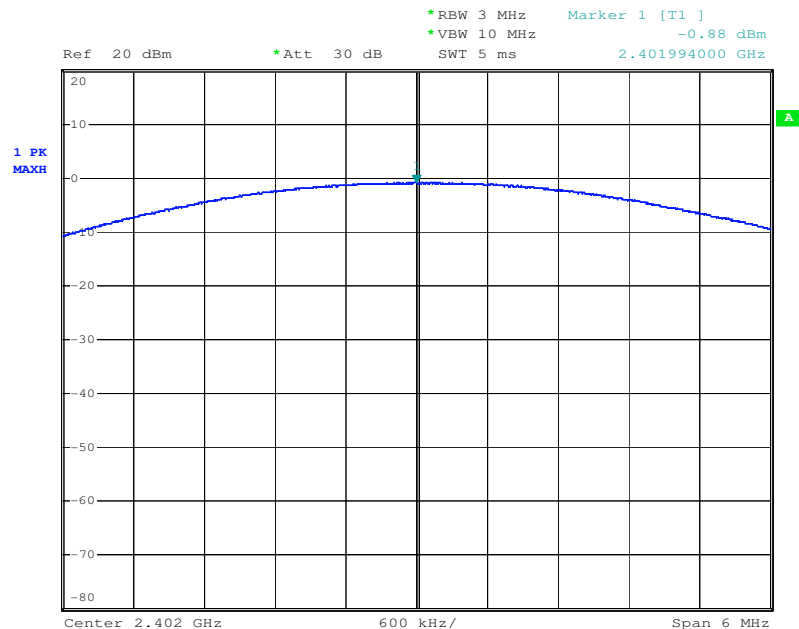




|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|

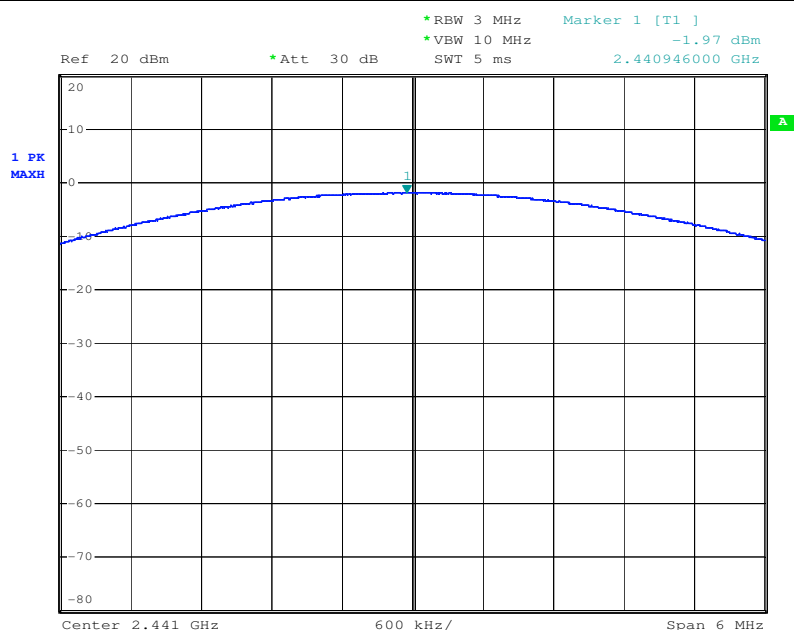


|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Lowest |
|------------|---------------|---------------|--------|

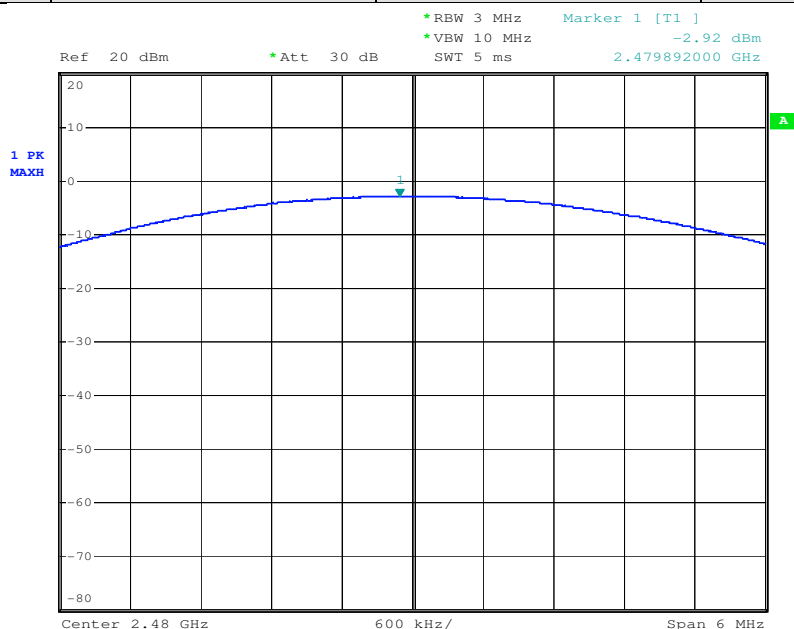




|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Middle |
|------------|---------------|---------------|--------|



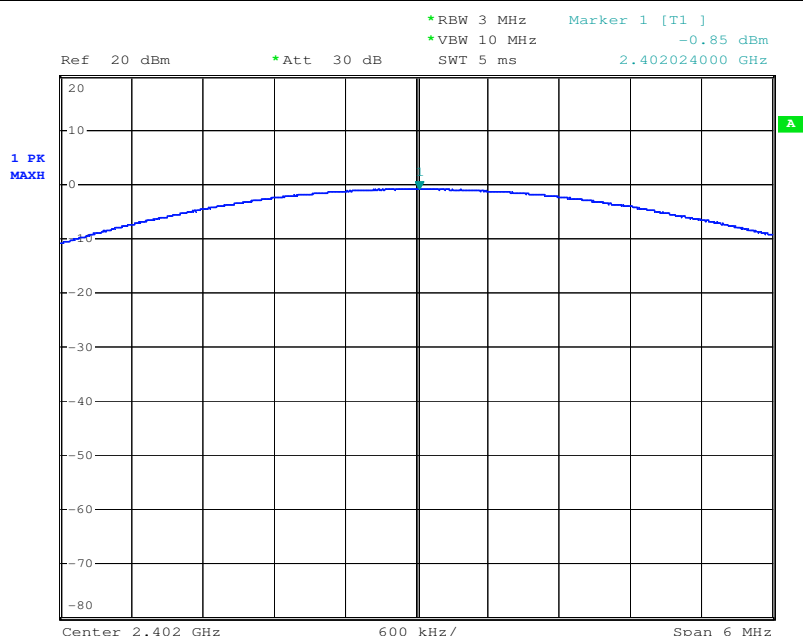
|            |               |               |         |
|------------|---------------|---------------|---------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Highest |
|------------|---------------|---------------|---------|



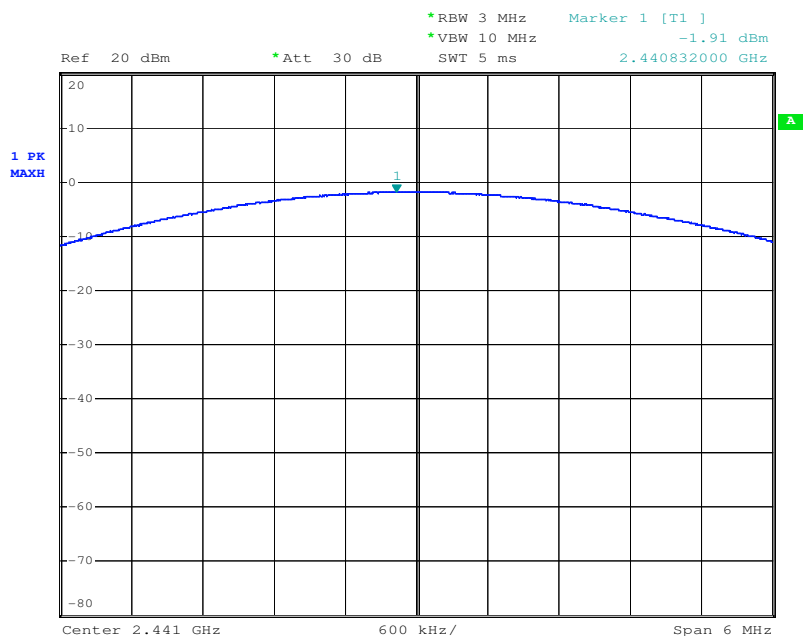




|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Lowest |
|------------|-------|---------------|--------|

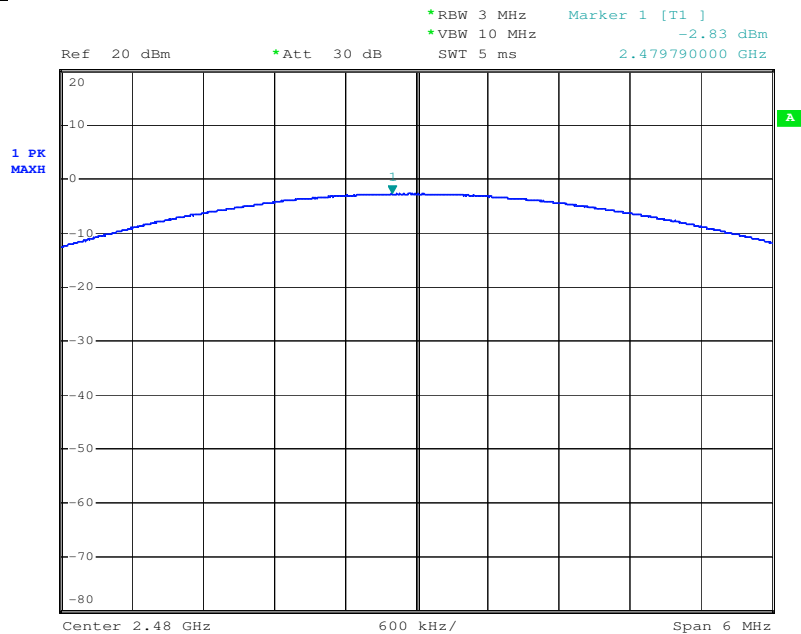


|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Middle |
|------------|-------|---------------|--------|





|            |       |               |         |
|------------|-------|---------------|---------|
| Test mode: | 8DPSK | Test channel: | Highest |
|------------|-------|---------------|---------|





## 7.6 Carrier Frequencies Separated

**Test Requirement:** FCC Part 15 C Section 15.247 (a)(1)  
**Test Method:** ANSI C63.10:2009 Clause 7.7.2  
**Test Date:** June 28, 2013  
**Limit:** 0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)  
**Test result:** Pass  
**Final Test Mode:** BT Transmitting mode

### Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW  $\geq$  1% of the span (set 100 kHz). VBW  $\geq$  RBW , Span = 3MHz. Sweep = auto; Detector Function = Peak. Trace = Max,hold.
3. 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.

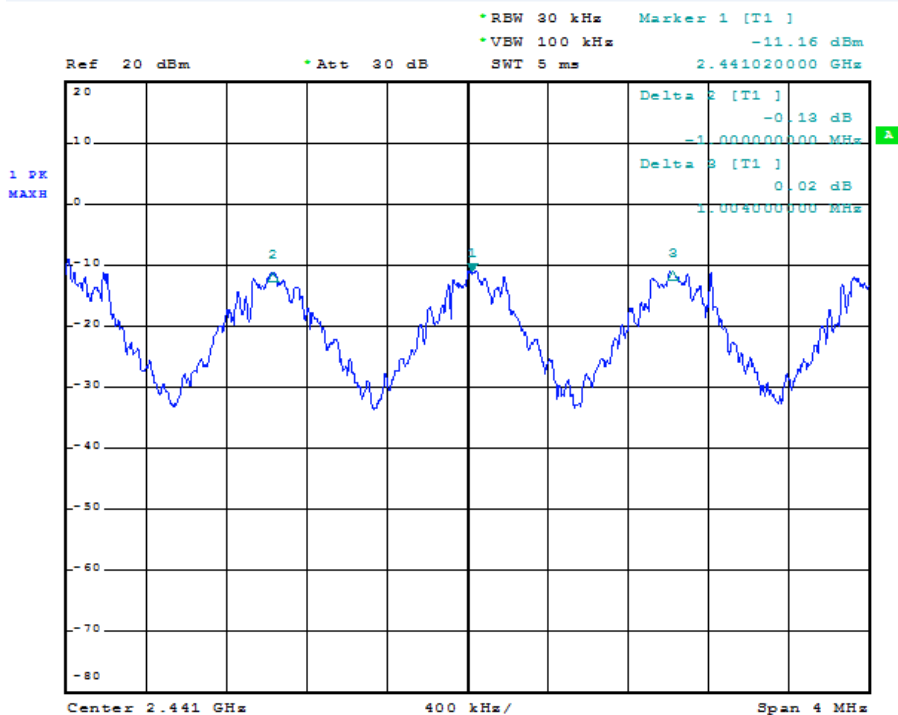
| Test Channel                                   | Modulation    | Carrier<br>Frequencies<br>Separated (MHz) | Limit<br>(25kHz or two-<br>thirds of the 20<br>dB bandwidth) | Results |
|--|---------------|---|--|---------|
| Middle Channels<br>(channel 39 and channel 40) | 8DPSK         | 1.000                                     | 25kHz/556kHz   | PASS    |
| Middle Channels<br>(channel 39 and channel 40) | GFSK          | 1.004                                     | 25kHz/832kHz   | PASS    |
| Middle Channels<br>(channel 39 and channel 40) | $\pi$ /4DQPSK | 1.000                                     | 25kHz/810kHz   | PASS    |

Note: 20dB bandwidth reference Section 7.4

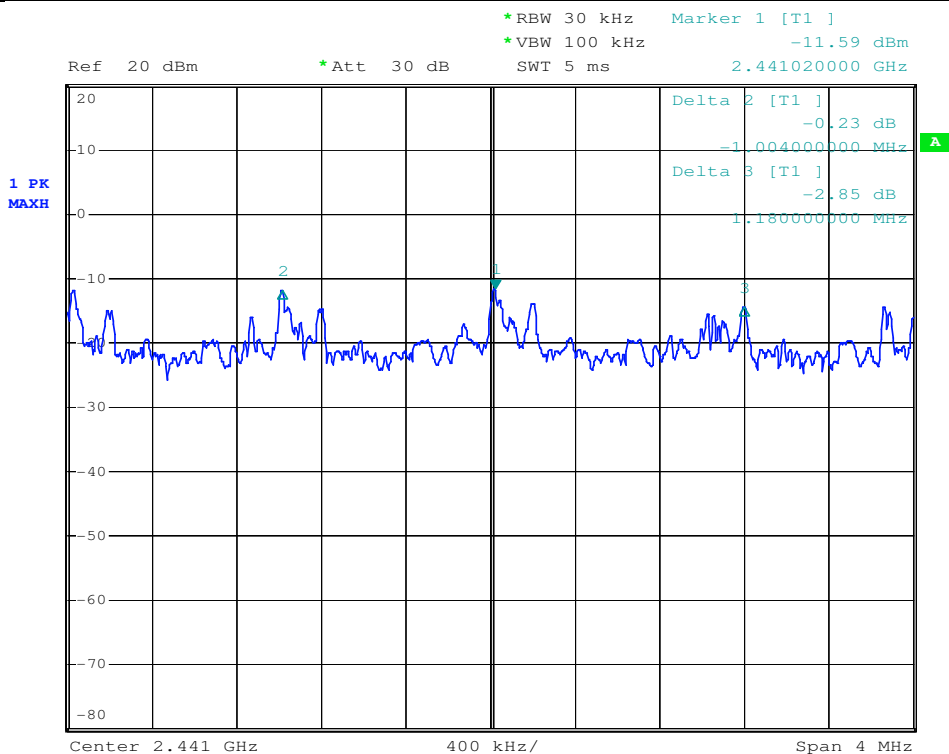


Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|

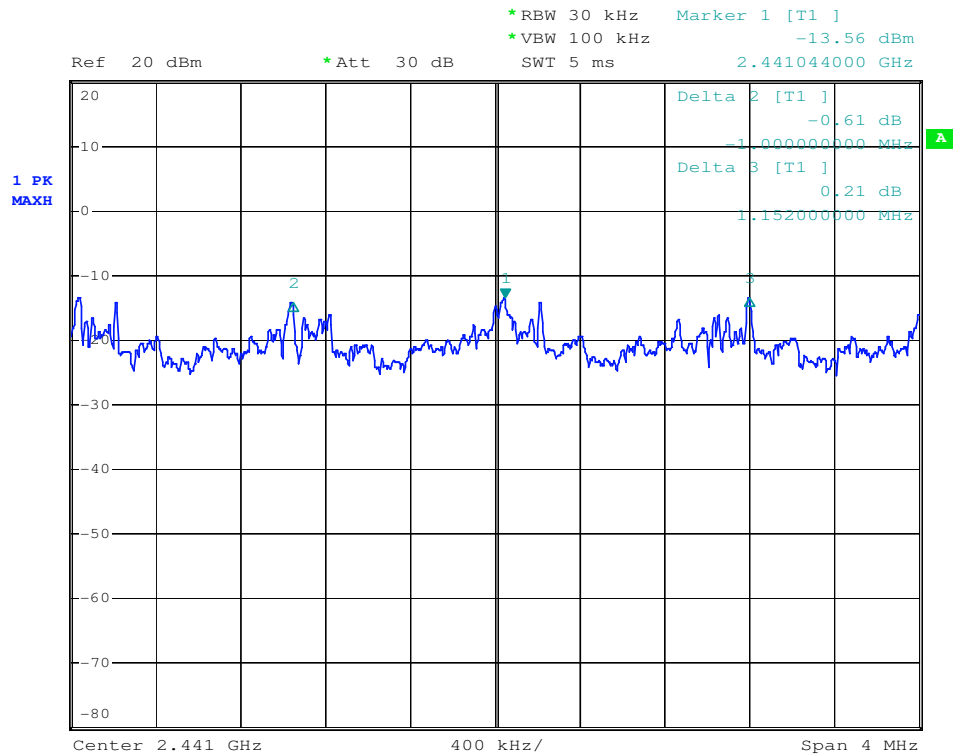


|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Middle |
|------------|---------------|---------------|--------|





|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Middle |
|------------|-------|---------------|--------|





## 7.7 Hopping Channel Number

**Test Requirement:** FCC Part15 C Section 15.247(b)

**Test Method:** ANSI C63.10:2009 Clause 7.7.3

**Test Date:** June 28, 2013

**Limit:** At least 15 channels

**Test Result:** Pass

**Test Mode:** BT Transmitting mode

**Test Procedure:**

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 300 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

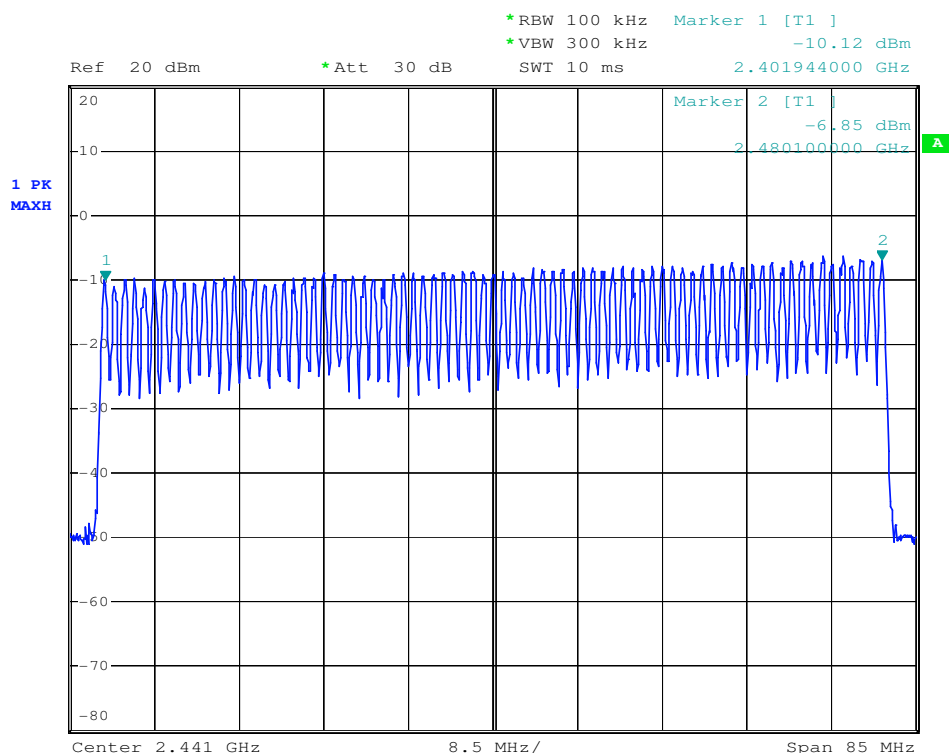
### Measurement Data

| Mode     | Hopping channel numbers | Limit | Results |
|----------|-------------------------|-------|---------|
| 8DPSK    | 79                      | ≥15   | Pass    |
| GFSK     | 79                      | ≥15   | Pass    |
| π/4DQPSK | 79                      | ≥15   | Pass    |

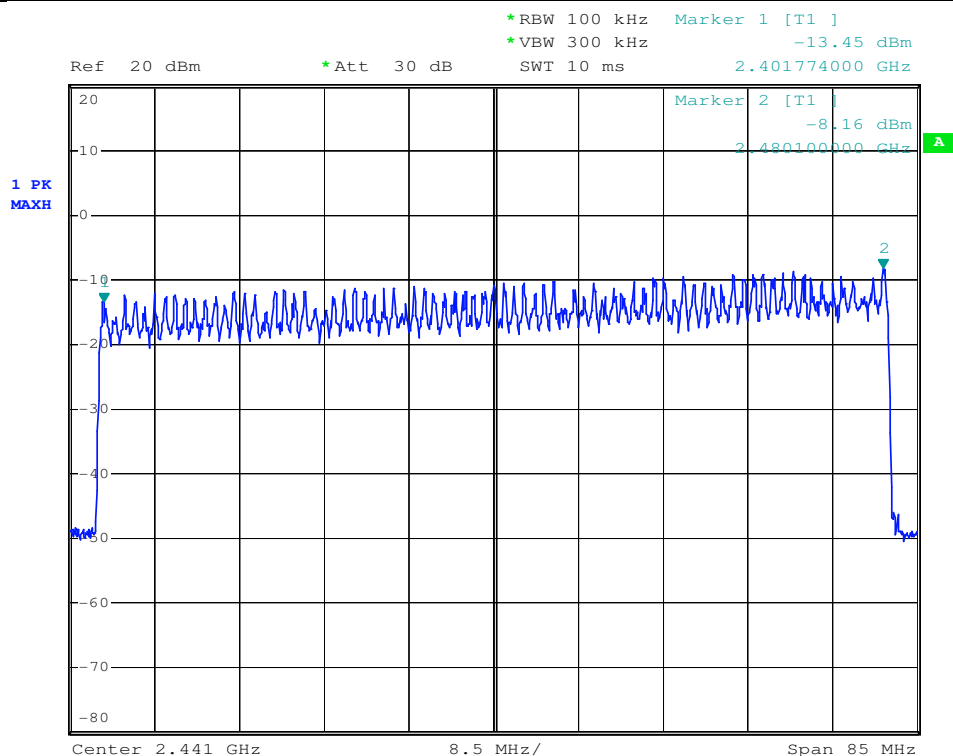


Test plot as follows:

|            |      |  |  |
|------------|------|--|--|
| Test mode: | GFSK |  |  |
|------------|------|--|--|

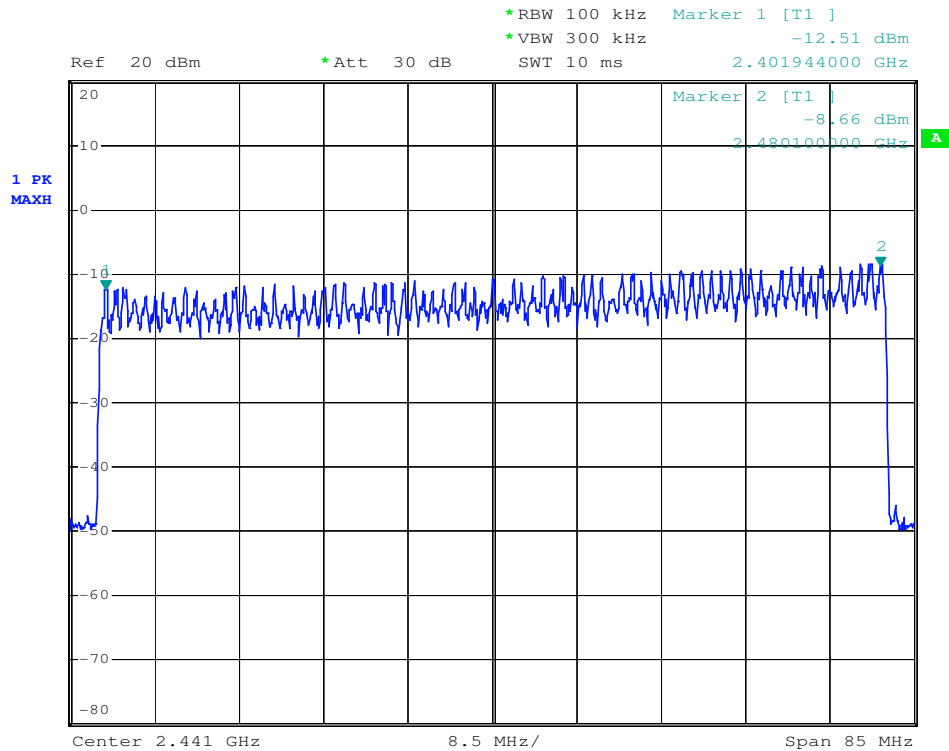


|            |               |  |  |
|------------|---------------|--|--|
| Test mode: | $\pi/4$ DQPSK |  |  |
|------------|---------------|--|--|





|            |       |  |  |
|------------|-------|--|--|
| Test mode: | 8DPSK |  |  |
|------------|-------|--|--|







## 7.8 Dwell Time

|                          |  |
|--------------------------|--|
| <b>Test Requirement:</b> | FCC Part 15 C Section 15.247(a)(1)   |
| <b>Test Method:</b>      | ANSI C63.10:2009 Clause 7.7.4  |
| <b>Test Date:</b>        | June 28, 2013  |
| <b>Limit:</b>            | Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. |
| <b>Test Status:</b>      | Hopping transmitting with all kind of modulation.  |
| <b>Test Result:</b>      | Pass   |
| <b>Test Procedure:</b>   |  |

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set spectrum analyzer span = 0. centered on a hopping channel;
3. Use Emission width\*No. of Hopping Channels in 31.6s to determine the dwell time.

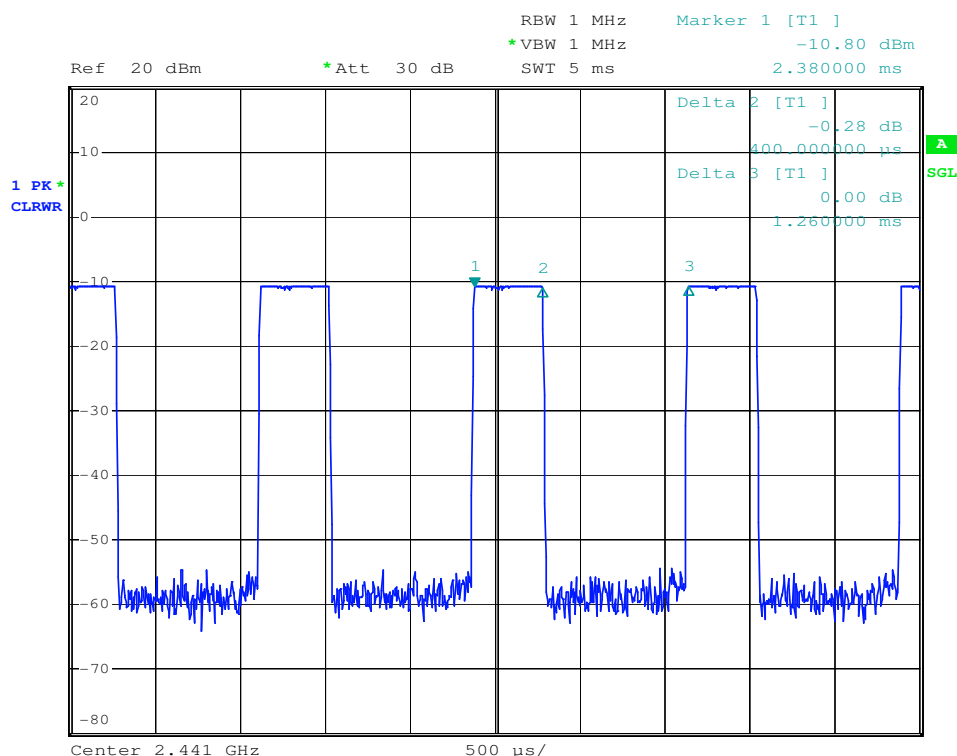
| Frequency (MHz) | Modulation    | Packet | Emission Width (ms) | Number of Hopping Channel in 31.6s | Average Time of Occupancy(s) | Limit(s) | Result |
|-----------------|---------------|--------|---------------------|------------------------------------|------------------------------|----------|--------|
| 2441            | 8DPSK         | DH1    | 0.40                | 201                                | 0.080                        | 0.4      | Pass   |
|                 |               | DH3    | 1.64                | 125                                | 0.205                        | 0.4      | Pass   |
|                 |               | DH5    | 2.90                | 90                                 | 0.261                        | 0.4      | Pass   |
|                 | GFSK          | DH1    | 0.40                | 211                                | 0.084                        | 0.4      | Pass   |
|                 |               | DH3    | 1.63                | 140                                | 0.228                        | 0.4      | Pass   |
|                 |               | DH5    | 2.89                | 88                                 | 0.254                        | 0.4      | Pass   |
|                 | $\pi/4$ DQPSK | DH1    | 0.40                | 164                                | 0.066                        | 0.4      | Pass   |
|                 |               | DH3    | 1.66                | 123                                | 0.204                        | 0.4      | Pass   |
|                 |               | DH5    | 1.70                | 102                                | 0.173                        | 0.4      | Pass   |



Test plot as follows::

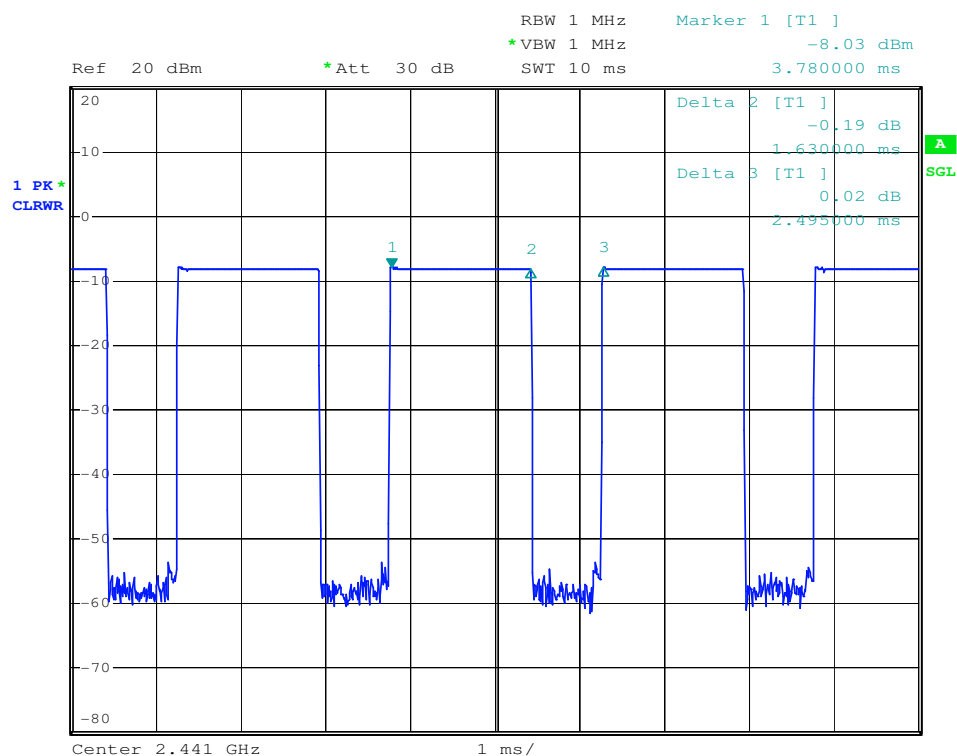
Frequency 2441MHz:

Modulation: GFSK-DH1



Frequency 2441MHz:

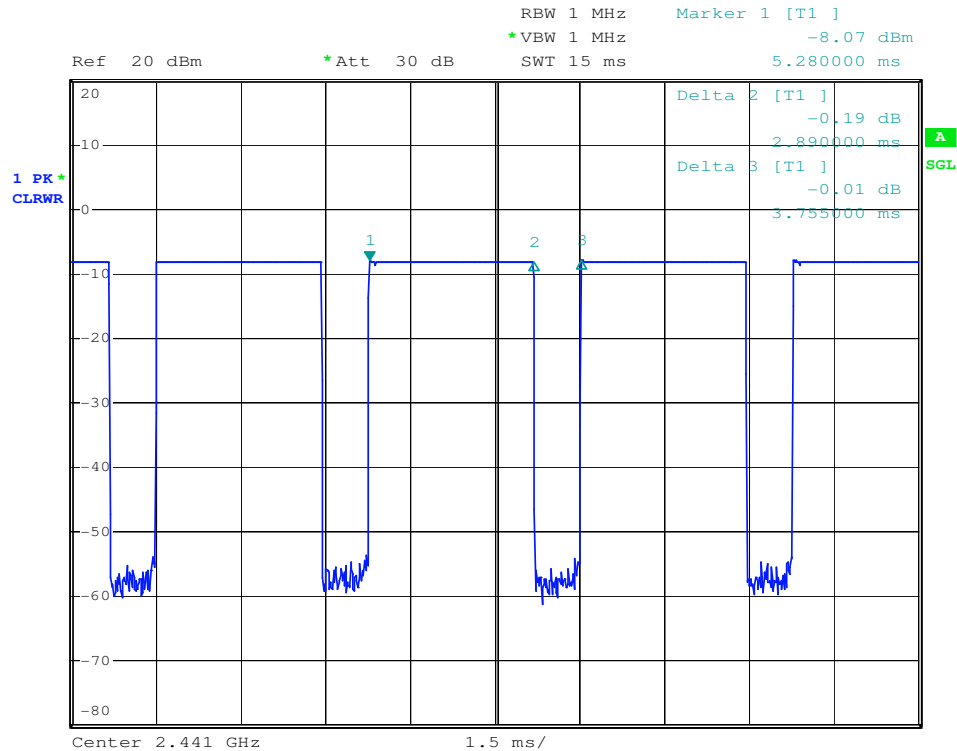
Modulation: GFSK- DH3





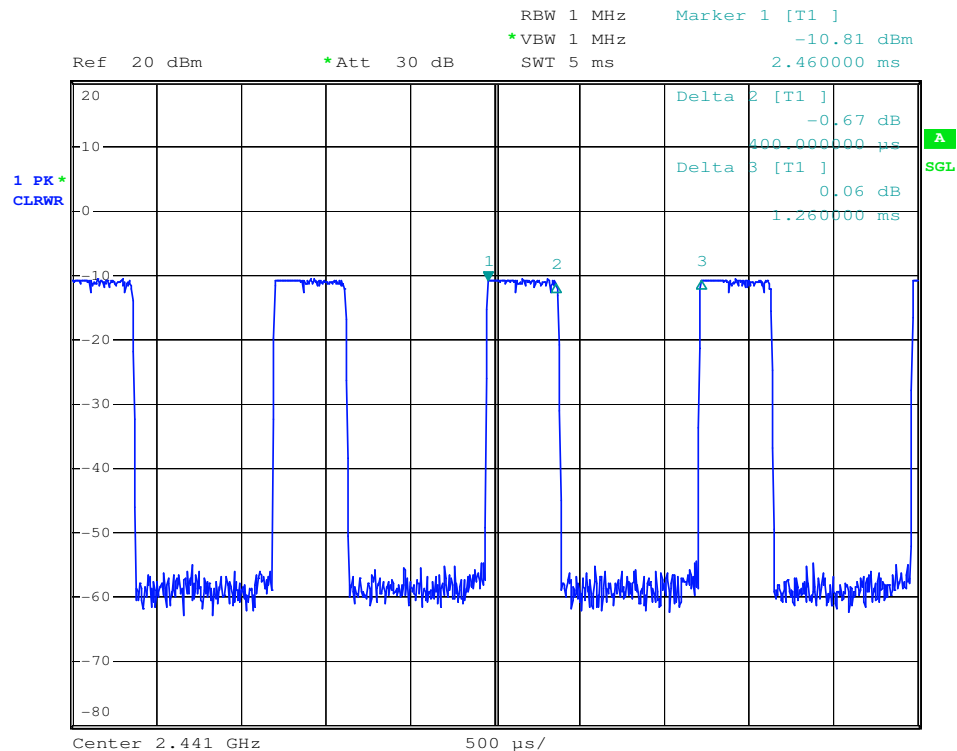
Frequency 2441MHz:

Modulation: GFSK- DH5



Frequency 2441MHz:

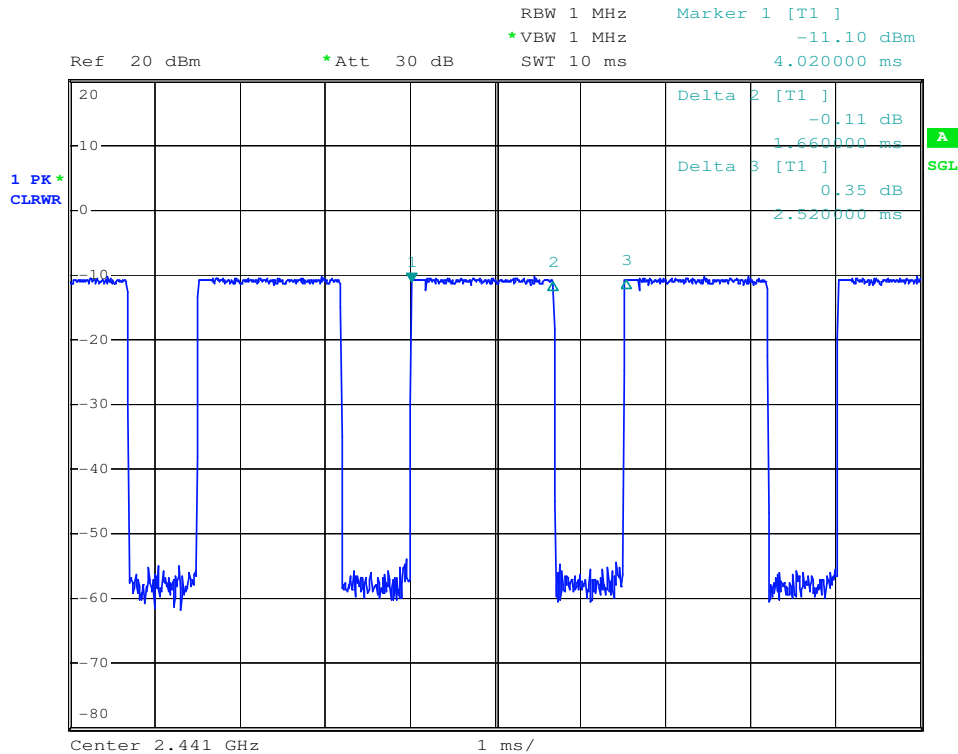
Modulation:  $\pi/4$ DQPSK -DH1





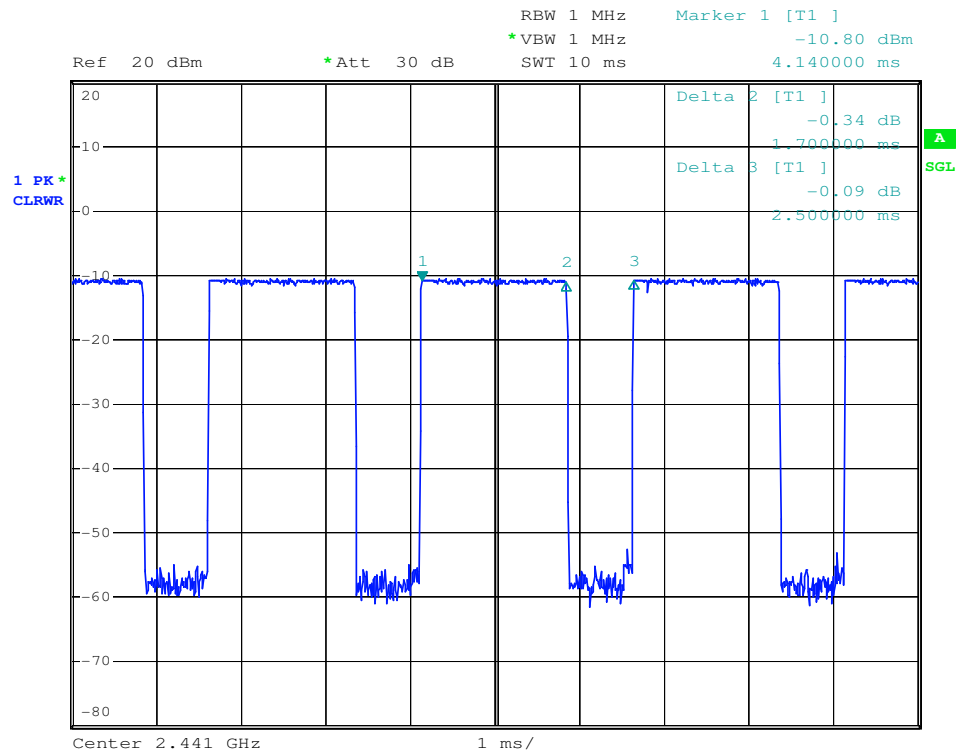
Frequency 2441MHz:

Modulation:  $\pi/4$ DQPSK - DH3



Frequency 2441MHz:

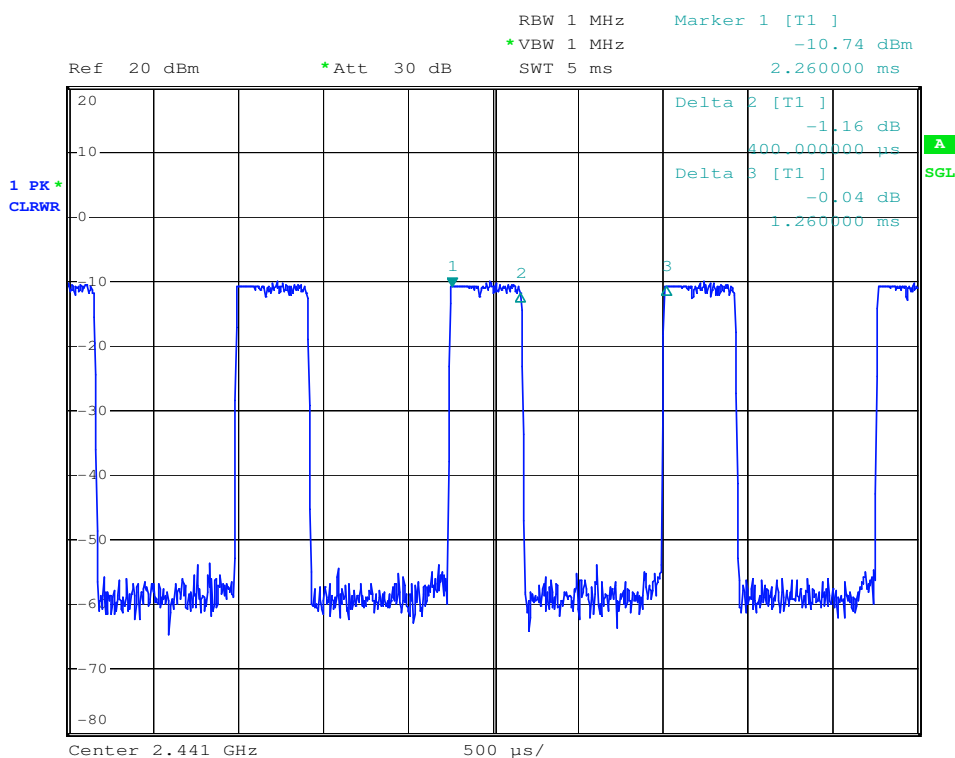
Modulation:  $\pi/4$ DQPSK - DH5





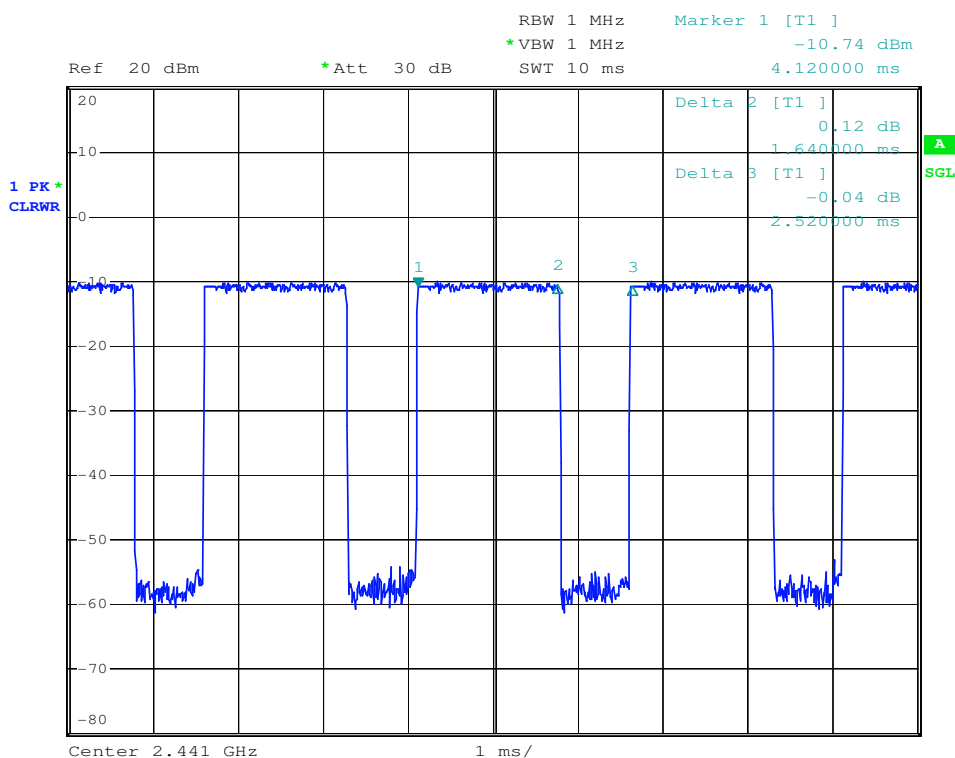
Frequency 2441MHz:

Modulation: 8DPSK –DH1



Frequency 2441MHz:

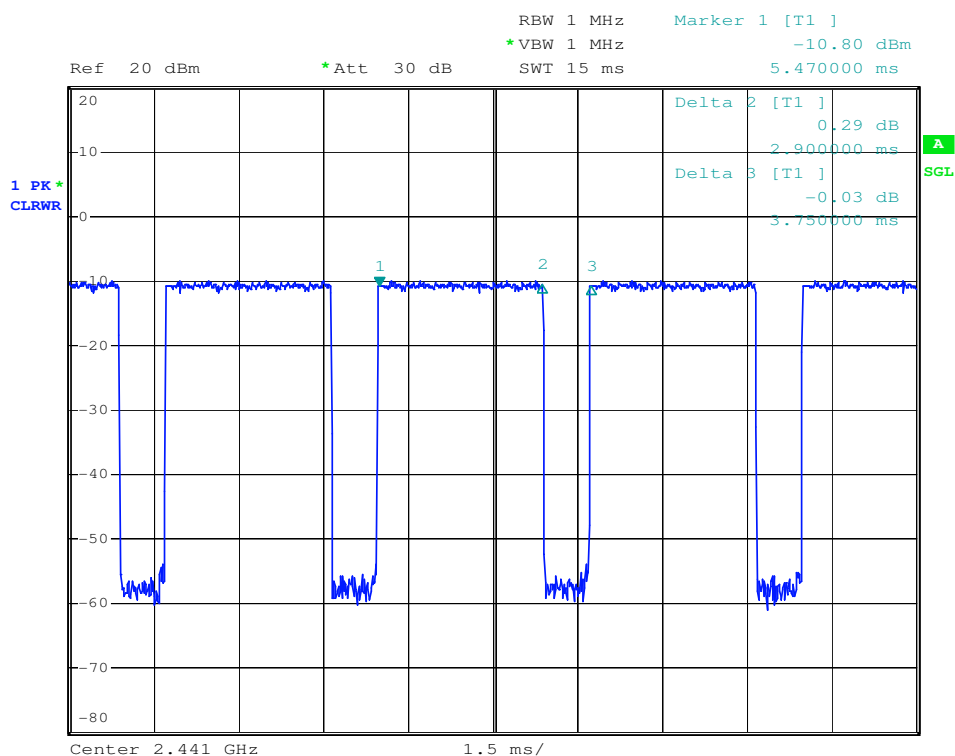
Modulation: 8DPSK - DH3





Frequency 2441MHz:

Modulation: 8DPSK - DH5



## 7.9 Conducted Spurious Emissions

**Test Requirement:** FCC Part 15 Section 15.247(d)

**Test Method:** ANSI C63.10:2009 Clause 7.7.10

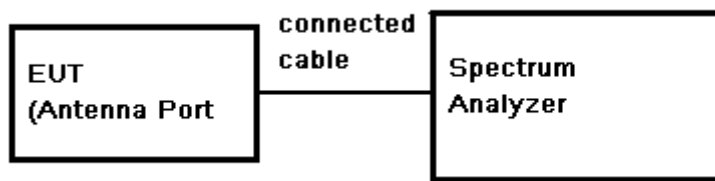
**Test Date:** July 01, 2013

**Limit:** (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.

**Test Status:** Test the lowest. Middle, highest channel.  
Remark: GFSK Modulation mode is the worst case (from the pre-test found GFSK modulation is the worst case).

**Test Result:** Pass

**Test Configuration:**



**Test Procedure:**

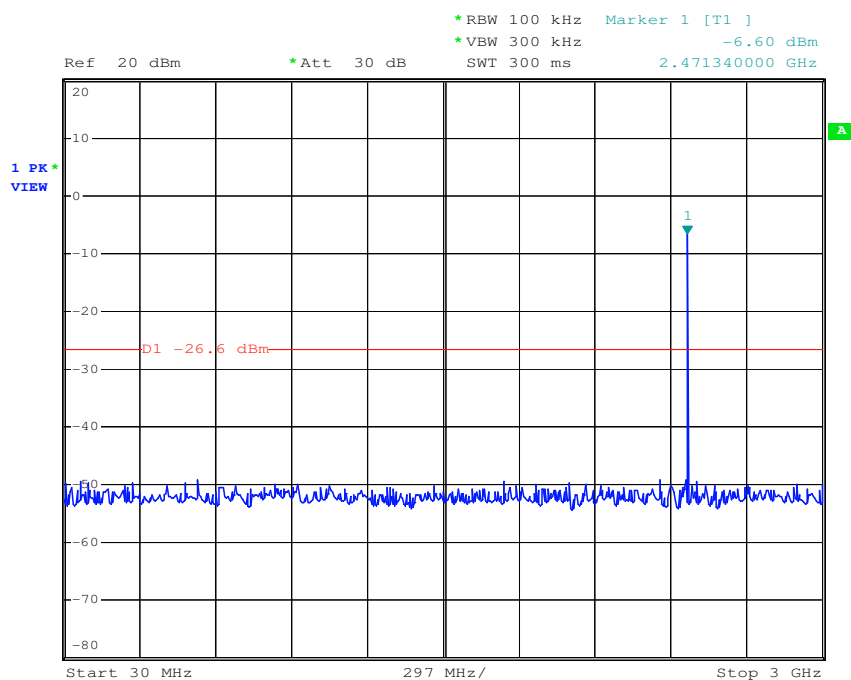
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).



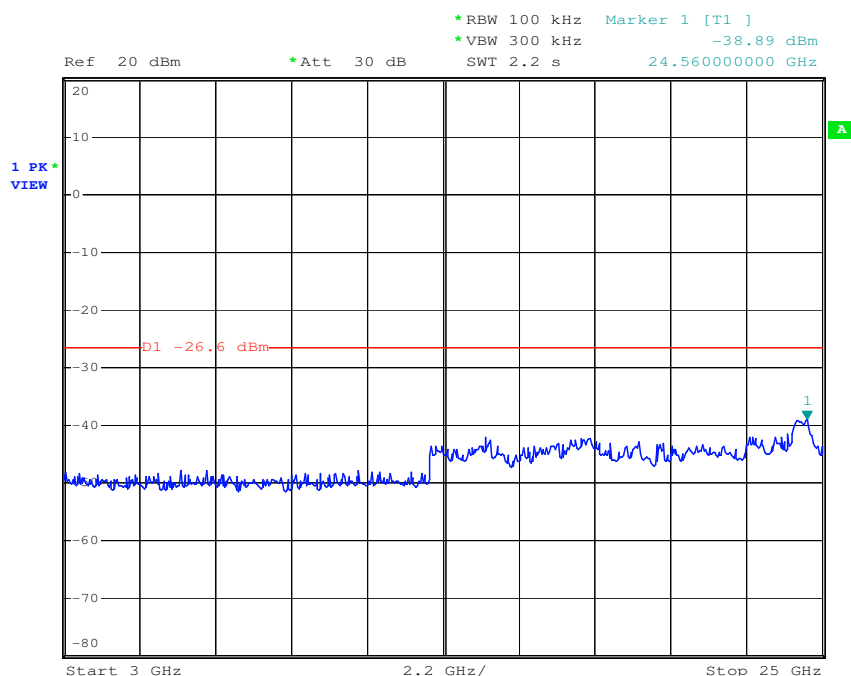
Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|

30MHz-3GHz:



3GHz-25GHz:

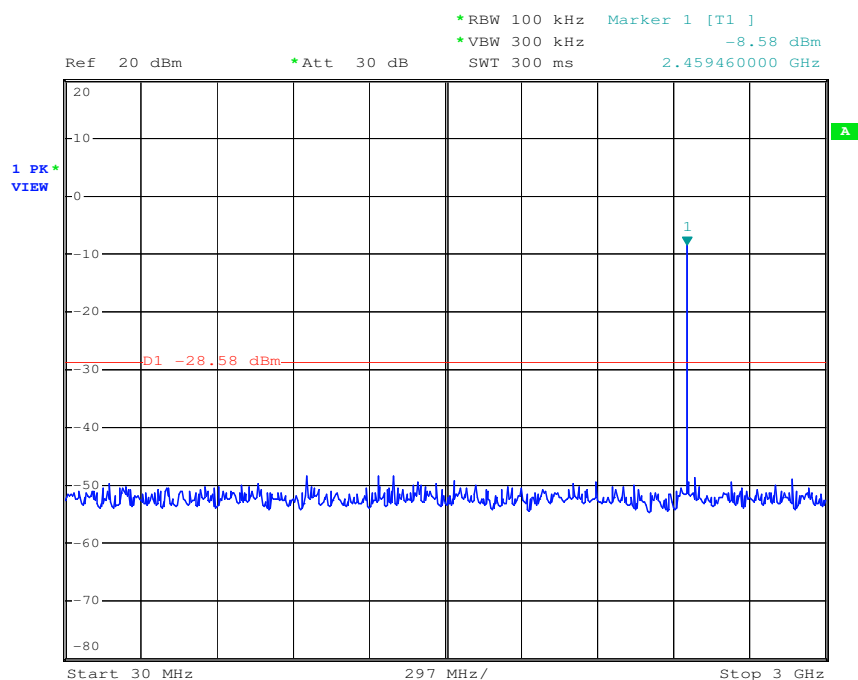




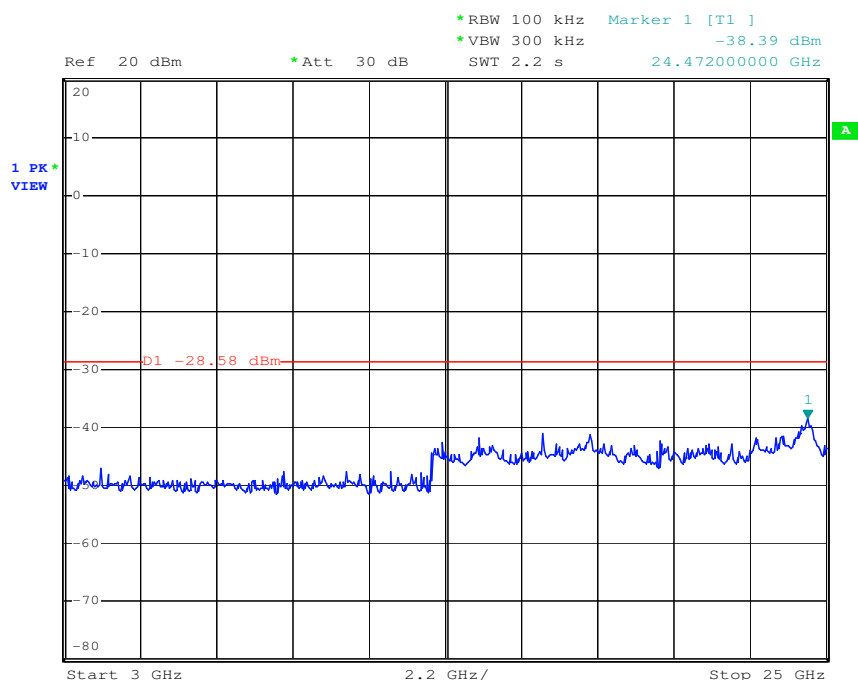


|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Middle |
|------------|------|---------------|--------|

30MHz-3GHz:



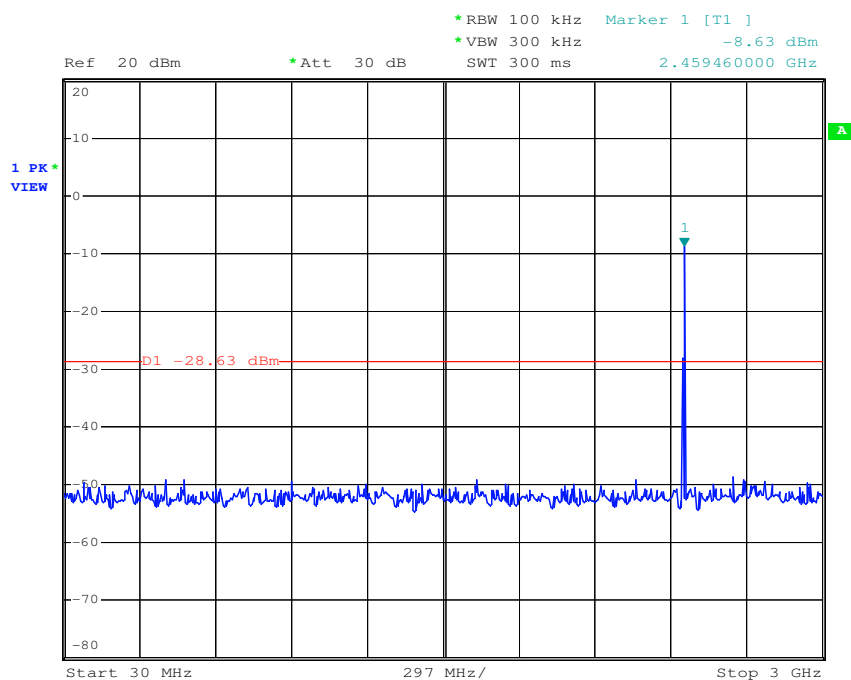
3GHz-25GHz:



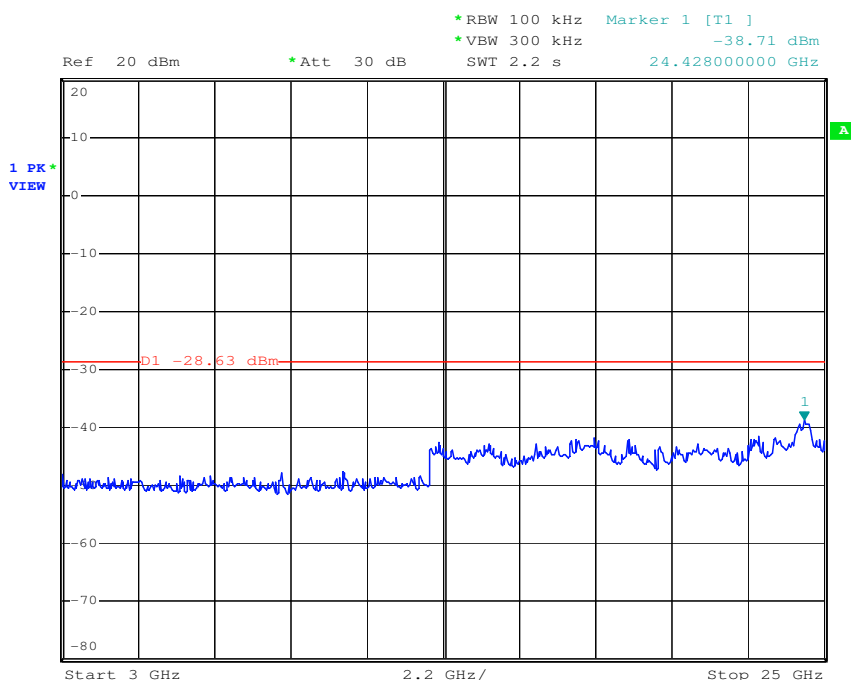


|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|

30MHz-3GHz:

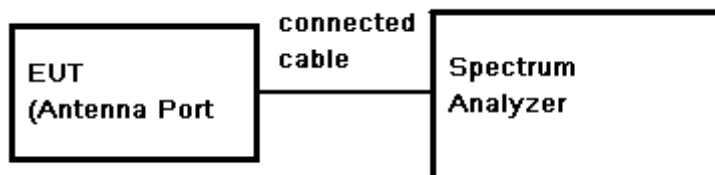


3GHz-25GHz:



## 7.10 Conducted Band-edge

**Test Requirement:** FCC Part 15 Section 15.247(d)  
**Test Method:** ANSI C63.10:2009 Clause 7.7.10  
**Test Date:** July 01, 2013  
**Limit:** (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.  
**Final Test Mode:** BT Transmitting mode  
**Test Result:** Pass  
**Test Configuration:**



**Test Procedure:**

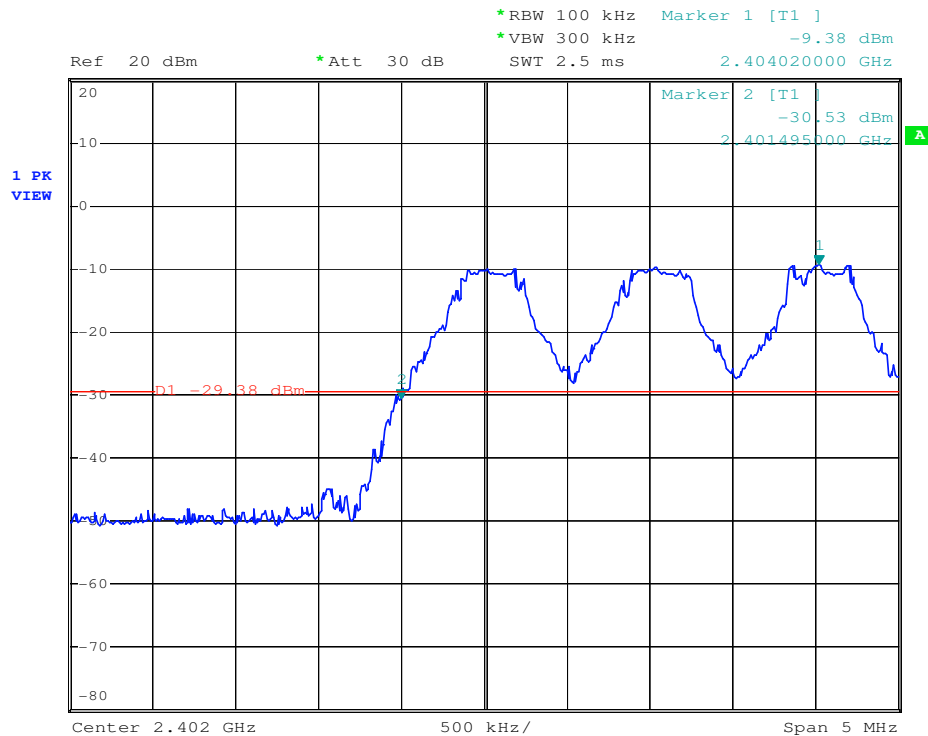
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW >= RBW. Sweep = auto; Detector Function = Peak (Max. hold).



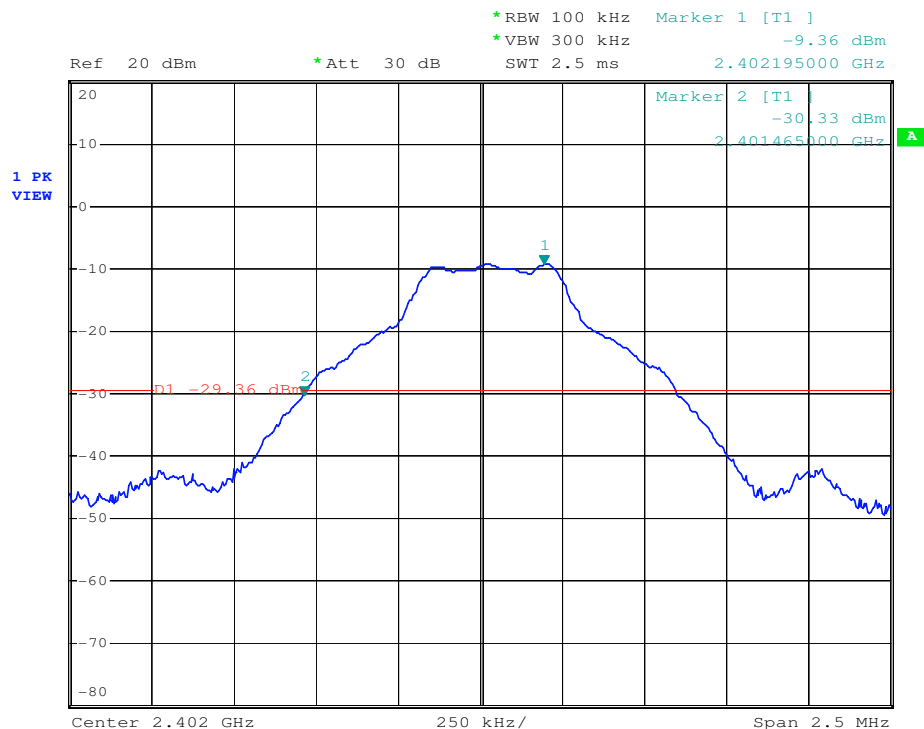
Test plot as follows:

|            |      |               |        |
|------------|------|---------------|--------|
| Test mode: | GFSK | Test channel: | Lowest |
|------------|------|---------------|--------|

For Hopping:



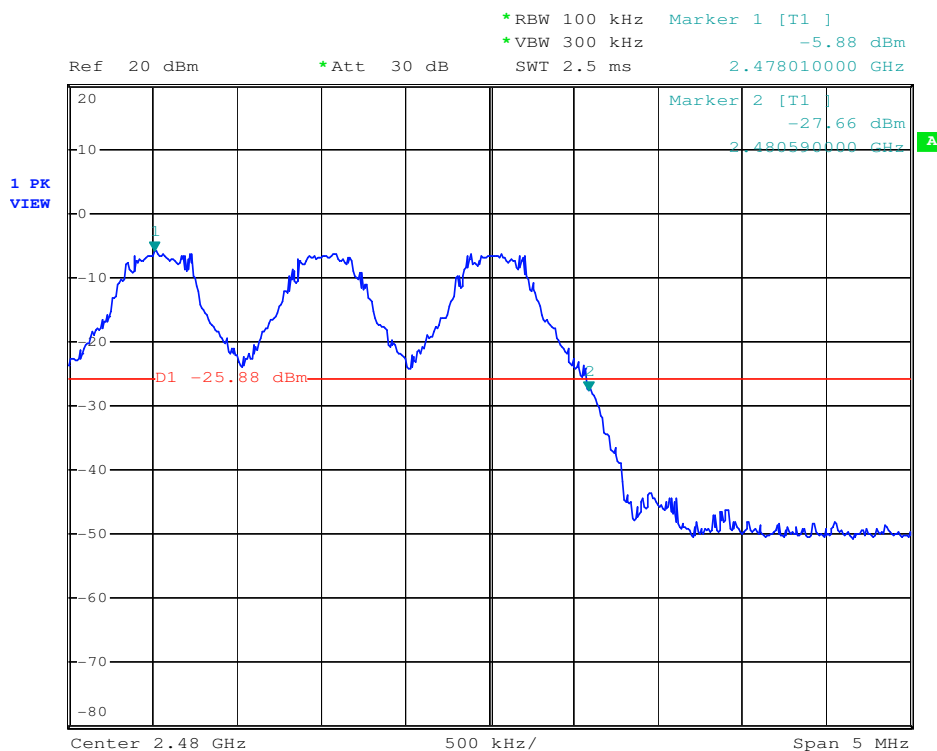
For Static:



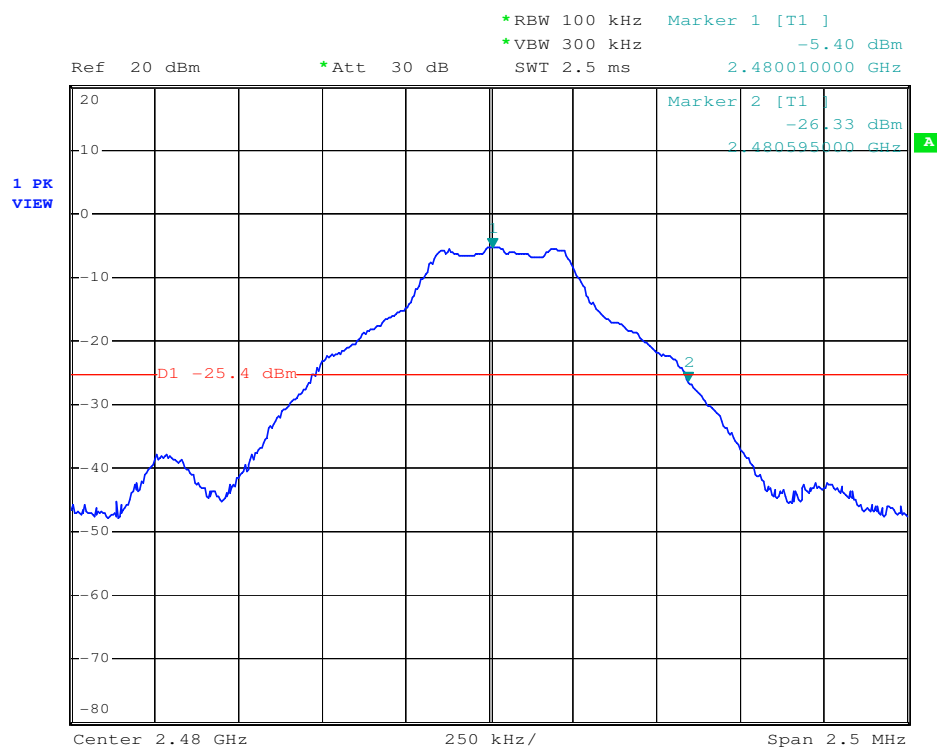


|            |      |               |         |
|------------|------|---------------|---------|
| Test mode: | GFSK | Test channel: | Highest |
|------------|------|---------------|---------|

For Hopping:



For Static:

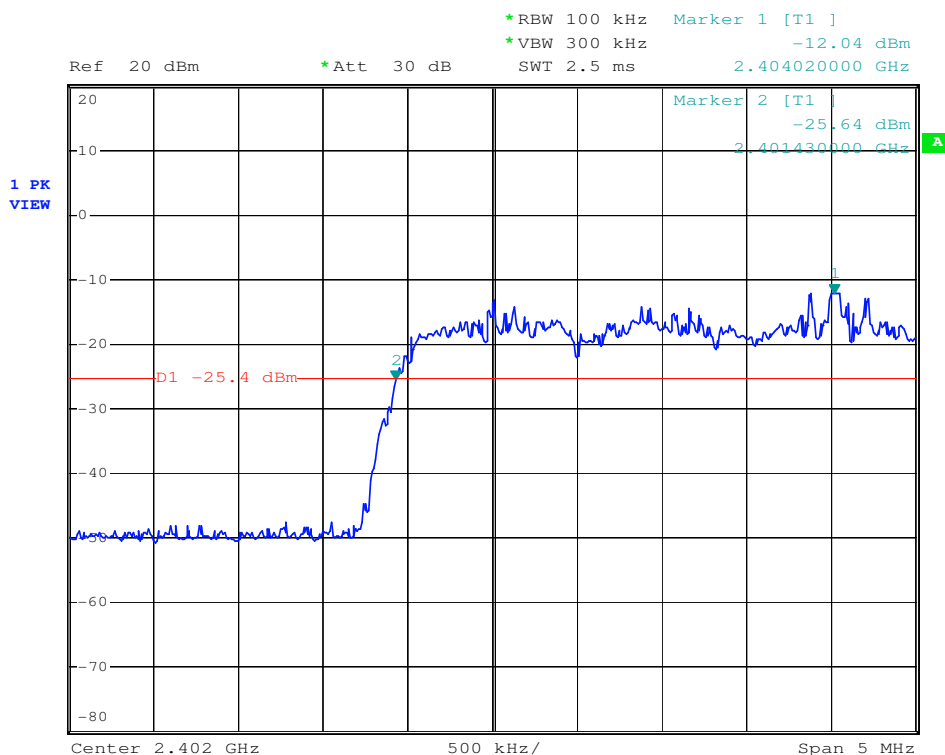


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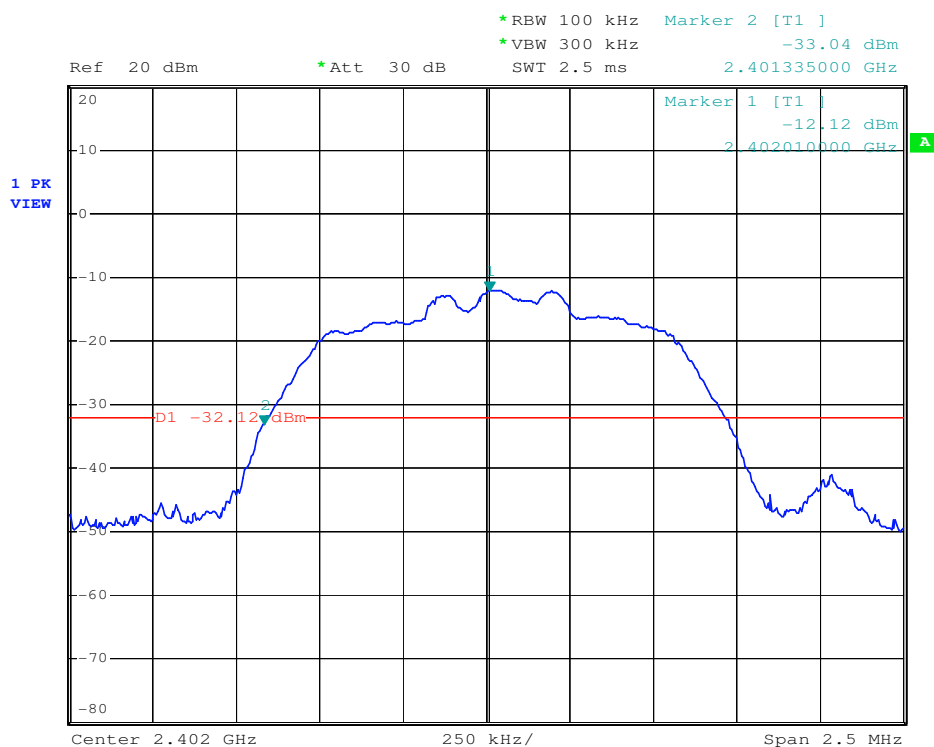


|            |               |               |        |
|------------|---------------|---------------|--------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Lowest |
|------------|---------------|---------------|--------|

For Hopping:



For Static:

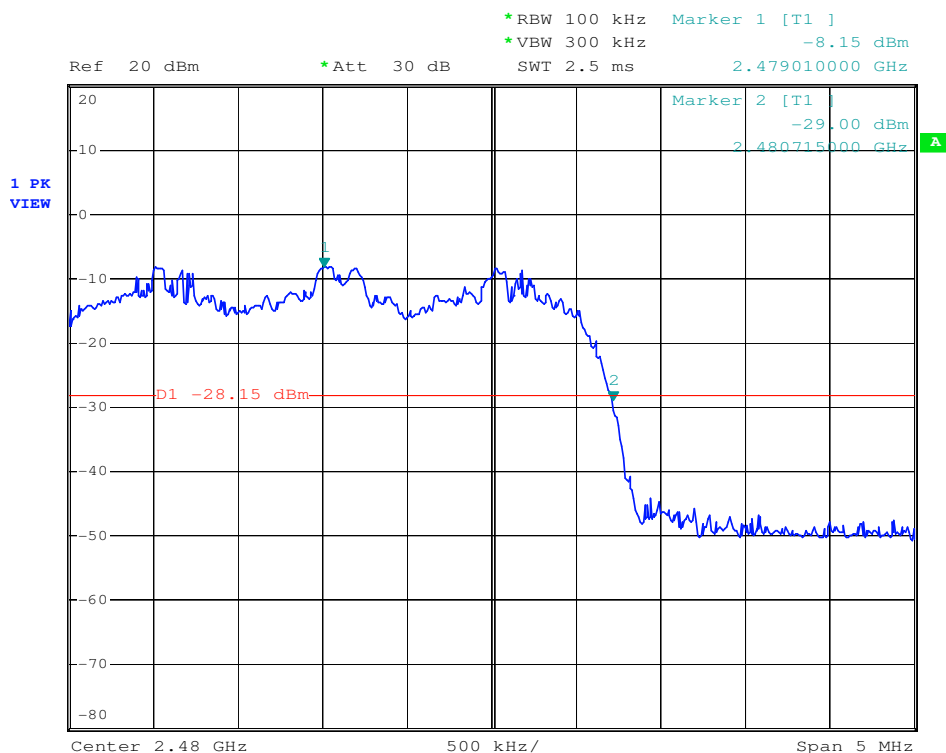


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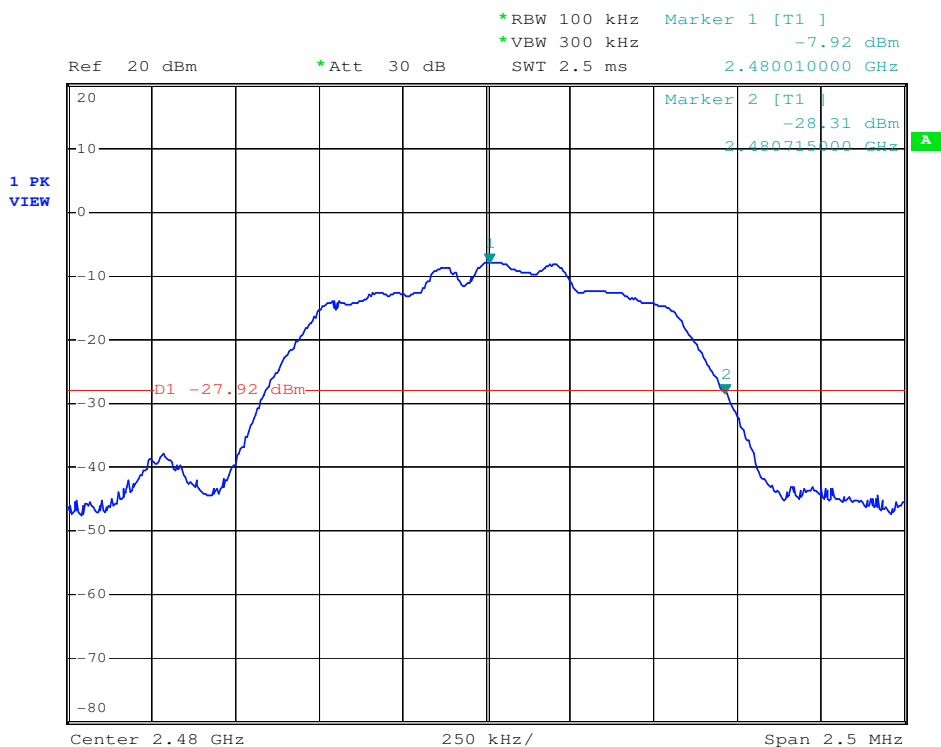


|            |               |               |         |
|------------|---------------|---------------|---------|
| Test mode: | $\pi/4$ DQPSK | Test channel: | Highest |
|------------|---------------|---------------|---------|

For Hopping:



For Static:

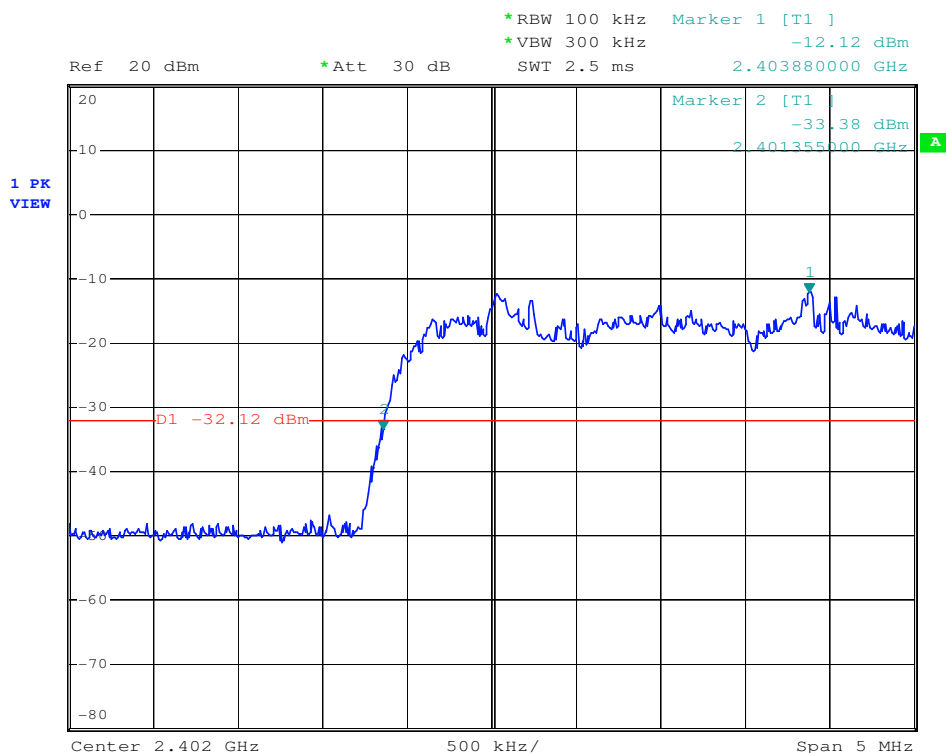


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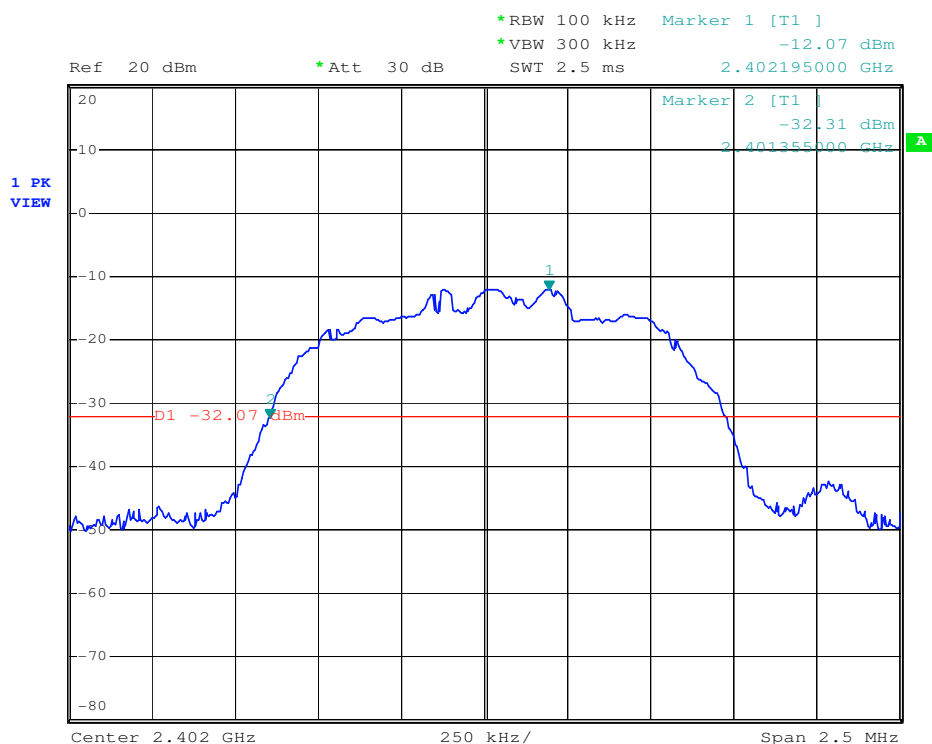


|            |       |               |        |
|------------|-------|---------------|--------|
| Test mode: | 8DPSK | Test channel: | Lowest |
|------------|-------|---------------|--------|

For Hopping:



For Static:



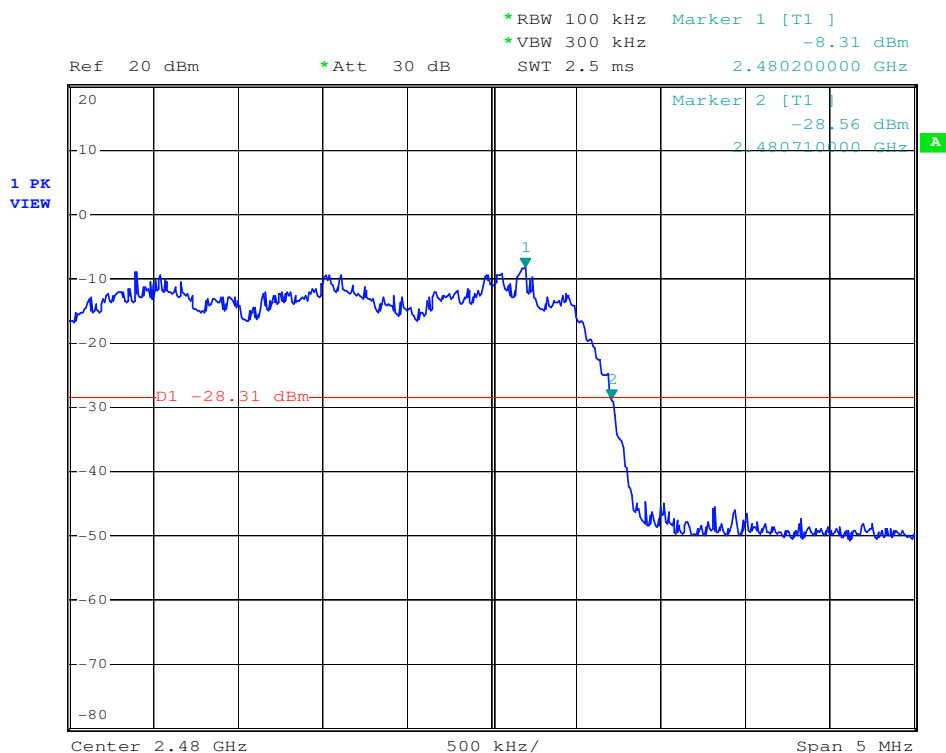
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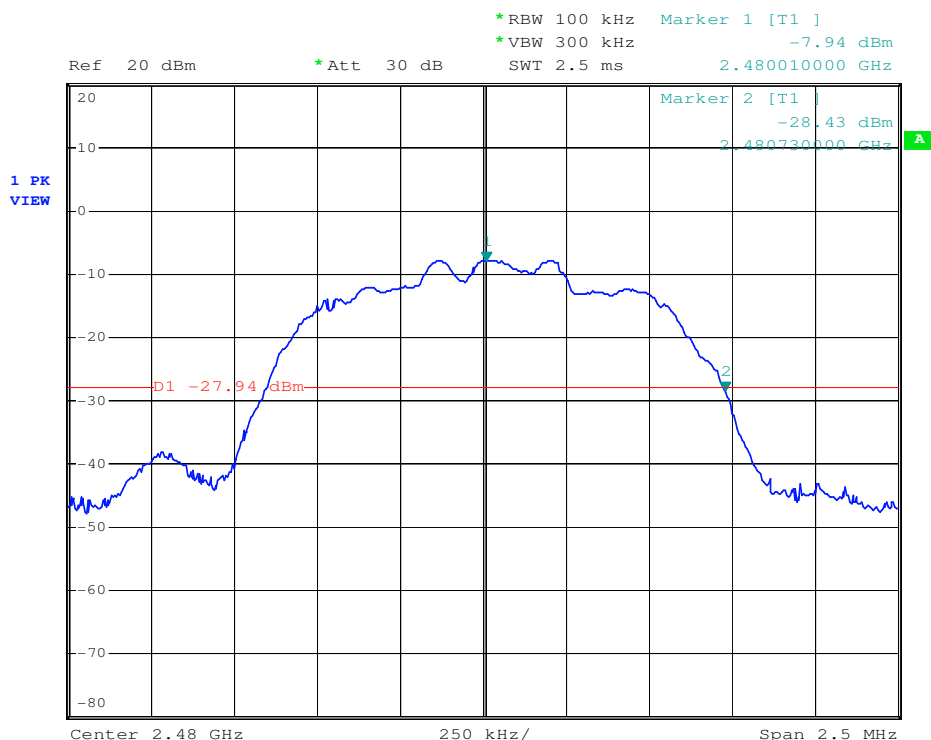


|            |       |               |         |
|------------|-------|---------------|---------|
| Test mode: | 8DPSK | Test channel: | Highest |
|------------|-------|---------------|---------|

For Hopping:



For Static:



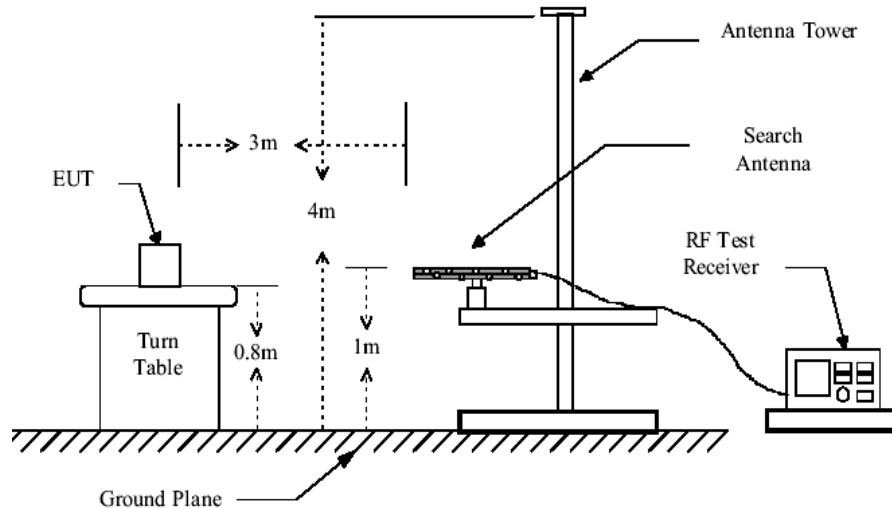
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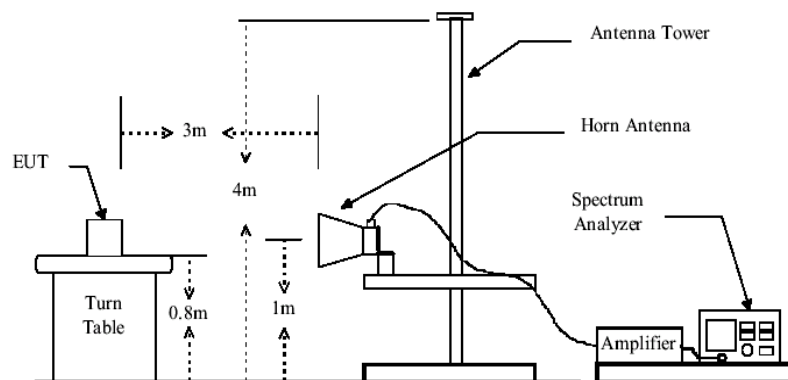
## 7.11 Radiated Spurious Emissions

|                          |   |
|--------------------------|---|
| <b>Test Requirement:</b> | FCC Part 15 Section 15.209 and Section 15.205   |
| <b>Test Method:</b>      | ANSI C63.10:2009 Clause 6.12  |
| <b>Test Date:</b>        | July 01, 2013   |
| <b>Final Test Mode:</b>  | BT Transmitting mode  |
| <b>Test site/setup:</b>  | Measurement Distance: 3m (Semi-Anechoic Chamber)<br>Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz).<br>For PK value:<br>RBW = 1 MHz for $f \geq 1$ GHz<br>VBW $\geq$ RBW; Sweep = auto<br>Detector function = peak<br>Trace = max hold<br>For AV value:<br>RBW = 1 MHz for $f \geq 1$ GHz<br>VBW = 10Hz; Sweep = auto<br>Detector function = peak<br>Trace = max hold<br>Receive antenna scan height 1 m - 4 m. polarization Vertical / Horizontal |
| <b>15.209 Limit:</b>     | 40.0 dB $\mu$ V/m between 30MHz & 88MHz<br>43.5 dB $\mu$ V/m between 88MHz & 216MHz<br>46.0 dB $\mu$ V/m between 216MHz & 960MHz<br>54.0 dB $\mu$ V/m above 960MHz  |

### Test Configuration:



**Figure 1. 30MHz to 1GHz radiated emissions test configuration**



**Figure 2. Above 1GHz radiated emissions test configuration**

### Test Procedure:

The procedure used was ANSI Standard C63.10:2009. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

Low noise amplifier was used below 1GHz, High pass Filter was used above 3GHz.

Between 1G and 3GHz, we did not use any amplifier or filter.

Pre-test was performed on GFSK and EDR mode with charging mode and only battery power mode, Compliance test was performed on worst case (GFSK mode).

Test were performed for three spatial orthogonal (X, Y, Z), the worst test data (X orthogonal)



was submitted.

1) For this intentional radiator operates below 25 GHz. the spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 5rd harmonic.

As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.



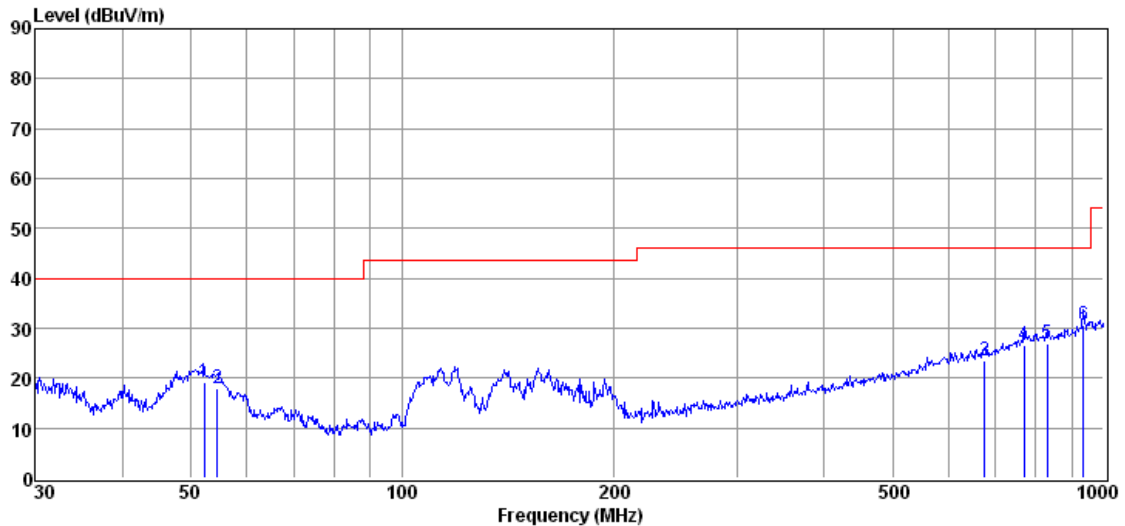
Below show the worst Test results:

30MHz to 1GHz

BT Transmitting mode

GFSK

Test Antenna Status: Vertical



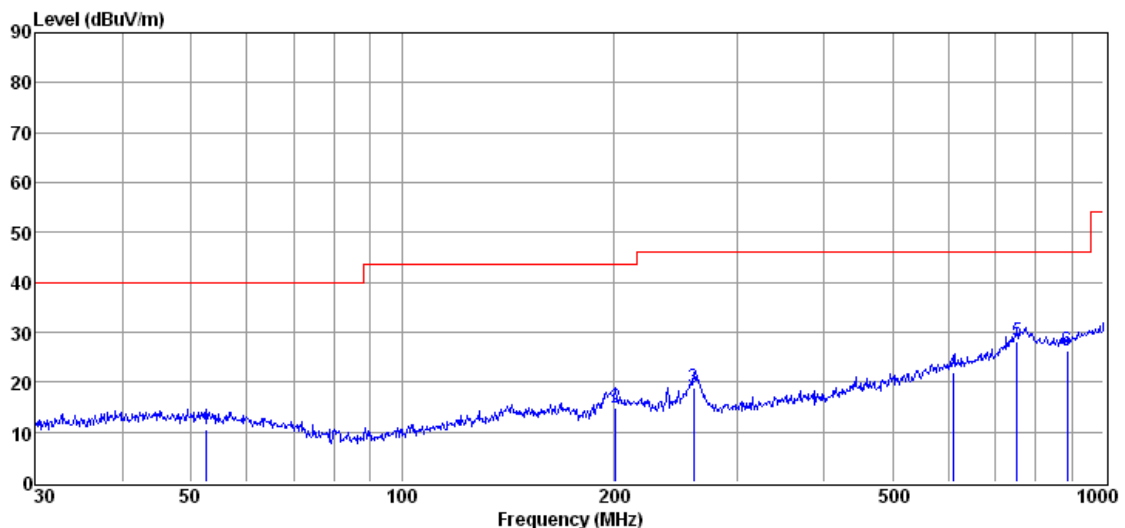
| Freq.<br>(MHz) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Result<br>Level<br>(dBμV/m) | Limit<br>Line<br>(dBμV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|-------------------------|-----------------------------|--------------------------|-----------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 52.16          | 30.63                   | 12.67                       | 24.70                    | 0.67                  | 19.27                       | 40.00                     | -20.73                | QP       | Vertical     |
| 54.58          | 29.50                   | 12.53                       | 24.70                    | 0.69                  | 18.02                       | 40.00                     | -21.98                | QP       | Vertical     |
| 677.26         | 24.30                   | 20.13                       | 24.10                    | 3.07                  | 23.40                       | 46.00                     | -22.60                | QP       | Vertical     |
| 770.28         | 25.42                   | 21.91                       | 24.00                    | 3.38                  | 26.71                       | 46.00                     | -19.29                | QP       | Vertical     |
| 831.54         | 24.75                   | 22.45                       | 23.90                    | 3.52                  | 26.82                       | 46.00                     | -19.18                | QP       | Vertical     |
| 935.94         | 27.09                   | 23.62                       | 23.80                    | 3.76                  | 30.67                       | 46.00                     | -15.33                | QP       | Vertical     |



BT Transmitting mode

GFSK

Test Antenna Status: Horizontal



| Freq.<br>(MHz) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>(dB/m) | Preamp<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Result<br>Level<br>(dBμV/m) | Limit<br>Line<br>(dBμV/m) | Over<br>Limit<br>(dB) | Detector | Polarization |
|----------------|-------------------------|-----------------------------|--------------------------|-----------------------|-----------------------------|---------------------------|-----------------------|----------|--------------|
| 52.58          | 21.98                   | 12.65                       | 24.70                    | 0.67                  | 10.60                       | 40.00                     | -29.40                | QP       | Horizontal   |
| 201.39         | 28.62                   | 9.29                        | 24.60                    | 1.52                  | 14.83                       | 43.50                     | -28.67                | QP       | Horizontal   |
| 260.14         | 30.66                   | 10.99                       | 24.50                    | 1.77                  | 18.92                       | 46.00                     | -27.08                | QP       | Horizontal   |
| 612.06         | 23.68                   | 19.44                       | 24.20                    | 2.94                  | 21.86                       | 46.00                     | -24.14                | QP       | Horizontal   |
| 752.74         | 27.15                   | 21.55                       | 24.00                    | 3.34                  | 28.04                       | 46.00                     | -17.96                | QP       | Horizontal   |
| 887.61         | 23.61                   | 22.80                       | 23.85                    | 3.63                  | 26.19                       | 46.00                     | -19.81                | QP       | Horizontal   |



1GHz-12GHz:

| BT Transmitting mode |                 | GFSK           | Test Channel: |                   | Low            | Test Antenna: |          | Horizontal |
|----------------------|-----------------|----------------|---------------|-------------------|----------------|---------------|----------|------------|
| Mark                 | Frequency (MHz) | Reading (dBuV) | Factor (dB)   | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB)   | Detector |            |
| 1                    | 4795            | 40.86          | 8.22          | 49.08             | 74             | -24.92        | peak     |            |
| 2                    | 7215            | 37.55          | 9.74          | 47.29             | 74             | -26.71        | peak     |            |
| 3                    | 9613            | 36.04          | 11.73         | 47.77             | 74             | -26.23        | peak     |            |

| BT Transmitting mode |                 | GFSK           | Test Channel: |                   | Low            | Test Antenna: |          | Vertical |
|----------------------|-----------------|----------------|---------------|-------------------|----------------|---------------|----------|----------|
| Mark                 | Frequency (MHz) | Reading (dBuV) | Factor (dB)   | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB)   | Detector |          |
| 1                    | 4806            | 37.75          | 8.24          | 45.99             | 74             | -28.01        | peak     |          |
| 2                    | 7215            | 36.46          | 9.74          | 46.2              | 74             | -27.8         | peak     |          |
| 3                    | 9602            | 35.84          | 11.74         | 47.58             | 74             | -26.42        | peak     |          |

| BT Transmitting mode |                 | GFSK           | Test Channel: |                   | Middle         | Test Antenna: |          | Horizontal |
|----------------------|-----------------|----------------|---------------|-------------------|----------------|---------------|----------|------------|
| Mark                 | Frequency (MHz) | Reading (dBuV) | Factor (dB)   | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB)   | Detector |            |
| 1                    | 4883            | 38.26          | 8.35          | 46.61             | 74             | -27.39        | peak     |            |
| 2                    | 7325            | 38.28          | 9.81          | 48.09             | 74             | -25.91        | peak     |            |
| 3                    | 9767            | 36.65          | 11.63         | 48.28             | 74             | -25.72        | peak     |            |

| BT Transmitting mode |                 | GFSK           | Test Channel: |                   | Middle         | Test Antenna: |          | Vertical |
|----------------------|-----------------|----------------|---------------|-------------------|----------------|---------------|----------|----------|
| Mark                 | Frequency (MHz) | Reading (dBuV) | Factor (dB)   | Emission (dBuV/m) | Limit (dBuV/m) | Margin (dB)   | Detector |          |
| 1                    | 4894            | 37.5           | 8.36          | 45.86             | 74             | -28.14        | peak     |          |
| 2                    | 7325            | 38.7           | 9.81          | 48.51             | 74             | -25.49        | peak     |          |
| 3                    | 9778            | 36.16          | 11.62         | 47.78             | 74             | -26.22        | peak     |          |



| BT Transmitting mode |                    | GFSK              | Test Channel:  |                      | High              | Test Antenna:  |          | Horizontal |
|----------------------|--------------------|-------------------|----------------|----------------------|-------------------|----------------|----------|------------|
| Mark                 | Frequency<br>(MHz) | Reading<br>(dBuV) | Factor<br>(dB) | Emission<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector |            |
| 1                    | 4949               | 38.45             | 8.44           | 46.89                | 74                | -27.11         | peak     |            |
| 2                    | 7457               | 37.73             | 9.9            | 47.63                | 74                | -26.37         | peak     |            |
| 3                    | 9943               | 35.91             | 11.51          | 47.42                | 74                | -26.58         | peak     |            |

| BT Transmitting mode |                    | GFSK              | Test Channel:  |                      | High              | Test Antenna:  |          | Vertical |
|----------------------|--------------------|-------------------|----------------|----------------------|-------------------|----------------|----------|----------|
| Mark                 | Frequency<br>(MHz) | Reading<br>(dBuV) | Factor<br>(dB) | Emission<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector |          |
| 1                    | 4949               | 37.52             | 8.44           | 45.96                | 74                | -28.04         | peak     |          |
| 2                    | 7457               | 37.47             | 9.9            | 47.37                | 74                | -26.63         | peak     |          |
| 3                    | 9910               | 35.65             | 11.53          | 47.18                | 74                | -26.82         | peak     |          |

Test Level =Receiver Reading + Antenna Factor + Cable Loss –Preamplifier Factor.

Remark: No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part. Hence there no other emissions have been reported.





## 7.12 Band edge (Radiated Emission)

|                              |  |
|------------------------------|--|
| <b>Test Requirement:</b>     | Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c).                               |
| <b>Test Method:</b>          | ANSI 63.10:2009 Clause 6.12  |
| <b>Test Date:</b>            | July 01, 2013  |
| <b>Measurement Distance:</b> | 3m (Semi-Anechoic Chamber)   |
| <b>Limit:</b>                | 40.0 dBμV/m between 30MHz & 88MHz;<br>43.5 dBμV/m between 88MHz & 216MHz;<br>46.0 dBμV/m between 216MHz & 960MHz;<br>54.0 dBμV/m above 960MHz.   |
| <b>Detector:</b>             | For PK value:<br>RBW = 1 MHz for $f \geq 1$ GHz<br>VBW $\geq$ RBW; Sweep = auto<br>Detector function = peak<br>Trace = max hold<br>For AV value:<br>RBW = 1 MHz for $f \geq 1$ GHz<br>VBW = 10Hz; Sweep = auto<br>Detector function = peak<br>Trace = max hold |

According to section, 15.35(b) for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Pre-test were performed for there spatial orthogonal(X, Y, Z), the worst test data (X orthogonal) was submitted.

Pre-test was performed on GFSK and EDR mode with charging mode and only battery power mode, Compliance test was performed on worse case (GFSK mode).

**Test Result:** The EUT does meet the FCC requirements.

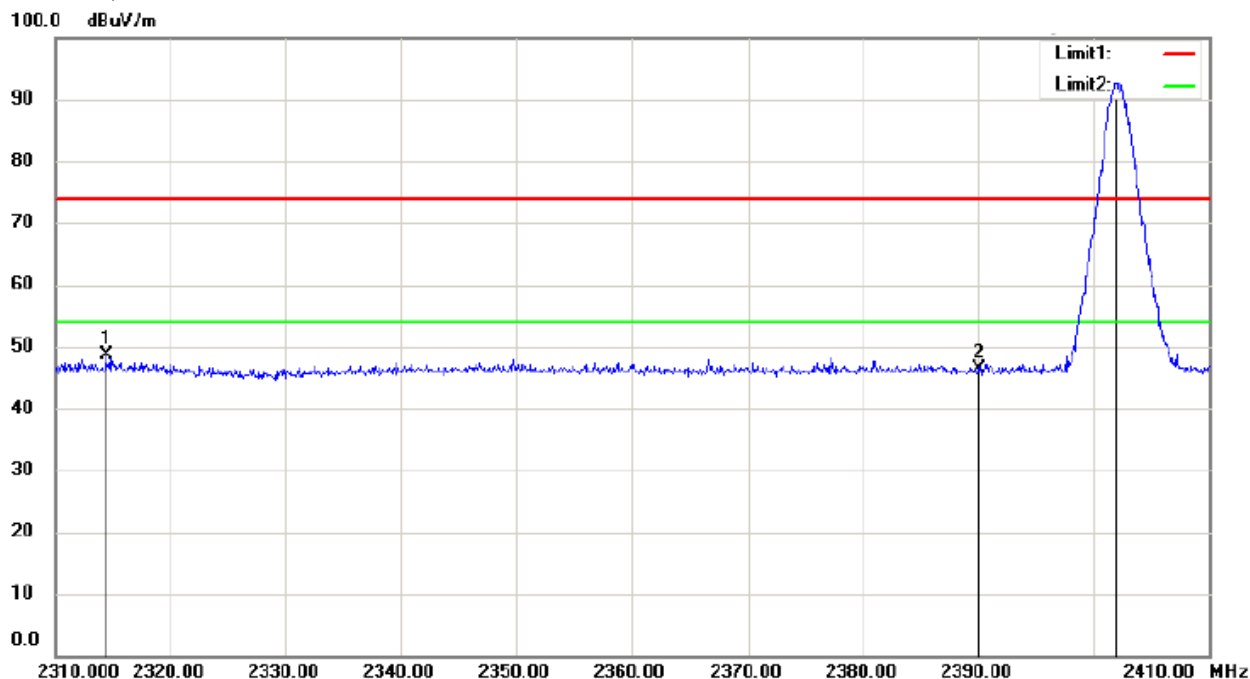


Measurement Result:

CH Low 2402MHz Radiated Bandedge

Modulation: GFSK

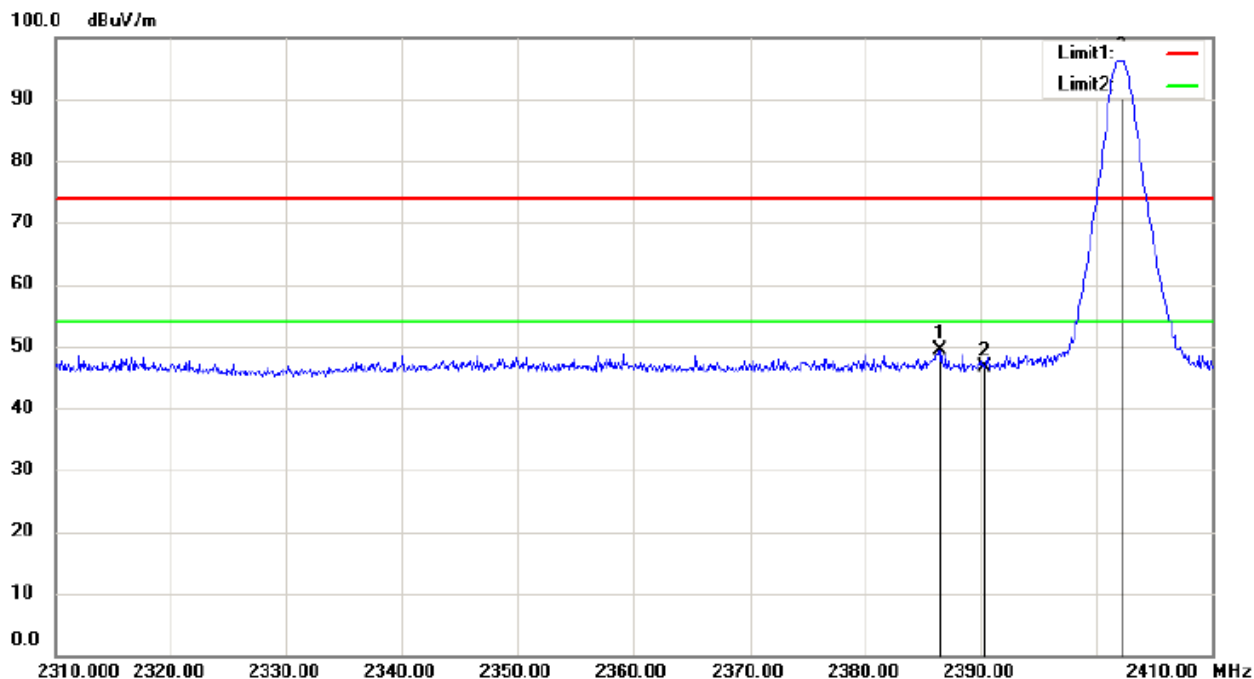
Horizontal, Peak Detector:



| MK. | Frequency (MHz) | Reading (dBuV/m) | Corrected factor(dB) | Result (dB uV/m) | Limit (dB uV/m) | Margin (dB) | Detector |
|-----|-----------------|------------------|----------------------|------------------|-----------------|-------------|----------|
| 1   | 2314.400        | 43.27            | 5.42                 | 48.69            | 54              | 5.31        | Peak     |
| 2   | 2390.100        | 40.99            | 5.46                 | 46.45            | 54              | 7.55        | Peak     |
| 3   | 2401.900        | 87.11            | 5.46                 | 92.57            | 54              | -38.57      | Peak     |



Vertical, Peak Detector:



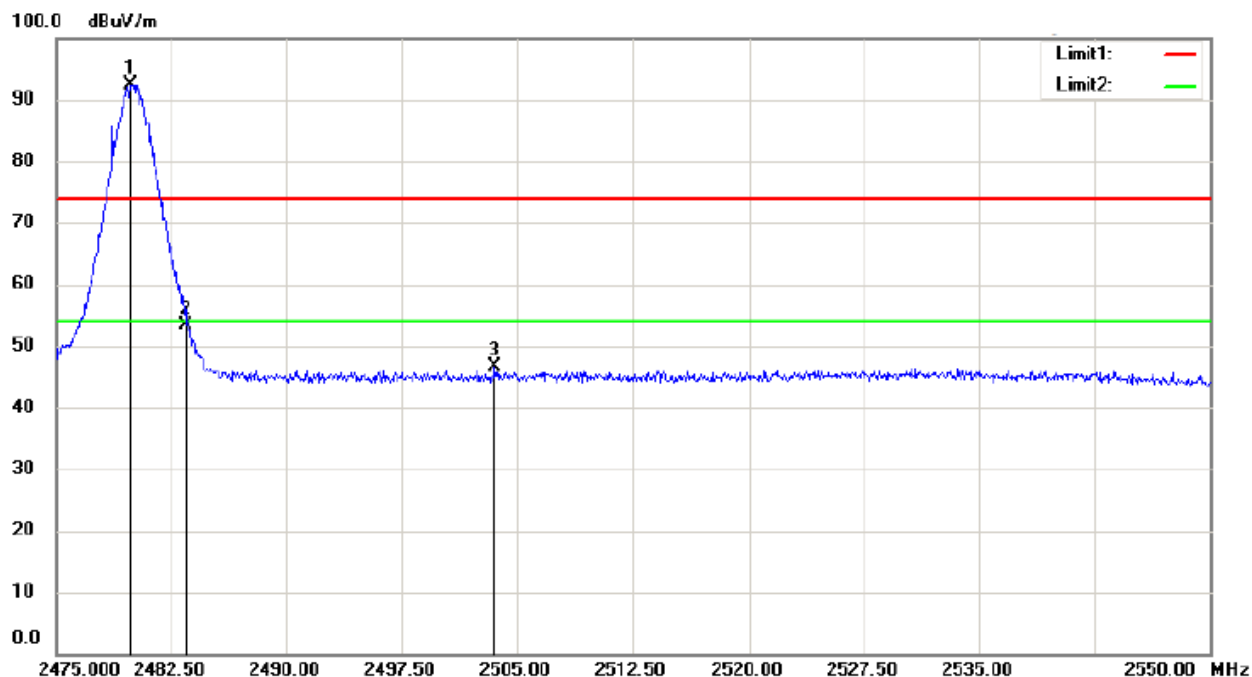
| MK. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corrected<br>factor(dB) | Result<br>(dB uV/m) | Limit<br>(dB uV/m) | Margin<br>(dB) | Detector |
|-----|--------------------|---------------------|-------------------------|---------------------|--------------------|----------------|----------|
| 1   | 2386.500           | 43.81               | 5.46                    | 49.27               | 54                 | 4.73           | Peak     |
| 2   | 2390.300           | 41.07               | 5.46                    | 46.53               | 54                 | 7.47           | Peak     |
| 3   | 2402.200           | 90.79               | 5.46                    | 96.25               | 54                 | -42.25         | Peak     |



CH Low 2480MHz Radiated Bandedge

Modulation: GFSK

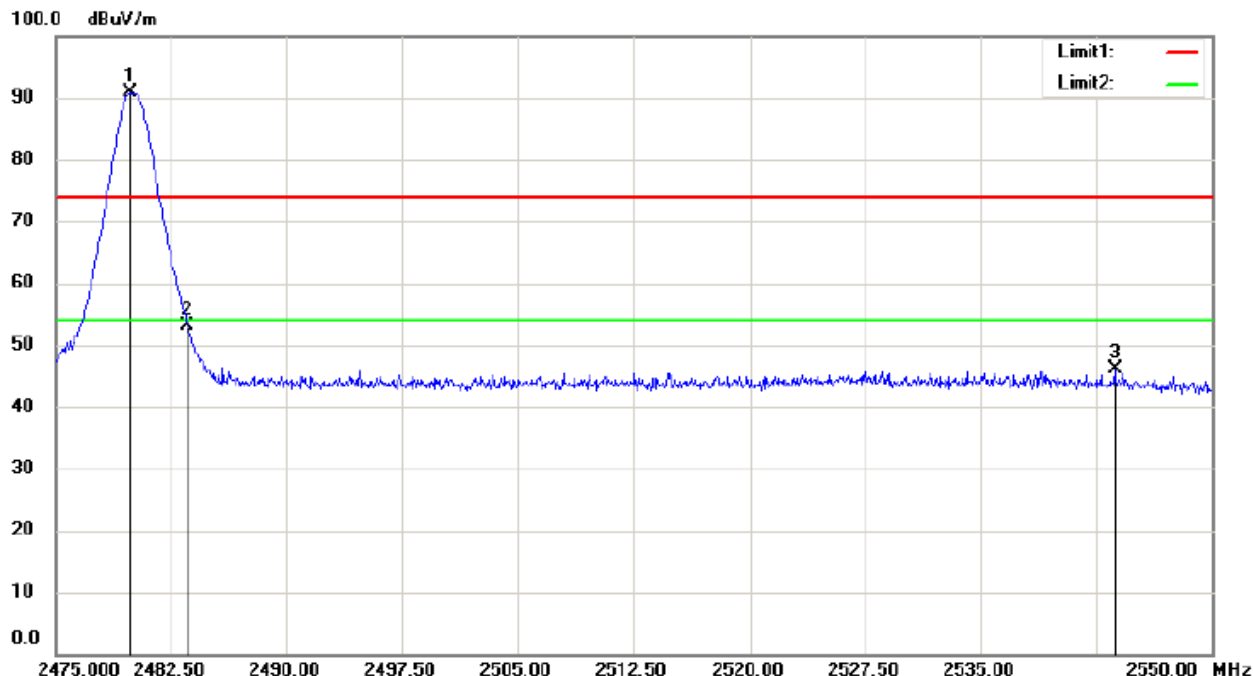
Horizontal, Peak Detector:



| MK. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corrected<br>factor(dB) | Result<br>(dB uV/m) | Limit<br>(dB uV/m) | Margin<br>(dB) | Detector |
|-----|--------------------|---------------------|-------------------------|---------------------|--------------------|----------------|----------|
| 1   | 2479.800           | 86.9                | 5.5                     | 92.4                | 54                 | -38.4          | Peak     |
| 2   | 2483.475           | 47.94               | 5.5                     | 53.44               | 54                 | 0.56           | Peak     |
| 3   | 2503.575           | 41.14               | 5.51                    | 46.65               | 54                 | 7.35           | Peak     |



Vertical, Peak Detector:



| MK. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Corrected<br>factor(dB) | Result<br>(dB uV/m) | Limit<br>(dB uV/m) | Margin<br>(dB) | Detector |
|-----|--------------------|---------------------|-------------------------|---------------------|--------------------|----------------|----------|
| 1   | 2479.875           | 85.26               | 5.50                    | 90.76               | 54                 | -36.76         | Peak     |
| 2   | 2483.500           | 47.69               | 5.50                    | 53.19               | 54                 | 0.81           | Peak     |
| 3   | 2543.700           | 40.47               | 5.54                    | 46.01               | 54                 | 7.99           | Peak     |

Note: The Peak Emission is below the Average Limit, so the Average Emission doesn't need to be test.

Remark: No any other emission which fall in restricted bands can be detected and be reported.

Test Level = Receiver Reading + Antenna Factor + Cable Loss- Preamplifier Factor

All frequencies within the "Restricted bands" have been evaluated to compliance. Section 15.205 Restricted bands of operation.



Except as shown in paragraph 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      | 399.9 - 410     | 4.5 - 5.15    |
| <sup>1</sup> 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 -         | 2483.5 - 2500   | 17.7 - 21.4   |
| 8.37625 - 8.38675          | 156.52525           | 2655 - 2900     | 22.01 - 23.12 |
| 8.41425 - 8.41475          | 156.7 - 156.9       | 3260 - 3267     | 23.6 - 24.0   |
| 12.29 - 12.293             | 162.0125 - 167.17   | 3332 - 3339     | 31.2 - 31.8   |
| 12.51975 - 12.52025        | 167.72 - 173.2      | 3345.8 - 3358   | 36.43 - 36.5  |
| 12.57675 - 12.57725        | 240 - 285           | 3600 - 4400     |               |
| 13.36 - 13.41              | 322 - 335.4         |                 |               |



## **8 Test Setup Photographs**

Refer to the < BT011\_Test Setup photos>.

## **9 EUT Constructional Details**

Refer to the < BT011\_External Photos > & < BT011\_Internal Photos >.

***End of Report***