

# FCC Radio Test Report

**FCC ID: 2AK8Q-BM307**

**FCC 47 CFR Part 15 Subpart C**

**RSS 247 Issue 1:2016**

|                         |   |                |
|-------------------------|---|----------------|
| <b>Product</b>          | : | Wireless mouse |
| <b>Trade Name</b>       | : | TECKNET        |
| <b>Model No.</b>        | : | BM307          |
| <b>Serise Model No.</b> | : | N/A            |

## Issued for

SHENZHEN UNICHAIN TECHNOLOGY CO., LTD

3 Floor, HongXiangJia electronic commerce Pioneer Park, Yang Mei, BanTian  
Street, Shenzhen City, China

## Issued by

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## TEST RESULT CERTIFICATION

**Product** ..... : Wireless mouse  
**Applicant** ..... : SHENZHEN UNICHAIN TECHNOLOGY CO., LTD  
**Address** ..... : 3 Floor, HongXiangJia electronic commerce Pioneer Park, Yang Mei, BanTian Street, Shenzhen City, China  
**Manufacturer** ..... : DONGGUAN TOGRAN ELECTRONICS TECHNOLOGY CO.,LTD  
**Address** ..... : 262 Shidan Rd the 3rd Industrial of Juzhou Shijie Town Dongguan Guangdong China  
**Model No.**..... : BM307  
**Standards** ..... : FCC Part 15 Subpart C (15.247)  
                               : RSS 247 Issue 1: 2016  
**Test Method**..... : ANSI C63.10: 2013

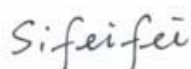
The above equipment has been tested by Shenzhen ATL Testing Technology Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

**Test**..... :

**Date of receipt of test item** ..... 2017-06-23

**Date(s) of performance of test**..... 2017-06-24 to 2017-06-30

**Test Result** ..... : **Pass**

|                      |                                                                                                       |               |                                          |
|----------------------|-------------------------------------------------------------------------------------------------------|---------------|------------------------------------------|
| <b>Testing by</b> :  | <br>(Si feifei)    | <b>Date</b> : | 2017-06-24<br><hr style="width: 100%;"/> |
| <b>Check by</b> :    | <br>(Xie Lingling) | <b>Date</b> : | 2017-06-29<br><hr style="width: 100%;"/> |
| <b>Approved by</b> : | <br>(Xu Peng)      | <b>Date</b> : | 2017-06-30<br><hr style="width: 100%;"/> |

| Table of Contents                                                 | Page      |
|-------------------------------------------------------------------|-----------|
| <b>1 . TEST SUMMARY</b>                                           | <b>6</b>  |
| 1.1 TEST FACILITY                                                 | 7         |
| 1.2 MEASUREMENT UNCERTAINTY                                       | 7         |
| <b>2 . GENERAL INFORMATION</b>                                    | <b>8</b>  |
| 2.1 GENERAL DESCRIPTION OF EUT                                    | 8         |
| 2.2 DESCRIPTION OF TEST MODES                                     | 10        |
| 2.3 DESCRIPTION OF TEST SETUP                                     | 11        |
| 2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL                | 12        |
| 2.5 EUT Exercise Software                                         | 12        |
| <b>3 . CONDUCTED EMISSION TEST</b>                                | <b>13</b> |
| 3.1 CONDUCTED EMISSION MEASUREMENT (Frequency Range 150KHz-30MHz) | 13        |
| 3.2 TEST PROCEDURE                                                | 13        |
| 3.3 TEST SETUP                                                    | 14        |
| 3.4 TEST INSTRUMENTS                                              | 14        |
| 3.5 EUT OPERATING CONDITIONS                                      | 14        |
| 3.6 TEST RESULTS                                                  | 14        |
| <b>4 . RADIATED EMISSION MEASUREMENT</b>                          | <b>15</b> |
| 4.1 RADIATED EMISSION LIMIT (Frequency Range 9KHz-1000MHz)        | 15        |
| 4.2 TEST PROCEDURE                                                | 15        |
| 4.3 TEST SETUP                                                    | 16        |
| 4.4 TEST INSTRUMENTS                                              | 17        |
| 4.5 EUT OPERATING CONDITIONS                                      | 17        |
| 4.6 TEST RESULTS                                                  | 18        |
| <b>5 . CONDUCTED OUTPUT POWER MEASUREMENT</b>                     | <b>26</b> |
| 5.1 LIMITS                                                        | 26        |
| 5.2 TEST PROCEDURE                                                | 26        |
| 5.3 TEST SETUP                                                    | 26        |
| 5.4 TEST INSTRUMENTS                                              | 26        |
| 5.5 EUT OPERATING CONDITIONS                                      | 26        |
| 5.6 TEST RESULTS                                                  | 26        |

| Table of Contents                                   | Page      |
|-----------------------------------------------------|-----------|
| <b>6 . OCCUPIED BANDWIDTH MEASUREMENT</b>           | <b>33</b> |
| 6.1 LIMITS                                          | 33        |
| 6.2 TEST PROCEDURE                                  | 33        |
| 6.3 TEST SETUP                                      | 33        |
| 6.4 TEST INSTRUMENTS                                | 33        |
| 6.5 EUT OPERATING CONDITIONS                        | 33        |
| 6.6 TEST RESULTS                                    | 33        |
| <b>7 . CARRIER FREQUENCY SEPARATION MEASUREMENT</b> | <b>38</b> |
| 7.1 LIMITS                                          | 38        |
| 7.2 TEST PROCEDURE                                  | 38        |
| 7.3 TEST SETUP                                      | 38        |
| 7.4 TEST INSTRUMENTS                                | 38        |
| 7.5 EUT OPERATING CONDITIONS                        | 38        |
| 7.6 TEST RESULTS                                    | 38        |
| <b>8 . NUMBER OF HOPPING</b>                        | <b>43</b> |
| 8.1 LIMITS                                          | 43        |
| 8.2 TEST PROCEDURE                                  | 43        |
| 8.3 TEST SETUP                                      | 43        |
| 8.4 TEST INSTRUMENTS                                | 43        |
| 8.5 EUT OPERATING CONDITIONS                        | 43        |
| 8.6 TEST RESULTS                                    | 43        |
| <b>9 . DWELL TIME</b>                               | <b>46</b> |
| 9.1 LIMITS                                          | 46        |
| 9.2 TEST PROCEDURE                                  | 46        |
| 9.3 TEST SETUP                                      | 46        |
| 9.4 TEST INSTRUMENTS                                | 46        |
| 9.5 EUT OPERATING CONDITIONS                        | 46        |
| 9.6 TEST RESULTS                                    | 46        |
| <b>10 . BAND EDGES MEASUREMENT</b>                  | <b>51</b> |
| 10.1 LIMITS                                         | 51        |
| 10.2 TEST PROCEDURE                                 | 51        |

| Table of Contents                                | Page      |
|--------------------------------------------------|-----------|
| 10.3 TEST SETUP                                  | 51        |
| 10.4 TEST INSTRUMENTS                            | 51        |
| 10.5 EUT OPERATING CONDITIONS                    | 52        |
| 10.6 TEST RESULTS                                | 52        |
| <b>11. FREQUENCY HOPPING SYSTEM</b>              | <b>59</b> |
| 11.1 STANDARD APPLICABLE                         | 59        |
| 11.2 FREQUENCY HOPPING SYSTEM                    | 59        |
| 11.3 EUT PSEUDORANDOM FREQUENCY HOPPING SEQUENCE | 60        |
| <b>12. ANTENNA REQUIREMENT</b>                   | <b>61</b> |
| 12.1 REQUIREMENT                                 | 61        |
| 12.2 ANTENNA CONNECTOR CONSTRUCTION              | 61        |

## 1. TEST SUMMARY

Test procedures according to the technical standards:

| FCC Part 15 Subpart C (15.247) |               |                                   |          |        |
|--------------------------------|---------------|-----------------------------------|----------|--------|
| Standard Section               |               | Test Item                         | Judgment | Remark |
| 15.207                         | RSS Gen 7.2.4 | AC Power Conducted Emission       | N/A      |        |
| 15.247(c)                      | RSS 247 5.5   | Transmitter Radiated Emissions    | PASS     |        |
| 15.247(b)(1)                   | RSS 247 5.1   | Output Power                      | PASS     |        |
| 15.247(a)(1)                   | RSS 247 5.1   | 20dB RF Bandwidth                 | PASS     |        |
| 15.247(a)(1)(iii)              | RSS 247 5.1   | Carrier Frequency Separation      | PASS     |        |
| 15.247(a)(1)(iii)              | RSS 247 5.1   | Hopping Number                    | PASS     |        |
| 15.247(a)(1)(iii)              | RSS 247 5.1   | Dwell Time                        | PASS     |        |
| 15.247(c)                      | RSS 247 5.1   | Occupied Bandwidth Measurement    | PASS     |        |
| 15.247(d)                      | RSS 247 5.5   | Band Edge (Out of Band Emissions) | PASS     |        |
| 15.247(g)&(h)                  | ----          | Frequency Hopping System          | PASS     |        |
| 15.203                         |               | Antenna Requirement               | PASS     |        |

### NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

(2) The test results of this report relate only to the tested sample(s) identified in this report.

## 1.1 TEST FACILITY

Shenzhen ATL Testing Technology Co., Ltd.

Add. : F/4, Building 10, Dayuan Industrial Zone, Xili Town, Nanshan District, Shenzhen, China

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95 %**.

### A. Conducted Emission :

The measurement uncertainty is evaluated as  $\pm 3.2$  dB.

### B. Radiated Measurement :

The measurement uncertainty is evaluated as  $\pm 3.7$  dB.

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                                   |                                                                               |
|-----------------------------------|-------------------------------------------------------------------------------|
| <b>Equipment</b>                  | Wireless mouse                                                                |
| <b>Model Name</b>                 | BM307                                                                         |
| <b>Additional Model Number(s)</b> | N/A                                                                           |
| <b>Model Difference</b>           | N/A                                                                           |
| <b>Frequency Range</b>            | Bluetooth 3.0: 2402~2480 MHz                                                  |
| <b>Number of Channel:</b>         | 79 Channels                                                                   |
| <b>Modulation Type</b>            | Bluetooth: GFSK/ $\pi$ /4-DQPSK/8-DPSK                                        |
| <b>RF Output Power</b>            | Max: 3.699 dBm(GFSK)                                                          |
| <b>Antenna Type</b>               | PCB Antenna (Gain: 0dBi)                                                      |
| <b>Power Source</b>               | DC Powered by Battery .                                                       |
| <b>Power Rating</b>               | DC 3.0V from 2*AA Battery.                                                    |
| <b>Remark</b>                     | More details EUT technical specifications, please refer to the User's Manual. |

**Note:**

This Test Report is FCC Part 15 Subpart C, 15.247 for Bluetooth. And the Test procedure follows the FCC Public Notice DA 00-705-Filing and Measurement Guidance for Frequency Hopping Spectrum Systems.



## (1) Channel List:

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

## (2) Transmitting mode with antennas

| Mode      | TX Antenna (s) |
|-----------|----------------|
| Bluetooth | 1              |

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Mode | Description                 |
|--------------|-----------------------------|
| Mode 1       | BT TX(GFSK) Mode            |
| Mode 2       | BT TX( $\pi/4$ -DQPSK) Mode |
| Mode 3       | BT TX(8-DPSK) Mode          |

| For Conducted Test |             |
|--------------------|-------------|
| Final Test Mode    | Description |
| Mode 1             | N/A         |

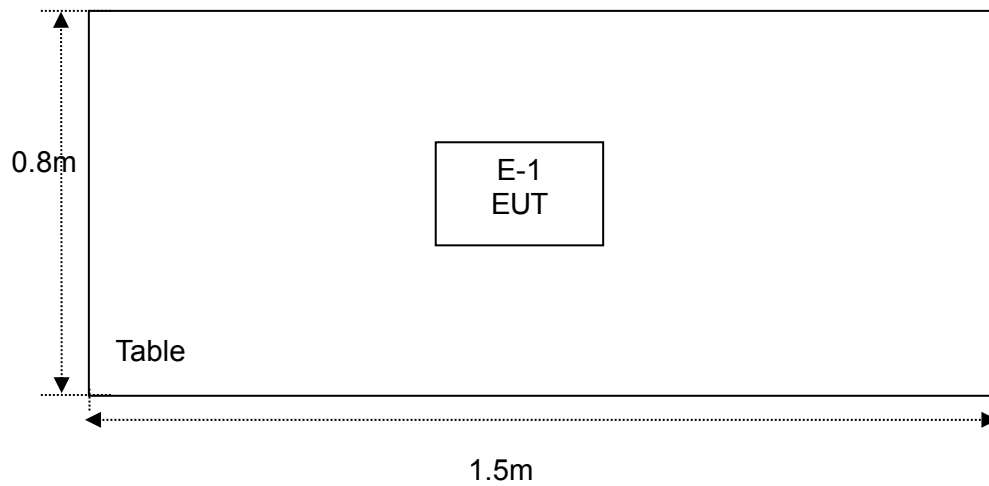
| For Radiated Test |                    |
|-------------------|--------------------|
| Final Test Mode   | Description        |
| Mode 1            | BT TX(GFSK) Mode   |
| Mode 2            | BT TX(8-DPSK) Mode |

Note:

- (1) Software used to control the EUT for staying in continuous transmitting mode was programmed. After verification, all tests were carried out with the worst case test modes as shown below.
- (2) GFSK Mode:  
Channel (2402/2441/2480 MHz) with DH1 data packet were chosen for full testing.
- (3) 8-DPSK Mode:  
Channel (2402/2441/2480 MHz) with 3DH1 data packet were chosen for full testing.
- (4) By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

## 2.3 DESCRIPTION OF TEST SETUP

### Radiated Emission



## 2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment      | Mfr/Brand | Model/Type No. | VOC/DOC | Note |
|------|----------------|-----------|----------------|---------|------|
| E-1  | Wireless mouse | TECKNET   | BM307          | /       | EUT  |
|      |                |           |                |         |      |
|      |                |           |                |         |      |
|      |                |           |                |         |      |
|      |                |           |                |         |      |
|      |                |           |                |         |      |
|      |                |           |                |         |      |
|      |                |           |                |         |      |
|      |                |           |                |         |      |
|      |                |           |                |         |      |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |
|      |               |              |        |      |

### Note:

- (1) The support equipment was authorized by Verification of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

## 2.5 EUT Exercise Software

| Test Software                                                                      | N/A |
|------------------------------------------------------------------------------------|-----|
| GFSK: The command set for RF power-DEF<br>8-DPSK: The command set for RF power-DEF |     |

### 3. CONDUCTED EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Quasi-peak | Average   |
|-----------------|------------|-----------|
|                 | dBuV       | dBuV      |
| 0.15 -0.5       | 66 - 56 *  | 56 - 46 * |
| 0.50 -5.0       | 56.00      | 46.00     |
| 5.0 -30.0       | 60.00      | 50.00     |

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

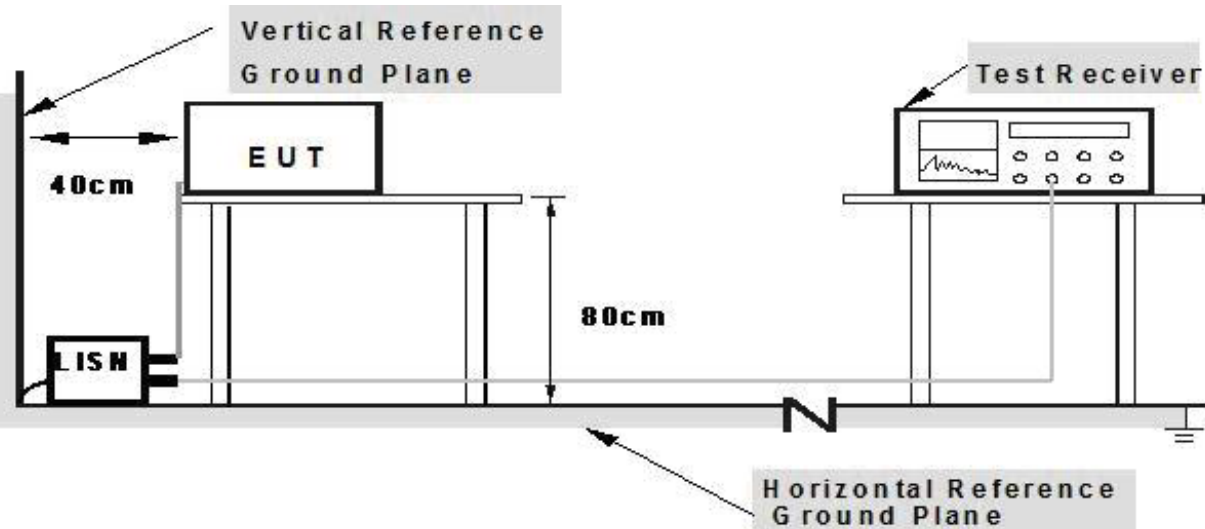
The following table is the setting of the receiver

| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |

#### 3.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.3 TEST SETUP



**Note: 1. Support units were connected to second LISN.**  
**2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes**

### 3.4 TEST INSTRUMENTS

| Equipment             | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|-----------------------|--------------|----------|------------|------------------|------------------|--------------------|
| LISN                  | R&S          | NSLK81   | 8126466    | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| LISN                  | R&S          | NSLK81   | 8126487    | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| 50Ω Switch            | ANRITSU CORP | MP59B    | 6200983704 | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Test Cable            | N/A          | C01      | N/A        | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Test Cable            | N/A          | C02      | N/A        | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Test Cable            | N/A          | C03      | N/A        | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| EMI Test Receiver     | R&S          | ESCI     | 1166.595   | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Passive Voltage Probe | ESH2-Z3      | R&S      | 100196     | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |

### 3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.6 TEST RESULTS

The EUT is powered by battery, so no requirement for this test item.

#### 4. RADIATED EMISSION MEASUREMENT

##### 4.1 RADIATED EMISSION LIMIT (Frequency Range 9KHz-1000MHz)

20 dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table bellow has to be followed.

| FREQUENCY (MHz) | Field Strength<br>(uV/m at meter) | Measurement Distance<br>(meters) |
|-----------------|-----------------------------------|----------------------------------|
| 0.009 -0.490    | 2400/F(KHz)                       | 300                              |
| 0.490 -1.705    | 24000/F(KHz)                      | 30                               |
| 1.705 -30.0     | 30                                | 30                               |
| 30 -88          | 100                               | 3                                |
| 88 -216         | 150                               | 3                                |
| 216~960         | 200                               | 3                                |
| Above 960       | 500                               | 3                                |

##### RADIATED EMISSION LIMITS (Above 1000MHz)

| FREQUENCY (MHz) | Distance of 3 M (dBuV/m) |         |
|-----------------|--------------------------|---------|
|                 | Peak                     | Average |
| Above 1000      | 74                       | 54      |

Note:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (2) Emission Level(dBuV/m)=20log Emission Level(uV/m)

The following table is the setting of the receiver

| Receiver Parameter              | Setting                        |
|---------------------------------|--------------------------------|
| Attenuation                     | Auto                           |
| Start Frequency~ Stop Frequency | 9kHz~150kHz/ RB 200Hz for QP   |
| Start Frequency~ Stop Frequency | 150kHz~30MHz/ RB 9kHz for QP   |
| Start Frequency~ Stop Frequency | 30MHz~1000MHz/ RB120kHz for QP |

The following table is the setting of the spectrum

| Spectrum Parameter                   | Setting                                         |
|--------------------------------------|-------------------------------------------------|
| Attenuation                          | Auto                                            |
| Start Frequency                      | 1000 MHz                                        |
| Stop Frequency                       | 10 <sup>th</sup> carrier harmonic               |
| RB/ VB (emission in restricted band) | 1MHz/ 3 MHz for Peak,<br>1MHz/ 10Hz for Average |

##### 4.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. 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, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

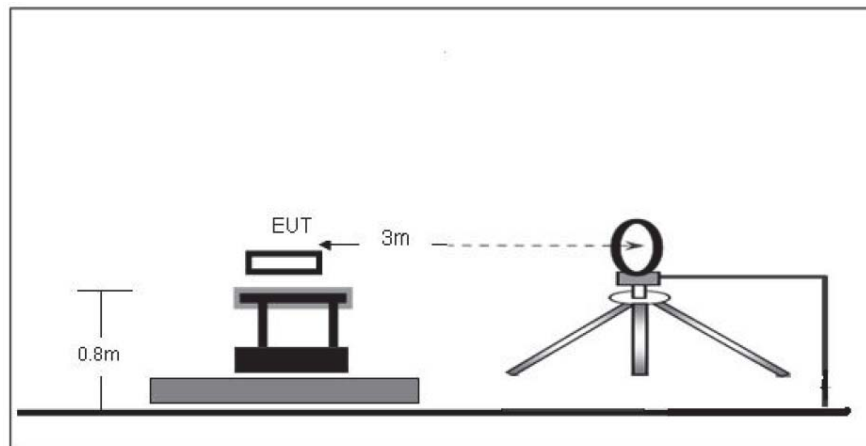
Note:

Both horizontal and vertical antenna polarities were tested.

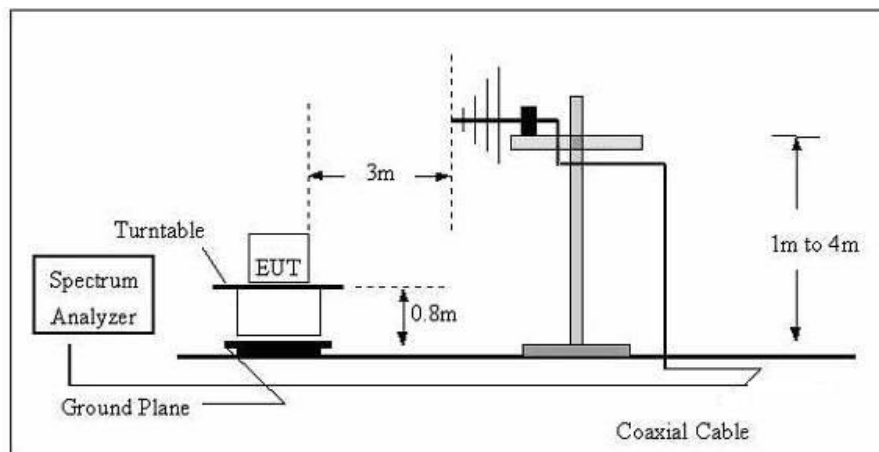
And performed pretest to three orthogonal axis. The worst case emissions were reported.

#### 4.3 TEST SETUP

##### (A) Radiated Emission Test Set-Up Frequency 9KHz~30MHz

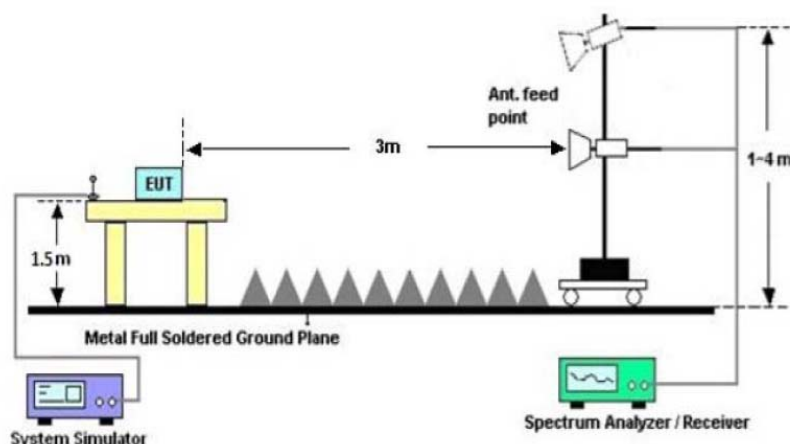


##### (B) Radiated Emission Test Set-Up Frequency Below 1 GHz





## (B) Radiated Emission Test Set-Up Frequency Above 1GHz



### 4.4 TEST INSTRUMENTS

| Equipment         | Manufacturer | Type No.  | Serial No.    | Last calibration | Calibrated until | Calibration period |
|-------------------|--------------|-----------|---------------|------------------|------------------|--------------------|
| Broadband Antenna | R&S          | VULB 9168 | VULB 9168-456 | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Test Cable        | N/A          | R-01      | N/A           | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Test Cable        | N/A          | R-02      | N/A           | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| EMI Test Receiver | R&S          | ESCI      | 101324        | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Antenna Mast      | EM           | SC100_1   | N/A           | N/A              | N/A              | N/A                |
| Turn Table        | EM           | SC100     | 060531        | N/A              | N/A              | N/A                |
| 50Ω Switch        | Anritsu Corp | MP59B     | 6200983705    | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Spectrum Analyzer | R&S          | FSP40     | 100154        | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Horn Antenna      | R&S          | HBM30706  | 10029         | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Amplifier         | EM           | EM-30180  | 060538        | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |

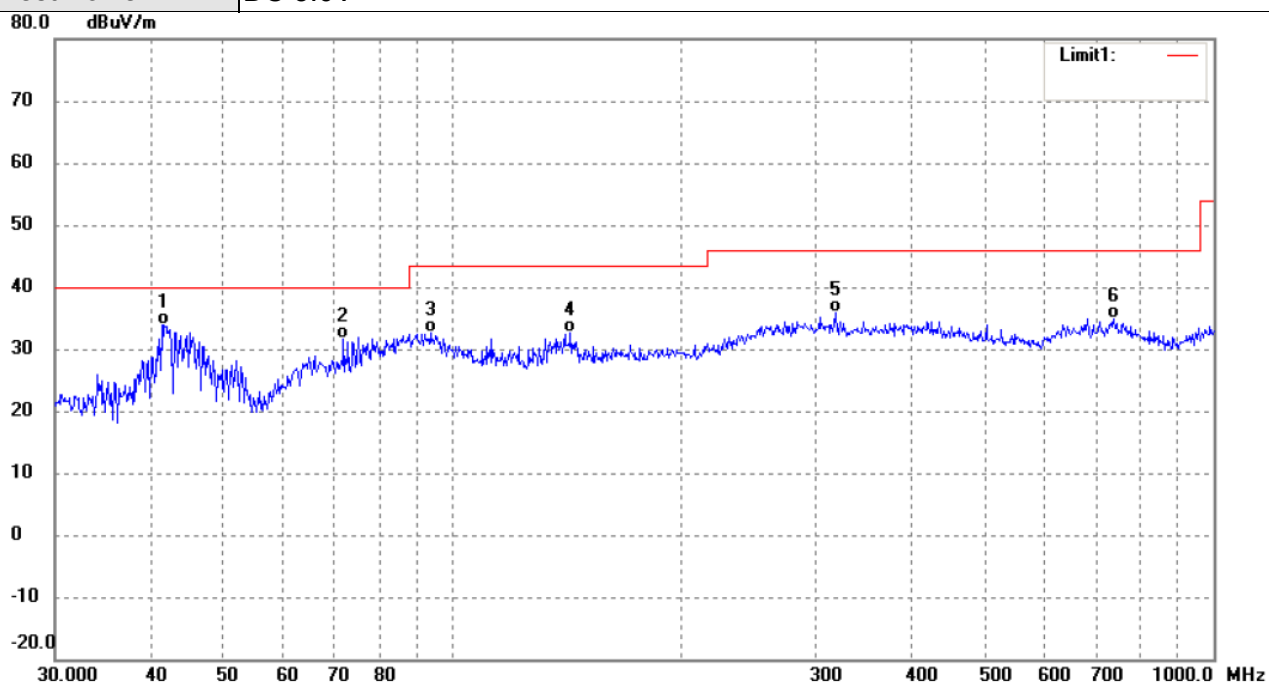
### 4.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

## 4.6 TEST RESULTS

### 4.6.1 TEST RESULTS (Bellow 1GHz)

|               |                |                     |            |
|---------------|----------------|---------------------|------------|
| EUT :         | Wireless mouse | Model Name. :       | BM307      |
| Temperature : | 26 °C          | Relative Humidity : | 56%        |
| Pressure :    | 1010 hPa       | Test Date :         | 2017-06-25 |
| Test Mode :   | BT TX Mode     | Polarization :      | Horizontal |
| Test Power :  | DC 3.0V        |                     |            |

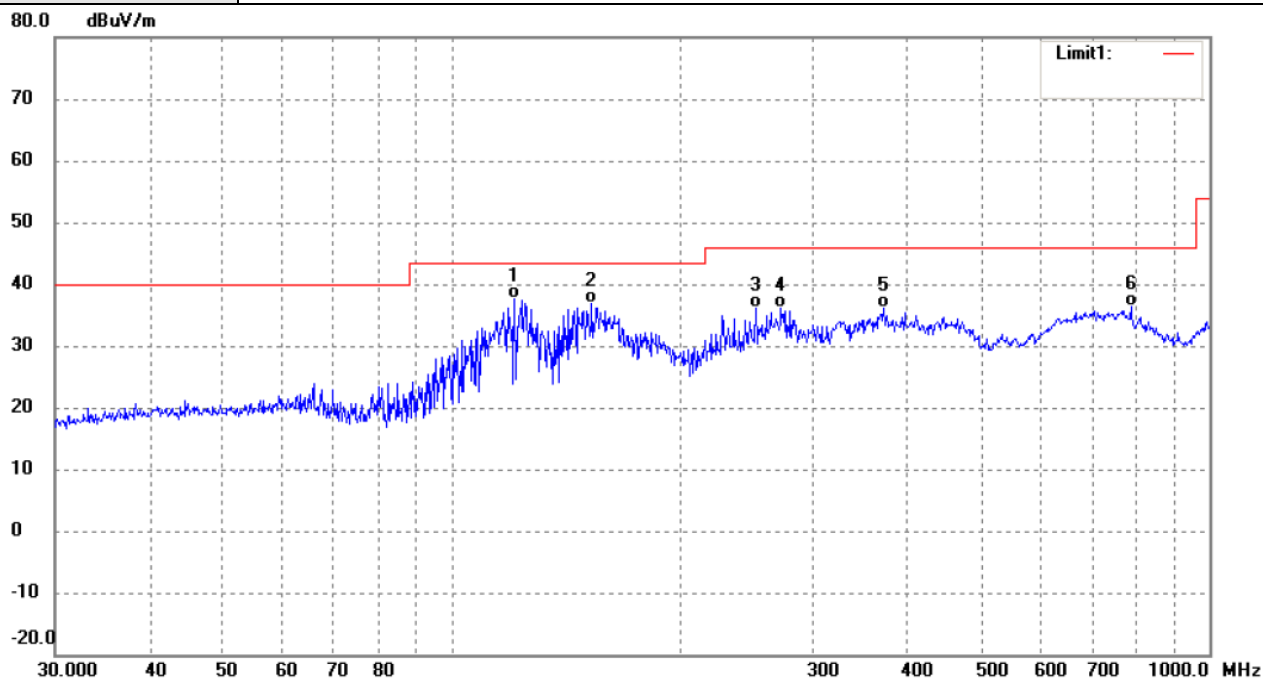


| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 41.7130            | 28.97               | 4.93            | 33.90              | 40.00             | -6.10          | 154           | 100            | peak   |
| 2   | 71.8320            | 28.91               | 2.65            | 31.56              | 40.00             | -8.44          | 170           | 100            | peak   |
| 3   | 93.4402            | 28.64               | 3.96            | 32.60              | 43.50             | -10.90         | 56            | 100            | peak   |
| 4   | 142.8244           | 29.68               | 3.04            | 32.72              | 43.50             | -10.78         | 127           | 100            | peak   |
| 5   | 318.8170           | 23.89               | 11.95           | 35.84              | 46.00             | -10.16         | 132           | 100            | peak   |
| 6   | 739.6605           | 15.96               | 19.00           | 34.96              | 46.00             | -11.04         | 337           | 100            | peak   |

Remark:

Factor = Antenna Factor + Cable Loss.

|               |                |                     |            |
|---------------|----------------|---------------------|------------|
| EUT :         | Wireless mouse | Model Name. :       | BM307      |
| Temperature : | 26 °C          | Relative Humidity : | 56%        |
| Pressure :    | 1010 hPa       | Test Date :         | 2017-06-25 |
| Test Mode :   | BT TX Mode     | Polarization :      | Vertical   |
| Test Power :  | DC 3.0V        |                     |            |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>dB/m | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Degree<br>( ) | Height<br>(cm) | Remark |
|-----|--------------------|---------------------|-----------------|--------------------|-------------------|----------------|---------------|----------------|--------|
| 1   | 121.1231           | 32.86               | 4.72            | 37.58              | 43.50             | -5.92          | 72            | 100            | peak   |
| 2   | 153.2004           | 34.23               | 2.64            | 36.87              | 43.50             | -6.63          | 106           | 100            | peak   |
| 3   | 252.0627           | 26.83               | 9.38            | 36.21              | 46.00             | -9.79          | 86            | 100            | peak   |
| 4   | 272.2776           | 25.43               | 10.58           | 36.01              | 46.00             | -9.99          | 136           | 100            | peak   |
| 5   | 372.0045           | 24.17               | 11.84           | 36.01              | 46.00             | -9.99          | 166           | 100            | peak   |
| 6   | 787.8513           | 19.86               | 16.59           | 36.45              | 46.00             | -9.55          | 282           | 100            | peak   |

Remark:

Factor = Antenna Factor + Cable Loss.

#### 4.6.2 TEST RESULTS (Above 1GHz)

| <b>EUT :</b>         | Wireless mouse          |                 |              | <b>Model Name. :</b>       | BM307                 |                |               |
|----------------------|-------------------------|-----------------|--------------|----------------------------|-----------------------|----------------|---------------|
| <b>Temperature :</b> | 26 °C                   |                 |              | <b>Relative Humidity :</b> | 56%                   |                |               |
| <b>Test Power :</b>  | DC 3.0V                 |                 |              | <b>Pressure :</b>          | 1010 hPa              |                |               |
| <b>Test Mode :</b>   | GFSK TX 2402MHz         |                 |              | <b>Test Date :</b>         | 2017-06-25            |                |               |
| <b>Freq.</b>         | <b>Deceiver Reading</b> | <b>Detector</b> | <b>Polar</b> | <b>Corrected Factor</b>    | <b>Emission Level</b> | <b>Limit</b>   | <b>Margin</b> |
| <b>MHz</b>           | <b>dBuV</b>             | <b>Peak/Avg</b> | <b>H/V</b>   | <b>dB</b>                  | <b>dBuV /m</b>        | <b>dBuV /m</b> | <b>dB</b>     |
| 4804                 | 63.96                   | Peak            | H            | -3.59                      | 60.37                 | 74             | -13.63        |
| 4804                 | 50.76                   | Avg             | H            | -3.59                      | 47.17                 | 54             | -6.83         |
| 7206                 | 57.68                   | Peak            | H            | -0.52                      | 57.16                 | 74             | -16.84        |
| 7206                 | 45.16                   | Avg             | H            | -0.52                      | 44.64                 | 54             | -9.36         |
| ---                  | ---                     | Peak            | H            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | H            |                            |                       | 54             |               |
| 4804                 | 63.24                   | Peak            | V            | -3.59                      | 59.65                 | 74             | -14.35        |
| 4804                 | 50.36                   | Avg             | V            | -3.59                      | 46.77                 | 54             | -7.23         |
| 7206                 | 56.31                   | Peak            | V            | -0.52                      | 55.79                 | 74             | -18.21        |
| 7206                 | 44.39                   | Avg             | V            | -0.52                      | 43.87                 | 54             | -10.13        |
| ---                  | ---                     | Peak            | V            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | V            |                            |                       | 54             |               |

Remark:

Emission Level= Read Level+ Correct Factor

Margin= Emission Level-Limit

The testing has been conformed to 10<sup>th</sup> harmonics(1G~25G)

Other harmonics emission are lower then 20dB below the allowable Limit

| <b>EUT :</b>         | Wireless mouse          |                 |              | <b>Model Name. :</b>       | BM307                 |                |               |
|----------------------|-------------------------|-----------------|--------------|----------------------------|-----------------------|----------------|---------------|
| <b>Temperature :</b> | 26 °C                   |                 |              | <b>Relative Humidity :</b> | 56%                   |                |               |
| <b>Test Power :</b>  | DC 3.0V                 |                 |              | <b>Pressure :</b>          | 1010 hPa              |                |               |
| <b>Test Mode :</b>   | GFSK TX 2441MHz         |                 |              | <b>Test Date :</b>         | 2017-06-25            |                |               |
| <b>Freq.</b>         | <b>Deceiver Reading</b> | <b>Detector</b> | <b>Polar</b> | <b>Corrected Factor</b>    | <b>Emission Level</b> | <b>Limit</b>   | <b>Margin</b> |
| <b>MHz</b>           | <b>dBuV</b>             | <b>Peak/Avg</b> | <b>H/V</b>   | <b>dB</b>                  | <b>dBuV /m</b>        | <b>dBuV /m</b> | <b>dB</b>     |
| 4882                 | 63.46                   | Peak            | H            | -3.49                      | 59.97                 | 74             | -14.03        |
| 4882                 | 50.60                   | Avg             | H            | -3.49                      | 47.11                 | 54             | -6.89         |
| 7323                 | 56.13                   | Peak            | H            | -0.47                      | 55.66                 | 74             | -18.34        |
| 7323                 | 45.24                   | Avg             | H            | -0.47                      | 44.77                 | 54             | -9.23         |
| ---                  | ---                     | Peak            | H            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | H            |                            |                       | 54             |               |
| 4882                 | 63.95                   | Peak            | V            | -3.49                      | 60.46                 | 74             | -13.54        |
| 4882                 | 50.34                   | Avg             | V            | -3.49                      | 46.85                 | 54             | -7.15         |
| 7323                 | 56.61                   | Peak            | V            | -0.47                      | 56.14                 | 74             | -17.86        |
| 7323                 | 45.52                   | Avg             | V            | -0.47                      | 45.05                 | 54             | -8.95         |
| ---                  | ---                     | Peak            | V            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | V            |                            |                       | 54             |               |

Remark:

Emission Level= Read Level+ Correct Factor

Margin= Emission Level-Limit

The testing has been conformed to 10<sup>th</sup> harmonics(1G~25G)

Other harmonics emission are lower then 20dB below the allowable Limit

| <b>EUT :</b>         | Wireless mouse          |                 |              | <b>Model Name. :</b>       | BM307                 |                |               |
|----------------------|-------------------------|-----------------|--------------|----------------------------|-----------------------|----------------|---------------|
| <b>Temperature :</b> | 26 °C                   |                 |              | <b>Relative Humidity :</b> | 56%                   |                |               |
| <b>Test Power :</b>  | DC 3.0V                 |                 |              | <b>Pressure :</b>          | 1010 hPa              |                |               |
| <b>Test Mode :</b>   | GFSK TX 2480MHz         |                 |              | <b>Test Date :</b>         | 2017-06-25            |                |               |
| <b>Freq.</b>         | <b>Deceiver Reading</b> | <b>Detector</b> | <b>Polar</b> | <b>Corrected Factor</b>    | <b>Emission Level</b> | <b>Limit</b>   | <b>Margin</b> |
| <b>MHz</b>           | <b>dBuV</b>             | <b>Peak/Avg</b> | <b>H/V</b>   | <b>dB</b>                  | <b>dBuV /m</b>        | <b>dBuV /m</b> | <b>dB</b>     |
| 4960                 | 63.98                   | Peak            | H            | -3.41                      | 60.57                 | 74             | -13.43        |
| 4960                 | 50.37                   | Avg             | H            | -3.41                      | 46.96                 | 54             | -7.04         |
| 7440                 | 56.48                   | Peak            | H            | -0.42                      | 56.06                 | 74             | -17.94        |
| 7440                 | 45.21                   | Avg             | H            | -0.42                      | 44.79                 | 54             | -9.21         |
| ---                  | ---                     | Peak            | H            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | H            |                            |                       | 54             |               |
| 4960                 | 63.09                   | Peak            | V            | -3.41                      | 59.68                 | 74             | -14.32        |
| 4960                 | 50.54                   | Avg             | V            | -3.41                      | 47.13                 | 54             | -6.87         |
| 7440                 | 57.20                   | Peak            | V            | -0.42                      | 56.78                 | 74             | -17.22        |
| 7440                 | 45.50                   | Avg             | V            | -0.42                      | 45.08                 | 54             | -8.92         |
| ---                  | ---                     | Peak            | V            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | V            |                            |                       | 54             |               |

Remark:

Emission Level= Read Level+ Correct Factor

Margin= Emission Level-Limit

The testing has been conformed to 10<sup>th</sup> harmonics(1G~25G)

Other harmonics emission are lower then 20dB below the allowable Limit

| <b>EUT :</b>         | Wireless mouse          |                 |              | <b>Model Name. :</b>       | BM307                 |                |               |
|----------------------|-------------------------|-----------------|--------------|----------------------------|-----------------------|----------------|---------------|
| <b>Temperature :</b> | 26 °C                   |                 |              | <b>Relative Humidity :</b> | 56%                   |                |               |
| <b>Test Power :</b>  | DC 3.0V                 |                 |              | <b>Pressure :</b>          | 1010 hPa              |                |               |
| <b>Test Mode :</b>   | 8-DPSK TX 2402MHz       |                 |              | <b>Test Date :</b>         | 2017-06-25            |                |               |
| <b>Freq.</b>         | <b>Deceiver Reading</b> | <b>Detector</b> | <b>Polar</b> | <b>Corrected Factor</b>    | <b>Emission Level</b> | <b>Limit</b>   | <b>Margin</b> |
| <b>MHz</b>           | <b>dBuV</b>             | <b>Peak/Avg</b> | <b>H/V</b>   | <b>dB</b>                  | <b>dBuV /m</b>        | <b>dBuV /m</b> | <b>dB</b>     |
| 4804                 | 62.75                   | Peak            | H            | -3.59                      | 59.16                 | 74             | -14.84        |
| 4804                 | 51.61                   | Avg             | H            | -3.59                      | 48.02                 | 54             | -5.98         |
| 7206                 | 58.03                   | Peak            | H            | -0.52                      | 57.51                 | 74             | -16.49        |
| 7206                 | 45.18                   | Avg             | H            | -0.52                      | 44.66                 | 54             | -9.34         |
| ---                  | ---                     | Peak            | H            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | H            |                            |                       | 54             |               |
| 4804                 | 62.73                   | Peak            | V            | -3.59                      | 59.14                 | 74             | -14.86        |
| 4804                 | 51.36                   | Avg             | V            | -3.59                      | 47.77                 | 54             | -6.23         |
| 7206                 | 56.94                   | Peak            | V            | -0.52                      | 56.42                 | 74             | -17.58        |
| 7206                 | 44.18                   | Avg             | V            | -0.52                      | 43.66                 | 54             | -10.34        |
| ---                  | ---                     | Peak            | V            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | V            |                            |                       | 54             |               |

Remark:

Emission Level= Read Level+ Correct Factor

Margin= Emission Level-Limit

The testing has been conformed to 10<sup>th</sup> harmonics(1G~25G)

Other harmonics emission are lower then 20dB below the allowable Limit

| <b>EUT :</b>         | Wireless mouse          |                 |              | <b>Model Name. :</b>       | BM307                 |                |               |
|----------------------|-------------------------|-----------------|--------------|----------------------------|-----------------------|----------------|---------------|
| <b>Temperature :</b> | 26 °C                   |                 |              | <b>Relative Humidity :</b> | 56%                   |                |               |
| <b>Test Power :</b>  | DC 3.0V                 |                 |              | <b>Pressure :</b>          | 1010 hPa              |                |               |
| <b>Test Mode :</b>   | 8-DPSK TX 2441MHz       |                 |              | <b>Test Date :</b>         | 2017-06-25            |                |               |
| <b>Freq.</b>         | <b>Deceiver Reading</b> | <b>Detector</b> | <b>Polar</b> | <b>Corrected Factor</b>    | <b>Emission Level</b> | <b>Limit</b>   | <b>Margin</b> |
| <b>MHz</b>           | <b>dBuV</b>             | <b>Peak/Avg</b> | <b>H/V</b>   | <b>dB</b>                  | <b>dBuV /m</b>        | <b>dBuV /m</b> | <b>dB</b>     |
| 4882                 | 65.45                   | Peak            | H            | -3.49                      | 61.96                 | 74             | -12.04        |
| 4882                 | 53.12                   | Avg             | H            | -3.49                      | 49.63                 | 54             | -4.37         |
| 7323                 | 59.39                   | Peak            | H            | -0.47                      | 58.92                 | 74             | -15.08        |
| 7323                 | 46.15                   | Avg             | H            | -0.47                      | 45.68                 | 54             | -8.32         |
| ---                  | ---                     | Peak            | H            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | H            |                            |                       | 54             |               |
| 4882                 | 65.46                   | Peak            | V            | -3.49                      | 61.97                 | 74             | -12.03        |
| 4882                 | 52.77                   | Avg             | V            | -3.49                      | 49.28                 | 54             | -4.72         |
| 7323                 | 58.51                   | Peak            | V            | -0.47                      | 58.04                 | 74             | -15.96        |
| 7323                 | 45.64                   | Avg             | V            | -0.47                      | 45.17                 | 54             | -8.83         |
| ---                  |                         | Peak            | V            |                            |                       | 74             |               |
| ---                  |                         | Avg             | V            |                            |                       | 54             |               |

Remark:

Emission Level= Read Level+ Correct Factor

Margin= Emission Level-Limit

The testing has been conformed to 10<sup>th</sup> harmonics(1G~25G)

Other harmonics emission are lower then 20dB below the allowable Limit



| <b>EUT :</b>         | Wireless mouse          |                 |              | <b>Model Name. :</b>       | BM307                 |                |               |
|----------------------|-------------------------|-----------------|--------------|----------------------------|-----------------------|----------------|---------------|
| <b>Temperature :</b> | 26 °C                   |                 |              | <b>Relative Humidity :</b> | 56%                   |                |               |
| <b>Test Power :</b>  | DC 3.0V                 |                 |              | <b>Pressure :</b>          | 1010 hPa              |                |               |
| <b>Test Mode :</b>   | 8-DPSK TX 2480MHz       |                 |              | <b>Test Date :</b>         | 2017-06-25            |                |               |
| <b>Freq.</b>         | <b>Deceiver Reading</b> | <b>Detector</b> | <b>Polar</b> | <b>Corrected Factor</b>    | <b>Emission Level</b> | <b>Limit</b>   | <b>Margin</b> |
| <b>MHz</b>           | <b>dBuV</b>             | <b>Peak/Avg</b> | <b>H/V</b>   | <b>dB</b>                  | <b>dBuV /m</b>        | <b>dBuV /m</b> | <b>dB</b>     |
| 4960                 | 65.96                   | Peak            | H            | -3.41                      | 62.55                 | 74             | -11.45        |
| 4960                 | 53.9                    | Avg             | H            | -3.41                      | 50.49                 | 54             | -3.51         |
| 7440                 | 57.94                   | Peak            | H            | -0.42                      | 57.52                 | 74             | -16.48        |
| 7440                 | 46.70                   | Avg             | H            | -0.42                      | 46.28                 | 54             | -7.72         |
| ---                  | ---                     | Peak            | H            |                            |                       | 74             |               |
| ---                  | ---                     | Avg             | H            |                            |                       | 54             |               |
| 4960                 | 64.85                   | Peak            | V            | -3.41                      | 61.44                 | 74             | -12.56        |
| 4960                 | 53.46                   | Avg             | V            | -3.41                      | 50.05                 | 54             | -3.95         |
| 7440                 | 58.43                   | Peak            | V            | -0.42                      | 58.01                 | 74             | -15.99        |
| 7440                 | 47.05                   | Avg             | V            | -0.42                      | 46.63                 | 54             | -7.37         |
| ---                  |                         | Peak            | V            |                            |                       | 74             |               |
| ---                  |                         | Avg             | V            |                            |                       | 54             |               |

Remark:

Emission Level= Read Level+ Correct Factor

Margin= Emission Level-Limit

The testing has been conformed to 10<sup>th</sup> harmonics(1G~25G)

Other harmonics emission are lower then 20dB below the allowable Limit

## 5. CONDUCTED OUTPUT POWER MEASUREMENT

### 5.1 LIMITS

|                   |                                                             |
|-------------------|-------------------------------------------------------------|
| Peak Output Power | Hopping Channels>75 Power<1W(30dBm)<br>Other <125 mW(21dBm) |
|-------------------|-------------------------------------------------------------|

### 5.2 TEST PROCEDURE

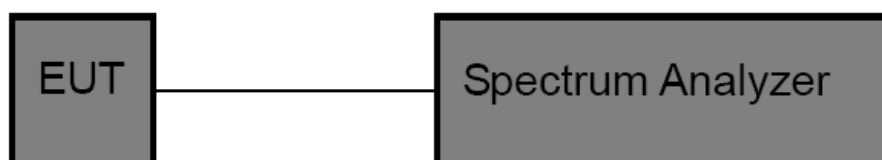
The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

Spectrum Setting:

Peak Detector: RBW=1 MHz, VBW=3 MHz for bandwidth less than 1MHz.

RBW=3 MHz, VBW=3 MHz for bandwidth more than 1MHz.

### 5.3 TEST SETUP



### 5.4 TEST INSTRUMENTS

| Equipment         | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|-------------------|--------------|----------|------------|------------------|------------------|--------------------|
| Spectrum Analyzer | R&S          | FSP40    | 100154     | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Spectrum Analyzer | Agilent      | E4407B   | MY41440432 | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |

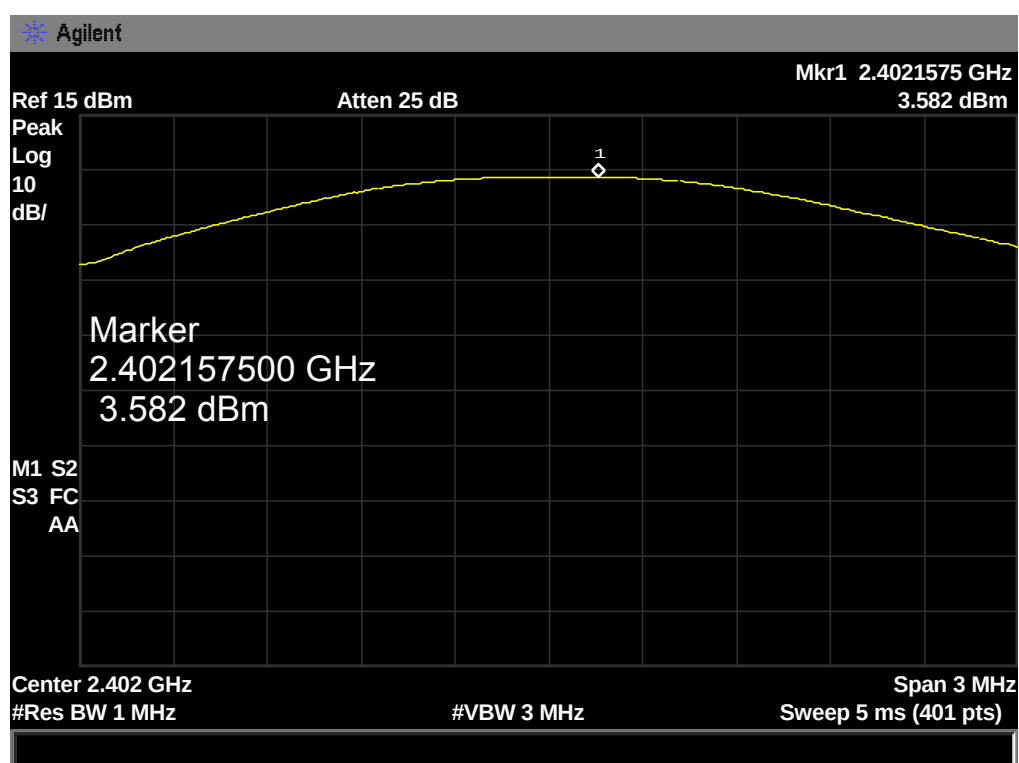
### 5.5 EUT OPERATING CONDITIONS

The EUT was set to continuously transmitting in the maximum power during the test.

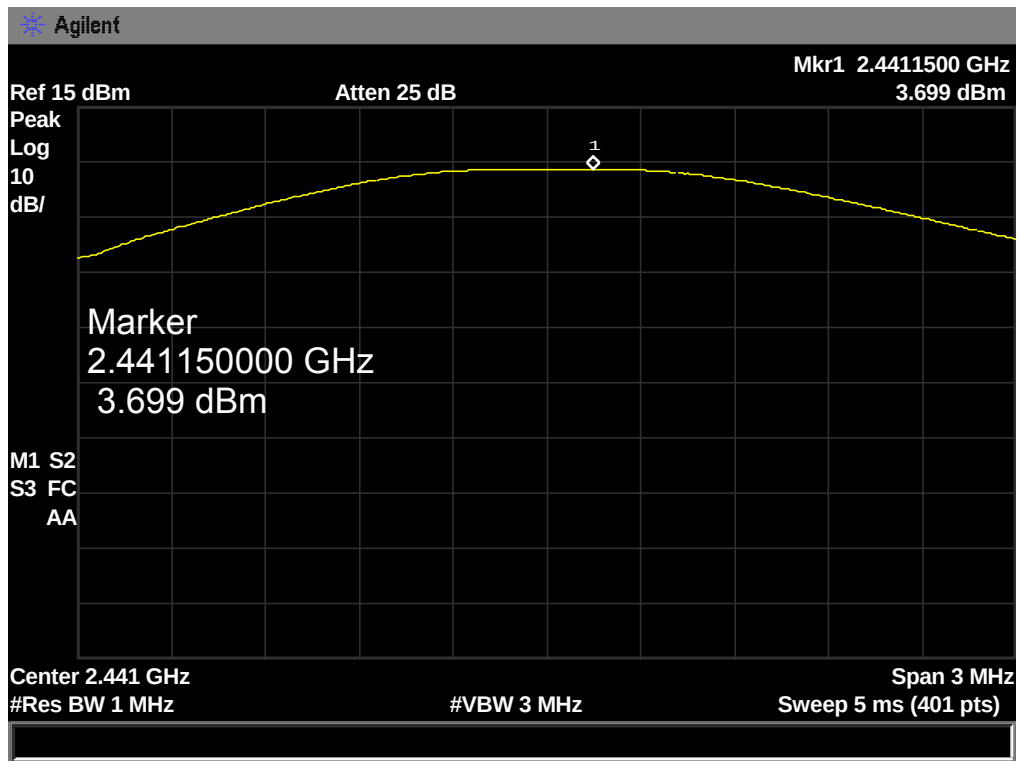
### 5.6 TEST RESULTS

| GFSK (1Mbps)    |                         |             |
|-----------------|-------------------------|-------------|
| Frequency (MHz) | Peak Output Power (dBm) | Limit (dBm) |
| 2402            | 3.582                   | <30         |
| 2441            | 3.699                   |             |
| 2480            | 3.582                   |             |

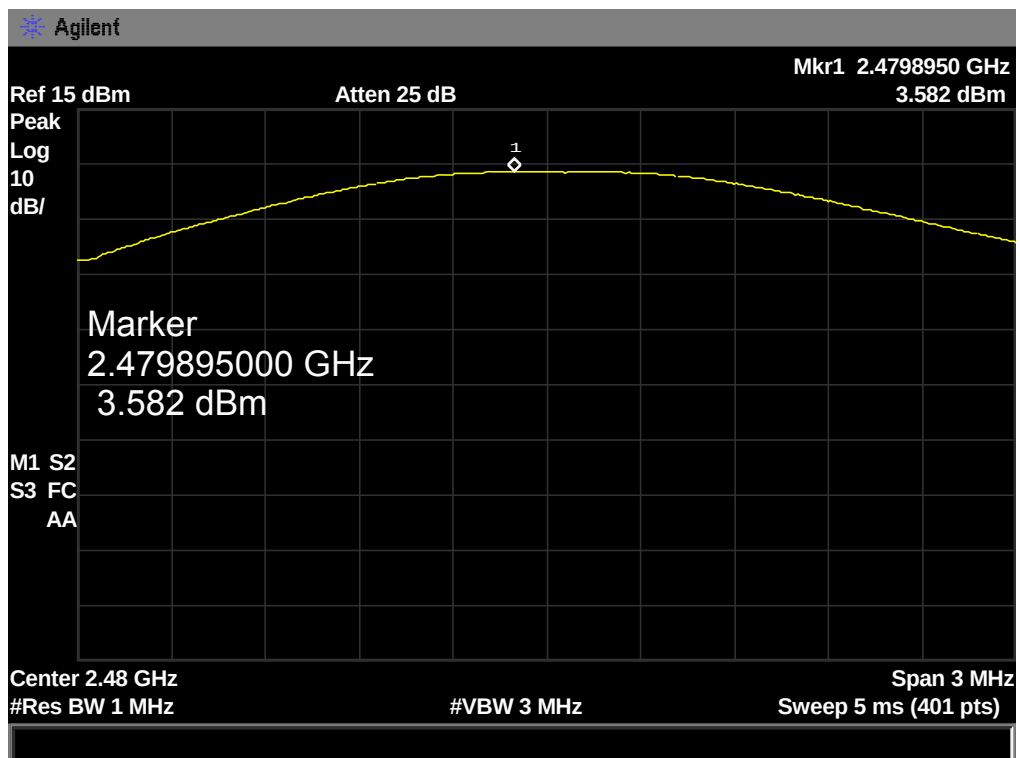
### 2402 MHz



### 2441 MHz

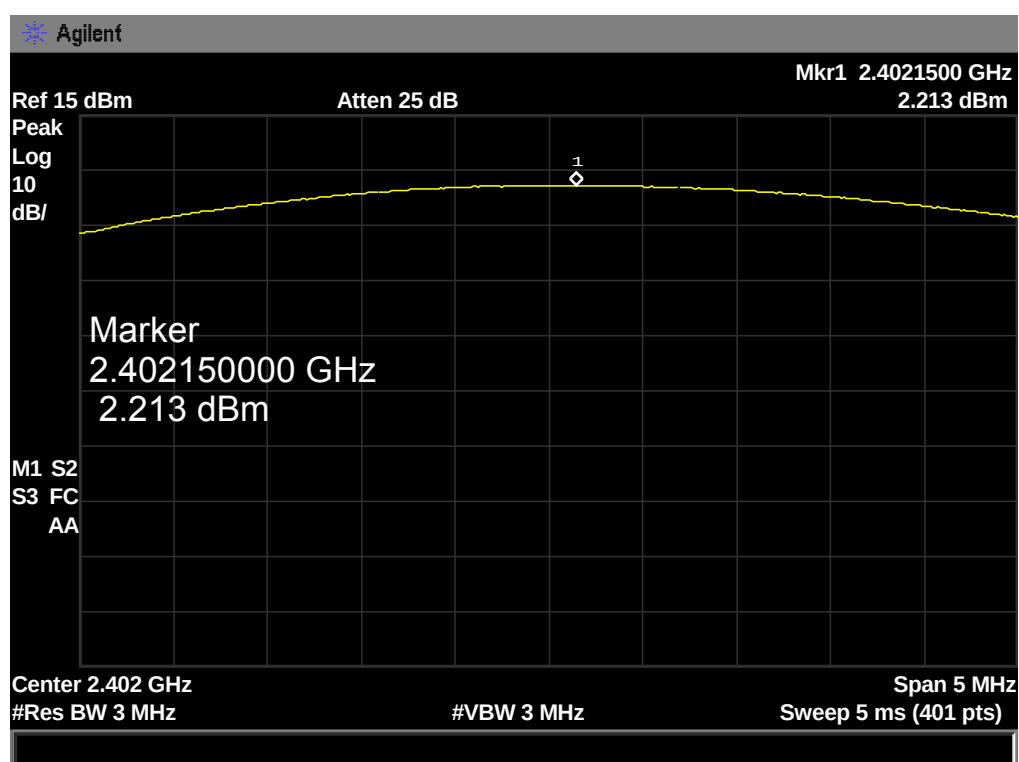


### 2480 MHz

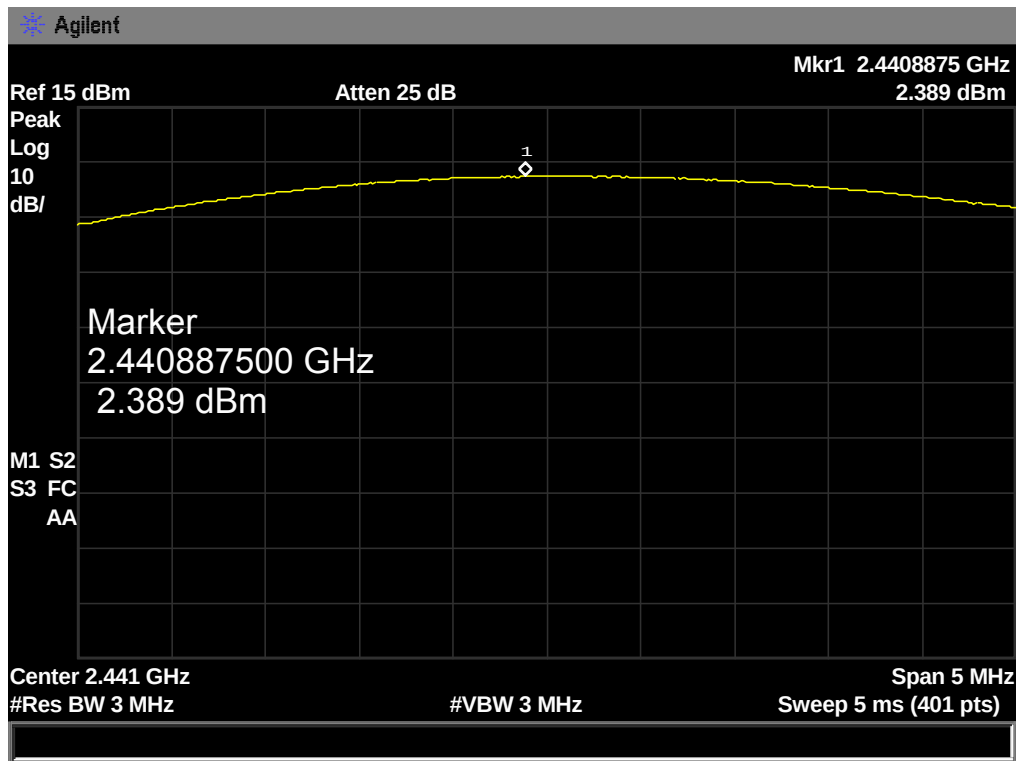


| $\pi$ /4-DQPSK (2Mbps) |                         |             |
|------------------------|-------------------------|-------------|
| Frequency (MHz)        | Peak Output Power (dBm) | Limit (dBm) |
| 2402                   | 2.213                   | <21         |
| 2441                   | 2.389                   |             |
| 2480                   | 2.273                   |             |

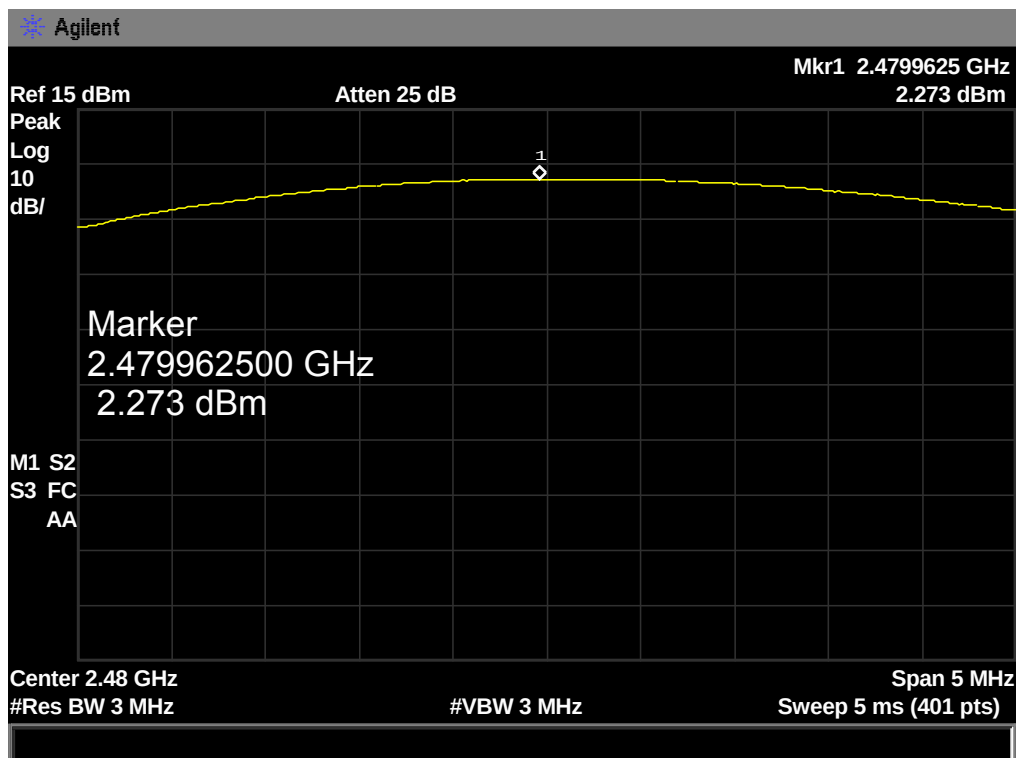
2402 MHz



### 2441 MHz

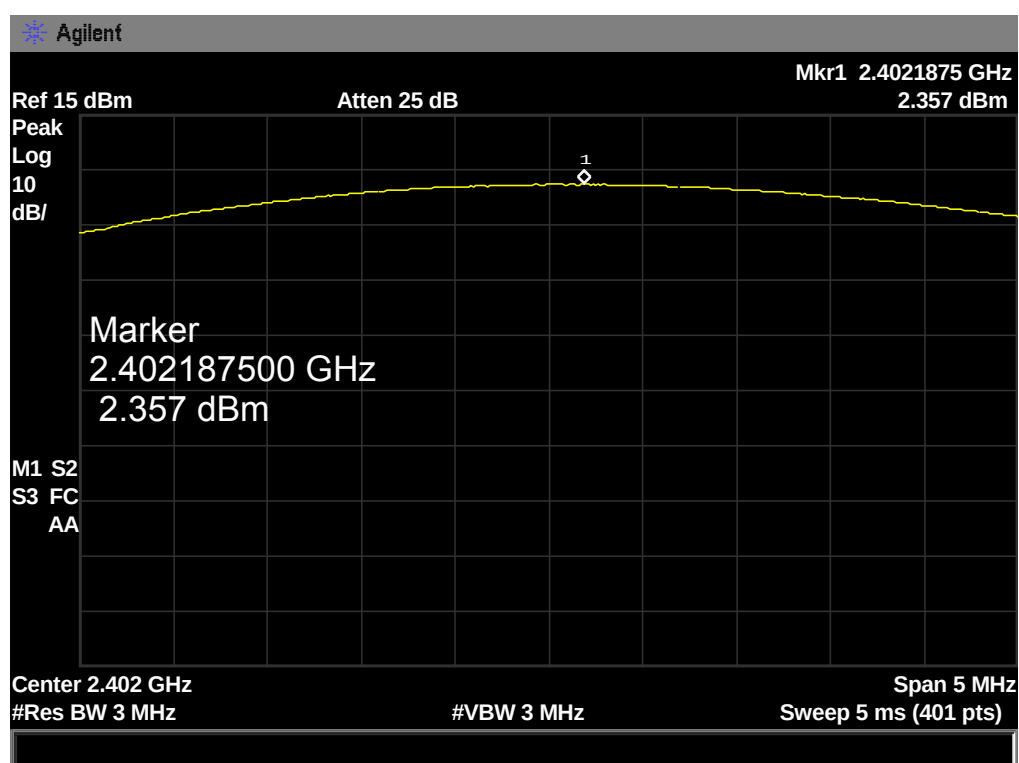


### 2480 MHz

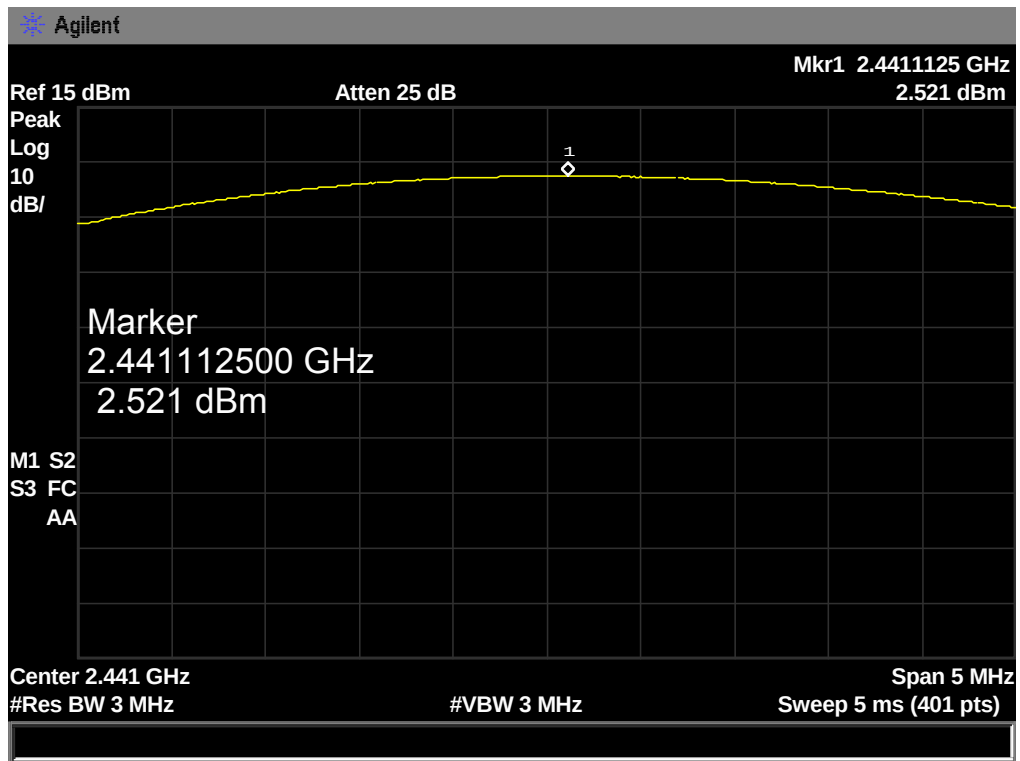


| 8-DPSK (3Mbps)  |                         |             |
|-----------------|-------------------------|-------------|
| Frequency (MHz) | Peak Output Power (dBm) | Limit (dBm) |
| 2402            | 2.357                   | <21         |
| 2441            | 2.521                   |             |
| 2480            | 2.395                   |             |

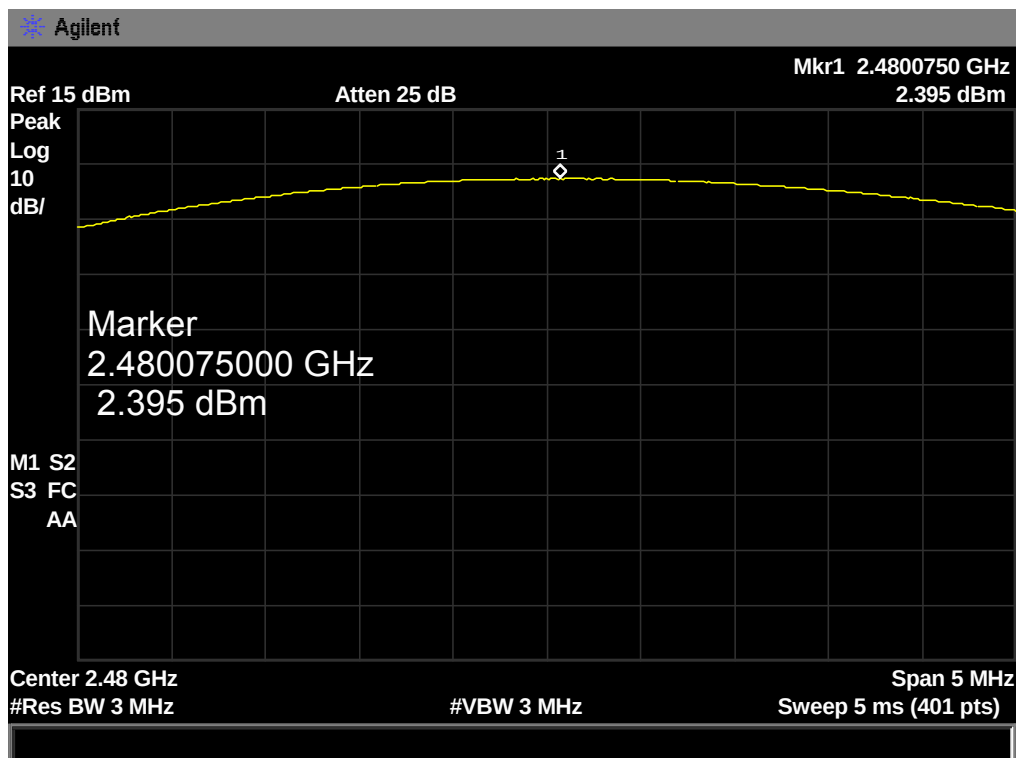
### 2402 MHz



### 2441 MHz



### 2480 MHz





## 6. OCCUPIED BANDWIDTH MEASUREMENT

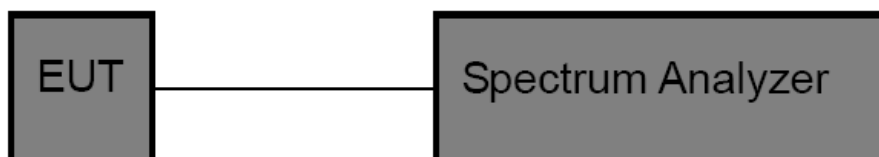
### 6.1 LIMITS

| Test Item          | Limit                                                                     | Frequency Range(MHz) |
|--------------------|---------------------------------------------------------------------------|----------------------|
| Bandwidth          | $\leq 1$ MHz<br>(20dB bandwidth)                                          | 2400~2483.5          |
| Channel Separation | $>25$ KHz or $>$ two-thirds of<br>the 20 dB bandwidth<br>Which is greater | 2400~2483.5          |

### 6.2 TEST PROCEDURE

The EUT was directly connected to the Spectrum analyzer and antenna output port as show in the block diagram as bellow.

### 6.3 TEST SETUP



### 6.4 TEST INSTRUMENTS

| Equipment         | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|-------------------|--------------|----------|------------|------------------|------------------|--------------------|
| Spectrum Analyzer | R&S          | FSP40    | 100154     | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Spectrum Analyzer | Agilent      | E4407B   | MY41440432 | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |

### 6.5 EUT OPERATING CONDITIONS

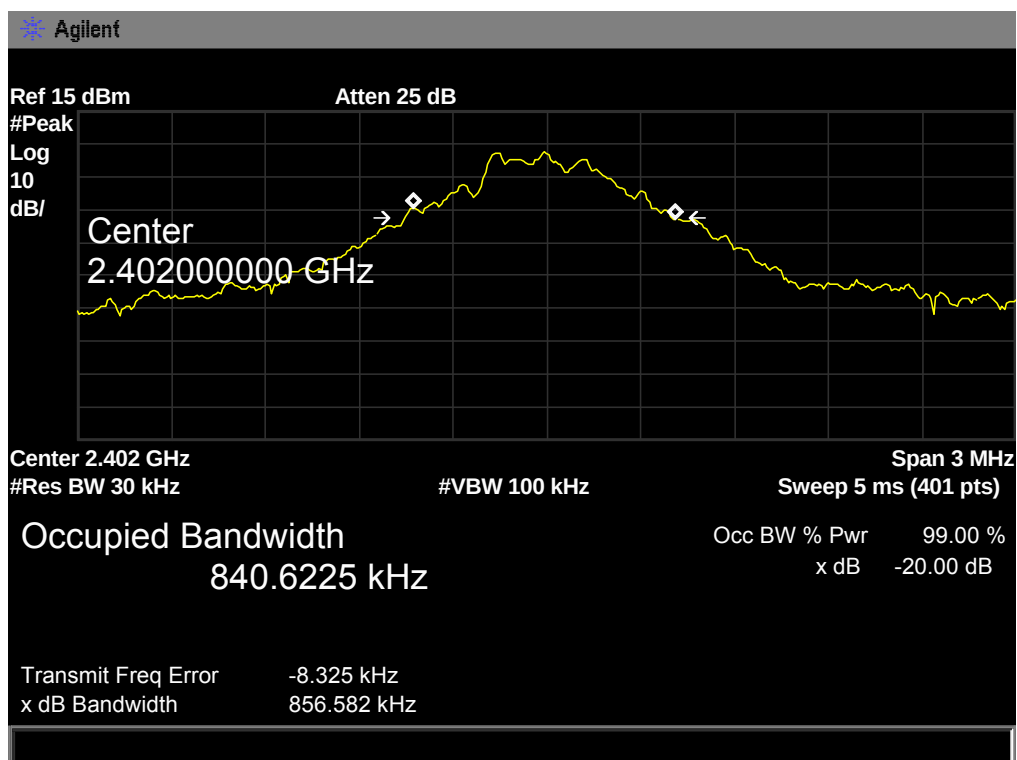
The EUT was set to continuously transmitting in the maximum power during the test.

### 6.6 TEST RESULTS

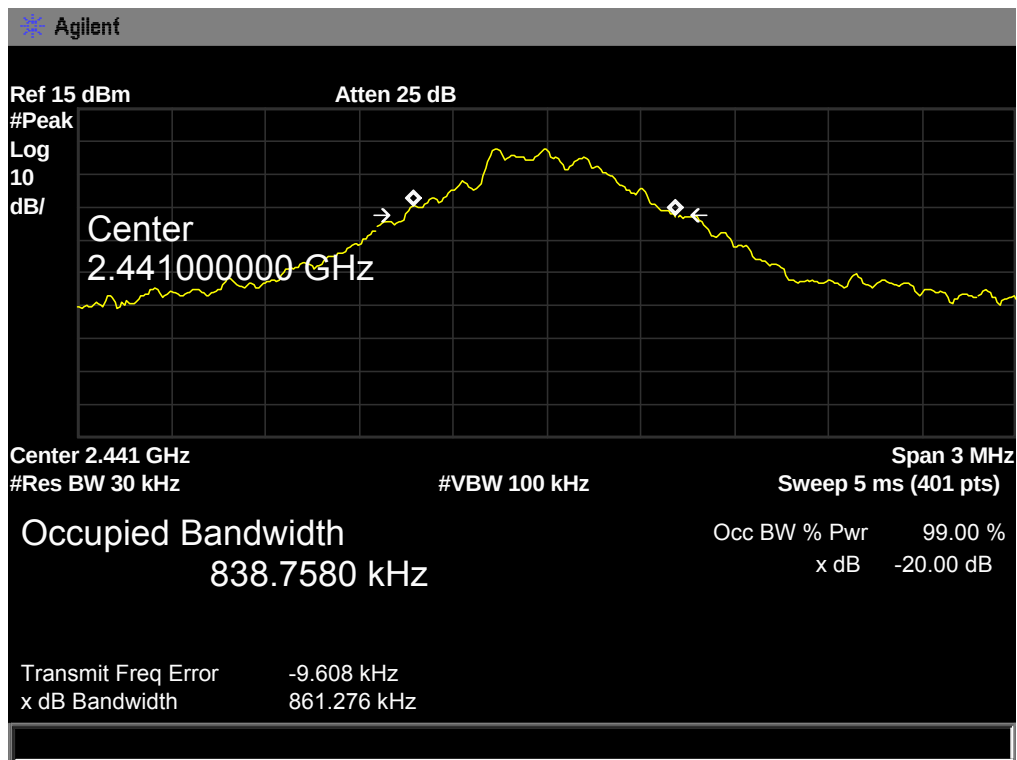
| GFSK Mode (1Mbps) |                      |               |                           |
|-------------------|----------------------|---------------|---------------------------|
| Frequency (MHz)   | 20dB Bandwidth (kHz) | 99% OBW (kHz) | 20dB Bandwidth *2/3 (kHz) |
| 2402              | 856.582              | 840.6225      |                           |
| 2441              | 861.276              | 838.7580      |                           |
| 2480              | 922.500              | 837.7272      |                           |

**Note:** Test plots please refer following pages.

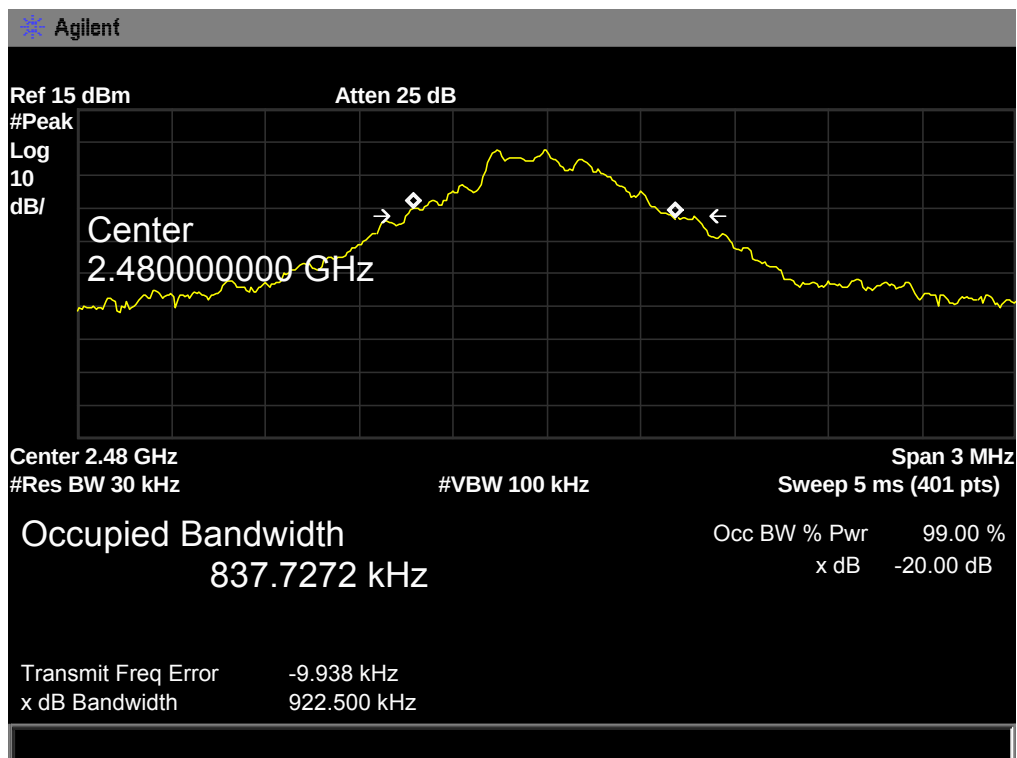
### 2402 MHz(GFSK) Bandwidth



### 2441 MHz(GFSK) Bandwidth



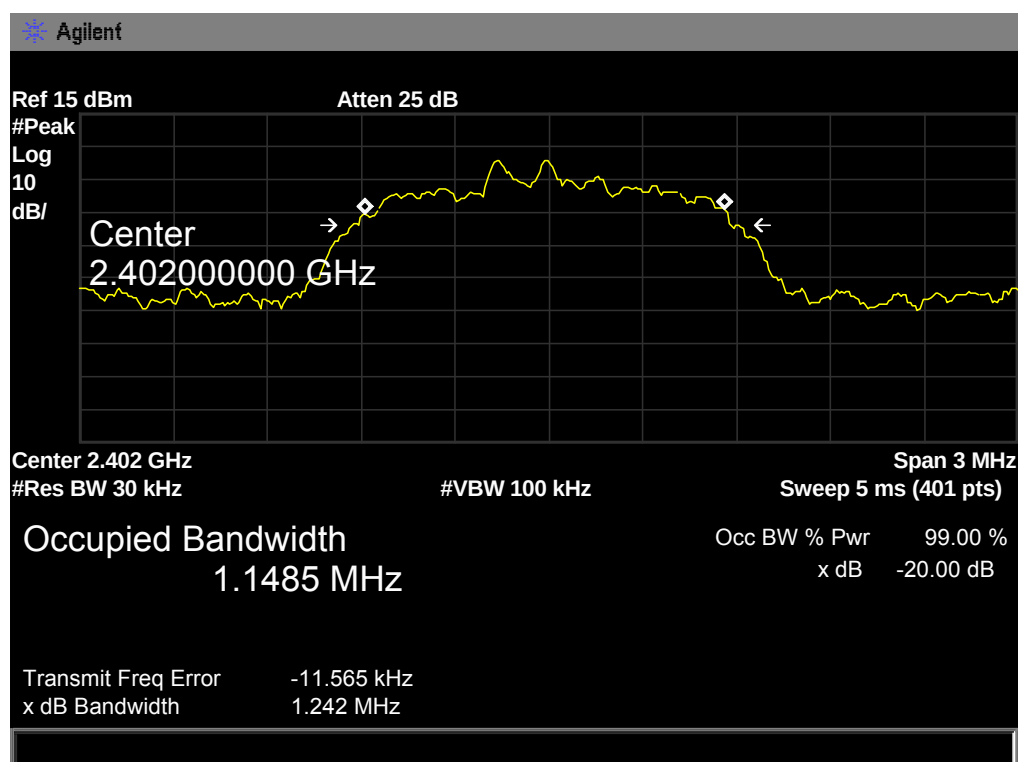
### 2480 MHz(GFSK) Bandwidth



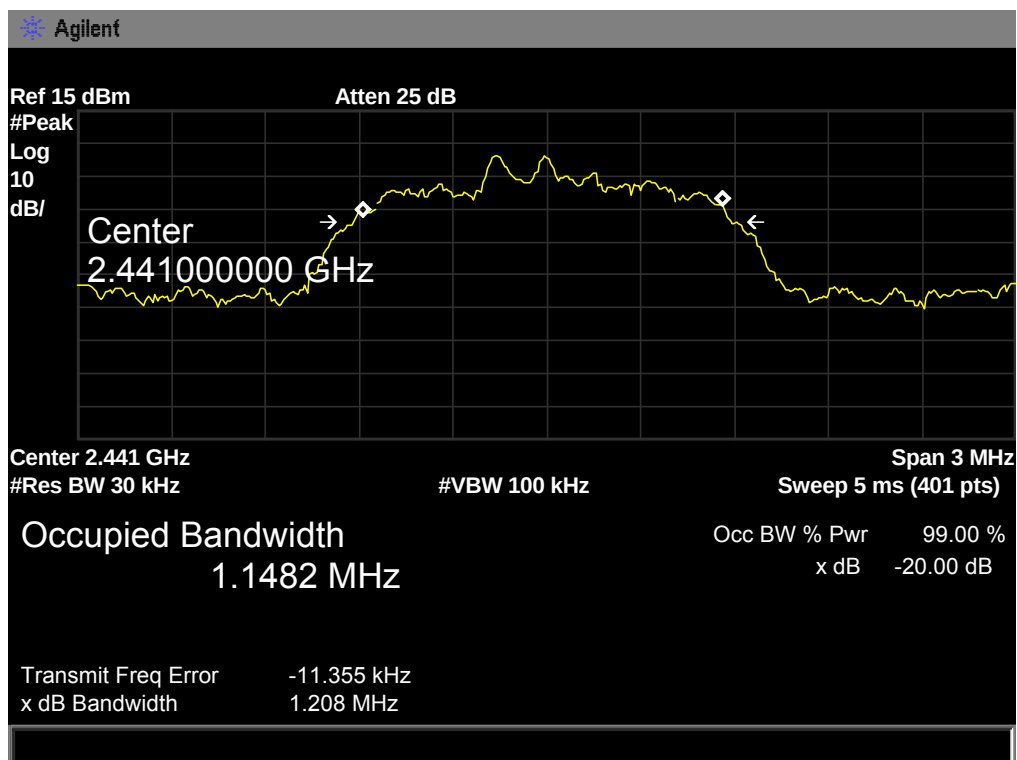
| 8-DPSK Mode (3Mbps) |                      |               |                           |
|---------------------|----------------------|---------------|---------------------------|
| Frequency (MHz)     | 20dB Bandwidth (kHz) | 99% OBW (kHz) | 20dB Bandwidth *2/3 (kHz) |
| 2402                | 1242.00              | 1148.500      | 828.00                    |
| 2441                | 1208.00              | 1148.200      | 805.33                    |
| 2480                | 1216.00              | 1151.200      | 810.67                    |

**Note:** Test plots please refer following pages.

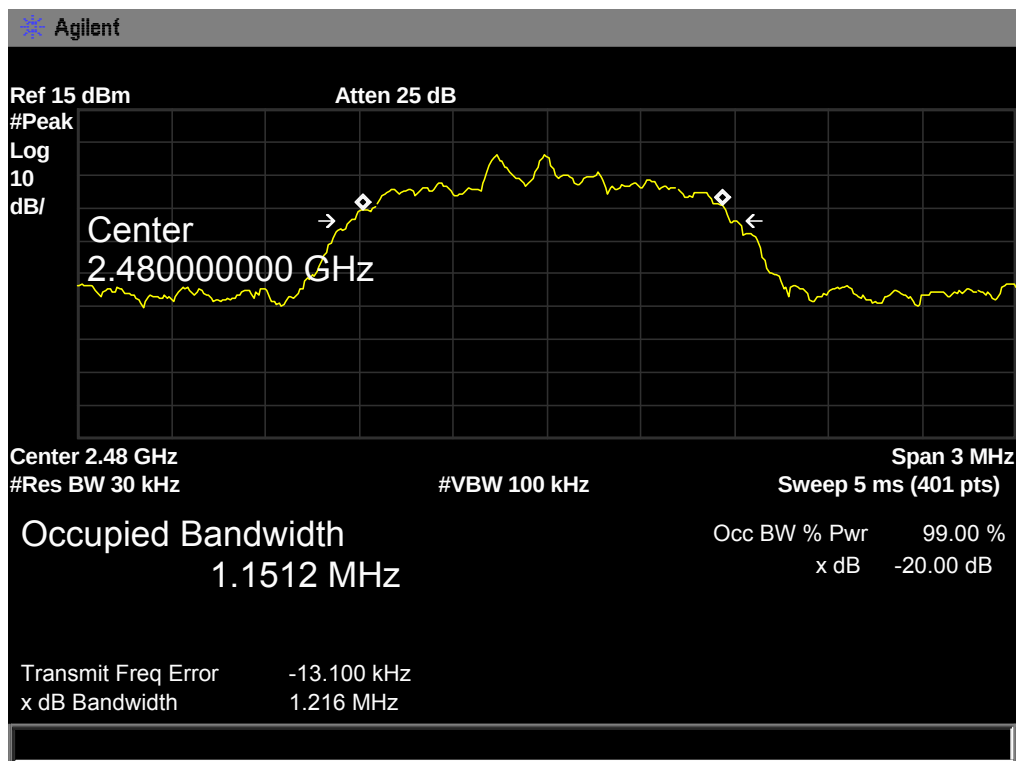
### 2402 MHz(8-DPSK) Bandwidth



### 2441 MHz(8-DPSK) Bandwidth



### 2480 MHz(8-DPSK) Bandwidth



## 7. CARRIER FREQUENCY SEPARATION MEASUREMENT

### 7.1 LIMITS

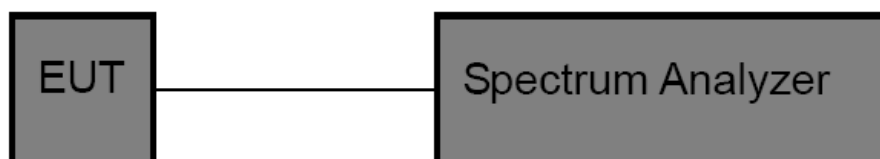
|                      |                                                                                       |
|----------------------|---------------------------------------------------------------------------------------|
| Frequency Separation | The channel spacing shall be a minimum of 25 kHz or two-thirds of the 20 dB Bandwidth |
|----------------------|---------------------------------------------------------------------------------------|

### 7.2 TEST PROCEDURE

The EUT was directly connected to the Spectrum analyzer and antenna output port as show in the block diagram as bellow.

- Set span= wide enough to capture the peaks of two adjacent channels.
- Set the RBW  $\geq 1\%$  of the span
- Set the VBW  $\geq 3$  RBW (30kHz/ 100kHz)
- Detector= Peak.
- Sweep time= auto couple
- Trace mode= max hold.
- Allow trace to fully stabilize.
- Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

### 7.3 TEST SETUP



### 7.4 TEST INSTRUMENTS

| Equipment         | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|-------------------|--------------|----------|------------|------------------|------------------|--------------------|
| Spectrum Analyzer | R&S          | FSP40    | 100154     | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Spectrum Analyzer | Agilent      | E4407B   | MY41440432 | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |

### 7.5 EUT OPERATING CONDITIONS

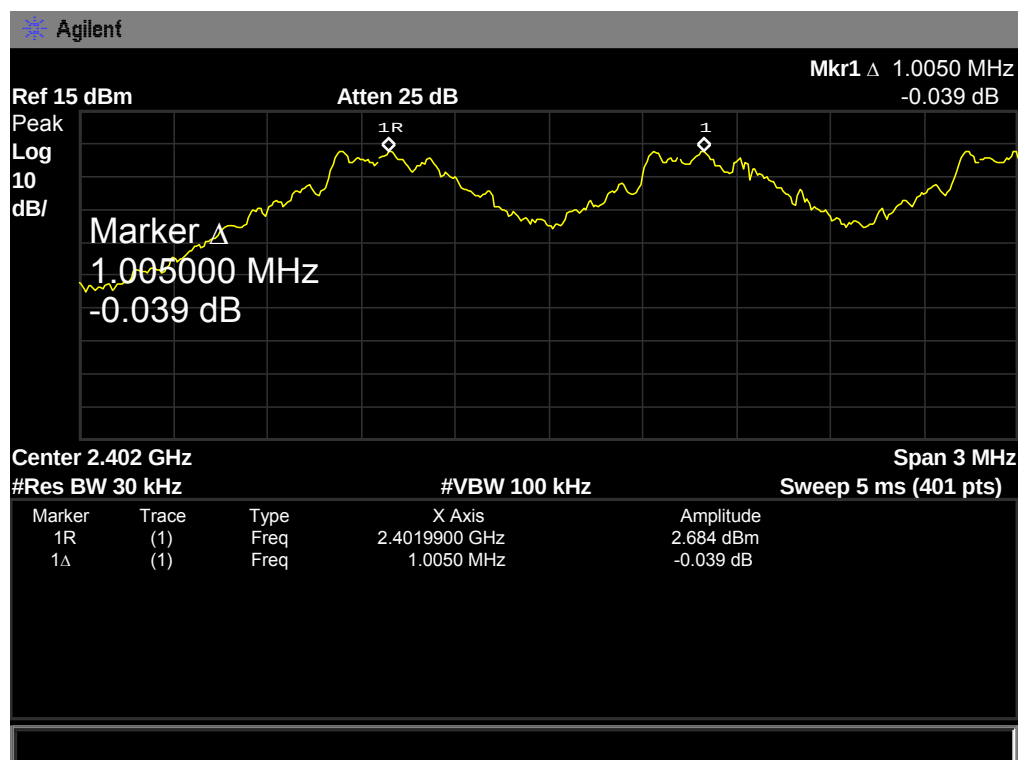
The EUT was set to continuously transmitting in the maximum power during the test.

### 7.6 TEST RESULTS

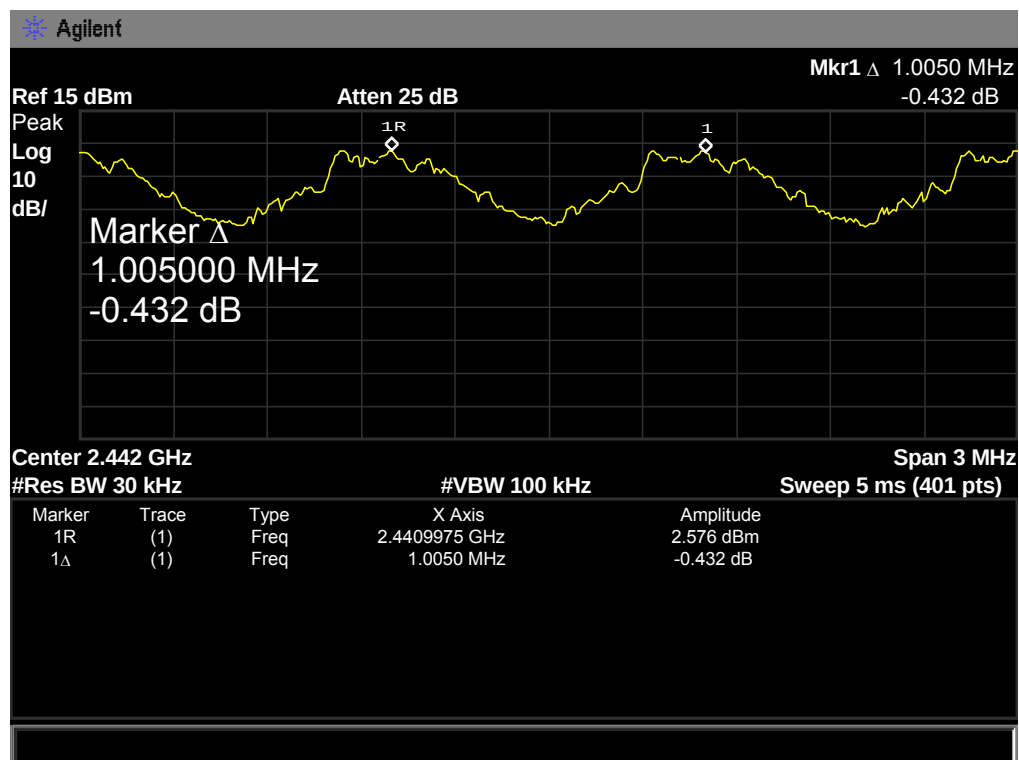
| GFSK Mode (1Mbps) |                          |             |
|-------------------|--------------------------|-------------|
| Frequency (MHz)   | Channel Separation (kHz) | Limit (kHz) |
| 2402              | 1005.00                  | 856.582     |
| 2441              | 1005.00                  | 861.276     |
| 2480              | 1005.00                  | 922.500     |

**Note:** Test plots please refer following pages.

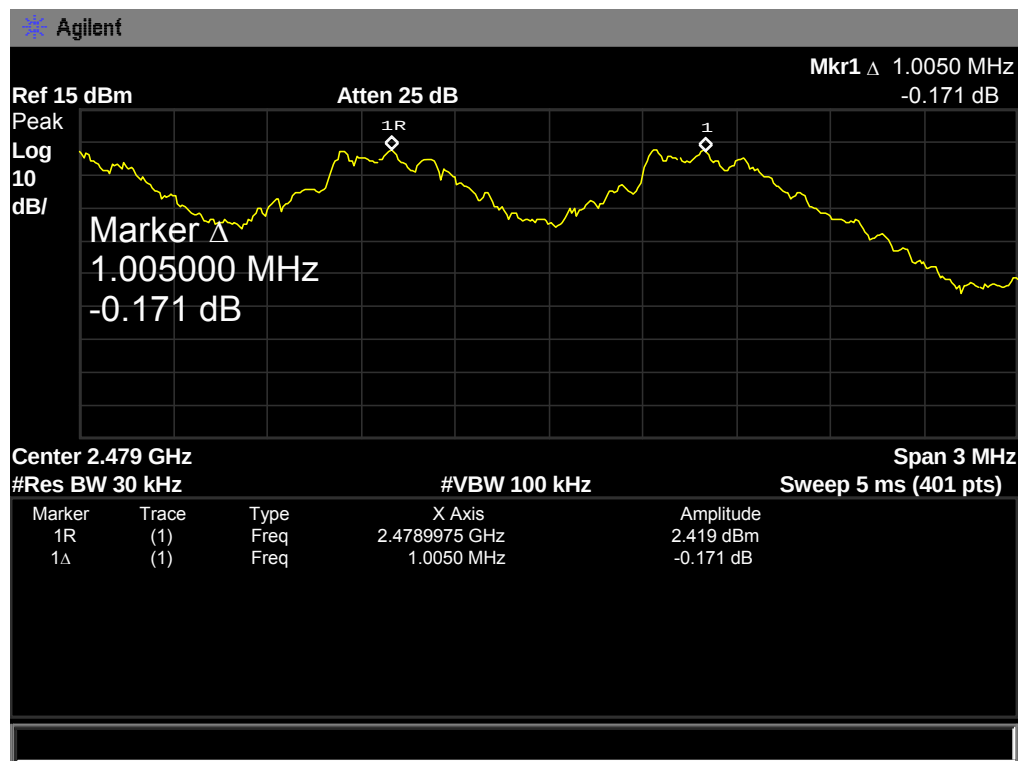
### 2402 MHz(GFSK)-Channel Separation



### 2441 MHz(GFSK)-Channel Separation



### 2480 MHz(GFSK)-Channel Separation

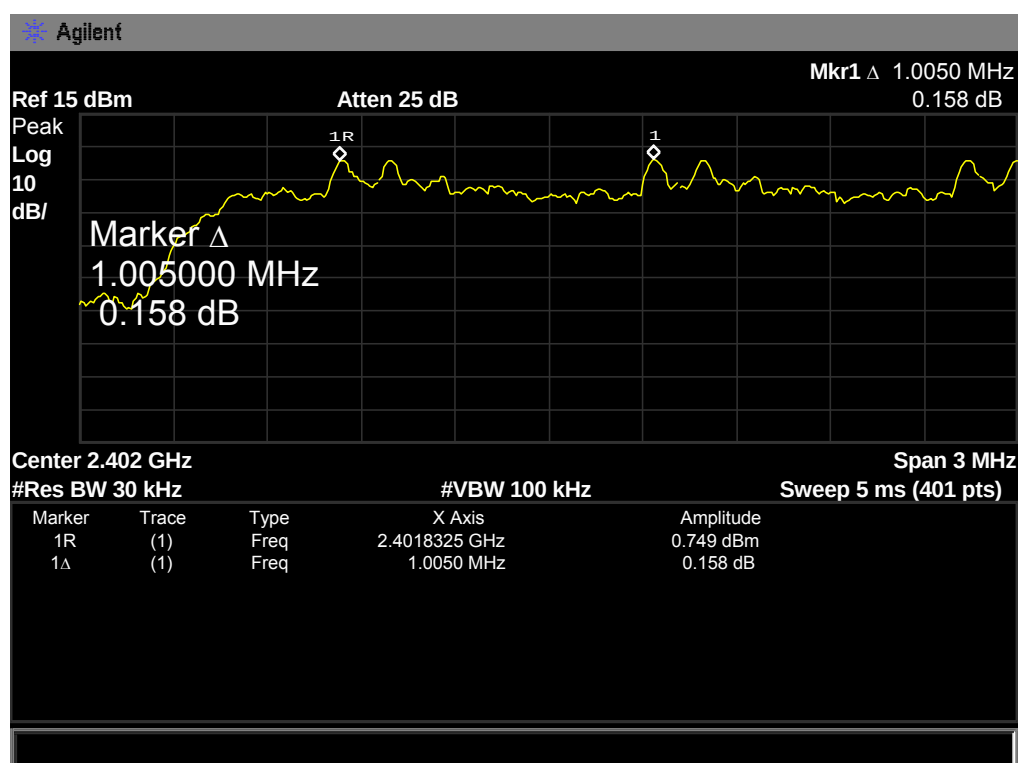




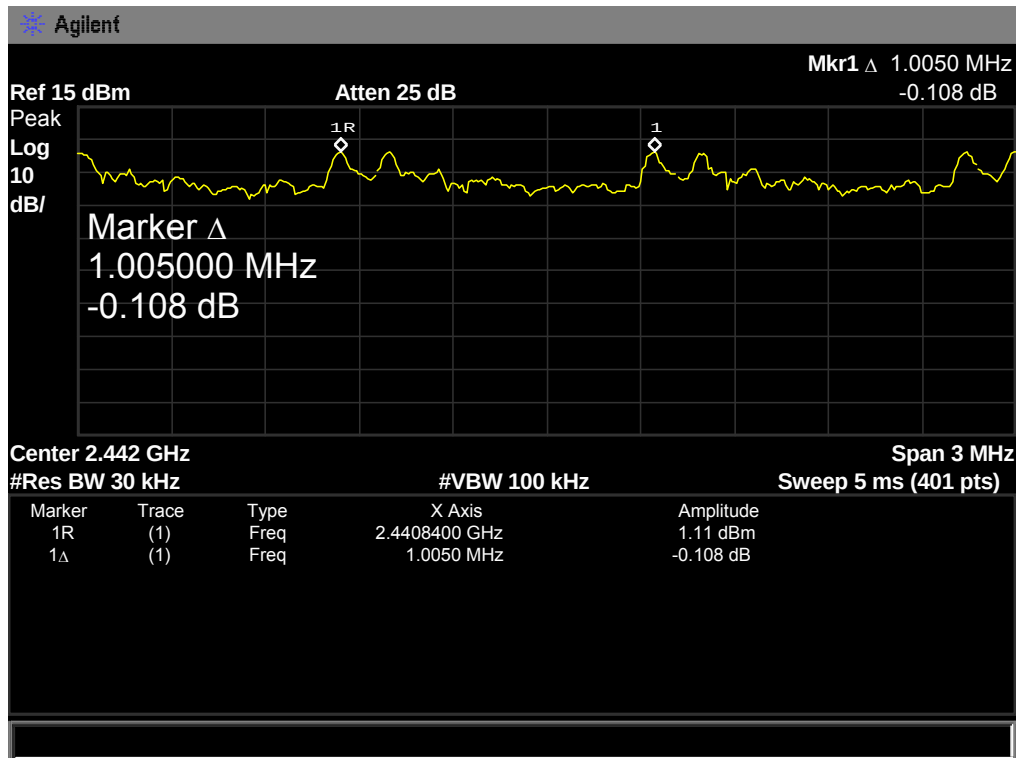
| 8-DPSK Mode (3Mbps) |                          |             |
|---------------------|--------------------------|-------------|
| Frequency (MHz)     | Channel Separation (kHz) | Limit (kHz) |
| 2402                | 1005.00                  | 828.00      |
| 2441                | 1005.00                  | 805.33      |
| 2480                | 1005.00                  | 810.67      |

**Note:** Test plots please refer following pages.

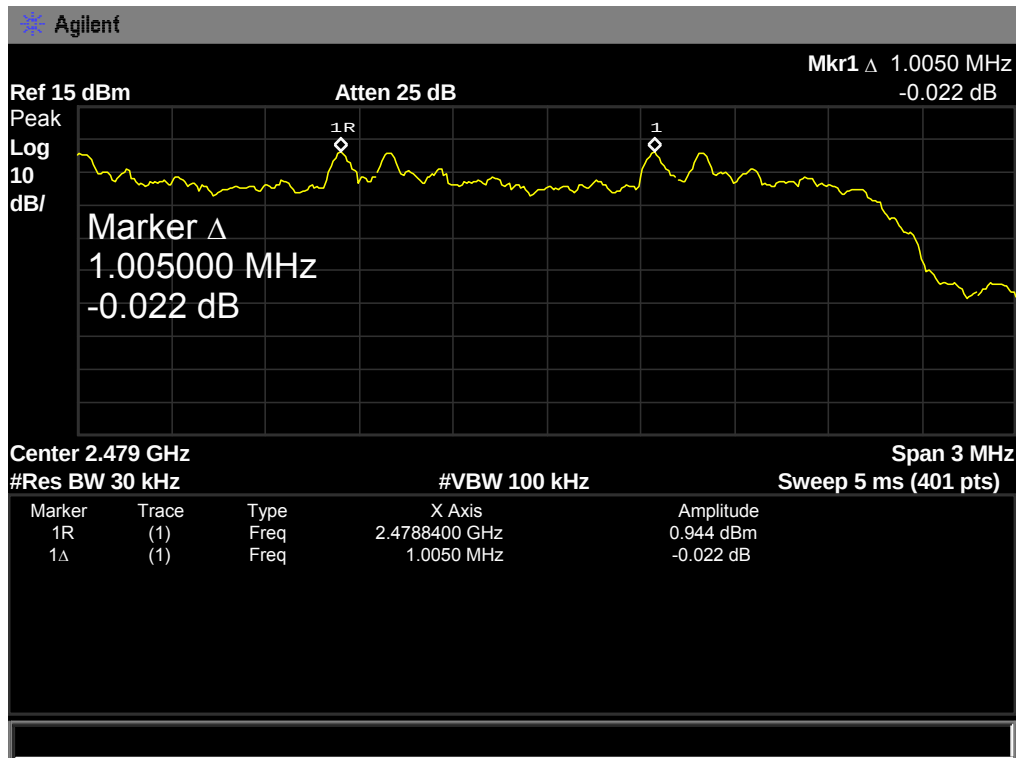
### 2402 MHz(8-DPSK)-Channel Separation



### 2441 MHz(8-DPSK)-Channel Separation



### 2480 MHz(8-DPSK)-Channel Separation



## 8. NUMBER OF HOPPING

### 8.1 LIMITS

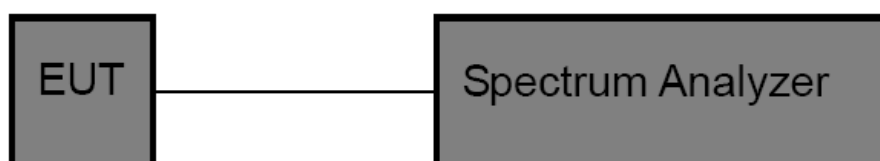
|                |                                                                                   |
|----------------|-----------------------------------------------------------------------------------|
| Hopping Number | Frequency hopping systems in 2400-2483.5 MHz band shall use at least 15 channels. |
|----------------|-----------------------------------------------------------------------------------|

### 8.2 TEST PROCEDURE

The EUT was directly connected to the Spectrum analyzer and antenna output port as show in the block diagram as bellow.

- Set span= the frequency band of operation.
- Set the RBW  $\geq 1\%$  of the span
- Set the VBW  $\geq 3$  RBW (100kHz/ 300kHz)
- Detector= Peak.
- Sweep time= auto couple
- Trace mode= max hold.
- Allow trace to fully stabilize.

### 8.3 TEST SETUP



### 8.4 TEST INSTRUMENTS

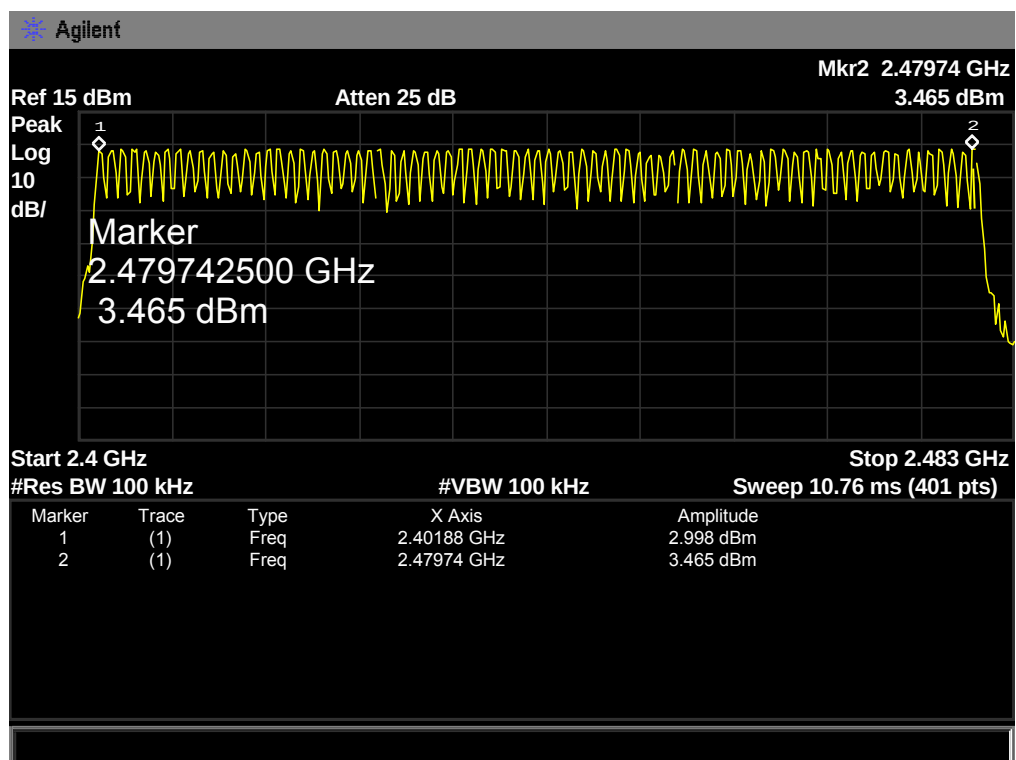
| Equipment         | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|-------------------|--------------|----------|------------|------------------|------------------|--------------------|
| Spectrum Analyzer | R&S          | FSP40    | 100154     | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Spectrum Analyzer | Agilent      | E4407B   | MY41440432 | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |

### 8.5 EUT OPERATING CONDITIONS

The EUT was set to continuously transmitting in the maximum power during the test.

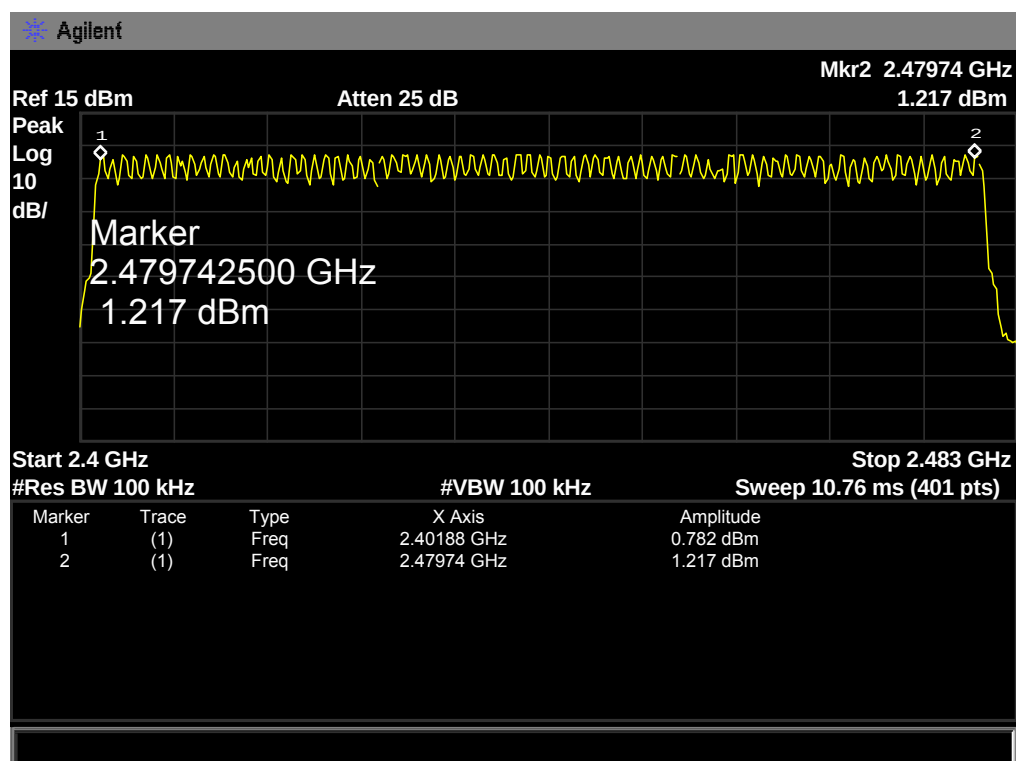
### 8.6 TEST RESULTS

| GFSK Mode (1Mbps)  |       |
|--------------------|-------|
| Measurement Number | Limit |
| 79                 | >15   |



### GFSK Mode (3Mbps)

| Measurement Number | Limit |
|--------------------|-------|
| 79                 | >15   |



## 9. DWELL TIME

### 9.1 LIMITS

|            |                                                                                                                                                                       |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 the number of hopping channels employed. |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 9.2 TEST PROCEDURE

The EUT was directly connected to the Spectrum analyzer and antenna output port as show in the block diagram as bellow.

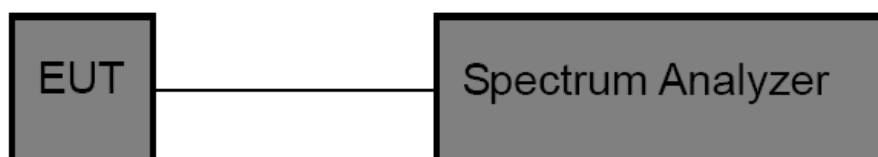
- Set span= zero
- Set the RBW= 1 MHz
- Set the VBW  $\geq$  RBW
- Detector= Peak.
- Sweep time= as necessary to capture the entire dwell time per hopping channel
- Trace mode= max hold
- Use the marker-delta function to determine the dwell time
- Set the EUT for DH5, DH3 and DH1 packet transmitting.
- Measure the maximum time duration of one single pulse.
- A Period Time = (channel number)\*0.4

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)

### 9.3 TEST SETUP



### 9.4 TEST INSTRUMENTS

| Equipment         | Manufacturer | Type No. | Serial No. | Last calibration | Calibrated until | Calibration period |
|-------------------|--------------|----------|------------|------------------|------------------|--------------------|
| Spectrum Analyzer | R&S          | FSP40    | 100154     | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Spectrum Analyzer | Agilent      | E4407B   | MY41440432 | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |

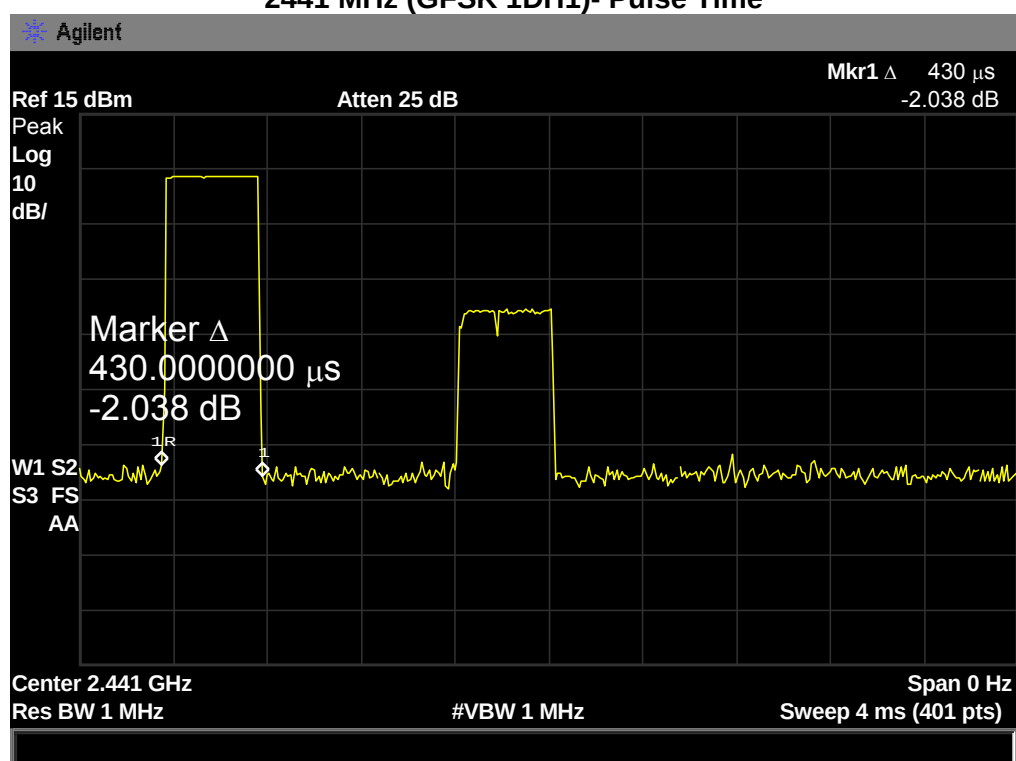
### 9.5 EUT OPERATING CONDITIONS

The EUT was set to continuously transmitting in the maximum power during the test.

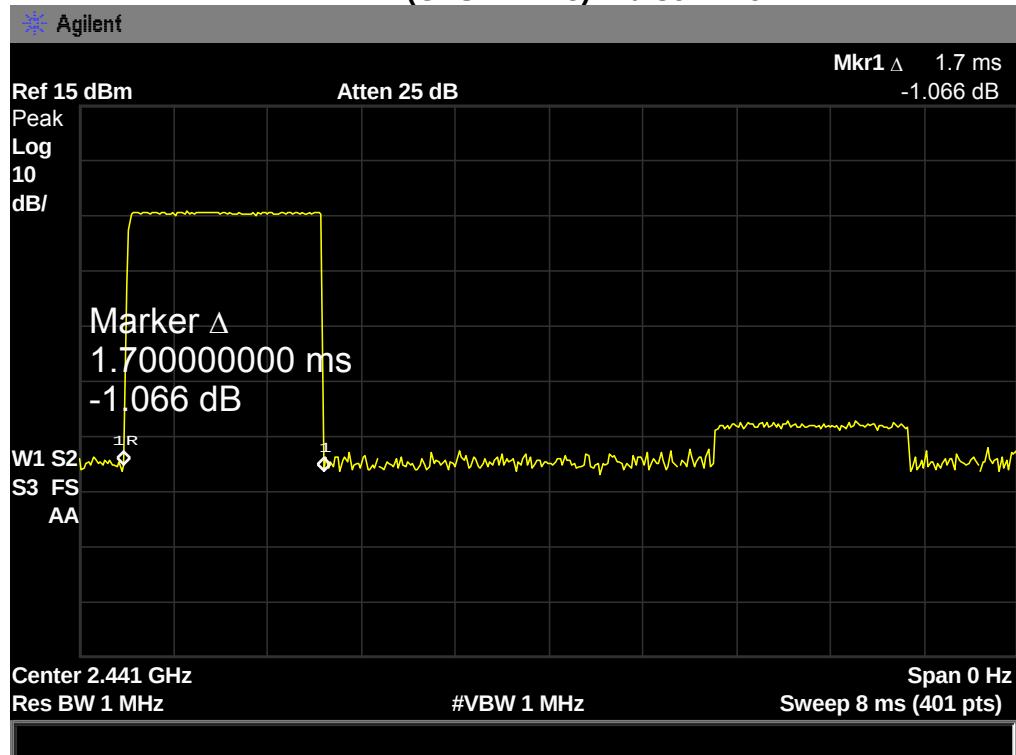
### 9.6 TEST RESULTS

| Hopping Mode                                    |                 |                     |                 |            |
|-------------------------------------------------|-----------------|---------------------|-----------------|------------|
| GFSK(1Mbps) 2441MHz                             |                 |                     |                 |            |
| Frequency (MHz)                                 | Pulse Time (ms) | Total of Dwell (ms) | Period Time (s) | Limit (ms) |
| 1DH1                                            | 0.430           | 137.60              | 31.60           | <400       |
| 1DH3                                            | 1.700           | 272.00              | 31.60           |            |
| 1DH5                                            | 3.000           | 320.00              | 31.60           |            |
| DH1 Total of Dwell= Pulse Time*(1600/2)*31.6/79 |                 |                     |                 |            |
| DH3 Total of Dwell= Pulse Time*(1600/4)*31.6/79 |                 |                     |                 |            |
| DH5 Total of Dwell= Pulse Time*(1600/6)*31.6/79 |                 |                     |                 |            |
| Note: Test plots please refer following pages.  |                 |                     |                 |            |

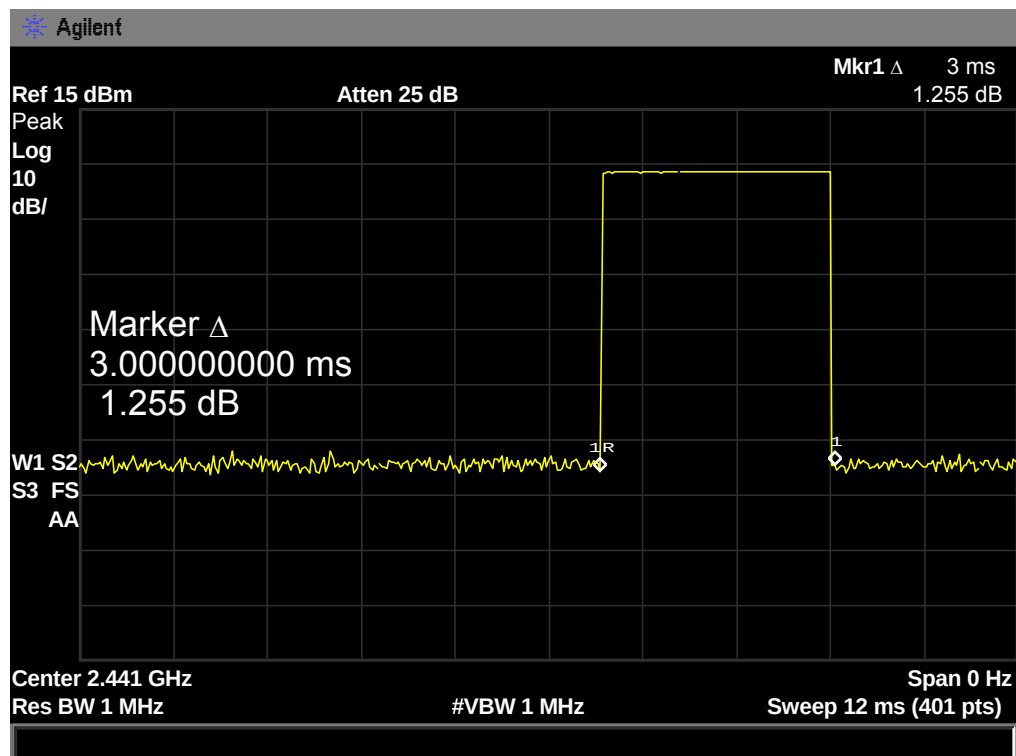
2441 MHz (GFSK 1DH1)- Pulse Time



### 2441 MHz (GFSK 1DH3)- Pulse Time



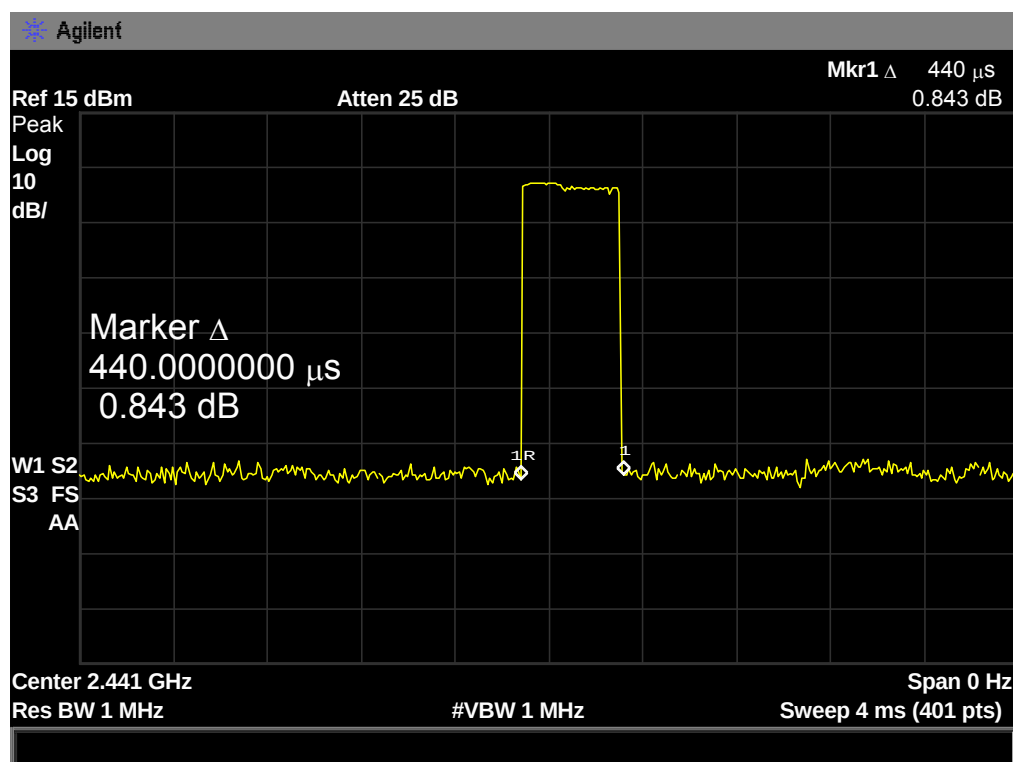
### 2441 MHz (GFSK 1DH5)- Pulse Time



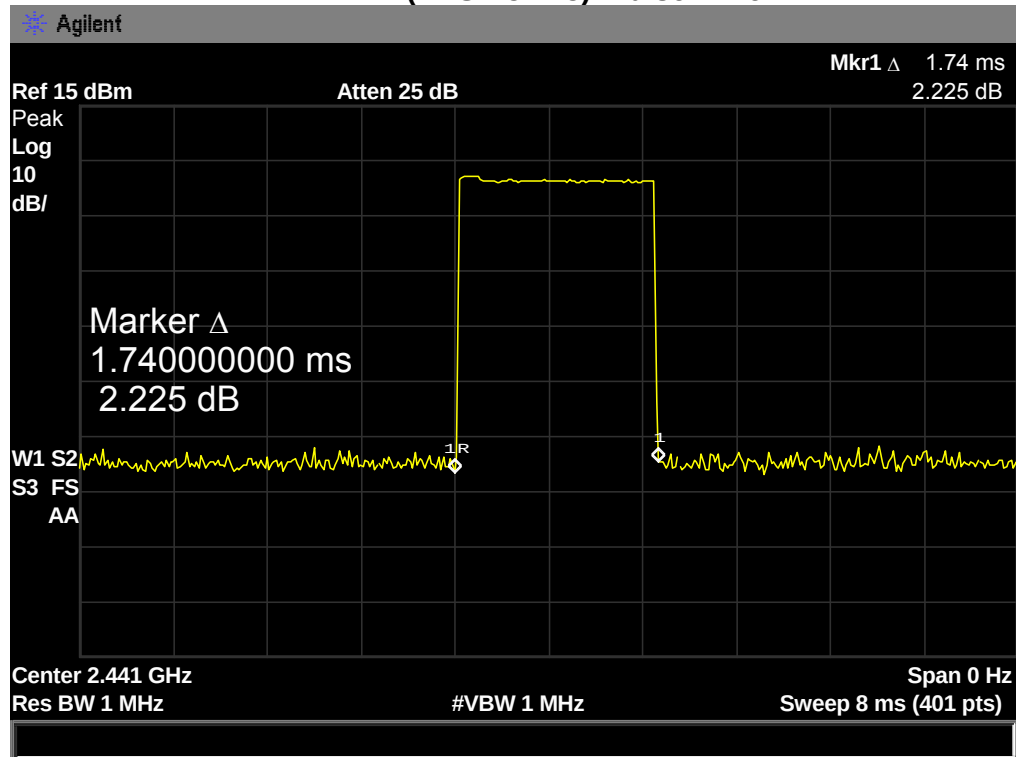


| Hopping Mode                                    |                 |                     |                 |            |
|-------------------------------------------------|-----------------|---------------------|-----------------|------------|
| 8-DPSK(3Mbps) 2441MHz                           |                 |                     |                 |            |
| Frequency (MHz)                                 | Pulse Time (ms) | Total of Dwell (ms) | Period Time (s) | Limit (ms) |
| 3DH1                                            | 0.440           | 140.80              | 31.60           | <400       |
| 3DH3                                            | 1.740           | 278.40              | 31.60           |            |
| 3DH5                                            | 3.030           | 323.20              | 31.60           |            |
| DH1 Total of Dwell= Pulse Time*(1600/2)*31.6/79 |                 |                     |                 |            |
| DH3 Total of Dwell= Pulse Time*(1600/4)*31.6/79 |                 |                     |                 |            |
| DH5 Total of Dwell= Pulse Time*(1600/6)*31.6/79 |                 |                     |                 |            |
| Note: Test plots please refer following pages.  |                 |                     |                 |            |

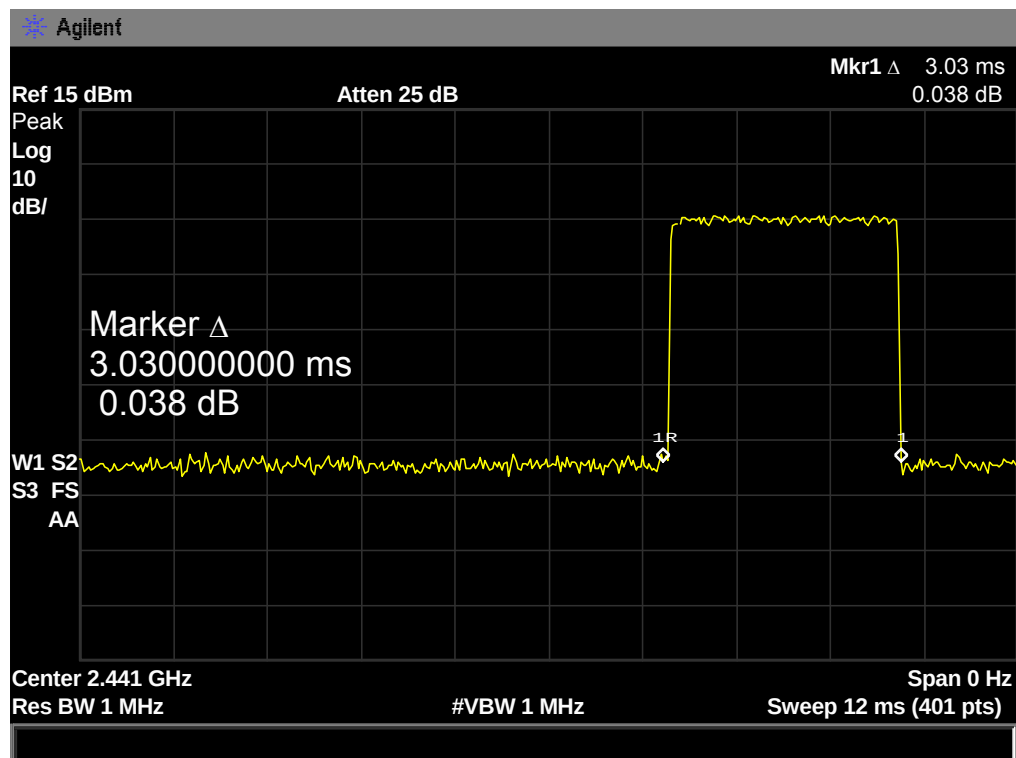
### 2441 MHz (DPSK 3DH1)- Pulse Time



### 2441 MHz (DPSK 3DH3)- Pulse Time



### 2441 MHz (8-DPSK 3DH5)- Pulse Time



## 10. BAND EDGES MEASUREMENT

### 10.1 LIMITS

|                        |                                                                                                                                                                                                                                                                                                    |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Band Edges Requirement | In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits. |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

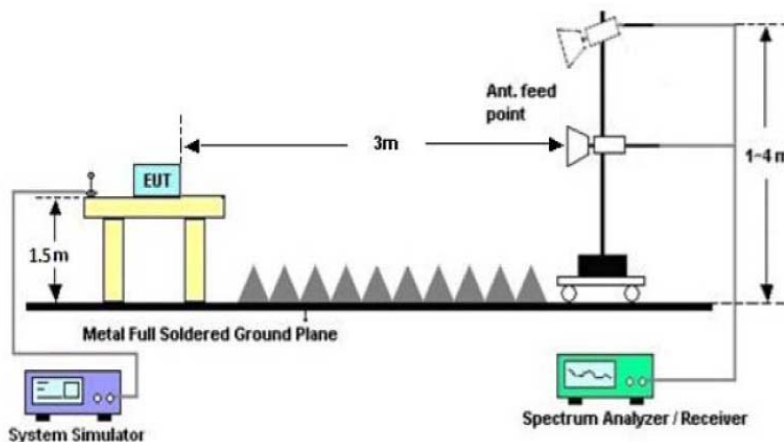
### 10.2 TEST PROCEDURE

The EUT was directly connected to the Spectrum analyzer and antenna output port as show in the block diagram as bellow.

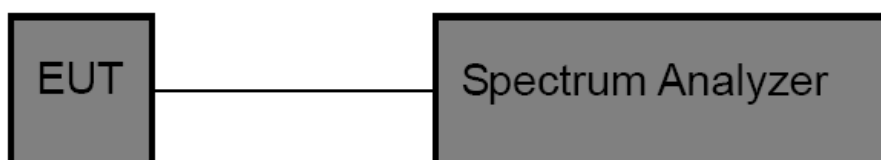
- Set frequency range to capture low band-edge from 2310 MHz up to 2390 MHz, and for up band-edge from 2483.5 MHz up to 2500 MHz
- For low band-edge set the equipment transmit at the lowest channel, and for up band-edge set the equipment transmit at the highest channel
- Set the VBW  $\geq 3$  RBW (100kHz/ 300kHz) for conducted measurement
- For radiated measurements the RBW set to 1 MHz, and the VBW set to 1 MHz for peak measurements and 10 Hz for average measurement

### 10.3 TEST SETUP

#### (A) Radiated Emission Test Set-Up



#### (B) Conducted Emission Test Setup



### 10.4 TEST INSTRUMENTS

| Equipment         | Manufacturer | Type No.  | Serial No.    | Last calibration | Calibrated until | Calibration period |
|-------------------|--------------|-----------|---------------|------------------|------------------|--------------------|
| Broadband Antenna | R&S          | VULB 9168 | VULB 9168-456 | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Test Cable        | N/A          | R-01      | N/A           | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Test Cable        | N/A          | R-02      | N/A           | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| EMI Test Receiver | R&S          | ESCI      | 101324        | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Spectrum Analyzer | Agilent      | E4407B    | MY41440432    | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Antenna Mast      | EM           | SC100_1   | N/A           | N/A              | N/A              | N/A                |
| Turn Table        | EM           | SC100     | 060531        | N/A              | N/A              | N/A                |
| 50Ω Switch        | Anritsu Corp | MP59B     | 6200983705    | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Spectrum Analyzer | R&S          | FSP40     | 100154        | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Horn Antenna      | R&S          | HBM30706  | 10029         | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |
| Amplifier         | EM           | EM-30180  | 060538        | Jul. 04, 2016    | Jul. 03. 2017    | 1 year             |

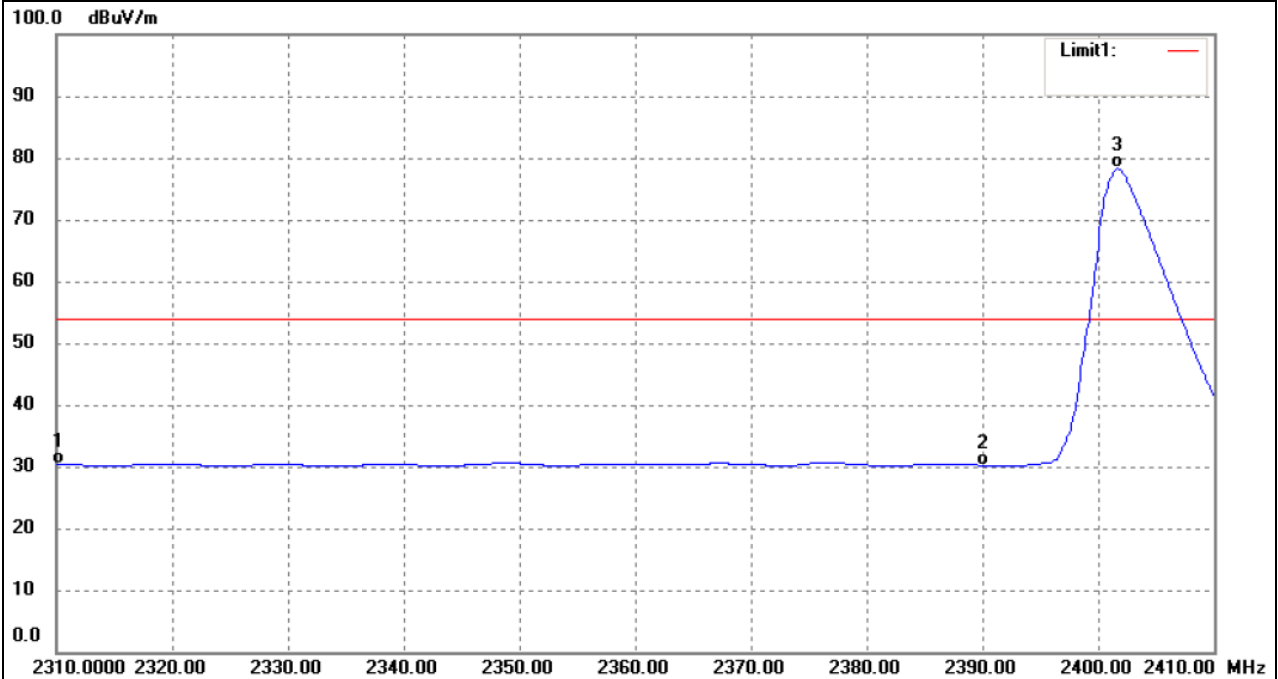
#### 10.5 EUT OPERATING CONDITIONS

The EUT was set to continuously transmitting in the maximum power during the test.

#### 10.6 TEST RESULTS

**Bandedge(Radiated Emission)- Only show the worst Case DH1.**

|                      |                              |                            |            |
|----------------------|------------------------------|----------------------------|------------|
| <b>EUT :</b>         | Wireless mouse               | <b>Model Name. :</b>       | BM307      |
| <b>Temperature :</b> | 26 °C                        | <b>Relative Humidity :</b> | 56%        |
| <b>Test Power :</b>  | DC 3.0V                      | <b>Pressure :</b>          | 1010 hPa   |
| <b>Test Mode :</b>   | TX GFSK Mode 2402MHz         | <b>Test Date :</b>         | 2017-06-25 |
| <b>Polarity :</b>    | Horizontal                   |                            |            |
| <b>Remark :</b>      | Only show the worst polarity |                            |            |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>Factor(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark           |
|-----|--------------------|---------------------|-----------------------|--------------------|-------------------|----------------|------------------|
| 1   | 2310.000           | 34.10               | -3.69                 | 30.41              | 54.00             | -23.59         | Average Detector |
|     | 2310.000           | 46.67               | -3.69                 | 42.98              | 74.00             | -31.02         | Peak Detector    |
| 2   | 2390.000           | 33.71               | -3.49                 | 30.22              | 54.00             | -23.78         | Average Detector |
|     | 2390.000           | 46.35               | -3.49                 | 42.86              | 74.00             | -31.14         | Peak Detector    |
| 3   | 2401.600           | 82.14               | -3.46                 | 78.68              | /                 | /              | Average Detector |
|     | 2401.600           | 103.02              | -3.46                 | 99.56              | /                 | /              | Peak Detector    |

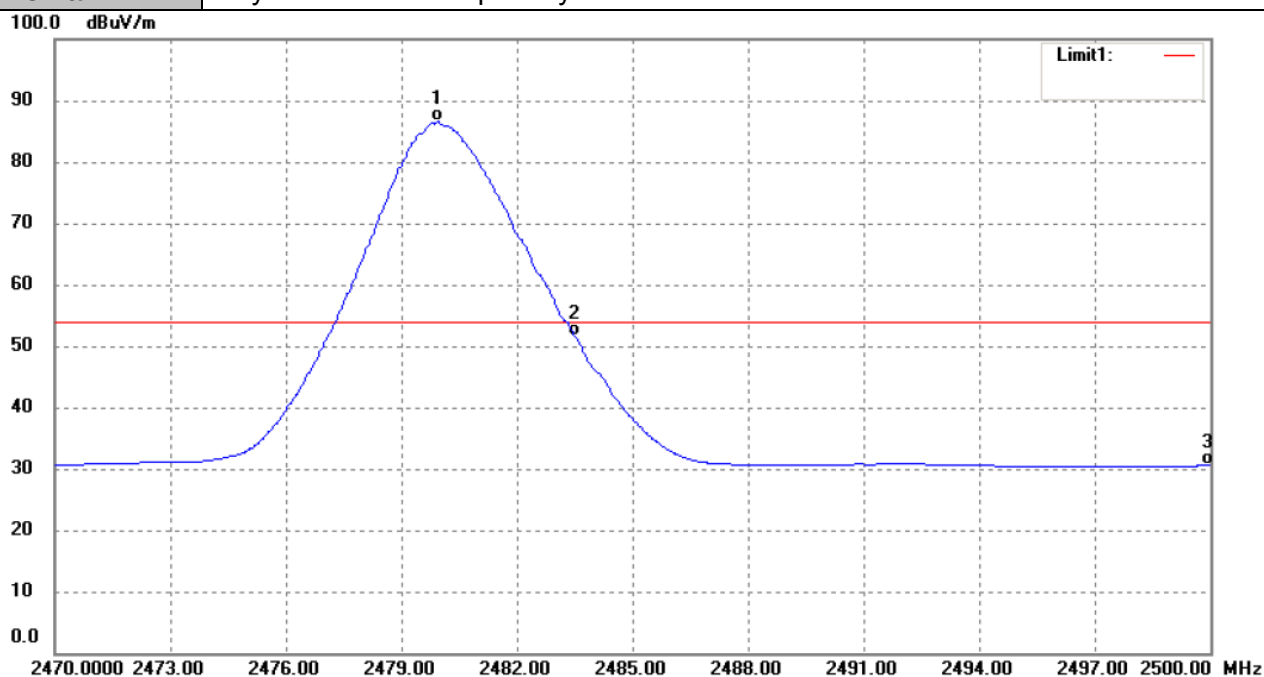
Remark:

Emission Level= Read Level+ Correct Factor

Margin= Emission Level-Limit

No report for the emission which more than 10 dB below the prescribed limit.

|                      |                              |                            |            |
|----------------------|------------------------------|----------------------------|------------|
| <b>EUT :</b>         | Wireless mouse               | <b>Model Name. :</b>       | BM307      |
| <b>Temperature :</b> | 26 °C                        | <b>Relative Humidity :</b> | 56%        |
| <b>Test Power :</b>  | DC 3.0V                      | <b>Pressure :</b>          | 1010 hPa   |
| <b>Test Mode :</b>   | TX GFSK Mode 2480MHz         | <b>Test Date :</b>         | 2017-06-25 |
| <b>Polarity :</b>    | Horizontal                   |                            |            |
| <b>Remark :</b>      | Only show the worst polarity |                            |            |



| No. | Frequency<br>(MHz) | Reading<br>(dBuV/m) | Correct<br>Factor(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Remark           |
|-----|--------------------|---------------------|-----------------------|--------------------|-------------------|----------------|------------------|
| 1   | 2479.93            | 89.80               | -3.25                 | 86.55              | /                 | /              | Average Detector |
|     | 2479.84            | 97.97               | -7.53                 | 90.44              | /                 | /              | Peak Detector    |
| 2   | 2483.50            | 54.90               | -3.25                 | 51.65              | 54.00             | -2.35          | Average Detector |
|     | 2483.50            | 59.21               | -7.53                 | 51.68              | 74.00             | -22.32         | Peak Detector    |
| 3   | 2500.00            | 33.74               | -3.20                 | 30.54              | 54.00             | -23.46         | Average Detector |
|     | 2500.00            | 45.14               | -7.50                 | 37.64              | 74.00             | -36.36         | Peak Detector    |

Remark:

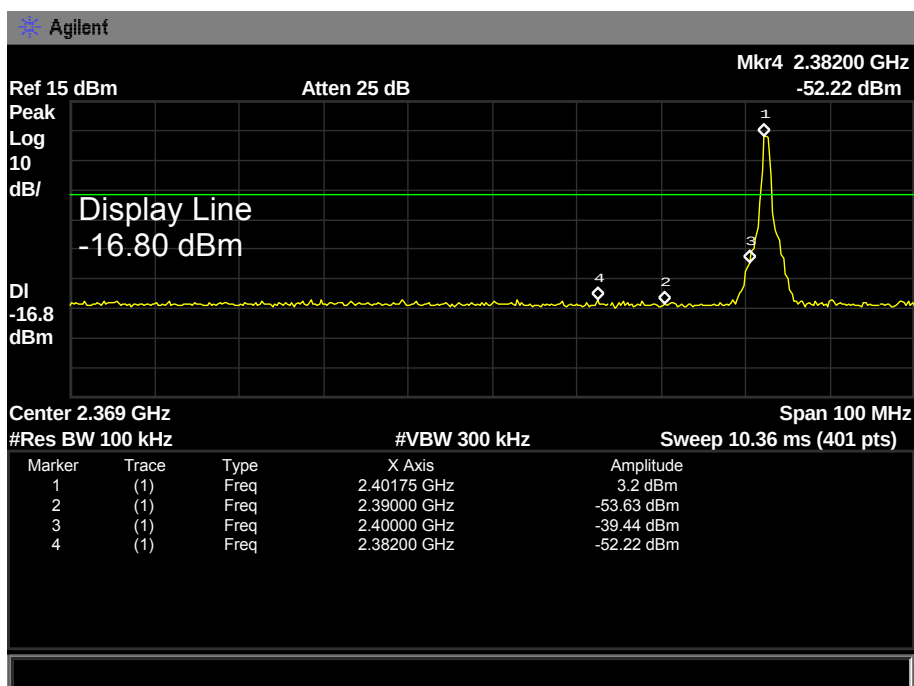
Emission Level= Read Level+ Correct Factor

Margin= Emission Level-Limit

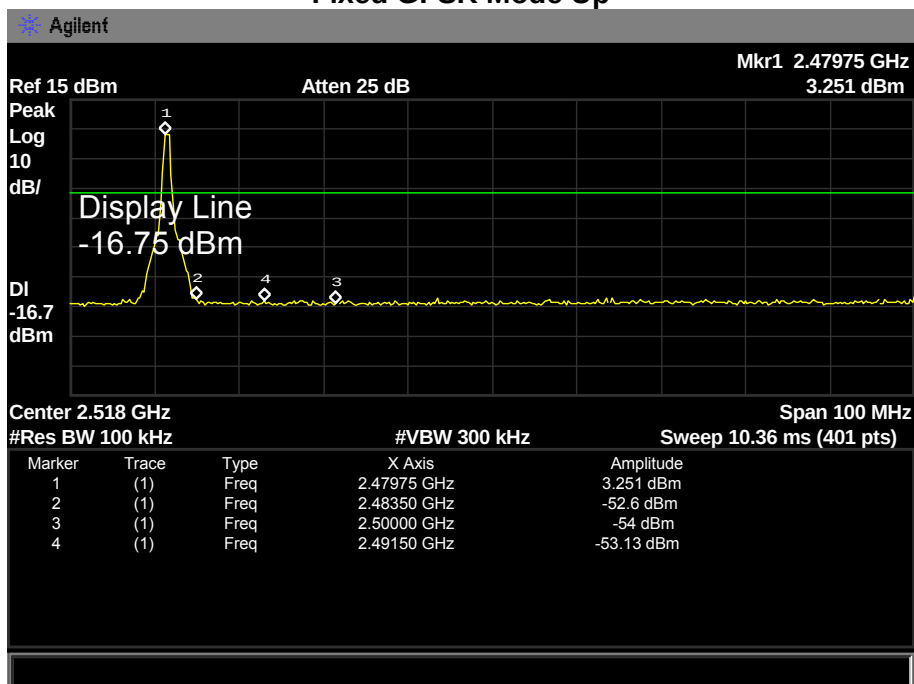
No report for the emission which more than 10 dB below the prescribed limit.

## Bandedge(Conducted Emission)

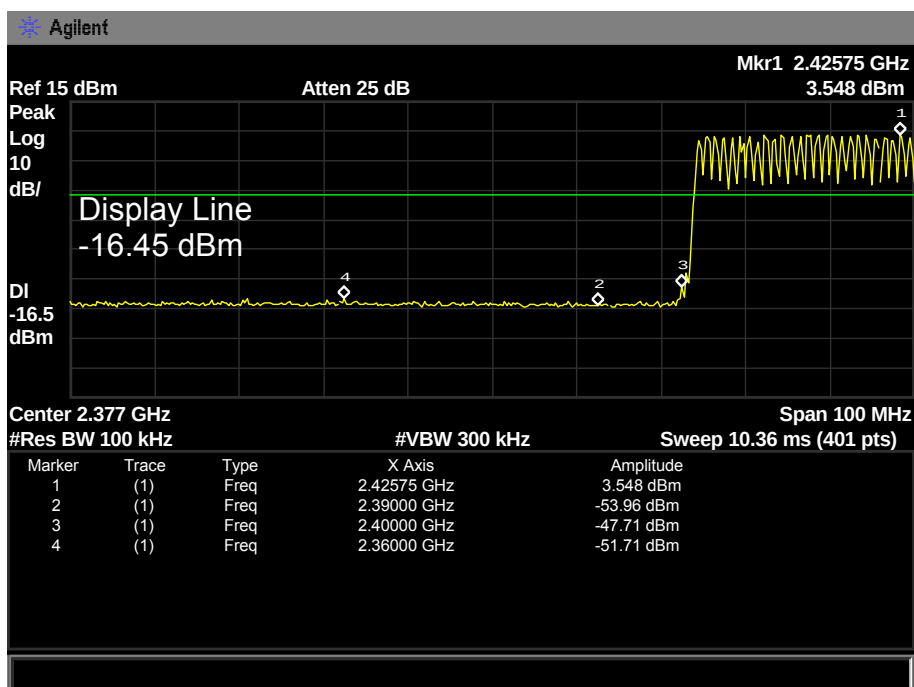
### Fixed GFSK Mode Low



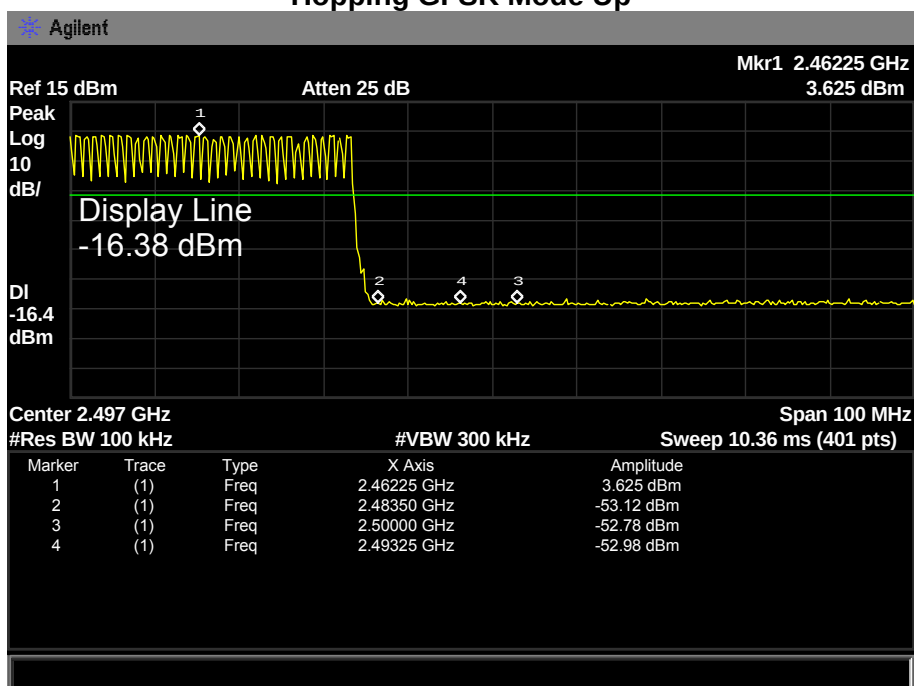
### Fixed GFSK Mode Up



### Hopping GFSK Mode Low

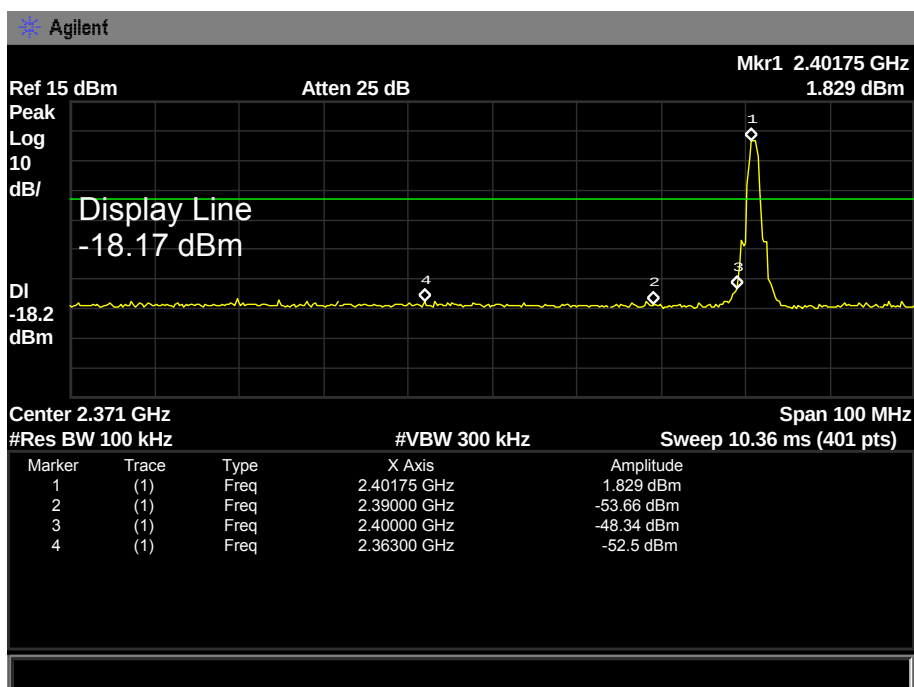


### Hopping GFSK Mode Up

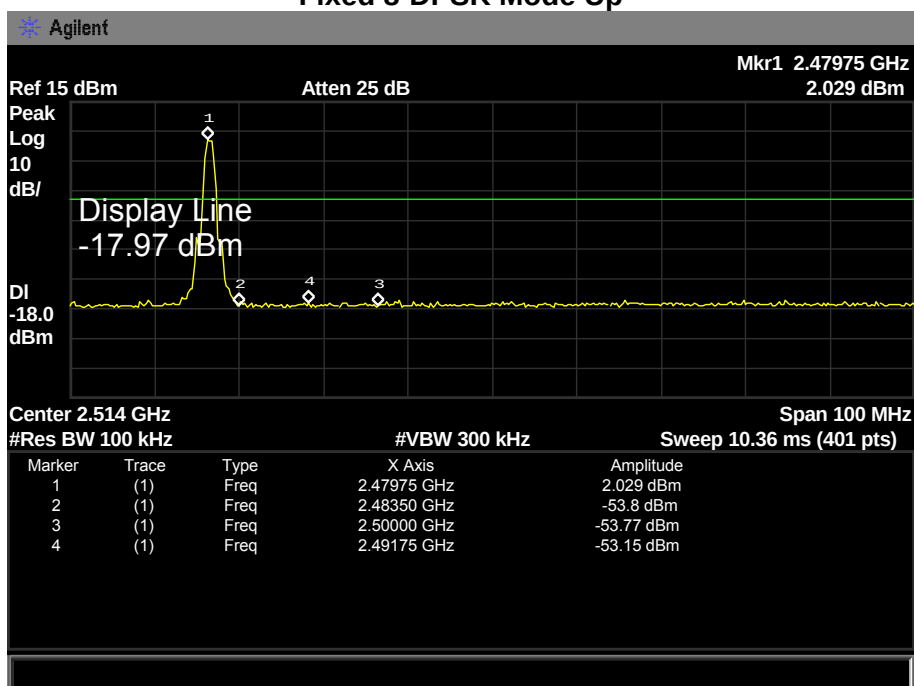




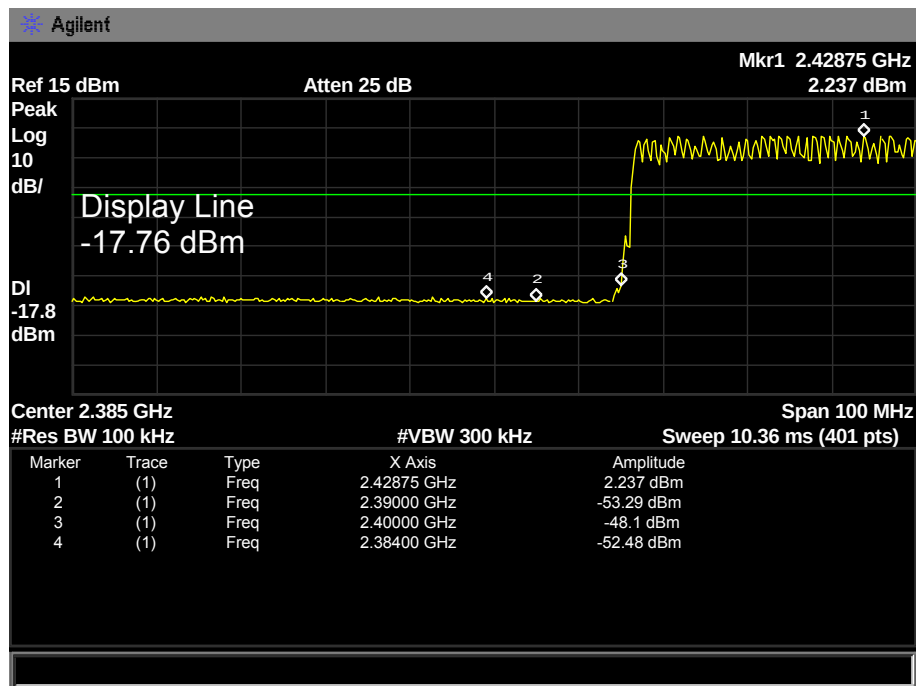
### Fixed 8-DPSK Mode Low



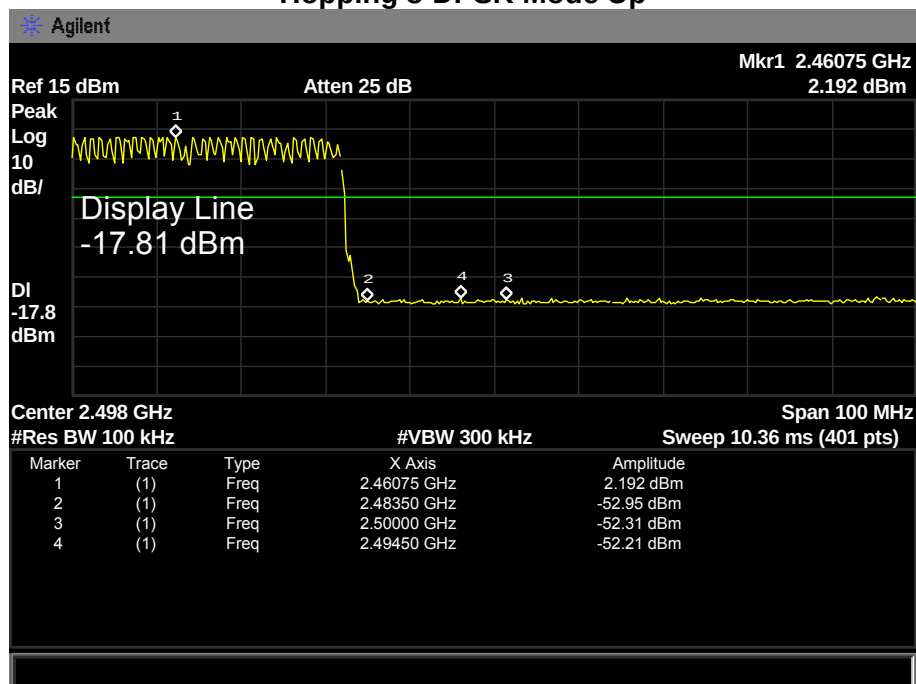
### Fixed 8-DPSK Mode Up



### Hopping 8-DPSK Mode Low



### Hopping 8-DPSK Mode Up



## 11. FREQUENCY HOPPING SYSTEM

### 11.1 STANDARD APPLICABLE

According to FCC Part 15.247(a)(1) The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

(h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

### 11.2 FREQUENCY HOPPING SYSTEM

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule.

This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centred from 2402 to 2480 MHz) in the range 2,400-2,483.5 MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock.

Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

This device was tested with an bluetooth system receiver to check that the device maintained hopping synchronization, and the device complied with these requirements for DA 00-705 and FCC Part 15.247 rule.

### 11.3 EUT PSEUDORANDOM FREQUENCY HOPPING SEQUENCE

Pseudorandom Frequency Hopping Sequence Table as below:

Channel: 17, 30, 02, 18, 78, 66, 19, 31, 32, 41, 50, 44, 73, 75, 51, 59, 49, 23, 29, 05, 63, 64, 42, 76, 70, 37, 71, 72, 20, 10, 60, 77, 25, 40, 51, 59, 73, 55, 69, 65, 48, 00, 12, 26, 01, 34, 15, 21, 56, 23, 07, 08, 11, 36, 21, 22, 68, 29, 06, 01, 34, 16, 03, 05, 68, 15, 46, 74, 14, 45, 28, etc.

The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

## 12. ANTENNA REQUIREMENT

### 12.1 REQUIREMENT

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Antenna Requirement<br>(15.203) | An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. |
| Antenna Requirement<br>(15.247) | If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.                                                                                                                                                                                                                                                                                                                                                |

### 12.2 ANTENNA CONNECTOR CONSTRUCTION

The EUT antenna is a PCB Antenna. And the maximum gain of this antenna is 0dBi. It complies with the standard requirement.

**\*\*\*\*\*END OF REPORT\*\*\*\*\***