



# FCC Part 15C Test Report

## FCC ID: 2AO96OBT-9708

|                  |                                                                                                                                                                   |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:    | <b>SIP Terminal Controller</b>                                                                                                                                    |
| Trademark:       | <b>OBT</b>                                                                                                                                                        |
| Model Name :     | <b>OBT-9708</b><br>OBT-9709, OBT-9806, OBT-POE611, OBT-POE902, OBT-NP6090, OBT-NP6150,<br>OBT-NP6250, OBT-NP6350, OBT-NP6450, OBT-NP6550, OBT-NP6650,<br>OBT-9928 |
| Prepared For :   | <b>Shenzhen OBTPA Technology Co., Ltd</b>                                                                                                                         |
| Address :        | Building A, HongPengHui Industrial Park, No.44 GongHeGongYe Road, Xixiang<br>Town, Bao'an District, Shenzhen City, Guangdong Province, China                      |
| Prepared By :    | <b>Shenzhen BCTC Testing Co., Ltd.</b>                                                                                                                            |
| Address :        | BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st<br>Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China             |
| Test Date:       | Feb. 23 - Mar. 02, 2018                                                                                                                                           |
| Date of Report : | Mar. 02, 2018                                                                                                                                                     |
| Report No.:      | BCTC-FY180100211-1E                                                                                                                                               |



## VERIFICATION OF COMPLIANCE

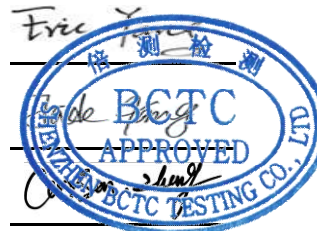
**Applicant's name** ..... : **Shenzhen OBTPA Technology Co., Ltd**  
**Address** ..... : Building A, HongPengHui Industrial Park, No.44 GongHeGongYe Road,  
Xixiang Town, Bao'an District, Shenzhen City, Guangdong Province,  
China  
**Manufacture's Name** ..... : **Shenzhen OBTPA Technology Co., Ltd**  
**Address** ..... : Building A, HongPengHui Industrial Park, No.44 GongHeGongYe Road,  
Xixiang Town, Bao'an District, Shenzhen City, Guangdong Province,  
China  
**Product description**  
**Product name** ..... : SIP Terminal Controller  
**Trademark:** OBT  
**Model Name:** OBT-9708  
FCC Part15.249  
**Test Standards:** ANSI C63.10-2013

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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

**Prepared by(Engineer):** Eric Yang  
**Reviewer(Supervisor):** Jade Yang  
**Approved(Manager):** Carson Zhang





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## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.249) , Subpart C |                                                      |          |        |
|---------------------------------|------------------------------------------------------|----------|--------|
| Standard Section                | Test Item                                            | Judgment | Remark |
| 15.207                          | Conducted Emission                                   | N/A      |        |
| 15.249                          | Fundamental & Radiated Spurious Emission Measurement | PASS     |        |
| 15.249                          | Bandwidth                                            | PASS     |        |
| 15.205                          | Band Edge Emission                                   | PASS     |        |
| 15.203                          | Antenna Requirement                                  | PASS     |        |

NOTE:

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

### 1.1 TEST FACILITY

Shenzhen BCTC Testing Co., Ltd.

Add.: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

Test Firm Registration Number: 712850

### 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 %.

| No. | Item                          | Uncertainty               |
|-----|-------------------------------|---------------------------|
| 1   | Conducted Emission Test       | $\pm 1.38\text{dB}$       |
| 2   | RF power, conducted           | $\pm 0.16\text{dB}$       |
| 3   | Spurious emissions, conducted | $\pm 0.21\text{dB}$       |
| 4   | All emissions, radiated (<1G) | $\pm 4.68\text{dB}$       |
| 5   | All emissions, radiated (>1G) | $\pm 4.89\text{dB}$       |
| 6   | Temperature                   | $\pm 0.5^{\circ}\text{C}$ |
| 7   | Humidity                      | $\pm 2\%$                 |



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                           |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------|---------------|------------------|----------------------|-------------------------|-------------|-------------------|-------|----------------------|--------------------|
| Equipment                                                                                                                                                                                                          | SIP Terminal Controller                                                                                                                                                                                                                                                                                                   |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Trade Name                                                                                                                                                                                                         | OBT                                                                                                                                                                                                                                                                                                                       |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Model Name                                                                                                                                                                                                         | OBT-9708                                                                                                                                                                                                                                                                                                                  |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Serial Model                                                                                                                                                                                                       | OBT-9709, OBT-9806, OBT-POE611, OBT-POE902, OBT-NP6090, OBT-NP6150, OBT-NP6250, OBT-NP6350, OBT-NP6450, OBT-NP6550, OBT-NP6650, OBT-9928                                                                                                                                                                                  |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Model Difference                                                                                                                                                                                                   | All the model are the same circuit and RF module, except model names.                                                                                                                                                                                                                                                     |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Product Description                                                                                                                                                                                                | <table><tr><td>Operation Frequency:</td><td>2402~2480 MHz</td></tr><tr><td>Modulation Type:</td><td>GFSK,PI/4 DPSK,8DPSK</td></tr><tr><td>Bit Rate of Transmitter</td><td>1M/2M/3Mbps</td></tr><tr><td>Number Of Channel</td><td>79 CH</td></tr><tr><td>Antenna Designation:</td><td>Please see Note 3.</td></tr></table> |                      | Operation Frequency: | 2402~2480 MHz | Modulation Type: | GFSK,PI/4 DPSK,8DPSK | Bit Rate of Transmitter | 1M/2M/3Mbps | Number Of Channel | 79 CH | Antenna Designation: | Please see Note 3. |
|                                                                                                                                                                                                                    | Operation Frequency:                                                                                                                                                                                                                                                                                                      | 2402~2480 MHz        |                      |               |                  |                      |                         |             |                   |       |                      |                    |
|                                                                                                                                                                                                                    | Modulation Type:                                                                                                                                                                                                                                                                                                          | GFSK,PI/4 DPSK,8DPSK |                      |               |                  |                      |                         |             |                   |       |                      |                    |
|                                                                                                                                                                                                                    | Bit Rate of Transmitter                                                                                                                                                                                                                                                                                                   | 1M/2M/3Mbps          |                      |               |                  |                      |                         |             |                   |       |                      |                    |
|                                                                                                                                                                                                                    | Number Of Channel                                                                                                                                                                                                                                                                                                         | 79 CH                |                      |               |                  |                      |                         |             |                   |       |                      |                    |
|                                                                                                                                                                                                                    | Antenna Designation:                                                                                                                                                                                                                                                                                                      | Please see Note 3.   |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual. |                                                                                                                                                                                                                                                                                                                           |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Channel List                                                                                                                                                                                                       | Please refer to the Note 2.                                                                                                                                                                                                                                                                                               |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Power Source                                                                                                                                                                                                       | DC 12V                                                                                                                                                                                                                                                                                                                    |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Connecting I/O Port(s)                                                                                                                                                                                             | Please refer to the User's Manual                                                                                                                                                                                                                                                                                         |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| hardware version                                                                                                                                                                                                   | --                                                                                                                                                                                                                                                                                                                        |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Software version                                                                                                                                                                                                   | --                                                                                                                                                                                                                                                                                                                        |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |
| Serial number                                                                                                                                                                                                      | --                                                                                                                                                                                                                                                                                                                        |                      |                      |               |                  |                      |                         |             |                   |       |                      |                    |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.

| 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 |    |      |

3.

Table for Filed Antenna

| Ant. | Brand | Model Name | Antenna Type     | Gain (dBi) | NOTE |
|------|-------|------------|------------------|------------|------|
| 1    | N/A   | N/A        | External antenna | 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.

| For All Mode | Description                                         | Modulation Type         |
|--------------|-----------------------------------------------------|-------------------------|
| Mode 1       | CH00                                                | GFSK,PI/4<br>DPSK,8DPSK |
| Mode 2       | CH39                                                |                         |
| Mode 3       | CH78                                                |                         |
| Mode 4       | Link mode(conducted emission and Radiated emission) |                         |

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) Fully-charged battery is used during the test

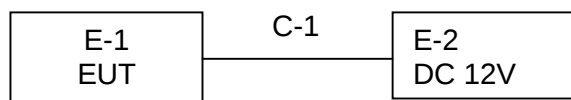
## 2.3 TABLE OF PARAMETERS OF TEST SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

|           |          |          |          |
|-----------|----------|----------|----------|
| Frequency | 2402 MHz | 2441 MHz | 2480 MHz |
| Channel   | Low      | Middle   | High     |

## 2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test





## 2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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. | Series No. | Note        |
|------|-------------------------|-----------|----------------|------------|-------------|
| E-1  | SIP Terminal Controller | N/A       | OBT-9708       | N/A        | EUT         |
| E-2  | Battery                 | N/A       | BCTC-020       | N/A        | Lab Provide |
|      |                         |           |                |            |             |

| Item | Shielded Type | Ferrite Core | Length | Note                |
|------|---------------|--------------|--------|---------------------|
| C-1  | NO            | NO           | 0.5M   | DC cable unshielded |
|      |               |              |        |                     |

Note:

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



## 2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

### Radiation Test equipment

| Item | Equipment                           | Manufacturer    | Type No.     | Serial No.       | Last calibration | Calibrated until |
|------|-------------------------------------|-----------------|--------------|------------------|------------------|------------------|
| 1    | Spectrum Analyzer<br>(9kHz-26.5GHz) | Agilent         | E4407B       | MY45108040       | 2017.08.27       | 2018.08.26       |
| 2    | Test Receiver<br>(9kHz-7GHz)        | R&S             | ESPI         | 101318           | 2017.08.27       | 2018.08.26       |
| 3    | Bilog Antenna<br>(30MHz-1GHz)       | R&S             | VULB<br>9168 | VULB91<br>68-438 | 2017.08.27       | 2018.08.26       |
| 4    | Horn Antenna<br>(1GHz-18GHz)        | SCHWARZBECK     | BBHA9120D    | 1201             | 2017.09.03       | 2018.09.02       |
| 5    | Horn Antenna<br>(14GHz-40GHz)       | SCHWARZBECK     | BBHA 9170    | 9170-181         | 2017.09.03       | 2018.09.02       |
| 6    | Amplifier<br>(9KHz-6GHz)            | SCHWARZBECK     | BBV9744      | 9744-0037        | 2017.08.27       | 2018.08.26       |
| 7    | Amplifier<br>(1GHz-18GHz)           | SCHWARZBECK     | BBV9718      | 9718-309         | 2017.08.27       | 2018.08.26       |
| 8    | Amplifier<br>(18GHz-40GHz)          | SCHWARZBECK     | BBV 9721     | 9721-205         | 2017.08.27       | 2018.08.26       |
| 9    | Loop Antenna<br>(9KHz-30MHz)        | SCHWARZBECK     | FMZB1519B    | 00014            | 2017.09.03       | 2018.09.02       |
| 10   | RF cables1<br>(9kHz-1GHz)           | R&S             | R203         | R20X             | 2017.08.27       | 2018.08.26       |
| 11   | RF cables2<br>(1GHz-40GHz)          | R&S             | R204         | R21X             | 2017.08.27       | 2018.08.26       |
| 12   | Antenna connector                   | Florida RF Labs | N/A          | RF 01#           | 2017.08.27       | 2018.08.26       |
| 13   | Power Metter                        | ANRITSU         | ML2487A      | 6K00001568       | 2017.08.27       | 2018.08.26       |
| 14   | Power Sensor (AV)                   | ANRITSU         | ML2491A      | 030989           | 2017.08.27       | 2018.08.26       |
| 15   | Signal Analyzer<br>9kHz-26.5GHz     | Agilent         | N9010A       | MY48030494       | 2017.08.27       | 2018.08.26       |
| 16   | Test Receiver<br>20kHz-40GHz        | R&S             | ESU 40       | 100376           | 2017.08.27       | 2018.08.26       |
| 17   | D.C. Power Supply                   | LongWei         | PS-305D      | 010964729        | 2017.08.27       | 2018.08.26       |

### Conduction Test equipment

| Item | Equipment     | Manufacturer | Type No. | Serial No.                 | Last calibration | Calibrated until |
|------|---------------|--------------|----------|----------------------------|------------------|------------------|
| 1    | Test Receiver | R&S          | ESCI     | 1166.5950K03-1011<br>65-ha | 2017.08.27       | 2018.08.26       |
| 2    | LISN          | SCHWARZBECK  | NSLK8127 | 8127739                    | 2017.08.27       | 2018.08.26       |
| 3    | LISN          | R&S          | NSLK8126 | 8126487                    | 2017.08.27       | 2018.08.26       |
| 4    | RF cables     | R&S          | R204     | R20X                       | 2017.08.27       | 2018.08.26       |
| 5    | Attenuator    | R&S          | ESH3-Z2  | 143206                     | 2017.08.27       | 2018.08.26       |



### 3. EMC EMISSION TEST

#### 3.1 RADIATED EMISSION MEASUREMENT

##### 3.1.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc 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 below has to be followed.

| Frequencies<br>(MHz) | Field Strength<br>(micorvolts/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                                |

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

| FREQUENCY (MHz) | Limit (dBuV/m) (at 3M) |         |
|-----------------|------------------------|---------|
|                 | PEAK                   | AVERAGE |
| Above 1000      | 74                     | 54      |

Notes:

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

##### FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

| Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz) | Range (MHz)                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Below 1.705                                                                                                                     | 30                                                                              |
| 1.705 – 108                                                                                                                     | 1000                                                                            |
| 108 – 500                                                                                                                       | 2000                                                                            |
| 500 – 1000                                                                                                                      | 5000                                                                            |
| Above 1000                                                                                                                      | 5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower |



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

| Receiver Parameter     | Setting                          |
|------------------------|----------------------------------|
| Attenuation            | Auto                             |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP    |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP    |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

### 3.1.2 TEST PROCEDURE

- The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 and 1.5 meters above the ground at a 3 meter semi-chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; above 1GHz, the height was 1.5m, 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.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the 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.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

- For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

Note:

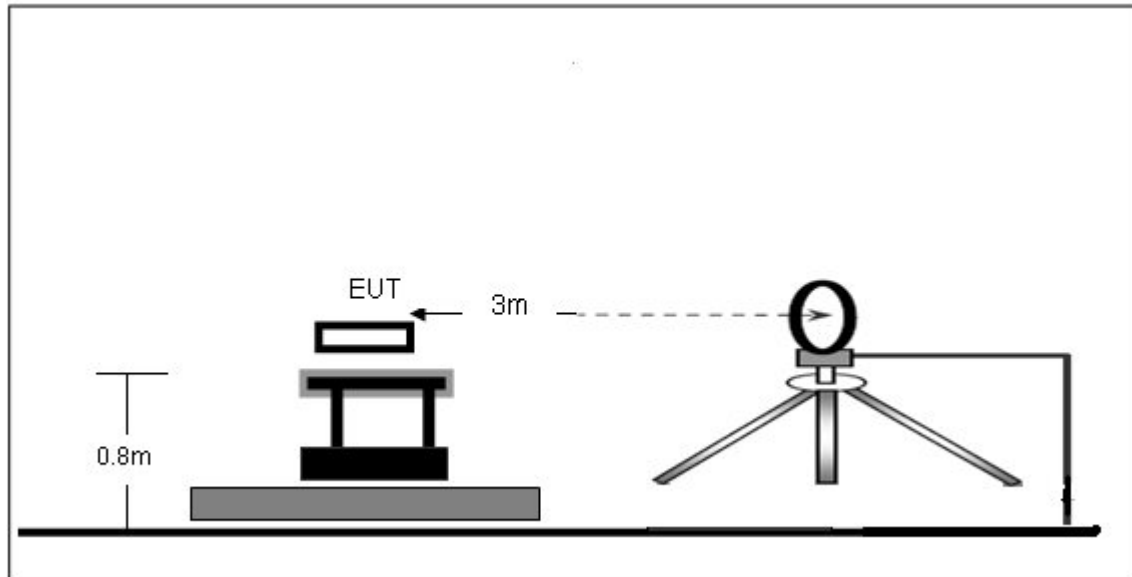
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

### 3.1.3 DEVIATION FROM TEST STANDARD

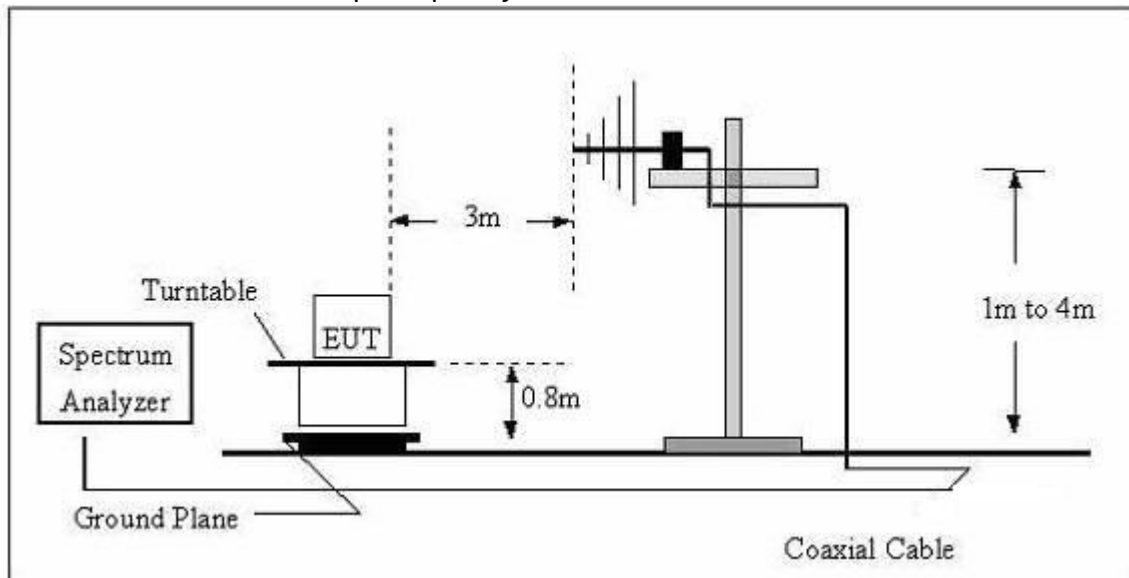
No deviation

### 3.1.4 TEST SETUP

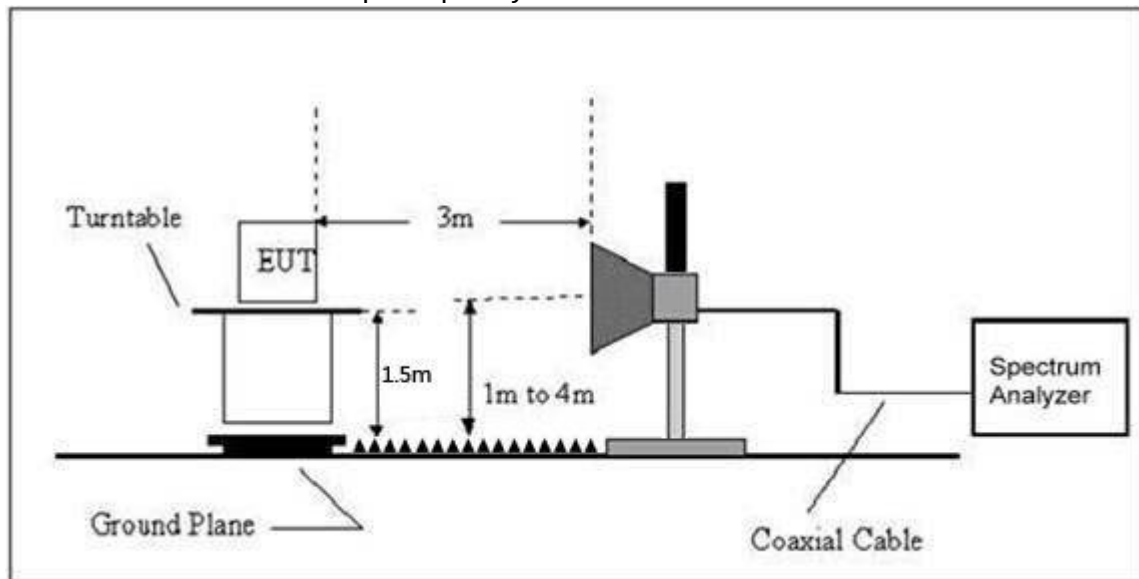
#### (A) Radiated Emission Test-Up Frequency Below 30MHz



#### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



### 3.1.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



### 3.1.6 TEST RESULTS

#### Radiated Spurious Emission (Below 30MHz )

|                |          |                     |     |
|----------------|----------|---------------------|-----|
| Temperature :  | 25 °C    | Relative Humidity : | 55% |
| Pressure :     | 1010 hPa | Polarization :      | --- |
| Test Voltage : | DC 12V   |                     |     |
| Test Mode :    | Mode 4   |                     |     |

| Freq. | Reading  | Limit    | Margin | State |
|-------|----------|----------|--------|-------|
| (MHz) | (dBuV/m) | (dBuV/m) | (dB)   | P/F   |
| --    | --       | --       | --     | PASS  |
| --    | --       | --       | --     | PASS  |

**NOTE:**

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

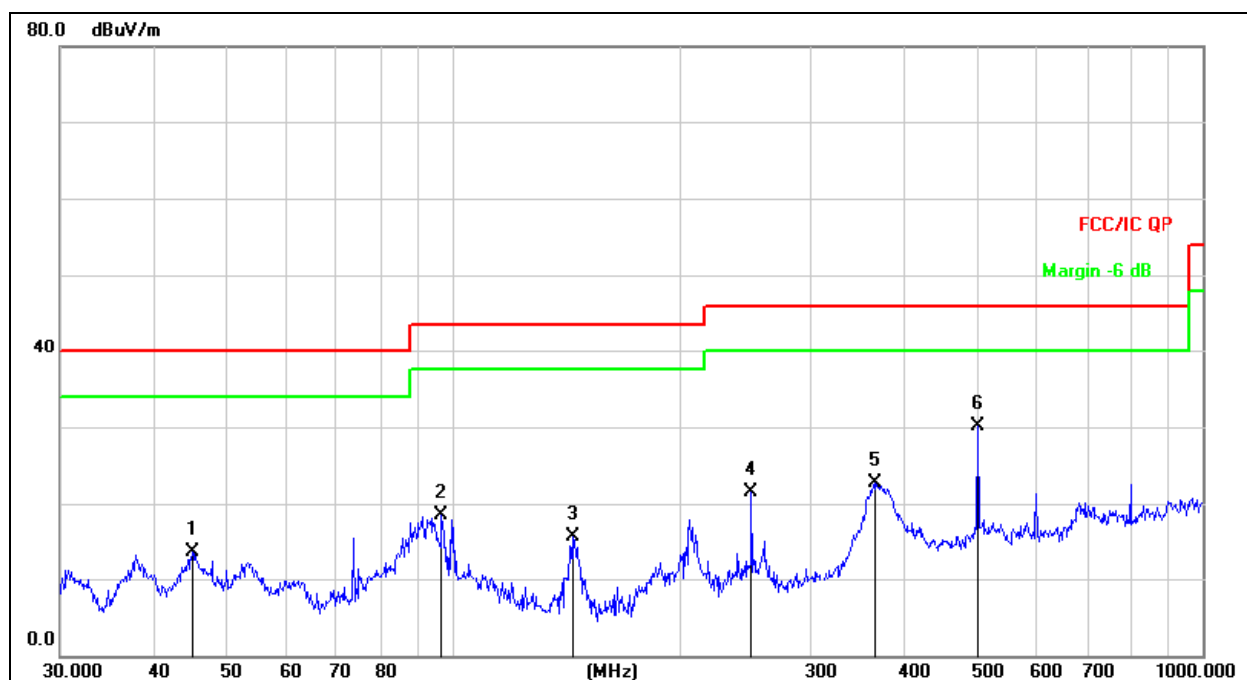
Distance extrapolation factor =  $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



Radiated Spurious Emission (Between 30MHz – 1GHz)

|                        |          |                     |            |
|------------------------|----------|---------------------|------------|
| Temperature :          | 25 °C    | Relative Humidity : | 55%        |
| Pressure :             | 1010 hPa | Polarization :      | Horizontal |
| Test Voltage :         | DC 12V   |                     |            |
| Test Mode :<br>(Worst) | Mode 4   |                     |            |

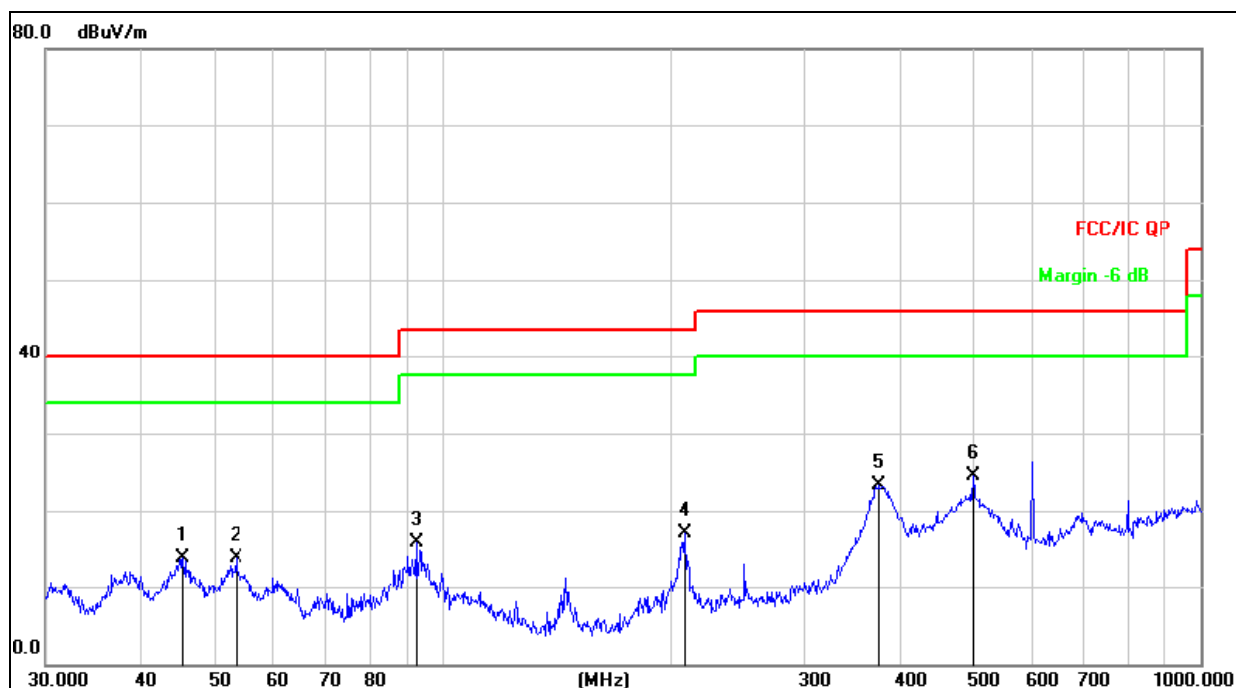


Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dB/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|---------------|------------|----------|
| 1   |     | 44.9006      | 27.79                    | -14.05                  | 13.74                      | 40.00         | -26.26     | QP       |
| 2   |     | 96.4362      | 34.68                    | -16.22                  | 18.46                      | 43.50         | -25.04     | QP       |
| 3   |     | 144.3348     | 35.01                    | -19.24                  | 15.77                      | 43.50         | -27.73     | QP       |
| 4   |     | 250.3012     | 36.65                    | -15.10                  | 21.55                      | 46.00         | -24.45     | QP       |
| 5   |     | 364.2595     | 34.79                    | -12.18                  | 22.61                      | 46.00         | -23.39     | QP       |
| 6   | *   | 501.1790     | 39.35                    | -9.29                   | 30.06                      | 46.00         | -15.94     | QP       |



|                        |          |                     |          |
|------------------------|----------|---------------------|----------|
| Temperature :          | 25 °C    | Relative Humidity : | 55%      |
| Pressure :             | 1010 hPa | Polarization :      | Vertical |
| Test Voltage :         | DC 12V   |                     |          |
| Test Mode :<br>(Worst) | Mode 4   |                     |          |



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dB/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|---------------|------------|----------|
| 1   |     | 45.3755      | 28.00                    | -14.02                  | 13.98                      | 40.00         | -26.02     | QP       |
| 2   |     | 53.3179      | 28.30                    | -14.49                  | 13.81                      | 40.00         | -26.19     | QP       |
| 3   |     | 92.1388      | 32.90                    | -17.04                  | 15.86                      | 43.50         | -27.64     | QP       |
| 4   |     | 207.8501     | 33.35                    | -16.24                  | 17.11                      | 43.50         | -26.39     | QP       |
| 5   |     | 375.9385     | 35.40                    | -12.19                  | 23.21                      | 46.00         | -22.79     | QP       |
| 6   | *   | 501.1790     | 33.79                    | -9.29                   | 24.50                      | 46.00         | -21.50     | QP       |



## GFSK

| Polar (H/V)                   | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|-------------------------------|-----------------|----------------------|--------------------|-----------------|-----------------------|-------------------------|-----------------|-------------|---------------|
| <b>Low Channel 2402MHz</b>    |                 |                      |                    |                 |                       |                         |                 |             |               |
| V                             | 2402.00         | 106.39               | 38.06              | 7.42            | 20.15                 | 95.90                   | 114.00          | -18.10      | PK            |
| V                             | 2402.00         | 89.75                | 38.06              | 7.42            | 20.15                 | 79.26                   | 94.00           | -14.74      | AV            |
| V                             | 4804.00         | 57.10                | 38.53              | 7.78            | 23.25                 | 49.60                   | 74.00           | -24.40      | PK            |
| V                             | 4804.00         | 43.65                | 38.53              | 7.78            | 23.25                 | 36.15                   | 54.00           | -17.85      | AV            |
| V                             | 16132.00        | 44.80                | 38.75              | 10.36           | 26.57                 | 42.98                   | 74.00           | -31.02      | PK            |
| H                             | 2402.00         | 107.30               | 38.06              | 7.42            | 20.15                 | 96.81                   | 114.00          | -17.19      | PK            |
| H                             | 2402.00         | 88.10                | 38.06              | 7.42            | 20.15                 | 77.61                   | 94.00           | -16.39      | AV            |
| H                             | 4804.00         | 58.08                | 38.53              | 7.78            | 23.25                 | 50.58                   | 74.00           | -23.43      | PK            |
| H                             | 4804.00         | 43.97                | 38.53              | 7.78            | 23.25                 | 36.47                   | 54.00           | -17.53      | AV            |
| H                             | 16132.00        | 45.29                | 38.75              | 10.36           | 26.57                 | 43.47                   | 74.00           | -30.53      | PK            |
| <b>Middle Channel 2441MHz</b> |                 |                      |                    |                 |                       |                         |                 |             |               |
| V                             | 2441.00         | 106.82               | 38.11              | 7.44            | 20.36                 | 96.51                   | 114.00          | -17.49      | PK            |
| V                             | 2441.00         | 89.52                | 38.11              | 7.44            | 20.36                 | 79.21                   | 94.00           | -14.79      | AV            |
| V                             | 4882.00         | 55.77                | 38.65              | 7.80            | 23.61                 | 48.53                   | 74.00           | -25.47      | PK            |
| V                             | 4882.00         | 46.40                | 38.65              | 7.80            | 23.61                 | 39.16                   | 54.00           | -14.84      | AV            |
| V                             | 16132.00        | 46.02                | 38.75              | 10.36           | 26.57                 | 44.20                   | 74.00           | -29.80      | PK            |
| H                             | 2441.00         | 105.70               | 38.11              | 7.44            | 20.36                 | 95.39                   | 114.00          | -18.61      | PK            |
| H                             | 2441.00         | 91.45                | 38.11              | 7.44            | 20.36                 | 81.14                   | 94.00           | -12.86      | AV            |
| H                             | 4882.00         | 58.88                | 38.65              | 7.80            | 23.61                 | 51.64                   | 74.00           | -22.36      | PK            |
| H                             | 4882.00         | 45.14                | 38.65              | 7.80            | 23.61                 | 37.90                   | 54.00           | -16.10      | AV            |
| H                             | 16132.00        | 44.31                | 38.75              | 10.36           | 26.57                 | 42.49                   | 74.00           | -31.51      | PK            |
| <b>High Channel 2480MHz</b>   |                 |                      |                    |                 |                       |                         |                 |             |               |
| V                             | 2480.00         | 105.56               | 38.17              | 7.47            | 20.51                 | 95.37                   | 114.00          | -18.63      | PK            |
| V                             | 2480.00         | 93.91                | 38.17              | 7.47            | 20.51                 | 83.72                   | 94.00           | -10.28      | AV            |
| V                             | 4960.00         | 57.99                | 38.69              | 7.83            | 23.83                 | 50.96                   | 74.00           | -23.04      | PK            |
| V                             | 4960.00         | 45.03                | 38.69              | 7.83            | 23.83                 | 38.00                   | 54.00           | -16.00      | AV            |
| V                             | 16132.00        | 45.18                | 38.75              | 10.36           | 26.57                 | 43.36                   | 74.00           | -30.64      | PK            |
| H                             | 2480.00         | 107.18               | 38.17              | 7.47            | 20.51                 | 96.99                   | 114.00          | -17.01      | PK            |
| H                             | 2480.00         | 97.90                | 38.17              | 7.47            | 20.51                 | 87.71                   | 94.00           | -6.29       | AV            |
| H                             | 4960.00         | 56.68                | 38.69              | 7.83            | 23.83                 | 49.65                   | 74.00           | -24.35      | PK            |
| H                             | 4960.00         | 44.74                | 38.69              | 7.83            | 23.83                 | 37.71                   | 54.00           | -16.29      | AV            |
| H                             | 16132.00        | 45.89                | 38.75              | 10.36           | 26.57                 | 44.07                   | 74.00           | -29.93      | PK            |

**Remark:**

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,  
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



## PI/4 DPSK

| Polar (H/V)                   | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|-------------------------------|-----------------|----------------------|--------------------|-----------------|-----------------------|-------------------------|-----------------|-------------|---------------|
| <b>Low Channel 2402MHz</b>    |                 |                      |                    |                 |                       |                         |                 |             |               |
| V                             | 2402.00         | 106.08               | 38.06              | 7.42            | 20.15                 | 95.59                   | 114.00          | -18.41      | PK            |
| V                             | 2402.00         | 89.49                | 38.06              | 7.42            | 20.15                 | 79.00                   | 94.00           | -15.00      | AV            |
| V                             | 4804.00         | 56.94                | 38.53              | 7.78            | 23.25                 | 49.44                   | 74.00           | -24.56      | PK            |
| V                             | 4804.00         | 43.52                | 38.53              | 7.78            | 23.25                 | 36.02                   | 54.00           | -17.98      | AV            |
| V                             | 16132.00        | 44.67                | 38.75              | 10.36           | 26.57                 | 42.85                   | 74.00           | -31.15      | PK            |
| H                             | 2402.00         | 106.99               | 38.06              | 7.42            | 20.15                 | 96.50                   | 114.00          | -17.50      | PK            |
| H                             | 2402.00         | 87.84                | 38.06              | 7.42            | 20.15                 | 77.35                   | 94.00           | -16.65      | AV            |
| H                             | 4804.00         | 57.91                | 38.53              | 7.78            | 23.25                 | 50.41                   | 74.00           | -23.59      | PK            |
| H                             | 4804.00         | 43.85                | 38.53              | 7.78            | 23.25                 | 36.35                   | 54.00           | -17.65      | AV            |
| H                             | 16132.00        | 45.16                | 38.75              | 10.36           | 26.57                 | 43.34                   | 74.00           | -30.66      | PK            |
| <b>Middle Channel 2441MHz</b> |                 |                      |                    |                 |                       |                         |                 |             |               |
| V                             | 2441.00         | 106.51               | 38.11              | 7.44            | 20.36                 | 96.20                   | 114.00          | -17.80      | PK            |
| V                             | 2441.00         | 89.27                | 38.11              | 7.44            | 20.36                 | 78.96                   | 94.00           | -15.04      | AV            |
| V                             | 4882.00         | 55.61                | 38.65              | 7.80            | 23.61                 | 48.37                   | 74.00           | -25.63      | PK            |
| V                             | 4882.00         | 46.27                | 38.65              | 7.80            | 23.61                 | 39.03                   | 54.00           | -14.97      | AV            |
| V                             | 16132.00        | 45.89                | 38.75              | 10.36           | 26.57                 | 44.07                   | 74.00           | -29.93      | PK            |
| H                             | 2441.00         | 105.40               | 38.11              | 7.44            | 20.36                 | 95.09                   | 114.00          | -18.91      | PK            |
| H                             | 2441.00         | 91.19                | 38.11              | 7.44            | 20.36                 | 80.88                   | 94.00           | -13.12      | AV            |
| H                             | 4882.00         | 58.71                | 38.65              | 7.80            | 23.61                 | 51.47                   | 74.00           | -22.53      | PK            |
| H                             | 4882.00         | 45.01                | 38.65              | 7.80            | 23.61                 | 37.77                   | 54.00           | -16.23      | AV            |
| H                             | 16132.00        | 44.18                | 38.75              | 10.36           | 26.57                 | 42.36                   | 74.00           | -31.64      | PK            |
| <b>High Channel 2480MHz</b>   |                 |                      |                    |                 |                       |                         |                 |             |               |
| V                             | 2480.00         | 105.26               | 38.17              | 7.47            | 20.51                 | 95.07                   | 114.00          | -18.93      | PK            |
| V                             | 2480.00         | 93.64                | 38.17              | 7.47            | 20.51                 | 83.45                   | 94.00           | -10.55      | AV            |
| V                             | 4960.00         | 57.82                | 38.69              | 7.83            | 23.83                 | 50.79                   | 74.00           | -23.21      | PK            |
| V                             | 4960.00         | 44.90                | 38.69              | 7.83            | 23.83                 | 37.87                   | 54.00           | -16.13      | AV            |
| V                             | 16132.00        | 45.05                | 38.75              | 10.36           | 26.57                 | 43.23                   | 74.00           | -30.77      | PK            |
| H                             | 2480.00         | 106.87               | 38.17              | 7.47            | 20.51                 | 96.68                   | 114.00          | -17.32      | PK            |
| H                             | 2480.00         | 97.62                | 38.17              | 7.47            | 20.51                 | 87.43                   | 94.00           | -6.57       | AV            |
| H                             | 4960.00         | 56.52                | 38.69              | 7.83            | 23.83                 | 49.49                   | 74.00           | -24.51      | PK            |
| H                             | 4960.00         | 44.61                | 38.69              | 7.83            | 23.83                 | 37.58                   | 54.00           | -16.42      | AV            |
| H                             | 16132.00        | 45.75                | 38.75              | 10.36           | 26.57                 | 43.93                   | 74.00           | -30.07      | PK            |

**Remark:**

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



## 8DPSK

| Polar (H/V)                   | Frequency (MHz) | Meter Reading (dBuV) | Pre-amplifier (dB) | Cable Loss (dB) | Antenna Factor (dB/m) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector Type |
|-------------------------------|-----------------|----------------------|--------------------|-----------------|-----------------------|-------------------------|-----------------|-------------|---------------|
| <b>Low Channel 2402MHz</b>    |                 |                      |                    |                 |                       |                         |                 |             |               |
| V                             | 2402.00         | 105.41               | 38.06              | 7.42            | 20.15                 | 94.92                   | 114.00          | -19.08      | PK            |
| V                             | 2402.00         | 88.93                | 38.06              | 7.42            | 20.15                 | 78.44                   | 94.00           | -15.56      | AV            |
| V                             | 4804.00         | 56.58                | 38.53              | 7.78            | 23.25                 | 49.08                   | 74.00           | -24.92      | PK            |
| V                             | 4804.00         | 43.25                | 38.53              | 7.78            | 23.25                 | 35.75                   | 54.00           | -18.25      | AV            |
| V                             | 16132.00        | 44.39                | 38.75              | 10.36           | 26.57                 | 42.57                   | 74.00           | -31.43      | PK            |
| H                             | 2402.00         | 106.32               | 38.06              | 7.42            | 20.15                 | 95.83                   | 114.00          | -18.17      | PK            |
| H                             | 2402.00         | 87.29                | 38.06              | 7.42            | 20.15                 | 76.80                   | 94.00           | -17.20      | AV            |
| H                             | 4804.00         | 57.54                | 38.53              | 7.78            | 23.25                 | 50.04                   | 74.00           | -23.96      | PK            |
| H                             | 4804.00         | 43.57                | 38.53              | 7.78            | 23.25                 | 36.07                   | 54.00           | -17.93      | AV            |
| H                             | 16132.00        | 44.88                | 38.75              | 10.36           | 26.57                 | 43.06                   | 74.00           | -30.94      | PK            |
| <b>Middle Channel 2441MHz</b> |                 |                      |                    |                 |                       |                         |                 |             |               |
| V                             | 2441.00         | 105.84               | 38.11              | 7.44            | 20.36                 | 95.53                   | 114.00          | -18.47      | PK            |
| V                             | 2441.00         | 88.70                | 38.11              | 7.44            | 20.36                 | 78.39                   | 94.00           | -15.61      | AV            |
| V                             | 4882.00         | 55.26                | 38.65              | 7.80            | 23.61                 | 48.02                   | 74.00           | -25.98      | PK            |
| V                             | 4882.00         | 45.98                | 38.65              | 7.80            | 23.61                 | 38.74                   | 54.00           | -15.26      | AV            |
| V                             | 16132.00        | 45.60                | 38.75              | 10.36           | 26.57                 | 43.78                   | 74.00           | -30.22      | PK            |
| H                             | 2441.00         | 104.74               | 38.11              | 7.44            | 20.36                 | 94.43                   | 114.00          | -19.57      | PK            |
| H                             | 2441.00         | 90.62                | 38.11              | 7.44            | 20.36                 | 80.31                   | 94.00           | -13.69      | AV            |
| H                             | 4882.00         | 58.34                | 38.65              | 7.80            | 23.61                 | 51.10                   | 74.00           | -22.90      | PK            |
| H                             | 4882.00         | 44.73                | 38.65              | 7.80            | 23.61                 | 37.49                   | 54.00           | -16.51      | AV            |
| H                             | 16132.00        | 43.91                | 38.75              | 10.36           | 26.57                 | 42.09                   | 74.00           | -31.91      | PK            |
| <b>High Channel 2480MHz</b>   |                 |                      |                    |                 |                       |                         |                 |             |               |
| V                             | 2480.00         | 104.60               | 38.17              | 7.47            | 20.51                 | 94.41                   | 114.00          | -19.59      | PK            |
| V                             | 2480.00         | 93.05                | 38.17              | 7.47            | 20.51                 | 82.86                   | 94.00           | -11.14      | AV            |
| V                             | 4960.00         | 57.46                | 38.69              | 7.83            | 23.83                 | 50.43                   | 74.00           | -23.57      | PK            |
| V                             | 4960.00         | 44.62                | 38.69              | 7.83            | 23.83                 | 37.59                   | 54.00           | -16.41      | AV            |
| V                             | 16132.00        | 44.77                | 38.75              | 10.36           | 26.57                 | 42.95                   | 74.00           | -31.05      | PK            |
| H                             | 2480.00         | 106.20               | 38.17              | 7.47            | 20.51                 | 96.01                   | 114.00          | -17.99      | PK            |
| H                             | 2480.00         | 97.00                | 38.17              | 7.47            | 20.51                 | 86.81                   | 94.00           | -7.19       | AV            |
| H                             | 4960.00         | 56.16                | 38.69              | 7.83            | 23.83                 | 49.13                   | 74.00           | -24.87      | PK            |
| H                             | 4960.00         | 44.33                | 38.69              | 7.83            | 23.83                 | 37.30                   | 54.00           | -16.70      | AV            |
| H                             | 16132.00        | 45.47                | 38.75              | 10.36           | 26.57                 | 43.65                   | 74.00           | -30.35      | PK            |

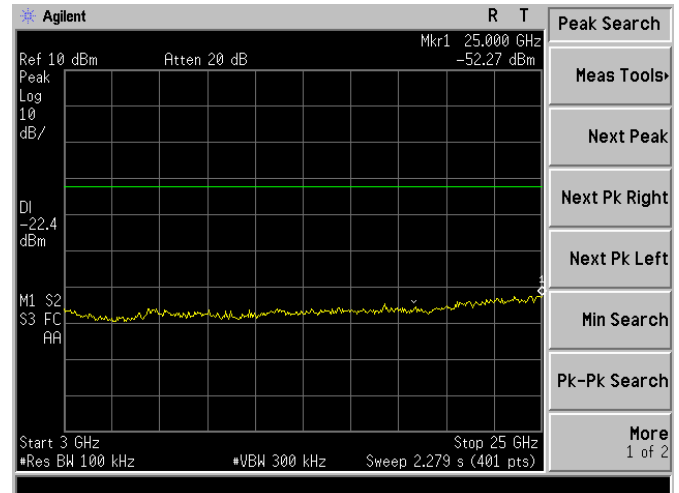
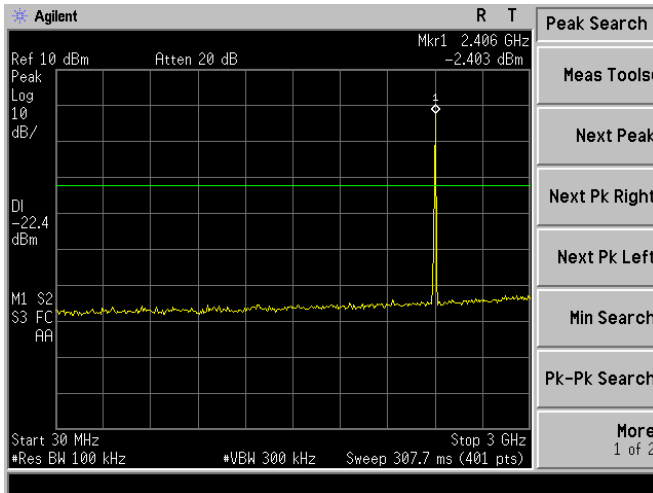
**Remark:**

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

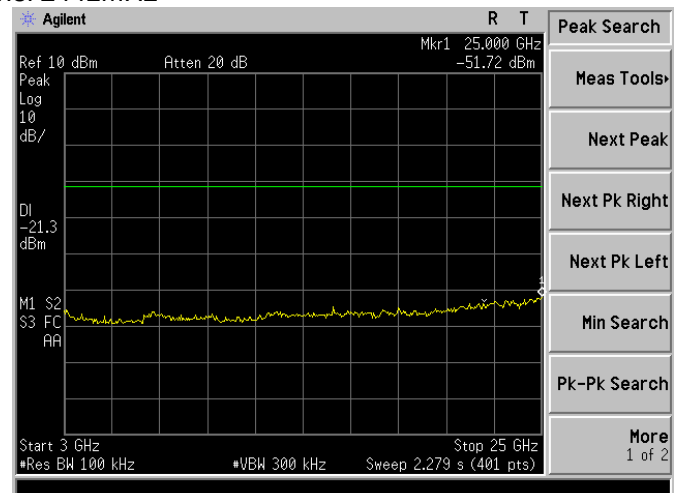
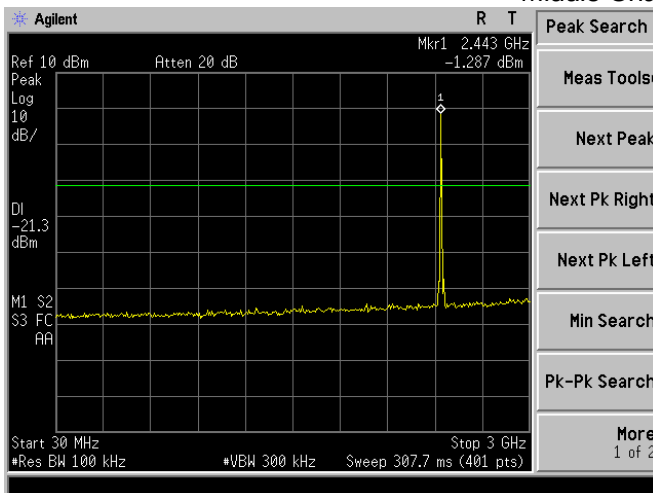
**CONDUCTED EMISSION MEASUREMENT**

GFSK

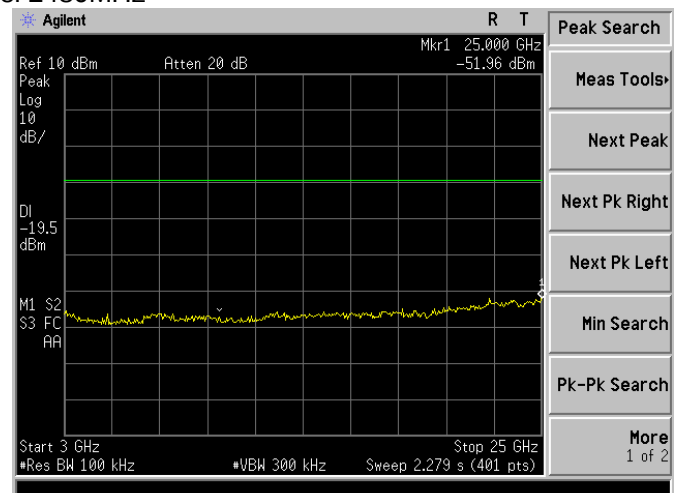
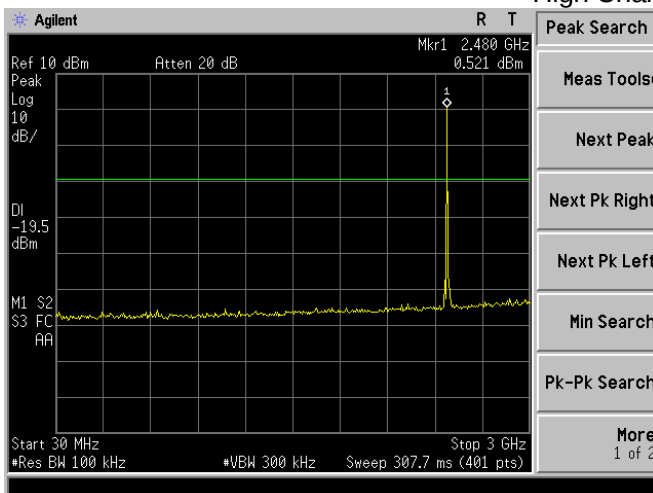
Low Channel 2402MHz



Middle Channel 2441MHz



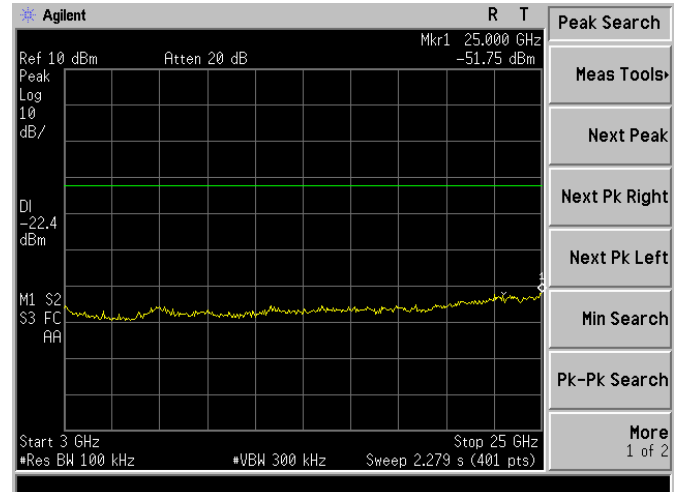
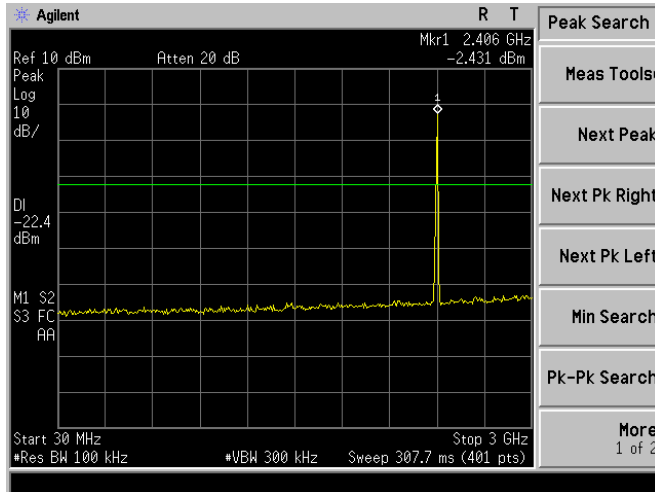
High Channel 2480MHz



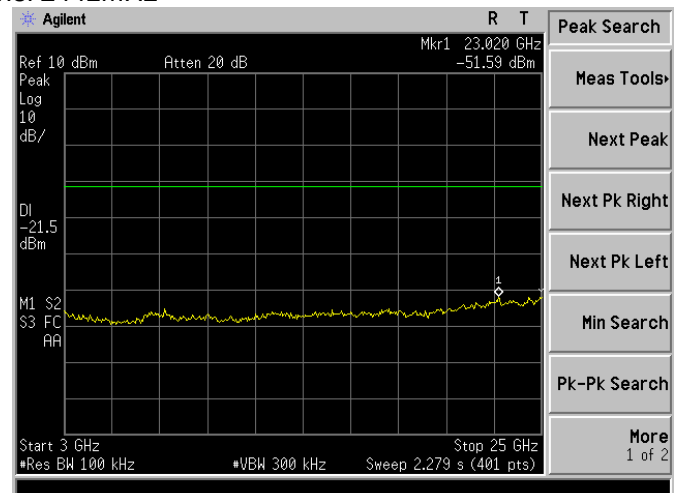
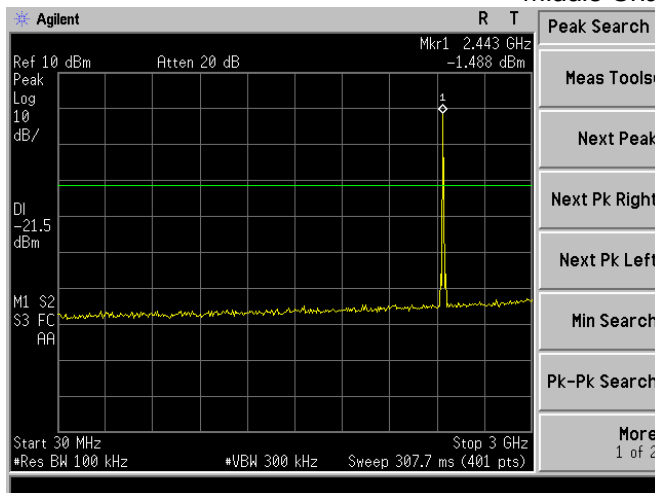


## PI/4 DPSK

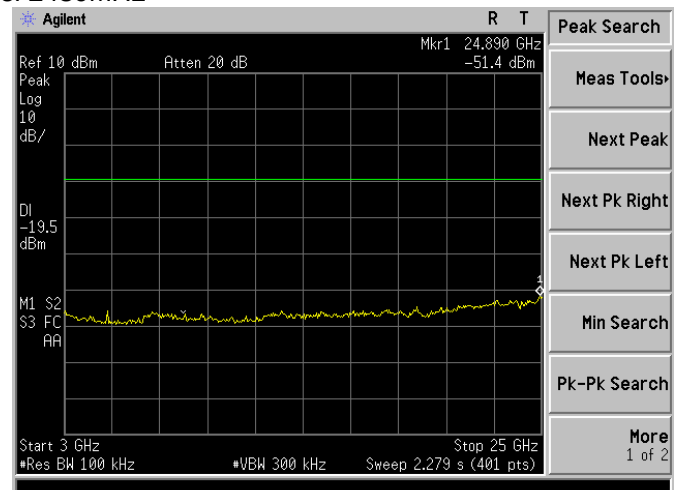
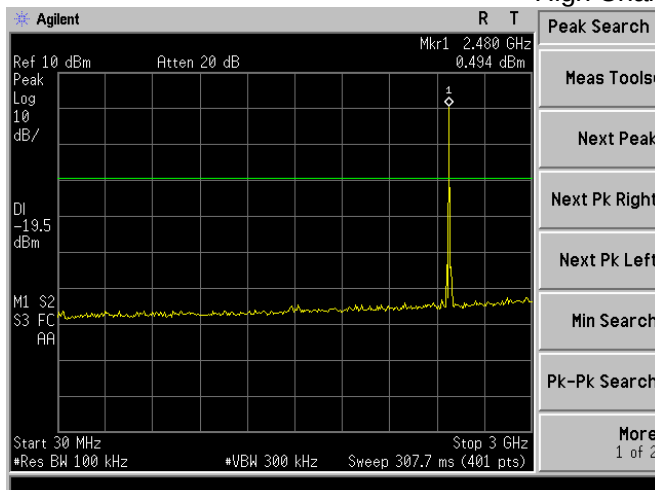
## Low Channel 2402MHz



## Middle Channel 2441MHz



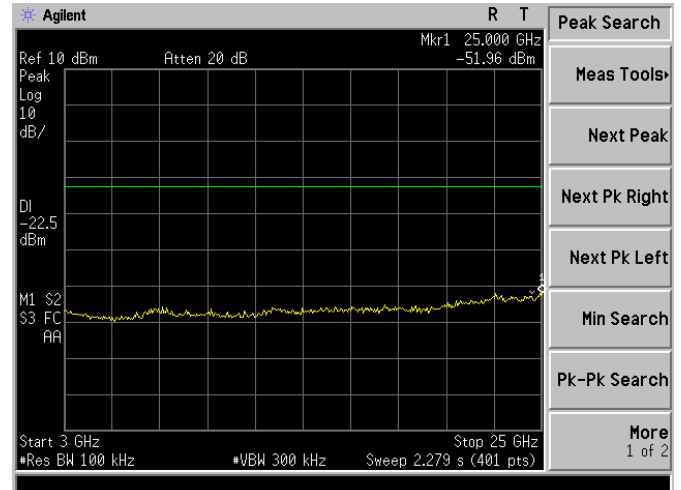
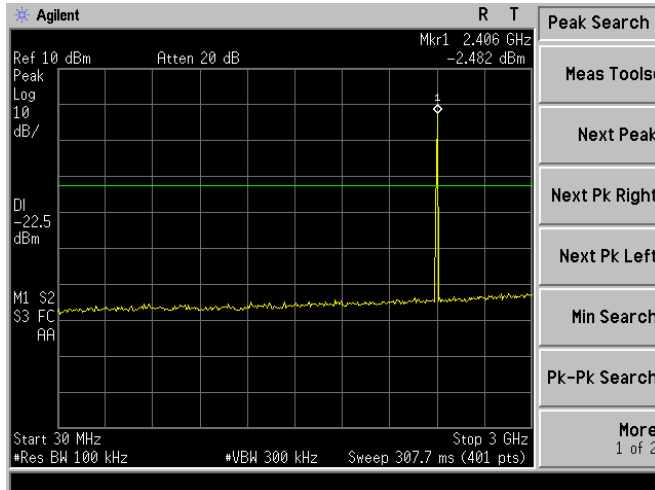
## High Channel 2480MHz



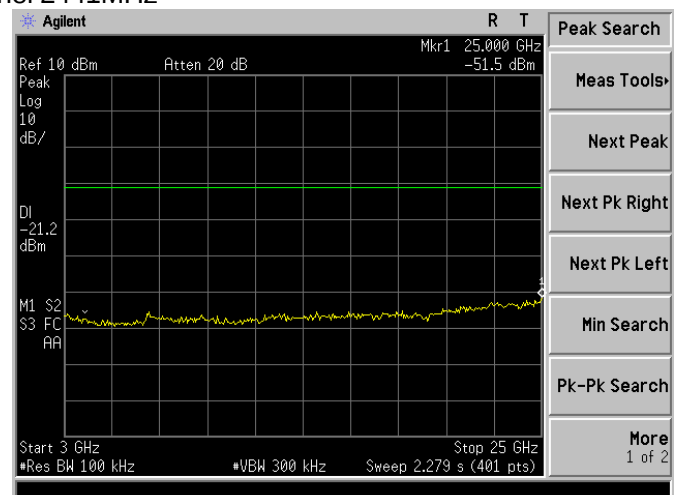
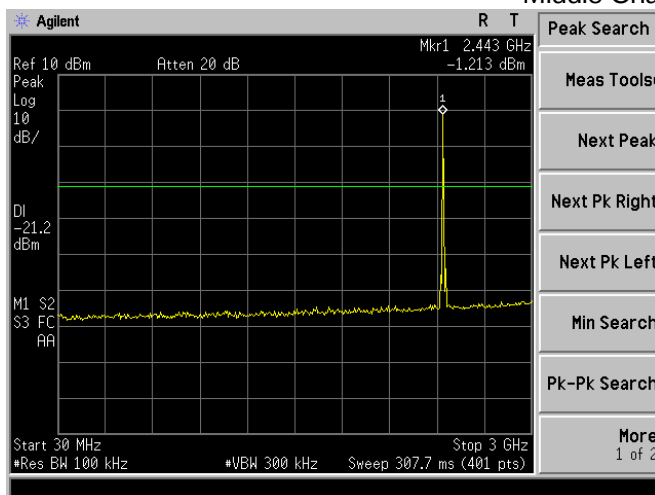


## 8DPSK

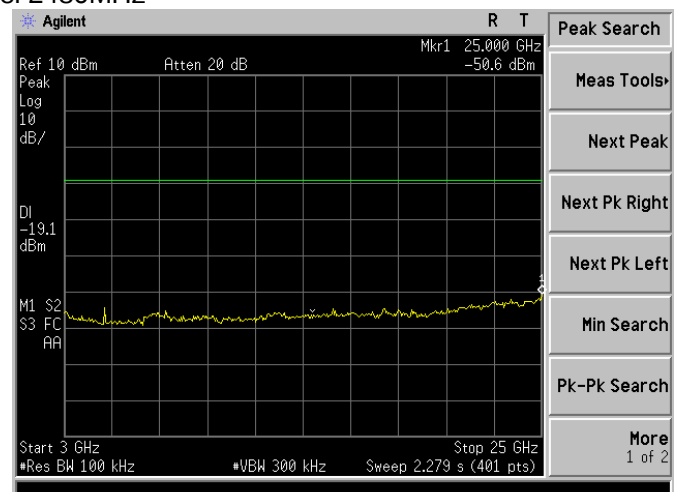
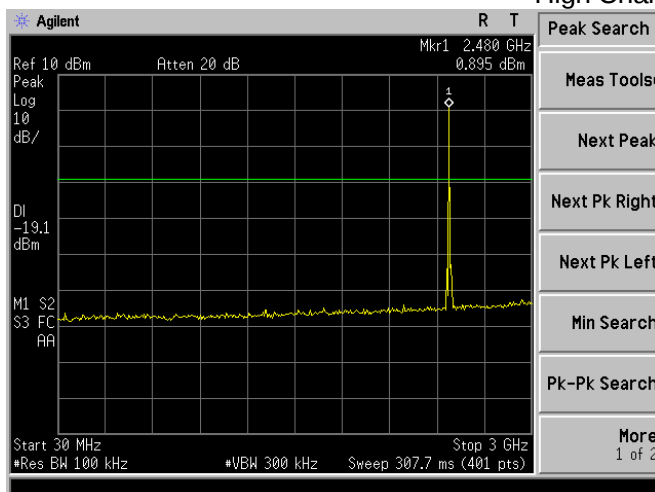
## Low Channel 2402MHz



## Middle Channel 2441MHz



## High Channel 2480MHz





## 4. BANDWIDTH TEST

### 4.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.249) , Subpart C |           |                  |                       |        |
|---------------------------------|-----------|------------------|-----------------------|--------|
| Section                         | Test Item | Limit            | Frequency Range (MHz) | Result |
| 15.249                          | Bandwidth | (20dB bandwidth) | 2400-2483.5           | PASS   |

| Spectrum Parameter | Setting                                       |
|--------------------|-----------------------------------------------|
| Attenuation        | Auto                                          |
| Span Frequency     | > Measurement Bandwidth or Channel Separation |
| RB                 | 100KHz                                        |
| VB                 | $\geq$ RBW                                    |
| Detector           | Peak                                          |
| Trace              | Max Hold                                      |
| Sweep Time         | Auto                                          |

#### 4.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW $\geq$  RBW, Sweep time = Auto.

#### 4.1.2 DEVIATION FROM STANDARD

No deviation.

#### 4.1.3 TEST SETUP



#### 4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



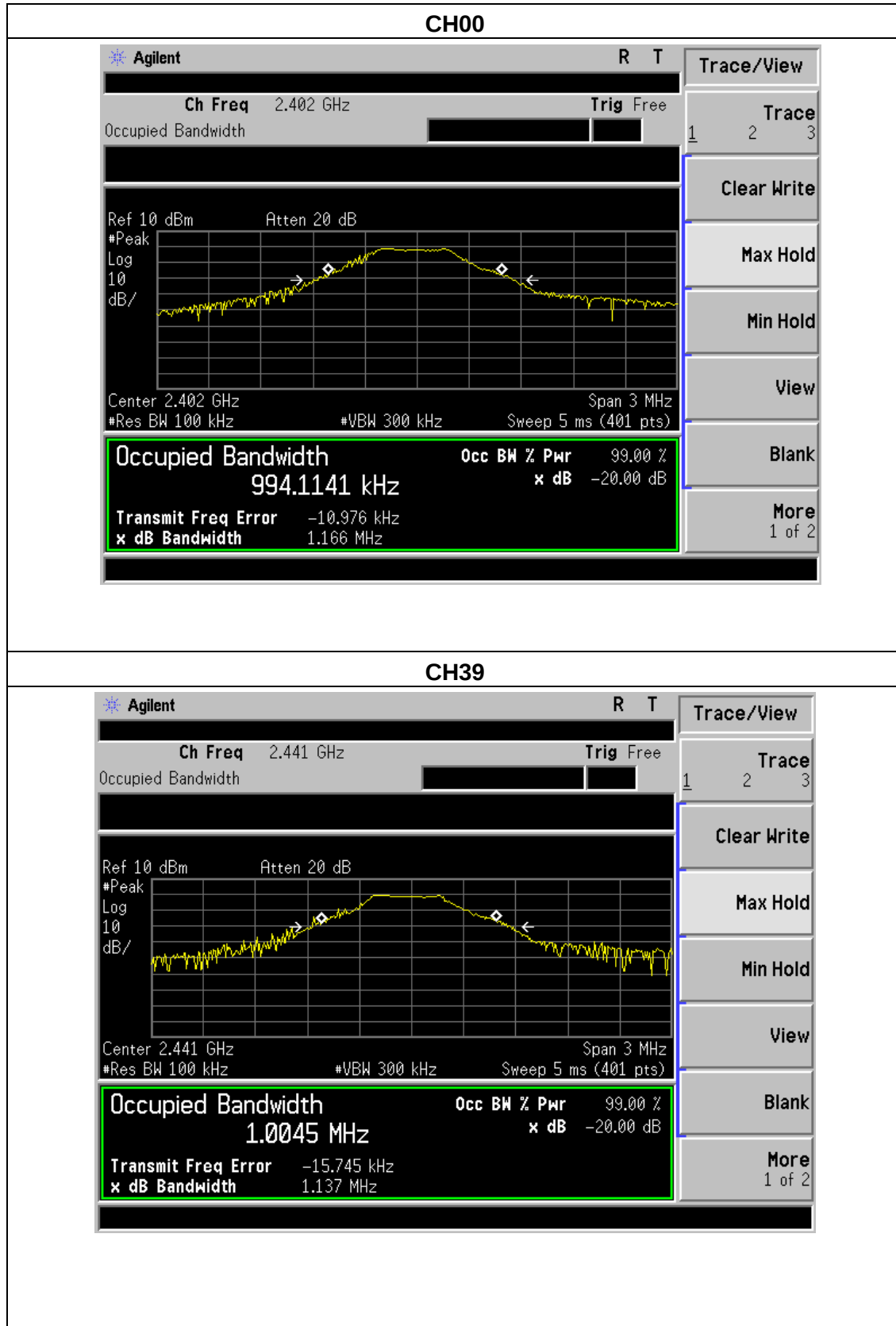
#### 4.1.5 TEST RESULTS

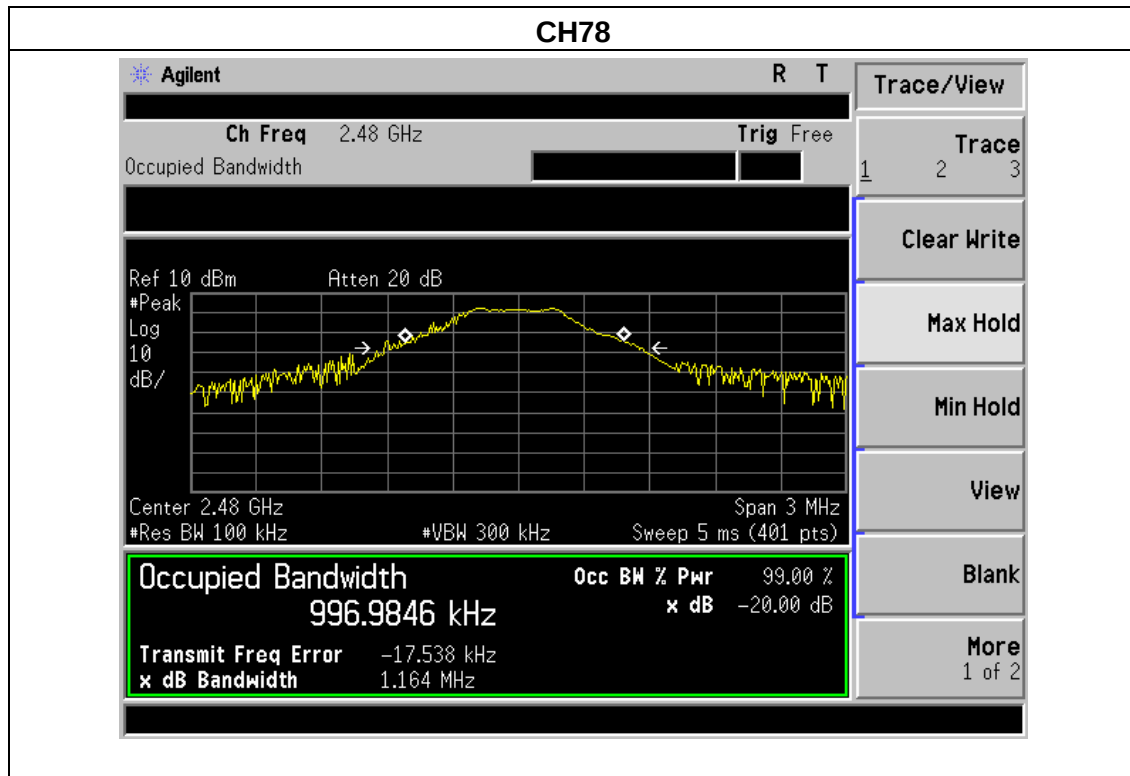
|               |               |                     |        |
|---------------|---------------|---------------------|--------|
| Temperature : | 25 °C         | Relative Humidity : | 55%    |
| Pressure :    | 1012 hPa      | Test Voltage :      | DC 12V |
| Test Mode :   | CH00/CH39/C78 |                     |        |

|           | Frequency | 20dB Bandwidth<br>(kHz) | Result |
|-----------|-----------|-------------------------|--------|
| GFSK      | 2402 MHz  | 1166                    | PASS   |
|           | 2441 MHz  | 1137                    | PASS   |
|           | 2480 MHz  | 1164                    | PASS   |
| PI/4 DPSK | 2402 MHz  | 1410                    | PASS   |
|           | 2441 MHz  | 1415                    | PASS   |
|           | 2480 MHz  | 1406                    | PASS   |
| 8DPSK     | 2402 MHz  | 1394                    | PASS   |
|           | 2441 MHz  | 1402                    | PASS   |
|           | 2480 MHz  | 1397                    | PASS   |



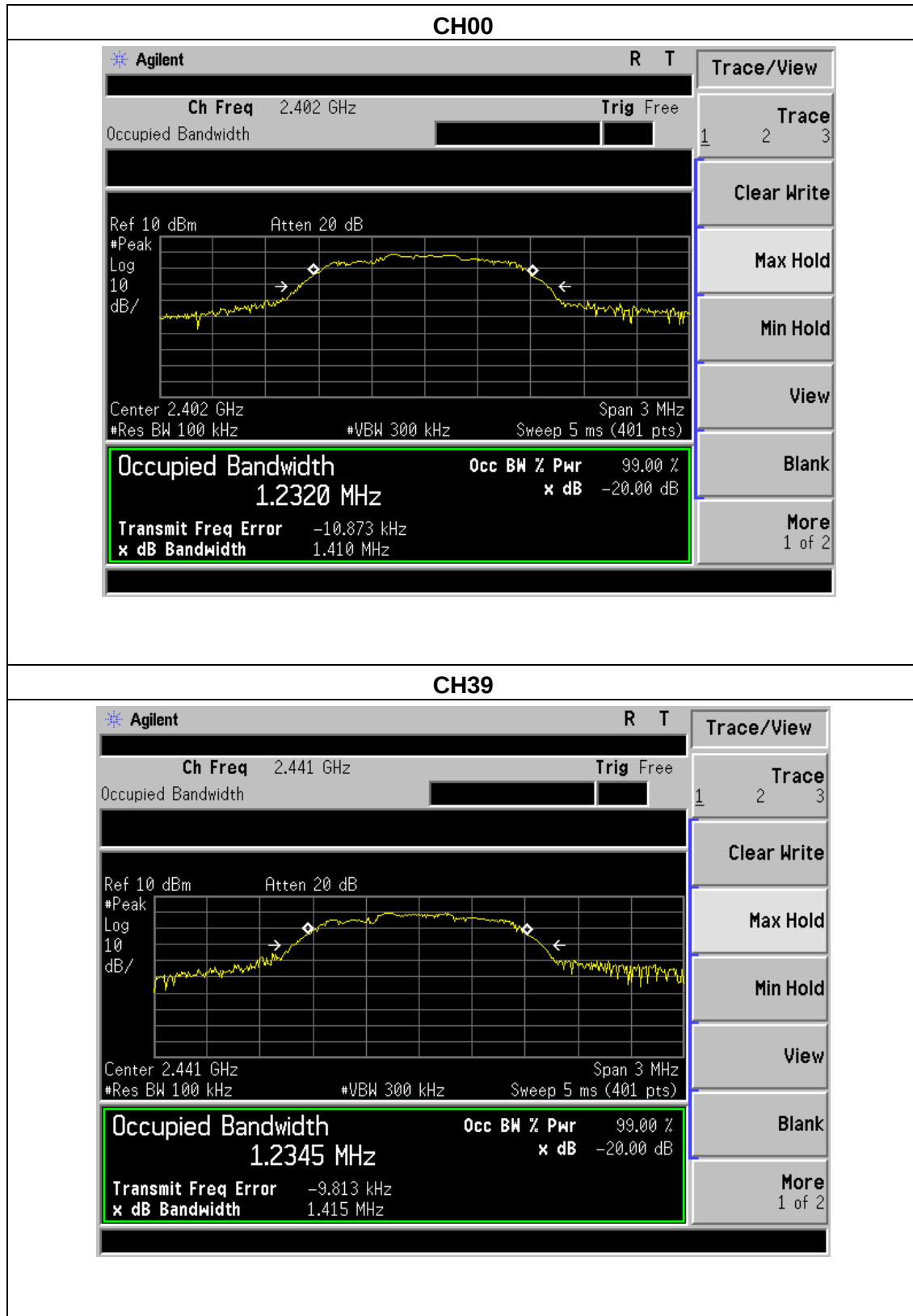
## GFSK

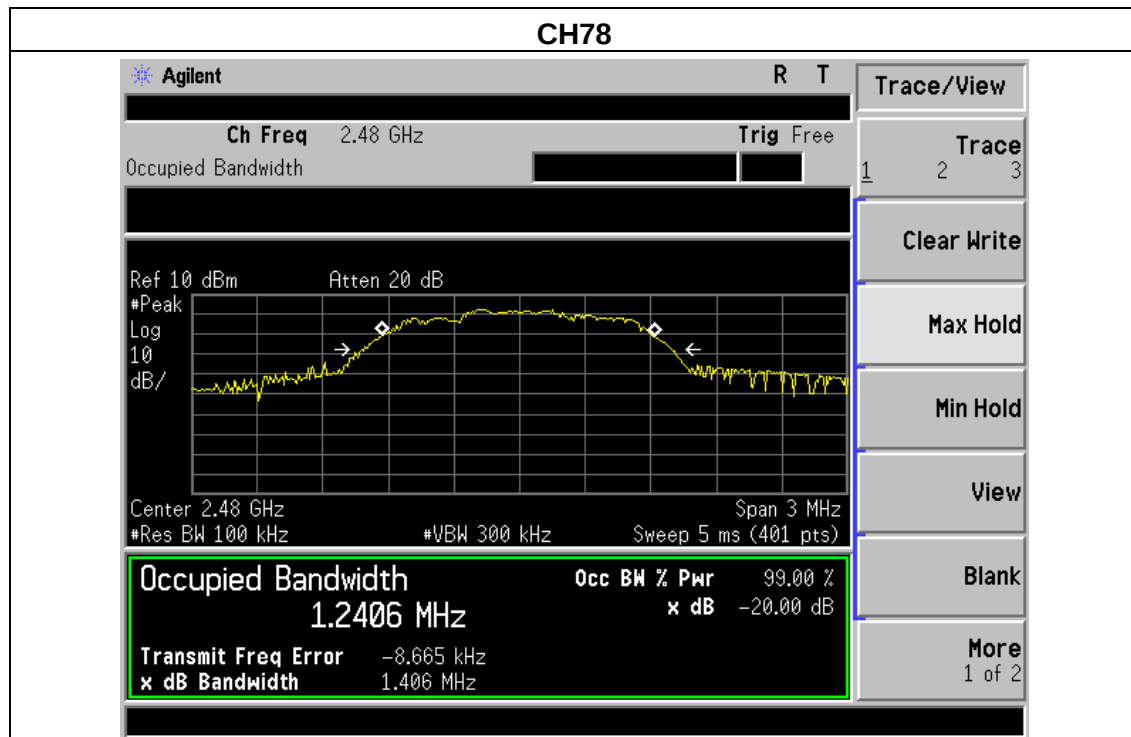






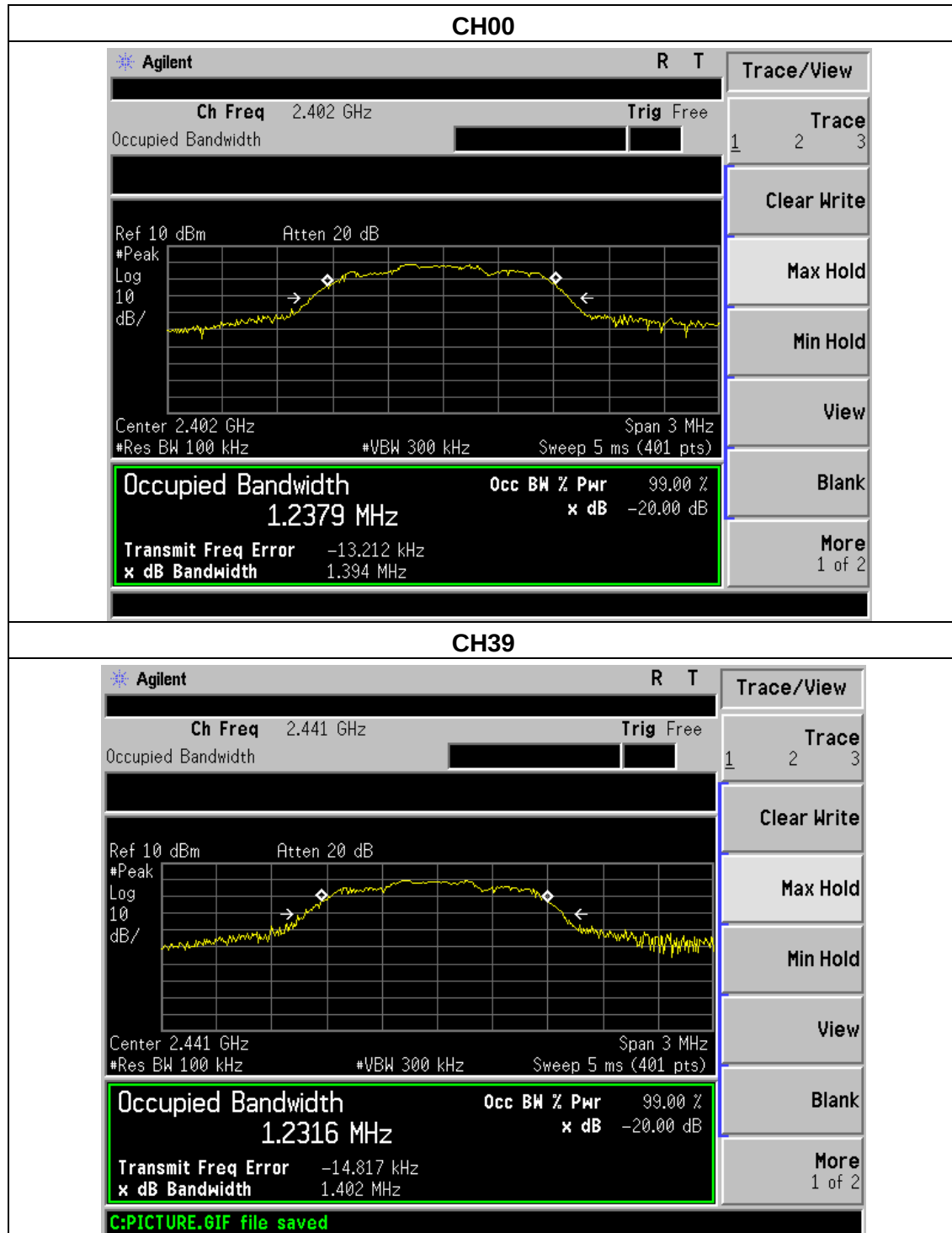
## PI/4 DPSK

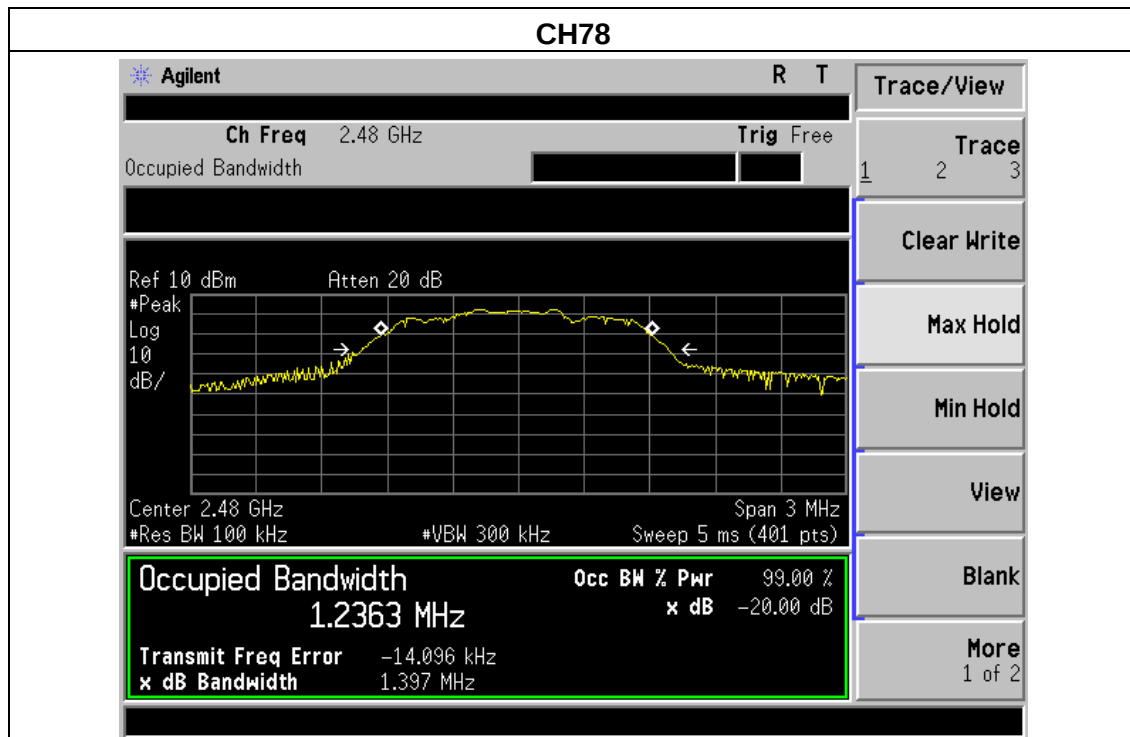






8DPSK







## **5. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE**

### **APPLICABLE STANDARD**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### **TEST PROCEDURE**

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) i) VBW for Peak, Quasi-peak, or Average Detector Function:  $3 \times \text{RBW}$
- d) Repeat above procedures until all measured frequencies were complete.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

### **5.1 DEVIATION FROM STANDARD**

No deviation.

### **5.2 TEST SETUP**

### **5.3 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



## 5.4 TEST RESULTS

|               |           |                     |        |
|---------------|-----------|---------------------|--------|
| Temperature : | 25 °C     | Relative Humidity : | 54%    |
| Pressure :    | 1012 hPa  | Test Voltage :      | DC 12V |
| Test Mode :   | CH00/CH78 |                     |        |

|              | Polar<br>(H/V)       | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-<br>amplifier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Emission<br>evel<br>(dBuV/m) | Limits<br>(dBuV/m) |       | Result |
|--------------|----------------------|--------------------|----------------------------|---------------------------|-----------------------|-----------------------------|------------------------------|--------------------|-------|--------|
|              |                      |                    |                            |                           |                       |                             | PK                           | PK                 | AV    |        |
| GFSK         | Low Channel 2402MHz  |                    |                            |                           |                       |                             |                              |                    |       |        |
|              | H                    | 2390.00            | 58.49                      | 38.06                     | 7.42                  | 20.15                       | 48.00                        | 74.00              | 54.00 | PASS   |
|              | H                    | 2400.00            | 59.42                      | 38.06                     | 7.42                  | 20.15                       | 48.93                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2390.00            | 59.48                      | 38.06                     | 7.42                  | 20.15                       | 48.99                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2400.00            | 59.81                      | 38.06                     | 7.42                  | 20.15                       | 49.32                        | 74.00              | 54.00 | PASS   |
|              | High Channel 2480MHz |                    |                            |                           |                       |                             |                              |                    |       |        |
|              | H                    | 2483.50            | 60.28                      | 38.17                     | 7.45                  | 20.54                       | 50.07                        | 74.00              | 54.00 | PASS   |
|              | H                    | 2485.50            | 58.01                      | 38.17                     | 7.45                  | 20.54                       | 47.80                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2483.50            | 59.11                      | 38.20                     | 7.45                  | 20.54                       | 48.90                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2485.50            | 57.51                      | 38.20                     | 7.45                  | 20.54                       | 47.30                        | 74.00              | 54.00 | PASS   |
| PI/4<br>DPSK | Low Channel 2402MHz  |                    |                            |                           |                       |                             |                              |                    |       |        |
|              | H                    | 2390.00            | 57.24                      | 38.06                     | 7.42                  | 20.15                       | 46.75                        | 74.00              | 54.00 | PASS   |
|              | H                    | 2400.00            | 58.14                      | 38.06                     | 7.42                  | 20.15                       | 47.65                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2390.00            | 58.20                      | 38.06                     | 7.42                  | 20.15                       | 47.71                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2400.00            | 58.52                      | 38.06                     | 7.42                  | 20.15                       | 48.03                        | 74.00              | 54.00 | PASS   |
|              | High Channel 2480MHz |                    |                            |                           |                       |                             |                              |                    |       |        |
|              | H                    | 2483.50            | 58.97                      | 38.17                     | 7.45                  | 20.54                       | 48.76                        | 74.00              | 54.00 | PASS   |
|              | H                    | 2485.50            | 56.76                      | 38.17                     | 7.45                  | 20.54                       | 46.55                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2483.50            | 57.83                      | 38.20                     | 7.45                  | 20.54                       | 47.62                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2485.50            | 56.28                      | 38.20                     | 7.45                  | 20.54                       | 46.07                        | 74.00              | 54.00 | PASS   |
| 8DPSK        | Low Channel 2402MHz  |                    |                            |                           |                       |                             |                              |                    |       |        |
|              | H                    | 2390.00            | 56.82                      | 38.06                     | 7.42                  | 20.15                       | 46.33                        | 74.00              | 54.00 | PASS   |
|              | H                    | 2400.00            | 57.71                      | 38.06                     | 7.42                  | 20.15                       | 47.22                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2390.00            | 57.77                      | 38.06                     | 7.42                  | 20.15                       | 47.28                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2400.00            | 58.09                      | 38.06                     | 7.42                  | 20.15                       | 47.60                        | 74.00              | 54.00 | PASS   |
|              | High Channel 2480MHz |                    |                            |                           |                       |                             |                              |                    |       |        |
|              | H                    | 2483.50            | 58.53                      | 38.17                     | 7.45                  | 20.54                       | 48.32                        | 74.00              | 54.00 | PASS   |
|              | H                    | 2485.50            | 56.34                      | 38.17                     | 7.45                  | 20.54                       | 46.13                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2483.50            | 57.40                      | 38.20                     | 7.45                  | 20.54                       | 47.19                        | 74.00              | 54.00 | PASS   |
|              | V                    | 2485.50            | 55.86                      | 38.20                     | 7.45                  | 20.54                       | 45.65                        | 74.00              | 54.00 | PASS   |

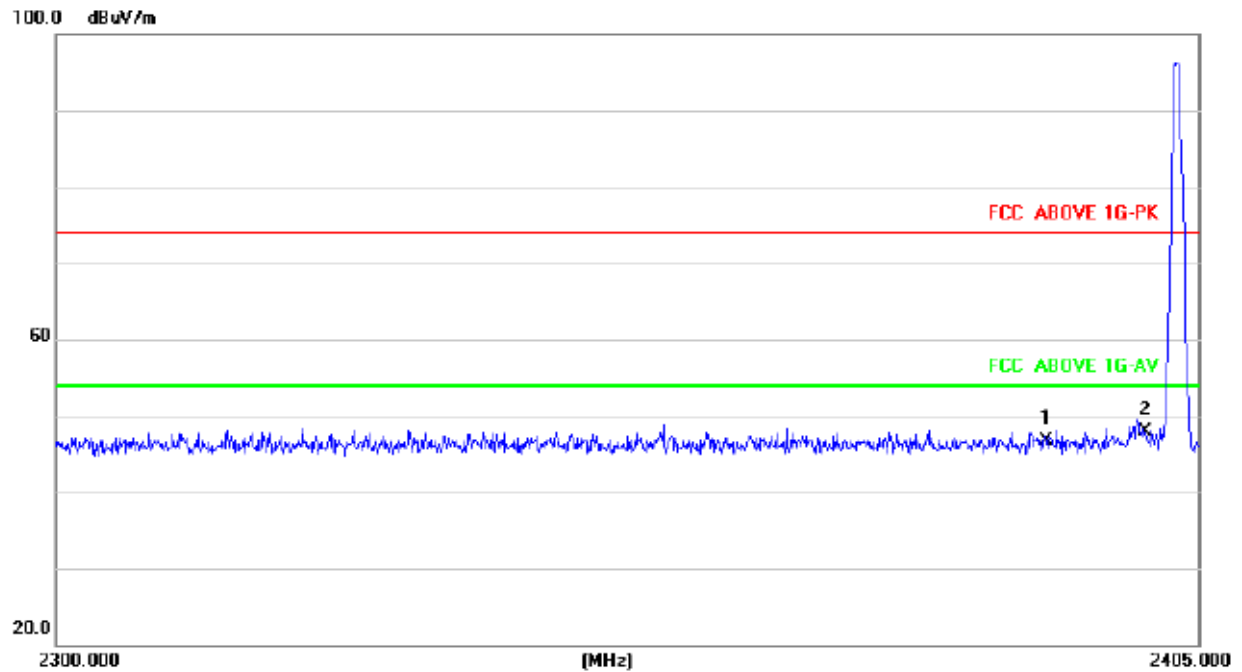
### Remark:

- Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit
- If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

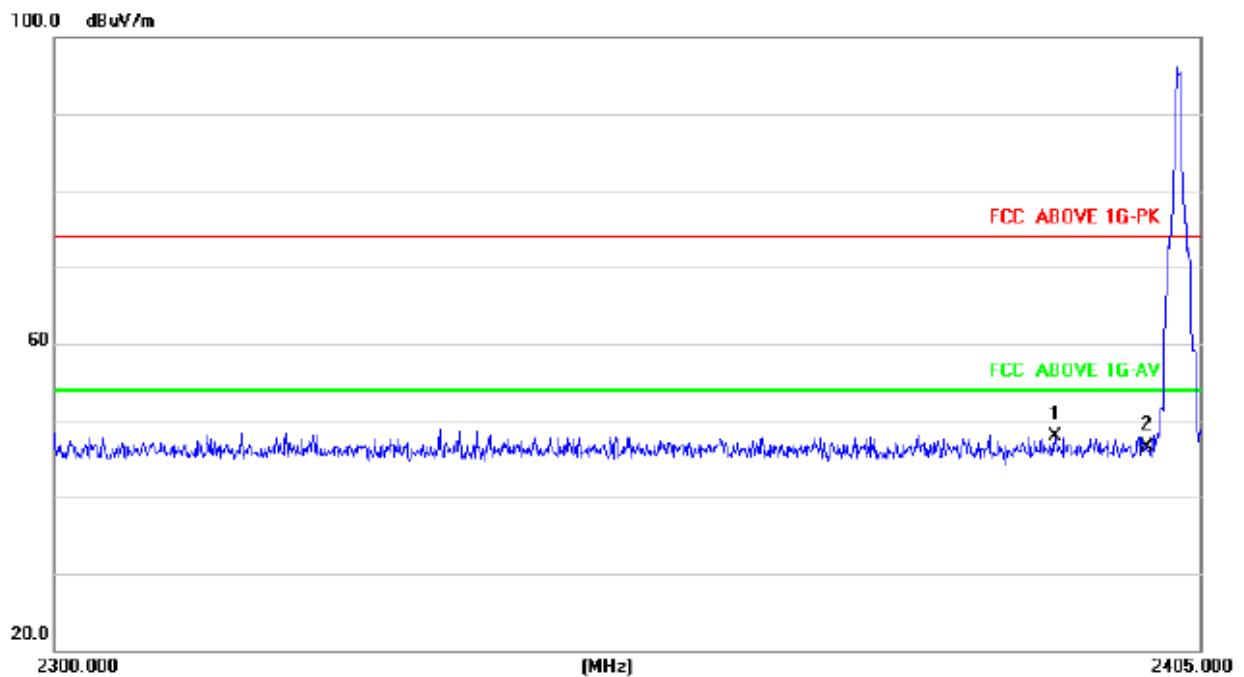


GFSK

2402MHz Horizontal

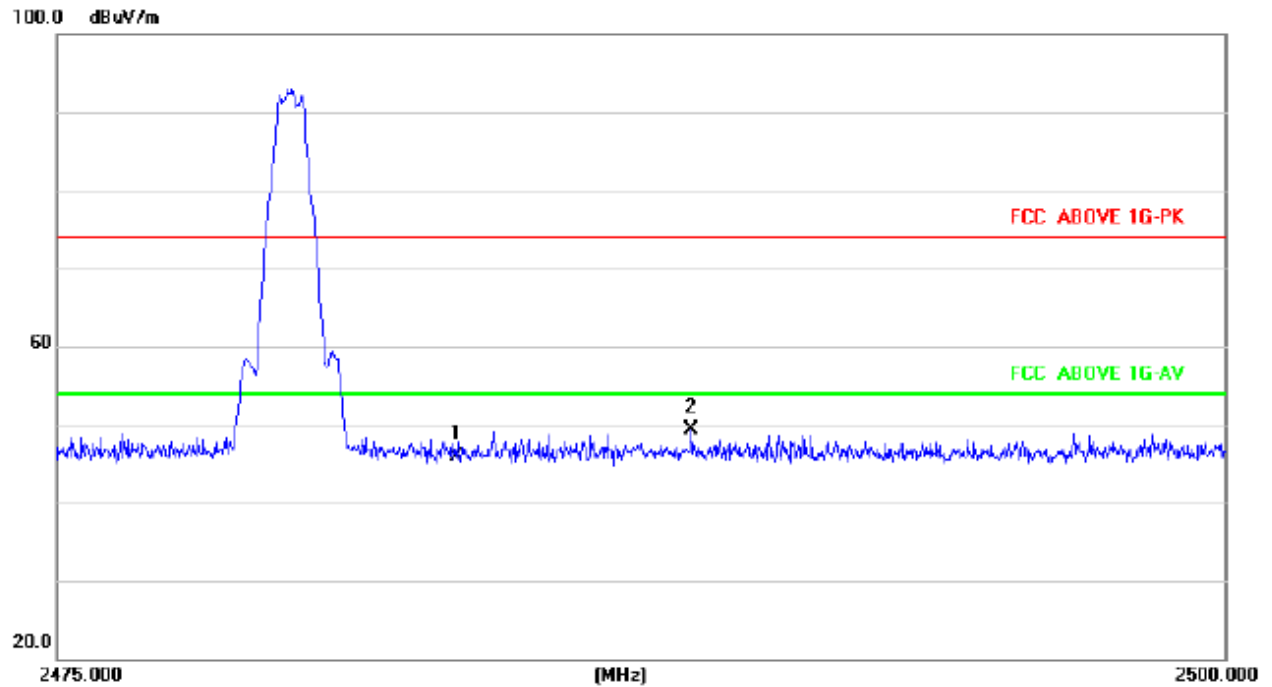


2402MHz Vertical

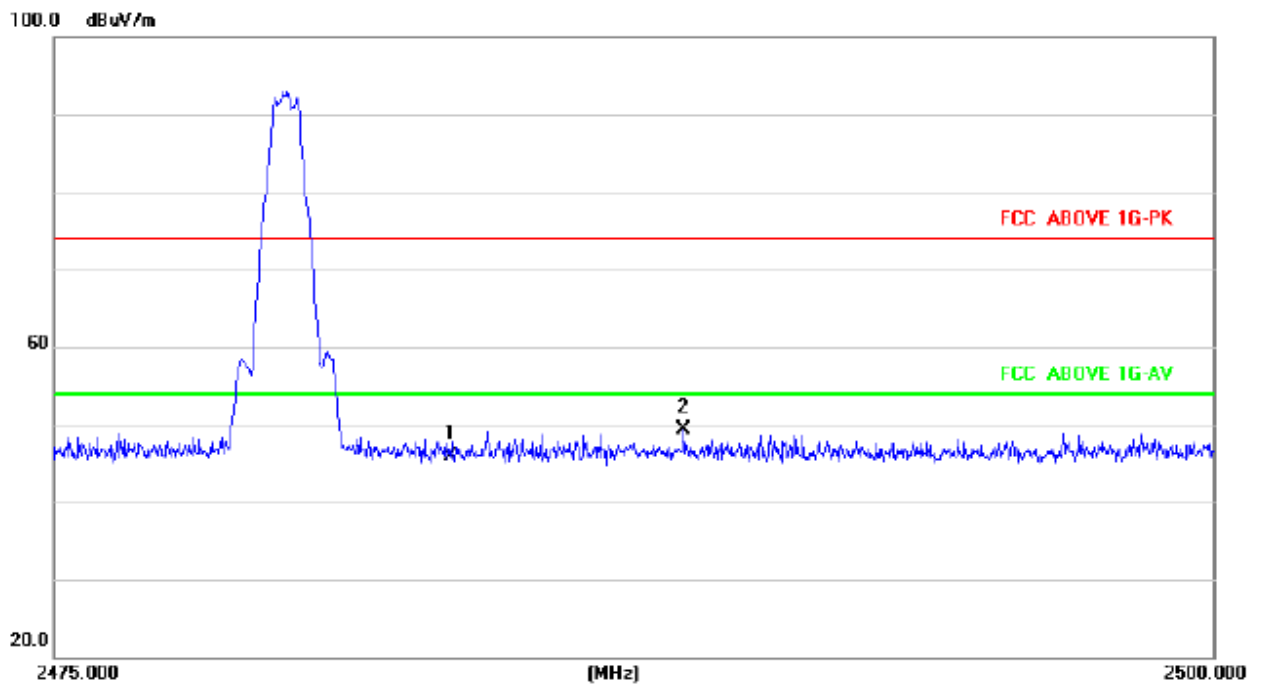




2480MHz Horizontal



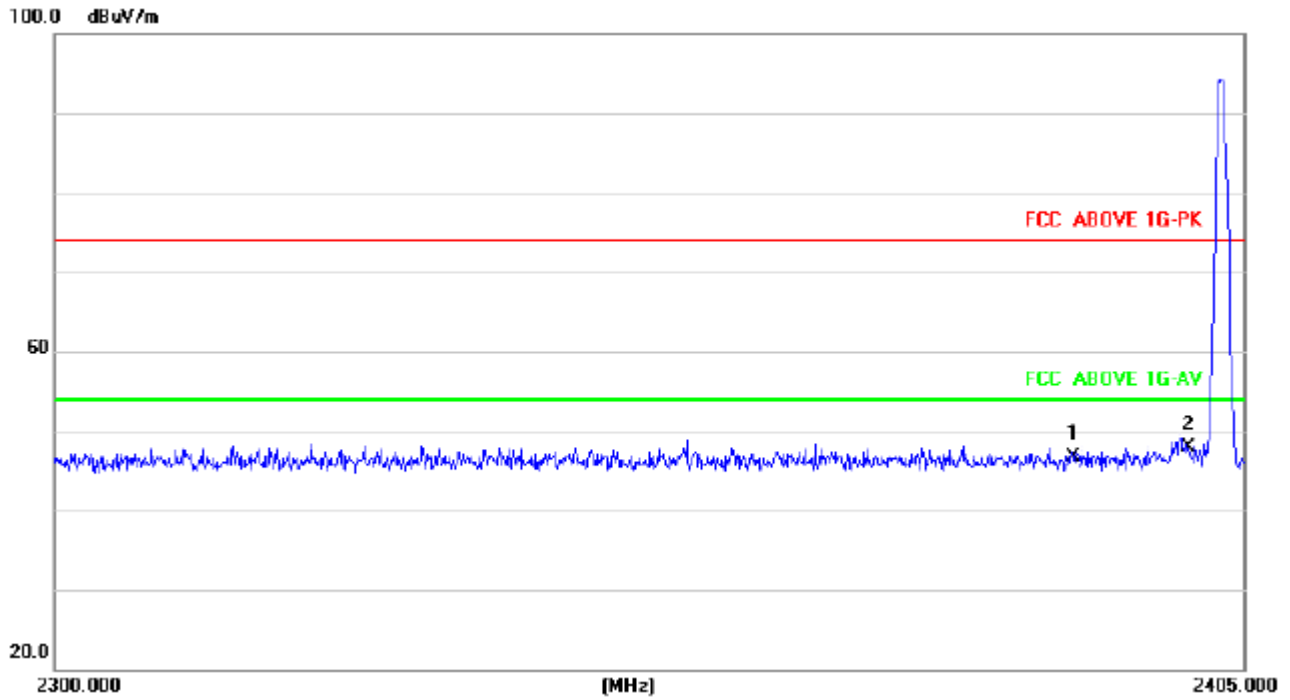
2480MHz Vertical



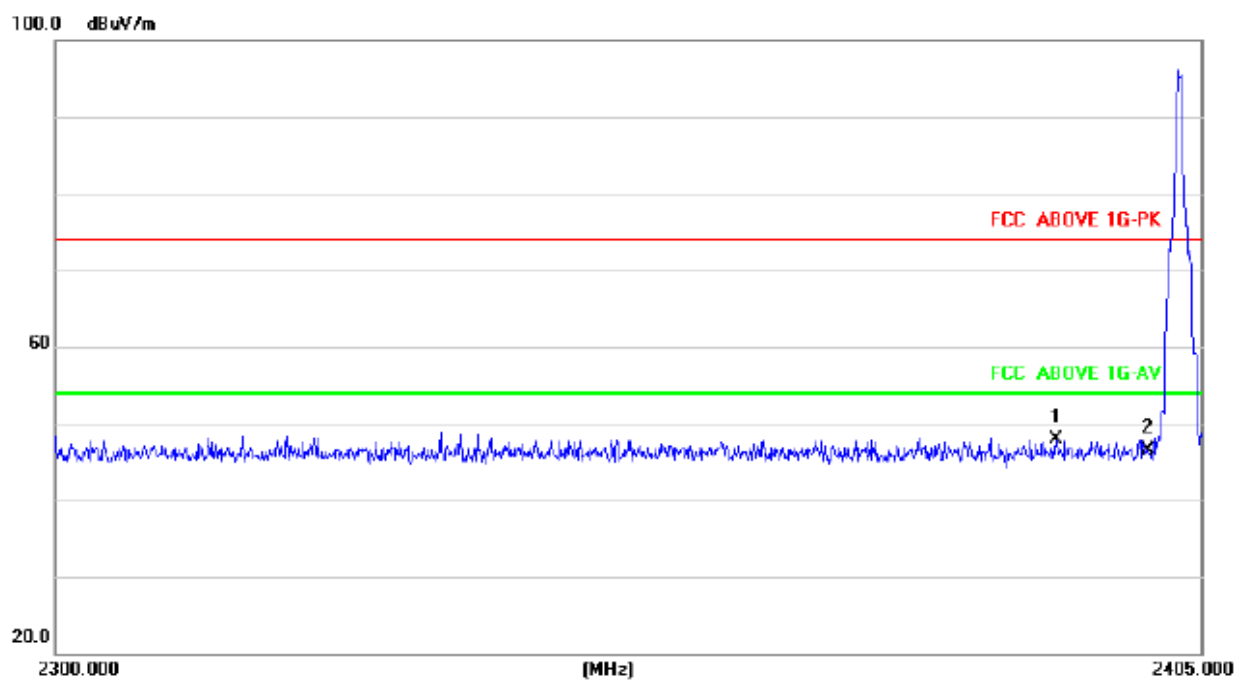


PI/4 DPSK

2402MHz Horizontal

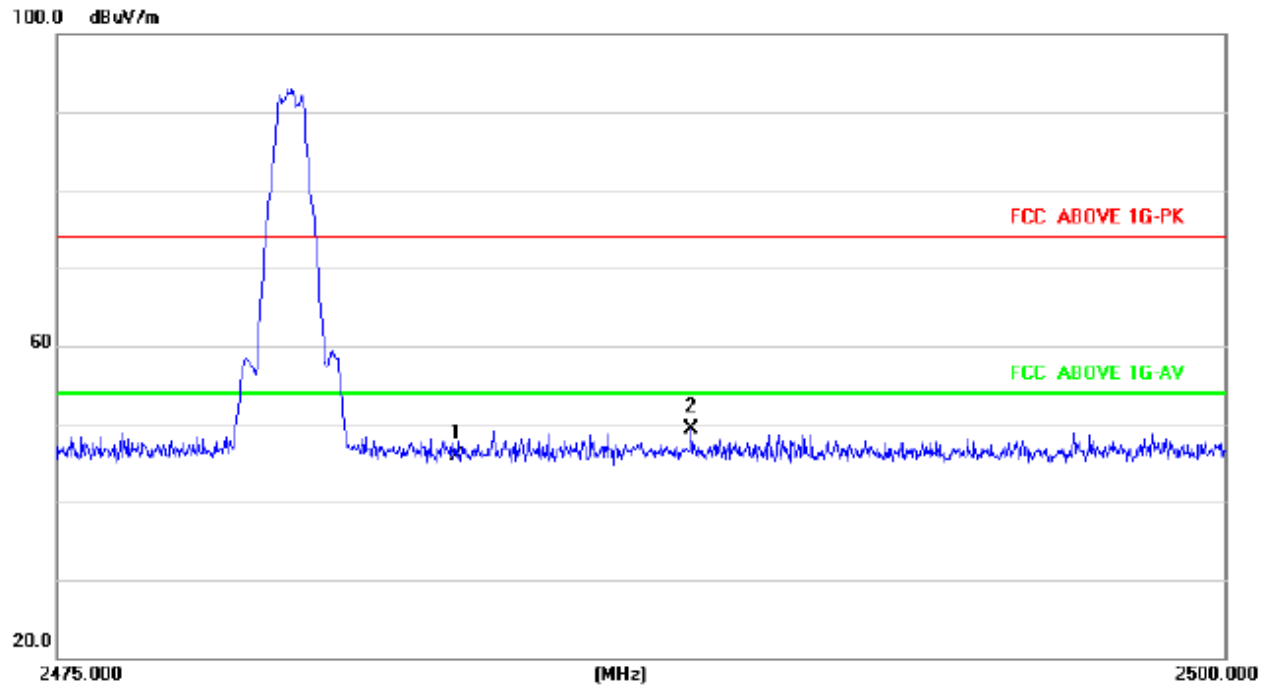


2402MHz Vertical

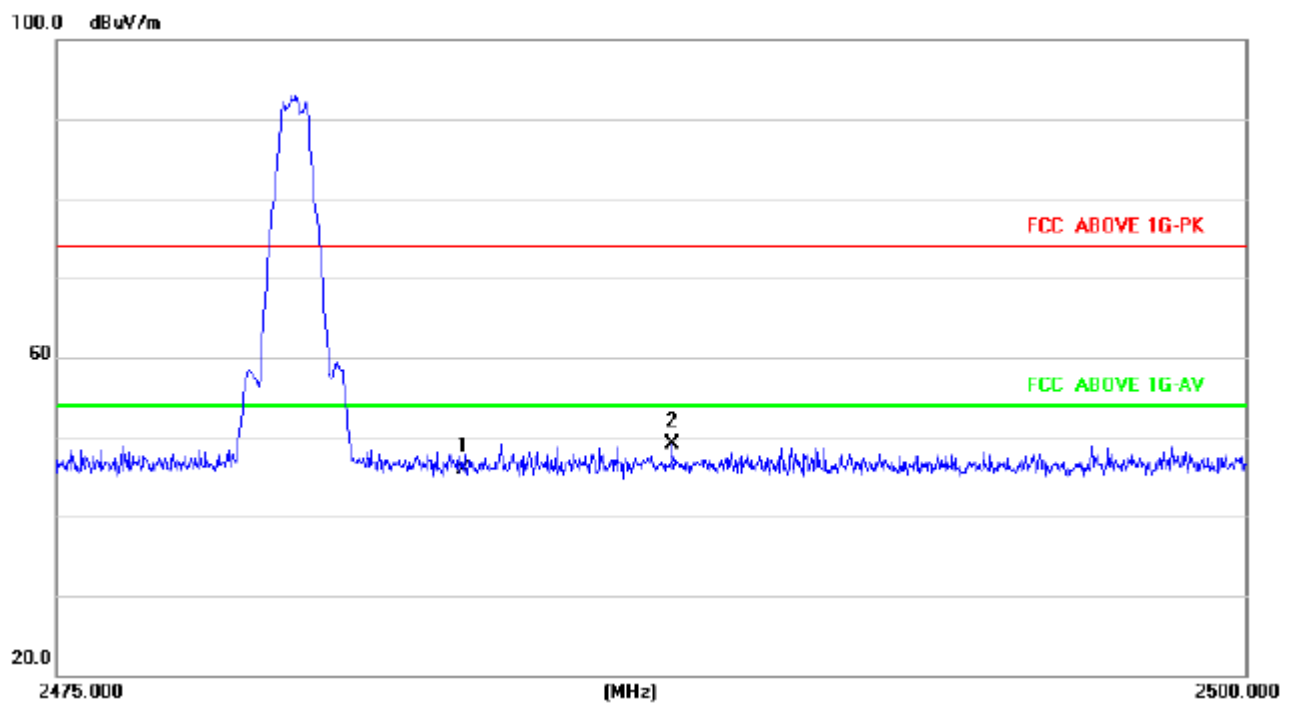




2480MHz Horizontal



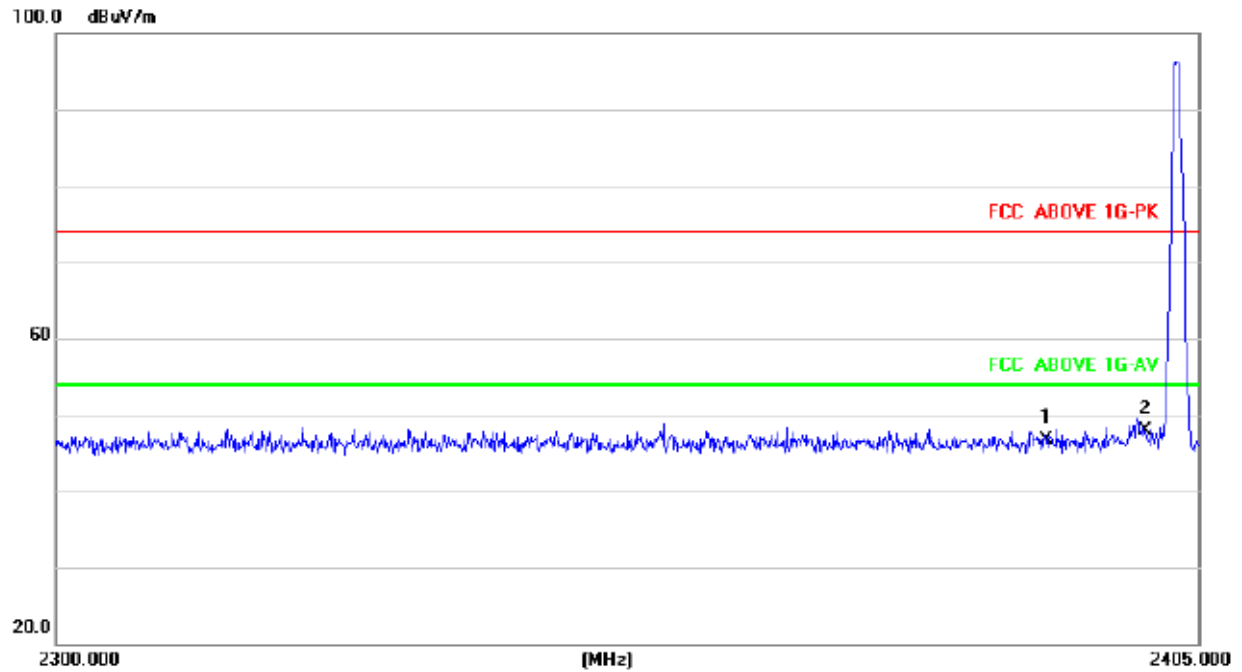
2480MHz Vertical



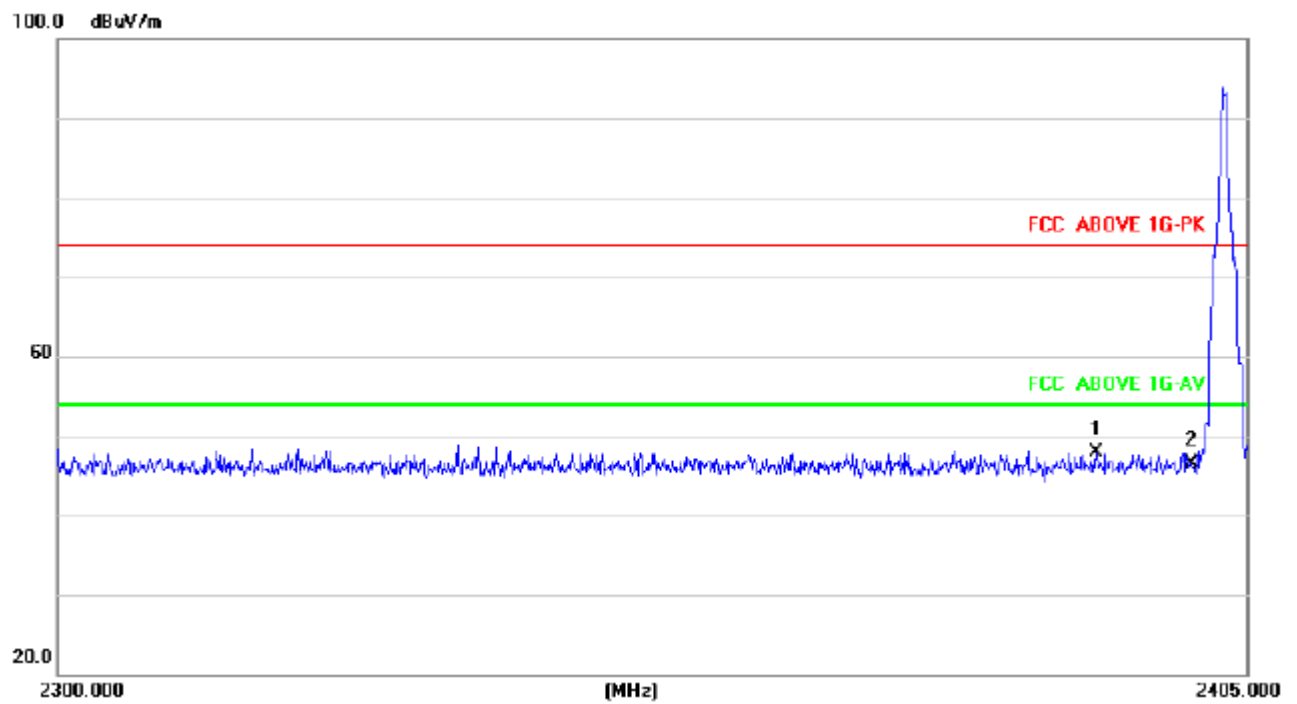


8DPSK

2402MHz Horizontal

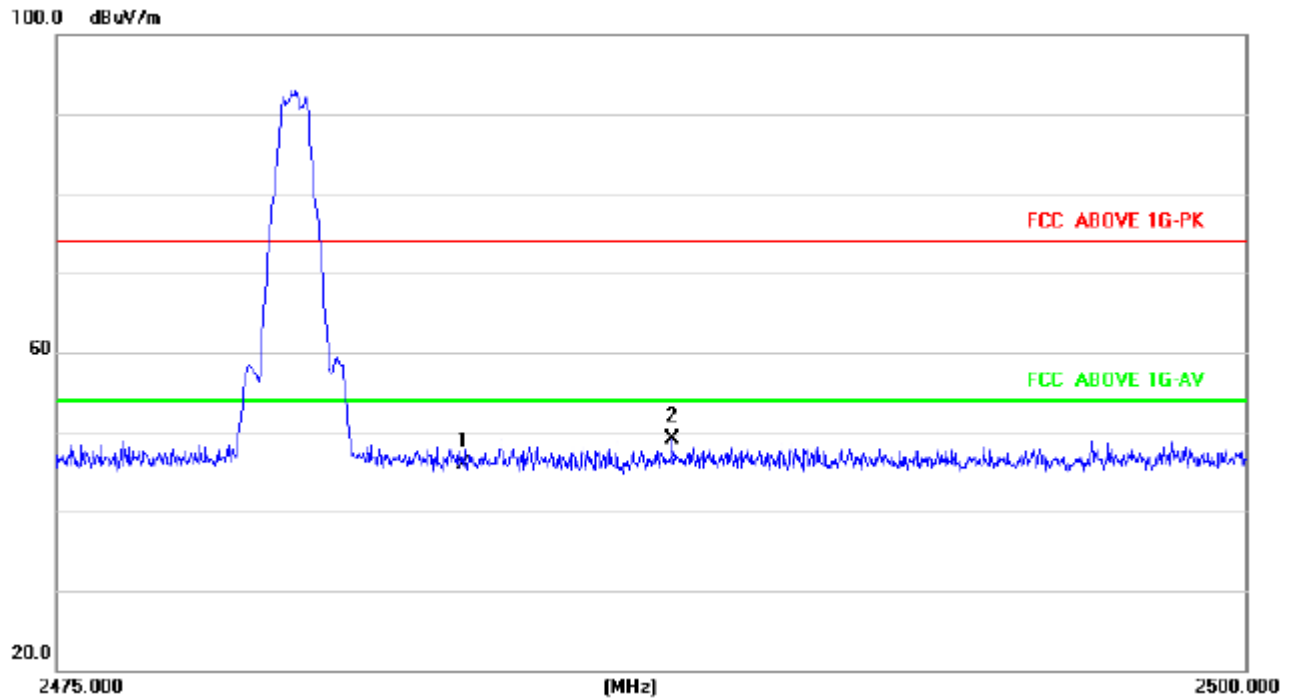


2402MHz Vertical

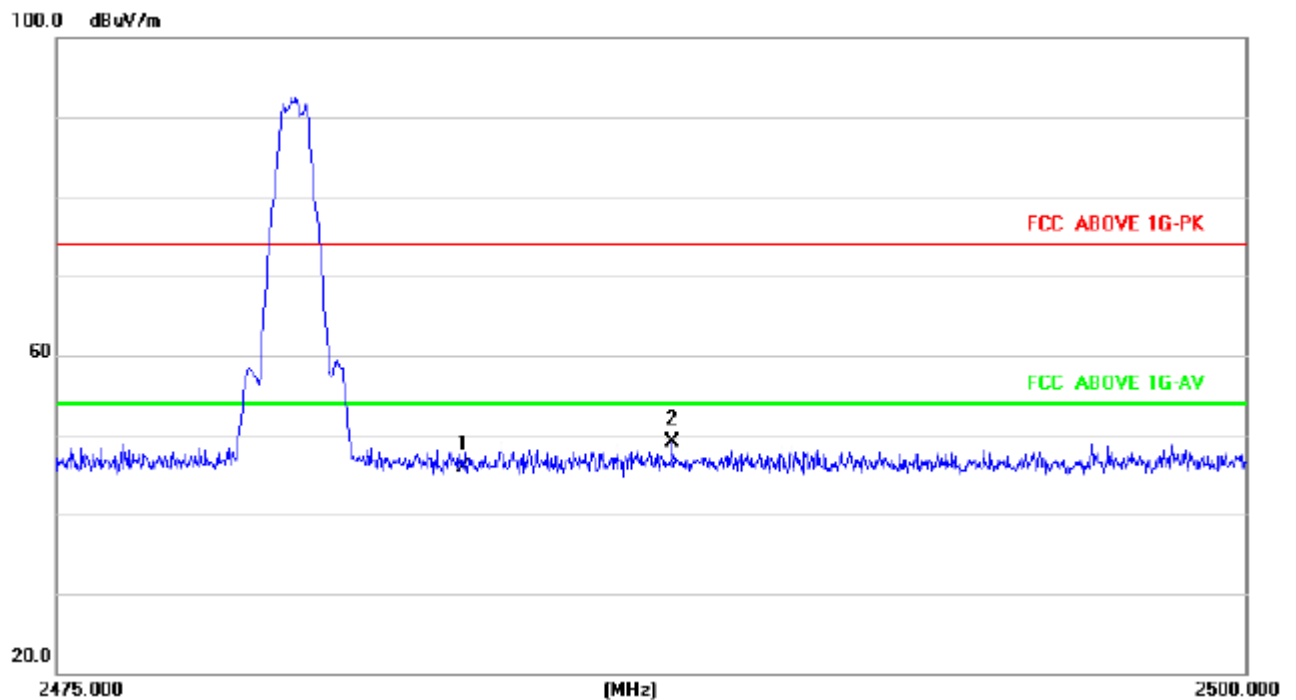




2480MHz Horizontal



2480MHz Vertical





## **6. ANTENNA REQUIREMENT**

### **6.1 STANDARD REQUIREMENT**

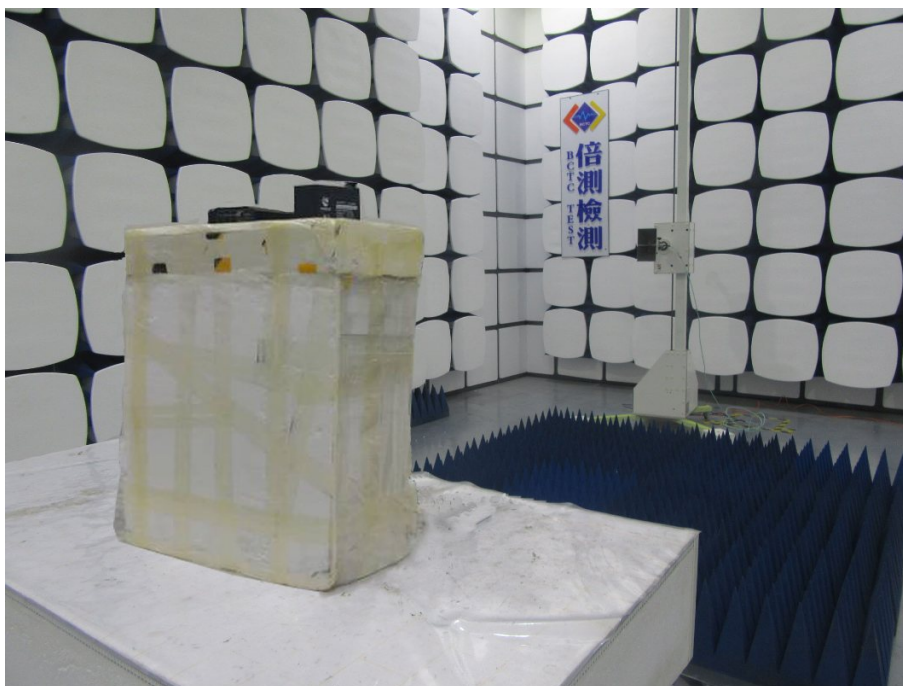
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### **6.2 EUT ANTENNA**

The EUT antenna is External antenna. It complies with the standard requirement.

## 7. EUT TEST PHOTO

### Radiated Measurement Photos



## 8. EUT PHOTO



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