

# FCC TEST REPORT

**REPORT NO.:** RF991126E02-1

**MODEL NO.:** AR5B225

**FCC ID:** PPD-AR5B225

**RECEIVED:** Nov. 25, 2010

**TESTED:** Dec. 16 to 29, 2010

**ISSUED:** Jan. 26, 2011

**APPLICANT:** Atheros Communications, Inc.

**ADDRESS:** 1700 Technology Drive, San Jose, CA 95110

**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)  
Ltd., Taoyuan Branch Hsin Chu Laboratory

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## RELEASE CONTROL RECORD

| ISSUE NO.        | REASON FOR CHANGE | DATE ISSUED   |
|------------------|-------------------|---------------|
| Original release | NA                | Jan. 26, 2011 |

## 1 CERTIFICATION

**PRODUCT :** 1X1 802.11b/g/n - BT Combo PCIe minicard  
**BRAND NAME :** Atheros  
**MODEL NO. :** AR5B225  
**APPLICANT :** Atheros Communications, Inc.  
**TESTED DATE :** Dec. 16 to 29, 2010  
**TEST SAMPLE :** R&D SAMPLE  
**STANDARDS :** FCC Part 15, Subpart C (Section 15.247),  
ANSI C63.4-2003  
ANSI C63.10-2009  
Canada RSS-210 Issue 8 (2010-12)  
Canada RSS-Gen Issue 3 (2010-12)

The above equipment (Model: AR5B225) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and was in compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY :** Carol Liao , **DATE:** Jan. 26, 2011  
( Carol Liao, Specialist )

**APPROVED BY :** May Chen , **DATE:** Jan. 26, 2011  
(May Chen, Deputy Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

### APPLIED STANDARD: FCC Part 15, Subpart C, Canada RSS-210/ RSS-GEN

| Standard Section |         |                      | Test Type and Limit                                                                                       | Result | REMARK                                                                          |
|------------------|---------|----------------------|-----------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------------------|
| RSS-210          | RSS-Gen | FCC Part 15          |                                                                                                           |        |                                                                                 |
| -                | 7.2.4   | 15.207               | AC Power Conducted Emission                                                                               | PASS   | Meet the requirement of limit<br>Minimum passing margin is -14.83dB at 0.263MHz |
| A8.1(d)          | -       | 15.247(a)(1)(I)-(ii) | Number of Hopping Frequency Used Spec.:<br>At least 15 channels                                           | PASS   | Meet the requirement of limit                                                   |
| A8.1(d)          | -       | 15.247(a)(1)(ii)     | Dwell Time on Each Channel<br>Spec. : Max. 0.4 second within 30 second                                    | PASS   | Meet the requirement of limit                                                   |
| A8.1(b)          | -       | 15.247(a)(1)(I)-(ii) | Hopping Channel Separation<br>Spec. : Min. 25 kHz or two-thirds of 20 dB bandwidth, which ever is greater | PASS   | Meet the requirement of limit                                                   |
| -                | 4.6     | 15.247(a)(2)         | Spectrum Bandwidth of a Frequency Hopping Spread Spectrum System                                          | PASS   | Meet the requirement of limit                                                   |
| A8.4(2)          | -       | 15.247(b)            | Maximum Peak Output Power<br>Spec.: max. 125mW                                                            | PASS   | Meet the requirement of limit                                                   |
| A8.5             | 4.9     | 15.247(c)            | Transmitter Radiated Emissions<br>FCC Limit: Table 15.209<br>RSS-Gen Limit: Table 5, 6                    | PASS   | Meet the requirement of limit<br>Minimum passing margin is -1.0dB at 199.23MHz  |
| -                | 6.1     | -                    | Receiver Radiated Emissions<br>RSS-Gen Limit: Table 2                                                     | PASS   | Meet the requirement of limit<br>Minimum passing margin is -1.0dB at 199.23MHz  |
| A8.5             | -       | 15.247(c)            | Conducted Out-Band Emission Measurement                                                                   | PASS   | Meet the requirement of limit                                                   |
|                  | 7.1.4   | 15.203               | Antenna Requirement                                                                                       | PASS   | Antenna connectors are IPEX, U.FL and SMA<br>Reverse not a standard connector.  |

## 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

| Measurement                       | Value   |
|-----------------------------------|---------|
| Conducted emissions               | 2.45 dB |
| Radiated emissions (30MHz-1GHz)   | 3.76 dB |
| Radiated emissions (1GHz -18GHz)  | 2.19 dB |
| Radiated emissions (18GHz -40GHz) | 2.55 dB |



### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                       |                                                                                          |
|-----------------------|------------------------------------------------------------------------------------------|
| PRODUCT               | 1X1 802.11b/g/n - BT Combo PCIe minicard                                                 |
| MODEL NO.             | AR5B225                                                                                  |
| FCC ID                | PPD-AR5B225                                                                              |
| IC ID                 | 4104A-AR5B225                                                                            |
| POWER SUPPLY          | DC 3.3V from host equipment                                                              |
| MODULATION TYPE       | GFSK, $\pi/4$ -DQPSK, 8DPSK                                                              |
| MODULATION TECHNOLOGY | FHSS                                                                                     |
| TRANSFER RATE         | 3/2/1 Mbits/s                                                                            |
| OPRTAING FREQUENCY    | 2402MHz ~ 2480MHz                                                                        |
| NUMBER OF CHANNEL     | For Bluetooth 2.1+ EDR: 79<br>For Bluetooth 4.0: 40 (37 hopping + 3 advertising channel) |
| MAXIMUM OUTPUT POWER  | GFSK: 9.8 mW<br>8DPSK: 12.4 mW<br>$\pi/4$ – DQPSK: 12.0 mW                               |
| ANTENNA TYPE          | See item 3.2                                                                             |
| ANTENNA CONNECTOR     | See item 3.2                                                                             |
| DATA CABLE            | NA                                                                                       |
| I/O PORTS             | NA                                                                                       |
| ASSOCIATED DEVICES    | NA                                                                                       |

#### NOTE:

1. There are Bluetooth technology and WLAN technology used for the EUT. <the WLAN test data please refer "RF991126E02">
2. The Bluetooth version 4.0 supports traditional GFSK and additional GFSK modulation.

3. For radiated : The EUT's antenna was pre-tested under the following modes:

| Test Mode | Description |
|-----------|-------------|
| Mode A    | X-Y axis    |
| Mode B    | Y-Z axis    |
| Mode C    | X-Z axis    |

From the above modes, the worst case was found in **Mode A**. Therefore only the test data of the mode was recorded in this report.

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

### 3.2 DESCRIPTION OF ANTENNA

There are five sets of antennas provided to this EUT, please refer to the following table:

| No. | Brand            | Model           | Gain(dBi)<br>(included cable loss) | Antenna<br>Type | Connector      | Cable<br>Loss(dB) | Cable<br>Length |
|-----|------------------|-----------------|------------------------------------|-----------------|----------------|-------------------|-----------------|
| 1   | WNC              | 81-EBJ15.005    | 3.62                               | PIFA            | IPEX           | 1.15              | 300mm           |
| 2   | INPAQ            | DAMA1BM30000402 | 3.2                                | Dipole          | SMA<br>Reverse | 0.5               | N.A.            |
| 3   | Tyco             | TBN009          | 2.06                               | PIFA            | U.FL           | 0.96              | 300mm           |
| 4   | Tyco             | TBN010          | 2.64                               | PIFA            | U.FL           | 0.95              | 300mm           |
| 5   | Hitachi<br>Cable | HBV17           | 1.97                               | PIFA            | IPEX           | 0.99              | 306mm           |

Note: 1. Main – Wireless / Aux. – BT

2. Antenna (model: 81-EBJ15.005 and DAMA1BM30000402) were chosen for final test.

### 3.3 DESCRIPTION OF TEST MODES

#### For Bluetooth 2.1+ EDR: 79

Seventy-nine channels are provided to this EUT.

| Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 0       | 2402        | 20      | 2422        | 40      | 2442        | 60      | 2462        |
| 1       | 2403        | 21      | 2423        | 41      | 2443        | 61      | 2463        |
| 2       | 2404        | 22      | 2424        | 42      | 2444        | 62      | 2464        |
| 3       | 2405        | 23      | 2425        | 43      | 2445        | 63      | 2465        |
| 4       | 2406        | 24      | 2426        | 44      | 2446        | 64      | 2466        |
| 5       | 2407        | 25      | 2427        | 45      | 2447        | 65      | 2467        |
| 6       | 2408        | 26      | 2428        | 46      | 2448        | 66      | 2468        |
| 7       | 2409        | 27      | 2429        | 47      | 2449        | 67      | 2469        |
| 8       | 2410        | 28      | 2430        | 48      | 2450        | 68      | 2470        |
| 9       | 2411        | 29      | 2431        | 49      | 2451        | 69      | 2471        |
| 10      | 2412        | 30      | 2432        | 50      | 2452        | 70      | 2472        |
| 11      | 2413        | 31      | 2433        | 51      | 2453        | 71      | 2473        |
| 12      | 2414        | 32      | 2434        | 52      | 2454        | 72      | 2474        |
| 13      | 2415        | 33      | 2435        | 53      | 2455        | 73      | 2475        |
| 14      | 2416        | 34      | 2436        | 54      | 2456        | 74      | 2476        |
| 15      | 2417        | 35      | 2437        | 55      | 2457        | 75      | 2477        |
| 16      | 2418        | 36      | 2438        | 56      | 2458        | 76      | 2478        |
| 17      | 2419        | 37      | 2439        | 57      | 2459        | 77      | 2479        |
| 18      | 2420        | 38      | 2440        | 58      | 2460        | 78      | 2480        |
| 19      | 2421        | 39      | 2441        | 59      | 2461        |         |             |

#### For Bluetooth 4.0: 40 (37 hopping + 3 advertising channel)

Forty channels are provided to this EUT.

| Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 0       | 2402        | 10      | 2422        | 20      | 2442        | 30      | 2462        |
| 1       | 2404        | 11      | 2424        | 21      | 2444        | 31      | 2464        |
| 2       | 2406        | 12      | 2426        | 22      | 2446        | 32      | 2466        |
| 3       | 2408        | 13      | 2428        | 23      | 2448        | 33      | 2468        |
| 4       | 2410        | 14      | 2430        | 24      | 2450        | 34      | 2470        |
| 5       | 2412        | 15      | 2432        | 25      | 2452        | 35      | 2472        |
| 6       | 2414        | 16      | 2434        | 26      | 2454        | 36      | 2474        |
| 7       | 2416        | 17      | 2436        | 27      | 2456        | 37      | 2476        |
| 8       | 2418        | 18      | 2438        | 28      | 2458        | 38      | 2478        |
| 9       | 2420        | 19      | 2440        | 29      | 2460        | 39      | 2480        |

### 3.4 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

The device has several types and different accessory, therefore the worst case base on investigation by different combination for each test item and its data was recorded in this report.

| EUT CONFIGURE<br>MODE | APPLICABLE TO |         |         |      | DESCRIPTION                                 |
|-----------------------|---------------|---------|---------|------|---------------------------------------------|
|                       | PLC           | RE < 1G | RE ≥ 1G | APCM |                                             |
| A                     | √             | √       | √       | √    | With PIFA antenna (Bluetooth traditional)   |
| B                     |               | √       | √       | √    | With PIFA antenna (Bluetooth Additional)    |
| C                     |               | √       | √       |      | With Dipole antenna (Bluetooth traditional) |
| D                     |               | √       | √       |      | With Dipole antenna (Bluetooth Additional)  |

Where **PLC**: Power Line Conducted Emission

**RE < 1G**: Radiated Emission below 1GHz

**RE ≥ 1G**: Radiated Emission above 1GHz

**APCM**: Antenna Port Conducted Measurement

#### Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| Available Channel | Tested Channel | Modulation Technology | Modulation Type | Packet Type |
|-------------------|----------------|-----------------------|-----------------|-------------|
| Worst Channel     | -              | -                     | -               | -           |

#### Radiated Emission Test (Below 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Radiated Emission Test Blow 1GHz: The receiving mode has shown equal or better performance than Tx mode during the pre-scan and hence the Tx mode data is re-used for.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| Available Channel | Tested Channel | Modulation Technology | Modulation Type | Packet Type | EUT CONFIGURE MODE |
|-------------------|----------------|-----------------------|-----------------|-------------|--------------------|
| 0 to 78           | 39             | FHSS                  | 8DPSK           | DH5         | A, C               |
| 0 to 39           | 19             | FHSS                  | Additional GFSK | -           | B, D               |

#### **Radiated Emission Test (Above 1 GHz):**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| Available Channel | Tested Channel | Modulation Technology | Modulation Type | Packet Type | EUT CONFIGURE MODE |
|-------------------|----------------|-----------------------|-----------------|-------------|--------------------|
| 0 to 78           | 0, 39, 78      | FHSS                  | GFSK            | DH5         | A, C               |
| 0 to 78           | 0, 39, 78      | FHSS                  | 8DPSK           | DH5         | A, C               |
| 0 to 39           | 0, 19, 39      | FHSS                  | Additional GFSK | -           | B, D               |
| Receiver          | 0, 39, 78      | FHSS                  | -               | -           | -                  |
| Receiver          | 0, 19, 39      | FHSS                  |                 |             |                    |

#### **Conducted Out-Band Measurement:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| Available Channel | Tested Channel | Modulation Technology | Modulation Type | Packet Type | EUT CONFIGURE MODE |
|-------------------|----------------|-----------------------|-----------------|-------------|--------------------|
| 0 to 78           | 0, 78          | FHSS                  | GFSK            | DH5         | A                  |
| 0 to 78           | 0, 78          | FHSS                  | 8DPSK           | DH5         | A                  |
| 0 to 78           | 0, 78          | FHSS                  | $\pi/4$ -DQPSK  | DH5         | A                  |
| 0 to 39           | 0, 39          | FHSS                  | Additional GFSK | -           | B                  |

#### **Antenna Port Conducted Measurement:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

| Available Channel | Tested Channel | Modulation Technology | Modulation Type | Packet Type | EUT CONFIGURE MODE |
|-------------------|----------------|-----------------------|-----------------|-------------|--------------------|
| 0 to 78           | 0, 39, 78      | FHSS                  | GFSK            | DH5         | A                  |
| 0 to 78           | 0, 39, 78      | FHSS                  | 8DPSK           | DH5         | A                  |
| 0 to 78           | 0, 39, 78      | FHSS                  | $\pi/4$ -DQPSK  | DH5         | A                  |
| 0 to 39           | 0, 19, 39      | FHSS                  | Additional GFSK | -           | B                  |

**TEST CONDITION:**

| APPLICABLE TO      | ENVIRONMENTAL CONDITIONS                                 | INPUT POWER (SYSTEM) | TESTED BY              |
|--------------------|----------------------------------------------------------|----------------------|------------------------|
| RE <sup>3</sup> 1G | 23deg. C, 64%RH, 1011 hPa /<br>20deg. C, 62%RH, 1011 hPa | 120Vac, 60Hz         | Eric Lee /<br>Kent Liu |
| RE<1G              | 20deg. C, 70%RH, 1011 hPa /<br>20deg. C, 70%RH, 1011 hPa | 120Vac, 60Hz         | Eric Lee /<br>Kent Liu |
| PLC                | 19deg. C, 57%RH, 1011 hPa                                | 120Vac, 60Hz         | Wen Yu                 |
| APCM               | 25deg. C, 60%RH, 1011 hPa                                | 120Vac, 60Hz         | Eric Lee               |

### **3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C. (15.247)**

**ANSI C63.4-2003**

**ANSI C63.10-2009**

**Canada RSS-210 Issue 8 (2010-12)**

**Canada RSS-Gen Issue 3 (2010-12)**

All test items have been performed and recorded as per the above standards.

### 3.6 DESCRIPTION OF SUPPORT UNITS

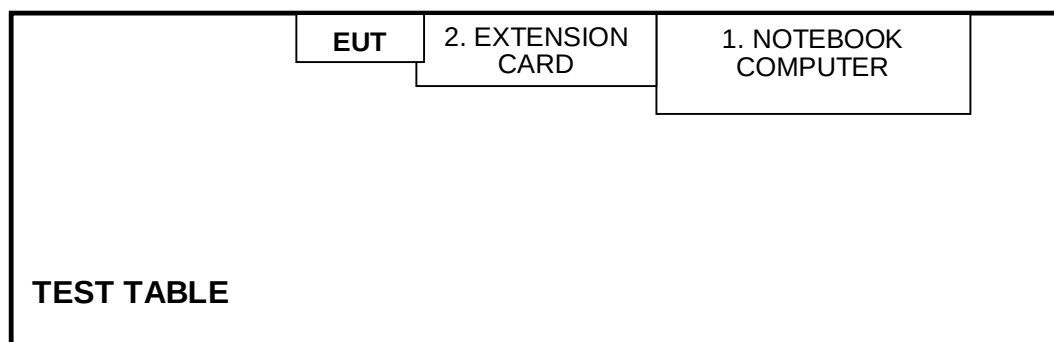
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| NO. | PRODUCT           | BRAND   | MODEL NO. | SERIAL NO. | FCC ID |
|-----|-------------------|---------|-----------|------------|--------|
| 1   | NOTEBOOK COMPUTER | Lenovo  | 3000 N200 | NA         | NA     |
| 2   | EXTENSION CARD    | Atheros | NA        | NA         | NA     |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|-----------------------------------------------------|
| 1   | NA                                                  |
| 2   | NA                                                  |

**NOTE:** All power cords of the above support units are non shielded (1.8m).

### 3.7 CONFIGURATION OF SYSTEM UNDER TEST





## 4 TEST PROCEDURES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dB $\mu$ V) |          |
|-----------------------------|------------------------------|----------|
|                             | Quasi-peak                   | Average  |
| 0.15-0.5                    | 66 to 56                     | 56 to 46 |
| 0.5-5                       | 56                           | 46       |
| 5-30                        | 60                           | 50       |

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER                            | MODEL NO.             | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|-------------------------------------------------------|-----------------------|------------|-----------------|------------------|
| ROHDE & SCHWARZ Test Receiver                         | ESCS 30               | 100287     | Mar. 01, 2010   | Feb. 28, 2011    |
| Line-Impedance Stabilization Network (for EUT)        | NSLK 8127             | 8127-523   | Sep. 17, 2010   | Sep. 16, 2011    |
| Line-Impedance Stabilization Network (for Peripheral) | ENV-216               | 100072     | June 11, 2010   | June 10, 2011    |
| RF Cable (JYEBAO)                                     | 5DFB                  | CONCAB-003 | Aug. 06, 2010   | Aug. 05, 2011    |
| 50 ohms Terminator                                    | 50                    | 3          | Nov. 03, 2010   | Nov. 02, 2011    |
| Software                                              | BV<br>ADT_Cond_V7.3.7 | NA         | NA              | NA               |

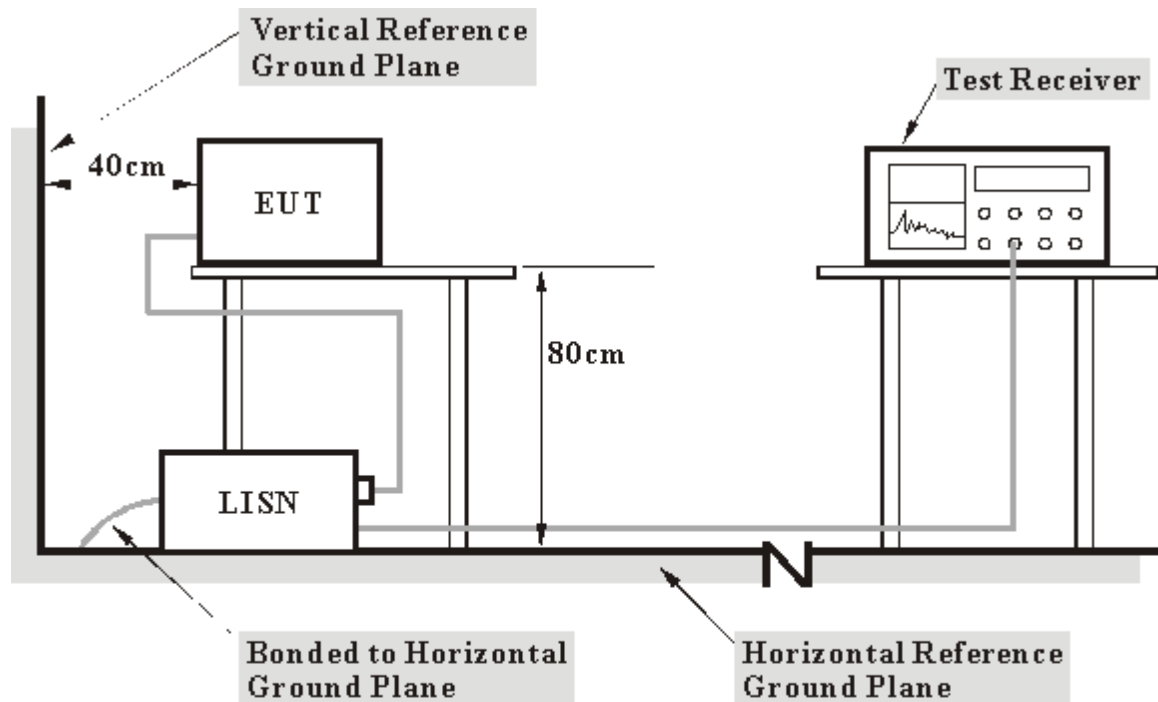
**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
- 3 The VCCI Con A Registration No. is C-817.

#### 4.1.3 TEST PROCEDURES

- The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT/HOST were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

#### 4.1.4 TEST SETUP



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

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.1.5 EUT OPERATING CONDITIONS

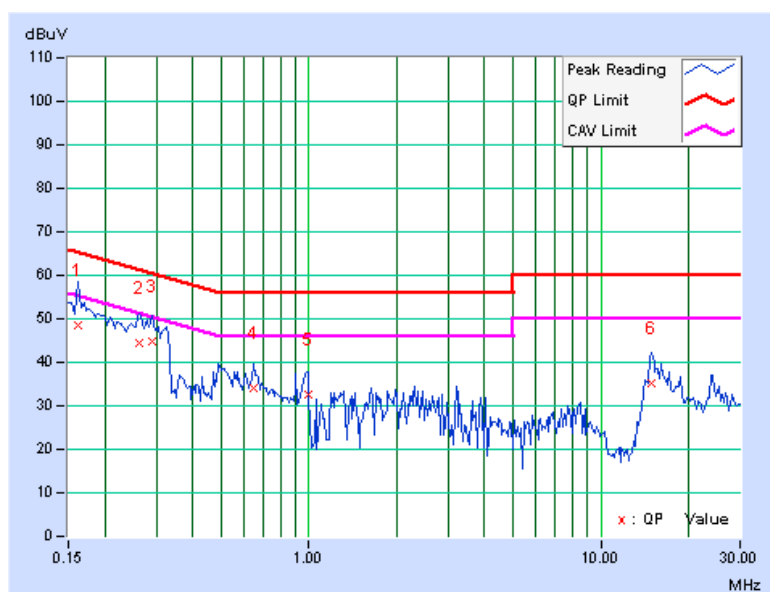
1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “BtUSB Tool V1.0 B18” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

#### 4.1.6 TEST RESULTS

|       |          |               |       |
|-------|----------|---------------|-------|
| PHASE | Line (L) | 6dB BANDWIDTH | 9 kHz |
|-------|----------|---------------|-------|

| No | Freq.  | Corr.  | Reading Value |     | Emission Level |     | Limit     |       | Margin |     |
|----|--------|--------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
|    | [MHz]  | Factor | [dB (uV)]     |     | [dB (uV)]      |     | [dB (uV)] |       | (dB)   |     |
|    |        | (dB)   | Q.P.          | AV. | Q.P.           | AV. | Q.P.      | AV.   | Q.P.   | AV. |
| 1  | 0.162  | 0.36   | 48.19         | -   | 48.55          | -   | 65.38     | 55.38 | -16.82 | -   |
| 2  | 0.263  | 0.36   | 43.99         | -   | 44.35          | -   | 61.33     | 51.33 | -16.98 | -   |
| 3  | 0.291  | 0.36   | 44.55         | -   | 44.91          | -   | 60.51     | 50.51 | -15.60 | -   |
| 4  | 0.646  | 0.38   | 33.73         | -   | 34.11          | -   | 56.00     | 46.00 | -21.89 | -   |
| 5  | 0.990  | 0.41   | 32.33         | -   | 32.74          | -   | 56.00     | 46.00 | -23.26 | -   |
| 6  | 14.910 | 0.99   | 34.28         | -   | 35.27          | -   | 60.00     | 50.00 | -24.73 | -   |

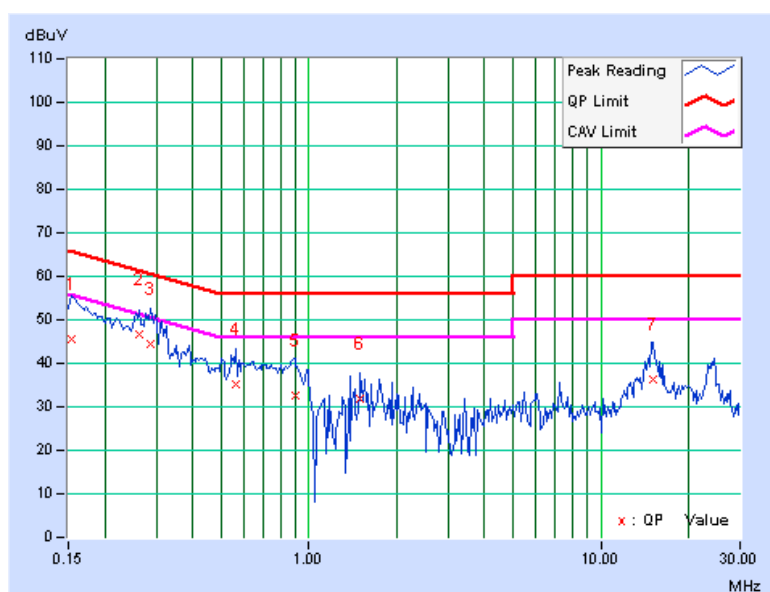
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.  
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.  
3. The emission levels of other frequencies were very low against the limit.  
4. Margin value = Emission level - Limit value  
5. Correction factor = Insertion loss + Cable loss  
6. Emission Level = Correction Factor + Reading Value.



|       |             |               |       |
|-------|-------------|---------------|-------|
| PHASE | Neutral (N) | 6dB BANDWIDTH | 9 kHz |
|-------|-------------|---------------|-------|

| No | Freq.  | Corr.  | Reading Value |     | Emission Level |     | Limit     |       | Margin |     |
|----|--------|--------|---------------|-----|----------------|-----|-----------|-------|--------|-----|
|    | [MHz]  | Factor | [dB (uV)]     |     | [dB (uV)]      |     | [dB (uV)] |       | (dB)   |     |
|    |        | (dB)   | Q.P.          | AV. | Q.P.           | AV. | Q.P.      | AV.   | Q.P.   | AV. |
| 1  | 0.154  | 0.10   | 45.63         | -   | 45.73          | -   | 65.79     | 55.79 | -20.06 | -   |
| 2  | 0.263  | 0.10   | 46.39         | -   | 46.49          | -   | 61.33     | 51.33 | -14.83 | -   |
| 3  | 0.287  | 0.10   | 44.19         | -   | 44.29          | -   | 60.62     | 50.62 | -16.32 | -   |
| 4  | 0.560  | 0.12   | 35.12         | -   | 35.24          | -   | 56.00     | 46.00 | -20.76 | -   |
| 5  | 0.896  | 0.15   | 32.36         | -   | 32.51          | -   | 56.00     | 46.00 | -23.49 | -   |
| 6  | 1.504  | 0.18   | 31.72         | -   | 31.90          | -   | 56.00     | 46.00 | -24.10 | -   |
| 7  | 15.168 | 0.95   | 35.21         | -   | 36.16          | -   | 60.00     | 50.00 | -23.84 | -   |

- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.  
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.  
3. The emission levels of other frequencies were very low against the limit.  
4. Margin value = Emission level - Limit value  
5. Correction factor = Insertion loss + Cable loss  
6. Emission Level = Correction Factor + Reading Value.



## 4.2 NUMBER OF HOPPING FREQUENCY USED

### 4.2.1 LIMIT OF HOPPING FREQUENCY USED

At least 15 hopping frequencies, and should be equally spaced.

### 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER   | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|------------------------------|-----------|------------|-----------------|------------------|
| PSA Series Spectrum Analyzer | FSP40     | 100036     | Dec. 08, 2010   | Dec. 07, 2011    |

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.2.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



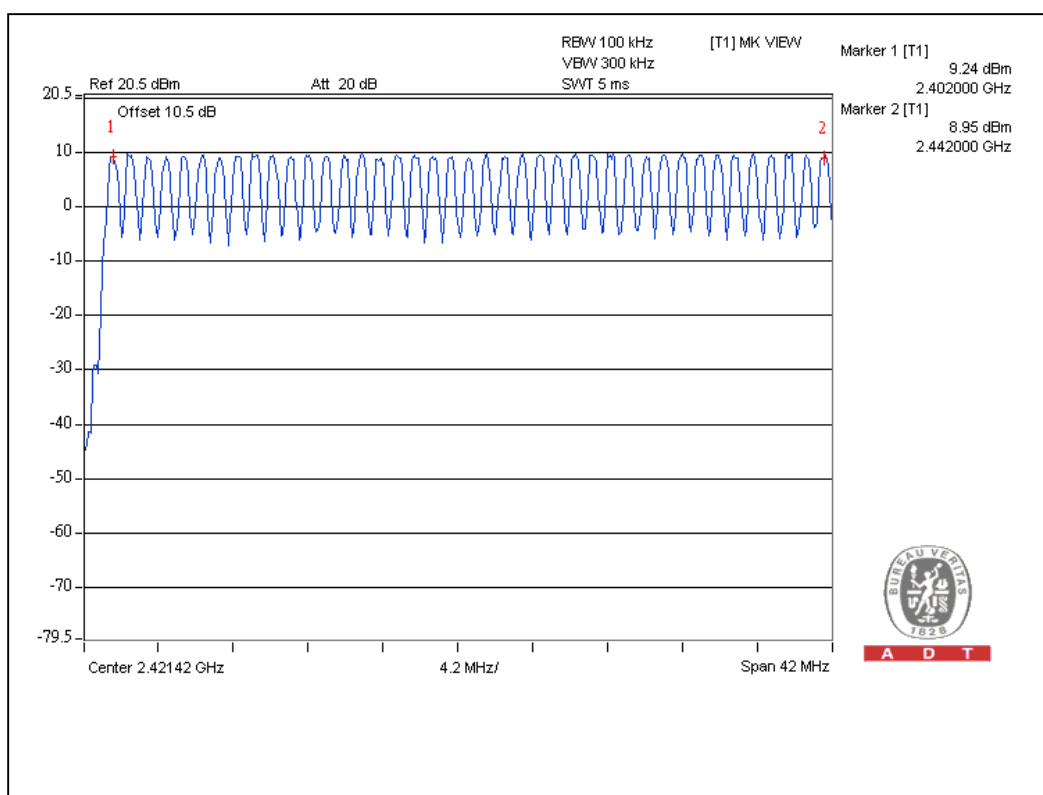
#### 4.2.6 TEST RESULTS

There are 79 hopping frequencies in the hopping mode. Please refer to next pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.

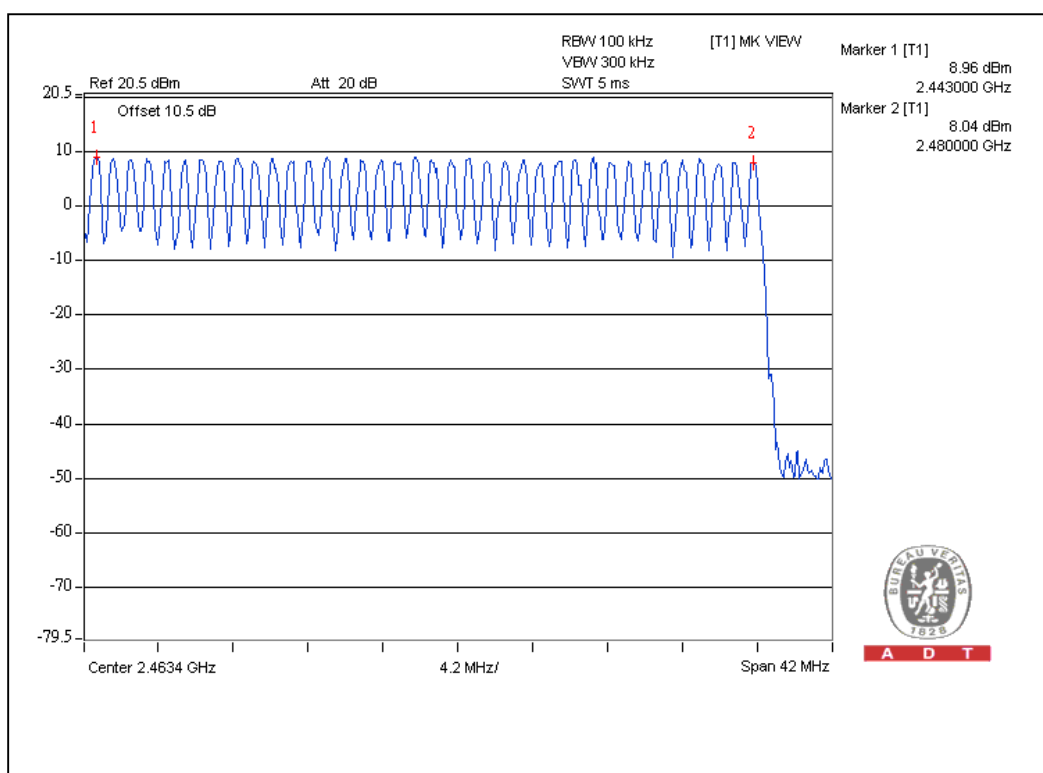


A D T

For GFSK:



A D T



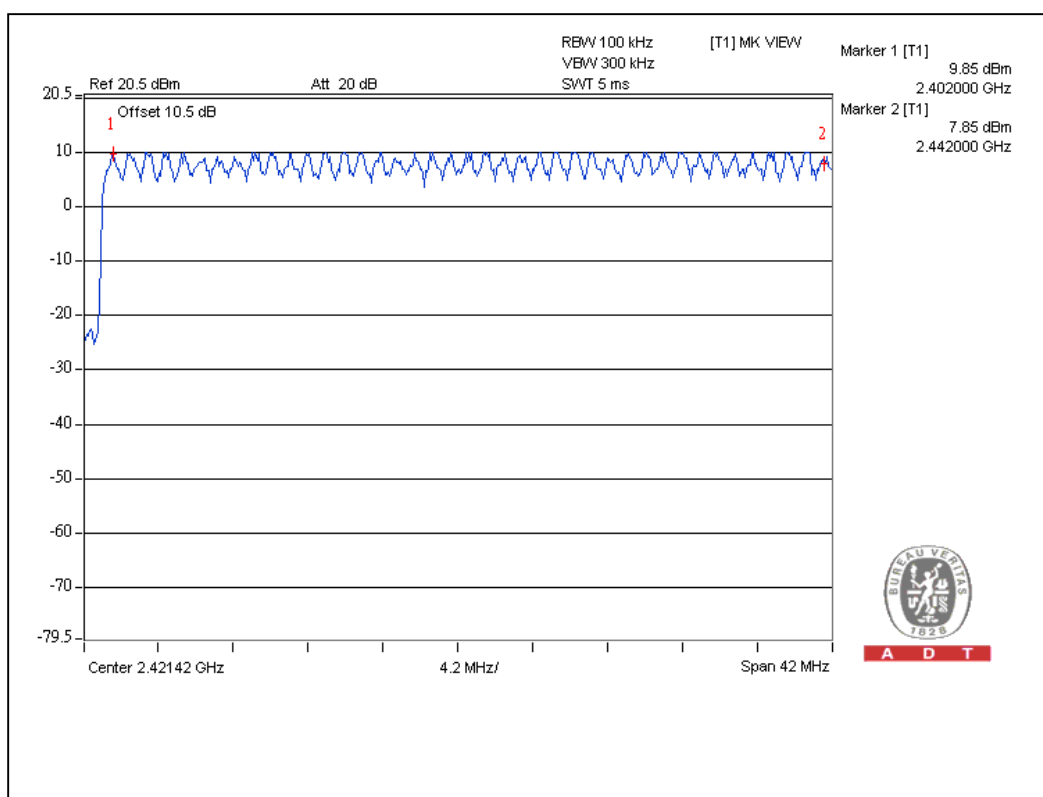
A D T



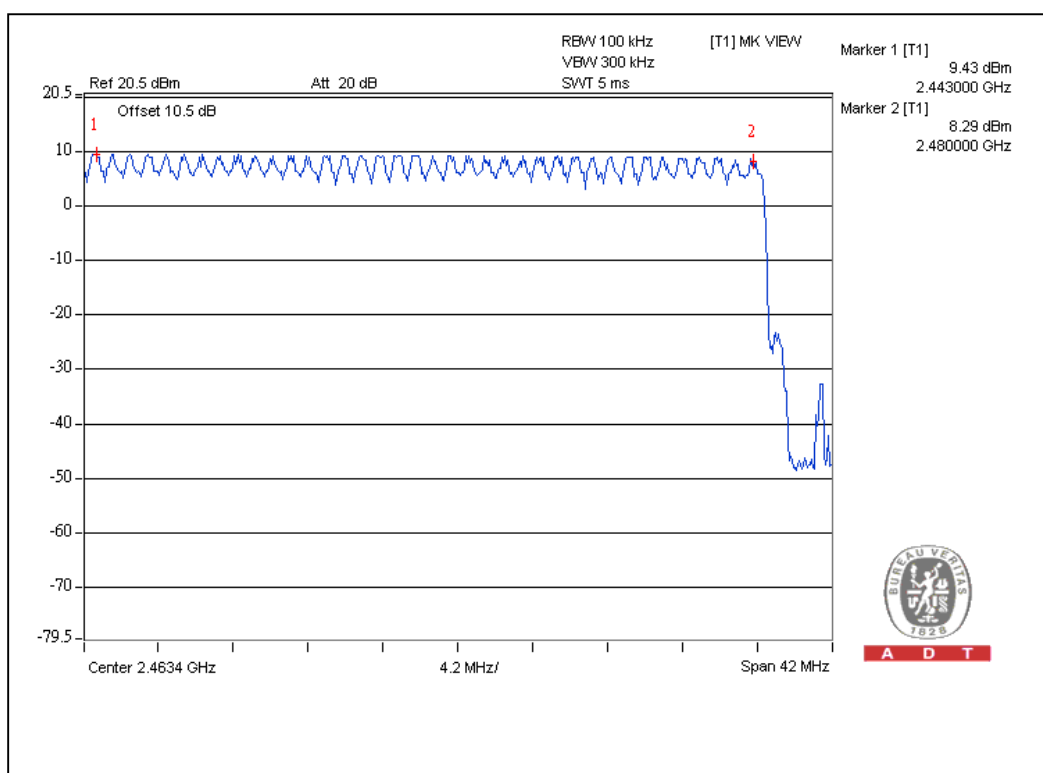


A D T

For 8DPSK:

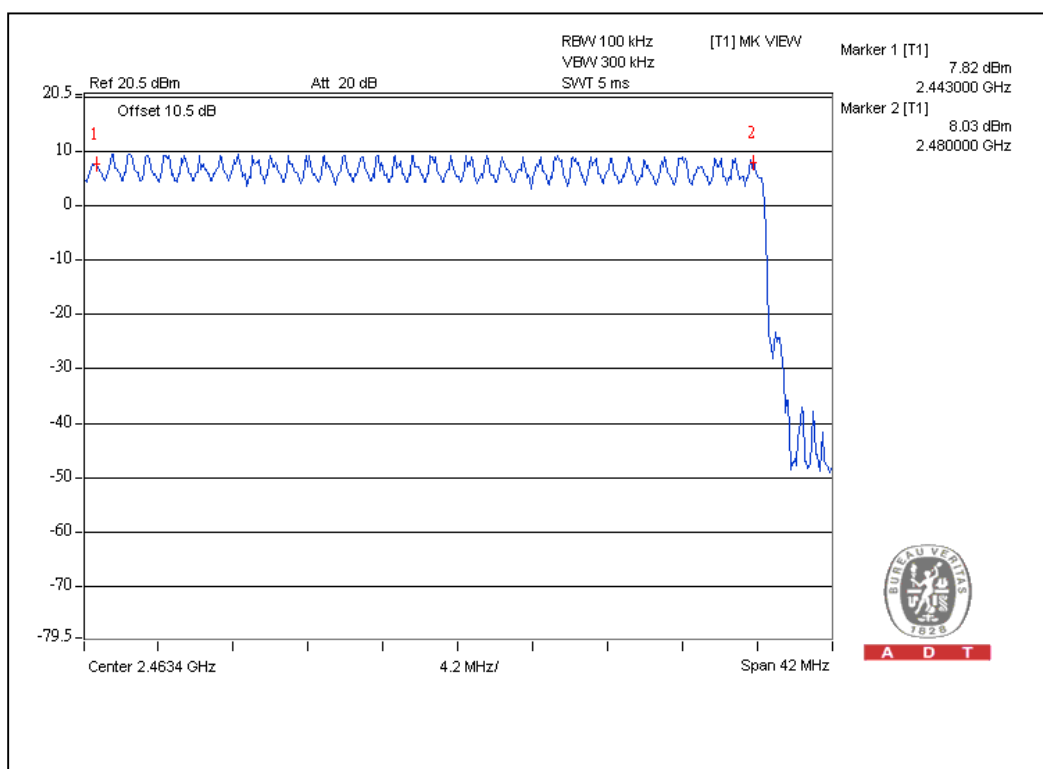
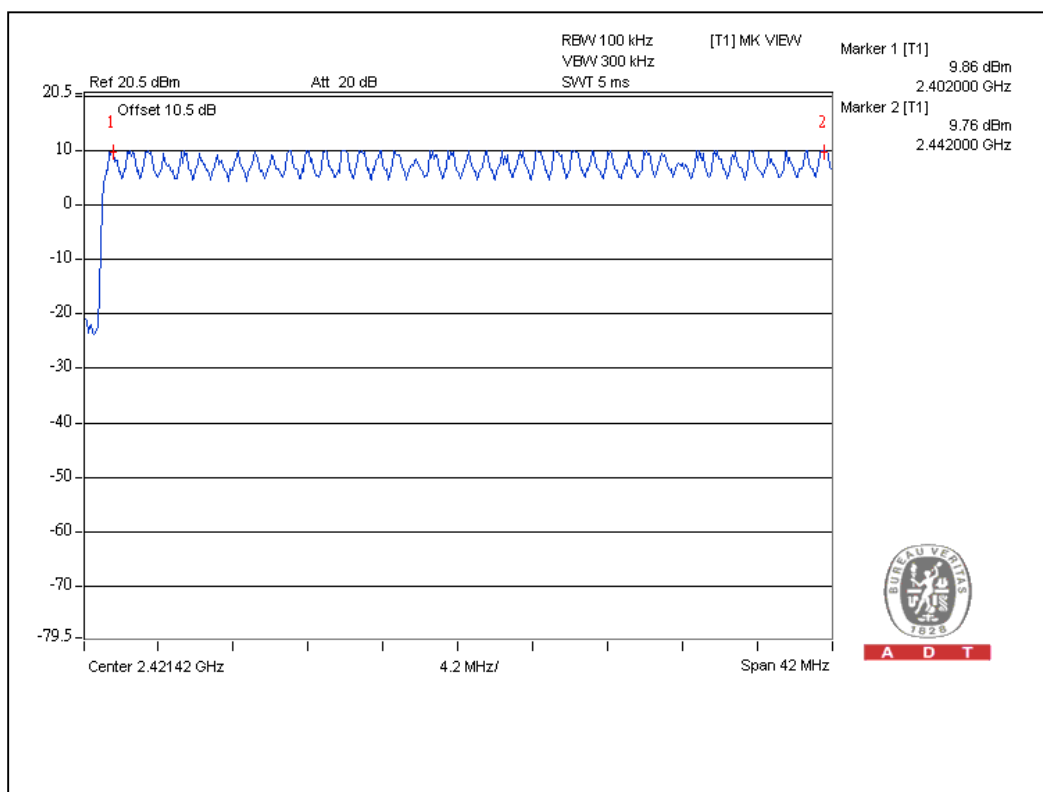


A D T

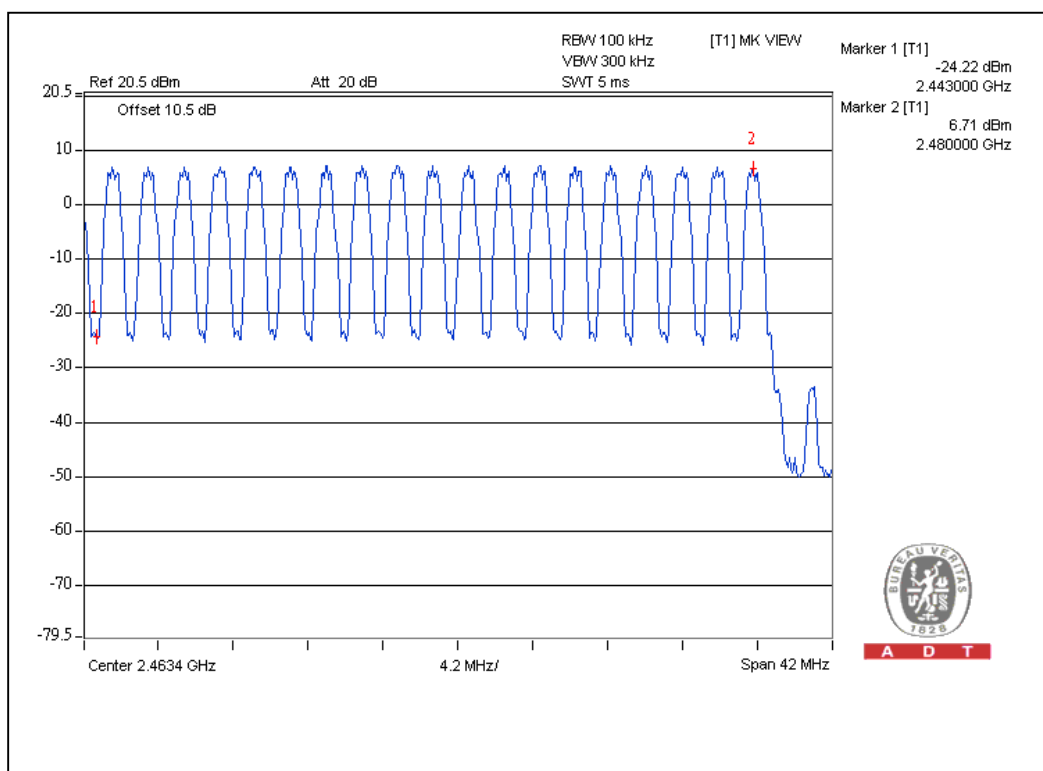
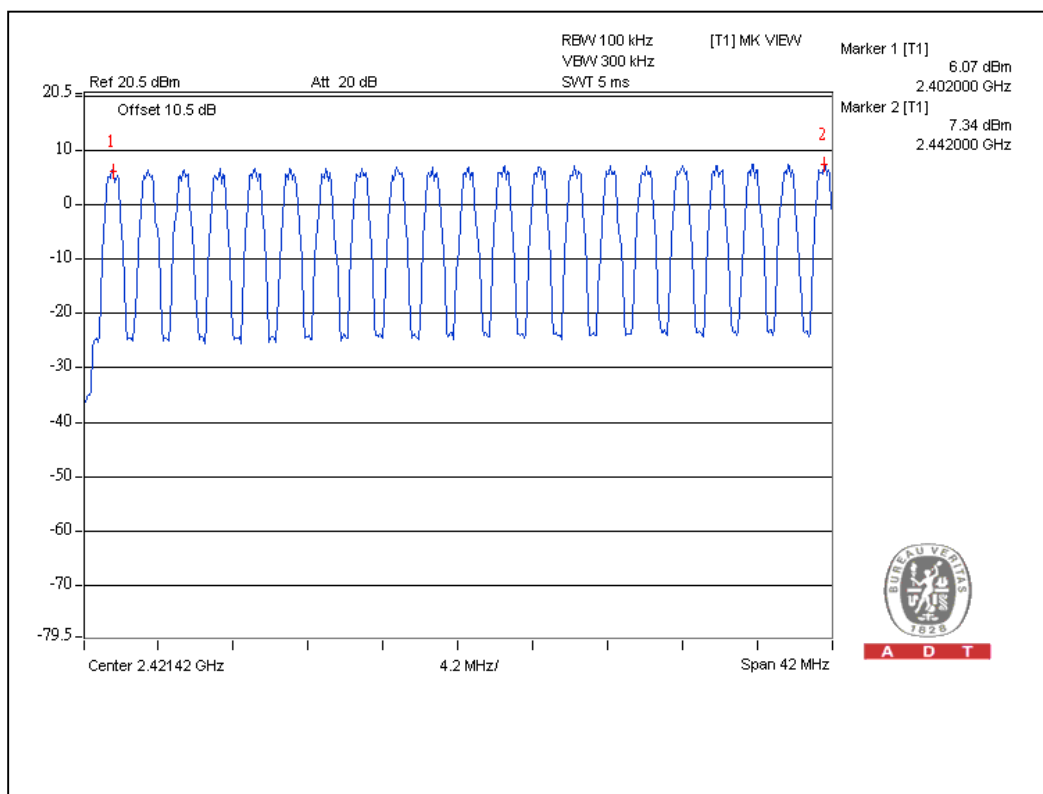


A D T

For  $\pi/4$ -DQPSK :



For additional GFSK:



### 4.3 DWELL TIME ON EACH CHANNEL

#### 4.3.1 LIMIT OF DWELL TIME USED

For FHSS, the average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

For hybrid systems, the average time of occupancy on any frequency should not exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4.

Note:

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 31.6 second period for traditional GFSK/( $\pi/4$ -DQPSK) /8DPSK. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 16 second period for additional GFSK

#### 4.3.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER   | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|------------------------------|-----------|------------|-----------------|------------------|
| PSA Series Spectrum Analyzer | FSP40     | 100036     | Dec. 08, 2010   | Dec. 07, 2011    |

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.3.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
5. Repeat above procedures until all frequencies measured were complete.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 TEST SETUP



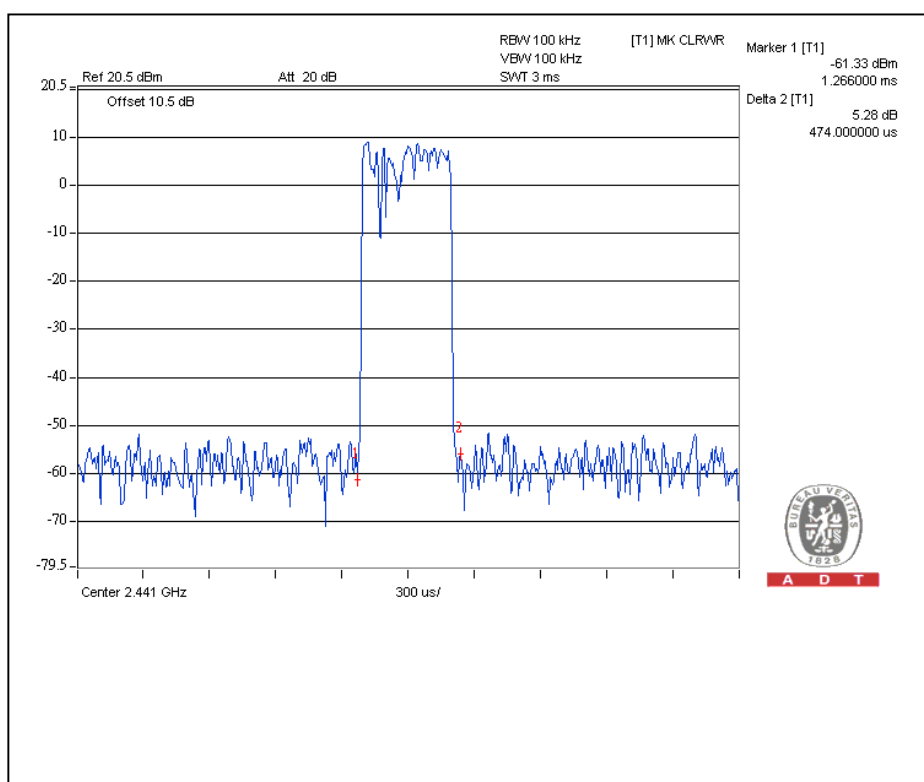
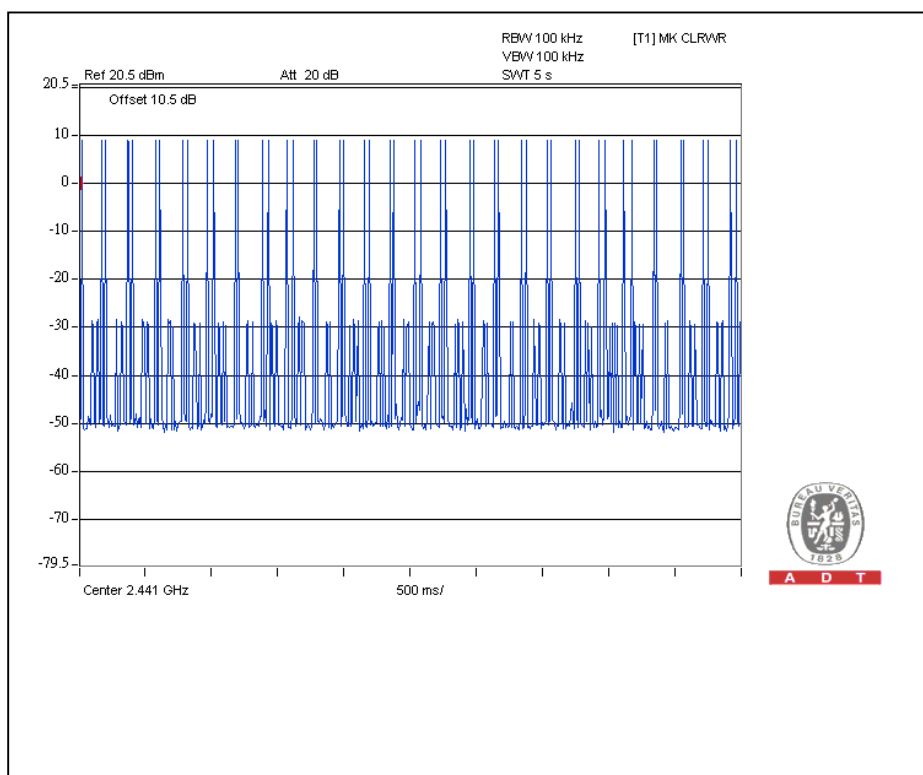
#### 4.3.6 TEST RESULTS

For GFSK:

| Mode | Number of transmission in a 31.6 (79Hopping*0.4) | Length of transmission time (msec) | Result (msec) | Limit (msec) |
|------|--------------------------------------------------|------------------------------------|---------------|--------------|
| DH1  | 56 (times / 5 sec) *6.32=353.9 times             | 0.474                              | 167.7         | 400          |
| DH3  | 25 (times / 5 sec) *6.32=158 times               | 1.704                              | 269.2         | 400          |
| DH5  | 17 (times / 5 sec) *6.32=107.4 times             | 2.960                              | 317.9         | 400          |

Test plots of the transmitting time slot are shown on next three pages.

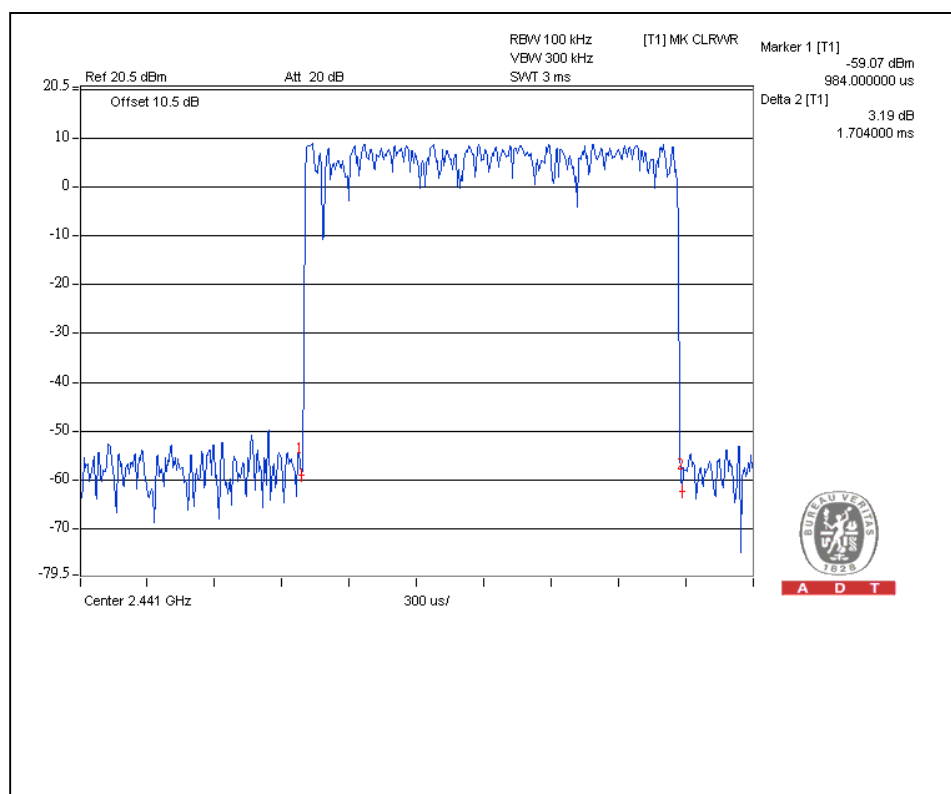
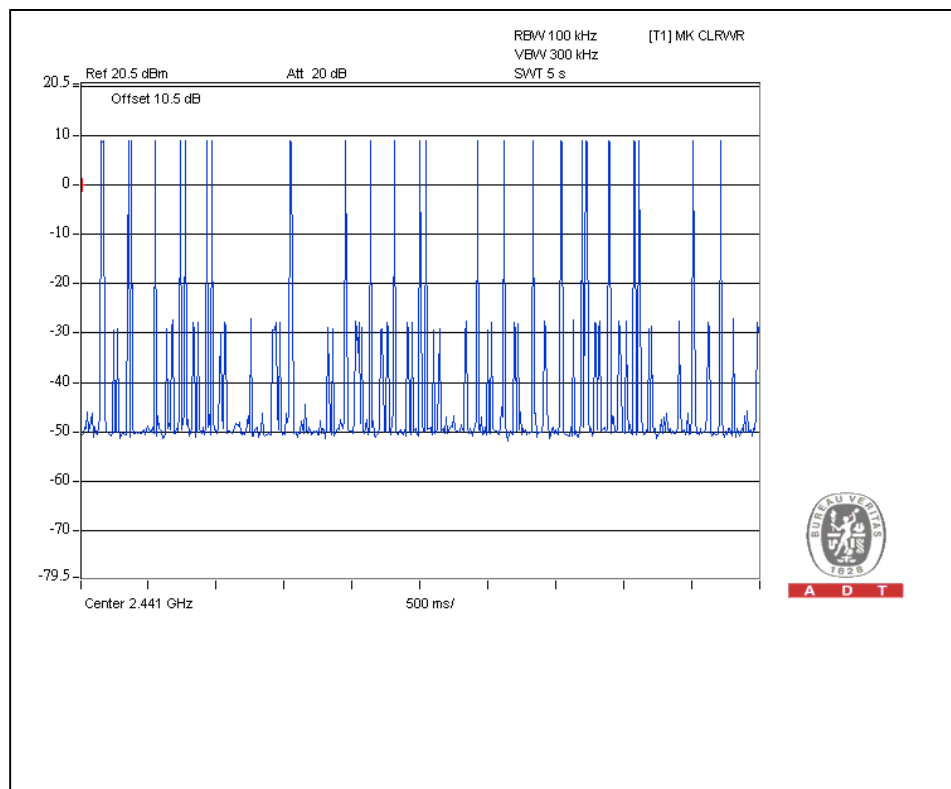
# DH1





A D T

## DH3

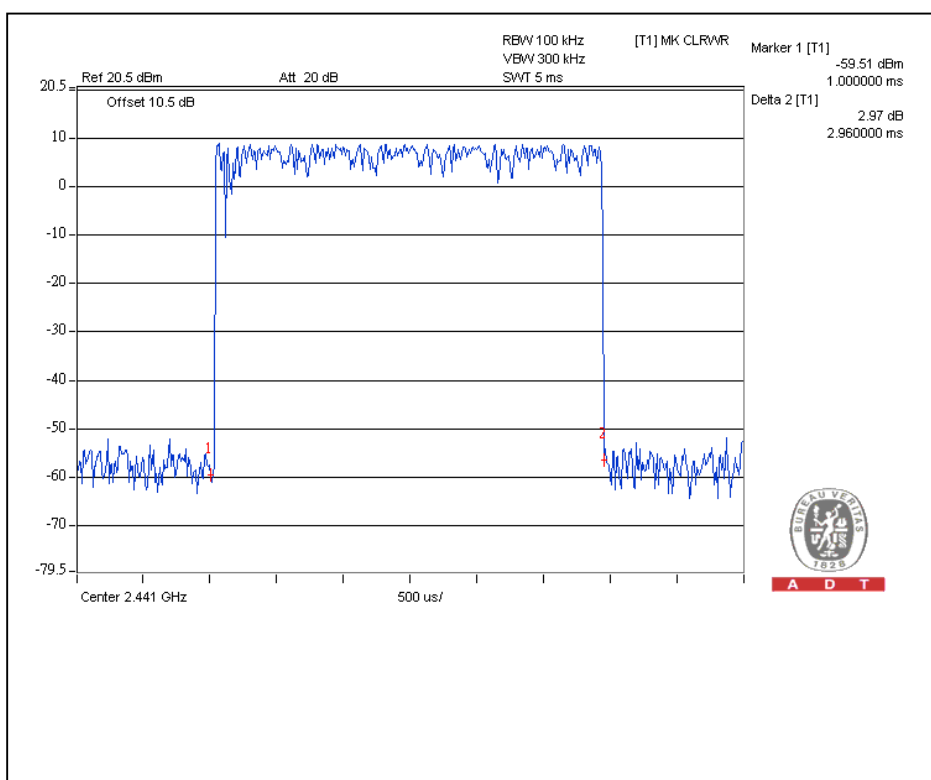
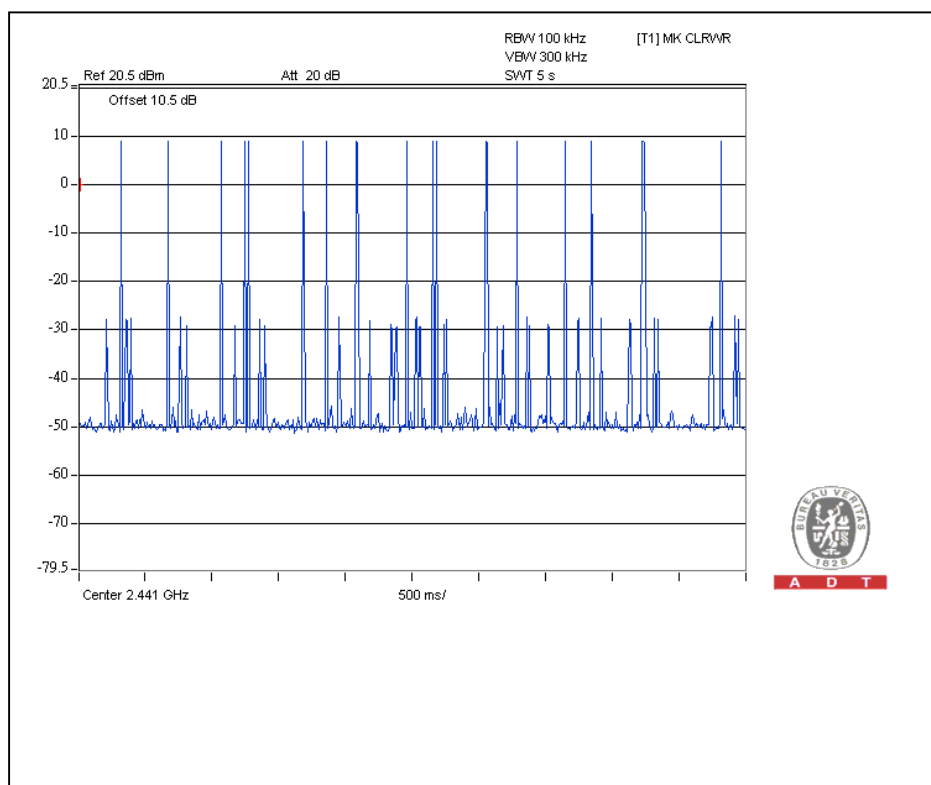






A D T

DH5

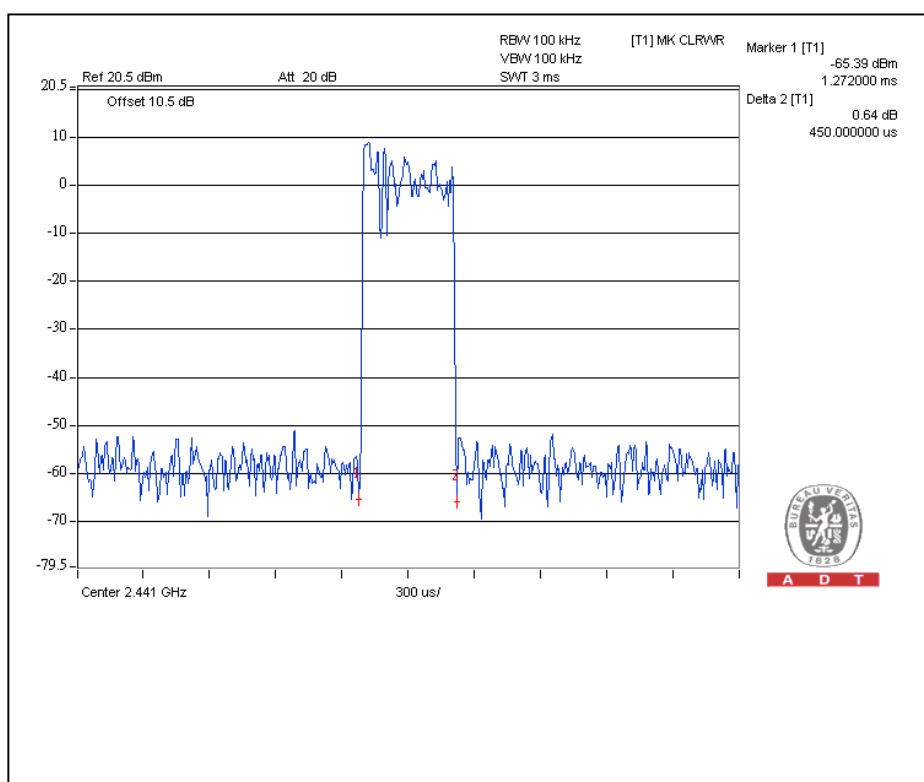
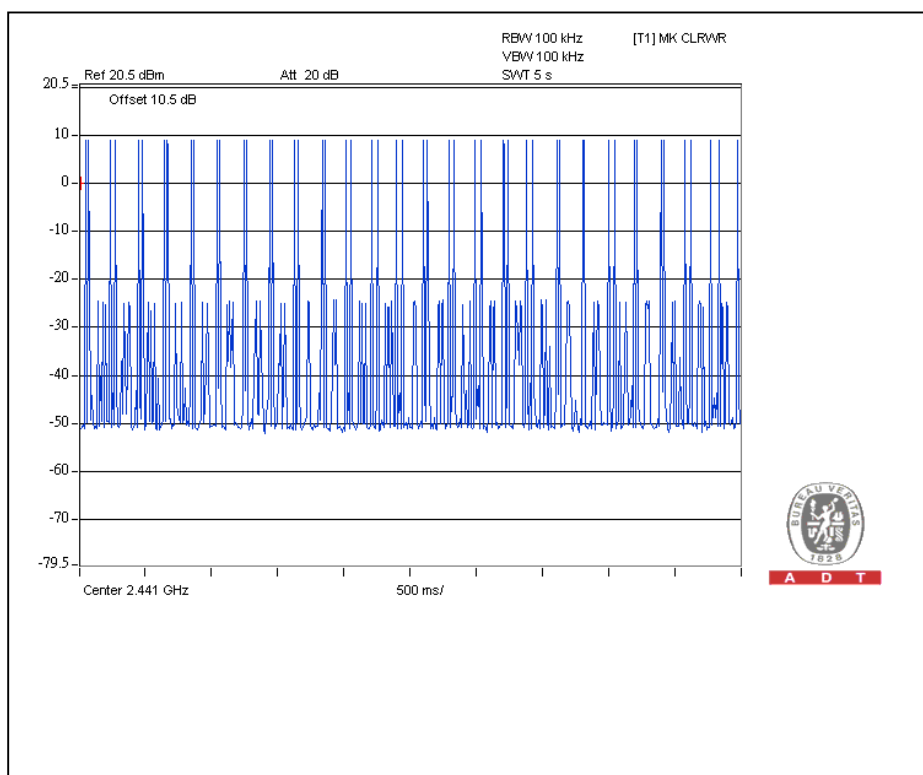


**For 8DPSK:**

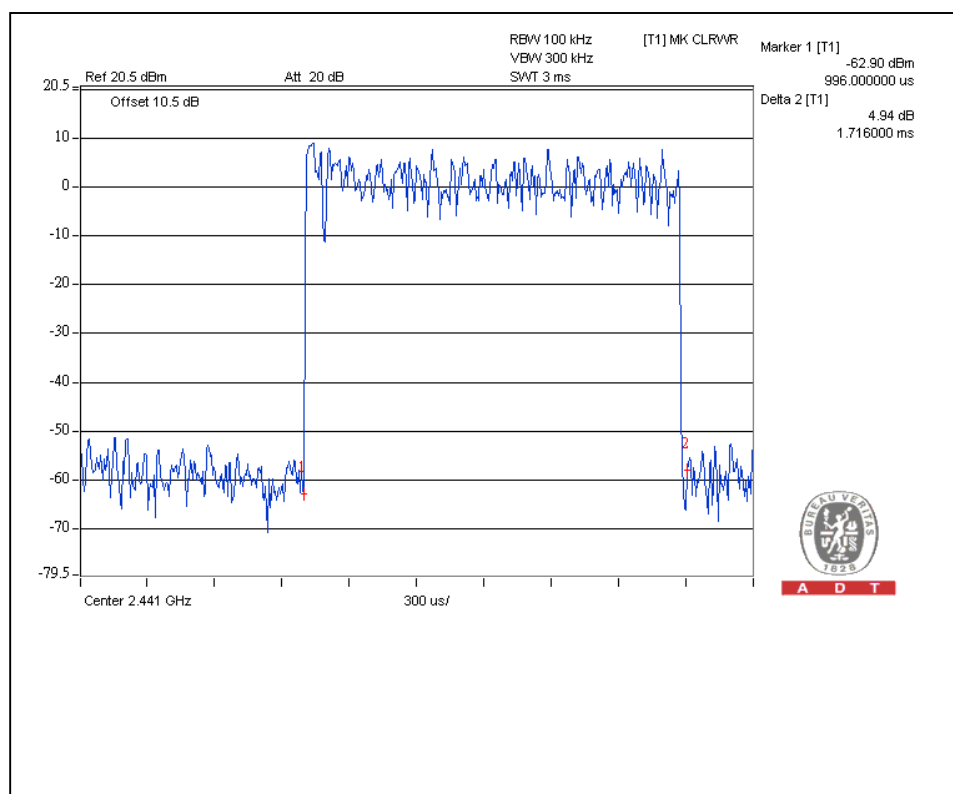
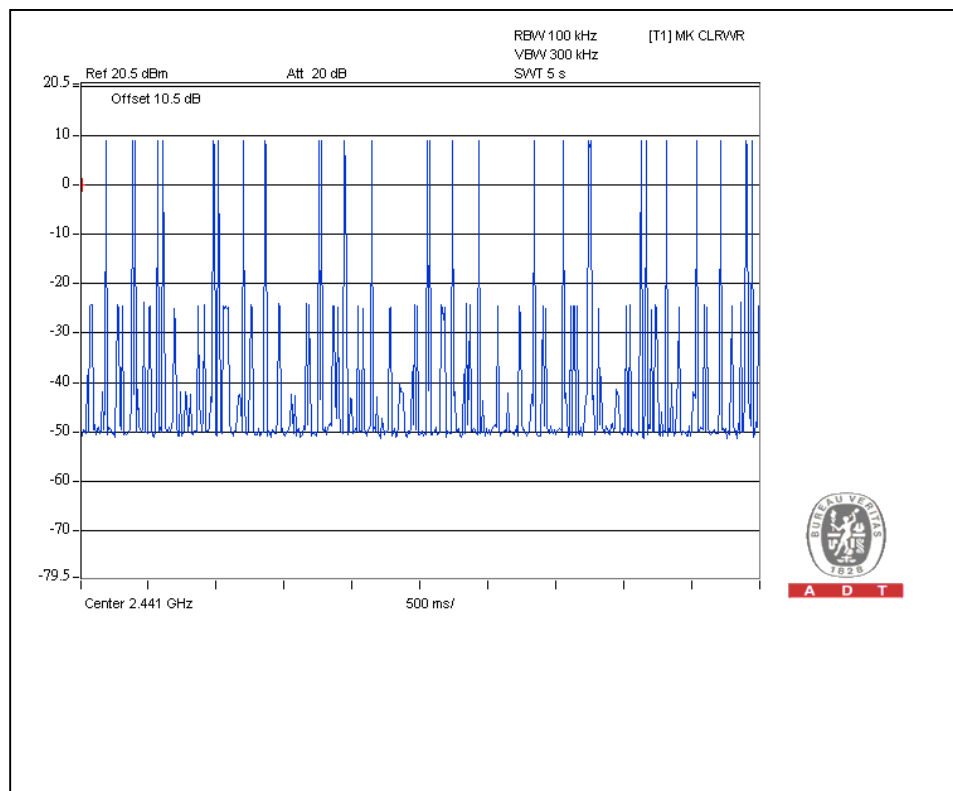
| Mode | Number of transmission in a 31.6 (79Hopping*0.4) | Length of transmission time (msec) | Result (msec) | Limit (msec) |
|------|--------------------------------------------------|------------------------------------|---------------|--------------|
| DH1  | 50 (times / 5 sec) *6.32=316 times               | 0.450                              | 142.2         | 400          |
| DH3  | 27 (times / 5 sec) *6.32=170.6 times             | 1.716                              | 292.7         | 400          |
| DH5  | 17 (times / 5 sec) *6.32=107.4 times             | 2.960                              | 317.9         | 400          |

Test plots of the transmitting time slot are shown on next three pages.

# DH1



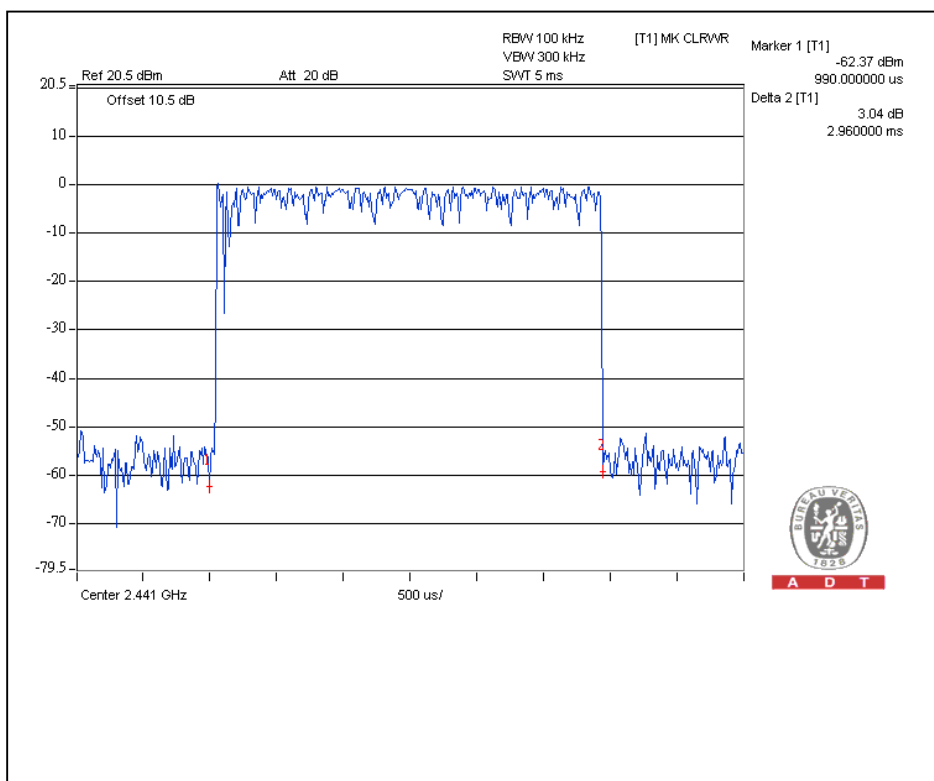
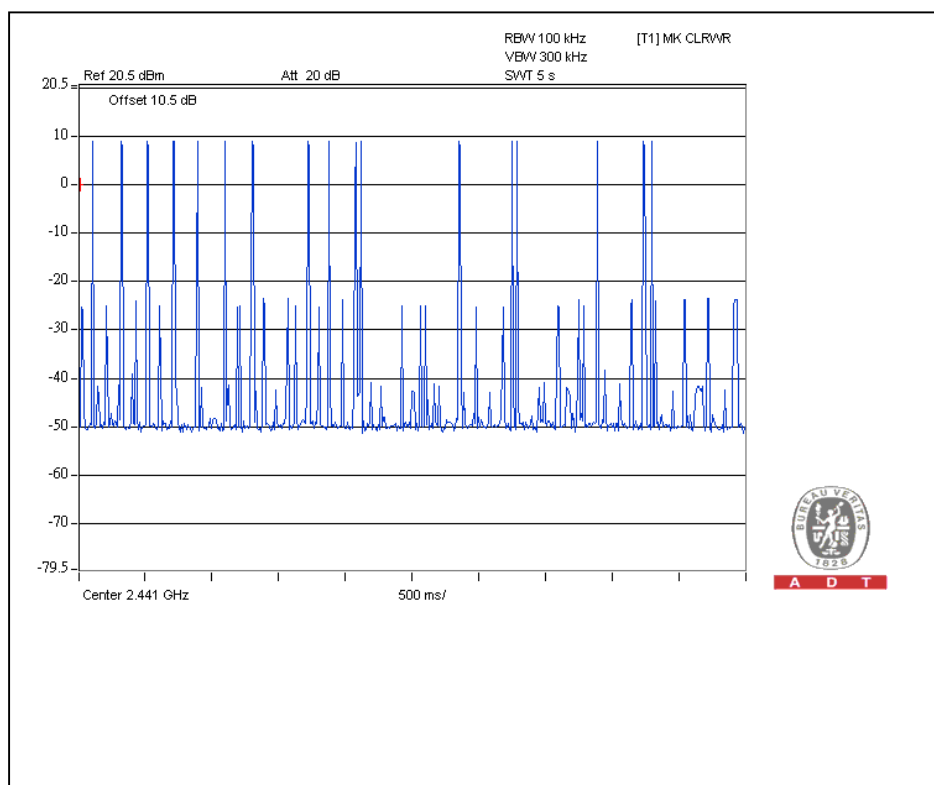
# DH3





A D T

DH5



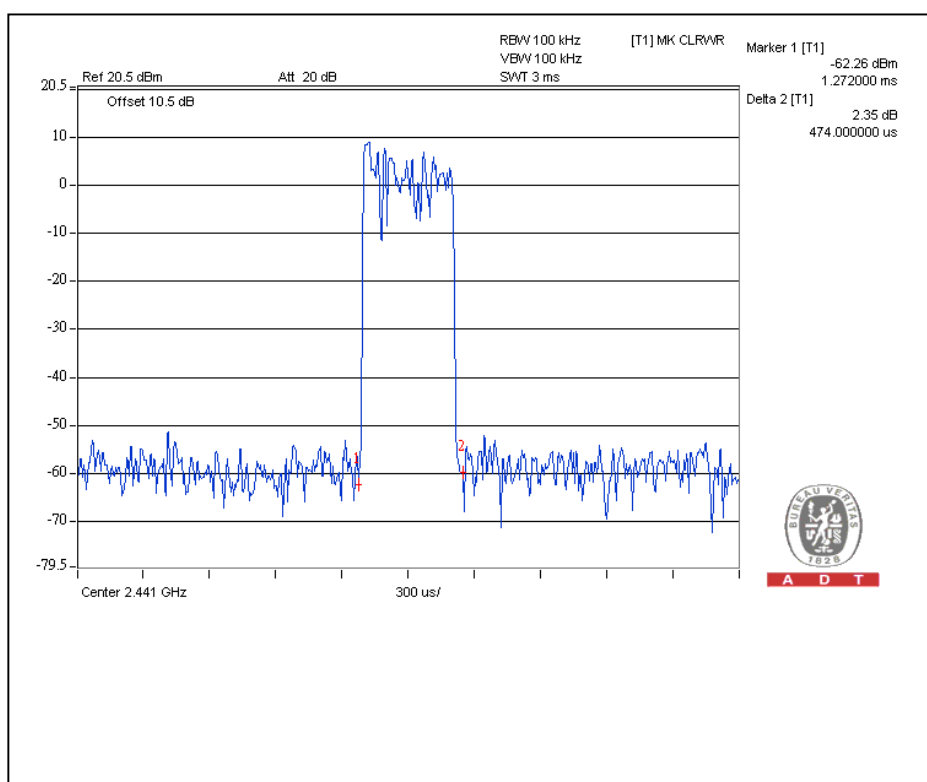
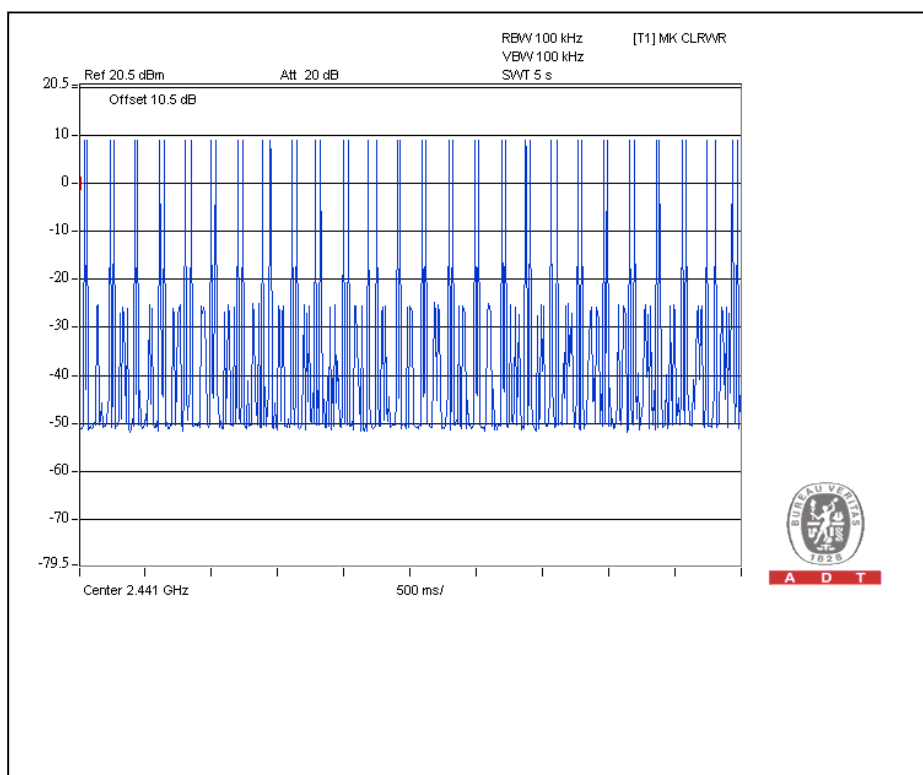


For  $\pi/4$  – DQPSK :

| Mode | Number of transmission in a 31.6 (79Hopping*0.4) | Length of transmission time (msec) | Result (msec) | Limit (msec) |
|------|--------------------------------------------------|------------------------------------|---------------|--------------|
| DH1  | 52 (times / 5 sec) *6.32=328.6 times             | 0.474                              | 155.8         | 400          |
| DH3  | 25 (times / 5 sec) *6.32=158 times               | 1.716                              | 271.1         | 400          |
| DH5  | 18 (times / 5 sec) *6.32=113.8 times             | 2.990                              | 340.3         | 400          |

Test plots of the transmitting time slot are shown on next three pages.

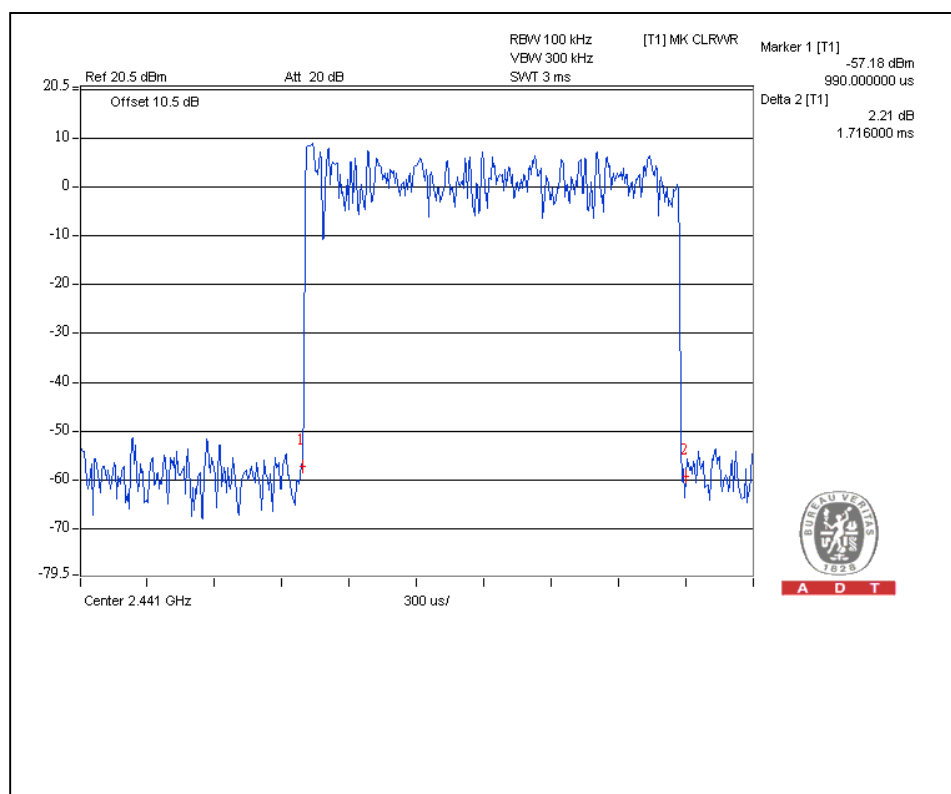
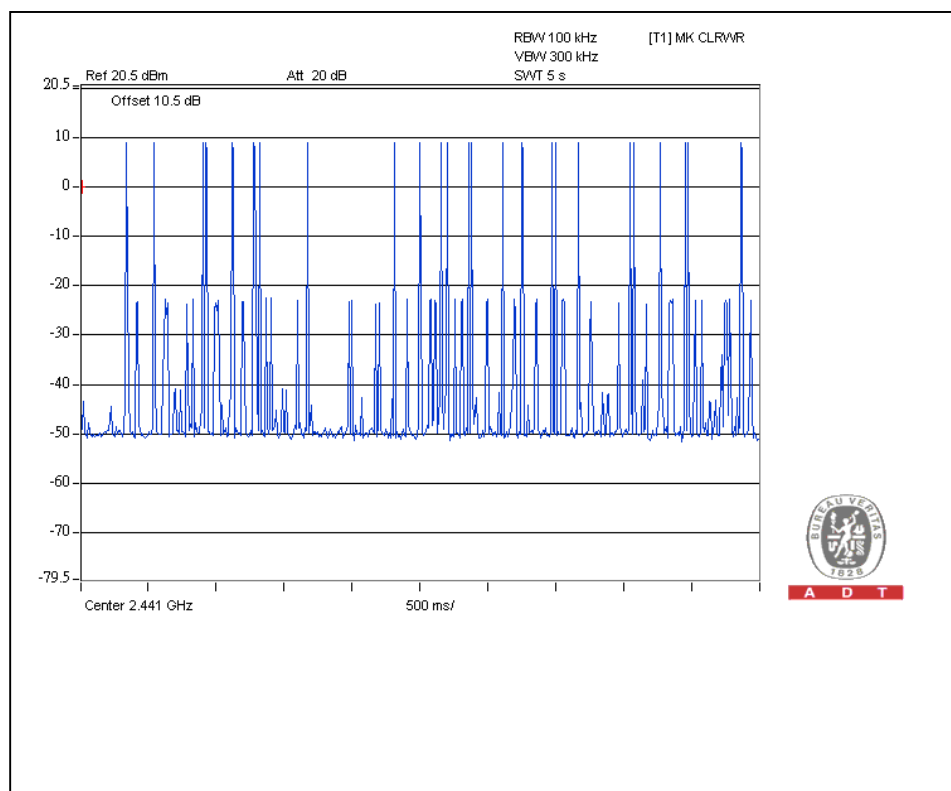
# DH1





A D T

## DH3

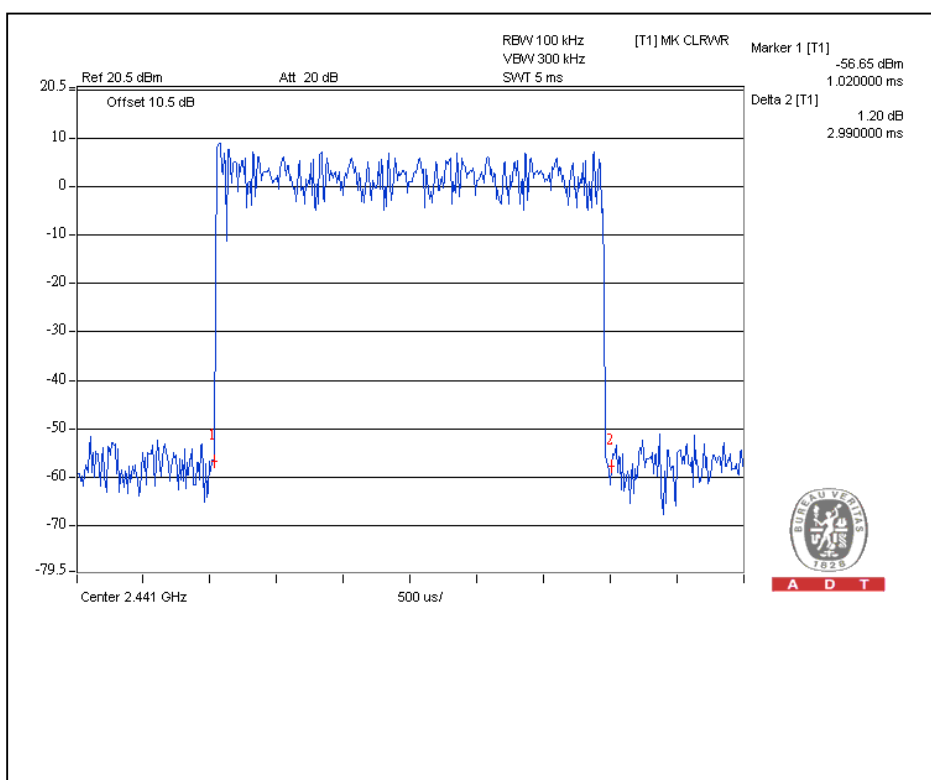
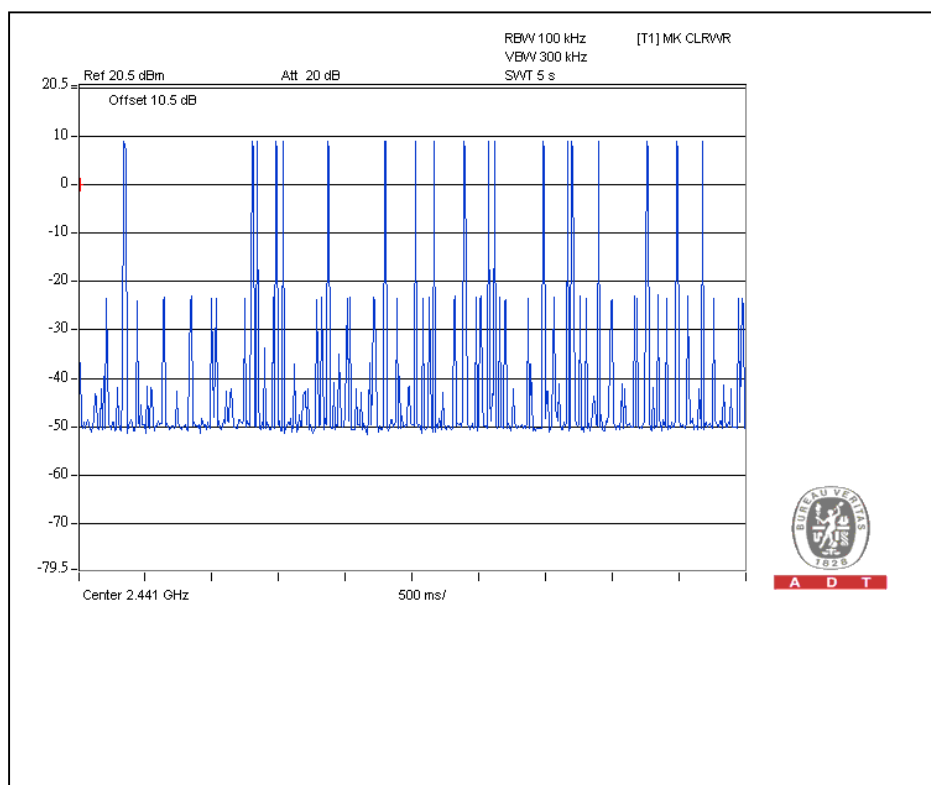






A D T

DH5





A D T

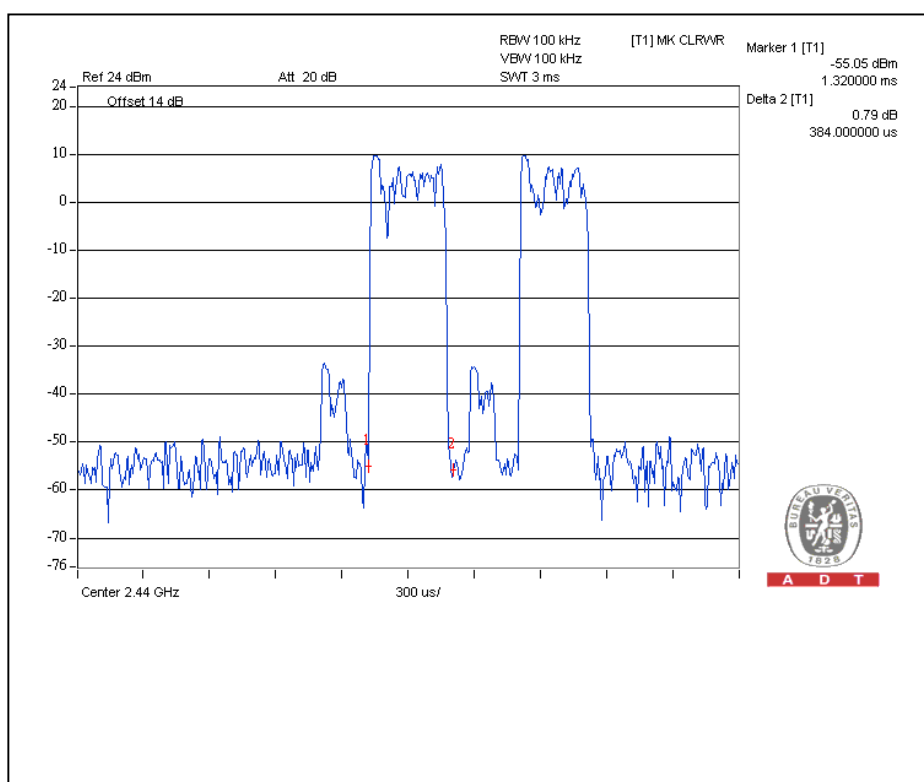
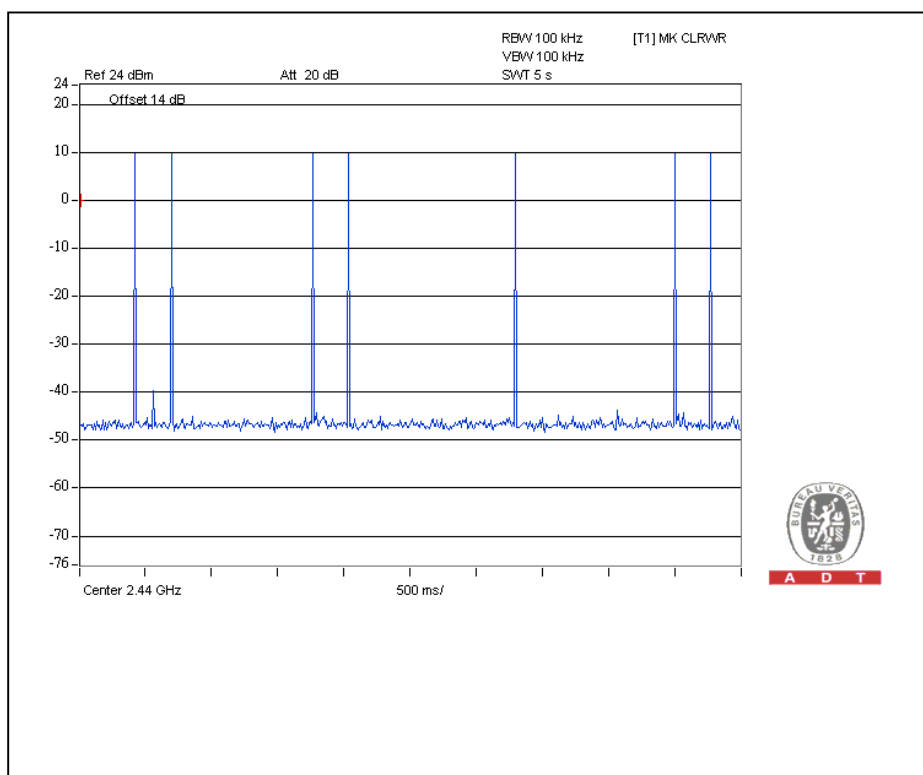
For additional GFSK:

| Mode | Number of transmission in a 16 (40Hopping*0.4) | Length of transmission time (msec)* | Result (msec) | Limit (msec) |
|------|------------------------------------------------|-------------------------------------|---------------|--------------|
| DH1  | 7 (times / 5 sec) *3.2=22.4 times              | 0.768                               | 17.2          | 400          |

\*There are two burst signal during transmission time period.

Test plots of the transmitting time slot are shown on next page.

# DH1



## 4.4 CHANNEL BANDWIDTH

### 4.4.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5MHz, If the two-thirds 20dB bandwidth of hopping channel is greater than 25kHz, X two-thirds 20dB bandwidth of hopping channel shall be a minimum limit for the hopping channel separation.

### 4.4.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER   | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|------------------------------|-----------|------------|-----------------|------------------|
| PSA Series Spectrum Analyzer | FSP40     | 100036     | Dec. 08, 2010   | Dec. 07, 2011    |

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.4.3 TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.4.5 TEST SETUP



#### 4.4.6 EUT OPERATING CONDITION

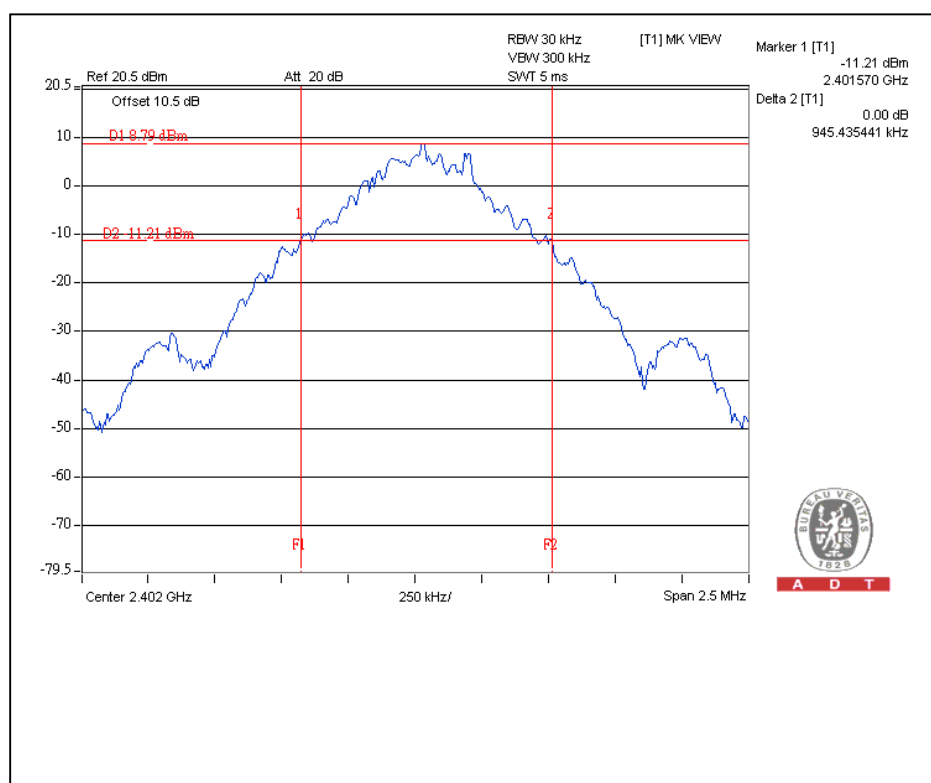
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

## 4.4.7 TEST RESULTS

For GFSK:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (MHz) |
|---------|-------------------------|----------------------|
| 0       | 2402                    | 0.94                 |
| 39      | 2441                    | 0.94                 |
| 78      | 2480                    | 0.94                 |

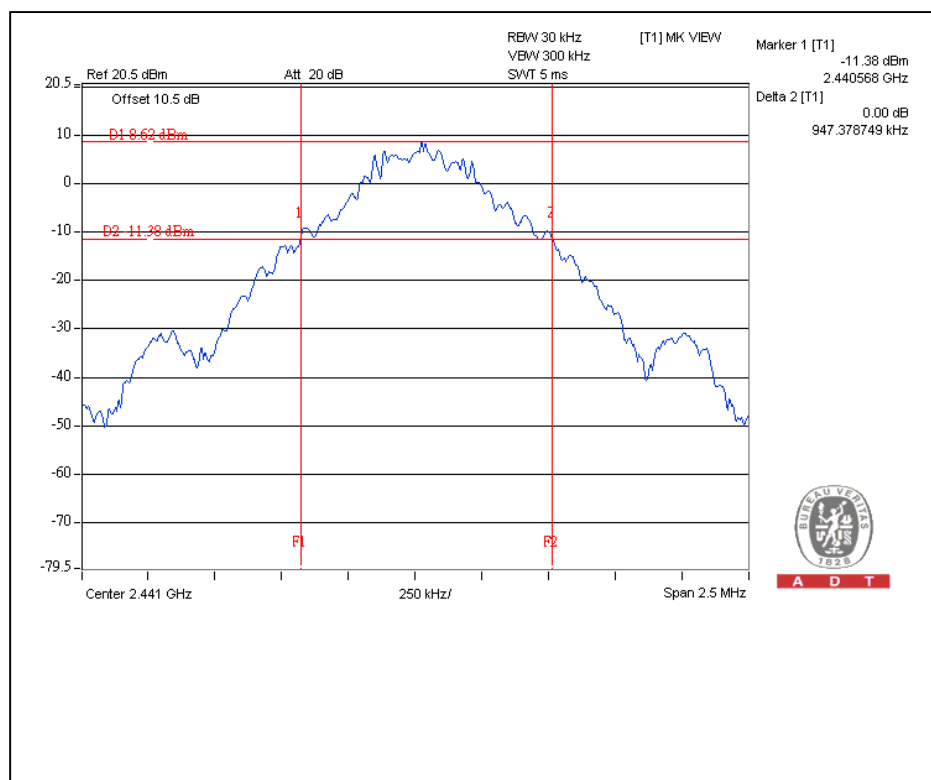
### Channel 0





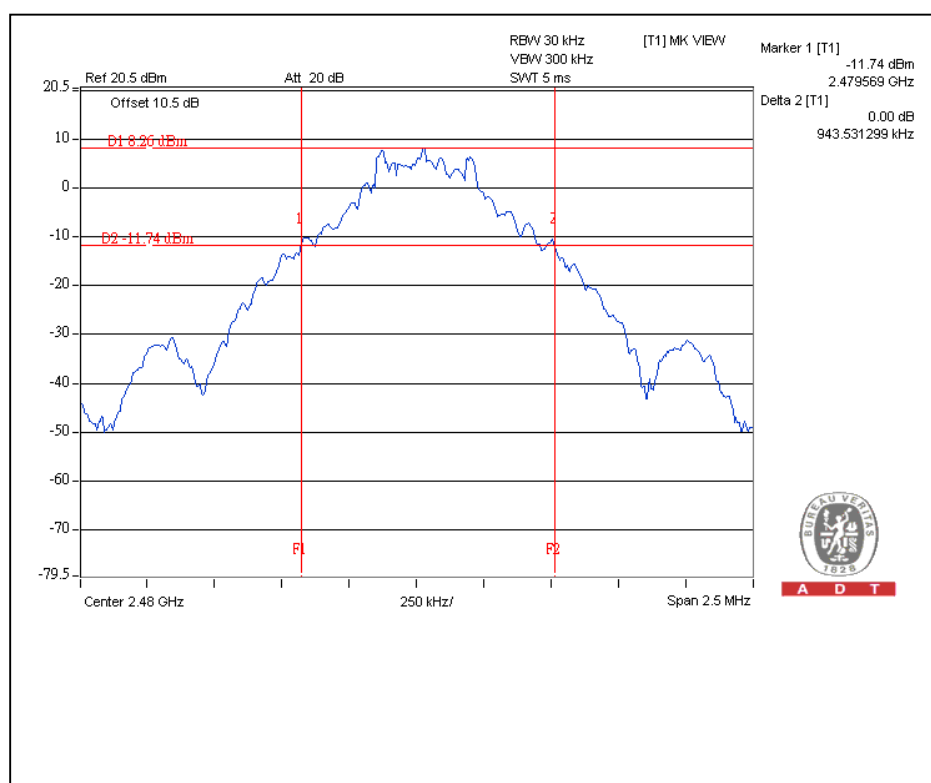
A D T

## Channel 39



A D T

## Channel 78

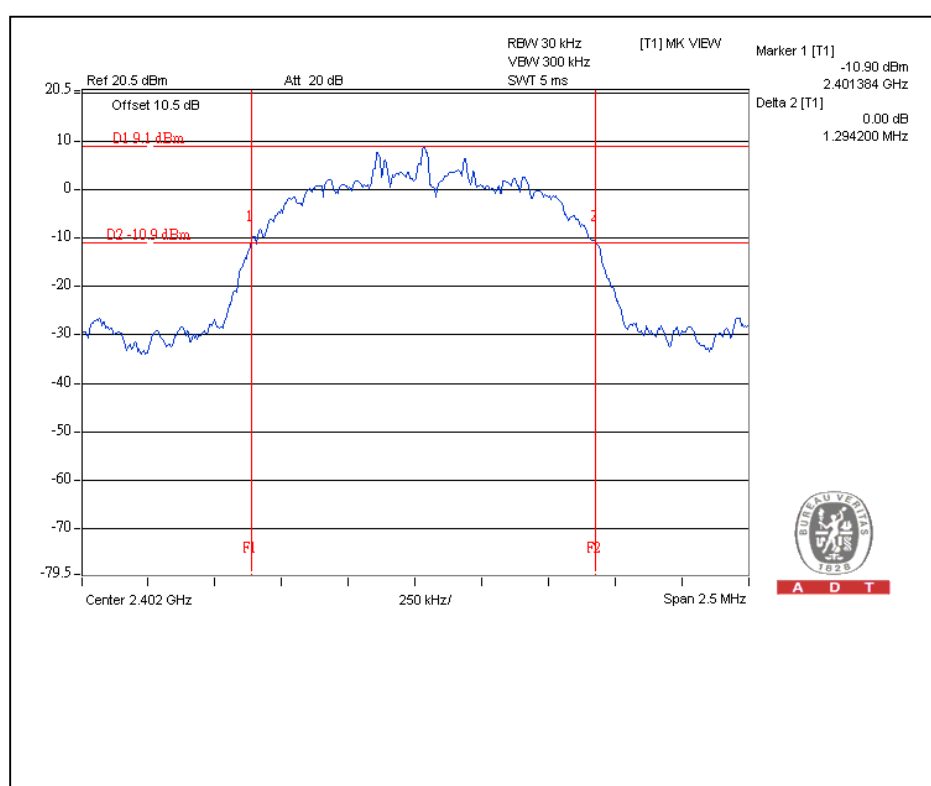


A D T

For 8DPSK:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (MHz) |
|---------|-------------------------|----------------------|
| 0       | 2402                    | 1.29                 |
| 39      | 2441                    | 1.30                 |
| 78      | 2480                    | 1.29                 |

## Channel 0

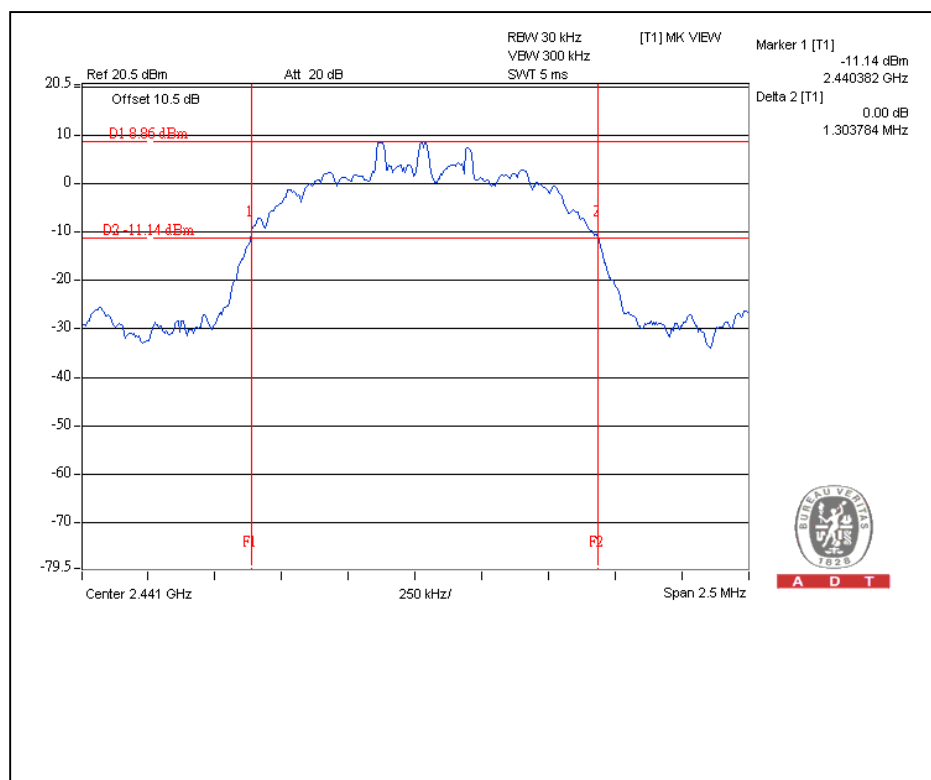




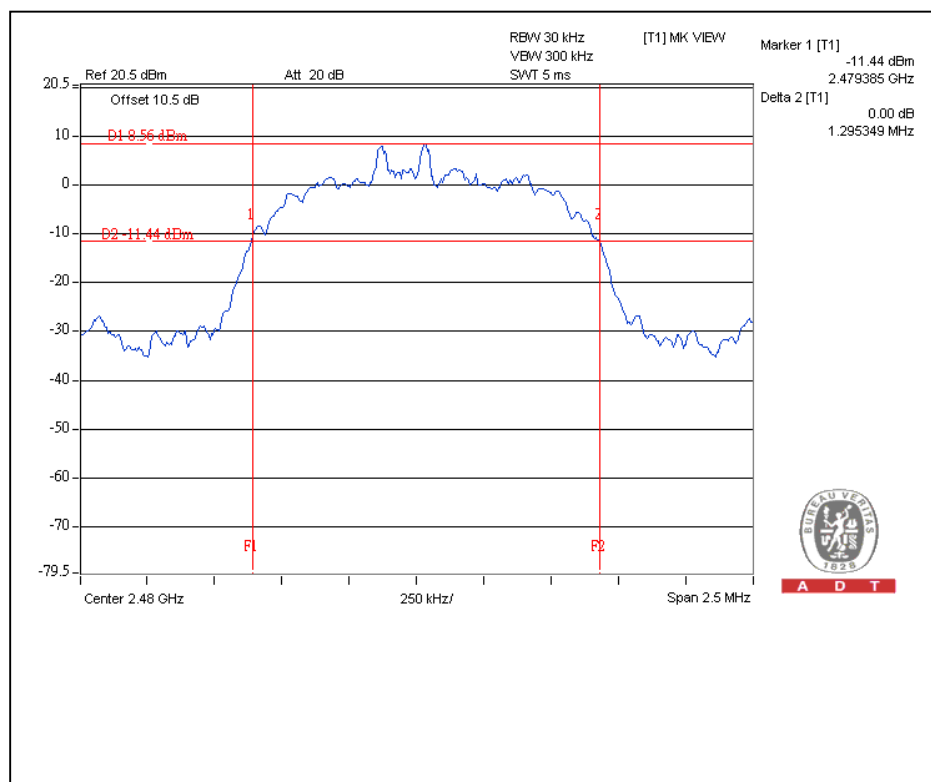


A D T

## Channel 39



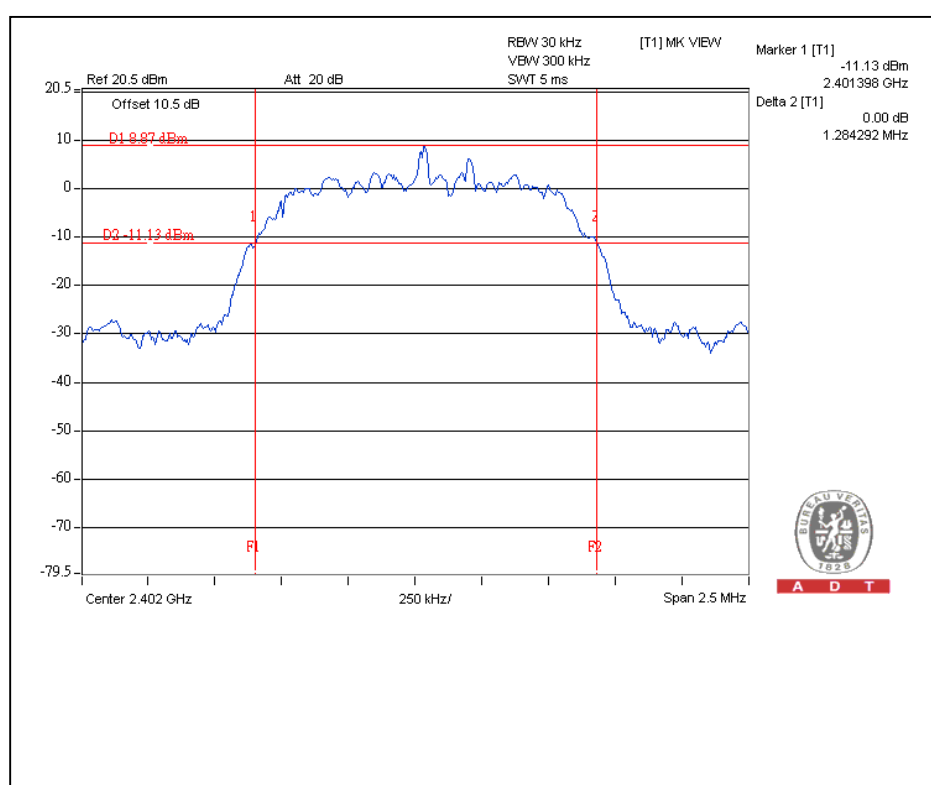
## Channel 78



For  $\pi/4$ -DQPSK:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (MHz) |
|---------|-------------------------|----------------------|
| 0       | 2402                    | 1.28                 |
| 39      | 2441                    | 1.28                 |
| 78      | 2480                    | 1.27                 |

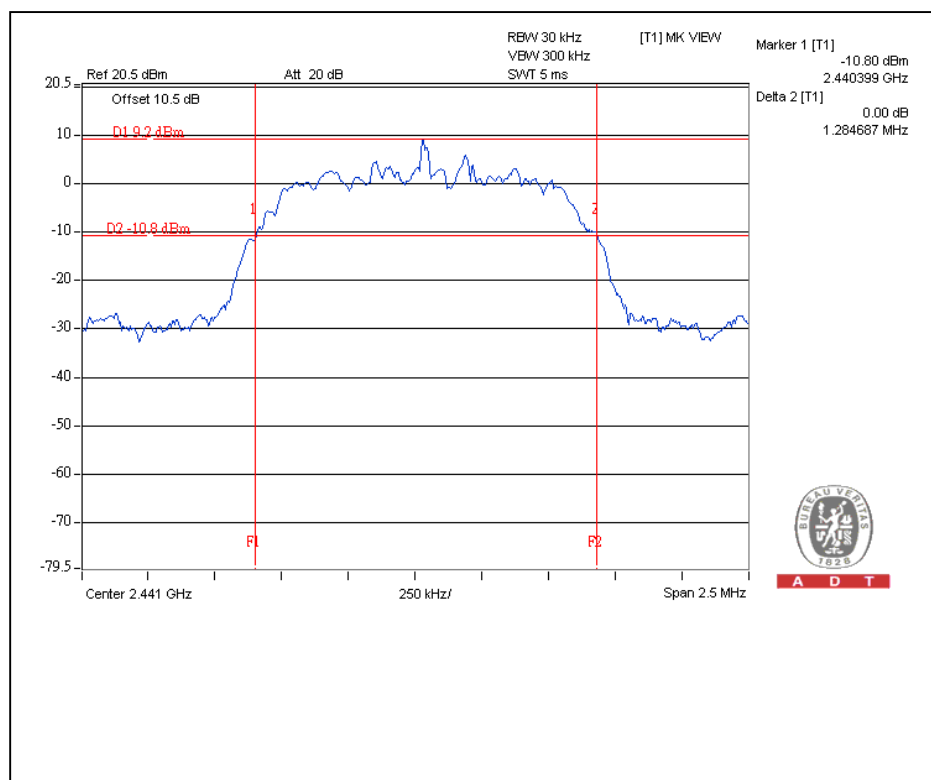
## Channel 0



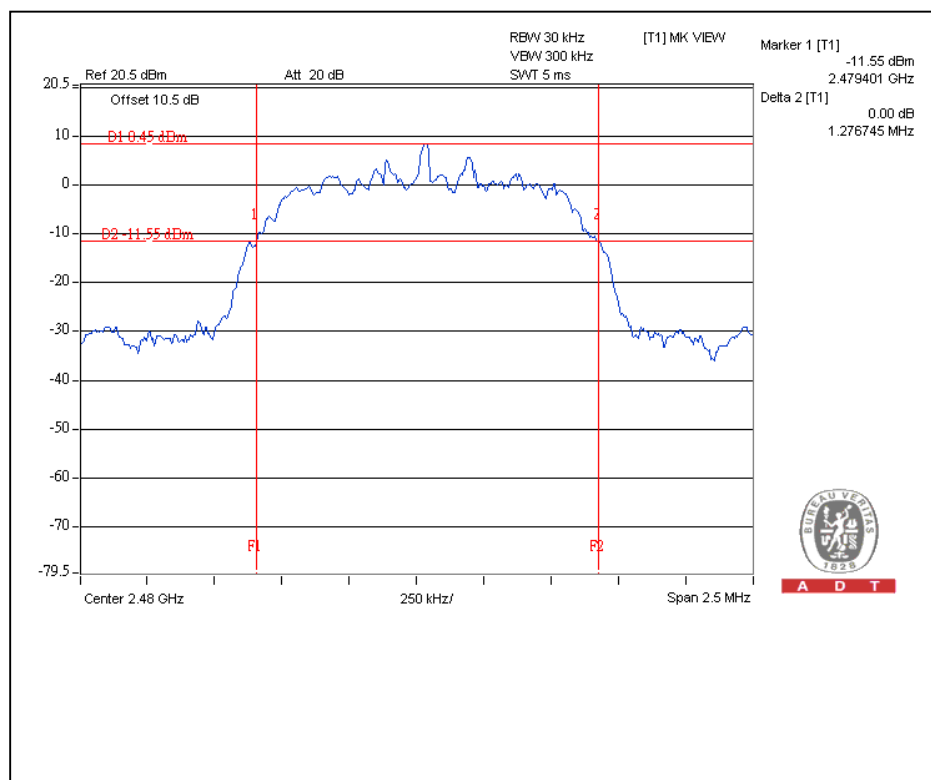


A D T

## Channel 39



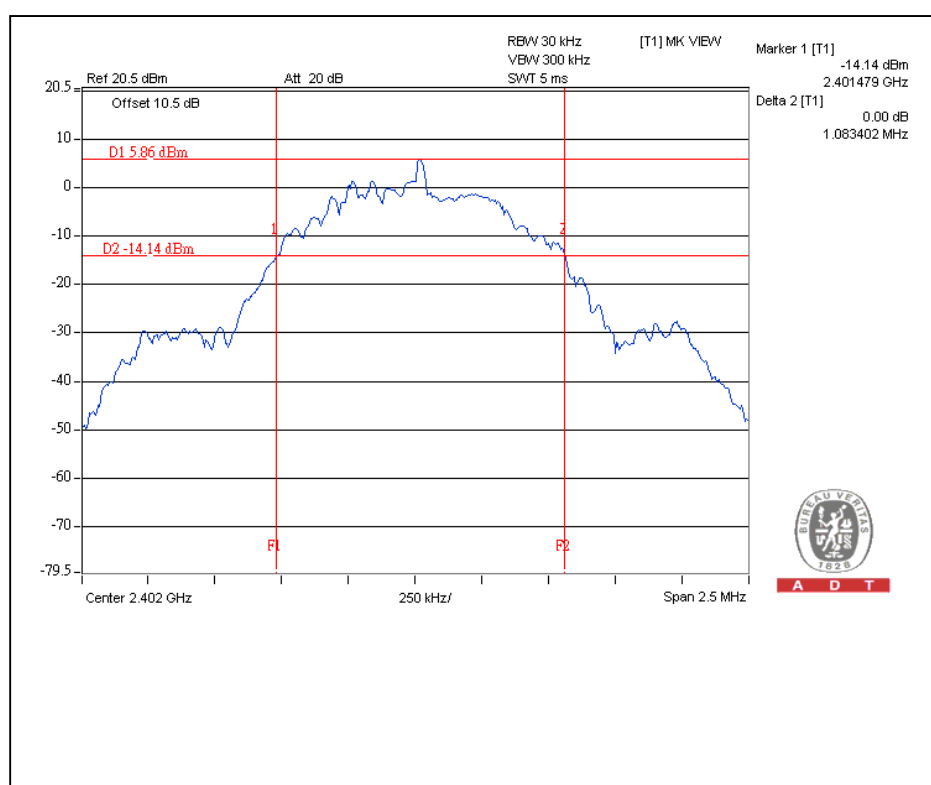
## Channel 78



For additional GFSK:

| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (MHz) |
|---------|-------------------------|----------------------|
| 0       | 2402                    | 1.08                 |
| 19      | 2440                    | 1.08                 |
| 39      | 2480                    | 1.09                 |

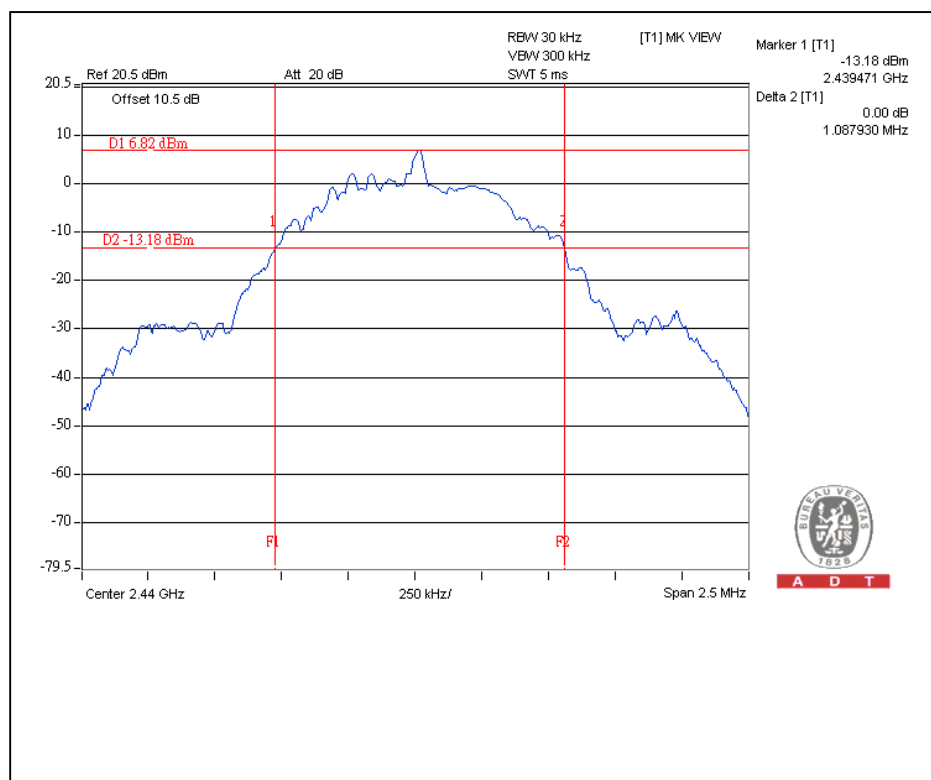
## Channel 0





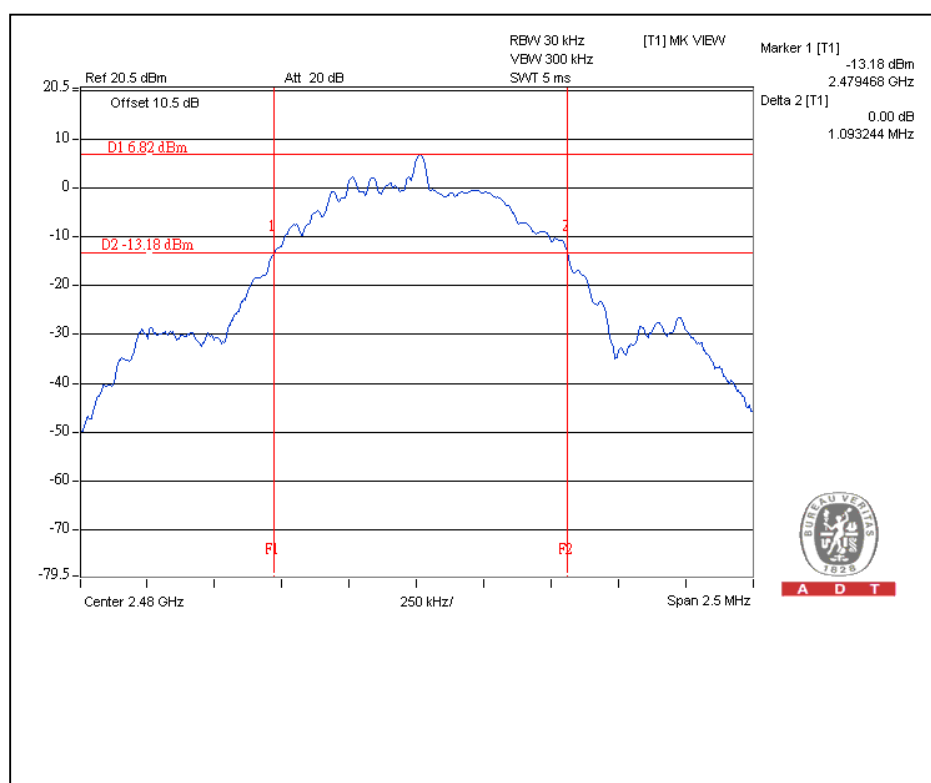
A D T

## Channel 19



A D T

## Channel 39



A D T

## 4.5 HOPPING CHANNEL SEPARATION

### 4.5.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25 kHz or two-thirds of 20dB hopping channel bandwidth (whichever is greater).

### 4.5.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER   | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|------------------------------|-----------|------------|-----------------|------------------|
| PSA Series Spectrum Analyzer | FSP40     | 100036     | Dec. 08, 2010   | Dec. 07, 2011    |

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

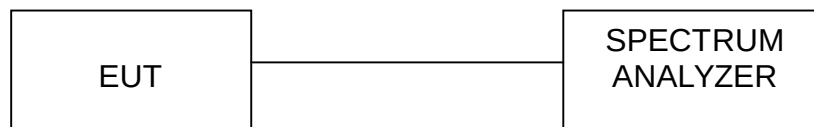
### 4.5.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

#### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.5.5 TEST SETUP



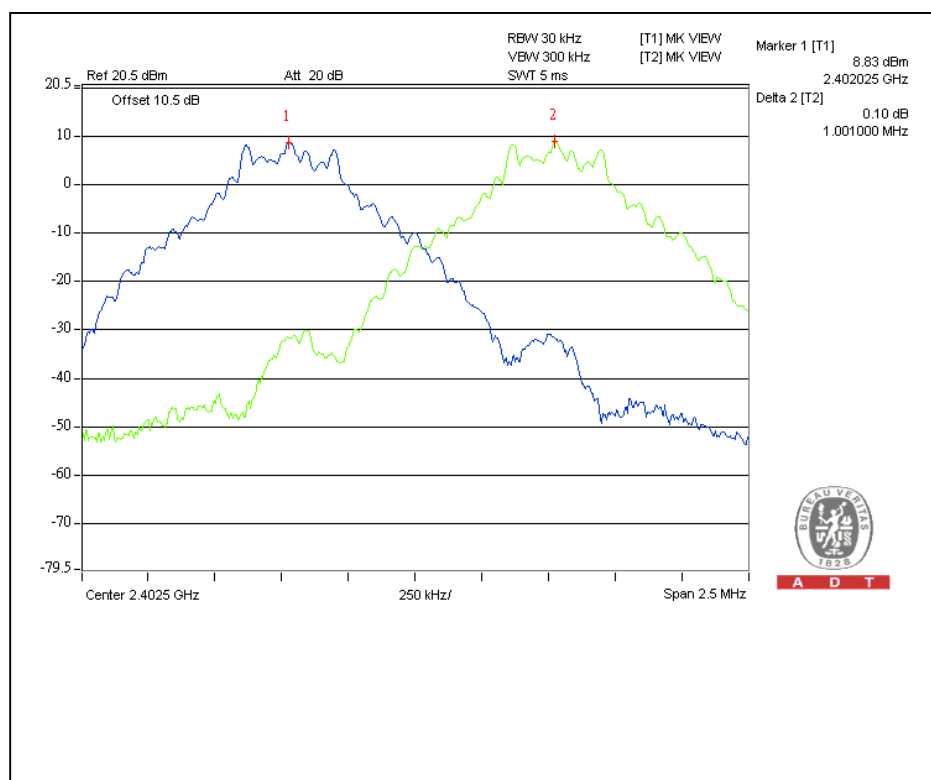
## 4.5.6 TEST RESULTS

### For GFSK

| Channel | Frequency (MHz) | Adjacent Channel Separation (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|-----------------------------------|---------------------|-------------|
| 0       | 2402            | 1.001                             | 0.627               | PASS        |
| 39      | 2441            | 1.003                             | 0.627               | PASS        |
| 78      | 2480            | 1.000                             | 0.627               | PASS        |

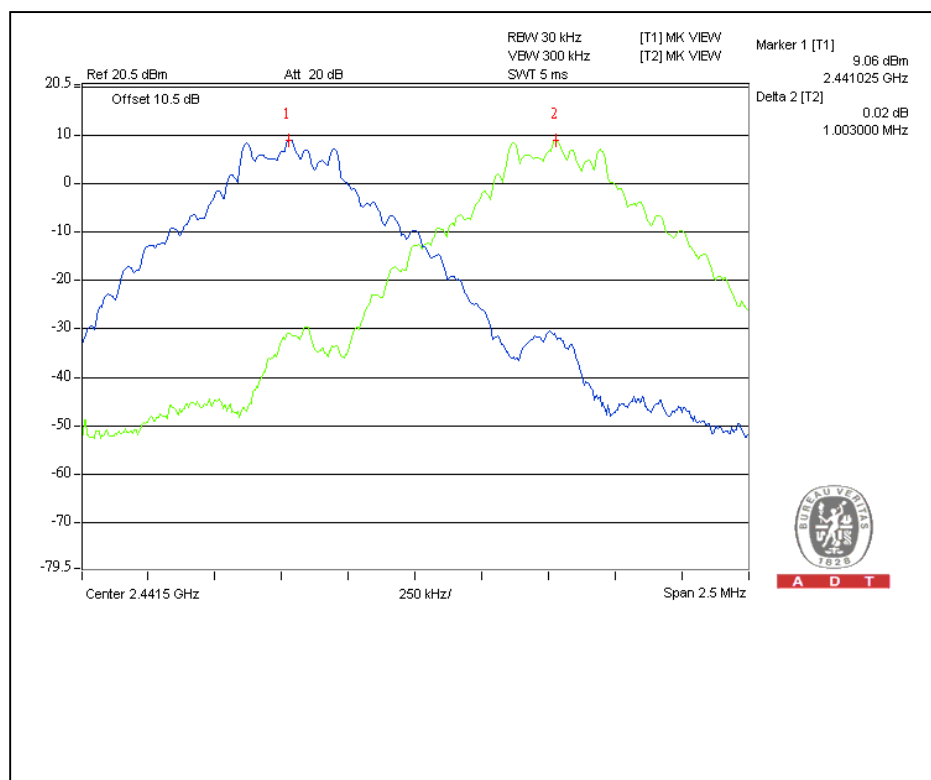
The minimum limit is two-thirds of 20dB bandwidth. Test results please refer to below pages.

### Channel 0

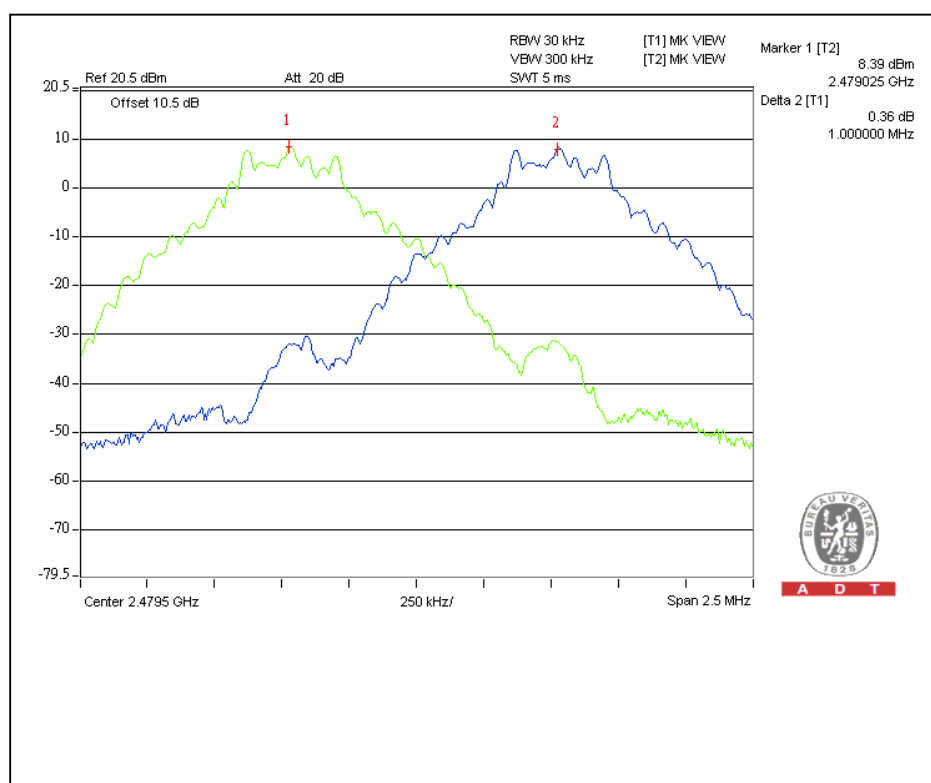




## Channel 39



## Channel 78





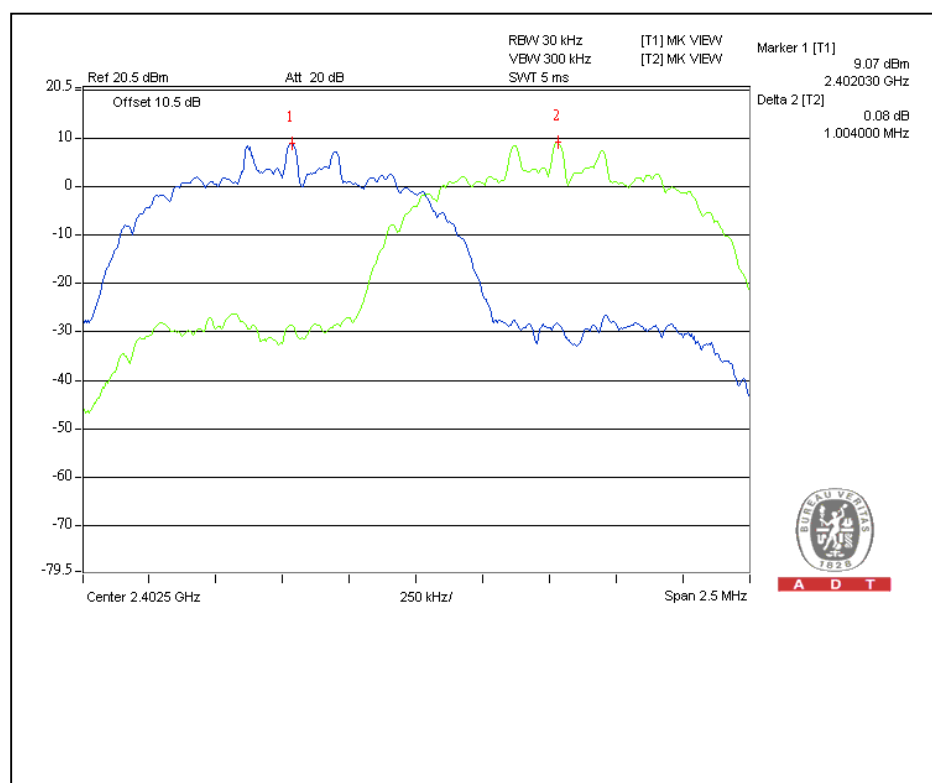
A D T

### For 8DPSK

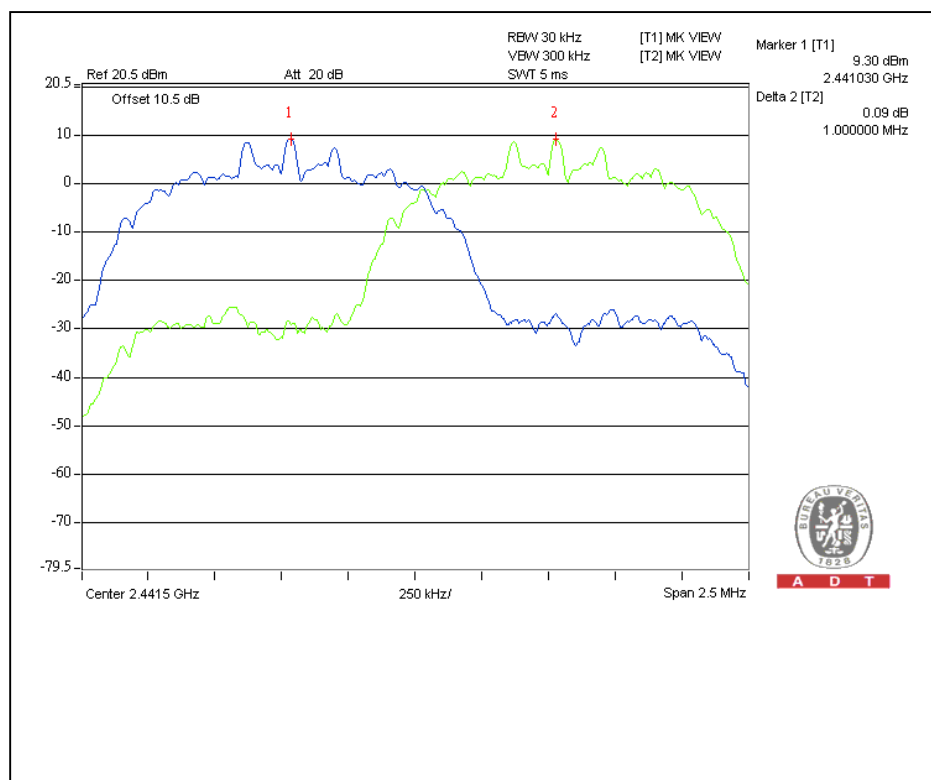
| Channel | Frequency (MHz) | Adjacent Channel Separation (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|-----------------------------------|---------------------|-------------|
| 0       | 2402            | 1.004                             | 0.860               | PASS        |
| 39      | 2441            | 1.000                             | 0.867               | PASS        |
| 78      | 2480            | 1.001                             | 0.860               | PASS        |

The minimum limit is two-thirds of 20dB bandwidth. Test results please refer to below pages.

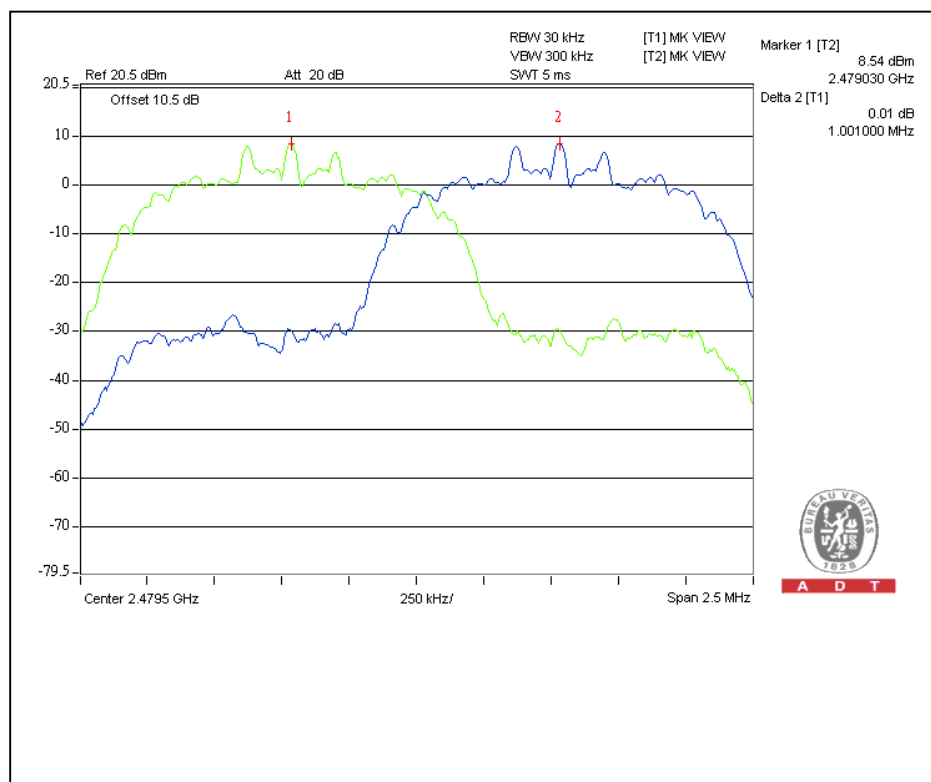
### Channel 0



## Channel 39



## Channel 78

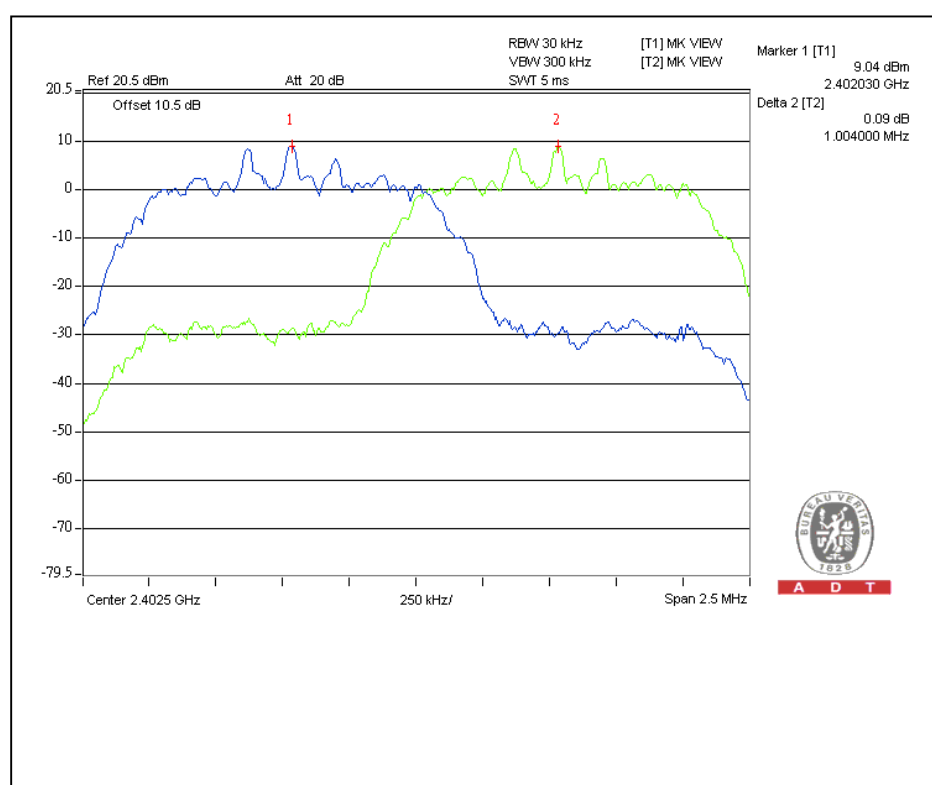


# For $\pi/4$ -DQPSK

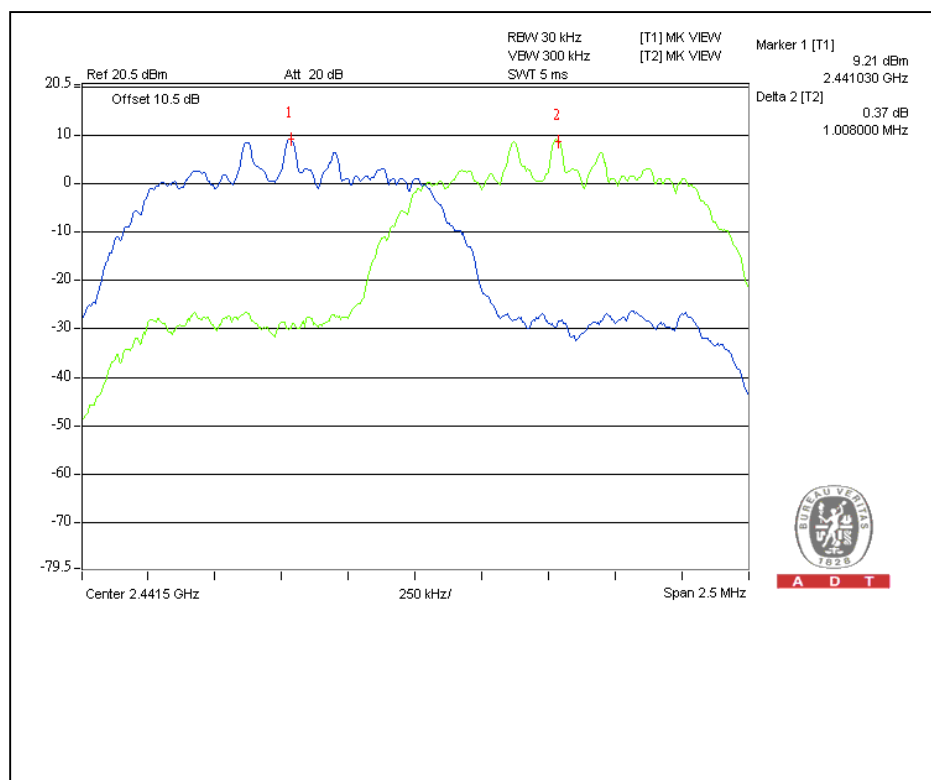
| Channel | Frequency (MHz) | Adjacent Channel Separation (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|-----------------------------------|---------------------|-------------|
| 0       | 2402            | 1.004                             | 0.853               | PASS        |
| 39      | 2441            | 1.008                             | 0.853               | PASS        |
| 78      | 2480            | 1.000                             | 0.847               | PASS        |

The minimum limit is two-thirds of 20dB bandwidth. Test results please refer to below pages.

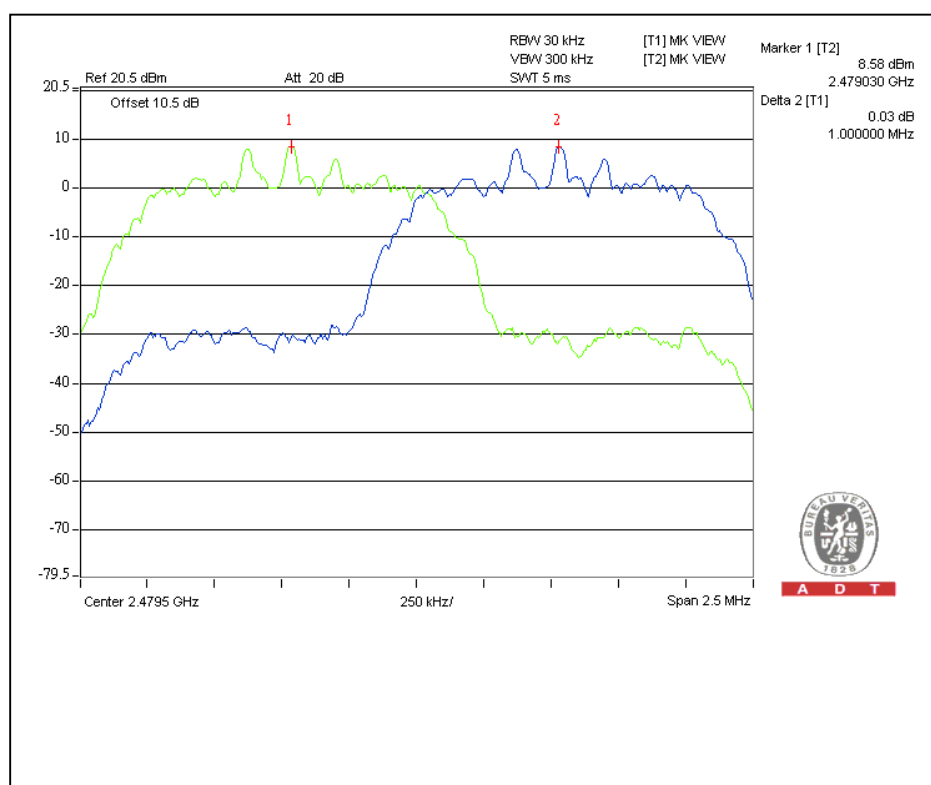
## Channel 0



## Channel 39



## Channel 78

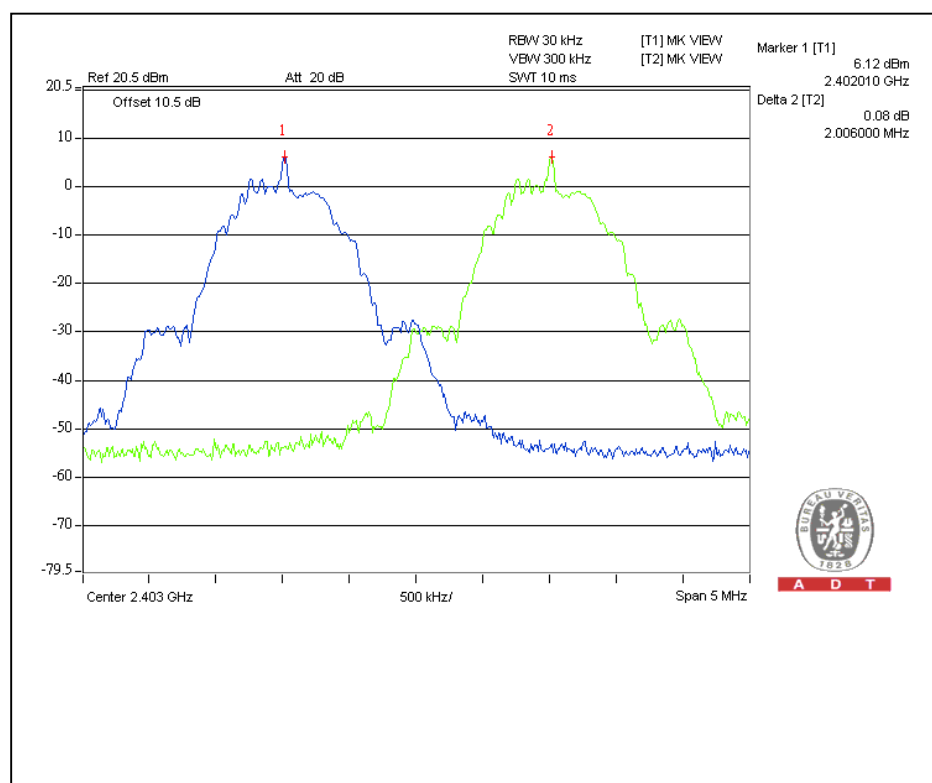


# For additional GFSK

| Channel | Frequency (MHz) | Adjacent Channel Separation (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|-----------------------------------|---------------------|-------------|
| 0       | 2402            | 2.006                             | 0.720               | PASS        |
| 19      | 2440            | 2.000                             | 0.720               | PASS        |
| 39      | 2480            | 2.007                             | 0.727               | PASS        |

The minimum limit is two-thirds of 20dB bandwidth. Test results please refer to below pages.

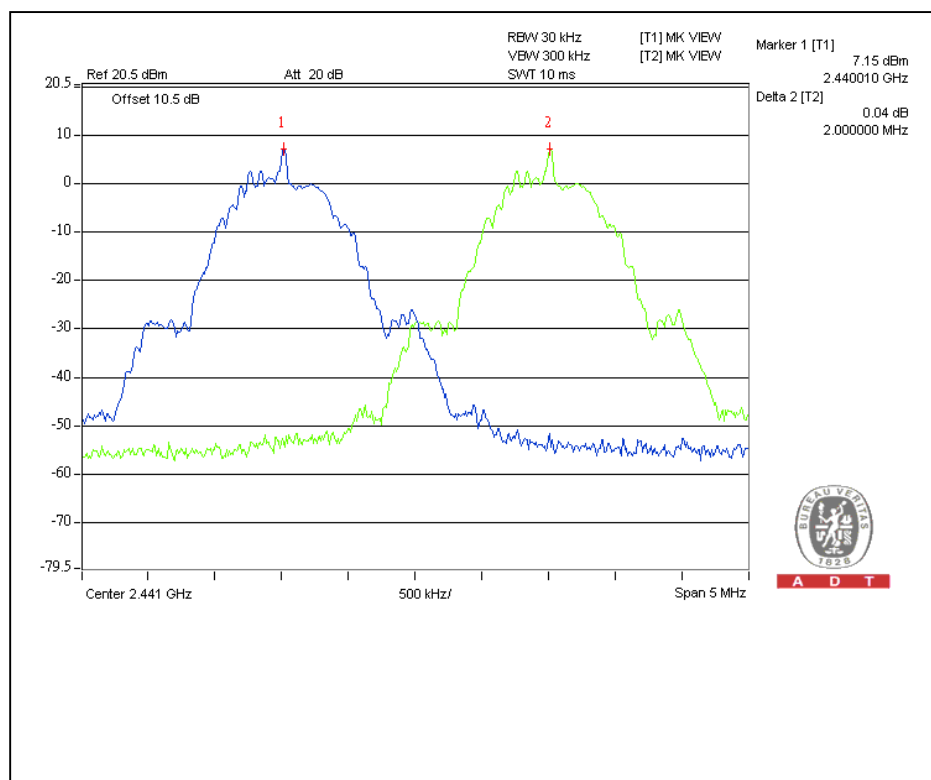
## Channel 0



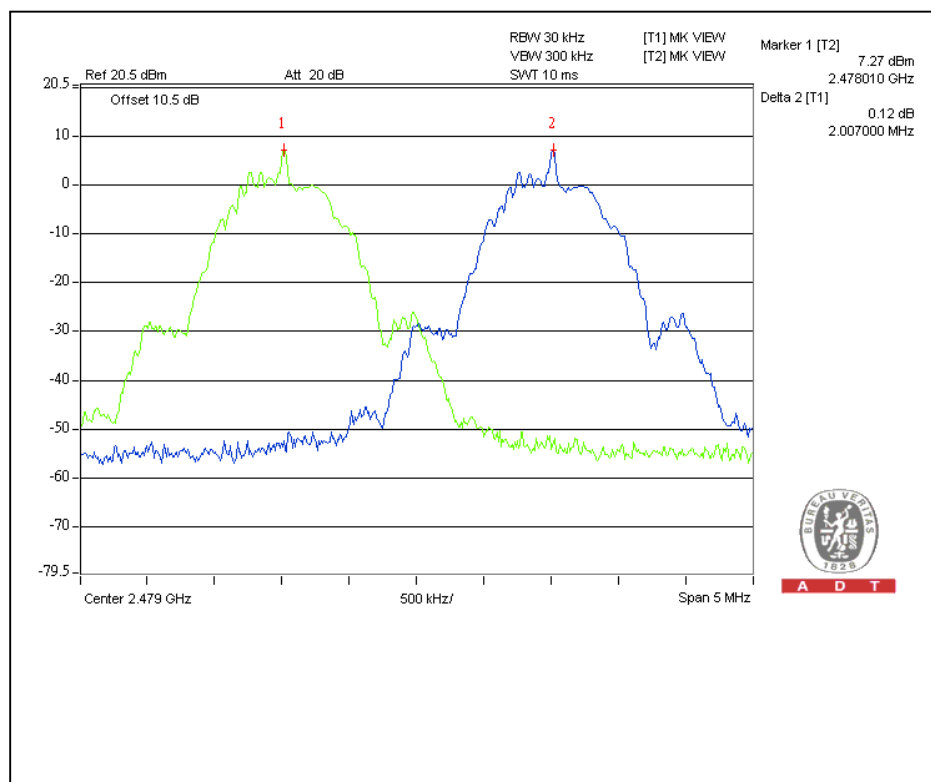


A D T

## Channel 19



## Channel 39



## 4.6 MAXIMUM PEAK OUTPUT POWER

### 4.6.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Limit is 125mW.

### 4.6.2 INSTRUMENTS

| DESCRIPTION & MANUFACTURER   | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|------------------------------|-----------|------------|-----------------|------------------|
| PSA Series Spectrum Analyzer | FSP40     | 100036     | Dec. 08, 2010   | Dec. 07, 2011    |

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3 MHz RBW and 10 MHz VBW.
4. Measure the captured power within the band and recording the plot.
5. Repeat above procedures until all frequencies measured were complete.

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation



#### 4.6.5 TEST SETUP



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

#### 4.6.6 EUT OPERATING CONDITION

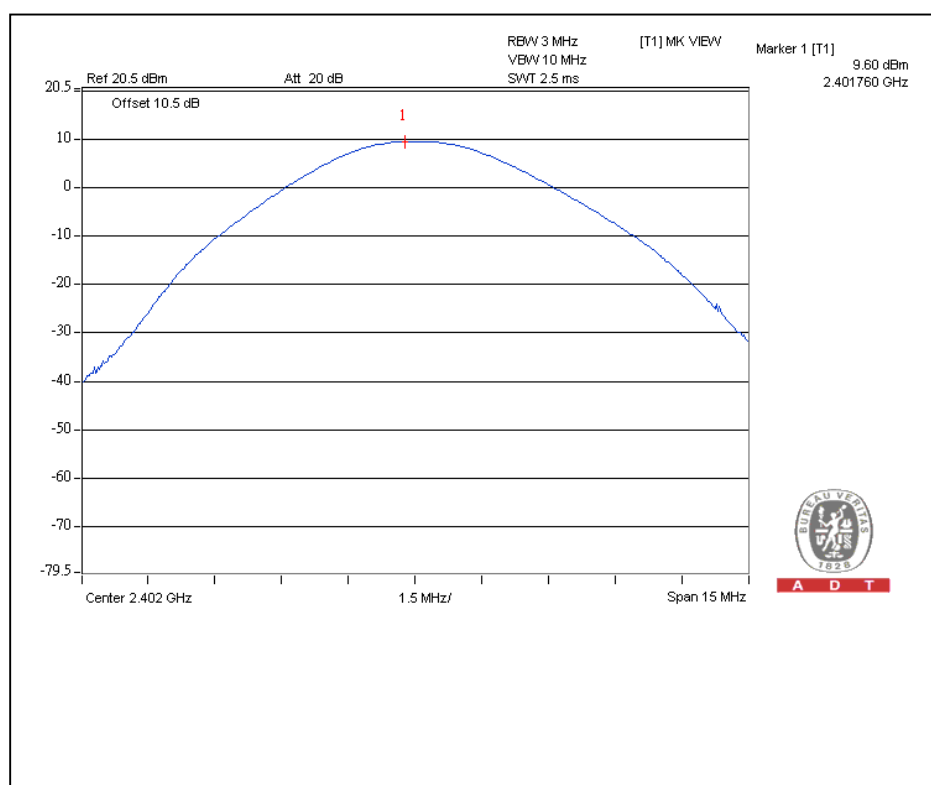
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

## 4.6.7 TEST RESULTS

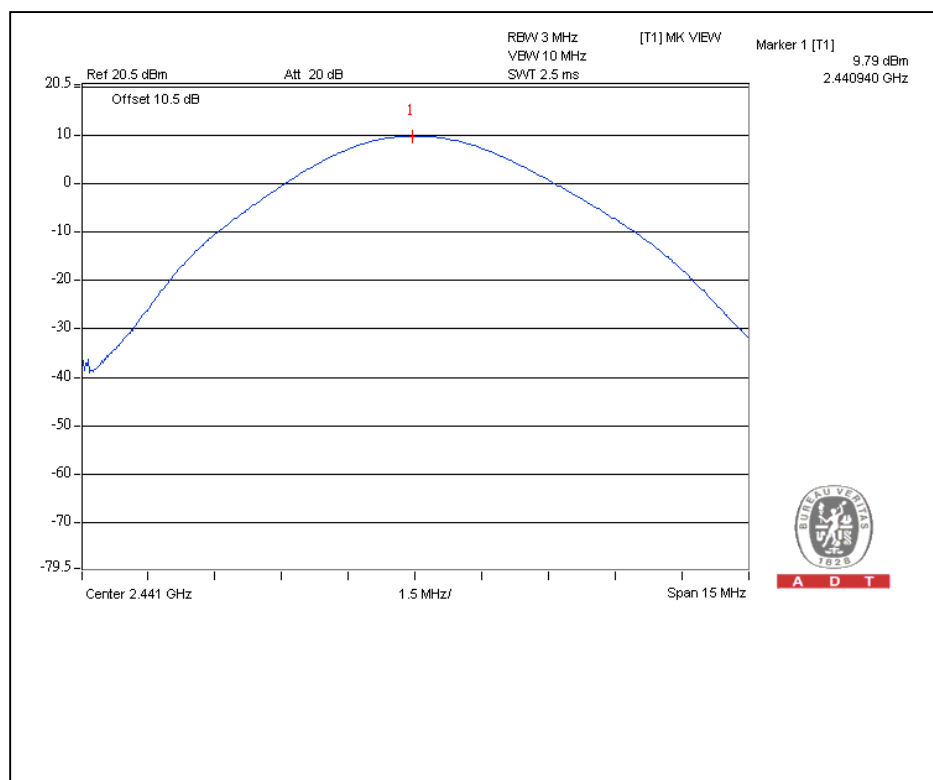
### For GFSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (dBm) | PEAK POWER OUTPUT (mW) | PEAK POWER LIMIT (mW) | PASS/FAIL |
|---------|-------------------------|-------------------------|------------------------|-----------------------|-----------|
| 0       | 2402                    | 9.6                     | 9.1                    | 125                   | PASS      |
| 39      | 2441                    | 9.8                     | 9.5                    | 125                   | PASS      |
| 78      | 2480                    | 9.2                     | 8.3                    | 125                   | PASS      |

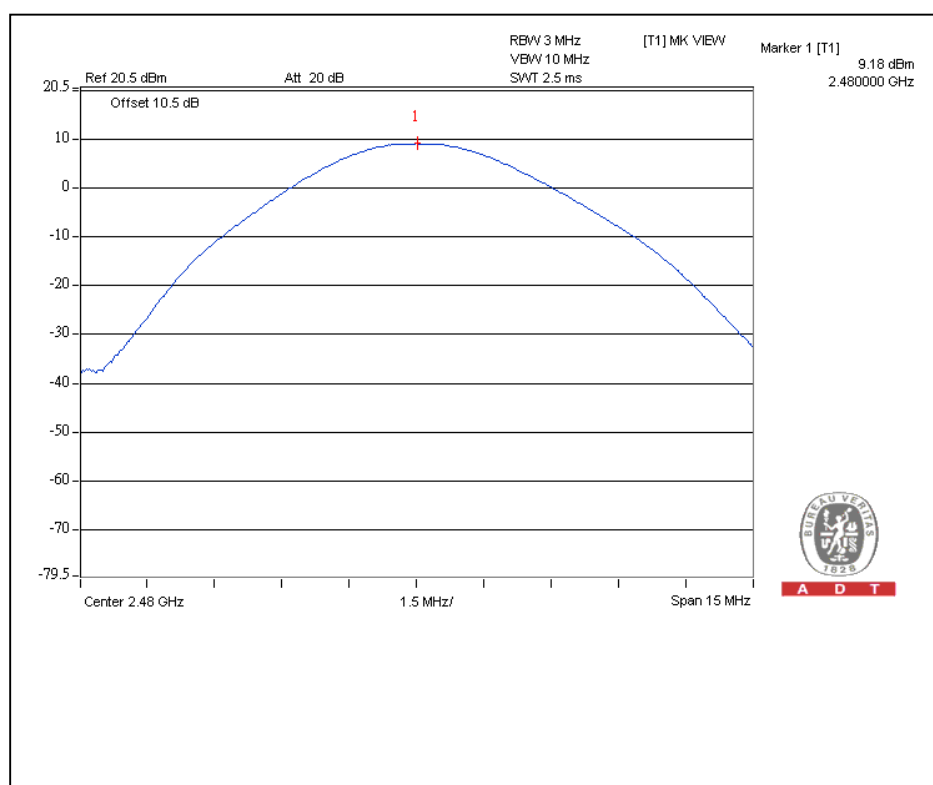
### Channel 0



## Channel 39



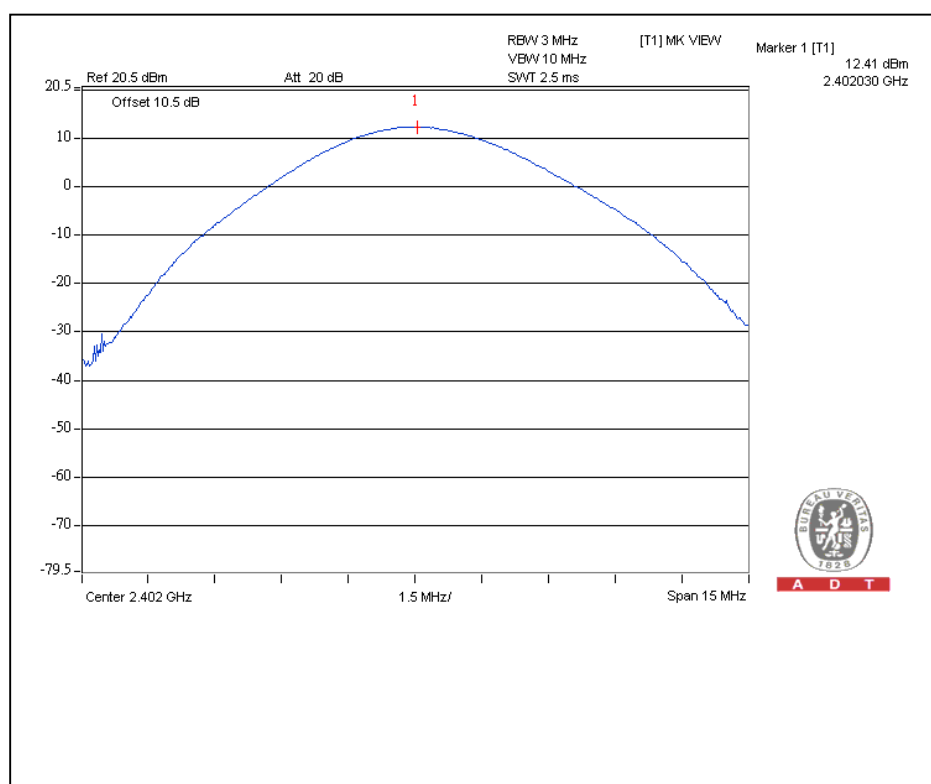
## Channel 78



# For 8DPSK

| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | PEAK POWER<br>OUTPUT<br>(dBm) | PEAK POWER<br>OUTPUT<br>(mW) | PEAK POWER<br>LIMIT (mW) | PASS/FAIL |
|---------|-------------------------------|-------------------------------|------------------------------|--------------------------|-----------|
| 0       | 2402                          | 12.4                          | 17.4                         | 125                      | PASS      |
| 39      | 2441                          | 12.4                          | 17.4                         | 125                      | PASS      |
| 78      | 2480                          | 11.8                          | 15.1                         | 125                      | PASS      |

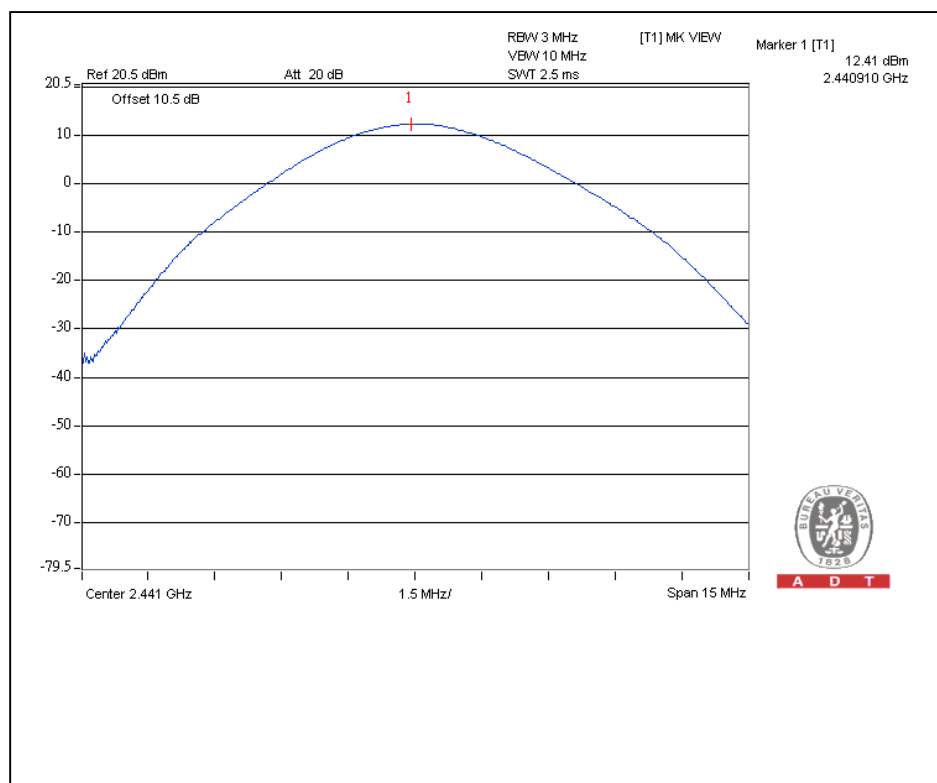
## Channel 0



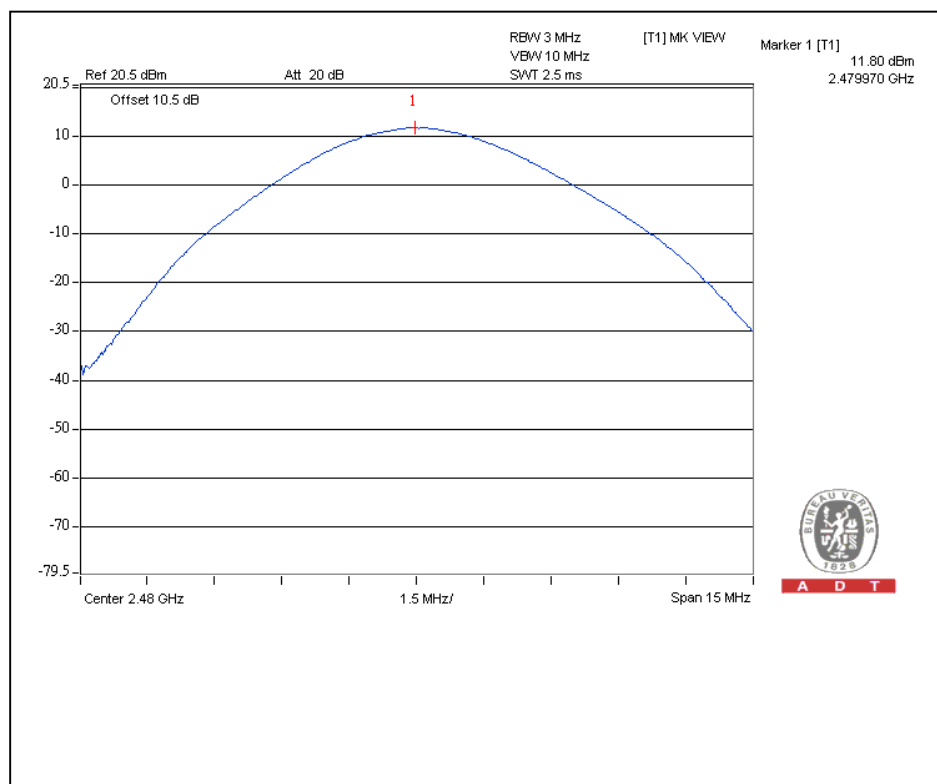


A D T

## Channel 39



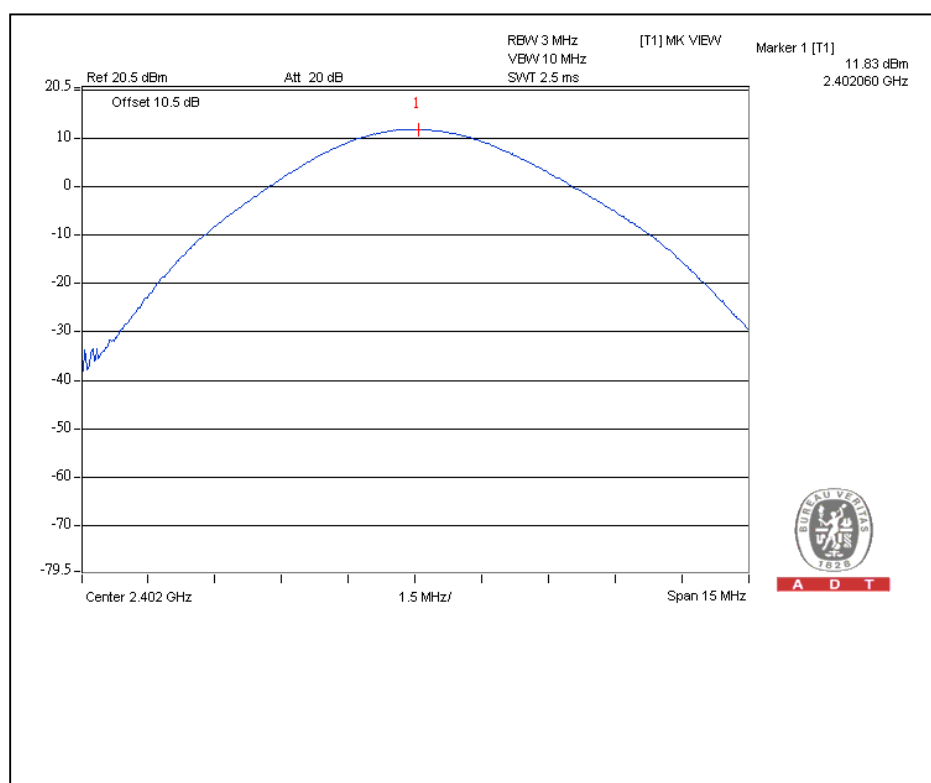
## Channel 78



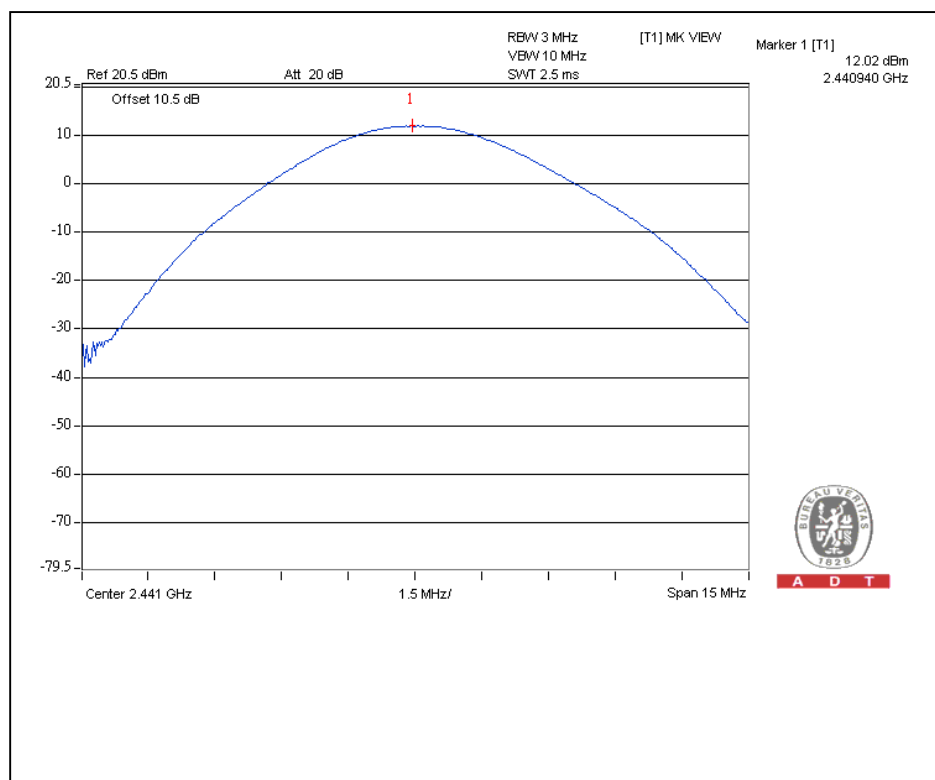
For  $\pi/4$ -QPSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (dBm) | PEAK POWER OUTPUT (mW) | PEAK POWER LIMIT (mW) | PASS/FAIL |
|---------|-------------------------|-------------------------|------------------------|-----------------------|-----------|
| 0       | 2402                    | 11.8                    | 15.1                   | 125                   | PASS      |
| 39      | 2441                    | 12.0                    | 15.8                   | 125                   | PASS      |
| 78      | 2480                    | 11.3                    | 13.5                   | 125                   | PASS      |

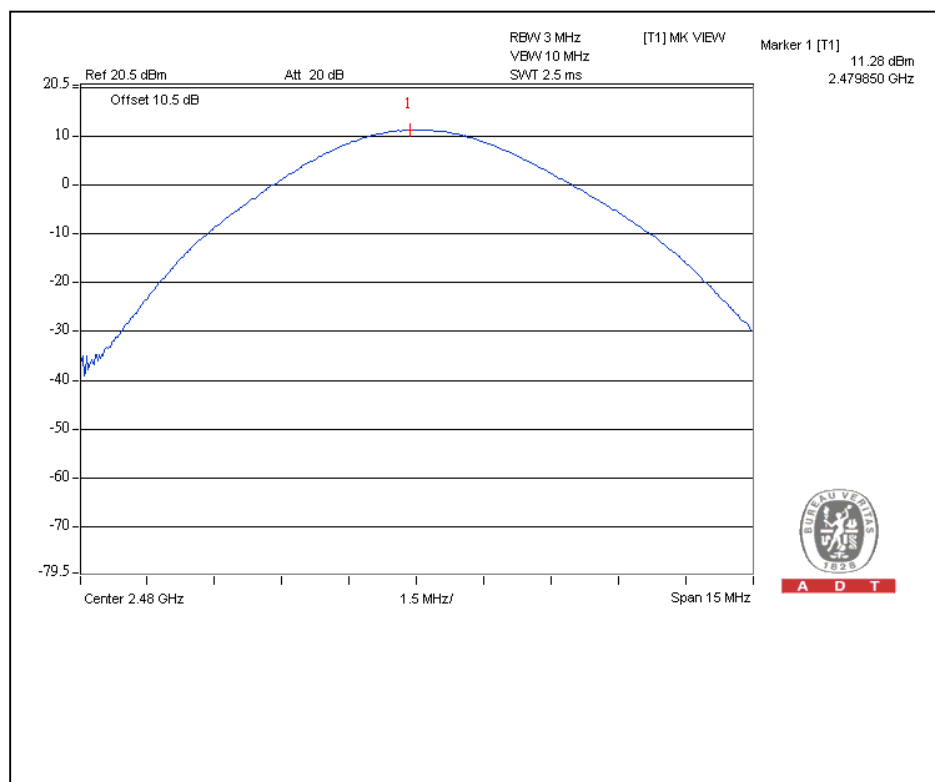
## Channel 0



## Channel 39



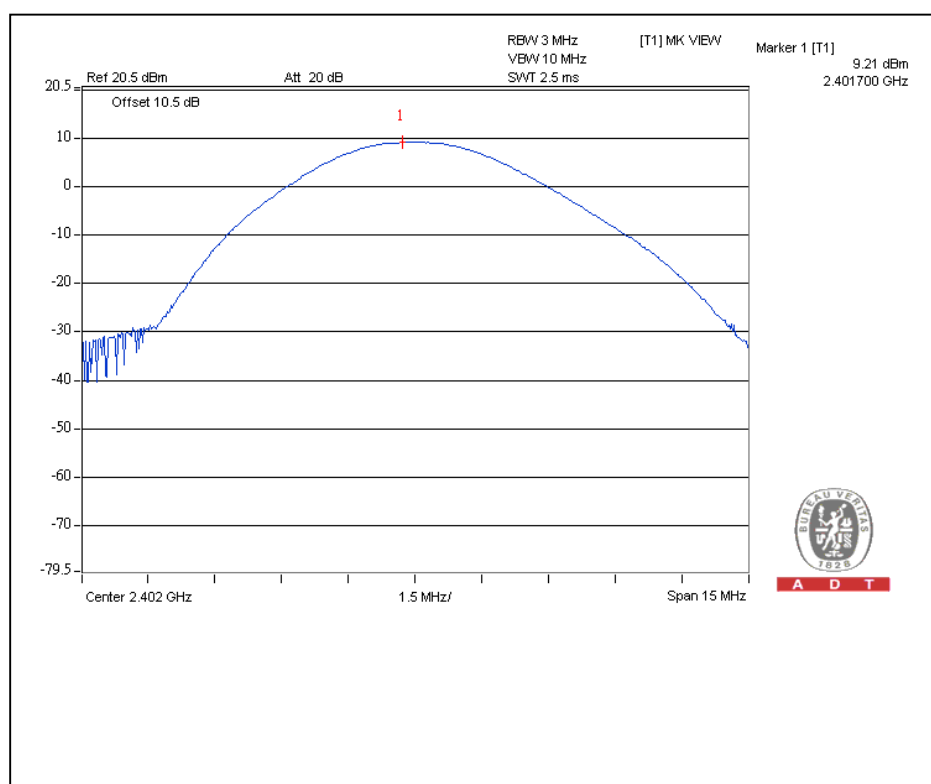
## Channel 78



### For additional GFSK

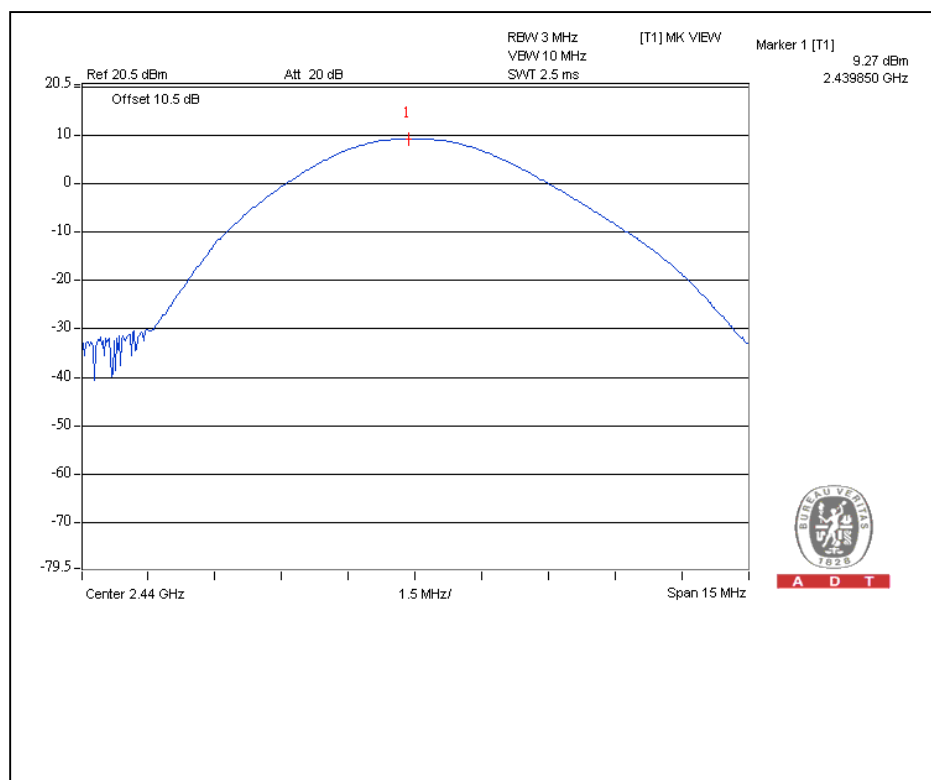
| CHANNEL | CHANNEL<br>FREQUENCY<br>(MHz) | PEAK POWER<br>OUTPUT<br>(dBm) | PEAK POWER<br>OUTPUT<br>(mW) | PEAK POWER<br>LIMIT (mW) | PASS/FAIL |
|---------|-------------------------------|-------------------------------|------------------------------|--------------------------|-----------|
| 0       | 2402                          | 9.2                           | 8.3                          | 125                      | PASS      |
| 19      | 2440                          | 9.3                           | 8.5                          | 125                      | PASS      |
| 39      | 2480                          | 8.8                           | 7.6                          | 125                      | PASS      |

### Channel 0

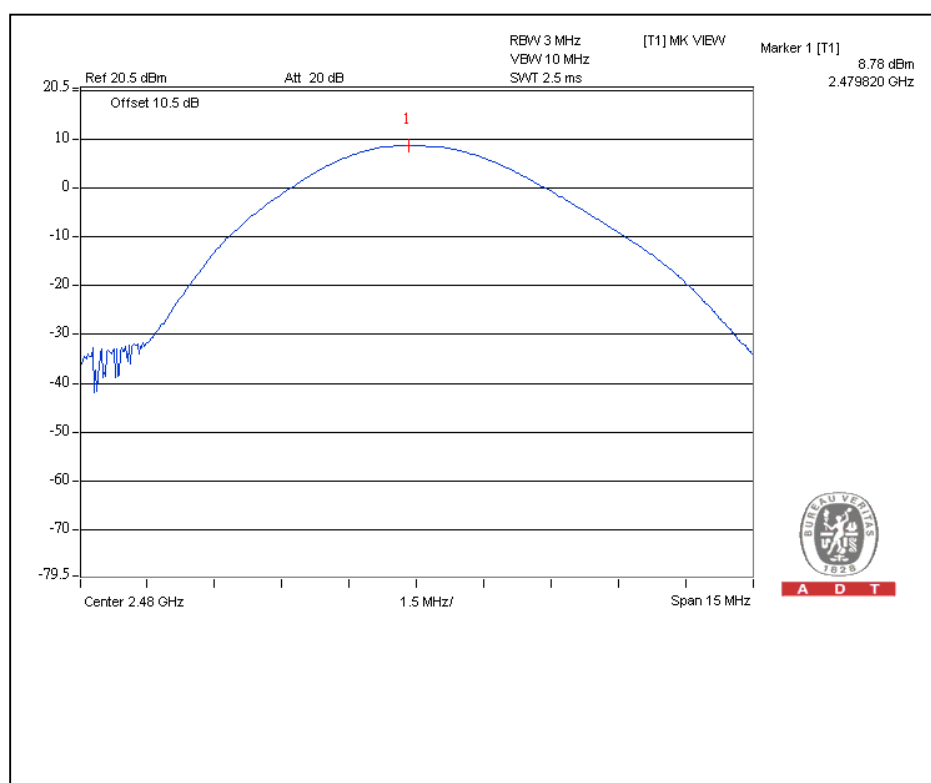




## Channel 19



## Channel 39



## 4.7 AVERAGE OUTPUT POWER

### 4.7.1 FOR REFERENCE.

### 4.7.2 INSTRUMENTS

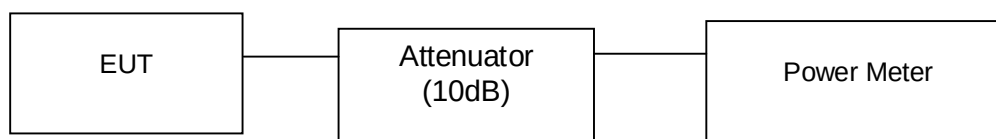
| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Peak Power Meter           | ML2495A   | 0824006    | May 04, 2010    | May 03, 2011     |
| Power Sensor               | MA2411B   | 0738172    | May 04, 2010    | May 03, 2011     |

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.7.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator, the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the average power level.

### 4.7.4 TEST SETUP



### 4.7.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

#### 4.7.6 TEST RESULTS

##### For GFSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER OUTPUT (dBm) |
|---------|-------------------------|----------------------------|
| 0       | 2402                    | 10.5                       |
| 39      | 2441                    | 10.6                       |
| 78      | 2480                    | 9.9                        |

##### For 8DPSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER OUTPUT (dBm) |
|---------|-------------------------|----------------------------|
| 0       | 2402                    | 10.5                       |
| 39      | 2441                    | 10.6                       |
| 78      | 2480                    | 9.8                        |

##### For $\pi/4$ -DQPSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER OUTPUT (dBm) |
|---------|-------------------------|----------------------------|
| 0       | 2402                    | 10.4                       |
| 39      | 2441                    | 10.6                       |
| 78      | 2480                    | 9.8                        |

##### For additional GFSK

| CHANNEL | CHANNEL FREQUENCY (MHz) | AVERAGE POWER OUTPUT (dBm) |
|---------|-------------------------|----------------------------|
| 0       | 2402                    | 9.38                       |
| 19      | 2440                    | 9.75                       |
| 39      | 2480                    | 9.32                       |

## 4.8 RADIATED EMISSION MEASUREMENT

### 4.8.1 LIMITS OF RADIATED EMISSION MEASUREMENT

#### For transmitter part:

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209(RSS-Gen table 5, 6) as following:

| Frequencies (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009-0.490       | 2400/F(kHz)                       | 300                           |
| 0.490-1.705       | 24000/F(kHz)                      | 30                            |
| 1.705-30.0        | 30                                | 30                            |
| 30-88             | 100                               | 3                             |
| 88-216            | 150                               | 3                             |
| 216-960           | 200                               | 3                             |
| Above 960         | 500                               | 3                             |

#### NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

### For receiver part:

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in RSS-Gen table 2 as following:

| Frequencies (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 30-88             | 100                               | 3                             |
| 88-216            | 150                               | 3                             |
| 216-960           | 200                               | 3                             |
| Above 960         | 500                               | 3                             |

### NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in RSS-Gen 7.2.3, for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

## 4.8.2 TEST INSTRUMENTS

**For Below 1GHz: Test date: Dec. 22, 2010**

| DESCRIPTION & MANUFACTURER           | MODEL NO.                   | SERIAL NO.                          | CALIBRATED DATE | CALIBRATED UNTIL |
|--------------------------------------|-----------------------------|-------------------------------------|-----------------|------------------|
| Agilent Spectrum Analyzer            | E4446A                      | MY48250253                          | Aug. 23, 2010   | Aug. 22, 2011    |
| Agilent Pre-Selector                 | N9039A                      | MY46520310                          | Aug. 23, 2010   | Aug. 22, 2011    |
| Agilent Signal Generator             | N5181A                      | MY49060347                          | July 30, 2010   | July 29, 2011    |
| LIG NEX1 Test Receiver               | ER-265                      | L09068005                           | Oct. 25, 2010   | Oct. 24, 2011    |
| Mini-Circuits Pre-Amplifier          | ZFL-1000VH2B                | AMP-ZFL-04                          | Nov. 16, 2010   | Nov. 15, 2011    |
| Agilent Pre-Amplifier                | 8449B                       | 3008A02465                          | Mar. 01, 2010   | Feb. 28, 2011    |
| Miteq Pre-Amplifier                  | AFS33-1800265<br>0-30-8P-44 | 881786                              | NA              | NA               |
| SCHWARZBECK Trilog Broadband Antenna | VULB 9168                   | 9168-361                            | Apr. 28, 2010   | Apr. 27, 2011    |
| AISI Horn_Antenna                    | AIH.8018                    | 0000220091110                       | Nov. 22, 2010   | Nov. 21, 2011    |
| SCHWARZBECK Horn_Antenna             | BBHA 9170                   | 9170-424                            | Oct. 08, 2010   | Oct. 07, 2011    |
| RF CABLE                             | NA                          | RF104-205<br>RF104-207<br>RF104-208 | Dec. 24, 2009   | Dec. 23, 2010    |
| RF Cable                             | NA                          | CHHCAB_001                          | NA              | NA               |
| Software                             | ADT_Radiated_V8.7.05        | NA                                  | NA              | NA               |
| CT Antenna Tower & Turn Table        | NA                          | NA                                  | NA              | NA               |

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.  
3. The test was performed in 966 Chamber No. H.  
4. The FCC Site Registration No. is 797305.  
5. The CANADA Site Registration No. is IC 7450H-3.



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**For Above 1GHz: Test date: Dec. 22, 2010**

| DESCRIPTION & MANUFACTURER           | MODEL NO.                   | SERIAL NO.                          | CALIBRATED DATE | CALIBRATED UNTIL |
|--------------------------------------|-----------------------------|-------------------------------------|-----------------|------------------|
| Agilent Spectrum Analyzer            | E4446A                      | MY48250254                          | July 14, 2010   | July 13, 2011    |
| Agilent Pre-Selector                 | N9039A                      | MY46520311                          | July 14, 2010   | July 13, 2011    |
| Agilent Signal Generator             | N5181A                      | MY49060517                          | July 14, 2010   | July 13, 2011    |
| Mini-Circuits Pre-Amplifier          | ZFL-1000VH2B                | AMP-ZFL-03                          | Nov. 16, 2010   | Nov. 15, 2011    |
| Agilent Pre-Amplifier                | 8449B                       | 3008A02578                          | July 05, 2010   | July 04, 2011    |
| Miteq Pre-Amplifier                  | AFS33-1800265<br>0-30-8P-44 | 881786                              | NA              | NA               |
| SCHWARZBECK Trilog Broadband Antenna | VULB 9168                   | 9168-360                            | Apr. 29, 2010   | Apr. 28, 2011    |
| AISI Horn_Antenna                    | AIH.8018                    | 0000320091110                       | Nov. 12, 2010   | Nov. 11, 2011    |
| SCHWARZBECK Horn_Antenna             | BBHA 9170                   | 9170-424                            | Oct. 08, 2010   | Oct. 07, 2011    |
| RF CABLE                             | NA                          | RF104-201<br>RF104-203<br>RF104-204 | Dec. 24, 2009   | Dec. 23, 2010    |
| RF Cable                             | NA                          | CHGCAB_001                          | NA              | NA               |
| Software                             | ADT_Radiated_<br>V8.7.05    | NA                                  | NA              | NA               |
| CT Antenna Tower & Turn Table        | NA                          | NA                                  | NA              | NA               |

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. G.

4. The FCC Site Registration No. is 966073.

5. The VCCI Site Registration No. is G-137.

6. The CANADA Site Registration No. is IC 7450H-2.

#### 4.8.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meters chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- a. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

**NOTE:**

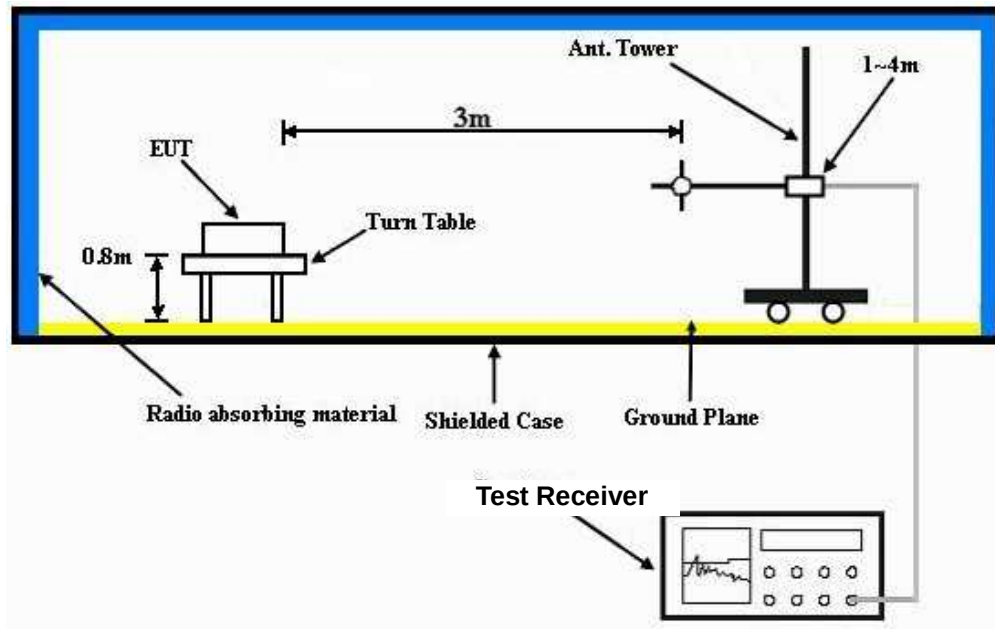
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.8.4 DEVIATION FROM TEST STANDARD

No deviation



## 4.8.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.8.6 TEST RESULTS (FOR TRANSMITTER PART)

##### 4.8.6.1 TEST RESULTS (PIFA Antenna - Bluetooth traditional GFSK/ $\pi$ /4-DQPSK/ 8DPSK)

##### BELOW 1GHz WORST-CASE DATA : 8DPSK MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 70%RH<br>1011 hPa | TESTED BY          | Eric Lee      |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 141.56      | 36.3 QP                 | 43.5           | -7.2        | 1.00 H             | 236                  | 22.17            | 14.13                    |
| 2                                                   | 148.01      | 39.8 QP                 | 43.5           | -3.7        | 1.50 H             | 47                   | 25.57            | 14.23                    |
| 3                                                   | 166.50      | 42.1 QP                 | 43.5           | -1.4        | 1.75 H             | 168                  | 28.12            | 13.98                    |
| 4                                                   | 184.53      | 35.6 QP                 | 43.5           | -7.9        | 1.25 H             | 86                   | 23.30            | 12.33                    |
| 5                                                   | 199.18      | 41.9 QP                 | 43.5           | -1.6        | 1.00 H             | 207                  | 30.62            | 11.24                    |
| 6                                                   | 499.51      | 33.9 QP                 | 46.0           | -12.1       | 1.50 H             | 86                   | 13.95            | 19.95                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 146.29      | 30.7 QP                 | 43.5           | -12.8       | 1.00 V             | 149                  | 16.52            | 14.21                    |
| 2                                                   | 166.42      | 36.1 QP                 | 43.5           | -7.4        | 1.00 V             | 190                  | 22.15            | 13.99                    |
| 3                                                   | 183.83      | 33.6 QP                 | 43.5           | -9.9        | 1.00 V             | 324                  | 21.25            | 12.38                    |
| 4                                                   | 199.23      | 34.2 QP                 | 43.5           | -9.3        | 1.50 V             | 326                  | 23.00            | 11.24                    |
| 5                                                   | 299.77      | 32.7 QP                 | 46.0           | -13.3       | 1.50 V             | 309                  | 17.75            | 14.92                    |
| 6                                                   | 499.55      | 35.3 QP                 | 46.0           | -10.7       | 1.25 V             | 297                  | 15.35            | 19.95                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.



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## ABOVE 1GHz WORST-CASE DATA :

## GFSK MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 64%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 57.1 PK                 | 74.0           | -16.9       | 1.16 H             | 20                   | 25.57            | 31.53                    |
| 2                                                   | 2322.00     | 46.2 AV                 | 54.0           | -7.8        | 1.16 H             | 20                   | 14.67            | 31.53                    |
| 3                                                   | *2402.00    | 107.5 PK                |                |             | 1.15 H             | 12                   | 75.70            | 31.80                    |
| 4                                                   | *2402.00    | 99.6 AV                 |                |             | 1.15 H             | 12                   | 67.80            | 31.80                    |
| 5                                                   | 4804.00     | 55.5 PK                 | 74.0           | -18.5       | 1.07 H             | 106                  | 16.30            | 39.20                    |
| 6                                                   | 4804.00     | 47.8 AV                 | 54.0           | -6.2        | 1.07 H             | 106                  | 8.60             | 39.20                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 55.2 PK                 | 74.0           | -18.8       | 1.00 V             | 18                   | 23.67            | 31.53                    |
| 2                                                   | 2322.00     | 44.4 AV                 | 54.0           | -9.6        | 1.00 V             | 18                   | 12.87            | 31.53                    |
| 3                                                   | *2402.00    | 105.7 PK                |                |             | 1.01 V             | 20                   | 73.90            | 31.80                    |
| 4                                                   | *2402.00    | 95.9 AV                 |                |             | 1.01 V             | 20                   | 64.10            | 31.80                    |
| 5                                                   | 4804.00     | 57.9 PK                 | 74.0           | -16.1       | 1.00 V             | 200                  | 18.70            | 39.20                    |
| 6                                                   | 4804.00     | 50.2 AV                 | 54.0           | -3.8        | 1.00 V             | 200                  | 11.00            | 39.20                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* ”: Fundamental frequency.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 64%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2441.00    | 107.6 PK                |                |             | 1.14 H             | 20                   | 75.67            | 31.93                    |
| 2                                                   | *2441.00    | 98.2 AV                 |                |             | 1.14 H             | 20                   | 66.27            | 31.93                    |
| 3                                                   | 4882.00     | 56.1 PK                 | 74.0           | -17.9       | 1.10 H             | 111                  | 16.63            | 39.47                    |
| 4                                                   | 4882.00     | 48.4 AV                 | 54.0           | -5.6        | 1.10 H             | 111                  | 8.93             | 39.47                    |
| 5                                                   | 7323.00     | 51.9 PK                 | 74.0           | -22.1       | 1.46 H             | 38                   | 5.14             | 46.76                    |
| 6                                                   | 7323.00     | 38.9 AV                 | 54.0           | -15.1       | 1.46 H             | 38                   | -7.86            | 46.76                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2441.00    | 106.0 PK                |                |             | 1.00 V             | 18                   | 74.07            | 31.93                    |
| 2                                                   | *2441.00    | 96.4 AV                 |                |             | 1.00 V             | 18                   | 64.47            | 31.93                    |
| 3                                                   | 4882.00     | 58.1 PK                 | 74.0           | -15.9       | 1.00 V             | 243                  | 18.63            | 39.47                    |
| 4                                                   | 4882.00     | 50.3 AV                 | 54.0           | -3.7        | 1.00 V             | 243                  | 10.83            | 39.47                    |
| 5                                                   | 7323.00     | 52.5 PK                 | 74.0           | -21.5       | 1.09 V             | 21                   | 5.74             | 46.76                    |
| 6                                                   | 7323.00     | 39.2 AV                 | 54.0           | -14.8       | 1.09 V             | 21                   | -7.56            | 46.76                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.



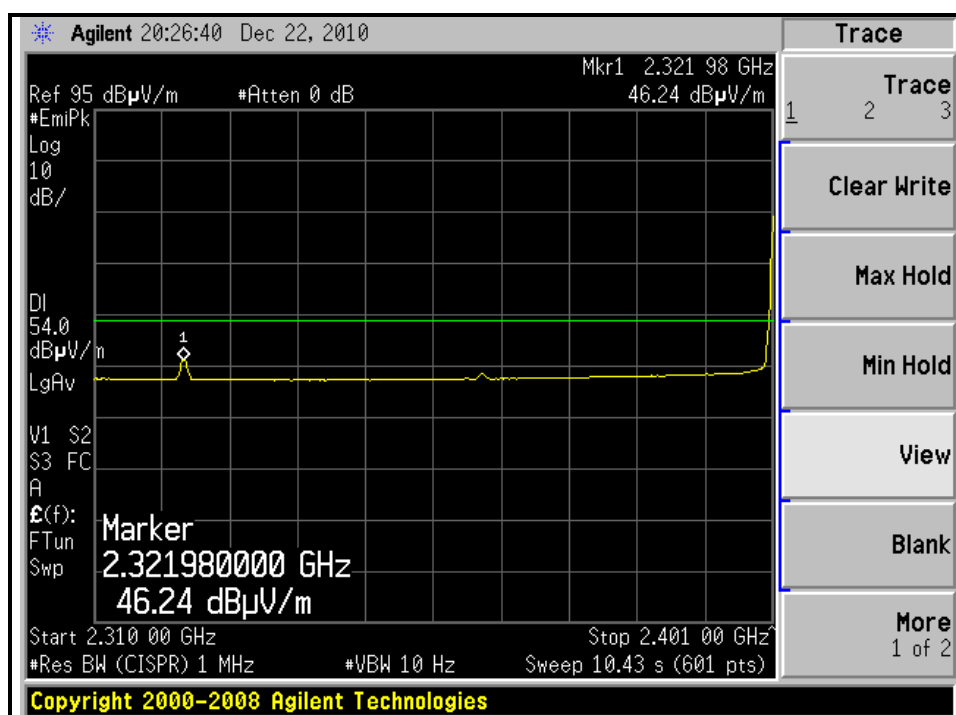
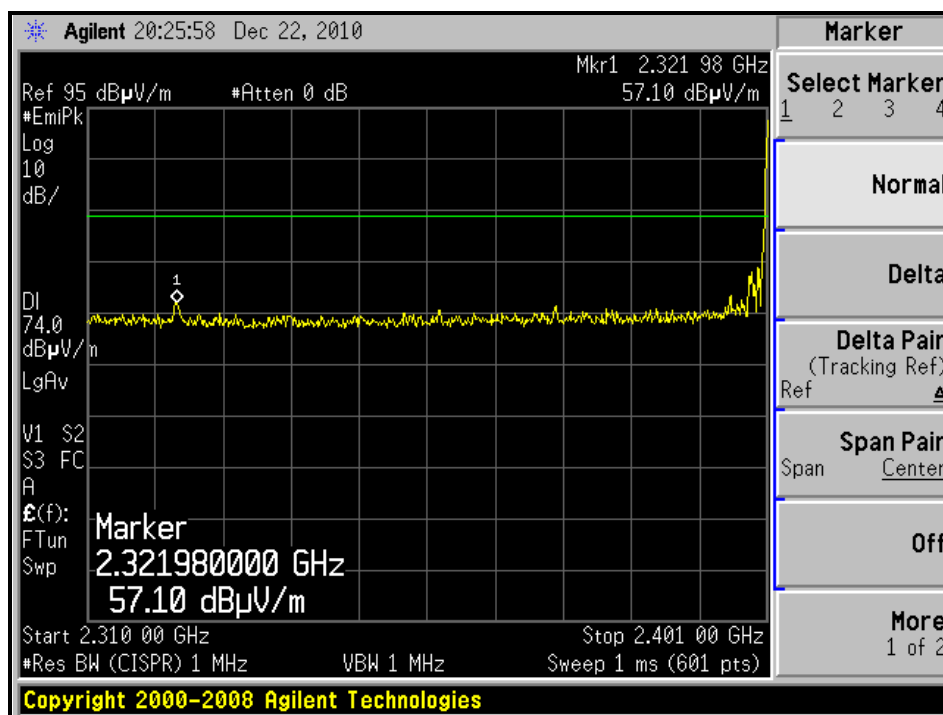
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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 78                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 64%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

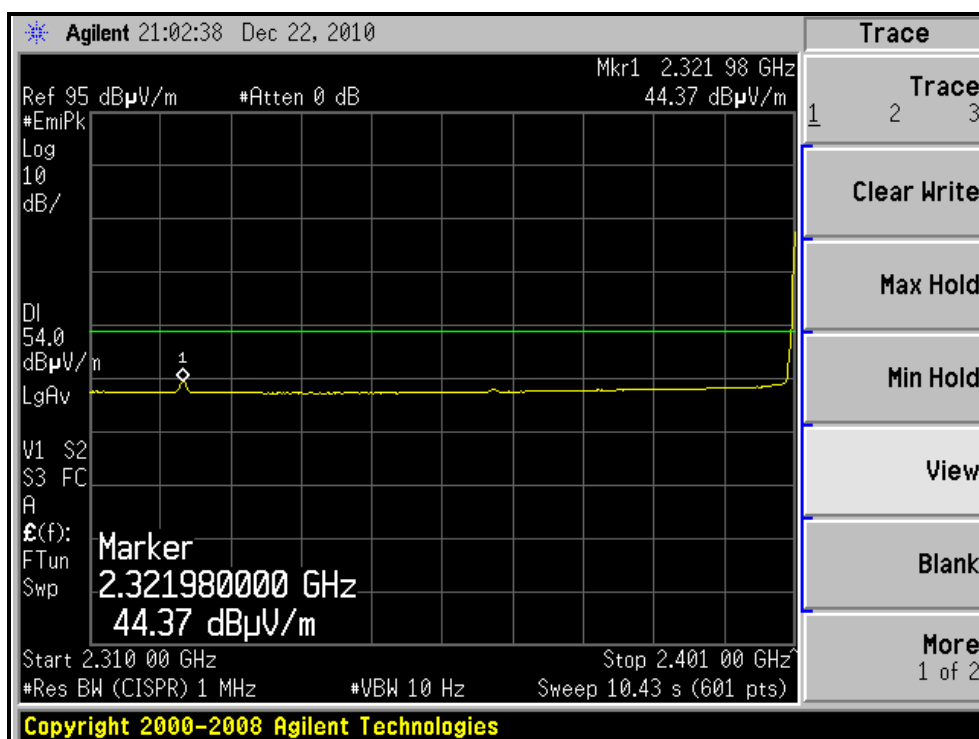
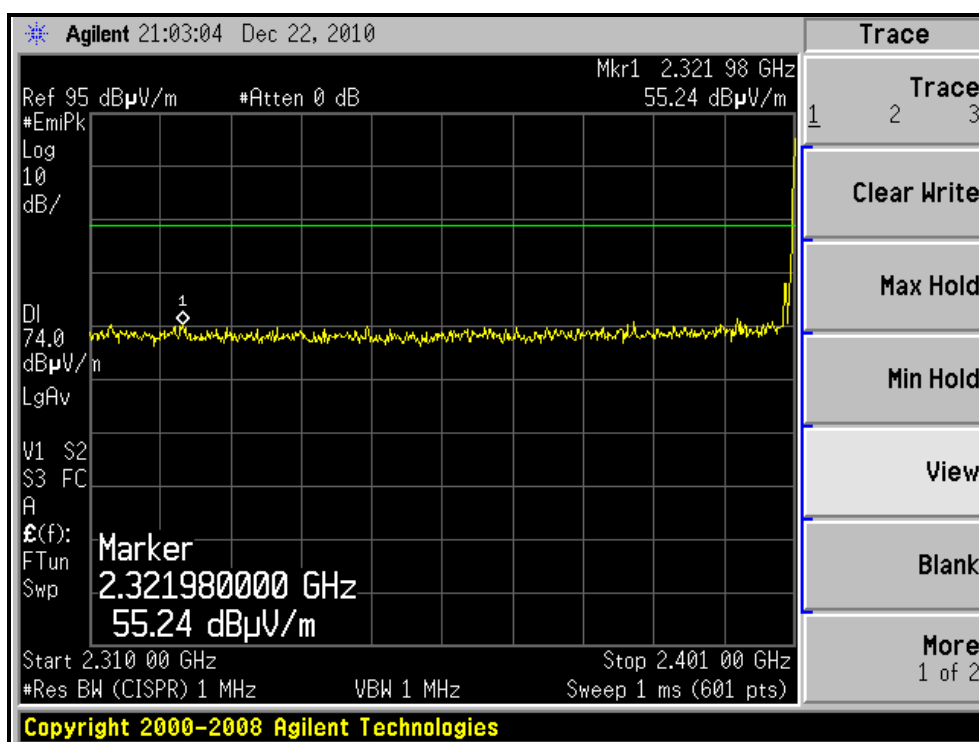
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 107.9 PK                |                |             | 1.11 H             | 15                   | 75.85            | 32.05                    |
| 2                                                   | *2480.00    | 98.1 AV                 |                |             | 1.11 H             | 15                   | 66.05            | 32.05                    |
| 3                                                   | 2483.50     | 62.0 PK                 | 74.0           | -12.0       | 1.11 H             | 20                   | 29.93            | 32.07                    |
| 4                                                   | 2483.50     | 43.7 AV                 | 54.0           | -10.3       | 1.11 H             | 20                   | 11.63            | 32.07                    |
| 5                                                   | 4960.00     | 55.8 PK                 | 74.0           | -18.2       | 1.09 H             | 111                  | 16.08            | 39.72                    |
| 6                                                   | 4960.00     | 48.1 AV                 | 54.0           | -5.9        | 1.09 H             | 111                  | 8.38             | 39.72                    |
| 7                                                   | 7440.00     | 51.7 PK                 | 74.0           | -22.3       | 1.50 H             | 44                   | 5.03             | 46.67                    |
| 8                                                   | 7440.00     | 38.2 AV                 | 54.0           | -15.8       | 1.50 H             | 44                   | -8.47            | 46.67                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 106.5 PK                |                |             | 1.00 V             | 18                   | 74.45            | 32.05                    |
| 2                                                   | *2480.00    | 96.9 AV                 |                |             | 1.00 V             | 18                   | 64.85            | 32.05                    |
| 3                                                   | 2483.50     | 59.9 PK                 | 74.0           | -14.1       | 1.01 V             | 20                   | 27.83            | 32.07                    |
| 4                                                   | 2483.50     | 43.3 AV                 | 54.0           | -10.7       | 1.01 V             | 20                   | 11.23            | 32.07                    |
| 5                                                   | 4960.00     | 59.2 PK                 | 74.0           | -14.8       | 1.01 V             | 266                  | 19.48            | 39.72                    |
| 6                                                   | 4960.00     | 51.2 AV                 | 54.0           | -2.8        | 1.01 V             | 266                  | 11.48            | 39.72                    |
| 7                                                   | 7440.00     | 53.6 PK                 | 74.0           | -20.4       | 1.00 V             | 29                   | 6.93             | 46.67                    |
| 8                                                   | 7440.00     | 39.3 AV                 | 54.0           | -14.7       | 1.00 V             | 29                   | -7.37            | 46.67                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.

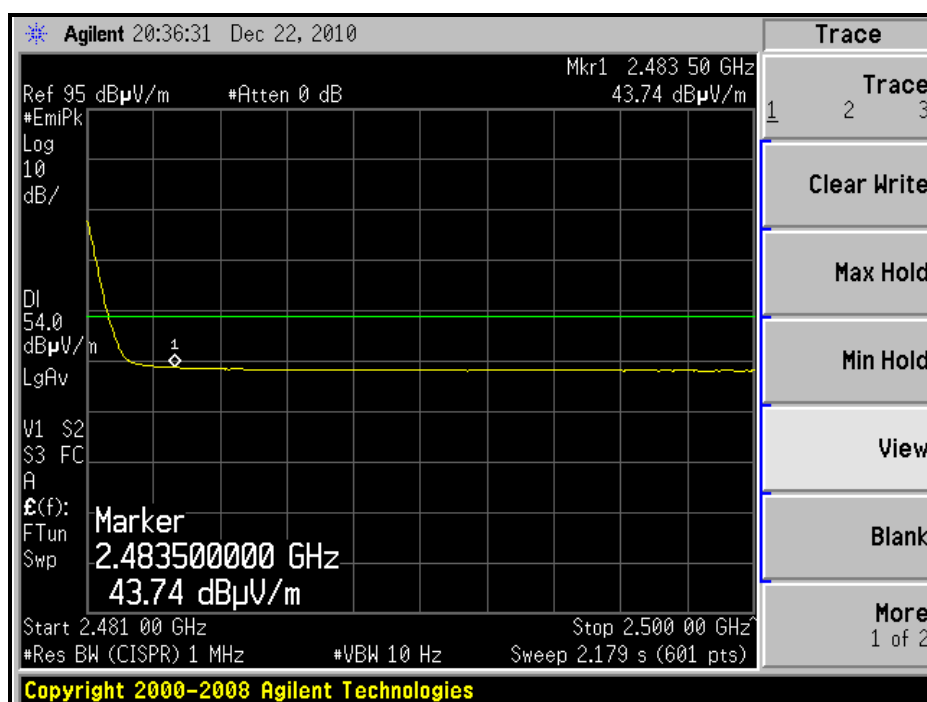
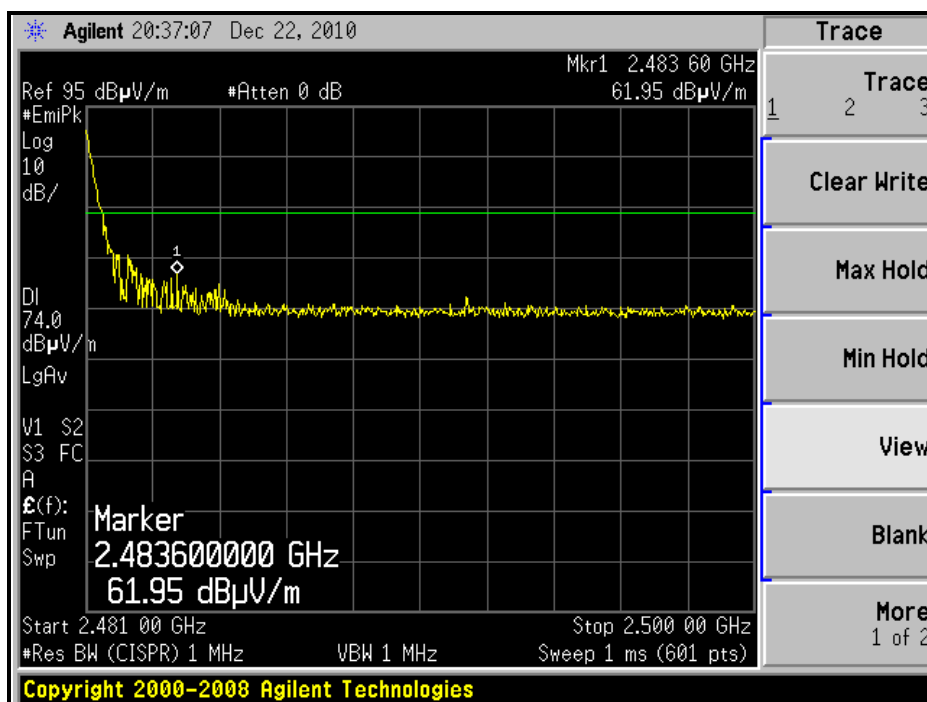
# RESTRICTED BANDEDGE (GFSK MODE, CH0, HORIZONTAL )



RESTRICTED BANDEDGE (GFSK MODE, CH0, VERTICAL )

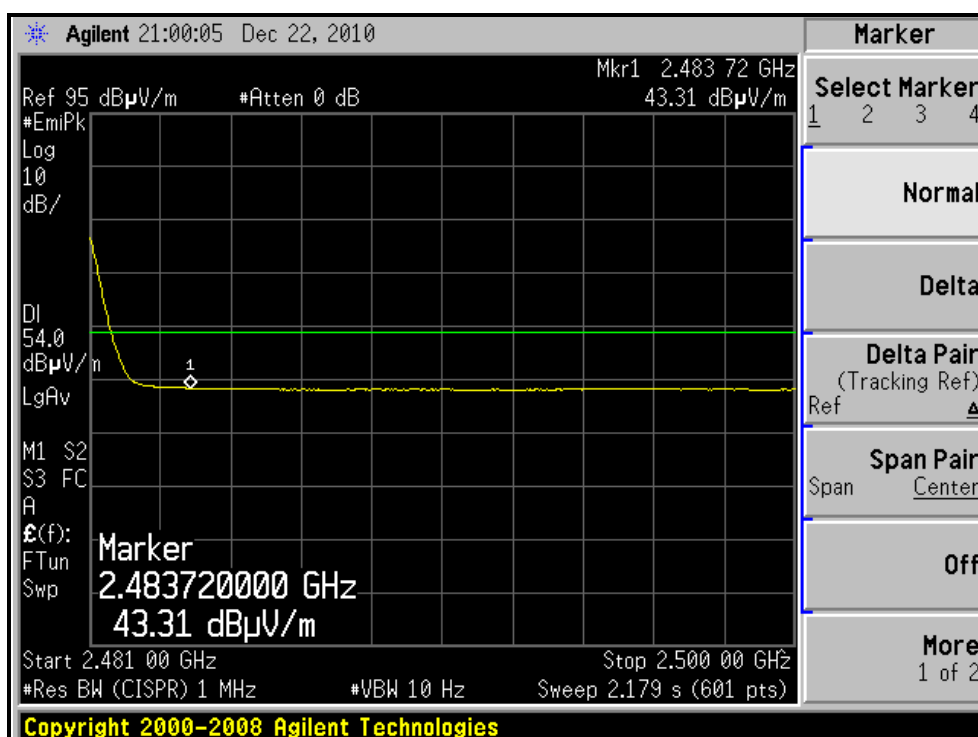
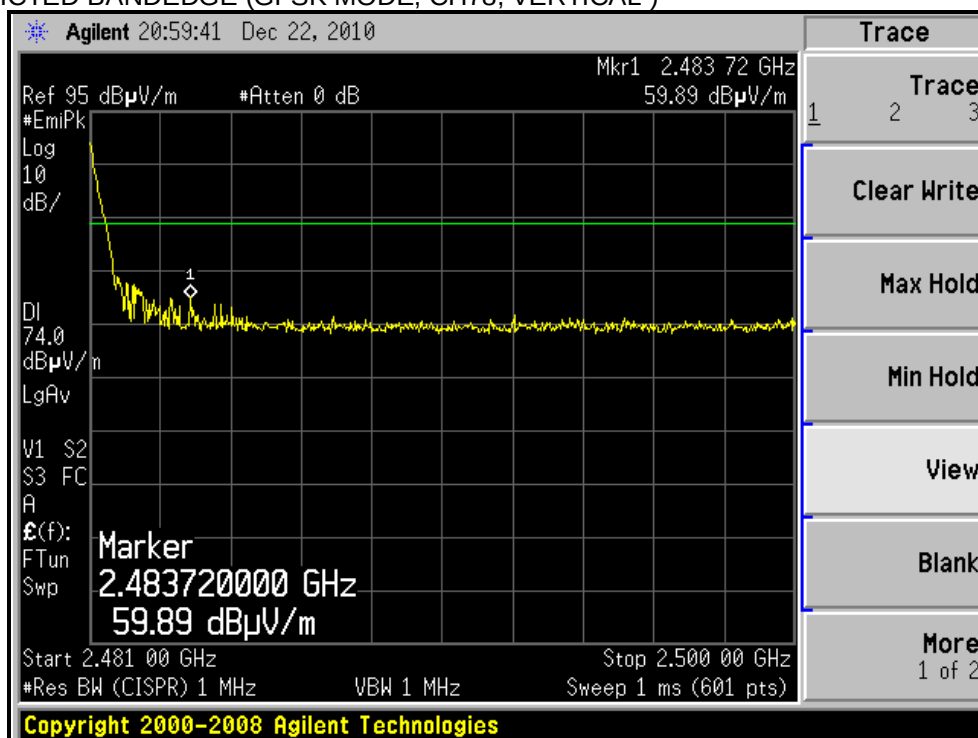


# RESTRICTED BANDEDGE (GFSK MODE, CH78, HORIZONTAL )





# RESTRICTED BANDEDGE (GFSK MODE, CH78, VERTICAL )





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**8DPSK MODULATION**

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 64%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 56.5 PK                 | 74.0           | -17.5       | 1.14 H             | 20                   | 24.97            | 31.53                    |
| 2                                                   | 2322.00     | 45.5 AV                 | 54.0           | -8.5        | 1.14 H             | 20                   | 13.97            | 31.53                    |
| 3                                                   | *2402.00    | 108.4 PK                |                |             | 1.12 H             | 15                   | 76.60            | 31.80                    |
| 4                                                   | *2402.00    | 96.1 AV                 |                |             | 1.12 H             | 15                   | 64.30            | 31.80                    |
| 5                                                   | 4804.00     | 55.1 PK                 | 74.0           | -18.9       | 1.12 H             | 133                  | 15.90            | 39.20                    |
| 6                                                   | 4804.00     | 47.6 AV                 | 54.0           | -6.4        | 1.12 H             | 133                  | 8.40             | 39.20                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 54.7 PK                 | 74.0           | -19.3       | 1.00 V             | 19                   | 23.17            | 31.53                    |
| 2                                                   | 2322.00     | 43.9 AV                 | 54.0           | -10.1       | 1.00 V             | 19                   | 12.37            | 31.53                    |
| 3                                                   | *2402.00    | 107.1 PK                |                |             | 1.01 V             | 20                   | 75.30            | 31.80                    |
| 4                                                   | *2402.00    | 95.4 AV                 |                |             | 1.01 V             | 20                   | 63.60            | 31.80                    |
| 5                                                   | 4804.00     | 57.8 PK                 | 74.0           | -16.2       | 1.00 V             | 261                  | 18.60            | 39.20                    |
| 6                                                   | 4804.00     | 50.1 AV                 | 54.0           | -3.9        | 1.00 V             | 261                  | 10.90            | 39.20                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* ”: Fundamental frequency.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 64%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2441.00    | 108.6 PK                |                |             | 1.13 H             | 20                   | 76.67            | 31.93                    |
| 2                                                   | *2441.00    | 96.4 AV                 |                |             | 1.13 H             | 20                   | 64.47            | 31.93                    |
| 3                                                   | 4882.00     | 55.4 PK                 | 74.0           | -18.6       | 1.11 H             | 140                  | 15.93            | 39.47                    |
| 4                                                   | 4882.00     | 47.8 AV                 | 54.0           | -6.2        | 1.11 H             | 140                  | 8.33             | 39.47                    |
| 5                                                   | 7323.00     | 51.2 PK                 | 74.0           | -22.8       | 1.50 H             | 50                   | 4.44             | 46.76                    |
| 6                                                   | 7323.00     | 38.1 AV                 | 54.0           | -15.9       | 1.50 H             | 50                   | -8.66            | 46.76                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2441.00    | 107.6 PK                |                |             | 1.00 V             | 19                   | 75.67            | 31.93                    |
| 2                                                   | *2441.00    | 95.4 AV                 |                |             | 1.00 V             | 19                   | 63.47            | 31.93                    |
| 3                                                   | 4882.00     | 57.9 PK                 | 74.0           | -16.1       | 1.01 V             | 250                  | 18.43            | 39.47                    |
| 4                                                   | 4882.00     | 50.0 AV                 | 54.0           | -4.0        | 1.01 V             | 250                  | 10.53            | 39.47                    |
| 5                                                   | 7323.00     | 52.6 PK                 | 74.0           | -21.4       | 1.10 V             | 30                   | 5.84             | 46.76                    |
| 6                                                   | 7323.00     | 38.4 AV                 | 54.0           | -15.6       | 1.10 V             | 30                   | -8.36            | 46.76                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* ”: Fundamental frequency.



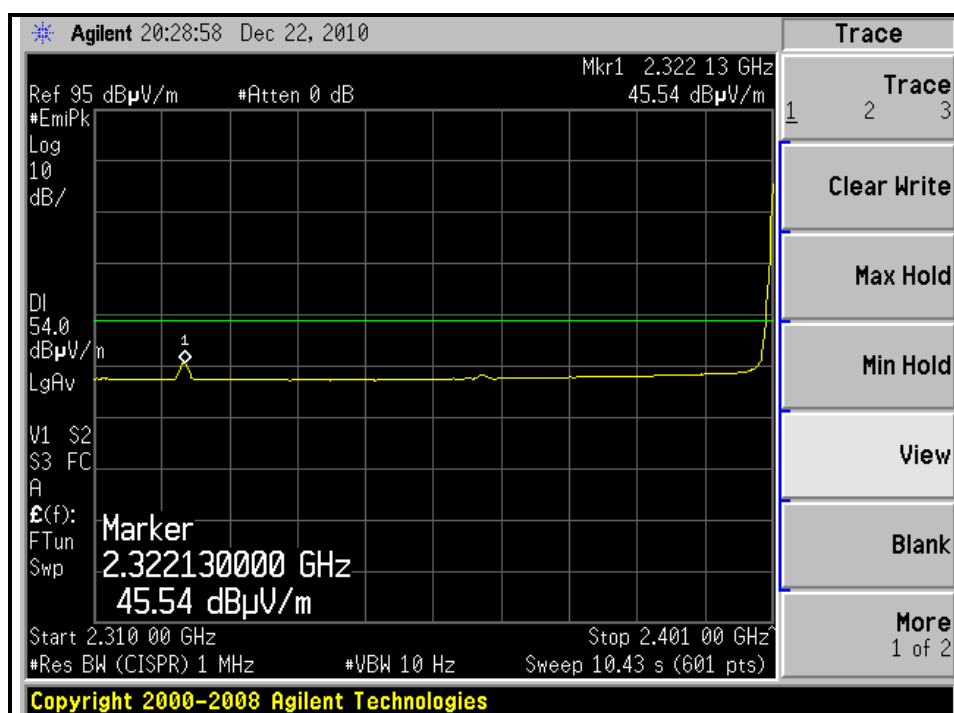
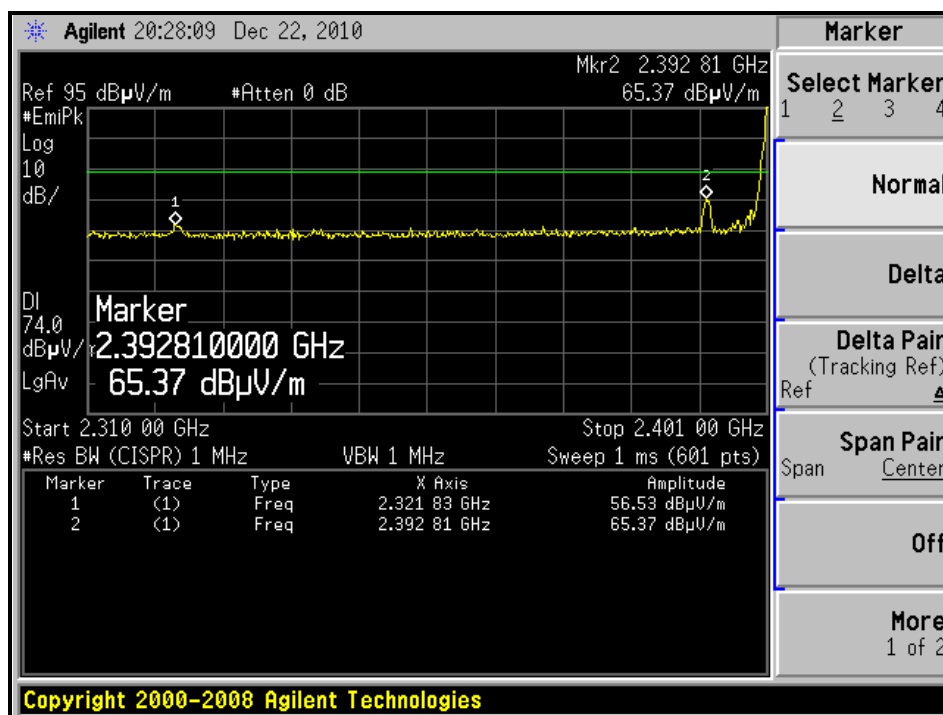
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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 78                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 64%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

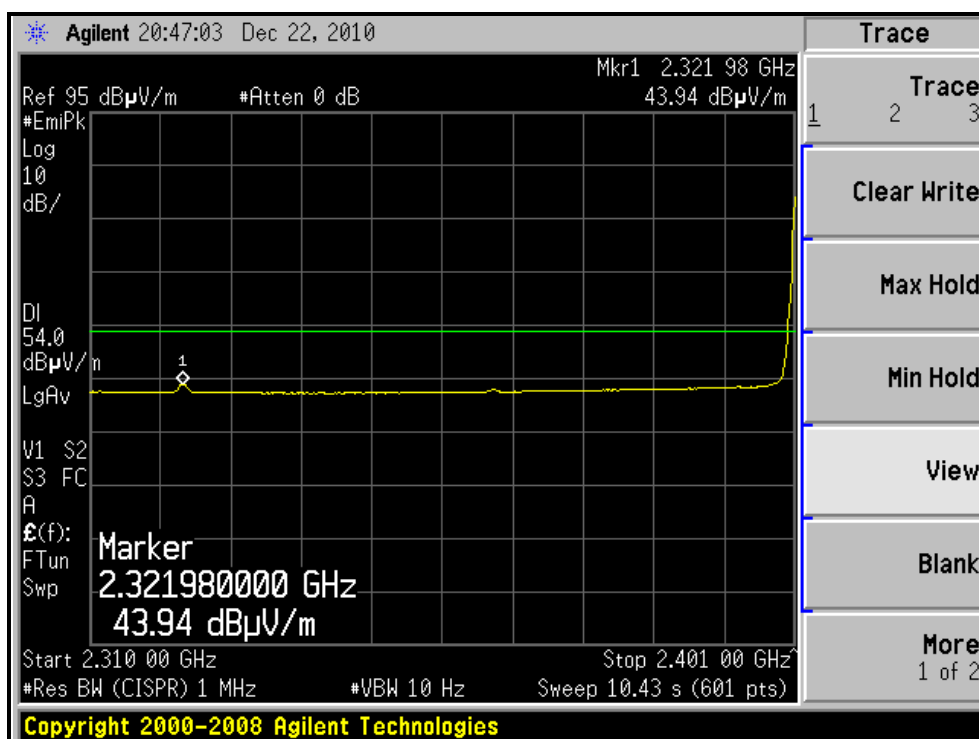
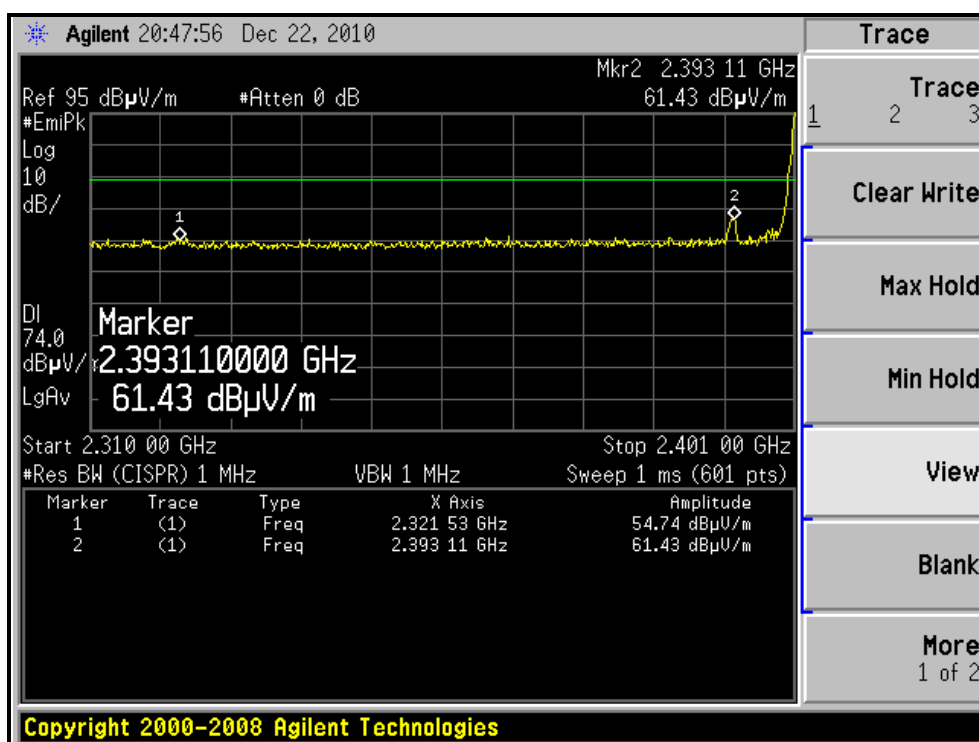
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 108.7 PK                |                |             | 1.10 H             | 209                  | 76.65            | 32.05                    |
| 2                                                   | *2480.00    | 96.6 AV                 |                |             | 1.10 H             | 209                  | 64.55            | 32.05                    |
| 3                                                   | 2483.90     | 60.3 PK                 | 74.0           | -13.7       | 1.11 H             | 214                  | 28.23            | 32.07                    |
| 4                                                   | 2483.90     | 43.8 AV                 | 54.0           | -10.2       | 1.11 H             | 214                  | 11.73            | 32.07                    |
| 5                                                   | 2492.80     | 64.5 PK                 | 74.0           | -9.5        | 1.11 H             | 214                  | 32.40            | 32.10                    |
| 6                                                   | 2492.80     | 43.3 AV                 | 54.0           | -10.7       | 1.11 H             | 214                  | 11.20            | 32.10                    |
| 7                                                   | 4960.00     | 55.7 PK                 | 74.0           | -18.3       | 1.10 H             | 112                  | 15.98            | 39.72                    |
| 8                                                   | 4960.00     | 47.9 AV                 | 54.0           | -6.1        | 1.10 H             | 112                  | 8.18             | 39.72                    |
| 9                                                   | 7440.00     | 51.5 PK                 | 74.0           | -22.5       | 1.49 H             | 43                   | 4.83             | 46.67                    |
| 10                                                  | 7440.00     | 37.9 AV                 | 54.0           | -16.1       | 1.49 H             | 43                   | -8.77            | 46.67                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 107.3 PK                |                |             | 1.11 V             | 21                   | 75.25            | 32.05                    |
| 2                                                   | *2480.00    | 95.5 AV                 |                |             | 1.11 V             | 21                   | 63.45            | 32.05                    |
| 3                                                   | 2484.80     | 59.3 PK                 | 74.0           | -14.7       | 1.11 V             | 20                   | 27.23            | 32.07                    |
| 4                                                   | 2484.80     | 43.3 AV                 | 54.0           | -10.7       | 1.11 V             | 20                   | 11.23            | 32.07                    |
| 5                                                   | 2494.70     | 64.9 PK                 | 74.0           | -9.1        | 1.11 V             | 20                   | 32.80            | 32.10                    |
| 6                                                   | 2494.70     | 43.2 AV                 | 54.0           | -10.8       | 1.11 V             | 20                   | 11.10            | 32.10                    |
| 7                                                   | 4960.00     | 59.1 PK                 | 74.0           | -14.9       | 1.00 V             | 280                  | 19.38            | 39.72                    |
| 8                                                   | 4960.00     | 51.0 AV                 | 54.0           | -3.0        | 1.00 V             | 280                  | 11.28            | 39.72                    |
| 9                                                   | 7440.00     | 52.6 PK                 | 74.0           | -21.4       | 1.11 V             | 39                   | 5.93             | 46.67                    |
| 10                                                  | 7440.00     | 38.2 AV                 | 54.0           | -15.8       | 1.11 V             | 39                   | -8.47            | 46.67                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* “: Fundamental frequency.

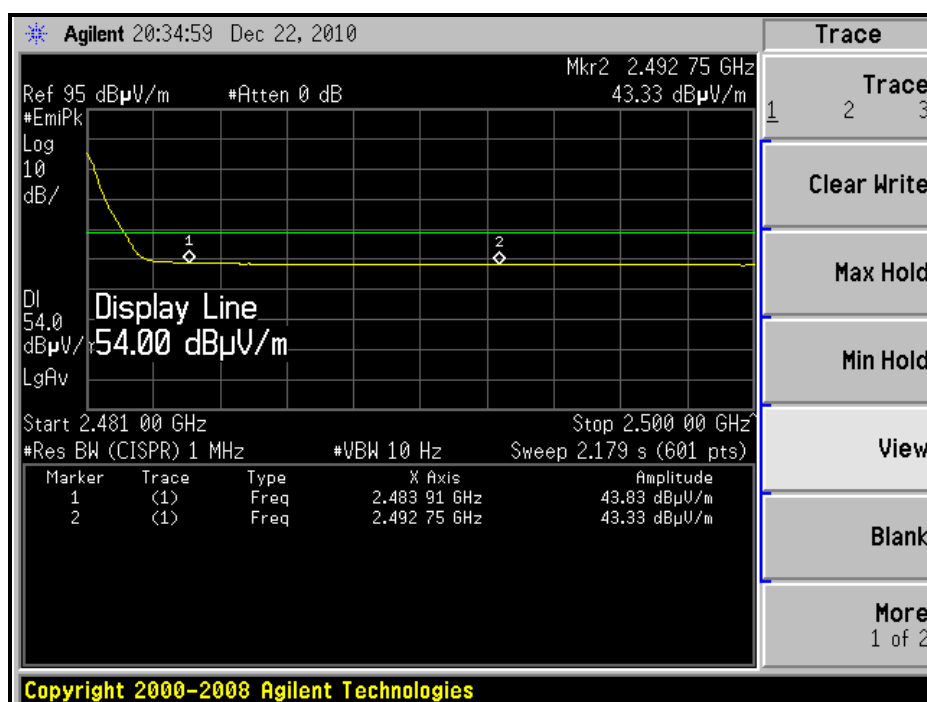
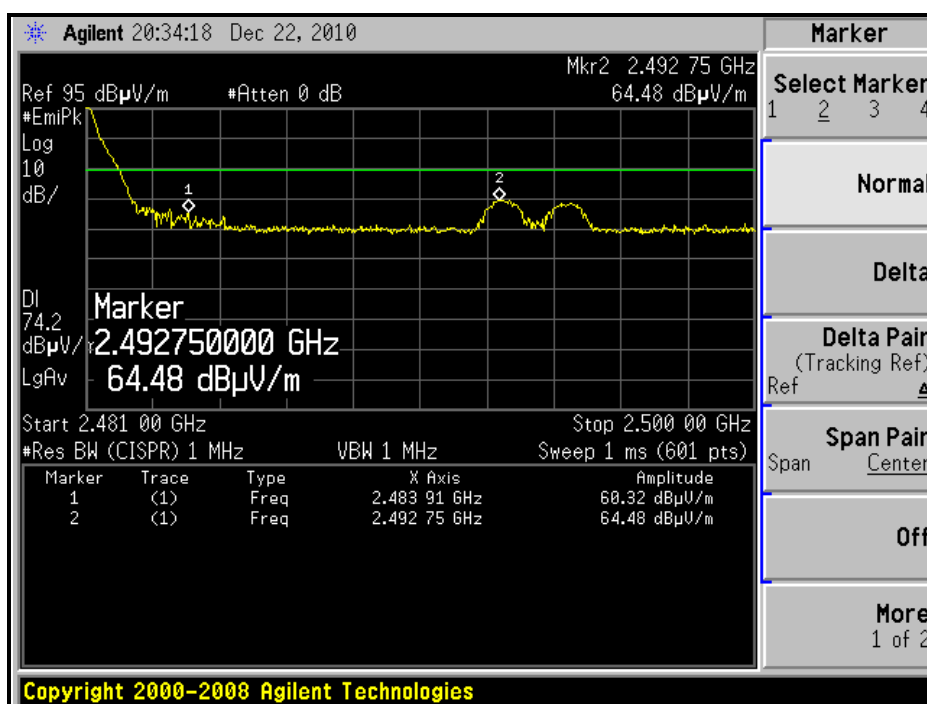
# RESTRICTED BANDEDGE (8DPSK MODE, CH0, HORIZONTAL )



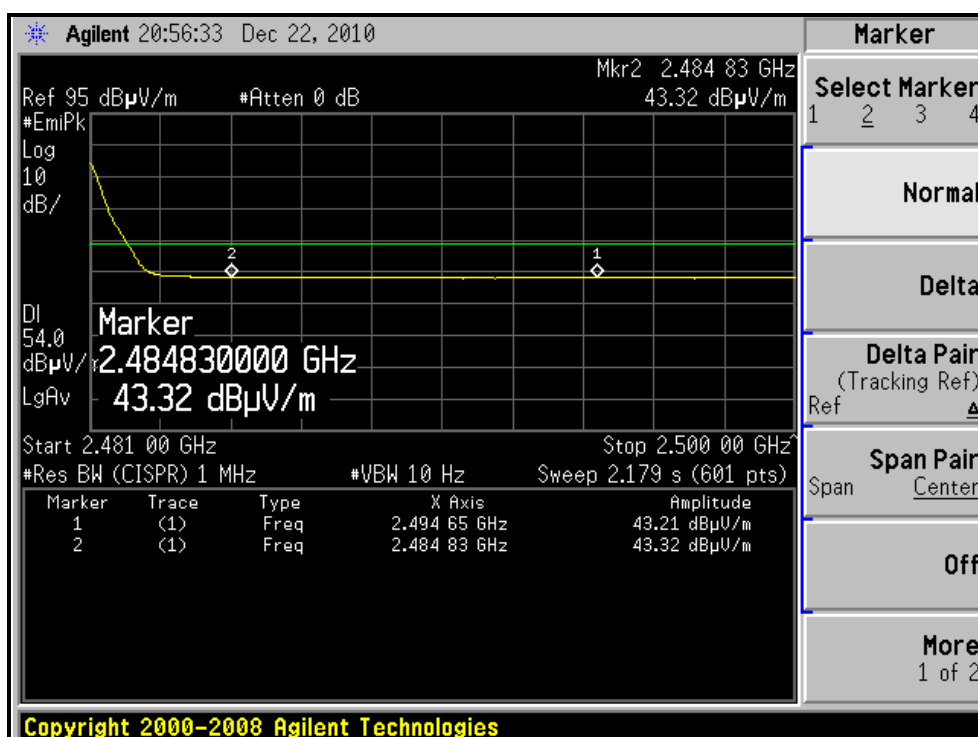
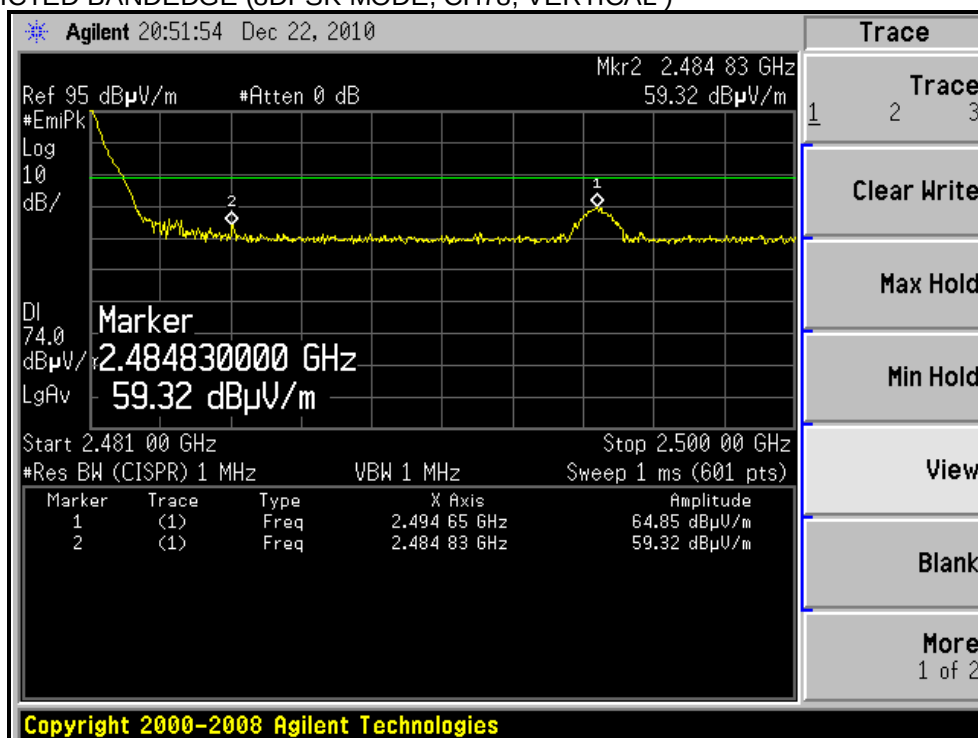
RESTRICTED BANDEDGE (8DPSK MODE, CH0, VERTICAL )



# RESTRICTED BANDEDGE (8DPSK MODE, CH78, HORIZONTAL )



# RESTRICTED BANDEDGE (8DPSK MODE, CH78, VERTICAL)





#### 4.8.6.2 TEST RESULTS (PIFA Antenna - Bluetooth additional GFSK)

##### BELOW 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 19                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 70%RH<br>1011 hPa | TESTED BY          | Kent Liu      |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 141.56      | 35.7 QP                 | 43.5           | -7.8        | 1.00 H             | 236                  | 21.57            | 14.13                    |
| 2                                                   | 148.01      | 38.6 QP                 | 43.5           | -4.9        | 1.50 H             | 47                   | 24.37            | 14.23                    |
| 3                                                   | 166.50      | 41.0 QP                 | 43.5           | -2.5        | 1.75 H             | 168                  | 27.02            | 13.98                    |
| 4                                                   | 184.53      | 35.8 QP                 | 43.5           | -7.7        | 1.25 H             | 86                   | 23.44            | 12.33                    |
| 5                                                   | 199.18      | 41.3 QP                 | 43.5           | -2.3        | 1.00 H             | 207                  | 30.01            | 11.24                    |
| 6                                                   | 499.51      | 34.3 QP                 | 46.0           | -11.7       | 1.50 H             | 86                   | 14.32            | 19.95                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 146.29      | 30.3 QP                 | 43.5           | -13.2       | 1.00 V             | 149                  | 16.13            | 14.21                    |
| 2                                                   | 166.42      | 36.1 QP                 | 43.5           | -7.4        | 1.00 V             | 190                  | 22.12            | 13.99                    |
| 3                                                   | 183.83      | 33.5 QP                 | 43.5           | -10.1       | 1.00 V             | 324                  | 21.07            | 12.38                    |
| 4                                                   | 199.23      | 34.3 QP                 | 43.5           | -9.2        | 1.50 V             | 326                  | 23.03            | 11.24                    |
| 5                                                   | 299.77      | 32.1 QP                 | 46.0           | -14.0       | 1.50 V             | 309                  | 17.13            | 14.92                    |
| 6                                                   | 499.55      | 35.0 QP                 | 46.0           | -11.0       | 1.25 V             | 297                  | 15.03            | 19.95                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.



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## ABOVE 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2402.00    | 102.9 PK                |                |             | 1.00 H             | 219                  | 71.10            | 31.80                    |
| 2                                                   | *2402.00    | 88.8 AV                 |                |             | 1.00 H             | 219                  | 57.00            | 31.80                    |
| 3                                                   | 2322.00     | 55.2 PK                 | 74.0           | -18.8       | 1.01 H             | 220                  | 23.67            | 31.53                    |
| 4                                                   | 2322.00     | 43.8 AV                 | 54.0           | -10.2       | 1.01 H             | 220                  | 12.27            | 31.53                    |
| 5                                                   | 4804.00     | 56.8 PK                 | 74.0           | -17.2       | 1.18 H             | 95                   | 17.60            | 39.20                    |
| 6                                                   | 4804.00     | 45.3 AV                 | 54.0           | -8.7        | 1.18 H             | 95                   | 6.10             | 39.20                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 56.5 PK                 | 74.0           | -17.5       | 1.01 V             | 299                  | 24.97            | 31.53                    |
| 2                                                   | 2322.00     | 44.4 AV                 | 54.0           | -9.6        | 1.01 V             | 299                  | 12.87            | 31.53                    |
| 3                                                   | *2402.00    | 100.5 PK                |                |             | 1.00 V             | 293                  | 68.70            | 31.80                    |
| 4                                                   | *2402.00    | 86.8 AV                 |                |             | 1.00 V             | 293                  | 55.00            | 31.80                    |
| 5                                                   | 4804.00     | 56.6 PK                 | 74.0           | -17.4       | 1.28 V             | 6                    | 17.40            | 39.20                    |
| 6                                                   | 4804.00     | 45.1 AV                 | 54.0           | -8.9        | 1.28 V             | 6                    | 5.90             | 39.20                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* ”: Fundamental frequency.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 19                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2440.00    | 104.4 PK                |                |             | 1.01 H             | 220                  | 72.48            | 31.92                    |
| 2                                                   | *2440.00    | 88.9 AV                 |                |             | 1.01 H             | 220                  | 56.98            | 31.92                    |
| 3                                                   | 4880.00     | 57.2 PK                 | 74.0           | -16.8       | 1.20 H             | 100                  | 17.74            | 39.46                    |
| 4                                                   | 4880.00     | 45.8 AV                 | 54.0           | -8.2        | 1.20 H             | 100                  | 6.34             | 39.46                    |
| 5                                                   | 7320.00     | 53.1 PK                 | 74.0           | -20.9       | 1.19 H             | 140                  | 6.33             | 46.77                    |
| 6                                                   | 7320.00     | 38.9 AV                 | 54.0           | -15.1       | 1.19 H             | 140                  | -7.87            | 46.77                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2440.00    | 100.8 PK                |                |             | 1.01 V             | 299                  | 68.88            | 31.92                    |
| 2                                                   | *2440.00    | 86.9 AV                 |                |             | 1.01 V             | 299                  | 54.98            | 31.92                    |
| 3                                                   | 4880.00     | 56.7 PK                 | 74.0           | -17.3       | 1.29 V             | 10                   | 17.24            | 39.46                    |
| 4                                                   | 4880.00     | 45.4 AV                 | 54.0           | -8.6        | 1.29 V             | 10                   | 5.94             | 39.46                    |
| 5                                                   | 7320.00     | 52.6 PK                 | 74.0           | -21.4       | 1.30 V             | 350                  | 5.83             | 46.77                    |
| 6                                                   | 7320.00     | 38.1 AV                 | 54.0           | -15.9       | 1.30 V             | 350                  | -8.67            | 46.77                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* ”: Fundamental frequency.



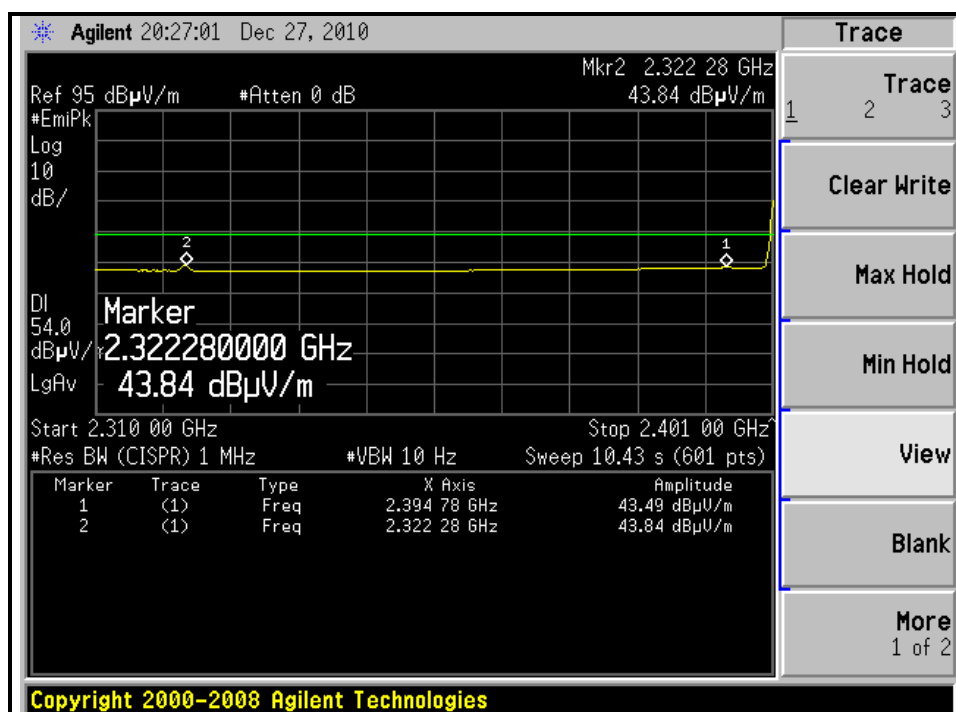
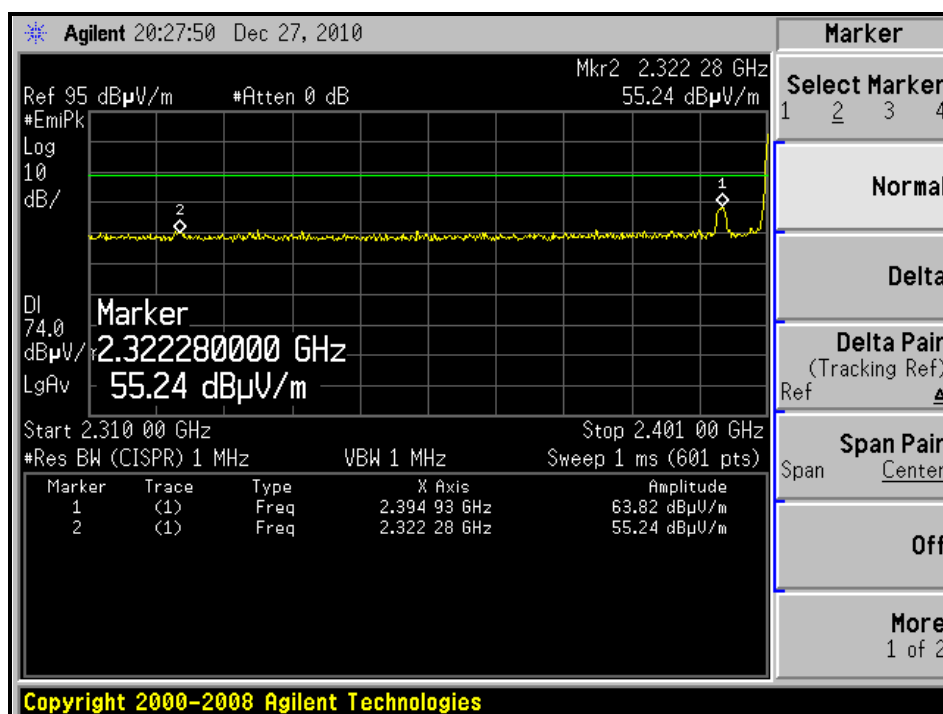
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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

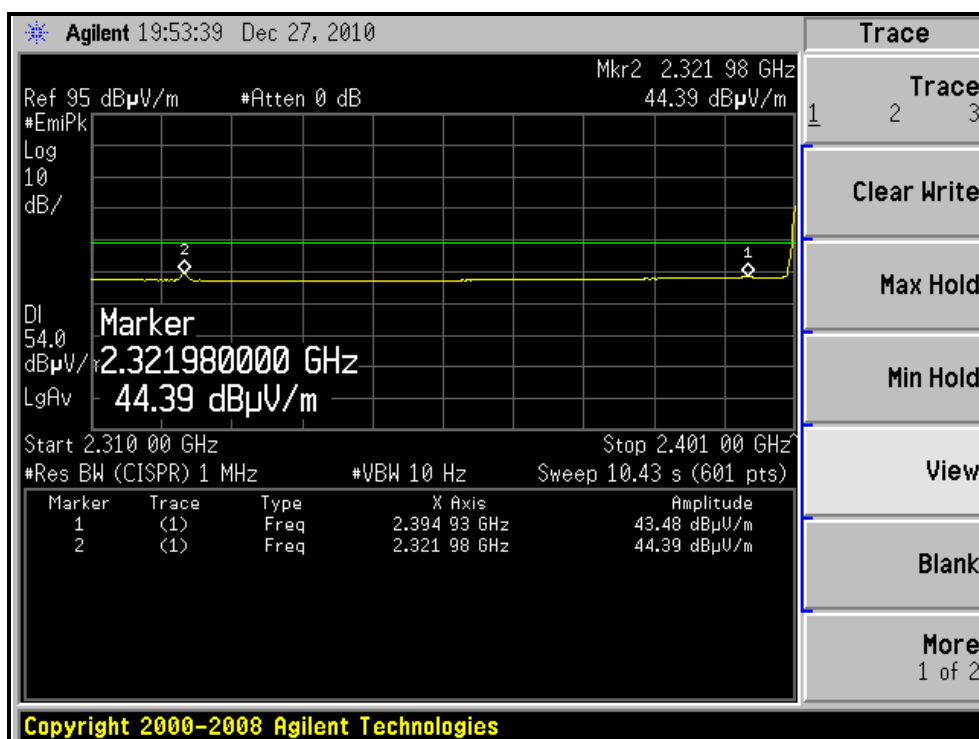
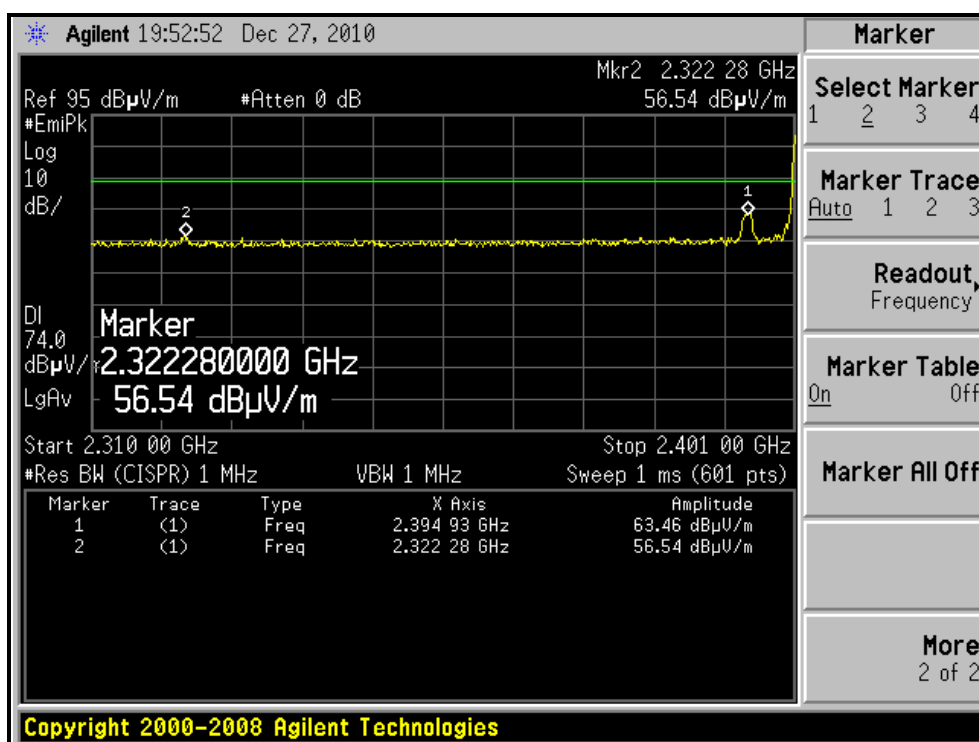
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 104.1 PK                |                |             | 1.00 H             | 71                   | 72.05            | 32.05                    |
| 2                                                   | *2480.00    | 89.7 AV                 |                |             | 1.00 H             | 71                   | 57.65            | 32.05                    |
| 3                                                   | 2483.50     | 56.4 PK                 | 74.0           | -17.6       | 1.01 H             | 80                   | 24.33            | 32.07                    |
| 4                                                   | 2483.50     | 42.9 AV                 | 54.0           | -11.1       | 1.01 H             | 80                   | 10.83            | 32.07                    |
| 5                                                   | 2487.30     | 63.9 PK                 | 74.0           | -10.1       | 1.01 H             | 80                   | 31.82            | 32.08                    |
| 6                                                   | 2487.30     | 43.3 AV                 | 54.0           | -10.7       | 1.01 H             | 80                   | 11.22            | 32.08                    |
| 7                                                   | 4960.00     | 57.3 PK                 | 74.0           | -16.7       | 1.21 H             | 98                   | 17.58            | 39.72                    |
| 8                                                   | 4960.00     | 46.1 AV                 | 54.0           | -7.9        | 1.21 H             | 98                   | 6.38             | 39.72                    |
| 9                                                   | 7440.00     | 53.6 PK                 | 74.0           | -20.4       | 1.25 H             | 132                  | 6.93             | 46.67                    |
| 10                                                  | 7440.00     | 39.2 AV                 | 54.0           | -14.8       | 1.25 H             | 132                  | -7.47            | 46.67                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 102.1 PK                |                |             | 1.01 V             | 270                  | 70.05            | 32.05                    |
| 2                                                   | *2480.00    | 87.9 AV                 |                |             | 1.01 V             | 270                  | 55.85            | 32.05                    |
| 3                                                   | 2483.60     | 54.4 PK                 | 74.0           | -19.6       | 1.01 V             | 267                  | 22.33            | 32.07                    |
| 4                                                   | 2483.60     | 42.8 AV                 | 54.0           | -11.2       | 1.01 V             | 267                  | 10.73            | 32.07                    |
| 5                                                   | 2487.40     | 62.2 PK                 | 74.0           | -11.8       | 1.01 V             | 267                  | 30.12            | 32.08                    |
| 6                                                   | 2487.40     | 43.2 AV                 | 54.0           | -10.8       | 1.01 V             | 267                  | 11.12            | 32.08                    |
| 7                                                   | 4960.00     | 56.9 PK                 | 74.0           | -17.1       | 1.30 V             | 11                   | 17.18            | 39.72                    |
| 8                                                   | 4960.00     | 45.5 AV                 | 54.0           | -8.5        | 1.30 V             | 11                   | 5.78             | 39.72                    |
| 9                                                   | 7440.00     | 52.4 PK                 | 74.0           | -21.6       | 1.40 V             | 348                  | 5.73             | 46.67                    |
| 10                                                  | 7440.00     | 38.2 AV                 | 54.0           | -15.8       | 1.40 V             | 348                  | -8.47            | 46.67                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* “: Fundamental frequency.

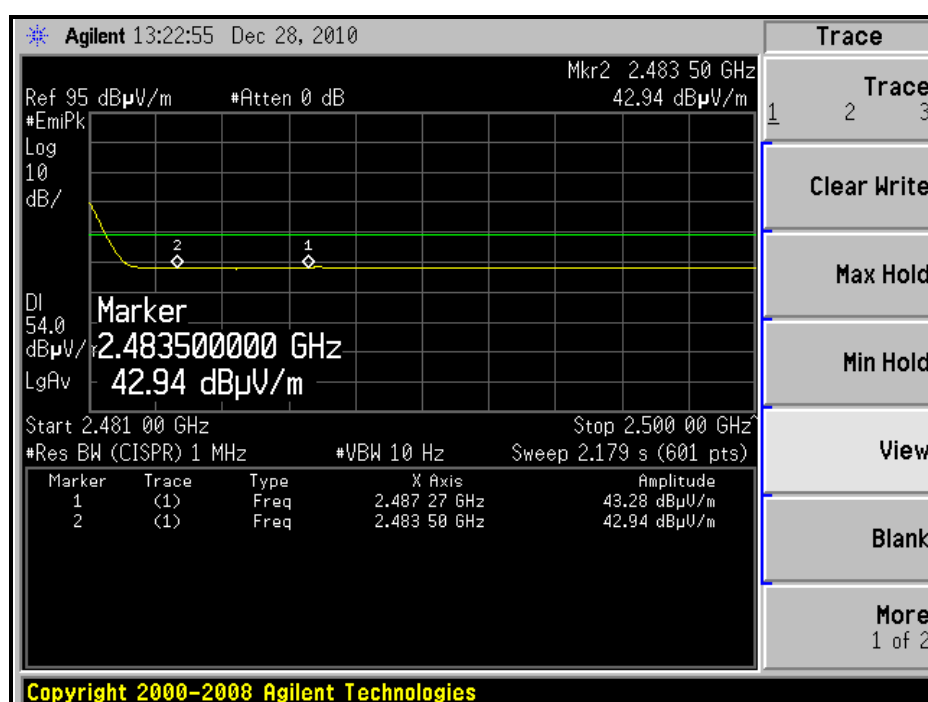
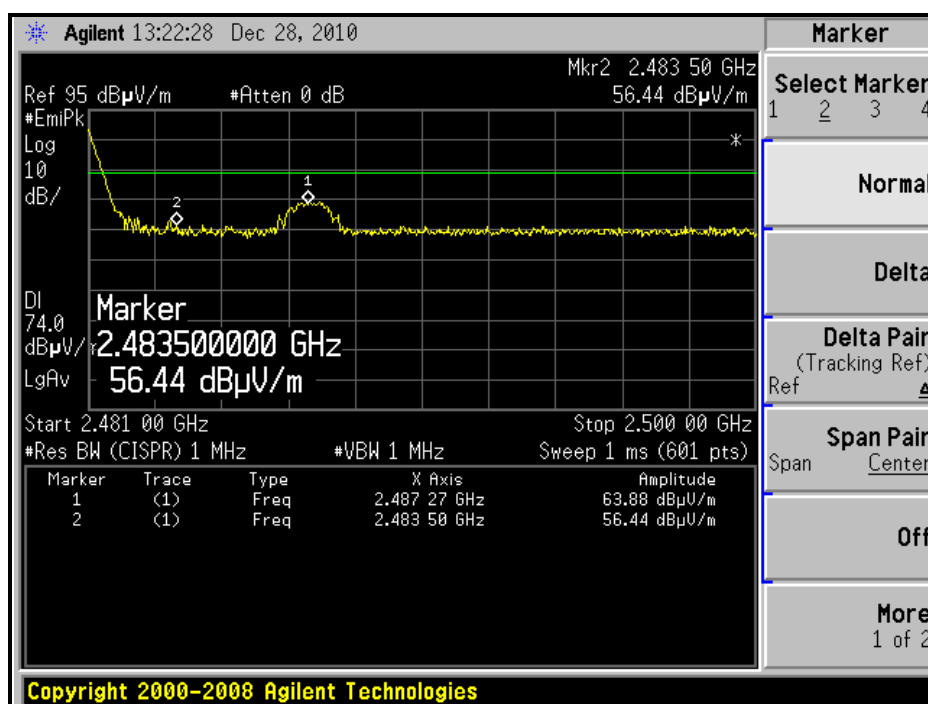
# RESTRICTED BANDEDGE (additional GFSK MODE, CH0, HORIZONTAL )



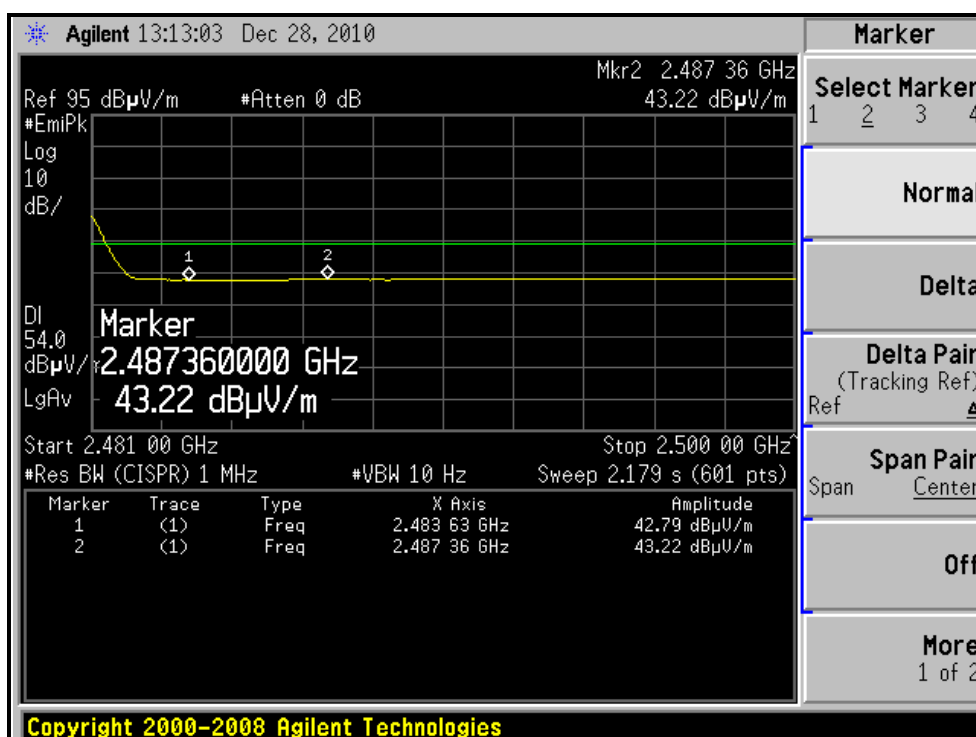
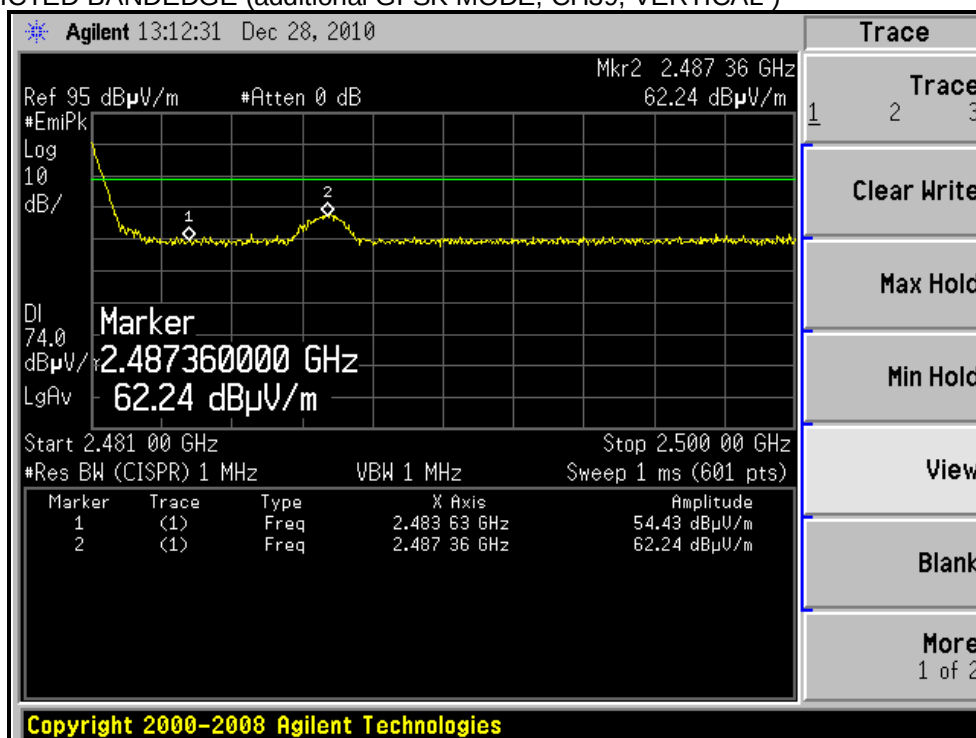
# RESTRICTED BANDEDGE (additional GFSK MODE, CH0, VERTICAL )



# RESTRICTED BANDEDGE (additional GFSK MODE, CH39, HORIZONTAL )



# RESTRICTED BANDEDGE (additional GFSK MODE, CH39, VERTICAL )







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4.8.6.3 TEST RESULTS (Dipole Antenna - Bluetooth traditional GFSK/  $\pi$ /4-DQPSK/ 8DPSK)

## BELOW 1GHz WORST-CASE DATA : 8DPSK MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 70%RH<br>1011 hPa | TESTED BY          | Eric Lee      |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 141.55      | 36.2 QP                 | 43.5           | -7.3        | 1.25 H             | 337                  | 22.06            | 14.13                    |
| 2                                                   | 147.95      | 40.6 QP                 | 43.5           | -2.9        | 1.00 H             | 360                  | 26.40            | 14.23                    |
| 3                                                   | 166.42      | 42.3 QP                 | 43.5           | -1.2        | 1.25 H             | 0                    | 28.27            | 13.99                    |
| 4                                                   | 184.42      | 35.8 QP                 | 43.5           | -7.7        | 1.50 H             | 213                  | 23.45            | 12.34                    |
| 5                                                   | 199.23      | 42.5 QP                 | 43.5           | -1.0        | 1.50 H             | 357                  | 31.24            | 11.24                    |
| 6                                                   | 499.55      | 34.2 QP                 | 46.0           | -11.9       | 1.00 H             | 248                  | 14.20            | 19.95                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 146.25      | 31.2 QP                 | 43.5           | -12.3       | 1.25 V             | 24                   | 17.03            | 14.21                    |
| 2                                                   | 166.50      | 36.6 QP                 | 43.5           | -6.9        | 1.50 V             | 203                  | 22.62            | 13.98                    |
| 3                                                   | 183.90      | 34.2 QP                 | 43.5           | -9.3        | 1.50 V             | 12                   | 21.82            | 12.38                    |
| 4                                                   | 200.00      | 34.6 QP                 | 43.5           | -8.9        | 1.00 V             | 84                   | 23.42            | 11.18                    |
| 5                                                   | 299.84      | 33.2 QP                 | 46.0           | -12.8       | 1.25 V             | 145                  | 18.28            | 14.92                    |
| 6                                                   | 499.61      | 36.6 QP                 | 46.0           | -9.4        | 1.00 V             | 245                  | 16.65            | 19.95                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.



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## ABOVE 1GHz WORST-CASE DATA :

## GFSK MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 54.5 PK                 | 74.0           | -19.5       | 1.58 H             | 292                  | 22.93            | 31.57                    |
| 2                                                   | 2322.00     | 44.0 AV                 | 54.0           | -10.0       | 1.58 H             | 292                  | 12.43            | 31.57                    |
| 3                                                   | *2402.00    | 102.6 PK                |                |             | 1.59 H             | 290                  | 70.77            | 31.83                    |
| 4                                                   | *2402.00    | 93.9 AV                 |                |             | 1.59 H             | 290                  | 62.07            | 31.83                    |
| 5                                                   | 4804.00     | 49.7 PK                 | 74.0           | -24.3       | 1.33 H             | 100                  | 8.77             | 40.93                    |
| 6                                                   | 4804.00     | 40.1 AV                 | 54.0           | -13.9       | 1.33 H             | 100                  | -0.83            | 40.93                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 58.1 PK                 | 74.0           | -15.9       | 1.66 V             | 280                  | 26.53            | 31.57                    |
| 2                                                   | 2322.00     | 47.7 AV                 | 54.0           | -6.3        | 1.66 V             | 280                  | 16.13            | 31.57                    |
| 3                                                   | 2387.00     | 60.5 PK                 | 74.0           | -13.5       | 1.66 V             | 280                  | 28.72            | 31.78                    |
| 4                                                   | 2387.00     | 43.1 AV                 | 54.0           | -10.9       | 1.66 V             | 280                  | 11.32            | 31.78                    |
| 5                                                   | *2402.00    | 108.2 PK                |                |             | 1.64 V             | 273                  | 76.37            | 31.83                    |
| 6                                                   | *2402.00    | 100.0 AV                |                |             | 1.64 V             | 273                  | 68.17            | 31.83                    |
| 7                                                   | 4804.00     | 51.9 PK                 | 74.0           | -22.1       | 1.28 V             | 40                   | 10.97            | 40.93                    |
| 8                                                   | 4804.00     | 45.2 AV                 | 54.0           | -8.8        | 1.28 V             | 40                   | 4.27             | 40.93                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* ”: Fundamental frequency.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2441.00    | 103.1 PK                |                |             | 1.60 H             | 288                  | 71.15            | 31.95                    |
| 2                                                   | *2441.00    | 94.8 AV                 |                |             | 1.60 H             | 288                  | 62.85            | 31.95                    |
| 3                                                   | 4882.00     | 49.5 PK                 | 74.0           | -24.5       | 1.29 H             | 98                   | 8.43             | 41.07                    |
| 4                                                   | 4882.00     | 40.3 AV                 | 54.0           | -13.7       | 1.29 H             | 98                   | -0.77            | 41.07                    |
| 5                                                   | 7323.00     | 51.4 PK                 | 74.0           | -22.6       | 1.06 H             | 78                   | 5.89             | 45.51                    |
| 6                                                   | 7323.00     | 40.5 AV                 | 54.0           | -13.5       | 1.06 H             | 78                   | -5.01            | 45.51                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2441.00    | 108.8 PK                |                |             | 1.55 V             | 270                  | 76.85            | 31.95                    |
| 2                                                   | *2441.00    | 101.1 AV                |                |             | 1.55 V             | 270                  | 69.15            | 31.95                    |
| 3                                                   | 4882.00     | 51.7 PK                 | 74.0           | -22.3       | 1.30 V             | 33                   | 10.63            | 41.07                    |
| 4                                                   | 4882.00     | 45.1 AV                 | 54.0           | -8.9        | 1.30 V             | 33                   | 4.03             | 41.07                    |
| 5                                                   | 7323.00     | 51.8 PK                 | 74.0           | -22.2       | 1.28 V             | 3                    | 6.29             | 45.51                    |
| 6                                                   | 7323.00     | 40.7 AV                 | 54.0           | -13.3       | 1.28 V             | 3                    | -4.81            | 45.51                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* ”: Fundamental frequency.



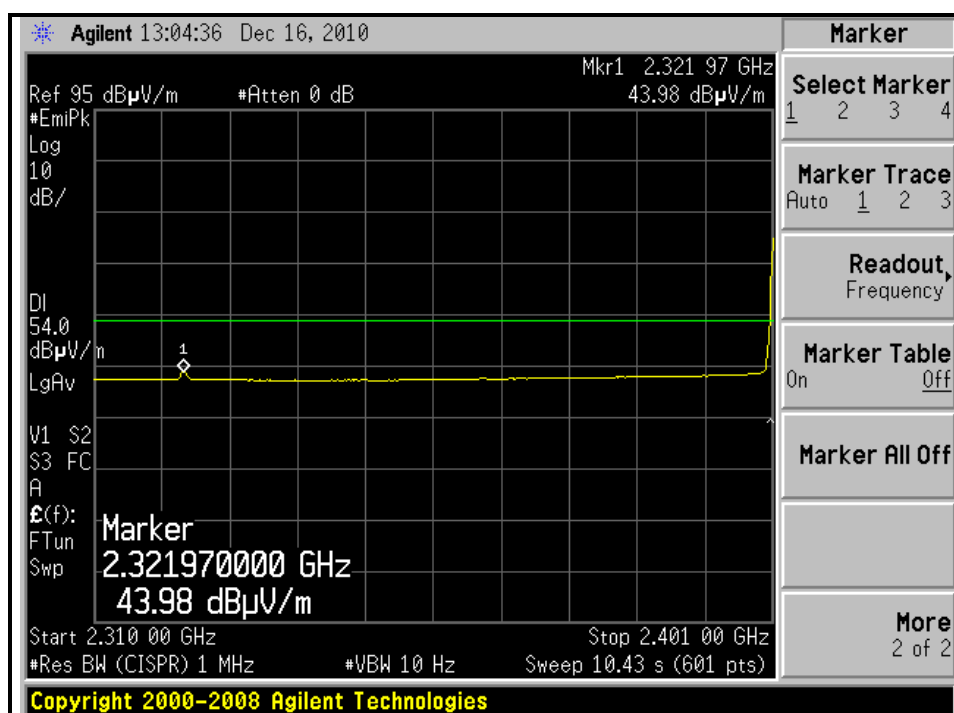
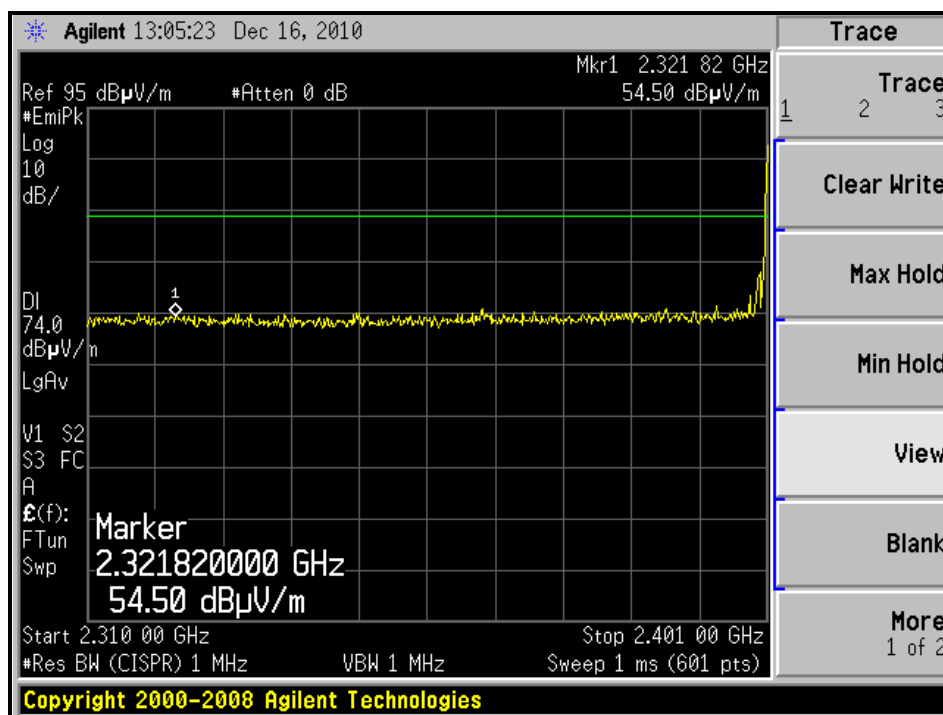
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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 78                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

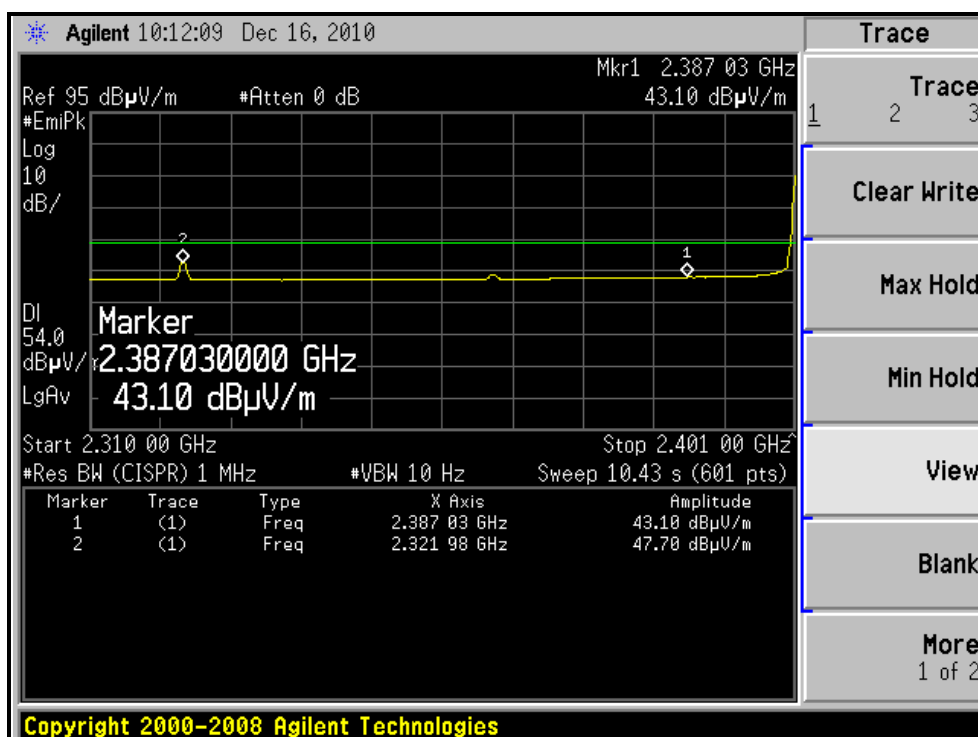
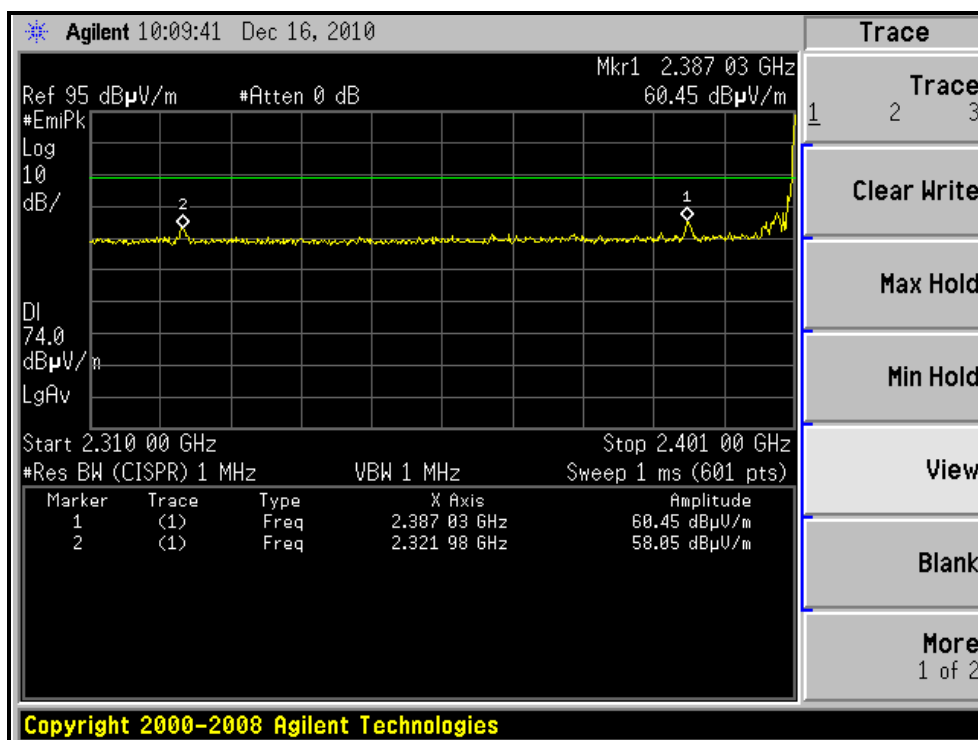
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 103.6 PK                |                |             | 1.58 H             | 272                  | 71.53            | 32.07                    |
| 2                                                   | *2480.00    | 94.9 AV                 |                |             | 1.58 H             | 272                  | 62.83            | 32.07                    |
| 3                                                   | 2483.50     | 56.9 PK                 | 74.0           | -17.1       | 1.60 H             | 280                  | 24.82            | 32.08                    |
| 4                                                   | 2483.50     | 43.1 AV                 | 54.0           | -10.9       | 1.60 H             | 280                  | 11.02            | 32.08                    |
| 5                                                   | 4960.00     | 49.6 PK                 | 74.0           | -24.4       | 1.36 H             | 96                   | 8.38             | 41.22                    |
| 6                                                   | 4960.00     | 40.2 AV                 | 54.0           | -13.8       | 1.36 H             | 96                   | -1.02            | 41.22                    |
| 7                                                   | 7440.00     | 51.6 PK                 | 74.0           | -22.4       | 1.07 H             | 100                  | 5.80             | 45.80                    |
| 8                                                   | 7440.00     | 40.6 AV                 | 54.0           | -13.4       | 1.07 H             | 100                  | -5.20            | 45.80                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 109.2 PK                |                |             | 1.53 V             | 267                  | 77.13            | 32.07                    |
| 2                                                   | *2480.00    | 101.0 AV                |                |             | 1.53 V             | 267                  | 68.93            | 32.07                    |
| 3                                                   | 2483.50     | 62.7 PK                 | 74.0           | -11.3       | 1.59 V             | 300                  | 30.62            | 32.08                    |
| 4                                                   | 2483.50     | 44.0 AV                 | 54.0           | -10.0       | 1.59 V             | 300                  | 11.92            | 32.08                    |
| 5                                                   | 4960.00     | 51.4 PK                 | 74.0           | -22.6       | 1.29 V             | 29                   | 10.18            | 41.22                    |
| 6                                                   | 4960.00     | 44.4 AV                 | 54.0           | -9.6        | 1.29 V             | 29                   | 3.18             | 41.22                    |
| 7                                                   | 7440.00     | 51.9 PK                 | 74.0           | -22.1       | 1.31 V             | 1                    | 6.10             | 45.80                    |
| 8                                                   | 7440.00     | 40.8 AV                 | 54.0           | -13.2       | 1.31 V             | 1                    | -5.00            | 45.80                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.

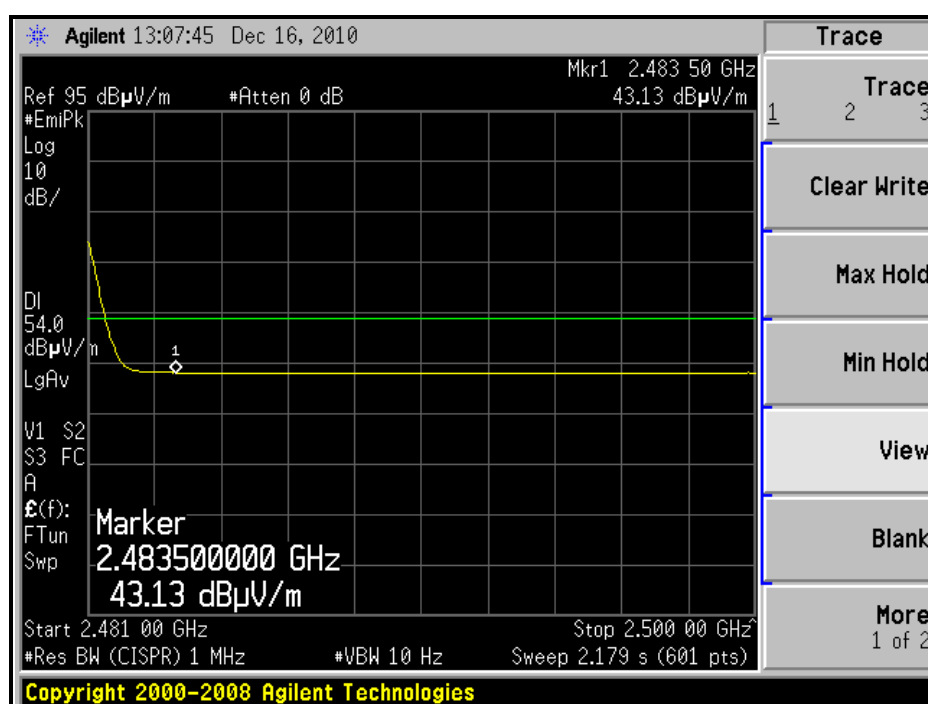
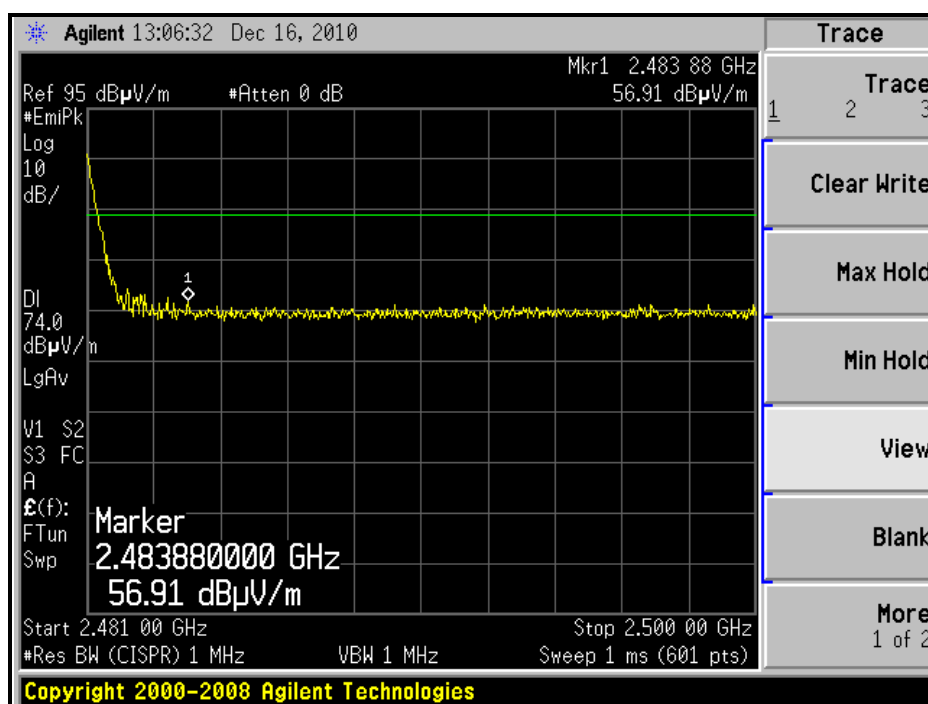
# RESTRICTED BANDEDGE (GFSK MODE, CH0, HORIZONTAL )



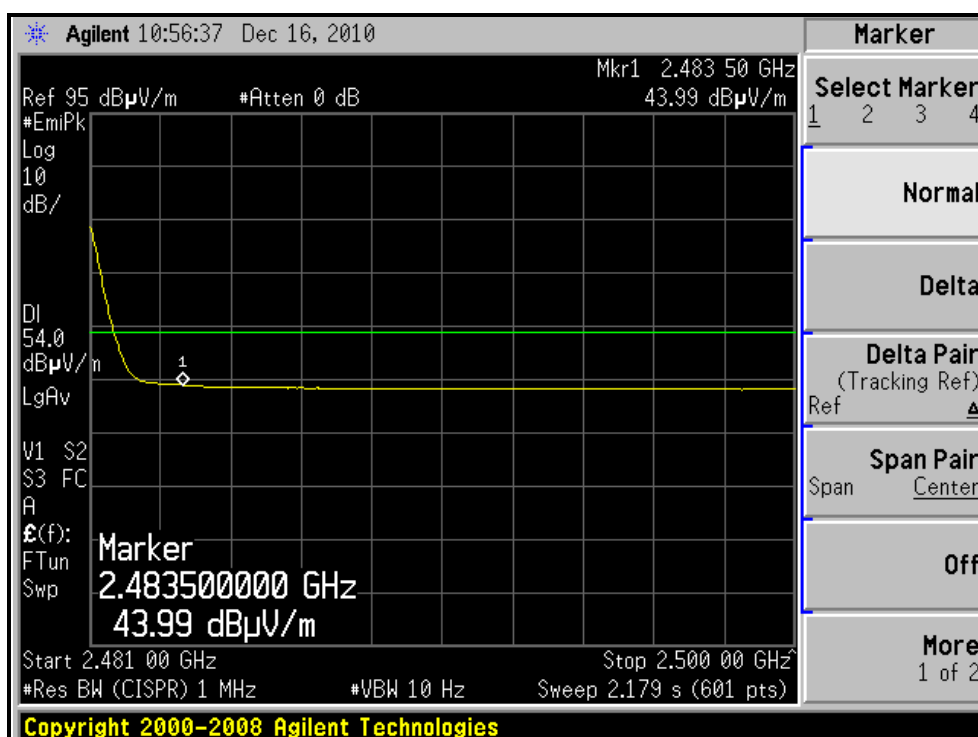
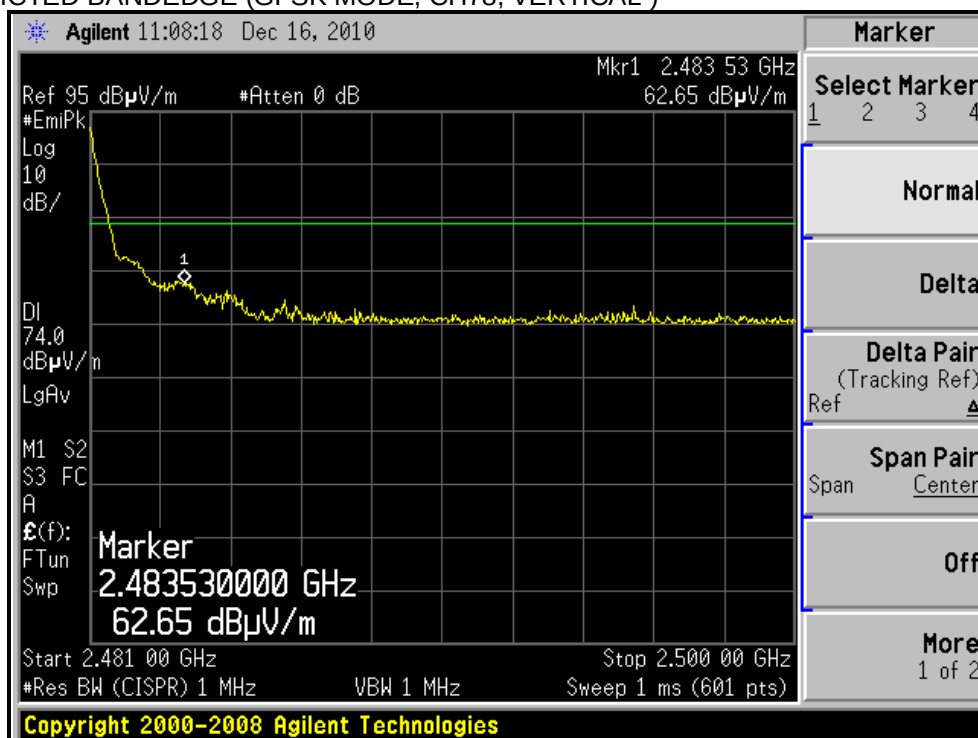
RESTRICTED BANDEDGE (GFSK MODE, CH0, VERTICAL )



# RESTRICTED BANDEDGE (GFSK MODE, CH78, HORIZONTAL )



# RESTRICTED BANDEDGE (GFSK MODE, CH78, VERTICAL )







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## 8DPSK MODULATION

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 55.3 PK                 | 74.0           | -18.7       | 1.49 H             | 288                  | 23.73            | 31.57                    |
| 2                                                   | 2322.00     | 43.7 AV                 | 54.0           | -10.3       | 1.49 H             | 288                  | 12.13            | 31.57                    |
| 3                                                   | *2402.00    | 103.2 PK                |                |             | 1.48 H             | 290                  | 71.37            | 31.83                    |
| 4                                                   | *2402.00    | 92.2 AV                 |                |             | 1.48 H             | 290                  | 60.37            | 31.83                    |
| 5                                                   | 4804.00     | 49.2 PK                 | 74.0           | -24.8       | 1.40 H             | 360                  | 8.27             | 40.93                    |
| 6                                                   | 4804.00     | 39.1 AV                 | 54.0           | -14.9       | 1.40 H             | 360                  | -1.83            | 40.93                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 56.8 PK                 | 74.0           | -17.2       | 1.60 V             | 280                  | 25.23            | 31.57                    |
| 2                                                   | 2322.00     | 46.8 AV                 | 54.0           | -7.2        | 1.60 V             | 280                  | 15.23            | 31.57                    |
| 3                                                   | *2402.00    | 108.9 PK                |                |             | 1.57 V             | 270                  | 77.07            | 31.83                    |
| 4                                                   | *2402.00    | 98.7 AV                 |                |             | 1.57 V             | 270                  | 66.87            | 31.83                    |
| 5                                                   | 4804.00     | 51.3 PK                 | 74.0           | -22.7       | 1.38 V             | 60                   | 10.37            | 40.93                    |
| 6                                                   | 4804.00     | 43.1 AV                 | 54.0           | -10.9       | 1.38 V             | 60                   | 2.17             | 40.93                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* ”: Fundamental frequency.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2441.00    | 103.9 PK                |                |             | 1.60 H             | 290                  | 71.95            | 31.95                    |
| 2                                                   | *2441.00    | 92.9 AV                 |                |             | 1.60 H             | 290                  | 60.95            | 31.95                    |
| 3                                                   | 4882.00     | 49.2 PK                 | 74.0           | -24.8       | 1.24 H             | 51                   | 8.13             | 41.07                    |
| 4                                                   | 4882.00     | 39.3 AV                 | 54.0           | -14.7       | 1.24 H             | 51                   | -1.77            | 41.07                    |
| 5                                                   | 7323.00     | 50.7 PK                 | 74.0           | -23.3       | 1.02 H             | 247                  | 5.19             | 45.51                    |
| 6                                                   | 7323.00     | 39.9 AV                 | 54.0           | -14.1       | 1.02 H             | 247                  | -5.61            | 45.51                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2441.00    | 109.2 PK                |                |             | 1.60 V             | 269                  | 77.25            | 31.95                    |
| 2                                                   | *2441.00    | 98.2 AV                 |                |             | 1.60 V             | 269                  | 66.25            | 31.95                    |
| 3                                                   | 4882.00     | 50.8 PK                 | 74.0           | -23.2       | 1.40 V             | 8                    | 9.73             | 41.07                    |
| 4                                                   | 4882.00     | 42.7 AV                 | 54.0           | -11.3       | 1.40 V             | 8                    | 1.63             | 41.07                    |
| 5                                                   | 7323.00     | 51.3 PK                 | 74.0           | -22.7       | 1.33 V             | 9                    | 5.79             | 45.51                    |
| 6                                                   | 7323.00     | 40.3 AV                 | 54.0           | -13.7       | 1.33 V             | 9                    | -5.21            | 45.51                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* ”: Fundamental frequency.



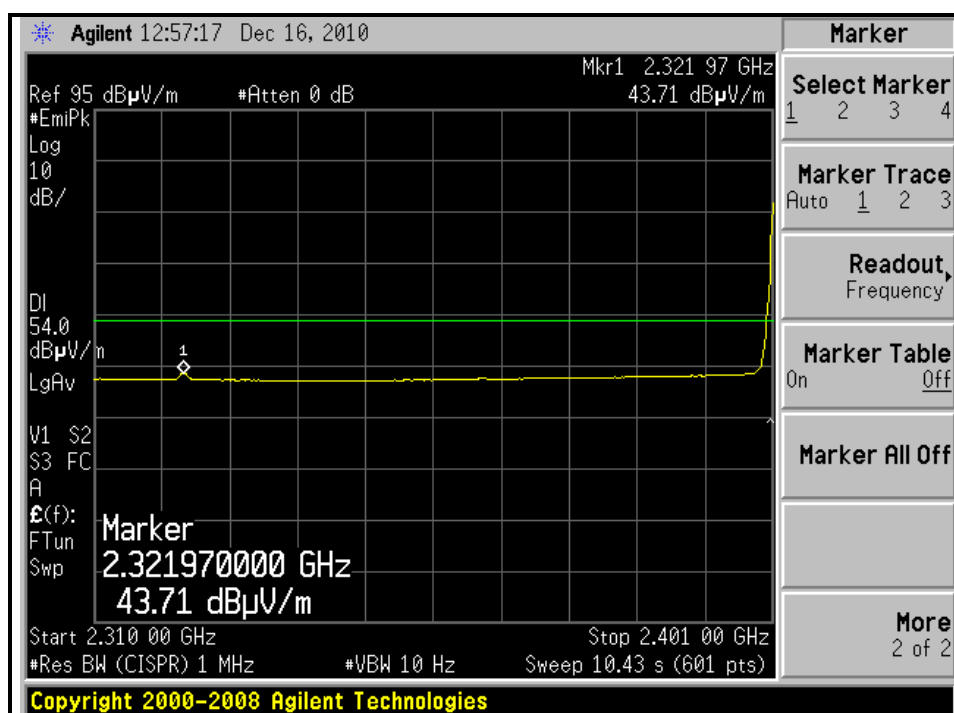
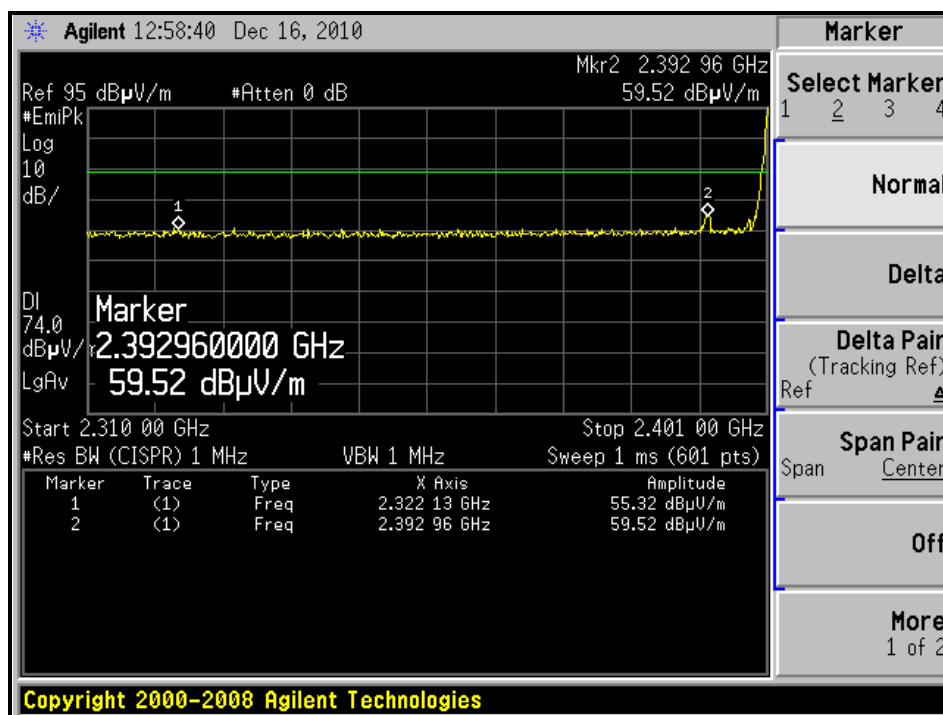
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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 78                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

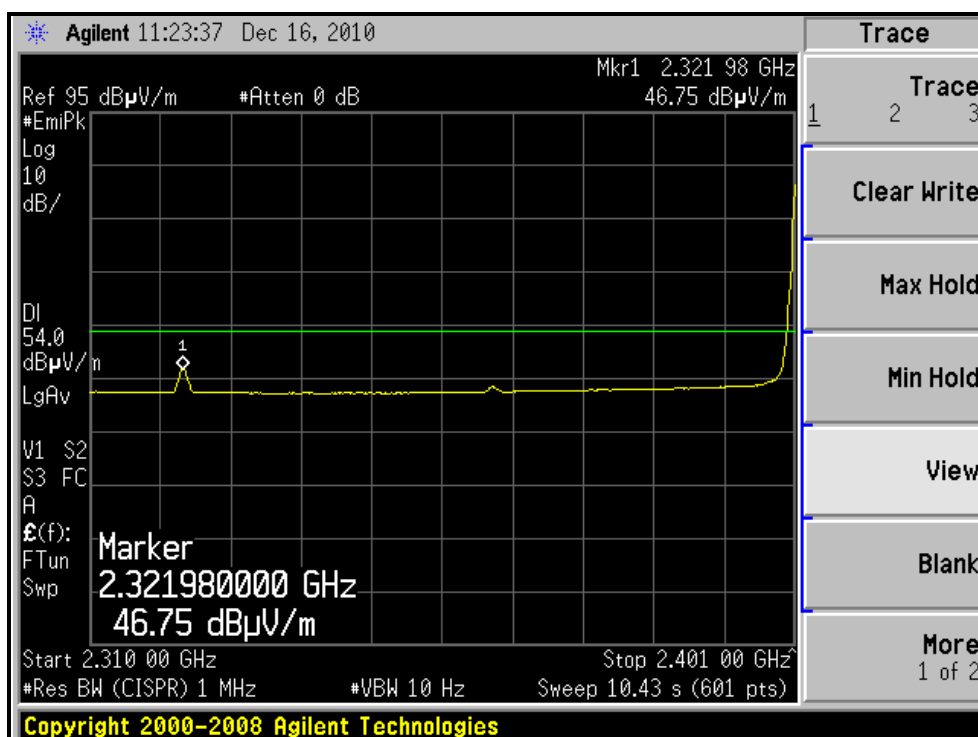
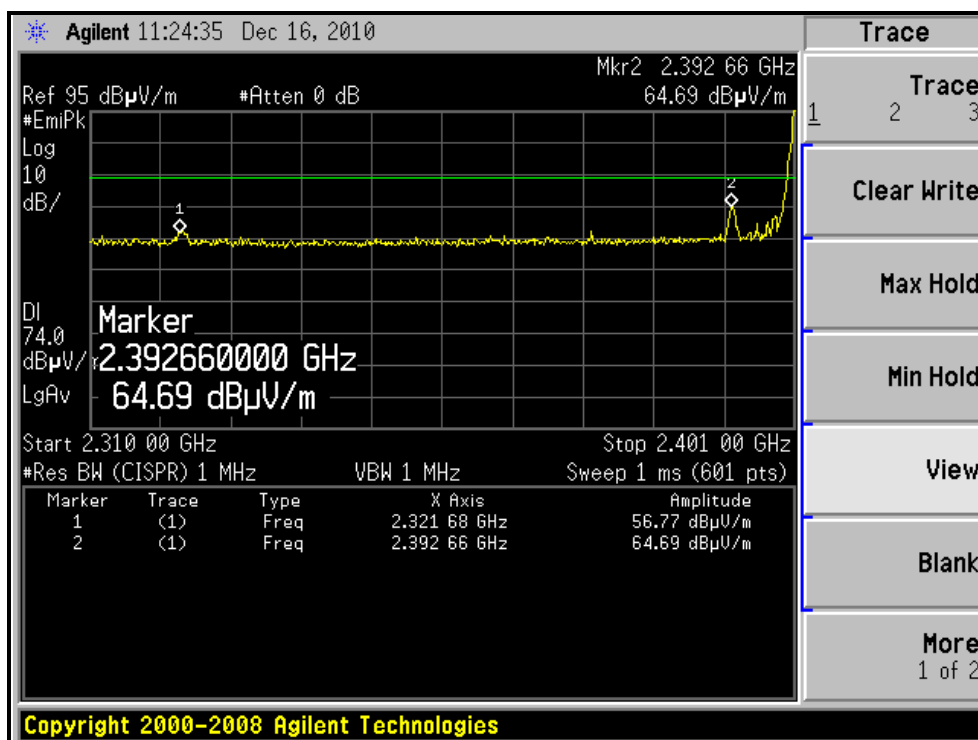
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 104.2 PK                |                |             | 1.56 H             | 285                  | 72.13            | 32.07                    |
| 2                                                   | *2480.00    | 93.0 AV                 |                |             | 1.56 H             | 285                  | 60.93            | 32.07                    |
| 3                                                   | 2483.70     | 57.4 PK                 | 74.0           | -16.6       | 1.55 H             | 279                  | 25.32            | 32.08                    |
| 4                                                   | 2483.70     | 43.2 AV                 | 54.0           | -10.8       | 1.55 H             | 279                  | 11.12            | 32.08                    |
| 5                                                   | 2494.70     | 60.4 PK                 | 74.0           | -13.6       | 1.55 H             | 279                  | 28.29            | 32.11                    |
| 6                                                   | 2494.70     | 43.1 AV                 | 54.0           | -10.9       | 1.55 H             | 279                  | 10.99            | 32.11                    |
| 7                                                   | 4960.00     | 49.5 PK                 | 74.0           | -24.5       | 1.36 H             | 96                   | 8.28             | 41.22                    |
| 8                                                   | 4960.00     | 39.4 AV                 | 54.0           | -14.6       | 1.36 H             | 96                   | -1.82            | 41.22                    |
| 9                                                   | 7440.00     | 50.9 PK                 | 74.0           | -23.1       | 1.08 H             | 94                   | 5.10             | 45.80                    |
| 10                                                  | 7440.00     | 40.1 AV                 | 54.0           | -13.9       | 1.08 H             | 94                   | -5.70            | 45.80                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 109.6 PK                |                |             | 1.57 V             | 322                  | 77.53            | 32.07                    |
| 2                                                   | *2480.00    | 97.2 AV                 |                |             | 1.57 V             | 322                  | 65.13            | 32.07                    |
| 3                                                   | 2483.60     | 61.8 PK                 | 74.0           | -12.2       | 1.60 V             | 311                  | 29.72            | 32.08                    |
| 4                                                   | 2483.60     | 44.2 AV                 | 54.0           | -9.8        | 1.60 V             | 311                  | 12.12            | 32.08                    |
| 5                                                   | 2494.70     | 63.8 PK                 | 74.0           | -10.2       | 1.60 V             | 311                  | 31.69            | 32.11                    |
| 6                                                   | 2494.70     | 43.3 AV                 | 54.0           | -10.7       | 1.60 V             | 311                  | 11.19            | 32.11                    |
| 7                                                   | 4960.00     | 50.9 PK                 | 74.0           | -23.1       | 1.33 V             | 34                   | 9.68             | 41.22                    |
| 8                                                   | 4960.00     | 42.8 AV                 | 54.0           | -11.2       | 1.33 V             | 34                   | 1.58             | 41.22                    |
| 9                                                   | 7440.00     | 51.2 PK                 | 74.0           | -22.8       | 1.40 V             | 25                   | 5.40             | 45.80                    |
| 10                                                  | 7440.00     | 40.3 AV                 | 54.0           | -13.7       | 1.40 V             | 25                   | -5.50            | 45.80                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* “: Fundamental frequency.

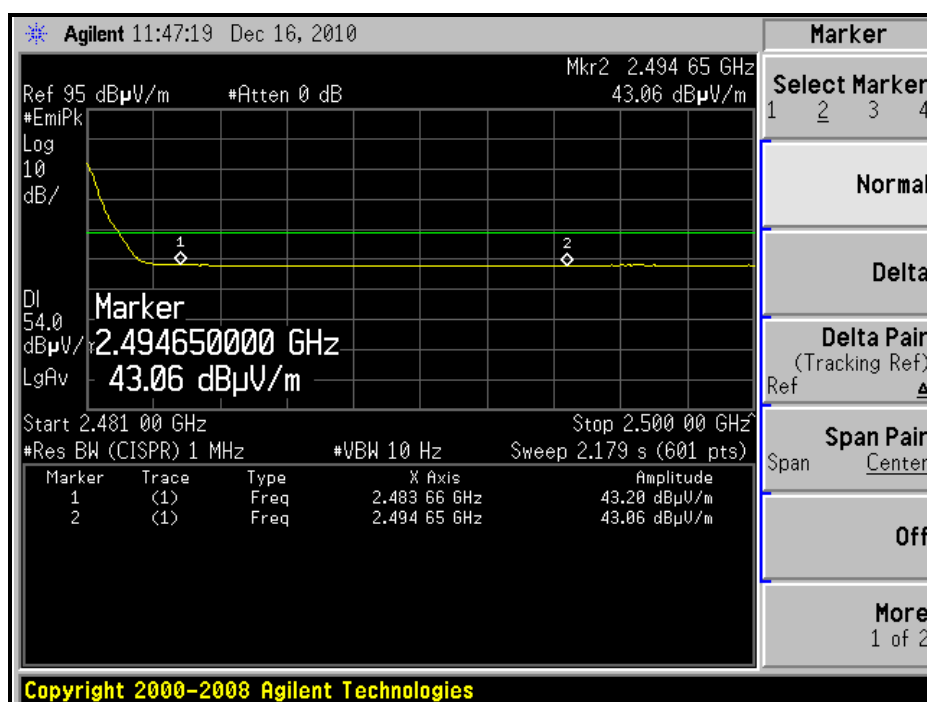
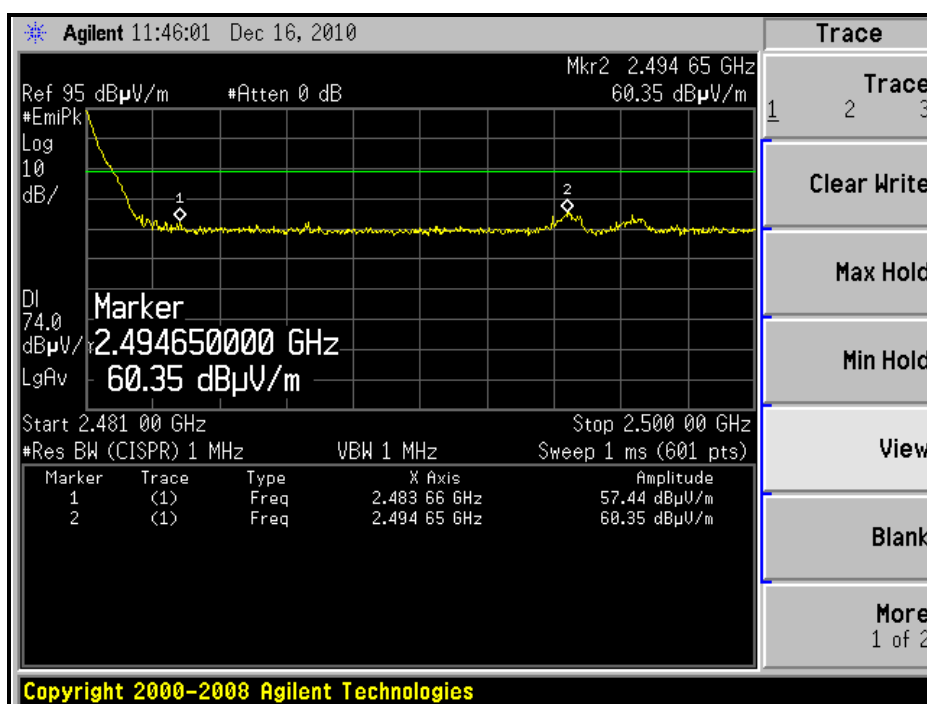
# RESTRICTED BANDEDGE (8DPSK MODE, CH0, HORIZONTAL )



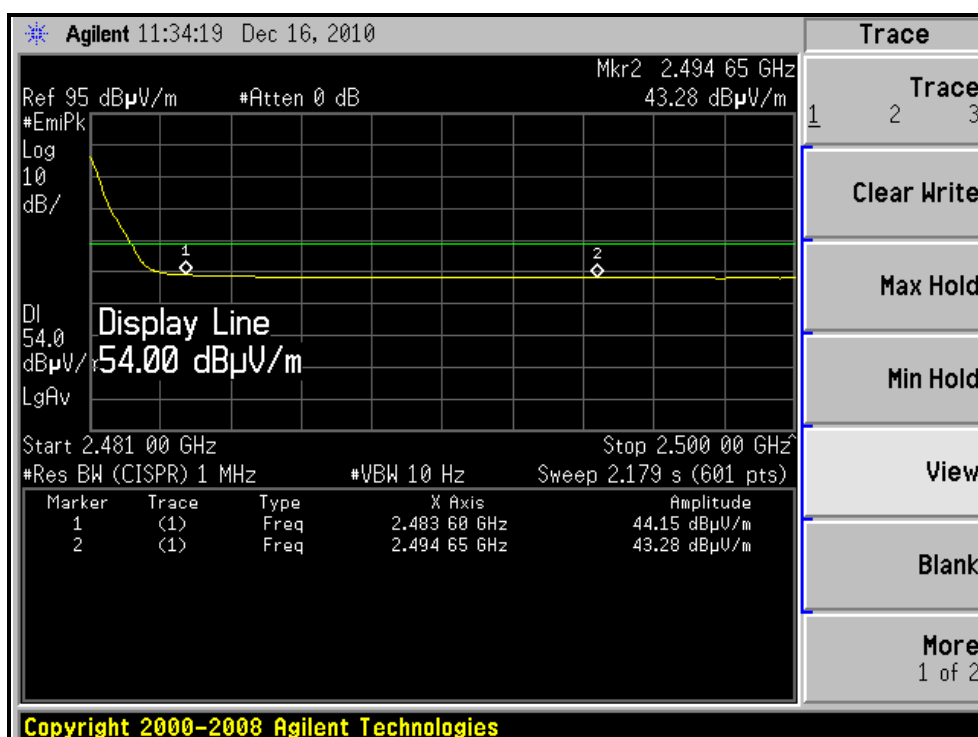
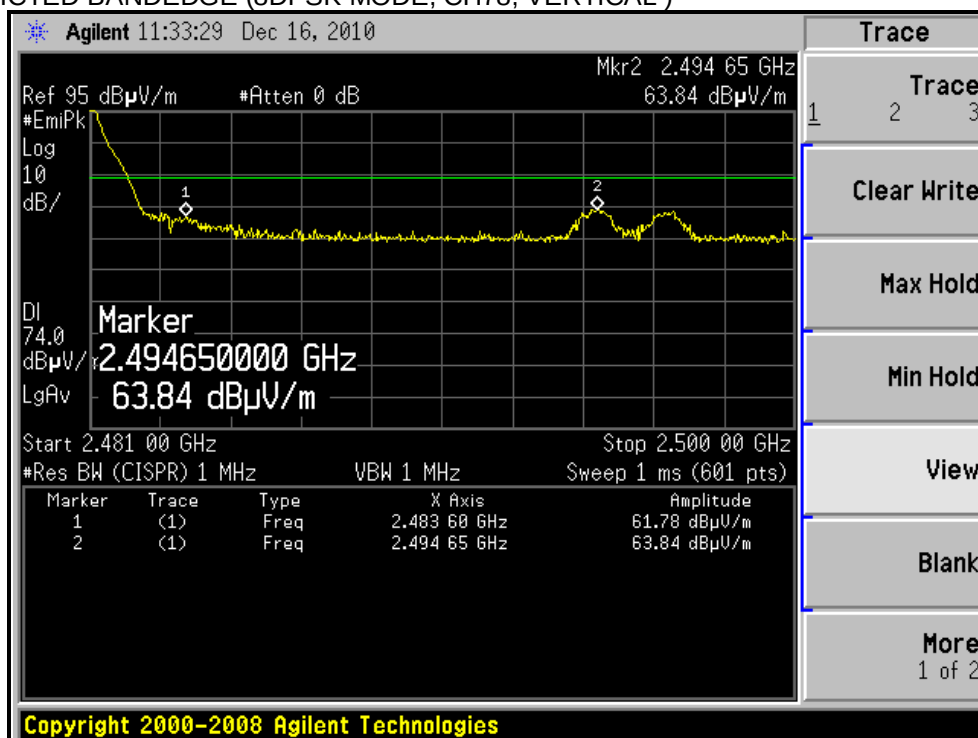
# RESTRICTED BANDEDGE (8DPSK MODE, CH0, VERTICAL )



# RESTRICTED BANDEDGE (8DPSK MODE, CH78, HORIZONTAL )



# RESTRICTED BANDEDGE (8DPSK MODE, CH78, VERTICAL)



#### 4.8.6.4 TEST RESULTS (Dipole Antenna - Bluetooth additional GFSK)

##### BELOW 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 19                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 70%RH<br>1011 hPa | TESTED BY          | Kent Liu      |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 141.55      | 36.2 QP                 | 43.5           | -7.3        | 1.25 H             | 337                  | 22.08            | 14.13                    |
| 2                                                   | 147.95      | 40.5 QP                 | 43.5           | -3.0        | 1.00 H             | 360                  | 26.29            | 14.23                    |
| 3                                                   | 166.42      | 42.4 QP                 | 43.5           | -1.1        | 1.25 H             | 0                    | 28.37            | 13.99                    |
| 4                                                   | 184.42      | 35.6 QP                 | 43.5           | -8.0        | 1.50 H             | 213                  | 23.21            | 12.34                    |
| 5                                                   | 199.23      | 42.1 QP                 | 43.5           | -1.4        | 1.50 H             | 357                  | 30.87            | 11.24                    |
| 6                                                   | 499.55      | 34.1 QP                 | 46.0           | -11.9       | 1.00 H             | 248                  | 14.16            | 19.95                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 146.25      | 31.0 QP                 | 43.5           | -12.5       | 1.25 V             | 24                   | 16.81            | 14.21                    |
| 2                                                   | 166.50      | 36.0 QP                 | 43.5           | -7.5        | 1.50 V             | 203                  | 22.00            | 13.98                    |
| 3                                                   | 183.90      | 34.3 QP                 | 43.5           | -9.2        | 1.50 V             | 12                   | 21.89            | 12.38                    |
| 4                                                   | 200.00      | 34.5 QP                 | 43.5           | -9.0        | 1.00 V             | 84                   | 23.34            | 11.18                    |
| 5                                                   | 299.84      | 33.3 QP                 | 46.0           | -12.7       | 1.25 V             | 145                  | 18.37            | 14.92                    |
| 6                                                   | 499.61      | 36.2 QP                 | 46.0           | -9.8        | 1.00 V             | 245                  | 16.29            | 19.95                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.





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## ABOVE 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2335.60     | 55.6 PK                 | 74.0           | -18.4       | 1.29 H             | 266                  | 24.02            | 31.58                    |
| 2                                                   | 2335.60     | 42.2 AV                 | 54.0           | -11.8       | 1.29 H             | 266                  | 10.62            | 31.58                    |
| 3                                                   | *2402.00    | 98.0 PK                 |                |             | 1.30 H             | 258                  | 66.20            | 31.80                    |
| 4                                                   | *2402.00    | 87.6 AV                 |                |             | 1.30 H             | 258                  | 55.80            | 31.80                    |
| 5                                                   | 4804.00     | 52.3 PK                 | 74.0           | -21.7       | 1.30 H             | 87                   | 13.10            | 39.20                    |
| 6                                                   | 4804.00     | 41.2 AV                 | 54.0           | -12.8       | 1.30 H             | 87                   | 2.00             | 39.20                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2322.00     | 55.7 PK                 | 74.0           | -18.3       | 1.28 V             | 288                  | 24.17            | 31.53                    |
| 2                                                   | 2322.00     | 44.7 AV                 | 54.0           | -9.3        | 1.28 V             | 288                  | 13.17            | 31.53                    |
| 3                                                   | *2402.00    | 104.5 PK                |                |             | 1.30 V             | 290                  | 72.70            | 31.80                    |
| 4                                                   | *2402.00    | 89.4 AV                 |                |             | 1.30 V             | 290                  | 57.60            | 31.80                    |
| 5                                                   | 4804.00     | 54.5 PK                 | 74.0           | -19.5       | 1.15 V             | 67                   | 15.30            | 39.20                    |
| 6                                                   | 4804.00     | 43.1 AV                 | 54.0           | -10.9       | 1.15 V             | 67                   | 3.90             | 39.20                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* ”: Fundamental frequency.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 19                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2440.00    | 99.2 PK                 |                |             | 1.29 H             | 261                  | 67.28            | 31.92                    |
| 2                                                   | *2440.00    | 88.1 AV                 |                |             | 1.29 H             | 261                  | 56.18            | 31.92                    |
| 3                                                   | 4880.00     | 52.9 PK                 | 74.0           | -21.1       | 1.30 H             | 87                   | 13.44            | 39.46                    |
| 4                                                   | 4880.00     | 41.3 AV                 | 54.0           | -12.7       | 1.30 H             | 87                   | 1.84             | 39.46                    |
| 5                                                   | 7320.00     | 51.2 PK                 | 74.0           | -22.8       | 1.19 H             | 206                  | 4.43             | 46.77                    |
| 6                                                   | 7320.00     | 38.0 AV                 | 54.0           | -16.0       | 1.19 H             | 206                  | -8.77            | 46.77                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2440.00    | 104.2 PK                |                |             | 1.29 V             | 288                  | 72.28            | 31.92                    |
| 2                                                   | *2440.00    | 89.8 AV                 |                |             | 1.29 V             | 288                  | 57.88            | 31.92                    |
| 3                                                   | 4880.00     | 54.9 PK                 | 74.0           | -19.1       | 1.18 V             | 70                   | 15.44            | 39.46                    |
| 4                                                   | 4880.00     | 43.8 AV                 | 54.0           | -10.2       | 1.18 V             | 70                   | 4.34             | 39.46                    |
| 5                                                   | 7320.00     | 52.4 PK                 | 74.0           | -21.6       | 1.21 V             | 14                   | 5.63             | 46.77                    |
| 6                                                   | 7320.00     | 38.2 AV                 | 54.0           | -15.8       | 1.21 V             | 14                   | -8.57            | 46.77                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* ”: Fundamental frequency.



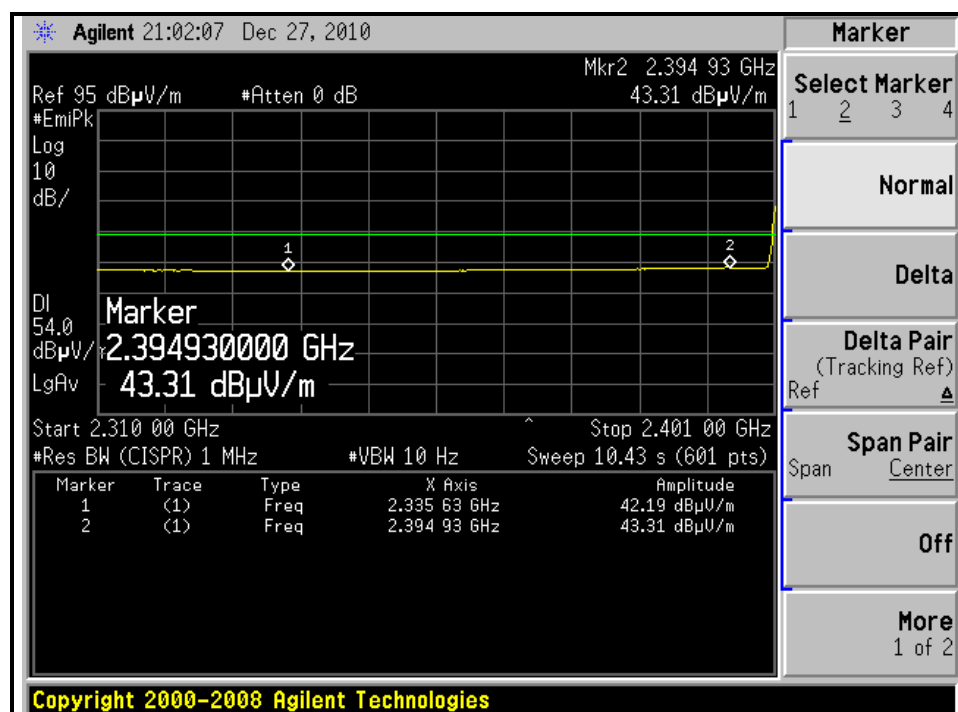
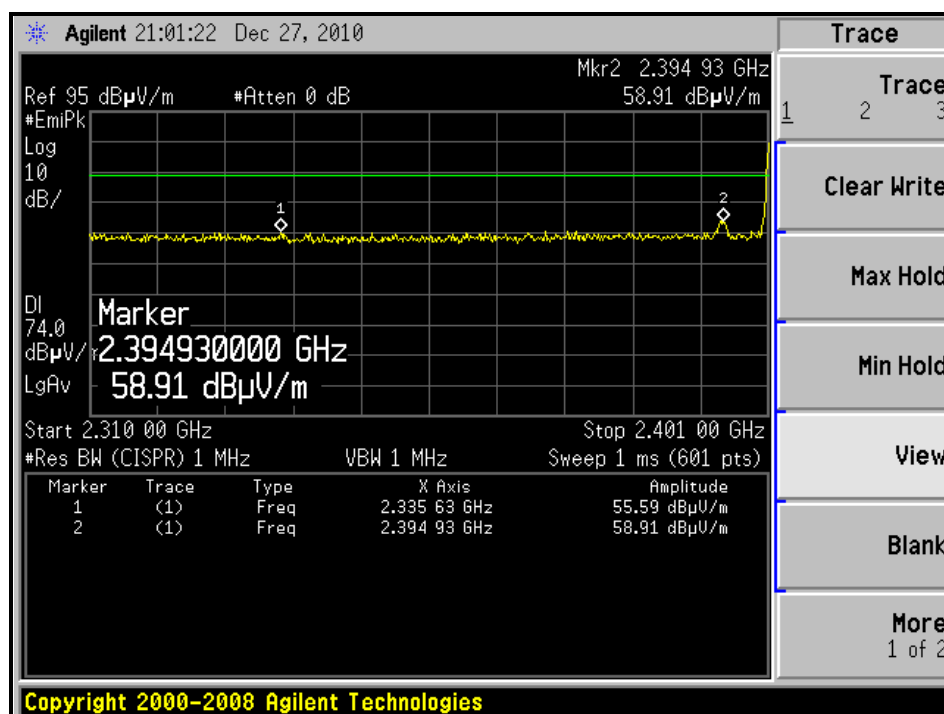
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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

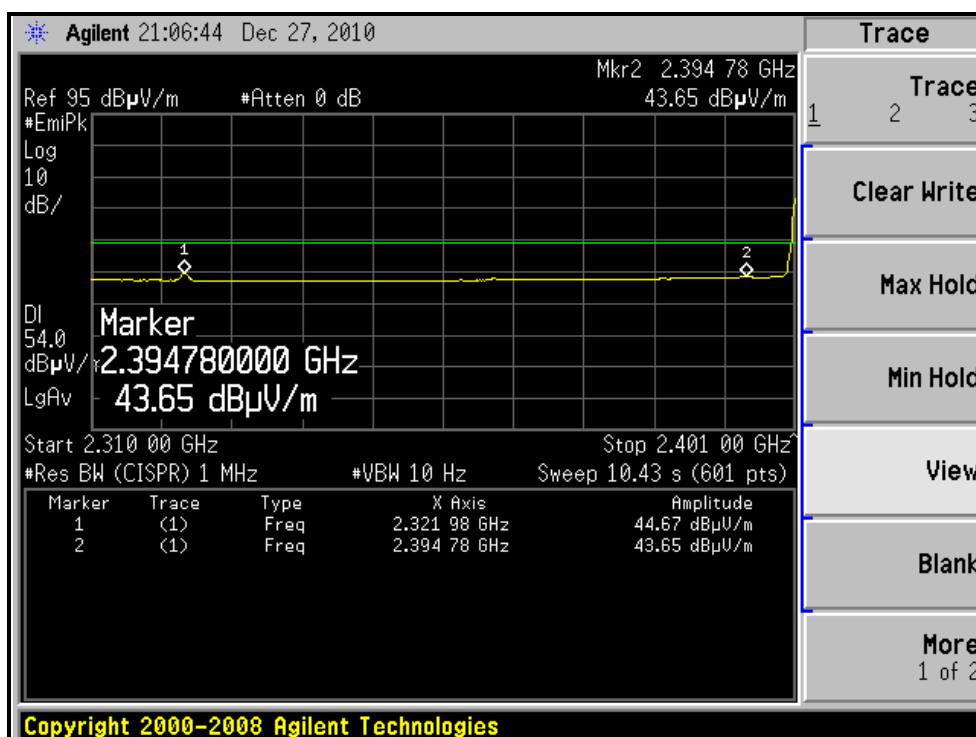
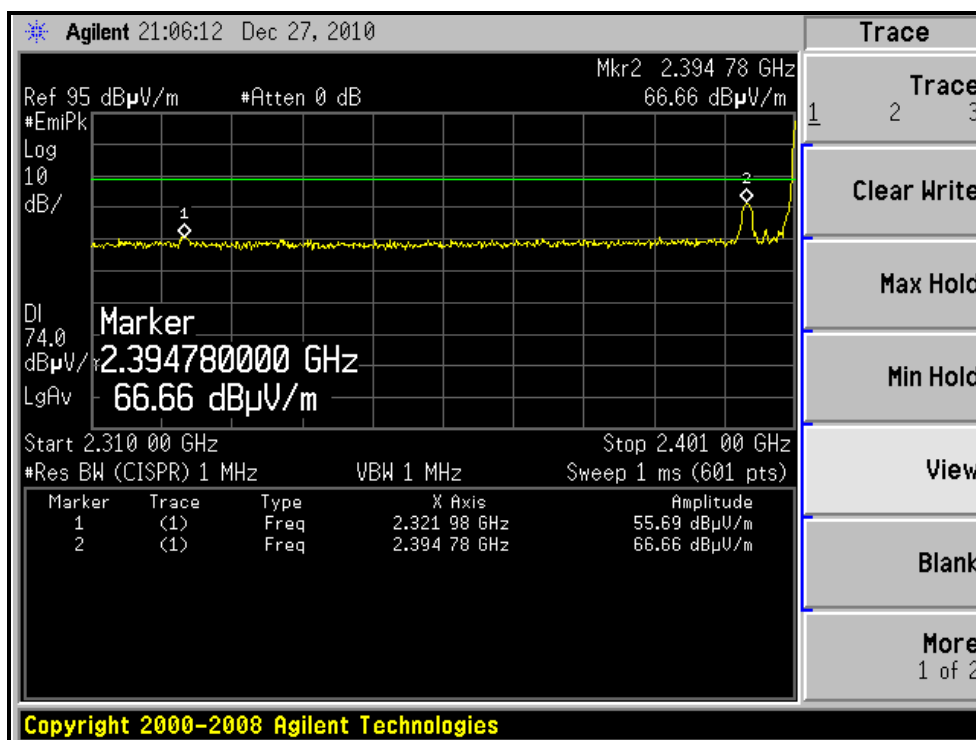
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 98.6 PK                 |                |             | 1.26 H             | 258                  | 66.55            | 32.05                    |
| 2                                                   | *2480.00    | 87.9 AV                 |                |             | 1.26 H             | 258                  | 55.85            | 32.05                    |
| 3                                                   | 2483.50     | 53.9 PK                 | 74.0           | -20.1       | 1.26 H             | 280                  | 21.83            | 32.07                    |
| 4                                                   | 2483.50     | 42.8 AV                 | 54.0           | -11.2       | 1.26 H             | 280                  | 10.73            | 32.07                    |
| 5                                                   | 2487.40     | 61.7 PK                 | 74.0           | -12.3       | 1.26 H             | 260                  | 29.62            | 32.08                    |
| 6                                                   | 2487.40     | 43.2 AV                 | 54.0           | -10.8       | 1.26 H             | 260                  | 11.12            | 32.08                    |
| 7                                                   | 4960.00     | 53.1 PK                 | 74.0           | -20.9       | 1.31 H             | 96                   | 13.38            | 39.72                    |
| 8                                                   | 4960.00     | 41.2 AV                 | 54.0           | -12.8       | 1.31 H             | 96                   | 1.48             | 39.72                    |
| 9                                                   | 7440.00     | 51.8 PK                 | 74.0           | -22.2       | 1.20 H             | 211                  | 5.13             | 46.67                    |
| 10                                                  | 7440.00     | 38.0 AV                 | 54.0           | -16.0       | 1.20 H             | 211                  | -8.67            | 46.67                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | *2480.00    | 104.1 PK                |                |             | 1.29 V             | 288                  | 72.05            | 32.05                    |
| 2                                                   | *2480.00    | 89.8 AV                 |                |             | 1.29 V             | 288                  | 57.75            | 32.05                    |
| 3                                                   | 2483.50     | 56.1 PK                 | 74.0           | -17.9       | 1.30 V             | 290                  | 24.03            | 32.07                    |
| 4                                                   | 2483.50     | 43.0 AV                 | 54.0           | -11.0       | 1.30 V             | 290                  | 10.93            | 32.07                    |
| 5                                                   | 2487.30     | 64.4 PK                 | 74.0           | -9.6        | 1.30 V             | 290                  | 32.32            | 32.08                    |
| 6                                                   | 2487.30     | 43.4 AV                 | 54.0           | -10.6       | 1.30 V             | 290                  | 11.32            | 32.08                    |
| 7                                                   | 4960.00     | 54.8 PK                 | 74.0           | -19.2       | 1.14 V             | 138                  | 15.08            | 39.72                    |
| 8                                                   | 4960.00     | 43.2 AV                 | 54.0           | -10.8       | 1.14 V             | 138                  | 3.48             | 39.72                    |
| 9                                                   | 7440.00     | 52.5 PK                 | 74.0           | -21.5       | 1.23 V             | 69                   | 5.83             | 46.67                    |
| 10                                                  | 7440.00     | 38.1 AV                 | 54.0           | -15.9       | 1.23 V             | 69                   | -8.57            | 46.67                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* “: Fundamental frequency.

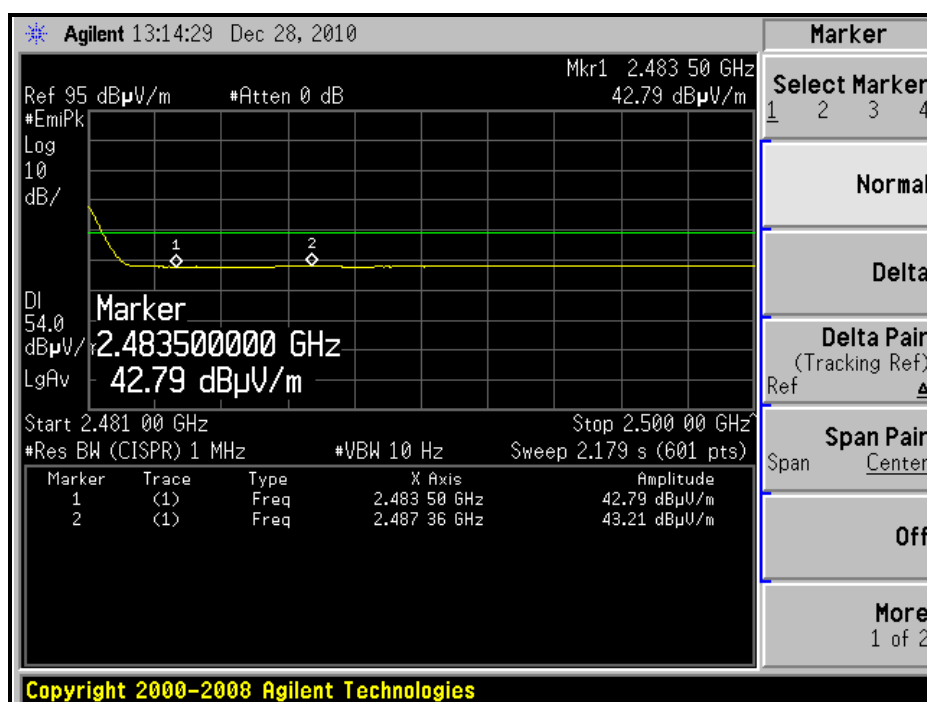
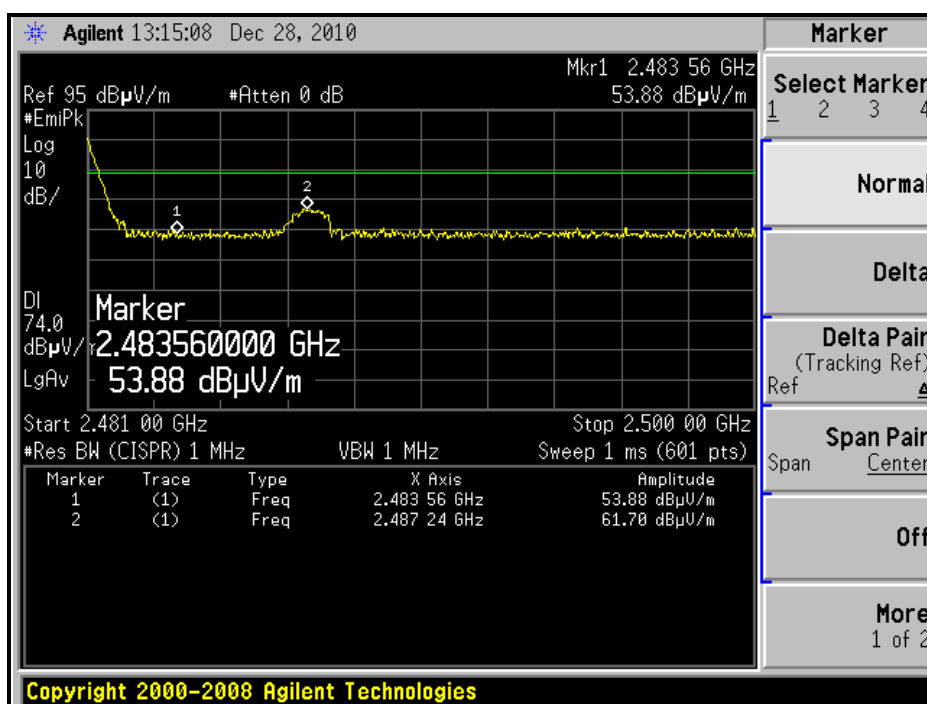
RESTRICTED BANDEDGE (additional GFSK MODE, CH0, HORIZONTAL )



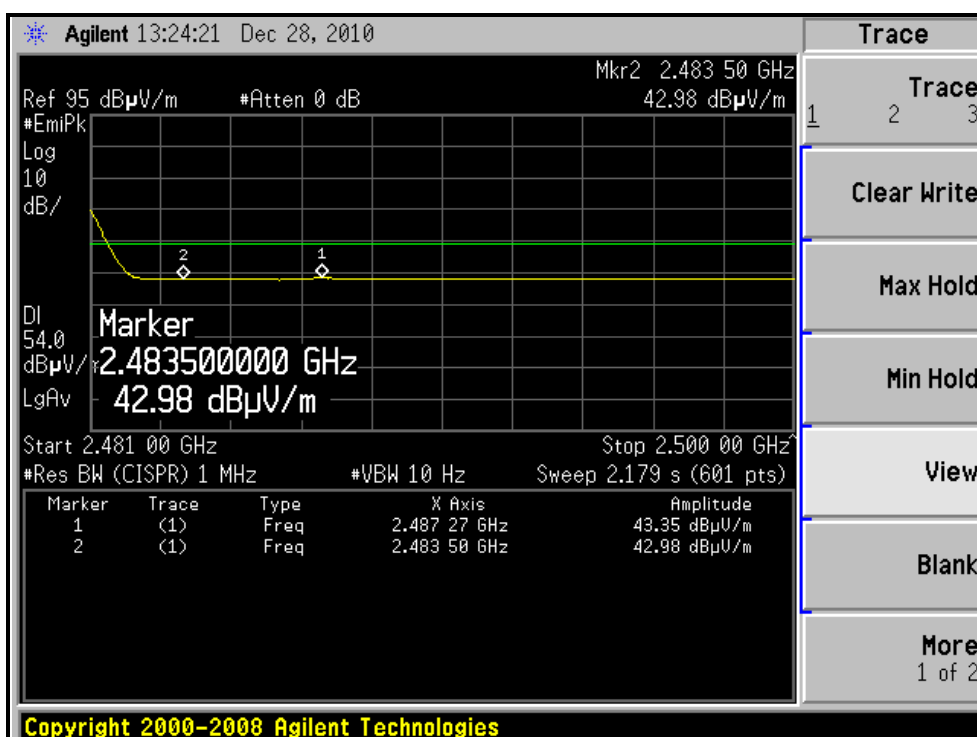
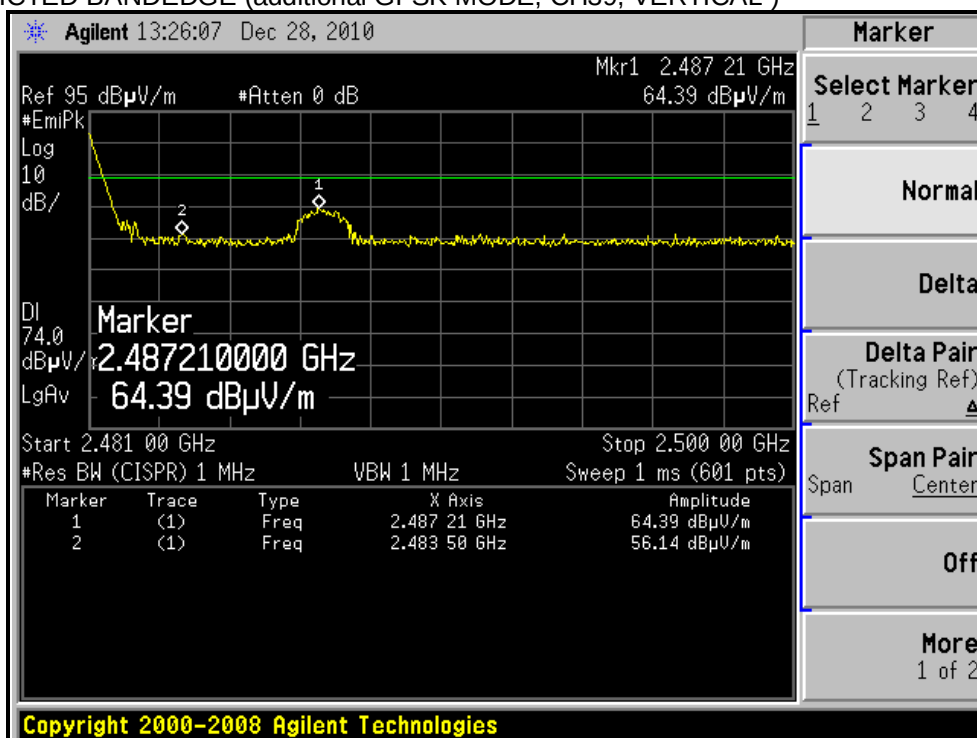
RESTRICTED BANDEDGE (additional GFSK MODE, CH0, VERTICAL )



# RESTRICTED BANDEDGE (additional GFSK MODE, CH39, HORIZONTAL )



RESTRICTED BANDEDGE (additional GFSK MODE, CH39, VERTICAL )



## 4.8.7 TEST RESULTS (FOR RECEIVER PART)

### 4.8.7.1 TEST RESULTS (PIFA Antenna - Bluetooth traditional GFSK/ $\pi/4$ -DQPSK/ 8DPSK)

#### BELOW 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 70%RH<br>1011 hPa | TESTED BY          | Kent Liu      |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 141.56      | 36.3 QP                 | 43.5           | -7.2        | 1.00 H             | 236                  | 22.17            | 14.13                    |
| 2                                                   | 148.01      | 39.8 QP                 | 43.5           | -3.7        | 1.50 H             | 47                   | 25.57            | 14.23                    |
| 3                                                   | 166.50      | 42.1 QP                 | 43.5           | -1.4        | 1.75 H             | 168                  | 28.12            | 13.98                    |
| 4                                                   | 184.53      | 35.6 QP                 | 43.5           | -7.9        | 1.25 H             | 86                   | 23.30            | 12.33                    |
| 5                                                   | 199.18      | 41.9 QP                 | 43.5           | -1.6        | 1.00 H             | 207                  | 30.62            | 11.24                    |
| 6                                                   | 499.51      | 33.9 QP                 | 46.0           | -12.1       | 1.50 H             | 86                   | 13.95            | 19.95                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 146.29      | 30.7 QP                 | 43.5           | -12.8       | 1.00 V             | 149                  | 16.52            | 14.21                    |
| 2                                                   | 166.42      | 36.1 QP                 | 43.5           | -7.4        | 1.00 V             | 190                  | 22.15            | 13.99                    |
| 3                                                   | 183.83      | 33.6 QP                 | 43.5           | -9.9        | 1.00 V             | 324                  | 21.25            | 12.38                    |
| 4                                                   | 199.23      | 34.2 QP                 | 43.5           | -9.3        | 1.50 V             | 326                  | 23.00            | 11.24                    |
| 5                                                   | 299.77      | 32.7 QP                 | 46.0           | -13.3       | 1.50 V             | 309                  | 17.75            | 14.92                    |
| 6                                                   | 499.55      | 35.3 QP                 | 46.0           | -10.7       | 1.25 V             | 297                  | 15.35            | 19.95                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.





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## ABOVE 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2400.00     | 41.2 PK                 | 74.0           | -32.8       | 1.53 H             | 4                    | 9.38             | 31.82                    |
| 2                                                   | 2400.00     | 30.1 AV                 | 54.0           | -23.9       | 1.53 H             | 4                    | -1.72            | 31.82                    |
| 3                                                   | 4800.00     | 49.1 PK                 | 74.0           | -24.9       | 1.46 H             | 312                  | 8.18             | 40.92                    |
| 4                                                   | 4800.00     | 36.9 AV                 | 54.0           | -17.1       | 1.46 H             | 312                  | -4.02            | 40.92                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2400.00     | 43.2 PK                 | 74.0           | -30.8       | 1.11 V             | 308                  | 11.38            | 31.82                    |
| 2                                                   | 2400.00     | 30.9 AV                 | 54.0           | -23.1       | 1.11 V             | 308                  | -0.92            | 31.82                    |
| 3                                                   | 4800.00     | 49.3 PK                 | 74.0           | -24.7       | 1.20 V             | 69                   | 8.38             | 40.92                    |
| 4                                                   | 4800.00     | 37.8 AV                 | 54.0           | -16.2       | 1.20 V             | 69                   | -3.12            | 40.92                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
 3. The other emission levels were very low against the limit.  
 4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2439.00     | 40.3 PK                 | 74.0           | -33.7       | 1.63 H             | 278                  | 8.36             | 31.94                    |
| 2                                                   | 2439.00     | 29.2 AV                 | 54.0           | -24.8       | 1.63 H             | 278                  | -2.74            | 31.94                    |
| 3                                                   | 4878.00     | 48.2 PK                 | 74.0           | -25.8       | 1.42 H             | 165                  | 7.14             | 41.06                    |
| 4                                                   | 4878.00     | 35.9 AV                 | 54.0           | -18.1       | 1.42 H             | 165                  | -5.16            | 41.06                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2439.00     | 42.9 PK                 | 74.0           | -31.1       | 1.57 V             | 69                   | 10.96            | 31.94                    |
| 2                                                   | 2439.00     | 30.6 AV                 | 54.0           | -23.4       | 1.57 V             | 69                   | -1.34            | 31.94                    |
| 3                                                   | 4878.00     | 49.1 PK                 | 74.0           | -24.9       | 1.48 V             | 342                  | 8.04             | 41.06                    |
| 4                                                   | 4878.00     | 37.6 AV                 | 54.0           | -16.4       | 1.48 V             | 342                  | -3.46            | 41.06                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 78                  | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2478.00     | 41.3 PK                 | 74.0           | -32.7       | 1.00 H             | 146                  | 9.24             | 32.06                    |
| 2                                                   | 2478.00     | 29.2 AV                 | 54.0           | -24.8       | 1.00 H             | 146                  | -2.86            | 32.06                    |
| 3                                                   | 4956.00     | 47.9 PK                 | 74.0           | -26.1       | 1.21 H             | 35                   | 6.69             | 41.21                    |
| 4                                                   | 4956.00     | 35.2 AV                 | 54.0           | -18.8       | 1.21 H             | 35                   | -6.01            | 41.21                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2478.00     | 43.1 PK                 | 74.0           | -30.9       | 1.54 V             | 69                   | 11.04            | 32.06                    |
| 2                                                   | 2478.00     | 30.9 AV                 | 54.0           | -23.1       | 1.54 V             | 69                   | -1.16            | 32.06                    |
| 3                                                   | 4956.00     | 50.2 PK                 | 74.0           | -23.8       | 1.63 V             | 114                  | 8.99             | 41.21                    |
| 4                                                   | 4956.00     | 39.2 AV                 | 54.0           | -14.8       | 1.63 V             | 114                  | -2.01            | 41.21                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.

#### 4.8.7.2 TEST RESULTS (PIFA Antenna - Bluetooth additional GFSK)

##### BELOW 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 19                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 70%RH<br>1011 hPa | TESTED BY          | Kent Liu      |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 141.56      | 35.7 QP                 | 43.5           | -7.8        | 1.00 H             | 236                  | 21.57            | 14.13                    |
| 2                                                   | 148.01      | 38.6 QP                 | 43.5           | -4.9        | 1.50 H             | 47                   | 24.37            | 14.23                    |
| 3                                                   | 166.50      | 41.0 QP                 | 43.5           | -2.5        | 1.75 H             | 168                  | 27.02            | 13.98                    |
| 4                                                   | 184.53      | 35.8 QP                 | 43.5           | -7.7        | 1.25 H             | 86                   | 23.44            | 12.33                    |
| 5                                                   | 199.18      | 41.3 QP                 | 43.5           | -2.3        | 1.00 H             | 207                  | 30.01            | 11.24                    |
| 6                                                   | 499.51      | 34.3 QP                 | 46.0           | -11.7       | 1.50 H             | 86                   | 14.32            | 19.95                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 146.29      | 30.3 QP                 | 43.5           | -13.2       | 1.00 V             | 149                  | 16.13            | 14.21                    |
| 2                                                   | 166.42      | 36.1 QP                 | 43.5           | -7.4        | 1.00 V             | 190                  | 22.12            | 13.99                    |
| 3                                                   | 183.83      | 33.5 QP                 | 43.5           | -10.1       | 1.00 V             | 324                  | 21.07            | 12.38                    |
| 4                                                   | 199.23      | 34.3 QP                 | 43.5           | -9.2        | 1.50 V             | 326                  | 23.03            | 11.24                    |
| 5                                                   | 299.77      | 32.1 QP                 | 46.0           | -14.0       | 1.50 V             | 309                  | 17.13            | 14.92                    |
| 6                                                   | 499.55      | 35.0 QP                 | 46.0           | -11.0       | 1.25 V             | 297                  | 15.03            | 19.95                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.



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## ABOVE 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4802.50     | 48.3 PK                 | 74.0           | -25.7       | 1.23 H             | 58                   | 9.10             | 39.20                    |
| 2                                                   | 4802.50     | 36.6 AV                 | 54.0           | -17.4       | 1.23 H             | 58                   | -2.60            | 39.20                    |
| 3                                                   | 9605.00     | 55.7 PK                 | 74.0           | -18.3       | 1.40 H             | 114                  | 9.49             | 46.21                    |
| 4                                                   | 9605.00     | 44.2 AV                 | 54.0           | -9.8        | 1.40 H             | 114                  | -2.01            | 46.21                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4802.50     | 48.2 PK                 | 74.0           | -25.8       | 1.23 V             | 358                  | 9.00             | 39.20                    |
| 2                                                   | 4802.50     | 36.7 AV                 | 54.0           | -17.3       | 1.23 V             | 358                  | -2.50            | 39.20                    |
| 3                                                   | 9605.00     | 55.6 PK                 | 74.0           | -18.4       | 1.40 V             | 65                   | 9.39             | 46.21                    |
| 4                                                   | 9605.00     | 44.1 AV                 | 54.0           | -9.9        | 1.40 V             | 65                   | -2.11            | 46.21                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 19                  | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4878.30     | 48.4 PK                 | 74.0           | -25.6       | 1.36 H             | 66                   | 8.94             | 39.46                    |
| 2                                                   | 4878.30     | 36.8 AV                 | 54.0           | -17.2       | 1.36 H             | 66                   | -2.66            | 39.46                    |
| 3                                                   | 9756.70     | 55.7 PK                 | 74.0           | -18.3       | 1.50 H             | 78                   | 9.50             | 46.20                    |
| 4                                                   | 9756.70     | 44.3 AV                 | 54.0           | -9.7        | 1.50 H             | 78                   | -1.90            | 46.20                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4878.30     | 48.3 PK                 | 74.0           | -25.7       | 1.00 V             | 7                    | 8.84             | 39.46                    |
| 2                                                   | 4878.30     | 36.5 AV                 | 54.0           | -17.5       | 1.00 V             | 7                    | -2.96            | 39.46                    |
| 3                                                   | 9756.70     | 55.5 PK                 | 74.0           | -18.5       | 1.42 V             | 342                  | 9.30             | 46.20                    |
| 4                                                   | 9756.70     | 44.0 AV                 | 54.0           | -10.0       | 1.42 V             | 342                  | -2.20            | 46.20                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4958.30     | 48.6 PK                 | 74.0           | -25.4       | 1.44 H             | 343                  | 8.88             | 39.72                    |
| 2                                                   | 4958.30     | 37.0 AV                 | 54.0           | -17.0       | 1.44 H             | 343                  | -2.72            | 39.72                    |
| 3                                                   | 9916.70     | 55.9 PK                 | 74.0           | -18.1       | 1.50 H             | 46                   | 9.71             | 46.19                    |
| 4                                                   | 9916.70     | 44.5 AV                 | 54.0           | -9.5        | 1.50 H             | 46                   | -1.69            | 46.19                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4958.30     | 48.5 PK                 | 74.0           | -25.5       | 1.29 V             | 174                  | 8.78             | 39.72                    |
| 2                                                   | 4958.30     | 36.9 AV                 | 54.0           | -17.1       | 1.29 V             | 174                  | -2.82            | 39.72                    |
| 3                                                   | 9916.70     | 55.7 PK                 | 74.0           | -18.3       | 1.34 V             | 78                   | 9.51             | 46.19                    |
| 4                                                   | 9916.70     | 44.3 AV                 | 54.0           | -9.7        | 1.34 V             | 78                   | -1.89            | 46.19                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.

#### 4.8.7.3 TEST RESULTS (Dipole Antenna - Bluetooth traditional GFSK/ $\pi/4$ -DQPSK/ 8DPSK)

##### BELOW 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 70%RH<br>1011 hPa | TESTED BY          | Eric Lee      |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 141.55      | 36.2 QP                 | 43.5           | -7.3        | 1.25 H             | 337                  | 22.06            | 14.13                    |
| 2                                                   | 147.95      | 40.6 QP                 | 43.5           | -2.9        | 1.00 H             | 360                  | 26.40            | 14.23                    |
| 3                                                   | 166.42      | 42.3 QP                 | 43.5           | -1.2        | 1.25 H             | 0                    | 28.27            | 13.99                    |
| 4                                                   | 184.42      | 35.8 QP                 | 43.5           | -7.7        | 1.50 H             | 213                  | 23.45            | 12.34                    |
| 5                                                   | 199.23      | 42.5 QP                 | 43.5           | -1.0        | 1.50 H             | 357                  | 31.24            | 11.24                    |
| 6                                                   | 499.55      | 34.2 QP                 | 46.0           | -11.9       | 1.00 H             | 248                  | 14.20            | 19.95                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 146.25      | 31.2 QP                 | 43.5           | -12.3       | 1.25 V             | 24                   | 17.03            | 14.21                    |
| 2                                                   | 166.50      | 36.6 QP                 | 43.5           | -6.9        | 1.50 V             | 203                  | 22.62            | 13.98                    |
| 3                                                   | 183.90      | 34.2 QP                 | 43.5           | -9.3        | 1.50 V             | 12                   | 21.82            | 12.38                    |
| 4                                                   | 200.00      | 34.6 QP                 | 43.5           | -8.9        | 1.00 V             | 84                   | 23.42            | 11.18                    |
| 5                                                   | 299.84      | 33.2 QP                 | 46.0           | -12.8       | 1.25 V             | 145                  | 18.28            | 14.92                    |
| 6                                                   | 499.61      | 36.6 QP                 | 46.0           | -9.4        | 1.00 V             | 245                  | 16.65            | 19.95                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.





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## ABOVE 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2400.00     | 41.5 PK                 | 74.0           | -32.5       | 1.41 H             | 88                   | 9.68             | 31.82                    |
| 2                                                   | 2400.00     | 29.3 AV                 | 54.0           | -24.7       | 1.41 H             | 88                   | -2.52            | 31.82                    |
| 3                                                   | 4800.00     | 46.8 PK                 | 74.0           | -27.2       | 1.19 H             | 67                   | 5.88             | 40.92                    |
| 4                                                   | 4800.00     | 35.3 AV                 | 54.0           | -18.7       | 1.19 H             | 67                   | -5.62            | 40.92                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2400.00     | 42.1 PK                 | 74.0           | -31.9       | 1.23 V             | 78                   | 10.28            | 31.82                    |
| 2                                                   | 2400.00     | 30.1 AV                 | 54.0           | -23.9       | 1.23 V             | 78                   | -1.72            | 31.82                    |
| 3                                                   | 4800.00     | 47.2 PK                 | 74.0           | -26.8       | 1.67 V             | 0                    | 6.28             | 40.92                    |
| 4                                                   | 4800.00     | 37.2 AV                 | 54.0           | -16.8       | 1.67 V             | 0                    | -3.72            | 40.92                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2439.00     | 41.3 PK                 | 74.0           | -32.7       | 1.54 H             | 241                  | 9.36             | 31.94                    |
| 2                                                   | 2439.00     | 29.7 AV                 | 54.0           | -24.3       | 1.54 H             | 241                  | -2.24            | 31.94                    |
| 3                                                   | 4878.00     | 47.1 PK                 | 74.0           | -26.9       | 1.25 H             | 25                   | 6.04             | 41.06                    |
| 4                                                   | 4878.00     | 35.1 AV                 | 54.0           | -18.9       | 1.25 H             | 25                   | -5.96            | 41.06                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2439.00     | 42.3 PK                 | 74.0           | -31.7       | 1.03 V             | 208                  | 10.36            | 31.94                    |
| 2                                                   | 2439.00     | 30.0 AV                 | 54.0           | -24.0       | 1.03 V             | 208                  | -1.94            | 31.94                    |
| 3                                                   | 4878.00     | 48.2 PK                 | 74.0           | -25.8       | 1.14 V             | 69                   | 7.14             | 41.06                    |
| 4                                                   | 4878.00     | 36.9 AV                 | 54.0           | -17.1       | 1.14 V             | 69                   | -4.16            | 41.06                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 78                  | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 17deg. C, 71%RH<br>1011 hPa | TESTED BY          | Eric Lee                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2478.00     | 41.6 PK                 | 74.0           | -32.4       | 1.61 H             | 312                  | 9.54             | 32.06                    |
| 2                                                   | 2478.00     | 29.8 AV                 | 54.0           | -24.2       | 1.61 H             | 312                  | -2.26            | 32.06                    |
| 3                                                   | 4956.00     | 47.2 PK                 | 74.0           | -26.8       | 1.28 H             | 69                   | 5.99             | 41.21                    |
| 4                                                   | 4956.00     | 35.8 AV                 | 54.0           | -18.2       | 1.28 H             | 69                   | -5.41            | 41.21                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 2478.00     | 41.9 PK                 | 74.0           | -32.1       | 1.43 V             | 78                   | 9.84             | 32.06                    |
| 2                                                   | 2478.00     | 29.9 AV                 | 54.0           | -24.1       | 1.43 V             | 78                   | -2.16            | 32.06                    |
| 3                                                   | 4956.00     | 47.4 PK                 | 74.0           | -26.6       | 1.50 V             | 114                  | 6.19             | 41.21                    |
| 4                                                   | 4956.00     | 36.2 AV                 | 54.0           | -17.8       | 1.50 V             | 114                  | -5.01            | 41.21                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.

#### 4.8.7.4 TEST RESULTS (Dipole Antenna - Bluetooth additional GFSK)

##### BELOW 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 19                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 70%RH<br>1011 hPa | TESTED BY          | Kent Liu      |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 141.55      | 36.2 QP                 | 43.5           | -7.3        | 1.25 H             | 337                  | 22.08            | 14.13                    |
| 2                                                   | 147.95      | 40.5 QP                 | 43.5           | -3.0        | 1.00 H             | 360                  | 26.29            | 14.23                    |
| 3                                                   | 166.42      | 42.4 QP                 | 43.5           | -1.1        | 1.25 H             | 0                    | 28.37            | 13.99                    |
| 4                                                   | 184.42      | 35.6 QP                 | 43.5           | -8.0        | 1.50 H             | 213                  | 23.21            | 12.34                    |
| 5                                                   | 199.23      | 42.1 QP                 | 43.5           | -1.4        | 1.50 H             | 357                  | 30.87            | 11.24                    |
| 6                                                   | 499.55      | 34.1 QP                 | 46.0           | -11.9       | 1.00 H             | 248                  | 14.16            | 19.95                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 146.25      | 31.0 QP                 | 43.5           | -12.5       | 1.25 V             | 24                   | 16.81            | 14.21                    |
| 2                                                   | 166.50      | 36.0 QP                 | 43.5           | -7.5        | 1.50 V             | 203                  | 22.00            | 13.98                    |
| 3                                                   | 183.90      | 34.3 QP                 | 43.5           | -9.2        | 1.50 V             | 12                   | 21.89            | 12.38                    |
| 4                                                   | 200.00      | 34.5 QP                 | 43.5           | -9.0        | 1.00 V             | 84                   | 23.34            | 11.18                    |
| 5                                                   | 299.84      | 33.3 QP                 | 46.0           | -12.7       | 1.25 V             | 145                  | 18.37            | 14.92                    |
| 6                                                   | 499.61      | 36.2 QP                 | 46.0           | -9.8        | 1.00 V             | 245                  | 16.29            | 19.95                    |

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.



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## ABOVE 1GHz WORST-CASE DATA :

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4802.50     | 48.2 PK                 | 74.0           | -25.8       | 1.30 H             | 143                  | 9.00             | 39.20                    |
| 2                                                   | 4802.50     | 36.7 AV                 | 54.0           | -17.3       | 1.30 H             | 143                  | -2.50            | 39.20                    |
| 3                                                   | 9605.00     | 55.5 PK                 | 74.0           | -18.5       | 1.40 H             | 20                   | 9.29             | 46.21                    |
| 4                                                   | 9605.00     | 44.0 AV                 | 54.0           | -10.0       | 1.40 H             | 20                   | -2.21            | 46.21                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4802.50     | 48.4 PK                 | 74.0           | -25.6       | 1.08 V             | 88                   | 9.20             | 39.20                    |
| 2                                                   | 4802.50     | 36.8 AV                 | 54.0           | -17.2       | 1.08 V             | 88                   | -2.40            | 39.20                    |
| 3                                                   | 9605.00     | 55.7 PK                 | 74.0           | -18.3       | 1.42 V             | 146                  | 9.49             | 46.21                    |
| 4                                                   | 9605.00     | 44.2 AV                 | 54.0           | -9.8        | 1.42 V             | 146                  | -2.01            | 46.21                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 19                  | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4878.30     | 48.0 PK                 | 74.0           | -26.0       | 1.14 H             | 308                  | 8.54             | 39.46                    |
| 2                                                   | 4878.30     | 36.0 AV                 | 54.0           | -18.0       | 1.14 H             | 308                  | -3.46            | 39.46                    |
| 3                                                   | 9756.70     | 55.2 PK                 | 74.0           | -18.8       | 1.20 H             | 257                  | 9.00             | 46.20                    |
| 4                                                   | 9756.70     | 43.8 AV                 | 54.0           | -10.2       | 1.20 H             | 257                  | -2.40            | 46.20                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4878.30     | 48.1 PK                 | 74.0           | -25.9       | 1.56 V             | 274                  | 8.64             | 39.46                    |
| 2                                                   | 4878.30     | 36.3 AV                 | 54.0           | -17.7       | 1.56 V             | 274                  | -3.16            | 39.46                    |
| 3                                                   | 9756.70     | 55.5 PK                 | 74.0           | -18.5       | 1.11 V             | 341                  | 9.30             | 46.20                    |
| 4                                                   | 9756.70     | 44.1 AV                 | 54.0           | -9.9        | 1.11 V             | 341                  | -2.10            | 46.20                    |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 39                  | FREQUENCY RANGE    | 1 ~ 7.5GHz                |
| INPUT POWER (SYSTEM)     | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 62%RH<br>1011 hPa | TESTED BY          | Kent Liu                  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4958.30     | 48.3 PK                 | 74.0           | -25.8       | 1.20 H             | 314                  | 8.53             | 39.72                    |
| 2                                                   | 4958.30     | 36.4 AV                 | 54.0           | -17.6       | 1.20 H             | 314                  | -3.32            | 39.72                    |
| 3                                                   | 9916.70     | 55.4 PK                 | 74.0           | -18.6       | 1.14 H             | 360                  | 9.21             | 46.19                    |
| 4                                                   | 9916.70     | 43.8 AV                 | 54.0           | -10.2       | 1.14 H             | 360                  | -2.39            | 46.19                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 4958.30     | 48.3 PK                 | 74.0           | -25.7       | 1.26 V             | 241                  | 8.58             | 39.72                    |
| 2                                                   | 4958.30     | 36.5 AV                 | 54.0           | -17.5       | 1.26 V             | 241                  | -3.22            | 39.72                    |
| 3                                                   | 9916.74     | 55.6 PK                 | 74.0           | -18.4       | 1.33 V             | 346                  | 9.41             | 46.19                    |
| 4                                                   | 9916.74     | 44.0 AV                 | 54.0           | -10.0       | 1.33 V             | 346                  | -2.19            | 46.19                    |

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.

## 4.9 CONDUCTED OUT-BAND EMISSION MEASUREMENT

### 4.8.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz RBW).

### 4.8.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER   | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|------------------------------|-----------|------------|-----------------|------------------|
| PSA Series Spectrum Analyzer | FSP40     | 100036     | Dec. 08, 2010   | Dec. 07, 2011    |

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 100 kHz and VBW of spectrum analyzer to 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges were measured and recorded.

### 4.8.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.9.1 TEST SETUP



### 4.8.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

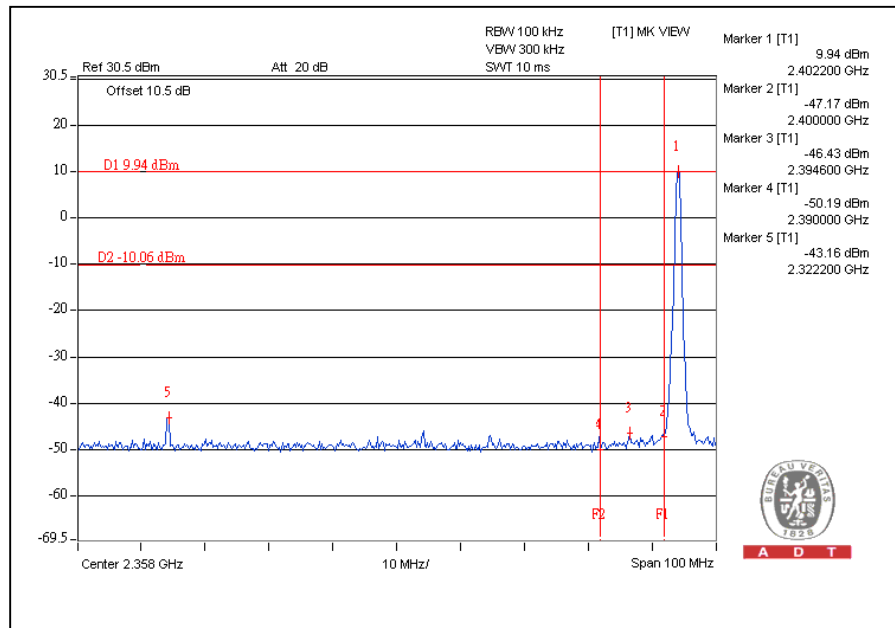


## 4.8.6 TEST RESULTS

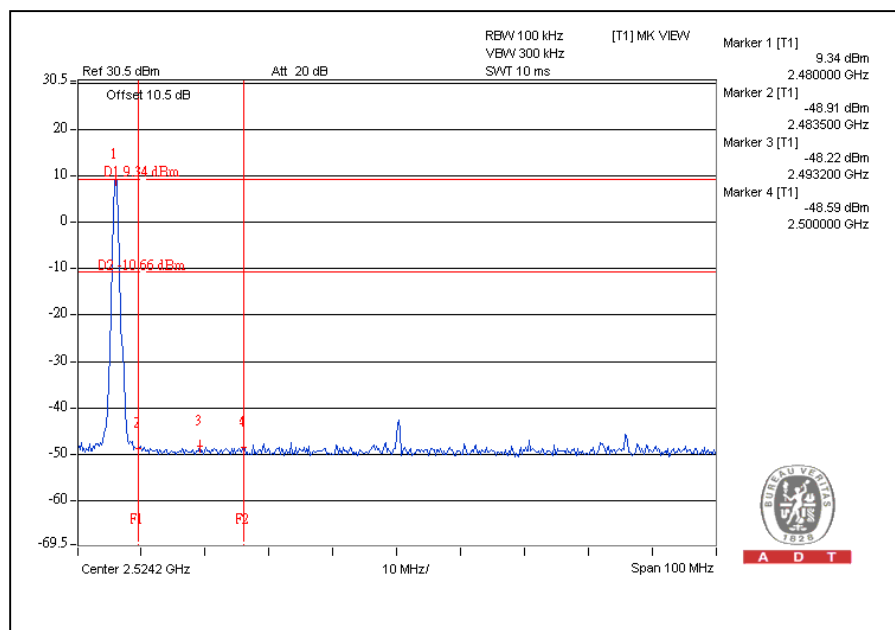
Emissions radiated outside of the specified frequency bands, please refer following pages for met the requirement of the general radiated emission limits in § 15.209.

**For GFSK Modulation Type:**

CH0



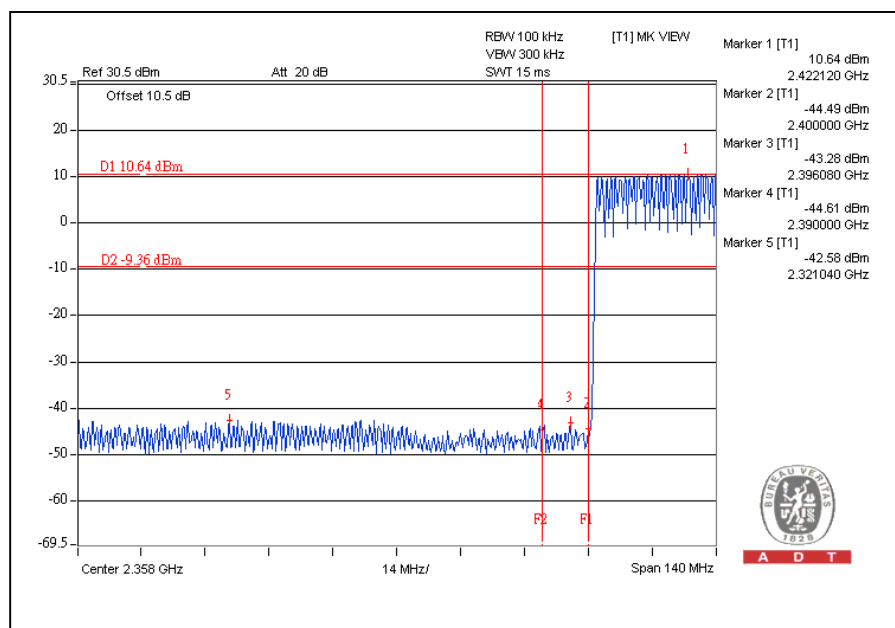
CH78



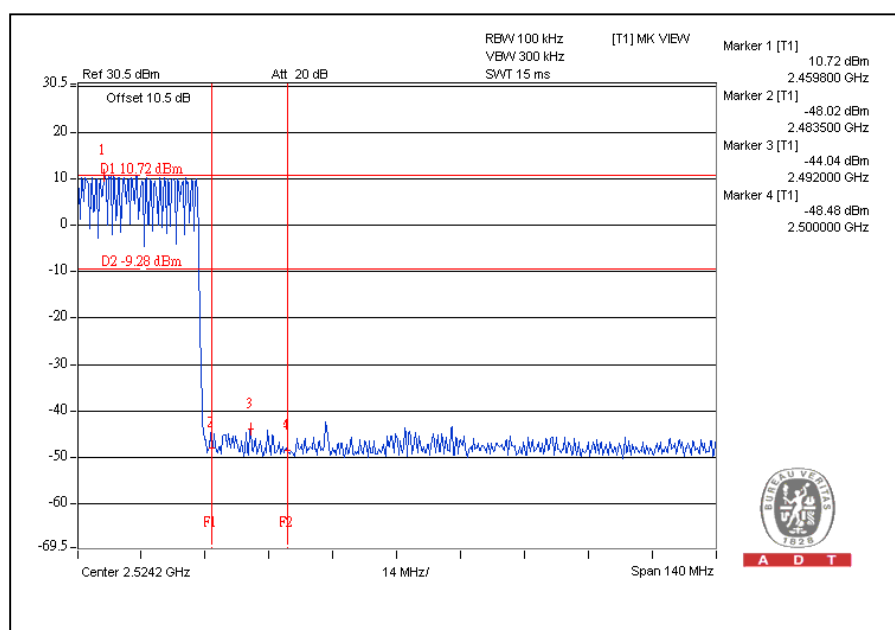


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CH0



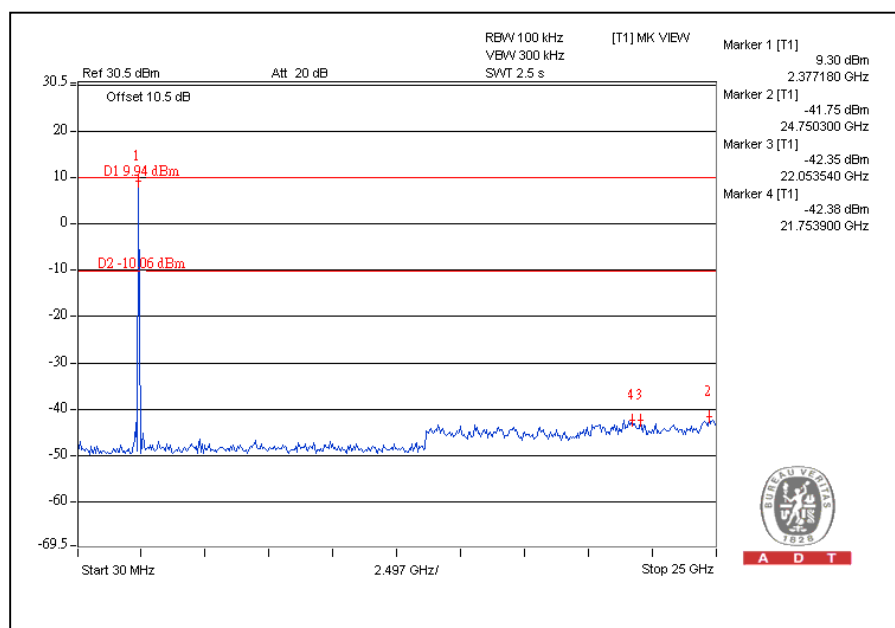
CH78



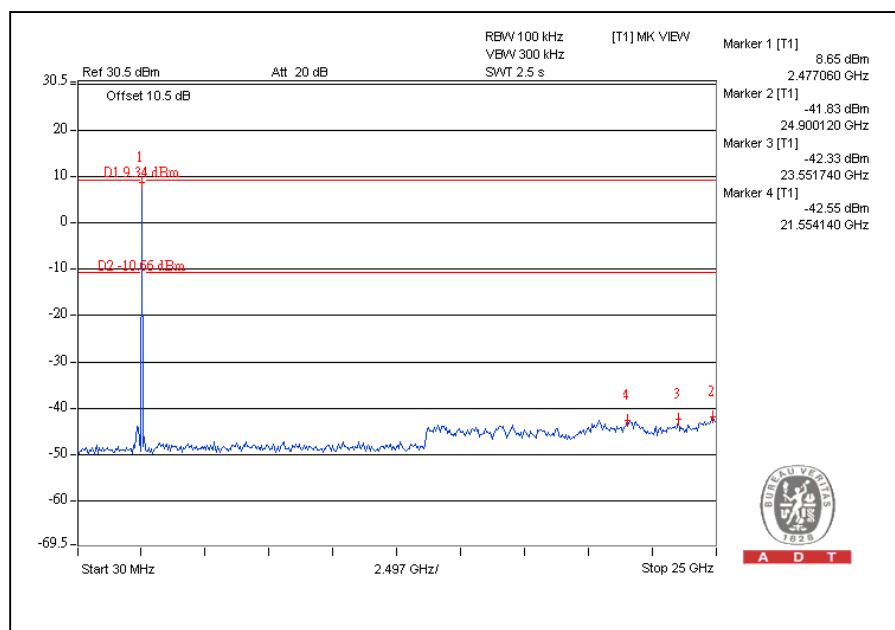


A D T

CH0

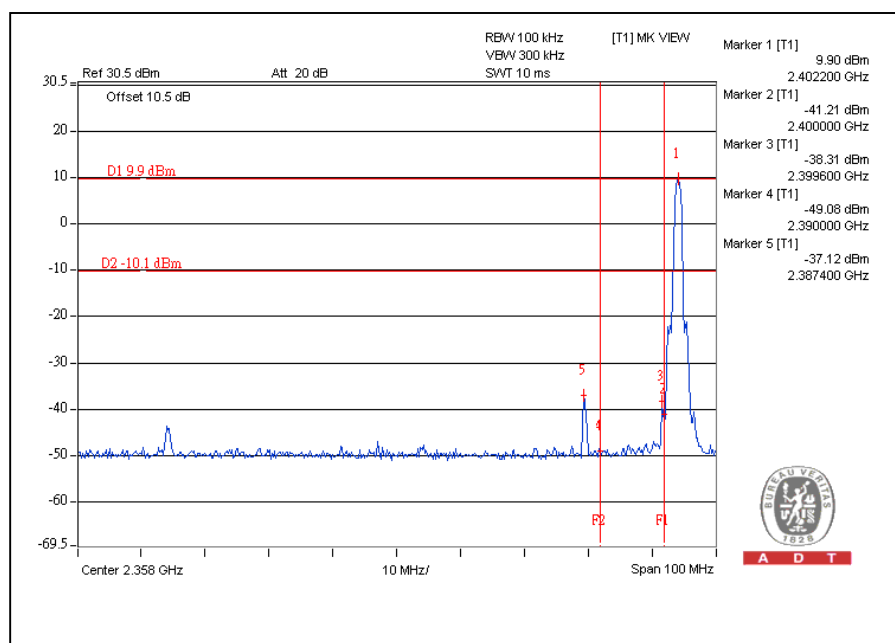


CH78

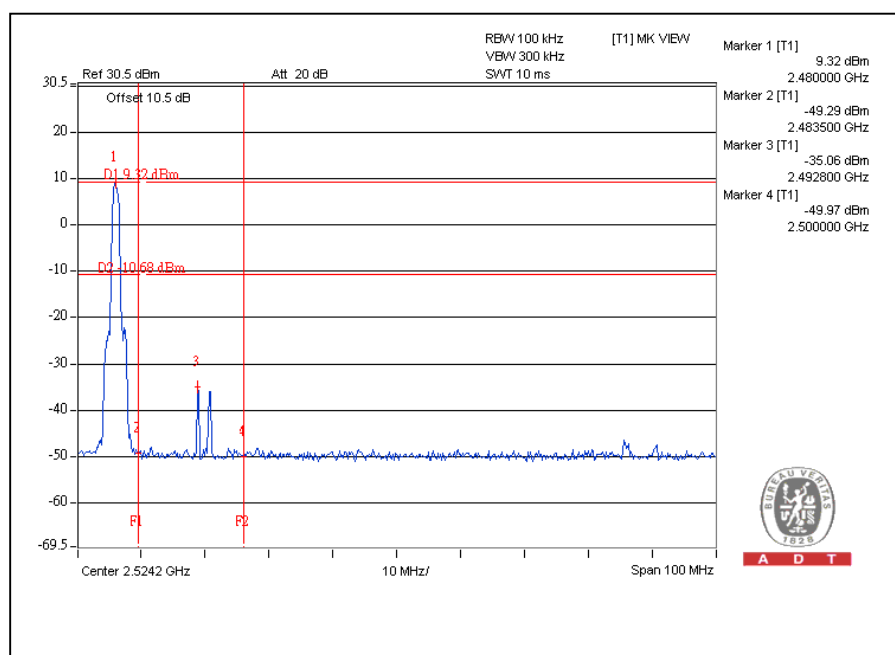


# For 8DPSK Modulation Type:

CH0



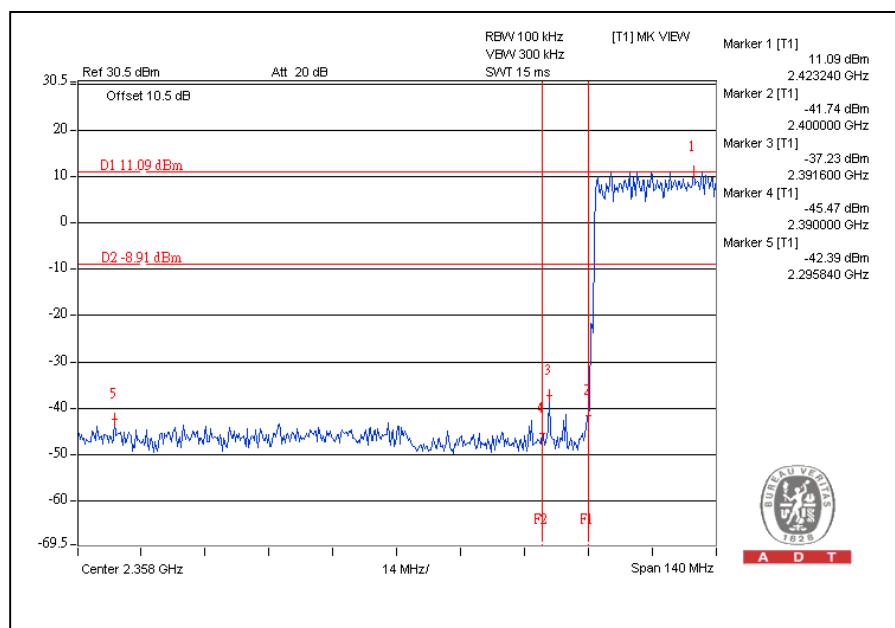
CH78



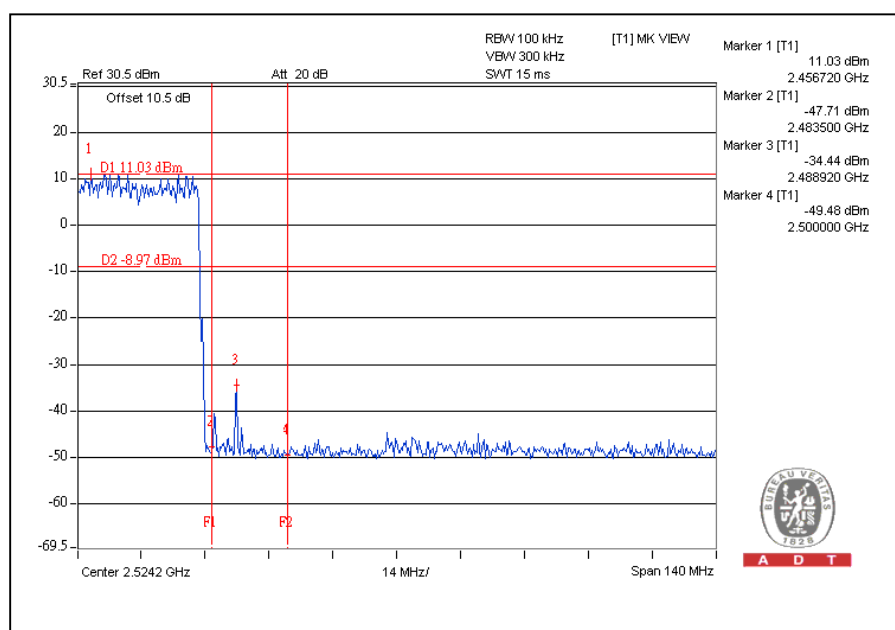


A D T

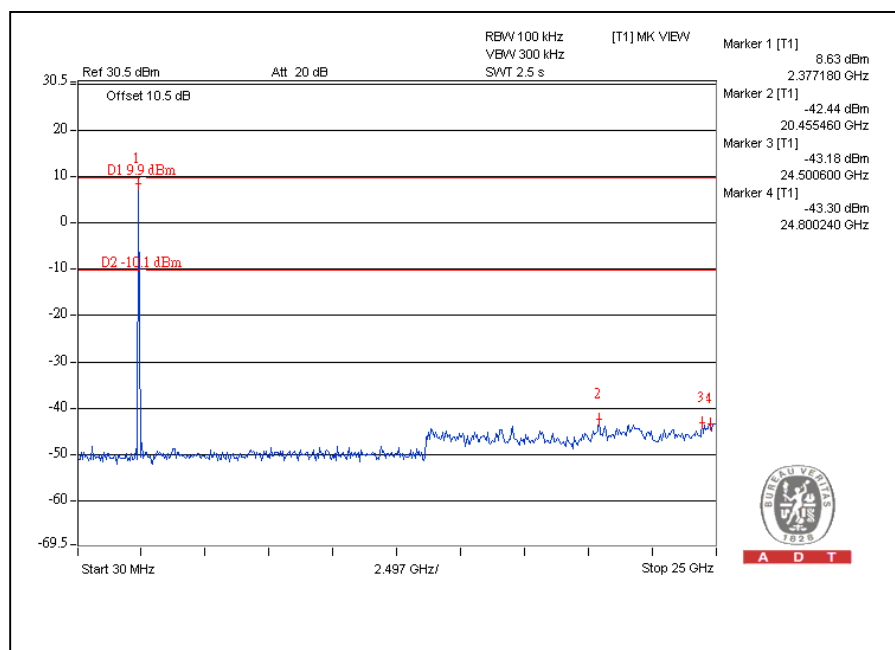
CH0



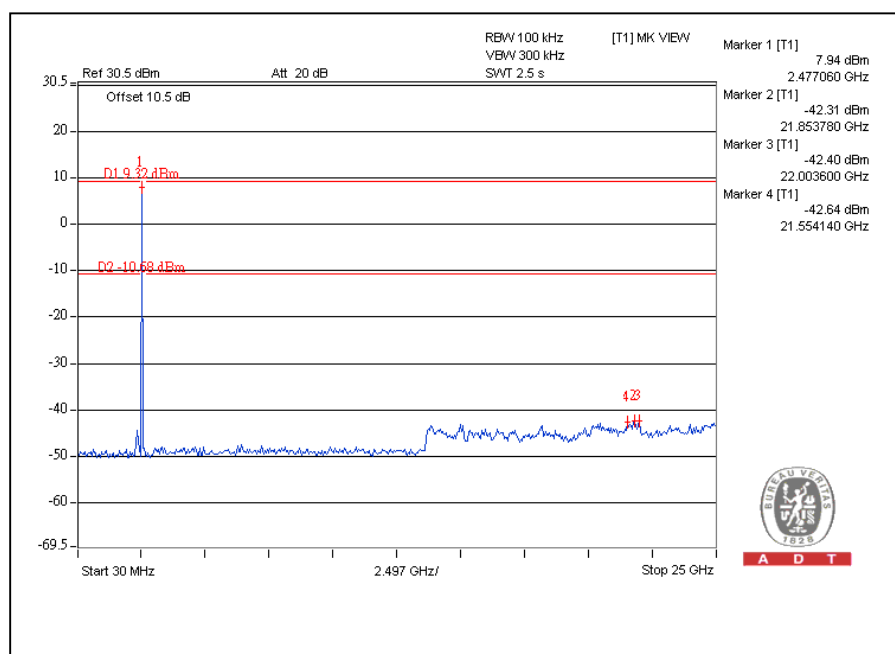
CH78



# CHO

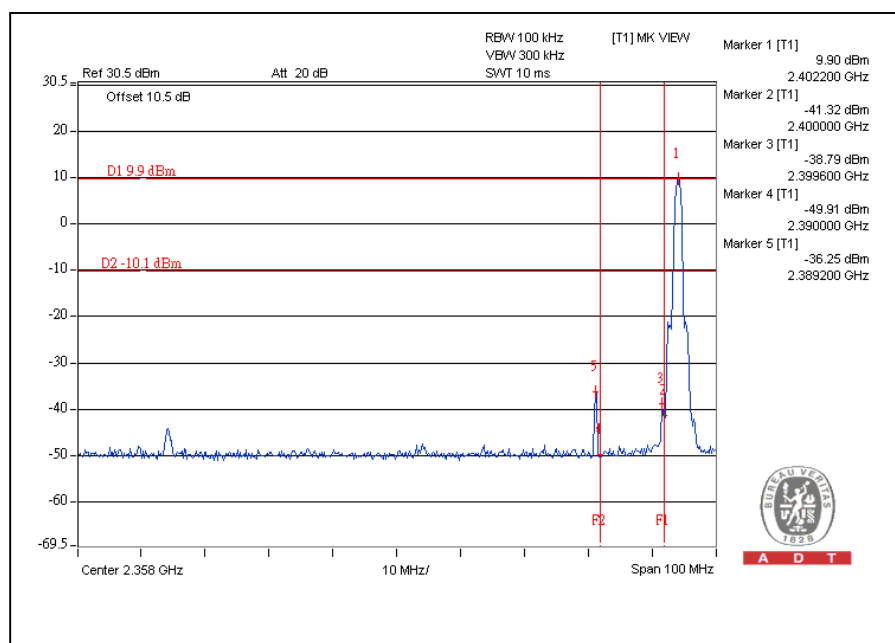


# CH78

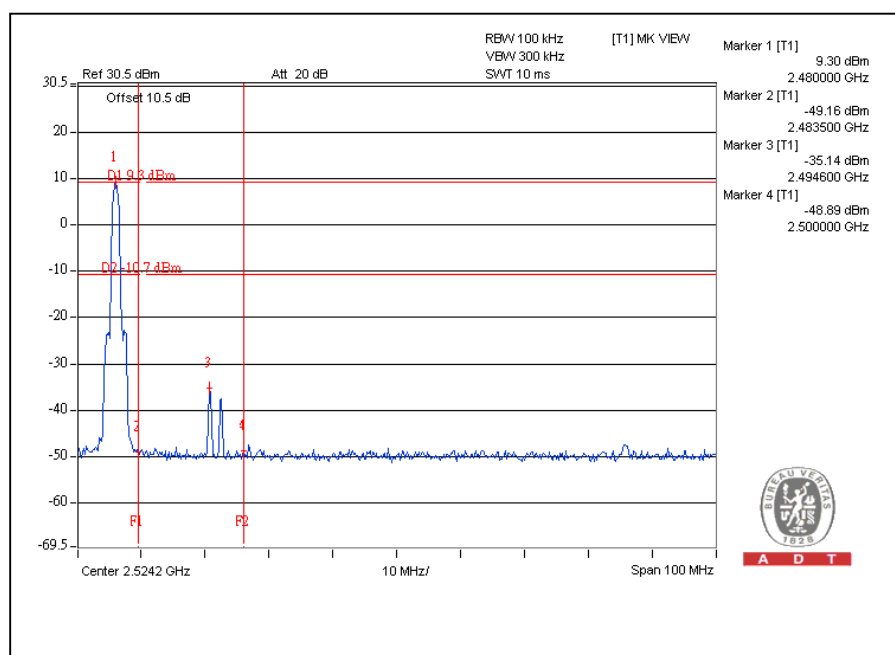


For  $\pi/4$ -DQPSK Modulation Type:

CH0



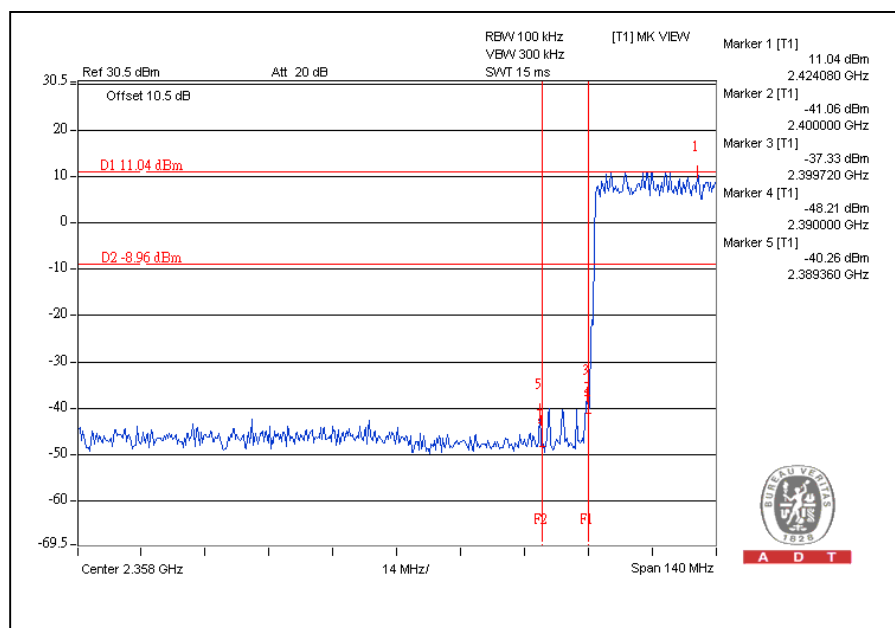
CH78



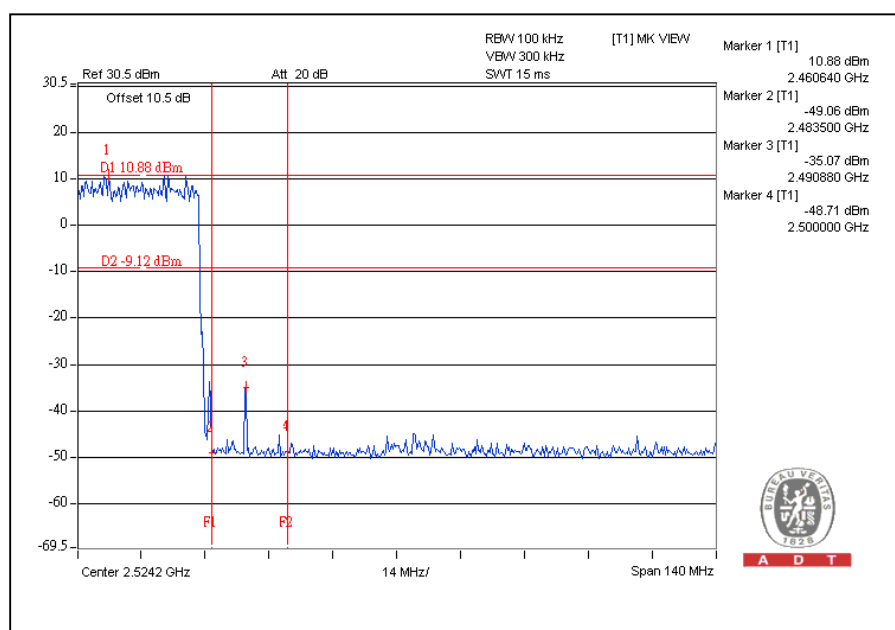


A D T

CH0

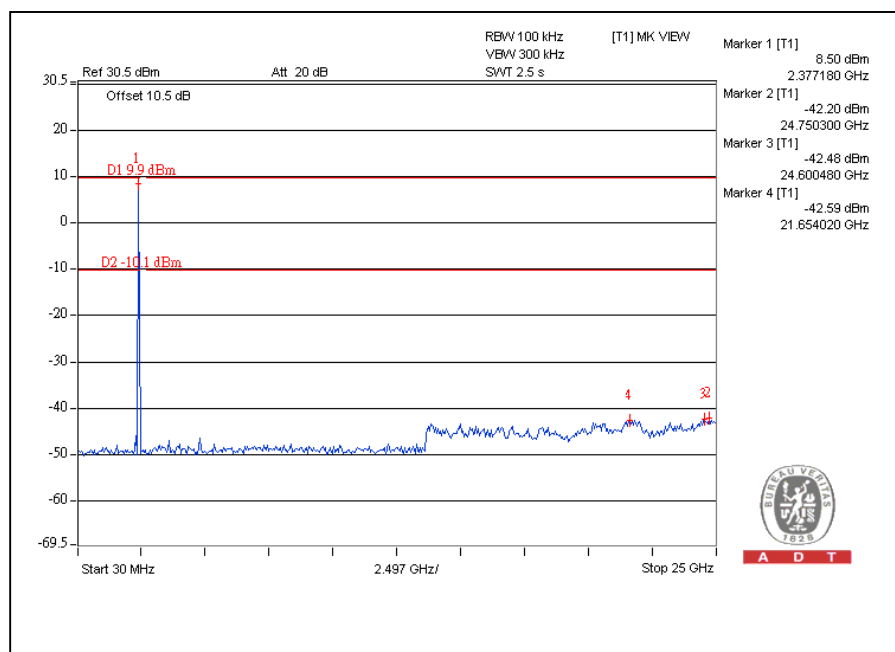


CH78

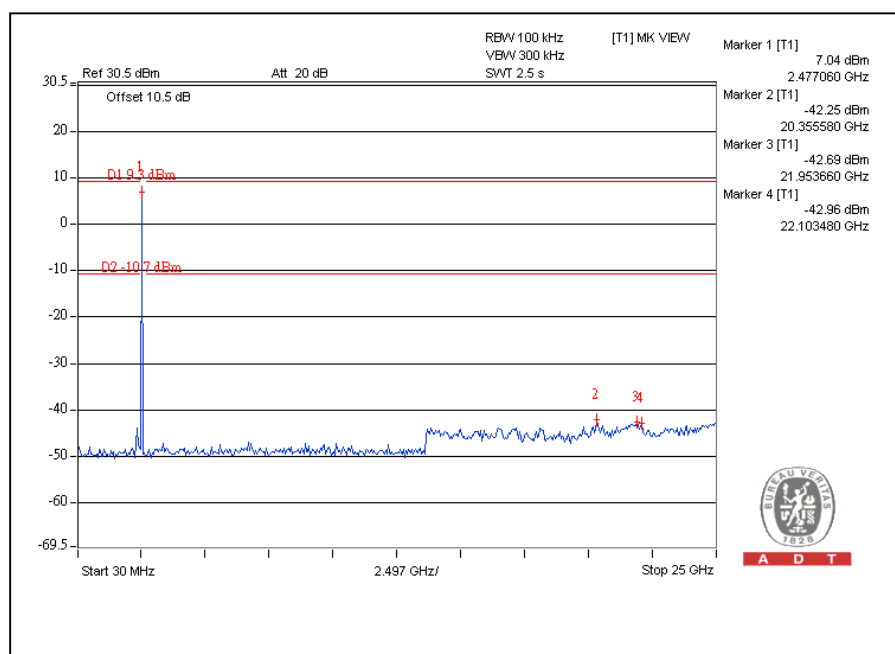




# CH0

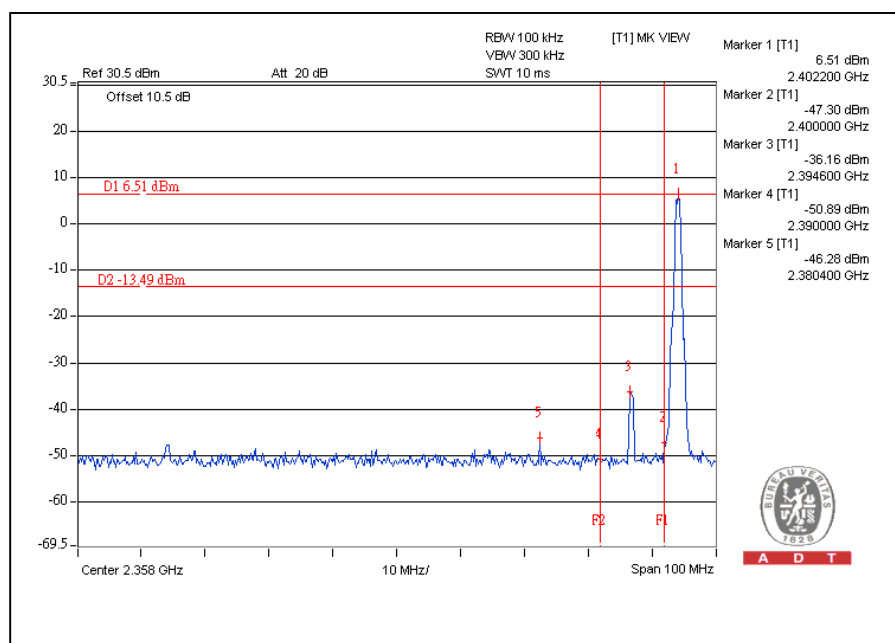


# CH78

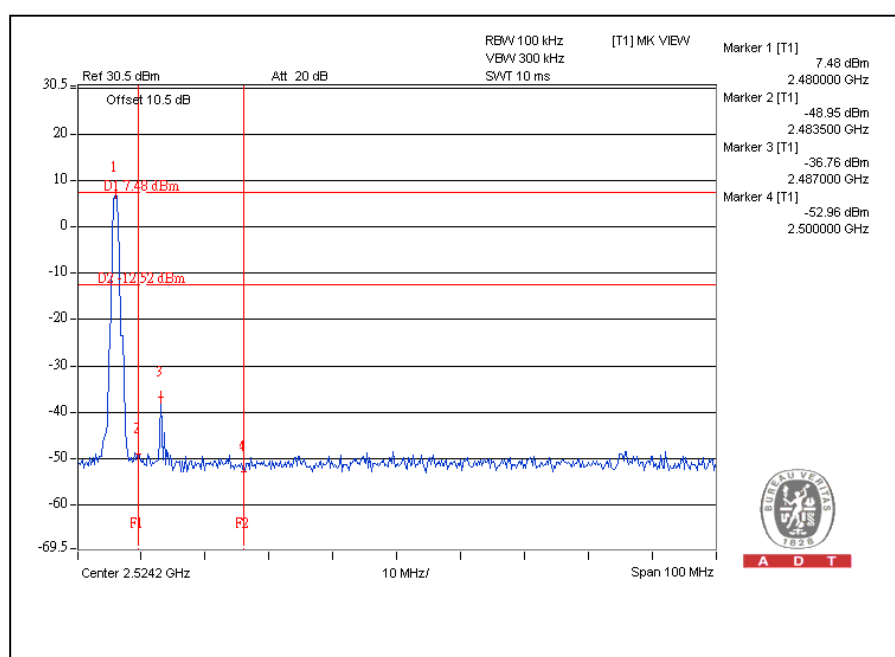


# For Additional GFSK Modulation Type:

## CH0



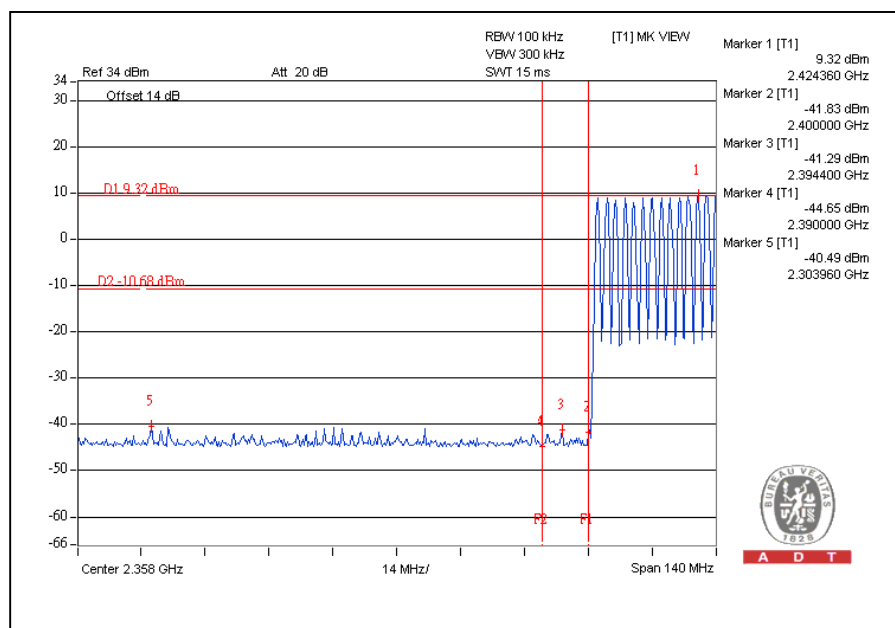
## CH39



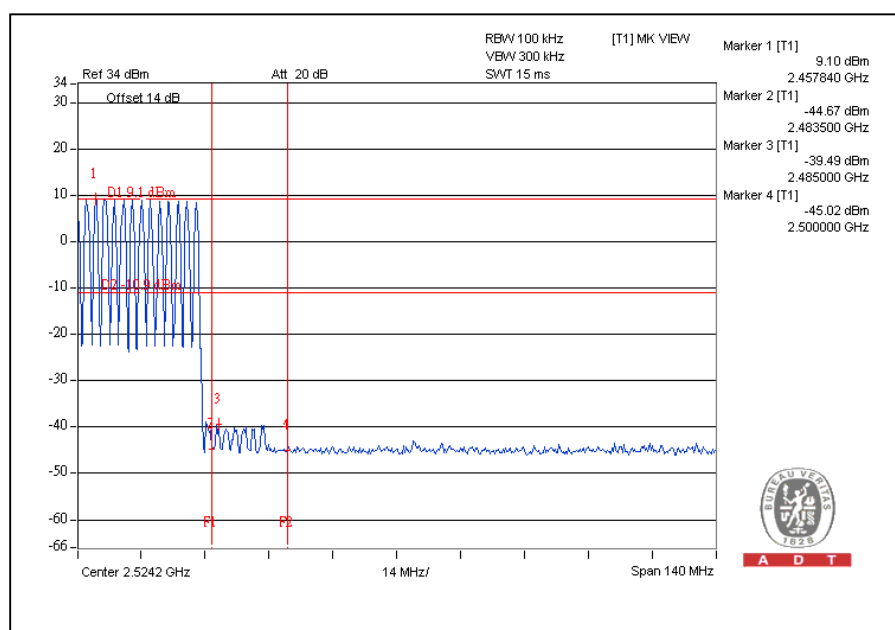


A D T

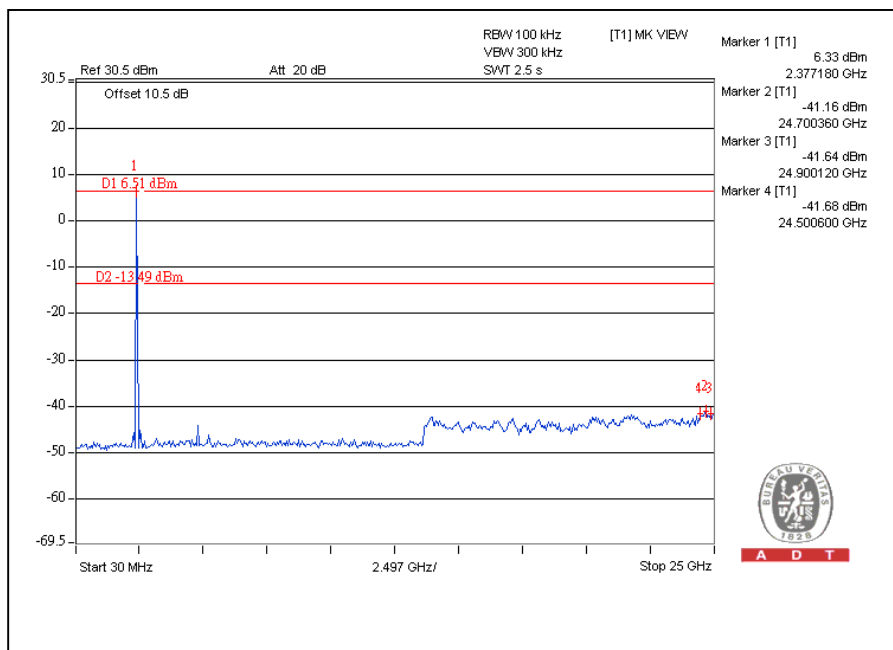
CH0



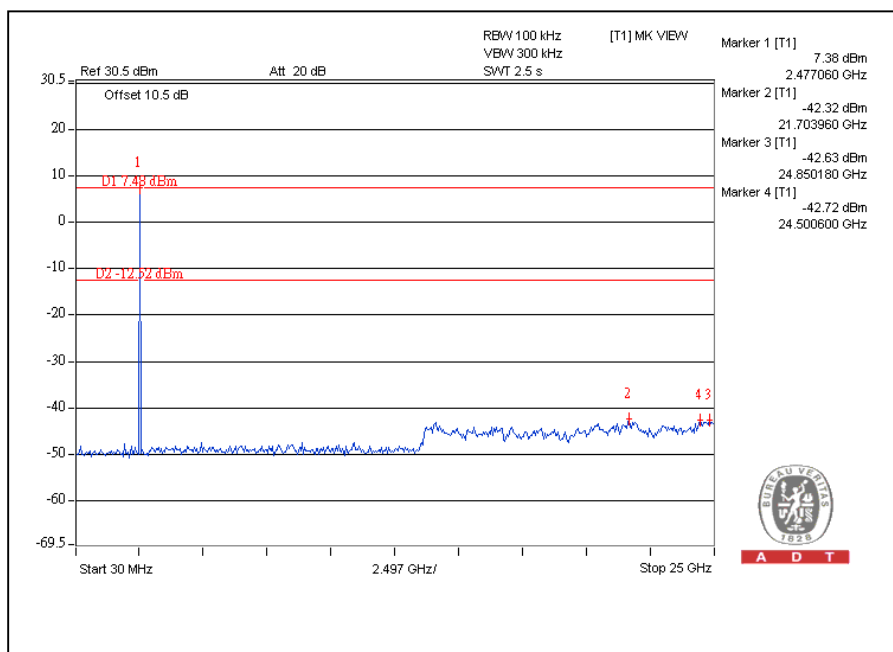
CH39



CH0



CH39



## 5 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025:

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5.phtml](http://www.adt.com.tw/index.5.phtml).  
If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

## **6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.

**--- END ---**