

# FCC TEST REPORT

**FCC ID** : SJ8-CA650D  
**Applicant** : RDI Technology (Shenzhen) Co., Ltd.  
**Address** : Building C1 Xintang Industrial Park, East Baishixia, Fuyong, Baoan, Shenzhen, China  
**Manufacturer** : The same as above  
**Address** : The same as above  
**Equipment Under Test (EUT) :**  
Product Name : Digital Camera  
Model No. : CA650D  
**Standards** : FCC CFR47 Part 15 Section 15.247:2010  
**Date of Test** : April 08~10, 2013  
**Date of Issue** : April 22, 2013

**Test Result** : **PASS**

Remark:

\* The sample described above has been tested to be in compliance with the requirements of ANSI C63.4:2003. The test results have been reviewed and comply with the rules listed above and found to meet their essential requirements.

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

Waltek Services (Shenzhen) Co., Ltd.

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Shenzhen 518105, China

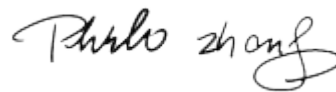
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Compiled by:



Zero Zhou / Project Engineer

Approved by:



Philo Zhong / Manager

## 2 Test Summary

| Test Items  | Test Requirement                 | Result |
|---|----------------------------------|--------|
| Radiated Spurious Emissions                                       | 15.205(a)<br>15.209<br>15.247(d) | PASS   |
| Duty Cycle  | 15.35                            | PASS   |
| Band edge   | 15.247(d)<br>15.205(a)           | PASS   |
| Conduct Emission  | 15.207                           | PASS   |
| 20dB Bandwidth  | 15.247(a)(1)                     | PASS   |
| Maximum Peak Output Power   | 15.247(b)(1)                     | PASS   |
| Frequency Separation  | 15.247(a)(1)                     | PASS   |
| Number of Hopping Frequency                                       | 15.247(a)(1)(iii)                | PASS   |
| Dwell time  | 15.247(a)(1)(iii)                | PASS   |
| Maximum Permissible Exposure<br>(Exposure of Humans to RF Fields) | 1.1307(b)(1)                     | PASS   |

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## 4 General Information

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

|                             |  |
|-----------------------------|--|
| <b>Product Name</b>         | : Digital Camera                           |
| <b>Model No.</b>            | : CA650D                                   |
| <b>Operation Frequency</b>  | : 2402MHz ~ 2478MHz,39 channels in total   |
| <b>Type of Modulation</b>   | : GFSK                                     |
| <b>Oscillator</b>           | :Crystal 27MHz for CPU,16MHz for RF module |
| <b>Antenna installation</b> | : Integrated Antenna                       |
| <b>Antenna Gain</b>         | : 2 dBi                                    |

### 4.2 Details of E.U.T.

|                             |   |
|-----------------------------|---|
| <b>Technical Data</b>       | : DC 5V 1.0A powered by adapter<br>(Input: 100 ~ 240VAC, 50/60Hz,200mA) |
| <b>Adapter manufacturer</b> | : Csec  |
| <b>M/N</b>                  | : CS6D050100FUF   |

### 4.3 Channel List

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 1           | 2402            | 2           | 2404            | 3           | 2406            | 4           | 2408            |
| 5           | 2410            | 6           | 2412            | 7           | 2414            | 8           | 2416            |
| 9           | 2418            | 10          | 2420            | 11          | 2422            | 12          | 2424            |
| 13          | 2426            | 14          | 2428            | 15          | 2430            | 16          | 2432            |
| 17          | 2434            | 18          | 2436            | 19          | 2438            | 20          | 2440            |
| 21          | 2442            | 22          | 2444            | 23          | 2446            | 24          | 2448            |
| 25          | 2450            | 26          | 2452            | 27          | 2454            | 28          | 2456            |
| 29          | 2458            | 30          | 2460            | 31          | 2462            | 32          | 2464            |
| 33          | 2466            | 34          | 2468            | 35          | 2470            | 36          | 2472            |
| 37          | 2474            | 38          | 2476            | 39          | 2478            | 40          | -               |

#### 4.4 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A**

Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

Registration 7760A, July 12, 2012.

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, May 26, 2011.

#### 4.5 Test Location

All the tests were performed at:

Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen, China

## 5 Equipment Used during Test

### 5.1 Equipments List

| <b>Conducted Emissions</b>   |                                |                                  |             |            |                       |                      |
|--|--------------------------------|----------------------------------|-------------|------------|-----------------------|----------------------|
| Item   | Equipment                      | Manufacturer                     | Model No.   | Serial No. | Last Calibration Date | Calibration Due Date |
| 1.   | EMI Test Receiver              | R&S                              | ESCI        | 101155     | Aug. 13,2012          | Aug. 13,2013         |
| 2.   | LISN                           | SCHWARZBECK                      | NSLK 8128   | 8128-289   | Aug. 13,2012          | Aug. 13,2013         |
| 3.   | Cable                          | LARGE                            | RF300       | EW02014-3  | Aug.14,2012           | Aug. 14,2013         |
| <b>3m Semi-anechoic Chamber for Radiation Emissions (Test Frequency: 1GHz ~6GHz)</b> |                                |                                  |             |            |                       |                      |
| Item   | Equipment                      | Manufacturer                     | Model No.   | Serial No. | Last Calibration Date | Calibration Due Date |
| 1.   | EMC Analyzer                   | Agilent                          | E7405A      | MY45114943 | Aug. 13,2012          | Aug. 13,2013         |
| 4.   | Broad-band Horn Antenna        | SCHWARZBECK                      | BBHA 9120 D | 667        | Aug. 13,2012          | Aug. 13,2013         |
| 5.   | Broad-band Horn Antenna        | SCHWARZBECK                      | BBHA 9170   | 399        | Aug. 13,2012          | Aug. 13,2013         |
| 6.   | Broadband Preamplifier         | COMPLIANCE DIRECTION             | PAP-1G18    | 2004       | Apr.07,2013           | Apr.07,2014          |
| 7.   | Broadband Preamplifier         | SCHWARZBECK                      | BBV 9718    | 9718-148   | Aug. 13,2012          | Aug. 13,2013         |
| 8.   | 10m Coaxial Cable with N- plug | SCHWARZBECK                      | AK 9515 H   | -          | Aug. 13,2012          | Aug. 13,2013         |
| <b>3m Semi-anechoic Chamber for Radiation(TDK) (Test Frequency: 32.768kHz ~1GHz)</b> |                                |                                  |             |            |                       |                      |
| Item   | Equipment                      | Manufacturer                     | Model No.   | Serial No  | Last Calibration Date | Calibration Due Date |
| 1  | Test Receiver                  | R&S                              | ESCI        | 101296     | Aug.09,2012           | Aug.09,2013          |
| 2  | Active Loop Antenna            | Beijing Dazhi                    | ZN30900A    | -          | Aug. 13,2012          | Aug. 13,2013         |
| 3  | Trilog Broadband Antenna       | SCHWARZBECK                      | VULB9160    | 9160-3325  | Aug.11,2012           | Aug.11,2013          |
| 4  | Amplifier                      | Compliance pirection systems inc | PAP-0203    | 22024      | Apr.07,2013           | Apr.07,2014          |
| 5  | Cable                          | HUBER+SUHNE R                    | CBL2        | 525178     | Sep.15,2012           | Sep.15,2013          |
| <b>Associated Equipment</b>  |                                |                                  |             |            |                       |                      |
| 1.   | Digital Monitor                | RDI                              | M420        | -          | -                     | -                    |

## 5.2 Measurement Uncertainty

| Parameter                         | Uncertainty                                    |
|-----------------------------------|--|
| Radio Frequency                   | $\pm 1 \times 10^{-6}$                         |
| RF Power                          | $\pm 1.0$ dB                                   |
| RF Power Density                  | $\pm 2.2$ dB                                   |
| Radiated Spurious Emissions test  | $\pm 5.03$ dB<br>(Bilog antenna 30M~1000MHz)   |
|                                   | $\pm 4.74$ dB<br>(Horn antenna 1000M~25000MHz) |
| Conducted Spurious Emissions test | $\pm 3.64$ dB<br>(AC mains 150KHz~30MHz)       |

## 5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.



## 6 Conducted Emission

|                   |  |
|-------------------|--|
| Test Requirement: | FCC CFR 47 Part 15 Section 15.207  |
| Test Method:      | ANSI C63.4:2003  |
| Test Result:      | PASS   |
| Frequency Range:  | 150kHz to 30MHz  |
| Class:            | Class B  |
| Limit:            | 66-56 dB $\mu$ V between 0.15MHz & 0.5MHz<br>56 dB $\mu$ V between 0.5MHz & 5MHz<br>60 dB $\mu$ V between 5MHz & 30MHz |
| Detector:         | Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit       |

### 6.1 E.U.T. Operation

#### Operating Environment:

Temperature: 25.5 °C

Humidity: 51 % RH

Atmospheric Pressure: 1010 mbar

#### EUT Operation:

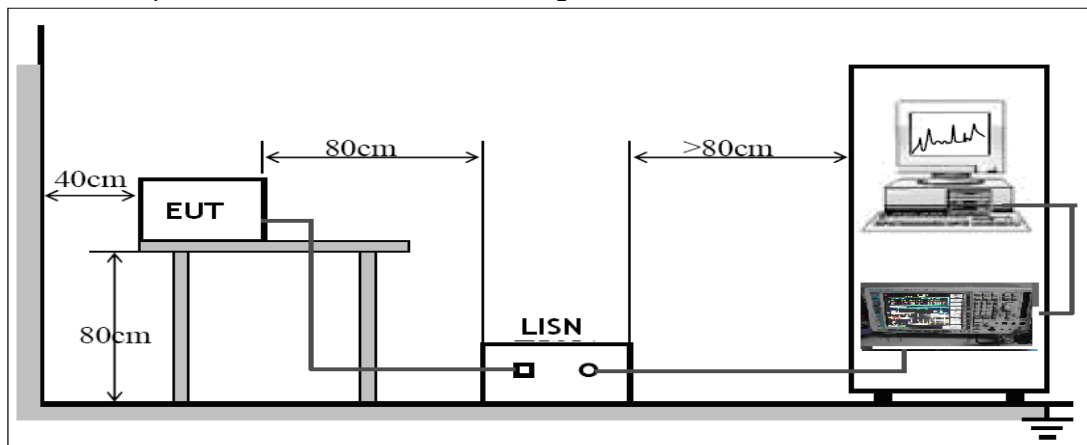
The pre-test was performed in normal link mode mode, the test data were shown in the report.

The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

### 6.2 EUT Setup

The EUT was placed on the test table in shielding room.

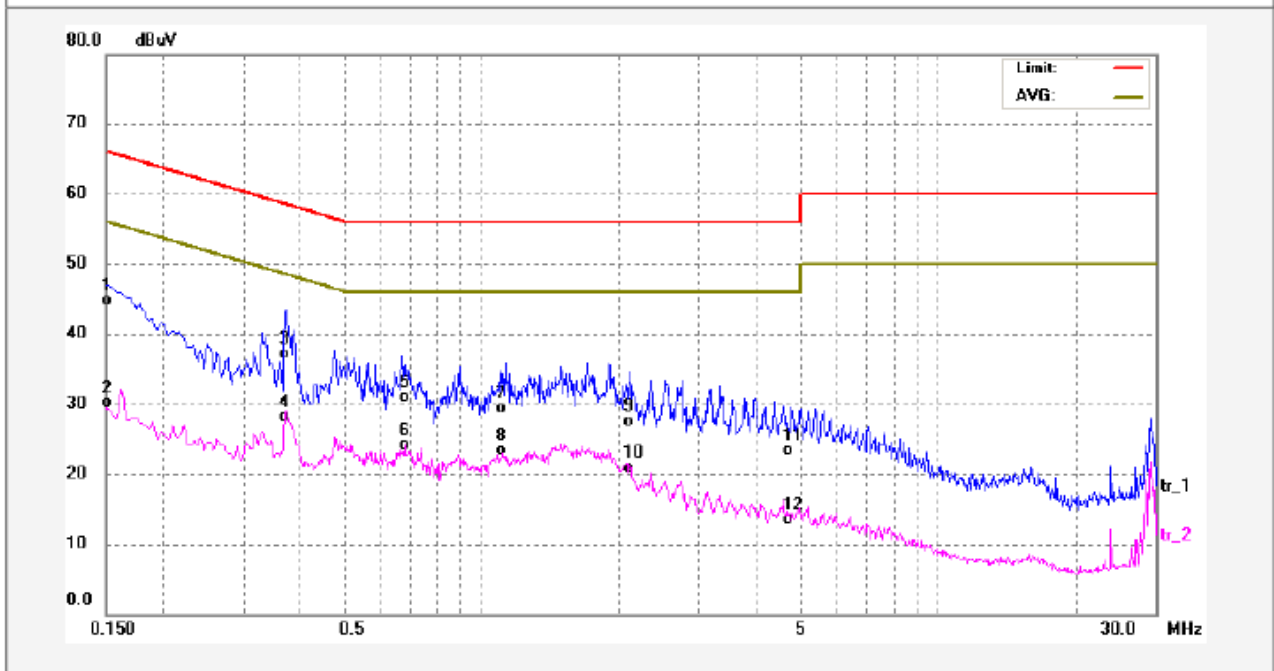


### 6.3 Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

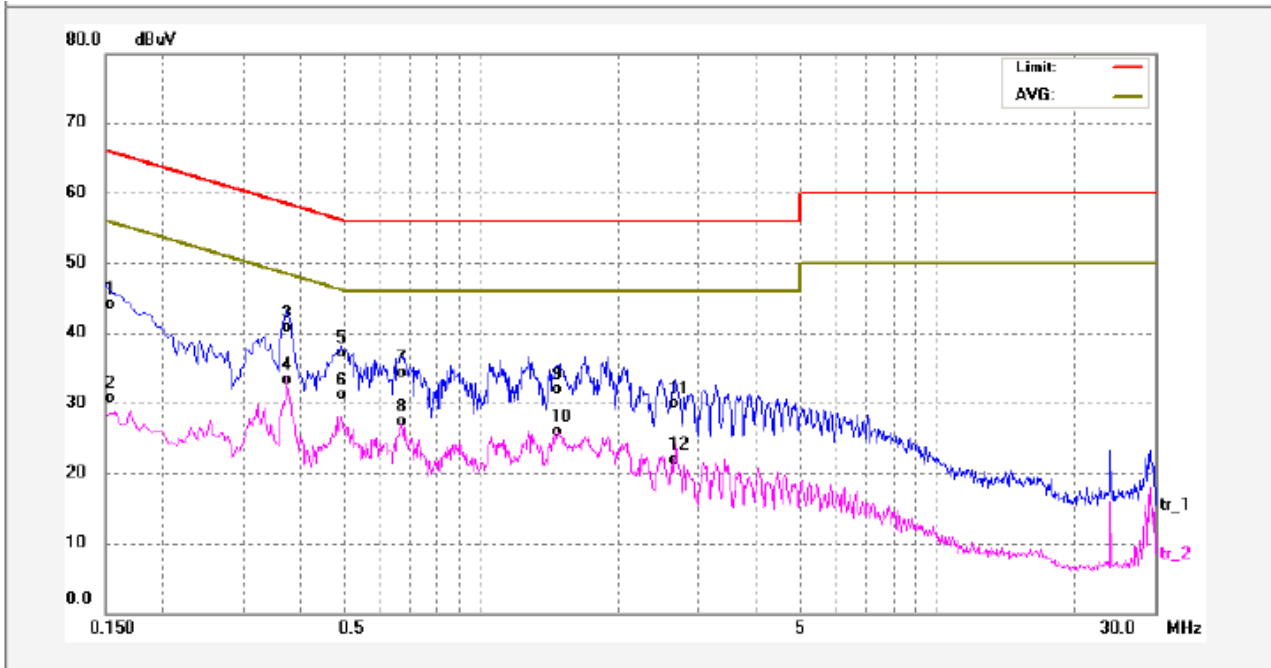
Test mode: normal operation mode

Live line:



| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB) | Result (dBuV) | Limit dBuV | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|------------|-------------|----------|--------|
| 1   | 0.1500      | 32.69          | 11.17       | 43.86         | 65.99      | -22.13      | QP       |        |
| 2   | 0.1500      | 18.21          | 11.17       | 29.38         | 55.99      | -26.61      | AVG      |        |
| 3   | 0.3700      | 25.07          | 11.31       | 36.38         | 58.50      | -22.12      | QP       |        |
| 4   | 0.3700      | 15.94          | 11.31       | 27.25         | 48.50      | -21.25      | AVG      |        |
| 5   | 0.6700      | 18.82          | 11.34       | 30.16         | 56.00      | -25.84      | QP       |        |
| 6   | 0.6700      | 11.96          | 11.34       | 23.30         | 46.00      | -22.70      | AVG      |        |
| 7   | 1.1260      | 17.37          | 11.18       | 28.55         | 56.00      | -27.45      | QP       |        |
| 8   | 1.1260      | 11.23          | 11.18       | 22.41         | 46.00      | -23.59      | AVG      |        |
| 9   | 2.1140      | 15.56          | 11.20       | 26.76         | 56.00      | -29.24      | QP       |        |
| 10  | 2.1140      | 8.92           | 11.20       | 20.12         | 46.00      | -25.88      | AVG      |        |
| 11  | 4.7940      | 11.19          | 11.24       | 22.43         | 56.00      | -33.57      | QP       |        |
| 12  | 4.7940      | 1.39           | 11.24       | 12.63         | 46.00      | -33.37      | AVG      |        |

Neutral line:



| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB) | Result (dBuV) | Limit dBuV | Margin (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|------------|-------------|----------|--------|
| 1   | 0.1500      | 32.10          | 11.17       | 43.27         | 65.99      | -22.72      | QP       |        |
| 2   | 0.1500      | 18.64          | 11.17       | 29.81         | 55.99      | -26.18      | AVG      |        |
| 3   | 0.3740      | 28.60          | 11.31       | 39.91         | 58.41      | -18.50      | QP       |        |
| 4   | 0.3740      | 21.17          | 11.31       | 32.48         | 48.41      | -15.93      | AVG      |        |
| 5   | 0.4940      | 25.02          | 11.31       | 36.33         | 56.10      | -19.77      | QP       |        |
| 6   | 0.4940      | 19.02          | 11.31       | 30.33         | 46.10      | -15.77      | AVG      |        |
| 7   | 0.6700      | 22.15          | 11.34       | 33.49         | 56.00      | -22.51      | QP       |        |
| 8   | 0.6700      | 15.11          | 11.34       | 26.45         | 46.00      | -19.55      | AVG      |        |
| 9   | 1.4819      | 19.91          | 11.19       | 31.10         | 56.00      | -24.90      | QP       |        |
| 10  | 1.4819      | 13.82          | 11.19       | 25.01         | 46.00      | -20.99      | AVG      |        |
| 11  | 2.6580      | 17.81          | 11.21       | 29.02         | 56.00      | -26.98      | QP       |        |
| 12  | 2.6580      | 9.89           | 11.21       | 21.10         | 46.00      | -24.90      | AVG      |        |

## 7 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: DA 00-705

Test Result: PASS

Frequency Range: 16MHz to 25GHz

Measurement Distance: 3m

Limit:

| Frequency<br>(MHz) | Field Strength |                 | Field Strength Limit at 3m Measurement Dist |                                |
|--------------------|----------------|-----------------|---|--------------------------------|
|                    | uV/m           | Distance<br>(m) | uV/m  | dBuV/m                         |
| 0.009 ~ 0.490      | 2400/F(kHz)    | 300             | 10000 * 2400/F(kHz)                         | $20\log^{(2400/F(kHz))} + 80$  |
| 0.490 ~ 1.705      | 24000/F(kHz)   | 30              | 100 * 24000/F(kHz)                          | $20\log^{(24000/F(kHz))} + 40$ |
| 1.705 ~ 30         | 30             | 30              | 100 * 30                                    | $20\log^{(30)} + 40$           |
| 30 ~ 88            | 100            | 3               | 100   | $20\log^{(100)}$               |
| 88 ~ 216           | 150            | 3               | 150   | $20\log^{(150)}$               |
| 216 ~ 960          | 200            | 3               | 200   | $20\log^{(200)}$               |
| Above 960          | 500            | 3               | 500   | $20\log^{(500)}$               |

### 7.1 EUT Operation :

Operating Environment:

Temperature: 25.5 °C

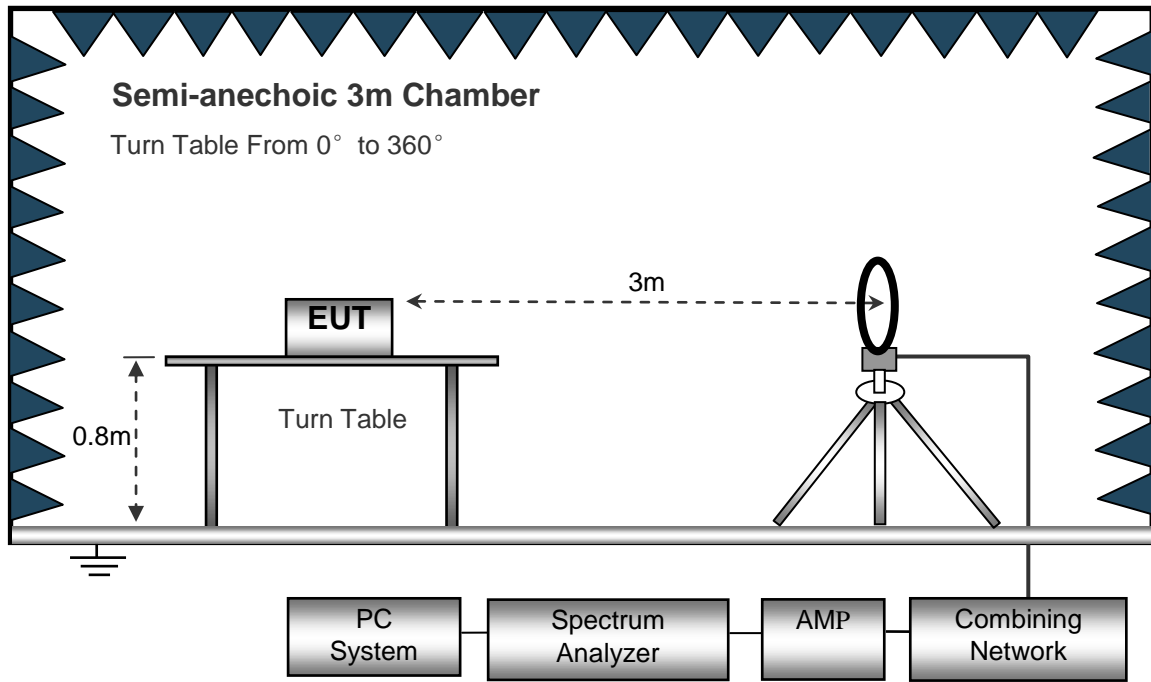
Humidity: 51 % RH

Atmospheric Pressure: 1012 mbar

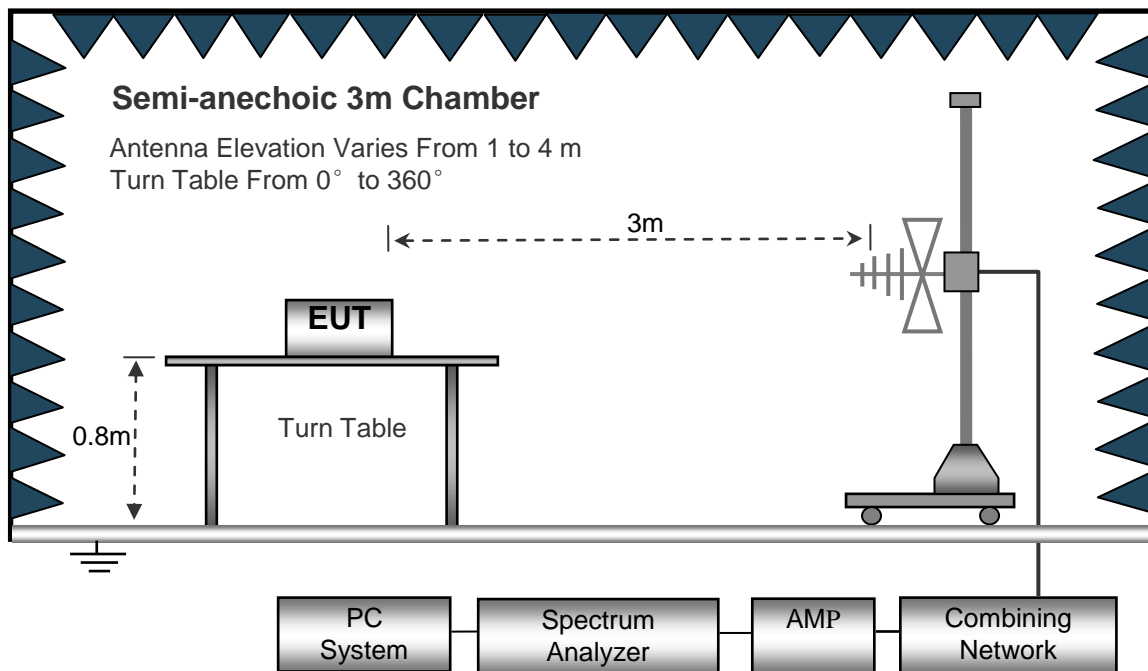
## 7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.

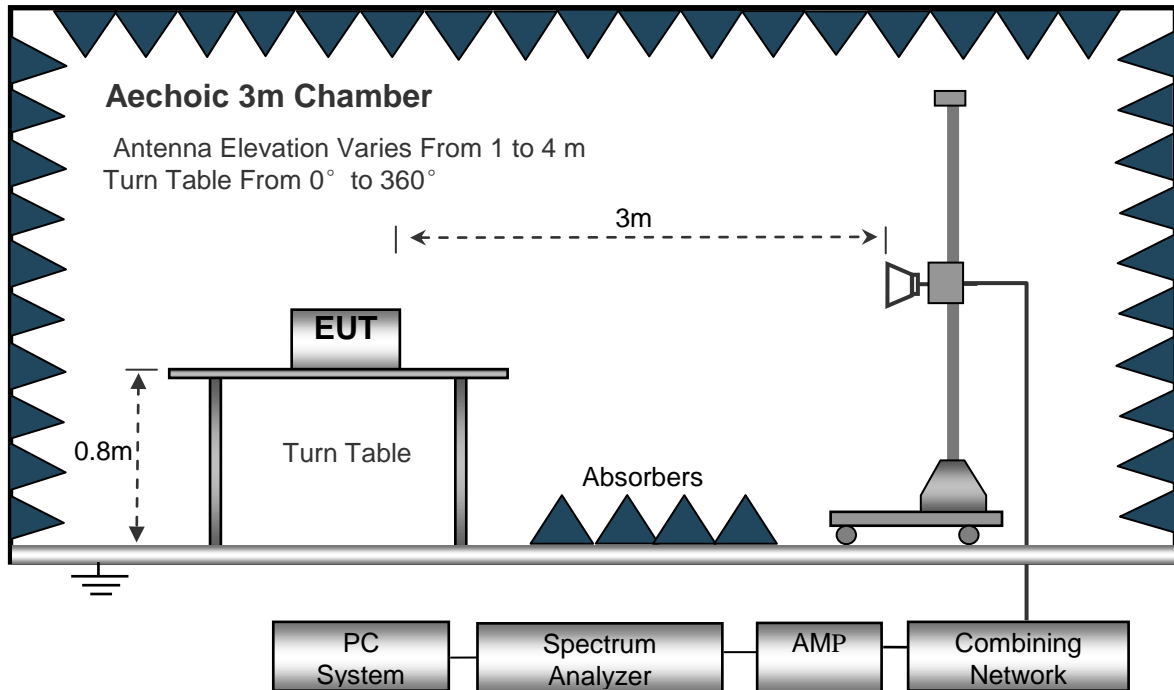
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



### 7.3 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested 16MHz to 25000MHz.

Below 30MHz

- Sweep Speed .....Auto
- IF Bandwidth .....10KHz
- Video Bandwidth .....10KHz
- Resolution Bandwidth .....10KHz

30MHz ~ 1GHz

- Sweep Speed .....Auto
- IF Bandwidth .....120 KHz
- Video Bandwidth .....100KHz
- Quasi-Peak Adapter Bandwidth .....120 KHz
- Quasi-Peak Adapter Mode .....Normal
- Resolution Bandwidth .....100KHz

Above 1GHz

- Sweep Speed .....Auto
- IF Bandwidth .....120 KHz
- Video Bandwidth .....3MHz
- Quasi-Peak Adapter Bandwidth .....120 KHz
- Quasi-Peak Adapter Mode .....Normal
- Resolution Bandwidth .....1MHz

## 7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

## 7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

## 7.6 Summary of Test Results

### Test Frequency :Below 30MHz

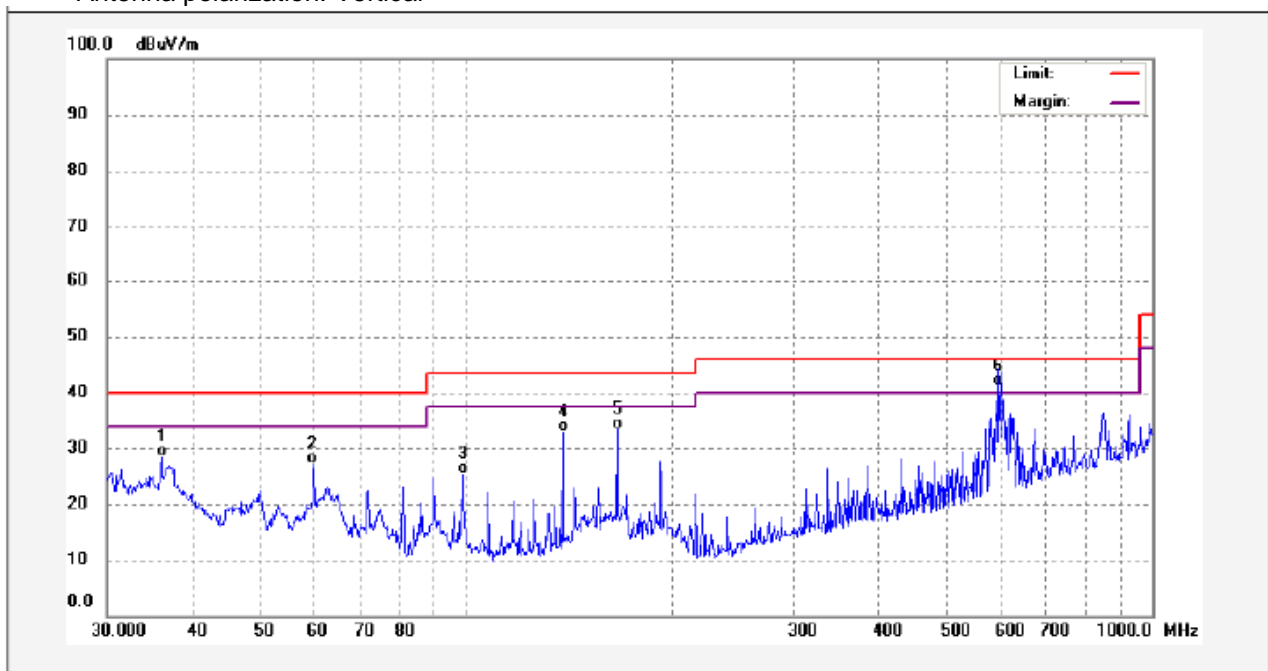
After pretest,we found no higher emission than background level, the data does not been shown in the test report.

### Test Frequency : 30MHz ~ 1000MHz

Remark: the EUT was pretested at the high, middle and low channel, and the worse case was the low Channel, so the data show was the low channel only.

Test mode: normal operation mode

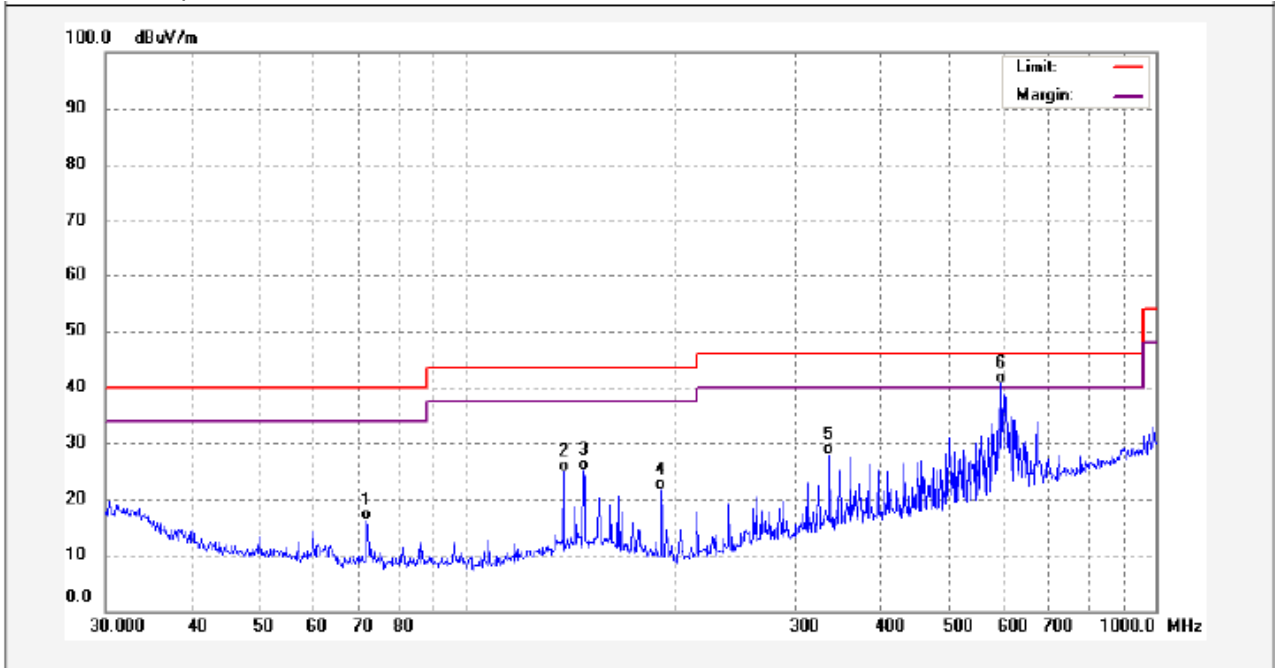
Antenna polarization: Vertical



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 36.0007     | 48.58            | -20.15      | 28.43           | 40.00          | -11.57      | QP       |        |
| 2   | 59.8588     | 50.35            | -23.30      | 27.05           | 40.00          | -12.95      | QP       |        |
| 3   | 98.8326     | 49.98            | -24.62      | 25.36           | 43.50          | -18.14      | QP       |        |
| 4   | 138.3873    | 54.62            | -21.65      | 32.97           | 43.50          | -10.53      | QP       |        |
| 5   | 166.0680    | 54.99            | -21.72      | 33.27           | 43.50          | -10.23      | QP       |        |
| 6   | 597.2234    | 52.68            | -11.53      | 41.15           | 46.00          | -4.85       | QP       |        |



Antenna polarization: Horizontal



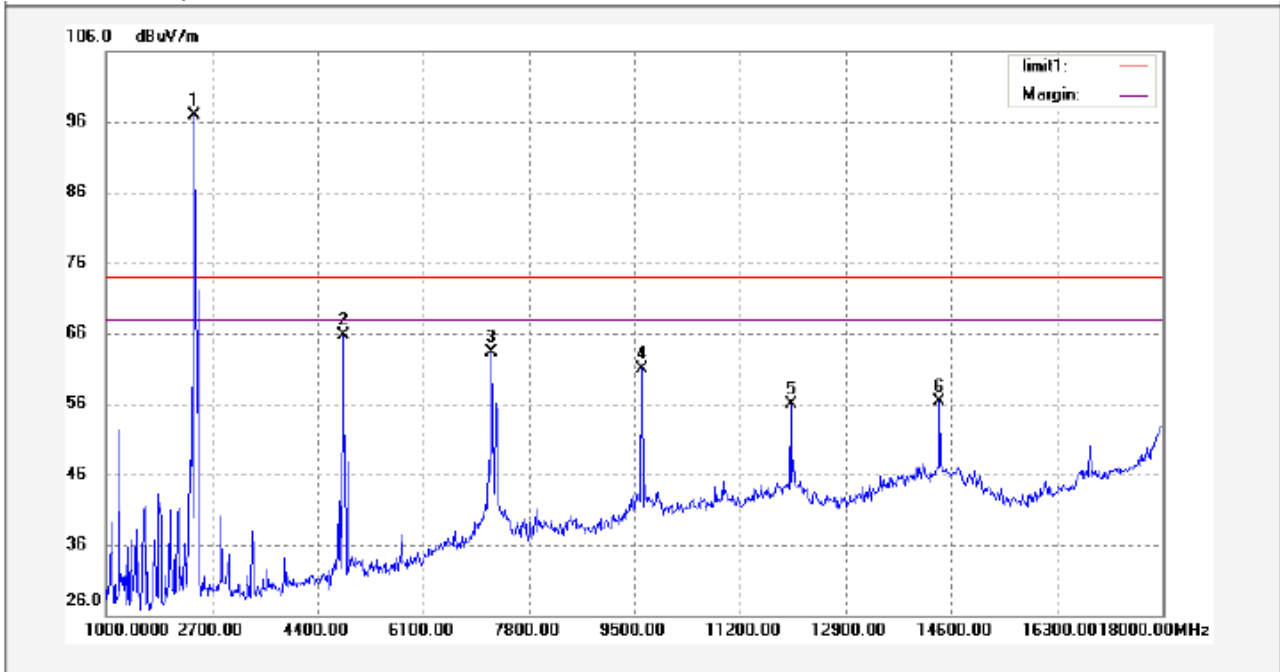
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 71.8320     | 39.84            | -23.66      | 16.18           | 40.00          | -23.82      | QP       |        |
| 2   | 138.3873    | 46.30            | -21.46      | 24.84           | 43.50          | -18.66      | QP       |        |
| 3   | 147.9214    | 46.01            | -20.86      | 25.15           | 43.50          | -18.35      | QP       |        |
| 4   | 191.7450    | 45.00            | -23.33      | 21.67           | 43.50          | -21.83      | QP       |        |
| 5   | 336.0352    | 46.32            | -18.54      | 27.78           | 46.00          | -18.22      | QP       |        |
| 6   | 597.2234    | 52.06            | -11.55      | 40.51           | 46.00          | -5.49       | QP       |        |

**Test Frequency: 1GHz ~ 18GHz**

AV = Peak +20Log<sub>10</sub>(duty cycle) =PK+(-15)=PK-15 [refer to section 8 for more detail]

Test channel: TX2402MHz

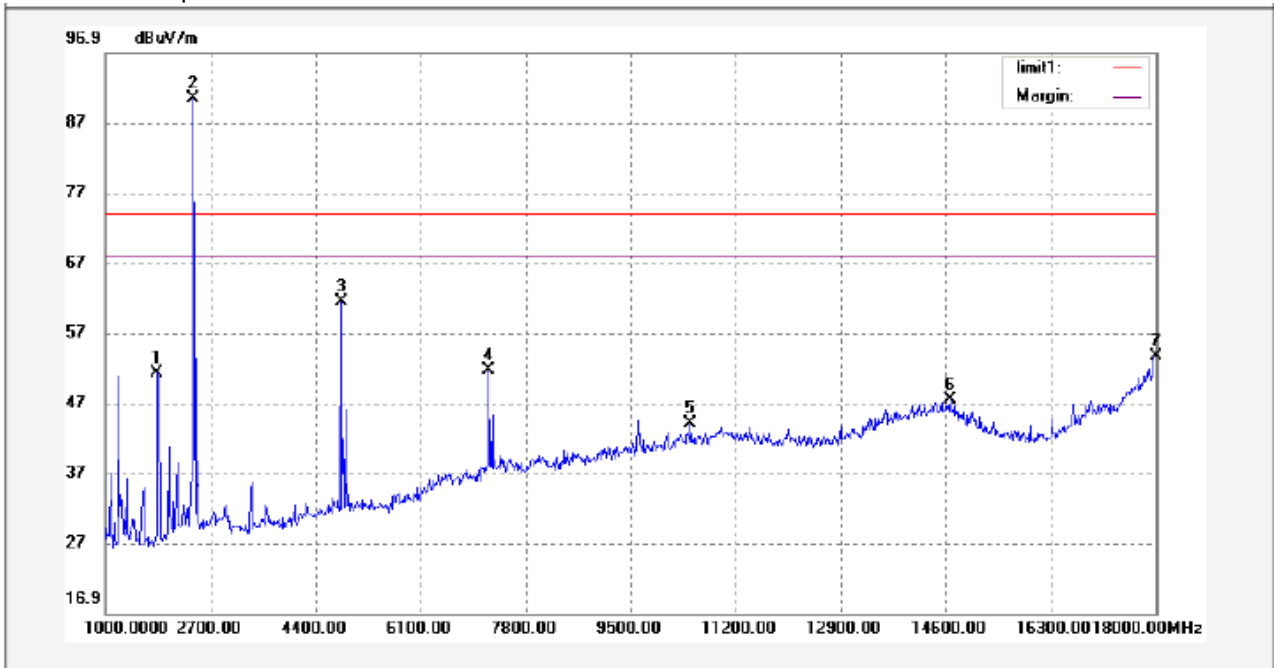
Antenna polarization: Vertical



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2402.000    | 112.61           | -15.61      | 97.00           | 74.00          | 23.00       | peak     |        |
| 2   | 4808.000    | 77.70            | -11.97      | 65.73           | 74.00          | -8.27       | peak     |        |
| 3   | 7205.000    | 70.54            | -7.21       | 63.33           | 74.00          | -10.67      | peak     |        |
| 4   | 9619.000    | 66.70            | -5.70       | 61.00           | 74.00          | -13.00      | peak     |        |
| 5   | 12016.000   | 60.45            | -4.47       | 55.98           | 74.00          | -18.02      | peak     |        |
| 6   | 14413.000   | 55.94            | 0.41        | 56.35           | 74.00          | -17.65      | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2402.000    | -15              | 82.00           | 54.00          | 28          | AV       |        |
| 2   | 4808.000    | -15              | 50.73           | 54.00          | -3.27       | AV       |        |
| 3   | 7205.000    | -15              | 48.33           | 54.00          | -5.67       | AV       |        |
| 4   | 9619.000    | -15              | 46.00           | 54.00          | -8          | AV       |        |
| 5   | 12016.000   | -15              | 40.98           | 54.00          | -13.02      | AV       |        |
| 6   | 14413.000   | -15              | 41.35           | 54.00          | -12.65      | AV       |        |

Antenna polarization: Horizontal



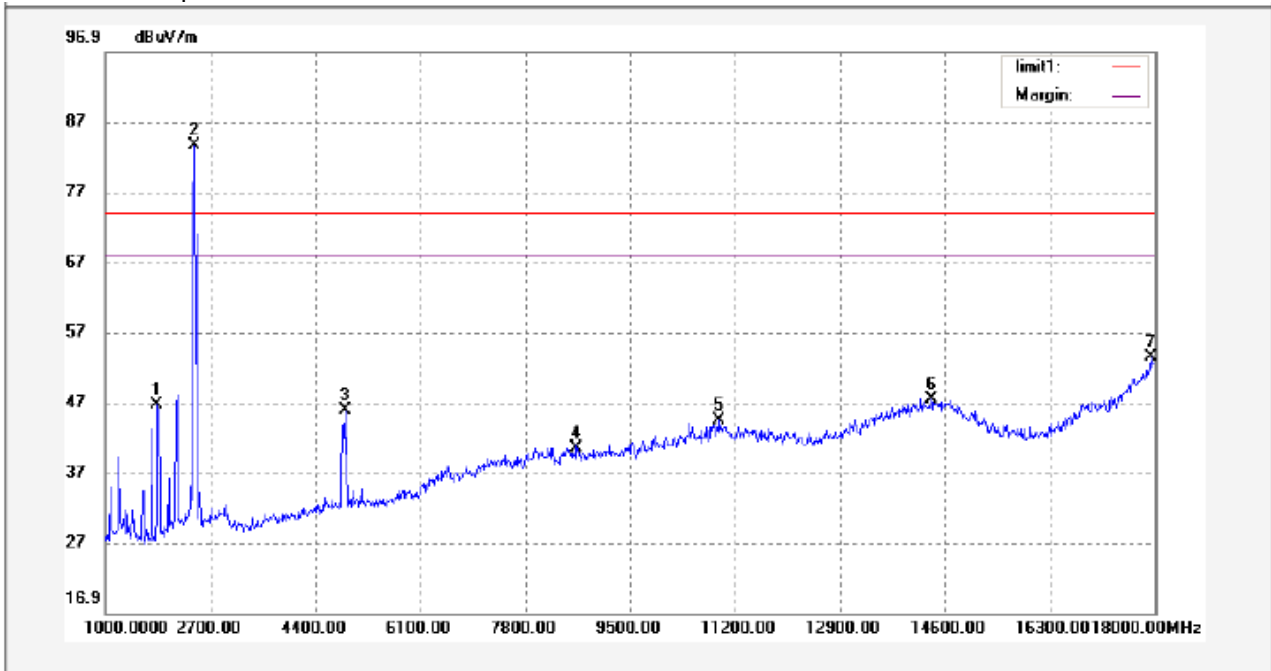
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1833.000    | 68.78            | -17.50      | 51.28           | 74.00          | -22.72      | peak     |        |
| 2   | 2402.000    | 106.06           | -15.59      | 90.47           | 74.00          | 16.47       | peak     |        |
| 3   | 4808.000    | 73.29            | -11.97      | 61.32           | 74.00          | -12.68      | peak     |        |
| 4   | 7205.000    | 58.74            | -7.21       | 51.53           | 74.00          | -22.47      | peak     |        |
| 5   | 10469.000   | 48.17            | -4.26       | 43.91           | 74.00          | -30.09      | peak     |        |
| 6   | 14668.000   | 47.04            | 0.33        | 47.37           | 74.00          | -26.63      | peak     |        |
| 7   | 18000.000   | 46.60            | 7.08        | 53.68           | 74.00          | -20.32      | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1833.000    | -15              | 36.28           | 54.00          | -17.72      | AV       |        |
| 2   | 2402.000    | -15              | 75.47           | 54.00          | 21.47       | AV       |        |
| 3   | 4808.000    | -15              | 46.32           | 54.00          | -7.68       | AV       |        |
| 4   | 7205.000    | -15              | 36.53           | 54.00          | -17.47      | AV       |        |
| 5   | 10469.000   | -15              | 28.91           | 54.00          | -25.09      | AV       |        |
| 6   | 14668.000   | -15              | 32.37           | 54.00          | -21.63      | AV       |        |
| 7   | 18000.000   | -15              | 38.68           | 54.00          | -15.32      | AV       |        |

Test Frequency: 1GHz ~ 18GHz

Test channel: TX2440MHz

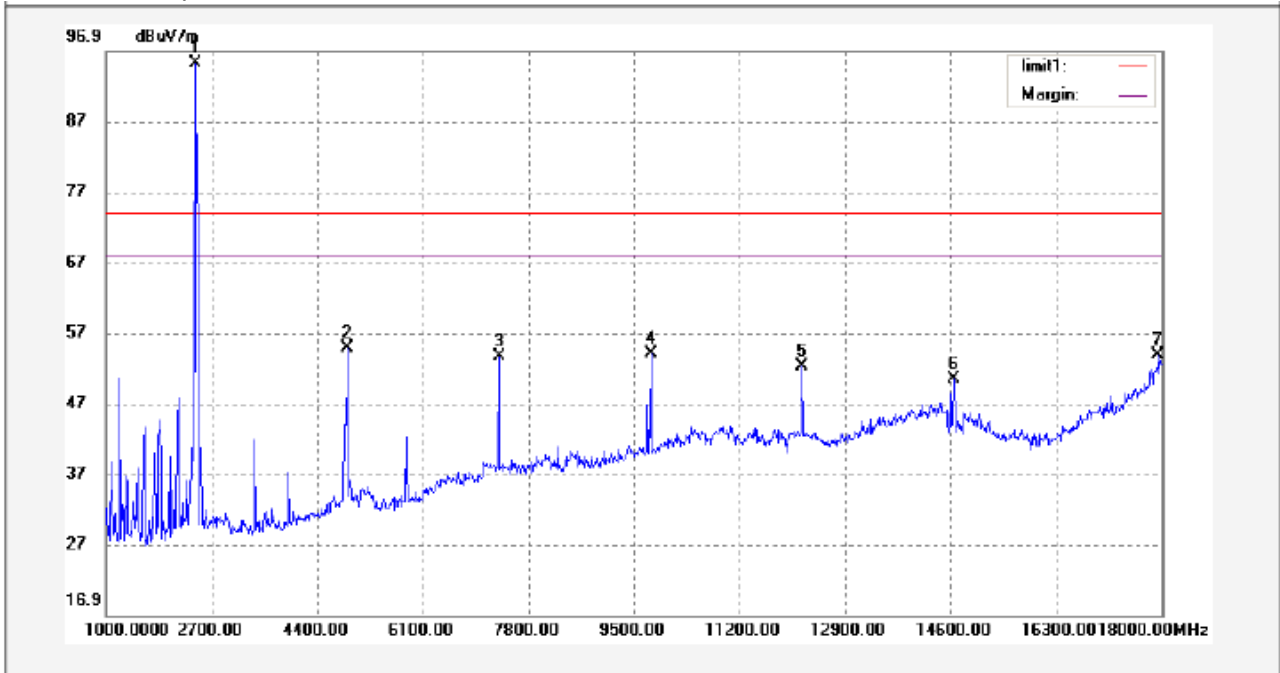
Antenna polarization: Vertical



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1833.000    | 64.03            | -17.50      | 46.53           | 74.00          | -27.47      | peak     |        |
| 2   | 2440.000    | 99.26            | -15.70      | 83.56           | 74.00          | 9.56        | peak     |        |
| 3   | 4893.000    | 57.78            | -11.91      | 45.87           | 74.00          | -28.13      | peak     |        |
| 4   | 8633.000    | 46.98            | -6.62       | 40.36           | 74.00          | -33.64      | peak     |        |
| 5   | 10945.000   | 47.94            | -3.48       | 44.46           | 74.00          | -29.54      | peak     |        |
| 6   | 14379.000   | 47.16            | 0.34        | 47.50           | 74.00          | -26.50      | peak     |        |
| 7   | 17932.000   | 47.43            | 6.06        | 53.49           | 74.00          | -20.51      | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1833.000    | -15              | 31.53           | 54.00          | -22.47      | AV       |        |
| 2   | 2440.000    | -15              | 68.56           | 54.00          | 14.56       | AV       |        |
| 3   | 4893.000    | -15              | 30.87           | 54.00          | -23.13      | AV       |        |
| 4   | 8633.000    | -15              | 25.36           | 54.00          | -28.64      | AV       |        |
| 5   | 10945.000   | -15              | 29.46           | 54.00          | -24.54      | AV       |        |
| 6   | 14379.000   | -15              | 32.50           | 54.00          | -21.5       | AV       |        |
| 7   | 17932.000   | -15              | 38.49           | 54.00          | -15.51      | AV       |        |

Antenna polarization: Horizontal

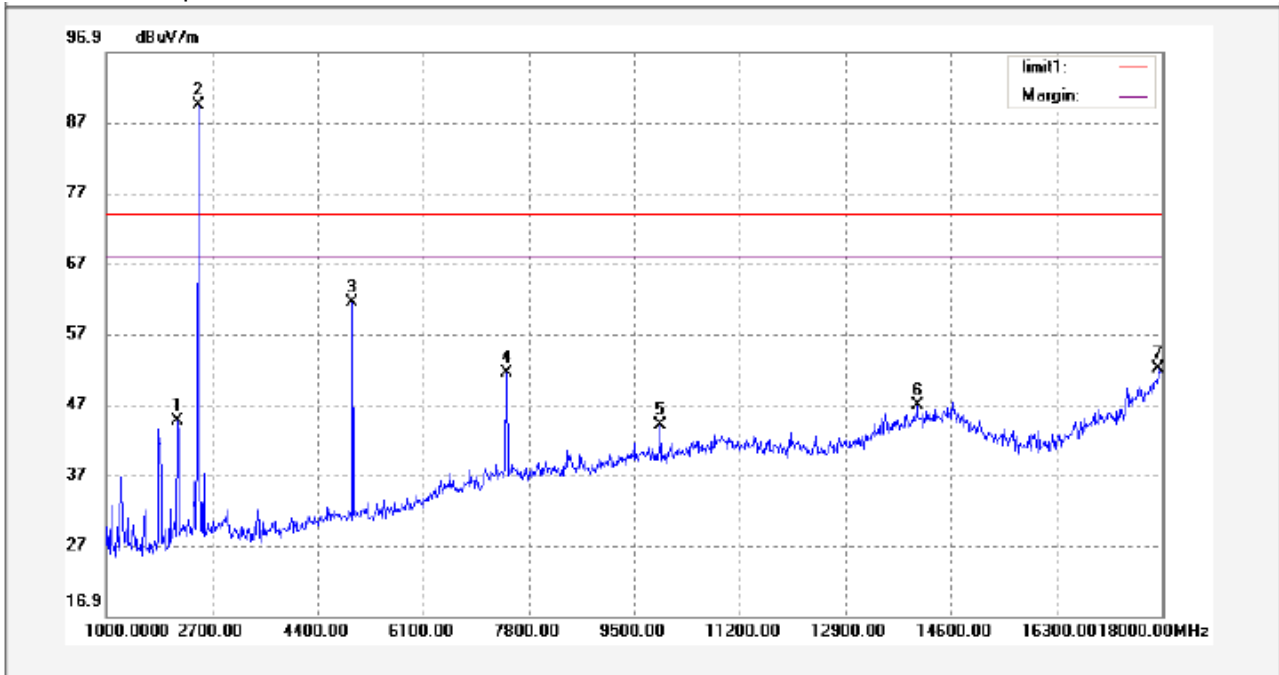


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2440.000    | 110.86           | -15.70      | 95.16           | 74.00          | 21.16       | peak     |        |
| 2   | 4893.000    | 66.66            | -11.91      | 54.75           | 74.00          | -19.25      | peak     |        |
| 3   | 7324.000    | 60.72            | -7.13       | 53.59           | 74.00          | -20.41      | peak     |        |
| 4   | 9772.000    | 59.20            | -5.28       | 53.92           | 74.00          | -20.08      | peak     |        |
| 5   | 12203.000   | 56.60            | -4.40       | 52.20           | 74.00          | -21.80      | peak     |        |
| 6   | 14651.000   | 50.12            | 0.37        | 50.49           | 74.00          | -23.51      | peak     |        |
| 7   | 17949.000   | 47.52            | 6.31        | 53.83           | 74.00          | -20.17      | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2440.000    | -15              | 80.16           | 54.00          | 26.16       | AV       |        |
| 2   | 4893.000    | -15              | 39.75           | 54.00          | -14.25      | AV       |        |
| 3   | 7324.000    | -15              | 38.59           | 54.00          | -15.41      | AV       |        |
| 4   | 9772.000    | -15              | 38.92           | 54.00          | -15.08      | AV       |        |
| 5   | 12203.000   | -15              | 37.20           | 54.00          | -16.8       | AV       |        |
| 6   | 14651.000   | -15              | 35.49           | 54.00          | -18.51      | AV       |        |
| 7   | 17949.000   | -15              | 38.83           | 54.00          | -15.17      | AV       |        |

Test channel: TX2478MHz

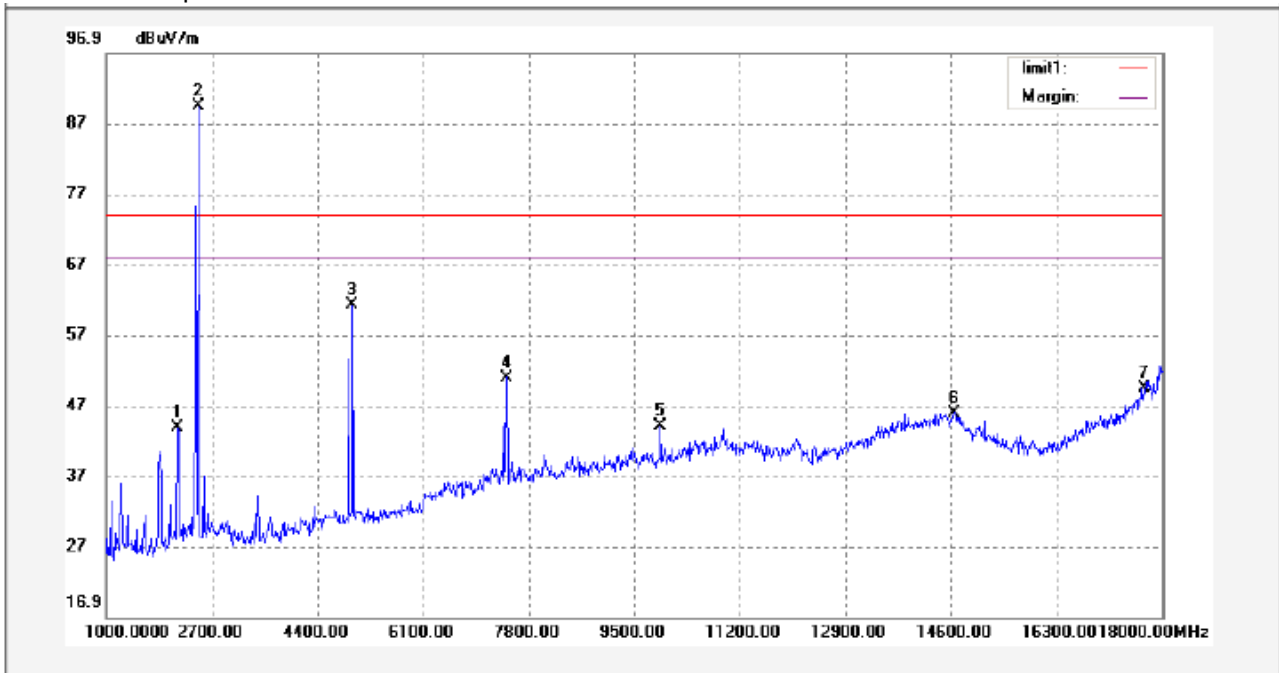
Antenna polarization: Vertical



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2139.000    | 59.93            | -15.41      | 44.52           | 74.00          | -29.48      | peak     |        |
| 2   | 2478.000    | 105.16           | -15.68      | 89.48           | 74.00          | 15.48       | peak     |        |
| 3   | 4961.000    | 73.12            | -11.77      | 61.35           | 74.00          | -12.65      | peak     |        |
| 4   | 7443.000    | 58.25            | -6.91       | 51.34           | 74.00          | -22.66      | peak     |        |
| 5   | 9925.000    | 49.12            | -5.15       | 43.97           | 74.00          | -30.03      | peak     |        |
| 6   | 14056.000   | 47.36            | -0.52       | 46.84           | 74.00          | -27.16      | peak     |        |
| 7   | 17949.000   | 45.63            | 6.31        | 51.94           | 74.00          | -22.06      | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2139.000    | -15              | 29.52           | 54.00          | -24.48      | AV       |        |
| 2   | 2478.000    | -15              | 74.48           | 54.00          | 20.48       | AV       |        |
| 3   | 4961.000    | -15              | 46.35           | 54.00          | -7.65       | AV       |        |
| 4   | 7443.000    | -15              | 36.34           | 54.00          | -17.66      | AV       |        |
| 5   | 9925.000    | -15              | 28.97           | 54.00          | -25.03      | AV       |        |
| 6   | 14056.000   | -15              | 31.84           | 54.00          | -22.16      | AV       |        |
| 7   | 17949.000   | -15              | 36.94           | 54.00          | -17.06      | AV       |        |

Antenna polarization: Horizontal



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2139.000    | 59.20            | -15.41      | 43.79           | 74.00          | -30.21      | peak     |        |
| 2   | 2478.000    | 105.16           | -15.68      | 89.48           | 74.00          | 15.48       | peak     |        |
| 3   | 4961.000    | 72.89            | -11.77      | 61.12           | 74.00          | -12.88      | peak     |        |
| 4   | 7443.000    | 57.81            | -6.91       | 50.90           | 74.00          | -23.10      | peak     |        |
| 5   | 9925.000    | 49.20            | -5.15       | 44.05           | 74.00          | -29.95      | peak     |        |
| 6   | 14651.000   | 45.53            | 0.37        | 45.90           | 74.00          | -28.10      | peak     |        |
| 7   | 17711.000   | 45.65            | 3.71        | 49.36           | 74.00          | -24.64      | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2139.000    | -15              | 28.79           | 54.00          | -25.21      | AV       |        |
| 2   | 2478.000    | -15              | 74.48           | 54.00          | 20.48       | AV       |        |
| 3   | 4961.000    | -15              | 46.12           | 54.00          | -7.88       | AV       |        |
| 4   | 7443.000    | -15              | 35.90           | 54.00          | -18.1       | AV       |        |
| 5   | 9925.000    | -15              | 29.05           | 54.00          | -24.95      | AV       |        |
| 6   | 14651.000   | -15              | 30.90           | 54.00          | -23.1       | AV       |        |
| 7.  | 17711.000   | -15              | 34.36           | 54.00          | -19.64      | AV       |        |

**Test Frequency :Above 18GHz**

After pretest,we found no higher emission than background level, the data does not been shown in the test report.

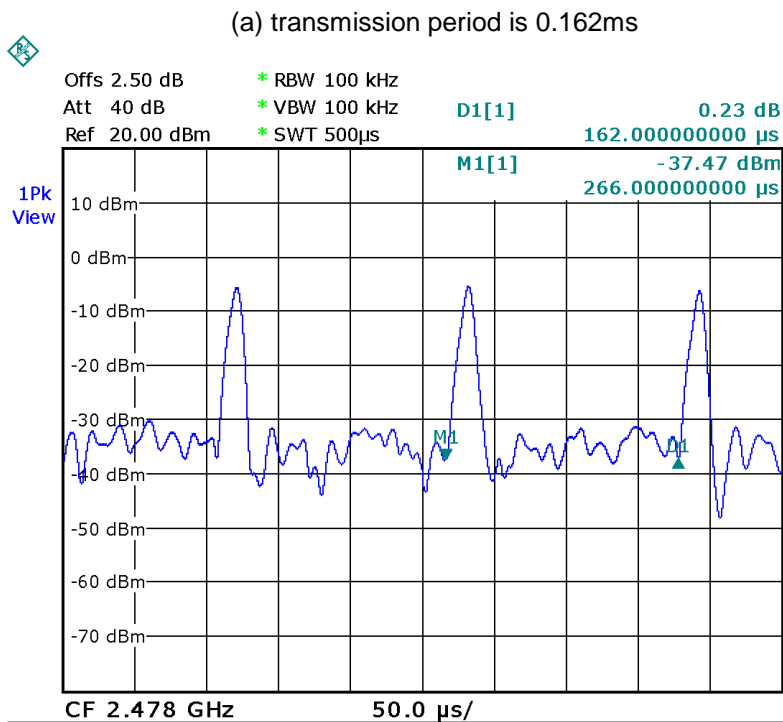
## 8 Duty Cycle

Test Requirement: FCC Part 15.35  
 Test Method: ANSI C63.4:2003  
 Test Status: TX mode.

### 8.1 Test Procedure

1. The EUT was placed on a turntable which is 0.8m above ground plane
2. Set EUT as normal working mode
3. Set SPA center frequency = fundamental frequency, RBW = 100 kHz, VBW = 100 kHz, Span = 0 Hz, Adjacent sweep time.

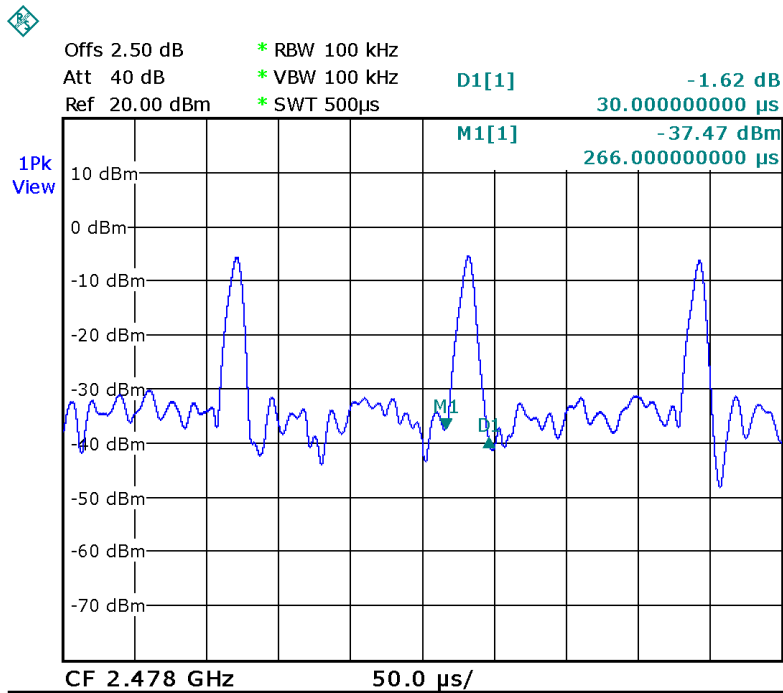
### 8.2 Test Result



Date: 19.JAN.2013 17:17:28



(b) Single pulse time is 0.030ms



Date: 19.JAN.2013 17:17:15

The EUT is auto. operation for transmitter, it is declared by the manufacturer as a duty cycle ratio of less than 100%.

The EUT's work time :  $T_{on} = \text{pulse time} = 0.030 \text{ ms}$

The EUT's work period :  $T = T_{ON} + T_{OFF} = \text{transmission period} = 0.162 \text{ ms}$

The EUT's duty cycle :  $D = T_{on} / T = 0.030 / 0.162 * 100\% = 18.52\%$

Duty Cycle Correction Factor(dB) =  $20 * \text{Log}_{10}(\text{Duty Cycle}) = 20 * \text{Log}_{10}(18.52\%)$

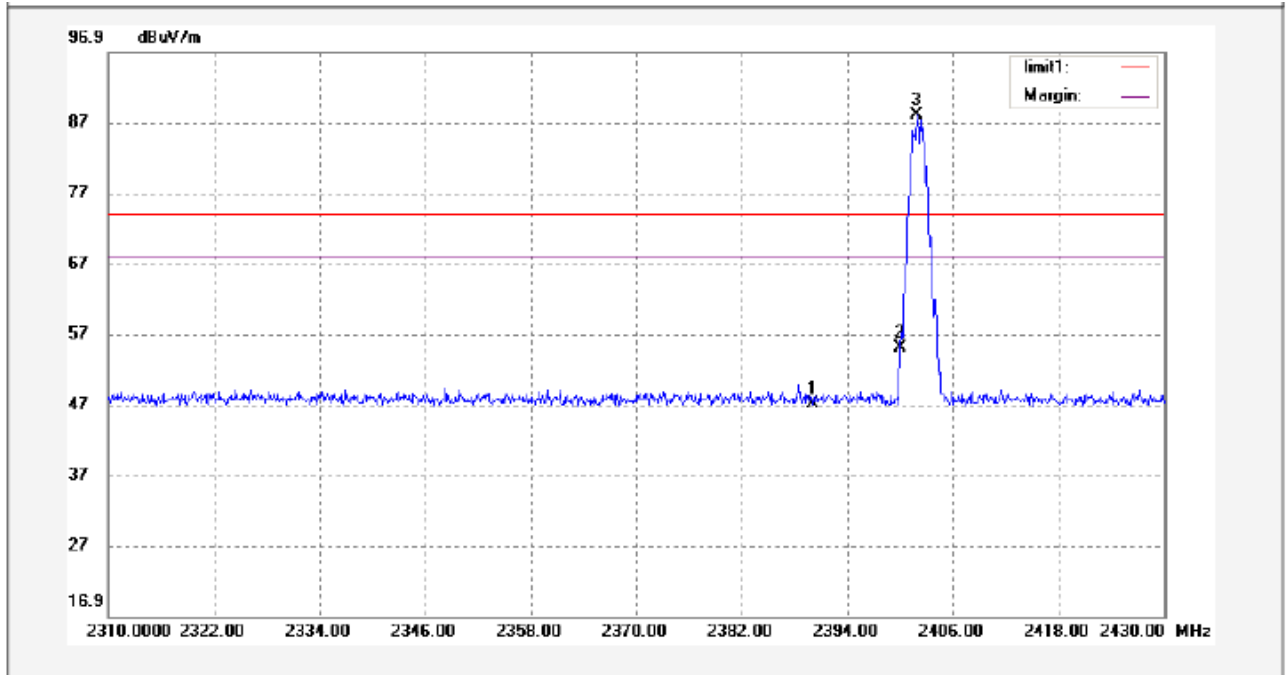
= -15dB

## 9 Band Edge Measurement

|                       |  |
|-----------------------|--|
| Test Requirement:     | Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).                                |
| Test Method:          | DA 00-705  |
| Measurement Distance: | 3m   |
| Limit:                | 40.0 dBuV/m between 30MHz & 88MHz;<br>43.5 dBuV/m between 88MHz & 216MHz;<br>46.0 dBuV/m between 216MHz & 960MHz;<br>54.0 dBuV/m above 960MHz.<br>74.0 dBuV/m for peak above 1GHz<br>54.0 dBuV/m for AVG above 1GHz  |
| Detector:             | For Peak value:<br>RBW = 1 MHz for $f \geq 1$ GHz<br>VBW $\geq$ RBW; Sweep = auto<br>Detector function = peak<br>Trace = max hold<br>For AVG value:<br>RBW = 1 MHz for $f \geq 1$ GHz<br>VBW = 10Hz; Sweep = auto<br>Detector function = AVG<br>Trace = max hold |
| Test mode:            | continuous transmitting  |

### 9.1 Test Result:

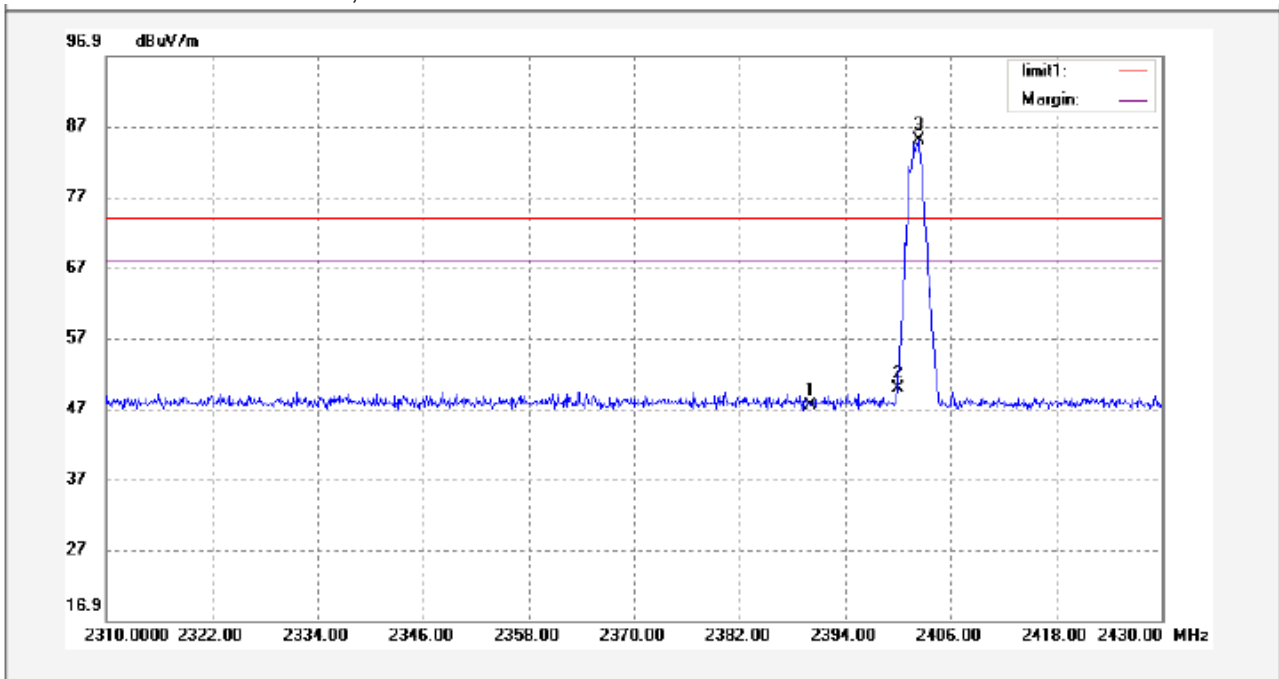
Lower Channel – Peak, Vertical



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2390.000    | 44.53            | 2.53        | 47.06           | 74.00          | -26.94      | peak     |        |
| 2   | 2400.000    | 52.47            | 2.52        | 54.99           | 74.00          | -19.01      | peak     |        |
| 3   | 2401.920    | 85.53            | 2.52        | 88.05           | 74.00          | 14.05       | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2390.000    | -15              | 32.06           | 54.00          | -21.94      | AV       |        |
| 2   | 2400.000    | -15              | 39.99           | 54.00          | -14.01      | AV       |        |
| 3   | 2401.920    | -15              | 73.05           | 54.00          | 25.05       | AV       |        |

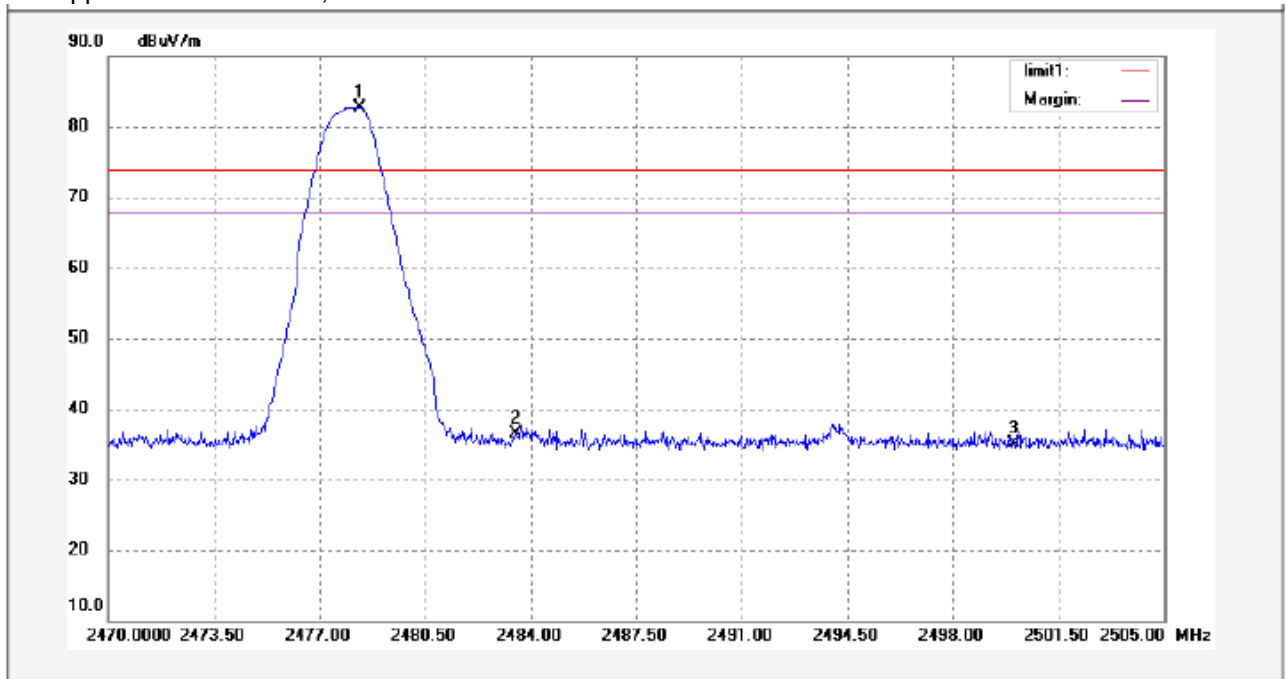
Lower Channel – Peak, Horizontal



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2390.000    | 44.94            | 2.53        | 47.47           | 74.00          | -26.53      | peak     |        |
| 2   | 2400.000    | 47.36            | 2.52        | 49.88           | 74.00          | -24.12      | peak     |        |
| 3   | 2402.400    | 82.41            | 2.51        | 84.92           | 74.00          | 10.92       | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2390.000    | -15              | 32.47           | 54.00          | -21.53      | AV       |        |
| 2   | 2400.000    | -15              | 34.88           | 54.00          | -19.12      | AV       |        |
| 3   | 2402.400    | -15              | 69.92           | 54.00          | 15.92       | AV       |        |

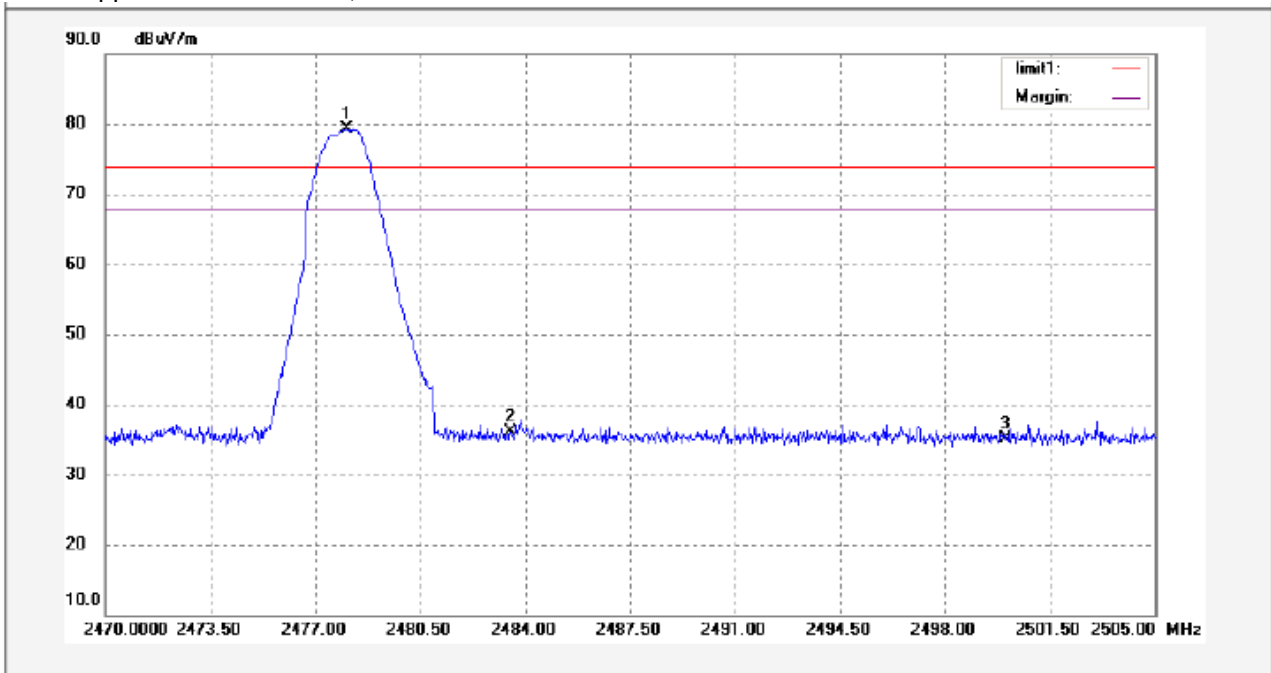
Upper Channel – Peak, Vertical



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2478.330    | 91.97            | -9.22       | 82.75           | 74.00          | 8.75        | peak     |        |
| 2   | 2483.500    | 45.73            | -9.20       | 36.53           | 74.00          | -37.47      | peak     |        |
| 3   | 2500.000    | 44.28            | -9.15       | 35.13           | 74.00          | -38.87      | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2478.330    | -15              | 67.75           | 54.00          | 19.75       | AV       |        |
| 2   | 2483.500    | -15              | 21.53           | 54.00          | -32.47      | AV       |        |
| 3   | 2500.00     | -15              | 20.13           | 54.00          | -33.87      | AV       |        |

Upper Channel – Peak, Horizontal



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2478.050    | 88.46            | -9.22       | 79.24           | 74.00          | 5.24        | peak     |        |
| 2   | 2483.500    | 45.37            | -9.20       | 36.17           | 74.00          | -37.83      | peak     |        |
| 3   | 2500.000    | 44.22            | -9.15       | 35.07           | 74.00          | -38.93      | peak     |        |

| No. | Freq. (MHz) | Duty Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2478.050    | -15              | 64.24           | 54.00          | 16.24       | AV       |        |
| 2   | 2483.500    | -15              | 21.17           | 54.00          | -32.83      | AV       |        |
| 3   | 2500.000    | -15              | 20.07           | 54.00          | -33.93      | AV       |        |

## 10 20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247  
 Test Method: DA 00-705  
 Test Mode: Test in fixing operating frequency at low, Middle, high channel.

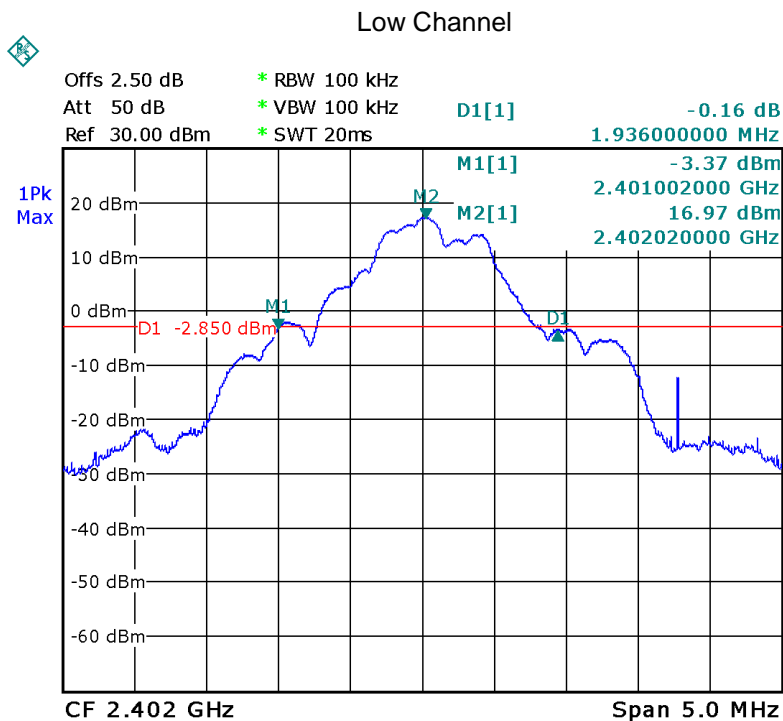
### 10.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 100kHz

### 10.2 Test Result:

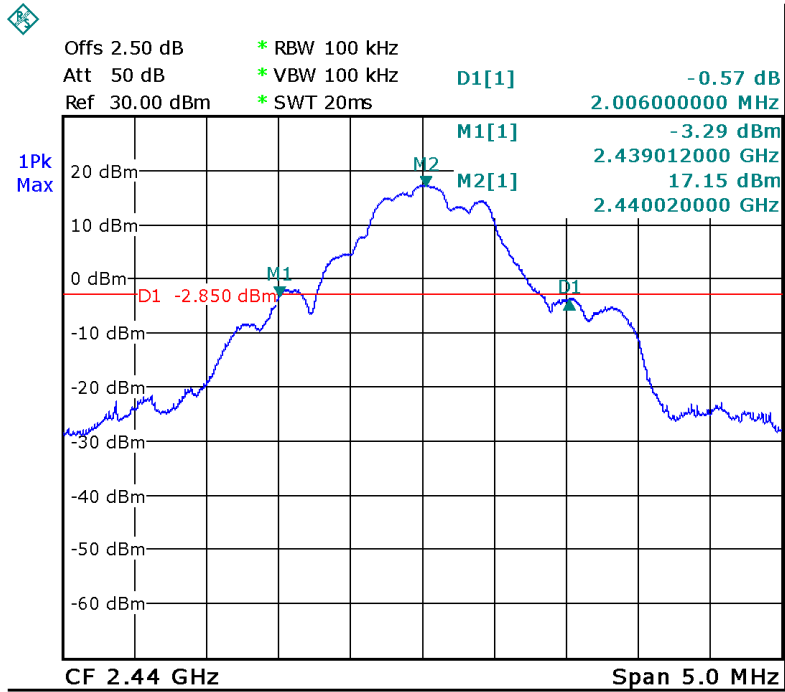
| Test Channel | Bandwidth |
|--------------|-----------|
| Low          | 1.936MHz  |
| Middle       | 2.006MHz  |
| High         | 1.866MHz  |

Test result plot as follows:



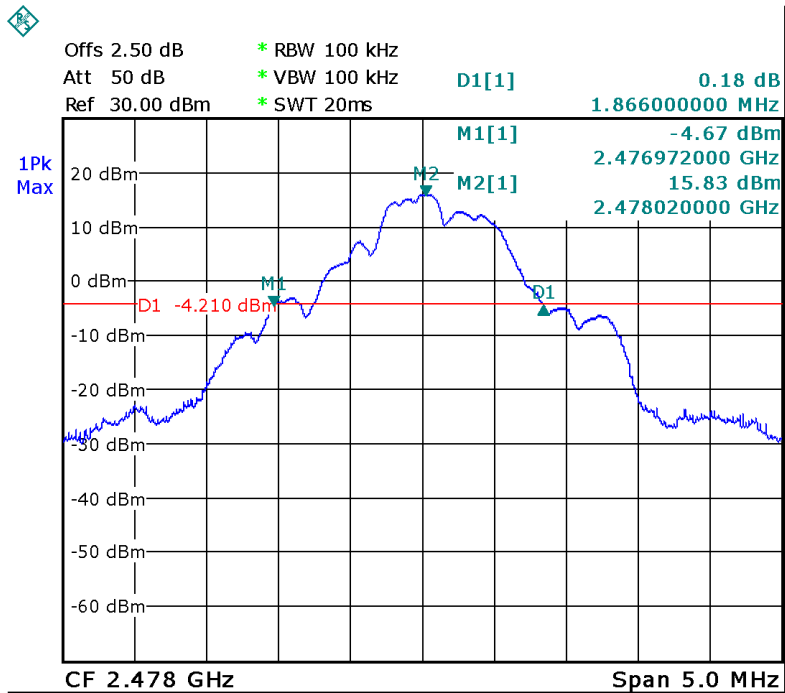
Date: 19.JAN.2013 15:50:04

Middle Channel



Date: 19.JAN.2013 15:49:04

High Channel



Date: 19.JAN.2013 15:43:39



## 11 Maximum Peak Output Power

|                   |   |
|-------------------|---|
| Test Requirement: | FCC CFR47 Part 15 Section 15.247  |
| Test Method:      | DA 00-705   |
| Test Limit:       | Regulation 15.247 (b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.<br>Refer to the result "Number of Hopping Frequency" of this document. The 0.125watts (20.97 dBm) limit applies. |
| Test mode:        | Test in fixing frequency transmitting mode.   |

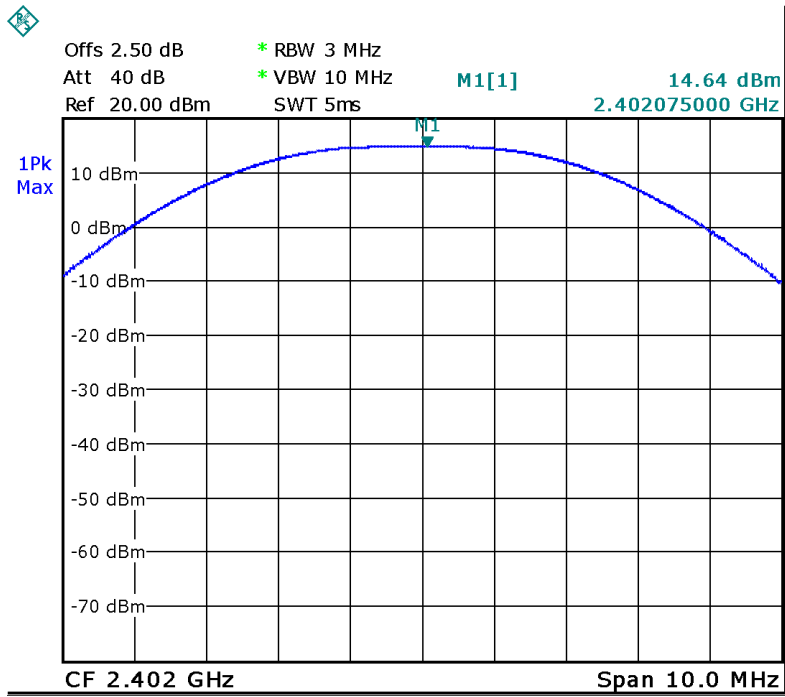
### 11.1 Test Procedure:

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

### 11.2 Test Result:

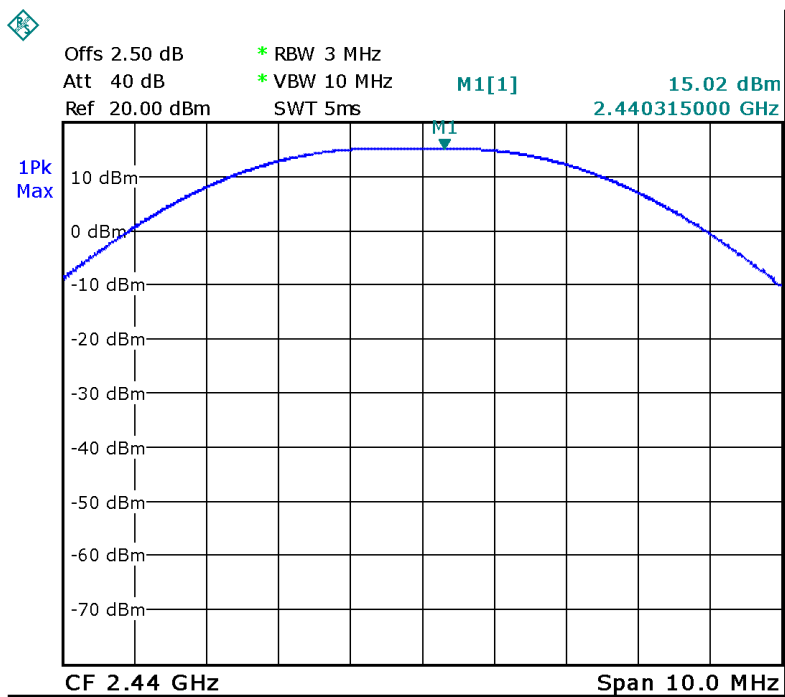
| Test Channel | Output Power (dBm) | Limit (dBm) |
|--------------|--------------------|-------------|
| Low          | 14.64              | 20.97       |
| Middle       | 15.02              | 20.97       |
| High         | 16.07              | 20.97       |

### Low Channel



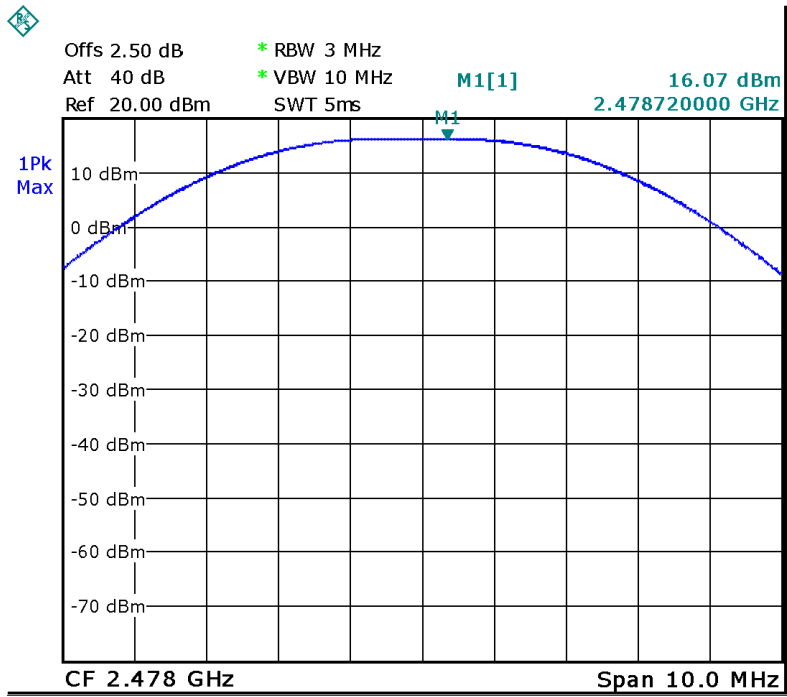
Date: 10.MAY.2013 11:10:13

### Middle Channel



Date: 10.MAY.2013 11:10:37

### High Channel



Date: 10.MAY.2013 11:09:46

## 12 Hopping Channel Separation

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705

Test Limit: Regulation 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 1W.

Test Mode: Test in hopping transmitting operating mode.

### 12.1 Test Procedure:

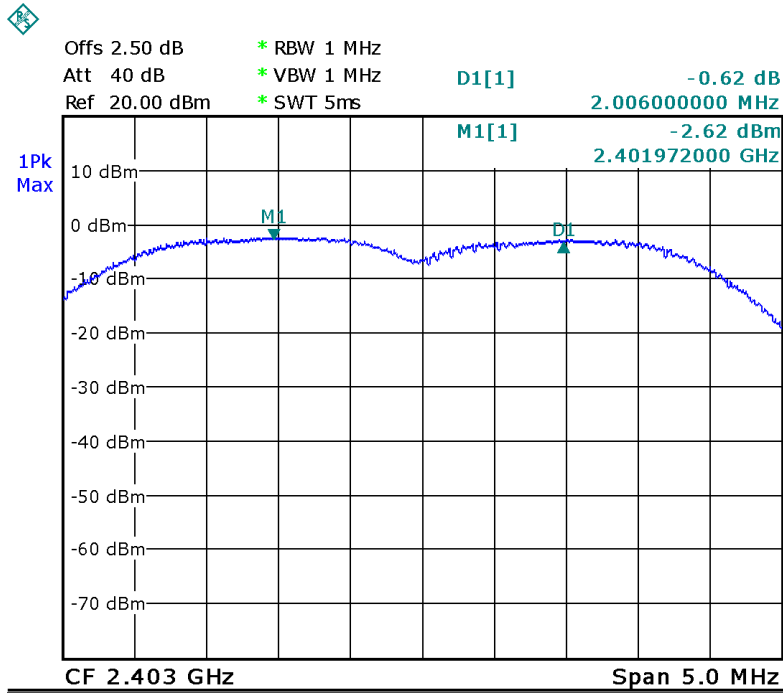
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1MHz. VBW = 1MHz , Span = 5MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section  
Submit this plot.

### 12.2 Test Result:

| Test Channel | Separation (MHz) | Result |
|--------------|------------------|--------|
| Low          | 2.006            | PASS   |
| Middle       | 2.016            | PASS   |
| High         | 2.006            | PASS   |

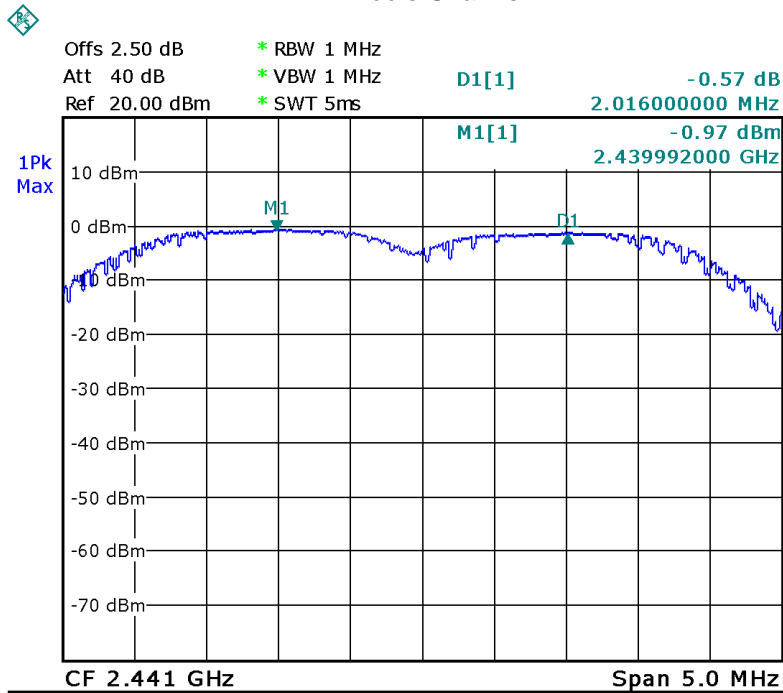
Test result plot as follows:

Low Channel



Date: 24.JAN.2013 14:13:25

Middle Channel



Date: 24.JAN.2013 14:11:58





## 14 Dwell Time

|                   |  |
|-------------------|--|
| Test Requirement: | FCC CFR47 Part 15 Section 15.247   |
| Test Method:      | DA 00-705  |
| Test Limit:       | Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. |
| Test Mode:        | Test in hopping transmitting operating mode.   |

### 14.1 Test Procedure:

- 1.Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
- 2.Set spectrum analyzer span = 0. centered on a hopping channel;
- 3.Set RBW = 1MHz and VBW = 1MHz.Sweep = as necessary to capture the entire dwell time per hopping channel.
- 4.Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

### 14.2 Test Result:

The test period:  $T = 0.4(s) * 39 = 15.6 (s)$

So, the Dwell Time can be calculated as follows:

Low channel: slot time= $12(\text{times})/1(s) * 0.210(\text{ms}) * 15.6(s) = 0.039(s)$

Middle channel: slot time= $15(\text{times})/1(s) * 0.209(\text{ms}) * 15.6(s) = 0.049(s)$

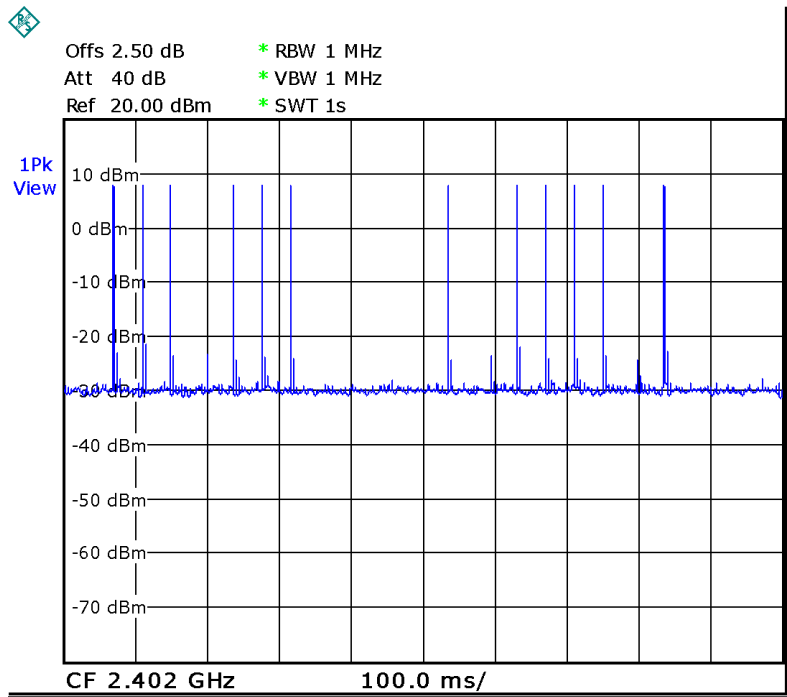
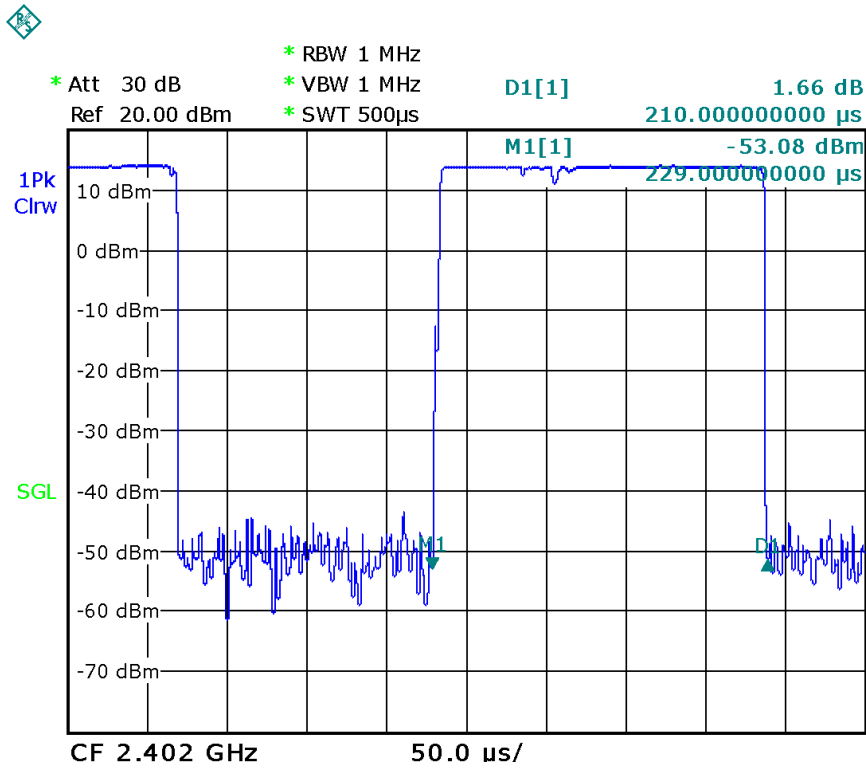
High channel: slot time= $15(\text{times})/1(s) * 0.212(\text{ms}) * 15.6(s) = 0.050(s)$

Note : Mkr Delta is once pulse time.

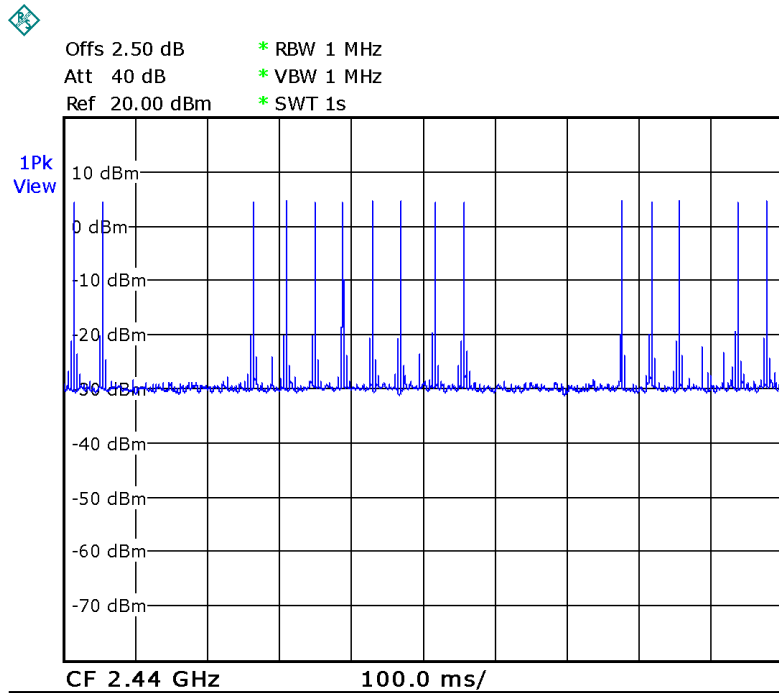
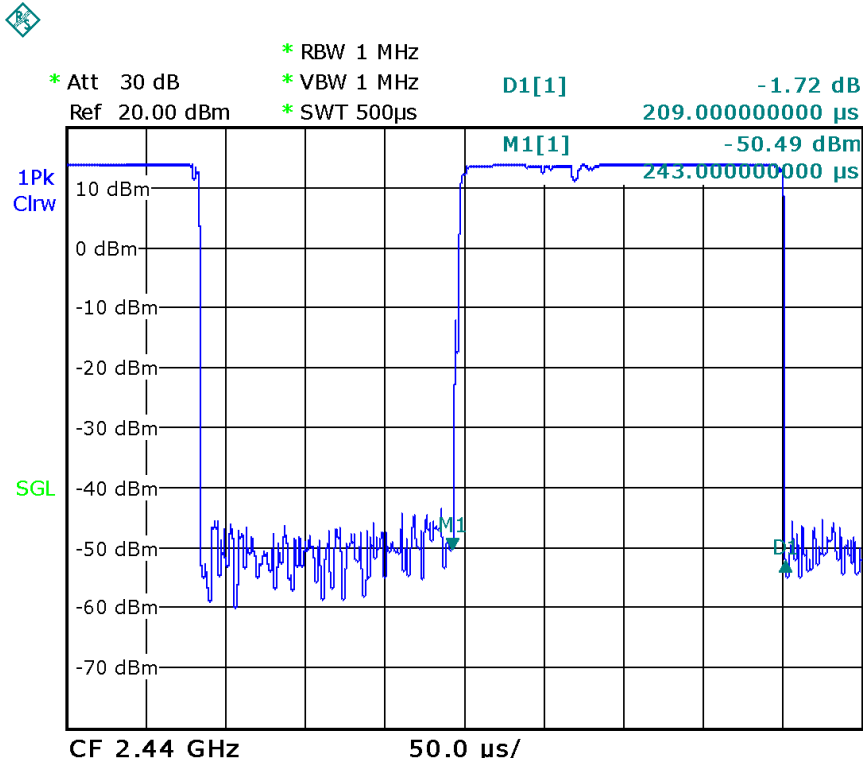
| Frequency | Mkr Delta(ms) | Dwell Time(s) | Limits(s) | Result |
|-----------|---------------|---------------|-----------|--------|
| 2402 MHz  | 0.210         | 0.039         | 0.400     | Pass   |
| 2440 MHz  | 0.209         | 0.049         | 0.400     | Pass   |
| 2478 MHz  | 0.212         | 0.050         | 0.400     | Pass   |



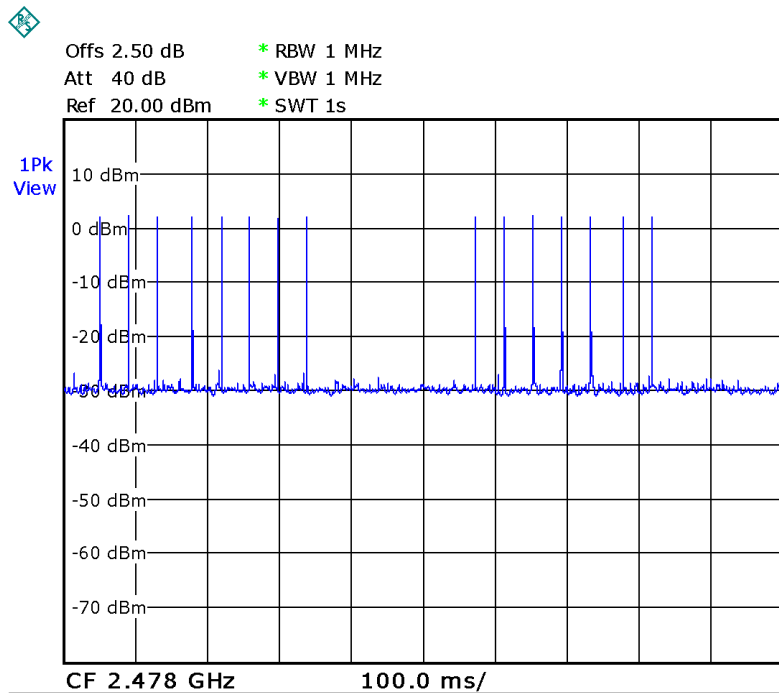
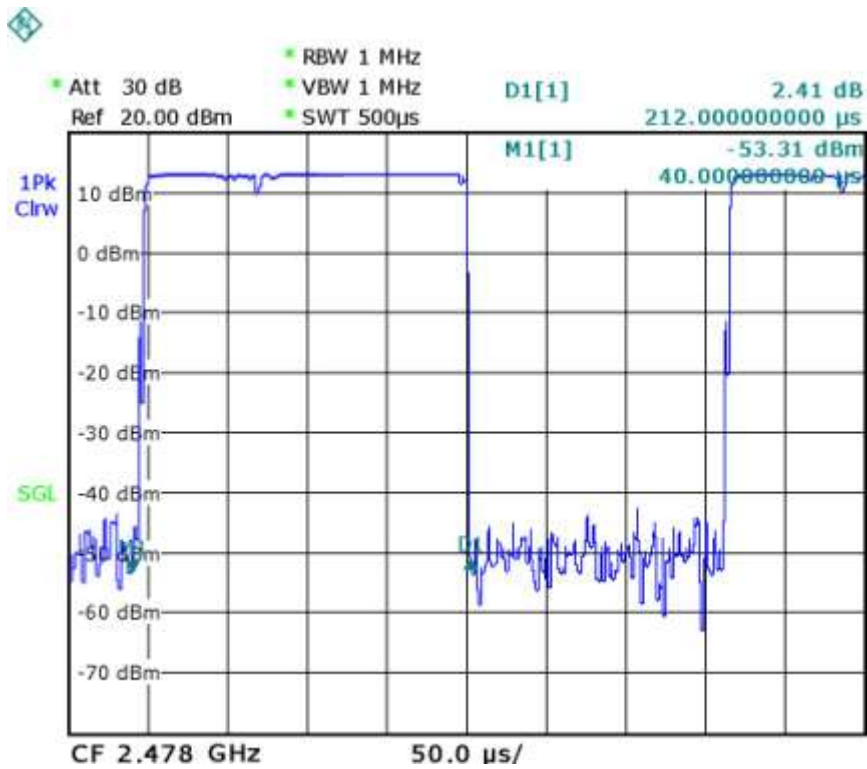
### Low Channel



### Middle Channel



### High Channel



## 15 Antenna Requirement

According to the FCC Part 15 Paragraph 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. This product has a antenna with RP SMA connector, fulfill the requirement of this section.

## 16 RF Exposure

Test Requirement: FCC Part 1.1307

Test Mode: The EUT work in test mode(Tx).

### 16.1 Requirments:

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

### 16.2 The procedures / limit

(A) Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|--|--|
| 0.3-3.0               | 614                               | 1.63                              | (100)*                                   | 6  |
| 3.0-30                | 1842 / f                          | 4.89 / f                          | (900 / f)*                               | 6  |
| 30-300                | 61.4                              | 0.163                             | 1.0                                      | 6  |
| 300-1500              |                                   |                                   | F/300                                    | 6  |
| 1500-100,000          |                                   |                                   | 5  | 6  |

(B) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|--|--|
| 0.3-1.34              | 614                               | 1.63                              | (100)*                                   | 30   |
| 1.34-30               | 824/f                             | 2.19/f                            | (180/f)*                                 | 30   |
| 30-300                | 27.5                              | 0.073                             | 0.2                                      | 30   |
| 300-1500              |                                   |                                   | F/1500                                   | 30   |
| 1500-100,000          |                                   |                                   | 1.0                                      | 30   |

Note: f = frequency in MHz ; \*Plane-wave equivalent power density

### 16.3 MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**E** = Electric field (V/m)

**P** = Peak RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

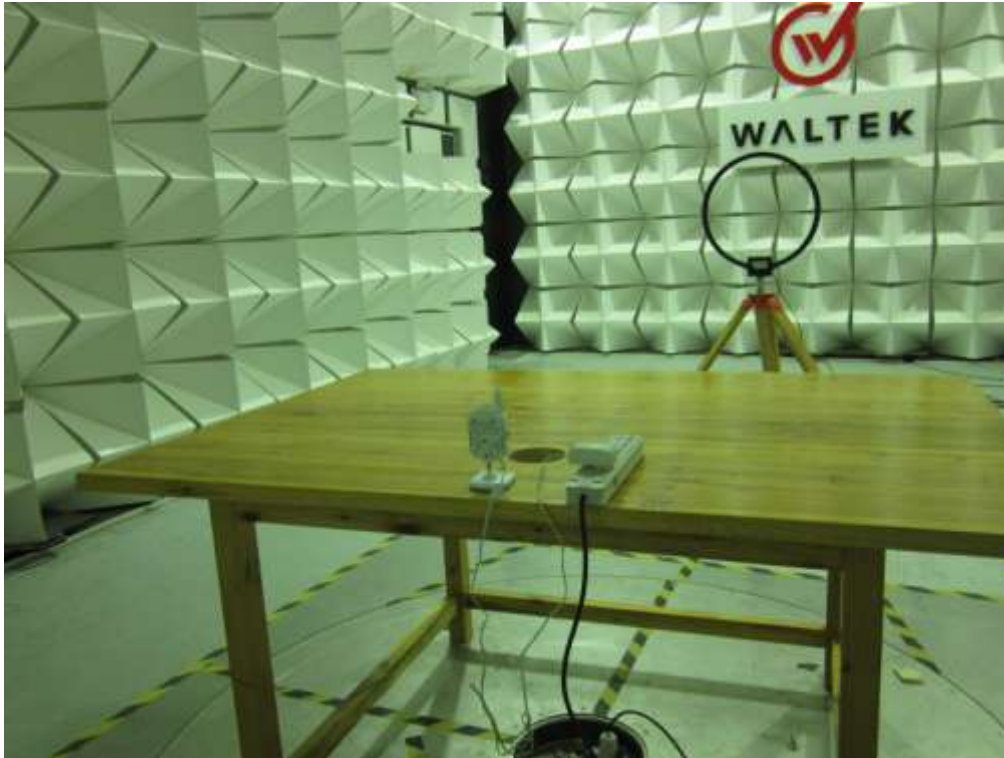
From the peak EUT RF output power, the minimum mobile separation distance,  $d=0.2\text{m}$ , as well as the gain of the used antenna, the RF power density can be obtained

| Antenna Gain (dBi) | Antenna Gain (numeric) | Peak Output Power (dBm) | Peak Output Power (mW) | Power Density (S) (mW/cm <sup>2</sup> ) | Limit of Power Density (S) (mW/cm <sup>2</sup> ) | Test Result |
|--------------------|------------------------|-------------------------|------------------------|---|--|-------------|
| 2                  | 1.58                   | 16.07                   | 40.46                  | 0.013                                   | 1  | Complies    |

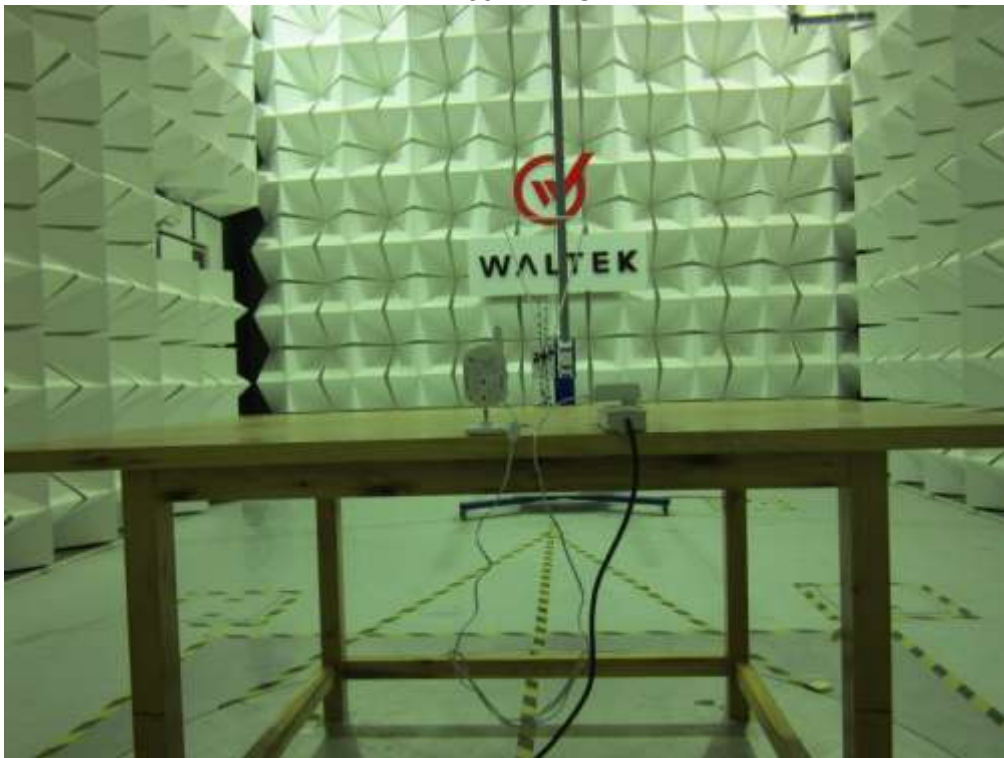
## 17 Photographs – Test Setup

### 17.1 Photograph – Radiation Spurious Emission Test Setup

Below 30MHz



30MHz-1GHz



Above 1GHz



17.2 Photograph – Conducted Emission Test Setup





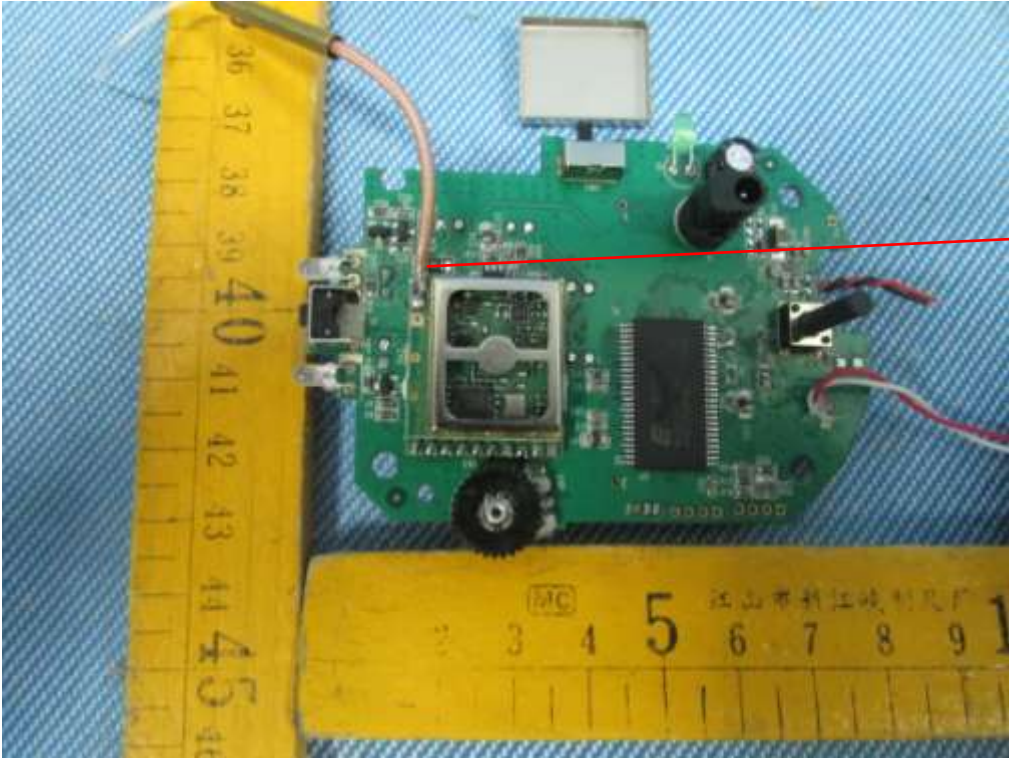
## 18 Photographs - Constructional Details

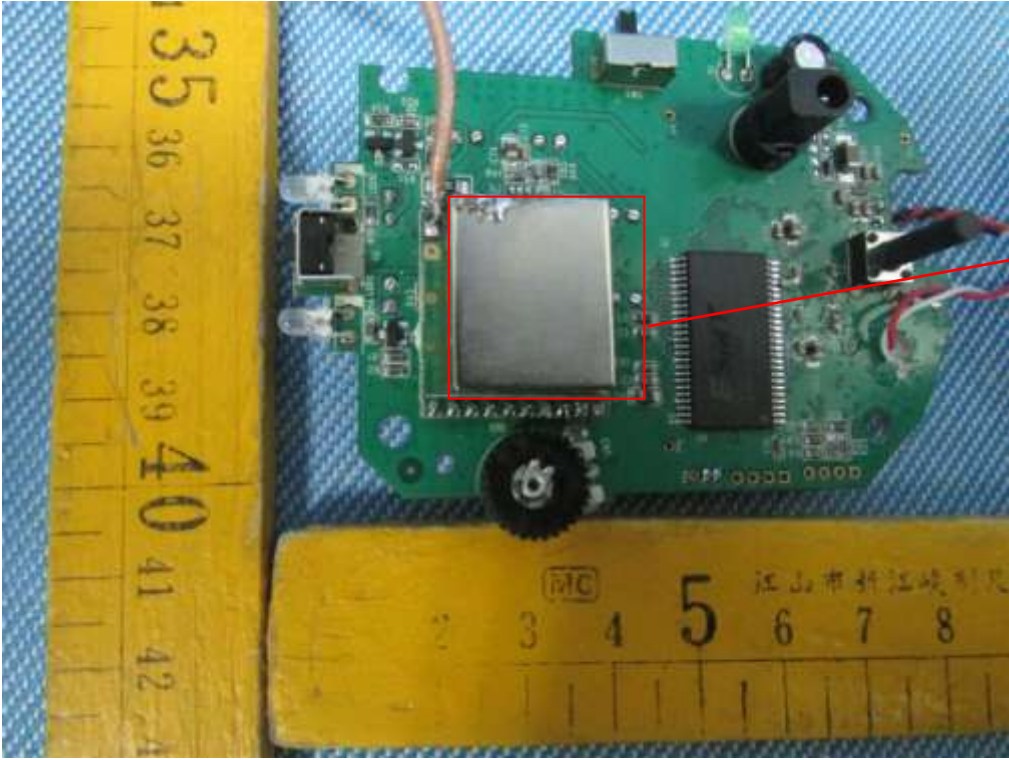
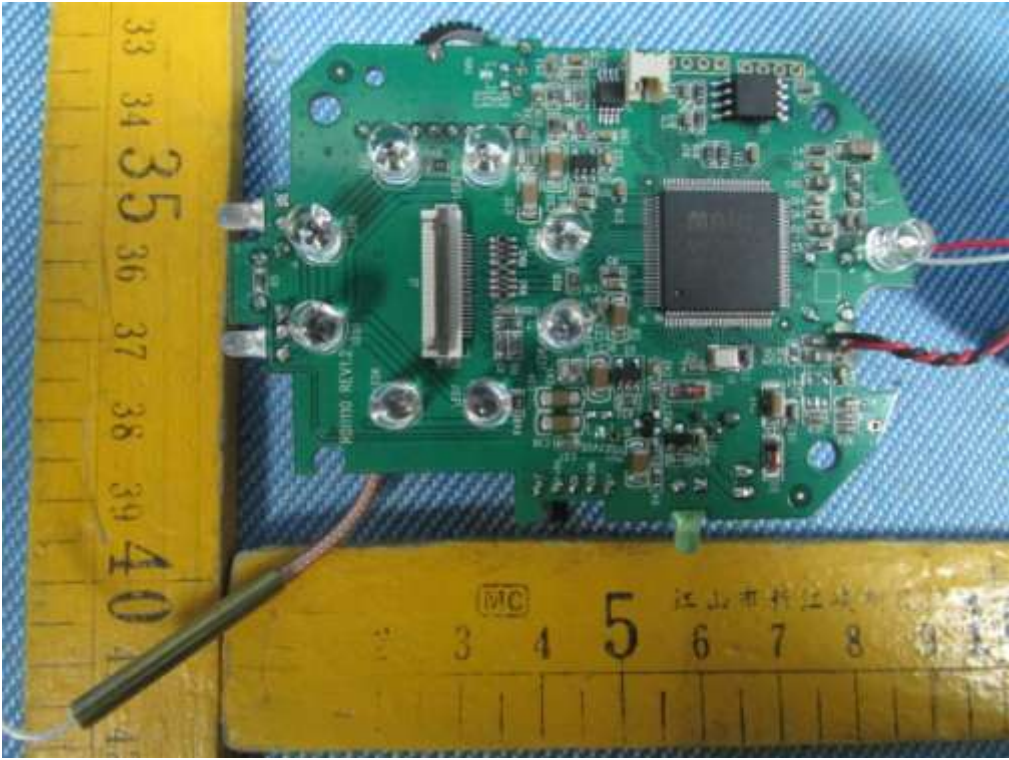
### 18.1 External View





18.2 EUT - Internal View



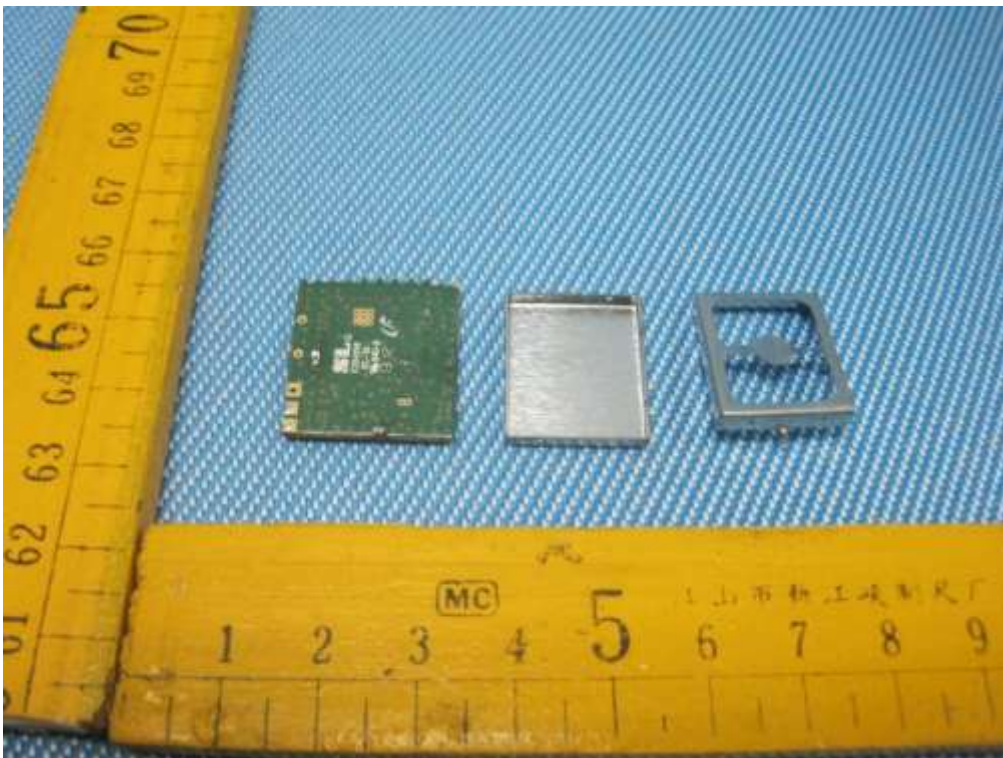


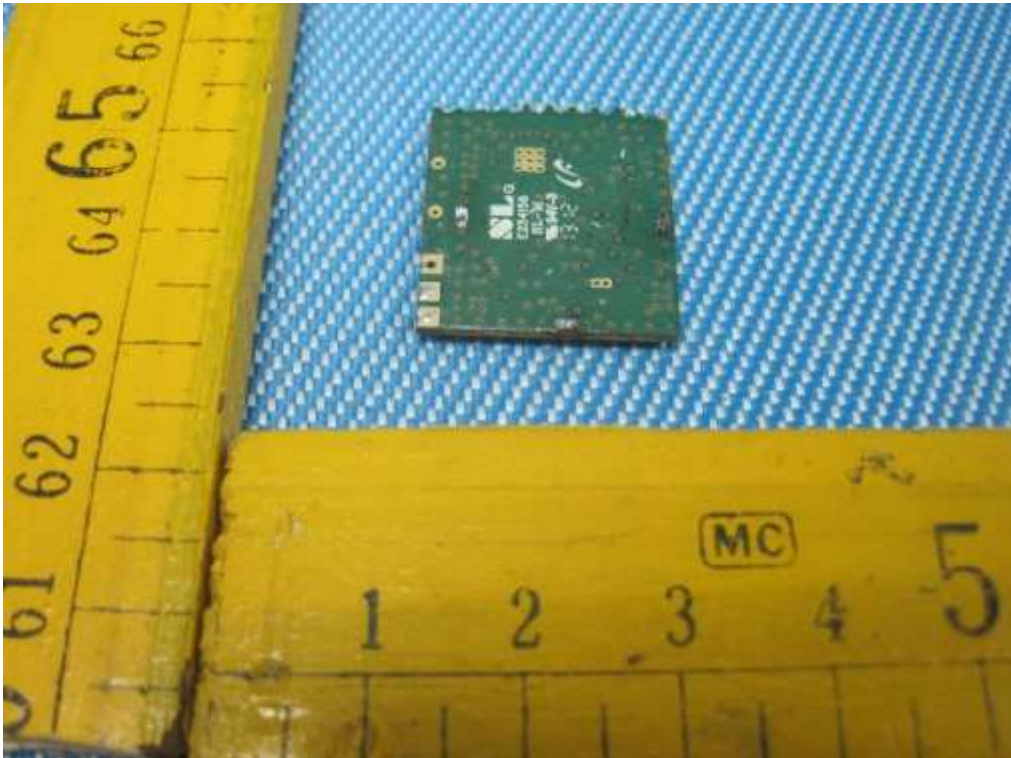


### 18.3 Adapter - View



### 18.4 EUT – RF module View





## **19 FCC Label**

FCC Label Sample for model: CA650D

FCC ID: SJ8-CA650D

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.



FCC Label Location for model: CA650D

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.



=End of report=