

FCC TEST REPORT

FCC ID : WVY-LB800F015A

Applicant : Ningbo Lion-Ball Electric Wire & Cable Co., LTD.

Address of Applicant : Jiangshan Town, Yinzhou District, Ningbo, ZheJiang Province, China

Equipment Under Test (EUT) :

Product description : Universal bluetooth headset for motorcycle helmets

Model No. : LB800F015A

Standards : FCC 15 Paragraph 15.247

Date of Test : July 12, 2010 to July 15, 2010

Test Engineer : Mike.Chen

Reviewed By :



PERPARED BY:

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3 Test Summary

| Test Items | Test Requirement | Test Method | Limit / Severity | Result |
|---|------------------|------------------|----------------------------------|--------|
| Maximum peak output power | FCC Part 15:2009 | ANSI C63.4: 2009 | 30dBm | PASS |
| Restricted Band | FCC Part 15:2009 | ANSI C63.4: 2009 | Note | PASS |
| Dwell time | FCC Part 15:2009 | ANSI C63.4: 2009 | Maximum:0.4 s | PASS |
| Channel separation | FCC Part 15:2009 | ANSI C63.4: 2009 | Channel separation at least 1MHz | PASS |
| Hopping channel No. | FCC Part 15:2009 | ANSI C63.4: 2009 | Total 79 channels | PASS |
| 20-dB Bandwidth | FCC Part 15:2009 | ANSI C63.4: 2009 | Note | PASS |
| RF Exposure Test | FCC Part 15:2009 | ANSI C63.4: 2009 | Note | PASS |
| Mains Terminal Disturbance Voltage, 150kHz to 30MHz | FCC Part 15:2009 | ANSI C63.4: 2009 | N/A | N/A |
| Radiation Emission, 30MHz to 25GHz | FCC Part 15:2009 | ANSI C63.4: 2009 | N/A | PASS |

Note : denote that for more details of the EUT , please refer to the relating test items as below .

Remark : the methods of measurement in all the test items were according to the FCC Public Notice DA 00-705 .

4 General Information

4.1 Client Information

Applicant : Ningbo Lion-Ball Electric Wire & Cable Co., LTD.

Address of Applicant: : Jiangshan Town,Yinzhou District, Ningbo, ZheJiang Province, China

Manufacturer: : Ningbo Lion-Ball Electric Wire & Cable Co., LTD.

Address of Manufacturer : Jiangshan Town,Yinzhou District, Ningbo, ZheJiang Province, China

4.2 General Description of E.U.T.

Product description: Universal bluetooth headset for motorcycle helmets

Model No.: LB800F015A

4.3 Details of E.U.T.

Power Supply: 3.7V DC, 330mAh Battery Built in

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Standards Applicable for Testing

The customer requested FCC tests for a Universal bluetooth headset for motorcycle helmets.

The standards used were FCC 15 Paragraph 15.247,Paragraph 15.205, Paragraph 15.207,Paragraph 15.209, Paragraph 15.31,Paragraph 15.33, Paragraph 15.35.

4.6 Test Facility

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

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

- **FCC – Registration No.: 759397**

Solid Industrial (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 759397, December 28, 2006.

4.7 Test Location

All Emissions tests were performed at:-

Solid Industrial (Shenzhen) Co., Ltd. at 333 Bulong Highway Buji Longgang, Shenzhen, Guangdong, China.

5 Equipment Used during Test

| Equipment | Brand Name | Model | Cal. Int Months | Last Cal. Date |
|---|--|------------|-----------------|----------------|
| 3m Anechoic chamber | | | | |
| EMC Analyzer | Agilent E7405A | MY45114943 | 12 | 2009-08 |
| EMI Test Receiver | R&S | ESS | 12 | 2009-08 |
| Pre Amplifier | Anritsu | MH648A | 12 | 2009-08 |
| Bilog Antenna | SCHAFFNER | CBL6111C | 12 | 2009-08 |
| Broad-band Horn Antenna | SCHWARZBECK MESS- ELEKTROM / VULB9163 | 667 | 12 | 2009-08 |
| 10m Coaxial Cable with N-male Connectors | SCHWARZBECK MESS-ELEKTROM / AK 9515 H | --- | 12 | 2009-08 |
| 10m 50 Ohm Coaxial Cable with N-plug, individual length | SCHWARZBECK MESSELEKTOM / AK 9513 | --- | 12 | 2009-08 |
| Test Receiver | ROHDE&SCHWARZ/ ESPI | 101155 | 12 | 2009-08 |
| AM/FM Stereo Signal Generator | Panasonic | VP-8122A | 12 | 2009-08 |
| Signal Generator | R&S | SMG | 12 | 2009-08 |
| | | | | |

6 Radiation Emission Test

| | |
|-----------------------|---|
| Test Requirement: | FCC Part15 Paragraph 15.247 |
| Test Method: | Based on ANSI 63.4:2009 |
| Test Date: | July 12, 2010 |
| Frequency Range: | 30MHz to 25GHz |
| Measurement Distance: | 3m |
| Detector: | Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximised peak within 6dB of limit |

6.1 Test Equipment

Please refer to Section 5 this report.

6.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

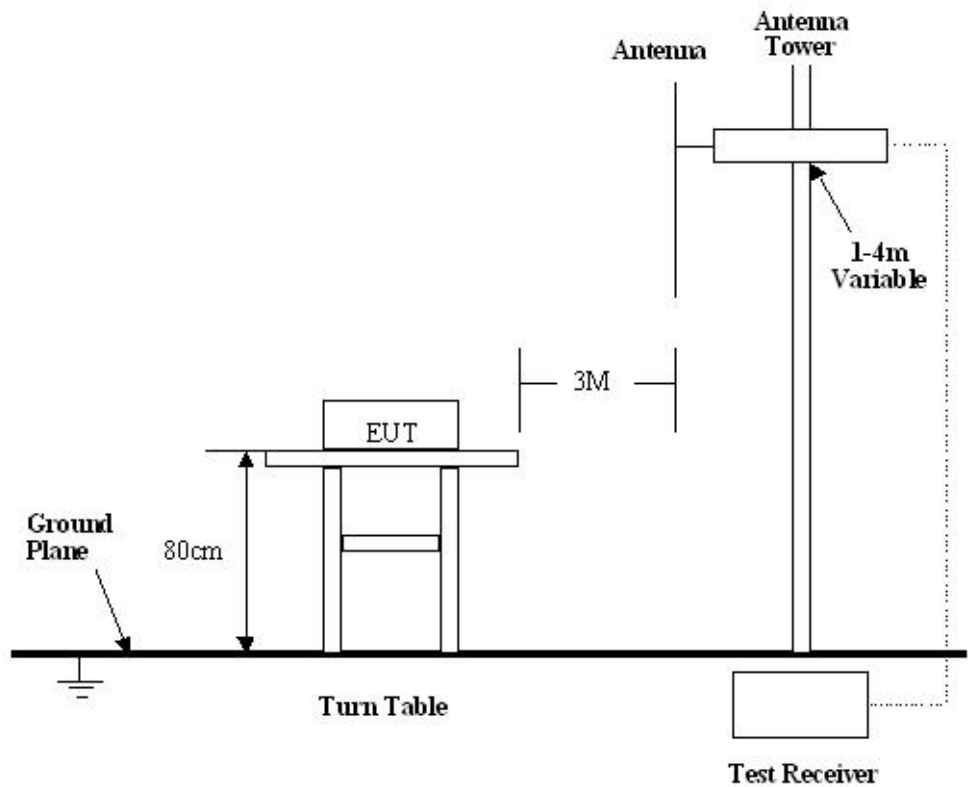
Based on ANSI C63.4:2009, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Solid Industrial (Shenzhen) Co., Ltd. EMC Lab is +/-2.98 dB.

6.3 Test Procedure

1. New battery were installed in the equipment under test for radiated emissions test.
2. This is a handheld device, The radiation emission should be 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.
3. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.
4. All data was recorded in the peak and average detection mode.
5. The EUT was under working mode during the final qualification test and the configuration was used to represent the worst case results.

6.4 Radiated Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2009, The specification used in this report was the FCC Part15 Paragraph 15.209 limits and Paragraph 15.247 limits.



6.5 Spectrum Analyzer Setup

According to FCC Part15 Paragraph 15.247 Rules, the system was tested to 25000 MHz. Below 1GHz

| | |
|------------------------------------|----------|
| Start Frequency | 30 MHz |
| Stop Frequency | 1000 MHz |
| 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

| | |
|------------------------------------|----------|
| Start Frequency | 1000 MHz |
| Stop Frequency | 25000MHz |
| Sweep Speed | Auto |
| IF Bandwidth..... | 120 kHz |
| Video Bandwidth | 1MHz |
| Quasi-Peak Adapter Bandwidth | 120 kHz |
| Quasi-Peak Adapter Mode..... | Normal |
| Resolution Bandwidth | 1MHz |

6.6 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 -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

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

6.7 Summary of Test Results

According to the data in section 6.11, the EUT complied with the FCC Part15 Paragraph 15.247 standards.

6.8 EUT Operating Condition

The same as section 6.4 of this report.

Let the EUT work in test mode and test it.

6.9 Radiated Emissions Limit on Paragraph 15.209

| Frequency(MHZ) | Distance(m) | Field strength(dBuV/m) |
|----------------|-------------|------------------------|
| 30-88 | 3 | 40.0 |
| 88-216 | 3 | 43.5 |
| 216-960 | 3 | 46.0 |
| Above 960 | 3 | 54.0 |

- Note:**
- (1) $RF\ Voltage(dBuV) = 20 \log RF\ Voltage(uV)$
 - (2) In the Above Table, the tighter limit applies at the band edges.
 - (3) Distance refers to the distance in meters between the measuring instrument antenna.
 - (4) The emission limit in this paragraph is based on measurement instrumentation employing an average detector. Measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
 - (5) Above 1GHz, make a Peak and average measurements for all emissions, Limit for peak is 74dBuV/m, According to Part 15.35(b) and average is 54BuV/m.

6.10 Radiated Emissions Test Result

Formula of conversion factors:the field strength at 3m was established by adding
The meter reading of the spectrum analyzer (which is set to read in units of dBuV/m)
To the antenna correction factor supplied by the antenna manufacturer. The antenna
Correction factors are stated in terms of dB.The gain of the pressletor was accounted
For in the spectrum analyser meter reading.

Example:

Freq(MHz) Meter Reading +ACF=FS

33 20dBuV+10.36dB=30.36dBuV/m @3m

6.11 Radiated Emission Data

A. Test Item: Radiated Emission Data
Test Mode: TX On
Temperature: 24 °C
Humidity: 52%RH
Test Result: PASS

Remarks: 30-1000MHz radiation test no significant emissions above the equipment noise floor were detected.

And the below is the Fundamental and Harmonic .

| Frequency (MHz) | Detect or | Antenna Polarization | Emission Level (dBuV/m) | FCC Part15 Subpart C Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Turntable Angle (°) |
|-----------------|-----------|----------------------|-------------------------|-------------------------------------|-------------|--------------------|---------------------|
| Low frequency | | | | | | | |
| 2402.00 | AV | Vertical | 96.52 | | (Fund.) | 1.2 | 150 |
| 4804.00 | AV | Vertical | 41.02 | 54.00 | 13.98 | 1.2 | 0 |
| 7206.00 | AV | Vertical | 35.23 | 54.00 | 19.73 | 1.5 | 120 |
| 9608.00 | AV | Vertical | 32.52 | 54.00 | 21.48 | 1.8 | 60 |
| 12010.00 | AV | Vertical | 31.25 | 54.00 | 22.75 | 1.6 | 90 |
| 14412.00 | AV | Vertical | 31.01 | 54.00 | 22.99 | 1.4 | 120 |
| 16814.00 | AV | Vertical | 30.02 | 54.00 | 23.98 | 1.7 | 100 |
| 19216.00 | AV | Vertical | 30.67 | 54.00 | 23.33 | 1.5 | 180 |
| 21618.00 | AV | Vertical | 29.63 | 54.00 | 24.34 | 1.6 | 120 |
| 24020.00 | AV | Vertical | 29.01 | 54.00 | 24.99 | 1.2 | 135 |
| 2402.00 | AV | Horizontal | 92.23 | | (Fund.) | 1.2 | 120 |
| 4804.00 | AV | Horizontal | 41.12 | 54.00 | 12.88 | 1.2 | 150 |
| 7206.00 | AV | Horizontal | 36.21 | 54.00 | 17.79 | 1.5 | 120 |
| 9608.00 | AV | Horizontal | 34.25 | 54.00 | 19.75 | 1.2 | 180 |

| | | | | | | | |
|------------------|----|------------|--------|-------|---------|-----|-----|
| 12010.00 | AV | Horizontal | 33.21 | 54.00 | 20.79 | 1.5 | 135 |
| 14412.00 | AV | Horizontal | 31.25 | 54.00 | 22.75 | 1.2 | 120 |
| 16814.00 | AV | Horizontal | 30.74 | 54.00 | 23.26 | 1.5 | 180 |
| 19216.00 | AV | Horizontal | 32.01 | 54.00 | 21.99 | 1.8 | 60 |
| 21618.00 | AV | Horizontal | 31.53 | 54.00 | 22.47 | 1.2 | 90 |
| 24020.00 | AV | Horizontal | 30.01 | 54.00 | 23.99 | 1.5 | 90 |
| 2402.00 | PK | Vertical | 106.41 | | (Fund.) | 1.5 | 180 |
| 4804.00 | PK | Vertical | 45.21 | 74.00 | 29.64 | 1.8 | 30 |
| 7206.00 | PK | Vertical | 40.01 | 74.00 | 33.99 | 1.6 | 110 |
| 9608.00 | PK | Vertical | 37.42 | 74.00 | 36.58 | 1.4 | 100 |
| 12010.00 | PK | Vertical | 36.21 | 74.00 | 37.79 | 1.2 | 90 |
| 14412.00 | PK | Vertical | 32.01 | 74.00 | 41.99 | 1.2 | 60 |
| 16814.00 | PK | Vertical | 33.21 | 74.00 | 40.79 | 1.4 | 90 |
| 19216.00 | PK | Vertical | 30.10 | 74.00 | 43.90 | 1.2 | 120 |
| 21618.00 | PK | Vertical | 29.01 | 74.00 | 44.99 | 1.7 | 120 |
| 24020.00 | PK | Vertical | 29.01 | 74.00 | 44.99 | 1.4 | 135 |
| 2402.00 | PK | Horizontal | 102.32 | | (Fund.) | 1.8 | 180 |
| 4804.00 | PK | Horizontal | 41.24 | 74.00 | 32.76 | 1.8 | 60 |
| 7206.00 | PK | Horizontal | 38.25 | 74.00 | 35.75 | 1.8 | 120 |
| 9608.00 | PK | Horizontal | 36.98 | 74.00 | 37.02 | 1.2 | 180 |
| 12010.00 | PK | Horizontal | 35.69 | 74.00 | 38.31 | 1.2 | 90 |
| 14412.00 | PK | Horizontal | 35.62 | 74.00 | 38.38 | 1.5 | 90 |
| 16814.00 | PK | Horizontal | 33.35 | 74.00 | 40.65 | 1.8 | 150 |
| 19216.00 | PK | Horizontal | 33.01 | 74.00 | 40.99 | 1.5 | 150 |
| 21618.00 | PK | Horizontal | 30.21 | 74.00 | 43.79 | 1.2 | 120 |
| 24020.00 | PK | Horizontal | 30.01 | 74.00 | 43.99 | 1.2 | 180 |
| Middle frequency | | | | | | | |
| 2441.00 | AV | Vertical | 92.21 | | (Fund.) | 1.5 | 0 |
| 4882.00 | AV | Vertical | 39.02 | 54.00 | 14.98 | 1.2 | 90 |
| 7323.00 | AV | Vertical | 35.21 | 54.00 | 18.71 | 1.0 | 90 |
| 9764.00 | AV | Vertical | 33.33 | 54.00 | 20.67 | 1.2 | 0 |
| 12205.00 | AV | Vertical | 32.02 | 54.00 | 21.98 | 1.2 | 0 |
| 14646.00 | AV | Vertical | 32.01 | 54.00 | 21.99 | 1.2 | 150 |
| 17087.00 | AV | Vertical | 30.26 | 54.00 | 23.74 | 1.5 | 0 |
| 19528.00 | AV | Vertical | 30.01 | 54.00 | 23.99 | 1.5 | 0 |
| 21969.00 | AV | Vertical | 29.02 | 54.00 | 24.98 | 1.8 | 180 |
| 24410.00 | AV | Vertical | 28.23 | 54.00 | 25.77 | 1.2 | 90 |
| 2441.00 | AV | Horizontal | 92.96 | | (Fund.) | 1.0 | 120 |
| 4882.00 | AV | Horizontal | 35.69 | 54.00 | 18.31 | 1.0 | 90 |
| 7323.00 | AV | Horizontal | 34.25 | 54.00 | 19.75 | 1.5 | 270 |
| 9764.00 | AV | Horizontal | 33.52 | 54.00 | 20.48 | 1.2 | 120 |
| 12205.00 | AV | Horizontal | 31.21 | 54.00 | 22.79 | 1.2 | 150 |
| 14646.00 | AV | Horizontal | 30.25 | 54.00 | 23.75 | 1.4 | 180 |

| | | | | | | | |
|----------------|----|------------|--------|-------|---------|-----|-----|
| 17087.00 | AV | Horizontal | 29.25 | 54.00 | 24.75 | 1.6 | 135 |
| 19528.00 | AV | Horizontal | 28.36 | 54.00 | 25.64 | 1.4 | 90 |
| 21969.00 | AV | Horizontal | 28.02 | 54.00 | 25.98 | 1.2 | 150 |
| 24410.00 | AV | Horizontal | 28.02 | 54.00 | 25.98 | 1.7 | 120 |
| 2441.00 | PK | Vertical | 107.52 | | (Fund.) | 1.0 | 0 |
| 4882.00 | PK | Vertical | 44.21 | 74.00 | 29.79 | 1.1 | 90 |
| 7323.00 | PK | Vertical | 38.25 | 74.00 | 35.75 | 1.4 | 100 |
| 9764.00 | PK | Vertical | 37.94 | 74.00 | 36.06 | 1.3 | 120 |
| 12205.00 | PK | Vertical | 37.87 | 74.00 | 36.13 | 1.7 | 180 |
| 14646.00 | PK | Vertical | 36.10 | 74.00 | 38.90 | 1.2 | 0 |
| 17087.00 | PK | Vertical | 32.03 | 74.00 | 41.97 | 1.4 | 0 |
| 19528.00 | PK | Vertical | 30.21 | 74.00 | 43.79 | 1.5 | 120 |
| 21969.00 | PK | Vertical | 28.30 | 74.00 | 45.70 | 1.5 | 135 |
| 24410.00 | PK | Vertical | 28.30 | 74.00 | 45.70 | 1.2 | 120 |
| 2441.00 | PK | Horizontal | 103.45 | | (Fund.) | 1.0 | 0 |
| 4882.00 | PK | Horizontal | 43.56 | 74.00 | 30.44 | 1.7 | 45 |
| 7323.00 | PK | Horizontal | 41.51 | 74.00 | 32.49 | 1.6 | 90 |
| 9764.00 | PK | Horizontal | 40.14 | 74.00 | 33.86 | 1.5 | 60 |
| 12205.00 | PK | Horizontal | 39.36 | 74.00 | 34.64 | 1.4 | 150 |
| 14646.00 | PK | Horizontal | 37.44 | 74.00 | 36.56 | 1.2 | 150 |
| 17087.00 | PK | Horizontal | 34.21 | 74.00 | 39.79 | 1.1 | 120 |
| 19528.00 | PK | Horizontal | 38.86 | 74.00 | 35.14 | 1.5 | 150 |
| 21969.00 | PK | Horizontal | 34.21 | 74.00 | 39.79 | 1.1 | 0 |
| 24410.00 | PK | Horizontal | 33.33 | 74.00 | 40.67 | 1.6 | 135 |
| High frequency | | | | | | | |
| 2480.00 | AV | Vertical | 93.42 | | (Fund.) | 1.0 | 0 |
| 4960.00 | AV | Vertical | 36.25 | 54.00 | 17.75 | 1.2 | 45 |
| 7440.00 | AV | Vertical | 32.25 | 54.00 | 21.75 | 1.2 | 120 |
| 9920.00 | AV | Vertical | 30.26 | 54.00 | 23.74 | 1.4 | 60 |
| 12400.00 | AV | Vertical | 30.55 | 54.00 | 23.45 | 1.5 | 135 |
| 14880.00 | AV | Vertical | 30.34 | 54.00 | 23.66 | 1.8 | 120 |
| 17360.00 | AV | Vertical | 30.62 | 54.00 | 23.38 | 1.1 | 100 |
| 19840.00 | AV | Vertical | 30.13 | 54.00 | 23.87 | 1.1 | 60 |
| 22320.00 | AV | Vertical | 30.27 | 54.00 | 23.73 | 1.4 | 0 |
| 24800.00 | AV | Vertical | 28.25 | 54.00 | 25.75 | 1.5 | 60 |
| 2480.00 | AV | Horizontal | 92.51 | | (Fund.) | 1.0 | 0 |
| 4960.00 | AV | Horizontal | 34.56 | 54.00 | 19.44 | 1.8 | 120 |
| 7440.00 | AV | Horizontal | 30.35 | 54.00 | 23.65 | 1.2 | 60 |
| 9920.00 | AV | Horizontal | 31.47 | 54.00 | 22.53 | 1.5 | 100 |
| 12400.00 | AV | Horizontal | 31.89 | 54.00 | 22.11 | 1.2 | 60 |
| 14880.00 | AV | Horizontal | 32.42 | 54.00 | 21.58 | 1.2 | 120 |
| 17360.00 | AV | Horizontal | 31.17 | 54.00 | 22.83 | 1.4 | 100 |
| 19840.00 | AV | Horizontal | 32.55 | 54.00 | 21.45 | 1.8 | 100 |
| 22320.00 | AV | Horizontal | 32.86 | 54.00 | 21.14 | 1.3 | 100 |

| | | | | | | | |
|----------|----|------------|--------|-------|---------|-----|-----|
| 24800.00 | AV | Horizontal | 30.25 | 54.00 | 22.75 | 1.6 | 10 |
| 2480.00 | PK | Vertical | 107.53 | | (Fund.) | 1.0 | 0 |
| 4960.00 | PK | Vertical | 44.21 | 74.00 | 29.79 | 1.2 | 60 |
| 7440.00 | PK | Vertical | 35.62 | 74.00 | 38.38 | 1.8 | 90 |
| 9920.00 | PK | Vertical | 35.35 | 74.00 | 38.65 | 1.5 | 180 |
| 12400.00 | PK | Vertical | 35.56 | 74.00 | 38.44 | 1.4 | 60 |
| 14880.00 | PK | Vertical | 34.21 | 74.00 | 39.79 | 1.2 | 60 |
| 17360.00 | PK | Vertical | 33.54 | 74.00 | 40.46 | 1.2 | 135 |
| 19840.00 | PK | Vertical | 36.26 | 74.00 | 37.74 | 1.2 | 120 |
| 22320.00 | PK | Vertical | 36.73 | 74.00 | 37.27 | 1.6 | 60 |
| 24800.00 | PK | Vertical | 30.21 | 74.00 | 43.99 | 1.4 | 90 |
| 2480.00 | PK | Horizontal | 93.64 | | (Fund.) | 1.1 | 60 |
| 4960.00 | PK | Horizontal | 42.58 | 74.00 | 31.42 | 1.4 | 90 |
| 7440.00 | PK | Horizontal | 38.64 | 74.00 | 35.36 | 1.5 | 60 |
| 9920.00 | PK | Horizontal | 35.37 | 74.00 | 38.63 | 1.3 | 0 |
| 12400.00 | PK | Horizontal | 35.52 | 74.00 | 38.48 | 1.2 | 135 |
| 14880.00 | PK | Horizontal | 35.26 | 74.00 | 38.74 | 1.7 | 0 |
| 17360.00 | PK | Horizontal | 36.41 | 74.00 | 37.59 | 1.8 | 180 |
| 19840.00 | PK | Horizontal | 32.41 | 74.00 | 41.59 | 1.5 | 60 |
| 22320.00 | PK | Horizontal | 31.11 | 74.00 | 42.89 | 1.8 | 120 |
| 24800.00 | PK | Horizontal | 28.21 | 74.00 | 45.79 | 1.0 | 60 |

7 Maximum Peak Output Power

| | |
|-------------------|--|
| Test Requirement: | FCC Part15 Paragraph 15.247 |
| Test Method: | Based on ANSI 63.4:2009 |
| Test Date: | July 13, 2010 |
| Test mode: | Compliance test in the worse case: Tx Lower/Tx Middle/Tx Upper |
| Requirements: | Regulation 15.247(b) The limit of Maximum Peak Output Power Measurement is 1W(30dBm) |

Test procedure:

The following test procedure as below:

The transmitter output (antenna port) was connected to the spectrum analyzer.EUT and its simulators are placed on a table, let EUT working in test mode,then test it.

The bandwidth of the fundamental frequency was measured with the spectrum analyser using 100kHz RBW and 100kHz VBW.

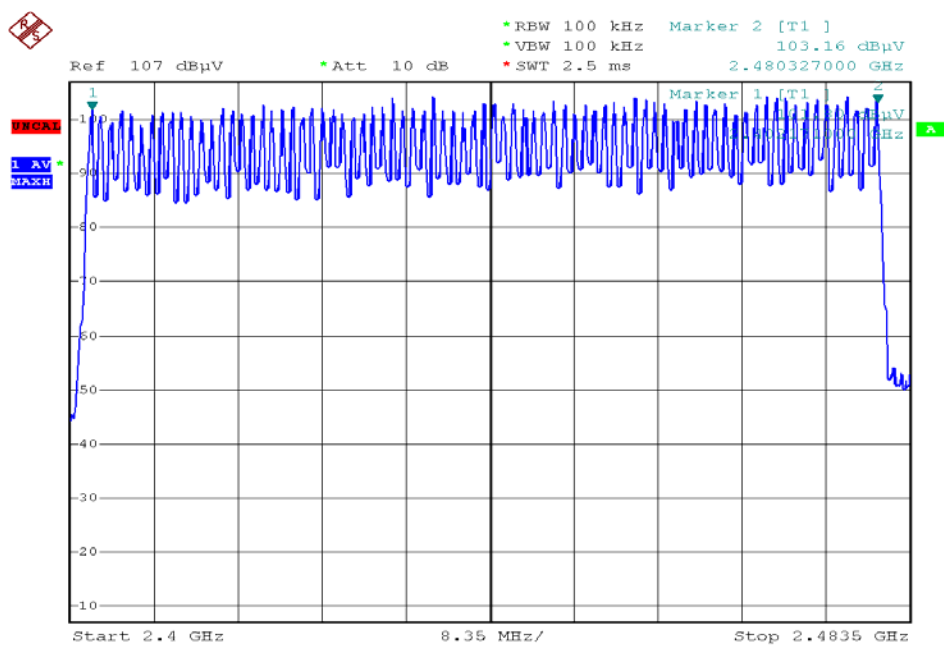
Test Result: The unit does meet the FCC requirements.

| Test Channel | Fundamental Frequency(MHz) | Output Power (mW) | Limit (W) | Power output level |
|--------------|----------------------------|-------------------|-----------|--------------------|
| Lower | 2402 | 1.32 | 1 | conducted |
| Middle | 2441 | 1.32 | 1 | conducted |
| Upper | 2480 | 1.30 | 1 | conducted |

8 Hopping Channel Number

| | |
|-------------------|---|
| Test Requirement: | FCC Part15 C |
| Test Method: | Based on FCC Part15 Paragraph 15.247 |
| Test Date: | July 13, 2010 |
| Test mode: | The EUT work in test mode(Tx) and test it |
| Requirements: | Regulation 15.247(b) For frequency hopping systems operating In the 2400-2483.5MHz band employing at least 15 hopping channels. |
| Test result: | The total number of channels would be 79 channels. The unit does meet the FCC requirements. |

Please refer the graph as below:



9 Frequency Separated

Requirement:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB 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 125 mW.

Test Status: Test in hopping transmitting operating mode.

Test Procedure:

1: Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.

Equipment mode: Spectrum analyzer

| | |
|-------------------|-------------------|
| Equipment Mode | Spectrum Analyzer |
| Detector Function | Peak Mode |
| RBW | 100KHz |
| VBW | 300KHz |

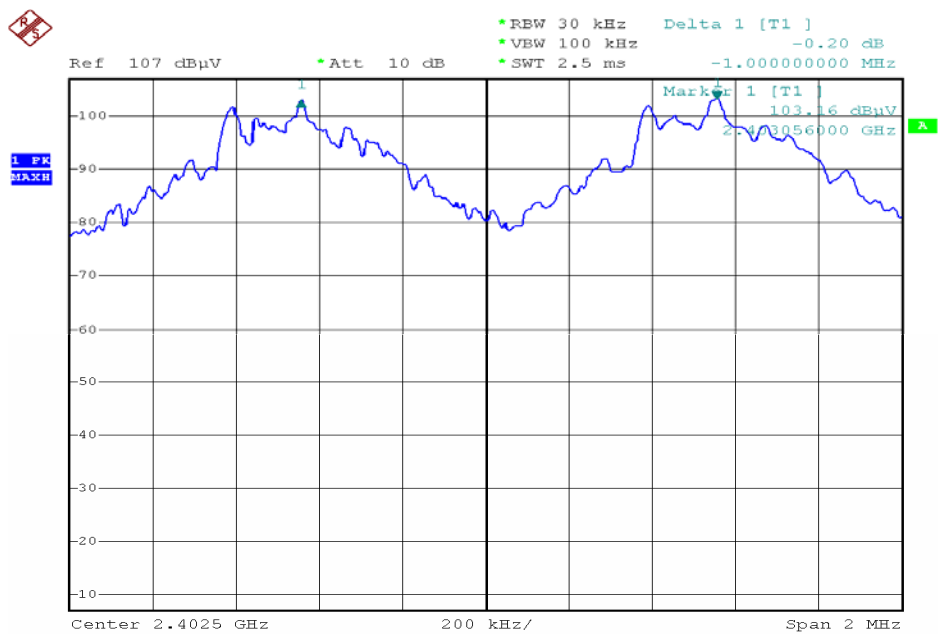
2. By using the Max-Hold function record the separation of two adjacent channels.
3. Measure the frequency difference of these two adjacent channels by spectrum analyzer Marker function.
4. Repeat above procedures until all frequencies measured were complete.

Test Result: PASS

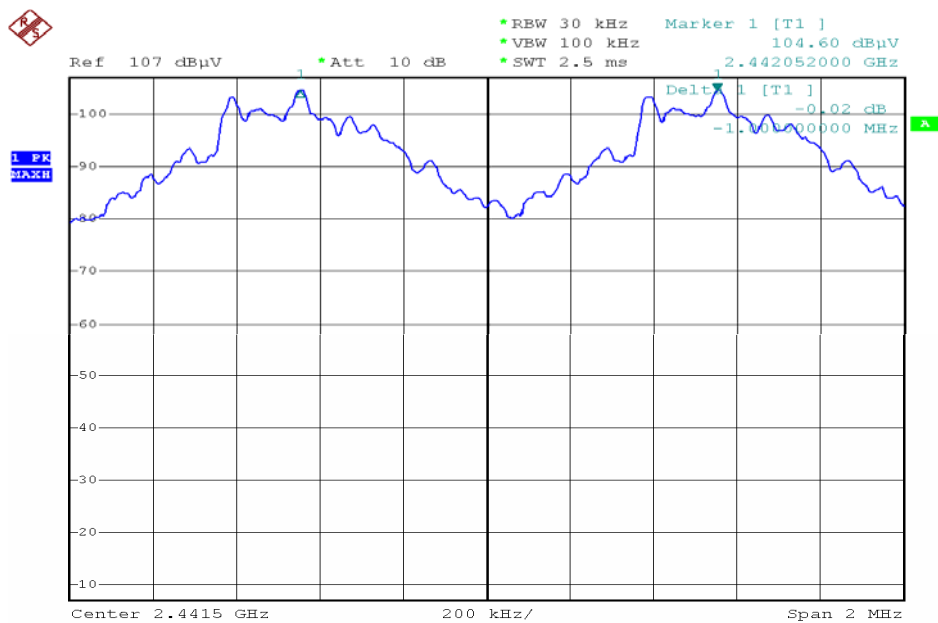
| Test Channel | Frequencies Separated | PASS/FAIL |
|---|-----------------------|-----------|
| Lower Channels | 1.000MHz | Pass |
| Middle Channels | 1.000MHz | Pass |
| Upper Channels | 1.000MHz | Pass |
| Remark: Preset in Bluetooth normal mode and the limit in normal mode is maximum 20dB channel bandwidth 1.12MHz. So report the normal mode data. | | |

Result plot as follows:

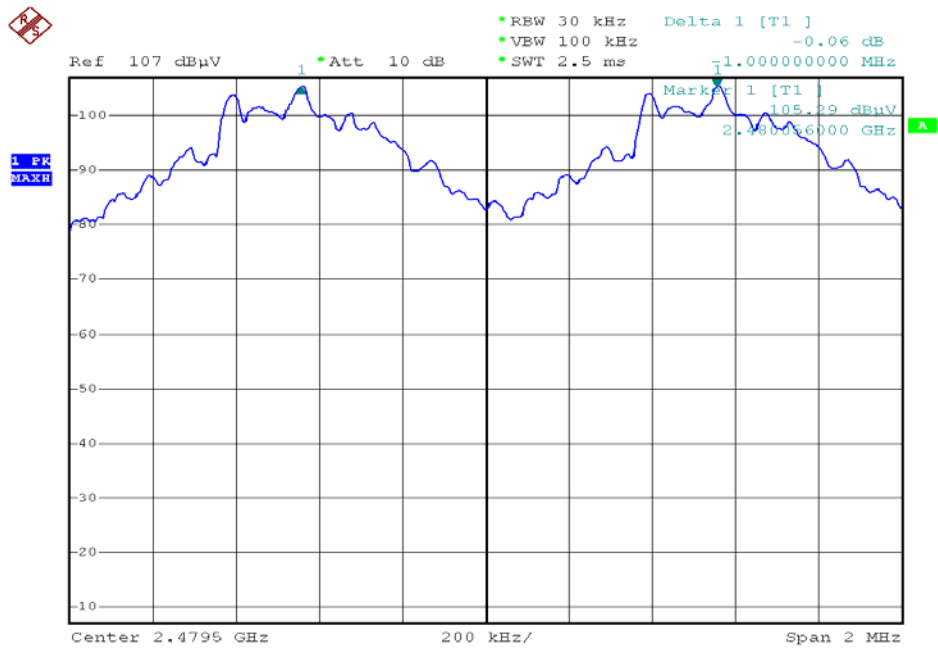
Lower Channel 2402MHz



Middle Channel 2441MHz



Upper Channel 2480MHz



10 Dwell time

Test Requirements: 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 Status: Test in hopping transmitting operating mode.

Test Procedure:

1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable.

| | |
|-------------------|-------------------|
| Equipment Mode | Spectrum Analyzer |
| Detector Function | Peak Mode |
| RBW | 1MHz |
| VBW | 1MHz |
| SPAN | ZERO |

2. Adjust the center frequency of spectrum analyzer on any frequency to be measured.
3. Measure the Dwell Time by spectrum analyzer Marker function.
4. Repeat above procedures until all frequencies measured are complete.
5. Set the EUT for DH5, DH3 and DH1 packet transmitting.
6. Measure the maximum time duration of one single pulse.
 - i. DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds.
7. DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds.
- 8k. DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds.

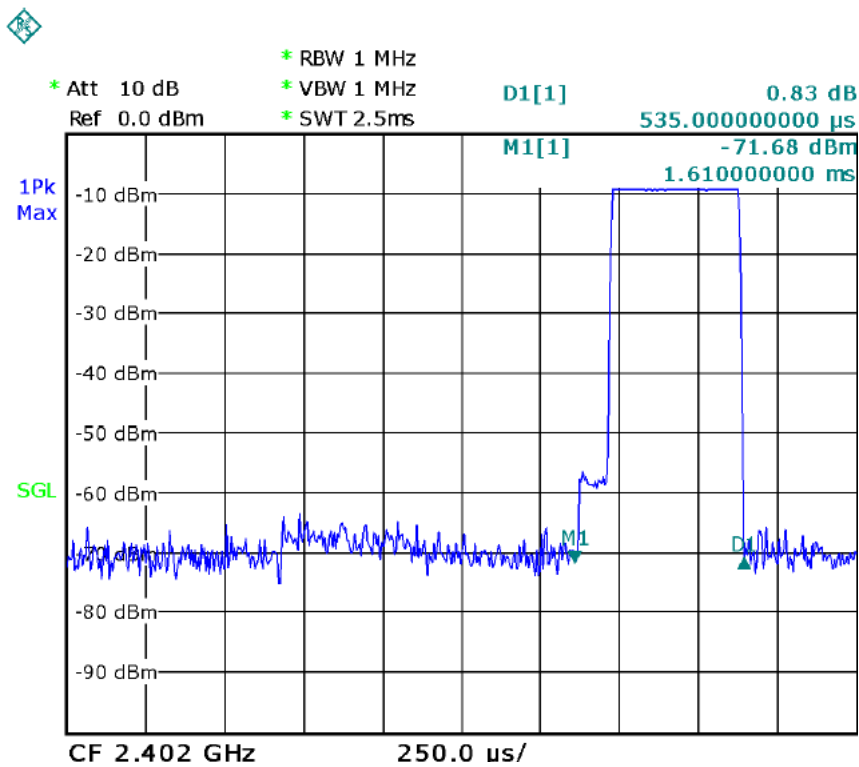
Test Result: Pass

Lower Channel (2402MHz)

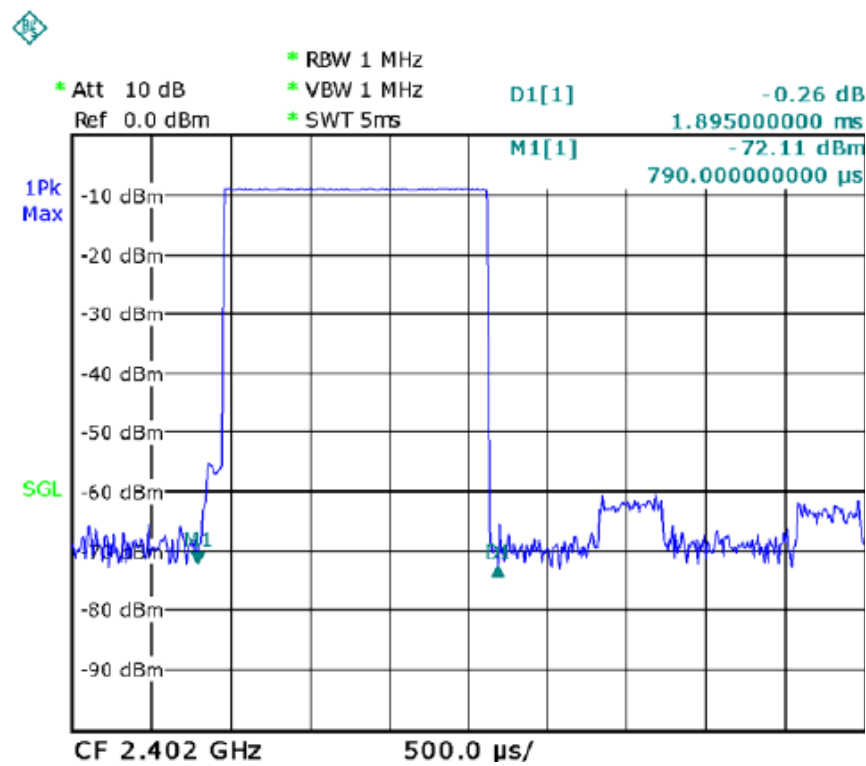
| Data Packet | Frequency | Pulse Duration(ms) | Dwell Time(s) | Limits(s) |
|-------------|-----------|--------------------|---------------|-----------|
| DH5 | 2402 MHz | 3.1150 | 0.3323 | 0.4000 |
| DH3 | 2402 MHz | 1.8950 | 0.3032 | 0.4000 |
| DH1 | 2402 MHz | 0.5350 | 0.1712 | 0.4000 |

Please refer to the below photos for more details.

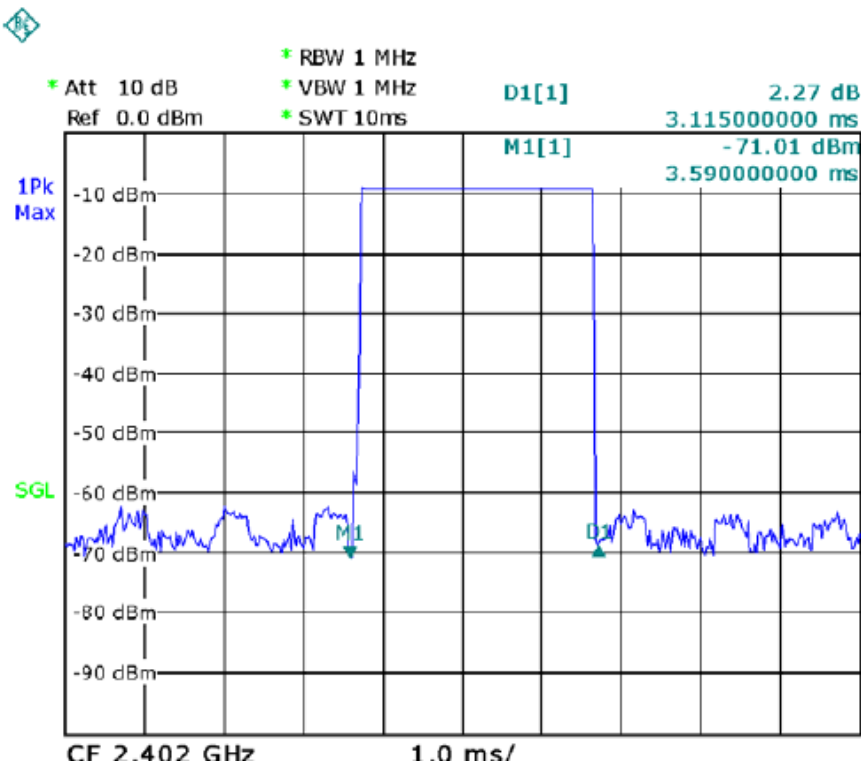
DH01:



DH03:



DH05:

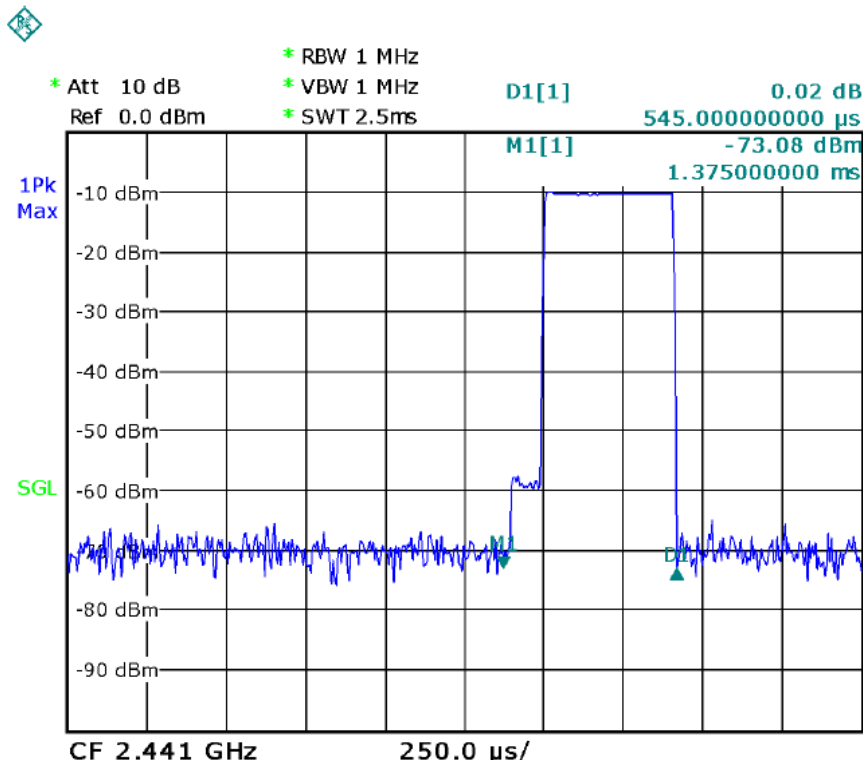


Middle Channel (2441MHz)

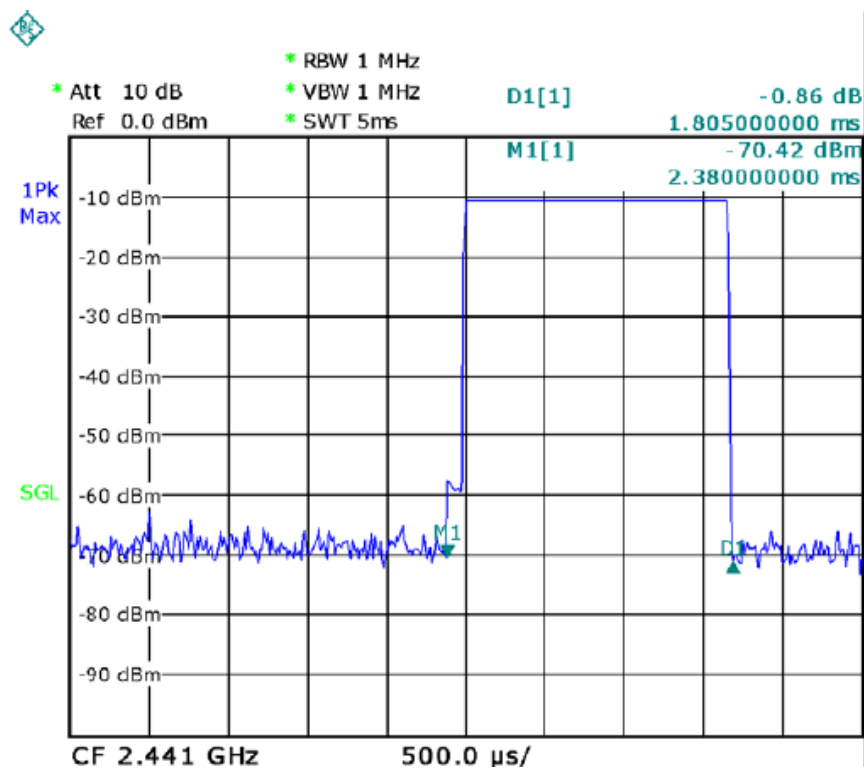
| Data Packet | Frequency | Pulse Duration(ms) | Dwell Time(s) | Limits(s) |
|-------------|-----------|--------------------|---------------|-----------|
| DH5 | 2441 MHz | 3.1750 | 0.3387 | 0.4000 |
| DH3 | 2441 MHz | 1.8050 | 0.2888 | 0.4000 |
| DH1 | 2441 MHz | 0.5450 | 0.1744 | 0.4000 |

Please refer to the below photos for more details.

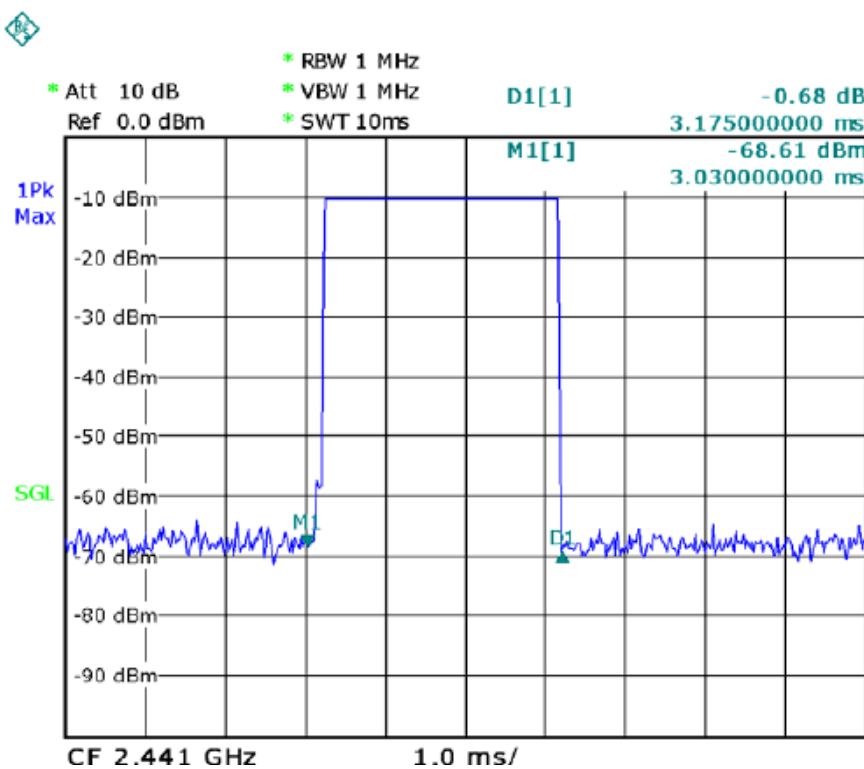
DH01:



DH03:



DH05:

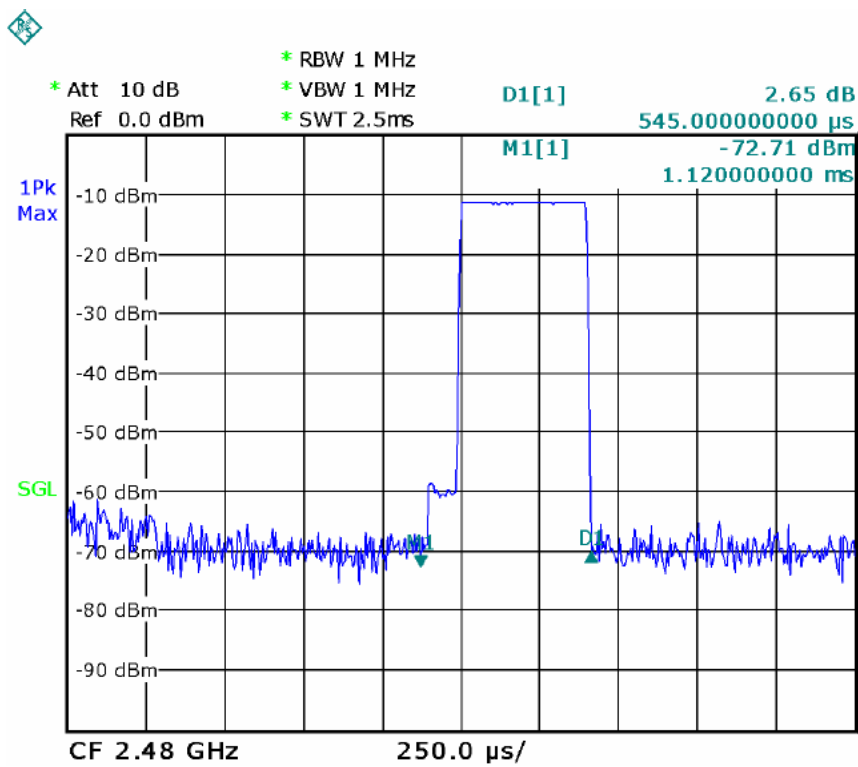


Upper Channel (2480MHz)

| Data Packet | Frequency | Pulse Duration(ms) | Dwell Time(s) | Limits(s) |
|-------------|-----------|--------------------|---------------|-----------|
| DH5 | 2480 MHz | 3.2150 | 0.3429 | 0.4000 |
| DH3 | 2480 MHz | 1.8350 | 0.2936 | 0.4000 |
| DH1 | 2480 MHz | 0.5450 | 0.1744 | 0.4000 |

Please refer to the below photos for more details.

DH01:



* Att 10 dB
 Ref 0.0 dBm
 * RBW 1 MHz
 * VBW 1 MHz
 * SWT 5ms

D1[1] 0.66 dB
 1.835000000 ms
 M1[1] -71.28 dBm
 2.290000000 ms

1Pk Max
 SGL
 CF 2.48 GHz
 500.0 μ s/

* RBW 1 MHz
 * VBW 1 MHz
 * SWT 10ms

Att 10 dB
 Ref 0.0 dBm

D1[1] -0.21 dB
 3.215000000 ms

M1[1] -69.81 dBm
 1.970000000 ms

1Pk Max
 SGL

CF 2.48 GHz 1.0 ms/

11 20-dB Bandwidth

Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 Paragraph 15.247
Test Date: July 14, 2010
Test mode: The EUT work in test mode(Tx) and test it

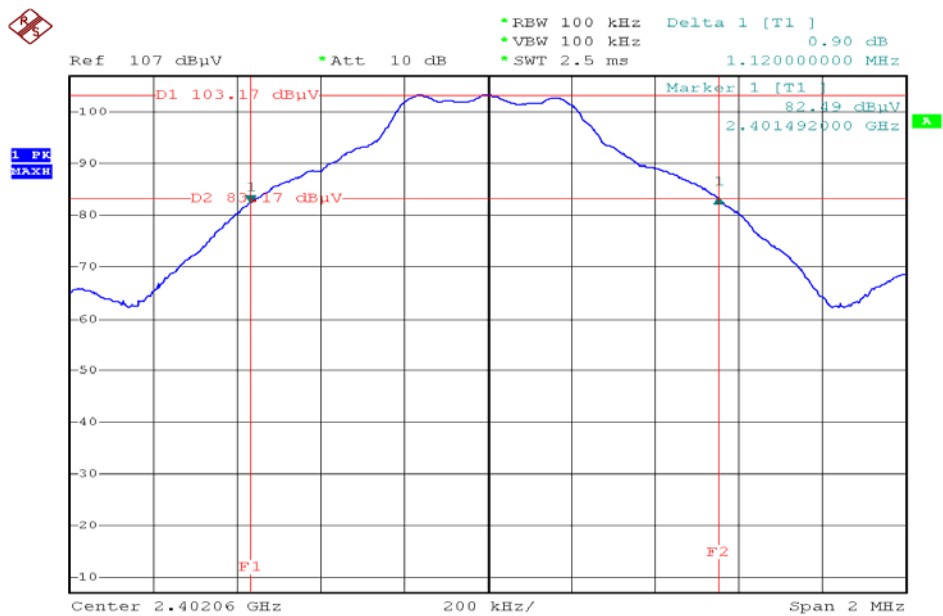
Test Procedure

- 1. The transmitter output (antenna port) was connected to the spectrum analyzer.
- 2. The bandwidth of the fundamental frequency was measure by spectrum analyser with 100KHz RBW and 100KHz VBW.The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power 20dB.

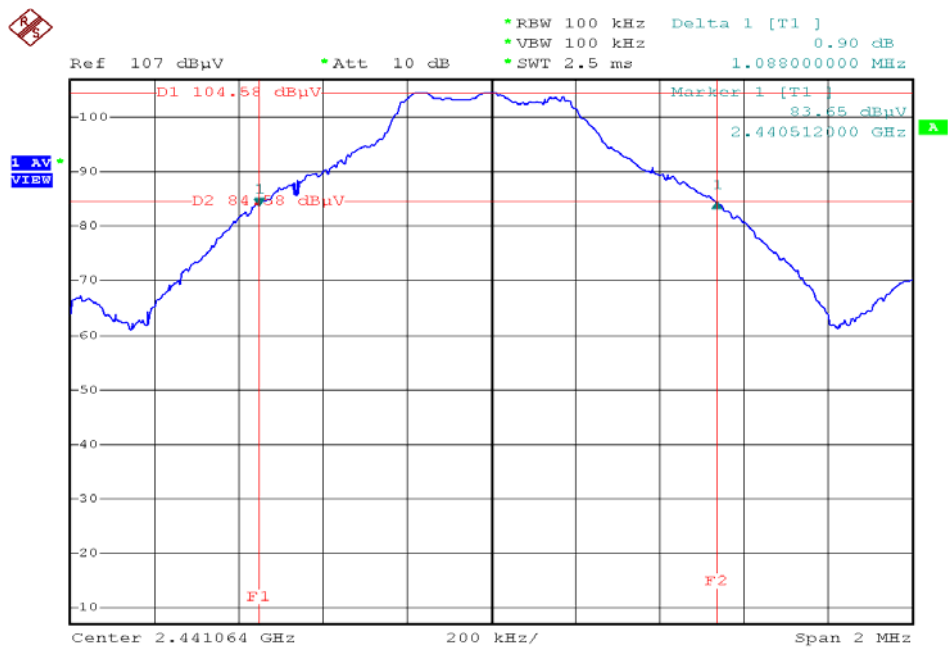
Test Result

Please refer the graph as below:

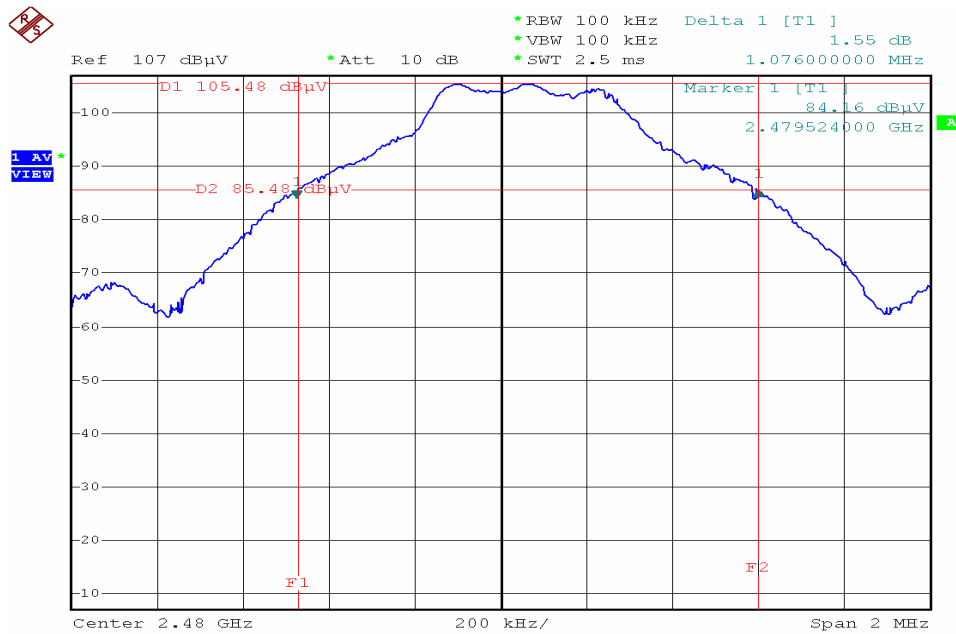
Lower Channel 2402MHz



Middle Channel 2441MHz



Upper Channel 2480MHz



12 Band Edge

Test Requirement: FCC 15.247(d)

Test Method: ANSI C63.4 & DA 00-705

Test Status: Test lowest channel, highest channel.

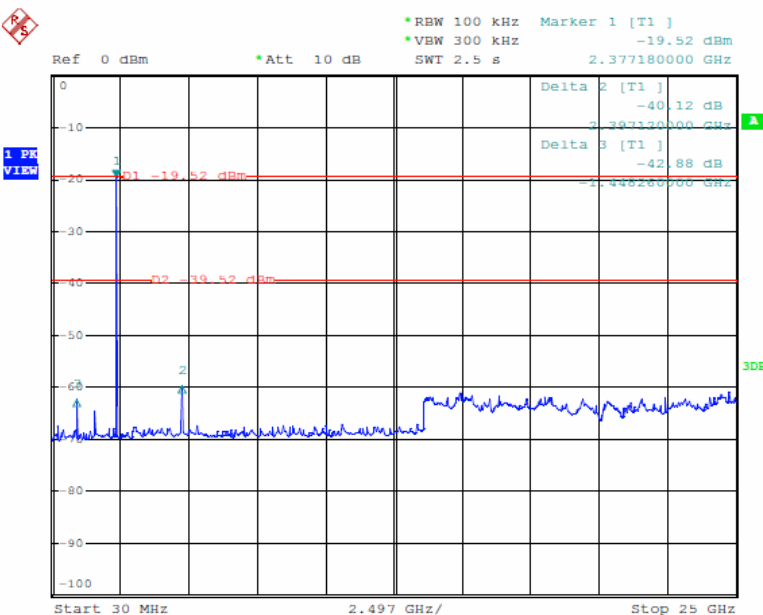
Test set: The transmitter output is connected to spectrum analyzer. The resolution bandwidth is set to 100KHz. The video bandwidth is set to 300KHz.

Limit: 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

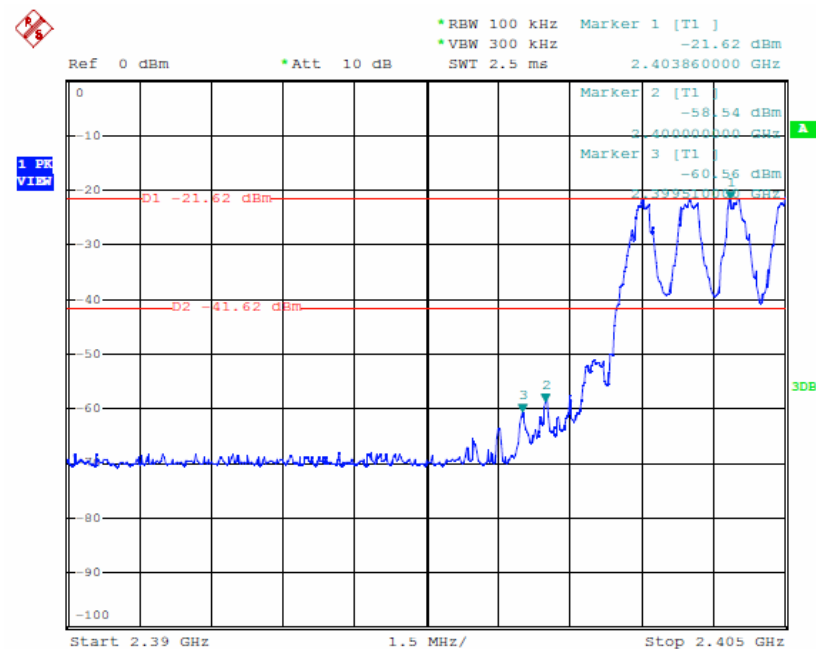
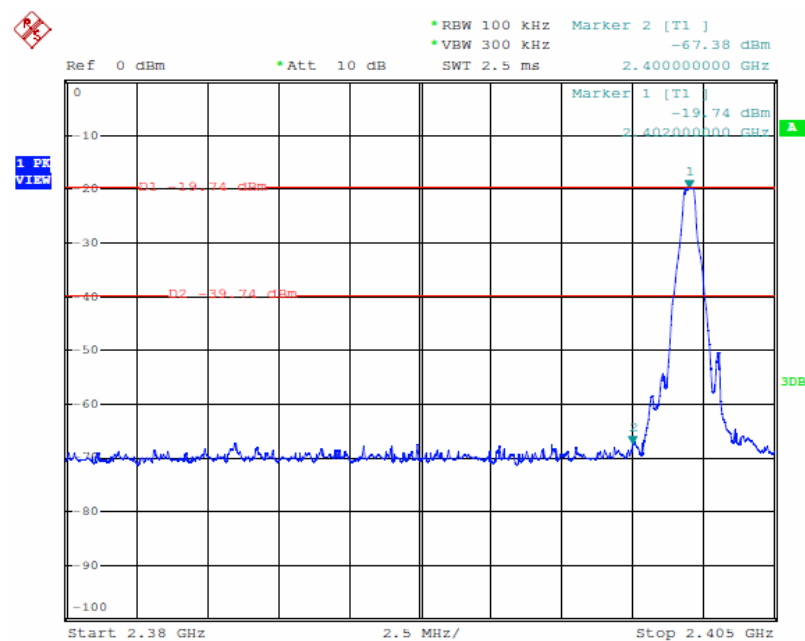
Out-OFF-band spurious emissions-conducted measurement:

1. The lower channel (2402MHz)

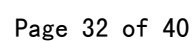
Conducted spurious (30MHz~25GHz)

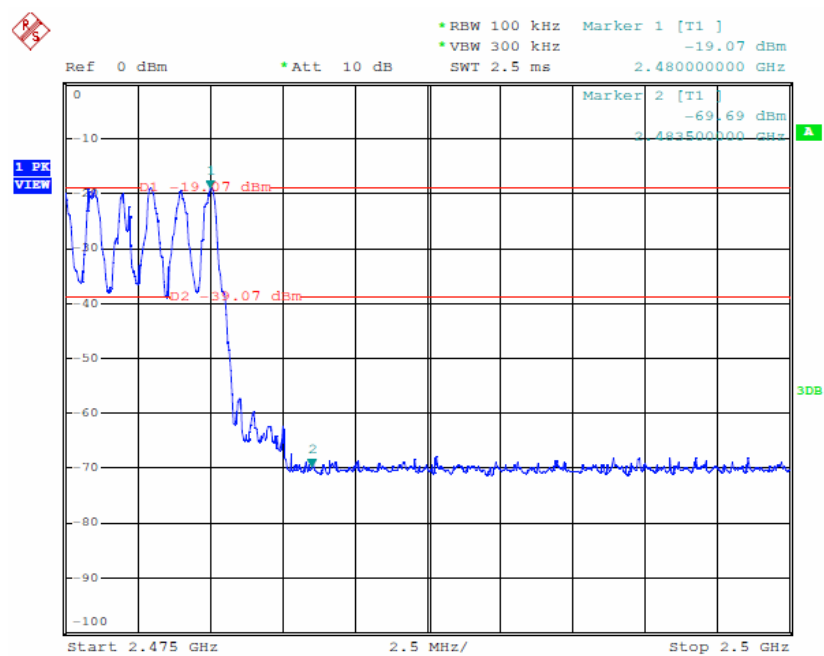


Conducted spurious (Lower Frequency band edge)



Conducted spurious (30MHz~25GHz)





13 Antenna Requirement

Requirement:

For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

EUT Antenna

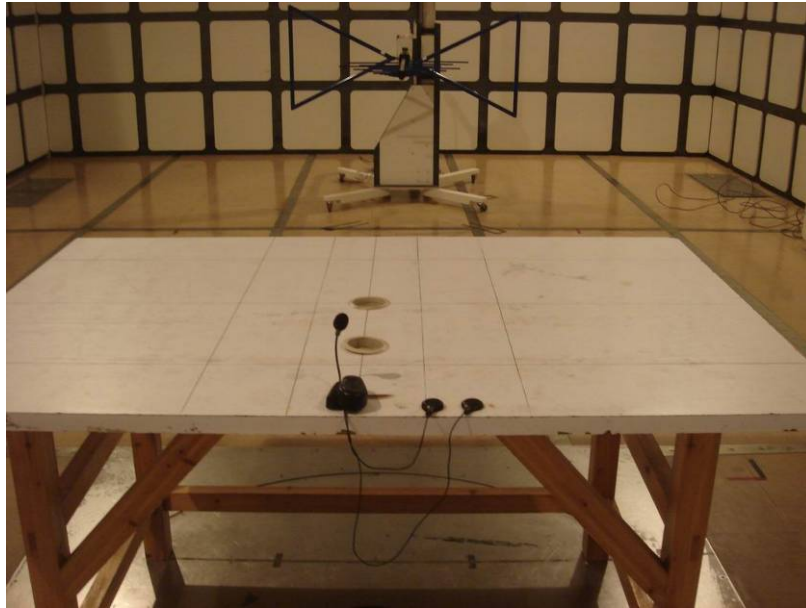
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

Test result: The EUT does meet the FCC requirements.

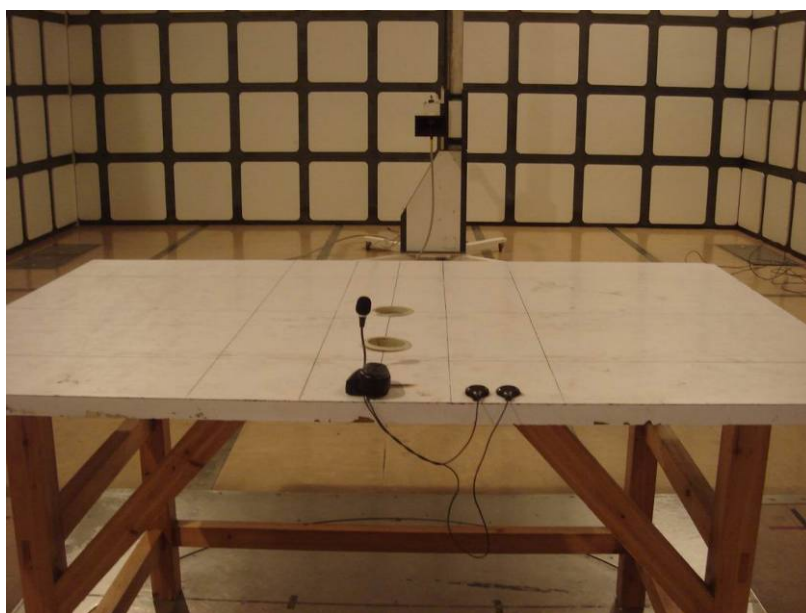
14 Photographs of Test Setup

Radiation Emission Test View

Bleow 1G:



Above 1G:



15 Photographs of EUT

15.1 EUT - Appearance View



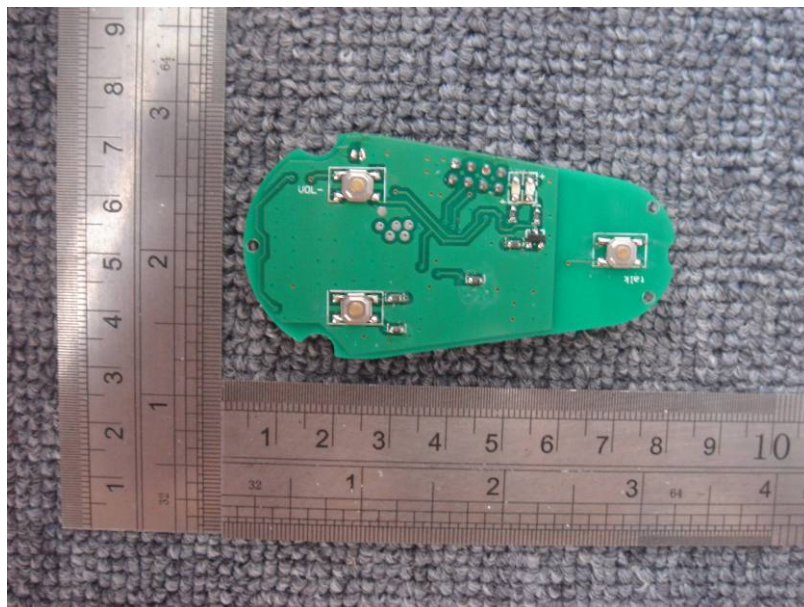
15.2 EUT - Appearance View



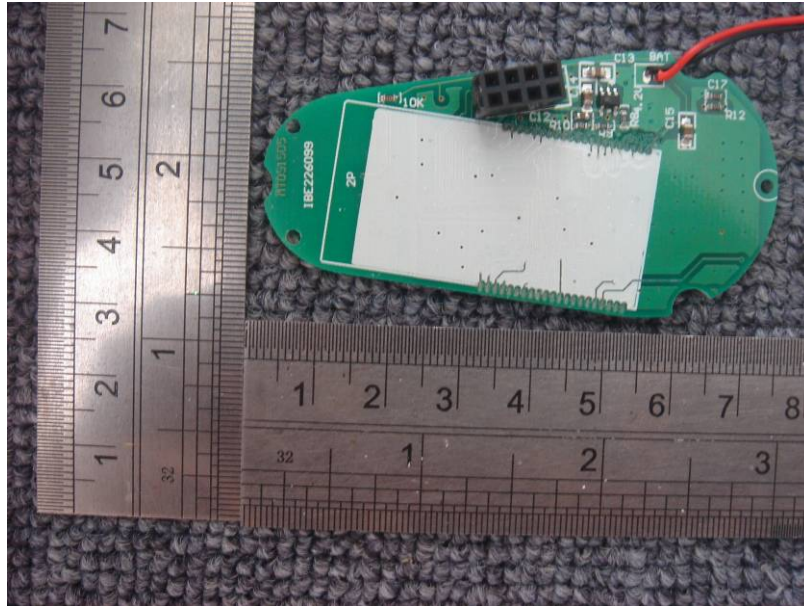
15.3 EUT – Internal View



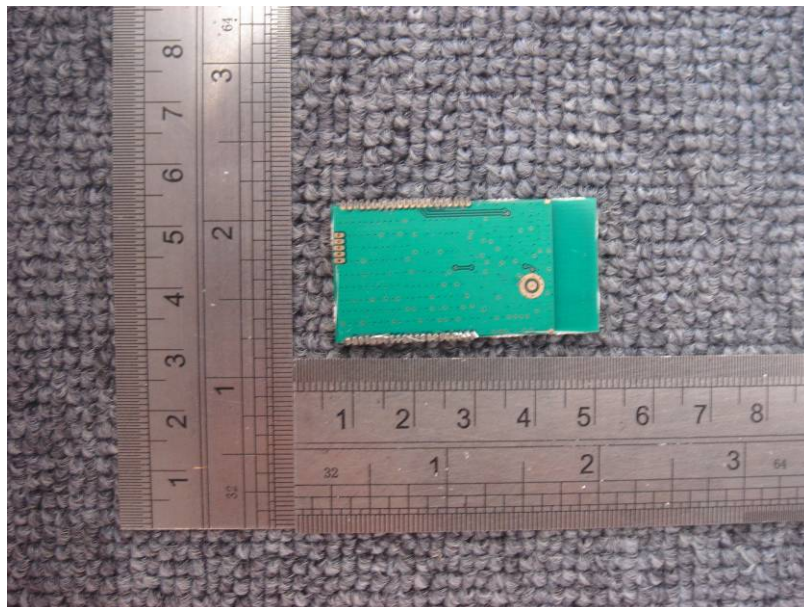
15.4 PCB1 - Front View



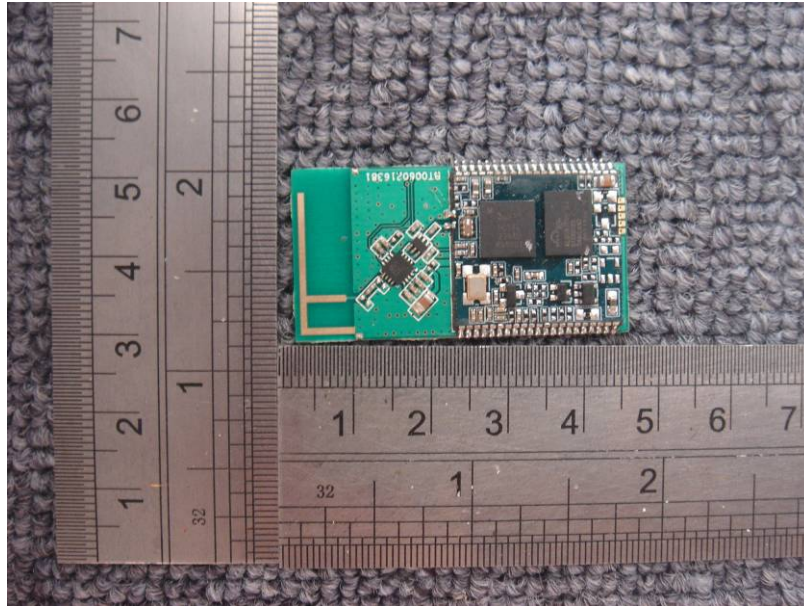
15.5 PCB1 - Rear View



15.6 PCB2 - Front View



15.7 PCB2 - Rear View



16 FCC ID Label

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

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.

Proposed Label Location on EUT
EUT Bottom View/proposed FCC Mark Location

