# RF TEST REPORT

**Report No.:** SET2016-05794

**Product Name:** LTE/WCDMA/GSM（GPRS）Mutil-Mode Digital Mobile Phone

**FCC ID:** SRQ-ZTEBLADEA510

**Model No. :** ZTE Blade A510/Blade A510

**Applicant:** ZTE Corporation

**Address:** ZTE Plaza, Keji Road South, Shenzhen, China

**Dates of Testing:** 04/06/2016 — 12/28/2016

**Issued by:** CCIC-SET

**Lab Location:** Building 28/29, East of Shigu, Xili Industrial Zone, Xili Road, Nanshan District, Shenzhen, Guangdong, China

**Tel:** 86 755 26627338 **Fax:** 86 755 26627238

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# Test Report

| | |
|---|---|
| **Product Name ..... :** | LTE/WCDMA/GSM（GPRS）Mutil-Mode Digital Mobile Phone |
| **Brand Name ..... :** | ZTE |
| **Trade Name ..... :** | ZTE |
| **Applicant ..... :** | ZTE Corporation |
| **Applicant Address ..... :** | ZTE Plaza, Keji Road South, Shenzhen, China |
| **Manufacturer ..... :** | ZTE Corporation |
| **Manufacturer Address ..... :** | ZTE Plaza, Keji Road South, Shenzhen, China |
| **Test Standards ..... :** | 47 CFR Part 15 Subpart C：Radio Frequency Devices<br>ANSI C63.10-2013：American National Standard for Testing Unlicensed Wireless Devices<br>KDB 558074D01 v03r05 |
| **Test Result ..... :** | PASS |
| **Tested by ..... :** | Fly Fan 2016.12.28<br>Fly Fan, Test Engineer |
| **Reviewed by ..... :** | Zhu Qi 2016.12.28<br>Zhu Qi, Senior Egineer |
| **Approved by ..... :** | Wu Lian 2016.12.28<br>Wu Li'an, Manager |

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| Change History | | |
|---|---|---|
| Issue | Date | Reason for change |
| 1.0 | 2016.12.28 | First edition |
| | | |
| | | |

# 1. General Information

## 1.1. EUT Description

| | | |
|---|---|---|
| EUT Type | LTE/WCDMA/GSM（GPRS）Mutil-Mode Digital Mobile Phone | |
| Hardware Version | u66A | |
| Software Version | PR_CLARO_P635A50V0.0.0B02 | |
| EUT supports Radios application | GSM/GPRS/EDGE/WCDMA/HSPA/ LTE<br>WLAN2.4GHz 802.11b/g/n (HT20)<br>Bluetooth V3.0+EDR / Bluetooth V4.0LE | |
| Frequency Range | Bluetooth LE 4.0 | 2402MHz~2480MHz |
| Channel Number | Bluetooth LE 4.0 | 40 |
| Bit Rate of Transmitter | Bluetooth LE 4.0 | 1Mbps |
| Modulation Type | Bluetooth LE 4.0 | GFSK |
| Antenna Type | Internal Antenna | |
| Antenna Gain | 1dBi | |

Note 1: The EUT is a Mobile Phone, it contain Bluetooth 4.0 LTE Module operating at 2.4GHz ISM band; the frequencies allocated for the Bluetooth 4.0 LTE is F(MHz)=2402+2*n (0<=n<=39). The lowest, middle, highest channel numbers of the Bluetooth Module used and tested in this report are separately 0 (2402MHz), 19(2440MHz) and 39 (2480MHz).

Note 2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Note 3: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

Note 4: The EUT is a Mobile Phone，it contains two models，they are ZTE Blade A510/Blade A510. They have the same size, appearance and internal structure, and the only difference is the model number.

Note 5: The EUT is operating at the engineer mode via the Software. The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

## 1.2. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C (Bluetooth, 2.4GHz ISM band radiators) for the EUT FCC Certification:

| No. | Identity | Document Title |
|---|---|---|
| 1 | 47 CFR Part 15 Subpart C 2016 | Radio Frequency Devices |
| 2 | ANSI C63.10-2013 | American National Standard for Testing Unlicensed Wireless Devices |

Test detailed items/section required by FCC rules and results are as below:

| No. | Section in CFR 47 | Description | Result |
|---|---|---|---|
| 1 | 15.203 | Antenna Requirement | PASS |
| 2 | 15.247(b) | Peak Output Power | PASS |
| 3 | 15.247(a) | Bandwidth | PASS |
| 4 | 15.247(d) | Conducted Band Edges and Spurious Emission | PASS |
| 5 | 15.247(e) | Power spectral density (PSD) | PASS |
| 6 | 15.207 | Conducted Emission | PASS |
| 7 | 15.209 15.247(d) | Radiated Band Edges and Spurious Emission | PASS |

The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10-2013.

These RF tests were performed according to the method of measurements prescribed in KDB 558074D01 v03r05.

**40 channels are provided for Bluetooth LE 4.0**

| Channel | Frequency(MHz) | Channel | Frequency(MHz) |
|---|---|---|---|
| 0 | 2402 | 20 | 2442 |
| 1 | 2404 | 21 | 2444 |
| 2 | 2406 | 22 | 2446 |
| 3 | 2408 | 23 | 2448 |
| 4 | 2410 | 24 | 2450 |
| 5 | 2412 | 25 | 2452 |
| 6 | 2414 | 26 | 2454 |
| 7 | 2416 | 27 | 2456 |
| 8 | 2418 | 28 | 2458 |
| 9 | 2420 | 29 | 2460 |
| 10 | 2422 | 30 | 2462 |
| 11 | 2424 | 31 | 2464 |

| | | | |
|---|---|---|---|
| 12 | 2426 | 32 | 2466 |
| 13 | 2428 | 33 | 2468 |
| 14 | 2430 | 34 | 2470 |
| 15 | 2432 | 35 | 2472 |
| 16 | 2434 | 36 | 2474 |
| 17 | 2436 | 37 | 2476 |
| 18 | 2438 | 38 | 2478 |
| 19 | 2440 | 39 | 2480 |

| | Test Items | Modulation | Channel |
|---|---|---|---|
| Bluetooth LE 4.0 | Peak Conducted Output Power<br>Power Spectral Density<br>6dB Bandwidth<br>Conducted and Spurious Emission<br>Radiated and Spurious Emission | GFSK | 0/19/39 |
| | Band Edge | GFSK | 0/39 |

## 1.3. Table for Supporting Units

| No. | Equipment | Brand Name | Model Name | Manufacturer | Serial No. | Note |
|---|---|---|---|---|---|---|
| 1 | Notebook | DELL | PP11L | DELL | H5914A03 | FCC DOC |

## 1.4. Facilities and Accreditations

### 1.4.1. Facilities

**CNAS-Lab Code: L1659**

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. CCIC is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659. A 12.8*6.8*6.4 (m) fully anechoic chamber was used for the radiated spurious emissions test.

**FCC-Registration No.: 406086**

CCIC Southern Electronic Product Testing (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 406086, valid time is until October 28, 2017.

**IC-Registration No.: 11185A-1**

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on July. 15, 2013, valid time is until July. 15, 2016.

### 1.4.2. Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature (°C): | 15°C - 35°C |
| Relative Humidity (%): | 30% -60% |
| Atmospheric Pressure (kPa): | 86KPa-106KPa |

# 2. 47 CFR Part 15C Requirements

## 2.1. Antenna requirement

### 2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

And according to FCC 47 CFR Section 15.247(c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 2.1.2. Antenna Information

**Antenna Category:** Internal antenna

An Internal antenna was soldered to the antenna port of EUT via an adaptor cable, can't be removed.

**Antenna General Information:**

| No. | EUT | Ant. Type | Gain(dBi) |
|---|---|---|---|
| 1 | LTE/WCDMA/GSM（GPRS）Mutil-Mode Digital Mobile Phone | Internal | 1 |

### 2.1.3. Result: comply

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

## 2.2. Peak Output Power

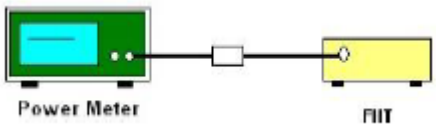
### 2.2.1. Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

### 2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.2.3. Test Setup




### 2.2.4. Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB 558074D01 v03r05.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

### 2.2.5. Test Result

| Channel | Frequency (MHz) | RF Power(dBm) GFSK/1Mbps | Limit (dBm) | Verdict |
|---|---|---|---|---|
| 0 | 2402 | -2.86 | 30 | PASS |
| 19 | 2440 | -1.65 | | PASS |
| 39 | 2480 | -2.63 | | PASS |

## 2.3. 6dB Bandwidth

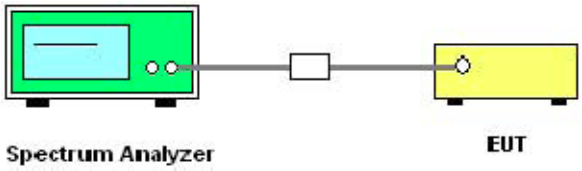
### 2.3.1. Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

### 2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.3.3. Test Setup




### 2.3.4. Test Procedures

1. The testing follows FCC KDB 558074D01 v03r05.

2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.

5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 30 kHz and set the Video bandwidth (VBW) = 100 kHz.

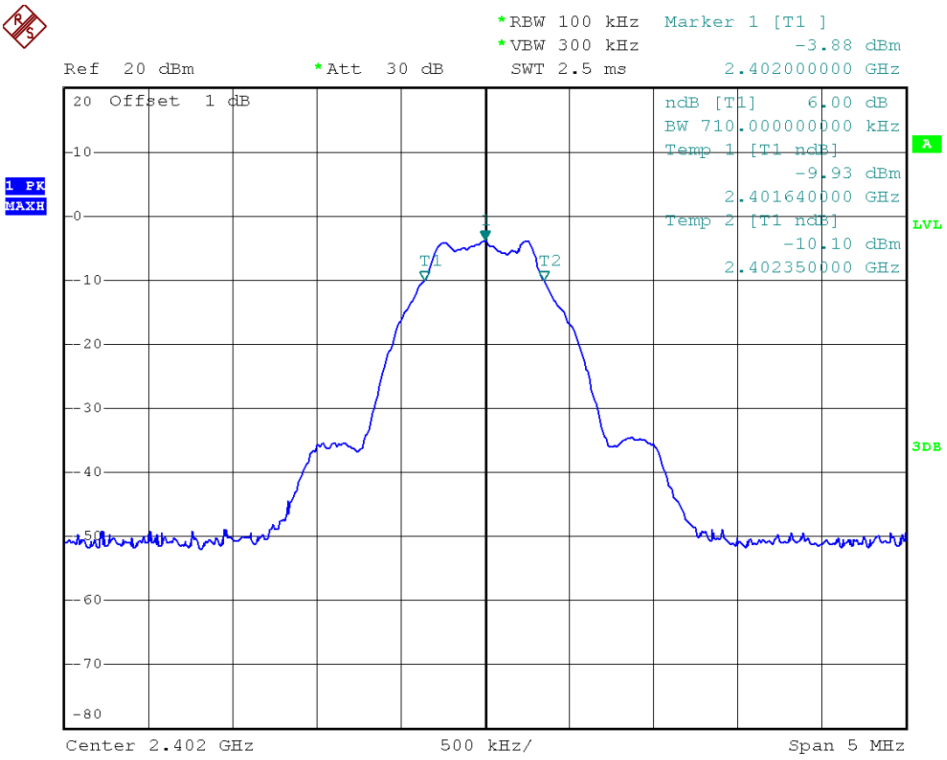
6. Measure and record the results in the test report.

### 2.3.5. Test Results of 6dB Bandwidth

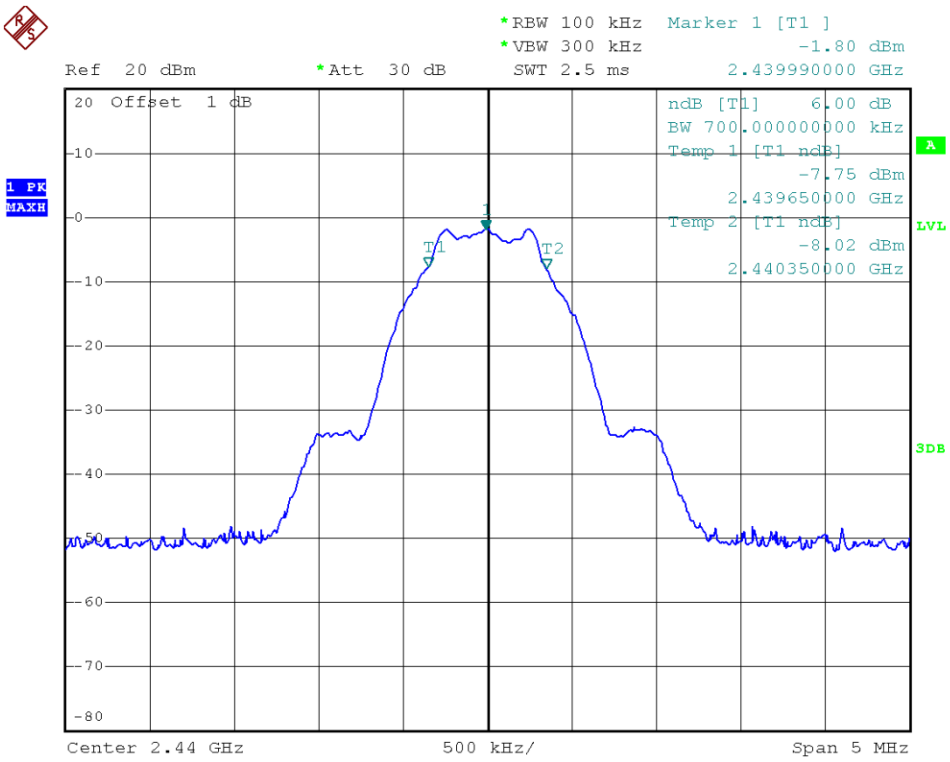
| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Limits (MHz) | Result |
|---|---|---|---|---|
| 0 | 2402 | 0.71 | ≥0.5 | PASS |
| 19 | 2440 | 0.70 | ≥0.5 | PASS |
| 39 | 2480 | 0.70 | ≥0.5 | PASS |

## 2.3.6. Test Results (plots) of 6dB Bandwidth

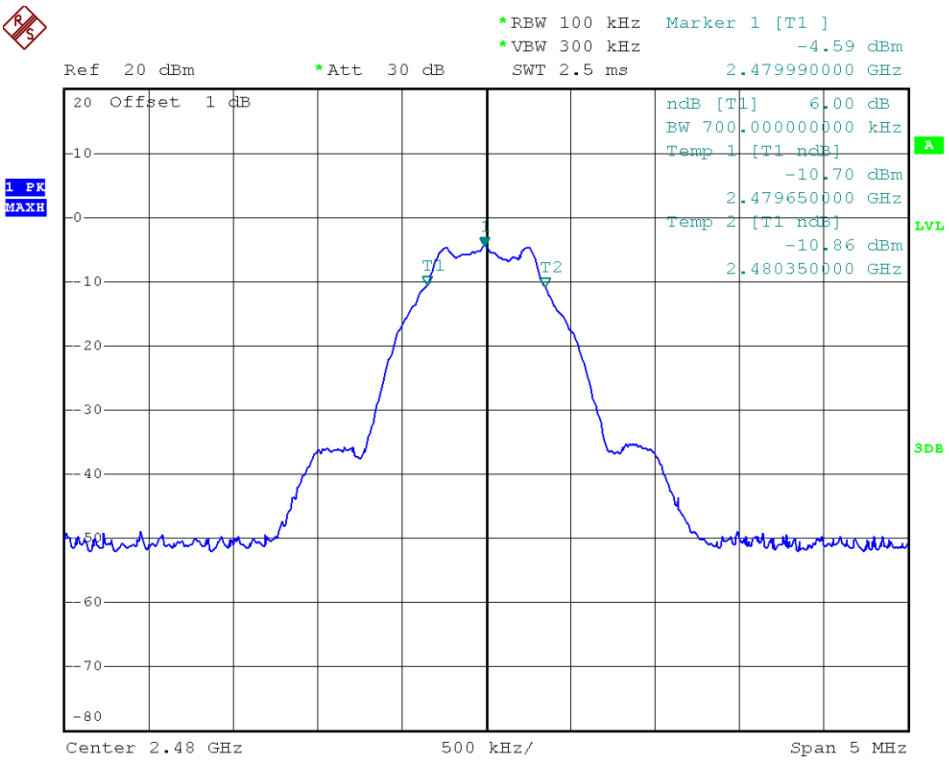
### 6 dB Bandwidth Plot on channel 0




### 6 dB Bandwidth Plot on channel 19



## 6 dB Bandwidth Plot on channel 39



## 2.4. Conducted Band Edges and Spurious Emissions

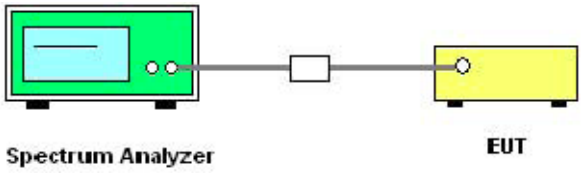
### 2.4.1. Limit of Conducted Band Edges and Spurious Emissions

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

### 2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

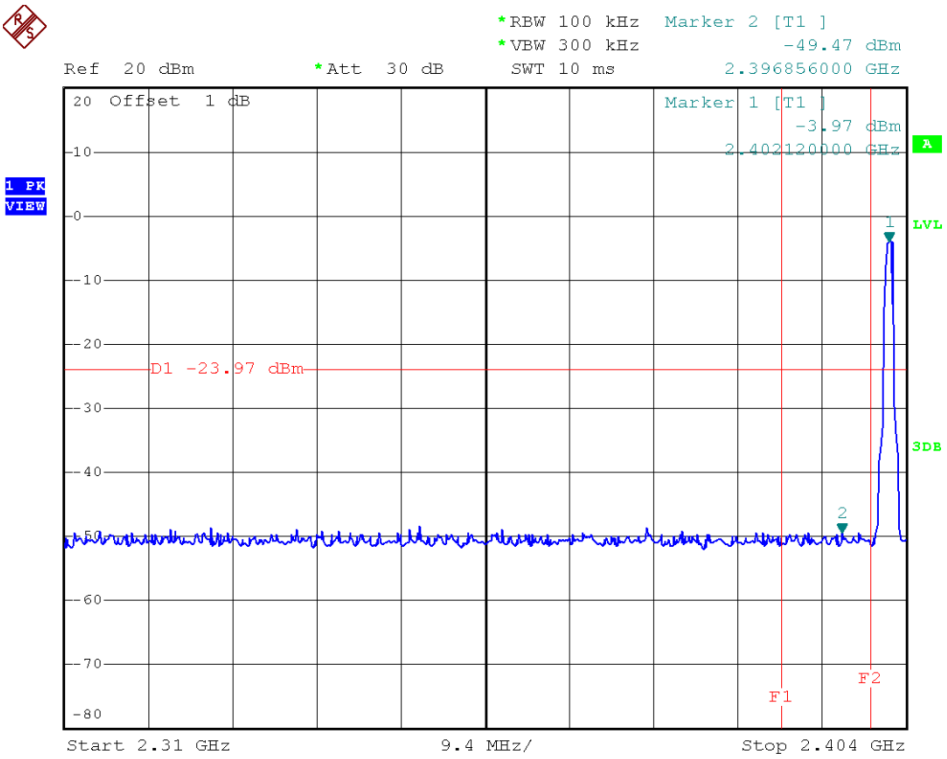
### 2.4.3. Test Setup



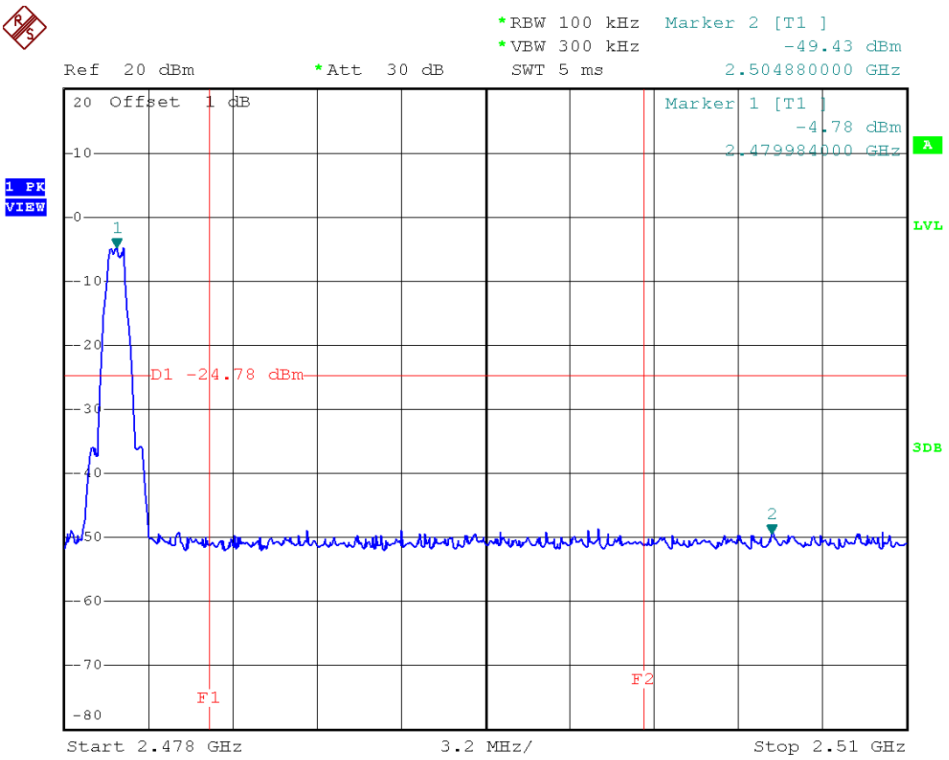

### 2.4.4. Test Procedure

1. The testing follows FCC KDB 558074D01 v03r05.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

## 2.4.5. Test Results of Conducted Band Edges



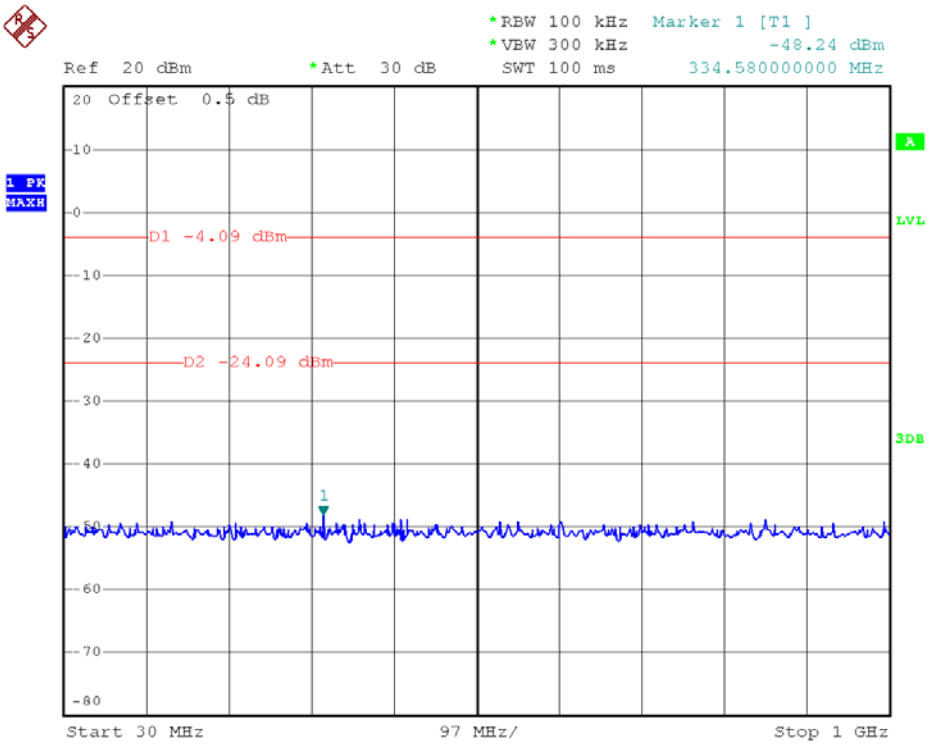

Low Band Edge Plot on Channel 0



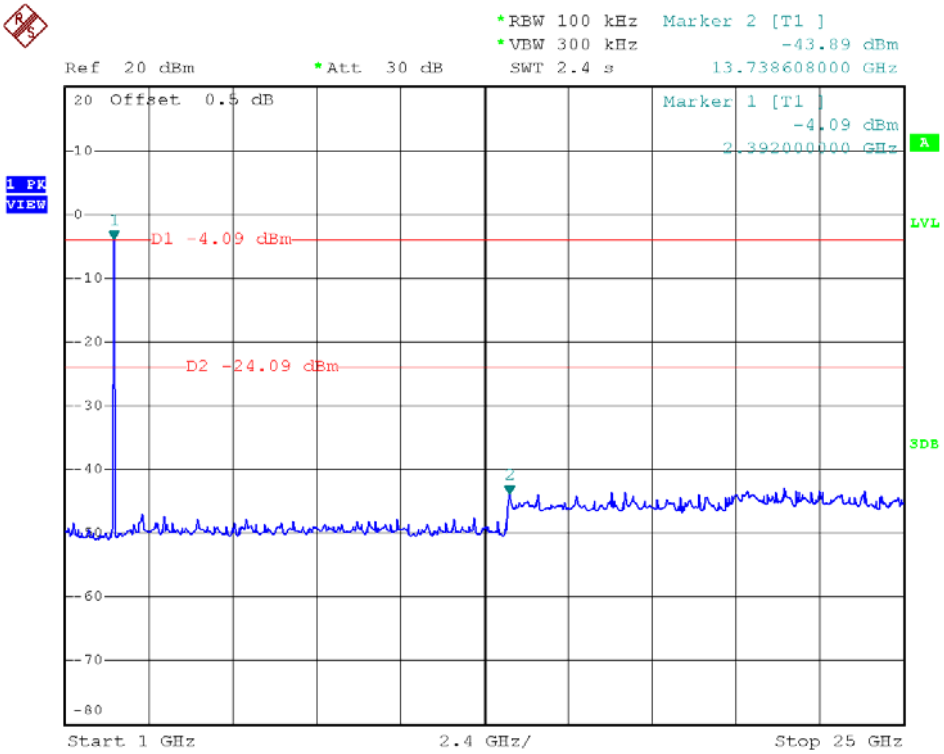

High Band Edge Plot on Channel 39

## 2.4.6. Test Result of Conducted Spurious Emission

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

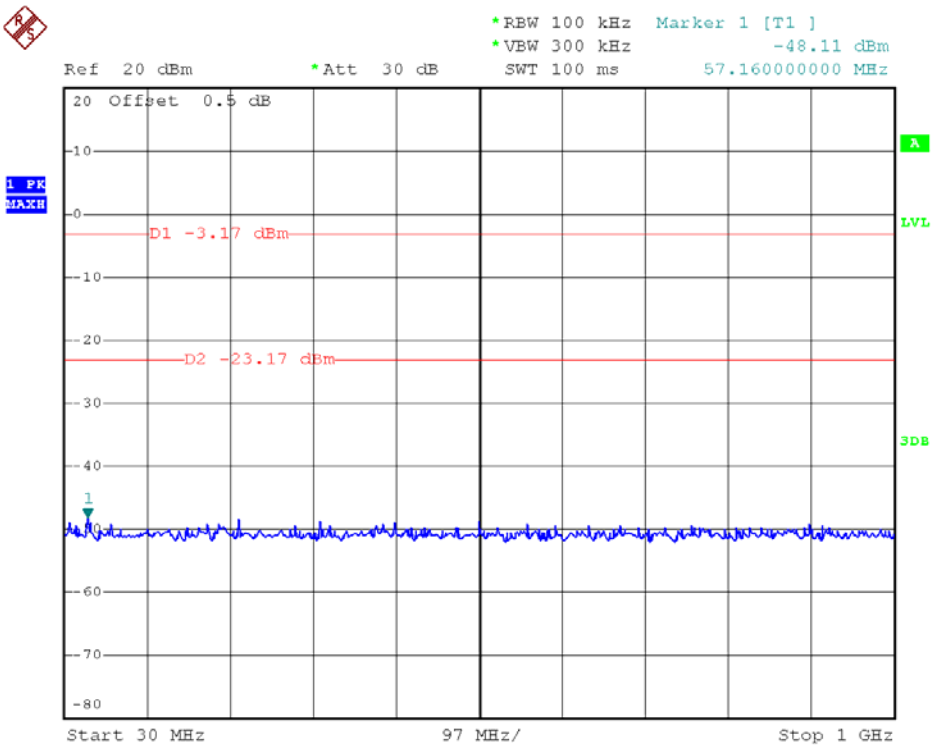



Channel = 0, 30MHz to 1GHz

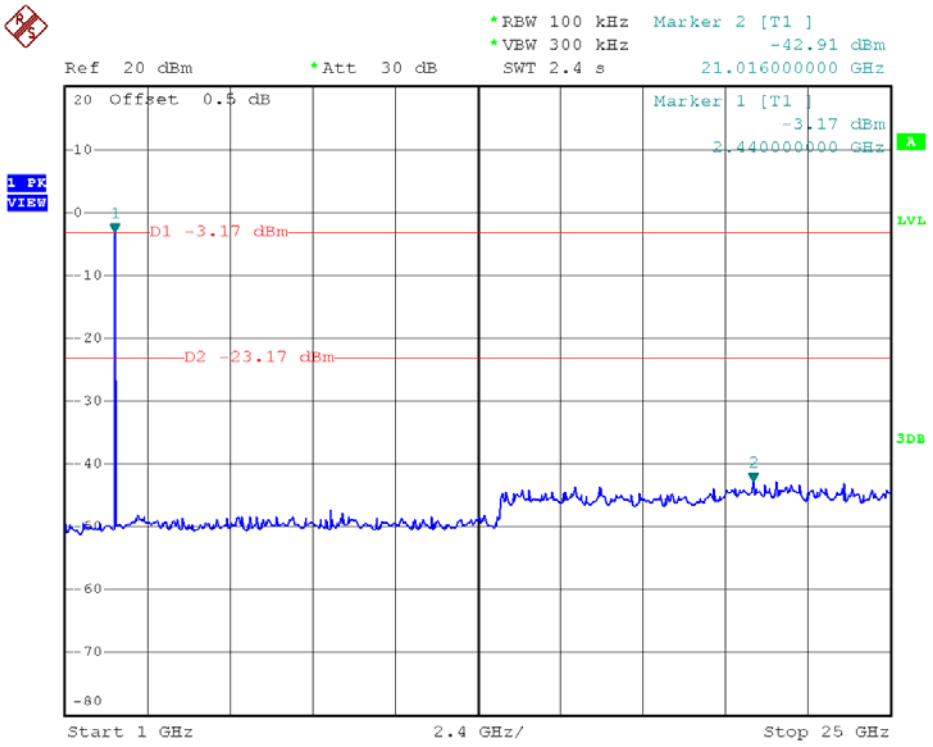



Channel = 0, 1GHz to 25GHz

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps

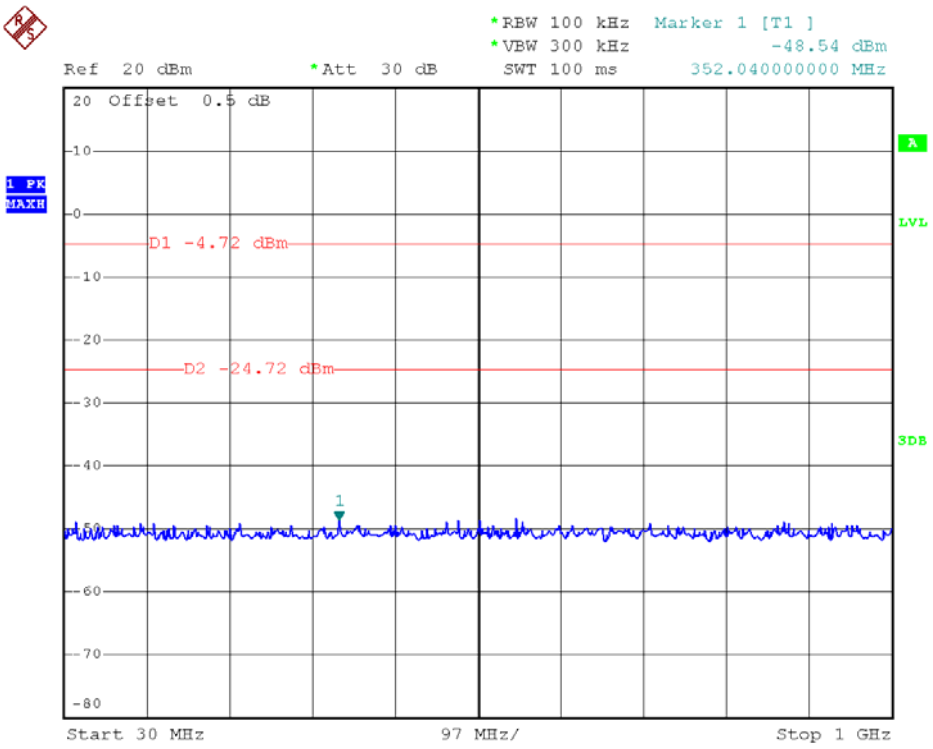



Channel = 19, 30MHz to 1GHz

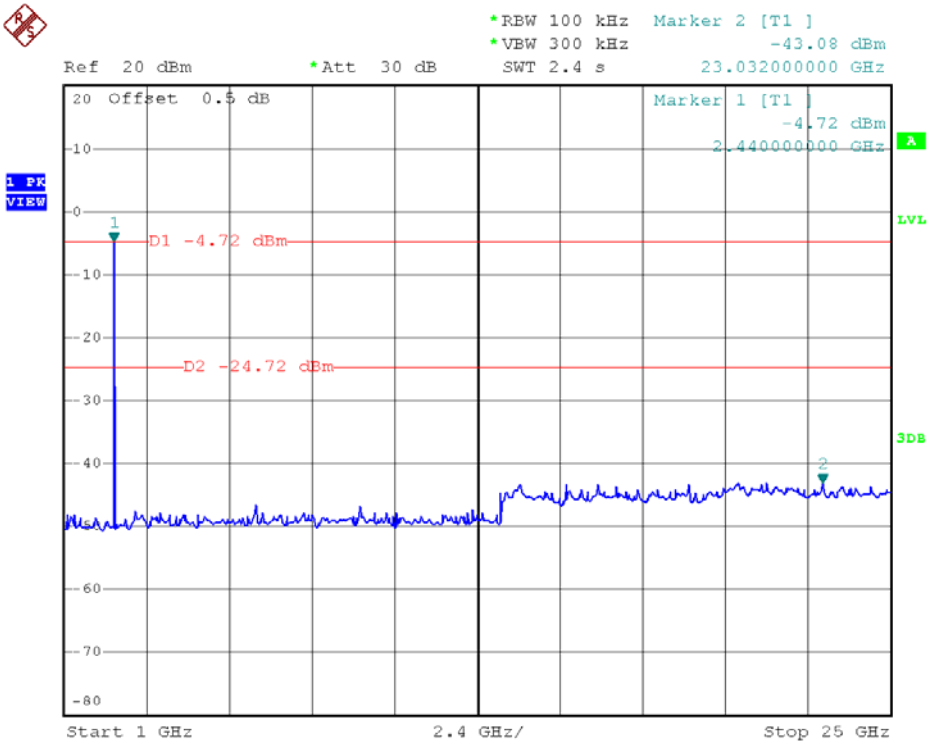



Channel = 19, 1GHz to 25GHz

Conducted Spurious Emission Plot on Bluetooth LE 1Mbps




Channel = 39, 30MHz to 1GHz




Channel = 39, 1GHz to 25GHz

## 2.5. Power spectral density (PSD)

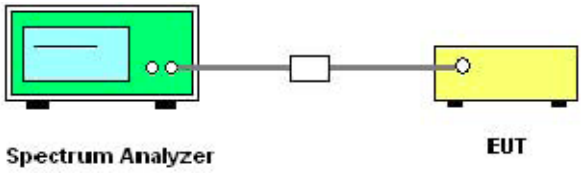
### 2.5.1. Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

### 2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.5.3. Test Setup




### 2.5.4. Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB 558074D01 v03r05.

2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)

5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.

6. Measure and record the results in the test report.

7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

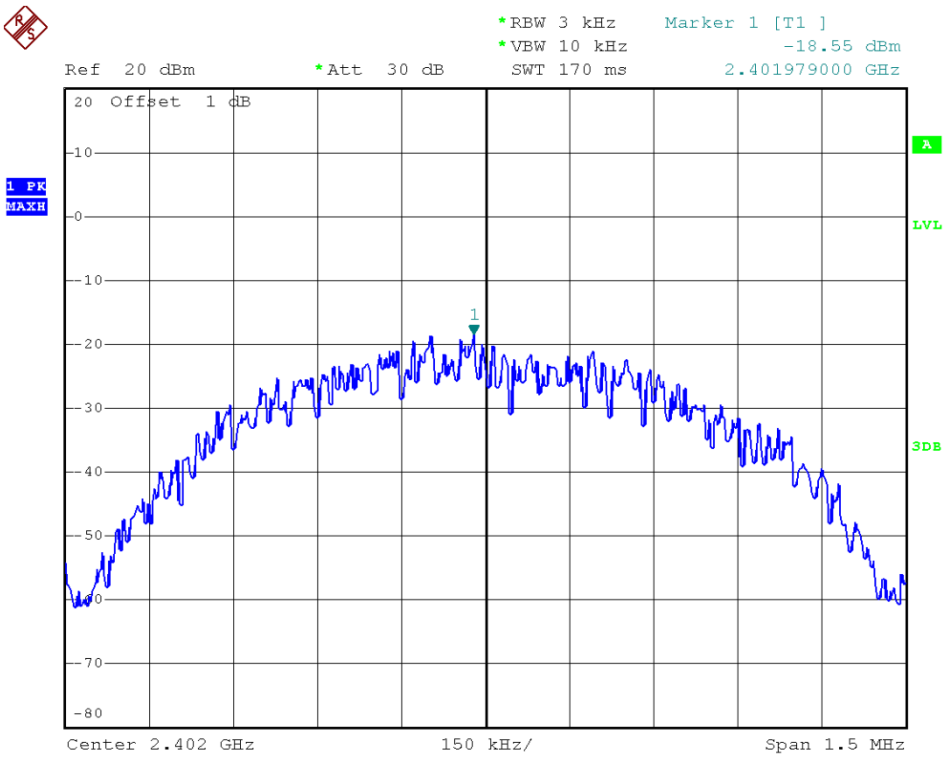
### 2.5.5. Test Results of Power spectral density

| Spectral power density (dBm) | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | PSD/3kHz (dBm) | Limit (dBm/3kHz) | Verdict |
| 0 | 2402 | -18.55 | 8 | PASS |
| 19 | 2440 | -16.56 | 8 | PASS |
| 39 | 2480 | -19.38 | 8 | PASS |
| Measurement uncertainty: ±1.3dB | | | | |

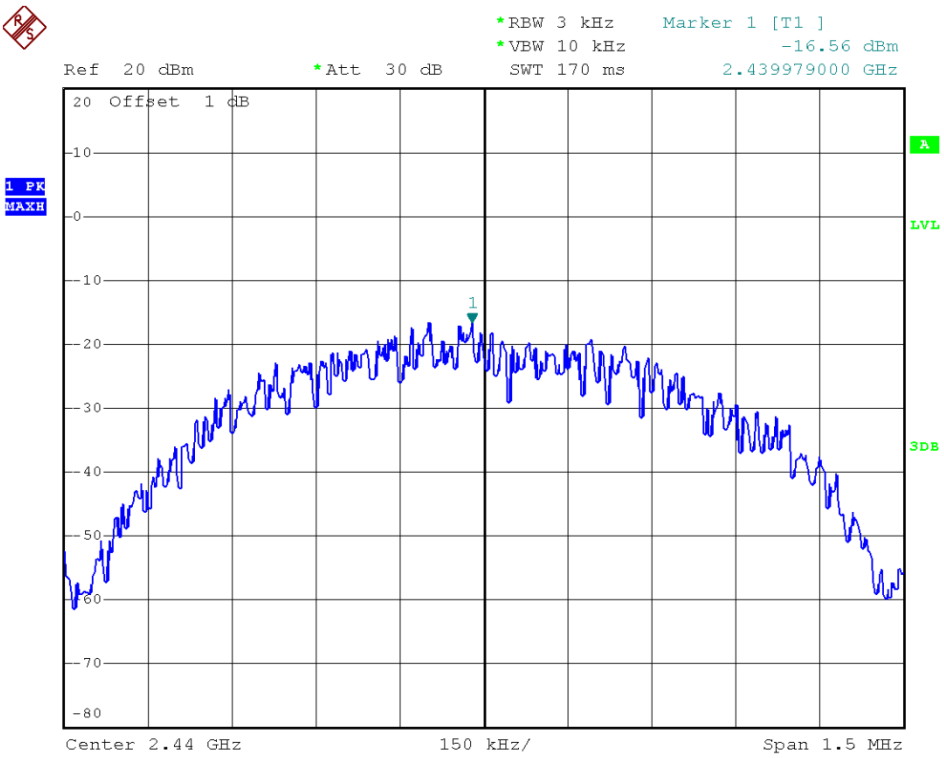
Note:

1. Measured power density (dBm) has offset with cable loss.

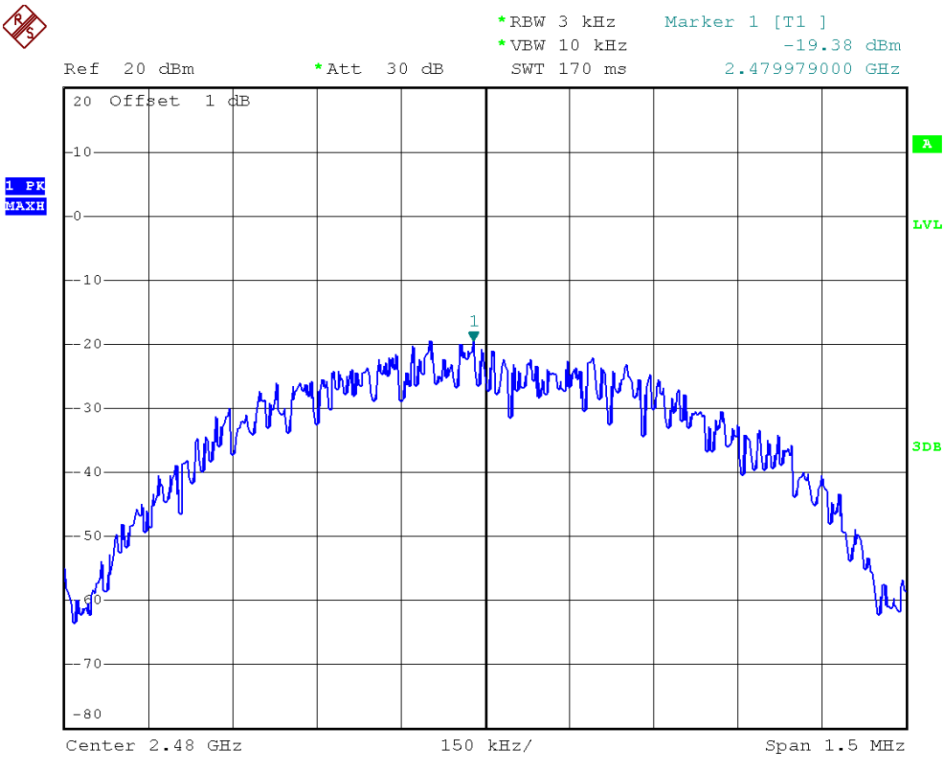
### 2.5.6. Test Results (plots) of Power spectral density




PSD Plot on Channel 0




PSD Plot on Channel 19




PSD Plot on Channel 39

## 2.6. Radiated Band Edge and Spurious Emission

### 2.6.1. Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Note: Wireless charger configuration was evaluated.

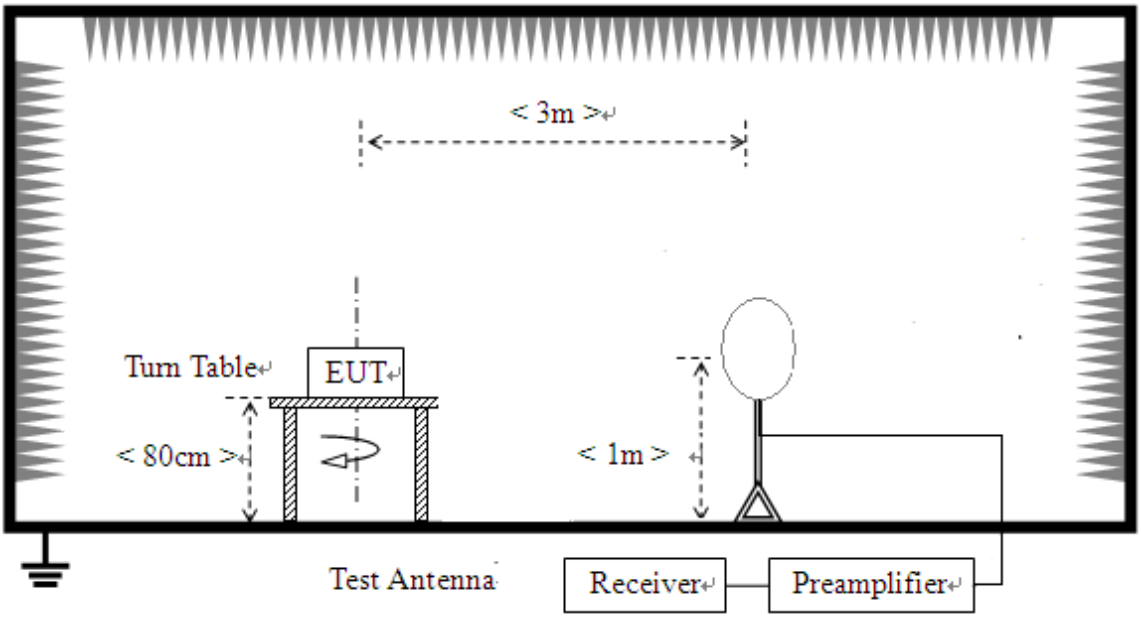
| Frequency (MHz) | Field Strength (μV/m) | Measurement Distance (m) |
|---|---|---|
| 0.009 - 0.490 | 2400/F(kHz) | 300 |
| 0.490 - 1.705 | 24000/F(kHz) | 30 |
| 1.705 - 30.0 | 30 | 30 |
| 30 - 88 | 100 | 3 |
| 88 - 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

### 2.6.2. Measuring Instruments

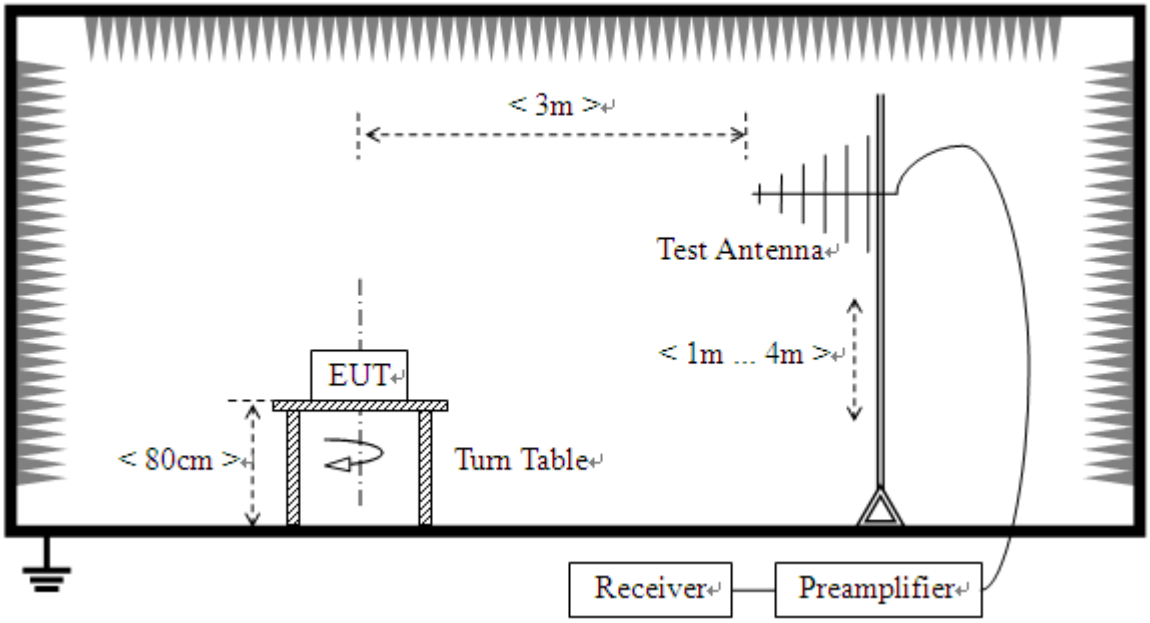
The measuring equipment is listed in the section 3 of this test report.

### 2.6.3. Test Setup

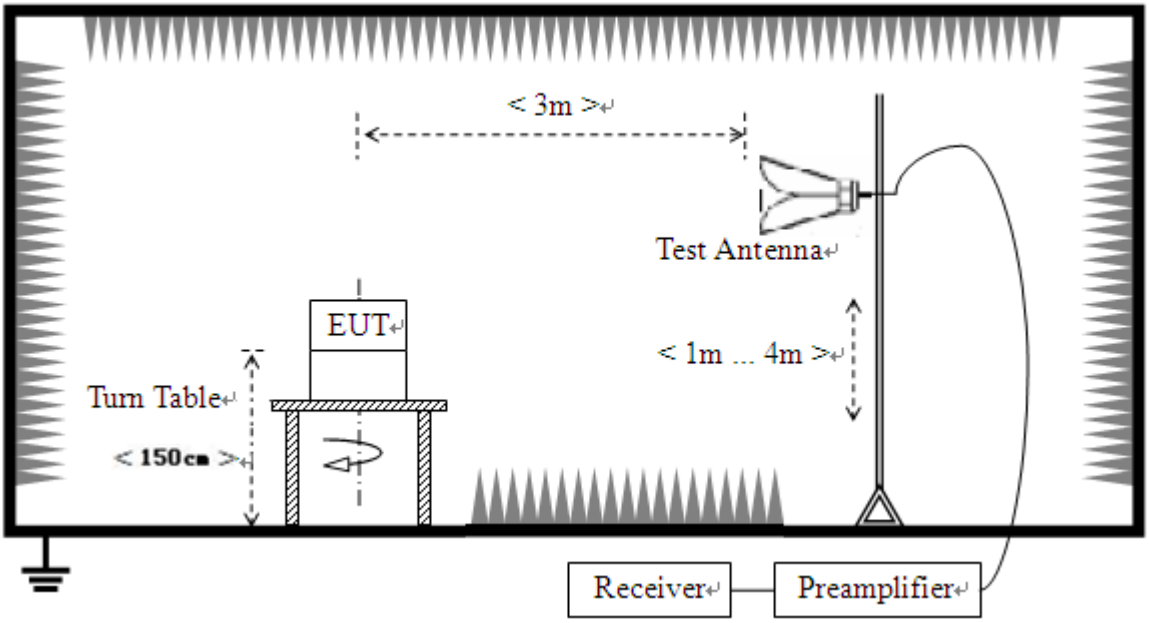
**For radiated emissions from 9kHz to 30MHz**



**For radiated emissions from 30MHz to 1GHz**




**For radiated emissions above 1GHz**



### 2.6.4. Test Procedures

1. The EUT was placed on the top of a rotating table 0.8/1.5 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. Height of receiving antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported.
   Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
7. For the radiated emission test above 1GHz:
   Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

NOTE:

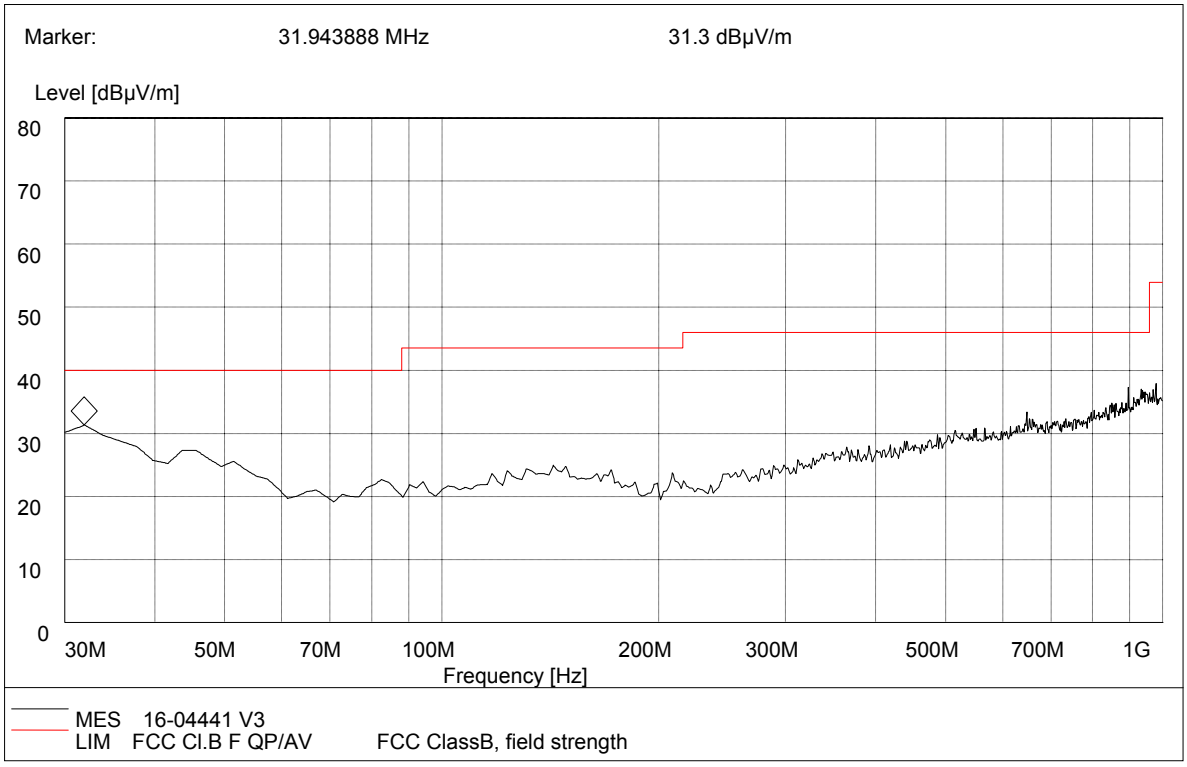
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is≥ 1/T (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.
5. Retest at 2016-09-28

## 2.6.5. Test Results of Radiated Band Edge and Spurious Emission

**For 9KHz to 30MHz**

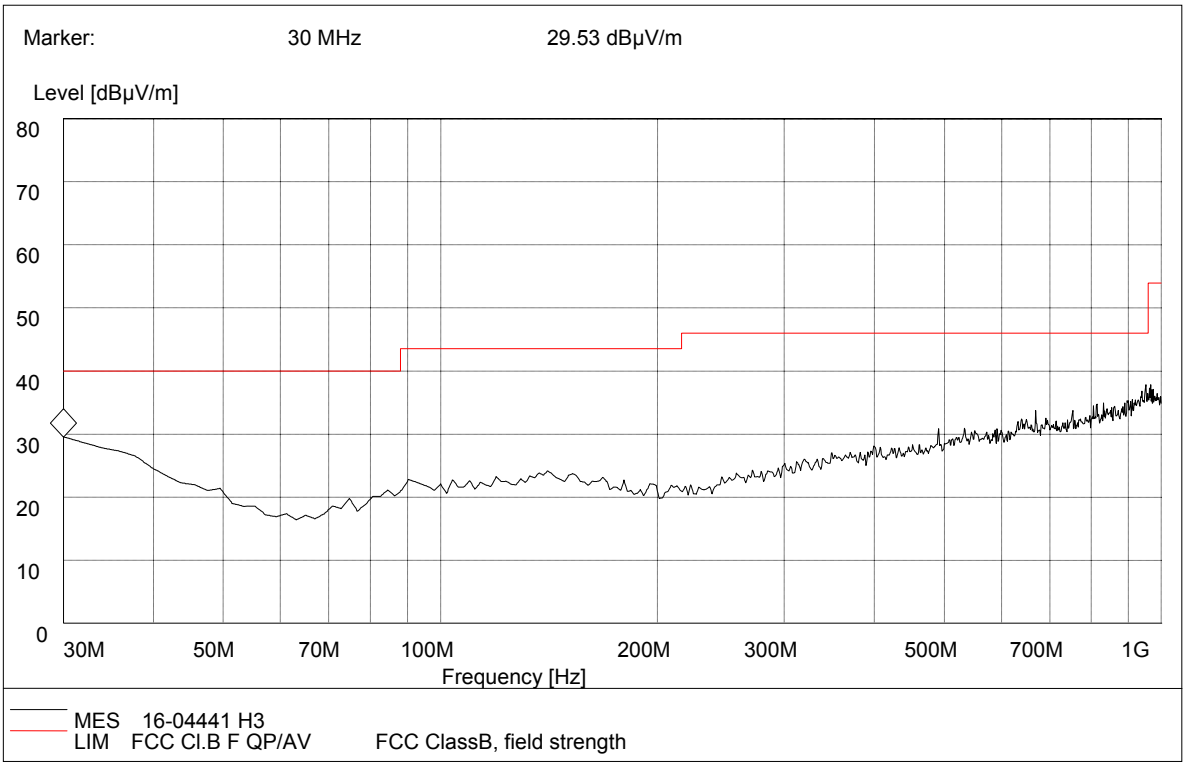
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

**For 30MHz to 1000 MHz**




Plot A: 30MHz to 1GHz, Antenna Vertical

| Frequency (MHz) | QuasiPeak (dBµV/m) | Bandwidth (kHz) | Antenna height (cm) | Limit (dBµV/m) | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 31.94 | 29.86 | 120.000 | 100.0 | 40.0 | Vertical | Pass |




Plot B: 30MHz to 1GHz, Antenna Horizontal

| Frequency (MHz) | QuasiPeak (dB µ V/m) | Bandwidth (kHz) | Antenna height (cm) | Limit (dB µ V/m) | Antenna | Verdict |
|---|---|---|---|---|---|---|
| 30.00 | 27.76 | 120.000 | 100.0 | 40.0 | Horizontal | Pass |

**For 1GHz to 25GHz**

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（0CH_2402MHz） | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emssion Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV/m) | Correction Factor (dB/m) |
| 1 | 2390.00 | 44.43 | PK | 74.0 | -29.57 | 1.50 H | 22 | 43.13 | 1.3 |
| 2 | 2390.00 | 33.28 | AV | 54.0 | -20.72 | 1.50 H | 22 | 31.98 | 1.3 |
| 3 | *2402.00 | 79.00 | PK | / | / | 1.50 H | 22 | 77.40 | 1.6 |
| 4 | *2402.00 | 53.93 | AV | / | / | 1.50 H | 22 | 52.33 | 1.6 |
| 5 | 4804.00 | 47.86 | PK | 74.00 | -26.14 | 1.50 H | 0 | 41.46 | 6.4 |
| 6 | 4804.00 | 36.35 | AV | 54.00 | -17.65 | 1.50 H | 0 | 29.95 | 6.4 |
| **ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（0CH_2402MHz）** | | | | | | | | | |
| No. | Frequency (MHz) | Emssion Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV/m) | Correction Factor (dB/m) |
| 1 | 2390.00 | 44.95 | PK | 74.0 | -29.05 | 1.50 V | 28 | 43.65 | 1.3 |
| 2 | 2390.00 | 33.75 | AV | 54.0 | -20.25 | 1.50 V | 28 | 32.45 | 1.3 |
| 3 | *2402.00 | 79.89 | PK | / | / | 1.50 V | 28 | 78.29 | 1.6 |
| 4 | *2402.00 | 55.34 | AV | / | / | 1.50 V | 28 | 53.74 | 1.6 |
| 5 | 4804.00 | 49.47 | PK | 74.00 | -24.53 | 1.50 V | 0 | 43.07 | 6.4 |
| 6 | 4804.00 | 36.76 | AV | 54.00 | -17.24 | 1.50 V | 0 | 30.36 | 6.4 |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（19CH_2440MHz） | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emssion Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV/m) | Correction Factor (dB/m) |
| 1 | *2440.00 | 78.76 | PK | / | / | 1.50 H | 30 | 76.66 | 2.1 |
| 2 | *2440.00 | 53.16 | AV | / | / | 1.50 H | 30 | 51.06 | 2.1 |
| 3 | 4884.00 | 49.53 | PK | 74.00 | -24.47 | 1.50 H | 30 | 43.03 | 6.5 |
| 4 | 4884.00 | 37.39 | AV | 54.00 | -16.61 | 1.50 H | 30 | 30.89 | 6.5 |
| **ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（19CH_2440MHz）** | | | | | | | | | |
| No. | Frequency (MHz) | Emssion Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV/m) | Correction Factor (dB/m) |
| 1 | *2440.00 | 78.56 | PK | / | / | 1.50 V | 28 | 76.46 | 2.1 |
| 2 | *2440.00 | 56.47 | AV | / | / | 1.50 V | 28 | 54.37 | 2.1 |
| 3 | 4884.00 | 48.75 | PK | 74.00 | -25.25 | 1.50 V | 28 | 42.25 | 6.5 |
| 4 | 4884.00 | 37.40 | AV | 54.00 | -16.6 | 1.50 V | 28 | 30.9 | 6.5 |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（39CH_2480MHz） | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. | Frequency (MHz) | Emssion Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV/m) | Correction Factor (dB/m) |
| 1 | *2480.00 | 75.84 | PK | / | / | 1.50 H | 24 | 73.24 | 2.6 |
| 2 | *2480.00 | 60.91 | AV | / | / | 1.50 H | 24 | 57.31 | 2.6 |
| 3 | 2483.50 | 56.90 | PK | 74.0 | -17.1 | 1.50 H | 24 | 54.3 | 2.6 |
| 4 | 2483.50 | 44.60 | AV | 54.0 | -9.4 | 1.50 H | 24 | 42 | 2.6 |
| 5 | 4960.00 | 49.40 | PK | 74.0 | -24.6 | 1.50 H | 0 | 42.7 | 6.7 |
| 6 | 4960.00 | 37.45 | AV | 54.0 | -16.55 | 1.50 H | 0 | 30.75 | 6.7 |
| **ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（39CH_2480MHz）** | | | | | | | | | |
| No. | Frequency (MHz) | Emssion Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV/m) | Correction Factor (dB/m) |
| 1 | *2480.00 | 76.72 | PK | / | / | 1.50 V | 26 | 74.12 | 2.6 |
| 2 | *2480.00 | 58.90 | AV | / | / | 1.50 V | 26 | 56.30 | 2.6 |
| 3 | 2483.50 | 56.80 | PK | 74.0 | -17.2 | 1.50 V | 26 | 54.2 | 2.6 |
| 4 | 2483.50 | 45.40 | AV | 54.0 | -8.6 | 1.50 V | 26 | 42.8 | 2.6 |
| 5 | 4960.00 | 48.81 | PK | 74.0 | -25.19 | 1.50 V | 0 | 42.11 | 6.7 |
| 6 | 4960.00 | 37.46 | AV | 54.0 | -16.54 | 1.50 V | 0 | 30.76 | 6.7 |

**REMARKS:**

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

## 2.7. Conducted Emission

### 2.7.1. Limit of Conducted Emission

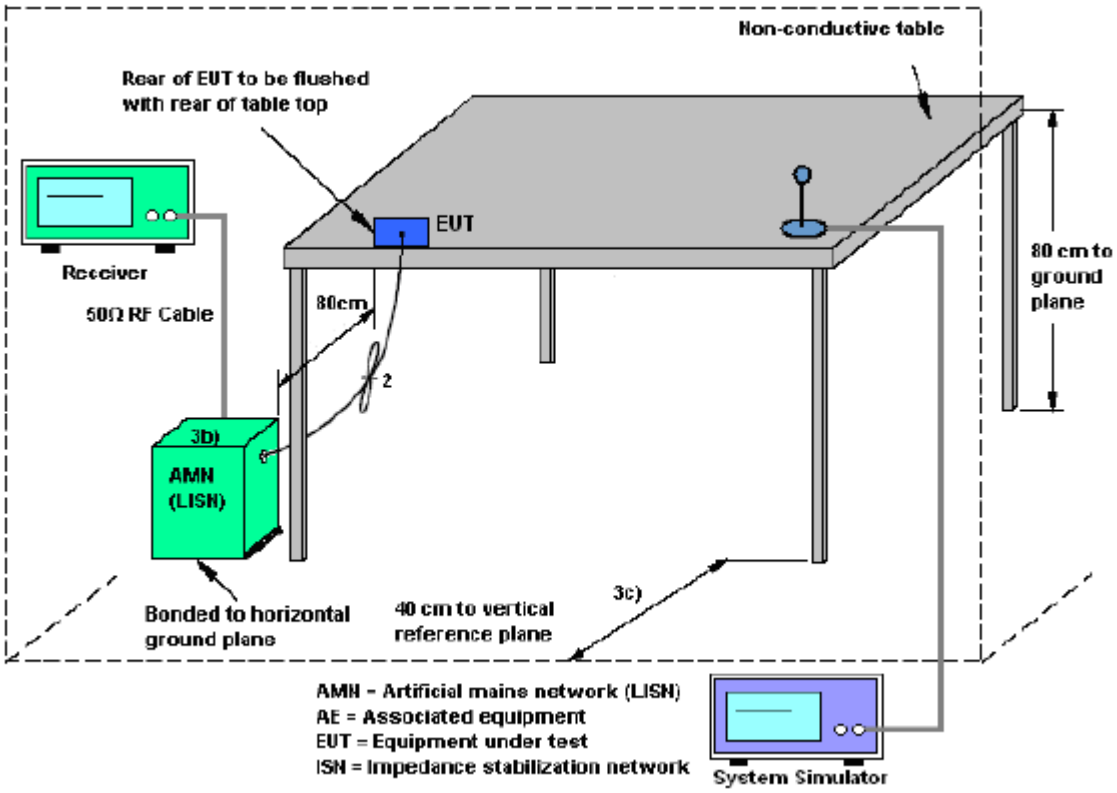
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

| Frequency range (MHz) | Conducted Limit (dBμV) | |
|---|---|---|
| | Quai-peak | Average |
| 0.15 - 0.50 | 66 to 56 | 56 to 46 |
| 0.50 - 5 | 56 | 46 |
| 5 - 30 | 60 | 50 |

### 2.7.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

### 2.7.3. Test Setup



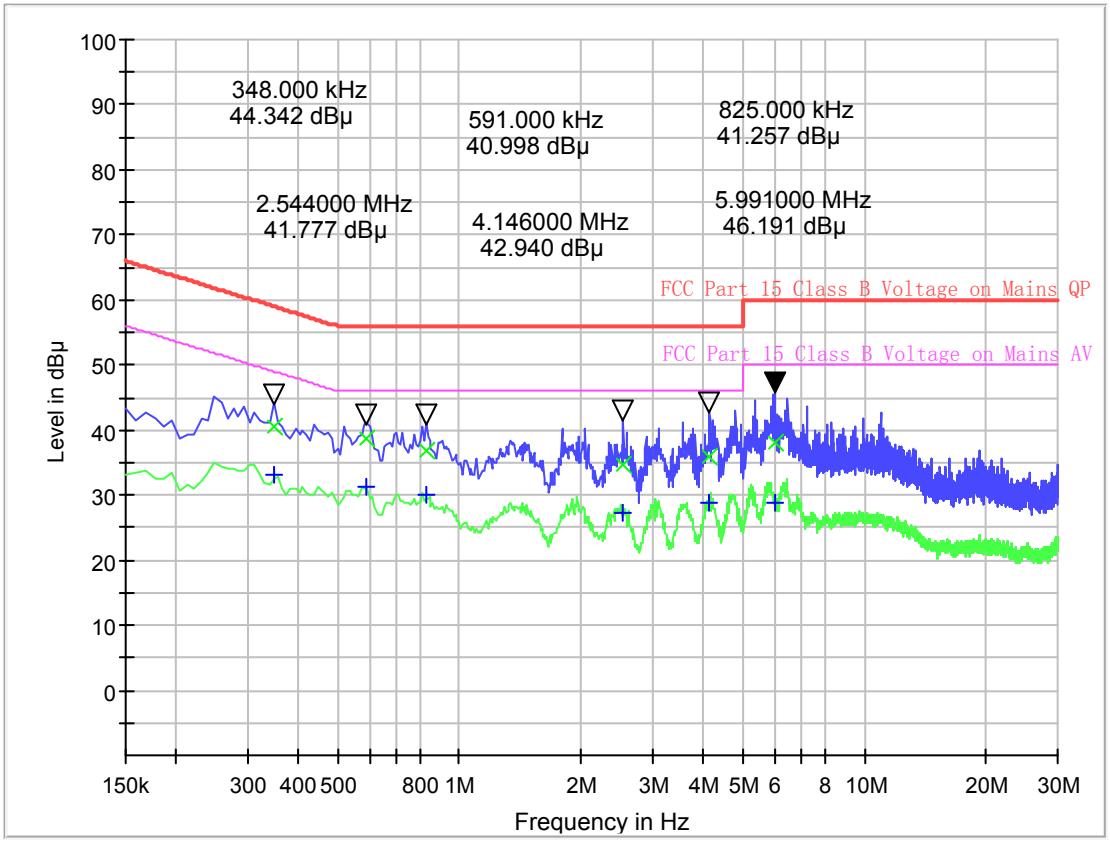
### 2.7.4. Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

### 2.7.5. Test Result

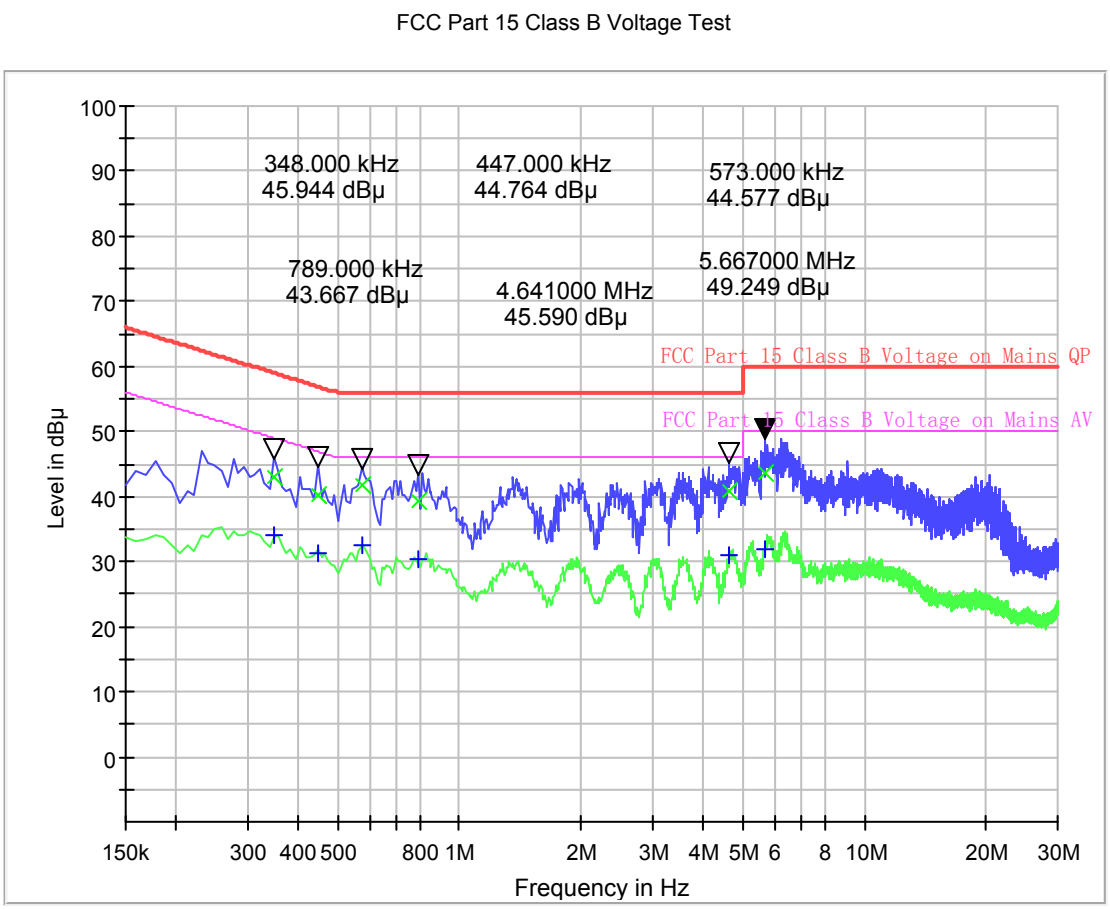
1. The EUT configuration of the emission tests is Bluetooth Link + USB Cable (Charging from Adapter) + Earphone.
2. The power adapter support (100~240V AC, 50/60Hz), the EUT was tested at the both available voltages (120, 240V AC), and 60Hz. Only the worst-case mode (120V/60Hz) was record in this report.
3. Retest at 2016-12-28

FCC Part 15 Class B Voltage Test




(Plot A: L Phase)

| Conducted Disturbance at Mains Terminals | | | | | |
|---|---|---|---|---|---|
| QP | | | AV | | |
| Frequency (MHz) | Limits (dBµV) | Measurement Value (dBµV) | Frequency (MHz) | Limits (dBµV) | Measurement Value (dBµV) |
| 0.348000 | 59.0 | 40.58 | 0.348000 | 49.0 | 33.22 |
| 0.591000 | 56.0 | 38.54 | 0.591000 | 46.0 | 31.16 |
| 0.825000 | 56.0 | 36.90 | 0.825000 | 46.0 | 30.14 |
| 2.544000 | 56.0 | 34.67 | 2.544000 | 46.0 | 27.43 |
| 4.146000 | 56.0 | 36.00 | 4.146000 | 46.0 | 28.88 |
| 5.991000 | 60.0 | 38.21 | 5.991000 | 50.0 | 28.72 |




(Plot B: N Phase)

| Conducted Disturbance at Mains Terminals | | | | | |
|---|---|---|---|---|---|
| QP | | | AV | | |
| Frequency (MHz) | Limits (dBµV) | Measurement Value (dBµV) | Frequency (MHz) | Limits (dBµV) | Measurement Value (dBµV) |
| 0.348000 | 59.0 | 43.12 | 0.348000 | 49.0 | 34.02 |
| 0.447000 | 56.9 | 40.36 | 0.447000 | 46.9 | 31.34 |
| 0.573000 | 56.0 | 41.77 | 0.573000 | 46.0 | 32.57 |
| 0.789000 | 56.0 | 39.17 | 0.789000 | 46.0 | 30.38 |
| 4.641000 | 56.0 | 40.83 | 4.641000 | 46.0 | 30.87 |
| 5.667000 | 60.0 | 43.70 | 5.667000 | 50.0 | 31.80 |

**Test Result: PASS**

# 4. List of measuring equipment

| Description | Manufacturer | Model | Serial No. | Cal. Date | Due Date | Remark |
|---|---|---|---|---|---|---|
| EMI Test Receiver | R&S | ESIB26 | A0304218 | 2016.06.02 | 2017.06.01 | Radiation |
| Full-Anechoic Chamber | Albatross | 12.8m*6.8m *6.4m | A0412372 | 2016.06.02 | 2017.06.01 | Radiation |
| Loop Antenna | Schwarz beck | HFH2-Z2 | 100047 | 2016.06.02 | 2017.06.01 | Radiation |
| Bilog Antenna | Schwarzbeck | VULB 9163 | 9163-274 | 2016.06.02 | 2017.06.01 | Radiation |
| Double ridge horn antenna | R&S | HF906 | 100150 | 2016.06.02 | 2017.06.01 | Radiation |
| Ultra-wideband antenna | R&S | HL562 | 100089 | 2016.06.02 | 2017.06.01 | Radiation |
| Test Antenna – Horn (18-26.5GHz) | ETS | 3160-09 | A0902607 | 2016.06.02 | 2017.06.01 | Radiation |
| Amplifier 20M~3GHz | R&S | PAP-0203H | 22018 | 2016.06.02 | 2017.06.01 | Radiation |
| Ampilier 1G~18GHz | R&S | MITEQ AFS42-0010 1800 | 25-S-42 | 2016.06.02 | 2017.06.01 | Radiation |
| Ampilier 18G~40GHz | R&S | JS42-180026 00-28-5A | 12111.0980.00 | 2016.06.02 | 2017.06.01 | Radiation |
| Spectrum Analyzer | R&S | FSP40 | 1164.4391.40 | 2016.07.07 | 2017.07.06 | Conducted |
| Power Meter | R&S | NRP2 | 1020.1809.02 | 2016.06.02 | 2017.06.01 | Conducted |
| Power Sensor | R&S | NRP-Z81 | 823.3618.03 | 2016.06.02 | 2017.06.01 | Conducted |
| LISN | ROHDE&SC HWARZ | ESH2-Z5 | A0304221 | 2016.06.02 | 2017.06.01 | Conducted |
| Test Receiver | R&S | ESCS30 | A0304260 | 2016.06.02 | 2017.06.01 | Conducted |
| Cable | SUNHNER | SUCOFLEX 100 | / | 2016.06.02 | 2017.06.01 | Radiation |
| Cable | SUNHNER | SUCOFLEX 104 | / | 2016.06.02 | 2017.06.01 | Radiation |

# 5. Uncertainty of Evaluation

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

| Measurement | Frequency | Uncertainty |
|---|---|---|
| Conducted emissions | 9kHz~30MHz | 2.35dB |
| Radiated emissions | 9kHz ~1000MHz | 2.45dB |
| | 1G~18GHz | 2.21dB |
| | 18G~40GHz | 3.96dB |
| RF Conducted | 9KHz~40GHz | 1.60 dB |

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

** END OF REPORT **