



# RF TEST REPORT

|                   |                           |
|-------------------|---------------------------|
| <b>Applicant</b>  | MOBILE DEVICES INGENIERIE |
| <b>FCC ID</b>     | A6GC4D-4G4USV7            |
| <b>Product</b>    | OBDV7+ 4G CAT4 US         |
| <b>Brand</b>      | T-Mobile, Metro, Munic    |
| <b>Model</b>      | C4D-4G4USAB_V7+           |
| <b>Marketing</b>  | C4D-4G4USAB_V7+           |
| <b>Report No.</b> | R1906A0298-R5             |
| <b>Issue Date</b> | August 6, 2019            |

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15C (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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## Summary of measurement results

| Number                                         | Summary of measurements of results     | Clause in FCC rules         | Verdict                 |
|------------------------------------------------|----------------------------------------|-----------------------------|-------------------------|
| 1                                              | Maximum Average conducted output power | 15.247(b)(3)                | Reference module report |
| 2                                              | 6 dB bandwidth                         | 15.247(a)(2)                | Reference module report |
| 3                                              | Power spectral density                 | 15.247(e)                   | Reference module report |
| 4                                              | Band Edge                              | 15.247(d)                   | Reference module report |
| 5                                              | Spurious RF Conducted Emissions        | 15.247(d)                   | Reference module report |
| 6                                              | Unwanted Emissions                     | 15.247(d),<br>15.205,15.209 | PASS                    |
| 7                                              | Conducted Emissions                    | 15.207                      | PASS                    |
| Date of Testing: June 27, 2019 ~ July 14, 2019 |                                        |                             |                         |

**Only Radiates Unwanted Emissions and Conducted Emissions were tested for C4D-4G4USAB\_V7+ in this report. Other conducted test items refer to the AriPrime BX 3210 Module report (Report No. :FR922501AL and FR922501AC ).**

## 1. Test Laboratory

### 1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

### 1.2. Test facility

#### **CNAS (accreditation number: L2264)**

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

#### **FCC (Designation number: CN1179, Test Firm Registration Number: 446626)**

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

#### **IC (recognition number is 8510A)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

#### **VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

#### **A2LA (Certificate Number: 3857.01)**

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

### 1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong  
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## 2. General Description of Equipment under Test

### Client Information

|                      |                                            |
|----------------------|--------------------------------------------|
| Applicant            | MOBILE DEVICES INGENIERIE                  |
| Applicant address    | 100 AVENUE DE STALINGRAD VILLEJUIF, France |
| Manufacturer         | MOBILE DEVICES INGENIERIE                  |
| Manufacturer address | 100 AVENUE DE STALINGRAD VILLEJUIF, France |

### General information

| EUT Description                                                   |                                                                                     |
|-------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Model:                                                            | C4D-4G4USAB_V7+                                                                     |
| IMEI:                                                             | 354328090017986                                                                     |
| Hardware Version:                                                 | SAP00422+SAP00421                                                                   |
| Software Version:                                                 | V2107                                                                               |
| Power Supply:                                                     | Battery                                                                             |
| Antenna Type:                                                     | metallic antenna                                                                    |
| Antenna Connector:                                                | A permanently attached antenna (meet with the standard FCC Part 15.203 requirement) |
| Antenna Gain:                                                     | 2.7 dBi for Wi-Fi 2.4G<br>2.4 dBi for BLE                                           |
| Directional Gain:                                                 | NA                                                                                  |
| additional beamforming gain:                                      | NA                                                                                  |
| Test Mode:                                                        | Bluetooth(Low Energy)<br>802.11b<br>802.11g, 802.11n(HT20);                         |
| Modulation Type:                                                  | BLE :GFSK<br>802.11b: DSSS;<br>802.11g/n(HT20): OFDM                                |
| Operating Frequency Range(s)                                      | 802.11b/g/n(HT20): 2412 ~ 2462 MHz<br>BLE: 2402 ~2480 MHz                           |
| EUT Accessory                                                     |                                                                                     |
| Battery                                                           | Manufacturer: HOWELL Energy Co., Ltd<br>Model: Li-polymer 352535H                   |
| Note: The information of the EUT is declared by the manufacturer. |                                                                                     |



### 3. Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

#### Test standards

- **FCC CFR47 Part 15C (2018) Radio Frequency Devices**
- **ANSI C63.10 (2013)**
- **KDB 558074 D01 DTS Meas Guidance v04**

## 4. Test Configuration

### Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the loop antenna is vertical, the others are vertical and horizontal. and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Preliminary tests have been done on all the configuration for confirming worst case. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

| Band                  | Data Rate |
|-----------------------|-----------|
| Bluetooth(Low Energy) | 1Mbps     |
| 802.11b               | 1 Mbps    |
| 802.11g               | 6 Mbps    |
| 802.11n HT20          | MCS0      |

## 5. Test Case Results

### 5.1. Unwanted Emission

#### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 102.5kPa |

#### Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10-2013.

The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna.

The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. Sweep the Restricted Band and the emissions less than 20 dB below the permissible value are reported.

The radiated emissions measurements were made in a typical installation configuration.

Sweep the whole frequency band through the range from 9 kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

This method refer to ANSI C63.10-2013.

The procedure for peak unwanted emissions measurements above 1000 MHz is as follows:

I) Peak emission levels are measured by setting the instrument as follows:

- 1) RBW = 1 MHz.
- 2) VBW  $\geq [3 \times \text{RBW}]$
- 3) Detector = peak.
- 4) Sweep time = auto.
- 5) Trace mode = max hold.
- 6) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, then the time required for the trace to stabilize will increase by a factor of approximately  $1 / D$ , where  $D$  is the duty cycle.

II) Average emission levels are measured by setting the instrument as follows:

- a) RBW = 1 MHz.
- b) VBW  $\geq [3 \times \text{RBW}]$ .
- c) Detector = RMS (power averaging), if  $[\text{span} / (\# \text{ of points in sweep})] \leq \text{RBW} / 2$ . Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the

condition is not satisfied, then the detector mode shall be set to peak.

d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)

e) Sweep time = auto.

f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of  $1 / D$ , where  $D$  is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)

g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is  $[10 \log (1 / D)]$ , where  $D$  is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

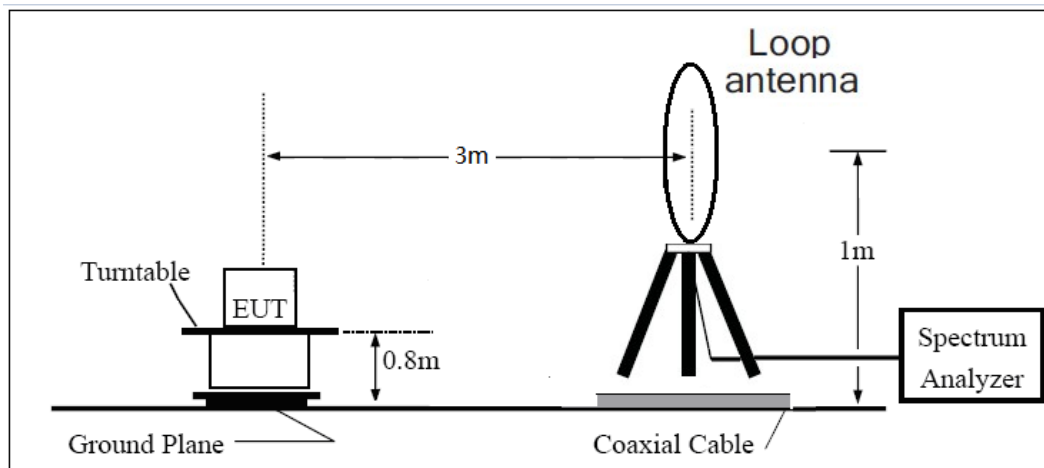
2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is  $[20 \log (1 / D)]$ , where  $D$  is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.

3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

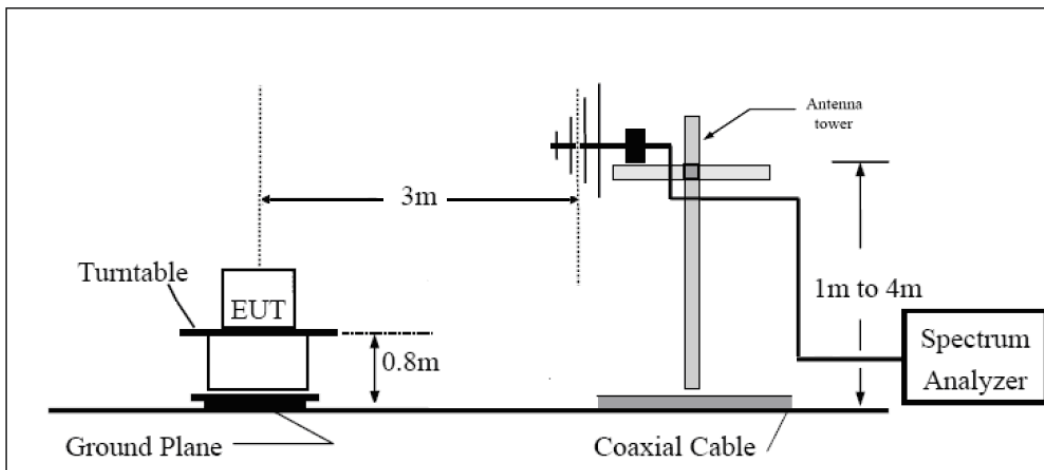
The test is in transmitting mode.

## Test setup

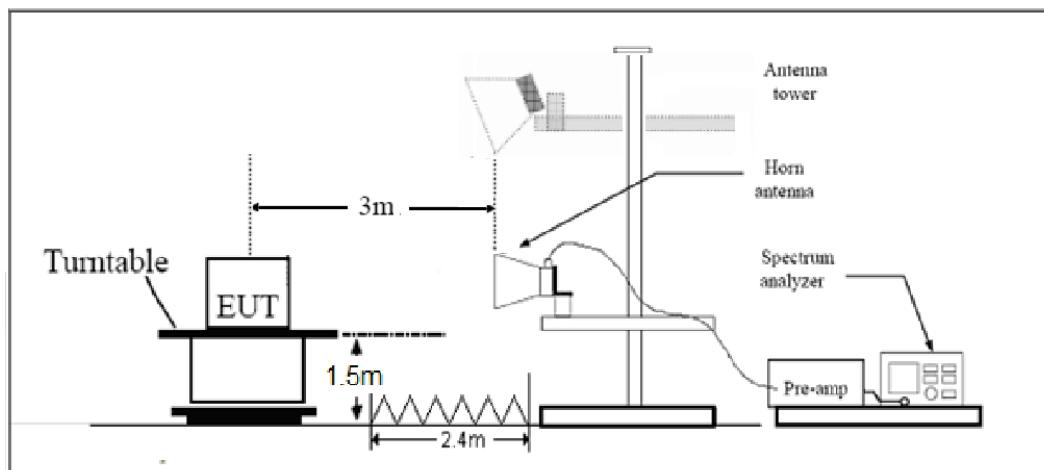
9KHz ~ 30MHz



30MHz ~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

## Limits

Rule Part 15.247(d) specifies that “In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).”

Limit in restricted band

| Frequency of emission (MHz) | Field strength(uV/m) | Field strength(dBuV/m) |
|-----------------------------|----------------------|------------------------|
| 0.009–0.490                 | 2400/F(kHz)          | /                      |
| 0.490–1.705                 | 24000/F(kHz)         | /                      |
| 1.705–30.0                  | 30                   | /                      |
| 30-88                       | 100                  | 40                     |
| 88-216                      | 150                  | 43.5                   |
| 216-960                     | 200                  | 46                     |
| Above960                    | 500                  | 54                     |

## §15.35(b)

There is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

Peak Limit=74 dBuV/m

Average Limit=54 dBuV/m

Spurious Radiated Emissions are permitted in any of the frequency bands listed below:

| MHz                        | MHz                   | MHz             | GHz              |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525   | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905            | 16.80425 - 16.80475   | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128              | 25.5 - 25.67          | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775          | 37.5 - 38.25          | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775          | 73 - 74.6             | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218              | 74.8 - 75.2           | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825          | 108 - 121.94          | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225          | 123 - 138             | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294              | 149.9 - 150.05        | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366              | 156.52475 - 156.52525 | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.7 - 156.9         | 2690 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 162.0125 - 167.17     | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 167.72 - 173.2        | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 240 - 285             | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 322 - 335.4           | 3600 - 4400     | ( <sup>2</sup> ) |
| 13.36 - 13.41              |                       |                 |                  |

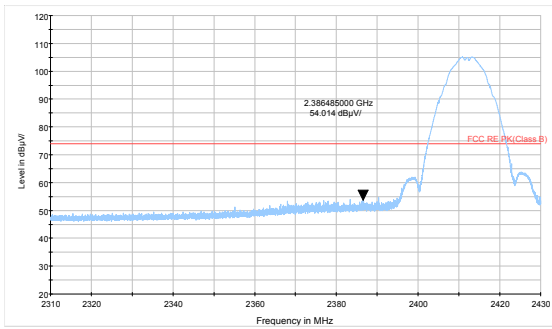
**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ .

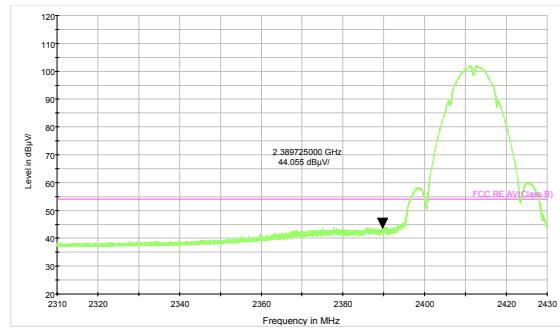
| Frequency    | Uncertainty |
|--------------|-------------|
| 9KHz-30MHz   | 3.55 dB     |
| 30MHz-200MHz | 4.02 dB     |
| 200MHz-1GHz  | 3.28 dB     |
| 1-18GHz      | 3.70 dB     |
| 18-26.5GHz   | 5.78 dB     |



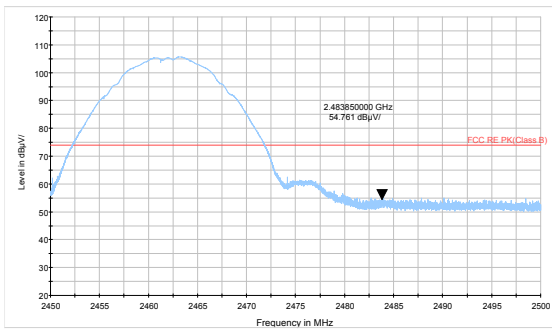
## Test Results:



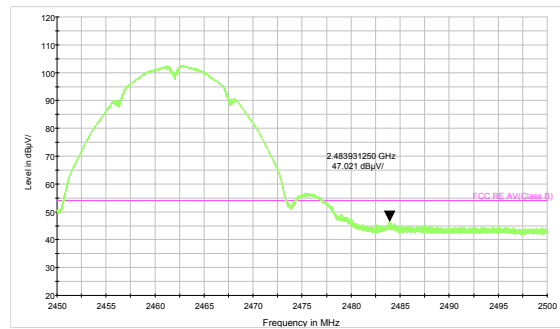
802.11b-Channel 1 Peak



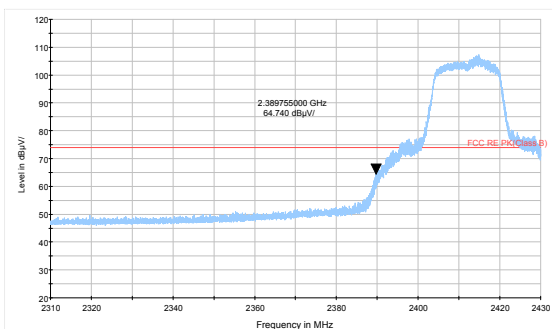
802.11b-Channel 1 Average



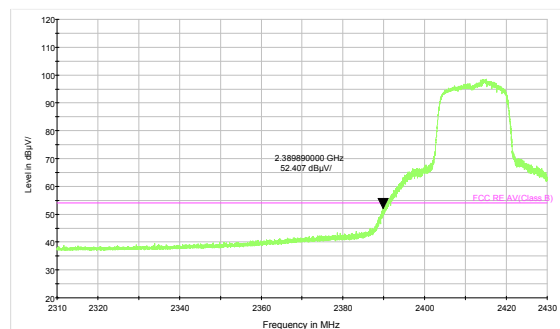
802.11b-Channel 11 Peak



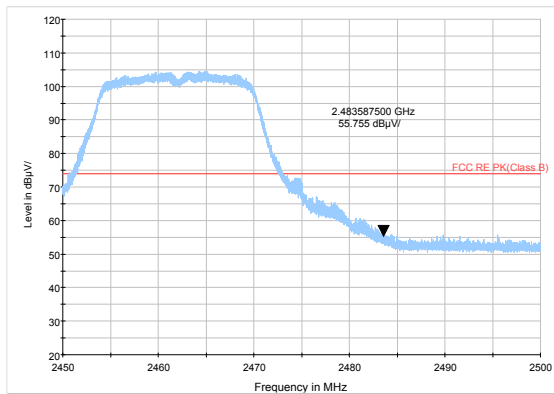
802.11b-Channel 11 Average



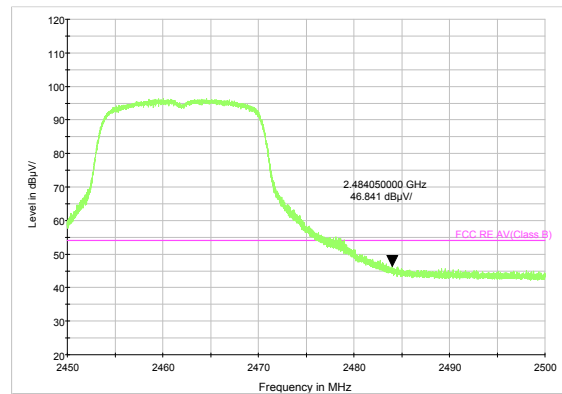
802.11g-Channel 1 Peak



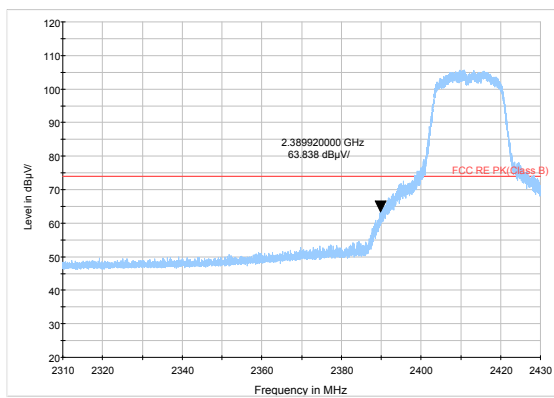
802.11g-Channel 1 Average



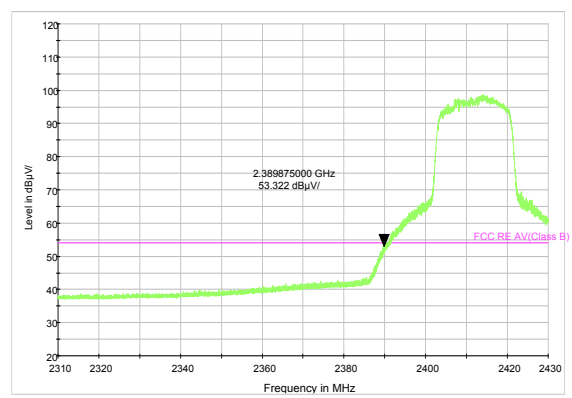
802.11g-Channel 11 Peak



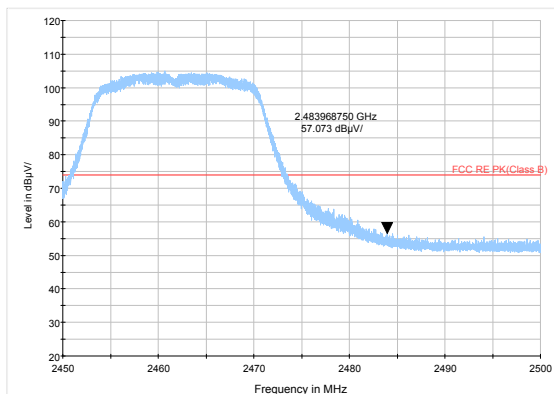
802.11g-Channel 11 Average



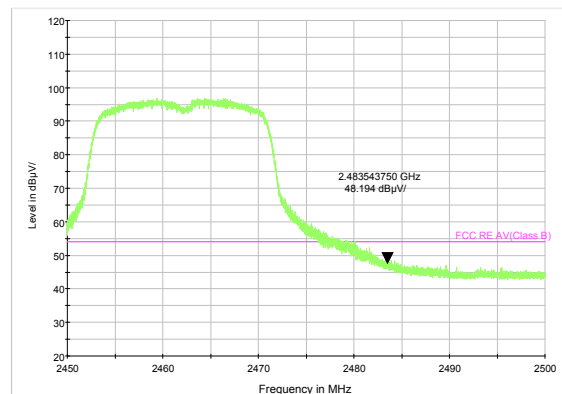
802.11n HT20 -Channel 1 Peak



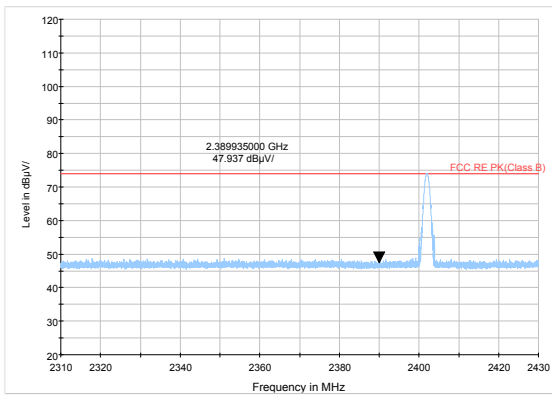
802.11n HT20 -Channel 1 Average



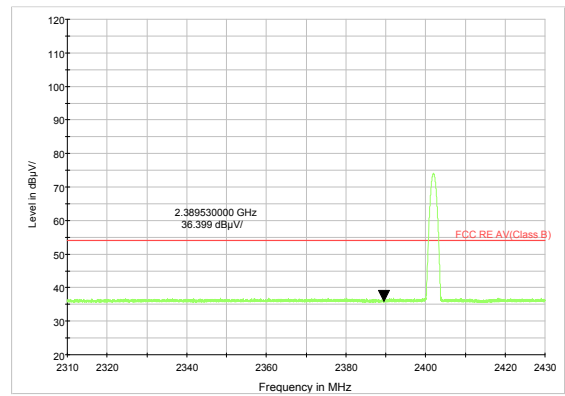
802.11n HT20 -Channel 11 Peak



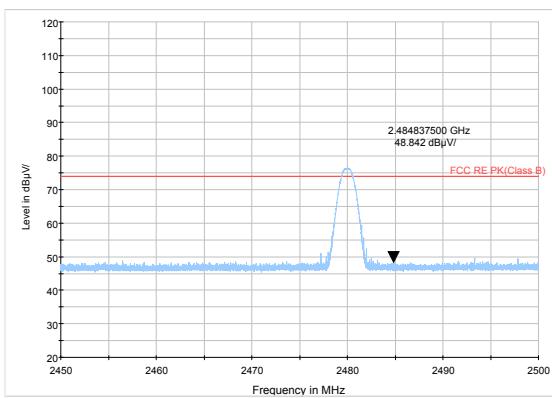
802.11n HT20 -Channel 11 Average



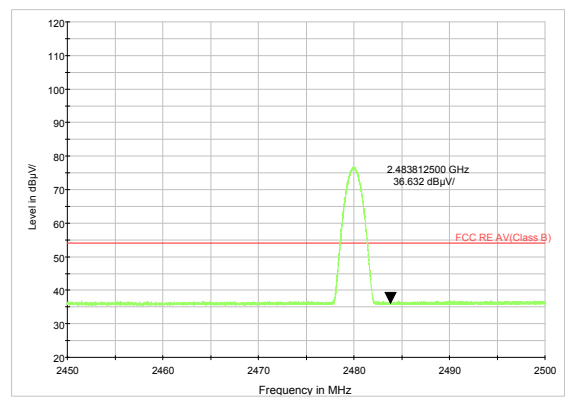
BLE Channel 0 Peak



BLE Channel 0 Average



BLE Channel 39 Peak



BLE Channel 39 Average

## Result of RE

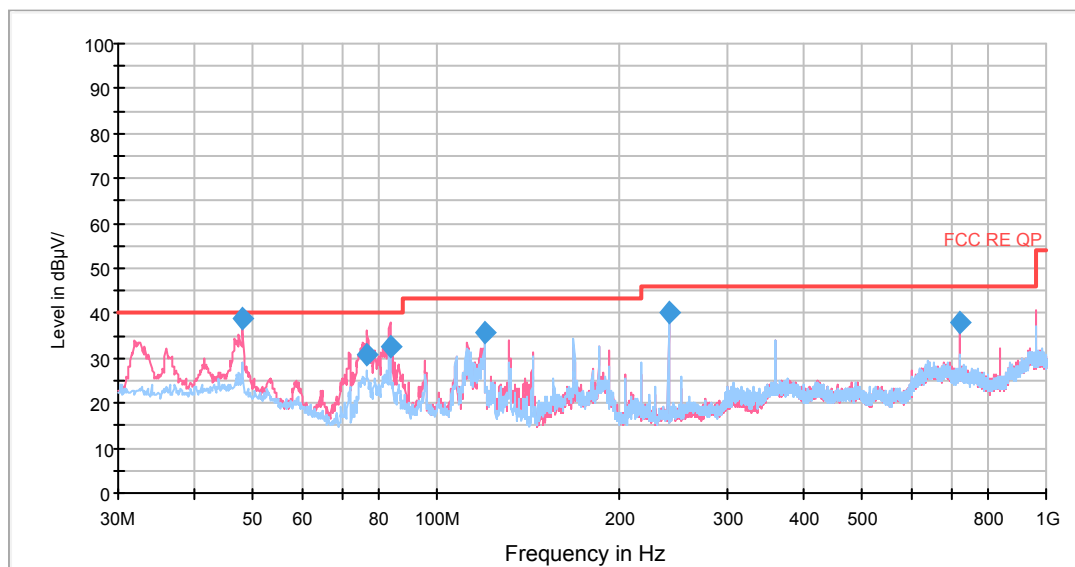
### Test result

Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the Emissions in the frequency band 9kHz-30MHz and 18GHz-26.5GHz are more than 20dB below the limit are not reported.

The following graphs display the maximum values of horizontal and vertical by software.  
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes with all channels, 802.11b CH1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

### Continuous TX mode:



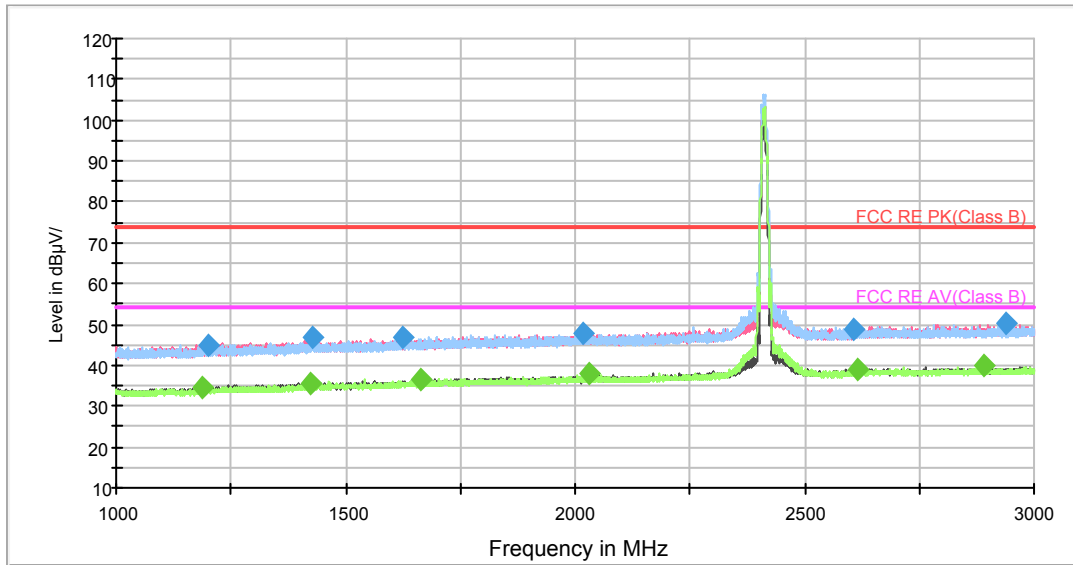
Radiates Emission from 30MHz to 1GHz

| Frequency (MHz) | Quasi-Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 47.985138       | 38.6                | 100.0       | V            | 75.0          | -4.9                | 1.4         | 40.0           |
| 76.810494       | 30.8                | 125.0       | V            | 10.0          | -13.4               | 9.2         | 40.0           |
| 83.865412       | 32.6                | 125.0       | V            | 251.0         | -11.7               | 7.4         | 40.0           |
| 120.027581      | 35.7                | 100.0       | V            | 191.0         | -13.3               | 7.8         | 43.5           |
| 240.005000      | 40.0                | 120.0       | H            | 292.0         | -11.7               | 6.0         | 46.0           |
| 720.034500      | 37.8                | 100.0       | V            | 91.0          | -1.6                | 8.2         | 46.0           |

Remark: 1. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

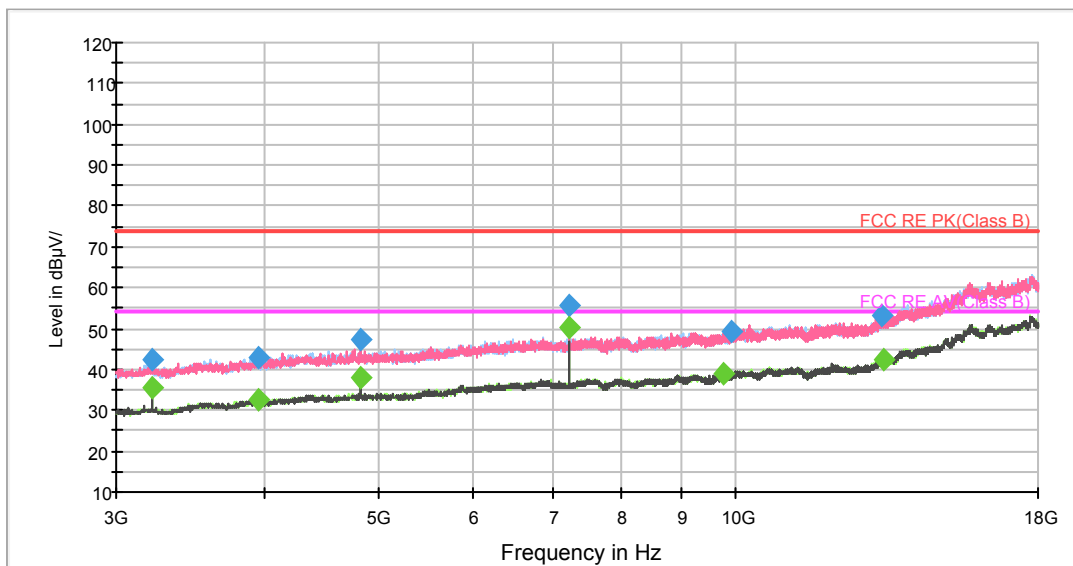
2. Margin = Limit – Quasi-Peak

802.11b CH1



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

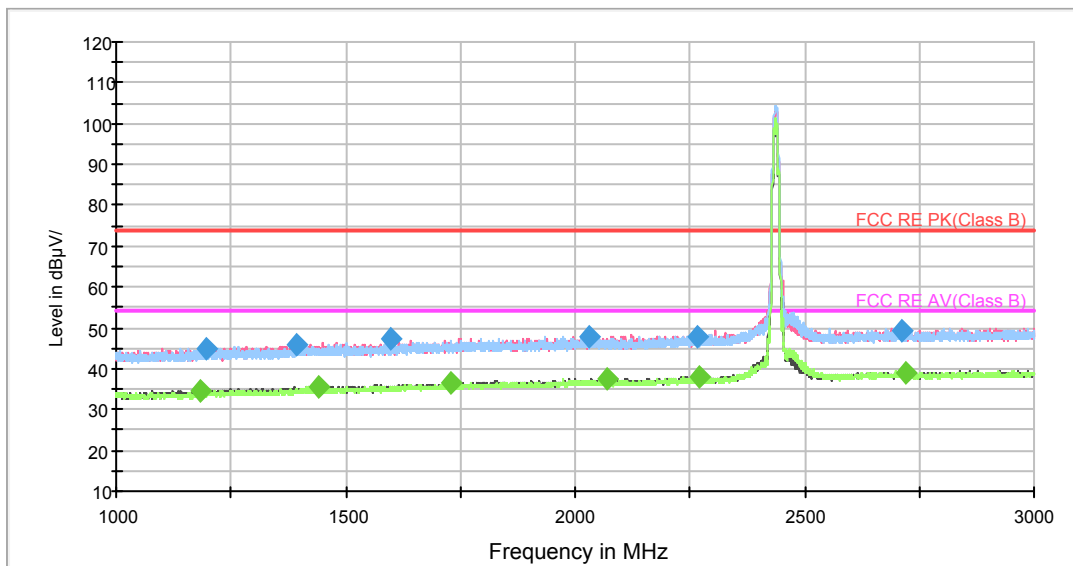
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1199.750000     | 45.0          | 100.0       | V            | 95.0          | 0.7                 | 29.0        | 74.0           |
| 1429.250000     | 46.6          | 200.0       | V            | 124.0         | 2.0                 | 27.4        | 74.0           |
| 1625.750000     | 47.0          | 200.0       | H            | 202.0         | 2.7                 | 27.0        | 74.0           |
| 2017.000000     | 48.0          | 200.0       | H            | 344.0         | 4.3                 | 26.0        | 74.0           |
| 2608.750000     | 48.8          | 100.0       | V            | 314.0         | 6.7                 | 25.2        | 74.0           |
| 2937.000000     | 50.0          | 100.0       | V            | 0.0           | 7.9                 | 24.0        | 74.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

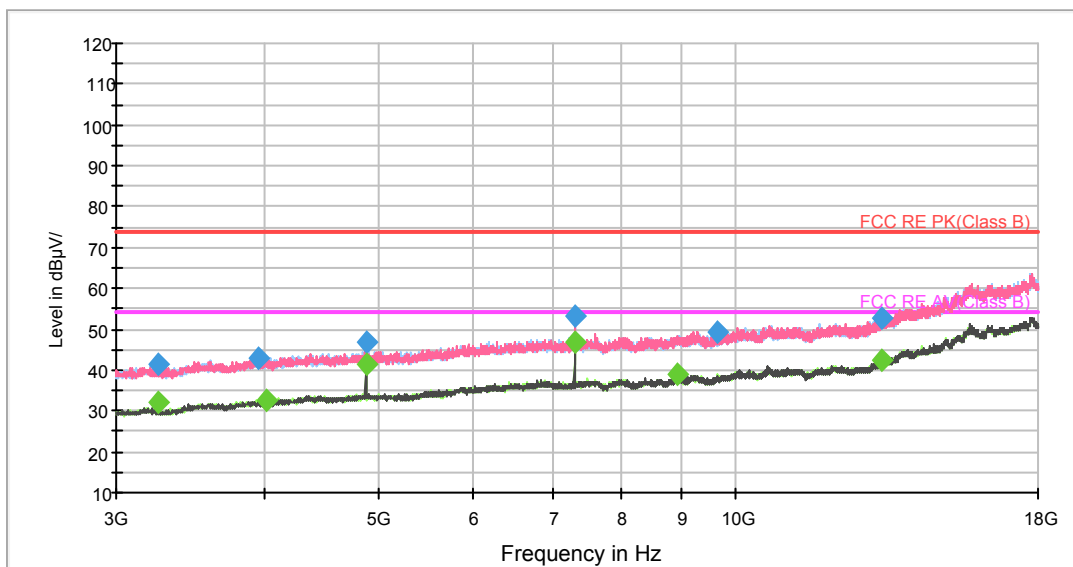
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1188.000000     | 34.5             | 200.0       | V            | 44.0          | 0.7                 | 19.5        | 54.0           |
| 1424.000000     | 35.6             | 200.0       | H            | 95.0          | 2.0                 | 18.4        | 54.0           |
| 1664.000000     | 36.6             | 200.0       | V            | 80.0          | 2.9                 | 17.4        | 54.0           |
| 2028.500000     | 38.1             | 200.0       | V            | 146.0         | 4.4                 | 15.9        | 54.0           |
| 2614.250000     | 38.8             | 200.0       | H            | 127.0         | 6.7                 | 15.2        | 54.0           |
| 2892.500000     | 39.9             | 100.0       | V            | 336.0         | 7.7                 | 14.1        | 54.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

## 802.11b CH6



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

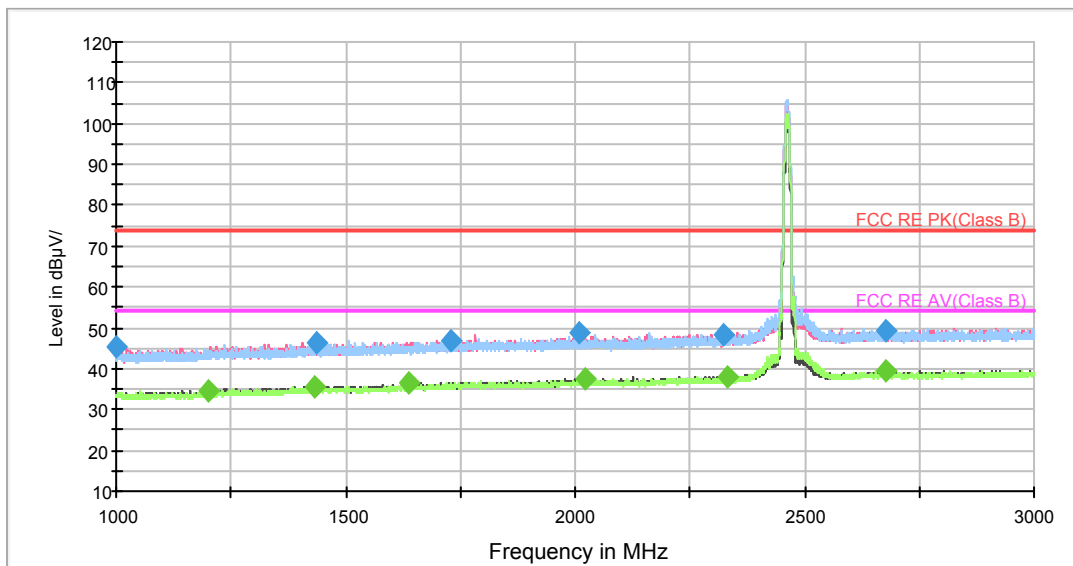
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1197.250000     | 45.0          | 100.0       | V            | 183.0         | 0.7                 | 29.0        | 74.0           |
| 1392.000000     | 45.9          | 100.0       | V            | 340.0         | 1.8                 | 28.1        | 74.0           |
| 1597.000000     | 47.1          | 200.0       | V            | 43.0          | 2.5                 | 26.9        | 74.0           |
| 2031.750000     | 48.0          | 100.0       | H            | 140.0         | 4.4                 | 26.0        | 74.0           |
| 2267.500000     | 47.7          | 100.0       | V            | 326.0         | 5.3                 | 26.3        | 74.0           |
| 2711.000000     | 49.3          | 200.0       | H            | 1.0           | 7.1                 | 24.7        | 74.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

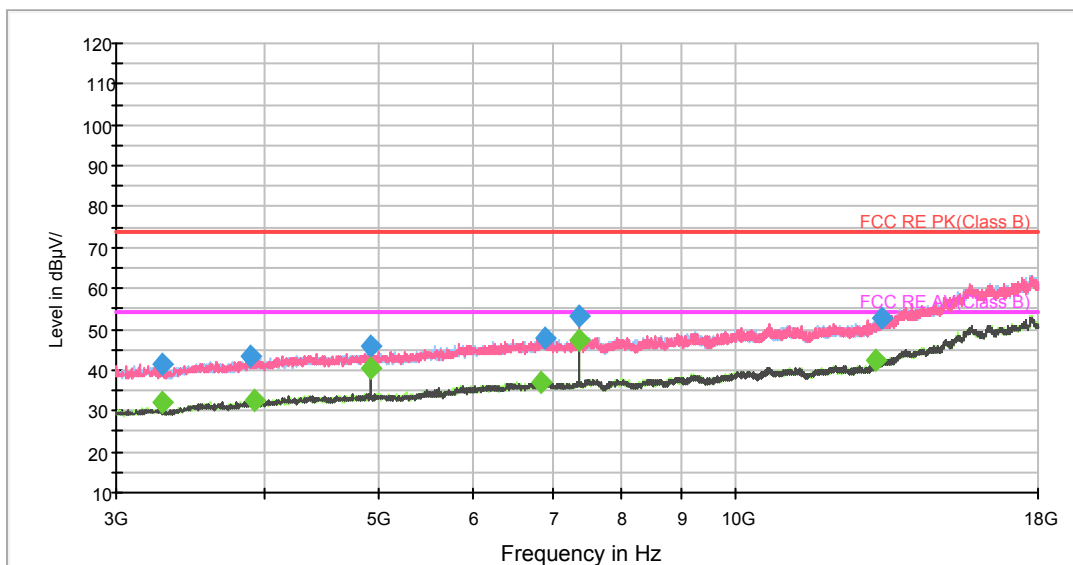
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1182.750000     | 34.6             | 100.0       | H            | 148.0         | 0.6                 | 19.4        | 54.0           |
| 1439.750000     | 35.6             | 200.0       | V            | 172.0         | 2.0                 | 18.4        | 54.0           |
| 1730.750000     | 36.6             | 100.0       | V            | 36.0          | 3.1                 | 17.4        | 54.0           |
| 2068.000000     | 37.4             | 100.0       | V            | 296.0         | 4.4                 | 16.6        | 54.0           |
| 2268.750000     | 38.2             | 100.0       | V            | 168.0         | 5.3                 | 15.8        | 54.0           |
| 2720.000000     | 38.8             | 200.0       | H            | 185.0         | 7.1                 | 15.2        | 54.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

# 802.11b CH11



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

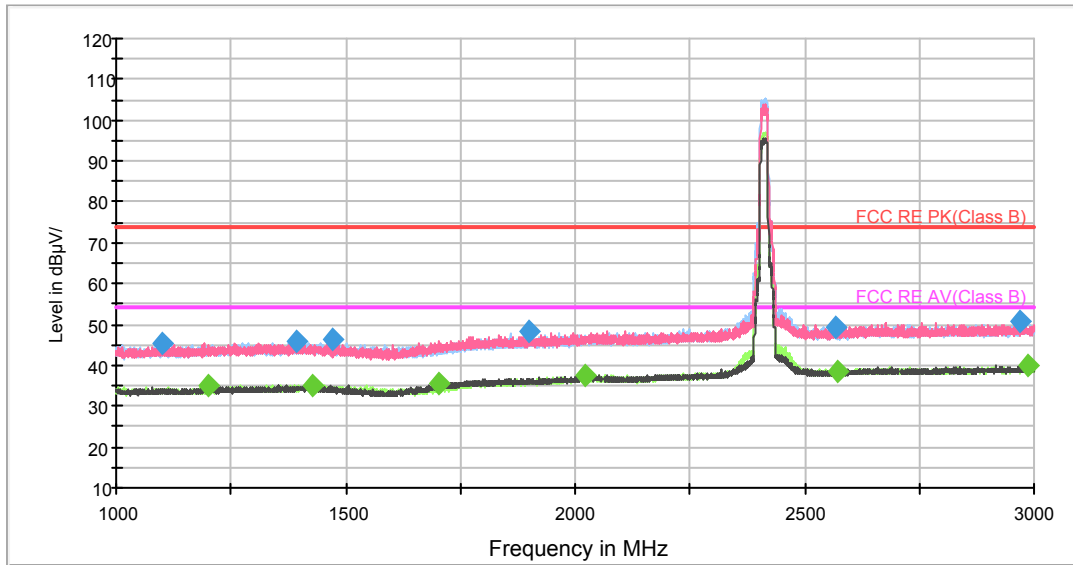
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1002.000000     | 45.2          | 100.0       | V            | 207.0         | -0.5                | 28.8        | 74.0           |
| 1436.750000     | 46.3          | 200.0       | H            | 0.0           | 2.0                 | 27.7        | 74.0           |
| 1728.500000     | 47.0          | 100.0       | H            | 239.0         | 3.1                 | 27.0        | 74.0           |
| 2006.750000     | 48.8          | 100.0       | V            | 341.0         | 4.3                 | 25.2        | 74.0           |
| 2322.750000     | 48.1          | 100.0       | H            | 239.0         | 5.5                 | 25.9        | 74.0           |
| 2678.750000     | 49.1          | 200.0       | V            | 298.0         | 7.0                 | 24.9        | 74.0           |

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

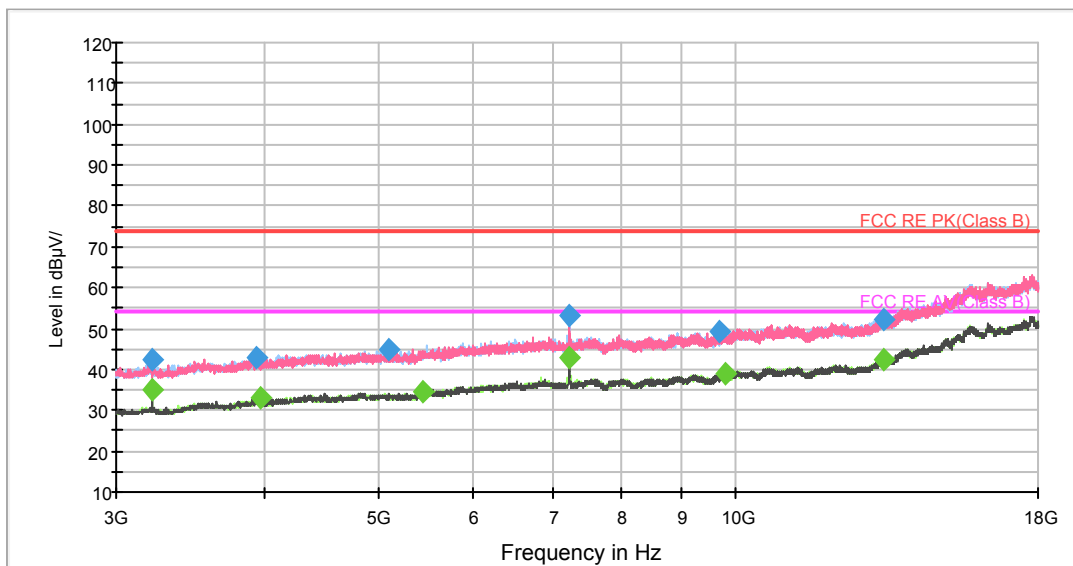
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1199.750000     | 34.5             | 200.0       | V            | 100.0         | 0.7                 | 19.5        | 54.0           |
| 1434.000000     | 35.6             | 200.0       | V            | 39.0          | 2.0                 | 18.4        | 54.0           |
| 1636.000000     | 36.7             | 100.0       | V            | 162.0         | 2.7                 | 17.3        | 54.0           |
| 2024.000000     | 37.6             | 200.0       | V            | 55.0          | 4.3                 | 16.4        | 54.0           |
| 2331.750000     | 38.2             | 200.0       | V            | 18.0          | 5.5                 | 15.8        | 54.0           |
| 2679.000000     | 39.3             | 100.0       | V            | 33.0          | 7.0                 | 14.7        | 54.0           |

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

# 802.11g CH1



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

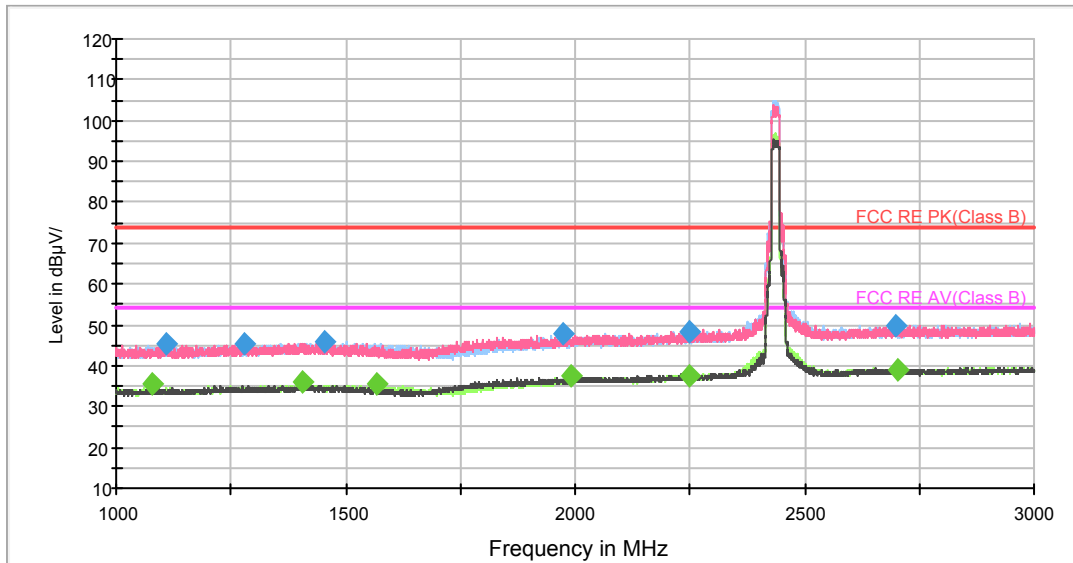
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1099.500000     | 45.3          | 200.0       | V            | 248.0         | 0.1                 | 28.7        | 74.0           |
| 1391.000000     | 46.1          | 100.0       | V            | 45.0          | 1.8                 | 27.9        | 74.0           |
| 1472.500000     | 46.4          | 200.0       | V            | 0.0           | 2.1                 | 27.6        | 74.0           |
| 1899.750000     | 48.2          | 100.0       | V            | 165.0         | 3.8                 | 25.8        | 74.0           |
| 2565.750000     | 49.4          | 100.0       | V            | 112.0         | 6.4                 | 24.6        | 74.0           |
| 2971.000000     | 50.8          | 100.0       | V            | 0.0           | 8.1                 | 23.2        | 74.0           |

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

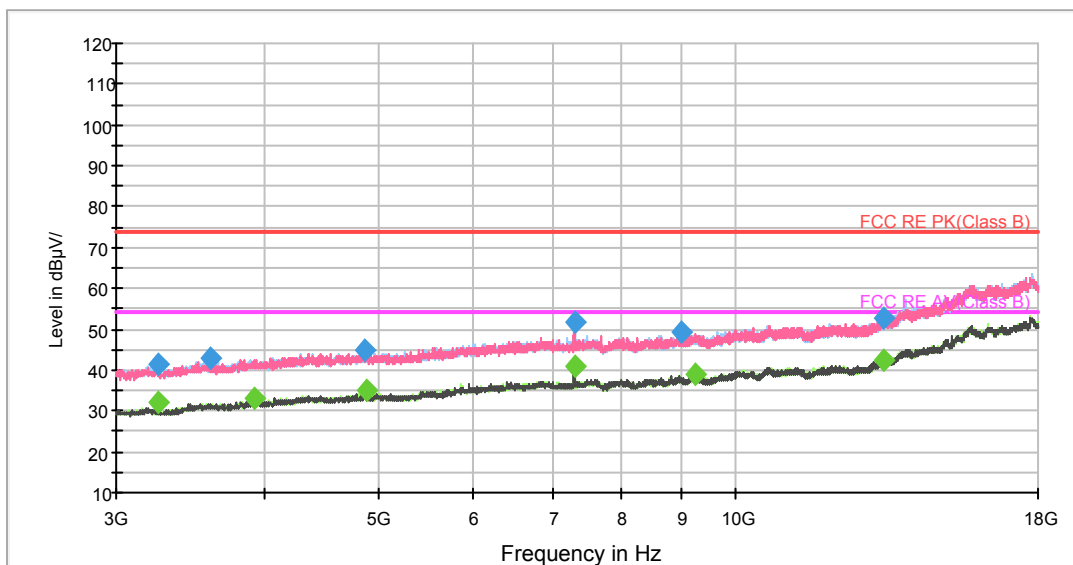
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1200.500000     | 35.1             | 200.0       | V            | 301.0         | 0.8                 | 18.9        | 54.0           |
| 1427.250000     | 35.1             | 200.0       | V            | 217.0         | 2.0                 | 18.9        | 54.0           |
| 1704.500000     | 35.6             | 100.0       | V            | 311.0         | 3.0                 | 18.4        | 54.0           |
| 2020.750000     | 37.5             | 100.0       | V            | 89.0          | 4.3                 | 16.5        | 54.0           |
| 2570.500000     | 38.5             | 200.0       | H            | 160.0         | 6.5                 | 15.5        | 54.0           |
| 2986.000000     | 39.9             | 200.0       | H            | 183.0         | 8.2                 | 14.1        | 54.0           |

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

# 802.11g CH6



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

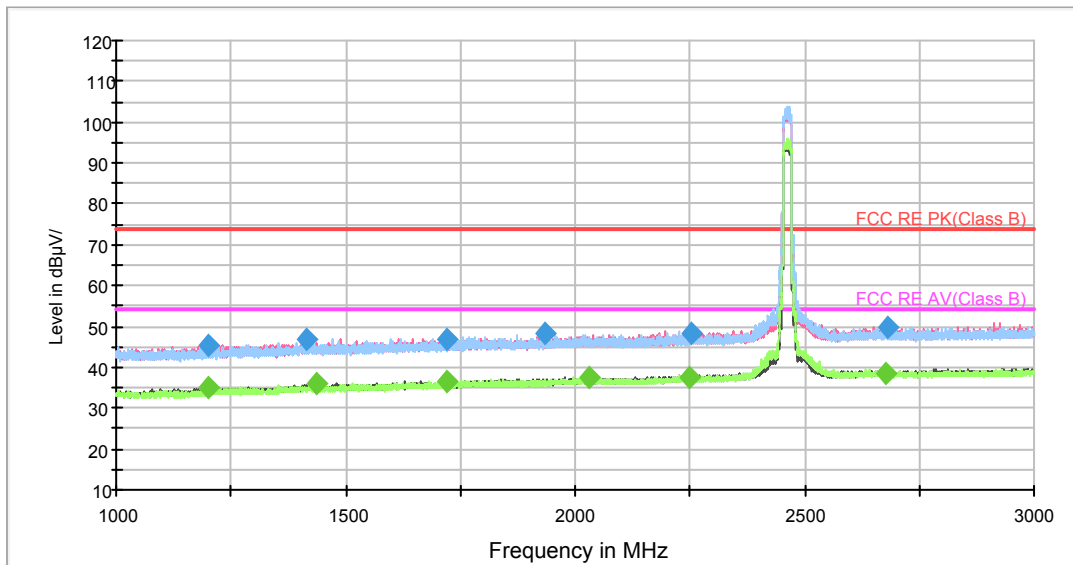
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1110.250000     | 45.5          | 200.0       | V            | 124.0         | 0.1                 | 28.5        | 74.0           |
| 1280.000000     | 45.6          | 100.0       | H            | 262.0         | 1.1                 | 28.4        | 74.0           |
| 1452.250000     | 45.9          | 100.0       | H            | 0.0           | 2.0                 | 28.1        | 74.0           |
| 1973.500000     | 47.8          | 100.0       | H            | 55.0          | 4.2                 | 26.2        | 74.0           |
| 2247.000000     | 48.4          | 200.0       | H            | 128.0         | 5.2                 | 25.6        | 74.0           |
| 2698.500000     | 49.9          | 200.0       | V            | 270.0         | 7.1                 | 24.1        | 74.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

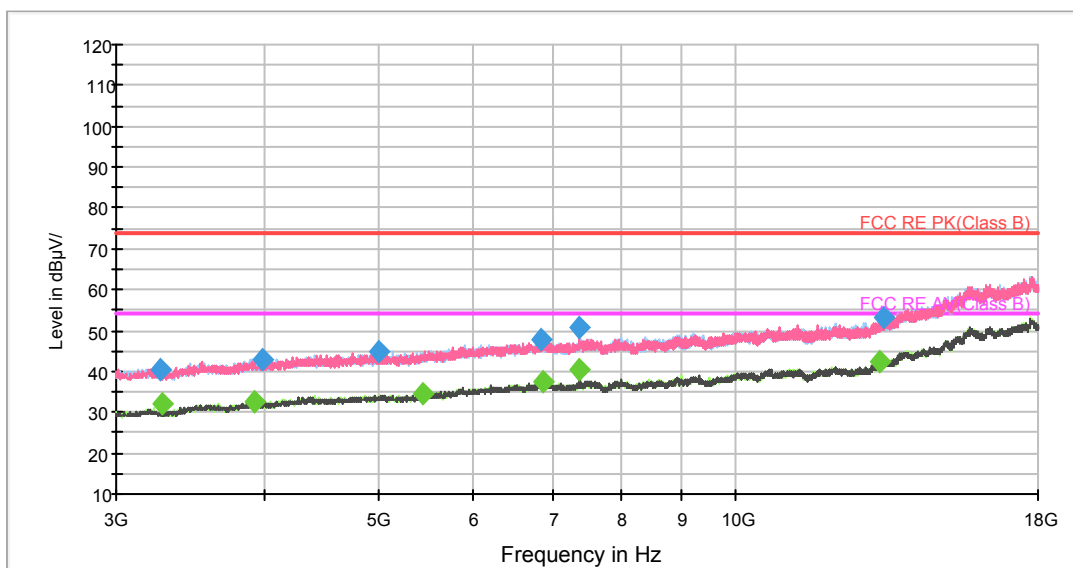
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1079.750000     | 35.5             | 100.0       | V            | 126.0         | -0.1                | 18.5        | 54.0           |
| 1407.000000     | 35.8             | 100.0       | H            | 123.0         | 1.9                 | 18.2        | 54.0           |
| 1568.250000     | 35.4             | 200.0       | H            | 39.0          | 2.4                 | 18.6        | 54.0           |
| 1990.000000     | 37.3             | 100.0       | V            | 200.0         | 4.2                 | 16.7        | 54.0           |
| 2247.500000     | 37.5             | 200.0       | H            | 0.0           | 5.2                 | 16.5        | 54.0           |
| 2701.250000     | 38.8             | 200.0       | H            | 17.0          | 7.1                 | 15.2        | 54.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

802.11g CH11



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

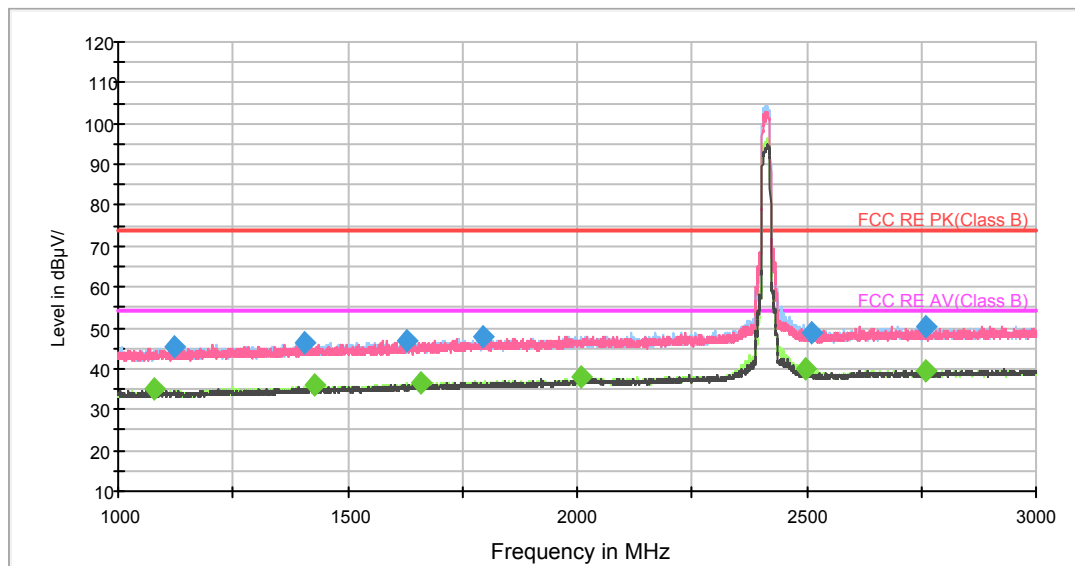
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1199.750000     | 45.4          | 200.0       | H            | 206.0         | 0.7                 | 28.6        | 74.0           |
| 1415.750000     | 46.8          | 100.0       | V            | 27.0          | 1.9                 | 27.2        | 74.0           |
| 1720.000000     | 47.0          | 200.0       | H            | 259.0         | 3.1                 | 27.0        | 74.0           |
| 1936.500000     | 48.1          | 100.0       | V            | 265.0         | 3.9                 | 25.9        | 74.0           |
| 2254.250000     | 48.3          | 200.0       | V            | 17.0          | 5.2                 | 25.7        | 74.0           |
| 2680.000000     | 49.8          | 200.0       | V            | 305.0         | 7.0                 | 24.2        | 74.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

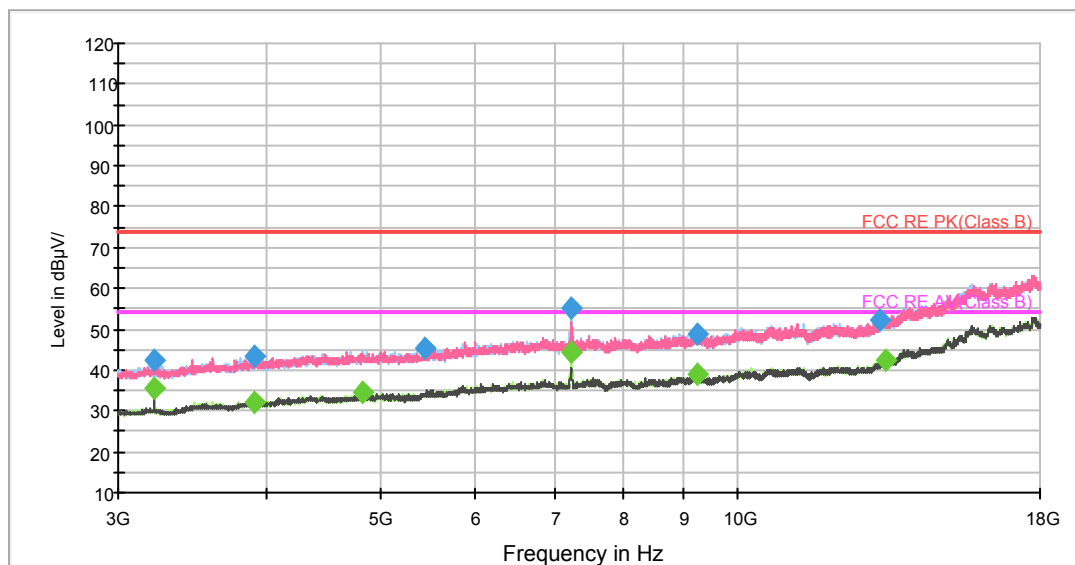
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1200.000000     | 35.0             | 200.0       | H            | 168.0         | 0.7                 | 19.0        | 54.0           |
| 1436.000000     | 35.8             | 100.0       | H            | 348.0         | 2.0                 | 18.2        | 54.0           |
| 1721.250000     | 36.6             | 200.0       | V            | 198.0         | 3.1                 | 17.4        | 54.0           |
| 2030.750000     | 37.5             | 200.0       | V            | 243.0         | 4.4                 | 16.5        | 54.0           |
| 2248.000000     | 37.6             | 200.0       | V            | 123.0         | 5.2                 | 16.4        | 54.0           |
| 2678.500000     | 38.7             | 100.0       | V            | 258.0         | 7.0                 | 15.3        | 54.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

# 802.11n (HT20) CH1



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

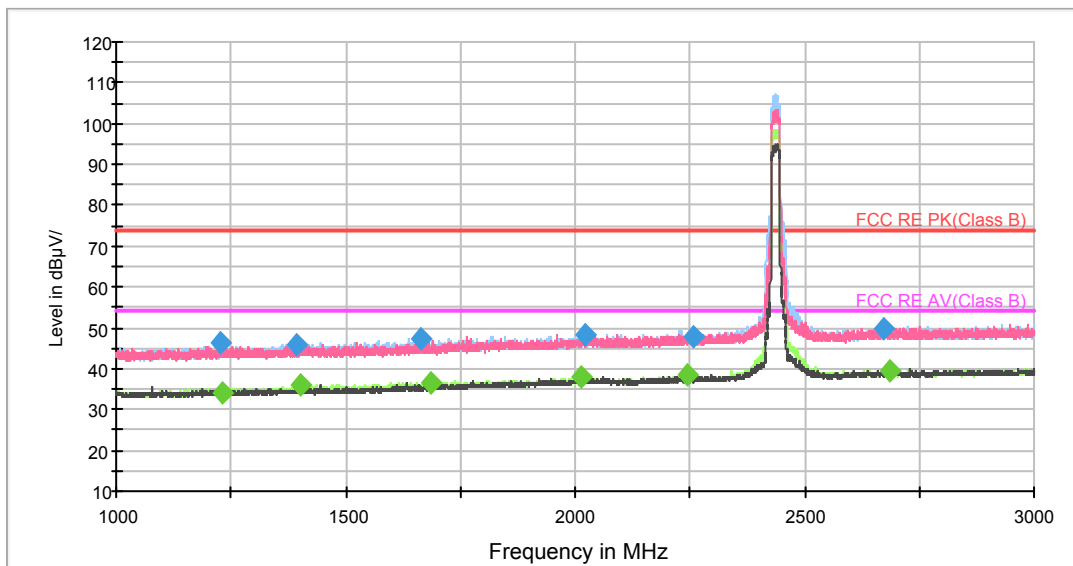
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1122.250000     | 45.4          | 100.0       | H            | 187.0         | 0.2                 | 28.6        | 74.0           |
| 1406.000000     | 46.5          | 200.0       | H            | 66.0          | 1.9                 | 27.5        | 74.0           |
| 1630.500000     | 47.0          | 200.0       | H            | 151.0         | 2.7                 | 27.0        | 74.0           |
| 1796.000000     | 48.0          | 100.0       | V            | 292.0         | 3.4                 | 26.0        | 74.0           |
| 2509.750000     | 49.0          | 200.0       | H            | 151.0         | 6.1                 | 25.0        | 74.0           |
| 2758.250000     | 50.4          | 100.0       | H            | 291.0         | 7.2                 | 23.6        | 74.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

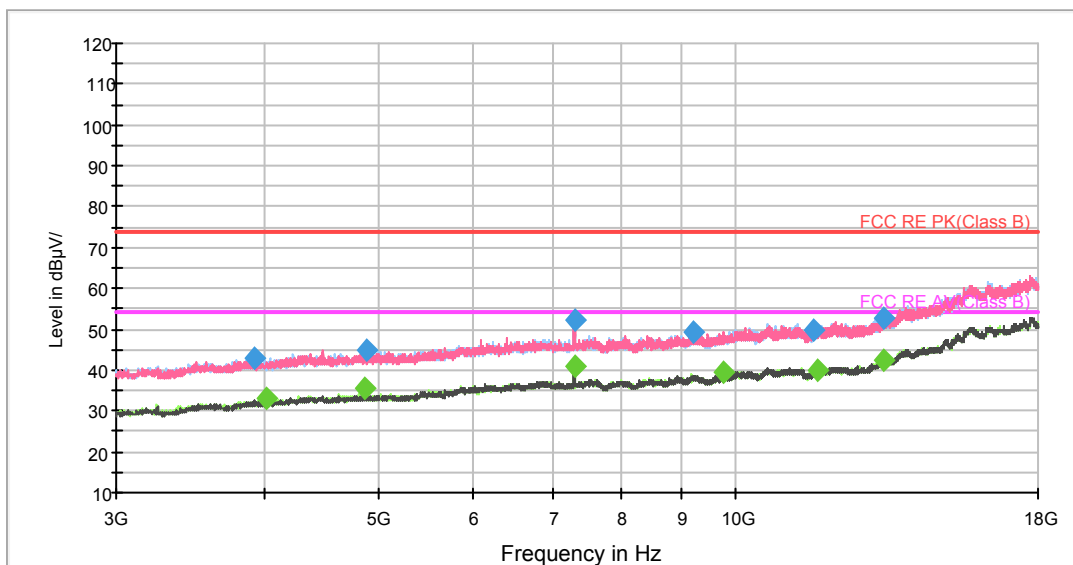
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1080.250000     | 34.9             | 100.0       | V            | 147.0         | -0.1                | 19.1        | 54.0           |
| 1426.500000     | 35.9             | 200.0       | H            | 151.0         | 2.0                 | 18.1        | 54.0           |
| 1661.250000     | 36.7             | 200.0       | H            | 45.0          | 2.8                 | 17.3        | 54.0           |
| 2009.000000     | 37.9             | 100.0       | V            | 0.0           | 4.3                 | 16.1        | 54.0           |
| 2499.250000     | 40.0             | 100.0       | H            | 239.0         | 6.1                 | 14.0        | 54.0           |
| 2758.750000     | 39.3             | 200.0       | H            | 195.0         | 7.2                 | 14.7        | 54.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

# 802.11n (HT20) CH6



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

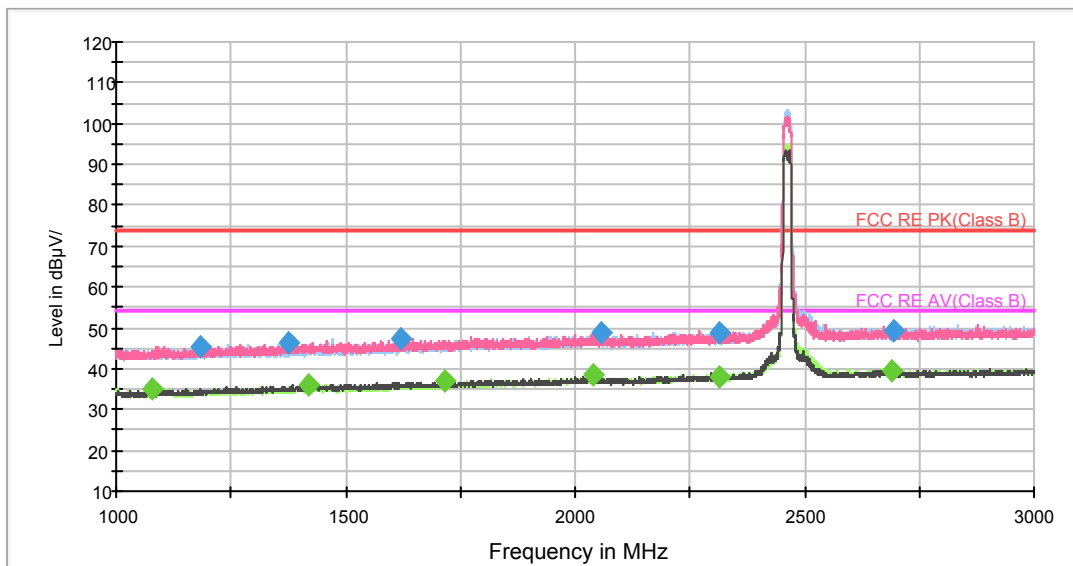
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1229.250000     | 46.1          | 200.0       | H            | 5.0           | 0.9                 | 27.9        | 74.0           |
| 1392.750000     | 45.9          | 200.0       | H            | 20.0          | 1.8                 | 28.1        | 74.0           |
| 1661.750000     | 47.4          | 200.0       | H            | 124.0         | 2.8                 | 26.6        | 74.0           |
| 2021.750000     | 48.5          | 200.0       | H            | 163.0         | 4.3                 | 25.5        | 74.0           |
| 2258.250000     | 47.9          | 200.0       | V            | 223.0         | 5.2                 | 26.1        | 74.0           |
| 2673.250000     | 49.7          | 100.0       | H            | 225.0         | 7.0                 | 24.3        | 74.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

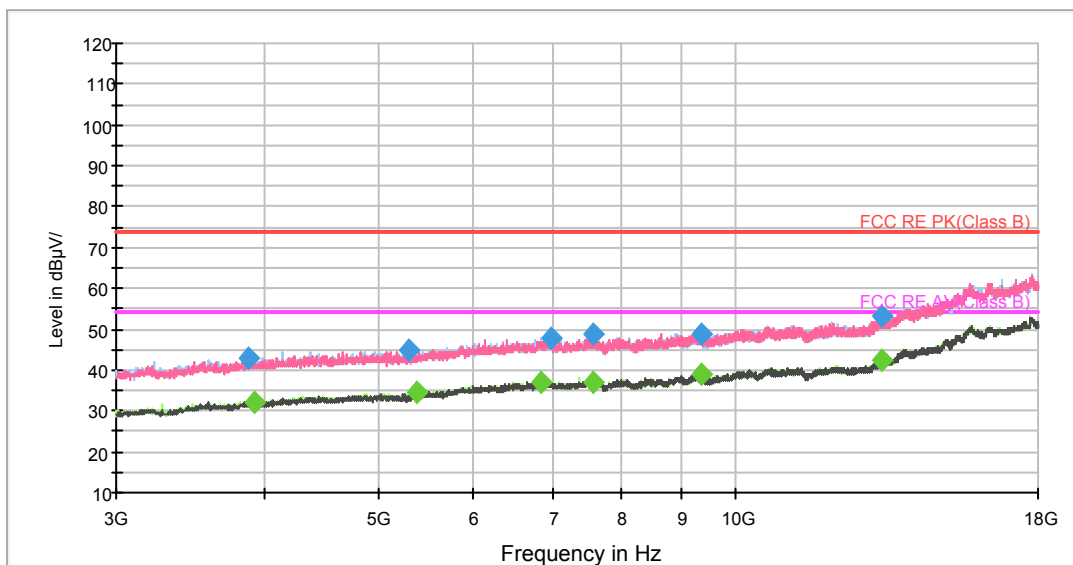
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1232.250000     | 34.1             | 200.0       | H            | 27.0          | 0.9                 | 19.9        | 54.0           |
| 1403.000000     | 35.9             | 200.0       | H            | 42.0          | 1.9                 | 18.1        | 54.0           |
| 1683.750000     | 36.7             | 200.0       | H            | 269.0         | 2.9                 | 17.3        | 54.0           |
| 2012.000000     | 37.9             | 200.0       | H            | 57.0          | 4.3                 | 16.1        | 54.0           |
| 2245.000000     | 38.4             | 200.0       | H            | 139.0         | 5.2                 | 15.6        | 54.0           |
| 2683.750000     | 39.4             | 200.0       | V            | 275.0         | 7.0                 | 14.6        | 54.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

# 802.11n (HT20) CH11



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

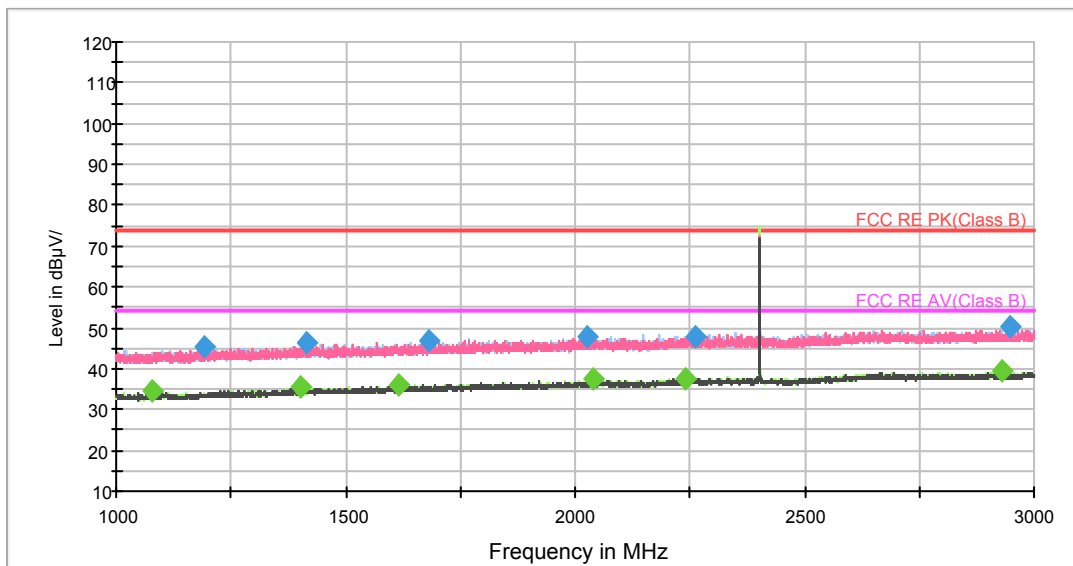
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1183.500000     | 45.3          | 200.0       | V            | 284.0         | 0.6                 | 28.7        | 74.0           |
| 1377.500000     | 46.5          | 200.0       | V            | 224.0         | 1.7                 | 27.5        | 74.0           |
| 1618.750000     | 47.4          | 200.0       | V            | 313.0         | 2.6                 | 26.6        | 74.0           |
| 2056.000000     | 48.7          | 200.0       | H            | 1.0           | 4.4                 | 25.3        | 74.0           |
| 2316.000000     | 48.7          | 200.0       | H            | 127.0         | 5.5                 | 25.3        | 74.0           |
| 2695.000000     | 49.2          | 200.0       | H            | 0.0           | 7.0                 | 24.8        | 74.0           |

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

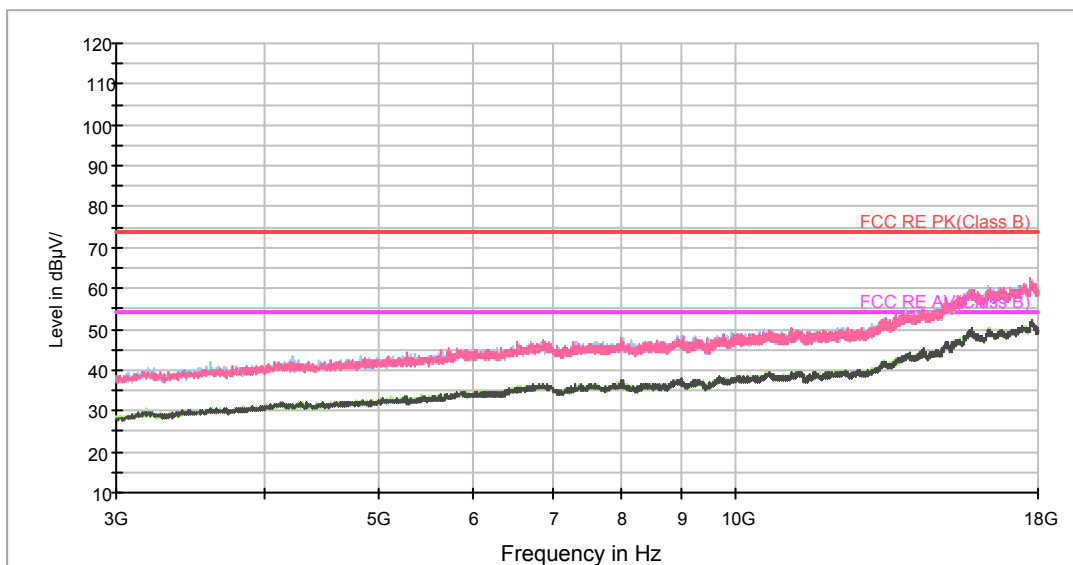
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1080.000000     | 35.2             | 100.0       | V            | 27.0          | -0.1                | 18.8        | 54.0           |
| 1417.500000     | 36.2             | 100.0       | V            | 0.0           | 1.9                 | 17.8        | 54.0           |
| 1715.750000     | 37.1             | 100.0       | V            | 27.0          | 3.1                 | 16.9        | 54.0           |
| 2039.750000     | 38.3             | 200.0       | H            | 61.0          | 4.4                 | 15.7        | 54.0           |
| 2316.250000     | 38.1             | 100.0       | V            | 124.0         | 5.5                 | 15.9        | 54.0           |
| 2689.500000     | 39.3             | 200.0       | H            | 68.0          | 7.0                 | 14.7        | 54.0           |

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

## BLE-Channel 0



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

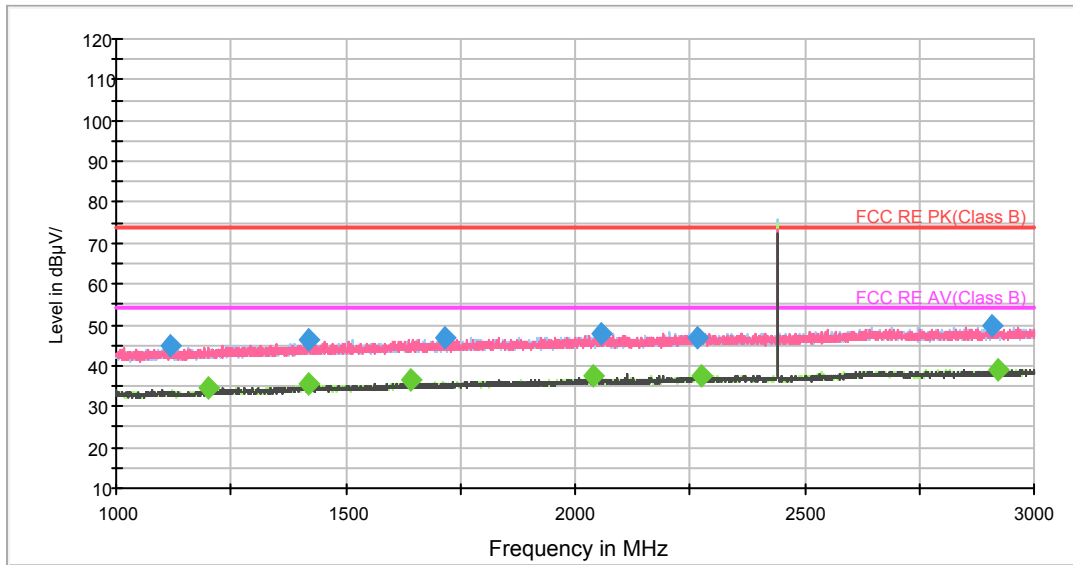
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1190.500000     | 45.4          | 200.0       | V            | 329.0         | 0.7                 | 28.6        | 74.0           |
| 1415.250000     | 46.2          | 200.0       | H            | 270.0         | 1.9                 | 27.8        | 74.0           |
| 1679.250000     | 47.0          | 200.0       | V            | 64.0          | 2.9                 | 27.0        | 74.0           |
| 2024.500000     | 47.8          | 100.0       | H            | 222.0         | 4.3                 | 26.2        | 74.0           |
| 2260.000000     | 47.8          | 200.0       | V            | 311.0         | 5.2                 | 26.2        | 74.0           |
| 2947.750000     | 50.1          | 100.0       | V            | 287.0         | 8.0                 | 23.9        | 74.0           |

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

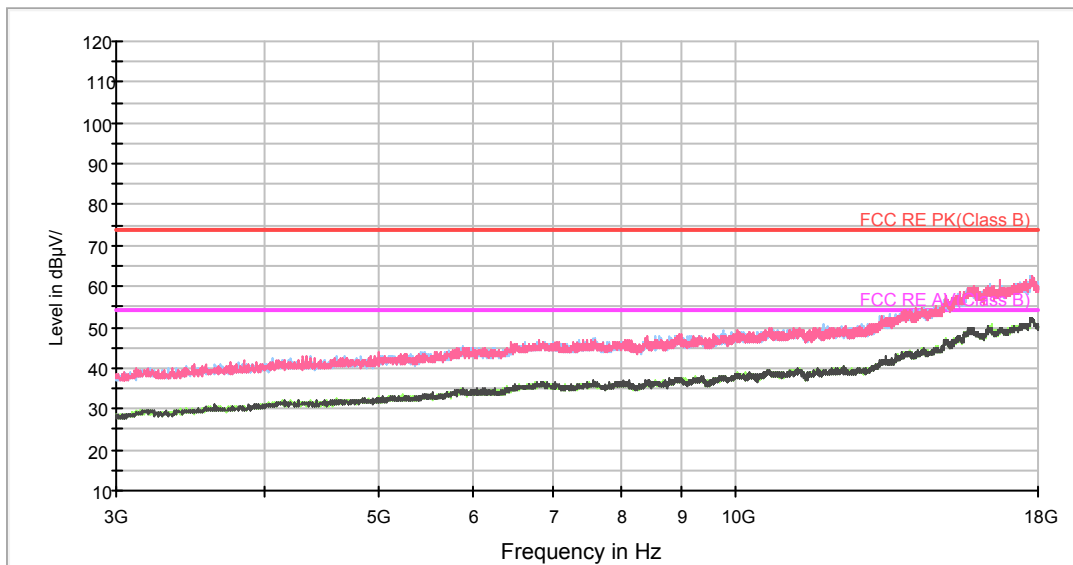
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1080.000000     | 34.5             | 100.0       | V            | 30.0          | -0.1                | 19.5        | 54.0           |
| 1402.500000     | 35.5             | 200.0       | H            | 182.0         | 1.9                 | 18.5        | 54.0           |
| 1617.000000     | 36.2             | 100.0       | H            | 222.0         | 2.6                 | 17.8        | 54.0           |
| 2040.000000     | 37.3             | 200.0       | V            | 338.0         | 4.4                 | 16.7        | 54.0           |
| 2239.500000     | 37.6             | 100.0       | V            | 22.0          | 5.1                 | 16.4        | 54.0           |
| 2931.750000     | 39.2             | 100.0       | V            | 339.0         | 7.9                 | 14.8        | 54.0           |

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

## BLE-Channel 19



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

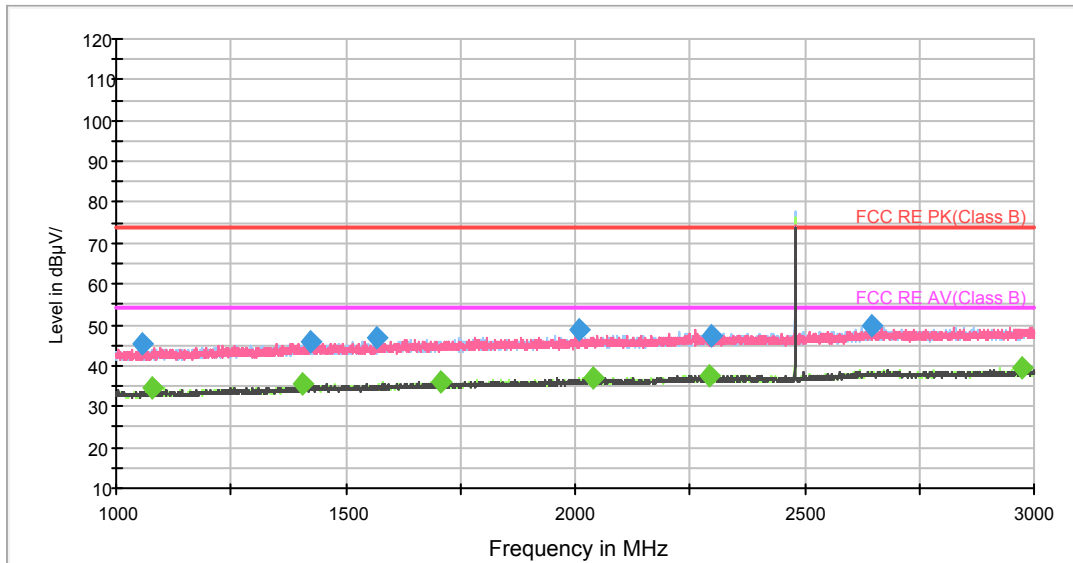
| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1116.000000     | 44.7          | 100.0       | H            | 223.0         | 0.2                 | 29.3        | 74.0           |
| 1420.750000     | 46.2          | 200.0       | V            | 351.0         | 1.9                 | 27.8        | 74.0           |
| 1717.750000     | 46.6          | 200.0       | H            | 103.0         | 3.1                 | 27.4        | 74.0           |
| 2055.000000     | 47.8          | 200.0       | V            | 308.0         | 4.4                 | 26.2        | 74.0           |
| 2265.750000     | 46.9          | 200.0       | H            | 147.0         | 5.3                 | 27.1        | 74.0           |
| 2910.000000     | 49.7          | 200.0       | H            | 33.0          | 7.8                 | 24.3        | 74.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

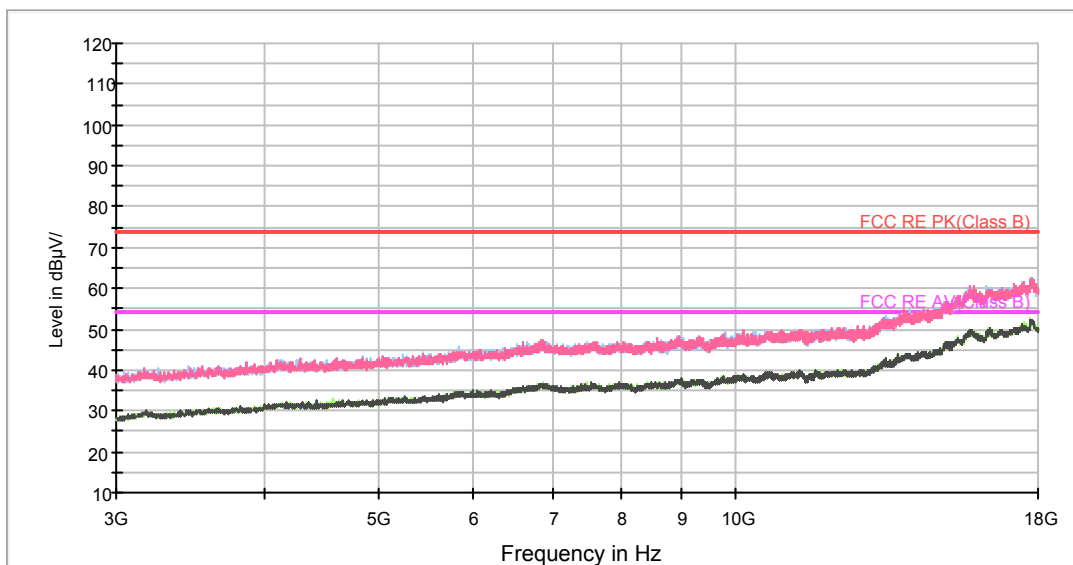
| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1200.750000     | 34.5             | 100.0       | V            | 0.0           | 0.8                 | 19.5        | 54.0           |
| 1420.000000     | 35.3             | 200.0       | V            | 342.0         | 1.9                 | 18.7        | 54.0           |
| 1644.000000     | 36.3             | 100.0       | V            | 335.0         | 2.8                 | 17.7        | 54.0           |
| 2040.250000     | 37.4             | 200.0       | V            | 359.0         | 4.4                 | 16.6        | 54.0           |
| 2276.750000     | 37.4             | 100.0       | H            | 214.0         | 5.3                 | 16.6        | 54.0           |
| 2919.250000     | 39.2             | 200.0       | H            | 138.0         | 7.8                 | 14.8        | 54.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

## BLE-Channel 39



Note: The signal beyond the limit is carrier.  
Radiates Emission from 1GHz to 3GHz



Radiates Emission from 3GHz to 18GHz

| Frequency (MHz) | Peak (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|---------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1056.250000     | 45.1          | 200.0       | V            | 259.0         | -0.3                | 28.9        | 74.0           |
| 1425.000000     | 45.8          | 200.0       | V            | 155.0         | 2.0                 | 28.2        | 74.0           |
| 1567.250000     | 46.9          | 100.0       | V            | 97.0          | 2.4                 | 27.1        | 74.0           |
| 2007.000000     | 48.8          | 100.0       | V            | 340.0         | 4.3                 | 25.2        | 74.0           |
| 2298.000000     | 47.4          | 200.0       | V            | 318.0         | 5.4                 | 26.6        | 74.0           |
| 2647.000000     | 49.7          | 200.0       | V            | 0.0           | 6.9                 | 24.3        | 74.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

| Frequency (MHz) | Average (dBuV/m) | Height (cm) | Polarization | Azimuth (deg) | Correct Factor (dB) | Margin (dB) | Limit (dBuV/m) |
|-----------------|------------------|-------------|--------------|---------------|---------------------|-------------|----------------|
| 1079.750000     | 34.6             | 100.0       | V            | 17.0          | -0.1                | 19.4        | 54.0           |
| 1407.750000     | 35.5             | 200.0       | H            | 279.0         | 1.9                 | 18.5        | 54.0           |
| 1706.000000     | 36.2             | 200.0       | V            | 47.0          | 3.0                 | 17.8        | 54.0           |
| 2040.250000     | 37.0             | 200.0       | V            | 301.0         | 4.4                 | 17.0        | 54.0           |
| 2292.000000     | 37.4             | 100.0       | V            | 149.0         | 5.4                 | 16.6        | 54.0           |
| 2973.500000     | 39.3             | 100.0       | V            | 357.0         | 8.1                 | 14.7        | 54.0           |

**Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)**

## 5.2. Conducted Emission

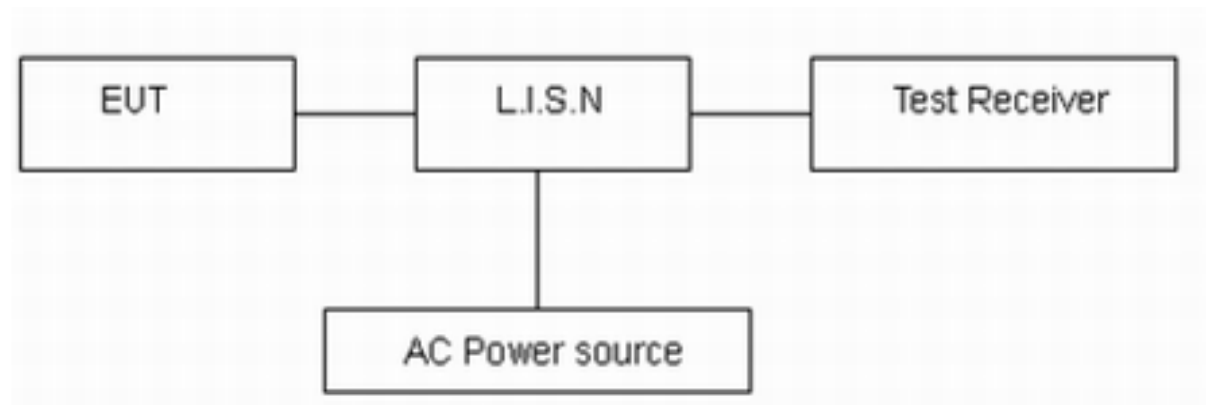
### Ambient condition

| Temperature | Relative humidity | Pressure |
|-------------|-------------------|----------|
| 23°C ~25°C  | 45%~50%           | 101.5kPa |

### Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.10-2013. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.  
The test is in transmitting mode.

### Test Setup



Note: AC Power source is used to change the voltage 110V/60Hz.

### Limits

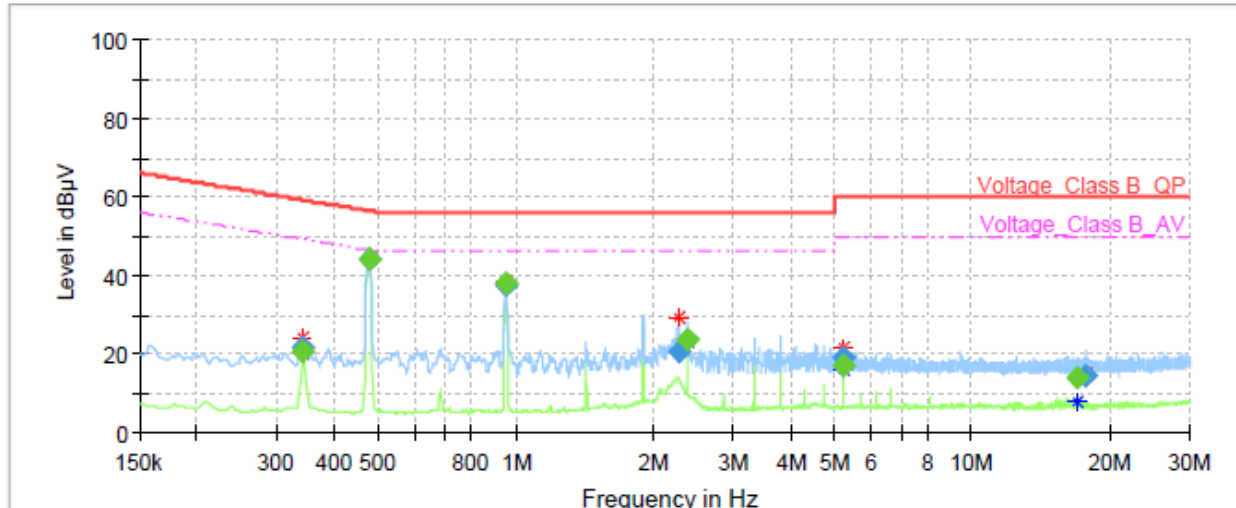
| Frequency<br>(MHz)                                | Conducted Limits(dBμV) |           |
|---------------------------------------------------|------------------------|-----------|
|                                                   | Quasi-peak             | Average   |
| 0.15 - 0.5                                        | 66 to 56 *             | 56 to 46* |
| 0.5 - 5                                           | 56                     | 46        |
| 5 - 30                                            | 60                     | 50        |
| *: Decreases with the logarithm of the frequency. |                        |           |

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U = 2.69$  dB.

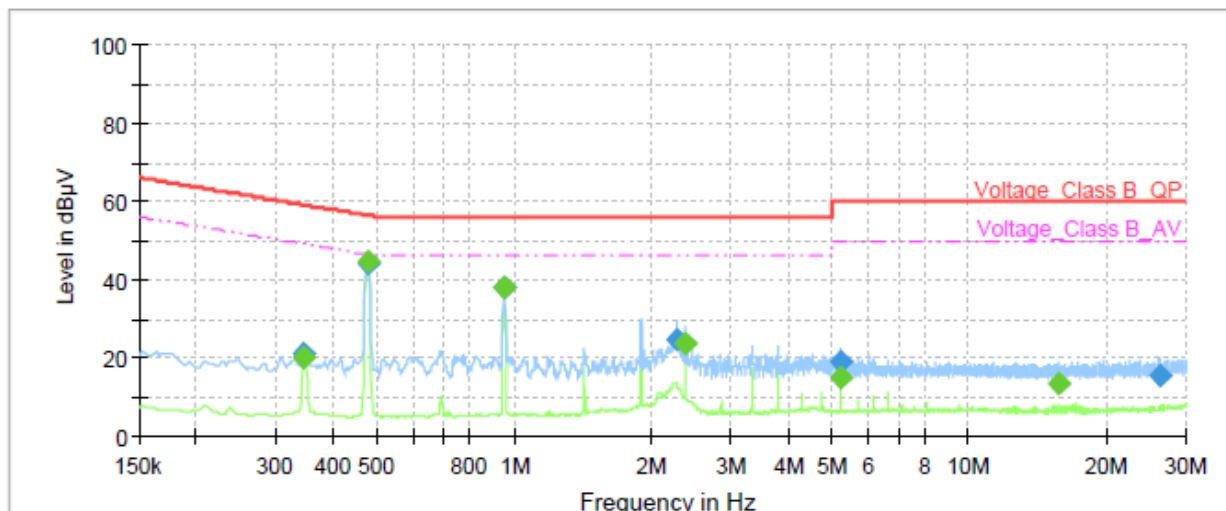
### Test Results:

Following plots, Blue trace uses the peak detection and Green trace uses the average detection. During the test, the Conducted Emission was performed in all modes (WIFI 2.4G/BLE ) with all channels, 802.11b CH1 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.



| Frequency (MHz) | QuasiPeak (dBμV) | Average (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Filter | Corr. (dB) |
|-----------------|------------------|----------------|--------------|-------------|-----------------|-----------------|------|--------|------------|
| 0.34            | ---              | 20.58          | 49.17        | 28.59       | 1000.0          | 9.000           | L1   | ON     | 19.18      |
| 0.34            | 21.47            | ---            | 59.17        | 37.70       | 1000.0          | 9.000           | L1   | ON     | 19.18      |
| 0.48            | ---              | 44.28          | 46.40        | 2.12        | 1000.0          | 9.000           | L1   | ON     | 19.23      |
| 0.48            | 44.11            | ---            | 56.40        | 12.29       | 1000.0          | 9.000           | L1   | ON     | 19.23      |
| 0.95            | ---              | 37.87          | 46.00        | 8.13        | 1000.0          | 9.000           | L1   | ON     | 19.24      |
| 0.95            | 37.57            | ---            | 56.00        | 18.43       | 1000.0          | 9.000           | L1   | ON     | 19.24      |
| 2.27            | 20.59            | ---            | 56.00        | 35.41       | 1000.0          | 9.000           | L1   | ON     | 19.05      |
| 2.38            | ---              | 23.43          | 46.00        | 22.57       | 1000.0          | 9.000           | L1   | ON     | 19.03      |
| 5.23            | 19.21            | ---            | 60.00        | 40.79       | 1000.0          | 9.000           | L1   | ON     | 19.09      |
| 5.23            | ---              | 17.06          | 50.00        | 32.94       | 1000.0          | 9.000           | L1   | ON     | 19.09      |
| 16.94           | ---              | 13.85          | 50.00        | 36.15       | 1000.0          | 9.000           | L1   | ON     | 19.56      |
| 17.76           | 14.47            | ---            | 60.00        | 45.53       | 1000.0          | 9.000           | L1   | ON     | 19.56      |

L line Conducted Emission from 150 KHz to 30 MHz



| Frequency (MHz) | QuasiPeak (dBμV) | Average (dBμV) | Limit (dBμV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Filter | Corr. (dB) |
|-----------------|------------------|----------------|--------------|-------------|-----------------|-----------------|------|--------|------------|
| 0.35            | ---              | 20.17          | 49.06        | 28.89       | 1000.0          | 9.000           | N    | ON     | 19.18      |
| 0.35            | 21.19            | ---            | 59.06        | 37.87       | 1000.0          | 9.000           | N    | ON     | 19.18      |
| 0.48            | ---              | 44.40          | 46.40        | 2.00        | 1000.0          | 9.000           | N    | ON     | 19.23      |
| 0.48            | 44.31            | ---            | 56.40        | 12.09       | 1000.0          | 9.000           | N    | ON     | 19.23      |
| 0.95            | ---              | 37.82          | 46.00        | 8.18        | 1000.0          | 9.000           | N    | ON     | 19.24      |
| 0.95            | 37.75            | ---            | 56.00        | 18.25       | 1000.0          | 9.000           | N    | ON     | 19.24      |
| 2.28            | 24.37            | ---            | 56.00        | 31.63       | 1000.0          | 9.000           | N    | ON     | 19.05      |
| 2.38            | ---              | 23.62          | 46.00        | 22.38       | 1000.0          | 9.000           | N    | ON     | 19.03      |
| 5.23            | ---              | 14.83          | 50.00        | 35.17       | 1000.0          | 9.000           | N    | ON     | 19.09      |
| 5.23            | 18.94            | ---            | 60.00        | 41.06       | 1000.0          | 9.000           | N    | ON     | 19.09      |
| 15.80           | ---              | 13.57          | 50.00        | 36.43       | 1000.0          | 9.000           | N    | ON     | 19.37      |
| 26.43           | 15.62            | ---            | 60.00        | 44.38       | 1000.0          | 9.000           | N    | ON     | 19.81      |

N line Conducted Emission from 150 KHz to 30 MHz

## 6. Main Test Instruments

| Name                                 | Manufacturer         | Type        | Serial Number | Calibration Date | Expiration Date |
|--------------------------------------|----------------------|-------------|---------------|------------------|-----------------|
| Spectrum Analyzer                    | R&S                  | FSV30       | 100815        | 2018-12-16       | 2019-12-15      |
| EMI Test Receiver                    | R&S                  | ESCI        | 100948        | 2019-05-20       | 2020-05-19      |
| Loop Antenna                         | SCHWARZBECK          | FMZB1519    | 1519-047      | 2017-09-26       | 2019-09-25      |
| TRILOG Broadband Antenna             | Schwarzbeck          | VULB 9163   | 9163-201      | 2017-11-18       | 2019-11-17      |
| Double Ridged Waveguide Horn Antenna | R&S                  | HF907       | 100126        | 2018-07-07       | 2020-07-06      |
| Standard Gain Horn                   | ETS-Lindgren         | 3160-09     | 00102643      | 2018-06-20       | 2020-06-19      |
| EMI Test Receiver                    | R&S                  | ESR         | 101667        | 2019-05-20       | 2020-05-19      |
| LISN                                 | R&S                  | ENV216      | 101171        | 2016-12-16       | 2019-12-15      |
| Spectrum Analyzer                    | Agilent              | N9010A      | MY47191109    | 2019-05-20       | 2020-05-19      |
| Power Meter                          | R&S                  | NRP         | 104306        | 2019-05-20       | 2020-05-19      |
| Power Sensor                         | R&S                  | NRP-Z21     | 104799        | 2019-05-20       | 2020-05-19      |
| 20dB Attenuator                      | Star River Highlight | UCL-TS2S-20 | 18013001      | 2018-12-16       | 2019-12-15      |
| RF Cable                             | Agilent              | SMA 15cm    | 0001          | 2019-06-14       | 2019-09-13      |
| Software                             | R&S                  | EMC32       | 9.26.0        | /                | /               |

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

## ANNEX A: EUT Appearance and Test Setup

### A.1 EUT Appearance



Front Side

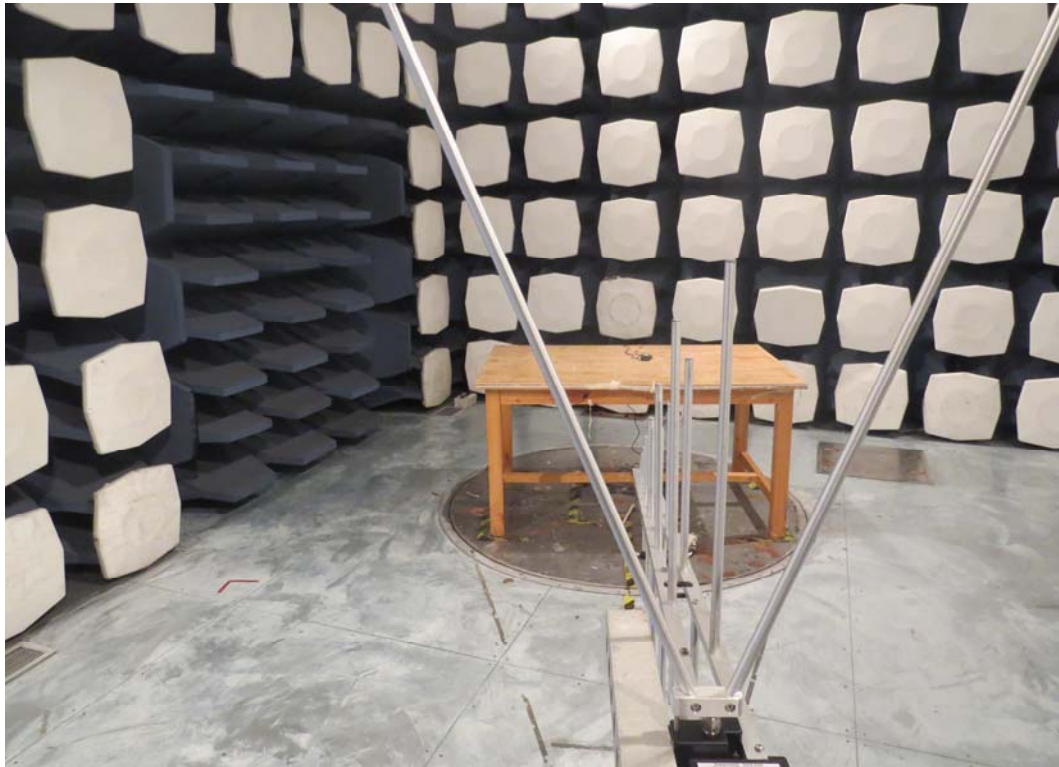


Back Side

a: EUT

Picture 1 EUT and Accessory

## A.2 Test Setup



30M Hz-1GHz



Above 1GHz

**Picture 2 Radiated Emission Test Setup**



**Picture 3 Conducted Emission Test Setup**