

# TEST REPORT

Reference No..... : WTD21D09098668W001  
FCC ID ..... : 2ADCSIFC67X1  
Applicant..... : SMART Wireless Computing Inc.  
Address..... : 39870 Eureka Dr, Newark, CA 94560, United States of America  
Manufacturer ..... : SMART Wireless Computing Inc.  
Address..... : 39870 Eureka Dr, Newark, CA 94560, United States of America  
Product..... : System on Module-IFC67X1  
Model(s). .... : IFC67X1  
Standards..... : FCC CFR47 Part 15.247  
Date of Receipt sample .... : 2021-09-16  
Date of Test ..... : 2021-09-16 to 2021-11-12  
Date of Issue..... : 2021-11-12  
Test Result..... : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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### 3 Revision History

| Test report No.        | Date of Receipt sample | Date of Test                   | Date of Issue | Purpose  | Comment | Approved |
|------------------------|------------------------|--------------------------------|---------------|----------|---------|----------|
| WTD21D09098668<br>W001 | 2021-09-16             | 2021-09-16<br>to<br>2021-11-12 | 2021-11-12    | Original | -       | Valid    |

## 4 General Information

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

|                      |                                                                                          |
|----------------------|------------------------------------------------------------------------------------------|
| Product:             | System on Module-IFC67X1                                                                 |
| Model(s):            | IFC67X1                                                                                  |
| Wi-Fi Specification: | 2.4G-802.11b/g/n HT20/n HT40<br>5G-802.11a/n/ac HT20 /n/ac HT40 / ac HT80/ ac HT80+ HT80 |
| GNSS:                | Support                                                                                  |
| Bluetooth Version:   | Bluetooth v5.0 with BLE                                                                  |
| Hardware Version:    | IFC67X1-XX-PX                                                                            |
| Software Version:    | Android 9.0                                                                              |

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

|                       |                                                                                           |
|-----------------------|-------------------------------------------------------------------------------------------|
| Operation Frequency:  | WiFi:<br>802.11b/g/n HT20: 2412~2462MHz<br>802.11n HT40: 2422~2452MHz<br>BLE:2402-2480MHz |
| Max. RF output power: | WiFi(2.4G):<br>ANT 0: 17.97dBm<br>ANT 1: 18.05dBm<br>Total:21.02dBm<br>BLE: 4.43 dBm      |
| Type of Modulation:   | WiFi: DSSS, OFDM<br>BLE:GFSK                                                              |
| Antenna installation: | WiFi/BLE: Stamped Metal Antenna,PCB printed antenna                                       |
| Antenna Gain:         | PCB printed antenna (2.1dBi), Stamped Metal Antenna (0.6dBi)                              |
| Ratings:              | DC 3.3V                                                                                   |

### 4.3 Channel List

#### WIFI

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 1           | 2412            | 2           | 2417            | 3           | 2422            | 4           | 2427            |
| 5           | 2432            | 6           | 2437            | 7           | 2442            | 8           | 2447            |
| 9           | 2452            | 10          | 2457            | 11          | 2462            | 12          | -               |

#### BT BLE

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 0           | 2402            | 1           | 2404            | 2           | 2406            | 3           | 2408            |
| 4           | 2410            | 5           | 2412            | 6           | 2414            | 7           | 2416            |
| 8           | 2418            | 9           | 2420            | 10          | 2422            | 11          | 2424            |
| 12          | 2426            | 13          | 2428            | 14          | 2430            | 15          | 2432            |
| 16          | 2434            | 17          | 2436            | 18          | 2438            | 19          | 2440            |
| 20          | 2442            | 21          | 2444            | 22          | 2446            | 23          | 2448            |
| 24          | 2450            | 25          | 2452            | 26          | 2454            | 27          | 2456            |
| 28          | 2458            | 29          | 2460            | 30          | 2462            | 31          | 2464            |
| 32          | 2466            | 33          | 2468            | 34          | 2470            | 35          | 2472            |
| 36          | 2474            | 37          | 2476            | 38          | 2478            | 39          | 2480            |

#### 4.4 Test Mode

Table 1 Tests Carried Out Under FCC part 15.247

| Test Items                     | Mode         | Data Rate | Channel | TX/RX |
|--------------------------------|--------------|-----------|---------|-------|
| Maximum Peak Output Power      | 802.11b      | 1 Mbps    | 1/6/11  | TX    |
|                                | 802.11g      | 6 Mbps    | 1/6/11  | TX    |
|                                | 802.11n HT20 | 108 Mbps  | 1/6/11  | TX    |
|                                | 802.11n HT40 | 150 Mbps  | 3/6/9   | TX    |
| Power Spectral Density         | 802.11b      | 1 Mbps    | 1/6/11  | TX    |
|                                | 802.11g      | 6 Mbps    | 1/6/11  | TX    |
|                                | 802.11n HT20 | 108 Mbps  | 1/6/11  | TX    |
|                                | 802.11n HT40 | 150 Mbps  | 3/6/9   | TX    |
| 6dB Bandwidth                  | 802.11b      | 1 Mbps    | 1/6/11  | TX    |
|                                | 802.11g      | 6 Mbps    | 1/6/11  | TX    |
|                                | 802.11n HT20 | 108 Mbps  | 1/6/11  | TX    |
|                                | 802.11n HT40 | 150 Mbps  | 3/6/9   | TX    |
| Band Edge                      | 802.11b      | 1 Mbps    | 1/6/11  | TX    |
|                                | 802.11g      | 6 Mbps    | 1/6/11  | TX    |
|                                | 802.11n HT20 | 108 Mbps  | 1/6/11  | TX    |
|                                | 802.11n HT40 | 150 Mbps  | 3/6/9   | TX    |
| Transmitter Spurious Emissions | 802.11b      | 1 Mbps    | 1/6/11  | TX    |
|                                | 802.11g      | 6 Mbps    | 1/6/11  | TX    |
|                                | 802.11n HT20 | 108 Mbps  | 1/6/11  | TX    |
|                                | 802.11n HT40 | 150 Mbps  | 3/6/9   | TX    |

Table 2 Tests Carried Out Under FCC part 15.247

| Test Items                     | Mode   | Data Rate | Channel | TX/RX |
|--------------------------------|--------|-----------|---------|-------|
| Maximum Peak Output Power      | BT BLE | 1 Mbps    | 0/19/39 | TX    |
| Power Spectral Density         | BT BLE | 1 Mbps    | 0/19/39 | TX    |
| 6dB Bandwidth                  | BT BLE | 1 Mbps    | 0/19/39 | TX    |
| Band Edge                      | BT BLE | 1 Mbps    | 0/19/39 | TX    |
| Transmitter Spurious Emissions | BT BLE | 1 Mbps    | 0/19/39 | TX    |

**Note** :Parameters set by test software during channel & power tests, the software provided by the customer was used to set the operating channels as well as the output power level. The RF output power set is the power expected by the manufacturer and is going to be fixed on the firmware of the final product .

## 5 Test Summary

| Test Items                                                        | Test Requirement                    | Result |
|-------------------------------------------------------------------|-------------------------------------|--------|
| Radiated Spurious Emissions                                       | 15.247(d)<br>15.205(a)<br>15.209(a) | PASS   |
| Conducted Spurious Emissions                                      | 15.247(d)                           | PASS   |
| Conducted Emissions                                               | 15.207(a)                           | N/A    |
| 6dB Bandwidth                                                     | 15.247(a)(2)                        | PASS   |
| Maximum Peak Output Power                                         | 15.247(b)(3),(4)                    | PASS   |
| Power Spectral Density                                            | 15.247(e)                           | PASS   |
| Band Edge                                                         | 15.247(d)                           | PASS   |
| Antenna Requirement                                               | 15.203                              | PASS   |
| Maximum Permissible Exposure<br>(Exposure of Humans to RF Fields) | 1.1307(b)(1)                        | PASS   |

## 6 Equipment Used during Test

### 6.1 Equipments List

| 3m Semi-anechoic Chamber for Radiation Emissions Test site 1# |                            |                      |             |            |                          |                          |
|---------------------------------------------------------------|----------------------------|----------------------|-------------|------------|--------------------------|--------------------------|
| Item                                                          | Equipment                  | Manufacturer         | Model No.   | Serial No. | Last Calibration Date    | Calibration Due Date     |
| 1                                                             | Spectrum Analyzer          | R&S                  | FSP30       | 100091     | 2021-04-26               | 2022-04-25               |
| 2                                                             | Amplifier                  | Agilent              | 8447D       | 2944A10178 | 2021-04-26               | 2022-04-25               |
| 3                                                             | Trilog Broadband Antenna   | SCHWARZBECK          | VULB9163    | 336        | 2021-08-23               | 2022-08-22               |
| 4                                                             | Coaxial Cable (below 1GHz) | Top                  | TYPE16(13M) | -          | 2021-04-26               | 2022-04-25               |
| 5                                                             | Broad-band Horn Antenna    | SCHWARZBECK          | BBHA 9120 D | 667        | 2021-04-26               | 2022-04-25               |
| 6                                                             | Broad-band Horn Antenna    | SCHWARZBECK          | BBHA 9170   | 335        | 2021-07-30               | 2022-07-29               |
| 7                                                             | Broadband Preamplifier     | COMPLIANCE DIRECTION | PAP-1G18    | 2004       | 2021-07-26               | 2022-07-25               |
| 8                                                             | Coaxial Cable (above 1GHz) | ZT26-NJ-NJ-8M/FA     | 1GHz-18GHz  | NA         | 2021-04-26               | 2022-04-25               |
| 3m Semi-anechoic Chamber for Radiation Emissions Test site 2# |                            |                      |             |            |                          |                          |
| Item                                                          | Equipment                  | Manufacturer         | Model No.   | Serial No. | Last Calibration Date    | Calibration Due Date     |
| 1                                                             | Test Receiver              | R&S                  | ESCI        | 101296     | 2021-04-26               | 2022-04-25               |
| 2                                                             | Trilog Broadband Antenna   | SCHWARZBECK          | VULB9160    | 9160-3325  | 2020-10-31<br>2021-10-28 | 2021-10-29<br>2022-10-27 |
| 3                                                             | Active Loop Antenna        | Com-Power Corp.      | AL-130R     | 10160007   | 2021-04-26               | 2022-04-25               |
| 4                                                             | Amplifier                  | ANRITSU              | MH648A      | M43381     | 2021-04-26               | 2022-04-25               |
| 5                                                             | Cable                      | HUBER+SUHNER         | CBL2        | 525178     | 2021-04-26               | 2022-04-25               |
| RF Conducted Testing                                          |                            |                      |             |            |                          |                          |
| Item                                                          | Equipment                  | Manufacturer         | Model No.   | Serial No. | Last Calibration Date    | Calibration Due Date     |
| 1.                                                            | EMC Analyzer (9k~26.5GHz)  | Agilent              | E7405A      | MY45114943 | 2021-04-26               | 2022-04-25               |
| 2.                                                            | Spectrum Analyzer          | R&S                  | FSP30       | 100091     | 2021-04-26               | 2022-04-25               |
| 3.                                                            | EXA Signal Analyzer        | Malaysia Keysight    | N9010A      | MY50520207 | 2021-04-26               | 2022-04-25               |

## 6.2 Description of Support Units

| Equipment              | Manufacturer                  | Model No. | Series No. |
|------------------------|-------------------------------|-----------|------------|
| Computer               | Dell                          | K053      | /          |
| Mouse                  | Lenovo                        | AP01      | /          |
| Transfer/carrier board | SMART Wireless Computing Inc. | /         | /          |

## 6.3 Measurement Uncertainty

| Parameter                         | Uncertainty                                 |
|-----------------------------------|---------------------------------------------|
| Radio Frequency                   | $\pm 1 \times 10^{-6}$                      |
| RF Power                          | $\pm 1.0$ dB                                |
| RF Power Density                  | $\pm 2.2$ dB                                |
| Radiated Spurious Emissions test  | $\pm 5.03$ dB (Bilog antenna 30M~1000MHz)   |
|                                   | $\pm 5.47$ dB (Horn antenna 1000M~25000MHz) |
| Conducted Emissions test          | $\pm 3.64$ dB (AC mains 150KHz~30MHz)       |
| Conducted Spurious Emissions test | $\pm 3.12$ dB (9kHz~30MHz)                  |
|                                   | $\pm 4.21$ dB (30M~1000MHz)                 |
|                                   | $\pm 5.14$ dB (1000M~26500MHz)              |

## 6.4 Test Facility

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

**ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.**

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

**FCC Designation No.: CN1201. Test Firm Registration No.: 523476. Certificate Number: 4243.01**

Waltek Testing Group 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 number 523476, September 10, 2019.

## 6.5 Test Equipment Calibration

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

## 7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247  
 Test Method: KDB 558074 D01 15.247 Meas Guidance v05 August 24, 2018;  
 ANSI C63.10:2013  
 Test Result: PASS  
 Measurement Distance: 3m

Limit:

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

### 7.1 EUT Operation

Operating Environment :

Temperature: 23.5 °C  
 Humidity: 52.1 % RH  
 Atmospheric Pressure: 101.2kPa

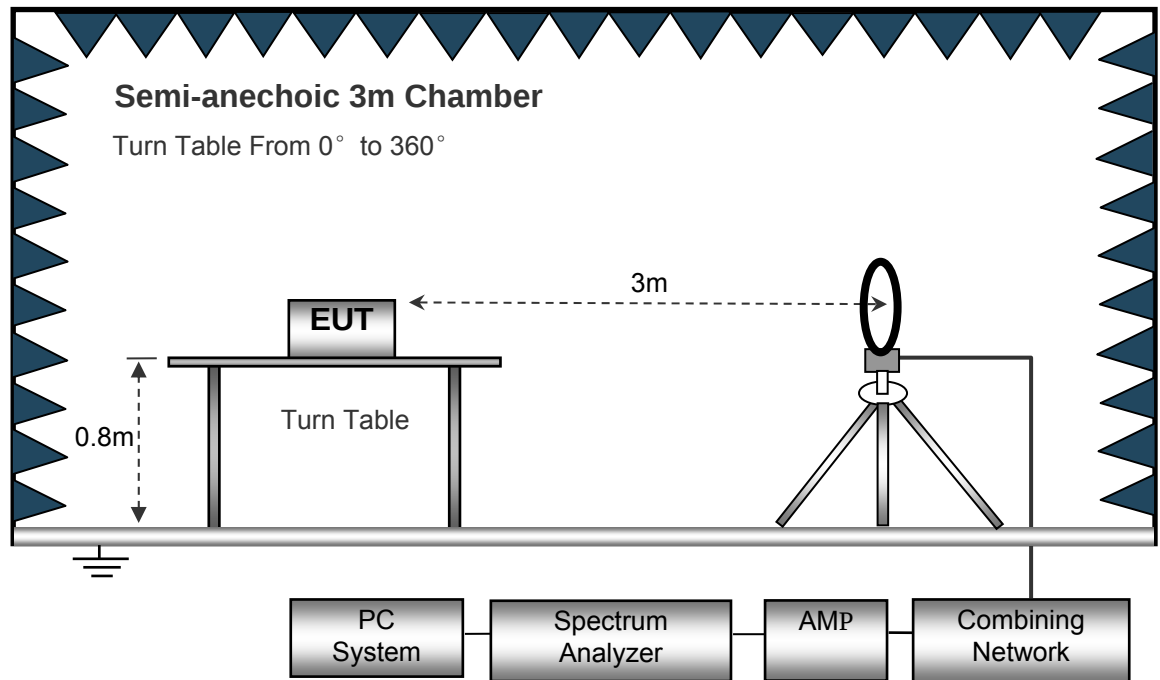
EUT Operation :

The test was performed in WIFI link and BLE link mode, the test data were shown in the report.

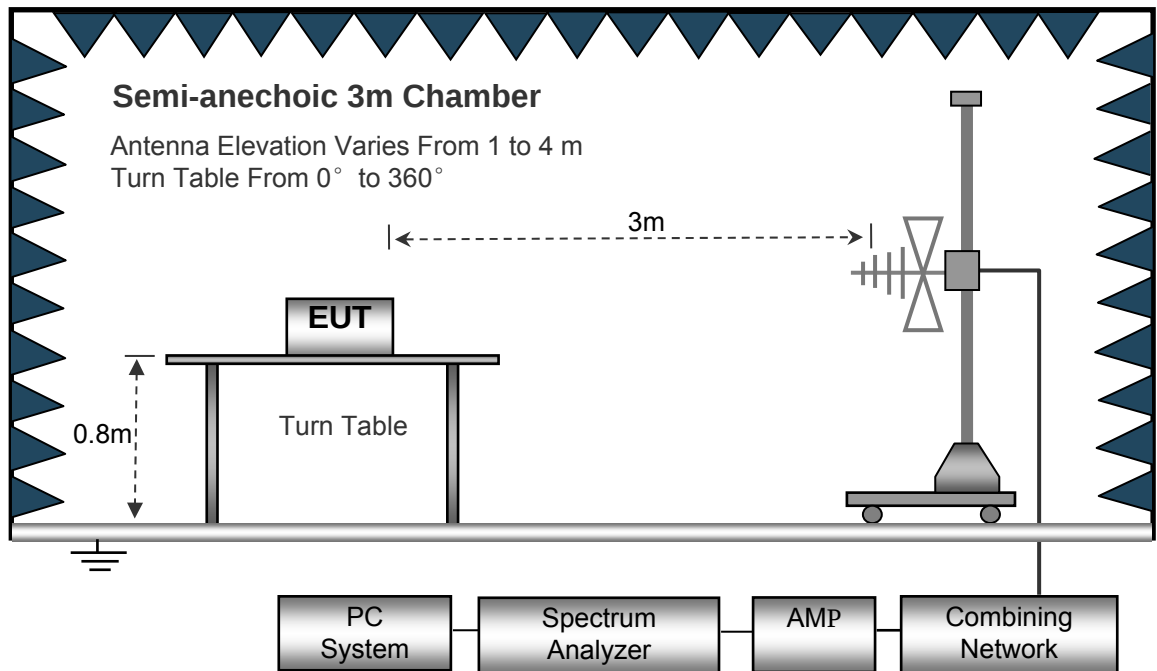
## 7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10.

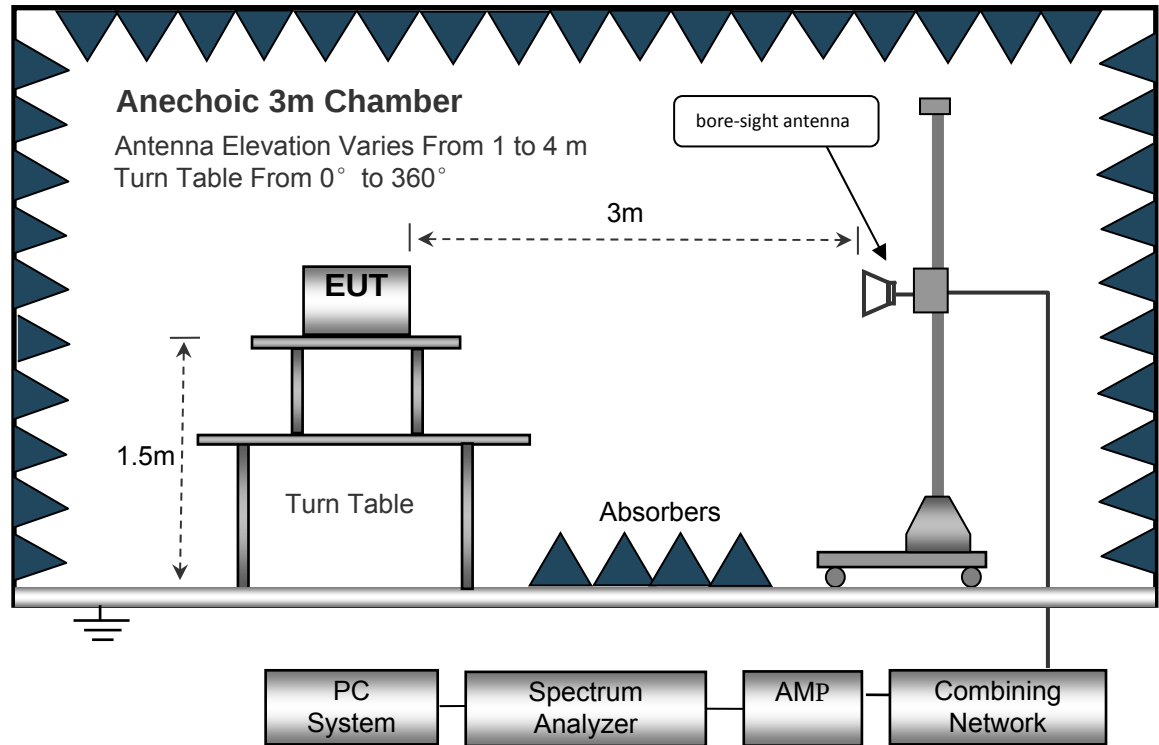
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



### 7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto  
IF Bandwidth..... 10kHz  
Video Bandwidth..... 10kHz  
Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto  
Detector ..... PK  
Resolution Bandwidth..... 100kHz  
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto  
Detector ..... PK  
Resolution Bandwidth..... 1MHz  
Video Bandwidth..... 3MHz  
Detector ..... Ave.  
Resolution Bandwidth..... 1MHz  
Video Bandwidth..... 10Hz

## 7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane for below 1GHz and 1.5m for above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in Z axis,so the worst data were shown as follow.
8. A 2.4GHz high –pass filter is used during radiated emissions above 1GHz measurement.

## 7.5 Corrected Amplitude & Margin Calculation

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

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

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

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

7.6 Summary of Test Results

Remark: Both ANT0 and ANT1 have tests, For 802.11b/g, Only record the Middle channel data of the worst case ANT0, and 802.11n worst case is MIMO(record the Middle channel data)

Wifi:

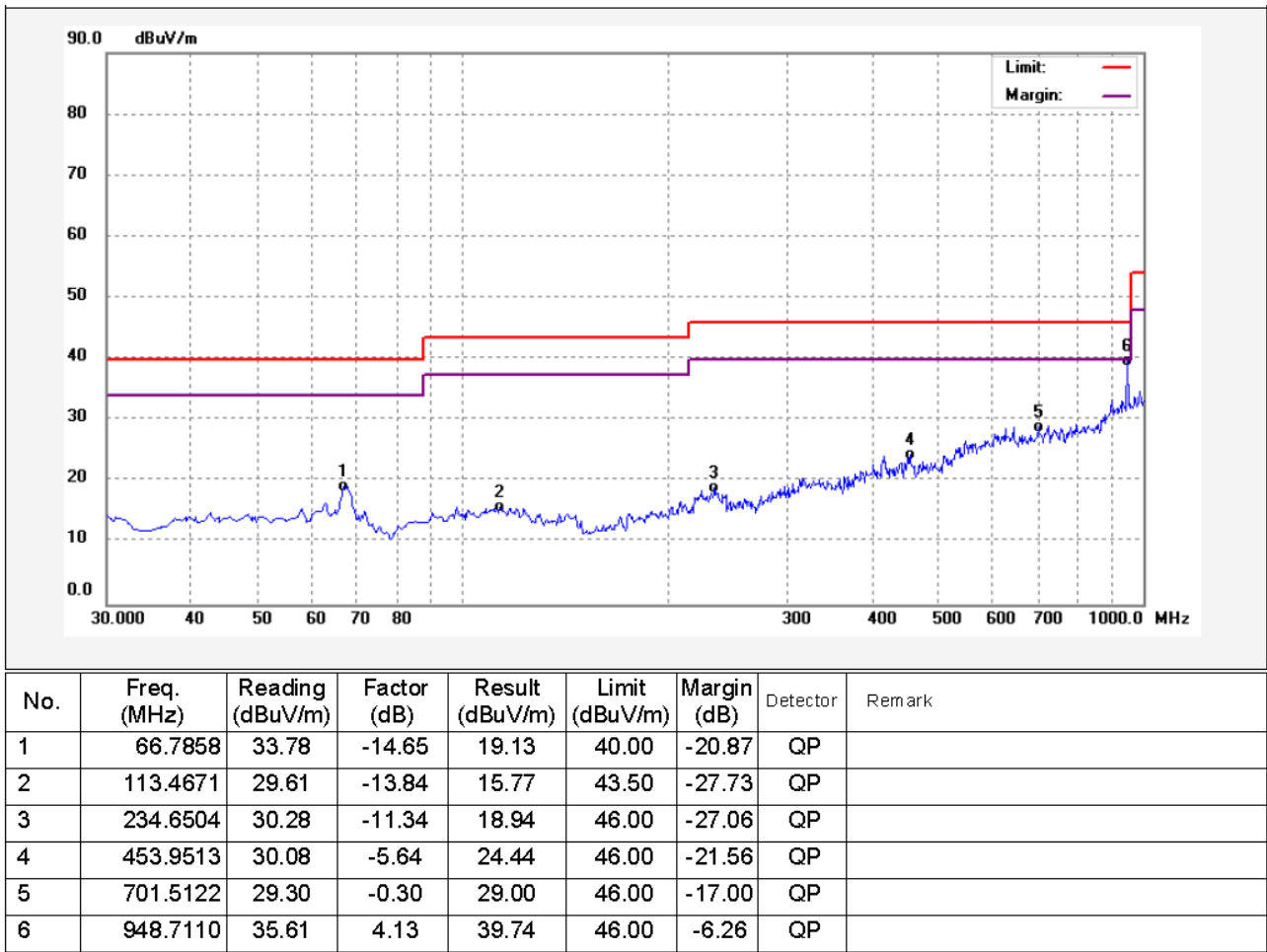
Test Frequency: 9KHz~30MHz

The measurements were more than 20 dB below the limit and not reported.

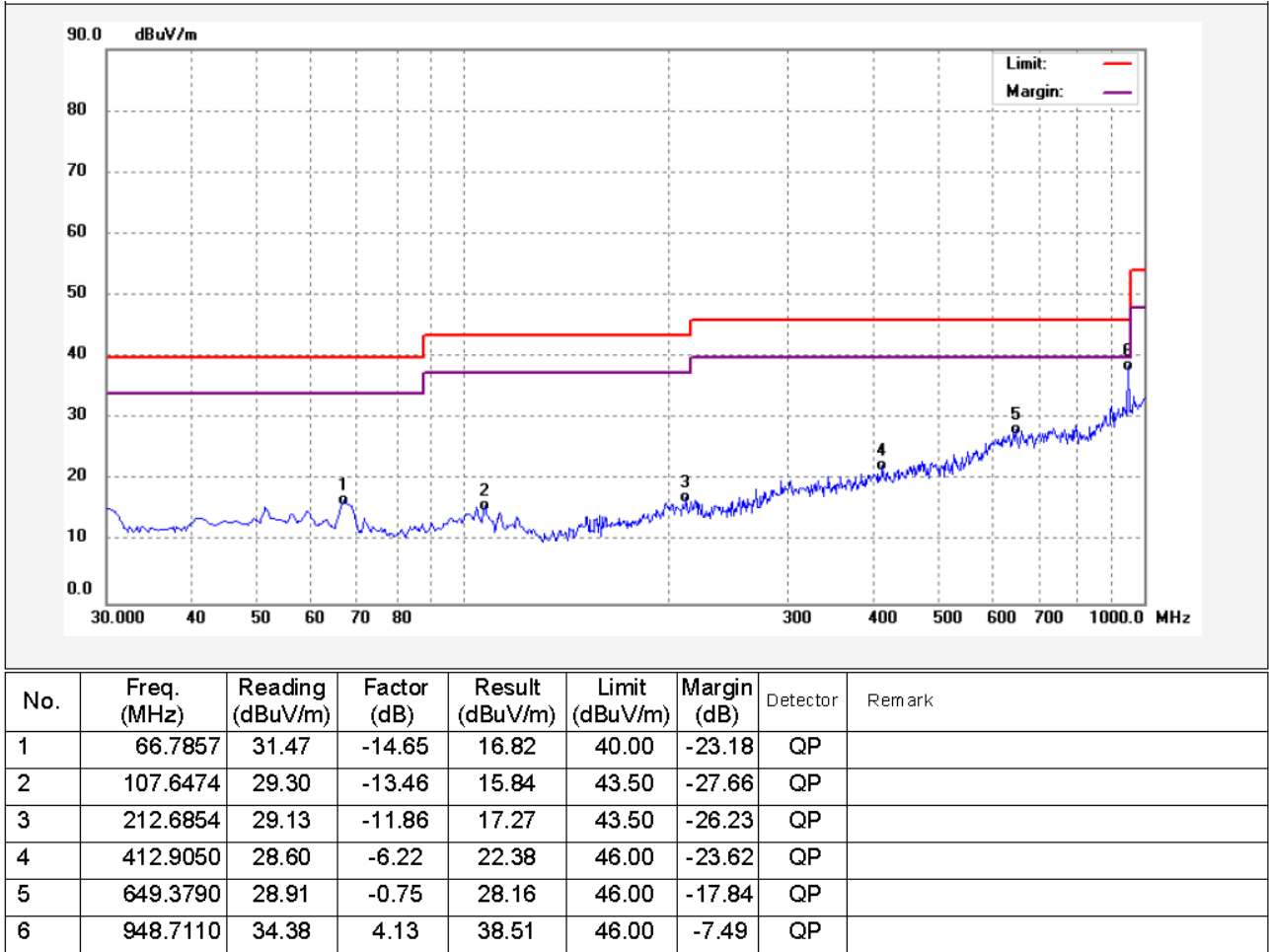
Test Frequency : 30MHz ~ 1GHz (only the worst-case plots for each mode)

WIFI: PCB printed antenna

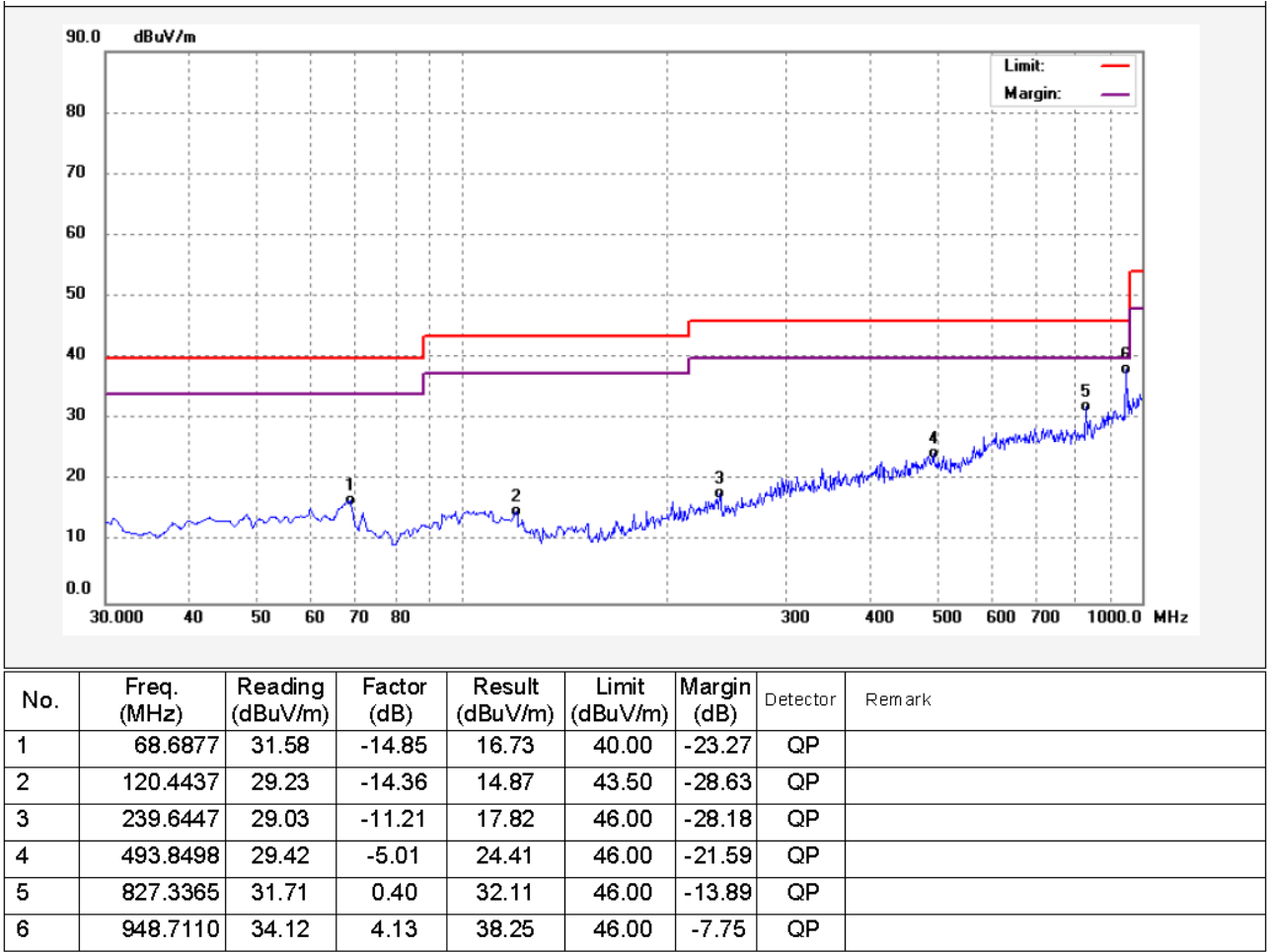
802.11b: Middle Channel 2437MHz (Vertical)



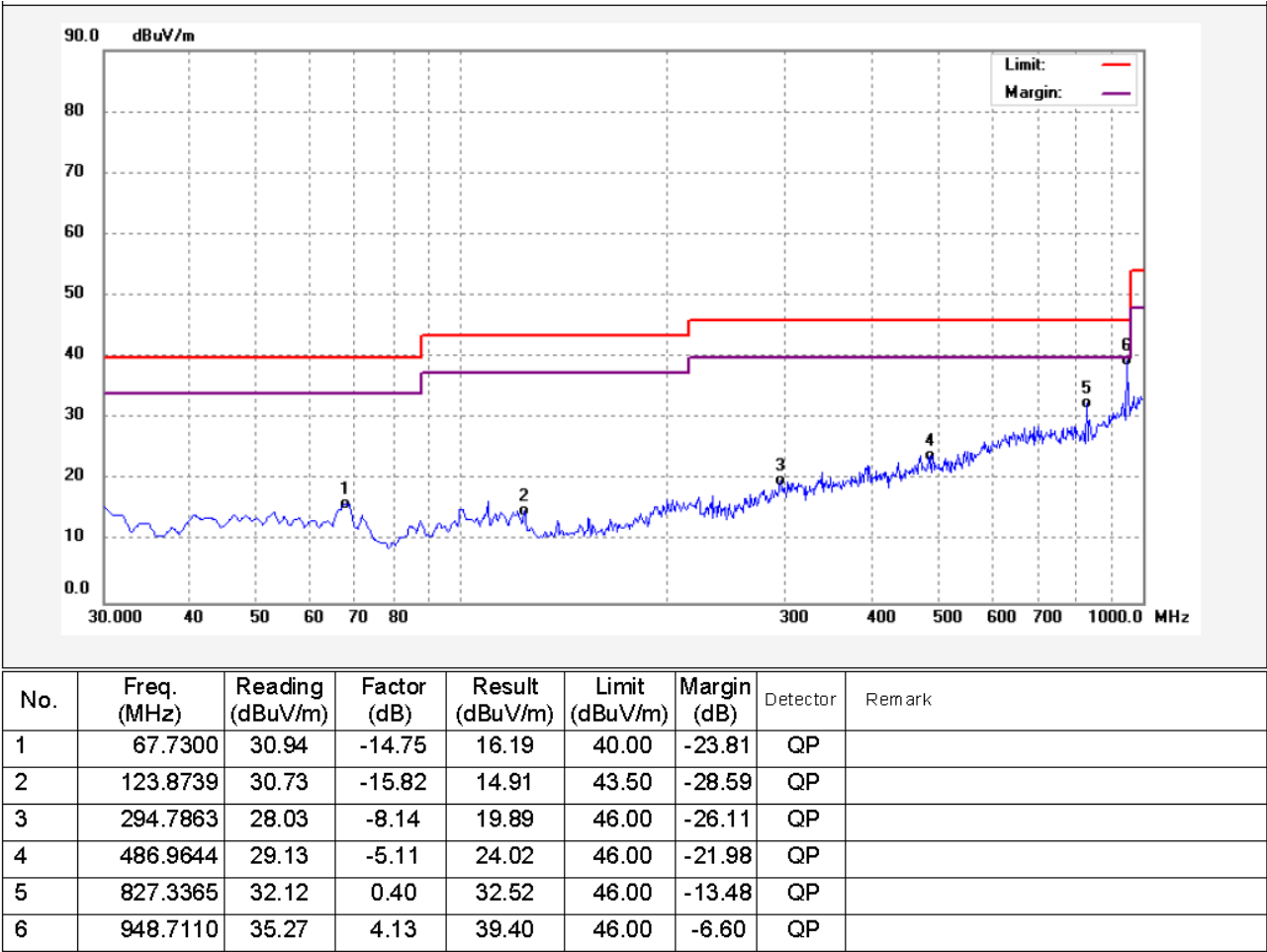
802.11b: Middle Channel 2437MHz (Horizontal)



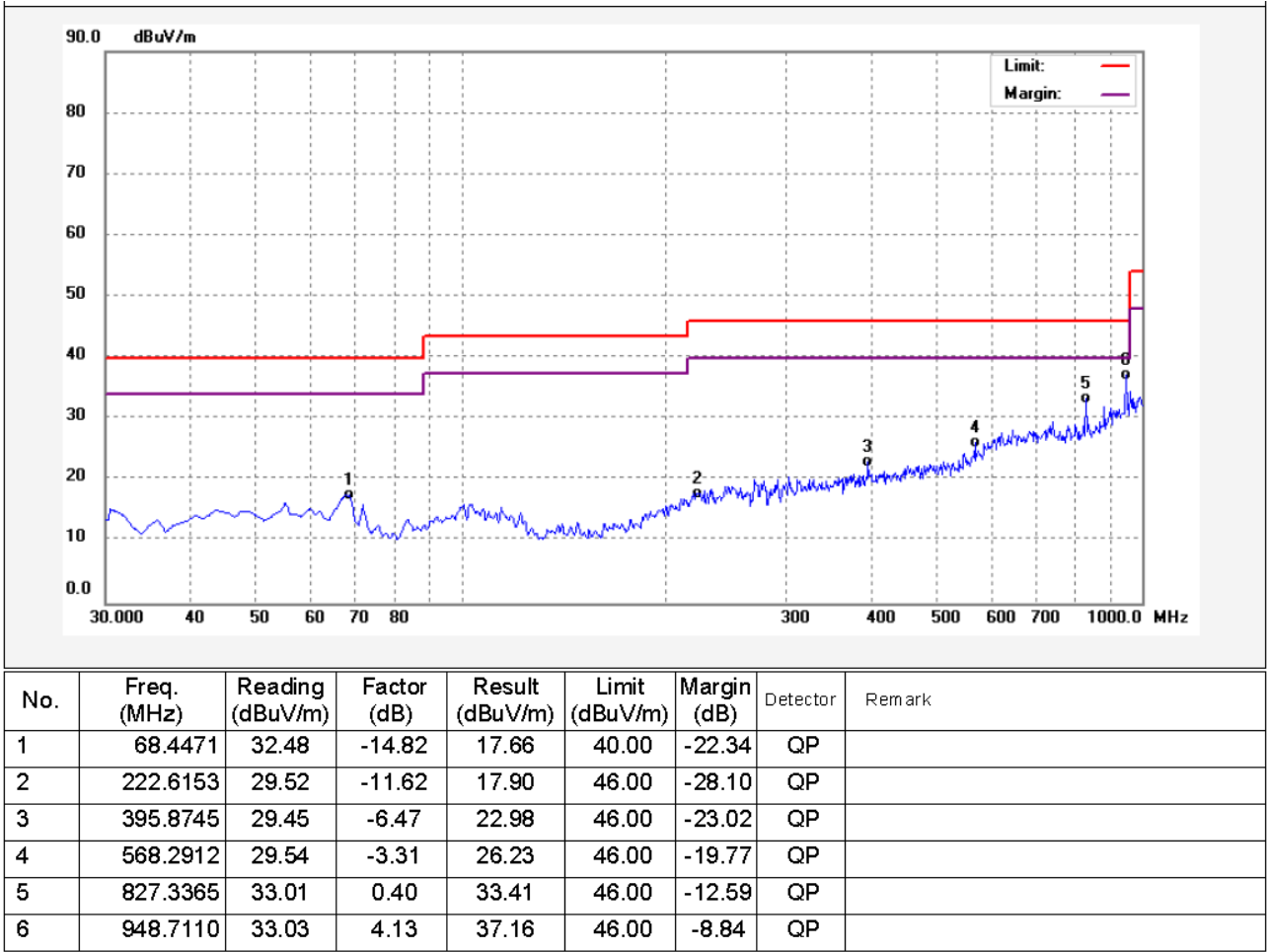
802.11g: Middle Channel 2437MHz (Vertical)



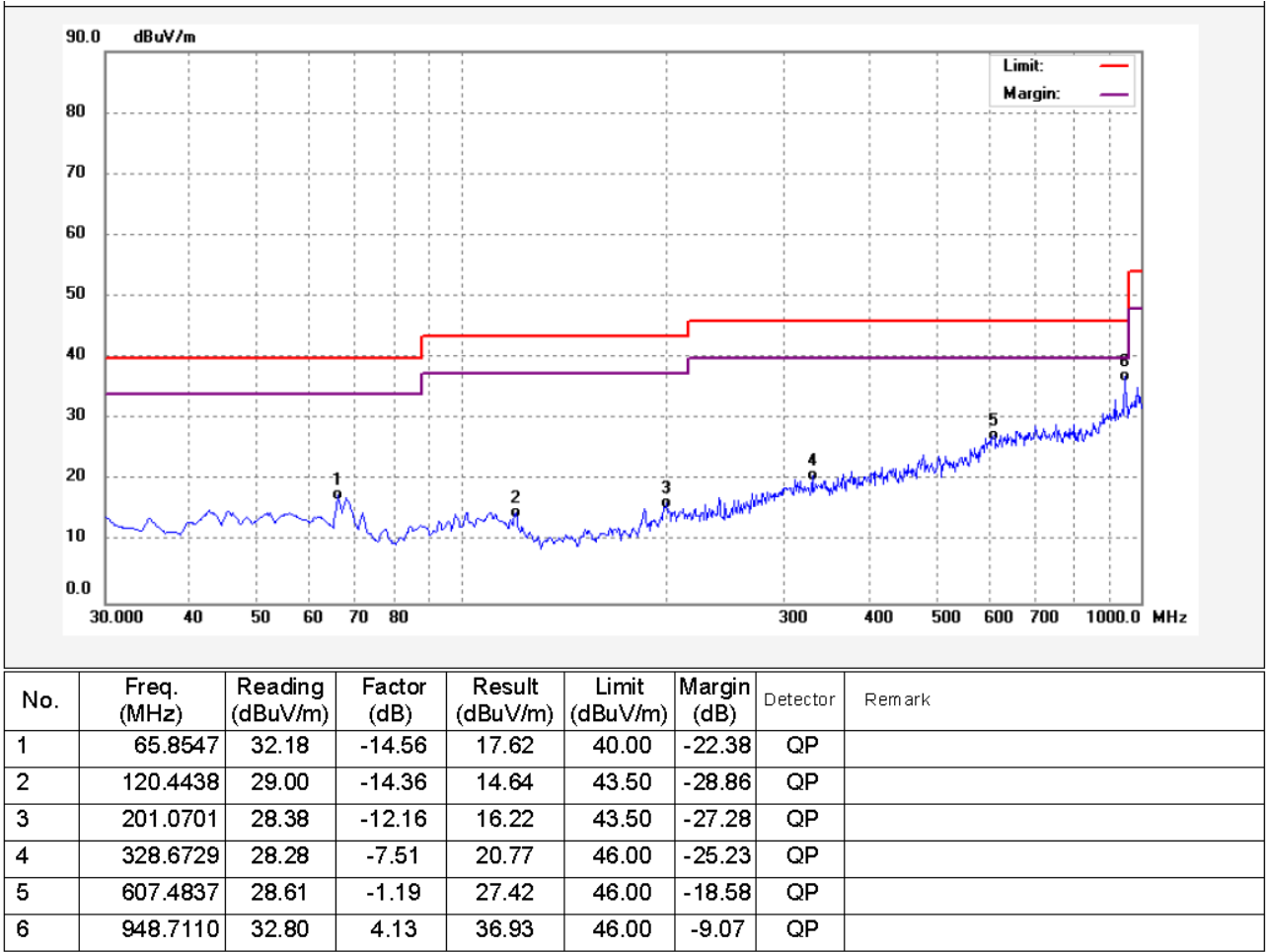
802.11g: Middle Channel 2437MHz (Horizontal)



802.11n: Middle Channel 2437MHz (Vertical)

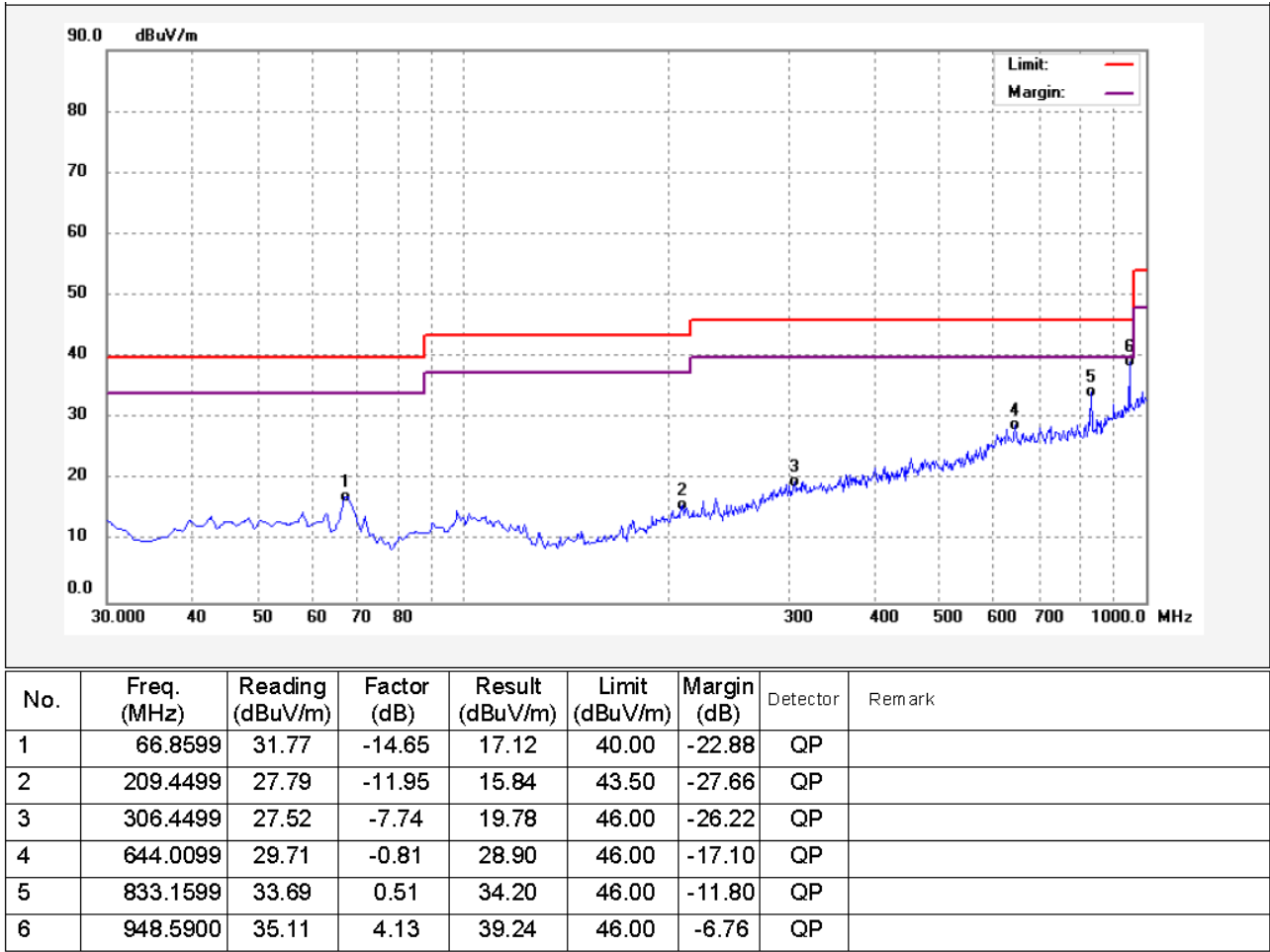


802.11n: Middle Channel 2437MHz (Horizontal)

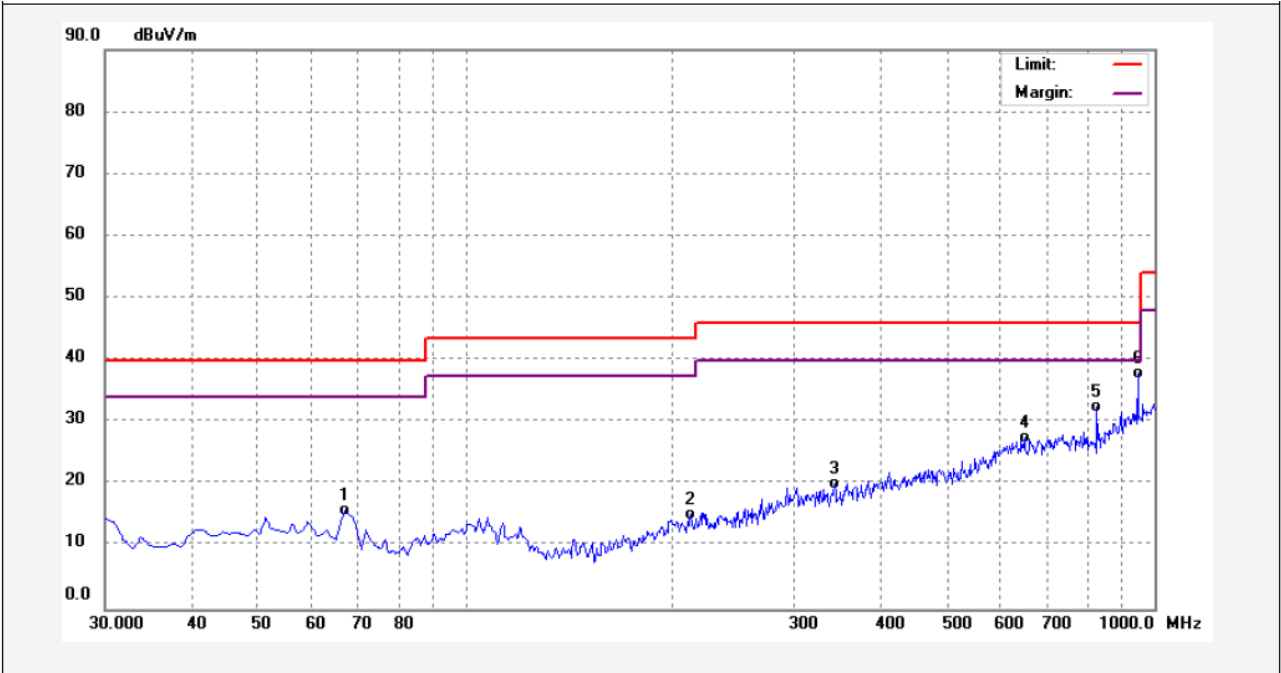


WIFI: Stamped Metal Antenna

802.11b: Middle Channel 2437MHz (Vertical)

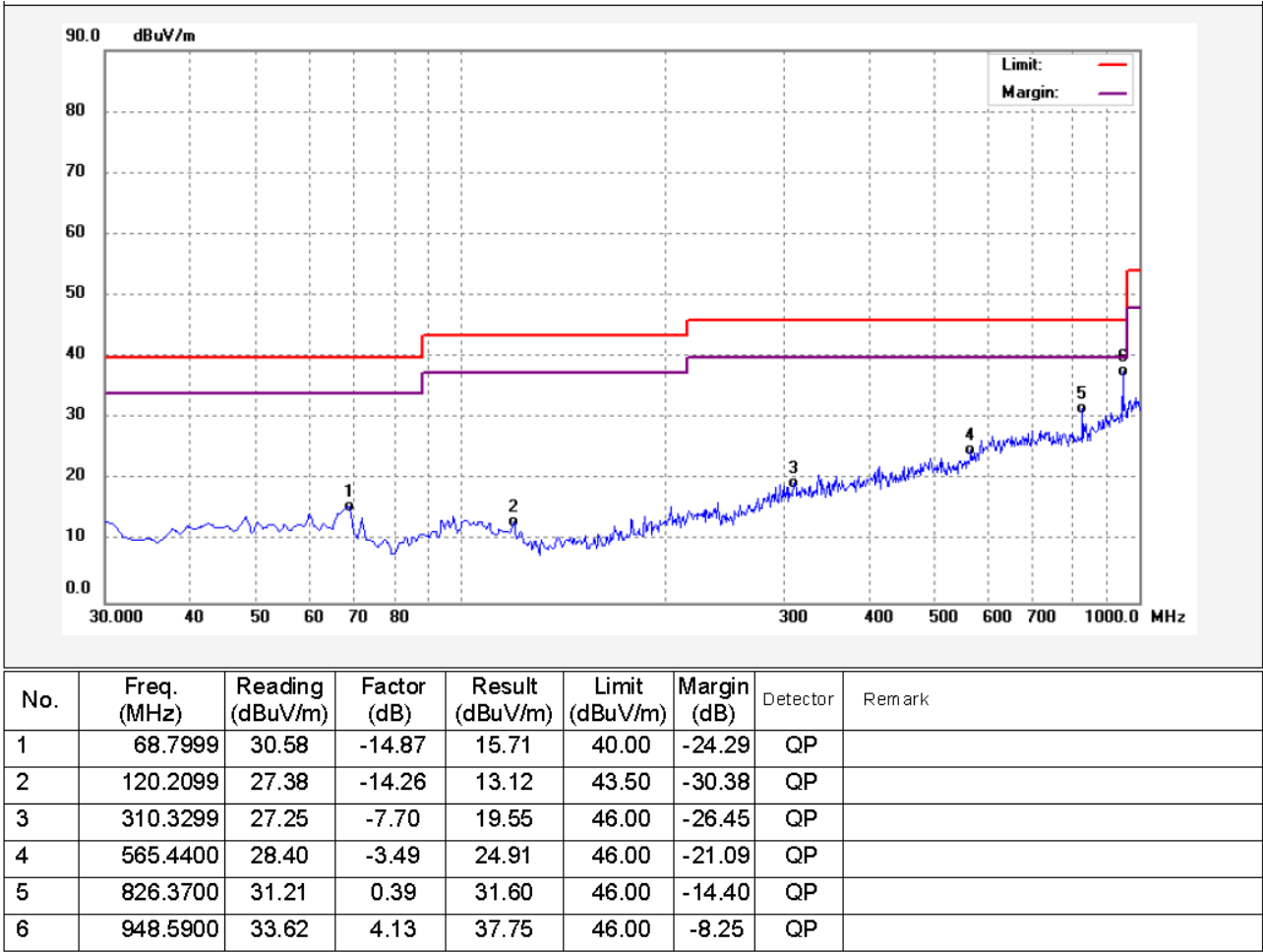


802.11b: Middle Channel 2437MHz (Horizontal)

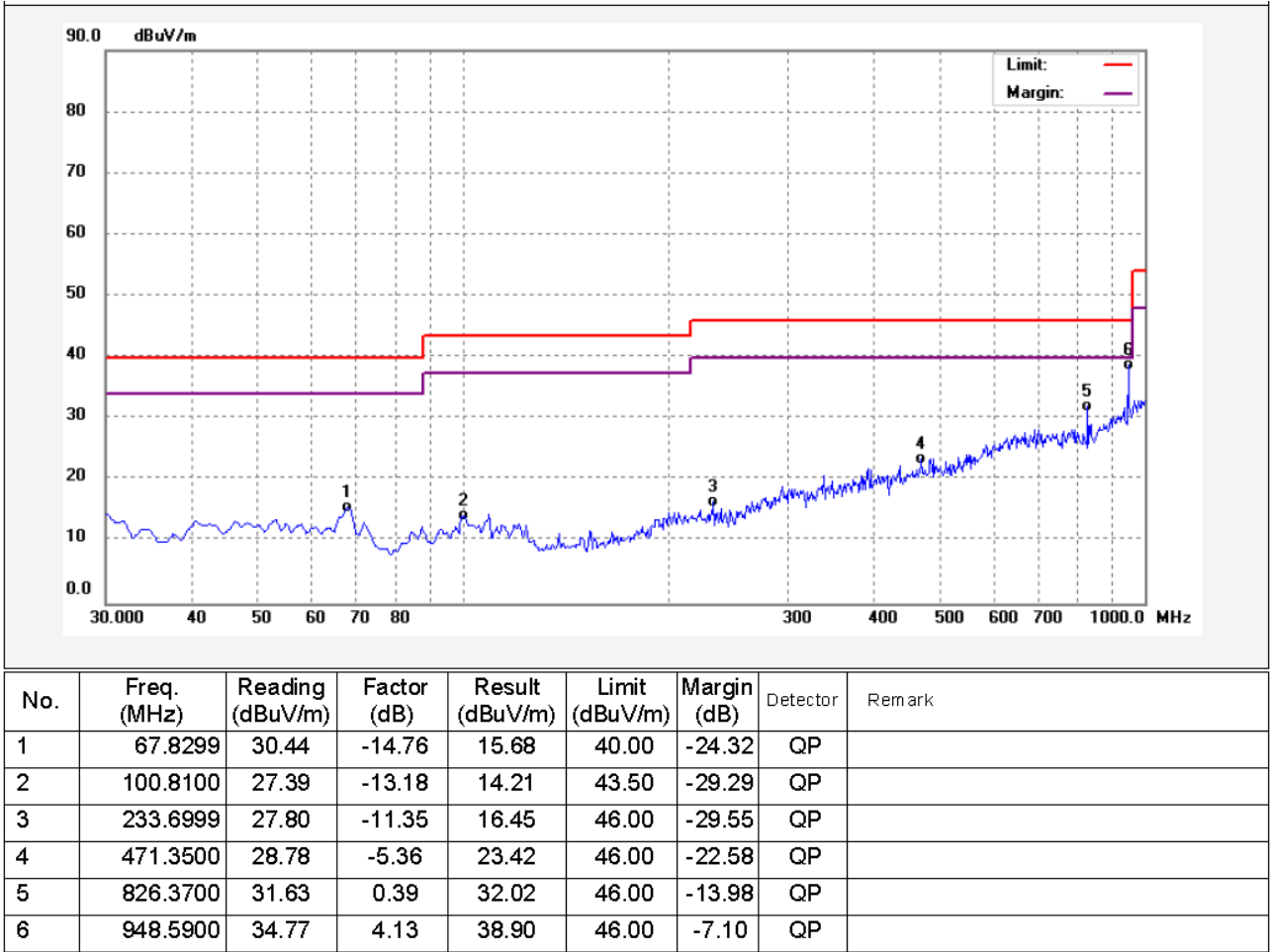


| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 66.8599     | 30.46            | -14.65      | 15.81           | 40.00          | -24.19      | QP       |        |
| 2   | 212.3600    | 27.13            | -11.88      | 15.25           | 43.50          | -28.25      | QP       |        |
| 3   | 344.2799    | 27.54            | -7.36       | 20.18           | 46.00          | -25.82      | QP       |        |
| 4   | 648.8600    | 28.41            | -0.76       | 27.65           | 46.00          | -18.35      | QP       |        |
| 5   | 826.3700    | 32.09            | 0.39        | 32.48           | 46.00          | -13.52      | QP       |        |
| 6   | 948.5900    | 33.88            | 4.13        | 38.01           | 46.00          | -7.99       | QP       |        |

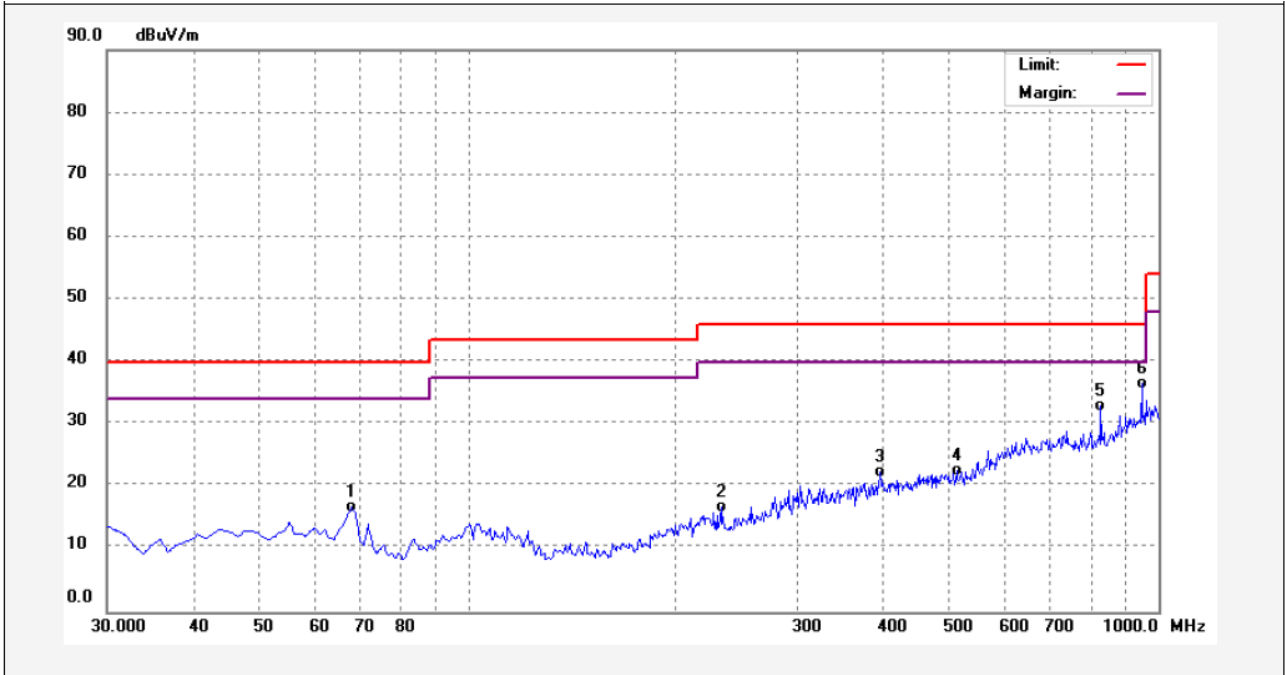
802.11g: Middle Channel 2437MHz (Vertical)



802.11g: Middle Channel 2437MHz (Horizontal)

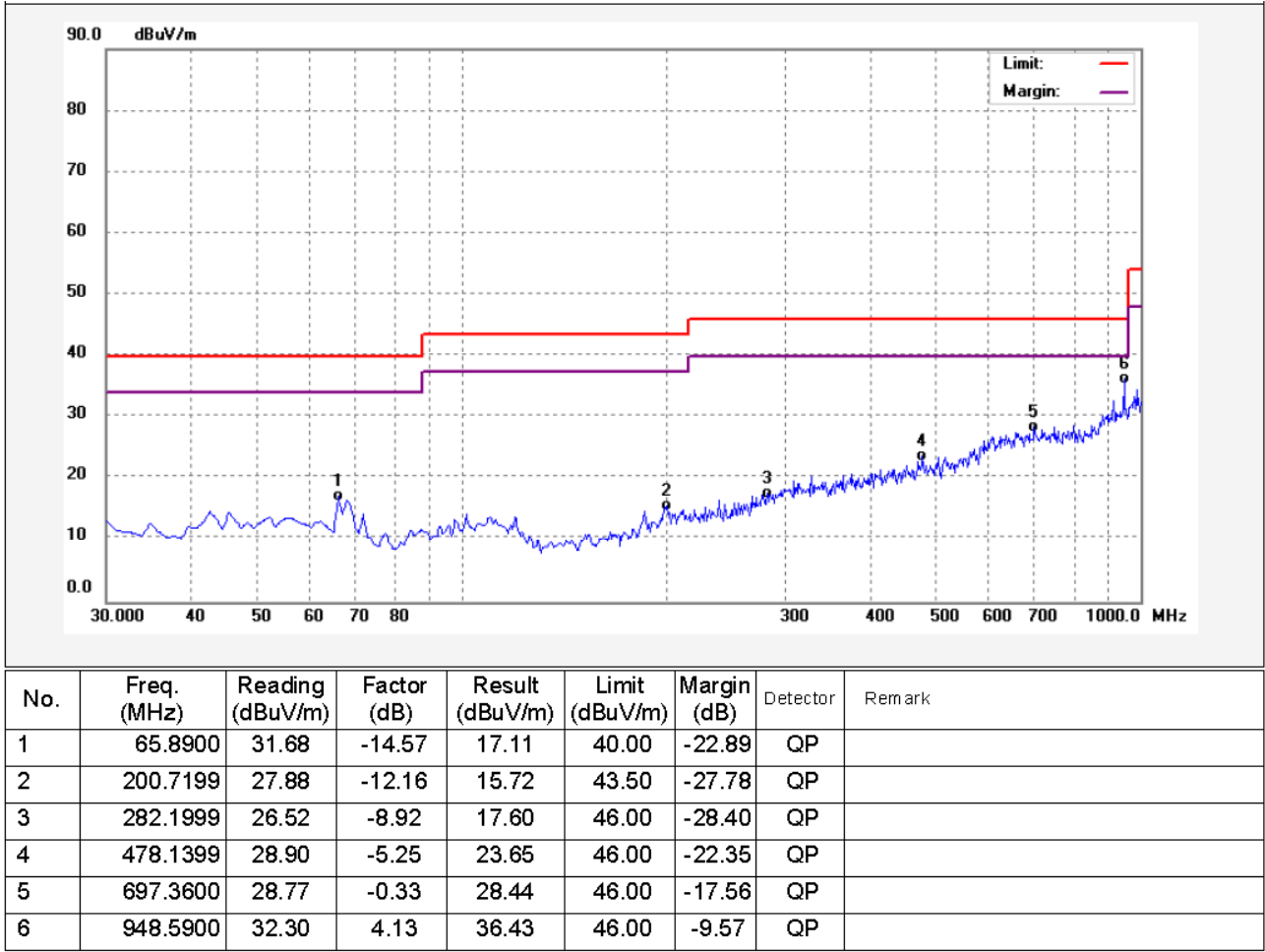


802.11n: Middle Channel 2437MHz (Vertical)



| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 67.8299     | 31.46            | -14.76      | 16.70           | 40.00          | -23.30      | QP       |        |
| 2   | 232.7299    | 28.04            | -11.37      | 16.67           | 46.00          | -29.33      | QP       |        |
| 3   | 395.6899    | 28.95            | -6.47       | 22.48           | 46.00          | -23.52      | QP       |        |
| 4   | 510.1499    | 27.38            | -4.82       | 22.56           | 46.00          | -23.44      | QP       |        |
| 5   | 826.3700    | 32.51            | 0.39        | 32.90           | 46.00          | -13.10      | QP       |        |
| 6   | 948.5900    | 32.53            | 4.13        | 36.66           | 46.00          | -9.34       | QP       |        |

802.11n: Middle Channel 2437MHz (Horizontal)

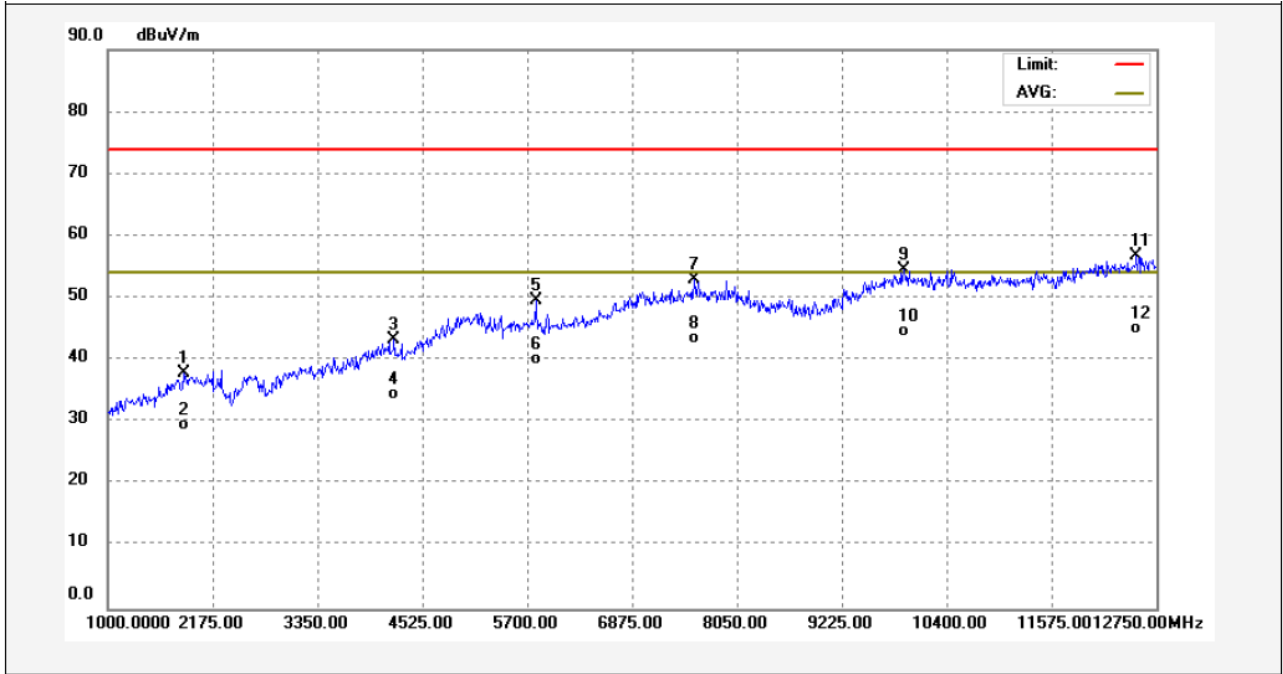


Test Frequency: 1GHz~12.75GHz (only the worst-case plots for each mode)

Remark: The current test plots doesn't have the fundamental signal, It's blocked by the filter

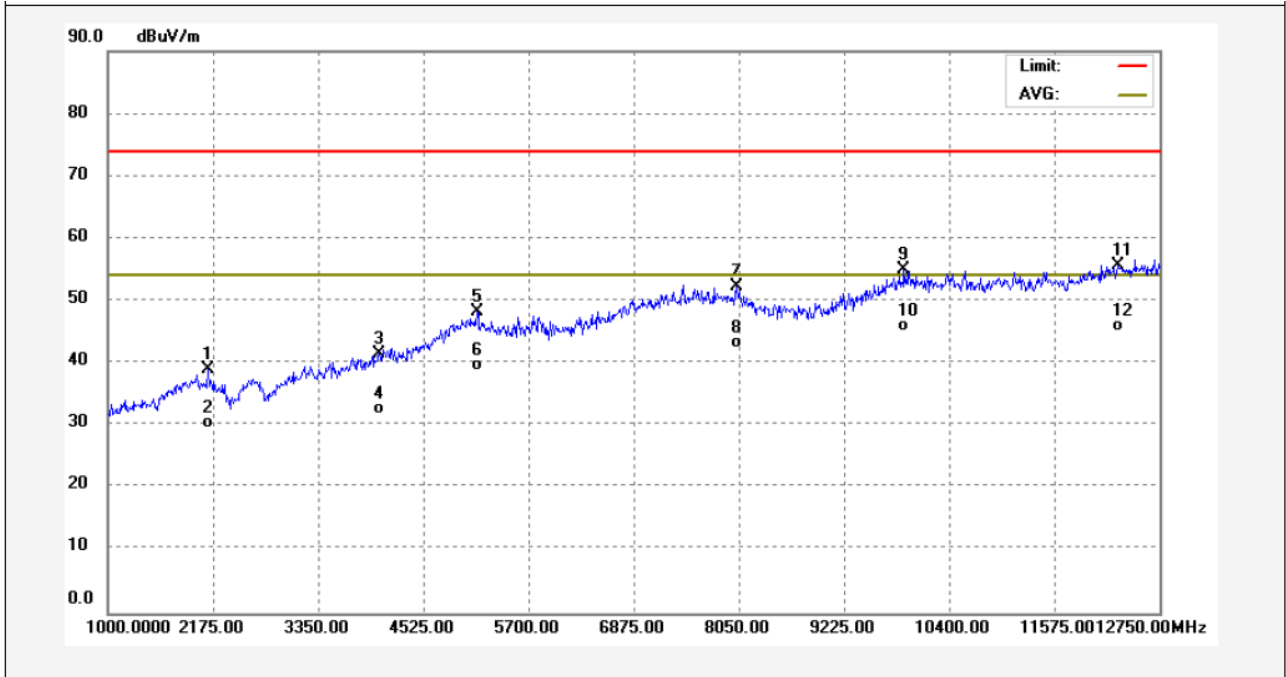
WIFI: PCB printed antenna

802.11b: Middle Channel 2437MHz (Vertical)



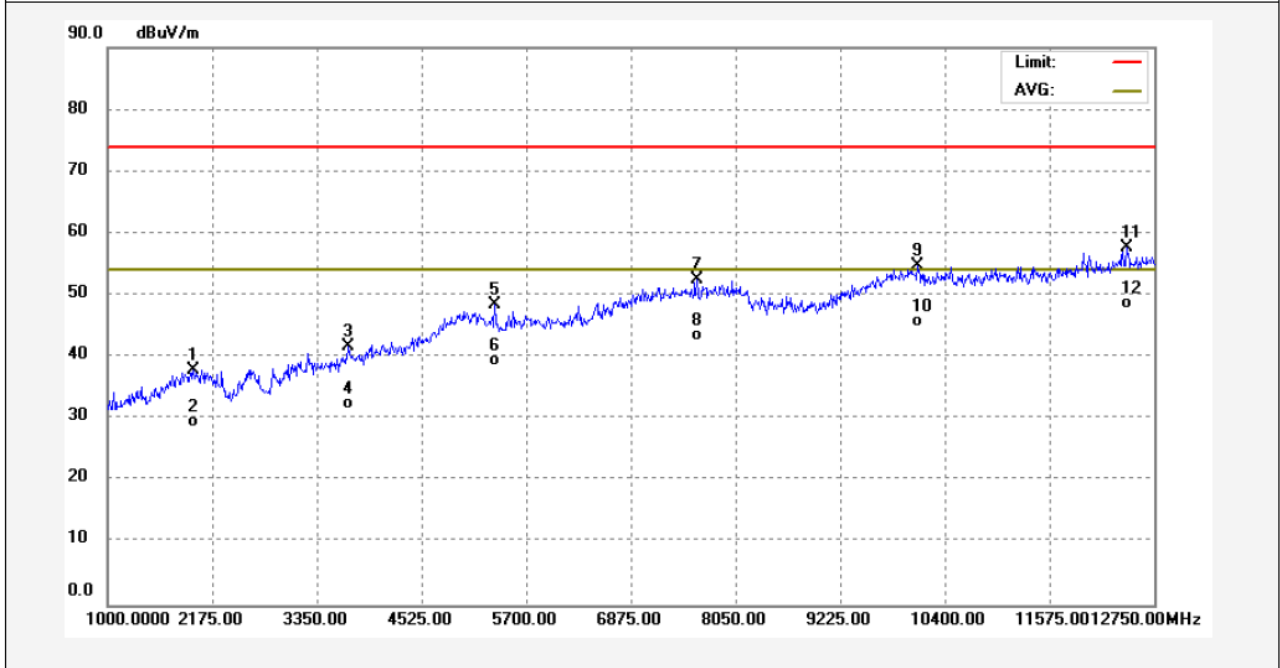
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1846.000    | 47.35            | -9.50       | 37.85           | 74.00          | -36.15      | peak     |        |
| 2   | 1846.000    | 39.08            | -9.50       | 29.58           | 54.00          | -24.42      | AVG      |        |
| 3   | 4207.750    | 49.52            | -6.12       | 43.40           | 74.00          | -30.60      | peak     |        |
| 4   | 4207.750    | 40.56            | -6.12       | 34.44           | 54.00          | -19.56      | AVG      |        |
| 5   | 5794.000    | 52.18            | -2.66       | 49.52           | 74.00          | -24.48      | peak     |        |
| 6   | 5794.000    | 42.80            | -2.66       | 40.14           | 54.00          | -13.86      | AVG      |        |
| 7   | 7568.250    | 50.22            | 2.75        | 52.97           | 74.00          | -21.03      | peak     |        |
| 8   | 7568.250    | 40.81            | 2.75        | 43.56           | 54.00          | -10.44      | AVG      |        |
| 9   | 9918.250    | 49.51            | 4.95        | 54.46           | 74.00          | -19.54      | peak     |        |
| 10  | 9918.250    | 39.69            | 4.95        | 44.64           | 54.00          | -9.36       | AVG      |        |
| 11  | 12526.750   | 49.76            | 6.95        | 56.71           | 74.00          | -17.29      | peak     |        |
| 12  | 12526.750   | 38.22            | 6.95        | 45.17           | 54.00          | -8.83       | AVG      |        |

802.11b: Middle Channel 2437MHz (Horizontal)



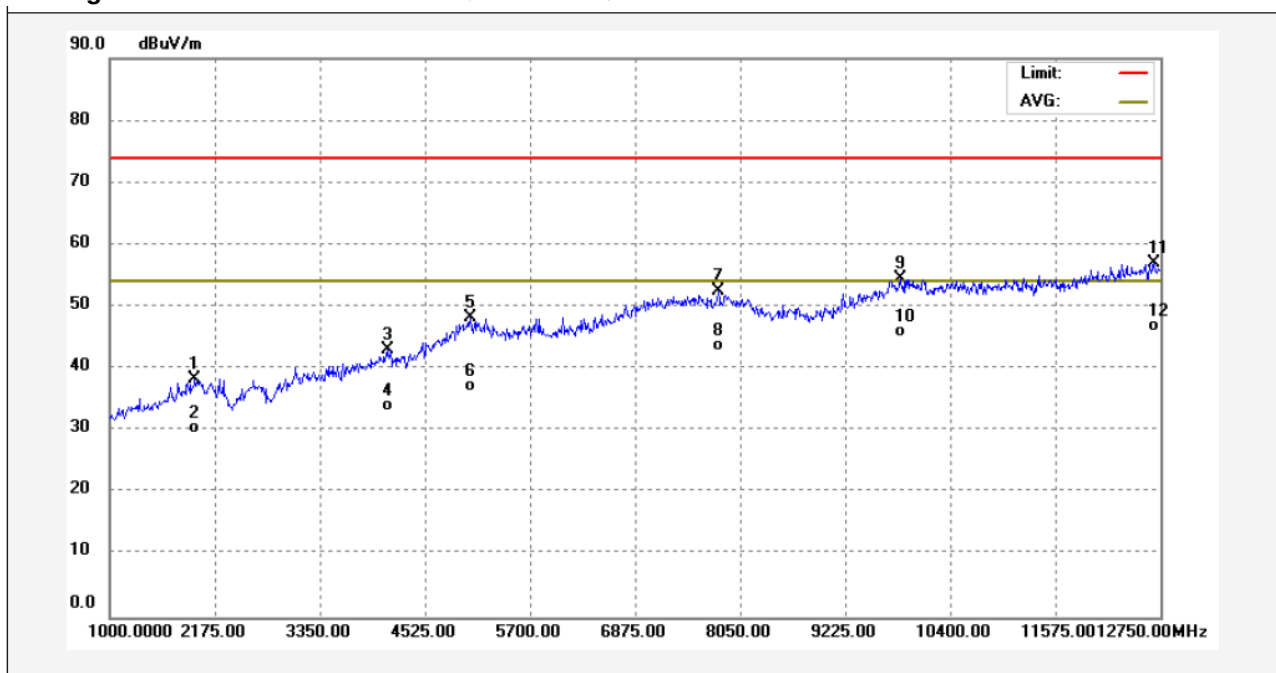
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2116.250    | 49.77            | -10.79      | 38.98           | 74.00          | -35.02      | peak     |        |
| 2   | 2116.250    | 41.26            | -10.79      | 30.47           | 54.00          | -23.53      | AVG      |        |
| 3   | 4031.500    | 48.19            | -6.71       | 41.48           | 74.00          | -32.52      | peak     |        |
| 4   | 4031.500    | 39.45            | -6.71       | 32.74           | 54.00          | -21.26      | AVG      |        |
| 5   | 5124.250    | 49.96            | -1.79       | 48.17           | 74.00          | -25.83      | peak     |        |
| 6   | 5124.250    | 41.50            | -1.79       | 39.71           | 54.00          | -14.29      | AVG      |        |
| 7   | 8026.500    | 50.01            | 2.22        | 52.23           | 74.00          | -21.77      | peak     |        |
| 8   | 8026.500    | 41.10            | 2.22        | 43.32           | 54.00          | -10.68      | AVG      |        |
| 9   | 9894.750    | 51.29            | 3.80        | 55.09           | 74.00          | -18.91      | peak     |        |
| 10  | 9894.750    | 42.12            | 3.80        | 45.92           | 54.00          | -8.08       | AVG      |        |
| 11  | 12291.750   | 49.02            | 6.75        | 55.77           | 74.00          | -18.23      | peak     |        |
| 12  | 12291.750   | 39.32            | 6.75        | 46.07           | 54.00          | -7.93       | AVG      |        |

802.11g: Middle Channel 2437MHz (Vertical)



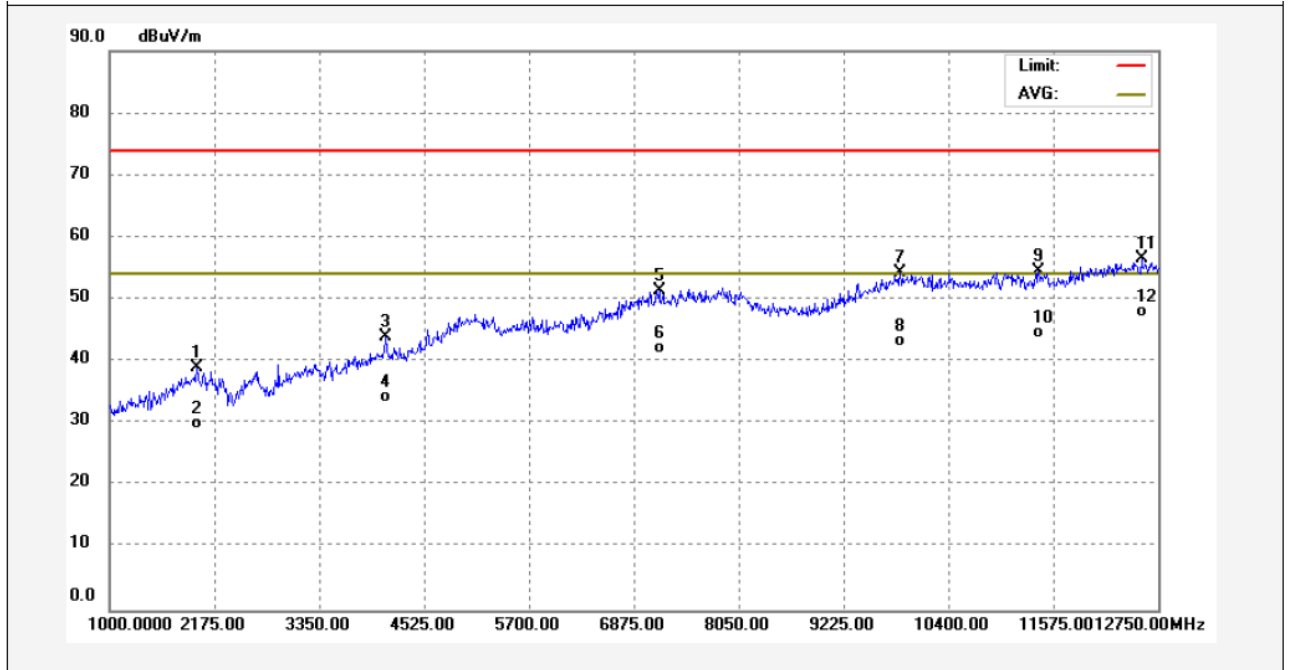
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1963.500    | 48.63            | -10.62      | 38.01           | 74.00          | -35.99      | peak     |        |
| 2   | 1963.500    | 40.19            | -10.62      | 29.57           | 54.00          | -24.43      | AVG      |        |
| 3   | 3702.500    | 50.09            | -8.25       | 41.84           | 74.00          | -32.16      | peak     |        |
| 4   | 3702.500    | 40.73            | -8.25       | 32.48           | 54.00          | -21.52      | AVG      |        |
| 5   | 5347.500    | 51.07            | -2.60       | 48.47           | 74.00          | -25.53      | peak     |        |
| 6   | 5347.500    | 42.11            | -2.60       | 39.51           | 54.00          | -14.49      | AVG      |        |
| 7   | 7615.250    | 50.45            | 2.01        | 52.46           | 74.00          | -21.54      | peak     |        |
| 8   | 7615.250    | 41.57            | 2.01        | 43.58           | 54.00          | -10.42      | AVG      |        |
| 9   | 10094.500   | 50.70            | 4.01        | 54.71           | 74.00          | -19.29      | peak     |        |
| 10  | 10094.500   | 41.70            | 4.01        | 45.71           | 54.00          | -8.29       | AVG      |        |
| 11  | 12444.500   | 50.67            | 6.99        | 57.66           | 74.00          | -16.34      | peak     |        |
| 12  | 12444.500   | 41.70            | 6.99        | 48.69           | 54.00          | -5.31       | AVG      |        |

## 802.11g: Middle Channel 2437MHz (Horizontal)



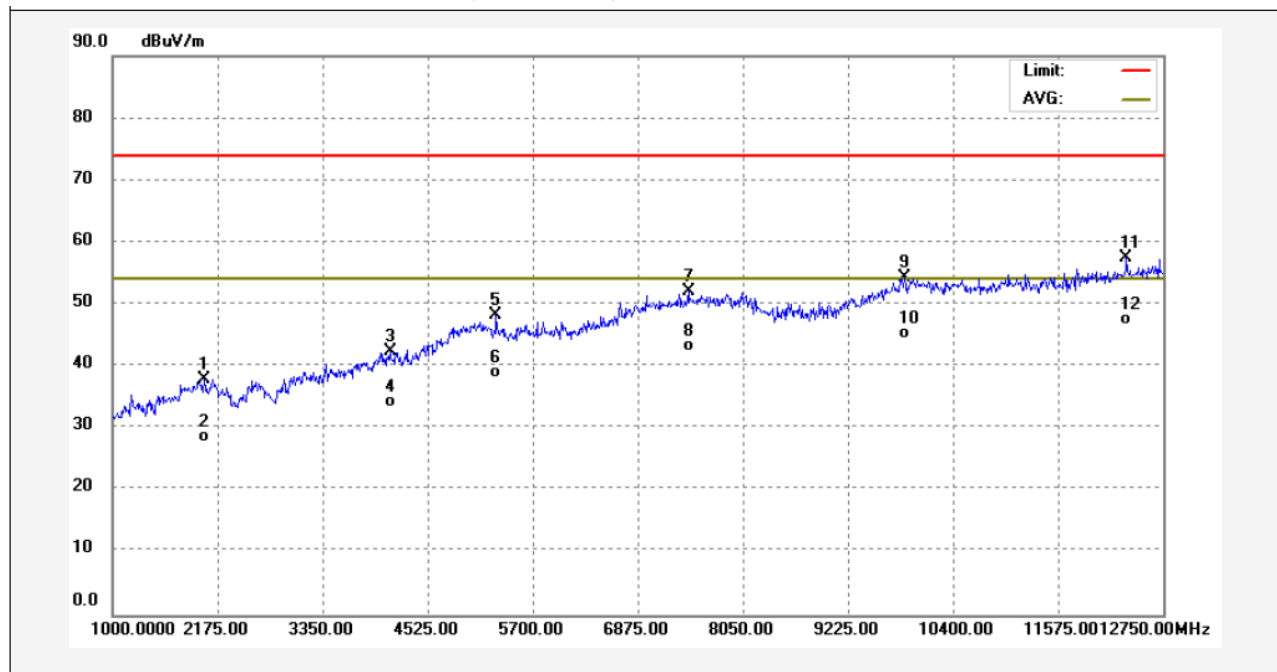
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1951.750    | 47.23            | -8.86       | 38.37           | 74.00          | -35.63      | peak     |        |
| 2   | 1951.750    | 39.38            | -8.86       | 30.52           | 54.00          | -23.48      | AVG      |        |
| 3   | 4102.000    | 49.37            | -6.32       | 43.05           | 74.00          | -30.95      | peak     |        |
| 4   | 4102.000    | 40.38            | -6.32       | 34.06           | 54.00          | -19.94      | AVG      |        |
| 5   | 5030.250    | 52.18            | -3.99       | 48.19           | 74.00          | -25.81      | peak     |        |
| 6   | 5030.250    | 41.28            | -3.99       | 37.29           | 54.00          | -16.71      | AVG      |        |
| 7   | 7803.250    | 49.66            | 2.81        | 52.47           | 74.00          | -21.53      | peak     |        |
| 8   | 7803.250    | 40.93            | 2.81        | 43.74           | 54.00          | -10.26      | AVG      |        |
| 9   | 9836.000    | 49.77            | 4.82        | 54.59           | 74.00          | -19.41      | peak     |        |
| 10  | 9836.000    | 41.21            | 4.82        | 46.03           | 54.00          | -7.97       | AVG      |        |
| 11  | 12679.500   | 49.65            | 7.37        | 57.02           | 74.00          | -16.98      | peak     |        |
| 12  | 12679.500   | 39.63            | 7.37        | 47.00           | 54.00          | -7.00       | AVG      |        |

## 802.11n: Middle Channel 2437MHz (Vertical)



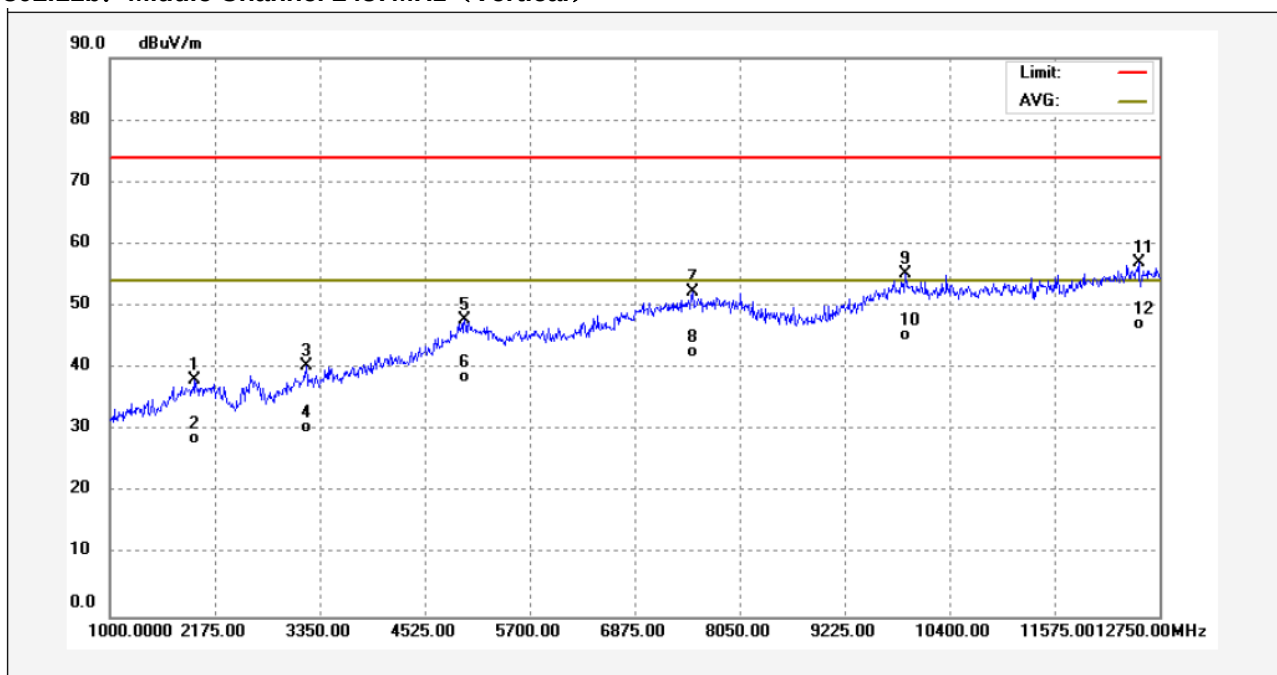
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1975.250    | 47.73            | -8.72       | 39.01           | 74.00          | -34.99      | peak     |        |
| 2   | 1975.250    | 38.84            | -8.72       | 30.12           | 54.00          | -23.88      | AVG      |        |
| 3   | 4090.250    | 50.27            | -6.34       | 43.93           | 74.00          | -30.07      | peak     |        |
| 4   | 4090.250    | 40.73            | -6.34       | 34.39           | 54.00          | -19.61      | AVG      |        |
| 5   | 7157.000    | 49.07            | 2.44        | 51.51           | 74.00          | -22.49      | peak     |        |
| 6   | 7157.000    | 39.75            | 2.44        | 42.19           | 54.00          | -11.81      | AVG      |        |
| 7   | 9859.500    | 49.38            | 4.86        | 54.24           | 74.00          | -19.76      | peak     |        |
| 8   | 9859.500    | 38.56            | 4.86        | 43.42           | 54.00          | -10.58      | AVG      |        |
| 9   | 11410.500   | 47.88            | 6.57        | 54.45           | 74.00          | -19.55      | peak     |        |
| 10  | 11410.500   | 38.02            | 6.57        | 44.59           | 54.00          | -9.41       | AVG      |        |
| 11  | 12562.000   | 49.44            | 7.05        | 56.49           | 74.00          | -17.51      | peak     |        |
| 12  | 12562.000   | 40.90            | 7.05        | 47.95           | 54.00          | -6.05       | AVG      |        |

## 802.11n: Middle Channel 2437MHz (Horizontal)

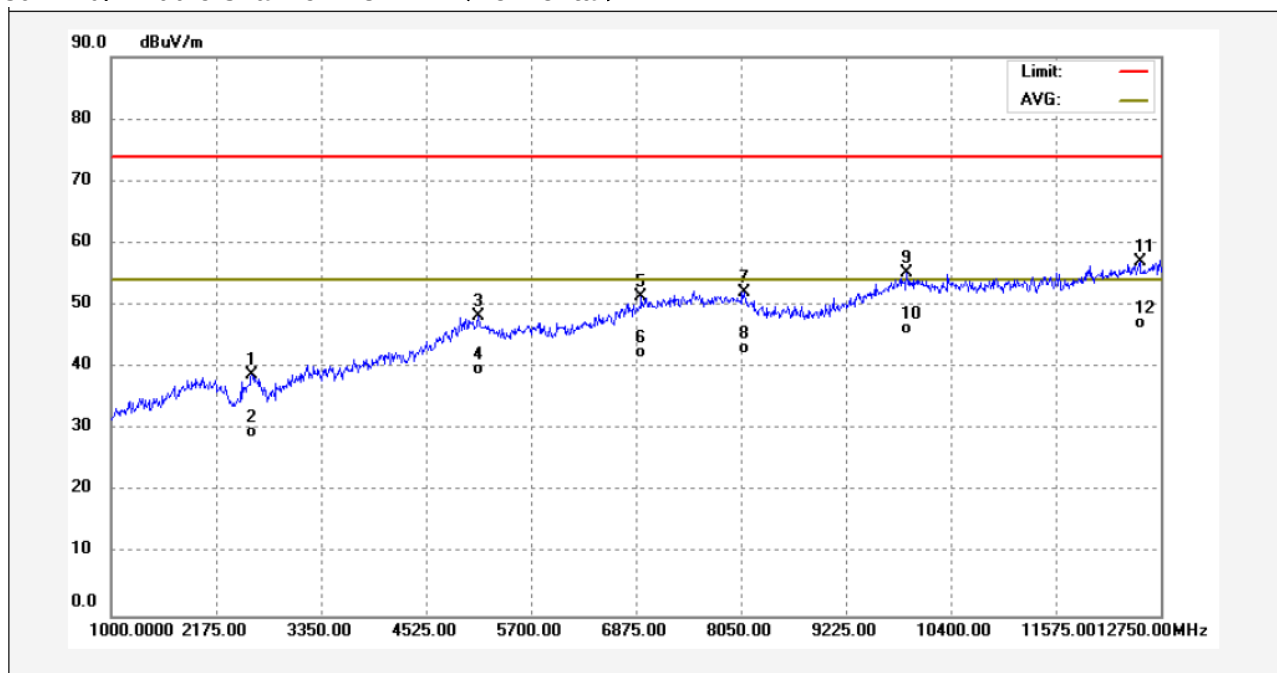


WIFI: Stamped Metal Antenna

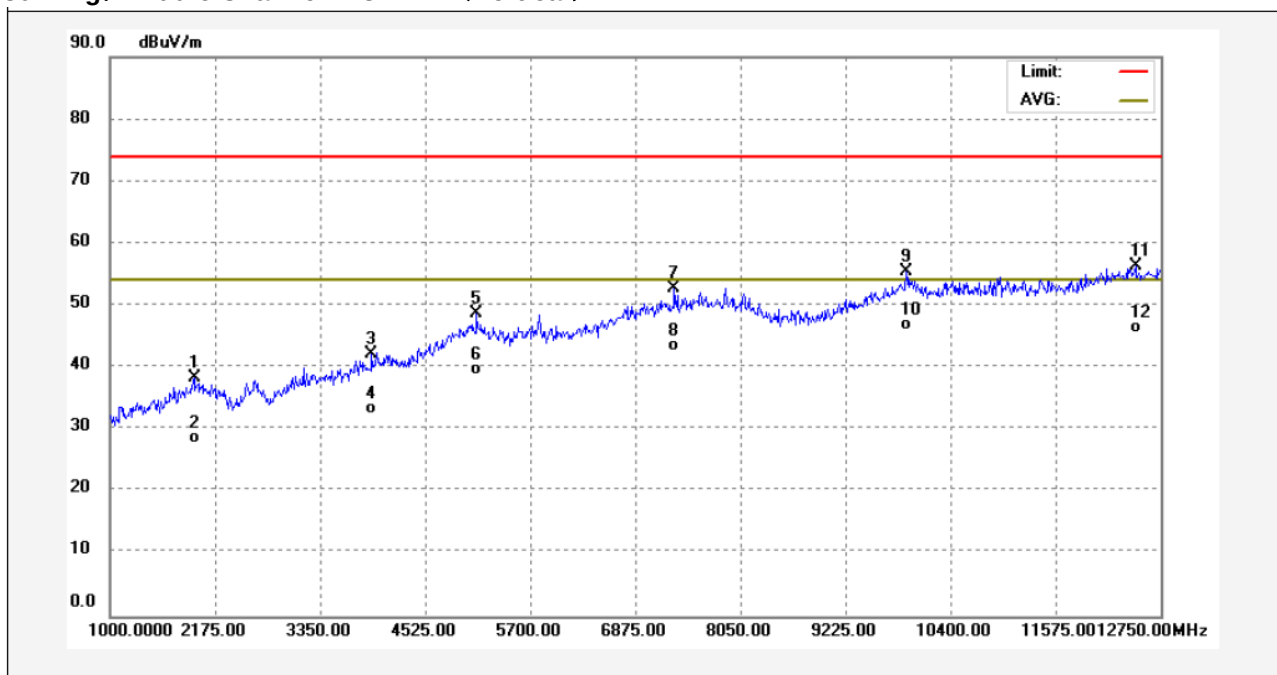
## 802.11b: Middle Channel 2437MHz (Vertical)



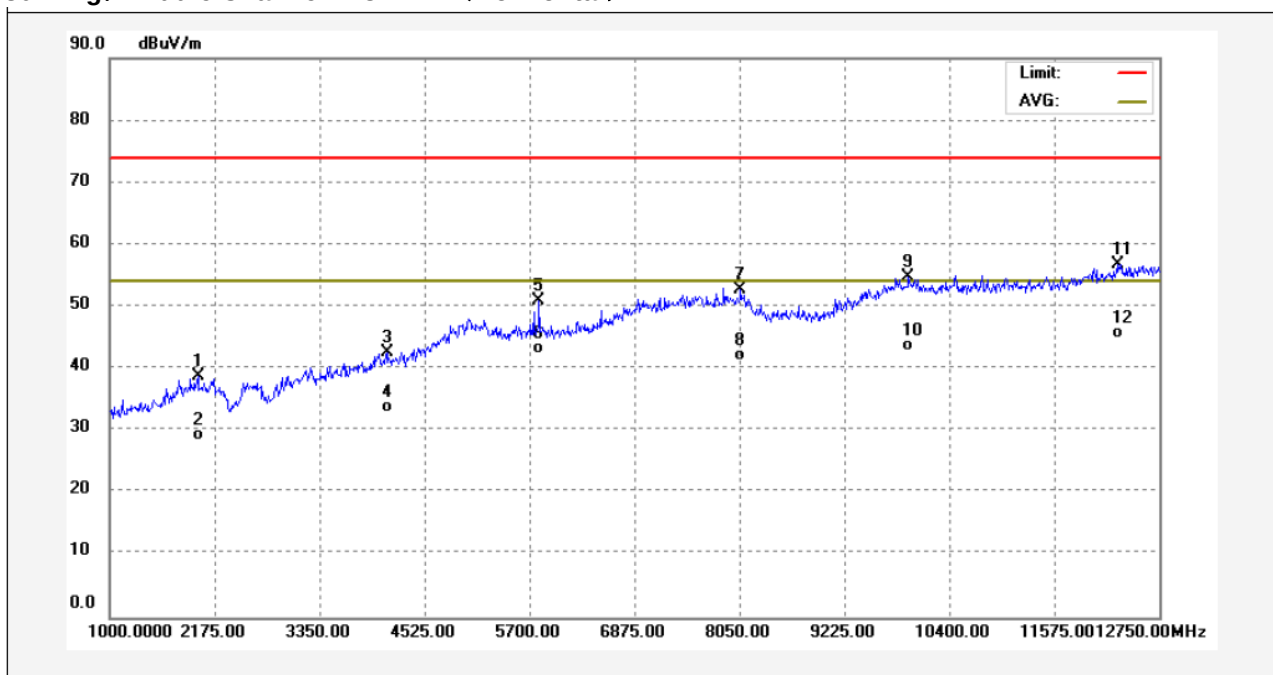
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1951.750    | 48.84            | -10.69      | 38.15           | 74.00          | -35.85      | peak     |        |
| 2   | 1951.750    | 39.36            | -10.69      | 28.67           | 54.00          | -25.33      | AVG      |        |
| 3   | 3197.250    | 50.38            | -10.09      | 40.29           | 74.00          | -33.71      | peak     |        |
| 4   | 3197.250    | 40.60            | -10.09      | 30.51           | 54.00          | -23.49      | AVG      |        |
| 5   | 4971.500    | 49.48            | -1.58       | 47.90           | 74.00          | -26.10      | peak     |        |
| 6   | 4971.500    | 40.22            | -1.58       | 38.64           | 54.00          | -15.36      | AVG      |        |
| 7   | 7521.250    | 50.45            | 1.96        | 52.41           | 74.00          | -21.59      | peak     |        |
| 8   | 7521.250    | 40.72            | 1.96        | 42.68           | 54.00          | -11.32      | AVG      |        |
| 9   | 9906.500    | 51.39            | 3.80        | 55.19           | 74.00          | -18.81      | peak     |        |
| 10  | 9906.500    | 41.56            | 3.80        | 45.36           | 54.00          | -8.64       | AVG      |        |
| 11  | 12515.000   | 49.83            | 7.12        | 56.95           | 74.00          | -17.05      | peak     |        |
| 12  | 12515.000   | 39.93            | 7.12        | 47.05           | 54.00          | -6.95       | AVG      |        |

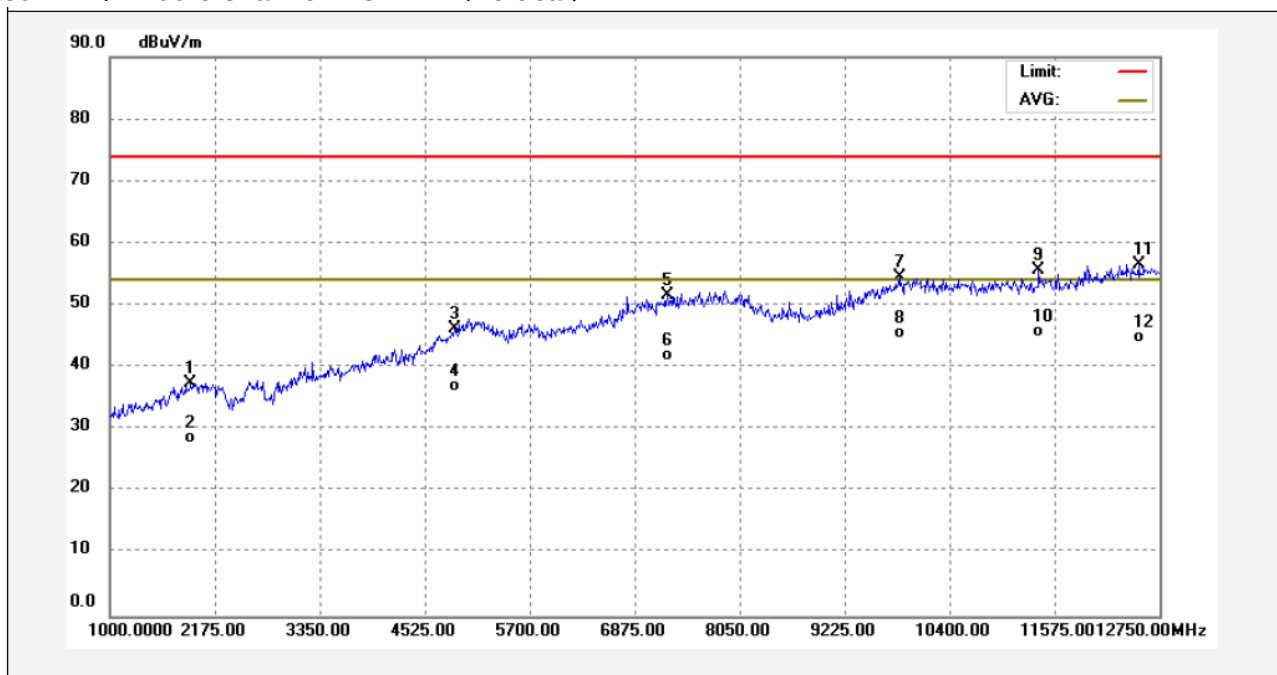
**802.11b: Middle Channel 2437MHz (Horizontal)**

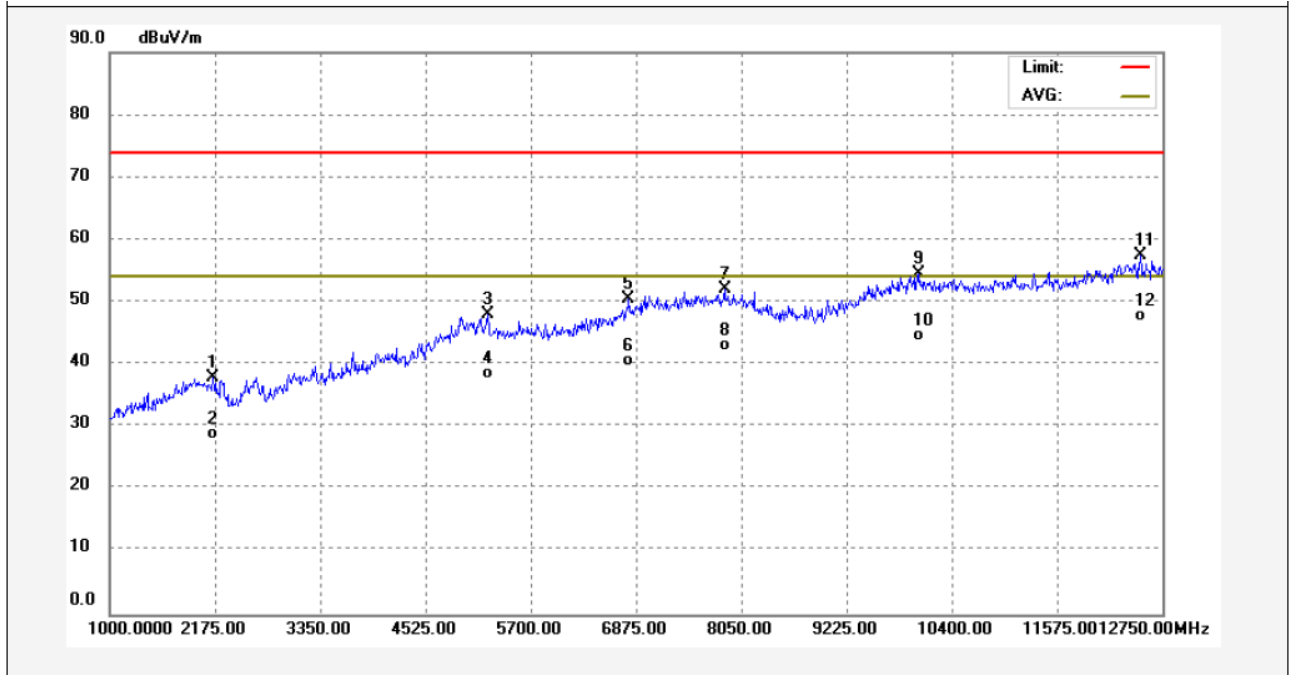
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2574.500    | 46.55            | -7.83       | 38.72           | 74.00          | -35.28      | peak     |        |
| 2   | 2574.500    | 37.40            | -7.83       | 29.57           | 54.00          | -24.43      | AVG      |        |
| 3   | 5112.500    | 52.14            | -3.81       | 48.33           | 74.00          | -25.67      | peak     |        |
| 4   | 5112.500    | 43.49            | -3.81       | 39.68           | 54.00          | -14.32      | AVG      |        |
| 5   | 6933.750    | 49.43            | 1.98        | 51.41           | 74.00          | -22.59      | peak     |        |
| 6   | 6933.750    | 40.53            | 1.98        | 42.51           | 54.00          | -11.49      | AVG      |        |
| 7   | 8085.250    | 49.15            | 2.91        | 52.06           | 74.00          | -21.94      | peak     |        |
| 8   | 8085.250    | 40.23            | 2.91        | 43.14           | 54.00          | -10.86      | AVG      |        |
| 9   | 9906.500    | 50.26            | 4.93        | 55.19           | 74.00          | -18.81      | peak     |        |
| 10  | 9906.500    | 41.28            | 4.93        | 46.21           | 54.00          | -7.79       | AVG      |        |
| 11  | 12515.000   | 50.04            | 6.91        | 56.95           | 74.00          | -17.05      | peak     |        |
| 12  | 12515.000   | 40.15            | 6.91        | 47.06           | 54.00          | -6.94       | AVG      |        |

**802.11g: Middle Channel 2437MHz (Vertical)**

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1940.000    | 47.20            | -8.94       | 38.26           | 74.00          | -35.74      | peak     |        |
| 2   | 1940.000    | 37.63            | -8.94       | 28.69           | 54.00          | -25.31      | AVG      |        |
| 3   | 3925.750    | 48.81            | -6.58       | 42.23           | 74.00          | -31.77      | peak     |        |
| 4   | 3925.750    | 39.92            | -6.58       | 33.34           | 54.00          | -20.66      | AVG      |        |
| 5   | 5100.750    | 52.43            | -3.83       | 48.60           | 74.00          | -25.40      | peak     |        |
| 6   | 5100.750    | 43.63            | -3.83       | 39.80           | 54.00          | -14.20      | AVG      |        |
| 7   | 7309.750    | 50.11            | 2.57        | 52.68           | 74.00          | -21.32      | peak     |        |
| 8   | 7309.750    | 41.01            | 2.57        | 43.58           | 54.00          | -10.42      | AVG      |        |
| 9   | 9906.500    | 50.64            | 4.93        | 55.57           | 74.00          | -18.43      | peak     |        |
| 10  | 9906.500    | 41.92            | 4.93        | 46.85           | 54.00          | -7.15       | AVG      |        |
| 11  | 12468.000   | 49.57            | 6.84        | 56.41           | 74.00          | -17.59      | peak     |        |
| 12  | 12468.000   | 39.71            | 6.84        | 46.55           | 54.00          | -7.45       | AVG      |        |

**802.11g: Middle Channel 2437MHz (Horizontal)**

**802.11n: Middle Channel 2437MHz (Vertical)**

**802.11n: Middle Channel 2437MHz (Horizontal)**

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 2151.500    | 46.38            | -8.37       | 38.01           | 74.00          | -35.99      | peak     |        |
| 2   | 2151.500    | 37.31            | -8.37       | 28.94           | 54.00          | -25.06      | AVG      |        |
| 3   | 5218.250    | 51.65            | -3.57       | 48.08           | 74.00          | -25.92      | peak     |        |
| 4   | 5218.250    | 42.25            | -3.57       | 38.68           | 54.00          | -15.32      | AVG      |        |
| 5   | 6792.750    | 49.33            | 1.26        | 50.59           | 74.00          | -23.41      | peak     |        |
| 6   | 6792.750    | 39.42            | 1.26        | 40.68           | 54.00          | -13.32      | AVG      |        |
| 7   | 7862.000    | 49.21            | 2.83        | 52.04           | 74.00          | -21.96      | peak     |        |
| 8   | 7862.000    | 40.32            | 2.83        | 43.15           | 54.00          | -10.85      | AVG      |        |
| 9   | 10035.750   | 49.39            | 5.12        | 54.51           | 74.00          | -19.49      | peak     |        |
| 10  | 10035.750   | 39.48            | 5.12        | 44.60           | 54.00          | -9.40       | AVG      |        |
| 11  | 12503.250   | 50.59            | 6.89        | 57.48           | 74.00          | -16.52      | peak     |        |
| 12  | 12503.250   | 40.95            | 6.89        | 47.84           | 54.00          | -6.16       | AVG      |        |

**Test Frequency : 12.75GHz ~ 25GHz**

The measurements were more than 20 dB below the limit and not reported.

BT BLE:

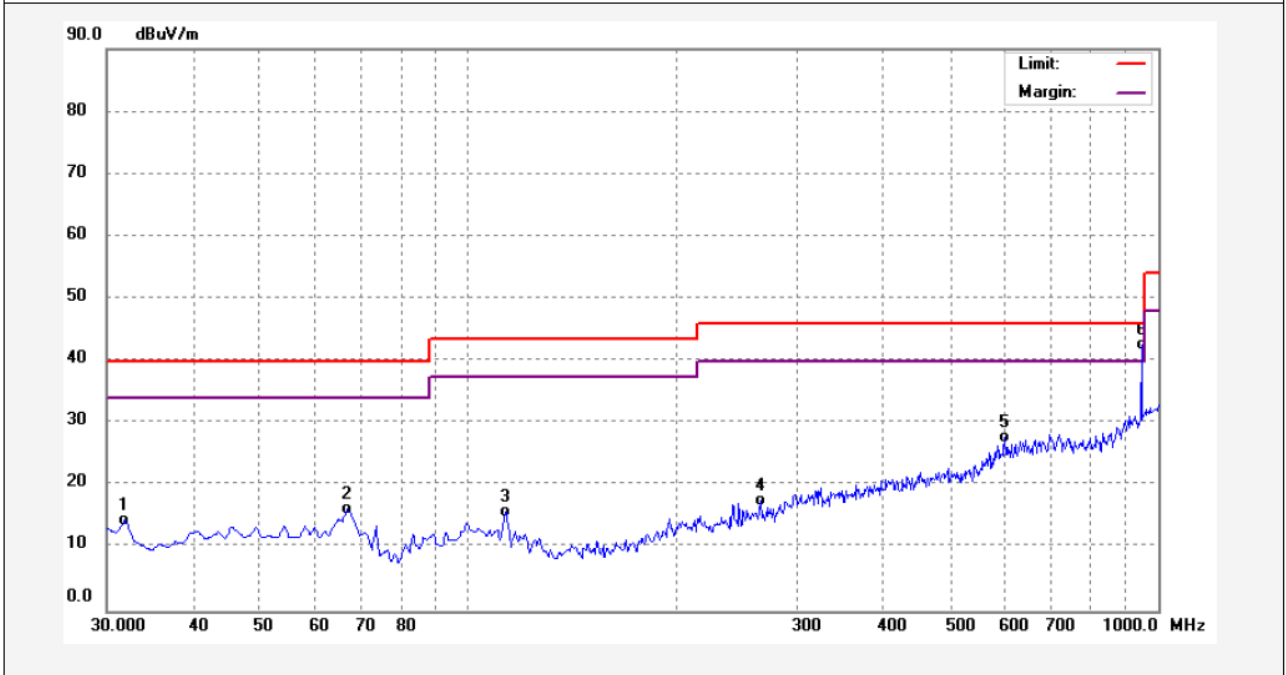
Test Frequency: 9KHz~30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency : 30MHz ~ 1GHz

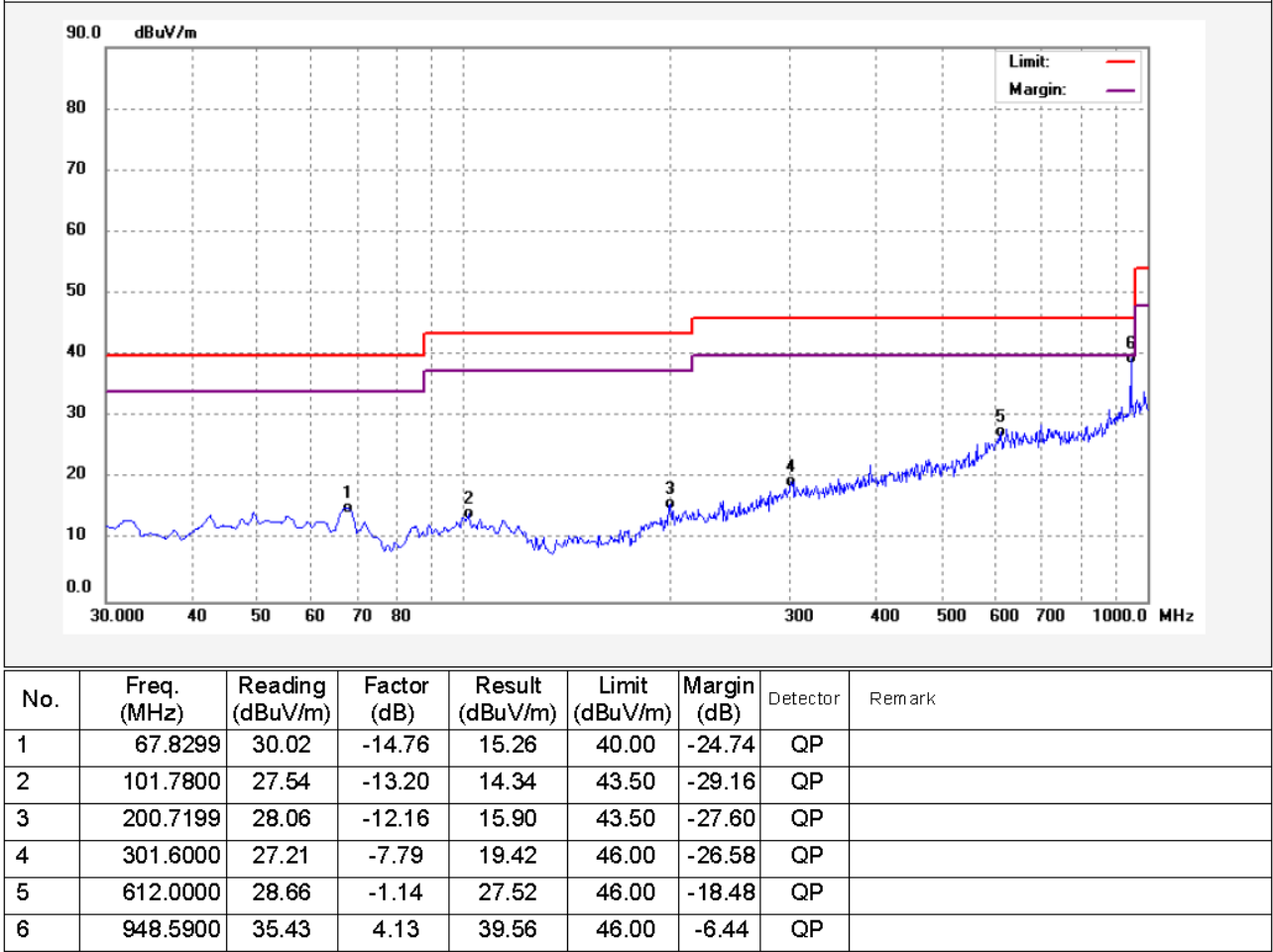
BLE: Stamped Metal Antenna

GFSK Low Channel 2402MHz(Vertical)



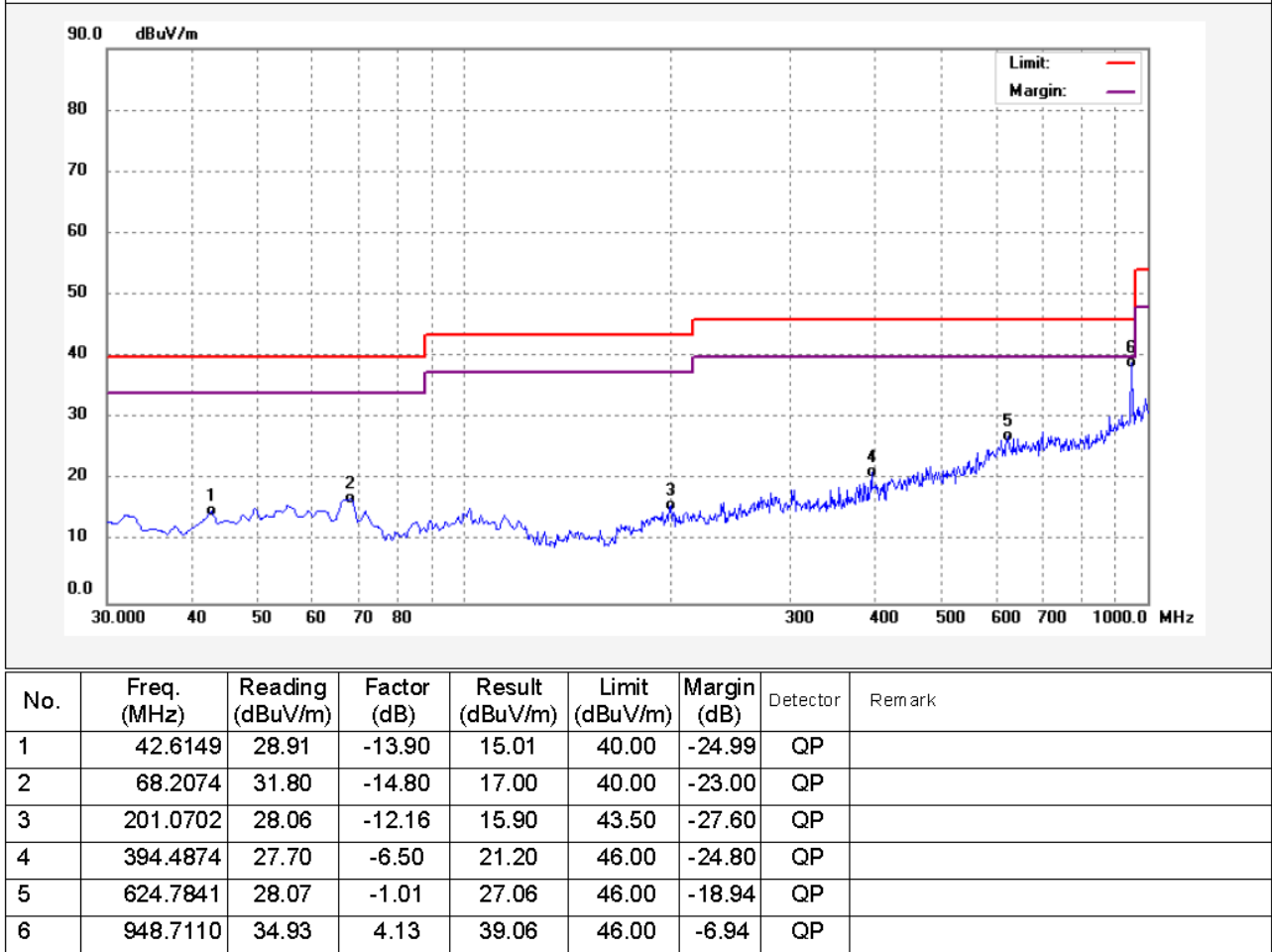
| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|--------|
| 1   | 31.9400        | 30.80               | -16.20         | 14.60              | 40.00             | -25.40         | QP       |        |
| 2   | 66.8599        | 30.86               | -14.65         | 16.21              | 40.00             | -23.79         | QP       |        |
| 3   | 113.4200       | 29.79               | -13.84         | 15.95              | 43.50             | -27.55         | QP       |        |
| 4   | 265.7099       | 27.58               | -9.96          | 17.62              | 46.00             | -28.38         | QP       |        |
| 5   | 601.3300       | 29.09               | -1.25          | 27.84              | 46.00             | -18.16         | QP       |        |
| 6   | 948.5900       | 38.45               | 4.13           | 42.58              | 46.00             | -3.42          | QP       |        |

GFSK Low Channel 2402MHz(Horizontal)

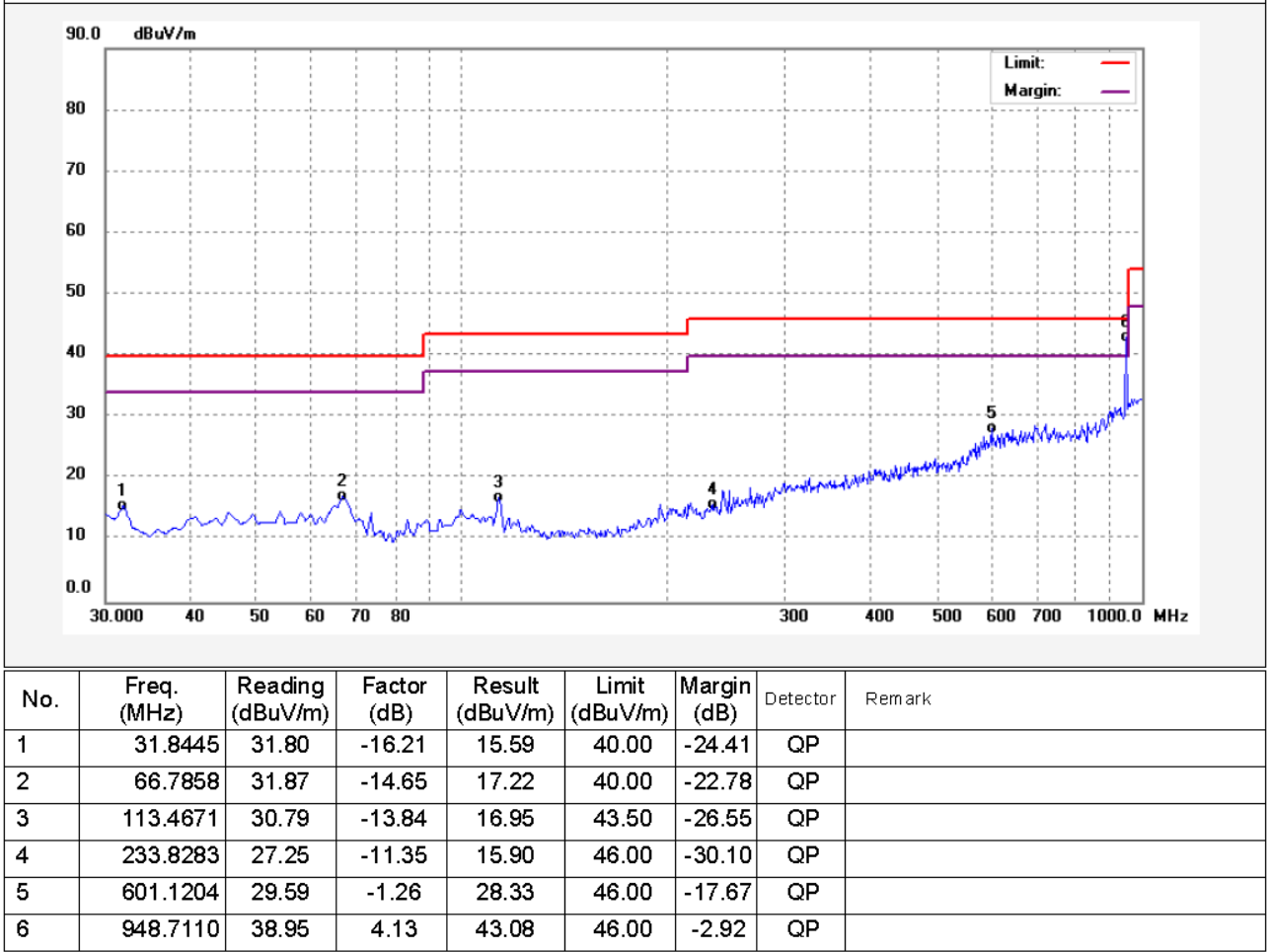


BLE:PCB printed antenna

GFSK Low Channel 2402MHz(Vertical)



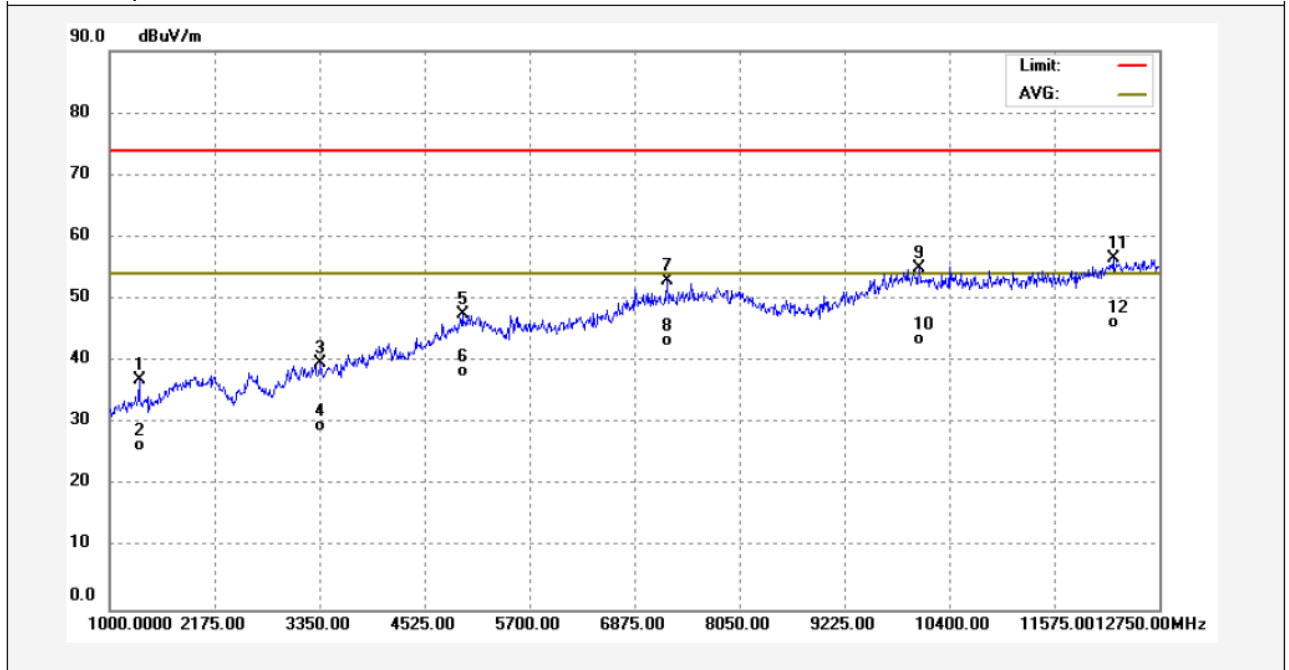
GFSK Low Channel 2402MHz(Horizontal)



Test Frequency : 1GHz ~ 12.75GHz

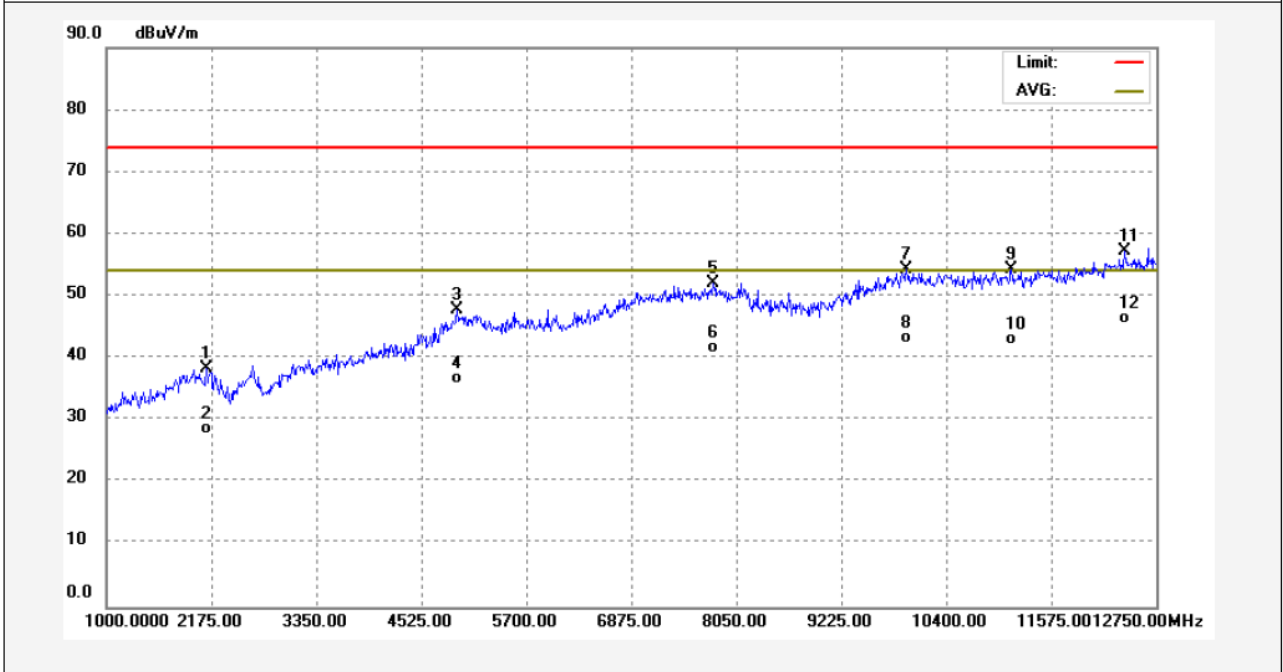
Remark: The current test plots doesn't have the fundamental signal, It's blocked by the filter  
GFSK Low Channel 2402MHz(Vertical)

BLE: Stamped Metal Antenna



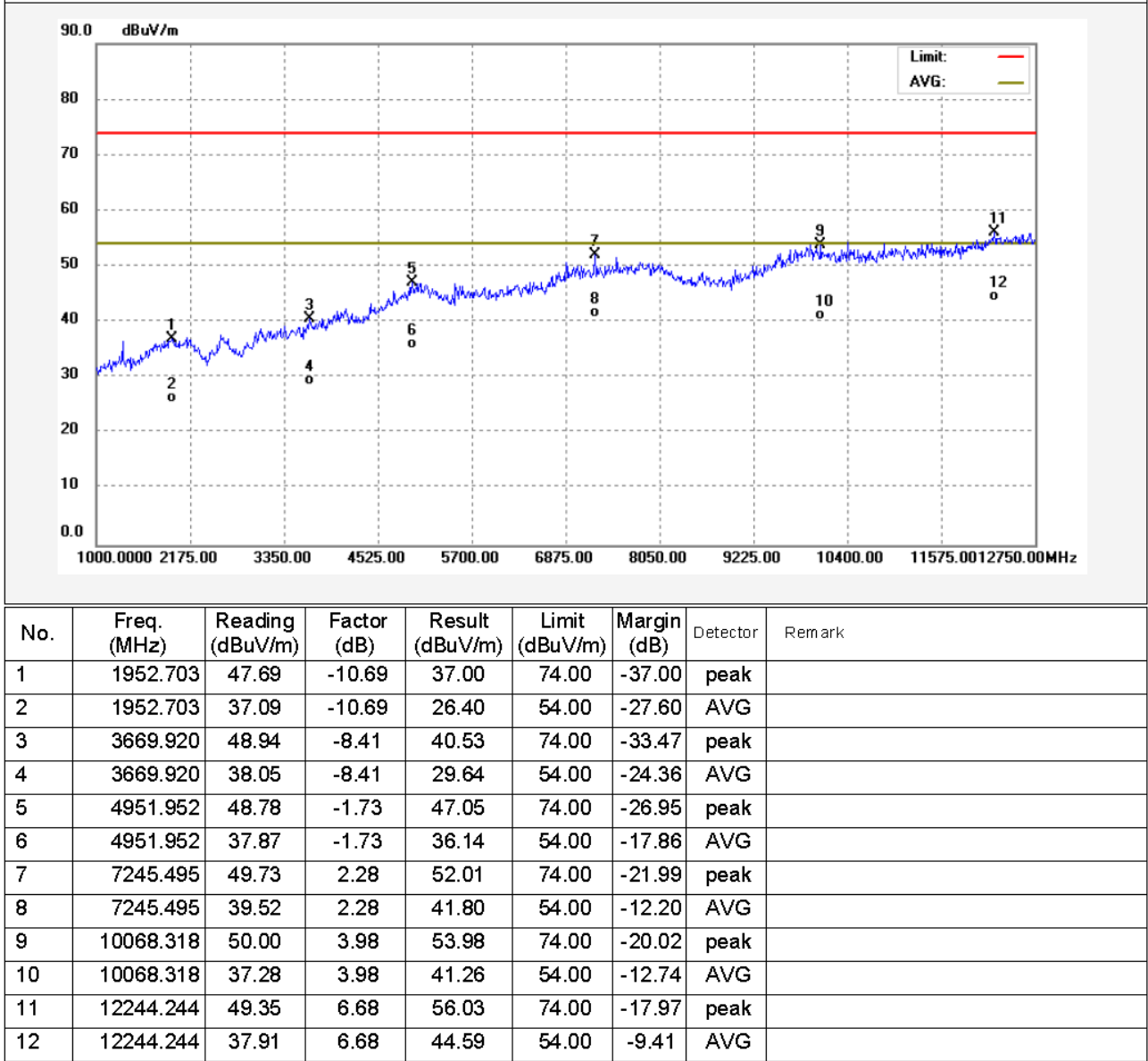
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1329.000    | 51.76            | -14.67      | 37.09           | 74.00          | -36.91      | peak     |        |
| 2   | 1329.000    | 41.01            | -14.67      | 26.34           | 54.00          | -27.66      | AVG      |        |
| 3   | 3361.750    | 49.39            | -9.62       | 39.77           | 74.00          | -34.23      | peak     |        |
| 4   | 3361.750    | 39.29            | -9.62       | 29.67           | 54.00          | -24.33      | AVG      |        |
| 5   | 4948.000    | 49.28            | -1.76       | 47.52           | 74.00          | -26.48      | peak     |        |
| 6   | 4948.000    | 40.17            | -1.76       | 38.41           | 54.00          | -15.59      | AVG      |        |
| 7   | 7239.250    | 50.73            | 2.29        | 53.02           | 74.00          | -20.98      | peak     |        |
| 8   | 7239.250    | 40.95            | 2.29        | 43.24           | 54.00          | -10.76      | AVG      |        |
| 9   | 10059.250   | 51.00            | 3.97        | 54.97           | 74.00          | -19.03      | peak     |        |
| 10  | 10059.250   | 39.62            | 3.97        | 43.59           | 54.00          | -10.41      | AVG      |        |
| 11  | 12233.000   | 49.85            | 6.65        | 56.50           | 74.00          | -17.50      | peak     |        |
| 12  | 12233.000   | 39.54            | 6.65        | 46.19           | 54.00          | -7.81       | AVG      |        |

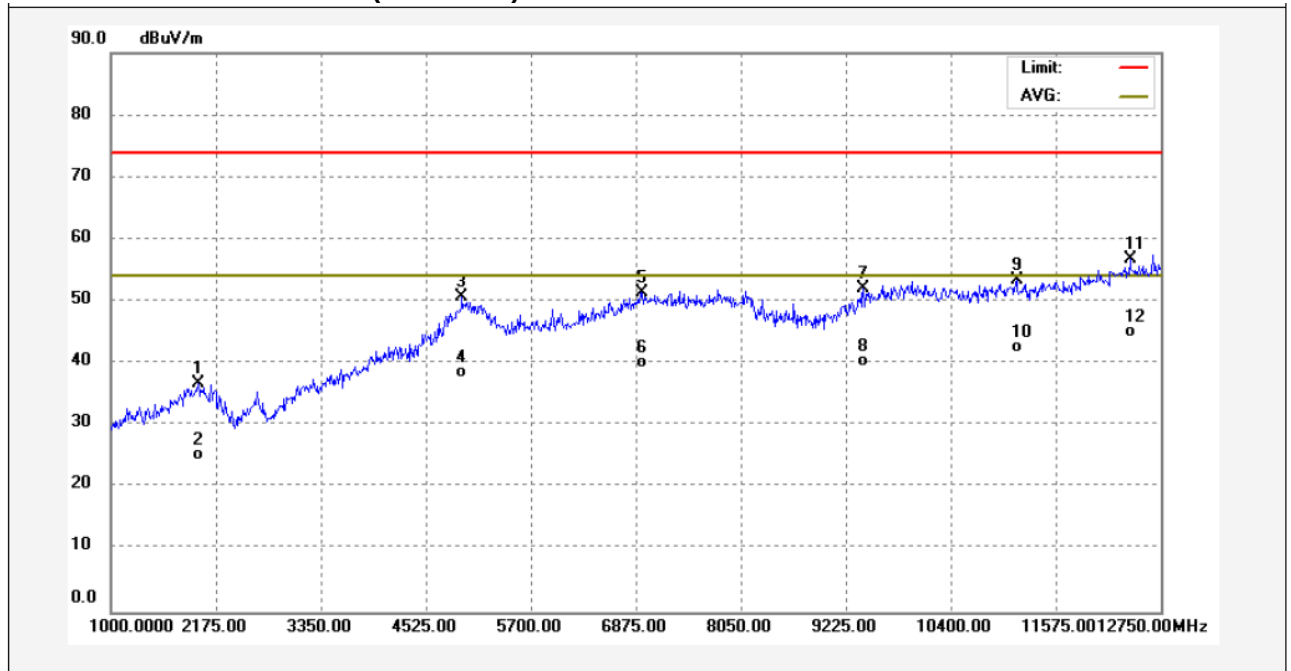
GFSK Low Channel 2402MHz(Horizontal)



| No. | Freq.<br>(MHz) | Reading<br>(dBuV/m) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Detector | Remark |
|-----|----------------|---------------------|----------------|--------------------|-------------------|----------------|----------|--------|
| 1   | 2116.250       | 46.88               | -8.41          | 38.47              | 74.00             | -35.53         | peak     |        |
| 2   | 2116.250       | 37.09               | -8.41          | 28.68              | 54.00             | -25.32         | AVG      |        |
| 3   | 4924.500       | 52.11               | -4.29          | 47.82              | 74.00             | -26.18         | peak     |        |
| 4   | 4924.500       | 41.08               | -4.29          | 36.79              | 54.00             | -17.21         | AVG      |        |
| 5   | 7791.500       | 49.29               | 2.80           | 52.09              | 74.00             | -21.91         | peak     |        |
| 6   | 7791.500       | 39.02               | 2.80           | 41.82              | 54.00             | -12.18         | AVG      |        |
| 7   | 9953.500       | 49.40               | 5.00           | 54.40              | 74.00             | -19.60         | peak     |        |
| 8   | 9953.500       | 38.24               | 5.00           | 43.24              | 54.00             | -10.76         | AVG      |        |
| 9   | 11128.500      | 48.20               | 6.22           | 54.42              | 74.00             | -19.58         | peak     |        |
| 10  | 11128.500      | 36.92               | 6.22           | 43.14              | 54.00             | -10.86         | AVG      |        |
| 11  | 12397.500      | 50.41               | 6.75           | 57.16              | 74.00             | -16.84         | peak     |        |
| 12  | 12397.500      | 39.63               | 6.75           | 46.38              | 54.00             | -7.62          | AVG      |        |

BLE: PCB printed antenna



**GFSK Low Channel 2402MHz(Horizontal)**

| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 1976.226    | 47.43            | -10.54      | 36.89           | 74.00          | -37.11      | peak     |        |
| 2   | 1976.226    | 35.82            | -10.54      | 25.28           | 54.00          | -28.72      | AVG      |        |
| 3   | 4928.428    | 52.61            | -1.91       | 50.70           | 74.00          | -23.30      | peak     |        |
| 4   | 4928.428    | 40.56            | -1.91       | 38.65           | 54.00          | -15.35      | AVG      |        |
| 5   | 6951.451    | 48.95            | 2.40        | 51.35           | 74.00          | -22.65      | peak     |        |
| 6   | 6951.451    | 37.74            | 2.40        | 40.14           | 54.00          | -13.86      | AVG      |        |
| 7   | 9421.421    | 48.80            | 3.27        | 52.07           | 74.00          | -21.93      | peak     |        |
| 8   | 9421.421    | 37.08            | 3.27        | 40.35           | 54.00          | -13.65      | AVG      |        |
| 9   | 11138.639   | 47.70            | 5.70        | 53.40           | 74.00          | -20.60      | peak     |        |
| 10  | 11138.639   | 36.87            | 5.70        | 42.57           | 54.00          | -11.43      | AVG      |        |
| 11  | 12408.909   | 49.91            | 6.93        | 56.84           | 74.00          | -17.16      | peak     |        |
| 12  | 12408.909   | 38.23            | 6.93        | 45.16           | 54.00          | -8.84       | AVG      |        |

**Test Frequency: 12.75GHz~25GHz**

The measurements were more than 20 dB below the limit and not reported.

## 8 Conducted Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05 August 24, 2018;  
ANSI C63.10:2013

Test Result: PASS

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### 8.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer:
  - a) Set instrument center frequency to DTS channel center frequency.
  - b) Set the span to \_ 1.5 times the DTS bandwidth.
  - c) Set the RBW = 100 kHz.
  - d) Set the VBW \_  $[3 \times \text{RBW}]$ .
  - e) Detector = peak.
  - f) Sweep time = auto couple.
  - g) Trace mode = max hold.
  - h) Allow trace to fully stabilize.
  - i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

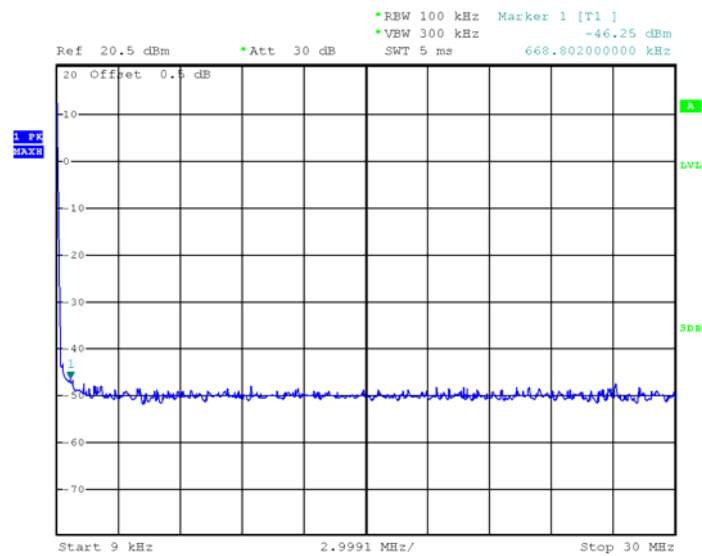
8.2 Test Result

Remark: For the WIFI, Both antenna 0 and antenna 1 are tested, and only the worst data antenna 0 is put in the report

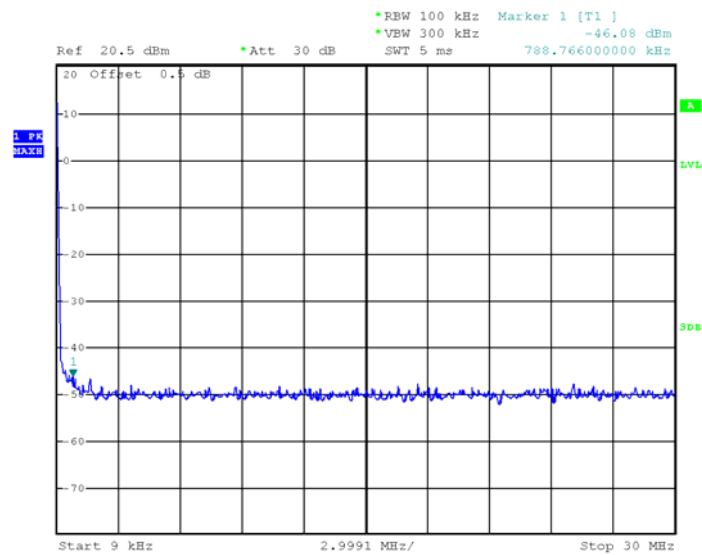
9KHz – 30MHz

802.11b

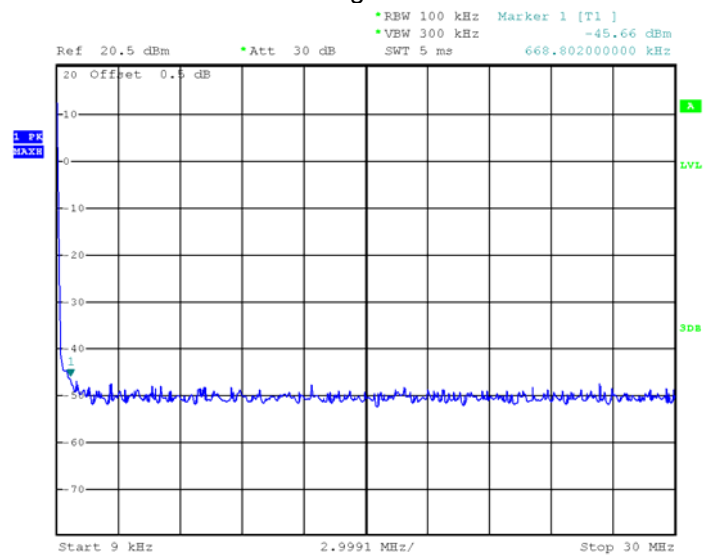
Low Channel



Middle Channel

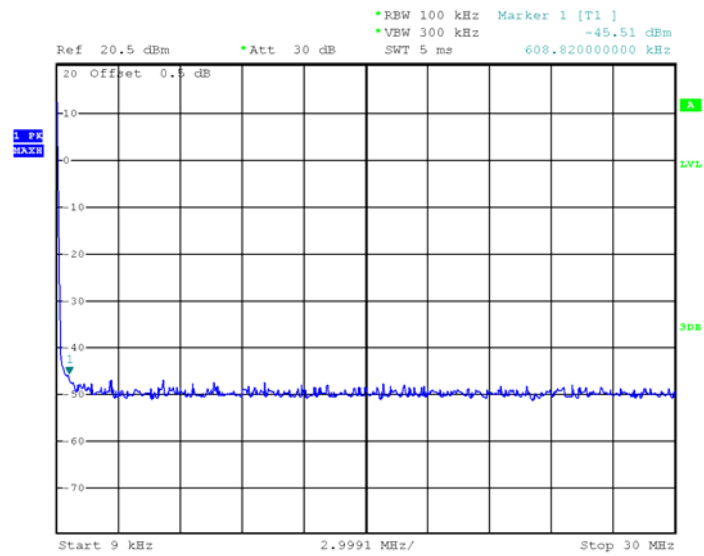


High Channel

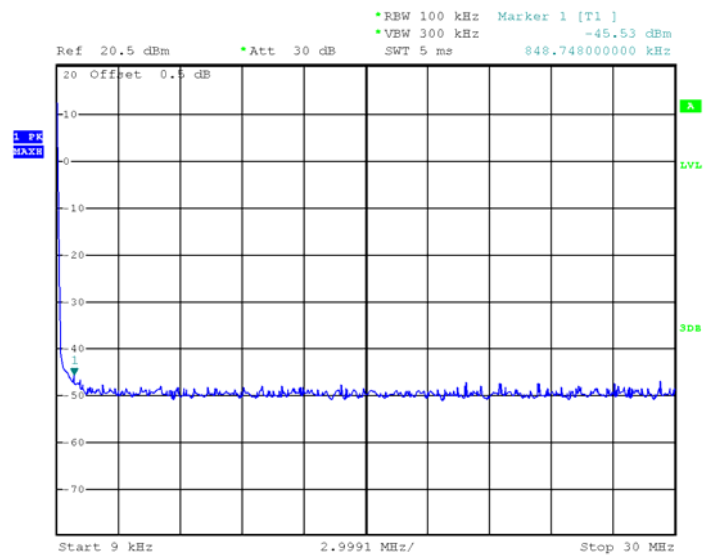


802.11g

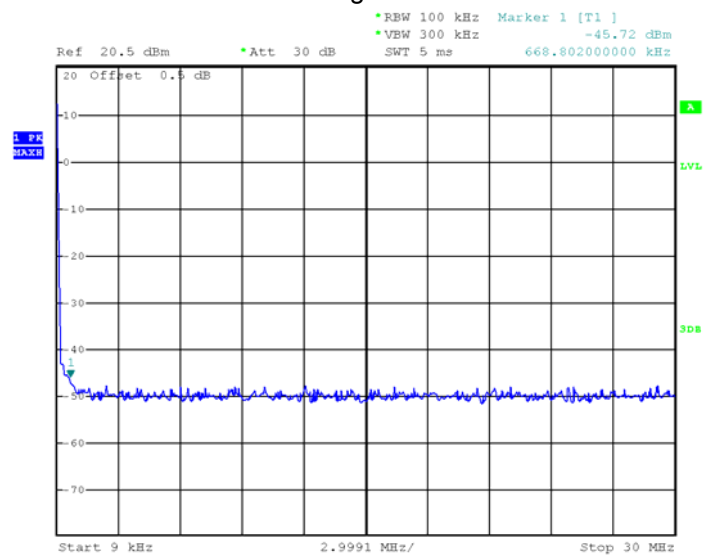
Low Channel



Middle Channel

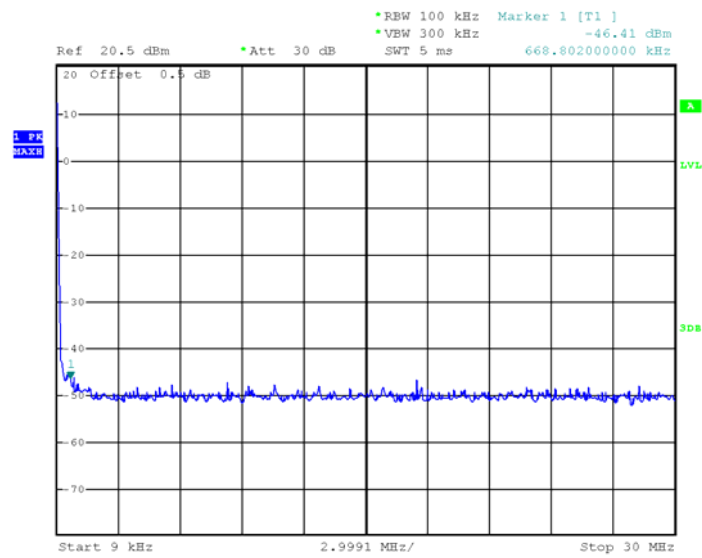


High Channel

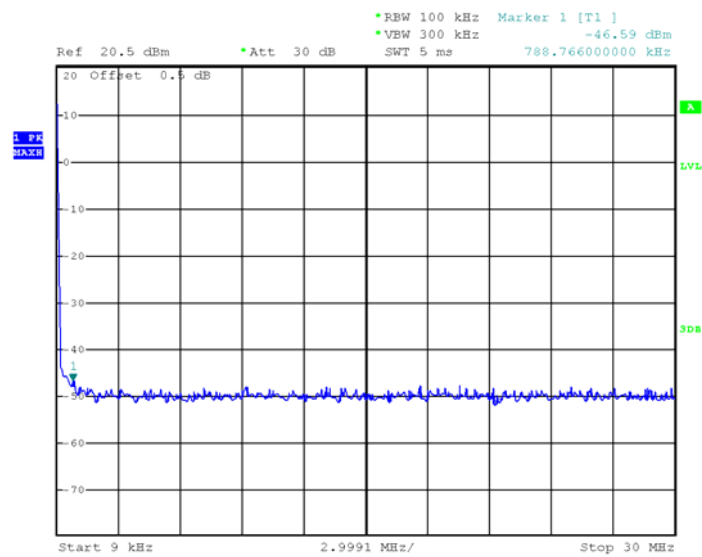


802.11n HT20

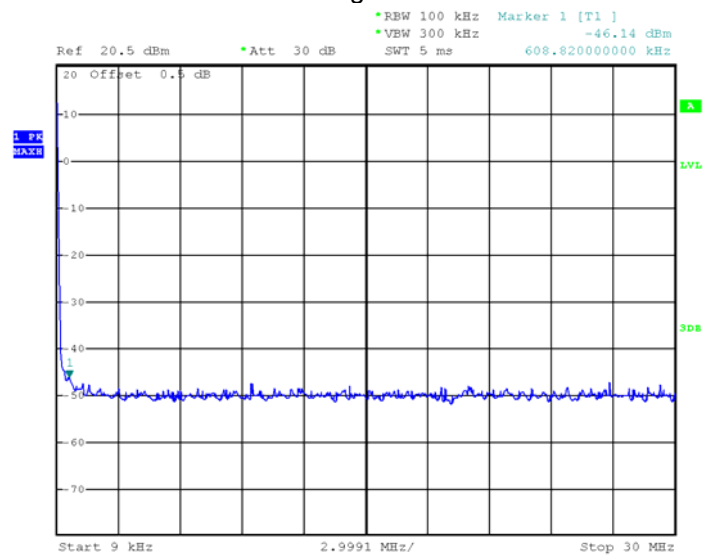
Low Channel



Middle Channel

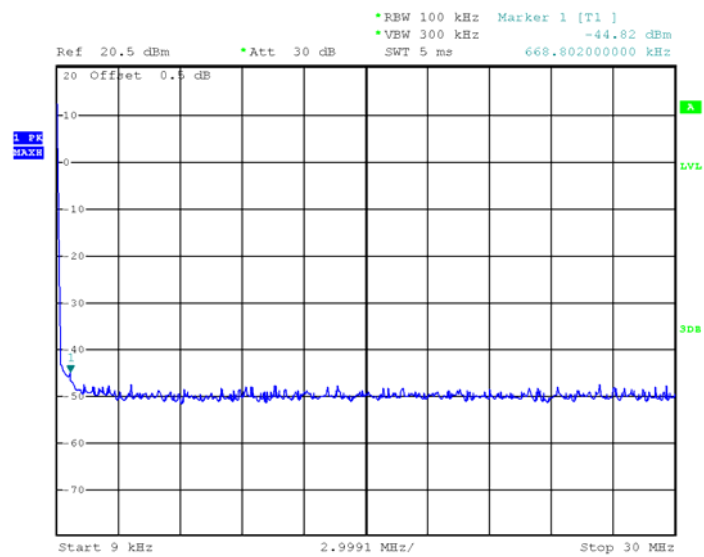


High Channel

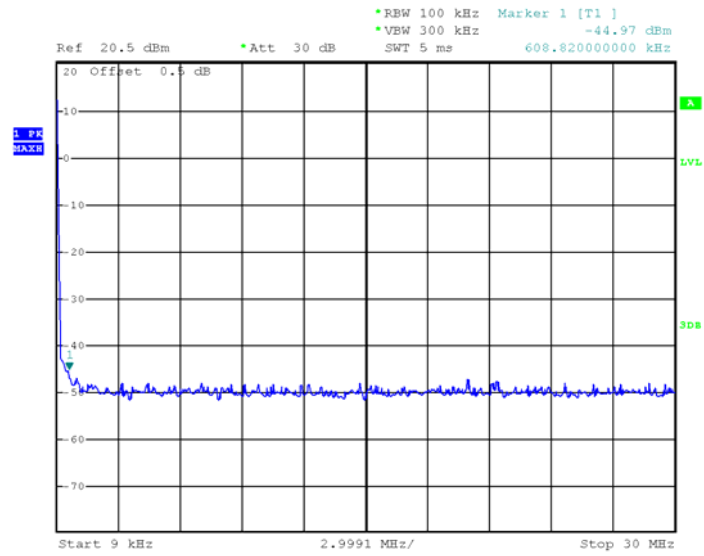


802.11n HT40

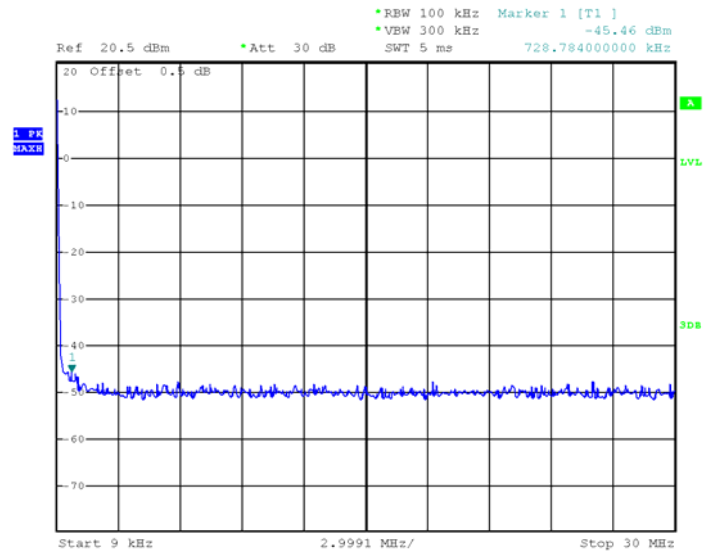
Low Channel



Middle Channel

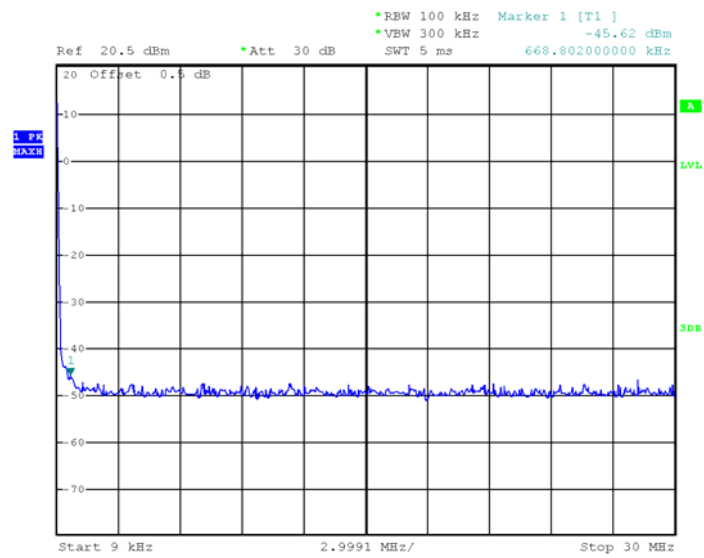


High Channel

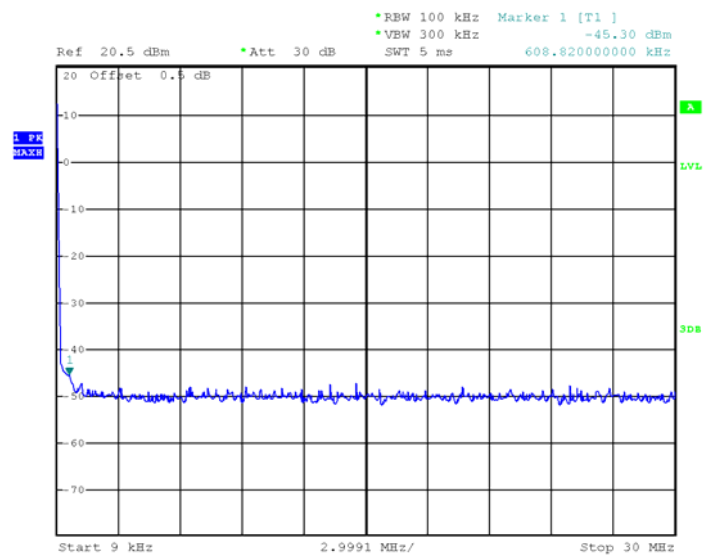


BLE

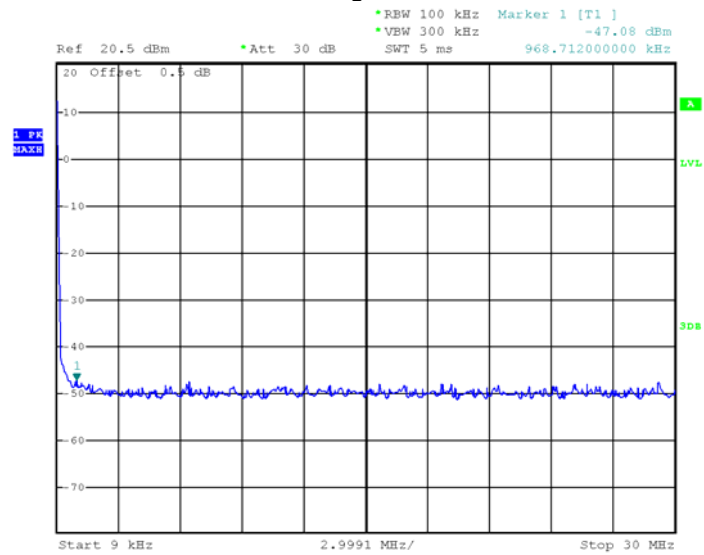
Low Channel



Middle Channel



High Channel

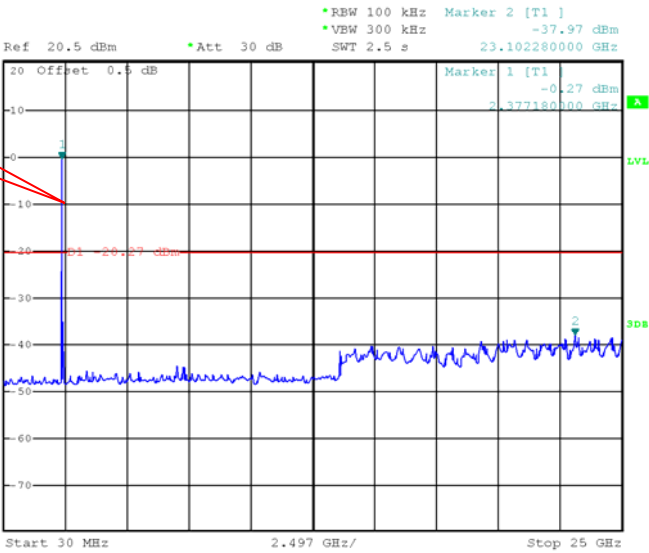


Above 30MHz

802.11b

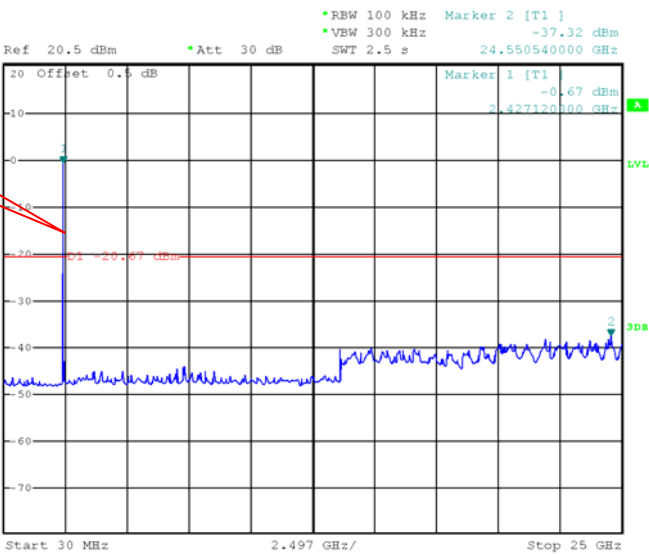
Low Channel

Fundamental



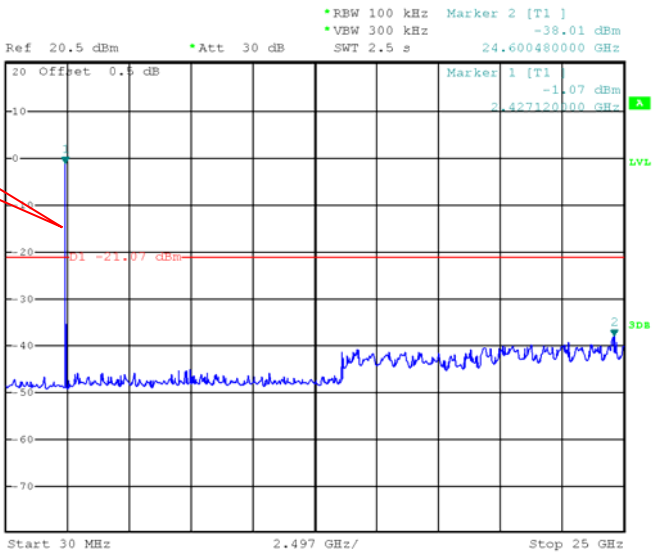
Middle Channel

Fundamental



High Channel

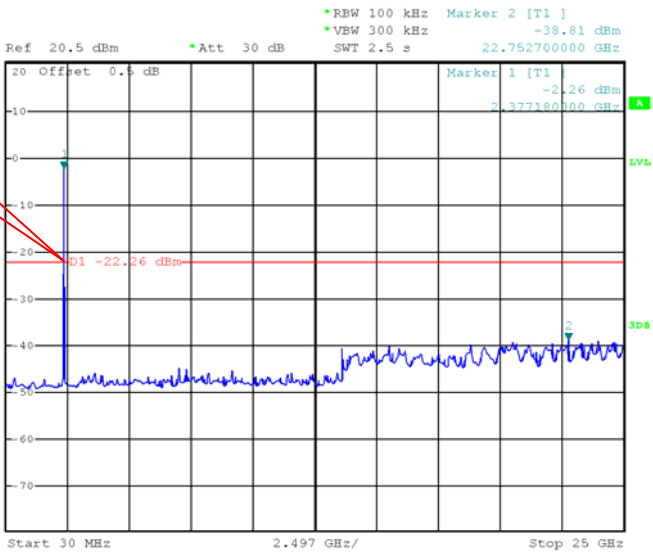
Fundamental



802.11g

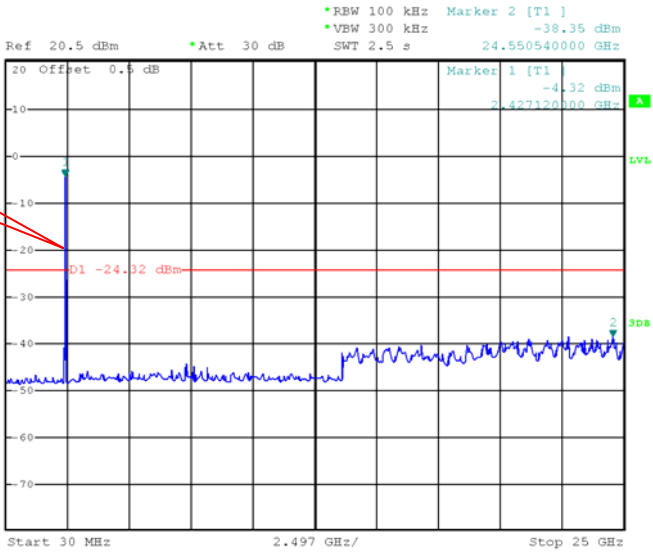
Low Channel

Fundamental



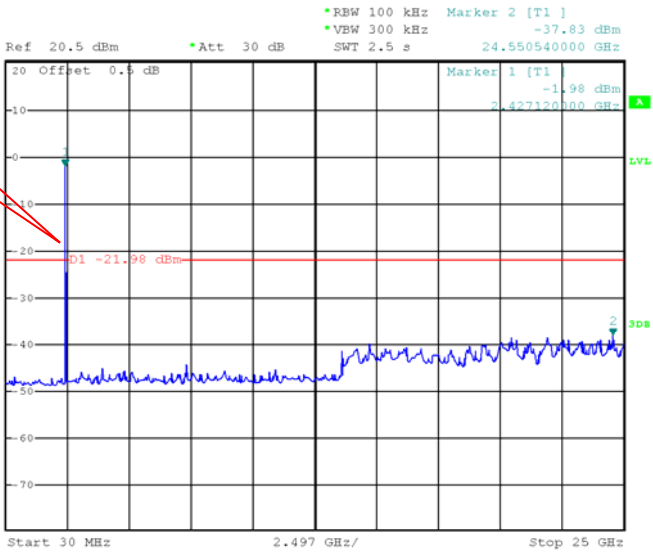
Middle Channel

Fundamental



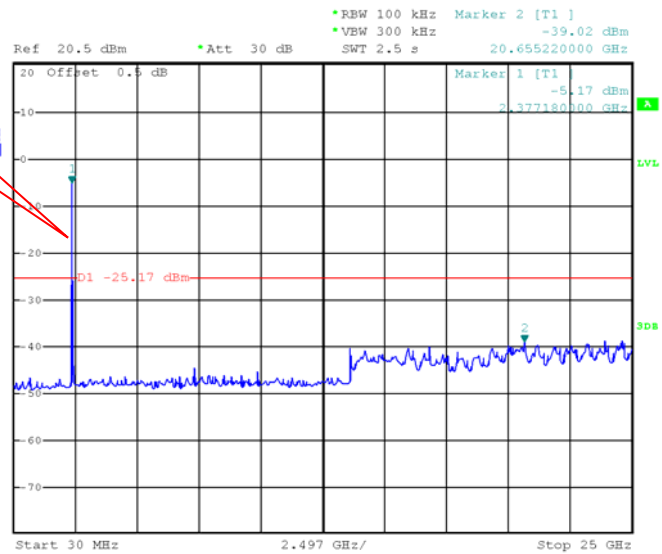
High Channel

Fundamental



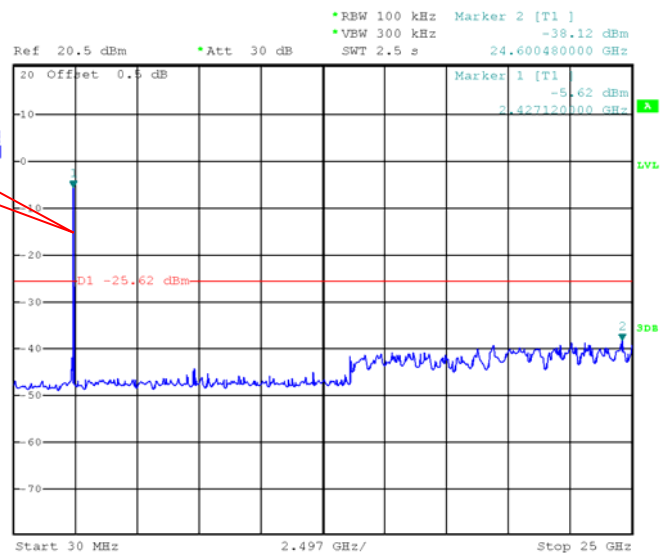
802.11n HT20  
Low Channel

Fundamental



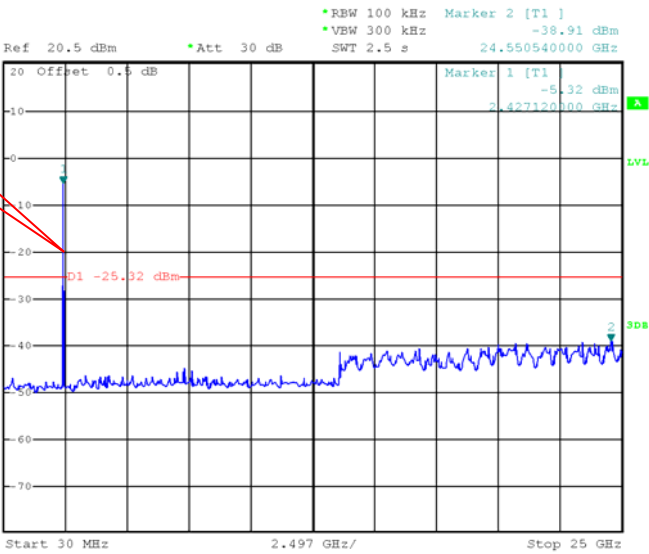
Middle Channel

Fundamental



High Channel

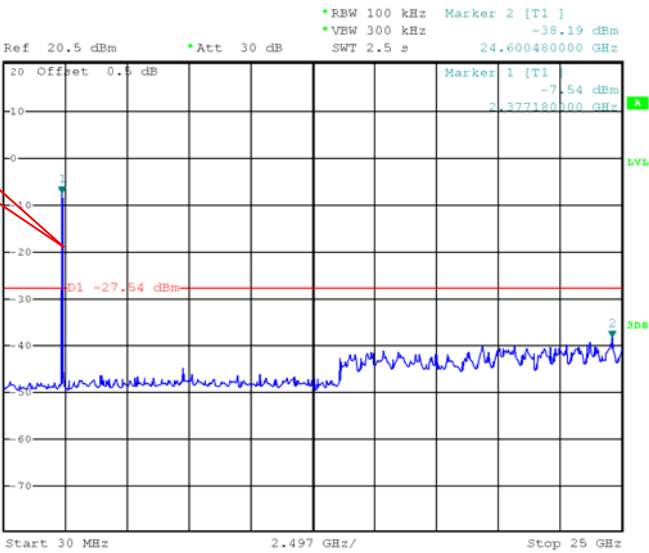
Fundamental



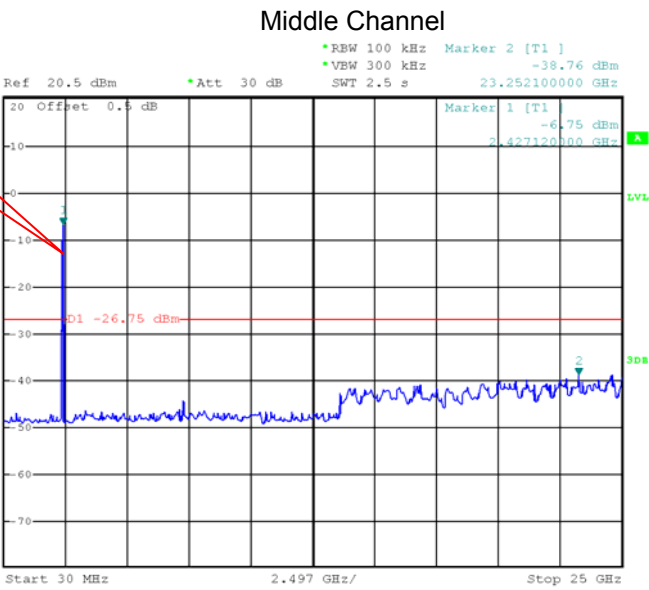
802.11n HT40

Low Channel

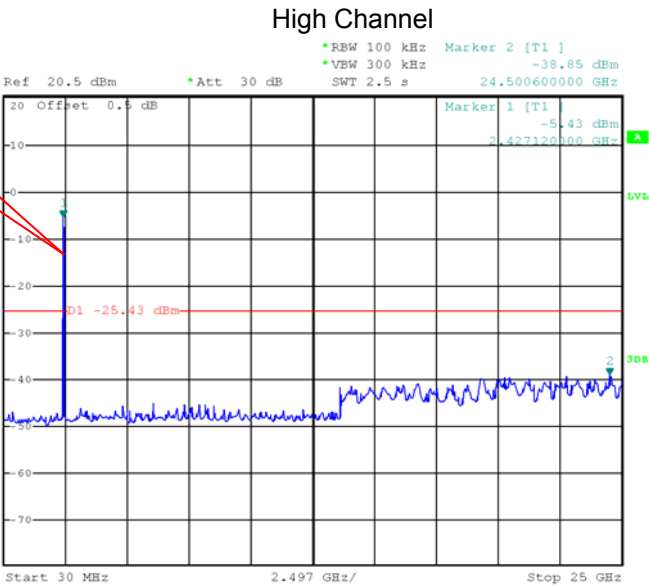
Fundamental



Fundamental



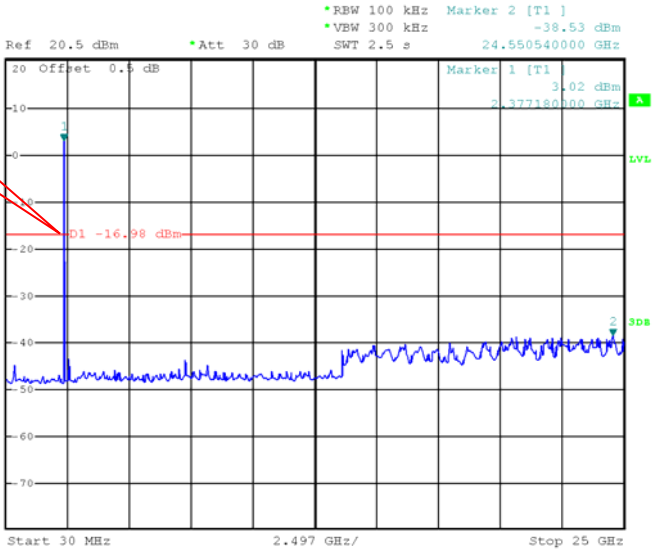
Fundamental



BLE

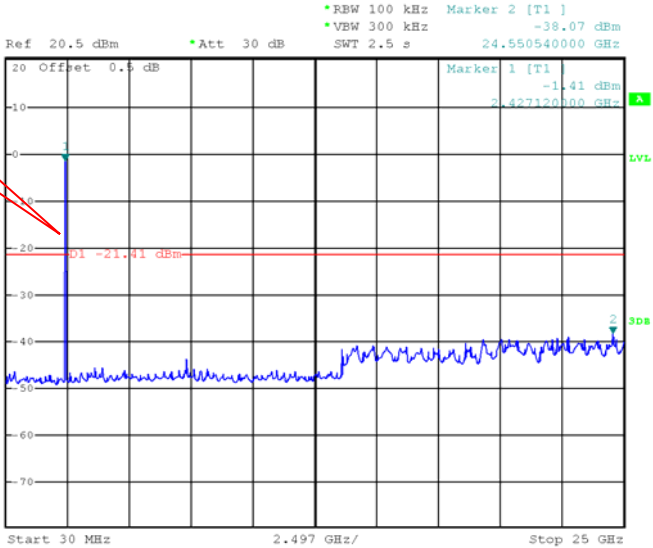
Low Channel

Fundamental

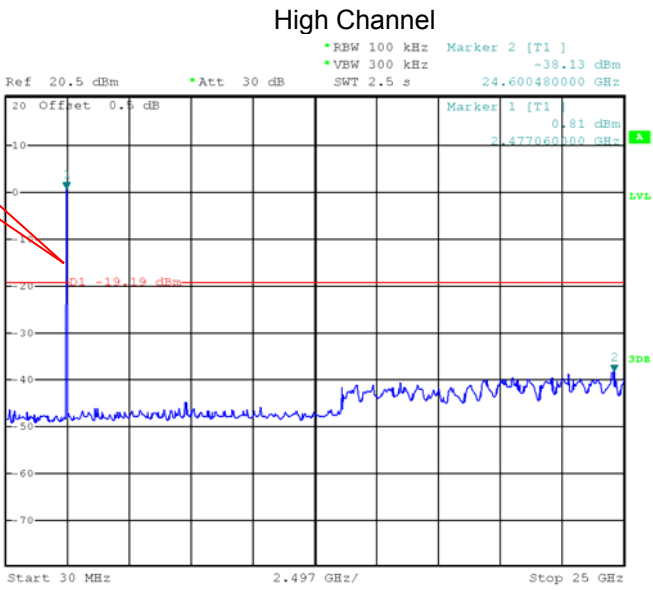


Middle Channel

Fundamental



Fundamental



## 9 Band Edge Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB 558074 D01 15.247 Meas Guidance v05 August 24, 2018;  
ANSI C63.10:2013

Test Limit: Regulation 15.247 (d), In any 100 kHz bandwidth outside the frequency band which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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)).

Test Mode: Transmitting

### 9.1 Test Produce

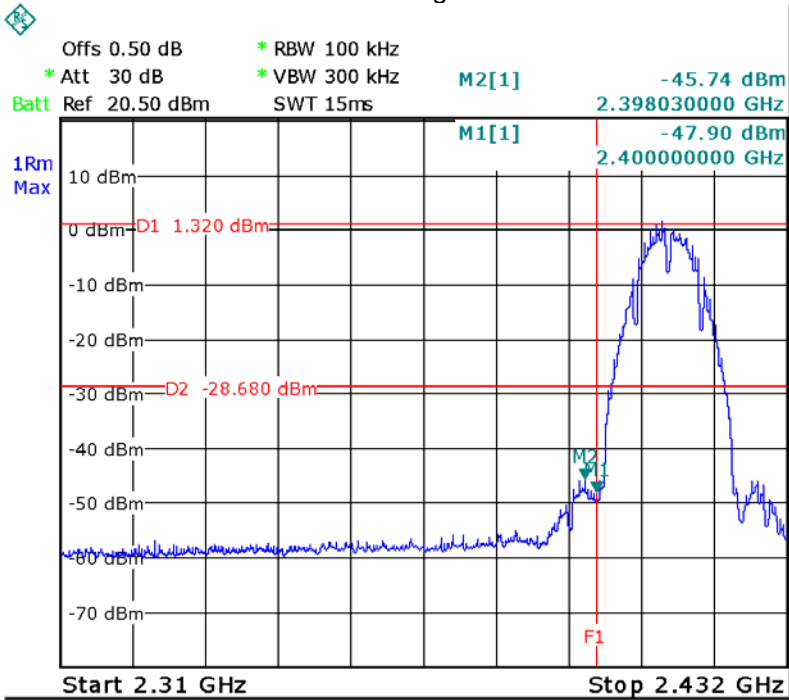
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

9.2 Test Result

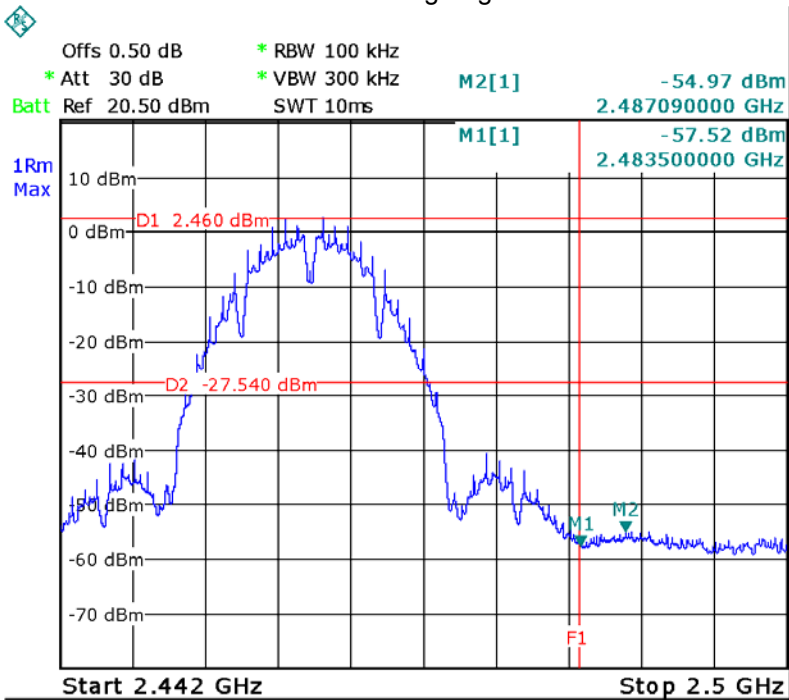
Test result plots shown as follows:

Antenna 0

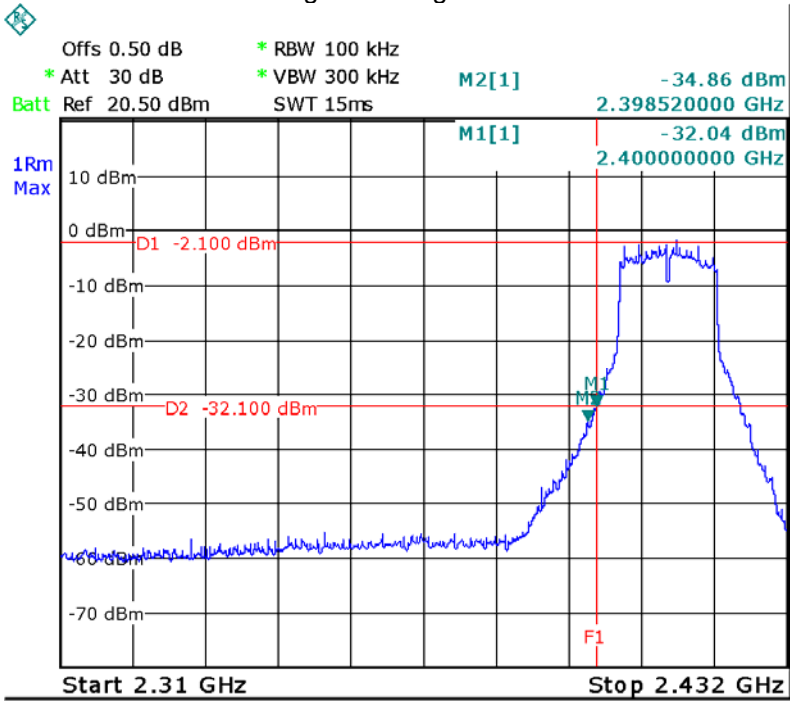
TX 11b: Band edge-left side



TX 11b: Band edge-right side



TX 11g: Band edge-left side



TX 11g: Band edge-right side

