

## 8.5 MAXIMUM POWER SPECTRAL DENSITY

### 8.5.1 Applicable Standard

According to FCC Part15.247(e)

According to RSS-247 5.2(b)

According to RSS-Gen 6.12

According to 558074 D01 15.247 Meas Guidance v05r02 Section 8.4

According to ANSI C63.10 Section 11.10.5

### 8.5.2 Conformance Limit

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of section 5.4(d), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

### 8.5.3 Test Configuration

Test according to clause 7.1 radio frequency test setup

### 8.5.4 Test Procedure

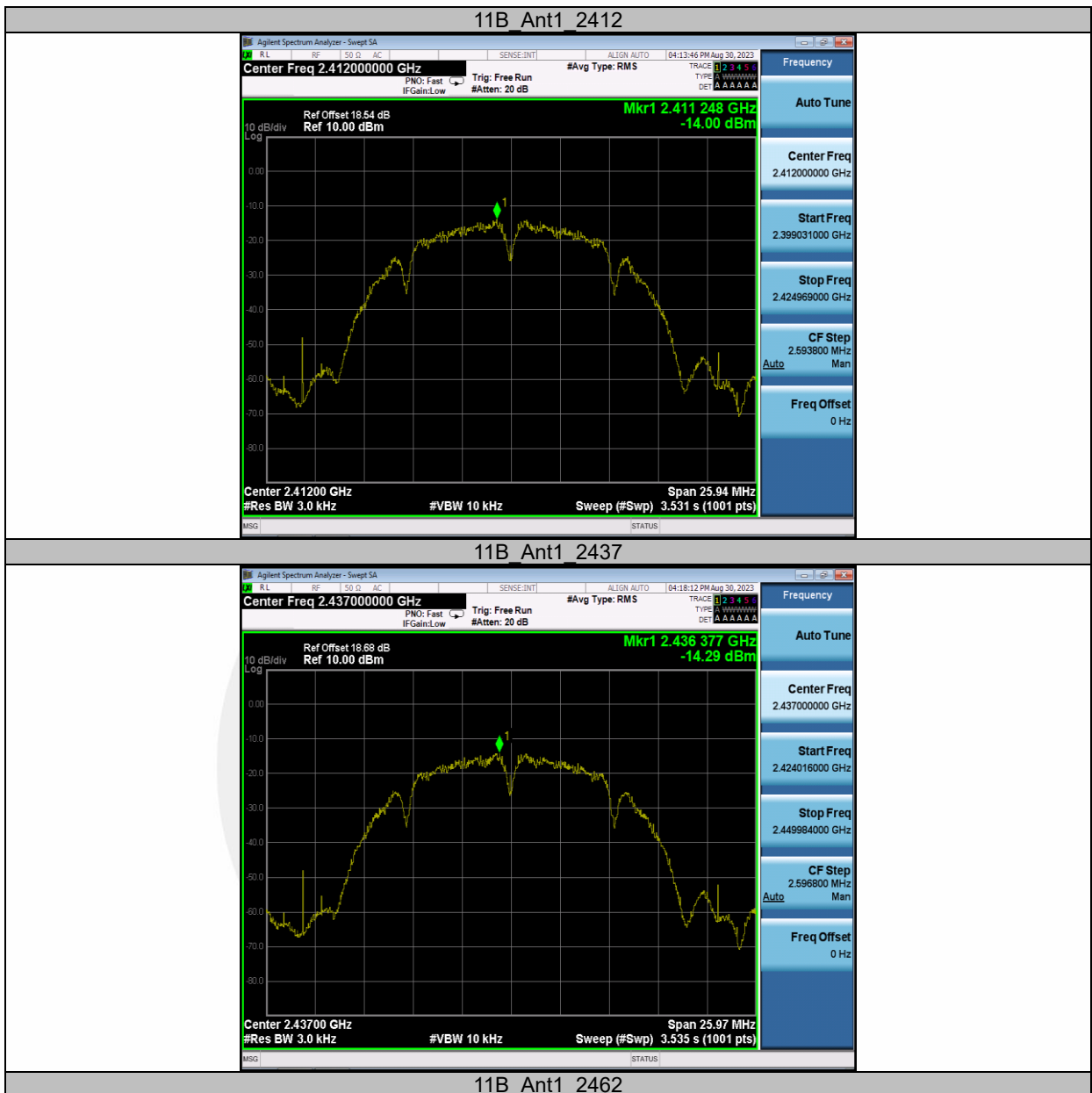
- a) Measure the duty cycle (D) of the transmitter output signal
- b) Set instrument center frequency to DTS channel center frequency.
- c) Set span to at least 1.5 times the OBW.
- d) Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- e) Set VBW  $\geq [3 \times \text{RBW}]$ .
- f) Detector = power averaging (rms) or sample detector (when rms not available).
- g) Ensure that the number of measurement points in the sweep  $\geq [2 \times \text{span} / \text{RBW}]$ .
- h) Sweep time = auto couple.
- i) Do not use sweep triggering; allow sweep to "free run."
- j) Employ trace averaging (rms) mode over a minimum of 100 traces.
- k) Use the peak marker function to determine the maximum amplitude level.
- l) Add  $[10 \log (1 / D)]$ , where D is the duty cycle measured in step a), to the measured PSD to compute the average PSD during the actual transmission time.
- m) If measured value exceeds requirement specified by regulatory agency, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

### 8.5.5 Test Results

|                    |           |
|--------------------|-----------|
| Temperature:       | 25 °C     |
| Relative Humidity: | 45%       |
| ATM Pressure:      | 1011 mbar |
| Test Engineer:     | XXH       |

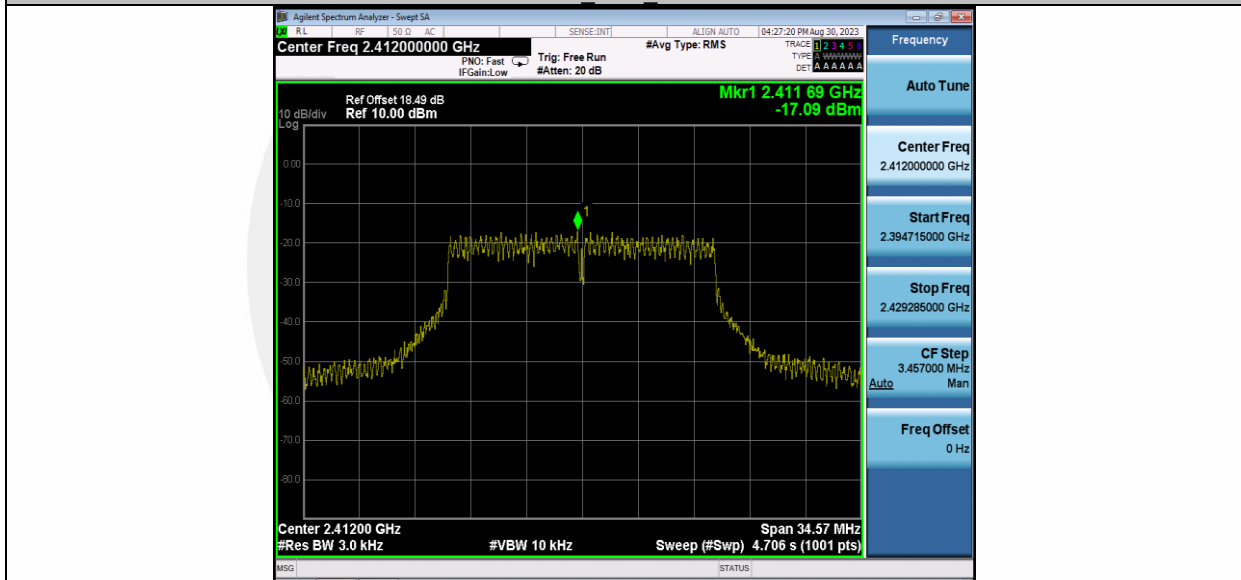
Note: N/A

| TestMode  | Antenna | Frequency[MHz] | Result[dBm/3-100kHz] | Limit[dBm/3kHz] | Verdict |
|-----------|---------|----------------|----------------------|-----------------|---------|
| 11B       | Ant1    | 2412           | -14                  | ≤8.00           | PASS    |
|           |         | 2437           | -14.29               | ≤8.00           | PASS    |
|           |         | 2462           | -14.09               | ≤8.00           | PASS    |
| 11G       | Ant1    | 2412           | -17.09               | ≤8.00           | PASS    |
|           |         | 2437           | -17.33               | ≤8.00           | PASS    |
|           |         | 2462           | -17.38               | ≤8.00           | PASS    |
| 11N20SISO | Ant1    | 2412           | -18.28               | ≤8.00           | PASS    |
|           |         | 2437           | -18.34               | ≤8.00           | PASS    |
|           |         | 2462           | -18.4                | ≤8.00           | PASS    |
| 11N40SISO | Ant1    | 2422           | -22.26               | ≤8.00           | PASS    |
|           |         | 2437           | -22.35               | ≤8.00           | PASS    |
|           |         | 2452           | -22.07               | ≤8.00           | PASS    |

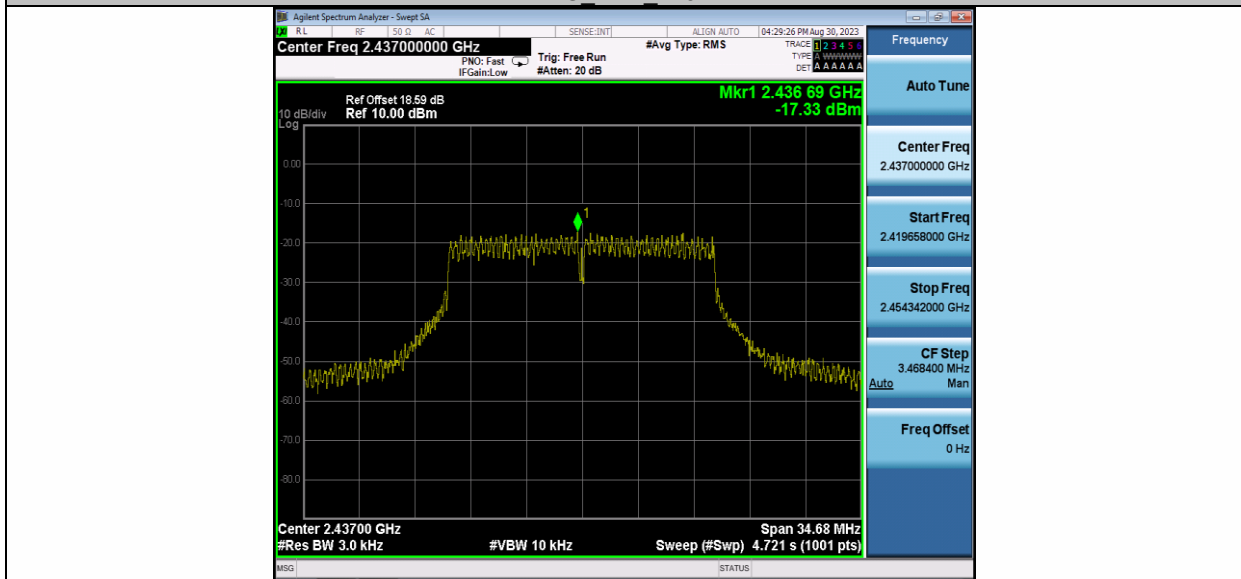


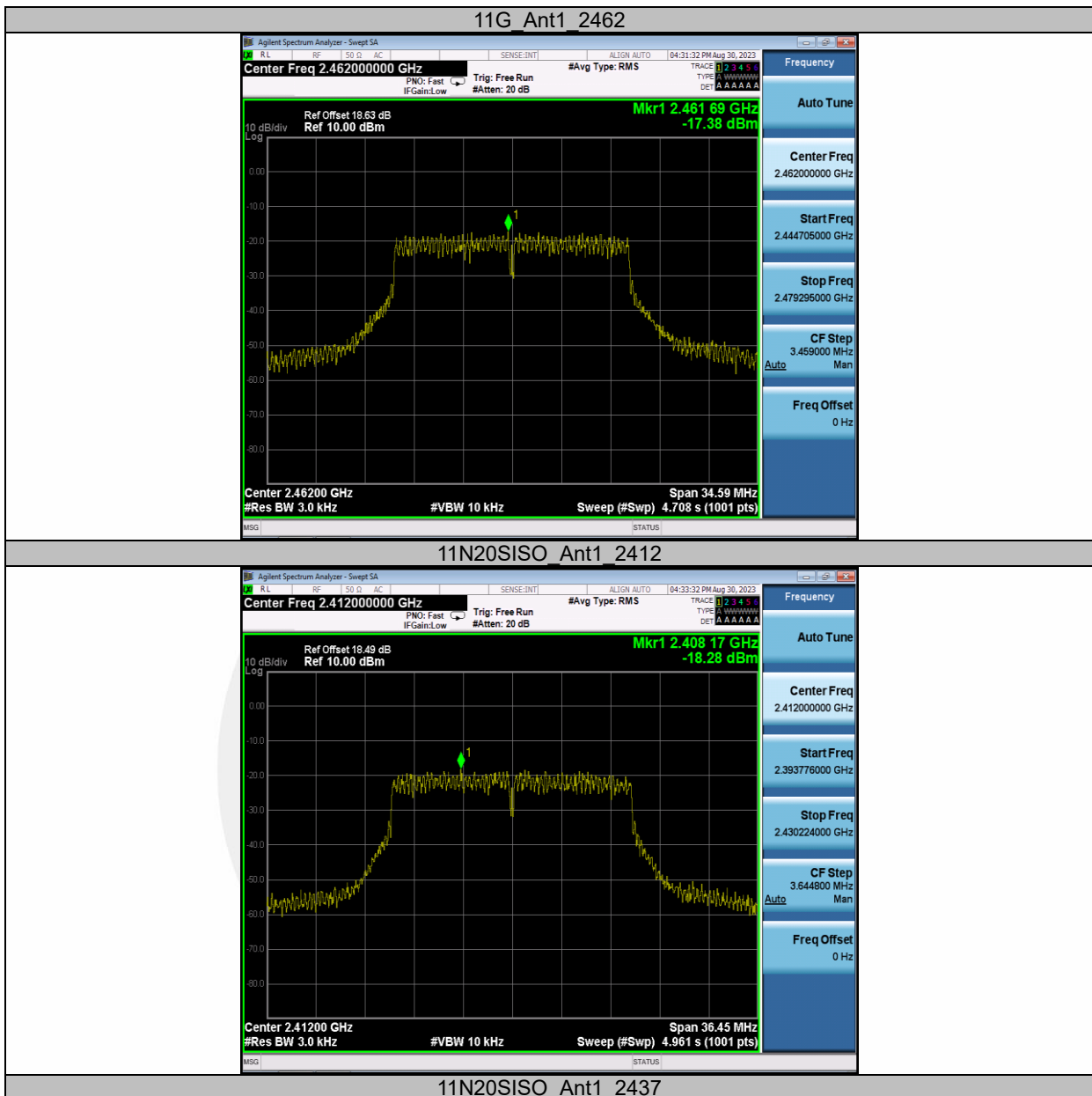


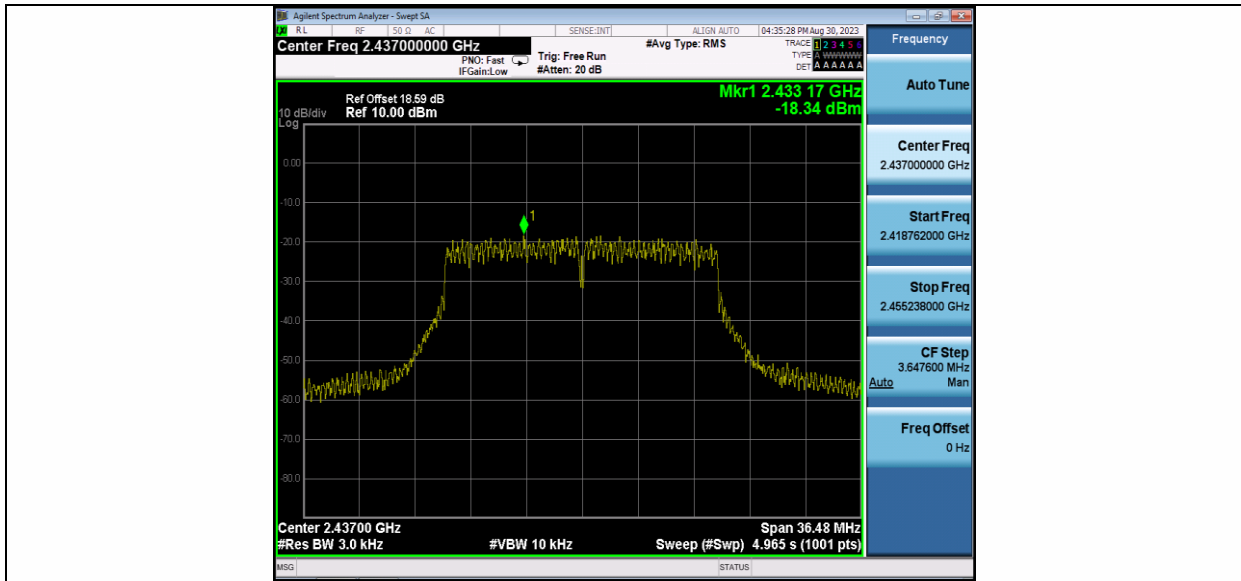
11G Ant1\_2412



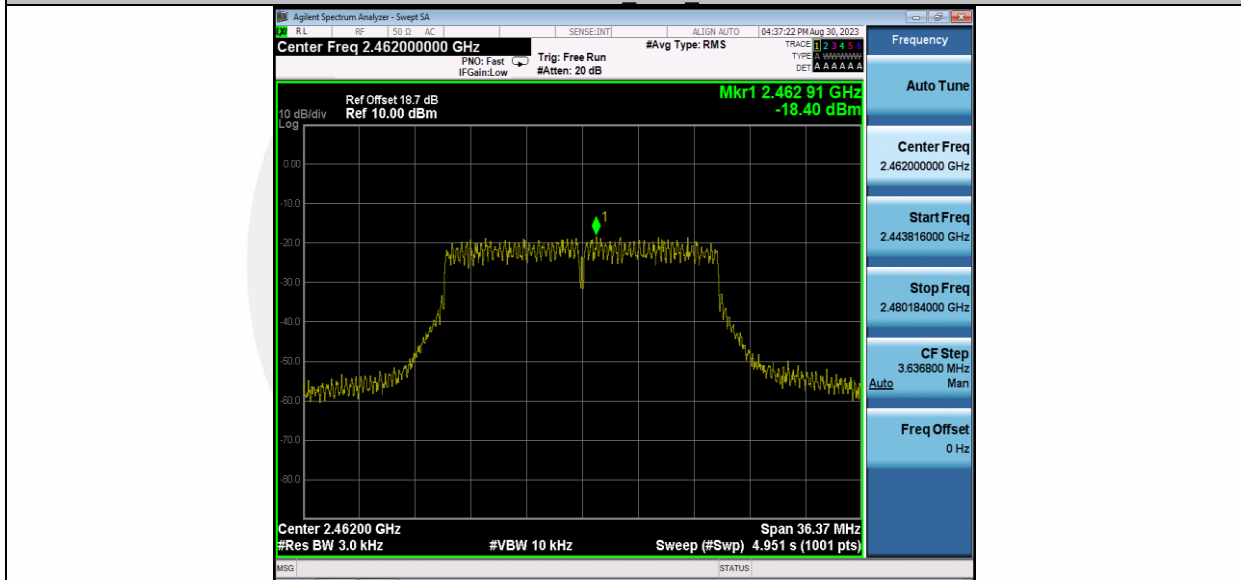
11G Ant1\_2437



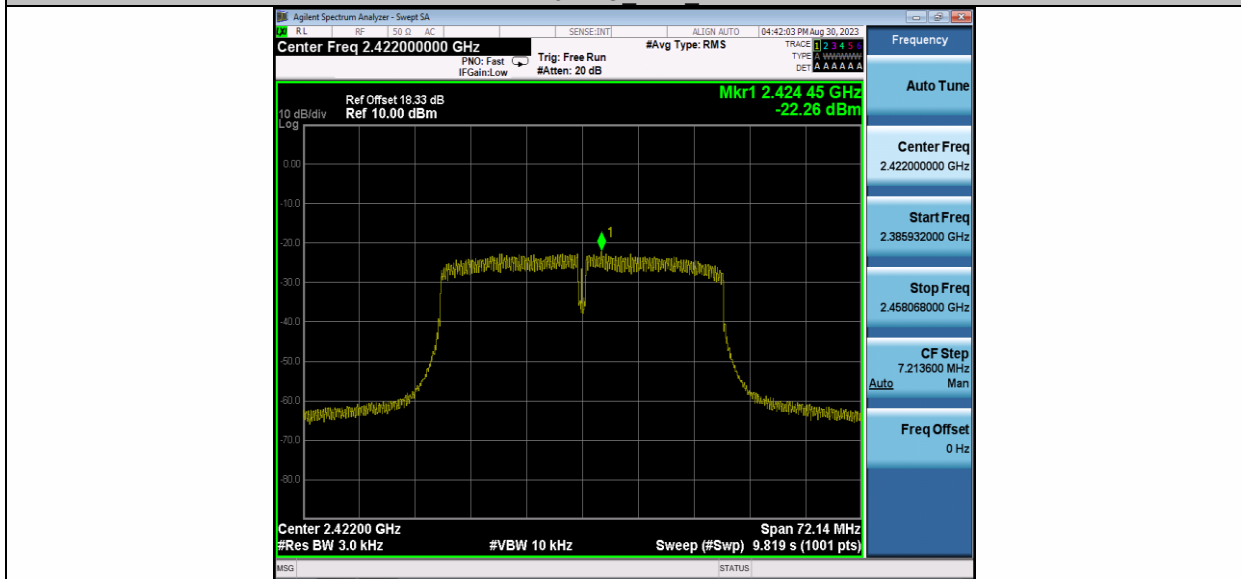


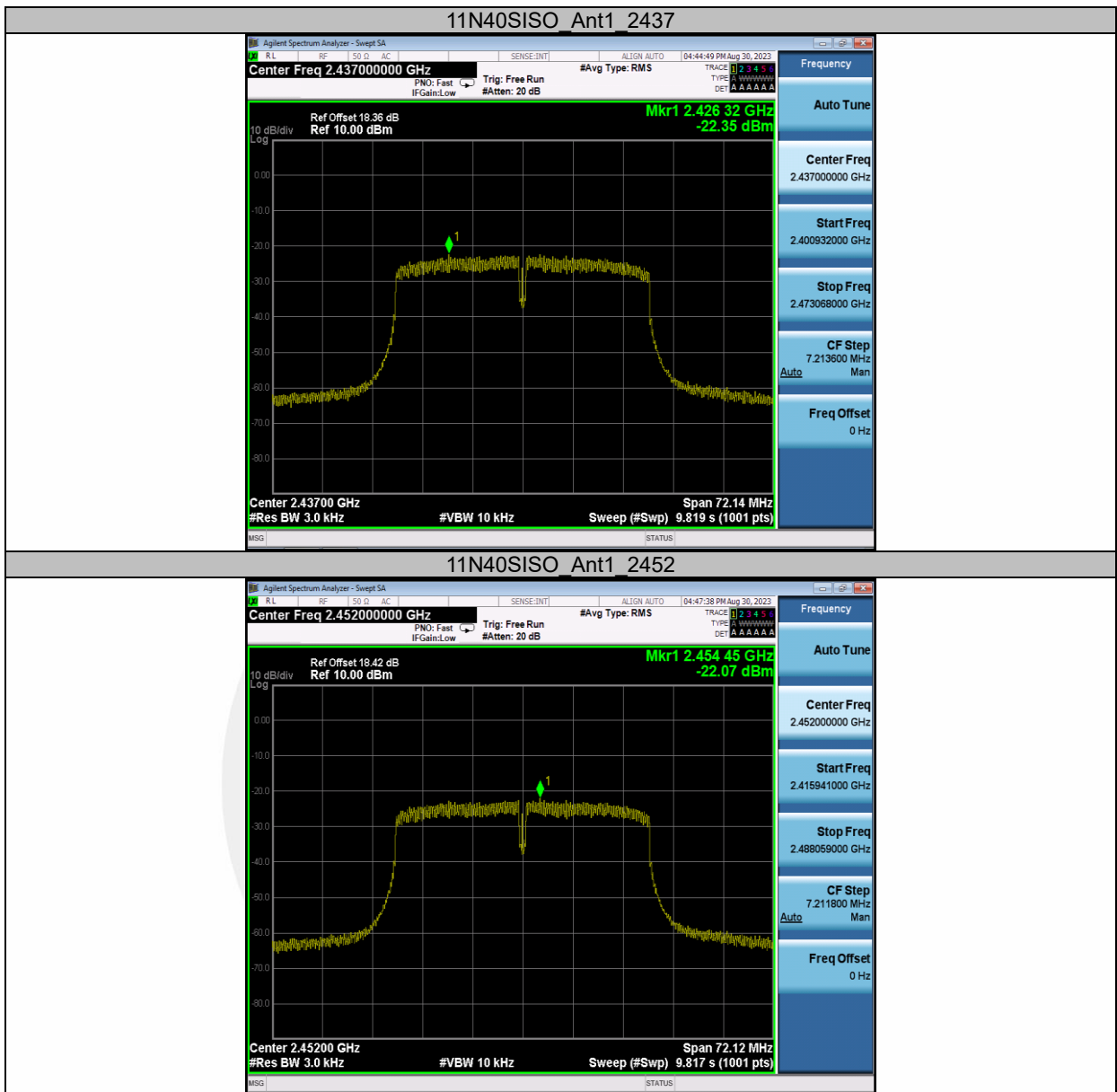


11N20SISO Ant1 2462



11N40SISO Ant1 2422







## 8.6 UNWANTED EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

### 8.6.1 Applicable Standard

According to FCC Part15.247(d)

According to RSS-247 5.5

According to 558074 D01 15.247 Meas Guidance v05r02 Section 8.5

According to ANSI C63.10 Section 11.11

### 8.6.2 Conformance Limit

According to FCC Part 15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

### 8.6.3 Test Configuration

Test according to clause 7.1 radio frequency test setup

### 8.6.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer

#### ■ Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to  $\geq 1.5$  times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW  $\geq 3 \times$  RBW.

Set Detector = peak.

Set Sweep time = auto couple.

Set Trace mode = max hold.

Allow trace to fully stabilize.

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.

#### ■ Band-edge measurement

Use the following spectrum analyzer settings:

Span = wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation

Set RBW  $\geq 1\%$  of the span=100kHz Set VBW  $\geq 3 \times$  RBW

Set Sweep = auto Set Detector function = peak Set Trace = max hold

Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.

#### ■ Emission level measurement

Set the center frequency and span to encompass frequency range to be measured.

Set the RBW = 100 kHz.

Set the VBW =300 kHz.

Set Detector = peak

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.



Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements . Report the three highest emissions relative to the limit.

### 8.6.5 Test Results

|                    |           |
|--------------------|-----------|
| Temperature:       | 25 °C     |
| Relative Humidity: | 45%       |
| ATM Pressure:      | 1011 mbar |
| Test Engineer:     | XXH       |

Note: N/A

#### Reference level measurement

| TestMode | Antenna | Freq(MHz) | Max.Point[MHz] | Result[dBm] |
|----------|---------|-----------|----------------|-------------|
| 11B      | Ant1    | 2412      | 2410.96        | 8.98        |
|          |         | 2437      | 2435.99        | 8.58        |
|          |         | 2462      | 2462.96        | 8.90        |

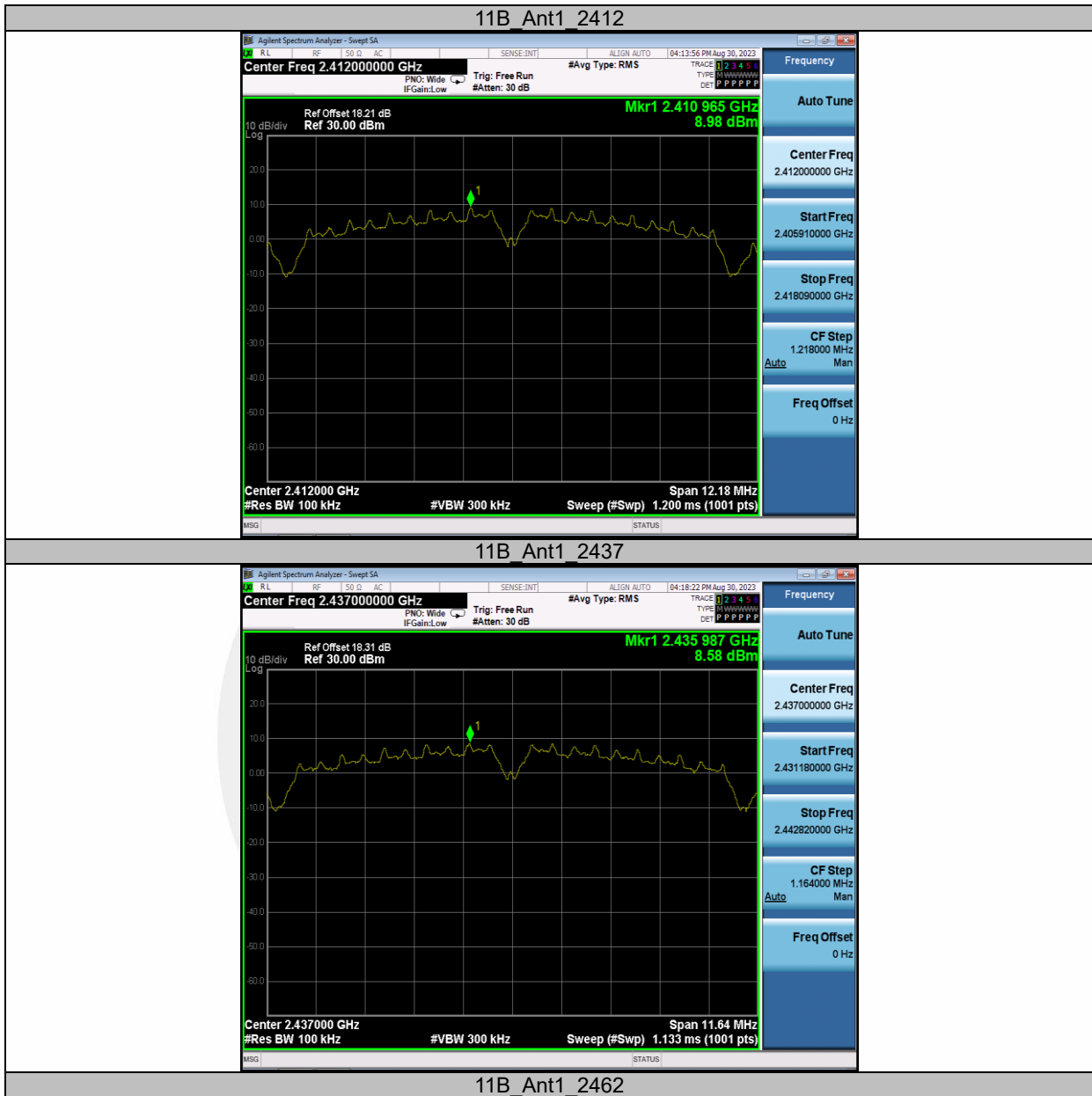
#### Band-edge measurement

| Test Mode | Antenna | ChName | Frequency [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|-----------|---------|--------|-----------------|----------------|--------------|-------------|---------|
| 11B       | Ant1    | Low    | 2412            | 8.98           | -30.69       | ≤-21.02     | PASS    |
|           |         | High   | 2462            | 8.90           | -37.14       | ≤-21.1      | PASS    |

#### Emission level measurement

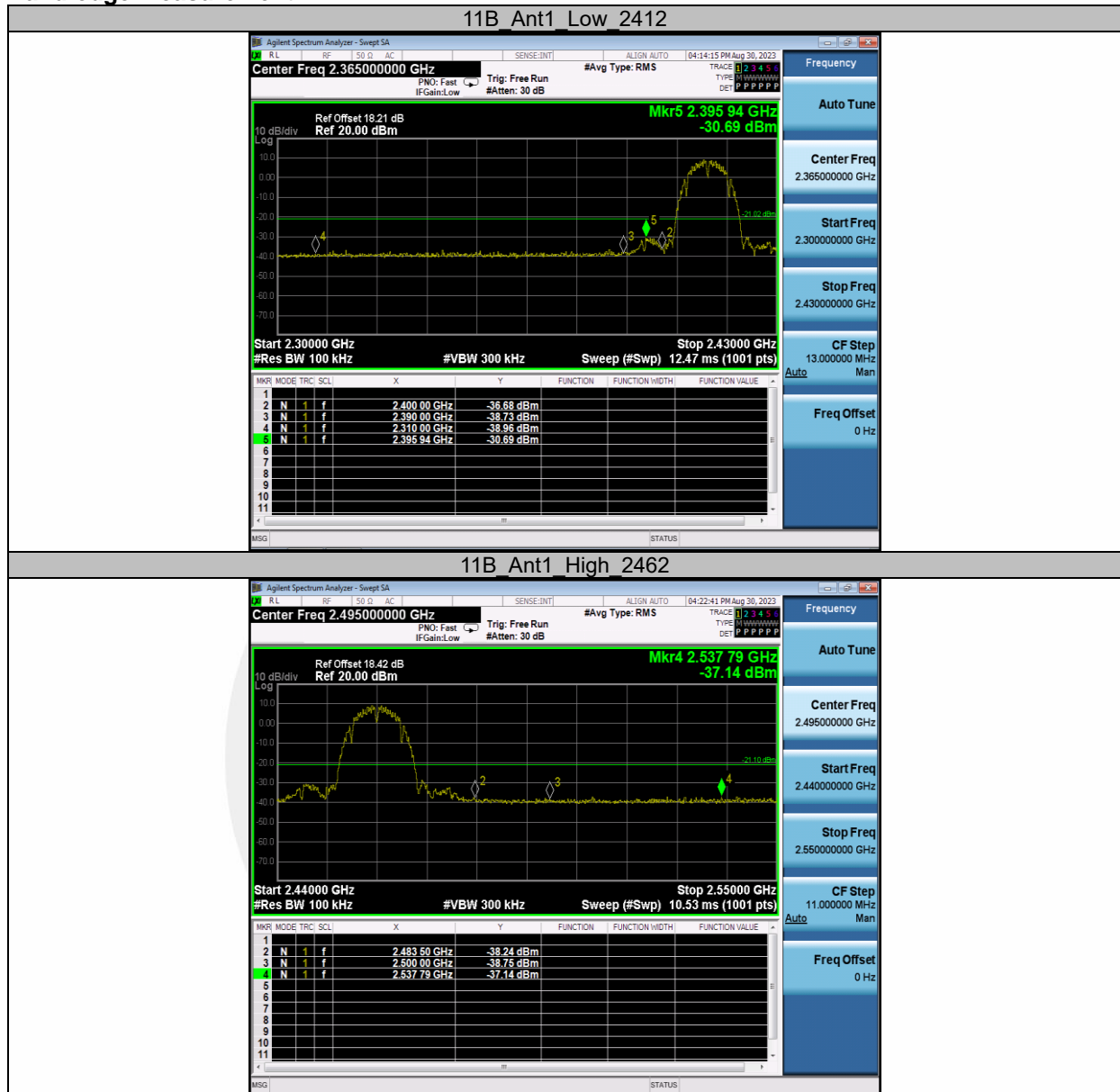
| TestMode | Antenna | Frequency[MHz] | FreqRange [Mhz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|----------|---------|----------------|-----------------|----------------|--------------|-------------|---------|
| 11B      | Ant1    | 2412           | 30~1000         | 8.98           | -67.26       | ≤-21.02     | PASS    |
|          |         |                | 1000~26500      | 8.98           | -45.15       | ≤-21.02     | PASS    |
|          |         | 2437           | 30~1000         | 8.58           | -66.7        | ≤-21.42     | PASS    |
|          |         |                | 1000~26500      | 8.58           | -45.69       | ≤-21.42     | PASS    |
|          |         | 2462           | 30~1000         | 8.90           | -66.31       | ≤-21.1      | PASS    |
|          |         |                | 1000~26500      | 8.90           | -46.38       | ≤-21.1      | PASS    |

### Reference level measurement

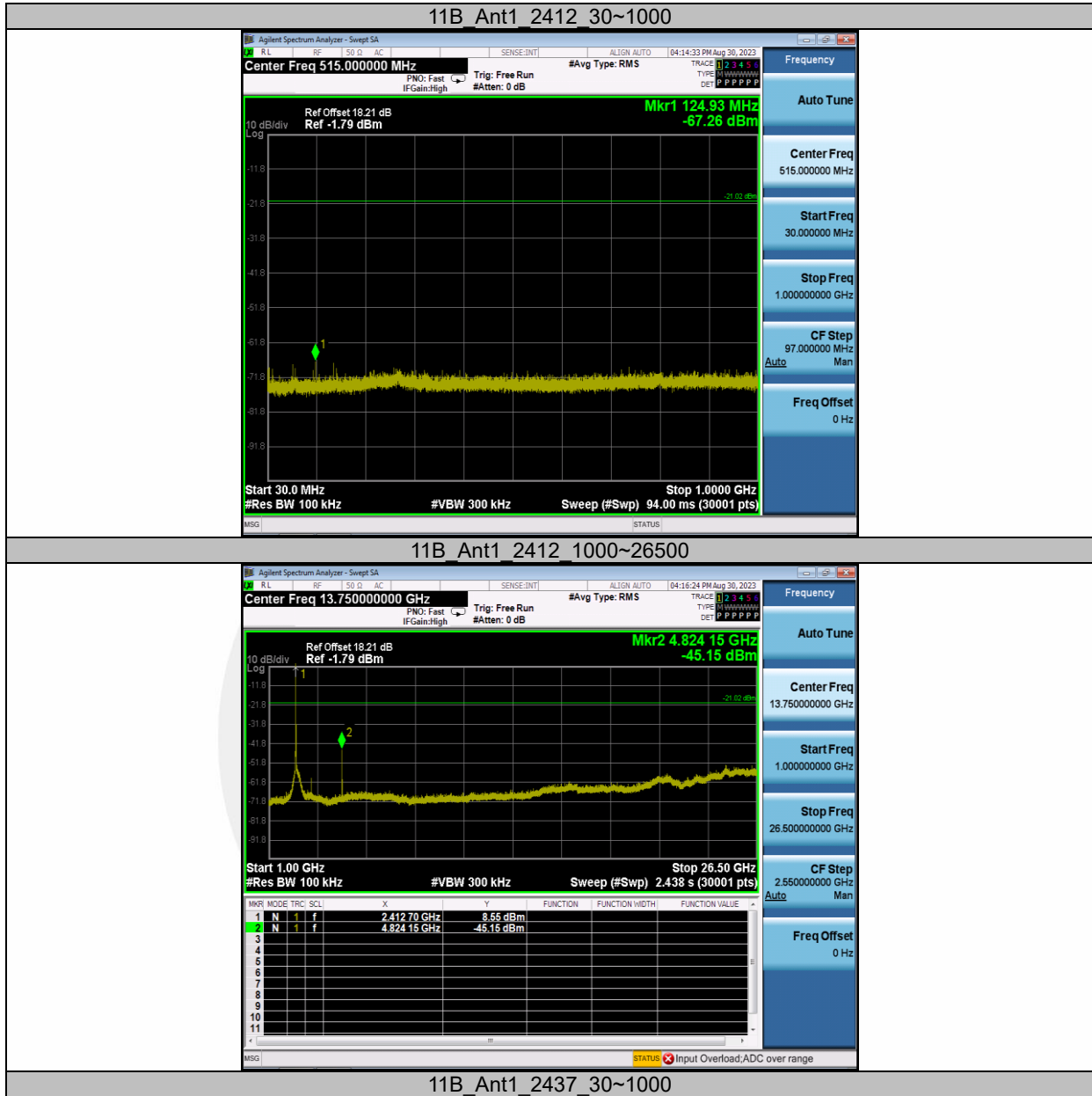


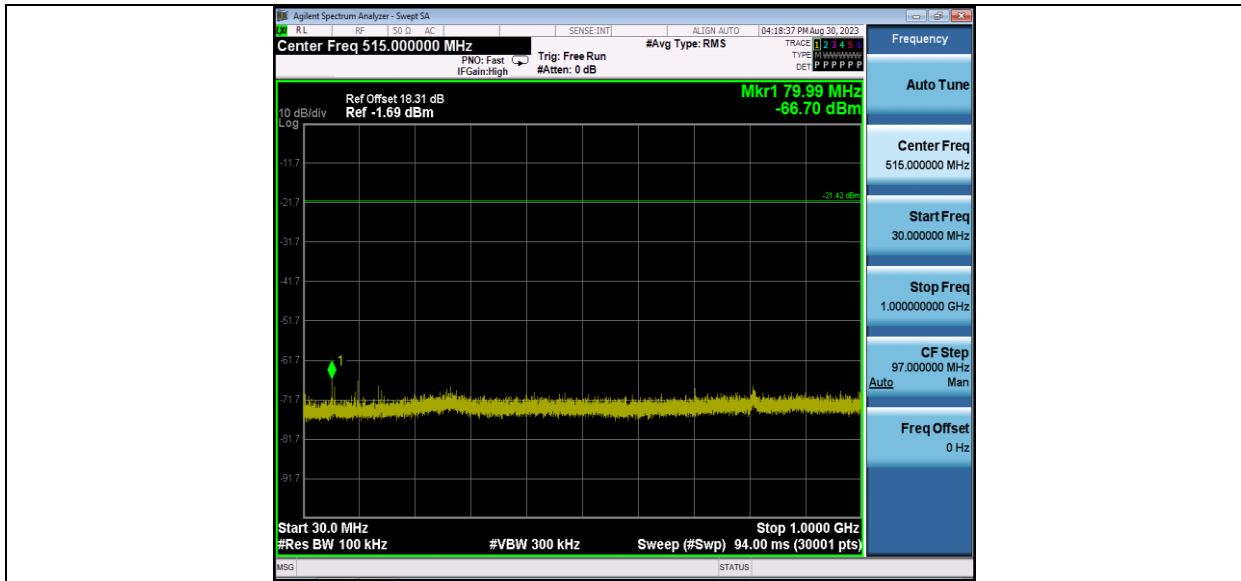


### Band-edge measurement

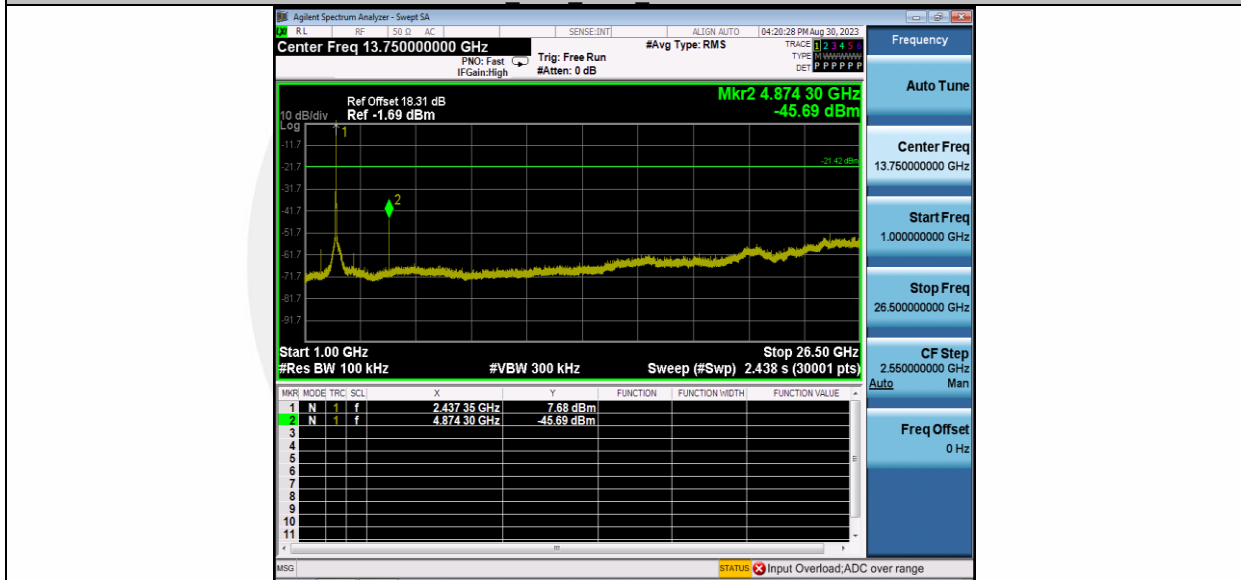


Emission level measurement

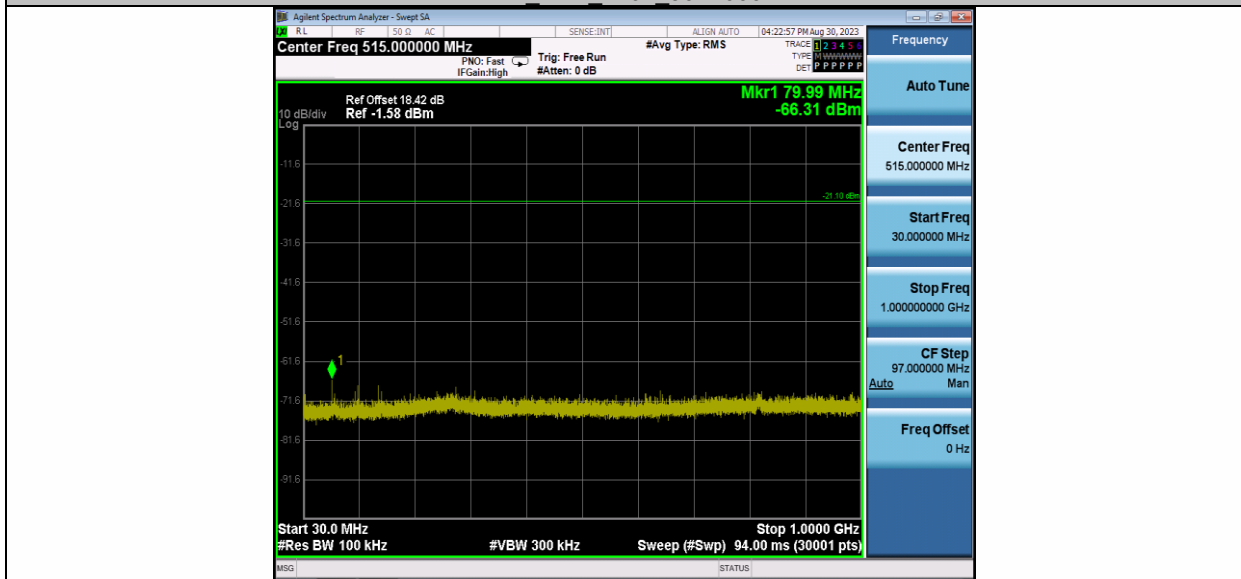


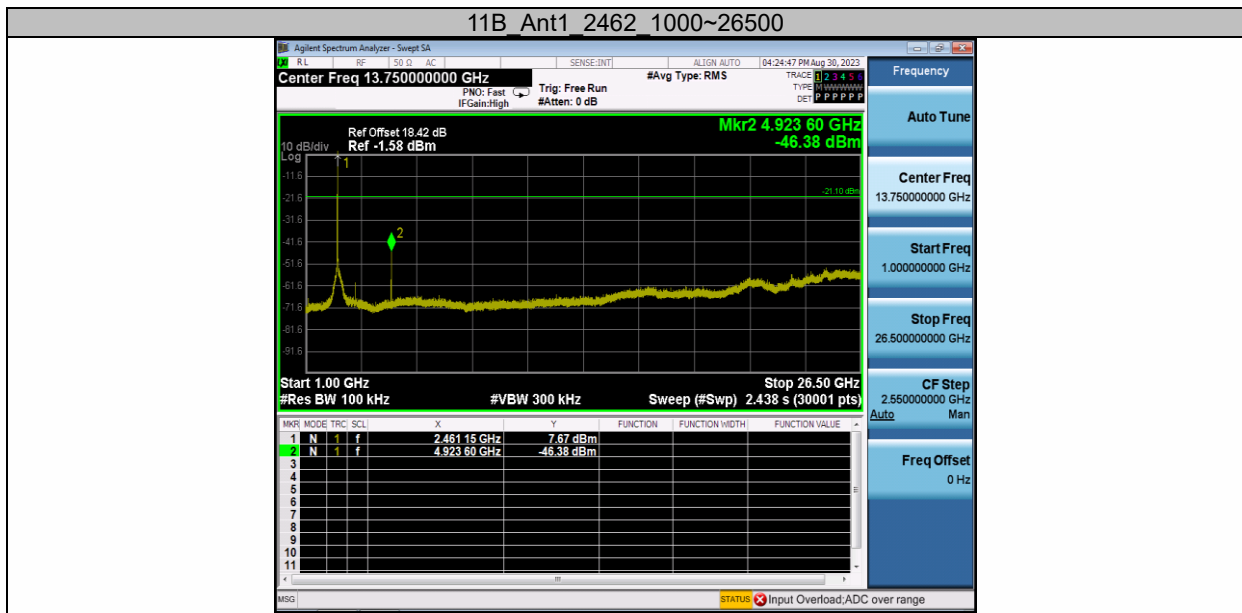


11B Ant1 2437 1000~26500



11B Ant1 2462 30~1000







## 8.7 RADIATED SPURIOUS EMISSION

### 8.7.1 Applicable Standard

According to FCC Part 15.247(d), 15.205, 15.209

According to RSS-Gen and RSS-247

According to 558074 D01 15.247 Meas Guidance v05r02 Section 8.6

According to ANSI C63.10 Section 11.12

### 8.7.2 Conformance Limit

According to FCC Part 15.247(d): 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)).

According to FCC Part 15.205, Restricted bands

| MHz               | MHz                 | MHz           | GHz         |
|-------------------|---------------------|---------------|-------------|
| 0.090-0.110       | 16.42-16.423        | 399.9-410     | 4.5-5.15    |
| 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   | 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     | Above 38.6  |
| 13.36-13.41       |                     |               |             |

According to FCC Part 15.205 the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

| Restricted Frequency(MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance |
|---------------------------|-----------------------|-------------------------|----------------------|
| 0.009-0.490               | 2400/F(KHz)           | 20 log (uV/m)           | 300                  |
| 0.490-1.705               | 24000/F(KHz)          | 20 log (uV/m)           | 30                   |
| 1.705-30                  | 30                    | 29.5                    | 30                   |
| 30-88                     | 100                   | 40                      | 3                    |
| 88-216                    | 150                   | 43.5                    | 3                    |
| 216-960                   | 200                   | 46                      | 3                    |
| Above 960                 | 500                   | 54                      | 3                    |

### 8.7.3 Test Configuration

Test according to clause 7.2 radio frequency test setup

### 8.7.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For average measurements the resolution bandwidth of spectrum analyzer is 1 MHz with the video bandwidth is  $\geq 1/T$  with peak detector.

For Below 1GHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz for

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 30MHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 9kHz

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 150KHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 200Hz

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

Trace = max hold

Follow the guidelines in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit. Submit this data.

### 8.7.5 Test Results

|                    |           |
|--------------------|-----------|
| Temperature:       | 26° C     |
| Relative Humidity: | 54%       |
| ATM Pressure:      | 1011 mbar |
| Test Engineer:     | XXH       |

#### ■ Spurious Emission below 30MHz(9KHz to 30MHz)

For Spurious Emission below 30MHz (9KHz to 30MHz), was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

■ Spurious Emission Above 1GHz(1GHz to 25GHz)

All the antenna(Antenna 1) and modes(802.11b/g/n) have been tested and the worst(Antenna 1, 802.11b) result recorded was report as below:

Test mode: 802.11b Frequency: Channel 1: 2412MHz

| Freq. (MHz) | Ant.Pol. | Reading Level (dBuV/m) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit 3m (dBuV/m) | Margin (dB) | Remark |
|-------------|----------|------------------------|-----------------------|----------------------------|-------------------|-------------|--------|
| 4822.5      | V        | 60.75                  | -13.41                | 47.34                      | 74.00             | 26.66       | Peak   |
| 14555.6     | V        | 54.38                  | 9.86                  | 64.24                      | 74.00             | 9.76        | Peak   |
| 17611.8     | V        | 53.88                  | 15.76                 | 69.64                      | 74.00             | 4.36        | Peak   |
| 4822.5      | V        | 55.23                  | -13.41                | 41.82                      | 54.00             | 12.18       | Avg    |
| 14555.62    | V        | 37.54                  | 9.86                  | 47.40                      | 54.00             | 6.60        | Avg    |
| 17611.87    | V        | 34.25                  | 15.76                 | 50.01                      | 54.00             | 3.99        | Avg    |
| 4822.5      | H        | 64.94                  | -13.41                | 51.53                      | 74.00             | 22.47       | Peak   |
| 14559.3     | H        | 53.56                  | 9.98                  | 63.54                      | 74.00             | 10.46       | Peak   |
| 17606.2     | H        | 54.00                  | 15.93                 | 69.93                      | 74.00             | 4.07        | Peak   |
| 4822.5      | H        | 55.25                  | -13.41                | 41.84                      | 54.00             | 12.16       | Avg    |
| 14559.37    | H        | 37.25                  | 9.98                  | 47.23                      | 54.00             | 6.77        | Avg    |
| 17606.25    | H        | 34.23                  | 15.93                 | 50.16                      | 54.00             | 3.84        | Avg    |

Note: (1) PeaK RBW = 1 MHz, VBW ≥ 3 × RBW, Detector = Peak;  
 (2) Avg RBW = 1 MHz, VBW = 1/T<sub>on</sub>, Detector = Peak, where: T<sub>on</sub> is transmit duration;  
 (3) Corrected Reading = Reading Level + Correct Factor;  
 (4) Correct Factor = Ant\_F + Cab\_L - Preamp;  
 (5) Margin = Limit - Corrected Reading;

Test mode: 802.11b Frequency: Channel 6: 2437MHz

| Freq. (MHz)   | Ant.Pol. | Reading Level (dBuV/m) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit 3m (dBuV/m) | Margin (dB) | Remark |
|---|----------|------------------------|-----------------------|----------------------------|-------------------|-------------|--------|
| 4873.12   | V        | 61.06                  | -13.43                | 47.63                      | 74.00             | 26.37       | Peak   |
| 14613.7   | V        | 53.20                  | 10.94                 | 64.14                      | 74.00             | 9.86        | Peak   |
| 17962.5   | V        | 56.61                  | 13.37                 | 69.98                      | 74.00             | 4.02        | Peak   |
| 4873.125  | V        | 55.21                  | -13.43                | 41.78                      | 54.00             | 12.22       | Avg    |
| 14613.75  | V        | 37.23                  | 10.94                 | 48.17                      | 54.00             | 5.83        | Avg    |
| 17962.5   | V        | 34.21                  | 13.37                 | 47.58                      | 54.00             | 6.42        | Avg    |
| 4873.12   | H        | 65.46                  | -13.43                | 52.03                      | 74.00             | 21.97       | Peak   |
| 14651.25  | H        | 53.25                  | 10.12                 | 63.37                      | 74.00             | 10.63       | Peak   |
| 17941.87  | H        | 57.10                  | 13.12                 | 70.22                      | 74.00             | 3.78        | Peak   |
| 4873.125  | H        | 55.01                  | -13.43                | 41.58                      | 54.00             | 12.42       | Avg    |
| 14651.25  | H        | 37.25                  | 10.12                 | 47.37                      | 54.00             | 6.63        | Avg    |
| 17941.87  | H        | 34.23                  | 13.12                 | 47.35                      | 54.00             | 6.65        | Avg    |
| Note: (1) Peak RBW = 1 MHz, VBW $\geq 3 \times$ RBW, Detector = Peak;<br>(2) Avg RBW = 1 MHz, VBW = $1/T_{on}$ , Detector = Peak, where: $T_{on}$ is transmit duration;<br>(3) Corrected Reading = Reading Level + Correct Factor;<br>(4) Correct Factor = Ant_F + Cab_L - Preamp;<br>(5) Margin = Limit - Corrected Reading; |          |                        |                       |                            |                   |             |        |

Test mode: 802.11b Frequency: Channel 11: 2462MHz

| Freq. (MHz)   | Ant.Pol. | Reading Level (dBuV/m) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit 3m (dBuV/m) | Margin (dB) | Remark |
|---|----------|------------------------|-----------------------|----------------------------|-------------------|-------------|--------|
| 4923.75   | V        | 62.78                  | -13.31                | 49.47                      | 74.00             | 24.53       | Peak   |
| 14604.3   | V        | 52.21                  | 11.14                 | 63.35                      | 74.00             | 10.65       | Peak   |
| 17610   | V        | 54.03                  | 15.81                 | 69.84                      | 74.00             | 4.16        | Peak   |
| 4923.75   | V        | 55.12                  | -13.31                | 41.81                      | 54.00             | 12.19       | Avg    |
| 14604.37  | V        | 37.45                  | 11.14                 | 48.59                      | 54.00             | 5.41        | Avg    |
| 17610   | V        | 34.16                  | 15.81                 | 49.97                      | 54.00             | 4.03        | Avg    |
| 4923.75   | H        | 67.05                  | -13.31                | 53.74                      | 74.00             | 20.26       | Peak   |
| 14641.8   | H        | 53.30                  | 10.32                 | 63.62                      | 74.00             | 10.38       | Peak   |
| 17617.5   | H        | 54.79                  | 15.57                 | 70.36                      | 74.00             | 3.64        | Peak   |
| 4923.75   | H        | 55.35                  | -13.31                | 42.04                      | 54.00             | 11.96       | Avg    |
| 14641.87  | H        | 37.54                  | 10.32                 | 47.86                      | 54.00             | 6.14        | Avg    |
| 17617.5   | H        | 34.58                  | 15.57                 | 50.15                      | 54.00             | 3.85        | Avg    |
| Note: (1) Peak RBW = 1 MHz, VBW $\geq 3 \times$ RBW, Detector = Peak;<br>(2) Avg RBW = 1 MHz, VBW = $1/T_{on}$ , Detector = Peak, where: $T_{on}$ is transmit duration;<br>(3) Corrected Reading = Reading Level + Correct Factor;<br>(4) Correct Factor = Ant_F + Cab_L - Preamp;<br>(5) Margin = Limit - Corrected Reading; |          |                        |                       |                            |                   |             |        |

■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

All the antenna(Antenna 1) and modes(802.11b/g/n) have been tested and the worst(Antenna 1, 802.11b) result recorded was report as below:

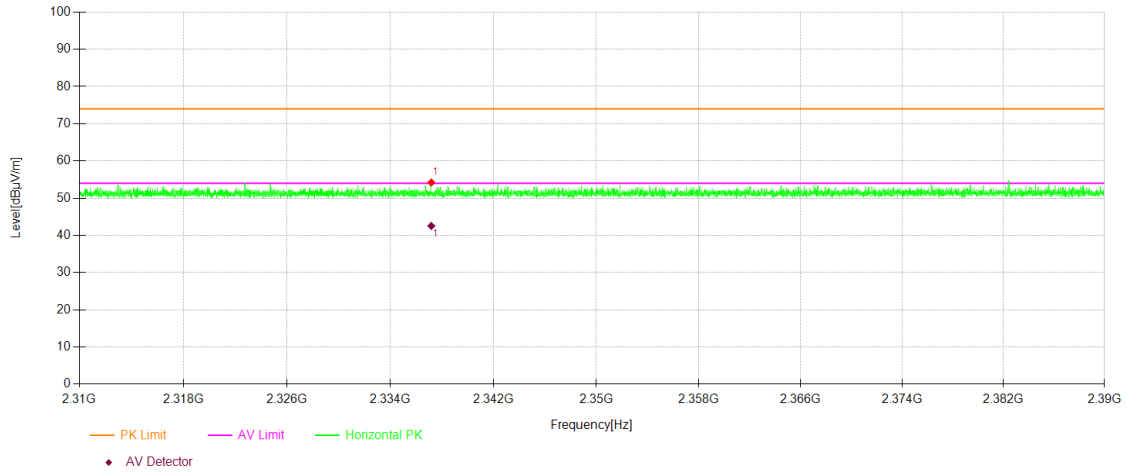
Test mode: 802.11b Frequency: Channel 1: 2412MHz

| Freq. (MHz)  | Ant.Pol. | Reading Level (dBuV/m) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit 3m (dBuV/m) | Margin (dB) | Remark |
|--|----------|------------------------|-----------------------|----------------------------|-------------------|-------------|--------|
| 2334.52  | V        | 22.71                  | 30.99                 | 53.70                      | 74.00             | 20.30       | peak   |
| 2334.52  | V        | 11.24                  | 30.99                 | 42.23                      | 54.00             | 11.77       | AVG    |
| 2337.16  | H        | 23.22                  | 30.99                 | 54.21                      | 74.00             | 19.79       | peak   |
| 2337.16  | H        | 11.54                  | 30.99                 | 42.53                      | 54.00             | 11.47       | AVG    |
| Note: (1) Peak RBW = 1 MHz, VBW $\geq 3 \times$ RBW, Detector = Peak;<br>(2) Avg RBW = 1 MHz, VBW $\geq 3 \times$ RBW, Detector = RMS;<br>(3) Corrected Reading = Reading Level + Correct Factor;<br>(4) Correct Factor = Ant_F + Cab_L - Preamp;<br>(5) Margin = Limit - Corrected Reading; |          |                        |                       |                            |                   |             |        |

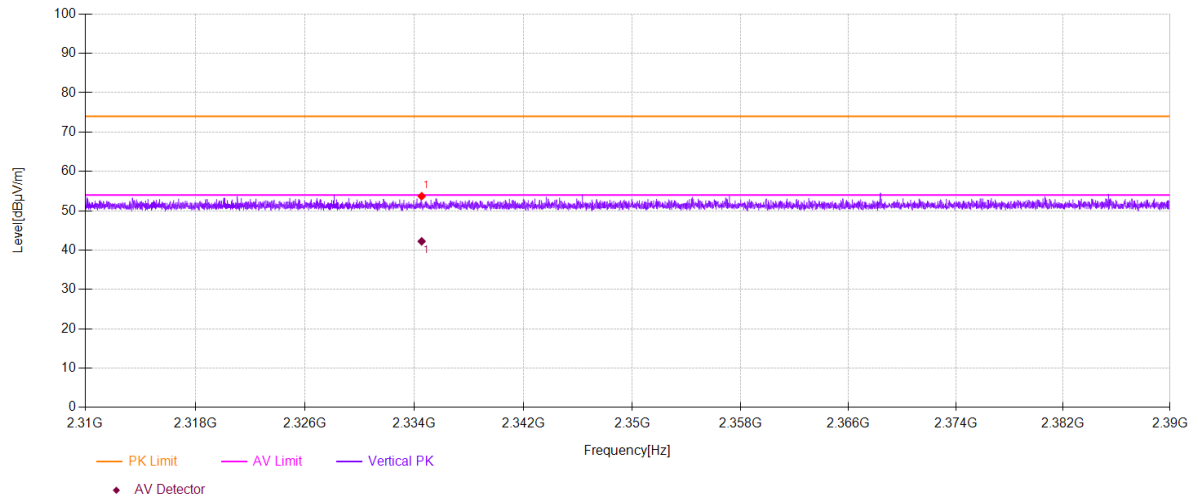
Test mode: 802.11b Frequency: Channel 11: 2462MHz

| Freq. (MHz)   | Ant.Pol. | Reading Level (dBuV/m) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit 3m (dBuV/m) | Margin (dB) | Remark |
|---|----------|------------------------|-----------------------|----------------------------|-------------------|-------------|--------|
| 2487.03   | V        | 23.82                  | 30.98                 | 54.80                      | 74.00             | 19.20       | peak   |
| 2487.037  | V        | 12.11                  | 30.98                 | 43.09                      | 54.00             | 10.91       | AVG    |
| 2488.80   | H        | 23.60                  | 30.98                 | 54.58                      | 74.00             | 19.42       | peak   |
| 2488.80   | H        | 12.21                  | 30.98                 | 43.19                      | 54.00             | 10.81       | AVG    |
| Note: (1) Peak RBW = 1 MHz, VBW $\geq 3 \times$ RBW, Detector = Peak;<br>(2) Avg RBW = 1 MHz, VBW = $1/T_{on}$ , Detector = Peak, where: $T_{on}$ is transmit duration;<br>(3) Corrected Reading = Reading Level + Correct Factor;<br>(4) Correct Factor = Ant_F + Cab_L - Preamp;<br>(5) Margin = Limit - Corrected Reading; |          |                        |                       |                            |                   |             |        |

**Test Model**                      **Spurious Emission in Restricted Band 2310-2390MHz**  
**802.11b**                                      **Channel 1: 2412MHz**                                      **Polarity: H**

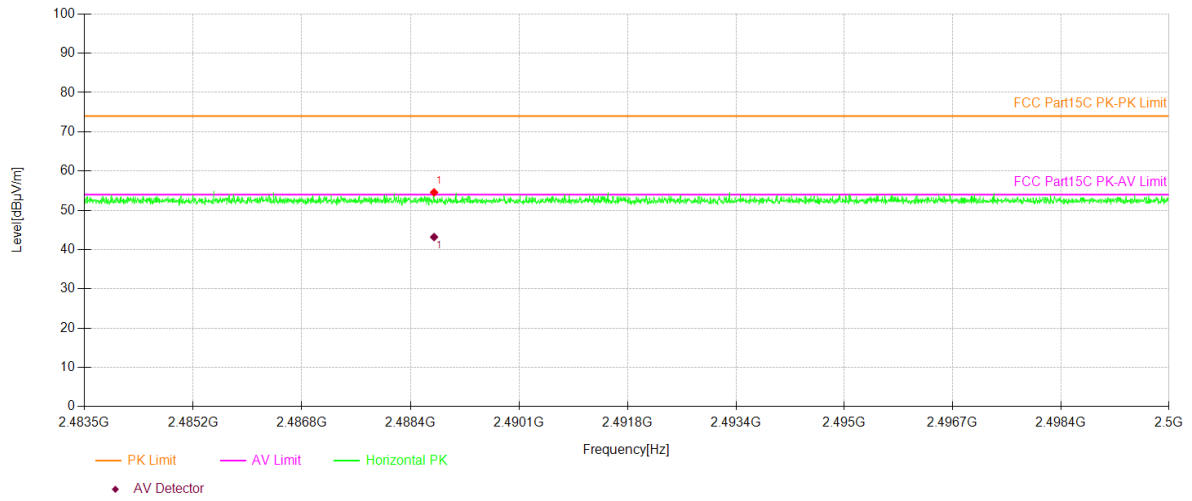


**Test Model**                      **Spurious Emission in Restricted Band 2310-2390MHz**  
**802.11b**                                      **Channel 1: 2412MHz**                                      **Polarity: V**

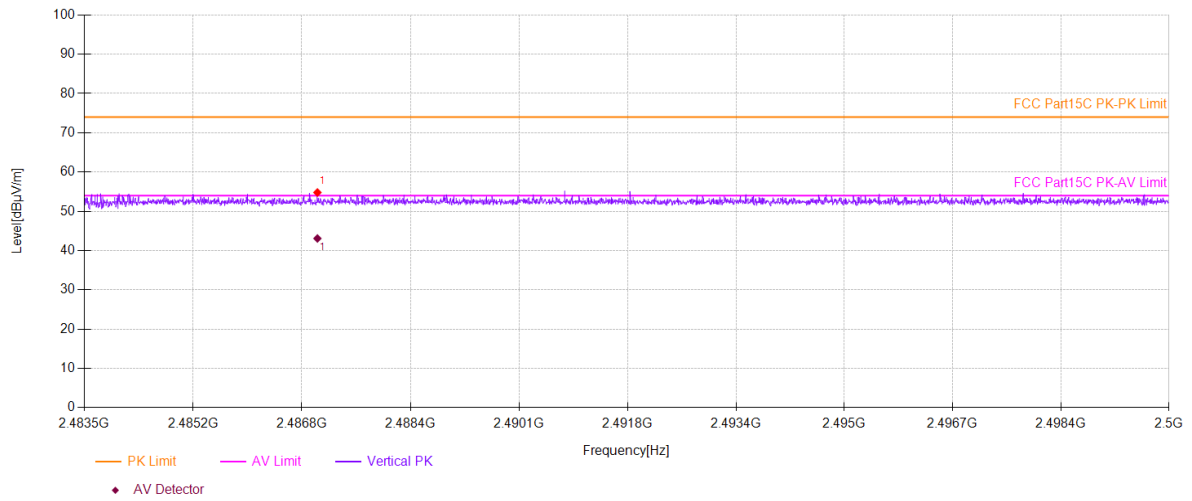




**Test Model**                      **Spurious Emission in Restricted Band 2483.5-2500MHz**  
**802.11b**                                      **Channel 11: 2462MHz**                                      **Polarity: H**



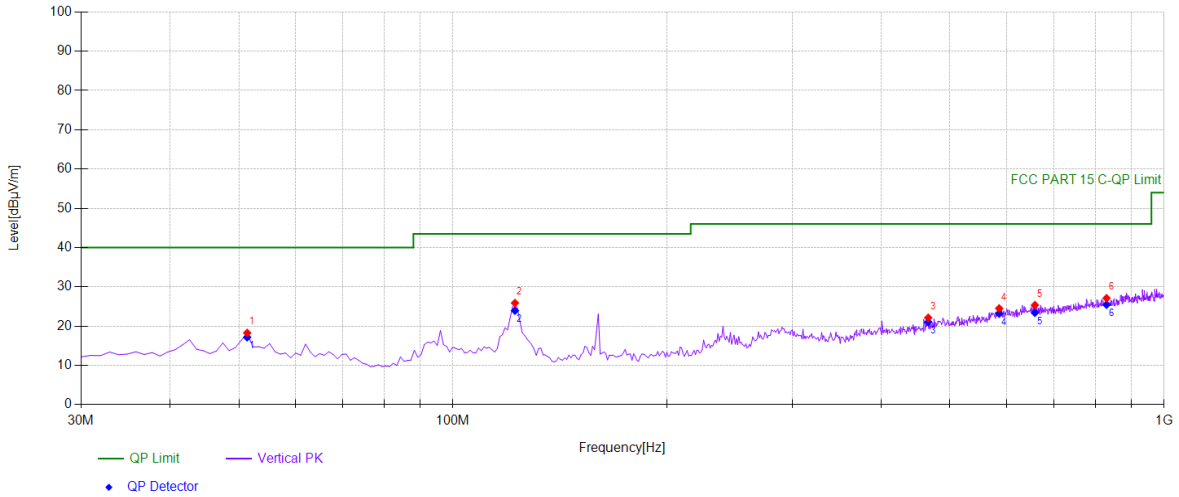
**Test Model**                      **Spurious Emission in Restricted Band 2483.5-2500MHz**  
**802.11b**                                      **Channel 11: 2462MHz**                                      **Polarity: V**



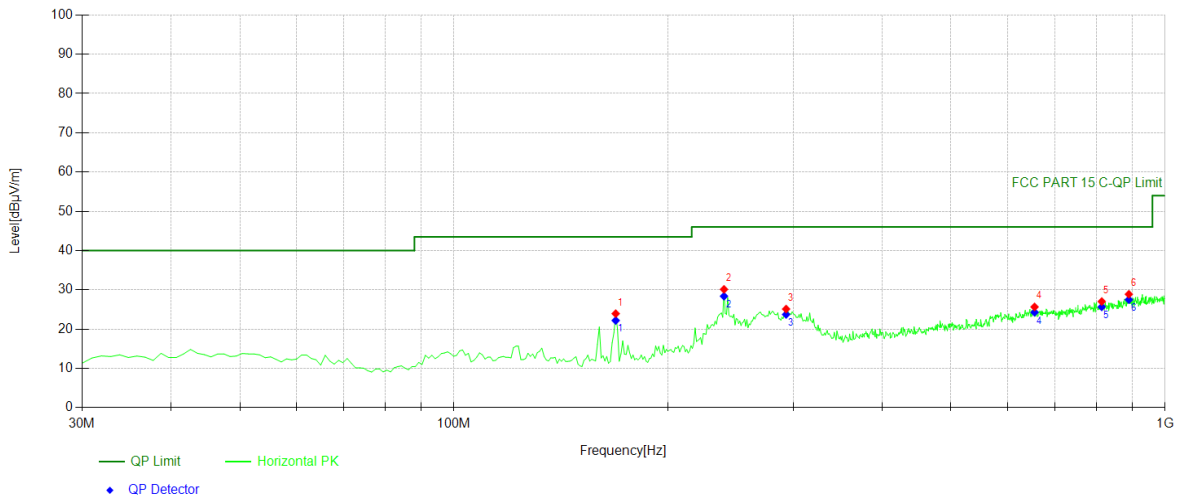
■ Spurious Emission below 1GHz (30MHz to 1GHz)

All the antenna(Antenna 1) and modes(802.11b/g/n) have been tested and the worst(Antenna 1, 802.11b) result recorded was report as below:

2412

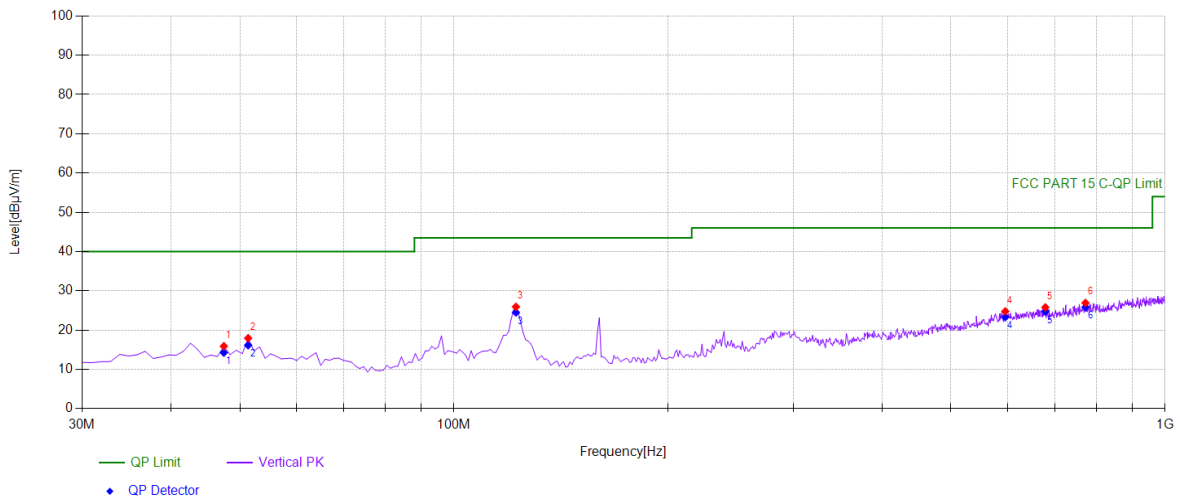


| Suspected Data List |             |                |               |                |          |                |             |          |
|---------------------|-------------|----------------|---------------|----------------|----------|----------------|-------------|----------|
| NO.                 | Freq. [MHz] | Reading [dBµV] | Factor [dB/m] | Level [dBµV/m] | Detector | Limit [dBµV/m] | Margin [dB] | Polarity |
| 1                   | 51.3614     | 35.66          | -17.39        | 18.27          | PK       | 40.00          | 21.73       | Vertical |
| 2                   | 122.242     | 44.05          | -18.16        | 25.89          | PK       | 43.50          | 17.61       | Vertical |
| 3                   | 465.966     | 32.80          | -10.67        | 22.13          | PK       | 46.00          | 23.87       | Vertical |
| 4                   | 586.366     | 31.65          | -7.14         | 24.51          | PK       | 46.00          | 21.49       | Vertical |
| 5                   | 658.218     | 31.51          | -6.15         | 25.36          | PK       | 46.00          | 20.64       | Vertical |
| 6                   | 830.080     | 31.24          | -4.12         | 27.12          | PK       | 46.00          | 18.88       | Vertical |

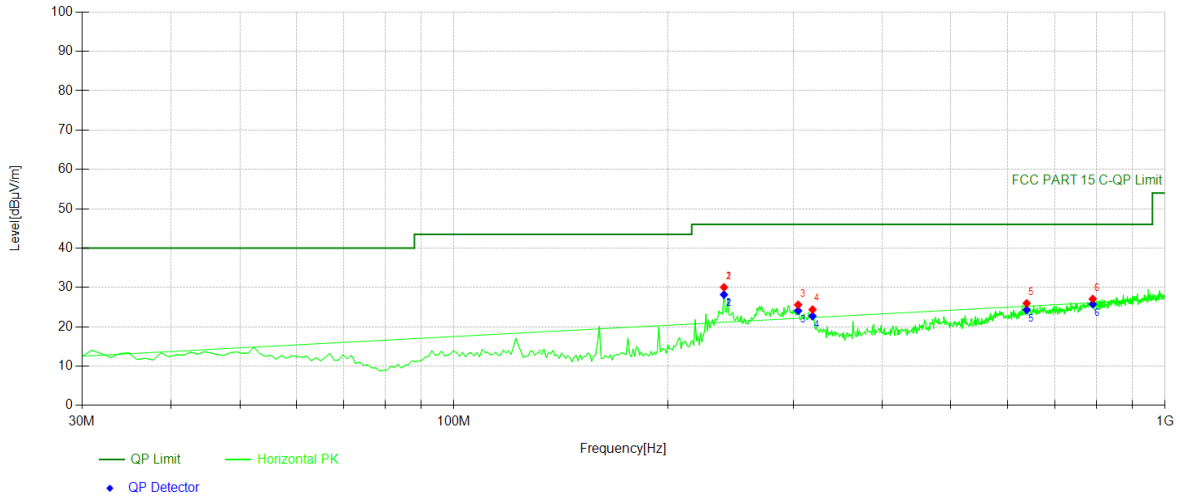


| Suspected Data List |             |                |               |                |          |                |             |            |
|---------------------|-------------|----------------|---------------|----------------|----------|----------------|-------------|------------|
| NO.                 | Freq. [MHz] | Reading [dBμV] | Factor [dB/m] | Level [dBμV/m] | Detector | Limit [dBμV/m] | Margin [dB] | Polarity   |
| 1                   | 168.848     | 42.97          | -19.03        | 23.94          | PK       | 43.50          | 19.56       | Horizontal |
| 2                   | 239.729     | 45.34          | -15.21        | 30.13          | PK       | 46.00          | 15.87       | Horizontal |
| 3                   | 293.133     | 39.27          | -14.15        | 25.12          | PK       | 46.00          | 20.88       | Horizontal |
| 4                   | 655.305     | 31.83          | -6.17         | 25.66          | PK       | 46.00          | 20.34       | Horizontal |
| 5                   | 814.544     | 31.36          | -4.32         | 27.04          | PK       | 46.00          | 18.96       | Horizontal |
| 6                   | 889.309     | 31.78          | -2.89         | 28.89          | PK       | 46.00          | 17.11       | Horizontal |

2437

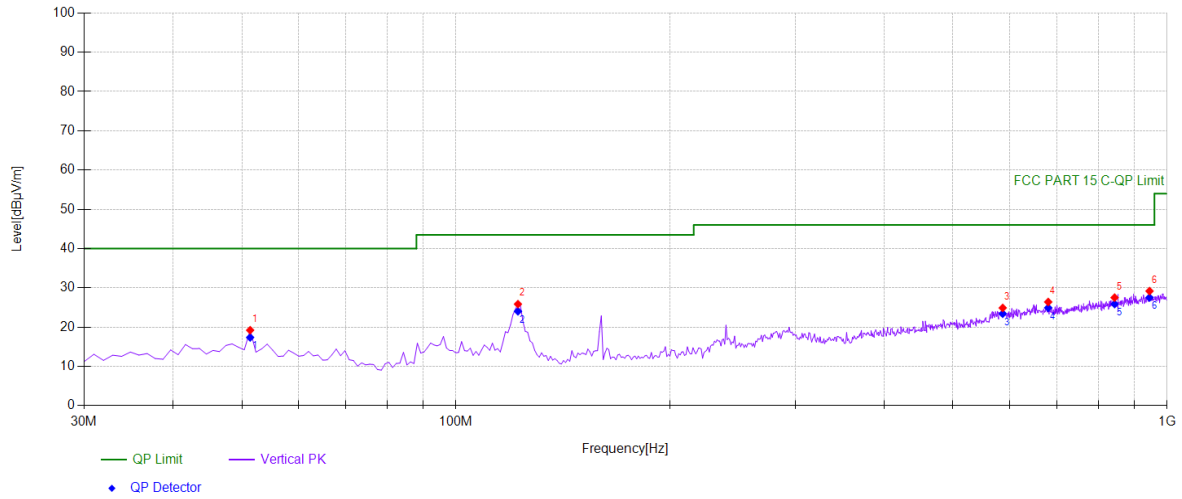


| Suspected Data List |             |                |               |                |          |                |             |          |
|---------------------|-------------|----------------|---------------|----------------|----------|----------------|-------------|----------|
| NO.                 | Freq. [MHz] | Reading [dBμV] | Factor [dB/m] | Level [dBμV/m] | Detector | Limit [dBμV/m] | Margin [dB] | Polarity |
| 1                   | 47.4775     | 33.30          | -17.39        | 15.91          | PK       | 40.00          | 24.09       | Vertical |
| 2                   | 51.3614     | 35.35          | -17.39        | 17.96          | PK       | 40.00          | 22.04       | Vertical |
| 3                   | 122.242     | 44.10          | -18.16        | 25.94          | PK       | 43.50          | 17.56       | Vertical |
| 4                   | 596.076     | 31.92          | -7.14         | 24.78          | PK       | 46.00          | 21.22       | Vertical |
| 5                   | 678.608     | 31.90          | -6.10         | 25.80          | PK       | 46.00          | 20.20       | Vertical |
| 6                   | 772.792     | 31.83          | -4.90         | 26.93          | PK       | 46.00          | 19.07       | Vertical |

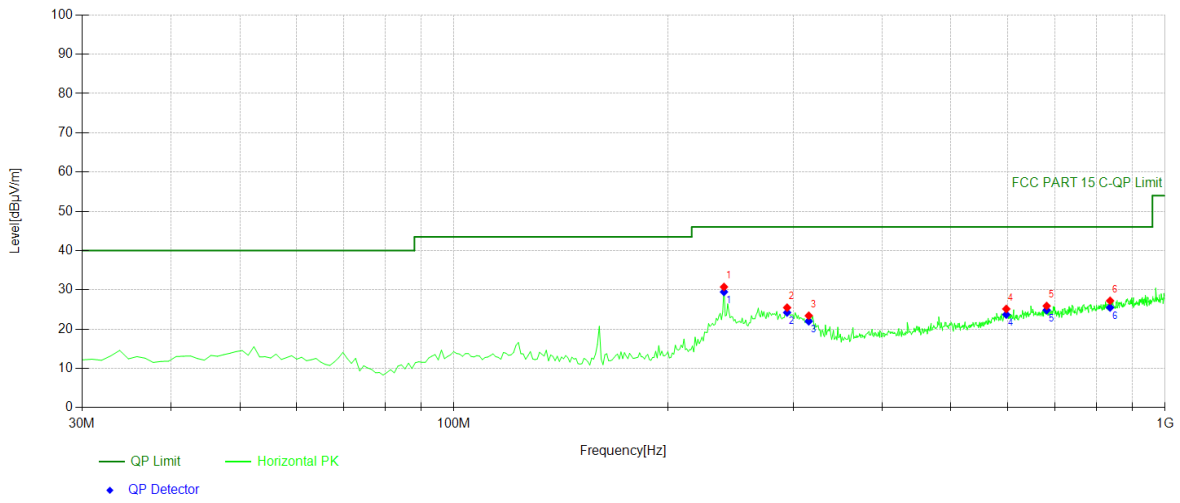


| Suspected Data List |             |                |               |                |          |                |             |            |
|---------------------|-------------|----------------|---------------|----------------|----------|----------------|-------------|------------|
| NO.                 | Freq. [MHz] | Reading [dBµV] | Factor [dB/m] | Level [dBµV/m] | Detector | Limit [dBµV/m] | Margin [dB] | Polarity   |
| 1                   | 239.729     | 45.25          | -15.21        | 30.04          | PK       | 46.00          | 15.96       | Horizontal |
| 2                   | 239.729     | 45.25          | -15.21        | 30.04          | PK       | 46.00          | 15.96       | Horizontal |
| 3                   | 304.784     | 39.73          | -14.14        | 25.59          | PK       | 46.00          | 20.41       | Horizontal |
| 4                   | 319.349     | 38.52          | -14.13        | 24.39          | PK       | 46.00          | 21.61       | Horizontal |
| 5                   | 638.798     | 32.28          | -6.31         | 25.97          | PK       | 46.00          | 20.03       | Horizontal |
| 6                   | 791.241     | 31.58          | -4.51         | 27.07          | PK       | 46.00          | 18.93       | Horizontal |

2462



| Suspected Data List |             |                |               |                |          |                |             |          |
|---------------------|-------------|----------------|---------------|----------------|----------|----------------|-------------|----------|
| NO.                 | Freq. [MHz] | Reading [dBμV] | Factor [dB/m] | Level [dBμV/m] | Detector | Limit [dBμV/m] | Margin [dB] | Polarity |
| 1                   | 51.3614     | 36.61          | -17.39        | 19.22          | PK       | 40.00          | 20.78       | Vertical |
| 2                   | 122.242     | 44.03          | -18.16        | 25.87          | PK       | 43.50          | 17.63       | Vertical |
| 3                   | 587.337     | 32.04          | -7.14         | 24.90          | PK       | 46.00          | 21.10       | Vertical |
| 4                   | 680.550     | 32.51          | -6.10         | 26.41          | PK       | 46.00          | 19.59       | Vertical |
| 5                   | 843.673     | 31.36          | -3.84         | 27.52          | PK       | 46.00          | 18.48       | Vertical |
| 6                   | 944.654     | 31.57          | -2.39         | 29.18          | PK       | 46.00          | 16.82       | Vertical |



### Suspected Data List

| NO. | Freq. [MHz] | Reading [dBµV] | Factor [dB/m] | Level [dBµV/m] | Detector | Limit [dBµV/m] | Margin [dB] | Polarity   |
|-----|-------------|----------------|---------------|----------------|----------|----------------|-------------|------------|
| 1   | 239.729     | 45.95          | -15.21        | 30.74          | PK       | 46.00          | 15.26       | Horizontal |
| 2   | 294.104     | 39.63          | -14.15        | 25.48          | PK       | 46.00          | 20.52       | Horizontal |
| 3   | 315.465     | 37.56          | -14.14        | 23.42          | PK       | 46.00          | 22.58       | Horizontal |
| 4   | 598.018     | 32.28          | -7.14         | 25.14          | PK       | 46.00          | 20.86       | Horizontal |
| 5   | 681.521     | 32.00          | -6.09         | 25.91          | PK       | 46.00          | 20.09       | Horizontal |
| 6   | 836.876     | 31.16          | -3.94         | 27.22          | PK       | 46.00          | 18.78       | Horizontal |



## 8.8 CONDUCTED EMISSION TEST

### 8.8.1 Applicable Standard

According to FCC Part 15.207(a)

According to RSS-Gen 8.8

### 8.8.2 Conformance Limit

| Frequency(MHz) | Conducted Emission Limit |         |
|----------------|--------------------------|---------|
|                | Quasi-peak               | Average |
| 0.15-0.5       | 66-56                    | 56-46   |
| 0.5-5.0        | 56                       | 46      |
| 5.0-30.0       | 60                       | 50      |

Note: 1. The lower limit shall apply at the transition frequencies  
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 8.8.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

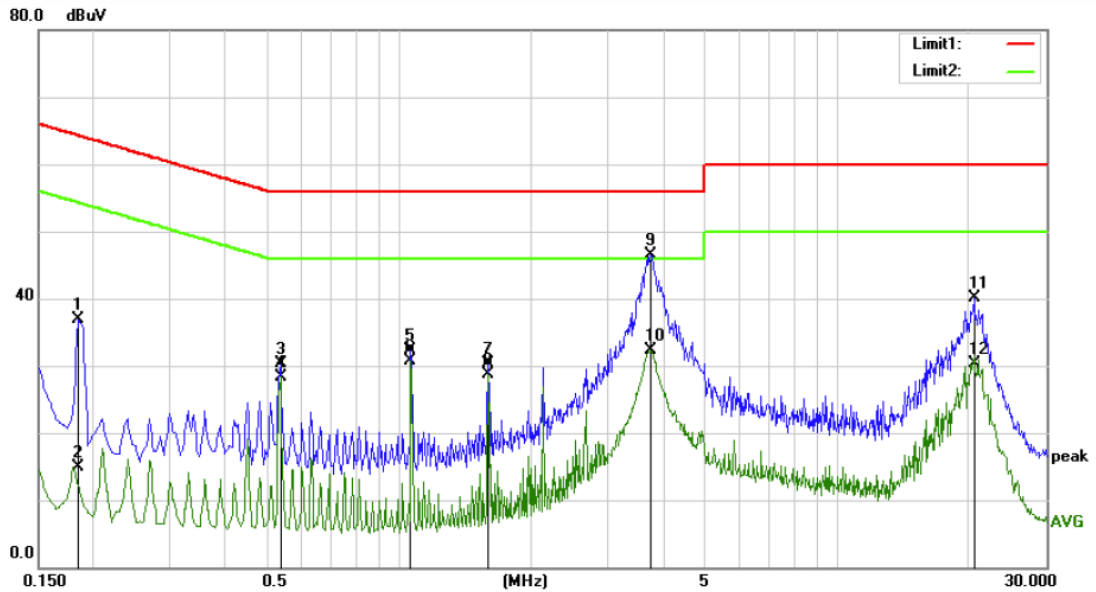
### 8.8.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.  
Maximum procedure was performed on the highest emissions to ensure EUT compliance.  
Repeat above procedures until all frequency measured were complete.

### 8.8.5 Test Results

Pass

The AC120V &240V voltage have been tested, and the worst result recorded was report as below:

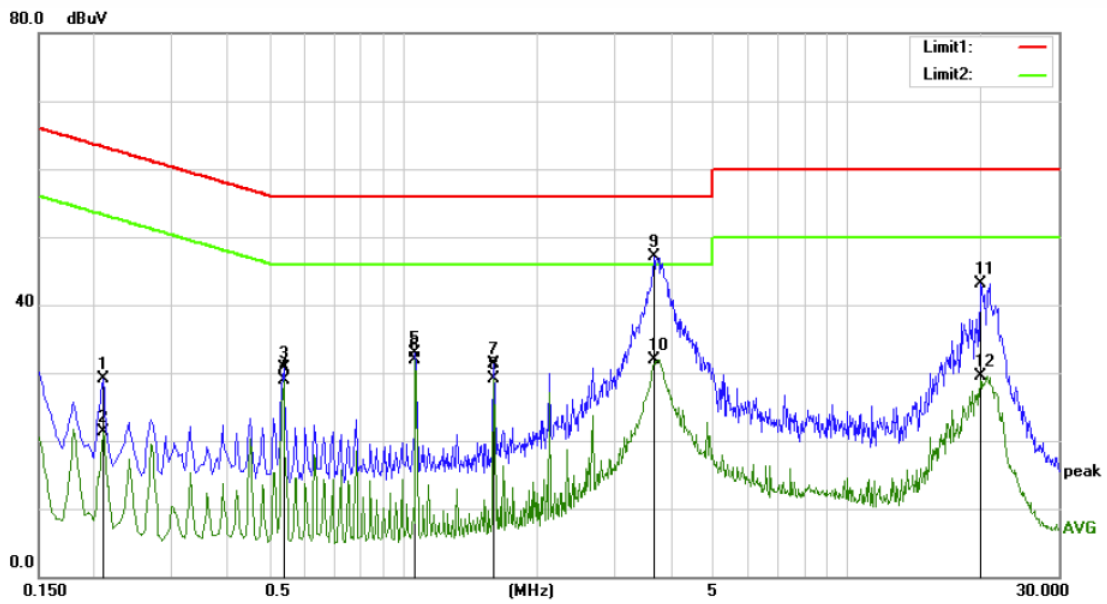


Site: Conduction #1  
 Limit: (CE)FCC PART 15 class B\_QP  
 Mode: WIFI MODE  
 Note: CHUANGLIAN

Phase: N  
 Power: AC 120V/60Hz

Temperature: 21.9  
 Humidity: 58 %

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.1850       | 27.07                    | 9.92                    | 36.99                    | 64.26         | -27.27     | QP       |         |
| 2   |     | 0.1850       | 4.91                     | 9.92                    | 14.83                    | 54.26         | -39.43     | AVG      |         |
| 3   |     | 0.5350       | 20.67                    | 9.67                    | 30.34                    | 56.00         | -25.66     | QP       |         |
| 4   |     | 0.5350       | 18.67                    | 9.67                    | 28.34                    | 46.00         | -17.66     | AVG      |         |
| 5   |     | 1.0650       | 22.41                    | 9.84                    | 32.25                    | 56.00         | -23.75     | QP       |         |
| 6   |     | 1.0650       | 20.91                    | 9.84                    | 30.75                    | 46.00         | -15.25     | AVG      |         |
| 7   |     | 1.6000       | 20.62                    | 9.76                    | 30.38                    | 56.00         | -25.62     | QP       |         |
| 8   |     | 1.6000       | 18.93                    | 9.76                    | 28.69                    | 46.00         | -17.31     | AVG      |         |
| 9   | *   | 3.7400       | 36.73                    | 9.81                    | 46.54                    | 56.00         | -9.46      | QP       |         |
| 10  |     | 3.7400       | 22.53                    | 9.81                    | 32.34                    | 46.00         | -13.66     | AVG      |         |
| 11  |     | 20.5300      | 29.77                    | 10.29                   | 40.06                    | 60.00         | -19.94     | QP       |         |
| 12  |     | 20.5300      | 20.08                    | 10.29                   | 30.37                    | 50.00         | -19.63     | AVG      |         |



Site Conduction #1 Phase: **L1** Temperature: 21.9  
 Limit: (CE)FCC PART 15 class B\_QP Power: AC 120V/60Hz Humidity: 58 %  
 Mode: WIFI MODE  
 Note: CHUANGLIAN

| No. | Mk. | Freq.   | Reading Level | Correct Factor | Measurement | Limit | Over   | Detector | Comment |
|-----|-----|---------|---------------|----------------|-------------|-------|--------|----------|---------|
|     |     | MHz     | dBuV          | dB             | dBuV        | dBuV  | dB     |          |         |
| 1   |     | 0.2100  | 18.98         | 10.09          | 29.07       | 63.21 | -34.14 | QP       |         |
| 2   |     | 0.2100  | 11.29         | 10.09          | 21.38       | 53.21 | -31.83 | AVG      |         |
| 3   |     | 0.5350  | 21.07         | 9.67           | 30.74       | 56.00 | -25.26 | QP       |         |
| 4   |     | 0.5350  | 19.19         | 9.67           | 28.86       | 46.00 | -17.14 | AVG      |         |
| 5   |     | 1.0650  | 23.13         | 9.84           | 32.97       | 56.00 | -23.03 | QP       |         |
| 6   |     | 1.0650  | 22.02         | 9.84           | 31.86       | 46.00 | -14.14 | AVG      |         |
| 7   |     | 1.6000  | 21.61         | 9.76           | 31.37       | 56.00 | -24.63 | QP       |         |
| 8   |     | 1.6000  | 19.38         | 9.76           | 29.14       | 46.00 | -16.86 | AVG      |         |
| 9   | *   | 3.6800  | 37.30         | 9.80           | 47.10       | 56.00 | -8.90  | QP       |         |
| 10  |     | 3.6800  | 22.15         | 9.80           | 31.95       | 46.00 | -14.05 | AVG      |         |
| 11  |     | 20.0550 | 32.83         | 10.35          | 43.18       | 60.00 | -16.82 | QP       |         |
| 12  |     | 20.0550 | 19.24         | 10.35          | 29.59       | 50.00 | -20.41 | AVG      |         |

## 8.9 ANTENNA APPLICATION

### 8.9.1 Antenna Requirement

| Standard                   | Requirement  |
|----------------------------|--|
| FCC CRF Part 15.203        | An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.  |
| FCC 47 CFR Part 15.247 (b) | If transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.   |
| RSS-Gen Section 6.8        | The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.   |
| RSS-247 Section 5.4        | If the transmitter employs an antenna system that emits multiple directional beams, but does not emit multiple directional beams simultaneously, the total output power conducted to the array or arrays that comprise the device (i.e. the sum of the power supplied to all antennas, antenna elements, staves, etc., and summed across all carriers or frequency channels) shall not exceed the applicable output power limit. However, the total conducted output power shall be reduced by 1 dB below the specified limits for each 3 dB that the directional gain of the antenna/antenna array exceeds 6 dBi. The directional antenna gain shall be computed as the sum of 10 log (number of array elements or staves) plus the directional gain of the element or staff having the highest gain. |

### 8.9.2 Result

PASS.

- Note:
- Antenna use a permanently attached antenna which is not replaceable.
  - Not using a standard antenna jack or electrical connector for antenna replacement
  - The antenna has to be professionally installed (please provide method of installation)

Please refer to the attached document Internal Photos to show the antenna connector.

----- END OF REPORT -----