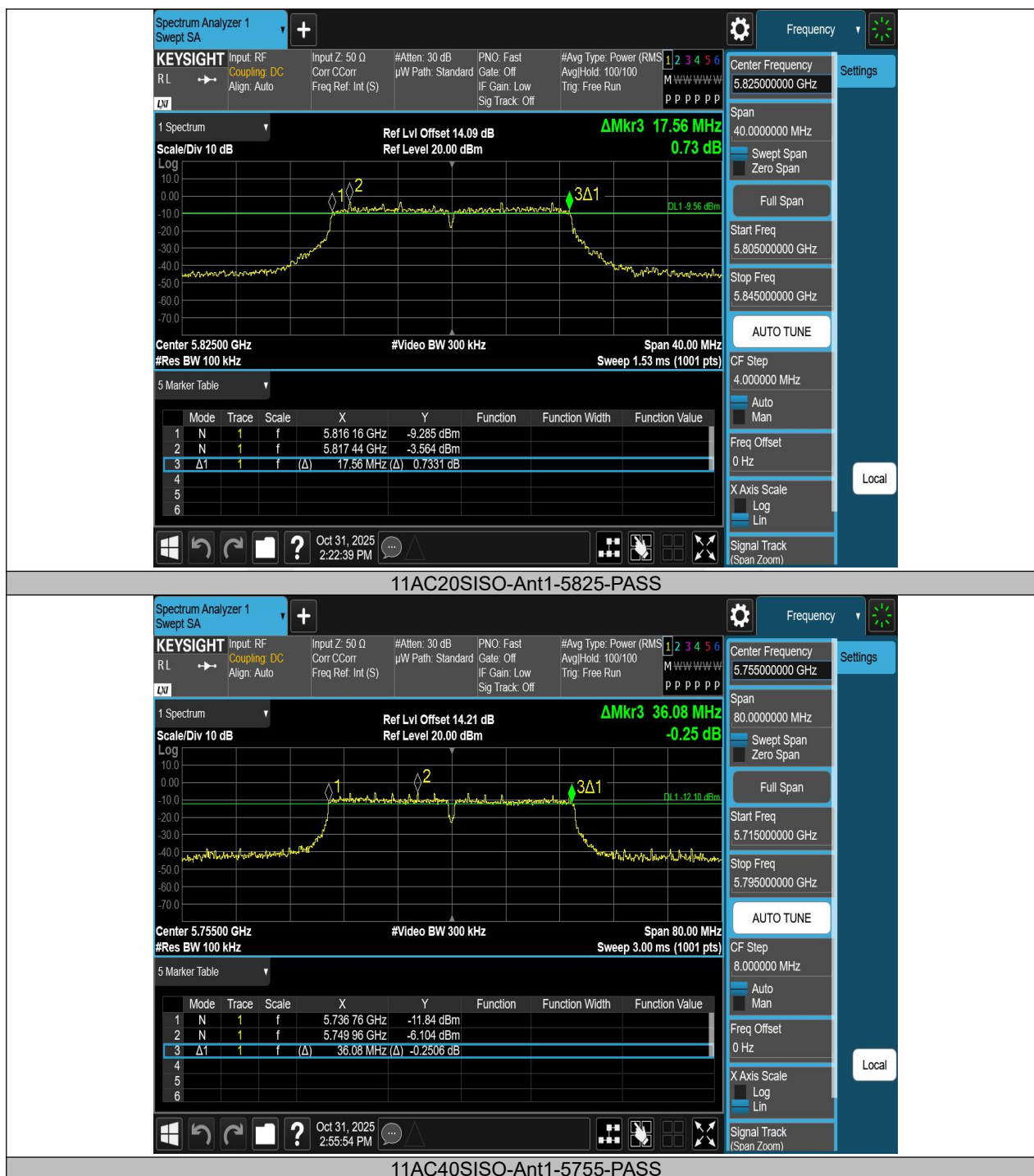
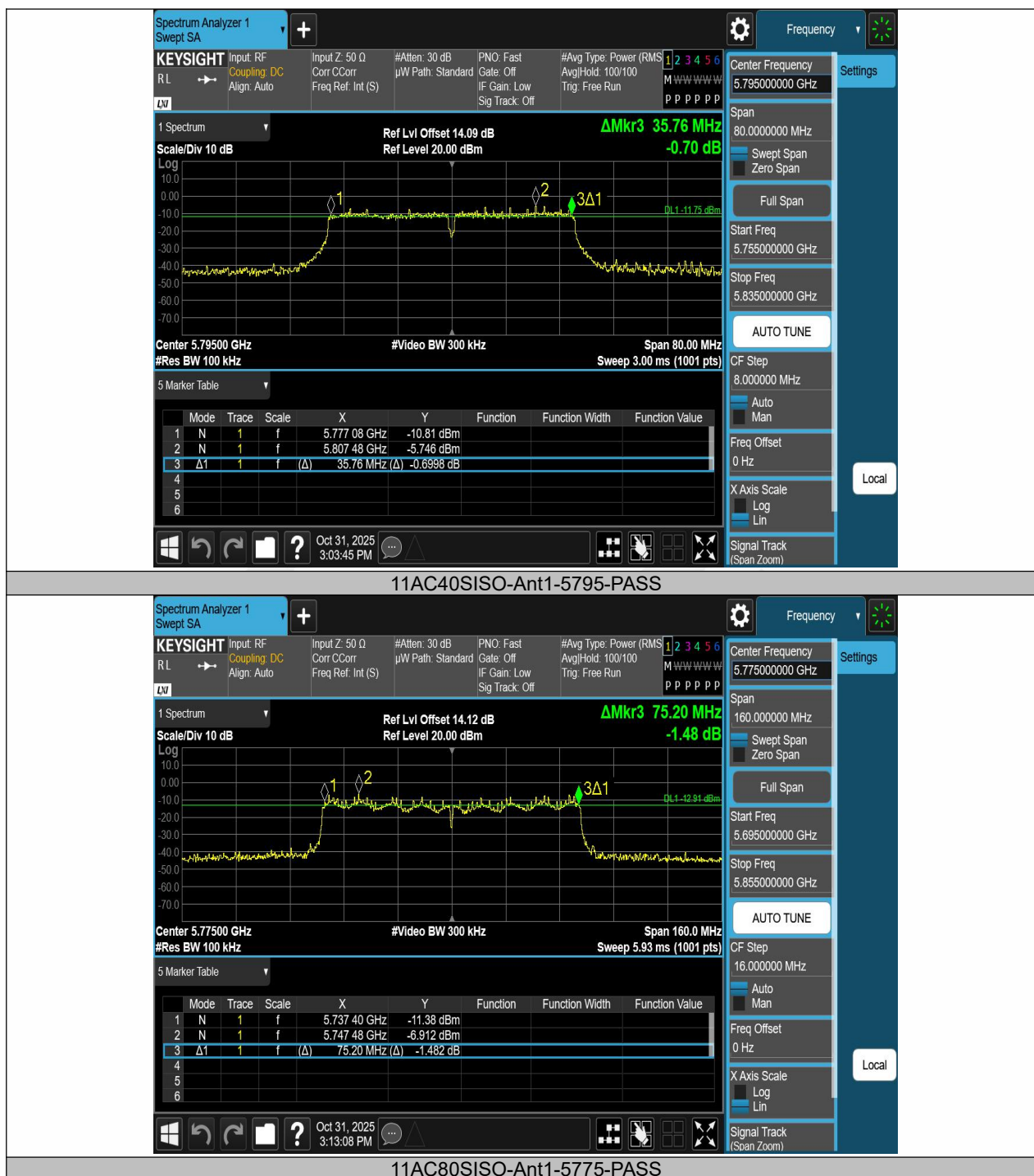






## 8.2 MAXIMUM CONDUCTED OUTPUT POWER

### 8.2.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I  
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C  
According to FCC Part 15.407(a)(3) for UNII Band III  
According to 789033 D02 Section II(E)  
According to RSS 247 6.2

### 8.2.2 Conformance Limit

#### FCC Limit:

##### ■ For the band 5.15-5.25 GHz

(a) (1) (i) For an outdoor access point, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(a) (1) (ii) For an indoor access point, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(a) (1) (iii) For fixed point-to-point access points, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(a) (1) (iv) For client devices, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

##### ■ For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

(a) (2) The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

##### ■ For the band 5.725-5.85 GHz

(a) (3) The maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations

#### IC Limit:

##### ■ Frequency band 5150-5250 MHz

The maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log_{10}B$ , dBm, whichever power is less. B is the 99% emission bandwidth in megahertz.

##### ■ Frequency band 5250-5350 MHz

The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10}B$ , dBm, whichever is less.

The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10}B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

##### ■ Frequency bands 5470-5600 MHz and 5650-5725 MHz

The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10}B$ , dBm, whichever is less.

The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10}B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

##### ■ Frequency band 5725-5850 MHz

The maximum conducted output power shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

### 8.2.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

### 8.2.4 Test Procedure

The maximum average conducted output power can be measured using Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

- The Transmitter output (antenna port) was connected to the power meter.
- Turn on the EUT and power meter and then record the power value.
- Repeat above procedures on all channels needed to be tested.

### 8.2.5 Test Results

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

Note: N/A

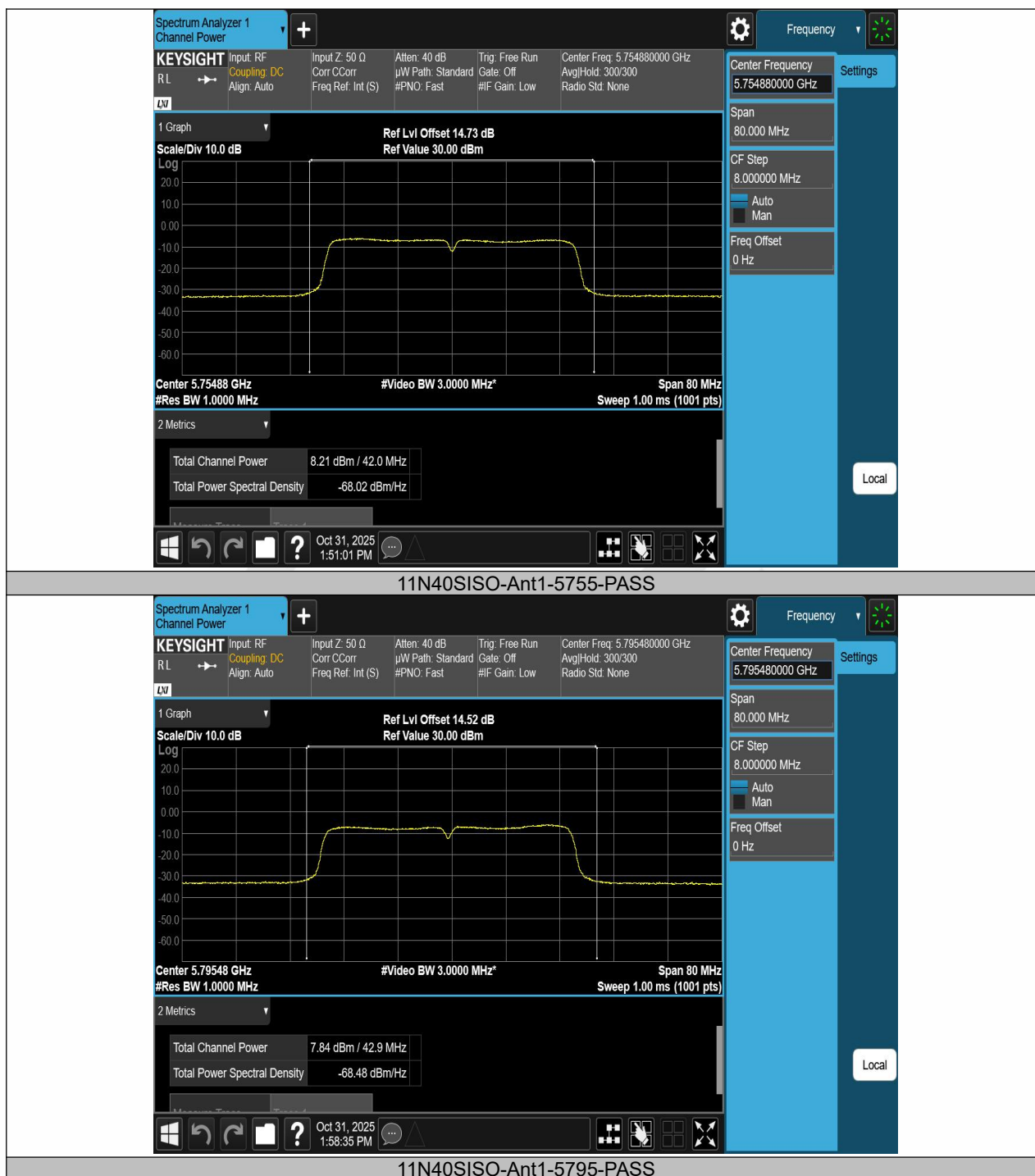
| Test Mode  | Antenna | Frequency[MHz] | Result [dBm] | Limit [dBm] | Gain [dBi] | EIRP [dBm] | EIRP Limit [dBm] | Verdict |
|------------|---------|----------------|--------------|-------------|------------|------------|------------------|---------|
| 11A        | Ant1    | 5745           | 8.46         | ≤30.00      | 4.12       | 12.58      | ---              | PASS    |
| 11A        | Ant1    | 5785           | 7.38         | ≤30.00      | 4.12       | 11.5       | ---              | PASS    |
| 11A        | Ant1    | 5825           | 8.43         | ≤30.00      | 4.12       | 12.55      | ---              | PASS    |
| 11N20SISO  | Ant1    | 5745           | 8.26         | ≤30.00      | 4.12       | 12.38      | ---              | PASS    |
| 11N20SISO  | Ant1    | 5785           | 7.31         | ≤30.00      | 4.12       | 11.43      | ---              | PASS    |
| 11N20SISO  | Ant1    | 5825           | 8.53         | ≤30.00      | 4.12       | 12.65      | ---              | PASS    |
| 11N40SISO  | Ant1    | 5755           | 8.21         | ≤30.00      | 4.12       | 12.33      | ---              | PASS    |
| 11N40SISO  | Ant1    | 5795           | 7.84         | ≤30.00      | 4.12       | 11.96      | ---              | PASS    |
| 11AC20SISO | Ant1    | 5745           | 8.35         | ≤30.00      | 4.12       | 12.47      | ---              | PASS    |
| 11AC20SISO | Ant1    | 5785           | 7.47         | ≤30.00      | 4.12       | 11.59      | ---              | PASS    |
| 11AC20SISO | Ant1    | 5825           | 8.55         | ≤30.00      | 4.12       | 12.67      | ---              | PASS    |
| 11AC40SISO | Ant1    | 5755           | 8.41         | ≤30.00      | 4.12       | 12.53      | ---              | PASS    |
| 11AC40SISO | Ant1    | 5795           | 8.13         | ≤30.00      | 4.12       | 12.25      | ---              | PASS    |
| 11AC80SISO | Ant1    | 5775           | 8.80         | ≤30.00      | 4.12       | 12.92      | ---              | PASS    |

















## 8.3 MAXIMUM PEAK POWER DENSITY

### 8.3.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I  
According to FCC Part 15.407(a)(3) for UNII Band III  
According to 789033 D02 Section II(F)  
According to RSS 247 6.2

### 8.3.2 Conformance Limit

#### FCC Limit:

■ For the band 5.15-5.25 GHz,

(a) (1) (i) For an outdoor access point, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(a) (1) (ii) For an indoor access point, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(a) (1) (iii) For fixed point-to-point access points, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(a) (1) (iv) For client devices, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the 5.25-5.35 GHz and 5.47-5.725 GHz bands

(b) (2) The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

■ For the band 5.725-5.85 GHz

(a) (3) The maximum power spectral density shall not exceed 30 dBm in any 500-kHz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations

#### IC Limit:

■ Frequency band 5150-5250 MHz

The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

■ Frequency band 5250-5350 MHz

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

■ Frequency bands 5470-5600 MHz and 5650-5725 MHz

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

■ Frequency band 5725-5850 MHz

The output power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

### 8.3.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

### 8.3.4 Test Procedure

Methods refer to FCC KDB 789033

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW  $\geq 1/T$ , where T is defined in section II.B.I.a).

b) Set VBW  $\geq 3$  RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add  $10\log(500\text{kHz}/\text{RBW})$  to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add  $10\log(1\text{MHz}/\text{RBW})$  to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections

5.c) and 5.d) above, since RBW=100 KHz is available on nearly all spectrum analyzers.

### 8.3.5 Test Results

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

Note: N/A

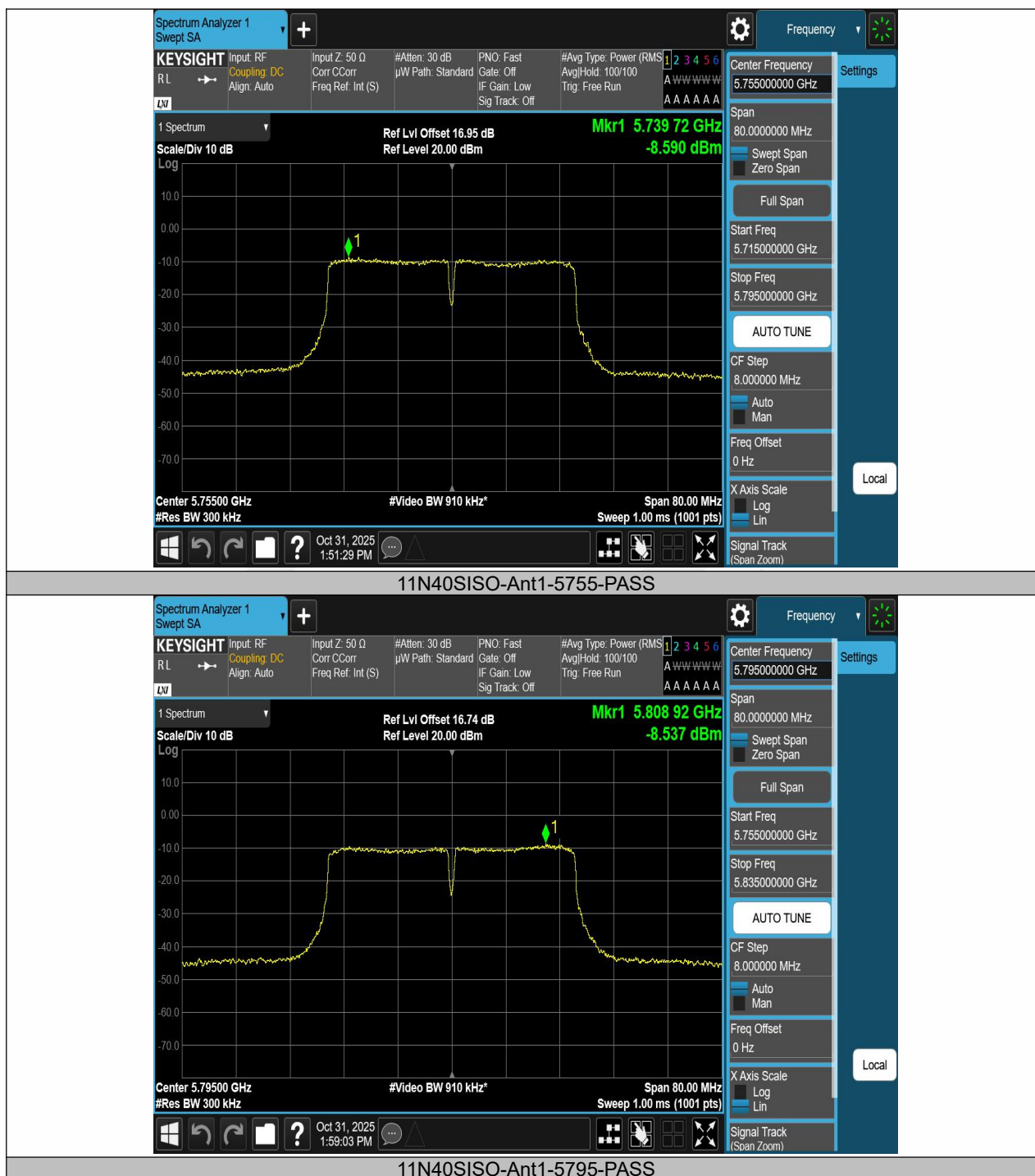
| TestMode   | Antenna | Frequency[MHz] | Result [dBm/MHz] | Limit[dBm/MHz] | Verdict |
|------------|---------|----------------|------------------|----------------|---------|
| 11A        | Ant1    | 5745           | -5.20            | ≤30.00         | PASS    |
| 11A        | Ant1    | 5785           | -6.49            | ≤30.00         | PASS    |
| 11A        | Ant1    | 5825           | -5.21            | ≤30.00         | PASS    |
| 11N20SISO  | Ant1    | 5745           | -5.61            | ≤30.00         | PASS    |
| 11N20SISO  | Ant1    | 5785           | -6.62            | ≤30.00         | PASS    |
| 11N20SISO  | Ant1    | 5825           | -5.56            | ≤30.00         | PASS    |
| 11N40SISO  | Ant1    | 5755           | -8.59            | ≤30.00         | PASS    |
| 11N40SISO  | Ant1    | 5795           | -8.54            | ≤30.00         | PASS    |
| 11AC20SISO | Ant1    | 5745           | -5.73            | ≤30.00         | PASS    |
| 11AC20SISO | Ant1    | 5785           | -6.45            | ≤30.00         | PASS    |
| 11AC20SISO | Ant1    | 5825           | -5.56            | ≤30.00         | PASS    |
| 11AC40SISO | Ant1    | 5755           | -8.10            | ≤30.00         | PASS    |
| 11AC40SISO | Ant1    | 5795           | -8.65            | ≤30.00         | PASS    |
| 11AC80SISO | Ant1    | 5775           | -9.59            | ≤30.00         | PASS    |

Note: 1. The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.  
2. The Duty Cycle Factor and RBW Factor is compensated in the graph.















## 8.4 UNDESIRABLE RADIATED SPURIOUS EMISSION

### 8.4.1 Applicable Standard

According to FCC Part 15.407 (b), 15.209, 15.205

According to 789033 D02 Section II(G)

According to RSS-GEN 8.9, 8.10 and 6.13

### 8.4.2 Conformance Limit

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

| 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                    |

The provisions of §15.205 apply to intentional radiators operating under this section, 15.205 Restricted bands of operation

| MHz               | MHz                 | MHz           | GHz         |
|-------------------|---------------------|---------------|-------------|
| 0.090-0.110       | 16.42-16.423        | 399.9-410     | 4.5-5.15    |
| 10.495-0.505      | 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     | (2)         |
| 13.36-13.41       |                     |               |             |

Remark: 1. Emission level in dBuV/m=20 log (uV/m)  
 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.  
 3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

### 8.4.3 Test Configuration

Test according to clause 6.2 radio frequency test setup

### 8.4.4 Test Procedure

#### ■ Unwanted Emissions Measurements below 1000 MHz

Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

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

And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Repeat above procedures until all frequency measured was complete.

We use software control the EUT, Let EUT hopping on and transmit with highest power, All the modes have been tested and the worst result was reported.

Use the following spectrum analyzer settings:

Set RBW=120kHz for  $f < 1$  GHz(30MHz to 1GHz), 200Hz for  $f < 150$  KHz(9KHz to 150KHz), 9KHz for  $f < 30$  MHz(150KHz to 30KHz).

Set the VBW > RBW.

Detector = Peak.

Trace mode = max hold.

Follow the guidelines in ANSI C63.10-2020 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 specified in Section 15.35(b). Submit this data.

Repeat above procedures until all frequency measured was complete.

#### ■ Unwanted Maximum peak Emissions Measurements above 1000 MHz

Maximum emission levels are measured by setting the analyzer as follows:

RBW = 1 MHz.

VBW  $\geq$  3 MHz.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately  $1/x$ , where  $x$  is the duty cycle. For example, at 50 percent duty cycle, the measurement time will increase by a factor of two relative to measurement time for continuous transmission.

#### ■ Unwanted Average Emissions Measurements above 1000 MHz

Method VB (Averaging using reduced video bandwidth): Alternative method.

RBW = 1 MHz.

Video bandwidth. • If the EUT is configured to transmit with duty cycle  $\geq$  98 percent, set  $VBW \leq RBW/100$  (i.e., 10 kHz) but not less than 10 Hz.

• If the EUT duty cycle is < 98 percent, set  $VBW \geq 1/T$ , where  $T$  is defined in section II.B.1.a).

Video bandwidth mode or display mode • The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).

• As an alternative, the analyzer may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some analyzers require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of 1/x, where x is the duty cycle. For example, use at least 200 traces if the duty cycle is 25 percent. (If a specific emission is demonstrated to be continuous—i.e., 100 percent duty cycle—rather than turning on and off with the transmit cycle, at least 50 traces shall be averaged.)

#### ■ Band edge measurements.

Unwanted band-edge emissions may be measured using either of the special band-edge measurement techniques (the marker-delta or integration methods) described below. Note that the marker-delta method is primarily a radiated measurement technique that requires the 99% occupied bandwidth edge to be within 2 MHz of the authorized band edge, whereas the integration method can be used in either a radiated or conducted measurement without any special requirement with regards to the displacement of the unwanted emission(s) relative to the authorized bandwidth.

Marker-Delta Method.

The marker-delta method, as described in ANSI C63.10, can be used to perform measurements of the radiated unwanted emissions level of emissions provided that the 99% occupied bandwidth of the fundamental is within 2 MHz of the authorized band-edge.

#### 8.4.5 Test Results

|                    |           |
|--------------------|-----------|
| Temperature:       | 22° C     |
| Relative Humidity: | 43%       |
| ATM Pressure:      | 1011 mbar |

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

| Freq.<br>(MHz) | Ant.Pol.<br>H/V | Emission<br>Level(dBuV/m) |    | Limit 3m(dBuV/m) |    | Over(dB) |    |
|----------------|-----------------|---------------------------|----|------------------|----|----------|----|
|                |                 | PK                        | AV | PK               | AV | PK       | AV |
| --             | --              | --                        | -- | --               | -- | --       | -- |

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor =  $40 \log(\text{Specific distance} / \text{test distance})$  (dB);

Limit line = Specific limits(dBuV) + distance extrapolation factor

■ For Undesirable radiated Spurious Emission in U-NII -3

● Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

All the antenna(Antenna 1) and modes(802.11a/n/ac) has been tested and the worst(Antenna 1, 802.11a) result recorded was report as below:

| Test mode:  |          | Frequency:              |               | Channel 149: 5745MHz |          |
|-------------|----------|-------------------------|---------------|----------------------|----------|
| Freq. (MHz) | Ant.Pol. | Field Strength (dBuV/m) | E.I.R.P (dBm) | Limit (dBm)          | Over(dB) |
| 11672.987   | V        | 58.4                    | -36.83        | -27                  | -9.83    |
| 15005.265   | V        | 56.1                    | -39.13        | -27                  | -12.13   |
| 18237.513   | V        | 56.6                    | -38.63        | -27                  | -11.63   |
| 12236.65    | H        | 57.7                    | -37.53        | -27                  | -10.53   |
| 14739.972   | H        | 57.8                    | -37.43        | -27                  | -10.43   |
| 17983.82    | H        | 54.5                    | -40.73        | -27                  | -13.73   |

| Test mode:  |          | Frequency:              |               | Channel 157: 5785MHz |          |
|-------------|----------|-------------------------|---------------|----------------------|----------|
| Freq. (MHz) | Ant.Pol. | Field Strength (dBuV/m) | E.I.R.P (dBm) | Limit (dBm)          | Over(dB) |
| 11494.78    | V        | 60.5                    | -34.73        | -27                  | -7.73    |
| 15134.188   | V        | 57                      | -38.23        | -27                  | -11.23   |
| 17944.883   | V        | 54.1                    | -41.13        | -27                  | -14.13   |
| 12218.83    | H        | 57.1                    | -38.13        | -27                  | -11.13   |
| 15072.989   | H        | 54.7                    | -40.53        | -27                  | -13.53   |
| 17970.972   | H        | 57.3                    | -37.93        | -27                  | -10.93   |

| Test mode:  |          | Frequency:              |               | Channel 165: 5825MHz |          |
|-------------|----------|-------------------------|---------------|----------------------|----------|
| Freq. (MHz) | Ant.Pol. | Field Strength (dBuV/m) | E.I.R.P (dBm) | Limit (dBm)          | Over(dB) |
| 11029.034   | V        | 60.8                    | -34.43        | -27                  | -7.43    |
| 14872.428   | V        | 56.1                    | -39.13        | -27                  | -12.13   |
| 17553.648   | V        | 54.6                    | -40.63        | -27                  | -13.63   |
| 11554.791   | H        | 56.8                    | -38.43        | -27                  | -11.43   |
| 14252.783   | H        | 57                      | -38.23        | -27                  | -11.23   |
| 17544.826   | H        | 56.6                    | -38.63        | -27                  | -11.63   |

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3)  $EIRP[dBm] = E[dBuV/m] + 20 \log(d[meters]) - 104.77$   
 d is the measurement distance in 3 meters

Test mode: 802.11a Frequency: Channel 149: 5745MHz

| Freq.<br>(MHz) | Ant.Pol. | Emission<br>Level(dBuV/m) |       | Limit 3m(dBuV/m) |       | Over(dB) |        |
|----------------|----------|---------------------------|-------|------------------|-------|----------|--------|
|                | H/V      | PK                        | AV    | PK               | AV    | PK       | AV     |
| 9160.65        | V        | 54.34                     | 41.05 | 74.00            | 54.00 | -19.66   | -12.95 |
| 10962.40       | V        | 54.65                     | 42.27 | 74.00            | 54.00 | -19.35   | -11.73 |
| 16538.74       | V        | 54.26                     | 41.31 | 74.00            | 54.00 | -19.74   | -12.69 |
| 9160.04        | H        | 55.34                     | 41.80 | 74.00            | 54.00 | -18.66   | -12.20 |
| 11710.24       | H        | 54.77                     | 41.57 | 74.00            | 54.00 | -19.23   | -12.43 |
| 12424.88       | H        | 55.43                     | 42.46 | 74.00            | 54.00 | -18.57   | -11.54 |

Test mode: 802.11a Frequency: Channel 157: 5785MHz

| Freq.<br>(MHz) | Ant.Pol. | Emission<br>Level(dBuV/m) |       | Limit 3m(dBuV/m) |       | Over(dB) |        |
|----------------|----------|---------------------------|-------|------------------|-------|----------|--------|
|                | H/V      | PK                        | AV    | PK               | AV    | PK       | AV     |
| 8208.63        | V        | 55.01                     | 41.56 | 74.00            | 54.00 | -18.99   | -12.44 |
| 14226.44       | V        | 54.97                     | 42.05 | 74.00            | 54.00 | -19.03   | -11.95 |
| 15858.07       | V        | 55.48                     | 43.02 | 74.00            | 54.00 | -18.52   | -10.98 |
| 8922.70        | H        | 55.87                     | 42.20 | 74.00            | 54.00 | -18.13   | -11.80 |
| 10248.06       | H        | 56.04                     | 42.52 | 74.00            | 54.00 | -17.96   | -11.48 |
| 13580.41       | H        | 56.53                     | 43.39 | 74.00            | 54.00 | -17.47   | -10.61 |

Test mode:: 802.11a Frequency: Channel 165: 5825MHz

| Freq.<br>(MHz) | Ant.Pol. | Emission<br>Level(dBuV/m) |       | Limit 3m(dBuV/m) |       | Over(dB) |        |
|----------------|----------|---------------------------|-------|------------------|-------|----------|--------|
|                | H/V      | PK                        | AV    | PK               | AV    | PK       | AV     |
| 10112.01       | V        | 53.40                     | 40.23 | 74.00            | 54.00 | -20.60   | -13.77 |
| 14702.65       | V        | 54.12                     | 41.37 | 74.00            | 54.00 | -19.88   | -12.63 |
| 15246.09       | V        | 53.81                     | 40.99 | 74.00            | 54.00 | -20.19   | -13.01 |
| 8922.05        | H        | 55.38                     | 42.25 | 74.00            | 54.00 | -18.62   | -11.75 |
| 11132.32       | H        | 55.24                     | 42.50 | 74.00            | 54.00 | -18.76   | -11.50 |
| 16742.19       | H        | 55.55                     | 43.24 | 74.00            | 54.00 | -18.45   | -10.76 |

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
  - (2) Emission Level= Reading Level+Correct Factor.
  - (3) Correct Factor= Ant\_F + Cab\_L - Preamp
  - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

● Undesirable radiated Undesirable radiated Spurious Emission in Band Edge

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

Test mode: 802.11a Frequency: Channel 149: 5745MHz

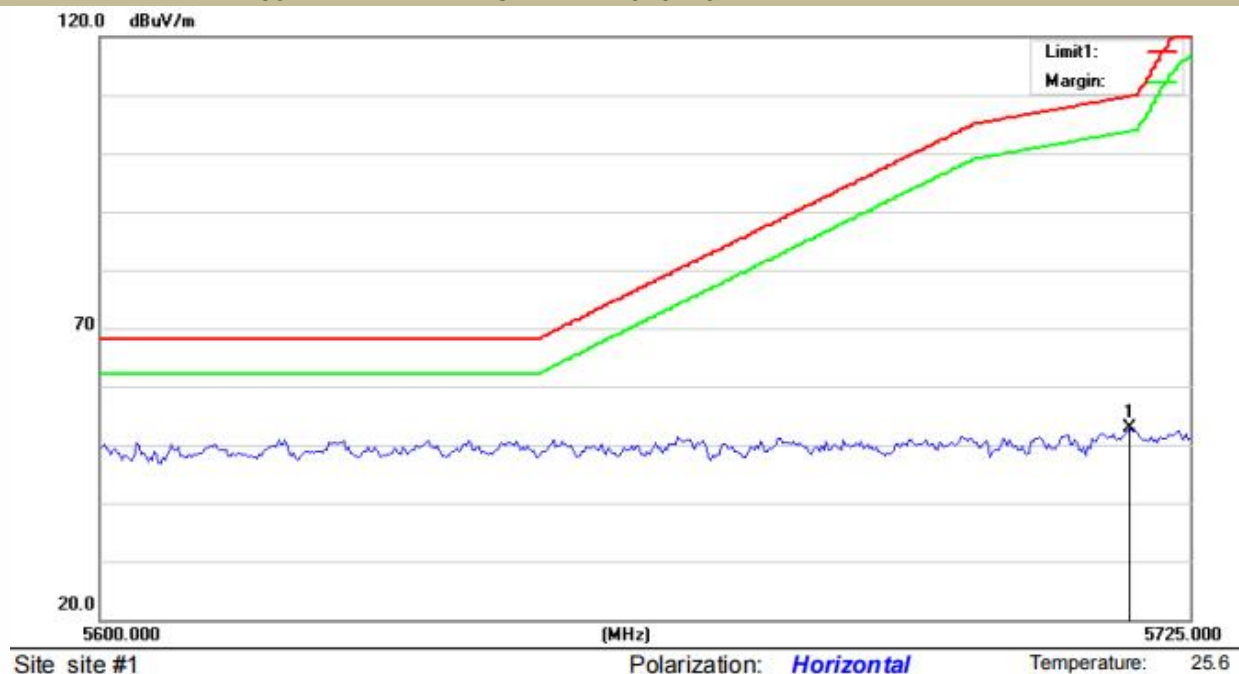
| Freq. (MHz) | Ant.Pol. | Field Strength (RBW=100KHz) (dBuV/m) | E.I.R.P (dBm) | Limit (dBm) | Verdict |
|-------------|----------|--------------------------------------|---------------|-------------|---------|
| 5716.75     | V        | 52.85                                | -42.38        | 109.41      | Pass    |
| 5718        | H        | 52.87                                | -42.36        | 109.74      | Pass    |

Test mode: 802.11a Frequency: Channel 165: 5825MHz

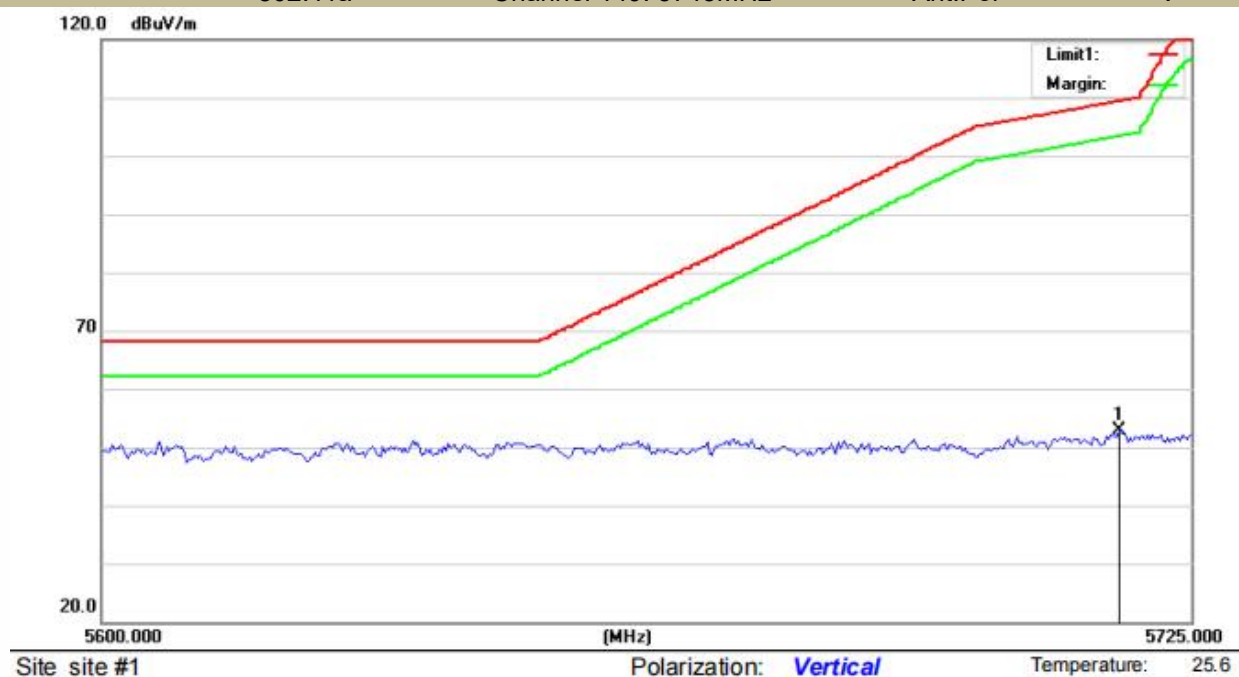
| Freq. (MHz) | Ant.Pol. | Field Strength (RBW=100KHz) (dBuV/m) | E.I.R.P (dBm) | Limit (dBm) | Verdict |
|-------------|----------|--------------------------------------|---------------|-------------|---------|
| 5859.75     | V        | 53.13                                | -42.1         | 108.81      | Pass    |
| 5868.75     | H        | 52.43                                | -42.8         | 106.56      | Pass    |

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).  
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss.  
 (3) EIRP[dBm] = E[dBuV/m] + 20 log(d[meters]) - 104.77  
 d is the measurement distance in 3 meters

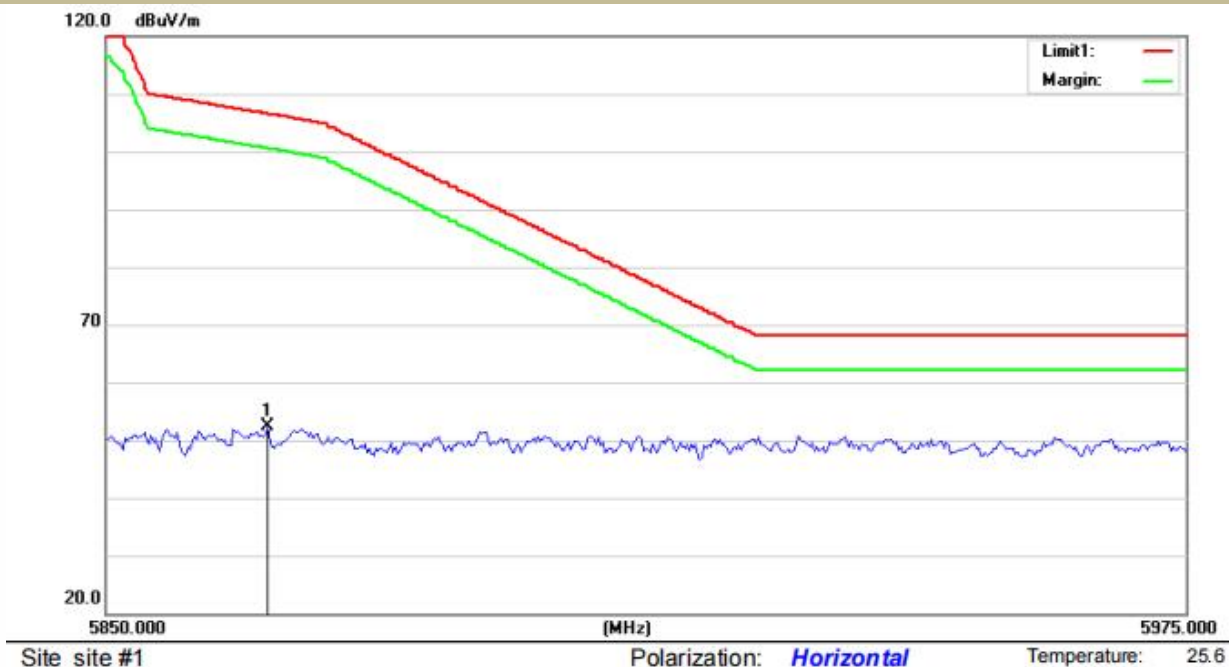
|            |                      |                      |                                |   |
|------------|----------------------|----------------------|--------------------------------|---|
| U-NII -3   |                      |                      |                                |   |
| Test Model | Undesirable radiated | Undesirable radiated | Spurious Emission in Band Edge |   |
|            | 802.11a              | Channel 149: 5745MHz | Ant.Pol                        | H |



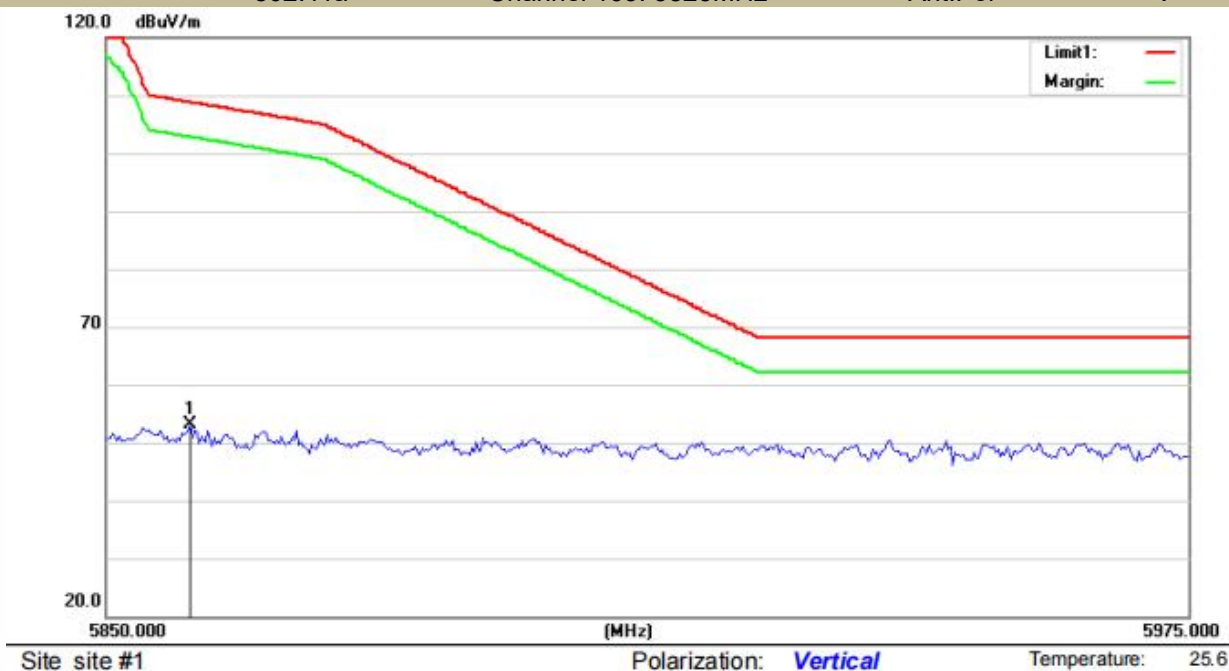
|            |                      |                      |                                |   |
|------------|----------------------|----------------------|--------------------------------|---|
| U-NII -3   |                      |                      |                                |   |
| Test Model | Undesirable radiated | Undesirable radiated | Spurious Emission in Band Edge |   |
|            | 802.11a              | Channel 149: 5745MHz | Ant.Pol                        | V |



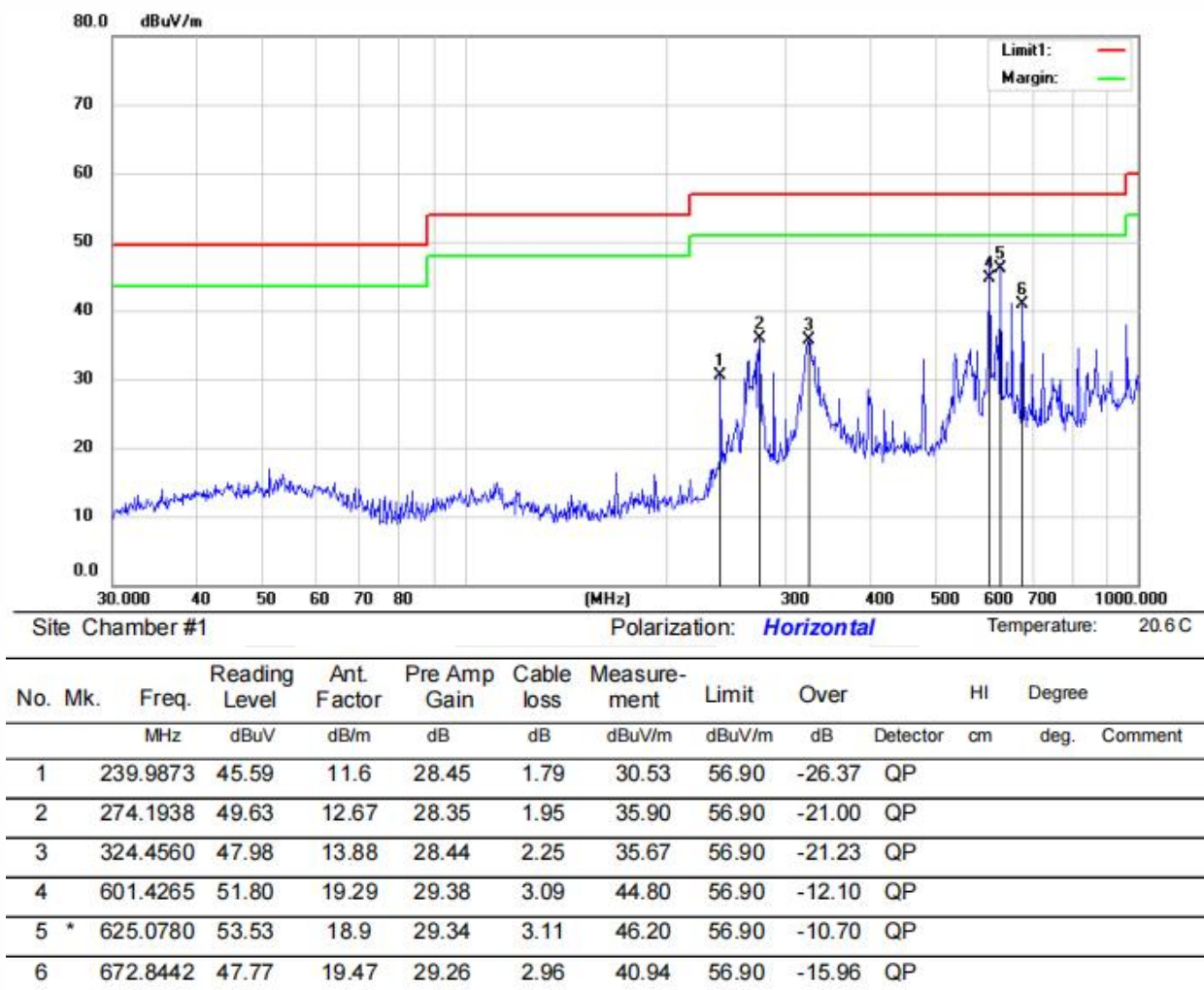
U-NII -3  
 Test Model Undesirable radiated Undesirable radiated Spurious Emission in Band Edge  
 802.11a Channel 165: 5825MHz Ant.Pol H



U-NII -3  
 Test Model Undesirable radiated Undesirable radiated Spurious Emission in Band Edge  
 802.11a Channel 165: 5825MHz Ant.Pol V

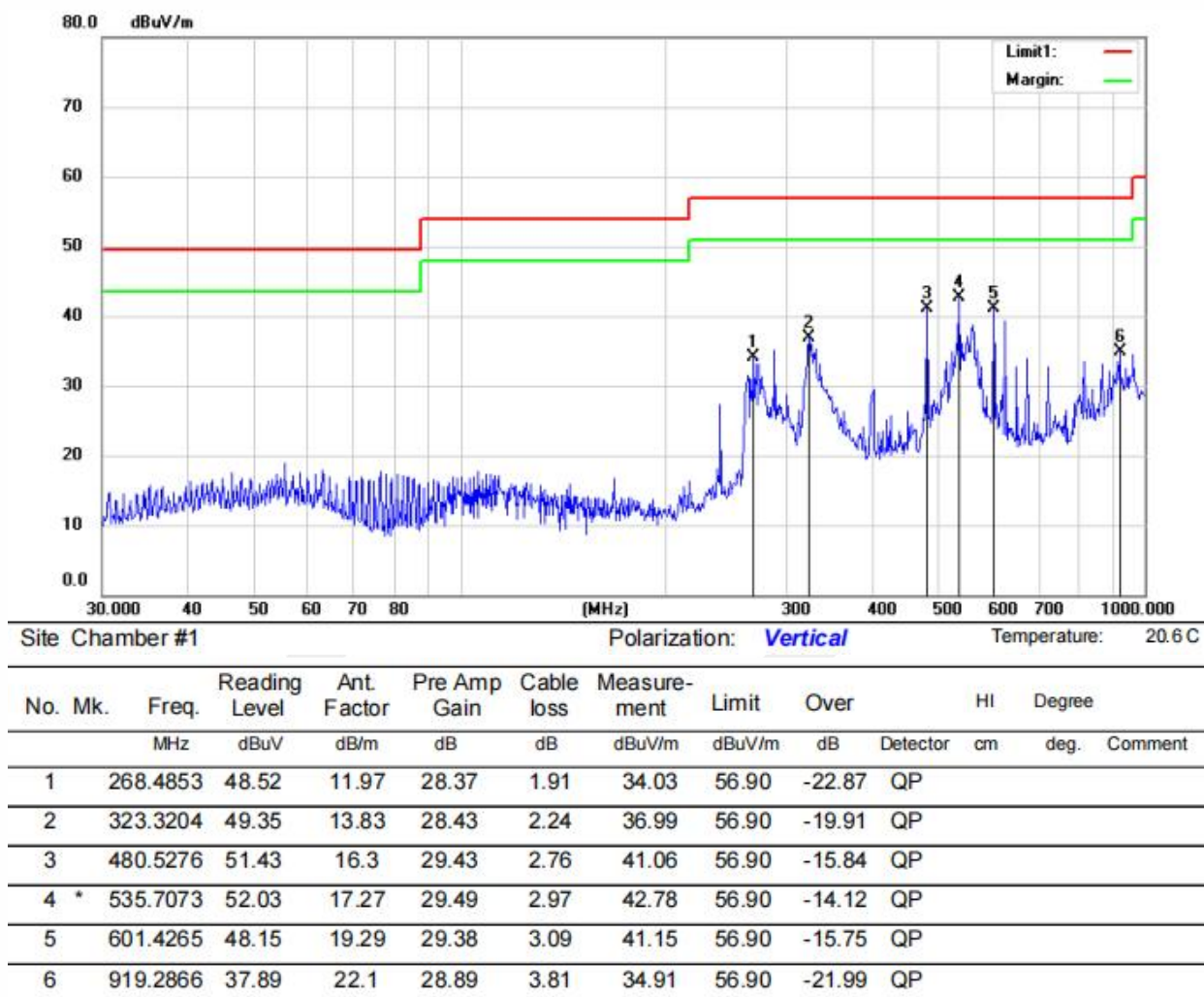


- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)  
All the antenna(Antenna 1 ) and modes(802.11a/n/ac) has been tested and the worst(Antenna 1 , 802.11a) result recorded was report as below:



\*:Maximum data x:Over limit !:over margin

Operator:



\*:Maximum data x:Over limit !:over margin

Operator:

## 8.5 POWER LINE CONDUCTED EMISSIONS

### 8.5.1 Applicable Standard

According to FCC Part 15.207(a)

According to IC RSS-Gen 8.8

### 8.5.2 Conformance Limit

| Frequency<br>(MHz)                                               | Limit (dB $\mu$ V) |               |
|------------------------------------------------------------------|--------------------|---------------|
|                                                                  | Quasi-peak Level   | Average Level |
| 0.15 ~ 0.50                                                      | 79                 | 66            |
| 0.50 ~ 30.00                                                     | 73                 | 60            |
| NOTE1-The lower limit shall apply at the transition frequencies. |                    |               |

### 8.5.3 Test Configuration

Test according to clause 6.3 conducted emission test setup

### 8.5.4 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.

### 8.5.5 Test Results

Pass

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



Site site #1

Phase: L1

Temperature: 22

| No. | Mk. | Freq.  | Reading | Correct | Measure- | Limit | Over   |          |         |
|-----|-----|--------|---------|---------|----------|-------|--------|----------|---------|
|     |     | MHz    | Level   | Factor  | ment     |       |        | Detector | Comment |
|     |     |        | dBuV    | dB      | dBuV     | dBuV  | dB     |          |         |
| 1   |     | 0.2300 | 21.40   | 18.22   | 39.62    | 79.00 | -39.38 | QP       |         |
| 2   |     | 0.2300 | 8.79    | 18.22   | 27.01    | 66.00 | -38.99 | AVG      |         |
| 3   |     | 0.7020 | 25.36   | 17.56   | 42.92    | 73.00 | -30.08 | QP       |         |
| 4   | *   | 0.7020 | 14.60   | 17.56   | 32.16    | 60.00 | -27.84 | AVG      |         |
| 5   |     | 1.2740 | 18.48   | 17.58   | 36.06    | 73.00 | -36.94 | QP       |         |
| 6   |     | 1.2740 | 8.53    | 17.58   | 26.11    | 60.00 | -33.89 | AVG      |         |
| 7   |     | 2.2580 | 18.86   | 17.63   | 36.49    | 73.00 | -36.51 | QP       |         |
| 8   |     | 2.2580 | 10.71   | 17.63   | 28.34    | 60.00 | -31.66 | AVG      |         |
| 9   |     | 5.2700 | 17.28   | 17.75   | 35.03    | 73.00 | -37.97 | QP       |         |
| 10  |     | 5.2700 | 12.35   | 17.75   | 30.10    | 60.00 | -29.90 | AVG      |         |
| 11  |     | 8.2980 | 16.73   | 17.76   | 34.49    | 73.00 | -38.51 | QP       |         |
| 12  |     | 8.2980 | 12.47   | 17.76   | 30.23    | 60.00 | -29.77 | AVG      |         |

\*:Maximum data

x:Over limit

!:over margin

Comment: Factor build in receiver.

Operator:



| 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   |     | 0.2140       | 23.28                    | 18.26                   | 41.54                    | 79.00         | -37.46     | QP       |         |
| 2   |     | 0.2140       | 8.38                     | 18.26                   | 26.64                    | 66.00         | -39.36     | AVG      |         |
| 3   | *   | 0.7060       | 23.28                    | 17.56                   | 40.84                    | 73.00         | -32.16     | QP       |         |
| 4   |     | 0.7060       | 9.15                     | 17.56                   | 26.71                    | 60.00         | -33.29     | AVG      |         |
| 5   |     | 1.3500       | 15.77                    | 17.59                   | 33.36                    | 73.00         | -39.64     | QP       |         |
| 6   |     | 1.3500       | 2.52                     | 17.59                   | 20.11                    | 60.00         | -39.89     | AVG      |         |
| 7   |     | 2.1540       | 16.41                    | 17.62                   | 34.03                    | 73.00         | -38.97     | QP       |         |
| 8   |     | 2.1540       | 2.63                     | 17.62                   | 20.25                    | 60.00         | -39.75     | AVG      |         |
| 9   |     | 3.7580       | 16.37                    | 17.69                   | 34.06                    | 73.00         | -38.94     | QP       |         |
| 10  |     | 3.7580       | 7.95                     | 17.69                   | 25.64                    | 60.00         | -34.36     | AVG      |         |
| 11  |     | 6.7660       | 14.79                    | 17.76                   | 32.55                    | 73.00         | -40.45     | QP       |         |
| 12  |     | 6.7660       | 9.09                     | 17.76                   | 26.85                    | 60.00         | -33.15     | AVG      |         |

\*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator:

## 8.6 ANTENNA APPLICATION

### 8.6.1 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 15.407(a) | 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. |

### 8.6.2 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.

## Detail of factor for radiated emission

| Frequency(MHz) | Ant_F(dB) | Cab_L(dB) | Preamp(dB) | Correct Factor(dB) |
|----------------|-----------|-----------|------------|--------------------|
| 0.009          | 20.6      | 0.03      | \          | 20.63              |
| 0.15           | 20.7      | 0.1       | \          | 20.8               |
| 1              | 20.9      | 0.15      | \          | 21.05              |
| 10             | 20.1      | 0.28      | \          | 20.38              |
| 30             | 18.8      | 0.45      | \          | 19.25              |
| 30             | 11.7      | 0.62      | 27.9       | -15.58             |
| 100            | 12.5      | 1.02      | 27.8       | -14.28             |
| 300            | 12.9      | 1.91      | 27.5       | -12.69             |
| 600            | 19.2      | 2.92      | 27         | -4.88              |
| 800            | 21.1      | 3.54      | 26.6       | -1.96              |
| 1000           | 22.3      | 4.17      | 26.2       | 0.27               |
| 1000           | 25.6      | 1.76      | 41.4       | -14.04             |
| 3000           | 28.9      | 3.27      | 43.2       | -11.03             |
| 5000           | 31.1      | 4.2       | 44.6       | -9.3               |
| 8000           | 36.2      | 5.95      | 44.7       | -2.55              |
| 10000          | 38.4      | 6.3       | 43.9       | 0.8                |
| 12000          | 38.5      | 7.14      | 42.3       | 3.34               |
| 15000          | 40.2      | 8.15      | 41.4       | 6.95               |
| 18000          | 45.4      | 9.02      | 41.3       | 13.12              |
| 18000          | 37.9      | 1.81      | 47.9       | -8.19              |
| 21000          | 37.9      | 1.95      | 48.7       | -8.85              |
| 25000          | 39.3      | 2.01      | 42.8       | -1.49              |
| 28000          | 39.6      | 2.16      | 46.0       | -4.24              |
| 31000          | 41.2      | 2.24      | 44.5       | -1.06              |
| 34000          | 41.5      | 2.29      | 46.6       | -2.81              |
| 37000          | 43.8      | 2.30      | 46.4       | -0.3               |
| 40000          | 43.2      | 2.50      | 42.2       | 3.5                |

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