

## TEST REPORT

### 6 Emission outside the frequency band

Test result: PASS

#### 6.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 30 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

#### 6.2 Measurement Procedure

The EUT was tested according to Subclause 11.11 of ANSI C63.10.

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

##### Emission level measurement

- Set the center frequency and span to encompass frequency range to be measured.
- Set the RBW = 100 kHz.
- Set the VBW  $\geq 3 \times$  RBW.
- 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 specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

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### 6.3 Test Configuration

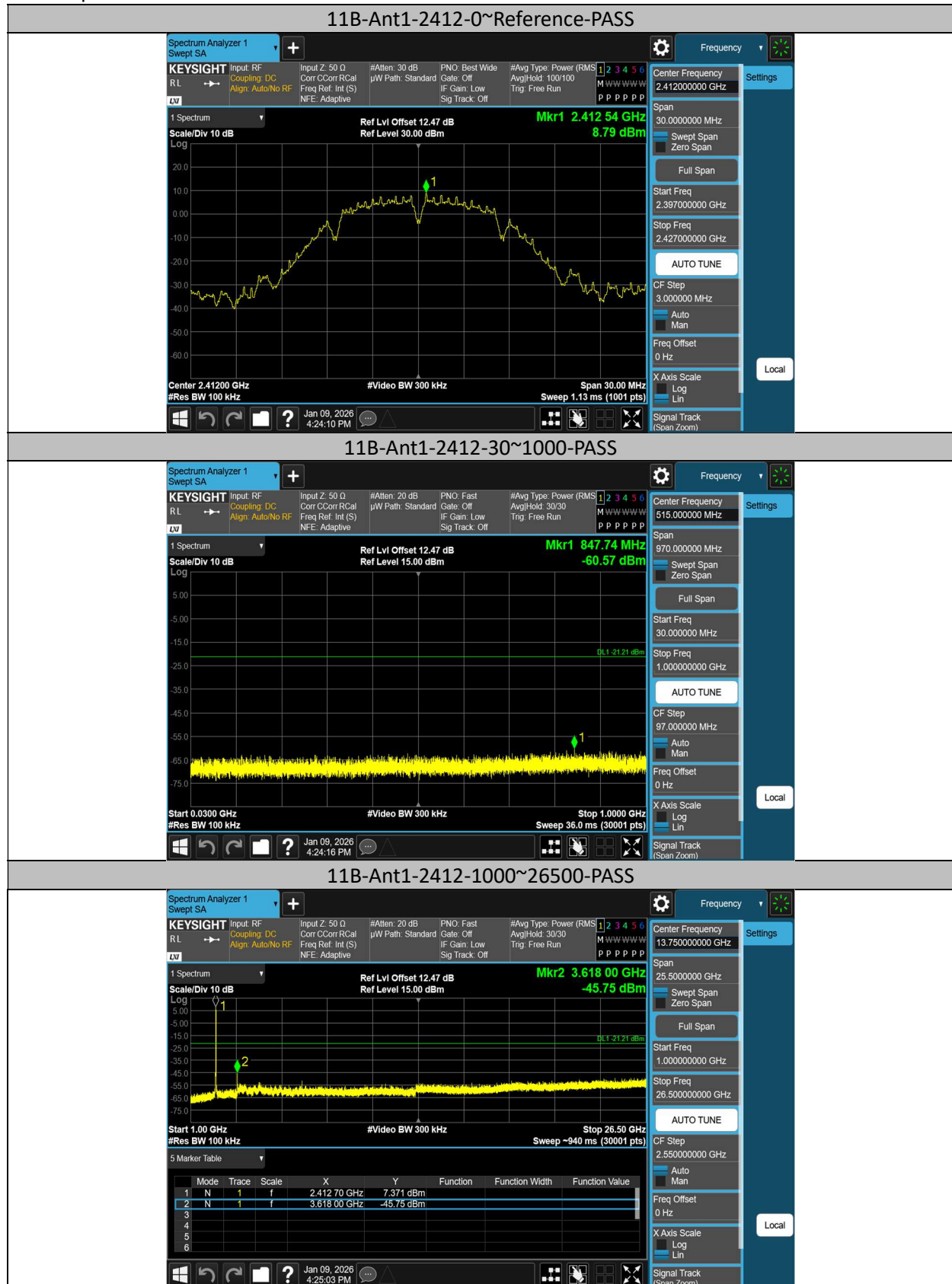


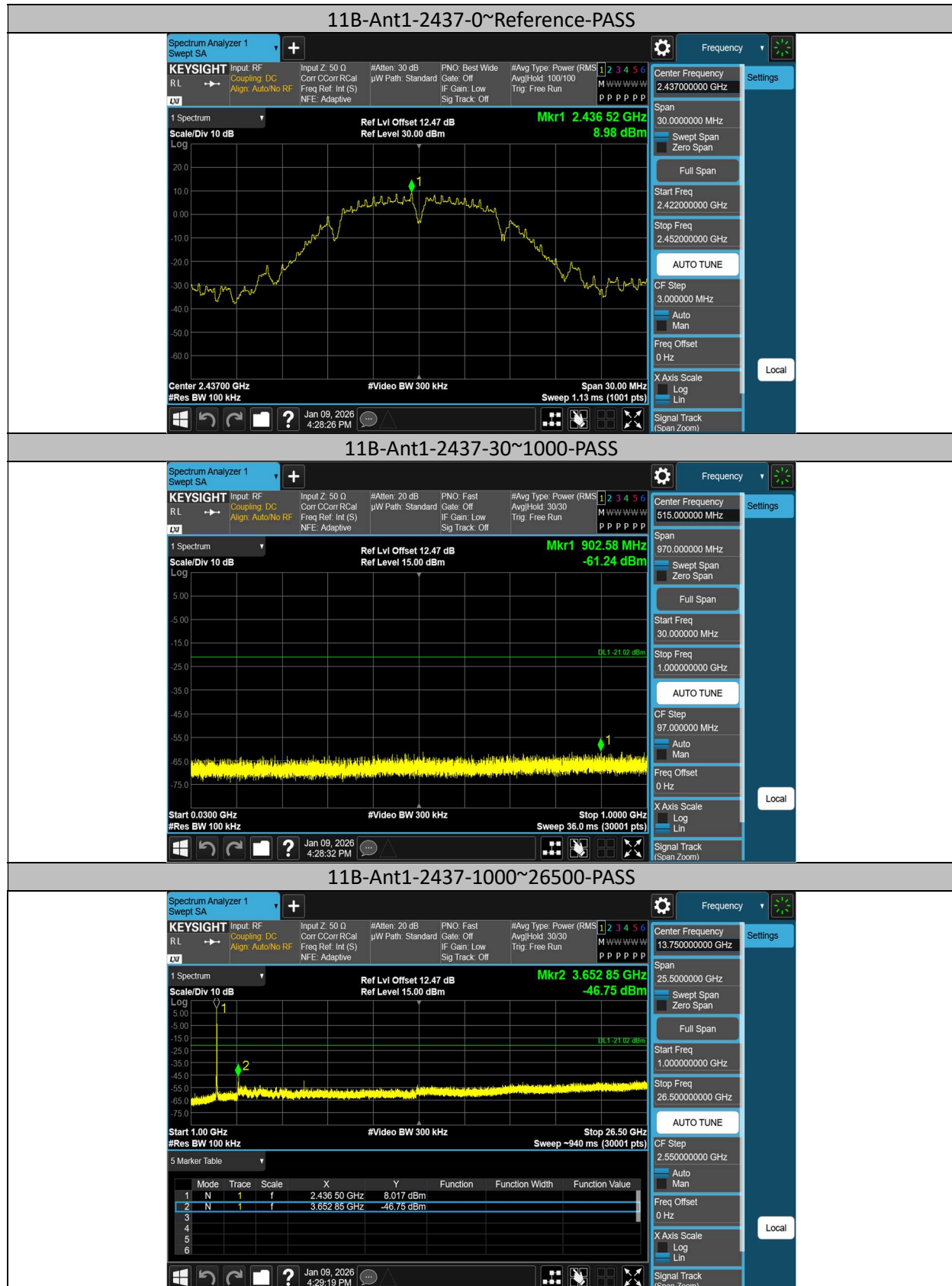
### 6.4 The results of Emission outside the frequency band

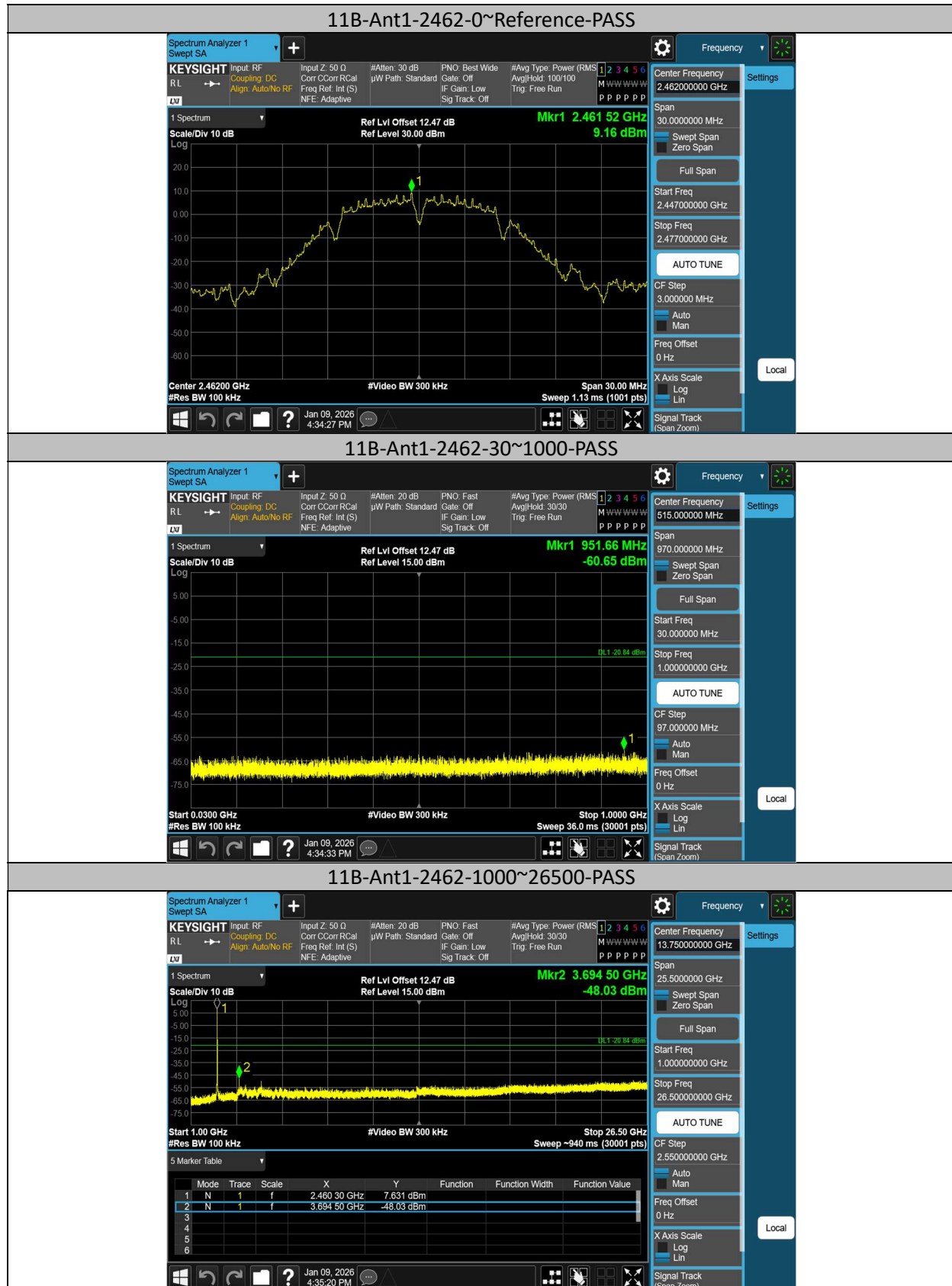
| TestMode | Antenna | Frequency[MHz] | FreqRange [Mhz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|----------|---------|----------------|-----------------|----------------|--------------|-------------|---------|
| 11B      | Ant1    | 2412           | 0~Reference     | 8.79           | 8.79         | ---         | PASS    |
| 11B      | Ant1    | 2412           | 30~1000         | 8.79           | -60.57       | ≤-21.21     | PASS    |
| 11B      | Ant1    | 2412           | 1000~26500      | 8.79           | -45.75       | ≤-21.21     | PASS    |
| 11B      | Ant1    | 2437           | 0~Reference     | 8.98           | 8.98         | ---         | PASS    |
| 11B      | Ant1    | 2437           | 30~1000         | 8.98           | -61.24       | ≤-21.02     | PASS    |
| 11B      | Ant1    | 2437           | 1000~26500      | 8.98           | -46.75       | ≤-21.02     | PASS    |
| 11B      | Ant1    | 2462           | 0~Reference     | 9.16           | 9.16         | ---         | PASS    |
| 11B      | Ant1    | 2462           | 30~1000         | 9.16           | -60.65       | ≤-20.84     | PASS    |
| 11B      | Ant1    | 2462           | 1000~26500      | 9.16           | -48.03       | ≤-20.84     | PASS    |
| 11G      | Ant1    | 2412           | 0~Reference     | 3.75           | 3.75         | ---         | PASS    |
| 11G      | Ant1    | 2412           | 30~1000         | 3.75           | -60.18       | ≤-26.25     | PASS    |
| 11G      | Ant1    | 2412           | 1000~26500      | 3.75           | -48.46       | ≤-26.25     | PASS    |
| 11G      | Ant1    | 2437           | 0~Reference     | 5.34           | 5.34         | ---         | PASS    |
| 11G      | Ant1    | 2437           | 30~1000         | 5.34           | -60.54       | ≤-24.66     | PASS    |
| 11G      | Ant1    | 2437           | 1000~26500      | 5.34           | -47.42       | ≤-24.66     | PASS    |
| 11G      | Ant1    | 2462           | 0~Reference     | 5.92           | 5.92         | ---         | PASS    |
| 11G      | Ant1    | 2462           | 30~1000         | 5.92           | -60.75       | ≤-24.08     | PASS    |
| 11G      | Ant1    | 2462           | 1000~26500      | 5.92           | -48.66       | ≤-24.08     | PASS    |
| 11N20    | Ant1    | 2412           | 0~Reference     | 3.01           | 3.01         | ---         | PASS    |
| 11N20    | Ant1    | 2412           | 30~1000         | 3.01           | -60.96       | ≤-26.99     | PASS    |
| 11N20    | Ant1    | 2412           | 1000~26500      | 3.01           | -47.22       | ≤-26.99     | PASS    |
| 11N20    | Ant1    | 2437           | 0~Reference     | 5.17           | 5.17         | ---         | PASS    |
| 11N20    | Ant1    | 2437           | 30~1000         | 5.17           | -61.29       | ≤-24.83     | PASS    |
| 11N20    | Ant1    | 2437           | 1000~26500      | 5.17           | -49.13       | ≤-24.83     | PASS    |
| 11N20    | Ant1    | 2462           | 0~Reference     | 4.92           | 4.92         | ---         | PASS    |
| 11N20    | Ant1    | 2462           | 30~1000         | 4.92           | -60.29       | ≤-25.08     | PASS    |
| 11N20    | Ant1    | 2462           | 1000~26500      | 4.92           | -49.25       | ≤-25.08     | PASS    |
| 11N40    | Ant1    | 2422           | 0~Reference     | 2.07           | 2.07         | ---         | PASS    |
| 11N40    | Ant1    | 2422           | 30~1000         | 2.07           | -61.17       | ≤-27.93     | PASS    |
| 11N40    | Ant1    | 2422           | 1000~26500      | 2.07           | -48.66       | ≤-27.93     | PASS    |
| 11N40    | Ant1    | 2437           | 0~Reference     | 2.26           | 2.26         | ---         | PASS    |
| 11N40    | Ant1    | 2437           | 30~1000         | 2.26           | -61.09       | ≤-27.74     | PASS    |
| 11N40    | Ant1    | 2437           | 1000~26500      | 2.26           | -49.18       | ≤-27.74     | PASS    |
| 11N40    | Ant1    | 2452           | 0~Reference     | 2.48           | 2.48         | ---         | PASS    |
| 11N40    | Ant1    | 2452           | 30~1000         | 2.48           | -61.17       | ≤-27.52     | PASS    |
| 11N40    | Ant1    | 2452           | 1000~26500      | 2.48           | -49.61       | ≤-27.52     | PASS    |

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## Test Graphs

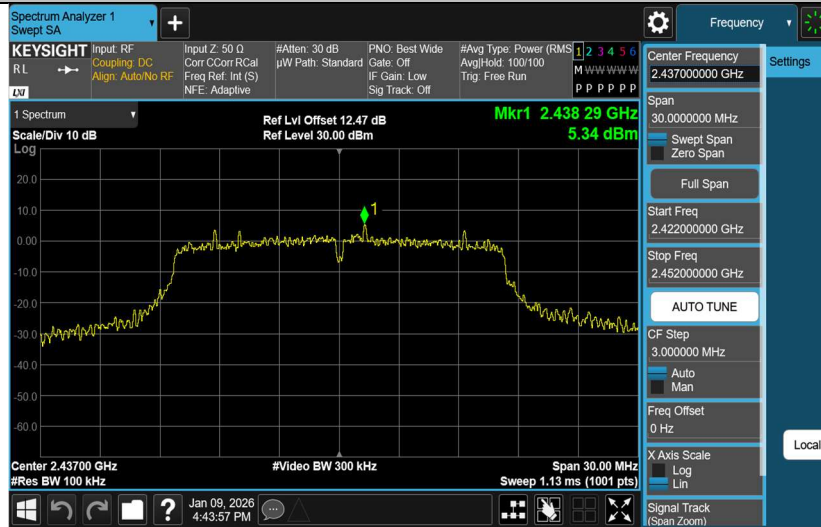




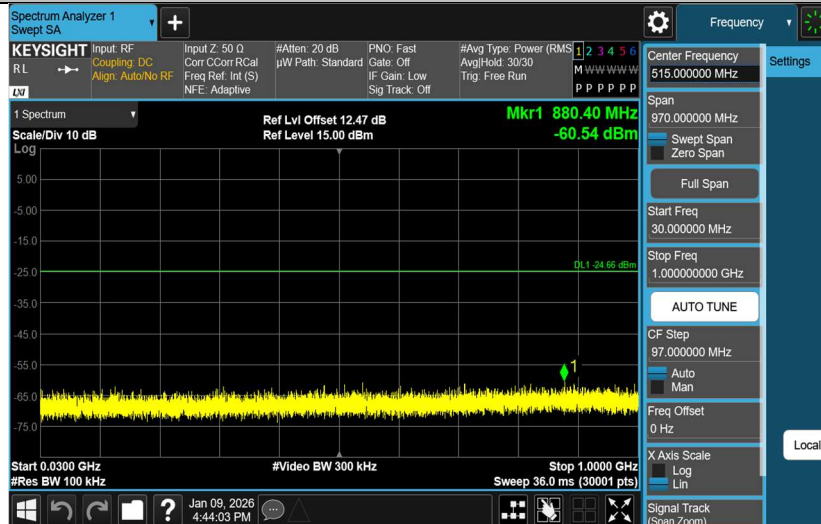




### 11G-Ant1-2437-0~Reference-PASS



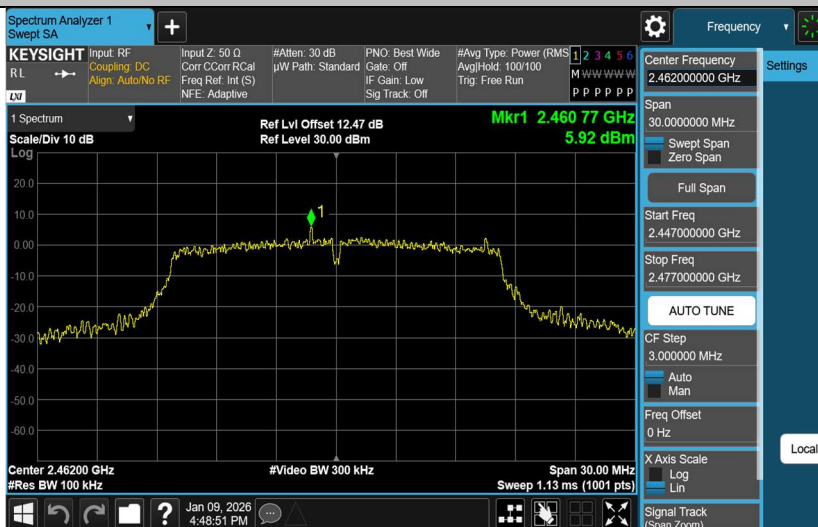
### 11G-Ant1-2437-30~1000-PASS



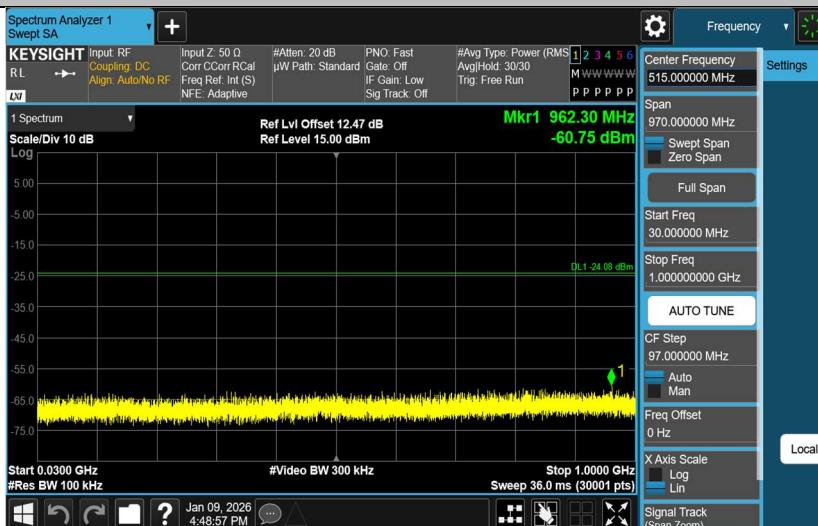
### 11G-Ant1-2437-1000~26500-PASS



### 11G-Ant1-2462-0~Reference-PASS



### 11G-Ant1-2462-30~1000-PASS



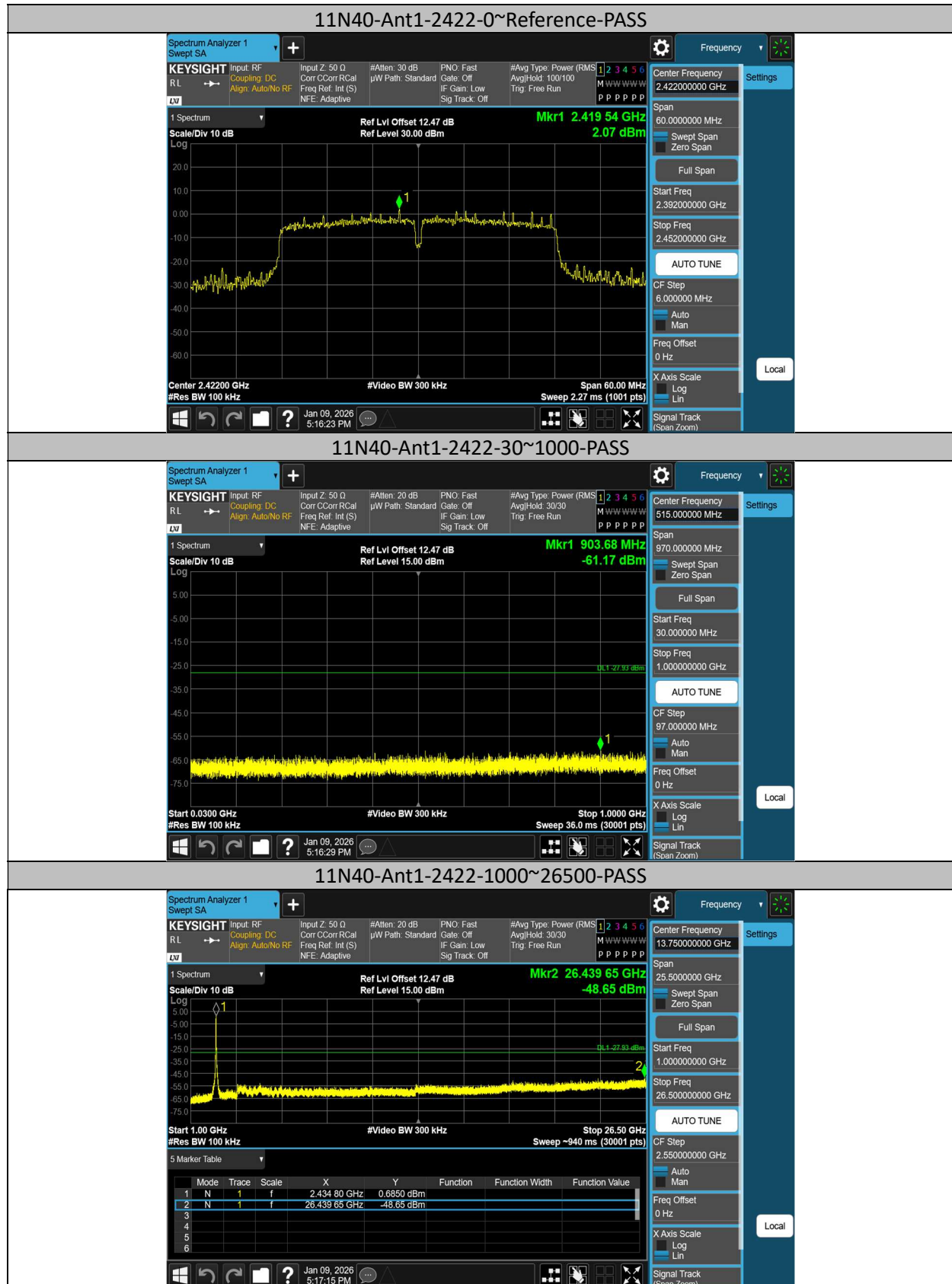
### 11G-Ant1-2462-1000~26500-PASS





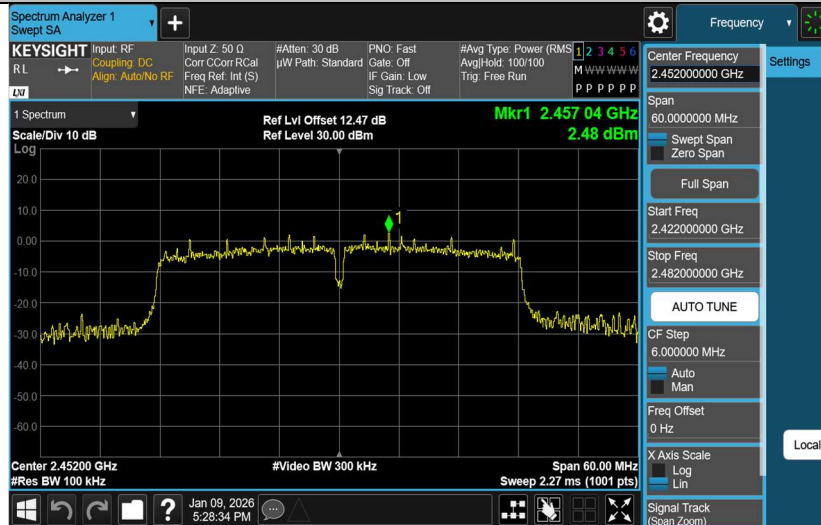




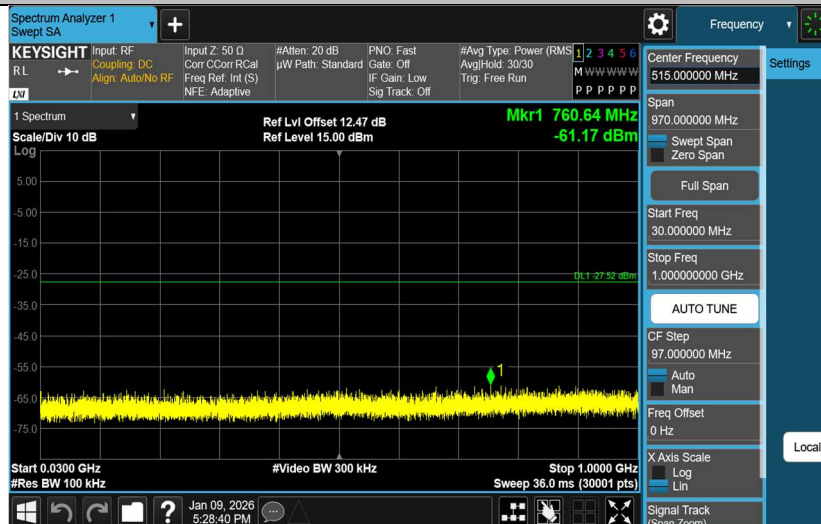




### 11N40-Ant1-2452-0~Reference-PASS



### 11N40-Ant1-2452-30~1000-PASS



### 11N40-Ant1-2452-1000~26500-PASS



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### 7 Radiated Emissions in restricted frequency bands

**Test result: PASS**

#### 7.1 Limit

The radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified showed as below:

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009 ~ 0.490     | 2400/F(kHz)                       | 300                           |
| 0.490 ~ 1.705     | 24000/F(kHz)                      | 30                            |
| 1.705 ~ 30.0      | 30                                | 30                            |
| 30 ~ 88           | 100                               | 3                             |
| 88 ~ 216          | 150                               | 3                             |
| 216 ~ 960         | 200                               | 3                             |
| Above 960         | 500                               | 3                             |

#### 7.2 Measurement Procedure

The EUT was tested according to Subclause 11.12 of ANSI C63.10.

##### For Radiated emission below 30MHz:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. For the floor-standing devices, the EUT was placed on the top of a rotating table 0.1 meters above the ground at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Both X and Y axes of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

##### NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

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### For Radiated emission above 30MHz:

- a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room. For the floor-standing devices, the EUT was placed on the top of a rotating table 0.1 meters above the ground at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detector function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

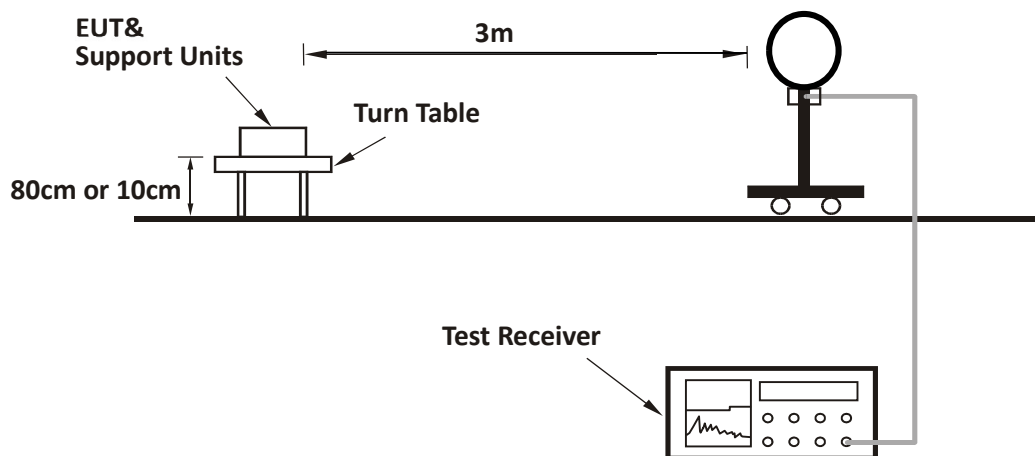
### Note:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle  $< 98\%$ ) or  $3 \times \text{RBW}$  (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions were reported.

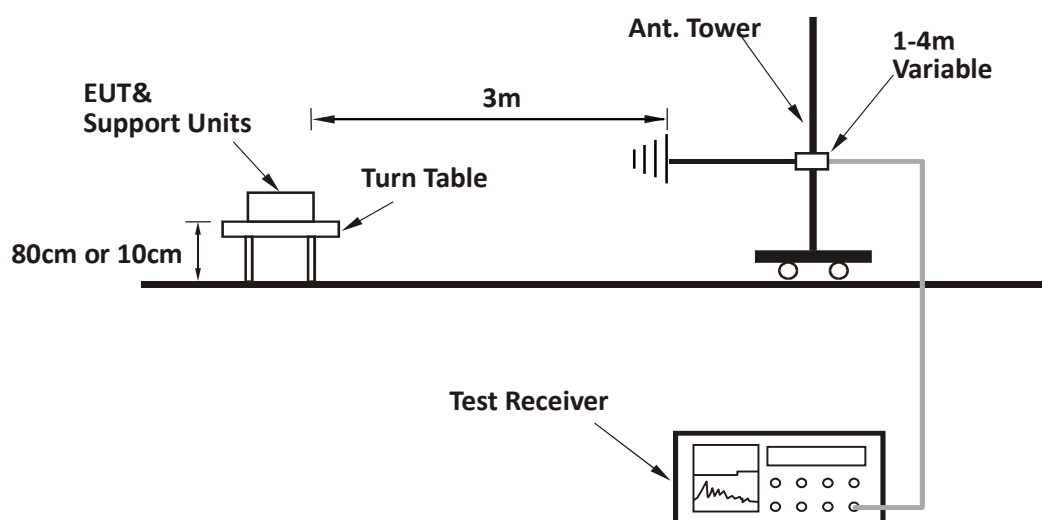
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### 7.3 Test Configuration

For Radiated emission below 30MHz:

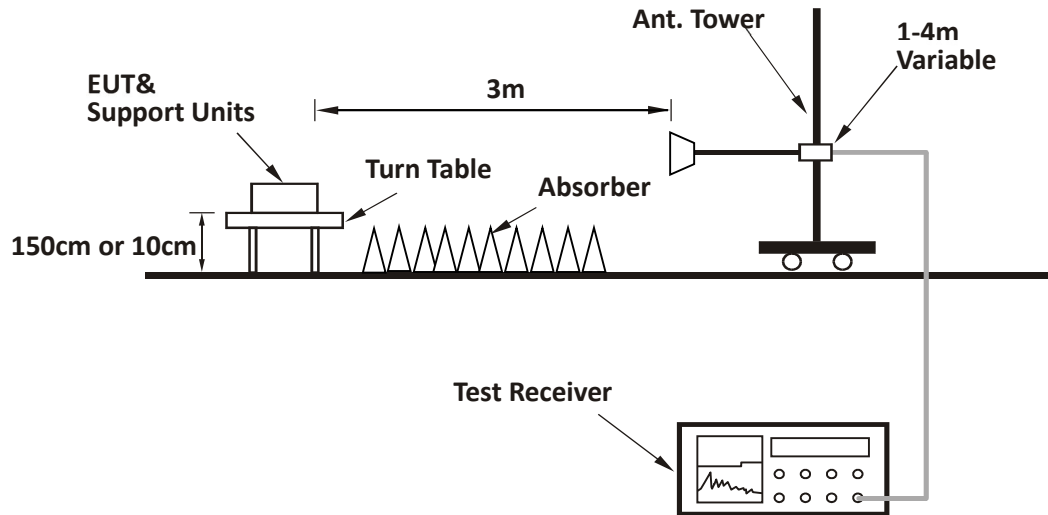


For Radiated emission 30MHz to 1GHz:



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**For Radiated emission above 1GHz:**

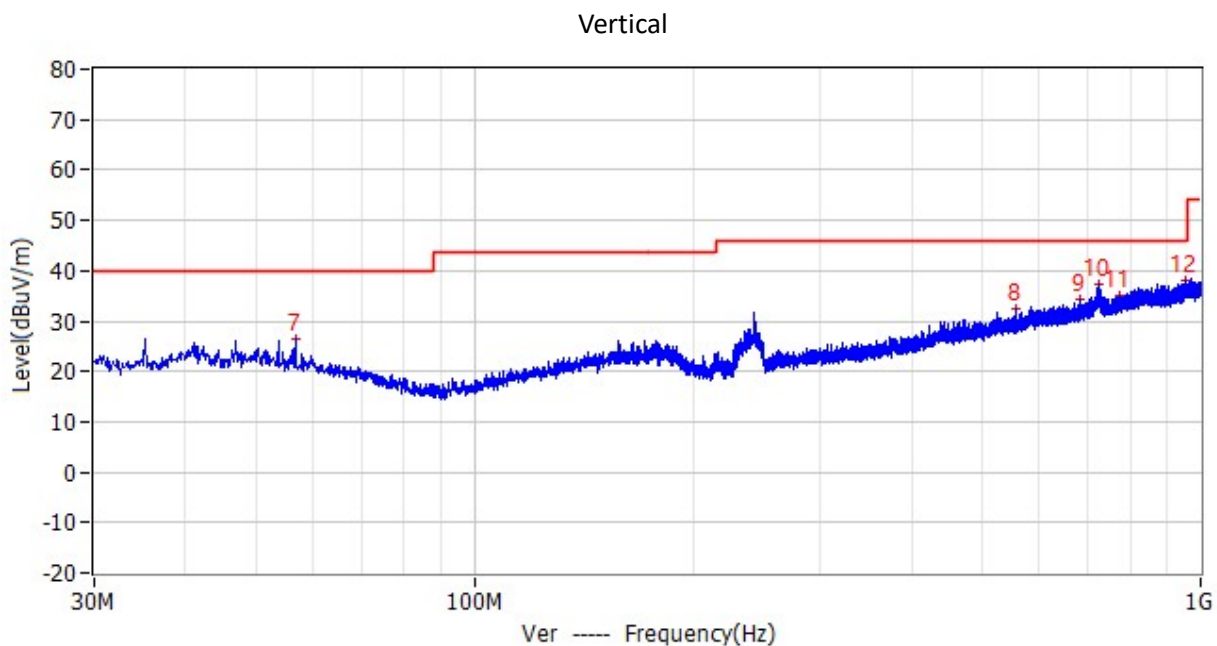
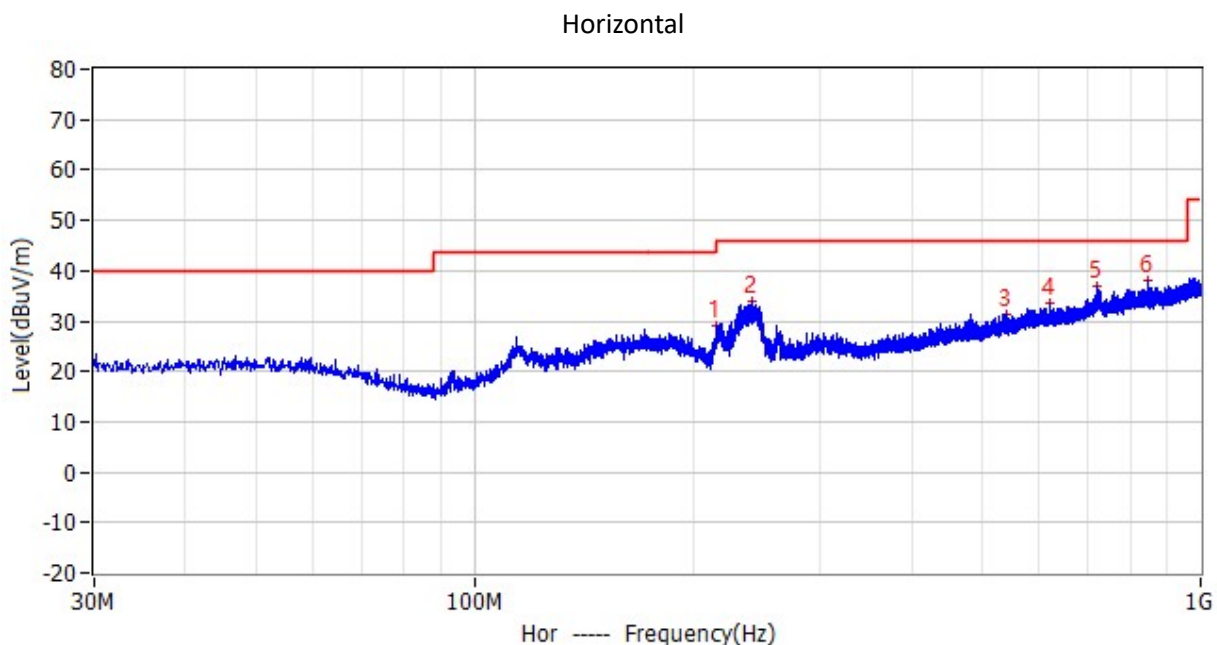


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### 7.4 Test Results of Radiated Emissions

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

The worst waveform from 30MHz to 1000MHz is listed as below:



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### Test data below 1GHz

| Antenna | Frequency (MHz) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|---------|-----------------|----------------------------|----------------|-------------|----------|
| H       | 215.561         | 29.09                      | 43.50          | 14.41       | QP       |
| H       | 240.684         | 33.82                      | 46.00          | 12.18       | QP       |
| H       | 541.190         | 31.47                      | 46.00          | 14.53       | QP       |
| H       | 621.021         | 33.59                      | 46.00          | 12.41       | QP       |
| H       | 719.379         | 36.79                      | 46.00          | 9.21        | QP       |
| H       | 843.733         | 38.05                      | 46.00          | 7.95        | QP       |
| V       | 56.772          | 26.32                      | 40.00          | 13.68       | QP       |
| V       | 555.546         | 32.54                      | 46.00          | 13.46       | QP       |
| V       | 682.616         | 34.16                      | 46.00          | 11.84       | QP       |
| V       | 724.714         | 37.16                      | 46.00          | 8.84        | QP       |
| V       | 774.281         | 34.99                      | 46.00          | 11.01       | QP       |
| V       | 955.671         | 38.04                      | 46.00          | 7.96        | QP       |

### Test result above 1GHz:

The emission was conducted from 1GHz to 25GHz  
802.11b

| CH | Antenna | Frequency (MHz) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector |
|----|---------|-----------------|----------------------------|----------------|-------------|----------|
| L  | H       | 2390            | 35.60                      | 74.00          | 38.40       | PK       |
|    | H       | 3618            | 47.19                      | 74.00          | 26.81       | PK       |
|    | H       | 7236            | 50.40                      | 74.00          | 23.60       | PK       |
|    | V       | 2390            | 34.90                      | 74.00          | 39.10       | PK       |
|    | V       | 7236            | 50.75                      | 74.00          | 23.25       | PK       |
| M  | H       | 7311            | 51.63                      | 74.00          | 22.37       | PK       |
|    | V       | 7311            | 52.08                      | 74.00          | 21.92       | PK       |
| H  | H       | 2483.5          | 34.80                      | 74.00          | 39.20       | PK       |
|    | H       | 7386            | 49.26                      | 74.00          | 24.74       | PK       |
|    | V       | 2483.5          | 35.70                      | 74.00          | 38.30       | PK       |
|    | V       | 7386            | 50.40                      | 74.00          | 23.60       | PK       |