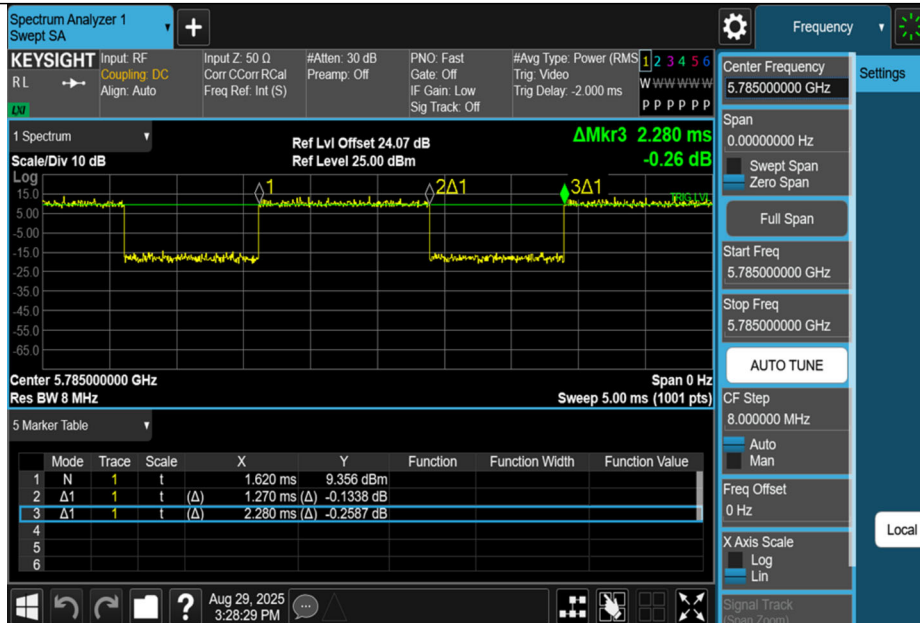
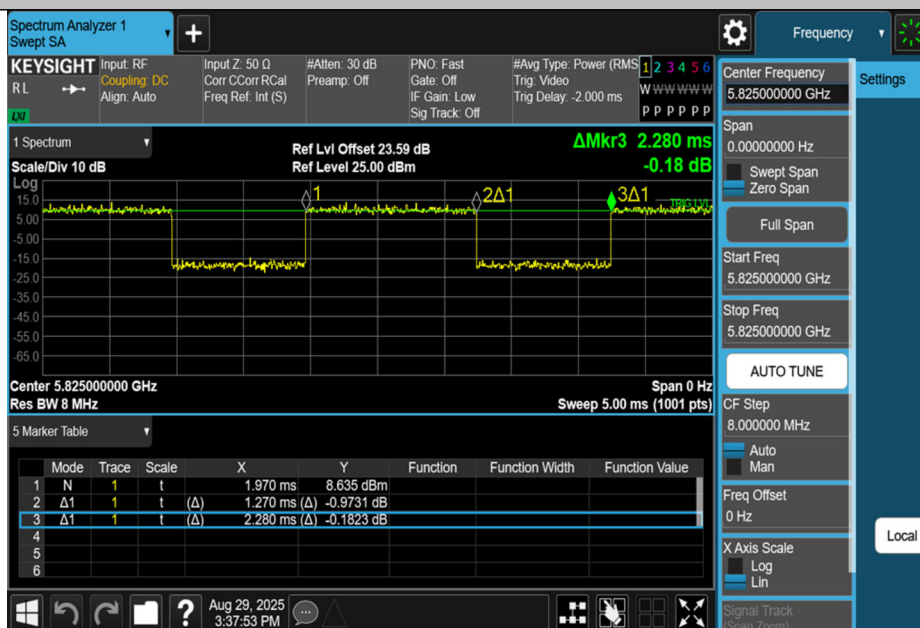
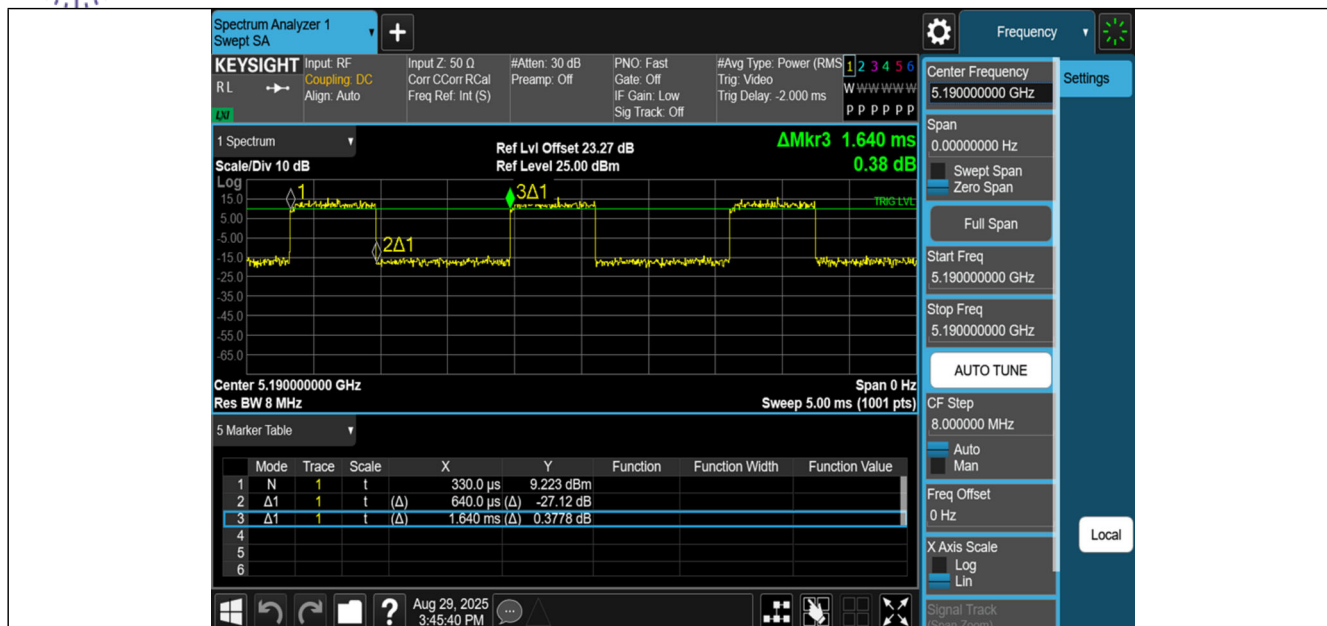




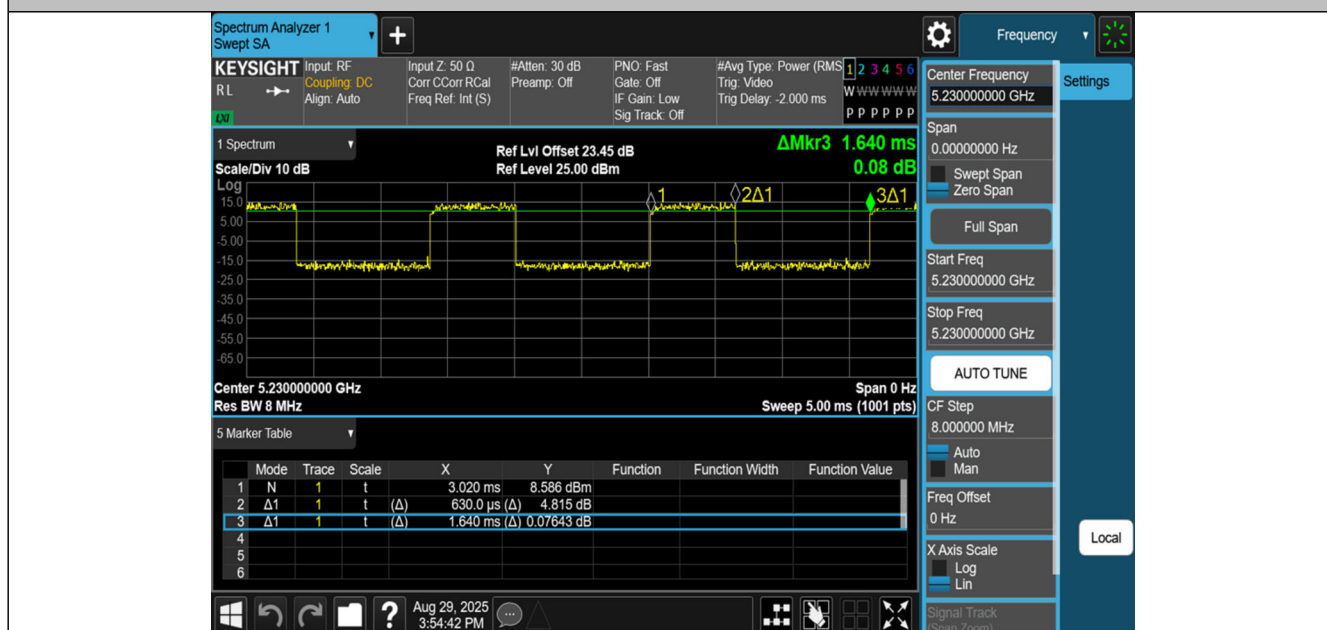
NTNV-11AC20SISO-Ant1-5785



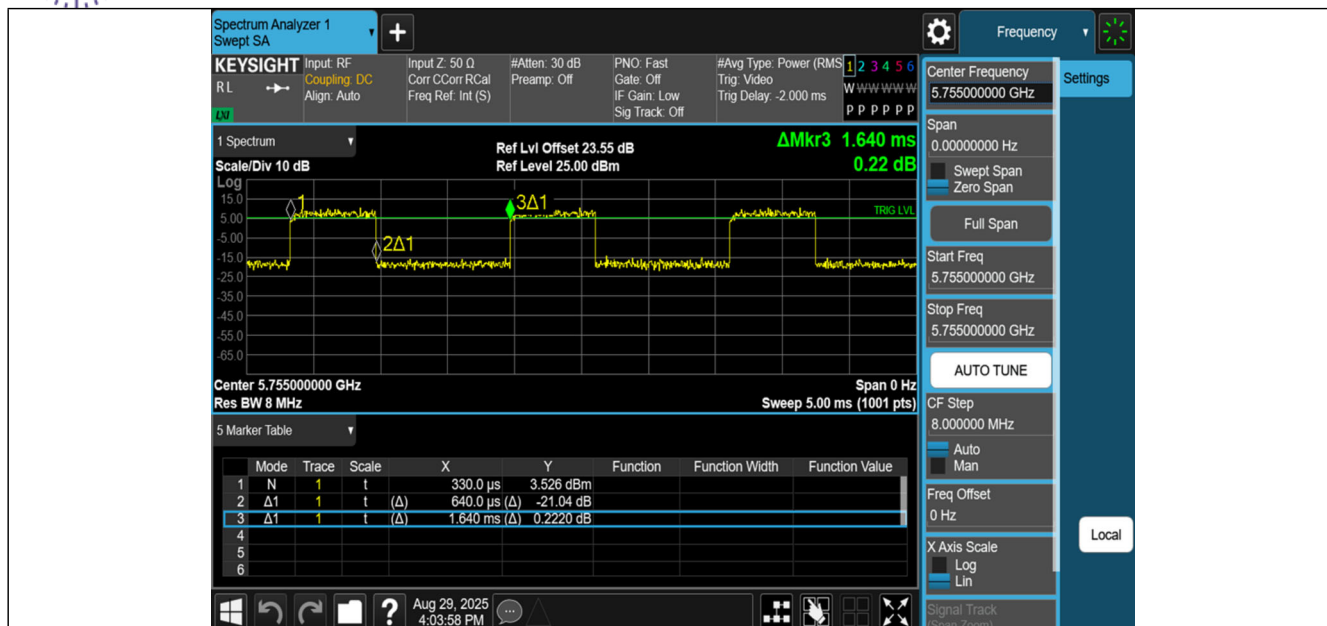
NTNV-11AC20SISO-Ant1-5825



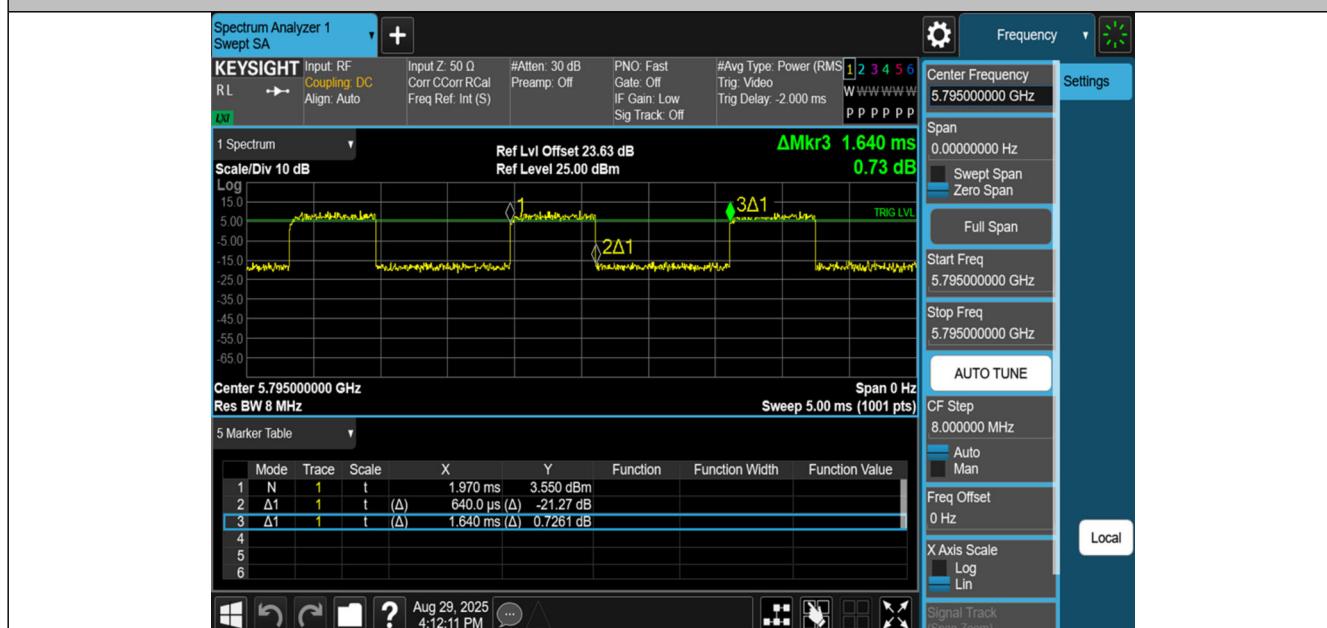
NTNV-11AC40SISO-Ant1-5190



NTNV-11AC40SISO-Ant1-5230



NTNV-11AC40SISO-Ant1-5755



NTNV-11AC40SISO-Ant1-5795



NTNV-11AC80SISO-Ant1-5210



NTNV-11AC80SISO-Ant1-5775

## 2.7 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

| Uncertainty                            |                      |
|----------------------------------------|----------------------|
| Parameter                              | Uncertainty          |
| Occupied Channel Bandwidth             | $\pm 102\text{kHz}$  |
| RF power conducted                     | $\pm 0.243\text{dB}$ |
| Power Spectral Density                 | $\pm 0.743\text{dB}$ |
| Conducted Spurious Emission            | $\pm 1.328\text{dB}$ |
| Conducted emission(9kHz~30MHz) AC main | $\pm 2.68\text{dB}$  |
| Radiated emission(9kHz~30MHz)          | $\pm 3.50\text{dB}$  |
| Radiated emission (30MHz~1GHz)         | $\pm 4.20\text{dB}$  |
| Radiated emission (1GHz~18GHz)         | $\pm 5.10\text{dB}$  |
| Radiated emission (18GHz~40GHz)        | $\pm 5.26\text{dB}$  |

## 2.8 Test Location

|                           |                                                                                             |
|---------------------------|---------------------------------------------------------------------------------------------|
| Company:                  | Shenzhen Haiyun Standard Technical Co., Ltd.                                                |
| Address:                  | No. 110-113, 115, 116, Block B, Jinyuan Business Building, Bao'an District, Shenzhen, China |
| CNAS Registration Number: | CNAS L18252                                                                                 |
| CAB identifier:           | CN0145                                                                                      |
| A2LA Certificate Number:  | 6823.01                                                                                     |
| Telephone:                | 0755-26024411                                                                               |

## 2.9 SUPPORT UNITS

| No. | Equipment          | Model       | Manufacturer | Series No |
|-----|--------------------|-------------|--------------|-----------|
| 1   | Flat Panel Monitor | S2721QS     | DELL         | /         |
| 2   | USB Disk1          | /           | Kingston     | /         |
| 3   | USB Disk2          | /           | Kingston     | /         |
| 4   | Earphone           | /           | /            | /         |
| 5   | Mouse              | DOK-680U    | LENOVO       | 701E8328  |
| 6   | Keyboard           | SK-8827     | LENOVO       | 21R1ADL   |
| 7   | Printer            | MJPMYTJHT01 | Xiaomi       | /         |

### 3. Test Procedure And Results

#### 3.1 AC Power Line Conducted Emission

##### 3.1.1 Limit

| Frequency       | Maximum RF Line Voltage       |                            |
|-----------------|-------------------------------|----------------------------|
|                 | Quasi-Peak Level dB( $\mu$ V) | Average Level dB( $\mu$ V) |
| 150kHz ~ 500kHz | 66 ~ 56*                      | 56 ~ 46*                   |
| 500kHz ~ 5MHz   | 56                            | 46                         |
| 5MHz ~ 30MHz    | 60                            | 50                         |

Notes: 1. \* Decreasing linearly with logarithm of frequency.

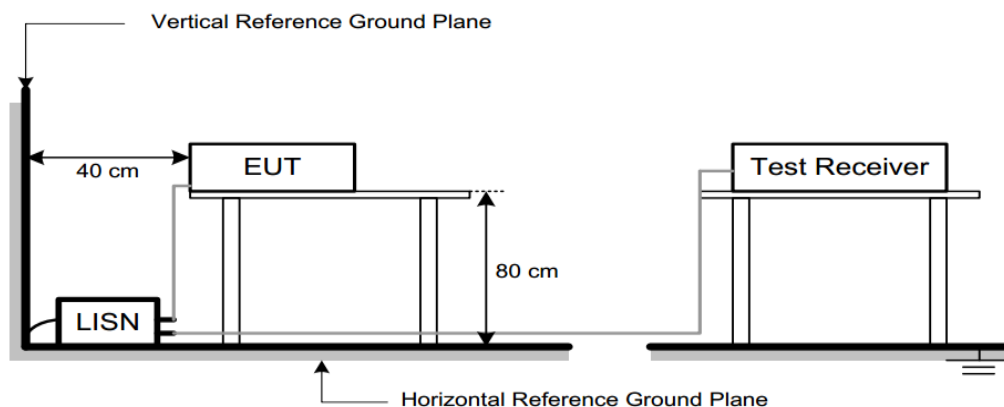
2. The lower limit shall apply at the transition frequencies.

##### 3.1.2 Test Procedure

| Test Method                          |                              |
|--------------------------------------|------------------------------|
| ●Conducted Measurement               | ○Radiated Measurement        |
| Test Channels                        |                              |
| ○ Lowest, Middle and Highest Channel | ○ Lowest and Highest Channel |
| Environmental conditions             |                              |
| ●Normal                              | ○Normal and Extreme          |
| Note: ●:Test    ○:No Test            |                              |

- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

##### 3.1.3 Test Setup



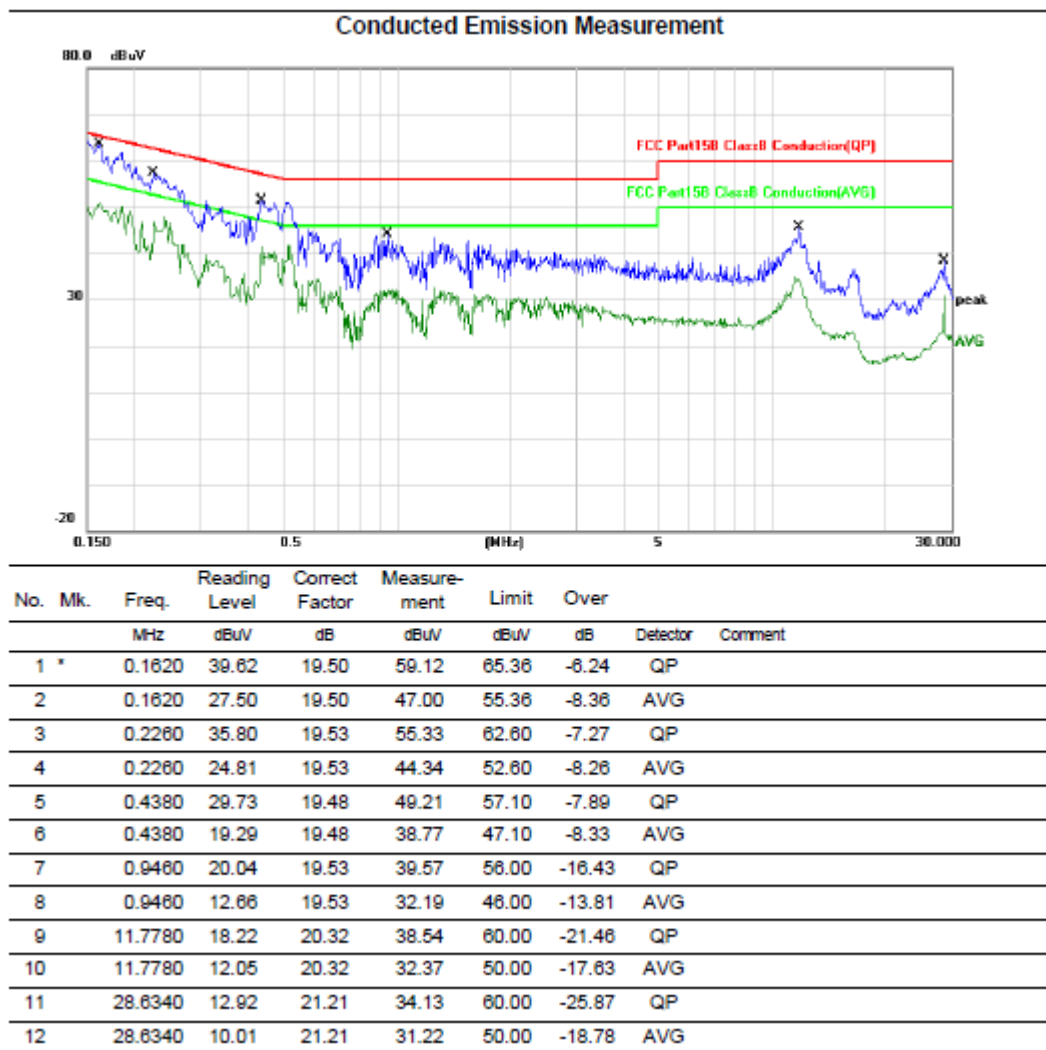
### 3.1.4 Test Result

**Note:**

1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Measurement = Reading + Correct Factor.
3. Over = Measurement – Limit
4. The TX AC20 Mode Channel 48 is found to be the worst case and recorded.

|              |                    |
|--------------|--------------------|
| 150kHz~30MHz | TX AC20 Channel 48 |
|--------------|--------------------|

Line

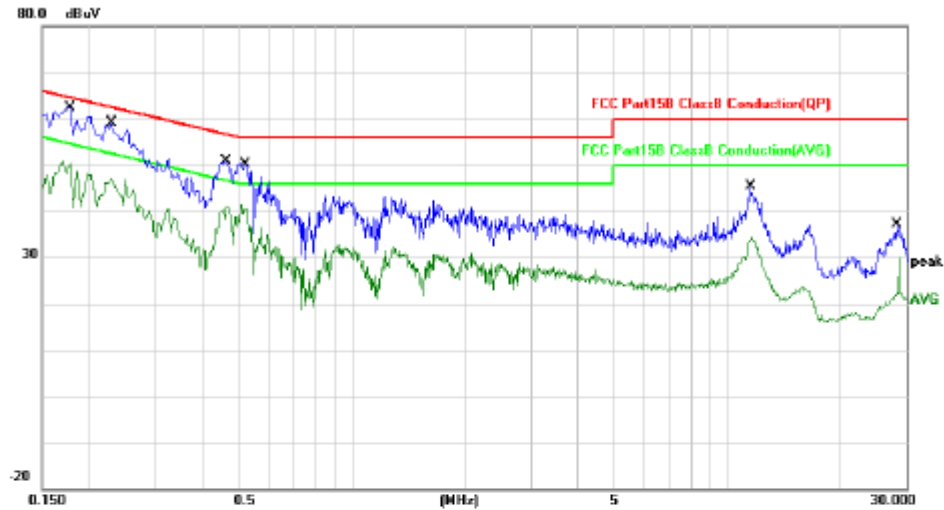


150kHz~30MHz

TX AC20 Channel 48

Neutral

### Conducted Emission Measurement



| No. | Mk. | Freq.   | Reading Level | Correct Factor | Measurement | Limit | Over   |          |         |
|-----|-----|---------|---------------|----------------|-------------|-------|--------|----------|---------|
|     |     | MHz     | dBuV          | dB             | dBuV        | dBuV  | dB     | Detector | Comment |
| 1   |     | 0.1780  | 37.91         | 19.51          | 57.42       | 64.58 | -7.16  | QP       |         |
| 2   |     | 0.1780  | 25.91         | 19.51          | 45.42       | 54.58 | -9.16  | AVG      |         |
| 3   |     | 0.2300  | 35.15         | 19.56          | 54.71       | 62.45 | -7.74  | QP       |         |
| 4   |     | 0.2300  | 24.42         | 19.56          | 43.98       | 52.45 | -8.47  | AVG      |         |
| 5   |     | 0.4620  | 31.86         | 19.51          | 51.37       | 56.66 | -5.29  | QP       |         |
| 6   |     | 0.4620  | 22.73         | 19.51          | 42.24       | 46.66 | -4.42  | AVG      |         |
| 7   |     | 0.5220  | 31.80         | 19.54          | 51.34       | 56.00 | -4.66  | QP       |         |
| 8 * |     | 0.5220  | 22.80         | 19.54          | 42.34       | 46.00 | -3.66  | AVG      |         |
| 9   |     | 11.5500 | 17.81         | 20.27          | 38.08       | 60.00 | -21.92 | QP       |         |
| 10  |     | 11.5500 | 12.25         | 20.27          | 32.52       | 50.00 | -17.48 | AVG      |         |
| 11  |     | 28.3500 | 7.29          | 21.18          | 28.47       | 60.00 | -31.53 | QP       |         |
| 12  |     | 28.3500 | 0.09          | 21.18          | 21.27       | 50.00 | -28.73 | AVG      |         |

## 3.2 Radiated Emission

### 3.2.1 Limit

#### 1) Limit of radiated emission measurement:

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

| Frequency<br>(MHz) | Distance<br>Meters(m) | Field Strength Limit                                                                              |                                   |
|--------------------|-----------------------|---------------------------------------------------------------------------------------------------|-----------------------------------|
|                    |                       | $\mu\text{V}/\text{m}$                                                                            | $\text{dB}(\mu\text{V})/\text{m}$ |
| 0.009 – 0.49       | 300                   | $2400/F(\text{kHz})$                                                                              | -                                 |
| 0.490 – 1.705      | 30                    | $24000/F(\text{kHz})$                                                                             | -                                 |
| 1.705 – 30         | 30                    | 30                                                                                                | -                                 |
| 30~88              | 3                     | 100                                                                                               | 40.0                              |
| 88~216             | 3                     | 150                                                                                               | 43.5                              |
| 216~960            | 3                     | 200                                                                                               | 46.0                              |
| 960~1000           | 3                     | 500                                                                                               | 54.0                              |
| Above 1000         | 3                     | 74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak)<br>54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average) |                                   |

Note: (1) Emission level  $\text{dB}\mu\text{V} = 20 \log$  Emission level  $\mu\text{V}/\text{m}$

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

#### 2) Limit of unwanted emission out of the restricted bands:

| Frequency(MHz) | EIRP Limit( $\text{dBm}/\text{MHz}$ ) | Equivalent Field Strength at 3m( $\text{dB}\mu\text{V}/\text{m}$ ) |
|----------------|---------------------------------------|--------------------------------------------------------------------|
| 5150-5250      | -27                                   | 68.2                                                               |
| 5250-5350      | -27                                   | 68.2                                                               |
| 5470-5725      | -27                                   | 68.2                                                               |
| 5725-5850      | -27 NOTE (2)                          | 68.2                                                               |
|                | 10 NOTE (2)                           | 105.2                                                              |
|                | 15.6 NOTE (2)                         | 110.8                                                              |
|                | 27 NOTE (2)                           | 122.2                                                              |

Note: (1) The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:  $E[\text{dB}\mu\text{V}/\text{m}] = \text{EIRP}[\text{dBm}] + 95.2$ , for  $d=3\text{m}$

(2) According to 15.407(b)(4)(i), all emissions shall be limited to a level of -27  $\text{dBm}/\text{MHz}$  at 75 MHz or more above or below the band edge increasing linearly to 10  $\text{dBm}/\text{MHz}$  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  $\text{dBm}/\text{MHz}$  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  $\text{dBm}/\text{MHz}$  at the band edge.

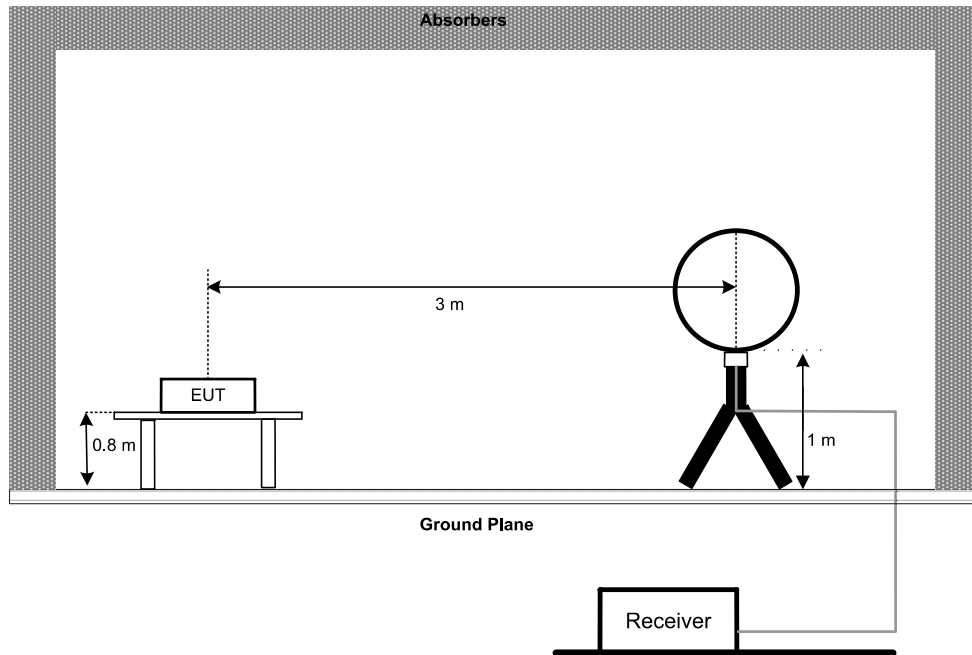
### 3.2.2 Test Procedure

| Test Method                         |                              |
|-------------------------------------|------------------------------|
| ○Conducted Measurement              | ●Radiated Measurement        |
| Test Channels                       |                              |
| ●Lowest, Middle and Highest Channel | ○ Lowest and Highest Channel |
| Environmental conditions            |                              |
| ●Normal                             | ○Normal and Extreme          |
| Note:●:Test    ○:No Test            |                              |

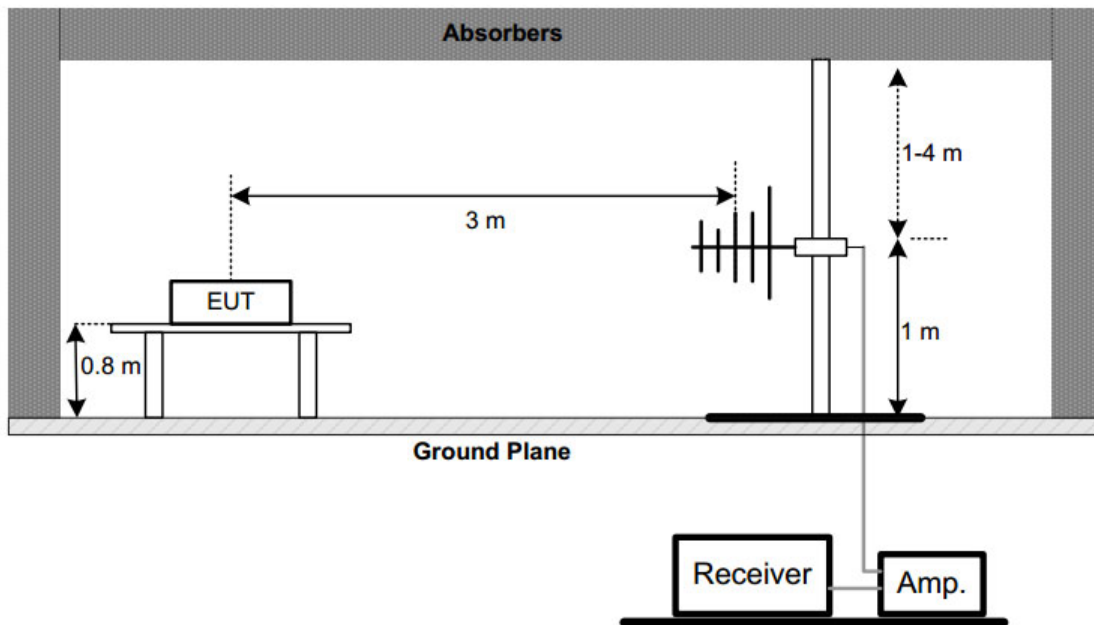
- a) The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
- b) The measuring distance of 3 m or 1.5m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c) The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. 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 find the maximum reading (used Bore sight function).
- e) The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- f) The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- g) All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1 GHz)
- h) All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1 GHz)
- i) For the actual test configuration, please refer to the related Item -EUT Test Photos.

### 3.2.3 Test Setup

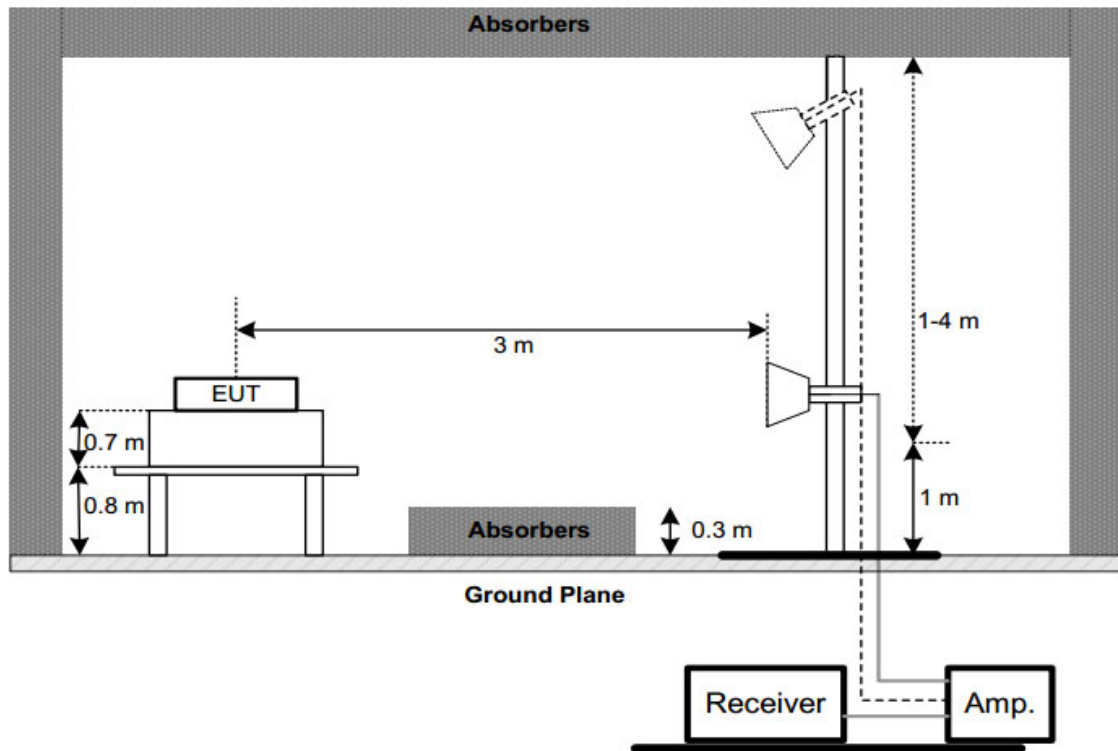
#### (A) Radiated Emission Test Set-Up Frequency Below 30 MHz



#### (B) Radiated Emission Test Set-Up Frequency 30 MHz-1000 MHz



(C) Radiated Emission Test Set-Up Frequency Above 1 GHz



### 3.2.4 Test Result

1) Radiated emission: 9kHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not recorded in this report.

2) Radiated emission: 30MHz-1GHz

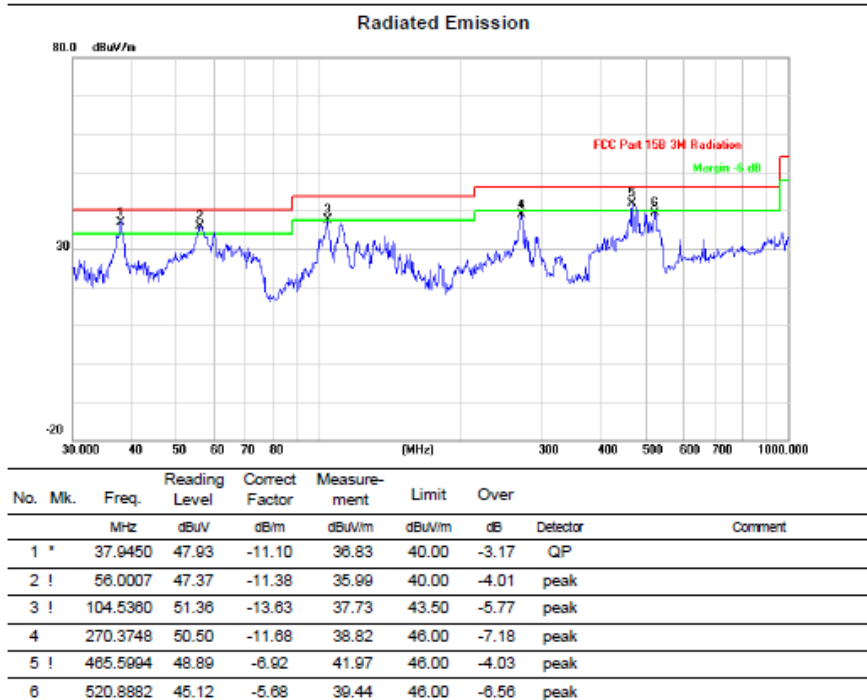
**Note:**

1. Measurement = Reading + Correct Factor.
2. Over = Measurement – Limit
3. The TX AC20 Mode Channel 48 is found to be the worst case and recorded.

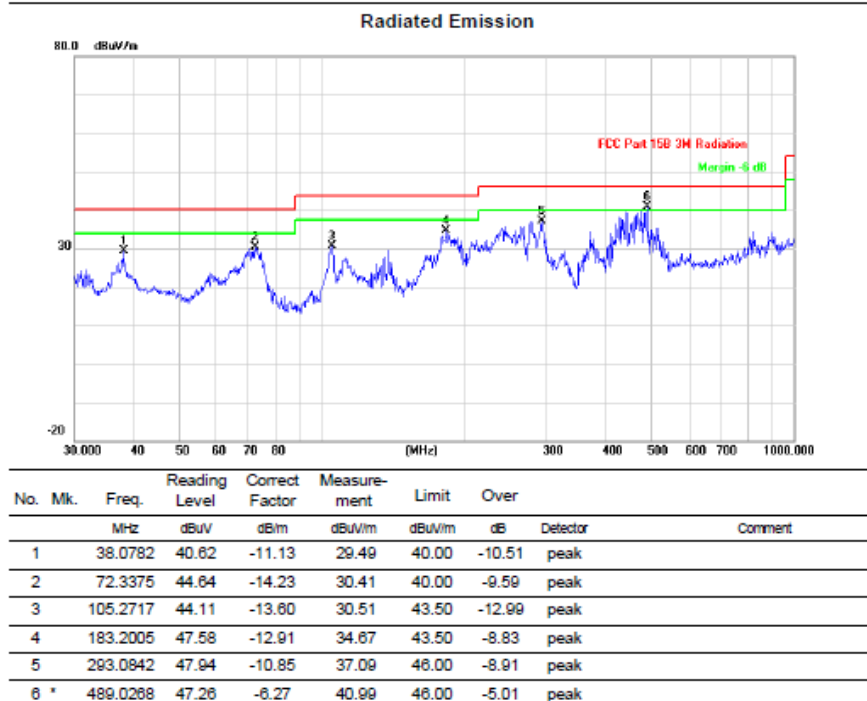
Below 1GHz (30MHz~1GHz)

TX AC20 Channel 48

### VERTICAL



### HORIZONTAL



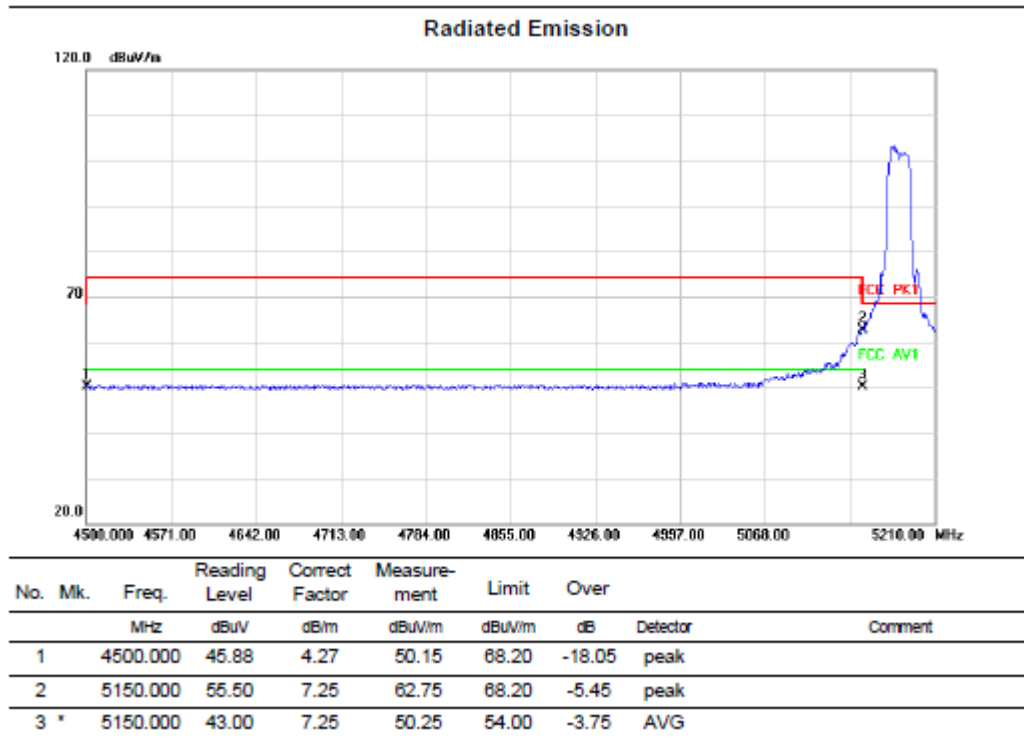
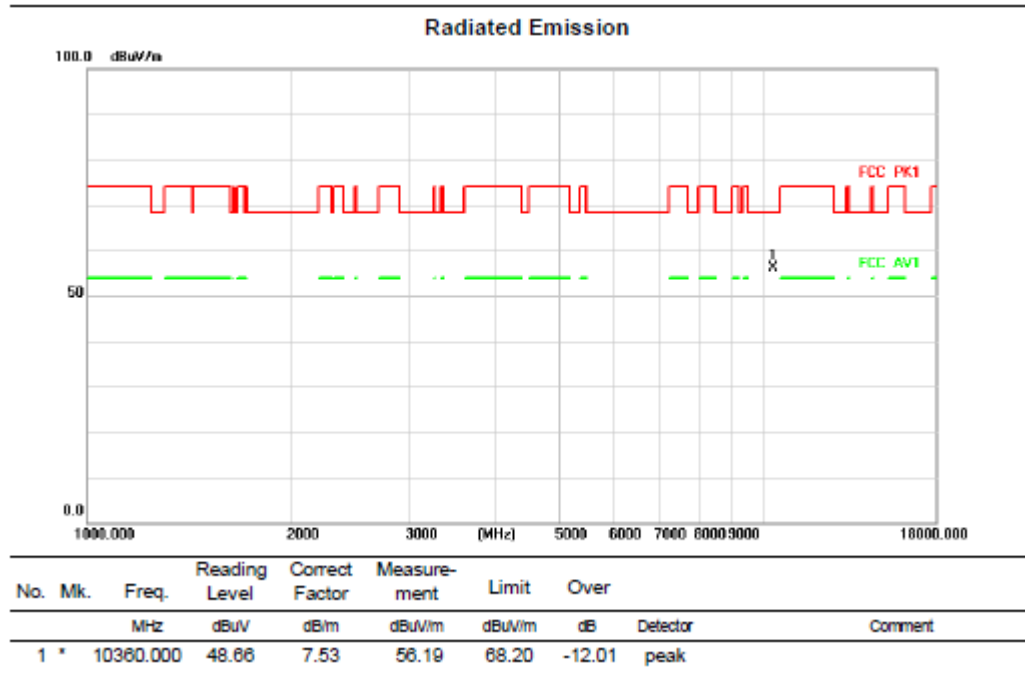
### 3) Radiated emission: Above 1GHz

**Note:**

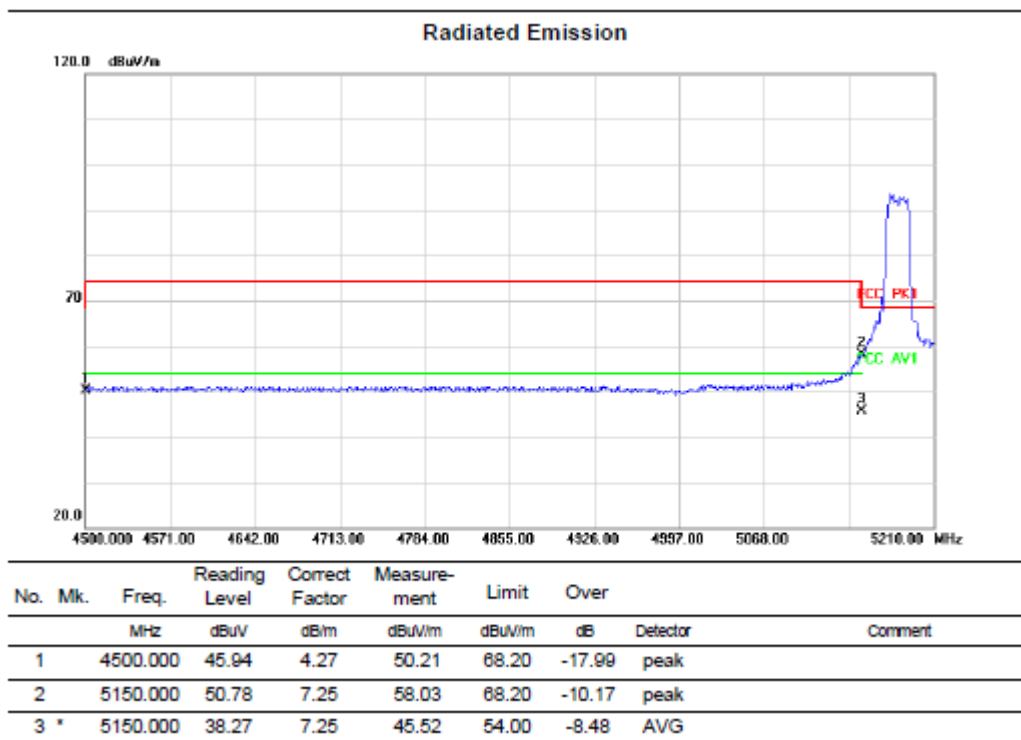
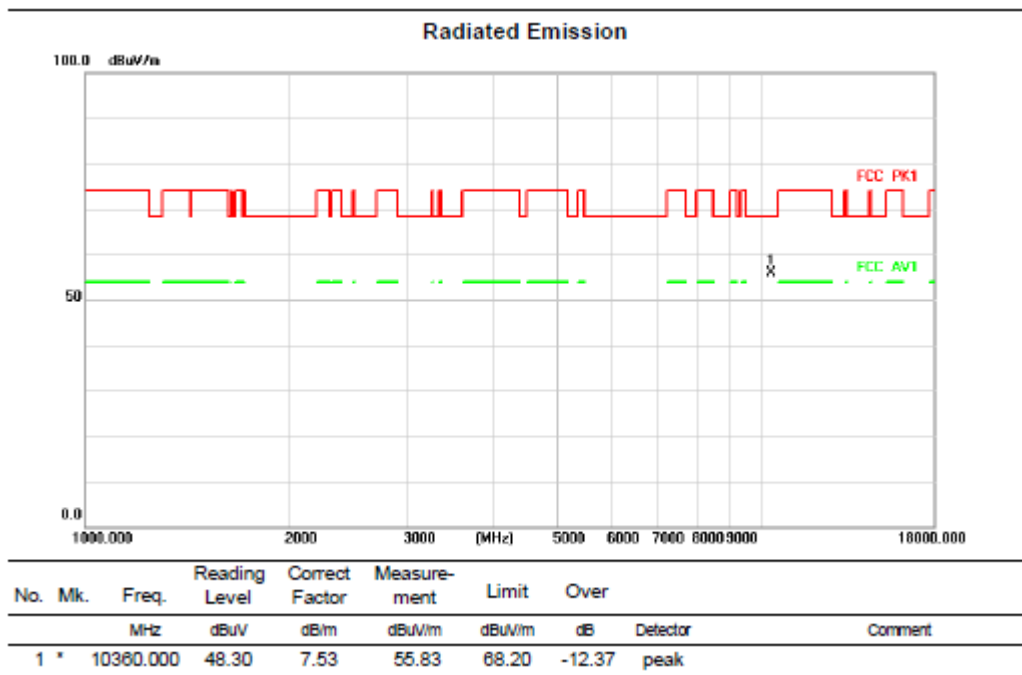
1. Measurement = Reading + Correct Factor.
2. Over = Measurement – Limit

|                         |               |                 |
|-------------------------|---------------|-----------------|
| Above 1GHz (1GHz~18GHz) | Test mode:11A | Test Channel:36 |
|-------------------------|---------------|-----------------|

#### VERTICAL



## HORIZONTALA

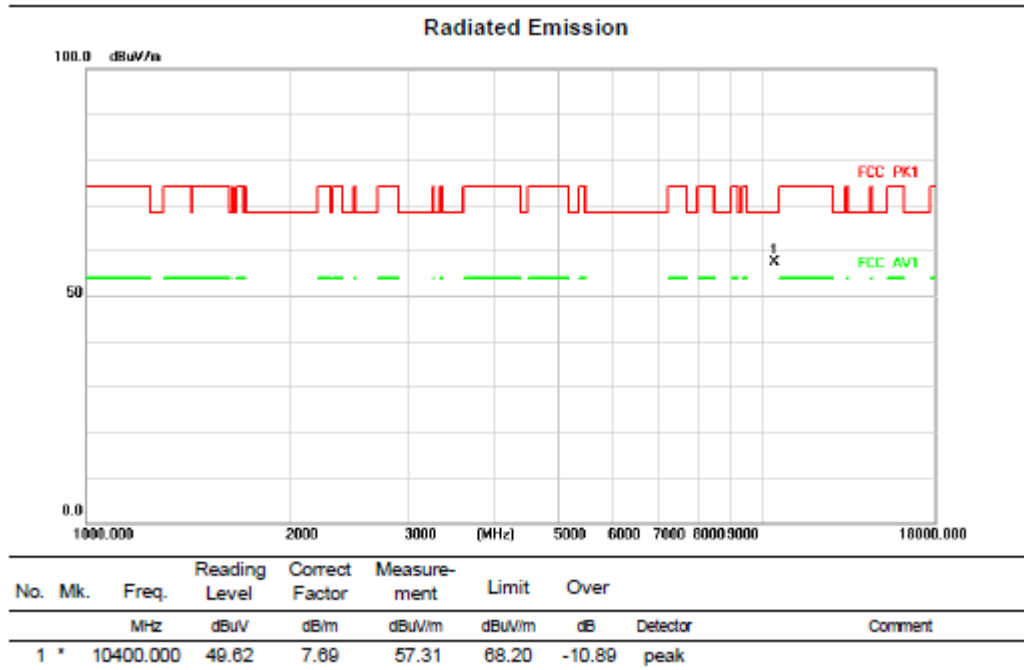


Above 1GHz (1GHz~18GHz)

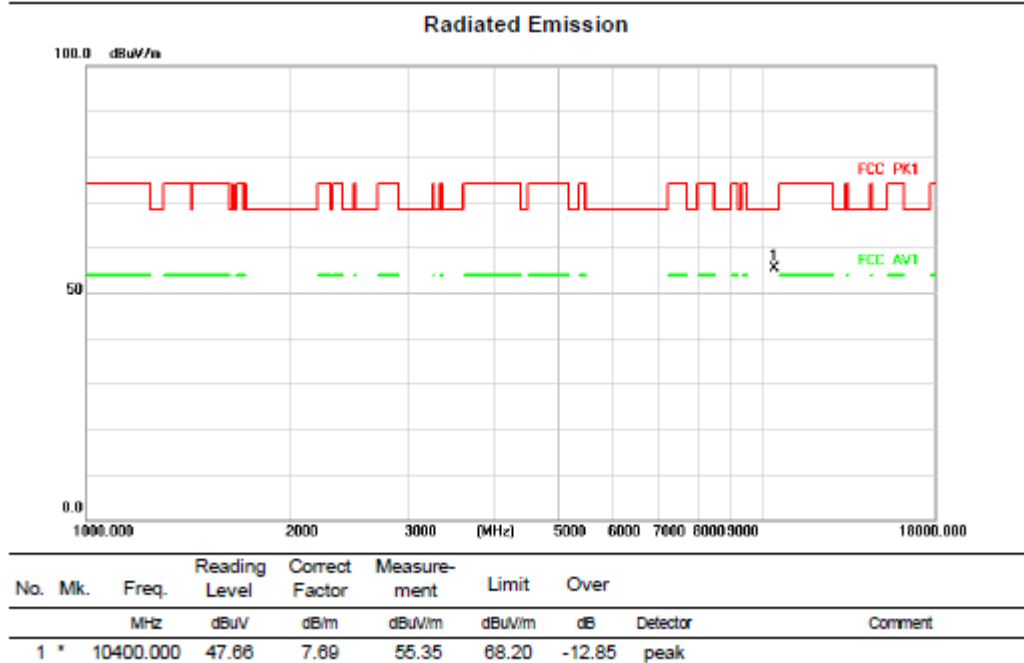
Test mode: 11A

Test Channel:40

VERTICAL



HORIZONTAL

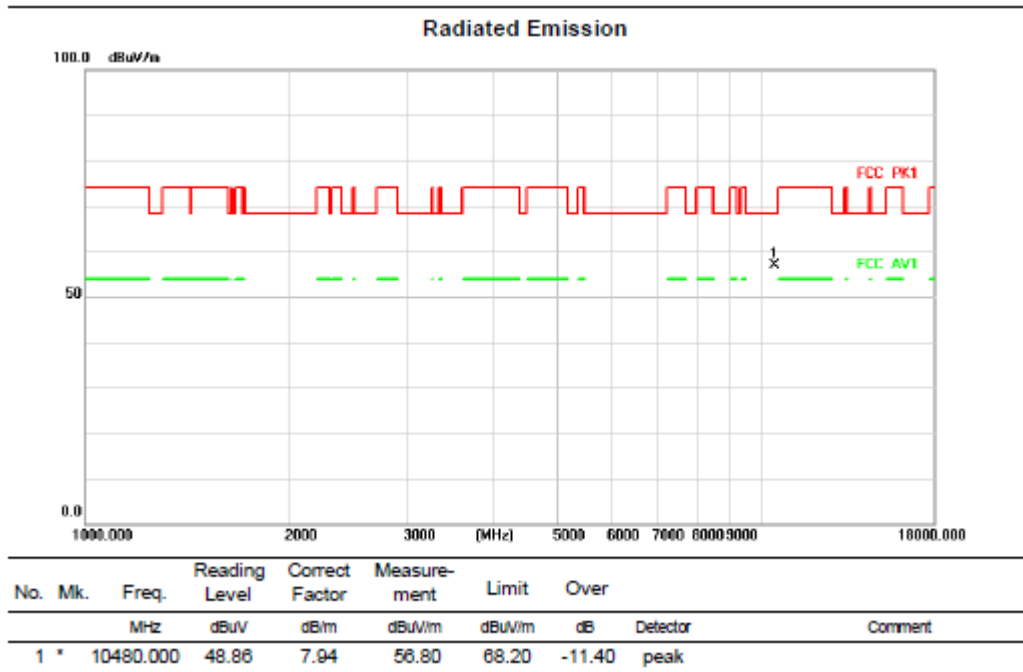


Above 1GHz (1GHz~18GHz)

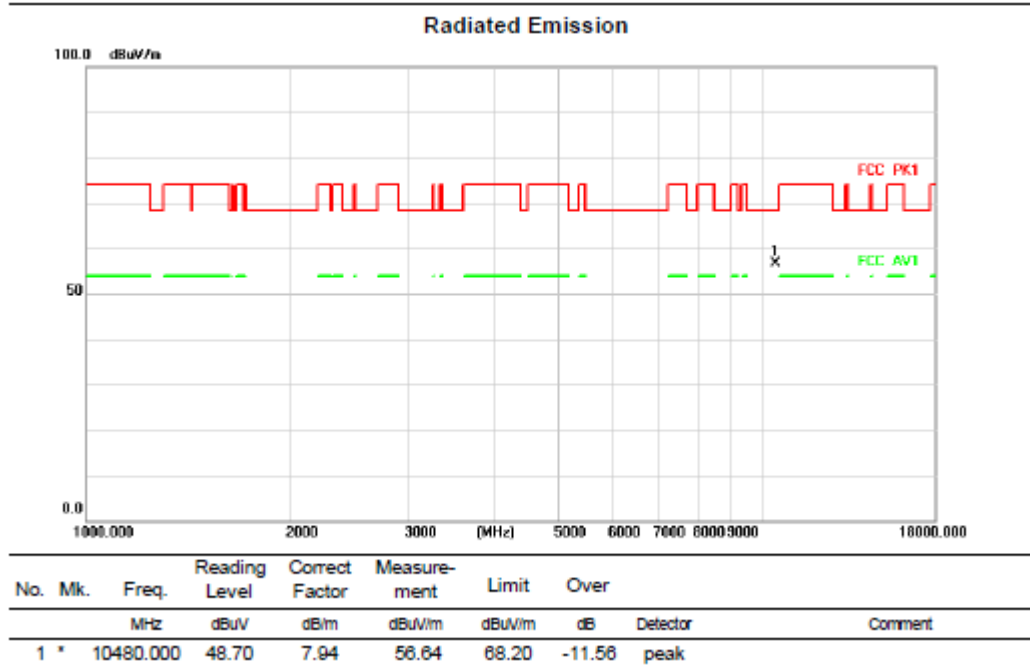
Test mode: 11A

Test Channel:48

VERTICAL



HORIZONTAL

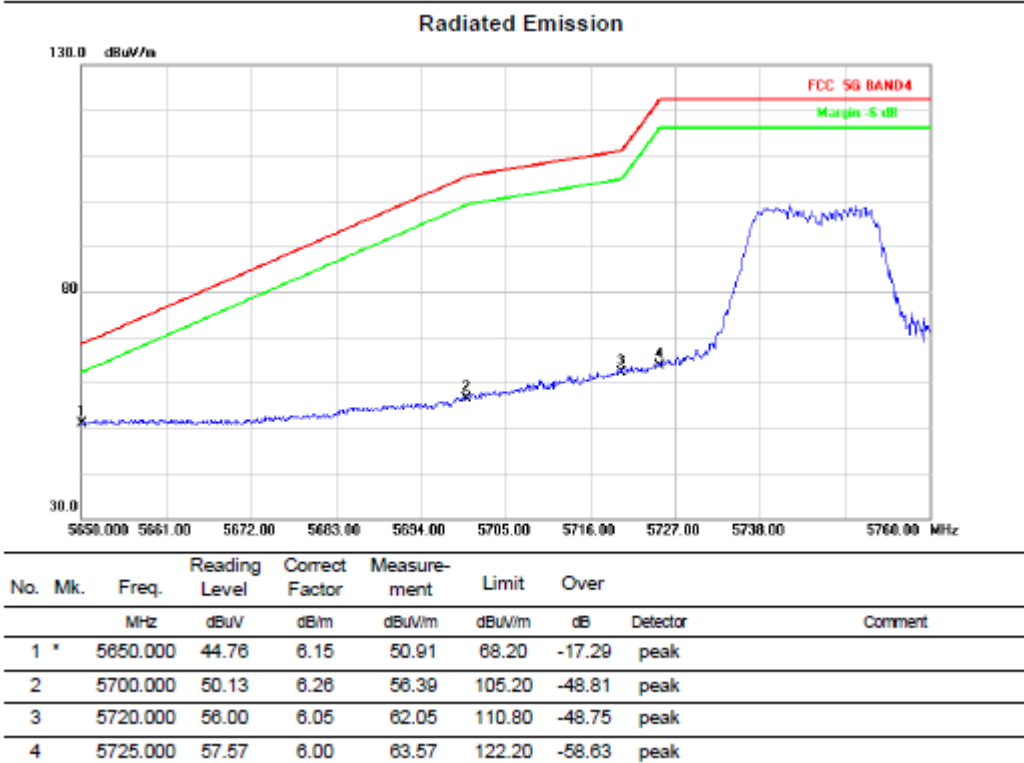
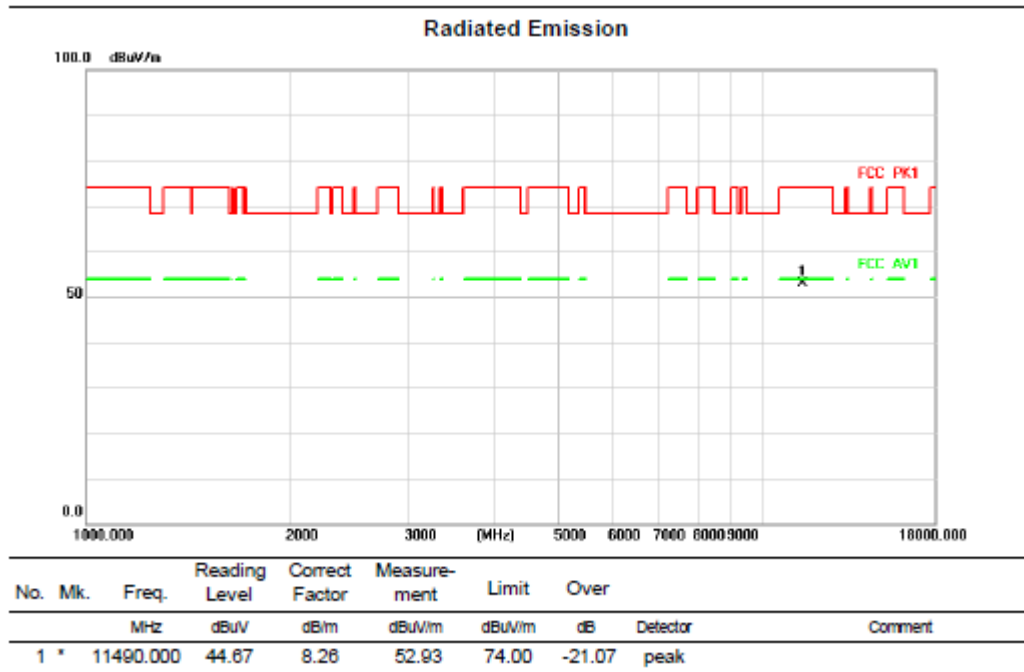


Above 1GHz (1GHz~18GHz)

Test mode: 11A

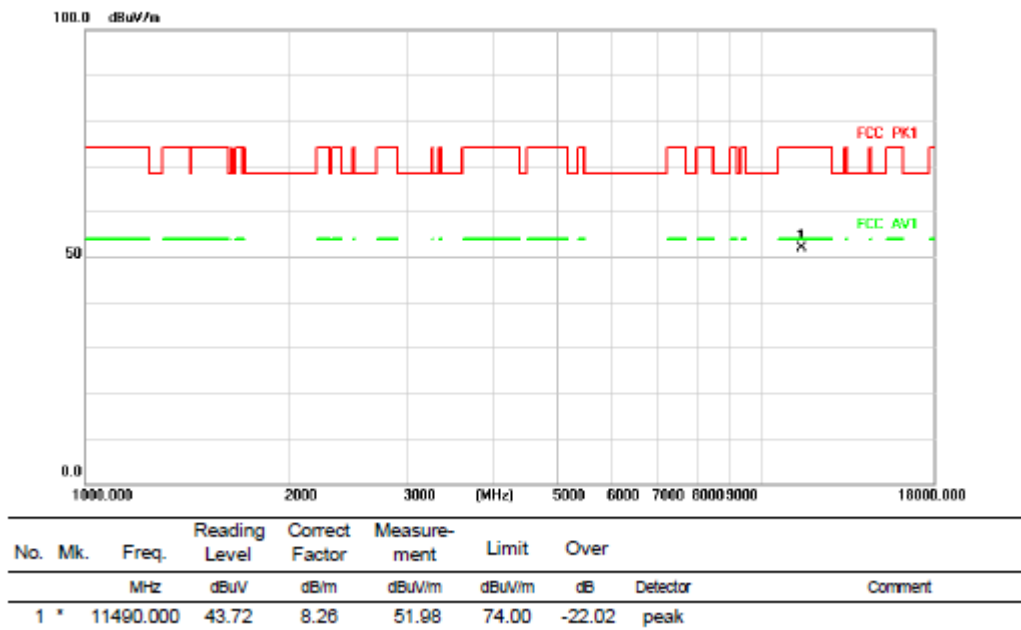
Test Channel:149

VERTICAL

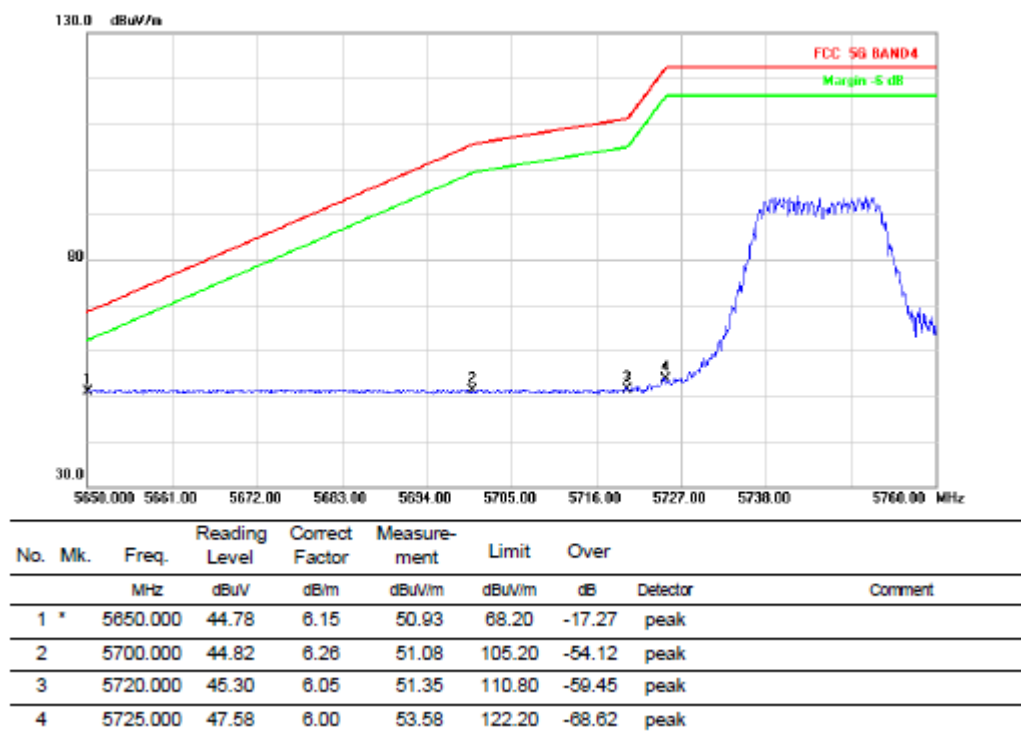


## HORIZONTALA

### Radiated Emission



### Radiated Emission

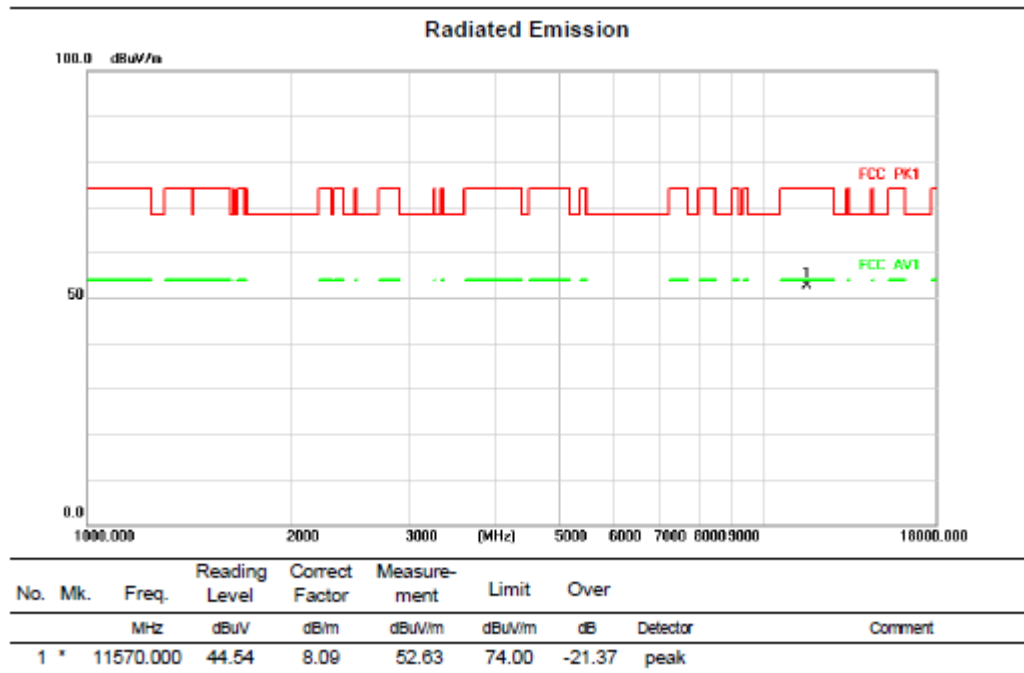


Above 1GHz (1GHz~18GHz)

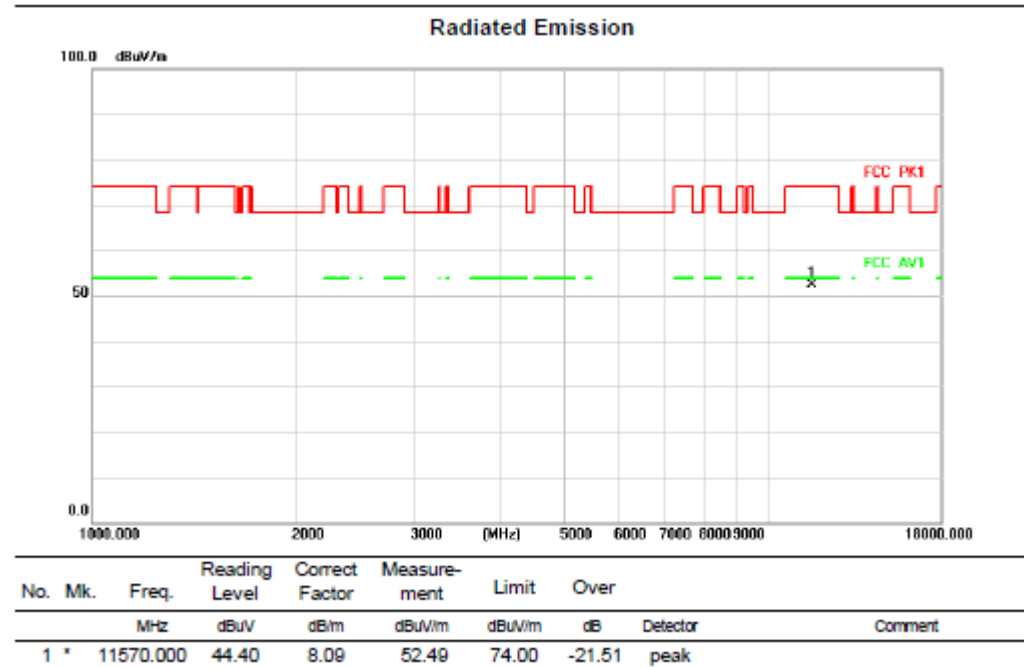
Test mode: 11A

Test Channel:157

VERTICAL



HORIZONTAL

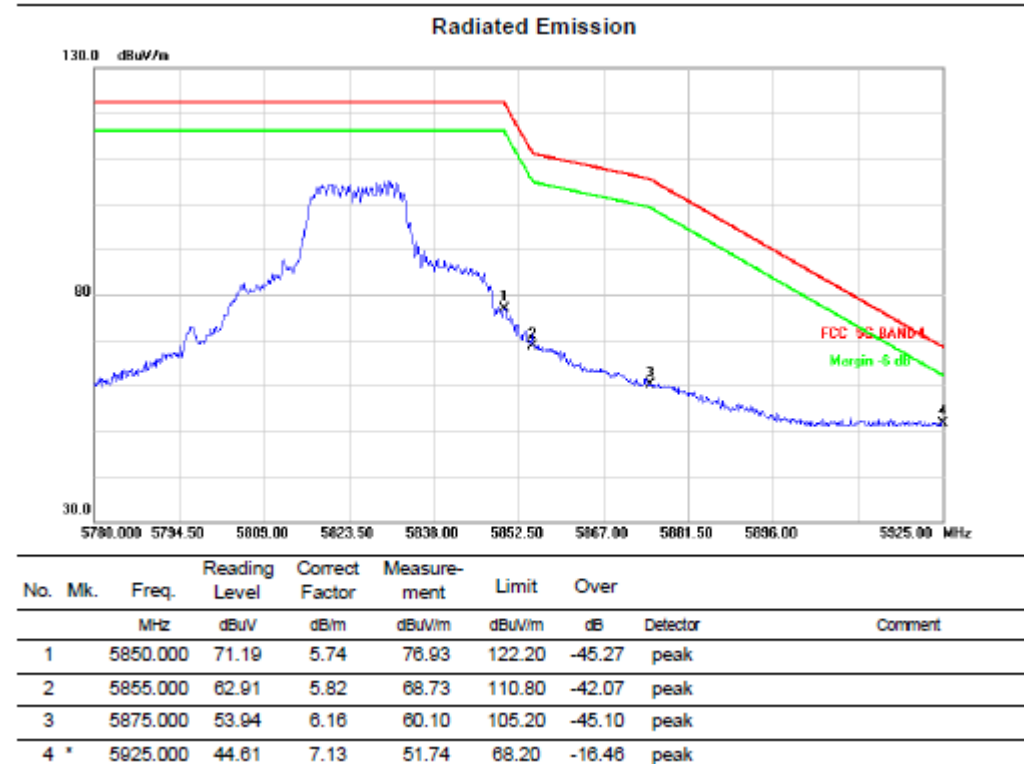


Above 1GHz (1GHz~18GHz)

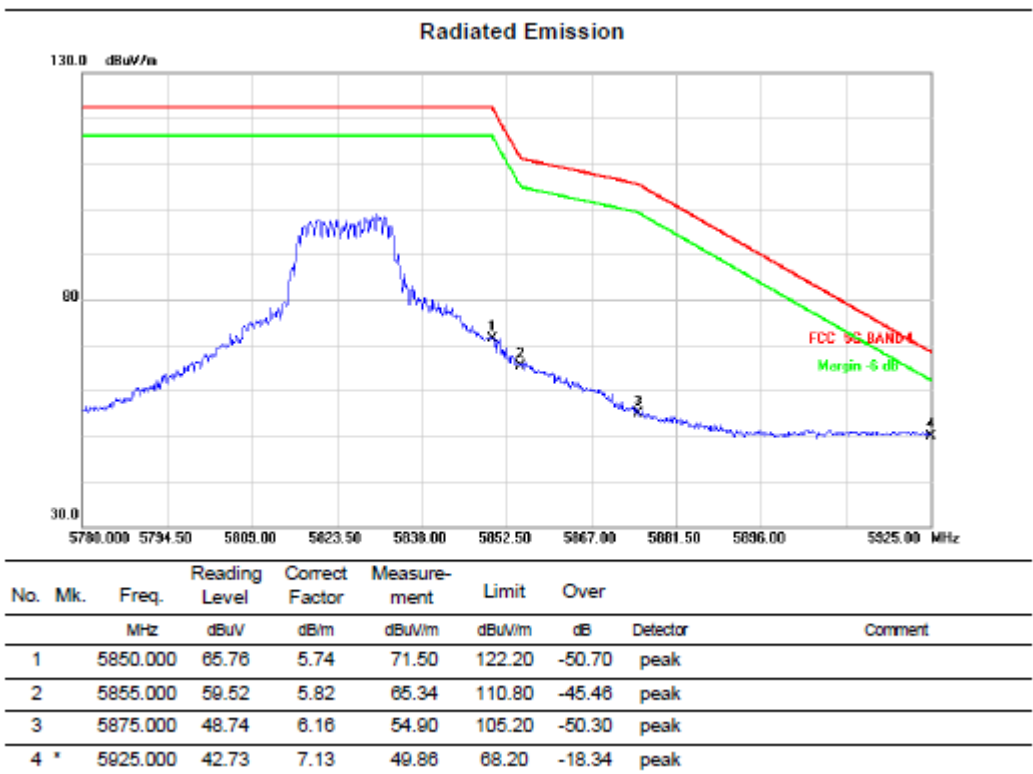
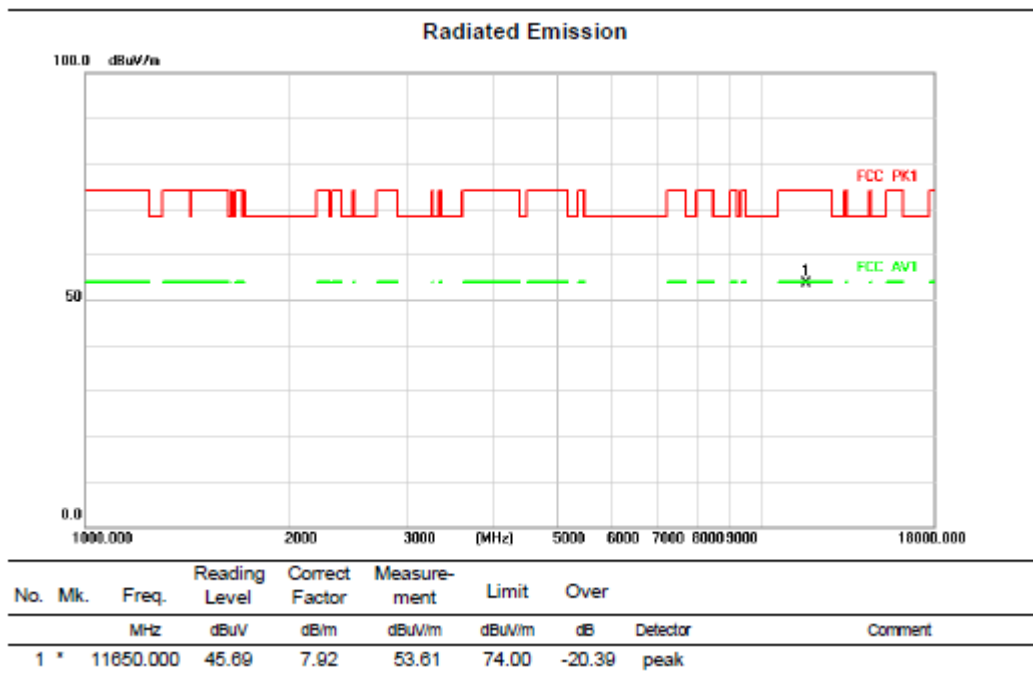
Test mode: 11A

Test Channel:165

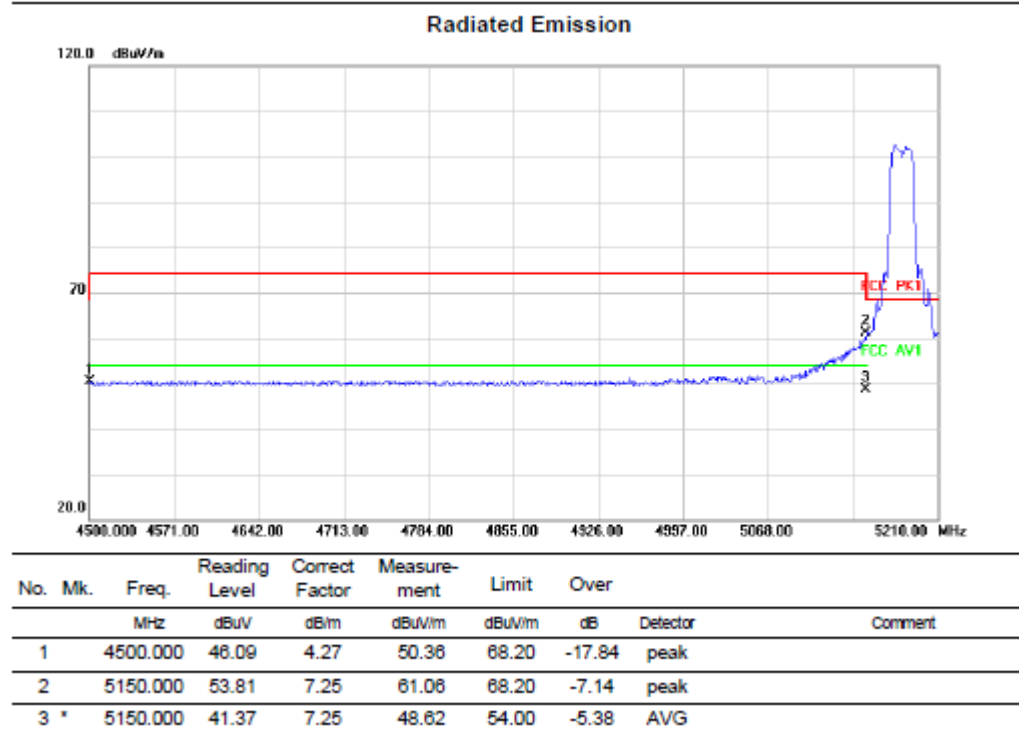
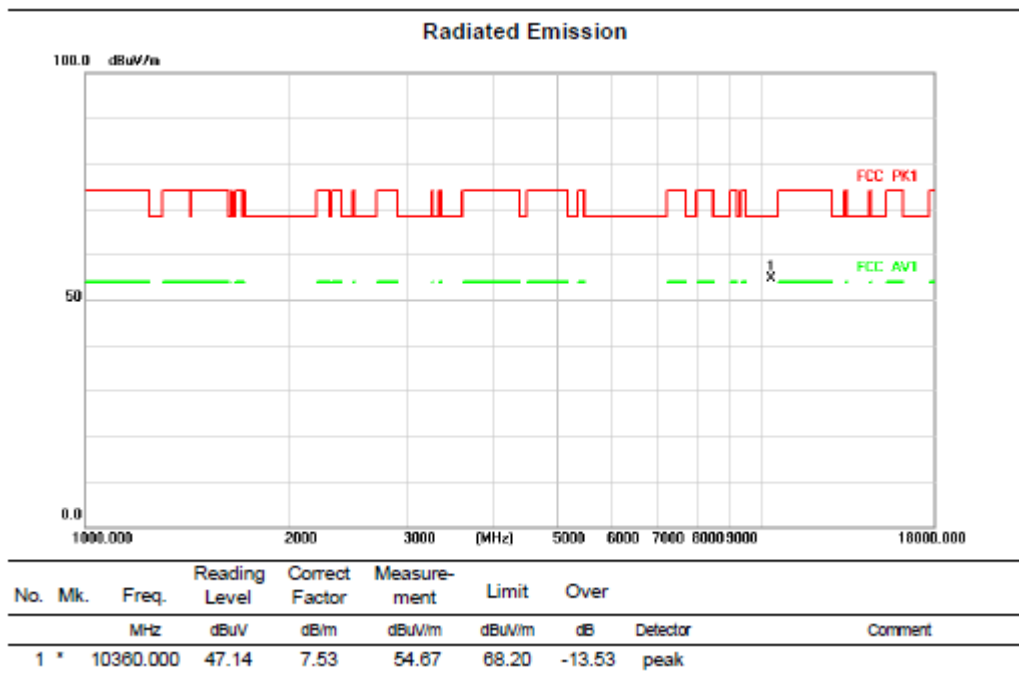
VERTICAL



# HORIZONTALA

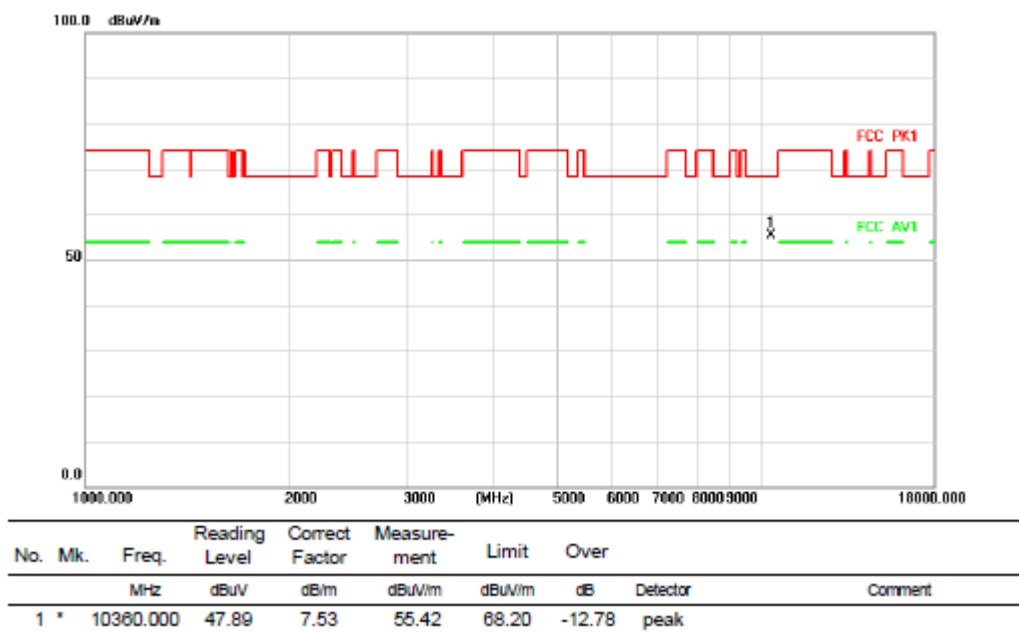


VERTICAL

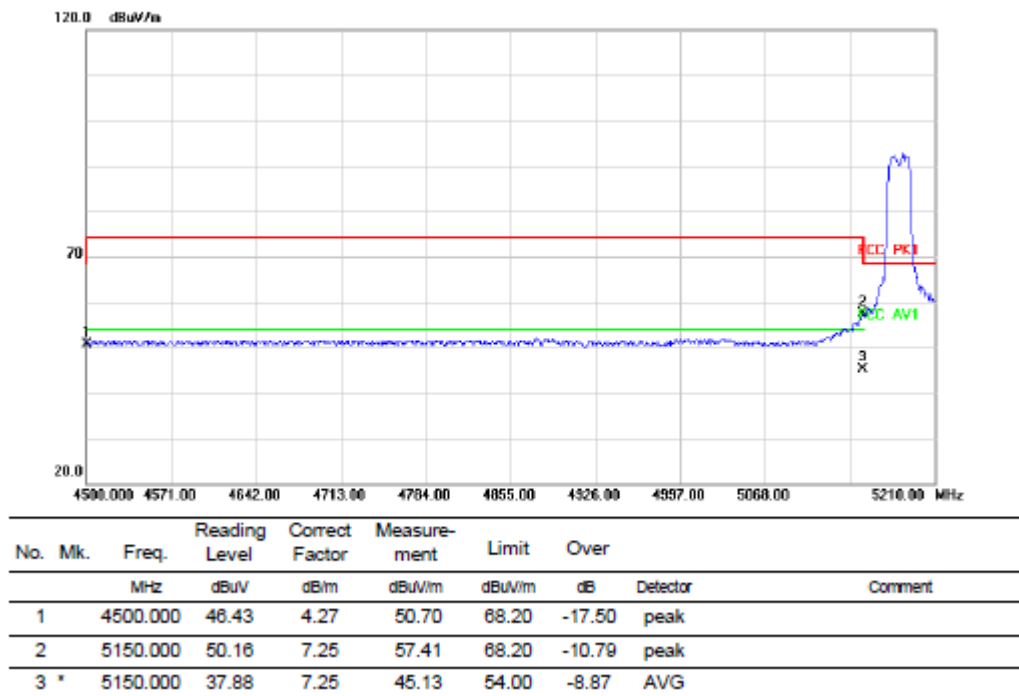


## HORIZONTAL

### Radiated Emission



### Radiated Emission

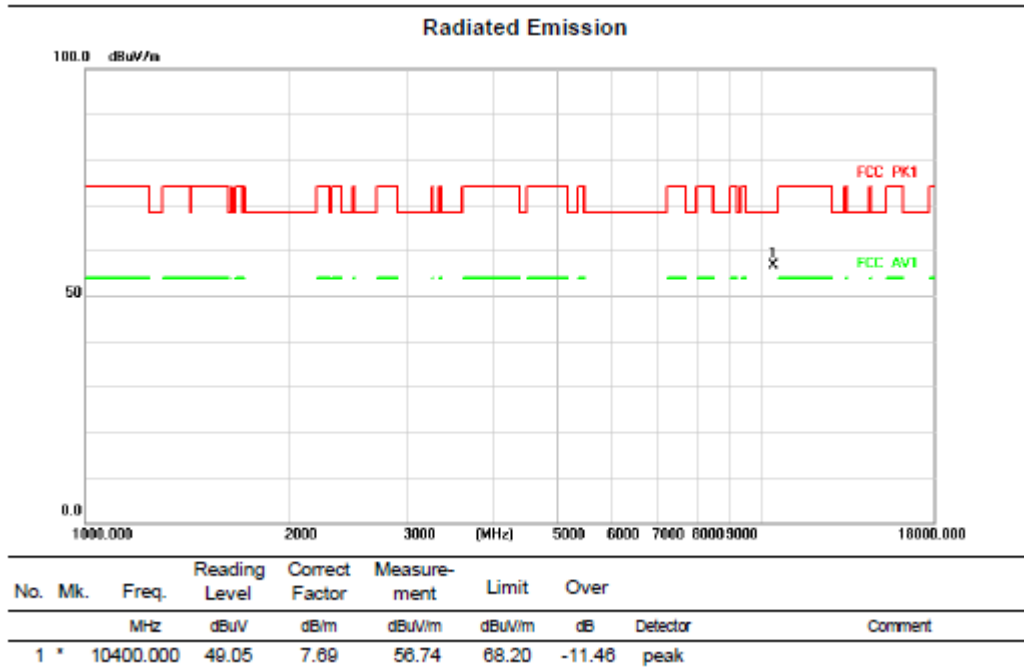


Above 1GHz (1GHz~18GHz)

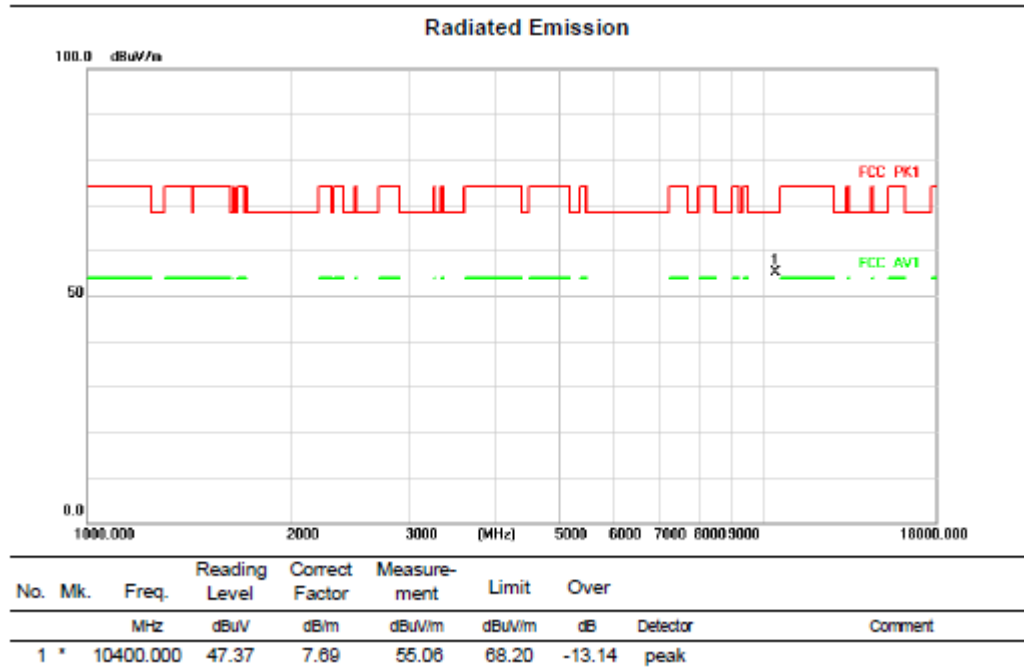
Test mode: 11N20

Test Channel:40

VERTICAL



HORIZONTAL

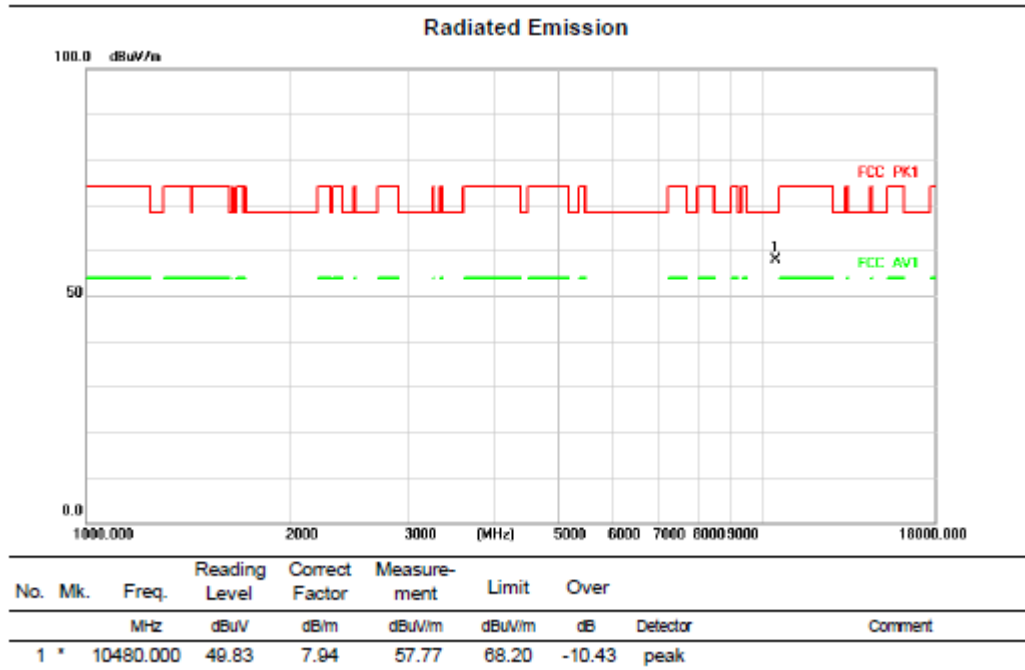


Above 1GHz (1GHz~18GHz)

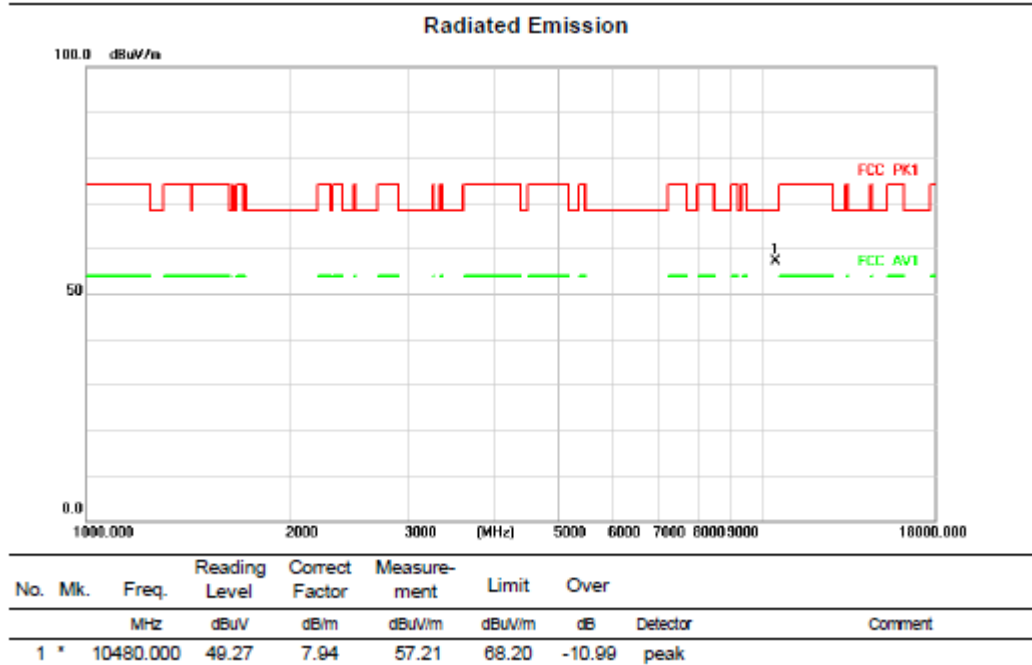
Test mode: 11N20

Test Channel:48

VERTICAL



HORIZONTAL

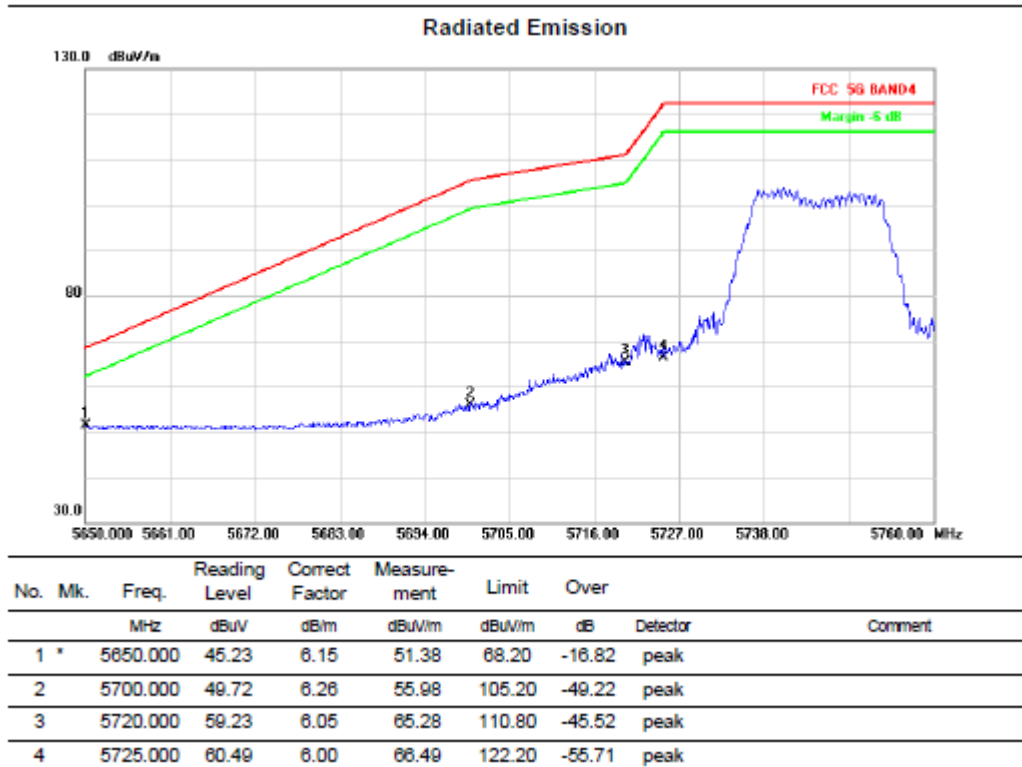
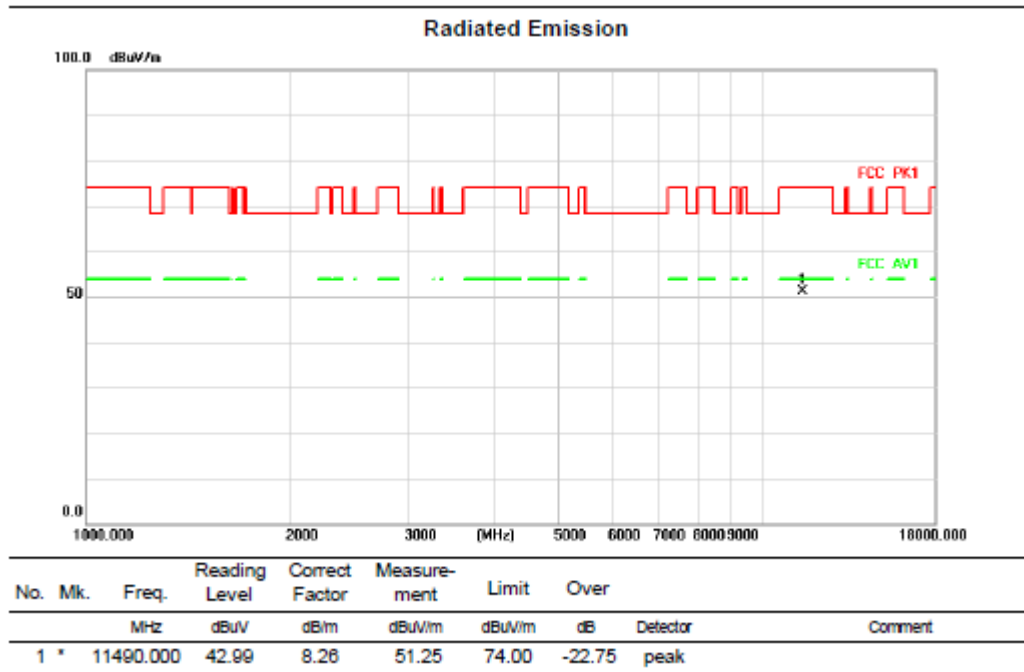


Above 1GHz (1GHz~18GHz)

Test mode: 11N20

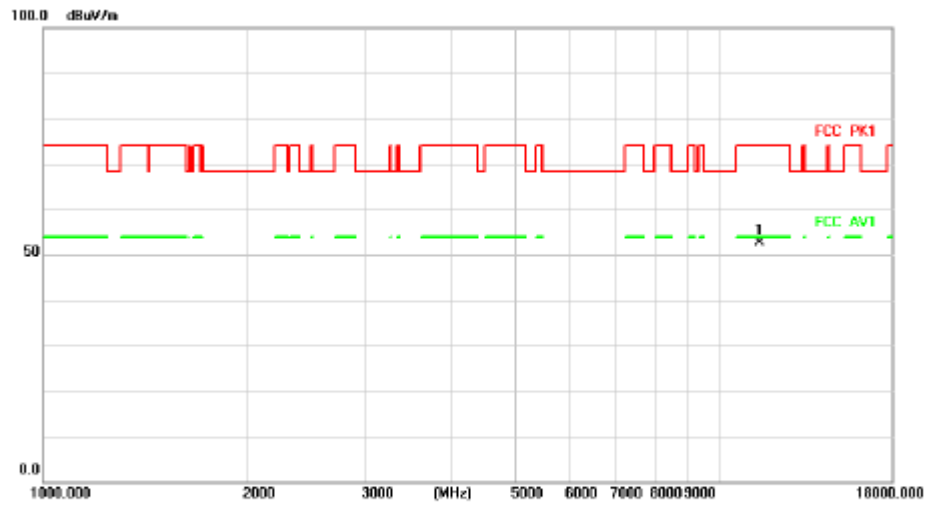
Test Channel:149

VERTICAL



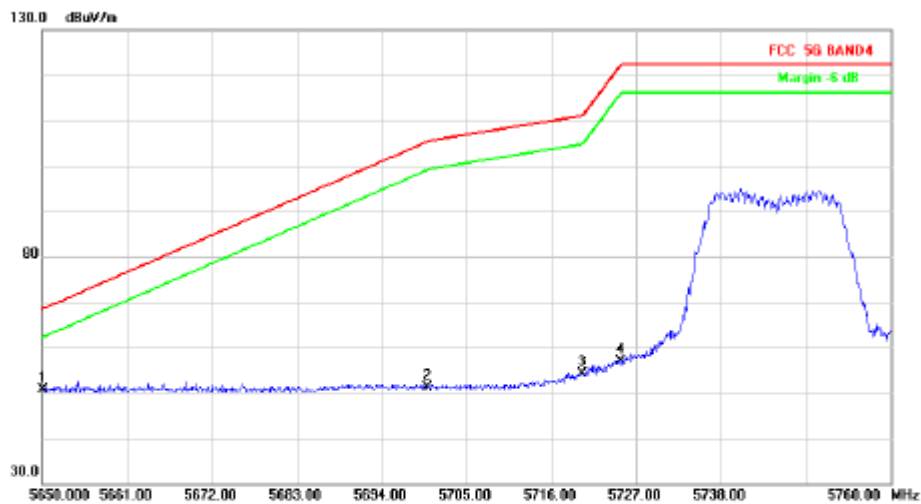
## HORIZONTALA

### Radiated Emission



| No. | Mk. | Freq.     | Reading Level | Correct Factor | Measurement | Limit  | Over   | Detector | Comment |
|-----|-----|-----------|---------------|----------------|-------------|--------|--------|----------|---------|
|     |     | MHz       | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     |          |         |
| 1   | *   | 11490.000 | 44.29         | 8.26           | 52.55       | 74.00  | -21.45 | peak     |         |

### Radiated Emission



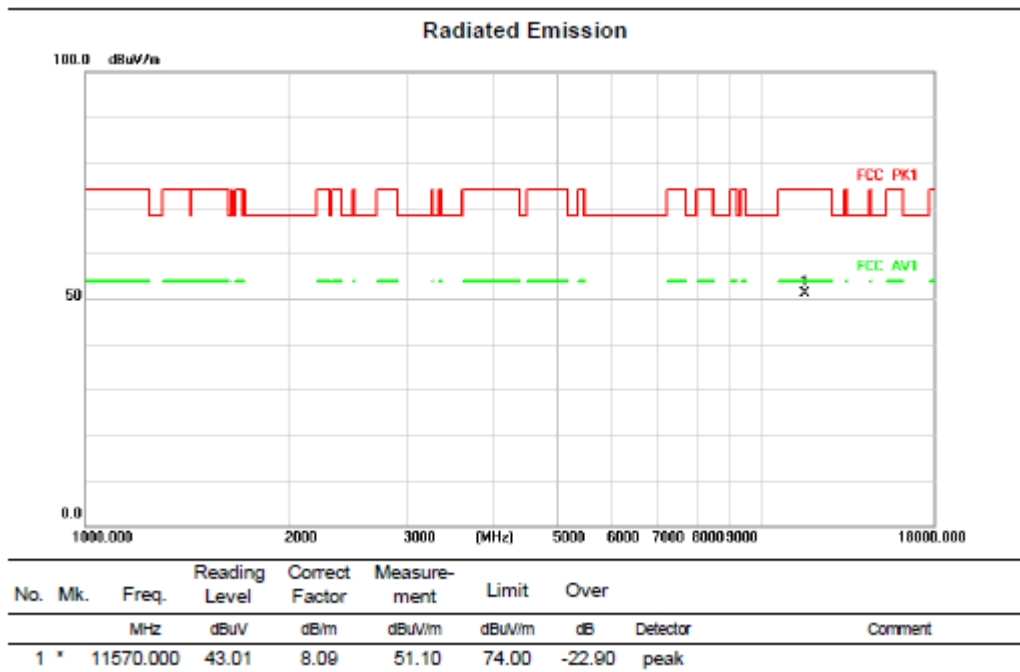
| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   | Detector | Comment |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB/m           | dBuV/m      | dBuV/m | dB     |          |         |
| 1   | *   | 5650.000 | 44.36         | 6.15           | 50.51       | 68.20  | -17.69 | peak     |         |
| 2   |     | 5700.000 | 44.93         | 6.26           | 51.19       | 105.20 | -54.01 | peak     |         |
| 3   |     | 5720.000 | 47.97         | 6.05           | 54.02       | 110.80 | -56.78 | peak     |         |
| 4   |     | 5725.000 | 50.86         | 6.00           | 56.86       | 122.20 | -65.34 | peak     |         |

Above 1GHz (1GHz~18GHz)

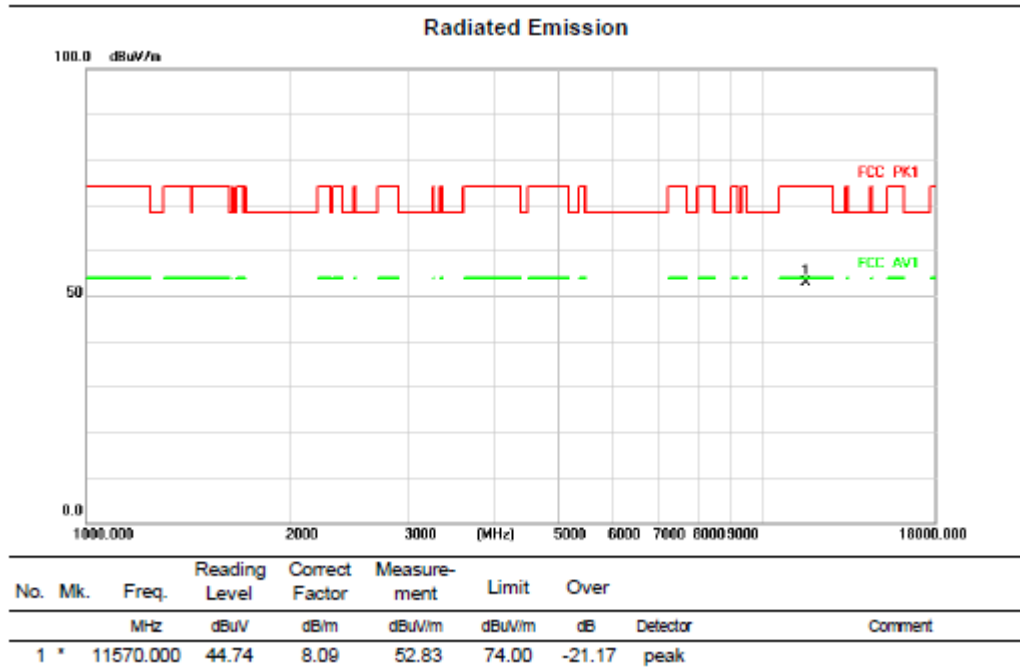
Test mode: 11N20

Test Channel:157

VERTICAL



HORIZONTAL



Above 1GHz (1GHz~18GHz)

Test mode: 11N20

Test Channel:165

VERTICAL

