

# FCC Part 15C Test Report

## FCC ID: 2AUVK-SLR12

|                  |                                                                                                                                                    |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name:    | RFID UHF Reader                                                                                                                                    |
| Trademark:       | N/A                                                                                                                                                |
| Model Name :     | SLR12<br>SR-1015, SR-5109, SR-5102, SR-5103, SR-5133U, SLR5, SLR10, SLR15, S5, S6, S8, S10, S602, V2000, SAC101, SACM1                             |
| Prepared For :   | SESAME ACCESS CO., LTD                                                                                                                             |
| Address :        | 308, Dongsheng Bd, Zhucun 6th Industry Zone, Tianhe Guangzhou, China, 510660                                                                       |
| Prepared By :    | Shenzhen BCTC Testing Co., Ltd.                                                                                                                    |
| Address :        | BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China |
| Test Date:       | Sep.23, 2019 – Oct. 11, 2019                                                                                                                       |
| Date of Report : | Oct. 11, 2019                                                                                                                                      |
| Report No.:      | BCTC-FY190906139E                                                                                                                                  |

## TEST RESULT CERTIFICATION

**Applicant's name** ..... : SESAME ACCESS CO., LTD

**Address** ..... : 308, Dongsheng Bd, Zhucun 6th Industry Zone, Tianhe  
Guangzhou, China, 510660

**Manufacture's Name**..... : SESAME ACCESS CO., LTD

**Address** ..... : 308, Dongsheng Bd, Zhucun 6th Industry Zone, Tianhe  
Guangzhou, China, 510660

### Product description

**Product name** ..... : RFID UHF Reader

**Trademark** ..... : N/A

**Model and/or type reference** : SLR12

SR-1015, SR-5109, SR-5102, SR-5103, SR-5133U, SLR5,  
SLR10, SLR15, S5, S6, S8, S10, S602, V2000, SAC101, SACM1

**Standards** ..... : FCC Part15.247

ANSI C63.10-2013

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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*This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen BCTC Technology Co., Ltd.*

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**11 . EUT PHOTO**

**50**

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.247) , Subpart C |                             |          |        |
|---------------------------------|-----------------------------|----------|--------|
| Standard Section                | Test Item                   | Judgment | Remark |
| 15.207                          | Conducted Emission          | PASS     |        |
| 15.247(a)(1)                    | Hopping Channel Separation  | PASS     |        |
| 15.247(b)(1)                    | Peak Output Power           | PASS     |        |
| 15.247(c)                       | Radiated Spurious Emission  | PASS     |        |
| 15.247(a)(iii)                  | Number of Hopping Frequency | PASS     |        |
| 15.247(a)(iii)                  | Dwell Time                  | PASS     |        |
| 15.247(a)(1)                    | Bandwidth                   | PASS     |        |
| 15.205                          | Band Edge Emission          | PASS     |        |
| 15.203                          | Antenna Requirement         | PASS     |        |

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

### 1.1 TEST FACILITY

Shenzhen BCTC Testing Co., Ltd.

Add.: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number:

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| No. | Item                         | Uncertainty               |
|-----|------------------------------|---------------------------|
| 1   | Conducted Emission Test      | $\pm 1.38\text{dB}$       |
| 2   | RF power,conducted           | $\pm 0.16\text{dB}$       |
| 3   | Spurious emissions,conducted | $\pm 0.21\text{dB}$       |
| 4   | All emissions,radiated(<1G)  | $\pm 4.68\text{dB}$       |
| 5   | All emissions,radiated(>1G)  | $\pm 4.89\text{dB}$       |
| 6   | Temperature                  | $\pm 0.5^{\circ}\text{C}$ |
| 7   | Humidity                     | $\pm 2\%$                 |

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                        |                                                                                                                                                                                                                    |                  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Equipment              | RFID UHF Reader                                                                                                                                                                                                    |                  |
| Trade Name             | N/A                                                                                                                                                                                                                |                  |
| Model Name             | SLR12<br>SR-1015, SR-5109, SR-5102, SR-5103, SR-5133U, SLR5, SLR10, SLR15, S5, S6, S8, S10, S602, V2000, SAC101, SACM1                                                                                             |                  |
| Model Difference       | All the model are the same circuit and RF module, except model names .                                                                                                                                             |                  |
| Product Description    | The EUT is a RFID UHF Reader                                                                                                                                                                                       |                  |
|                        | Operation Frequency:                                                                                                                                                                                               | 902.75-927.25MHz |
|                        | Modulation Type:                                                                                                                                                                                                   | FHSS(GFSK)       |
|                        | Number Of Channel                                                                                                                                                                                                  | 50CH             |
|                        | Antenna type:                                                                                                                                                                                                      | Internal antenna |
|                        | Antenna Gain (dBi)                                                                                                                                                                                                 | 0dBi             |
|                        | Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual. |                  |
| Channel List           | Please refer to the Note 2.                                                                                                                                                                                        |                  |
| Power                  | DC 12V from adapter                                                                                                                                                                                                |                  |
| Adapter                | Input: AC 100-240V 50/60Hz 1.5A MAX<br>Output: DC 12V 2.6A                                                                                                                                                         |                  |
| hardware version       | --                                                                                                                                                                                                                 |                  |
| Software version       | --                                                                                                                                                                                                                 |                  |
| Serial number          | --                                                                                                                                                                                                                 |                  |
| Connecting I/O Port(s) | Please refer to the User's Manual                                                                                                                                                                                  |                  |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



| 2. | Channel List |                        |    |                        |    |                        |    |                        |
|----|--------------|------------------------|----|------------------------|----|------------------------|----|------------------------|
|    | CH           | Center frequency (MHz) | CH | Center frequency (MHz) | CH | Center frequency (MHz) | CH | Center frequency (MHz) |
|    | 1            | 902.75                 | 14 | 909.25                 | 27 | 915.75                 | 39 | 921.75                 |
|    | 2            | 903.25                 | 15 | 909.75                 | 28 | 916.25                 | 40 | 922.25                 |
|    | 3            | 903.75                 | 16 | 910.25                 | 29 | 916.75                 | 41 | 922.75                 |
|    | 4            | 904.25                 | 17 | 910.75                 | 30 | 917.25                 | 42 | 923.25                 |
|    | 5            | 904.75                 | 18 | 911.25                 | 31 | 917.75                 | 43 | 923.75                 |
|    | 6            | 905.25                 | 19 | 911.75                 | 32 | 918.25                 | 44 | 924.25                 |
|    | 7            | 905.75                 | 20 | 912.25                 | 33 | 918.75                 | 45 | 924.75                 |
|    | 8            | 906.25                 | 21 | 912.75                 | 34 | 919.25                 | 46 | 925.25                 |
|    | 9            | 906.75                 | 22 | 913.25                 | 35 | 919.75                 | 47 | 925.75                 |
|    | 10           | 907.25                 | 23 | 913.75                 | 36 | 920.25                 | 48 | 926.25                 |
|    | 11           | 907.75                 | 24 | 914.25                 | 37 | 920.75                 | 49 | 926.75                 |
|    | 12           | 908.25                 | 25 | 914.75                 | 38 | 921.25                 | 50 | 927.25                 |
|    | 13           | 908.75                 | 26 | 915.25                 |    |                        |    |                        |

## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

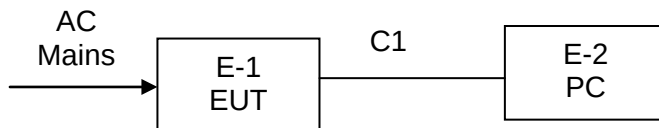
| Pretest Mode                      | Description |  |
|-----------------------------------|-------------|--|
| Mode 1                            | CH01        |  |
| Mode 2                            | CH25        |  |
| Mode 3                            | CH50        |  |
| Mode 4                            | Link Mode   |  |
| For Conducted & Radiated Emission |             |  |
| Final Test Mode                   | Description |  |
| Mode 1                            | CH01        |  |
| Mode 2                            | CH25        |  |
| Mode 3                            | CH50        |  |
| Mode 4                            | Link Mode   |  |

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) Directional Gain=0dBi+10log(4)=6.0dBi

## 2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated & Conducted Spurious Emission Test



## 2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment       | Mfr/Brand | Model/Type No. | Series No. | Note |
|------|-----------------|-----------|----------------|------------|------|
| E-1  | UHF Card Reader | N/A       | SLR12          | N/A        | EUT  |
| E-2  | PC              | ASUS      | AWT8000        | N/A        |      |
| E-2  | Adapter         | N/A       | DJ-U48S-1226   | N/A        | EUT  |

| Item | Shielded Type | Ferrite Core | Length | Note     |
|------|---------------|--------------|--------|----------|
| C1   | No            | No           | 1.5m   | USB Line |

Note:

- (1) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

## 2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 6db bandwidth test equipment

| Item | Equipment                        | Manufacturer | Type No.      | Serial No.    | Last calibration | Calibrated until |
|------|----------------------------------|--------------|---------------|---------------|------------------|------------------|
| 1    | Spectrum Analyzer (9kHz-26.5GHz) | Agilent      | E4407B        | MY45109572    | Jun. 13, 2019    | Jun. 12, 2020    |
| 2    | Test Receiver (9kHz-7GHz)        | R&S          | ESR7          | 101154        | Jun. 13, 2019    | Jun. 12, 2020    |
| 3    | Bilog Antenna (30MHz-3GHz)       | SCHWARZBECK  | VULB9163      | VULB9163-942  | Jun. 22, 2019    | Jun. 21, 2020    |
| 4    | Horn Antenna (1GHz-18GHz)        | SCHWARZBECK  | BBHA9120D     | 1541          | Jun. 22, 2019    | Jun. 21, 2020    |
| 5    | Horn Antenna (18GHz-40GHz)       | SCHWARZBECK  | BBHA9170      | 822           | Jun. 22, 2019    | Jun. 21, 2020    |
| 6    | Amplifier (9KHz-6GHz)            | SCHWARZBECK  | BBV9744       | 9744-0037     | Jun. 25, 2019    | Jun. 24, 2020    |
| 7    | Amplifier (0.5GHz-18GHz)         | SCHWARZBECK  | BBV9718       | 9718-309      | Jun. 25, 2019    | Jun. 24, 2020    |
| 8    | Amplifier (18GHz-40GHz)          | MITEQ        | TTA1840-35-HG | 2034381       | Jun. 17, 2019    | Jun. 16, 2020    |
| 9    | Loop Antenna (9KHz-30MHz)        | SCHWARZBECK  | FMZB1519B     | 014           | Jun. 25, 2019    | Jun. 24, 2020    |
| 10   | RF cables1 (9kHz-30MHz)          | Huber+Suhnar | 9kHz-30MHz    | B1702988-0008 | Jun. 25, 2019    | Jun. 24, 2020    |
| 11   | RF cables2 (30MHz-1GHz)          | Huber+Suhnar | 30MHz-1GHz    | 1486150       | Jun. 25, 2019    | Jun. 24, 2020    |
| 12   | RF cables3 (1GHz-40GHz)          | Huber+Suhnar | 1GHz-40GHz    | 1607106       | Jun. 25, 2019    | Jun. 24, 2020    |
| 13   | Power Metter                     | Keysight     | E4419         | \             | Jun. 17, 2019    | Jun. 16, 2020    |
| 14   | Power Sensor (AV)                | Keysight     | E9 300A       | \             | Jun. 17, 2019    | Jun. 16, 2020    |
| 15   | Signal Analyzer 20kHz-26.5GHz    | KEYSIGHT     | N9020A        | MY49100060    | Jun. 13, 2019    | Jun. 12, 2020    |
| 16   | Spectrum Analyzer 9kHz-40GHz     | Aglient      | FSP40         | 100363        | Jun. 13, 2019    | Jun. 12, 2020    |
| 17   | D.C. Power Supply                | LongWei      | TPR-6405D     | \             | \                | \                |
| 18   | Software                         | Frad         | EZ-EMC        | FA-03A2 RE    | \                | \                |

## Conduction Test equipment

| Item | Equipment     | Manufacturer    | Type No.   | Serial No.        | Last calibration | Calibrated until |
|------|---------------|-----------------|------------|-------------------|------------------|------------------|
| 1    | Test Receiver | R&S             | ESR3       | 102075            | Jun. 13, 2019    | Jun. 12, 2020    |
| 2    | LISN          | SCHWARZBEC<br>K | NSLK8127   | 8127739           | Jun. 13, 2019    | Jun. 12, 2020    |
| 3    | LISN          | R&S             | ENV216     | 101375            | Jun. 13, 2019    | Jun. 12, 2020    |
| 4    | RF cables     | Huber+Suhnar    | 9kHz-30MHz | B1702988-00<br>08 | Jun. 25, 2019    | Jun. 24, 2020    |
| 5    | Software      | Frad            | EZ-EMC     | EMC-CON<br>3A1    | \                | \                |

### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Limit (dBuV) |           | Standard |
|-----------------|--------------|-----------|----------|
|                 | Quasi-peak   | Average   |          |
| 0.15 -0.5       | 66 - 56 *    | 56 - 46 * | FCC      |
| 0.50 -5.0       | 56.00        | 46.00     | FCC      |
| 5.0 -30.0       | 60.00        | 50.00     | FCC      |

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |

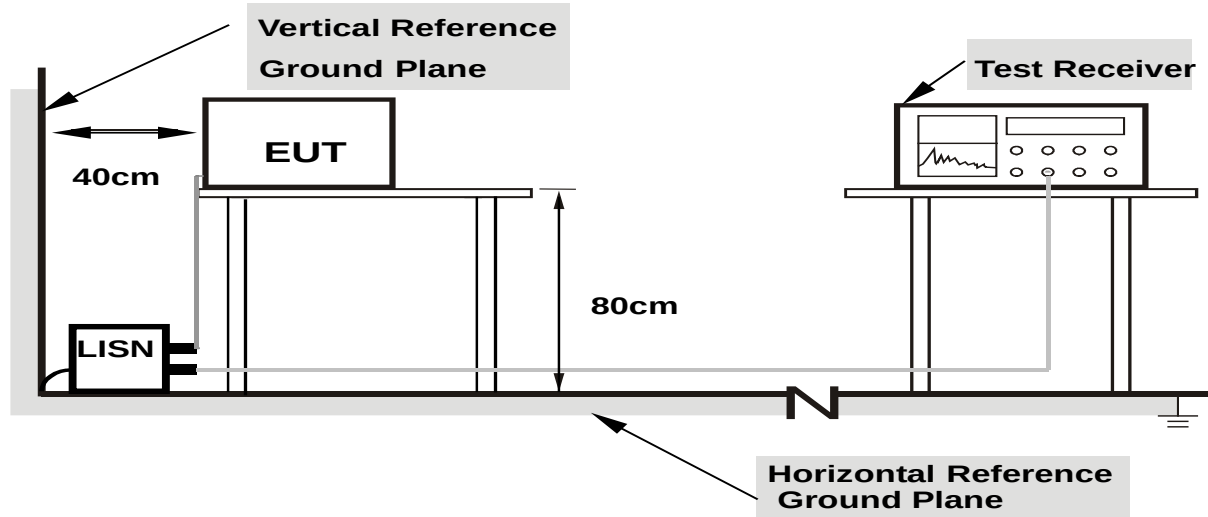
##### 3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

##### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



**Note: 1.Support units were connected to second LISN.**

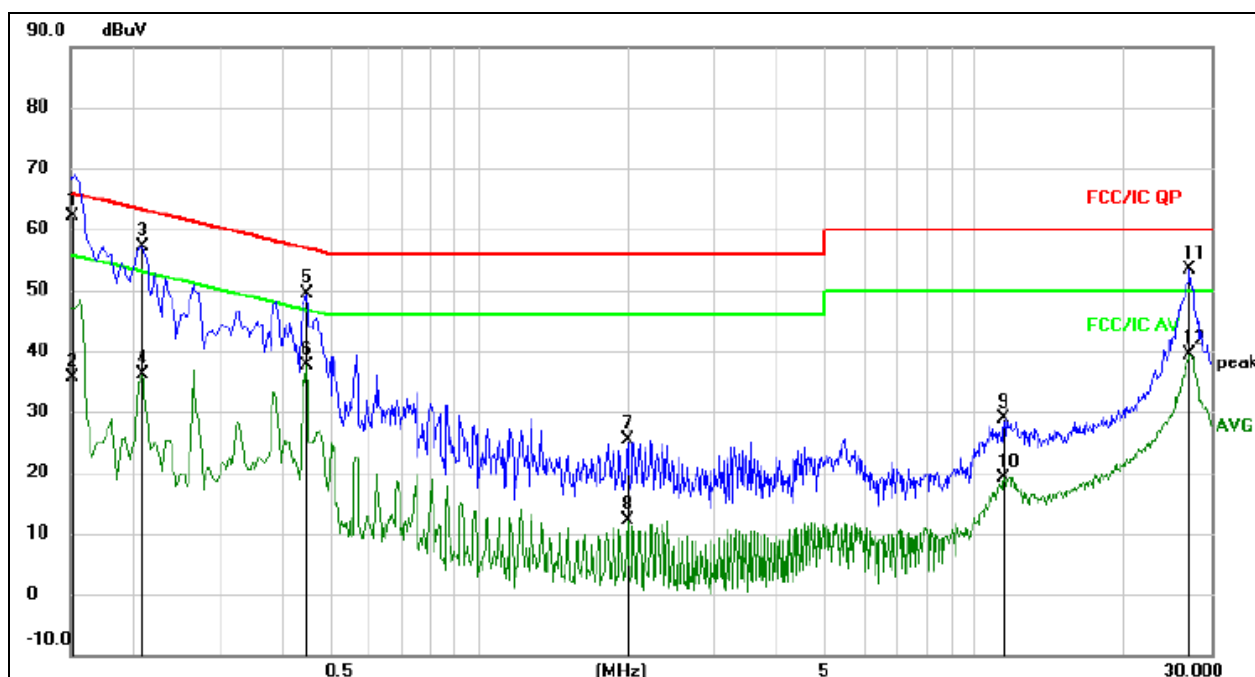
**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

### 3.1.6 TEST RESULTS

|                |              |                     |        |
|----------------|--------------|---------------------|--------|
| Temperature :  | 26 °C        | Relative Humidity : | 54%    |
| Pressure :     | 101kPa       | Phase :             | L      |
| Test Voltage : | AC 120V/60Hz | Test Mode :         | Mode 4 |

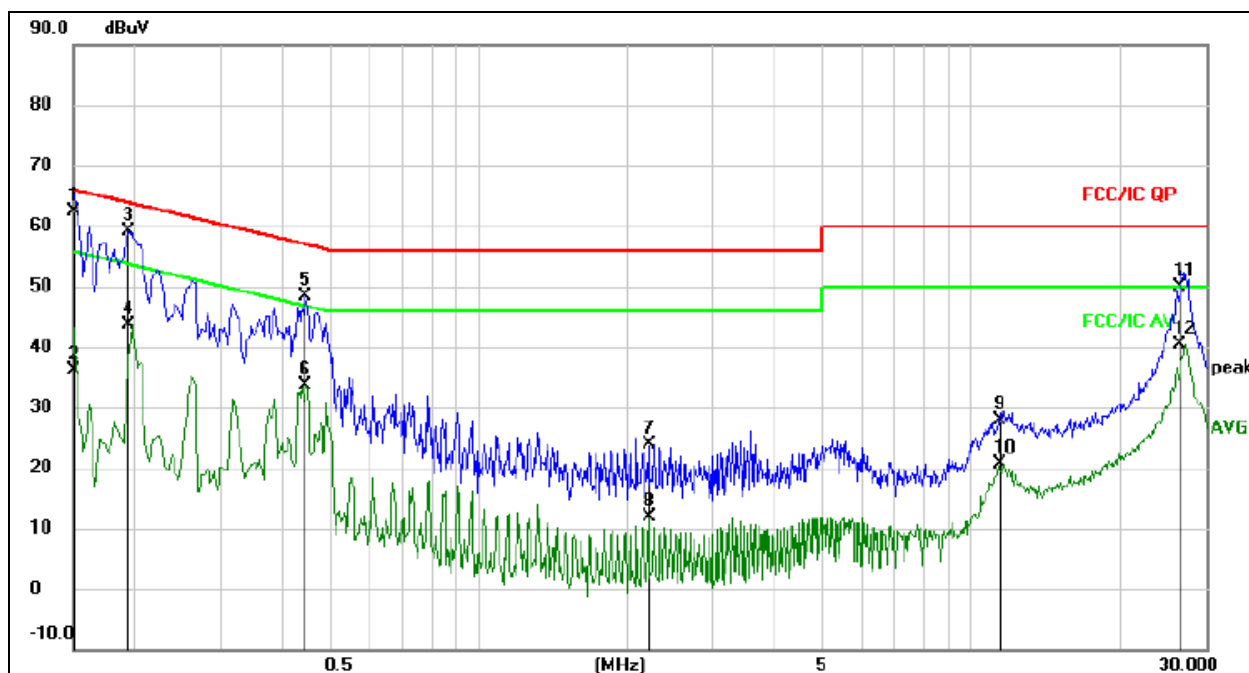


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------|--------------------------|---------------|------------|----------|
| 1   | *   | 0.1510       | 52.62                    | 9.52              | 62.14                    | 65.94         | -3.80      | QP       |
| 2   |     | 0.1510       | 26.06                    | 9.52              | 35.58                    | 55.94         | -20.36     | AVG      |
| 3   |     | 0.2100       | 47.61                    | 9.47              | 57.08                    | 63.21         | -6.13      | QP       |
| 4   |     | 0.2100       | 26.71                    | 9.47              | 36.18                    | 53.21         | -17.03     | AVG      |
| 5   |     | 0.4500       | 39.96                    | 9.54              | 49.50                    | 56.88         | -7.38      | QP       |
| 6   |     | 0.4500       | 27.99                    | 9.54              | 37.53                    | 46.88         | -9.35      | AVG      |
| 7   |     | 1.9940       | 15.83                    | 9.59              | 25.42                    | 56.00         | -30.58     | QP       |
| 8   |     | 1.9940       | 2.46                     | 9.59              | 12.05                    | 46.00         | -33.95     | AVG      |
| 9   |     | 11.4780      | 19.10                    | 9.69              | 28.79                    | 60.00         | -31.21     | QP       |
| 10  |     | 11.4780      | 9.49                     | 9.69              | 19.18                    | 50.00         | -30.82     | AVG      |
| 11  |     | 27.1620      | 43.58                    | 9.73              | 53.31                    | 60.00         | -6.69      | QP       |
| 12  |     | 27.1620      | 29.65                    | 9.73              | 39.38                    | 50.00         | -10.62     | AVG      |

|                |              |                     |        |
|----------------|--------------|---------------------|--------|
| Temperature :  | 26 °C        | Relative Humidity : | 54%    |
| Pressure :     | 101kPa       | Phase :             | N      |
| Test Voltage : | AC 120V/60Hz | Test Mode :         | Mode 4 |



Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------|--------------------------|---------------|------------|----------|
| 1   | *   | 0.1510       | 52.87                    | 9.52              | 62.39                    | 65.94         | -3.55      | QP       |
| 2   |     | 0.1510       | 26.72                    | 9.52              | 36.24                    | 55.94         | -19.70     | AVG      |
| 3   |     | 0.1940       | 49.56                    | 9.47              | 59.03                    | 63.86         | -4.83      | QP       |
| 4   |     | 0.1940       | 34.11                    | 9.47              | 43.58                    | 53.86         | -10.28     | AVG      |
| 5   |     | 0.4460       | 38.76                    | 9.54              | 48.30                    | 56.95         | -8.65      | QP       |
| 6   |     | 0.4460       | 24.09                    | 9.54              | 33.63                    | 46.95         | -13.32     | AVG      |
| 7   |     | 2.2180       | 14.33                    | 9.61              | 23.94                    | 56.00         | -32.06     | QP       |
| 8   |     | 2.2180       | 2.34                     | 9.61              | 11.95                    | 46.00         | -34.05     | AVG      |
| 9   |     | 11.4060      | 18.10                    | 9.69              | 27.79                    | 60.00         | -32.21     | QP       |
| 10  |     | 11.4060      | 10.89                    | 9.69              | 20.58                    | 50.00         | -29.42     | AVG      |
| 11  |     | 26.6820      | 40.08                    | 9.73              | 49.81                    | 60.00         | -10.19     | QP       |
| 12  |     | 26.6820      | 30.74                    | 9.73              | 40.47                    | 50.00         | -9.53      | AVG      |



### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

| Frequencies<br>(MHz) | Field Strength<br>(micorvolts/meter) | Measurement Distance<br>(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                                |

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

| FREQUENCY (MHz) | Limit (dBuV/m) (at 3M) |         |
|-----------------|------------------------|---------|
|                 | PEAK                   | AVERAGE |
| Above 1000      | 74                     | 54      |

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

| Spectrum Parameter                    | Setting                                          |
|---------------------------------------|--------------------------------------------------|
| Attenuation                           | Auto                                             |
| Start Frequency                       | 1000 MHz                                         |
| Stop Frequency                        | 25GHz                                            |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |

| Receiver Parameter     | Setting                          |
|------------------------|----------------------------------|
| Attenuation            | Auto                             |
| Start ~ Stop Frequency | 9kHz~150kHz / RB 200Hz for QP    |
| Start ~ Stop Frequency | 150kHz~30MHz / RB 9kHz for QP    |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB 120kHz for QP |

### 3.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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.
- The antenna height 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.
- 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre( Above 18GHz the distance is 1 meter and table is 1.5 metre).
- Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

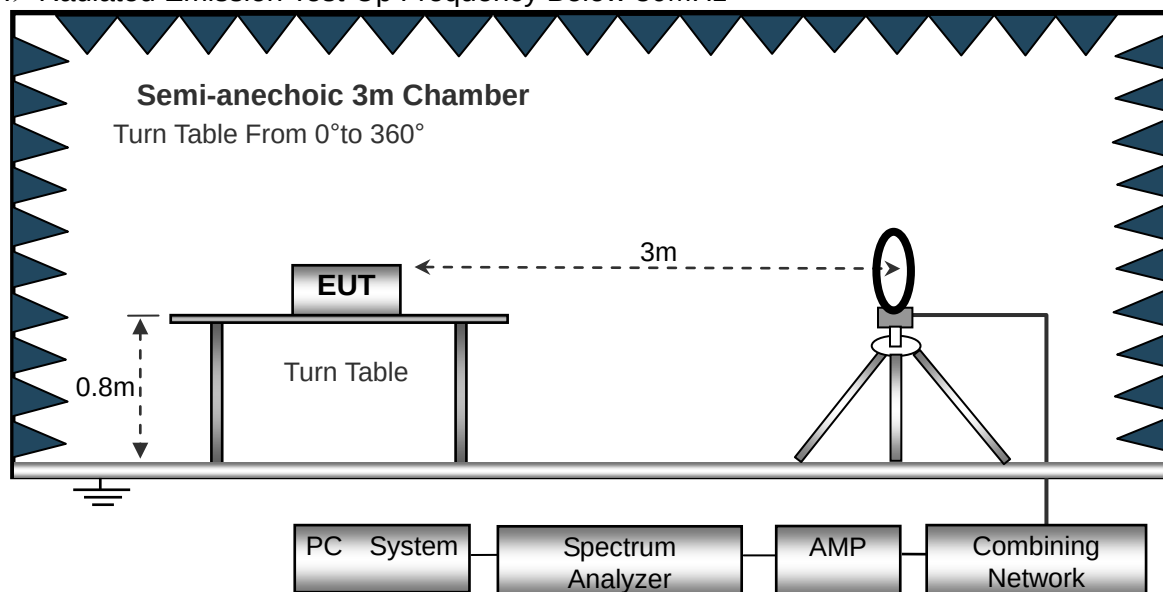
Both horizontal and vertical antenna polarities were tested  
and performed pretest to three orthogonal axis. The worst case emissions were reported

### 3.2.3 DEVIATION FROM TEST STANDARD

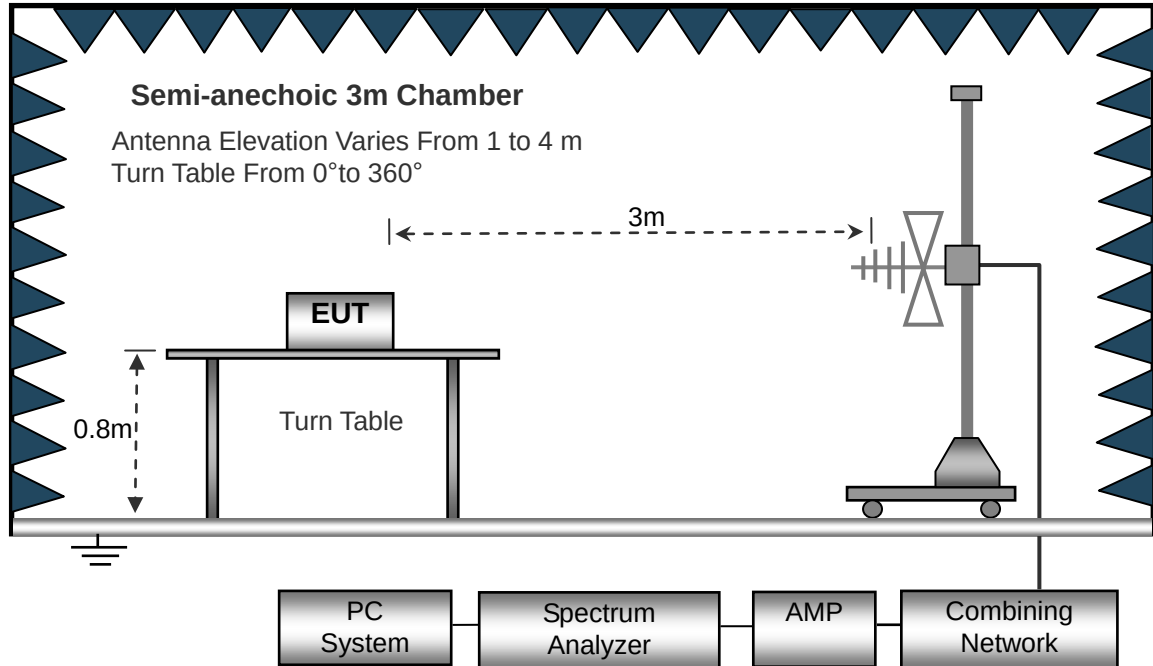
No deviation

### 3.2.4 TEST SETUP

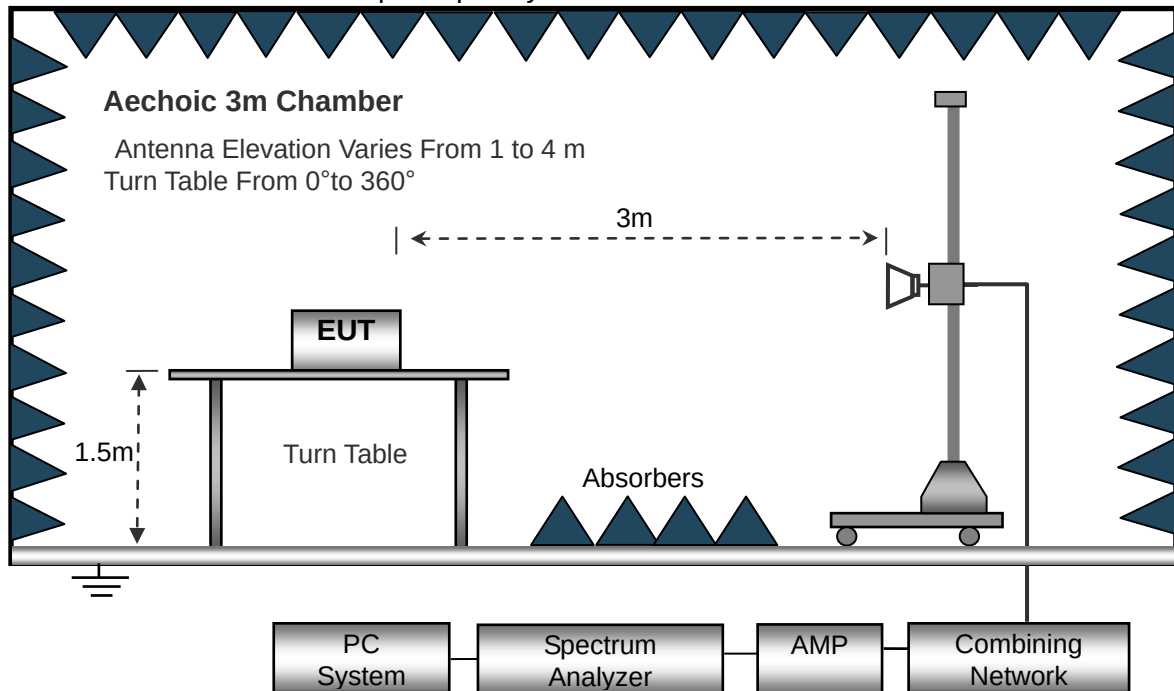
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



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



### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

|              |         |                    |                                          |
|--------------|---------|--------------------|------------------------------------------|
| Temperature: | 26°C    | Relative Humidity: | 54%                                      |
| Pressure:    | 101 kPa | Test Voltage :     | DC 9V from adapter<br>input AC 120V/60Hz |
| Test Mode :  | Mode 4  | Polarization :     | --                                       |

| Freq. | Reading  | Limit    | Margin | State |
|-------|----------|----------|--------|-------|
| (MHz) | (dBuV/m) | (dBuV/m) | (dB)   | P/F   |
| --    | --       | --       | --     | PASS  |
| --    | --       | --       | --     | PASS  |

#### NOTE:

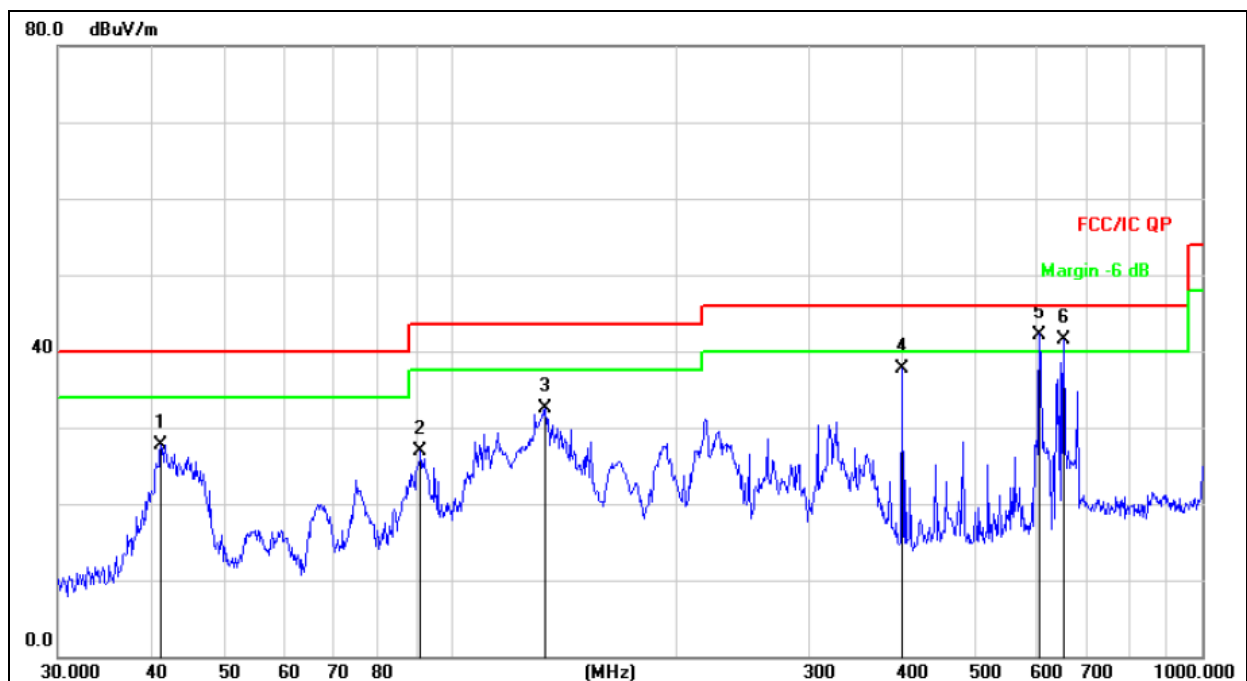
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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

Limit line = specific limits(dBuv) + distance extrapolation factor.

### 3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

|                |                                        |                     |            |
|----------------|----------------------------------------|---------------------|------------|
| Temperature :  | 26°C                                   | Relative Humidity : | 54%        |
| Pressure :     | 101 kPa                                | Polarization :      | Horizontal |
| Test Voltage : | DC 12V from adapter input AC 120V/60Hz |                     |            |
| Test Mode :    | Mode 4                                 |                     |            |

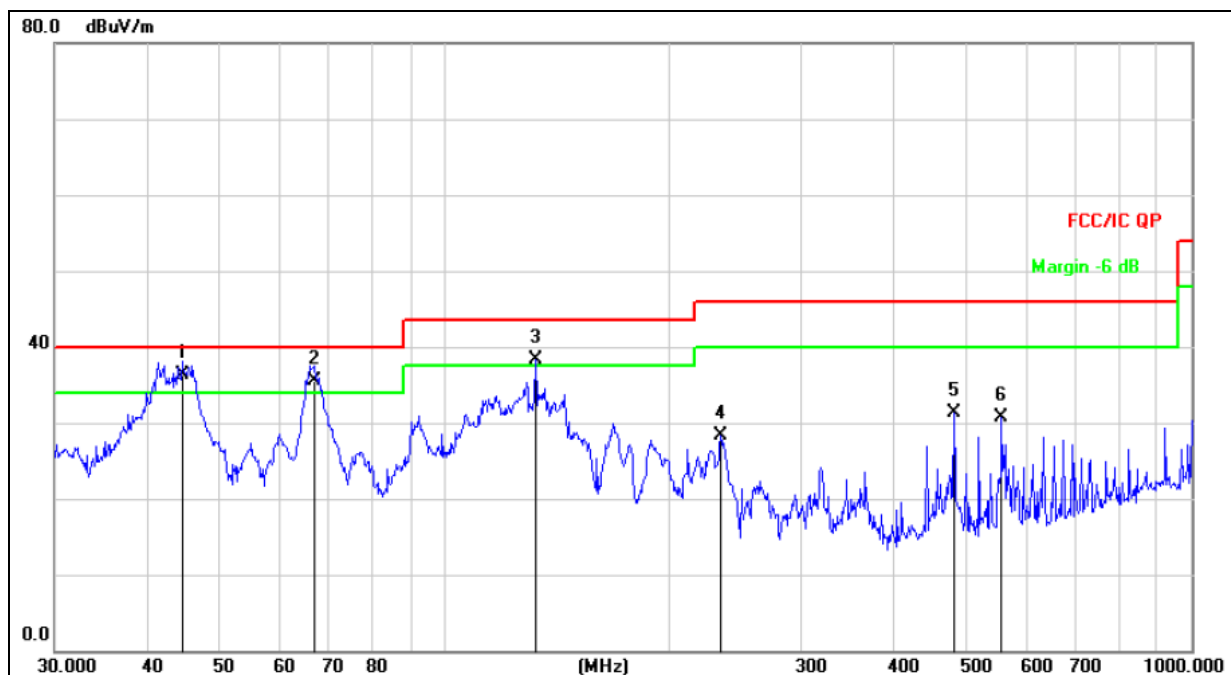


Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit | Over   |          |
|-----|-----|----------|---------------|----------------|-------------|-------|--------|----------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dB/m  | dB     | Detector |
| 1   |     | 41.1319  | 43.05         | -15.35         | 27.70       | 40.00 | -12.30 | QP       |
| 2   |     | 91.1745  | 44.80         | -17.89         | 26.91       | 43.50 | -16.59 | QP       |
| 3   |     | 133.6187 | 50.99         | -18.45         | 32.54       | 43.50 | -10.96 | QP       |
| 4   |     | 399.0300 | 48.74         | -11.11         | 37.63       | 46.00 | -8.37  | QP       |
| 5   | *   | 607.7866 | 48.76         | -6.56          | 42.20       | 46.00 | -3.80  | QP       |
| 6   | !   | 654.2318 | 48.11         | -6.67          | 41.44       | 46.00 | -4.56  | QP       |

|                |                                        |                     |          |
|----------------|----------------------------------------|---------------------|----------|
| Temperature :  | 26°C                                   | Relative Humidity : | 54%      |
| Pressure :     | 101 kPa                                | Polarization :      | Vertical |
| Test Voltage : | DC 12V from adapter input AC 120V/60Hz |                     |          |
| Test Mode :    | Mode 4                                 |                     |          |



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

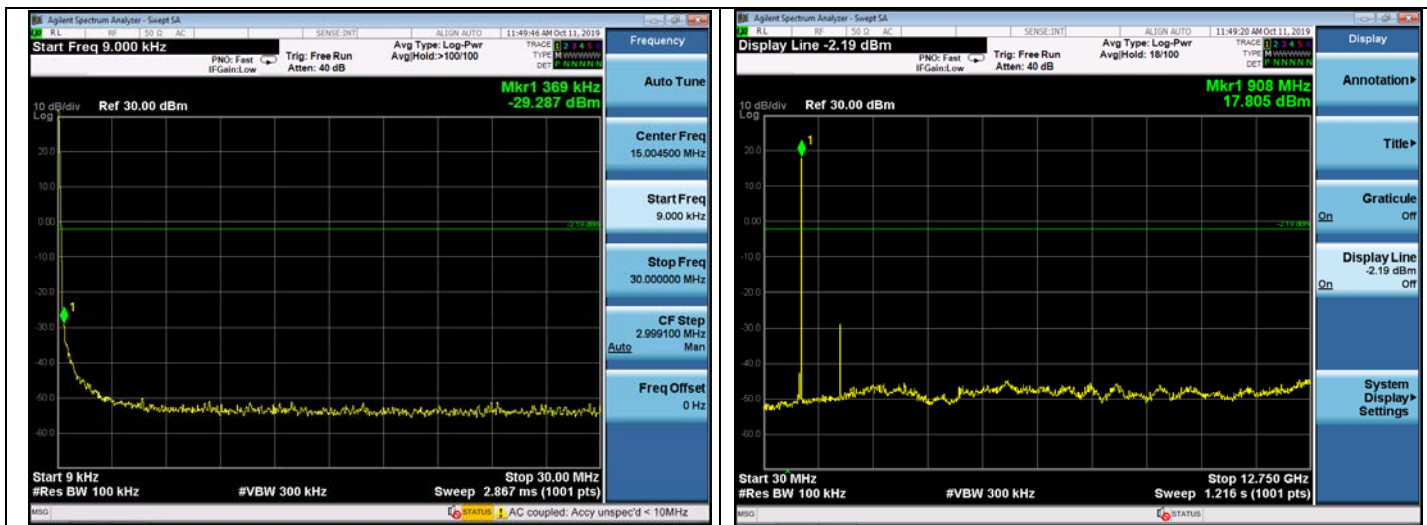
| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit | Over   |          |
|-----|-----|----------|---------------|----------------|-------------|-------|--------|----------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dB/m  | dB     | Detector |
| 1   | *   | 44.4307  | 51.41         | -15.16         | 36.25       | 40.00 | -3.75  | QP       |
| 2   | !   | 66.7325  | 52.94         | -17.45         | 35.49       | 40.00 | -4.51  | QP       |
| 3   | !   | 132.2205 | 56.63         | -18.36         | 38.27       | 43.50 | -5.23  | QP       |
| 4   |     | 234.1683 | 43.85         | -15.51         | 28.34       | 46.00 | -17.66 | QP       |
| 5   |     | 480.5276 | 40.72         | -9.34          | 31.38       | 46.00 | -14.62 | QP       |
| 6   |     | 556.7744 | 38.19         | -7.52          | 30.67       | 46.00 | -15.33 | QP       |

### 3.2.8 TEST RESULTS (1GHZ~11GHZ)

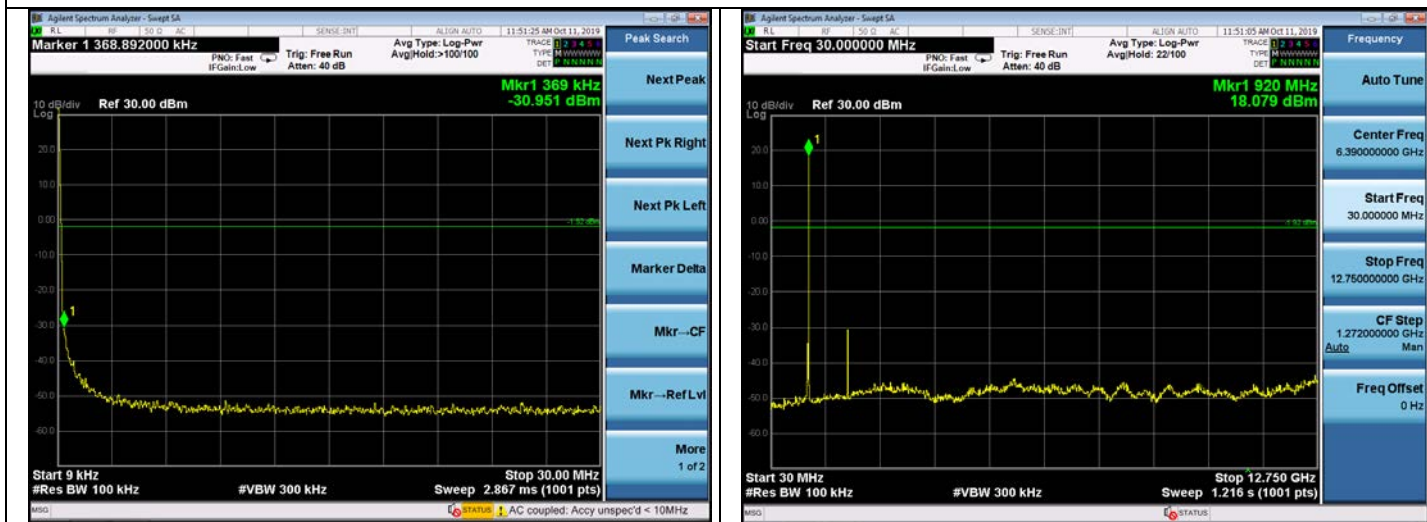
| Polar<br>(H/V)                                                                                                                                                                                                                                                                                                                                            | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Pre-<br>amplifier<br>(dB) | Cable<br>Loss<br>(dB) | Antenna<br>Factor<br>(dB/m) | Emission<br>Level<br>(dBuV/m) | Limits<br>(dBuV/m) | Margin<br>(dB) | Detector<br>Type |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|---------------------------|-----------------------|-----------------------------|-------------------------------|--------------------|----------------|------------------|
| <b>operation frequency:902.75</b>                                                                                                                                                                                                                                                                                                                         |                    |                            |                           |                       |                             |                               |                    |                |                  |
| V                                                                                                                                                                                                                                                                                                                                                         | 1805.50            | 53.25                      | 33.75                     | 5.38                  | 20.46                       | 45.34                         | 74.00              | -28.66         | PK               |
| V                                                                                                                                                                                                                                                                                                                                                         | 1805.50            | 44.36                      | 33.75                     | 5.38                  | 20.46                       | 36.45                         | 54.00              | -17.55         | AV               |
| V                                                                                                                                                                                                                                                                                                                                                         | 2708.25            | 52.69                      | 34.45                     | 6.61                  | 21.57                       | 46.42                         | 74.00              | -27.58         | PK               |
| V                                                                                                                                                                                                                                                                                                                                                         | 2708.25            | 45.30                      | 34.45                     | 6.61                  | 21.57                       | 39.03                         | 54.00              | -14.97         | AV               |
| V                                                                                                                                                                                                                                                                                                                                                         | 10308.00           | 53.01                      | 36.29                     | 9.16                  | 24.57                       | 50.45                         | 74.00              | -23.55         | PK               |
| H                                                                                                                                                                                                                                                                                                                                                         | 1805.50            | 54.25                      | 33.75                     | 5.38                  | 20.46                       | 46.34                         | 74.00              | -27.66         | PK               |
| H                                                                                                                                                                                                                                                                                                                                                         | 1805.50            | 46.35                      | 33.75                     | 5.38                  | 20.46                       | 38.44                         | 54.00              | -15.56         | AV               |
| H                                                                                                                                                                                                                                                                                                                                                         | 2708.25            | 51.36                      | 34.45                     | 6.61                  | 21.57                       | 45.09                         | 74.00              | -28.91         | PK               |
| H                                                                                                                                                                                                                                                                                                                                                         | 2708.25            | 40.36                      | 34.45                     | 6.61                  | 21.57                       | 34.09                         | 54.00              | -19.91         | AV               |
| H                                                                                                                                                                                                                                                                                                                                                         | 10308.00           | 52.14                      | 36.29                     | 9.16                  | 24.57                       | 49.58                         | 74.00              | -24.42         | PK               |
| <b>operation frequency:914.75</b>                                                                                                                                                                                                                                                                                                                         |                    |                            |                           |                       |                             |                               |                    |                |                  |
| V                                                                                                                                                                                                                                                                                                                                                         | 1829.50            | 52.14                      | 33.75                     | 5.38                  | 20.46                       | 44.23                         | 74.00              | -29.77         | PK               |
| V                                                                                                                                                                                                                                                                                                                                                         | 1829.50            | 45.36                      | 33.75                     | 5.38                  | 20.46                       | 37.45                         | 54.00              | -16.55         | AV               |
| V                                                                                                                                                                                                                                                                                                                                                         | 2744.25            | 51.36                      | 34.45                     | 6.61                  | 21.57                       | 45.09                         | 74.00              | -28.91         | PK               |
| V                                                                                                                                                                                                                                                                                                                                                         | 2744.25            | 40.49                      | 34.45                     | 6.61                  | 21.57                       | 34.22                         | 54.00              | -19.78         | AV               |
| V                                                                                                                                                                                                                                                                                                                                                         | 10308.00           | 53.16                      | 36.29                     | 9.16                  | 24.57                       | 50.60                         | 74.00              | -23.40         | PK               |
| H                                                                                                                                                                                                                                                                                                                                                         | 1829.50            | 50.47                      | 33.75                     | 5.38                  | 20.46                       | 42.56                         | 74.00              | -31.44         | PK               |
| H                                                                                                                                                                                                                                                                                                                                                         | 1829.50            | 41.36                      | 33.75                     | 5.38                  | 20.46                       | 33.45                         | 54.00              | -20.55         | AV               |
| H                                                                                                                                                                                                                                                                                                                                                         | 2744.25            | 48.36                      | 34.45                     | 6.61                  | 21.57                       | 42.09                         | 74.00              | -31.91         | PK               |
| H                                                                                                                                                                                                                                                                                                                                                         | 2744.25            | 40.25                      | 34.45                     | 6.61                  | 21.57                       | 33.98                         | 54.00              | -20.02         | AV               |
| H                                                                                                                                                                                                                                                                                                                                                         | 10308.00           | 51.36                      | 36.29                     | 9.16                  | 24.57                       | 48.80                         | 74.00              | -25.20         | PK               |
| <b>operation frequency:927.25</b>                                                                                                                                                                                                                                                                                                                         |                    |                            |                           |                       |                             |                               |                    |                |                  |
| V                                                                                                                                                                                                                                                                                                                                                         | 1854.50            | 52.36                      | 33.75                     | 5.38                  | 20.46                       | 44.45                         | 74.00              | -29.55         | PK               |
| V                                                                                                                                                                                                                                                                                                                                                         | 1854.50            | 43.52                      | 33.75                     | 5.38                  | 20.46                       | 35.61                         | 54.00              | -18.39         | AV               |
| V                                                                                                                                                                                                                                                                                                                                                         | 2781.75            | 52.01                      | 34.45                     | 6.61                  | 21.57                       | 45.74                         | 74.00              | -28.26         | PK               |
| V                                                                                                                                                                                                                                                                                                                                                         | 2781.75            | 44.21                      | 34.45                     | 6.61                  | 21.57                       | 37.94                         | 54.00              | -16.06         | AV               |
| V                                                                                                                                                                                                                                                                                                                                                         | 10308.00           | 50.38                      | 36.29                     | 9.16                  | 24.57                       | 47.82                         | 74.00              | -26.18         | PK               |
| H                                                                                                                                                                                                                                                                                                                                                         | 1854.50            | 51.24                      | 33.75                     | 5.38                  | 20.46                       | 43.33                         | 74.00              | -30.67         | PK               |
| H                                                                                                                                                                                                                                                                                                                                                         | 1854.50            | 44.35                      | 33.75                     | 5.38                  | 20.46                       | 36.44                         | 54.00              | -17.56         | AV               |
| H                                                                                                                                                                                                                                                                                                                                                         | 2781.75            | 52.04                      | 34.45                     | 6.61                  | 21.57                       | 45.77                         | 74.00              | -28.23         | PK               |
| H                                                                                                                                                                                                                                                                                                                                                         | 2781.75            | 43.33                      | 34.45                     | 6.61                  | 21.57                       | 37.06                         | 54.00              | -16.94         | AV               |
| H                                                                                                                                                                                                                                                                                                                                                         | 10308.00           | 50.38                      | 36.29                     | 9.16                  | 24.57                       | 47.82                         | 74.00              | -26.18         | PK               |
| <b>Remark:</b><br>1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,<br>Margin= Emission Level - Limit<br>2. If peak below the average limit, the average emission was no test.<br>3. The amplitude of spurious emissions which are attenuated by more than 20dB below the<br>permissible value has no need to be reported. |                    |                            |                           |                       |                             |                               |                    |                |                  |



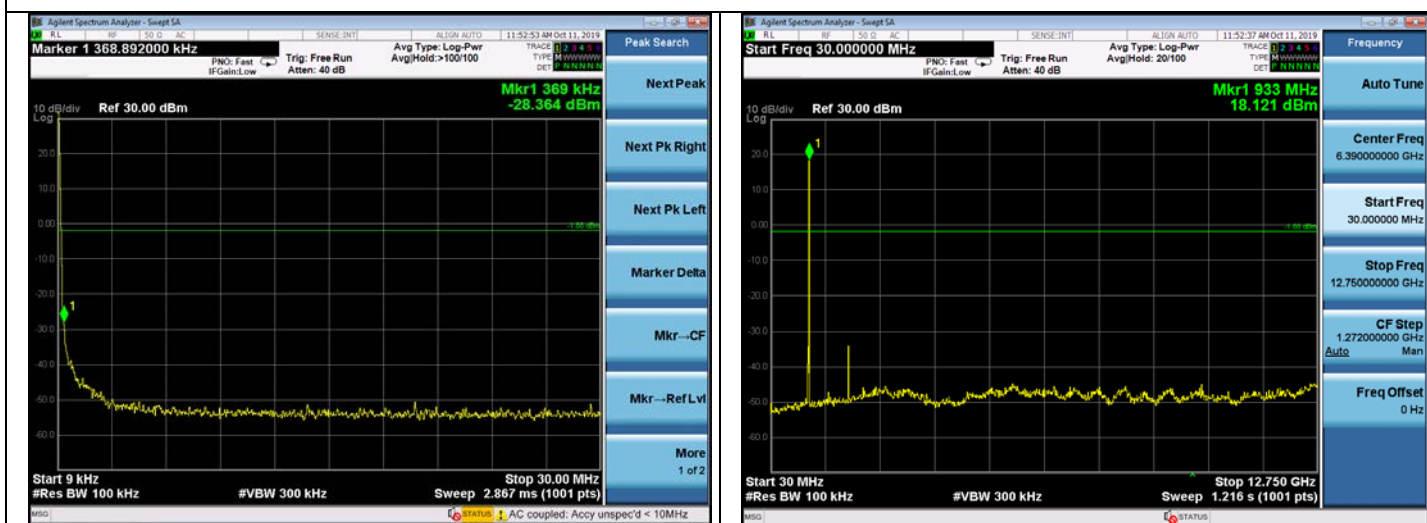
For Conducted



Lowest channel



Middle channel



Highest channel



### 3.3 RADIATED BAND EMISSION MEASUREMENT

#### 3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.205

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

| FREQUENCY (MHz) | Limit (dBuV/m) (at 3M) |         |
|-----------------|------------------------|---------|
|                 | PEAK                   | AVERAGE |
| Above 1000      | 74                     | 54      |

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

| Spectrum Parameter                    | Setting                                          |
|---------------------------------------|--------------------------------------------------|
| Attenuation                           | Auto                                             |
| Start Frequency                       | 2300MHz                                          |
| Stop Frequency                        | 2520                                             |
| RB / VB (emission in restricted band) | 1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average |

#### 3.3.2 TEST PROCEDURE

Above 1GHz test procedure as below:

- a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. 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 antenna height 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel,the Highest channel

Note:

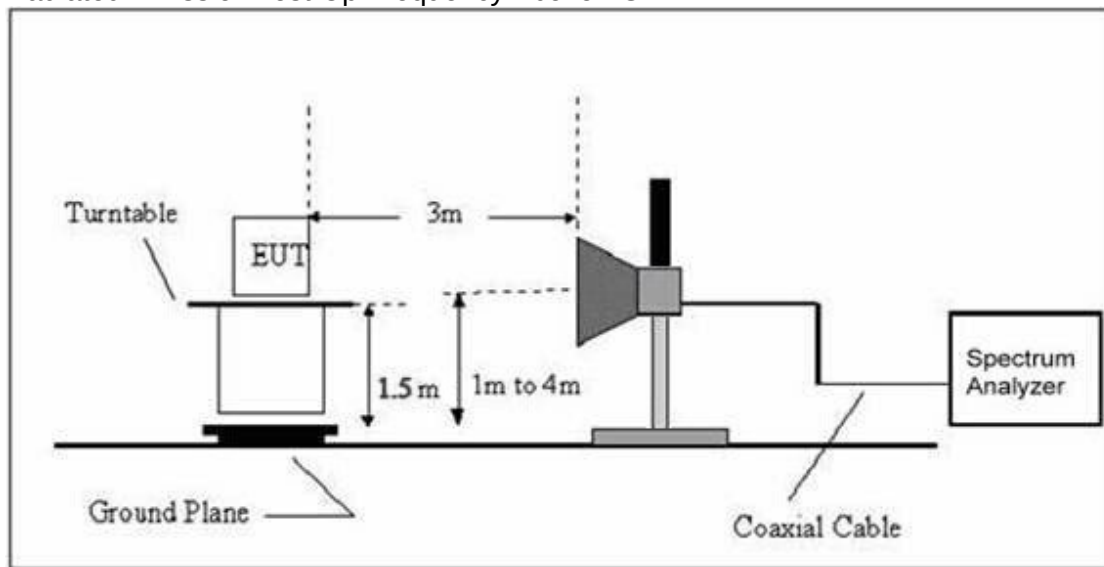
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

### 3.3.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.3.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz

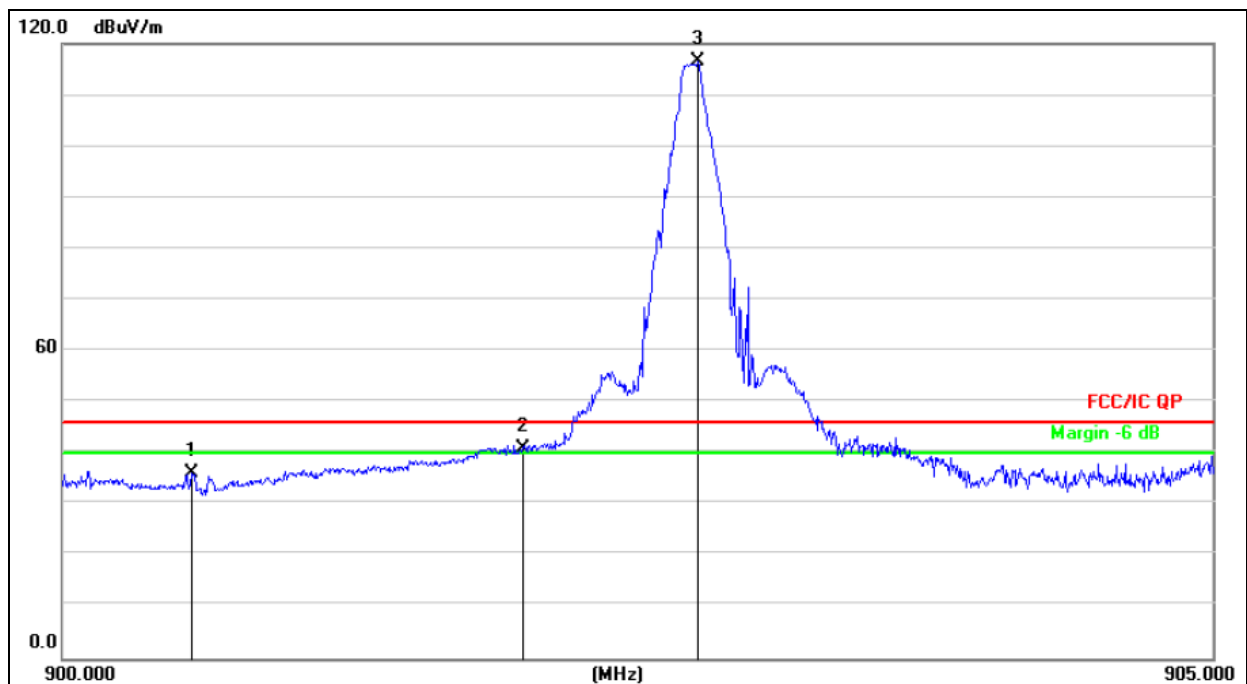


### 3.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

### 3.3.6 TEST RESULT

|                |                                       |                     |            |
|----------------|---------------------------------------|---------------------|------------|
| Temperature :  | 26 °C                                 | Relative Humidity : | 54%        |
| Pressure :     | 101 kPa                               | Polarization :      | Horizontal |
| Test Voltage : | DC 9V from adapter input AC 120V/60Hz |                     |            |
| Test Mode :    | Mode 1                                |                     |            |

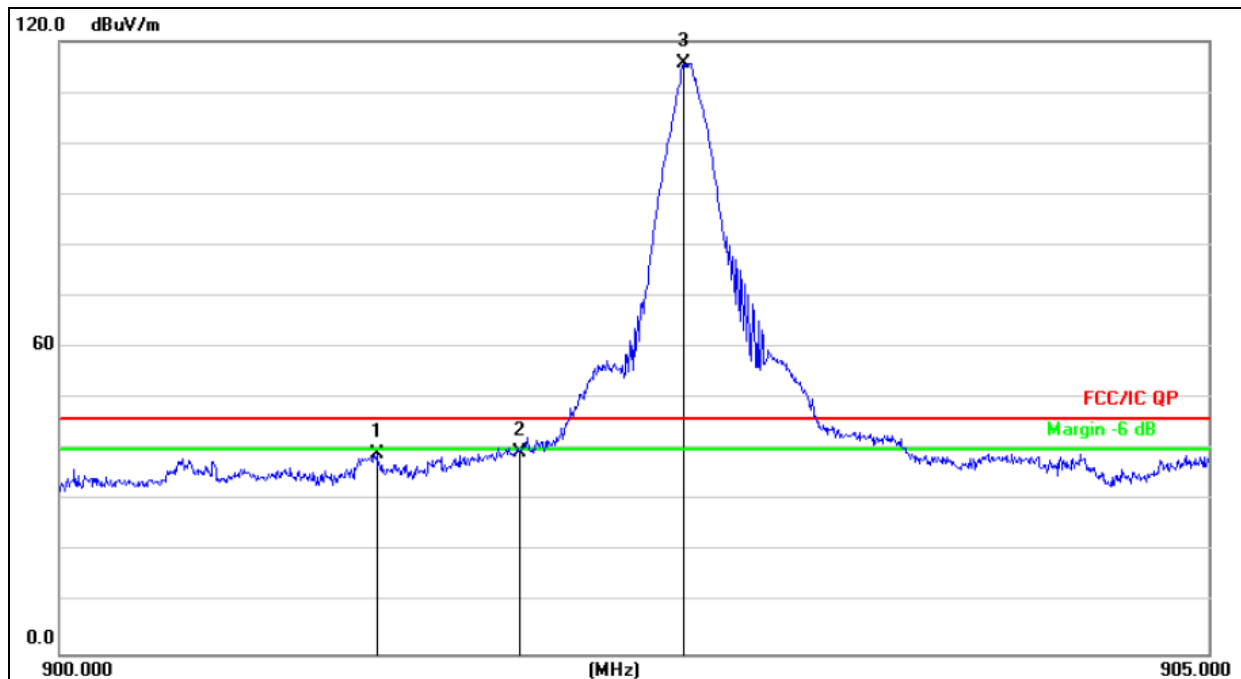


Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dB/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|---------------|------------|----------|
| 1   |     | 900.5599     | 37.69                    | -1.50                   | 36.19                      | 46.00         | -9.81      | peak     |
| 2   | !   | 902.0000     | 42.46                    | -1.48                   | 40.98                      | 46.00         | -5.02      | peak     |
| 3   | *   | 902.7599     | 117.95                   | -1.48                   | 116.47                     | 46.00         | 70.47      | peak     |

|                |                                       |                     |          |
|----------------|---------------------------------------|---------------------|----------|
| Temperature :  | 26 °C                                 | Relative Humidity : | 54%      |
| Pressure :     | 101 kPa                               | Polarization :      | Vertical |
| Test Voltage : | DC 9V from adapter input AC 120V/60Hz |                     |          |
| Test Mode :    | Mode 1                                |                     |          |

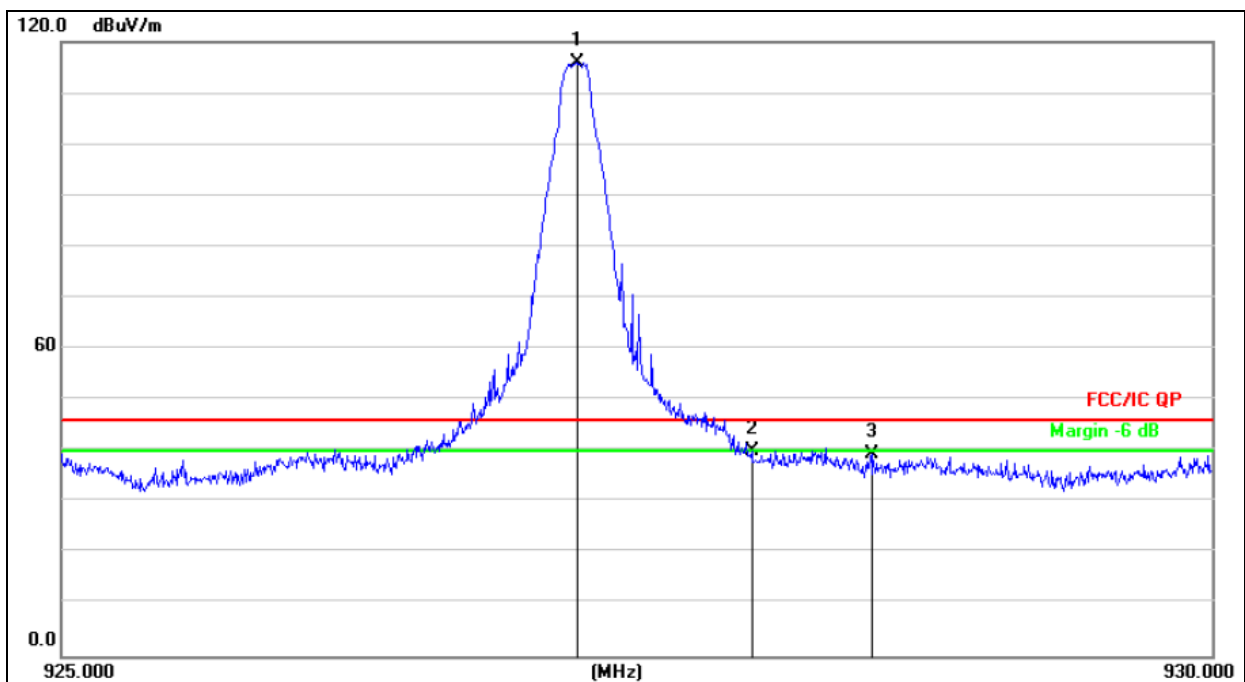


Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dB/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|---------------|------------|----------|
| 1   |     | 901.3799     | 40.54                    | -1.49                   | 39.05                      | 46.00         | -6.95      | peak     |
| 2   |     | 902.0000     | 40.93                    | -1.48                   | 39.45                      | 46.00         | -6.55      | peak     |
| 3   | *   | 902.7150     | 117.24                   | -1.48                   | 115.76                     | 46.00         | 69.76      | peak     |

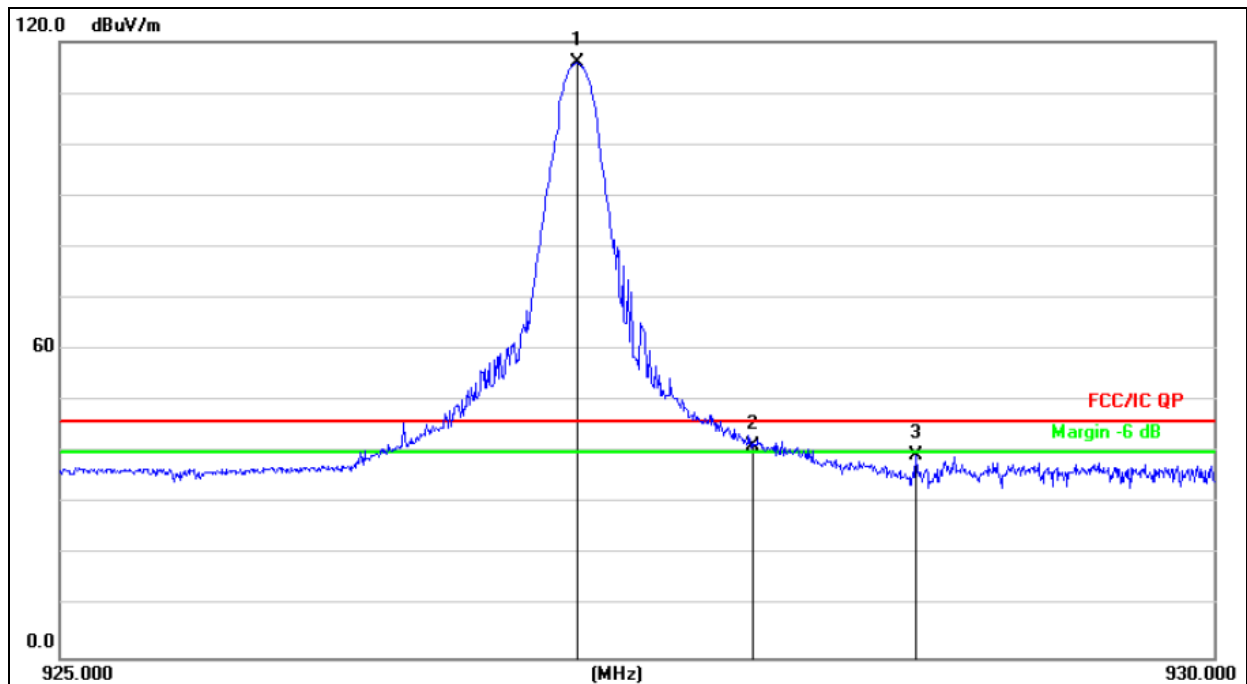
|                |                                        |                     |            |
|----------------|----------------------------------------|---------------------|------------|
| Temperature :  | 26 °C                                  | Relative Humidity : | 54%        |
| Pressure :     | 101 kPa                                | Polarization :      | Horizontal |
| Test Voltage : | DC 12V from adapter input AC 120V/60Hz |                     |            |
| Test Mode :    | Mode 4                                 |                     |            |



Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit | Over  |          |
|-----|-----|----------|---------------|----------------|-------------|-------|-------|----------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dBm   | dB    | Detector |
| 1   | *   | 927.2400 | 117.12        | -1.29          | 115.83      | 46.00 | 69.83 | peak     |
| 2   |     | 928.0000 | 41.24         | -1.28          | 39.96       | 46.00 | -6.04 | peak     |
| 3   |     | 928.5200 | 40.70         | -1.28          | 39.42       | 46.00 | -6.58 | peak     |

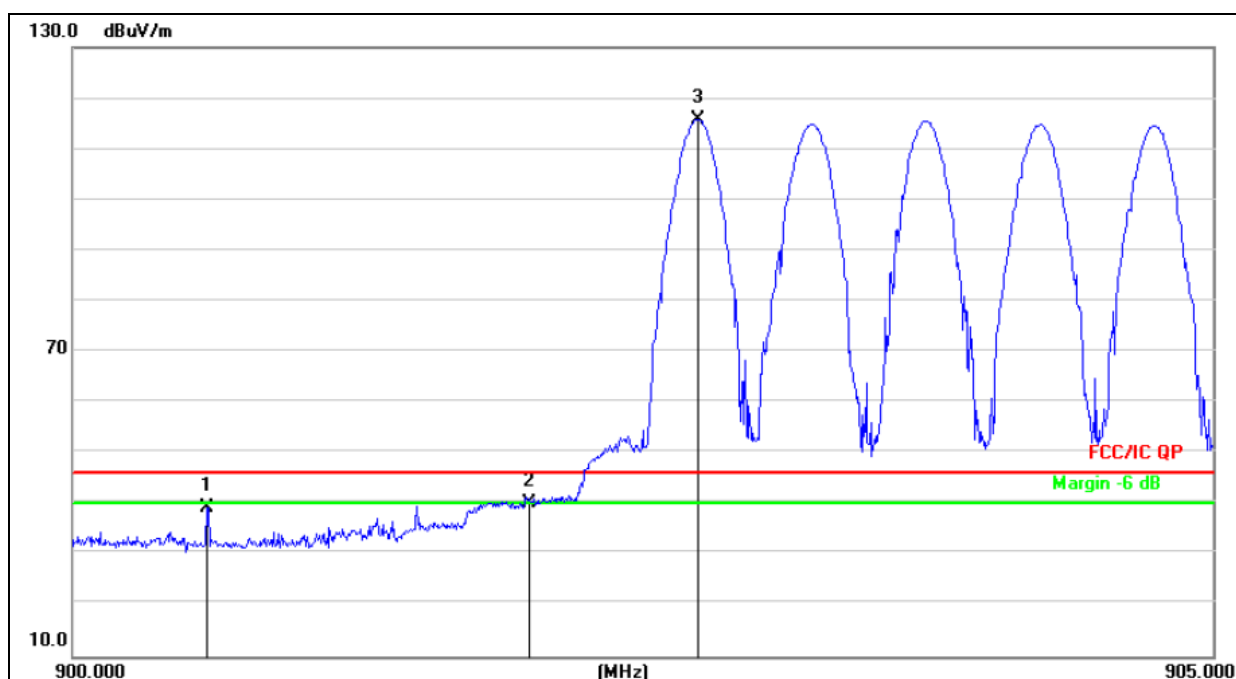
|                |                                        |                     |          |
|----------------|----------------------------------------|---------------------|----------|
| Temperature :  | 26 °C                                  | Relative Humidity : | 54%      |
| Pressure :     | 101 kPa                                | Polarization :      | Vertical |
| Test Voltage : | DC 12V from adapter input AC 120V/60Hz |                     |          |
| Test Mode :    | Mode 4                                 |                     |          |



Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit | Over  |          |
|-----|-----|----------|---------------|----------------|-------------|-------|-------|----------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dB/m  | dB    | Detector |
| 1   | *   | 927.2400 | 117.14        | -1.29          | 115.85      | 46.00 | 69.85 | peak     |
| 2   | !   | 928.0000 | 42.55         | -1.28          | 41.27       | 46.00 | -4.73 | peak     |
| 3   |     | 928.7100 | 40.65         | -1.28          | 39.37       | 46.00 | -6.63 | peak     |

|                |                                        |                     |            |
|----------------|----------------------------------------|---------------------|------------|
| Temperature :  | 26 °C                                  | Relative Humidity : | 54%        |
| Pressure :     | 101 kPa                                | Polarization :      | Horizontal |
| Test Voltage : | DC 12V from adapter input AC 120V/60Hz |                     |            |
| Test Mode :    | Hopping                                |                     |            |

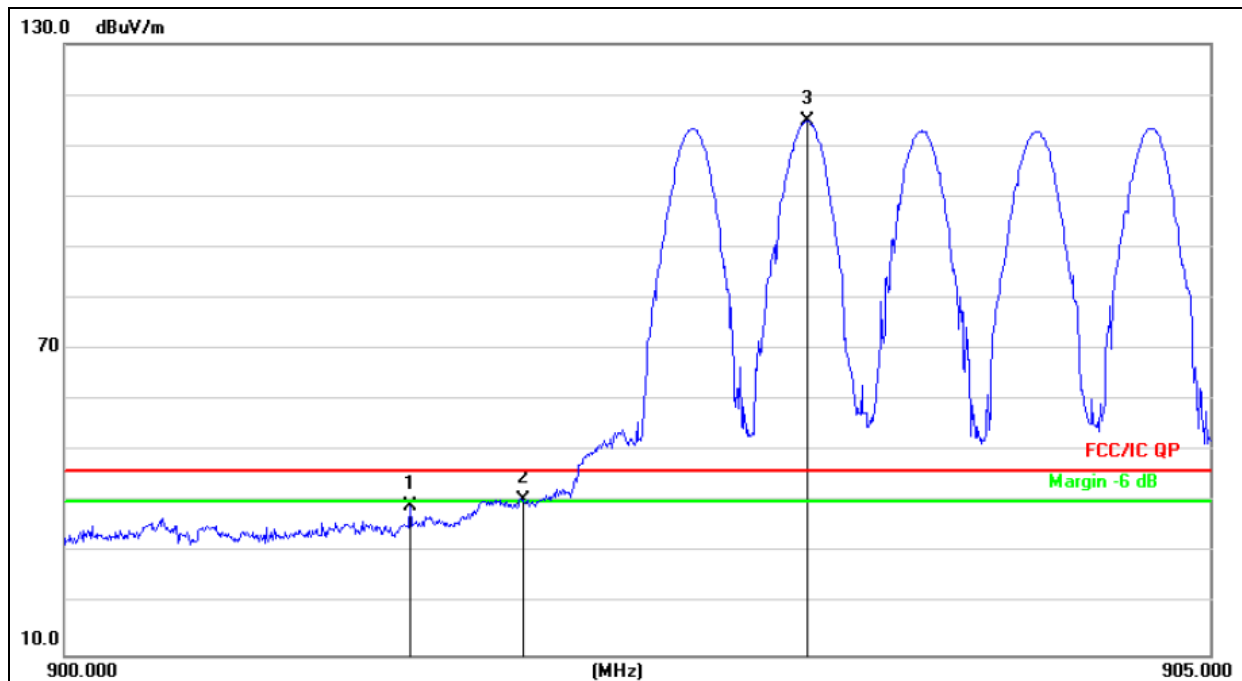


Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dB/m | Over<br>dB | Detector |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|---------------|------------|----------|
| 1   |     | 900.5900     | 40.89                    | -1.50                   | 39.39                      | 46.00         | -6.61      | peak     |
| 2   | !   | 902.0000     | 41.54                    | -1.48                   | 40.06                      | 46.00         | -5.94      | peak     |
| 3   | *   | 902.7400     | 117.32                   | -1.48                   | 115.84                     | 46.00         | 69.84      | peak     |

|                |                                        |                     |          |
|----------------|----------------------------------------|---------------------|----------|
| Temperature :  | 26 °C                                  | Relative Humidity : | 54%      |
| Pressure :     | 101 kPa                                | Polarization :      | Vertical |
| Test Voltage : | DC 12V from adapter input AC 120V/60Hz |                     |          |
| Test Mode :    | Hopping                                |                     |          |



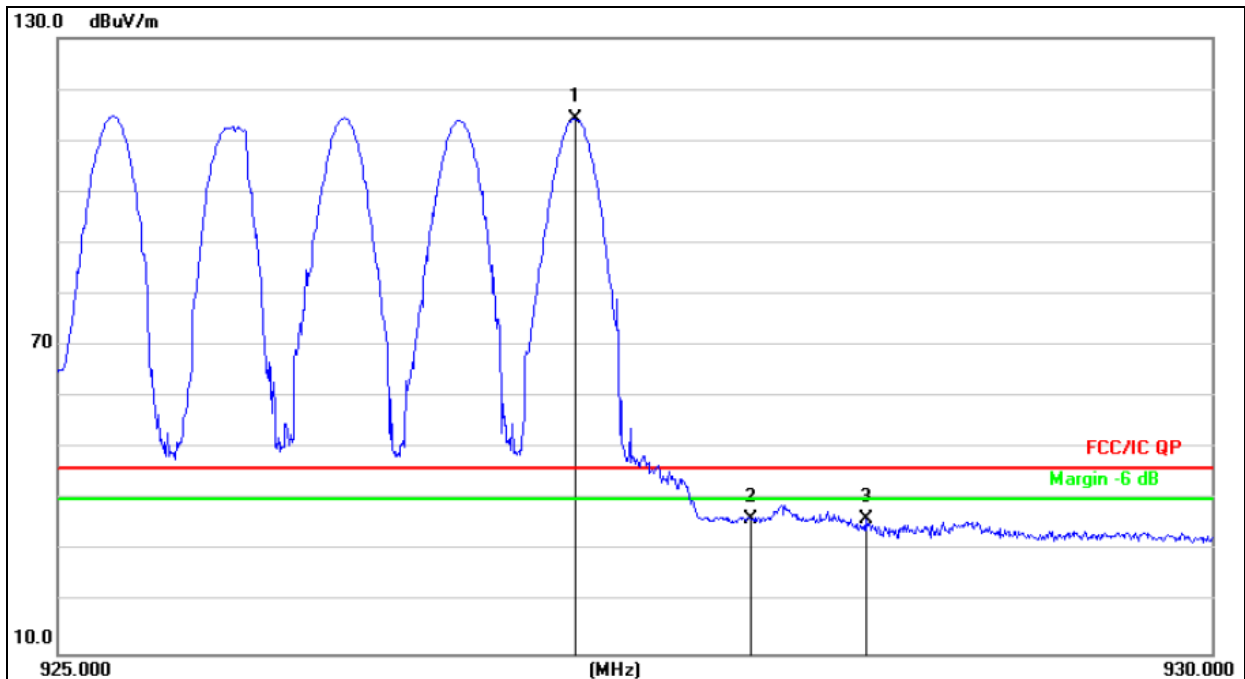
Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit | Over  |          |
|-----|-----|----------|---------------|----------------|-------------|-------|-------|----------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dB/m  | dB    | Detector |
| 1   |     | 901.5071 | 40.67         | -1.49          | 39.18       | 46.00 | -6.82 | peak     |
| 2   | !   | 902.0000 | 41.97         | -1.48          | 40.49       | 46.00 | -5.51 | peak     |
| 3   | *   | 903.2368 | 116.28        | -1.47          | 114.81      | 46.00 | 68.81 | peak     |



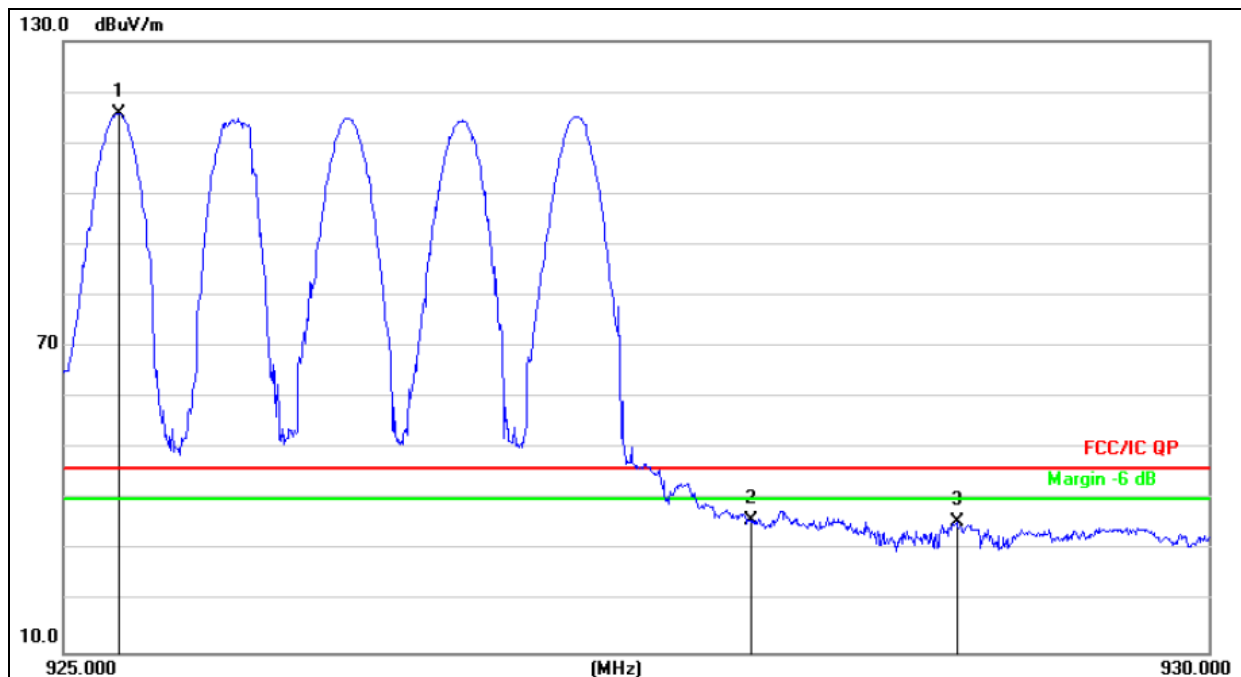
|                |                                        |                     |            |
|----------------|----------------------------------------|---------------------|------------|
| Temperature :  | 26 °C                                  | Relative Humidity : | 54%        |
| Pressure :     | 101 kPa                                | Polarization :      | Horizontal |
| Test Voltage : | DC 12V from adapter input AC 120V/60Hz |                     |            |
| Test Mode :    | Hopping                                |                     |            |



Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit | Over  | Detector |
|-----|-----|----------|---------------|----------------|-------------|-------|-------|----------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dB/m  | dB    |          |
| 1   | *   | 927.2400 | 115.51        | -1.29          | 114.22      | 46.00 | 68.22 | peak     |
| 2   |     | 928.0000 | 37.47         | -1.28          | 36.19       | 46.00 | -9.81 | peak     |
| 3   |     | 928.5000 | 37.43         | -1.28          | 36.15       | 46.00 | -9.85 | peak     |

|                |                                        |                     |          |
|----------------|----------------------------------------|---------------------|----------|
| Temperature :  | 26 °C                                  | Relative Humidity : | 54%      |
| Pressure :     | 101 kPa                                | Polarization :      | Vertical |
| Test Voltage : | DC 12V from adapter input AC 120V/60Hz |                     |          |
| Test Mode :    | Hopping                                |                     |          |



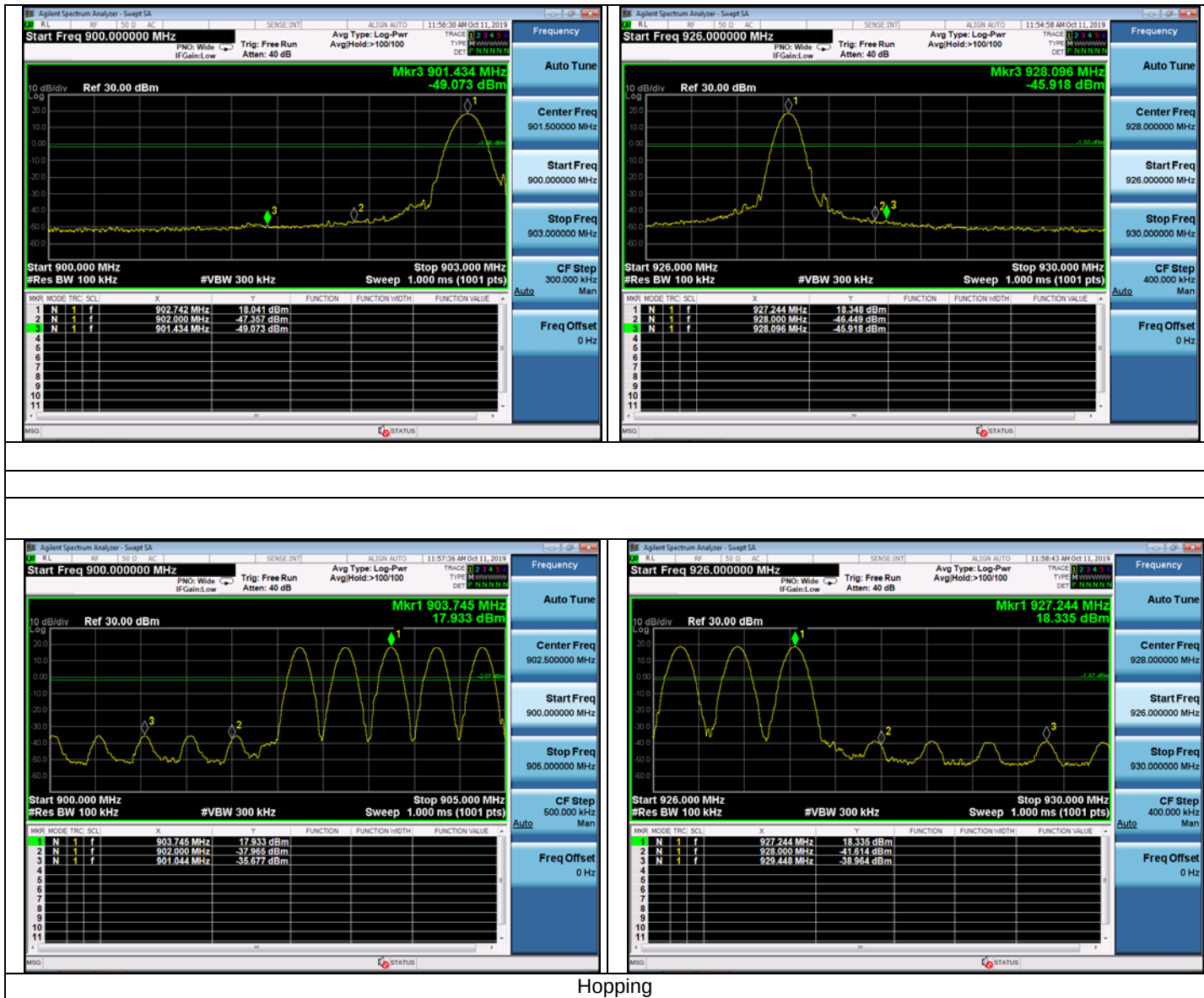
Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit | Over   |          |
|-----|-----|----------|---------------|----------------|-------------|-------|--------|----------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dB/m  | dB     | Detector |
| 1   | *   | 925.2394 | 117.12        | -1.30          | 115.82      | 46.00 | 69.82  | peak     |
| 2   |     | 928.0000 | 37.15         | -1.28          | 35.87       | 46.00 | -10.13 | peak     |
| 3   |     | 928.8977 | 36.79         | -1.27          | 35.52       | 46.00 | -10.48 | peak     |



For Conducted  
Unhopping



## 4. BANDWIDTH TEST

### 4.1 APPLIED PROCEDURES / LIMIT

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

#### 4.1.1 TEST PROCEDURE

1. Set RBW = 1%-5%OBW.
2. Set the video bandwidth (VBW)  $\geq 3 \times \text{RBW}$ .
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

#### 4.1.2 DEVIATION FROM STANDARD

No deviation.

#### 4.1.3 TEST SETUP



#### 4.1.4 EUT OPERATION CONDITIONS

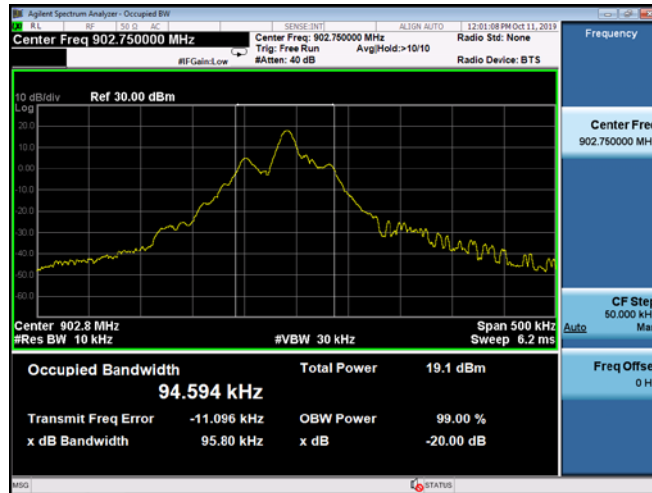
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.1.5 TEST RESULTS

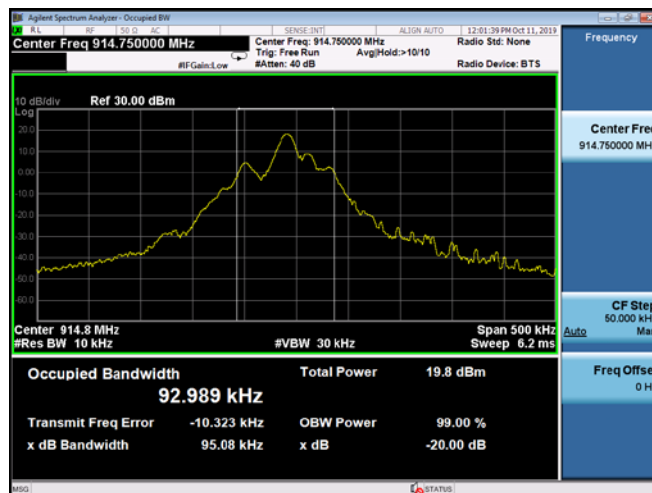
|               |                           |                     |                                           |
|---------------|---------------------------|---------------------|-------------------------------------------|
| Temperature : | 26°C                      | Relative Humidity : | 54%                                       |
| Pressure :    | 1012 hPa                  | Test Voltage :      | DC 12V from adapter input<br>AC 120V/60Hz |
| Test Mode :   | TX Mode /CH01, CH25, CH50 |                     |                                           |

|      | Frequency<br>(MHz) | 20dB Bandwidth<br>(kHz) | Result |
|------|--------------------|-------------------------|--------|
| GFSK | 902.75             | 95.80                   | Pass   |
|      | 914.75             | 95.08                   | Pass   |
|      | 927.25             | 94.88                   | Pass   |

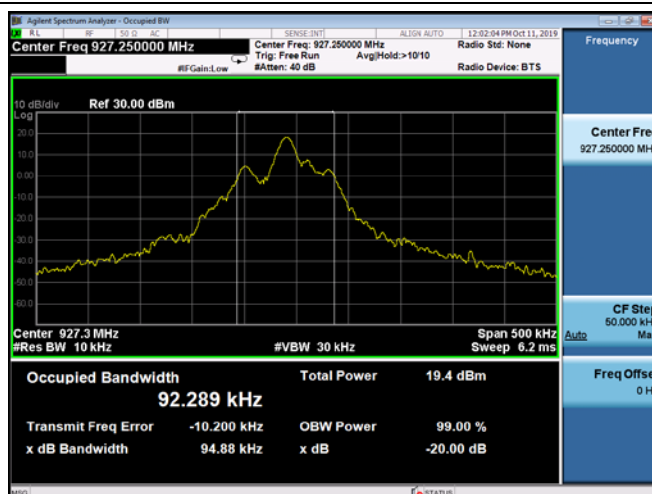
### TX CH 01



### TX CH 25



### TX CH 50



## 5. NUMBER OF HOPPING CHANNEL

### 5.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C |                           |           |                       |        |
|---------------------------------|---------------------------|-----------|-----------------------|--------|
| Section                         | Test Item                 | Limit     | Frequency Range (MHz) | Result |
| 15.247<br>(a)(1)(iii)           | Number of Hopping Channel | $\geq 50$ | 902-928               | PASS   |

| Spectrum Parameters | Setting                           |
|---------------------|-----------------------------------|
| Attenuation         | Auto                              |
| Span Frequency      | = the frequency band of operation |
| RB                  | $RBW \geq 1\%$ of the span        |
| VB                  | $VBW \geq RBW$                    |
| Detector            | Peak                              |
| Trace               | Max Hold                          |
| Sweep Time          | Auto                              |

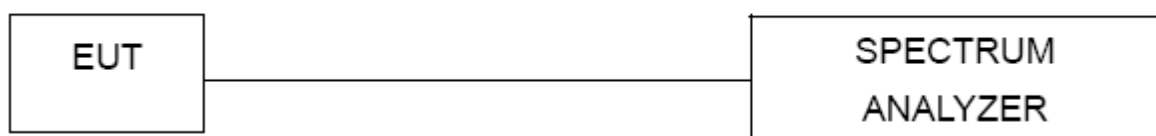
#### 5.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting :  $RBW = 100\text{KHz}$ ,  $VBW = 3\text{fere3rddrrnryyt566tryiugmj00KHz}$ , Sweep time = Auto.

#### 5.1.2 DEVIATION FROM STANDARD

No deviation.

#### 5.1.3 TEST SETUP



#### 5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 5.1.5 TEST RESULTS

|               |              |                     |                                           |
|---------------|--------------|---------------------|-------------------------------------------|
| Temperature : | 26 °C        | Relative Humidity : | 54%                                       |
| Pressure :    | 101 kPa      | Test Voltage :      | DC 12V from adapter input<br>AC 120V/60Hz |
| Test Mode :   | Hopping Mode |                     |                                           |

| Number of Hopping Channel | Limit | Result |
|---------------------------|-------|--------|
| 50                        | ≥50   | PASS   |





## 6. AVERAGE TIME OF OCCUPANCY

### 6.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C |                           |        |                       |        |
|---------------------------------|---------------------------|--------|-----------------------|--------|
| Section                         | Test Item                 | Limit  | Frequency Range (MHz) | Result |
| 15.247<br>(a)(1)(iii)           | Average Time of Occupancy | 0.4sec | 902-928               | PASS   |

#### 6.1.1 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyzer
- Set RBW of spectrum analyzer to 100KHz and VBW to 300KHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

#### 6.1.3 TEST SETUP



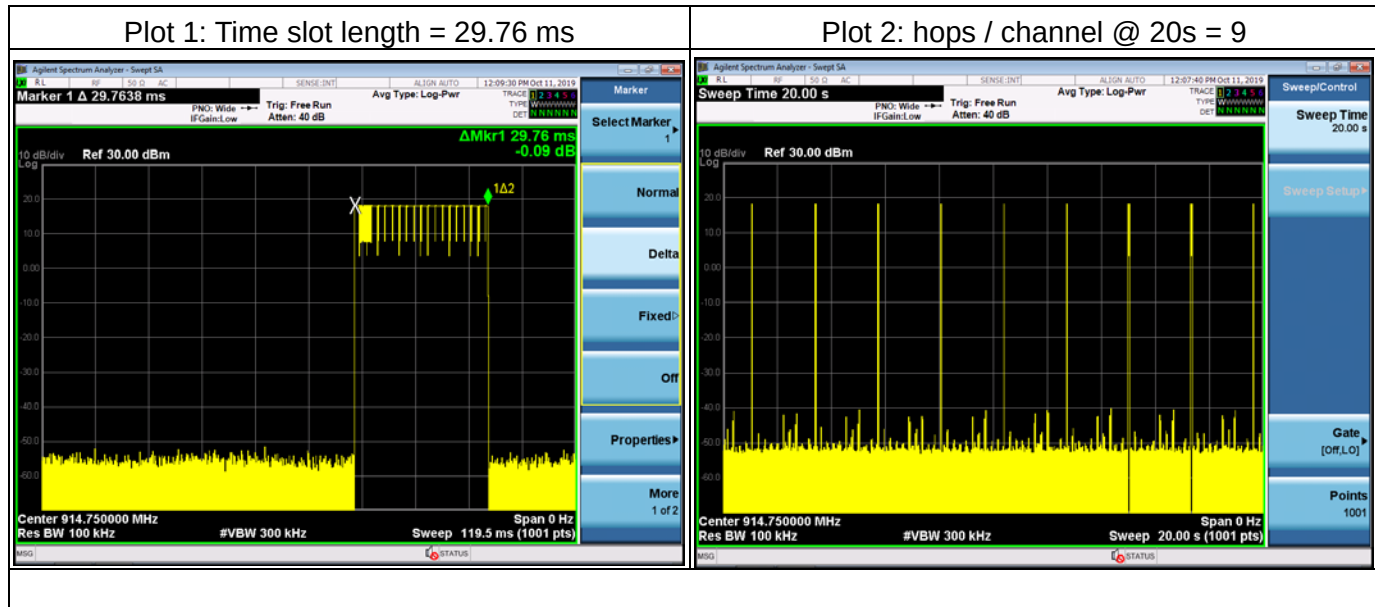
#### 6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 6.1.5 TEST RESULTS

| Frequency | Dwell time(ms) | Limit(ms) | Result |
|-----------|----------------|-----------|--------|
| 914.75MHz | 267.84         | 400       | Pass   |

Within 20 s period, the average time of occupancy = Time slot length (ms) \* hops number / channel @ 20s



## 7. HOPPING CHANNEL SEPARATION MEASUREMENT

### 7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 902-928 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

| Spectrum Parameter | Setting                                       |
|--------------------|-----------------------------------------------|
| Attenuation        | Auto                                          |
| Span Frequency     | > Measurement Bandwidth or Channel Separation |
| RB                 | 100 kHz (Channel Separation)                  |
| VB                 | 300 kHz (Channel Separation)                  |
| Detector           | Peak                                          |
| Trace              | Max Hold                                      |
| Sweep Time         | Auto                                          |

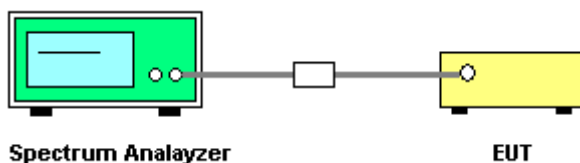
#### 7.1.1 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- The resolution bandwidth of 100 kHz and the video bandwidth of 300 kHz were utilised for channel separation measurement.

#### 7.1.2 DEVIATION FROM STANDARD

No deviation.

#### 7.1.3 TEST SETUP



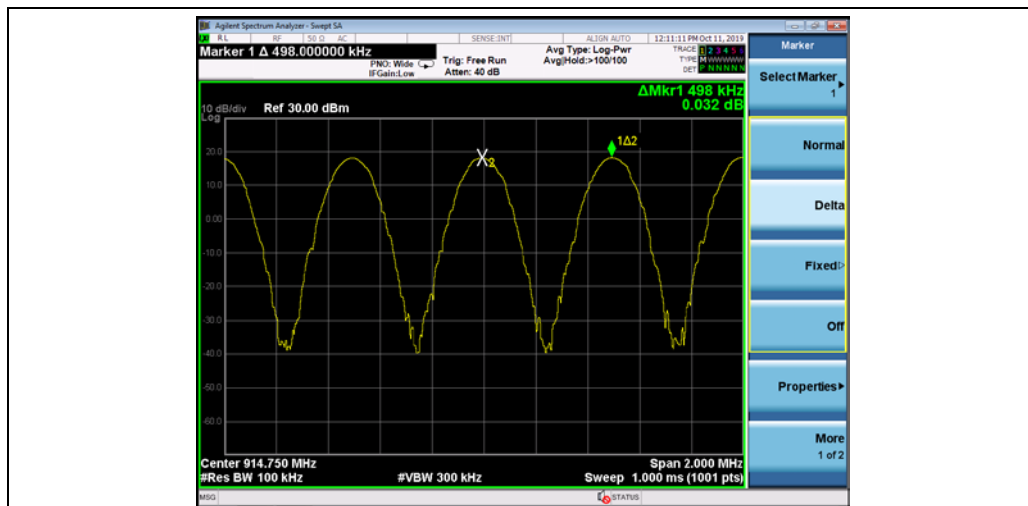
#### 7.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 7.1.5 TEST RESULTS

|               |         |                     |                                           |
|---------------|---------|---------------------|-------------------------------------------|
| Temperature : | 26 °C   | Relative Humidity : | 54%                                       |
| Pressure :    | 101 kPa | Test Voltage :      | DC 12V from adapter input<br>AC 120V/60Hz |
| Test Mode :   | Tx Mode |                     |                                           |

| Test Mode | Ch. Separation (MHz) | Limit (MHz) | Result   |
|-----------|----------------------|-------------|----------|
| TX        | 0.498                | 0.094       | Complies |



## 8. PEAK OUTPUT POWER

### 8.1 APPLIED PROCEDURES / LIMIT

| FCC Part15 (15.247) , Subpart C |                   |                  |                       |        |
|---------------------------------|-------------------|------------------|-----------------------|--------|
| Section                         | Test Item         | Limit            | Frequency Range (MHz) | Result |
| 15.247 (b)(i)                   | Peak Output Power | 30Bm or 20.96dBm | 902-928               | PASS   |

#### 8.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

#### 8.1.2 DEVIATION FROM STANDARD

No deviation.

#### 8.1.3 TEST SETUP



#### 8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 8.1.5 TEST RESULTS



|               |                  |                     |                                           |
|---------------|------------------|---------------------|-------------------------------------------|
| Temperature : | 26 °C            | Relative Humidity : | 54%                                       |
| Pressure :    | 101 kPa          | Test Voltage :      | DC 12V from adapter input<br>AC 120V/60Hz |
| Test Mode :   | CH01/ CH25 /CH50 |                     |                                           |

| Test Channel | Peak Output Power (dBm) | LIMIT (dBm) |
|--------------|-------------------------|-------------|
| CH00         | 19.25                   | 30.00       |
| CH25         | 19.14                   | 30.00       |
| CH78         | 19.31                   | 30.00       |

## **9. ANTENNA REQUIREMENT**

### **9.1 STANDARD REQUIREMENT**

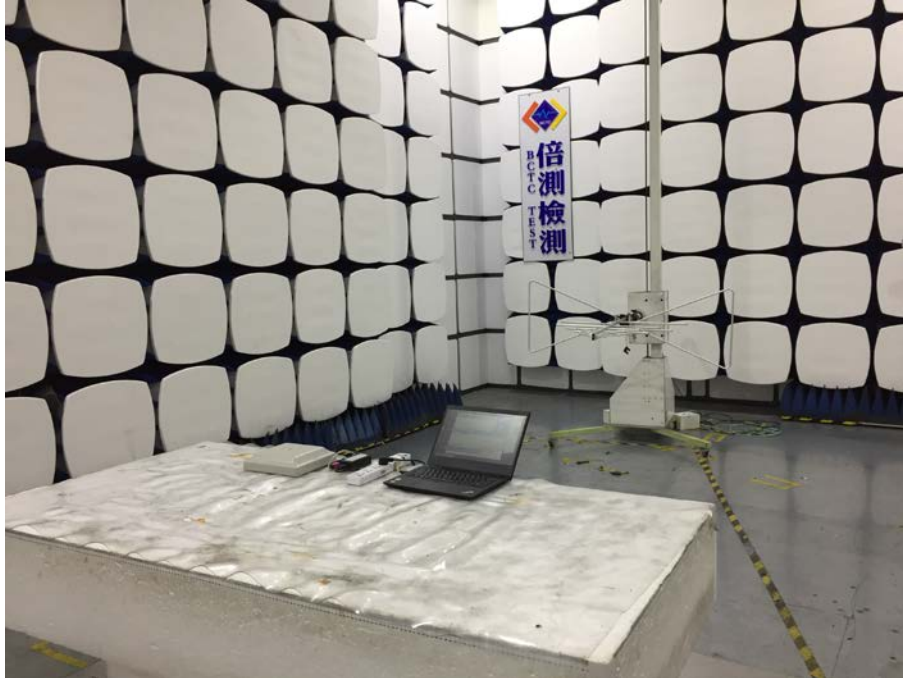
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### **9.2 EUT ANTENNA**

The EUT antenna is Internal antenna,. It comply with the standard requirement.

## 10. TEST SEUUP PHOTO

### Radiated Measurement Photos





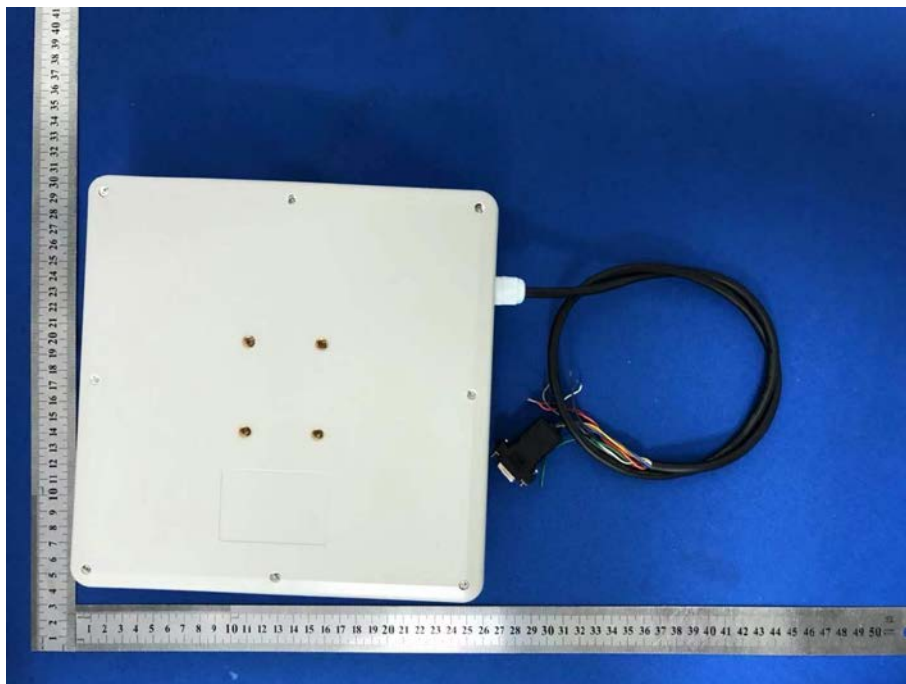


### Conducted Measurement Photos



## 11. EUT PHOTO





\*\*\*\*\* END OF REPORT \*\*\*\*\*