


FCC Part 15C Test Report

FCC ID: 2AD5YFMBT3353

| | |
|------------------|--|
| Product Name: | WIRELESS FM Transmitter with Headset With Bluetooth® Wireless Technology |
| Trademark: |  |
| Model Name : | 100014268 CBT3353, MBT3353, G52 |
| Prepared For : | Shenzhen Orderly Electronics Co., Ltd. |
| Address : | 4F, Building 7, Asian Industry Park, Bantian Street, Longgang District, Shenzhen, China, 518129 |
| 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: | Dec. 31, 2019 – Jan. 08, 2020 |
| Date of Report : | Jan. 08, 2020 |
| Report No.: | BCTC2001000012-1E |

VERIFICATION OF COMPLIANCE

Applicant's name Shenzhen Orderly Electronics Co., Ltd.

Address 4F, Building 7, Asian Industry Park, Bantian Street, Longgang District,
Shenzhen, China, 518129

Manufacture's Name... Shenzhen Orderly Electronics Co., Ltd.

Address 4F, Building 7, Asian Industry Park, Bantian Street, Longgang District,
Shenzhen, China, 518129

Product description

Product name WIRELESS FM Transmitter with Headset With Bluetooth® Wireless
Technology

Trademark:



Model Name: 100014268
CBT3353, MBT3353, G52
Test Standards: FCC Part15.239
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.

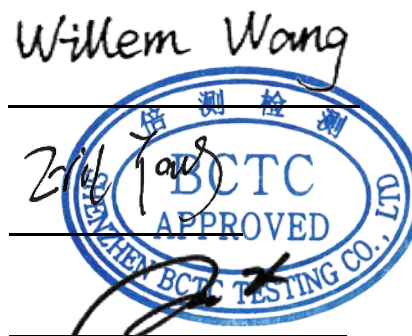
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Test Result..... **Pass**

Prepared by(Engineer): Willem Wang

Reviewer(Supervisor): Eric Yang

Approved(Manager): Zero Zhou



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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| FCC Part15 (15.239) , Subpart C | | | |
|---------------------------------|---|----------|--------|
| Standard Section | Test Item | Judgment | Remark |
| 15.207 | Conducted Emission | N/A | |
| 15.209&15.239 | Fundamental &Radiated Spurious Emission Measurement | PASS | |
| 15.239a | Occupy Bandwidth | PASS | |
| 15.203 | Antenna Requirement | PASS | |
| 15.239c | Band Edge Measurement | 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: 712850

IC Registered No.: 23583


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 | 3m chamber Radiated spurious emission(30MHz-1GHz) | U=4.3dB |
| 2 | 3m chamber Radiated spurious emission(1GHz-18GHz) | U=4.5dB |
| 3 | 3m chamber Radiated spurious emission(18GHz-40GHz) | U=3.34dB |
| 4 | Conducted Adjacent channel power | U=1.38dB |
| 5 | Conducted output power uncertainty Above 1G | U=1.576dB |
| 6 | Conducted output power uncertainty below 1G | U=1.28dB |
| 7 | humidity uncertainty | U=5.3% |
| 8 | Temperature uncertainty | U=0.59 °C |

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

| | | | | | | | | | | |
|------------------------|--|--|----------------------|--------------------|------------------|----|---------------|-------------|---------------|------|
| Equipment | WIRELESS FM Transmitter with Headset With Bluetooth® Wireless Technology | | | | | | | | | |
| Trade Name |  | | | | | | | | | |
| Model Name | 100014268 CBT3353, MBT3353, G52 | | | | | | | | | |
| Model Difference | All the model are the same circuit and RF module, except model names | | | | | | | | | |
| Product Description | <table><tr><td>Operation Frequency:</td><td>88.1 MHz ~107.9MHz</td></tr><tr><td>Modulation Type:</td><td>FM</td></tr><tr><td>Antenna Type:</td><td>PCB antenna</td></tr><tr><td>Antenna Gain:</td><td>0dBi</td></tr></table> <p>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.</p> | | Operation Frequency: | 88.1 MHz ~107.9MHz | Modulation Type: | FM | Antenna Type: | PCB antenna | Antenna Gain: | 0dBi |
| Operation Frequency: | 88.1 MHz ~107.9MHz | | | | | | | | | |
| Modulation Type: | FM | | | | | | | | | |
| Antenna Type: | PCB antenna | | | | | | | | | |
| Antenna Gain: | 0dBi | | | | | | | | | |
| Ratings | DC 12V | | | | | | | | | |
| 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.

2.2 DESCRIPTION OF TEST MODES

| For All Emission | |
|------------------|------------------------------|
| Final Test Mode | Description |
| Mode 1 | CH01 |
| Mode 2 | CH50 |
| Mode 3 | CH100 |
| Mode 4 | Link mode(Radiated emission) |

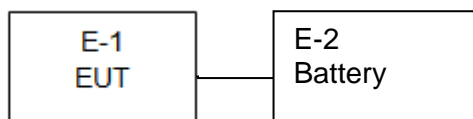
| Channel | Frequency (MHz) |
|---------|-----------------|
| 01 | 88.1 |
| 02 | 88.3 |
| 03 | 88.5 |
| ~ | ~ |
| 98 | 107.5 |
| 99 | 107.7 |
| 100 | 107.9 |

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious EmissionTest



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.

| No. | Device Type | Brand | Model | Series No. | Data Cable |
|-----|--|---------|-----------|------------|------------|
| E-1 | WIRELESS FM Transmitter with Headset With Bluetooth® | N/A | 100014268 | N/A | EUT |
| E-2 | Battery | CONSENT | 12V14AH | 170119 | Auxiliary |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
| - | - | - | - | - |

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation 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 | Jul. 02, 2019 | Jul. 01, 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 | E4419B | \ | 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 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 08 | Jun. 25, 2019 | Jun. 24, 2020 |
| 5 | Software | Frad | EZ-EMC | EMC-CON 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 |

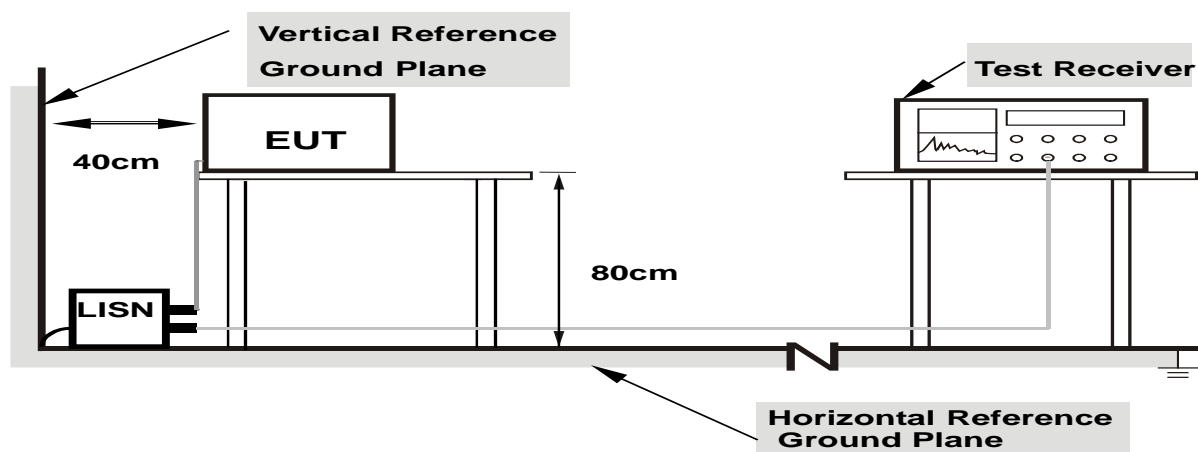
3.1.2 TEST PROCEDURE

- 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- 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.

We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

3.1.6 TEST RESULTS

NOTE: This EUT is powered by the battery only, this test item is not applicable.

3.2 RADIATED EMISSION MEASUREMENT

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

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.209&15.239 limit in the table below has to be followed.

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

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).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For intentional radiators)

| Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz) | Range (MHz) |
|---|--|
| Below 1.705 | 30 |
| 1.705 – 108 | 1000 |
| 108 – 500 | 2000 |
| 500 – 1000 | 5000 |
| Above 1000 | 10 th harmonic of the highest frequency or 40 GHz, whichever is lower |

| Spectrum Parameter | Setting |
|--------------------|--|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10th carrier harmonic |
| RBW / VBW setting | 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

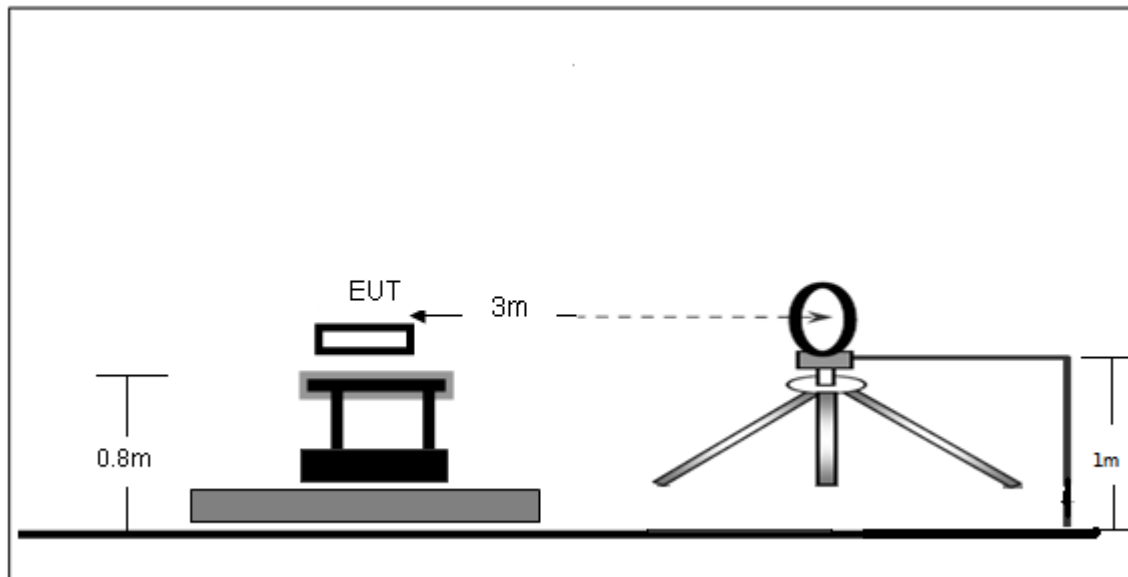
- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; above 1GHz, the height was 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.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

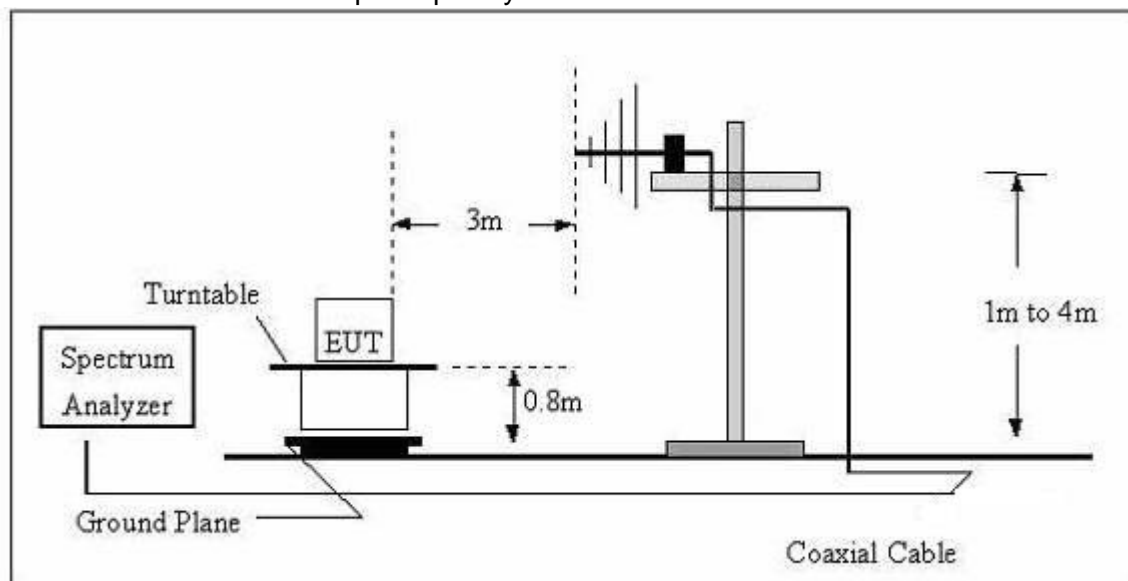
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case was X axis and the emissions were reported

3.2.3 TEST SETUP

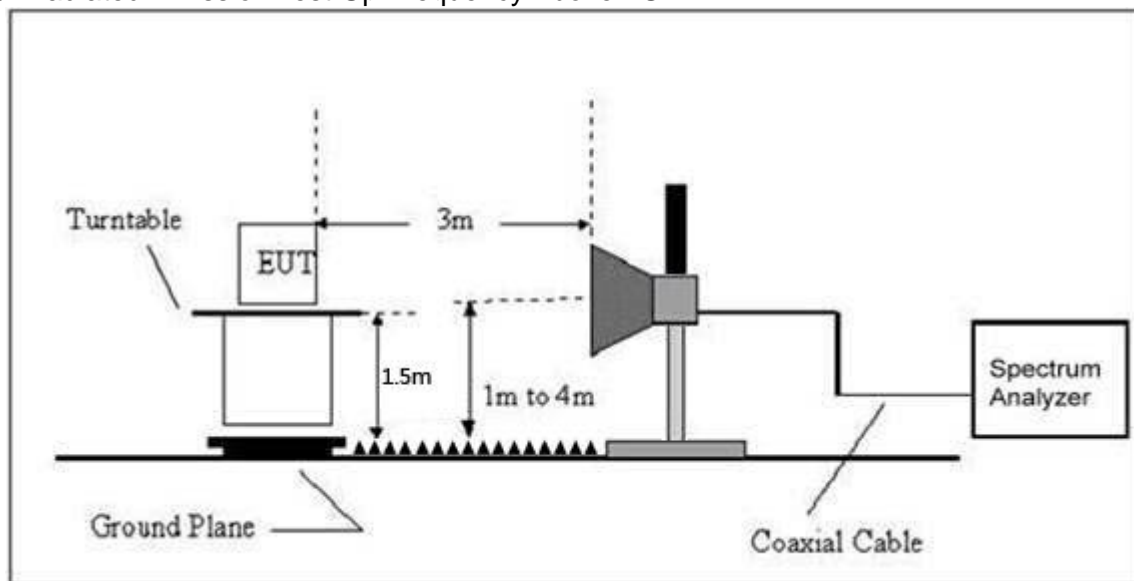
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



3.2.4 EUT OPERATING 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.

3.2.5 TEST RESULTS

Radiated Spurious Emission (Below 9KHz – 30MHz)

| | | | |
|----------------|---------|---------------------|-----|
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 101 kPa | Polarization : | --- |
| Test Voltage : | DC 12V | | |
| Test Mode : | TX Mode | | |

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

NOTE:

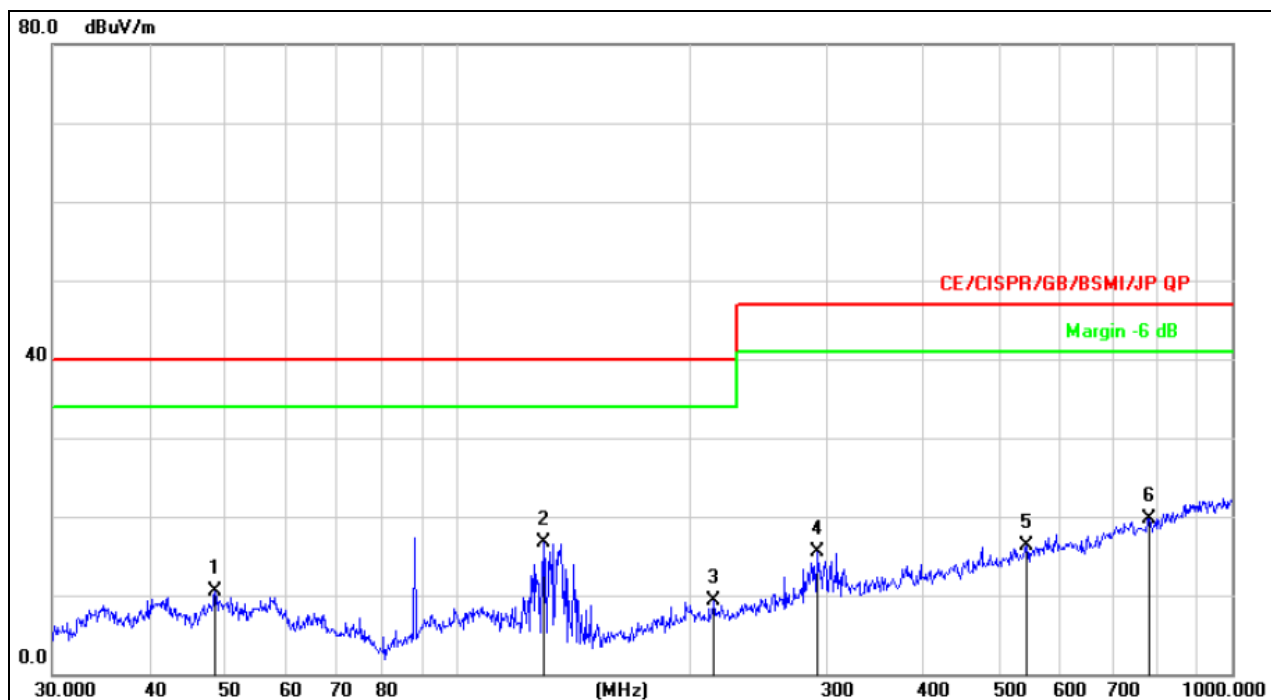
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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

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

Radiated Spurious Emission (Between 30MHz – 1GHz)

| | | | |
|----------------|--------|---------------------|-----------------|
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 101kPa | Phase : | H |
| Test Voltage : | DC 12V | Test Mode : | Mode 1(88.1MHz) |

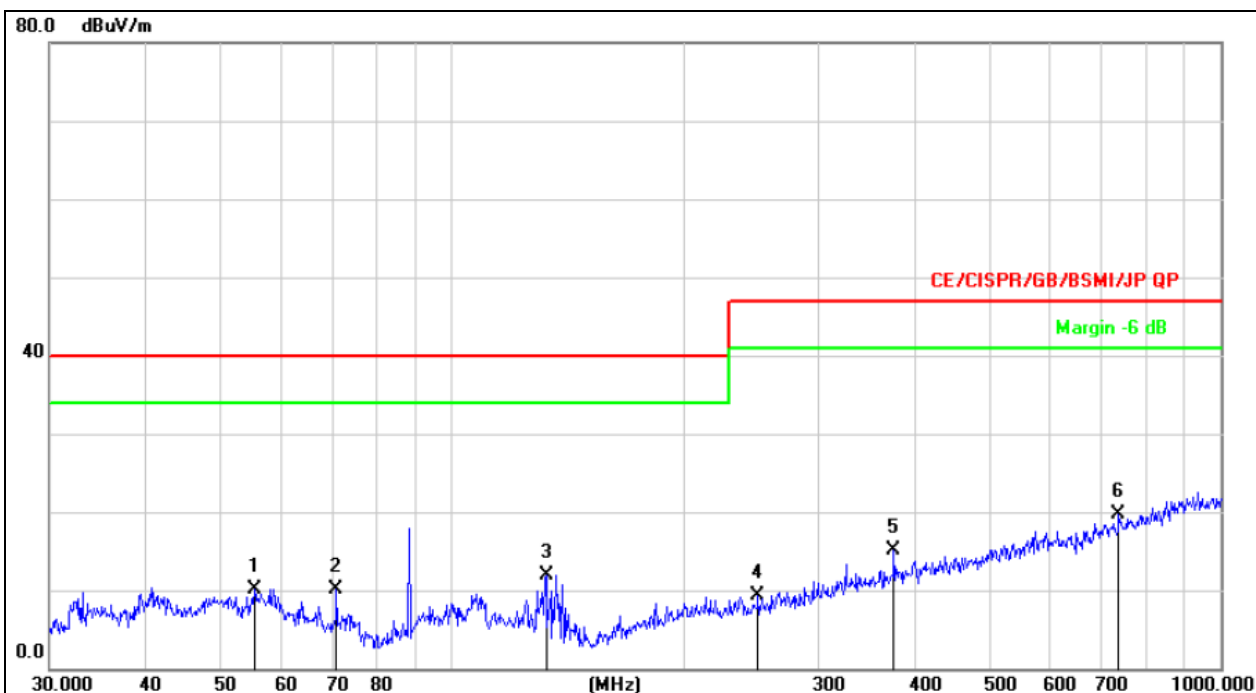


Remark:

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

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|-----|-----|----------|---------------|----------------|--------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 48.6719 | 25.40 | -14.92 | 10.48 | 40.00 | -29.52 | QP |
| 2 | * | 129.4677 | 34.84 | -18.18 | 16.66 | 40.00 | -23.34 | QP |
| 3 | | 214.5143 | 25.22 | -15.97 | 9.25 | 40.00 | -30.75 | QP |
| 4 | | 292.0583 | 29.29 | -13.85 | 15.44 | 47.00 | -31.56 | QP |
| 5 | | 543.2742 | 24.19 | -7.85 | 16.34 | 47.00 | -30.66 | QP |
| 6 | | 782.3453 | 23.64 | -3.89 | 19.75 | 47.00 | -27.25 | QP |

| | | | |
|----------------|--------|---------------------|-----------------|
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 101kPa | Phase : | V |
| Test Voltage : | DC 12V | Test Mode : | Mode 1(88.1MHz) |

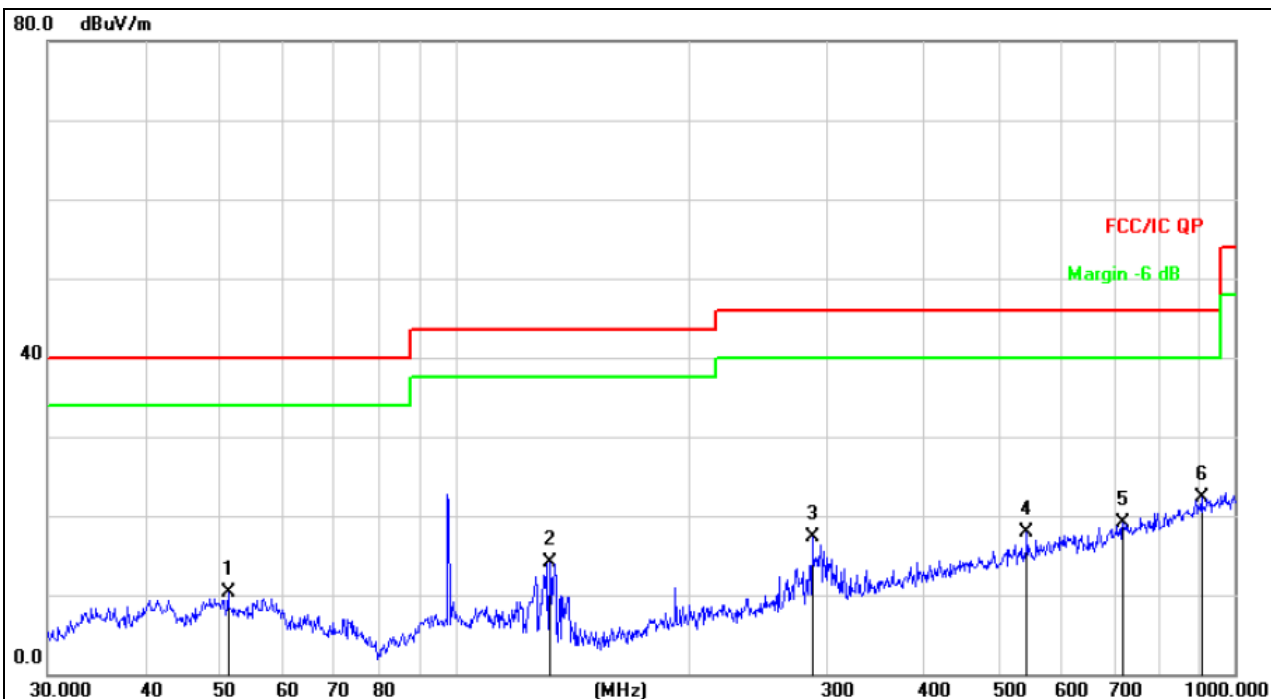


Remark:

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

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|-----|-----|----------|---------------|----------------|--------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 55.4147 | 25.58 | -15.42 | 10.16 | 40.00 | -29.84 | QP |
| 2 | | 70.8315 | 28.57 | -18.37 | 10.20 | 40.00 | -29.80 | QP |
| 3 | | 132.6850 | 30.37 | -18.38 | 11.99 | 40.00 | -28.01 | QP |
| 4 | | 250.3012 | 24.50 | -15.14 | 9.36 | 47.00 | -37.64 | QP |
| 5 | | 375.9385 | 26.66 | -11.64 | 15.02 | 47.00 | -31.98 | QP |
| 6 | * | 737.0714 | 24.32 | -4.55 | 19.77 | 47.00 | -27.23 | QP |

| | | | |
|----------------|--------|---------------------|---------------|
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 101kPa | Phase : | H |
| Test Voltage : | DC 12V | Test Mode : | Mode 2(98MHz) |

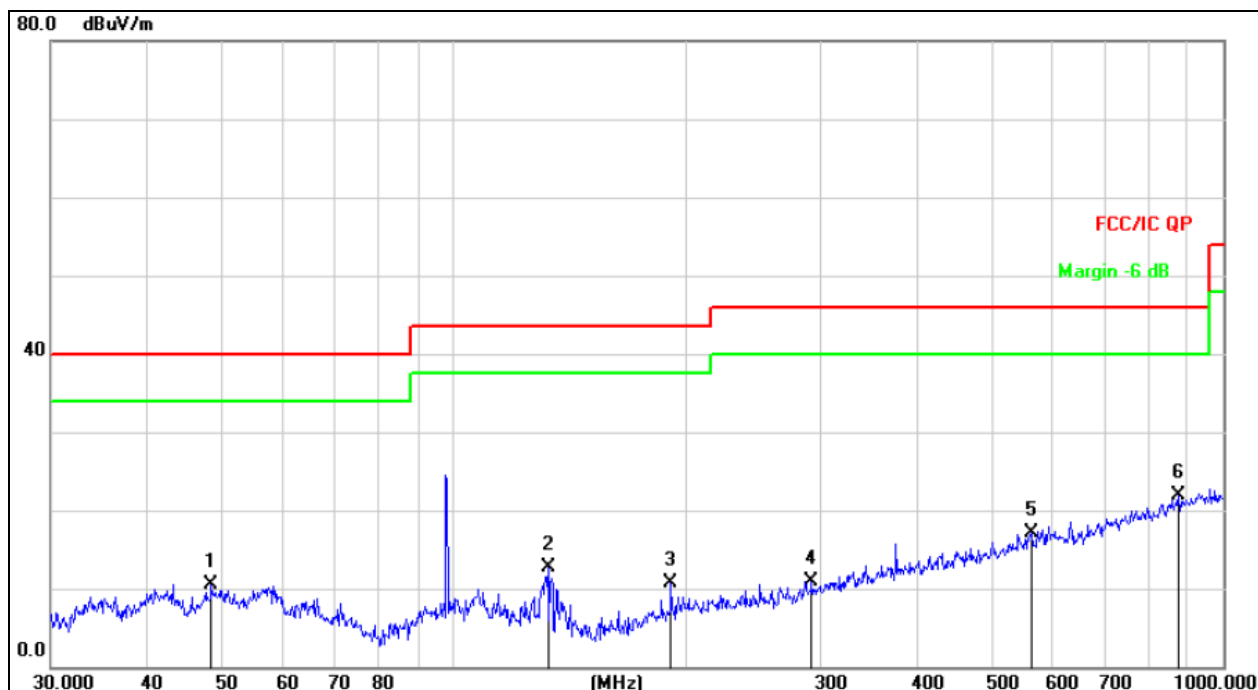


Remark:

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

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | |
|-----|-----|----------|---------------|----------------|-------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 51.1209 | 25.20 | -14.97 | 10.23 | 40.00 | -29.77 | QP |
| 2 | | 132.2206 | 32.39 | -18.36 | 14.03 | 43.50 | -29.47 | QP |
| 3 | | 286.9823 | 31.32 | -14.00 | 17.32 | 46.00 | -28.68 | QP |
| 4 | | 541.3725 | 25.81 | -7.90 | 17.91 | 46.00 | -28.09 | QP |
| 5 | | 719.1994 | 23.84 | -4.83 | 19.01 | 46.00 | -26.99 | QP |
| 6 | * | 906.4824 | 23.78 | -1.45 | 22.33 | 46.00 | -23.67 | QP |

| | | | |
|----------------|--------|---------------------|---------------|
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 101kPa | Phase : | V |
| Test Voltage : | DC 12V | Test Mode : | Mode 2(98MHz) |

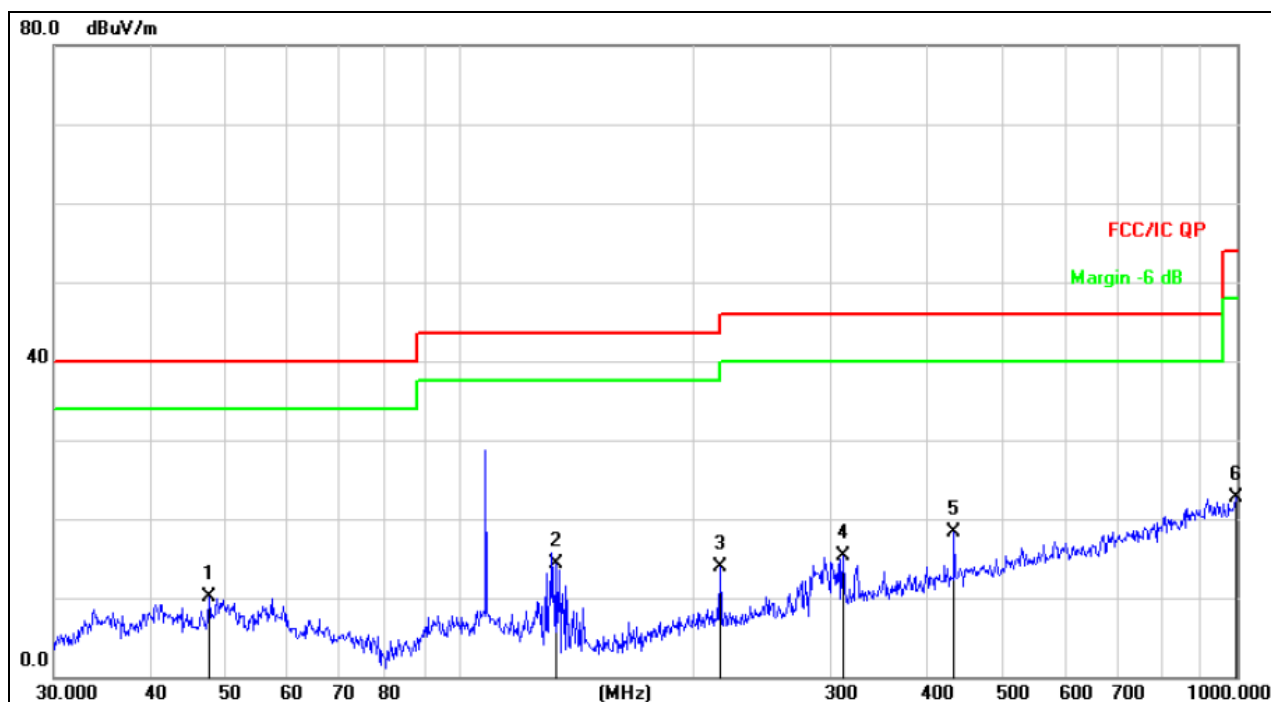


Remark:

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

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | |
|-----|-----|----------|---------------|----------------|-------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 48.5016 | 25.35 | -14.93 | 10.42 | 40.00 | -29.58 | QP |
| 2 | | 132.6850 | 31.00 | -18.38 | 12.62 | 43.50 | -30.88 | QP |
| 3 | | 191.7450 | 27.53 | -16.83 | 10.70 | 43.50 | -32.80 | QP |
| 4 | | 292.0583 | 24.80 | -13.85 | 10.95 | 46.00 | -35.05 | QP |
| 5 | | 562.6624 | 24.58 | -7.39 | 17.19 | 46.00 | -28.81 | QP |
| 6 | * | 875.2470 | 23.85 | -2.00 | 21.85 | 46.00 | -24.15 | QP |

| | | | |
|----------------|--------|---------------------|------------------|
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 101kPa | Phase : | H |
| Test Voltage : | DC 12V | Test Mode : | Mode 3(107.9MHz) |

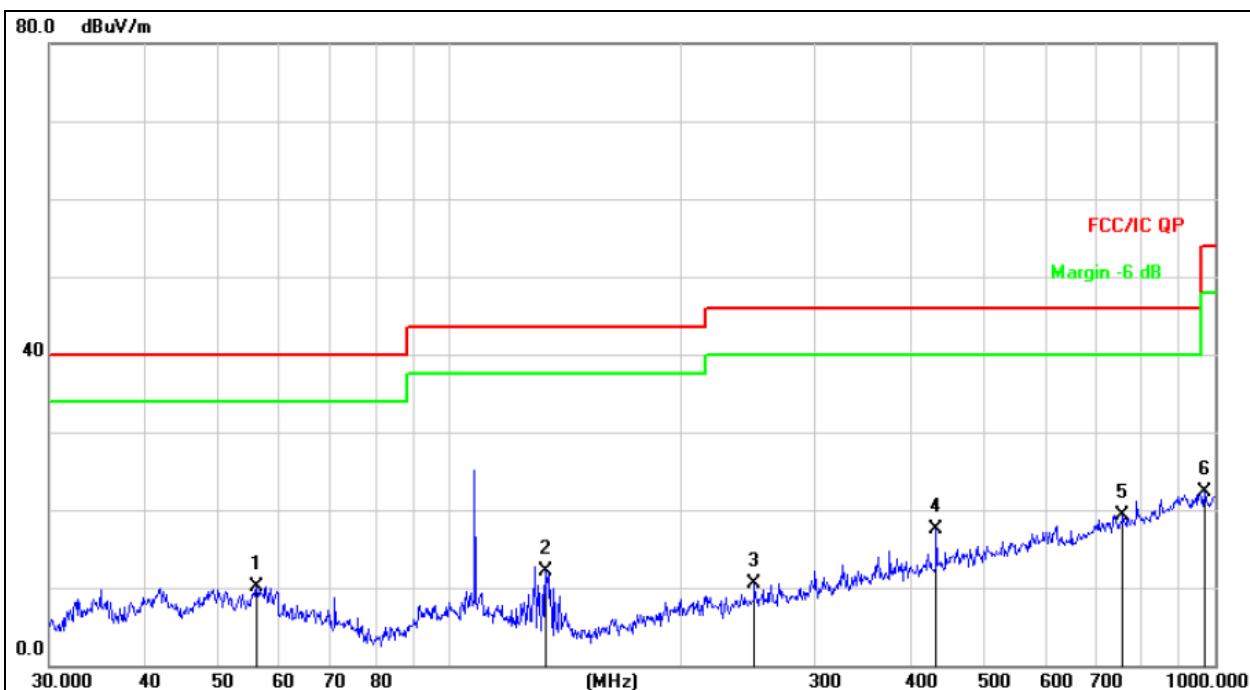


Remark:

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

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | |
|-----|-----|----------|---------------|----------------|--------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 47.4918 | 25.19 | -14.99 | 10.20 | 40.00 | -29.80 | QP |
| 2 | | 132.6850 | 32.64 | -18.38 | 14.26 | 43.50 | -29.24 | QP |
| 3 | | 216.0240 | 29.79 | -15.93 | 13.86 | 46.00 | -32.14 | QP |
| 4 | | 311.0867 | 28.68 | -13.30 | 15.38 | 46.00 | -30.62 | QP |
| 5 | * | 432.5457 | 28.68 | -10.36 | 18.32 | 46.00 | -27.68 | QP |
| 6 | | 996.4995 | 23.53 | -0.83 | 22.70 | 54.00 | -31.30 | QP |

| | | | |
|----------------|--------|---------------------|------------------|
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 101kPa | Phase : | V |
| Test Voltage : | DC 12V | Test Mode : | Mode 3(107.9MHz) |



Remark:

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

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | |
|-----|-----|----------|---------------|----------------|-------------|-------|--------|----------|
| | | MHz | dBuV | dB | dBuV/m | dB/m | dB | Detector |
| 1 | | 56.0007 | 25.56 | -15.49 | 10.07 | 40.00 | -29.93 | QP |
| 2 | | 133.6188 | 30.63 | -18.45 | 12.18 | 43.50 | -31.32 | QP |
| 3 | | 250.3012 | 25.65 | -15.14 | 10.51 | 46.00 | -35.49 | QP |
| 4 | | 432.5457 | 27.89 | -10.36 | 17.53 | 46.00 | -28.47 | QP |
| 5 | * | 758.0408 | 23.54 | -4.23 | 19.31 | 46.00 | -26.69 | QP |
| 6 | | 968.9338 | 23.27 | -1.00 | 22.27 | 54.00 | -31.73 | QP |

3.2.6 TEST RESULTS (1GHZ~6GHZ)

| Polar (H/V) | Frequency | Meter Reading | Pre-amplifier | Cable Loss | Antenna Factor | Emission Level | Limits | Margin | Detector Type |
|----------------|-----------|------------------|---------------|---------------|-------------------|-------------------|----------|--------|------------------|
| | (MHz) | (dBuV) | (dB) | (dB) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| V | 1057.20 | 53.98 | 39.55 | 7.77 | 25.66 | 47.86 | 74.00 | -26.14 | PK |
| V | 1057.20 | 43.90 | 39.55 | 7.77 | 25.66 | 37.78 | 54.00 | -16.22 | AV |
| V | 1174.80 | 53.08 | 38.33 | 7.30 | 24.55 | 46.60 | 74.00 | -27.40 | PK |
| V | 1174.80 | 43.39 | 38.33 | 7.30 | 24.55 | 36.91 | 54.00 | -17.09 | AV |
| V | 1292.40 | 52.57 | 35.23 | 6.60 | 26.59 | 50.53 | 74.00 | -23.47 | PK |
| V | 1292.40 | 54.11 | 39.55 | 6.60 | 25.66 | 46.82 | 74.00 | -27.18 | AV |
| H | 1145.30 | 43.82 | 39.55 | 7.45 | 25.66 | 37.38 | 54.00 | -16.62 | PK |
| H | 1145.30 | 50.73 | 38.33 | 7.45 | 24.55 | 44.40 | 74.00 | -29.60 | AV |
| H | 1272.70 | 43.36 | 38.33 | 6.70 | 24.55 | 36.28 | 54.00 | -17.72 | PK |
| H | 1272.70 | 53.14 | 35.45 | 6.70 | 26.59 | 50.98 | 74.00 | -23.02 | AV |
| H | 1400.10 | 53.98 | 39.55 | 5.80 | 25.66 | 45.89 | 74.00 | -28.11 | PK |
| H | 1400.10 | 43.90 | 39.55 | 5.80 | 25.66 | 35.81 | 54.00 | -18.19 | AV |

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,

Margin= Emission Level - Limit

2. If peak below the average limit, the average emission was no test.

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

3.2.7 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS=RA+AF+CL-AG$$

| | |
|----------------------|--|
| FS=Field Strength | CL=Cable Attenuation Factor (Cable Loss) |
| RA=Reading Amplitude | AG=Amplifier Gain |
| AF=Antenna Factor | |

Test Result:

| | | | |
|----------------|--------|---------------------|------------|
| Temperature : | 26℃ | Relative Humidity : | 54% |
| Pressure : | 101kPa | Polarization : | Horizontal |
| Test Voltage : | DC 12V | | |
| Test Mode : | Mode 1 | | |

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 88.1 | 36.01 | -18.55 | 17.46 | 68.00 | -50.54 | Peak |
| 88.1 | 30.11 | -18.55 | 11.56 | 48.00 | -36.44 | Average |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. All interfaces was connected, and TX mode | | | | | | |

| | | | |
|----------------|--------|---------------------|----------|
| Temperature : | 26℃ | Relative Humidity : | 54% |
| Pressure : | 101kPa | Polarization : | Vertical |
| Test Voltage : | AC 12V | | |
| Test Mode : | Mode 1 | | |

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 88.1 | 36.40 | -18.55 | 17.85 | 68.00 | -50.15 | Peak |
| 88.1 | 30.14 | -18.55 | 11.59 | 48.00 | -36.41 | Average |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. All interfaces was connected, and TX mode | | | | | | |

| | | | |
|----------------|--------|---------------------|------------|
| Temperature : | 26°C | Relative Humidity : | 54% |
| Pressure : | 101kPa | Polarization : | Horizontal |
| Test Voltage : | DC 12V | | |
| Test Mode : | Mode 2 | | |

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 98.0 | 40.14 | -16.68 | 23.46 | 68.00 | -44.54 | Peak |
| 98.0 | 33.58 | -16.68 | 16.9 | 48.00 | -31.10 | Average |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. All interfaces was connected, and TX mode | | | | | | |

| | | | |
|----------------|--------|---------------------|----------|
| Temperature : | 26°C | Relative Humidity : | 54% |
| Pressure : | 101kPa | Polarization : | Vertical |
| Test Voltage : | AC 12V | | |
| Test Mode : | Mode 2 | | |

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|---|---------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 98.0 | 42.04 | -16.68 | 25.36 | 68.00 | -42.64 | Peak |
| 98.0 | 35.74 | -16.68 | 19.06 | 48.00 | -28.94 | Average |
| Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier. All interfaces was connected, and TX mode | | | | | | |

| | | | |
|----------------|--------|---------------------|------------|
| Temperature : | 26℃ | Relative Humidity : | 54% |
| Pressure : | 101kPa | Polarization : | Horizontal |
| Test Voltage : | DC 12V | | |
| Test Mode : | Mode 3 | | |

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 107.9 | 46.35 | -16.79 | 29.56 | 68.00 | -38.44 | Peak |
| 107.9 | 40.17 | -16.79 | 23.38 | 48.00 | -24.62 | Average |

Remark:

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

All interfaces was connected, and TX mode

| | | | |
|----------------|--------|---------------------|----------|
| Temperature : | 26℃ | Relative Humidity : | 54% |
| Pressure : | 101kPa | Polarization : | Vertical |
| Test Voltage : | AC 12V | | |
| Test Mode : | Mode 3 | | |

| Frequency | Meter Reading | Factor | Emission Level | Limits | Margin | Detector Type |
|-----------|---------------|--------|----------------|----------|--------|---------------|
| (MHz) | (dBμV) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | |
| 107.9 | 42.31 | -16.79 | 25.52 | 68.00 | -42.48 | Peak |
| 107.9 | 36.17 | -16.79 | 19.38 | 48.00 | -28.62 | Average |

Remark:

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

All interfaces was connected, and TX mode

4. BANDWIDTH TEST

4.1 APPLIED PROCEDURES / LIMIT

According to 15.209&15.239 requirement:

The bandwidth of the emission shall not exceed 200 kHz.

| Spectrum Parameter | Setting |
|--------------------|---|
| Attenuation | Auto |
| Span Frequency | > Measurement Bandwidth or Channel Separation |
| RB | 1kHz |
| VB | \geq RBW |
| Detector | Peak |
| Trace | Max Hold |
| Sweep Time | Auto |

4.1.1 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= 1kHz, VBW \geq RBW, Sweep time = Auto.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

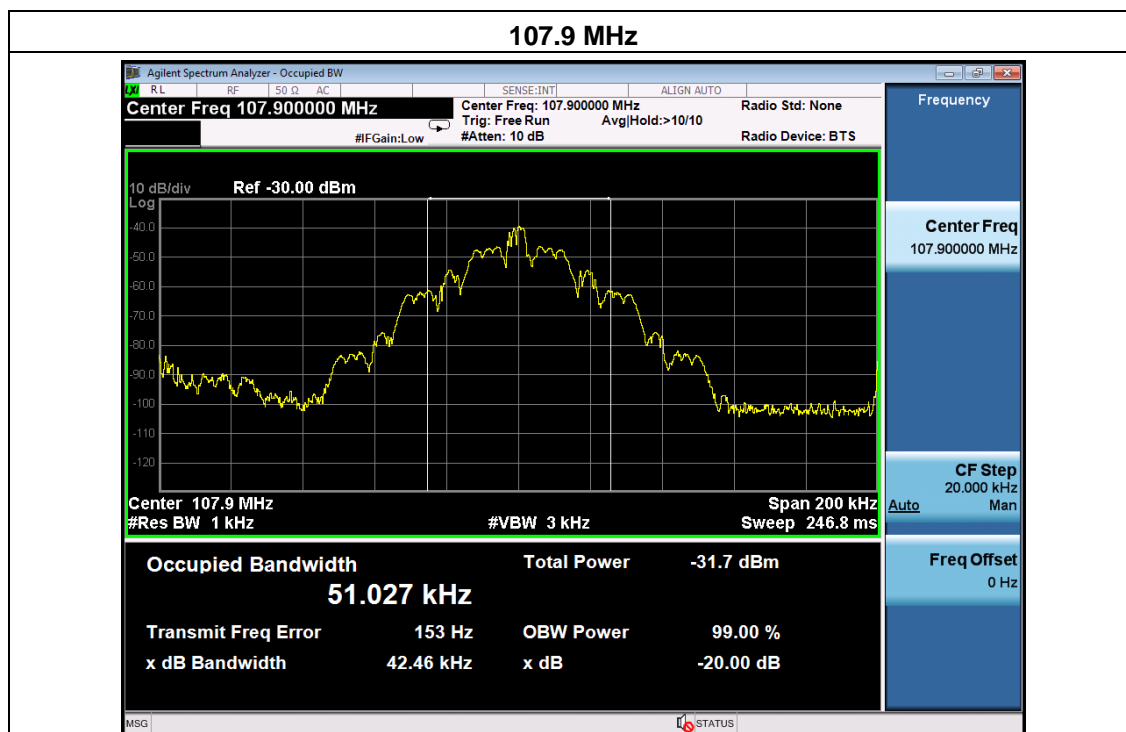
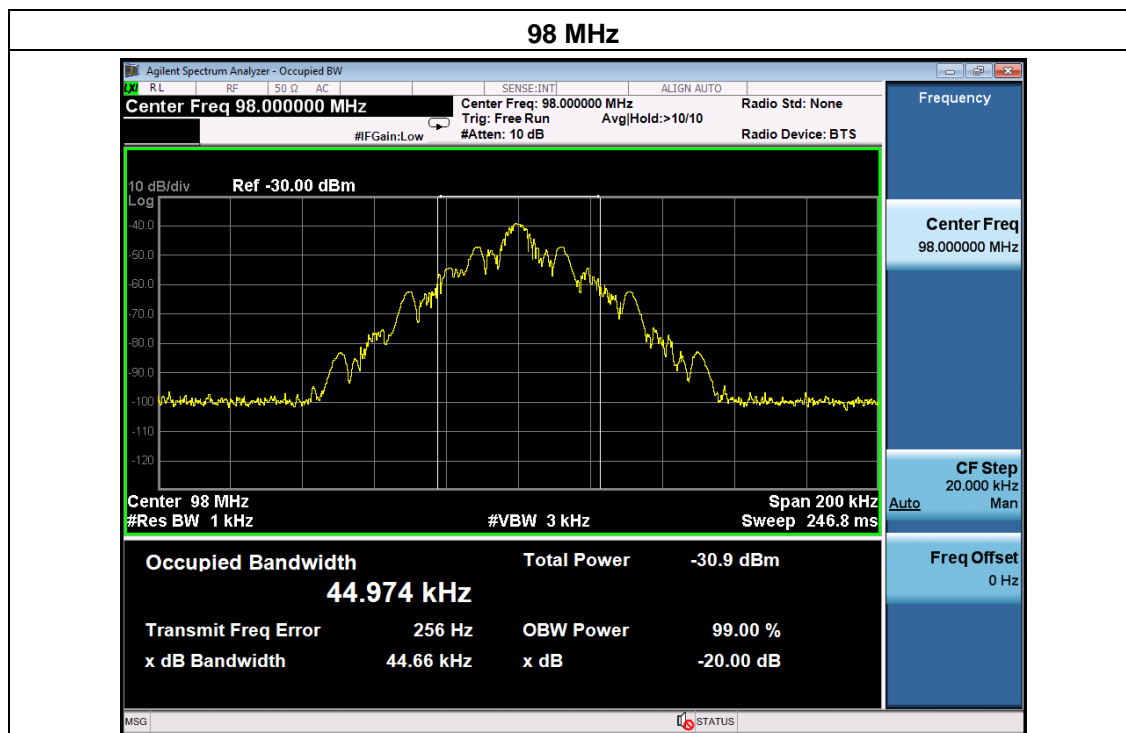
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

| | | | |
|---------------|---------|---------------------|--------|
| Temperature : | 26 °C | Relative Humidity : | 54% |
| Pressure : | 101kPa | Test Voltage : | DC 12V |
| Test Mode : | TX Mode | | |

| Frequency | 20dBc bandwidth (kHz) | Limit (kHz) | Result |
|-----------|-----------------------|-------------|--------|
| 88.1MHz | 48.49 | 200 | PASS |
| 98 MHz | 44.66 | 200 | PASS |
| 107.9 MHz | 42.46 | 200 | PASS |





5. BAND EDGE MEASUREMENT

5.1 APPLICABLE STANDARD

FCC Part15 Paragraph 15.209&15.239

Outside the 200kHz band(as well as outside the 88-108MHz band), the general field strength limits listed in 15.209 apply.

5.2 TEST PROCEDURE

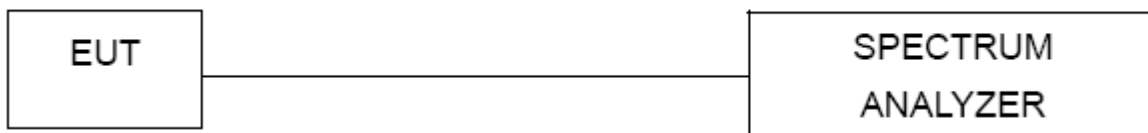
Using the following spectrum analyzer setting:

- a) Set the RBW = 3KHz.
- b) Set the VBW = 10KHz.
- c) Sweep time = auto couple.
- d) Detector function = peak.
- e) Trace mode = max hold.
- f) Allow trace to fully stabilize.

5.3 DEVIATION FROM STANDARD

No deviation.

5.4 TEST SETUP

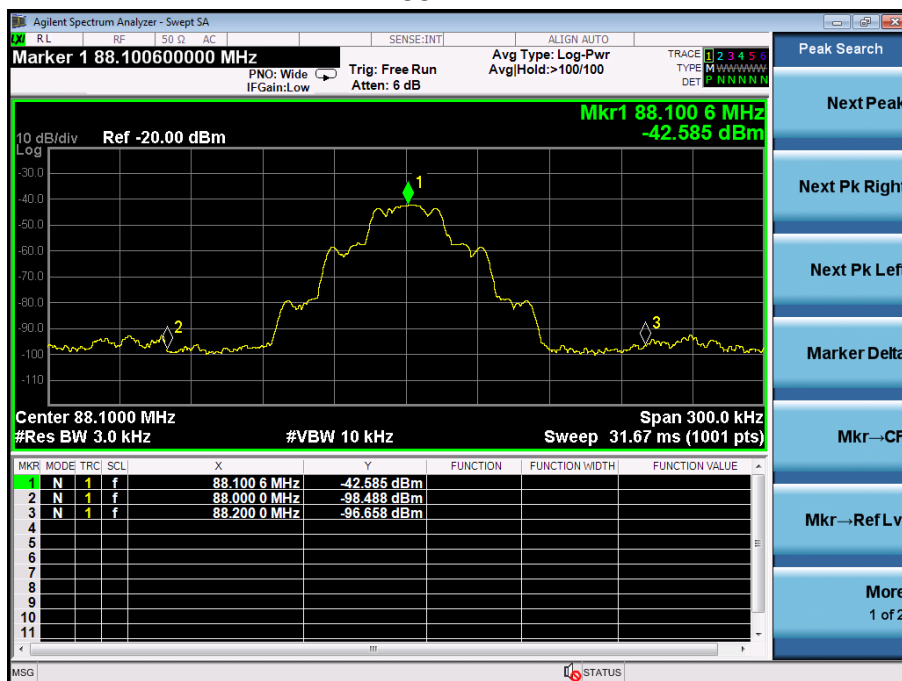


5.5 EUT OPERATION CONDITIONS

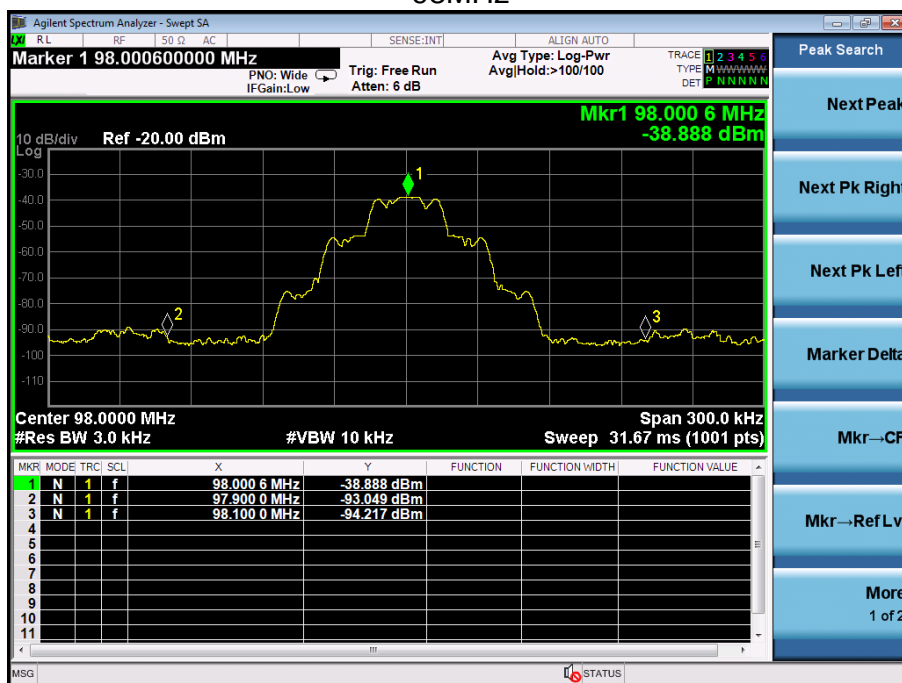
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULTS

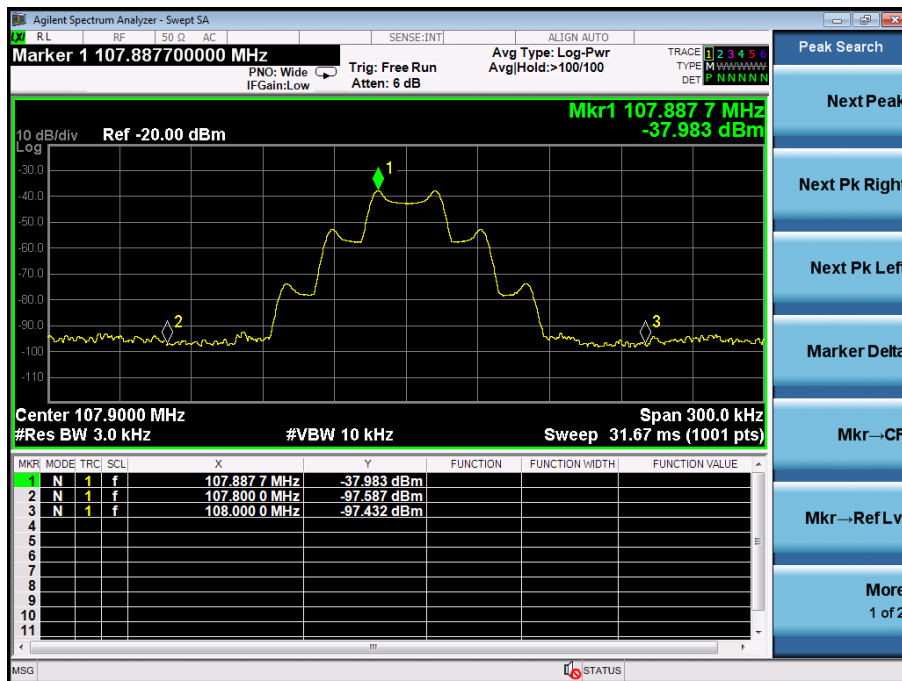
88.1MHz



98MHz



107.9MHz



6. ANTENNA REQUIREMENT

6.1 STANDARD REQUIREMENT

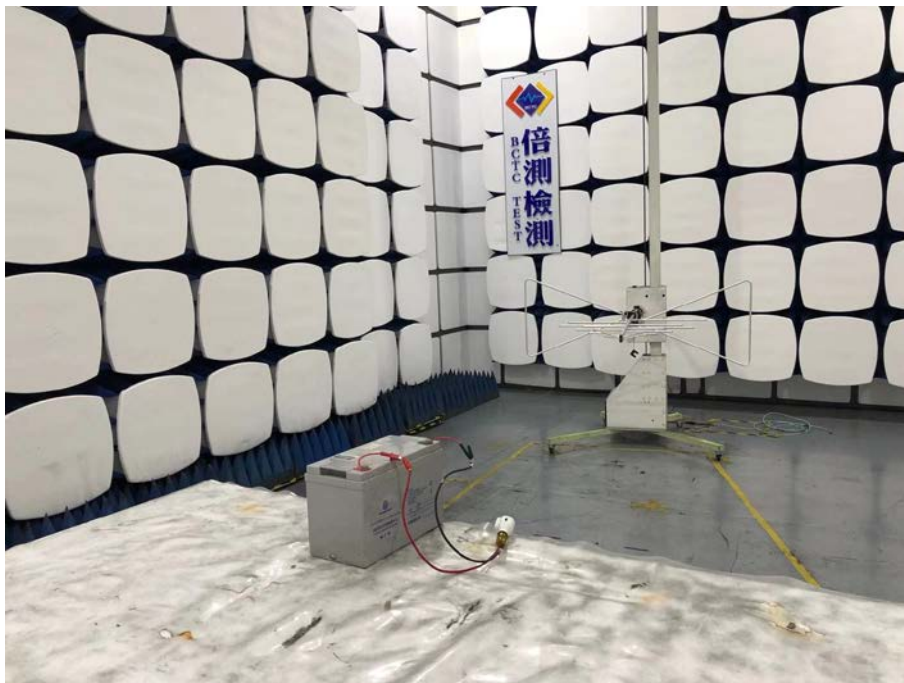
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

6.2 EUT ANTENNA

The EUT antenna is the PCB Antenna. It comply with the standard requirement.

7. EUT TEST PHOTO

Radiated Measurement Photos



8. EUT PHOTO

EUT Photo 1



EUT Photo 2



EUT Photo 3



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