

TEST REPORT

Client Information:

Applicant: Enping Fly Sound Equipment Co.,Ltd.

Applicant add.: Fourth Floor, 12th Building, No. 33, Enzhou Industrial Avenue, Enping City, Guangdong Province, China

Manufacturer: ENPING FLY SOUND EQUIPMENT CO.,LTD.

Manufacturer add.: Fourth Floor, 12th Building, No. 33, Enzhou Industrial Avenue, Enping City, Guangdong Province, China

Product Information:

Product Name: UHF Wireless Microphone

Model No.: FS-204B

Brand Name: **decibel PYLE**

Test samples.: AIT24060409001

FCC ID: 2AUCK-FS204B

Applicable standards: FCC Part 15.236

Prepared By:

Guangdong Asia Hongke Test Technology Limited

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Date of Receipt: June 07, 2024

Date of Test: June 07~ June 18, 2024

Date of Issue: June 18, 2024

Test Result: Pass

This device described above has been tested by Guangdong Asia Hongke Test Technology Limited 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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Reviewed by:

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Approved by:

Sean She

Sean She



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Revision History

| Revision | Issue Date | Revisions | Revised By |
|----------|---------------|---------------|------------|
| 01 | June 18, 2024 | Initial Issue | Sean She |
| | | | |
| | | | |

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

The EUT has been tested according to FCC CFR 47:

Part 15.236: Operation of wireless microphones in the bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-698 MHz.

| Emission | | | |
|------------------|----------------------------|---------------------------------|--------|
| Standard | Item | Limit | Result |
| FCC 15.236(g) | Radiated Spurious Emission | Refer to 300 422-1 V1.4.2 (8.4) | PASS |
| FCC 15.236(d)(1) | EIRP | ≤50 mW | PASS |
| FCC 15.215 | Occupied Bandwidth | -- | PASS |
| FCC 15.236(f)(3) | Frequency tolerance | ±0.005% | PASS |
| FCC 15.236(g) | Necessary Bandwidth (Mask) | Refer to 300 422-1 V1.4.2 (8.3) | PASS |
| FCC 15.207 | Conducted Emission | -- | PASS |

NOTE:

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

1.1 TEST FACTORY

The test facility is recognized, certified or accredited by the following organizations:

FCC-Registration No.: 251906 Designation Number: CN1376

Guangdong Asia Hongke Test Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC —Registration No.: 31737 CAB identifier: CN0165

The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01

Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.2 DEVIATION FROM STANDARD

None

1.3 ABNORMALITIES FROM STANDARD CONDITIONS

None

1.4 TEST LOCATION

Guangdong Asia Hongke Test Technology Limited

Address: B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Tel.: +86 0755-230967639 Fax.: +86 0755-230967639

1.5 MEASUREMENT UNCERTAINTY

| Test Item | Frequency Range | Measurement Uncertainty | Notes |
|----------------------------------|-----------------|-------------------------|-------|
| Radiated Emission | 0.009MHz-30MHz | 3.10dB | (1) |
| Radiated Emission | 30MHz-1GHz | 3.75dB | (1) |
| Radiated Emission | 1GHz-18GHz | 3.88dB | (1) |
| Radiated Emission | 18GHz-40GHz | 3.88dB | (1) |
| AC Power Line Conducted Emission | 0.15MHz ~ 30MHz | 1.20dB | (1) |

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF THE EUT

| | |
|-------------------------------|---|
| Product Name: | UHF Wireless Microphone |
| Brand Name: | decibel PYLE |
| Model Name: | FS-204B |
| Series Model : | FS-104B, FS-2023D, FS-2023, FS-201, FS-202, FS-203, FS-204, FS-206, FS-207, FS-211, PDWMU112, PDWMU214, PDWMU211, PDWMU105, PDWM4120, PDWM2125, VocalAi202, VocalAi201, FS-2025 |
| Model Difference description: | Only different of model name and brand name. |
| Power supply: | DC 5V IN Battery: DC 3.7V 18650 |
| Operation Frequency Range | 470.2 – 607.7 MHz |
| Maximum Transmitter Power: | 6.34 dBm |
| Modulation mode / type: | FM |
| Temperature Range: | -20°C-50°C |
| Antenna Type: | Spring antenna |
| Antenna gain: | 4 dBi |
| Test frequency list: | Please refer to the Note 4. |
| Software version number: | N/A |
| Hardware version number: | N/A |
| Connecting I/O Port(s): | Please refer to the Note 1. |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
2. Note: The product has the same digital working characters when operating in both two digitized voice/data mode. So only one set of test results for digital modulation modes are provided in this test report.

3.

| Channel List | | | | | |
|--------------|-----------------|---------|-----------------|---------|-----------------|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 01 | 470.2 | 02 | 563 | 03 | 607.7 |

4. Test frequency list

| Test Channel List | | |
|-------------------|-------------|----------------------|
| Test Channel | EUT Channel | Test Frequency (MHz) |
| CH01 | CH01 | 470.2 |
| CH02 | CH02 | 563 |
| CH03 | CH03 | 607.7 |

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above listed frequency for testing.

2.2 DESCRIPTION OF THE 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.

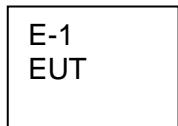
| Pretest Mode | Description |
|--------------|-------------|
| Mode 1 | CH01 |
| Mode 2 | CH02 |
| Mode 3 | CH03 |

| For Radiated Emission | |
|-----------------------|-------------|
| Final Test Mode | Description |
| Mode 1 | CH01 |
| Mode 2 | CH02 |
| Mode 3 | CH03 |

Note:

(1) Due to the different configuration and test, in this list only some worse mode. The worst test data of the worse mode is reported by this report.

2.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



2.4 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

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.

Necessary accessories

| Item | Equipment | Mfr/Brand | Model/Type No. | Length | Note |
|------|-----------|-----------|----------------|--------|------|
| N/A | Adapter | N/A | GQ12-120100-CU | N/A | N/A |
| | | | | | |
| | | | | | |
| | | | | | |

Support units

| Item | Equipment | Mfr/Brand | Model/Type No. | Length | Note |
|------|-----------|-----------|----------------|--------|------|
| N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | |
| | | | | | |
| | | | | | |

Note:

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

2.5 TEST EQUIPMENT

| No | Test Equipment | Manufacturer | Model No | Serial No | Cal. Date | Cal. Due Date |
|----|-------------------------------------|--------------|-----------------|--------------|------------|---------------|
| 1 | Spectrum Analyzer | R&S | FSV40 | 101470 | 2023.09.08 | 2024.09.07 |
| 2 | Spectrum Analyzer | Keysight | N9020A | MY51280643 | 2023.09.08 | 2024.09.07 |
| 3 | EMI Measuring Receiver | R&S | ESR | 101660 | 2023.09.08 | 2024.09.07 |
| 4 | Low Noise Pre-Amplifier | HP | HP8447E | 1937A01855 | 2023.09.08 | 2024.09.07 |
| 5 | Low Noise Pre-Amplifier | Tsj | MLA-0120-A02-34 | 2648A04738 | 2023.09.08 | 2024.09.07 |
| 6 | Passive Loop | ETS | 6512 | 00165355 | 2022.09.04 | 2024.09.03 |
| 7 | TRILOG Super Broadband test Antenna | SCHWARZBECK | VULB9160 | 9160-3206 | 2021.08.29 | 2024.08.28 |
| 8 | Broadband Horn Antenna | SCHWARZBECK | BBHA9120D | 452 | 2021.08.29 | 2024.08.28 |
| 9 | SHF-EHF Horn Antenna 15-40GHz | SCHWARZBECK | BBHA9170 | BBHA9170367d | 2021.08.29 | 2024.08.28 |
| 10 | EMI Measuring Receiver | R&S | ESR | 101160 | 2023.09.13 | 2024.09.12 |
| 11 | LISN | SCHWARZBECK | NNLK 8129 | 8130179 | 2023.10.29 | 2024.10.28 |
| 12 | Pulse Limiter | R&S | ESH3-Z2 | 102789 | 2023.09.13 | 2024.09.12 |
| 13 | Pro.Temp&Humi.chamber | MENTEK | MHP-150-1C | MAA08112501 | 2023.09.08 | 2024.09.07 |
| 14 | RF Automatic Test system | MW | MW100-RFCB | 21033016 | 2023.09.08 | 2024.09.07 |
| 15 | Signal Generator | Agilent | N5182A | MY50143009 | 2023.09.08 | 2024.09.07 |
| 16 | Wideband Radio communication tester | R&S | CMW500 | 1201.0002K50 | 2023.09.08 | 2024.09.07 |
| 17 | RF Automatic Test system | MW | MW100-RFCB | 21033016 | 2023.09.08 | 2024.09.07 |
| 18 | DC power supply | ZHAOXIN | RXN-305D-2 | 28070002559 | N/A | N/A |
| 19 | RE Software | EZ | EZ-EMC_RE | Ver.AIT-03A | N/A | N/A |
| 20 | CE Software | EZ | EZ-EMC_CE | Ver.AIT-03A | N/A | N/A |
| 21 | RF Software | MW | MTS 8310 | 2.0.0.0 | N/A | N/A |
| 22 | temporary antenna connector(Note) | NTS | R001 | N/A | N/A | N/A |

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

| FREQUENCY (MHz) | Conducted Emission limit (dBuV) | |
|-----------------|---------------------------------|-----------|
| | Quasi-peak | Average |
| 0.15 -0.5 | 66 - 56 * | 56 - 46 * |
| 0.50 -5.0 | 56.00 | 46.00 |
| 5.0 -30.0 | 60.00 | 50.00 |

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.

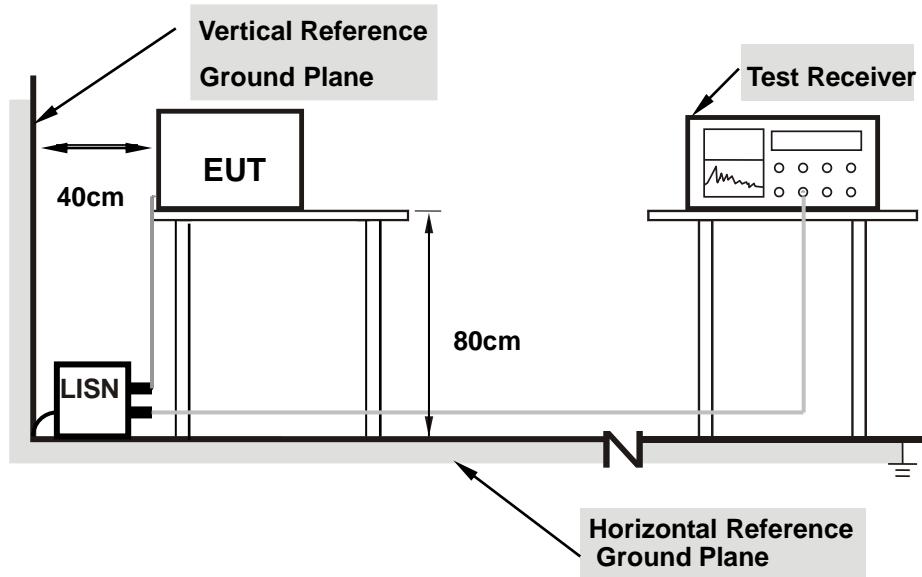
The following table is the setting of the receiver

| 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 is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 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 is at least 80 cm from the nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

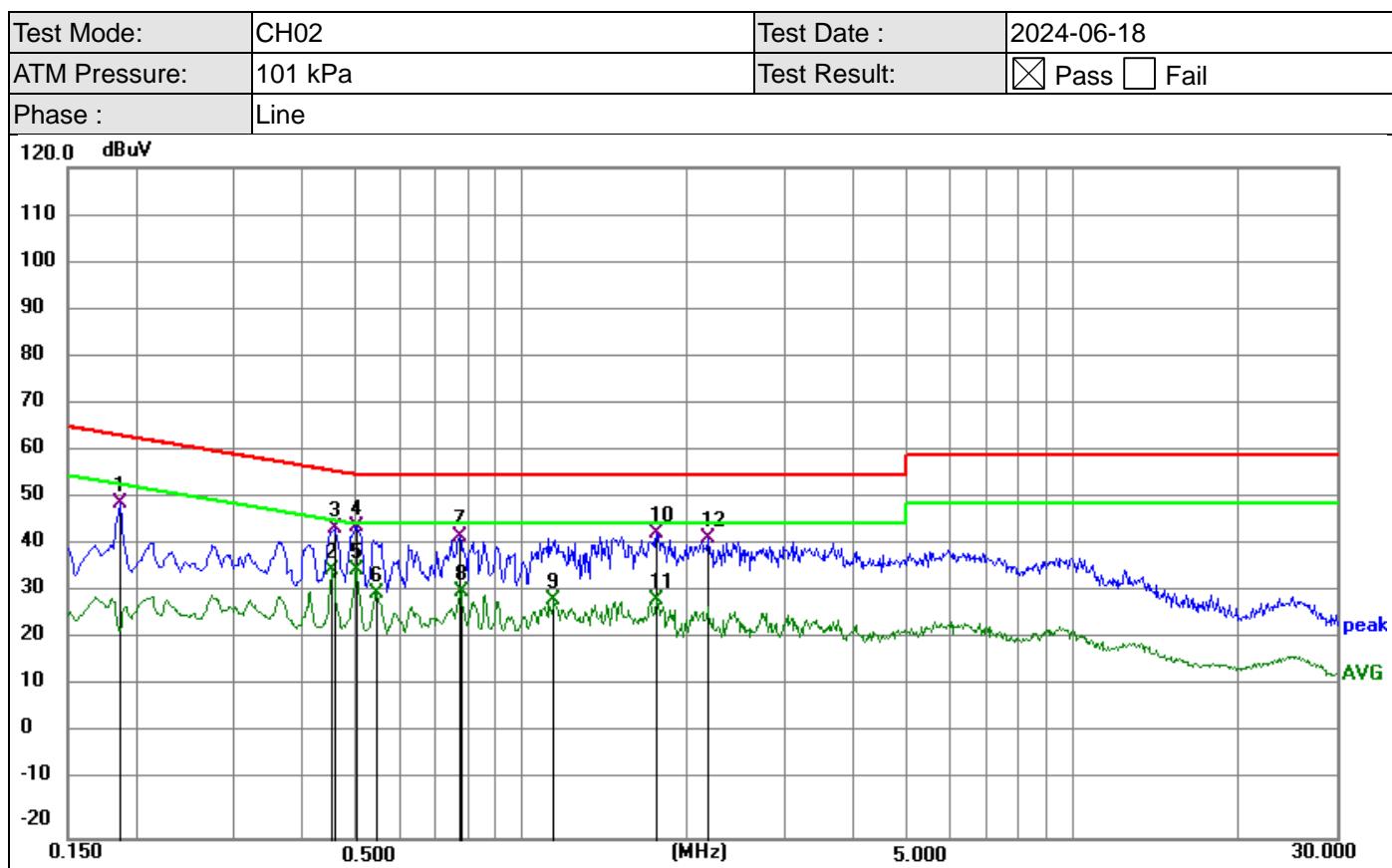
3.1.3 TEST SETUP



Note:

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes support.

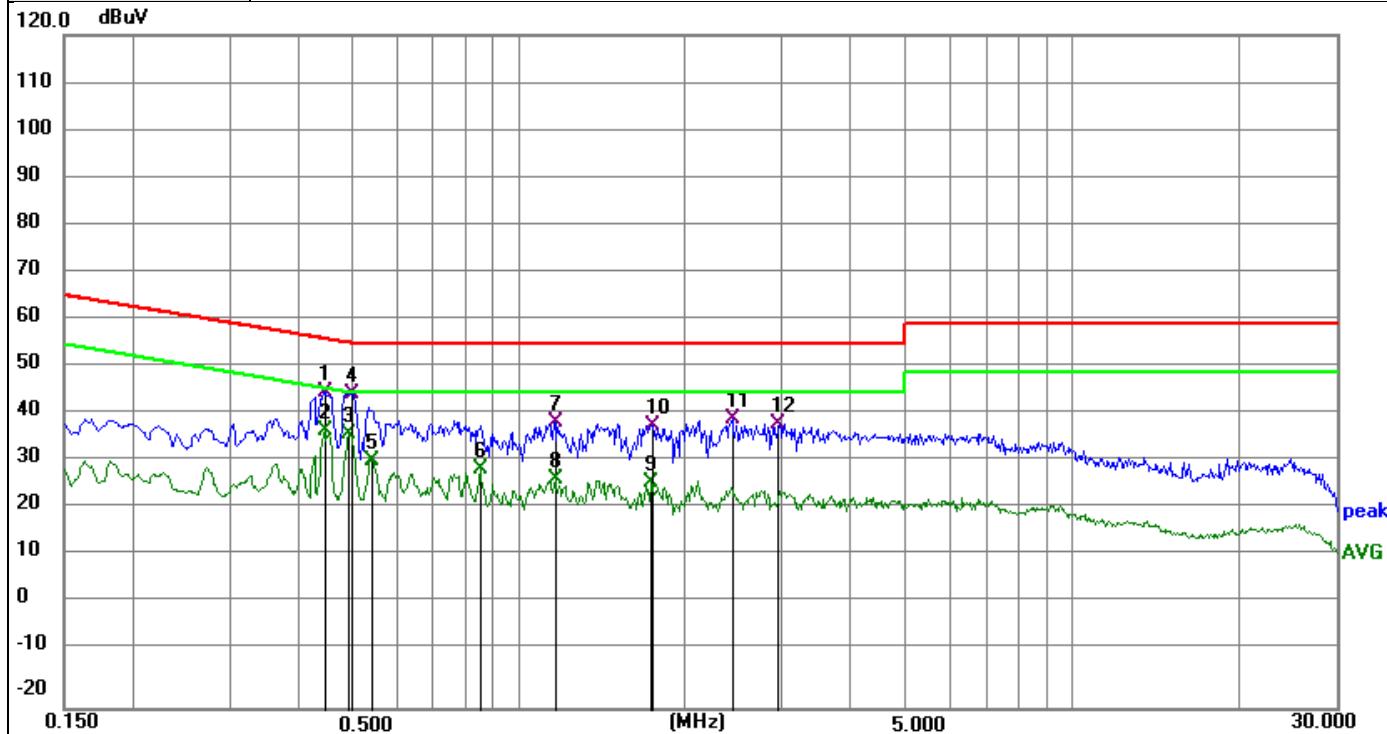
3.1.4 TEST RESULT



Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;
Measurement Result = Reading Level +Correct Factor;
Margin = Measurement Result- Limit;

| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|--------|
| 1 | 0.1860 | 39.23 | 10.69 | 49.92 | 64.21 | -14.29 | QP |
| 2 | 0.4515 | 25.27 | 10.69 | 35.96 | 46.85 | -10.89 | AVG |
| 3 | 0.4560 | 34.11 | 10.69 | 44.80 | 56.77 | -11.97 | QP |
| 4 | 0.5010 | 34.42 | 10.69 | 45.11 | 56.00 | -10.89 | QP |
| 5 | 0.5010 | 25.40 | 10.69 | 36.09 | 46.00 | -9.91 | AVG |
| 6 | 0.5460 | 20.69 | 10.68 | 31.37 | 46.00 | -14.63 | AVG |
| 7 | 0.7710 | 32.35 | 10.67 | 43.02 | 56.00 | -12.98 | QP |
| 8 | 0.7753 | 20.78 | 10.67 | 31.45 | 46.00 | -14.55 | AVG |
| 9 | 1.1445 | 19.13 | 10.67 | 29.80 | 46.00 | -16.20 | AVG |
| 10 | 1.7610 | 32.89 | 10.75 | 43.64 | 56.00 | -12.36 | QP |
| 11 | 1.7610 | 19.10 | 10.75 | 29.85 | 46.00 | -16.15 | AVG |
| 12 | 2.1750 | 32.07 | 10.79 | 42.86 | 56.00 | -13.14 | QP |

| | | | |
|---------------|---------|--------------|--|
| Test Mode: | CH02 | Test Date : | 2024-06-18 |
| ATM Pressure: | 101 kPa | Test Result: | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| Phase : | Neutral | | |



Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;

Measurement Result = Reading Level +Correct Factor;

Margin = Measurement Result- Limit;

| No. | Frequency (MHz) | Reading (dBuV) | Correct (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|--------------------|-------------------|-----------------|------------------|-----------------|----------------|--------|
| 1 | 0.4425 | 35.18 | 10.69 | 45.87 | 57.01 | -11.14 | QP |
| 2 | 0.4425 | 27.32 | 10.69 | 38.01 | 47.01 | -9.00 | AVG |
| 3 | 0.4920 | 26.29 | 10.69 | 36.98 | 46.13 | -9.15 | AVG |
| 4 | 0.4964 | 34.95 | 10.69 | 45.64 | 56.06 | -10.42 | QP |
| 5 | 0.5413 | 20.96 | 10.68 | 31.64 | 46.00 | -14.36 | AVG |
| 6 | 0.8520 | 19.34 | 10.65 | 29.99 | 46.00 | -16.01 | AVG |
| 7 | 1.1625 | 29.06 | 10.66 | 39.72 | 56.00 | -16.28 | QP |
| 8 | 1.1625 | 17.15 | 10.66 | 27.81 | 46.00 | -18.19 | AVG |
| 9 | 1.7295 | 16.45 | 10.74 | 27.19 | 46.00 | -18.81 | AVG |
| 10 | 1.7383 | 28.18 | 10.74 | 38.92 | 56.00 | -17.08 | QP |
| 11 | 2.4270 | 29.41 | 10.78 | 40.19 | 56.00 | -15.81 | QP |
| 12 | 2.9534 | 28.56 | 10.78 | 39.34 | 56.00 | -16.66 | QP |

3.2 RADIATED EMISSIONS MEASUREMENT

3.2.1 STANDARD REQUIREMENT:

Table 3: Limits for spurious emissions

| State | Frequency | Other Frequencies below 1 000 MHz | Frequencies above 1 000 MHz |
|-----------|---|-----------------------------------|-----------------------------|
| | 47 MHz to 74 MHz 87,5 MHz to 137 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz | | |
| Operation | 4 nW | 250 nW | 1 µW |
| Standby | 2 nW | 2 nW | 20 nW |

3.2.2 MEASURING INSTRUMENTS AND SETTING:

Please refer to equipment list in this report. The following table is the setting of spectrum analyzer and receiver.

| Spectrum Parameter | Setting |
|---|---|
| Attenuation | Auto |
| Start Frequency | 1000 MHz |
| Stop Frequency | 10 th carrier harmonic |
| RB / VB (Emission in restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average |
| RB / VB (Emission in non-restricted band) | 1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average |

| Receiver Parameter | Setting |
|------------------------|--|
| Attenuation | Auto |
| Start ~ Stop Frequency | 9kHz~150kHz / RB/VB 200Hz/1KHz for QP/AVG |
| Start ~ Stop Frequency | 150kHz~30MHz / RB/VB 9kHz/30KHz for QP/AVG |
| Start ~ Stop Frequency | 30MHz~1000MHz / RB/VB 120kHz/1MHz for QP |

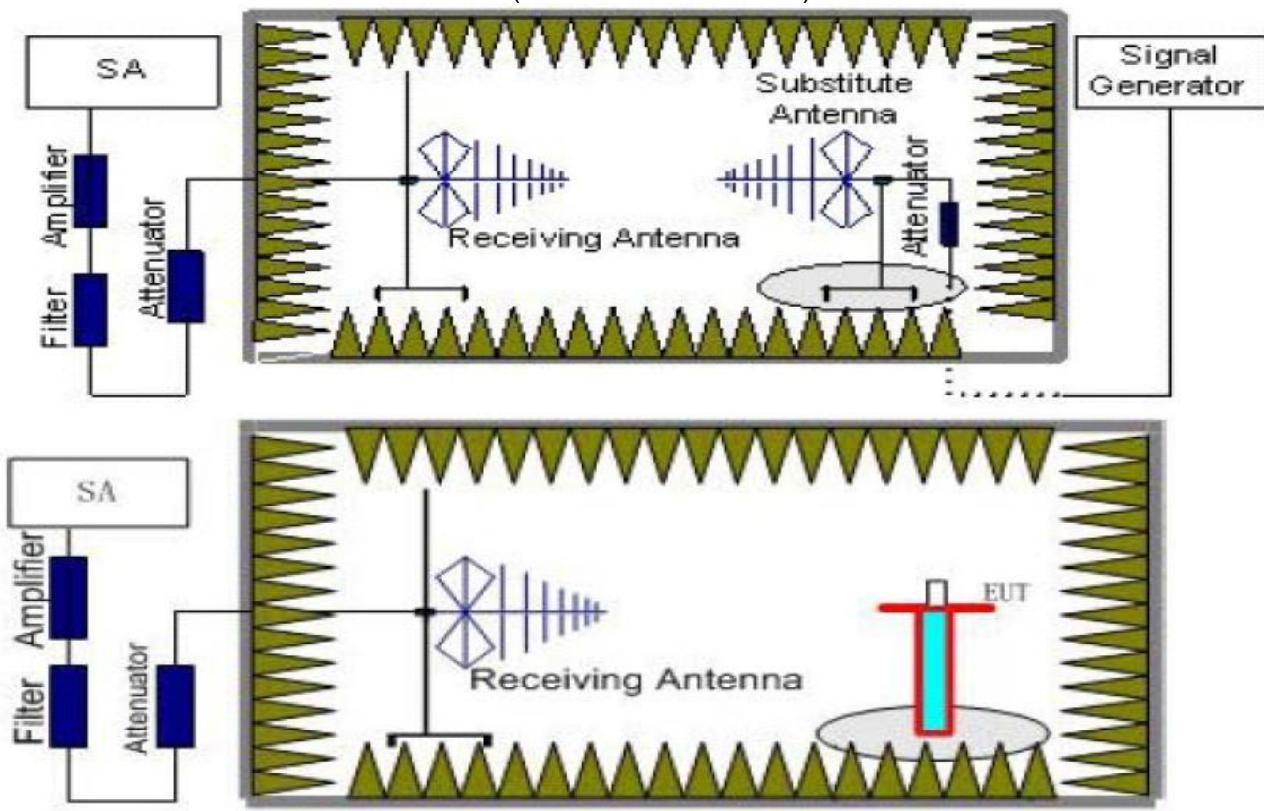
3.2.3 TEST PROCEDURES

1. Please refer to ETSI EN 300 422-1 V1.4.2 (2011-08) clause 6.1 for the test conditions.
2. Please refer to ETSI EN 300 422-1 V1.4.2 (2011-08) clause 8.4.2 for the measurement method.

3.2.4 TEST SETUP LAYOUT

Test Configuration

Effective Radiated Power measurement (30 MHz to 12.75 GHz)



3.2.5 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

3.2.6 TEST RESULT

| | | | |
|----------------|------|----------|-----|
| Temperature | 26°C | Humidity | 53% |
| Configurations | TX | | |

Remarks:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

Spurious emissions

The test frequency range from 25MHz to 6GHz and recorded worst at below:

| Test mode: Tx (470.2MHz) | | | | | | |
|--------------------------|----------|------------------------|-------|--------|--------|--|
| Frequency (MHz) | Pol./Ant | Measurement EIRP (dBm) | Limit | Margin | Result | |
| | | | (dBm) | (dB) | | |
| 54.1 | V | -80.13 | -54 | 26.13 | | |
| 331.5 | V | -70.56 | -36 | 34.56 | | |
| 642.4 | V | -66.79 | -54 | 12.79 | | |
| 940.4 | V | -60.27 | -54 | 6.27 | | |
| 1410.6 | V | -41.78 | -30 | 11.78 | | |
| 1880.8 | V | -40.75 | -30 | 10.75 | | |
| 2351 | V | -37.71 | -30 | 7.71 | | |
| 2821.2 | V | -36.94 | -30 | 6.94 | | |
| -- | -- | -- | -- | -- | | |
| 54.7 | V | -80.33 | -54 | 26.33 | | |
| 331.2 | V | -71.47 | -36 | 35.47 | | |
| 641.5 | V | -65.33 | -54 | 11.33 | | |
| 940.4 | H | -61.55 | -54 | 7.55 | | |
| 1410.6 | H | -42.63 | -30 | 12.63 | | |
| 1880.8 | H | -39.86 | -30 | 9.86 | | |
| 2351 | H | -38.31 | -30 | 8.31 | | |
| 2821.2 | H | -37.05 | -30 | 7.05 | | |
| -- | -- | -- | -- | -- | | |

PASS

| Test mode: Tx (563MHz) | | | | | | |
|------------------------|----------|------------------------|-------|--------|--------|--|
| Frequency (MHz) | Pol./Ant | Measurement EIRP (dBm) | Limit | Margin | Result | |
| | | | (dBm) | (dB) | | |
| 58.3 | V | -80.89 | -54 | 26.89 | | |
| 334.2 | V | -70.28 | -36 | 34.28 | | |
| 641.5 | V | -66.31 | -54 | 12.31 | | |
| 1126 | V | -44.16 | -30 | 14.16 | | |
| 1689 | V | -41.30 | -30 | 11.30 | | |
| 2252 | V | -40.42 | -30 | 10.42 | | |
| 2815 | V | -38.18 | -30 | 8.18 | | |
| 3378 | V | -37.36 | -30 | 7.36 | | |
| -- | -- | -- | -- | -- | | |
| 57.2 | H | -80.26 | -54 | 26.26 | | |
| 321.4 | H | -70.51 | -36 | 34.51 | | |
| 638.7 | H | -67.44 | -54 | 13.44 | | |
| 1126 | H | -44.47 | -30 | 14.47 | | |
| 1689 | H | -41.63 | -30 | 11.63 | | |
| 2252 | H | -40.04 | -30 | 10.04 | | |
| 2815 | H | -38.63 | -30 | 8.63 | | |
| 3378 | H | -37.54 | -30 | 7.54 | | |
| -- | -- | -- | -- | -- | | |

PASS

| Test mode: Tx (607.7MHz) | | | | | |
|--------------------------|----------|------------------------|-------|--------|--------|
| Frequency (MHz) | Pol./Ant | Measurement EIRP (dBm) | Limit | Margin | Result |
| | | | (dBm) | (dB) | |
| 53.5 | V | -78.18 | -54 | 24.18 | PASS |
| 335.8 | V | -71.332 | -36 | 35.33 | |
| 643.6 | V | -66.31 | -54 | 12.31 | |
| 1215.4 | V | -43.30 | -30 | 13.30 | |
| 1823.1 | V | -42.18 | -30 | 12.18 | |
| 2430.8 | V | -39.73 | -30 | 9.73 | |
| 3038.5 | V | -37.44 | -30 | 7.44 | |
| 3646.2 | V | -36.57 | -30 | 6.57 | |
| -- | -- | -- | -- | -- | |
| 54 | V | -80.67 | -54 | 26.67 | |
| 334.2 | V | -70.21 | -36 | 34.21 | |
| 642.7 | V | -66.34 | -54 | 12.34 | |
| 1215.4 | H | -44.06 | -30 | 14.06 | |
| 1823.1 | H | -42.00 | -30 | 12.00 | |
| 2430.8 | H | -40.35 | -30 | 10.35 | |
| 3038.5 | H | -37.07 | -30 | 7.07 | |
| 3646.2 | H | -36.86 | -30 | 6.86 | |
| -- | -- | -- | -- | -- | |

Remark:

1. The test frequency range from 25MHz to 6GHz, RBW/VBW: 100 KHz/300KHz below 1GHz, RBW/VBW: 1000 KHz/3000KHz above 1GHz.
2. "--"Other emission levels were very low against the limit and not reported.

Emission Mask

ETSI EN 300 422-1 V1.4.2 Clause 8.3.1.2 The Maximum Measurement of Necessary Bandwidth Test Plot:

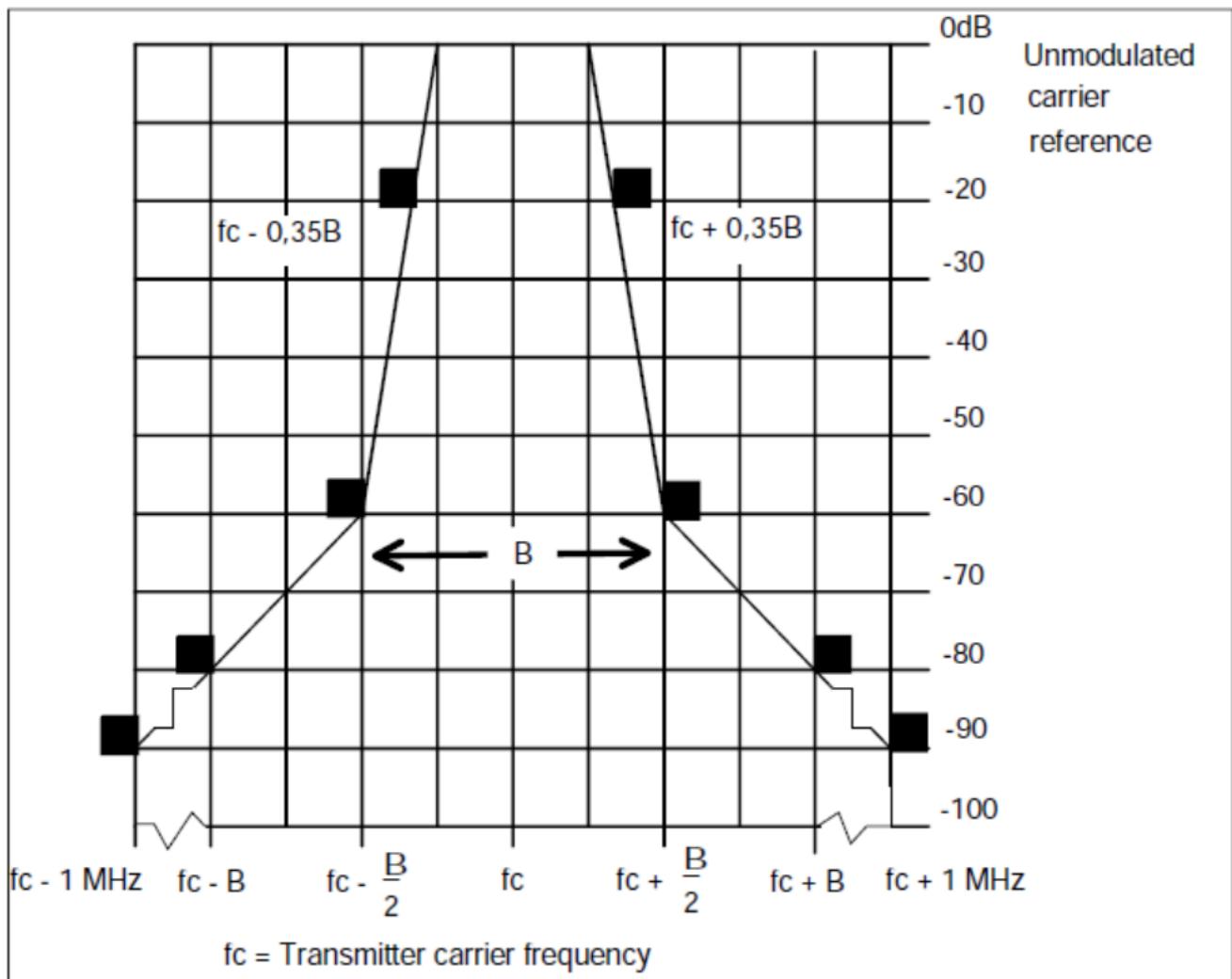
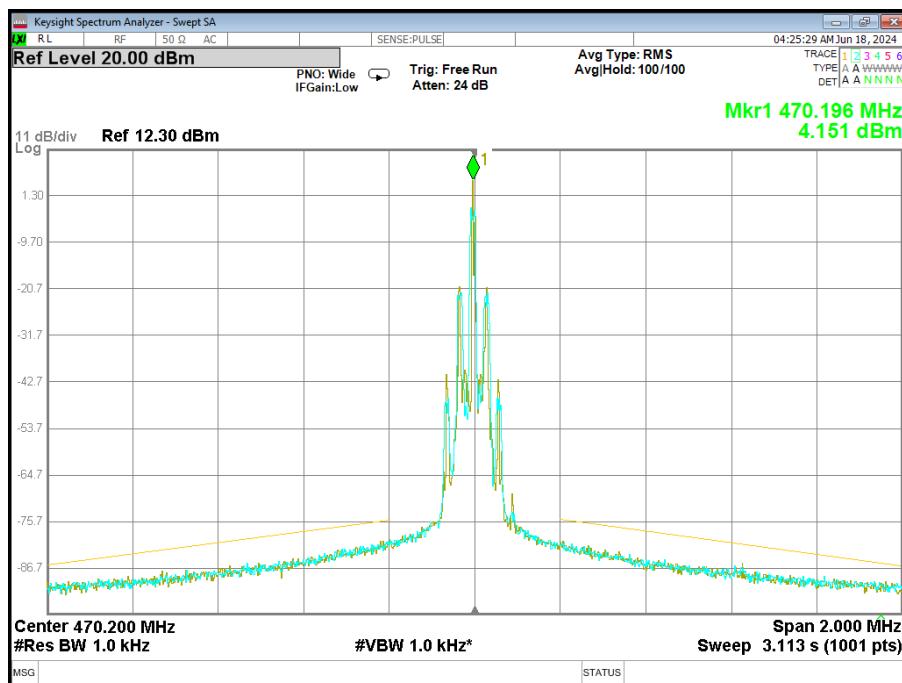
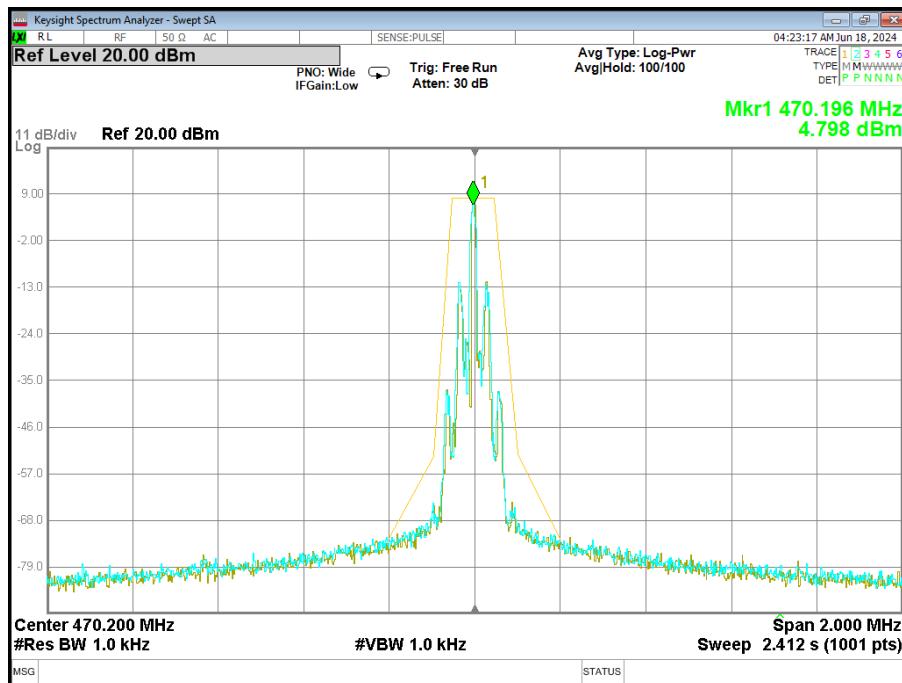


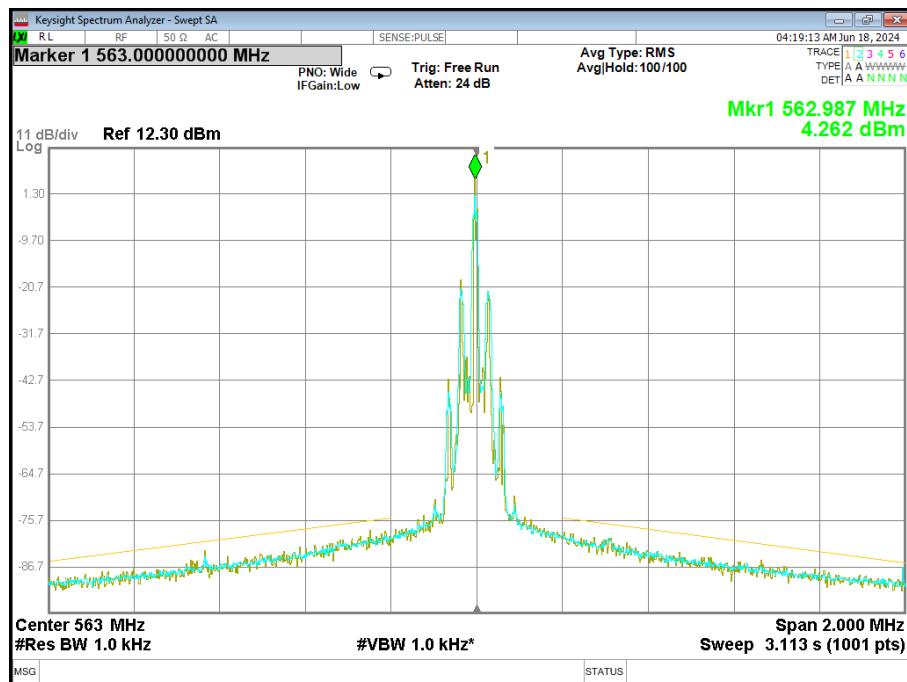
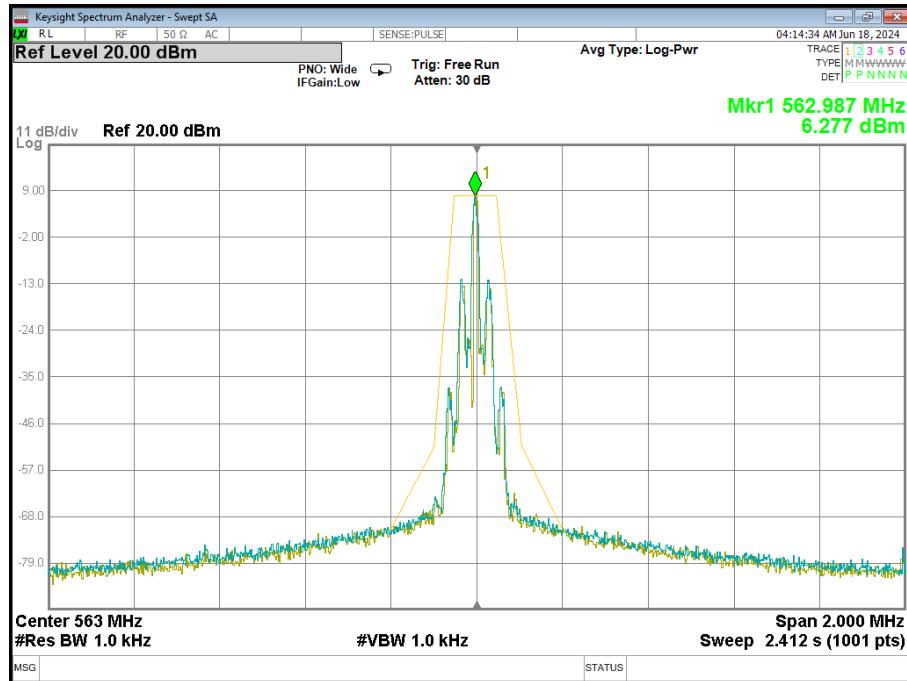
Figure 3: Spectrum mask for analogue systems in all bands

| Frequency (MHz) | Declared Bandwidth B (KHz) | B/2 (KHz) | 0.35B (KHz) |
|-----------------|----------------------------|-----------|-------------|
| 470.2 | 200 | 100 | 70 |
| 563 | 200 | 100 | 70 |
| 607.7 | 200 | 100 | 70 |

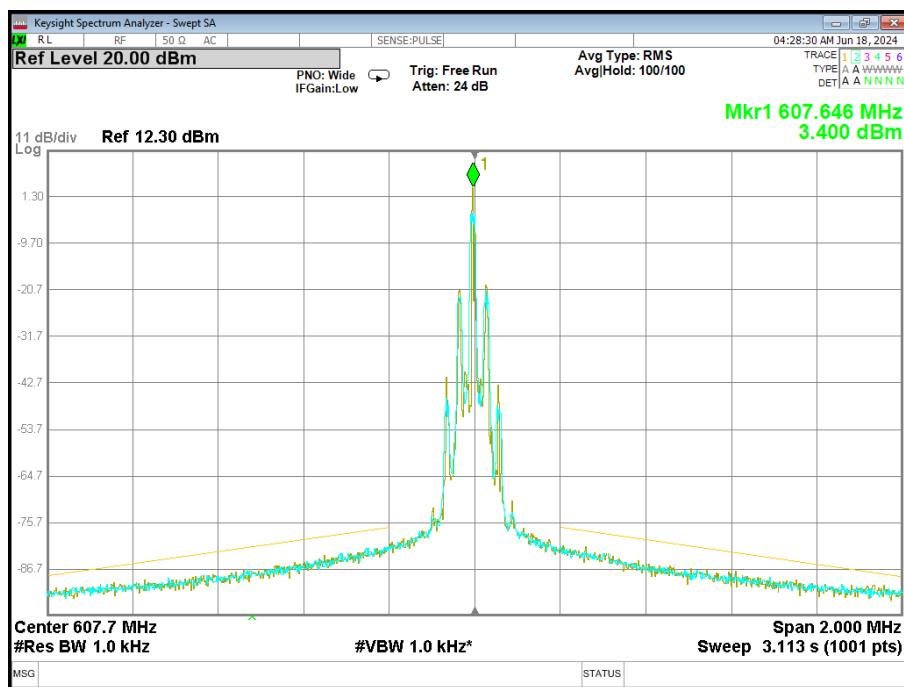
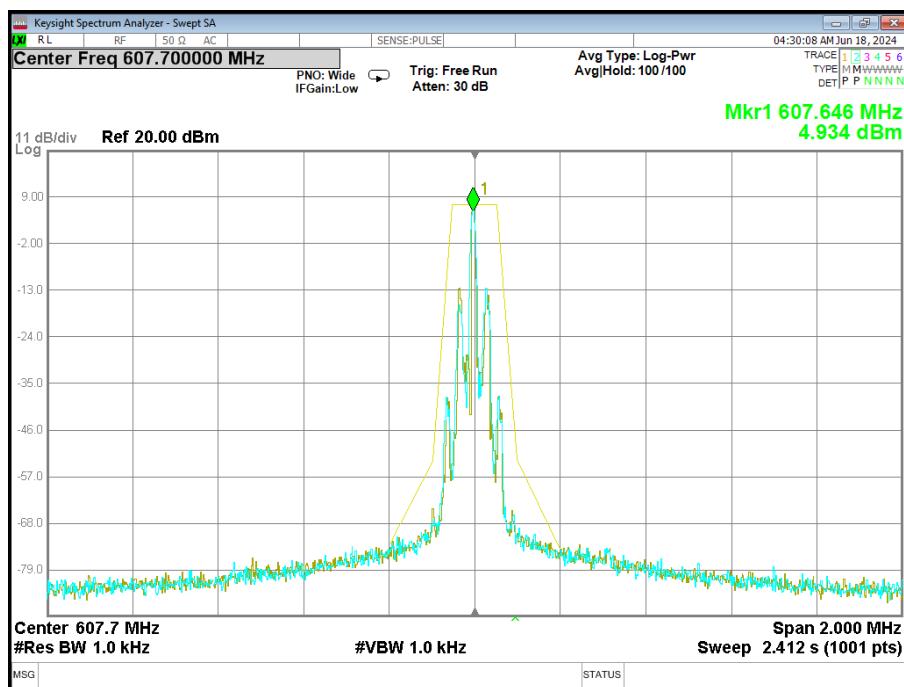
CH 01



CH 02



CH 03



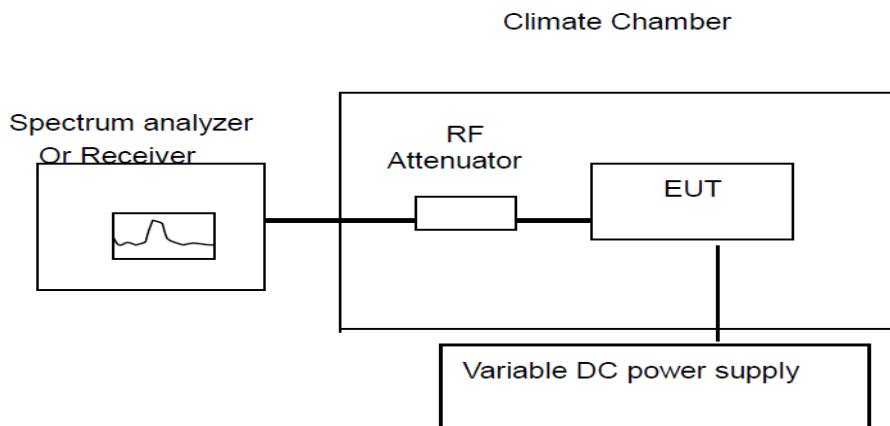
4. Part 15.236 REQUIREMENTS

4.1 FREQUENCY STABILITY VS. TEMPERATURE & VOLTAGE

TEST LIMIT

According to Part 15.236 (f)(3), the frequency tolerance of the carrier signal shall be maintained within $\pm 0.005\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. Battery operated equipment shall be tested using a new battery.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was connected to an external DC power supply and the RF output was connected to a frequency counter via feed through attenuators. The EUT was placed inside the temperature chamber. The DC leads and the RF output cable, exited the chamber through an opening made for that purpose.

After the temperature stabilized the frequency output was recorded from the counter.

An external variable DC power supply was connected to the battery terminals of the equipment under test.

- For hand carried, battery powered equipment primary supply voltage was reduced to the battery operating end point as specified by the manufacturer. The output frequency was recorded for each battery voltage.

TEST RESULTS

(1) Frequency stability versus input voltage (Supply Nominal voltage is DC 3.7V)

| Reference Frequency: 470.2MHz | | | | | |
|-------------------------------|------------------------------|----------------------|---------------------|-----------|---------|
| Power Supply (V) | Environment Temperature (°C) | Frequency Error (Hz) | Frequency Error (%) | Limit (%) | Results |
| 4.07 | 20 | 4980 | 0.00106 | ±0.005 | PASS |
| 3.7 | 20 | 4971 | 0.00106 | | |
| 3.33 | 20 | 4974 | 0.00106 | | |

| Reference Frequency: 470.2MHz | | | | |
|-------------------------------|---|---------------------|-----------|---------|
| Environment Temperature(°C) | Frequency Deviation measured with time Elapse(30 minutes) | | | |
| | Frequency Error (Hz) | Frequency Error (%) | Limit (%) | Results |
| 50 | 4917 | 0.00105 | ±0.005 | PASS |
| 40 | 5078 | 0.00108 | | |
| 30 | 5015 | 0.00107 | | |
| 20 | 4972 | 0.00106 | | |
| 10 | 5031 | 0.00107 | | |
| 0 | 5042 | 0.00107 | | |
| -10 | 4927 | 0.00105 | | |
| -20 | 5009 | 0.00107 | | |

| Reference Frequency: 563MHz | | | | | |
|-----------------------------|------------------------------|----------------------|---------------------|-----------|---------|
| Power Supply (V) | Environment Temperature (°C) | Frequency Error (Hz) | Frequency Error (%) | Limit (%) | Results |
| 4.07 | 20 | 5020 | 0.00089 | ±0.005 | PASS |
| 3.7 | 20 | 4924 | 0.00087 | | |
| 3.33 | 20 | 5004 | 0.00089 | | |

| Reference Frequency: 563MHz | | | | |
|-----------------------------|---|---------------------|-----------|---------|
| Environment Temperature(°C) | Frequency Deviation measured with time Elapse(30 minutes) | | | |
| | Frequency Error (Hz) | Frequency Error (%) | Limit (%) | Results |
| 50 | 4957 | 0.00088 | ±0.005 | PASS |
| 40 | 5000 | 0.00089 | | |
| 30 | 4993 | 0.00089 | | |
| 20 | 4938 | 0.00088 | | |
| 10 | 5005 | 0.00089 | | |
| 0 | 5004 | 0.00089 | | |
| -10 | 5014 | 0.00089 | | |
| -20 | 5008 | 0.00089 | | |

| Reference Frequency: 607.7MHz | | | | | |
|-------------------------------|------------------------------|----------------------|---------------------|-----------|---------|
| Power Supply (V) | Environment Temperature (°C) | Frequency Error (Hz) | Frequency Error (%) | Limit (%) | Results |
| 4.07 | 20 | 4993 | 0.00082 | ±0.005 | PASS |
| 3.7 | 20 | 4994 | 0.00082 | | |
| 3.33 | 20 | 4955 | 0.00082 | | |

| Reference Frequency: 607.7MHz | | | | |
|-------------------------------|---|---------------------|-----------|---------|
| Environment Temperature(°C) | Frequency Deviation measured with time Elapse(30 minutes) | | | |
| | Frequency Error (Hz) | Frequency Error (%) | Limit (%) | Results |
| 50 | 4997 | 0.00082 | ±0.005 | PASS |
| 40 | 4957 | 0.00082 | | |
| 30 | 5023 | 0.00083 | | |
| 20 | 5020 | 0.00083 | | |
| 10 | 5010 | 0.00082 | | |
| 0 | 4990 | 0.00082 | | |
| -10 | 4964 | 0.00082 | | |
| -20 | 4974 | 0.00082 | | |

4.2 OCCUPIED BANDWIDTH

LIMIT

The operating bandwidth shall not exceed 200 kHz.

TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting : RBW= 3KHz, VBW \geq RBW, Sweep time = Auto.

TEST CONFIGURATION

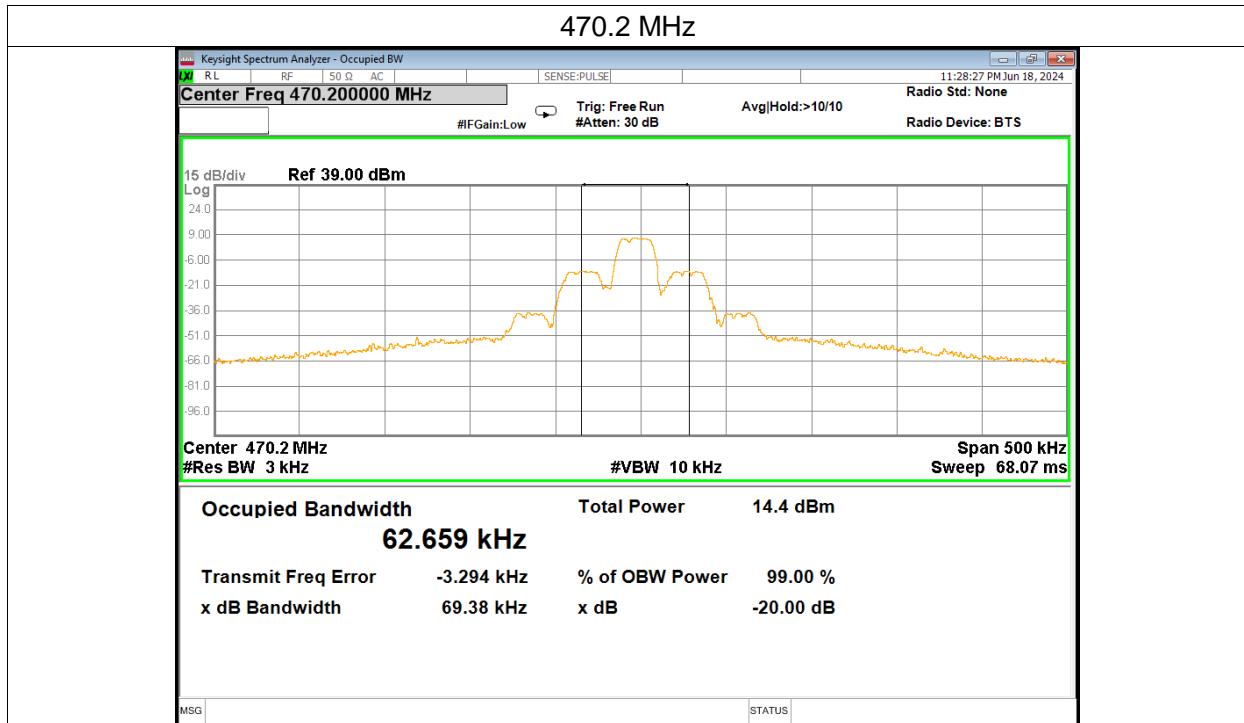


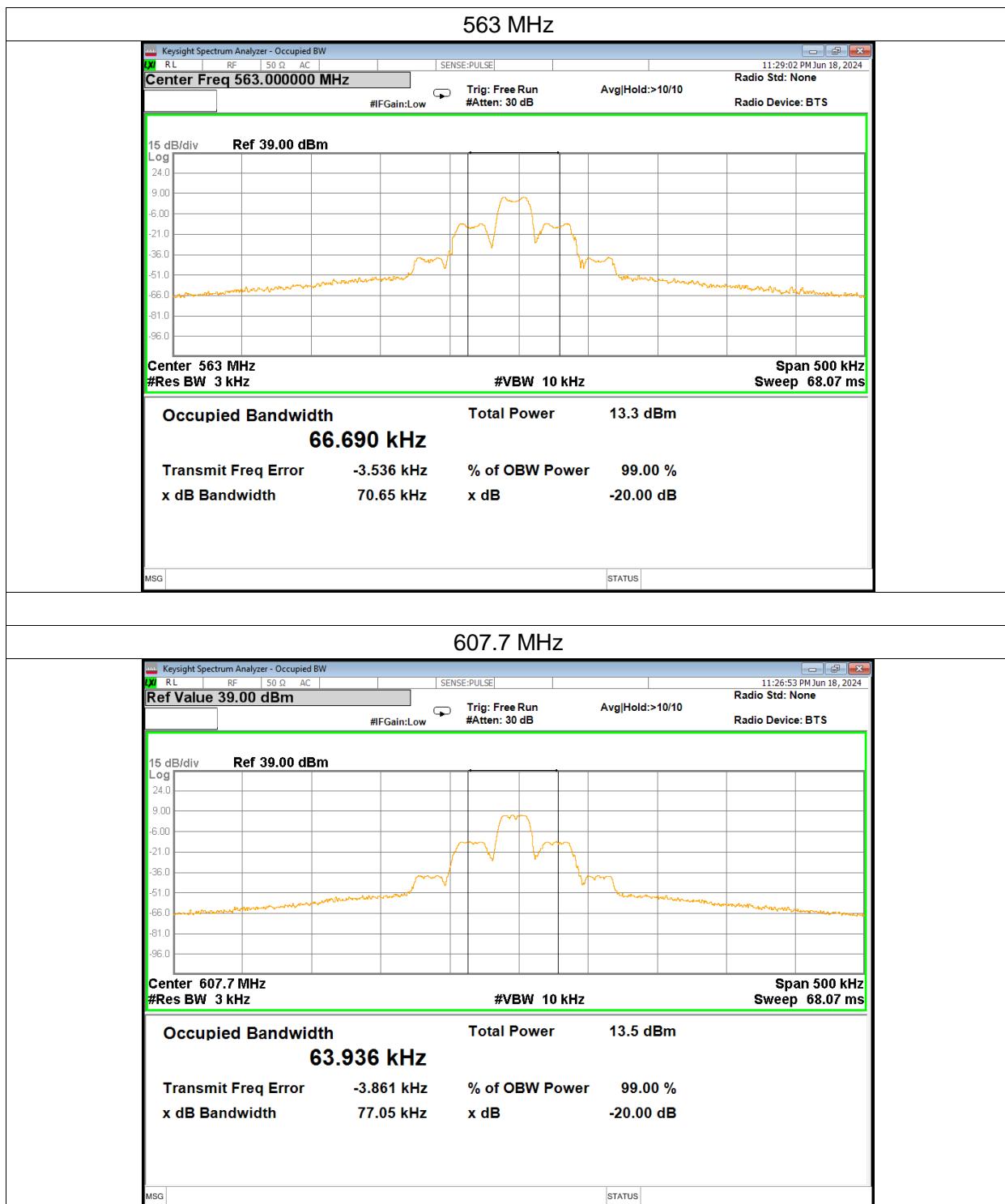
EUT OPERATION CONDITIONS

TX mode.

TEST RESULT

| Frequency (MHz) | 99% Occupied Bandwidth (KHz) | 20dB Bandwidth (KHz) | Result |
|-----------------|------------------------------|----------------------|--------|
| 470.2 | 62.659 | 69.38 | Pass |
| 563 | 66.690 | 70.65 | Pass |
| 607.7 | 63.936 | 77.05 | Pass |





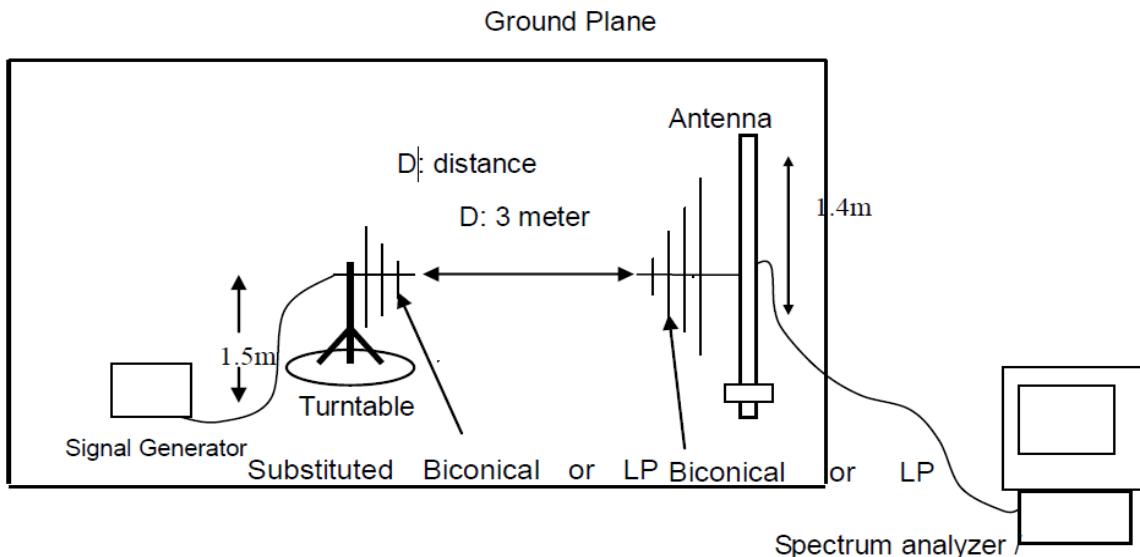
4.3 RADIATED POWER

TEST LIMIT

According to Part 15.236(d), the maximum radiated power shall not exceed the following:

- (1) In the bands allocated and assigned for broadcast television and in the 600 MHz service band: 50 mW EIRP
- (2) In the 600 MHz guard band and the 600 MHz duplex gap: 20 mW EIRP.

TEST CONFIGURATION



TEST PROCEDURE

- a. On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
- b. The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
- c. The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
- d. The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
- e. The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
- f. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- g. The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
- h. The maximum signal level detected by the measuring receiver shall be noted.
- i. The measurement shall be repeated with the test antenna set to horizontal polarization.
- j. Replace the antenna with a proper Antenna (substitution antenna).
- k. The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
- l. The substitution antenna shall be connected to a calibrated signal generator.

- m If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- n The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
- o The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
- p The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
- q The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

TEST RESULT

| Maximum Equivalent Isotropically Radiated Power | | | | | | | | |
|---|------------------|---------------|------------------------|---------------|--------------|---------------|----------|--------|
| Ambient temperature: 22 °C | | | Relative humidity: 55% | | | | | |
| Frequency (MHz) | S.G.Lev (dBm) | Ant (dBi) | Loss (dB) | EIRP (dBm) | EIRP (mW) | Limit (mW) | Polarity | Result |
| 470.2 | 0.07 | 4.8 | 1.6 | 3.27 | 2.13 | 50 | H | Pass |
| 470.2 | 2.91 | 4.8 | 1.6 | 6.11 | 4.08 | 50 | V | Pass |
| 563 | -0.98 | 6 | 1.9 | 3.12 | 2.05 | 50 | H | Pass |
| 563 | 2.24 | 6 | 1.9 | 6.34 | 4.31 | 50 | V | Pass |
| 607.7 | -1.40 | 6.1 | 2 | 2.70 | 1.86 | 50 | H | Pass |
| 607.7 | 1.61 | 6.1 | 2 | 5.71 | 3.72 | 50 | V | Pass |

Note: 1. EIRP (dBm) = S.G.Lev + Ant – Loss

2. mW = $10^{(dBm/10)}$

PHOTOS OF TEST SETUP

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

※※※※※END OF THE REPORT※※※※※