

FCC TEST REPORT

Report No.: NTC-ER2007072

Applicant's name: CWCE Lighting (Shenzhen) Co., Ltd.

Address: A/area, 9F/Bldg,Cuijing Rd 28, Longtian
Town,Pingshan New District,SHENZHEN Guangdong
518122

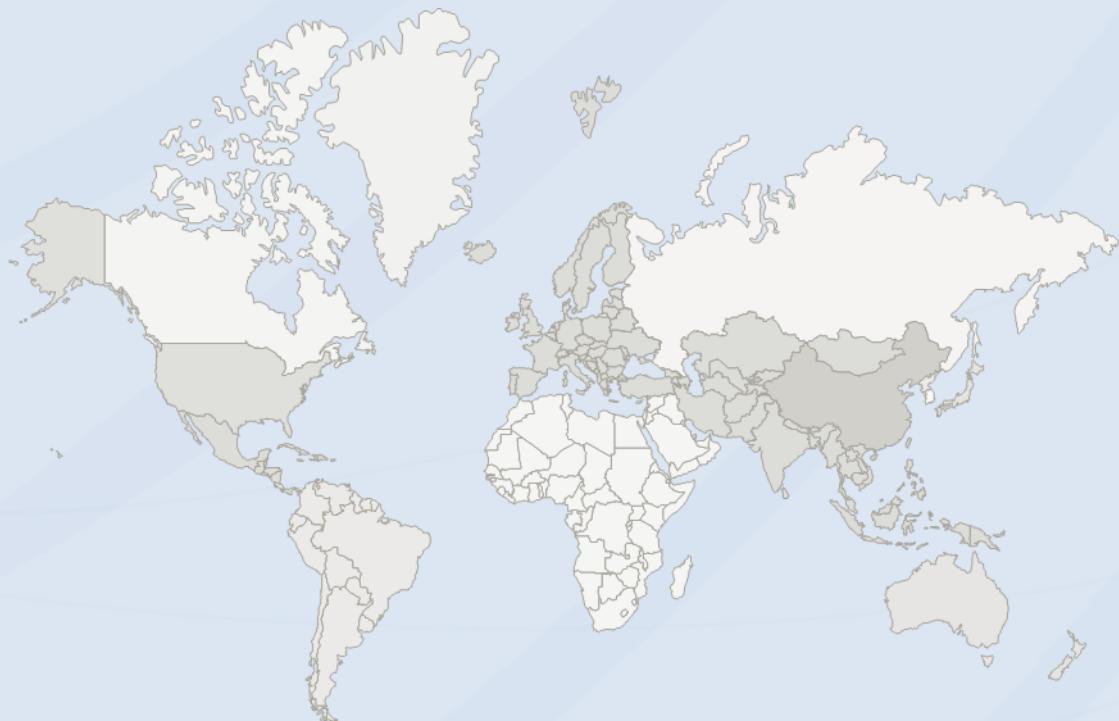


TABLE OF CONTENTS

| | |
|---|----------|
| Test Report Declare..... | 3 |
| 1. Summary of test results | 3 |
| 2. General test information | 3 |
| 2.1. Description of EUT | 3 |
| 2.2. Detail models..... | 4 |
| 2.3. Block diagram EUT configuration for test | 4 |
| 2.4. Test environment conditions | 4 |
| 2.5. Measurement uncertainty..... | 5 |
| 2.6. Support Equipment | 5 |
| 3. Power Line Conducted Emission Test | 6 |
| 3.1. Test equipment | 6 |
| 3.2. Block diagram of test setup..... | 6 |
| 3.3. Power Line Conducted Emission Limits (Class B) | 6 |
| 3.4. Test Procedure..... | 7 |
| 3.5. Test Result..... | 7 |
| 4. Radiated emission test..... | 10 |
| 4.1. Test equipment | 10 |
| 4.2. Block diagram of test setup..... | 11 |
| 4.3. Limit | 13 |
| 4.4. Test Procedure..... | 14 |
| 4.5. Test result | 14 |
| 5. -20dB Bandwidth | 18 |
| 5.1. Test equipment | 18 |
| 5.2. Block diagram of test setup..... | 18 |
| 5.3. Limit | 18 |
| 5.4. Test Procedure..... | 18 |
| 5.5. Test result | 19 |
| 6. Antenna Requirements | 20 |
| 6.1. Limit | 20 |
| 6.2. Result..... | 20 |
| 7. Test setup photograph | 21 |
| 7.1. Photos of power line conducted emission test..... | 21 |
| 7.2. Photos of radiated emission test | 21 |
| 8. Photos of the EUT | 23 |

TEST REPORT DECLARE

| | | |
|-----------------------------|---|--|
| FCC ID | : | 2AXAA-HN022-01V |
| Applicant | : | CWCE Lighting (Shenzhen) Co., Ltd. |
| Address | : | A/area, 9F/Bldg,Cuijing Rd 28, Longtian Town,Pingshan New District,SHENZHEN Guangdong 518122 |
| Equipment under Test | : | Microwave Motion Sensor |
| Model No | : | HN022-01V |
| Trade Mark | : |  中奇创享 |
| Manufacturer | : | CWCE Lighting (Shenzhen) Co., Ltd. |
| Address | : | A/area, 9F/Bldg,Cuijing Rd 28, Longtian Town,Pingshan New District,SHENZHEN Guangdong 518122 |
| Test Laboratory | : | Dongguan New Testing Centre Co., Ltd |
| Address | : | 3F, No. 1 the 1st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China, 523808 |

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C: 2017, ANSI C63.10:2013.

We Declare:

The equipment described above is tested by Dongguan New Testing Centre Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan New Testing Centre Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

| | | | |
|----------------------|------------------------------|------------------------|--------------|
| Report No.: | NTC-ER2007072 | | |
| Date of Test: | Jun.26, 2020 to Aug.01, 2020 | Date of Report: | Aug.02, 2020 |

Prepared By:



Jeffrey Zhang/Engineer



Dave Gao/LAB Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan New Testing Centre Co., Ltd

1. Summary of test results

| Description of Test Item | Standard | Results |
|--------------------------|---|---------|
| 20dB Bandwidth | &15.215(c) ANSI C63.10 :2013 | PASS |
| Radiated Emission | 15.209,&15.205,&15.249 ANSI C63.10 :2013 | PASS |
| Conducted Emissions | &15.207(a) ANSI C63.10 :2009 | PASS |
| Antenna requirement | &15.203 | PASS |

2. General test information

2.1. Description of EUT

| | | |
|--------------------------|---|---|
| EUT* Name | : | Microwave Motion Sensor |
| Test model | : | HN022-01V |
| EUT function description | : | Please reference user manual of this device |
| Power supply | : | DC 12V |
| Trade mark | : |  |
| Operation frequency | : | 915 MHz |
| Antenna Type | : | Wire antenna |
| Antenna Gain | : | 0 dBi |

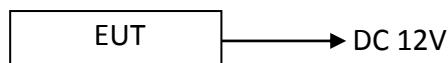
Note: 1,EUT is the ab. of equipment under test.

2.2. Detail models

| Model | Rating | Note |
|-----------|-------------|--|
| HN022-01V | DC 12V 50mA | Microwave / constant illumination+RF(915MHz) |

2.3. Block diagram EUT configuration for test

For EUT Tx mode:



2.4. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

| | |
|--------------------|-----------|
| Temperature range: | 21-24°C |
| Humidity range: | 40-75% |
| Pressure range: | 86-106kPa |

2.5. Measurement uncertainty

| Test Item | Uncertainty |
|---|-----------------------|
| Uncertainty for Conduction emission test | 2.44dB |
| Uncertainty for Radiation Emission test (30MHz – 1GHz) | 3.14 dB (Polarize: V) |
| | 3.16 dB (Polarize: H) |
| Uncertainty for Radiation Emission test (1GHz – 18GHz) | 4.27 dB (Polarize: V) |
| | 4.51 dB (Polarize: H) |
| Bandwidth | ±1.2% |
| Stop Transmitting Time Test | ±0.5% |
| Frequency error | 5.8×10^{-8} |

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

2.6. SUPPORT EQUIPMENT

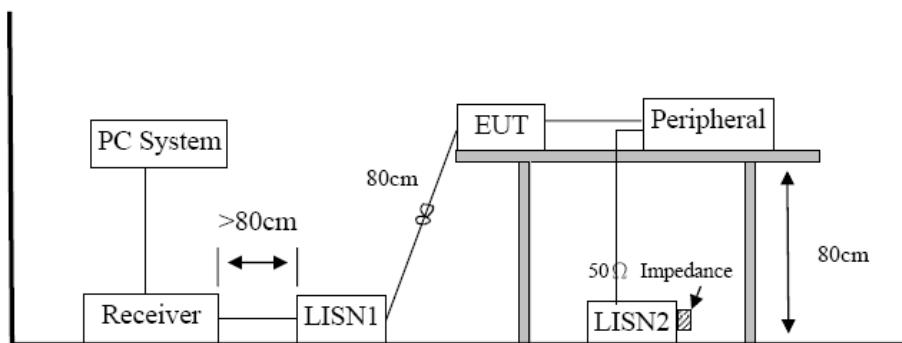
| Device Type | Manufacturer | Model Name | Serial No. | Data Cable | Power Cable |
|-------------|--------------|------------|------------|------------|-------------|
| Adapter | yuewei | YW-212W | -- | -- | -- |

3. Power Line Conducted Emission Test

3.1. Test equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|----------------------|--------------|---------------------|------------------|------------|---------------|
| 1 | Test Receiver | R&S | ESCS30 | 8341151006 | 2019-12-09 | 1 Year |
| 2 | LISN | R&S | ENV216 | 3650.6550.0 6 | 2020-05-25 | 1 Year |
| 3 | Pulse Limiter | R&S | ESH3-Z2 | 0357-8810.5 4 | 2020-05-25 | 1 Year |
| 4 | RF Cable | HUBER | SUCOFLEX1 00 | 30722/4E | 2019-05-13 | 2 Year |
| 5 | MEASUREMENT SOFTWARE | FARAD | EZ-EMC(VER:1.1.4.2) | N/A | N/A | N/A |

3.2. BLOCK DIAGRAM OF TEST SETUP



3.3. Power Line Conducted Emission Limits (Class B)

| Frequency | Quasi-Peak Level dB(μV) | Average Level dB(μV) |
|-----------------|----------------------------|-------------------------|
| 150kHz ~ 500kHz | 66 ~ 56* | 56 ~ 46* |
| 500kHz ~ 5MHz | 56 | 46 |
| 5MHz ~ 30MHz | 60 | 50 |

Note 1: * Decreasing linearly with logarithm of frequency.

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

3.4. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 3.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.3 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

3.5. Test Result

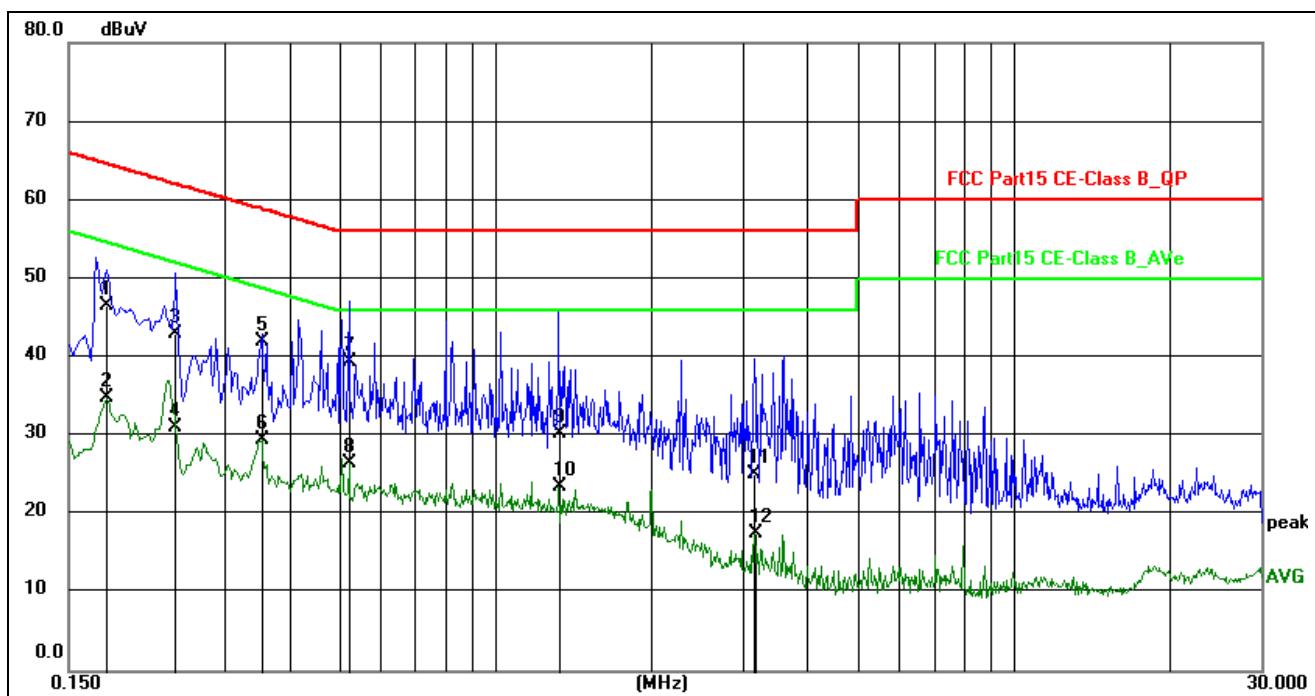
PASS. (See below detailed test result)

Note1: All emissions not reported below are too low against the prescribed limits.

Note2: “----” means Peak detection; “----” mans Average detection

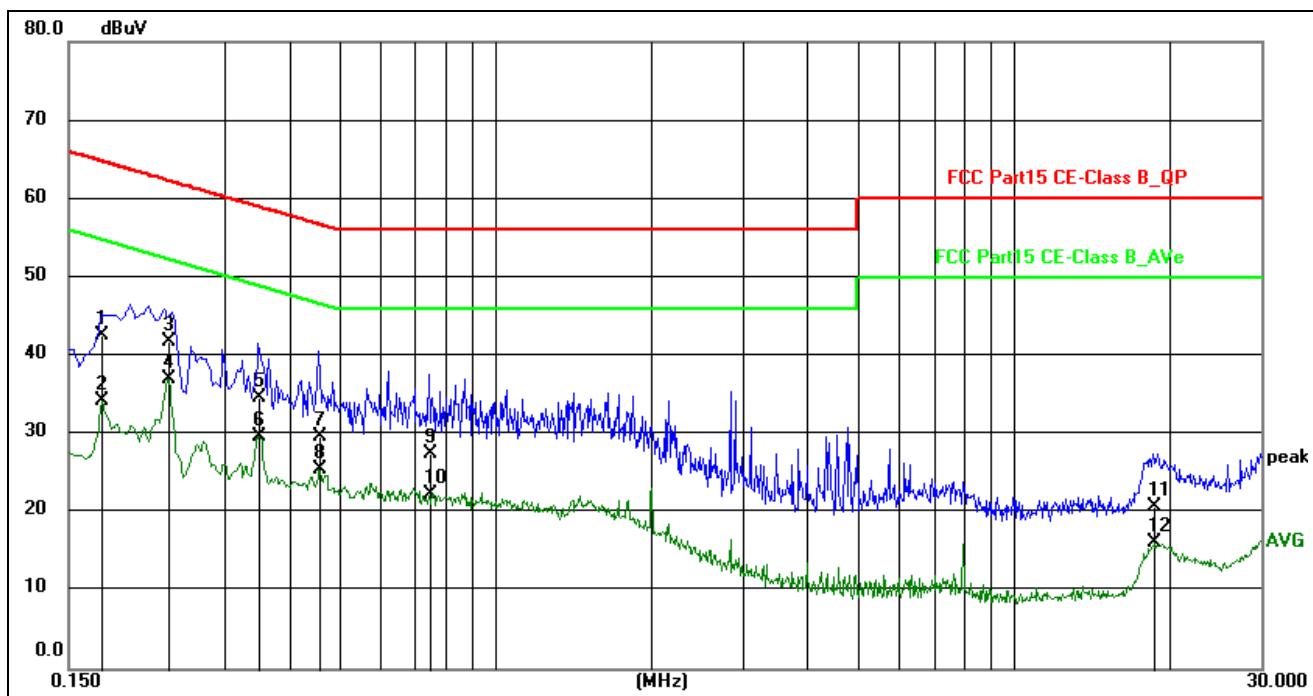
Note3: Measurement = Reading Level + Factor, Margin= Measurement-Limit

Conducted Emission Test Result



| | | | |
|--------|--------------------------|----------------|-------------------------------------|
| Site: | 844LAB | Phase:N | Temperature(C):24(C) |
| Limit: | FCC Part15 CE-Class B_QP | | Humidity(%):63% |
| EUT: | Microwave Motion Sensor | Test Time: | 2020/7/7 17:10:18 |
| M/N.: | HN022-01V | Power Rating: | DC 12V by adapter input 120/60Hz |
| Mode: | Tx | Test Engineer: | |
| Note: | | | |

| No. | Frequency (MHz) | Reading Level(dBuV) | Factor (dB) | Measure-ment(dBuV) | Limit (dBuV) | Margin (dB) | Detector | Comment |
|-----|-----------------|---------------------|-------------|--------------------|--------------|-------------|----------|---------|
| 1 | 0.1773 | 36.70 | 9.91 | 46.61 | 64.61 | -18.00 | QP | |
| 2 | 0.1774 | 24.90 | 9.91 | 34.81 | 54.61 | -19.80 | AVG | |
| 3 | 0.2407 | 33.07 | 9.88 | 42.95 | 62.07 | -19.12 | QP | |
| 4 | 0.2407 | 21.24 | 9.88 | 31.12 | 52.07 | -20.95 | AVG | |
| 5 | 0.3521 | 32.24 | 9.82 | 42.06 | 58.91 | -16.85 | QP | |
| 6 | 0.3524 | 19.63 | 9.82 | 29.45 | 48.91 | -19.46 | AVG | |
| 7 * | 0.5193 | 29.57 | 9.75 | 39.32 | 56.00 | -16.68 | QP | |
| 8 | 0.5196 | 16.66 | 9.75 | 26.41 | 46.00 | -19.59 | AVG | |
| 9 | 1.3253 | 20.67 | 9.64 | 30.31 | 56.00 | -25.69 | QP | |
| 10 | 1.3283 | 13.84 | 9.64 | 23.48 | 46.00 | -22.52 | AVG | |
| 11 | 3.1548 | 15.44 | 9.58 | 25.02 | 56.00 | -30.98 | QP | |
| 12 | 3.1571 | 7.92 | 9.58 | 17.50 | 46.00 | -28.50 | AVG | |



| | | | |
|--------|--------------------------|----------------|-------------------------------------|
| Site: | 844LAB | Phase:L1 | Temperature(C):24(C) |
| Limit: | FCC Part15 CE-Class B_QP | | Humidity(%):63% |
| EUT: | Microwave Motion Sensor | Test Time: | 2020/7/7 17:14:23 |
| M/N.: | HN022-01V | Power Rating: | DC 12V by adapter input 120/60Hz |
| Mode: | Tx | Test Engineer: | |
| Note: | | | |

| No. | Frequency (MHz) | Reading Level(dBuV) | Factor (dB) | Measure-ment(dBuV) | Limit (dBuV) | Margin (dB) | Detector | Comment |
|-----|-----------------|---------------------|-------------|--------------------|--------------|-------------|----------|---------|
| 1 | 0.1732 | 32.64 | 9.90 | 42.54 | 64.81 | -22.27 | QP | |
| 2 | 0.1732 | 24.32 | 9.90 | 34.22 | 54.81 | -20.59 | AVG | |
| 3 | 0.2329 | 31.82 | 9.88 | 41.70 | 62.35 | -20.65 | QP | |
| 4 * | 0.2330 | 27.16 | 9.88 | 37.04 | 52.34 | -15.30 | AVG | |
| 5 | 0.3500 | 24.73 | 9.82 | 34.55 | 58.96 | -24.41 | QP | |
| 6 | 0.3501 | 19.82 | 9.82 | 29.64 | 48.96 | -19.32 | AVG | |
| 7 | 0.4580 | 19.94 | 9.77 | 29.71 | 56.73 | -27.02 | QP | |
| 8 | 0.4580 | 15.68 | 9.77 | 25.45 | 46.73 | -21.28 | AVG | |
| 9 | 0.7460 | 17.76 | 9.70 | 27.46 | 56.00 | -28.54 | QP | |
| 10 | 0.7460 | 12.57 | 9.70 | 22.27 | 46.00 | -23.73 | AVG | |
| 11 | 18.5820 | 11.07 | 9.77 | 20.84 | 60.00 | -39.16 | QP | |
| 12 | 18.5820 | 6.40 | 9.77 | 16.17 | 50.00 | -33.83 | AVG | |

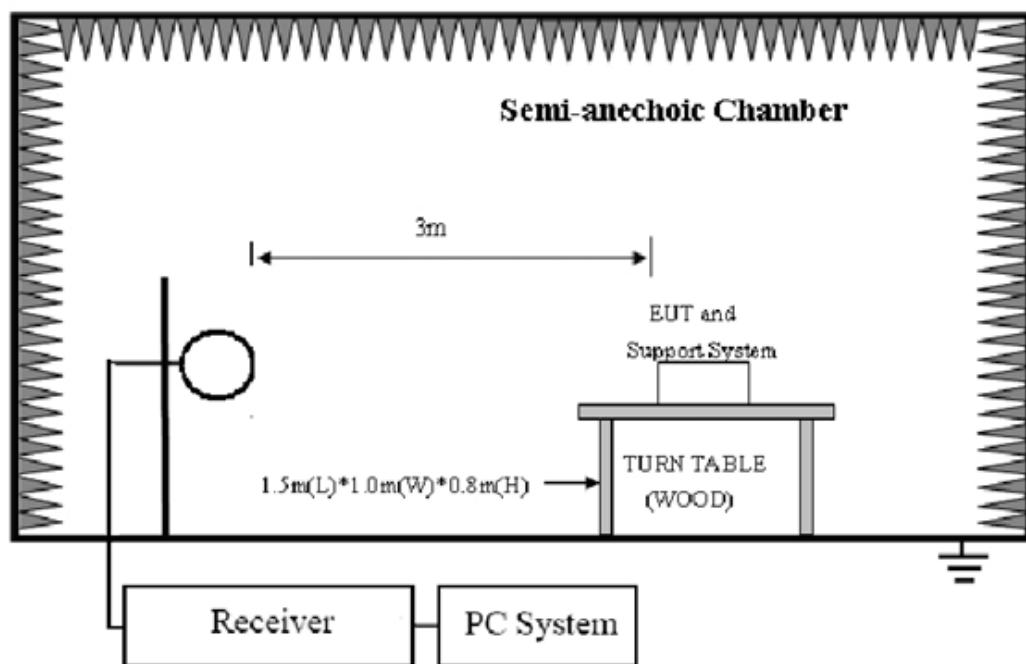
4. Radiated emission test

4.1. Test equipment

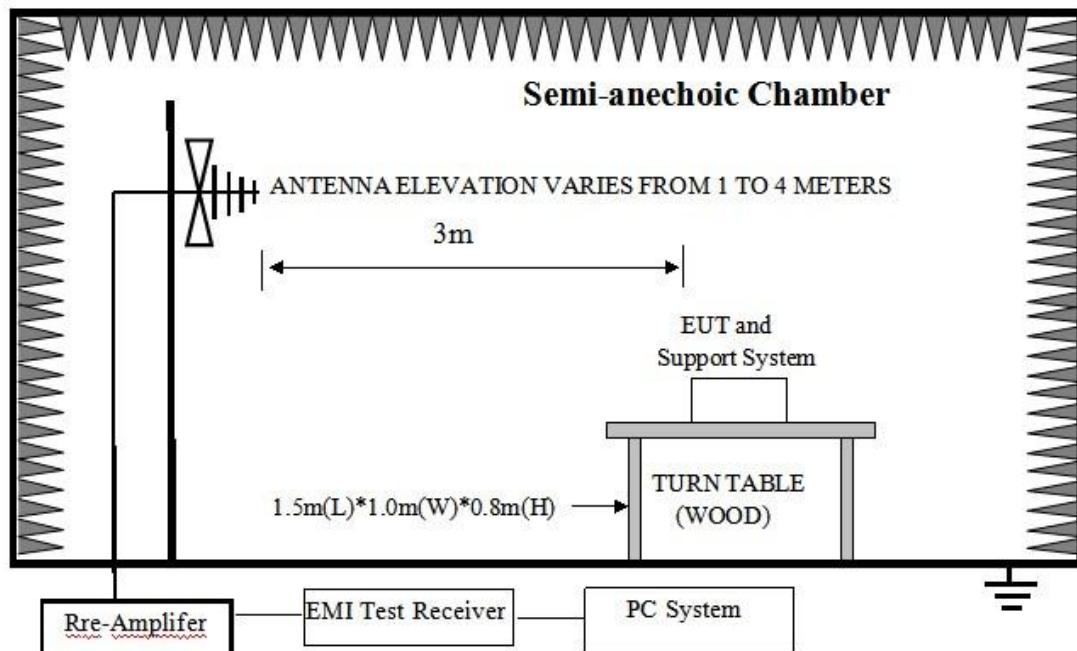
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------------------|--------------|-------------------------|--------------------------------|------------|---------------|
| 1 | EMI Test Receiver | R&S | ESR | 7250-30406 7528 | 2020-05-24 | 1 Year |
| 2 | Trilog Broadband Antenna | Schwarzbeck | VULB9168 | 00969 | 2019-06-14 | 2 Year |
| 3 | Pre-amplifier | R&S | 8447F | 3113A04553 | 2020-05-24 | 1 Year |
| 4 | Active Loop antenna | Schwarzbeck | FMZB-1519 | 1519-038 | 2019-05-23 | 2 Year |
| 5 | Horn antenna | Schwarzbeck | BBHA9120D | 453 | 2019-05-23 | 2 Year |
| 6 | Double Ridged Horn Antenna | A.H. System | SAS-574 | 584 | 2019-05-23 | 2 Year |
| 7 | Pre-amplifier | R&S | SCU18 | 105326 | 2020-05-24 | 1 Year |
| 8 | RF Cable | GORE | OSQ01Q010 78.7 | SN1545847 3 | 2019-05-23 | 2 Year |
| 9 | RF Cable | GORE | OSQ01Q010 78.7 | SN1545847 4 | 2019-05-23 | 2 Year |
| 10 | RF Cable | ESCO | ETS-LINGR EN | RFC-SMS-1 00-SMS-340 -IN | 2019-05-23 | 2 Year |
| 11 | Measurement software | Farad | EZ-EMC(VE R:1.1.4.2) | N/A | N/A | N/A |

4.2. Block diagram of test setup

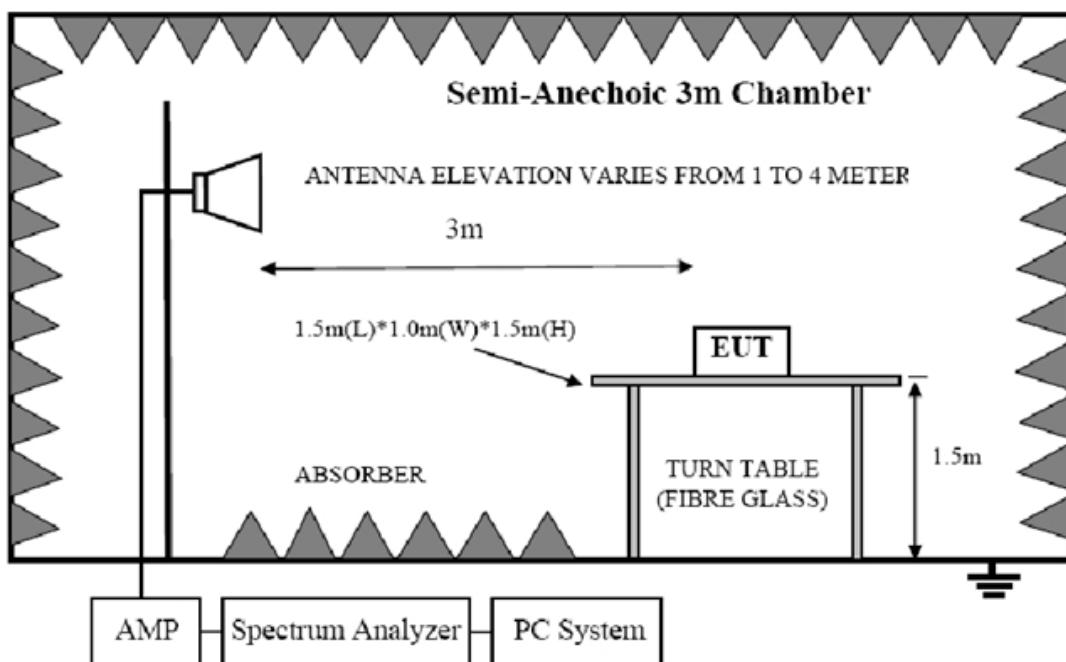
In 3m Anechoic Chamber Test Setup Diagram for 9KHz to 30MHz:



In 3m Anechoic Chamber Test Setup Diagram for 30MHz to 1GHz:



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz:



4.3. Limit

FCC 15.205 Restricted frequency band:

| MHz | MHz | MHz | GHz |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | (²) |

FCC 15.109 Limit

| Frequency (MHz) | Distance (Meters) | Field Strengths Limits dB(μ V)/m |
|-----------------|-------------------|---------------------------------------|
| 30--88 | 3 | 40.0 |
| 88--216 | 3 | 43.5 |
| 216--960 | 3 | 46.0 |
| 960--1000 | 3 | 54.0 |
| Above 1GHz | 3 | Peak: 74.0 |
| | 3 | Average:54.0 |

Note: (1) The smaller limit shall apply at the cross point between two frequency bands.

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

(3)The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz.Radiated emissions limits in these three bands are based on measurements employing an average detector.

(4) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3m}(\text{dBuV/m}) = \text{Limit}_{30m}(\text{dBuV/m}) + 40\log(30m/3m)$$

(5)All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.109, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.109 limits.

4.4. Test Procedure

Procedure of Preliminary Test

Configuration EUT to simulate typical usage as described in clause 2.3 and test equipment as described in clause 4.2 of this report.

Mains cables, telephone lines or other connections to auxiliary equipment located outside the test are shall drape to the floor, be fitted with ferrite clamps or ferrite tubes placed on the floor at the point where the cable reaches the floor and then routed to the place where they leave the turntable. No extension cords shall be used to mains receptacle.

EUT height should be 0.8m for below 1GHz and 1.5m for above 1GHz at ground with absorbers.

The antenna was placed at 3 meter away from the EUT as stated in ANSI C63.10. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.

The Analyzer / Receiver quickly scanned from 30MHz to 18GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

The X, Y, Z three axial are tested and the report only the worst case.

The emissions from 9KHz to 1GHz, QP or average values were measured with EMI receiver with below RBW:

| Frequency band | RBW |
|----------------|--------|
| 9KHz-150KHz | 200Hz |
| 150KHz-30MHz | 9KHz |
| 30MHz-1GHz | 120KHz |

For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RMS detector RBW 1MHz VBW 3MHz for Average measure.

4.5. Test result

PASS. (See below detailed test result)

All the emissions except fundamental emission from 9 KHz to 40GHz were comply with FCC PART 15.109 limits limit.

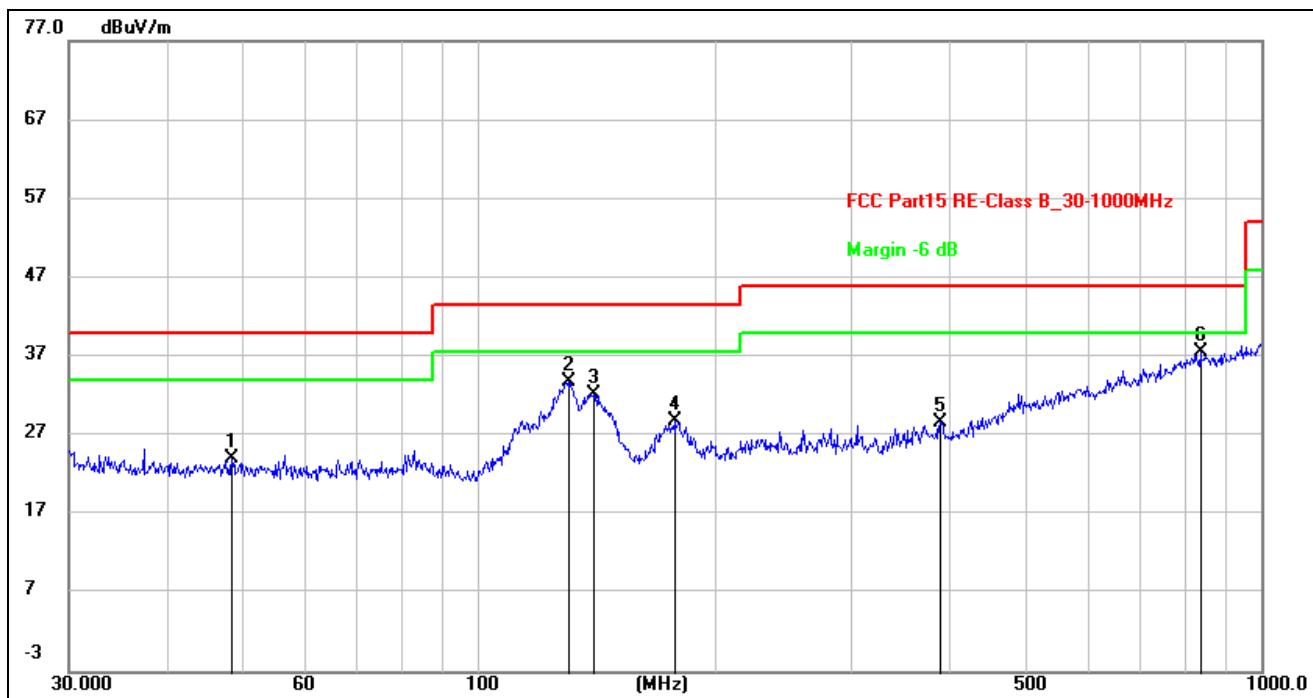
Note1: According exploratory test no any obvious emission were detected from 9KHz to 30MHz and

18GHz to 40GHz, so the final test was performed with frequency range from 30MHz to 18GHz and recorded in below.

Note2: For emissions above 1GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

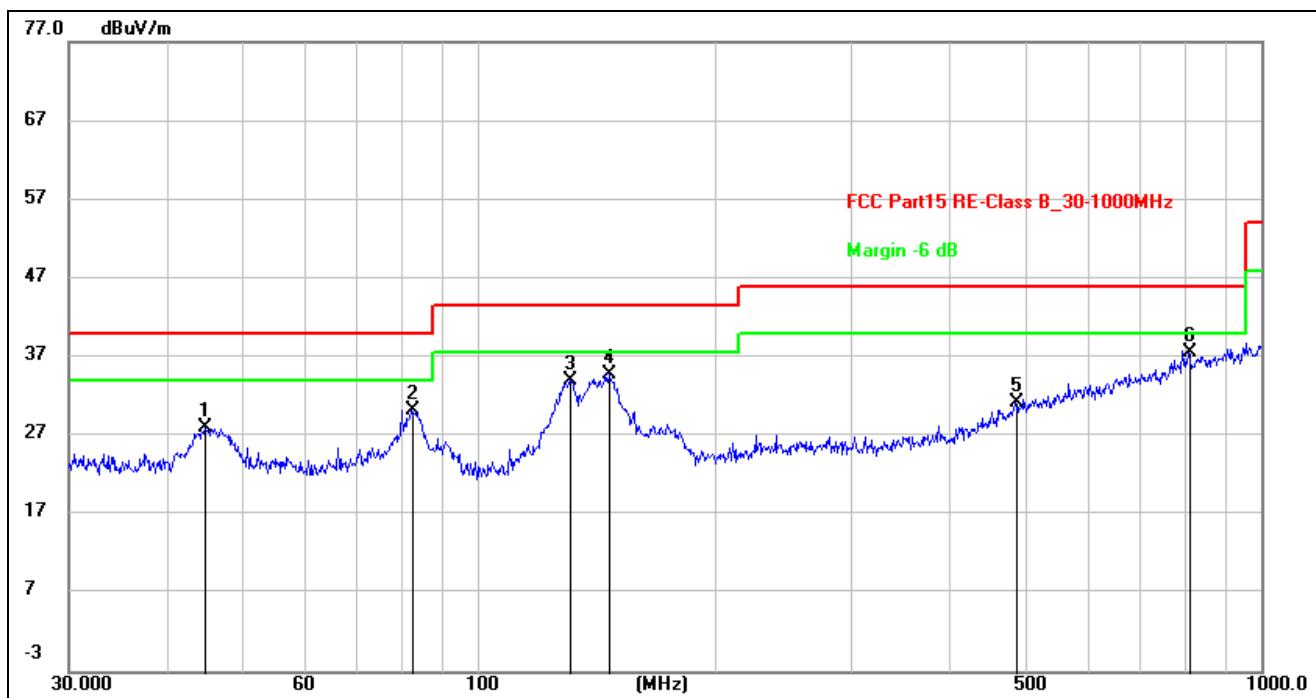
Note3: Level = Reading Level + Factor, Margin= Level-Limit

Radiated Emission Test Result



| | | | |
|--------|----------------------------------|---------------------|-------------------------------------|
| Site: | 966LAB | Antenna::Horizontal | Temperature(C):24(C) |
| Limit: | FCC Part15 RE-Class B_30-1000MHz | | Humidity(%):60% |
| EUT: | Microwave Motion Sensor | Test Time: | 2020/7/8 10:58:59 |
| M/N.: | HN022-01V | Power Rating: | DC 12V by adapter input 120/60Hz |
| Mode: | Tx | Test Engineer: | |
| Note: | | | |

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|------|-------------|---------------|--------|
| 1 | 48.5015 | 10.98 | 13.10 | 24.08 | 40.00 | -15.92 | peak | 200 | 3 | |
| 2 | 130.3789 | 20.91 | 12.82 | 33.73 | 43.50 | -9.77 | peak | 200 | 3 | |
| 3 | 140.8350 | 19.51 | 12.78 | 32.29 | 43.50 | -11.21 | peak | 200 | 34 | |
| 4 | 178.7584 | 16.12 | 12.79 | 28.91 | 43.50 | -14.59 | peak | 200 | 3 | |
| 5 | 389.3548 | 13.37 | 15.26 | 28.63 | 46.00 | -17.37 | peak | 100 | 21 | |
| 6 * | 836.2443 | 13.95 | 23.73 | 37.68 | 46.00 | -8.32 | peak | 100 | 63 | |



| | | | |
|---------------|---|---------------------------|--------------------------------|
| Site: | 966LAB | Antenna:: Vertical | Temperature(C): 24(C) |
| Limit: | FCC Part15 RE-Class B_30-1000MHz | | Humidity(%): 60% |
| EUT: | Microwave Motion Sensor | Test Time: | 2020/7/8 11:01:32 |
| M/N.: | HN022-01V | Power Rating: | DC 12V by adapter input |
| Mode: | Tx | Test Engineer: | |
| Note: | | | |

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|------|-------------|---------------|--------|
| 1 | 44.7433 | 15.00 | 13.13 | 28.13 | 40.00 | -11.87 | peak | 100 | 97 | |
| 2 | 82.0706 | 18.82 | 11.38 | 30.20 | 40.00 | -9.80 | peak | 200 | 174 | |
| 3 | 131.2965 | 21.23 | 12.81 | 34.04 | 43.50 | -9.46 | peak | 100 | 3 | |
| 4 | 146.8877 | 21.96 | 12.92 | 34.88 | 43.50 | -8.62 | peak | 100 | 345 | |
| 5 | 485.6093 | 13.00 | 18.30 | 31.30 | 46.00 | -14.70 | peak | 200 | 19 | |
| 6 * | 807.4291 | 13.95 | 23.64 | 37.59 | 46.00 | -8.41 | peak | 200 | 237 | |

| | | | |
|---------------|--------------------------------|-----------------------|---|
| Site: | 966 LAB | Antenna::H / V | Temperature(C):24(C) |
| Limit: | FCC Part 15.249 | | Humidity(%):60% |
| EUT: | Microwave Motion Sensor | Test Time: | 2020/08/01 |
| M/N.: | HN022-01V | Power Rating: | DC 12V by adapter input 120/60Hz |
| Mode: | Tx mode | Test Engineer: | |
| Note: | | | |

| Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Pre- amp (dB) | Cable lost (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detect | Antenna polarizat ion |
|--------------------|-------------------|------------------|---------------------|--------------------|--------------------|-------------------|----------------|---------|-----------------------------|
| 901.00 | 41.66 | 20.80 | 25.85 | 3.16 | 39.77 | 46.00 | -6.23 | QP | H |
| 915.00 | 93.82 | 20.93 | 25.86 | 3.23 | 92.12 | 114.00 | -21.88 | Peak | H |
| 915.00 | 82.15 | 20.93 | 25.86 | 3.23 | 80.45 | 94.00 | -13.55 | Average | H |
| 930.00 | 40.66 | 20.98 | 25.88 | 3.25 | 39.01 | 46.00 | -6.99 | QP | H |
| 1830.00 | 64.82 | 25.60 | 40.37 | 4.52 | 54.57 | 74.00 | -19.43 | Peak | H |
| 1830.00 | 50.28 | 25.60 | 40.37 | 4.52 | 40.03 | 54.00 | -13.97 | Average | H |
| 2745.00 | 63.82 | 26.43 | 40.21 | 4.85 | 54.89 | 74.00 | -19.11 | Peak | H |
| 2745.00 | 55.66 | 26.43 | 40.21 | 4.85 | 46.73 | 54.00 | -7.27 | Average | H |
| 901.00 | 36.28 | 20.80 | 25.85 | 3.16 | 34.39 | 46.00 | -11.61 | QP | V |
| 915.00 | 85.82 | 20.93 | 25.86 | 3.23 | 84.12 | 114.00 | -29.88 | Peak | V |
| 915.00 | 75.28 | 20.93 | 25.86 | 3.23 | 73.58 | 94.00 | -20.42 | Average | V |
| 930.00 | 40.82 | 20.98 | 25.88 | 3.25 | 39.17 | 46.00 | -6.83 | QP | V |
| 1830.00 | 61.66 | 25.60 | 40.37 | 4.52 | 51.41 | 74.00 | -22.59 | Peak | V |
| 1830.00 | 48.28 | 25.60 | 40.37 | 4.52 | 38.03 | 54.00 | -15.97 | Average | V |
| 2745.00 | 58.82 | 26.43 | 40.21 | 4.85 | 49.89 | 74.00 | -24.11 | Peak | V |
| 2745.00 | 46.15 | 26.43 | 40.21 | 4.85 | 37.22 | 54.00 | -16.78 | Average | V |

Note: 1. Result Level = Reading Level + Antenna Factor + Cable loss – Pre-amp Factor.

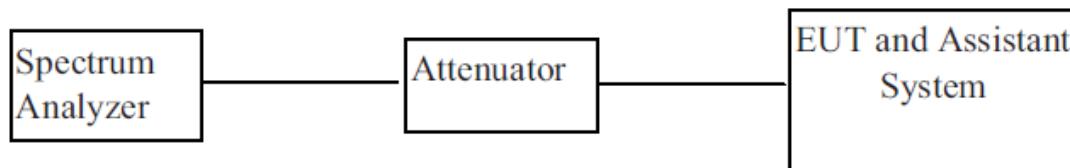
2. Antenna polarization: "H" means Horizontal, "V" means Vertical.

5. -20dB Bandwidth

5.1. Test equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-----------------|--------------|-----------|------------|------------|---------------|
| 1 | Signal Analyzer | Agilent | N9020A | MY54510476 | 2020-05-25 | 1 Year |

5.2. BLOCK DIAGRAM OF TEST SETUP



5.3. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained

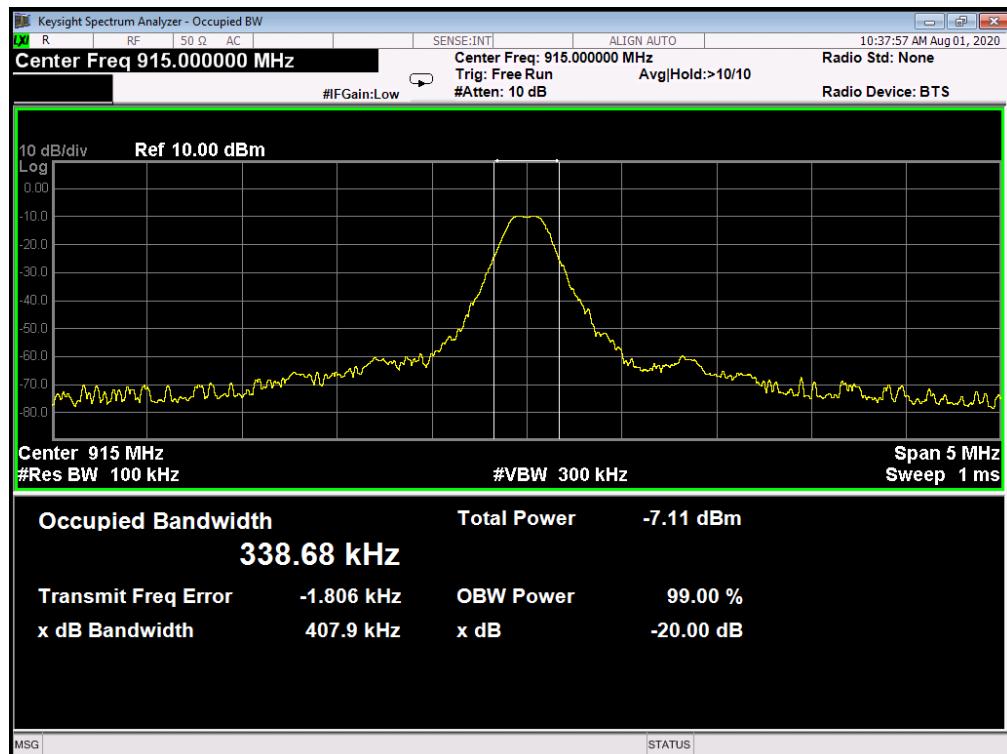
in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.4. Test Procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 300 kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.5. Test result

| | |
|-------------|-----------------|
| Cent. Freq. | -20dB bandwidth |
| (MHz) | Result (KHz) |
| 915 | 407.9 |



6. Antenna Requirements

6.1. Limit

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.249 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

6.2. Result

The EUT has an internal chip antenna permanently soldering on the printed circuit board, which complied with 15.203, the maximum gain was 0 dBi.

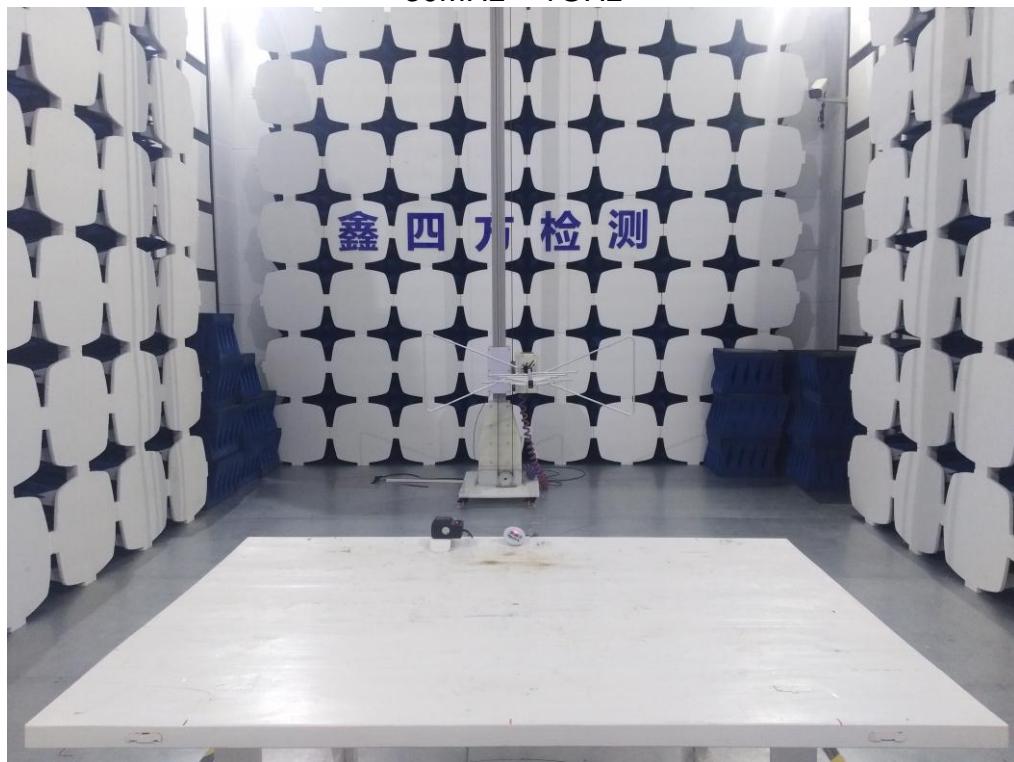
7. Test setup photograph

7.1. Photos of power line conducted emission test



7.2. Photos of radiated emission test

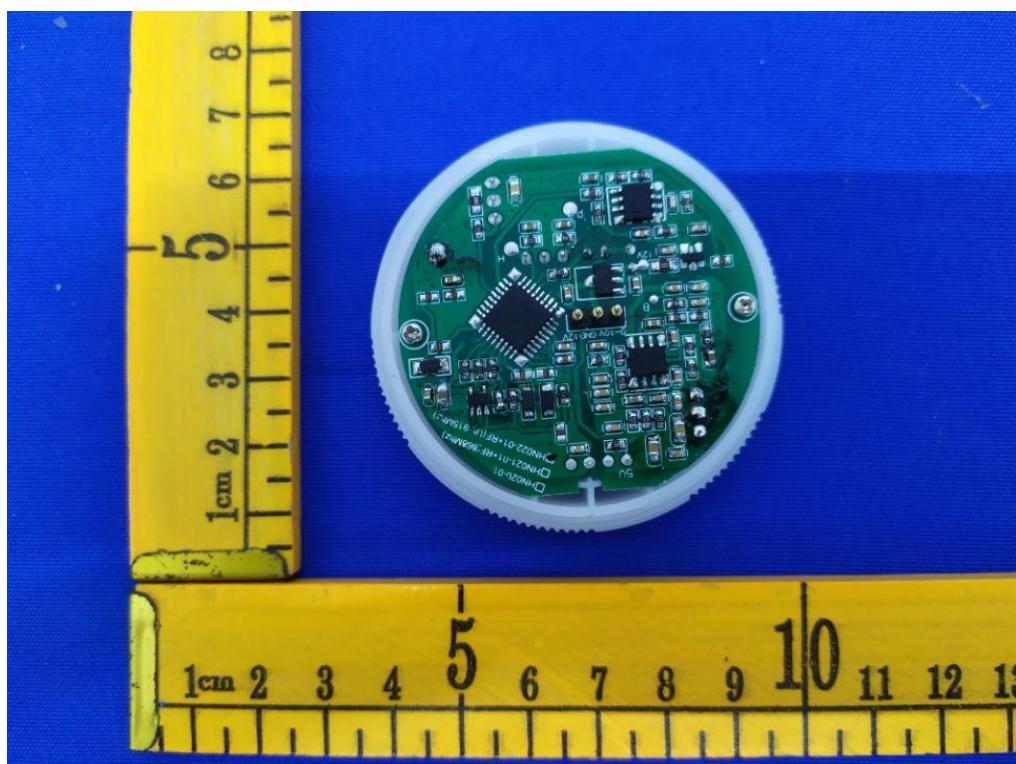
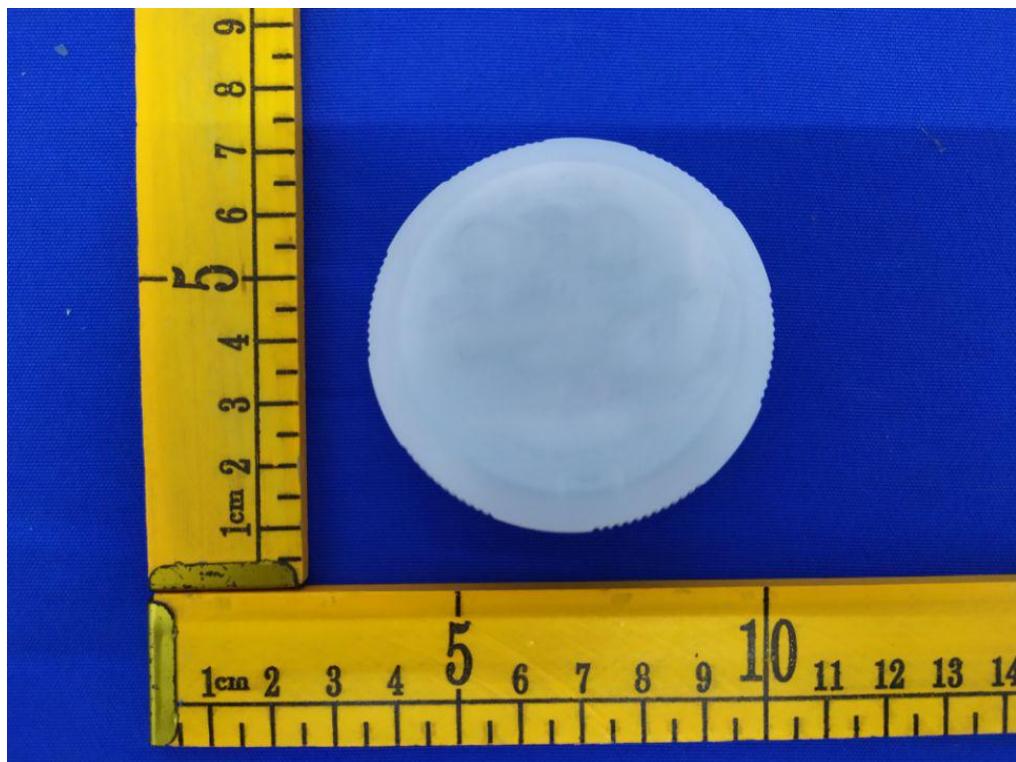
30MHz – 1GHz

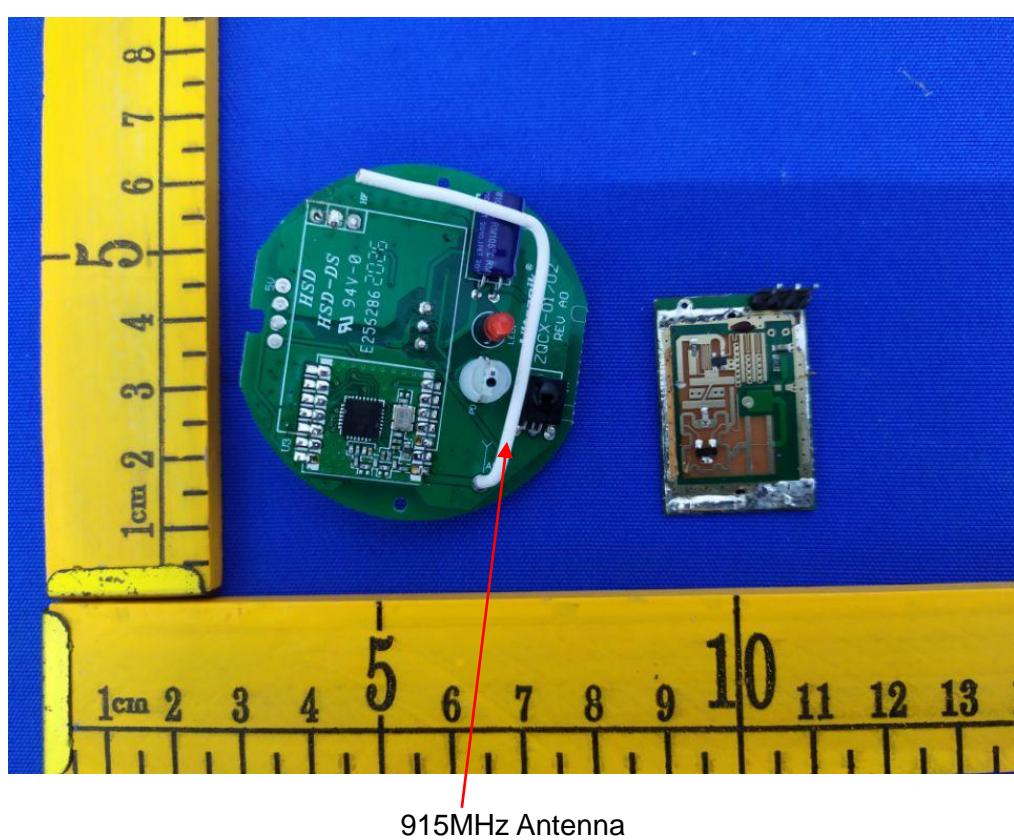
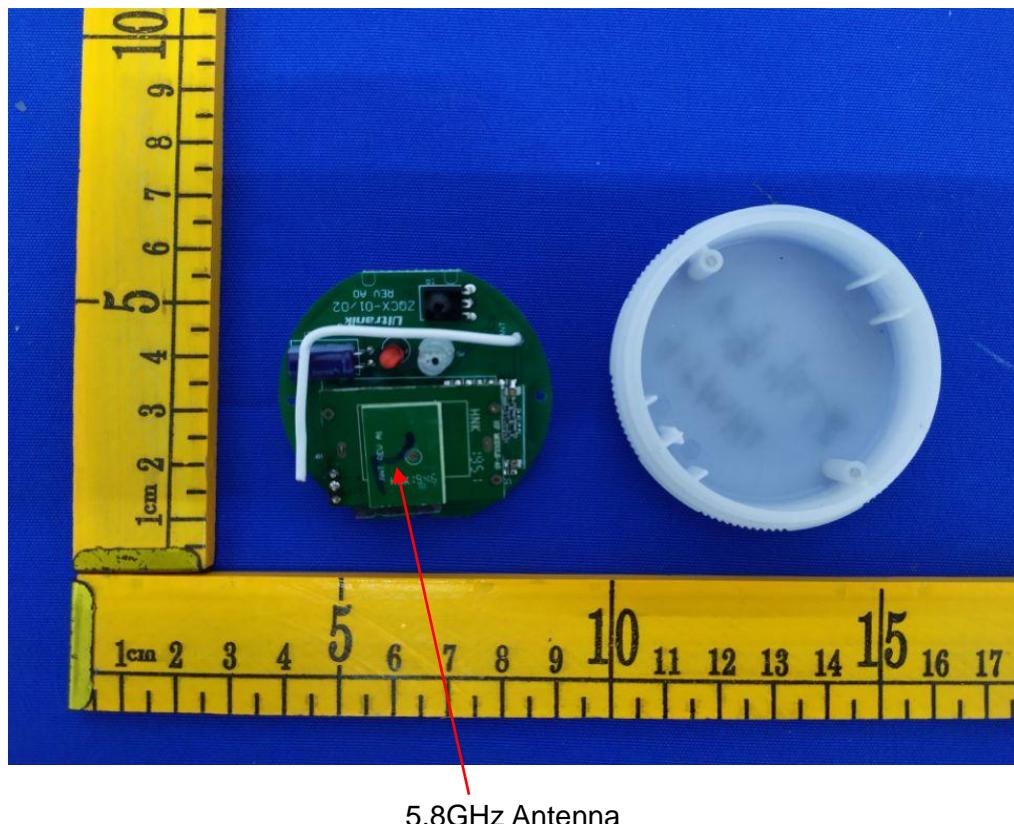


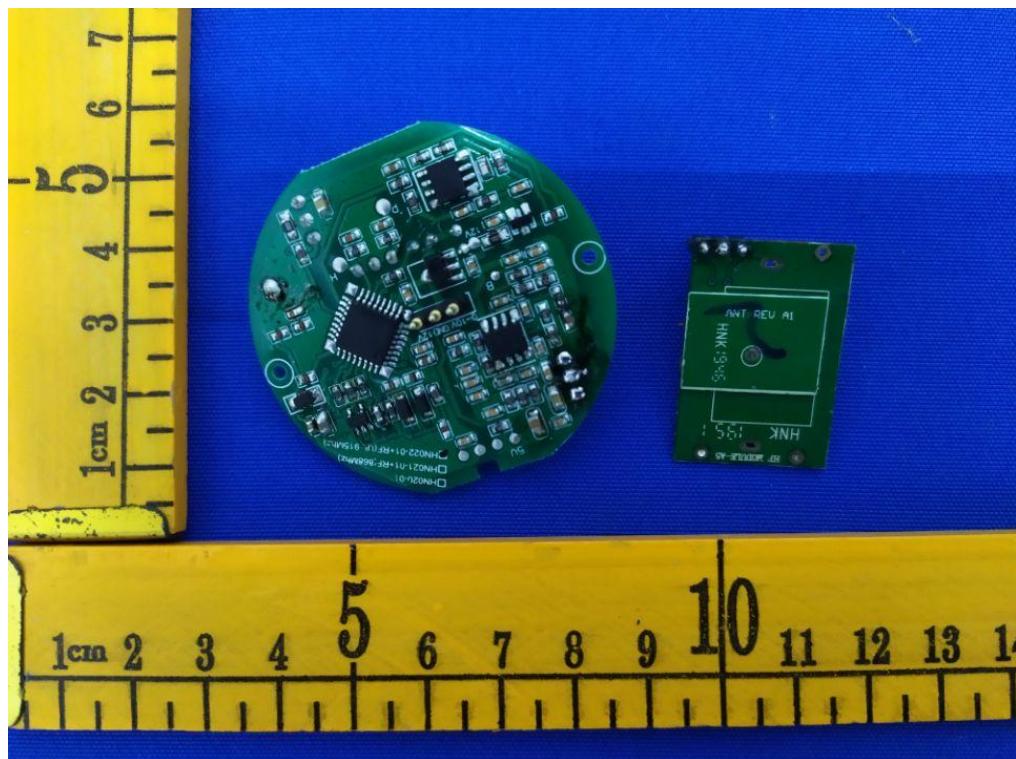
Above 1GHz



8. Photos of the EUT







--END OF REPORT--