# TEST REPORT

| | |
|---|---|
| **Application No.:** | SZEM1907016701CR |
| **Applicant:** | M&S Accessory Network |
| **Address of Applicant:** | 10 West 33rd Street, Suite 718 New York, NY 11223, USA |
| **Manufacturer:** | M&S Accessory Network |
| **Address of Manufacturer:** | 10 W 33rd St. Suite 718, New York, NY 10001, USA |
| **Factory:** | M&S Accessory Network |
| **Address of Factory:** | 10 W 33rd St. Suite 718, New York, NY 10001, USA |
| **Equipment Under Test (EUT):** | |
| **EUT Name:** | Marble Premium Wireless Charger |
| **Model No.:** | GG-QIWC-BMRB |
| **Trade mark:** | Gabba goods |
| **FCC ID:** | 2AFXXGGQIWCBMRB |
| **Standard(s) :** | 47 CFR Part 15, Subpart C |
| **Date of Receipt:** | 2019-07-24 |
| **Date of Test:** | 2019-07-24 to 2019-08-02 |
| **Date of Issue:** | 2019-08-07 |
| **Test Result:** | **Pass*** |

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

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| Revision Record | | | | |
|---|---|---|---|---|
| **Version** | **Chapter** | **Date** | **Modifier** | **Remark** |
| 01 | | 2019-08-07 | | Original |
| | | | | |
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|---|---|---|---|---|
| **Authorized for issue by:** | | | | |
| | | Bill Chen<br>**Bill Chen /Project Engineer** | | |
| | | Eric Fu<br>**Eric Fu /Reviewer** | | |

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# 2 Test Summary

| Radio Spectrum Technical Requirement | | | | |
|---|---|---|---|---|
| **Item** | **Standard** | **Method** | **Requirement** | **Result** |
| Antenna Requirement | 47 CFR Part 15, Subpart C | N/A | 47 CFR Part 15, Subpart C 15.203 | Pass |

| Item | Standard | Method | Requirement | Result |
|---|---|---|---|---|
| Conducted Emissions at AC Power Line (150kHz-30MHz) | 47 CFR Part 15, Subpart C | ANSI C63.10 (2013) Section 6.2 | 47 CFR Part 15, Subpart C 15.207 | Pass |
| 20dB Bandwidth | 47 CFR Part 15, Subpart C | ANSI C63.10 (2013) Section 6.9.2 | 47 CFR Part 15, Subpart C 15.215 | Pass |
| Restricted Bands | 47 CFR Part 15, Subpart C | ANSI C63.10 (2013) Section 6.10.5 | 47 CFR Part 15, Subpart C 15.205 | Pass |
| Radiated Emissions (9kHz-30MHz) | 47 CFR Part 15, Subpart C | ANSI C63.10 (2013) Section 6.4 | 47 CFR Part 15, Subpart C 15.205 & 15.209 | Pass |
| Radiated Emissions (30MHz-1GHz) | 47 CFR Part 15, Subpart C | ANSI C63.10 (2013) Section 6.5 | 47 CFR Part 15, Subpart C 15.205 & 15.209 | Pass |

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# 4 General Information

## 4.1 Details of E.U.T.

| | |
|---|---|
| Power supply: | Input：DC 5V 2A<br>Wireless output：5W |
| Cable: | USB cable：115cm unshielded |
| Antenna Type: | Loop Antenna |
| Modulation Type: | Load Modulation |
| Operation Frequency: | 110.737kHz to 146.795kHz |
| Antenna Gain: | 0dBi |

## 4.2 Description of Support Units

| Description | Manufacturer | Model No. | Serial No. |
|---|---|---|---|
| Adapter | SAMSUNG | EP-TA200 | R37J8YA7W71DK3 |
| SAMSUNG Galaxy S8 | SAMSUNG | SM-G9500 | R28J9140LPB |

## 4.3 Measurement Uncertainty

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | Conduction emission | ± 3.45dB (9kHz to 150kHz) |
| | | ± 3.0dB (150kHz to 30MHz) |
| 2 | Radiated emission | ± 4.5dB (30MHz-1GHz) |
| | | ± 4.8dB (1GHz-6GHz) |
| 3 | Restricted Bands | ± 3% |
| 4 | Temperature test | ± 1℃ |
| 5 | Humidity test | ± 3% |

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## 4.4 Test Location

All tests were performed at:

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No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

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No tests were sub-contracted.

## 4.5 Test Facility

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

**• CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

**• A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

**• VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

**• FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

**• Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

## 4.6 Deviation from Standards

None

## 4.7 Abnormalities from Standard Conditions

None

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# 5 Equipment List

| Conducted Emissions at AC Power Line (150kHz-30MHz) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Inventory No** | **Cal Date** | **Cal Due Date** |
| Shielding Room | ZhongYu Electron | GB-88 | SEM001-06 | 2019-06-13 | 2024-06-12 |
| Measurement Software | AUDIX | e3 V8.2014-6-27 | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM024-01 | 2019-07-11 | 2020-07-10 |
| LISN | Rohde & Schwarz | ENV216 | SEM007-01 | 2018-09-25 | 2019-09-24 |
| LISN | ETS-LINDGREN | 3816/2 | SEM007-02 | 2019-04-01 | 2020-03-31 |
| EMI Test Receiver | Rohde & Schwarz | ESCI | SEM004-02 | 2019-04-01 | 2020-03-31 |

| 20dB Bandwidth | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Inventory No** | **Cal Date** | **Cal Due Date** |
| DC Power Supply | ZhaoXin | RXN-305D | SEM011-02 | 2018-09-25 | 2019-09-24 |
| Spectrum Analyzer | Rohde & Schwarz | FSP | SEM004-06 | 2018-09-27 | 2019-09-26 |
| Measurement Software | JS Tonscend | JS1120-2 BT/WIFI V2. | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM031-02 | 2018-07-12 | 2019-07-11 |
| | | | | 2019-07-11 | 2020-07-10 |
| Attenuator | Weinschel Associates | WA41 | SEM021-09 | N/A | N/A |
| Signal Generator | KEYSIGHT | N5173B | SEM006-05 | 2018-09-27 | 2019-09-26 |
| Power Meter | Rohde & Schwarz | NRVS | SEM014-02 | 2018-09-25 | 2019-09-24 |

| Restricted Bands Measurement | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Inventory No** | **Cal Date** | **Cal Due Date** |
| DC Power Supply | ZhaoXin | RXN-305D | SEM011-02 | 2018-09-25 | 2019-09-24 |
| Spectrum Analyzer | Rohde & Schwarz | FSP | SEM004-06 | 2018-09-27 | 2019-09-26 |
| Measurement Software | JS Tonscend | JS1120-2 BT/WIFI V2. | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM031-02 | 2018-07-12 | 2019-07-11 |
| | | | | 2019-07-11 | 2020-07-10 |
| Attenuator | Weinschel Associates | WA41 | SEM021-09 | N/A | N/A |
| Signal Generator | KEYSIGHT | N5173B | SEM006-05 | 2018-09-27 | 2019-09-26 |
| Power Meter | Rohde & Schwarz | NRVS | SEM014-02 | 2018-09-25 | 2019-09-24 |

| Radiated Emissions (9kHz-30MHz) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Inventory No** | **Cal Date** | **Cal Due Date** |
| 10m Semi-Anechoic Chamber | SAEMC | FSAC1018 | SEM001-03 | 2018-03-31 | 2021-03-30 |
| Measurement Software | AUDIX | e3 V8.2014-6-27 | N/A | N/A | N/A |

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| | | | | | |
|---|---|---|---|---|---|
| Coaxial Cable | SGS | N/A | SEM029-01 | 2019-07-11 | 2020-07-10 |
| EMI Test Receiver (9kHz-7GHz) | Rohde & Schwarz | ESR | SEM004-03 | 2019-04-01 | 2020-03-31 |
| BiConiLog Antenna (26-3000MHz) | ETS-LINDGREN | 3142C | SEM003-02 | 2019-05-24 | 2022-05-23 |
| Pre-amplifier | Sonoma Instrument Co | 310N | SEM005-04 | 2019-04-12 | 2020-04-11 |
| Active Loop Antenna | ETS-Lindgren | 6502 | SEM003-08 | 2017-08-22 | 2020-08-21 |

| **RE in Chamber** | | | | | |
|---|---|---|---|---|---|
| **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal. Date** | **Cal. Due date** |
| 3m Semi-Anechoic Chamber | ETS-LINDGREN | N/A | SEM001-01 | 2017-08-05 | 2020-08-04 |
| MXE EMI Receiver (20Hz-8.4GHz) | Agilent Technologies | N9038A | SEM004-05 | 2018-09-25 | 2019-09-24 |
| BiConiLog Antenna (26-3000MHz) | ETS-LINDGREN | 3142C | SEM003-01 | 2017-06-27 | 2020-06-26 |
| Pre-amplifier (0.1-1300MHz) | Agilent Technologies | 8447D | SEM005-01 | 2019-04-01 | 2020-03-31 |
| Measurement Software | AUDIX | e3 V8.2014-6-27 | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM025-01 | 2018-07-12 | 2019-07-11 |

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| General used equipment | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No** | **Inventory No** | **Cal Date** | **Cal Due Date** |
| Humidity/ Temperature Indicator | Shanghai Meteorological Industry Factory | ZJ1-2B | SEM002-03 | 2018-09-27 | 2019-09-26 |
| Humidity/ Temperature Indicator | Shanghai Meteorological Industry Factory | ZJ1-2B | SEM002-04 | 2018-09-27 | 2019-09-26 |
| Humidity/ Temperature Indicator | Mingle | N/A | SEM002-08 | 2018-09-27 | 2019-09-26 |
| Barometer | Changchun Meteorological Industry Factory | DYM3 | SEM002-01 | 2019-04-04 | 2020-04-03 |

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# 6 Radio Spectrum Technical Requirement

## 6.1 Antenna Requirement

### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

### 6.1.2 Conclusion

Standard Requirement:

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. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

Antenna location: Refer to Appendix(Internal photos)

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# 7 Radio Spectrum Matter Test Results

## 7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

| Frequency of emission(MHz) | Conducted limit(dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| *Decreases with the logarithm of the frequency. | | |

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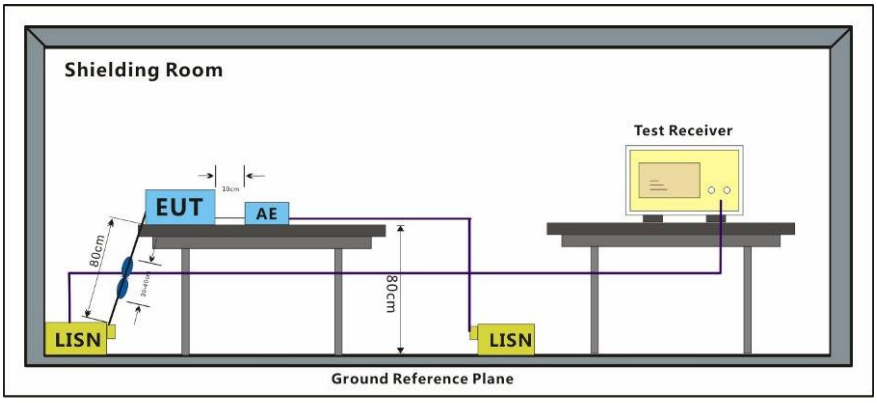
### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 21.4 °C Humidity: 56.3 % RH Atmospheric Pressure: 1005 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

### 7.1.2 Test Setup Diagram




### 7.1.3 Measurement Procedure and Data

1) The mains terminal disturbance voltage test was conducted in a shielded room.

2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,

4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

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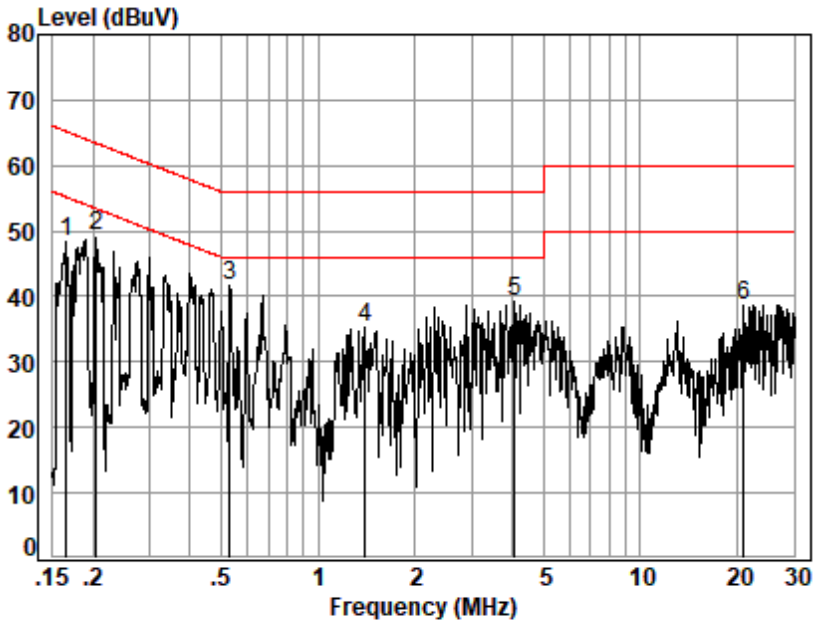
Mode:a; Line:Live Line




Site : Shielding Room
Condition: Line
Job No. : 16701CR
Test mode: a

| | Freq | Cable Loss | LISN Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB | dBuV | dBuV | dBuV | dB | |
| 1 | 0.1650 | 0.01 | 9.66 | 38.75 | 48.42 | 55.21 | -6.79 | Peak |
| 2 | 0.2040 | 0.02 | 9.66 | 39.64 | 49.32 | 53.45 | -4.13 | Peak |
| 3 | 0.5322 | 0.06 | 9.67 | 31.79 | 41.52 | 46.00 | -4.48 | Peak |
| 4 | 1.3958 | 0.12 | 9.73 | 25.48 | 35.33 | 46.00 | -10.67 | Peak |
| 5 | 4.0704 | 0.16 | 9.72 | 29.47 | 39.35 | 46.00 | -6.65 | Peak |
| 6 | 20.9243 | 0.24 | 10.10 | 28.39 | 38.73 | 50.00 | -11.27 | Peak |

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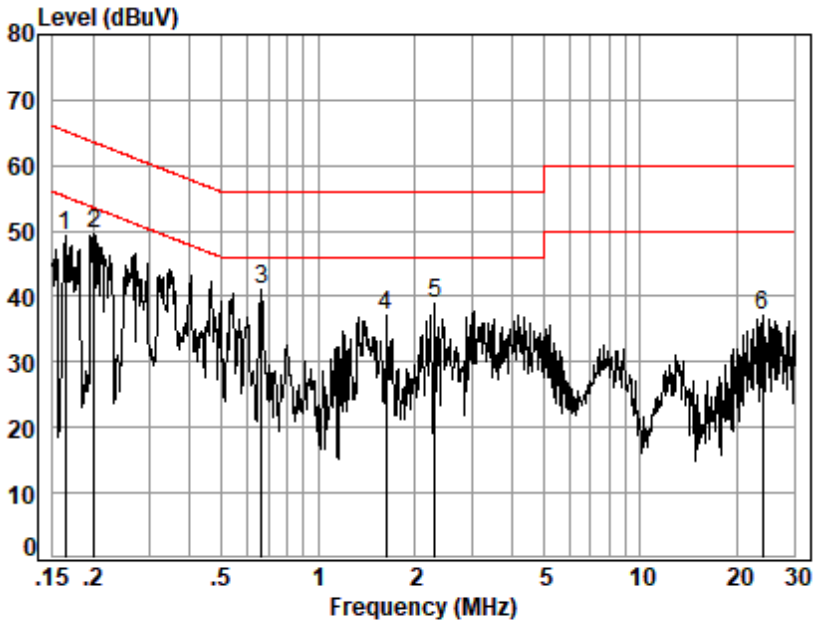
Mode:a; Line:Neutral Line




Site : Shielding Room
Condition: Neutral
Job No. : 16701CR
Test mode: a

| | Freq | Cable Loss | LISN Factor | Read Level | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB | dBuV | dBuV | dBuV | dB | |
| 1 | 0.1641 | 0.01 | 9.64 | 39.76 | 49.41 | 55.25 | -5.84 | Peak |
| 2 | 0.2018 | 0.02 | 9.64 | 39.91 | 49.57 | 53.54 | -3.97 | Peak |
| 3 | 0.6648 | 0.07 | 9.65 | 31.25 | 40.97 | 46.00 | -5.03 | Peak |
| 4 | 1.6276 | 0.14 | 9.70 | 27.22 | 37.06 | 46.00 | -8.94 | Peak |
| 5 | 2.2968 | 0.16 | 9.68 | 29.01 | 38.85 | 46.00 | -7.15 | Peak |
| 6 | 23.8878 | 0.26 | 10.25 | 26.69 | 37.20 | 50.00 | -12.80 | Peak |

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## 7.2 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215

Test Method: ANSI C63.10 (2013) Section 6.9.2

Limit: N/A

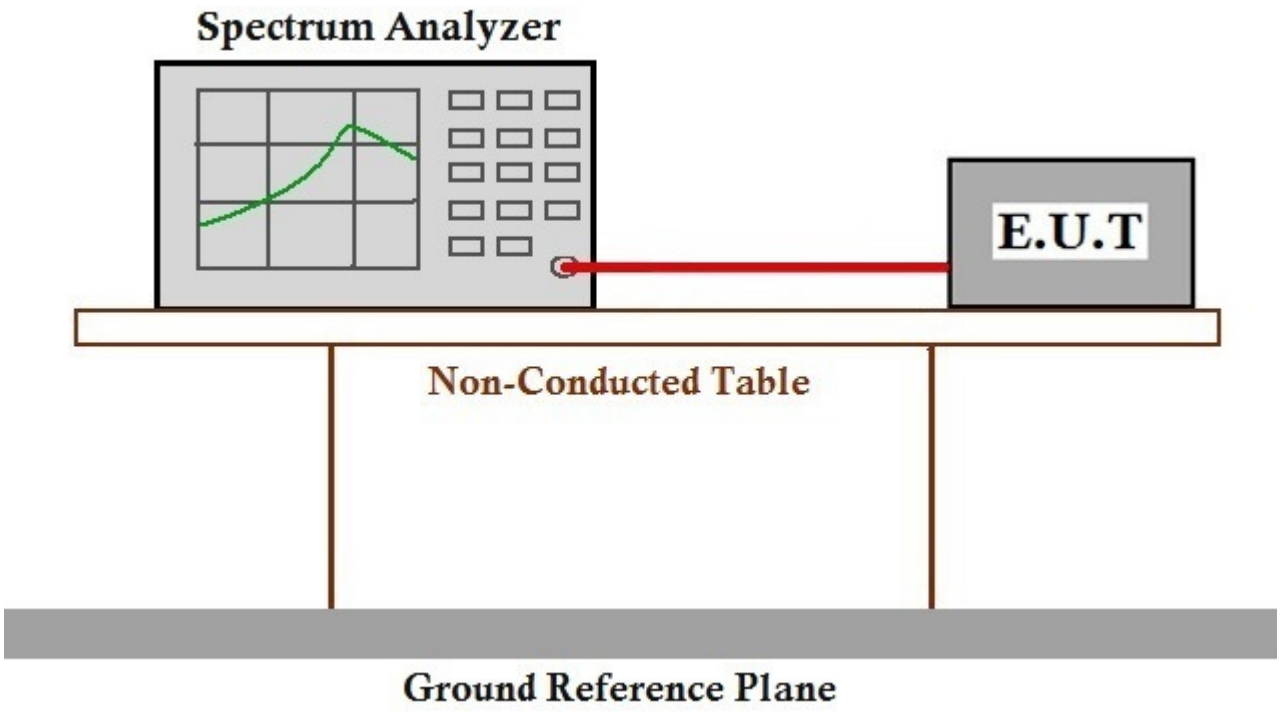
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 53 % RH Atmospheric Pressure: 1005 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

### 7.2.2 Test Setup Diagram




### 7.2.3 Measurement Procedure and Data

| Test Frequency(KHz) | 20dB bandwidth (KHz) | Limit (KHz) | Results |
|---|---|---|---|
| 146.79 | 0.026 | N/A | Pass |

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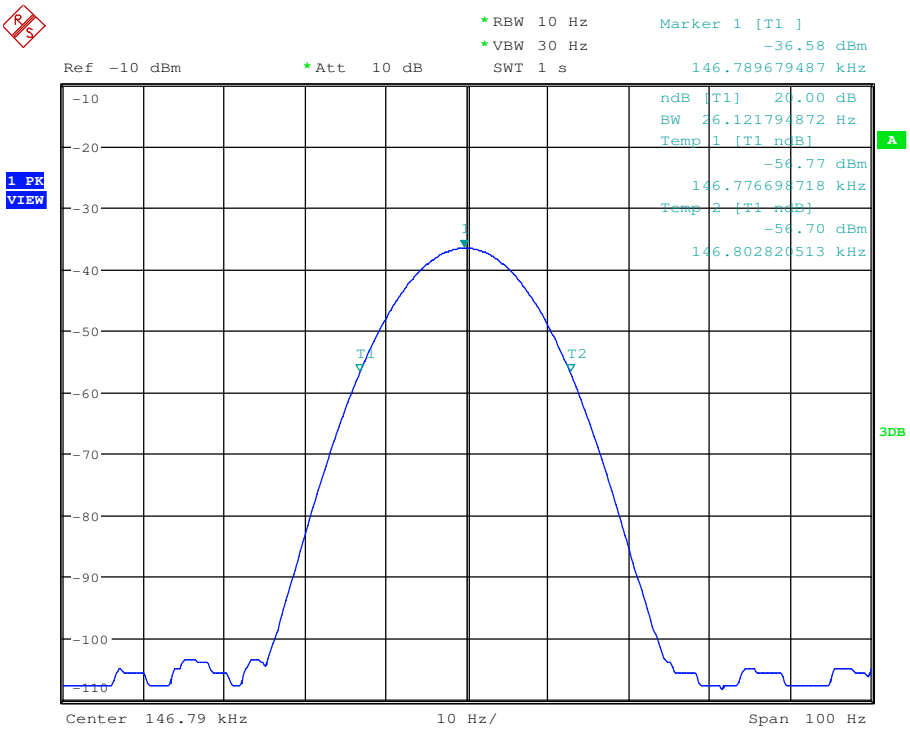


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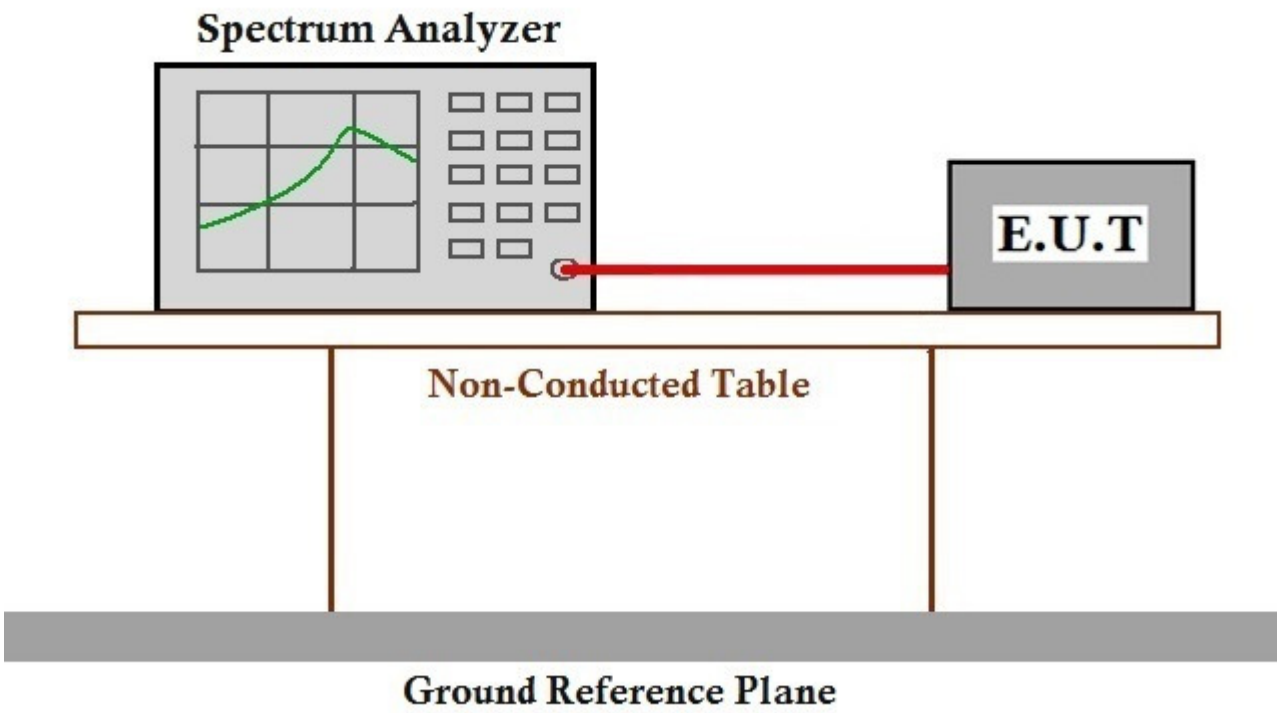
## 7.3 Restricted Bands

Test Requirement 47 CFR Part 15, Subpart C 15.205
Test Method: ANSI C63.10 (2013) Section 6.10.5
Limit: The fundamental wave can not fall in the restricted band 90KHz-110KHz

### 7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 25 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar
Test mode: b:Wireless charge mode_Keep the EUT wireless charging

### 7.3.2 Test Setup Diagram




### 7.3.3 Measurement Procedure and Data

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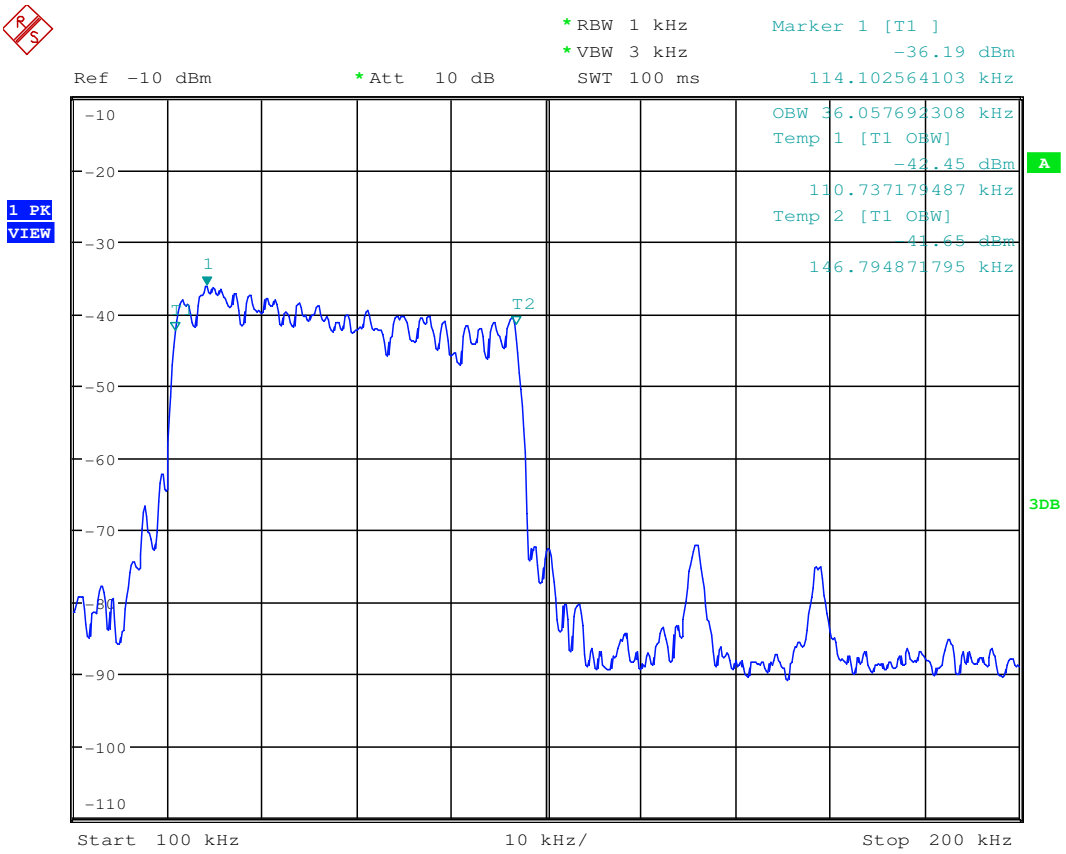


According the test data above, the fundamental wave is not fall in the restricted band 90KHz-110KHz, the field strength also meet the 15.209 requirement, so this test is Pass.

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## 7.4 Radiated Emissions (9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.4
Measurement Distance: 3m
Limit:

| Frequency(MHz) | Field strength(microvolts/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 |
| Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. | | |

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than λ/2π and the limit distance is greater than λ/2π, the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the λ/2π distance, and at a 20 dB/decade of distance rate beyond λ/2π. This shall be accomplished using Equation (2):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(near\ field)}/d_{(10m)}\} + 20\log\{d_{(30/300m)}/d_{(near\ field)}\} \quad (2)$$

If the single point measured is at a distance greater than λ/2π, then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(10m)} = FS_{(30/300m)} + 20\log\{d_{(30/300m)}/d_{(10m)}\} \quad (3)$$

If both the single point and the limit distance are equal to or closer to the EUT than λ/2π, then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(30/300m)}/d_{(10m)}\} \quad (4)$$

Remark:

$$d_{near\ field} = 47.77 / f_{MHz}$$

where $f_{MHz}$ is the frequency of the emission being measured in MHz.

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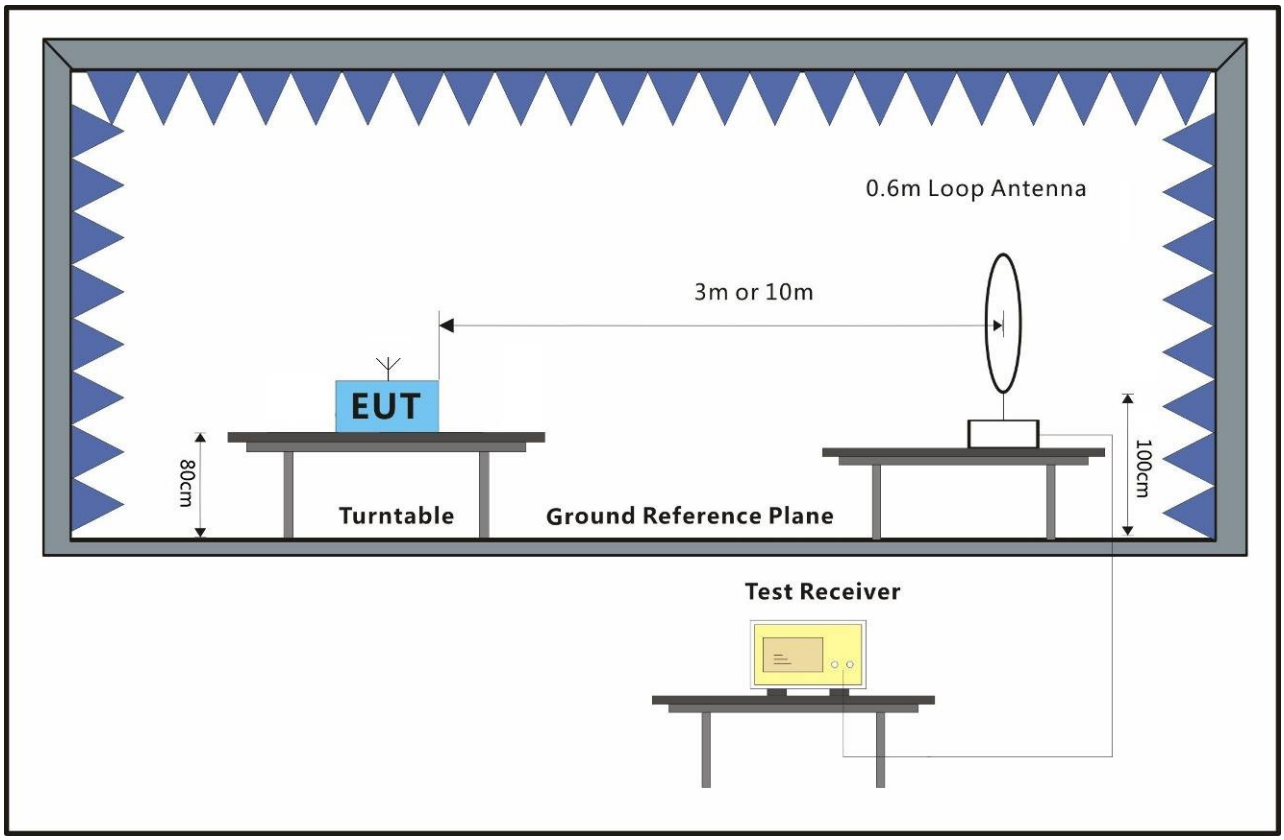
### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 53 % RH Atmospheric Pressure: 1005 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

### 7.4.2 Test Setup Diagram




### 7.4.3 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

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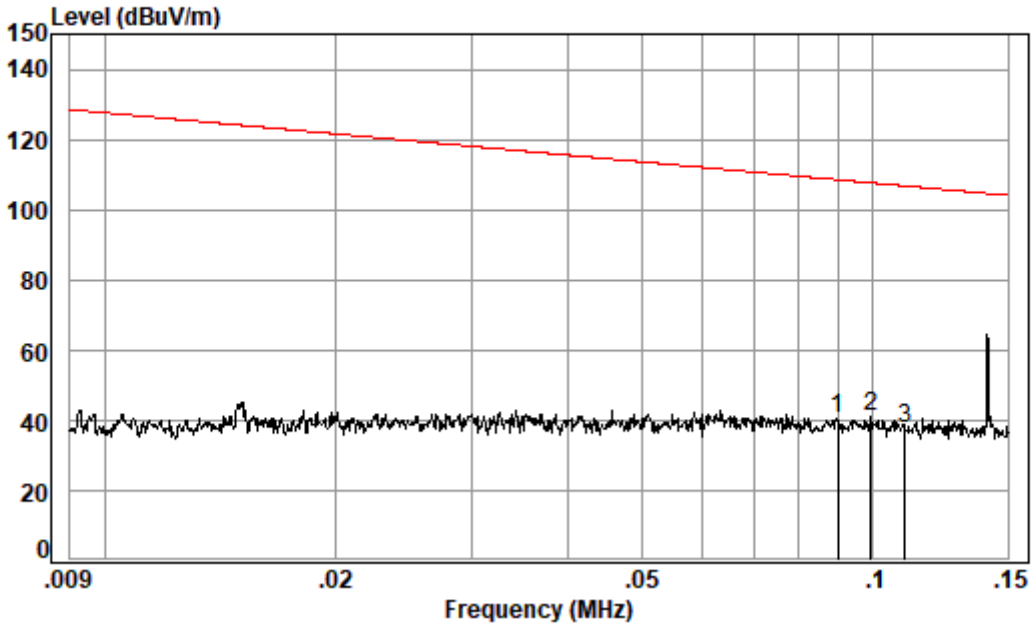
Mode:a
9kHz-150KHz




Condition: 3m
Job No. : 16701CR
Test Mode: a

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB |
| 1 | 0.09 | 0.00 | 12.04 | 32.12 | 60.60 | 40.52 | 108.52 | -68.00 |
| 2 pp | 0.10 | 0.00 | 12.00 | 32.19 | 61.38 | 41.19 | 107.65 | -66.46 |
| 3 | 0.11 | 0.00 | 11.93 | 32.19 | 57.80 | 37.54 | 106.78 | -69.24 |

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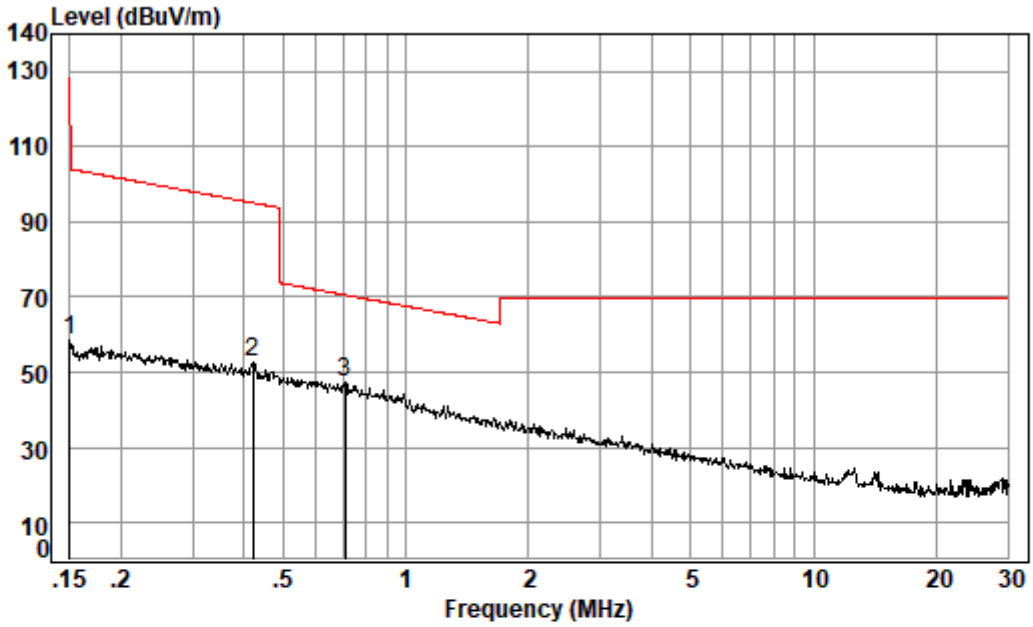
150kHz-30MHz




Condition: 3m
Job No. : 16701CR
Test Mode: a

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB |
| 1 | 0.15 | 0.00 | 11.70 | 32.20 | 78.94 | 58.44 | 104.08 | -45.64 |
| 2 | 0.42 | 0.00 | 11.77 | 32.24 | 73.34 | 52.87 | 95.11 | -42.24 |
| 3 pp | 0.71 | 0.00 | 11.96 | 32.26 | 67.79 | 47.49 | 70.60 | -23.11 |

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## 7.5 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.5
Measurement Distance: 10m

| Frequency(MHz) | Field strength(microvolts/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 |
| Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. | | |

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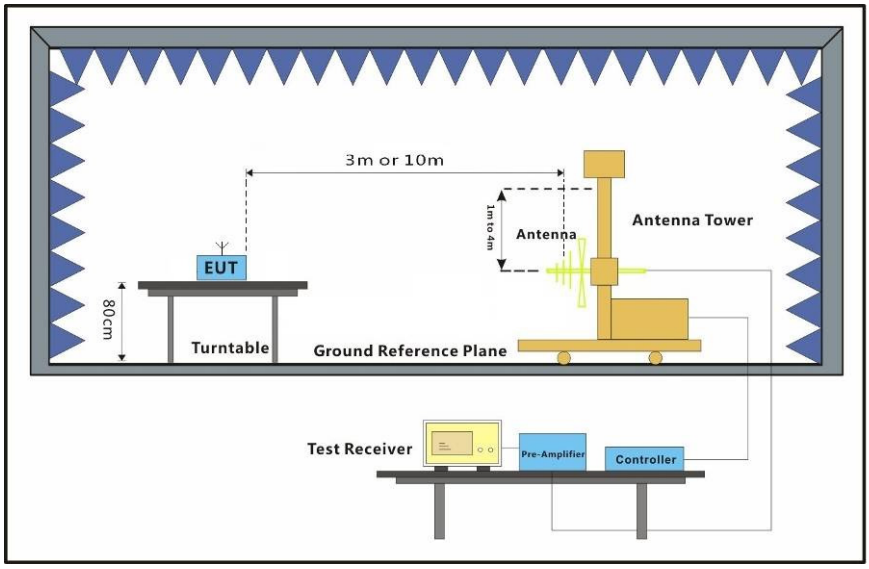
### 7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 53 % RH Atmospheric Pressure: 1005 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

### 7.5.2 Test Setup Diagram




### 7.5.3 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel,the middle channel,the Highest channel

h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.

i. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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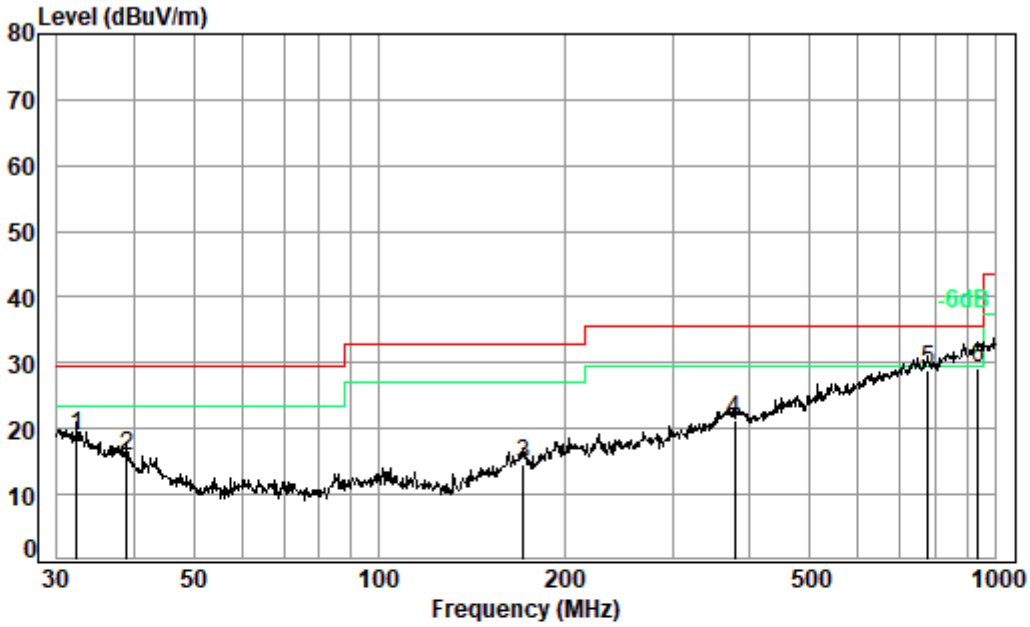
Mode: a; Polarization: Horizontal




Condition: 10m HORIZONTAL
Job No. : 16701CR
Test Mode: a

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB |
| 1 | 32.29 | 0.70 | 21.41 | 32.04 | 28.79 | 18.86 | 29.50 | -10.64 |
| 2 | 39.02 | 0.78 | 18.58 | 32.03 | 28.50 | 15.83 | 29.50 | -13.67 |
| 3 | 171.39 | 1.50 | 15.57 | 31.76 | 29.31 | 14.62 | 33.00 | -18.38 |
| 4 | 378.58 | 2.30 | 22.20 | 31.48 | 28.16 | 21.18 | 35.60 | -14.42 |
| 5 | 779.61 | 3.25 | 28.10 | 31.34 | 29.01 | 29.02 | 35.60 | -6.58 |
| 6 pp | 938.83 | 3.55 | 29.20 | 30.17 | 26.52 | 29.10 | 35.60 | -6.50 |

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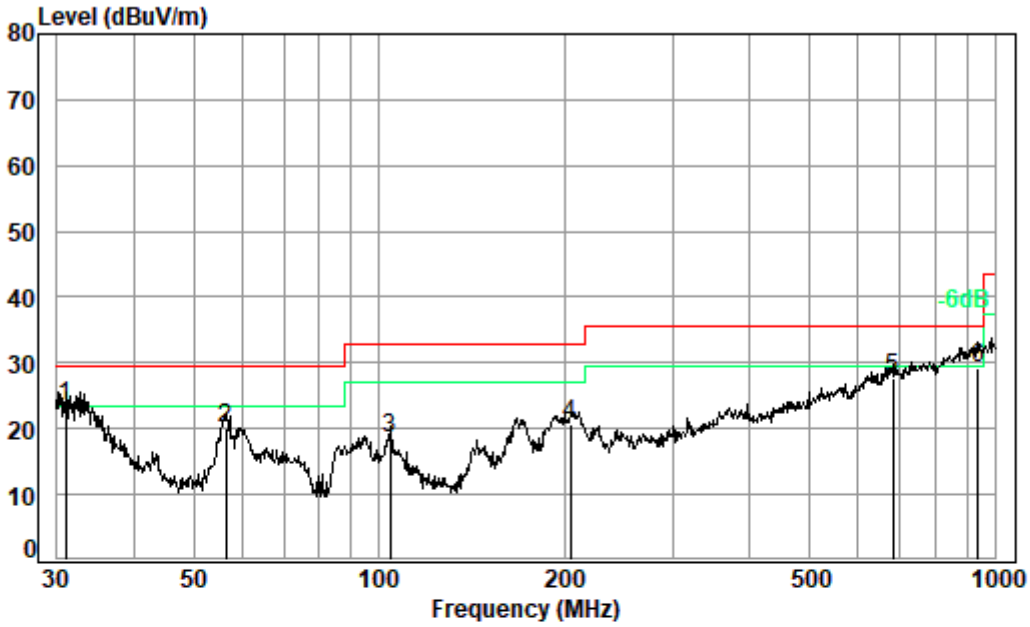
Mode: a; Polarization: Vertical




Condition: 10m VERTICAL
Job No. : 16701CR
Test Mode: a

| | Freq | Cable Loss | Ant Factor | Preamp Factor | Read Level | Level | Limit Line | Over Limit |
|---|---|---|---|---|---|---|---|---|
| | MHz | dB | dB/m | dB | dBuV | dBuV/m | dBuV/m | dB |
| 1 pp | 30.96 | 0.70 | 22.27 | 32.05 | 32.59 | 23.51 | 29.50 | -5.99 |
| 2 | 56.39 | 1.00 | 12.96 | 32.01 | 38.16 | 20.11 | 29.50 | -9.39 |
| 3 | 104.17 | 1.22 | 13.87 | 31.94 | 35.26 | 18.41 | 33.00 | -14.59 |
| 4 | 204.24 | 1.62 | 16.01 | 31.69 | 34.62 | 20.56 | 33.00 | -12.44 |
| 5 | 682.35 | 3.11 | 27.22 | 31.63 | 29.06 | 27.76 | 35.60 | -7.84 |
| 6 | 938.83 | 3.55 | 29.20 | 30.17 | 26.52 | 29.10 | 35.60 | -6.50 |

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The test was performed at a 10m test site. According to below formulate and the test data at 10m test distance,

$L_3 / L_{10} = D_{10} / D_3$

Note:

$L_3$: Level @ 3m distance. Unit: uV/m;

$L_{10}$: Level @ 10m distance. Unit: uV/m;

$D_3$: 3m distance. Unit: m

$D_{10}$: 10m distance. Unit: m

The level at 3m test distance is below:

| Frequency (MHz) | Level @ 10m (dBuV/m) | Level @ 10m (uV/m) | Level @ 3m (uV/m) | Level @ 3m (dBuV/m) | Limit @ 3m (dBuV/m) | Margin (dB) | Ant. Polarization |
|---|---|---|---|---|---|---|---|
| 30.96 | 23.51 | 14.98 | 49.93 | 33.97 | 40.00 | -6.03 | V |
| 56.39 | 20.11 | 10.13 | 33.76 | 30.57 | 40.00 | -9.43 | V |
| 104.17 | 18.41 | 8.33 | 27.76 | 28.87 | 43.50 | -14.63 | V |
| 204.24 | 20.56 | 10.67 | 35.55 | 31.02 | 43.50 | -12.48 | V |
| 682.35 | 27.76 | 24.43 | 81.45 | 38.22 | 46.00 | -7.78 | V |
| 938.83 | 29.10 | 28.51 | 95.03 | 39.56 | 46.00 | -6.44 | V |
| 32.29 | 18.86 | 8.77 | 29.23 | 29.32 | 40.00 | -10.68 | H |
| 39.02 | 15.83 | 6.19 | 20.62 | 26.29 | 40.00 | -13.71 | H |
| 171.39 | 14.62 | 5.38 | 17.94 | 25.08 | 43.50 | -18.42 | H |
| 378.58 | 21.18 | 11.46 | 38.18 | 31.64 | 46.00 | -14.36 | H |
| 779.61 | 29.02 | 28.25 | 94.16 | 39.48 | 46.00 | -6.52 | H |
| 938.83 | 29.10 | 28.51 | 95.03 | 39.56 | 46.00 | -6.44 | H |

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# 8 Photographs

## 8.1 Test Setup

Refer to Setup Photos

## 8.2 EUT Constructional Details (EUT Photos)

Refer to EUT external and internal photos

- End of the Report -

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