# FCC TEST REPORT

| | |
|---|---|
| **Product Name:** | Mobile Phone |
| **Trade Mark:** | iotapk, HONOR CHOICE |
| **Model No.:** | GAS-L13 |
| **Report Number:** | 26073026340RFC-5 |
| **Test Standards:** | FCC 47 CFR Part 15 Subpart C |
| **FCC ID:** | 2BAII-GAS-L13 |
| **Test Result:** | PASS |
| **Date of Issue:** | September 18, 2026 |

Prepared for:

**Shenzhen Water World Information Co.,Ltd.**
**Building 3, Dexinchang Wisdom Park, No.23, Heping Road, Qinghua Community, Longhua Subdistrict Longhua District, Shenzhen, Guangdong. China**

Prepared by:

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**
**16/F., Block A, Building 6, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, Guangdong, China**
**TEL: +86-755-2823 0888**
**FAX: +86-755-2823 0886**

Prepared by: David Chen
David Chen
Senior Project Engineer

Reviewed by:
Kevin Liang
Assistant Manager

Approved by:
Billy Li
Technical Director

Date: September 18, 2026

# Version

| Version No. | Date | Description |
|---|---|---|
| V1.0 | September 18, 2026 | Original |

# CONTENTS


1. GENERAL INFORMATION ..... 4
   1.1 CLIENT INFORMATION ..... 4
   1.2 EUT INFORMATION ..... 4
      1.2.1 GENERAL DESCRIPTION OF EUT ..... 4
      1.2.2 DESCRIPTION OF ACCESSORIES ..... 4
   1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD ..... 5
   1.4 OTHER INFORMATION ..... 5
   1.5 DESCRIPTION OF SUPPORT UNITS ..... 5
   1.6 TEST LOCATION ..... 5
   1.7 TEST FACILITY ..... 6
   1.8 DEVIATION FROM STANDARDS ..... 6
   1.9 ABNORMALITIES FROM STANDARD CONDITIONS ..... 6
   1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER ..... 6
   1.11 MEASUREMENT UNCERTAINTY ..... 6
2. TEST SUMMARY ..... 7
3. EQUIPMENT LIST ..... 8
4. TEST CONFIGURATION ..... 9
   4.1 ENVIRONMENTAL CONDITIONS FOR TESTING ..... 9
      4.1.1 NORMAL OR EXTREME TEST CONDITIONS ..... 9
      4.1.2 RECORD OF NORMAL ENVIRONMENT AND TEST SAMPLE ..... 9
   4.2 TEST CHANNELS ..... 9
   4.3 EUT TEST STATUS ..... 9
   4.4 PRE-SCAN ..... 10
   4.5 TEST SETUP ..... 11
      4.5.1 FOR RADIATED EMISSIONS TEST SETUP ..... 11
      4.5.2 FOR CONDUCTED EMISSIONS TEST SETUP ..... 12
      4.5.3 FOR CONDUCTED RF TEST SETUP ..... 12
   4.6 SYSTEM TEST CONFIGURATION ..... 14
5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION ..... 15
   5.1 REFERENCE DOCUMENTS FOR TESTING ..... 15
   5.2 ANTENNA REQUIREMENT ..... 15
   5.3 20DB BANDWIDTH ..... 15
   5.4 THE FIELD STRENGTH OF ANY EMISSIONS APPEARING OUTSIDE OF THE 13.110-14.010 MHZ BAND ..... 17
   5.5 FUNDAMENTAL FIELD STRENGTH AND EMISSION MASK 13.110 MHZ TO 14.010 MHZ ..... 21
   5.6 FREQUENCY TOLERANCE ..... 23
   5.7 CONDUCTED EMISSION ..... 24
APPENDIX 1 PHOTOS OF TEST SETUP ..... 27
APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS ..... 27

# 1. GENERAL INFORMATION

## 1.1 CLIENT INFORMATION

| | |
|---|---|
| **Applicant:** | Shenzhen Water World Information Co.,Ltd. |
| **Address of Applicant:** | Building 3, Dexinchang Wisdom Park, No.23, Heping Road, Qinghua Community, Longhua Subdistrict Longhua District, Shenzhen, Guangdong. China |
| **Manufacturer:** | Shenzhen Water World Information Co.,Ltd. |
| **Address of Manufacturer:** | Building 3, Dexinchang Wisdom Park, No.23, Heping Road, Qinghua Community, Longhua Subdistrict Longhua District, Shenzhen, Guangdong. China |

## 1.2 EUT INFORMATION

### 1.2.1 General Description of EUT

| | | | |
|---|---|---|---|
| **Product Name:** | Mobile Phone | | |
| **Model No.:** | GAS-L13 | | |
| **Trade Mark:** | iotapk, HONOR CHOICE | | |
| **DUT Stage:** | Identical Prototype | | |
| **EUT Supports Function:** (Provided by the customer) | GSM Bands: | GSM 850/ PCS 1900 | |
| | UTRA Bands: | Band II/ Band IV/ Band V | |
| | E-UTRA Bands: | FDD Band 2/ 4/ 5/ 7/ 13/ 17/ 26/ 66/ 71 | |
| | | TDD Band 38/ 40/ 41 | |
| | 2.4 GHz ISM Band: | IEEE 802.11b/g/n | |
| | | Bluetooth V5.0 | |
| | U-NII 5 GHz Bands: | 5 150 - 5 250 MHz | IEEE 802.11a/n/ac |
| | | 5 250 - 5 350 MHz | IEEE 802.11a/n/ac |
| | | 5 470 - 5 725 MHz | IEEE 802.11a/n/ac |
| | | 5 725 - 5 850 MHz | IEEE 802.11a/n/ac |
| | RNSS Bands: | 1559 - 1610 MHz | GPS/ Galileo/ BDS |
| | NFC: | 13.553 MHz to 13.567 MHz | |
| **Software Version:** | FS376L5P_CF1_WX09_CD1666_HONOR_20260826_A16_VOLTE_W1258_L1_3_5 7_8_20_28F_38_40_41F_HONOR_GLOBAL_ALS_DualMic_FP_debug_190223 (Provided by the customer) | | |
| **Hardware Version:** | FS376-MB-0.1 (Provided by the customer) | | |
| **Sample Received Date:** | July 6, 2026 | | |
| **Sample Tested Date:** | August 22, 2026 to September 3, 2026 | | |
| **Note:** There are two different versions of this model. The main difference is that the secondary supply screen. For more detail, please refer to manufacturer's difference declaration letter. In electrical characteristics, the above configuration have the same circuit diagram and PCB layout. The original screen configuration was chosen to perform the RF tests as representative. | | | |

**Remark:**
The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.

### 1.2.2 Description of Accessories

Refer to Report 26073026340EMC-1 for accessories.

## 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

| | |
|---|---|
| **Frequency Range:** | 13.110 MHz to 14.010 MHz |
| **Nominal Operating Frequency:** | 13.56 MHz |
| **Work in Modes:** | ☑ Card Emulation |
| | ☑ Reader/Writer |
| | ☐ Peer-to-Peer |
| **NFC Type:** | ☑ NFC A Type |
| | ☑ NFC B Type |
| | ☑ NFC F Type |
| | ☑ NFC V Type |
| **Max. Data Rates:** | 848 Kbps |
| **Type of Modulation:** | ASK |
| **Number of Channels:** | 1 |
| **Antenna Type:** | Loop Antenna |
| **Maximum Field Strength:** | 59.18 dBµV/m at 3 meter |
| **Normal Test Voltage:** | 3.91 Vdc |
| **Extreme Test Voltage:** | 3.4 to 4.5 Vdc |
| **Extreme Test Temperature:** | -20 °C to +50 °C |

## 1.4 OTHER INFORMATION

None

## 1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested independently

## 1.6 TEST LOCATION

**Shenzhen UnionTrust Quality and Technology Co., Ltd.**

Address: 16/F., Block A, Building 6, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

## 1.7 TEST FACILITY

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

**CNAS-Lab Code: L9069**
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

**A2LA-Lab Certificate No.: 4312.01**
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

**ISED Wireless Device Testing Laboratories**
CAB identifier: CN0032

**FCC Accredited Lab.**
Designation Number: CN1194
Test Firm Registration Number: 259480

## 1.8 DEVIATION FROM STANDARDS

None.

## 1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

## 1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

## 1.11 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | Conducted emission 9kHz-150kHz | ±3.2 dB |
| 2 | Conducted emission 150kHz-30MHz | ±3.1 dB |
| 3 | Radiated emission 9kHz-30MHz | ±4.7 dB |
| 4 | Radiated emission 30MHz-1GHz | ±4.6 dB |
| 5 | Radiated emission 1GHz-18GHz | ±4.4 dB |
| 6 | Radiated emission 18GHz-40GHz | ±4.6 dB |
| 7 | Occupied Bandwidth | ± 1.86 % |
| 8 | Radio Frequency | ± 7 x $10^{-8}$ |

## 2. TEST SUMMARY

| FCC 47 CFR Part 15 Subpart C Test Cases | | | |
|---|---|---|---|
| **Test Item** | **Test Requirement** | **Test Method** | **Result** |
| **Antenna Requirement** | FCC 47 CFR Part 15 Subpart C Section 15.203 | N/A | PASS |
| **Conducted Emission** | FCC 47 CFR Part 15 Subpart C Section 15.207 | ANSI C63.10-2020 | PASS |
| **The field strength of any emissions appearing outside of the 13.110-14.010 MHz band** | FCC 47 CFR Part 15 Subpart C Section 15.225(d) /15.209 | ANSI C63.10-2020 | PASS |
| **Fundamental Field Strength and Emission Mask 13.110 MHz to 14.010 MHz** | FCC 47 CFR Part 15 Subpart C Section 15.227(a) (b) (c) /15.205 | ANSI C63.10-2020 | PASS |
| **20DB Bandwidth** | FCC 47 CFR Part 15 Subpart C Section 15.215(c) | ANSI C63.10-2020 | PASS |
| **Occupied Bandwidth** | N/A | ANSI C63.10-2020 | None; for reporting purposes only. |
| **Frequency Tolerance** | FCC 47 CFR Part 15 Subpart C Section 15.225(e) | ANSI C63.10-2020 | PASS |
| **Disclaimer and Explanations:**<br>The declared of product specification and data (e.g., antenna gain, RF specification, etc) for EUT presented in the report are provided by the customer, and the customer takes all the responsibilities for the accuracy of product specification. | | | |

# 3. EQUIPMENT LIST

| Radiated Emission Test Equipment List | | | | | | |
|---|---|---|---|---|---|---|
| **Used** | **Equipment** | **Manufacturer** | **Model No.** | **Serial Number** | **Cal. date** | **Cal. Due date** |
| ☑ | 3 m SAC | ETS-Lindgren | 3 m | Euroshiedpn-CT001270-1317 | 11-Nov-2023 | 10-Nov-2026 |
| ☑ | Loop Antenna | ETS-Lindgren | 6502 | 00202525 | 26-Jan-2026 | 25-Jan-2027 |
| ☑ | Broadband Antenna | ETS-Lindgren | 3142E | 00201566 | 26-Oct-2025 | 25-Oct-2026 |
| ☑ | 6dB Attenuator | Talent | RA6A5-N-18 | 18103001 | 26-Oct-2025 | 25-Oct-2026 |
| ☑ | Receiver | ROHDE & SCHWARZ | ESIB26 | 100114 | 24-Oct-2025 | 23-Oct-2026 |
| ☑ | Pre-amplifier | HP | 8447F | 2805A02960 | 24-Oct-2025 | 23-Oct-2026 |
| ☑ | Multi device Controller | ETS-Lindgren | 7006-001 | 160105.00 | N/A | N/A |
| ☑ | Test Software | Audix | e3 | Software Version: 9.160323 | | |

| Conducted Emission Test Equipment List | | | | | | |
|---|---|---|---|---|---|---|
| **Used** | **Equipment** | **Manufacturer** | **Model No.** | **Serial Number** | **Cal. date** | **Cal. Due date** |
| ☑ | LISN | ROHDE & SCHWARZ | ENV216 | 3560.6550.12 | 22-Jan-2026 | 21-Jan-2027 |
| ☐ | LISN | ETS-Lindgren | 3816/2SH | 00201088 | 22-Jan-2026 | 21-Jan-2027 |
| ☑ | Receiver | ROHDE & SCHWARZ | ESCI 3 | 101192 | 24-Oct-2025 | 23-Oct-2026 |
| ☑ | Shielding room | ETS-Lindgren | 843 | Euroshiedpn-CT001270-1246 | 25-Oct-2024 | 24-Oct-2027 |
| ☑ | Test Software | EZ-EMC | EZ-CON | Software Version:EMC-CON 3A1.1 | | |

| RF Conducted Test Equipment List | | | | | | |
|---|---|---|---|---|---|---|
| **Used** | **Equipment** | **Manufacturer** | **Model No.** | **Serial Number** | **Cal. date** | **Cal. Due date** |
| ☑ | Spectrum analyzer | ROHDE & SCHWARZ | FSV40-N | 101653 | 20-Mar-2026 | 19-Mar-2027 |
| ☑ | Loop Antenna | ETS-Lindgren | 6502 | 00202525 | 26-Jan-2026 | 25-Jan-2027 |
| ☑ | DC Source | KIKUSUI | PWR400L | LK003024 | 11-Jul-2026 | 10-Jul-2027 |
| ☑ | Temp Humidity chamber | Votisch | VT4002 | 58566133290020 | 20-Mar-2026 | 19-Mar-2027 |

# 4. TEST CONFIGURATION

## 4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

### 4.1.1 Normal or Extreme Test Conditions

| Test Environment | Selected Values During Tests | | |
|---|---|---|---|
| Test Condition | Ambient | | |
| | Temperature (°C) | Voltage (V) | Relative Humidity (%) |
| TN/VN | +15 to +35 | 3.91 | 20 to 75 |
| TL/VL | -20 | 3.4 | 20 to 75 |
| TH/VL | +50 | 3.4 | 20 to 75 |
| TL/VH | -20 | 4.5 | 20 to 75 |
| TH/VH | +50 | 4.5 | 20 to 75 |

**Remark:**
1) The EUT just work in such extreme temperature of -20 °C to +50 °C and the extreme voltage of 3.4 V to 4.5 V, so here the EUT is tested in the temperature of -20 °C to +50 °C and the voltage of 3.4 V to 4.5 V.
2) VN: Normal Voltage; TN: Normal Temperature;
TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.

### 4.1.2 Record of Normal Environment and Test Sample

| Test Item | Sample No. | Tested by |
|---|---|---|
| Conducted Emission | S202609189686-ZJA02/5 | Shirley Wu |
| The field strength of any emissions appearing outside of the 13.110-14.010 MHz band | S202609189686-ZJA03/5 | Erina Chen |
| Fundamental Field Strength and Emission Mask 13.110 MHz to 14.010 MHz | | |
| 20DB Bandwidth | | |
| Radiated Spurious Emissions | S202609189686-ZJA03/5 | Leo Li |

## 4.2 TEST CHANNELS

| Frequency | Test RF Channel |
|---|---|
| 13.56 MHz | Channel 1 |
| | 13.56 MHz |

## 4.3 EUT TEST STATUS

| Frequency | Tx Function | Description |
|---|---|---|
| 13.56 MHz | 1Tx | 1. Keep the EUT in continuously transmitting during the test. |

## 4.4 PRE-SCAN

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, work in modes and data rates. Selected for the final test as listed below.

| Frequency | Work in Modes | Type | Data Rate (kbps) |
|---|---|---|---|
| 13.56 MHz | ☐ Card Emulation<br>☑ Reader/Writer<br>☐ Peer-to-Peer | ☑ A<br>☐ B<br>☐ F<br>☐ V | ☑ 106<br>☐ 212<br>☐ 424<br>☐ 848 |
| **Remark:**<br>The mark"☑" means is chosen for testing;<br>The mark"☐" means is not chosen for testing. | | | |

## 4.5 TEST SETUP

### 4.5.1 For Radiated Emissions test setup

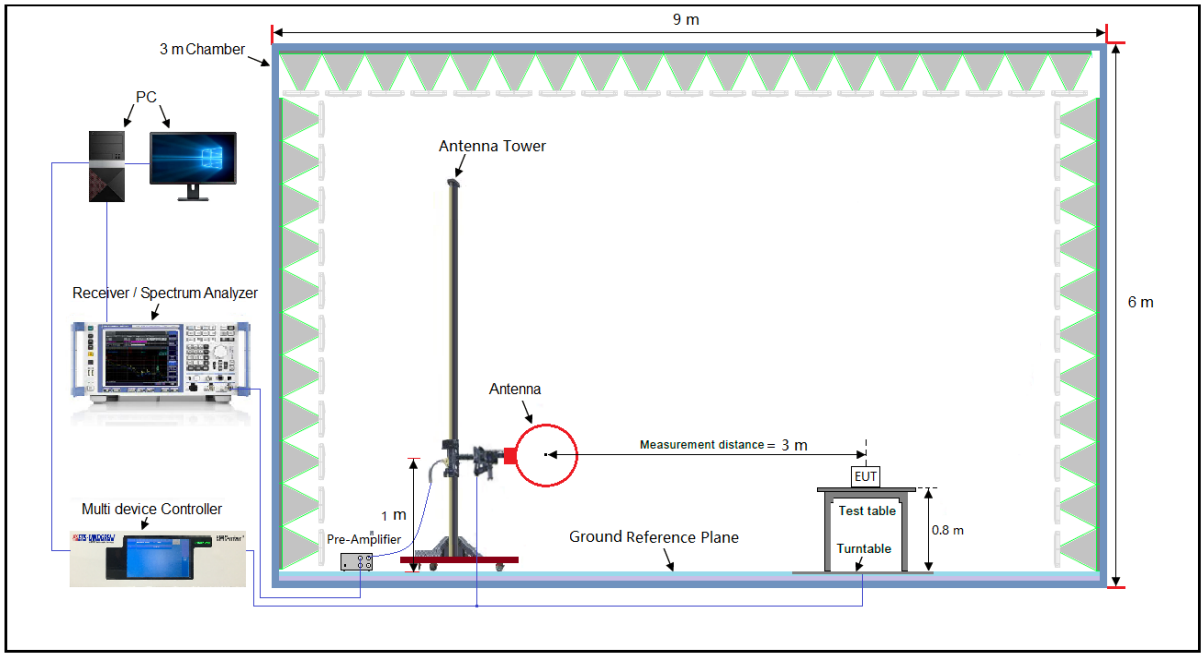



Figure 1. Below 30MHz

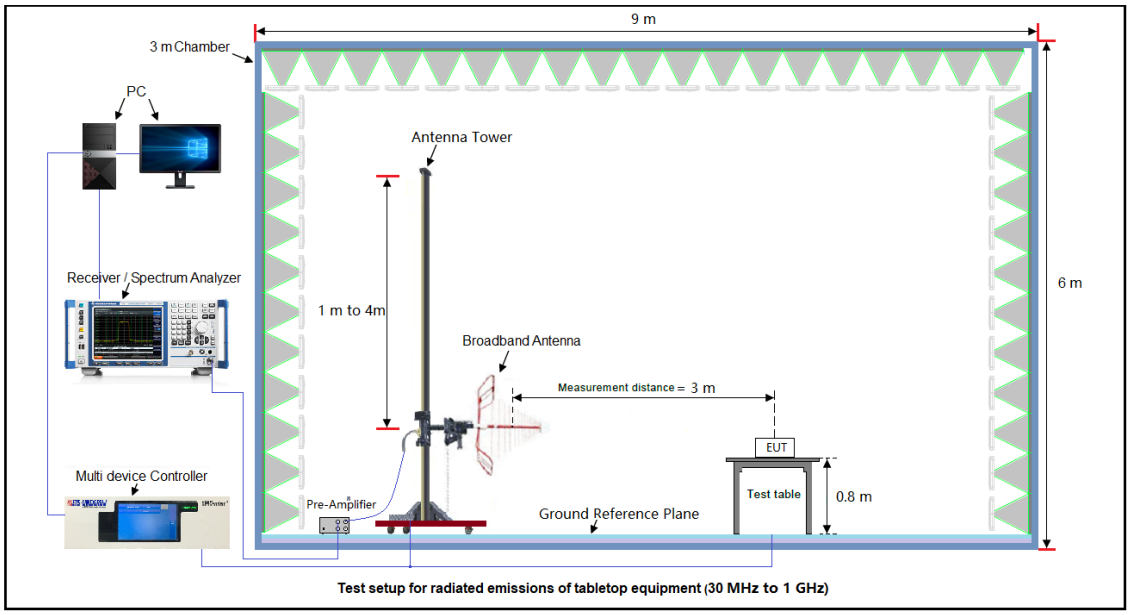
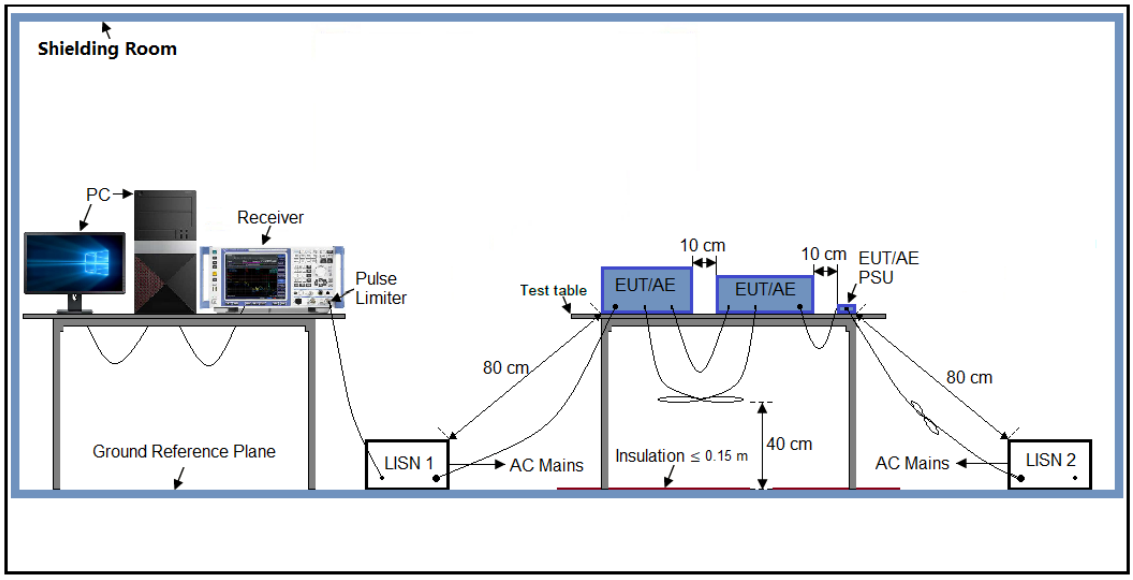
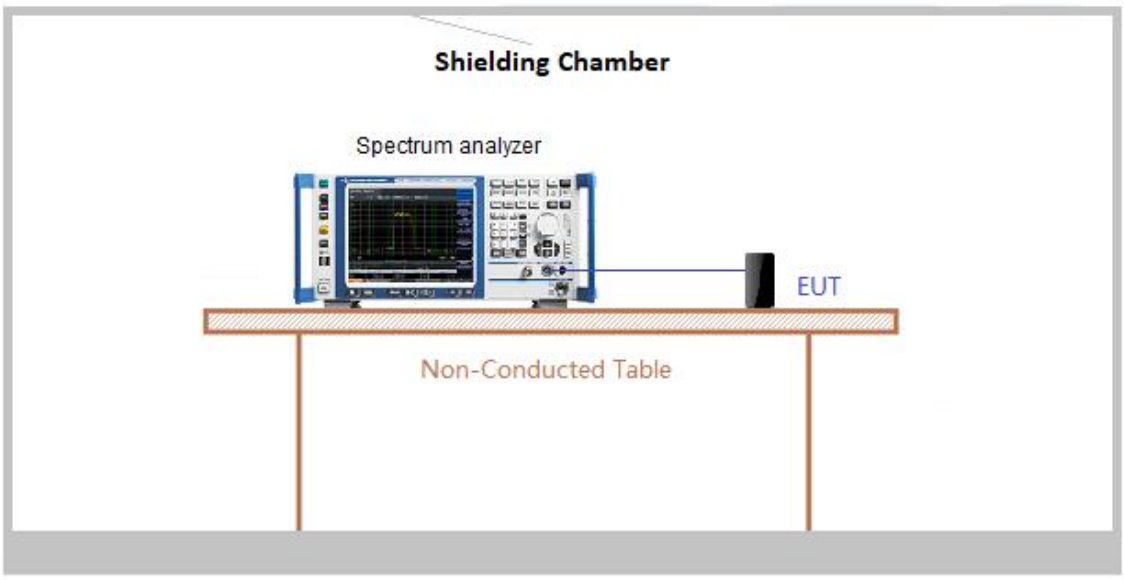



Figure 2. 30MHz to 1GHz

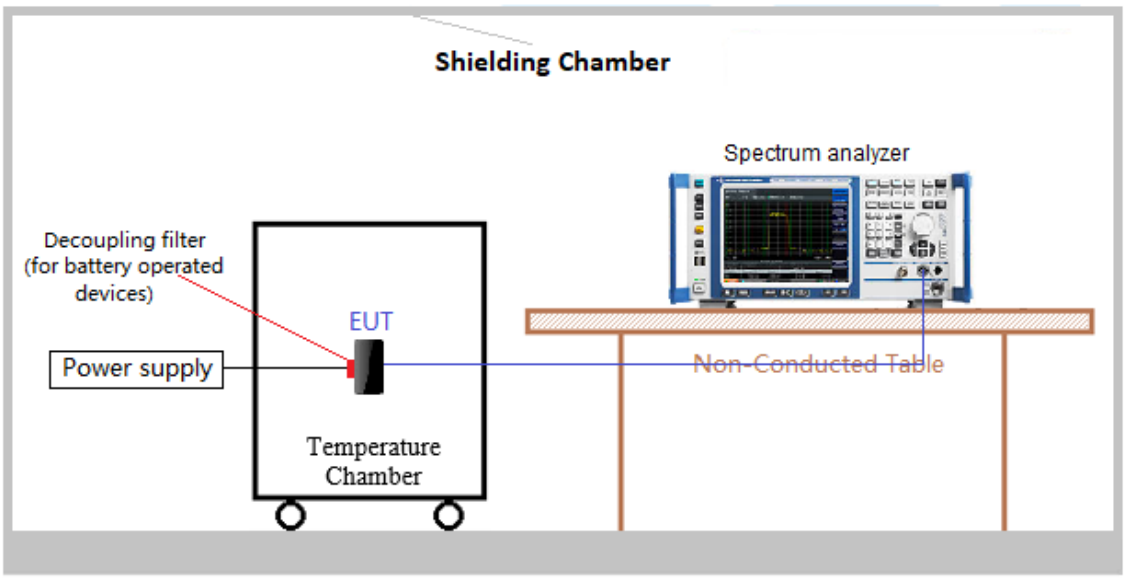
### 4.5.2 For Conducted Emissions test setup




### 4.5.3 For Conducted RF test setup




Normal Environment




Extreme Environment

## 4.6 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.91Vdc rechargeable Li-on battery. Only the worst case data were recorded in this test report.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

# 5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

## 5.1 REFERENCE DOCUMENTS FOR TESTING

| No. | Identity | Document Title |
|---|---|---|
| 1 | FCC 47 CFR Part 15 | Radio Frequency Devices |
| 2 | ANSI C63.10-2020 | American National Standard for Testing Unlicesed Wireless Devices |

## 5.2 ANTENNA REQUIREMENT

| Standard Requirement |
|---|
| **15.203 requirement:**<br>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 permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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:** |
| This product has a permanent antenna, fulfill the requirement of this section. |

## 5.3 20DB BANDWIDTH

**Test Requirement:** FCC 47 CFR Part 15 Subpart C Section 15.215 (c)

**Test Method:** ANSI C63.10-2020

**Limit:** Operation within the band 13.110 MHz to 14.010 MHz

**Requirement:** 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 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equip compliance with the 20dB attenuation specification may base on measurement at the intentional radiator's antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be. Demonstrated by measuring the radiated emissions.

**Test Procedure:** Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
Use the following spectrum analyzer settings:

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency
b) Span = approximately 2 to 5 times the OBW
c) RBW = 1% to 5%of the OBW
d) VBW ≥ 3*RBW
e) Sweep = auto;
f) Detector function = peak
g) Trace = max hold
h) All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down bandwidth of the emission.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.5.3 for details.

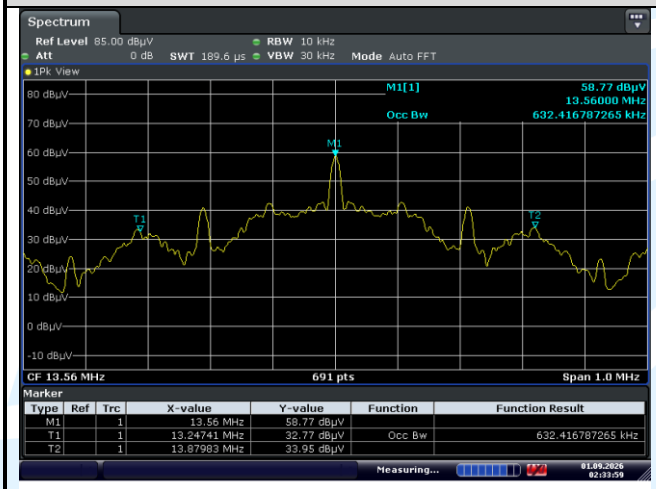
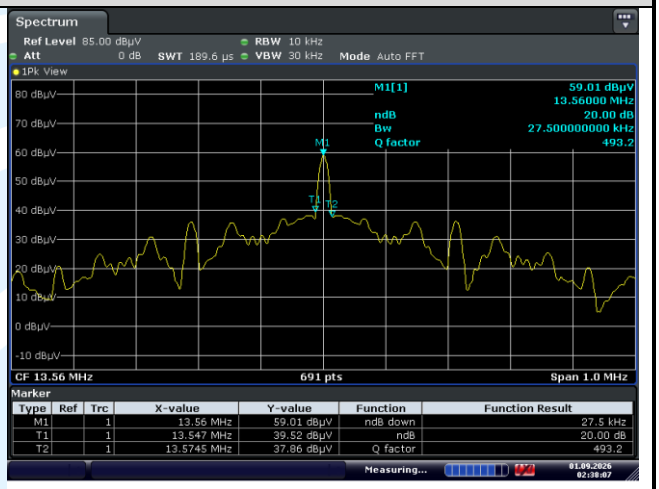
**Instruments Used:** Refer to section 3 for details

**Test Mode:** Transmitter mode

**Test Results:** Pass

| Test Frequency | Reader Mode | | Limit |
|---|---|---|---|
| | OBW (kHz) | 20 dB BW (kHz) | |
| 13.56 MHz | 632.417 | 27.5 | Operation within the band 13.110 MHz to 14.010 MHz |

**The test plot as follows:**

| OBW | 20 dB BW |
|---|---|
|  |  |

## 5.4 THE FIELD STRENGTH OF ANY EMISSIONS APPEARING OUTSIDE OF THE 13.110-14.010 MHZ BAND

**Test Requirement:** FCC 47 CFR Part 15 Subpart C Section 15.225(d) /15.209

**Test Method:** ANSI C63.10-2020

**Receiver Setup:**

| Frequency | RBW |
|---|---|
| 0.009 MHz-0.150 MHz | 200/300 kHz |
| 0.150 MHz -30 MHz | 9/10 kHz |
| 30 MHz-1 GHz | 100/120 kHz |
| Above 1 GHz | 1 MHz |

**Limits:**

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

**Spurious Emissions**

| Frequency | Field strength (microvolt/meter) | Limit (dBμV/m) | Remark | Measurement distance (m) |
|---|---|---|---|---|
| 0.009 MHz-0.490 MHz | 2400/F(kHz) | -- | -- | 300 |
| 0.490 MHz-1.705 MHz | 24000/F(kHz) | -- | -- | 30 |
| 1.705 MHz-30 MHz | 30 | -- | -- | 30 |
| 30 MHz-88 MHz | 100 | 40.0 | Quasi-peak | 3 |
| 88 MHz-216 MHz | 150 | 43.5 | Quasi-peak | 3 |
| 216 MHz-960 MHz | 200 | 46.0 | Quasi-peak | 3 |
| 960MHz-1GHz | 500 | 54.0 | Quasi-peak | 3 |
| Above 1 GHz | 500 | 54.0 | Average | 3 |

**Remark:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (μV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, 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.
4. For Below 30MHz, the measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

   **Example:**

   Field strength limit for 13.56MHz = 15848 μV/m at 30m
   = 84 dBμV/m at 30m
   = 84 dBμV/m + 40log(30/3) dB at 3m
   = 124 dBμV/m at 3m

**Test Setup:** Refer to section 4.5.1 for details.

**Test Procedures:**

1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3) 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.
4) 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 rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.

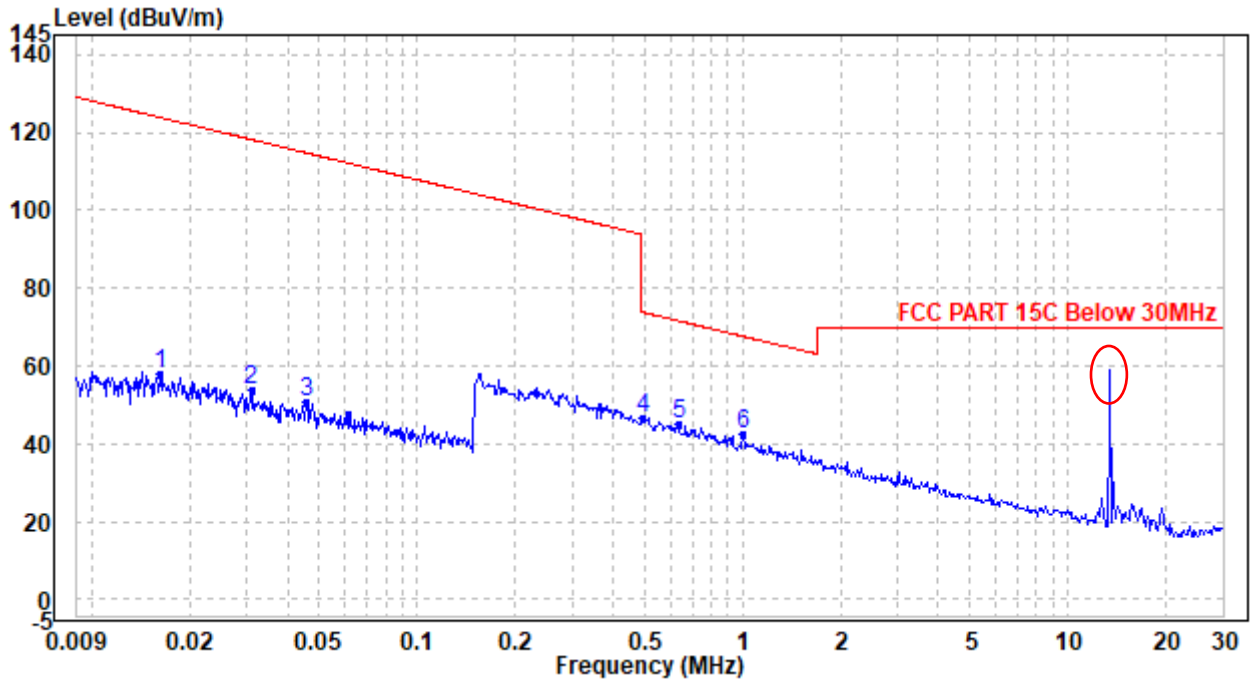
5) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions 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.
7) The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.(for portable and mobile devices)

**Equipment Used:** Refer to section 3 for details.

**Test Result:** Pass

**Radiated Emission Test Data (9 kHz ~ 30 MHz):**

**Horizontal**

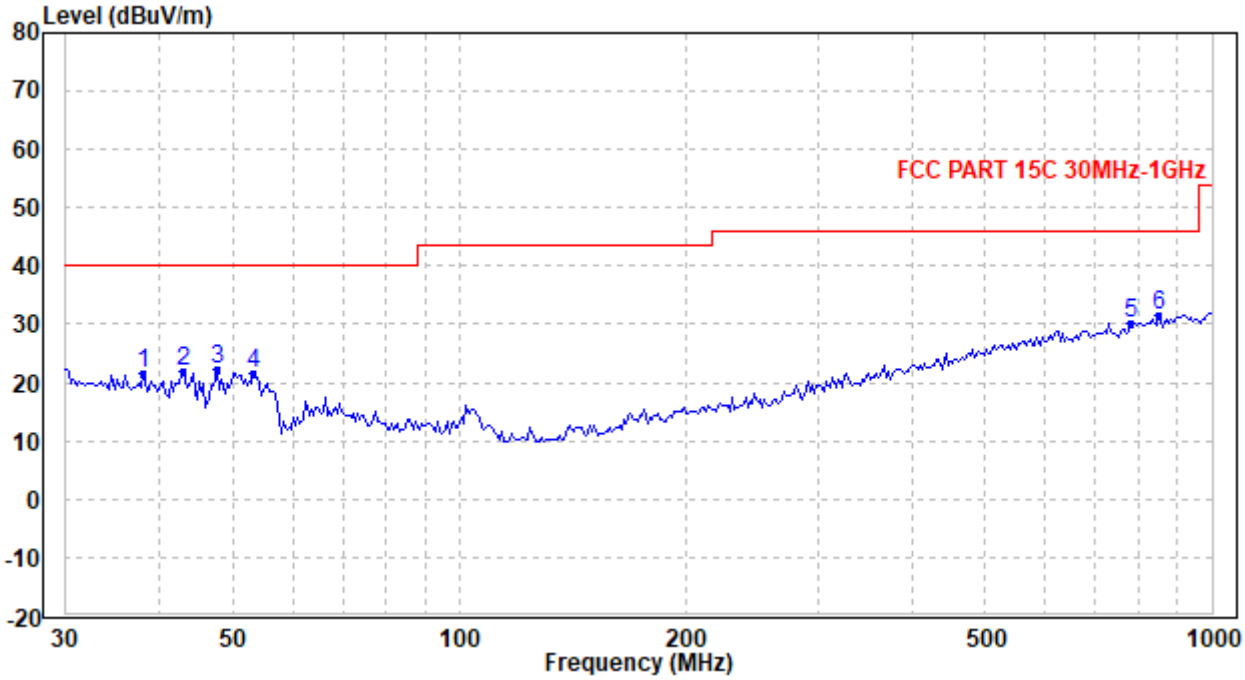



| No. | Frequency (MHz) | Reading (dBµV) | Correction factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.016 | 70.89 | -13.04 | 57.85 | 123.79 | -65.94 | Peak |
| 2 | 0.031 | 70.85 | -16.92 | 53.93 | 118.13 | -64.20 | Peak |
| 3 | 0.045 | 68.65 | -18.11 | 50.54 | 114.75 | -64.21 | Peak |
| 4 | 0.493 | 64.83 | -18.39 | 46.44 | 73.75 | -27.31 | Peak |
| 5 | 0.636 | 63.17 | -18.39 | 44.78 | 71.55 | -26.77 | Peak |
| 6 | 1.003 | 60.67 | -18.35 | 42.32 | 67.59 | -25.27 | Peak |

Note: The red circle waveform is 13.56MHz fundamental frequency.

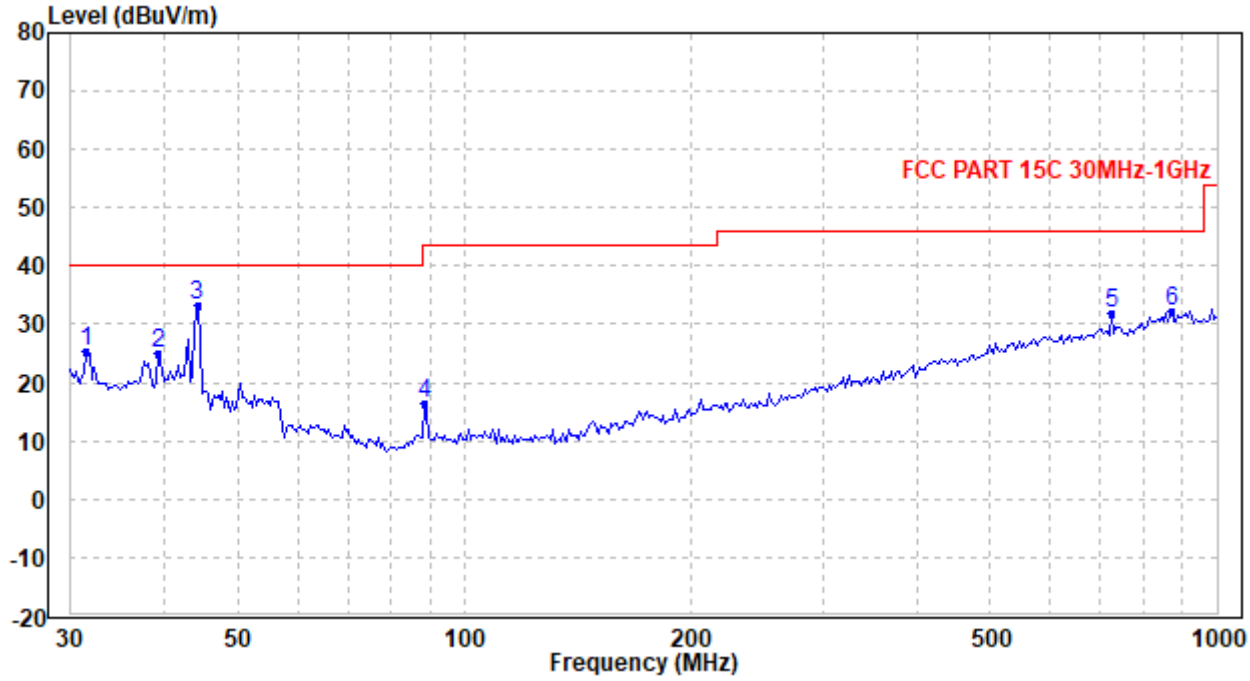
**Radiated Emission Test Data (30 MHz ~ 1 GHz):**

**Horizontal**




| No. | Frequency (MHz) | Reading (dBµV) | Correction factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 38.096 | 30.40 | -8.66 | 21.74 | 40.00 | -18.26 | Peak |
| 2 | 42.931 | 33.75 | -11.72 | 22.03 | 40.00 | -17.97 | Peak |
| 3 | 47.703 | 36.70 | -14.52 | 22.18 | 40.00 | -17.82 | Peak |
| 4 | 53.379 | 38.30 | -16.60 | 21.70 | 40.00 | -18.30 | Peak |
| 5 | 781.961 | 26.46 | 3.80 | 30.26 | 46.00 | -15.74 | Peak |
| 6 | 850.760 | 26.04 | 5.36 | 31.40 | 46.00 | -14.60 | Peak |

**Vertical**




| No. | Frequency (MHz) | Reading (dBμV) | Correction factor (dB/m) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 31.513 | 32.40 | -7.15 | 25.25 | 40.00 | -14.75 | Peak |
| 2 | 39.182 | 34.63 | -9.61 | 25.02 | 40.00 | -14.98 | Peak |
| 3 | 44.154 | 47.03 | -13.60 | 33.43 | 40.00 | -6.57 | Peak |
| 4 | 88.534 | 33.31 | -17.04 | 16.27 | 43.50 | -27.23 | Peak |
| 5 | 723.793 | 28.77 | 2.98 | 31.75 | 46.00 | -14.25 | Peak |
| 6 | 868.886 | 26.32 | 5.90 | 32.22 | 46.00 | -13.78 | Peak |

Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

## 5.5 FUNDAMENTAL FIELD STRENGTH AND EMISSION MASK 13.110 MHZ TO 14.010 MHZ

**Test Requirement:** FCC 47 CFR Part 15 Subpart C Section 15.227(a) (b) (c) /15.205

**Test Method:** ANSI C63.10-2020

**Limits:**

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

**Remark:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBμV/m) = 20 log Emission level (μV/m).
3. For Below 30MHz, the measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

**Example:**

| | | | |
|---|---|---|---|
| Field strength limit for 13.56MHz | = | 15848 μV/m | at 30m |
| | = | 84 dBμV/m | at 30m |
| | = | 84 dBμV/m + 40log(30/3) dB | at 3m |
| | = | 124 dBμV/m | at 3m |

**Test Setup:** Refer to section 4.5.1 for details.

**Test Procedures:**

As the radiation test, set the RBW=10kHz VBW=30kHz, observed the outside band of 13.110 MHz to 14.010 MHz, than mark the higher-level emission for comparing with the FCC rules.

**Equipment Used:** Refer to section 3 for details.

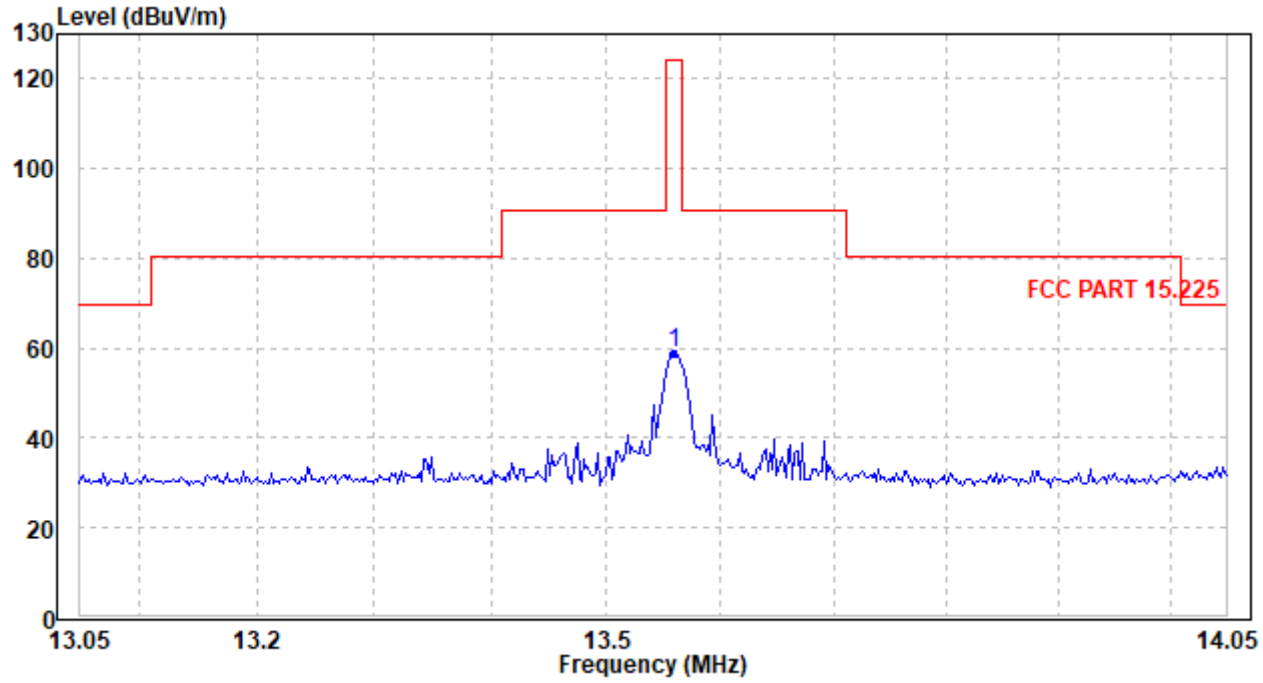
**Test Result:** Pass

**Maximum Field Strength:**

| Fundamental frequency | Detector | Result at 3m (dBμV/m) | Limit at 3m (dBμV/m) | Margin (dB) |
|---|---|---|---|---|
| 13.56 MHz | Peak | 59.18 | 124 | -64.82 |

**Emission Mask:**

**The worst-case test plots as below.**



## 5.6 FREQUENCY TOLERANCE

**Test Requirement:** FCC 47 CFR Part 15 Subpart C Section 15.225(e)

**Test Method:** ANSI C63.10-2020

**Limits:**

The frequency tolerance of the carrier signal shall be maintained within ±0.01% 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. For battery operated equipment, the equipment tests shall be performed using a new battery.

**Test Setup:** Refer to section 4.5.3 for details.

**Test Procedures:**

1) The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2) Turn the EUT on and couple its output to a spectrum analyzer.
3) Turn the EUT off and set the chamber to the highest temperature specified.
4) Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5) Repeat step c) and d) with the temperature chamber set to the lowest temperature.
6) The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

**Equipment Used:** Refer to section 3 for details.

**Test Result:** Pass

| Frequency Tolerance VS Temperature and Voltage | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Temp.(°C) | Voltage | Test time (minutes) | | | | | | | |
| | | 0 | 2 | 5 | 10 | 0 | 2 | 5 | 10 |
| | | Measured Frequency (MHz) | | | | Frequency Drift (%) | | | |
| 50 | VN | 13.56014 | 13.56034 | 13.56022 | 13.56011 | 0.0010 | 0.0025 | 0.0016 | 0.0008 |
| 40 | VN | 13.56023 | 13.56061 | 13.56069 | 13.56014 | 0.0017 | 0.0045 | 0.0051 | 0.0010 |
| 30 | VN | 13.56026 | 13.56042 | 13.56062 | 13.56004 | 0.0019 | 0.0031 | 0.0046 | 0.0003 |
| 20 | VN | 13.56031 | 13.56041 | 13.56067 | 13.56002 | 0.0023 | 0.0030 | 0.0049 | 0.0001 |
| | VL | 13.56064 | 13.56002 | 13.56032 | 13.5603 | 0.0047 | 0.0001 | 0.0024 | 0.0022 |
| | VH | 13.56071 | 13.56023 | 13.56002 | 13.56002 | 0.0052 | 0.0017 | 0.0001 | 0.0001 |
| 10 | VN | 13.56063 | 13.56044 | 13.5603 | 13.56022 | 0.0046 | 0.0032 | 0.0022 | 0.0016 |
| 0 | VN | 13.56065 | 13.56002 | 13.56032 | 13.56032 | 0.0048 | 0.0001 | 0.0024 | 0.0024 |
| -10 | VN | 13.56018 | 13.56013 | 13.56002 | 13.56002 | 0.0013 | 0.0010 | 0.0001 | 0.0001 |
| -20 | VN | 13.56014 | 13.56061 | 13.56008 | 13.56012 | 0.0010 | 0.0045 | 0.0006 | 0.0009 |
| **Limit:** ±0.01 % | | | | | | | | | |

## 5.7 CONDUCTED EMISSION

**Test Requirement:** FCC 47 CFR Part 15 Subpart C Section 15.207

**Test Method:** ANSI C63.10-2020 Section 6.2

**Limits:**

| Frequency range (MHz) | Limits (dB(μV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0,15 to 0,50 | 66 to 56 | 56 to 46 |
| 0,50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

**Remark:**

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

**Test Setup:** Refer to section 4.5.2 for details.

**Test Procedures:**

Test frequency range :150KHz-30MHz

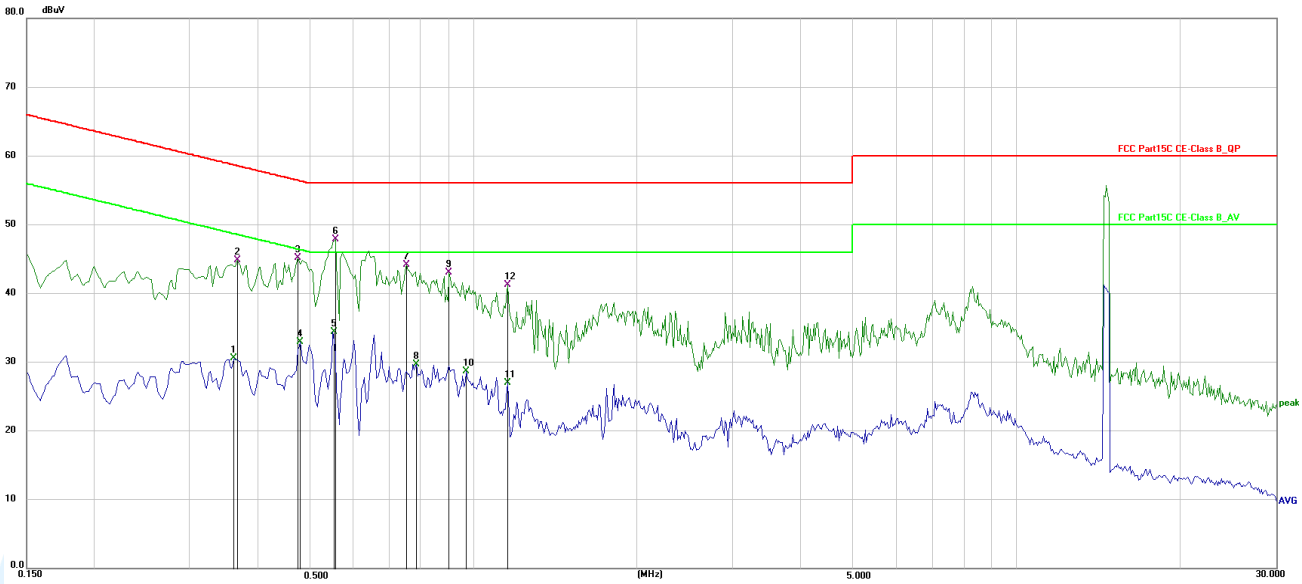
7) The mains terminal disturbance voltage test was conducted in a shielded room.
8) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second 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.
9) 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,
10) 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.
11) 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.

**Equipment Used:** Refer to section 3 for details.

**Test Result:** Pass

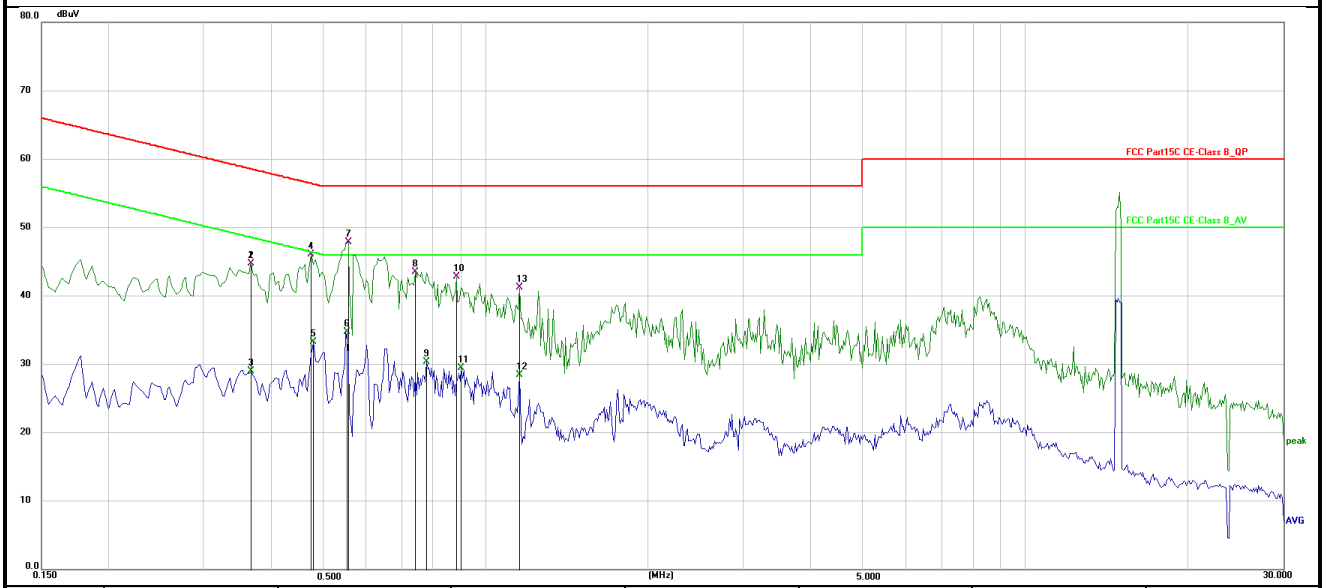
**The measurement data as follows:**
**Quasi Peak and Average:**
**Mode: NFC**

**Live Line**




| No. | Frequency (MHz) | Reading (dBμV) | Correction factor(dB) | Result (dBμV) | Limit (dBμV) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.3613 | 20.30 | 10.22 | 30.52 | 48.70 | -18.18 | AVG |
| 2 | 0.3660 | 34.66 | 10.22 | 44.88 | 58.59 | -13.71 | QP |
| 3 | 0.4740 | 34.94 | 10.22 | 45.16 | 56.44 | -11.28 | QP |
| 4 | 0.4783 | 22.71 | 10.21 | 32.92 | 46.37 | -13.45 | AVG |
| 5 | 0.5503 | 24.15 | 10.20 | 34.35 | 46.00 | -11.65 | AVG |
| 6 | 0.5550 | 37.61 | 10.21 | 47.82 | 56.00 | -8.18 | QP |
| 7 | 0.7530 | 33.92 | 10.19 | 44.11 | 56.00 | -11.89 | QP |
| 8 | 0.7842 | 19.55 | 10.18 | 29.73 | 46.00 | -16.27 | AVG |
| 9 | 0.9014 | 32.88 | 10.17 | 43.05 | 56.00 | -12.95 | QP |
| 10 | 0.9735 | 18.47 | 10.18 | 28.65 | 46.00 | -17.35 | AVG |
| 11 | 1.1533 | 16.78 | 10.18 | 26.96 | 46.00 | -19.04 | AVG |
| 12 | 1.1534 | 31.10 | 10.18 | 41.28 | 56.00 | -14.72 | QP |

**Neutral Line**




| No. | Frequency (MHz) | Reading (dBµV) | Correction factor(dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.3660 | 34.46 | 10.22 | 44.68 | 58.59 | -13.91 | QP |
| 2 | 0.3660 | 34.46 | 10.22 | 44.68 | 58.59 | -13.91 | QP |
| 3 | 0.3660 | 18.73 | 10.22 | 28.95 | 48.59 | -19.64 | AVG |
| 4 | 0.4740 | 35.81 | 10.20 | 46.01 | 56.44 | -10.43 | QP |
| 5 | 0.4783 | 23.05 | 10.20 | 33.25 | 46.37 | -13.12 | AVG |
| 6 | 0.5503 | 24.53 | 10.20 | 34.73 | 46.00 | -11.27 | AVG |
| 7 | 0.5550 | 37.71 | 10.20 | 47.91 | 56.00 | -8.09 | QP |
| 8 | 0.7395 | 33.32 | 10.19 | 43.51 | 56.00 | -12.49 | QP |
| 9 | 0.7753 | 20.11 | 10.20 | 30.31 | 46.00 | -15.69 | AVG |
| 10 | 0.8834 | 32.57 | 10.18 | 42.75 | 56.00 | -13.25 | QP |
| 11 | 0.9013 | 19.27 | 10.18 | 29.45 | 46.00 | -16.55 | AVG |
| 12 | 1.1533 | 18.29 | 10.19 | 28.48 | 46.00 | -17.52 | AVG |

Remark:

1. Correct Factor = LISN Factor + Cable Loss + Pulse Limiter Factor, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit
4. An initial pre-scan was performed on the Phase and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.
5. All possible modes of operation were investigated, and testing at two nominal voltages of 240V~50Hz and 120V~60Hz, only the worst case emissions reported.
6. The 13.56MHz frequency in the test figure is the NFC operating frequency and belongs to the exempt frequency band.

## APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

## APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

---

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.

---