# TEST REPORT

| | |
|---|---|
| **Applicant:** | Fort Robotics Inc. |
| **Address of Applicant:** | 1608 Walnut Street Floor 12, Philadelphia, Pennsylvania 19103, United States |
| **Manufacturer/Factory:** | Fort Robotics Inc. |
| **Address of Manufacturer/Factory:** | 1608 Walnut Street Floor 12, Philadelphia, Pennsylvania 19103, United States |
| **Equipment Under Test (EUT)** | |
| Product Name: | Wireless E-Stop Pro |
| Model No.: | WESP 1003 |
| Trade Mark: | FORT Robotics |
| **FCC ID:** | 2A8I8-1000415 |
| **Applicable standards:** | FCC CFR Title 47 Part 15 Subpart C Section 15.247 |
| **Date of sample receipt:** | September 08, 2025 |
| **Date of Test:** | September 08, 2025-November 05, 2025 |
| **Date of report issued:** | November 05, 2025 |
| **Test Result :** | PASS * |

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

Authorized Signature:

深圳市环球众一科技有限公司 Global United Technology Services Co., Ltd. 检验检测专用章 Inspection&Testing Services

**Robinson Luo**
**Laboratory Manager**

TESTING
NVLAP LAB CODE 600179-0

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

## 2 Version

| Version No. | Date | Description |
|---|---|---|
| *00* | *November 05, 2025* | *Original* |
| | | |
| | | |
| | | |
| | | |

| | | | |
|---|---|---|---|
| ***Tested By:*** | ***Test Engineer*** | ***Date:*** | *November 05, 2025* |
| ***Prepared By:*** | ***Project Engineer*** | ***Date:*** | *November 05, 2025* |
| ***Check By:*** | ***Reviewer*** | ***Date:*** | *November 05, 2025* |

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# 4 Test Summary

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| Antenna requirement | 15.203/15.247 (c) | Pass |
| AC Power Line Conducted Emission | 15.207 | Pass |
| Conducted Output Power | 15.247 (b)(3) | Pass |
| Channel Bandwidth | 15.247 (a)(2) | Pass |
| Power Spectral Density | 15.247 (e) | Pass |
| Band Edge | 15.247(d) | Pass |
| Spurious Emission | 15.205/15.209 | Pass |

*Remarks:*

1. *Pass: The EUT complies with the essential requirements in the standard.*
2. *Test according to ANSI C63.10:2020*

**Measurement Uncertainty**

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | Radio Frequency | $\pm 7.25\times 10^{-8}$ |
| 2 | Duty cycle | ±0.37% |
| 3 | Occupied Bandwidth | ±3% |
| 4 | RF conducted power | ±0.75dB |
| 5 | RF power density | ±3dB |
| 6 | Conducted Spurious emissions | ±2.58dB |
| 7 | AC Power Line Conducted Emission | ±3.44dB (0.15MHz ~ 30MHz) |
| 8 | Radiated Spurious emission test | ±3.1dB (9kHz-30MHz) |
| | | ±3.8039dB (30MHz-200MHz) |
| | | ±3.9679dB (200MHz-1GHz) |
| | | ±4.29dB (1GHz-18GHz) |
| | | ±3.30dB (18GHz-40GHz) |
| 9 | Temperature test | ±1°C |
| 10 | Humidity test | ±3% |
| 11 | Time | ±3% |

# 5 General Information

## 5.1 General Description of EUT

| | |
|---|---|
| Product Name: | Wireless E-Stop Pro |
| Model No.: | WESP 1003 |
| Test sample(s) ID: | GTS2025090138-1 |
| Sample(s) Status: | Engineer sample |
| S/N: | DEVHW00004 |
| Operation Frequency: | 2402MHz~2480MHz |
| Channel Numbers: | 40 |
| Channel Separation: | 2MHz |
| Modulation Type: | GFSK |
| Data Rate: | LE 1M PHY: 1 Mb/s |
| Antenna Type: | Whip Antenna |
| Antenna Gain: | 2.6dBi |
| Power Supply: | Adapter<br>Input: AC 110-240V, 50/60Hz, 1.5A<br>Output: DC 5V, 2.1A<br>Or<br>DC 4.20V, 4000mAh for Li-ion battery |

Disclaimer statement:
1. Antenna gain information provided by the customer, and the laboratory is not responsible for its authenticity.
2. The information in this section is provided by the applicant or manufacturer, GTS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

| Operation Frequency each of channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 1 | 2402 MHz | 11 | 2422 MHz | 21 | 2442 MHz | 31 | 2462 MHz |
| 2 | 2404 MHz | 12 | 2424 MHz | 22 | 2444 MHz | 32 | 2464 MHz |
| 3 | 2406 MHz | 13 | 2426 MHz | 23 | 2446 MHz | 33 | 2466 MHz |
| 4 | 2408 MHz | 14 | 2428 MHz | 24 | 2448 MHz | 34 | 2468 MHz |
| 5 | 2410 MHz | 15 | 2430 MHz | 25 | 2450 MHz | 35 | 2470 MHz |
| 6 | 2412 MHz | 16 | 2432 MHz | 26 | 2452 MHz | 36 | 2472 MHz |
| 7 | 2414 MHz | 17 | 2434 MHz | 27 | 2454 MHz | 37 | 2474 MHz |
| 8 | 2416 MHz | 18 | 2436 MHz | 28 | 2456 MHz | 38 | 2476 MHz |
| 9 | 2418 MHz | 19 | 2438 MHz | 29 | 2458 MHz | 39 | 2478 MHz |
| 10 | 2420 MHz | 20 | 2440 MHz | 30 | 2460 MHz | 40 | 2480 MHz |

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Channel | Frequency |
|---|---|
| The lowest channel | 2402MHz |
| The middle channel | 2440MHz |
| The Highest channel | 2480MHz |

## 5.2 Test mode

| | |
|---|---|
| Transmitting mode | Keep the EUT in continuously transmitting mode. |

## 5.3 Description of Support Units

None.

## 5.4 Deviation from Standards

None.

## 5.5 Abnormalities from Standard Conditions

None.

## 5.6 Test Facility

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

● **FCC—Registration No.: 381383**

Designation Number: CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

● **ISED—Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

## 5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

## 5.8 Additional Instructions

| | |
|---|---|
| Test Software | Putty |
| Power level setup | Default |

# 6 Test Instruments list

| Radiated Emission: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.2(L)*6.2(W)* 6.4(H) | GTS250 | Apr. 11, 2025 | Apr. 10, 2026 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS251 | N/A | N/A |
| 3 | EMI Test Receiver | Rohde & Schwarz | ESU26 | GTS203 | Apr. 12, 2025 | Apr. 11, 2026 |
| 4 | BiConiLog Antenna | SCHWARZBECK MESS-ELEKTRONIK | VULB9168 | GTS640 | Apr. 12, 2025 | Apr. 11, 2026 |
| 5 | Double -ridged waveguide horn | SCHWARZBECK MESS-ELEKTRONIK | BBHA 9120 D | GTS208 | Apr. 11, 2025 | Apr. 10, 2026 |
| 6 | Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | GTS575 | Jul. 01, 2025 | Jun. 30, 2026 |
| 7 | Loop Antenna | ZHINAN | ZN30900A | GTS534 | Nov.16, 2024 | Nov.15, 2025 |
| 8 | Broadband Preamplifier | SCHWARZBECK | BBV9718 | GTS535 | Apr. 11, 2025 | Apr. 10, 2026 |
| 9 | Amplifier(1GHz-26.5GHz) | HP | 8449B | GTS601 | Apr. 11, 2025 | Apr. 10, 2026 |
| 10 | Horn Antenna (18GH-40GHz) | Schwarzbeck | BBHA 9170 | GTS691 | Apr. 11, 2025 | Apr. 10, 2026 |
| 11 | FSV·Signal Analyzer (10Hz-40GHz) | Keysight | FSV-40-N | GTS666 | Mar. 11, 2025 | Mar. 10, 2026 |
| 12 | Amplifier | / | LNA-1000-30S | GTS650 | Apr. 11, 2025 | Apr. 10, 2026 |
| 13 | CDNE M2+M3-16A | HCT | 30MHz-300MHz | GTS692 | Nov. 13, 2024 | Nov. 12, 2025 |
| 14 | Wideband Amplifier | / | WDA-01004000-15P35 | GTS602 | Apr. 11, 2025 | Apr. 10, 2026 |
| 15 | Thermo meter | JINCHUANG | GSP-8A | GTS643 | Apr. 15, 2025 | Apr. 14, 2026 |
| 16 | RE cable 1 | GTS | N/A | GTS675 | Jul. 11, 2025 | Jul. 10, 2026 |
| 17 | RE cable 2 | GTS | N/A | GTS676 | Jul. 11, 2025 | Jul. 10, 2026 |
| 18 | RE cable 3 | GTS | N/A | GTS677 | Jul. 11, 2025 | Jul. 10, 2026 |
| 19 | RE cable 4 | GTS | N/A | GTS678 | Jul. 11, 2025 | Jul. 10, 2026 |
| 20 | RE cable 5 | GTS | N/A | GTS679 | Jul. 11, 2025 | Jul. 10, 2026 |
| 21 | RE cable 6 | GTS | N/A | GTS680 | Jul. 11, 2025 | Jul. 10, 2026 |
| 22 | RE cable 7 | GTS | N/A | GTS681 | Jul. 11, 2025 | Jul. 10, 2026 |
| 23 | RE cable 8 | GTS | N/A | GTS682 | Jul. 11, 2025 | Jul. 10, 2026 |
| 24 | EMI Test Software | AUDIX | E3-6.100614a | GTS725 | N/A | N/A |

| Conducted Emission | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | Shielding Room | ZhongYu Electron | 7.3(L)x3.1(W)x2.9(H) | GTS252 | Jul. 12, 2022 | Jul. 11, 2027 |
| 2 | EMI Test Receiver | R&S | ESCI 7 | GTS552 | Apr. 12, 2025 | Apr. 11, 2026 |
| 3 | LISN | ROHDE & SCHWARZ | ENV216 | GTS226 | Apr. 11, 2025 | Apr. 10, 2026 |
| 4 | Coaxial Cable | GTS | N/A | GTS227 | N/A | N/A |
| 5 | Thermo meter | JINCHUANG | GSP-8A | GTS642 | Apr. 15, 2025 | Apr. 14, 2026 |
| 6 | Absorbing clamp | Elektronik-Feinmechanik | MDS21 | GTS229 | Apr. 12, 2025 | Apr. 11, 2026 |
| 7 | ISN | SCHWARZBECK | NTFM 8158 | GTS565 | Apr. 11, 2025 | Apr. 10, 2026 |
| 8 | High voltage probe | SCHWARZBECK | TK9420 | GTS537 | Apr. 11, 2025 | Apr. 10, 2026 |
| 9 | Antenna end assembly | Weinschel | 1870A | GTS560 | Apr. 11, 2025 | Apr. 10, 2026 |
| 10 | EMI Test Software | AUDIX | E3-6.100622 | GTS726 | N/A | N/A |
| 11 | Current probe | CYBERTEK | EM5011 | GTS698 | Jan. 13, 2025 | Jan. 12, 2026 |

| RF Conducted Test: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | MXA Signal Analyzer | Agilent | N9020A | GTS566 | Apr. 11, 2025 | Apr. 10, 2026 |
| 2 | EMI Test Receiver | R&S | ESCI 7 | GTS552 | Apr. 12, 2025 | Apr. 11, 2026 |
| 3 | PSA Series Spectrum Analyzer | Agilent | E4440A | GTS536 | Apr. 11, 2025 | Apr. 10, 2026 |
| 4 | MXG vector Signal Generator | Agilent | N5182A | GTS567 | Apr. 11, 2025 | Apr. 10, 2026 |
| 5 | ESG Analog Signal Generator | Agilent | E4428C | GTS568 | Apr. 11, 2025 | Apr. 10, 2026 |
| 6 | Wideband Power Meter | Keysighte | N1924A | GTS673 | Apr. 11, 2025 | Apr. 10, 2026 |
| 7 | USB RF Power Sensor | DARE | RPR3006W | GTS569 | Apr. 11, 2025 | Apr. 10, 2026 |
| 8 | RF Switch Box | Shongyi | RFSW3003328 | GTS571 | Apr. 11, 2025 | Apr. 10, 2026 |
| 9 | Programmable Constant Temp & Humi Test Chamber | WEWON | WHTH-150L-40-880 | GTS572 | Apr. 11, 2025 | Apr. 10, 2026 |
| 10 | Thermo meter | JINCHUANG | GSP-8A | GTS641 | Apr. 15, 2025 | Apr. 14, 2026 |
| 11 | EXA Signal Analyzer | Keysight | N9010B | MY60241168 | Nov. 02, 2024 | Nov. 01, 2025 |

| General used equipment: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | Barometer | KUMAO | SF132 | GTS647 | Jul. 16, 2025 | Jul. 15, 2026 |

# 7 Test results and Measurement Data

## 7.1 Antenna requirement

| Standard requirement: | FCC Part15 C Section 15.203 /247(c) |
|---|---|
| **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.<br>**15.247(c) (1)(i) requirement:**<br>(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi. | |
| **E.U.T Antenna:** | |
| The antenna is Whip Antenna, reference to the appendix II for details | |

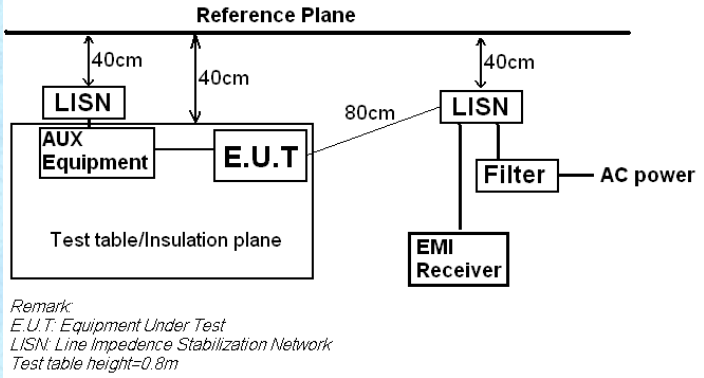
## 7.2 Conducted Emissions

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.207 |
| Test Method: | ANSI C63.10:2020 |
| Test Frequency Range: | 150KHz to 30MHz |
| Receiver setup: | RBW=9KHz, VBW=30KHz, Sweep time=auto |
| Limit: | |

| Frequency range (MHz) | Limit (dBuV) | |
|---|---|---|
| | 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.

Test setup:




Test procedure:

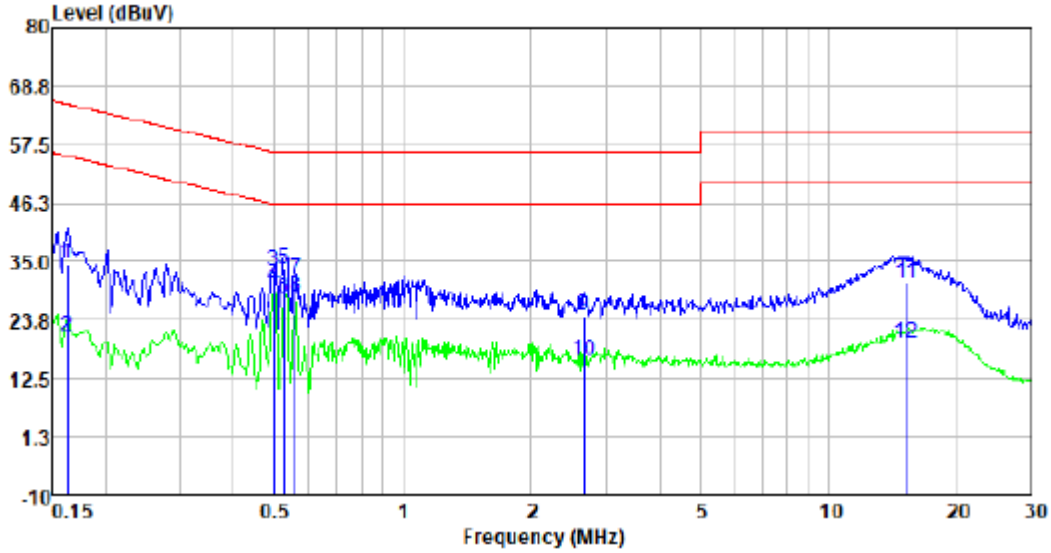
1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2020 on conducted measurement.

| | | | | | | |
|---|---|---|---|---|---|---|
| Test Instruments: | Refer to section 6.0 for details | | | | | |
| Test mode: | Refer to section 5.2 for details | | | | | |
| Test environment: | Temp.: | 25 °C | Humid.: | 52% | Press.: | 1012mbar |
| Test voltage: | AC 120V, 60Hz | | | | | |
| Test results: | Pass | | | | | |

**Measurement data**

Pre-scan all test modes, found worst case at 2480MHz, and so only show the test result of 2480MHz,

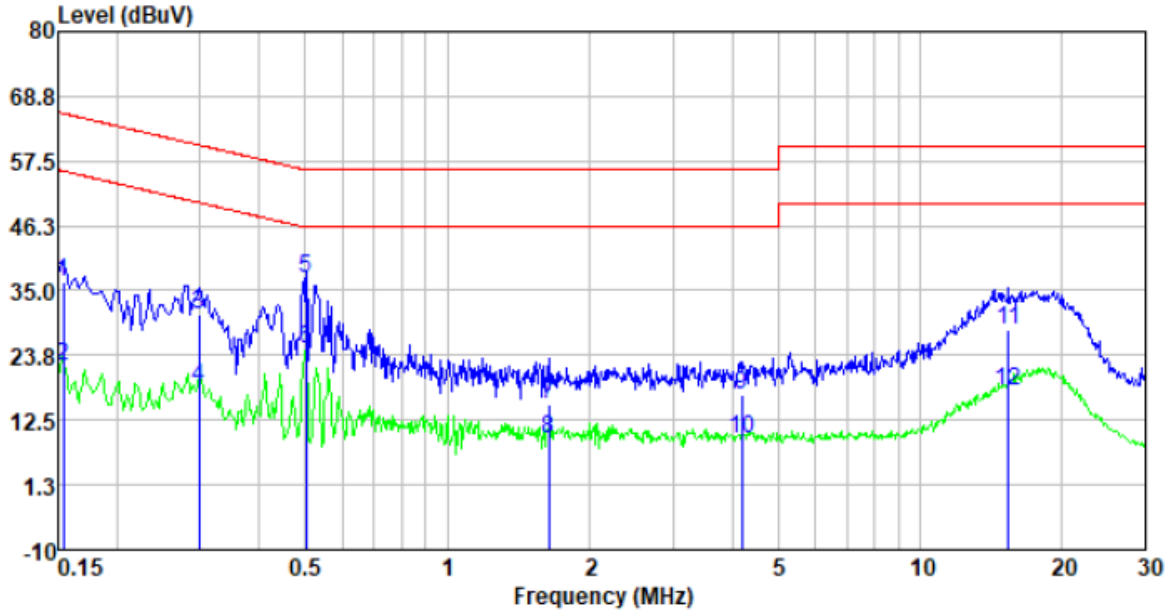
**Line:**




| Freq | Reading level | Correct Factor | Final level | Limit level | Over limit | Remark |
|---|---|---|---|---|---|---|
| MHz | dBuV | dB | dBuV | level | dBuV | |
| 0.16 | 14.84 | 19.60 | 34.44 | 65.34 | -30.90 | QP |
| 0.16 | 0.92 | 19.60 | 20.52 | 55.34 | -34.82 | Average |
| 0.50 | 13.56 | 19.60 | 33.16 | 56.05 | -22.89 | QP |
| 0.50 | 10.60 | 19.60 | 30.20 | 46.05 | -15.85 | Average |
| 0.53 | 13.96 | 19.60 | 33.56 | 56.00 | -22.44 | QP |
| 0.53 | 8.30 | 19.60 | 27.90 | 46.00 | -18.10 | Average |
| 0.56 | 11.95 | 19.60 | 31.55 | 56.00 | -24.45 | QP |
| 0.56 | 8.70 | 19.60 | 28.30 | 46.00 | -17.70 | Average |
| 2.66 | 4.84 | 19.66 | 24.50 | 56.00 | -31.50 | QP |
| 2.66 | -3.79 | 19.66 | 15.87 | 46.00 | -30.13 | Average |
| 15.23 | 11.20 | 19.81 | 31.01 | 60.00 | -28.99 | QP |
| 15.23 | -0.64 | 19.81 | 19.17 | 50.00 | -30.83 | Average |

Note:Correct Factor (dB)=ISN Factor (dB) + Cable Loss (dB)
Final level (dBuV)=Reading level (dBuV) + Correct Factor (dB)

**Neutral:**



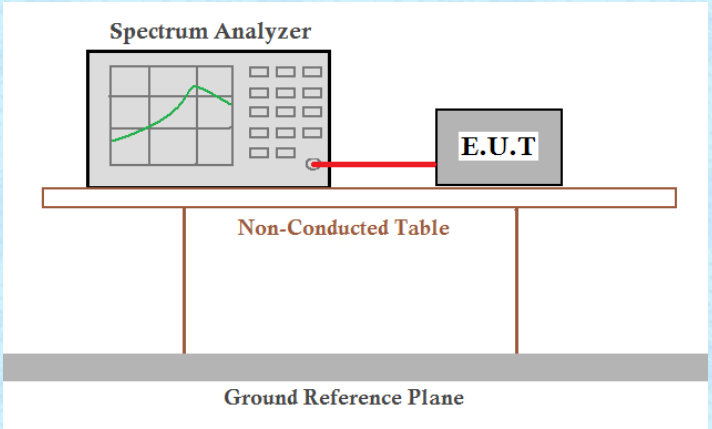

| Freq | Reading level | Correct Factor | Final level | Limit level | Over limit | Remark |
|---|---|---|---|---|---|---|
| MHz | dBuV | dB | dBuV | level | dBuV | |
| 0.15 | 16.90 | 19.60 | 36.50 | 65.78 | -29.28 | QP |
| 0.15 | 2.37 | 19.60 | 21.97 | 55.78 | -33.81 | Average |
| 0.30 | 11.24 | 19.60 | 30.84 | 60.28 | -29.44 | QP |
| 0.30 | -1.36 | 19.60 | 18.24 | 50.28 | -32.04 | Average |
| 0.50 | 17.60 | 19.60 | 37.20 | 56.00 | -18.80 | QP |
| 0.50 | 5.12 | 19.60 | 24.72 | 46.00 | -21.28 | Average |
| 1.64 | -4.54 | 19.65 | 15.11 | 56.00 | -40.89 | QP |
| 1.64 | -10.28 | 19.65 | 9.37 | 46.00 | -36.63 | Average |
| 4.20 | -2.85 | 19.68 | 16.83 | 56.00 | -39.17 | QP |
| 4.20 | -10.53 | 19.68 | 9.15 | 46.00 | -36.85 | Average |
| 15.39 | 8.29 | 19.83 | 28.12 | 60.00 | -31.88 | QP |
| 15.39 | -2.37 | 19.83 | 17.46 | 50.00 | -32.54 | Average |

Note:Correct Factor (dB)=ISN Factor (dB) + Cable Loss (dB)
Final level (dBuV)=Reading level (dBuV) + Correct Factor (dB)

*Notes:*

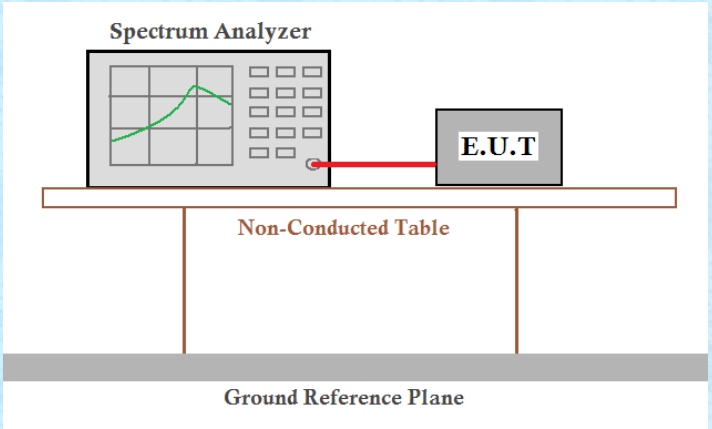
1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

## 7.3 Conducted Output Power

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (b)(3) |
| Test Method: | ANSI C63.10:2020 and KDB558074 D01 15.247 Meas Guidance v05r02 |
| Limit: | 30dBm |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

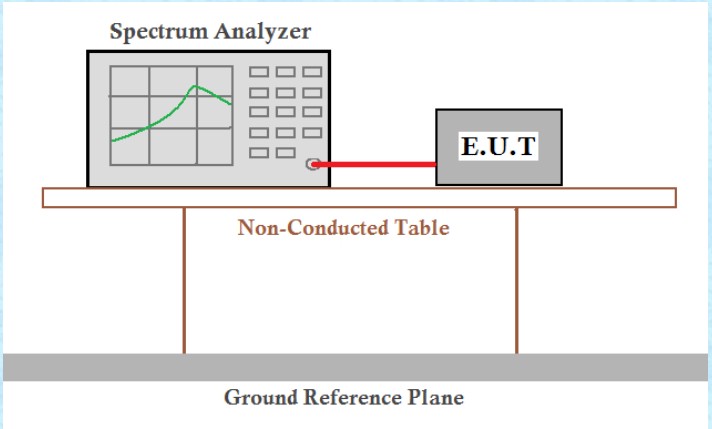
**Measurement Data:** The detailed test data see Appendix for BLE.

## 7.4 Channel Bandwidth

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(2) |
| Test Method: | ANSI C63.10:2020 and KDB558074 D01 15.247 Meas Guidance v05r02 |
| Limit: | >500KHz |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data:** The detailed test data see Appendix for BLE.

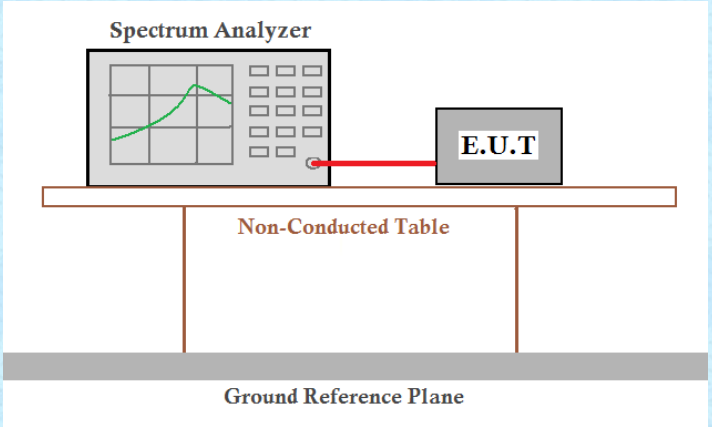
## 7.5 Power Spectral Density

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (e) |
| Test Method: | ANSI C63.10:2020 and KDB558074 D01 15.247 Meas Guidance v05r02 |
| Limit: | 8dBm/3kHz |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data:** The detailed test data see Appendix for BLE.

## 7.6 Spurious Emission in Non-restricted & restricted Bands

### 7.6.1 Conducted Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (d) |
| Test Method: | ANSI C63.10:2020 and KDB558074 D01 15.247 Meas Guidance v05r02 |
| Limit: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data:** The detailed test data see Appendix for BLE.

### 7.6.2 Radiated Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.209 |
| Test Method: | ANSI C63.10:2020 |
| Test Frequency Range: | 9kHz to 25GHz |
| Test site: | Measurement Distance: 3m |
| Receiver setup: | |

| Frequency | Detector | RBW | VBW | Value |
|---|---|---|---|---|
| 9KHz-150KHz | Quasi-peak | 200Hz | 600Hz | Quasi-peak |
| 150KHz-30MHz | Quasi-peak | 9KHz | 30KHz | Quasi-peak |
| 30MHz-1GHz | Quasi-peak | 120KHz | 300KHz | Quasi-peak |
| Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| | Peak | 1MHz | 10Hz | Average |

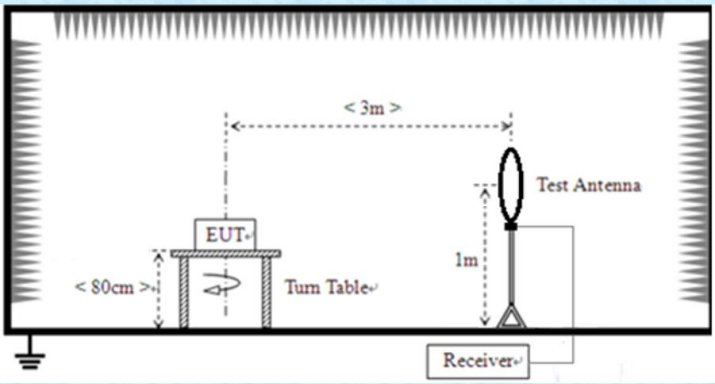
Note: For Duty cycle ⩾ 98%, average detector set as above For Duty cycle < 98%, average detector set as below: VBW ⩾ 1 / T

Limit:

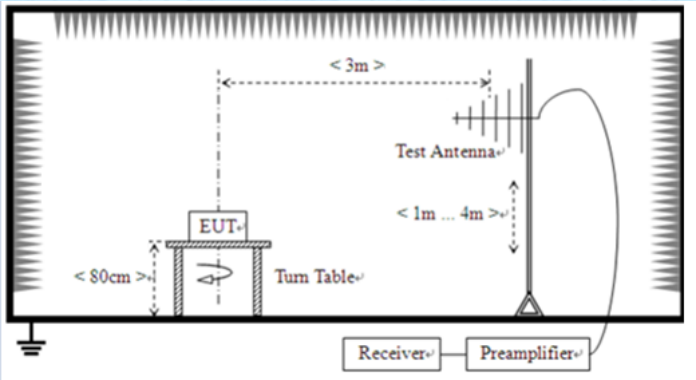
| Frequency | Limit (uV/m) | Value | Measurement Distance |
|---|---|---|---|
| 0.009MHz-0.490MHz | 2400/F(KHz) | QP/PK/AV | 300m |
| 0.490MHz-1.705MHz | 24000/F(KHz) | QP | 30m |
| 1.705MHz-30MHz | 30 | QP | 30m |
| 30MHz-88MHz | 100 | QP | 3m |
| 88MHz-216MHz | 150 | QP | |
| 216MHz-960MHz | 200 | QP | |
| 960MHz-1GHz | 500 | QP | |
| Above 1GHz | 500 | Average | |
| | 5000 | Peak | |

Test setup:

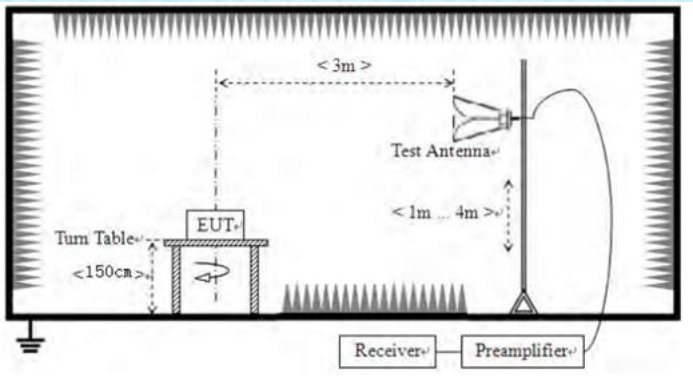
For radiated emissions from 9kHz to 30MHz



For radiated emissions from 30MHz to1GHz




For radiated emissions above 1GHz




| | | | | | | |
|---|---|---|---|---|---|---|
| Test Procedure: | 1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>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.<br>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.<br>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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.<br>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.<br>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. | | | | | |
| Test Instruments: | Refer to section 6.0 for details | | | | | |
| Test mode: | Refer to section 5.2 for details | | | | | |
| Test environment: | Temp.: | 25 °C | Humid.: | 52% | Press.: | 1012mbar |
| Test voltage: | DC 4.2V | | | | | |

| Test results: | Pass |
|---|---|

**Measurement data:**

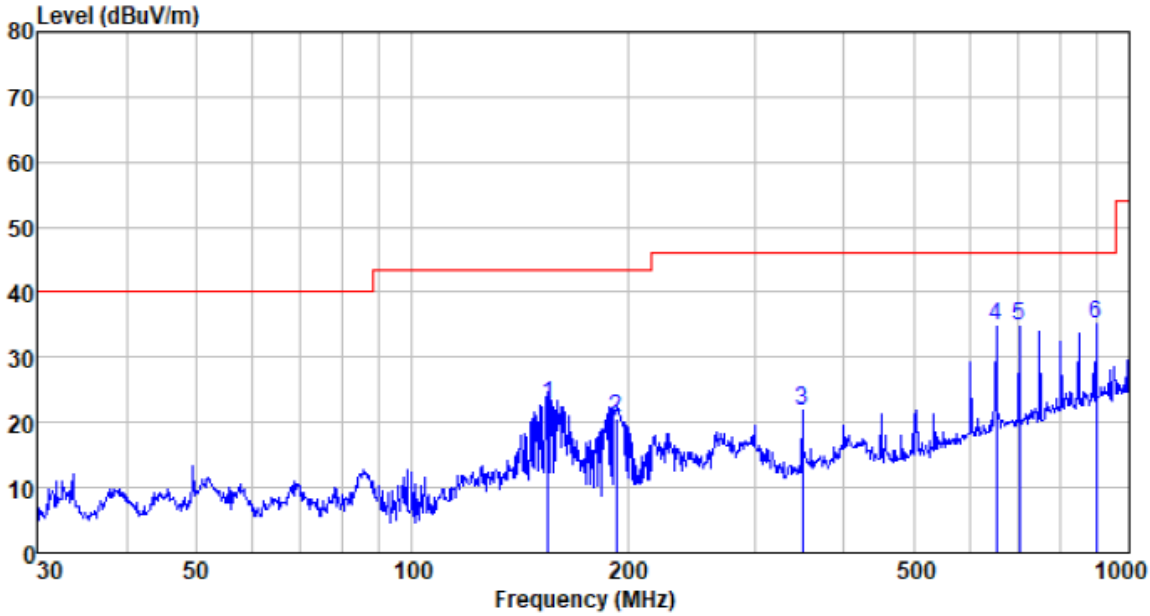
*Remark:*
*Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

■ **9kHz~30MHz**

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

■ **Below 1GHz**

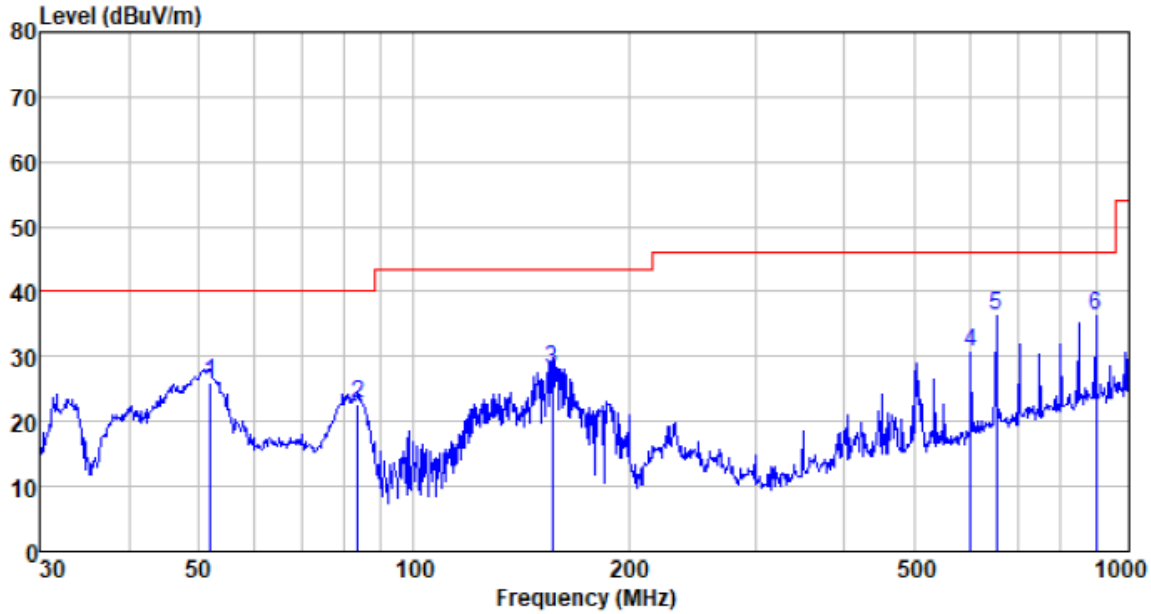
Pre-scan all test modes, found worst case at 2480MHz, and so only show the test result of 2480MHz,
**Horizontal:**




| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | Final level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 154.821 | 38.94 | 14.90 | 2.48 | 33.47 | 22.85 | 43.50 | -20.65 | QP |
| 192.419 | 40.84 | 10.56 | 2.74 | 33.41 | 20.73 | 43.50 | -22.77 | QP |
| 350.477 | 37.42 | 13.71 | 3.87 | 33.11 | 21.89 | 46.00 | -24.11 | QP |
| 651.942 | 41.97 | 20.00 | 5.32 | 32.50 | 34.79 | 46.00 | -11.21 | QP |
| 701.761 | 41.18 | 20.54 | 5.53 | 32.40 | 34.85 | 46.00 | -11.15 | QP |
| 900.147 | 37.59 | 23.00 | 6.21 | 31.62 | 35.18 | 46.00 | -10.82 | QP |

Remarks:
Final level(dBuV/m) = Reading level(dBuV) + Antenna factor(dB/m) + Cable loss(dB) - Preamp Factor(dB)

**Vertical:**




| Freq MHz | Reading level dBuV | Antenna factor dB/m | Cable loss dB | Preamp factor dB | Final level dBuV/m | Limit level dBuV/m | Over limit dB | Remark |
|---|---|---|---|---|---|---|---|---|
| 52.025 | 45.33 | 12.70 | 1.49 | 33.51 | 26.01 | 40.00 | -13.99 | QP |
| 83.522 | 44.90 | 9.50 | 1.76 | 33.57 | 22.59 | 40.00 | -17.41 | QP |
| 156.458 | 44.11 | 14.80 | 2.50 | 33.47 | 27.94 | 43.50 | -15.56 | QP |
| 601.427 | 39.22 | 19.03 | 5.09 | 32.62 | 30.72 | 46.00 | -15.28 | QP |
| 651.942 | 43.49 | 20.00 | 5.32 | 32.50 | 36.31 | 46.00 | -9.69 | QP |
| 900.147 | 38.80 | 23.00 | 6.21 | 31.62 | 36.39 | 46.00 | -9.61 | QP |

Remarks:
Final level(dBuV/m) = Reading level(dBuV) + Antenna factor(dB/m) + Cable loss(dB) - Preamp Factor(dB)

- **Above 1GHz**
- **Unwanted Emissions in Non-restricted Frequency Bands**

| Test channel: | Lowest channel |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4804.00 | 36.44 | 31.06 | 16.91 | 38.36 | 46.05 | 74.00 | -27.95 | Vertical |
| 7206.00 | 30.92 | 35.91 | 23.33 | 38.96 | 51.20 | 74.00 | -22.80 | Vertical |
| 9608.00 | 31.22 | 37.91 | 30.16 | 39.68 | 59.61 | 74.00 | -14.39 | Vertical |
| 4804.00 | 40.75 | 31.06 | 16.91 | 38.36 | 50.36 | 74.00 | -23.64 | Horizontal |
| 7206.00 | 32.91 | 35.91 | 23.33 | 38.96 | 53.19 | 74.00 | -20.81 | Horizontal |
| 9608.00 | 29.93 | 37.91 | 30.16 | 39.68 | 58.32 | 74.00 | -15.68 | Horizontal |

**Average value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4804.00 | 24.99 | 31.06 | 16.91 | 38.36 | 34.60 | 54.00 | -19.40 | Vertical |
| 7206.00 | 19.80 | 35.91 | 23.33 | 38.96 | 40.08 | 54.00 | -13.92 | Vertical |
| 9608.00 | 19.19 | 37.91 | 30.16 | 39.68 | 47.58 | 54.00 | -6.42 | Vertical |
| 4804.00 | 29.36 | 31.06 | 16.91 | 38.36 | 38.97 | 54.00 | -15.03 | Horizontal |
| 7206.00 | 21.97 | 35.91 | 23.33 | 38.96 | 42.25 | 54.00 | -11.75 | Horizontal |
| 9608.00 | 19.12 | 37.91 | 30.16 | 39.68 | 47.51 | 54.00 | -6.49 | Horizontal |

| Test channel: | Middle channel |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4880.00 | 36.60 | 31.28 | 17.16 | 38.38 | 46.66 | 74.00 | -27.34 | Vertical |
| 7320.00 | 31.02 | 36.16 | 24.06 | 39.00 | 52.24 | 74.00 | -21.76 | Vertical |
| 9760.00 | 31.32 | 38.06 | 30.51 | 39.72 | 60.17 | 74.00 | -13.83 | Vertical |
| 4880.00 | 40.94 | 31.28 | 17.16 | 38.38 | 51.00 | 74.00 | -23.00 | Horizontal |
| 7320.00 | 33.03 | 36.16 | 24.06 | 39.00 | 54.25 | 74.00 | -19.75 | Horizontal |
| 9760.00 | 30.04 | 38.06 | 30.51 | 39.72 | 58.89 | 74.00 | -15.11 | Horizontal |

**Average value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4880.00 | 25.12 | 31.28 | 17.16 | 38.38 | 35.18 | 54.00 | -18.82 | Vertical |
| 7320.00 | 19.89 | 36.16 | 24.06 | 39.00 | 41.11 | 54.00 | -12.89 | Vertical |
| 9760.00 | 19.27 | 38.06 | 30.51 | 39.72 | 48.12 | 54.00 | -5.88 | Vertical |
| 4880.00 | 29.51 | 31.28 | 17.16 | 38.38 | 39.57 | 54.00 | -14.43 | Horizontal |
| 7320.00 | 22.07 | 36.16 | 24.06 | 39.00 | 43.29 | 54.00 | -10.71 | Horizontal |
| 9760.00 | 19.22 | 38.06 | 30.51 | 39.72 | 48.07 | 54.00 | -5.93 | Horizontal |

| Test channel: | Highest channel |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4960.00 | 36.59 | 31.52 | 17.43 | 38.54 | 47.00 | 74.00 | -27.00 | Vertical |
| 7440.00 | 31.02 | 36.34 | 24.43 | 39.23 | 52.56 | 74.00 | -21.44 | Vertical |
| 9920.00 | 31.31 | 38.32 | 30.75 | 39.96 | 60.42 | 74.00 | -13.58 | Vertical |
| 4960.00 | 40.93 | 31.52 | 17.43 | 38.54 | 51.34 | 74.00 | -22.66 | Horizontal |
| 7440.00 | 33.02 | 36.34 | 24.43 | 39.23 | 54.56 | 74.00 | -19.44 | Horizontal |
| 9920.00 | 30.03 | 38.32 | 30.75 | 39.96 | 59.14 | 74.00 | -14.86 | Horizontal |

**Average value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 4960.00 | 25.15 | 31.52 | 17.43 | 38.54 | 35.56 | 54.00 | -18.44 | Vertical |
| 7440.00 | 19.91 | 36.34 | 24.43 | 39.23 | 41.45 | 54.00 | -12.55 | Vertical |
| 9920.00 | 19.28 | 38.32 | 30.75 | 39.96 | 48.39 | 54.00 | -5.61 | Vertical |
| 4960.00 | 29.54 | 31.52 | 17.43 | 38.54 | 39.95 | 54.00 | -14.05 | Horizontal |
| 7440.00 | 22.09 | 36.34 | 24.43 | 39.23 | 43.63 | 54.00 | -10.37 | Horizontal |
| 9920.00 | 19.23 | 38.32 | 30.75 | 39.96 | 48.34 | 54.00 | -5.66 | Horizontal |

*Remarks:*

1. *Final Level (dBuV/m) = Reading level (dBuV)+ Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Factor (dB)*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

■ **Unwanted Emissions in Restricted Frequency Bands**

| Test channel: | Lowest channel |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2310.00 | 44.89 | 27.17 | 4.60 | 38.52 | 38.14 | 74.00 | -35.86 | Horizontal |
| 2390.00 | 48.19 | 27.27 | 4.65 | 38.56 | 41.55 | 74.00 | -32.45 | Horizontal |
| 2310.00 | 44.95 | 27.17 | 4.60 | 38.52 | 38.20 | 74.00 | -35.80 | Vertical |
| 2390.00 | 49.54 | 27.27 | 4.65 | 38.56 | 42.90 | 74.00 | -31.10 | Vertical |

**Average value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2310.00 | 34.68 | 27.17 | 4.60 | 38.52 | 27.93 | 54.00 | -26.07 | Horizontal |
| 2390.00 | 36.17 | 27.27 | 4.65 | 38.56 | 29.53 | 54.00 | -24.47 | Horizontal |
| 2310.00 | 34.73 | 27.17 | 4.60 | 38.52 | 27.98 | 54.00 | -26.02 | Vertical |
| 2390.00 | 36.65 | 27.27 | 4.65 | 38.56 | 30.01 | 54.00 | -23.99 | Vertical |

| Test channel: | Highest channel |
|---|---|

**Peak value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 46.83 | 27.38 | 4.52 | 38.59 | 40.14 | 74.00 | -33.86 | Horizontal |
| 2500.00 | 45.78 | 27.40 | 4.49 | 38.60 | 39.07 | 74.00 | -34.93 | Horizontal |
| 2483.50 | 47.88 | 27.38 | 4.52 | 38.59 | 41.19 | 74.00 | -32.81 | Vertical |
| 2500.00 | 46.89 | 27.40 | 4.49 | 38.60 | 40.18 | 74.00 | -33.82 | Vertical |

**Average value:**

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 35.63 | 27.38 | 4.52 | 38.59 | 28.94 | 54.00 | -25.06 | Horizontal |
| 2500.00 | 35.61 | 27.40 | 4.49 | 38.60 | 28.90 | 54.00 | -25.10 | Horizontal |
| 2483.50 | 36.49 | 27.38 | 4.52 | 38.59 | 29.80 | 54.00 | -24.20 | Vertical |
| 2500.00 | 35.68 | 27.40 | 4.49 | 38.60 | 28.97 | 54.00 | -25.03 | Vertical |

*Remarks:*

1. *Final Level (dBuV/m) = Reading level (dBuV)+ Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Factor (dB)*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

# 8 Test Setup Photo

Reference to the **appendix I** for details.

# 9 EUT Constructional Details

Reference to the **appendix II** for details.

------End------