

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640 Fax: +86-755-26648637

Website: www.cqa-cert.com Report Template Revision Date: 2021-11-03

Report Template Version: V05

Test Report

Report No.: CQASZ20241002132E-02

Applicant: Shenzhen DO Intelligent Technology Co., Ltd

Address of Applicant: 11th Floor, 3# Building, Guole Tech Park, Lirong Road, Dalang, Longhua

District, Shenzhen, China

Equipment Under Test (EUT):

Product: Smart Watch

Model No.: DR05, DR03, DR06

Test Model No.: DR05
Brand Name: IDO

FCC ID: 2AHFT863

Standards: 47 CFR Part 15, Subpart C

KDB558074 D01 15.247 Meas Guidance v05r02

ANSI C63.10:2013

Date of Receipt: 2024-10-10

Date of Test: 2024-10-10 to 2024-10-21

Date of Issue: 2025-1-15
Test Result: PASS*

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

Tested By:

(Lewis Zhou)

Reviewed By:

(Timo Lei)

Approved By:

(Jack Ai)





Report No.: CQASZ20241002132E-02

1 Version

Revision History Of Report

| Report No. | Version | Description | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20241002132E-02 | Rev.01 | Initial report | 2025-1-15 |





2 Test Summary

| Test Item | Test Requirement | Test method | Result |
|---|--|------------------|--------|
| Antenna Requirement | 47 CFR Part 15, Subpart C Section 15.203/15.247 (c) | ANSI C63.10 2013 | PASS |
| AC Power Line Conducted Emission | 47 CFR Part 15, Subpart C Section 15.207 | ANSI C63.10 2013 | PASS |
| Conducted Peak Output Power | 47 CFR Part 15, Subpart C Section 15.247 (b)(3) | ANSI C63.10 2013 | PASS |
| 6dB Occupied Bandwidth | 47 CFR Part 15, Subpart C Section 15.247 (a)(2) | ANSI C63.10 2013 | PASS |
| Power Spectral Density | 47 CFR Part 15, Subpart C Section 15.247 (e) | ANSI C63.10 2013 | PASS |
| Band-edge for RF Conducted Emissions | 47 CFR Part 15, Subpart C Section 15.247(d) | ANSI C63.10 2013 | PASS |
| RF Conducted Spurious Emissions | 47 CFR Part 15, Subpart C Section 15.247(d) | ANSI C63.10 2013 | PASS |
| Radiated Spurious Emissions | 47 CFR Part 15, Subpart C Section 15.205/15.209 | ANSI C63.10 2013 | PASS |
| Restricted bands around fundamental frequency (Radiated Emission) | 47 CFR Part 15, Subpart C Section 15.205/15.209 | ANSI C63.10 2013 | PASS |



3 Contents

| | Page |
|---|--|
| 1 VERSION | 2 |
| 2 TEST SUMMARY | 3 |
| 3 CONTENTS | 4 |
| 4 GENERAL INFORMATION | |
| 4.1 CLIENT INFORMATION. 4.2 GENERAL DESCRIPTION OF EUT. 4.3 ADDITIONAL INSTRUCTIONS. 4.4 TEST ENVIRONMENT. 4.5 DESCRIPTION OF SUPPORT UNITS. 4.6 STATEMENT OF THE MEASUREMENT UNCERTAINTY. 4.7 TEST LOCATION. 4.8 TEST FACILITY. 4.9 DEVIATION FROM STANDARDS. 4.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER. 4.11 EQUIPMENT LIST. | 55 57 88 88 99 10 10 10 10 |
| 5 TEST RESULTS AND MEASUREMENT DATA | 12 |
| 5.1 Antenna Requirement 5.2 Conducted Emissions 5.3 Conducted Peak Output Power 5.4 6db Occupy Bandwidth 5.5 Power Spectral Density 5.6 Band-edge for RF Conducted Emissions 5.7 Spurious RF Conducted Emissions 5.8 Radiated Spurious Emission & Restricted Bands 5.8.1 Spurious Emissions | 20 24 28 32 35 44 |
| 6 PHOTOGRAPHS - EUT TEST SETUP | 55 |
| 6.1 RADIATED SPURIOUS EMISSION | |
| 7 PHOTOGRAPHS - FUT CONSTRUCTIONAL DETAILS | 57 |



4 General Information

4.1 Client Information

| Applicant: | Shenzhen DO Intelligent Technology Co., Ltd |
|--------------------------|--|
| Address of Applicant: | 11th Floor, 3# Building, Guole Tech Park, Lirong Road, Dalang, Longhua District, Shenzhen, China |
| Manufacturer: | Shenzhen DO Intelligent Technology Co., Ltd |
| Address of Manufacturer: | 11th Floor, 3# Building, Guole Tech Park, Lirong Road, Dalang, Longhua District, Shenzhen, China |
| Factory: | Shenzhen DO Intelligent Technology Co., Ltd |
| Address of Factory: | 11th Floor, 3# Building, Guole Tech Park, Lirong Road, Dalang, Longhua District, Shenzhen, China |

4.2 General Description of EUT

| Product Name: | Smart Watch |
|---------------------------|--|
| Model No.: | DR05, DR03, DR06 |
| Test Model No.: | DR05 |
| Trade Mark: | IDO |
| Software Version: | V1.00.05 |
| Hardware Version: | V1.2 |
| Operation Frequency: | 2402MHz~2480MHz |
| Bluetooth Version: | V5.3 |
| Modulation Type: | GFSK |
| Transfer Rate: | 1Mbps, 2Mbps |
| Number of Channel: | 40 |
| Product Type: | ☐ Mobile ☐ Portable |
| Test Software of EUT: | SiFli_RF_Tool v1.1.6 |
| Antenna Type: | DR05/DR06:Metal center frame antenna DR03:FPC antenna |
| Antenna Gain: | DR05/DR06:-0.96dBi DR03:-2.52dBi |
| EUT Power Supply: | Li-ion battery: DC 3.8V 290mAh, Charge by DC 5V for adapter |
| Simultaneous Transmission | ☐ Simultaneous TX is supported and evaluated in this report. |
| | ⊠ Simultaneous TX is not supported. |



Report No.: CQASZ20241002132E-02

| Operation Frequency each of channel | | | | | | | |
|-------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 0 | 2402MHz | 10 | 2422MHz | 20 | 2442MHz | 30 | 2462MHz |
| 1 | 2404MHz | 11 | 2424MHz | 21 | 2444MHz | 31 | 2464MHz |
| 2 | 2406MHz | 12 | 2426MHz | 22 | 2446MHz | 32 | 2466MHz |
| 3 | 2408MHz | 13 | 2428MHz | 23 | 2448MHz | 33 | 2468MHz |
| 4 | 2410MHz | 14 | 2430MHz | 24 | 2450MHz | 34 | 2470MHz |
| 5 | 2412MHz | 15 | 2432MHz | 25 | 2452MHz | 35 | 2472MHz |
| 6 | 2414MHz | 16 | 2434MHz | 26 | 2454MHz | 36 | 2474MHz |
| 7 | 2416MHz | 17 | 2436MHz | 27 | 2456MHz | 37 | 2476MHz |
| 8 | 2418MHz | 18 | 2438MHz | 28 | 2458MHz | 38 | 2478MHz |
| 9 | 2420MHz | 19 | 2440MHz | 29 | 2460MHz | 39 | 2480MHz |

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 (CH0) | 2402MHz |
| The middle channel (CH19) | 2440MHz |
| The highest channel (CH39) | 2480MHz |

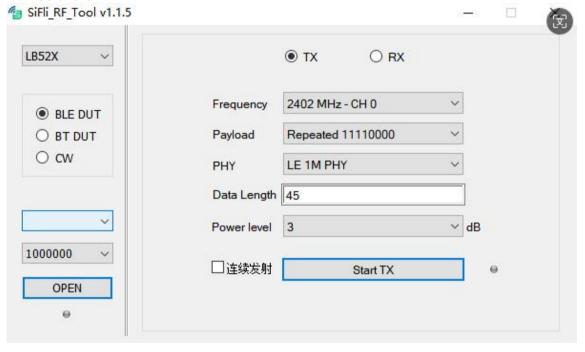


Report No.: CQASZ20241002132E-02

4.3 Additional Instructions

| EUT Test Software Settings: | | | | | | |
|-----------------------------|---|--|--|--|--|--|
| Mode: | ⊠ Special software is used. | ⊠ Special software is used. | | | | |
| | | ☐ Through engineering command into the engineering mode. | | | | |
| | engineering command: *#*#3646633 | 3#*#* | | | | |
| EUT Power level: | Class2 (Power level is built-in set pa selected) | Class2 (Power level is built-in set parameters and cannot be changed and selected) | | | | |
| | lowest frequency, the middle frequency a | nd the highest frequency keep | | | | |
| transmitting of the EUT. | | | | | | |
| Mode | Channel | Frequency(MHz) | | | | |
| | CH0 | 2402 | | | | |
| GFSK | 2440 | | | | | |
| | CH39 2480 | | | | | |

Run Software:





Report No.: CQASZ20241002132E-02

4.4 Test Environment

| Operating Environment: | Operating Environment: | | | |
|------------------------|---|--|--|--|
| Temperature: | 24.5°C | | | |
| Humidity: | 59% RH | | | |
| Atmospheric Pressure: | 1009mbar | | | |
| Test Mode: | Use test software to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT. | | | |

4.5 Description of Support Units

The EUT has been tested with associated equipment below.

1) Support equipment

| Description | Manufacturer | Model No. | Certification | Supplied by |
|-------------|--------------|--------------|-------------------|-------------|
| Adapter | MI | / | 1 | CQA |
| 2) Cable | | | | |
| Cable No. | Description | Manufacturer | Cable Type/Length | Supplied by |
| , | , | , | , | , |





4.6 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** guality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

| No. | Item | Uncertainty |
|-----|------------------------------------|--------------------|
| 1 | Radiated Emission (Below 1GHz) | 5.12dB |
| 2 | Radiated Emission (Above 1GHz) | 4.60dB |
| 3 | Conducted Disturbance (0.15~30MHz) | 3.34dB |
| 4 | Radio Frequency | 3×10 ⁻⁸ |
| 5 | Duty cycle | 0.6 % |
| 6 | Occupied Bandwidth | 1.1% |
| 7 | RF conducted power | 0.86dB |
| 8 | RF power density | 0.74 |
| 9 | Conducted Spurious emissions | 0.86dB |
| 10 | Temperature test | 0.8℃ |
| 11 | Humidity test | 2.0% |
| 12 | Supply voltages | 0.5 % |
| 13 | Frequency Error | 5.5 Hz |



Report No.: CQASZ20241002132E-02

4.7 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.8 Test Facility

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology 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 our files. Registration No.:522263

4.9 Deviation from Standards

None.

4.10 Other Information Requested by the Customer

None.



4.11 Equipment List

| | | | Instrument | Calibration | Calibration |
|---|--------------|----------------------------|------------|-------------|-------------|
| Test Equipment | Manufacturer | Model No. | No. | Date | Due Date |
| EMI Test Receiver | R&S | ESR7 | CQA-005 | 2024/9/2 | 2025/9/1 |
| Spectrum analyzer | R&S | FSU26 | CQA-038 | 2024/9/2 | 2025/9/1 |
| Spectrum analyzer | R&S | FSU40 | CQA-075 | 2024/9/2 | 2025/9/1 |
| Preamplifier | MITEQ | AFS4-00010300-18- 10P-4 | CQA-035 | 2024/9/2 | 2025/9/1 |
| Preamplifier | MITEQ | AMF-6D-02001800- 29-20P | CQA-036 | 2024/9/2 | 2025/9/1 |
| Preamplifier | EMCI | EMC184055SE | CQA-089 | 2024/9/2 | 2025/9/1 |
| Loop antenna | Schwarzbeck | FMZB1516 | CQA-060 | 2023/9/8 | 2026/9/7 |
| Bilog Antenna | R&S | HL562 | CQA-011 | 2023/11/01 | 2026/10/31 |
| Horn Antenna | R&S | HF906 | CQA-012 | 2023/11/01 | 2026/10/31 |
| Horn Antenna | Schwarzbeck | BBHA 9170 | CQA-088 | 2024/9/2 | 2025/9/1 |
| Coaxial Cable (Above 1GHz) | CQA | N/A | C007 | 2024/9/2 | 2025/9/1 |
| Coaxial Cable (Below 1GHz) | CQA | N/A | C013 | 2024/9/2 | 2025/9/1 |
| RF | | | | | |
| cable(9KHz~40GHz) | CQA | RF-01 | CQA-079 | 2024/9/2 | 2025/9/1 |
| Antenna Connector | CQA | RFC-01 | CQA-080 | 2024/9/2 | 2025/9/1 |
| Power Sensor | KEYSIGHT | U2021XA | CQA-30 | 2024/9/2 | 2025/9/1 |
| N1918A Power Analysis Manager Power Panel | Agilent | N1918A | CQA-074 | 2024/9/2 | 2025/9/1 |
| Power meter | R&S | NRVD | CQA-029 | 2024/9/2 | 2025/9/1 |
| Power divider | MIDWEST | PWD-2533-02-SMA- 79 | CQA-067 | 2024/9/2 | 2025/9/1 |
| EMI Test Receiver | R&S | ESR7 | CQA-005 | 2024/9/2 | 2025/9/1 |
| LISN | R&S | ENV216 | CQA-003 | 2024/9/2 | 2025/9/1 |
| Coaxial cable | CQA | N/A | CQA-C009 | 2024/9/2 | 2025/9/1 |
| DC power | KEYSIGHT | E3631A | CQA-028 | 2024/9/2 | 2025/9/1 |

Note:

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





5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203 /247(c)

15.203 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 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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

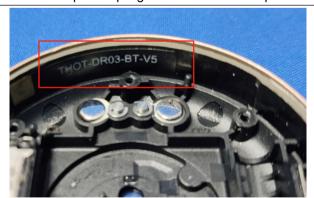
EUT Antenna:



The antenna is Metal center frame antenna.

The connection/connection type between the antenna to the EUT's antenna port is: unique coupling. This is either permanently attachment or a unique coupling that satisfies the requirement.

EUT Antenna:



The antenna is FPC antenna.

The connection/connection type between the antenna to the EUT's antenna port is: unique couplingx. This is either permanently attachment or a unique coupling that satisfies the requirement.



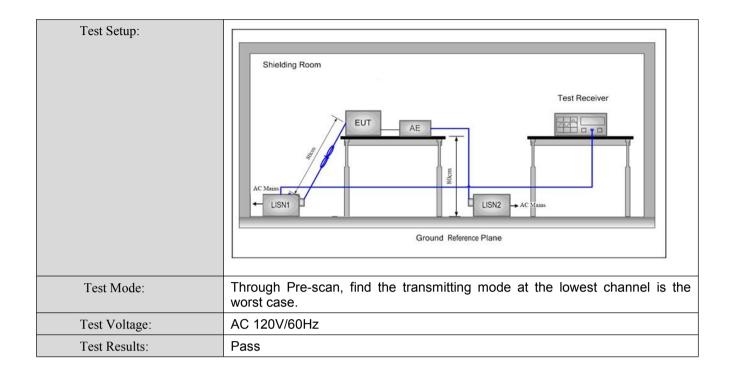


Report No.: CQASZ20241002132E-02

5.2 Conducted Emissions

| Test Requirement: | 47 CFR Part 15C Section 15.207 | | | | |
|-----------------------|--|--------------|-----------|------|--|
| Test Method: | ANSI C63.10: 2013 | | | | |
| Test Frequency Range: | 150kHz to 30MHz | | | | |
| Limit: | F.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | Limit (dBuV) | | | |
| | Frequency range (MHz) | 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 Procedure: | The mains terminal disturbance voltage test was conducted in a shielde room. The EUT was connected to AC power source through a LISN 1 (Line) | | | | |
| | | | | | |
| | Impedance Stabilization N | • | • | near | |
| | impedance. The power cal | | | | |
| | connected to a second LIS reference plane in the sam | | - | | |
| | · · | • | • | | |
| | 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 | | | to | |
| | ANSI C63.10: 2013 on conducted measurement. | | | | |



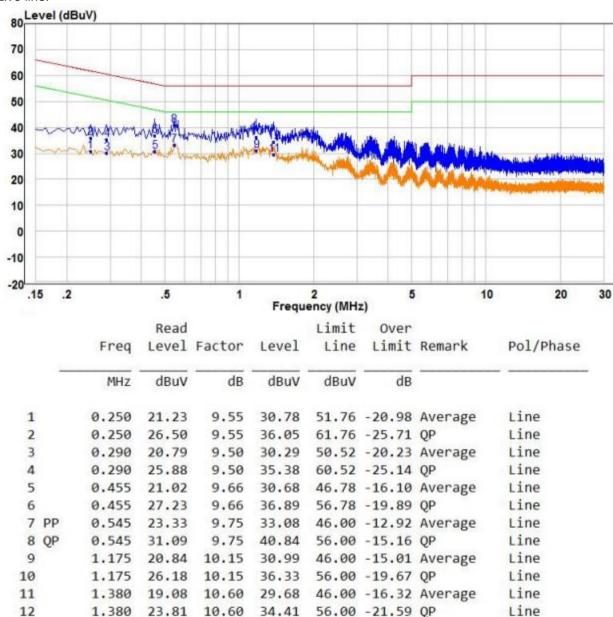




DR05

Measurement Data

Live line:



Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.

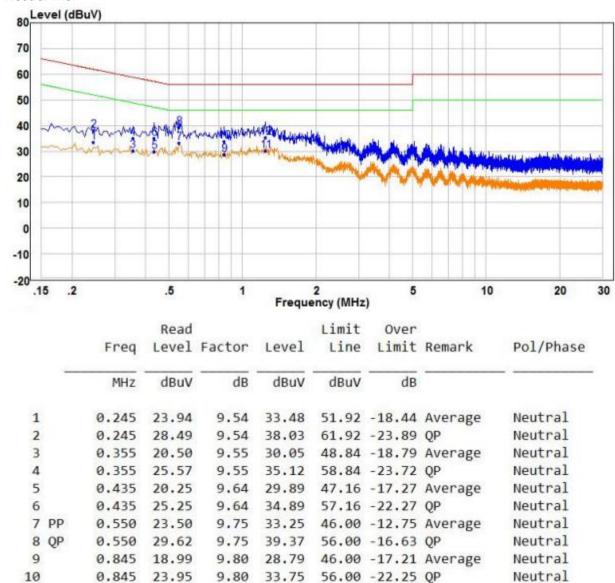




Neutral

Neutral

Neutral line:



Remark:

11

12

1.245

1. The following Quasi-Peak and Average measurements were performed on the EUT:

9.71 30.23

2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.

20.52

1.245 25.59

3. If the Peak value under Average limit, the Average value is not recorded in the report.

9.71 35.30 56.00 -20.70 QP

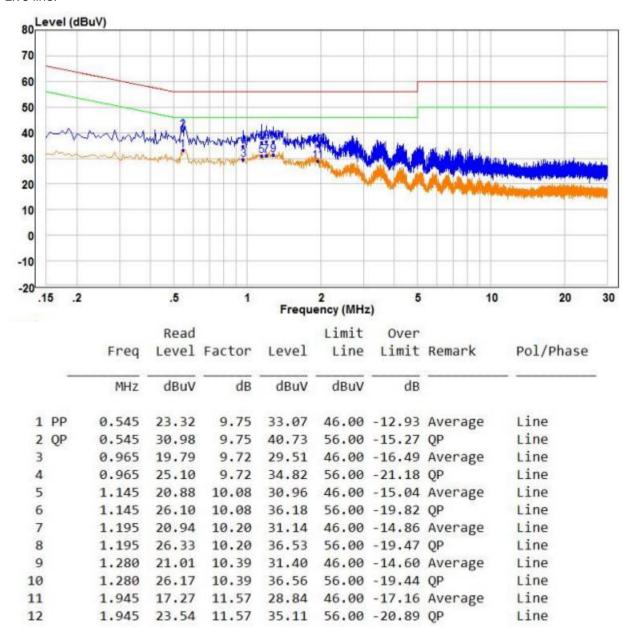
46.00 -15.77 Average



DR03

Measurement Data

Live line:

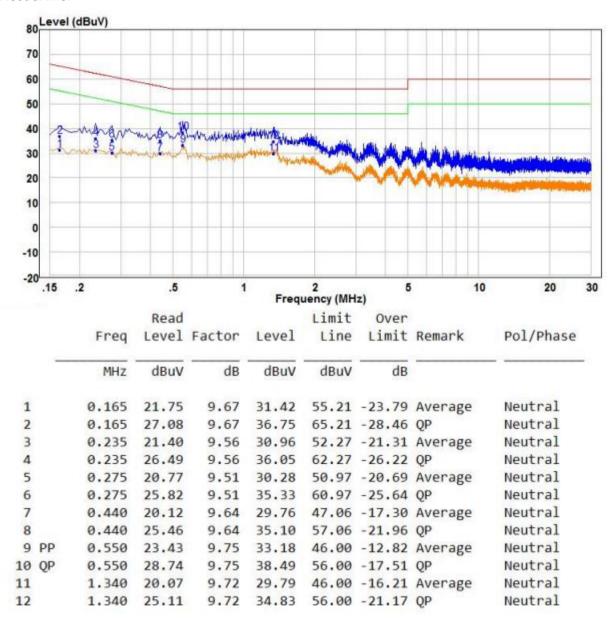


Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



Neutral line:



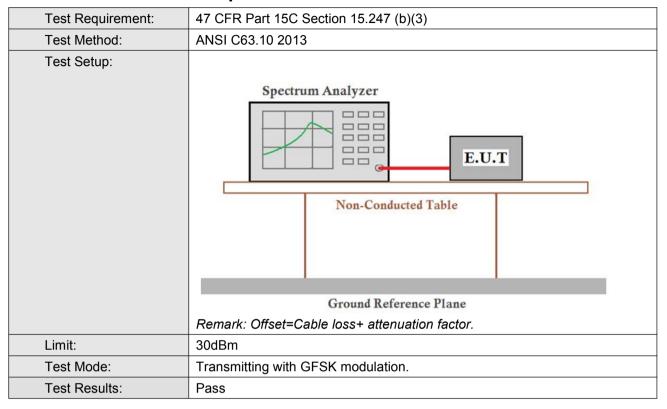
Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.





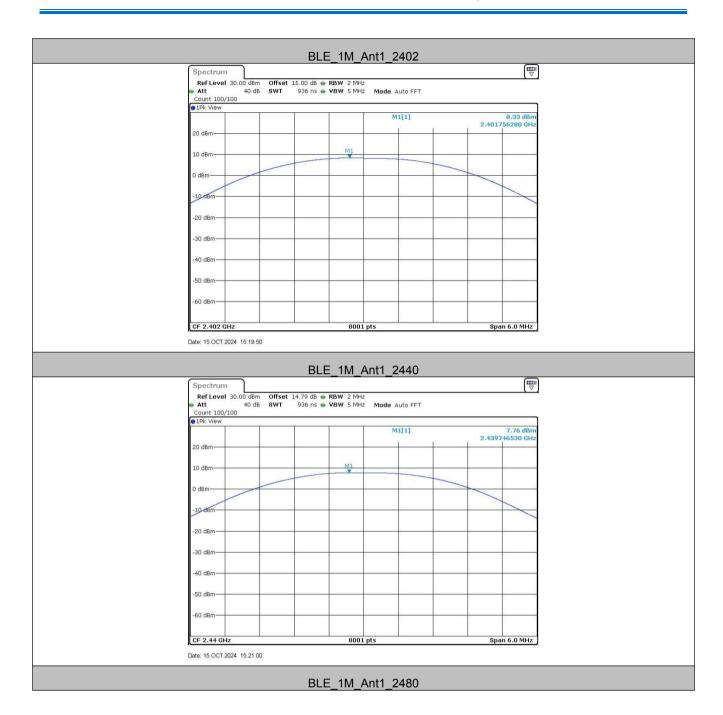
5.3 Conducted Peak Output Power



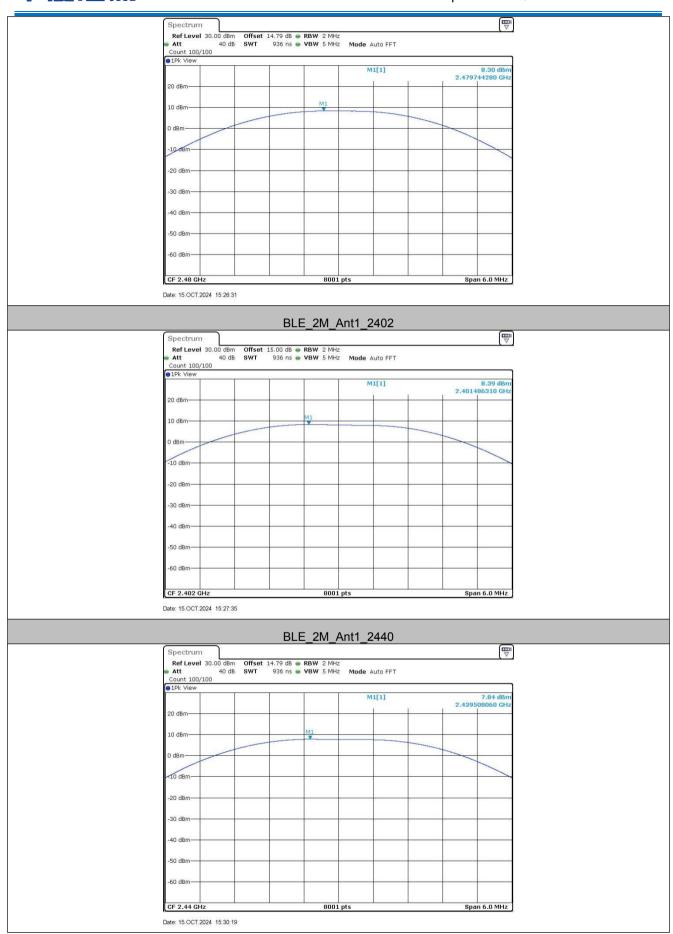
Measurement Data

| acaronnont Bata | iouromont Butu | | | | |
|-------------------|-------------------------|-------------|--------|--|--|
| GFSK mode (1Mbps) | | | | | |
| Test channel | Peak Output Power (dBm) | Result | | | |
| Lowest | 8.33 | 30.00 | Pass | | |
| Middle | 7.76 | 30.00 | Pass | | |
| Highest | 8.3 30.00 | | Pass | | |
| GFSK mode (2Mbps) | | | | | |
| Test channel | Peak Output Power (dBm) | Limit (dBm) | Result | | |
| Lowest | 8.39 30.00 | | Pass | | |
| Middle | 7.84 | 30.00 | Pass | | |
| Highest | 8.42 | 30.00 | Pass | | |
| | | | | | |







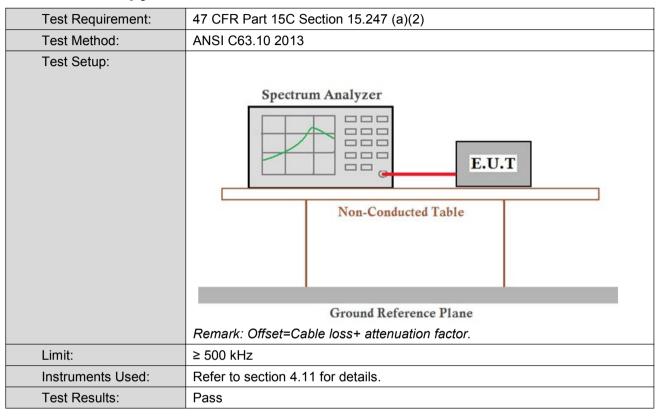








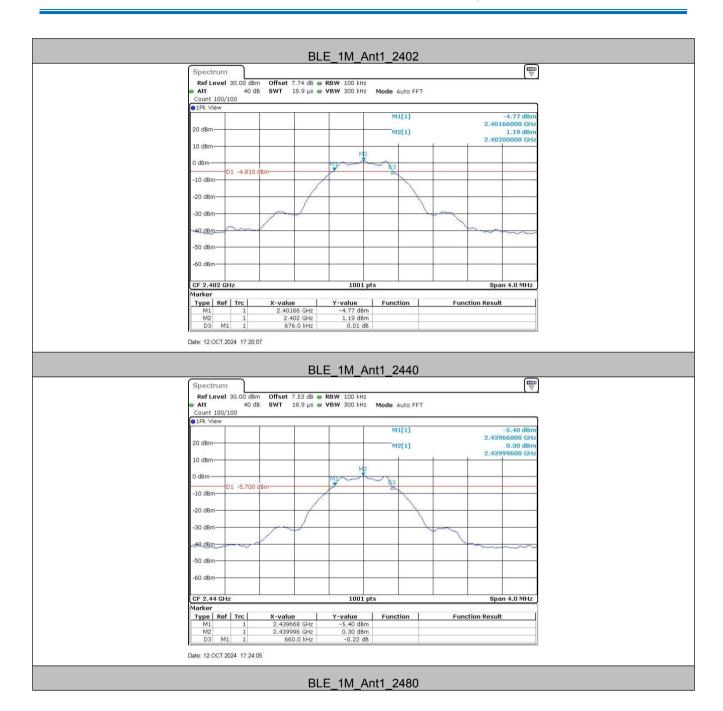
5.4 6dB Occupy Bandwidth



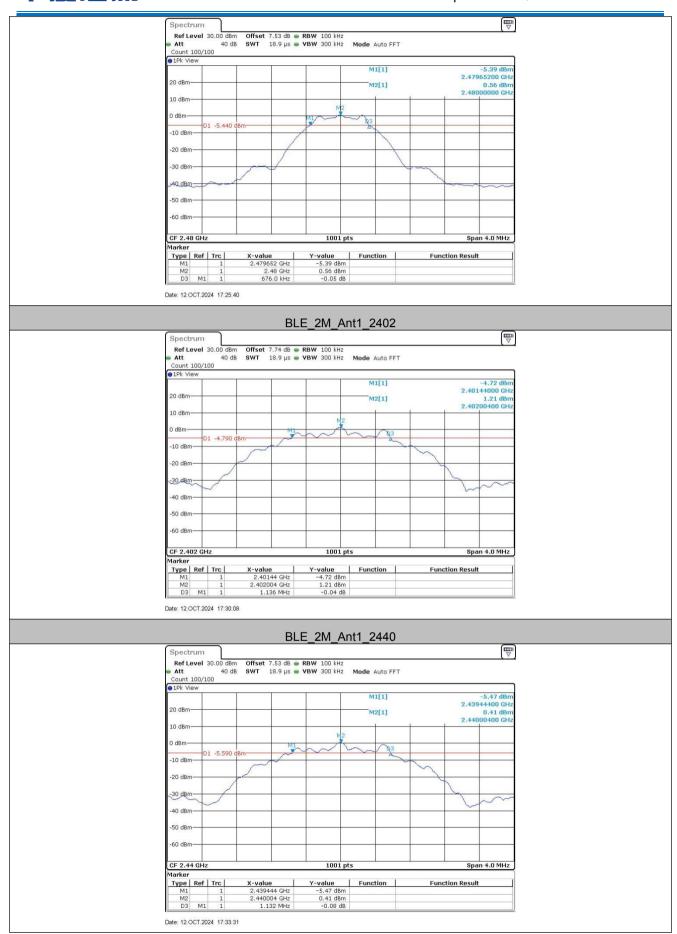
Measurement Data

| GFSK mode (1Mbps) | | | | | |
|-------------------|---|-------------|--------|--|--|
| Test channel | 6dB Occupy Bandwidth (MHz) | Limit (kHz) | Result | | |
| Lowest | 0.68 | ≥500 | Pass | | |
| Middle | 0.66 | ≥500 | Pass | | |
| Highest | 0.68 | ≥500 | Pass | | |
| | GFSK mode (2Mbps) | | | | |
| Test channel | Test channel 6dB Occupy Bandwidth (MHz) | | Result | | |
| Lowest | Lowest 1.14 | | Pass | | |
| Middle | 1.13 | ≥500 | Pass | | |
| Highest | Highest 1.14 | | Pass | | |

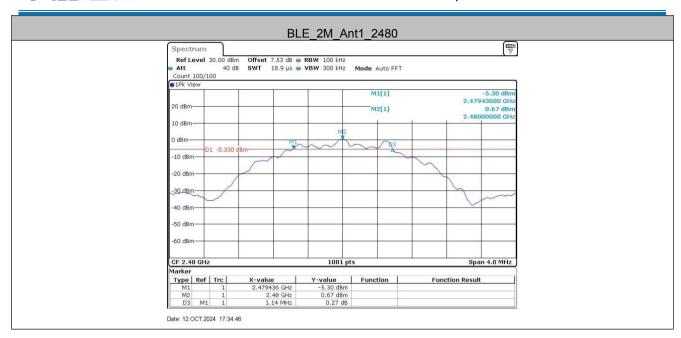






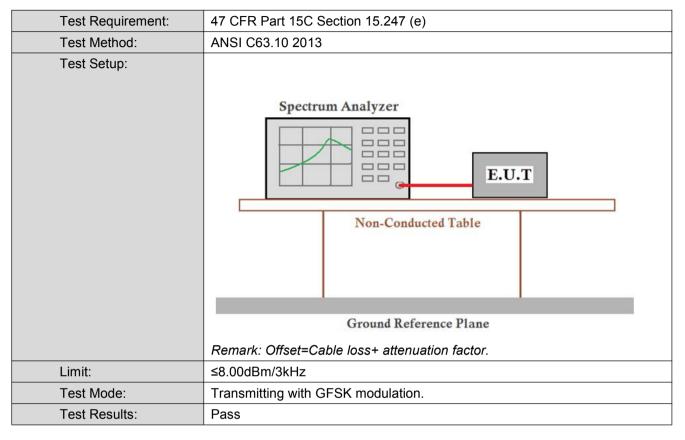








5.5 Power Spectral Density

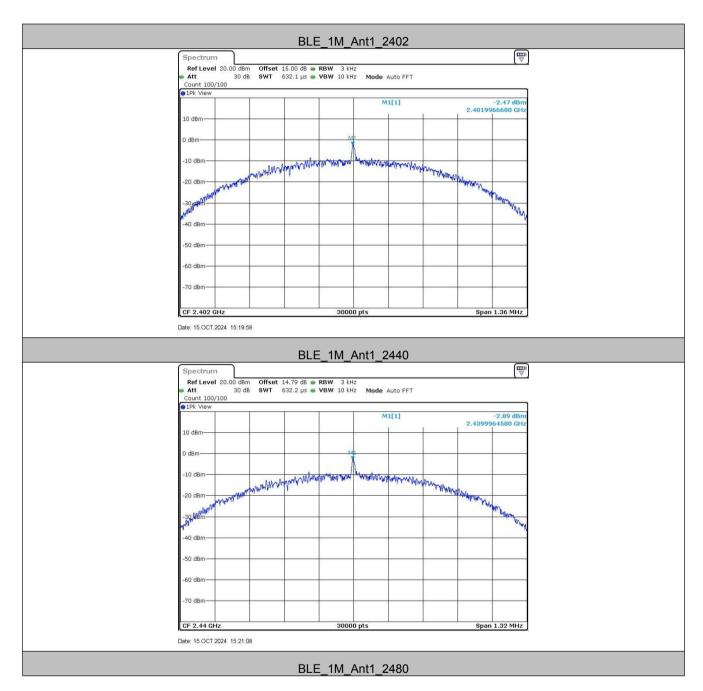


Measurement Data

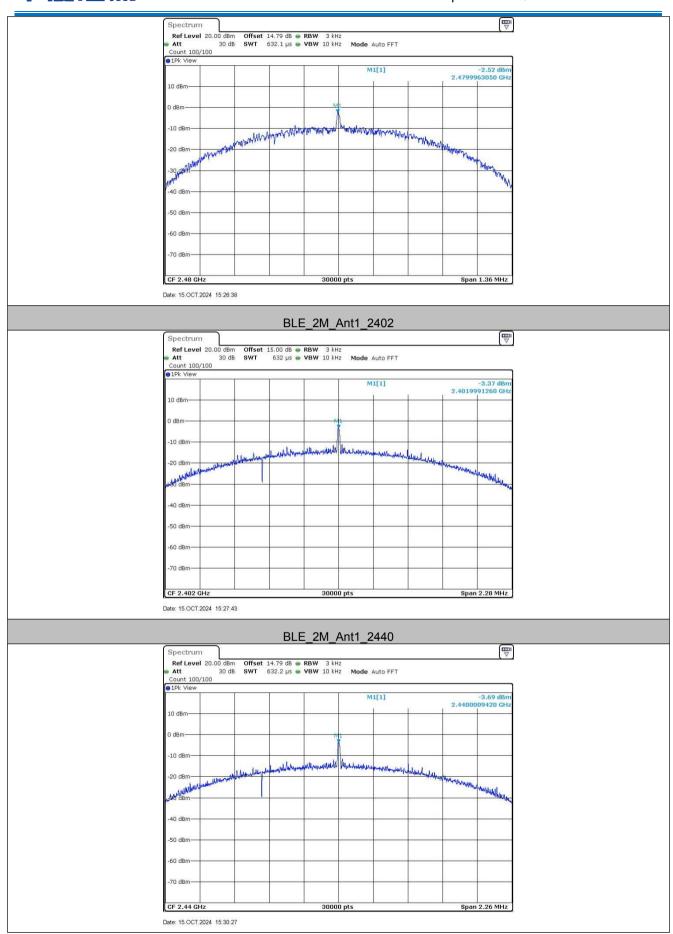
| | mode of the first batta | | | | | |
|--------------|--|------------------|--------|--|--|--|
| | GFSK mode (1Mbps) | | | | | |
| Test channel | Power Spectral Density (dBm/3kHz) | Limit (dBm/3kHz) | Result | | | |
| Lowest | -2.47 | ≤8.00 | Pass | | | |
| Middle | -2.89 | ≤8.00 | Pass | | | |
| Highest | -2.52 | ≤8.00 | Pass | | | |
| | GFSK mode (2Mbps) | | | | | |
| Test channel | st channel Power Spectral Density (dBm/3kHz) | | Result | | | |
| Lowest | owest -3.37 | | Pass | | | |
| Middle | -3.69 | ≤8.00 | Pass | | | |
| Highest | Highest -3.31 | | Pass | | | |



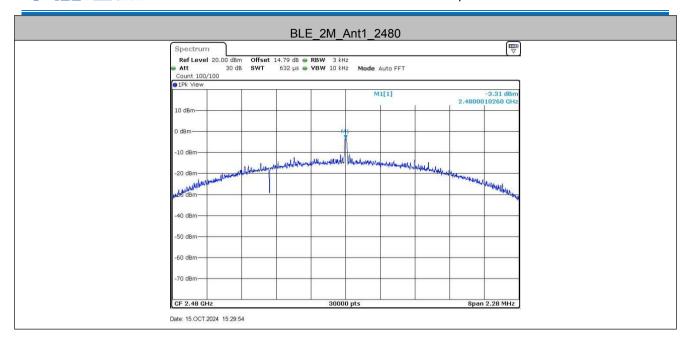
Test plot as follows:







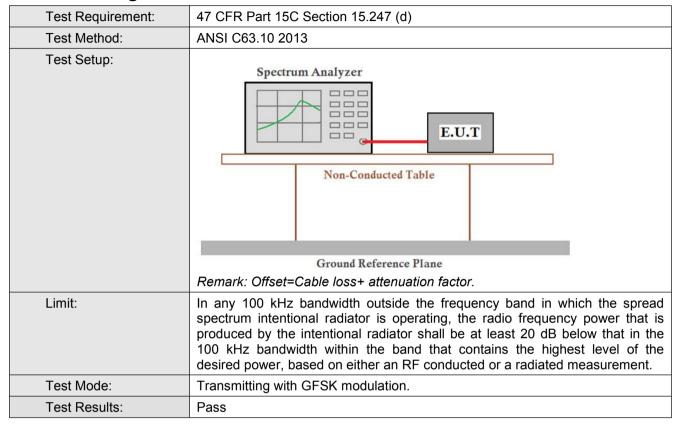








5.6 Band-edge for RF Conducted Emissions

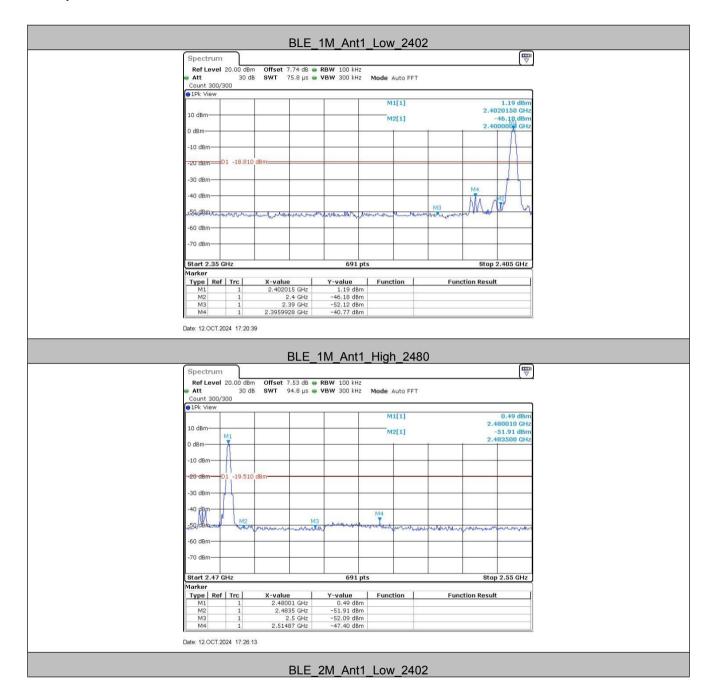


| TestMode | ChName | Freq(MHz) | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|--------|-----------|---------------|-------------|------------|---------|
| BLE_1M | Low | 2402 | 1.19 | -40.77 | ≤-18.81 | PASS |
| | High | 2480 | 0.49 | -47.4 | ≤-19.51 | PASS |
| BLE_2M | Low | 2402 | 1.25 | -30.98 | ≤-18.75 | PASS |
| | High | 2480 | 0.62 | -47.04 | ≤-19.38 | PASS |

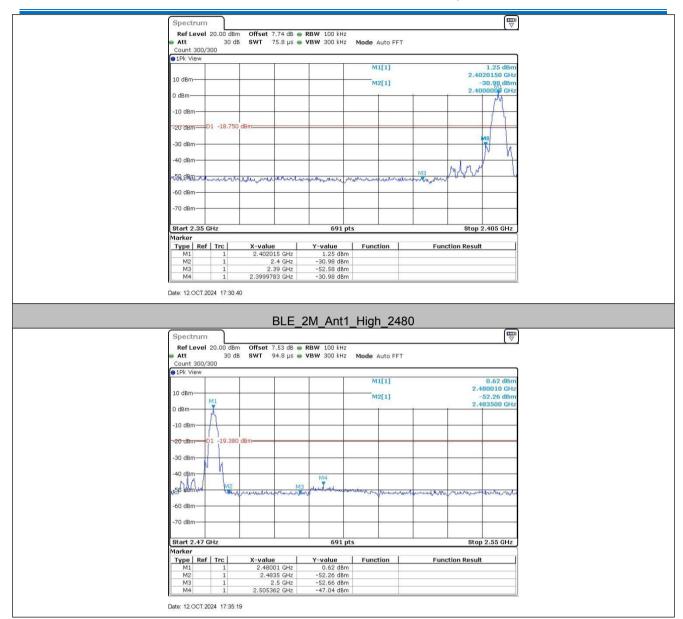


Report No.: CQASZ20241002132E-02

Test plot as follows:



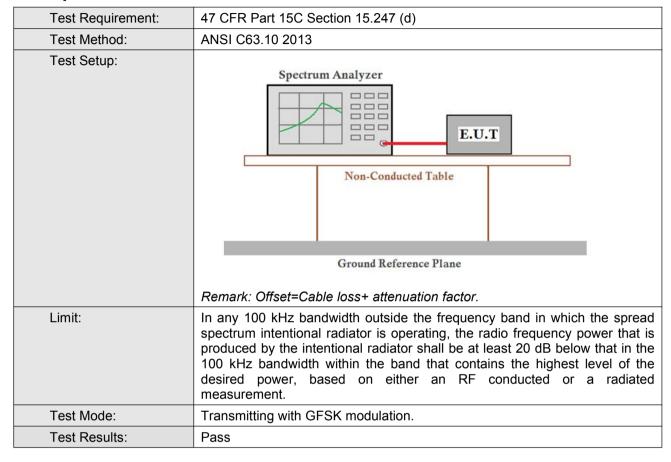






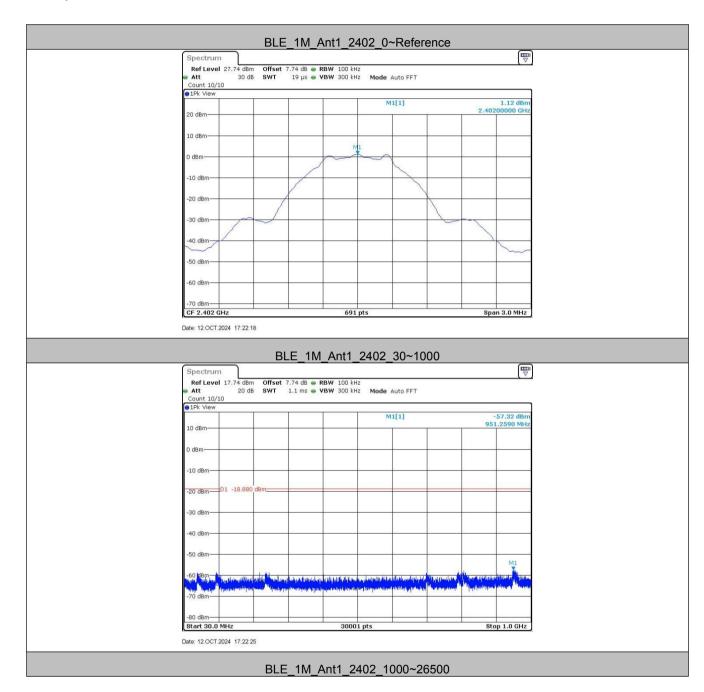


5.7 Spurious RF Conducted Emissions

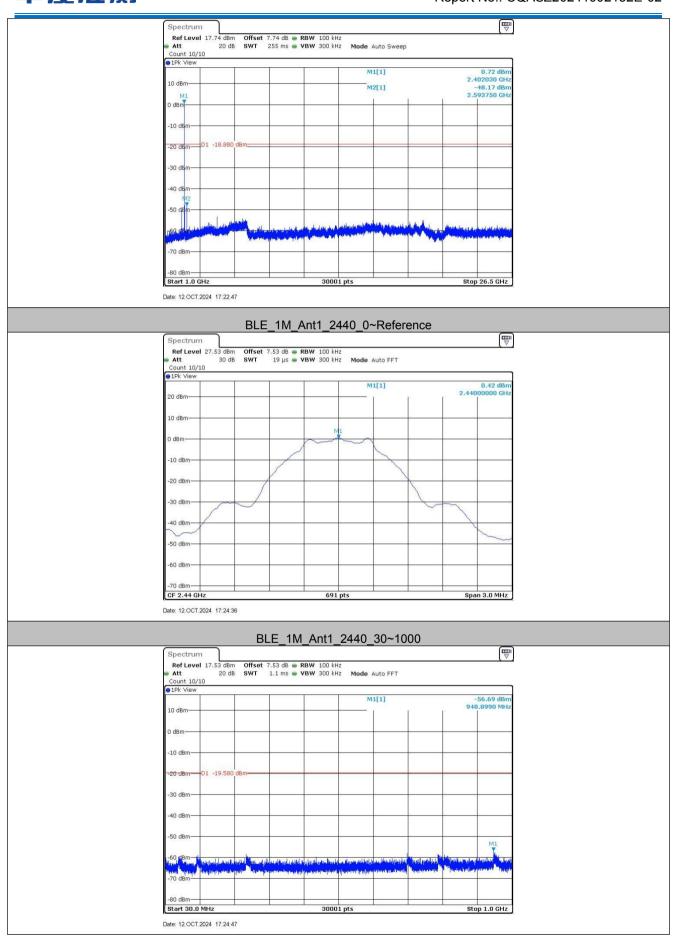




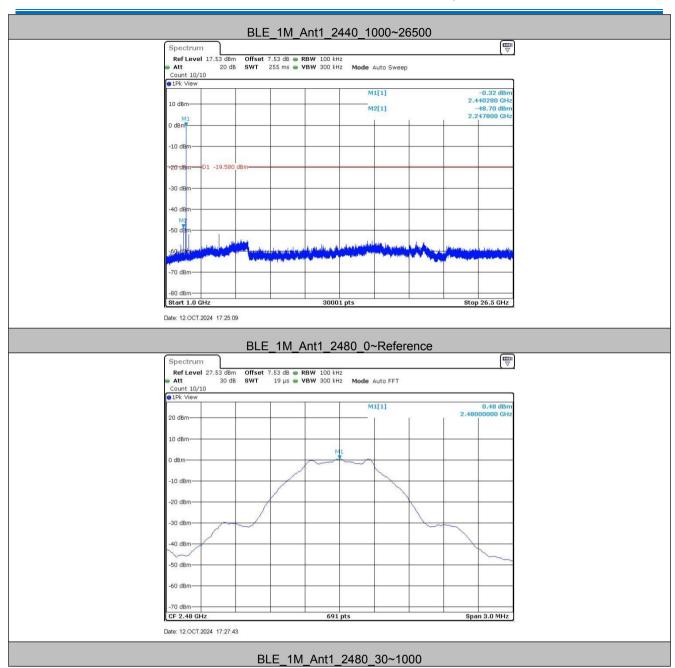
Test plot as follows:



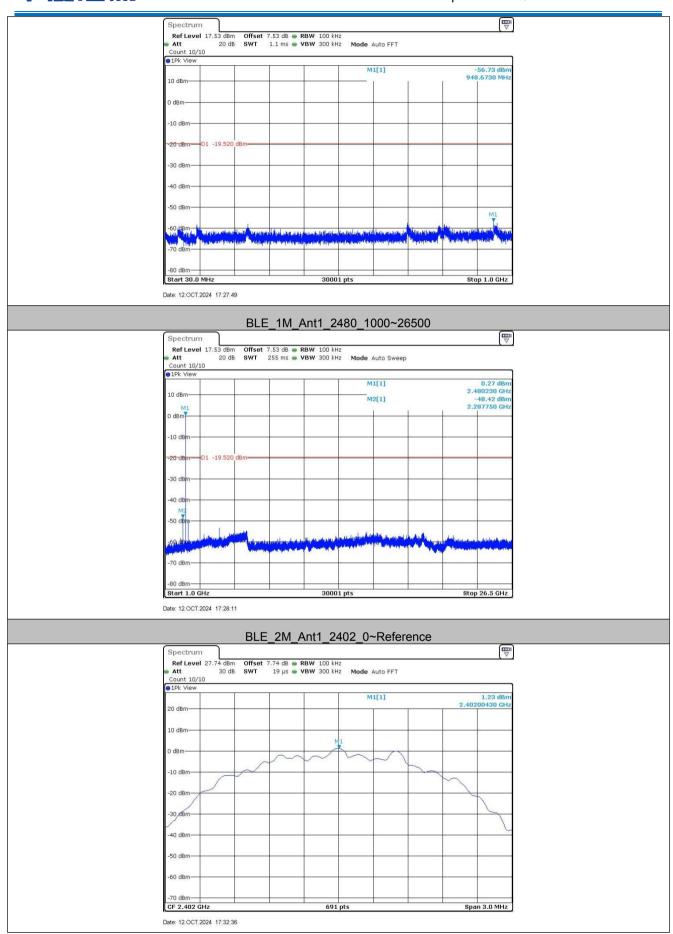




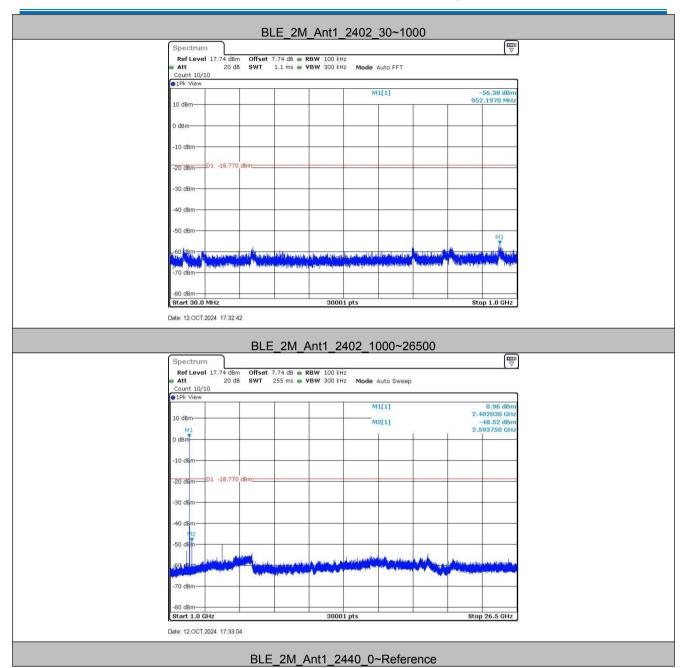




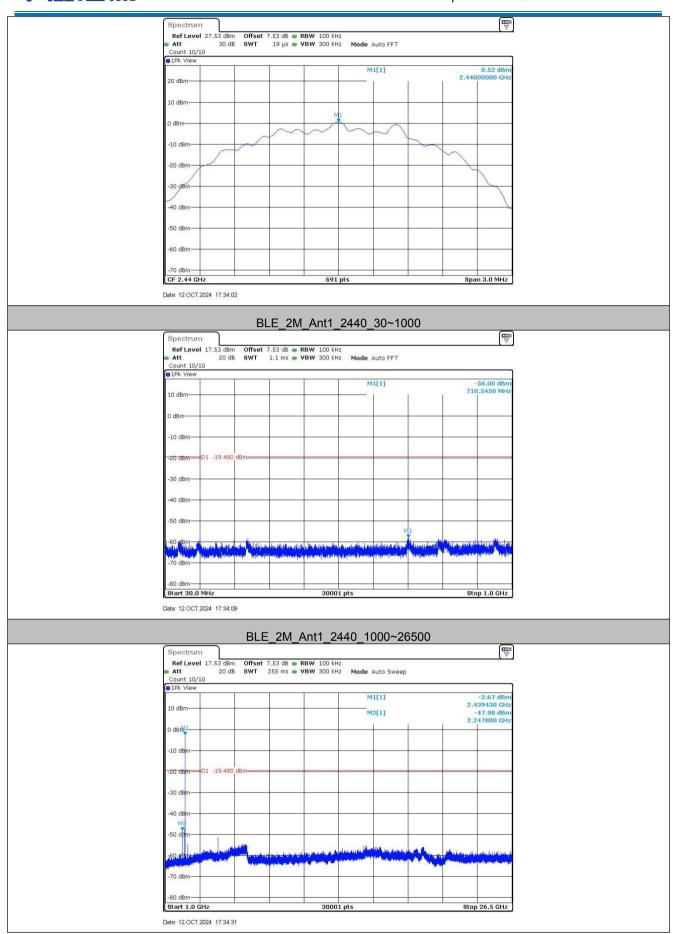




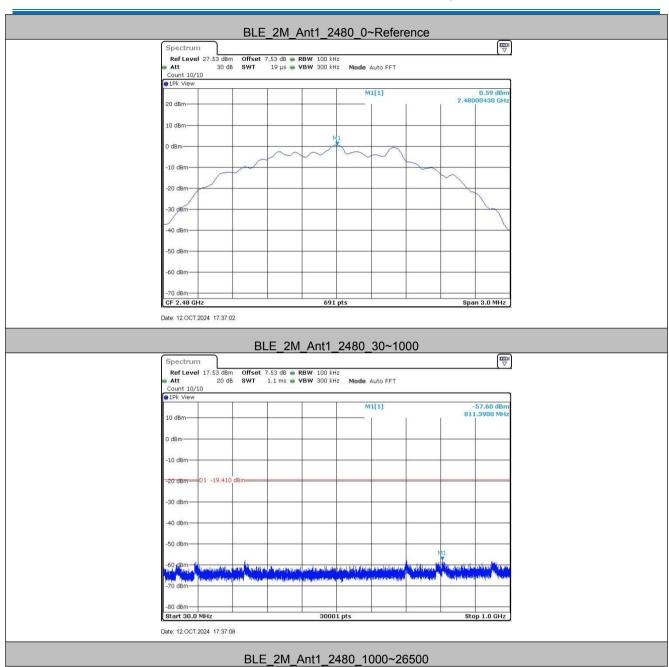






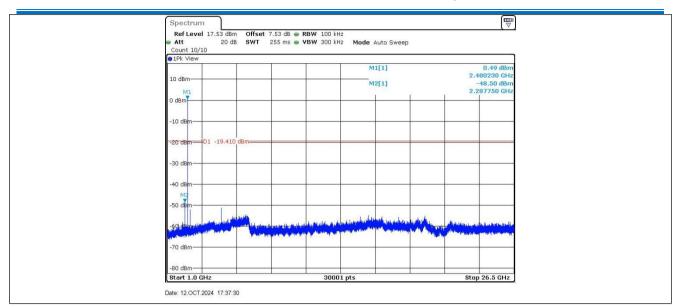








Report No.: CQASZ20241002132E-02



Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.

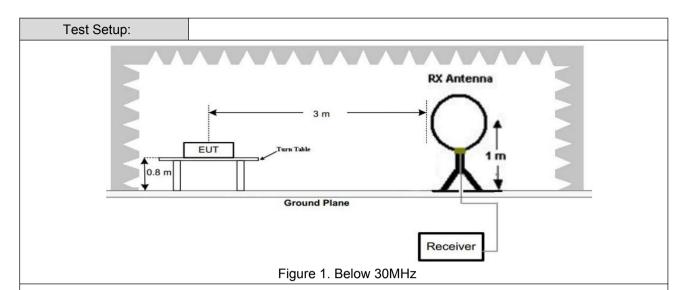


5.8 Radiated Spurious Emission & Restricted bands

| 5.8.1 Spurious Emiss | 5.8.1 Spurious Emissions | | | | | | | | | |
|----------------------|--|-------------|--------------------------------|------------------------|------------|-----------|--------------------------|--|--|--|
| Test Requirement: | 47 CFR Part 15C Section | on 1 | 5.209 and 15 | .205 | | | | | | |
| Test Method: | ANSI C63.10 2013 | | | | | | | | | |
| Test Site: | Measurement Distance | : 3m | ı (Semi-Anech | noic Cham | ber) | | | | | |
| Receiver Setup: | Frequency | | Detector | RBW | | VBW | Remark | | | |
| | 0.009MHz-0.090MH | Z | Peak | 10kHz | <u>z</u> : | 30kHz | Peak | | | |
| | 0.009MHz-0.090MH | Z | Average | 10kHz | <u>z</u> : | 30kHz | Average | | | |
| | 0.090MHz-0.110MH | Z | Quasi-peak | 10kHz | <u>z</u> : | 30kHz | Quasi-peak | | | |
| | 0.110MHz-0.490MH | z | Peak | 10kHz | <u>z</u> : | 30kHz | Peak | | | |
| | 0.110MHz-0.490MH | z | Average | 10kHz | <u>z</u> : | 30kHz | Average | | | |
| | 0.490MHz -30MHz 30MHz-1GHz | | Quasi-peak | 10kHz | <u>z</u> : | 30kHz | Quasi-peak | | | |
| | | | Quasi-peak | 100 kH | Iz 3 | 300kHz | Quasi-peak | | | |
| | Above 1GHz | | Peak | 1MHz | · | 3MHz | Peak | | | |
| | Above IGHZ | | Peak | 1MHz | <u>.</u> | 10Hz | Average | | | |
| Limit: | Frequency | | eld strength crovolt/meter) | Limit (dBuV/m) | R | emark | Measureme distance (m | | | |
| | 0.009MHz-0.490MHz | 2 | 400/F(kHz) | - | | - | 300 | | | |
| | 0.490MHz-1.705MHz | 24 | 1000/F(kHz) | - | | - | 30 | | | |
| | 1.705MHz-30MHz | | 30 | - | | - | 30 | | | |
| | 30MHz-88MHz | | 100 | 40.0 | Qua | asi-peak | 3 | | | |
| | 88MHz-216MHz | | 150 | 43.5 | Qua | asi-peak | 3 | | | |
| | 216MHz-960MHz | | 200 | 46.0 | Qua | asi-peak | 3 | | | |
| | 960MHz-1GHz | | 500 | 54.0 | Qua | asi-peak | 3 | | | |
| | Above 1GHz | 500 | 54.0 | Α١ | /erage | 3 | | | | |
| | Note: 15.35(b), frequency emissions is limit applicable to the epeak emission level race | 20d quip | IB above the imment under t | maximum est. This p | perm | itted ave | erage emissior | | | |







Antenna Tower

AE EUT

Ground Reference Plane

Test Receiver

Test Receiver

AE EUT

Ground Rafeeros Plane

Test Receiver

Test Receiver

Controller

Figure 2. 30MHz to 1GHz

Figure 3. Above 1 GHz

Test Procedure:

- a. 1) Below 1G: 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) Above 1G: The EUT was placed on the top of a rotating table 1.5 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.

Note: For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- 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 (2402MHz),the middle channel (2440MHz),the Highest channel (2480MHz) |
| | h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case. |
| | i. Repeat above procedures until all frequencies measured was complete. |
| Exploratory Test Mode: | Transmitting with GFSK modulation. Transmitting mode. |
| Final Test Mode: | Through Pre-scan, find the 1Mbps of data type and GFSK modulation is the worst case. |
| | For below 1GHz part, through pre-scan, the worst case is the highest channel. |
| | Only the worst case is recorded in the report. |
| Test Results: | Pass |



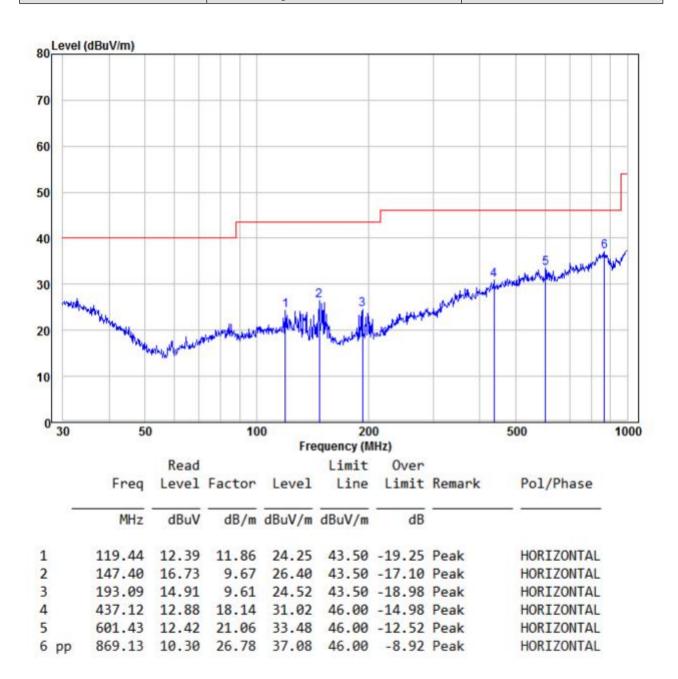
Report No.: CQASZ20241002132E-02

Radiated Emission below 1GHz

30MHz~1GHz, the worst case

DR05

Test mode: Transmitting mode Horizontal



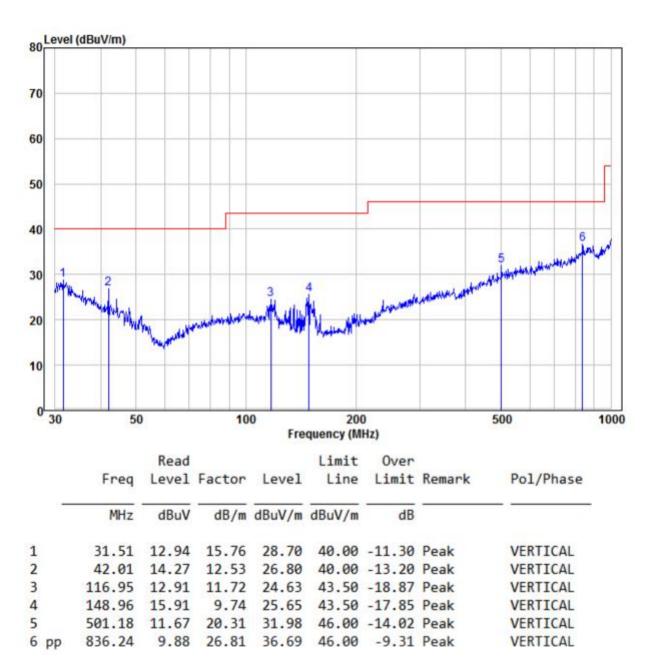
Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

| 30MHz~1GHz, the worst case | | |
|----------------------------|-------------------|----------|
| Test mode: | Transmitting mode | Vertical |



Remark

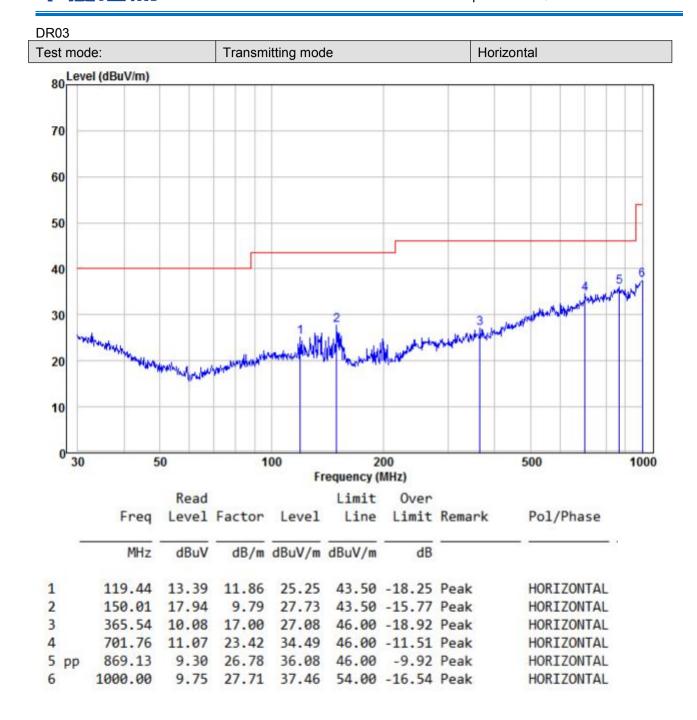
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,



Report No.: CQASZ20241002132E-02



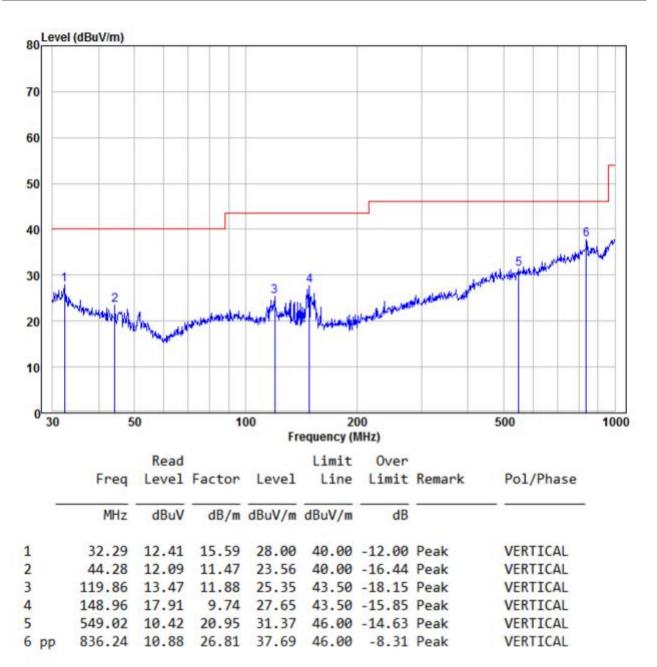
Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,

| 30MHz~1GHz, the worst case | | |
|----------------------------|-------------------|----------|
| Test mode: | Transmitting mode | Vertical |



Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor = Antenna Factor + Cable Factor - Preamplifier Factor,

Level = Read Level + Factor,





Transmitter Emission above 1GHz

DR05

| Worse case m | ode: | GFSK(1Mbps | s) | Test chann | el: | Lowest | |
|--------------|------------------|------------|-------------------|------------|--------|------------------|-----------|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V |
| 2390 | 54.89 | -9.2 | 45.69 | 74 | -28.31 | Peak | Н |
| 2400 | 56.69 | -9.39 | 47.30 | 74 | -26.70 | Peak | Н |
| 4804 | 53.40 | -4.33 | 49.07 | 74 | -24.93 | Peak | Н |
| 7206 | 49.50 | 1.01 | 50.51 | 74 | -23.49 | Peak | Н |
| 2390 | 52.40 | -9.2 | 43.20 | 74 | -30.80 | Peak | V |
| 2400 | 51.31 | -9.39 | 41.92 | 74 | -32.08 | Peak | V |
| 4804 | 55.09 | -4.33 | 50.76 | 74 | -23.24 | Peak | V |
| 7206 | 48.70 | 1.01 | 49.71 | 74 | -24.29 | Peak | V |

| Worse case mode: | | GFSK(1Mbps) | | Test channel: | | Middle | |
|------------------|------------------|-------------|-------------------|---------------|--------|------------------|-----------|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V |
| 4880 | 50.67 | -4.11 | 46.56 | 74 | -27.44 | peak | Н |
| 7320 | 51.18 | 1.51 | 52.69 | 74 | -21.31 | peak | Н |
| 4880 | 51.46 | -4.11 | 47.35 | 74 | -26.65 | peak | V |
| 7320 | 49.70 | 1.51 | 51.21 | 74 | -22.79 | peak | V |

| Worse case m | orse case mode: | | GFSK(1Mbps) | | Test channel: | | Highest | |
|--------------|------------------|--------|-------------------|----------|---------------|------------------|-----------|--|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. | |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V | |
| 2483.5 | 56.46 | -9.29 | 47.17 | 74 | -26.83 | Peak | Н | |
| 4960 | 51.96 | -4.04 | 47.92 | 74 | -26.08 | Peak | Н | |
| 7440 | 50.08 | 1.57 | 51.65 | 74 | -22.35 | Peak | Н | |
| 2483.5 | 56.20 | -9.29 | 46.91 | 74 | -27.09 | Peak | V | |
| 4960 | 49.29 | -4.04 | 45.25 | 74 | -28.75 | Peak | V | |
| 7440 | 50.89 | 1.57 | 52.46 | 74 | -21.54 | Peak | V | |





| Worse case m | Worse case mode: | | GFSK(2Mbps) | | Test channel: | | Lowest | |
|--------------|------------------|--------|-------------------|----------|---------------|------------------|-----------|--|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. | |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V | |
| 2390 | 55.95 | -9.2 | 46.75 | 74 | -27.25 | Peak | Н | |
| 2400 | 55.08 | -9.39 | 45.69 | 74 | -28.31 | Peak | Н | |
| 4804 | 51.86 | -4.33 | 47.53 | 74 | -26.47 | Peak | Н | |
| 7206 | 51.13 | 1.01 | 52.14 | 74 | -21.86 | Peak | Н | |
| 2390 | 52.69 | -9.2 | 43.49 | 74 | -30.51 | Peak | V | |
| 2400 | 51.45 | -9.39 | 42.06 | 74 | -31.94 | Peak | V | |
| 4804 | 52.71 | -4.33 | 48.38 | 74 | -25.62 | Peak | V | |
| 7206 | 50.79 | 1.01 | 51.80 | 74 | -22.20 | Peak | V | |

| Worse case m | ode: | GFSK(2Mbps) | | Test channel: | | Middle | |
|--------------|------------------|-------------|-------------------|---------------|--------|------------------|-----------|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V |
| 4880 | 53.17 | -4.11 | 49.06 | 74 | -24.94 | peak | Н |
| 7320 | 50.17 | 1.51 | 51.68 | 74 | -22.32 | peak | Н |
| 4880 | 53.07 | -4.11 | 48.96 | 74 | -25.04 | peak | V |
| 7320 | 49.52 | 1.51 | 51.03 | 74 | -22.97 | peak | V |

| Worse case mode: | | GFSK(2Mbps) | | Test channel: | | Highest | |
|------------------|------------------|-------------|-------------------|---------------|--------|------------------|-----------|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V |
| 2483.5 | 55.53 | -9.29 | 46.24 | 74 | -27.76 | Peak | Н |
| 4960 | 50.68 | -4.04 | 46.64 | 74 | -27.36 | Peak | Н |
| 7440 | 48.50 | 1.57 | 50.07 | 74 | -23.93 | Peak | Н |
| 2483.5 | 57.80 | -9.29 | 48.51 | 74 | -25.49 | Peak | V |
| 4960 | 50.08 | -4.04 | 46.04 | 74 | -27.96 | Peak | V |
| 7440 | 48.48 | 1.57 | 50.05 | 74 | -23.95 | Peak | V |



Report No.: CQASZ20241002132E-02

DR03

| Worse case m | ode: | GFSK(1Mbps | s) | Test chann | el: | Lowest | |
|--------------|------------------|------------|-------------------|------------|--------|------------------|-----------|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V |
| 2390 | 54.83 | -9.2 | 45.63 | 74 | -28.37 | Peak | Н |
| 2400 | 57.14 | -9.39 | 47.75 | 74 | -26.25 | Peak | Н |
| 4804 | 54.15 | -4.33 | 49.82 | 74 | -24.18 | Peak | Н |
| 7206 | 48.85 | 1.01 | 49.86 | 74 | -24.14 | Peak | Н |
| 2390 | 54.83 | -9.2 | 45.63 | 74 | -28.37 | Peak | V |
| 2400 | 52.17 | -9.39 | 42.78 | 74 | -31.22 | Peak | V |
| 4804 | 54.91 | -4.33 | 50.58 | 74 | -23.42 | Peak | V |
| 7206 | 48.89 | 1.01 | 49.90 | 74 | -24.10 | Peak | V |

| Worse case m | Worse case mode: | | GFSK(1Mbps) | | Test channel: | | Middle | |
|--------------|------------------|--------|-------------------|----------|---------------|------------------|-----------|--|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. | |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V | |
| 4880 | 52.77 | -4.11 | 48.66 | 74 | -25.34 | peak | Н | |
| 7320 | 48.69 | 1.51 | 50.20 | 74 | -23.80 | peak | Н | |
| 4880 | 53.30 | -4.11 | 49.19 | 74 | -24.81 | peak | V | |
| 7320 | 49.33 | 1.51 | 50.84 | 74 | -23.16 | peak | V | |

| Worse case mode: | | GFSK(1Mbps) | | Test channel: | | Highest | |
|------------------|------------------|-------------|-------------------|---------------|--------|------------------|-----------|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V |
| 2483.5 | 55.18 | -9.29 | 45.89 | 74 | -28.11 | Peak | Н |
| 4960 | 52.86 | -4.04 | 48.82 | 74 | -25.18 | Peak | Н |
| 7440 | 49.07 | 1.57 | 50.64 | 74 | -23.36 | Peak | Н |
| 2483.5 | 57.55 | -9.29 | 48.26 | 74 | -25.74 | Peak | V |
| 4960 | 50.17 | -4.04 | 46.13 | 74 | -27.87 | Peak | V |
| 7440 | 48.42 | 1.57 | 49.99 | 74 | -24.01 | Peak | V |





| Worse case mode: | | GFSK(2Mbps) | | Test channel: | | Lowest | |
|------------------|------------------|-------------|-------------------|---------------|--------|------------------|-----------|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V |
| 2390 | 55.48 | -9.2 | 46.28 | 74 | -27.72 | Peak | Н |
| 2400 | 56.04 | -9.39 | 46.65 | 74 | -27.35 | Peak | Н |
| 4804 | 51.31 | -4.33 | 46.98 | 74 | -27.02 | Peak | Н |
| 7206 | 49.91 | 1.01 | 50.92 | 74 | -23.08 | Peak | Н |
| 2390 | 54.16 | -9.2 | 44.96 | 74 | -29.04 | Peak | V |
| 2400 | 52.10 | -9.39 | 42.71 | 74 | -31.29 | Peak | V |
| 4804 | 52.64 | -4.33 | 48.31 | 74 | -25.69 | Peak | V |
| 7206 | 50.05 | 1.01 | 51.06 | 74 | -22.94 | Peak | V |

| Worse case mode: | | GFSK(2Mbps) | | Test channel: | | Middle | |
|------------------|------------------|-------------|-------------------|---------------|--------|------------------|-----------|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V |
| 4880 | 50.85 | -4.11 | 46.74 | 74 | -27.26 | peak | Н |
| 7320 | 48.73 | 1.51 | 50.24 | 74 | -23.76 | peak | Н |
| 4880 | 52.97 | -4.11 | 48.86 | 74 | -25.14 | peak | V |
| 7320 | 48.36 | 1.51 | 49.87 | 74 | -24.13 | peak | V |

| Worse case mode: | | GFSK(2Mbps) | | Test channel: | | Highest | |
|------------------|------------------|-------------|-------------------|---------------|--------|------------------|-----------|
| Frequency | Meter Reading | Factor | Emission Level | Limits | Over | Detector Type | Ant. Pol. |
| (MHz) | (dBµV) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | | H/V |
| 2483.5 | 54.81 | -9.29 | 45.52 | 74 | -28.48 | Peak | Н |
| 4960 | 50.70 | -4.04 | 46.66 | 74 | -27.34 | Peak | Н |
| 7440 | 49.80 | 1.57 | 51.37 | 74 | -22.63 | Peak | Н |
| 2483.5 | 56.91 | -9.29 | 47.62 | 74 | -26.38 | Peak | V |
| 4960 | 50.01 | -4.04 | 45.97 | 74 | -28.03 | Peak | V |
| 7440 | 49.60 | 1.57 | 51.17 | 74 | -22.83 | Peak | V |

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 - Final Test Level =Receiver Reading + Antenna Factor + Cable Factor Preamplifier Factor
- 2) Scan from 9kHz to 25GHz, the disturbance above 10GHz and below 30MHz was very low. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. 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. So, only the peak measurements were shown in the report.



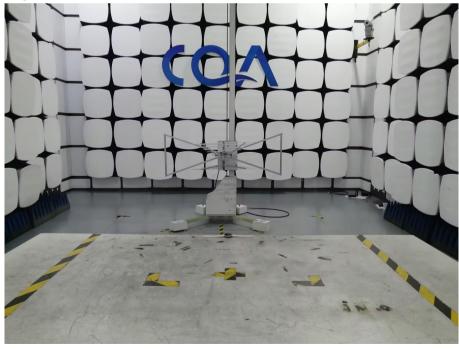
6 Photographs - EUT Test Setup

6.1 Radiated Spurious Emission

9KHz~30MHz:



30MHz~1GHz:





Above 1GHz:



6.2 Conducted Emission





7 Photographs - EUT Constructional Details

Refer to Photographs - EUT Constructional Details OF EUT for CQASZ20241002132E-01.

*** END OF REPORT ***