# FCC Test Report

| | |
|---|---|
| **Report No.:** | 2405Z107575EC |
| **Applicant:** | Shenzhen Qianyan Technology LTD |
| **Address:** | No.3301, Block C, Section 1, Chuangzhi Yuncheng Building, Liuxian Avenue, Xili Community, Xili Street, Nanshan District, Shenzhen, China |
| **Product Name:** | Govee Outdoor Spotlights 2 |
| **Product Model:** | H7094 |
| **Multiple Models:** | H7093 |
| **Trade Mark:** | Govee |
| **FCC ID:** | 2A7VD-H7093 |
| **Standards:** | FCC CFR Title 47 Part 15C (§15.247) |
| **Test Date:** | 2024-12-09 to 2025-03-18 |
| **Test Result:** | Complied |
| **Report Date:** | 2025-04-02 |

**Reviewed by:** Abel chen

Abel Chen
Project Engineer

**Approved by:** Jacob Gong

Jacob Kong
Manager

**Prepared by:**

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

This report may contain data that are not covered by the NVLAP accreditation and shall be marked with an asterisk "★"

# Announcement

1. This test report shall not be reproduced except in full, without the written approval of World Alliance Testing & Certification (Shenzhen) Co., Ltd

2. The results in this report apply only to the sample tested.

3. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

4. The information marked "#" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

# Revision History

| Version No. | Issued Date | Description |
|---|---|---|
| *00* | *2025-04-02* | *Original* |

# Contents

# 1 General Information

## 1.1 Client Information

| | |
|---|---|
| Applicant: | Shenzhen Qianyan Technology LTD |
| Address: | No.3301, Block C, Section 1, Chuangzhi Yuncheng Building, Liuxian Avenue, Xili Community, Xili Street, Nanshan District, Shenzhen, China |
| Manufacturer: | Shenzhen Qianyan Technology LTD |
| Address: | No.3301, Block C, Section 1, Chuangzhi Yuncheng Building, Liuxian Avenue, Xili Community, Xili Street, Nanshan District, Shenzhen, China |

## 1.2 Product Description of EUT

The EUT is Govee Outdoor Spotlights 2 that contains BLE and 2.4G WLAN radios, this report covers the full testing of the BLE radio.

| | |
|---|---|
| Sample Serial Number | 2VA3-3(H7094), 2VA3-4(H7093) for CE& RE below 1G test,<br>2VA3-1 for RE above 1G test,<br>2VA3-2 for RF conducted test(assigned by WATC) |
| Sample Received Date | 2024-12-02 |
| Sample Status | Good Condition |
| Frequency Range | 2402MHz - 2480MHz(BLE1M) |
| Maximum Conducted Peak Output Power | -0.99dBm |
| Modulation Technology | GFSK |
| Spatial Streams | SISO (1TX, 1RX) |
| Antenna Gain# | 3.79dBi |
| Power Supply | DC 24V from adapter |
| Adapter Information (for H7094) | Model: BI48G-240200-AdU2<br>Input: AC100-240V, 50/60Hz, 1.4A<br>Output: DC 24V/2A, |
| Adapter Information (for H7093) | Model: BI24G-240100-AdU2<br>Input: AC100-240V, 50/60Hz, 0.8A<br>Output: DC 24V/1A, |
| Modification | Sample No Modification by the test lab |

## 1.3 Antenna information

**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.

| **Device Antenna information:** | |
|---|---|

The BLE antenna is an internal antenna which cannot replace by end-user, please see product internal photos for details.

## 1.4 Related Submittal(s)/Grant(s)

| |
|---|
| No related submittal(s)/Grant(s) |

## 1.5 Measurement Uncertainty

| Parameter | | Expanded Uncertainty (Confidence of 95%(U = 2Uc(y))) |
|---|---|---|
| AC Power Lines Conducted Emissions | | ±3.14dB |
| Emissions, Radiated | Below 30MHz | ±2.78dB |
| | Below 1GHz | ±4.84dB |
| | Above 1GHz | ±5.44dB |
| Emissions, Conducted | | 1.75dB |
| Conducted Power | | 0.74dB |
| Frequency Error | | 150Hz |
| Bandwidth | | 0.34% |
| Power Spectral Density | | 0.74dB |
| ***Note:*** *The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.* | | |

## 1.6 Laboratory Location

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: qa@watc.com.cn

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

## 1.7 Test Methodology

FCC CFR 47 Part 2

FCC CFR 47 Part 15

KDB 558074 D01 15.247 Meas Guidance v05r02

ANSI C63.10-2013

Unless otherwise stated there are no any additions to, deviations, or exclusions from the method

# 2 Description of Measurement

## 2.1 Test Configuration

| **Operating channels:** | | | | | |
|---|---|---|---|---|---|
| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
| 0 | 2402 | 19 | 2440 | 38 | 2478 |
| 1 | 2404 | 20 | 2442 | 39 | 2480 |
| … | … | … | … | / | / |
| 18 | 2438 | … | … | / | / |
| According to ANSI C63.10-2013 chapter 5.6.1 Table 11 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows: | | | | | |
| Lowest channel | | Middle channel | | Highest channel | |
| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
| 0 | 2402 | 19 | 2440 | 39 | 2480 |

| **Test Mode:** | | | | |
|---|---|---|---|---|
| Transmitting mode: | Keep the EUT in continuous transmitting with modulation | | | |
| Exercise software#: | sscom5.13.1 | | | |
| **Mode** | **Data rate** | **Power Level Setting#** | | |
| | | **Low Channel** | **Middle Channel** | **High Channel** |
| BLE 1M | 1Mbps | 0x0C | 0x0C | 0x0C |
| The exercise software and the maximum power setting that provided by manufacturer. | | | | |

| **Worst-Case Configuration:** |
|---|
| For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was recorded in report<br><br>For AC power line conducted emission and radiated emission 9kHz-1GHz and above 18GHz were performed with the EUT transmits at the channel with highest output power as worst-case scenario.<br><br>For radiated emissions below 30MHz, three antenna orientations (parallel, perpendicular, gound-parallel) were tested, only record the worse case test data in report.<br><br>EUT model H7094 and H7093 are electrical identical, except for difference number of lights and adapter, model H7094 was selected for full test, model H7093 was checked AC line conducted emission and radiated emission of below 1GHz. |

## 2.2 Test Auxiliary Equipment

| **Manufacturer** | **Description** | **Model** | **Serial Number** |
|---|---|---|---|
| / | / | / | / |

## 2.1 Interconnecting Cables

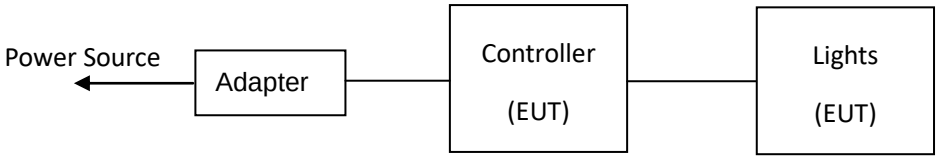
H7093

| Manufacturer | Description | Length(m) | From | To |
|---|---|---|---|---|
| Unknown | DC cable | 3 | Adapter | Controller |
| Unknown | DC cable | 2.7 | Controller | Lights1 |
| Unknown | DC cable | 5.7 | Controller | Lights2 |

H7094

| Manufacturer | Description | Length(m) | From | To |
|---|---|---|---|---|
| Unknown | DC cable | 3 | Adapter | Controller |
| Unknown | DC cable | 2.7 | Controller | Lights1 |
| Unknown | DC cable | 5.7 | Controller | Lights2 |
| Unknown | DC cable | 8.7 | Controller | Lights3 |
| Unknown | DC cable | 11.7 | Controller | Lights4 |

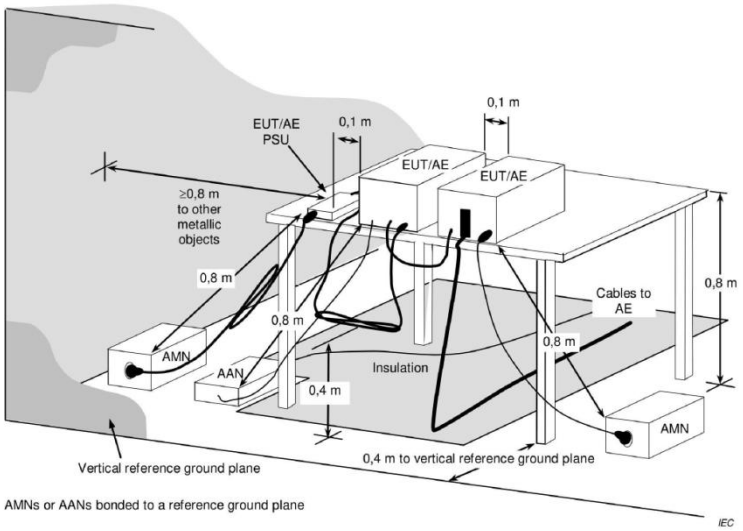
## 2.2 Block Diagram of Connection between EUT and AE




*Note: for reference only, the actual connection setup used for testing please refer to the test photos.*

## 2.3 Test Setup

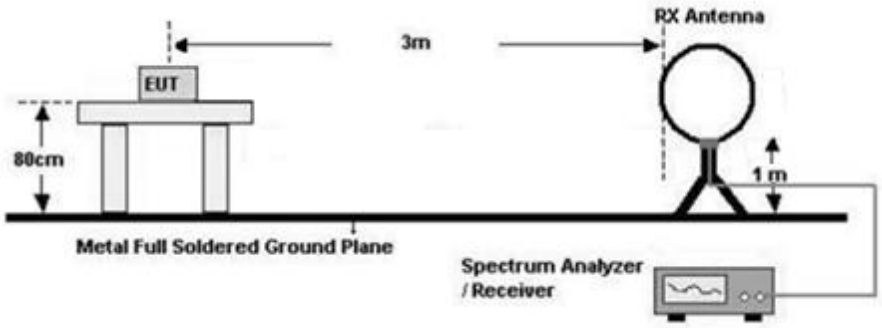
**1) Conducted emission measurement:**



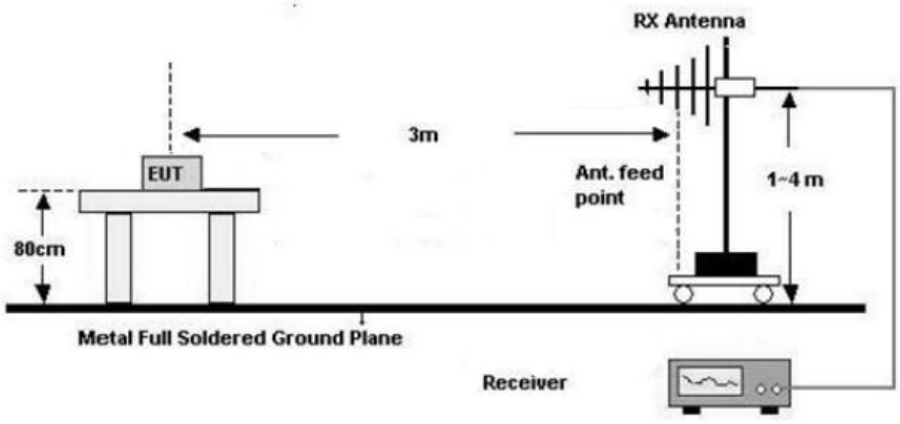

**Note:** The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

**2) Radiated emission measurement:**

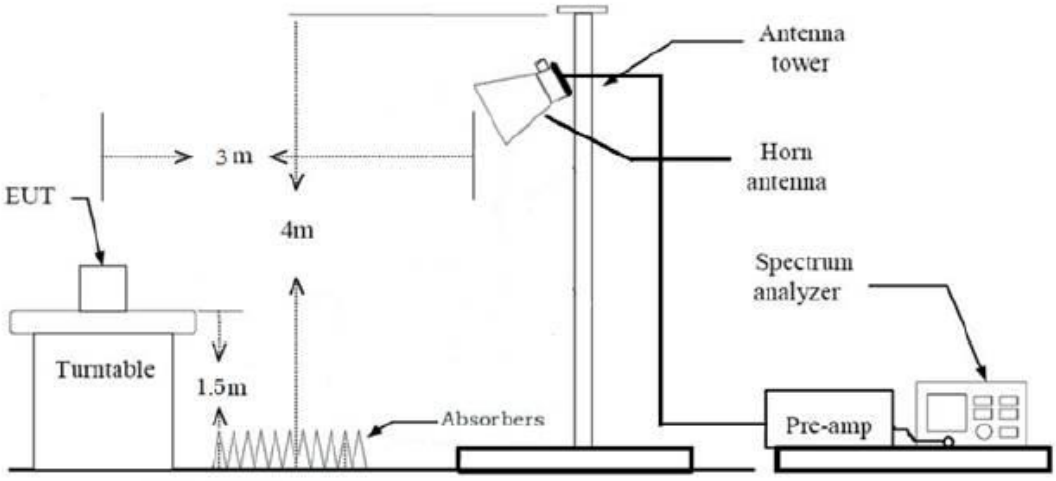
Below 30MHz (3m SAC)



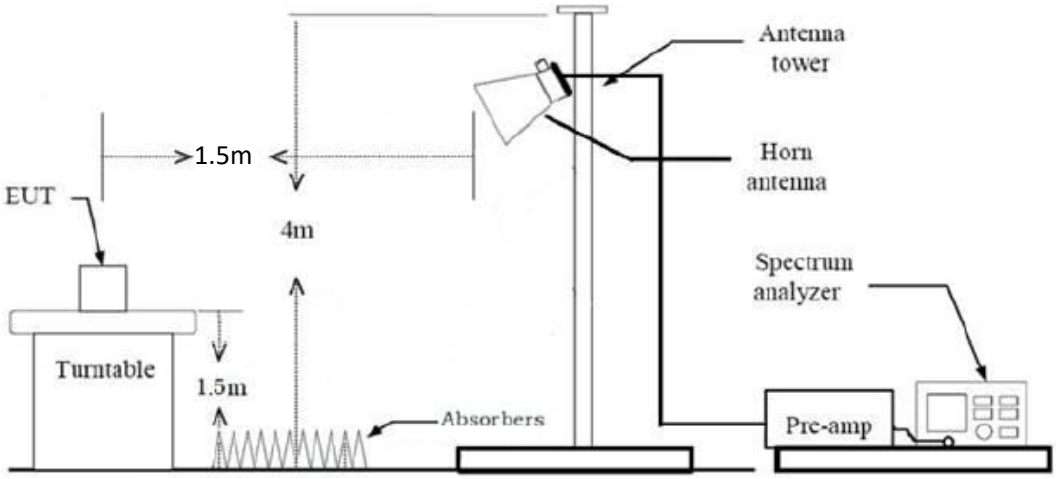

30MHz-1GHz (3m SAC)



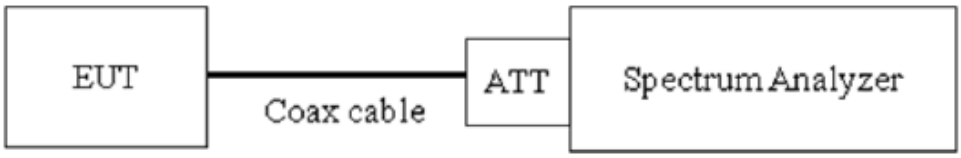
1GHz-18GHz



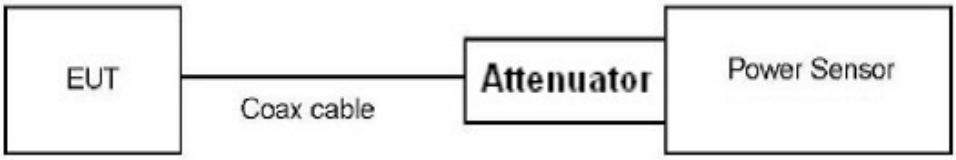

Above 18GHz




**3) RF Conducted Test**




or



## 2.4 Test Procedure

**Conducted emission:**

1. The E.U.T is placed on a non-conducting table 40cm from the vertical ground plane and 80cm above the horizontal ground plane (Please refer to the block diagram of the test setup and photographs).
2. 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 on conducted measurement.
3. The IF BW of receiver is set to 200Hz for 9kHz to 150kHz range(If apply), to 9kHz for 150kHz to 30MHz range for scan peak/average emissions, selected at least six highest EUT emissions relative to the limit to do final measurement in the Quasi-peak or average detection mode.
4. Line conducted data is recorded for both Line and Neutral

**Radiated Emission Procedure:**

**a) For below 30MHz**

1. All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz- 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).
2. Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, gound-parallel)
3. The RBW/VBW of receiver is set to 200Hz/1kHz for 9kHz to 150kHz range, to 9kHz/30kHz for 150kHz to 30MHz range for scan Peak emission, 200Hz/9kHz IF BW was used for final measurement in the Quasi-peak or average detection mode for frequency range 9~150kHz/150kHz~30MHz respectively.
4. If the Peak emission complies with the QP limit, then perform final measurement is optional.

**b) For 30MHz-1GHz:**

1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
3. The RBW/VBW of receiver is set to 100kHz/300kHz for scan Peak emission, 120kHz IF BW was used for final measurement in the Quasi-peak detection mode.
4. If the Peak emission complies with the QP limit, then perform final measurement is optional.

**c) For above 1GHz:**

1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m (1-18GHz) and 1.5 m (above 18GHz).
2. EUT works in each mode of operation that needs to be tested，and having the EUT continuously working. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal

polarizations.

3. The RBW/VBW of spectrum analyzer is set to 1MHz/3MHz for scan Peak emission, for measured average emission, reduce the VBW to 10Hz(for duty cycle≥98%), or ≥1/T(for duty cycle<98%). T is minimum transmission duration. (Note: a high VBW (for example 1kHz, not less than 1/T) may used to scan average emissions to avoid long sweep time.)
4. If the Peak emission complies with the Average limit, then perform average measurement is optional.
5. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
6. Base on FCC part 15.31(f): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

**RF Conducted Test:**

1. The antenna port of EUT was connected to the RF port of the test equipment (Power Meter or Spectrum analyzer) through Attenuator and RF cable.
2. The cable assembly insertion loss of 6.5dB (including 6.0 dB Attenuator and 0.5dB cable) was entered as an offset in the power meter. Note: Actual cable loss was unavailable at the time of testing, therefore a loss of 0.5dB was assumed as worst case. This was later verified to be true by laboratory. ( if the RF cable provided by client, the cable loss declared by client)
3. The EUT is keeping in continuous transmission mode and tested in all modulation modes.

## 2.5 Measurement Method

| Description of Test | Measurement Method |
|---|---|
| AC Line Conducted Emissions | ANSI C63.10-2013 Section 6.2 |
| Maximum Conducted Output Power | ANSI C63.10-2013 Section 11.9.1.1 |
| Power Spectral Density | ANSI C63.10-2013 Section 11.10.2 |
| 6 dB Emission Bandwidth | ANSI C63.10-2013 Section 11.8.1 |
| 99% Occupied Bandwidth | ANSI C63.10-2013 Section 6.9.3 |
| 100kHz Bandwidth of Frequency Band Edge | ANSI C63.10-2013 Section 6.10 |
| Radiated emission | ANSI C63.10-2013 Section 11.11&11.12.1 |
| Duty Cycle | ANSI C63.10-2013 Section 11.6 |

## 2.6 Measurement Equipment

| Manufacturer | Description | Model | Management No. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|
| AC Line Conducted Emission Test | | | | | |
| ROHDE& SCHWARZ | EMI TEST RECEIVER | ESR | 101817 | 2024/6/4 | 2025/6/3 |
| R&S | LISN | ENV216 | 101748 | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.12 | N/A | 2024/6/4 | 2025/6/3 |
| Farad | Test Software | EZ-EMC | Ver. EMEC-3A1 | / | / |
| Radiated Emission Test | | | | | |
| R&S | EMI test receiver | ESR3 | 102758 | 2024/6/4 | 2025/6/3 |
| ROHDE& SCHWARZ | SPECTRUM ANALYZER | FSV40-N | 101608 | 2024/6/4 | 2025/6/3 |
| SONOMA INSTRUMENT | Low frequency amplifier | 310 | 186014 | 2024/6/4 | 2025/6/3 |
| A.H. Systems | PREAMPLIFIER | PAM-0118P | 531 | 2024/6/4 | 2025/6/3 |
| COM-POWER | Amplifier | PAM-840A | 461306 | 2024/8/7 | 2025/8/6 |
| BACL | Loop Antenna | 1313-1A | 4010611 | 2024/2/7 | 2027/2/6 |
| SCHWARZBECK | Log - periodic wideband antenna | VULB 9163 | 9163-872 | 2023/7/7 | 2026/7/6 |
| Astro Antenna Ltd | Horn antenna | AHA-118S | 3015 | 2023/7/6 | 2026/7/5 |
| Ducommun technologies | Horn Antenna | ARH-4223-02 | 1007726-03 | 2023/7/10 | 2026/7/9 |
| Oulitong | Band Reject Filter | OBSF-2400-248 3.5-50N | OE02103119 | 2024/6/4 | 2025/6/3 |
| Unknown | 6.7G High Pass Filter | Unknown | 6.7G | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.9 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.13 | N/A | 2024/8/7 | 2025/8/6 |
| N/A | Coaxial Cable | NO.15 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.16 | N/A | 2024/6/4 | 2025/6/3 |
| N/A | Coaxial Cable | NO.17 | N/A | 2024/6/4 | 2025/6/3 |
| Audix | Test Software | E3 | 191218 V9 | / | / |
| RF Conducted Test | | | | | |
| ROHDE& SCHWARZ | SPECTRUM ANALYZER | FSV40 | 101419 | 2024/6/4 | 2025/6/3 |
| narda | 6dB attenuator | 603-06-1 | N/A | 2024/6/4 | 2025/6/3 |

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

# 3 Test Results

## 3.1 Test Summary

| FCC Rules | Description of Test | Result |
|---|---|---|
| §15.203 | Antenna Requirement | Compliance |
| §15.207 (a) | AC Line Conducted Emissions | Compliance |
| §15.247(b)(3) | Maximum Conducted Output Power | Compliance |
| §15.247(e) | Power Spectral Density | Compliance |
| §15.247 (a)(2) | 6 dB Emission Bandwidth | Compliance |
| - | 99% Occupied Bandwidth | Report only |
| §15.247(d) | 100kHz Bandwidth of Frequency Band Edge | Compliance |
| §15.205, §15.209, §15.247(d) | Radiated emission | Compliance |
| - | Duty Cycle | Report only |

## 3.2 Limit

| Test items | Limit |
|---|---|
| AC Line Conducted Emissions | See details §15.207 (a) |
| Conducted Output Power | For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. |
| 6dB Emission Bandwidth | The minimum 6 dB bandwidth shall be at least 500 kHz. |
| Power Spectral Density | For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. |
| Spurious Emissions, 100kHz Bandwidth of Frequency Band Edge | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)). |

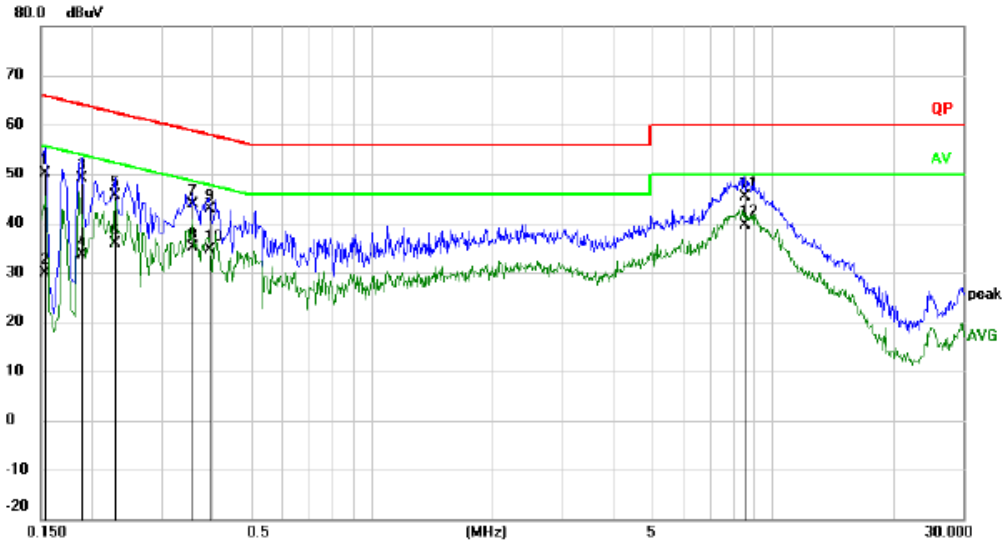
## 3.3 AC Line Conducted Emissions Test Data

| Test Date: | 2025-03-18 | Test By: | Ryan Zhang |
|---|---|---|---|
| Environment condition: | Temperature: 24.8°C; Relative Humidity:34%; ATM Pressure: 101.0kPa | | |

Model: H7094

Conducted Emission Measurement

File :2405Z107575E Data :#3 Date: 2025/3/18 Time: 13:15:43




Limit: QP
Mode: Transmitting
Note: BLE 2402

Phase: L1
Power: AC 120V/60Hz

Temperature: 24.8 ℃
Humidity: 34 %
Air Pressure: 1010 hpa

Receiver Setting: 0.15~30MHz: Pre-scan: RBW: 9kHz, DET: PK/AV; Final measure: RBW: 9kHz, DET: QP/AV

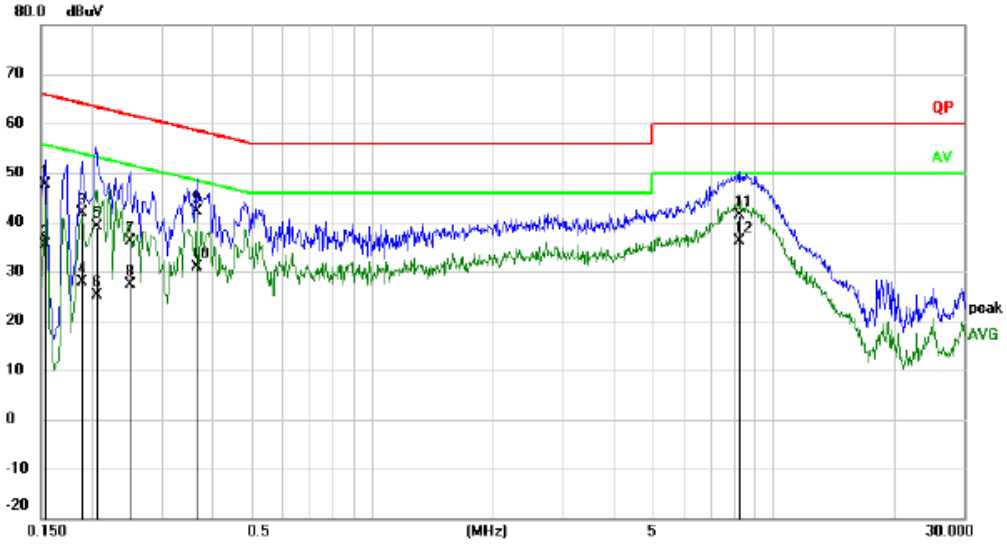
| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over Limit | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1539 | 39.53 | 10.56 | 50.09 | 65.79 | -15.70 | QP | |
| 2 | | 0.1539 | 19.33 | 10.56 | 29.89 | 55.79 | -25.90 | AVG | |
| 3 | | 0.1900 | 38.57 | 10.64 | 49.21 | 64.04 | -14.83 | QP | |
| 4 | | 0.1900 | 22.99 | 10.64 | 33.63 | 54.04 | -20.41 | AVG | |
| 5 | | 0.2300 | 35.02 | 10.67 | 45.69 | 62.45 | -16.76 | QP | |
| 6 | | 0.2300 | 25.10 | 10.67 | 35.77 | 52.45 | -16.68 | AVG | |
| 7 | | 0.3580 | 33.18 | 10.68 | 43.86 | 58.77 | -14.91 | QP | |
| 8 | | 0.3580 | 24.55 | 10.68 | 35.23 | 48.77 | -13.54 | AVG | |
| 9 | | 0.3940 | 32.16 | 10.68 | 42.84 | 57.98 | -15.14 | QP | |
| 10 | | 0.3940 | 24.03 | 10.68 | 34.71 | 47.98 | -13.27 | AVG | |
| 11 | | 8.5100 | 34.78 | 10.48 | 45.26 | 60.00 | -14.74 | QP | |
| 12 | * | 8.5100 | 29.16 | 10.48 | 39.64 | 50.00 | -10.36 | AVG | |

*:Maximum data x:Over limit !:over margin

Engineer Signature: Ryan

## Conducted Emission Measurement

File :2405Z107575E Data :#4 Date: 2025/3/18 Time: 13:17:30




Limit: QP
Mode: Transmitting
Note: BLE 2402

Phase: N
Power: AC 120V/60Hz

Temperature: 24.8 ℃
Humidity: 34 %
Air Pressure: 1010 hpa

Receiver Setting: 0.15~30MHz: Pre-scan: RBW: 9kHz, DET: PK/AV; Final measure: RBW: 9kHz, DET: QP/AV

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over Limit | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1539 | 37.16 | 10.45 | 47.61 | 65.79 | -18.18 | QP | |
| 2 | | 0.1539 | 24.98 | 10.45 | 35.43 | 55.79 | -20.36 | AVG | |
| 3 | | 0.1900 | 31.48 | 10.46 | 41.94 | 64.04 | -22.10 | QP | |
| 4 | | 0.1900 | 17.37 | 10.46 | 27.83 | 54.04 | -26.21 | AVG | |
| 5 | | 0.2060 | 28.63 | 10.47 | 39.10 | 63.37 | -24.27 | QP | |
| 6 | | 0.2060 | 14.67 | 10.47 | 25.14 | 53.37 | -28.23 | AVG | |
| 7 | | 0.2500 | 25.60 | 10.52 | 36.12 | 61.76 | -25.64 | QP | |
| 8 | | 0.2500 | 16.85 | 10.52 | 27.37 | 51.76 | -24.39 | AVG | |
| 9 | | 0.3660 | 31.46 | 10.65 | 42.11 | 58.59 | -16.48 | QP | |
| 10 | | 0.3660 | 20.22 | 10.65 | 30.87 | 48.59 | -17.72 | AVG | |
| 11 | | 8.2660 | 30.95 | 10.45 | 41.40 | 60.00 | -18.60 | QP | |
| 12 | * | 8.2660 | 25.72 | 10.45 | 36.17 | 50.00 | -13.83 | AVG | |

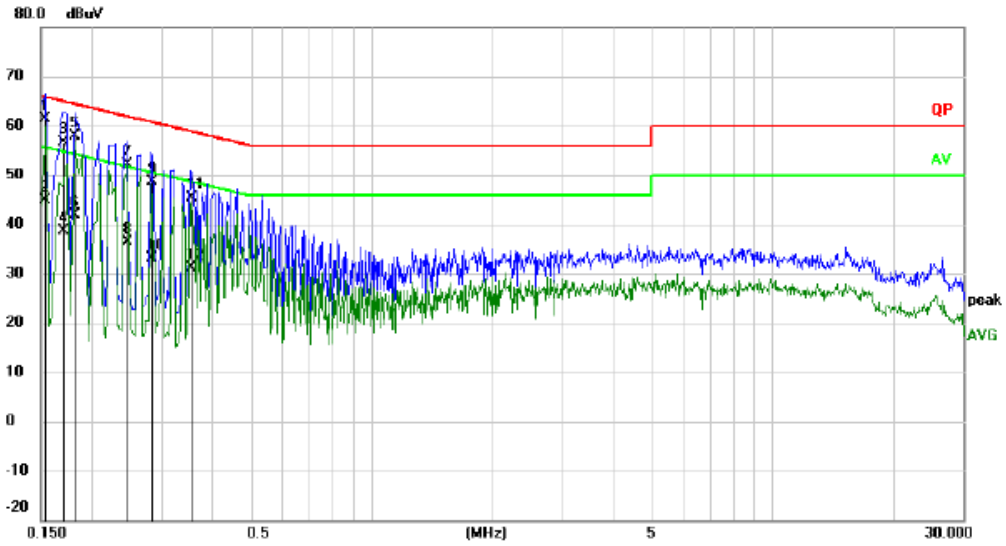
*:Maximum data x:Over limit !:over margin

Engineer Signature: Ryan

Model: H7093

## Conducted Emission Measurement

File :2405Z107575E Data :#21 Date: 2025/3/18 Time: 15:00:27




Limit: QP
Mode: Transmitting
Note: BLE 2402

Phase: L1
Power: AC 120V/60Hz

Temperature: 24.8 ℃
Humidity: 34 %
Air Pressure: 1010 hpa

Receiver Setting: 0.15~30MHz: Pre-scan: RBW: 9kHz, DET: PK/AV; Final measure: RBW: 9kHz, DET: QP/AV

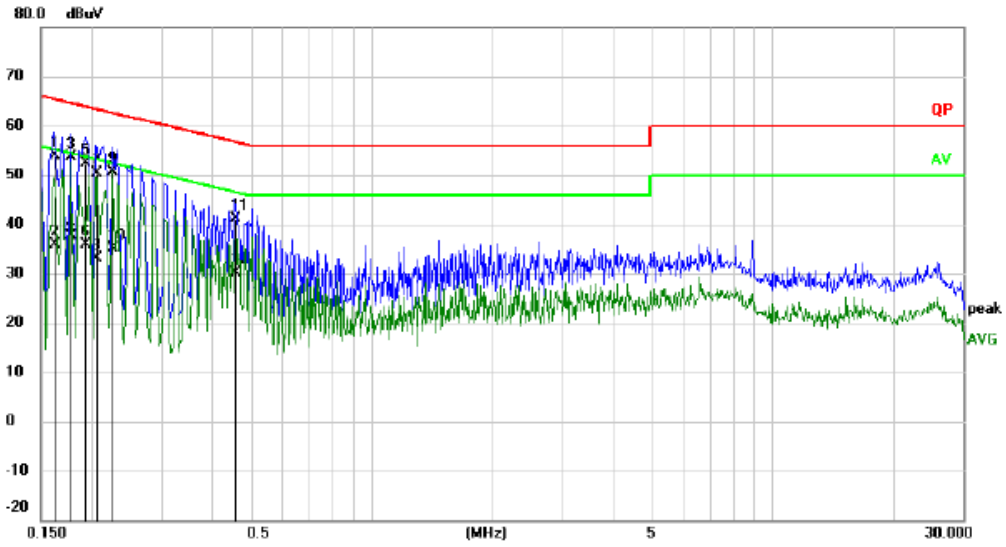
| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over Limit | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | * | 0.1539 | 50.80 | 10.56 | 61.36 | 65.79 | -4.43 | QP | |
| 2 | | 0.1539 | 34.38 | 10.56 | 44.94 | 55.79 | -10.85 | AVG | |
| 3 | | 0.1700 | 45.93 | 10.59 | 56.52 | 64.96 | -8.44 | QP | |
| 4 | | 0.1700 | 28.00 | 10.59 | 38.59 | 54.96 | -16.37 | AVG | |
| 5 | | 0.1819 | 47.15 | 10.62 | 57.77 | 64.40 | -6.63 | QP | |
| 6 | | 0.1819 | 31.23 | 10.62 | 41.85 | 54.40 | -12.55 | AVG | |
| 7 | | 0.2460 | 41.51 | 10.67 | 52.18 | 61.89 | -9.71 | QP | |
| 8 | | 0.2460 | 25.69 | 10.67 | 36.36 | 51.89 | -15.53 | AVG | |
| 9 | | 0.2819 | 37.88 | 10.68 | 48.56 | 60.76 | -12.20 | QP | |
| 10 | | 0.2819 | 22.47 | 10.68 | 33.15 | 50.76 | -17.61 | AVG | |
| 11 | | 0.3540 | 34.59 | 10.68 | 45.27 | 58.87 | -13.60 | QP | |
| 12 | | 0.3540 | 20.34 | 10.68 | 31.02 | 48.87 | -17.85 | AVG | |

*:Maximum data x:Over limit !:over margin

Engineer Signature: Ryan

**Conducted Emission Measurement**

File :2405Z107575E Data :#22 Date: 2025/3/18 Time: 15:02:53




Limit: QP
Mode: Transmitting
Note: BLE 2402

Phase: N
Power: AC 120V/60Hz

Temperature: 24.8 ℃
Humidity: 34 %
Air Pressure: 1010 hpa

Receiver Setting: 0.15~30MHz: Pre-scan: RBW: 9kHz, DET: PK/AV; Final measure: RBW: 9kHz, DET: QP/AV

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over Limit | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1620 | 43.45 | 10.45 | 53.90 | 65.36 | -11.46 | QP | |
| 2 | | 0.1620 | 25.46 | 10.45 | 35.91 | 55.36 | -19.45 | AVG | |
| 3 | * | 0.1780 | 43.19 | 10.46 | 53.65 | 64.58 | -10.93 | QP | |
| 4 | | 0.1780 | 27.26 | 10.46 | 37.72 | 54.58 | -16.86 | AVG | |
| 5 | | 0.1940 | 41.94 | 10.46 | 52.40 | 63.86 | -11.46 | QP | |
| 6 | | 0.1940 | 25.46 | 10.46 | 35.92 | 53.86 | -17.94 | AVG | |
| 7 | | 0.2060 | 39.82 | 10.47 | 50.29 | 63.37 | -13.08 | QP | |
| 8 | | 0.2060 | 22.78 | 10.47 | 33.25 | 53.37 | -20.12 | AVG | |
| 9 | | 0.2260 | 40.24 | 10.50 | 50.74 | 62.60 | -11.86 | QP | |
| 10 | | 0.2260 | 24.52 | 10.50 | 35.02 | 52.60 | -17.58 | AVG | |
| 11 | | 0.4580 | 30.32 | 10.75 | 41.07 | 56.73 | -15.66 | QP | |
| 12 | | 0.4580 | 19.42 | 10.75 | 30.17 | 46.73 | -16.56 | AVG | |

*:Maximum data x:Over limit !:over margin

Engineer Signature: Ryan

***Remark:***

*Measurement (dBuV)= Reading Level (dBuV) + Correct Factor(dB)*

*Correct Factor(dB)= LISN Voltage Division Factor (dB)+ Cable loss(dB)*

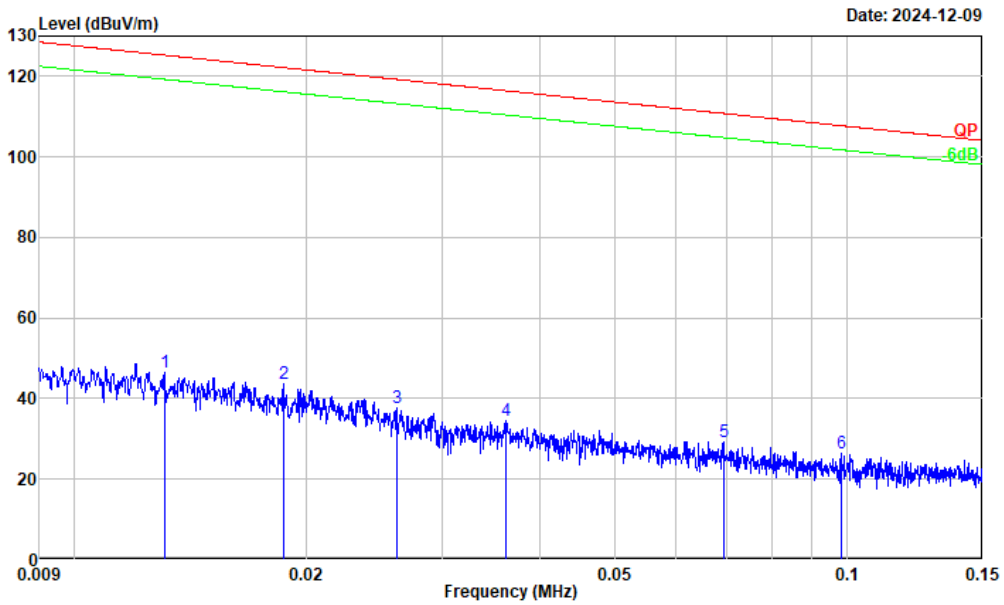
*Over Limit = Measurement – Limit*

# 3.4 Radiated emission Test Data

**9 kHz-30MHz:**

| | | | |
|---|---|---|---|
| **Test Date:** | 2024-12-09 | **Test By:** | Luke Li |
| **Environment condition:** | Temperature: 25.2°C; Relative Humidity:43%; ATM Pressure: 101.1kPa | | |

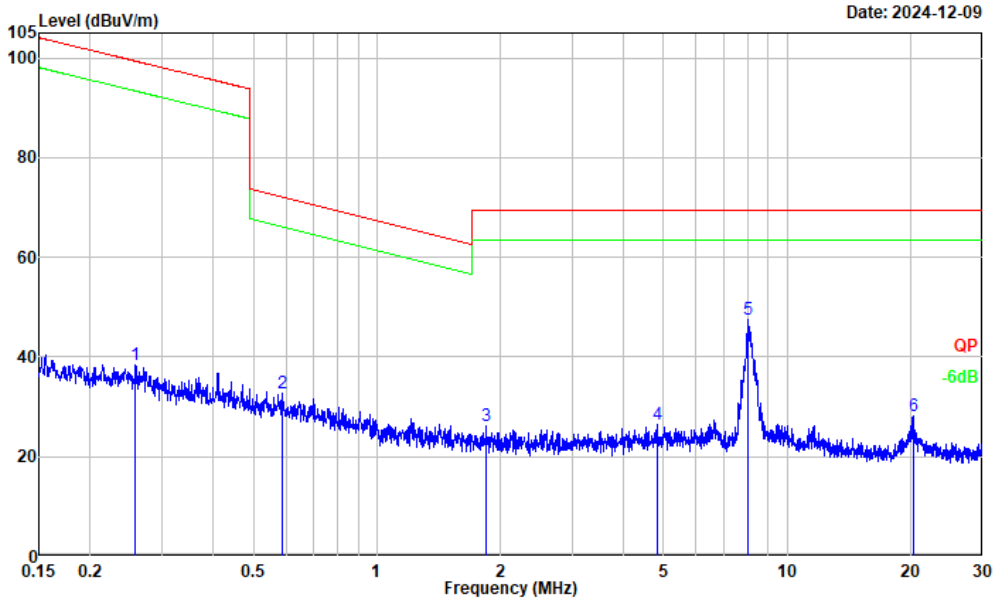
Model: H7094




Project No. : 2405Z107575E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 25.2℃/43%R.H./101.1kPa
Tested by : Luke Li
Polarization : PARALLEL
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.013 | 11.22 | 35.33 | 46.55 | 125.27 | -78.72 | Peak |
| 2 | 0.019 | 11.81 | 31.79 | 43.60 | 122.19 | -78.59 | Peak |
| 3 | 0.026 | 10.48 | 27.06 | 37.54 | 119.27 | -81.73 | Peak |
| 4 | 0.036 | 11.12 | 23.32 | 34.44 | 116.42 | -81.98 | Peak |
| 5 | 0.069 | 11.54 | 17.84 | 29.38 | 110.78 | -81.40 | Peak |
| 6 | 0.098 | 11.26 | 15.23 | 26.49 | 107.76 | -81.27 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: RBW/VBW: 200Hz/1kHz, DET: PK

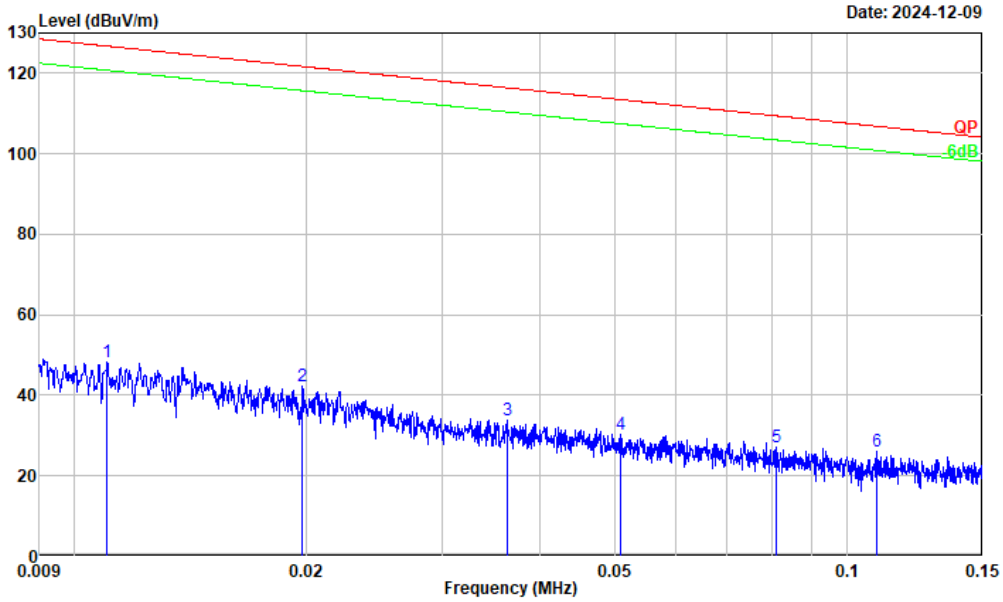



Project No. : 2405Z107575E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 25.2℃/43%R.H./101.1kPa
Tested by : Luke Li
Polarization : PARALLEL
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.258 | 27.77 | 10.63 | 38.40 | 99.37 | -60.97 | Peak |
| 2 | 0.589 | 28.08 | 4.74 | 32.82 | 72.17 | -39.35 | Peak |
| 3 | 1.843 | 28.11 | -1.98 | 26.13 | 69.54 | -43.41 | Peak |
| 4 | 4.811 | 30.47 | -3.90 | 26.57 | 69.54 | -42.97 | Peak |
| 5 | 8.030 | 51.31 | -3.83 | 47.48 | 69.54 | -22.06 | Peak |
| 6 | 20.375 | 31.31 | -3.11 | 28.20 | 69.54 | -41.34 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: RBW/VBW: 9kHz/30kHz, DET: PK

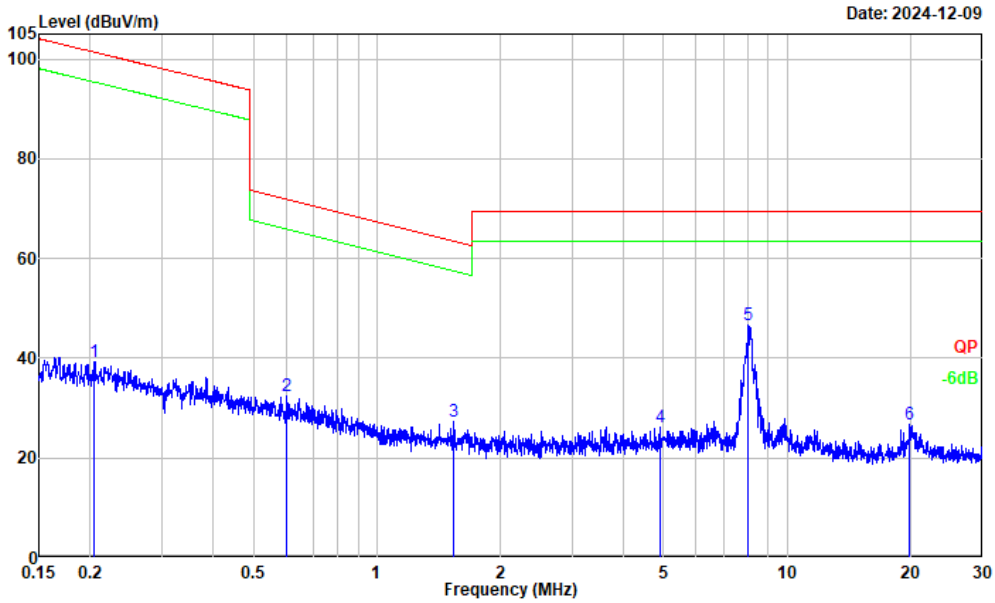
Model: H7093




Project No. : 2405Z107575E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 25.2℃/43%R.H./101.1kPa
Tested by : Luke Li
Polarization : PARALLEL
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.011 | 11.49 | 36.63 | 48.12 | 126.75 | -78.63 | Peak |
| 2 | 0.020 | 11.23 | 31.12 | 42.35 | 121.70 | -79.35 | Peak |
| 3 | 0.036 | 10.63 | 23.30 | 33.93 | 116.39 | -82.46 | Peak |
| 4 | 0.051 | 10.07 | 20.36 | 30.43 | 113.45 | -83.02 | Peak |
| 5 | 0.081 | 10.95 | 16.30 | 27.25 | 109.42 | -82.17 | Peak |
| 6 | 0.109 | 11.36 | 14.84 | 26.20 | 106.82 | -80.62 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: RBW/VBW: 200Hz/1kHz, DET: PK




Project No. : 2405Z107575E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 25.2℃/43%R.H./101.1kPa
Tested by : Luke Li
Polarization : PARALLEL
Remark : BLE 1M 2402

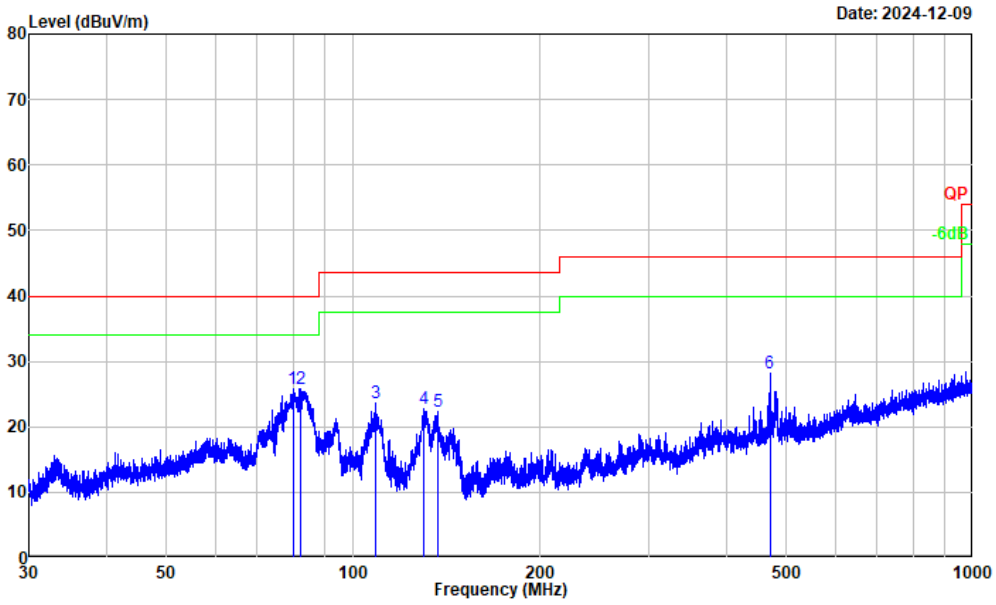
| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 0.205 | 27.12 | 12.10 | 39.22 | 101.37 | -62.15 | Peak |
| 2 | 0.605 | 27.83 | 4.57 | 32.40 | 71.94 | -39.54 | Peak |
| 3 | 1.539 | 28.52 | -1.08 | 27.44 | 63.65 | -36.21 | Peak |
| 4 | 4.888 | 30.07 | -3.91 | 26.16 | 69.54 | -43.38 | Peak |
| 5 | 8.030 | 50.40 | -3.83 | 46.57 | 69.54 | -22.97 | Peak |
| 6 | 19.912 | 29.73 | -3.08 | 26.65 | 69.54 | -42.89 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: RBW/VBW: 9kHz/30kHz, DET: PK

**30MHz-1GHz:**

| **Test Date:** | 2024-12-09 | **Test By:** | Bard Huang |
|---|---|---|---|
| **Environment condition:** | Temperature: 25.2°C; Relative Humidity:43%; ATM Pressure: 101.1kPa | | |

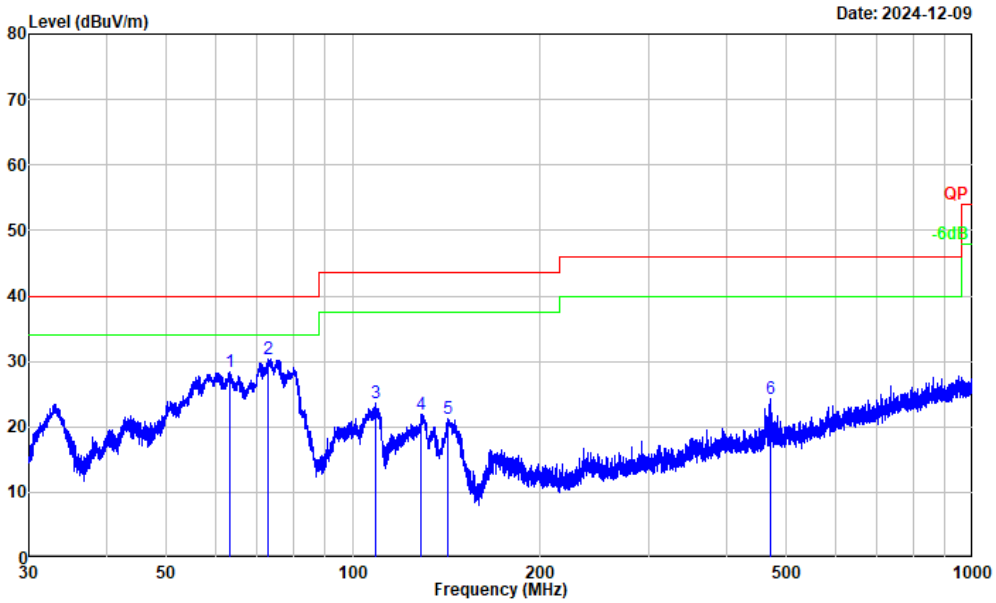
Model: H7094




Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 25.2℃/43%R.H./101.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 79.975 | 43.92 | -18.06 | 25.86 | 40.00 | -14.14 | Peak |
| 2 | 82.431 | 43.49 | -17.66 | 25.83 | 40.00 | -14.17 | Peak |
| 3 | 108.933 | 37.63 | -14.09 | 23.54 | 43.50 | -19.96 | Peak |
| 4 | 130.322 | 40.13 | -17.27 | 22.86 | 43.50 | -20.64 | Peak |
| 5 | 137.119 | 39.92 | -17.52 | 22.40 | 43.50 | -21.10 | Peak |
| 6 | 470.317 | 36.42 | -8.16 | 28.26 | 46.00 | -17.74 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Pre-scan: RBW/VBW: 100kHz/300kHz, DET: PK
Final measure: RBW: 120kHz, DET: QP

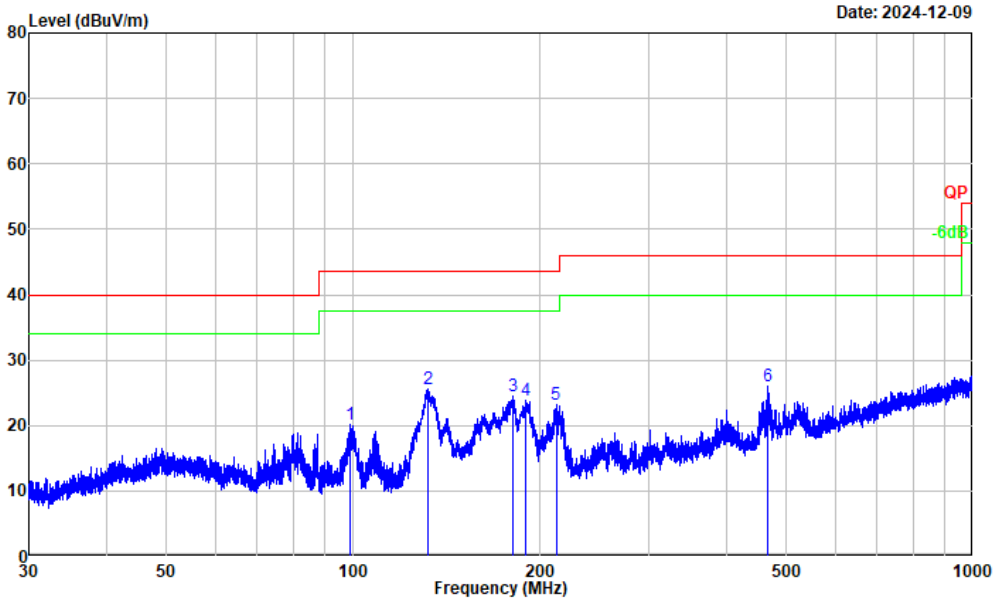



Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 25.2℃/43%R.H./101.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 63.369 | 42.45 | -14.13 | 28.32 | 40.00 | -11.68 | Peak |
| 2 | 73.103 | 47.84 | -17.46 | 30.38 | 40.00 | -9.62 | Peak |
| 3 | 109.029 | 37.64 | -14.10 | 23.54 | 43.50 | -19.96 | Peak |
| 4 | 128.845 | 39.02 | -17.15 | 21.87 | 43.50 | -21.63 | Peak |
| 5 | 142.574 | 38.92 | -17.58 | 21.34 | 43.50 | -22.16 | Peak |
| 6 | 470.523 | 32.35 | -8.16 | 24.19 | 46.00 | -21.81 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Pre-scan: RBW/VBW: 100kHz/300kHz, DET: PK
Final measure: RBW: 120kHz, DET: QP

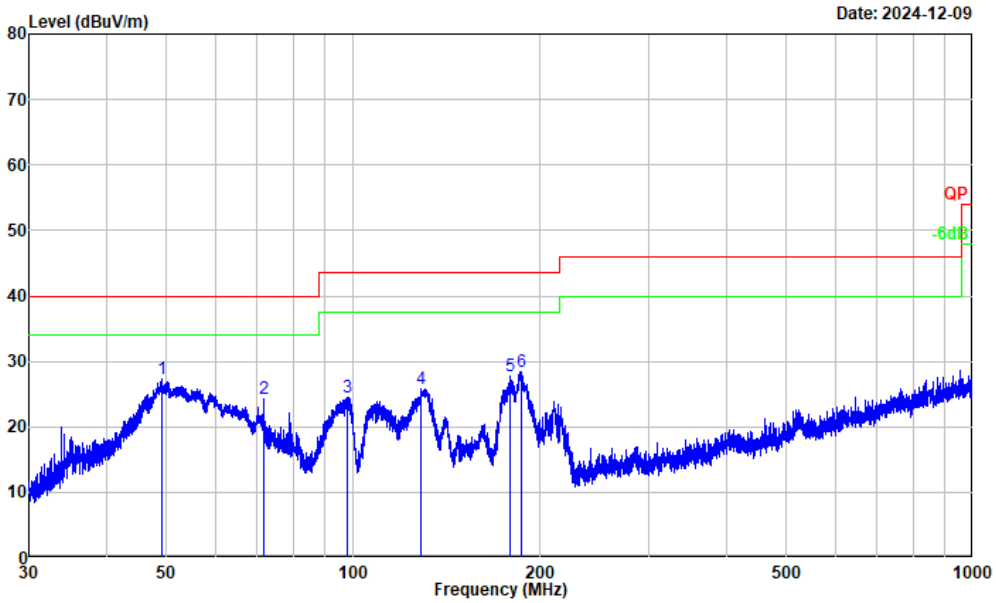
Model: H7093




Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 25.2℃/43%R.H./101.1kPa
Tested by : Bard Huang
Polarization : horizontal
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 98.963 | 34.46 | -14.35 | 20.11 | 43.50 | -23.39 | Peak |
| 2 | 131.989 | 42.87 | -17.35 | 25.52 | 43.50 | -17.98 | Peak |
| 3 | 181.125 | 40.11 | -15.60 | 24.51 | 43.50 | -18.99 | Peak |
| 4 | 189.739 | 38.54 | -14.69 | 23.85 | 43.50 | -19.65 | Peak |
| 5 | 212.642 | 37.07 | -13.88 | 23.19 | 43.50 | -20.31 | Peak |
| 6 | 467.235 | 34.35 | -8.23 | 26.12 | 46.00 | -19.88 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Pre-scan: RBW/VBW: 100kHz/300kHz, DET: PK
Final measure: RBW: 120kHz, DET: QP




Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 25.2℃/43%R.H./101.1kPa
Tested by : Bard Huang
Polarization : vertical
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 49.165 | 39.39 | -12.15 | 27.24 | 40.00 | -12.76 | Peak |
| 2 | 71.801 | 41.25 | -17.06 | 24.19 | 40.00 | -15.81 | Peak |
| 3 | 97.927 | 38.88 | -14.45 | 24.43 | 43.50 | -19.07 | Peak |
| 4 | 128.902 | 42.93 | -17.16 | 25.77 | 43.50 | -17.73 | Peak |
| 5 | 178.915 | 43.42 | -15.72 | 27.70 | 43.50 | -15.80 | Peak |
| 6 | 186.932 | 43.41 | -14.99 | 28.42 | 43.50 | -15.08 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Pre-scan: RBW/VBW: 100kHz/300kHz, DET: PK
Final measure: RBW: 120kHz, DET: QP

**Above 1GHz:**

| **Test Date:** | 2025-02-05 | **Test By:** | Luke Li |
|---|---|---|---|
| **Environment condition:** | Temperature: 20.9°C; Relative Humidity:44%; ATM Pressure:101.3k Pa | | |

| **Frequency (MHz)** | **Reading level (dBμV)** | **Polar** | **Corrected Factor (dB/m)** | **Corrected Amplitude (dBμV/m)** | **Limit (dBμV/m)** | **Margin (dB)** | **Remark** |
|---|---|---|---|---|---|---|---|
| BLE 1M | | | | | | | |
| Low Channel | | | | | | | |
| 4804.000 | 54.69 | horizontal | -2.87 | 51.82 | 74.00 | -22.18 | Peak |
| 4804.000 | 52.52 | vertical | -2.87 | 49.65 | 74.00 | -24.35 | Peak |
| 7206.000 | 52.98 | horizontal | -1.98 | 51.00 | 74.00 | -23.00 | Peak |
| 7206.000 | 55.06 | vertical | -1.98 | 53.08 | 74.00 | -20.92 | Peak |
| Middle Channel | | | | | | | |
| 4880.000 | 54.84 | horizontal | -2.34 | 52.50 | 74.00 | -21.50 | Peak |
| 4880.000 | 53.18 | vertical | -2.34 | 50.84 | 74.00 | -23.16 | Peak |
| 7320.000 | 53.67 | horizontal | -2.24 | 51.43 | 74.00 | -22.57 | Peak |
| 7320.000 | 55.73 | vertical | -2.24 | 53.49 | 74.00 | -20.51 | Peak |
| High Channel | | | | | | | |
| 4960.000 | 53.23 | horizontal | -2.18 | 51.05 | 74.00 | -22.95 | Peak |
| 4960.000 | 51.88 | vertical | -2.18 | 49.70 | 74.00 | -24.30 | Peak |
| 7440.000 | 54.37 | horizontal | -1.99 | 52.38 | 74.00 | -21.62 | Peak |
| 7440.000 | 55.67 | vertical | -1.99 | 53.68 | 74.00 | -20.32 | Peak |

*Remark:*

*Corrected Amplitude= Reading level + corrected Factor*

*Corrected Factor = Antenna factor + Cable loss – Amplifier gain*

*Margin = Corrected Amplitude – Limit*

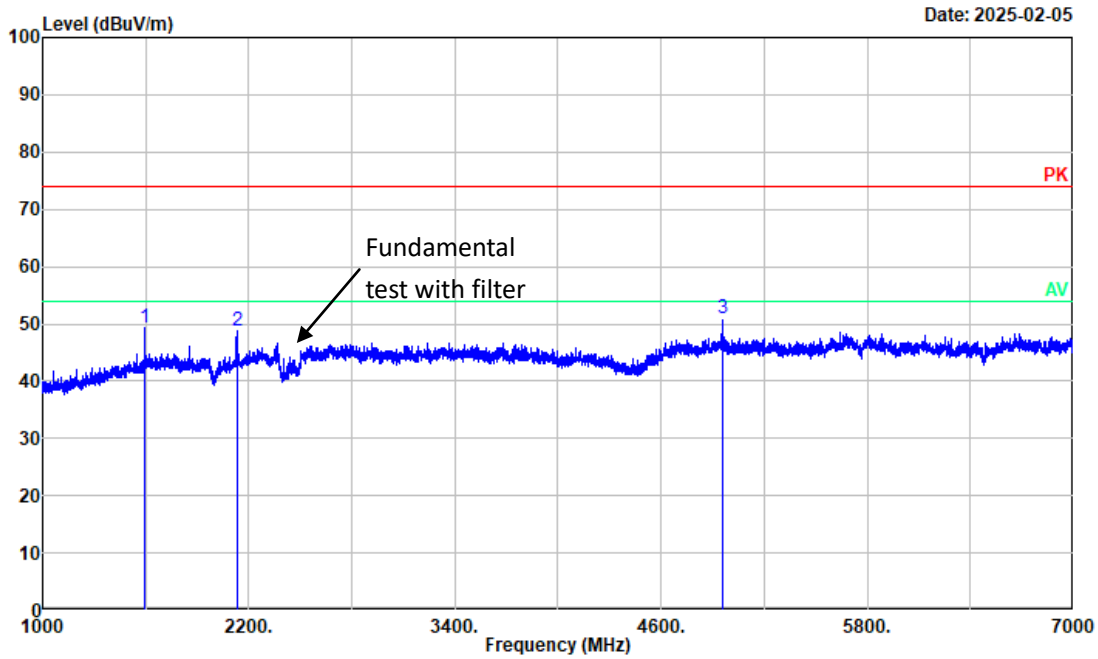
*For the test result of Peak below the Peak limit more than 20dB, which can compliance with the average limit, just the Peak level was recorded.*

*The emission levels of other frequencies that were lower than the limit 20dB, not show in test report.*

*For emissions in 18GHz-25GHz range, all emissions were investigated and in the noise floor level.*

**Test plot for worst case as below:**

| Mode: | BLE 1M | Channel: | 2480MHz |
|---|---|---|---|

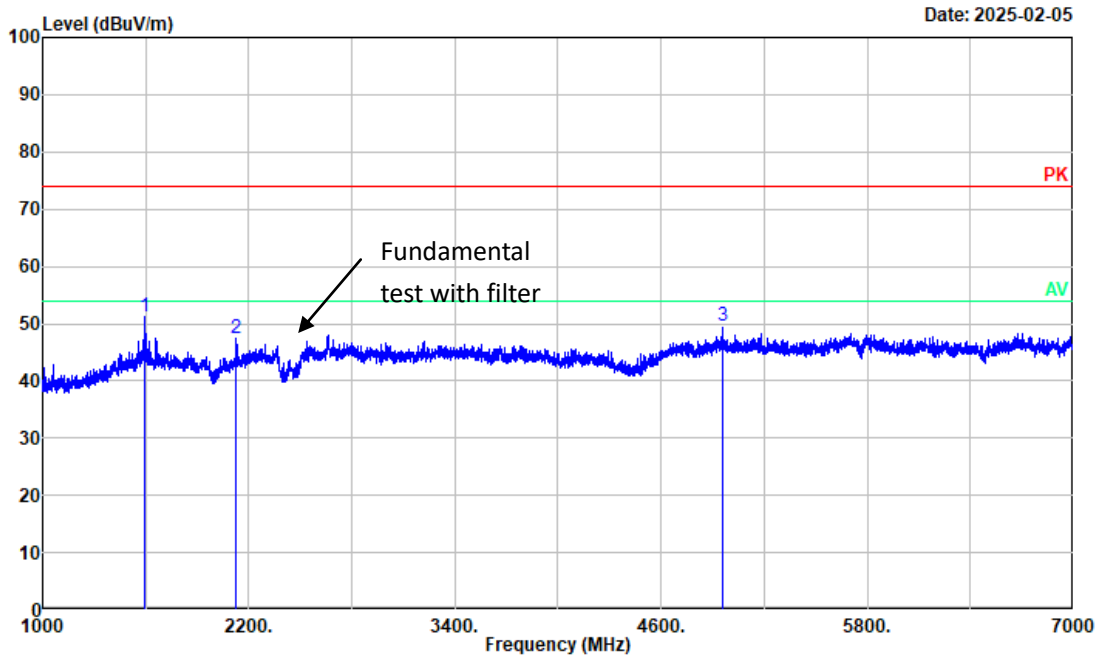



Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 20.9℃/44%R.H./101.3kPa
Tested by : Luke Li
Polarization : horizontal
Remark : BLE 1M 2480

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 1593.000 | 53.86 | -4.51 | 49.35 | 74.00 | -24.65 | Peak |
| 2 | 2131.000 | 52.94 | -4.23 | 48.71 | 74.00 | -25.29 | Peak |
| 3 | 4960.000 | 53.23 | -2.18 | 51.05 | 74.00 | -22.95 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VWB: 1MHz/3MHz, DET: PK
Average: RBW/VWB: 1MHz/10Hz , DET: PK

| Mode: | BLE 1M | Channel: | 2480MHz |
|---|---|---|---|

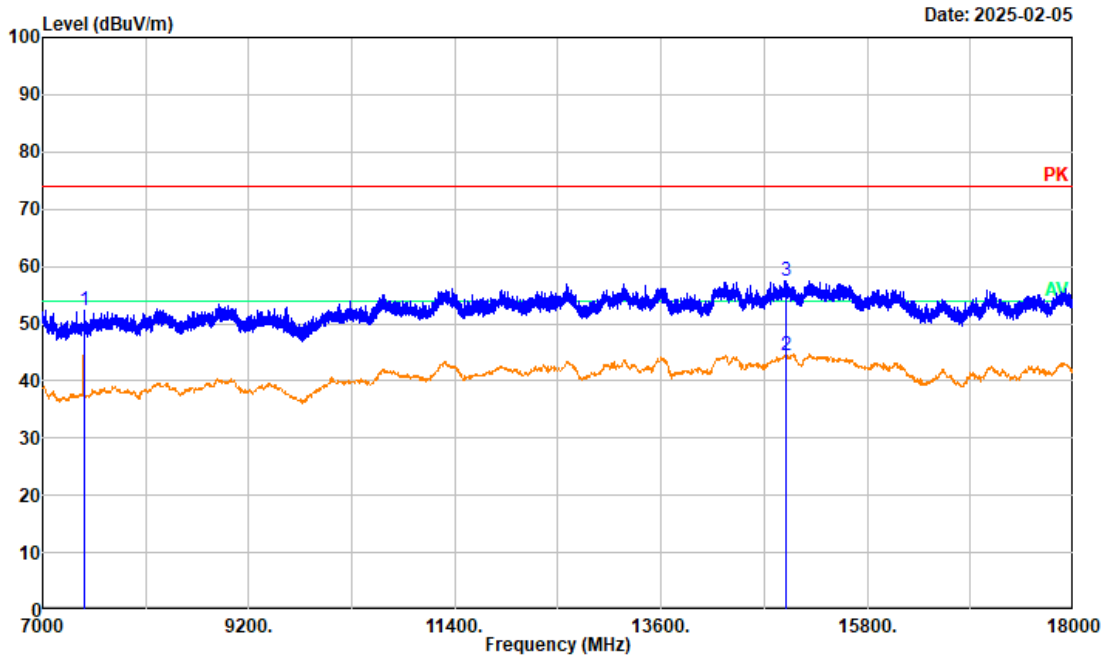



Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 20.9℃/44%R.H./101.3kPa
Tested by : Luke Li
Polarization : vertical
Remark : BLE 1M 2480

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 1595.000 | 55.73 | -4.49 | 51.24 | 74.00 | -22.76 | Peak |
| 2 | 2125.000 | 51.60 | -4.25 | 47.35 | 74.00 | -26.65 | Peak |
| 3 | 4960.000 | 51.88 | -2.18 | 49.70 | 74.00 | -24.30 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VWB: 1MHz/3MHz, DET: PK
Average: RBW/VWB: 1MHz/10Hz , DET: PK

| Mode: | BLE 1M | Channel: | 2480MHz |
|---|---|---|---|

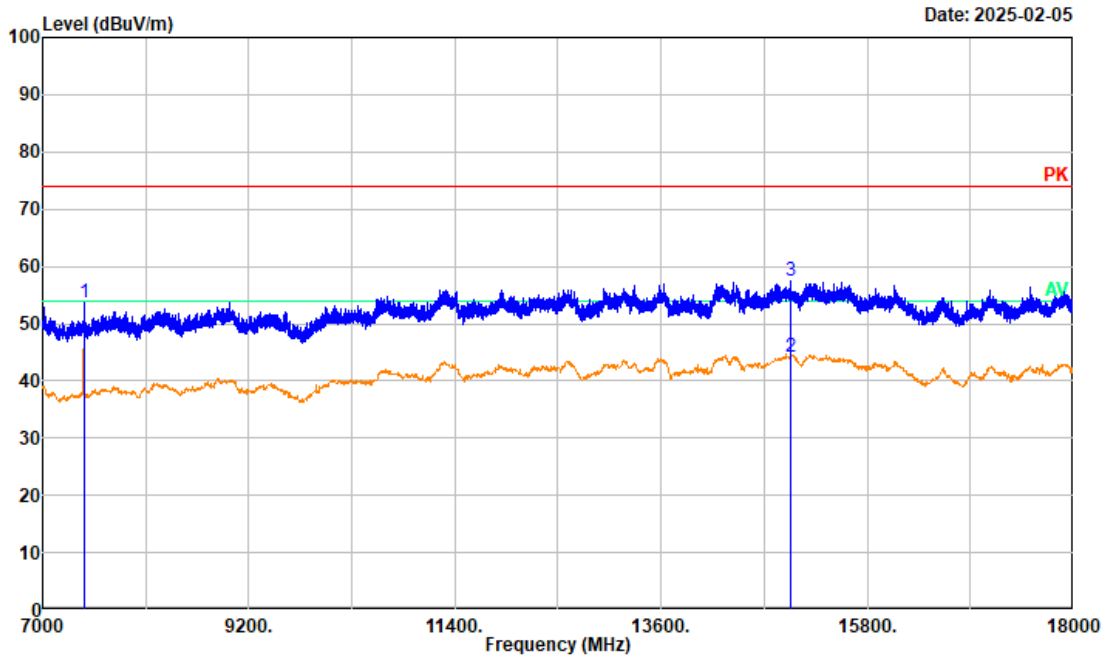



Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 20.9℃/44%R.H./101.3kPa
Tested by : Luke Li
Polarization : horizontal
Remark : BLE 1M 2480

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 7440.000 | 54.37 | -1.99 | 52.38 | 74.00 | -21.62 | Peak |
| 2 | 14934.000 | 38.76 | 5.57 | 44.33 | 54.00 | -9.67 | Average |
| 3 | 14934.000 | 52.01 | 5.57 | 57.58 | 74.00 | -16.42 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VWB: 1MHz/3MHz, DET: PK
Average: RBW/VWB: 1MHz/1kHz, DET: PK

| Mode: | BLE 1M | Channel: | 2480MHz |
|---|---|---|---|

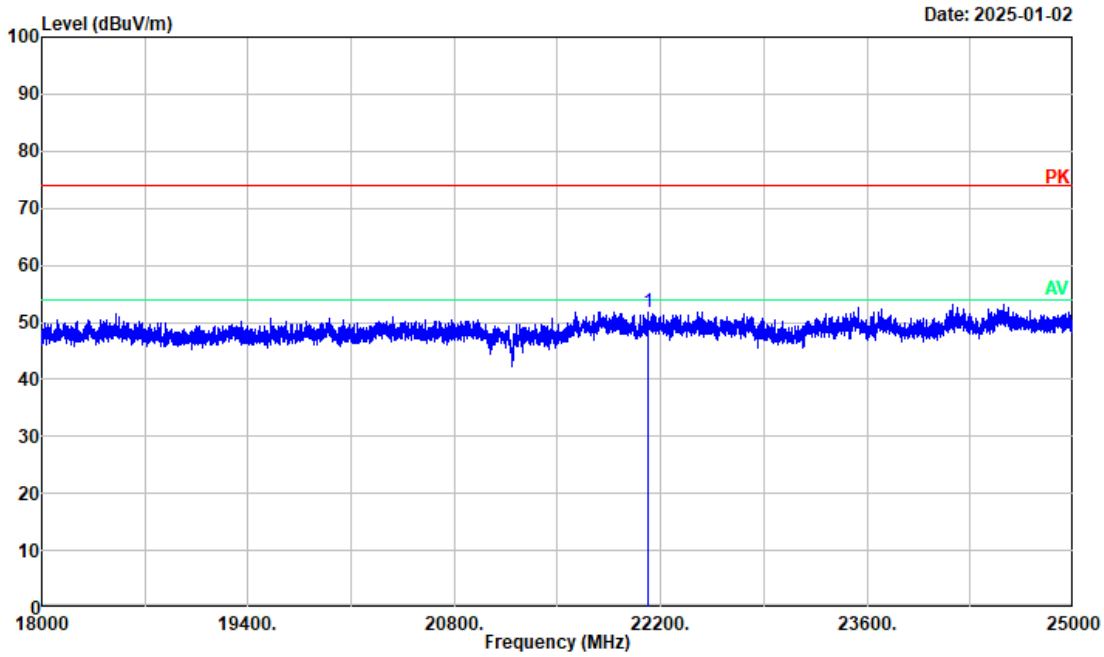



Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 20.9℃/44%R.H./101.3kPa
Tested by : Luke Li
Polarization : vertical
Remark : BLE 1M 2480

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 7440.000 | 55.67 | -1.99 | 53.68 | 74.00 | -20.32 | Peak |
| 2 | 14975.000 | 38.58 | 5.59 | 44.17 | 54.00 | -9.83 | Average |
| 3 | 14975.000 | 51.87 | 5.59 | 57.46 | 74.00 | -16.54 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VWB: 1MHz/3MHz, DET: PK
Average: RBW/VWB: 1MHz/1kHz, DET: PK

| Mode: | BLE 1M | Channel: | 2402MHz |
|---|---|---|---|

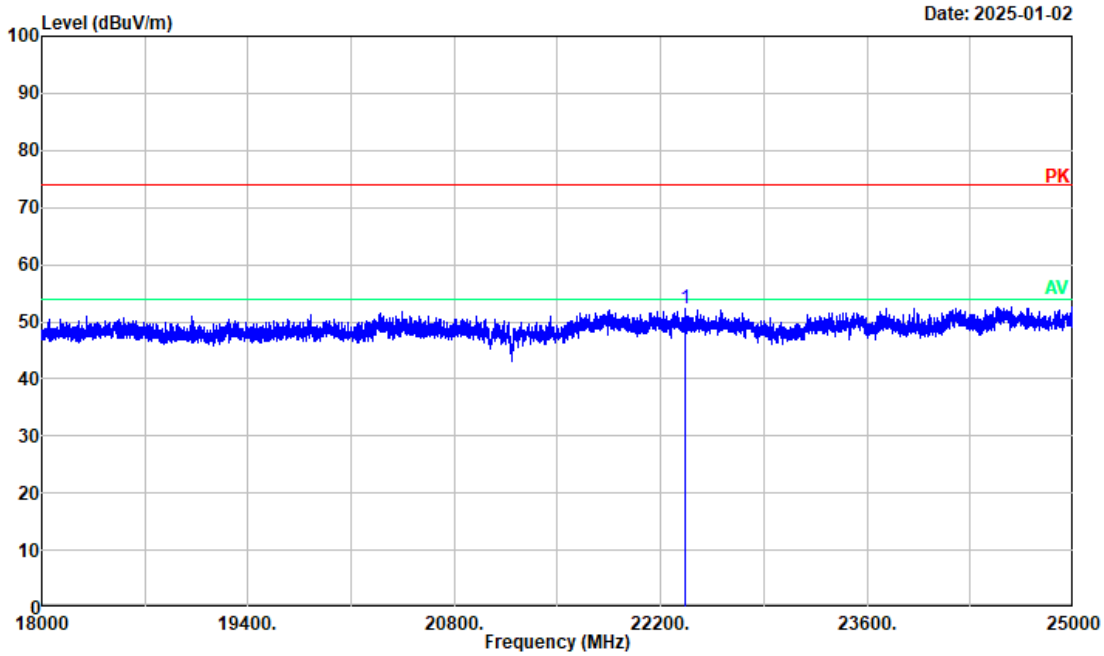



Project No. : 2405Z107575E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.5℃/40%R.H./101.1kPa
Tested by : Luke Li
Polarization : horizontal
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 22119.000 | 54.73 | -2.91 | 51.82 | 74.00 | -22.18 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain - Distance extrapolate factor
Distance extrapolate factor = 20*log(specified distance/measured distance)
Specified distance = 3 meters, measured distance = 1.5 meters
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK
Average: RBW/VBW: 1MHz/1kHz, DET: PK

| Mode: | BLE 1M | Channel: | 2402MHz |
|---|---|---|---|



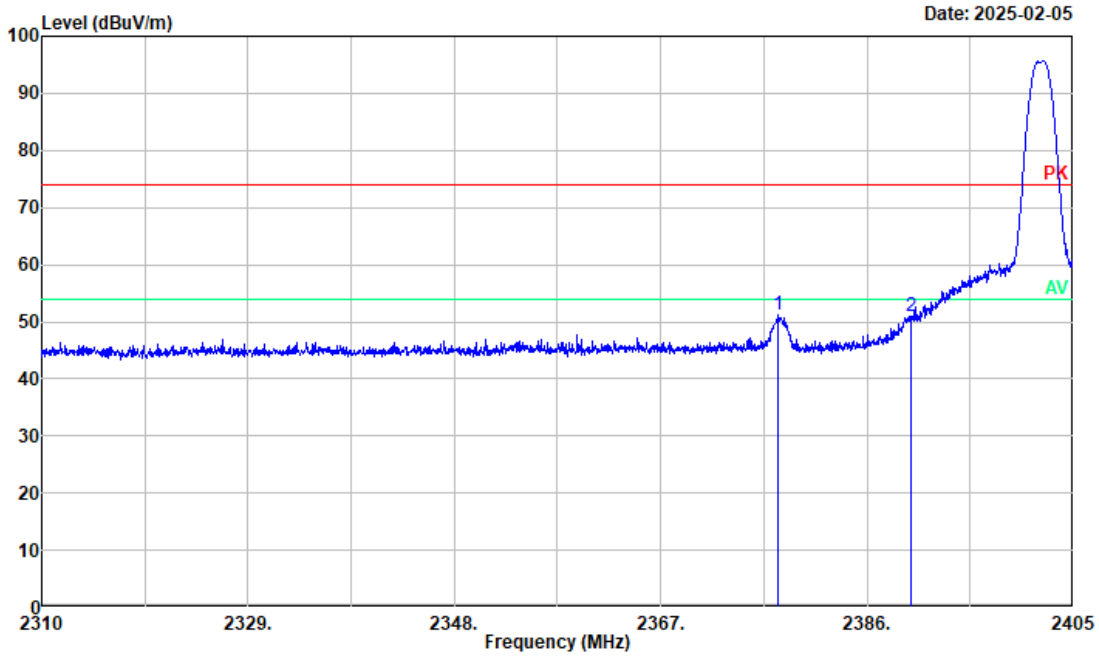

Project No. : 2405Z107575E-RF
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 24.5℃/40%R.H./101.1kPa
Tested by : Luke Li
Polarization : vertical
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 22366.000 | 55.31 | -2.87 | 52.44 | 74.00 | -21.56 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain - Distance extrapolate factor
Distance extrapolate factor = 20*log(specified distance/measured distance)
Specified distance = 3 meters, measured distance = 1.5 meters
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VBW: 1MHz/3MHz, DET: PK
Average: RBW/VBW: 1MHz/1kHz, DET: PK

**Radiated Band edge:**

| Mode: | BLE 1M | Channel: | 2402MHz |
|---|---|---|---|

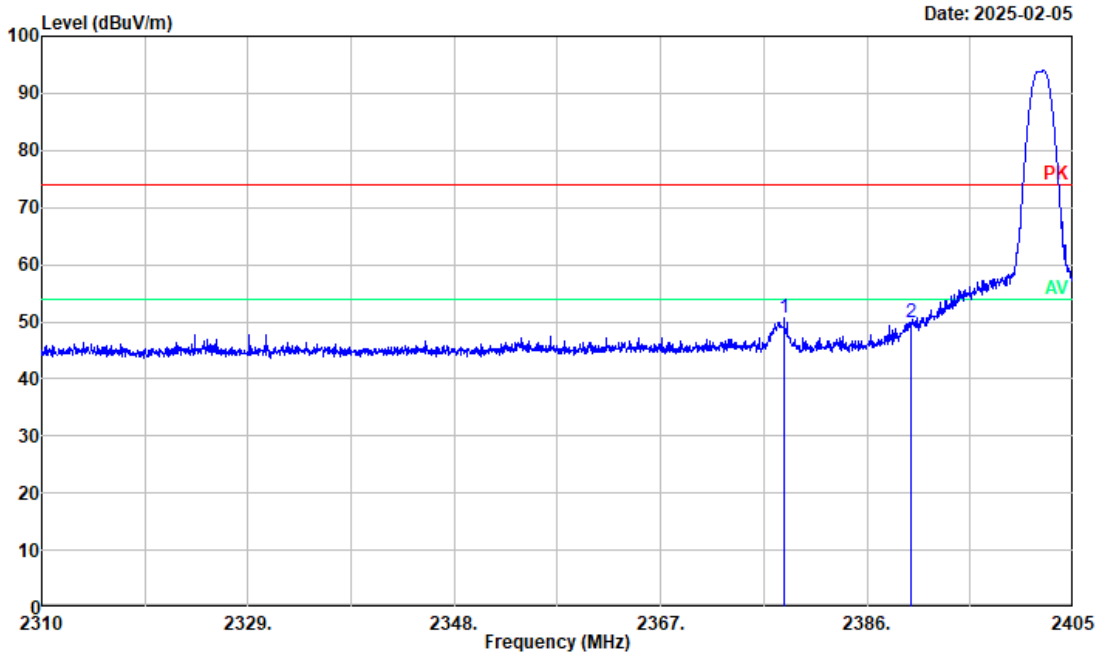



Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 20.9℃/44%R.H./101.3kPa
Tested by : Luke Li
Polarization : horizontal
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2377.864 | 54.51 | -3.18 | 51.33 | 74.00 | -22.67 | Peak |
| 2 | 2390.000 | 54.00 | -3.18 | 50.82 | 74.00 | -23.18 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VWB: 1MHz/3MHz, DET: PK
Average: RBW/VWB: 1MHz/10Hz , DET: PK

| Mode: | BLE 1M | Channel: | 2402MHz |
|---|---|---|---|

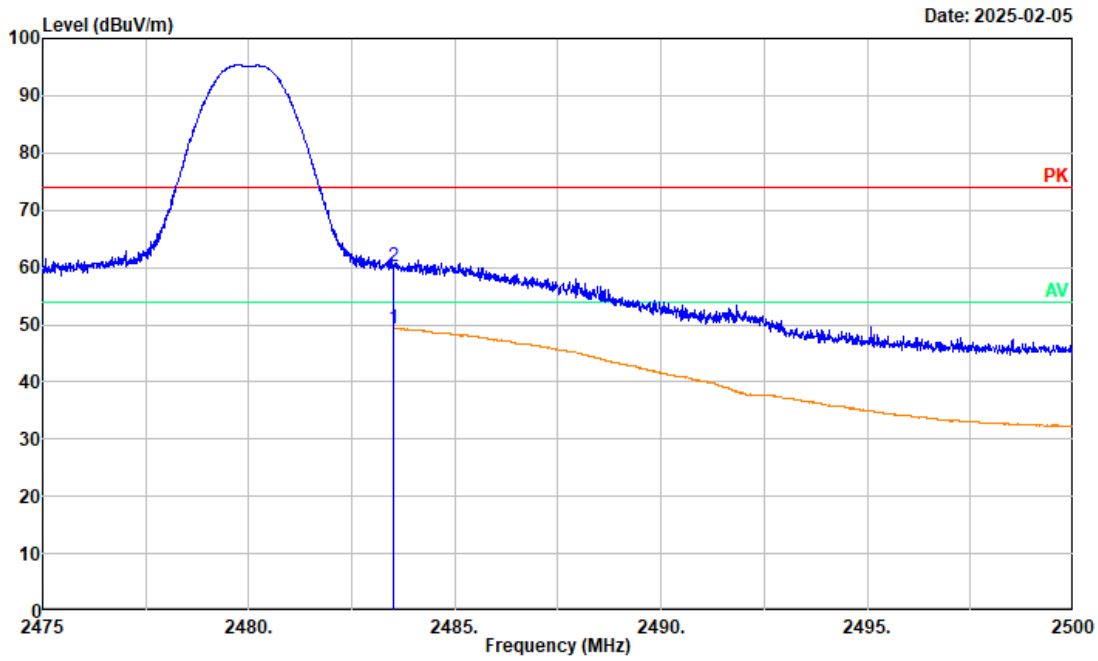



Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 20.9℃/44%R.H./101.3kPa
Tested by : Luke Li
Polarization : vertical
Remark : BLE 1M 2402

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2378.387 | 53.74 | -3.18 | 50.56 | 74.00 | -23.44 | Peak |
| 2 | 2390.000 | 53.07 | -3.18 | 49.89 | 74.00 | -24.11 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VWB: 1MHz/3MHz, DET: PK
Average: RBW/VWB: 1MHz/10Hz , DET: PK

| Mode: | BLE 1M | Channel: | 2480MHz |
|---|---|---|---|

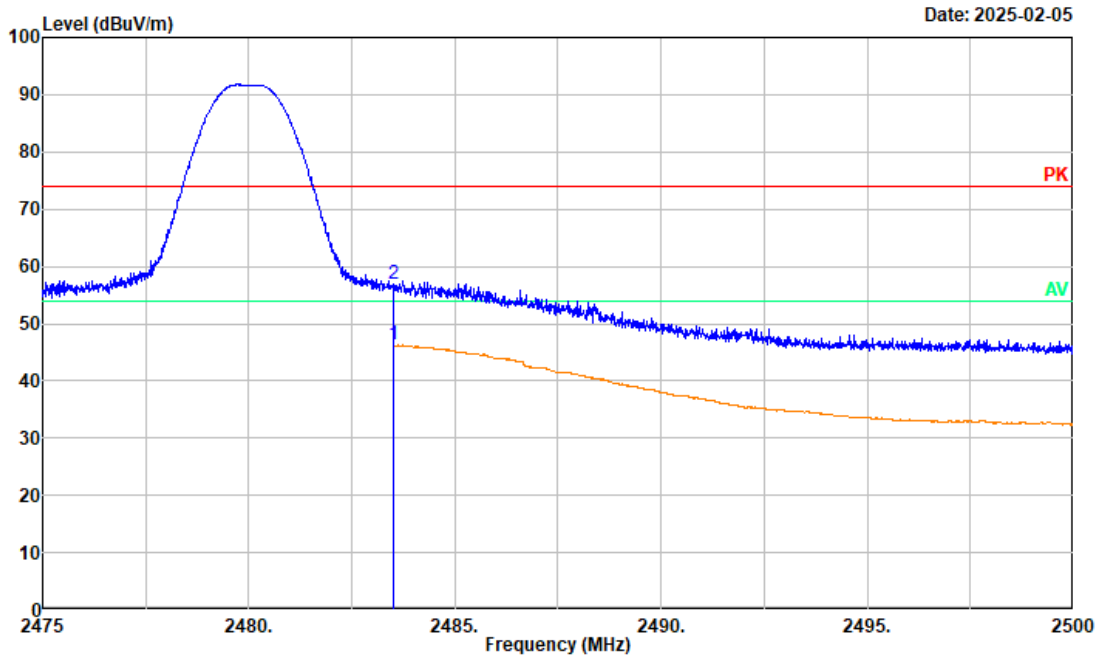



Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 20.9℃/44%R.H./101.3kPa
Tested by : Luke Li
Polarization : horizontal
Remark : BLE 1M 2480

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2483.500 | 52.31 | -2.98 | 49.33 | 54.00 | -4.67 | Average |
| 2 | 2483.500 | 63.12 | -2.98 | 60.14 | 74.00 | -13.86 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VWB: 1MHz/3MHz, DET: PK
Average: RBW/VWB: 1MHz/10Hz , DET: PK

| Mode: | BLE 1M | Channel: | 2480MHz |
|---|---|---|---|




Project No. : 2405Z107575E
Test Mode : Transmitting
Test Voltage : AC 120V/60Hz
Environment : 20.9℃/44%R.H./101.3kPa
Tested by : Luke Li
Polarization : vertical
Remark : BLE 1M 2480

| --No. | Frequency (MHz) | Reading (dBµV) | Factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Over Limit (dB) | Detector |
|---|---|---|---|---|---|---|---|
| 1 | 2483.500 | 49.22 | -2.98 | 46.24 | 54.00 | -7.76 | Average |
| 2 | 2483.500 | 59.76 | -2.98 | 56.78 | 74.00 | -17.22 | Peak |

Remarks: Factor = Antenna factor + Cable loss - Preamp gain
Result = Reading + Factor
Over Limit = Result - Limit
SA setting: Peak: RBW/VWB: 1MHz/3MHz, DET: PK
Average: RBW/VWB: 1MHz/10Hz , DET: PK

# 3.5 RF Conducted Test Data

| Test Date: | 2025-02-08 | Test By: | Ryan Zhang |
|---|---|---|---|
| Environment condition: | Temperature: 24.1°C;RelativeHumidity:53%; ATM Pressure: 100.3kPa | | |

## 3.5.1 6 dB Emission Bandwidth

**BLE 1M**

| Channel | Result (MHz) | Limit (MHz) | Verdict |
|---|---|---|---|
| Low | 0.681 | ≥0.5 | Pass |
| Middle | 0.681 | ≥0.5 | Pass |
| High | 0.681 | ≥0.5 | Pass |

## 3.5.2 99% Occupied Bandwidth

**BLE 1M**

| Channel | 99% OBW (MHz) |
|---|---|
| Low | 1.064 |
| Middle | 1.072 |
| High | 1.076 |

## 3.5.3 Maximum Conducted Peak Output Power

**BLE 1M**

| Channel | Result (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|
| Low | -0.99 | 30.00 | Pass |
| Middle | -1.09 | 30.00 | Pass |
| High | -1.12 | 30.00 | Pass |

## 3.5.4 Power Spectral Density

**BLE 1M**

| Channel | Result (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|---|---|---|---|
| Low | -14.77 | 8 | Pass |
| Middle | -14.99 | 8 | Pass |
| High | -14.92 | 8 | Pass |

## 3.5.5 100 kHz Bandwidth of Frequency Band Edge

**BLE 1M**

| Channel | Result (dB) | Limit (dB) | Verdict |
|---|---|---|---|
| Low | 41.26 | 20 | Pass |
| High | 42.34 | 20 | Pass |

## 3.5.6 Duty Cycle

**BLE 1M**

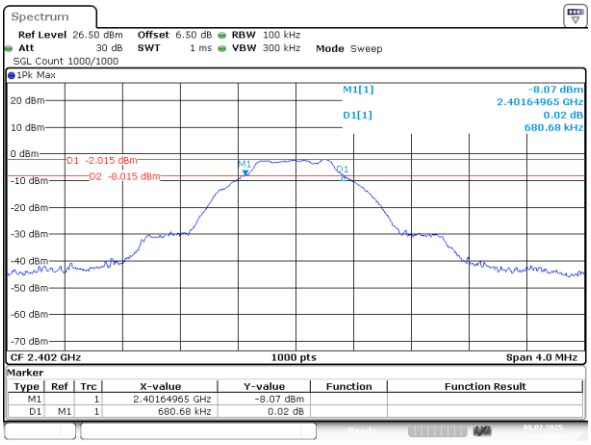
| Channel | Ton (ms) | Ton+Toff (ms) | Duty Cycle (%) | Duty Cycle Factor(dB) | 1/Ton (Hz) | VBW Setting (kHz) |
|---|---|---|---|---|---|---|
| Middle | 100 | 100 | 100 | / | NA | 0.010 |

# Test Plots:

### 6 dB Emission Bandwidth:

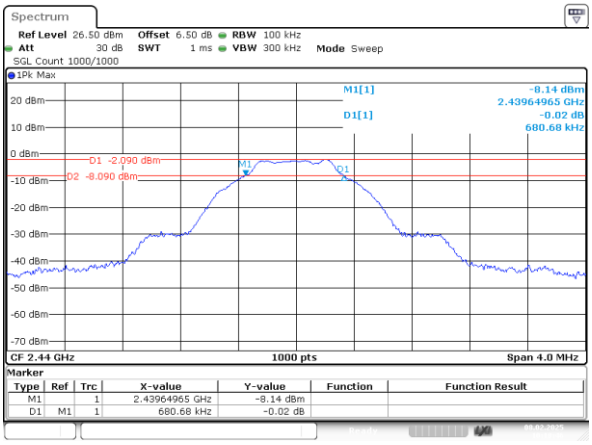
## BLE 1M

BLE_1M_Low_Channel



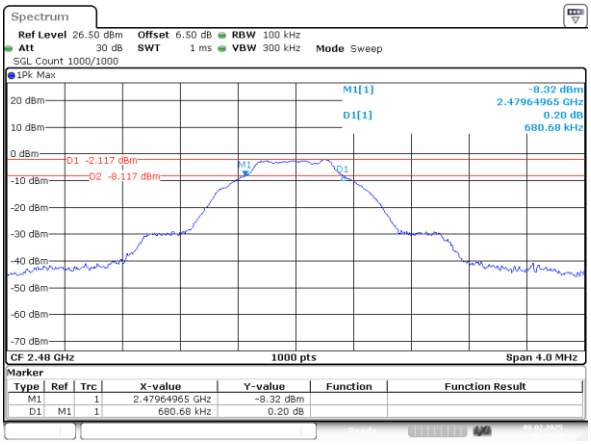

ProjectNo.:2405Z107575E-RF Tester:Ryan Zhang
Date: 8.FEB.2025 10:16:46

BLE_1M_Middle_Channel




ProjectNo.:2405Z107575E-RF Tester:Ryan Zhang
Date: 8.FEB.2025 10:18:46

BLE_1M_High_Channel

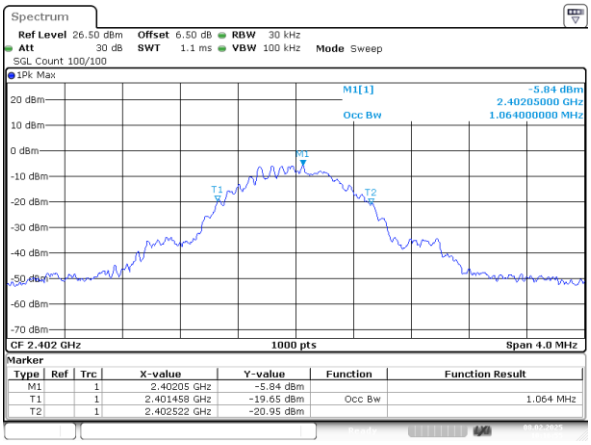



ProjectNo.:2405Z107575E-RF Tester:Ryan Zhang
Date: 8.FEB.2025 10:23:37

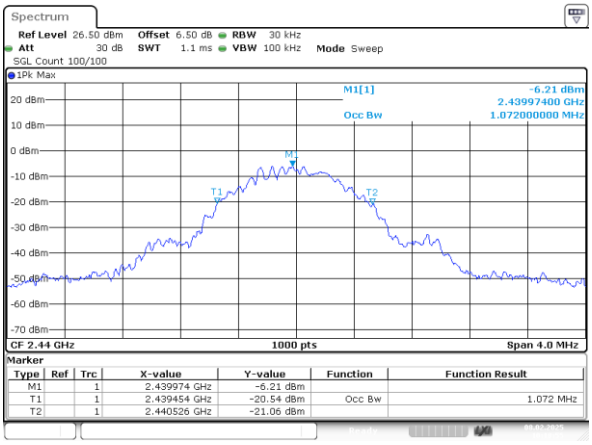
**99% Occupied Bandwidth:**

## BLE 1M

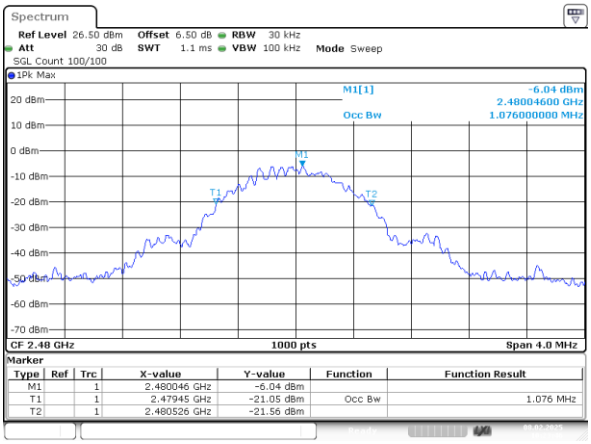
BLE_1M_Low_Channel




BLE_1M_Middle_Channel



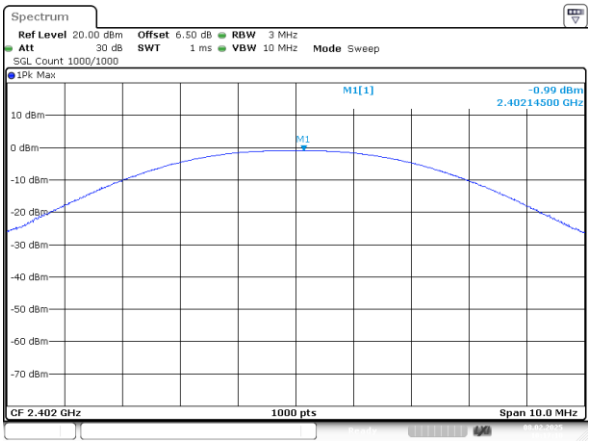

BLE_1M_High_Channel



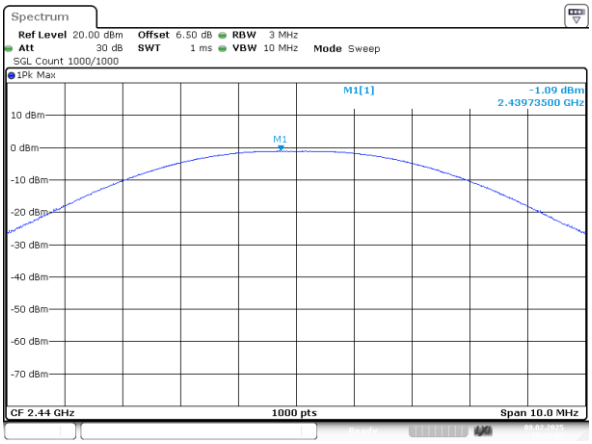
**Maximum Conducted Peak Output Power:**

**BLE 1M**

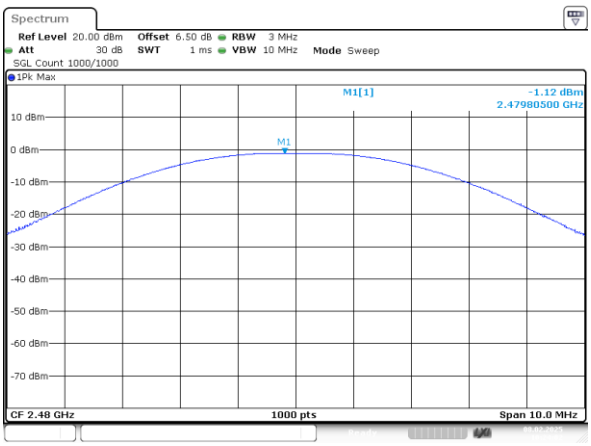
BLE_1M_Low_Channel




BLE_1M_Middle_Channel



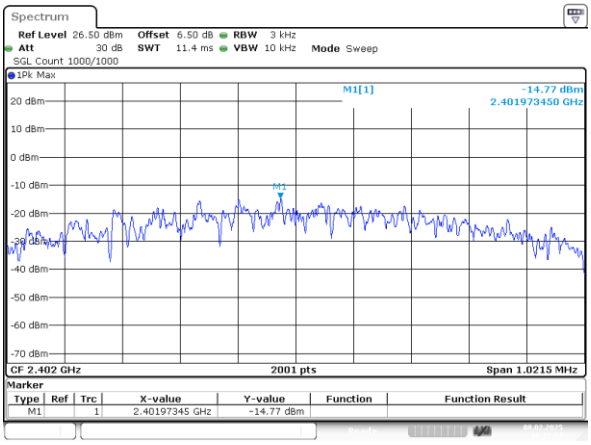

BLE_1M_High_Channel



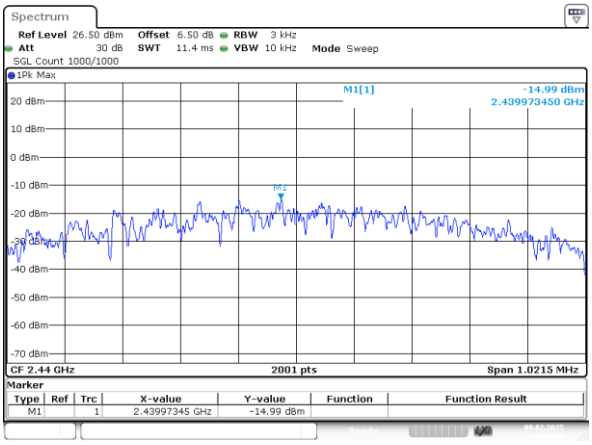
**Power Spectral Density:**

**BLE 1M**

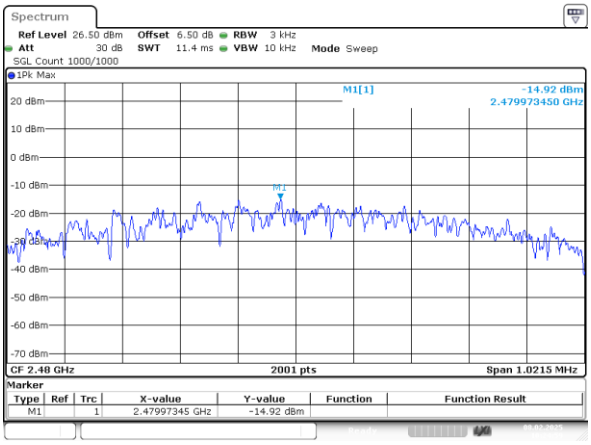
BLE_1M_Low_Channel




BLE_1M_Middle_Channel



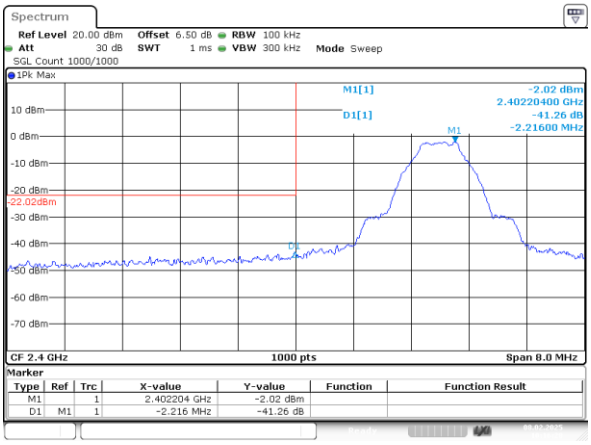

BLE_1M_High_Channel



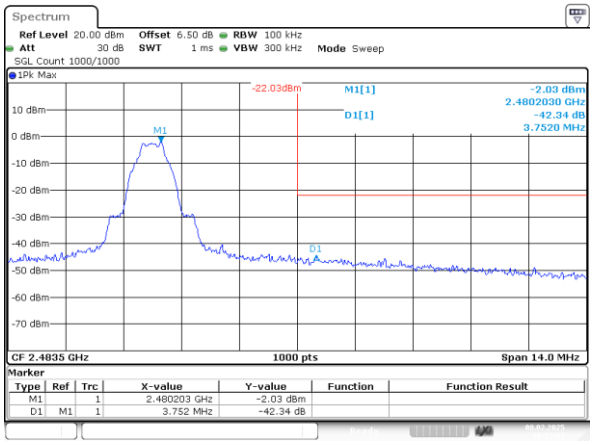
**100kHz Bandwidth of Frequency Band Edge:**

**BLE 1M**

BLE_1M_Low_Channel



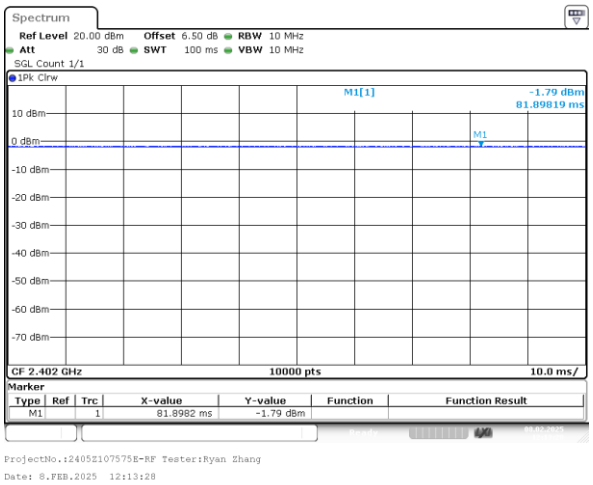

BLE_1M_High_Channel




**Duty cycle:**

**BLE 1M**

BLE_1M_Middle_Channel



# 4 Test Setup Photo

Please refer to the attachment 2405Z107575E Test Setup photo.

# 5 E.U.T Photo

Please refer to the attachment 2405Z107575E External photo and 2405Z107575E Internal photo.

**---End of Report---**