# TEST REPORT
On behalf of

Signify (China) Investment Co., Ltd.

Product Name: Sensor

Model No.: SC100B/02 SR Transceiver WH

FCC ID: 2AGBWSC100B

Prepared For: Signify (China) Investment Co., Ltd.
Building no.9, Lane 888, Tianlin Road, Minhang District,
Shanghai 200233, China

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TESTING
NVLAP LAB CODE 200371-0

| | | |
|---|---|---|
| File No. | : | C1D2401016 |
| Report No. | : | ACI-F24033 |
| Date of Test | : | 2024.01.31-02.24 |
| Date of Report | : | 2024.02.28 |

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.
The 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.

# TABLE OF CONTENTS

Page

**1 SUMMARY OF STANDARDS AND RESULTS ..... 5**
1.1 Description of Standards and Results ..... 5
**2 GENERAL INFORMATION ..... 6**
2.1 Description of Equipment Under Test ..... 6
2.2 EUT Specifications Assessed in Current Report ..... 7
2.3 Test Information ..... 7
2.4 Duty Cycle Check ..... 8
2.5 Sample Description ..... 9
2.6 Supported equipment ..... 9
2.7 Description of Test Facility ..... 9
**3 RADIATED EMISSION TEST ..... 10**
3.1 Test Equipment ..... 10
3.2 Block Diagram of Test Setup ..... 11
3.3 Radiated Emission Limit (§15.209) ..... 12
3.4 Test Configuration ..... 12
3.5 Operating Condition of EUT ..... 12
3.6 Test Procedures ..... 12
3.7 Test Results ..... 14
**4 6 DB BANDWIDTH MEASUREMENT ..... 35**
4.1 Test Equipment ..... 35
4.2 Block Diagram of Test Setup ..... 35
4.3 Specification Limits (§15.247(a)(2)) ..... 35
4.4 Operating Condition of EUT ..... 35
4.5 Test Procedure ..... 35
4.6 Test Results ..... 36
**5 MAXIMUM PEAK OUTPUT POWER MEASUREMENT ..... 39**
5.1 Test Equipment ..... 39
5.2 Block Diagram of Test Setup ..... 39
5.3 Specification Limits ((§15.247(b)(3)) ..... 39
5.4 Operating Condition of EUT ..... 39
5.5 Test Procedure ..... 39
5.6 Test Results ..... 40
**6 EMISSION LIMITATIONS MEASUREMENT ..... 43**
6.1 Test Equipment ..... 43
6.2 Block Diagram of Test Setup ..... 43
6.3 Specification Limits (§15.247(d)) ..... 43
6.4 Operating Condition of EUT ..... 43
6.5 Test Procedure ..... 43
6.6 Test Results ..... 45
**7 POWER SPECTRAL DENSITY MEASUREMENT ..... 52**
7.1 Test Equipment ..... 52
7.2 Block Diagram of Test Setup ..... 52
7.3 Specification Limits (§15.247(e)) ..... 52
7.4 Operating Condition of EUT ..... 52

7.5 Test Procedure ..... 52
7.6 Test Results ..... 53
**8 ANTENNA REQUIREMENT ..... 56**
8.1 Specification Limits (§15.203) ..... 56
8.2 Result ..... 56
**9 DEVIATION TO TEST SPECIFICATIONS ..... 57**
**10 MEASUREMENT UNCERTAINTY LIST ..... 58**
APPENDIX I PHOTOGRAPHS OF TEST
APPENDIX II PHOTOGRAPHS OF EUT

# TEST REPORT

| | | |
|---|---|---|
| Applicant | : | Signify (China) Investment Co., Ltd. |
| EUT Description | : | Sensor |
| | | (A) Model No. : Refer to Sec.2.1 |
| | | (B) Power Supply : 12 to 22Vdc |
| | | (C) Test Voltage : DC 16V (From DALI Extender) |

**Test Procedure Used:**

*FCC RULES AND REGULATIONS PART 15 SUBPART C*
*AND ANSI C63.10-2013*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: Refer to Sec2.1), which was tested is technically compliance with the FCC limits.

This report applies to above tested Sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

***The test results for EUT's ZigBee function are contained in No.ACI-F24034 report.***

Date of Test : 2024.01.31-02.24 Date of Report : 2024.02.28

Producer : Huimin Yan
HUIMIN YAN / Assistant

Review : Jarey Lu
JAREY LU / Deputy Assistant Manager

AUDIX® For and on behalf of Audix Technology (Shanghai) Co., Ltd.

Signatory : Kamp. Chen.
KAMP CHEN / Manager

Authorized Signature(s)

# 1 SUMMARY OF STANDARDS AND RESULTS

## 1.1 Description of Standards and Results

The result is determined according to the decision rules of customer selection in the ASC-403 application service form.
1. According to IEC GUIDE 115 Procedure 2 and ILAC-G8, the uncertainties value is not used in determining the PASS/FAIL results.
2. If the required specification or standard already contains the decision rules, it will be carried out in accordance with the regulations or standard documents or the requirements of the competent units. If the required specification or standard does not contain a decision rule, the same paragraph 1.
3. If your company has a required decision rule, it will be implemented in accordance with the requirements and ISO/IEC Guide 98-4 specifications.

The EUT have been tested according to the applicable standards as referenced below:

| Description / Test Item | Test Standard | Results | Meets Limit |
|---|---|---|---|
| **EMISSION** | | | |
| Conducted Emission | FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013 | N/A | 15.207 |
| Radiated Emission | FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013 | Pass | 15.209(a) 15.205(a)(c) |
| 6 dB Bandwidth Measurement | FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013 | Pass | 15.247(a)(2) |
| Maximum Peak Output Power Measurement | FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013 | Pass | 15.247(b)(3) |
| Emission Limitations Measurement | FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013 | Pass | 15.247(d) |
| Band Edge Measurement | FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013 | Pass | 15.247(d) |
| Power Spectral Density Measurement | FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013 | Pass | 15.247(e) |
| Antenna Requirement | FCC RULES AND REGULATIONS PART 15 SUBPART C AND ANSI C63.10:2013 | Pass | 15.203 |
| N/A is an abbreviation for Not Applicable. | | | |

# 2 GENERAL INFORMATION

## 2.1 Description of Equipment Under Test

| | | |
|---|---|---|
| Description | : | Sensor |
| Type of EUT | : | ☑ Production ☐ Pre-product ☐ Pro-type |
| Model Number | : | SC100B/02 SR Transceiver WH |
| Radio Tech | : | BLE 5.0;<br>Zigbee. |
| Channel Freq. | : | BLE: 2402MHz-2480MHz;<br>Zigbee: 2405MHz-2480MHz; |
| Modulation | : | BLE: GFSK;<br>Zigbee: QOPSK; |
| Antenna Info. | : | Antenna Type: PCB Antenna<br>Antenna Gain: 1.6 dBi |
| Applicant | : | Signify (China) Investment Co., Ltd.<br>Building no.9, Lane 888, Tianlin Road, Minhang District, Shanghai 200233, China |

## 2.2 EUT Specifications Assessed in Current Report

| Mode | Modulation | Data Rate(Mbps) |
|---|---|---|
| BLE | GFSK | Up to 2 |

| Channel List | | | |
|---|---|---|---|
| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
| 00 | 2402 | 20 | 2442 |
| 01 | 2404 | 21 | 2444 |
| 02 | 2406 | 22 | 2446 |
| … | … | … | … |
| … | … | … | … |
| … | … | … | … |
| 17 | 2436 | 37 | 2476 |
| 18 | 2438 | 38 | 2478 |
| 19 | 2440 | 39 | 2480 |

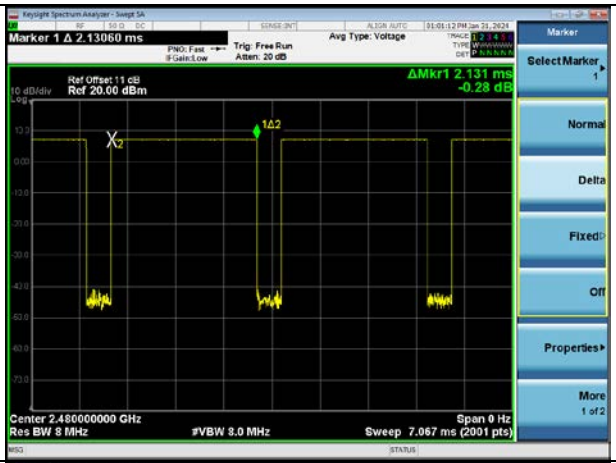
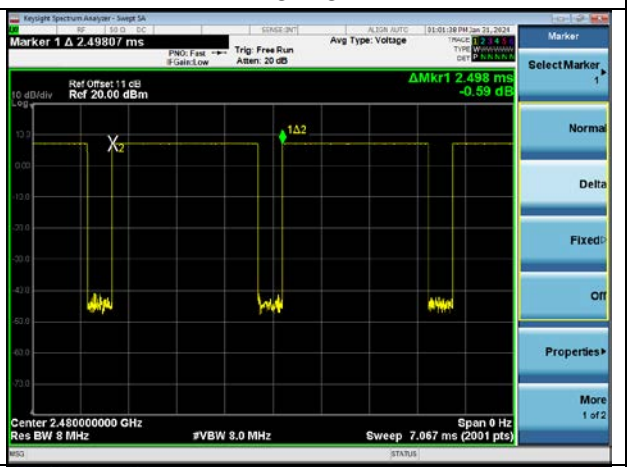
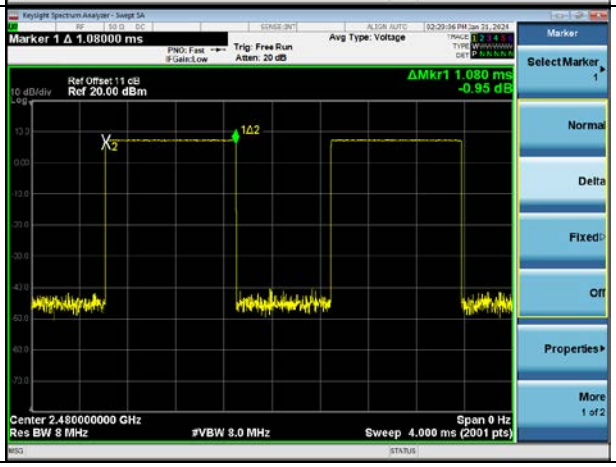
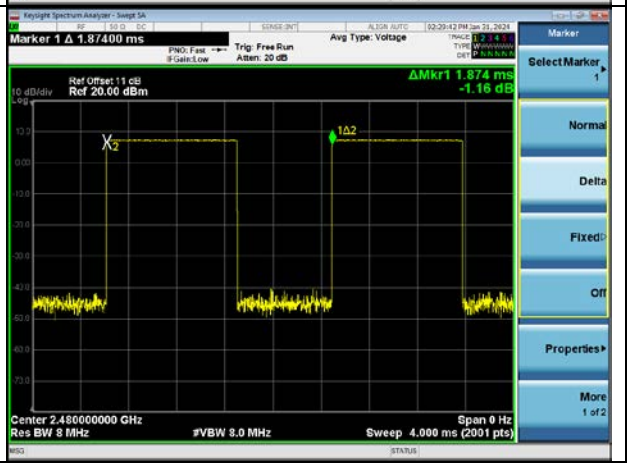
## 2.3 Test Information

The test software “ Docklight.exe” was used to control EUT work in TX mode, Power Setting and select test channel.

| Mode | data rate (Mbps) | Power Setting | Test Channel | | Frequency (MHz) |
|---|---|---|---|---|---|
| BLE 1M | 1 | 7 | Low: | 00 | 2402 |
| | | 7 | Middle: | 20 | 2442 |
| | | 7 | High: | 39 | 2480 |
| BLE 2M | 2 | 7 | Low: | 00 | 2402 |
| | | 7 | Middle: | 20 | 2442 |
| | | 7 | High: | 39 | 2480 |

## 2.4 Duty Cycle Check

| Mode | Transmission Duration (ms) | Transmission Period (ms) | Duty Cycle (%) |
|---|---|---|---|
| BLE 1M | 2.131 | 2.498 | 85.31 |
| BLE 2M | 1.08 | 1.874 | 57.63 |

| Mode | Ton | Ton+off |
|---|---|---|
| BLE 1M |   |   |
| BLE 2M |   |   |

## 2.5 Sample Description

| Test Item | Model Number | Sample Number | Date of receipted |
|---|---|---|---|
| Radiated Emission | SC100B/02 SR Transceiver WH | E20240130065a-01/02 | 2024.01.30 |
| Conducted RF Test | SC100B/02 SR Transceiver WH | E20240130065a-02/02 | 2024.01.30 |

## 2.6 Supported equipment

Brand : Acer
Product Name: : Notebook PC
Model Name : TravelMate P238 series
Model Number : N15W8

Product Name : Test Fixture
Mode Number : WSTK JLINK
Product Function : USB to TTL

Brand : PHILIPS
Product Name: : DALI Extender
Model Name : 9137010662

## 2.7 Description of Test Facility

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3F, Building 34, No. 680 Guiping Rd., Caohejing, Hi-Tech Park, Shanghai 200233, China

Accredited by NVLAP, Lab Code : 200371-0

FCC Designation Number : CN5027

Test Firm Registration Number : 954668

# 3 RADIATED EMISSION TEST

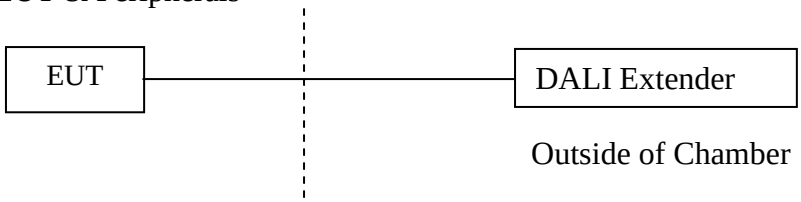
## 3.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

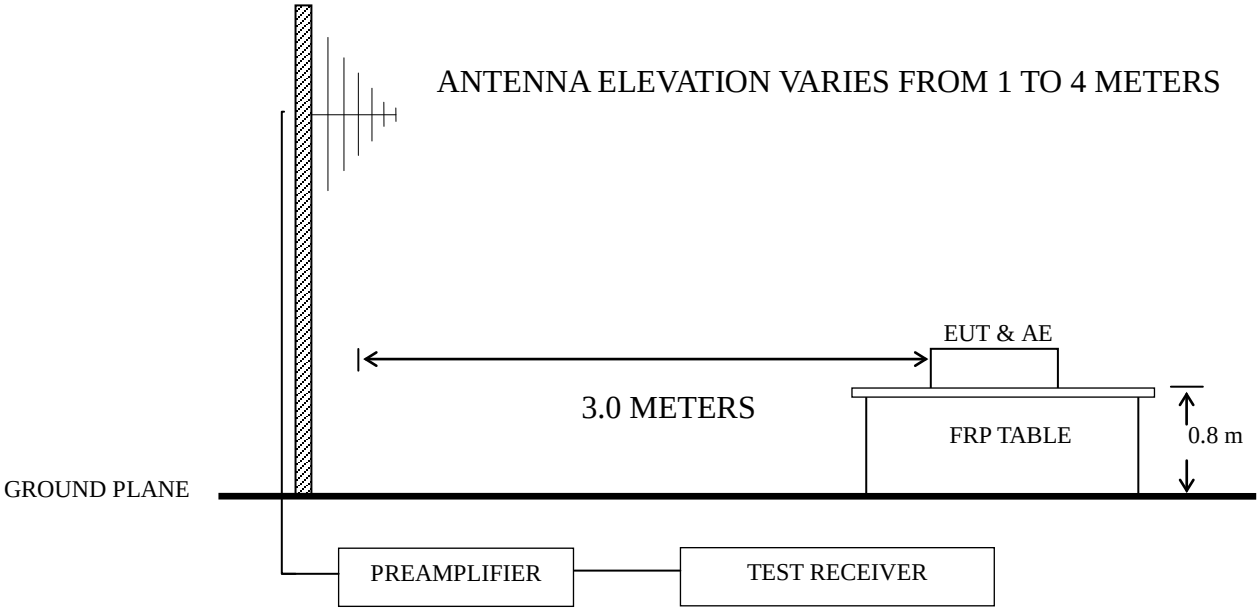
| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Preamplifier | Agilent | 8447D | 2944A10548 | 2024.02.22 | 1 Year |
| 2. | Preamplifier | HP | 8449B | 3008A00864 | 2024.02.22 | 1 Year |
| 3. | EXA Signal Analyzer | Agilent | N9010A | MY52221182 | 2023.08.09 | 1 Year |
| 4. | Test Receiver | R&S | ESCI | 101303 | 2024.02.22 | 1 Year |
| 5. | Bilog Antenna+6dB Attenuator | Schwarzbeck | VULB 9168+EMCI-N-6-06 | 707+AT-N0637 | 2023.08.09 | 1 Year |
| 6. | Horn Antenna | EMCO | 3115 | 96074878 | 2023.08.02 | 1 Year |
| 7. | Horn Antenna | EMCO | 3116 | 00062643 | 2023.01.30 | 2 Year |
| 8. | Cavity Band Rejection Filter | Microwave | WT-A3882-R 10 | WT200312-1-1 | 2024.02.22 | 1 Year |
| 9. | Coaxial Switch | Anritsu | MP59B | 6200655086 | 2024.02.22 | 1 Year |
| 10. | Coaxial Cable | SCHAFFNER | RG 212U-MIL C 17+N1K50-E W0630-N1K5 0-15m-1 | RE-10m-001/ RE-15m-002 | 2024.02.22 | 1 Year |
| 11. | Software | Audix | e3 | v9.210616 | -- | -- |

## 3.2 Block Diagram of Test Setup

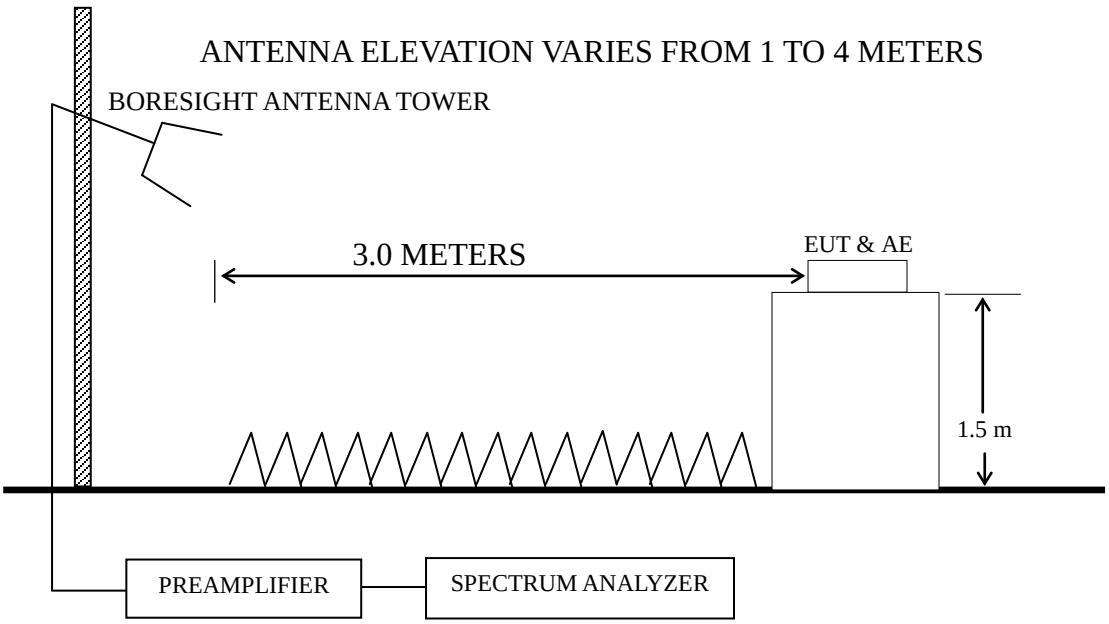
### 3.2.1 EUT & Peripherals




### 3.2.2 Below 1GHz




### 3.2.3 Above 1GHz



## 3.3 Radiated Emission Limit (§15.209)

| Frequency (MHz) | Distance (m) | Field strength limits (μV/m) | |
|---|---|---|---|
| | | (μV/m) | dB(μV/m) |
| 30 ~ 88 | 3 | 100 | 40.0 |
| 88 ~ 216 | 3 | 150 | 43.5 |
| 216 ~ 960 | 3 | 200 | 46.0 |
| Above 960 | 3 | 500 | 54.0 |

NOTE 1 - Emission Level dB (μV/m) = 20 log Emission Level (μV/m)
NOTE 2 - The tighter limit applies at the band edges.
NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.
NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT

## 3.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.4.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

## 3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Disconnect the wire between DALI Extender and EUT.

3.5.3 Plug Test Fixture to EUT through HCI cable.

3.5.4 Use the software as section 2.3 to select the test mode, then disconnect the Test Fixture from EUT, remove the Test Fixture and Notebook PC.

3.5.5 Then connect the wire between DALI Extender and EUT, turn EUT on, then test.

3.5.6 Repeat step 3.5.2 and 3.5.5, until the test of all modes finished.

## 3.6 Test Procedures

Radiated emission test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A pre-amp is necessary for this measurement. For measurement above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

The EUT was placed on a turntable. Below 1 GHz, the table height is 80 cm above the reference ground plane. Above 1 GHz, the table height is 1.5 m. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down

between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.10: 2013 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz.

The bandwidth of Agilent N9010A was set at 1MHz for above 1GHz.

The frequency range from 30 MHz to 25 GHz (Up to $10^{th}$ harmonics from fundamental frequency) was checked.

All the test results are listed in Sec.3.7.

## 3.7 Test Results

**<PASS>**

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Frequency range: below 1GHz (Worst case emission)

| No. | Operation | Mode | Channel | Frequency | Data Page |
|---|---|---|---|---|---|
| 1. | Transmitting | BLE 1M | 00 | 2402MHz | P15-16 |
| 2. | Transmitting | BLE 2M | 00 | 2402MHz | P17-18 |

Frequency range: above 1GHz

| No. | Operation | Mode | Channel | Frequency | Data Page |
|---|---|---|---|---|---|
| 1. | Transmitting | BLE 1M | 00 | 2402 MHz | P19-20 |
| 2. | | | 20 | 2442 MHz | P21-22 |
| 3. | | | 39 | 2480 MHz | P23-24 |
| 4. | Transmitting | BLE 2M | 00 | 2402 MHz | P25-26 |

Band-Edge and Restricted bands:

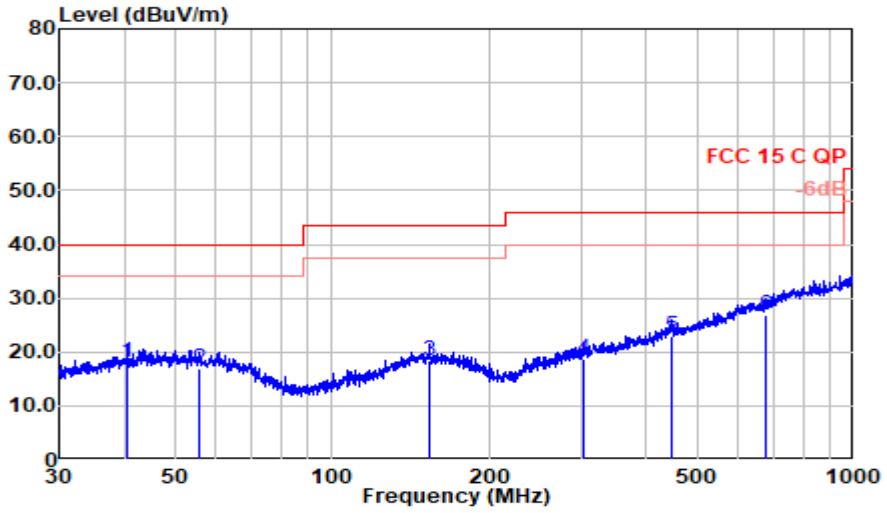
| No. | Operation | Mode | Channel | Frequency | Data Page |
|---|---|---|---|---|---|
| 1. | Transmitting | BLE 1M | 00 | 2402 MHz | P27-28 |
| 2. | | | 39 | 2480 MHz | P29-30 |
| 4. | | BLE 2M | 00 | 2402 MHz | P31-32 |
| 5. | | | 39 | 2480 MHz | P33-34 |

NOTE 1 – Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin = Limits - Emission Level.
NOTE 2 – “QP” means “Quasi-Peak” values.
NOTE 3 – 0°was the table front facing the antenna. Degree is calculated from 0°clockwise facing the antenna.
NOTE 4 – The emission levels which not reported are too low against the official limit.
NOTE 5 – The emission levels recorded below is data of EUT configured in Lying direction, for this direction was the maximum emission direction during the test. The data of Side & Standing direction are too low against the official limit to be reported.
NOTE 6 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.
For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.
NOTE 7 – The frequency range 2310-2390MHz & 2483.5-2500MHz were tested for Restricted bands.

# Radiated emission < 1GHz

| Test Date: | 2024.02.24 | Temp./Hum.: | 22℃/51%RH | Test By: | Jarey |
|---|---|---|---|---|---|

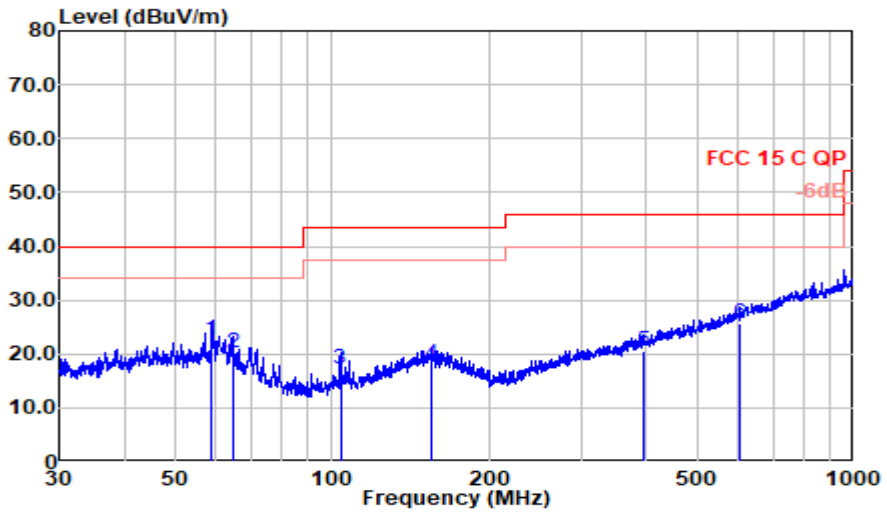
**Mode: BLE1M CH2402MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 40.488 | 27.69 | 19.60 | 0.70 | 29.90 | 18.09 | 40.00 | 21.91 | QP |
| 55.805 | 26.42 | 19.62 | 0.81 | 29.88 | 16.97 | 40.00 | 23.03 | QP |
| 154.008 | 27.27 | 19.30 | 1.36 | 29.39 | 18.55 | 43.50 | 24.95 | QP |
| 302.481 | 26.28 | 19.25 | 1.93 | 28.71 | 18.75 | 46.00 | 27.25 | QP |
| 449.556 | 26.77 | 23.00 | 2.34 | 29.30 | 22.81 | 46.00 | 23.19 | QP |
| 678.769 | 25.98 | 26.55 | 2.89 | 28.62 | 26.80 | 46.00 | 19.20 | QP |

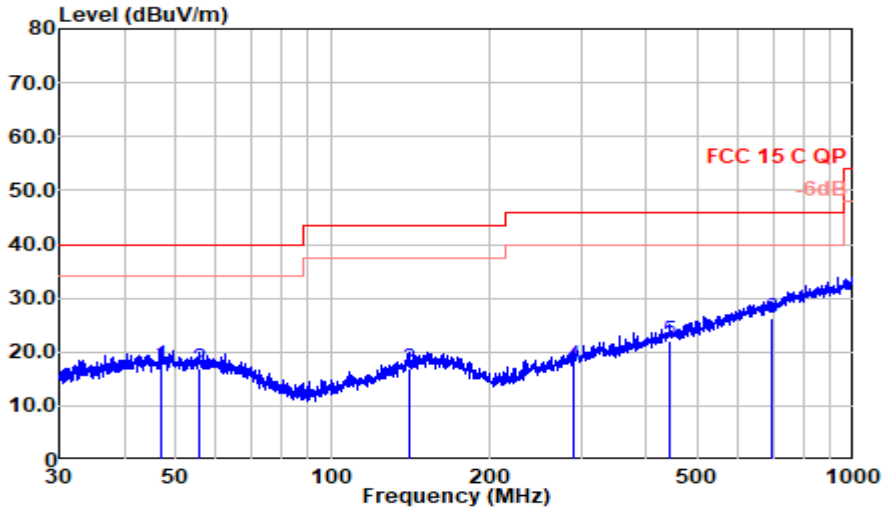
**Mode: BLE1M CH2402MHz**




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 58.819 | 32.59 | 19.22 | 0.84 | 29.87 | 22.77 | 40.00 | 17.23 | QP |
| 64.433 | 30.83 | 18.46 | 0.87 | 29.85 | 20.31 | 40.00 | 19.69 | QP |
| 103.806 | 30.40 | 15.26 | 1.18 | 29.68 | 17.16 | 43.50 | 26.34 | QP |
| 154.821 | 26.79 | 19.30 | 1.37 | 29.38 | 18.08 | 43.50 | 25.42 | QP |
| 395.547 | 26.03 | 21.31 | 2.18 | 29.08 | 20.44 | 46.00 | 25.56 | QP |
| 603.539 | 26.22 | 25.61 | 2.83 | 28.99 | 25.68 | 46.00 | 20.32 | QP |

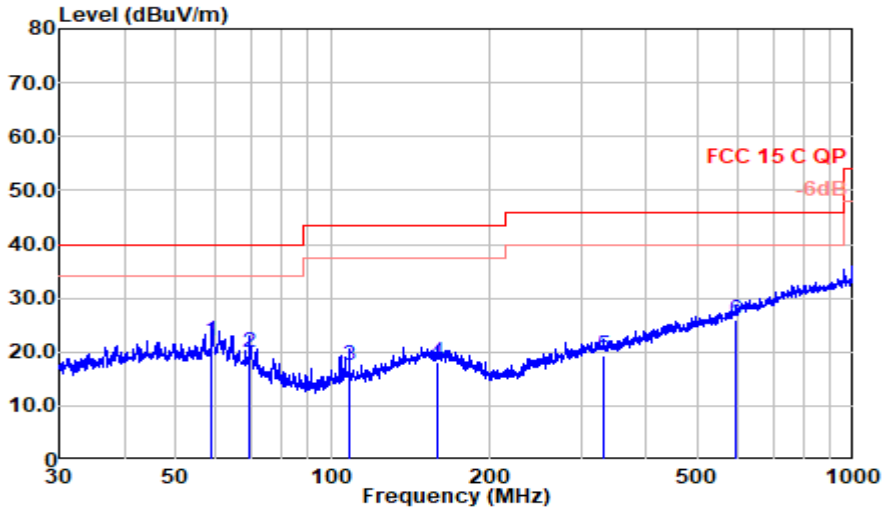
**Mode: BLE2M CH2402MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 46.912 | 26.46 | 20.09 | 0.75 | 29.90 | 17.40 | 40.00 | 22.60 | QP |
| 55.707 | 26.33 | 19.63 | 0.81 | 29.88 | 16.89 | 40.00 | 23.11 | QP |
| 140.342 | 26.23 | 18.80 | 1.30 | 29.46 | 16.87 | 43.50 | 26.63 | QP |
| 289.509 | 25.31 | 18.99 | 1.90 | 28.75 | 17.45 | 46.00 | 28.55 | QP |
| 444.851 | 26.01 | 22.99 | 2.33 | 29.28 | 22.05 | 46.00 | 23.95 | QP |
| 694.417 | 25.35 | 26.60 | 2.90 | 28.53 | 26.32 | 46.00 | 19.68 | QP |

**Mode: BLE2M CH2402MHz**



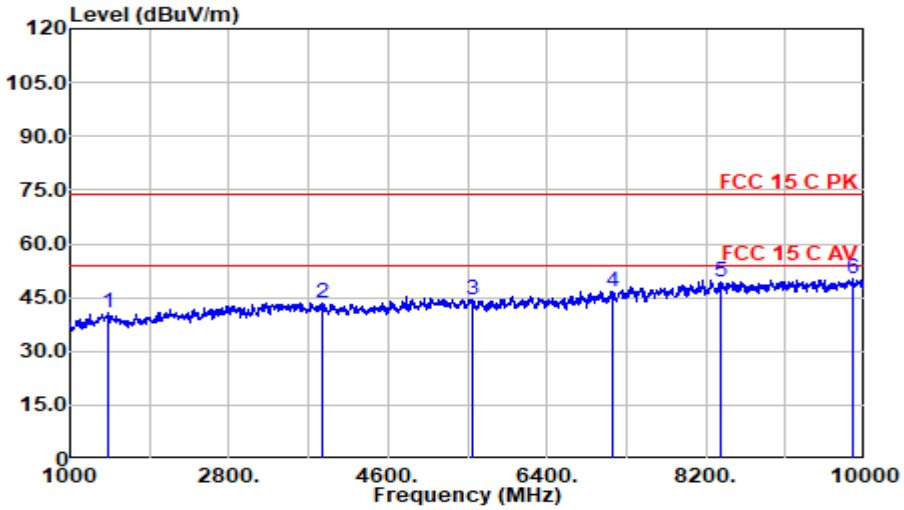

Polarization at Vertical

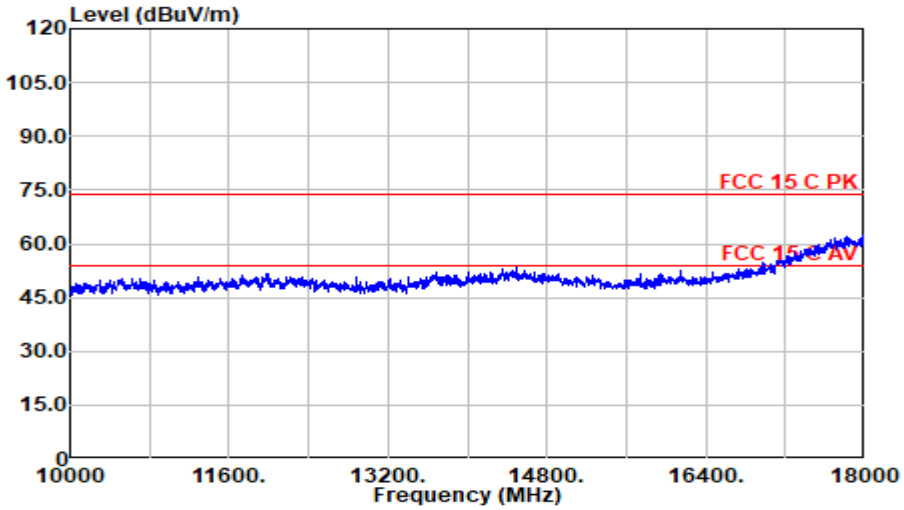
| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 58.819 | 31.93 | 19.22 | 0.84 | 29.87 | 22.12 | 40.00 | 17.88 | QP |
| 69.600 | 31.34 | 17.38 | 0.90 | 29.83 | 19.80 | 40.00 | 20.20 | QP |
| 107.699 | 30.34 | 15.64 | 1.19 | 29.66 | 17.51 | 43.50 | 25.99 | QP |
| 158.946 | 26.91 | 19.30 | 1.39 | 29.37 | 18.23 | 43.50 | 25.27 | QP |
| 331.936 | 25.88 | 20.20 | 1.98 | 28.83 | 19.22 | 46.00 | 26.78 | QP |
| 595.133 | 26.72 | 25.30 | 2.81 | 29.02 | 25.82 | 46.00 | 20.18 | QP |

## Radiated Emission > 1GHz

| Test Date: | 2024.02.24 | Temp./Hum.: | 22°C/51%RH | Test By: | Jarey |
|---|---|---|---|---|---|

**Mode: BLE1M CH2402MHz**

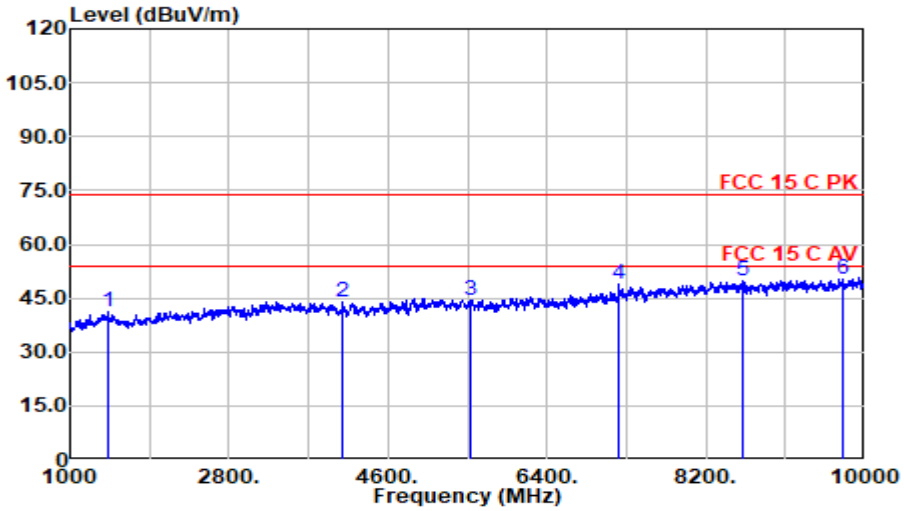


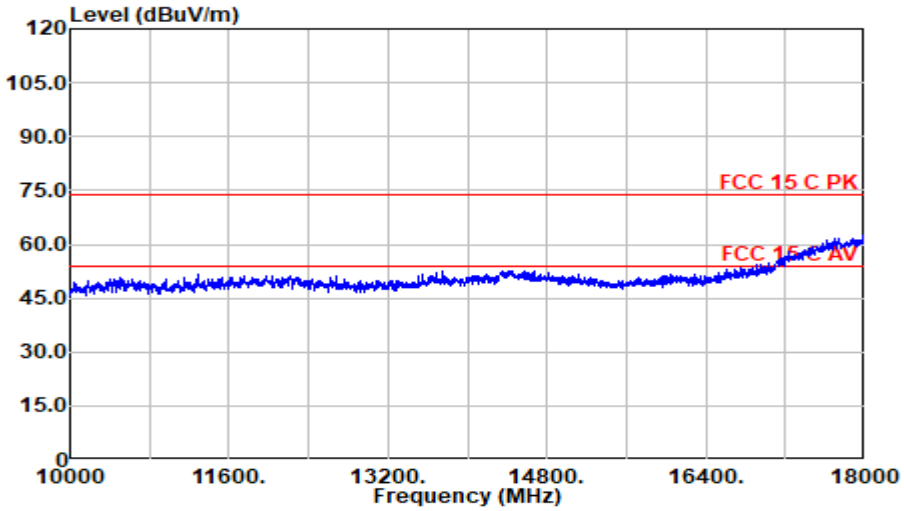




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1423.000 | 47.01 | 26.00 | 4.27 | 36.50 | 40.78 | 74.00 | 33.22 | Peak |
| 3853.000 | 39.46 | 32.51 | 6.64 | 35.05 | 43.55 | 74.00 | 30.45 | Peak |
| 5558.500 | 36.84 | 34.08 | 8.16 | 34.60 | 44.48 | 74.00 | 29.52 | Peak |
| 7133.500 | 35.93 | 35.93 | 9.40 | 34.64 | 46.62 | 74.00 | 27.38 | Peak |
| 8371.000 | 35.66 | 38.10 | 10.43 | 34.82 | 49.37 | 74.00 | 24.63 | Peak |
| 9865.000 | 35.32 | 38.26 | 11.34 | 34.61 | 50.31 | 74.00 | 23.69 | Peak |

**Mode: BLE1M CH2402MHz**

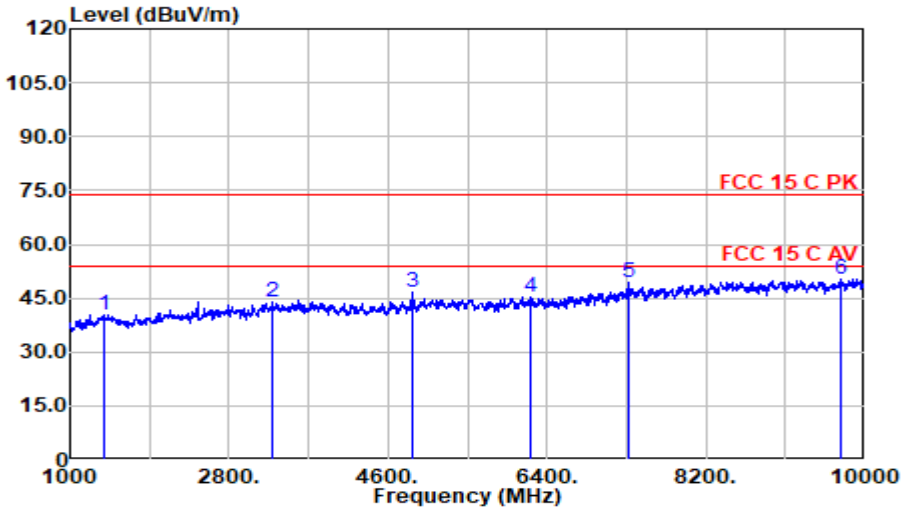


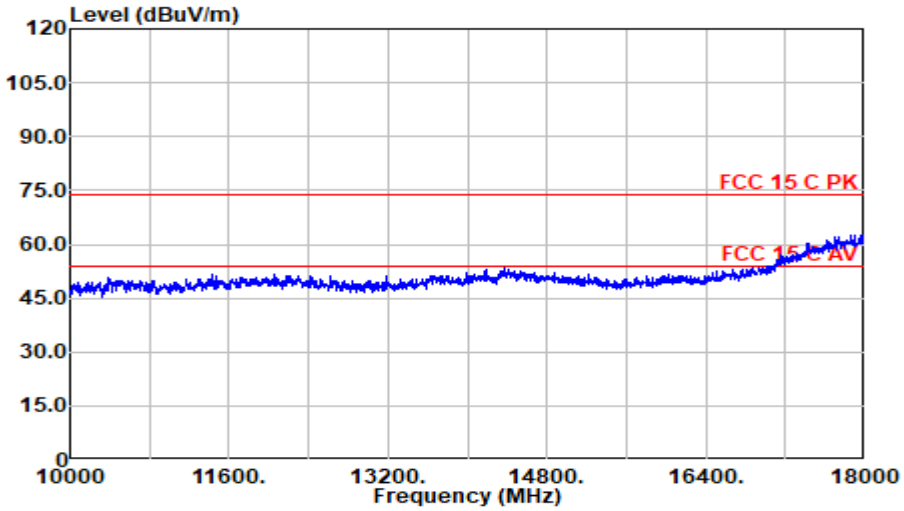




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1436.500 | 47.32 | 26.00 | 4.29 | 36.50 | 41.11 | 74.00 | 32.89 | Peak |
| 4078.000 | 39.49 | 32.49 | 6.84 | 34.97 | 43.85 | 74.00 | 30.15 | Peak |
| 5536.000 | 36.83 | 34.13 | 8.15 | 34.60 | 44.51 | 74.00 | 29.49 | Peak |
| 7205.500 | 37.92 | 36.16 | 9.48 | 34.67 | 48.89 | 74.00 | 25.11 | Peak |
| 8618.500 | 35.77 | 38.10 | 10.51 | 34.77 | 49.61 | 74.00 | 24.39 | Peak |
| 9748.000 | 35.73 | 38.10 | 11.25 | 34.62 | 50.46 | 74.00 | 23.54 | Peak |

**Mode: BLE1M CH2442MHz**

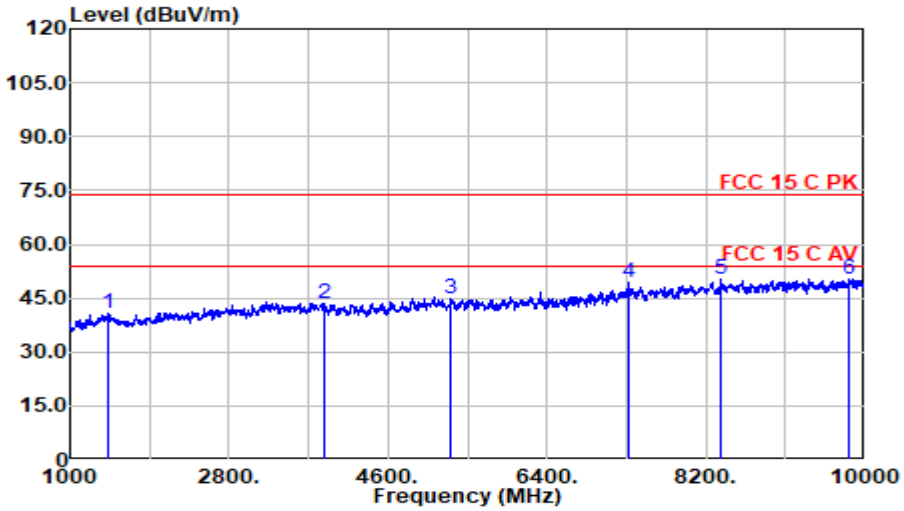


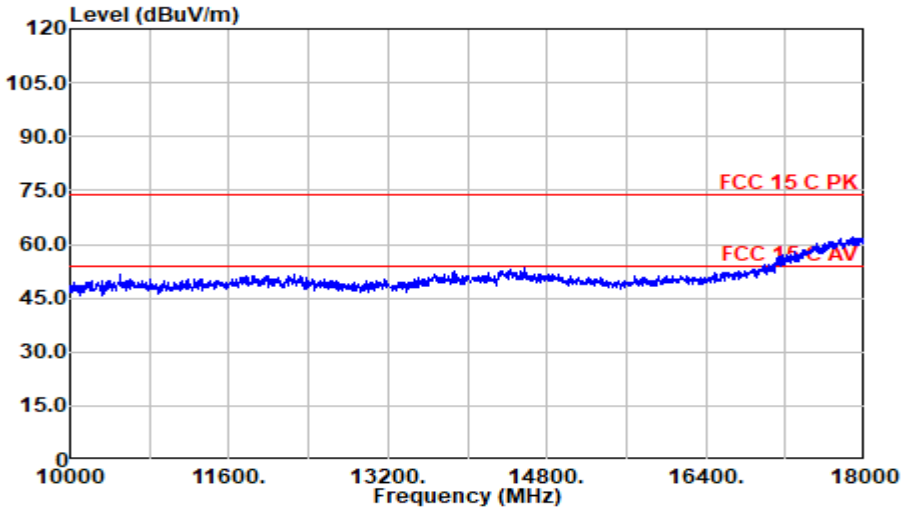




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1382.500 | 46.79 | 26.03 | 4.21 | 36.50 | 40.53 | 74.00 | 33.47 | Peak |
| 3286.000 | 41.53 | 31.32 | 6.15 | 35.27 | 43.72 | 74.00 | 30.28 | Peak |
| 4879.000 | 40.25 | 33.37 | 7.69 | 34.64 | 46.67 | 74.00 | 27.33 | Peak |
| 6211.000 | 36.56 | 34.62 | 8.61 | 34.60 | 45.19 | 74.00 | 28.81 | Peak |
| 7322.500 | 37.61 | 36.74 | 9.61 | 34.70 | 49.25 | 74.00 | 24.75 | Peak |
| 9730.000 | 35.57 | 38.10 | 11.24 | 34.63 | 50.28 | 74.00 | 23.72 | Peak |

**Mode: BLE1M CH2442MHz**

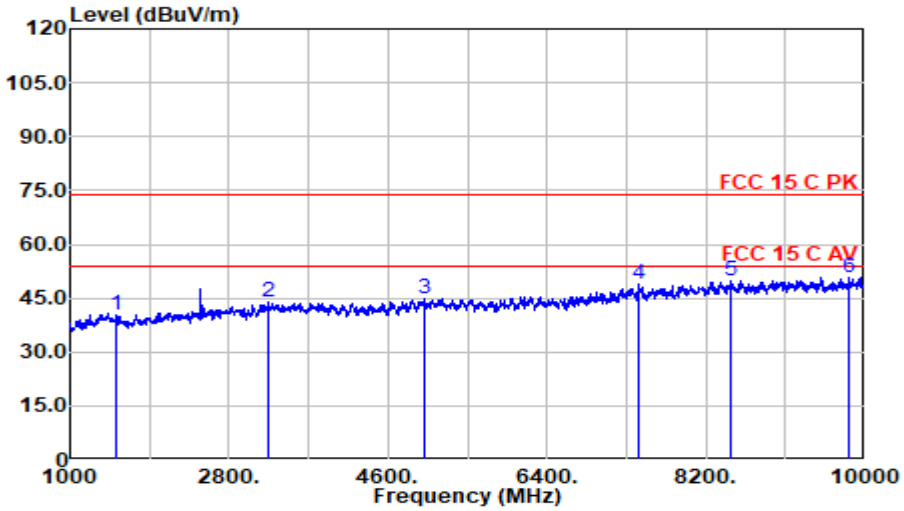


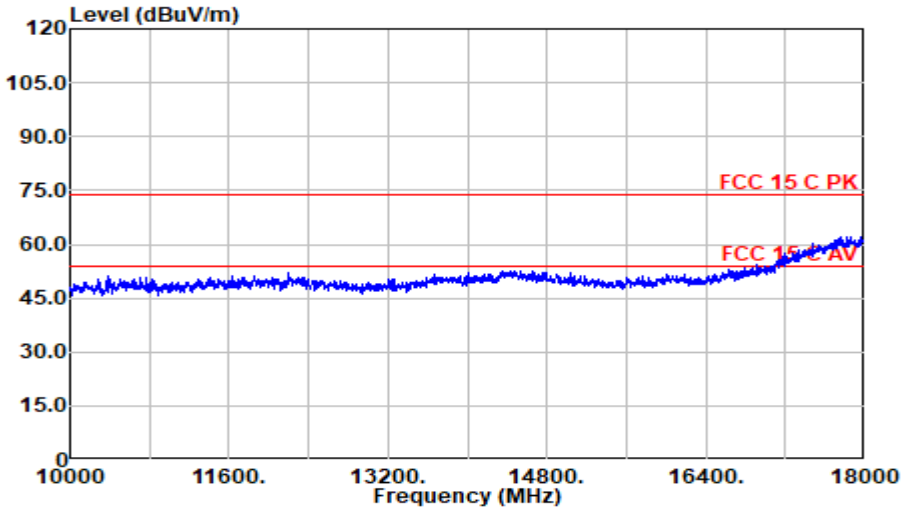




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1441.000 | 46.89 | 26.00 | 4.30 | 36.50 | 40.68 | 74.00 | 33.32 | Peak |
| 3880.000 | 39.32 | 32.62 | 6.66 | 35.04 | 43.56 | 74.00 | 30.44 | Peak |
| 5315.500 | 37.50 | 33.96 | 8.01 | 34.60 | 44.88 | 74.00 | 29.12 | Peak |
| 7322.500 | 37.49 | 36.74 | 9.61 | 34.70 | 49.13 | 74.00 | 24.87 | Peak |
| 8366.500 | 36.45 | 38.10 | 10.43 | 34.82 | 50.16 | 74.00 | 23.84 | Peak |
| 9815.500 | 35.34 | 38.13 | 11.31 | 34.62 | 50.16 | 74.00 | 23.84 | Peak |

**Mode: BLE1M CH2480MHz**

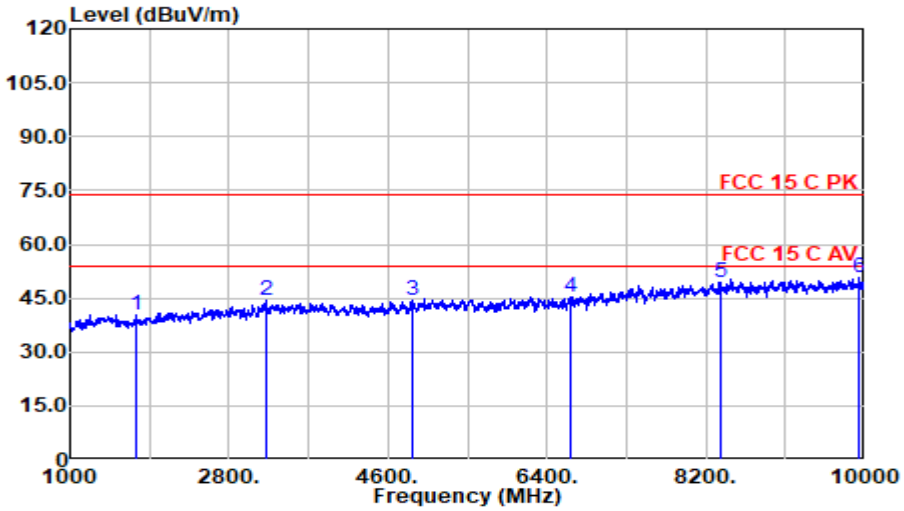


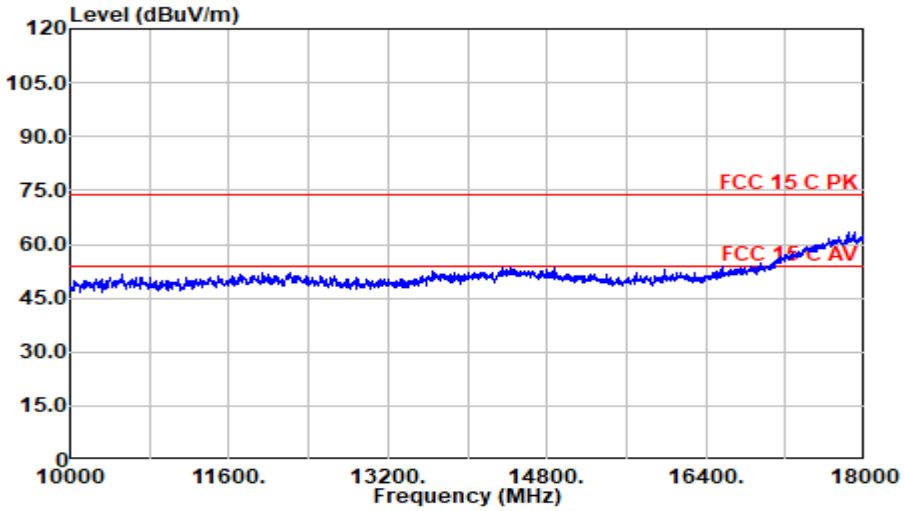




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1517.500 | 46.31 | 26.10 | 4.41 | 36.50 | 40.31 | 74.00 | 33.69 | Peak |
| 3236.500 | 41.83 | 31.10 | 6.10 | 35.29 | 43.74 | 74.00 | 30.26 | Peak |
| 5014.000 | 38.10 | 33.43 | 7.82 | 34.60 | 44.75 | 74.00 | 29.25 | Peak |
| 7439.500 | 37.10 | 36.90 | 9.73 | 34.74 | 48.99 | 74.00 | 25.01 | Peak |
| 8479.000 | 35.81 | 38.20 | 10.47 | 34.80 | 49.68 | 74.00 | 24.32 | Peak |
| 9820.000 | 36.01 | 38.14 | 11.31 | 34.62 | 50.84 | 74.00 | 23.16 | Peak |

**Mode: BLE1M CH2480MHz**

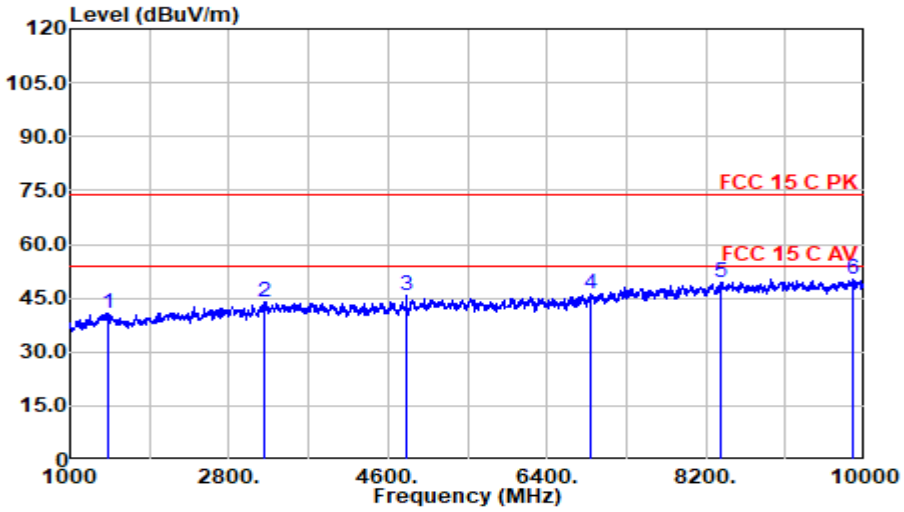


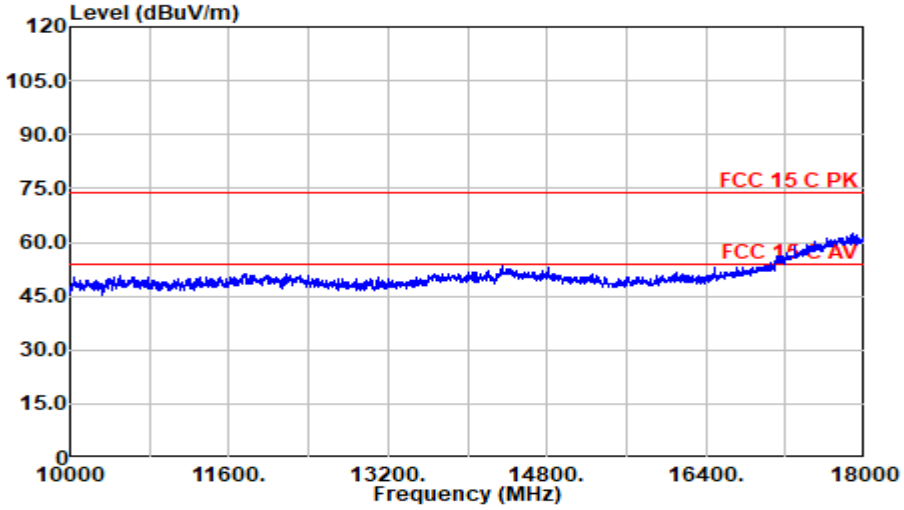




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1747.000 | 45.17 | 26.85 | 4.72 | 36.50 | 40.23 | 74.00 | 33.77 | Peak |
| 3214.000 | 42.30 | 31.10 | 6.08 | 35.30 | 44.18 | 74.00 | 29.82 | Peak |
| 4870.000 | 38.08 | 33.32 | 7.68 | 34.65 | 44.44 | 74.00 | 29.56 | Peak |
| 6670.000 | 36.08 | 34.94 | 8.99 | 34.60 | 45.41 | 74.00 | 28.59 | Peak |
| 8371.000 | 35.66 | 38.10 | 10.43 | 34.82 | 49.37 | 74.00 | 24.63 | Peak |
| 9932.500 | 35.33 | 38.40 | 11.40 | 34.61 | 50.52 | 74.00 | 23.48 | Peak |

**Mode: BLE2M CH2402MHz**

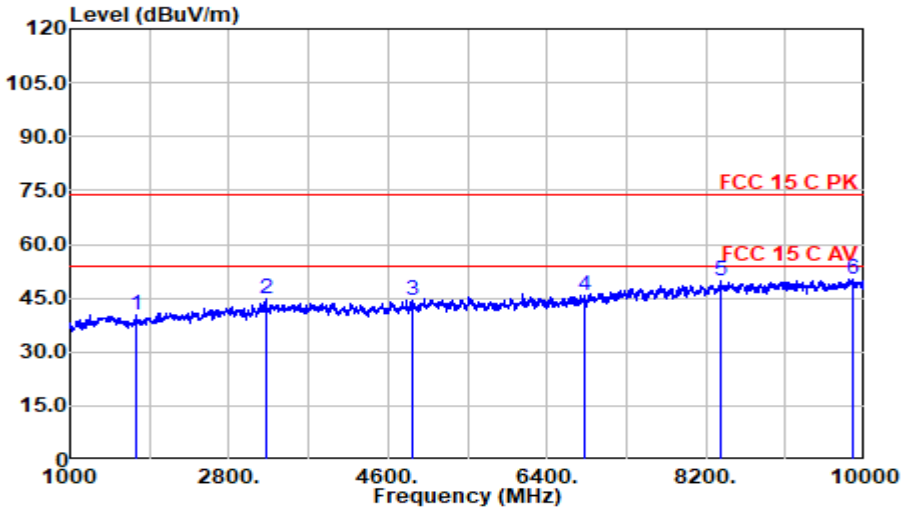


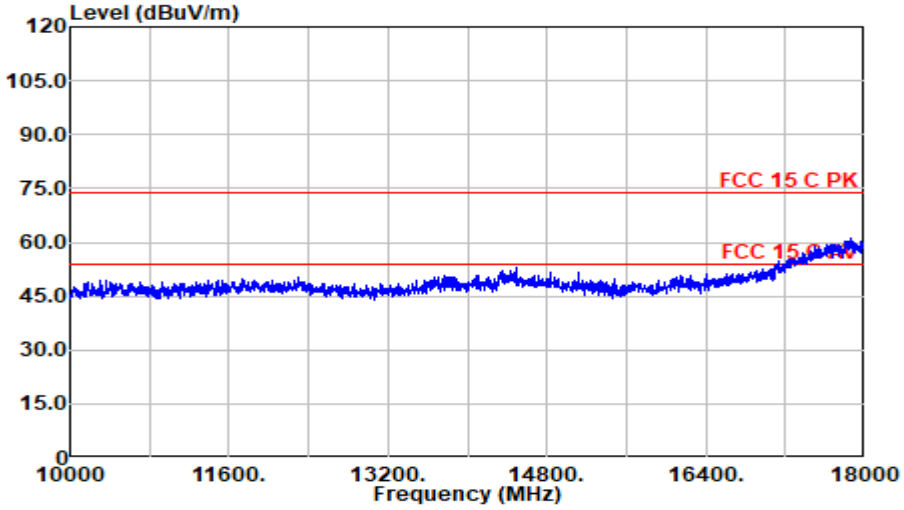




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1432.000 | 46.89 | 26.00 | 4.28 | 36.50 | 40.67 | 74.00 | 33.33 | Peak |
| 3205.000 | 41.87 | 31.10 | 6.07 | 35.31 | 43.73 | 74.00 | 30.27 | Peak |
| 4802.500 | 39.94 | 32.92 | 7.62 | 34.67 | 45.81 | 74.00 | 28.19 | Peak |
| 6899.500 | 36.15 | 35.50 | 9.17 | 34.60 | 46.22 | 74.00 | 27.78 | Peak |
| 8371.000 | 35.66 | 38.10 | 10.43 | 34.82 | 49.37 | 74.00 | 24.63 | Peak |
| 9865.000 | 35.32 | 38.26 | 11.34 | 34.61 | 50.31 | 74.00 | 23.69 | Peak |

**Mode: BLE2M CH2402MHz**



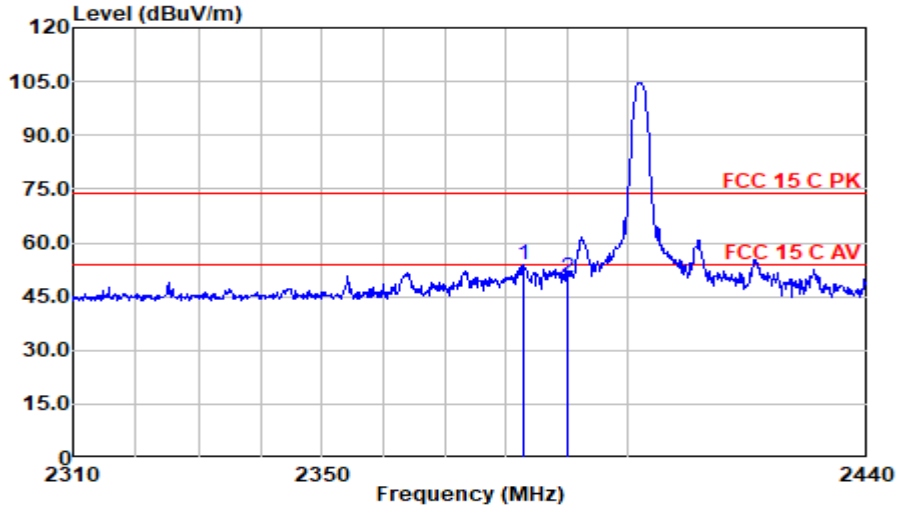

Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 1747.000 | 45.17 | 26.85 | 4.72 | 36.50 | 40.23 | 74.00 | 33.77 | Peak |
| 3214.000 | 42.74 | 31.10 | 6.08 | 35.30 | 44.61 | 74.00 | 29.39 | Peak |
| 4870.000 | 38.08 | 33.32 | 7.68 | 34.65 | 44.44 | 74.00 | 29.56 | Peak |
| 6832.000 | 35.85 | 35.36 | 9.12 | 34.60 | 45.74 | 74.00 | 28.26 | Peak |
| 8366.500 | 35.94 | 38.10 | 10.43 | 34.82 | 49.65 | 74.00 | 24.35 | Peak |
| 9860.500 | 35.41 | 38.24 | 11.34 | 34.61 | 50.38 | 74.00 | 23.62 | Peak |

## Band-Edge and Restricted bands:

| Test Date: | 2024.02.24 | Temp./Hum.: | 22°C/51%RH | Test By: | Jarey |
|---|---|---|---|---|---|

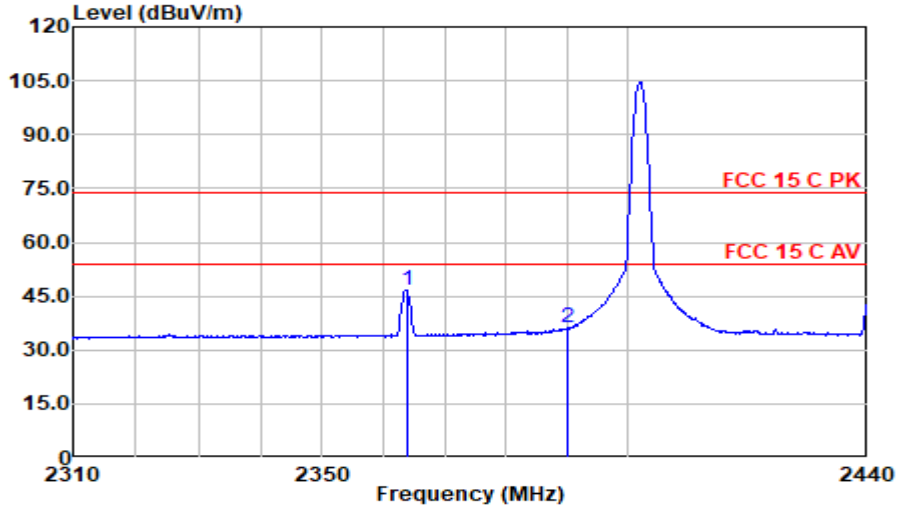
**Mode: BLE1M CH2402MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2382.800 | 55.91 | 28.53 | 5.38 | 36.02 | 53.80 | 74.00 | 20.20 | Peak |
| 2390.000 | 52.33 | 28.56 | 5.39 | 36.02 | 50.26 | 74.00 | 23.74 | Peak |

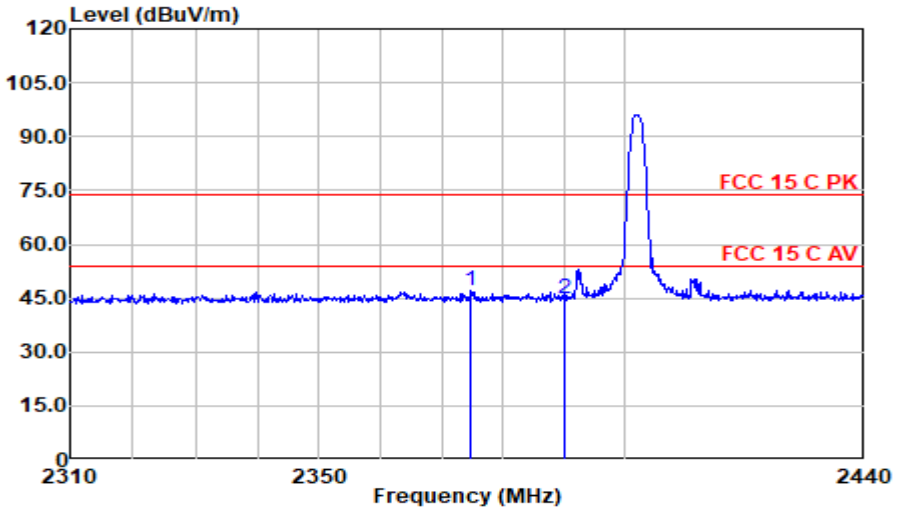
**Mode: BLE1M CH2402MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2363.690 | 49.09 | 28.46 | 5.36 | 36.05 | 46.86 | 54.00 | 7.14 | Average |
| 2390.000 | 38.21 | 28.56 | 5.39 | 36.02 | 36.14 | 54.00 | 17.86 | Average |

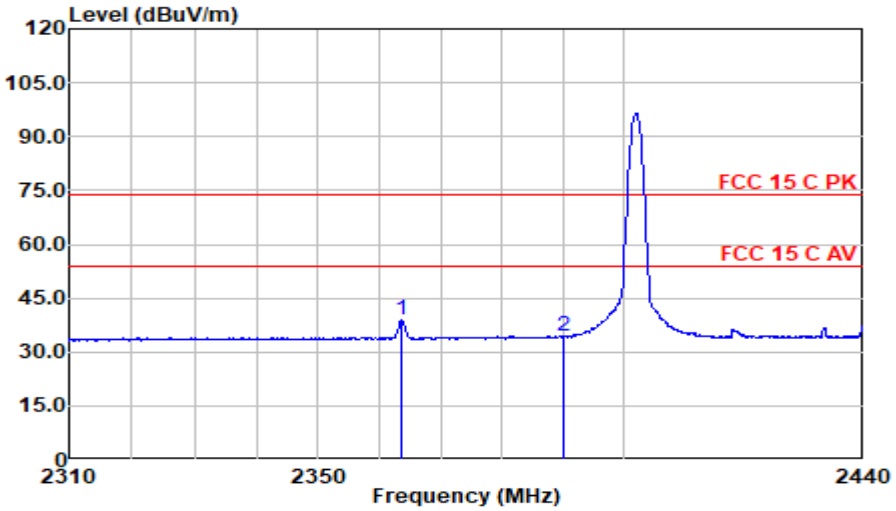
**Mode: BLE1M CH2402MHz**




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2374.740 | 49.03 | 28.50 | 5.37 | 36.03 | 46.87 | 74.00 | 27.13 | Peak |
| 2390.000 | 46.67 | 28.56 | 5.39 | 36.02 | 44.60 | 74.00 | 29.40 | Peak |

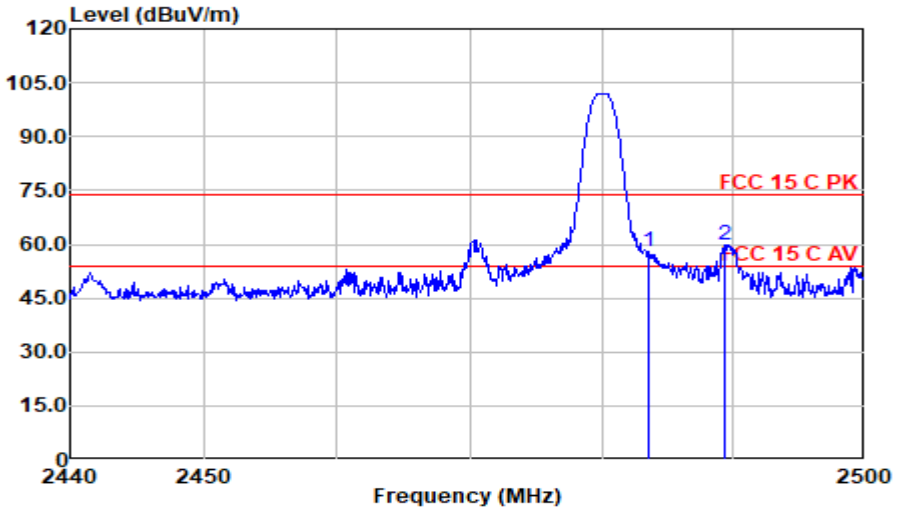
**Mode: BLE1M CH2402MHz**




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2363.430 | 41.14 | 28.45 | 5.36 | 36.05 | 38.91 | 54.00 | 15.09 | Average |
| 2390.000 | 36.34 | 28.56 | 5.39 | 36.02 | 34.27 | 54.00 | 19.73 | Average |

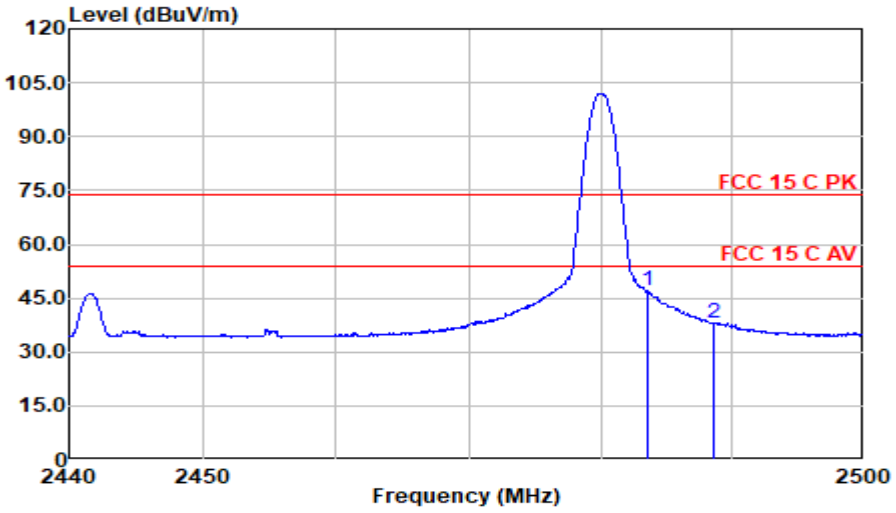
**Mode: BLE1M CH2480MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 59.60 | 28.63 | 5.47 | 35.91 | 57.79 | 74.00 | 16.21 | Peak |
| 2489.380 | 61.66 | 28.66 | 5.47 | 35.91 | 59.89 | 74.00 | 14.11 | Peak |

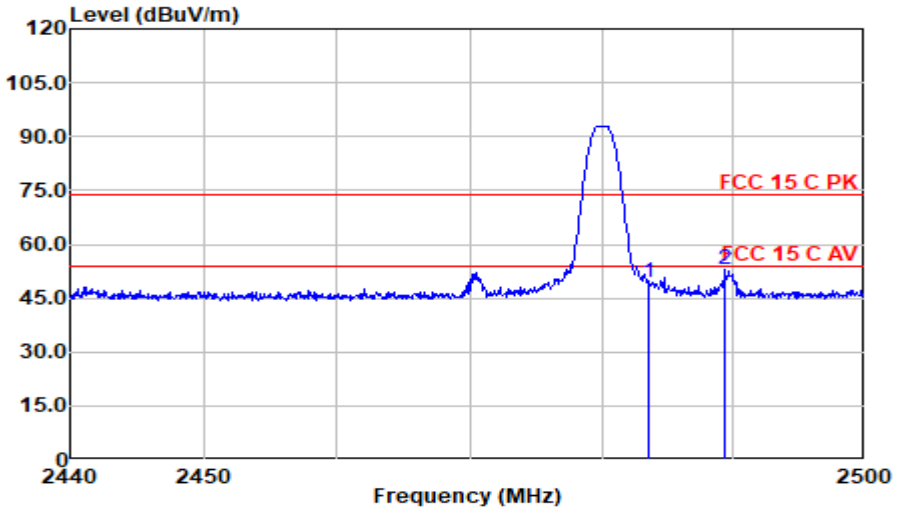
**Mode: BLE1M CH2480MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 48.70 | 28.63 | 5.47 | 35.91 | 46.89 | 54.00 | 7.11 | Average |
| 2488.600 | 39.99 | 28.65 | 5.47 | 35.91 | 38.21 | 54.00 | 15.79 | Average |

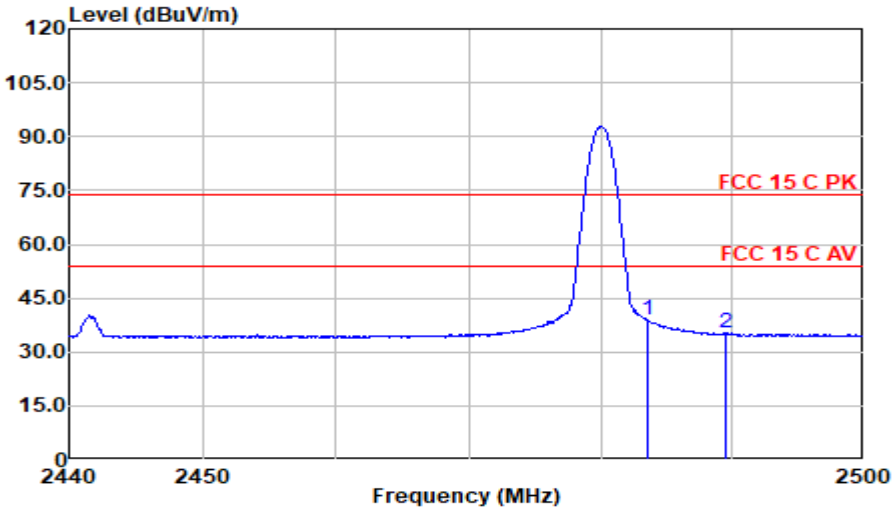
**Mode: BLE1M CH2480MHz**




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 51.19 | 28.63 | 5.47 | 35.91 | 49.38 | 74.00 | 24.62 | Peak |
| 2489.380 | 54.96 | 28.66 | 5.47 | 35.91 | 53.19 | 74.00 | 20.81 | Peak |

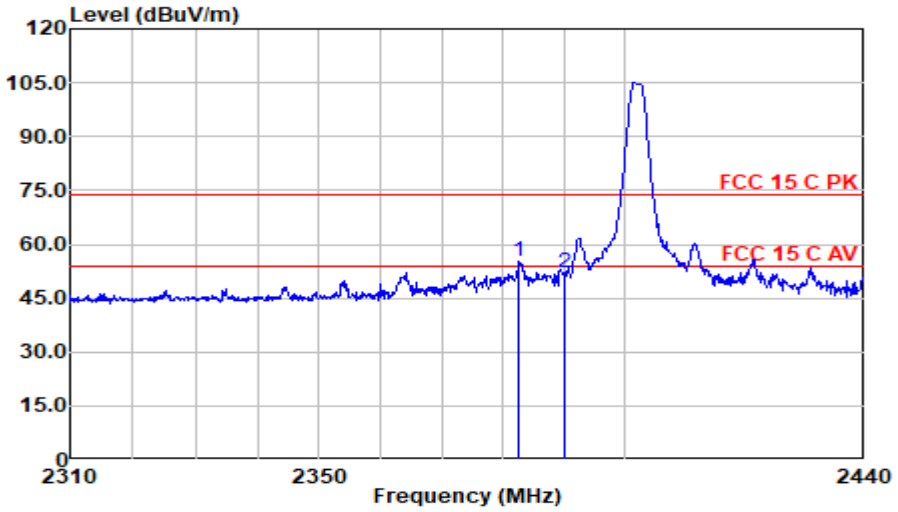
**Mode: BLE1M CH2480MHz**




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 40.70 | 28.63 | 5.47 | 35.91 | 38.89 | 54.00 | 15.11 | Average |
| 2489.500 | 37.15 | 28.66 | 5.47 | 35.91 | 35.38 | 54.00 | 18.62 | Average |

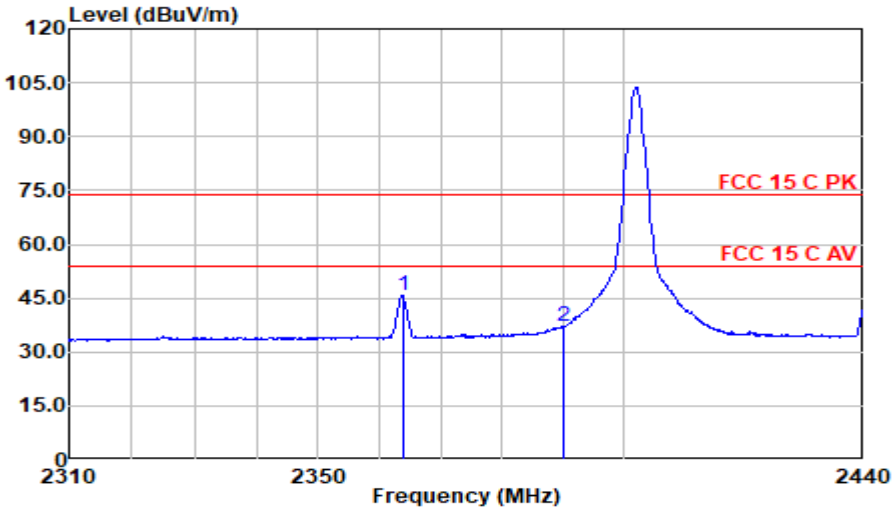
**Mode: BLE2M CH2402MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2382.540 | 57.15 | 28.53 | 5.38 | 36.03 | 55.03 | 74.00 | 18.97 | Peak |
| 2390.000 | 54.31 | 28.56 | 5.39 | 36.02 | 52.24 | 74.00 | 21.76 | Peak |

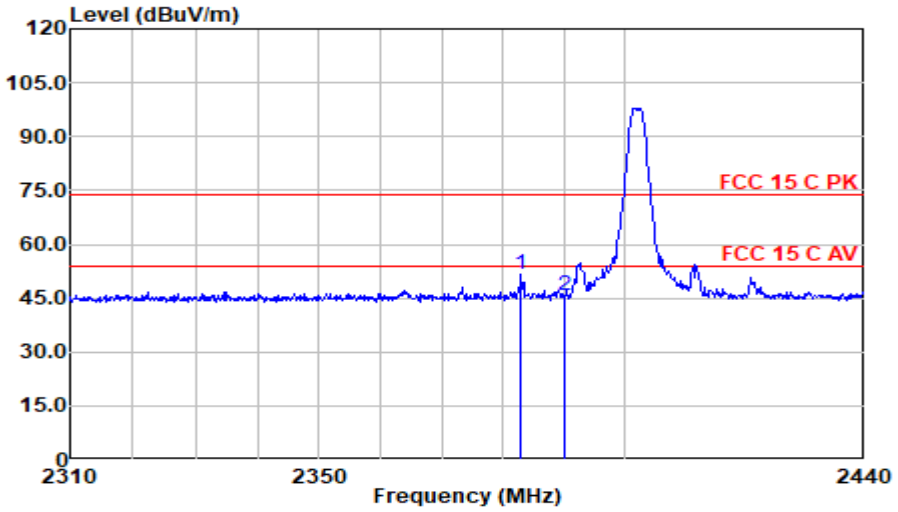
**Mode: BLE2M CH2402MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2363.690 | 47.86 | 28.46 | 5.36 | 36.05 | 45.64 | 54.00 | 8.36 | Average |
| 2390.000 | 39.11 | 28.56 | 5.39 | 36.02 | 37.04 | 54.00 | 16.96 | Average |

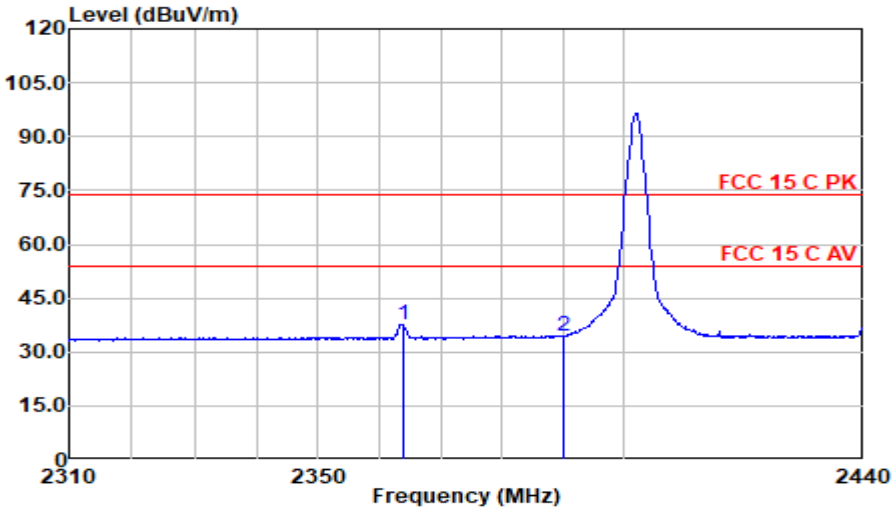
**Mode: BLE2M CH2402MHz**




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2382.800 | 53.91 | 28.53 | 5.38 | 36.02 | 51.80 | 74.00 | 22.20 | Peak |
| 2390.000 | 47.72 | 28.56 | 5.39 | 36.02 | 45.65 | 74.00 | 28.35 | Peak |

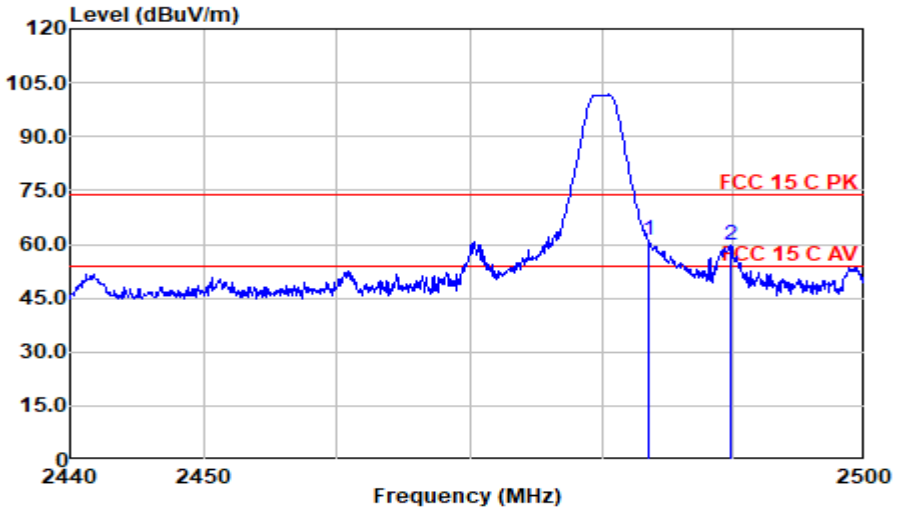
**Mode: BLE2M CH2402MHz**




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2363.690 | 39.93 | 28.46 | 5.36 | 36.05 | 37.70 | 54.00 | 16.30 | Average |
| 2390.000 | 36.39 | 28.56 | 5.39 | 36.02 | 34.32 | 54.00 | 19.68 | Average |

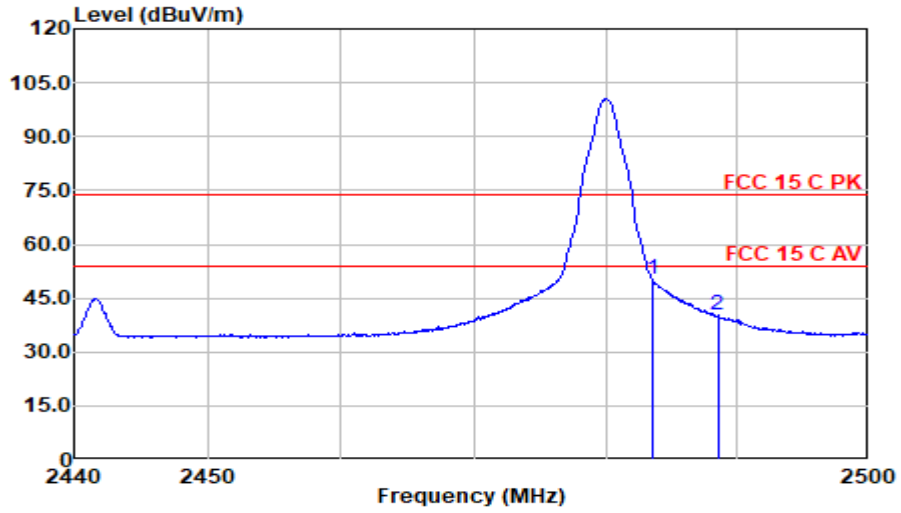
**Mode: BLE2M CH2480MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 63.09 | 28.63 | 5.47 | 35.91 | 61.28 | 74.00 | 12.72 | Peak |
| 2489.740 | 61.58 | 28.66 | 5.47 | 35.91 | 59.81 | 74.00 | 14.19 | Peak |

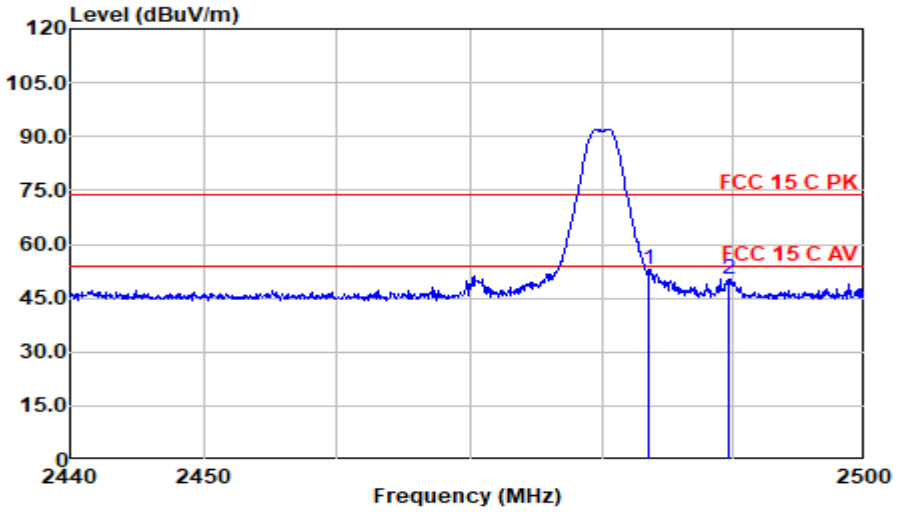
**Mode: BLE2M CH2480MHz**




Polarization at Horizontal

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 51.88 | 28.63 | 5.47 | 35.91 | 50.07 | 54.00 | 3.93 | Average |
| 2488.480 | 41.87 | 28.65 | 5.47 | 35.91 | 40.09 | 54.00 | 13.91 | Average |

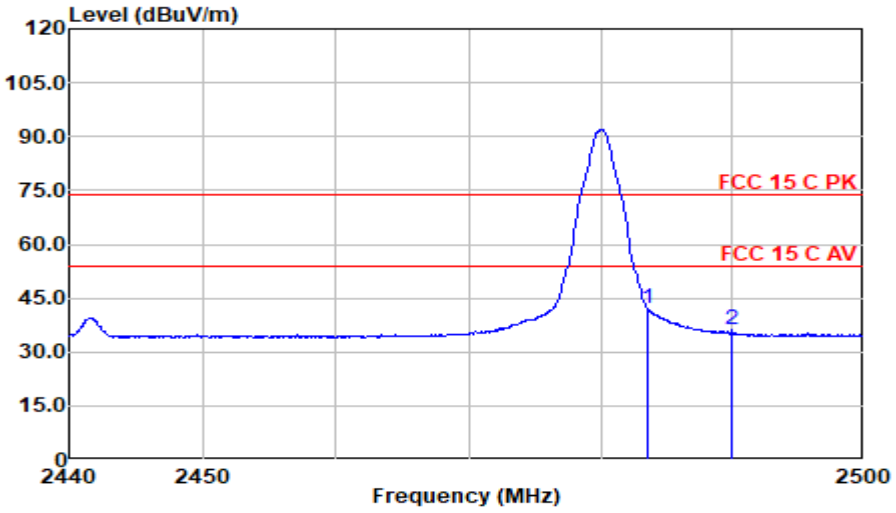
**Mode: BLE2M CH2480MHz**




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 54.97 | 28.63 | 5.47 | 35.91 | 53.16 | 74.00 | 20.84 | Peak |
| 2489.680 | 52.17 | 28.66 | 5.47 | 35.91 | 50.40 | 74.00 | 23.60 | Peak |

**Mode: BLE2M CH2480MHz**




Polarization at Vertical

| Frequency (MHz) | Meter Reading dB (μV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Emission Level dB (μV/m) | Limits dB (μV/m) | Margin (dB) | Remark |
|---|---|---|---|---|---|---|---|---|
| 2483.500 | 43.91 | 28.63 | 5.47 | 35.91 | 42.10 | 54.00 | 11.90 | Average |
| 2489.860 | 37.79 | 28.66 | 5.47 | 35.91 | 36.02 | 54.00 | 17.98 | Average |

# 4 6 dB BANDWIDTH MEASUREMENT

## 4.1 Test Equipment

The following test equipment was used during the Emission Bandwidth measurement:

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | N9010A | MY52221182 | 2023.08.09 | 1 Year |
| 2. | RF Cable | Mini-Circuits | FLC-3FT-SM SM+ | 22022838 | 2023.08.09 | 1 Year |
| 3. | 10 dB Attenuator | Mini-Circuits | BW-S10W2+ | 001 | 2023.08.09 | 1 Year |

## 4.2 Block Diagram of Test Setup

## 4.3 Specification Limits (§15.247(a)(2))

The minimum 6 dB bandwidth shall be at least 500 kHz.

## 4.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

## 4.5 Test Procedure

The transmitter output was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measure by spectrum analyzer with settings: RBW = 100kHz, VBW ≥ 3 × RBW.

The 6 dB bandwidth is defined as the total spectrum the power of which is lower than peak power minus 6 dB .

The test procedure is defined in ANSI C63.10-2013 (the 11.8.2 Measurement Procedure “Option 2” was used).

## 4.6 Test Results

**PASSED.**

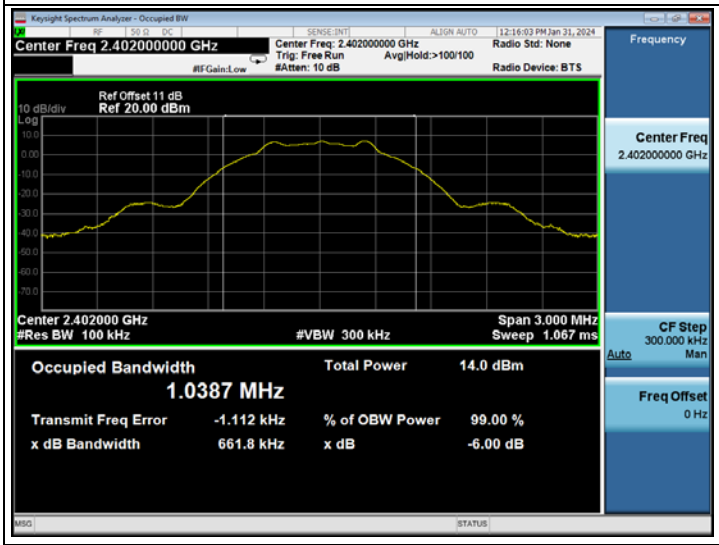
All the test results are attached in next pages.

(Test Date: 2024.01.31 Temperature: 23℃ Humidity: 51 %)

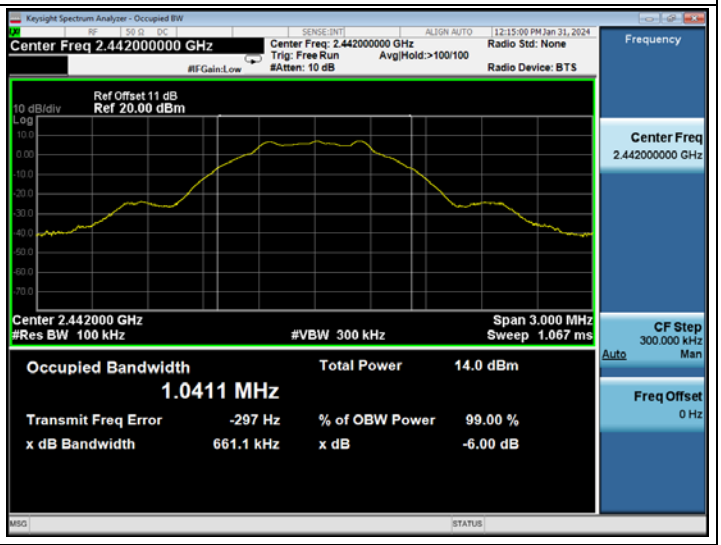
| Mode | Channel | Frequency (MHz) | **6dB Bandwidth (kHz)** | Limit |
|---|---|---|---|---|
| BLE 1M | 00 | 2402 | **661.8** | 500 kHz |
| | 20 | 2442 | **661.1** | 500 kHz |
| | 39 | 2480 | **659.9** | 500 kHz |
| BLE 2M | 00 | 2402 | **1114** | 500 kHz |
| | 20 | 2442 | **1115** | 500 kHz |
| | 39 | 2480 | **1114** | 500 kHz |

**BLE 1M**

CH2402



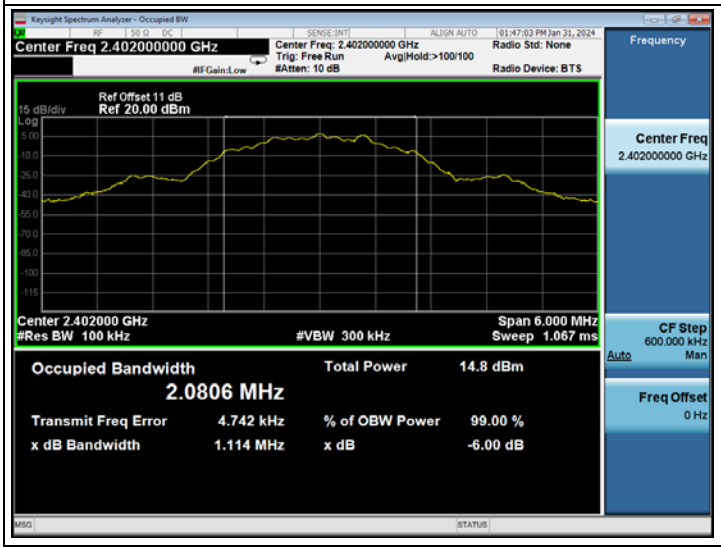

CH2442



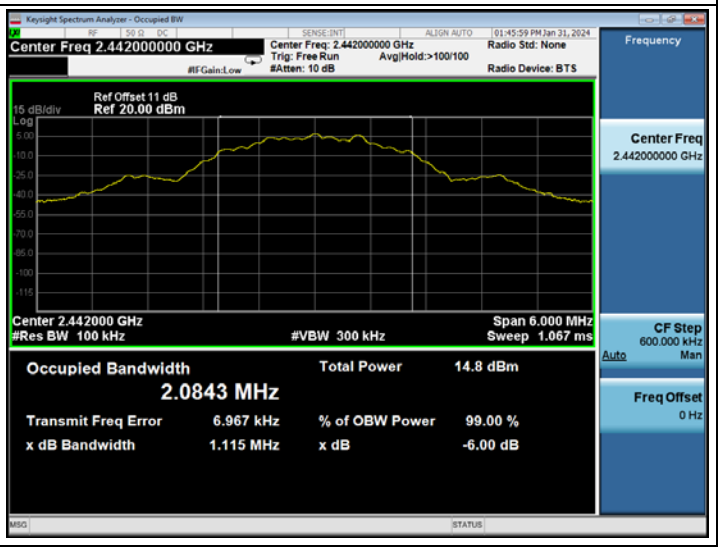

CH2480

**BLE 2M**

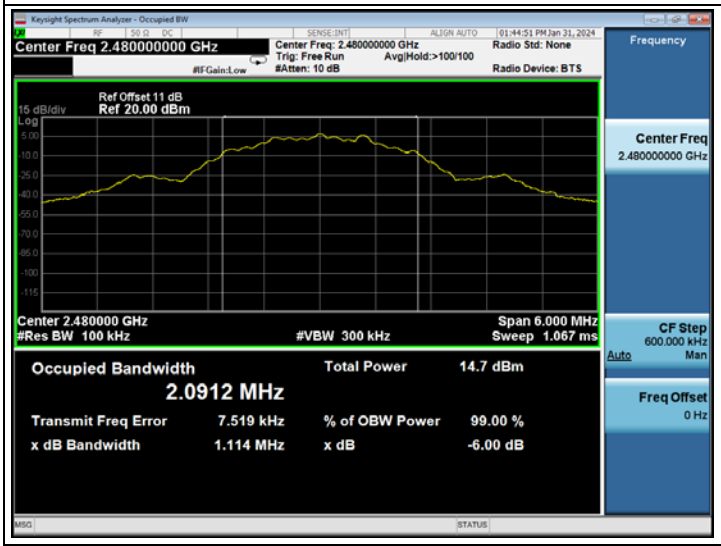
CH2402




CH2442




CH2480



# 5 MAXIMUM PEAK OUTPUT POWER MEASUREMENT

## 5.1 Test Equipment

The following test equipment was used during the maximum peak output power measurement:

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | N9010A | MY52221182 | 2023.08.09 | 1 Year |
| 2. | RF Cable | Mini-Circuits | FLC-3FT-SM SM+ | 22022838 | 2023.08.09 | 1 Year |
| 3. | 10 dB Attenuator | Mini-Circuits | BW-S10W2+ | 001 | 2023.08.09 | 1 Year |

## 5.2 Block Diagram of Test Setup

The Same as Section. 5.2.

## 5.3 Specification Limits ((§15.247(b)(3))

The Limits of maximum Peak Output Power for digital modulation in 2400-2483.5 MHz is: 1 Watt. (30 dBm)

## 5.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

## 5.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:
a) RBW ≥ DTS Bandwidth.
b) VBW ≥ [3 × RBW].
c) Span ≥ [3 × RBW].
d) Sweep time = auto.
e) Detector = peak.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

The test procedure is defined in ANSI C63.10-2013 ( 11.9.1.1 Measurement Procedure “ RBW □ DTS bandwidth” was used).

## 5.6 Test Results

**PASSED.**

All the test results are listed below.

(Test Date: 2024.01.31 Temperature: 23℃ Humidity: 51 %)

| Mode | Channel | Frequency (MHz) | **Peak Output Power (dBm)** | Limit |
|---|---|---|---|---|
| BLE 1M | 00 | 2402 | **7.247** | 30 dBm |
| | 20 | 2442 | **7.303** | 30 dBm |
| | 39 | 2480 | **7.115** | 30 dBm |
| BLE 2M | 00 | 2402 | **7.316** | 30 dBm |
| | 20 | 2442 | **7.33** | 30 dBm |
| | 39 | 2480 | **7.153** | 30 dBm |

**BLE 1M**

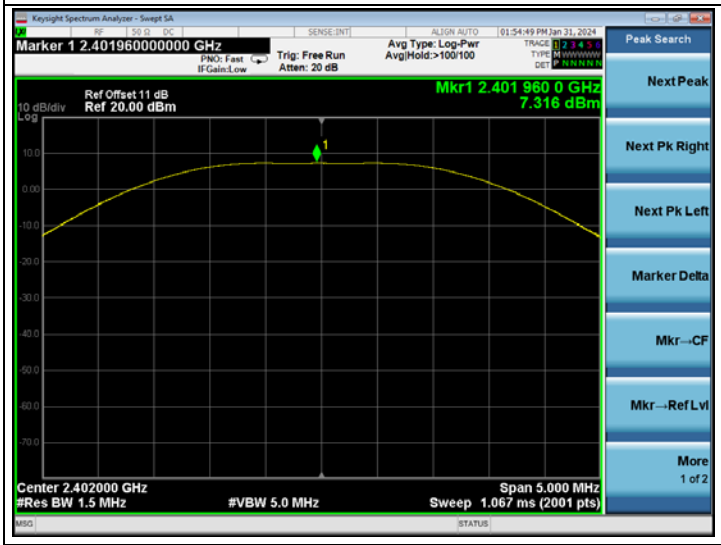
CH2402

CH2442

CH2480

**BLE 2M**

CH2402




CH2442

CH2480

# 6 EMISSION LIMITATIONS MEASUREMENT

## 6.1 Test Equipment

The following test equipment was used during the emission limitations test:

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | N9010A | MY52221182 | 2023.08.09 | 1 Year |
| 2. | RF Cable | Mini-Circuits | FLC-3FT-SM SM+ | 22022838 | 2023.08.09 | 1 Year |
| 3. | 10 dB Attenuator | Mini-Circuits | BW-S10W2+ | 001 | 2023.08.09 | 1 Year |

## 6.2 Block Diagram of Test Setup

The Same as Section. 5.2.

## 6.3 Specification Limits (§15.247(d))

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)). (※This test result attaching to Section. 3.7)

## 6.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

## 6.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

Establish a reference level by using the following procedure:
a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to ≥ 1.5 times the DTS bandwidth.
c) Set the RBW = 100 kHz.
d) Set the VBW ≥ [3 × RBW].
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.
Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Establish an emission level by using the following procedure:
a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Scan up through $10^{th}$ harmonic.

The test procedure is defined in ANSI C63.10-2013 (11.11.2 Reference level measurement and 11.11.3 Emission level measurement was used).

## 6.6 Test Results

**PASSED**.

The test data was attached in the next pages.

(Test Date: 2024.01.31 Temperature: 23℃ Humidity: 51 %)

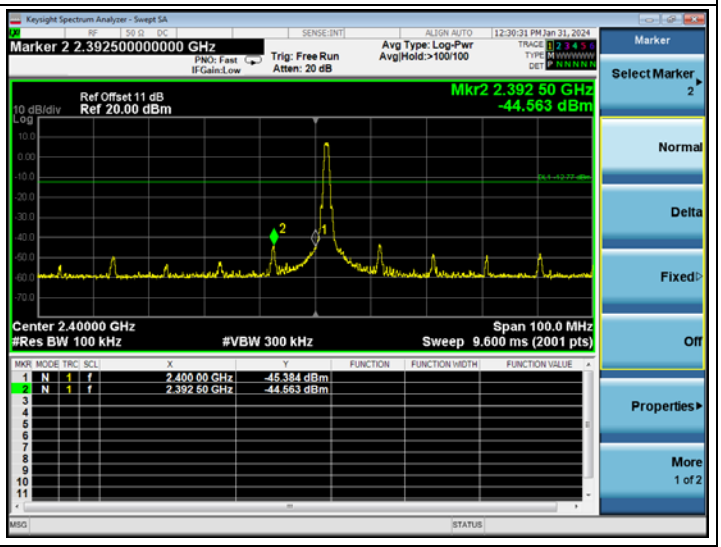
| Mode | Channel | Frequency (MHz) | Data Page |
|---|---|---|---|
| BLE 1M | 00 | 2402 | P46 |
| | 20 | 2442 | P47 |
| | 39 | 2480 | P48 |
| BLE 2M | 00 | 2402 | P49 |
| | 20 | 2442 | P50 |
| | 39 | 2480 | P51 |

**BLE 1M**

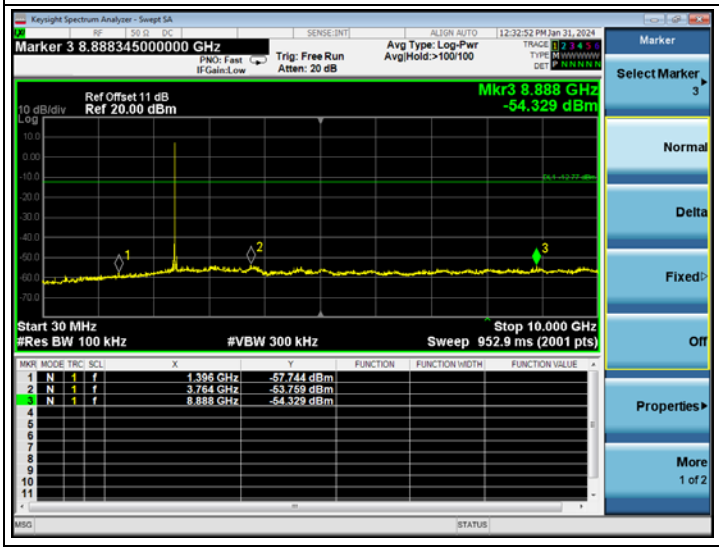
CH2402

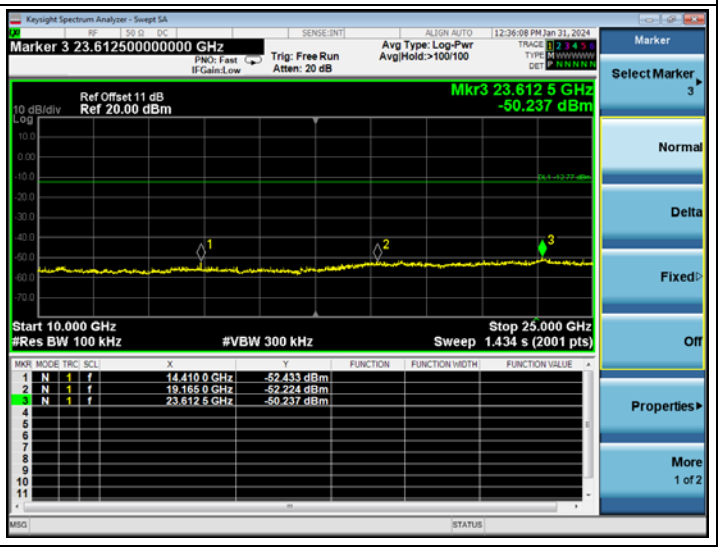
Reference Level

Lower Edge




Emission Level



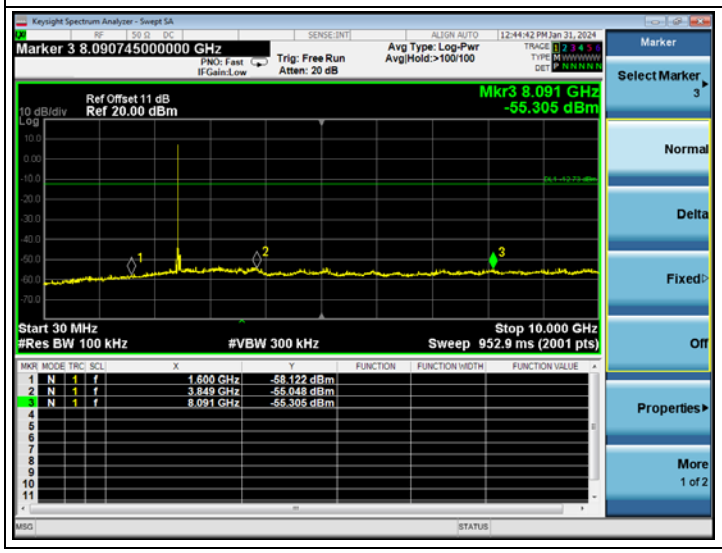



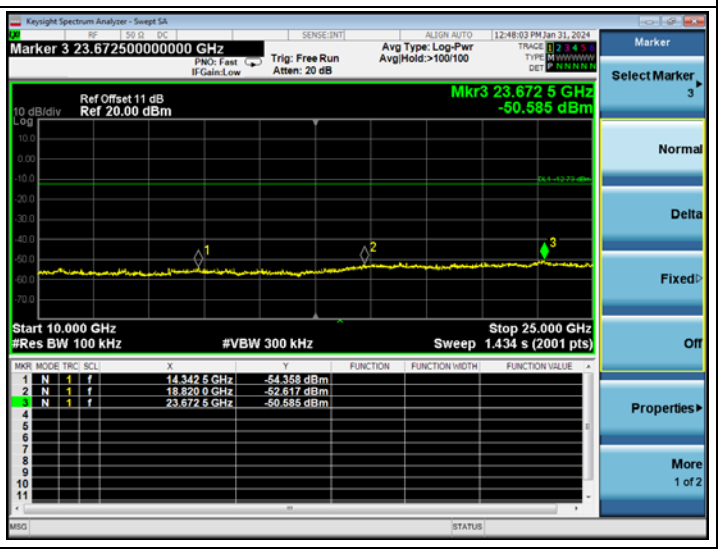
**BLE 1M**

CH2442

Reference Level

Emission Level



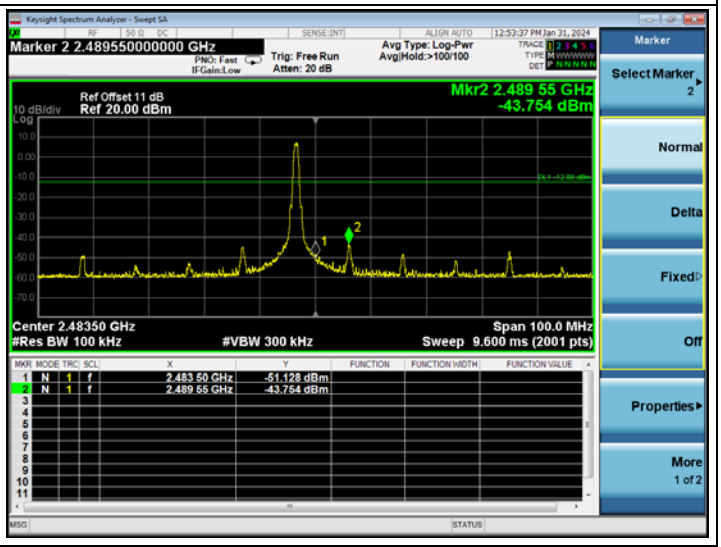



**BLE 1M**

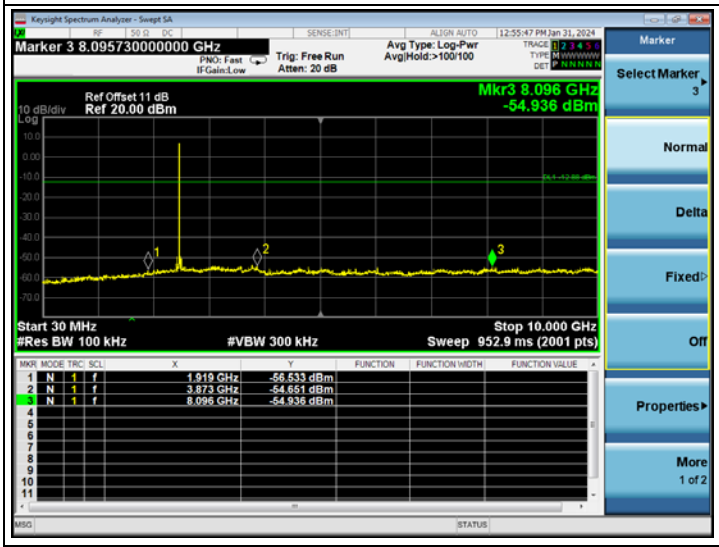
CH2480

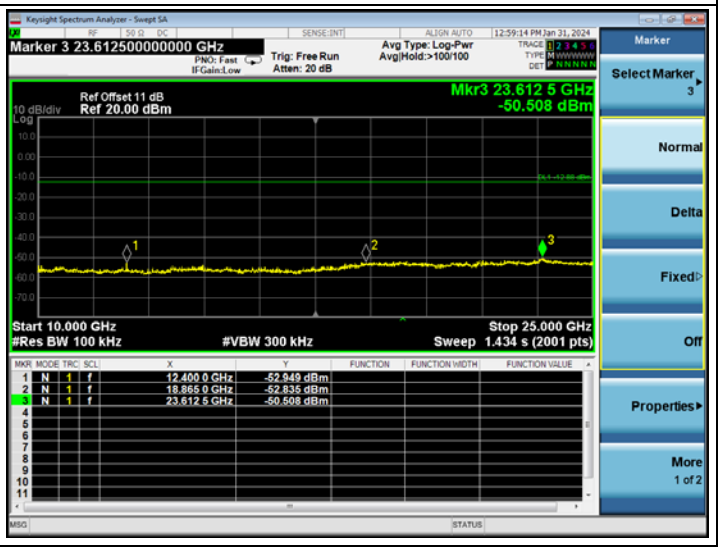
Reference Level

Higher Edge




Emission Level



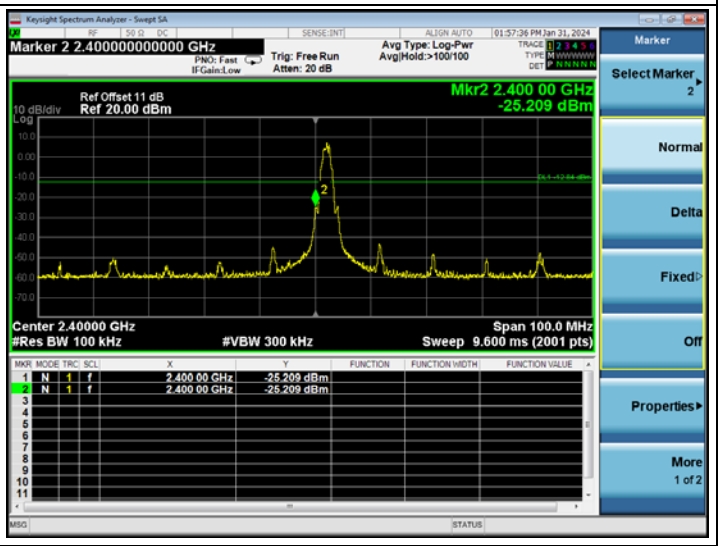



**BLE 2M**

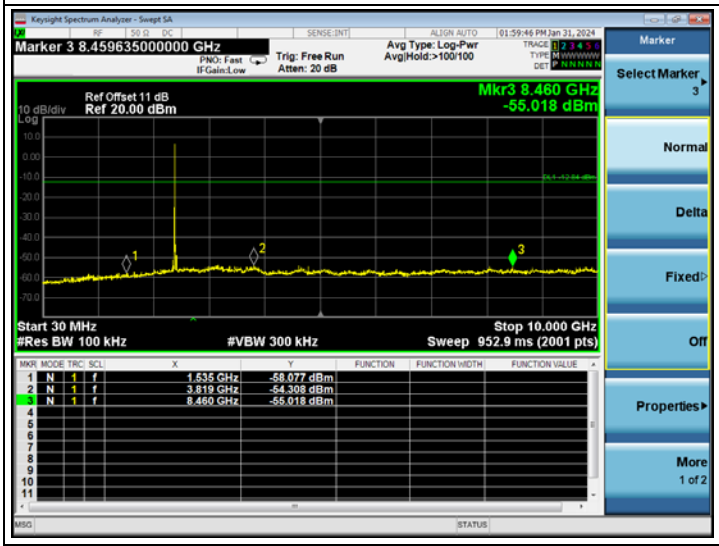
CH2402

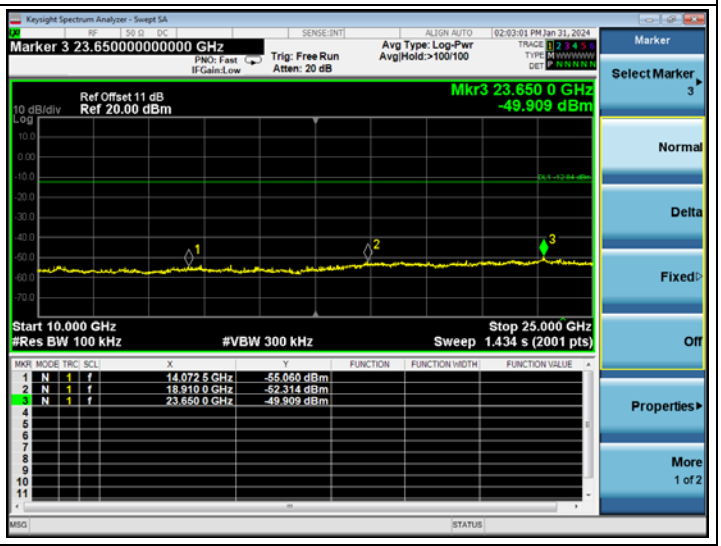
Reference Level

Lower Edge




Emission Level



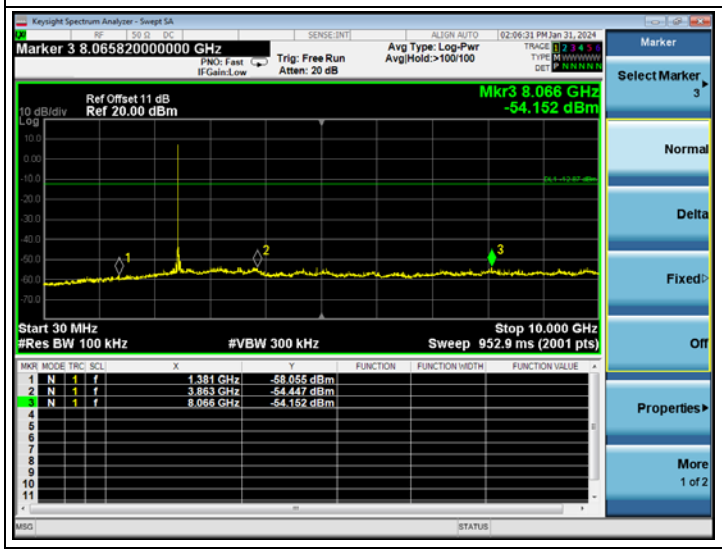



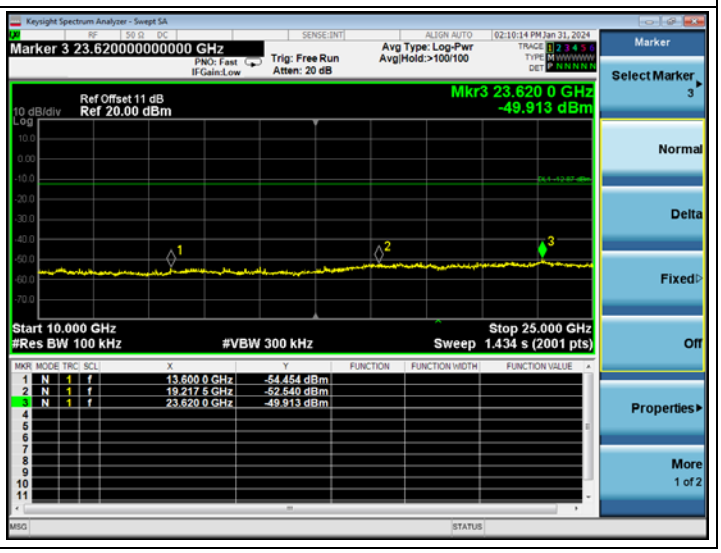
**BLE 2M**

CH2442

Reference Level

Emission Level



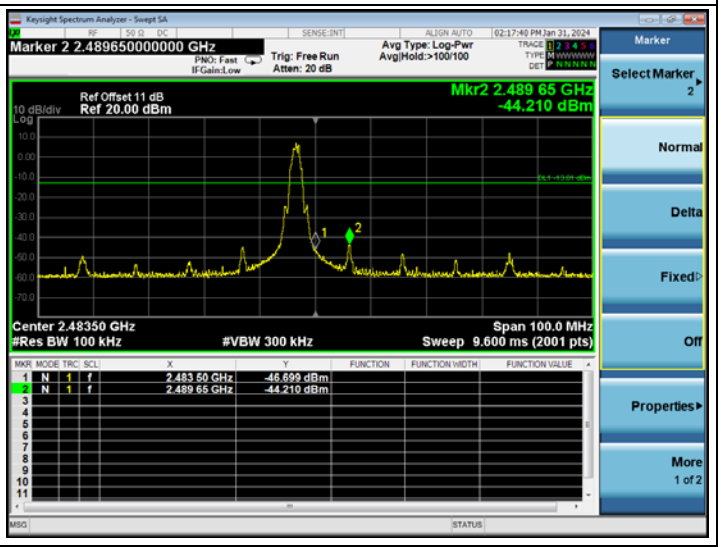



**BLE 2M**

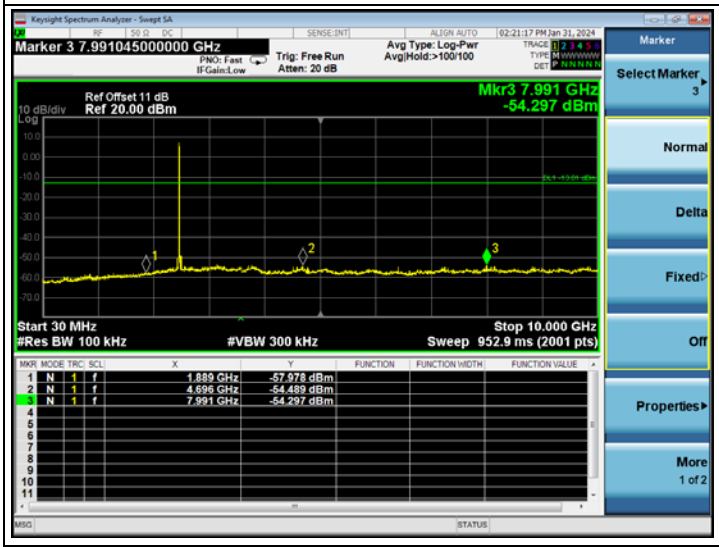
CH2480

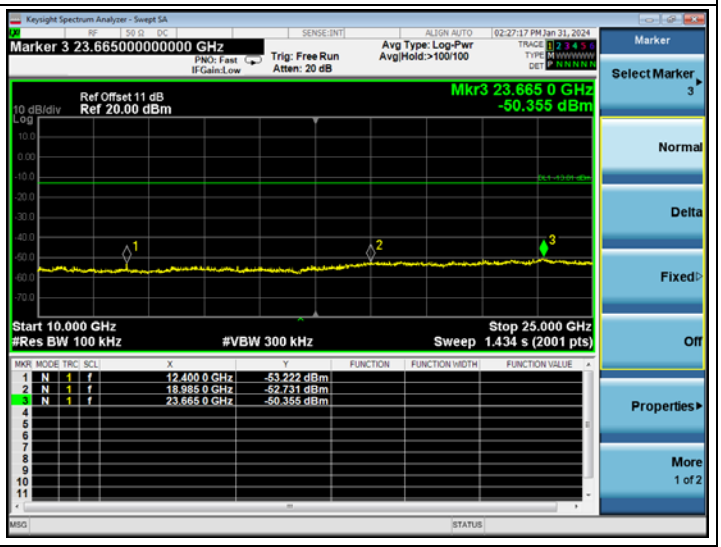
Reference Level

Higher Edge




Emission Level



# 7 POWER SPECTRAL DENSITY MEASUREMENT

## 7.1 Test Equipment

The following test equipment was used during the power spectral density measurement:

| Item | Type | Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Interval |
|---|---|---|---|---|---|---|
| 1. | Spectrum Analyzer | Agilent | N9010A | MY52221182 | 2023.08.09 | 1 Year |
| 2. | RF Cable | Mini-Circuits | FLC-3FT-SM SM+ | 22022838 | 2023.08.09 | 1 Year |
| 3. | 10 dB Attenuator | Mini-Circuits | BW-S10W2+ | 001 | 2023.08.09 | 1 Year |

## 7.2 Block Diagram of Test Setup

The Same as section 5.2.

## 7.3 Specification Limits (§15.247(e))

The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band.

## 7.4 Operating Condition of EUT

The software as section 2.3 was used to enable the EUT to change the test mode one by one.

## 7.5 Test Procedure

The transmitter output was connected to the spectrum analyzer.

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ [3 × RBW].
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

The test procedure is defined in ANSI C63.10-2013 ( 11.10.2 Measurement Procedure “Method PKPSD (peak PSD)” was used).

## 7.6 Test Results

**PASSED**.

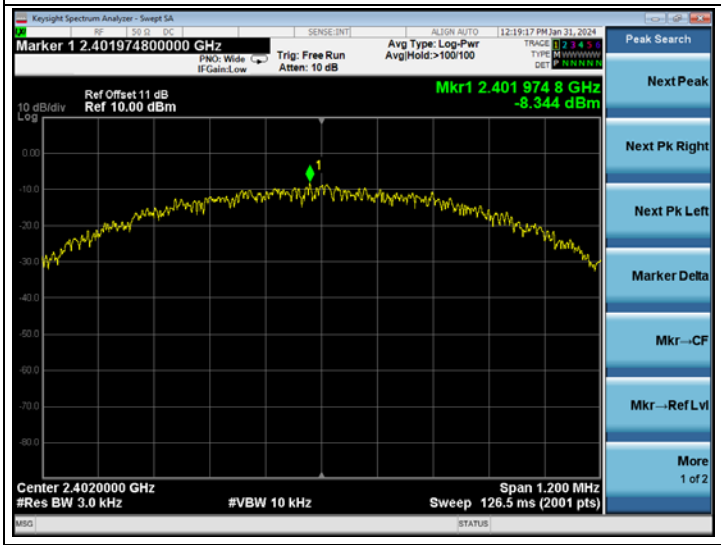
All the test results are attached in next pages.

(Test Date: 2024.01.31 Temperature: 23℃ Humidity: 51 %)

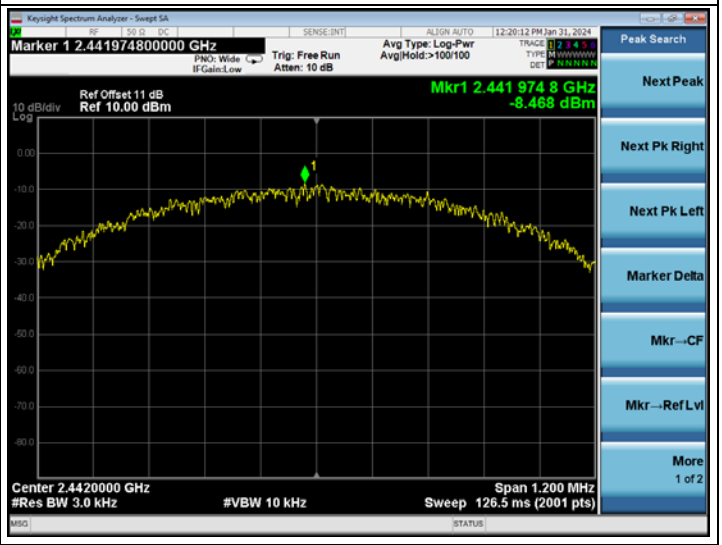
| Mode | Channel | Frequency (MHz) | **Power Spectral Density (dBm)** | Limit |
|---|---|---|---|---|
| BLE 1M | 00 | 2402 | **-8.344** | 8 dBm |
| | 20 | 2442 | **-8.468** | 8 dBm |
| | 39 | 2480 | **-8.566** | 8 dBm |
| BLE 2M | 00 | 2402 | **-9.618** | 8 dBm |
| | 20 | 2442 | **-9.626** | 8 dBm |
| | 39 | 2480 | **-9.863** | 8 dBm |

**BLE 1M**

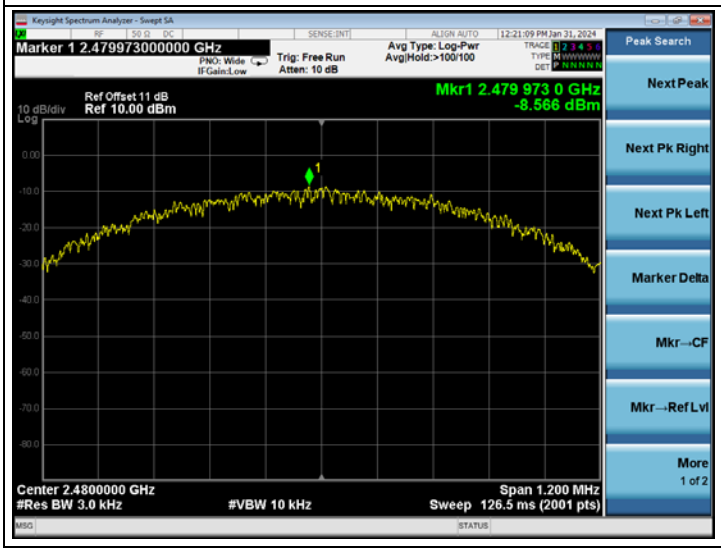
CH2402




CH2442

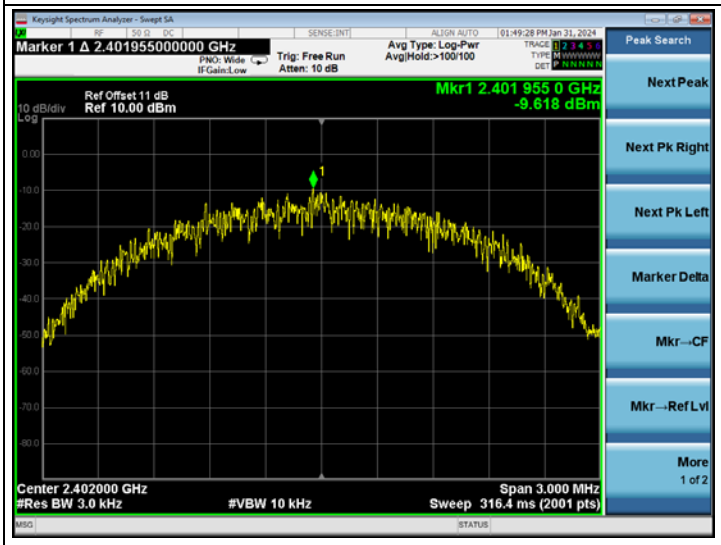



CH2480



**BLE 2M**

CH2402

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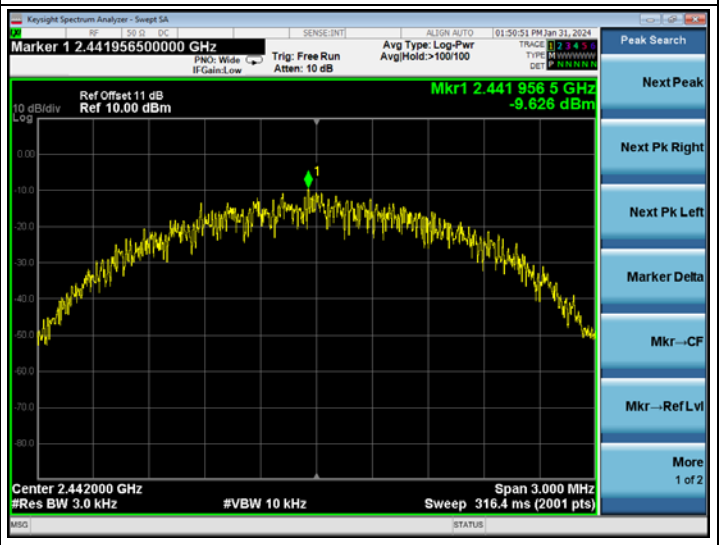
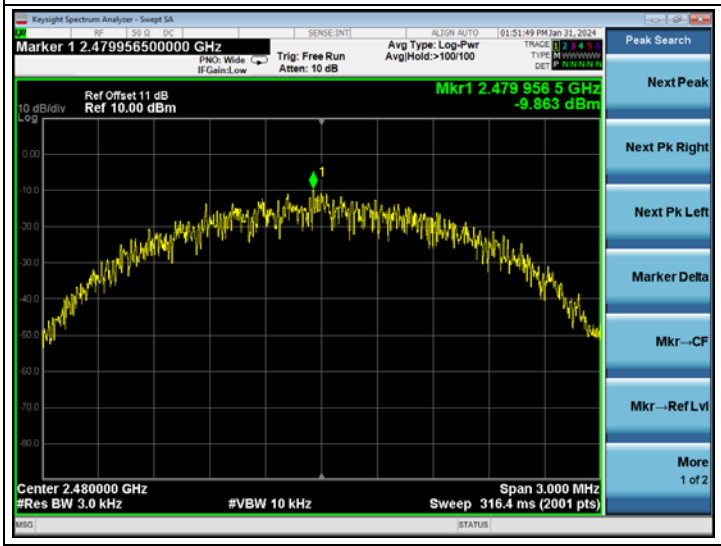



CH2480



# 8 ANTENNA REQUIREMENT

## 8.1 Specification Limits (§15.203)

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.

## 8.2 Result

| |
|---|
| According to KDB 353028 D1, the following describes the three ways that can be used to demonstrate compliance to Section 15.203:<br>a) Antenna permanently attached.<br>b) Unique (non-standard) antenna connector.<br>c) Professional installation. |
| For this product, the antenna is:<br>☑ Antenna permanently attached<br>☐ Unique (non-standard) antenna connector<br>☐ Professional installation<br>☐ not meet any of ways list above<br>that<br>☑ compliant<br>☐ not compliant<br>with the requirement of Section 15.203. |

# 9 DEVIATION TO TEST SPECIFICATIONS

None.

# 10 MEASUREMENT UNCERTAINTY LIST

The measurement uncertainty was estimated for test on the EUT according to CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage of K=2.
The uncertainties value is not used in determining the PASS/FAIL results.

| Test Items/Facilities | Frequency/Equipment/Unit | Uncertainty |
|---|---|---|
| Conducted Emission No.1 Shielded Room | 9kHz~150kHz | ±3.1 dB |
| | 150kHz~30MHz | ±2.6 dB |
| Conducted Emission No.3 Shielded Room | 9kHz~150kHz | ±3.1 dB |
| | 150kHz~30MHz | ±2.6 dB |
| Radiated Emission | 30MHz~200MHz, Horizontal | ±3.8 dB |
| | 30MHz~200MHz, Vertical | ±4.1 dB |
| | 200MHz~1000MHz, Horizontal | ±3.6 dB |
| | 200MHz~1000MHz, Vertical | ±5.1 dB |
| | 1GHz~6GHz | ±5.3 dB |
| | 6GHz~18GHz | ±5.3 dB |
| | 18GHz~40GHz | ±3.5 dB |
| Output Power Test | 50MHz~18GHz | 0.77 dB |
| Power Density Test | 9kHz~6GHz | 1.08 dB |
| RF Frequency Test | 9kHz~40GHz | $6*10^{-4}$ |
| Bandwidth Test | 9kHz~6GHz | $1.5*10^{-3}$ |
| RF Radiated Power Test | 30MHz~1000MHz | 3.06 dB |
| Conducted Output Power Test | 50MHz~18GHz | 0.83 dB |
| AC Voltage(<10kHz) Test | 120V~230V | 0.04 % |
| DC Power Test | 0V~30V | 0.4 % |
| Temperature | -40℃~+100℃ | 0.52 ℃ |
| Humidity | 30%~95% | 2.6 % |