

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 1 of 49

**Applicant** : Ehong Technology Co.,Ltd  
**Address of Applicant** : Room 501, No.485 Xingmei Road,  
Minhang Dis,Shanghai, China.

**Product Name** : Ehong BLE Module  
**Brand Name** : Ehong  
**Model Name** : EQM100-5B, EQM100-5U  
**Sample Acquisition Method** : Sent by Client  
**Sample No.** : E23070127-01#01(EQM100-5B Model)  
E23070127-01#03(EQM100-5U Model)

**FCC ID** : 2ACCREQM100

**Standards** : FCC CFR47 Part 15, Subpart C

**Date of Receipt** : 2023-07-31  
**Date of Test** : 2023-08-01~ 2023-08-16  
**Date of Issue** : 2023-08-17

**Remark:**

*This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.*

Prepared by:



(Erik Yang)

Reviewed by:



(Jennifer Zhou)

Approved by:



(Authorized signatory: Echo Mu)

# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 2 of 49

## Contents

- 1 GENERAL INFORMATION ..... 3
  - 1.1 TESTING LABORATORY ..... 3
  - 1.2 DETAILS OF APPLICATION ..... 3
  - 1.3 DETAILS OF EUT ..... 3
  - 1.4 TEST METHODOLOGY ..... 4
  - 1.5 TEST SUMMARY ..... 5
- 2 TEST CONDITION ..... 6
  - 2.1 ENVIRONMENTAL CONDITIONS ..... 6
  - 2.2 EQUIPMENT LIST ..... 6
  - 2.3 MEASUREMENT UNCERTAINTY ..... 7
- 3 TEST SET-UP AND OPERATION MODES ..... 8
  - 3.1 DETAILS OF TEST MODE ..... 8
  - 3.2 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT ..... 8
  - 3.3 SUPPORT SOFTWARE ..... 8
  - 3.4 TEST SETUP DIAGRAM ..... 9
- 4 TEST RESULTS ..... 11
  - 4.1 TRANSMITTER REQUIREMENT & TEST SUITES ..... 11
    - 4.1.1 Antenna Requirement ..... 11
    - 4.1.2 Maximum peak conducted output power ..... 12
    - 4.1.3 6dB Bandwidth ..... 16
    - 4.1.4 Maximum conducted output power spectral density ..... 20
    - 4.1.5 Conducted Spurious Emission & Authorized-band band-edge ..... 24
    - 4.1.6 Radiated Emission ..... 36
    - 4.1.7 Band Edge (Restricted-band band-edge) ..... 37
  - 4.2 MAINS EMISSIONS ..... 38
    - 4.2.1 Conducted Emission on AC Mains ..... 38
- 5 APPENDIXES ..... 43
  - 5.1 PHOTOGRAPHS OF THE SAMPLE ..... 43
  - 5.2 SET-UP FOR CONDUCTED EMISSIONS ..... 46
  - 5.3 SET-UP FOR CONDUCTED RF TEST AT ANTENNA PORT ..... 47
  - 5.4 SET-UP FOR SPURIOUS EMISSIONS BELOW 1GHZ ..... 48
  - 5.5 SET-UP FOR SPURIOUS EMISSIONS ABOVE 1GHZ ..... 49

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 3 of 49

## 1 General Information

### 1.1 Testing Laboratory

|              |                                                      |
|--------------|------------------------------------------------------|
| Company Name | ICAS Testing Technology Service (Shanghai) Co., Ltd. |
| Address      | No.1298 Pingan Rd, Minhang District, Shanghai, China |
| Telephone    | 0086 21-51682999                                     |
| Fax          | 0086 21-54711112                                     |
| Homepage     | www.icasiso.com                                      |

### 1.2 Details of Application

|                           |                                                             |
|---------------------------|-------------------------------------------------------------|
| Applicant Company Name    | Ehong Technology Co.,Ltd                                    |
| Address                   | Room 501, No.485 Xingmei Road, Minhang Dis,Shanghai, China. |
| Contact Person            | Rik Tang                                                    |
| Telephone                 | 02164769993                                                 |
| Email                     | rik.tang@ehonglink.com                                      |
| Manufacturer Company Name | Ehong Technology Co.,Ltd                                    |
| Address                   | Room 501, No.485 Xingmei Road, Minhang Dis,Shanghai, China. |
| Factory Company Name      | Ehong Technology Co.,Ltd                                    |
| Address                   | Room 501, No.485 Xingmei Road, Minhang Dis,Shanghai, China. |

### 1.3 Details of EUT

|                           |                                                                                                                           |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Product Name              | Ehong BLE Module                                                                                                          |
| Brand Name                | Ehong                                                                                                                     |
| Test Model Name           | EQM100-5B                                                                                                                 |
| Series Model Name         | EQM100-5U                                                                                                                 |
| Difference Description    | All the same except for the antenna type<br>EQM100-5B Model is the pcb antenna<br>EQM100-5U Model is the external antenna |
| FCC ID                    | 2ACCREQM100                                                                                                               |
| Mode of Operation         | Bluetooth Version 5.3                                                                                                     |
| Frequency Range           | 2402MHz ~ 2480MHz                                                                                                         |
| Number of Channels        | 40 (at intervals of 2 MHz)                                                                                                |
| Modulation Type           | BLE <input checked="" type="checkbox"/> GFSK 1Mbps <input checked="" type="checkbox"/> GFSK 2Mbps                         |
| RF Output Power           | EQM100-5B (6.61dBm)<br>EQM100-5U (6.61dBm)                                                                                |
| Antenna Type              | EQM100-5B (PCB Antenna)<br>EQM100-5U (External Antenna)                                                                   |
| Antenna Gain              | EQM100-5B (-0.8dBi)<br>EQM100-5U (3.0dBi)                                                                                 |
| Extreme Temperature Range | -10℃~ +85℃                                                                                                                |

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 4 of 49

|                             |                                         |
|-----------------------------|-----------------------------------------|
| Test Voltage                | DC 3.3V                                 |
| Hardware version            | V1.0                                    |
| Software version            | V1.0                                    |
| RF power setting in TEST SW | sscom5.13.1_Power level setting_Default |

Note:

1. The above information was declared by the manufacture.
2. For more details, please refer to the User's manual of the EUT.

## Channel List

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|---------|-----------|
| 0       | 2.402GHz  | 14      | 2.430GHz  | 28      | 2.458GHz  |
| 1       | 2.404GHz  | 15      | 2.432GHz  | 29      | 2.460GHz  |
| 2       | 2.406GHz  | 16      | 2.434GHz  | 30      | 2.462GHz  |
| 3       | 2.408GHz  | 17      | 2.436GHz  | 31      | 2.464GHz  |
| 4       | 2.410GHz  | 18      | 2.438GHz  | 32      | 2.466GHz  |
| 5       | 2.412GHz  | 19      | 2.440GHz  | 33      | 2.468GHz  |
| 6       | 2.414GHz  | 20      | 2.442GHz  | 34      | 2.470GHz  |
| 7       | 2.416GHz  | 21      | 2.444GHz  | 35      | 2.472GHz  |
| 8       | 2.418GHz  | 22      | 2.446GHz  | 36      | 2.474GHz  |
| 9       | 2.420GHz  | 23      | 2.448GHz  | 37      | 2.476GHz  |
| 10      | 2.422GHz  | 24      | 2.450GHz  | 38      | 2.478GHz  |
| 11      | 2.424GHz  | 25      | 2.452GHz  | 39      | 2.480GHz  |
| 12      | 2.426GHz  | 26      | 2.454GHz  |         |           |
| 13      | 2.428GHz  | 27      | 2.456GHz  |         |           |

## 1.4 Test Methodology

|                                   |                                                                    |
|-----------------------------------|--------------------------------------------------------------------|
| 47 CFR Part 15, Subpart C         | Telecommunication-Radio Frequency Devices-Intentional Radiators    |
| KDB Publication 558074 D01 v05r02 | 15.247 Meas Guidance.                                              |
| ANSI C63.10-2013                  | American National Standard for Testing Unlicensed Wireless Devices |

### Note(s):

All test items were verified and recorded according to the standards and without any addition/deviation/exclusion during the test

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 5 of 49

## 1.5 Test Summary

| Test Item                                                  | FCC Rules                             | Result |
|------------------------------------------------------------|---------------------------------------|--------|
| Antenna Requirement                                        | FCC Part 15.247(b)(4),<br>Part 15.203 | PASS   |
| Maximum peak conducted output power                        | FCC Part 15.247(b)(3)                 | PASS   |
| 6dB Bandwidth                                              | FCC Part 15.247(a)(2)                 | PASS   |
| Maximum conducted output power spectral density            | FCC Part 15.247(e)                    | PASS   |
| Conducted Spurious Emission & Authorized-band<br>band-edge | FCC Part 15.247(d)                    | PASS   |
| Radiated Emission                                          | FCC Part 15.247(d), 15.205, 15.209    | PASS   |
| Band Edge (Restricted-band band-edge)                      | FCC Part 15.247(d), 15.205, 15.209    | PASS   |
| Conducted Emission on AC Mains                             | FCC Part 15.207(a)                    | PASS   |

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 6 of 49

## 2 Test Condition

### 2.1 Environmental conditions

|                            |          |
|----------------------------|----------|
| Temperature (°C)           | 18-25    |
| Humidity (%RH)             | 40-65    |
| Barometric Pressure (mbar) | 960-1060 |

### 2.2 Equipment List

| Name of Equipment                | Manufacturer    | Model           | Serial No.        | Cal. Date  | Cal. Due   |
|----------------------------------|-----------------|-----------------|-------------------|------------|------------|
| Spectrum Analyzer                | Keysight        | N9020B          | MY59260184        | 2023-07-27 | 2024-07-26 |
| Spectrum Analyzer                | Rohde & Schwarz | FSV40N          | 101450            | 2023-06-08 | 2024-06-07 |
| Signal Generator                 | Rohde & Schwarz | SMR27           | 100184            | 2023-07-27 | 2024-07-26 |
| EMI Test Receiver                | Rohde & Schwarz | ESR 7           | 101911            | 2023-06-08 | 2024-06-07 |
| EMI Test Receiver                | Rohde & Schwarz | ESPI3           | 100173            | 2023-06-08 | 2024-06-07 |
| V-network                        | SCHWARZBECK     | NSLK8127        | 8127-902          | 2023-06-07 | 2024-06-06 |
| Attenuator                       | SCHWARZBECK     | VTSD<br>9561-FN | /                 | 2023-06-06 | 2024-06-05 |
| Broadband Antenna                | SCHWARZBECK     | VULB9163        | 9163-1037         | 2023-03-22 | 2025-03-21 |
| Horn Antenna-18G                 | SCHWARZBECK     | BBHA9120D       | 9120D-1775        | 2023-06-13 | 2025-06-12 |
| Horn Antenna-40G                 | YINGLIAN        | LB-180400-KF    | N/A               | 2023-06-18 | 2025-06-17 |
| Loop Antenna                     | SCHWARZBECK     | FMZB 1513       | /                 | 2022-07-02 | 2024-07-01 |
| Broadband Preamplifier           | SCHWARZBECK     | BBV 9718        | 346               | 2023-06-08 | 2024-06-07 |
| EMC chamber 9*6*6 (L*W*H)        | CHANGNING       | 966             | N/A               | 2023-06-09 | 2026-06-08 |
| Shielded Enclosure 8*5*4 (L*W*H) | CHANGNING       | 854             | N/A               | 2023-06-09 | 2025-06-08 |
| Test Software                    | BL              | BL410_E         | Version:1.0.0.117 | N/A        | N/A        |
| Test Software                    | BL              | BL410_R         | Version:2.1.1.409 | N/A        | N/A        |

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 7 of 49

## 2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI. The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95%.

| Parameter                       |               | Uncertainty   |
|---------------------------------|---------------|---------------|
| Antenna Port Conducted Emission | < 1GHz        | $\pm 1.5$ dB  |
|                                 | > 1GHz        | $\pm 1.5$ dB  |
| Radiated Emission               | 9KHz – 30MHz  | $\pm 3.42$ dB |
|                                 | 30 MHz – 1GHz | $\pm 5.00$ dB |
|                                 | > 1GHz        | $\pm 4.88$ dB |
| Conducted Emission on AC Mains  | 150kHz-30MHz  | $\pm 2.68$ dB |
| Occupied Channel Bandwidth      |               | $\pm 5$ %     |

# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 8 of 49

## 3 Test Set-up and Operation Modes

### 3.1 Details of Test Mode

Using test software was control EUT work in continuous transmitter and receiver mode. Select test channel as below:

| Channel                   | Frequency |
|---------------------------|-----------|
| The lowest channel(CH0)   | 2402MHz   |
| The middle channel(CH19)  | 2440MHz   |
| The Highest channel(CH39) | 2480MHz   |

The basic operation modes are:

- A. On
  - 1. BLE mode
    - a. Transmitting
      - i. Low Channel
      - ii. Middle Channel
      - iii. High Channel
    - b. Receiving
  - 2. Normal working with Bluetooth on
- B. Standby
- C. Off

### 3.2 Special Accessories and Auxiliary Equipment

| Description | Manufacturer | Model Name        | Serial No.       |
|-------------|--------------|-------------------|------------------|
| Laptop      | HP           | HP ZHAN 66 Pro G1 | N/A              |
| USB Cable   | N/A          | N/A               | 1.00m Unshielded |
| Adapter     | N/A          | A8-501000         | 2017030060611    |

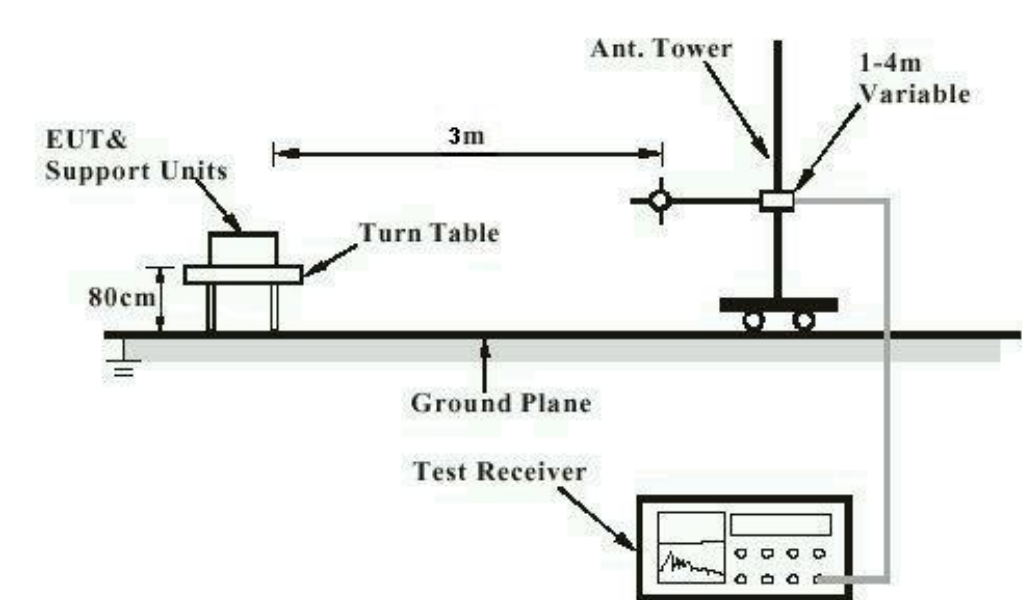
### 3.3 Support Software

| Description | Manufacturer | Software Name |
|-------------|--------------|---------------|
| Software    | N/A          | sscom5.13.1   |

# TEST REPORT

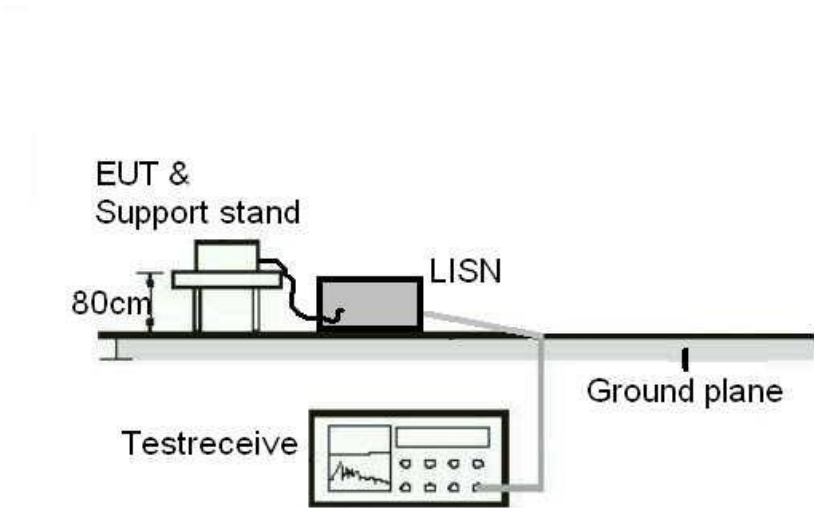
## 3.4 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



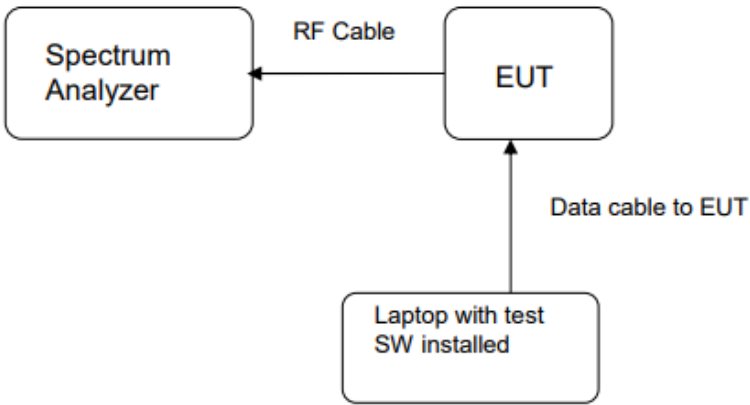
Note: Measurements above 1GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Configuration for Conduction Test



# TEST REPORT

Diagram of Measurement Equipment Configuration for Transmitter Test



# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 11 of 49

## 4 Test Results

### 4.1 Transmitter Requirement & Test Suites

#### 4.1.1 Antenna Requirement

RESULT:

**PASS**

Test standard : FCC Part 15.247(b)(4), Part 15.203

Requirement : The use of approved antennas only with directional gains that do not exceed 6dBi

According to the manufacturer declaration, an antenna with a directional gain of 3.0dBi(max). The antenna is a External antenna with no possibility of replacement with a non-approved antenna by the end-user.

Therefore, the EUT is considered to comply with this provision.

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 12 of 49

## 4.1.2 Maximum peak conducted output power

RESULT:

PASS

Test standard : FCC Part 15.247(b)(3)

Requirement : ANSI C63.10-2013 clause 11.9.1.1,  
KDB 558074 clause 8.3.1.1

Kind of test site : Shielded room

### Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.9°C

Relative humidity : 56%

Table 1: Maximum peak conducted output power

| Test Mode | Test Channel<br>(MHz) | Maximum peak conducted output power |      | Limit<br>(W) |
|-----------|-----------------------|-------------------------------------|------|--------------|
|           |                       | (dBm)                               | (mW) |              |
| BLE-1Mbps | 2402                  | 6.58                                | 4.55 | < 1          |
|           | 2440                  | 6.53                                | 4.50 |              |
|           | 2480                  | 6.49                                | 4.46 |              |
| BLE-2Mbps | 2402                  | 6.61                                | 4.58 |              |
|           | 2440                  | 6.51                                | 4.48 |              |
|           | 2480                  | 6.42                                | 4.39 |              |

# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 13 of 49

Figure 1: Peak Output Power, 2402MHz BLE-1Mbps

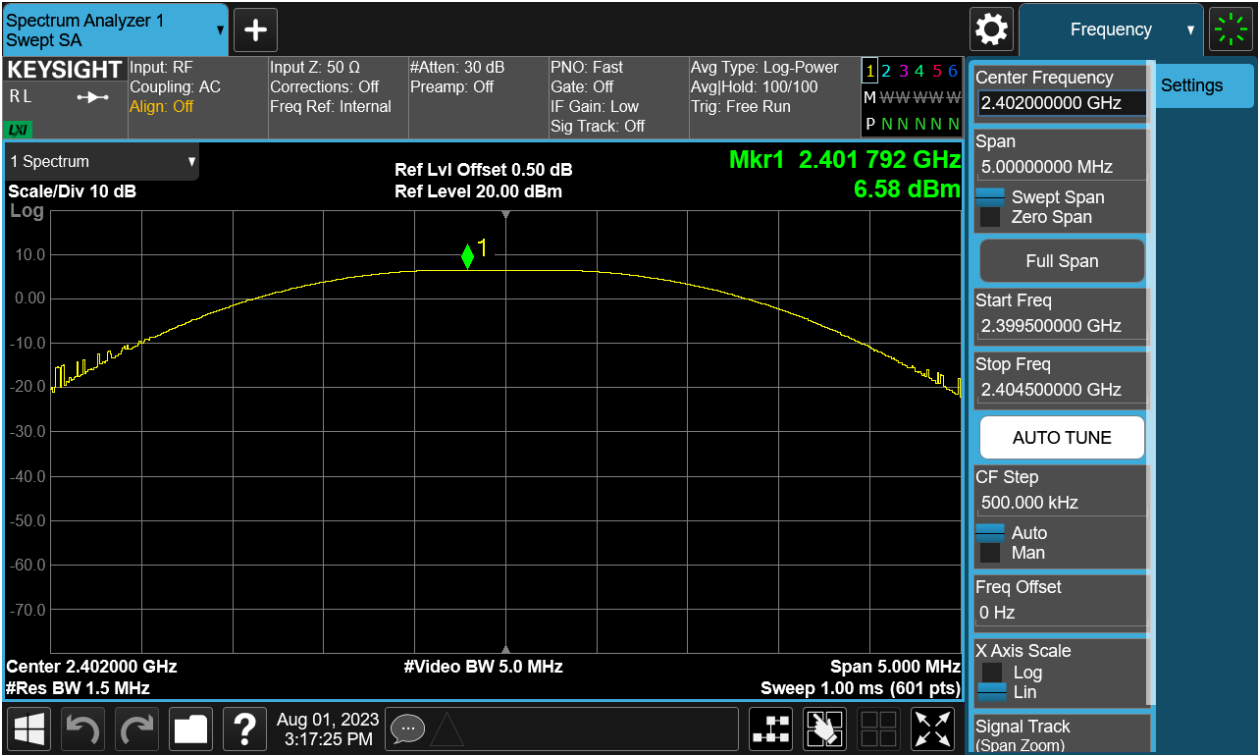


Figure 2: Peak Output Power, 2440MHz BLE-1Mbps



# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 14 of 49

Figure 3: Peak Output Power, 2480MHz BLE-1Mbps

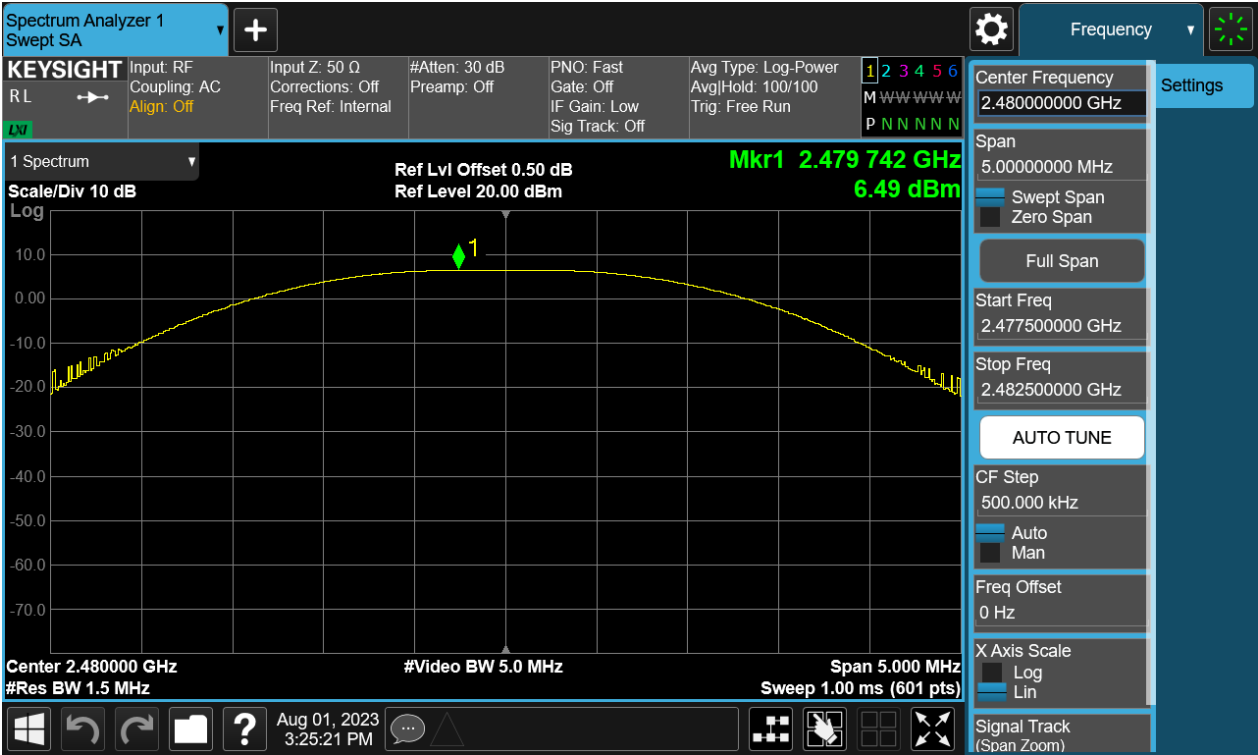


Figure 4: Peak Output Power, 2402MHz BLE-2Mbps



# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 15 of 49

Figure 5: Peak Output Power, 2440MHz BLE-2Mbps

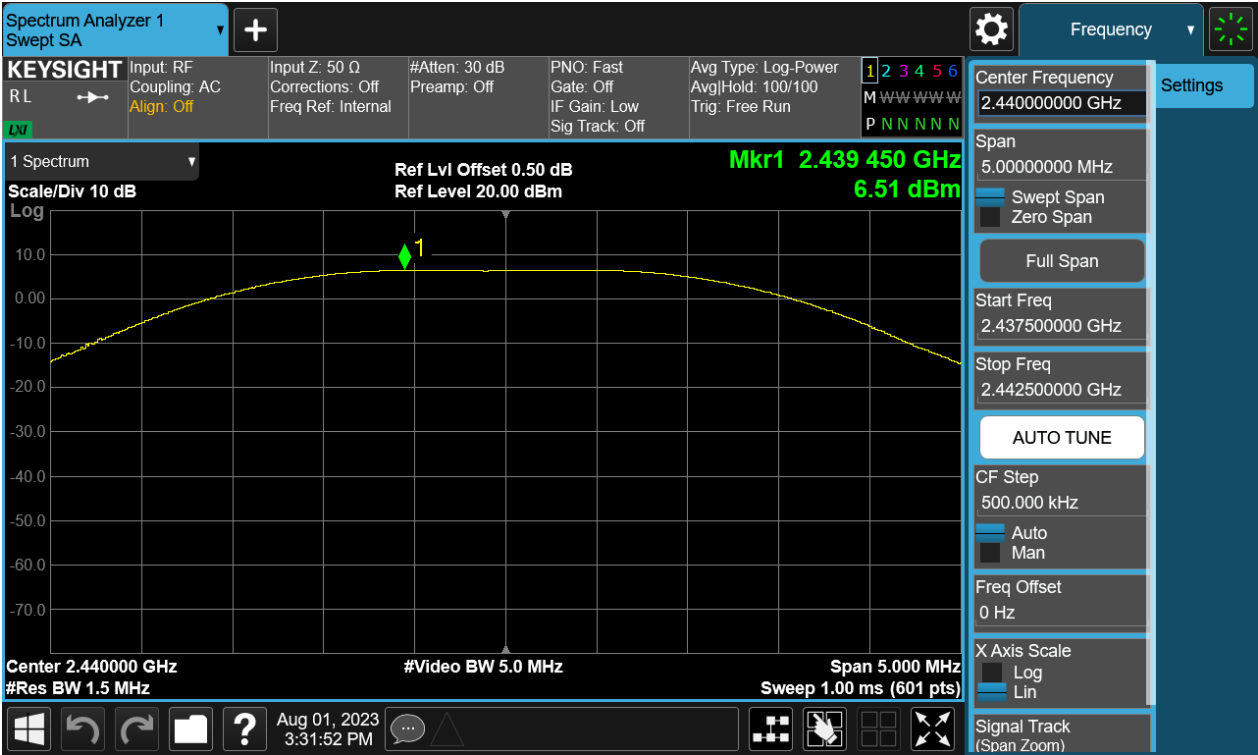


Figure 6: Peak Output Power, 2480MHz BLE-2Mbps



# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 16 of 49

## 4.1.3 6dB Bandwidth

RESULT:

PASS

Test standard : FCC Part 15.247(a)(2)

Requirement : ANSI C63.10-2013 clause 11.8.1,  
KDB 558074 clause 8.2

Kind of test site : Shielded room

### Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.9°C

Relative humidity : 56%

Table 2: 6dB Bandwidth

| Test Mode | Test Channel (MHz) | 6dB Bandwidth (MHz) | Limit    |
|-----------|--------------------|---------------------|----------|
| BLE-1Mbps | 2402               | 0.6846              | >0.5 MHz |
|           | 2440               | 0.7214              |          |
|           | 2480               | 0.7231              |          |
| BLE-2Mbps | 2402               | 1.1300              |          |
|           | 2440               | 1.1540              |          |
|           | 2480               | 1.1240              |          |

# TEST REPORT

Report No.: SHE23070127-02AE

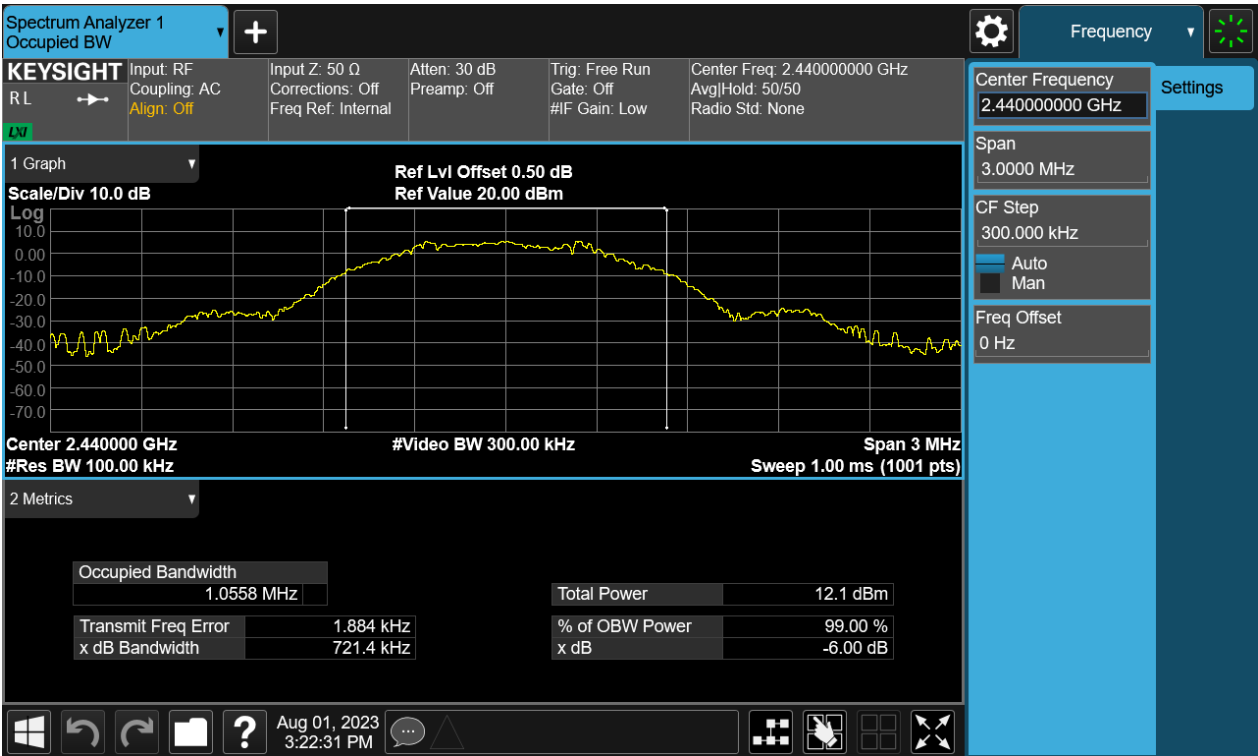
Date: 2023-08-17

Page 17 of 49

Figure 7: 6dB Bandwidth, 2402MHz BLE-1Mbps



Figure 8: 6dB Bandwidth, 2440MHz BLE-1Mbps



# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 18 of 49

Figure 9: 6dB Bandwidth, 2480MHz BLE-1Mbps

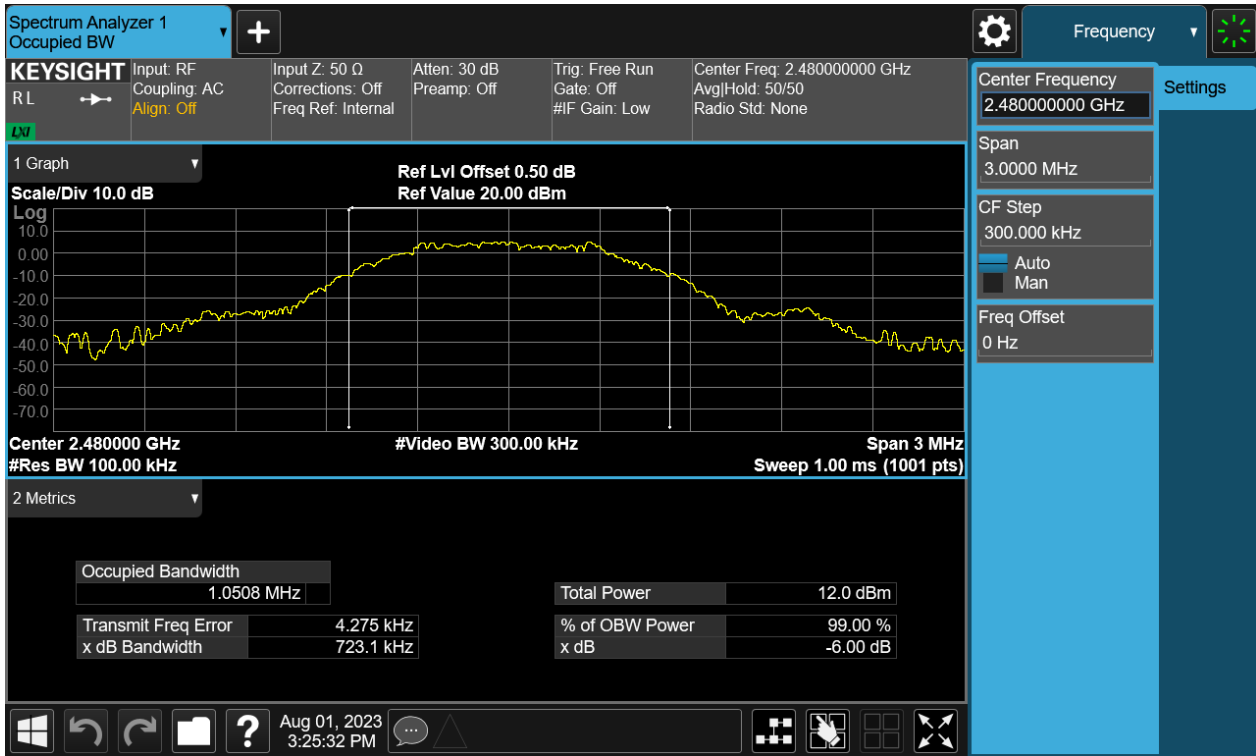
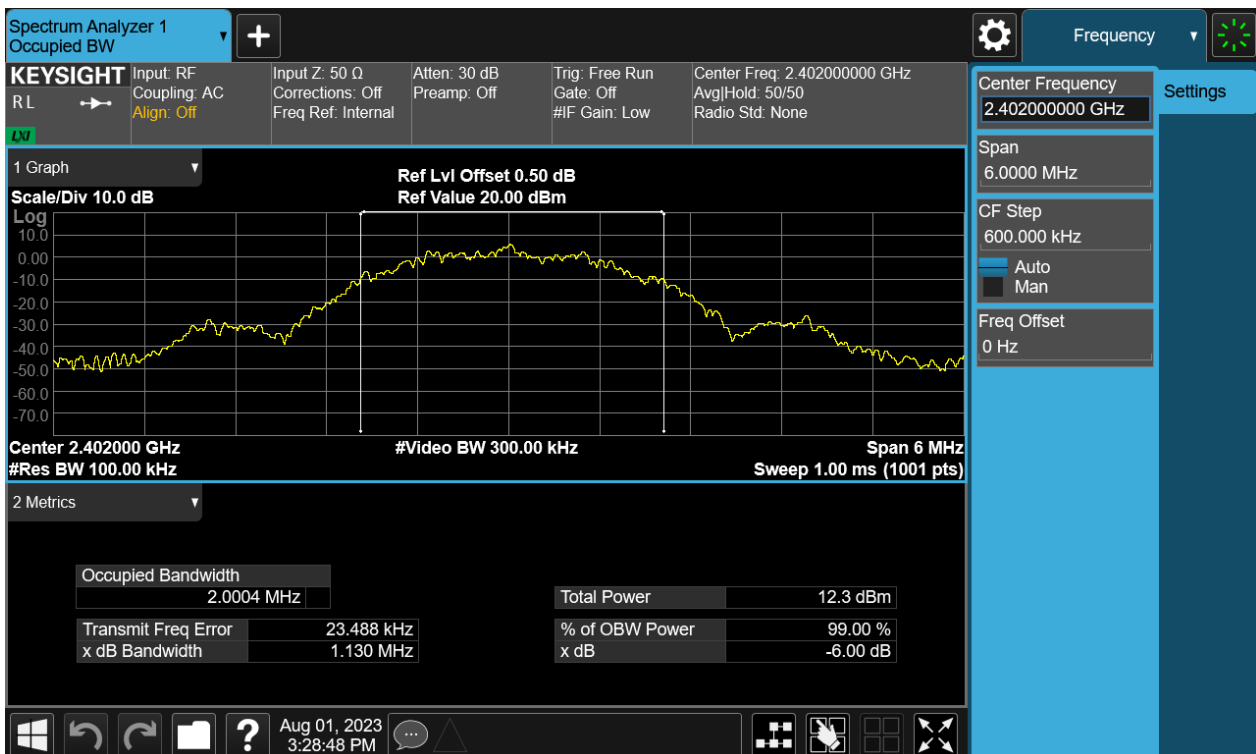


Figure 10: 6dB Bandwidth, 2402MHz BLE-2Mbps



# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 19 of 49

Figure 11: 6dB Bandwidth, 2440MHz BLE-2Mbps

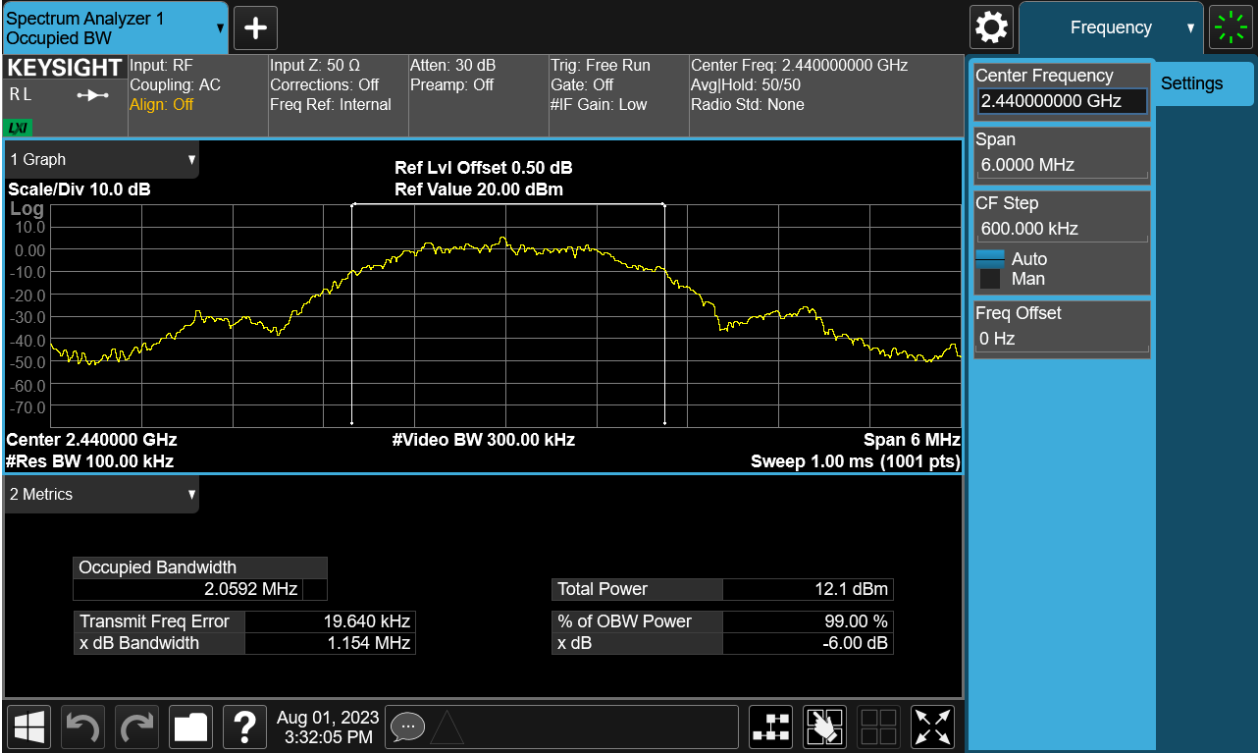


Figure 12: 6dB Bandwidth, 2480MHz BLE-2Mbps



# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 20 of 49

## 4.1.4 Maximum conducted output power spectral density

RESULT:

PASS

Test standard : FCC Part 15.247(e)

Requirement : ANSI C63.10-2013 clause 11.10.2,  
KDB 558074 clause 8.4

Kind of test site : Shielded room

### Test setup

Test Channel : Low/Middle/High

Operation Mode : A.1.a

Ambient temperature : 24.9°C

Relative humidity : 56%

Table 3: Maximum conducted output power spectral density

| Test Mode | Test Channel (MHz) | Measured Result (dBm/3kHz) | Limit (dBm/3kHz) |
|-----------|--------------------|----------------------------|------------------|
| BLE-1Mbps | 2402               | -8.77                      | 8                |
|           | 2440               | -8.98                      |                  |
|           | 2480               | -8.66                      |                  |
| BLE-2Mbps | 2402               | -12.45                     |                  |
|           | 2440               | -12.35                     |                  |
|           | 2480               | -12.28                     |                  |

# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 21 of 49

Figure 13: Power Spectral Density, 2402MHz BLE-1Mbps

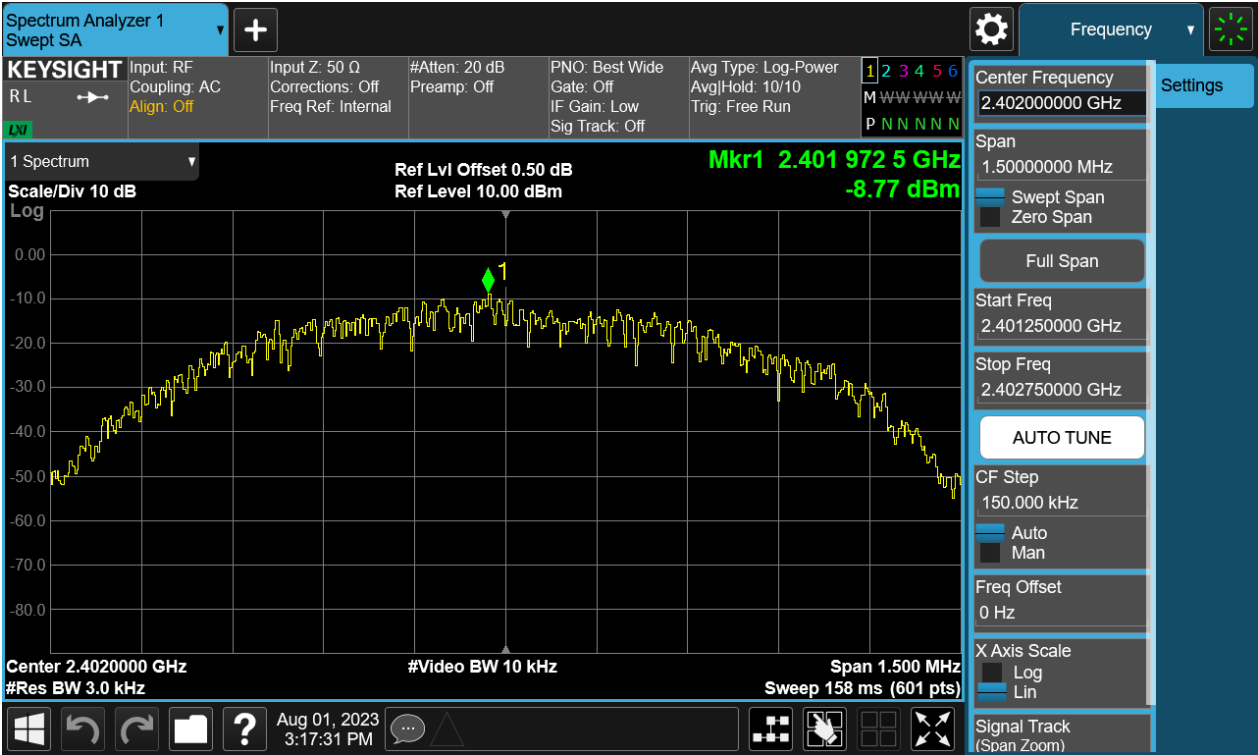
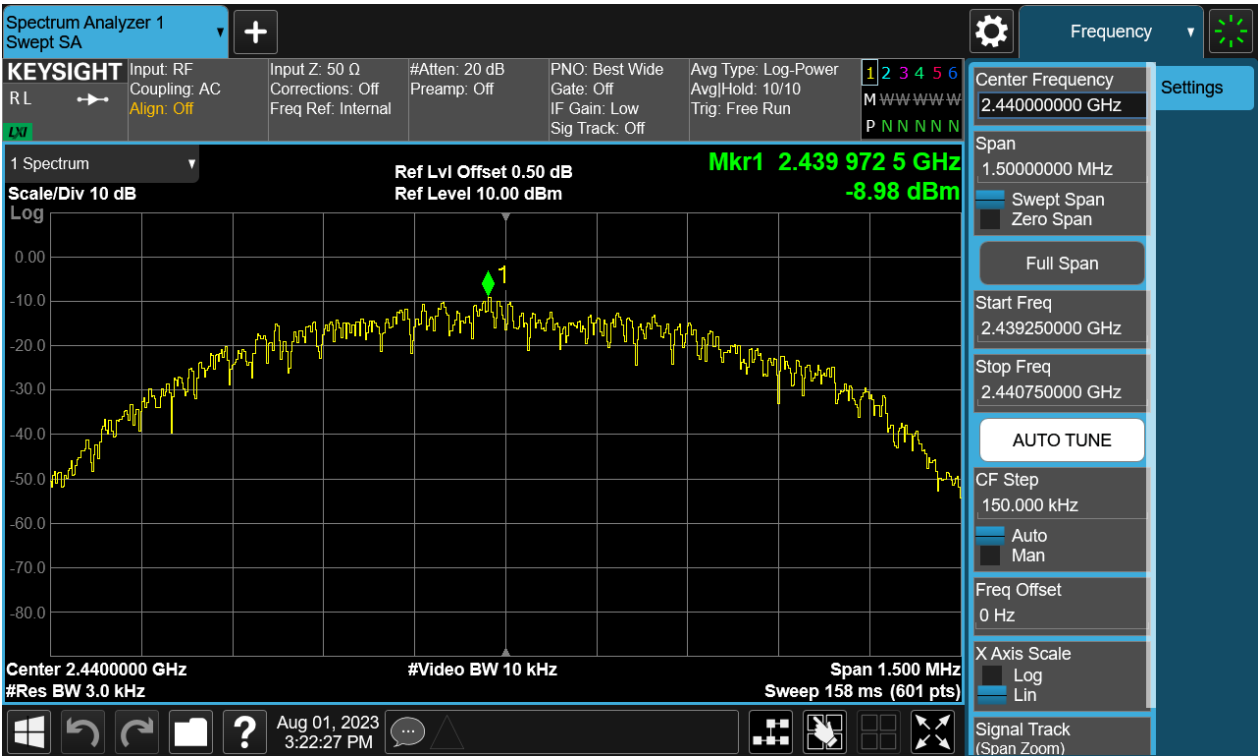


Figure 14: Power Spectral Density, 2440MHz BLE-1Mbps



# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 22 of 49

Figure 15: Power Spectral Density, 2480MHz BLE-1Mbps

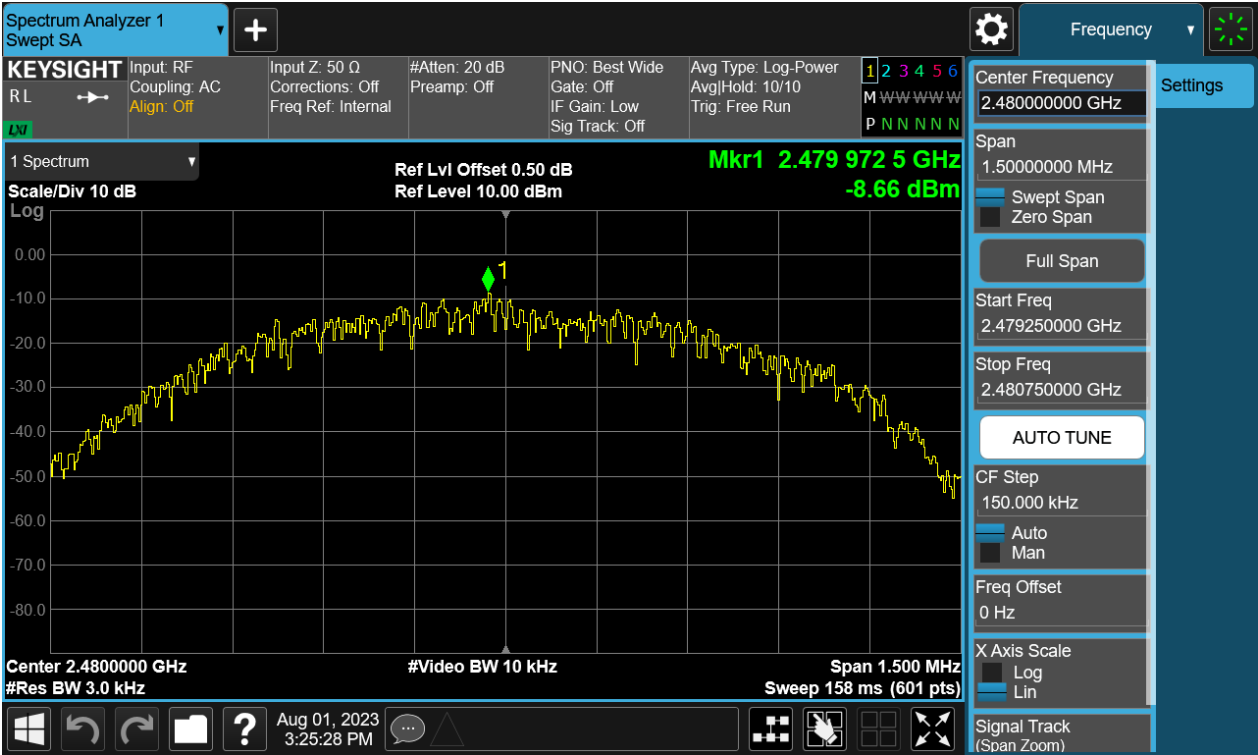
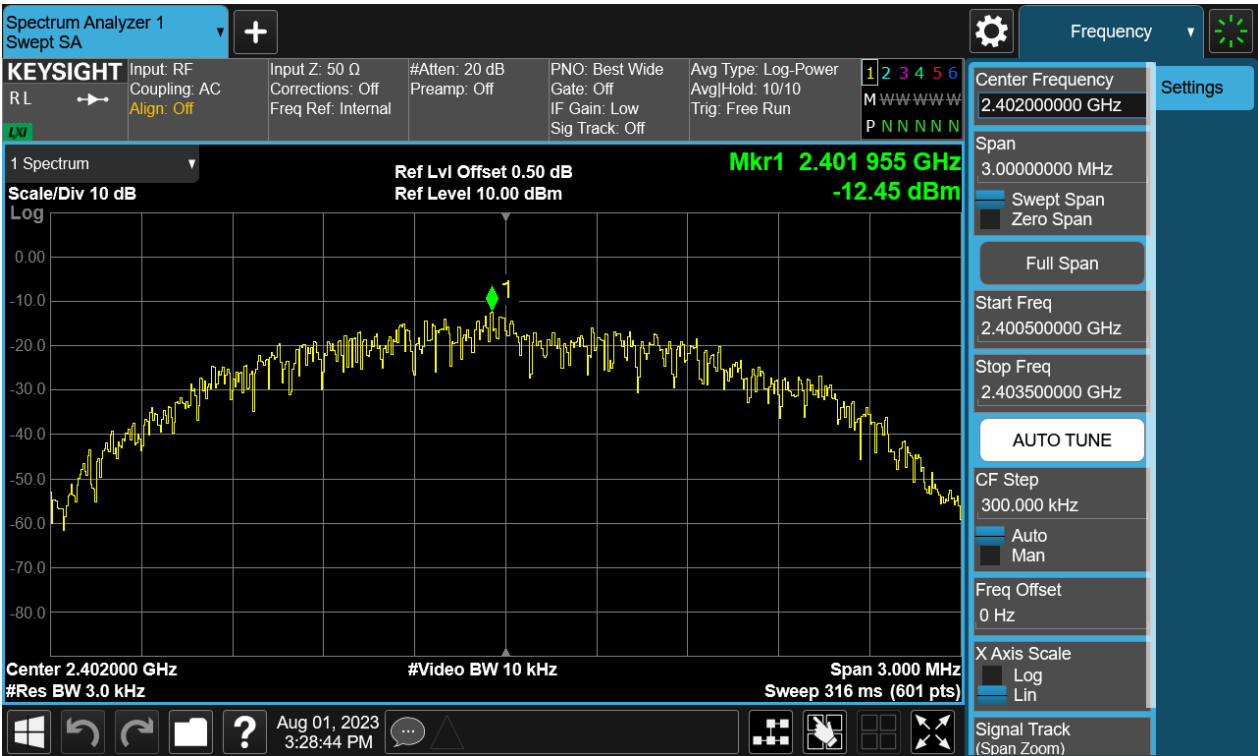


Figure 16: Power Spectral Density, 2402MHz BLE-2Mbps



**Report No.:** SHE23070127-02AE      **Date:** 2023-08-17      Page 23 of 49

Spectrum Analyzer 1  
Swept SA

**KEYSIGHT** Input: RF  
RL Coupling: AC  
Align: Off

Input Z: 50  $\Omega$   
Corrections: Off  
Freq Ref: Internal

#Atten: 20 dB  
Preamp: Off

PNO: Best Wide  
Gate: Off  
IF Gain: Low  
Sig Track: Off

Avg Type: Log-Power  
AvalHold: 10/10  
Trig: Free Run

1 2 3 4 5 6  
M WWWWWW  
P NNNNN

Center Frequency  
2.44000000 GHz

Span  
3.00000000 MHz

Swept Span  
Zero Span

Full Span

Start Freq  
2.438500000 GHz

Stop Freq  
2.441500000 GHz

AUTO TUNE

CF Step  
300.000 kHz

Auto  
Man

Freq Offset  
0 Hz

X Axis Scale  
Log  
Lin

Signal Track  
(Span Zoom)

1 Spectrum  
Scale/Div 10 dB  
Log

Ref Lvl Offset 0.50 dB  
Ref Level 10.00 dBm

Mkr1 2.439 955 GHz  
-12.35 dBm

Center 2.440000 GHz  
#Res BW 3.0 kHz  
#Video BW 10 kHz  
Span 3.000 MHz  
Sweep 316 ms (601 pts)

**Spectrum Analyzer 1**  
Swept SA

**KEYSIGHT** Input: RF  
Coupling: AC  
Align: Off

Input Z: 50  $\Omega$   
Corrections: Off  
Freq Ref: Internal

#Atten: 20 dB  
Preamp: Off

PNO: Best Wide  
Gate: Off  
IF Gain: Low  
Sig Track: Off

Avg Type: Log-Power  
Avg/Hold: 10/10  
Trig: Free Run

1 2 3 4 5 6  
M WWW WWW  
P N N N N N

**Center Frequency**  
2.48000000 GHz

**Span**  
3.00000000 MHz

☒ Swept Span  
☐ Zero Span

**Full Span**

**Start Freq**  
2.478500000 GHz

**Stop Freq**  
2.481500000 GHz

**AUTO TUNE**

**CF Step**  
300.000 kHz

☒ Auto  
☐ Man

**Freq Offset**  
0 Hz

**X Axis Scale**  
☐ Log  
☒ Lin

**Signal Track**  
(Sweep Zoom)

1 Spectrum  
Scale/Div 10 dB  
Log

Ref Lvl Offset 0.50 dB  
Ref Level 10.00 dBm

**Mkr1 2.479 955 GHz**  
**-12.28 dBm**

Center 2.480000 GHz  
#Res BW 3.0 kHz  
#Video BW 10 kHz  
Span 3.000 MHz  
Sweep 316 ms (601 pts)

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 24 of 49

## 4.1.5 Conducted Spurious Emission & Authorized-band band-edge

RESULT:

**PASS**

|                   |                                                           |
|-------------------|-----------------------------------------------------------|
| Test standard     | : FCC Part 15.247(d)                                      |
| Requirement       | : ANSI C63.10-2013 clause 11.11,<br>KDB 558074 clause 8.5 |
| Kind of test site | : Shielded room                                           |

### Test setup

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
| Test Channel        | : Low/Middle/High for spurious, Low/High for Band<br>Edge |
| Operation Mode      | : A.1.a                                                   |
| Ambient temperature | : 24.9°C                                                  |
| Relative humidity   | : 56%                                                     |

For details refer to following test plot.

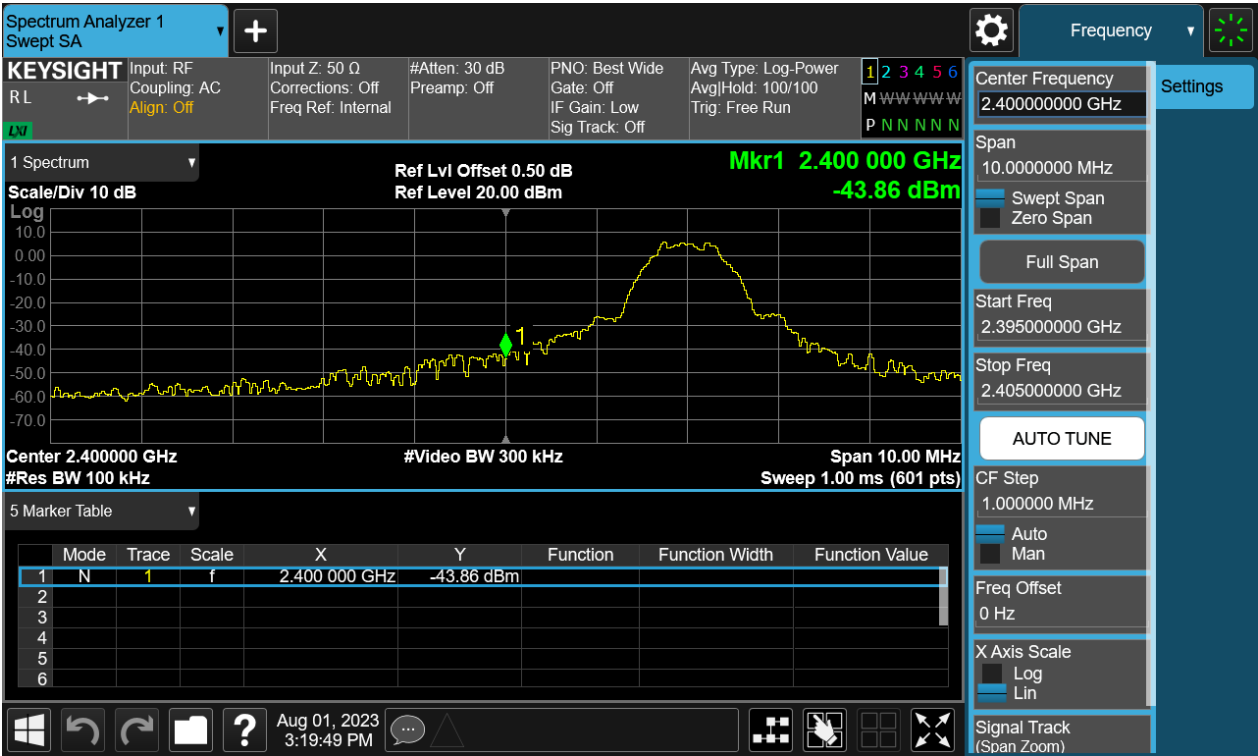
# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 25 of 49

Figure 19: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, BLE-1M Carrier Level



## Band Edge



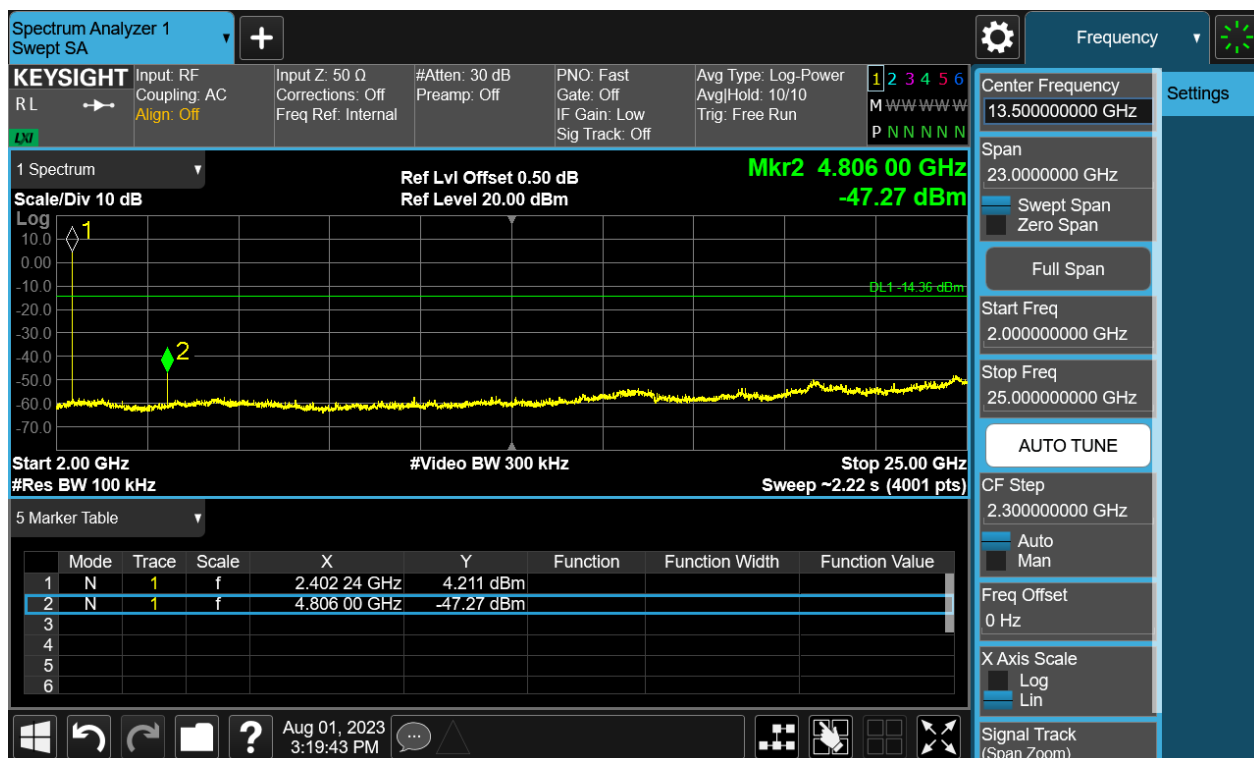
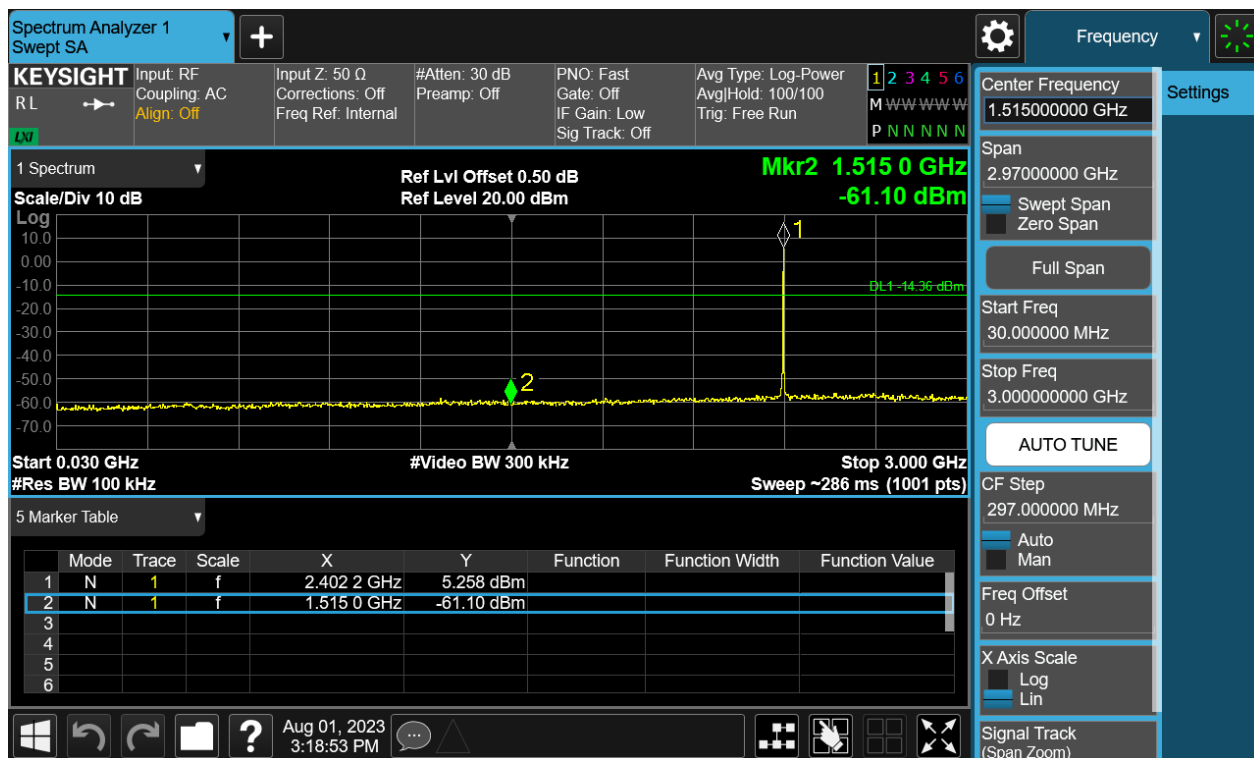
# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 26 of 49

## Conducted spurious emissions 30MHz-25GHz



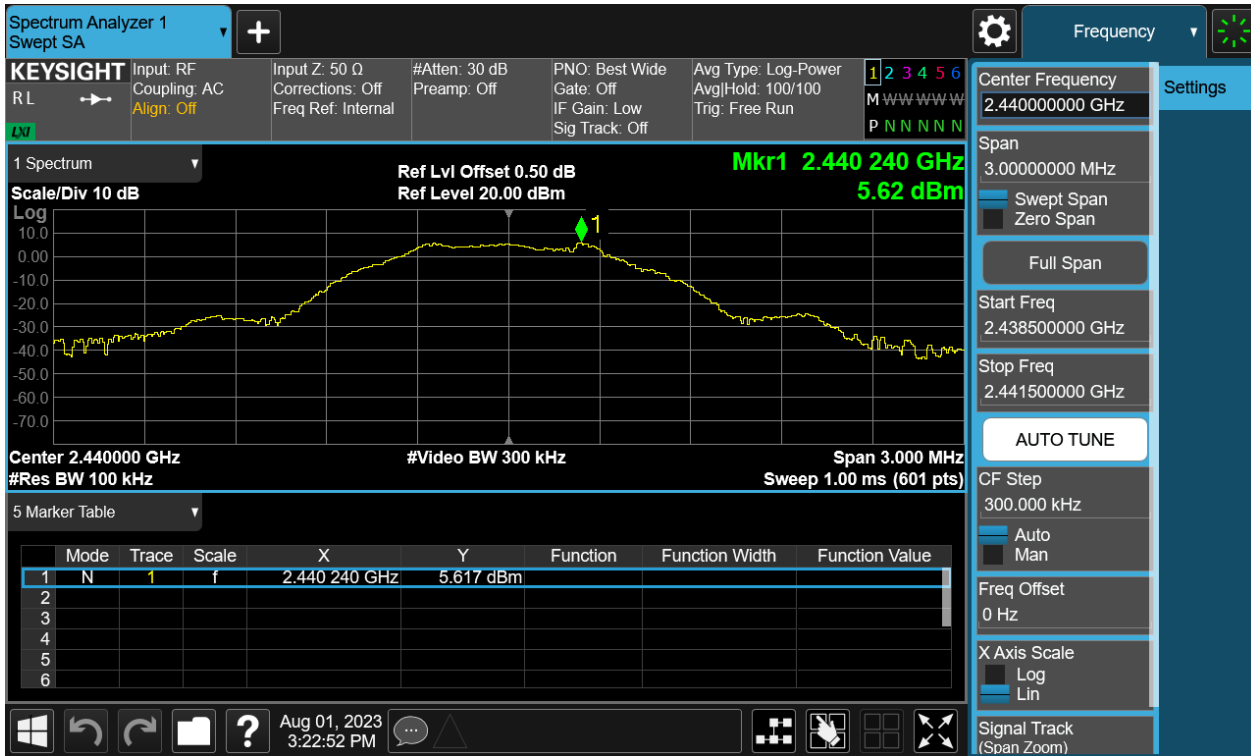
# TEST REPORT

Report No.: SHE23070127-02AE

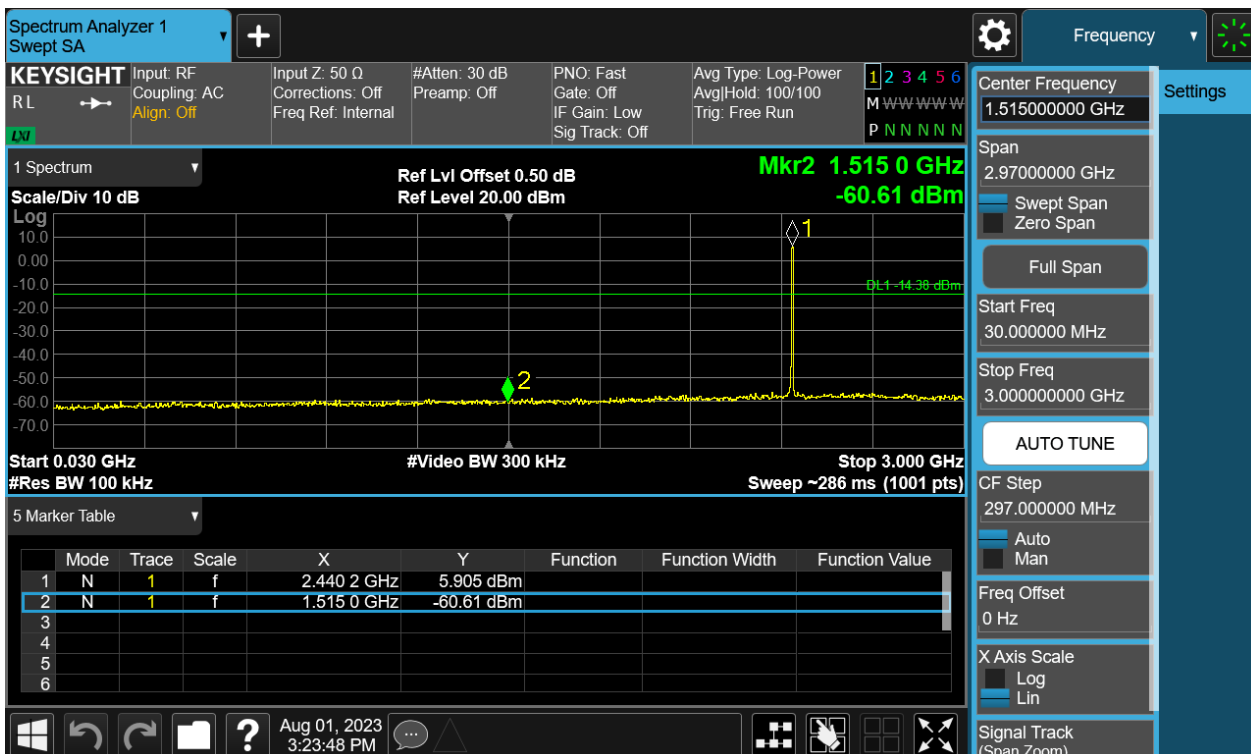
Date: 2023-08-17

Page 27 of 49

Figure 20: Conducted Spurious Emission & Authorized-band band-edge, 2440MHz, BLE-1M Carrier Level



Conducted spurious emissions 30MHz-25GHz



# TEST REPORT

Report No.: SHE23070127-02AE Date: 2023-08-17 Page 28 of 49

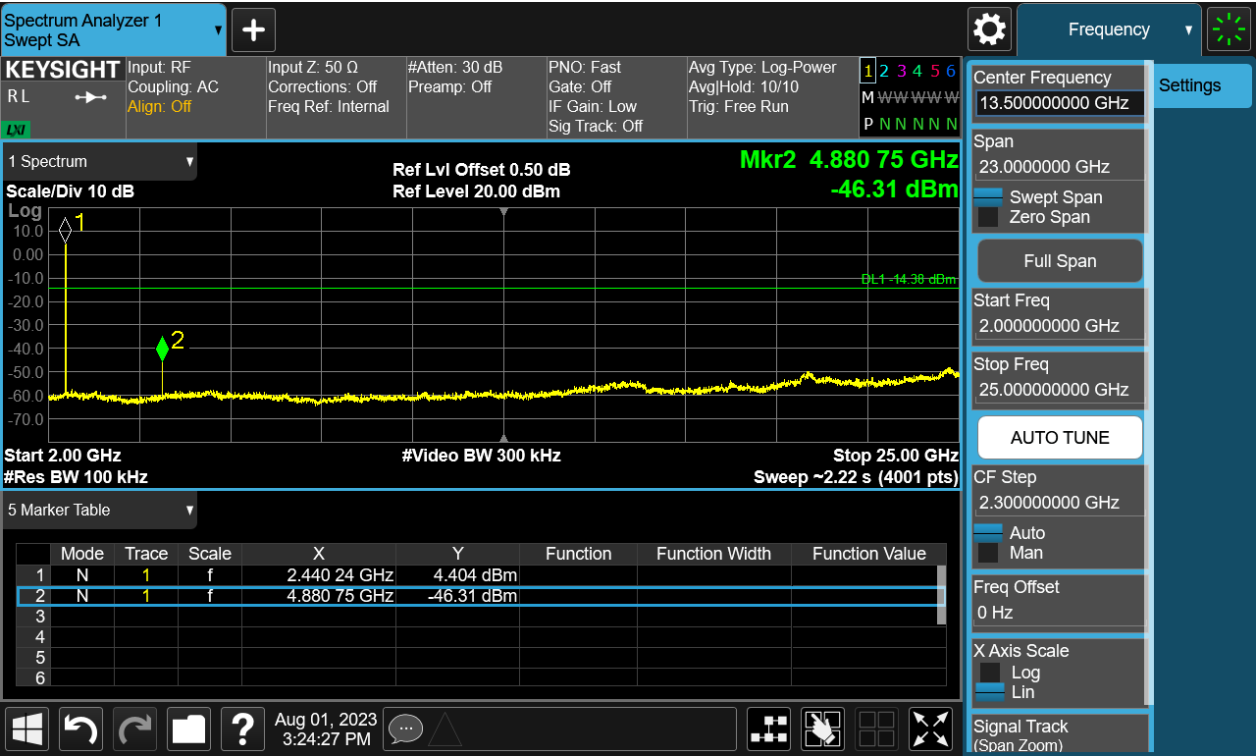


Figure 21: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, BLE-1M Carrier Level



# TEST REPORT

Report No.: SHE23070127-02AE

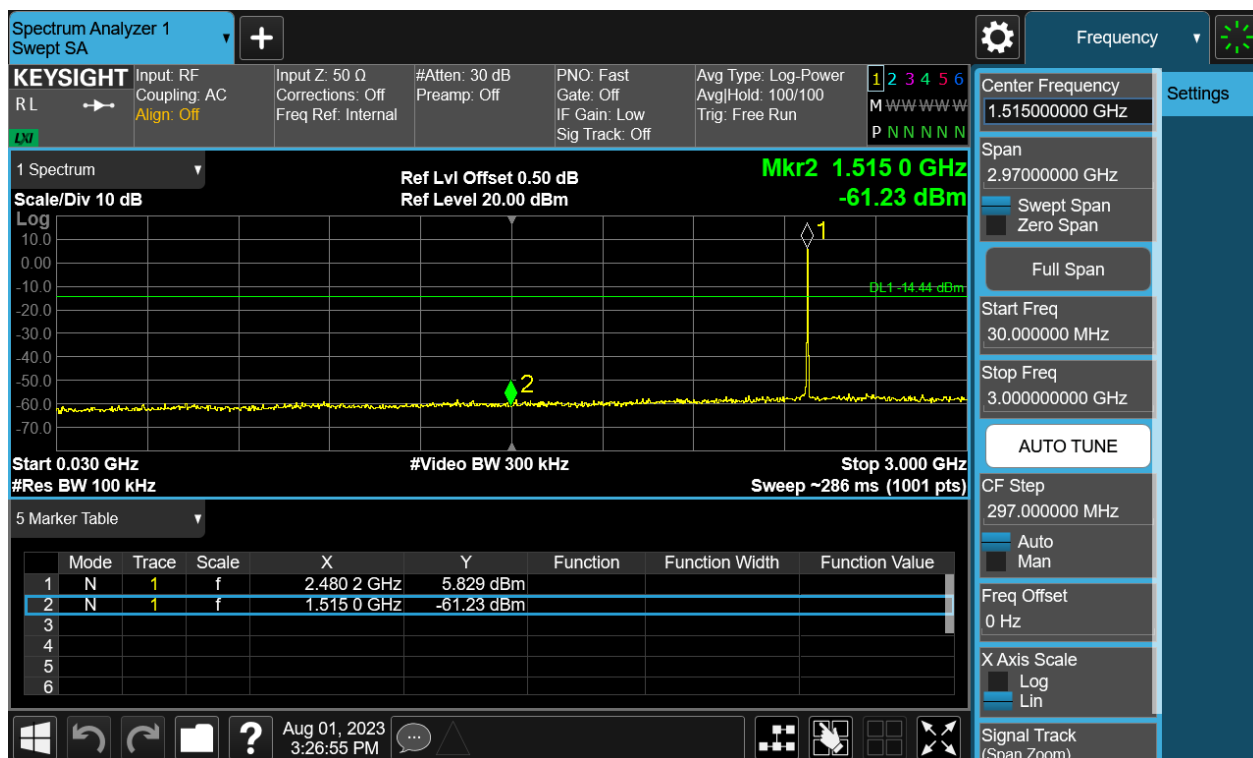
Date: 2023-08-17

Page 29 of 49

## Band Edge



## Conducted spurious emissions 30MHz-25GHz



# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 30 of 49

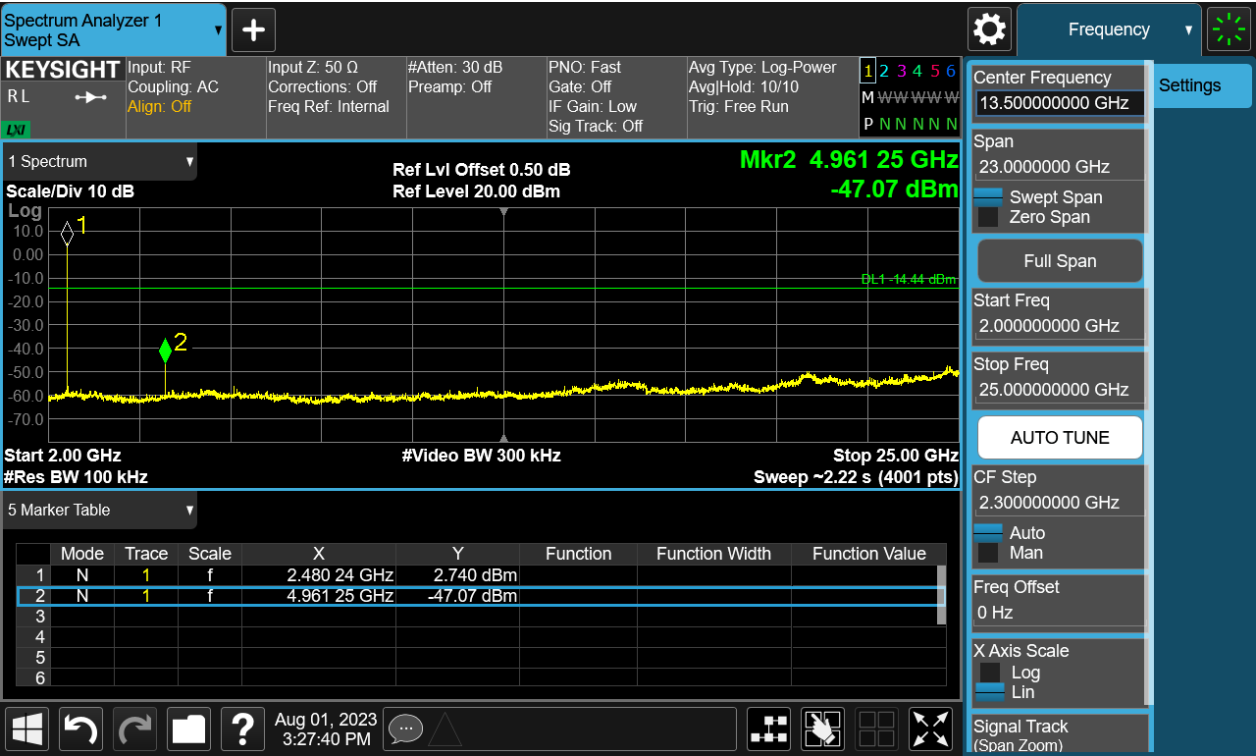
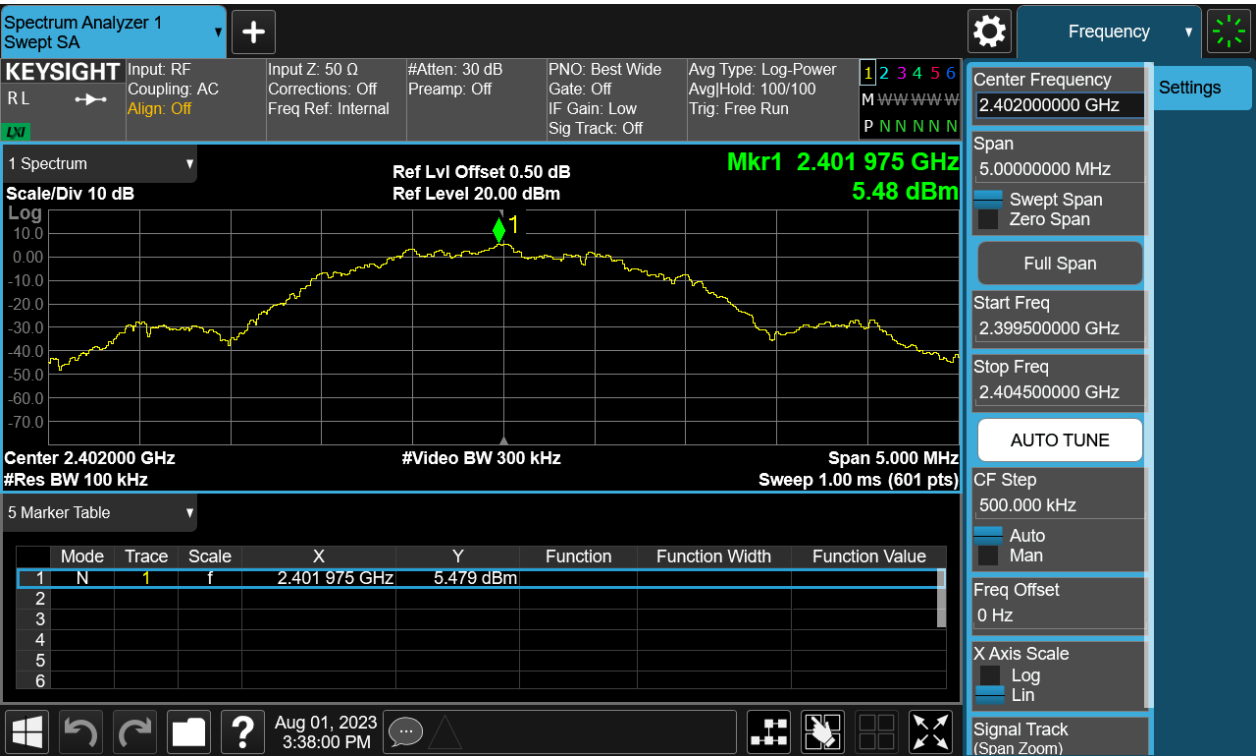


Figure 22: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, BLE-2M Carrier Level



# TEST REPORT

Report No.: SHE23070127-02AE

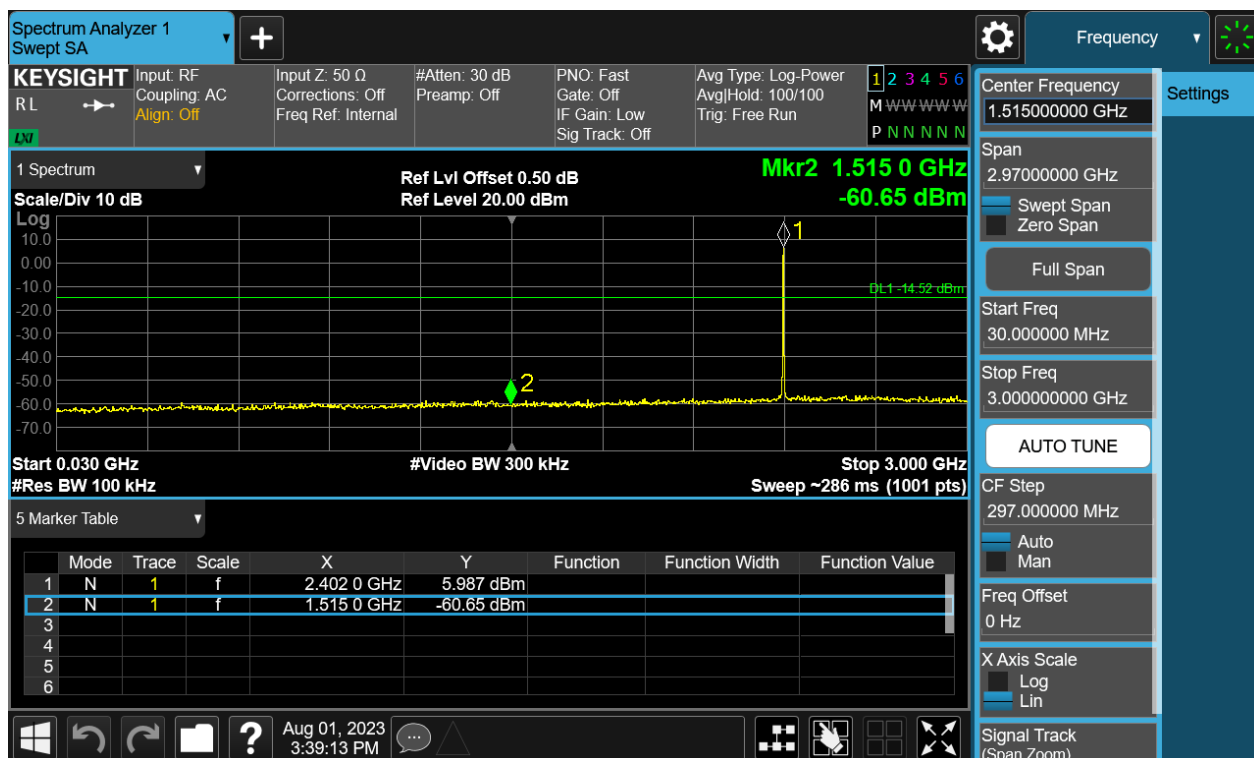
Date: 2023-08-17

Page 31 of 49

## Band Edge



## Conducted spurious emissions 30MHz-25GHz



# TEST REPORT

Report No.: SHE23070127-02AE Date: 2023-08-17 Page 32 of 49

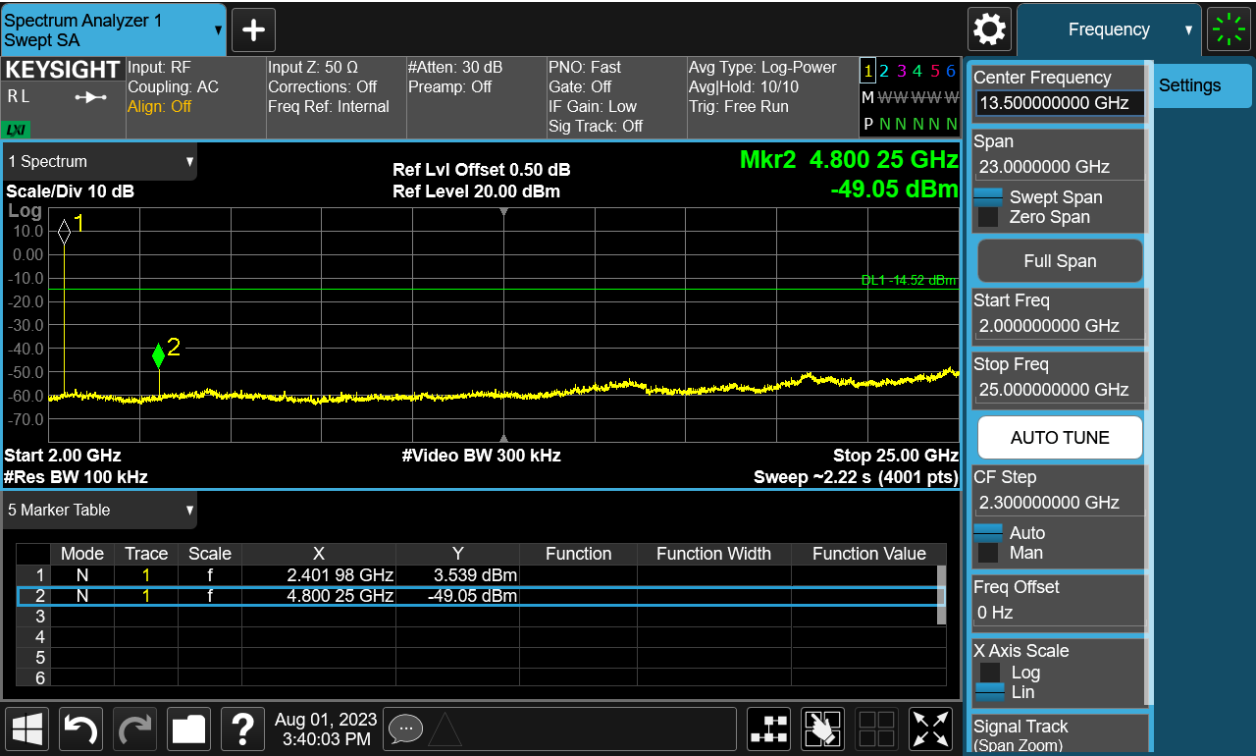
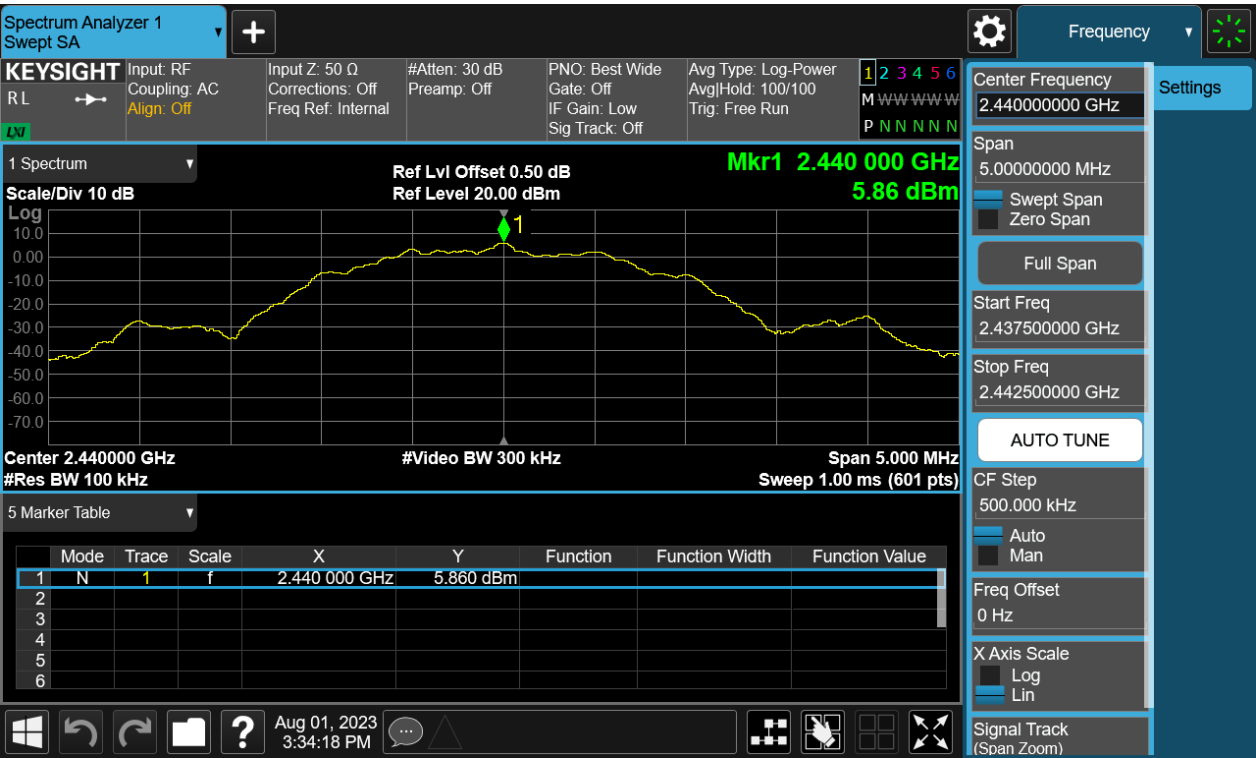


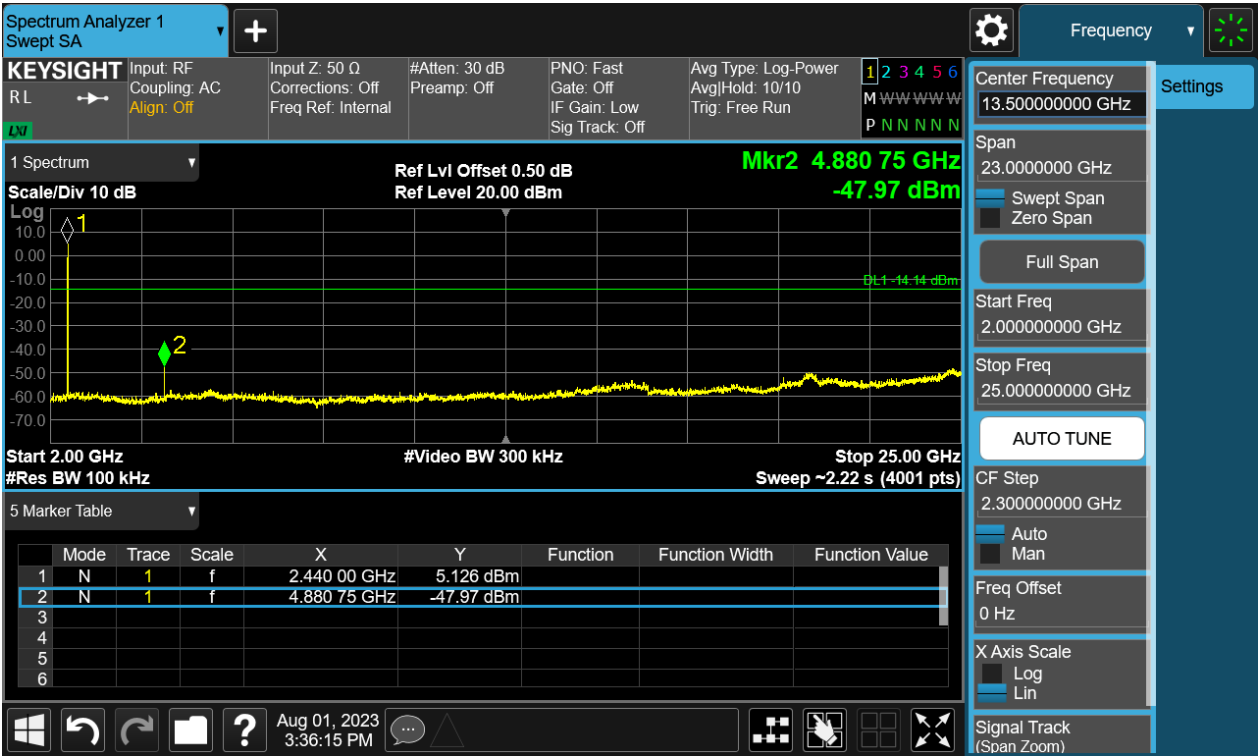
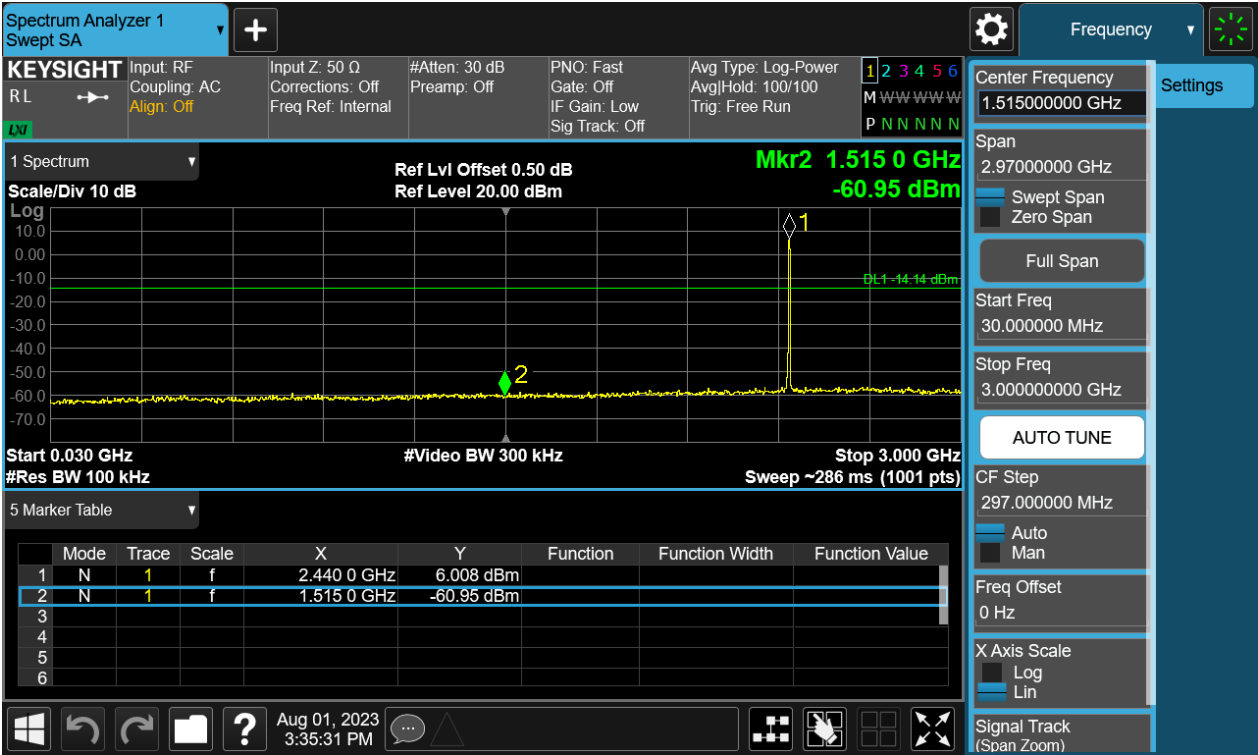
Figure 23: Conducted Spurious Emission & Authorized-band band-edge, 2440MHz, BLE-2M Carrier Level



# TEST REPORT

Report No.: SHE23070127-02AE Date: 2023-08-17 Page 33 of 49

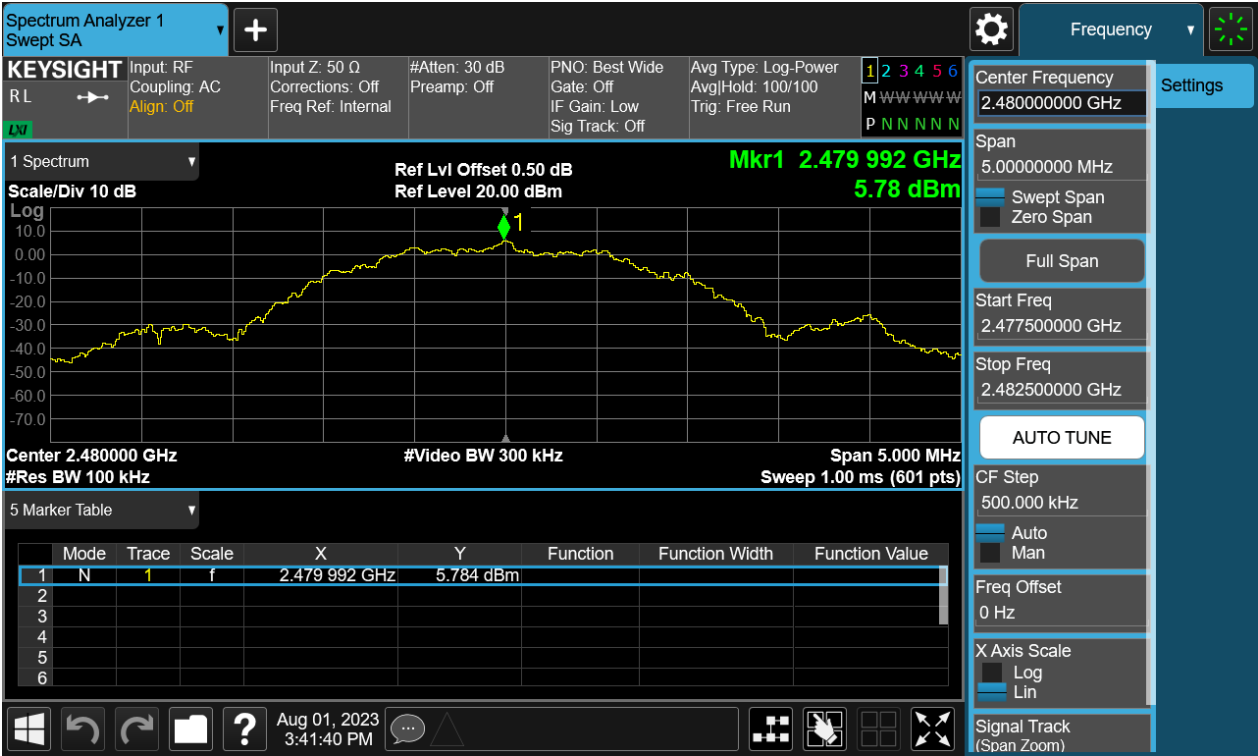
## Conducted spurious emissions 30MHz-25GHz



# TEST REPORT

Report No.: SHE23070127-02AE      Date: 2023-08-17      Page 34 of 49

Figure 24: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, BLE-2M Carrier Level



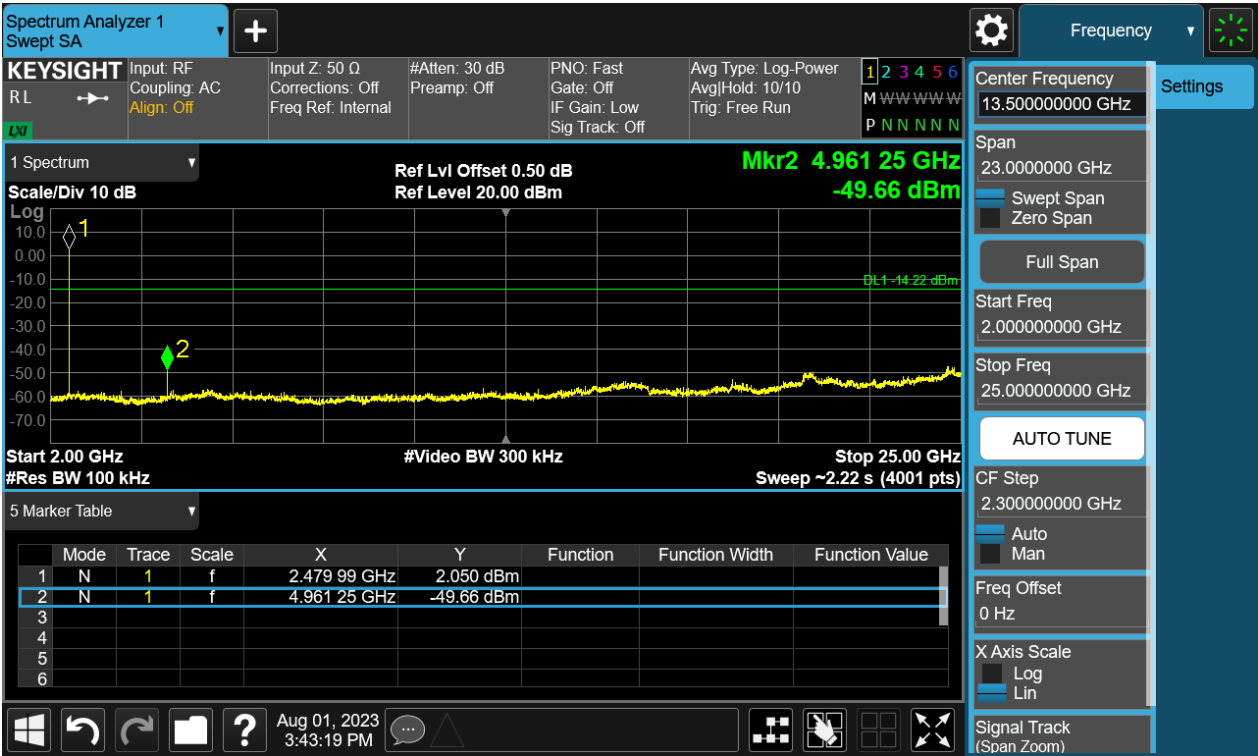
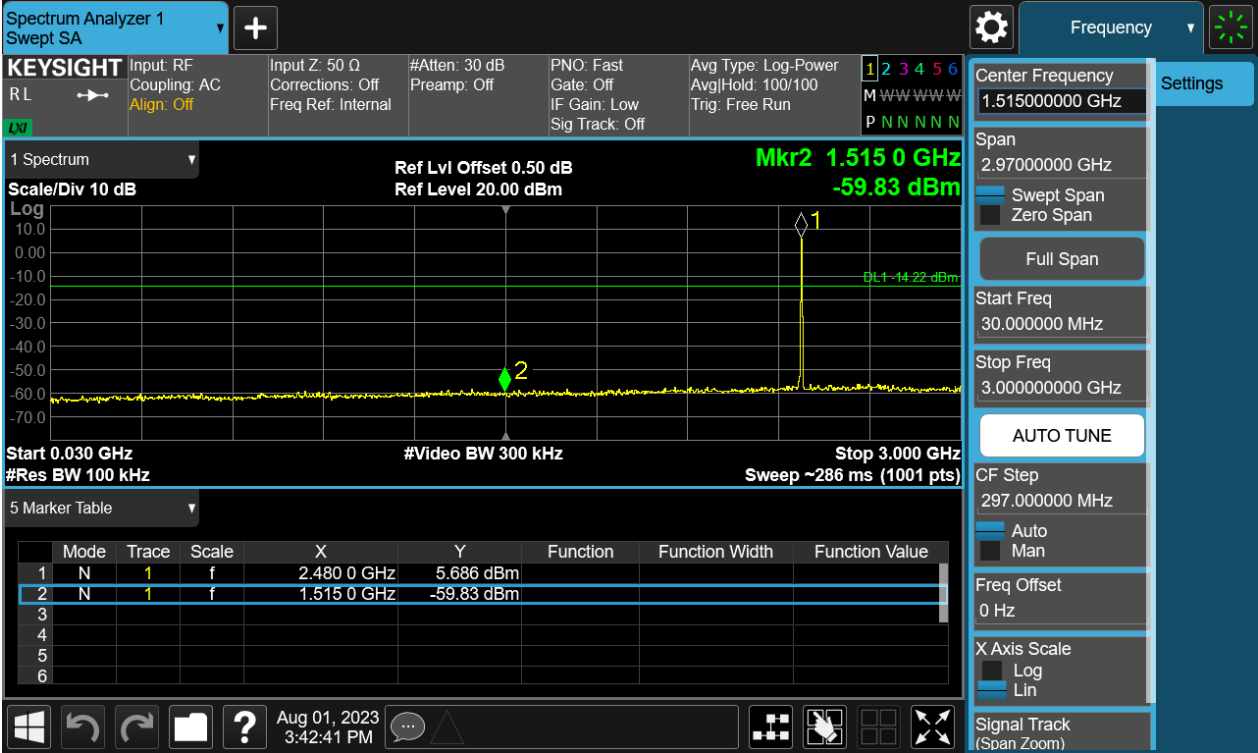
## Band Edge



# TEST REPORT

Report No.: SHE23070127-02AE Date: 2023-08-17 Page 35 of 49

## Conducted spurious emissions 30MHz-25GHz



# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 36 of 49

## 4.1.6 Radiated Emission

RESULT:

PASS

Test standard : FCC Part 15.247(d), 15.205, 15.209  
Requirement : ANSI C63.10-2013 clause 11.12,  
KDB 558074 clause 8.6  
Kind of test site : 3m Semi-Anechoic Chamber

### Test setup

Test Channel : Low/Middle/High  
Operation Mode : A  
Ambient temperature : 24.5°C  
Relative humidity : 53%

### Notes

Test plots please refer to the annex document "SHE23070127-02AE DATA BLE-TX EXHIBIT A of EQM100-5B Model" and "SHE23070127-02AE DATA BLE-TX EXHIBIT A of EQM100-5U Model".

1. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
2. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
3. All test modes had been pre-tested, but only the BLE-1M&2M at low channel of below 1 GHz is the worst case and recorded in the report.
4. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement -X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 37 of 49

## 4.1.7 Band Edge (Restricted-band band-edge)

RESULT:

PASS

Test standard : FCC Part 15.247(d), 15.205, 15.209  
Requirement : ANSI C63.10-2013 clause 11.13,  
KDB 558074 clause 8.7  
Kind of test site : 3m Semi-Anechoic Chamber

### Test setup

Test Channel : Low/Middle/High  
Operation Mode : A.1  
Ambient temperature : 24.5°C  
Relative humidity : 53%

### Notes

*Test plots please refer to the annex document "SHE23070127-02AE DATA BLE-TX EXHIBIT A of EQM100-5B Model" and "SHE23070127-02AE DATA BLE-TX EXHIBIT A of EQM100-5U Model".*

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 38 of 49

## 4.2 Mains Emissions

### 4.2.1 Conducted Emission on AC Mains

RESULT:

PASS

|                   |                               |
|-------------------|-------------------------------|
| Test standard     | : FCC Part 15.207(a)          |
| Requirement       | : ANSI C63.10-2013 clause 6.2 |
| Kind of test site | : Shielded room               |

#### Test setup

|                     |                                      |
|---------------------|--------------------------------------|
| Input Voltage       | : which received AC 120V, 60Hz Power |
| Operation Mode      | : A.1.a                              |
| Earthing            | : Not Connected                      |
| Ambient temperature | : 24.4°C                             |
| Relative humidity   | : 54%                                |

For details refer to following test plot.

# TEST REPORT

Report No.: SHE23070127-02AE

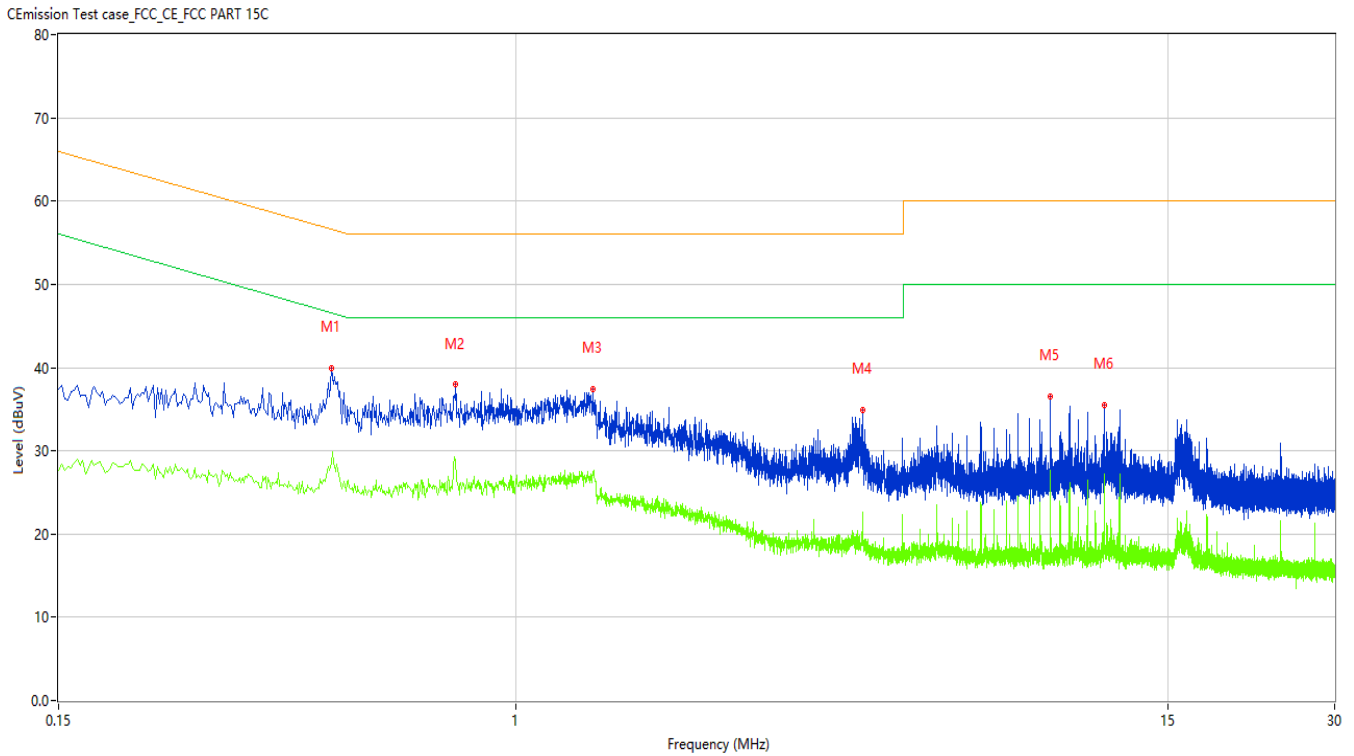
Date: 2023-08-17

Page 39 of 49

Note: The all configurations were tested respectively, but only the worst configuration shown here.

Model: EQM100-5B

**Figure 25: Conducted Emission on AC Mains, L Phase**



| No. | Frequency (MHz) | Results (dBuV) | Factor (dB) | Limit (dBuV) | Margin (dB) | Detector | Line | Verdict |
|-----|-----------------|----------------|-------------|--------------|-------------|----------|------|---------|
| 1   | 0.466           | 39.93          | 9.96        | 56.58        | 16.65       | Peak     | L    | Pass    |
| 1** | 0.466           | 28.61          | 9.96        | 46.58        | 17.97       | AV       | L    | Pass    |
| 2   | 0.780           | 37.94          | 9.94        | 56.00        | 18.06       | Peak     | L    | Pass    |
| 2** | 0.780           | 28.77          | 9.94        | 46.00        | 17.23       | AV       | L    | Pass    |
| 3   | 1.378           | 37.45          | 9.84        | 56.00        | 18.55       | Peak     | L    | Pass    |
| 3** | 1.378           | 27.49          | 9.84        | 46.00        | 18.51       | AV       | L    | Pass    |
| 4   | 4.222           | 34.92          | 9.82        | 56.00        | 21.08       | Peak     | L    | Pass    |
| 4** | 4.222           | 22.58          | 9.82        | 46.00        | 23.42       | AV       | L    | Pass    |
| 5   | 9.212           | 36.58          | 9.71        | 60.00        | 23.42       | Peak     | L    | Pass    |
| 5** | 9.212           | 27.70          | 9.71        | 50.00        | 22.30       | AV       | L    | Pass    |
| 6   | 11.516          | 35.53          | 9.64        | 60.00        | 24.47       | Peak     | L    | Pass    |
| 6** | 11.516          | 27.23          | 9.64        | 50.00        | 22.77       | AV       | L    | Pass    |

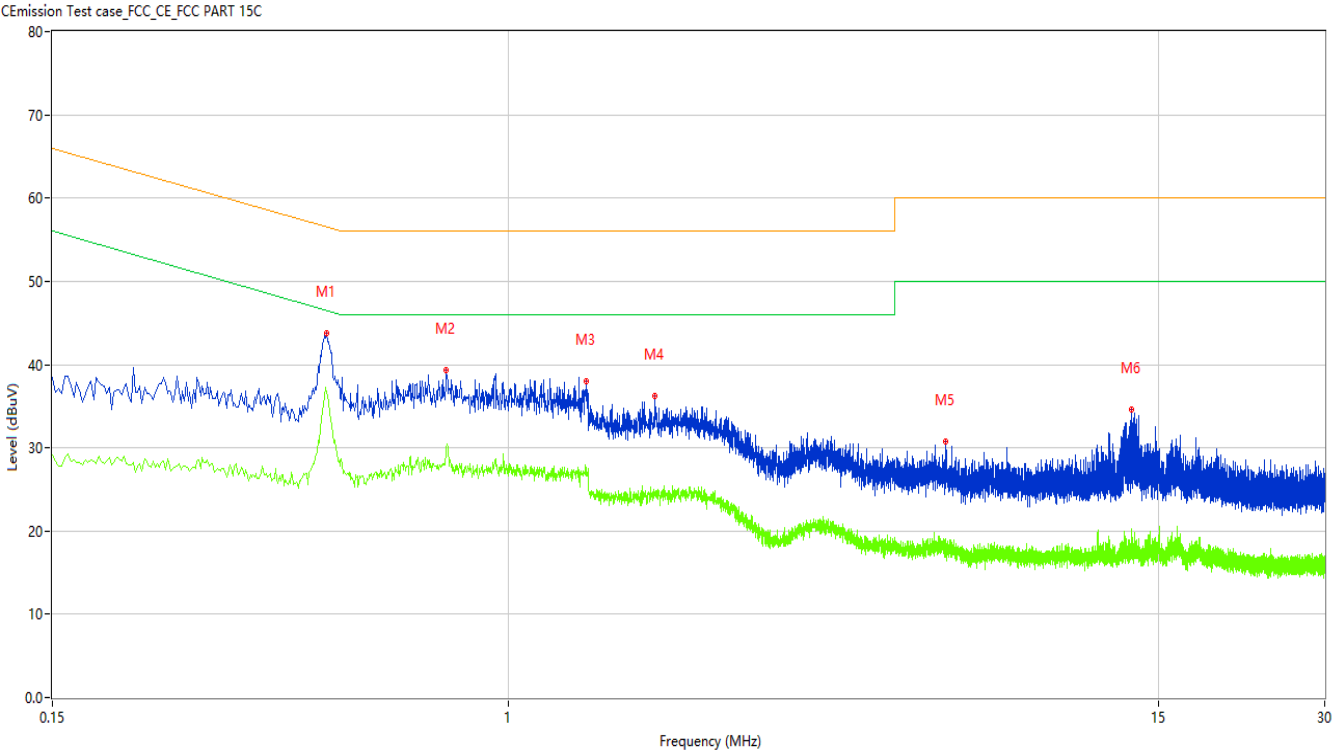
# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 40 of 49

Figure 26: Conducted Emission on AC Mains, N Phase



| No. | Frequency (MHz) | Results (dBuV) | Factor (dB) | Limit (dBuV) | Margin (dB) | Detector | Line | Verdict |
|-----|-----------------|----------------|-------------|--------------|-------------|----------|------|---------|
| 1   | 0.470           | 43.77          | 10.07       | 56.51        | 12.74       | Peak     | N    | Pass    |
| 1** | 0.470           | 36.67          | 10.07       | 46.51        | 9.84        | AV       | N    | Pass    |
| 2   | 0.774           | 39.34          | 10.04       | 56.00        | 16.66       | Peak     | N    | Pass    |
| 2** | 0.774           | 29.99          | 10.04       | 46.00        | 16.01       | AV       | N    | Pass    |
| 3   | 1.386           | 38.06          | 9.94        | 56.00        | 17.94       | Peak     | N    | Pass    |
| 3** | 1.386           | 27.31          | 9.94        | 46.00        | 18.69       | AV       | N    | Pass    |
| 4   | 1.842           | 36.21          | 9.94        | 56.00        | 19.79       | Peak     | N    | Pass    |
| 4** | 1.842           | 24.32          | 9.94        | 46.00        | 21.68       | AV       | N    | Pass    |
| 5   | 6.190           | 30.79          | 9.80        | 60.00        | 29.21       | Peak     | N    | Pass    |
| 5** | 6.190           | 18.70          | 9.80        | 50.00        | 31.30       | AV       | N    | Pass    |
| 6   | 13.426          | 34.59          | 9.65        | 60.00        | 25.41       | Peak     | N    | Pass    |
| 6** | 13.426          | 20.27          | 9.65        | 50.00        | 29.73       | AV       | N    | Pass    |

# TEST REPORT

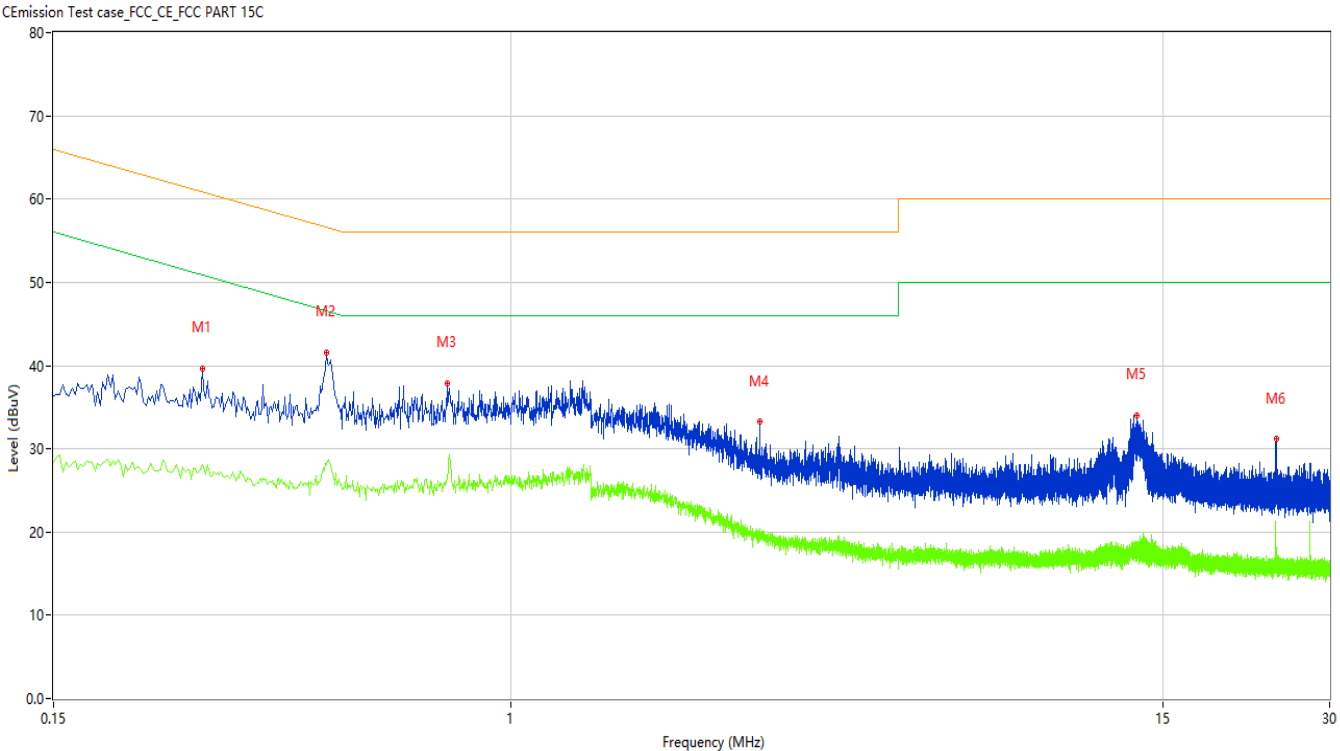
Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 41 of 49

Model: EQM100-5U

Figure 27: Conducted Emission on AC Mains, L Phase



| No. | Frequency (MHz) | Results (dBuV) | Factor (dB) | Limit (dBuV) | Margin (dB) | Detector | Line | Verdict |
|-----|-----------------|----------------|-------------|--------------|-------------|----------|------|---------|
| 1   | 0.278           | 39.64          | 9.97        | 60.88        | 21.24       | Peak     | L    | Pass    |
| 1** | 0.278           | 28.07          | 9.97        | 50.88        | 22.81       | AV       | L    | Pass    |
| 2   | 0.466           | 41.59          | 9.96        | 56.58        | 14.99       | Peak     | L    | Pass    |
| 2** | 0.466           | 28.16          | 9.96        | 46.58        | 18.42       | AV       | L    | Pass    |
| 3   | 0.770           | 37.87          | 9.94        | 56.00        | 18.13       | Peak     | L    | Pass    |
| 3** | 0.770           | 26.26          | 9.94        | 46.00        | 19.74       | AV       | L    | Pass    |
| 4   | 2.812           | 33.20          | 9.84        | 56.00        | 22.80       | Peak     | L    | Pass    |
| 4** | 2.812           | 20.36          | 9.84        | 46.00        | 25.64       | AV       | L    | Pass    |
| 5   | 13.462          | 34.06          | 9.58        | 60.00        | 25.94       | Peak     | L    | Pass    |
| 5** | 13.462          | 18.18          | 9.58        | 50.00        | 31.82       | AV       | L    | Pass    |
| 6   | 24.036          | 31.15          | 9.19        | 60.00        | 28.85       | Peak     | L    | Pass    |
| 6** | 24.036          | 18.25          | 9.19        | 50.00        | 31.75       | AV       | L    | Pass    |

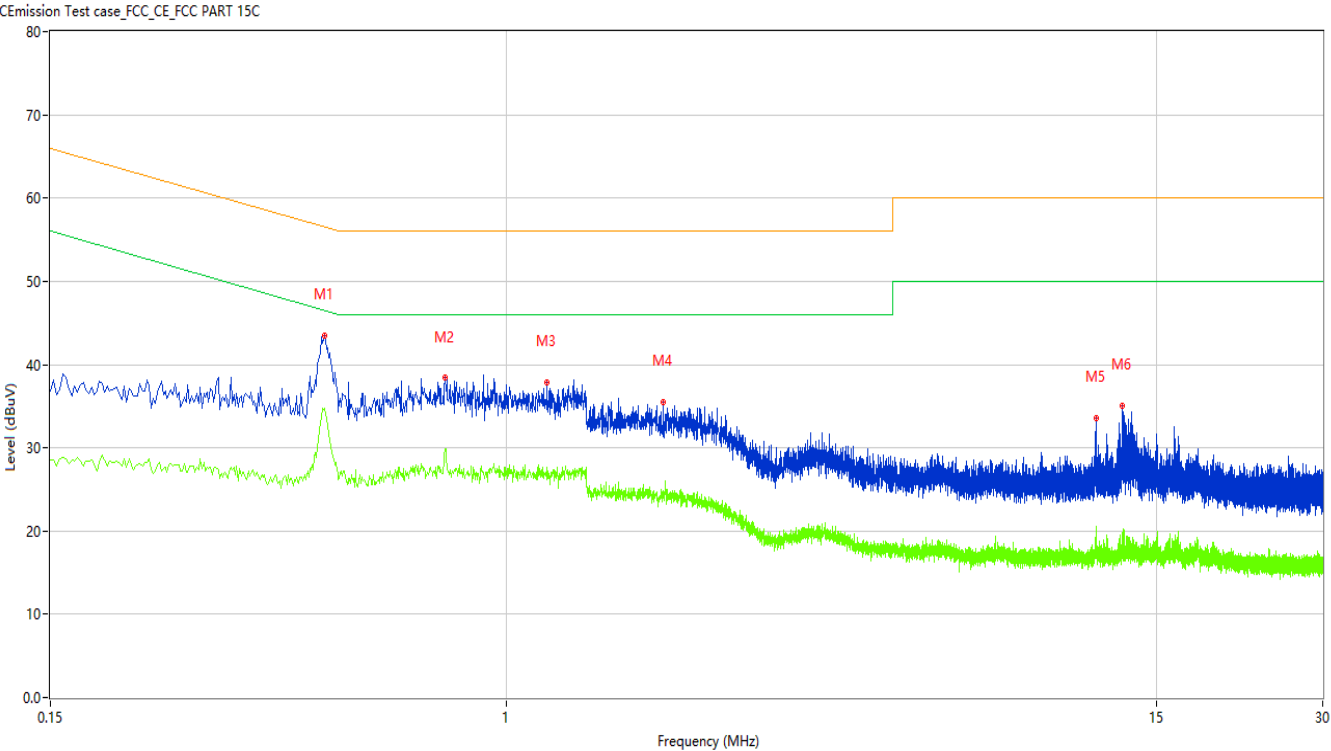
# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 42 of 49

Figure 28: Conducted Emission on AC Mains, N Phase



| No. | Frequency (MHz) | Results (dBuV) | Factor (dB) | Limit (dBuV) | Margin (dB) | Detector | Line | Verdict |
|-----|-----------------|----------------|-------------|--------------|-------------|----------|------|---------|
| 1   | 0.470           | 43.44          | 10.07       | 56.51        | 13.07       | Peak     | N    | Pass    |
| 1** | 0.470           | 34.69          | 10.07       | 46.51        | 11.82       | AV       | N    | Pass    |
| 2   | 0.776           | 38.38          | 10.04       | 56.00        | 17.62       | Peak     | N    | Pass    |
| 2** | 0.776           | 29.93          | 10.04       | 46.00        | 16.07       | AV       | N    | Pass    |
| 3   | 1.186           | 37.83          | 9.95        | 56.00        | 18.17       | Peak     | N    | Pass    |
| 3** | 1.186           | 27.17          | 9.95        | 46.00        | 18.83       | AV       | N    | Pass    |
| 4   | 1.924           | 35.46          | 9.94        | 56.00        | 20.54       | Peak     | N    | Pass    |
| 4** | 1.924           | 24.80          | 9.94        | 46.00        | 21.20       | AV       | N    | Pass    |
| 5   | 11.692          | 33.51          | 9.71        | 60.00        | 26.49       | Peak     | N    | Pass    |
| 5** | 11.692          | 20.56          | 9.71        | 50.00        | 29.44       | AV       | N    | Pass    |
| 6   | 13.026          | 35.05          | 9.67        | 60.00        | 24.95       | Peak     | N    | Pass    |
| 6** | 13.026          | 19.79          | 9.67        | 50.00        | 30.21       | AV       | N    | Pass    |

# TEST REPORT

Report No.: SHE23070127-02AE

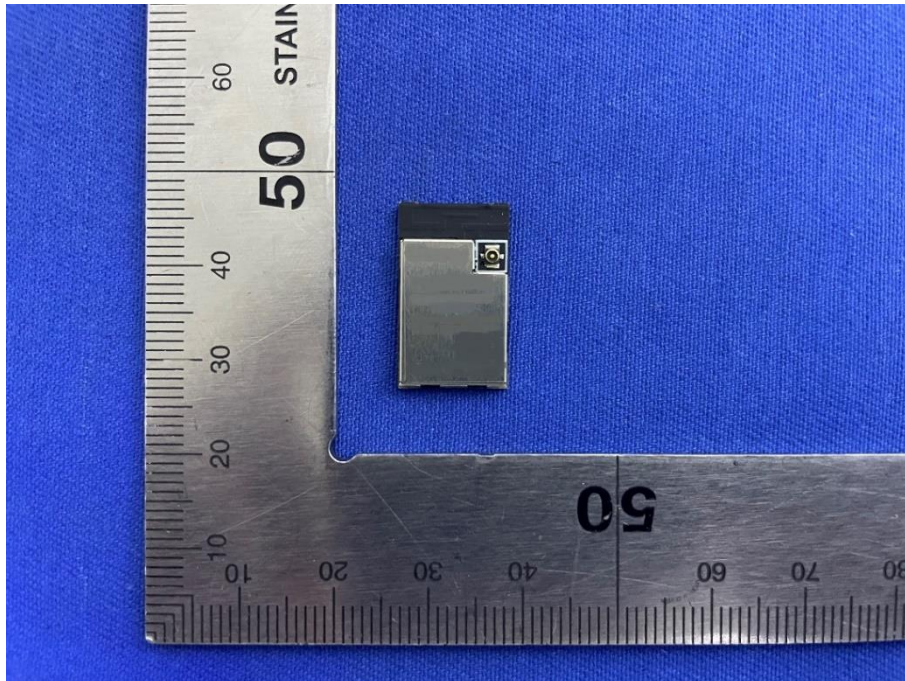
Date: 2023-08-17

Page 43 of 49

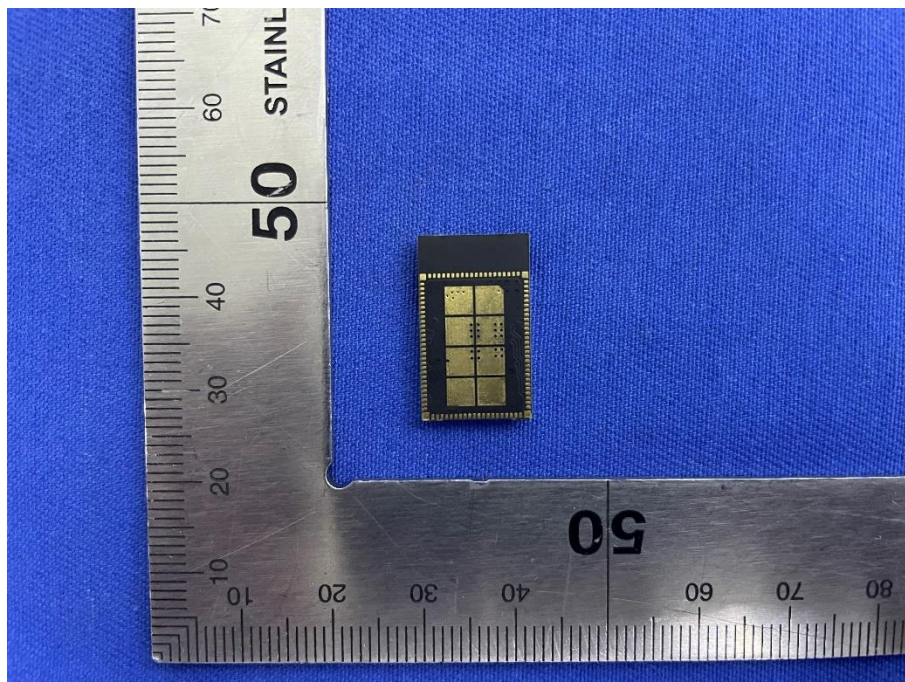
## 5 Appendixes

### 5.1 Photographs of the Sample

Model: EQM100-5B

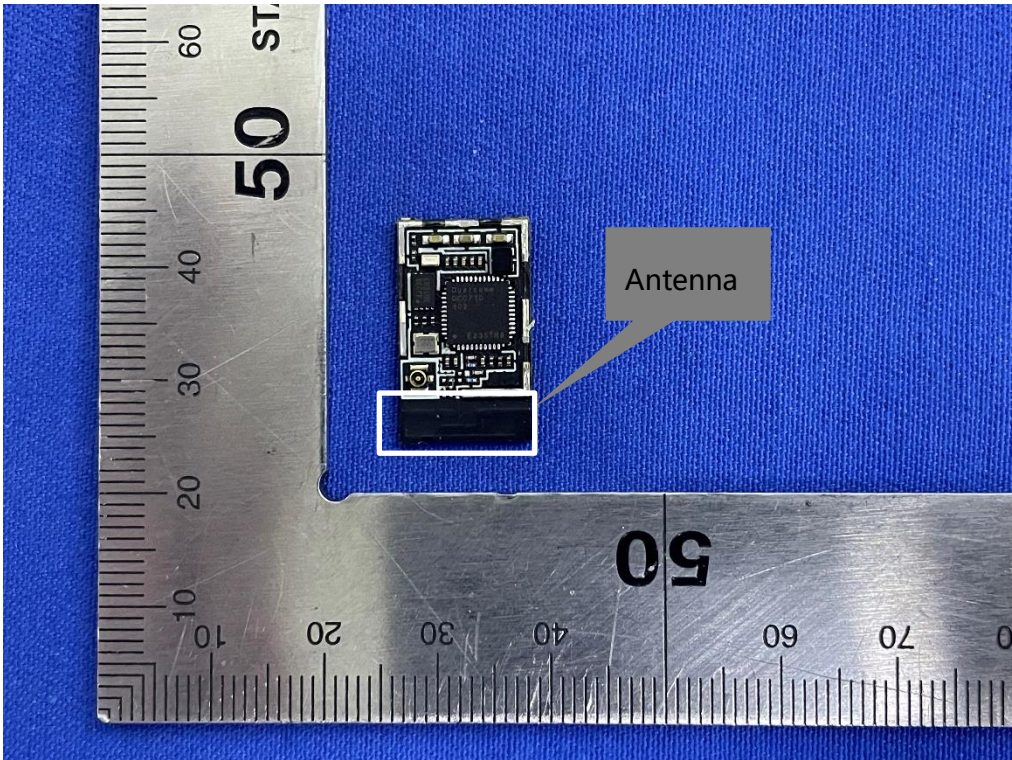


Front of the sample



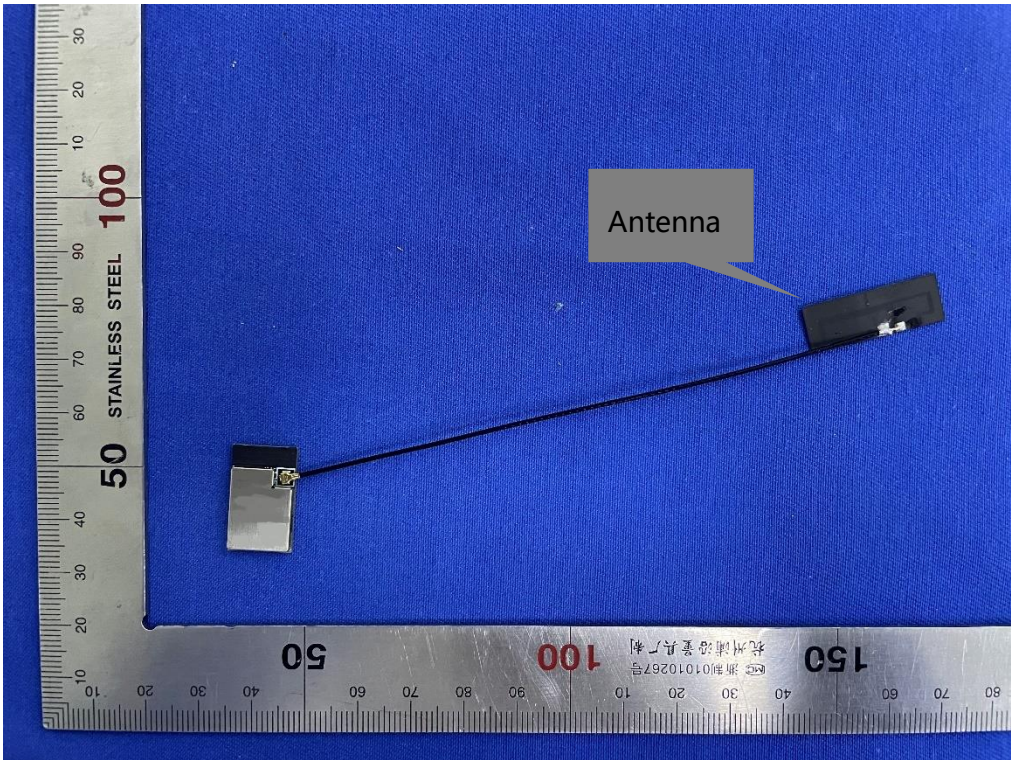
Rear of the sample

# TEST REPORT



Remove the shield cover and Antenna Position

Model: EQM100-5U



Antenna Position

# TEST REPORT

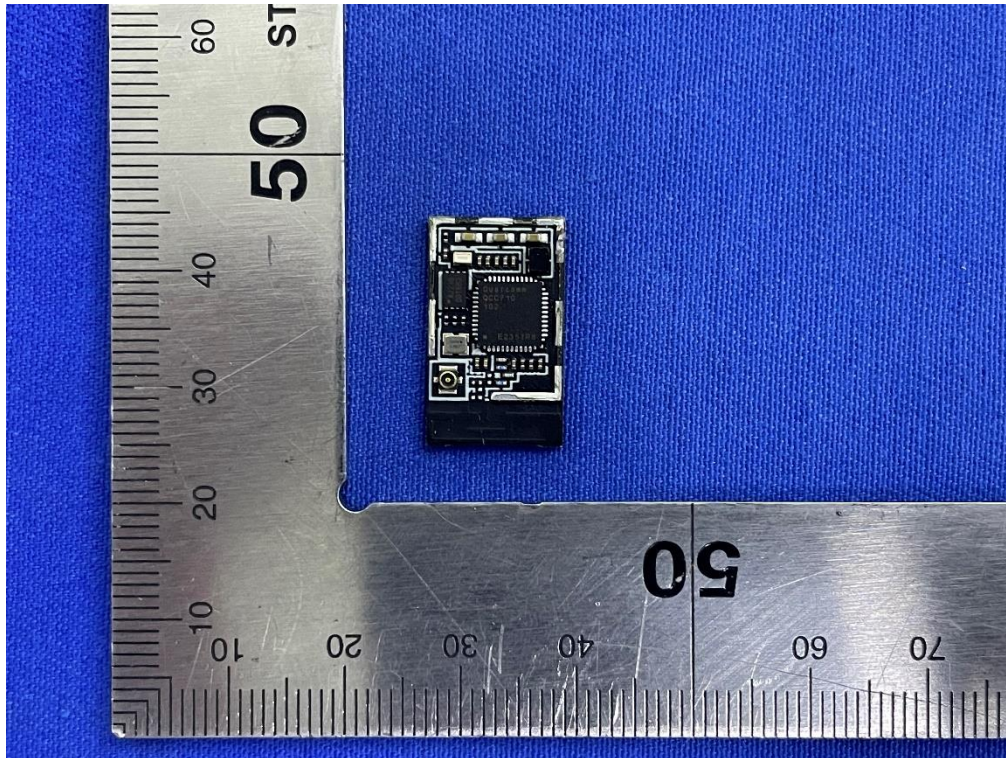
Report No.:

SHE23070127-02AE

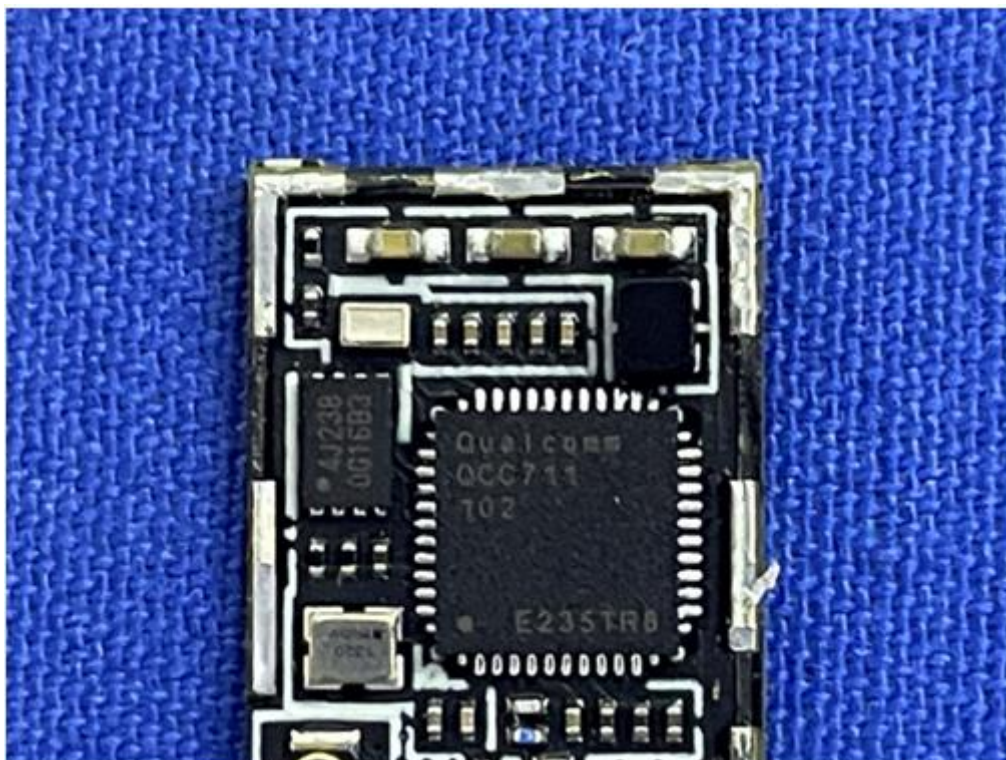
Date:

2023-08-17

Page 45 of 49



Remove the shield cover



Chip

# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 46 of 49

## 5.2 Set-up for Conducted Emissions

Model: EQM100-5B



Model: EQM100-5U



# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 47 of 49

## 5.3 Set-up for Conducted RF test at Antenna Port



# TEST REPORT

Report No.: SHE23070127-02AE

Date: 2023-08-17

Page 48 of 49

## 5.4 Set-up for Spurious Emissions below 1GHz

Model: EQM100-5B



Model: EQM100-5U



# TEST REPORT

Report No.:

SHE23070127-02AE

Date:

2023-08-17

Page 49 of 49

## 5.5 Set-up for Spurious Emissions above 1GHz

Model: EQM100-5B



Model: EQM100-5U



\*\*\*End of the report\*\*\*