

| R                 | F TEST REPORT   |  |  |  |
|-------------------|---|--|--|--|
| Report No.:       | 20240917G19677X-W2  |  |  |  |
| Product Name:     | OBDII   |  |  |  |
| Model No. :       | BTOBDII   |  |  |  |
| FCC ID:           | 2BHGX-BTOBDII   |  |  |  |
| Applicant:        | Thermal Master Technology Co., Ltd.   |  |  |  |
| Address:          | Building C, Room 606, No. 3 Nanchang Street, Guxian Street, Yantai, Shandong, China                           |  |  |  |
| Dates of Testing: | 09/29/2024 - 11/12/2024   |  |  |  |
| Issued by:        | CCIC Southern Testing Co., Ltd.   |  |  |  |
| Lab Location:     | Electronic Testing Building, No.43, Shahe Road, Xili Street,<br>Nanshan District, Shenzhen, Guangdong, China. |  |  |  |
|                   | Tel:86-755-26627338E-Mail:manager@ccic-set.com  |  |  |  |

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# **Test Report**

| Product:              | OBDII  |                       |  |
|-----------------------|--|-----------------------|--|
| Trade Name:           | N/A  |                       |  |
| Applicant:            | Thermal Master Technology Co.,                                     | Ltd.                  |  |
| Applicant Address:    | Building C, Room 606, No. 3 Nan<br>Street, Yantai, Shandong, China | chang Street, Guxian  |  |
| Manufacturer          | Thermal Master Technology Co.,                                     | Ltd.                  |  |
| Manufacturer Address: | Building C, Room 606, No. 3 Nan<br>Street, Yantai, Shandong, China | ichang Street, Guxian |  |
| Test Standards        | 47 CFR Part 15 Subpart C 15.24<br>ANSI C63.10-2020                 | 7                     |  |
| Test Result:          | Pass   |                       |  |
| Tested by:            | (hwizwany zhang  | 2024.11.12            |  |
|                       | Chuiwang Zhang, Test Engineer                                      |                       |  |
| Reviewed by:          | Sun Jiaohui  | 2024.11.12            |  |
|                       | Sun Jiaohui, Senior Engineer                                       |                       |  |
| Approved by:          | Chris You<br>Chris You   | 2024.11.12            |  |
|                       | Chris You, Manager   |                       |  |



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| Change History |            |                   |  |  |
|----------------|------------|-------------------|--|--|
| Issue          | Date       | Reason for change |  |  |
| 1.0            | 2024.11.12 | First edition     |  |  |
|                |            |                   |  |  |



## 1. General Information

#### **1.1. EUT Description**

| Product Name                    | OBDII            |
|---------------------------------|------------------|
| EUT supports Radios application | Bluetooth LE     |
| Frequency Range                 | 2402MHz~2480MHz  |
| Channel Number                  | 40               |
| Bit Rate of Transmitter         | 1Mbps            |
| Modulation Type                 | GFSK             |
| Antenna Type                    | Internal antenna |
| Antenna Gain                    | 0.5dBi           |
| Power supply                    | DC 12V           |

Note 1: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Note 2: The information of antenna gain and cable loss is provided by the manufacturer and our lab is not responsible for the accuracy of the antenna gain and cable loss information.



#### **1.2.** Test Standards and Results

The purpose of the report is to conduct testing according to the following FCC certification standards:

| No. | Identity          | Document Title  |  |  |
|-----|-------------------|---|--|--|
| 1   | 47 CFR Part 15    | Radio Frequency Devices                                     |  |  |
|     | Subpart C         |   |  |  |
| 2   | ANSI C63.10-2020  | American National Standard for Testing Unlicensed Wireless  |  |  |
| 2   | AINSI C03.10-2020 | Devices   |  |  |
|     | KDB 558074 D01    | Cuidance for Compliance Measurement on Digital Transmission |  |  |
| 2   | 15.247 Meas       | Systems, Frequency Hopping Spread Spectrum Systems, and     |  |  |
| 5   | Guidance v05r02   | Hybrid System Devices Operating under Section 15.247 of the |  |  |
|     |                   | FCC Rules   |  |  |

Test detailed items/section required by FCC rules and results are as below:

| No.         | Section in CFR 47 | Description                                | Result                |
|-------------|-------------------|--|-----------------------|
| 1           | 15.203            | Antenna Requirement                        | PASS                  |
| 1 15.247(c) |                   | Antenna Requirement                        | TASS                  |
| 2           | 15.247(b)(3)      | Maximum Conducted Output Power             | PASS                  |
| 3           | 15.247(a)(2)      | 6dB and 99% Bandwidth                      | PASS                  |
| 4           | 15.247(d)         | Conducted Band Edges and Spurious Emission | PASS                  |
| 5           | 15.247(e)         | Power spectral density (PSD)               | PASS                  |
| 6           | 15.207            | AC Power Line Conducted Emission           | N/A <sup>Note 3</sup> |
|             | 15.209            |  |                       |
| 7           | 15.205            | Radiated Band Edges and Spurious Emission  | PASS                  |
|             | 15.247(d)         |  |                       |

Note 1: The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10-2020.

Note 2: These RF tests were performed according to the method of measurements prescribed in KDB 558074 D01 15.247 Meas Guidance v05r02.

Note 3: Not applicable, EUT is powered by DC 12V only.



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

40 channels are provided for Bluetooth LE.

| Test Items   | Modulation Type | Data Rate | Channel |
|--|-----------------|-----------|---------|
| Maximum Conducted Output Power<br>Power Spectral Density<br>6dB and 99% Bandwidth<br>Conducted Spurious Emission<br>Radiated Spurious Emission | GFSK            | 1Mbps     | 0/19/39 |
| Band Edge  | GFSK            | 1Mbps     | 0/39    |

## **1.3.** Table for Supporting Units

| No | Equipment | Brand Name | Model Name | Manufacturer | Serial No. | Note    |
|----|-----------|------------|------------|--------------|------------|---------|
| 1  | Laptop    | HP         | TPN-Q221   | HP           | 5CD14347QB | FCC DOC |

#### **1.4.** EUT Operation Test Setup

For RF test items, an engineering test program was provided and enable to make EUT transmitting.

#### **1.5.** Test environment and mode

During the measurement, the environmental conditions were within the listed ranges:

| Operating Environment          |   |  |  |  |
|--------------------------------|---|--|--|--|
| Temperature                    | 15°C - 35°C   |  |  |  |
| Humidity                       | 30% -60%  |  |  |  |
| Atmospheric Pressure           | 86kPa-106kPa  |  |  |  |
| Test mode:                     |   |  |  |  |
| Continuously transmitting mode | Keep the EUT in continuous transmitting with modulation |  |  |  |



#### **1.6.** Laboratory Facilities

#### FCC-Registration No.: CN1283

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until Jun. 30th, 2025.

#### ISED Registration: 11185A

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A on Aug. 04, 2016, valid time is until Jun. 30th, 2025. **CAB number: CN0064** 

#### A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.



## 2. Test Requirements

#### 2.1. Antenna requirement

#### 2.1.1. Applicable Standard

According to FCC 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

And according to FCC 47 CFR Section 15.247(c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

#### 2.1.2. Antenna Information

#### Antenna Category: Internal Antenna

A internal Antenna was soldered to the antenna port of EUT via an adaptor cable, can't be removed.

#### Antenna General Information:

| No. | EUT   | Operating frequency range | Ant. Type | Ant. Gain |
|-----|-------|---------------------------|-----------|-----------|
| 1   | OBDII | 2402-2480MHz              | Internal  | 0.5 dBi   |

#### 2.1.3. Result: comply

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.



#### 2.2. Maximum Conducted Output Power

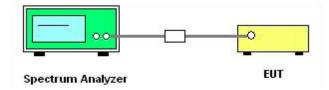
#### 2.2.1. Limit of Maximum Conducted Output Power

For DTSs employing digital modulation techniques operating in the bands 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W.

#### 2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

#### 2.2.3. Test Setup



#### 2.2.4. Test Procedures

- 1. The testing follows the Measurement Procedure of ANSI C63.10-2020 Section 11.9.1.1.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Use the following spectrum analyzer settings:

 $RBW \ge DTS$  bandwidth /  $VBW \ge 3*RBW$  / Sweep time: Auto couple / Detector mode: Peak /

Trace mode: Max hold / Allow trace to fully stabilize / Use peak marker function to determine the peak amplitude level.

5. Record the measurement results in the test report.



#### 2.2.5. Test Result of Maximum Conducted Output Power

Please refer to Appendix A for detail.



#### 2.3. 6dB and 99% Bandwidth

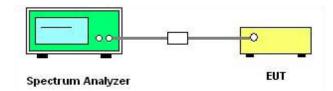
#### 2.3.1. Limit of 6dB and 99% Bandwidth

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

#### 2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

#### 2.3.3. Test Setup



#### **2.3.4.** Test Procedures

- 1. The testing follows the Measurement Procedure of ANSI C63.10-2020 Section 11.8.1.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

- 4. Use the spectrum analyzer "Channel Bandwidth" function to easurement the 6dB EBW and 99% OBW.
- 5. For 6dB EBW Use the following spectrum analyzer settings:

RBW: 100kHz / VBW: 300kHz / Detector: Peak / Trace mode: Max hold / Sweep time: Auto couple / Allow trace to fully stabilize.

6. For 99% OBW Use the following spectrum analyzer settings:

Set RBW = approximately 1% EBW or 1.5 times to 5.0 times the OBW,  $VBW \ge 3 \times RBW$ .

7. Record the measurement results in the test report.



#### 2.3.5. Test Results of 6dB and 99% Bandwidth

Please refer to Appendix A for detail.



#### 2.4. Power spectral density (PSD)

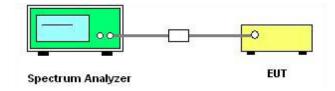
#### 2.4.1. Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

#### 2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

#### 2.4.3. Test Setup



#### 2.4.4. Test Procedures

- 1. The testing follows the Measurement Procedure of ANSI C63.10-2020 Section 11.10.2.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Use the following spectrum analyzer settings:

Set instrument center frequency to DTS channel center frequency / Set the span to 1.5 times the DTS bandwidth / RBW: 3kHz / VBW: 10kHz / Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize / Use the peak marker function to determine the maximum power level.

5. Record the measurement results in the test report.



## 2.4.5. Test Results of Power spectral density

Please refer to Appendix A for detail.



#### 2.5. Conducted Band Edges and Spurious Emissions

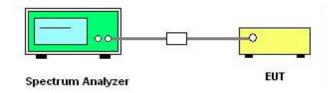
#### 2.5.1. Limit of Conducted Band Edges and Spurious Emissions

In any 100 kHz bandwidth outside the frequency band in which the intentional radiator is perating, 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.

#### 2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

#### 2.5.3. Test Setup



#### 2.5.4. Test Procedure

- 1. The testing follows the Measurement Procedure of ANSI C63.10-2020 Section 11.11 and 11.13.
- 2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 3. Set to the maximum power setting and enable the EUT transmit continuously.
- 4. Use the following spectrum analyzer settings:

Reference level measurement: Set spectrum analyzer center frequency to DTS channel center frequency / Set the span to  $\geq$ 1.5 times the DTS bandwidth / RBW: 100kHz / VBW: 300kHz / Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize / Use the peak marker function to determine the maximum PSD level and attenuate it by 20dB. Emission level measurement: Set the center frequency and span to encompass frequency range to be measured / RBW: 100kHz / VBW: 300kHz / Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize / Use the peak marker function to determine the maximum amplitude level.

5. Record the measurement results in the test report.



#### 2.5.5. Test Results of Conducted Band Edges and Spurious Emissions

Please refer to Appendix A for detail.



#### 2.6. Radiated Band Edge and Spurious Emission

#### 2.6.1. Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the frequency band in which the 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. If the transmitter uses an RMS average conducted power limit, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the estricted bands, as defi ned in §15.205(a), must also comply with the radiated emission limits specifi ed in §15.209(a).

§15.209(a) Radiated emission limits:

| Frequency (MHz) | Field Strength (µV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 0.009 - 0.490   | 2400/F(kHz)           | 300                      |
| 0.490 - 1.705   | 24000/F(kHz)          | 30                       |
| 1.705 - 30.0    | 30                    | 30                       |
| 30 - 88         | 100                   | 3                        |
| 88 - 216        | 150                   | 3                        |
| 216 - 960       | 200                   | 3                        |
| Above 960       | 500                   | 3                        |

Restricted bands of operation refer to §15.205 (a):

| MHz                                 | MHz                          | MHz                        | GHz         |  |  |
|-------------------------------------|------------------------------|----------------------------|-------------|--|--|
| 0.090-0.110                         | 16.42-16.423                 | 399.9-410                  | 4.5-5.15    |  |  |
| <sup>1</sup> 0.495-0.505            | 16.69475-16.69525            | 608-614                    | 5.35-5.46   |  |  |
| 2.1735-2.1905                       | 16.80425-16.80475            | 960-1240                   | 7.25-7.75   |  |  |
| 4.125-4.128                         | 25.5-25.67                   | 1300-1427                  | 8.025-8.5   |  |  |
| 4.17725-4.17775                     | 37.5-38.25                   | 1435-1626.5                | 9.0-9.2     |  |  |
| 4.20725-4.20775                     | 73-74.6                      | 1645.5-1646.5              | 9.3-9.5     |  |  |
| 6.215-6.218                         | 74.8-75.2                    | 1660-1710                  | 10.6-12.7   |  |  |
| 6.26775-6.26825                     | 108-121.94                   | 1718.8-1722.2              | 13.25-13.4  |  |  |
| 6.31175-6.31225                     | 123-138                      | 2200-2300                  | 14.47-14.5  |  |  |
| 8.291-8.294                         | 149.9-150.05                 | 2310-2390                  | 15.35-16.2  |  |  |
| 8.362-8.366                         | 156.52475-156.52525          | 2483.5-2500                | 17.7-21.4   |  |  |
| 8.37625-8.38675                     | 156.7-156.9                  | 2690-2900                  | 22.01-23.12 |  |  |
| 8.41425-8.41475                     | 162.0125-167.17              | 3260-3267                  | 23.6-24.0   |  |  |
| 12.29-12.293                        | 167.72-173.2                 | 3332-3339                  | 31.2-31.8   |  |  |
| 12.51975-12.52025                   | 240-285                      | 3345.8-3358                | 36.43-36.5  |  |  |
| 12.57675-12.57725                   | 322-335.4                    | 3600-4400                  | (2)         |  |  |
| 13.36-13.41                         | 1                            | 1                          | /           |  |  |
| Note: <sup>1</sup> Until February 1 | , 1999, this restricted bane | d shall be 0.490-0.510 MHz | Ζ.          |  |  |
| <sup>2</sup> Above 38.6.            |                              |                            |             |  |  |

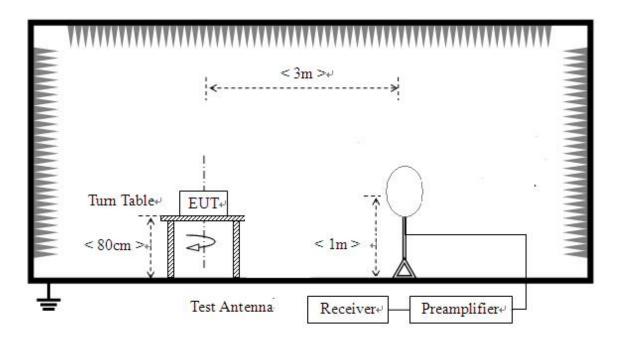


#### 2.6.2. Measuring Instruments

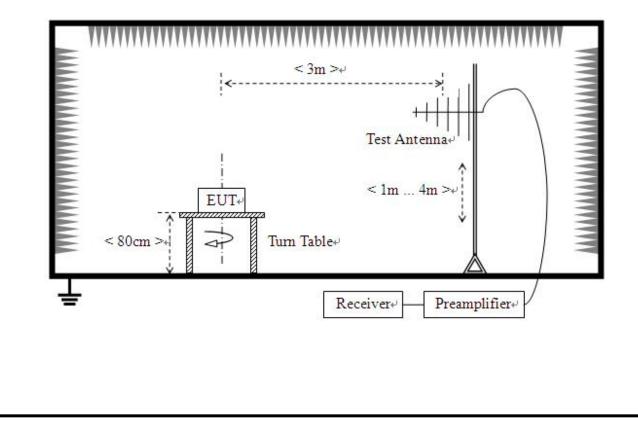
The measuring equipment is listed in the section 3 of this test report.

#### 2.6.3. Test Setup

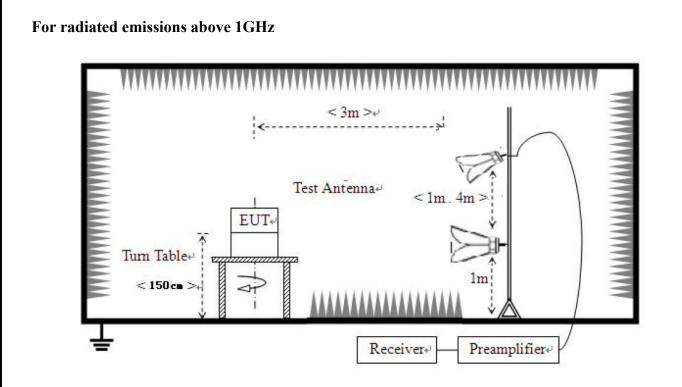
For radiated emissions from 9 kHz to 30 MHz



For radiated emissions from 30MHz to 1GHz







#### 2.6.4. Test Procedures

- 1. The EUT was placed on the top of a rotating table 0.8m for below 1GHz and 1.5m for above 1GHz above the ground at a 3 meters semi-anechoic chamber.
- 2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- 3. Height of receiving antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 6. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then



reported in a data sheet.

7. For the radiated emission test above 1GHz:

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

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T(Duty cycle < 98%) or 10Hz (Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
- 4. All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

#### 2.6.5. Test Results of Radiated Band Edge and Spurious Emission

For 9 kHz to 30MHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1GHz, All of the EUT Configure mode were tested and found 2402MHz channel is the worst mode, the worst case is recorded in this report.



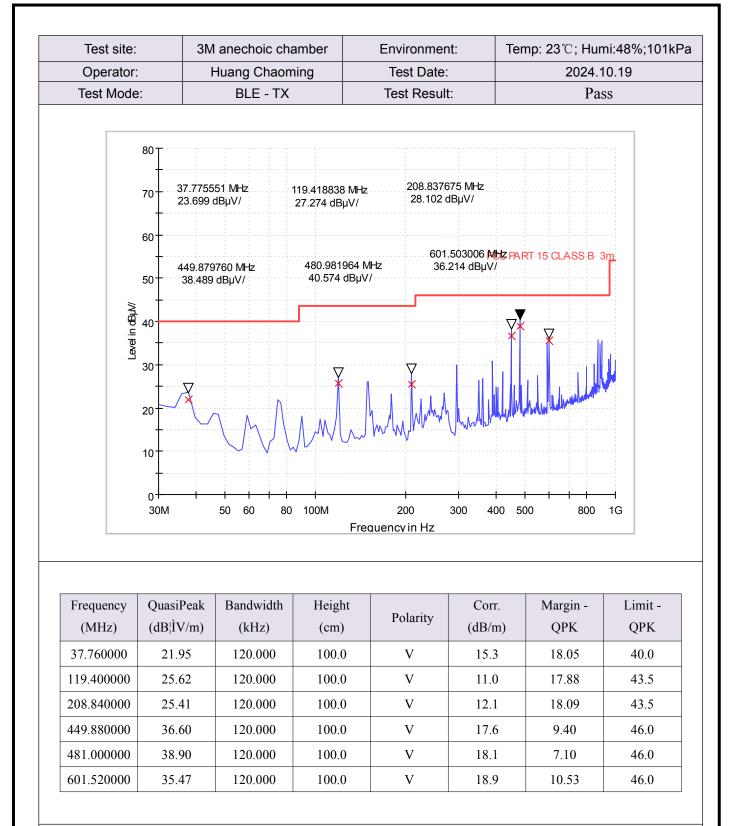
#### 3M anechoic chamber Test site: Environment: Temp: 23°C; Humi:48%;101kPa 2024.10.19 Operator: Huang Chaoming Test Date: Test Mode: BLE - TX Test Result: Pass 80 350.741483 MHz 296.312625 MHz 389.619239 MHz 70 31.947 dBµV/ 33.973 dBµV/ 32.774 dBµV/ 60 449.879760 MHz 480.981964 MEC PART 15 CLASS B 3m 35.387 dBµV/ 420.721443 MHz 37.364 dBµV/ 50 37.914 dBµV/ Level in dBµ// 40 30 20 MAN 10 0-1G 30M 50 60 80 100M 200 300 400 500 800 Frequency in Hz Frequency QuasiPeak Bandwidth Height Corr. Margin -Limit -Polarity (dB|IV/m)(MHz) (kHz) (cm)(dB/m)**QPK QPK** 296.320000 31.87 120.000 100.0 14.9 14.13 Η 46.0 16.0 350.760000 30.99 120.000 100.0 Η 15.01 46.0 389.600000 31.44 120.000 100.0 Η 16.7 14.56 46.0 420.720000 35.07 120.000 100.0 Н 17.210.93 46.0 449.880000 32.41 120.000 100.0 Η 17.6 13.59 46.0 481.000000 34.43 120.000 100.0 Η 18.1 11.57 46.0

#### For 30MHz to 1000MHz

Remark:

- 1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
- 2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB).
- **3**. Margin value = Limit value Emission Level.
- 4. The emission levels of other frequencies are very lower than the limit and not show in test report.
- 5. Only the antenna height (from 1m to 4m) at maximum reading are recorded.





Remark:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).

2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB).

**3**. Margin value = Limit value - Emission Level.

4. The emission levels of other frequencies are very lower than the limit and not show in test report.

5. Only the antenna height (from 1m to 4m) at maximum reading are recorded.

#### For 1GHz to 25GHz

|                    |                              |                   |                | GFS                      | K_2402M                    | Hz                       |                             |            |          |
|--------------------|------------------------------|-------------------|----------------|--------------------------|----------------------------|--------------------------|-----------------------------|------------|----------|
| Frequency<br>(MHz) | Emssion<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Antenna<br>Height<br>(m) | Table<br>Angle<br>(Degree) | Raw<br>Value<br>(dBuV/m) | Correction Factor<br>(dB/m) | Polarity   | Detector |
| 2390.00            | 53.85                        | 74.00             | -20.15         | 1.50                     | 200                        | 56.94                    | -3.09                       | Horizontal | Peak     |
| 2390.00            | 43.64                        | 54.00             | -10.36         | 1.50                     | 200                        | 46.73                    | -3.09                       | Horizontal | Average  |
| 4804.00            | 54.20                        | 74.00             | -19.80         | 1.50                     | 200                        | 52.94                    | 1.26                        | Horizontal | Peak     |
| 4804.00            | 46.67                        | 54.00             | -7.33          | 1.50                     | 200                        | 45.41                    | 1.26                        | Horizontal | Average  |
| 7206.00            | 50.91                        | 74.00             | -23.09         | 1.50                     | 200                        | 44.74                    | 6.17                        | Horizontal | Peak     |
| 7206.00            | 41.08                        | 54.00             | -12.92         | 1.50                     | 200                        | 34.91                    | 6.17                        | Horizontal | Average  |
| 2390.00            | 53.17                        | 74.00             | -20.83         | 1.50                     | 180                        | 56.26                    | -3.09                       | Vertical   | Peak     |
| 2390.00            | 43.43                        | 54.00             | -10.57         | 1.50                     | 180                        | 46.52                    | -3.09                       | Vertical   | Average  |
| 4804.00            | 53.35                        | 74.00             | -20.65         | 1.50                     | 180                        | 52.09                    | 1.26                        | Vertical   | Peak     |
| 4804.00            | 46.72                        | 54.00             | -7.28          | 1.50                     | 180                        | 45.46                    | 1.26                        | Vertical   | Average  |
| 7206.00            | 50.46                        | 74.00             | -23.54         | 1.50                     | 180                        | 44.29                    | 6.17                        | Vertical   | Peak     |
| 7206.00            | 41.46                        | 54.00             | -12.54         | 1.50                     | 180                        | 35.29                    | 6.17                        | Vertical   | Average  |
|                    |                              |                   |                | GFS                      | K_2440M                    | Hz                       |                             |            |          |
| Frequency<br>(MHz) | Emssion<br>Level<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) | Antenna<br>Height<br>(m) | Table<br>Angle<br>(Degree) | Raw<br>Value<br>(dBuV/m) | Correction Factor<br>(dB/m) | Polarity   | Detector |
| 4880.00            | 54.27                        | 74.00             | -19.73         | 1.50                     | 200                        | 53.34                    | 0.93                        | Horizontal | Peak     |
| 4880.00            | 46.86                        | 54.00             | -7.14          | 1.50                     | 200                        | 45.93                    | 0.93                        | Horizontal | Average  |
| 7320.00            | 50.67                        | 74.00             | -23.33         | 1.50                     | 200                        | 45.08                    | 5.59                        | Horizontal | Peak     |
| 7320.00            | 41.23                        | 54.00             | -12.77         | 1.50                     | 200                        | 35.64                    | 5.59                        | Horizontal | Average  |
| 4880.00            | 53.54                        | 74.00             | -20.46         | 1.50                     | 180                        | 52.61                    | 0.93                        | Vertical   | Peak     |
| 4880.00            | 46.73                        | 54.00             | -7.27          | 1.50                     | 180                        | 45.80                    | 0.93                        | Vertical   | Average  |
| 7320.00            | 50.74                        | 74.00             | -23.26         | 1.50                     | 180                        | 45.15                    | 5.59                        | Vertical   | Peak     |
| 7320.00            | 41.93                        | 54.00             | -12.07         | 1.50                     | 180                        | 36.34                    | 5.59                        | Vertical   | Average  |

Remark:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)

2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB)

3. Margin value = Emission Level – Limit value

4. The emission levels of other frequencies are very lower than the limit and not show in test report.

5. Trily the antenna height (from 1m to 4m) and turntable angle (from 0 degrees to 360 degrees) at maximum reading are recorded.



|                    | GFSK_2480MHz      |                   |                |                   |                 |                   |                             |            |          |
|--------------------|-------------------|-------------------|----------------|-------------------|-----------------|-------------------|-----------------------------|------------|----------|
| Frequency<br>(MHz) | Emssion<br>Level  | Limit<br>(dBuV/m) | Margin<br>(dB) | Antenna<br>Height | Table<br>Angle  | Raw<br>Value      | Correction Factor<br>(dB/m) | Polarity   | Detector |
| 2483.50            | (dBuV/m)<br>53.55 | 74.00             | -20.45         | (m)<br>1.50       | (Degree)<br>200 | (dBuV/m)<br>58.30 | -4.75                       | Horizontal | Peak     |
| 2483.50            | 43.64             | 54.00             | -10.36         | 1.50              | 200             | 48.39             | -4.75                       | Horizontal | Average  |
| 4960.00            | 48.12             | 74.00             | -25.88         | 1.50              | 200             | 47.88             | 0.24                        | Horizontal | Peak     |
| 4960.00            | 39.00             | 54.00             | -15.00         | 1.50              | 200             | 38.76             | 0.24                        | Horizontal | Average  |
| 7440.00            | 49.93             | 74.00             | -24.07         | 1.50              | 200             | 44.11             | 5.82                        | Horizontal | Peak     |
| 7440.00            | 39.94             | 54.00             | -14.06         | 1.50              | 200             | 34.12             | 5.82                        | Horizontal | Average  |
| 2483.50            | 53.85             | 74.00             | -20.15         | 1.50              | 180             | 58.60             | -4.75                       | Vertical   | Peak     |
| 2483.50            | 43.65             | 54.00             | -10.35         | 1.50              | 180             | 48.40             | -4.75                       | Vertical   | Average  |
| 4960.00            | 48.17             | 74.00             | -25.83         | 1.50              | 180             | 47.93             | 0.24                        | Vertical   | Peak     |
| 4960.00            | 39.86             | 54.00             | -14.14         | 1.50              | 180             | 39.62             | 0.24                        | Vertical   | Average  |
| 7440.00            | 48.89             | 74.00             | -25.11         | 1.50              | 180             | 43.07             | 5.82                        | Vertical   | Peak     |
| 7440.00            | 40.18             | 54.00             | -13.82         | 1.50              | 180             | 34.36             | 5.82                        | Vertical   | Average  |

Remark:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)

2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) - Pre-Amplifier Factor(dB)

3. Margin value = Emission Level – Limit value

4. The emission levels of other frequencies are very lower than the limit and not show in test report.

5. Trily the antenna height (from 1m to 4m) and turntable angle (from 0 degrees to 360 degrees) at maximum reading are recorded.



#### 2.7. AC Power Line Conducted Emission

#### 2.7.1. Limit of AC Power Line Conducted Emission

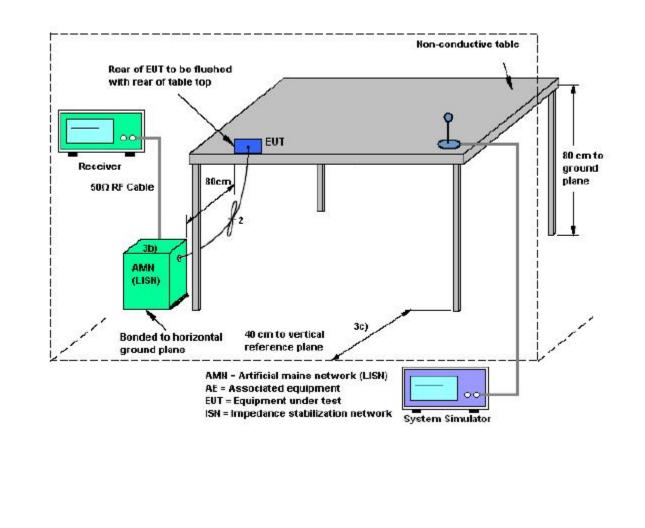
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

| Eraguanay ranga (MHz) | Conducted Limit (dBµV) |          |  |  |
|-----------------------|------------------------|----------|--|--|
| Frequency range (MHz) | Quai-peak              | Average  |  |  |
| 0.15 - 0.50           | 66 to 56               | 56 to 46 |  |  |
| 0.50 - 5              | 56                     | 46       |  |  |
| 5 - 30                | 60                     | 50       |  |  |

#### 2.7.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

#### 2.7.3. Test Setup





#### 2.7.4. Test Procedures

- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- 2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- 3. All the support units are connecting to the other LISN.
- 4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- 5. The FCC states that a 50 ohm, 50 micrometry LISN should be used.
- 6. Both sides of AC line were checked for maximum conducted interference.
- 7. The frequency range from 150 kHz to 30 MHz was searched.
- 8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

#### 2.7.5. Test Results of Conducted Emission

Not applicable, EUT is powered by DC 12V only.



# 3. List of measuring equipment

| Item | Test Equipment                    | Manufacturer  | Model No.                 | Serial No. | Cal Date   | Due Date   |
|------|-----------------------------------|---------------|---------------------------|------------|------------|------------|
| 1    | 5M Anechoic Chamber               | Albatross     | SAC-5MAC<br>12.8x6.8x6.4m | A0304210   | 2023.08.01 | 2026.07.31 |
| 2    | EMI Test Receiver                 | ROHDE&SCHWARZ | ESW26                     | A180502935 | 2024.05.23 | 2025.05.22 |
| 3    | Loop Antenna                      | Schwarz beck  | HFH2-Z2                   | A0304220   | 2022.05.02 | 2025.05.01 |
| 4    | Broadband antenna<br>(30MHz~1GHz) | R&S           | HL562                     | A0304224   | 2023.06.08 | 2026.06.07 |
| 5    | EMI Horn Ant.<br>(1-18G)          | ETC           | MCTD-1209                 | A150402241 | 2023.05.16 | 2026.05.15 |
| 6    | Horn antenna<br>(18GHz~26.5GHz)   | AR            | AT4510                    | A0804450   | 2023.06.01 | 2026.05.31 |
| 7    | Amplifier 30M~1GHz                | MILMEGA       | 80RF1000-10004            | A140101634 | 2023.11.27 | 2024.11.26 |
| 8    | Amplifier 1G~18GHz                | MILMEGA       | AS0104R-800/400           | A160302517 | 2024.05.25 | 2025.05.24 |
| 9    | Spectrum Analyzer                 | KEYSIGHT      | N9030A                    | A160702554 | 2024.01.18 | 2025.01.17 |
| 10   | Test Receiver                     | R&S           | ESIB7                     | A0501375   | 2024.02.28 | 2025.02.27 |
| 11   | Broadband Ant.                    | ETC           | MCTD 2786                 | A150402240 | 2023.05.22 | 2026.05.21 |
| 12   | 3M Anechoic Chamber               | Albatross     | SAC-3MAC<br>9*6*6m        | A0412375   | 2024.02.27 | 2027.02.26 |
| 13   | Cable(9kHz~30MHz)                 | /             | /                         | C230800587 | 2023.08.21 | 2026.08.20 |
| 14   | Cable(30MHz~18GHz)                | /             | XSMJA750-SMN<br>M(RA)-12M | C230800588 | 2023.08.21 | 2026.08.20 |
| 15   | Cable(18GHz~40GHz)                | /             | SUCOFLEX102               | C230800590 | 2023.08.21 | 2026.08.20 |



## 4. Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2020. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of AC Power Line Conducted Emission Measurement (150kHz~30MHz)

| Measuring Uncertainty for a level of | 2.8dB |
|--------------------------------------|-------|
| confidence of 95%(U=2Uc(y))          |       |

Uncertainty of Radiated Emission Measurement (9kHz~30MHz)

| Measuring Uncertainty for a level of | 2 5 JD |
|--------------------------------------|--------|
| confidence of 95%(U=2Uc(y))          | 3.5dB  |

Uncertainty of Radiated Emission Measurement (30MHz~1GHz)

| Measuring Uncertainty for a level of | 3.91dB |
|--------------------------------------|--------|
| confidence of 95%(U=2Uc(y))          | 5.51dB |

Uncertainty of Radiated Emission Measurement (1GHz~18GHz)

| Measuring Uncertainty for a level of | 4.5 dD |
|--------------------------------------|--------|
| confidence of 95%(U=2Uc(y))          | 4.5dB  |

Uncertainty of Radiated Emission Measurement (18GHz~40GHz)

| Measuring Uncertainty for a level of | 4.9dB |
|--------------------------------------|-------|
| confidence of 95%(U=2Uc(y))          |       |

Uncertainty of RF Conducted Measurement (9kHz~40GHz)

| Measuring Uncertainty for a level of | 1.3dB          |
|--------------------------------------|----------------|
| confidence of 95%(U=2Uc(y))          | 1.5 <b>u</b> D |



## Appendix A

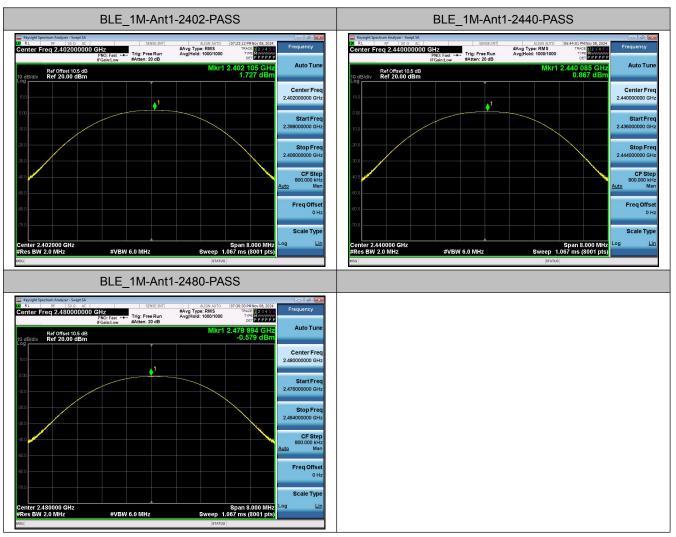
## Maximum Conducted Output Power

#### **Test Result and Data**

| Test Mode | Antenna | Frequency[MHz] | Peak Output Power[dBm] | Limit [dBm] | Verdict |
|-----------|---------|----------------|------------------------|-------------|---------|
| BLE_1M    | Ant1    | 2402           | 1.73                   | ≤30         | PASS    |
| BLE_1M    | Ant1    | 2440           | 0.87                   | ≤30         | PASS    |
| BLE_1M    | Ant1    | 2480           | -0.58                  | ≤30         | PASS    |



#### **Test Graphs**





### 6dB Bandwidth

#### Test Result and Data

| Test Mode | Antenna | Frequency[MHz] | DTS BW [MHz] | Limit[MHz] | Verdict |
|-----------|---------|----------------|--------------|------------|---------|
| BLE_1M    | Ant1    | 2402           | 0.708        | 0.5        | PASS    |
| BLE_1M    | Ant1    | 2440           | 0.720        | 0.5        | PASS    |
| BLE_1M    | Ant1    | 2480           | 0.717        | 0.5        | PASS    |



## **Test Graphs**

| BLE_1M-Ant1-2402-PASS  | BLE_1M-Ant1-2440-PASS   |
|--|---|
| Keyligh Spectrum Analyzer - Swept SA         SENSE (MT)         ALLON AUTO         (0722:53 PM Nov (8), 2024           Inter Freq 2.402000000 GHz         Trig: Free Run         #Vorg Type: RNS         Trick The 2.8 45           PRO, Wide  | Keysight Spectrum Analyzer - Swept SA         50195-0111         ALIGN AUTO         64-33-19 PN kvr (8, 2024           VIII R.L.         RF         1510 AC         50195-0111         ALIGN AUTO         64-33-19 PN kvr (8, 2024           VIII R.L.         RF         1510 AC         Trig: Free Run         4Avg Type: RMS         Trig: B2 845         Frequency           If Gent.tox         Frequency         Autors 2004 AC         Augited: 1000/1000         Trig: Free Run         Augited: 1000/10000         Trig: Free Run         F        |
| Ref offset 10.5 dB   | Ref offset 105 dB         ΔMkr3 720 kHz         Auto Tr.           10 dB/dw         Ref 20.00 dBm         0.044 dB         Center F           10 0         1         2         3Δ1         450 db         24000000 db           10 0         1         0         450 db         Start F         24000000 db           10 0         1         0         450 db         Start F         24000000 db   |
| 240050000 GH2<br>es BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts)<br>300.000 Hz #VBW 300 kHz Sweep 1.000 ms (1001 pts)   | 400         2239500000           900         900           900  |
| NODE TRES ECL         X         Y         Function         PUNCTION NUCLE         PUNCTION NUCLE           N         1         7         2.401 670 GHz         -5.471 BFm         Function         Function NULLE         Freq Offset           N         1         7         2.402 671 GHz         -0.453 GHm         Function         Function NULLE         Freq Offset           A1         1         7         (A)         -0.101 dB         Freq Offset         0 Hz           Image: Solid Strain S | Mini Mode Tric (sc.)         X         Y         Function         Function Work         Function Work <th< td=""></th<> |
| BLE_1M-Ant1-2480-PASS  |   |
| Kongel Spectrom Analyse - Sweet SA         Server Entry         ALLOW AUTO         597 396.20 PM Nov.08, 2024         Frequency           R.L         SF         S0.0         AC         Server Entry         ALLOW AUTO         57 396.20 PM Nov.08, 2024         Frequency           Inter Freq 2.4800000000         FWD, Web         Trig: Free Run         Avg/Intel: 10001000         Trick: Figure Rule         Frequency           FWD, Web         FWD, Web         20 B         Avg/Intel: 10001000         Trick: Figure Rule   |   |
| GE/Offset 10.5 dB         ΔΜΙΚΤ3 // 17 KH2           0         0   |   |
| φ         Span 3.000 MHz         Span 3.000 MHz         CF Step<br>30.000 KHz           R locat fric Sci.         # VBW 300 KHz         Sweep 1.000 ms (1001 pts)<br>30.000 KHz         Auto   |   |
| scale type   |   |



## 99% Occupied Bandwidth

#### Test Result and Data

| Test Mode | Antenna | Frequency[MHz] | 99% OBW[MHz] | Limit[MHz] | Verdict |
|-----------|---------|----------------|--------------|------------|---------|
| BLE_1M    | Ant1    | 2402           | 1.0525       |            |         |
| BLE_1M    | Ant1    | 2440           | 1.0519       |            |         |
| BLE_1M    | Ant1    | 2480           | 1.0525       |            |         |



## **Test Graphs**

| BLE_1M-Ant1-2402  | BLE_1M-Ant1-2440   |
|---|--|
| Keysigk Spectrum Analyzer - Occupied BW         SEREE.NT         ALLOW AUTO         07.22:03.94 Mov (85, 2024)           W 8.L         FF         15.00 AC         Center Freq: 2.40200000 GHz         Radio Std: None           Center Freq: 2.40200000 GHz         Frequency         Frequency           #If Geint.Low         #Atten: 20 dB         Mkr1         2.401772 GHz  | Keyight Spectrum Analyzer - Occupied BW         Strike INT         ALION AUTO         664-351 BW Nov 66, 2024         Frequency           Center Freq 2.440000000 GHz         Center Freq: 2.44000000 GHz         Radio Std: None         Radio Std: None           #Frequency         Frequency         Frequency         Radio Device: BTS         Radio Device: BTS   |
| Ref Offset 105 dB         MKT         2.401172 GHz         2.5661 dBm           Log   | Original Part of the t105 dB         MKT 2.440018 GHz           10 dB/div         Ref 20.00 dBm         4.4176 dBm           100         1         2.44008 GHz           100         1         2.44000000 GHz           100         1         1           100         1         2.44000000 GHz           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1         1           100         1 |
| Center 2.402 GHz Span 3 MHz CF Step<br>#Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms<br>400 Man  | Center 2.44 GHz Span 3 MHz CF Step<br>#Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms<br>00.000 kHz Manual Step   |
| Occupied Bandwidth Total Power 8.05 dBm 1.0525 MHz Transmit Freq Error 28.911 kHz % of OBW Power 99.00 % x dB Bandwidth 1.335 MHz x dB -26.00 dB  | Occupied Bandwidth     Total Power     7.21 dBm       1.0519 MHz     Transmit Freq Error     28.943 kHz       % of OBW Power     99.00 %       x dB Bandwidth     1.340 MHz     x dB       -26.00 dB     (17.016)  |
| BLE_1M-Ant1-2480  |  |
| Knytight Spectrum Analyzer - Occupied BW         School Entry         ALIGN AUTO         07:09:20 PM kov 56, 2023         Context Free         2400 AUTO         07:09:20 PM kov 56, 2023         Frequency           Center Free 2.48000000 GHz         Center Free 2.48000000 GHz         Radio Std: None         Frequency         Frequency           #fGeInLow         #fGeInLow         #fGeInLow         Frequency         Frequency   |  |
| Ref Offset 10.5 dB         Mkr1         2.480018 GHz         Center Freq           10 dBldtv         48         -5.8879 dBm         2.4800000 GHz         2.4800000 GHz           00         1         -         -         2.4800000 GHz         2.4800000 GHz           00         - |  |
| #Res BW 30 kHz #VBW 100 kHz Sweep 3.2 ms<br>Occupied Bandwidth Total Power 5.76 dBm   |  |
| 1.0525 MHz     Freq Offset       Transmit Freq Error     30.237 kHz       % of OBW Power     99.00 %       x dB Bandwidth     1.349 MHz     x dB  |  |
| INSG STATUS   |  |



## **Power Spectral Density**

## Test Result and Data

| Test Mode | Antenna | Frequency[MHz] | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|-----------|---------|----------------|------------------|-----------------|---------|
| BLE_1M    | Ant1    | 2402           | -13.35           | ≤8.00           | PASS    |
| BLE_1M    | Ant1    | 2440           | -14.18           | ≤8.00           | PASS    |
| BLE_1M    | Ant1    | 2480           | -15.45           | ≤8.00           | PASS    |



## **Test Graphs**

| BLE_1M-Ant1-2402-PASS  | BLE_1M-Ant1-2440-PASS  |
|--|--|
| Compared Section Magnet Section Magnet Section S   | Angel Statute         Angel St |
| Ref Offset 10.5 dB         MKT 2.402 02.3 4 GPz           10.8 gradie         -13.351 dBm           00         -13.351 dBm           01         -13.351 dBm           02         -13.351 dBm           03         -13.351 dBm           04         -13.351 dBm           05         -13.351 dBm           06         -13.351 dBm           07         -13.351 dBm           08         -13.351 dBm           09         -13.351 dBm           09         -13.351 dBm           00         -13.351 dBm           01         -13.351 dBm           02         -13.351 dBm           03         -13.351 dBm           04         -13.351 dBm           05         -13.351 dBm           04         -13.351 dBm           05         -13.351 dBm           06         -13.351 dBm           07         -13.351 dBm           08         -13.351 dBm           08         -13.351 dBm           08         -13.351 dBm           09         -13.351 dBm           100.200 dBm         -13.351 dBm           101.200 dBm         -13.351 dBm <td< td=""><td>Ref Offset 10.6 dB         MRT 2.440 022 b8 GFJ         Center Freq           10 dB/dW         -14.178 dBm         Center Freq           000         -14.178 dBm         Start Freq           010         -14.178 dBm         -14.178 dBm           010         -14.178 dBm</td></td<> | Ref Offset 10.6 dB         MRT 2.440 022 b8 GFJ         Center Freq           10 dB/dW         -14.178 dBm         Center Freq           000         -14.178 dBm         Start Freq           010         -14.178 dBm         -14.178 dBm           010         -14.178 dBm  |
| BLE_1M-Ant1-2480-PASS  | MBG  |
| Regist Systems Adapter - Swept Sta         Stack Intro         ALLOB AUTO         OT 3052 PM/bit (8, 2014)         Frequency           Center Freq 2.48000000 CHz<br>(10 dB/dwit weithing in the constraint of the constra   |  |



## **Conducted Band Edges**

## Test Result and Data

| Test Mode | Antenna | ChName | Frequency[MHz] | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|--------|----------------|---------------|-------------|------------|---------|
| BLE_1M    | Ant1    | Low    | 2402           | 0.48          | -48.55      | ≤-19.52    | PASS    |
| BLE_1M    | Ant1    | High   | 2480           | -1.74         | -47.48      | ≤-21.74    | PASS    |



## **Test Graphs**

| BLE_1M-Ant1-2   | 2402-PASS  | BLE_1M-Ant1-2480-PASS  |                               |  |
|---|--|--|-------------------------------|--|
| Reyulght Spectrum Analyzer - Swept 55<br>A.L RF 200 AC<br>Center Freq 2.3552600000 GHz<br>FNO: Fast   | ALIGN MITO 0723-11 PM Nov 06, 1024<br>Avg Type: RMS<br>Trace Data Strate Data Strate<br>VogiHold: 200/200<br>The Data Strate S | 30         R.L         RF         39.0         AC         SENSE IMT         ALISA AUTO         07:395 PMM or 66 20:401         Freque           Center Freq 2.510000000 GHz         Freque         #Vor Type: RMS         Trice: IB2-20:401         Freque         #Vor Type: RMS         Trice: IB2-20:401         Freque           File         Freque         #Atten: X0 B         X00         Trice: IB2-20:401         Freque | Jency<br>Ito Tune             |  |
| no dB/div Ref 20.00 dBm   | Mkr5 2.353 970 GHz<br>-48.549 dBm  | Ref Offset 10.5 dB Mkr4 2.528 08 GHz 40<br>10 dB/div Ref 20.00 dBm -47.475 dBm   | to rune                       |  |
| 100   | 01 Center Freq<br>2.352500000 GHz  | 10.0 01 Cent<br>0.00 0.0 01 2.510000   | nter Freq<br>0000 GHz         |  |
| 200   | 2.30000000 GHz   | 30.0 A A A A A A A A A A A A A A A A A A   | t <b>art Freq</b><br>0000 GHz |  |
| 60.0<br>maineter Matsatteren oberterterterterterterterterterterterterte   | A  |  | top Fred<br>0000 GH2          |  |
| Start 2.30000 GHz<br>#Res BW 100 kHz #VBW 300 kHz<br>MKR NODE TRCI SCL X Y FUNCTIC  | Stop 2.40500 GHz         CF Step           Sweep 10.07 ms (1001 pts)         10.500000 MHz           N         FUNCTION WIDTH         FUNCTION WIDTH   |  | CF Step<br>0000 MHz<br>Mar    |  |
| N         1         2.402 270 GHz         0.483 dBm           2         N         1         2.200 270 GHz         0.53 cHz           3         N         1         7         2.300 000 GHz         -55 cHz           3         N         1         7         2.300 000 GHz         -55 cHz         48m           4         N         1         f         2.350 000 GHz         -590.331 dBm           6         N         1         f         2.353 970 GHz         -48.549 dBm | Freq Offset<br>0 Hz  | 1 N 1 f 2.480 24 GHz -1.740 dBm  | e <b>q Offset</b><br>0 Hz     |  |
|   | Scale Type   | 9  | ale Type                      |  |
|   |  | 10 Log   | Li                            |  |



## **Conducted Spurious Emissions**

#### **Test Result and Data**

| Test Mode | Antenna | Frequency[MHz] | FreqRange[Mhz] | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|----------------|----------------|---------------|-------------|------------|---------|
| BLE_1M    | Ant1    | 2402           | 0~Reference    | 0.50          | 0.50        |            | PASS    |
| BLE_1M    | Ant1    | 2402           | 30~25000       | 0.50          | -35.57      | ≤-19.5     | PASS    |
| BLE_1M    | Ant1    | 2440           | 0~Reference    | -0.53         | -0.53       |            | PASS    |
| BLE_1M    | Ant1    | 2440           | 30~25000       | -0.53         | -36.82      | ≤-20.53    | PASS    |
| BLE_1M    | Ant1    | 2480           | 0~Reference    | -1.93         | -1.93       |            | PASS    |
| BLE_1M    | Ant1    | 2480           | 30~25000       | -1.93         | -32.55      | ≤-21.93    | PASS    |



#### **Test Graphs**

