



**Spectrum Research  
& Testing Lab., Inc.**  
No.167, Ln. 780, Shan-Tong  
Rd., Ling 8, Shan-Tong Li,  
Chung-Li Dist., Taoyuan  
City 320, Taiwan (R.O.C.)

## TEST REPORT

Reference No.: A23070303  
Report No.: FCCA23070303-B0  
FCC ID : QCI-SKIWB800D3  
Page: 1 of 26  
Date: Aug. 02, 2023

Product Name: BT/BLE/WiFi 6 radio module  
Brand Name: SMART  
Model No.: SKI.WB800D.3  
Series Model: ---  
Applicant: SMART TECHNOLOGIES ULC  
3636 RESEARCH ROAD NW CALGARY, AB T2L 1Y1  
CANADA  
Date of Receipt: Jul. 03, 2023  
Finished date of Test: Jul. 27, 2023  
Applicable Standards: 47 CFR FCC Part 15 Subpart E-2021  
FCC KDB Publication 905462 D02 v02 (April 8, 2016)

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Jimmy Tseng , Date: Aug. 02, 2023  
(Jimmy Tseng)

Approved By : Johnson Ho , Date: 8/2/2023  
( Johnson Ho, Director )



|                                                                                                                                                                                                                                              |                      |                                                                                                                            |
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|  <b>Spectrum Research &amp; Testing Lab., Inc.</b><br>No.167,Ln. 780, Shan-Tong Rd.,Ling 8, Shan-Tong Li, Chung-Li Dist., Taoyuan City 320, Taiwan (R.O.C.) | <h1>TEST REPORT</h1> | Reference No.: A23070303<br>Report No.: FCCA23070303-B0<br>FCC ID : QCI-SKIWB800D3<br>Page: 2 of 55<br>Date: Aug. 02, 2023 |
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## Revisions History

| Report No.      | Issue Date    | Revisions      |
|-----------------|---------------|----------------|
| DGTA23070303-B0 | Aug. 02, 2023 | Initial issue. |



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## 1. DOCUMENT POLICY AND TEST STATEMENT

### 1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.
- FCC Registered Test Site Number : TW1016

### 1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source from DC 5V.

### 1.3 EUT MODIFICATION

- No modification in SRT Lab.

### 1.4 DECISION RULE

- To make sure the testing report(s) meet the requirement of ISO/IEC 17025:2017 standard and meet chapter 7.1 (Review of Requests, Tenders and Contracts), chapter 7.4 (Handling of Test or Calibration Items), chapter 7.8.2 (Reporting of Results – Common Requirement for Reports (Test, Calibration or Sampling)), This decision rule will be the base of adjustment (include the disclaimer scope) from SRT LAB.
- After communicate between SRT LAB. and clients /applicants and get the agreement, SRT LAB. will do the adjustment. According to this decision rule, SRT LAB. Manager(s) will do the Pass or Fail adjustment. (But one thing need to be concerned is, not every assessing rule suits all declaration of conformity assessing actions, it should be ruled depends on product's feature, test standard, technical regulation, test results, and also acceptance of risk of both sides.)
- This report according to the “description of applied standards and statements of conformity” on the report, as the decision rule.

### 1.5 REPORTING STATEMENTS OF CONFORMITY

Base on ISO/IEC 17025, the statements of conformity requirement of testing results.

- ☐ It does not need to provide the statements of conformity.
- ☒ It need to provide the statements of conformity and
  - ☒ Use CISPR 16-4, ISO/IEC Guide 98-3, IEC Guide 115, ETSI ETR 028 speciation and it does not need to provide additional uncertainty of the testing results or data on the report(s).
  - ☐ It need to provide additional uncertainty of the testing results or data on the report(s).

|                                                                                                                                                                                                                                                |                      |                                                                                                                            |
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## 2. DESCRIPTION OF EUT AND TEST MODE

### 2.1 GENERAL DESCRIPTION OF EUT

|                                |                            |
|--------------------------------|----------------------------|
| <b>PRODUCT</b>                 | BT/BLE/WiFi 6 radio module |
| <b>MODEL NO.</b>               | SKI.WB800D.3               |
| <b>BRAND NAME</b>              | SMART                      |
| <b>POWER SUPPLY</b>            | 5Vdc 1A                    |
| <b>CABLE</b>                   | N/A                        |
| <b>FREQUENCY BAND</b>          | 2400 ~ 2483.5 MHz          |
| <b>CARRIER FREQUENCY</b>       | 2402 ~ 2480 MHz            |
| <b>NUMBER OF CHANNEL</b>       | 79                         |
| <b>RATED RF OUTPUT POWER</b>   | 1.72 dBm(1.486 mW)         |
| <b>MODULATION TYPE</b>         | GFSK                       |
| <b>BIT RATE OF TRANSMITTER</b> | 1 Mbps, 2 Mbps, 3Mbps      |
| <b>ANTENNA TYPE</b>            | Dipole Antenna             |
| <b>ANTENNA GAIN</b>            | 3.19 dBi                   |

**NOTE:**

For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

### 2.2 DESCRIPTION OF EUT INTERNAL DEVICE

| DEVICE       | BRAND / MAKER | MODEL #  | FCC ID / DOC | REMARK                                         |
|--------------|---------------|----------|--------------|------------------------------------------------|
| RF IC        | AICSEMI       | AIC8800D | N/A          | WIFI 6 BT5.0 Moudle                            |
| XTLA         | N/A           | M26.00   | N/A          | 26MHz XTAL                                     |
| Front end IC | CHIPBETTER    | CB5717   | N/A          | WIFI 6 5G Front-end Module                     |
| Antenna      | HONGFUTAI     | Dipole   | N/A          | 2.4G paek Gain 3.19dbi<br>602-0015-065-A       |
| Antenna      | Megahertz     | Dipole   | N/A          | 2.4G paek Gain 2.06dbi<br>6150-000000-36000001 |
| Antenna      | Megahertz     | Dipole   | N/A          | 2.4G paek Gain 3.17dbi<br>6150-015600-36000001 |

|                                                                                                                                                                                                                                              |                      |                                                                                                                            |
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## 2.3 DESCRIPTION OF TEST MODE

The EUT in BR/EDR mode has 79 channels and the modulations are GFSK,  $\pi/4$  DQPSK, and 8DPSK.

Use the software in TX test mode is “SecureCRTPortable”.

After pre-test in chamber and evaluate:

1. GFSK was the worst modulation, so use of GFSK for the final test mode.
2. Choose lowest, middle and highest channels for final test.
3. Three axis (X, Y and Z axis) are evaluated in chamber, the X axis is the worst in test.

| Test Mode |         | Frequency | Conducted Emission | Radiated Emission |
|-----------|---------|-----------|--------------------|-------------------|
| 1         | TX1     | 2402 MHz  | N/A                | ✓                 |
| 2         | TX2     | 2441 MHz  | N/A                | ✓                 |
| 3         | TX3     | 2480 MHz  | N/A                | ✓                 |
| 4         | Standby | N/A       | ✓                  | ✓                 |
| 5         | Link    | N/A       | ✓                  | ✓                 |

### NOTE:

1. Below 1 GHz were pre-tested in chamber and chosen the worst case for conducted and radiated emission test.
2. Above 1 GHz were tested individually.

|                                                                                                                                                                                                                                              |                      |                                                                                                                            |
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## 2.4 EUT OPERATING CONDITION

1. Setup the EUT and all peripheral devices .
2. Turn on the power of all equipment and EUT.
3. Transfer board between PC and EUT. Into engineering & Standby mode.

## 2.5 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.10:2013. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

| NO | DEVICE             | BRAND   | MODEL #    | FCC ID/DOC | CABLE                                                     |
|----|--------------------|---------|------------|------------|-----------------------------------------------------------|
| 1  | PC                 | ASUS    | M32AA1     | DoC        | 1.8m unshielded power cable.                              |
| 2  | LCD Monitor        | DELL    | U2311Hb    | DoC        | 1.8m unshielded power cable.<br>1.5m shielded data cable. |
| 3  | Mouse              | ASUS    | MOBTUO     | DoC        | 1.5m unshielded data cable.                               |
| 4  | Keyboard           | ASUS    | AW211      | DoC        | 1.5m unshielded data cable                                |
| 5  | Printer            | HP      | C8995A     | DoC        | 1.5m unshielded power cable.<br>1.5m shielded data cable. |
| 6  | USB 2.0 HDD        | Terasys | F-12U      | DoC        | 1.5m shielded data cable.                                 |
| 7  | USB Transfer board | SMART   | USB TO TTL | NA         | NA                                                        |

**NOTE:** For the actual test configuration, please refer to the photos of testing.

## 2.6 CHANNEL AND FREQUENCY TABLE

| Channel (CH) | Frequency (MHz) | Channel (CH) | Frequency (MHz) | Channel (CH) | Frequency (MHz) | Channel (CH) | Frequency (MHz) |
|--------------|-----------------|--------------|-----------------|--------------|-----------------|--------------|-----------------|
| 00           | 2402            | 20           | 2422            | 40           | 2442            | 60           | 2462            |
| 01           | 2403            | 21           | 2423            | 41           | 2443            | 61           | 2463            |
| 02           | 2404            | 22           | 2424            | 42           | 2444            | 62           | 2464            |
| 03           | 2405            | 23           | 2425            | 43           | 2445            | 63           | 2465            |
| 04           | 2406            | 24           | 2426            | 44           | 2446            | 64           | 2466            |
| 05           | 2407            | 25           | 2427            | 45           | 2447            | 65           | 2467            |
| 06           | 2408            | 26           | 2428            | 46           | 2448            | 66           | 2468            |
| 07           | 2409            | 27           | 2429            | 47           | 2449            | 67           | 2469            |
| 08           | 2410            | 28           | 2430            | 48           | 2450            | 68           | 2470            |
| 09           | 2411            | 29           | 2431            | 49           | 2451            | 69           | 2471            |
| 10           | 2412            | 30           | 2432            | 50           | 2452            | 70           | 2472            |
| 11           | 2413            | 31           | 2433            | 51           | 2453            | 71           | 2473            |
| 12           | 2414            | 32           | 2434            | 52           | 2454            | 72           | 2474            |
| 13           | 2415            | 33           | 2435            | 53           | 2455            | 73           | 2475            |
| 14           | 2416            | 34           | 2436            | 54           | 2456            | 74           | 2476            |
| 15           | 2417            | 35           | 2437            | 55           | 2457            | 75           | 2477            |
| 16           | 2418            | 36           | 2438            | 56           | 2458            | 76           | 2478            |
| 17           | 2419            | 37           | 2439            | 57           | 2459            | 77           | 2479            |
| 18           | 2420            | 38           | 2440            | 58           | 2460            | 78           | 2480            |
| 19           | 2421            | 39           | 2441            | 59           | 2461            |              |                 |

|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
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### 3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

- 47 CFR Part 15, Subpart C, 15.247
- ANSI C63.10: 2013
- FCC publication KDB 558074 D01 15.247 Meas Guidance v05r02 Apr 02, 2019

All tests have been performed and recorded as the above standards.

#### 3.1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| STANDARD SECTION                    | TEST TYPE AND LIMIT RESULTS                                                     | RESULTS |
|-------------------------------------|---------------------------------------------------------------------------------|---------|
| 15.207                              | AC Power Line Conducted Emission                                                | PASS    |
| 15.247(d)<br>15.205(a)<br>15.209(a) | Transmitter Radiated Emissions<br>Limit: Table 15.209                           | PASS    |
| 15.247(a)                           | 20dB Bandwidth                                                                  | PASS    |
| 15.247(a)                           | Maximum Peak Conducted Output Power                                             | PASS    |
| 15.247(d)                           | Band Edge Measurement:                                                          | PASS    |
| 15.247(a)                           | Time of occupancy (Dwell Time)<br>Limit : greater than 0.4 seconds              | PASS    |
| 15.247(a)(b)                        | Quantity of hopping channel test<br>Limit : 75 non-overlapping hopping channels | PASS    |
| 15.247(a)                           | Channel separation test<br>Limit : minimum of 25 kHz or the 20 dB bandwidth     | PASS    |

|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
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## 4. CONDUCTED EMISSION TEST

### 4.1 LIMIT

| Frequency (MHz) | Class A (dBμV) |         | Class B (dBμV) |         |
|-----------------|----------------|---------|----------------|---------|
|                 | Quasi-peak     | Average | Quasi-peak     | Average |
| 0.15 - 0.5      | 79             | 66      | 66 - 56        | 56 - 46 |
| 0.50 - 5.0      | 73             | 60      | 56             | 46      |
| 5.0 - 30.0      | 73             | 60      | 60             | 50      |

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 4.2 TEST EQUIPMENT

The following test equipment was used for the test:

| Equipment/<br>Facilities | Specifications                               | Manufacturer    | Model #/<br>Serial #      | Due Date<br>of Cal.<br>& Cal. Center | Final<br>Test be<br>Used |
|--------------------------|----------------------------------------------|-----------------|---------------------------|--------------------------------------|--------------------------|
| EMI TEST RECEIVER        | 9 kHz ~ 2.75 GHz                             | ROHDE & SCHWARZ | ESCS30 / 100376           | APR. 26, 2024 ETC                    | ■                        |
| LISN                     | 50 μH, 50 ohm                                | SOLAR           | 9252-50-R-24-BNC / 951315 | FEB. 22, 2024 ETC                    | ■                        |
| LISN                     | 50 μH, 50 ohm                                | SCHWARZBECK     | NSLK 8127/ 8127-808       | MAR. 08, 2024 ETC                    | ■                        |
| 50Ω BNC TYPE TERMINATOR  | 50 ohm                                       | N/A             | 11593A/ L1TEQU005         | FEB. 14, 2024 ETC                    | ■                        |
| 50Ω BNC TYPE TERMINATOR  | 50 ohm                                       | N/A             | B00-CD-357 / L1TEQU009    | JUL. 14, 2024 ETC                    | ■                        |
| COAXIAL CABLE            | 5 m                                          | HUBER+ SUHNER   | RG214/U(5m) / L1TCAB013   | JUN. 23, 2024 ETC                    | ■                        |
| FILTER                   | 2 LINE, 30 A                                 | FIL.COIL        | FC-943 / 771              | NCR                                  | ■                        |
| GROUND PLANE             | 2 m (H) x 3 m (W)                            | SRT             | N/A                       | NCR                                  | ■                        |
| GROUND PLANE             | 2.5 m (H) x 3 m (W)                          | SRT             | N/A                       | NCR                                  | ■                        |
| PULSE LIMITER            | 9 kHz ~ 30 MHz<br>Insertion Loss= 10dB±0.3dB | ROHDE & SCHWARZ | ESH3-Z2 / L1TTES010       | FEB. 16, 2024 ETC                    | ■                        |
| THERMO-HYGRO             | 15 – 40 °C,                                  | TOP             | 20-A / 6644               | MAR. 01, 2024 ETC                    | ■                        |
| MEASUREMENT SOFTWARE     | N/A                                          | EZ-EMC          | SRT-03A1                  | NCR                                  | ■                        |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



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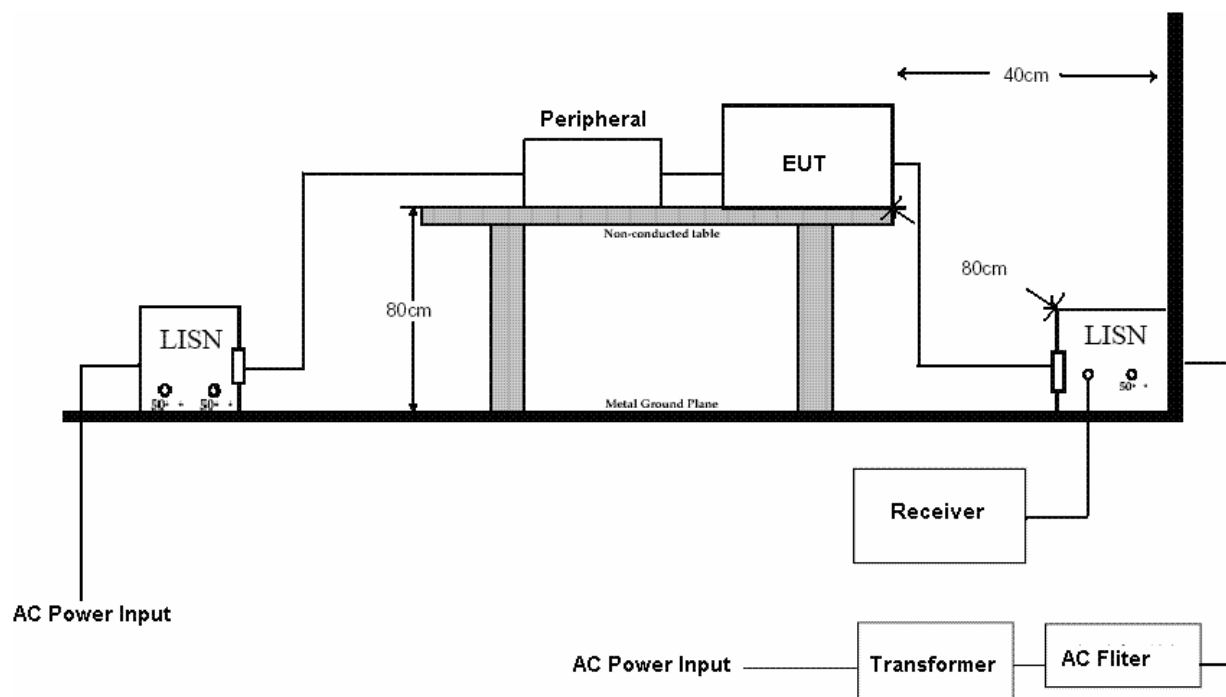
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## 4.3 TEST SETUP



**NOTE:**

1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.

## 4.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.10:2013 and EN 55022. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50 $\mu$ H as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



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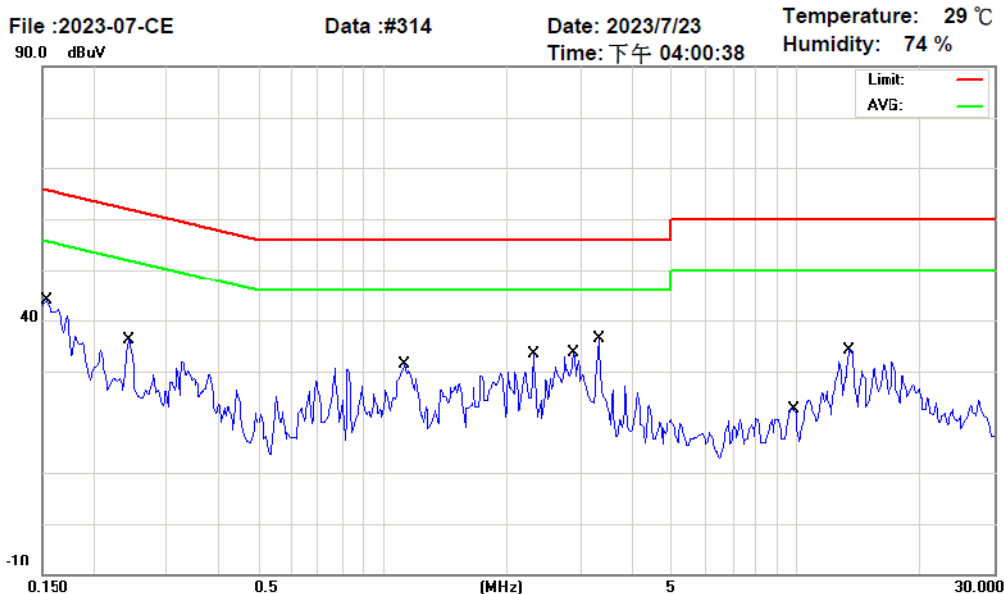
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## 4.5 TEST RESULT

Temperature: 29 °C Humidity: 74 %RH  
Frequency Range: 0.15 – 30 MHz Tested Mode: Standby  
Receiver Detector: Q.P. and AV. Tested Date: Jul. 23, 2023

Power Line Measured : Line



| Mk. | No. | Frequency (MHz) | Reading (dBuV) | Corrected factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Comment |
|-----|-----|-----------------|----------------|----------------------|---------------|--------------|-------------|----------|---------|
|     | 1   | 0.1539          | 36.44          | -0.04                | 36.40         | 65.79        | -29.39      | QP       |         |
|     | 2   | 0.1539          | 12.43          | -0.04                | 12.39         | 55.79        | -43.40      | AVG      |         |
|     | 3   | 0.2437          | 35.05          | -0.04                | 35.01         | 61.97        | -26.96      | QP       |         |
|     | 4   | 0.2437          | 34.77          | -0.04                | 34.73         | 51.97        | -17.24      | AVG      |         |
|     | 5   | 1.1305          | 27.66          | -0.02                | 27.64         | 56.00        | -28.36      | QP       |         |
|     | 6   | 1.1305          | 21.57          | -0.02                | 21.55         | 46.00        | -24.45      | AVG      |         |
|     | 7   | 2.3102          | 19.77          | 0.02                 | 19.79         | 56.00        | -36.21      | QP       |         |
|     | 8   | 2.3102          | 8.29           | 0.02                 | 8.31          | 46.00        | -37.69      | AVG      |         |
|     | 9   | 2.8961          | 20.99          | 0.05                 | 21.04         | 56.00        | -34.96      | QP       |         |
|     | 10  | 2.8961          | 10.50          | 0.05                 | 10.55         | 46.00        | -35.45      | AVG      |         |
|     | 11  | 3.3125          | 35.12          | 0.06                 | 35.18         | 56.00        | -20.82      | QP       |         |
| *   | 12  | 3.3125          | 34.66          | 0.06                 | 34.72         | 46.00        | -11.28      | AVG      |         |
|     | 13  | 10.0000         | 12.29          | 0.28                 | 12.57         | 60.00        | -47.43      | QP       |         |
|     | 14  | 10.0000         | 7.24           | 0.28                 | 7.52          | 50.00        | -42.48      | AVG      |         |
|     | 15  | 13.3750         | 30.68          | 0.34                 | 31.02         | 60.00        | -28.98      | QP       |         |
|     | 16  | 13.3750         | 22.93          | 0.34                 | 23.27         | 50.00        | -26.73      | AVG      |         |

### NOTE:

- Measurement uncertainty is 1.61 dB.
- Result = Reading + Correction factor.
- Corrected Factor = Cable loss + Insertion loss of LISN  
Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
- Margin = Result – Limit.



**Spectrum Research & Testing Lab., Inc.**

No.167,Ln. 780, Shan-Tong Rd.,Ling 8, Shan-Tong Li, Chung-Li Dist., Taoyuan City 320, Taiwan (R.O.C.)

# TEST REPORT

Reference No.: A23070303

Report No.: FCCA23070303-B0

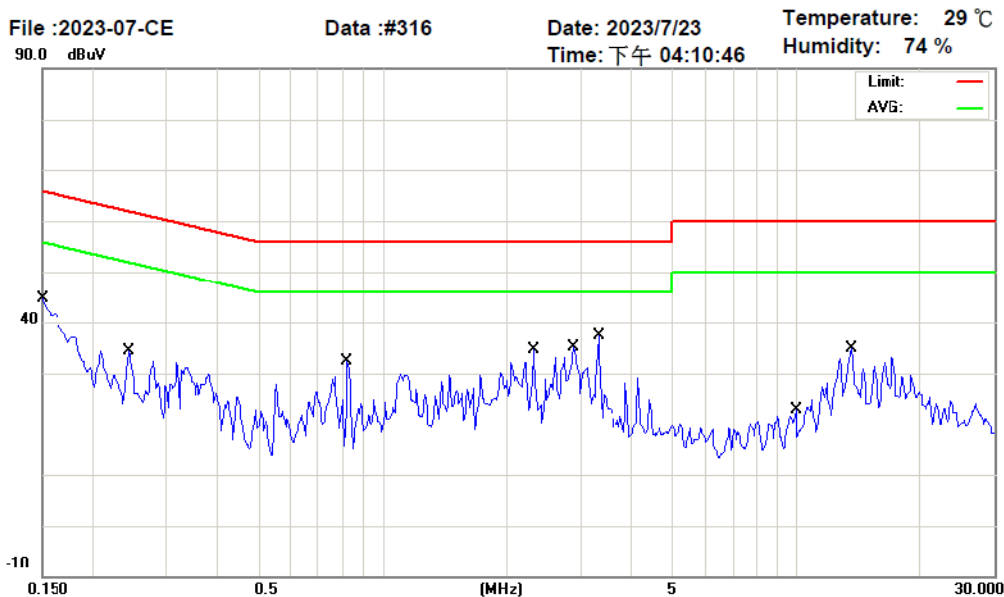
FCC ID : QCI-SKIWB800D3

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Date: Aug. 02, 2023

Temperature: 29 °C Humidity: 74 %RH  
Frequency Range: 0.15 – 30 MHz Tested Mode: Standby  
Receiver Detector: Q.P. and AV. Tested Date: Jul. 23, 2023

Power Line Measured : Neutral



| Mk. | No.  | Frequency (MHz) | Reading (dBuV) | Corrected factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Comment |
|-----|------|-----------------|----------------|----------------------|---------------|--------------|-------------|----------|---------|
|     | 1    | 0.1500          | 37.37          | -0.09                | 37.28         | 66.00        | -28.72      | QP       |         |
|     | 2    | 0.1500          | 20.75          | -0.09                | 20.66         | 56.00        | -35.34      | AVG      |         |
|     | 3    | 0.2437          | 32.35          | -0.08                | 32.27         | 61.97        | -29.70      | QP       |         |
|     | 4    | 0.2437          | 31.82          | -0.08                | 31.74         | 51.97        | -20.23      | AVG      |         |
|     | 5    | 0.8258          | 30.63          | -0.06                | 30.57         | 56.00        | -25.43      | QP       |         |
|     | 6    | 0.8258          | 28.67          | -0.06                | 28.61         | 46.00        | -17.39      | AVG      |         |
|     | 7    | 2.3141          | 24.30          | -0.01                | 24.29         | 56.00        | -31.71      | QP       |         |
|     | 8    | 2.3141          | 8.38           | -0.01                | 8.37          | 46.00        | -37.63      | AVG      |         |
|     | 9    | 2.8883          | 21.59          | 0.02                 | 21.61         | 56.00        | -34.39      | QP       |         |
|     | 10   | 2.8883          | 9.28           | 0.02                 | 9.30          | 46.00        | -36.70      | AVG      |         |
|     | 11   | 3.3125          | 35.83          | 0.03                 | 35.86         | 56.00        | -20.14      | QP       |         |
|     | * 12 | 3.3125          | 35.38          | 0.03                 | 35.41         | 46.00        | -10.59      | AVG      |         |
|     | 13   | 10.0000         | 12.67          | 0.25                 | 12.92         | 60.00        | -47.08      | QP       |         |
|     | 14   | 10.0000         | 7.54           | 0.25                 | 7.79          | 50.00        | -42.21      | AVG      |         |
|     | 15   | 13.5742         | 30.97          | 0.30                 | 31.27         | 60.00        | -28.73      | QP       |         |
|     | 16   | 13.5742         | 23.09          | 0.30                 | 23.39         | 50.00        | -26.61      | AVG      |         |

**NOTE:**

1. Measurement uncertainty is 1.61 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN  
Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.

## 5. RADIATED EMISSION TEST

### 5.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| FREQUENCY (MHz) | FIELD STRENGTH (microvolts/meter) | DISTANCE (m) | FIELD STRENGTH (dBμV/m) |
|-----------------|-----------------------------------|--------------|-------------------------|
| 0.009 - 0.490   | 2400/F(kHz)                       | 300          | 67.6-20log(kHz)         |
| 0.490 - 1.705   | 24000/F(kHz)                      | 30           | 87.6-20log(kHz)         |
| 1.705 - 30      | 30                                | 30           | 30                      |
| 30 - 88         | 100                               | 3            | 40.0                    |
| 88 - 216        | 150                               | 3            | 43.5                    |
| 216 - 960       | 200                               | 3            | 46.0                    |
| ≥ 960           | 500                               | 3            | 54.0                    |

#### NOTE:

1. 30 dBuV (in 30m) = 70 dBuV (in 3m).
2. In the emission tables above , the tighter limit applies at the band edges.
3. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

FCC Part 15, Section 15.35(b) limit of radiated emission for frequency above 1000 MHz

| FREQUENCY (MHz) | Class A (dBuV/m) (at 3m) |         | Class B (dBuV/m) (at 3m) |         |
|-----------------|--------------------------|---------|--------------------------|---------|
|                 | PEAK                     | AVERAGE | PEAK                     | AVERAGE |
| Above 1000      | 80.0                     | 60.0    | 74.0                     | 54.0    |

|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
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## 5.2 TEST EQUIPMENT

Below 1 GHz The following test equipment was used during the radiated emission test:

| Equipment/<br>Facilities | Specifications         | Manufacturer    | Model #/<br>Serial #      | Due Date<br>of Cal.<br>& Cal. Center | Final<br>Test be<br>Used |
|--------------------------|------------------------|-----------------|---------------------------|--------------------------------------|--------------------------|
| EMI Test Receiver        | 9 kHz ~ 2.75 GHz       | ROHDE & SCHWARZ | ESCS30 / 100376           | APR. 26, 2024 ETC                    | ■                        |
| LOOP ANTENNA             | 9 kHz ~ 30 MHz         | ROHDE & SCHWARZ | HFH2-Z2 / 860605/002      | JUL. 19, 2024 ETC                    | ■                        |
| Biconical Antenna        | 30 MHz ~ 200 MHz       | EMCO            | 3108 / 2380               | MAY. 01, 2024 ETC                    | ■                        |
| Log Periodic Antenna     | 200 MHz ~ 1 GHz        | EMCO            | 3146 / 9002-2686          | MAY. 01, 2024 ETC                    | ■                        |
| Open Area Test Site      | 3 ~ 10 M Measurement   | SRT             | A02 / SRT002              | MAR. 07, 2024 SRT                    | ■                        |
| Coaxial Cable            | 9 kHz ~ 1 GHz          | TIMES           | LMR-400(30m) / L1TCAB014  | Jul. 06, 2024 ETC                    | ■                        |
| Coaxial Cable            | 9 kHz ~ 1 GHz          | Time            | LMR-400 (#2m) / L1TCAB012 | MAR. 20, 2024 ETC                    | ■                        |
| Filter                   | 2 LINE, 30 A           | FIL.COIL        | FC-943 / 869              | NCR                                  | ■                        |
| CDN                      | 0.15 MHz ~ 300 MHz     | LUTHI           | CDN L-801 M2/M3 / 2790    | JUN. 10, 2024 ETC                    | □                        |
| Pre-Amplifier            | 0.1 MHz ~ 1.3 GHz      | HP              | 8447D / 2944A06746        | APR. 19, 2024 ETC                    | ■                        |
| Thermo-Hygro             | 15 ~ 40°C, 0 ~ 100% RH | TOP             | 20-A / 9326               | MAR. 26, 2024 ETC                    | ■                        |

**NOTE:** The Open Area Test Site (SRT-1) is registered by FCC with No. 90957

|                                                                                                                                                                                                                                                |                      |                                                                                                                             |
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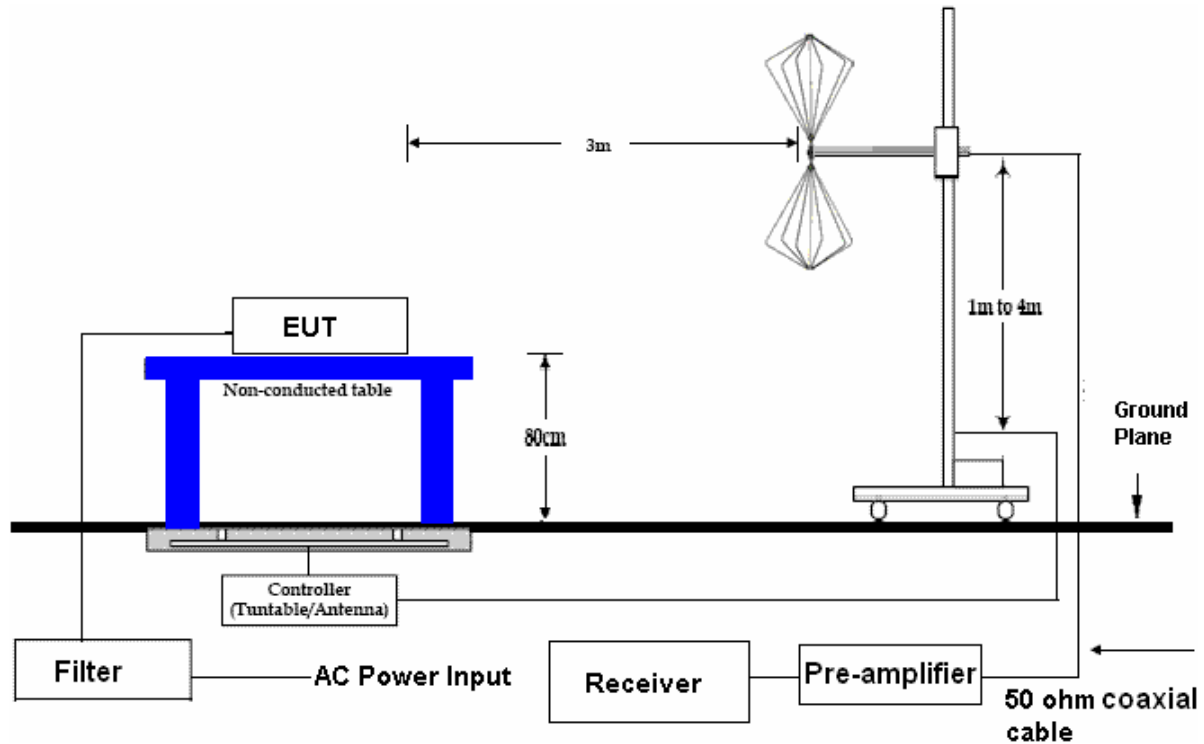
Above 1 GHz The following test equipment was used during the radiated emission test:

| Equipment/<br>Facilities | Specifications             | Manufacturer     | Model #/<br>Serial #             | Due Date<br>of Cal.<br>& Cal. Center | Final<br>Test be<br>Used |
|--------------------------|----------------------------|------------------|----------------------------------|--------------------------------------|--------------------------|
| EXA Signal Analyzer      | 10Hz ~ 44 GHz              | KEYSIGHT         | N9010A /<br>MY56480554           | Jul. 10, 2024<br>ETC                 | ■                        |
| Pre-Amplifier            | 1 GHz ~<br>26.5 GHz        | AGILENT          | 8449B /<br>3008A01995            | MAR. 06, 2024<br>ETC                 | ■                        |
| Horn Antenna             | 1 GHz ~<br>18 GHz          | EMCO             | 3115 /<br>9602-4681              | FEB. 23, 2024<br>ETC                 | ■                        |
| Horn Antenna             | 18 ~ 40 GHZ                | ETS-LINDGREN     | 3116 /<br>2567                   | MAY.13, 2024<br>ETC                  | ■                        |
| Anechoic Chamber         | 3 M<br>Measurement         | SRT              | A01 /<br>SRT001                  | JUN. 22, 2024<br>SRT                 | ■                        |
| RF Cable                 | Up to 18 GHz<br>6 m*2      | EMCI             | EMC107-SM-6000 /<br>230726       | JUN. 14, 2024<br>ETC                 | ■                        |
| RF Cable                 | Up to 18 GHz<br>1.5 m      | JYEBAO           | A30A30-L 142 /<br>EQF-0035(001)  | FEB. 16, 2024<br>ETC                 | ■                        |
| K-Type Cable             | Up tp 40 GHz<br>3 m        | HUBER+<br>SUHNER | SF102-46/2*11SK252 /<br>MY2611/2 | APR. 24, 2024<br>ETC                 | ■                        |
| K-Type Cable             | Up to 40 GHz,<br>1 m       | HUBER+<br>SUHNER | SF102/2*11SK252 /<br>MY3331/2    | FEB. 13, 2024<br>ETC                 | ■                        |
| Filter                   | 2 Line, 30 A               | FIL.COIL         | FC-943 /<br>869                  | NCR                                  | ■                        |
| Thermo-Hygro             | 15 ~ 40 °C,<br>0 ~ 100% RH | TOP              | 20-A /<br>6644                   | MAR. 01,2024<br>ETC                  | ■                        |
| Measurement Software     | N/A                        | EZ-EMC           | SRT-03A1                         | NCR                                  | ■                        |
| Notch filter             | NF2400-2500<br>MHz         | EMCI             | NF5150-5350                      | Dec.8.2023<br>ETC                    | ■                        |

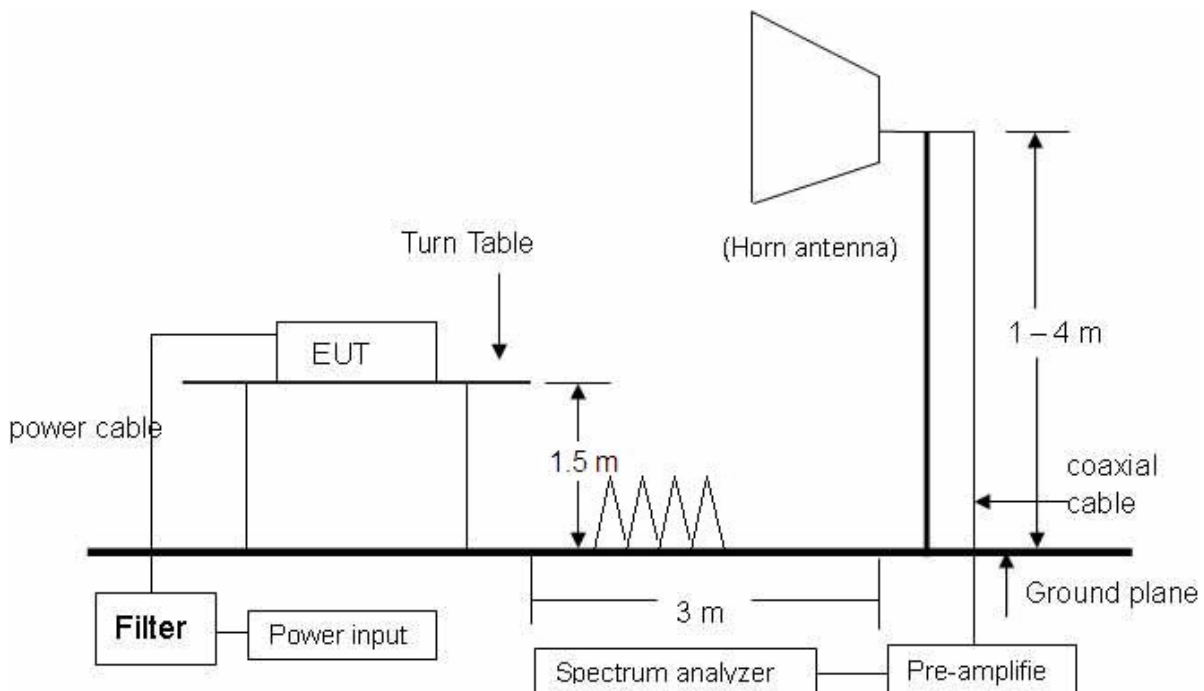


## 5.3 TEST SET-UP

30 MHz ~ 1 GHz



Above 1 GHz



**NOTE:** The EUT system was put on a Styrofoam table with 1.5m heights above a ground plane.  
For the actual test configuration, please refer to the photos of testing.

|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
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## 5.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.10:2013 and EN 55022. When the frequency spectrum measured started from 9 kHz to 30 MHz, then use antenna is a loop antenna. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 9kHz to 30MHz and 30 MHz to 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.

|                                                                                                                                                                                                                                                |                      |                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
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## 5.5 TEST RESULT

|                  |                |               |               |
|------------------|----------------|---------------|---------------|
| Temperature:     | 29 °C          | Humidity:     | 76 %RH        |
| Frequency Range: | 30 MHz ~ 1 GHz | Tested Mode:  | Standby       |
| Detector Type:   | Quasi-peak     | IF Bandwidth: | 120 kHz       |
| Tested By:       | Jimmy Tseng    | Tested Date:  | Jul. 24, 2023 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Pre-Amp (dB) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ (°) | EL (m) |
|-----------------|-----------------|-----------------------|--------------|---------------------|-------------------------|----------------|-------------|--------|--------|
| 183.26          | 3.34            | 13.20                 | 27.66        | 49.05               | 37.93                   | 43.5           | -5.57       | 67     | 3.53   |
| 231.76          | 3.87            | 12.62                 | 27.49        | 45.31               | 34.31                   | 46.0           | -11.69      | 322    | 3.38   |
| 276.38          | 4.48            | 13.76                 | 27.36        | 45.36               | 36.24                   | 46.0           | -9.76       | 45     | 3.24   |
| 303.54          | 4.64            | 15.72                 | 27.31        | 43.73               | 36.78                   | 46.0           | -9.22       | 204    | 3.15   |
| 361.74          | 5.17            | 16.08                 | 27.70        | 40.83               | 34.38                   | 46.0           | -11.62      | 80     | 2.97   |
| 720.64          | 8.29            | 21.50                 | 28.36        | 34.28               | 35.71                   | 46.0           | -10.29      | 358    | 1.86   |

Antenna Polarization : Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Pre-Amp (dB) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ (°) | EL (m) |
|-----------------|-----------------|-----------------------|--------------|---------------------|-------------------------|----------------|-------------|--------|--------|
| 43.58           | 2.01            | 12.60                 | 28.27        | 47.83               | 34.17                   | 40.0           | -5.83       | 291    | 1.04   |
| 51.34           | 2.07            | 11.50                 | 28.23        | 41.39               | 26.73                   | 40.0           | -13.27      | 166    | 1.07   |
| 231.76          | 3.87            | 12.62                 | 27.49        | 48.44               | 37.44                   | 46.0           | -8.56       | 62     | 1.62   |
| 334.58          | 4.93            | 15.18                 | 27.52        | 40.15               | 32.74                   | 46.0           | -13.26      | 48     | 1.94   |
| 355.92          | 5.12            | 15.50                 | 27.66        | 41.85               | 34.81                   | 46.0           | -11.19      | 249    | 2.01   |
| 716.76          | 8.25            | 21.50                 | 28.37        | 34.26               | 35.64                   | 46.0           | -10.36      | 217    | 3.13   |

### NOTE:

1. Measurement uncertainty is 4.20 dB.
2. "\*\*\*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

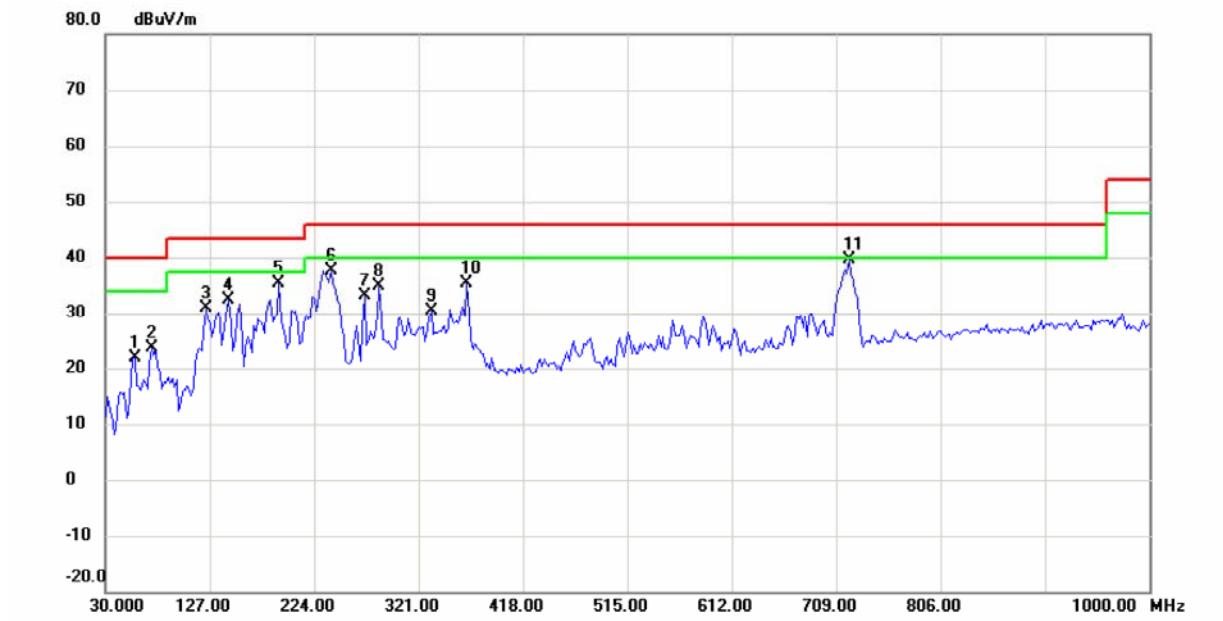


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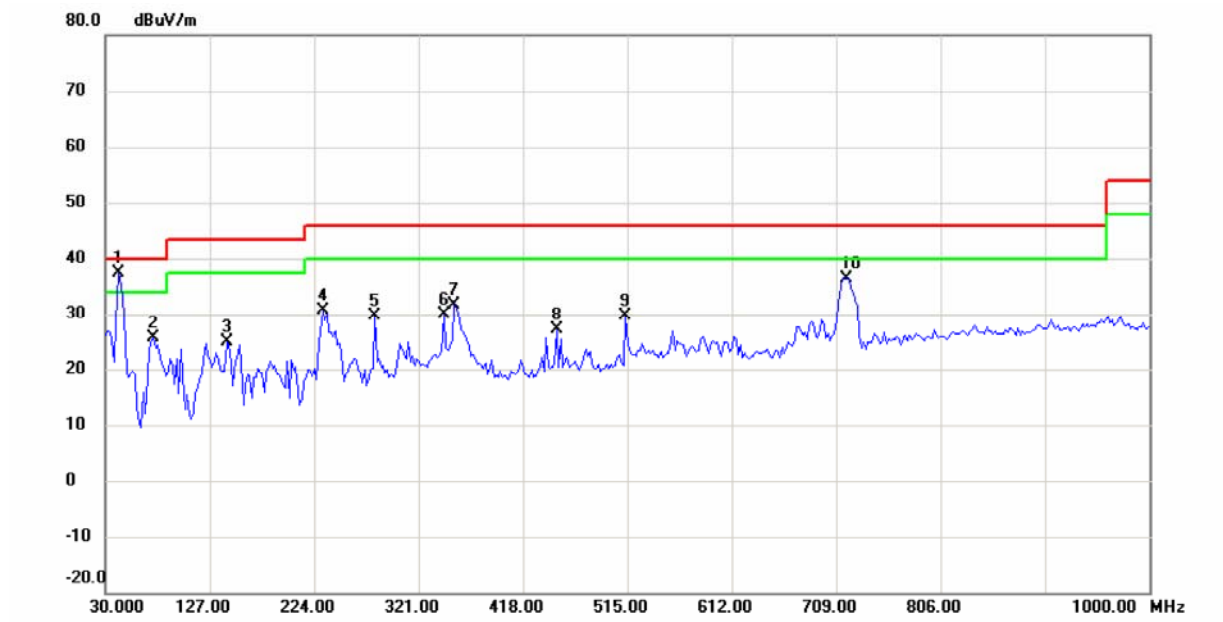
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Antenna Polarization : Horizontal



Antenna Polarization : Vertical



|                                                                                                                                                                                                                                                |                      |                                                                                                                             |
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|                  |                |               |               |
|------------------|----------------|---------------|---------------|
| Temperature:     | 29 °C          | Humidity:     | 76 %RH        |
| Frequency Range: | 30 MHz ~ 1 GHz | Tested Mode:  | Link          |
| Detector Type:   | Quasi-peak     | IF Bandwidth: | 120 kHz       |
| Tested By:       | Jimmy Tseng    | Tested Date:  | Jul. 24, 2023 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Pre-Amp (dB) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ (°) | EL (m) |
|-----------------|-----------------|-----------------------|--------------|---------------------|-------------------------|----------------|-------------|--------|--------|
| 50.78           | 2.06            | 11.50                 | 28.23        | 44.25               | 29.58                   | 40.0           | -10.42      | 192    | 3.94   |
| 43.56           | 2.01            | 12.60                 | 28.27        | 42.51               | 28.85                   | 40.0           | -11.15      | 210    | 3.96   |
| 48.44           | 2.04            | 11.90                 | 28.24        | 39.68               | 25.38                   | 40.0           | -14.62      | 198    | 3.94   |
| 40.27           | 1.98            | 12.90                 | 28.28        | 42.15               | 28.75                   | 40.0           | -11.25      | 356    | 3.97   |
| 35.06           | 1.83            | 13.50                 | 28.29        | 30.28               | 17.32                   | 40.0           | -22.68      | 70     | 3.98   |
| 720.64          | 8.29            | 21.50                 | 28.36        | 35.26               | 36.69                   | 46.0           | -9.31       | 230    | 1.86   |

Antenna Polarization : Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Pre-Amp (dB) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ (°) | EL (m) |
|-----------------|-----------------|-----------------------|--------------|---------------------|-------------------------|----------------|-------------|--------|--------|
| 55.48           | 2.09            | 10.80                 | 28.21        | 50.16               | 34.83                   | 40.0           | -5.17       | 52     | 1.04   |
| 49.75           | 2.05            | 11.70                 | 28.24        | 42.62               | 28.14                   | 40.0           | -11.86      | 204    | 1.20   |
| 47.11           | 2.04            | 11.80                 | 28.25        | 40.58               | 26.17                   | 40.0           | -13.83      | 50     | 1.64   |
| 39.12           | 1.95            | 13.00                 | 28.28        | 41.32               | 27.99                   | 40.0           | -12.01      | 328    | 2.45   |
| 37.50           | 1.89            | 13.20                 | 28.29        | 39.68               | 26.49                   | 40.0           | -13.51      | 328    | 2.50   |
| 39.23           | 1.95            | 13.00                 | 28.28        | 35.24               | 21.91                   | 40.0           | -18.09      | 183    | 3.13   |

**NOTE:**

1. Measurement uncertainty is 4.20 dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

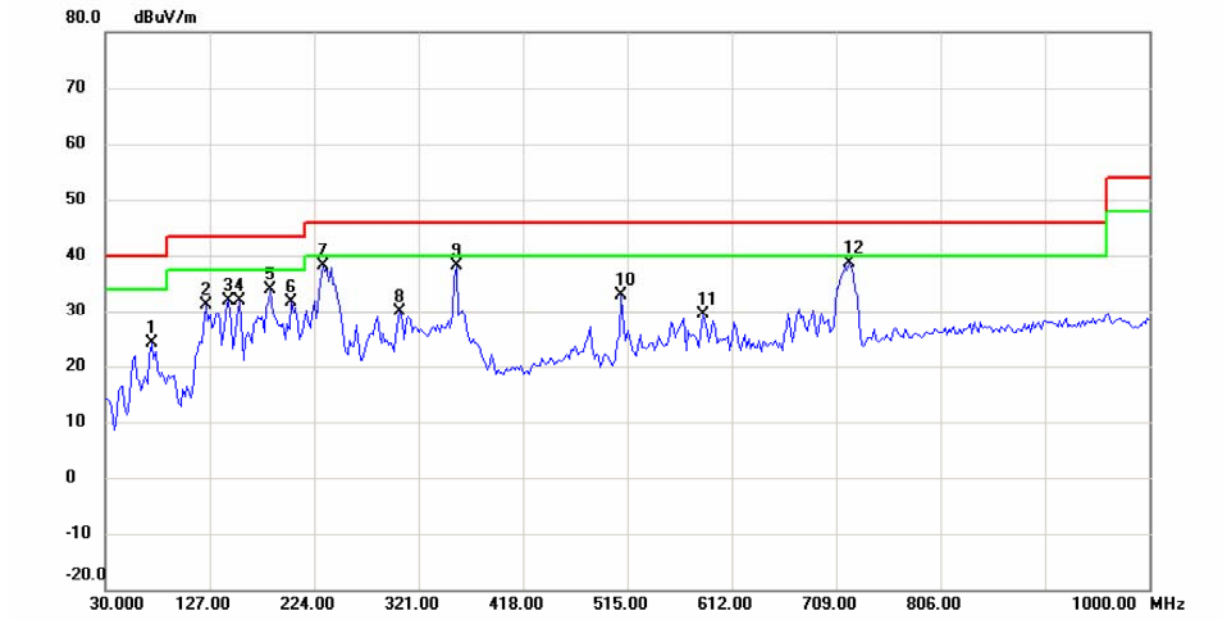


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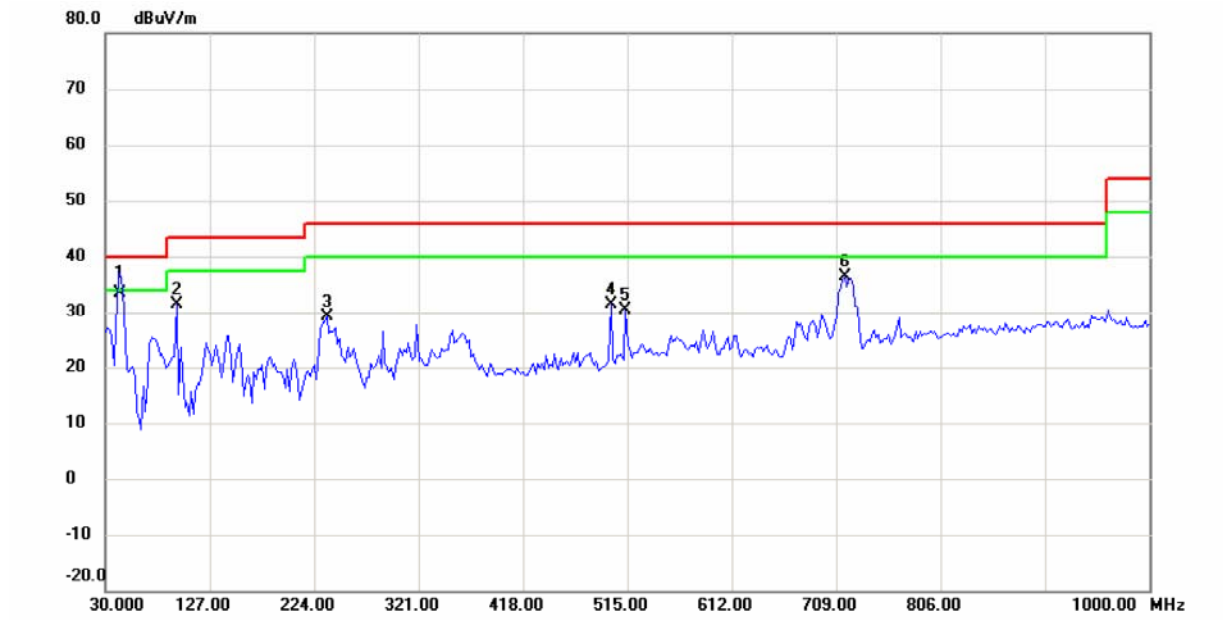
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Antenna Polarization : Horizontal



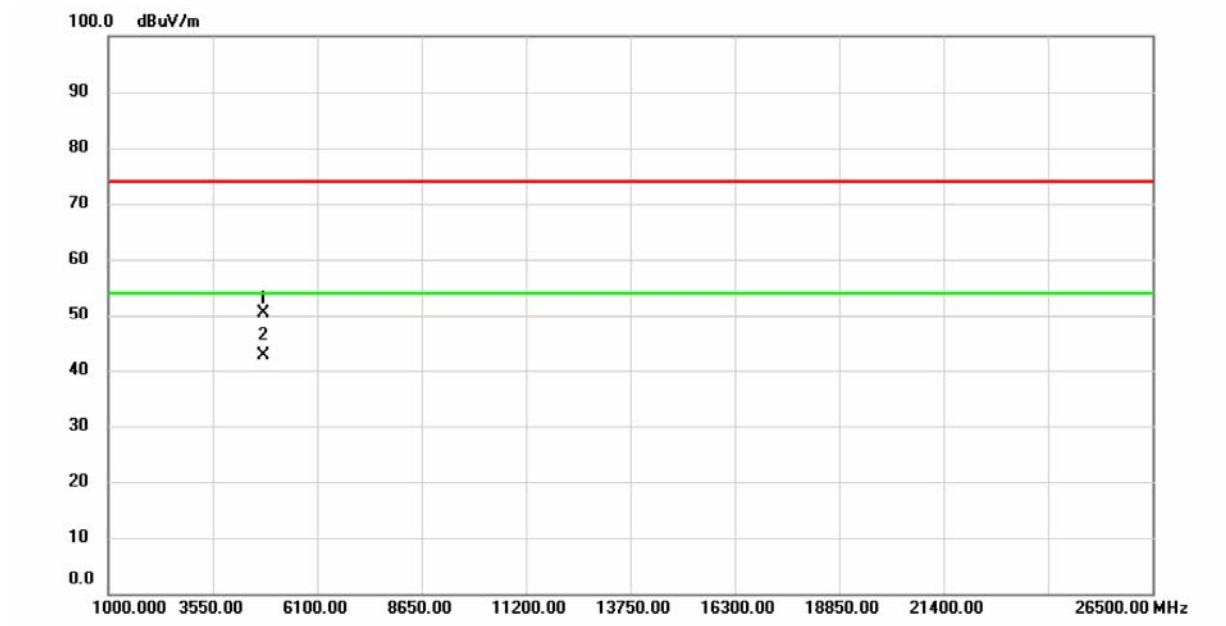
Antenna Polarization : Vertical





|                  |             |               |               |
|------------------|-------------|---------------|---------------|
| Temperature:     | 27 °C       | Humidity:     | 76 %RH        |
| Frequency Range: | 1 ~ 25 GHz  | Tested Mode:  | BT_X1         |
| Detector Type:   | PK. and AV. | IF Bandwidth: | 1 MHz         |
| Tested By:       | Jimmy Tseng | Tested Date:  | Jul. 22, 2023 |

Antenna Polarization : Horizontal



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measure-ment | Limit  | Over   |          |         |
|-----|-----|----------|---------------|----------------|--------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m       | dBuV/m | dB     | Detector | Comment |
| 1   |     | 4803.650 | 44.26         | 6.06           | 50.32        | 74.00  | -23.68 | peak     |         |
| 2   | *   | 4803.950 | 36.64         | 6.07           | 42.71        | 54.00  | -11.29 | AVG      |         |

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



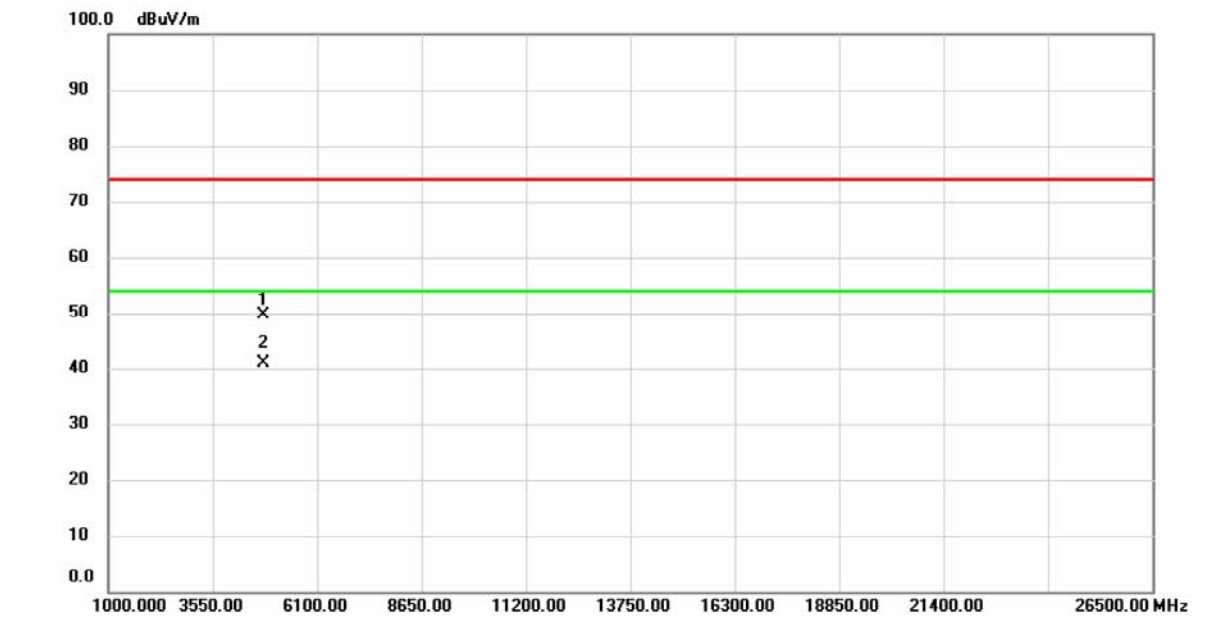
**Spectrum Research & Testing Lab., Inc.**  
No.167,Ln. 780, Shan-Tong Rd.,Ling 8, Shan-Tong Li, Chung-Li Dist., Taoyuan City 320, Taiwan (R.O.C.)

## TEST REPORT

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|                  |             |               |               |
|------------------|-------------|---------------|---------------|
| Temperature:     | 27 °C       | Humidity:     | 76 %RH        |
| Frequency Range: | 1 ~ 25 GHz  | Tested Mode:  | BT_X1         |
| Detector Type:   | PK. and AV. | IF Bandwidth: | 1 MHz         |
| Tested By:       | Jimmy Tseng | Tested Date:  | Jul. 22, 2023 |

Antenna Polarization : Vertical



| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV/m | Limit<br>dBuV/m | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|---------|
| 1   |     | 4803.880     | 43.46                    | 6.07                    | 49.53                      | 74.00           | -24.47     | peak     |         |
| 2   | *   | 4804.015     | 34.87                    | 6.07                    | 40.94                      | 54.00           | -13.06     | AVG      |         |

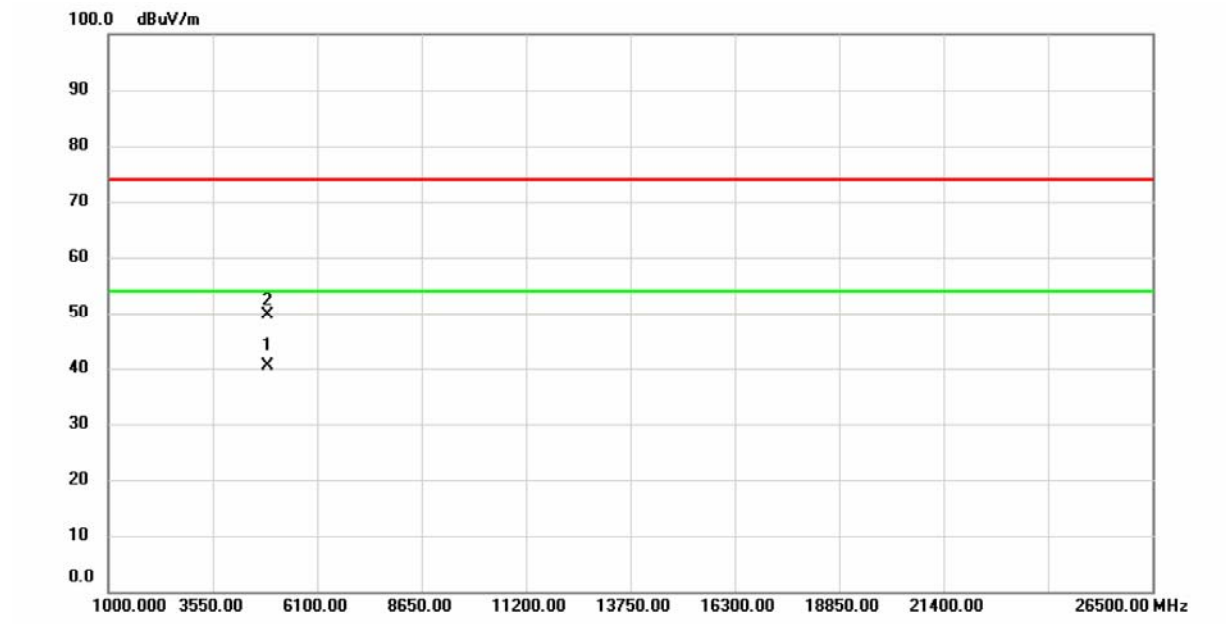
### NOTE:

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



|                  |             |               |               |
|------------------|-------------|---------------|---------------|
| Temperature:     | 27 °C       | Humidity:     | 76 %RH        |
| Frequency Range: | 1 ~ 25 GHz  | Tested Mode:  | BT_X2         |
| Detector Type:   | PK. and AV. | IF Bandwidth: | 1 MHz         |
| Tested By:       | Jimmy Tseng | Tested Date:  | Jul. 22, 2023 |

Antenna Polarization : Horizontal



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measure-ment | Limit  | Over   | Detector | Comment |
|-----|-----|----------|---------------|----------------|--------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m       | dBuV/m | dB     |          |         |
| 1   | *   | 4881.980 | 33.82         | 6.54           | 40.36        | 54.00  | -13.64 | AVG      |         |
| 2   |     | 4881.990 | 43.12         | 6.54           | 49.66        | 74.00  | -24.34 | peak     |         |

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



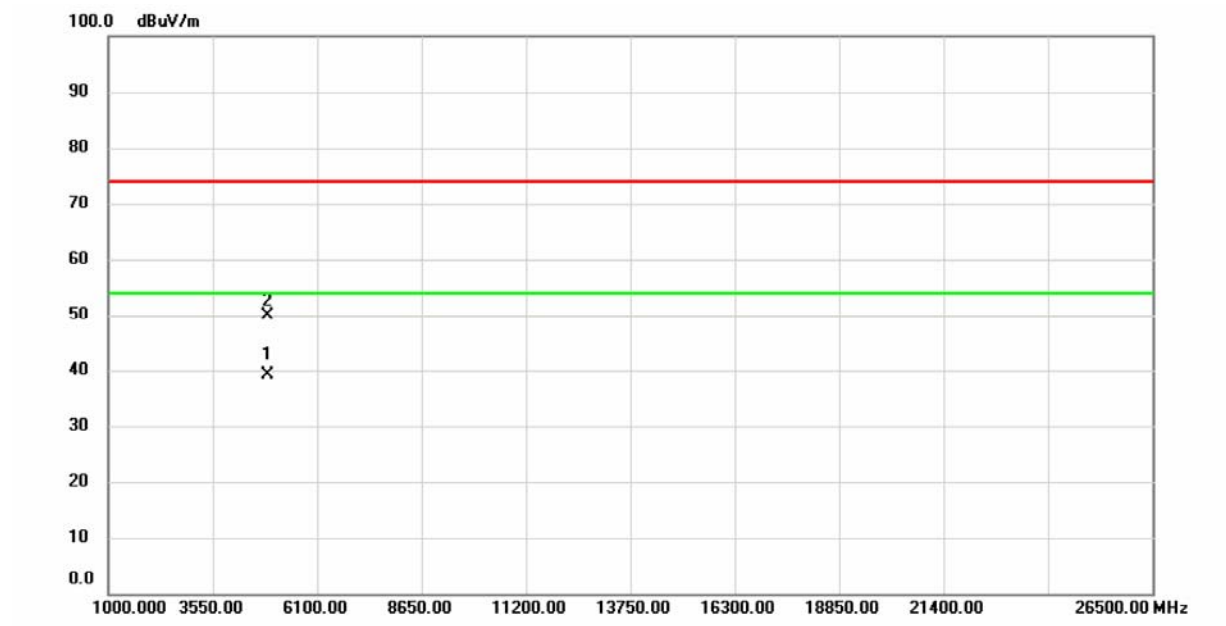
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|                  |             |               |               |
|------------------|-------------|---------------|---------------|
| Temperature:     | 27 °C       | Humidity:     | 76 %RH        |
| Frequency Range: | 1 ~ 25 GHz  | Tested Mode:  | BT_X2         |
| Detector Type:   | PK. and AV. | IF Bandwidth: | 1 MHz         |
| Tested By:       | Jimmy Tseng | Tested Date:  | Jul. 22, 2023 |

Antenna Polarization : Vertical



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measure-ment | Limit  | Over   |          |         |
|-----|-----|----------|---------------|----------------|--------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m       | dBuV/m | dB     | Detector | Comment |
| 1   | *   | 4882.270 | 32.65         | 6.54           | 39.19        | 54.00  | -14.81 | AVG      |         |
| 2   |     | 4883.170 | 43.31         | 6.55           | 49.86        | 74.00  | -24.14 | peak     |         |

### NOTE:

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



**Spectrum Research & Testing Lab., Inc.**

No.167,Ln. 780, Shan-Tong Rd.,Ling 8, Shan-Tong Li, Chung-Li Dist., Taoyuan City 320, Taiwan (R.O.C.)

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|                  |             |               |               |
|------------------|-------------|---------------|---------------|
| Temperature:     | 27 °C       | Humidity:     | 76 %RH        |
| Frequency Range: | 1 ~ 25 GHz  | Tested Mode:  | BT_X3         |
| Detector Type:   | PK. and AV. | IF Bandwidth: | 1 MHz         |
| Tested By:       | Jimmy Tseng | Tested Date:  | Jul. 22, 2023 |

Antenna Polarization : Horizontal



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   |          |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dBuV/m | dB     | Detector | Comment |
| 1   |     | 4959.900 | 42.48         | 6.85           | 49.33       | 74.00  | -24.67 | peak     |         |
| 2   | *   | 4959.975 | 32.19         | 6.85           | 39.04       | 54.00  | -14.96 | AVG      |         |

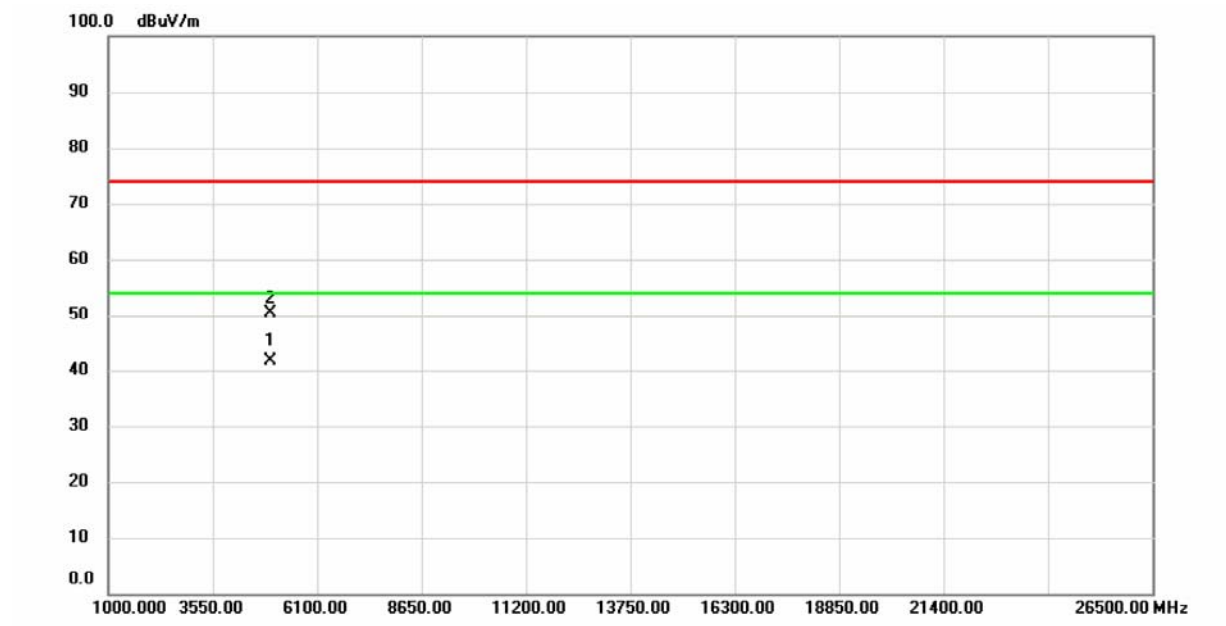
**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



|                  |             |               |               |
|------------------|-------------|---------------|---------------|
| Temperature:     | 27 °C       | Humidity:     | 76 %RH        |
| Frequency Range: | 1 ~ 25 GHz  | Tested Mode:  | BT_X3         |
| Detector Type:   | PK. and AV. | IF Bandwidth: | 1 MHz         |
| Tested By:       | Jimmy Tseng | Tested Date:  | Jul. 22, 2023 |

Antenna Polarization : Vertical



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measure-ment | Limit  | Over   |          |         |
|-----|-----|----------|---------------|----------------|--------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m       | dBuV/m | dB     | Detector | Comment |
| 1   | *   | 4959.955 | 34.81         | 6.85           | 41.66        | 54.00  | -12.34 | AVG      |         |
| 2   |     | 4960.375 | 43.41         | 6.85           | 50.26        | 74.00  | -23.74 | peak     |         |

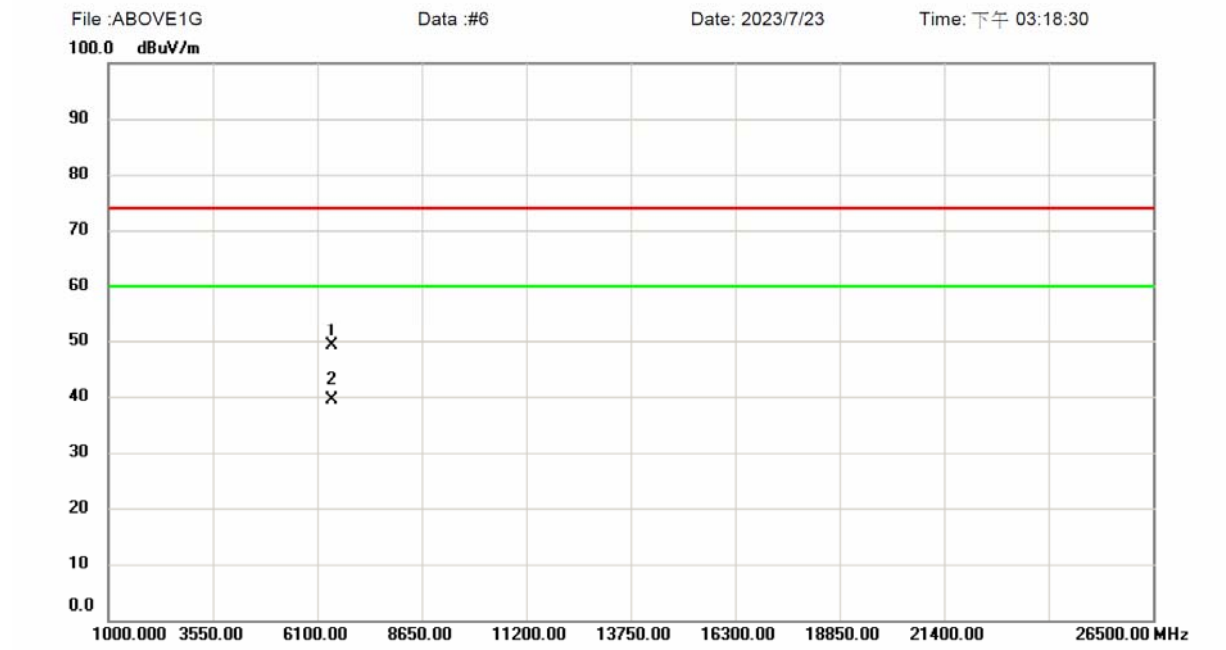
**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



|                  |             |               |               |
|------------------|-------------|---------------|---------------|
| Temperature:     | 27 °C       | Humidity:     | 76 %RH        |
| Frequency Range: | 1 ~ 25 GHz  | Tested Mode:  | Standby       |
| Detector Type:   | PK. and AV. | IF Bandwidth: | 1 MHz         |
| Tested By:       | Jimmy Tseng | Tested Date:  | Jul. 22, 2023 |

Antenna Polarization : Horizontal



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   |          |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dBuV/m | dB     | Detector | Comment |
| 1   |     | 6460.000 | 40.41         | 8.70           | 49.11       | 74.00  | -24.89 | peak     |         |
| 2   | *   | 6460.000 | 30.73         | 8.70           | 39.43       | 60.00  | -20.57 | AVG      |         |

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



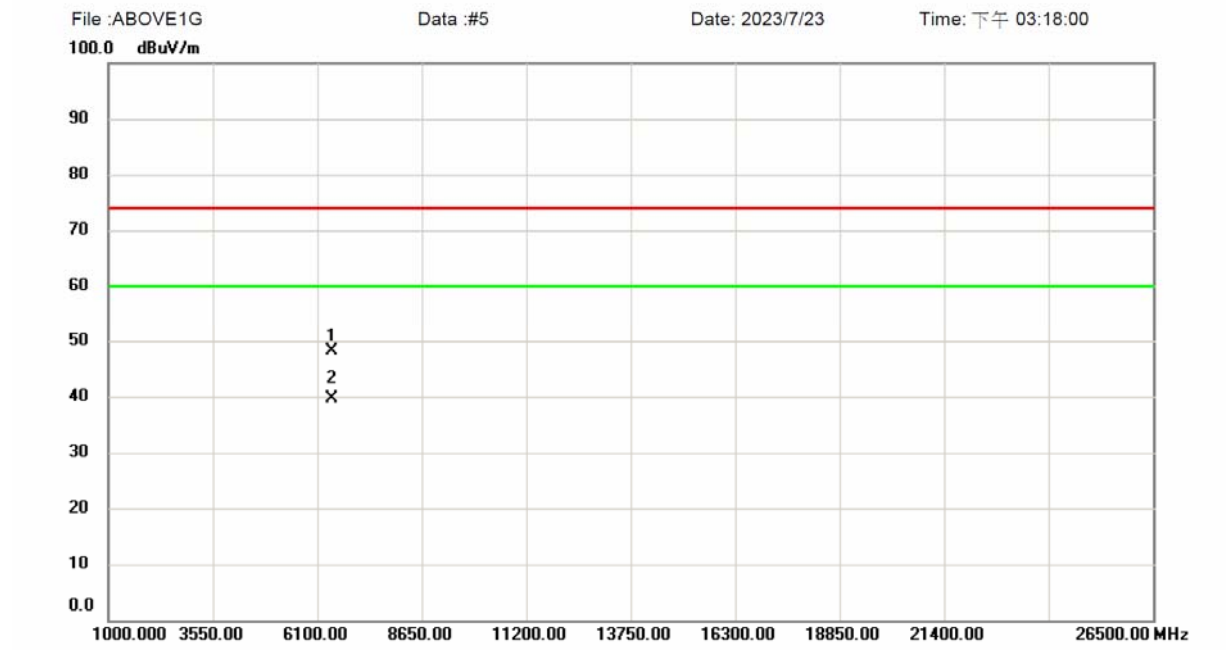
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No.167,Ln. 780, Shan-Tong Rd.,Ling 8, Shan-Tong Li, Chung-Li Dist., Taoyuan City 320, Taiwan (R.O.C.)

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|                  |             |               |               |
|------------------|-------------|---------------|---------------|
| Temperature:     | 27 °C       | Humidity:     | 76 %RH        |
| Frequency Range: | 1 ~ 25 GHz  | Tested Mode:  | Standby       |
| Detector Type:   | PK. and AV. | IF Bandwidth: | 1 MHz         |
| Tested By:       | Jimmy Tseng | Tested Date:  | Jul. 22, 2023 |

Antenna Polarization : Vertical



| No. | Mk. | Freq.    | Reading Level | Correct Factor | Measurement | Limit  | Over   |          |         |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------|---------|
|     |     | MHz      | dBuV          | dB             | dBuV/m      | dBuV/m | dB     | Detector | Comment |
| 1   |     | 6460.000 | 39.43         | 8.70           | 48.13       | 74.00  | -25.87 | peak     |         |
| 2   | *   | 6460.000 | 30.93         | 8.70           | 39.63       | 60.00  | -20.37 | AVG      |         |

### NOTE:

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.

|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
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## 6. 20dB Bandwidth

### 6.1 LIMIT

FCC Part15, Subpart C Section 15.247(a).

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

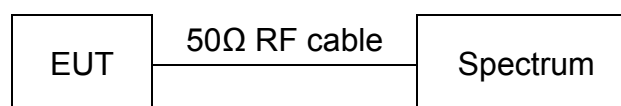
### 6.2 TEST EQUIPMENT

The following test equipment was used during the test :

| Equipment/<br>Facilities | Specifications | Manufacturer | Model #/<br>Serial # | Due Date of Cal.<br>& Cal. Center |
|--------------------------|----------------|--------------|----------------------|-----------------------------------|
| R&S spectrum Analyzer    | 9KHz ~ 30GHz   | R & S        | 100854 /<br>E007     | May 19, 2023<br>ETC               |
| RF CABLE                 | 1GHz~ 30GHz    | HUBER SUHNER | SF102 /<br>2         | Feb. 20, 2023<br>ETC              |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 6.3 TEST SET-UP



### 6.4 TEST PROCEDURE

The EUT was operated in hopping mode or any specific channel.  
 Printed out the test result from the spectrum by hard copy function.

### 6.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.

|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
|  <b>Spectrum Research &amp; Testing Lab., Inc.</b><br>No.167,Ln. 780, Shan-Tong Rd.,Ling 8, Shan-Tong Li, Chung-Li Dist., Taoyuan City 320, Taiwan (R.O.C.) | <h1>TEST REPORT</h1> | Reference No.: A23070303<br>Report No.: FCCA23070303-B0<br>FCC ID : QCI-SKIWB800D3<br>Page: 33 of 55<br>Date: Aug. 02, 2023 |
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## 6.6 TEST RESULT

### 20dB Bandwidth :

|              |              |              |               |
|--------------|--------------|--------------|---------------|
| Temperature: | 18 °C        | Humidity:    | 77 %RH        |
| RBW:         | 30 kHz       | Modulation:  | GFSK          |
| Detector:    | Peak         | VBW:         | 100 kHz       |
| Tested By:   | Jlmmmy Tseng | Tested Date: | Jul. 26, 2023 |

| Channel | Frequency (MHz) | 20 dB Down Bandwidth (kHz) | BW > 500 kHz |
|---------|-----------------|----------------------------|--------------|
| CH00    | 2402            | 949.9                      | PASS         |
| CH39    | 2440            | 953.8                      | PASS         |
| CH78    | 2480            | 950.2                      | PASS         |

### CH00



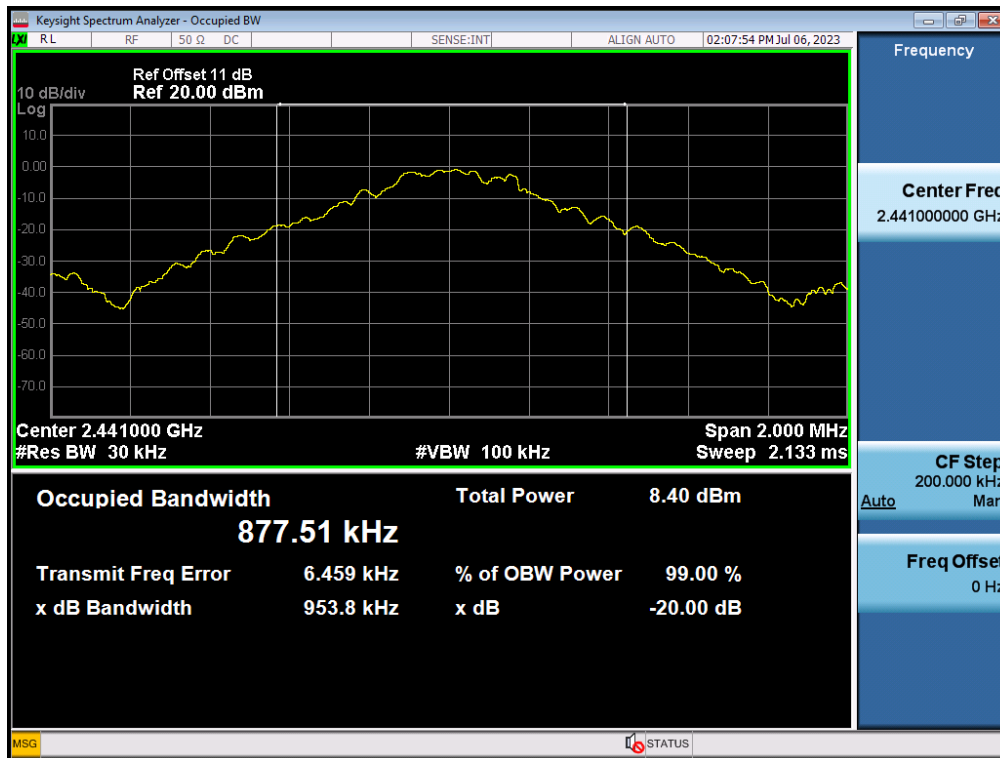


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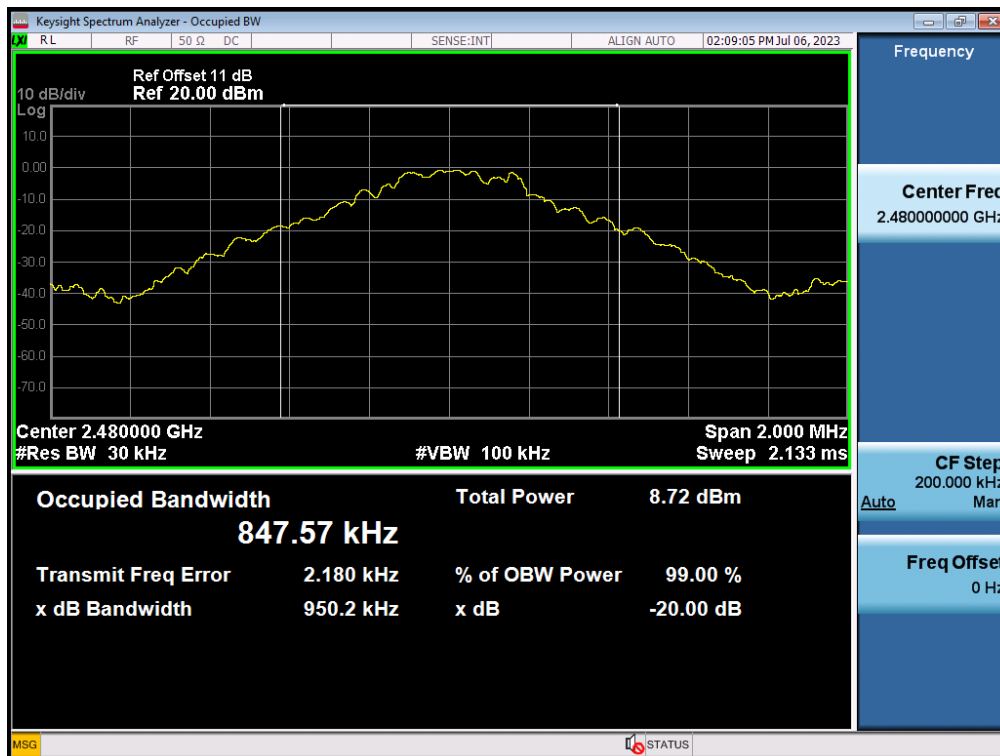
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CH39



CH78



## 7. PEAK CONDUCTED OUTPUT POWER TEST

### 7.1 LIMIT

FCC Part15, Subpart C Section 15.247(a).

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

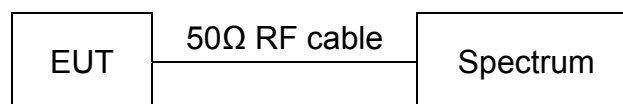
### 7.2 TEST EQUIPMENT

The following test equipment was used during the test :

| Equipment/<br>Facilities | Specifications | Manufacturer | Model #/<br>Serial # | Due Date of Cal.<br>& Cal. Center |
|--------------------------|----------------|--------------|----------------------|-----------------------------------|
| R&S spectrum Analyzer    | 9KHz ~ 30GHz   | R & S        | 100854 /<br>E007     | May 19, 2023<br>ETC               |
| RF CABLE                 | 1GHz~ 30GHz    | HUBER SUHNER | SF102 /<br>2         | Feb. 20, 2023<br>ETC              |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 7.3 TEST SET-UP



### 7.4 TEST PROCEDURE

The EUT was operating in continuous transmission mode or could control its channel. Printed out the test result from the spectrum by hard copy function.

### 7.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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## TEST REPORT

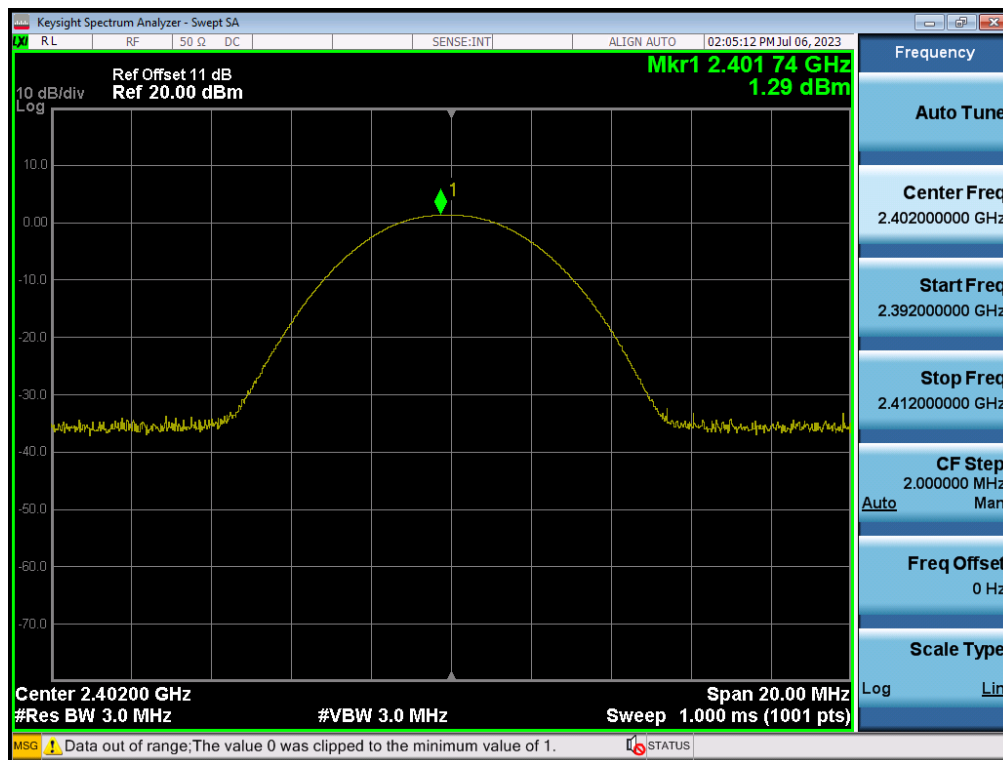
Reference No.: A23070303  
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### 7.6 TEST RESULT

Temperature: 18 °C Humidity: 77 %RH  
Detector: Peak Modulation: GFSK  
RBW: 3 MHz VBW: 3 MHz  
Tested By: Jimmy Tseng Tested Date: Jul. 26, 2023

| Channel | Frequency (MHz) | Peak Conducted Output Power |        | Limit (dBm) |
|---------|-----------------|-----------------------------|--------|-------------|
|         |                 | (dBm)                       | (mW)   |             |
| CH00    | 2402            | 1.29                        | 1.3459 | 21          |
| CH39    | 2440            | 1.51                        | 1.4158 | 21          |
| CH78    | 2480            | 1.72                        | 1.4859 | 21          |

CH00



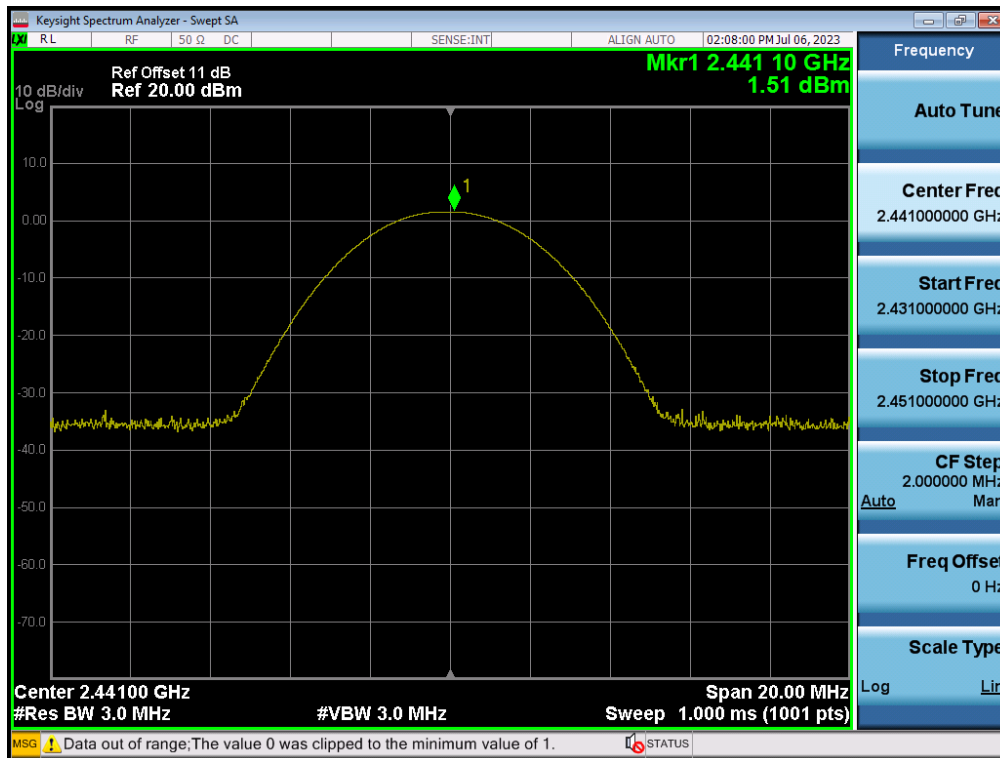


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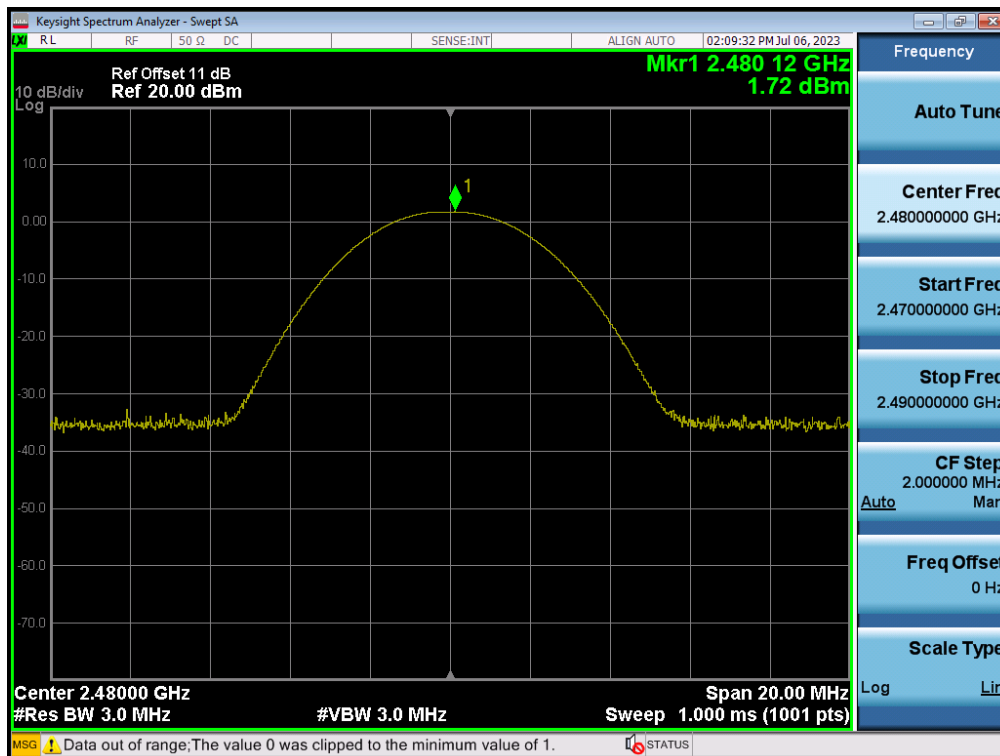
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CH39\_1Mbps :



CH78\_1Mbps :



|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
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## 8. BAND EDGE TEST

### 8.1 LIMIT

FCC Part15, Subpart C Section 15.247(d).

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

### 8.2 TEST EQUIPMENT

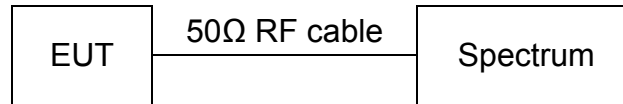
The following test equipment was used during the test :

| Equipment/<br>Facilities | Specifications | Manufacturer | Model #/<br>Serial # | Due Date of Cal.<br>& Cal. Center |
|--------------------------|----------------|--------------|----------------------|-----------------------------------|
| R&S spectrum Analyzer    | 9KHz ~ 30GHz   | R & S        | 100854 /<br>E007     | May 19, 2023<br>ETC               |
| RF CABLE                 | 1GHz~ 30GHz    | HUBER SUHNER | SF102 /<br>2         | Feb. 20, 2023<br>ETC              |

**NOTE :** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
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### 8.3 TEST SET-UP



### 8.4 TEST PROCEDURE

The EUT was operating in continuous transmission mode or could control its channel.  
 Printed out the test result from the spectrum by hard copy function.

### 8.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.

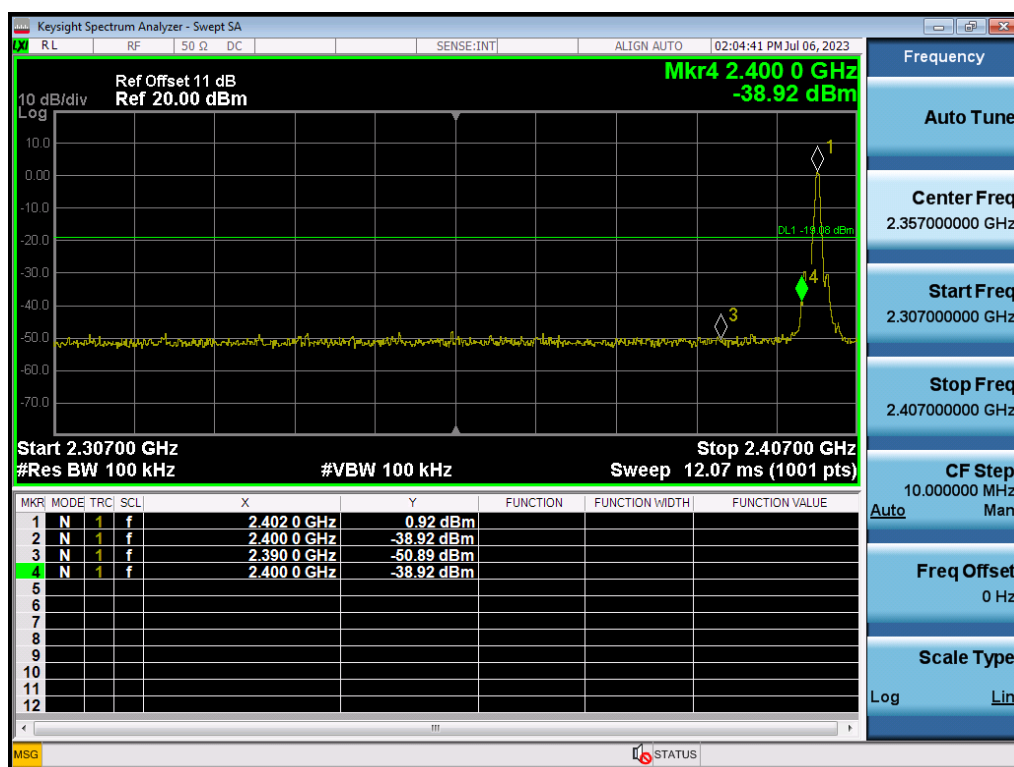
|                                                                                                                                                            |                      |                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Spectrum Research &amp; Testing Lab., Inc.</b><br>No.167,Ln. 780, Shan-Tong Rd.,Ling 8, Shan-Tong Li, Chung-Li Dist., Taoyuan City 320, Taiwan (R.O.C.) | <h1>TEST REPORT</h1> | Reference No.: A23070303<br>Report No.: FCCA23070303-B0<br>FCC ID : QCI-SKIWB800D3<br>Page: 40 of 55<br>Date: Aug. 02, 2023 |
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## 8.6 TEST RESULT

|              |             |              |               |
|--------------|-------------|--------------|---------------|
| Temperature: | 21 °C       | Humidity:    | 75 %RH        |
| Detector:    | Peak        | Test Mode:   | Hopping_1Mbps |
| RBW:         | 100 kHz     | VBW:         | 100 kHz       |
| Tested By:   | Jimmy Tseng | Tested Date: | Jul. 06, 2023 |

| Frequency (MHz) | Peak Power Output (dBm) | Emission Read Value(dBm) | Result of Band Edge (dBc) | Band Edge Limit (dBc) | Resule |
|-----------------|-------------------------|--------------------------|---------------------------|-----------------------|--------|
| 2402            | 0.92                    | -50.89                   | 51.81                     | 20                    | PASS   |
| 2480            | 1.56                    | -50.90                   | 52.46                     | 20                    | PASS   |

CH00



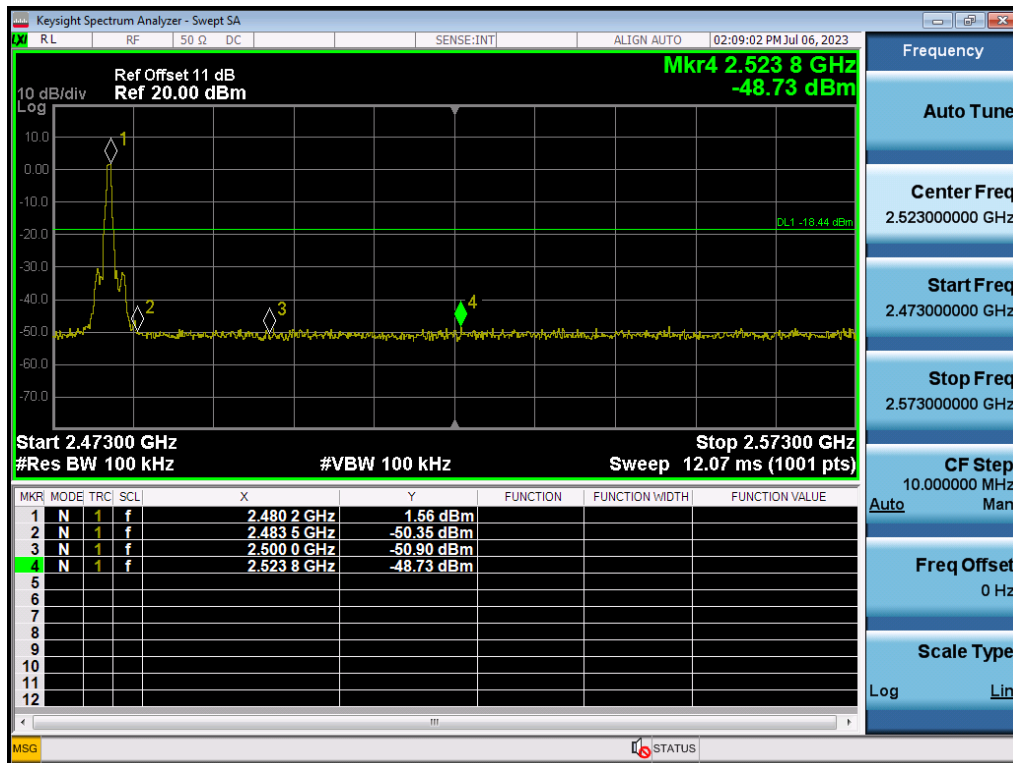


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CH78



|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
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## 9. TIME OF OCCUPANCY (Dwell Time)

### 9.1 LIMIT

FCC Part15, Subpart C Section 15.247(a)(iii).

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

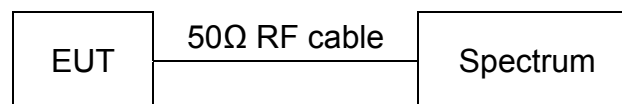
### 9.2 TEST EQUIPMENT

The following test equipment was used during the test :

| Equipment/<br>Facilities | Specifications | Manufacturer | Model #/<br>Serial # | Due Date of Cal.<br>& Cal. Center |
|--------------------------|----------------|--------------|----------------------|-----------------------------------|
| R&S spectrum Analyzer    | 9KHz ~ 30GHz   | R & S        | 100854 /<br>E007     | May 19, 2023<br>ETC               |
| RF CABLE                 | 1GHz~ 30GHz    | HUBER SUHNER | SF102 /<br>2         | Feb. 20, 2023<br>ETC              |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 9.3 TEST SET-UP



### 9.4 TEST PROCEDURE

The EUT was operating in transmitter mode and could be controlled its channel.  
 Printed out the test result from the spectrum by hard copy function.

### 9.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.

|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
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## 9.6 TEST RESULT

|                    |              |              |               |
|--------------------|--------------|--------------|---------------|
| Temperature:       | 28 °C        | Humidity:    | 70 %RH        |
| Spectrum Detector: | PK.          | Modulation:  | GFSK          |
| RBW:               | 1 MHz        | VBW:         | 1 MHz         |
| Tested By:         | Jlmmmy Tseng | Tested Date: | Jul. 06, 2023 |

| Channel  | Frequency (MHz) | Pulse Time (ms) | Time of Occupancy (Dwell Time) (ms) | Average Time of Occupancy Limit (ms) |
|----------|-----------------|-----------------|-------------------------------------|--------------------------------------|
| CH00_DH1 | 2402            | 0.367           | 117.44                              | 400                                  |
| CH00_DH3 | 2402            | 1.620           | 260.80                              | 400                                  |
| CH00_DH5 | 2402            | 2.880           | 307.20                              | 400                                  |
| CH39_DH1 | 2441            | 0.377           | 120.64                              | 400                                  |
| CH39_DH3 | 2441            | 1.620           | 259.20                              | 400                                  |
| CH39_DH5 | 2441            | 2.880           | 307.20                              | 400                                  |
| CH78_DH1 | 2480            | 0.377           | 120.64                              | 400                                  |
| CH78_DH3 | 2480            | 1.630           | 260.80                              | 400                                  |
| CH78_DH5 | 2480            | 2.880           | 307.20                              | 400                                  |

**Note:** Dwell Time = 0.4(ms) x 79 = 31.6(s) hopping times of total = 1600/s

$$\text{CH00\_DH1} = 0.367(\text{ms}) \times (1600 / 2 / 79) \times 31.6 = 117.44(\text{ms})$$

$$\text{CH00\_DH3} = 1.620(\text{ms}) \times (1600 / 4 / 79) \times 31.6 = 260.80(\text{ms})$$

$$\text{CH00\_DH5} = 2.880(\text{ms}) \times (1600 / 6 / 79) \times 31.6 = 307.20(\text{ms})$$

$$\text{CH39\_DH1} = 0.377(\text{ms}) \times (1600 / 2 / 79) \times 31.6 = 120.64(\text{ms})$$

$$\text{CH39\_DH3} = 1.620(\text{ms}) \times (1600 / 4 / 79) \times 31.6 = 259.20(\text{ms})$$

$$\text{CH39\_DH5} = 2.880(\text{ms}) \times (1600 / 6 / 79) \times 31.6 = 307.20(\text{ms})$$

$$\text{CH78\_DH1} = 0.377(\text{ms}) \times (1600 / 2 / 79) \times 31.6 = 120.64(\text{ms})$$

$$\text{CH78\_DH3} = 1.630(\text{ms}) \times (1600 / 4 / 79) \times 31.6 = 260.80(\text{ms})$$

$$\text{CH78\_DH5} = 2.880(\text{ms}) \times (1600 / 6 / 79) \times 31.6 = 307.20(\text{ms})$$

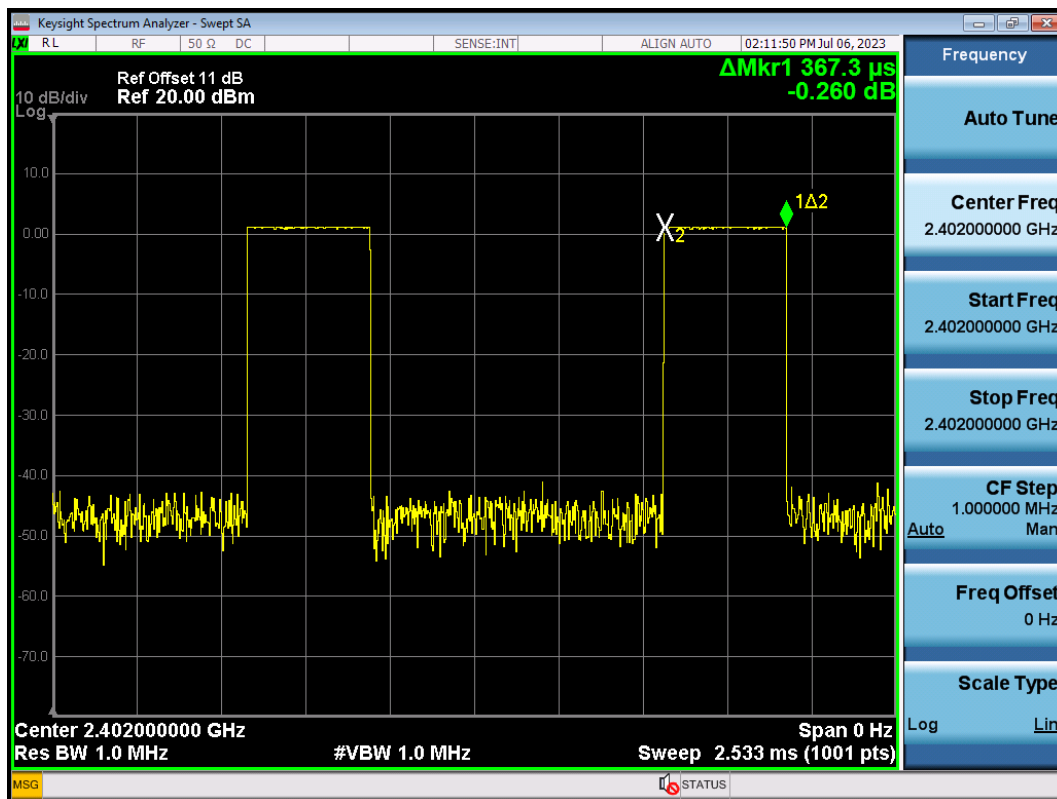


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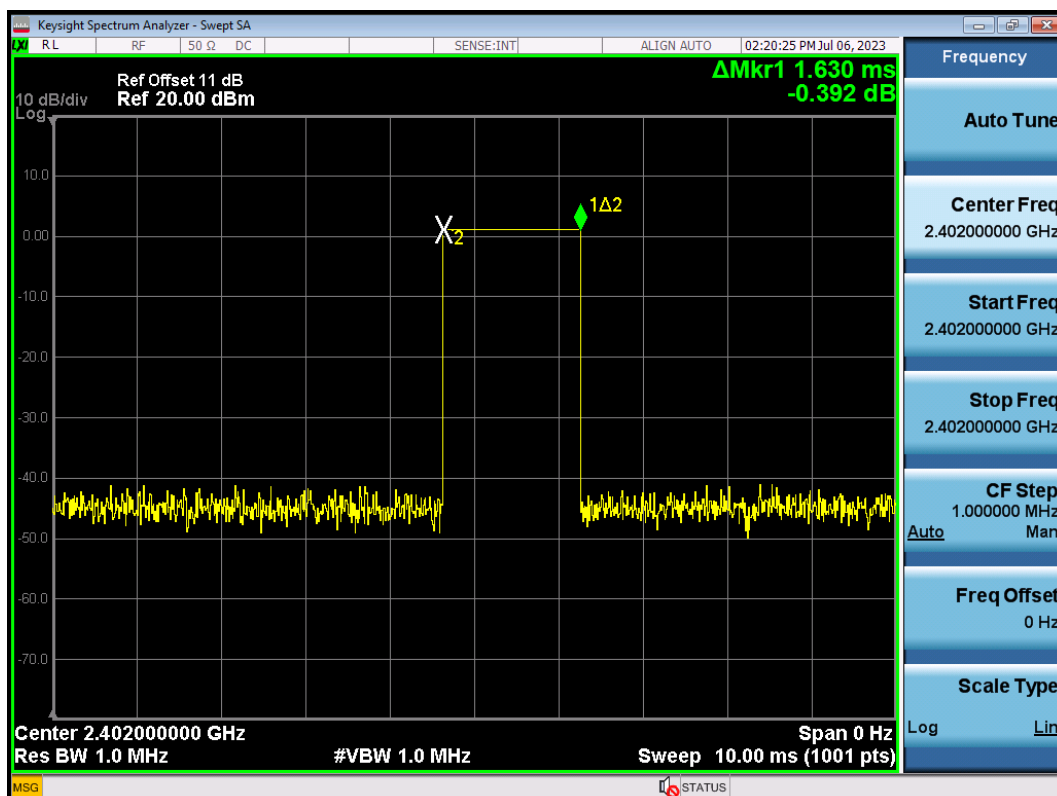
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CH00\_DH1 :



CH00\_DH3 :



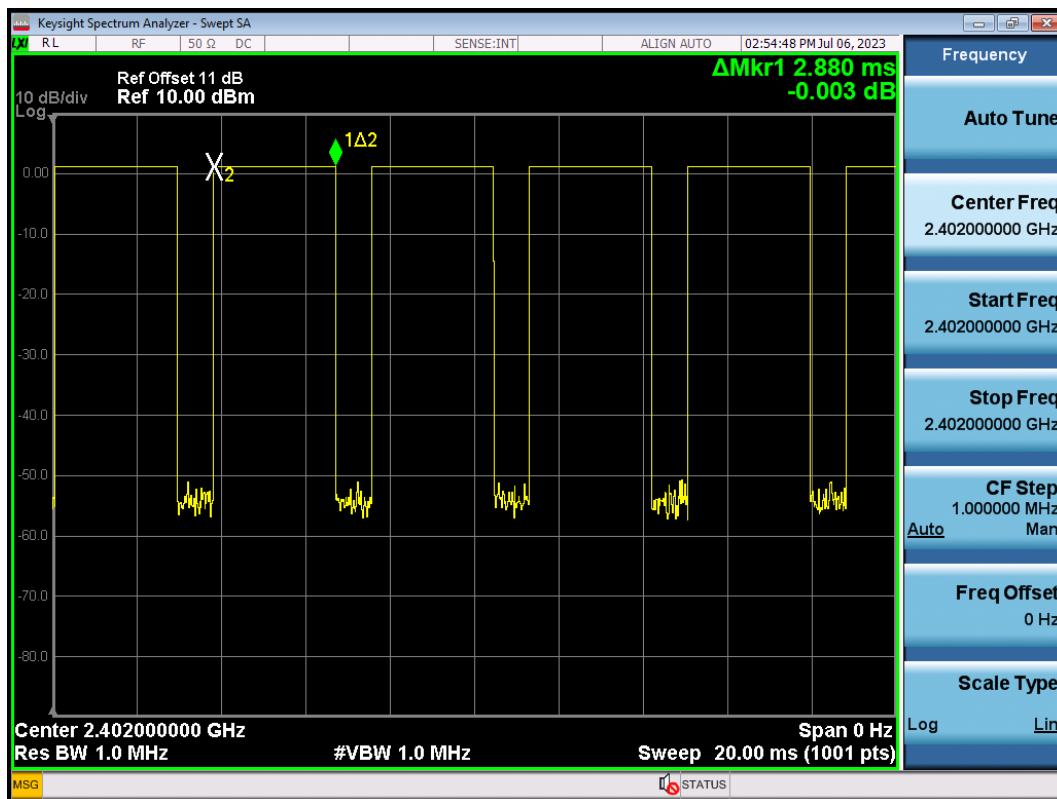


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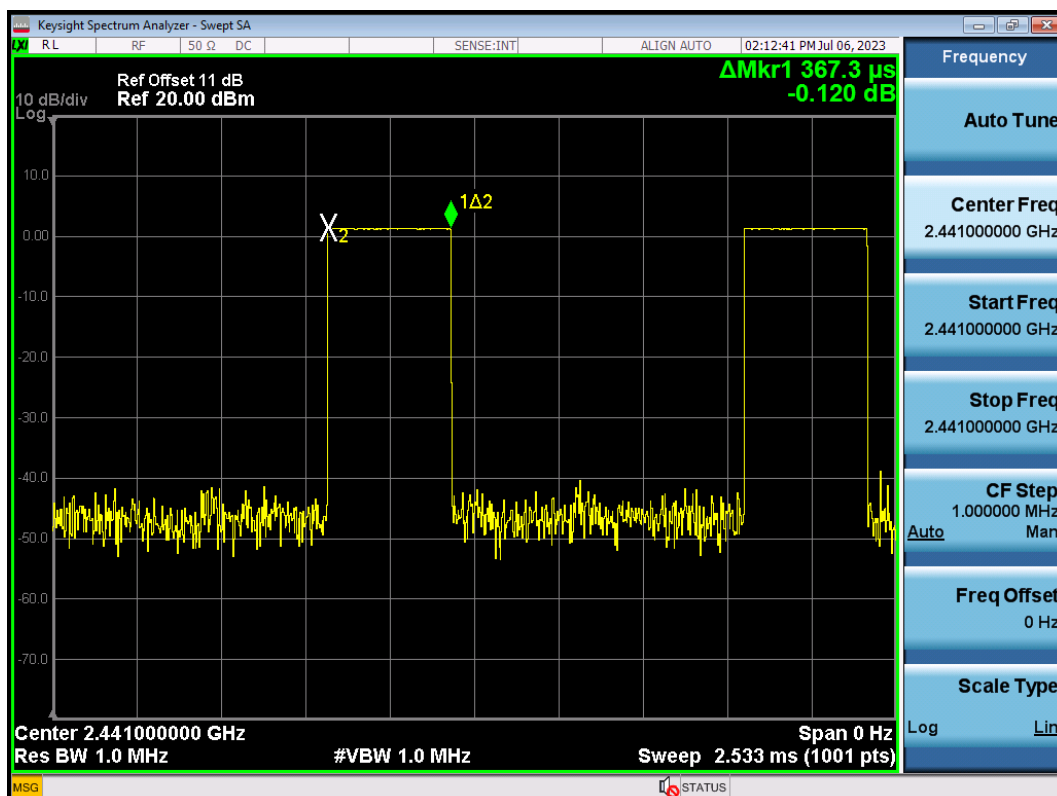
# TEST REPORT

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CH00\_DH5 :



CH39\_DH1 :



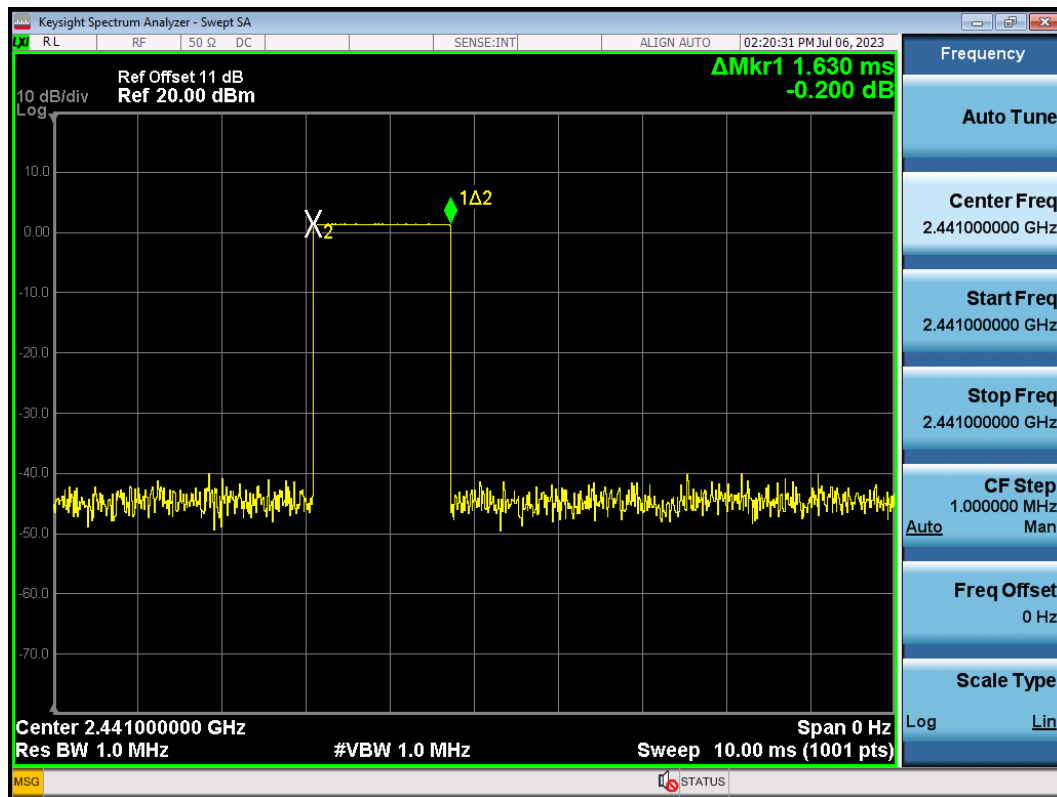


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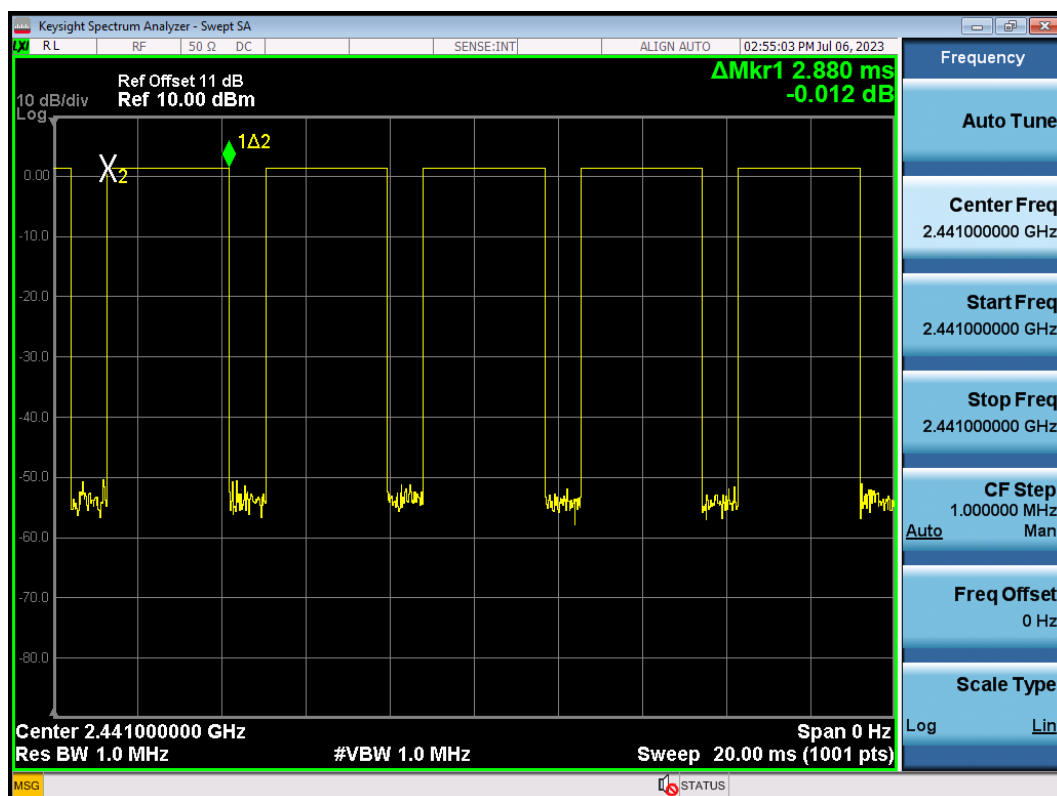
# TEST REPORT

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CH39\_DH3 :



CH39\_DH5 :



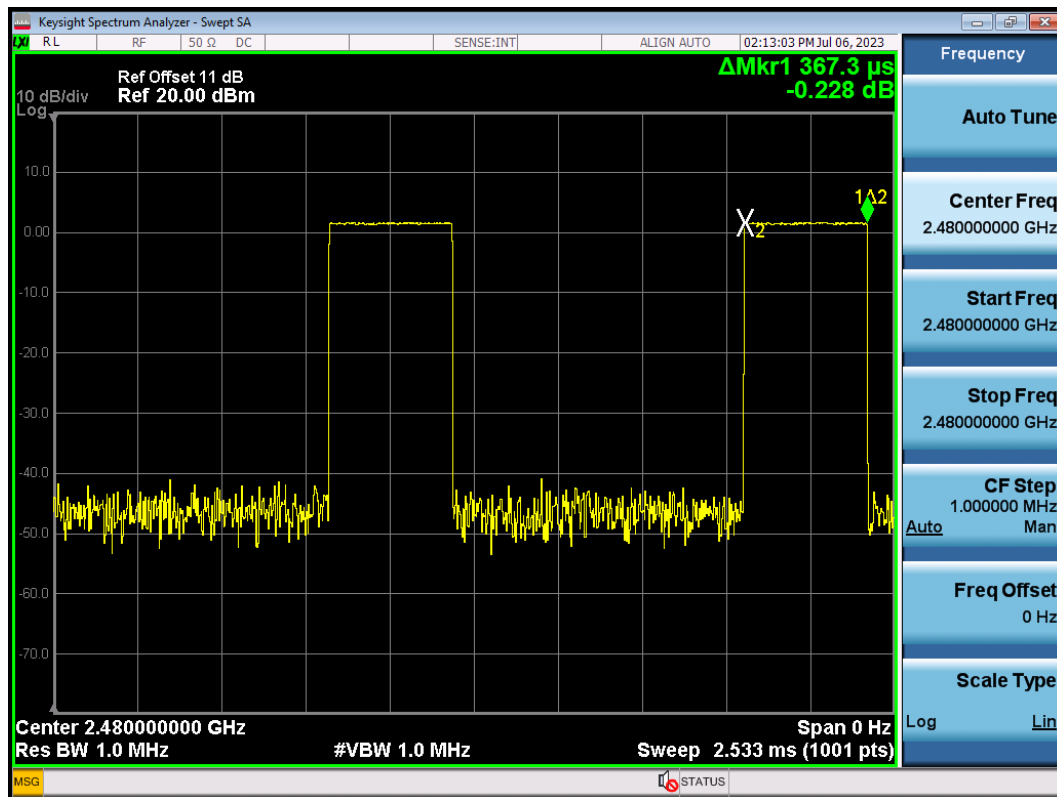


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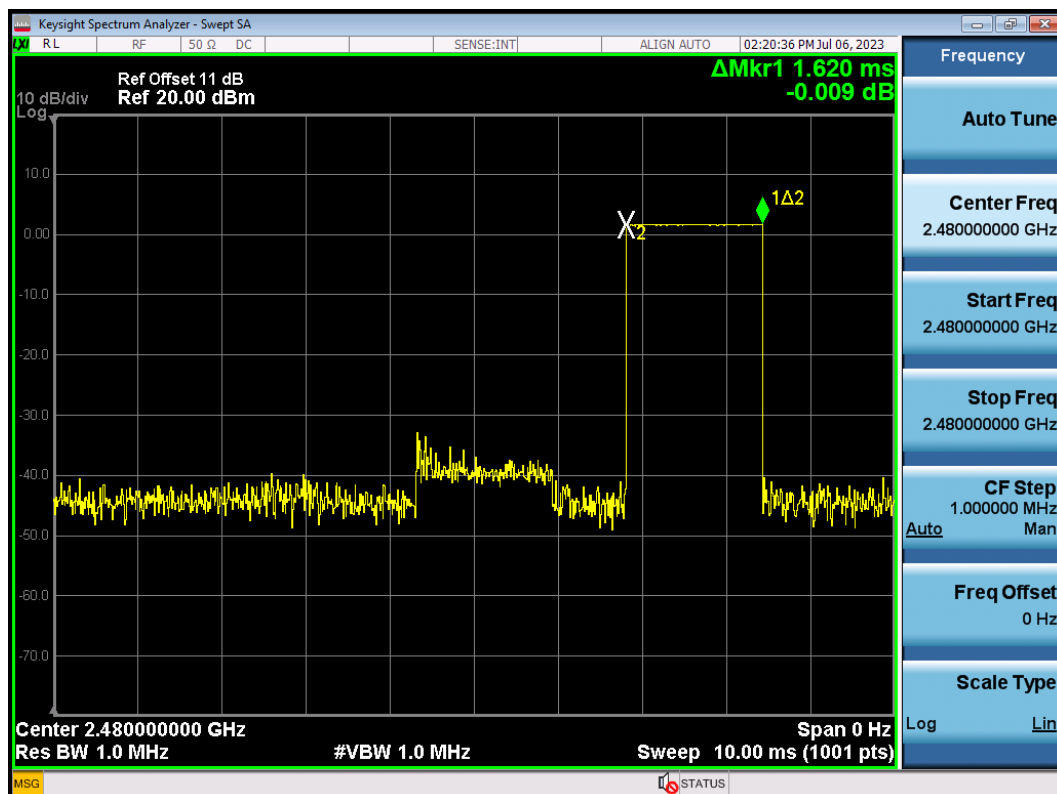
# TEST REPORT

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CH78\_DH1 :



CH78\_DH3 :



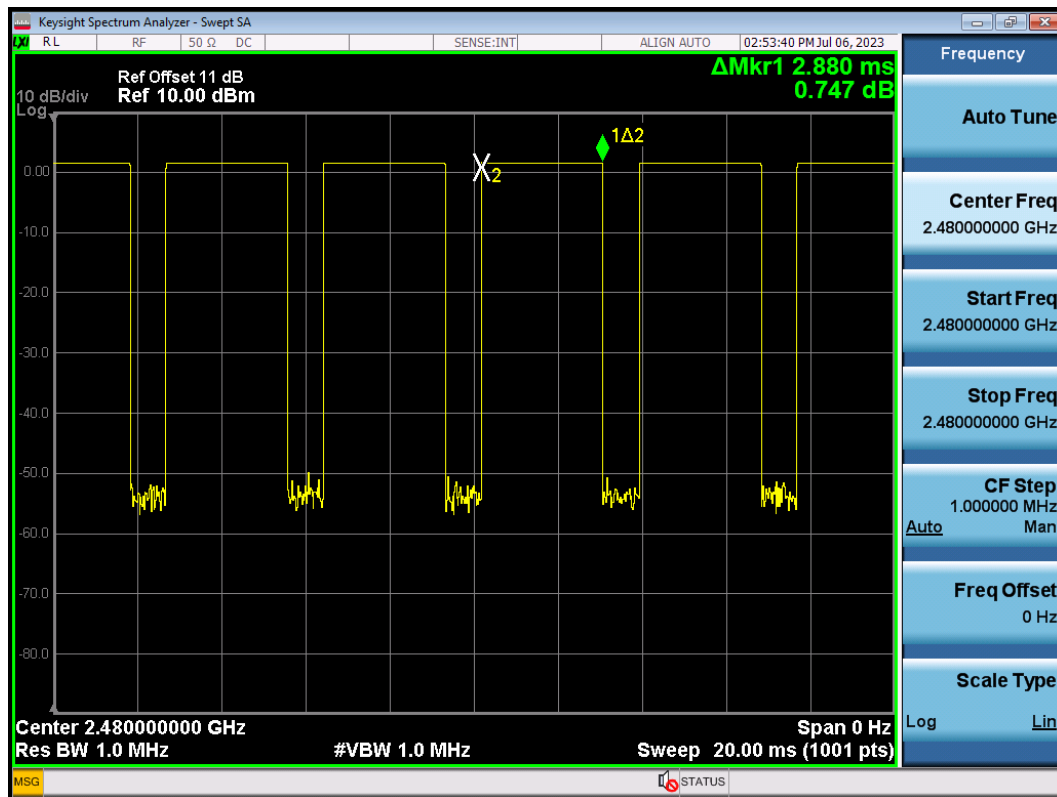


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CH78\_DH5 :



|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
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## 10. QUANTITY OF HOPPING CHANNEL TEST

### 10.1 LIMIT

FCC Part15, Subpart C Section 15.247(a)(b).

Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels.

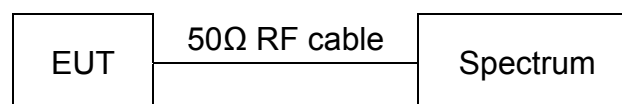
### 10.2 TEST EQUIPMENT

The following test equipment was used during the test :

| Equipment/<br>Facilities | Specifications | Manufacturer | Model #/<br>Serial # | Due Date of Cal.<br>& Cal. Center |
|--------------------------|----------------|--------------|----------------------|-----------------------------------|
| R&S spectrum Analyzer    | 9KHz ~ 30GHz   | R & S        | 100854 /<br>E007     | May 19, 2023<br>ETC               |
| RF CABLE                 | 1GHz~ 30GHz    | HUBER SUHNER | SF102 /<br>2         | Feb. 20, 2023<br>ETC              |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 10.3 TEST SET-UP



### 10.4 TEST PROCEDURE

The EUT was operating in hopping mode or could control its channel.

Printed out the test result from the spectrum by hard copy function.

### 10.5 EUT OPERATING CONDITION

1. Set the EUT under frequency hopping transmission condition.
2. The EUT was set to the highest available power level.

|                             |
|-----------------------------|
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|                    |              |              |               |
|--------------------|--------------|--------------|---------------|
| Temperature:       | 28 °C        | Humidity:    | 70 %RH        |
| Spectrum Detector: | PK.          | Modulation:  | GFSK          |
| RBW:               | 100 kHz      | VBW:         | 100 kHz       |
| Tested By:         | Jlmmxy Tseng | Tested Date: | Feb. 17, 2023 |

| Hopping Channel<br>Frequency Range<br>(MHz) | Quantity of<br>Hopping Channel<br>Read Value | Quantity of<br>Hopping Channel<br>Limit |
|---------------------------------------------|----------------------------------------------|-----------------------------------------|
| 2402 ~ 2480                                 | 79                                           | 75                                      |

Keysight Spectrum Analyzer - Swept SA

RL RF 50 Ω DC SENSE:INT ALIGN AUTO 02:18:20 PM Jul 06, 2023

Ref Offset 11 dB  
Ref 20.00 dBm

10 dB/div  
Log

Mkr2 2.480 130 0 GHz  
1.49 dBm

Start 2.40000 GHz  
#Res BW 100 kHz

Stop 2.48350 GHz  
Sweep 10.13 ms (1001 pts)

| MKR | MODE | TRC | SCL | X               | Y        | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-----|-----------------|----------|----------|----------------|----------------|
| 1   | N    | 1   | f   | 2.401 965 0 GHz | 0.90 dBm |          |                |                |
| 2   | N    | 1   | f   | 2.480 130 0 GHz | 1.49 dBm |          |                |                |
| 3   |      |     |     |                 |          |          |                |                |
| 4   |      |     |     |                 |          |          |                |                |
| 5   |      |     |     |                 |          |          |                |                |
| 6   |      |     |     |                 |          |          |                |                |
| 7   |      |     |     |                 |          |          |                |                |
| 8   |      |     |     |                 |          |          |                |                |
| 9   |      |     |     |                 |          |          |                |                |
| 10  |      |     |     |                 |          |          |                |                |
| 11  |      |     |     |                 |          |          |                |                |
| 12  |      |     |     |                 |          |          |                |                |

Frequency

Auto Tune

Center Freq  
2.441750000 GHz

Start Freq  
2.400000000 GHz

Stop Freq  
2.483500000 GHz

CF Step  
8.350000 MHz  
Man

Auto

Freq Offset  
0 Hz

Scale Type  
Log

MSG STATUS

|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
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## 11. CHANNEL SEPARATION TEST

### 11.1 LIMIT

FCC Part15, Subpart C Section 15.247(a)(1).

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel

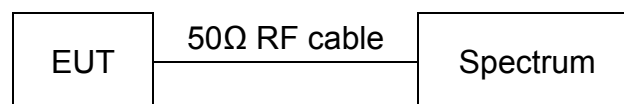
### 11.2 TEST EQUIPMENT

The following test equipment was used during the test :

| Equipment/<br>Facilities | Specifications | Manufacturer | Model #/<br>Serial # | Due Date of Cal.<br>& Cal. Center |
|--------------------------|----------------|--------------|----------------------|-----------------------------------|
| R&S spectrum Analyzer    | 9KHz ~ 30GHz   | R & S        | 100854 /<br>E007     | May 19, 2023<br>ETC               |
| RF CABLE                 | 1GHz~ 30GHz    | HUBER SUHNER | SF102 /<br>2         | Feb. 20, 2023<br>ETC              |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 11.3 TEST SET-UP



### 11.4 TEST PROCEDURE

The EUT was operating in hopping mode or could control its channel.  
 Printed out the test result from the spectrum by hard copy function.

### 11.5 EUT OPERATING CONDITION

1. Set the EUT under frequency hopping transmission condition.
2. The EUT was set to the highest available power level.

|                                                                                                                                                            |                      |                                                                                                                             |
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## 11.6 TEST RESULT

|                    |              |              |               |
|--------------------|--------------|--------------|---------------|
| Temperature:       | 28 °C        | Humidity:    | 70 %RH        |
| Spectrum Detector: | PK.          | Modulation:  | GFSK          |
| RBW:               | 30 kHz       | VBW:         | 100 kHz       |
| Tested By:         | Jlmmmy Tseng | Tested Date: | Jul. 07, 2023 |

| Channel | Frequency (MHz) | Separation Read Value (kHz) | 20 dB bandwidth (kHz) | Limit (kHz)<br>(> two-thirds of the 20 dB bandwidth) |
|---------|-----------------|-----------------------------|-----------------------|------------------------------------------------------|
| CH00    | 2402            | 888                         | 842.35                | 561.57                                               |
| CH39    | 2441            | 1005                        | 877.51                | 585.01                                               |
| CH78    | 2480            | 960                         | 847.57                | 565.05                                               |

CH00 :





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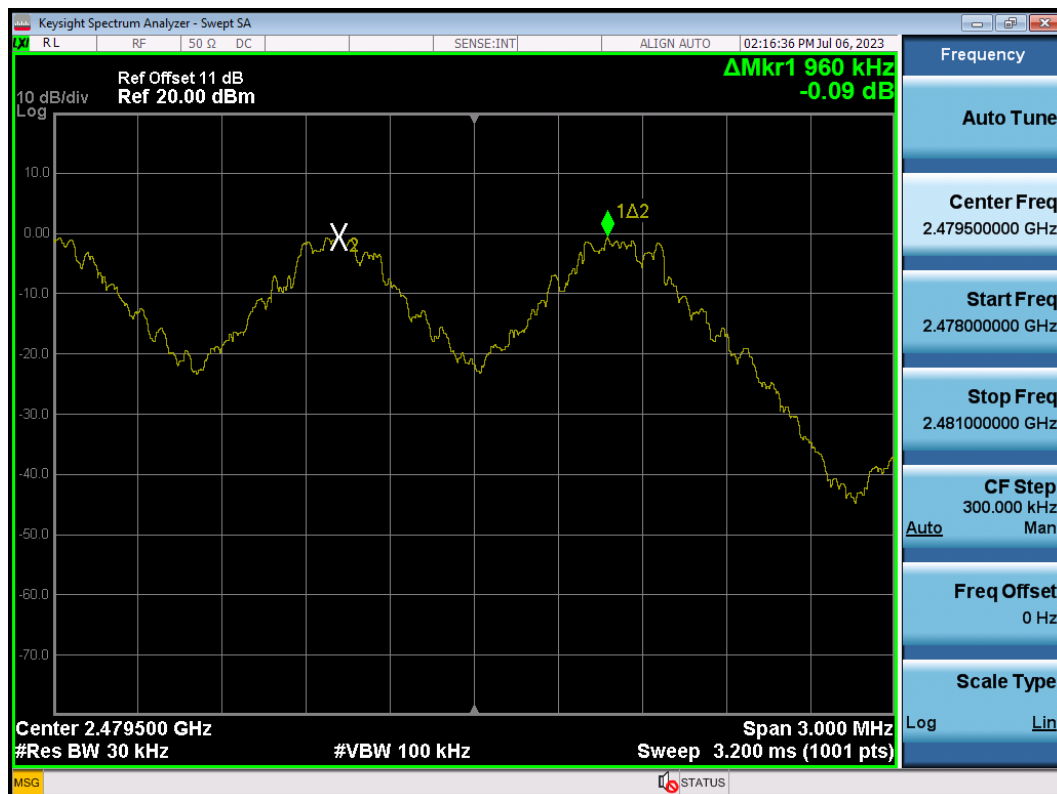
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CH39 :



CH78 :



|                                                                                                                                                                                                                                              |                      |                                                                                                                             |
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## 12. Antenna application

### 12.1 Antenna requirement

FCC Part 15E section 15.407 requirement:

For the band 5.725-5.85 GHz, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 12.2 Result

The EUT's antenna used a Dipole Antenna . antenna gain is 3.09 dBi that meet the requirement.

|                                                                                                                                                                                                                                                |                      |                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
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### 13. TERMS OF ABBREVIATION

|          |                                              |
|----------|----------------------------------------------|
| AV.      | Average detection                            |
| AZ(°)    | Turn table azimuth                           |
| Correct. | Correction                                   |
| EL(m)    | Antenna height (meter)                       |
| EUT      | Equipment Under Test                         |
| Horiz.   | Horizontal direction                         |
| LISN     | Line Impedance Stabilization Network         |
| NSA      | Normalized Site Attenuation                  |
| Q.P.     | Quasi-peak detection                         |
| SRT Lab  | Spectrum Research & Testing Laboratory, Inc. |
| Vert.    | Vertical direction                           |