# RF MEASUREMENT REPORT

| | |
|---|---|
| **FCC ID:** | 2BEY3LCUR57WWDC |
| **Applicant:** | NETPRISMA INC. |
| **Product:** | LTE-A Cat 16 M.2 Module |
| **Model No.:** | LCUR57-WWD |
| **Brand Name:** | Vrileg |
| **FCC Rule(s):** | Part 27 Subpart D |
| **Result:** | Complies |
| **Received Date:** | 2024-04-22 |
| **Test Date:** | 2024-05-05 ~ 2024-05-27 |

**Reviewed By:** Sunny Sun

**Approved By:** Robin Wu


The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.26-2015. Test results reported herein relate only to the item(s) tested.

## Revision History

| Report No. | Version | Description | Issue Date | Note |
|---|---|---|---|---|
| 2404RSU035-U5 | V01 | Initial Report | 2024-06-07 | Valid |
| | | | | |

CONTENTS

# 1. Genneral Information

## 1.1. Applicant

NETPRISMA INC.

1301 6TH AVE, SEATTLE, WA, 98101-2304, UNITED STATES

## 1.2. Manufacturer

NETPRISMA INC.

1301 6TH AVE, SEATTLE, WA, 98101-2304, UNITED STATES

## 1.3. Testing Facility

| | | | | | |
|---|---|---|---|---|---|
| ☒ | **Test Site – MRT Suzhou Laboratory** | | | | |
| | **Laboratory Location (Suzhou - Wuzhong)** | | | | |
| | D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China | | | | |
| | **Laboratory Location (Suzhou - SIP)** | | | | |
| | 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China | | | | |
| | **Laboratory Accreditations** | | | | |
| | A2LA: 3628.01 | | CNAS: L10551 | | |
| | FCC: CN1166 | | ISED: CN0001 | | |
| | VCCI: | ☐R-20025 | ☐G-20034 | ☐C-20020 | ☐T-20020 |
| | | ☐R-20141 | ☐G-20134 | ☐C-20103 | ☐T-20104 |
| ☐ | **Test Site – MRT Shenzhen Laboratory** | | | | |
| | **Laboratory Location (Shenzhen)** | | | | |
| | 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China | | | | |
| | **Laboratory Accreditations** | | | | |
| | A2LA: 3628.02 | | CNAS: L10551 | | |
| | FCC: CN1284 | | ISED: CN0105 | | |
| ☐ | **Test Site – MRT Taiwan Laboratory** | | | | |
| | **Laboratory Location (Taiwan)** | | | | |
| | No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) | | | | |
| | **Laboratory Accreditations** | | | | |
| | TAF: 3261 | | | | |
| | FCC: 291082, TW3261 | | ISED: TW3261 | | |

### 1.4. Product Information

| | |
|---|---|
| Product Name | LTE-A Cat 16 M.2 Module |
| Model No. | LCUR57-WWD |
| Brand Name | Vrileg |
| Serial No. | D1C24CG1D000013 (Conducted)<br>D1C24CG1D000108 (Radiated) |
| 3GPP Specification | WCDMA Band II/IV/V<br>LTE Band 2, 4, 5, 7, 12, 13, 14, 25, 26, 30, 38, 41, 42, 43, 48, 66 |
| Operating Temperature Range | -25 ~ 75 °C |
| Supply Voltage Rating | 3.135 – 4.4Vdc, typical 3.7Vdc |
| Antenna Specification | Refer to Section 1.6 |
| Remark:<br>The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer. | |

### 1.5. Radio Specification under Test

| E-UTRA Specification | |
|---|---|
| TX Frequency Range | Band 30: 2305 ~ 2315 MHz |
| RX Frequency Range | Band 30: 2350 ~ 2360 MHz |
| Support Bandwidth | 5MHz, 10MHz |
| Support Power Class | PC3 |
| Modulation | UL up to 64QAM & DL up to 256QAM |

### 1.6. Description of Available Antennas

| Technology | Frequency Range (MHz) | Antenna Type | MaxPeak Gain (dBi) |
|---|---|---|---|
| LTE Band 30 | 2305 ~ 2315 | PIFA | 0.98 |
| Note 1: All antenna information (Antenna type and Peak Gain) is provided by the manufacturer.<br>Note 2: The typical antennas used to calculate the ERP (EIRP). | | | |

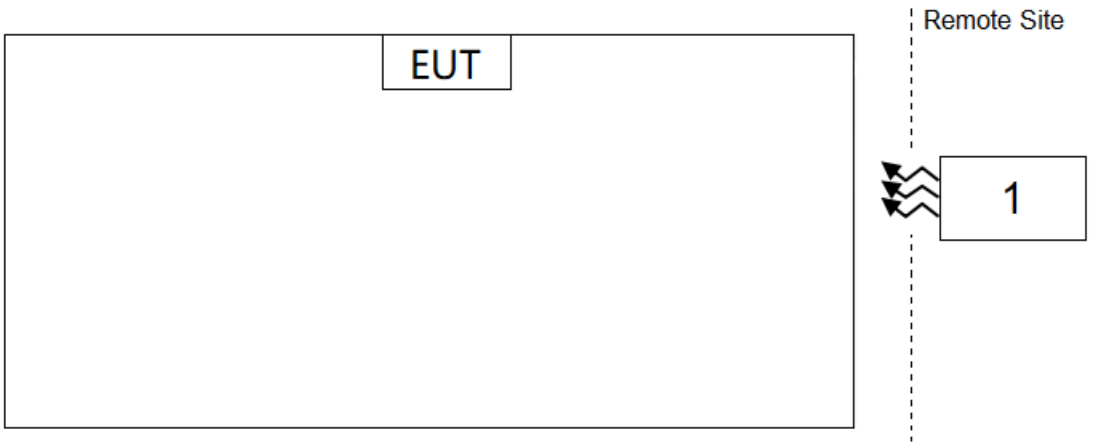
### 1.7. Test Methodology

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ANSI C63.26:2015
- FCC CFR 47 Part 27
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01: Determining ERP and EIRP

# 2. Test Configuration

## 2.1. Test System Connection Diagram




| Product | | Manufacturer | Model No. |
|---|---|---|---|
| 1 | Wideband Radio Communication Tester | R&S | CMW 500 |

## 2.2. Test Environment Condition

| | |
|---|---|
| Ambient Temperature | 15 ~ 35°C |
| Relative Humidity | 20% ~ 75%RH |

## 3. Measuring Instrument

| Instrument | Manufacturer | Model No. | Asset No. | Cali. Interval | Cali. Due Date | Test Site |
|---|---|---|---|---|---|---|
| Communication Tester | R&S | CMW500 | MRTSUE06243 | 1 year | 2024-09-27 | SIP-SR1 |
| Thermohygrometer | testo | 622 | MRTSUE06629 | 1 year | 2024-12-21 | SIP-SR1 |
| Communication Tester | R&S | CMW500 | MRTSUE06881 | 1 year | 2024-05-09 | SIP-SR1 |
| | | | | 1 year | 2025-05-08 | SIP-SR1 |
| Temperature Chamber | BAOYT | BYG-80CL | MRTSUE06932 | 1 year | 2025-02-03 | SIP-SR1 |
| Shielding Room | MIX-BEP | SIP-SR1 | MRTSUE06948 | N/A | N/A | SIP-SR1 |
| Directional Coupler | MVE | MVE4912-10 | MRTSUE07052 | 1 year | 2024-08-24 | SIP |
| Attenuator | MVE | MVE2213 | MRTSUE11111 | 1 year | 2024-08-02 | SIP |
| Signal Analyzer | Keysight | N9010B | MRTSUE07028 | 1 year | 2024-10-23 | SIP-SR1 |
| Directional Coupler | MVE | MVE4912-10 | MRTSUE07052 | 1 year | 2024-08-24 | SIP |
| Communication Tester | R&S | CMW500 | MRTSUE06108 | 1 year | 2024-10-23 | WZ-SR6 |
| Thermohygrometer | testo | 608-H1 | MRTSUE06362 | 1 year | 2025-02-04 | WZ-SR6 |
| Shielding Room | HUAMING | WZ-SR6 | MRTSUE06443 | N/A | N/A | WZ-SR6 |
| Radio Communication Analyzer | Anritsu | MT8821C | MRTSUE06960 | 1 year | 2024-07-06 | WZ-SR6 |
| Temperature Chamber | BAOYT | BYH-150CL | MRTSUE06051 | 1 year | 2024-09-27 | WZ-TR3 |
| Thermohygrometer | testo | 608-H1 | MRTSUE11268 | 1 year | 2024-12-14 | WZ-TR3 |
| Thermohygrometer | testo | 608-H1 | MRTSUE06362 | 1 year | 2025-02-04 | WZ-SR6 |
| Shielding Room | HUAMING | WZ-SR6 | MRTSUE06443 | N/A | N/A | WZ-SR6 |
| Signal Analyzer | Keysight | N9020B | MRTSUE06583 | 1 year | 2024-09-27 | WZ-SR6 |
| USB Power Sensor | Keysight | U8488A | MRTSUE06958 | 5 years | 2026-07-08 | SIP-SR3 |
| Thermohygrometer | testo | 608-H1 | MRTSUE06616 | 1 year | 2024-10-28 | SIP-AC1 |
| Horn Antenna | R&S | HF907 | MRTSUE06610 | 1 year | 2024-06-17 | SIP-AC1 |
| EMI Test Receiver | R&S | ESR3 | MRTSUE06185 | 1 year | 2024-12-17 | SIP-AC1 |
| Anechoic Chamber | RIKEN | SIP-AC1 | MRTSUE06554 | 1 year | 2024-12-21 | SIP-AC1 |
| Signal Analyzer | Keysight | N9010B | MRTSUE06559 | 1 year | 2024-05-09 | SIP-AC1 |
| | | | | 1 year | 2025-05-08 | SIP-AC1 |
| Horn Antenna | Schwarzbeck | BBHA 9170 | MRTSUE06599 | 1 year | 2024-09-24 | SIP-AC1 |
| Preamplifier | EMCI | EMC184045SE | MRTSUE06602 | 1 year | 2024-10-09 | SIP-AC1 |
| Loop Antenna | Schwarzbeck | FMZB 1519 B | MRTSUE06937 | 1 year | 2025-01-27 | SIP-AC1 |
| Signal Analyzer | Keysight | N9010B | MRTSUE07028 | 1 year | 2024-10-23 | SIP-AC1 |
| Active Loop Antenna | Schwarzbeck | FMZB 1519-60 D | MRTSUE07075 | 1 year | 2024-12-04 | SIP-AC1 |
| Cable | HUBER+SUHNER | SF106 | MRTSUE06594 | 1 year | 2024-12-21 | SIP-AC1 |
| Cable | HUBER+SUHNER | SF106 | MRTSUE06874 | 1 year | 2024-12-21 | SIP-AC1 |

| Software | Version | Function |
|---|---|---|
| EMI Software | V3.0.0 | EMI Test Software |
| Controller_MF 7802BS | 1.02 | RE Antenna & Turntable |
| CMWrun | V 1.9.10.20 | license 2G & 3G & 4G |
| UCTS | V 6.23.217.99 | license 3G & 4G & 5G |
| Agilent Power Analyzer/Agilent Power Panel | V R03.09.00 | Power |

# 4. Decision Rules and Measurement Uncertainty

## 4.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

## 4.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

| Radiated Spurious Emissions |
|---|
| Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):<br>Coaxial: 9kHz~30MHz: 2.61dB<br>Coplanar: 9kHz~30MHz: 2.62dB<br>Horizontal: 30MHz~200MHz: 3.79dB<br>200MHz~1GHz: 3.91dB<br>1GHz~40GHz: 4.99dB<br>Vertical: 30MHz~200MHz: 4.06dB<br>200MHz~1GHz: 5.21dB<br>1GHz~40GHz: 4.90dB |
| Conducted Spurious Emissions |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):<br>1.47dB |
| Output Power |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):<br>0.66dB |
| Occupied Bandwidth |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):<br>69.28kHz |
| Frequency Stability |
| Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)):<br>8.04Hz |

# 5. Test Result

## 5.1. Summary

| FCC Part Section(s) | Test Description | Test Condition | Test Result |
|---|---|---|---|
| 2.1049 | Occupied Bandwidth | Conducted | Pass |
| 2.1055, 27.54 | Frequency Stability | | Pass |
| 27.50(a)(3) | Transmitter Output Power | | Pass |
| 2.1051, 27.53(a)(4) | Transmitter unwanted emissions (band-edge) | | Pass |
| 2.1051, 27.53(a)(4) | Transmitter unwanted emissions (spurious) | | |
| 2.1053, 27.53(a)(4) | Transmitter Spurious Emission | Radiated | Pass |

**Notes:**

1) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part ofthe system to connect the EUT to the analyzer at all frequencies of interest.
2) All supported modulation types were evaluated. The worst-case emission of modulation was selected. Therefore, the Frequency Stability, Transmitter unwanted emissions (band-edge), Transmitter unwanted emissions (spurious), Radiated Spurious Emission were presented worst-case in the test report.
3) For radiated emission tests, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.
4) This report is based on MRT Original “2404RSU035-U5” Report, FCC ID: 2BEY3LCUR57WWDA to copying report and updating the FCC ID.

## 5.2. Occupied Bandwidth Measurement

### 5.2.1. Test Limit

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

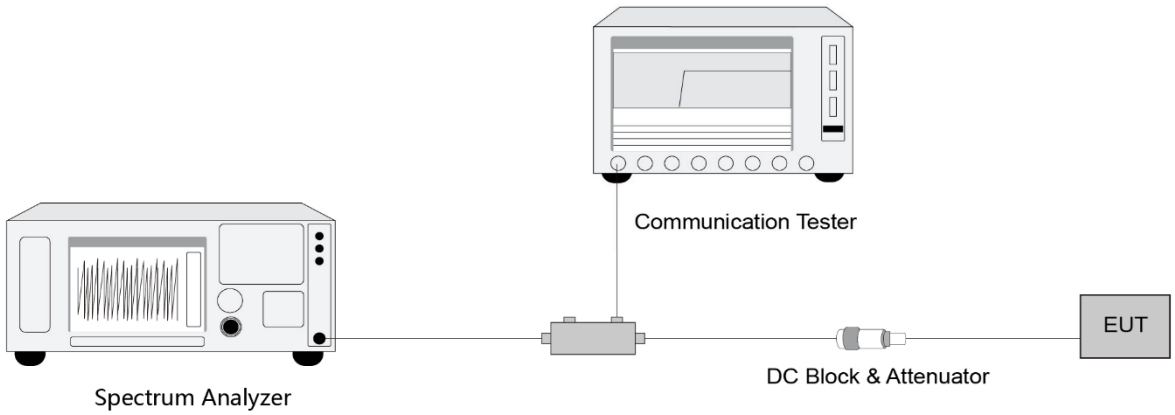
### 5.2.2. Test Procedure

ANSI C63.26-2015 - Section 5.4.4

### 5.2.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency
2. RBW = The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace to stabilize
8. Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

### 5.2.4. Test Setup




### 5.2.5. Test Result

Refer to Appendix A.1.

## 5.3. Frequency Stability Measurement

### 5.3.1. Test Limit

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 5.3.2. Test Procedure

ANSI C63.26-2015 - Section 5.6

### 5.3.3. Test Setting

1. A reference point shall be established at the applicable unwanted emissions limit using a RBW equal to the RBW required by the unwanted emissions specification of the applicable regulatory standard. These reference points measured using the lowest and highest channel of operation shall be identified as $f_L$ and $f_H$ respectively.
2. Use the frequency error function of the instrument and record the frequency error.
3. Change the temperature of equipment and repeat Steps 2.
4. Change the Voltage of equipment and repeat Steps 2.
5. The frequency error offset determined in the above methods shall be added or subtracted from the values of $f_L$ and $f_H$ and the resulting frequencies must remain within the band

**Frequency Stability Under Temperature Variations:**

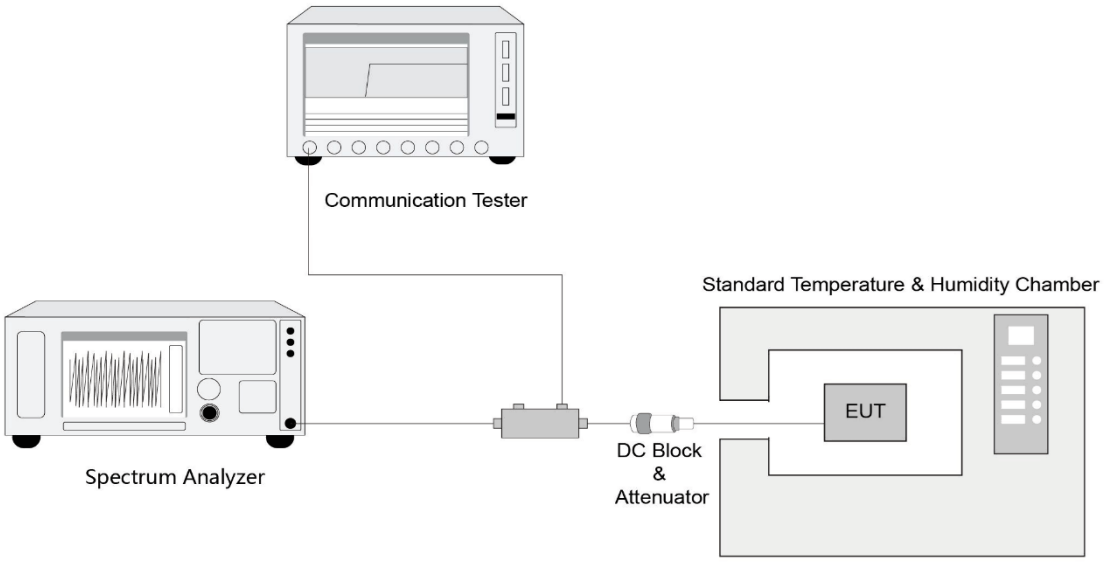
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

**Frequency Stability Under Voltage Variations:**

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the inputvoltage to specify extreme voltage variation (±15%) and endpoint, recordthe maximum frequency change.

### 5.3.4. Test Setup




### 5.3.5. Test Result

Refer to Appendix A.2.

## 5.4. Transmitter Output Power Measurement

### 5.4.1. Test Limit

For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth.

### 5.4.2. Test Procedure

ANSI C63.26-2015 - Section 5.2.4.2 & 5.2.4.4

### 5.4.3. Test Setting

**Average Power Measurement**

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

**Average Power Spectral Density Measurement**

1. Set span to 2 × to 3 × the OBW;
2. Set RBW = 1% to 5% of the OBW;
3. Set VBW ≥ 3 × RBW;
4. Set number of measurement points in sweep ≥ 2 × span / RBW;
5. Sweep time set to auto;
6. Detector = power averaging (rms);
7. If the EUT can be configured to transmit continuously, then set the trigger to free run;
8. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep.
9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the

sweep time.

10. Compute power by integrating the spectrum across the specified bandwidth of the signal using the instrument's band or channel power measurement function with band/channel limits set equal to the specified bandwidth band edges. If the instrument does not have a band or channel power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire specified bandwidth of the spectrum.

**ERP & EIRP Measurement**

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation (1) as follows:

$$\text{ERP or EIRP} = P_{Meas} + G_T \quad (1)$$

where

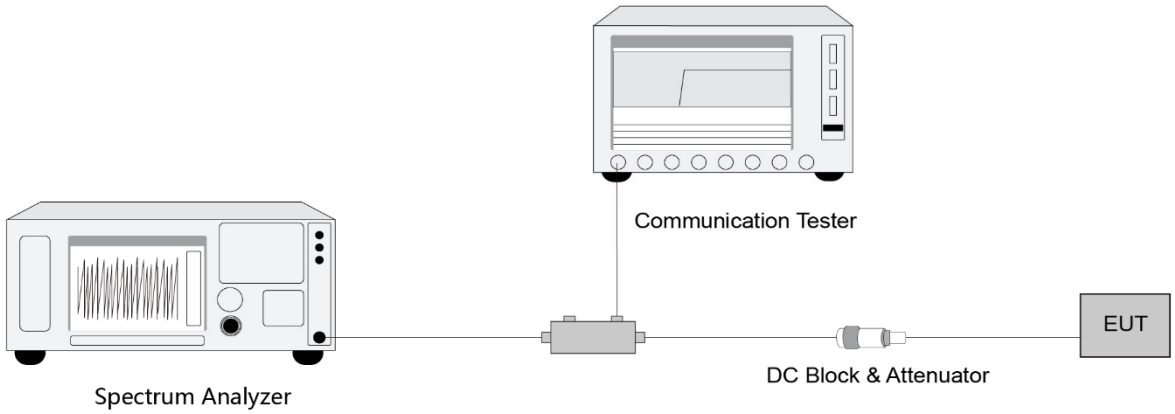
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as $P_{Meas}$, e.g., dBm or dBW)

$P_{Meas}$ measured transmitter output power or PSD, in dBm or dBW

$G_T$ gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

For devices utilizing multiple antennas, see 6.4 for guidance with respect to determining the effective array transmit antenna gain term to be used in the above equation.

### 5.4.4. Test Setup




### 5.4.5. Test Result

Refer to Appendix A.3.

## 5.5. Transmitter unwanted emissions (band-edge) Measurement

### 5.5.1. Test Limit

For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360MHz bands:

(1) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

(2) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(3) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

### 5.5.2. Test Procedure

ANSI C63.26-2015 - Section5.7

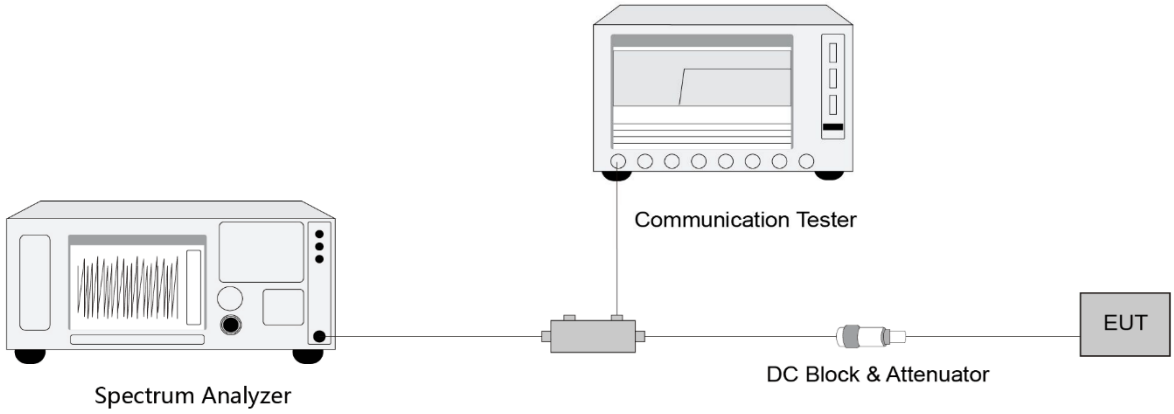
### 5.5.3. Test Setting

1. Set the analyzer frequency to Low or High channel
2. RBW = specified resolution bandwidth, for improvement of the accuracy in the measurement of the average power of a noise-like emission, a RBW narrower than the specified reference bandwidth can be used (generally limited to no less than 1% of the frequency block group, provided that a subsequent integration is performed over the full required measurement bandwidth. This integration should be performed using the spectrum analyzer’s band power functions.
3. VBW ≥ 3*RBW
4. Sweep time = auto
5. Detector = power averaging (rms)
6. If the EUT can be configured to transmit continuously, then set the trigger to free run
7. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire

duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints

8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.
9. Compute the power by integrating the spectrum across the specified resolution bandwidth using the instrument's band or channel power measurement function, with the band/channel limits set equal to the specified resolution bandwidth, when using a measurement bandwidth smaller than the specified bandwidth. Otherwise, Use the peak marker function to determine the maximum amplitude level.

### 5.5.4. Test Setup




### 5.5.5. Test Result

Refer to Appendix A.4.

## 5.6. Transmitter unwanted emissions (spurious) Measurement

### 5.6.1. Test Limit

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10$^{th}$harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) bya factor of at least 70 + 10 log (P) dB.

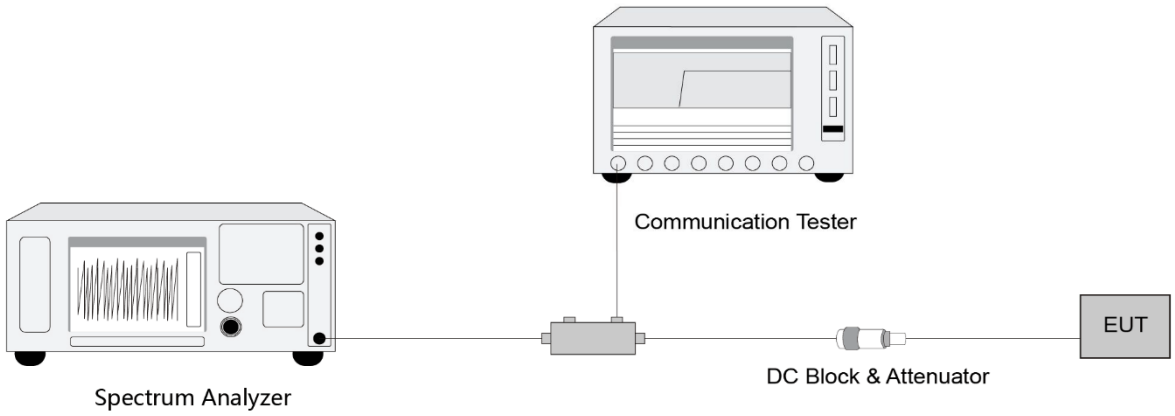
### 5.6.2. Test Procedure

ANSI C63.26-2015 - Section 5.7

### 5.6.3. Test Setting

1. Set the analyzer frequency to low, Mid or high channel.
2. RBW = specified resolution bandwidth
3. VBW ≥ 3*RBW
4. Sweep time = auto
5. Detector = power averaging (rms)
6. If the EUT can be configured to transmit continuously, then set the trigger to free run
7. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.
9. Use the peak marker function to determine the maximum amplitude level.

### 5.6.4. Test Setup




### 5.6.5. Test Result

Refer to Appendix A.5.

## 5.7. Radiated Spurious Emissions Measurement

### 5.7.1. Test Limit

Out of band emissions: The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 70 + 10 log (P) dB.

E (dBμV/m) = EIRP (dBm) - 20 log D + 104.8; where D is the measurement distance in meters. The emission limit equal to 55.3dBμV/m.

### 5.7.2. Test Procedure

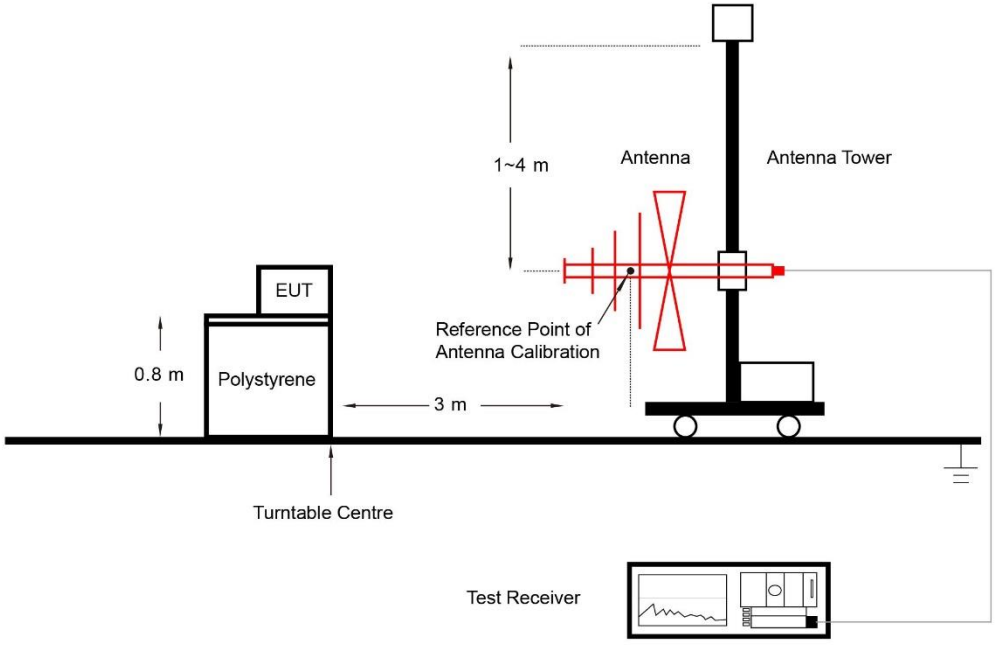
ANSI C63.26-2015 - Section 5.2.7 & 5.5

### 5.7.3. Test Setting

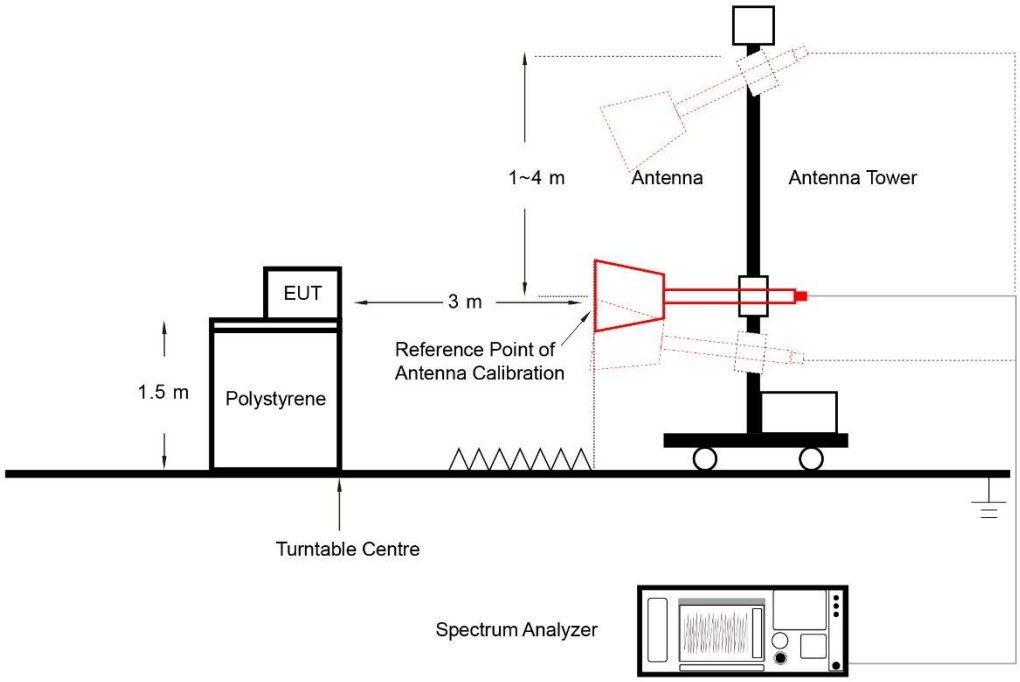
1. RBW = 120kHz or 1MHz
2. VBW ≥ 3*RBW
3. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period)
4. Detector = CISPR quasi-peak / average detector (Below 1 GHz, compliance with the limits shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth. Above 1 GHz, compliance with the limits shall be demonstrated using a linear average detector with a minimum resolution bandwidth of 1 MHz.)
5. The trace was allowed to stabilize

### 5.7.4. Test Setup

Below 1GHz Test Setup:




Above 1GHz Test Setup:




### 5.7.5. Test Result

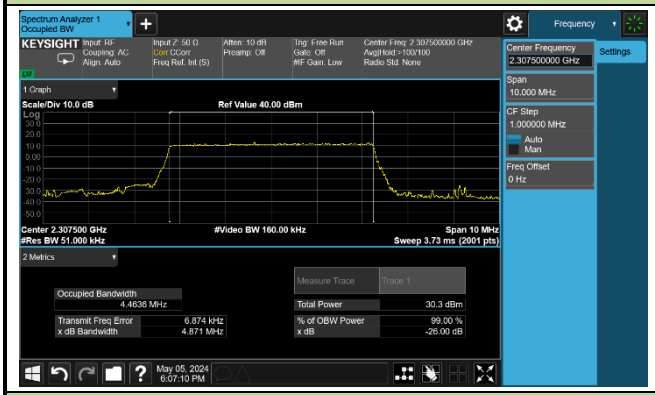
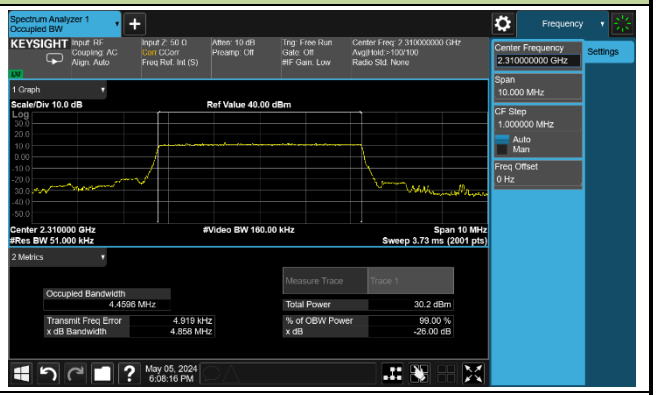
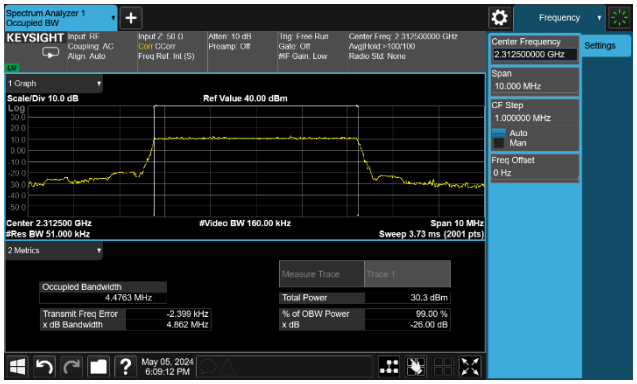
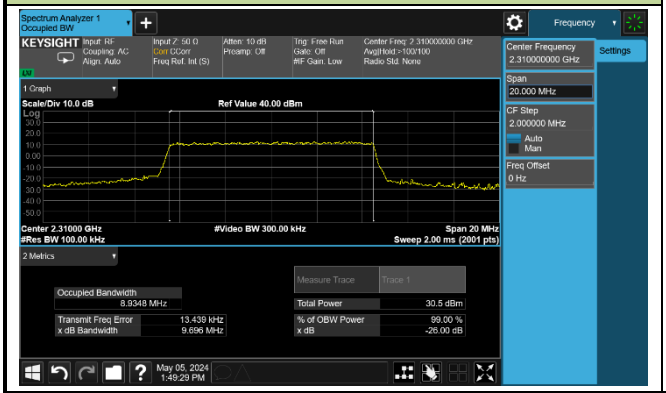
Refer to Appendix A.6.

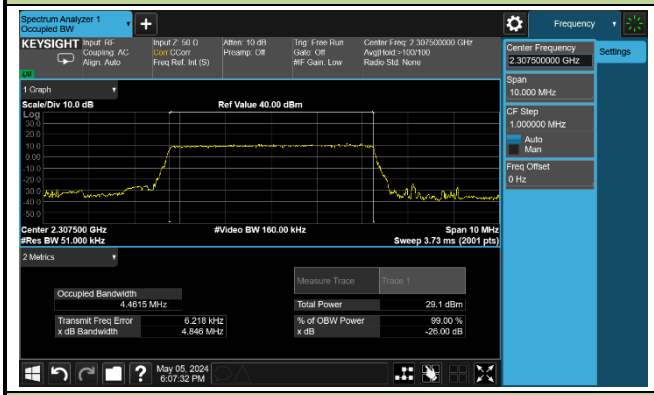
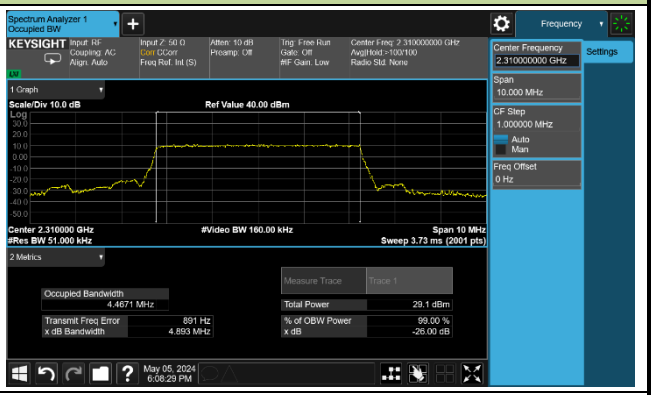
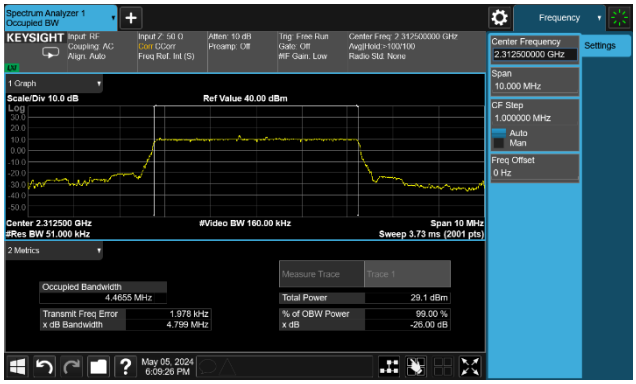
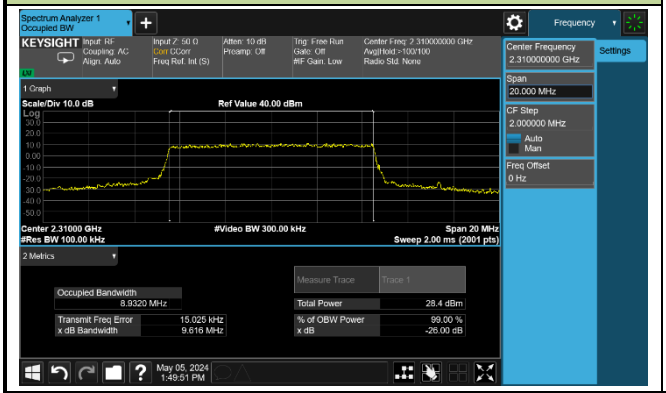
# Appendix A - Test Result

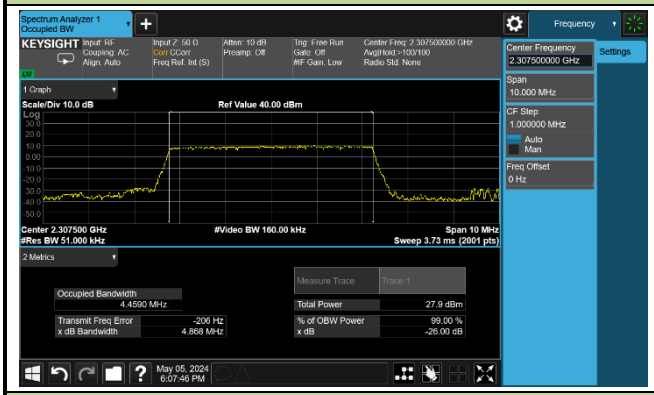
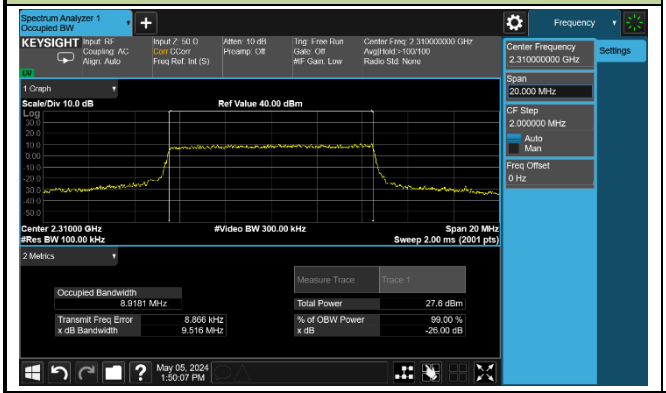
## A.1 Occupied Bandwidth Test Result

| | | | |
|---|---|---|---|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-05-05 | Test Band | Band 30 |

| Bandwidth (MHz) | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| QPSK | | |
| 5 | 2307.5 | 4.46 |
| | 2310.0 | 4.46 |
| | 2312.5 | 4.48 |
| 10 | 2310.0 | 8.93 |
| 16QAM | | |
| 5 | 2307.5 | 4.46 |
| | 2310.0 | 4.47 |
| | 2312.5 | 4.47 |
| 10 | 2310.0 | 8.93 |
| 64QAM | | |
| 5 | 2307.5 | 4.46 |
| | 2310.0 | 4.46 |
| | 2312.5 | 4.46 |
| 10 | 2310.0 | 8.92 |

| 99% Bandwidth – 5MHz Bandwidth QPSK | |
|---|---|
| Low Channel Bandwidth | Middle Channel Bandwidth |
|  |  |
| High Channel Bandwidth | |
|  | |
| 99% Bandwidth – 10MHz Bandwidth QPSK | |
| Middle Channel Bandwidth | |
|  | |

| 99% Bandwidth – 5MHz Bandwidth 16QAM | |
|---|---|
| Low Channel Bandwidth | Middle Channel Bandwidth |
|  |  |
| High Channel Bandwidth | |
|  | |
| 99% Bandwidth – 10MHz Bandwidth 16QAM | |
| Low Channel Bandwidth | |
|  | |

| 99% Bandwidth – 5MHz Bandwidth 64QAM | |
|---|---|
| Low Channel Bandwidth | Middle Channel Bandwidth |
|  |  |
| High Channel Bandwidth | |
|  | |
| 99% Bandwidth – 10MHz Bandwidth 64QAM | |
| Low Channel Bandwidth | |
|  | |

### A.2 Frequency Stability Test Result

| Test Site | WZ-TR3 | Test Engineer | Jone Zhang |
|---|---|---|---|
| Test Date | 2024-05-23 ~ 2024-05-27 | Test Band | Band 30 |

| Voltage | Temp (°C) | Frequency Range (MHz) | | Delta (Hz) | Frequency stability (ppm) | Within Authorized Frequency Block |
|---|---|---|---|---|---|---|
| | | 2305.0 | 2315.0 | | | |
| | | $f_L$ | $f_H$ | | | |
| Normal | + 20 (Ref) | 2305.1950 | 2314.8050 | 0.00 | 0.0000 | Pass |
| | + 50 | 2305.1950 | 2314.8050 | 10.00 | 0.0043 | Pass |
| | + 40 | 2305.1950 | 2314.8050 | 11.10 | 0.0048 | Pass |
| | + 30 | 2305.1950 | 2314.8050 | -10.90 | -0.0047 | Pass |
| | + 10 | 2305.1950 | 2314.8050 | 14.20 | 0.0061 | Pass |
| | 0 | 2305.1950 | 2314.8050 | -10.20 | -0.0044 | Pass |
| | - 10 | 2305.1950 | 2314.8050 | -8.80 | -0.0038 | Pass |
| | - 20 | 2305.1950 | 2314.8050 | 10.10 | 0.0044 | Pass |
| | - 30 | 2305.1950 | 2314.8050 | 11.40 | 0.0049 | Pass |
| 15% | + 20 | 2305.1950 | 2314.8050 | 9.60 | 0.0042 | Pass |
| -15% | + 20 | 2305.1950 | 2314.8050 | 13.20 | 0.0057 | Pass |

### A.3 Transmitter Output Power Test Result

| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
|---|---|---|---|
| Test Date | 2024-05-09 | Test Band | Band 30 |

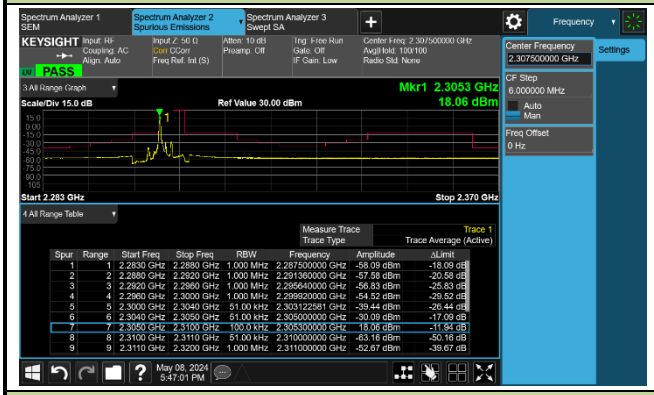
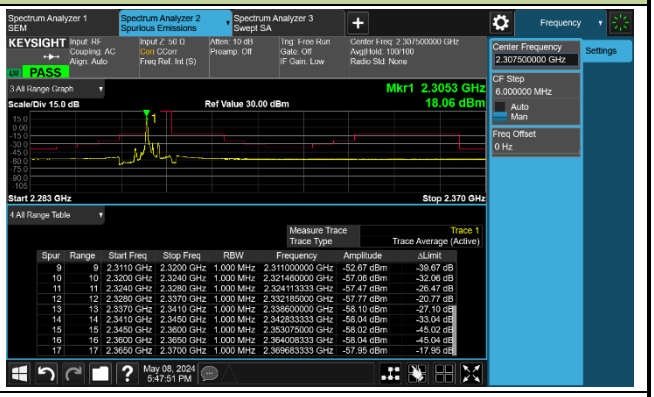
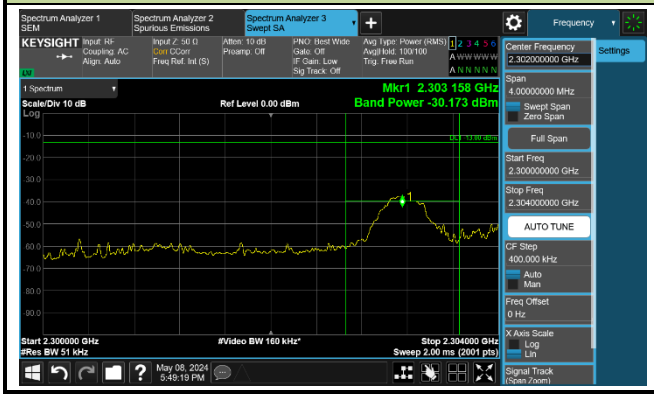
| Frequency (MHz) | Channel Bandwidth (MHz) | RB Size | RB Offset | Power Spectral Density (dBm/5MHz) | EIRP Spectral Density (dBm/5MHz) | Limit (dBm /5MHz) |
|---|---|---|---|---|---|---|
| QPSK | | | | | | |
| 2307.5 | 5 | 1 | 0 | 22.23 | 23.21 | < 23.98 |
| 2310.0 | | | | 22.23 | 23.21 | < 23.98 |
| 2312.5 | | | | 22.27 | 23.25 | < 23.98 |
| 2307.5 | 5 | 1 | 12 | 22.28 | 23.26 | < 23.98 |
| 2310.0 | | | | 22.24 | 23.22 | < 23.98 |
| 2312.5 | | | | 22.23 | 23.21 | < 23.98 |
| 2307.5 | 5 | 1 | 24 | 22.22 | 23.20 | < 23.98 |
| 2310.0 | | | | 22.18 | 23.16 | < 23.98 |
| 2312.5 | | | | 22.15 | 23.13 | < 23.98 |
| 2307.5 | 5 | 25 | 0 | 21.30 | 22.28 | < 23.98 |
| 2310.0 | | | | 21.31 | 22.29 | < 23.98 |
| 2312.5 | | | | 21.39 | 22.37 | < 23.98 |
| 2310.0 | 10 | 1 | 0 | 22.16 | 23.14 | < 23.98 |
| 2310.0 | | | 24 | 22.24 | 23.22 | < 23.98 |
| 2310.0 | | | 49 | 22.45 | 23.43 | < 23.98 |
| 2310.0 | | 50 | 0 | 19.09 | 20.07 | < 23.98 |
| Note: The EIRP Spectral Density (dBm/5MHz) = Power Spectral Density (dBm/5MHz) + Antenna Gain (dBi) | | | | | | |

| Frequency (MHz) | Channel Bandwidth (MHz) | RB Size | RB Offset | Power Spectral Density (dBm/5MHz) | EIRP Spectral Density (dBm/5MHz) | Limit (dBm /5MHz) |
|---|---|---|---|---|---|---|
| 16QAM | | | | | | |
| 2307.5 | 5 | 1 | 0 | 21.26 | 22.24 | < 23.98 |
| 2310.0 | | | | 21.35 | 22.33 | < 23.98 |
| 2312.5 | | | | 21.38 | 22.36 | < 23.98 |
| 2307.5 | 5 | 1 | 12 | 21.62 | 22.60 | < 23.98 |
| 2310.0 | | | | 21.40 | 22.38 | < 23.98 |
| 2312.5 | | | | 21.75 | 22.73 | < 23.98 |
| 2307.5 | 5 | 1 | 24 | 21.30 | 22.28 | < 23.98 |
| 2310.0 | | | | 21.15 | 22.13 | < 23.98 |
| 2312.5 | | | | 21.56 | 22.54 | < 23.98 |
| 2307.5 | 5 | 25 | 0 | 20.24 | 21.22 | < 23.98 |
| 2310.0 | | | | 20.37 | 21.35 | < 23.98 |
| 2312.5 | | | | 20.39 | 21.37 | < 23.98 |
| 2310.0 | 10 | 1 | 0 | 21.56 | 22.54 | < 23.98 |
| 2310.0 | | | 24 | 21.65 | 22.63 | < 23.98 |
| 2310.0 | | | 49 | 21.52 | 22.50 | < 23.98 |
| 2310.0 | | 50 | 0 | 17.93 | 18.91 | < 23.98 |
| Note: The EIRP Spectral Density (dBm/5MHz) = Power Spectral Density (dBm/5MHz) + Antenna Gain (dBi) | | | | | | |

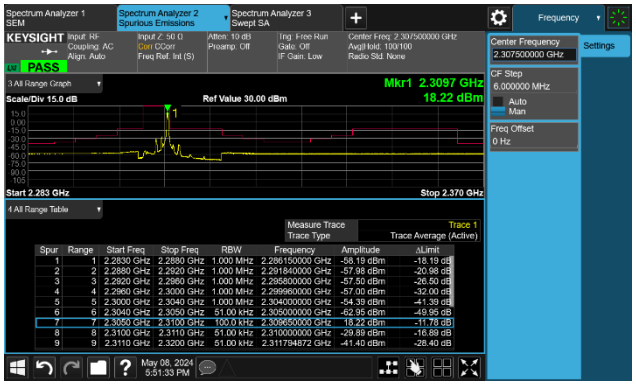
| Frequency (MHz) | Channel Bandwidth (MHz) | RB Size | RB Offset | Power Spectral Density (dBm/5MHz) | EIRP Spectral Density (dBm/5MHz) | Limit (dBm /5MHz) |
|---|---|---|---|---|---|---|
| 64QAM | | | | | | |
| 2307.5 | 5 | 1 | 0 | 19.63 | 20.61 | < 23.98 |
| 2310.0 | | | | 20.68 | 21.66 | < 23.98 |
| 2312.5 | | | | 20.50 | 21.48 | < 23.98 |
| 2307.5 | 5 | 1 | 12 | 20.43 | 21.41 | < 23.98 |
| 2310.0 | | | | 20.86 | 21.84 | < 23.98 |
| 2312.5 | | | | 20.25 | 21.23 | < 23.98 |
| 2307.5 | 5 | 1 | 24 | 20.34 | 21.32 | < 23.98 |
| 2310.0 | | | | 20.37 | 21.35 | < 23.98 |
| 2312.5 | | | | 20.37 | 21.35 | < 23.98 |
| 2307.5 | 5 | 25 | 0 | 19.22 | 20.20 | < 23.98 |
| 2310.0 | | | | 19.39 | 20.37 | < 23.98 |
| 2312.5 | | | | 19.40 | 20.38 | < 23.98 |
| 2310.0 | 10 | 1 | 0 | 19.85 | 20.83 | < 23.98 |
| 2310.0 | | | 24 | 20.35 | 21.33 | < 23.98 |
| 2310.0 | | | 49 | 20.47 | 21.45 | < 23.98 |
| 2310.0 | | 50 | 0 | 16.89 | 17.87 | < 23.98 |
| Note: The EIRP Spectral Density (dBm/5MHz) = Power Spectral Density (dBm/5MHz) + Antenna Gain (dBi) | | | | | | |

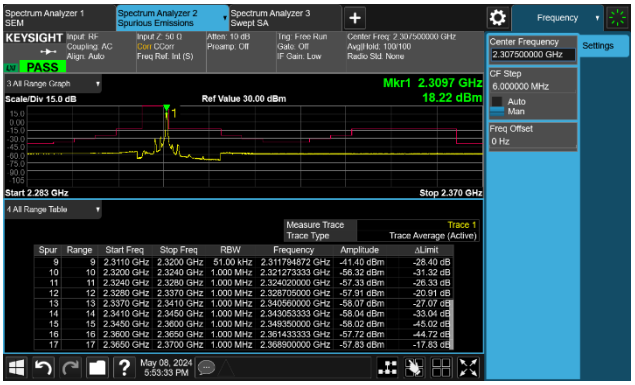
## A.4 Transmitter unwanted emissions (band-edge) Test Result

| | | | |
|---|---|---|---|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-05-08 | Test Band | Band 30 |

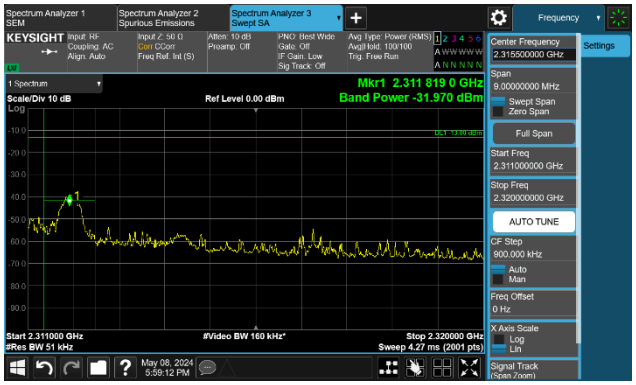
| 5MHz Channel Bandwidth - 1RB | |
|---|---|
| Low Channel_1RB_Low | |
|  |  |
| Extended Band Edge | |
|  | |

## Low Channel_1RB_High

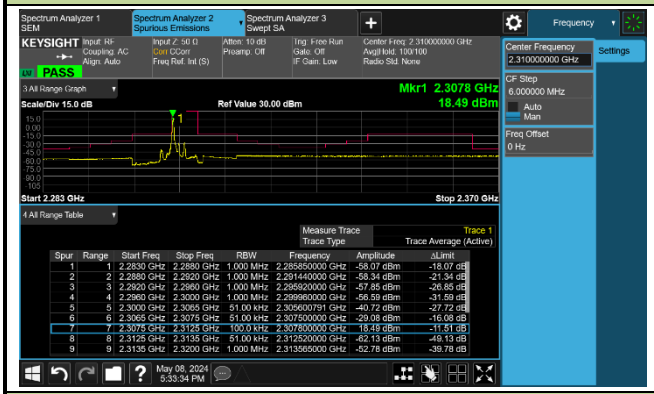


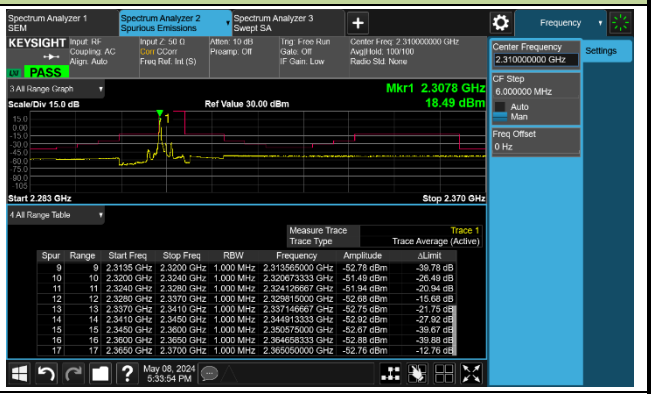




## Extended Band Edge



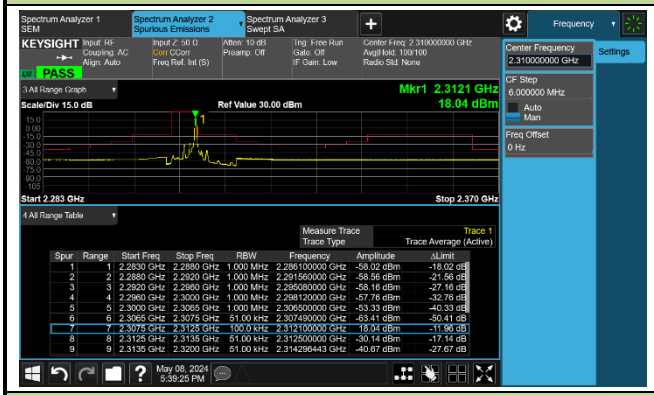

## Middle Channel_1RB_Low

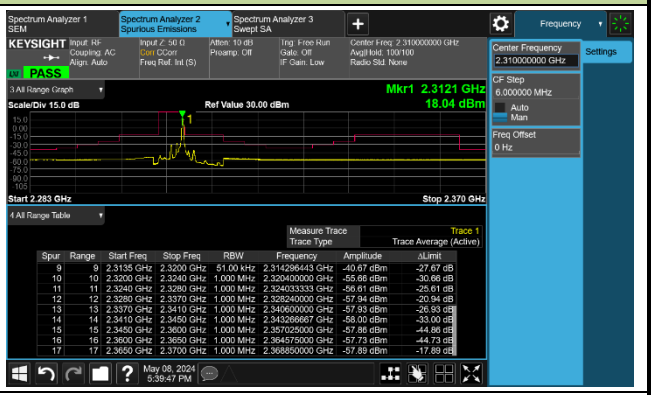


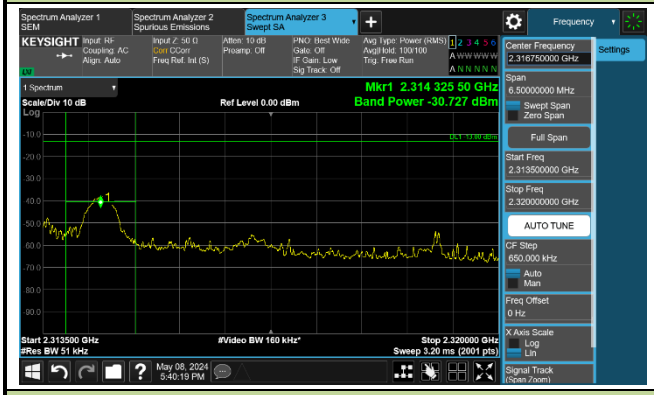

## Extended Band Edge

## Middle Channel_1RB_High

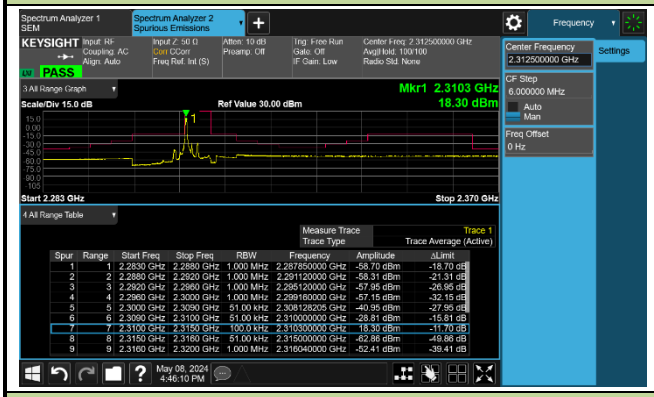


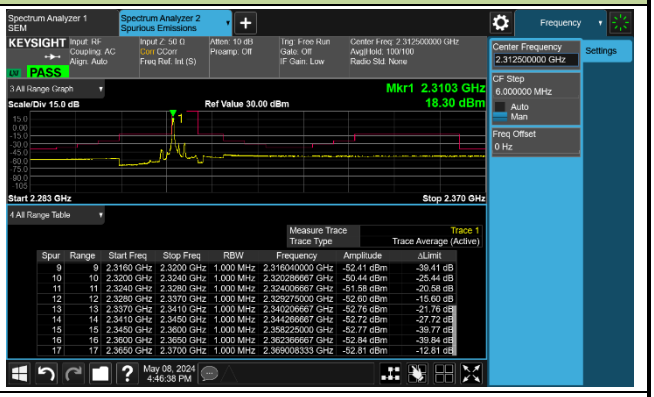




## Extended Band Edge

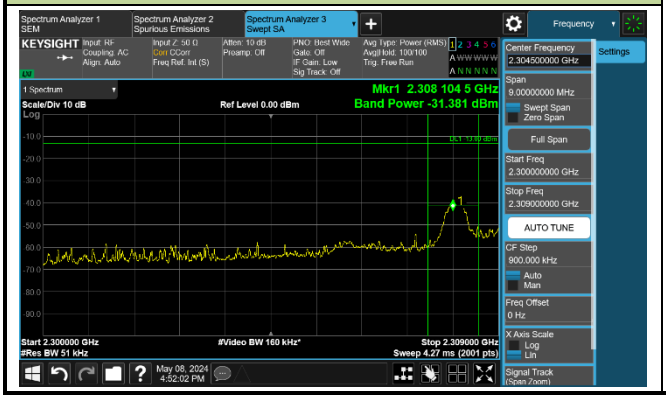



## High Channel_1RB_Low

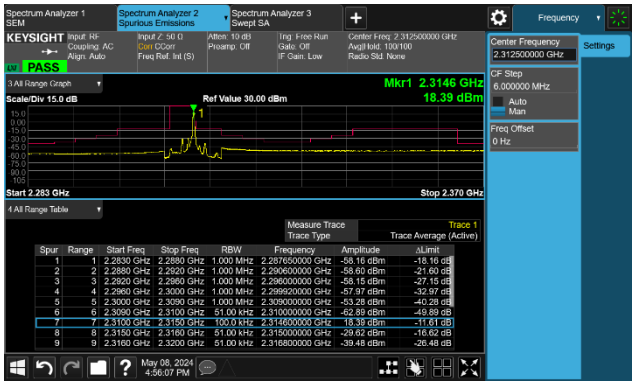


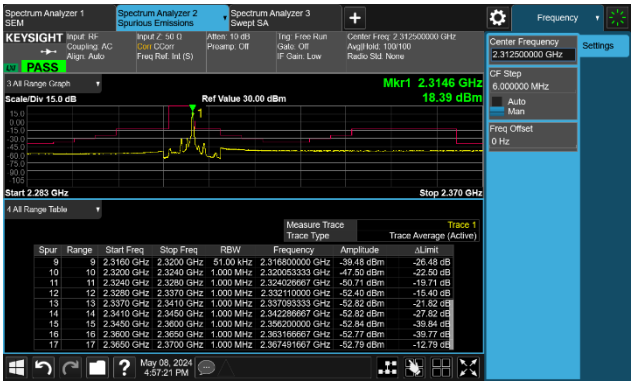




## Extended Band Edge



## High Channel_1RB_High

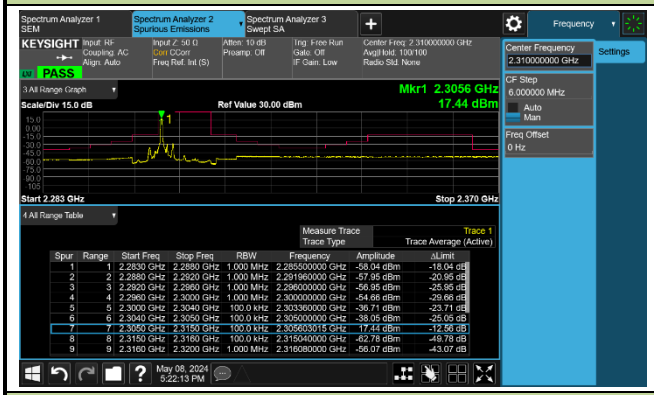


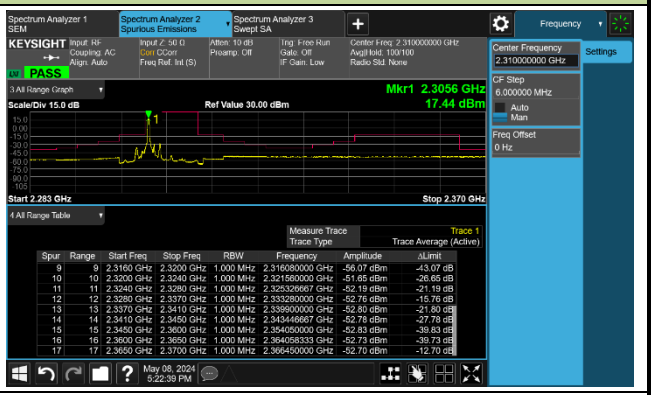




## Extended Band Edge

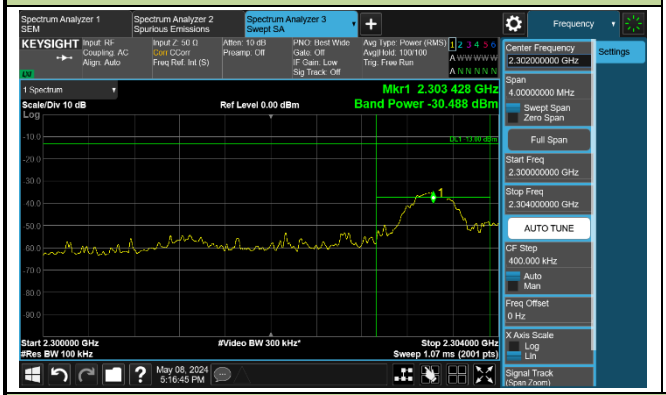
## 10MHz Channel Bandwidth - 1RB

### Middle Channel_1RB_Low

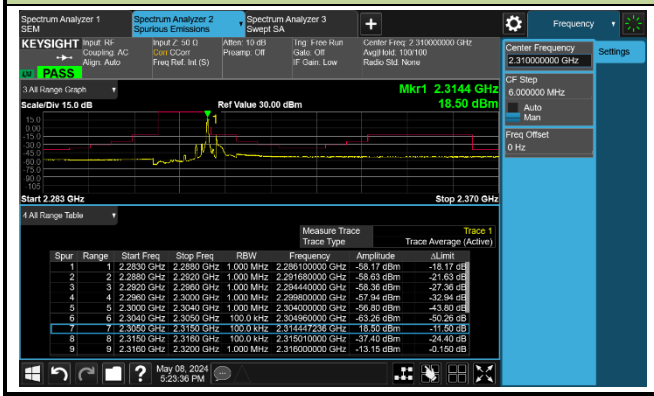


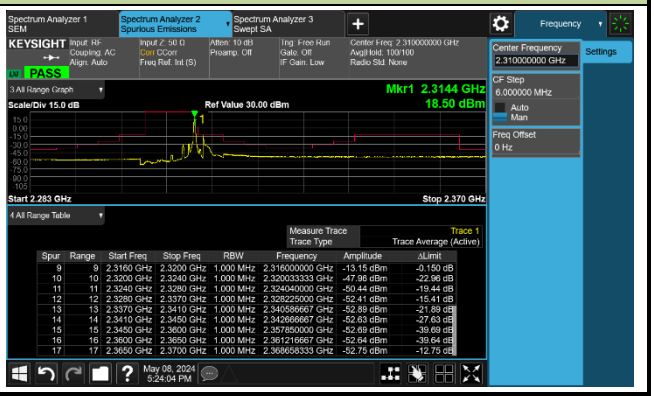




### Extended Band Edge



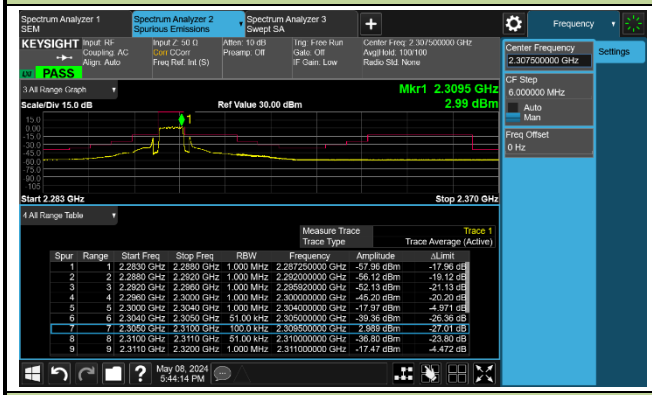

### Middle Channel_1RB_High

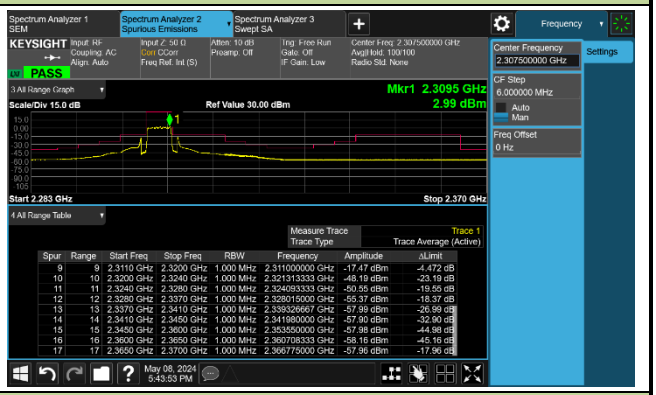


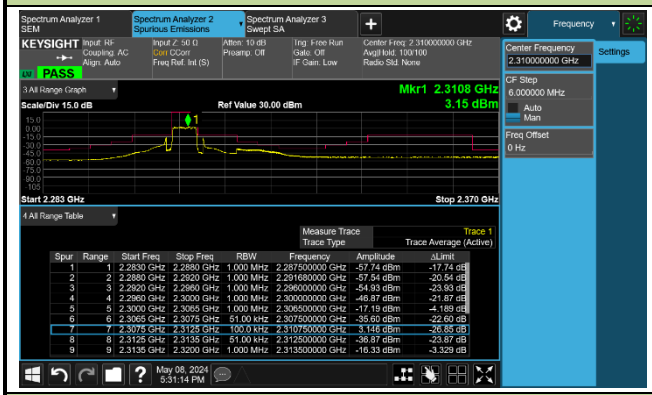
## 5MHz Channel Bandwidth - Full RB

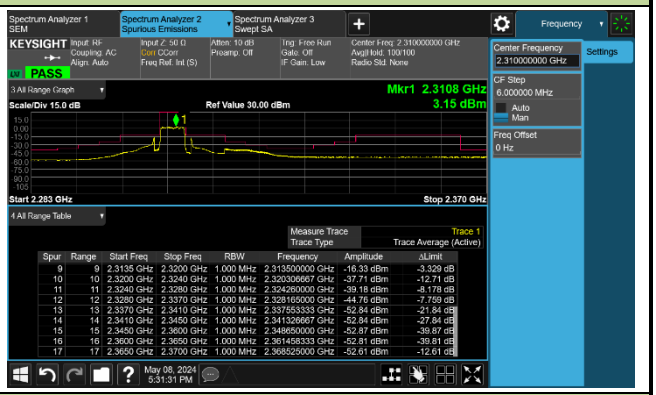
### Low Channel



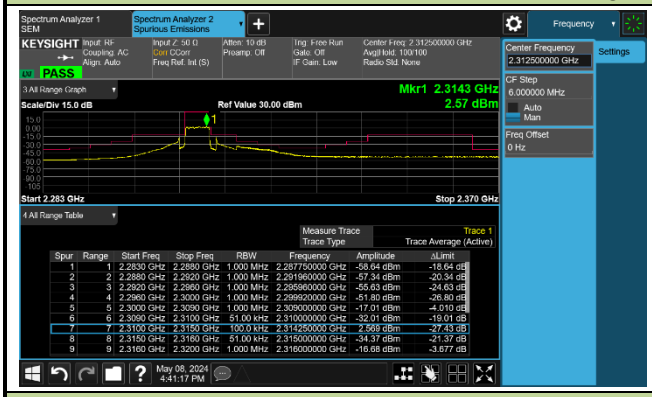



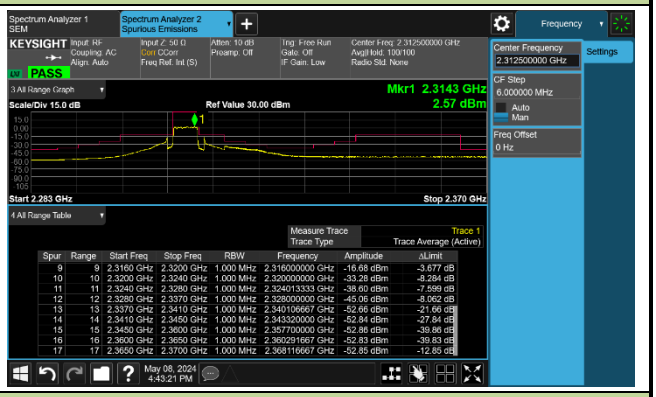

### Middle Channel



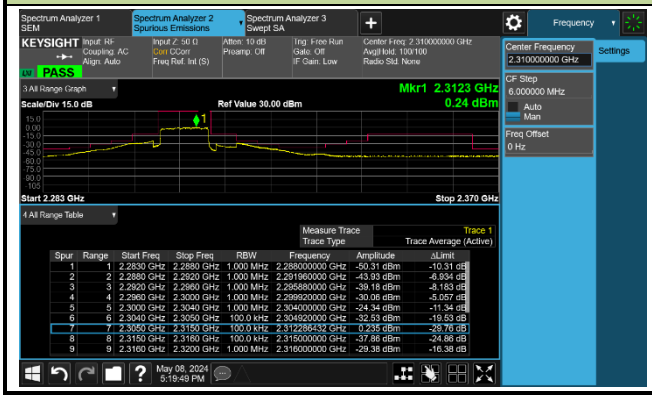

### High Channel

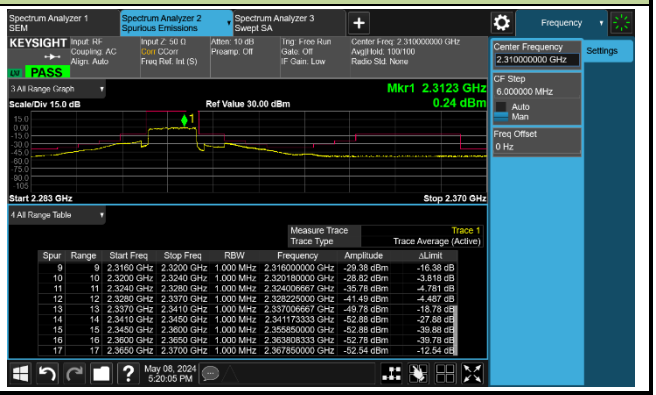



## 10MHz Channel Bandwidth - Full RB

### Middle Channel

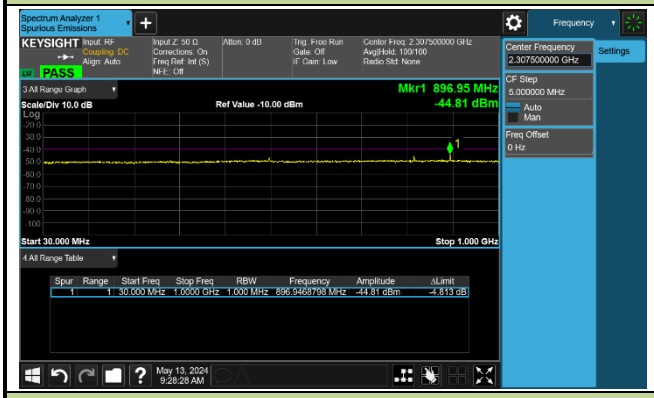
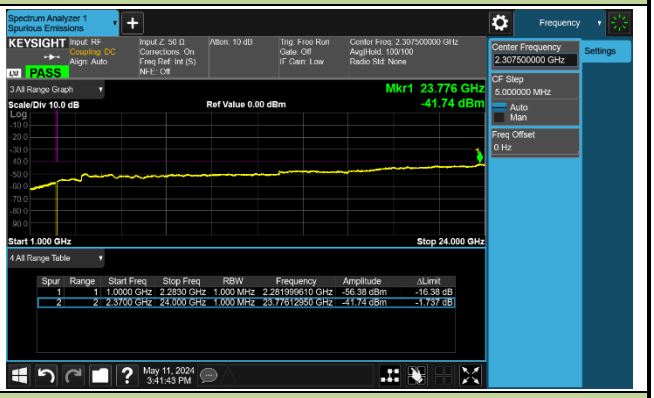
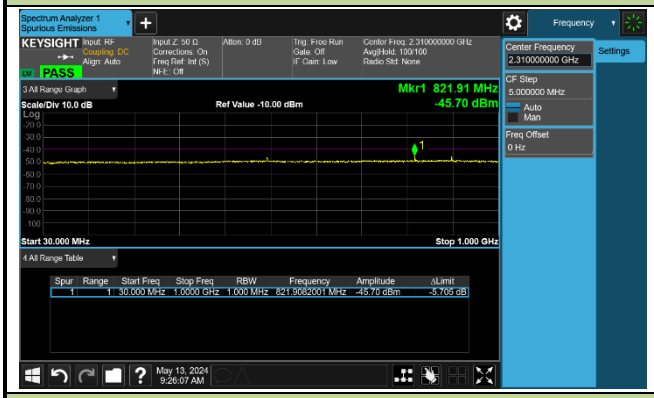
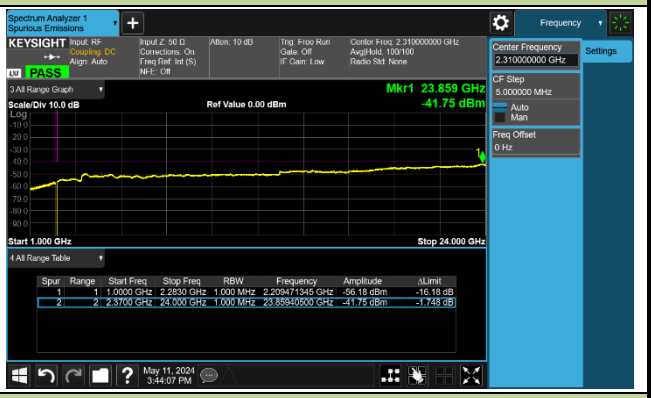
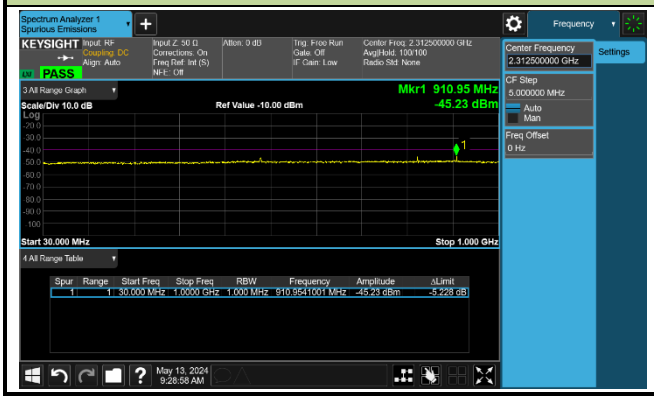
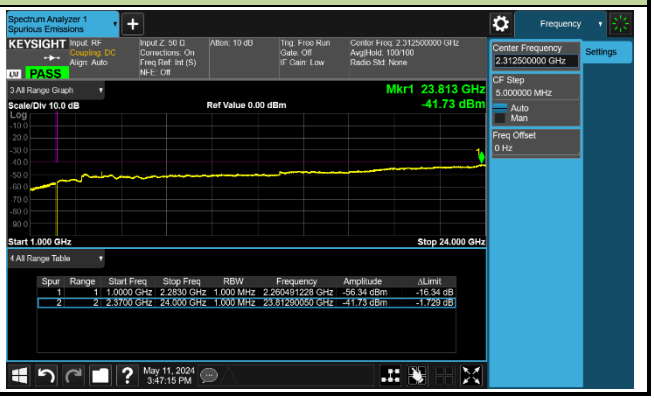


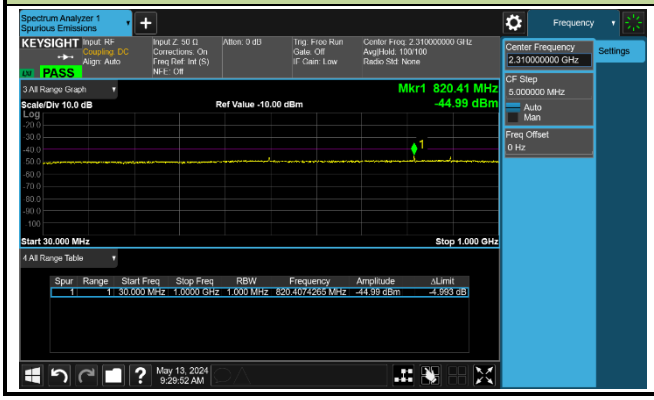
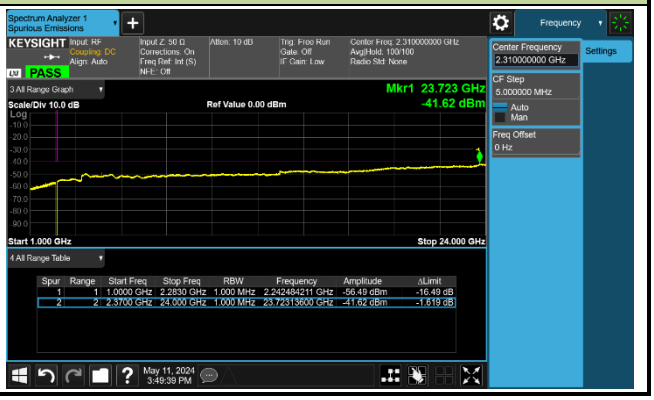



### A.5 Transmitter unwanted emissions (spurious) Test Result

| | | | |
|---|---|---|---|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-05-11 ~ 2024-05-13 | Test Band | Band 30, 1RB, QPSK |

| Channel Bandwidth (MHz) | Frequency (MHz) | Frequency Range (MHz) | Max Spurious Emissions (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|---|
| 5 | 2307.5 | 30 ~ 1000 | -44.81 | ≤ -40.00 | Pass |
| | | 1000 ~ 24000 | -41.74 | ≤ -40.00 | Pass |
| | 2310.0 | 30 ~ 1000 | -45.70 | ≤ -40.00 | Pass |
| | | 1000 ~ 24000 | -41.75 | ≤ -40.00 | Pass |
| | 2312.5 | 30 ~ 1000 | -45.23 | ≤ -40.00 | Pass |
| | | 1000 ~ 24000 | -41.73 | ≤ -40.00 | Pass |
| 10 | 2310.0 | 30 ~ 1000 | -44.99 | ≤ -40.00 | Pass |
| | | 1000 ~ 24000 | -41.62 | ≤ -40.00 | Pass |
| Note: The amplitude of Conducted Spurious emissions (frequency range from 9kHz to 30MHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report. | | | | | |

| 5MHz Channel Bandwidth | |
|---|---|
| Low Channel 30 ~ 1000MHz | Low Channel 1000 ~ 24000MHz |
|  |  |
| Middle Channel 30 ~ 1000MHz | Middle Channel 1000 ~ 24000MHz |
|  |  |
| High Channel 30 ~ 1000MHz | High Channel 1000 ~ 24000MHz |
|  |  |

| 10MHz Channel Bandwidth | |
|---|---|
| Middle Channel 30 ~ 1000MHz | Middle Channel 1000 ~ 24000MHz |
|  |  |

### A.6 Radiated Spurious Emissions Test Result

| Test Site | SIP-AC1 | Test Engineer | Fusco Pan |
|---|---|---|---|
| Test Date | 2024-05-06 ~ 2024-05-10 | Test Band | Band 30, 1RB, QPSK |

| Frequency (MHz) | Reading Level (dBμV) | Factor (dB/m) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|---|---|---|---|---|---|---|---|
| Low Channel | | | | | | | |
| 465.0 | 3.9 | 22.3 | 26.2 | 55.3 | -29.1 | Quasi-Peak | Horizontal |
| 891.8 | -1.0 | 29.4 | 28.4 | 55.3 | -26.9 | Quasi-Peak | Horizontal |
| 54.3 | 15.4 | 17.9 | 33.3 | 55.3 | -22.0 | Quasi-Peak | Vertical |
| 462.6 | 3.4 | 22.4 | 25.8 | 55.3 | -29.5 | Quasi-Peak | Vertical |
| 4451.0 | 38.7 | 3.7 | 42.4 | 55.3 | -12.9 | Peak | Horizontal |
| 10936.5 | 35.7 | 13.1 | 48.8 | 55.3 | -6.5 | Peak | Horizontal |
| 3813.5 | 39.8 | 2.6 | 42.4 | 55.3 | -12.9 | Peak | Vertical |
| 9729.5 | 36.9 | 10.5 | 47.4 | 55.3 | -7.9 | Peak | Vertical |
| Middle Channel | | | | | | | |
| 37.8 | 18.2 | 17.1 | 35.3 | 55.3 | -20.0 | Quasi-Peak | Horizontal |
| 464.1 | 4.1 | 22.3 | 26.4 | 55.3 | -28.9 | Quasi-Peak | Horizontal |
| 44.6 | 16.4 | 18.0 | 34.4 | 55.3 | -20.9 | Quasi-Peak | Vertical |
| 463.6 | 4.3 | 22.4 | 26.7 | 55.3 | -28.6 | Quasi-Peak | Vertical |
| 4111.0 | 39.4 | 3.3 | 42.7 | 55.3 | -12.6 | Peak | Horizontal |
| 8845.5 | 36.9 | 9.9 | 46.8 | 55.3 | -8.5 | Peak | Horizontal |
| 5335.0 | 36.8 | 5.9 | 42.7 | 55.3 | -12.6 | Peak | Vertical |
| 11523.0 | 34.7 | 13.6 | 48.3 | 55.3 | -7.0 | Peak | Vertical |
| High Channel | | | | | | | |
| 232.7 | 16.2 | 15.4 | 31.6 | 55.3 | -23.7 | Quasi-Peak | Horizontal |
| 469.4 | 4.4 | 22.3 | 26.7 | 55.3 | -28.6 | Quasi-Peak | Horizontal |
| 42.1 | 8.6 | 17.8 | 26.4 | 55.3 | -28.9 | Quasi-Peak | Vertical |
| 935.5 | -1.6 | 29.7 | 28.1 | 55.3 | -27.2 | Quasi-Peak | Vertical |
| 4706.0 | 38.2 | 4.3 | 42.5 | 55.3 | -12.8 | Peak | Horizontal |
| 8786.0 | 36.9 | 9.9 | 46.8 | 55.3 | -8.5 | Peak | Horizontal |
| 6491.0 | 35.4 | 7.4 | 42.8 | 55.3 | -12.5 | Peak | Vertical |
| 10715.5 | 34.8 | 12.9 | 47.7 | 55.3 | -7.6 | Peak | Vertical |

Note1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note2: The peak-detection value will always be equal to or greater than average-detection value. In a result, the peak-detection value measured by spectrum analyzer shall represent the worst-case results.

Note 3: The amplitude of Radiated transmitter spurious emissions (Frequency range from 9kHz to 30MHz and above 18GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

## Appendix B - Test Setup Photograph

Refer to “2404RSU035-UT” file.

## Appendix C - EUT Photograph

Refer to “2404RSU035-UE” file.

The End