

RF MEASUREMENT REPORT

FCC ID: XMR2023EM160RGL
Applicant: Quectel Wireless Solutions Co., Ltd
Product: LTE-A Cat 16 M.2 Module
Model No.: EM160R-GL
Brand Name: QUECTEL
FCC Rule(s): Part 2, 27
Result: Complies
Received Date: 2024-01-05
Test Date: 2024-01-07 ~ 2024-01-25

Reviewed By:

Sunny Sun

Sunny Sun

Approved By:

Robin Wu

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.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

| Report No. | Version | Description | Issue Date | Note |
|---------------|---------|----------------|------------|-------|
| 2401RSU007-U2 | V01 | Initial Report | 2024-01-30 | Valid |
| | | | | |

Note: This report is prepared for FCC Class II permissive supplement to FCC ID: XMR2023EM160RGL adding new antenna and enabling LTE Band 42/43 via SW.

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1.4. Product Information

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Product Name | LTE-A Cat 16 M.2 Module |
| Model No. | EM160R-GL |
| Brand Name | Quectel |
| IMEI | 865361050122902 (Conducted) 865361050122894 (Radiated) |
| 3GPP Specification | WCDMA Band II/IV/V LTE Band 2, 4, 5, 7, 12, 13, 14, 25, 26, 30, 38, 41, 42, 43, 48, 66 |
| Temperature Operating Range | -25 ~ 75 °C |
| Power Supply Rating | 3.1 ~ 4.4Vdc, typical 3.7Vdc |
| Remark: 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 Testing

| | |
|----------------------|----------------------------------------------------------|
| E-UTRA Specification | |
| TX Frequency Range | LTE Band 42: 3450 ~ 3550MHz, LTE Band 43: 3700 ~ 3800MHz |
| RX Frequency Range | LTE Band 42: 3450 ~ 3550MHz, LTE Band 43: 3700 ~ 3800MHz |
| Modulation | UL up to 64QAM & DL up to 256QAM |
| Power Class | 3 |

1.6. Description of Available Antennas

| Technology | Frequency Range (MHz) | Antenna Type | Model | Max Peak Gain (dBi) |
|-------------|-----------------------|--------------|-------------|---------------------|
| LTE Band 42 | 3400 ~ 3600 | PIFA | Y0QUE00ABDA | 2.35 |
| LTE Band 43 | 3600 ~ 3800 | | Y0QUE00ABDA | 1.94 |

Note 1: All antenna information (Antenna type and Peak Gain) is provided by the manufacturer.

Note 2: The typical antennas used to calculate the ERP (EIRP).

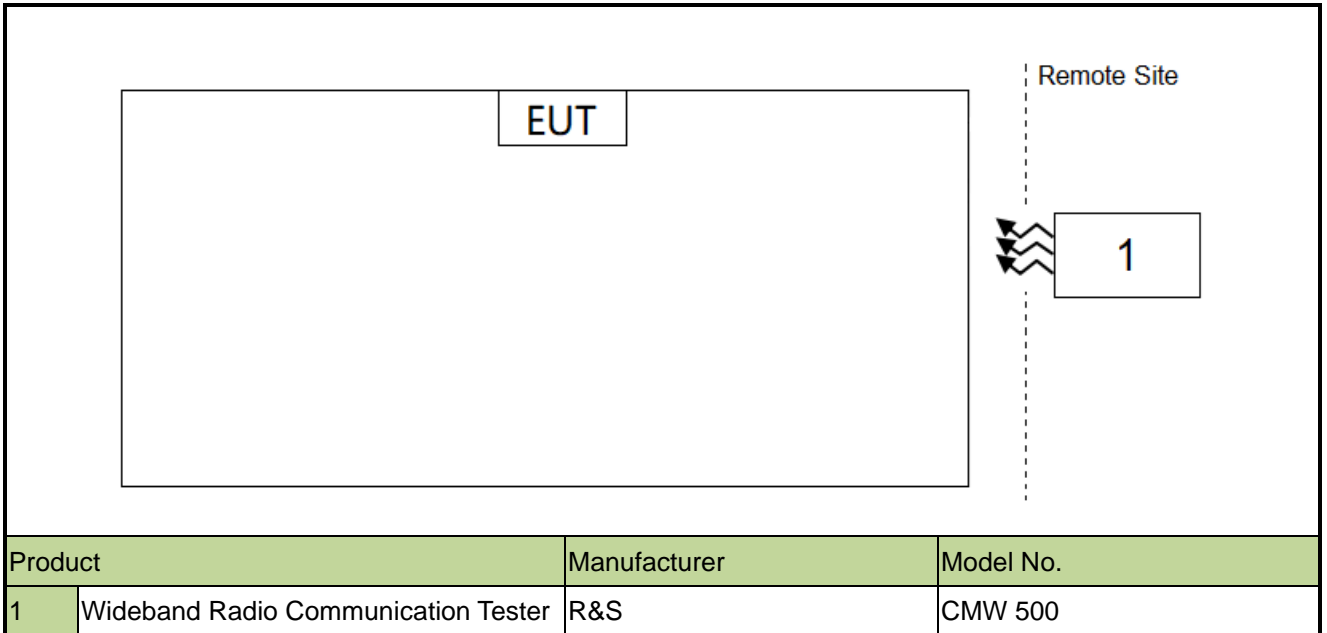
1.7. Test Methodology

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 2, 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



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 | 2024-05-23 | SIP-SR1 |
| Signal Analyzer | Keysight | N9010B | MRTSUE06559 | 1 year | 2024-12-17 | SIP-SR1 |
| DC POWER MODULE | Keysight | N6743B | MRTSUE06905 | N/A | N/A | SIP-SR1 |
| DC POWER MODULE | Keysight | N6743B | MRTSUE06906 | N/A | N/A | SIP-SR1 |
| Signal Analyzer | Keysight | N9021B | MRTSUE06915 | 1 year | 2024-12-17 | SIP-SR1 |
| Temperature Chamber | BAOYT | BYG-80CL | MRTSUE06932 | 1 year | 2024-02-12 | SIP-SR1 |
| Shielding Room | MIX-BEP | SIP-SR1 | MRTSUE06948 | N/A | N/A | SIP-SR1 |
| Directional Coupler | MVE | MVE4816-10 | MRTSUE11117 | 1 year | 2024-08-24 | SIP |
| Radio Communication Analyzer | Anritsu | MT8821C | MRTSUE06960 | 1 year | 2024-07-06 | WZ-SR6 |
| TRILOG Antenna | Schwarzbeck | VULB 9162 | MRTSUE06022 | 1 year | 2024-05-15 | WZ-AC2 |
| Loop Antenna | Schwarzbeck | FMZB 1519 | MRTSUE06025 | 1 year | 2024-09-17 | WZ-AC2 |
| EMI Test Receiver | Agilent | N9038A | MRTSUE06125 | 1 year | 2024-05-23 | WZ-AC2 |
| Horn Antenna | Schwarzbeck | BBHA 9120D | MRTSUE06171 | 1 year | 2024-10-11 | WZ-AC2 |
| Preamplifier | Schwarzbeck | BBV 9718 | MRTSUE06176 | 1 year | 2024-05-07 | WZ-AC2 |
| Anechoic Chamber | RIKEN | WZ-AC2 | MRTSUE06213 | 1 year | 2024-04-20 | WZ-AC2 |
| Horn Antenna | Schwarzbeck | BBHA 9170 | MRTSUE06597 | 1 year | 2024-11-04 | WZ-AC2 |
| Preamplifier | EMCI | EMC184045SE | MRTSUE06640 | 1 year | 2025-01-11 | WZ-AC2 |
| Preamplifier | EMCI | EMC051845SE | MRTSUE06987 | 1 year | 2024-09-07 | WZ-AC2 |
| Thermohygrometer | testo | 608-H1 | MRTSUE11038 | 1 year | 2024-10-25 | WZ-AC2 |
| Thermohygrometer | testo | 608-H1 | MRTSUE11263 | 1 year | 2024-11-07 | WZ-AC2 |
| Directional Coupler | MVE | MVE4912-10 | MRTSUE07051 | 1 year | 2024-08-23 | WZ |
| Attenuator | MVE | MVE2365 | MRTSUE07070 | 1 year | 2024-11-27 | WZ |
| Attenuator | MVE | MVE2365 | MRTSUE07071 | 1 year | 2024-11-27 | WZ |

| Software | Version | Function |
|--------------------|---------|------------------------|
| EMI Software | V3.0.0 | EMI Test Software |
| Controller_MF 7802 | 2.03C | RE Antenna & Turntable |

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 |
| <p>The maximum measurement uncertainty is evaluated as:</p> <p>Coaxial: 9kHz~30MHz: 2.59dB</p> <p>Coplanar: 9kHz~30MHz: 2.60dB</p> <p>Horizontal: 30MHz~200MHz: 3.85dB 200MHz~1GHz: 4.36dB 1GHz~40GHz: 4.98dB</p> <p>Vertical: 30MHz~200MHz: 4.06dB 200MHz~1GHz: 5.28dB 1GHz~40GHz: 4.91dB</p> |
| Conducted Spurious Emissions |
| <p>Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.47dB</p> |
| Output Power |
| <p>Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.66dB</p> |
| Occupied Bandwidth |
| <p>Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 69.28kHz</p> |
| Frequency Stability |
| <p>Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 8.04Hz</p> |

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(j)(3) (k)(3) | Equivalent Isotropically Radiated Power | | Pass |
| 27.50(j)(4) (k)(4) | Peak to Average Ratio | | Pass |
| 2.1051, 27.53(i)(2) (n)(2) | Band Edge | | Pass |
| 2.1051, 27.53(i)(2) (n)(2) | Spurious Emissions | Radiated | Pass |
| 2.1051, 27.53(i)(2) (n)(2) | Spurious Emissions | | |

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 of the 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, Peak to Average Ratio, Channel Band Edge, Conducted Spurious Emission, Radiated Spurious Emission were presented the 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.

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.

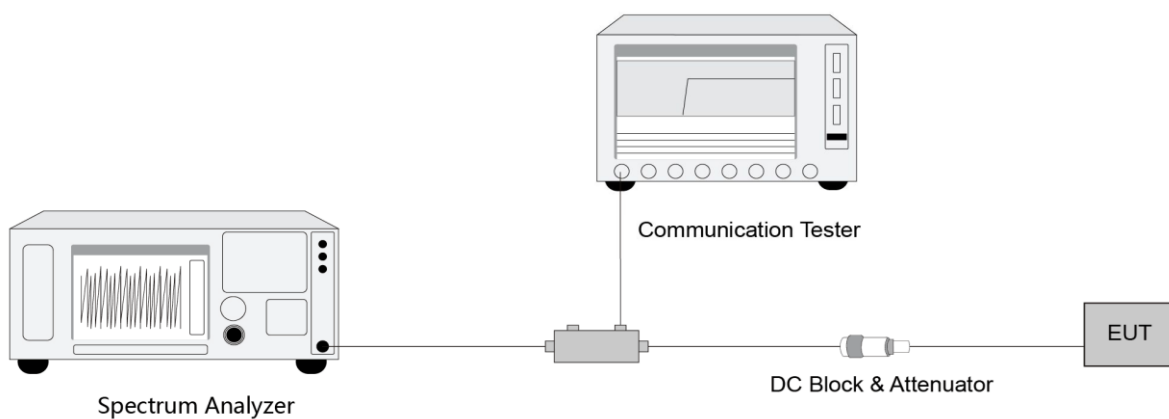
5.2.2. Test Procedure

ANSI C63.26-2015 - Section 5.4

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 $\geq 3 \times$ 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 measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

5.3.2. Test Procedure

ANSI C63.26-2015 - Section 5.4 & 5.6

5.3.3. Test Setting

1. Use the occupied bandwidth function of the instrument and record the low edge for low channel occupancy bandwidth and the high edge for high channel occupancy bandwidth.
2. Change the temperature of equipment and repeat Steps 1.
3. Change the Voltage of equipment and repeat Steps 1.
4. Use the frequency error function of the instrument and record the frequency error.
5. Change the temperature of equipment and repeat Steps 4.
6. Change the Voltage of equipment and repeat Steps 4.

Frequency Stability Under Temperature Variations:

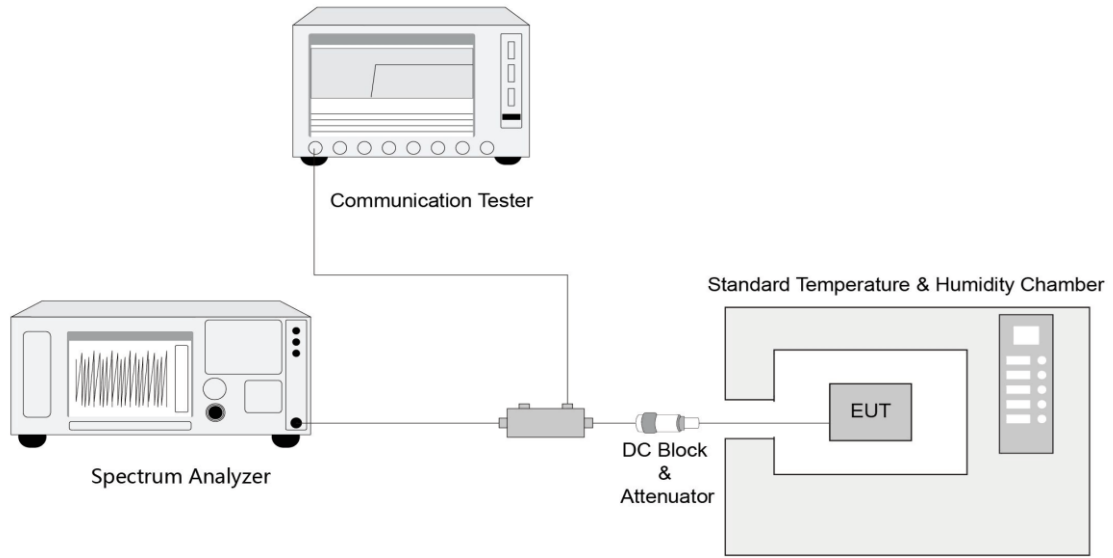
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain 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 input voltage to specify extreme voltage variation ($\pm 15\%$) and endpoint, record the maximum frequency change.

5.3.4. Test Setup



5.3.5. Test Result

Refer to Appendix A.2.

5.4. Equivalent Isotropically Radiated Power Measurement

5.4.1. Test Limit

Band 42:

Mobile devices are limited to 1Watt (30 dBm) EIRP.

Band 43:

Mobile and portable stations are limited to 1 Watt EIRP.

5.4.2. Test Procedure

ANSI C63.26-2015 - Section 5.2

5.4.3. Test Setting

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.

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

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_{\text{T}}$$

where

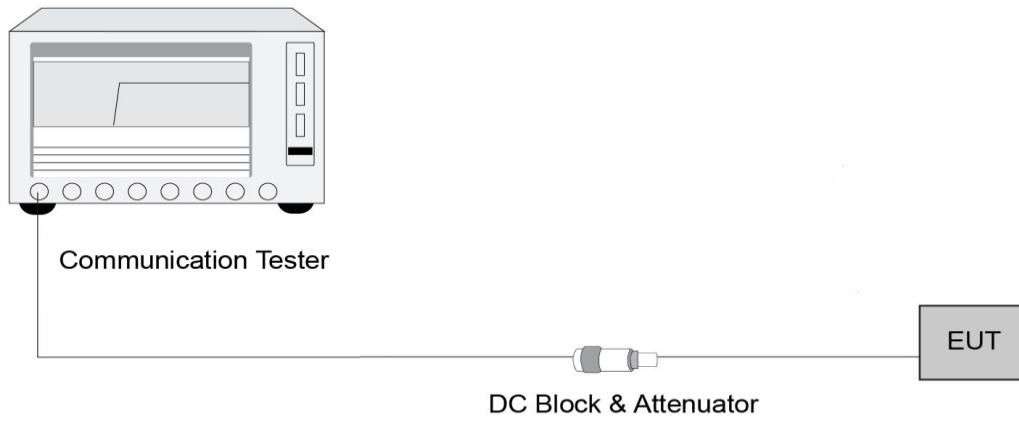
ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , e.g., dBm or dBW)

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)

$$\text{ERP} = \text{EIRP} - 2.15$$

5.4.4. Test Setup



5.4.5. Test Result

Refer to Appendix A.3.

5.5. Peak to Average Ratio Measurement

5.5.1. Test Limit

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

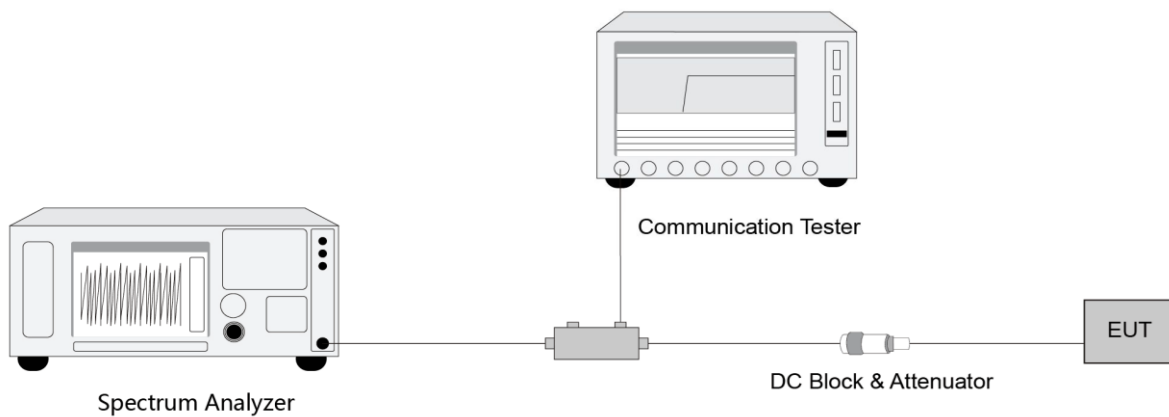
5.5.2. Test Procedure

ANSI C63.26-2015 - Section 5.2.3.4 (CCDF).

5.5.3. Test Setting

1. Set the resolution / measurement bandwidth \geq signal's occupied bandwidth
2. Set the number of counts to a value that stabilizes the measured CCDF curve
3. Record the maximum PARR level associated with a probability of 0.1%

5.5.4. Test Setup



5.5.5. Test Result

Refer to Appendix A.4

5.6. Band Edge Measurement

5.6.1. Test Limit

27.53 (n)(2)

For mobile operations in the 3450–3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz.

27.53 (l)(2)

For mobile operations in the 3700–3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (l)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz.

5.6.2. Test Procedure

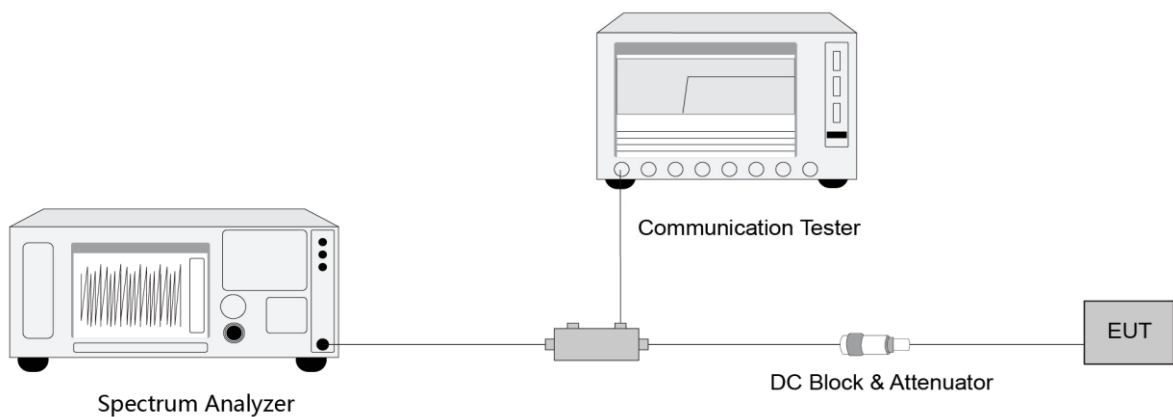
ANSI C63.26-2015 - Section 5.7

5.6.3. Test Setting

1. Set the analyzer frequency to low or high channel
2. $RBW \geq$ The nominal RBW shall be in the range of 1% of the anticipated OBW (in the 1MHz band immediately outside and adjacent to the band edge). 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 OBW), 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. $VBW \geq 3*RBW$
4. Sweep time = auto

5. Detector = power averaging (rms)
6. Set sweep trigger to “free run.”
7. User gate triggered such that the analyzer only sweeps when the device is transmitting at full power
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.

5.6.4. Test Setup



5.6.5. Test Result

Refer to Appendix A.5.

5.7. Conducted Spurious Emissions Measurement

5.7.1. 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 10th 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 attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

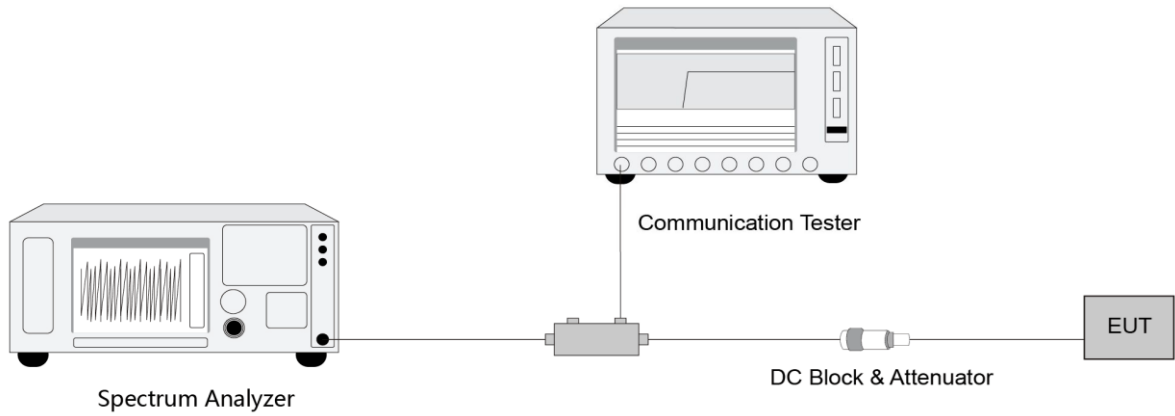
5.7.2. Test Procedure

ANSI C63.26-2015 - Section 5.7

5.7.3. Test Setting

1. Set the analyzer frequency to low, mid, high channel.
2. RBW = 1MHz
3. VBW $\geq 3 \cdot$ RBW
4. Sweep time = auto
5. Detector = power averaging (rms)
6. Set sweep trigger to "free run."
7. User gate triggered such that the analyzer only sweeps when the device is transmitting at full power.
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.

5.7.4. Test Setup



5.7.5. Test Result

Refer to Appendix A.6

5.8. Radiated Spurious Emissions Measurement

5.8.1. Test Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm.

E (dB μ V/m) = EIRP (dBm) - 20 log D + 104.8; where D is the measurement distance in meters. The emission limit equal to 82.3dB μ V/m.

5.8.2. Test Procedure

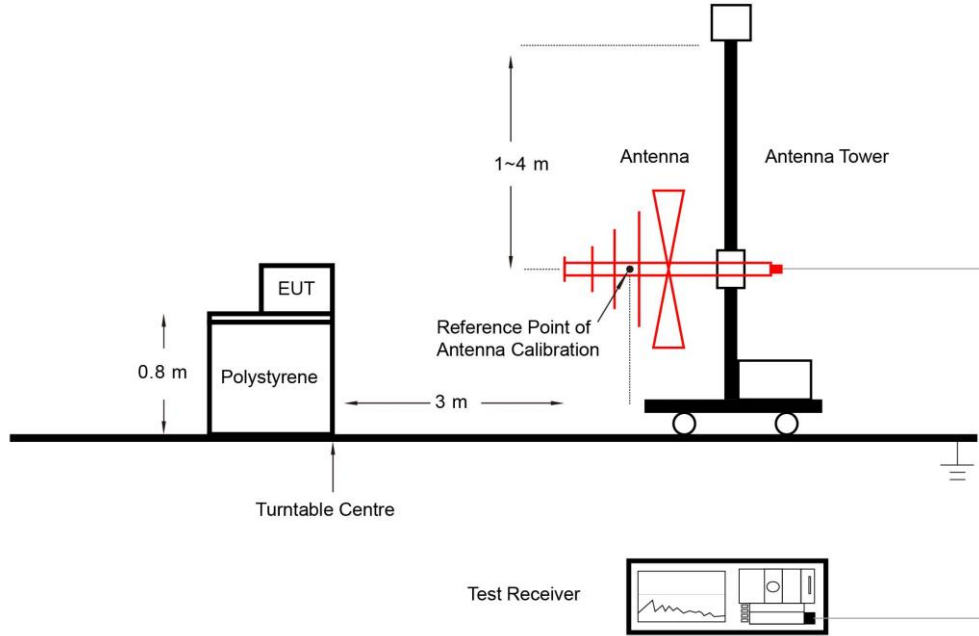
ANSI C63.26-2015 - Section 5.2.7 & 5.5

5.8.3. Test Setting

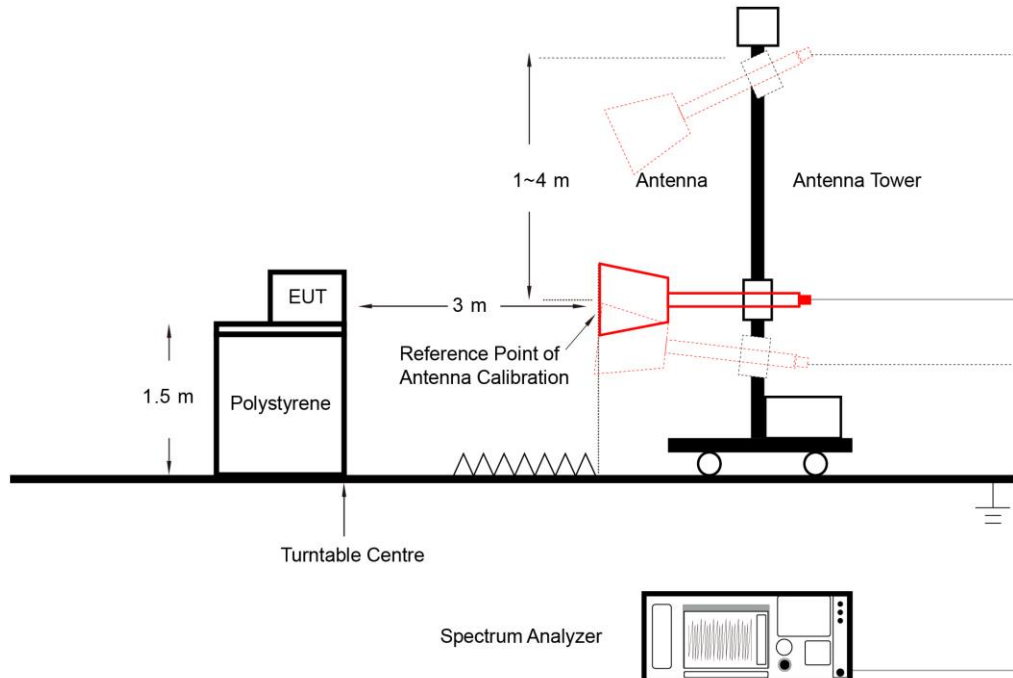
1. RBW = 1MHz
2. VBW \geq 3*RBW
3. Sweep time \geq 10 \times (number of points in sweep) \times (transmission symbol period)
4. Detector = Peak
5. Trace mode = max hold
6. The trace was allowed to stabilize

5.8.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



5.8.5. Test Result

Refer to Appendix A.7.

Appendix A - Test Result

A.1 Occupied Bandwidth Test Result

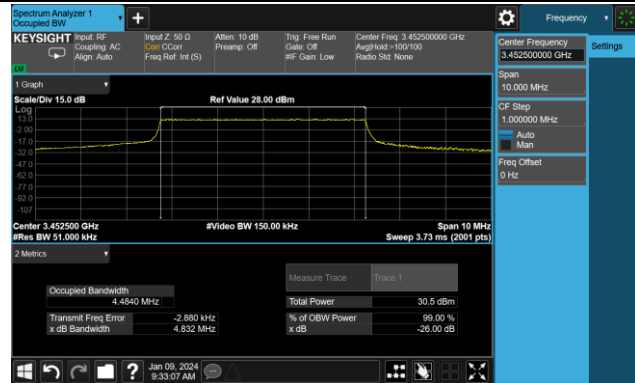
| | | | |
|-----------|-------------------------|---------------|--------------|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-01-07 ~ 2024-01-09 | Test Band | LTE Band 42 |

| Bandwidth (MHz) | Frequency (MHz) | 99% Bandwidth (MHz) |
|-----------------|-----------------|---------------------|
| QPSK | | |
| 5 | 3452.5 | 4.48 |
| | 3500.0 | 4.47 |
| | 3547.5 | 4.47 |
| 10 | 3455.0 | 8.95 |
| | 3500.0 | 8.96 |
| | 3545.0 | 8.96 |
| 15 | 3457.5 | 13.41 |
| | 3500.0 | 13.43 |
| | 3542.5 | 13.41 |
| 20 | 3460.0 | 17.87 |
| | 3500.0 | 17.90 |
| | 3540.0 | 17.90 |
| 16QAM | | |
| 5 | 3452.5 | 4.47 |
| | 3500.0 | 4.47 |
| | 3547.5 | 4.47 |
| 10 | 3455.0 | 8.93 |
| | 3500.0 | 8.96 |
| | 3545.0 | 8.94 |
| 15 | 3457.5 | 13.45 |
| | 3500.0 | 13.43 |
| | 3542.5 | 13.44 |
| 20 | 3460.0 | 17.86 |
| | 3500.0 | 17.89 |
| | 3540.0 | 17.89 |

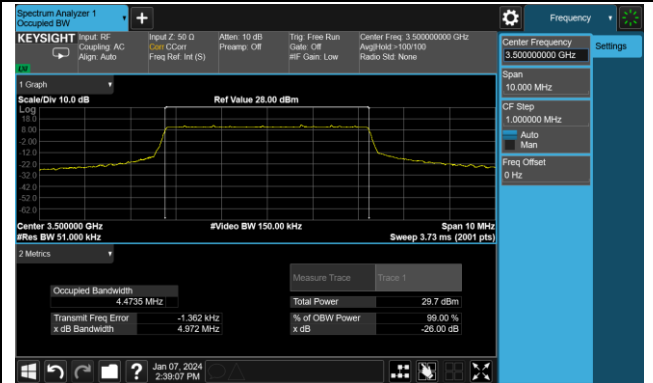
| 64QAM | | |
|-------|--------|-------|
| 5 | 3452.5 | 4.46 |
| | 3500.0 | 4.48 |
| | 3547.5 | 4.48 |
| 10 | 3455.0 | 8.95 |
| | 3500.0 | 8.97 |
| | 3545.0 | 8.96 |
| 15 | 3457.5 | 13.42 |
| | 3500.0 | 13.40 |
| | 3542.5 | 13.42 |
| 20 | 3460.0 | 17.88 |
| | 3500.0 | 17.85 |
| | 3540.0 | 17.87 |

99% Bandwidth - 5MHz Bandwidth_QPSK

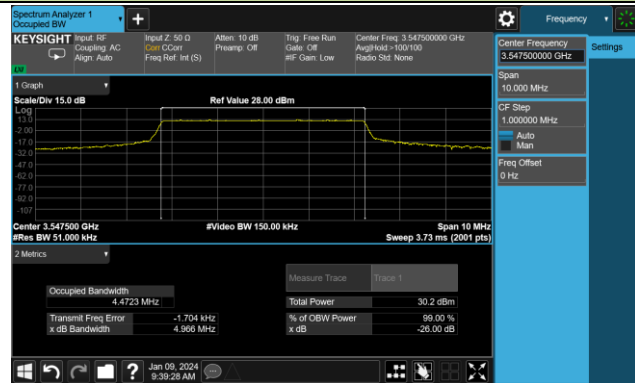
Low Channel



Middle Channel

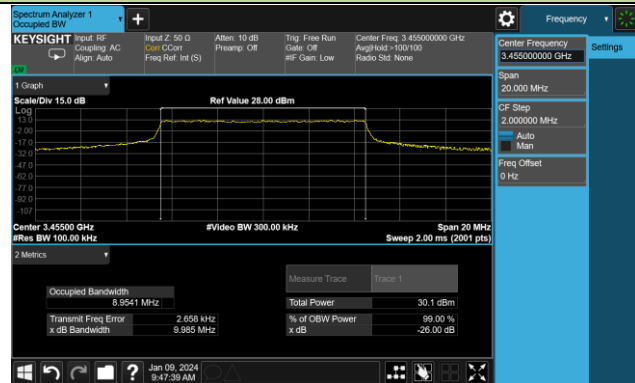


High Channel

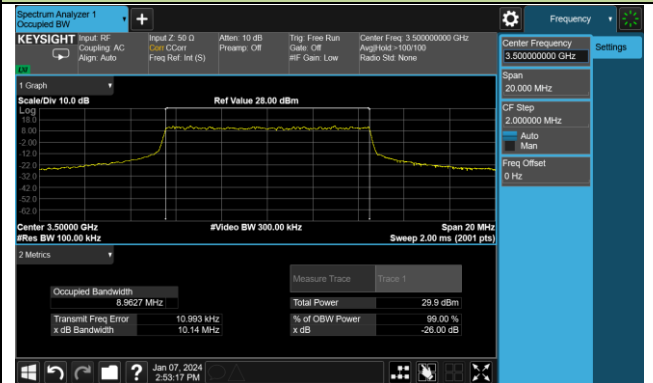


99% Bandwidth - 10MHz Bandwidth_QPSK

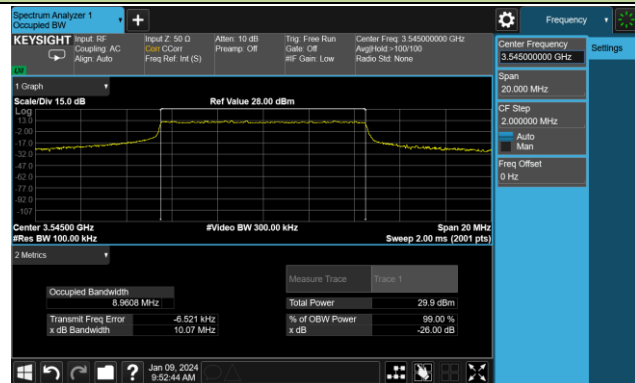
Low Channel



Middle Channel

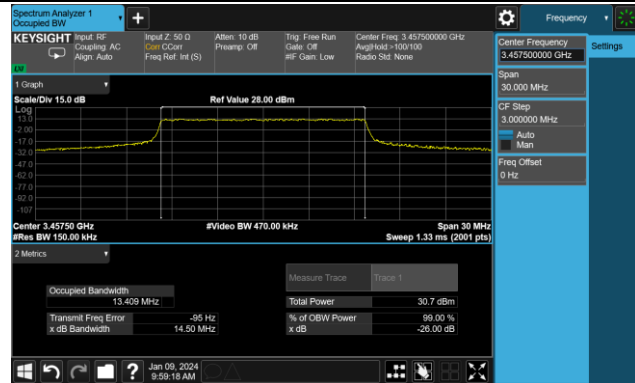


High Channel

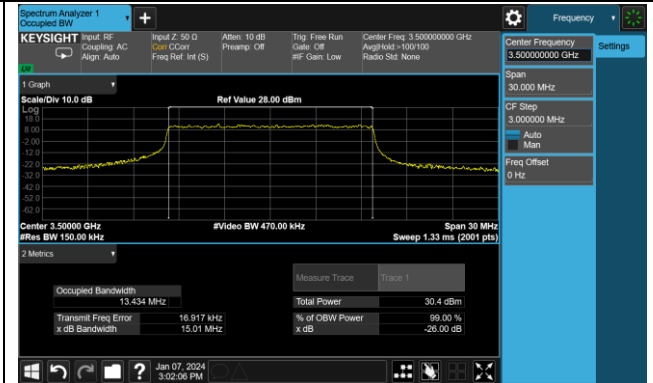


99% Bandwidth - 15MHz Bandwidth_QPSK

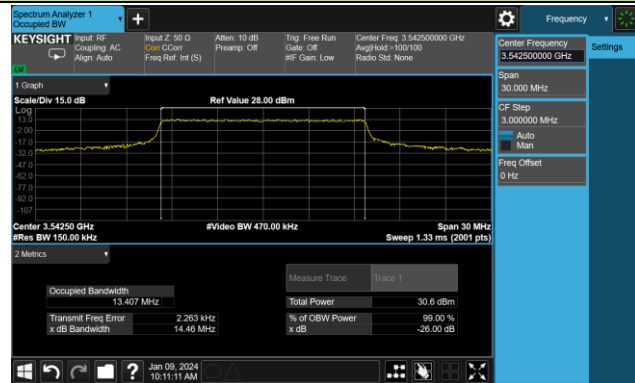
Low Channel



Middle Channel



High Channel

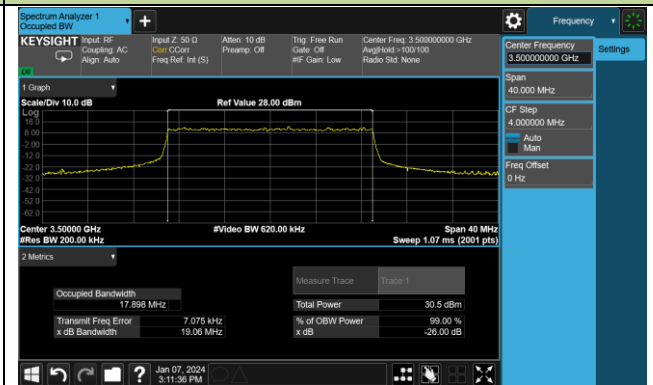


99% Bandwidth - 20MHz Bandwidth_QPSK

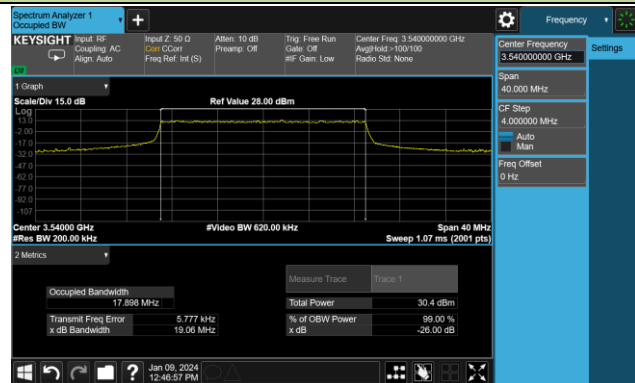
Low Channel



Middle Channel

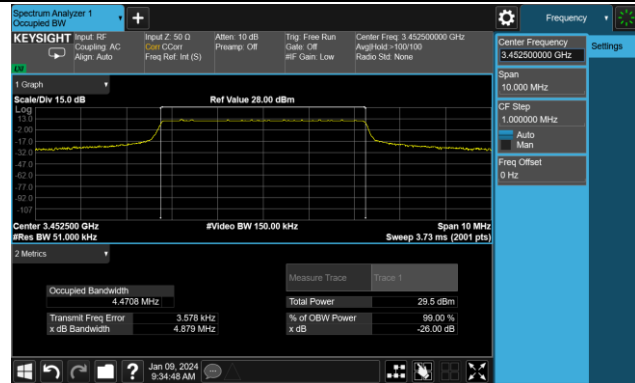


High Channel

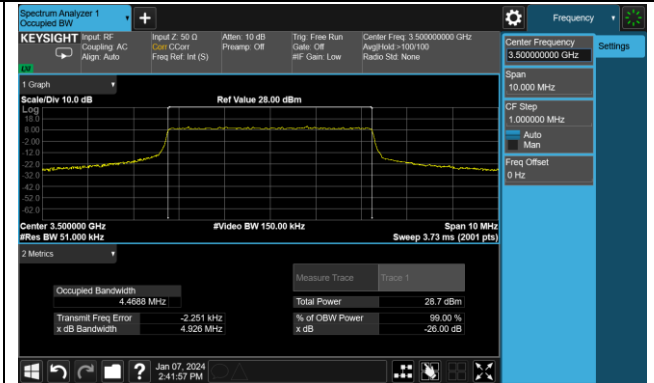


99% Bandwidth - 5MHz Bandwidth_16QAM

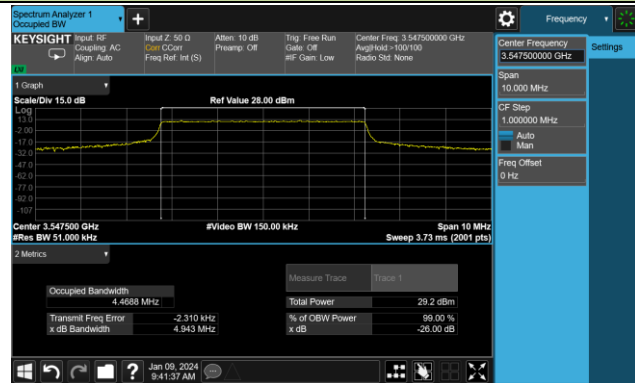
Low Channel



Middle Channel

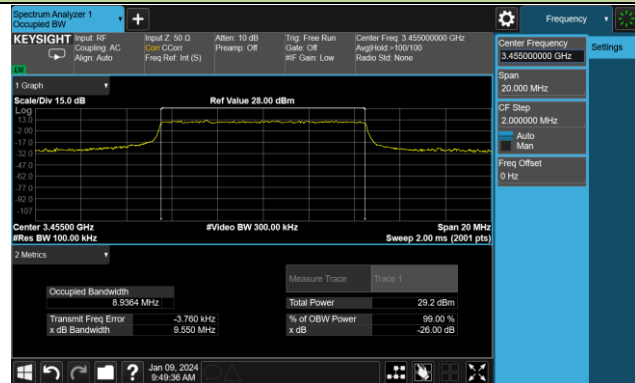


High Channel

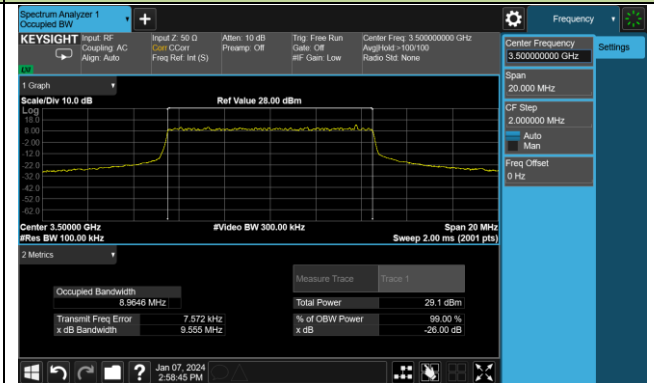


99% Bandwidth - 10MHz Bandwidth_16QAM

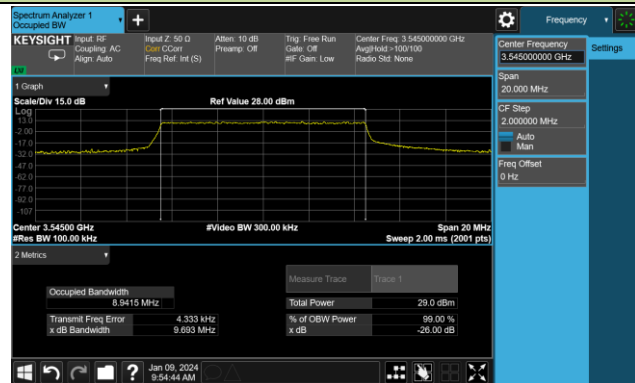
Low Channel



Middle Channel

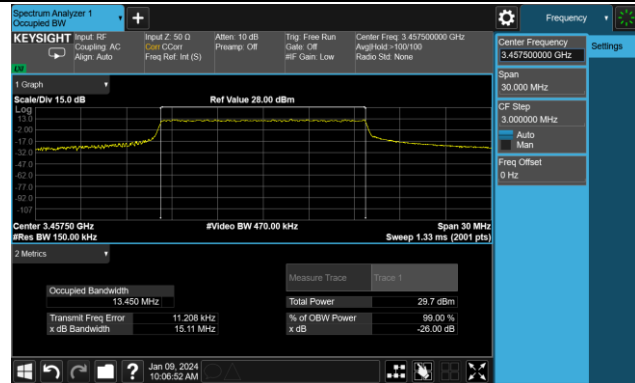


High Channel

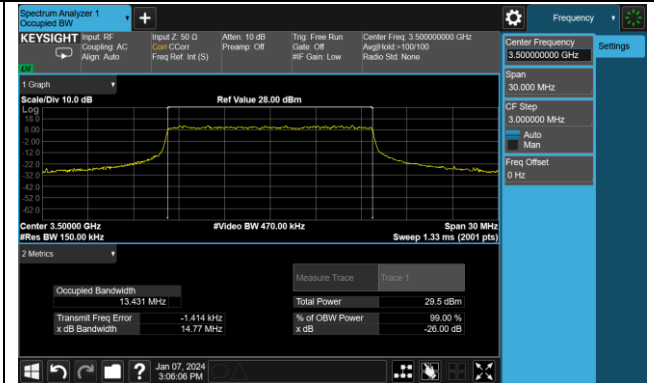


99% Bandwidth - 15MHz Bandwidth_16QAM

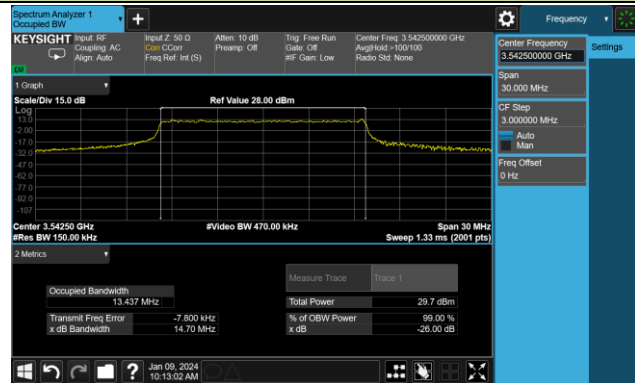
Low Channel



Middle Channel

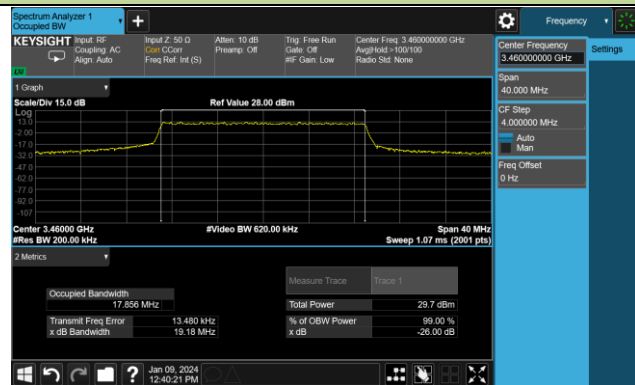


High Channel



99% Bandwidth - 20MHz Bandwidth_16QAM

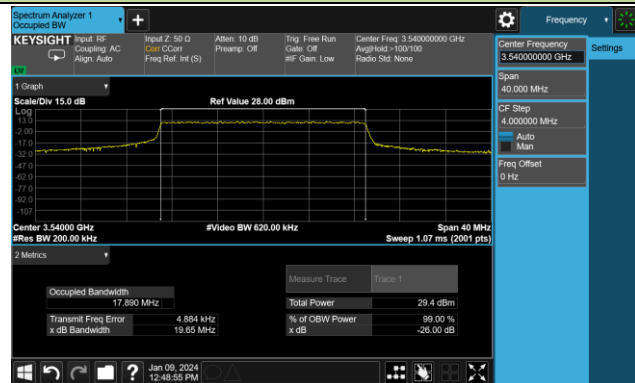
Low Channel



Middle Channel

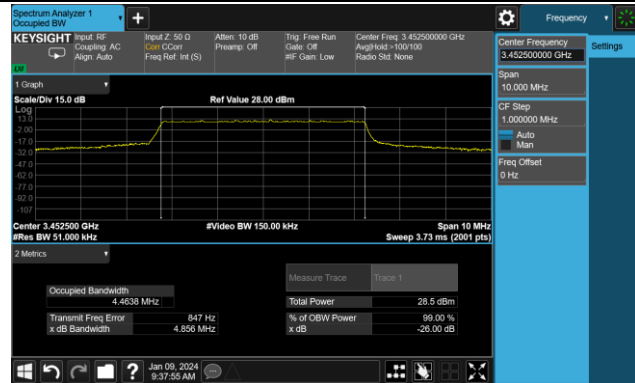


High Channel

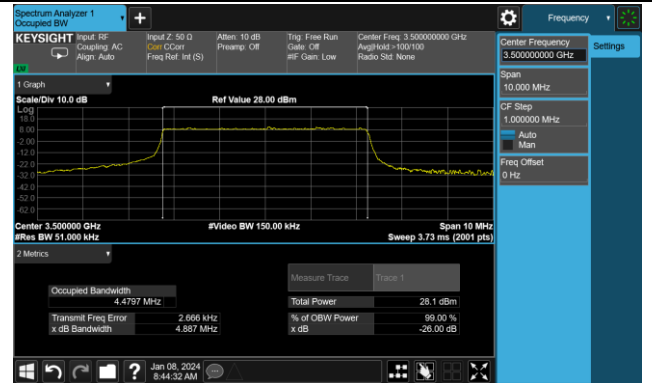


99% Bandwidth - 5MHz Bandwidth_64QAM

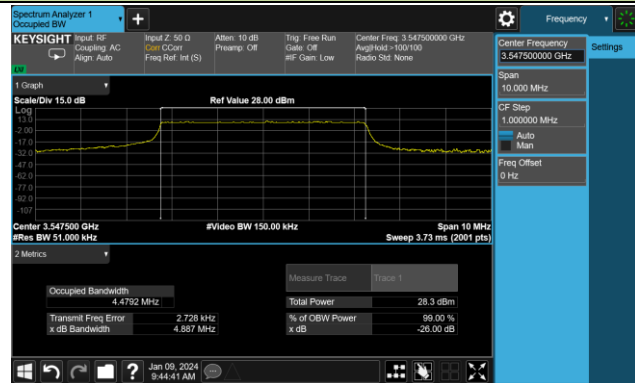
Low Channel



Middle Channel

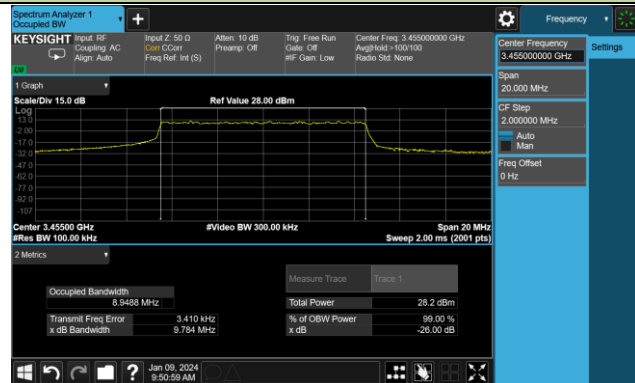


High Channel

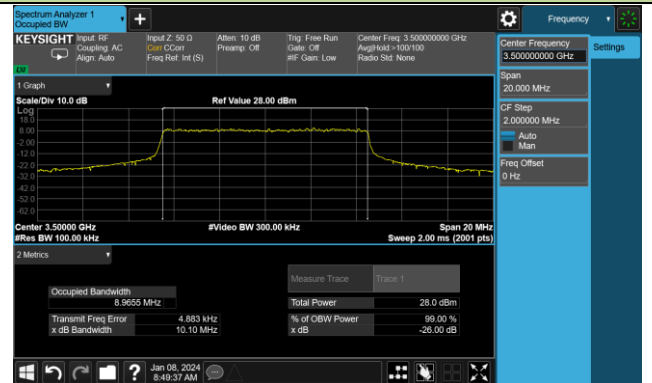


99% Bandwidth - 10MHz Bandwidth_64QAM

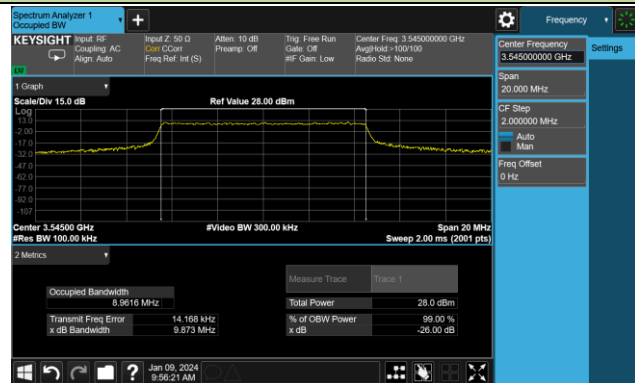
Low Channel



Middle Channel

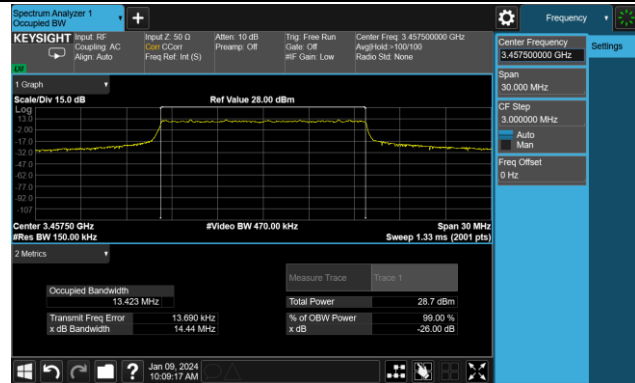


High Channel

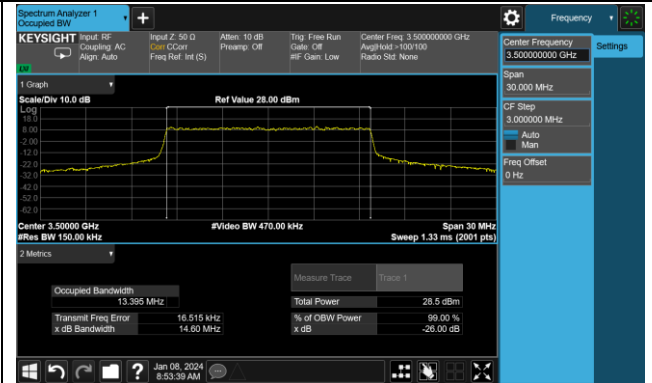


99% Bandwidth - 15MHz Bandwidth_64QAM

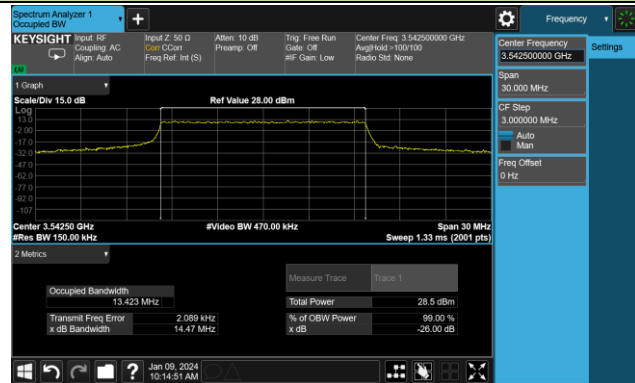
Low Channel



Middle Channel

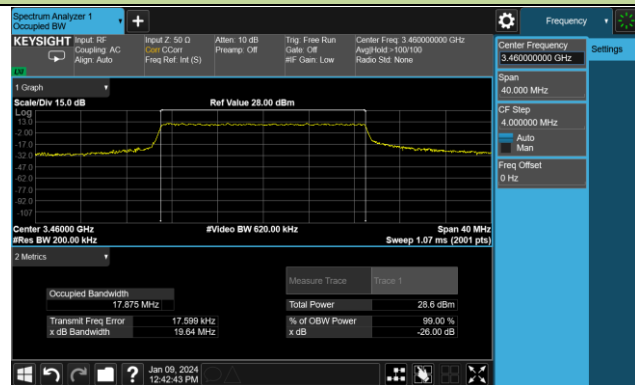


High Channel



99% Bandwidth - 20MHz Bandwidth_64QAM

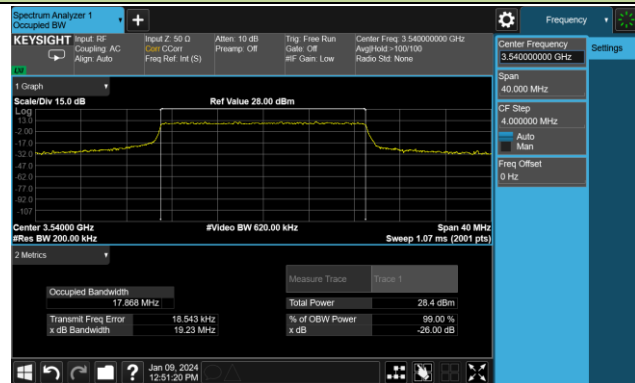
Low Channel



Middle Channel



High Channel



| | | | |
|-----------|-------------------------|---------------|--------------|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-01-07 ~ 2024-01-08 | Test Band | LTE Band 43 |

| Bandwidth (MHz) | Frequency (MHz) | 99% Bandwidth (MHz) |
|-----------------|-----------------|---------------------|
| QPSK | | |
| 5 | 3702.5 | 4.48 |
| | 3750.0 | 4.48 |
| | 3797.5 | 4.47 |
| 10 | 3705.0 | 8.95 |
| | 3750.0 | 8.96 |
| | 3795.0 | 8.95 |
| 15 | 3707.5 | 13.41 |
| | 3750.0 | 13.43 |
| | 3792.5 | 13.41 |
| 20 | 3710.0 | 17.90 |
| | 3750.0 | 17.90 |
| | 3790.0 | 17.87 |
| 16QAM | | |
| 5 | 3702.5 | 4.47 |
| | 3750.0 | 4.47 |
| | 3797.5 | 4.48 |
| 10 | 3705.0 | 8.96 |
| | 3750.0 | 8.96 |
| | 3795.0 | 8.94 |
| 15 | 3707.5 | 13.45 |
| | 3750.0 | 13.43 |
| | 3792.5 | 13.44 |
| 20 | 3710.0 | 17.88 |
| | 3750.0 | 17.89 |
| | 3790.0 | 17.89 |

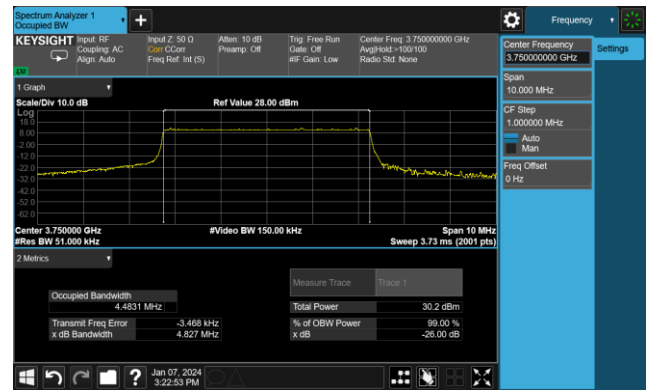
| 64QAM | | |
|-------|--------|-------|
| 5 | 3702.5 | 4.47 |
| | 3750.0 | 4.47 |
| | 3797.5 | 4.46 |
| 10 | 3705.0 | 8.96 |
| | 3750.0 | 8.96 |
| | 3795.0 | 8.96 |
| 15 | 3707.5 | 13.42 |
| | 3750.0 | 13.39 |
| | 3792.5 | 13.42 |
| 20 | 3710.0 | 17.88 |
| | 3750.0 | 17.89 |
| | 3790.0 | 17.88 |

99% Bandwidth - 5MHz Bandwidth_QPSK

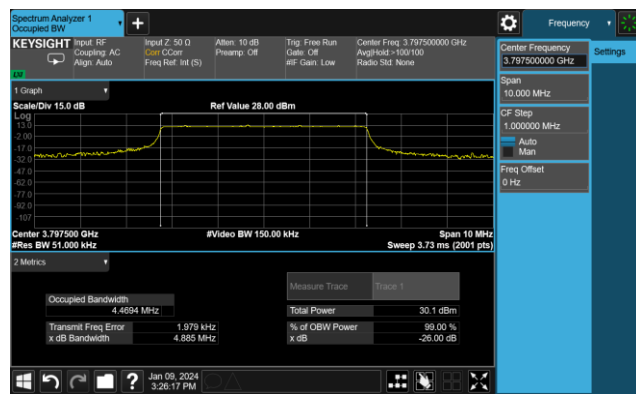
Low Channel



Middle Channel



High Channel

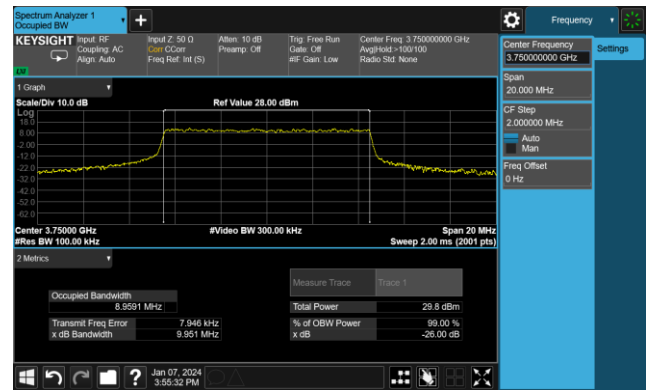


99% Bandwidth - 10MHz Bandwidth_QPSK

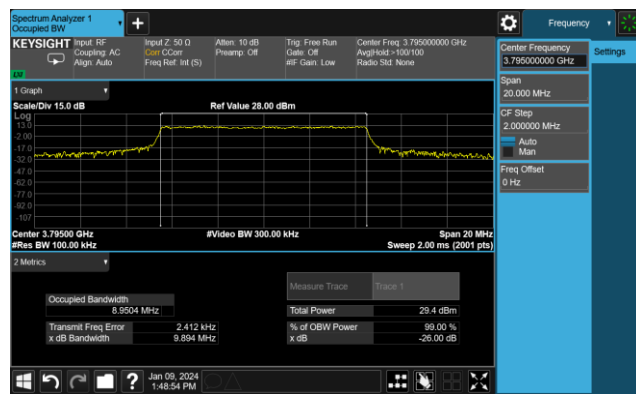
Low Channel



Middle Channel



High Channel



99% Bandwidth - 15MHz Bandwidth_QPSK

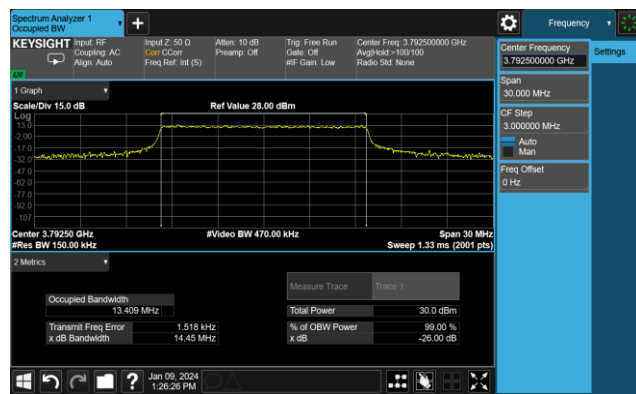
Low Channel



Middle Channel



High Channel

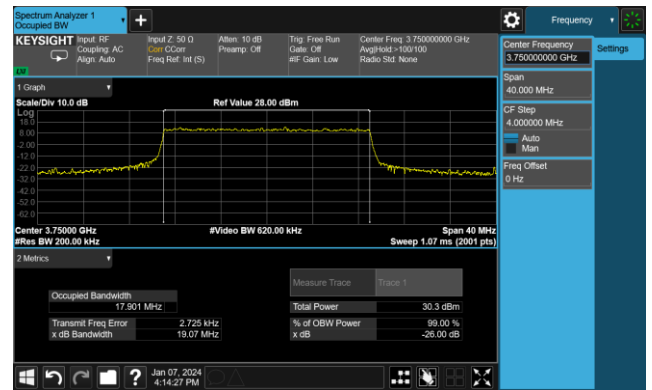


99% Bandwidth - 20MHz Bandwidth_QPSK

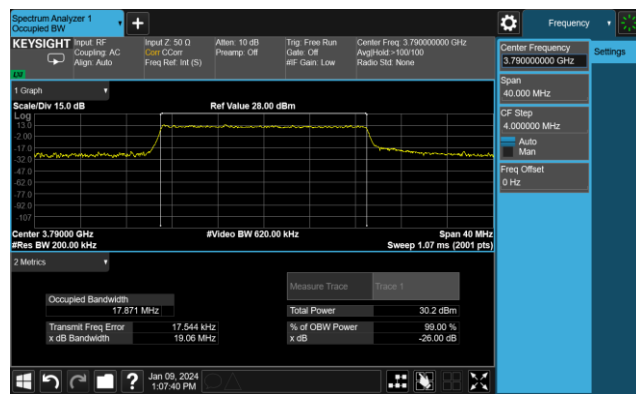
Low Channel



Middle Channel



High Channel

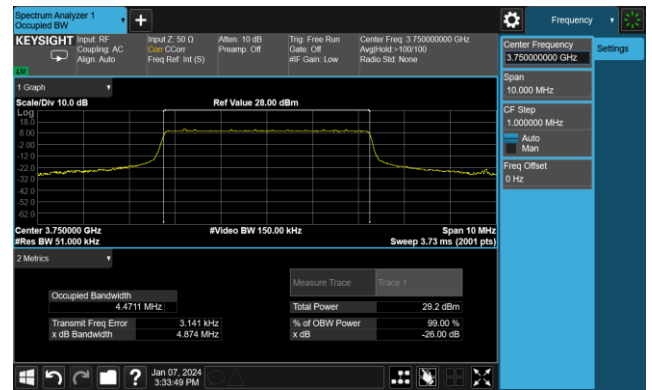


99% Bandwidth - 5MHz Bandwidth_16QAM

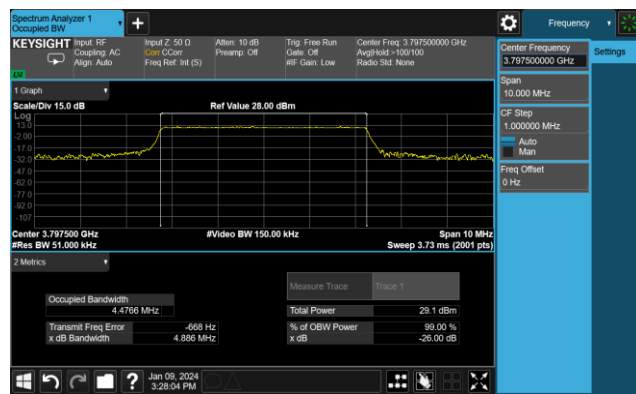
Low Channel



Middle Channel



High Channel

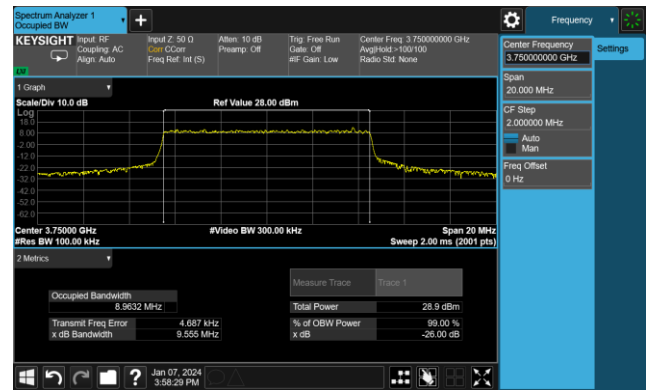


99% Bandwidth - 10MHz Bandwidth_16QAM

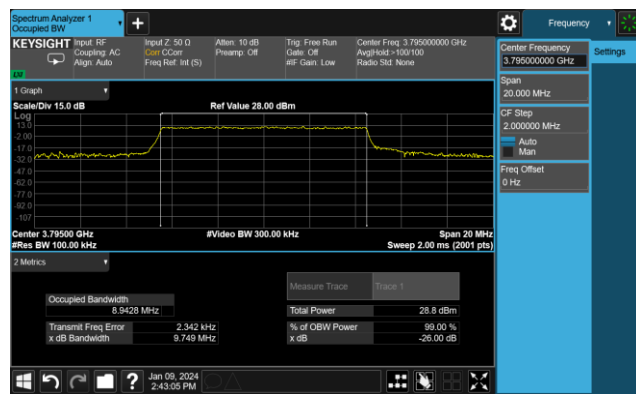
Low Channel



Middle Channel

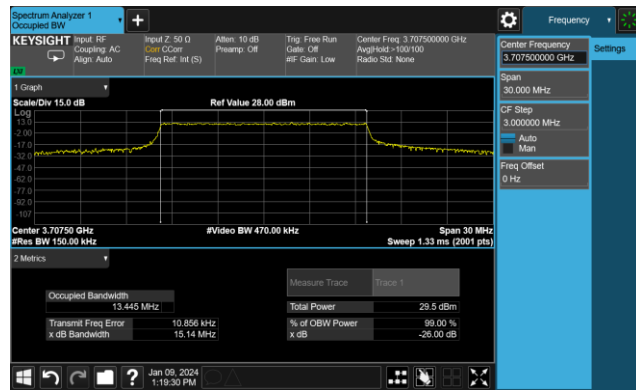


High Channel

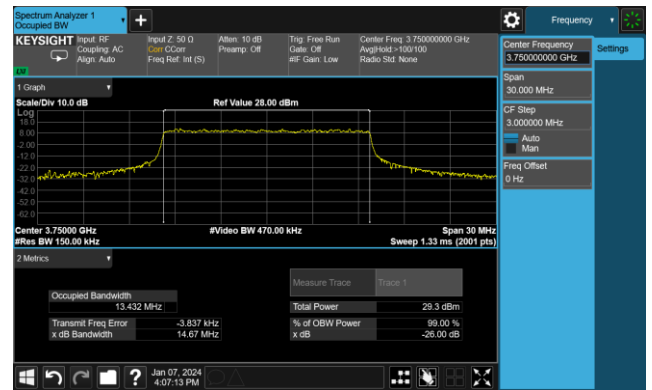


99% Bandwidth - 15MHz Bandwidth_16QAM

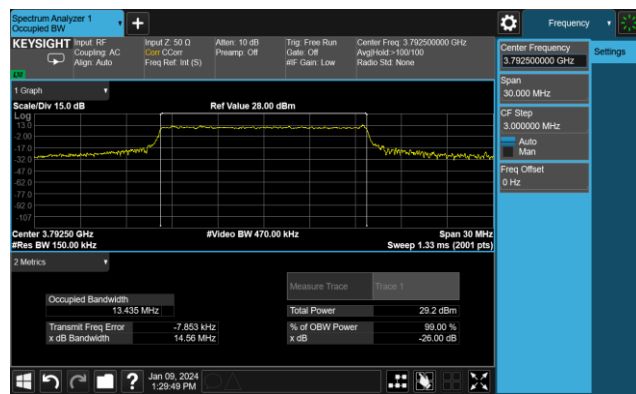
Low Channel



Middle Channel

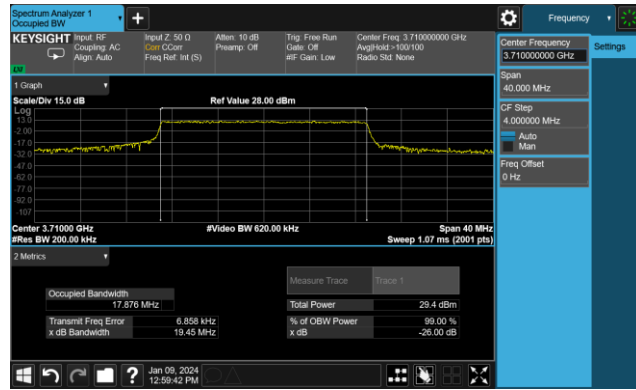


High Channel



99% Bandwidth - 20MHz Bandwidth_16QAM

Low Channel



Middle Channel

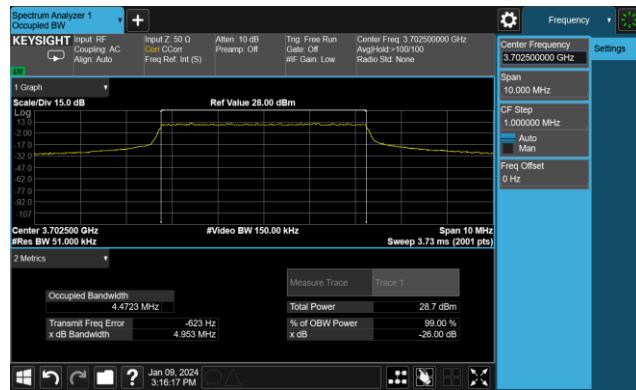


High Channel

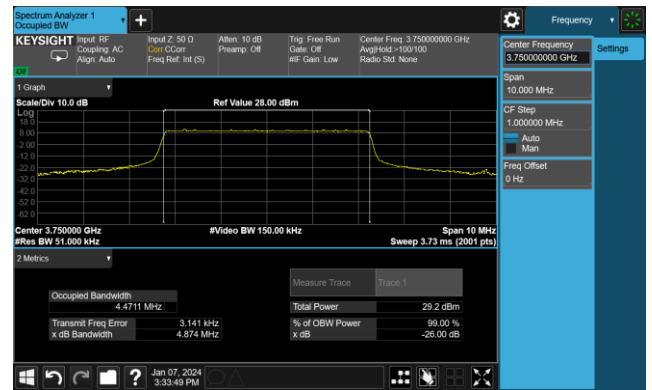


99% Bandwidth - 5MHz Bandwidth_64QAM

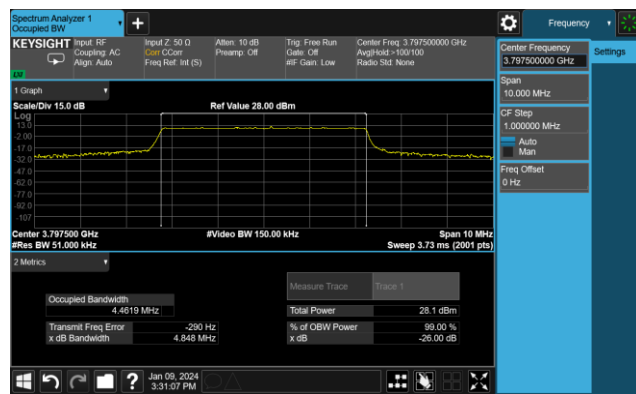
Low Channel



Middle Channel



High Channel

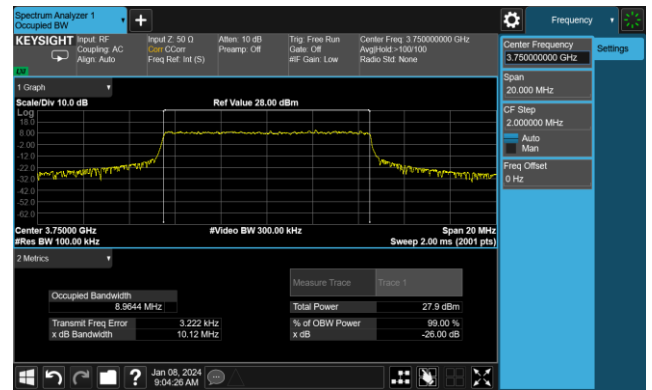


99% Bandwidth - 10MHz Bandwidth_64QAM

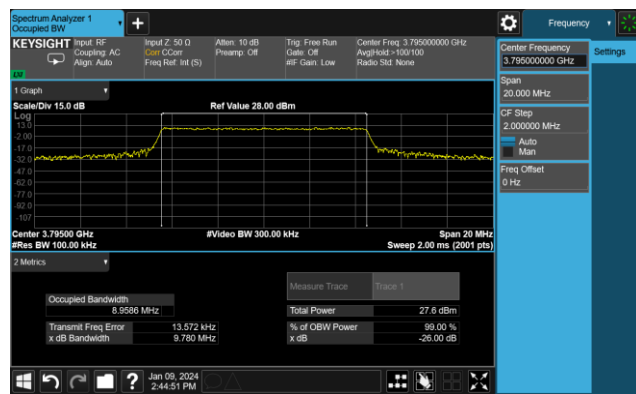
Low Channel



Middle Channel

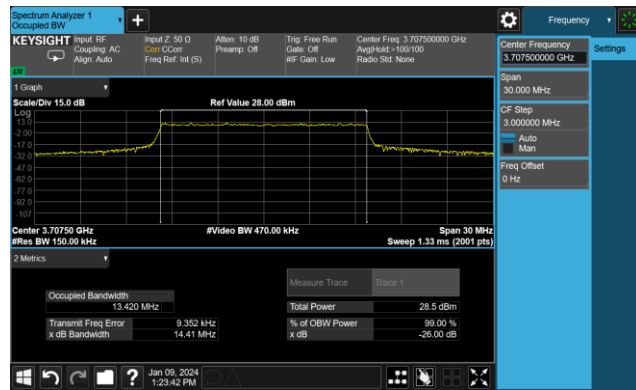


High Channel

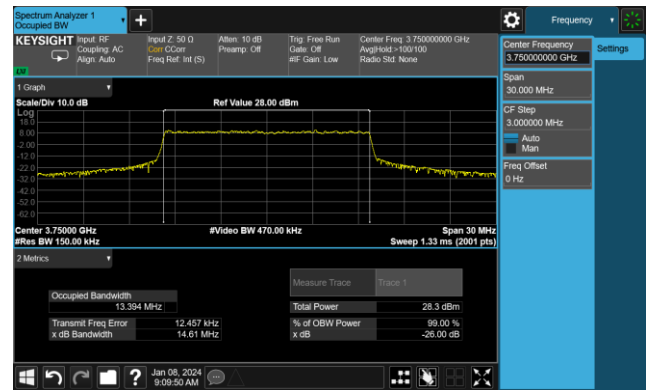


99% Bandwidth - 15MHz Bandwidth_64QAM

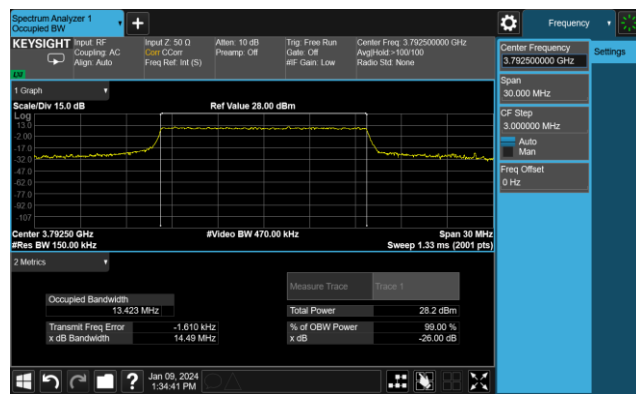
Low Channel



Middle Channel

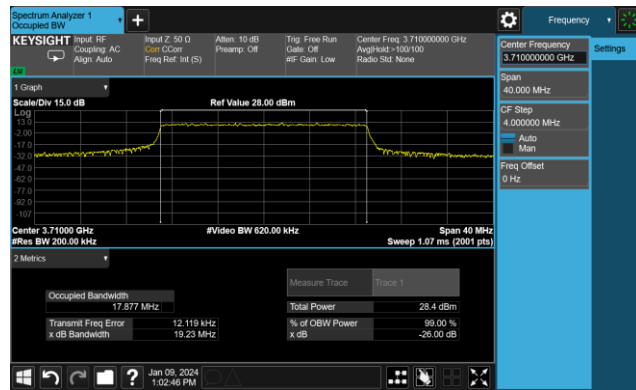


High Channel

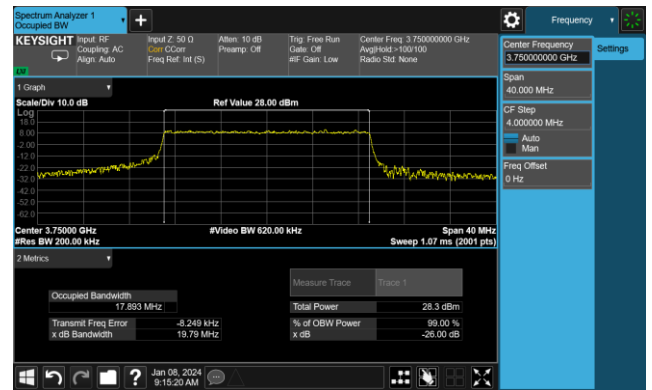


99% Bandwidth - 20MHz Bandwidth_64QAM

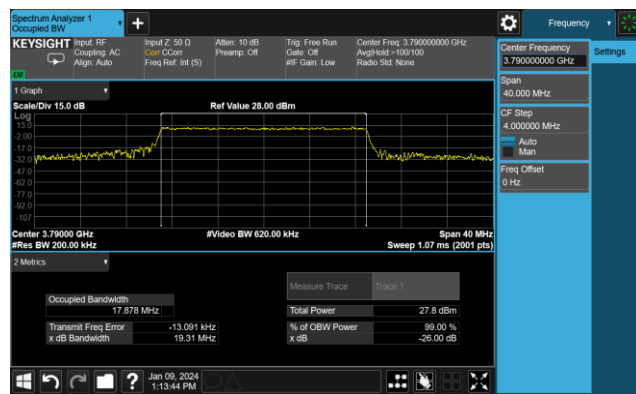
Low Channel



Middle Channel



High Channel



A.2 Frequency Stability Test Result

| | | | |
|-----------|------------|---------------|--------------|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-01-19 | Test Band | LTE Band 42 |

| Voltage | Temp (°C) | Frequency Range (MHz) | | Frequency stability (ppm) | Within Authorized Frequency Block |
|---------|------------|-----------------------|----------------|---------------------------|-----------------------------------|
| | | 3450 | 3550 | | |
| | | f _L | f _H | | |
| Normal | + 20 (Ref) | 3450.2651 | 3549.5242 | 0.0000 | Pass |
| | + 50 | 3450.2651 | 3549.5242 | -0.0002 | Pass |
| | + 40 | 3450.2651 | 3549.5242 | 0.0012 | Pass |
| | + 30 | 3450.2651 | 3549.5242 | -0.0002 | Pass |
| | + 10 | 3450.2651 | 3549.5242 | 0.0002 | Pass |
| | 0 | 3450.2651 | 3549.5242 | -0.0001 | Pass |
| | - 10 | 3450.2651 | 3549.5242 | -0.0001 | Pass |
| | - 20 | 3450.2651 | 3549.5242 | 0.0000 | Pass |
| | - 30 | 3450.2651 | 3549.5242 | 0.0006 | Pass |
| 15% | + 20 | 3450.2651 | 3549.5242 | 0.0006 | Pass |
| -15% | + 20 | 3450.2651 | 3549.5242 | 0.0008 | Pass |

| | | | |
|-----------|------------|---------------|--------------|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-01-19 | Test Band | LTE Band 43 |

| Voltage | Temp (°C) | Frequency Range (MHz) | | Frequency stability (ppm) | Within Authorized Frequency Block |
|---------|------------|-----------------------|----------------|---------------------------|-----------------------------------|
| | | 3700 | 3800 | | |
| | | f _L | f _H | | |
| Normal | + 20 (Ref) | 3700.5258 | 3549.5242 | 0.0000 | Pass |
| | + 50 | 3700.5258 | 3549.5242 | 0.0013 | Pass |
| | + 40 | 3700.5258 | 3549.5242 | 0.0010 | Pass |
| | + 30 | 3700.5258 | 3549.5242 | 0.0009 | Pass |
| | + 10 | 3700.5258 | 3549.5242 | 0.0003 | Pass |
| | 0 | 3700.5258 | 3549.5242 | 0.0009 | Pass |
| | - 10 | 3700.5258 | 3549.5242 | 0.0000 | Pass |
| | - 20 | 3700.5258 | 3549.5242 | -0.0007 | Pass |
| - 30 | 3700.5258 | 3549.5242 | 0.0011 | Pass | |
| 15% | + 20 | 3700.5258 | 3549.5242 | 0.0003 | Pass |
| -15% | + 20 | 3700.5258 | 3549.5242 | 0.0010 | Pass |

A.3 Equivalent Isotropically Radited Power Test Result

| | | | |
|-----------|------------|---------------|--------------|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-01-21 | Test Band | LTE Band 42 |

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|-------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| QPSK | | | | | | |
| 5 | 3452.50 | 1 | 0 | 21.47 | 23.82 | < 30.00 |
| | 3500.00 | | | 21.28 | 23.63 | < 30.00 |
| | 3547.50 | | | 21.27 | 23.62 | < 30.00 |
| 5 | 3452.50 | 1 | 12 | 21.54 | 23.89 | < 30.00 |
| | 3500.00 | | | 21.29 | 23.64 | < 30.00 |
| | 3547.50 | | | 21.29 | 23.64 | < 30.00 |
| 5 | 3452.50 | 1 | 24 | 21.36 | 23.71 | < 30.00 |
| | 3500.00 | | | 21.15 | 23.50 | < 30.00 |
| | 3547.50 | | | 21.25 | 23.60 | < 30.00 |
| 5 | 3452.50 | 25 | 0 | 20.45 | 22.80 | < 30.00 |
| | 3500.00 | | | 20.25 | 22.60 | < 30.00 |
| | 3547.50 | | | 20.25 | 22.60 | < 30.00 |
| 10 | 3455.00 | 1 | 0 | 21.16 | 23.51 | < 30.00 |
| | 3500.00 | | | 21.77 | 24.12 | < 30.00 |
| | 3545.00 | | | 21.87 | 24.22 | < 30.00 |
| 10 | 3455.00 | 1 | 24 | 21.22 | 23.57 | < 30.00 |
| | 3500.00 | | | 21.78 | 24.13 | < 30.00 |
| | 3545.00 | | | 21.83 | 24.18 | < 30.00 |
| 10 | 3455.00 | 1 | 49 | 21.21 | 23.56 | < 30.00 |
| | 3500.00 | | | 21.79 | 24.14 | < 30.00 |
| | 3545.00 | | | 21.75 | 24.10 | < 30.00 |
| 10 | 3455.00 | 50 | 0 | 20.91 | 23.26 | < 30.00 |
| | 3500.00 | | | 20.64 | 22.99 | < 30.00 |
| | 3545.00 | | | 20.67 | 23.02 | < 30.00 |

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|-------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| QPSK | | | | | | |
| 15 | 3457.50 | 1 | 0 | 21.43 | 23.78 | < 30.00 |
| | 3500.00 | | | 21.20 | 23.55 | < 30.00 |
| | 3542.50 | | | 21.16 | 23.51 | < 30.00 |
| 15 | 3457.50 | 1 | 37 | 21.48 | 23.83 | < 30.00 |
| | 3500.00 | | | 21.16 | 23.51 | < 30.00 |
| | 3542.50 | | | 21.13 | 23.48 | < 30.00 |
| 15 | 3457.50 | 1 | 74 | 21.59 | 23.94 | < 30.00 |
| | 3500.00 | | | 21.25 | 23.60 | < 30.00 |
| | 3542.50 | | | 21.17 | 23.52 | < 30.00 |
| 15 | 3457.50 | 75 | 0 | 20.39 | 22.74 | < 30.00 |
| | 3500.00 | | | 20.38 | 22.73 | < 30.00 |
| | 3542.50 | | | 20.34 | 22.69 | < 30.00 |
| 20 | 3460.00 | 1 | 0 | 21.56 | 23.91 | < 30.00 |
| | 3500.00 | | | 21.33 | 23.68 | < 30.00 |
| | 3540.00 | | | 21.18 | 23.53 | < 30.00 |
| 20 | 3460.00 | 1 | 49 | 21.44 | 23.79 | < 30.00 |
| | 3500.00 | | | 21.19 | 23.54 | < 30.00 |
| | 3540.00 | | | 21.07 | 23.42 | < 30.00 |
| 20 | 3460.00 | 1 | 99 | 21.52 | 23.87 | < 30.00 |
| | 3500.00 | | | 21.33 | 23.68 | < 30.00 |
| | 3540.00 | | | 21.19 | 23.54 | < 30.00 |
| 20 | 3460.00 | 100 | 0 | 20.32 | 22.67 | < 30.00 |
| | 3500.00 | | | 20.49 | 22.84 | < 30.00 |
| | 3540.00 | | | 20.38 | 22.73 | < 30.00 |

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|-------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| 16QAM | | | | | | |
| 5 | 3452.50 | 1 | 0 | 20.60 | 22.95 | < 30.00 |
| | 3500.00 | | | 20.47 | 22.82 | < 30.00 |
| | 3547.50 | | | 20.45 | 22.80 | < 30.00 |
| 5 | 3452.50 | 1 | 12 | 20.71 | 23.06 | < 30.00 |
| | 3500.00 | | | 20.46 | 22.81 | < 30.00 |
| | 3547.50 | | | 20.48 | 22.83 | < 30.00 |
| 5 | 3452.50 | 1 | 24 | 20.56 | 22.91 | < 30.00 |
| | 3500.00 | | | 20.35 | 22.70 | < 30.00 |
| | 3547.50 | | | 20.34 | 22.69 | < 30.00 |
| 5 | 3452.50 | 25 | 0 | 19.47 | 21.82 | < 30.00 |
| | 3500.00 | | | 19.27 | 21.62 | < 30.00 |
| | 3547.50 | | | 19.27 | 21.62 | < 30.00 |
| 10 | 3455.00 | 1 | 0 | 20.12 | 22.47 | < 30.00 |
| | 3500.00 | | | 20.95 | 23.30 | < 30.00 |
| | 3545.00 | | | 20.91 | 23.26 | < 30.00 |
| 10 | 3455.00 | 1 | 24 | 20.17 | 22.52 | < 30.00 |
| | 3500.00 | | | 20.96 | 23.31 | < 30.00 |
| | 3545.00 | | | 20.95 | 23.30 | < 30.00 |
| 10 | 3455.00 | 1 | 49 | 20.17 | 22.52 | < 30.00 |
| | 3500.00 | | | 20.98 | 23.33 | < 30.00 |
| | 3545.00 | | | 20.88 | 23.23 | < 30.00 |
| 10 | 3455.00 | 50 | 0 | 19.93 | 22.28 | < 30.00 |
| | 3500.00 | | | 19.64 | 21.99 | < 30.00 |
| | 3545.00 | | | 19.62 | 21.97 | < 30.00 |

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|-------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| 16QAM | | | | | | |
| 15 | 3457.50 | 1 | 0 | 20.36 | 22.71 | < 30.00 |
| | 3500.00 | | | 20.36 | 22.71 | < 30.00 |
| | 3542.50 | | | 20.40 | 22.75 | < 30.00 |
| 15 | 3457.50 | 1 | 37 | 20.43 | 22.78 | < 30.00 |
| | 3500.00 | | | 20.31 | 22.66 | < 30.00 |
| | 3542.50 | | | 20.38 | 22.73 | < 30.00 |
| 15 | 3457.50 | 1 | 74 | 20.69 | 23.04 | < 30.00 |
| | 3500.00 | | | 20.44 | 22.79 | < 30.00 |
| | 3542.50 | | | 20.42 | 22.77 | < 30.00 |
| 15 | 3457.50 | 75 | 0 | 20.17 | 22.52 | < 30.00 |
| | 3500.00 | | | 19.96 | 22.31 | < 30.00 |
| | 3542.50 | | | 19.95 | 22.30 | < 30.00 |
| 20 | 3460.00 | 1 | 0 | 20.67 | 23.02 | < 30.00 |
| | 3500.00 | | | 20.73 | 23.08 | < 30.00 |
| | 3540.00 | | | 20.25 | 22.60 | < 30.00 |
| 20 | 3460.00 | 1 | 49 | 20.51 | 22.86 | < 30.00 |
| | 3500.00 | | | 20.51 | 22.86 | < 30.00 |
| | 3540.00 | | | 20.10 | 22.45 | < 30.00 |
| 20 | 3460.00 | 1 | 99 | 20.62 | 22.97 | < 30.00 |
| | 3500.00 | | | 20.64 | 22.99 | < 30.00 |
| | 3540.00 | | | 20.20 | 22.55 | < 30.00 |
| 20 | 3460.00 | 100 | 0 | 19.31 | 21.66 | < 30.00 |
| | 3500.00 | | | 19.48 | 21.83 | < 30.00 |
| | 3540.00 | | | 19.49 | 21.84 | < 30.00 |

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|----------------------------------------------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| 64QAM | | | | | | |
| 5 | 3452.50 | 1 | 0 | 19.34 | 21.69 | < 30.00 |
| | 3500.00 | | | 19.21 | 21.56 | < 30.00 |
| | 3547.50 | | | 19.24 | 21.59 | < 30.00 |
| 5 | 3452.50 | 1 | 12 | 19.50 | 21.85 | < 30.00 |
| | 3500.00 | | | 19.34 | 21.69 | < 30.00 |
| | 3547.50 | | | 19.31 | 21.66 | < 30.00 |
| 5 | 3452.50 | 1 | 24 | 19.37 | 21.72 | < 30.00 |
| | 3500.00 | | | 19.25 | 21.60 | < 30.00 |
| | 3547.50 | | | 19.17 | 21.52 | < 30.00 |
| 5 | 3452.50 | 25 | 0 | 18.43 | 20.78 | < 30.00 |
| | 3500.00 | | | 18.30 | 20.65 | < 30.00 |
| | 3547.50 | | | 18.24 | 20.59 | < 30.00 |
| 10 | 3455.00 | 1 | 0 | 19.50 | 21.85 | < 30.00 |
| | 3500.00 | | | 19.44 | 21.79 | < 30.00 |
| | 3545.00 | | | 19.03 | 21.38 | < 30.00 |
| 10 | 3455.00 | 1 | 24 | 19.57 | 21.92 | < 30.00 |
| | 3500.00 | | | 19.47 | 21.82 | < 30.00 |
| | 3545.00 | | | 19.08 | 21.43 | < 30.00 |
| 10 | 3455.00 | 1 | 49 | 19.53 | 21.88 | < 30.00 |
| | 3500.00 | | | 19.40 | 21.75 | < 30.00 |
| | 3545.00 | | | 19.07 | 21.42 | < 30.00 |
| 10 | 3455.00 | 50 | 0 | 18.34 | 20.69 | < 30.00 |
| | 3500.00 | | | 17.94 | 20.29 | < 30.00 |
| | 3545.00 | | | 17.87 | 20.22 | < 30.00 |
| Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi) | | | | | | |

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|----------------------------------------------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| 64QAM | | | | | | |
| 15 | 3457.50 | 1 | 0 | 19.30 | 21.65 | < 30.00 |
| | 3500.00 | | | 19.70 | 22.05 | < 30.00 |
| | 3542.50 | | | 19.20 | 21.55 | < 30.00 |
| 15 | 3457.50 | 1 | 37 | 19.26 | 21.61 | < 30.00 |
| | 3500.00 | | | 19.60 | 21.95 | < 30.00 |
| | 3542.50 | | | 19.22 | 21.57 | < 30.00 |
| 15 | 3457.50 | 1 | 74 | 19.46 | 21.81 | < 30.00 |
| | 3500.00 | | | 19.72 | 22.07 | < 30.00 |
| | 3542.50 | | | 19.28 | 21.63 | < 30.00 |
| 15 | 3457.50 | 75 | 0 | 18.73 | 21.08 | < 30.00 |
| | 3500.00 | | | 18.30 | 20.65 | < 30.00 |
| | 3542.50 | | | 18.23 | 20.58 | < 30.00 |
| 20 | 3460.00 | 1 | 0 | 19.49 | 21.84 | < 30.00 |
| | 3500.00 | | | 19.59 | 21.94 | < 30.00 |
| | 3540.00 | | | 19.46 | 21.81 | < 30.00 |
| 20 | 3460.00 | 1 | 49 | 19.39 | 21.74 | < 30.00 |
| | 3500.00 | | | 19.46 | 21.81 | < 30.00 |
| | 3540.00 | | | 19.37 | 21.72 | < 30.00 |
| 20 | 3460.00 | 1 | 99 | 19.42 | 21.77 | < 30.00 |
| | 3500.00 | | | 19.55 | 21.90 | < 30.00 |
| | 3540.00 | | | 19.45 | 21.80 | < 30.00 |
| 20 | 3460.00 | 100 | 0 | 18.36 | 20.71 | < 30.00 |
| | 3500.00 | | | 18.25 | 20.60 | < 30.00 |
| | 3540.00 | | | 18.22 | 20.57 | < 30.00 |
| Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi) | | | | | | |

| | | | |
|-----------|------------|---------------|--------------|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-01-21 | Test Band | LTE Band 43 |

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|-------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| QPSK | | | | | | |
| 5 | 3702.50 | 1 | 0 | 21.41 | 23.35 | < 30.00 |
| | 3750.00 | | | 21.28 | 23.22 | < 30.00 |
| | 3797.50 | | | 21.24 | 23.18 | < 30.00 |
| 5 | 3702.50 | 1 | 12 | 21.41 | 23.35 | < 30.00 |
| | 3750.00 | | | 21.34 | 23.28 | < 30.00 |
| | 3797.50 | | | 21.32 | 23.26 | < 30.00 |
| 5 | 3702.50 | 1 | 24 | 21.40 | 23.34 | < 30.00 |
| | 3750.00 | | | 21.32 | 23.26 | < 30.00 |
| | 3797.50 | | | 21.24 | 23.18 | < 30.00 |
| 5 | 3702.50 | 25 | 0 | 20.47 | 22.41 | < 30.00 |
| | 3750.00 | | | 20.38 | 22.32 | < 30.00 |
| | 3797.50 | | | 20.41 | 22.35 | < 30.00 |
| 10 | 3705.00 | 1 | 0 | 21.29 | 23.23 | < 30.00 |
| | 3750.00 | | | 21.43 | 23.37 | < 30.00 |
| | 3795.00 | | | 21.18 | 23.12 | < 30.00 |
| 10 | 3705.00 | 1 | 24 | 21.23 | 23.17 | < 30.00 |
| | 3750.00 | | | 21.47 | 23.41 | < 30.00 |
| | 3795.00 | | | 21.22 | 23.16 | < 30.00 |
| 10 | 3705.00 | 1 | 49 | 21.20 | 23.14 | < 30.00 |
| | 3750.00 | | | 21.50 | 23.44 | < 30.00 |
| | 3795.00 | | | 21.28 | 23.22 | < 30.00 |
| 10 | 3705.00 | 50 | 0 | 20.06 | 22.00 | < 30.00 |
| | 3750.00 | | | 20.41 | 22.35 | < 30.00 |
| | 3795.00 | | | 20.00 | 21.94 | < 30.00 |

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|-------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| QPSK | | | | | | |
| 15 | 3707.50 | 1 | 0 | 21.48 | 23.42 | < 30.00 |
| | 3750.00 | | | 21.22 | 23.16 | < 30.00 |
| | 3792.50 | | | 21.45 | 23.39 | < 30.00 |
| 15 | 3707.50 | 1 | 37 | 21.47 | 23.41 | < 30.00 |
| | 3750.00 | | | 21.05 | 22.99 | < 30.00 |
| | 3792.50 | | | 21.40 | 23.34 | < 30.00 |
| 15 | 3707.50 | 1 | 74 | 21.09 | 23.03 | < 30.00 |
| | 3750.00 | | | 21.07 | 23.01 | < 30.00 |
| | 3792.50 | | | 21.50 | 23.44 | < 30.00 |
| 15 | 3707.50 | 75 | 0 | 20.36 | 22.30 | < 30.00 |
| | 3750.00 | | | 20.07 | 22.01 | < 30.00 |
| | 3792.50 | | | 20.33 | 22.27 | < 30.00 |
| 20 | 3710.00 | 1 | 0 | 21.45 | 23.39 | < 30.00 |
| | 3750.00 | | | 21.23 | 23.17 | < 30.00 |
| | 3790.00 | | | 20.89 | 22.83 | < 30.00 |
| 20 | 3710.00 | 1 | 49 | 21.39 | 23.33 | < 30.00 |
| | 3750.00 | | | 21.05 | 22.99 | < 30.00 |
| | 3790.00 | | | 21.41 | 23.35 | < 30.00 |
| 20 | 3710.00 | 1 | 99 | 21.29 | 23.23 | < 30.00 |
| | 3750.00 | | | 21.02 | 22.96 | < 30.00 |
| | 3790.00 | | | 21.16 | 23.10 | < 30.00 |
| 20 | 3710.00 | 100 | 0 | 20.26 | 22.20 | < 30.00 |
| | 3750.00 | | | 20.59 | 22.53 | < 30.00 |
| | 3790.00 | | | 20.23 | 22.17 | < 30.00 |

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|-------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| 16QAM | | | | | | |
| 5 | 3702.50 | 1 | 0 | 20.56 | 22.50 | < 30.00 |
| | 3750.00 | | | 20.48 | 22.42 | < 30.00 |
| | 3797.50 | | | 20.47 | 22.41 | < 30.00 |
| 5 | 3702.50 | 1 | 12 | 20.54 | 22.48 | < 30.00 |
| | 3750.00 | | | 20.48 | 22.42 | < 30.00 |
| | 3797.50 | | | 20.48 | 22.42 | < 30.00 |
| 5 | 3702.50 | 1 | 24 | 20.53 | 22.47 | < 30.00 |
| | 3750.00 | | | 20.45 | 22.39 | < 30.00 |
| | 3797.50 | | | 20.48 | 22.42 | < 30.00 |
| 5 | 3702.50 | 25 | 0 | 19.45 | 21.39 | < 30.00 |
| | 3750.00 | | | 19.33 | 21.27 | < 30.00 |
| | 3797.50 | | | 19.37 | 21.31 | < 30.00 |
| 10 | 3705.00 | 1 | 0 | 20.18 | 22.12 | < 30.00 |
| | 3750.00 | | | 20.63 | 22.57 | < 30.00 |
| | 3795.00 | | | 20.31 | 22.25 | < 30.00 |
| 10 | 3705.00 | 1 | 24 | 20.23 | 22.17 | < 30.00 |
| | 3750.00 | | | 20.68 | 22.62 | < 30.00 |
| | 3795.00 | | | 20.37 | 22.31 | < 30.00 |
| 10 | 3705.00 | 1 | 49 | 20.36 | 22.30 | < 30.00 |
| | 3750.00 | | | 20.69 | 22.63 | < 30.00 |
| | 3795.00 | | | 20.38 | 22.32 | < 30.00 |
| 10 | 3705.00 | 50 | 0 | 19.08 | 21.02 | < 30.00 |
| | 3750.00 | | | 19.33 | 21.27 | < 30.00 |
| | 3795.00 | | | 19.05 | 20.99 | < 30.00 |

Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|----------------------------------------------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| 16QAM | | | | | | |
| 15 | 3707.50 | 1 | 0 | 20.40 | 22.34 | < 30.00 |
| | 3750.00 | | | 20.85 | 22.79 | < 30.00 |
| | 3792.50 | | | 20.64 | 22.58 | < 30.00 |
| 15 | 3707.50 | 1 | 37 | 20.43 | 22.37 | < 30.00 |
| | 3750.00 | | | 20.93 | 22.87 | < 30.00 |
| | 3792.50 | | | 20.58 | 22.52 | < 30.00 |
| 15 | 3707.50 | 1 | 74 | 20.48 | 22.42 | < 30.00 |
| | 3750.00 | | | 21.04 | 22.98 | < 30.00 |
| | 3792.50 | | | 20.69 | 22.63 | < 30.00 |
| 15 | 3707.50 | 75 | 0 | 19.39 | 21.33 | < 30.00 |
| | 3750.00 | | | 19.62 | 21.56 | < 30.00 |
| | 3792.50 | | | 19.38 | 21.32 | < 30.00 |
| 20 | 3710.00 | 1 | 0 | 20.52 | 22.46 | < 30.00 |
| | 3750.00 | | | 20.80 | 22.74 | < 30.00 |
| | 3790.00 | | | 20.76 | 22.70 | < 30.00 |
| 20 | 3710.00 | 1 | 49 | 20.44 | 22.38 | < 30.00 |
| | 3750.00 | | | 20.82 | 22.76 | < 30.00 |
| | 3790.00 | | | 20.67 | 22.61 | < 30.00 |
| 20 | 3710.00 | 1 | 99 | 20.56 | 22.50 | < 30.00 |
| | 3750.00 | | | 21.01 | 22.95 | < 30.00 |
| | 3790.00 | | | 20.78 | 22.72 | < 30.00 |
| 20 | 3710.00 | 100 | 0 | 19.28 | 21.22 | < 30.00 |
| | 3750.00 | | | 19.59 | 21.53 | < 30.00 |
| | 3790.00 | | | 19.27 | 21.21 | < 30.00 |
| Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi) | | | | | | |

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|----------------------------------------------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| 64QAM | | | | | | |
| 5 | 3702.50 | 1 | 0 | 19.39 | 21.33 | < 30.00 |
| | 3750.00 | | | 19.35 | 21.29 | < 30.00 |
| | 3797.50 | | | 19.32 | 21.26 | < 30.00 |
| 5 | 3702.50 | 1 | 12 | 19.47 | 21.41 | < 30.00 |
| | 3750.00 | | | 19.42 | 21.36 | < 30.00 |
| | 3797.50 | | | 19.43 | 21.37 | < 30.00 |
| 5 | 3702.50 | 1 | 24 | 19.47 | 21.41 | < 30.00 |
| | 3750.00 | | | 19.37 | 21.31 | < 30.00 |
| | 3797.50 | | | 19.35 | 21.29 | < 30.00 |
| 5 | 3702.50 | 25 | 0 | 18.53 | 20.47 | < 30.00 |
| | 3750.00 | | | 18.45 | 20.39 | < 30.00 |
| | 3797.50 | | | 18.42 | 20.36 | < 30.00 |
| 10 | 3705.00 | 1 | 0 | 19.00 | 20.94 | < 30.00 |
| | 3750.00 | | | 19.10 | 21.04 | < 30.00 |
| | 3795.00 | | | 19.07 | 21.01 | < 30.00 |
| 10 | 3705.00 | 1 | 24 | 19.04 | 20.98 | < 30.00 |
| | 3750.00 | | | 19.12 | 21.06 | < 30.00 |
| | 3795.00 | | | 18.98 | 20.92 | < 30.00 |
| 10 | 3705.00 | 1 | 49 | 19.01 | 20.95 | < 30.00 |
| | 3750.00 | | | 19.02 | 20.96 | < 30.00 |
| | 3795.00 | | | 19.04 | 20.98 | < 30.00 |
| 10 | 3705.00 | 50 | 0 | 17.85 | 19.79 | < 30.00 |
| | 3750.00 | | | 17.88 | 19.82 | < 30.00 |
| | 3795.00 | | | 17.73 | 19.67 | < 30.00 |
| Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi) | | | | | | |

| Channel Bandwidth (MHz) | Frequency (MHz) | RB Size | RB Offset | Output Power (dBm) | EIRP (dBm) | Limit (dBm) |
|----------------------------------------------------------------|-----------------|---------|-----------|--------------------|------------|-------------|
| 64QAM | | | | | | |
| 15 | 3707.50 | 1 | 0 | 19.59 | 21.53 | < 30.00 |
| | 3750.00 | | | 19.30 | 21.24 | < 30.00 |
| | 3792.50 | | | 19.49 | 21.43 | < 30.00 |
| 15 | 3707.50 | 1 | 37 | 19.62 | 21.56 | < 30.00 |
| | 3750.00 | | | 19.24 | 21.18 | < 30.00 |
| | 3792.50 | | | 19.50 | 21.44 | < 30.00 |
| 15 | 3707.50 | 1 | 74 | 19.68 | 21.62 | < 30.00 |
| | 3750.00 | | | 19.18 | 21.12 | < 30.00 |
| | 3792.50 | | | 19.58 | 21.52 | < 30.00 |
| 15 | 3707.50 | 75 | 0 | 18.23 | 20.17 | < 30.00 |
| | 3750.00 | | | 18.12 | 20.06 | < 30.00 |
| | 3792.50 | | | 18.15 | 20.09 | < 30.00 |
| 20 | 3710.00 | 1 | 0 | 19.20 | 21.14 | < 30.00 |
| | 3750.00 | | | 19.84 | 21.78 | < 30.00 |
| | 3790.00 | | | 19.50 | 21.44 | < 30.00 |
| 20 | 3710.00 | 1 | 49 | 19.21 | 21.15 | < 30.00 |
| | 3750.00 | | | 19.68 | 21.62 | < 30.00 |
| | 3790.00 | | | 19.48 | 21.42 | < 30.00 |
| 20 | 3710.00 | 1 | 99 | 19.38 | 21.32 | < 30.00 |
| | 3750.00 | | | 19.66 | 21.60 | < 30.00 |
| | 3790.00 | | | 19.67 | 21.61 | < 30.00 |
| 20 | 3710.00 | 100 | 0 | 18.16 | 20.10 | < 30.00 |
| | 3750.00 | | | 18.15 | 20.09 | < 30.00 |
| | 3790.00 | | | 18.13 | 20.07 | < 30.00 |
| Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi) | | | | | | |

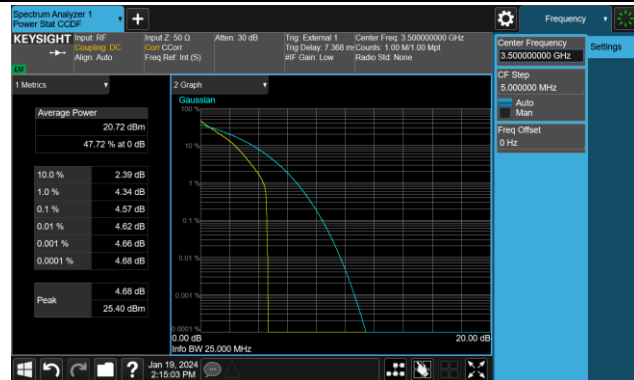
A.4 Peak to Average Radio Test Result

| | | | |
|-----------|------------|---------------|--------------|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-01-19 | Test Band | Band 42 |

| Frequency (MHz) | Channel Bandwidth (MHz) | Peak to Average Ratio (dB) | Limit (dB) | Result |
|-----------------|-------------------------|----------------------------|------------|--------|
| QPSK | | | | |
| 3500.0 | 5 | 4.57 | ≤ 13.00 | Pass |
| | 10 | 5.51 | ≤ 13.00 | Pass |
| | 15 | 4.74 | ≤ 13.00 | Pass |
| | 20 | 5.20 | ≤ 13.00 | Pass |
| 16QAM | | | | |
| 3500.0 | 5 | 5.59 | ≤ 13.00 | Pass |
| | 10 | 5.72 | ≤ 13.00 | Pass |
| | 15 | 5.67 | ≤ 13.00 | Pass |
| | 20 | 5.69 | ≤ 13.00 | Pass |
| 64QAM | | | | |
| 3500.0 | 5 | 6.60 | ≤ 13.00 | Pass |
| | 10 | 6.46 | ≤ 13.00 | Pass |
| | 15 | 6.55 | ≤ 13.00 | Pass |
| | 20 | 6.53 | ≤ 13.00 | Pass |

5MHz Channel Bandwidth – Middle Channel

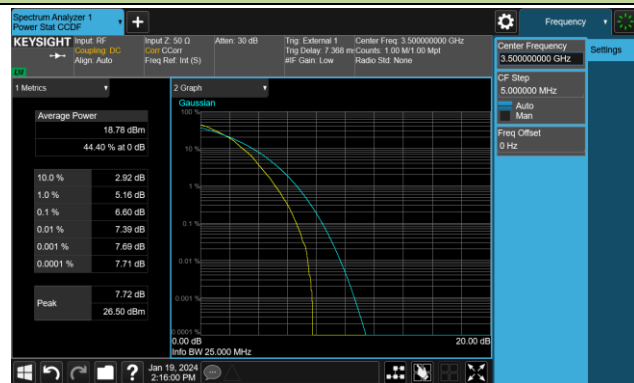
QPSK



16QAM

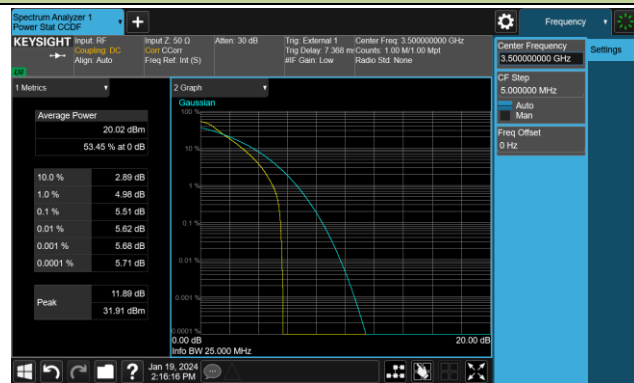


64QAM



10MHz Channel Bandwidth – Middle Channel

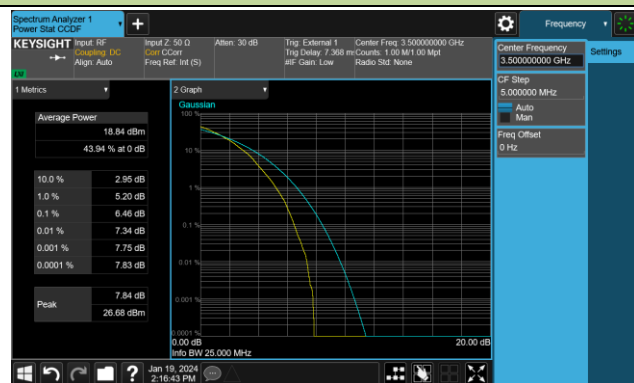
QPSK



16QAM

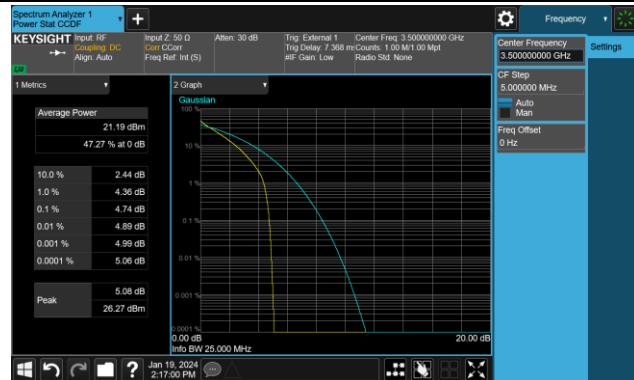


64QAM



15MHz Channel Bandwidth – Middle Channel

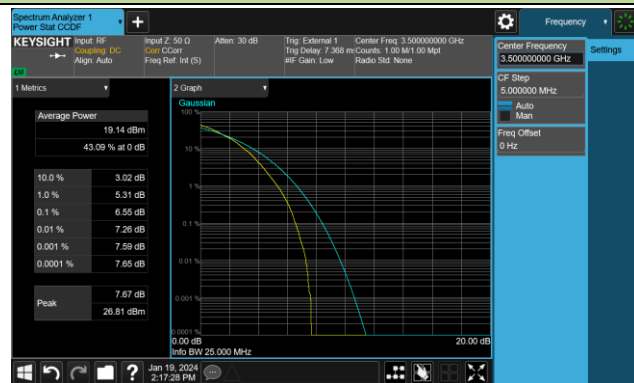
QPSK



16QAM

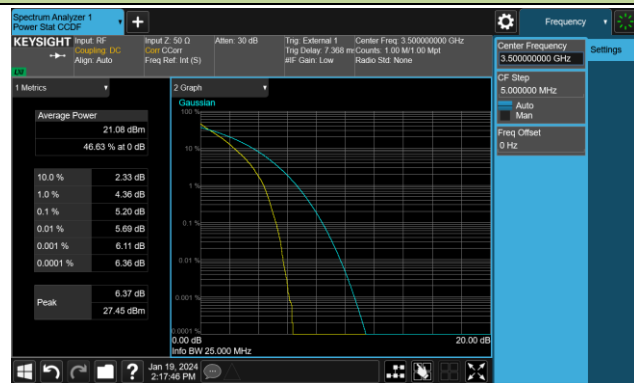


64QAM

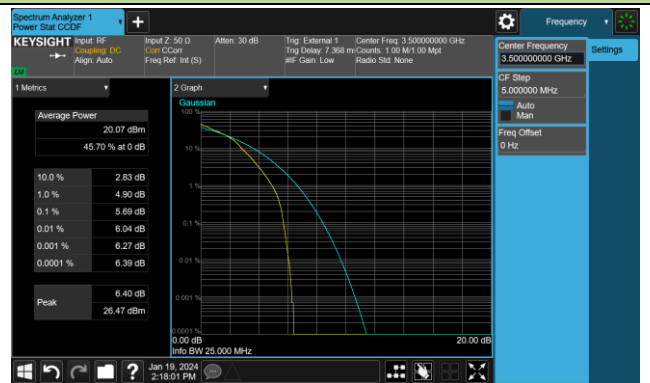


20MHz Channel Bandwidth – Middle Channel

QPSK



16QAM



64QAM



| | | | |
|-----------|------------|---------------|--------------|
| Test Site | SIP-SR1 | Test Engineer | Yoniter Yang |
| Test Date | 2024-01-19 | Test Band | Band 43 |

| Frequency (MHz) | Channel Bandwidth (MHz) | Peak to Average Ratio (dB) | Limit (dB) | Result |
|-----------------|-------------------------|----------------------------|------------|--------|
| QPSK | | | | |
| 3750.0 | 5 | 5.27 | ≤ 13.00 | Pass |
| | 10 | 4.52 | ≤ 13.00 | Pass |
| | 15 | 5.40 | ≤ 13.00 | Pass |
| | 20 | 5.16 | ≤ 13.00 | Pass |
| 16QAM | | | | |
| 3750.0 | 5 | 6.01 | ≤ 13.00 | Pass |
| | 10 | 5.47 | ≤ 13.00 | Pass |
| | 15 | 6.11 | ≤ 13.00 | Pass |
| | 20 | 5.96 | ≤ 13.00 | Pass |
| 64QAM | | | | |
| 3750.0 | 5 | 6.60 | ≤ 13.00 | Pass |
| | 10 | 6.50 | ≤ 13.00 | Pass |
| | 15 | 6.57 | ≤ 13.00 | Pass |
| | 20 | 6.50 | ≤ 13.00 | Pass |