RF MEASUREMENT REPORT

FCC ID:	XMR2023RG520NNA
Applicant:	Quectel Wireless Solutions Co., Ltd
Product:	5G Sub-6 GHz LGA Module
Model No.:	RG520N-NA
Brand Name:	Quectel
FCC Rule(s):	Part 96
Result:	Complies
Received Date:	2024-01-23
Test Date:	2024-01-23 ~ 2024-03-11

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.
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
2401RSU047-U3	V01	Added 15MHz Channel Bandwidth	2024-03-18	Valid

Note: This report is prepared for FCC Class II permissive supplement to FCC ID: XMR2023RG520NNA enable the 15MHz bandwidths of n48 via SW.

CONTENTS

1. General Information

1.1. Applicant

Quectel Wireless Solutions Co., Ltd

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

1.2. Manufacturer

Quectel Wireless Solutions Co., Ltd

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

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	5G Sub-6 GHz LGA Module
Model No.	RG520N-NA
Brand Name	Quectel
IMEI	Conducted Measurement 1: 863109050294995 Conducted Measurement 2: 863109050298111 Conducted Measurement 3: 863109050295893 Radiated Measurement: 863109050298590
3GPP Specification	LTE Band 2/4/5/7/12/13/14/17/25/26/29/30/38/41/42/43/46/48/66/71 NR SA/NSA Band n2/5/7/12/13/14/25/26/29/30/38/41/48/66/70/71/77/78
Temperature Operating Range	-30 ~ 75 °C
Power Supply Rating	3.3 ~ 4.4Vdc, typical 3.8Vdc
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

TDD T_X & R_X Frequency Range	n48: 3550 ~ 3700 MHz
SCS for NR cell	30kHz
Channel Bandwidth	15MHz
Modulation	UL up to 256QAM, DL up to 256QAM
Device Type	End User Device

1.6. Description of Available Antennas

Technology	Frequency Range (MHz)	Antenna Type	MaxPeak Gain (dBi)
n48	3550 ~ 3700	Dipole	0.58

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 Part 96
- 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

1.8. Device Capabilities

This device contains 5G NR SA & EN-DC the following capabilities:

PI/2 BPSK modulation applied for 5G NR band frequencies and has the same tune up power as QPSK modulations.

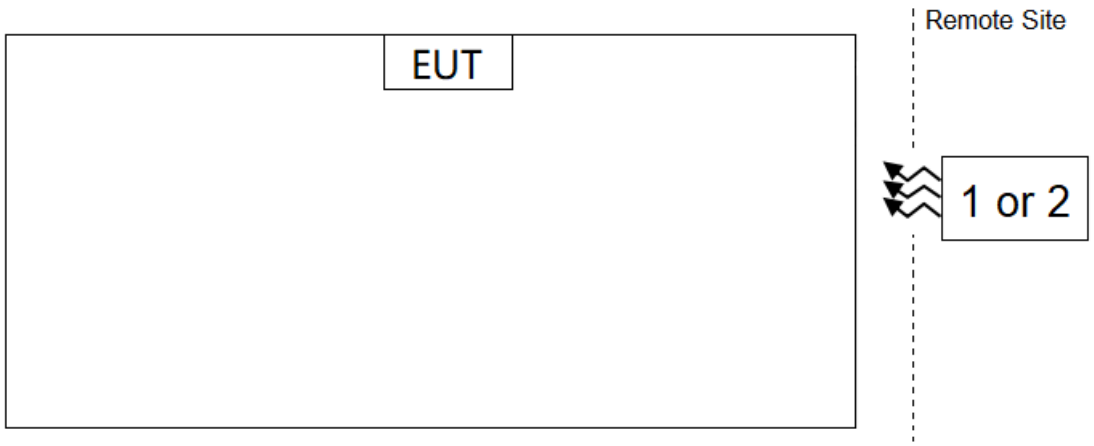
The DFT-s-OFDM and CP-OFDM waveforms were investigated, and DFT-s-OFDM was found to be the worst case.

UL MIMO mode only support CP-OFDM.

The worst-case scenario for all measurements is based on an engineering evaluation and QPSK was observed as the worst one and set for all conducted. Output power measurements were measured on PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM, and BPSK modulations.

2. Test Configuration

2.1. Test System Connection Diagram



Product		Manufacturer	Model No.
1	UXM 5G Wireless Test Platform	Keysight	E7515B
2	Radio Communication Test Station	Anritsu	MT8000A

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
Thermohygrometer	testo	608-H1	MRTSUE06362	1 year	2024-02-14	WZ-SR6
				1 year	2025-02-04	
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	Agilent	U2021XA	MRTSUE06030	1 year	2024-09-27	WZ-SR6
5G Wireless Test Platform	Keysight	E7515B	MRTSUE06942	1 year	2024-02-29	WZ-SR6
				1 year	2025-02-03	
Radio Communication Test Station	Anritsu	MT8000A	MRTSUE06961	1 year	2024-06-29	WZ-SR6
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
UXM 5G Automation Toolset	V 7.3	License 4G & 5G
Agilent Power Analyzer/Agilent Power Panel	VR03.09.00	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.

Conducted Spurious Emissions
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.47dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.66dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 69.28kHz

5. Test Result

5.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Verdict
2.1049	Occupied Bandwidth	Conducted	Pass
96.41(b)	Equivalent Isotropic Radiated Power		Pass
2.1051 96.41(e)	Band Edge Emissions Spurious Emissions		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 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 Channel Band Edge, Conducted Spurious Emission were presented worst-case in the test report.
3) The worst-case scenario for all measurements is based on an engineering evaluation and QPSK was observed as the worst one and set for all conducted. Output power measurements were measured on DFT-s PI/2 BPSK, DFT-s QPSK, DFT-s 16QAM, DFT-s 64QAM, DFT-s 256QAM, and CP QPSK modulations.

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.

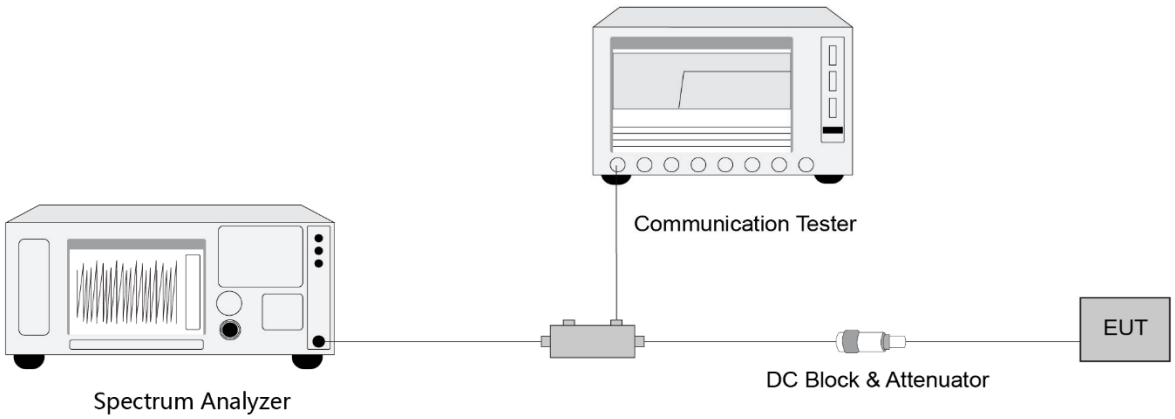
5.2.2. Test Procedure

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. Equivalent Isotropically Radiated Power Measurement

5.3.1. Test Limit

The maximum effective isotropic radiated power (EIRP) End User Device is 23dBm/10MHz

5.3.2. Test Procedure

ANSI C63.26-2015 - Section 5.2.4.4.2 & 5.2.5.5

5.3.3. Test Setting

When the fundamental condition for average power measurements cannot be realized (i.e., the EUT can not be configured to transmit at full-power on a continuous basis (i.e., duty cycle < 98%) and the instrumentation cannot be configured to measure only during active full-power transmissions), then thefollowing procedure can be used if the EUT duty cycle is constant (i.e., duty cycle variations are less thanor equal to ±2%).

a) Set span to 2 × to 3 × the OBW.

b) Set RBW = 1% to 5% of the OBW.

c) Set VBW ≥ 3 × RBW.

d) Set number of measurement points in sweep ≥ 2 × span / RBW.

e) Sweep time:

1) Set = auto-couple, or

2) Set ≥ [10 × (number of points in sweep) × (transmission symbol period)] for single sweep (automation-compatible) measurement.

f) Detector = power averaging (rms).

g) Set sweep trigger to “free run.”

h) 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.

i) Using the marker function to identify the maximum PSD.

j) Add 10 log (1/duty cycle) to the measured power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.

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.

EIRP & 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:

ERP or EIRP = P_{Meas} + G_T

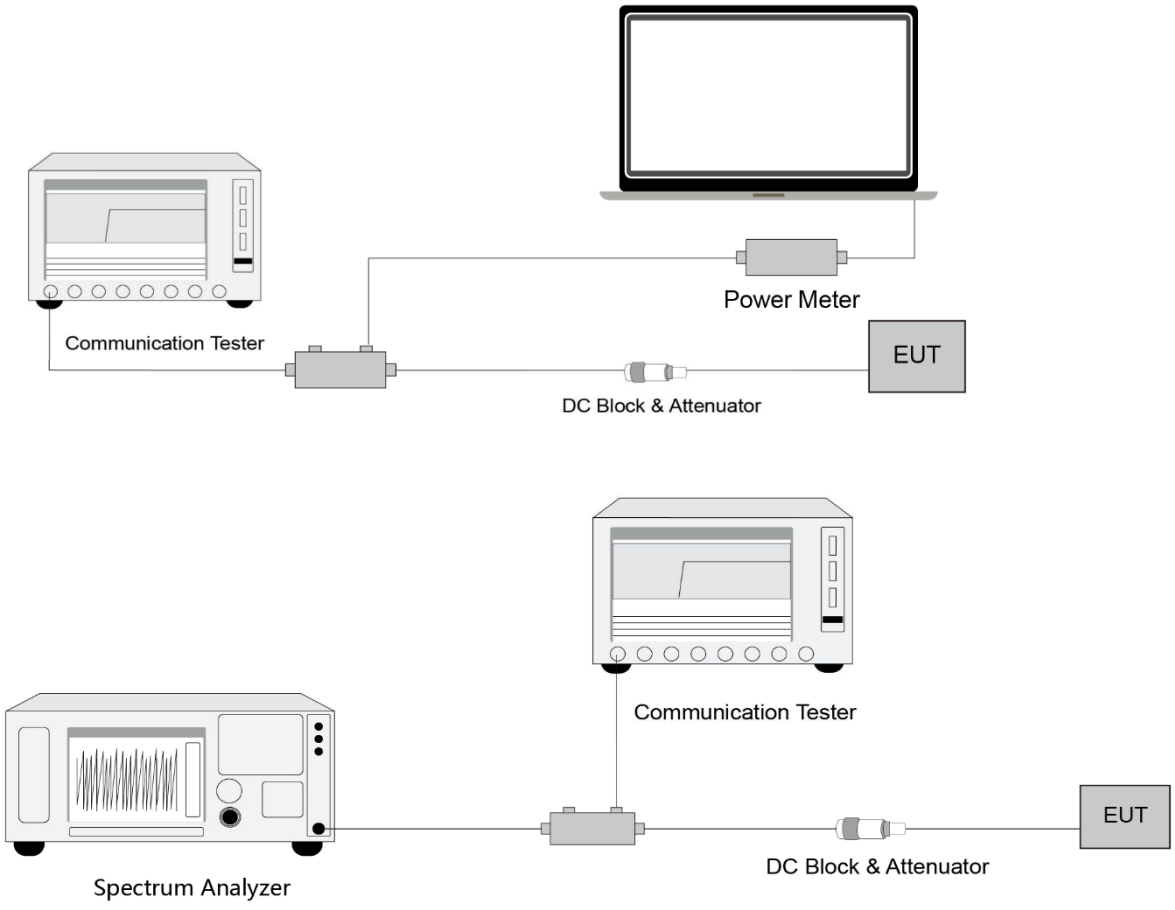
where

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)

5.3.4. Test Setup



5.3.5. Test Result

Refer to Appendix A.2.

5.4. Band Edge Measurement

5.4.1. Test Limit

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 conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed −25 dBm/MHz.

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/Mhz.

5.4.2. Test Procedure

ANSI C63.26-2015 - Section5.7

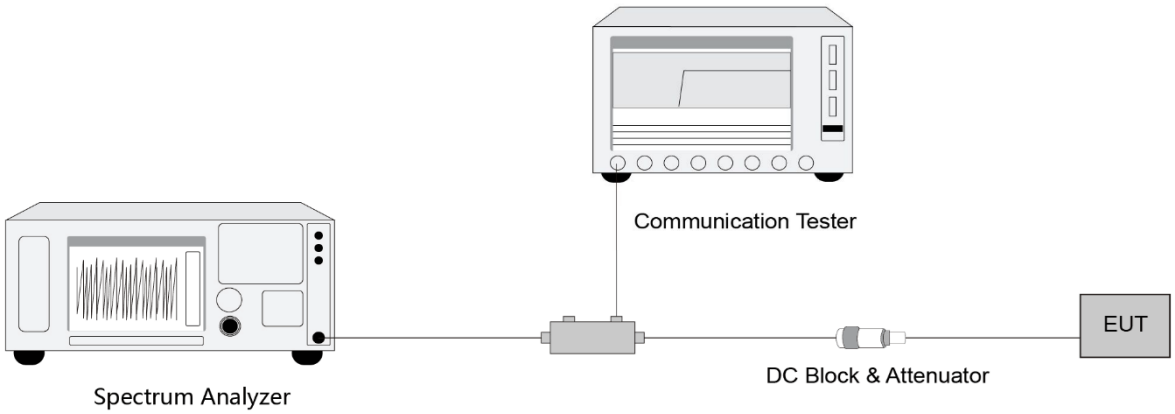
5.4.3. Test Setting

1. Set the analyzer frequency to low, middle, high channel.
2. RBW ≥ 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 ≥ 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.

9. Used power integration whenusing a measurement bandwidth smaller than the specified bandwidth.

5.4.4. Test Setup



5.4.5. Test Result

Refer to Appendix A.3.

5.5. Conducted Spurious Emissions Measurement

5.5.1. 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 conducted power of any emissions below 3530MHz or above 3720MHz shall not exceed -40dBm/MHz.

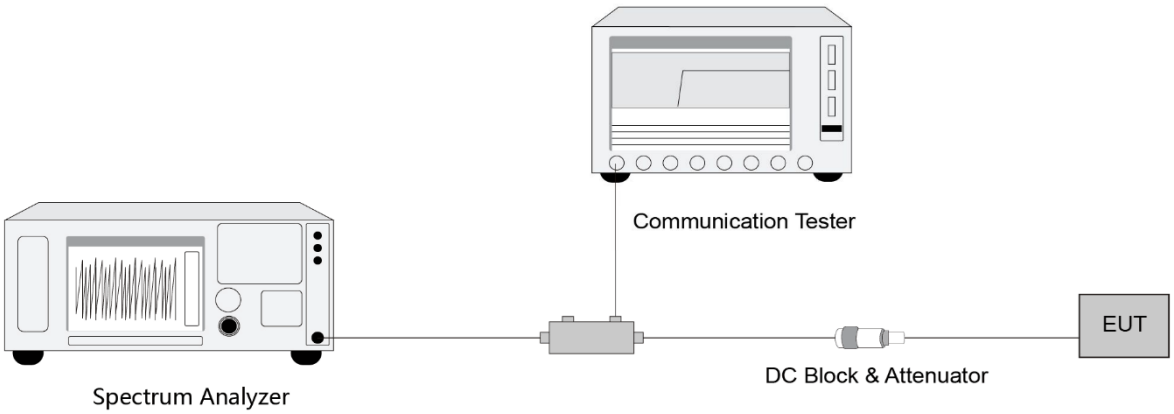
5.5.2. Test Procedure

ANSI C63.26-2015 - Section 5.7

5.5.3. Test Setting

1. Set the analyzer frequency to low, mid, high channel.
2. RBW = 1MHz
3. VBW ≥ 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.

5.5.4. Test Setup



5.5.5. Test Result

Refer to Appendix A.4.

Appendix A - Test Result

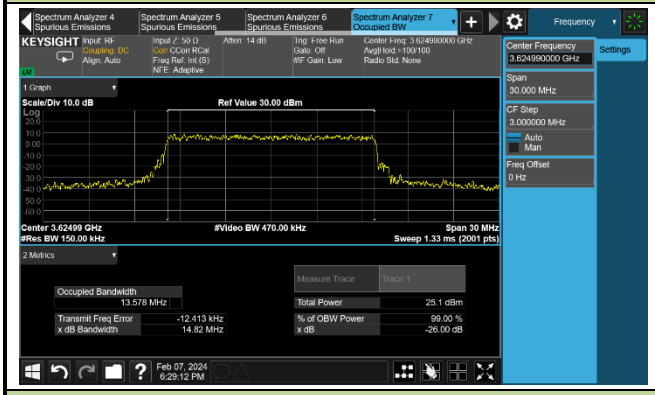
A.1 Occupied Bandwidth Test Result

Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-02-07	Test Band	n48_SA

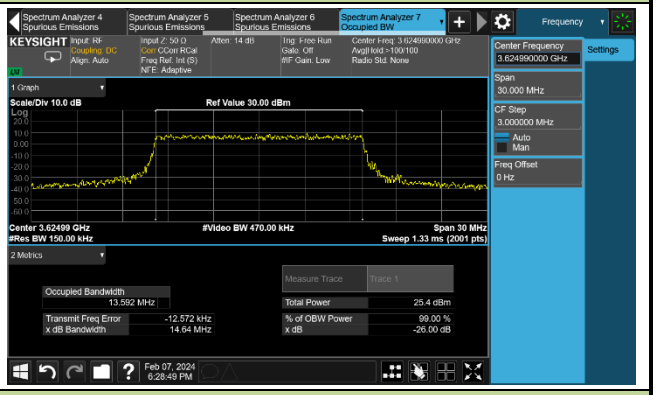
Modulation	Frequency (MHz)	Bandwidth (MHz)	99% Bandwidth (MHz)
QPSK	3624.99	15	13.578
16QAM			13.592
64QAM			13.600
256QAM			13.590

99% Bandwidth – 15MHz Channel Bandwidth

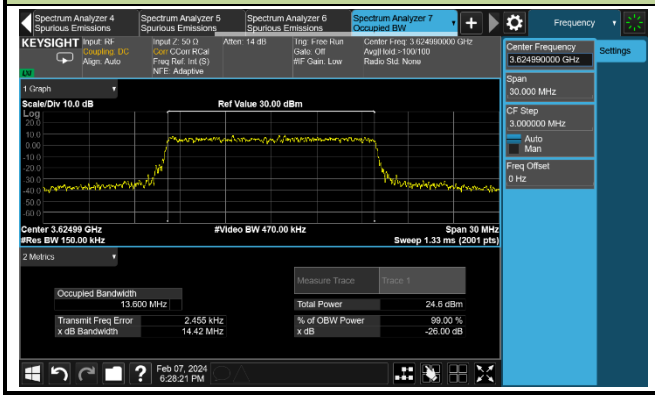
QPSK



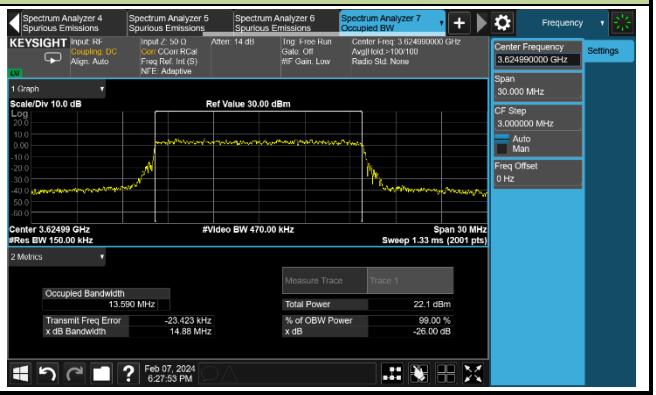
16QAM



64QAM



256QAM

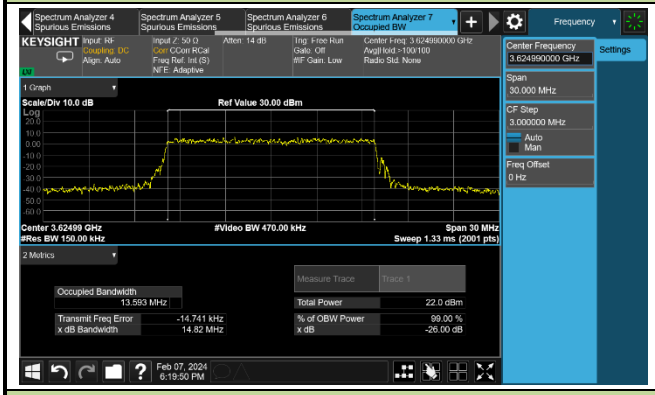


Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-02-07	Test Band	n48_UL MIMO (Port 0)

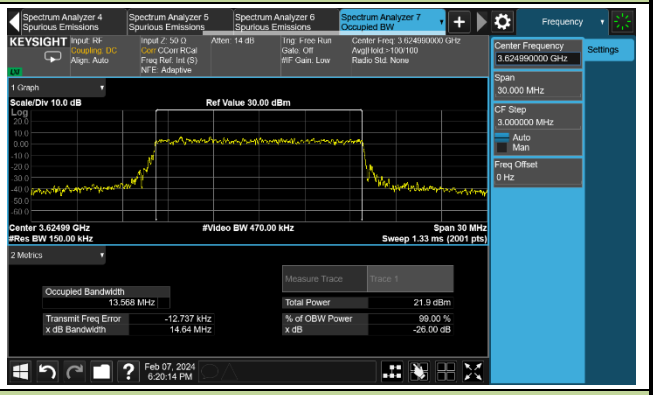
Modulation	Frequency (MHz)	Bandwidth (MHz)	99% Bandwidth (MHz)
QPSK	3624.99	15	13.593
16QAM			13.568
64QAM			13.543
256QAM			13.550

99% Bandwidth – 15MHz Channel Bandwidth

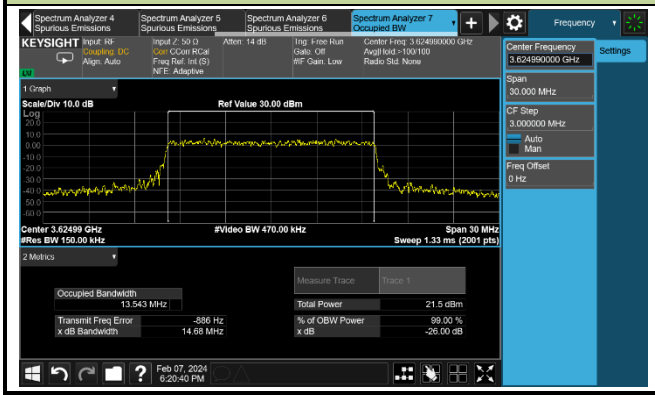
QPSK



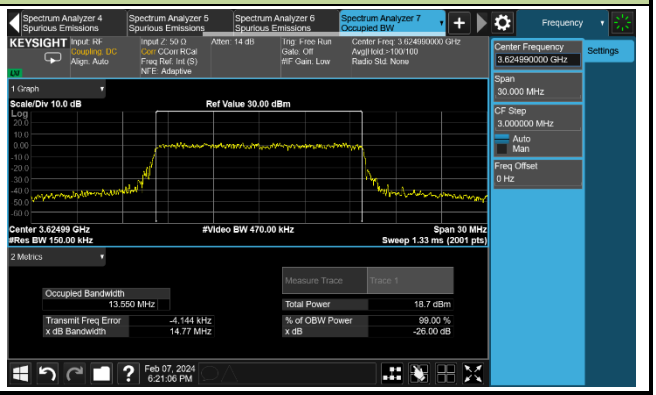
16QAM



64QAM



256QAM

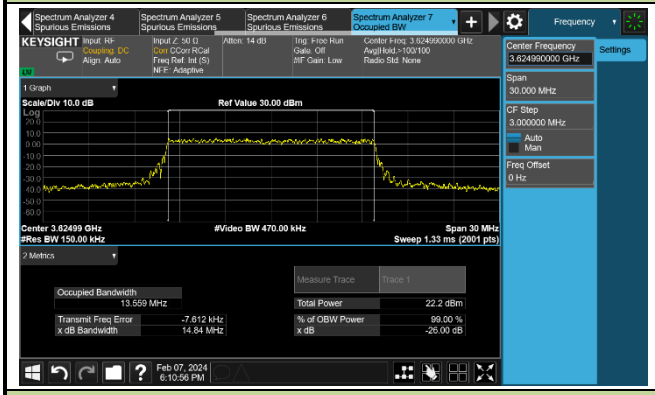


Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-02-07	Test Band	n48_UL MIMO (Port 3)

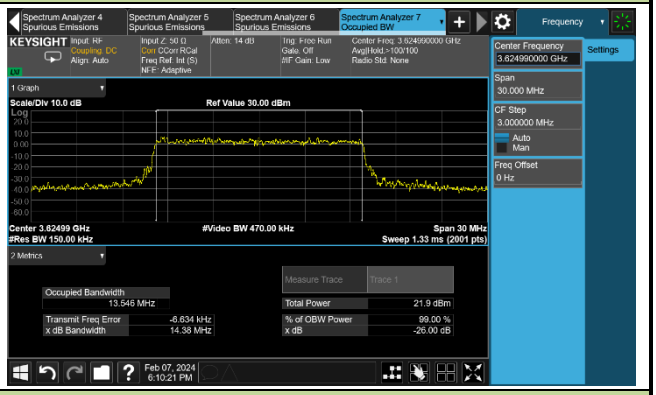
Modulation	Frequency (MHz)	Bandwidth (MHz)	99% Bandwidth (MHz)
QPSK	3624.99	15	13.559
16QAM			13.546
64QAM			13.581
256QAM			13.621

99% Bandwidth – 15MHz Channel Bandwidth

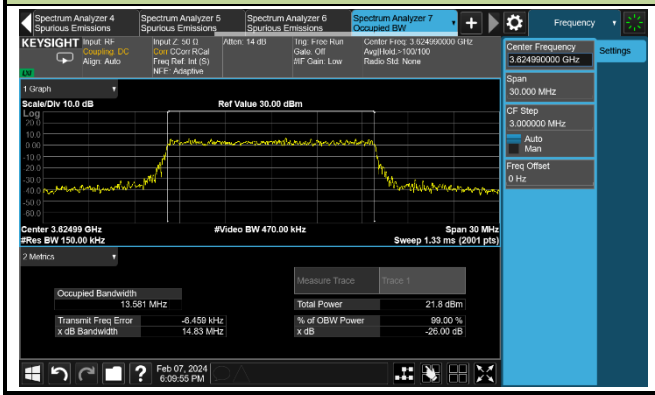
QPSK



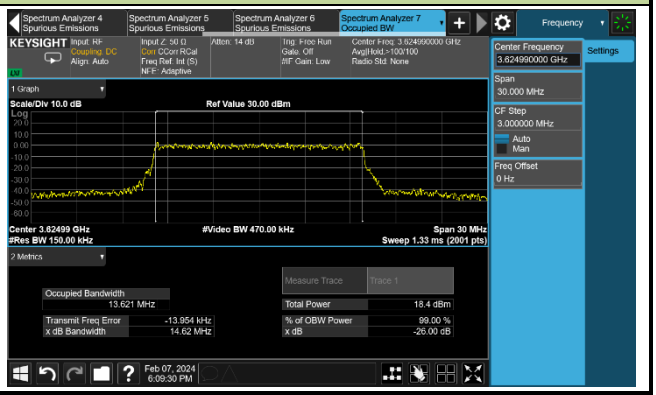
16QAM



64QAM



256QAM



A.2 Equivalent Isotropically Radiated Power Test Result

Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-01-29 ~ 2024-01-30	Test Band	n48_SA

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
DFT-s OFDM PI/2 BPSK						
3557.52	15	18	9	21.91	22.49	<23.00
		1	1	21.73	22.31	<23.00
		1	36	21.93	22.51	<23.00
		36	0	20.32	20.90	<23.00
		1	0	21.30	21.88	<23.00
		1	37	21.41	21.99	<23.00
3624.99	15	18	9	21.90	22.48	<23.00
		1	1	22.12	22.70	<23.00
		1	36	22.09	22.67	<23.00
		36	0	20.22	20.80	<23.00
		1	0	21.63	22.21	<23.00
		1	37	21.55	22.13	<23.00
3692.49	15	18	9	22.07	22.65	<23.00
		1	1	21.88	22.46	<23.00
		1	36	22.08	22.66	<23.00
		36	0	20.40	20.98	<23.00
		1	0	21.39	21.97	<23.00
		1	37	21.58	22.16	<23.00
Note: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
DFT-s OFDM QPSK						
3557.52	15	18	9	21.92	22.50	<23.00
		1	1	21.83	22.41	<23.00
		1	36	22.03	22.61	<23.00
		36	0	19.84	20.42	<23.00
		1	0	20.91	21.49	<23.00
		1	37	20.98	21.56	<23.00
3624.99	15	18	9	21.84	22.42	<23.00
		1	1	21.74	22.32	<23.00
		1	36	21.81	22.39	<23.00
		36	0	19.79	20.37	<23.00
		1	0	20.87	21.45	<23.00
		1	37	20.84	21.42	<23.00
3692.49	15	18	9	22.10	22.68	<23.00
		1	1	22.06	22.64	<23.00
		1	36	22.15	22.73	<23.00
		36	0	19.91	20.49	<23.00
		1	0	21.03	21.61	<23.00
		1	37	21.19	21.77	<23.00
Note: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
DFT-s OFDM 16QAM						
3557.52	15	18	9	20.98	21.56	<23.00
		1	1	20.61	21.19	<23.00
		1	36	20.84	21.42	<23.00
		36	0	18.80	19.38	<23.00
		1	0	19.72	20.30	<23.00
		1	37	19.77	20.35	<23.00
3624.99	15	18	9	20.92	21.50	<23.00
		1	1	20.81	21.39	<23.00
		1	36	20.76	21.34	<23.00
		36	0	18.66	19.24	<23.00
		1	0	19.86	20.44	<23.00
		1	37	19.76	20.34	<23.00
3692.49	15	18	9	21.14	21.72	<23.00
		1	1	20.97	21.55	<23.00
		1	36	21.09	21.67	<23.00
		36	0	18.96	19.54	<23.00
		1	0	20.38	20.96	<23.00
		1	37	20.45	21.03	<23.00
Note: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
DFT-s OFDM 64QAM						
3557.52	15	18	9	19.36	19.94	<23.00
		1	1	19.59	20.17	<23.00
		1	36	19.76	20.34	<23.00
		36	0	18.30	18.88	<23.00
		1	0	19.69	20.27	<23.00
		1	37	19.79	20.37	<23.00
3624.99	15	18	9	19.30	19.88	<23.00
		1	1	19.28	19.86	<23.00
		1	36	19.17	19.75	<23.00
		36	0	18.20	18.78	<23.00
		1	0	19.26	19.84	<23.00
		1	37	19.18	19.76	<23.00
3692.49	15	18	9	19.64	20.22	<23.00
		1	1	19.87	20.45	<23.00
		1	36	20.03	20.61	<23.00
		36	0	18.44	19.02	<23.00
		1	0	19.93	20.51	<23.00
		1	37	20.02	20.60	<23.00
Note: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
DFT-s OFDM 256QAM						
3557.52	15	18	9	17.54	18.12	<23.00
		1	1	17.38	17.96	<23.00
		1	36	17.58	18.16	<23.00
		36	0	16.46	17.04	<23.00
		1	0	17.47	18.05	<23.00
		1	37	17.56	18.14	<23.00
3624.99	15	18	9	17.30	17.88	<23.00
		1	1	17.44	18.02	<23.00
		1	36	16.92	17.50	<23.00
		36	0	16.12	16.70	<23.00
		1	0	16.95	17.53	<23.00
		1	37	16.91	17.49	<23.00
3692.49	15	18	9	17.66	18.24	<23.00
		1	1	17.68	18.26	<23.00
		1	36	17.77	18.35	<23.00
		36	0	16.58	17.16	<23.00
		1	0	17.69	18.27	<23.00
		1	37	17.75	18.33	<23.00
Note: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)						

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
CP OFDM QPSK						
3557.52	15	19	9	20.53	21.11	<23.00
		1	1	20.43	21.01	<23.00
		1	36	20.64	21.22	<23.00
		38	0	17.64	18.22	<23.00
		1	0	18.97	19.55	<23.00
		1	37	19.13	19.71	<23.00
3624.99	15	19	9	20.43	21.01	<23.00
		1	1	20.68	21.26	<23.00
		1	36	20.80	21.38	<23.00
		38	0	17.44	18.02	<23.00
		1	0	19.32	19.90	<23.00
		1	37	19.34	19.92	<23.00
3692.49	15	19	9	20.56	21.14	<23.00
		1	1	21.03	21.61	<23.00
		1	36	21.27	21.85	<23.00
		38	0	17.75	18.33	<23.00
		1	0	19.46	20.04	<23.00
		1	37	19.71	20.29	<23.00
Note: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)						

Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-01-29 ~ 2024-01-30	Test Band	n48_UL MIMO

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)		Total Power (dBm/ 10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
				Port 0	Port 3			
CP OFDM QPSK								
3557.52	15	19	9	17.38	17.09	20.25	20.83	<23.00
		1	1	17.32	17.04	20.19	20.77	<23.00
		1	36	17.57	17.21	20.40	20.98	<23.00
		38	0	14.50	14.31	17.42	18.00	<23.00
		1	0	15.86	15.95	18.92	19.50	<23.00
		1	37	16.06	15.60	18.85	19.43	<23.00
3624.99	15	19	9	17.37	17.57	20.48	21.06	<23.00
		1	1	17.63	17.63	20.64	21.22	<23.00
		1	36	17.76	17.60	20.69	21.27	<23.00
		38	0	14.45	14.66	17.57	18.15	<23.00
		1	0	16.21	16.18	19.21	19.79	<23.00
		1	37	16.04	16.30	19.18	19.76	<23.00
3692.49	15	19	9	17.63	17.53	20.59	21.17	<23.00
		1	1	17.72	17.35	20.55	21.13	<23.00
		1	36	17.74	17.39	20.58	21.16	<23.00
		38	0	14.73	14.73	17.74	18.32	<23.00
		1	0	15.97	16.08	19.04	19.62	<23.00
		1	37	16.24	16.26	19.26	19.84	<23.00

Note 1: Total Power (dBm) = 10*log{10^(Port 0 Output Power / 10) + 10^(Port 1 Output Power / 10)}

Note 2: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)		Total Power (dBm/ 10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
				Port 0	Port 3			
CP OFDM 16QAM								
3557.52	15	19	9	16.86	16.71	19.80	20.38	<23.00
		1	1	16.82	16.48	19.66	20.24	<23.00
		1	36	16.99	16.51	19.77	20.35	<23.00
		38	0	14.49	14.49	17.50	18.08	<23.00
		1	0	15.94	15.71	18.84	19.42	<23.00
		1	37	16.11	15.44	18.80	19.38	<23.00
3624.99	15	19	9	16.92	16.97	19.96	20.54	<23.00
		1	1	16.73	16.99	19.87	20.45	<23.00
		1	36	16.65	16.83	19.75	20.33	<23.00
		38	0	14.55	14.64	17.61	18.19	<23.00
		1	0	15.76	16.09	18.94	19.52	<23.00
		1	37	15.54	15.94	18.75	19.33	<23.00
3692.49	15	19	9	17.20	16.96	20.09	20.67	<23.00
		1	1	16.83	16.92	19.89	20.47	<23.00
		1	36	16.85	16.56	19.72	20.30	<23.00
		38	0	14.76	14.68	17.73	18.31	<23.00
		1	0	15.76	15.80	18.79	19.37	<23.00
		1	37	15.98	15.78	18.89	19.47	<23.00

Note 1: Total Power (dBm) = $10*\log\{10^{(\text{Port 0 Output Power} / 10)} + 10^{(\text{Port 1 Output Power} / 10)}\}$

Note 2: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)		Total Power (dBm/ 10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
				Port 0	Port 3			
CP OFDM 64QAM								
3557.52	15	19	9	15.55	15.33	18.45	19.03	<23.00
		1	1	14.80	15.52	18.19	18.77	<23.00
		1	36	14.83	15.29	18.08	18.66	<23.00
		38	0	13.97	13.95	16.97	17.55	<23.00
		1	0	14.82	15.45	18.16	18.74	<23.00
		1	37	14.88	15.40	18.16	18.74	<23.00
3624.99	15	19	9	15.42	15.43	18.44	19.02	<23.00
		1	1	15.39	15.73	18.57	19.15	<23.00
		1	36	15.33	15.52	18.44	19.02	<23.00
		38	0	14.03	14.14	17.10	17.68	<23.00
		1	0	15.44	16.00	18.74	19.32	<23.00
		1	37	15.29	15.75	18.54	19.12	<23.00
3692.49	15	19	9	15.59	15.45	18.53	19.11	<23.00
		1	1	15.33	15.69	18.52	19.10	<23.00
		1	36	15.22	15.46	18.35	18.93	<23.00
		38	0	14.28	14.25	17.28	17.86	<23.00
		1	0	15.04	15.53	18.30	18.88	<23.00
		1	37	15.23	15.63	18.44	19.02	<23.00

Note 1: Total Power (dBm) = 10*log{10^(Port 0 Output Power / 10) + 10^(Port 1 Output Power / 10)}

Note 2: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm/10MHz)		Total Power (dBm/ 10MHz)	EIRP (dBm/ 10MHz)	Limit (dBm/ 10MHz)
				Port 0	Port 3			
CP OFDM 256QAM								
3557.52	15	19	9	12.17	12.29	15.24	15.82	<23.00
		1	1	12.22	12.38	15.31	15.89	<23.00
		1	36	12.30	12.65	15.49	16.07	<23.00
		38	0	10.93	10.86	13.91	14.49	<23.00
		1	0	12.41	12.62	15.53	16.11	<23.00
		1	37	12.40	12.60	15.51	16.09	<23.00
3624.99	15	19	9	12.30	12.50	15.41	15.99	<23.00
		1	1	12.16	12.65	15.42	16.00	<23.00
		1	36	12.25	12.79	15.54	16.12	<23.00
		38	0	10.99	11.04	14.03	14.61	<23.00
		1	0	12.37	12.80	15.60	16.18	<23.00
		1	37	12.18	13.08	15.66	16.24	<23.00
3692.49	15	19	9	12.53	12.59	15.57	16.15	<23.00
		1	1	12.53	12.84	15.70	16.28	<23.00
		1	36	12.59	12.85	15.73	16.31	<23.00
		38	0	11.15	11.07	14.12	14.70	<23.00
		1	0	12.31	12.69	15.51	16.09	<23.00
		1	37	12.56	12.79	15.69	16.27	<23.00

Note 1: Total Power (dBm) = $10*\log\{10^{(\text{Port 0 Output Power} / 10)} + 10^{(\text{Port 1 Output Power} / 10)}\}$

Note 2: The EIRP (dBm/10MHz) = Output Power (dBm/10MHz) + Antenna Gain (dBi)

Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-03-02	Test Band	n48_SA

Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)	EIRP (dBm)	Limit (dBm)
DFT-s OFDM PI/2 BPSK						
3557.52	15	36	0	21.92	22.50	N/A
3624.99	15	36	0	21.96	22.54	N/A
3692.49	15	36	0	22.01	22.59	N/A
DFT-s OFDM QPSK						
3557.52	15	36	0	21.95	22.53	N/A
3624.99	15	36	0	21.93	22.51	N/A
3692.49	15	36	0	22.05	22.63	N/A
DFT-s OFDM 16QAM						
3557.52	15	36	0	20.89	21.47	N/A
3624.99	15	36	0	20.88	21.46	N/A
3692.49	15	36	0	20.96	21.54	N/A
DFT-s OFDM 64QAM						
3557.52	15	36	0	20.44	21.02	N/A
3624.99	15	36	0	20.44	21.02	N/A
3692.49	15	36	0	20.66	21.24	N/A
DFT-s OFDM 256QAM						
3557.52	15	36	0	18.42	19.00	N/A
3624.99	15	36	0	18.32	18.90	N/A
3692.49	15	36	0	18.52	19.10	N/A
CP OFDM QPSK						
3557.52	15	38	0	19.92	20.50	N/A
3624.99	15	38	0	19.88	20.46	N/A
3692.49	15	38	0	20.11	20.69	N/A
Note: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)						

Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-03-02	Test Band	n48_UL MIMO

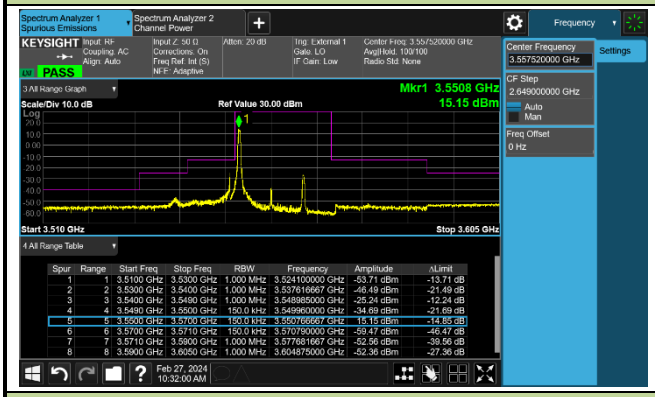
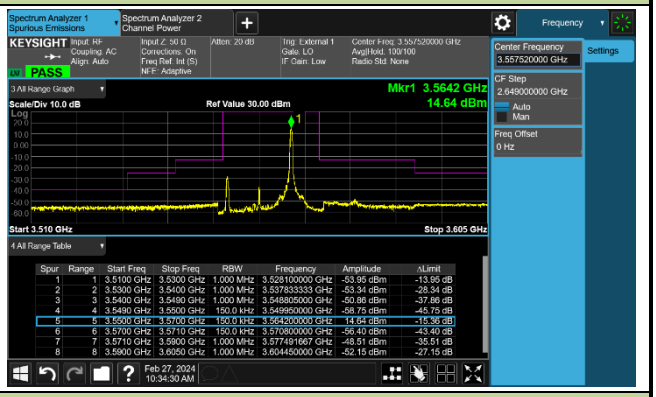
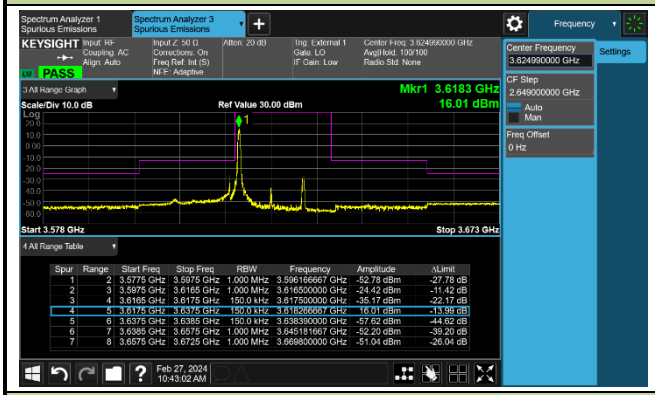
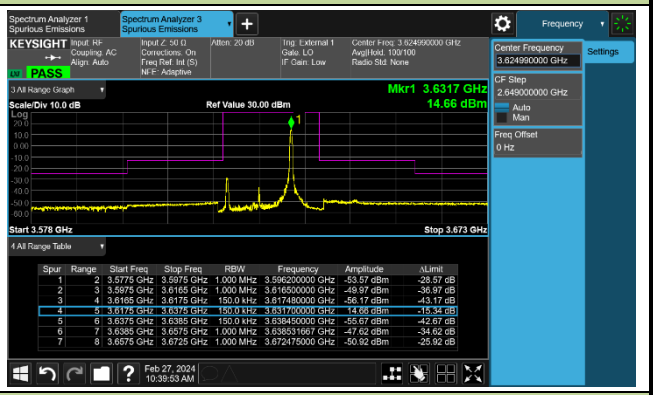
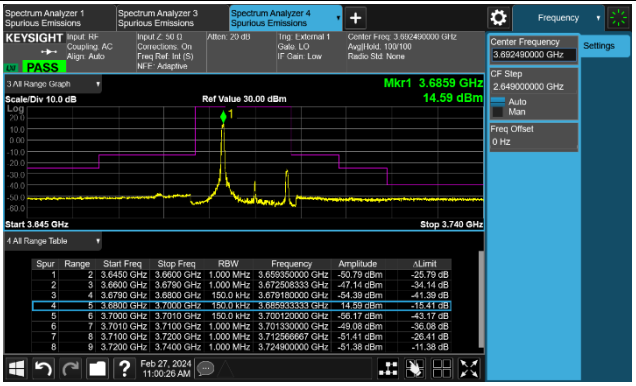
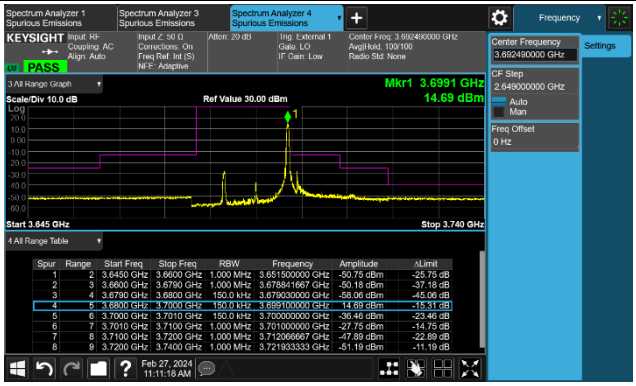
Frequency (MHz)	Channel Bandwidth (MHz)	RB Size	RB Offset	Output Power (dBm)		Total Power (dBm)	EIRP (dBm)	Limit (dBm)
				Port 0	Port 3			
CP OFDM QPSK								
3557.52	15	38	0	16.76	16.70	19.74	20.32	N/A
3624.99	15	38	0	16.81	16.63	19.73	20.31	N/A
3692.49	15	38	0	17.09	16.87	19.99	20.57	N/A
CP OFDM 16QAM								
3557.52	15	38	0	16.78	16.69	19.75	20.33	N/A
3624.99	15	38	0	16.85	16.64	19.76	20.34	N/A
3692.49	15	38	0	17.13	16.93	20.04	20.62	N/A
CP OFDM 64QAM								
3557.52	15	38	0	16.40	16.16	19.29	19.87	N/A
3624.99	15	38	0	16.38	16.23	19.32	19.90	N/A
3692.49	15	38	0	16.53	16.41	19.48	20.06	N/A
CP OFDM 256QAM								
3557.52	15	38	0	13.29	13.24	16.28	16.86	N/A
3624.99	15	38	0	13.39	13.30	16.36	16.94	N/A
3692.49	15	38	0	13.51	13.39	16.46	17.04	N/A

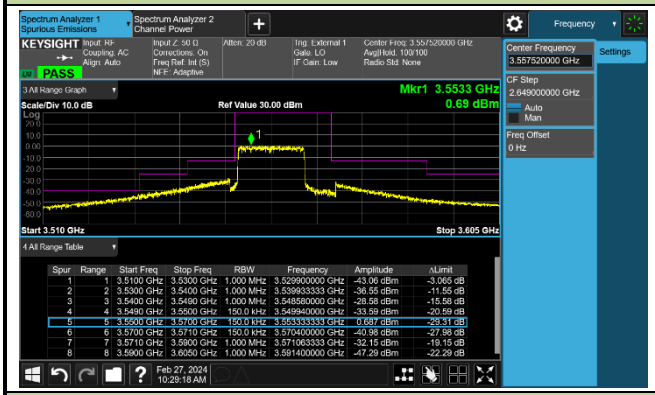
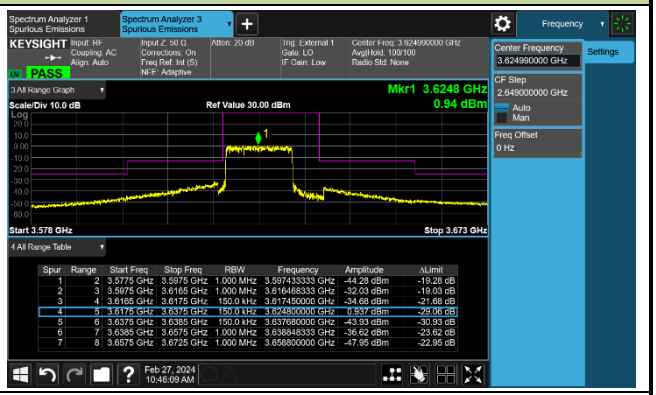
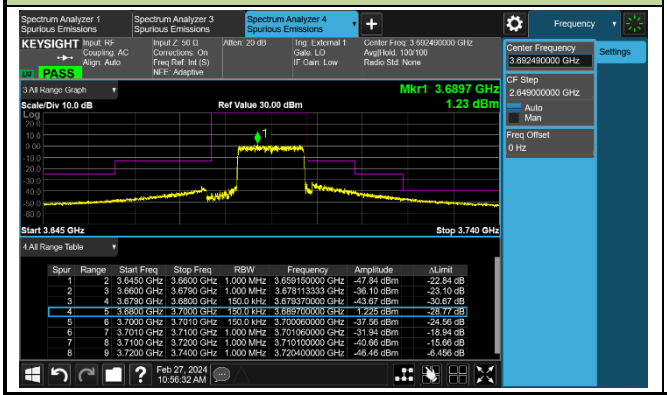
Note 1: Total Power (dBm) = 10*log{10^(Port 0 Output Power / 10) + 10^(Port 3 Output Power / 10)}

Note 2: The EIRP (dBm) = Output Power (dBm) + Antenna Gain (dBi)

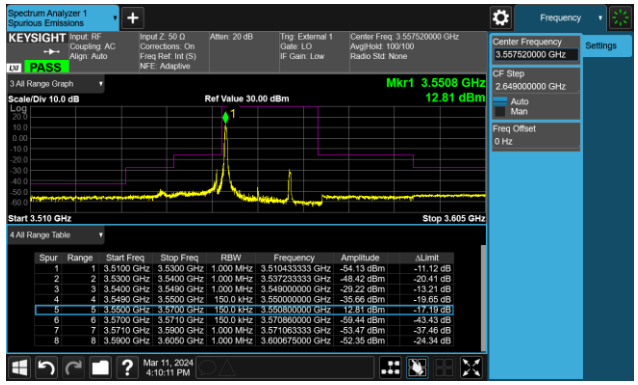
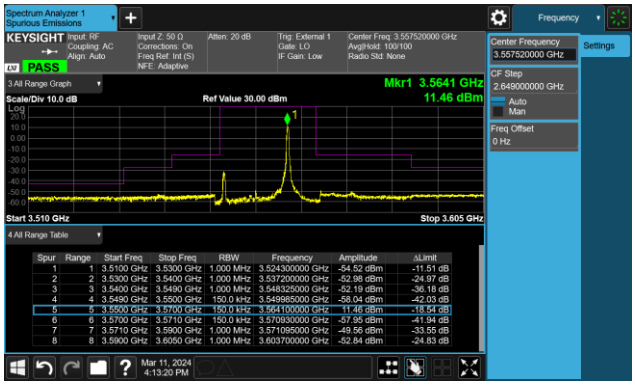
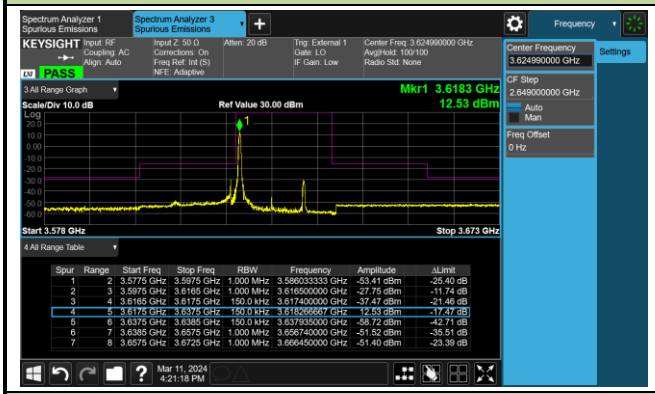
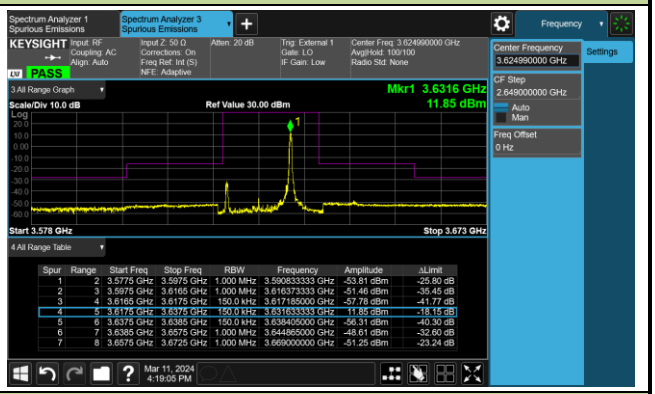
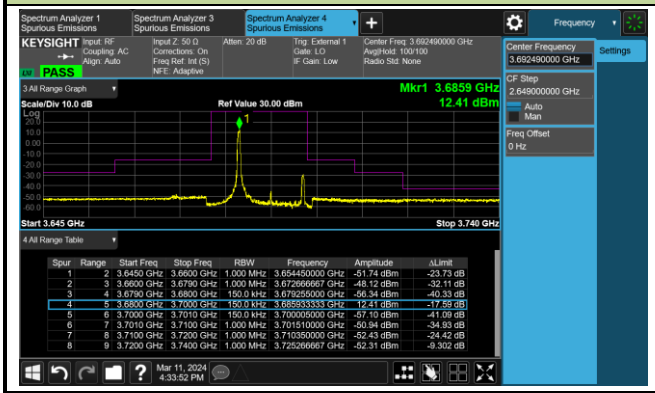
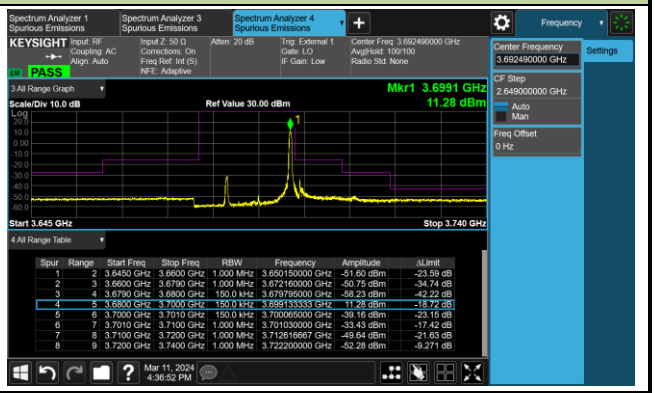
A.3 Band Edge Test Result

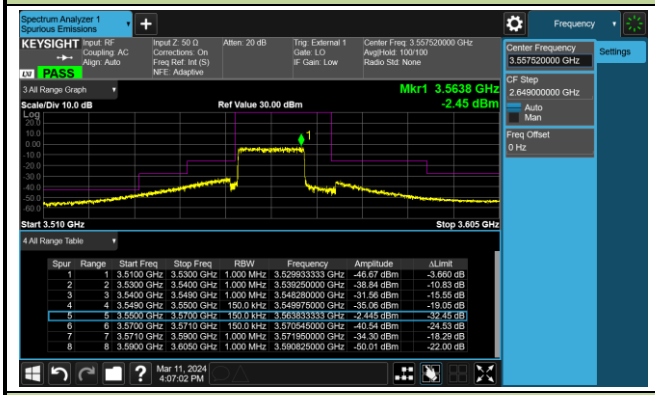
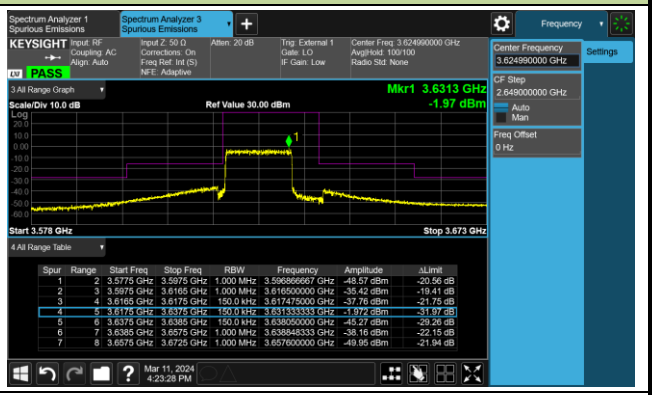
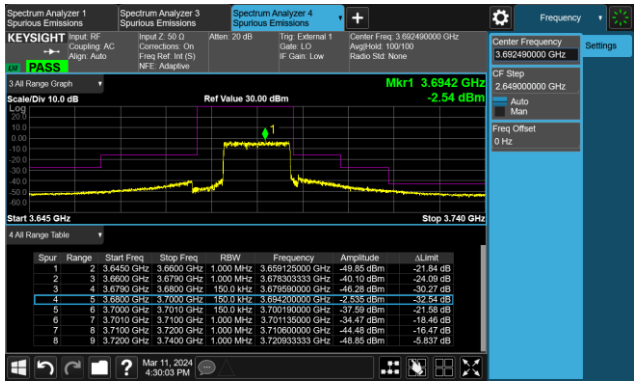
Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-02-27	Test Band	n48_SA

15MHz Channel Bandwidth - 1RB	
Low Channel ACP - Low RB Position	Low Channel ACP - High RB Position
	
Middle Channel ACP - Low RB Position	Middle Channel ACP - High RB Position
	
High Channel ACP - Low RB Position	High Channel ACP - High RB Position
	

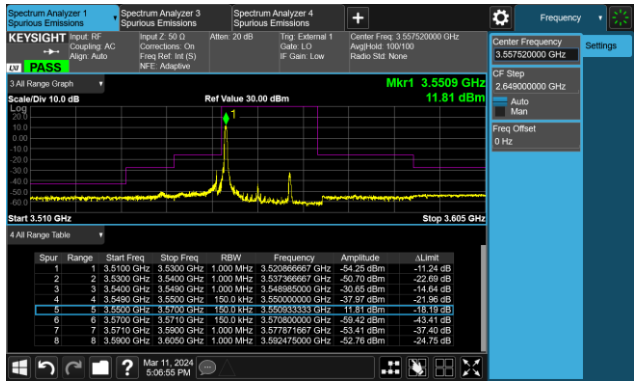
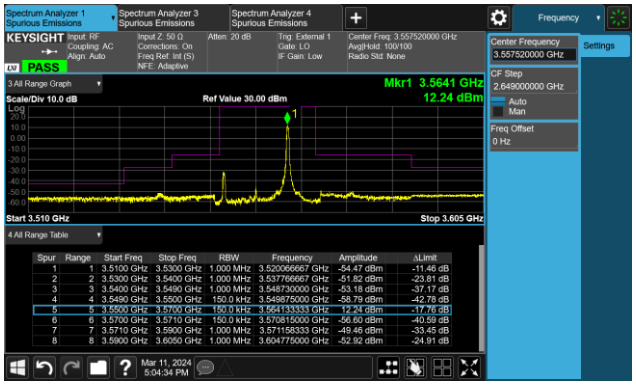
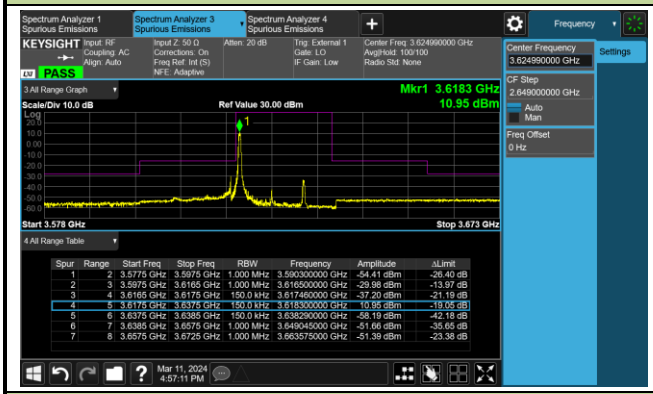
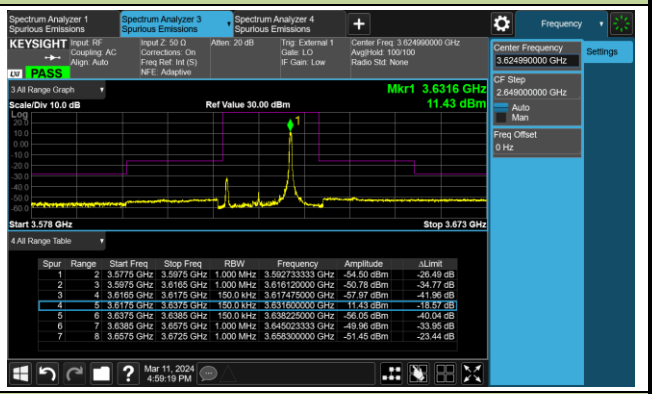
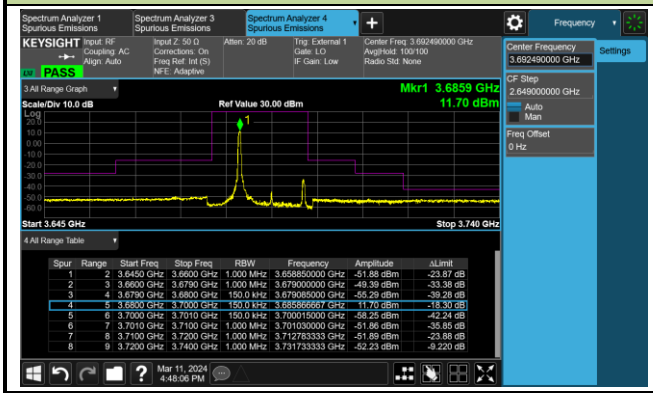
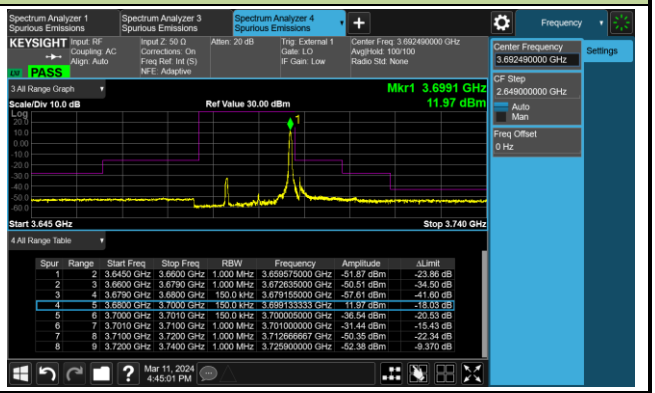
15MHz Channel Bandwidth – Full RB	
Low Channel ACP	Middle Channel ACP
	
High Channel ACP	
	

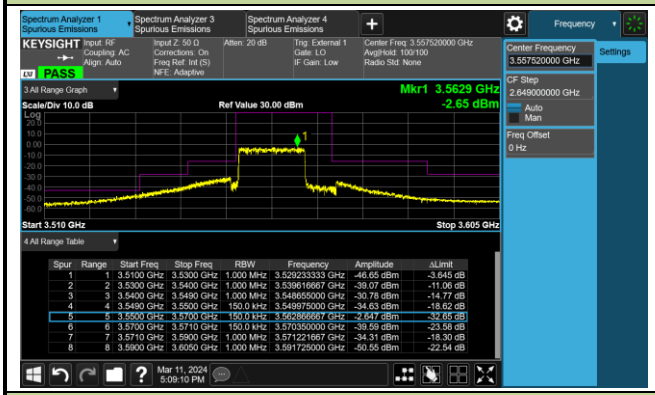
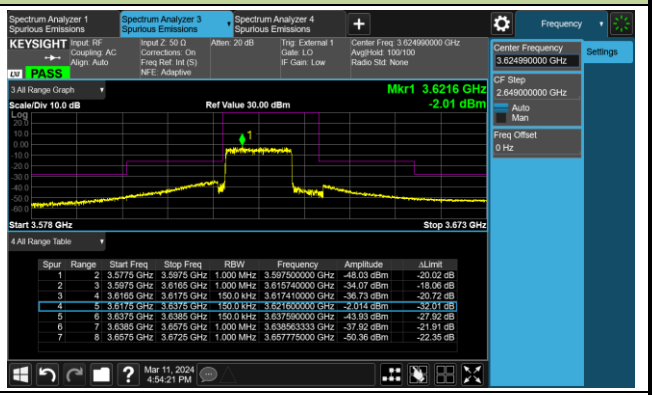
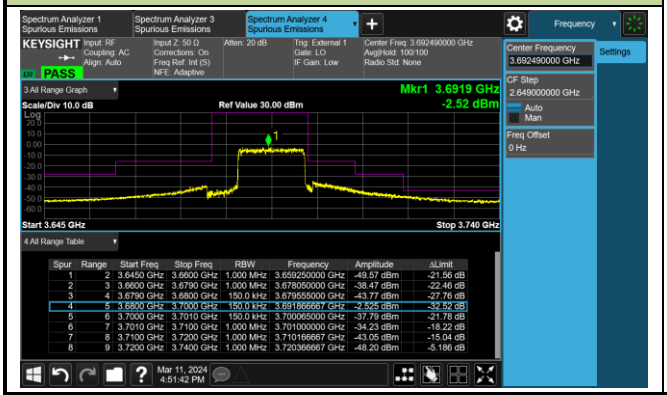
Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-03-11	Test Band	n48_UL MIMO (Port 0)

15MHz Channel Bandwidth - 1RB	
Low Channel ACP - Low RB Position	Low Channel ACP - High RB Position
	
Middle Channel ACP - Low RB Position	Middle Channel ACP - High RB Position
	
High Channel ACP - Low RB Position	High Channel ACP - High RB Position
	

15MHz Channel Bandwidth – Full RB	
Low Channel ACP	Middle Channel ACP
	
High Channel ACP	
	

Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-03-11	Test Band	n48_UL MIMO (Port 3)

15MHz Channel Bandwidth - 1RB	
Low Channel ACP - Low RB Position	Low Channel ACP - High RB Position
	
Middle Channel ACP - Low RB Position	Middle Channel ACP - High RB Position
	
High Channel ACP - Low RB Position	High Channel ACP - High RB Position
	

15MHz Channel Bandwidth – Full RB	
Low Channel ACP	Middle Channel ACP
	
High Channel ACP	
	

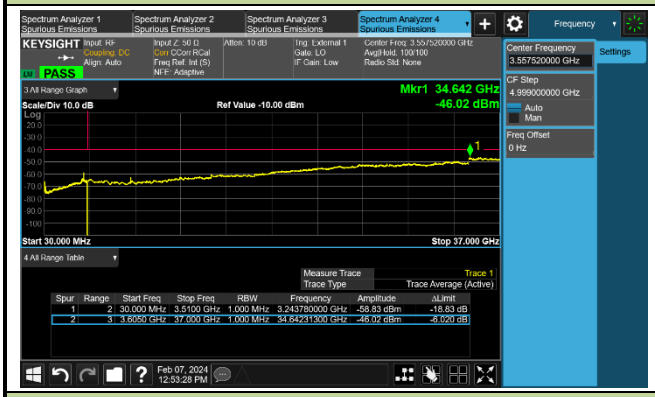
A.4 Conducted Spurious Emissions Test Result

Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-02-07	Test Band	n48_SA

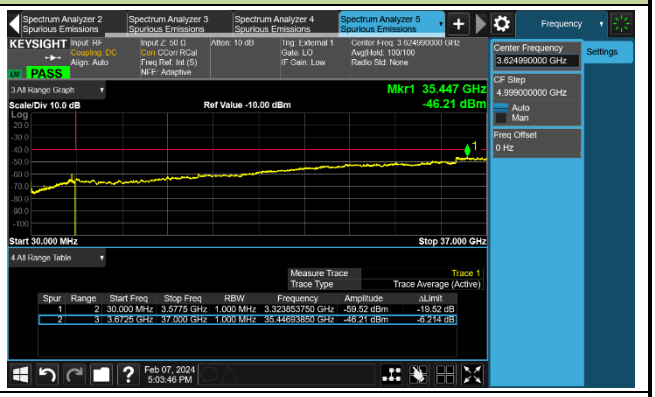
Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm/MHz)	Limit (dBm/ MHz)	Result
QPSK					
3557.52	15	30 ~ 38000	-46.02	≤ -40.00	Pass
3624.99	15	30 ~ 38000	-46.21	≤ -40.00	Pass
3692.49	15	30 ~ 38000	-45.98	≤ -40.00	Pass

15MHz Channel Bandwidth

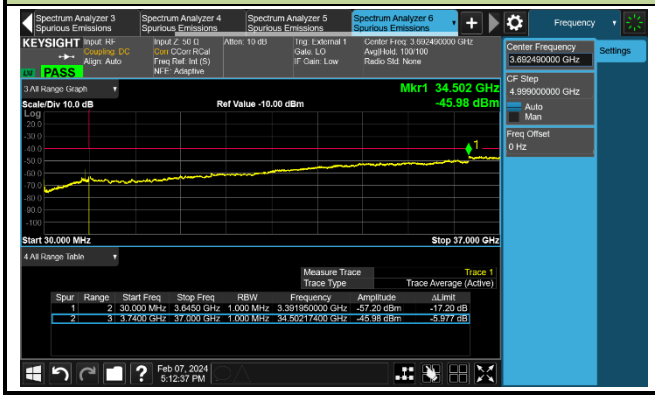
Low Channel



Middle Channel



High Channel

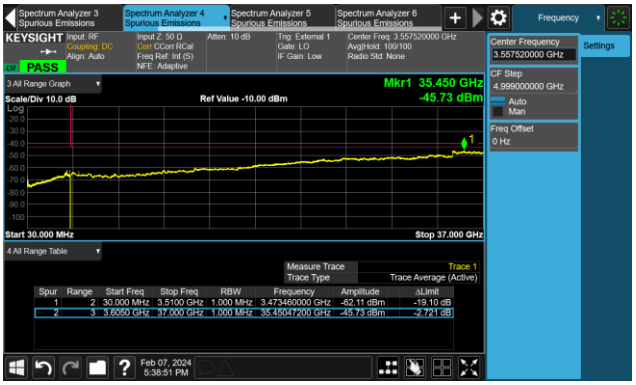


Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-02-07	Test Band	n48_UL MIMO (Port 0)

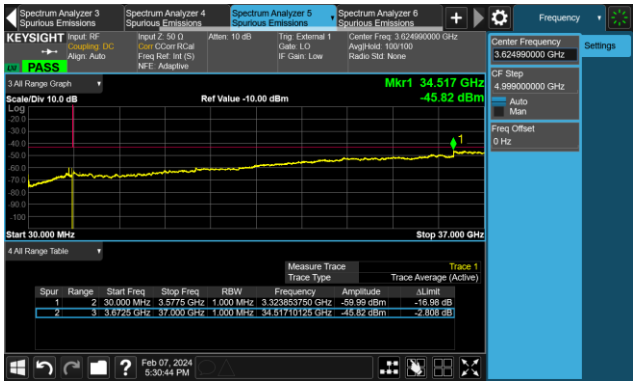
Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm/MHz)	Limit (dBm/ MHz)	Result
QPSK					
3557.52	15	30 ~ 38000	-45.73	≤ -40.00	Pass
3624.99	15	30 ~ 38000	-45.82	≤ -40.00	Pass
3692.49	15	30 ~ 38000	-45.70	≤ -40.00	Pass

15MHz Channel Bandwidth

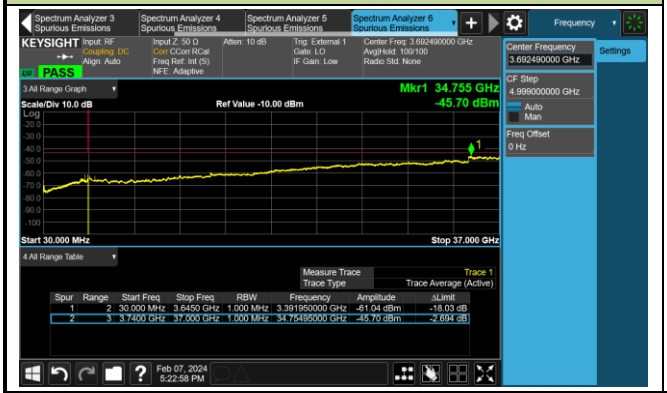
Low Channel



Middle Channel



High Channel



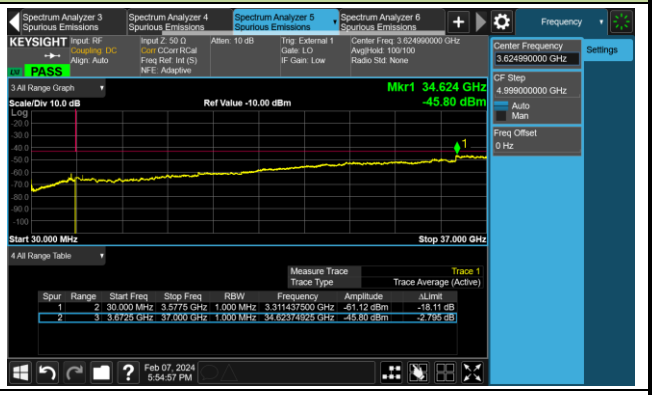
Test Site	WZ-SR6	Test Engineer	Lucas Wang
Test Date	2024-02-07	Test Band	n48_UL MIMO (Port 3)

Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm/MHz)	Limit (dBm/ MHz)	Result
QPSK					
3557.52	15	30 ~ 38000	-46.00	≤ -40.00	Pass
3624.99	15	30 ~ 38000	-45.80	≤ -40.00	Pass
3692.49	15	30 ~ 38000	-45.65	≤ -40.00	Pass

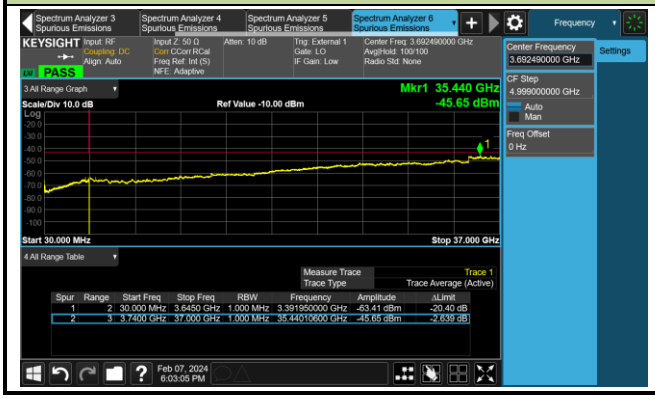
15MHz Channel Bandwidth

Low Channel

Middle Channel



High Channel



Appendix B - Test Setup Photograph

Refer to “2401RSU047-UT” file.

Appendix C - EUT Photograph

Refer to “2401RSU047-UE” file.

The End