

FCC Test Report (Part 96 – NR B48)

Report No.: RFBEIH-WTW-P23110582

FCC ID: 2ASK53SM0065

Test Model: Nokia AiOSCSMn48

Received Date: Nov. 22, 2023

Test Date: Dec. 05, 2023 ~ Mar. 27, 2024

Issued Date: Mar. 27, 2024

Applicant: Nokia

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / 788550 / TW0003

Designation Number: 281270 / TW0032



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Release Control Record

Issue No.	Description	Date Issued
RFBEIH-WTW-P23110582	Original release	Mar. 27, 2024

1 Certificate of Conformity

Product: Nokia AiO Small Cell Strand Mount n48

Brand: Nokia

Test Model: Nokia AiOSCSMn48

Sample Status: Engineering sample

Applicant: Nokia

Test Date: Dec. 05, 2023 ~ Mar. 27, 2024

Standards: 47 CFR FCC Part 96

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : *Polly Chien* , **Date:** Mar. 27, 2024
Polly Chien / Specialist

Approved by : *Jeremy Lin* , **Date:** Mar. 27, 2024
Jeremy Lin / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 96			
FCC Clause	Test Item	Result	Remarks
2.1046 96.41(b)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047 96.41(a)	Modulation Characteristics	Pass	Meet the requirement of limit.
2.1046 96.41(b)	Maximum Power Spectral Density	Pass	Meet the requirement of limit.
96.41(g)	Peak to Average Ration	Pass	Meet the requirement of limit.
2.1049	Emission Bandwidth	Pass	Meet the requirement of limit.
2.1055	Frequency Stability	Pass	Meet the requirement of limit.
2.1051 96.41(e)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 96.41(e)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -2.06dB at 7310.04MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (\pm)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.00 dB
	30MHz ~ 200MHz	2.91 dB
	200MHz ~ 1000MHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Nokia AiO Small Cell Strand Mount n48		
Brand	Nokia		
Test Model	Nokia AiOSCSMn48		
Sample Status	Engineering sample		
Power Supply Rating	44Vac / 60Vac / 100Vac		
Modulation Type	QPSK, 64QAM, 256QAM		
Operating Frequency	NR Band 48 (Channel Bandwidth 10MHz)	3555.00MHz ~ 3694.98MHz	
	NR Band 48 (Channel Bandwidth 20MHz)	3560.01MHz ~ 3690.00MHz	
	NR Band 48 (Channel Bandwidth 40MHz)	3570.00MHz ~ 3679.98MHz	

1CC

		QPSK	64QAM	256QAM
		Max. EIRP Power (Per 10M Power)	NR Band 48 (Channel Bandwidth 10MHz)	27733.201mW (44.43dBm/ 10MHz)
	NR Band 48 (Channel Bandwidth 20MHz)	24878.350mW (43.96dBm/ 10MHz)	24368.353mW (43.87dBm/ 10MHz)	23878.113mW (43.78dBm/ 10MHz)
	NR Band 48 (Channel Bandwidth 40MHz)	10510.002mW (40.22dBm/ 10MHz)	10294.389mW (40.13dBm/ 10MHz)	10094.843mW (40.04dBm/ 10MHz)
		QPSK	64QAM	256QAM
		Max. EIRP Power (Full power)	NR Band 48 (Channel Bandwidth 10MHz)	27733.201mW (44.43dBm/ Channel Bandwidth)
	NR Band 48 (Channel Bandwidth 20MHz)	45081.670mW (46.54dBm/ Channel Bandwidth)	44157.045mW (46.45dBm/ Channel Bandwidth)	43151.908mW (46.35dBm/ Channel Bandwidth)
	NR Band 48 (Channel Bandwidth 40MHz)	40271.703mW (46.05dBm/ Channel Bandwidth)	39445.730mW (45.96dBm/ Channel Bandwidth)	38636.698mW (45.87dBm/ Channel Bandwidth)
		QPSK	64QAM	256QAM
		Emission Designator	NR Band 48 (Channel Bandwidth 10MHz)	8M58G7D
	NR Band 48 (Channel Bandwidth 20MHz)	18M2G7D	18M2D7W	18M2D7W
	NR Band 48 (Channel Bandwidth 40MHz)	37M8G7D	37M8D7W	37M9D7W

2CC

Max. EIRP Power (Per 10M Power)		QPSK	64QAM	256QAM
	NR Band 48 (Channel Bandwidth 10MHz+20MHz)	30060.763mW (44.78dBm/ 10MHz)	29444.216mW (44.69dBm/ 10MHz)	28840.315mW (44.60dBm/ 10MHz)
	NR Band 48 (Channel Bandwidth 20MHz+10MHz)	28054.336mW (44.48dBm/ 10MHz)	27542.287mW (44.40dBm/ 10MHz)	26977.394mW (44.31dBm/ 10MHz)
	NR Band 48 (Channel Bandwidth 20MHz+20MHz)	24774.221mW (43.94dBm/ 10MHz)	24266.101mW (43.85dBm/ 10MHz)	23768.403mW (43.76dBm/ 10MHz)
Max. EIRP Power (Full power)		QPSK	64QAM	256QAM
	NR Band 48 (Channel Bandwidth 10MHz+20MHz)	43853.070mW (46.42dBm/ channel bandwidth)	42953.643mW (46.33dBm/ channel bandwidth)	42072.663mW (46.24dBm/ channel bandwidth)
	NR Band 48 (Channel Bandwidth 20MHz+10MHz)	41020.410mW (46.13dBm/ channel bandwidth)	40271.703mW (46.05dBm/ channel bandwidth)	39355.008mW (45.95dBm/ channel bandwidth)
	NR Band 48 (Channel Bandwidth 20MHz+20MHz)	44668.359mW (46.50dBm/ channel bandwidth)	43752.211mW (46.41dBm/ channel bandwidth)	42854.852mW (46.32dBm/ channel bandwidth)
Emission Designator		QPSK	64QAM	256QAM
	NR Band 48 (Channel Bandwidth 10MHz+20MHz)	26M8G7D	26M8D7W	26M8D7W
	NR Band 48 (Channel Bandwidth 20MHz+10MHz)	26M8G7D	26M8D7W	26M8D7W
	NR Band 48 (Channel Bandwidth 20MHz+20MHz)	36M4G7D	36M4D7W	36M4D7W
Antenna Type	Refer to note			
Antenna Connector	Refer to note			
Accessory Device	N/A			
Cable Supplied	N/A			

Note:

1. The EUT supports the following configuration.

5G NR	FCC 5G FR1	
	1CC_SCS_30kHz	2CC_SCS_30kHz
Bandwidth (MHz)	10/20/40	10+20 / 20+10 / 20+20

2. The following antennas were provided to the EUT.

Worst-case gains used to calculate the directional gain for cross-polarization:

Gain at Position (dBi)					
Position (θ, φ)	Ant. 0 (Port 1)	Ant. 1 (Port 2)	Ant. 2 (Port 3)	Ant. 3 (Port 4)	calculate the Directional Gain (dBi)
(90, 135)	5.0		7.6		9.41
(90, 135)		4.1		8.0	9.28

Single antenna port peak gains:

Antenna Type	Patch			
Antenna Connector	NEX 10 Female			
Ant. No.	Ant. 0 (Port 1)	Ant. 1 (Port 2)	Ant. 2 (Port 3)	Ant. 3 (Port 4)
Band	Gain (dBi)			
Band 48	8	7.8	8.3	8.6

*The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

Note:

3.55GHz correlated calculation for P1&P3, P2&P4:

Maximum correlated gain for port1 and port3:9.41dBi. This occurs at: 3550MHz: phi 315 / theta 90
 $= 10 \cdot \text{LOG}(((10^{(\text{Port1}/20)})+10^{(\text{Port3}/20)})^{2/2}) = 10 \cdot \text{LOG}(((10^{(5.0/20)})+10^{(7.6/20)})^{2/2})$

Maximum correlated gain for port2 and port4:9.28dBi. This occurs at: 3550MHz: phi 315 / theta 90
 $= 10 \cdot \text{LOG}(((10^{(\text{Port2}/20)})+10^{(\text{Port4}/20)})^{2/2}) = 10 \cdot \text{LOG}(((10^{(4.1/20)})+10^{(8.0/20)})^{2/2})$

3.55GHz uncorrelated calculation for two cross-polarized pairs:

Maximum uncorrelated gain for two cross-polarized pairs:9.35. This occurs at: 3550MHz: phi 315 / theta 90
 $= 10 \cdot \text{LOG}(((10^{(\text{P1\&P3 Correlated}/10)})+10^{(\text{P2\&P4 Correlated}/10)})/2) =$
 $10 \cdot \text{LOG}(((10^{(9.41/10)})+10^{(9.28/10)})/2)$

3.2 Test Mode Applicability and Tested Channel Detail

The EUT is designed to be positioned on the X-plane only.

Test results are presented in the report as below.

Test Mode	Test Condition
A	1CC mode
B	2CC mode

Following channel(s) was (were) selected for the final test as listed below:

Mode A: 1CC

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
A	Maximum Output Power	637000 to 646332	637000 (3555.00MHz), 641666 (3624.99MHz), 646332 (3694.98MHz)	10MHz	QPSK / 64QAM / 256QAM
		637334 to 646000	637334 (3560.01MHz), 641666 (3624.99MHz), 646000 (3690.00MHz)	20MHz	QPSK / 64QAM / 256QAM
		638000 to 645332	638000 (3570.00MHz), 641666 (3624.99MHz), 645332 (3679.98MHz)	40MHz	QPSK / 64QAM / 256QAM
A	Maximum Power Spectral Density	637000 to 646332	637000 (3555.00MHz), 641666 (3624.99MHz), 646332 (3694.98MHz)	10MHz	QPSK
		637334 to 646000	637334 (3560.01MHz), 641666 (3624.99MHz), 646000 (3690.00MHz)	20MHz	QPSK
		638000 to 645332	638000 (3570.00MHz), 641666 (3624.99MHz), 645332 (3679.98MHz)	40MHz	QPSK
A	Modulation Characteristics	638000 to 645332	641666 (3624.99MHz)	40MHz	QPSK / 64QAM / 256QAM
A	Frequency Stability	637000 to 646332	637000 (3555.00MHz), 646332 (3694.98MHz)	10MHz	QPSK
		637334 to 646000	637334 (3560.01MHz), 646000 (3690.00MHz)	20MHz	QPSK
		638000 to 645332	638000 (3570.00MHz), 645332 (3679.98MHz)	40MHz	QPSK
A	Occupied Bandwidth	637000 to 646332	637000 (3555.00MHz), 641666 (3624.99MHz), 646332 (3694.98MHz)	10MHz	QPSK / 64QAM / 256QAM
		637334 to 646000	637334 (3560.01MHz), 641666 (3624.99MHz), 646000 (3690.00MHz)	20MHz	QPSK / 64QAM / 256QAM
		638000 to 645332	638000 (3570.00MHz), 641666 (3624.99MHz), 645332 (3679.98MHz)	40MHz	QPSK / 64QAM / 256QAM

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
A	Peak to Average Ratio	637000 to 646332	637000 (3555.00MHz), 641666 (3624.99MHz), 646332 (3694.98MHz)	10MHz	QPSK / 64QAM / 256QAM
		637334 to 646000	637334 (3560.01MHz), 641666 (3624.99MHz), 646000 (3690.00MHz)	20MHz	QPSK / 64QAM / 256QAM
		638000 to 645332	638000 (3570.00MHz), 641666 (3624.99MHz), 645332 (3679.98MHz)	40MHz	QPSK / 64QAM / 256QAM
A	Conducted Emission	637000 to 646332	637000 (3555.00MHz), 641666 (3624.99MHz), 646332 (3694.98MHz)	10MHz	QPSK
		637334 to 646000	637334 (3560.01MHz), 641666 (3624.99MHz), 646000 (3690.00MHz)	20MHz	QPSK
		638000 to 645332	638000 (3570.00MHz), 641666 (3624.99MHz), 645332 (3679.98MHz)	40MHz	QPSK
A	Radiated Emission Above 1GHz	637000 to 646332	637000 (3555.00MHz), 641666 (3624.99MHz), 646332 (3694.98MHz)	10MHz	QPSK
		637334 to 646000	637334 (3560.01MHz), 641666 (3624.99MHz), 646000 (3690.00MHz)	20MHz	QPSK
		638000 to 645332	638000 (3570.00MHz), 641666 (3624.99MHz), 645332 (3679.98MHz)	40MHz	QPSK

Mode B: 2CC

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
B	Maximum Output Power	637000 to 642502	637000 (3555.00MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 644000 (3660.00MHz), 641168 (3617.52MHz) + 642502 (3637.53MHz)	10MHz+20MHz	QPSK / 64QAM / 256QAM
		637334 to 642168	637334 (3560.01MHz) + 646332 (3694.98MHz), 639334 (3590.01MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642168 (3632.52MHz)	20MHz+10MHz	QPSK / 64QAM / 256QAM
		637334 to 642502	637334 (3560.01MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642502 (3637.53MHz)	20MHz+20MHz	QPSK / 64QAM / 256QAM
B	Maximum Power Spectral Density	637000 to 642502	637000 (3555.00MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 644000 (3660.00MHz), 641168 (3617.52MHz) + 642502 (3637.53MHz)	10MHz+20MHz	QPSK
		637334 to 642168	637334 (3560.01MHz) + 646332 (3694.98MHz), 639334 (3590.01MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642168 (3632.52MHz)	20MHz+10MHz	QPSK
		637334 to 642502	637334 (3560.01MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642502 (3637.53MHz)	20MHz+20MHz	QPSK
B	*Frequency Stability	637000 to 642502	637000 (3555.00MHz) + 646000 (3690.00MHz)	10MHz+20MHz	QPSK
		637334 to 642168	637334 (3560.01MHz) + 646332 (3694.98MHz)	20MHz+10MHz	QPSK
		637334 to 642502	637334 (3560.01MHz) + 646000 (3690.00MHz)	20MHz+20MHz	QPSK

*Worst channel had been chosen for final test on frequency stability test.

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
B	Occupied Bandwidth	637000 to 642502	637000 (3555.00MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 644000 (3660.00MHz), 641168 (3617.52MHz) + 642502 (3637.53MHz)	10MHz+20MHz	QPSK / 64QAM / 256QAM
		637334 to 642168	637334 (3560.01MHz) + 646332 (3694.98MHz), 639334 (3590.01MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642168 (3632.52MHz)	20MHz+10MHz	QPSK / 64QAM / 256QAM
		637334 to 642502	637334 (3560.01MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642502 (3637.53MHz)	20MHz+20MHz	QPSK / 64QAM / 256QAM
B	Peak to Average Ratio	637000 to 642502	637000 (3555.00MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 644000 (3660.00MHz), 641168 (3617.52MHz) + 642502 (3637.53MHz)	10MHz+20MHz	QPSK / 64QAM / 256QAM
		637334 to 642168	637334 (3560.01MHz) + 646332 (3694.98MHz), 639334 (3590.01MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642168 (3632.52MHz)	20MHz+10MHz	QPSK / 64QAM / 256QAM
		637334 to 642502	637334 (3560.01MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642502 (3637.53MHz)	20MHz+20MHz	QPSK / 64QAM / 256QAM
B	Conducted Emission	637000 to 642502	637000 (3555.00MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 644000 (3660.00MHz), 641168 (3617.52MHz) + 642502 (3637.53MHz)	10MHz+20MHz	QPSK
		637334 to 642168	637334 (3560.01MHz) + 646332 (3694.98MHz), 639334 (3590.01MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642168 (3632.52MHz)	20MHz+10MHz	QPSK
		637334 to 642502	637334 (3560.01MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642502 (3637.53MHz)	20MHz+20MHz	QPSK

Test Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation
B	Radiated Emission Below 1GHz	637334 to 642168	637334 (3560.01MHz) + 646332 (3694.98MHz)	20MHz+10MHz	QPSK
B	Radiated Emission Above 1GHz	637000 to 642502	637000 (3555.00MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 644000 (3660.00MHz), 641168 (3617.52MHz) + 642502 (3637.53MHz)	10MHz+20MHz	QPSK
		637334 to 642168	637334 (3560.01MHz) + 646332 (3694.98MHz), 639334 (3590.01MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642168 (3632.52MHz)	20MHz+10MHz	QPSK
		637334 to 642502	637334 (3560.01MHz) + 646000 (3690.00MHz), 639668 (3595.02MHz) + 643668 (3655.02MHz), 640834 (3612.51MHz) + 642502 (3637.53MHz)	20MHz+20MHz	QPSK

Note:

1. For radiated emission below 1GHz, select the worst radiated emission channel (above 1GHz) for final testing.
2. The output power for QPSK, 64QAM, and 256QAM, measured value of is QPSK higher than 64QAM, and 256QAM mode. Therefore, only occupied bandwidth and Peak to average ratio items had been tested under QPSK, 64QAM, and 256QAM modes, the other test items were performed under QPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
Maximum Output Power	25deg. C, 60%RH	60Vac	Noah Chang
Maximum Power Spectral Density	25deg. C, 60%RH	60Vac	Noah Chang
Modulation Characteristics	25deg. C, 60%RH	60Vac	Noah Chang
Frequency Stability	25deg. C, 60%RH	60Vac	Noah Chang
Occupied Bandwidth	25deg. C, 60%RH	60Vac	Noah Chang
Peak To Average Ratio	25deg. C, 60%RH	60Vac	Noah Chang
Conducted Emission	25deg. C, 60%RH	60Vac	Noah Chang
Radiated Emission	22deg. C, 72%RH	60Vac	Noah Chang

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

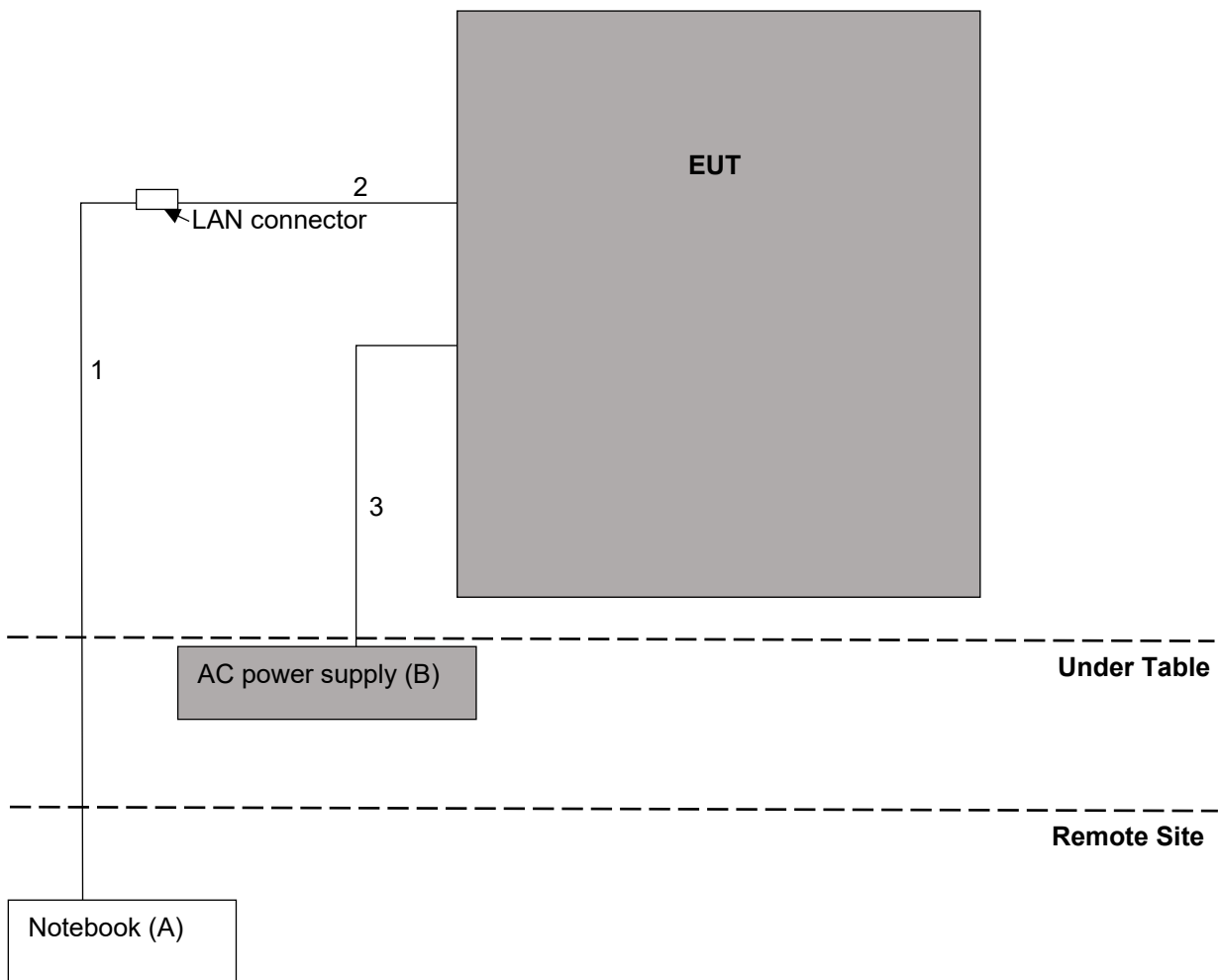
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	Dell	P111G	NA	NA	Supplied by applicant
B.	AC power supply	Lindsay Broadband	LBNS-PS6090-8A-L	NA	NA	Supplied by applicant

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	N	0	Provided by Lab
2.	Console Cable	1	0.6	N	0	Supplied by applicant
3.	Coaxial Cable	1	1	Y	0	Supplied by applicant

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 96

ANSI/TIA/EIA-603-E-2016

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

KDB 940660 D01 Part 96 CBRS Eqpt v03

All test items have been performed as a reference to the above KDB test guidance.

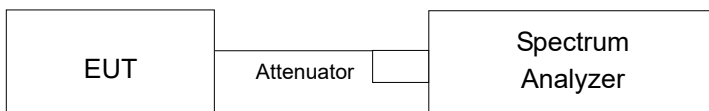
4 Test Types and Results

4.1 Maximum Output Power Measurement

4.1.1 Limits of Maximum Output Power Measurement

Device		Maximum EIRP (dBm/10 MHz)
<input type="checkbox"/>	End User Device	23
<input type="checkbox"/>	Category A CBSD	30
<input checked="" type="checkbox"/>	Category B CBSD	47

4.1.2 Test Setup



4.1.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer KEYSIGHT	N9030B	MY57140488	Mar. 06, 2023	Mar. 05, 2024
			Mar. 06, 2024	Mar. 05, 2025
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Mar. 03, 2023	Mar. 02, 2024
			Mar. 13, 2024	Mar. 12, 2025
RF cable	JB200	Cable-OVEN-02	NA	NA
DC-6GHz 20dB 50W Fixed attenuator Woken	MDC9331N-20	0724	Jul. 01, 2022	Jun. 30, 2024
STANDARD TEMPERATURE & HUMIDITY CHAMBER TERCHY	MHU-225AU	911033	Nov. 16, 2023	Nov. 15, 2024
AC Power Supply Extech	CFW-105	E000603	NA	NA
Digital Multimeter Fluke	87-III	70360742	Jun. 06, 2023	Jun. 05, 2024

- Note: 1. The calibration interval of the above test instruments is 12/24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. Tested date: Dec. 05, 2023 ~ Mar. 27, 2024

4.1.4 Test Procedures

Conducted output power measurement

- a. Connect the DUT transmitter output to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
- b. Set span to at least 1.5 times the OBW.
- c. Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
- d. Set VBW $\geq 3 \times$ RBW.
- e. Set number of points in sweep $\geq 2 \times$ span / RBW.
- f. Sweep time = auto-couple.
- g. Detector = RMS (power averaging).
- h. If the EUT can be configured to transmit continuously (i.e., burst duty cycle $\geq 98\%$), then set the trigger to free run.
- i. If the EUT cannot be configured to transmit continuously (i.e., burst duty cycle $< 98\%$), then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Ensure that the sweep time is less than or equal to the transmission burst duration.
- j. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
- k. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
- l. For per 10MHz method, channel power integrating bandwidth 10MHz is used for bandwidth 10M, 20M, 30M and 40M. For full power method, channel power integrating bandwidth 10MHz is used for bandwidth 10M, integrating bandwidth 20MHz is used for bandwidth 20M, integrating bandwidth 30MHz is used for bandwidth 30M, integrating bandwidth 40MHz is used for bandwidth 40M.

Maximum EIRP

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

4.1.5 Deviation from Test Standard

No deviation.

4.1.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.1.7 Test Results

Mode A: 1CC

Conducted Output Power and EIRP Power (dBm/10MHz)

Bandwidth	Frequency (MHz)	Modulation	Ant.0	Ant.1	Ant.2	Ant.3	Total	EIRP (dBm/10MHz)	Verdict
10M	3555	QPSK	29.21	29.20	28.84	28.82	35.04	44.39	PASS
		64QAM	29.11	29.11	28.75	28.74	34.95	44.30	PASS
		256QAM	29.01	29.02	28.67	28.64	34.86	44.21	PASS
	3624.99	QPSK	29.24	29.22	28.93	28.83	35.08	44.43	PASS
		64QAM	29.15	29.12	28.84	28.75	34.99	44.34	PASS
		256QAM	29.06	29.02	28.74	28.64	34.89	44.24	PASS
	3694.98	QPSK	28.21	28.15	28.12	28.09	34.16	43.51	PASS
		64QAM	28.14	28.13	28.10	28.05	34.13	43.48	PASS
		256QAM	28.13	28.09	28.07	28.00	34.09	43.44	PASS
20M	3560.01	QPSK	28.75	28.72	28.45	28.42	34.61	43.96	PASS
		64QAM	28.67	28.62	28.37	28.32	34.52	43.87	PASS
		256QAM	28.56	28.54	28.27	28.24	34.43	43.78	PASS
	3624.99	QPSK	27.99	27.97	27.50	27.49	33.76	43.11	PASS
		64QAM	27.91	27.88	27.40	27.41	33.68	43.03	PASS
		256QAM	27.83	27.79	27.31	27.31	33.59	42.94	PASS
	3690	QPSK	25.63	25.59	25.40	25.29	31.50	40.85	PASS
		64QAM	25.57	25.52	25.33	25.20	31.43	40.78	PASS
		256QAM	25.49	25.47	25.26	25.14	31.36	40.71	PASS
40M	3570	QPSK	25.02	24.74	24.42	24.30	30.65	40.00	PASS
		64QAM	24.93	24.64	24.34	24.21	30.56	39.91	PASS
		256QAM	24.84	24.56	24.24	24.11	30.47	39.82	PASS
	3624.99	QPSK	25.09	25.02	24.65	24.60	30.87	40.22	PASS
		64QAM	25.00	24.93	24.55	24.52	30.78	40.13	PASS
		256QAM	24.91	24.85	24.47	24.43	30.69	40.04	PASS
	3679.98	QPSK	22.50	22.47	22.39	22.25	28.42	37.77	PASS
		64QAM	22.42	22.40	22.32	22.17	28.35	37.70	PASS
		256QAM	22.35	22.34	22.25	22.08	28.28	37.63	PASS

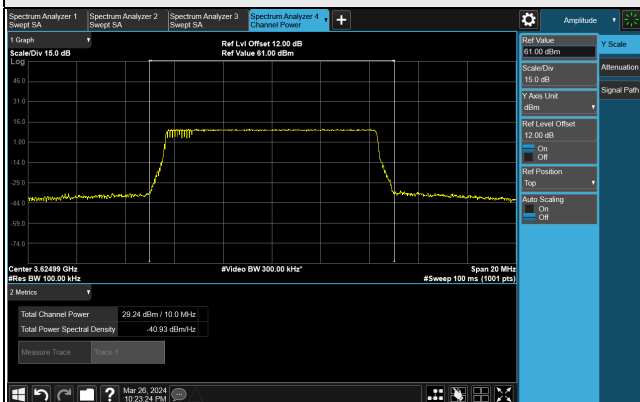
Note:

1. Directional gain: $10 \cdot \text{LOG}(((10^{(9.41/10)}) + 10^{(9.28/10)})/2) = 9.35 \text{ dBi}$
2. EIRP (dBm/10MHz) = Total Conducted Output Power (dBm/10MHz) + Directional Gain

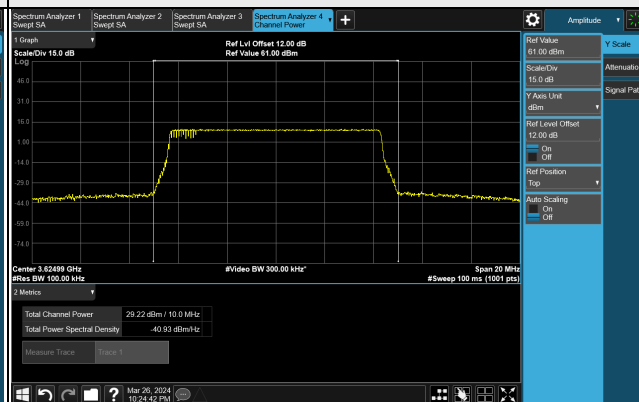
Spectrum Plot of Worst Value

10MHz / QPSK

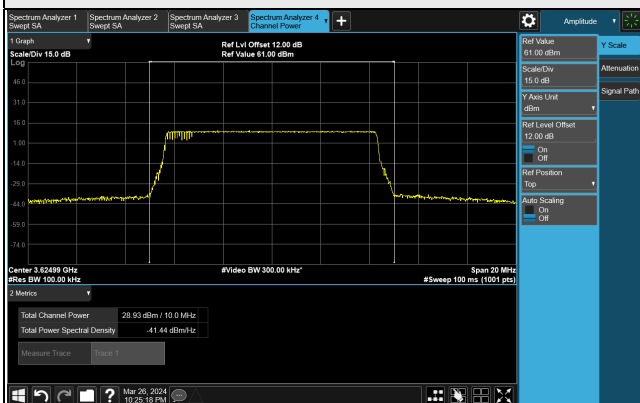
Ant.0



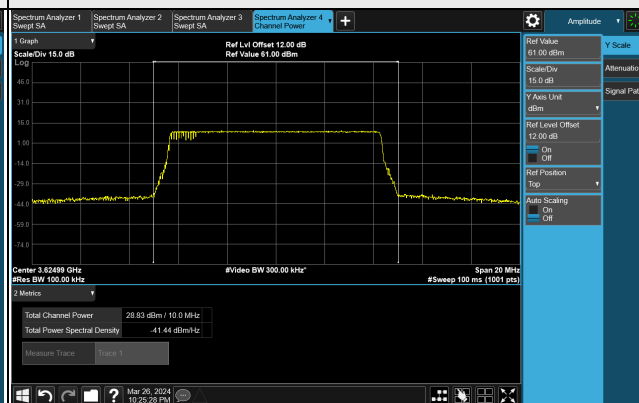
Ant.1



Ant.2



Ant.3



Full Conducted Output Power and Full EIRP Power (dBm/Channel Bandwidth)

Bandwidth	Frequency (MHz)	Modulation	Ant.0	Ant.1	Ant.2	Ant.3	Total	EIRP (dBm/Channel Bandwidth)	Verdict
10M	3555	QPSK	29.21	29.20	28.84	28.82	35.04	44.39	PASS
		64QAM	29.11	29.11	28.75	28.74	34.95	44.30	PASS
		256QAM	29.01	29.02	28.67	28.64	34.86	44.21	PASS
	3624.99	QPSK	29.24	29.22	28.93	28.83	35.08	44.43	PASS
		64QAM	29.15	29.12	28.84	28.75	34.99	44.34	PASS
		256QAM	29.06	29.02	28.74	28.64	34.89	44.24	PASS
	3694.98	QPSK	28.21	28.15	28.12	28.09	34.16	43.51	PASS
		64QAM	28.14	28.13	28.10	28.05	34.13	43.48	PASS
		256QAM	28.13	28.09	28.07	28.00	34.09	43.44	PASS
20M	3560.01	QPSK	31.32	31.30	31.03	31.00	37.19	46.54	PASS
		64QAM	31.24	31.21	30.95	30.90	37.10	46.45	PASS
		256QAM	31.15	31.12	30.84	30.81	37.00	46.35	PASS
	3624.99	QPSK	30.57	30.55	30.17	30.16	36.39	45.74	PASS
		64QAM	30.48	30.47	30.08	30.07	36.30	45.65	PASS
		256QAM	30.38	30.37	29.98	29.97	36.20	45.55	PASS
	3690	QPSK	28.35	28.33	28.15	28.04	34.24	43.59	PASS
		64QAM	28.26	28.25	28.10	28.02	34.18	43.53	PASS
		256QAM	28.20	28.19	28.05	28.00	34.13	43.48	PASS
40M	3570	QPSK	30.70	30.56	30.24	30.21	36.45	45.80	PASS
		64QAM	30.62	30.48	30.14	30.11	36.36	45.71	PASS
		256QAM	30.51	30.40	30.04	30.01	36.27	45.62	PASS
	3624.99	QPSK	30.95	30.93	30.48	30.33	36.70	46.05	PASS
		64QAM	30.84	30.85	30.39	30.25	36.61	45.96	PASS
		256QAM	30.75	30.76	30.30	30.15	36.52	45.87	PASS
	3679.98	QPSK	28.41	28.39	28.21	28.16	34.31	43.66	PASS
		64QAM	28.34	28.30	28.02	28.10	34.21	43.56	PASS
		256QAM	28.27	28.25	28.00	28.05	34.16	43.51	PASS

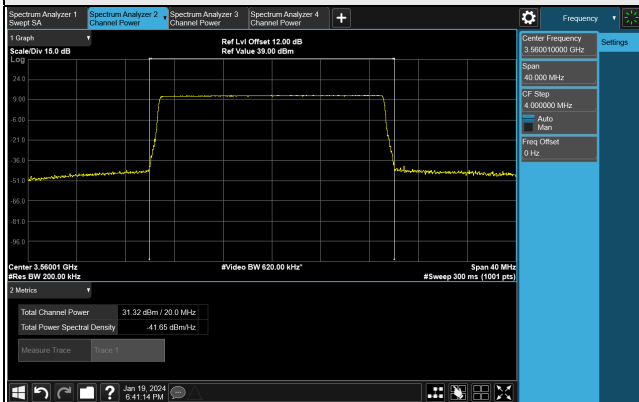
Note:

1. Directional gain: $10 \cdot \text{LOG}(((10^{(9.41/10)}) + 10^{(9.28/10)})/2) = 9.35 \text{ dBi}$
2. EIRP (dBm/Channel Bandwidth) = Total Conducted Output Power (dBm/Channel Bandwidth) + Directional Gain

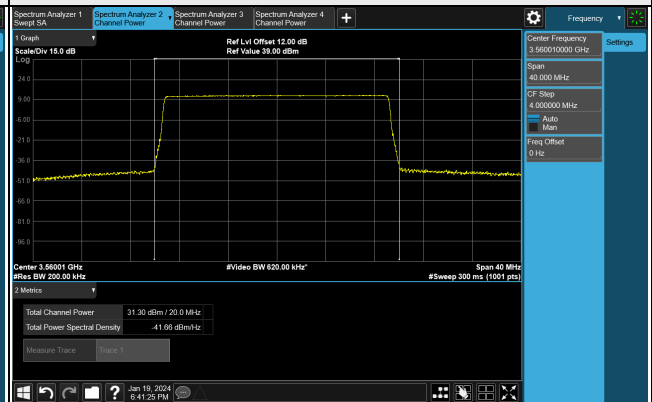
Spectrum Plot of Worst Value

20MHz / QPSK

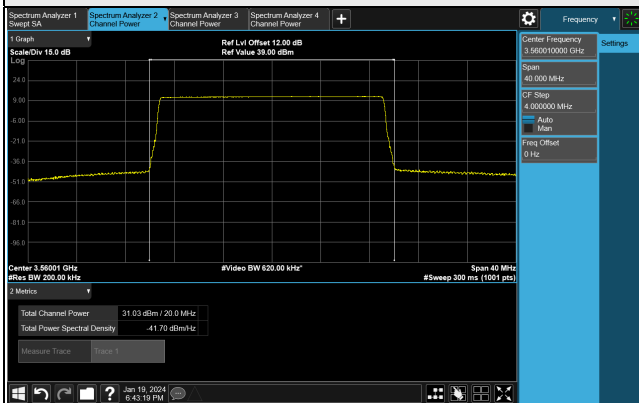
Ant.0



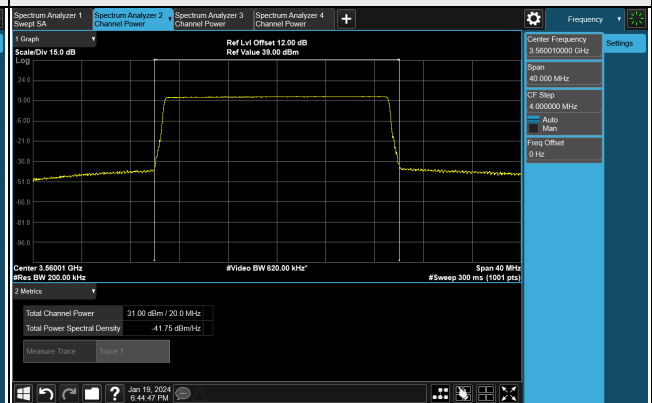
Ant.1



Ant.2



Ant.3



Mode B: 2CC

Conducted Output Power and EIRP Power (dBm/10MHz)

Bandwidth	Frequency (MHz)	Modulation	Carrier	Ant.0	Ant.1	Ant.2	Ant.3	Total	EIRP (dBm/10MHz)	Verdict
10M+20M	3555+3690	QPSK	CC0	24.79	24.89	25.18	25.22	31.04	43.82	PASS
			CC1	25.58	25.61	26.01	26.07	31.84		
		64QAM	CC0	24.75	24.86	25.14	25.18	31.01	43.79	PASS
			CC1	25.57	25.58	25.98	26.04	31.82		
		256QAM	CC0	24.71	24.82	25.12	25.15	30.97	43.76	PASS
			CC1	25.53	25.55	25.94	26.00	31.78		
	3595.02+3660	QPSK	CC0	25.89	25.74	26.03	26.08	31.96	44.78	PASS
			CC1	26.58	26.53	26.94	27.20	32.84		
		64QAM	CC0	25.79	25.65	25.95	25.98	31.87	44.69	PASS
			CC1	26.48	26.44	26.85	27.12	32.75		
		256QAM	CC0	25.71	25.55	25.86	25.89	31.78	44.60	PASS
			CC1	26.40	26.35	26.75	27.03	32.66		
3617.52+3637.53	QPSK	CC0	25.45	25.70	25.79	25.91	31.74	44.62	PASS	
		CC1	26.49	26.68	26.78	26.86	32.73			
	64QAM	CC0	25.35	25.59	25.71	25.82	31.64	44.53	PASS	
		CC1	26.39	26.58	26.70	26.77	32.63			
	256QAM	CC0	25.25	25.48	25.61	25.74	31.54	44.43	PASS	
		CC1	26.30	26.48	26.62	26.67	32.54			
20M+10M	3560.01+3694.98	QPSK	CC0	25.50	25.61	25.68	25.71	31.65	43.80	PASS
			CC1	25.01	25.15	25.28	25.34	31.22		
		64QAM	CC0	25.49	25.58	25.67	25.68	31.63	43.78	PASS
			CC1	25.00	25.13	25.25	25.33	31.20		
		256QAM	CC0	25.48	25.57	25.65	25.64	31.61	43.75	PASS
			CC1	24.96	25.12	25.22	25.30	31.17		
	3590.01+3655.02	QPSK	CC0	26.13	26.21	26.29	26.37	32.27	44.48	PASS
			CC1	25.80	25.90	26.01	26.09	31.97		
		64QAM	CC0	26.05	26.12	26.19	26.27	32.18	44.40	PASS
			CC1	25.71	25.82	25.93	26.01	31.89		
		256QAM	CC0	25.95	26.04	26.10	26.18	32.09	44.31	PASS
			CC1	25.61	25.72	25.85	25.93	31.80		
3612.51+3632.52	QPSK	CC0	26.24	26.29	26.33	26.53	32.37	44.46	PASS	
		CC1	25.60	25.75	25.88	25.92	31.81			
	64QAM	CC0	26.16	26.20	26.25	26.45	32.29	44.37	PASS	
		CC1	25.50	25.65	25.80	25.82	31.72			
	256QAM	CC0	26.05	26.10	26.16	26.35	32.19	44.27	PASS	
		CC1	25.41	25.56	25.70	25.72	31.62			
20M+20M	3560.01+3690	QPSK	CC0	24.01	24.08	24.18	24.23	30.15	42.77	PASS
			CC1	24.50	24.62	24.68	24.73	30.65		
		64QAM	CC0	23.99	24.07	24.16	24.19	30.12	42.74	PASS
			CC1	24.46	24.58	24.64	24.72	30.62		
		256QAM	CC0	23.97	24.03	24.13	24.15	30.09	42.71	PASS
			CC1	24.42	24.56	24.60	24.70	30.59		
	3595.02+3655.02	QPSK	CC0	25.25	25.33	25.49	25.52	31.42	43.94	PASS
			CC1	25.53	25.63	25.78	25.93	31.74		
		64QAM	CC0	25.15	25.24	25.39	25.44	31.33	43.85	PASS
			CC1	25.45	25.54	25.68	25.85	31.65		
		256QAM	CC0	25.06	25.16	25.31	25.34	31.24	43.76	PASS
			CC1	25.36	25.44	25.60	25.76	31.56		
3612.51+3637.53	QPSK	CC0	24.79	24.85	25.05	25.09	30.97	43.43	PASS	
		CC1	24.91	25.19	25.20	25.28	31.17			
	64QAM	CC0	24.71	24.76	24.95	24.99	30.87	43.34	PASS	
		CC1	24.82	25.11	25.11	25.18	31.08			
	256QAM	CC0	24.62	24.68	24.85	24.91	30.79	43.25	PASS	
		CC1	24.74	25.01	25.01	25.08	30.98			

Note:

1. Directional gain: $10 \cdot \text{LOG}(((10^{(9.41/10)}) + 10^{(9.28/10)})/2) = 9.35 \text{ dBi}$
2. EIRP (dBm/10MHz) = Total Conducted Output Power (dBm/10MHz) + Directional Gain

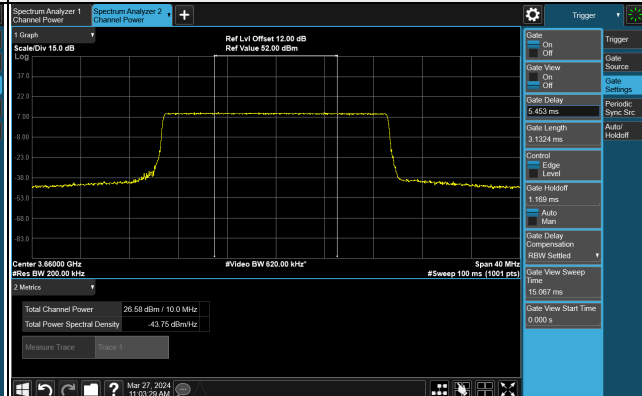
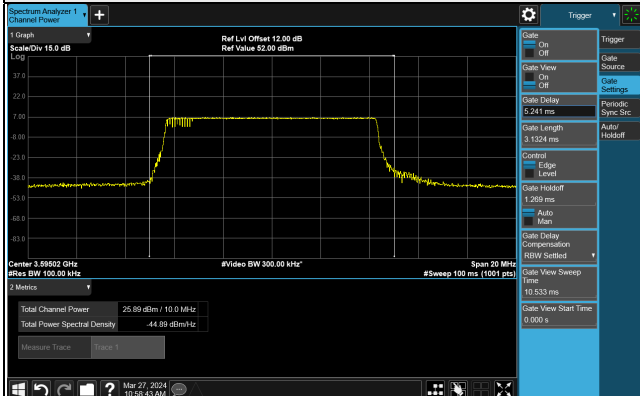
Spectrum Plot of Worst Value

10MHz+20MHz / QPSK

Ant.0

3595.02 MHz

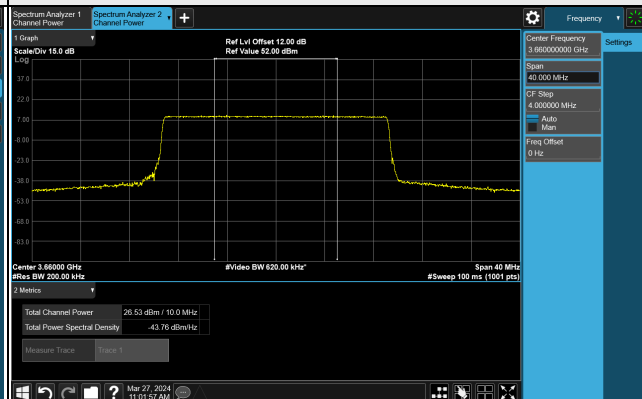
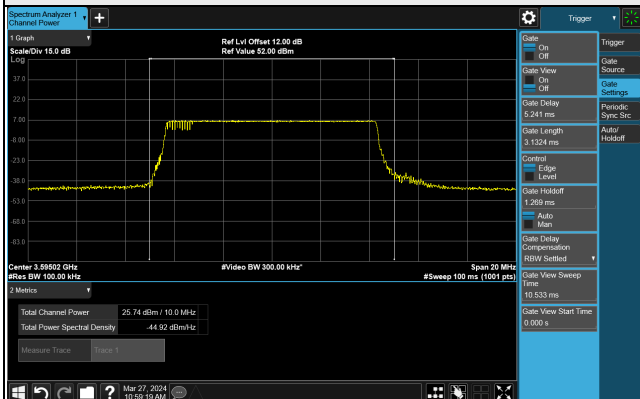
3660.00 MHz



Ant.1

3595.02 MHz

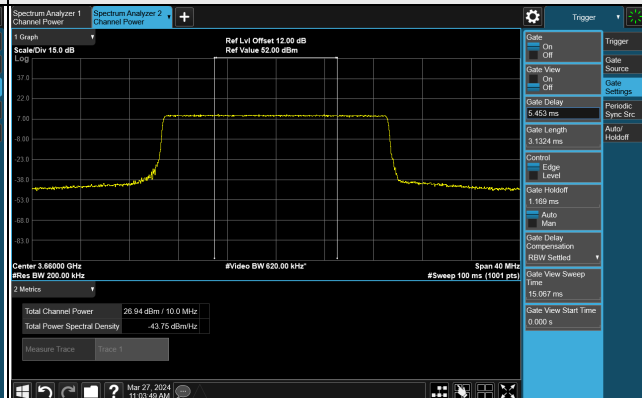
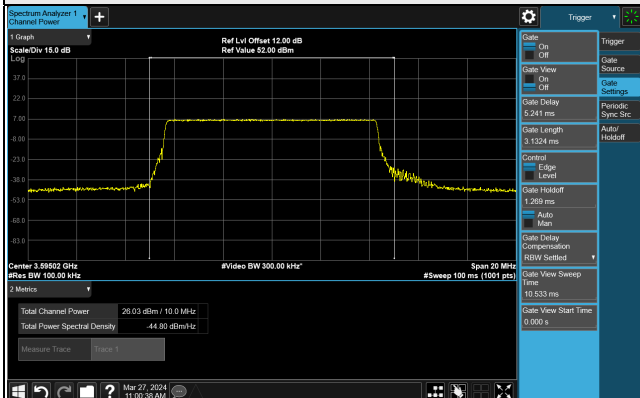
3660.00 MHz



Ant.2

3595.02 MHz

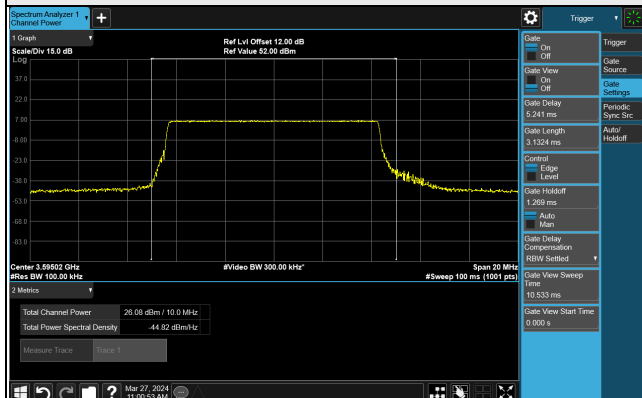
3660.00 MHz



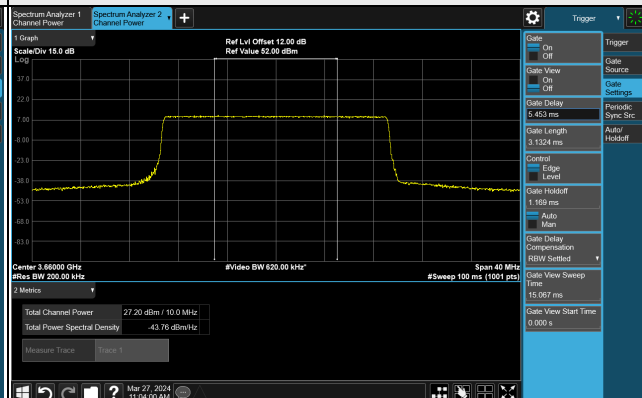


Ant.3

3595.02 MHz



3660.00 MHz



Full Conducted Output Power and Full EIRP Power (dBm/Channel Bandwidth)

Bandwidth	Frequency (MHz)	Modulation	Carrier	Ant.0	Ant.1	Ant.2	Ant.3	Total	EIRP (dBm/Channel Bandwidth)	Verdict
10M+20M	3555+3690	QPSK	CC0	24.79	24.89	25.18	25.22	31.04	45.38	PASS
			CC1	28.10	28.18	28.48	28.63	34.37		
		64QAM	CC0	24.75	24.86	25.14	25.18	31.01	45.36	PASS
			CC1	28.09	28.15	28.45	28.62	34.35		
	256QAM	CC0	24.71	24.82	25.12	25.15	30.97	45.33	PASS	
		CC1	28.06	28.11	28.44	28.59	34.33			
	3595.02+3660	QPSK	CC0	25.89	25.74	26.03	26.08	31.96	46.42	PASS
			CC1	29.29	29.20	29.54	29.77	35.48		
		64QAM	CC0	25.79	25.65	25.95	25.98	31.87	46.33	PASS
			CC1	29.19	29.10	29.46	29.69	35.39		
	256QAM	CC0	25.71	25.55	25.86	25.89	31.78	46.24	PASS	
		CC1	29.13	29.01	29.35	29.59	35.30			
3617.52+3637.53	QPSK	CC0	25.45	25.70	25.79	25.91	31.74	46.24	PASS	
		CC1	29.13	29.25	29.37	29.42	35.31			
	64QAM	CC0	25.35	25.59	25.71	25.82	31.64	46.15	PASS	
		CC1	29.05	29.17	29.29	29.31	35.23			
	256QAM	CC0	25.25	25.48	25.61	25.74	31.54	46.06	PASS	
		CC1	28.95	29.08	29.19	29.24	35.14			
20M+10M	3560.01+3694.98	QPSK	CC0	28.01	28.16	28.21	28.36	34.21	45.33	PASS
			CC1	25.01	25.15	25.28	25.34	31.22		
		64QAM	CC0	27.99	28.14	28.17	28.34	34.18	45.30	PASS
			CC1	25.00	25.13	25.25	25.33	31.20		
	256QAM	CC0	27.95	28.11	28.15	28.33	34.16	45.28	PASS	
		CC1	24.96	25.12	25.22	25.30	31.17			
	3590.01+3655.02	QPSK	CC0	28.76	28.88	28.91	29.00	34.91	46.04	PASS
			CC1	25.80	25.90	26.01	26.09	31.97		
		64QAM	CC0	28.66	28.78	28.81	28.92	34.81	45.95	PASS
			CC1	25.71	25.82	25.93	26.01	31.89		
	256QAM	CC0	28.59	28.68	28.73	28.81	34.72	45.86	PASS	
		CC1	25.61	25.72	25.85	25.93	31.80			
3612.51+3632.52	QPSK	CC0	28.93	29.08	29.10	29.29	35.12	46.13	PASS	
		CC1	25.60	25.75	25.88	25.92	31.81			
	64QAM	CC0	28.83	29.00	29.01	29.21	35.04	46.05	PASS	
		CC1	25.50	25.65	25.80	25.82	31.72			
	256QAM	CC0	28.76	28.89	28.90	29.11	34.94	45.95	PASS	
		CC1	25.41	25.56	25.70	25.72	31.62			
20M+20M	3560.01+3690	QPSK	CC0	26.40	26.65	26.80	26.89	32.71	45.30	PASS
			CC1	26.95	27.10	27.21	27.30	33.16		
		64QAM	CC0	26.37	26.64	26.79	26.88	32.69	45.28	PASS
			CC1	26.91	27.07	27.18	27.26	33.13		
	256QAM	CC0	26.33	26.62	26.78	26.85	32.67	45.25	PASS	
		CC1	26.90	27.04	27.14	27.22	33.10			
	3595.02+3655.02	QPSK	CC0	27.82	27.93	28.00	28.07	33.98	46.50	PASS
			CC1	28.15	28.21	28.29	28.45	34.30		
		64QAM	CC0	27.72	27.84	27.92	27.98	33.89	46.41	PASS
			CC1	28.07	28.11	28.21	28.36	34.21		
	256QAM	CC0	27.64	27.75	27.83	27.88	33.80	46.32	PASS	
		CC1	27.97	28.03	28.11	28.26	34.11			
3612.51+3637.53	QPSK	CC0	27.52	27.54	27.59	27.65	33.60	46.01	PASS	
		CC1	27.62	27.65	27.68	27.80	33.71			
	64QAM	CC0	27.43	27.43	27.49	27.56	33.50	45.92	PASS	
		CC1	27.52	27.56	27.60	27.70	33.62			
	256QAM	CC0	27.35	27.33	27.41	27.46	33.41	45.83	PASS	
		CC1	27.43	27.48	27.52	27.62	33.53			

Note:

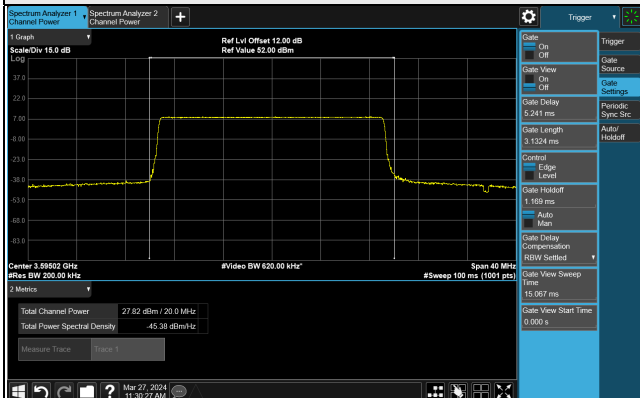
- Directional gain: $10 \cdot \text{LOG}(((10^{9.41/10}) + 10^{9.28/10})/2) = 9.35 \text{ dBi}$
- EIRP (dBm/Channel Bandwidth) = Total Conducted Output Power (dBm/Channel Bandwidth) + Directional Gain

Spectrum Plot of Worst Value

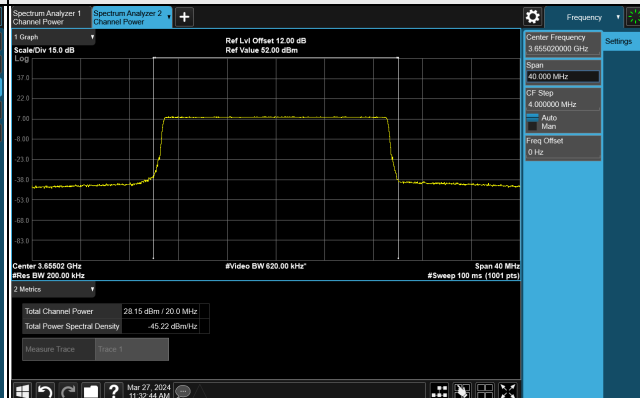
20MHz+20MHz / QPSK

Ant.0

3595.02 MHz

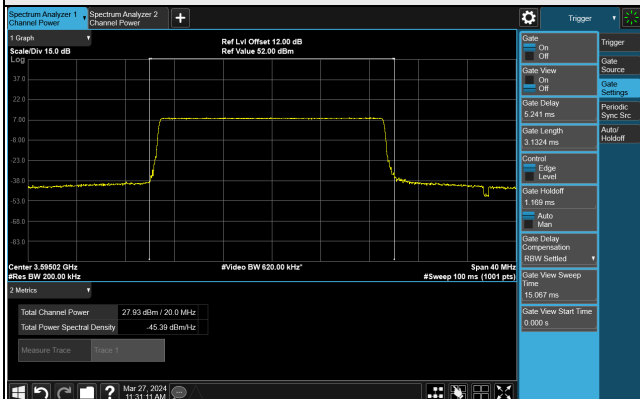


3655.02 MHz

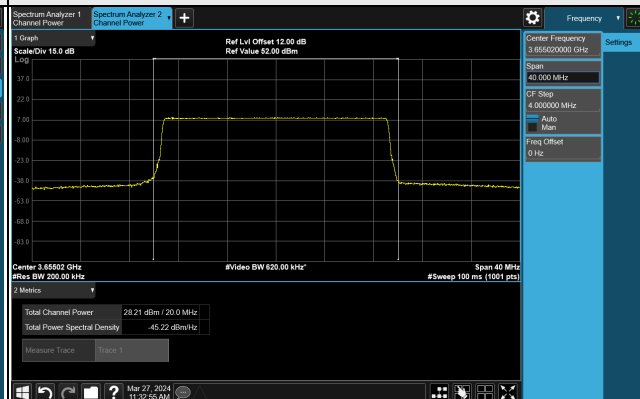


Ant.1

3595.02 MHz

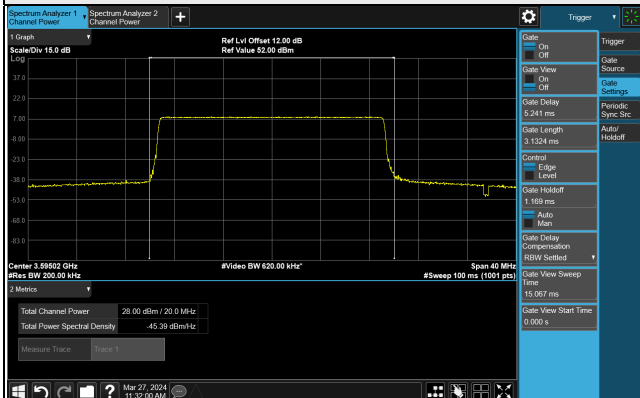


3655.02 MHz

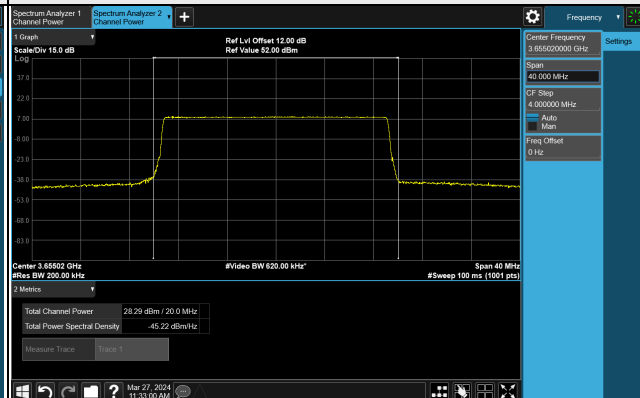


Ant.2

3595.02 MHz

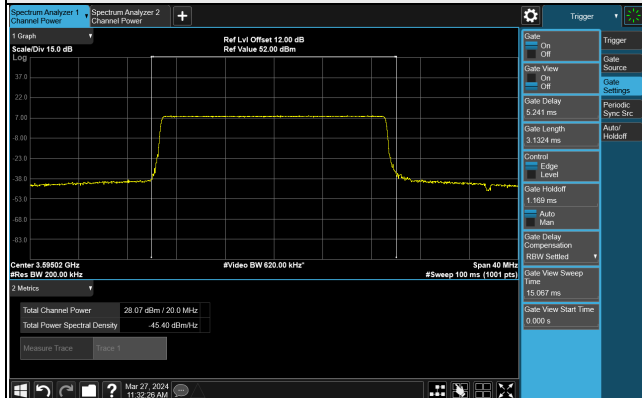


3655.02 MHz

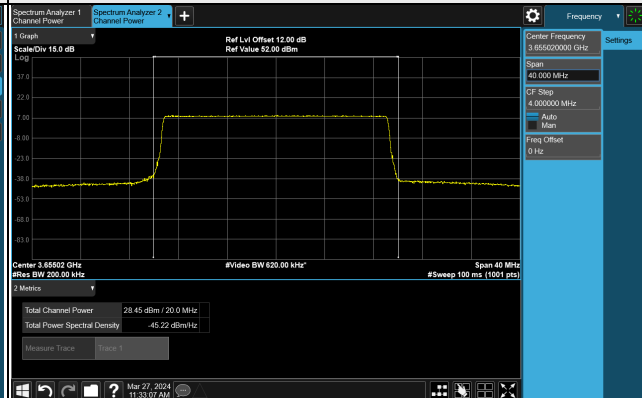


Ant.3

3595.02 MHz



3655.02 MHz

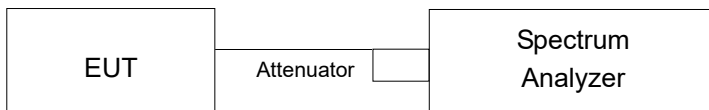


4.2 Maximum Power Spectral Density Measurement

4.2.1 Limits of Maximum Power Spectral Density Measurement

Device		Maximum PSD (dBm/MHz)
<input type="checkbox"/>	End User Device	n/a
<input type="checkbox"/>	Category A CBSD	20
<input checked="" type="checkbox"/>	Category B CBSD	37

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.2.4 Test Procedure

- Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
- Set instrument center frequency to OBW center frequency.
- Set span to $2 \times$ to $3 \times$ the OBW.
- Set the RBW to the specified reference bandwidth (often 1 MHz).
- Set VBW $\geq 3 \times$ RBW.
- Detector = RMS (power averaging).
- Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
- Sweep time = auto couple.
- Employ trace averaging (RMS) mode over a minimum of 100 traces.
- Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.2.7 Test Results

Mode A: 1CC

Power Spectral Density (dBm/MHz)

Bandwidth	Frequency	Modulation	Ant.0	Ant.1	Ant.2	Ant.3	Total	EIRP (dBm/MHz)	Verdict
10M	3555	QPSK	20.27	20.26	19.87	19.80	26.08	35.43	PASS
		64QAM	20.19	20.18	19.78	19.70	25.99	35.34	PASS
		256QAM	20.09	20.08	19.69	19.61	25.89	35.24	PASS
	3624.99	QPSK	20.26	20.24	19.87	19.79	26.07	35.42	PASS
		64QAM	20.17	20.16	19.78	19.69	25.98	35.33	PASS
		256QAM	20.07	20.08	19.68	19.58	25.88	35.23	PASS
	3694.98	QPSK	19.14	19.10	18.98	18.85	25.04	34.39	PASS
		64QAM	19.07	19.02	18.90	18.77	24.96	34.31	PASS
		256QAM	19.01	18.92	18.85	18.72	24.90	34.25	PASS
20M	3560.01	QPSK	19.39	19.19	18.85	18.73	25.07	34.42	PASS
		64QAM	19.29	19.10	18.74	18.65	24.97	34.32	PASS
		256QAM	19.21	18.99	18.65	18.55	24.88	34.23	PASS
	3624.99	QPSK	18.37	18.35	17.88	17.81	24.13	33.48	PASS
		64QAM	18.29	18.27	17.78	17.72	24.04	33.39	PASS
		256QAM	18.20	18.19	17.69	17.64	23.96	33.31	PASS
	3690	QPSK	15.78	15.69	15.66	15.48	21.67	31.02	PASS
		64QAM	15.70	15.62	15.57	15.41	21.60	30.95	PASS
		256QAM	15.60	15.54	15.48	15.34	21.51	30.86	PASS
40M	3570	QPSK	15.59	15.47	15.16	15.15	21.37	30.72	PASS
		64QAM	15.49	15.39	15.06	15.05	21.27	30.62	PASS
		256QAM	15.40	15.29	14.98	14.95	21.18	30.53	PASS
	3624.99	QPSK	15.65	15.61	15.13	15.01	21.38	30.73	PASS
		64QAM	15.55	15.51	15.05	14.93	21.29	30.64	PASS
		256QAM	15.45	15.40	14.95	14.84	21.19	30.54	PASS
	3679.98	QPSK	12.75	12.66	12.60	12.49	18.65	28.00	PASS
		64QAM	12.69	12.58	12.51	12.44	18.58	27.93	PASS
		256QAM	12.64	12.50	12.44	12.37	18.51	27.86	PASS

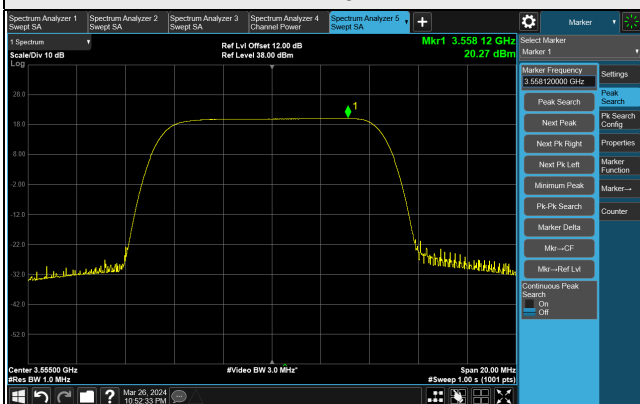
Note:

1. Directional gain: $10 \cdot \text{LOG}(((10^{(9.41/10)}) + 10^{(9.28/10)})/2) = 9.35 \text{ dBi}$
2. EIRP Power Spectral Density (dBm/MHz) = Total Power Spectral Density (dBm/MHz) + Directional Gain

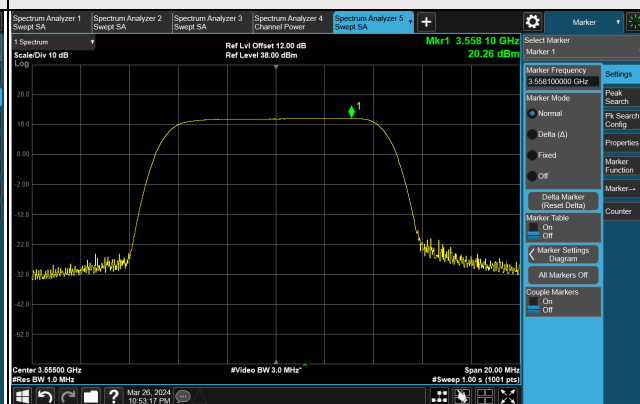
Spectrum Plot of Worst Value

10MHz / QPSK

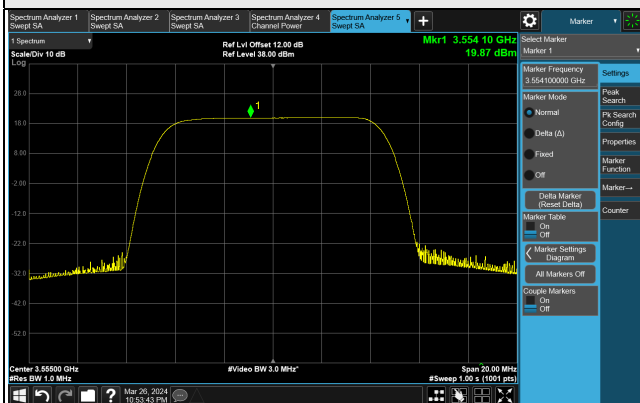
Ant.0



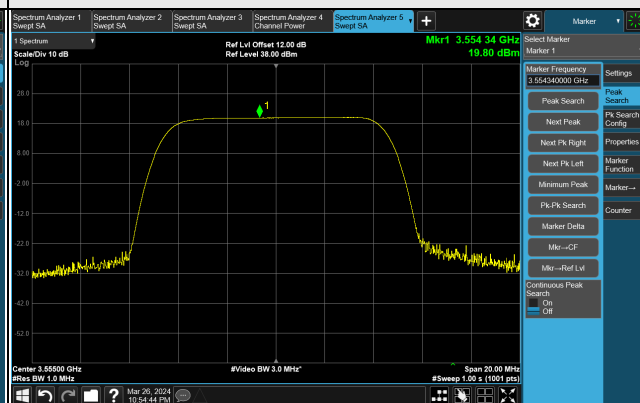
Ant.1



Ant.2



Ant.3



Mode B: 2CC

Bandwidth	Frequency (MHz)	Modulation	Carrier	Ant.0	Ant.1	Ant.2	Ant.3	Total	EIRP (dBm/MHz)	Verdict
10M+20M	3555+3690	QPSK	CC0	15.88	16.01	16.19	16.24	22.10	34.57	PASS
			CC1	16.01	16.29	16.40	16.49	22.32		
		64QAM	CC0	15.85	15.97	16.17	16.23	22.08	34.55	PASS
			CC1	16.00	16.26	16.37	16.47	22.30		
		256QAM	CC0	15.83	15.93	16.16	16.21	22.06	34.52	PASS
			CC1	15.96	16.23	16.33	16.45	22.27		
	3595.02+3660	QPSK	CC0	16.85	16.79	17.11	17.18	23.01	35.52	PASS
			CC1	17.16	17.01	17.32	17.60	23.30		
		64QAM	CC0	16.76	16.71	17.01	17.09	22.92	35.43	PASS
			CC1	17.08	16.91	17.24	17.52	23.21		
		256QAM	CC0	16.66	16.63	16.92	16.98	22.82	35.33	PASS
			CC1	17.00	16.81	17.15	17.42	23.12		
3617.52+3637.53	QPSK	CC0	16.72	16.75	16.91	16.97	22.86	35.34	PASS	
		CC1	16.99	17.00	17.13	17.15	23.09			
	64QAM	CC0	16.62	16.67	16.82	16.87	22.77	35.24	PASS	
		CC1	16.90	16.90	17.03	17.06	22.99			
	256QAM	CC0	16.54	16.57	16.74	16.79	22.68	35.16	PASS	
		CC1	16.80	16.82	16.95	16.97	22.91			
20M+10M	3560.01+3694.98	QPSK	CC0	16.00	16.10	16.29	16.36	22.21	34.67	PASS
			CC1	16.21	16.35	16.42	16.57	22.41		
		64QAM	CC0	15.96	16.07	16.27	16.35	22.19	34.65	PASS
			CC1	16.18	16.31	16.40	16.55	22.38		
		256QAM	CC0	15.94	16.04	16.25	16.32	22.16	34.62	PASS
			CC1	16.17	16.27	16.39	16.53	22.36		
	3590.01+3655.02	QPSK	CC0	16.50	16.73	16.80	16.83	22.74	35.22	PASS
			CC1	16.78	16.80	17.11	17.13	22.98		
		64QAM	CC0	16.40	16.63	16.71	16.74	22.64	35.13	PASS
			CC1	16.69	16.70	17.02	17.05	22.89		
		256QAM	CC0	16.32	16.53	16.63	16.65	22.56	35.04	PASS
			CC1	16.61	16.60	16.94	16.96	22.80		
3612.51+3632.52	QPSK	CC0	16.69	16.81	16.98	17.05	22.91	35.31	PASS	
		CC1	16.70	16.91	17.08	17.20	23.00			
	64QAM	CC0	16.60	16.73	16.88	16.95	22.81	35.22	PASS	
		CC1	16.62	16.83	16.98	17.12	22.91			
	256QAM	CC0	16.52	16.65	16.79	16.85	22.72	35.13	PASS	
		CC1	16.52	16.73	16.90	17.04	22.82			
20M+20M	3560.01+3690	QPSK	CC0	14.52	14.65	14.75	14.83	20.71	33.28	PASS
			CC1	14.95	15.01	15.16	15.28	21.12		
		64QAM	CC0	14.50	14.61	14.74	14.79	20.68	33.26	PASS
			CC1	14.93	14.99	15.12	15.26	21.10		
		256QAM	CC0	14.47	14.58	14.72	14.76	20.65	33.23	PASS
			CC1	14.92	14.95	15.11	15.24	21.08		
	3595.02+3655.02	QPSK	CC0	15.61	15.70	15.88	15.93	21.80	34.30	PASS
			CC1	15.87	15.96	16.10	16.29	22.08		
		64QAM	CC0	15.51	15.62	15.79	15.85	21.72	34.22	PASS
			CC1	15.78	15.88	16.01	16.20	21.99		
		256QAM	CC0	15.42	15.53	15.69	15.76	21.62	34.13	PASS
			CC1	15.70	15.80	15.93	16.12	21.91		
3612.51+3637.53	QPSK	CC0	15.20	15.21	15.35	15.38	21.31	33.80	PASS	
		CC1	15.46	15.48	15.59	15.63	21.56			
	64QAM	CC0	15.12	15.13	15.26	15.28	21.22	33.71	PASS	
		CC1	15.37	15.38	15.49	15.55	21.47			
	256QAM	CC0	15.03	15.03	15.16	15.20	21.13	33.61	PASS	
		CC1	15.27	15.29	15.40	15.45	21.37			

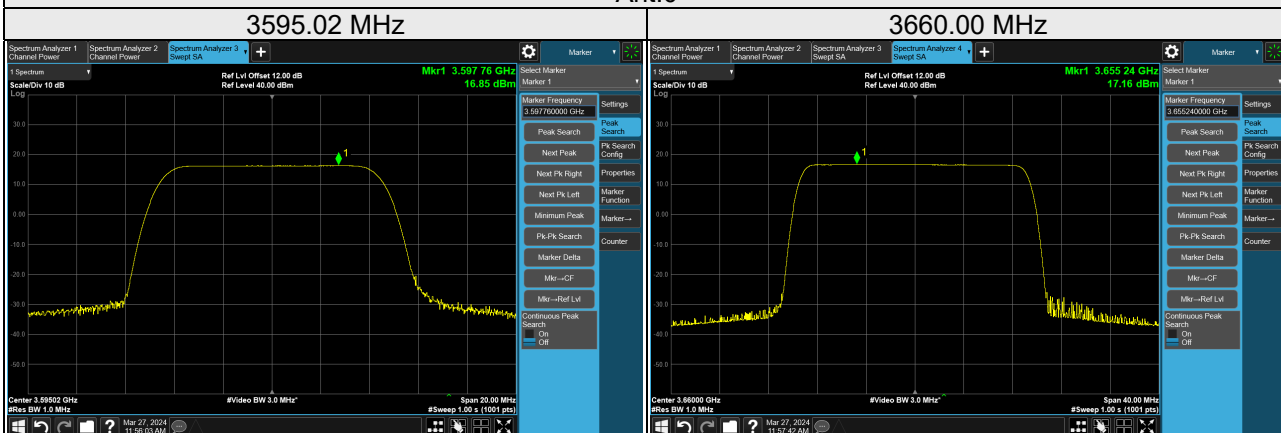
Note:

1. Directional gain: $10 \cdot \text{LOG}(((10^{9.41/10}) + 10^{9.28/10})/2) = 9.35 \text{ dBi}$
2. EIRP Power Spectral Density (dBm/MHz) = Total Power Spectral Density (dBm/MHz) + Directional Gain

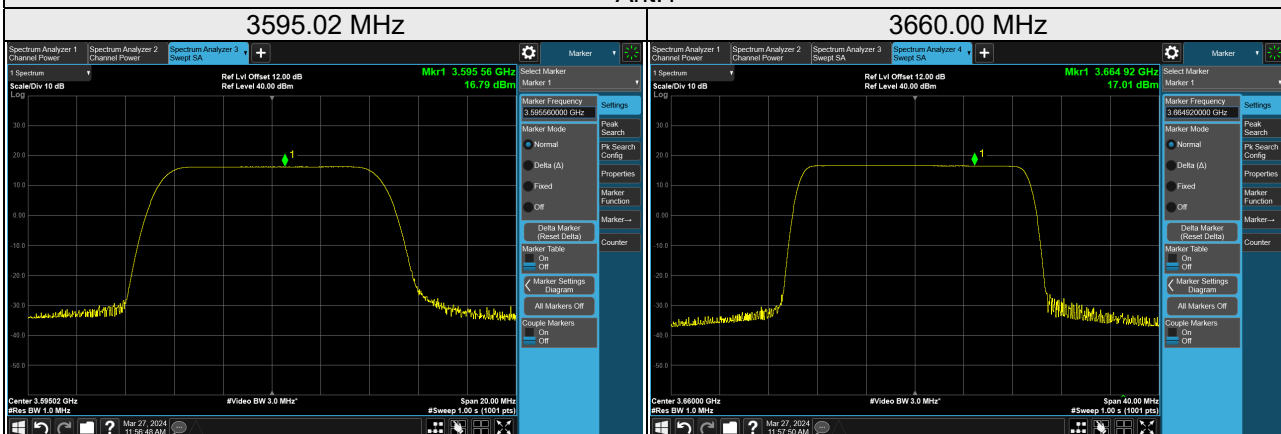
Spectrum Plot of Worst Value

10MHz+20MHz / QPSK

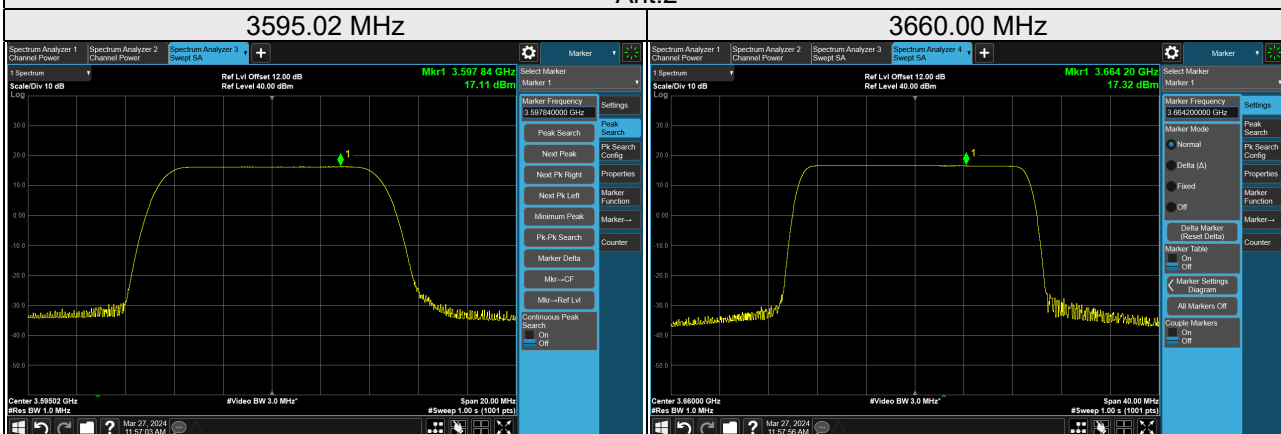
Ant.0



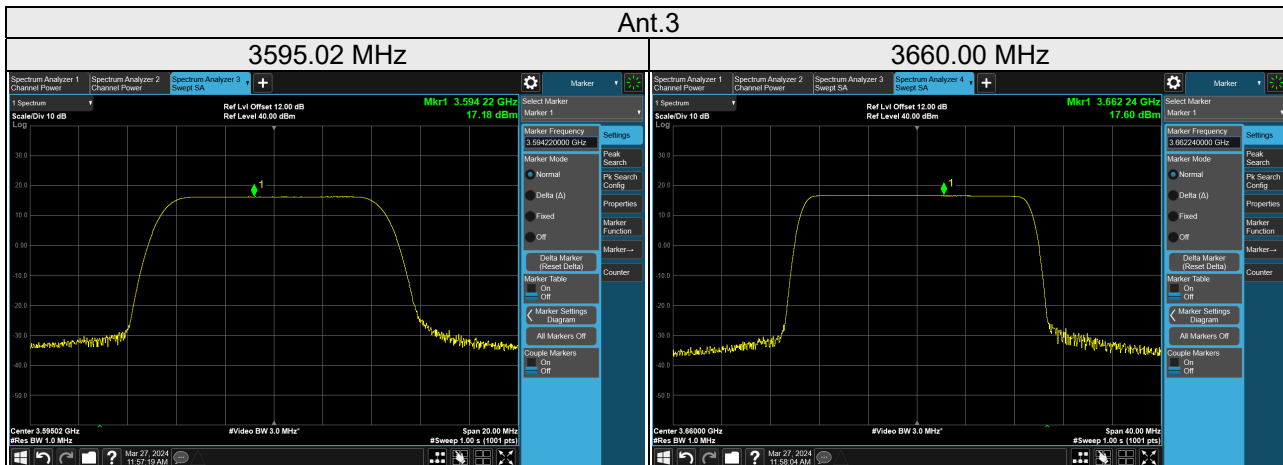
Ant.1



Ant.2



Ant.3



4.3 Modulation Characteristics Measurement

4.3.1 Limits of Modulation Characteristics

N/A

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.3.4 Deviation from Test Standard

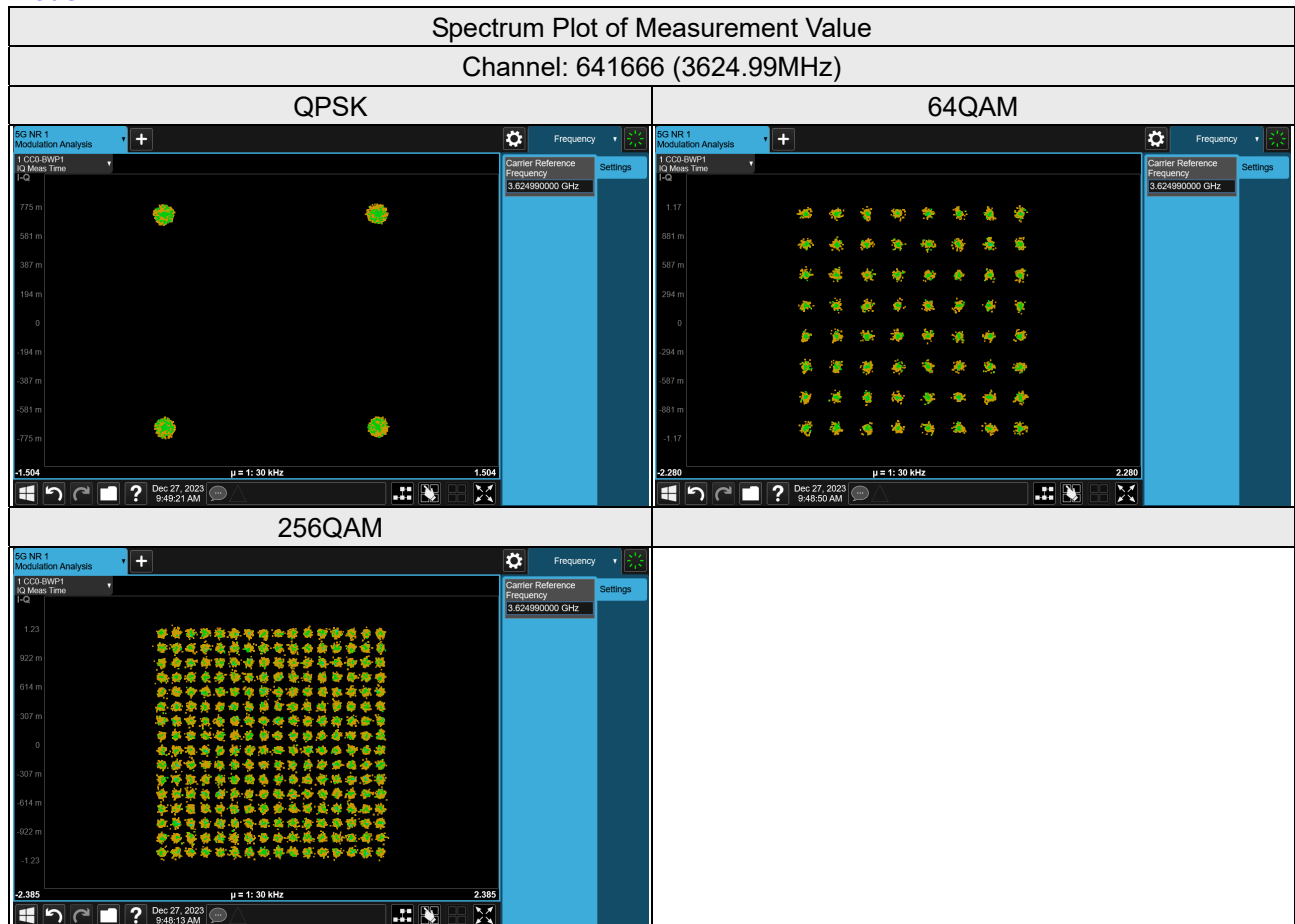
No deviation.

4.3.5 EUT Operating Conditions

Connect the EUT to Communication Simulator via the antenna connector, the frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.3.6 Test Results

Mode A: 1CC

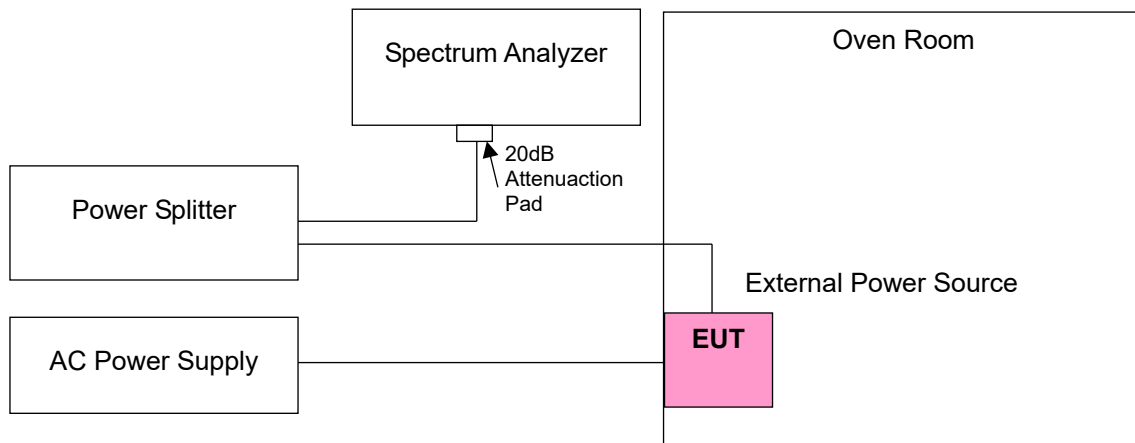


4.4 Frequency Stability Measurement

4.4.1 Limits of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency band.

4.4.2 Test Setup



4.4.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Radio Communication Analyzer Anritsu	MT8821C	6201462755	Mar. 03, 2023	Mar. 02, 2024
STANDARD TEMPERATURE & HUMIDITY CHAMBER TERCHY	MHU-225AU	911033	Nov. 16, 2023	Nov. 15, 2024
Three-phase coupling / decoupling network TESEQ	CDN 3063	4006	Mar. 08, 2023	Mar. 07, 2024
AC Power Supply Extech	CFW-105	E000603	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date: Jan. 19, 2024

4.4.4 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the AC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the communication simulator.

4.4.5 Test Results

Mode A: 1CC

Antenna 0

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3555.000001	0.000281	3694.980004	0.001083
60	3555.000002	0.000563	3694.979999	-0.000271
100	3554.999997	-0.000844	3694.980003	0.000812

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3554.999996	-0.001125	3694.979997	-0.000812
-30	3555.000002	0.000563	3694.979999	-0.000271
-20	3555.000003	0.000844	3694.979999	-0.000271
-10	3554.999999	-0.000281	3694.980001	0.000271
0	3555.000004	0.001125	3694.980003	0.000812
10	3554.999998	-0.000563	3694.979998	-0.000541
20	3555.000003	0.000844	3694.980001	0.000271
30	3554.999998	-0.000563	3694.980003	0.000812
40	3555.000003	0.000844	3694.979997	-0.000812
50	3554.999999	-0.000281	3694.980003	0.000812
60	3554.999998	-0.000563	3694.980003	0.000812

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.010001	0.000281	3690.000004	0.001084
60	3560.010004	0.001124	3689.999997	-0.000813
100	3560.010001	0.000281	3690.000004	0.001084

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.009997	-0.000843	3689.999999	-0.000271
-30	3560.009999	-0.000281	3690.000004	0.001084
-20	3560.010001	0.000281	3689.999999	-0.000271
-10	3560.009999	-0.000281	3689.999998	-0.000542
0	3560.009999	-0.000281	3689.999996	-0.001084
10	3560.010002	0.000562	3690.000003	0.000813
20	3560.010001	0.000281	3689.999996	-0.001084
30	3560.009999	-0.000281	3690.000003	0.000813
40	3560.010003	0.000843	3689.999997	-0.000813
50	3560.009997	-0.000843	3689.999997	-0.000813
60	3560.009998	-0.000562	3689.999998	-0.000542

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3569.999999	0.000842	3679.979997	-0.001085
60	3570.000004	-0.001122	3679.980001	-0.000271
100	3569.999998	-0.000561	3679.980003	0.000543

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3570.000003	-0.000842	3679.980003	-0.000543
-30	3570.000002	-0.000842	3679.980003	-0.000543
-20	3570.000003	0.000842	3679.980003	0.000814
-10	3569.999999	-0.000281	3679.980004	0.001085
0	3570.000003	0.000842	3679.980003	0.000814
10	3569.999998	-0.000561	3679.980003	0.000814
20	3569.999999	-0.000281	3679.979998	-0.000543
30	3569.999999	-0.000281	3679.979998	-0.000543
40	3569.999996	-0.001122	3679.980004	0.001085
50	3570.000003	0.000842	3679.980003	0.000814
60	3570.000004	0.001122	3679.979998	-0.000543

Antenna 1

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3555.000003	0.000844	3694.979998	-0.000541
60	3555.000002	0.000563	3694.980004	0.001083
100	3555.000003	0.000844	3694.980001	0.000271

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000003	0.000844	3694.980001	0.000271
-30	3555.000001	0.000281	3694.979998	-0.000541
-20	3555.000002	0.000563	3694.979999	-0.000271
-10	3554.999999	-0.000281	3694.980002	0.000541
0	3554.999996	-0.001125	3694.979999	-0.000271
10	3554.999996	-0.001125	3694.979996	-0.001083
20	3555.000003	0.000844	3694.980001	0.000271
30	3554.999999	-0.000281	3694.980003	0.000812
40	3554.999998	-0.000563	3694.979996	-0.001083
50	3554.999999	-0.000281	3694.979998	-0.000541
60	3554.999999	-0.000281	3694.980004	0.001083

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.010001	0.000281	3690.000004	0.001084
60	3560.010003	0.000843	3689.999999	-0.000271
100	3560.009999	-0.000281	3689.999997	-0.000813

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.009998	-0.000562	3690.000003	0.000813
-30	3560.009996	-0.001124	3689.999998	-0.000542
-20	3560.009996	-0.001124	3689.999998	-0.000542
-10	3560.010002	0.000562	3689.999997	-0.000813
0	3560.009996	-0.001124	3689.999998	-0.000542
10	3560.009998	-0.000562	3689.999996	-0.001084
20	3560.010001	0.000281	3690.000003	0.000813
30	3560.009998	-0.000562	3689.999996	-0.001084
40	3560.010002	0.000562	3690.000004	0.001084
50	3560.010004	0.001124	3690.000003	0.000813
60	3560.010004	0.001124	3690.000002	0.000542

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3569.999998	0.000842	3679.980001	-0.001085
60	3570.000004	-0.001122	3679.979996	-0.000271
100	3570.000001	-0.000561	3679.980003	0.000543

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3569.999996	-0.000842	3679.980003	-0.000543
-30	3569.999999	-0.000842	3679.980004	-0.000543
-20	3569.999999	-0.000281	3679.980003	0.000814
-10	3570.000002	0.000561	3679.980002	0.000543
0	3570.000002	0.000561	3679.980002	0.000543
10	3569.999996	-0.001122	3679.980003	0.000814
20	3570.000002	0.000561	3679.980004	0.001085
30	3570.000004	0.001122	3679.979996	-0.001085
40	3570.000004	0.001122	3679.980002	0.000543
50	3569.999997	-0.000842	3679.979999	-0.000271
60	3570.000002	0.000561	3679.979999	-0.000271

Antenna 2

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3554.999998	-0.000563	3694.979996	-0.001083
60	3555.000002	0.000563	3694.979998	-0.000541
100	3555.000003	0.000844	3694.980002	0.000541

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3554.999996	-0.001125	3694.979999	-0.000271
-30	3555.000002	0.000563	3694.980002	0.000541
-20	3555.000003	0.000844	3694.979997	-0.000812
-10	3554.999997	-0.000844	3694.979996	-0.001083
0	3554.999998	-0.000563	3694.979998	-0.000541
10	3554.999999	-0.000281	3694.980001	0.000271
20	3555.000001	0.000281	3694.979996	-0.001083
30	3554.999998	-0.000563	3694.980004	0.001083
40	3555.000002	0.000563	3694.980004	0.001083
50	3554.999997	-0.000844	3694.980001	0.000271
60	3554.999999	-0.000281	3694.980004	0.001083

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.009999	-0.000281	3690.000003	0.000813
60	3560.009997	-0.000843	3690.000004	0.001084
100	3560.009998	-0.000562	3690.000001	0.000271

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.009997	-0.000843	3689.999996	-0.001084
-30	3560.010003	0.000843	3689.999996	-0.001084
-20	3560.010001	0.000281	3689.999998	-0.000542
-10	3560.009996	-0.001124	3689.999998	-0.000542
0	3560.009997	-0.000843	3690.000004	0.001084
10	3560.009996	-0.001124	3689.999999	-0.000271
20	3560.009996	-0.001124	3689.999999	-0.000271
30	3560.010004	0.001124	3690.000002	0.000542
40	3560.010004	0.001124	3690.000001	0.000271
50	3560.009999	-0.000281	3690.000002	0.000542
60	3560.009999	-0.000281	3690.000003	0.000813

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3570.000001	0.000842	3679.980001	-0.001085
60	3569.999997	-0.001122	3679.980001	-0.000271
100	3569.999998	-0.000561	3679.979999	0.000543

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3570.000001	-0.000842	3679.980003	-0.000543
-30	3569.999998	-0.000842	3679.980004	-0.000543
-20	3569.999999	-0.000281	3679.980001	0.000271
-10	3570.000004	0.001122	3679.979996	-0.001085
0	3569.999997	-0.000842	3679.980002	0.000543
10	3569.999997	-0.000842	3679.980002	0.000543
20	3569.999999	-0.000281	3679.979997	-0.000814
30	3570.000003	0.000842	3679.980001	0.000271
40	3569.999997	-0.000842	3679.979996	-0.001085
50	3569.999996	-0.001122	3679.979996	-0.001085
60	3569.999999	-0.000281	3679.980004	0.001085

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Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3554.999998	-0.000563	3694.980002	0.000541
60	3555.000004	0.001125	3694.980003	0.000812
100	3554.999997	-0.000844	3694.980001	0.000271

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3554.999996	-0.001125	3694.980001	0.000271
-30	3554.999997	-0.000844	3694.979998	-0.000541
-20	3555.000002	0.000563	3694.980004	0.001083
-10	3554.999999	-0.000281	3694.979996	-0.001083
0	3554.999996	-0.001125	3694.980001	0.000271
10	3555.000003	0.000844	3694.980002	0.000541
20	3554.999999	-0.000281	3694.980003	0.000812
30	3555.000003	0.000844	3694.979997	-0.000812
40	3555.000003	0.000844	3694.979997	-0.000812
50	3554.999998	-0.000563	3694.979998	-0.000541
60	3554.999996	-0.001125	3694.979998	-0.000541

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.010001	0.000281	3689.999998	-0.000542
60	3560.010003	0.000843	3689.999996	-0.001084
100	3560.009997	-0.000843	3689.999998	-0.000542

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.010003	0.000843	3689.999997	-0.000813
-30	3560.010003	0.000843	3689.999996	-0.001084
-20	3560.010003	0.000843	3689.999998	-0.000542
-10	3560.010004	0.001124	3690.000004	0.001084
0	3560.009997	-0.000843	3689.999999	-0.000271
10	3560.009997	-0.000843	3689.999998	-0.000542
20	3560.009998	-0.000562	3689.999996	-0.001084
30	3560.009999	-0.000281	3690.000003	0.000813
40	3560.009996	-0.001124	3689.999996	-0.001084
50	3560.010001	0.000281	3690.000003	0.000813
60	3560.009997	-0.000843	3690.000002	0.000542

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3570.000003	0.000842	3679.979998	-0.001085
60	3570.000001	-0.001122	3679.979999	-0.000271
100	3570.000004	-0.000561	3679.979999	0.000543

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 40MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3569.999996	-0.000842	3679.979999	-0.000543
-30	3569.999996	-0.000842	3679.979999	-0.000543
-20	3570.000003	0.000842	3679.979999	-0.000271
-10	3569.999998	-0.000561	3679.979998	-0.000543
0	3569.999999	-0.000281	3679.979998	-0.000543
10	3570.000003	0.000842	3679.980001	0.000271
20	3569.999996	-0.001122	3679.980003	0.000814
30	3569.999997	-0.000842	3679.980004	0.001085
40	3569.999997	-0.000842	3679.980004	0.001085
50	3569.999999	-0.000281	3679.980003	0.000814
60	3569.999997	-0.000842	3679.979999	-0.000271

Mode B: 2CC

Antenna 0

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 10MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3554.999996	-0.001125	3689.999996	-0.001084
60	3554.999999	-0.000281	3690.000002	0.000542
100	3555.000004	0.001125	3689.999998	-0.000542

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 10MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000001	0.000281	3690.000001	0.000271
-30	3555.000001	0.000281	3690.000001	0.000271
-20	3554.999996	-0.001125	3689.999997	-0.000813
-10	3554.999998	-0.000563	3689.999999	-0.000271
0	3554.999997	-0.000844	3689.999996	-0.001084
10	3555.000001	0.000281	3690.000001	0.000271
20	3554.999996	-0.001125	3689.999996	-0.001084
30	3555.000004	0.001125	3689.999997	-0.000813
40	3555.000002	0.000563	3689.999999	-0.000271
50	3554.999997	-0.000844	3690.000001	0.000271
60	3554.999996	-0.001125	3690.000002	0.000542

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz+10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.009999	-0.000281	3694.979999	-0.000271
60	3560.009997	-0.000843	3694.979999	-0.000271
100	3560.009996	-0.001124	3694.980004	0.001083

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.010001	0.000281	3694.979998	-0.000541
-30	3560.010002	0.000562	3694.979999	-0.000271
-20	3560.009998	-0.000562	3694.980001	0.000271
-10	3560.009998	-0.000562	3694.979999	-0.000271
0	3560.010002	0.000562	3694.979999	-0.000271
10	3560.010004	0.001124	3694.979999	-0.000271
20	3560.009999	-0.000281	3694.980004	0.001083
30	3560.009998	-0.000562	3694.980003	0.000812
40	3560.009998	-0.000562	3694.980001	0.000271
50	3560.010002	0.000562	3694.980001	0.000271
60	3560.009996	-0.001124	3694.980001	0.000271

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.009996	0.000842	3689.999997	-0.001085
60	3560.009999	-0.001122	3689.999997	-0.000271
100	3560.009997	-0.000561	3690.000002	0.000543

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.009996	-0.000842	3689.999998	-0.000543
-30	3560.010004	-0.000842	3689.999996	-0.000543
-20	3560.009999	-0.000281	3690.000002	0.000543
-10	3560.009997	-0.000842	3689.999996	-0.001085
0	3560.009998	-0.000561	3690.000002	0.000543
10	3560.009998	-0.000561	3690.000002	0.000543
20	3560.009998	-0.000561	3689.999997	-0.000814
30	3560.010001	0.000281	3690.000002	0.000543
40	3560.010003	0.000842	3689.999998	-0.000543
50	3560.009998	-0.000561	3690.000003	0.000814
60	3560.010002	0.000561	3690.000003	0.000814

Antenna 1

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 10MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3555.000002	0.000563	3689.999998	-0.000542
60	3554.999996	-0.001125	3689.999999	-0.000271
100	3554.999996	-0.001125	3689.999996	-0.001084

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 10MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000001	0.000281	3690.000003	0.000813
-30	3554.999996	-0.001125	3690.000003	0.000813
-20	3555.000003	0.000844	3690.000004	0.001084
-10	3554.999998	-0.000563	3689.999999	-0.000271
0	3555.000003	0.000844	3690.000004	0.001084
10	3554.999996	-0.001125	3689.999996	-0.001084
20	3555.000001	0.000281	3689.999998	-0.000542
30	3554.999996	-0.001125	3689.999996	-0.001084
40	3555.000004	0.001125	3690.000002	0.000542
50	3555.000004	0.001125	3690.000001	0.000271
60	3555.000004	0.001125	3690.000002	0.000542

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz+10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.010002	0.000562	3694.980003	0.000812
60	3560.009999	-0.000281	3694.979996	-0.001083
100	3560.009999	-0.000281	3694.980002	0.000541

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.010002	0.000562	3694.979997	-0.000812
-30	3560.010004	0.001124	3694.979999	-0.000271
-20	3560.010004	0.001124	3694.979999	-0.000271
-10	3560.009998	-0.000562	3694.980002	0.000541
0	3560.010002	0.000562	3694.979996	-0.001083
10	3560.010004	0.001124	3694.979999	-0.000271
20	3560.009996	-0.001124	3694.980002	0.000541
30	3560.010002	0.000562	3694.980004	0.001083
40	3560.010004	0.001124	3694.979998	-0.000541
50	3560.009999	-0.000281	3694.980001	0.000271
60	3560.010004	0.001124	3694.980003	0.000812

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.009996	0.000842	3690.000004	-0.001085
60	3560.010004	-0.001122	3690.000004	-0.000271
100	3560.009996	-0.000561	3690.000001	0.000543

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.009999	-0.000842	3690.000003	-0.000543
-30	3560.010003	-0.000842	3689.999999	-0.000543
-20	3560.009999	-0.000281	3690.000001	0.000271
-10	3560.010004	0.001122	3689.999996	-0.001085
0	3560.010002	0.000561	3689.999999	-0.000271
10	3560.009997	-0.000842	3689.999996	-0.001085
20	3560.009996	-0.001122	3689.999996	-0.001085
30	3560.009996	-0.001122	3689.999998	-0.000543
40	3560.010001	0.000281	3689.999997	-0.000814
50	3560.009997	-0.000842	3690.000004	0.001085
60	3560.010001	0.000281	3689.999996	-0.001085

Antenna 2

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 10MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3555.000003	0.000844	3689.999996	-0.001084
60	3555.000001	0.000281	3690.000003	0.000813
100	3555.000004	0.001125	3690.000002	0.000542

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 10MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3554.999997	-0.000844	3690.000003	0.000813
-30	3555.000004	0.001125	3690.000001	0.000271
-20	3555.000004	0.001125	3689.999997	-0.000813
-10	3555.000002	0.000563	3690.000001	0.000271
0	3554.999997	-0.000844	3690.000003	0.000813
10	3555.000002	0.000563	3689.999998	-0.000542
20	3554.999998	-0.000563	3690.000002	0.000542
30	3555.000001	0.000281	3689.999997	-0.000813
40	3554.999997	-0.000844	3690.000001	0.000271
50	3555.000003	0.000844	3690.000003	0.000813
60	3555.000002	0.000563	3690.000003	0.000813

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz+10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.009999	-0.000281	3694.980004	0.001083
60	3560.010003	0.000843	3694.980003	0.000812
100	3560.009999	-0.000281	3694.980002	0.000541

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.010001	0.000281	3694.979996	-0.001083
-30	3560.009997	-0.000843	3694.980003	0.000812
-20	3560.010002	0.000562	3694.979996	-0.001083
-10	3560.010003	0.000843	3694.979999	-0.000271
0	3560.010003	0.000843	3694.980002	0.000541
10	3560.010004	0.001124	3694.980001	0.000271
20	3560.009997	-0.000843	3694.980003	0.000812
30	3560.010003	0.000843	3694.979997	-0.000812
40	3560.009996	-0.001124	3694.980004	0.001083
50	3560.010002	0.000562	3694.979998	-0.000541
60	3560.010003	0.000843	3694.980003	0.000812

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.009996	0.000842	3689.999999	-0.001085
60	3560.009996	-0.001122	3689.999998	-0.000271
100	3560.010003	-0.000561	3690.000004	0.000543

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.010001	-0.000842	3690.000004	-0.000543
-30	3560.010004	-0.000842	3689.999997	-0.000543
-20	3560.009997	-0.000842	3689.999997	-0.000814
-10	3560.010002	0.000561	3689.999997	-0.000814
0	3560.010004	0.001122	3689.999999	-0.000271
10	3560.010003	0.000842	3689.999999	-0.000271
20	3560.009997	-0.000842	3689.999998	-0.000543
30	3560.009996	-0.001122	3689.999998	-0.000543
40	3560.009997	-0.000842	3690.000003	0.000814
50	3560.009998	-0.000561	3689.999996	-0.001085
60	3560.010002	0.000561	3689.999998	-0.000543

Antenna 3

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 10MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3555.000003	0.000844	3690.000002	0.000542
60	3554.999996	-0.001125	3690.000003	0.000813
100	3555.000004	0.001125	3689.999998	-0.000542

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 10MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3555.000001	0.000281	3690.000003	0.000813
-30	3554.999998	-0.000563	3689.999997	-0.000813
-20	3554.999998	-0.000563	3690.000003	0.000813
-10	3554.999997	-0.000844	3689.999997	-0.000813
0	3555.000001	0.000281	3690.000001	0.000271
10	3555.000001	0.000281	3690.000004	0.001084
20	3554.999996	-0.001125	3689.999997	-0.000813
30	3555.000003	0.000844	3689.999999	-0.000271
40	3554.999996	-0.001125	3689.999996	-0.001084
50	3554.999999	-0.000281	3689.999997	-0.000813
60	3554.999996	-0.001125	3689.999997	-0.000813

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz+10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.009999	-0.000281	3694.980001	0.000271
60	3560.010004	0.001124	3694.979998	-0.000541
100	3560.009999	-0.000281	3694.980003	0.000812

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+10MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.009999	-0.000281	3694.980003	0.000812
-30	3560.010003	0.000843	3694.979999	-0.000271
-20	3560.009999	-0.000281	3694.980003	0.000812
-10	3560.009999	-0.000281	3694.979997	-0.000812
0	3560.010004	0.001124	3694.979998	-0.000541
10	3560.009999	-0.000281	3694.979997	-0.000812
20	3560.010003	0.000843	3694.980004	0.001083
30	3560.009997	-0.000843	3694.980001	0.000271
40	3560.009999	-0.000281	3694.980002	0.000541
50	3560.009999	-0.000281	3694.980003	0.000812
60	3560.009998	-0.000562	3694.979999	-0.000271

Frequency Error vs. Voltage

Voltage (Vac)	NR Band 48, Channel Bandwidth: 20MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
44	3560.009998	0.000842	3690.000004	-0.001085
60	3560.009999	-0.001122	3690.000004	-0.000271
100	3560.010001	-0.000561	3690.000001	0.000543

Note: The applicant defined the normal working voltage is from 44Vac to 100Vac.

Frequency Error vs. Temperature

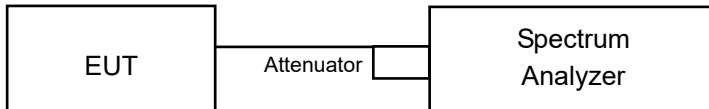
Temp. (°C)	NR Band 48, Channel Bandwidth: 20MHz+20MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-40	3560.009999	-0.000842	3689.999998	-0.000543
-30	3560.009996	-0.000842	3690.000002	-0.000543
-20	3560.010004	0.001122	3689.999998	-0.000543
-10	3560.010004	0.001122	3690.000004	0.001085
0	3560.010002	0.000561	3690.000001	0.000271
10	3560.010004	0.001122	3689.999996	-0.001085
20	3560.009996	-0.001122	3689.999997	-0.000814
30	3560.010002	0.000561	3689.999996	-0.001085
40	3560.009996	-0.001122	3689.999999	-0.000271
50	3560.009998	-0.000561	3689.999996	-0.001085
60	3560.010004	0.001122	3689.999998	-0.000543

4.5 Emission Bandwidth Measurement

4.5.1 Limits of Emission Bandwidth Measurement

According to FCC 47 CFR part 2.1049, 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% of the total mean power radiated by a given emission.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedure

Occupied Bandwidth & 26dBc Bandwidth

- a. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
- b. The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set $\geq 3 \times \text{RBW}$.
- c. Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.
NOTE—Step 1), step 2), and step 3) may require iteration to adjust within the specified tolerances.
- d. The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “-X dB” requirement, i.e., if the requirement calls for measuring the -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
- e. Set spectrum analyzer detection mode to peak, and the trace mode to max hold.
- f. Determine the reference value by either of the following:
 - a) Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
 - b) Set the EUT to transmit an unmodulated carrier. Set the spectrum analyzer marker to the level of the carrier.
- g. Determine the “-X dB amplitude” as equal to (Reference Value - X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Result

Mode A: 1CC

Occupied Bandwidth

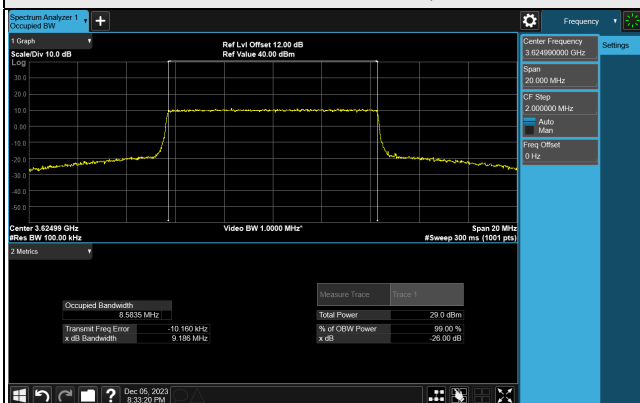
NR Band 48, Channel Bandwidth 10MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		Antenna 0			Antenna 1		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637000	3555.00	8.58	8.58	8.57	8.57	8.57	8.57
641666	3624.99	8.58	8.58	8.58	8.58	8.58	8.58
646332	3694.98	8.58	8.58	8.58	8.57	8.58	8.58
Channel	Frequency (MHz)	Antenna 2			Antenna 3		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		637000	3555.00	8.57	8.57	8.57	8.58
641666	3624.99	8.58	8.58	8.58	8.58	8.58	8.58
646332	3694.98	8.58	8.57	8.58	8.58	8.58	8.58
NR Band 48, Channel Bandwidth 20MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		Antenna 0			Antenna 1		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637334	3560.01	18.21	18.20	18.21	18.20	18.21	18.19
641666	3624.99	18.21	18.21	18.21	18.20	18.20	18.19
646000	3690.00	18.20	18.20	18.20	18.20	18.20	18.20
Channel	Frequency (MHz)	Antenna 2			Antenna 3		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		637334	3560.01	18.20	18.20	18.20	18.20
641666	3624.99	18.21	18.21	18.20	18.20	18.20	18.21
646000	3690.00	18.20	18.20	18.20	18.20	18.20	18.20

NR Band 48, Channel Bandwidth 40MHz

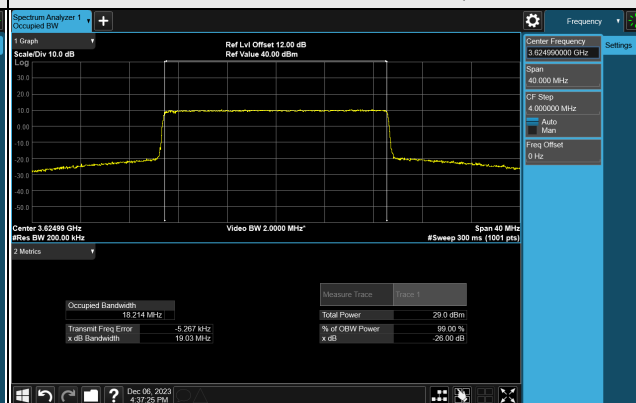
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)					
		Antenna 0			Antenna 1		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
638000	3570.00	37.79	37.80	37.83	37.81	37.80	37.83
641666	3624.99	37.83	37.82	37.85	37.83	37.81	37.85
645332	3679.98	37.79	37.79	37.82	37.79	37.78	37.81
Channel	Frequency (MHz)	Antenna 2			Antenna 3		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		638000	3570.00	37.80	37.81	37.83	37.81
641666	3624.99	37.83	37.81	37.85	37.83	37.83	37.86
645332	3679.98	37.79	37.79	37.81	37.79	37.80	37.82

Spectrum Plot of Worst Value

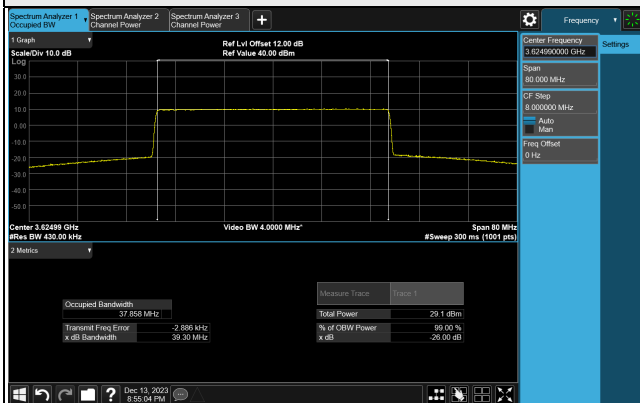
10MHz / Antenna 2 / QPSK



20MHz / Antenna 3 / 256QAM



40MHz / Antenna 3 / 256QAM



26dB Bandwidth

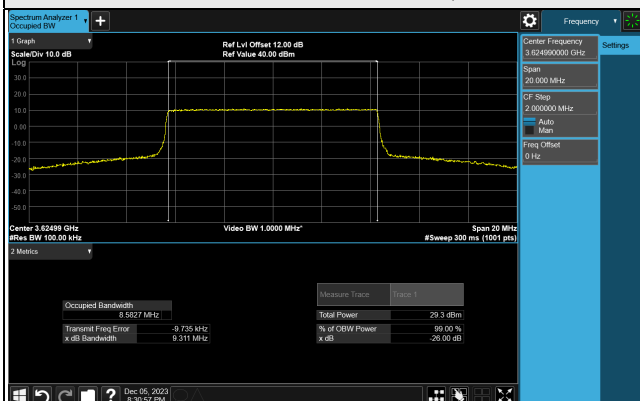
NR Band 48, Channel Bandwidth 10MHz							
Channel	Frequency (MHz)	26dB Bandwidth (MHz)					
		Antenna 0			Antenna 1		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637000	3555.00	9.23	9.22	9.16	9.23	9.18	9.20
641666	3624.99	9.24	9.31	9.27	9.20	9.22	9.29
646332	3694.98	9.27	9.21	9.26	9.22	9.22	9.20
Channel	Frequency (MHz)	Antenna 2			Antenna 3		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		637000	3555.00	9.21	9.20	9.18	9.23
641666	3624.99	9.19	9.22	9.29	9.24	9.31	9.24
646332	3694.98	9.21	9.20	9.23	9.28	9.23	9.20
NR Band 48, Channel Bandwidth 20MHz							
Channel	Frequency (MHz)	26dB Bandwidth (MHz)					
		Antenna 0			Antenna 1		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637334	3560.01	19.05	18.97	19.01	19.01	19.01	18.95
641666	3624.99	19.03	19.01	19.00	18.96	18.98	19.03
646000	3690.00	19.00	18.95	18.96	18.99	18.93	18.96
Channel	Frequency (MHz)	Antenna 2			Antenna 3		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		637334	3560.01	19.01	18.96	18.97	19.01
641666	3624.99	18.97	18.98	19.00	19.02	18.95	19.03
646000	3690.00	19.00	18.98	18.93	18.99	19.00	18.96

NR Band 48, Channel Bandwidth 40MHz

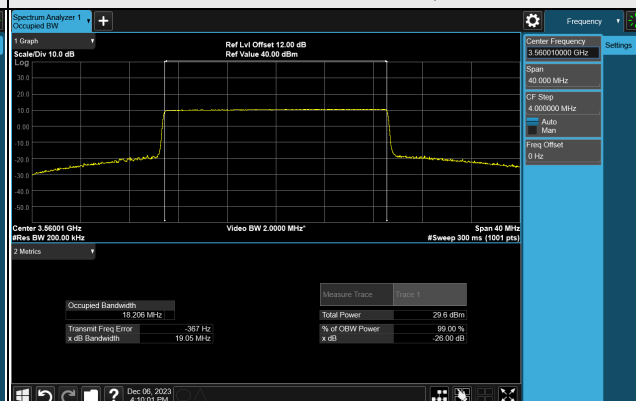
Channel	Frequency (MHz)	26dB Bandwidth (MHz)					
		Antenna 0			Antenna 1		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
638000	3570.00	39.22	39.21	39.25	39.24	39.22	39.26
641666	3624.99	39.25	39.23	39.27	39.26	39.22	39.28
645332	3679.98	39.23	39.23	39.25	39.23	39.21	39.24
Channel	Frequency (MHz)	Antenna 2			Antenna 3		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		638000	3570.00	39.22	39.21	39.24	39.23
641666	3624.99	39.25	39.22	39.25	39.26	39.21	39.30
645332	3679.98	39.23	39.23	39.25	39.23	39.22	39.24

Spectrum Plot of Worst Value

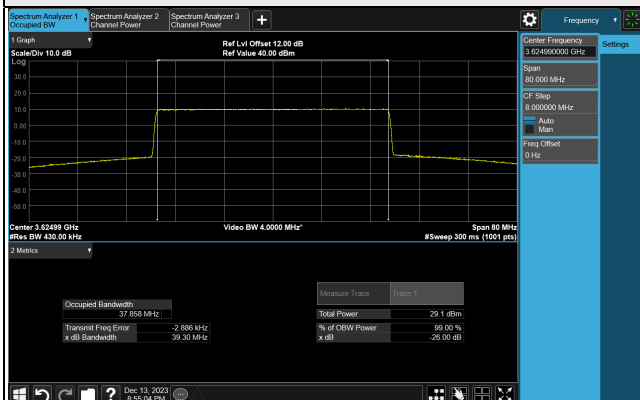
10MHz / Antenna 3 / 64QAM



20MHz / Antenna 0 / QPSK



40MHz / Antenna 3 / 256QAM



Mode B: 2CC
Occupied Bandwidth

Bandwidth	Frequency (MHz)	Modulation	Antenna	CC0	CC1	Total (MHz)
10MHz+20MHz	3555.00+3690.00	QPSK	0	8.5712	18.196	26.7672
			1	8.5668	18.191	26.7578
			2	8.5683	18.195	26.7633
			3	8.5688	18.19	26.7588
		64QAM	0	8.5695	18.194	26.7635
			1	8.569	18.196	26.765
			2	8.5713	18.194	26.7653
			3	8.5718	18.193	26.7648
		256QAM	0	8.5674	18.188	26.7554
			1	8.5689	18.189	26.7579
			2	8.57	18.192	26.762
			3	8.5706	18.191	26.7616
	3595.02+3660.00	QPSK	0	8.5722	18.2	26.7722
			1	8.5726	18.195	26.7676
			2	8.5728	18.198	26.7708
			3	8.5689	18.194	26.7629
		64QAM	0	8.5772	18.185	26.7622
			1	8.5777	18.198	26.7757
			2	8.5638	18.2	26.7638
			3	8.5716	18.188	26.7596
		256QAM	0	8.5774	18.202	26.7794
			1	8.5792	18.188	26.7672
			2	8.573	18.193	26.766
			3	8.5671	18.199	26.7661
	3617.52+3637.53	QPSK	0	8.5757	18.193	26.7687
			1	8.5781	18.194	26.7721
			2	8.575	18.19	26.765
			3	8.5729	18.196	26.7689
		64QAM	0	8.5725	18.198	26.7705
			1	8.5722	18.186	26.7582
			2	8.5726	18.197	26.7696
			3	8.5763	18.202	26.7783
		256QAM	0	8.5785	18.188	26.7665
			1	8.5843	18.195	26.7793
			2	8.5852	18.19	26.7752
			3	8.5847	18.188	26.7727

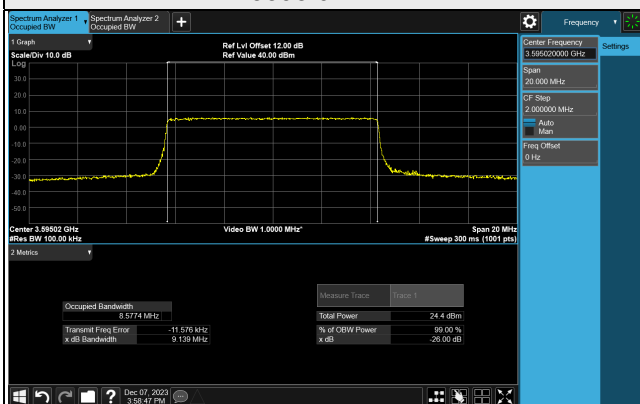
Bandwidth	Frequency (MHz)	Modulation	Antenna	CC0	CC1	Total (MHz)
20MHz+10MHz	3560.01+3694.98	QPSK	0	18.195	8.5805	26.7755
			1	18.182	8.581	26.763
			2	18.193	8.5809	26.7739
			3	18.194	8.578	26.772
		64QAM	0	18.193	8.5801	26.7731
			1	18.19	8.5819	26.7719
			2	18.185	8.5797	26.7647
			3	18.188	8.5824	26.7704
		256QAM	0	18.19	8.5682	26.7582
			1	18.187	8.578	26.765
			2	18.191	8.5724	26.7634
			3	18.191	8.5668	26.7578
	3590.01+3655.02	QPSK	0	18.189	8.5768	26.7658
			1	18.201	8.5758	26.7768
			2	18.195	8.5758	26.7708
			3	18.195	8.5758	26.7708
		64QAM	0	18.203	8.5886	26.7916
			1	18.198	8.5783	26.7763
			2	18.204	8.583	26.787
			3	18.204	8.5829	26.7869
		256QAM	0	18.196	8.5758	26.7718
			1	18.199	8.5723	26.7713
			2	18.19	8.5726	26.7626
			3	18.202	8.58	26.782
	3612.51+3632.52	QPSK	0	18.201	8.5836	26.7846
			1	18.202	8.5807	26.7827
			2	18.203	8.5769	26.7799
			3	18.197	8.5797	26.7767
		64QAM	0	18.197	8.587	26.784
			1	18.201	8.5906	26.7916
			2	18.203	8.5856	26.7886
			3	18.196	8.5832	26.7792
		256QAM	0	18.2	8.5791	26.7791
			1	18.195	8.5805	26.7755
			2	18.196	8.5881	26.7841
			3	18.193	8.5857	26.7787

Bandwidth	Frequency (MHz)	Modulation	Antenna	CC0	CC1	Total (MHz)
20MHz+20MHz	3560.01+3690.00	QPSK	0	18.193	18.2	36.393
			1	18.188	18.194	36.382
			2	18.197	18.202	36.399
			3	18.198	18.202	36.4
		64QAM	0	18.198	18.205	36.403
			1	18.192	18.203	36.395
			2	18.197	18.196	36.393
			3	18.195	18.195	36.39
		256QAM	0	18.196	18.206	36.402
			1	18.196	18.198	36.394
			2	18.2	18.196	36.396
			3	18.199	18.201	36.4
	3595.02+3655.02	QPSK	0	18.204	18.205	36.409
			1	18.202	18.208	36.41
			2	18.207	18.21	36.417
			3	18.211	18.207	36.418
		64QAM	0	18.207	18.207	36.414
			1	18.203	18.213	36.416
			2	18.209	18.21	36.419
			3	18.202	18.206	36.408
		256QAM	0	18.208	18.206	36.414
			1	18.212	18.2	36.412
			2	18.21	18.211	36.421
			3	18.209	18.199	36.408
	3612.51+3637.53	QPSK	0	18.207	18.213	36.42
			1	18.203	18.201	36.404
			2	18.206	18.219	36.425
			3	18.201	18.212	36.413
		64QAM	0	18.208	18.224	36.432
			1	18.203	18.213	36.416
			2	18.197	18.214	36.411
			3	18.204	18.217	36.421
		256QAM	0	18.2	18.202	36.402
			1	18.202	18.198	36.4
			2	18.202	18.194	36.396
			3	18.202	18.205	36.407

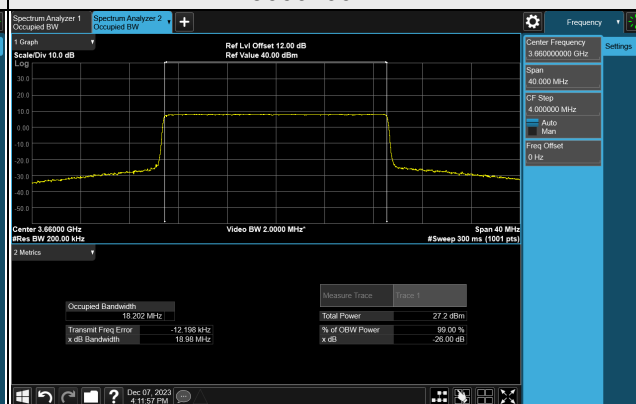
Spectrum Plot of Worst Value

10MHz+20MHz / Antenna 0 / 256QAM

3595.02MHz

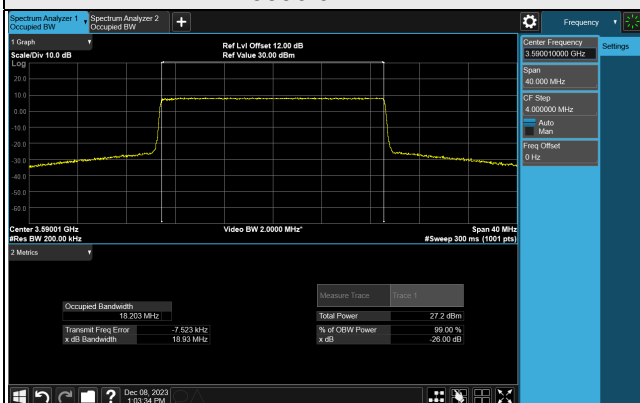


3660.00MHz

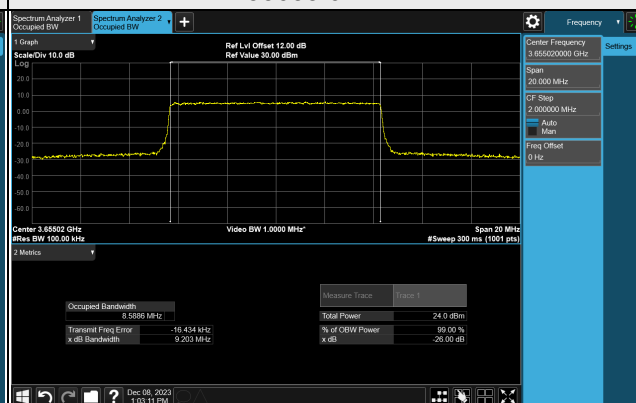


20MHz+10MHz / Antenna 0 / 64QAM

3590.01MHz

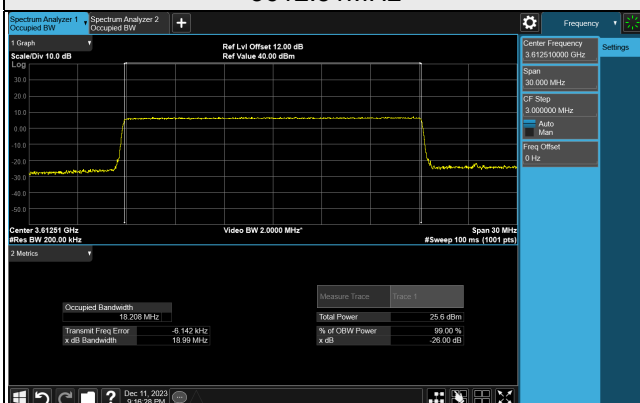


33655.02MHz

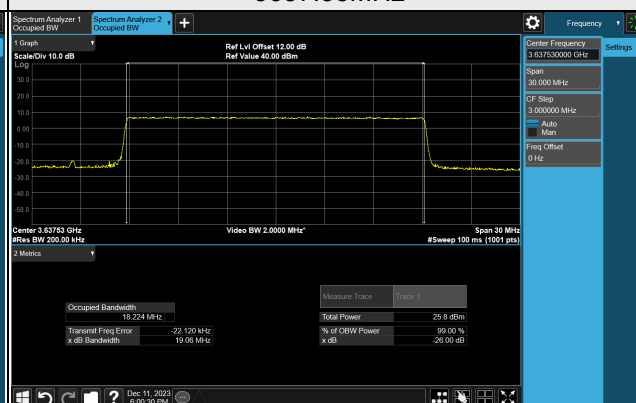


20MHz+20MHz / Antenna 0 / 64QAM

3612.51MHz



3637.53MHz



26dB Bandwidth

Bandwidth	Frequency (MHz)	Modulation	Antenna	CC0	CC1	Total (MHz)
10MHz+20MHz	3555.00+3690.00	QPSK	0	9.16	18.95	28.11
			1	9.189	18.98	28.169
			2	9.143	18.96	28.103
			3	9.18	18.99	28.17
		64QAM	0	9.137	18.94	28.077
			1	9.167	18.95	28.117
			2	9.163	18.96	28.123
			3	9.144	18.97	28.114
		256QAM	0	9.157	18.97	28.127
			1	9.161	18.96	28.121
			2	9.102	18.96	28.062
			3	9.132	18.98	28.112
	3595.02+3660.00	QPSK	0	9.209	19	28.209
			1	9.177	18.99	28.167
			2	9.169	18.95	28.119
			3	9.192	18.95	28.142
		64QAM	0	9.204	18.95	28.154
			1	9.156	18.95	28.106
			2	9.161	18.98	28.141
			3	9.131	18.96	28.091
		256QAM	0	9.139	18.98	28.119
			1	9.119	18.97	28.089
			2	9.129	18.93	28.059
			3	9.113	18.96	28.073
	3617.52+3637.53	QPSK	0	9.201	18.99	28.191
			1	9.166	18.97	28.136
			2	9.184	18.99	28.174
			3	9.182	18.96	28.142
		64QAM	0	9.174	18.99	28.164
			1	9.178	18.92	28.098
			2	9.171	18.98	28.151
			3	9.222	18.97	28.192
		256QAM	0	9.18	18.96	28.14
			1	9.144	18.96	28.104
			2	9.177	18.97	28.147
			3	9.164	18.97	28.134

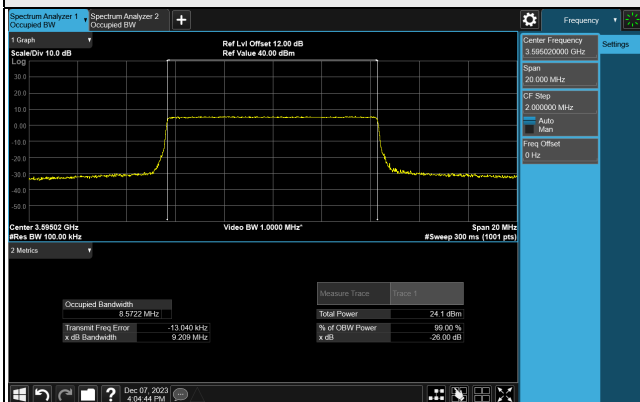
Bandwidth	Frequency (MHz)	Modulation	Antenna	CC0	CC1	Total (MHz)
20MHz+10MHz	3560.01+3694.98	QPSK	0	18.95	9.243	28.193
			1	18.93	9.188	28.118
			2	18.95	9.198	28.148
			3	18.93	9.242	28.172
		64QAM	0	18.91	9.148	28.058
			1	18.94	9.226	28.166
			2	18.91	9.17	28.08
			3	18.93	9.152	28.082
		256QAM	0	18.92	9.153	28.073
			1	18.93	9.171	28.101
			2	18.93	9.158	28.088
			3	18.92	9.151	28.071
	3590.01+3655.02	QPSK	0	18.94	9.155	28.095
			1	18.94	9.199	28.139
			2	18.95	9.185	28.135
			3	18.91	9.195	28.105
		64QAM	0	18.93	9.203	28.133
			1	18.96	9.231	28.191
			2	18.95	9.18	28.13
			3	18.91	9.234	28.144
		256QAM	0	18.94	9.183	28.123
			1	18.91	9.14	28.05
			2	18.93	9.181	28.111
			3	18.9	9.156	28.056
	3612.51+3632.52	QPSK	0	19	9.266	28.266
			1	18.96	9.163	28.123
			2	18.97	9.223	28.193
			3	18.98	9.224	28.204
		64QAM	0	18.95	9.192	28.142
			1	18.91	9.199	28.109
			2	18.95	9.157	28.107
			3	18.95	9.236	28.186
		256QAM	0	18.91	9.176	28.086
			1	18.96	9.168	28.128
			2	18.95	9.203	28.153
			3	18.93	9.227	28.157

Bandwidth	Frequency (MHz)	Modulation	Antenna	CC0	CC1	Total (MHz)
20MHz+20MHz	3560.01+3690.00	QPSK	0	18.99	19.05	38.04
			1	19	18.98	37.98
			2	18.99	18.95	37.94
			3	19.05	18.92	37.97
		64QAM	0	19.01	18.97	37.98
			1	19.03	19.04	38.07
			2	18.98	18.97	37.95
			3	18.98	18.9	37.88
		256QAM	0	19.02	18.99	38.01
			1	18.95	18.98	37.93
			2	19.01	18.96	37.97
			3	18.96	18.99	37.95
	3595.02+3655.02	QPSK	0	18.98	19	37.98
			1	19.03	18.96	37.99
			2	18.98	19	37.98
			3	18.93	19.04	37.97
		64QAM	0	18.98	18.95	37.93
			1	19.16	18.97	38.13
			2	18.93	18.97	37.9
			3	19.13	19.01	38.14
		256QAM	0	19	18.98	37.98
			1	19.02	19.05	38.07
			2	19.01	19.02	38.03
			3	19.17	18.96	38.13
	3612.51+3637.53	QPSK	0	18.99	18.99	37.98
			1	18.96	19.07	38.03
			2	18.96	18.95	37.91
			3	18.96	19	37.96
		64QAM	0	18.99	19.06	38.05
			1	19.02	18.94	37.96
			2	19.02	18.99	38.01
			3	19.01	18.92	37.93
		256QAM	0	19.01	18.96	37.97
			1	18.98	18.91	37.89
			2	19.03	19.03	38.06
			3	19	18.99	37.99

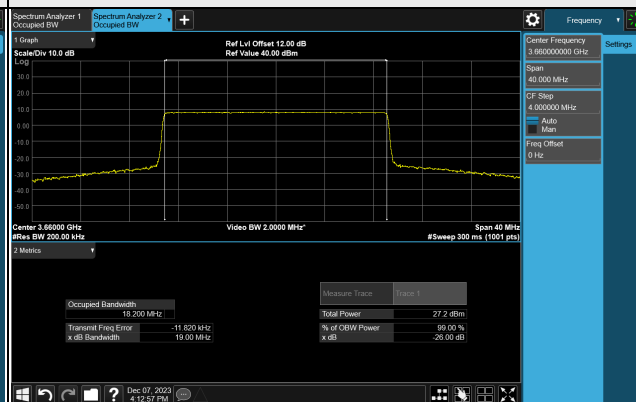
Spectrum Plot of Worst Value

10MHz+20MHz / Antenna 0 / QPSK

3595.02MHz

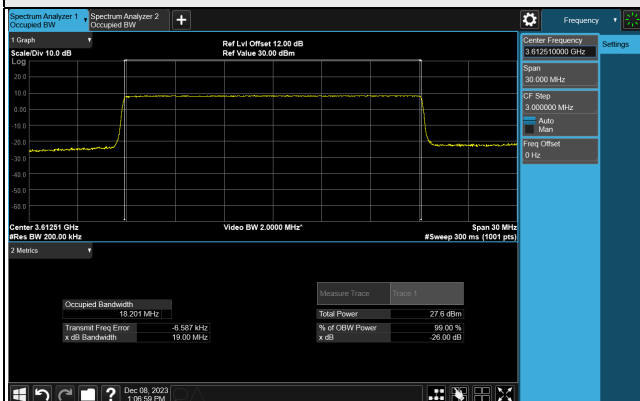


3660.00MHz

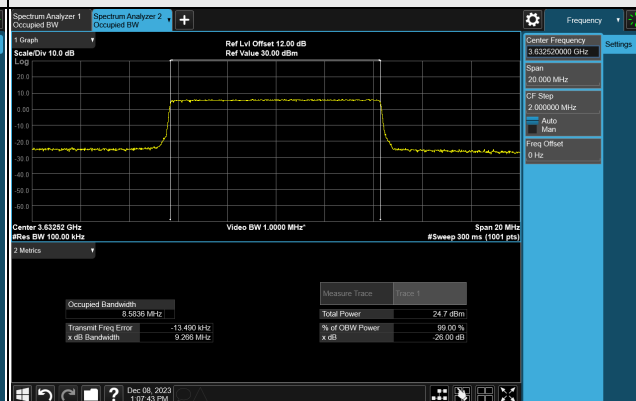


20MHz+10MHz / Antenna 0 / QPSK

3612.51MHz

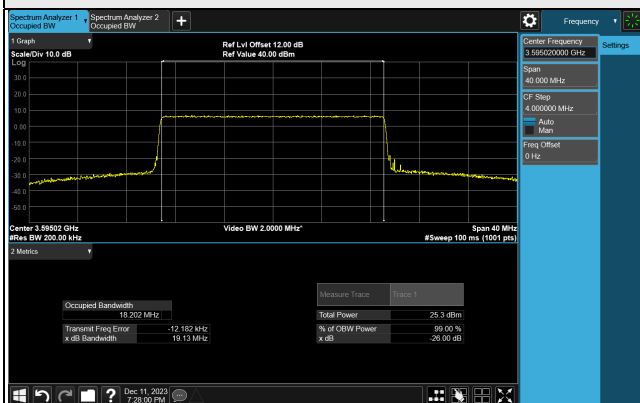


3632.52MHz



20MHz+20MHz / Antenna 3 / 64QAM

3595.02MHz



3655.02 MHz

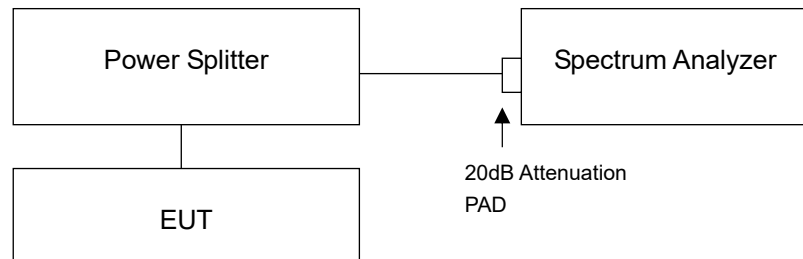


4.6 Peak to Average Ratio Measurement

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.6.4 Test Procedures

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.6.7 Test Results

Mode A: 1CC

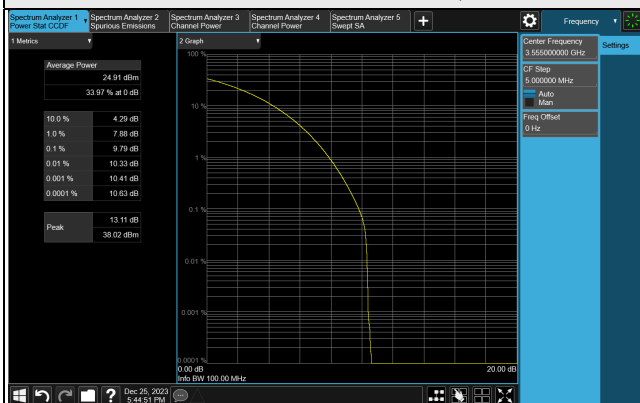
NR Band 48, Channel Bandwidth 10MHz							
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		Antenna 0			Antenna 1		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637000	3555.00	9.11	9.11	9.69	9.09	9.08	9.41
641666	3624.99	9.43	9.46	9.43	9.46	9.52	9.58
646332	3694.98	9.04	8.95	8.67	8.89	9.08	8.84
Channel	Frequency (MHz)	Antenna 2			Antenna 3		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		637000	3555.00	9.02	9.13	9.79	8.99
641666	3624.99	9.69	9.35	9.40	9.47	9.56	9.47
646332	3694.98	9.04	9.01	8.99	8.98	9.00	8.87
NR Band 48, Channel Bandwidth 20MHz							
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		Antenna 0			Antenna 1		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
637334	3560.01	9.93	9.88	10.18	9.93	9.88	10.18
641666	3624.99	9.88	9.63	9.36	9.88	9.63	9.36
646000	3690.00	9.01	9.03	9.04	9.01	9.03	9.04
Channel	Frequency (MHz)	Antenna 2			Antenna 3		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		637334	3560.01	10.24	9.61	10.12	9.94
641666	3624.99	9.78	9.42	9.37	9.44	9.39	9.54
646000	3690.00	8.85	9.32	9.17	9.02	9.06	9.00

NR Band 48, Channel Bandwidth 40MHz

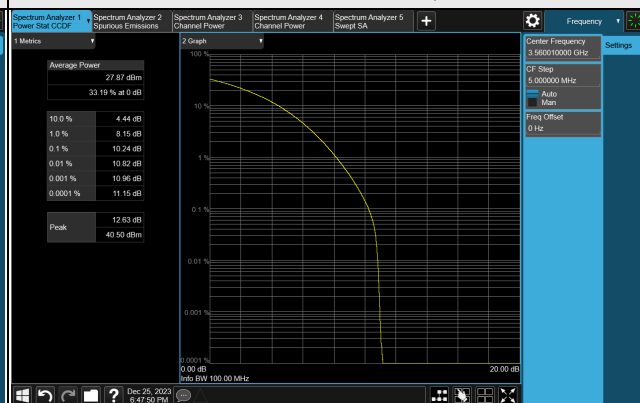
Channel	Frequency (MHz)	Peak To Average Ratio (dB)					
		Antenna 0			Antenna 1		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
638000	3570.00	9.27	9.21	9.28	9.29	9.16	9.25
641666	3624.99	8.72	8.89	8.92	8.87	8.83	8.92
645332	3679.98	8.82	8.89	8.87	8.86	8.57	8.85
Channel	Frequency (MHz)	Antenna 2			Antenna 3		
		QPSK	64QAM	256QAM	QPSK	64QAM	256QAM
		638000	3570.00	9.12	9.30	9.26	9.25
641666	3624.99	8.90	9.20	8.82	8.92	9.29	8.81
645332	3679.98	8.63	8.75	8.70	8.58	8.56	8.76

Spectrum Plot of Worst Value

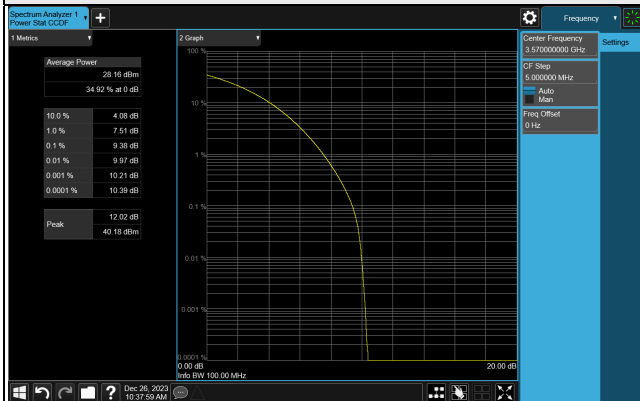
10MHz / Antenna 2 / 256QAM



20MHz / Antenna 2 / QPSK



40MHz / Antenna 3 / 256QAM



Mode B: 2CC

NR Band 48, Channel Bandwidth 10MHz+20MHz													
Channel	Frequency (MHz)	Peak To Average Ratio (dB)											
		Antenna 0						Antenna 1					
		QPSK		64QAM		256QAM		QPSK		64QAM		256QAM	
637000+ 646000	3555.00+ 3690.00	8.88	8.96	8.84	8.99	8.83	9.02	8.83	8.88	8.88	8.90	8.82	8.95
639668+ 644000	3595.02+ 3660.00	8.94	9.10	8.88	8.97	8.86	9.03	8.98	9.12	9.01	8.99	8.89	9.08
641168+ 642502	3617.52+ 3637.53	8.95	9.21	8.98	9.04	8.90	9.19	9.00	9.26	8.97	8.98	8.92	9.16
Channel	Frequency (MHz)	Antenna 2						Antenna 3					
		QPSK		64QAM		256QAM		QPSK		64QAM		256QAM	
		637000+ 646000	3555.00+ 3690.00	8.84	8.87	8.88	8.89	8.81	8.93	8.88	8.82	8.93	8.86
639668+ 644000	3595.02+ 3660.00	8.96	9.06	8.83	9.05	8.89	9.05	8.91	9.11	8.89	9.04	8.84	9.08
641168+ 642502	3617.52+ 3637.53	8.97	9.12	8.94	9.02	8.89	9.24	9.00	9.17	9.02	9.07	8.88	9.21
NR Band 48, Channel Bandwidth 20MHz+10MHz													
Channel	Frequency (MHz)	Peak To Average Ratio (dB)											
		Antenna 0						Antenna 1					
		QPSK		64QAM		256QAM		QPSK		64QAM		256QAM	
637334+ 646332	3560.01+ 3694.98	8.93	8.80	8.88	8.88	8.94	8.87	8.86	8.81	8.99	8.91	8.98	8.87
639334+ 643668	3590.01+ 3655.02	9.02	8.79	8.90	8.86	8.97	8.85	8.98	8.98	9.01	8.94	8.92	8.91
640834+ 642168	3612.51+ 3632.52	9.26	8.86	9.01	9.13	9.35	8.97	9.12	8.83	9.14	9.10	9.08	8.81
Channel	Frequency (MHz)	Antenna 2						Antenna 3					
		QPSK		64QAM		256QAM		QPSK		64QAM		256QAM	
		637334+ 646332	3560.01+ 3694.98	9.03	8.87	8.97	8.85	8.89	8.81	8.86	8.83	9.00	8.92
639334+ 643668	3590.01+ 3655.02	9.00	8.88	9.00	8.98	9.01	8.90	9.06	8.83	9.05	8.97	8.99	8.93
640834+ 642168	3612.51+ 3632.52	9.07	8.84	8.95	8.97	9.20	8.95	9.12	8.86	9.09	9.06	9.05	9.00

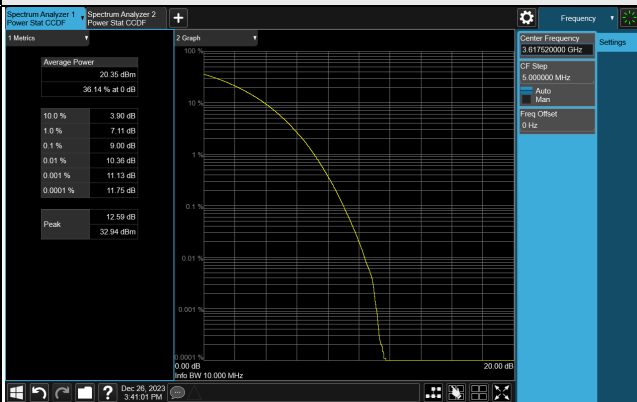
NR Band 48, Channel Bandwidth 20MHz+20MHz

Channel	Frequency (MHz)	Peak To Average Ratio (dB)											
		Antenna 0						Antenna 1					
		QPSK		64QAM		256QAM		QPSK		64QAM		256QAM	
637334+ 646000	3560.01+ 3690.00	9.04	8.65	9.02	8.69	9.15	8.68	8.87	8.59	8.93	8.78	9.05	8.68
639668+ 643668	3595.02+ 3655.02	8.71	8.54	8.57	8.45	8.82	8.66	8.68	8.70	8.72	8.94	8.74	8.53
640834+ 642502	3612.51+ 3637.53	9.32	8.86	9.07	8.73	9.27	8.69	9.41	8.99	9.08	8.78	9.15	8.93
Channel	Frequency (MHz)	Antenna 2						Antenna 3					
		QPSK		64QAM		256QAM		QPSK		64QAM		256QAM	
637334+ 646000	3560.01+ 3690.00	9.15	8.64	9.07	8.76	8.89	8.68	9.03	8.82	9.06	8.78	8.96	8.65
639668+ 643668	3595.02+ 3655.02	8.68	8.71	8.73	8.87	8.69	8.74	8.68	8.62	8.61	8.71	8.73	8.80
640834+ 642502	3612.51+ 3637.53	9.28	9.00	9.17	8.89	9.15	8.75	9.36	9.04	9.15	8.93	9.31	8.82

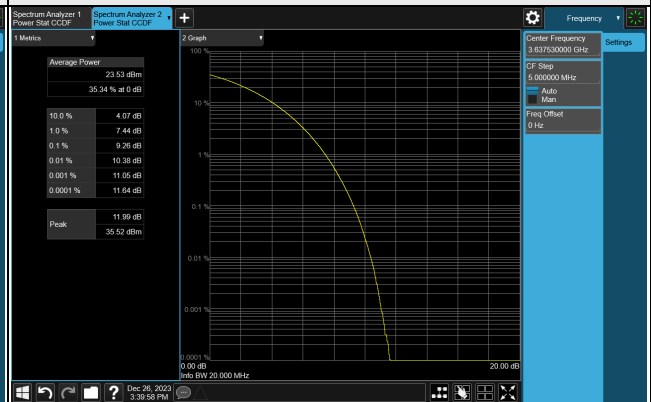
Spectrum Plot of Worst Value

10MHz+20MHz / Antenna 1 / QPSK

3617.52MHz

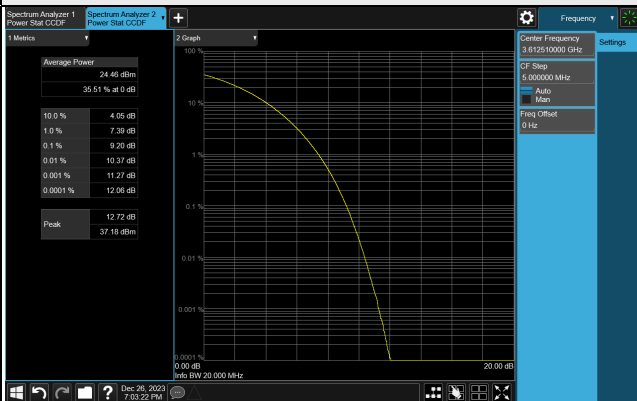


3637.53MHz

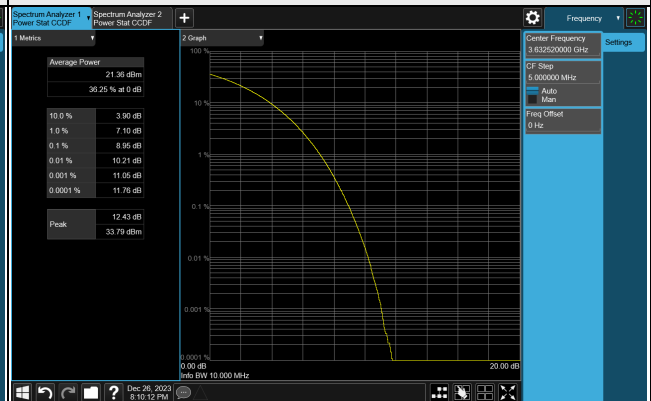


20MHz+10MHz / Antenna 2 / 256QAM

3612.51MHz

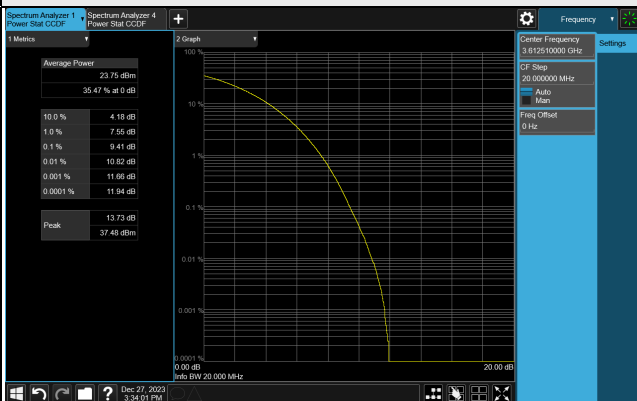


3632.52MHz

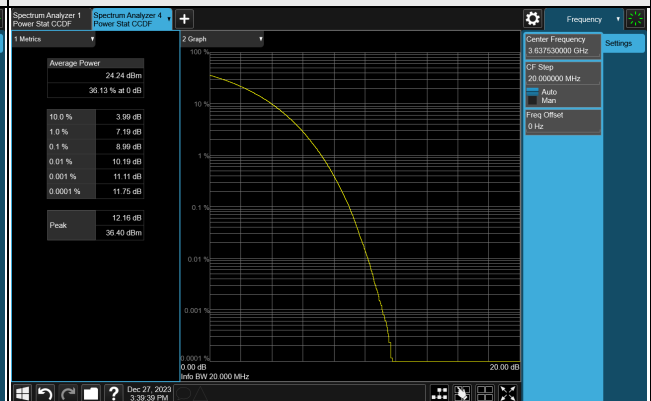


20MHz+20MHz / Antenna 1 / QPSK

3612.51MHz



3637.53MHz



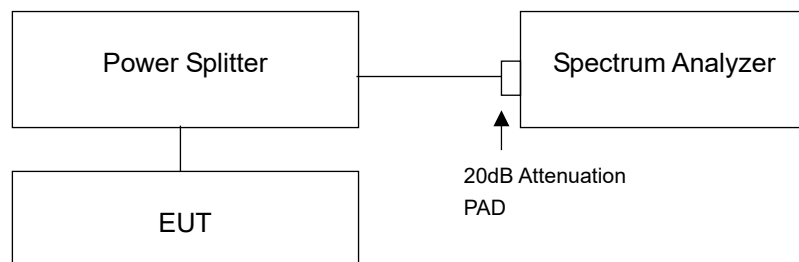
4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

Power of any emissions outside the Fundamental	Limit
Within 0-10MHz above the Assigned Channel	-13 dBm/MHz
Within 0-10MHz below the Assigned Channel	
Greater than 10MHz above the Assigned Channel	-25 dBm/MHz
Greater than 10MHz below the Assigned Channel	
Power of any emission below 3530MHz	-40 dBm/MHz
Power of any emission above 3720MHz	

Note: This device can be implement MIMO function, so the limit of emission mask / conducted emissions needs to be reduced by $10\log(\text{NumbersAnt})$ according to FCC KDB 662911 D01 guidance. (e.g., For MIMO conducted spurious emission limit total $-40 - 10\log(4) = -46.02$ dB)

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.7.4 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range are from 9 kHz to 40GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement. Detector = Average.
- Measuring frequency band edge, 20dB attenuation pad is connected with spectrum. 1% of the fundamental emission bandwidth is used for conducted emission measurement.

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

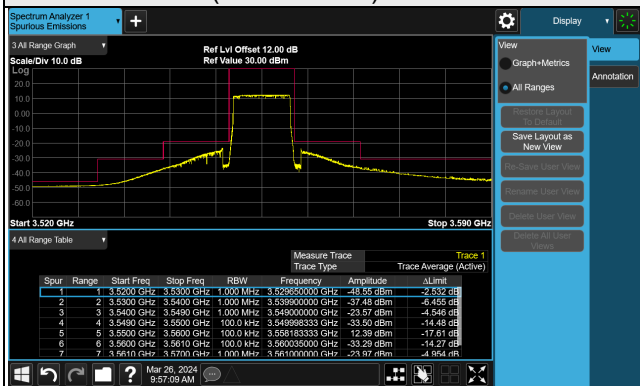
4.7.7 Test Results

Mode A: 1CC

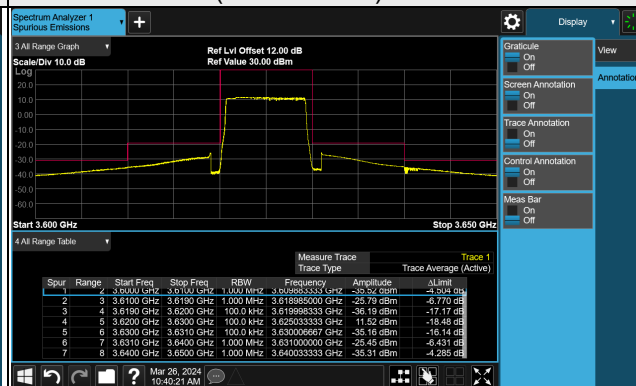
Antenna 0

NR Band 48, Channel Bandwidth 10MHz

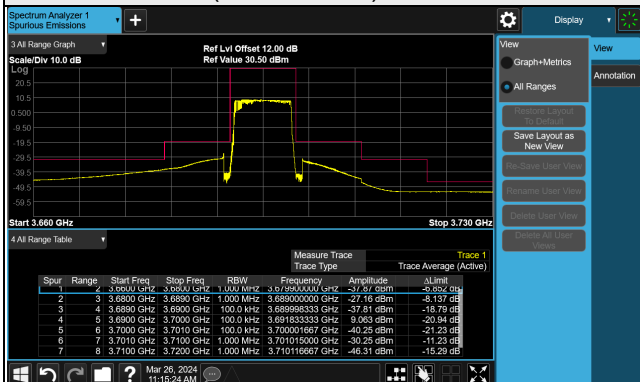
Channel 637000 (3555.00MHz)



Channel 641666 (3624.99MHz)



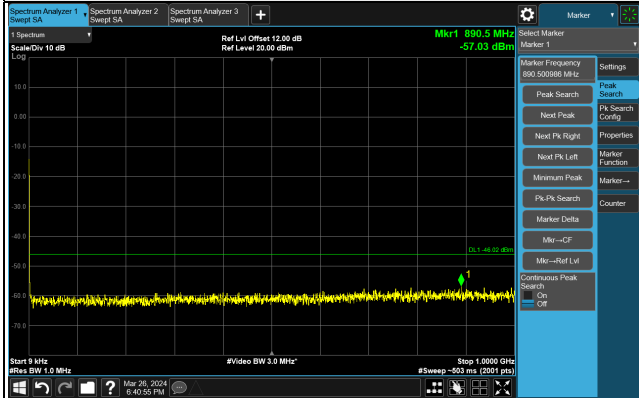
Channel 646332 (3694.98MHz)



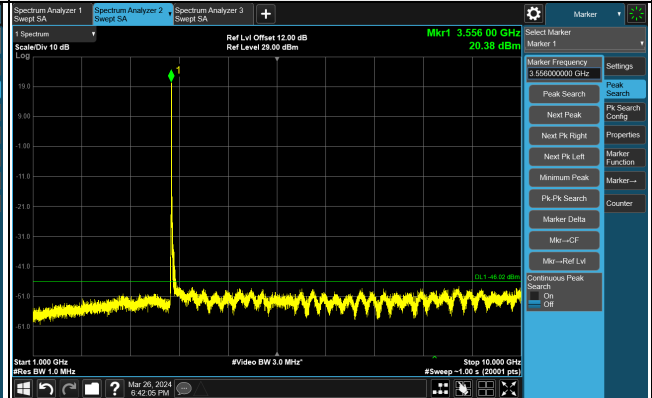
NR Band 48, Channel Bandwidth 10MHz

Channel 637000 (3555.00MHz)

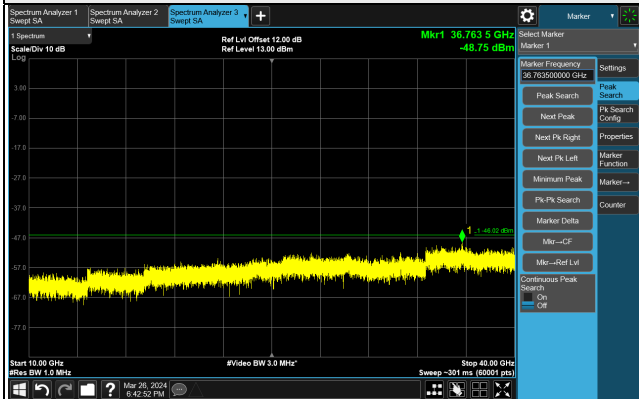
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 10GHz



Frequency Range : 10GHz ~ 40GHz

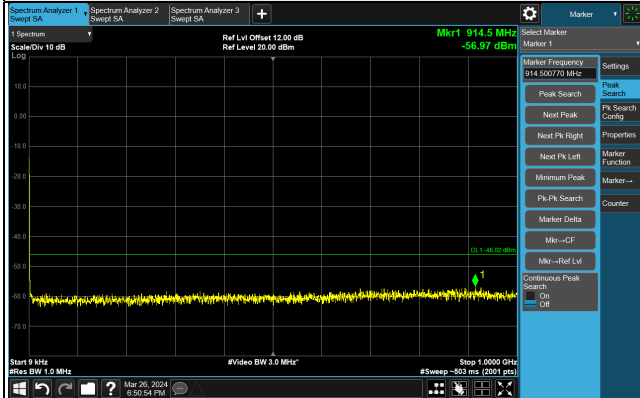


Note: The signal at 9 kHz is IF signal from spectrum analyzer.

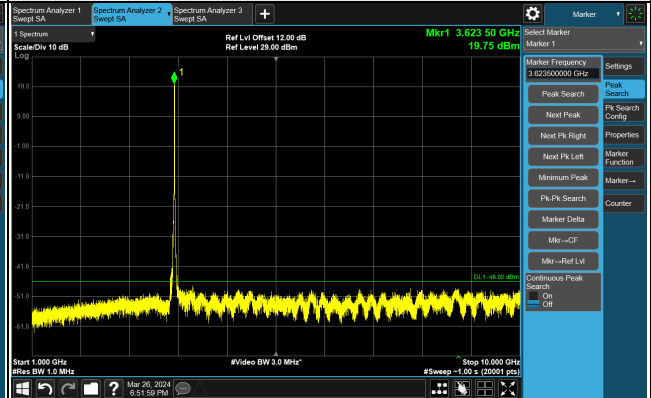
NR Band 48, Channel Bandwidth 10MHz

Channel 641666 (3624.99MHz)

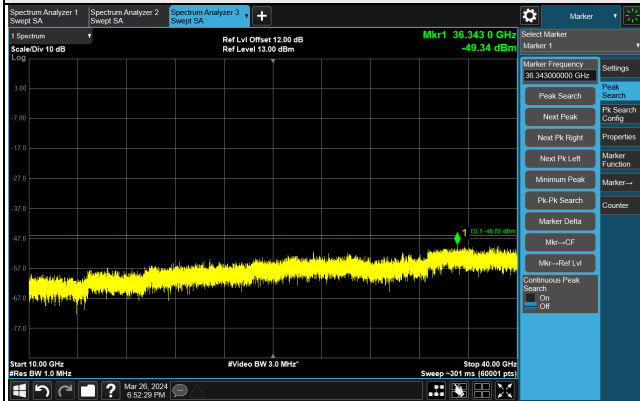
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 10GHz



Frequency Range : 10GHz ~ 40GHz

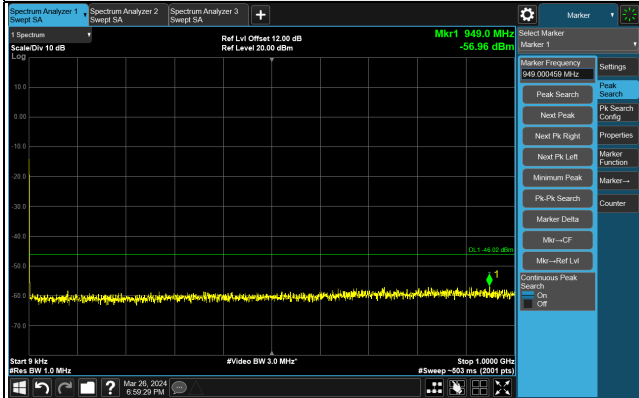


Note: The signal at 9 kHz is IF signal from spectrum analyzer.

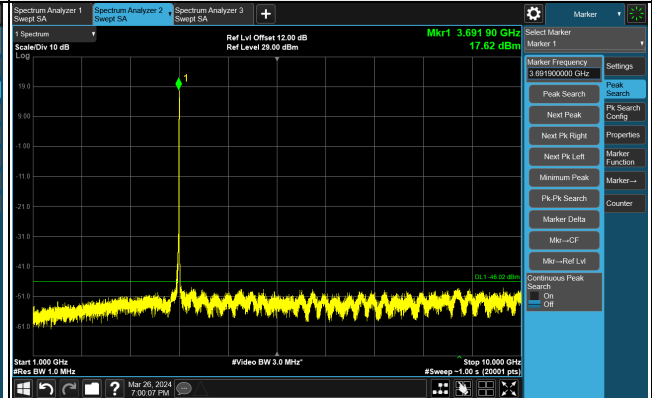
NR Band 48, Channel Bandwidth 10MHz

Channel 646332 (3694.98MHz)

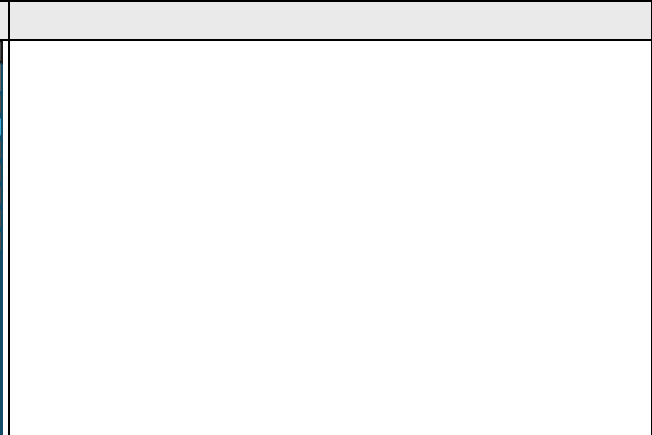
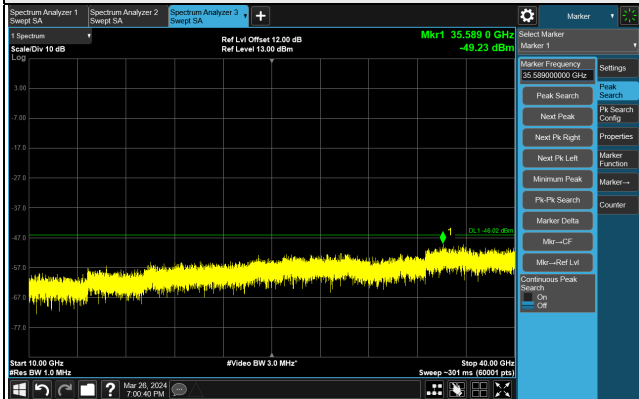
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 10GHz



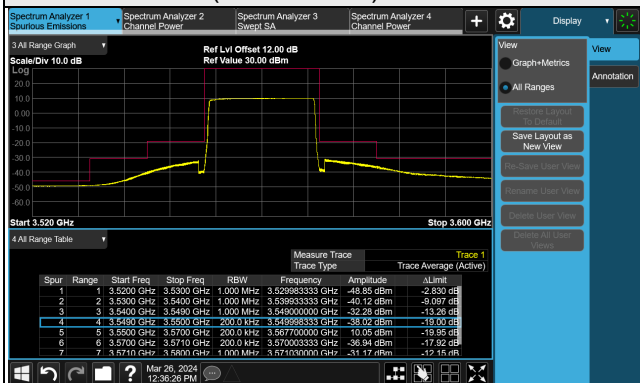
Frequency Range : 10GHz ~ 40GHz



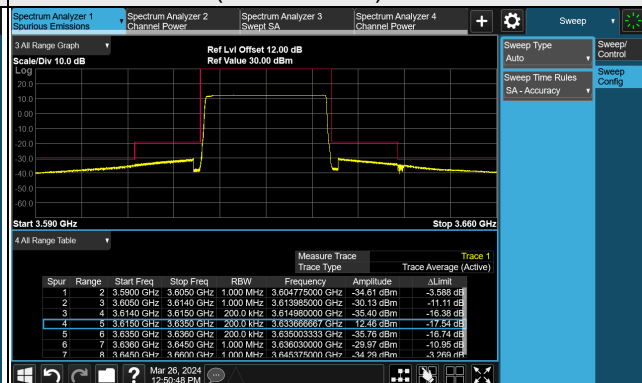
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

NR Band 48, Channel Bandwidth 20MHz

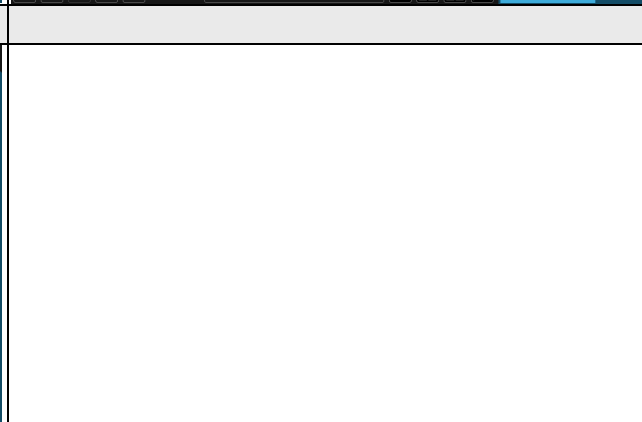
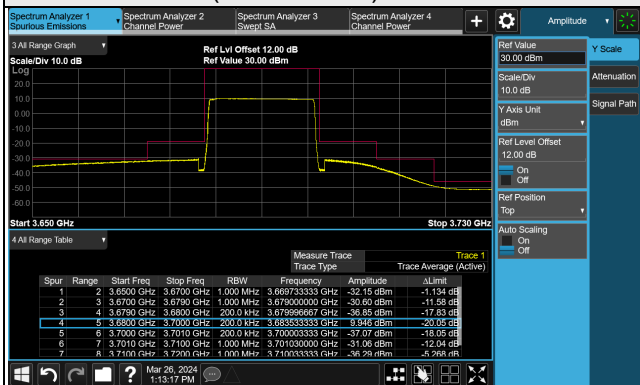
Channel 637334 (3560.01MHz)



Channel 641666 (3624.99MHz)



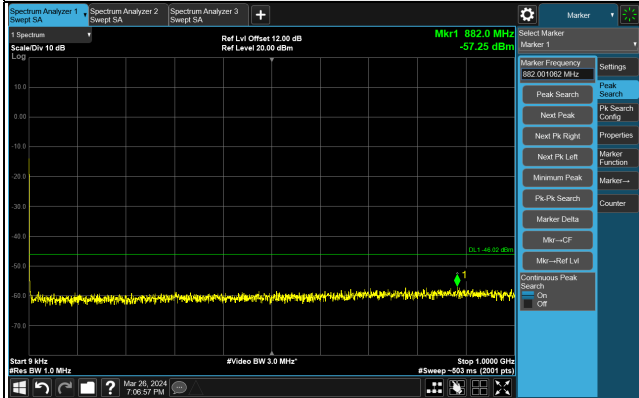
Channel 646000 (3690.00MHz)



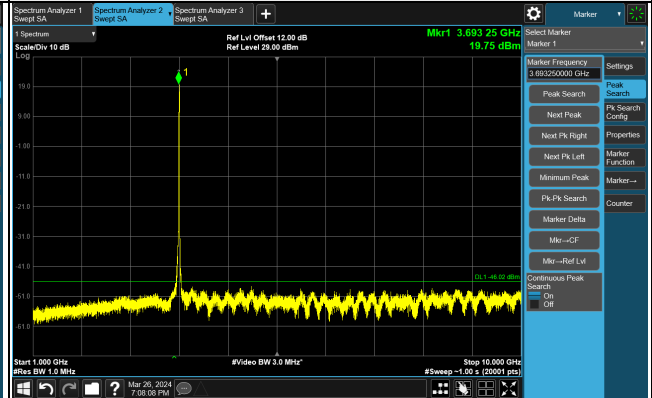
NR Band 48, Channel Bandwidth 20MHz

Channel 637334 (3560.01MHz)

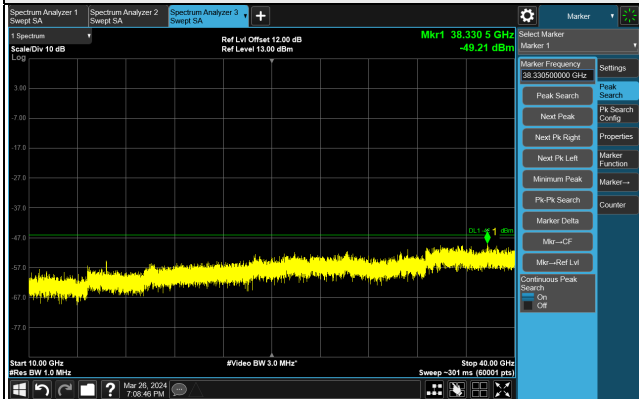
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 10GHz



Frequency Range : 10GHz ~ 40GHz

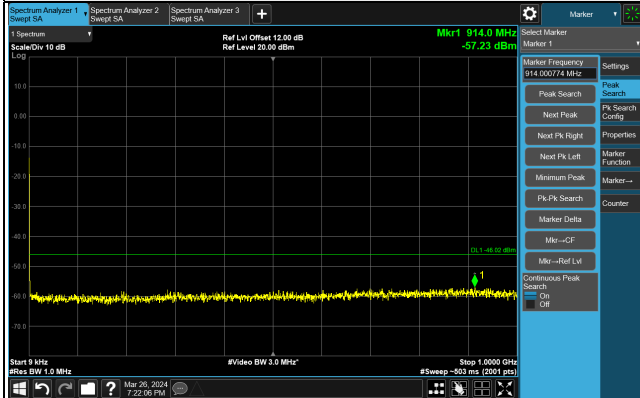


Note: The signal at 9 kHz is IF signal from spectrum analyzer.

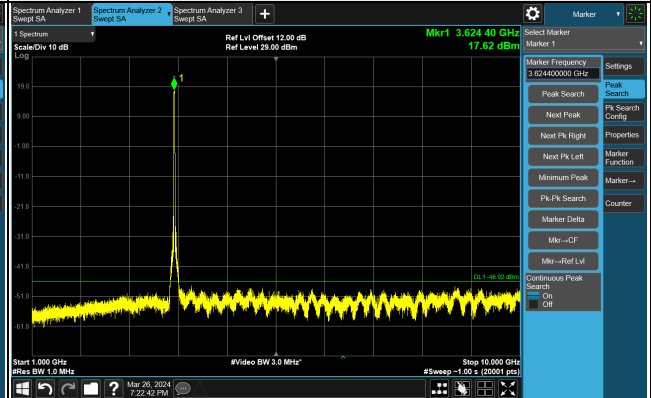
NR Band 48, Channel Bandwidth 20MHz

Channel 641666 (3624.99MHz)

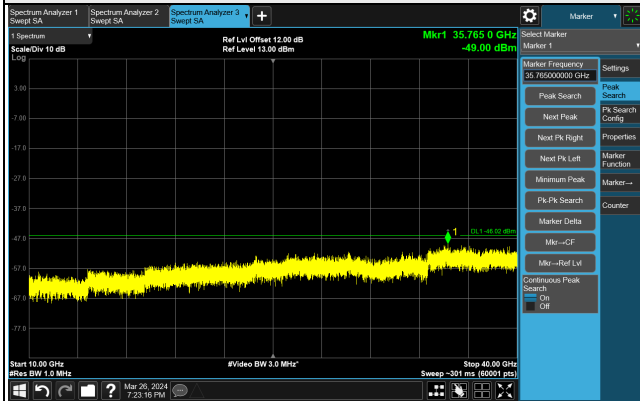
Frequency Range : 9kHz ~ 1GHz



Frequency Range : 1GHz ~ 10GHz



Frequency Range : 10GHz ~ 40GHz



Note: The signal at 9 kHz is IF signal from spectrum analyzer.