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Title 47 Code of Federal Regulations Test Report

Regulation:
FCC Part 2 and 27

Client:
NOKIA SOLUTIONS AND NETWORKS, OY

Product Evaluated:
AKQW AirScale RRH 8T8R n77 320W

Report Number:
TR-2023-0137-FCC2-27

Date Issued:
January 4, 2024

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Revisions

Date	Revision	Section	Change
1/4/2024	0		Initial Release


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1. System Information and Requirements

Report copies and other information not contained in this report are held by either the product engineer or in an identified file at the Global Product Compliance Laboratory in Murray-Hill, NJ.

Equipment Under Test (EUT):	AKQW AirScale RRH 8T8R n77 320W
Serial Number:	Refer to Section 1.3.2
FCC ID:	VBNAKQW-01
Hardware Version:	Refer to Section 1.3.2
Software Version:	SBTS24R1
Frequency Range:	3700-3980 MHz
GPCL Project Number:	2023-0137
Applicant:	NOKIA SOLUTIONS AND NETWORKS Steve Mitchell Nokia Solutions and Networks 3201 Olympus Blvd Dallas, Texas, 75019. USA
Test Requirement(s):	Title 47 CFR Parts 2 and 27
Test Standards:	See Section 1.5.1
Measurement Procedure(s):	See Section 1.5.2
Test Date(s):	11/20/2023 - 12/14/2023
Test Performed By:	Nokia Global Product Compliance Laboratory 600-700 Mountain Ave. P.O. Box 636 Murray Hill, NJ 07974-0636 Test Site Number: US5302
Product Engineer(s):	Ron Remy
Lead Engineer:	Steve Gordon
Test Engineer (s):	Nilesh Patel
Test Results: The EUT, <i>as tested</i> met the above listed Test Requirements. The decision rule employed is binary (Pass/Fail) based on the measured values without accounting for Measurement Uncertainty or any Guard Band. The measured values obtained during testing were compared to a value given in the referenced regulation or normative standard. Report copies and other information not contained in this report are held by either the product engineer or in an identified file at the Global Product Compliance Laboratory in New Providence, NJ.	

1.1 Introduction

This Conformity test report applies to the **AKQW AirScale RRH 8T8R n77 320W**, hereinafter referred to as the Equipment Under Test (EUT).

1.2 Purpose and Scope

The purpose of this document is to provide the testing data required for qualifying the EUT in compliance with FCC Parts 2 and 27 measured in accordance with the procedures set out in Section 2.1033 (c) (14) of the Rules.

The AKQW supports NR (New Radio), a maximum conducted RF power of 320W per unit, with bandwidths of 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100 MHz for single carriers and dual carrier in combinations of approved single carrier bandwidths between the 20+20, 100+100 MHz multi-carriers that were tested. The product supports the frequency range of 3700 – 3980 MHz.

This test program tested the following Channel Bandwidths:

- Single Carrier: 20, 30, 40, 50, 60, 70, 80, 90, 100
- Dual Carriers: 20+20, 100+100 MHz in Contiguous and Non-Contiguous configurations

The power levels tested were limited for 20MHz (160 W), 30 MHz (240 W) and 40 MHz (280 W) carriers. The full 320 W power capability of the EUT was tested for all remaining configurations.

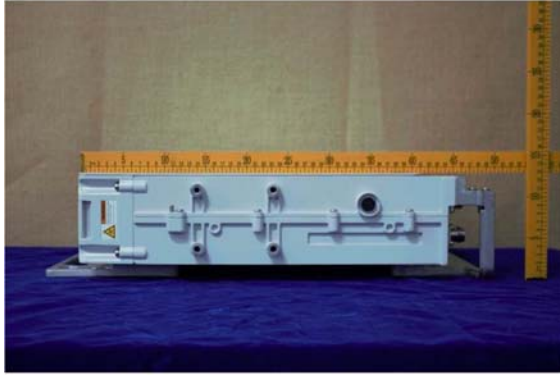
1.3 EUT Details

1.3.1 Specifications

Specification Items	Description
Radio Access Technology	5G-NR
Modulation Type(s)	QPSK, 16QAM, 64QAM, 256QAM
Frequency Range	3700 – 3980 MHz
Channel Bandwidth	20, 30, 40, 50, 60, 70, 80, 90, 100 MHz
Number of Tx Ports per Unit	2X / 4X / 8X
MIMO	Yes
Max Conducted Power	8 x 46 dBm (40 W)
Deployment Environment	Outdoor
Environment Temperature Range	-40°C to 55°C
Power Source	Voltage Ranges (VDC)

1.3.2 Photographs





1.4 Test Requirements

Each required measurement is listed below:

47 CFR FCC Sections	Description of Tests	Test Required
2.1046, 27.53	RF Power Output	Yes
2.1047, 27.53	Modulation Characteristics	Yes
2.1049, 27.53	(a) Occupied Bandwidth (b) Out-of-Band Emissions	Yes
2.1051, 27.53	Spurious Emissions at Antenna Terminals	Yes
2.1053, 27.53	Field Strength of Spurious Radiation	Yes
2.1055, 27.53	Frequency Stability	Yes

1.5 Test Standards & Measurement Procedures

1.5.1 Test Standards

- Title 47 Code of Federal Regulations, Federal Communications Commission Part 2.
- Title 47 Code of Federal Regulations, Federal Communications Commission Part 27.
- KDB 971168 D01 Power Measurement License Digital Systems v03r01 April 9, 2018.
- KDB 662911 D01 Multiple Transmitter Output v02r01 Oct 2013.
- ANSI C63.26-2015, American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services.
- ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

1.5.2 Measurement Procedures

- FCC-IC-OB - GPCL Power Measurement, Occupied Bandwidth & Modulation Test Procedure 6-20-2019.
- FCC-IC-SE - GPCL Spurious Emissions Test Procedure 6-20-2019.
- FCC-IC-FS – GPCL Frequency Stability Measurement Process 6-20-2019.

1.5.3 MEASUREMENT UNCERTAINTY

The results of the calculations to estimate uncertainties for the several test methods and standards are shown in the Table below. These are the worst-case values.

Worst-Case Estimated Measurement Uncertainties

Standard, Method or Procedure	Condition	Frequency MHz	Expanded Uncertainty (k=2)
a. Classical Emissions, (<i>e.g.</i> , ANSI C63.4, CISPR 11, 14, 22, <i>etc.</i> , using ESHS 30,	Conducted Emissions	0.009 - 30	±3.5 dB
	Radiated Emissions (AR-6 Semi-Anechoic Chamber)	30 MHz – 200MHz H 30 MHz – 200 MHz V 200 MHz – 1000 MHz H 200 MHz – 1000 MHz V 1 GHz - 18 GHz	±5.1 dB ±5.1 dB ±4.7 dB ±4.7 dB ±3.3 dB

Antenna Port Test	Signal Bandwidth	Frequency Range	Expanded Uncertainty (k=2), Amplitude
Occupied Bandwidth, Edge of Band, Conducted Spurious Emissions	10 Hz	9 kHz to 20 MHz	1.78 dB
	100 Hz	20 MHz to 1 GHz	
	10 kHz to 1 MHz	1 GHz to 10 GHz	
	1MHz	10 GHz to 40 GHz:	
RF Power	10 Hz to 20 MHz	50 MHz to 18 GHz	0.5 dB

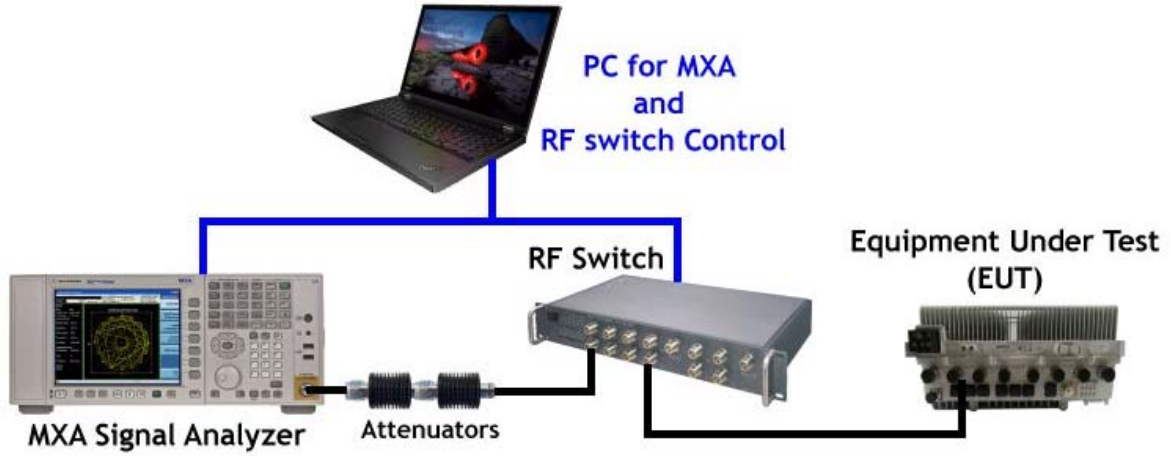
1.6 Executive Summary

Requirement	Description	Result
47 CFR FCC Parts 2 and 27		
2.1046, 27.53	RF Power Output Peak to Average Power Ratio	COMPLIES
2.1047, 27.53	Modulation Characteristics	COMPLIES
2.1049, 27.53	(a) Occupied Bandwidth (b) Edge of Band Emissions	COMPLIES
2.1051, 27.53	Spurious Emissions at Antenna Terminals	COMPLIES
2.1053, 27.53	Field Strength of Spurious Radiation	COMPLIES
2.1055, 27.53	Frequency Stability	COMPLIES

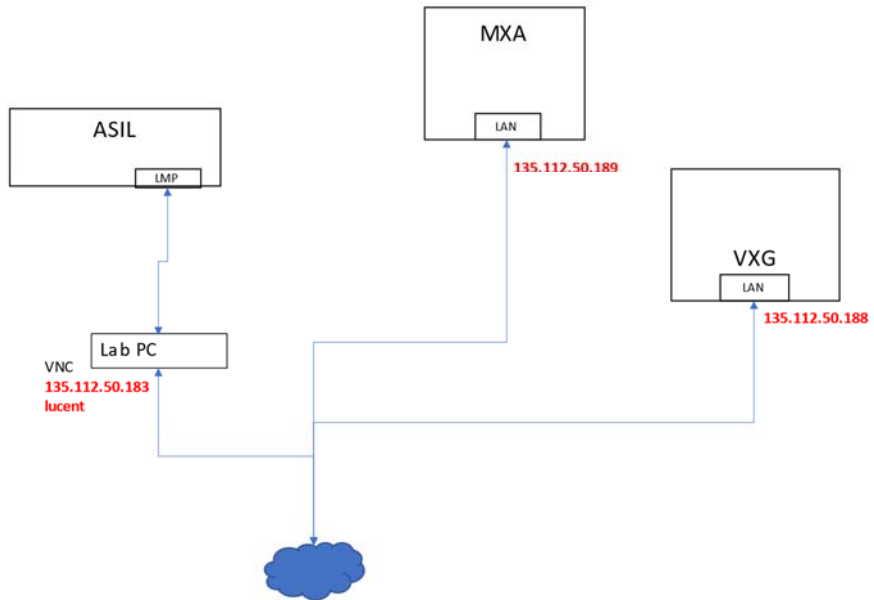
1. **COMPLIES** - Passed all applicable tests.
2. **N/A** – Not Applicable.
3. **NT** – Not Tested.

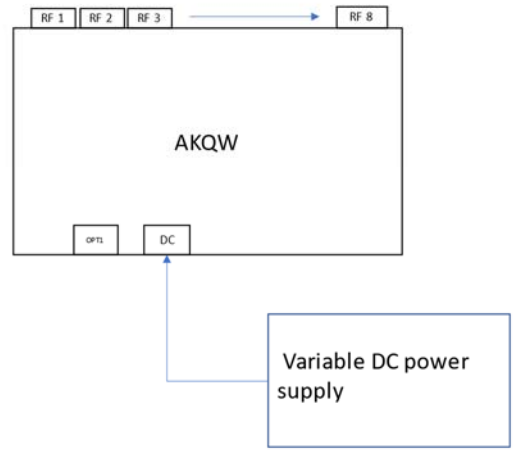
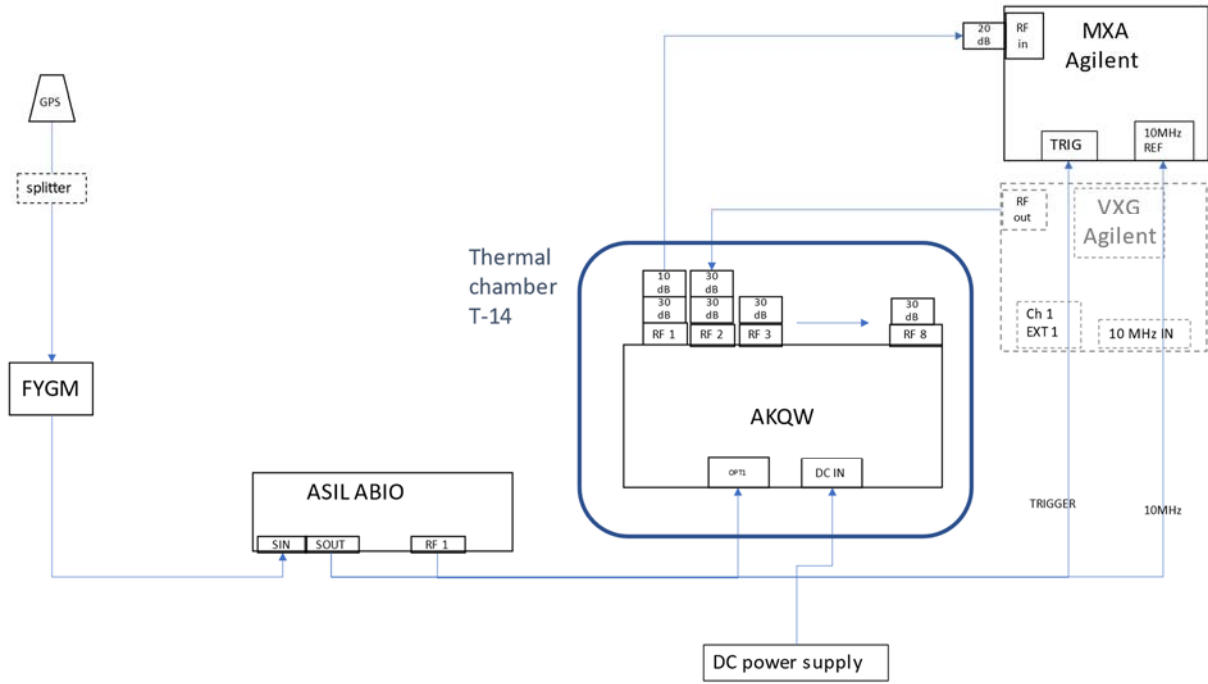
1.7 Test Configuration

Test Setup for all Antenna Port Measurements



Test Setup for Frequency Stability





2. FCC Section 2.1046 - RF Power Output

2.1 RF Power Output

This test is a measurement of the total RF power level transmitted at the antenna-transmitting terminal. The product was configured for test as shown in the section above and allowed to warm up and stabilize per KDB 971168 D01 and ANSI C63.26.

Per FCC 27.50(J)(2), the power of each fixed or base station transmitting in the 3700-3980MHz band is limited to an EIRP of 1640W/MHz, i.e., 62.15dBm/MHz EIRP. See **Summary of PSD Results** Table below.

PSD Results Table

Signal BW MHz	Channel Frequency MHz	Peak PSD per Port (dBm/MHz)	Peak PSD for 8 Ports (dBm/MHz)	EIRP Limit (Urban) (dBm/MHz)	Antenna Gain Allowed (dBi)
20	3710	31.29	40.32	62.15	21.83
20	3800	32.38	41.41	62.15	20.74
20	3970	31.04	40.07	62.15	22.08
30	3715	31.43	40.46	62.15	21.69
30	3800	32.73	41.76	62.15	20.39
30	3965	31.53	40.56	62.15	21.59
40	3720	30.58	39.61	62.15	22.54
40	3800	32.17	41.20	62.15	20.95
40	3960	30.21	39.24	62.15	22.91
50	3725	30.46	39.49	62.15	22.66
50	3800	31.76	40.79	62.15	21.36
50	3955	30.66	39.69	62.15	22.46
60	3730	29.45	38.48	62.15	23.67
60	3800	31.16	40.19	62.15	21.96
60	3950	29.63	38.66	62.15	23.49
70	3735	28.87	37.90	62.15	24.25
70	3800	30.50	39.53	62.15	22.62
70	3945	28.90	37.93	62.15	24.22
80	3740	28.34	37.37	62.15	24.78
80	3800	30.04	39.07	62.15	23.08
80	3940	28.34	37.37	62.15	24.78
90	3745	27.88	36.91	62.15	25.24
90	3800	29.54	38.57	62.15	23.58
90	3935	27.71	36.74	62.15	25.41
100	3750	27.32	36.35	62.15	25.8
100	3800	29.08	38.11	62.15	24.04
100	3930	27.16	36.19	62.15	25.96
20+20	3710+3730	31.63	40.66	62.15	21.49
20+20	3790+3810	31.71	40.74	62.15	21.41
20+20	3790+3970	31.27	40.30	62.15	21.85
20+20	3950+3970	30.25	39.28	62.15	22.87
100+100	3750+3850	26.29	35.32	62.15	26.83
100+100	3830+3930	24.09	33.12	62.15	29.03

Total EIRP = Max Output Power per Port + 10 log (8) + Bandwidth Correction

The Total EIRP was calculated assuming a 0dBi antenna value.

The antenna gain permitted for rural area or configurations with different polarization could be higher.

Power measurements were made with an MXA Signal Analyzer. The Average Max RF Power Values are bolded in each configuration.

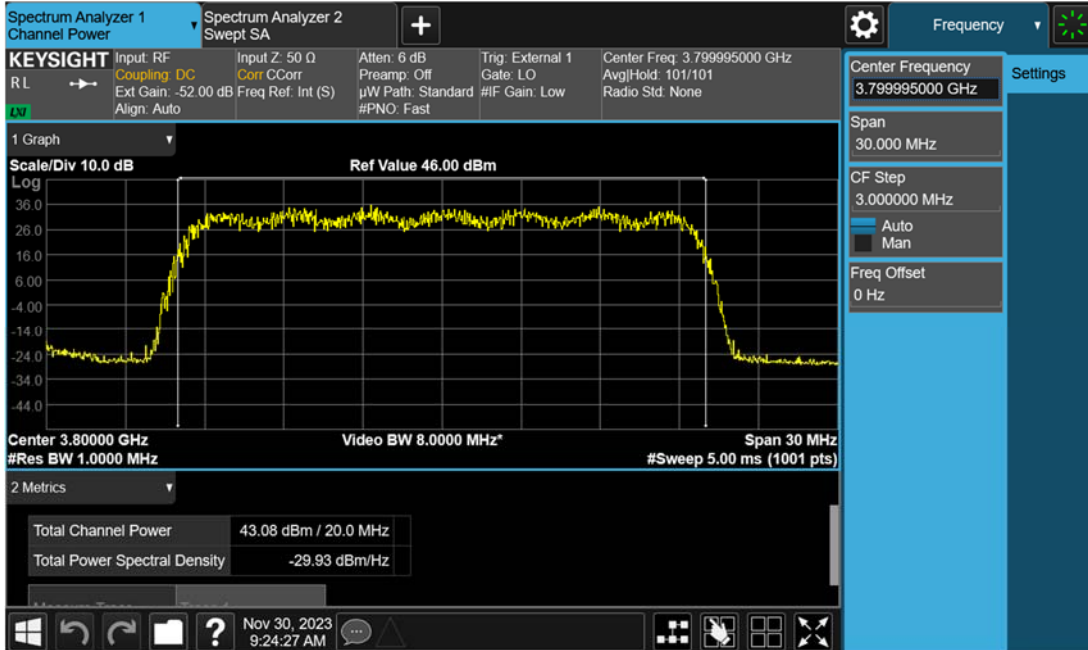
NOTE: Only a sample of the plots are used in this report. The full suite of raw data resides at the MH, New Jersey location.

1 Carrier, 20MHz BW

Channel Power - Signal BW 20MHz					
Test Model 3.1 Modulation 64QAM Channel Frequency 3700MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3800MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3970MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	42.80	1	42.75	1	42.85
2	42.78	2	42.76	2	42.81
3	43.02	3	43.08	3	43.06
4	42.58	4	42.54	4	42.56
5	42.68	5	42.91	5	42.85
6	42.59	6	42.81	6	42.85
7	42.55	7	42.70	7	42.79
8	42.75	8	42.92	8	43.00
Total Power (dBm)	51.75	Total Power (dBm)	51.84	Total Power (dBm)	51.88
Total Power (W)	149.70	Total Power (W)	152.84	Total Power (W)	154.15

1 Carrier, 20MHz BW, Max Value Plot

Test Model 3.2, Modulation QPSK/16QAM, Channel Frequency 3800MHz, TX3

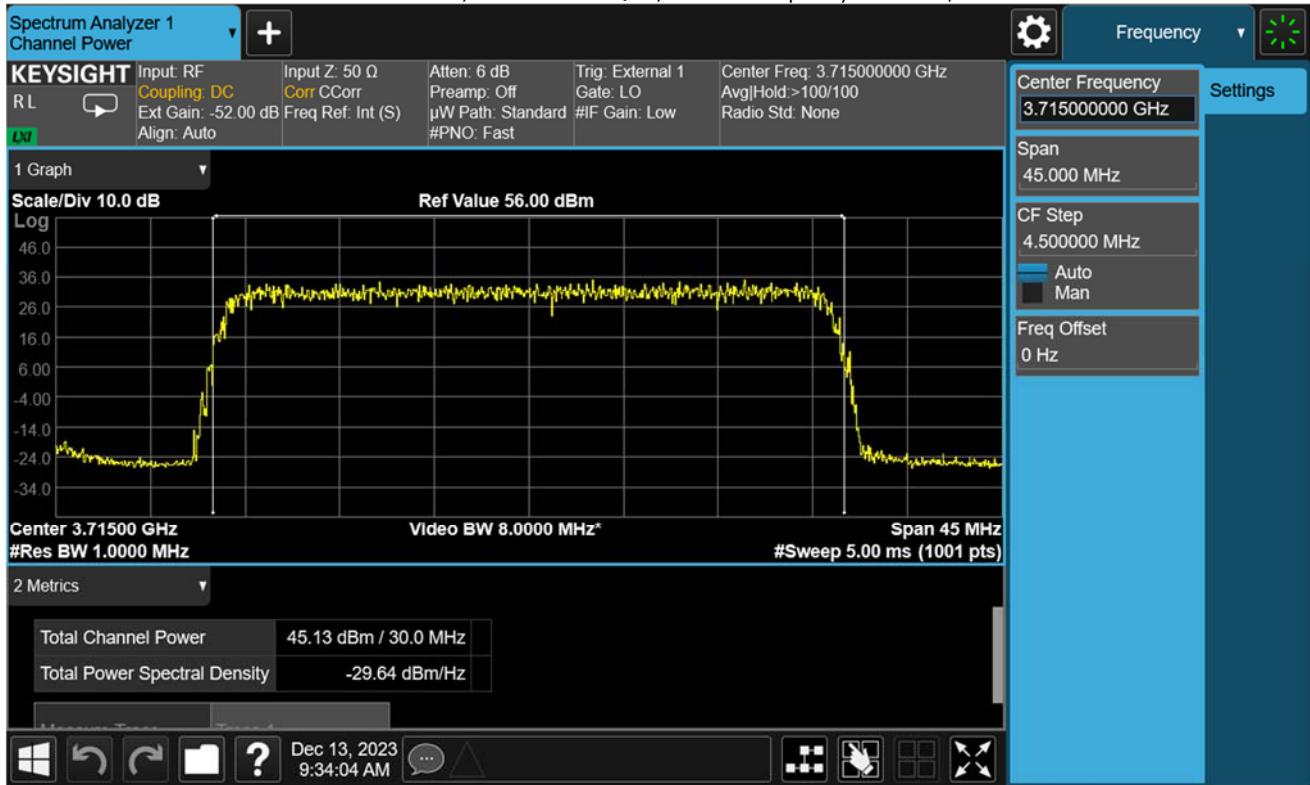


1 Carrier, 30MHz BW

Channel Power - Signal BW 30MHz					
Test Model 3.1 Modulation 64QAM Channel Frequency 3715MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3800MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3965MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	44.69	1	44.47	1	44.65
2	44.69	2	44.46	2	44.62
3	44.62	3	44.43	3	44.60
4	45.13	4	44.61	4	45.00
5	44.84	5	44.71	5	44.58
6	44.73	6	44.55	6	44.56
7	44.71	7	44.55	7	44.59
8	44.84	8	44.64	8	44.67
Total Power (dBm)	53.81	Total Power (dBm)	53.58	Total Power (dBm)	53.69
Total Power (W)	240.70	Total Power (W)	228.26	Total Power (W)	233.98

1 Carrier, 30MHz BW, Max Value Plot

Test Model 3.1, Modulation 64QAM, Channel Frequency 3715MHz, TX4

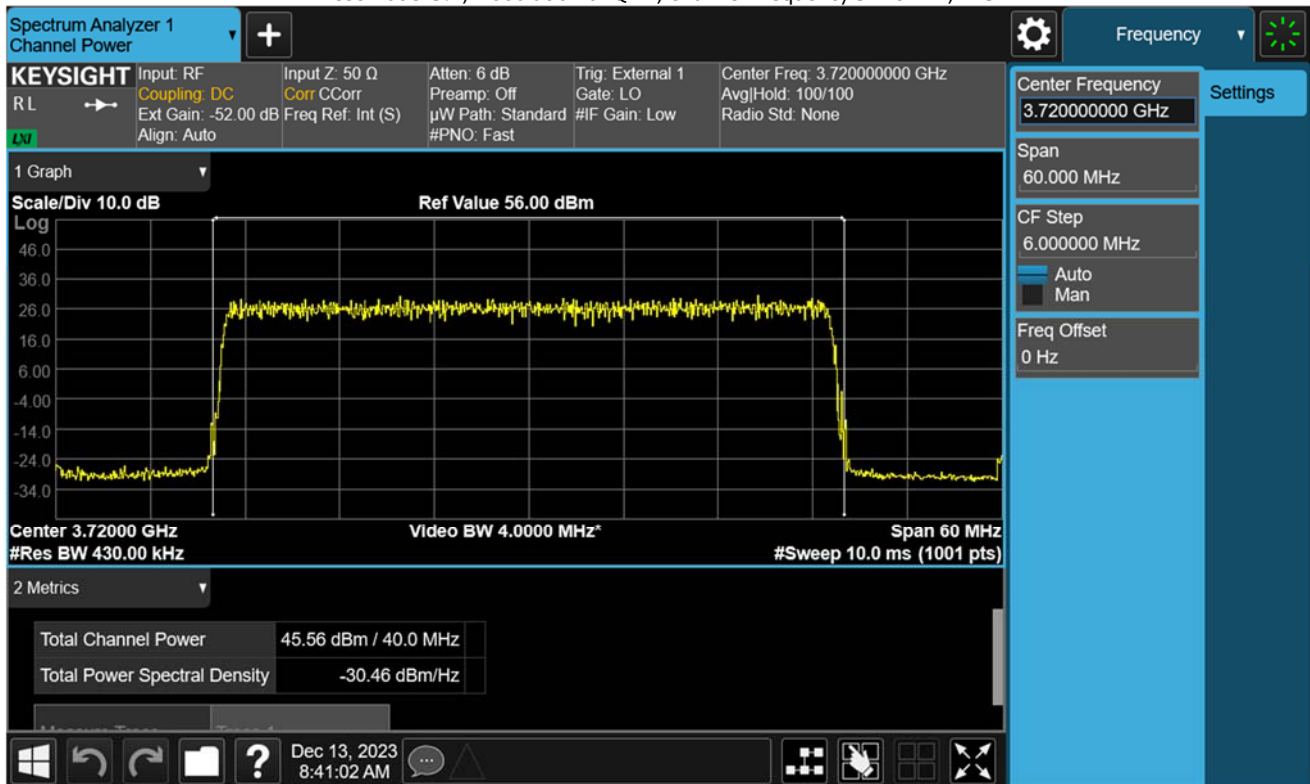


1 Carrier, 40MHz BW

Channel Power - Signal BW 40MHz					
Test Model 3.1 Modulation 64QAM Channel Frequency 3720MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3800MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3960MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	45.37	1	45.45	1	45.55
2	45.34	2	45.40	2	45.47
3	45.29	3	45.38	3	45.45
4	45.54	4	45.37	4	45.33
5	45.56	5	45.46	5	45.46
6	45.33	6	45.34	6	45.43
7	45.29	7	45.31	7	45.41
8	45.38	8	45.39	8	45.48
Total Power (dBm)	54.42	Total Power (dBm)	54.42	Total Power (dBm)	54.48
Total Power (W)	276.66	Total Power (W)	276.61	Total Power (W)	280.47

1 Carrier, 40MHz BW, Max Value Plot

Test Model 3.1, Modulation 64QAM, Channel Frequency 3720MHz, TX5

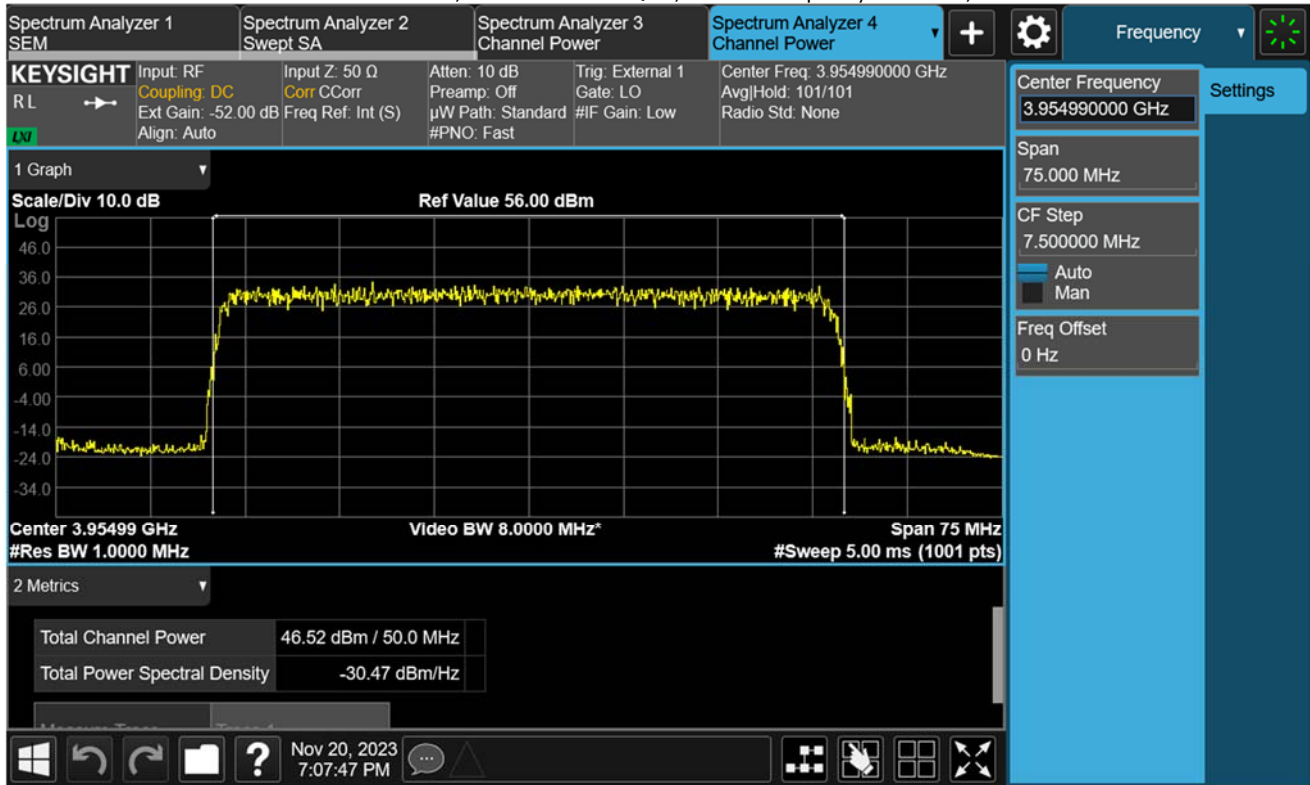


1 Carrier, 50MHz BW

Channel Power - Signal BW 50MHz					
Test Model 3.1 Modulation 64QAM Channel Frequency 3725MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3800MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3955MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	46.18	1	45.94	1	46.09
2	46.15	2	45.89	2	46.10
3	46.38	3	46.08	3	46.42
4	45.63	4	45.45	4	45.73
5	46.45	5	46.39	5	46.51
6	46.33	6	46.26	6	46.52
7	46.06	7	46.01	7	46.31
8	46.23	8	46.21	8	46.42
Total Power (dBm)	55.21	Total Power (dBm)	55.07	Total Power (dBm)	55.30
Total Power (W)	332.17	Total Power (W)	321.21	Total Power (W)	338.90

1 Carrier, 50MHz BW, Max Value Plot

Test Model 3.1a, Modulation 256QAM, Channel Frequency 3955MHz, TX6

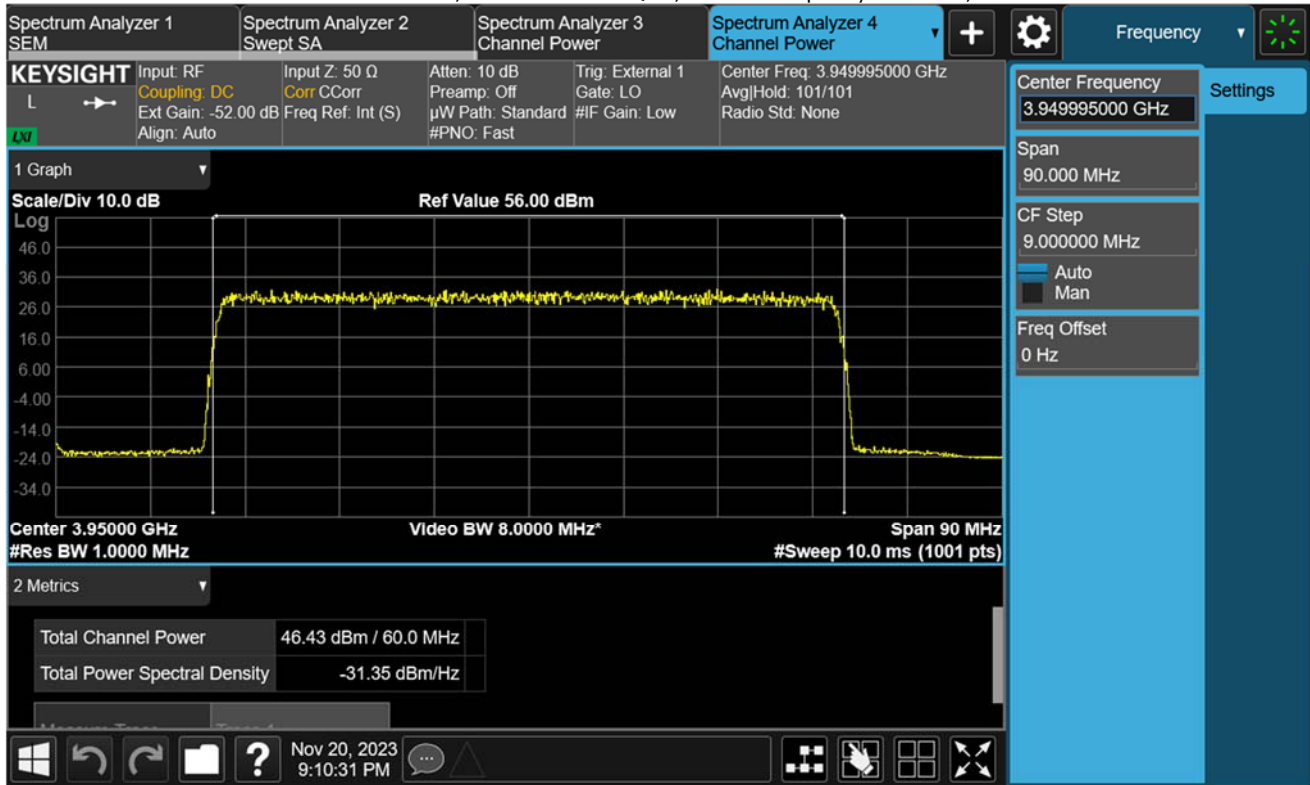


1 Carrier, 60MHz BW

Channel Power - Signal BW 60MHz					
Test Model 3.1 Modulation 64QAM Channel Frequency 3730MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3800MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3950MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	46.07	1	46.00	1	46.18
2	46.02	2	45.91	2	46.18
3	46.16	3	46.13	3	46.37
4	45.56	4	45.58	4	45.54
5	46.29	5	46.35	5	46.43
6	46.17	6	46.23	6	46.41
7	45.88	7	45.99	7	46.16
8	46.12	8	46.17	8	46.28
Total Power (dBm)	55.07	Total Power (dBm)	55.08	Total Power (dBm)	55.23
Total Power (W)	321.34	Total Power (W)	322.21	Total Power (W)	333.62

1 Carrier, 60MHz BW, Max Value Plot

Test Model 3.1a, Modulation 2564QAM, Channel Frequency 3950MHz, TX5

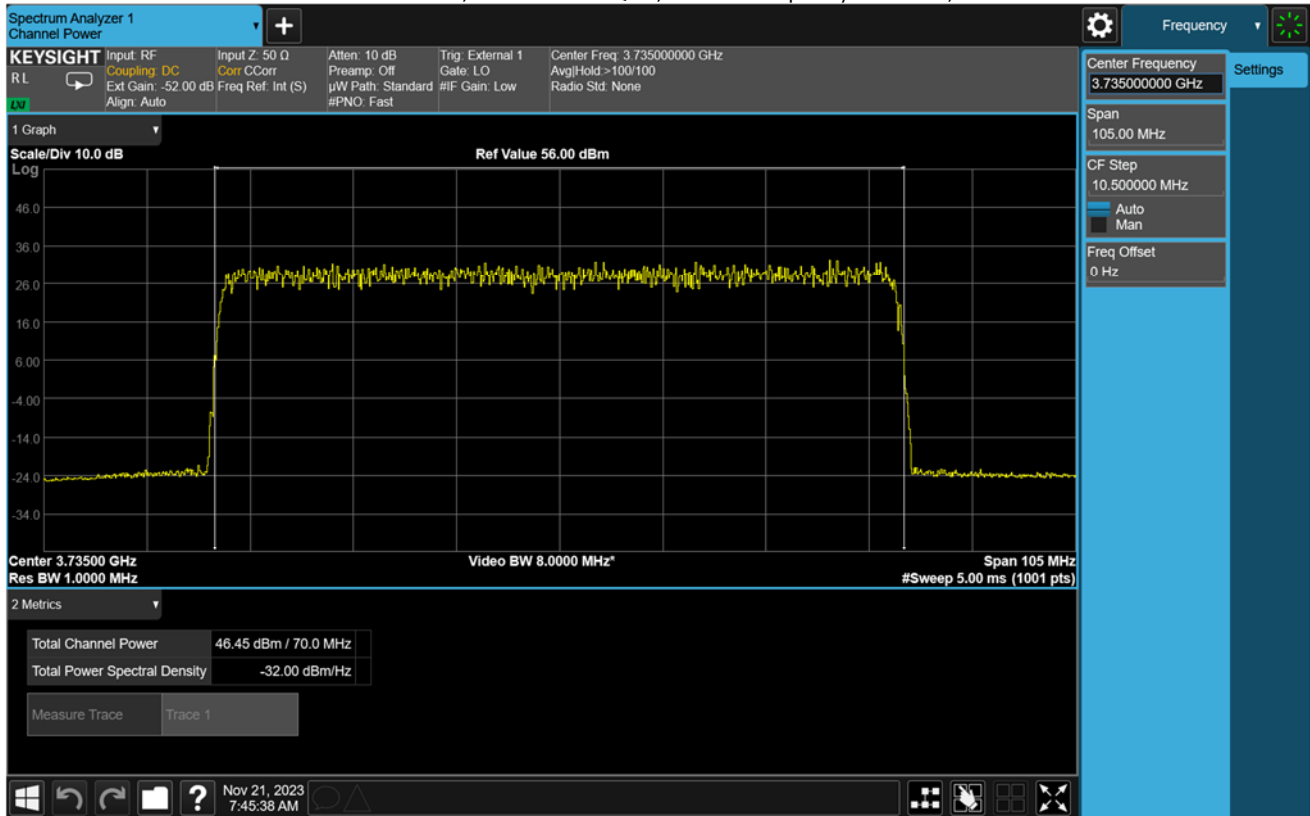


1 Carrier, 70MHz BW

Channel Power - Signal BW 70MHz					
Test Model 3.1 Modulation 64QAM Channel Frequency 3735MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3800MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3945MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	46.03	1	45.99	1	46.14
2	46.01	2	45.93	2	46.14
3	46.22	3	46.19	3	46.33
4	45.52	4	45.54	4	45.42
5	46.45	5	46.36	5	46.38
6	46.33	6	46.23	6	46.36
7	46.07	7	46.01	7	46.09
8	46.27	8	46.18	8	46.23
Total Power (dBm)	55.15	Total Power (dBm)	55.09	Total Power (dBm)	55.18
Total Power (W)	327.45	Total Power (W)	322.92	Total Power (W)	329.34

1 Carrier, 70MHz BW, Max Value Plot

Test Model 3.1, Modulation 64QAM, Channel Frequency 3735MHz, TX5



1 Carrier, 80MHz BW

Channel Power - Signal BW 80MHz					
Test Model 3.1 Modulation 64QAM Channel Frequency 3740MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3800MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3939MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	46.11	1	46.08	1	46.02
2	46.08	2	46.01	2	46.04
3	46.29	3	46.25	3	46.27
4	45.52	4	45.46	4	45.53
5	46.39	5	46.41	5	46.41
6	46.28	6	46.28	6	46.38
7	46.02	7	46.06	7	46.12
8	46.20	8	46.23	8	46.24
Total Power (dBm)	55.15	Total Power (dBm)	55.14	Total Power (dBm)	55.16
Total Power (W)	327.28	Total Power (W)	326.33	Total Power (W)	328.47

1 Carrier, 80MHz BW, Max Value Plot

Test Model 3.2, Modulation QPSK/16QAM, Channel Frequency 3800MHz, TX5

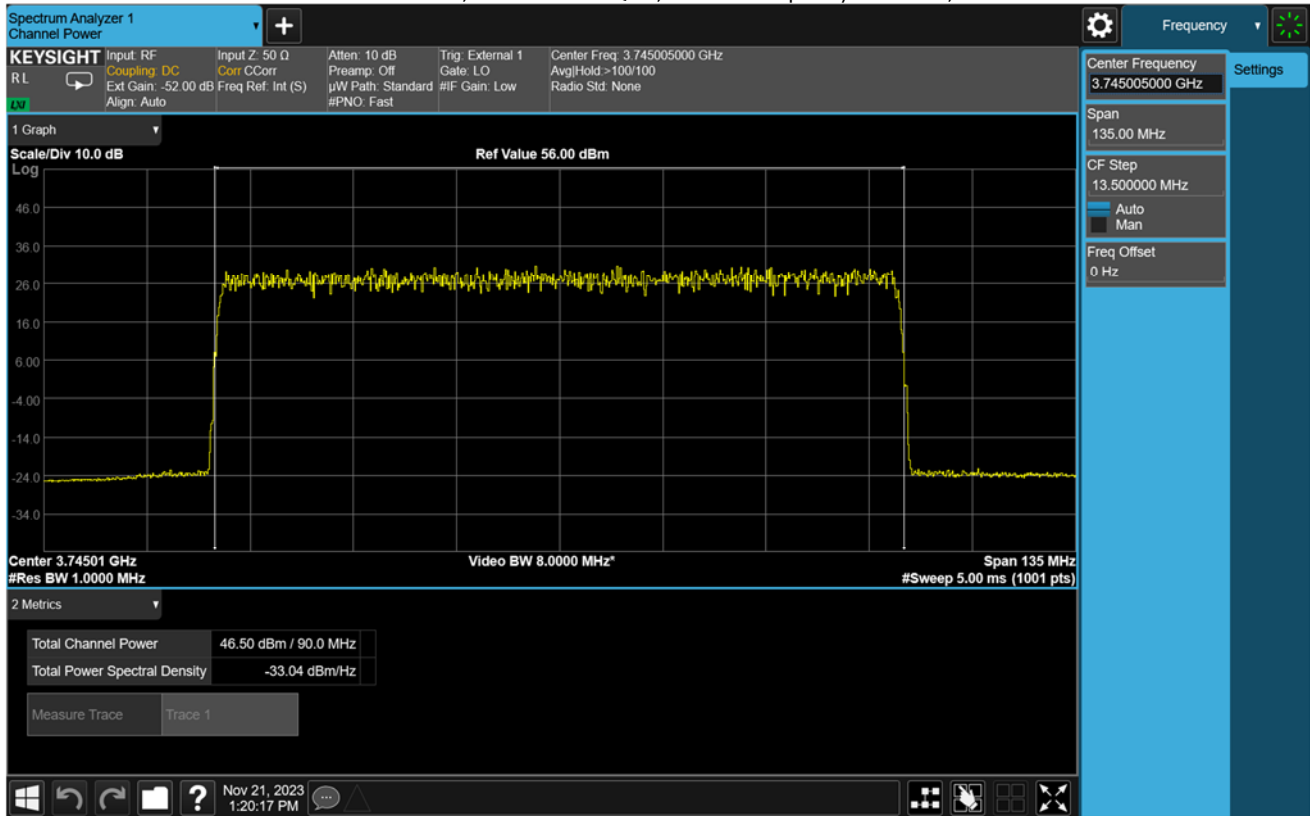


1 Carrier, 90MHz BW

Channel Power - Signal BW 90MHz					
Test Model 3.1 Modulation 64QAM Channel Frequency 3745MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3800MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3935MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	45.91	1	45.97	1	46.09
2	45.92	2	45.90	2	46.13
3	46.13	3	46.16	3	46.36
4	45.68	4	45.47	4	45.62
5	46.50	5	46.47	5	46.50
6	46.41	6	46.38	6	46.49
7	46.16	7	46.16	7	46.23
8	46.33	8	46.34	8	46.35
Total Power (dBm)	55.17	Total Power (dBm)	55.15	Total Power (dBm)	55.26
Total Power (W)	328.76	Total Power (W)	327.15	Total Power (W)	335.75

1 Carrier, 90MHz BW, Max Value Plot

Test Model 3.1, Modulation 64QAM, Channel Frequency 3745MHz, TX5

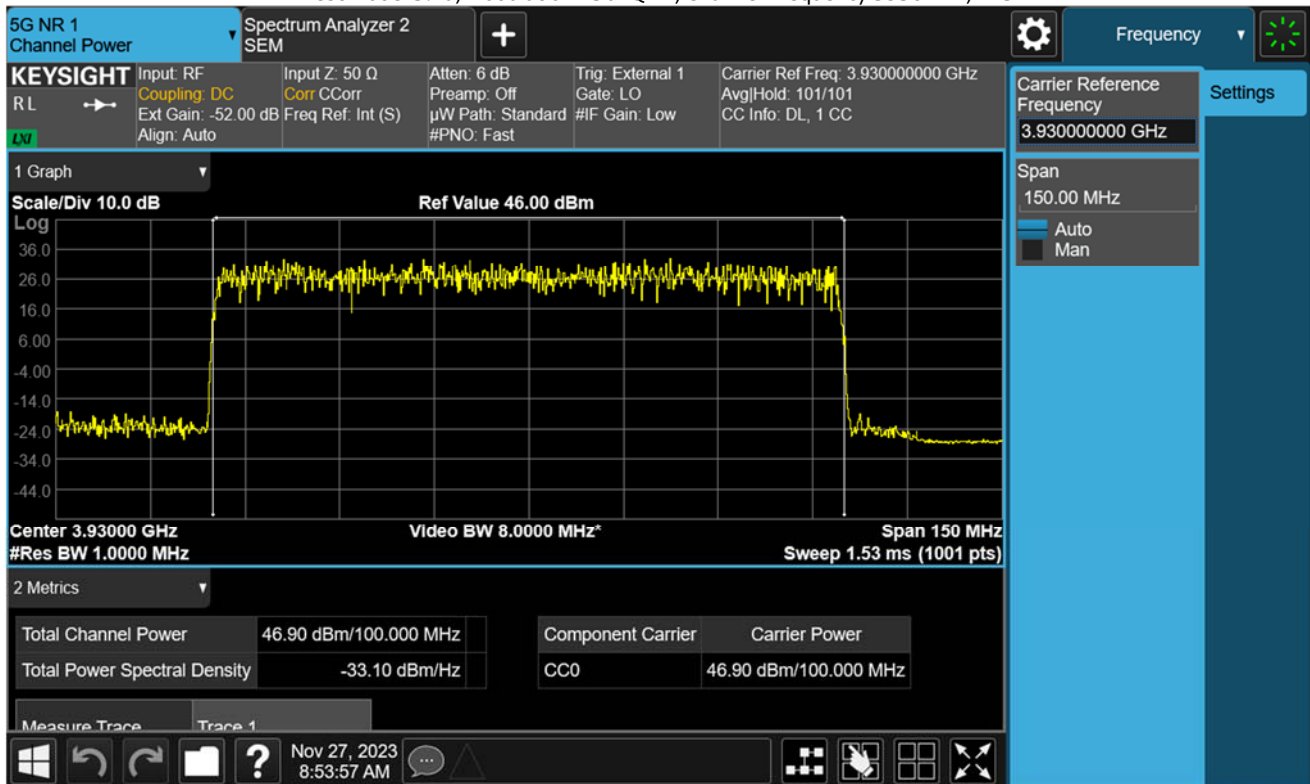


1 Carrier, 100MHz BW

Channel Power - Signal BW 100MHz					
Test Model 3.1 Modulation 64QAM Channel Frequency 3750MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3800MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3930MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	46.29	1	46.26	1	46.70
2	46.32	2	46.21	2	46.70
3	46.59	3	46.41	3	46.90
4	45.97	4	45.64	4	45.99
5	46.89	5	46.63	5	46.88
6	46.78	6	46.49	6	46.87
7	46.54	7	46.28	7	46.59
8	46.73	8	46.46	8	46.74
Total Power (dBm)	55.55	Total Power (dBm)	55.34	Total Power (dBm)	55.71
Total Power (W)	359.24	Total Power (W)	341.76	Total Power (W)	372.45

1 Carrier, 100MHz BW, Max Value Plot

Test Model 3.1a, Modulation 256QAM, Channel Frequency 3930MHz, TX3

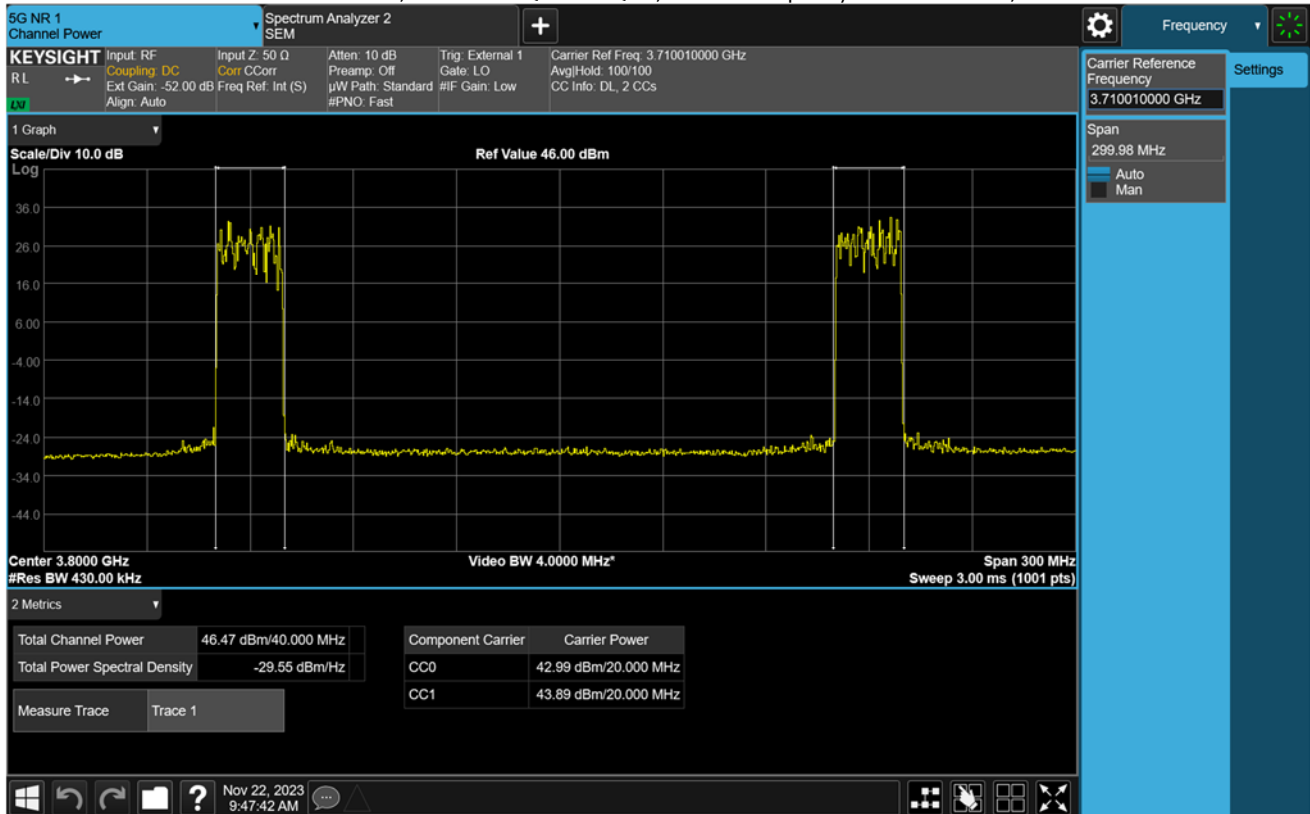


2 Carrier, 20+20MHz BW

Channel Power - Signal BW 20+20MHz					
Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3710+3730MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3710+3890MHz		Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3790+3810MHz	
TX Port	(dBm)	TX Port	(dBm)	TX Port	(dBm)
1	45.14	1	46.25	1	45.15
2	45.11	2	46.19	2	45.09
3	45.07	3	46.47	3	45.04
4	45.16	4	45.78	4	45.18
5	45.25	5	46.12	5	45.41
6	45.14	6	46.09	6	45.28
7	45.10	7	45.89	7	45.27
8	45.20	8	46.02	8	45.36
Total Power (dBm)	54.18	Total Power (dBm)	55.14	Total Power (dBm)	54.26
Total Power (W)	261.67	Total Power (W)	326.35	Total Power (W)	266.38

2 Carrier, 20+20MHz BW, Max Value Plot

Test Model 3.2, Modulation QPSK/16QAM, Channel Frequency 3710+3890MHz, TX3

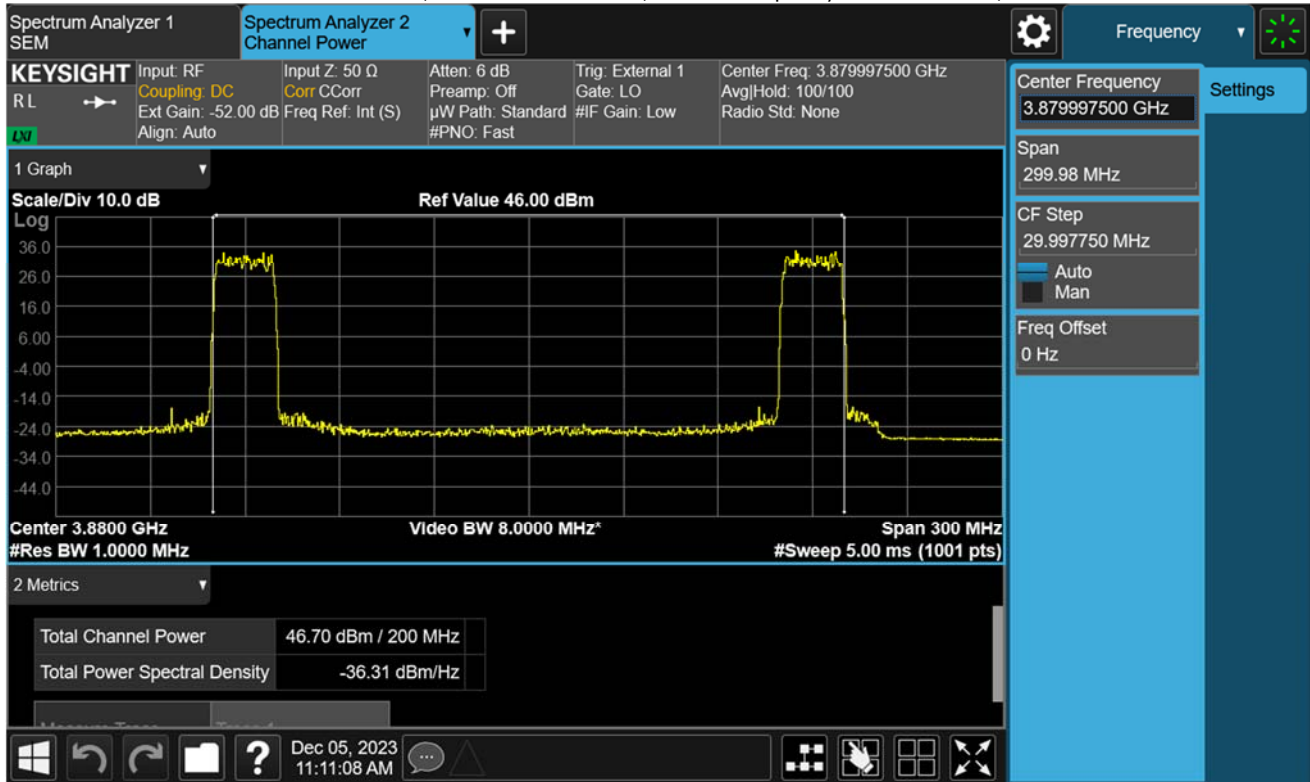


2 Carrier, 20+20MHz BW

Channel Power - Signal BW 20+20MHz			
Test Model 3.1a Modulation 256QAM Channel Frequency 3790+3970MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3950+3970MHz	
TX Port	(dBm)	TX Port	(dBm)
1	45.89	1	45.51
2	45.83	2	45.45
3	46.08	3	45.41
4	45.54	4	45.42
5	46.70	5	45.29
6	46.60	6	45.28
7	46.37	7	45.26
8	46.56	8	45.36
Total Power (dBm)	55.25	Total Power (dBm)	54.40
Total Power (W)	334.58	Total Power (W)	275.69

2 Carrier, 20+20MHz BW, Max Value Plot

Test Model 3.1a, Modulation 256QAM, Channel Frequency 3790+3970MHz, TX5

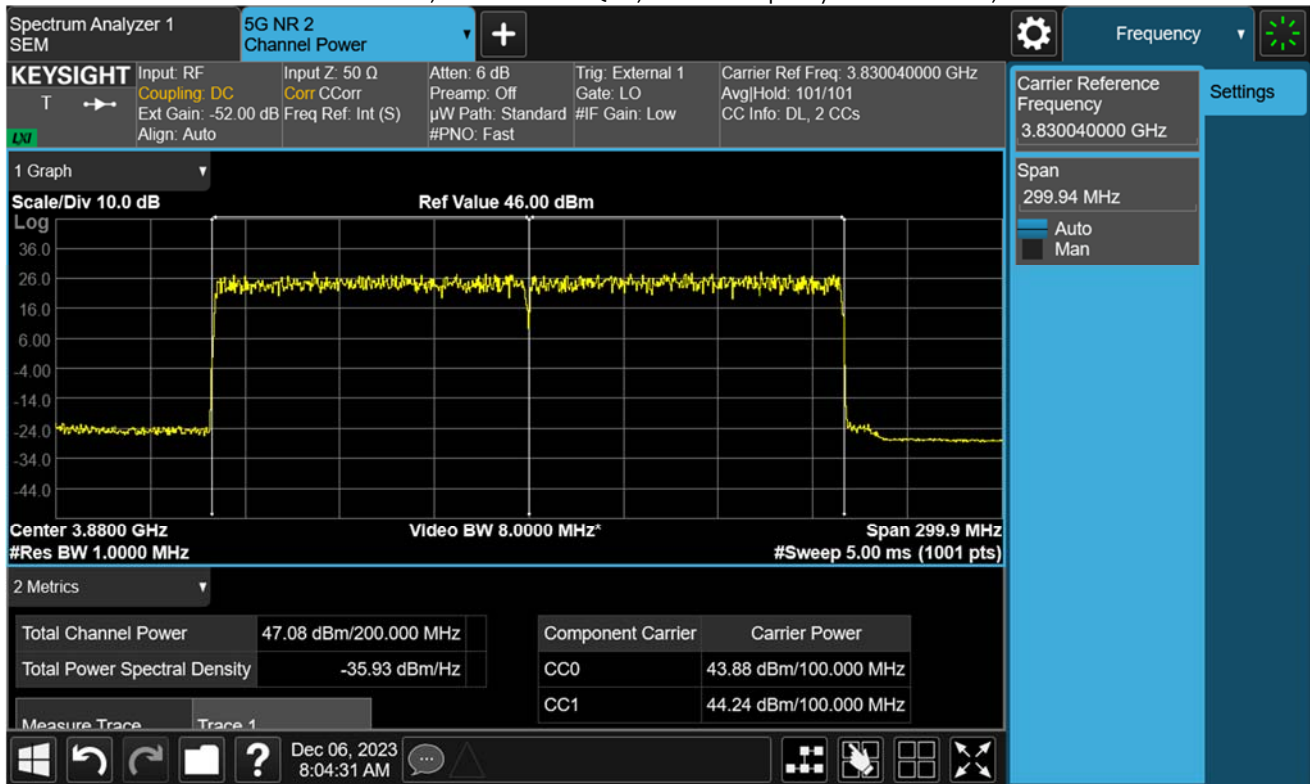


2 Carrier, 100+100MHz BW

Channel Power - Signal BW 100+100MHz			
Test Model 3.2 Modulation QPSK/16QAM Channel Frequency 3750+3850MHz		Test Model 3.1a Modulation 256QAM Channel Frequency 3830+3930MHz	
TX Port	(dBm)	TX Port	(dBm)
1	45.83	1	46.52
2	45.79	2	46.94
3	45.98	3	46.90
4	45.46	4	46.70
5	46.22	5	47.08
6	46.11	6	47.07
7	45.86	7	46.27
8	46.07	8	46.38
Total Power (dBm)	54.95	Total Power (dBm)	55.77
Total Power (W)	312.71	Total Power (W)	377.86

2 Carrier, 100+100MHz BW, Max Value Plot

Test Model 3.1a, Modulation 256QAM, Channel Frequency 3830+3930MHz, TX5



2.2 Peak-to-Average Power Ratio (PAPR)

The Peak-to-Average Power Ratio (PAPR) was evaluated per KDB 971168 for Single and Multiple Carriers. The PAPR values of all carriers measured are below 13dB.

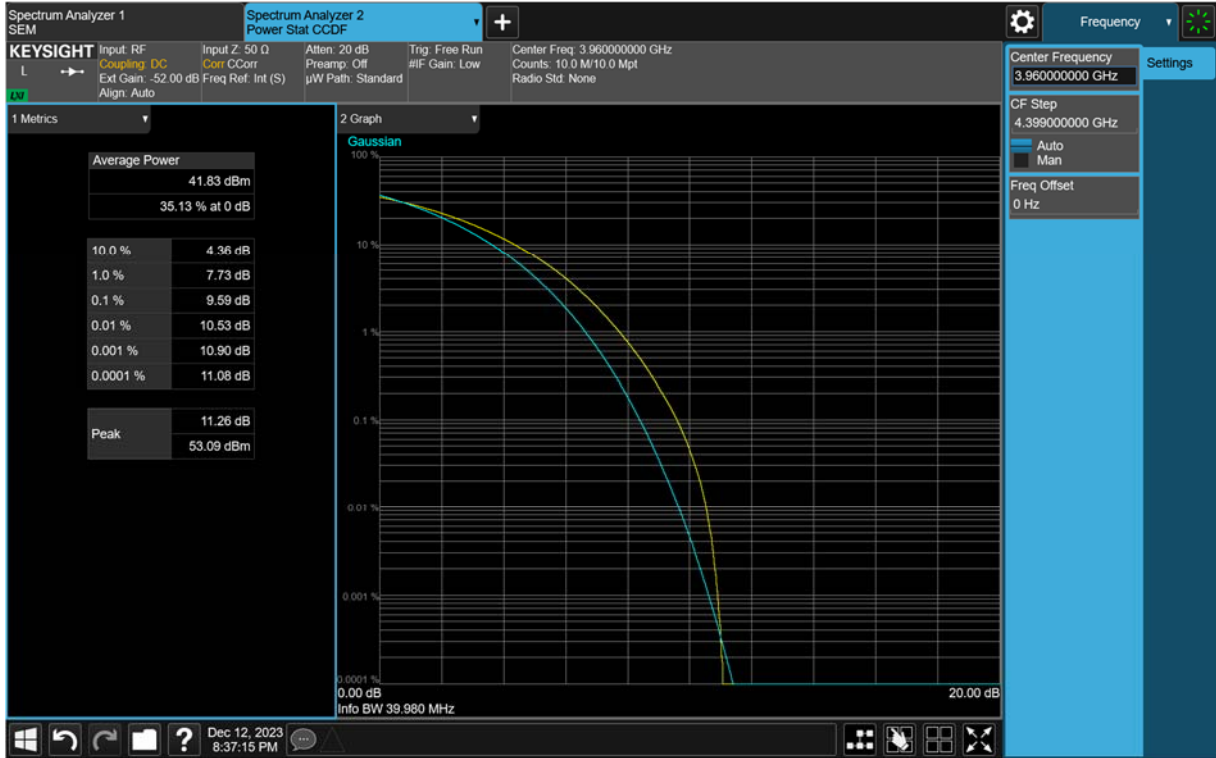
Tabular Data – PAPR

# of Carrier	Signal BW MHz	Modulation	TX Port	Channel Frequency MHz	PAR at 0.1% Limit - 13 dB
1	20	64QAM	3	3710	8.72
1	20	QPSK/16QAM	3	3800	8.71
1	20	256QAM	3	3970	8.77
1	30	64QAM	5	3715	8.44
1	30	QPSK/16QAM	5	3800	8.60
1	30	256QAM	4	3965	8.59
1	40	64QAM	5	3720	8.00
1	40	QPSK/16QAM	5	3800	8.09
1	40	64QAM	5	3960	8.11
1	50	64QAM	5	3725	8.18
1	50	QPSK/16QAM	5	3800	8.30
1	50	256QAM	5	3955	8.27
1	60	64QAM	5	3730	8.27
1	60	64QAM	5	3800	8.30
1	60	256QAM	5	3950	8.35
1	70	64QAM	5	3735	8.43
1	70	QPSK/16QAM	5	3800	8.41
1	70	256QAM	5	3945	8.40
1	80	64QAM	5	3740	8.49
1	80	QPSK/16QAM	5	3800	8.42
1	80	256QAM	5	3940	8.46
1	90	64QAM	5	3745	8.55
1	90	QPSK/16QAM	5	3800	8.46
1	90	256QAM	5	3935	8.61
1	100	64QAM	5	3750	8.56
1	100	QPSK/16QAM	5	3800	8.54
1	100	256QAM	5	3930	8.54
2	20+20	QPSK/16QAM	5	3710+3730	8.19
2	20+20	QPSK/16QAM	5	3710+3890	8.45+8.60
2	20+20	QPSK/16QAM	5	3790+3810	8.52
2	20+20	256QAM	5	3790+3970	8.50+8.38
2	20+20	256QAM	1	3950+3970	9.59
2	100+100	QPSK/16QAM	5	3750+3850	8.67
2	100+100	256QAM	5	3830+3930	8.66

2.2.1 Peak-to-Average Power Ratio Plots

NOTE: Only the plot with the minimum margin measured is given in this report. The full suite of raw data resides at the MH, New Jersey location.

# of Carriers	Signal BW MHz	Test Model	Modulation	TX Port	Channel Frequency MHz
2	20+20	3.1a	256QAM	1	3950+3970



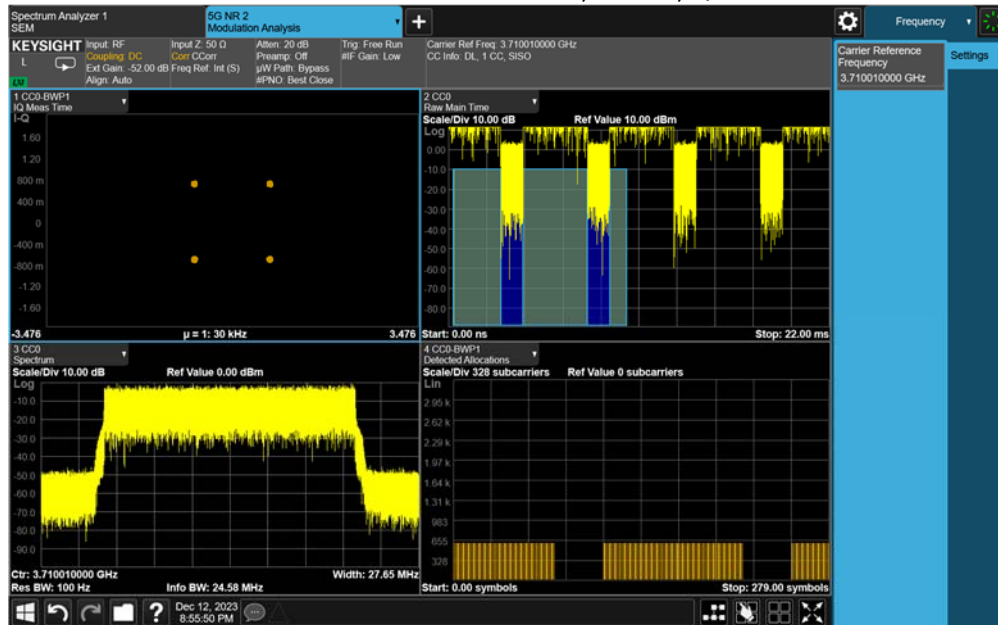
3. FCC Section 2.1047 - Modulation Characteristics

3.1 Modulation Characteristics

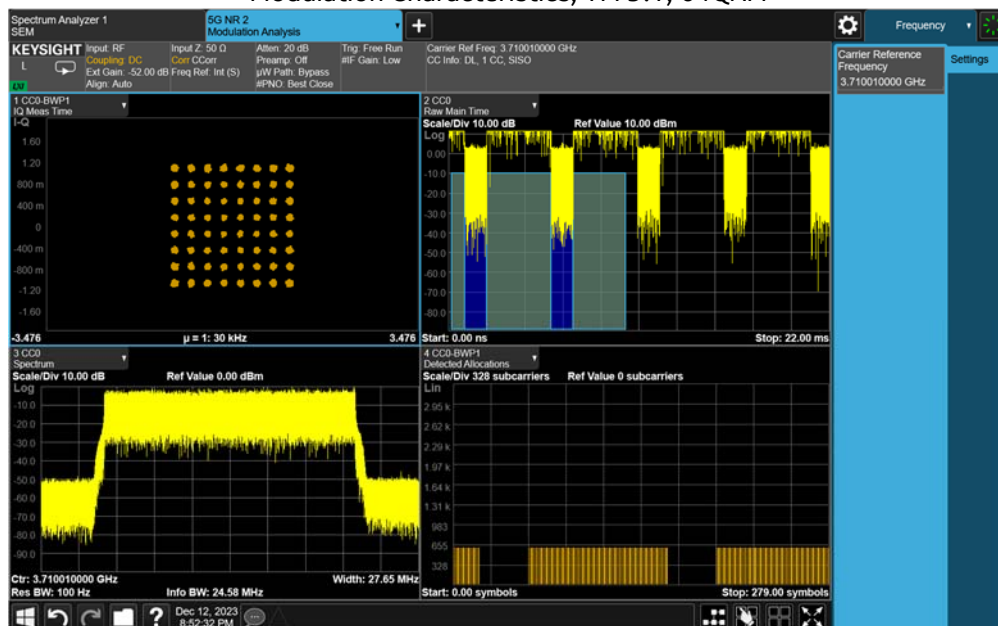
The RF signal at the antenna port was demodulated and verified for correctness of the modulation signal used before each test was performed.

3.1.1 Modulation Characteristics – Plots

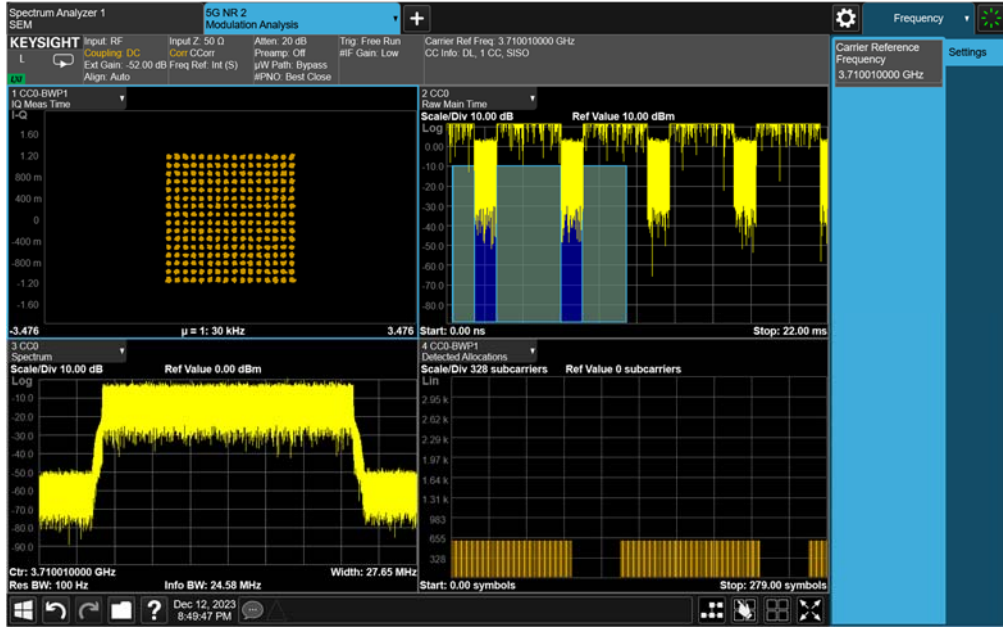
Modulation Characteristics, TM 1.1, QPSK



Modulation Characteristics, TM 3.1, 64QAM



Modulation Characteristics, TM 3.1a, 256QAM



Modulation Characteristics TM 3.2, QPSK/16QAM

