Global Product Compliance Laboratory
600-700 Mountain Avenue
Room 5B-108
Murray Hill, New Jersey 07974-0636 USA

TESTING
NVLAP LAB CODE: 100275-0

Title 47 Code of Federal Regulations Test Report

Regulation:
Title 47 CFR FCC Part 96

Client:
NOKIA SOLUTIONS AND NETWORKS, OY

Product Evaluated:
AirScale Indoor pico RRH 4T4R n48 AWPQY/Z

Report Number:
TR-2022-0137-FCC96

Date Issued:
January 23, 2023

Table of Contents

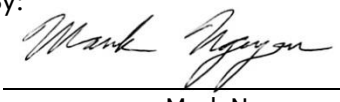
Revisions

Date	Revision	Section	Change
1/23/2023	0		Initial Release

Nokia Global Product Compliance Laboratories is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP®) for specific services, listed on the Scope of Accreditation, for: Electromagnetic Compatibility and Telecommunications. This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009). NVLAP LAB CODE: 100275-0.

Nokia Global Product Compliance Laboratory represents to the client that the laboratory's accreditation or test reports in no way constitutes or implies product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. government.

Prepared By:

Signed:  1/23/2023

Mark Nguyen
Compliance Engineer
NVLAP Signatory
mark.nguyen@nokia-bell-labs.com

Approved By:

Signed:  1/23/2023

Raymond Johnson
Technical Manager
NVLAP Signatory
ray.johnson@nokia-bell-labs.com

Reviewed By:

Signed:  1/23/2023

Steve Gordon
EMC Engineer
NVLAP Signatory
steve.gordon@nokia-bell-labs.com

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):	AirScale Indoor pico RRH 4T4R n48 AWPQY/Z
Serial Number:	Refer to Section 1.3.2
Hardware Version:	Refer to Section 1.3.2
Software Version:	SBTS23R1
Frequency Range:	3550 - 3700 MHz
GPCL Project Number:	2022-0137
Manufacturer:	NOKIA SOLUTIONS AND NETWORKS OY KARAKAARI 7, FI-02610 ESPOO FINLAND
Applicant:	Nokia Solutions and Networks, OY 2000 Lucent Lane Naperville, Illinois 60563
Test Requirement(s):	Title 47 CFR Part96
Test Standards:	Refer to Section 1.5.1
Measurement Procedure(s):	Refer to Section 1.5.2
Test Date(s):	10/28/2022 – 1/13/2022 (Radio) 11/22/2022 – 11/28/2022 (Radiated Emission) 11/18/2022 – 12/1/2022 (Frequency Stability)
Test Performed By:	Nokia Global Product Compliance Laboratory 600-700 Mountain Ave. P.O. Box 636 Murray Hill, NJ 07974-0636
Product Engineer(s):	Ron Remy
Lead Engineer:	Steve Gordon
Test Engineer (s):	Norman Albrecht, Chris Polanco, Hussain Saifnijat, Mike Soli, Jaideep Yadav
Test Results: The EUT, *as tested* 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 AirScale Indoor pico RRH 4T4R n48 AWPQY/Z, hereinafter referred to as the Equipment Under Test (EUT).

The Nokia AWPQY/Z is a 4 port radio head that transmits 0.25 Watts per port over the B48/n48 spectrum (3550 – 3700 MHz). This product supports LTE 10MHz, 20 MHz single carriers, and 10+10 MHz dual carrier. It also supports 5G-NR 20, 30, 40, 50, 60, 70, 80, 90, 100 MHz single carriers and 20+100 MHz & 50+100 MHz dual carrier. The product utilizes QPSK, 16QAM, 64QAM and 256QAM modulation formats.

1.2 Purpose and Scope

This document is to provide the testing data required for qualifying the EUT in compliance with FCC Part 96 measured in accordance with the procedures set out in Section 2.1033 (c) (14) of the Rules.

FCC testing for Part 96 certification was performed on two models (AWPQY and AWPQZ). This report will demonstrate compliance to Category A power requirements with integral and optional external antenna specified by the manufacturer for the product.

1.3 EUT Details

1.3.1 Specifications

Standard	3GPP / WINNF / CBRS Alliance / FCC Part 96 FCC (Category A CBSD)
Band	3GPP band B48/n48
Spectrum Range	3550–3700MHz
IBW	150MHz
OBW	150MHz
Carriers	HW ready to support up to 7 non-contiguous LTE+NR carriers (or as many as possible) with 4T4R antenna config. Actual support according to SW availability
Carrier Bandwidths	10/20/10+10 MHz LTE carrier 10/20/30/40/50/60/70/80/90 /100/20+100/50+100 MHz 5G-NR carrier
RF Chain	4T4R
RF Power	50 to 250mW per path
Total TX Power	1W
Interface (FH/BH)	1x SFP+ /SFP28 Port for 25GE/10GE eCPRI, future SW support for 24.3/10.1Gbps CPRI 1x RJ45 Port for 10GE eCPRI and power input
Input Power	PoE, 43-57V DC 1. input from hybrid fiber cable 2. input via external AC adapter 3. input from Ethernet cable
Power Consumption	71W max
Antenna	Configuration: 4 Tx/ 4 Rx AWPQY: Integrated omni AWPQZ: External antenna (SMA female)
MIMO layers	4x4DL MIMO
Modulation Schemes	QPSK 16QAM 64QAM 256QAM

1.3.2 Photographs

Serial Number

AWPQZ

1.4 Test Requirements

Each required measurement is listed below:

47 CFR FCC Sections	Description of Tests	Test Required
2.1046, 96.41 (b) 96.41(g)	RF Power Output (b) Power Limits, EIRP, PSD (g) Peak-to-Average Power Ratio	Yes
2.1047, 96.41(a)	Modulation Characteristics	Yes
2.1049, 96.41(e)(2)(3)	(a) Occupied Bandwidth (b) Out-of-Band Emissions	Yes
2.1051, 96.41(e)	Spurious Emissions at Antenna Terminals	Yes
2.1053, 96.41(e)(2)(3)	Field Strength of Spurious Radiation	Yes
2.1055, 96.41(e)(2)(3)	Measurement of 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 96.
- KDB 940660 D01 Certification And Test Procedures For Citizens Broadband Radio Service Devices Authorized Under Part 96, v03, Oct 29, 2020
- 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

1.6 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, (*e.g.*, ANSI C63.4, CISPR 11, 14, 22, *etc.*, 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 100 Hz 1 MHz 1MHz	9 kHz to 20 MHz 20 MHz to 1 GHz 1 GHz to 10 GHz 10 GHz to 40 GHz:	1.78 dB
RF Power	10 Hz to 20 MHz	50 MHz to 18 GHz	0.5 dB

1.7 Executive Summary

Requirement 47 CFR FCC Parts 2 and 96	Description of Tests	Result
2.1046, 96.41 (b) 96.41(g)	RF Power Output (b) Power Limits, EIRP, PSD (g) Peak-to-Average Power Ratio	COMPLIES
2.1047, 96.41(a)	Modulation Characteristics	COMPLIES
2.1049, 96.41(e)(2)(3)	(a) Occupied Bandwidth (b) Out-of-Band Emissions	COMPLIES
2.1051, 96.41(e)	Spurious Emissions at Antenna Terminals	COMPLIES
2.1053, 96.41(e)	Field Strength of Spurious Radiation	COMPLIES
2.1055	Measurement of Frequency Stability	COMPLIES

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

1.8 Test Configurations

Test Setup for all Antenna Port Measurements

2. FCC Section 2.1046 - RF Power Output and Power Spectral Density

2.1 RF Power Output

2.1.1 Limits

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

For 5G-NR transmit carrier operation, the AirScale Indoor pico RRH 4T4R n48 AWPQY/Z, is specified to provide a maximum power output of 0.25W/24 dBm per transmit port for a sum total of 1 Watts /30 dBm per transmit module.

The power is under digital control. The product is designed to operate under Part 96 rules for Band 48.

Under Part 96 the product is limited to the Category A CBSD maximum EIRP of 30 dBm/10 MHz with a PSD of 20 dBm/MHz.

This unit can operate with an integrated antenna with an average peak gain of 5.50 dBi, or with the following externally mounted Omni antennas:
Antenna gains are Amphenol (5 dBi), Spinner (4.5 dBi), Commscope (5.2 dBi), and Huber Suhner (4.5 dBi).

The EIRP data provided for the external antenna is the worst-case data based on the Commscope external antenna with a gain of 5.2 dBi.

If the product is installed with other antenna(s), then per FCC Rules the RF exposure compliance shall be addressed at the time of licensing, as required by the responsible FCC Bureau(s), including antenna co-location requirements of Part 1.1307(b)(3).

2.1.2 Results

Power measurements of the TDD transmit signal were conducted with an MXA Signal analyzer per KDB 971168 D01 and ANSI C63.26. The applied signal from the **AirScale Indoor pico RRH 4T4R n48 AWPQY/Z**, met the recommended characteristics as defined in 3GPP TS 36.141 V16.9.0 (2021-04) Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) conformance testing (Release 14). The Channel power was measured when the product was set to provide the maximum rated power at the antenna transmitting terminals. The output power of the EUT was measured per ANSI C63.26 methods and procedures and the Channel Power Measurement feature of the MXA Analyzer.

The measured output power at antenna ports was documented in the table below. The Maximum Average RF Power Values are bolded in each configuration.

2.1.2.1 Channel RF Power 5G-NR Results

Table 2.1.1

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3560	20	20.03
3.1	64QAM	1	3560	20	**20.21**
3.1	64QAM	2	3560	20	19.95
3.1	64QAM	3	3560	20	20.22
3.2	QPSK/16QAM	0	3625	20	**20.31**
3.2	QPSK/16QAM	1	3625	20	20.28
3.2	QPSK/16QAM	2	3625	20	19.69
3.2	QPSK/16QAM	3	3625	20	19.84
3.1a	256QAM	0	3690	20	20.22
3.1a	256QAM	1	3690	20	**20.32**
3.1a	256QAM	2	3690	20	19.88
3.1a	256QAM	3	3690	20	20.15

Table 2.1.2

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3565	30	21.56
3.1	64QAM	1	3565	30	**21.63**
3.1	64QAM	2	3565	30	21.44
3.1	64QAM	3	3565	30	21.71
3.2	QPSK/16QAM	0	3625	30	**22.79**
3.2	QPSK/16QAM	1	3625	30	22.79
3.2	QPSK/16QAM	2	3625	30	22.22
3.2	QPSK/16QAM	3	3625	30	22.37
3.1a	256QAM	0	3685	30	22.69
3.1a	256QAM	1	3685	30	**22.75**
3.1a	256QAM	2	3685	30	22.33
3.1a	256QAM	3	3685	30	22.40

Table 2.1.3

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3570	40	**22.75**
3.1	64QAM	1	3570	40	22.74
3.1	64QAM	2	3570	40	22.65
3.1	64QAM	3	3570	40	22.97
3.2	QPSK/16QAM	0	3625	40	22.99
3.2	QPSK/16QAM	1	3625	40	**23.03**
3.2	QPSK/16QAM	2	3625	40	22.49
3.2	QPSK/16QAM	3	3625	40	22.64
3.1a	256QAM	0	3680	40	22.88

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1a	256QAM	1	3680	40	**23.02**
3.1a	256QAM	2	3680	40	22.60
3.1a	256QAM	3	3680	40	22.54

Table 2.1.4

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3575	50	**24.00**
3.1	64QAM	1	3575	50	23.88
3.1	64QAM	2	3575	50	23.75
3.1	64QAM	3	3575	50	23.81
3.2	QPSK/16QAM	0	3625	50	23.68
3.2	QPSK/16QAM	1	3625	50	**24.09**
3.2	QPSK/16QAM	2	3625	50	23.87
3.2	QPSK/16QAM	3	3625	50	23.67
3.1a	256QAM	0	3675	50	**23.99**
3.1a	256QAM	1	3675	50	23.80
3.1a	256QAM	2	3675	50	23.72
3.1a	256QAM	3	3675	50	23.80

Table 2.1.5

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3580	60	23.99
3.1	64QAM	1	3580	60	**24.04**
3.1	64QAM	2	3580	60	23.81
3.1	64QAM	3	3580	60	23.89
3.2	QPSK/16QAM	0	3625	60	23.52
3.2	QPSK/16QAM	1	3625	60	**23.88**
3.2	QPSK/16QAM	2	3625	60	23.64
3.2	QPSK/16QAM	3	3625	60	23.49
3.1a	256QAM	0	3670	60	23.89
3.1a	256QAM	1	3670	60	**24.05**
3.1a	256QAM	2	3670	60	23.80
3.1a	256QAM	3	3670	60	23.84

Table 2.1.6

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3585	70	24.05
3.1	64QAM	1	3585	70	**24.11**
3.1	64QAM	2	3585	70	23.93
3.1	64QAM	3	3585	70	23.95
3.2	QPSK/16QAM	0	3625	70	23.81
3.2	QPSK/16QAM	1	3625	70	**24.09**
3.2	QPSK/16QAM	2	3625	70	23.86
3.2	QPSK/16QAM	3	3625	70	23.77
3.1a	256QAM	0	3665	70	23.98
3.1a	256QAM	1	3665	70	**24.18**
3.1a	256QAM	2	3665	70	23.93
3.1a	256QAM	3	3665	70	23.91

Table 2.1.7

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3590	80	23.90
3.1	64QAM	1	3590	80	**24.02**
3.1	64QAM	2	3590	80	23.83
3.1	64QAM	3	3590	80	23.79
3.2	QPSK/16QAM	0	3625	80	23.92
3.2	QPSK/16QAM	1	3625	80	**24.17**
3.2	QPSK/16QAM	2	3625	80	23.96
3.2	QPSK/16QAM	3	3625	80	23.87
3.1a	256QAM	0	3660	80	23.80
3.1a	256QAM	1	3660	80	**24.05**
3.1a	256QAM	2	3660	80	23.81
3.1a	256QAM	3	3660	80	23.70

Table 2.1.8

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3595	90	23.83
3.1	64QAM	1	3595	90	**23.98**
3.1	64QAM	2	3595	90	23.80
3.1	64QAM	3	3595	90	23.71
3.2	QPSK/16QAM	0	3625	90	23.97
3.2	QPSK/16QAM	1	3625	90	**24.17**
3.2	QPSK/16QAM	2	3625	90	23.96
3.2	QPSK/16QAM	3	3625	90	23.87
3.1a	256QAM	0	3655	90	23.92
3.1a	256QAM	1	3655	90	**24.21**
3.1a	256QAM	2	3655	90	23.98
3.1a	256QAM	3	3655	90	23.86

Table 2.1.9

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3600	100	23.92
3.1	64QAM	1	3600	100	**24.11**
3.1	64QAM	2	3600	100	23.54
3.1	64QAM	3	3600	100	23.78
3.2	QPSK/16QAM	0	3625	100	24.02
3.2	QPSK/16QAM	1	3625	100	**24.20**
3.2	QPSK/16QAM	2	3625	100	23.64
3.2	QPSK/16QAM	3	3625	100	23.91
3.1a	256QAM	0	3650	100	23.60
3.1a	256QAM	1	3650	100	**23.88**
3.1a	256QAM	2	3650	100	23.30
3.1a	256QAM	3	3650	100	23.55

Table 2.1.10

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3560+3650	20+100	24.04
3.1	64QAM	1	3560+3650	20+100	**24.17**
3.1	64QAM	2	3560+3650	20+100	23.95
3.1	64QAM	3	3560+3650	20+100	24.00

Table 2.1.11

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1a	256QAM	0	3575+3650	50+100	23.92
3.1a	256QAM	1	3575+3650	50+100	**24.00**
3.1a	256QAM	2	3575+3650	50+100	23.84
3.1a	256QAM	3	3575+3650	50+100	23.80

2.1.2.2 Channel RF Power LTE Results

Table 2.1.12

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3550	10	16.73
3.1	64QAM	1	3550	10	**16.99**
3.1	64QAM	2	3550	10	16.69
3.1	64QAM	3	3550	10	17.15
3.2	QPSK/16QAM	0	3625	10	**16.98**
3.2	QPSK/16QAM	1	3625	10	16.83
3.2	QPSK/16QAM	2	3625	10	16.23
3.2	QPSK/16QAM	3	3625	10	16.36
3.1a	256QAM	0	3695	10	16.74
3.1a	256QAM	1	3695	10	**17.06**
3.1a	256QAM	2	3695	10	16.61
3.1a	256QAM	3	3695	10	17.02

Table 2.1.13

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.2	QPSK/16QAM	0	3555+3565	10+10	19.87
3.2	QPSK/16QAM	1	3555+3565	10+10	**20.05**
3.2	QPSK/16QAM	2	3555+3565	10+10	19.78
3.2	QPSK/16QAM	3	3555+3565	10+10	20.07
3.2	QPSK/16QAM	0	3555+3695	10+10	20.00
3.2	QPSK/16QAM	1	3555+3695	10+10	**20.27**
3.2	QPSK/16QAM	2	3555+3695	10+10	19.63
3.2	QPSK/16QAM	3	3555+3695	10+10	20.12
3.1	64QAM	0	3620+3630	10+10	**20.16**
3.1	64QAM	1	3620+3630	10+10	20.12
3.1	64QAM	2	3620+3630	10+10	19.54
3.1	64QAM	3	3620+3630	10+10	19.69
3.1a	256QAM	0	3685+3695	10+10	20.01
3.1a	256QAM	1	3685+3695	10+10	**20.10**
3.1a	256QAM	2	3685+3695	10+10	19.66
3.1a	256QAM	3	3685+3695	10+10	19.91

Table 2.1.14

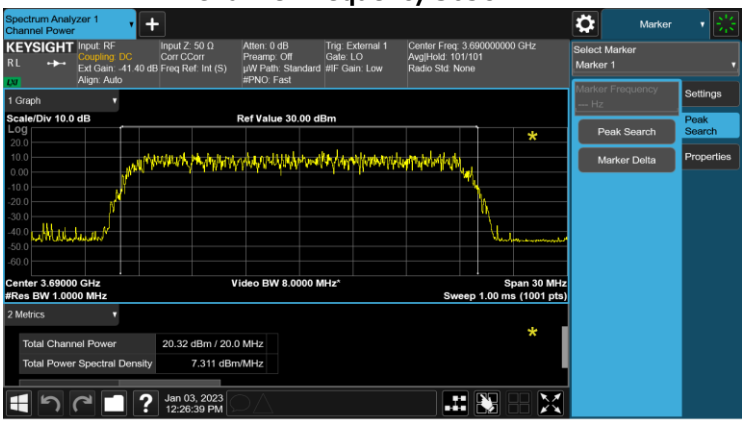
Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Channel Power dBm/BW
3.1	64QAM	0	3560	20	19.99
3.1	64QAM	1	3560	20	20.16
3.1	64QAM	2	3560	20	19.90
3.1	64QAM	3	3560	20	**20.19**
3.2	QPSK/16QAM	0	3625	20	**20.42**
3.2	QPSK/16QAM	1	3625	20	20.32
3.2	QPSK/16QAM	2	3625	20	19.75
3.2	QPSK/16QAM	3	3625	20	19.88
3.1a	256QAM	0	3690	20	20.23
3.1a	256QAM	1	3690	20	**20.30**
3.1a	256QAM	2	3690	20	19.88
3.1a	256QAM	3	3690	20	20.16

2.1.3 Maximum RF Conducted Output Power Plots

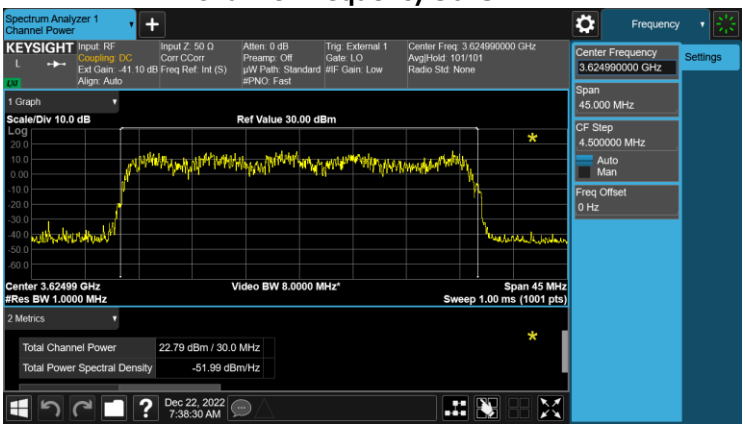
NOTE: Only a sample of the plots are used in this report. The full suite of raw data resides at the MH, New Jersey location.

2.1.3.1 5G-NR Plots

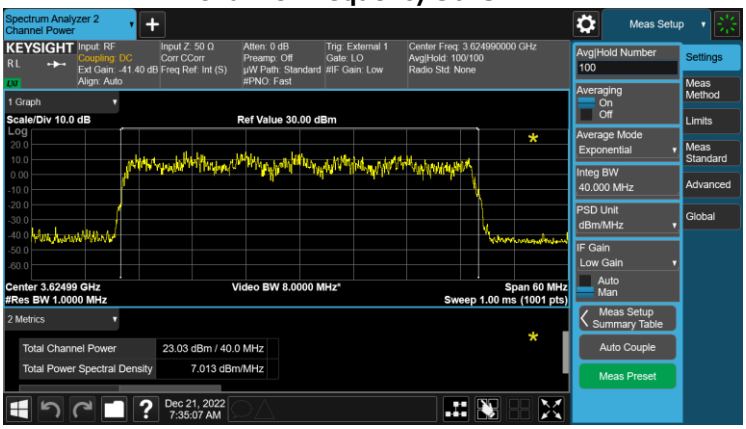
Signal BW 20MHz, TM 3.1a, 256QAM, TX1
Channel Frequency 3690MHz



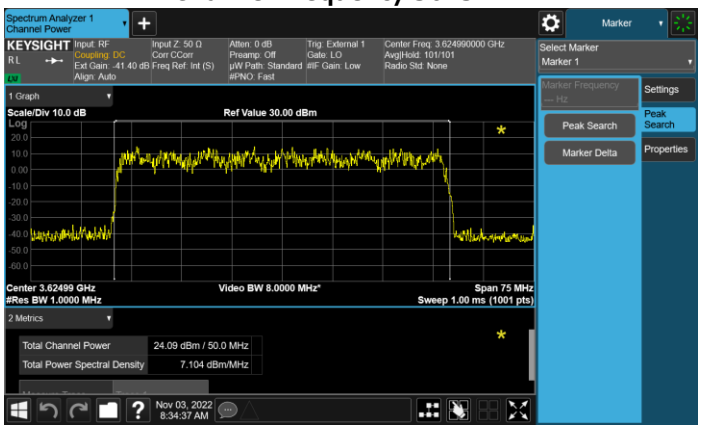
Signal BW 30MHz, TM 3.2, QPSK/16QAM, TX0
Channel Frequency 3625MHz



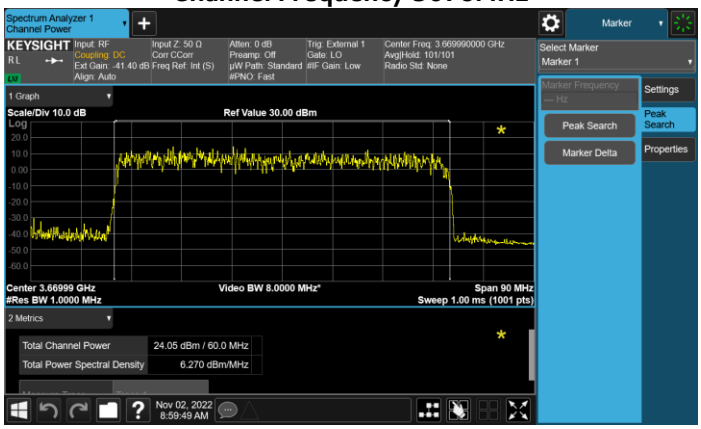
Signal BW 40MHz, TM 3.2, QPSK/16QAM, TX1
Channel Frequency 3625MHz



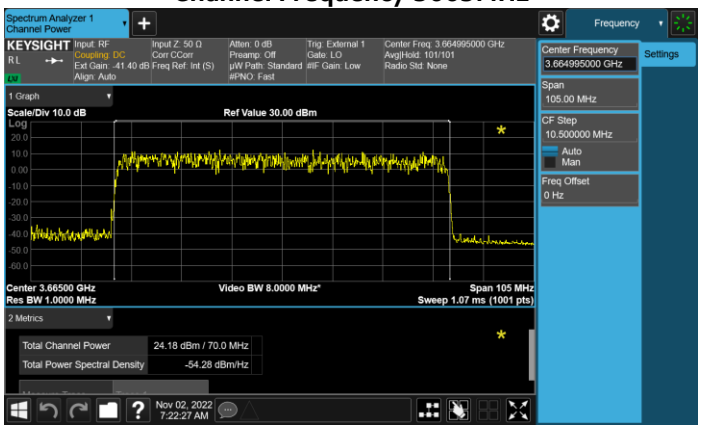
Signal BW 50MHz, TM 3.2, QPSK/16QAM, TX1
Channel Frequency 3625MHz



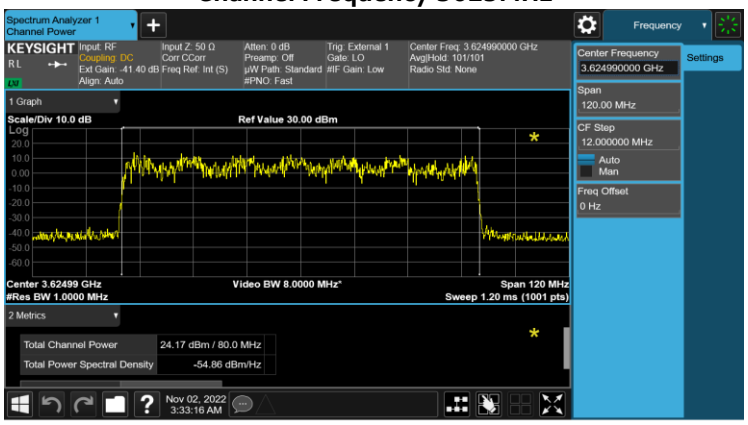
Signal BW 60MHz, TM 3.1a, 256QAM, TX1
Channel Frequency 3670MHz



Signal BW 70MHz, TM 3.1a, 256QAM, TX1
Channel Frequency 3665MHz

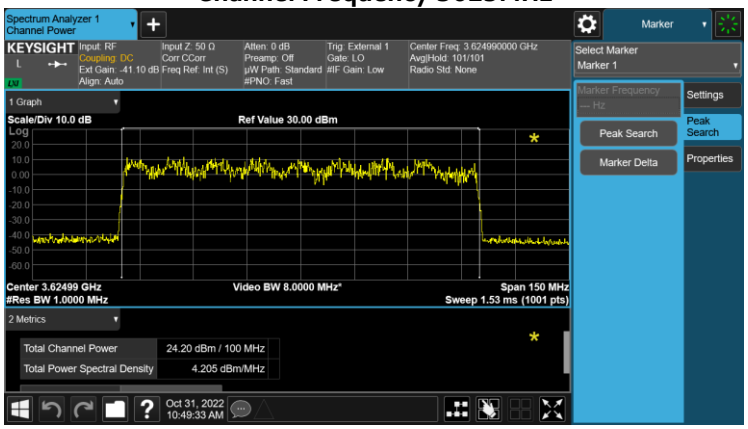


Signal BW 80MHz, TM 3.2, QPSK/16QAM, TX1
Channel Frequency 3625MHz

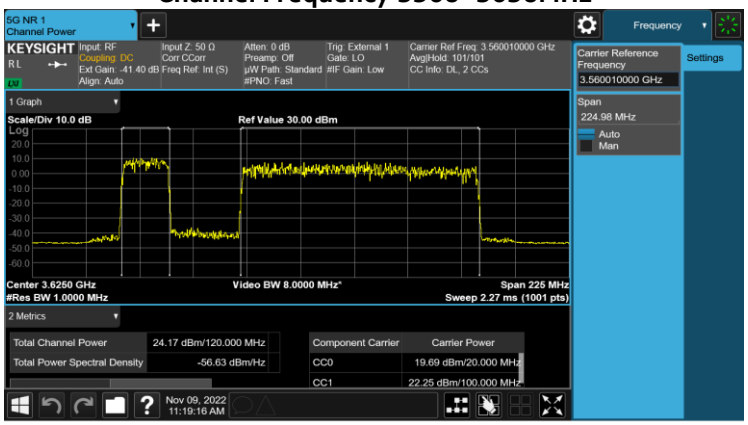


Signal BW 90MHz, TM 3.1a, 256QAM, TX1
Channel Frequency 3655MHz

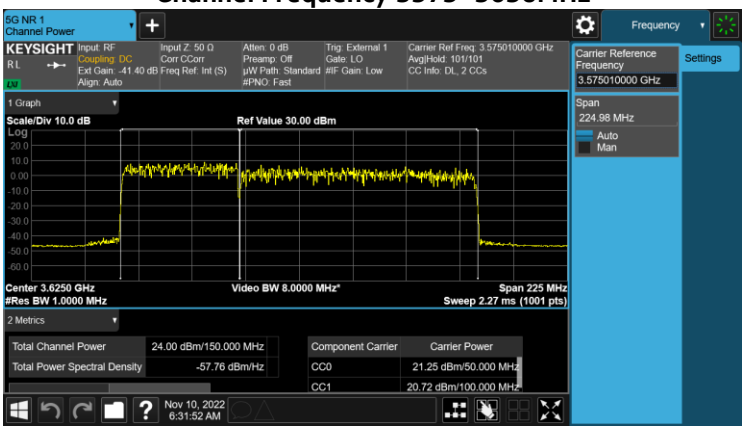
Signal BW 100MHz, TM 3.2, QPSK/16QAM, TX1
Channel Frequency 3625MHz



Signal BW 20+100MHz, TM 3.1, 64QAM, TX1
Channel Frequency 3560+3650MHz

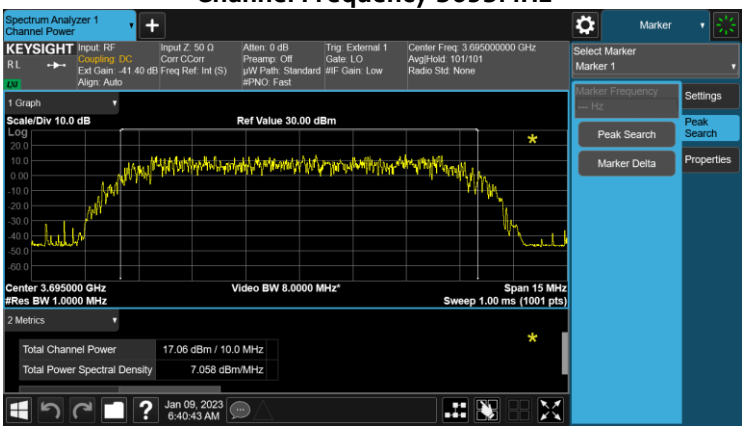


Signal BW 50+100MHz, TM 3.1a, 256QAM, TX1
Channel Frequency 3575+3650MHz

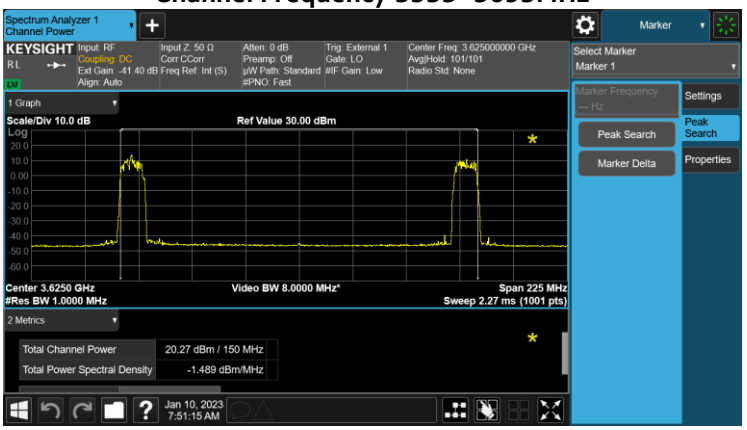


2.1.3.2 LTE Plots

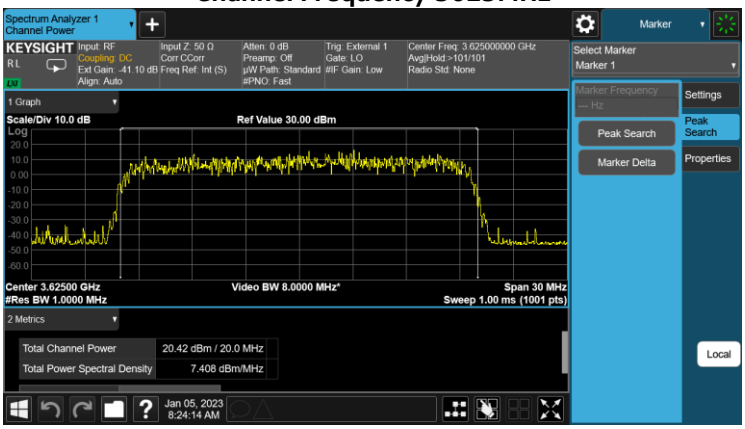
Signal BW 10MHz, TM 3.1a, 256QAM, TX1
Channel Frequency 3695MHz



Signal BW 10+10MHz, TM 3.2, QPSK/16QAM, TX1
Channel Frequency 3555+3695MHz



Signal BW 20MHz, TM 3.2, QPSK/16QAM, TX0
Channel Frequency 3625MHz



2.2 Power Spectral Density

2.2.1 Results

The PSD of the EUT was measured per ANSI C63.26 methods and procedures and the PSD Measurement feature of the MXA Analyzer. The PSD was measured when the product was set to provide the maximum rated power at the antenna transmitting terminals. The signal bandwidths, modulations and transmit channels identified in Table below were evaluated. The measured power spectral density level was documented in the table below.

Table 2.4 Power Spectral Density Results

Total PSD (Summing Method)

Transmit Signal Bandwidth (MHz)	Freq (MHz)	Port	PSD measured dBm/MHz	Average Peak Antenna gain	TM1.1 PSD EIRP dBm/MHz
20	3560	0	8.33		
20	3560	1	8.46		
20	3560	2	8.22		
20	3560	3	8.38		
			Sum = 14.369 dBm	5.5	19.869
Transmit Signal Bandwidth (MHz)	**Freq (MHz)**	**Port**	**PSD measured dBm/MHz**	**Average Peak Antenna gain**	**TM1.1 PSD EIRP dBm/MHz**
30	3625	0	8.38		
30	3625	1	8.38		
30	3565	2	8.04		
30	3565	3	8.48		
			Sum = 14.344 dBm	5.5	19.844
Transmit Signal Bandwidth (MHz)	**Freq (MHz)**	**Port**	**PSD measured dBm/MHz**	**Average Peak Antenna gain**	**TM1.1 PSD EIRP dBm/MHz**
40	3570	0	8.06		
40	3679.995	1	8.04		
40	3670	2	8.06		
40	3570	3	8.69		
			Sum = 14.242 dBm	5.5	19.742

				Total PSD	17.742< 20
			LTE		
Transmit Signal Bandwidth (MHz)	**Freq (MHz)**	**Port**	**PSD measured dBm/MHz**	**Average Peak Antenna gain**	**TM1.1 PSD EIRP dBm/MHz**
10	3555	0	8.01		
10	3555	1	8.26		
10	3555	2	7.98		
10	3555	3	8.51		
			Sum = 14.216 dBm	5.5	19.716
Transmit Signal Bandwidth (MHz)	**Freq (MHz)**	**Port**	**PSD measured dBm/MHz**	**Average Peak Antenna gain**	**TM1.1 PSD EIRP dBm/MHz**
10	3695	0	8.15		
10	3695	1	8.32		
10	3695	2	7.85		
10	3695	3	8.32		
			Sum = 14.185 dBm	5.5	19.685
Transmit Signal Bandwidth (MHz)	**Freq (MHz)**	**Port**	**PSD measured dBm/MHz**	**Average Peak Antenna gain**	**TM1.1 PSD EIRP dBm/MHz**
20	3560	0	8.11		
20	3560	1	8.16		
20	3560	2	7.97		
20	3560	3	8.28		
			Sum = 14.152 dBm	5.5	19.652
Transmit Signal Bandwidth (MHz)	**Freq (MHz)**	**Port**	**PSD measured dBm/MHz**	**Average Peak Antenna gain**	**TM1.1 PSD EIRP dBm/MHz**
20	3625	0	8.35		
20	3625	1	8.23		
20	3625	2	7.62		
20	3625	3	8.00		

			Sum = 14.079 dBm	5.5	19.579
Transmit Signal Bandwidth (MHz)	**Freq (MHz)**	**Port**	**PSD measured dBm/MHz**	**Average Peak Antenna gain**	**TM1.1 PSD EIRP dBm/MHz**
20	3690	0	8.39		
20	3690	1	8.33		
20	3690	2	7.90		
20	3690	3	8.34		
			Sum = 14.265 dBm	5.5	19.765
				Total PSD	**19.930< 20**

Total PSD (MIMO 10 log (4) Method)

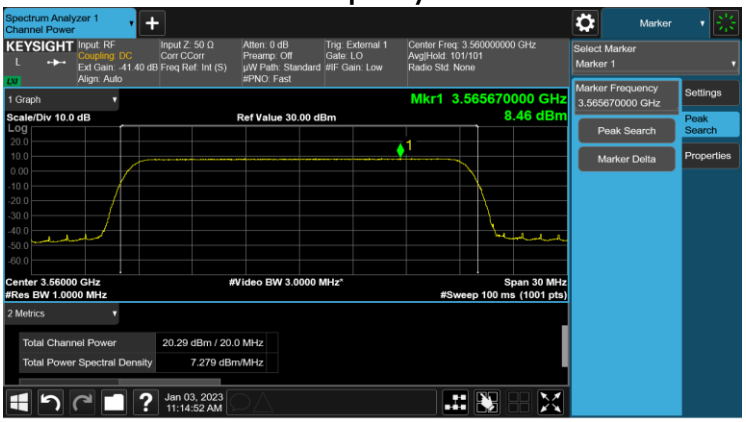
Transmit Signal Bandwidth	Maxi PSD per Port* (dBm)	Maxi Total Conducted PSD (dBm) for 4 Ports)	Effective Antenna Gain (dBi)	Total PSD (dBm/W)	Total PSD Limit (dBm/1MHz) Cat A	Results
50 MHz	7.88	13.90	5.5	19.40/0.087	20	Pass
60 MHz	7.29	13.31	5.5	18.81/0.076	20	Pass
70 MHz	6.68	13.70	5.5	19.20/0.083	20	Pass
80 MHz	5.92	11.94	5.5	17.44/0.055	20	Pass
90 MHz	5.40	11.42	5.5	16.92/0.049	20	Pass

2.2.2 Maximum Conducted PSD Plots

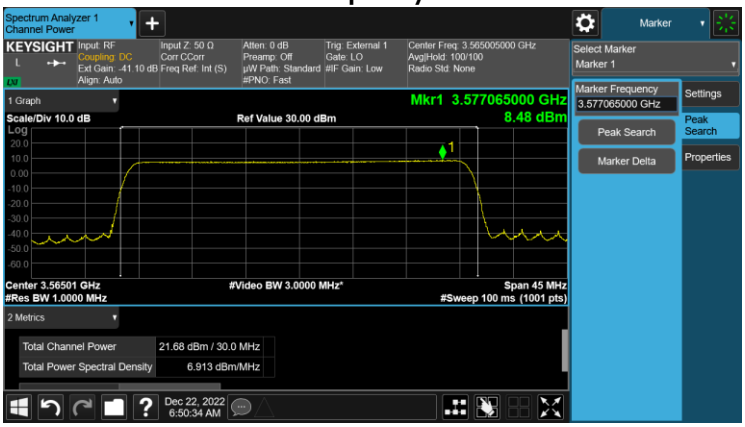
NOTE: Only a sample of the plots are used in this report. The full suite of raw data resides at the MH, New Jersey location.

2.2.2.1 5G-NR Plots

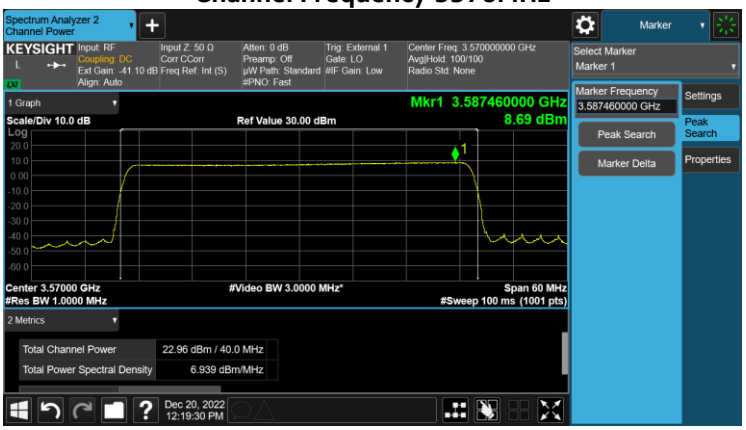
20MHz BW, TM1.1
Channel Frequency 3560MHz



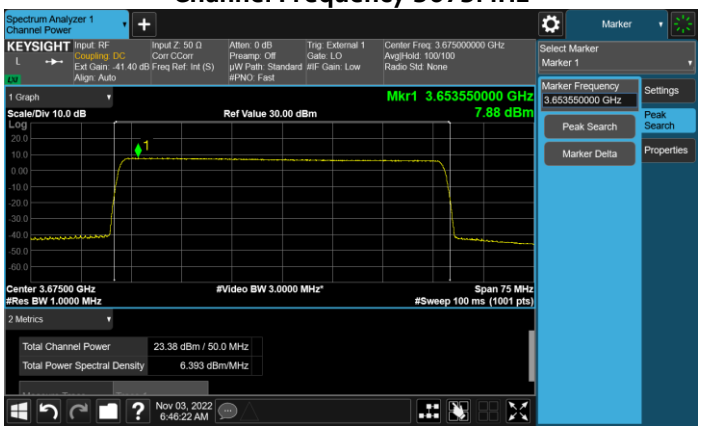
30MHz BW, TM1.1
Channel Frequency 3565MHz



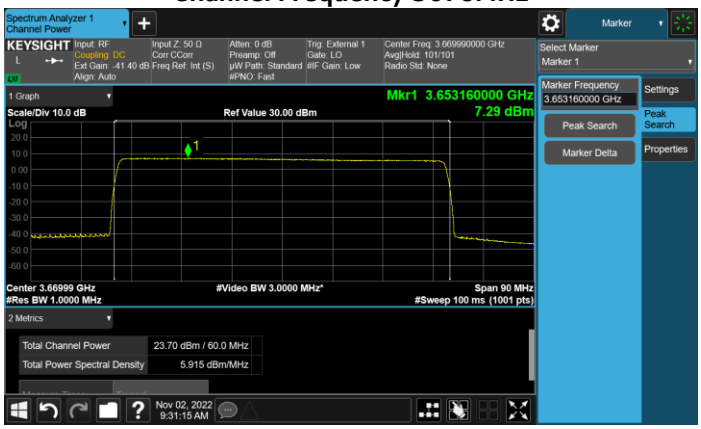
40MHz BW, TM1.1
Channel Frequency 3570MHz



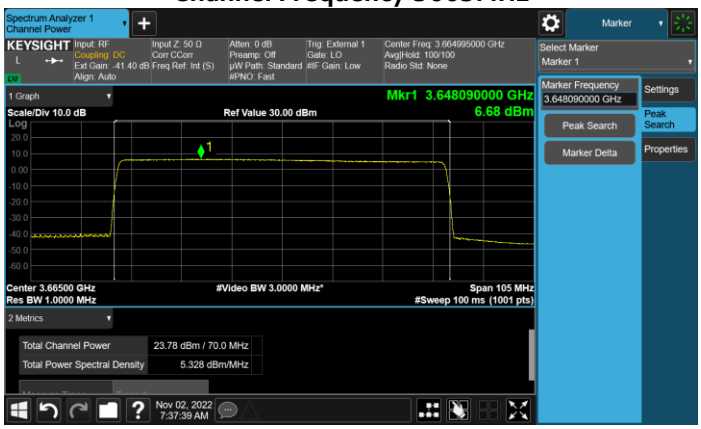
50MHz BW, TM1.1
Channel Frequency 3675MHz



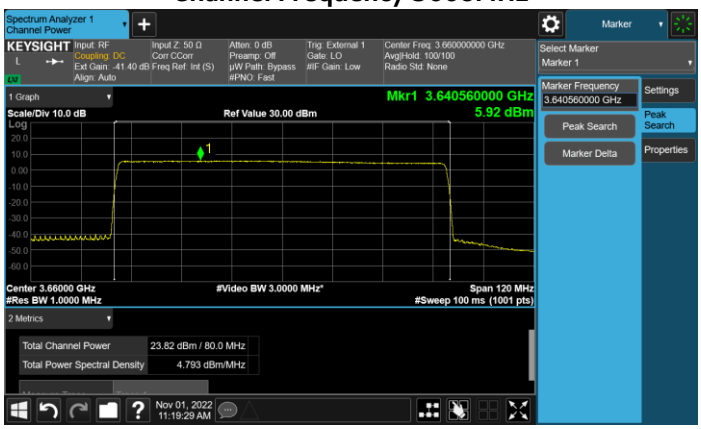
60MHz BW, TM1.1
Channel Frequency 3670MHz



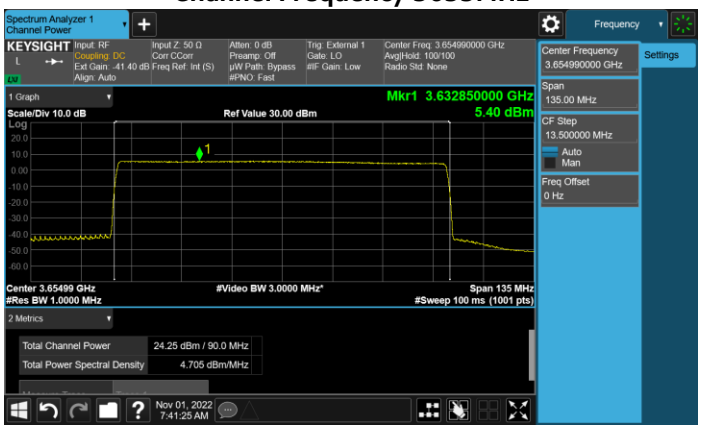
70MHz BW, TM1.1
Channel Frequency 3665MHz



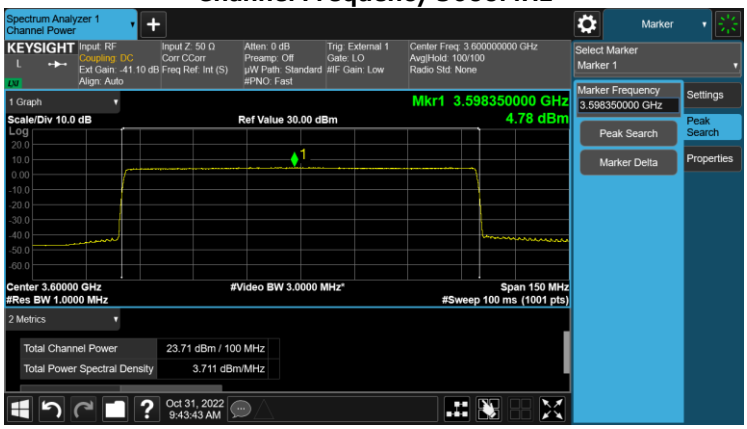
80MHz BW, TM1.1
Channel Frequency 3660MHz



90MHz BW, TM1.1
Channel Frequency 3655MHz

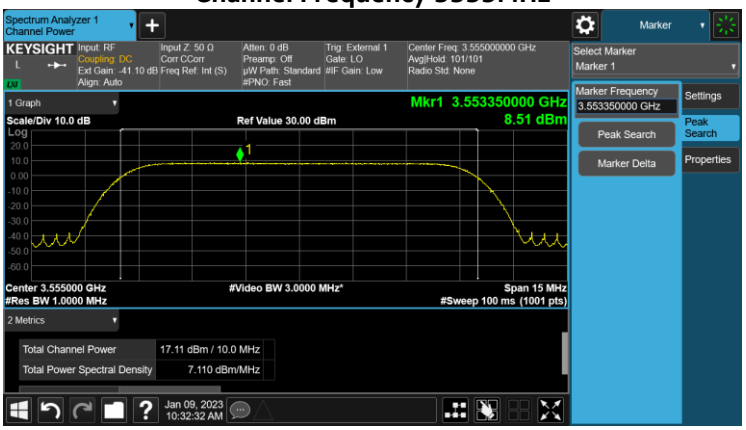


100MHz BW, TM3.1
Channel Frequency 3600MHz

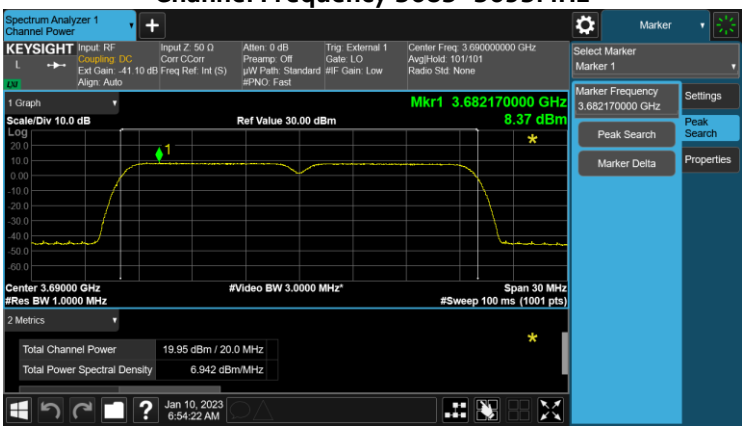


2.2.2.2 LTE Plots

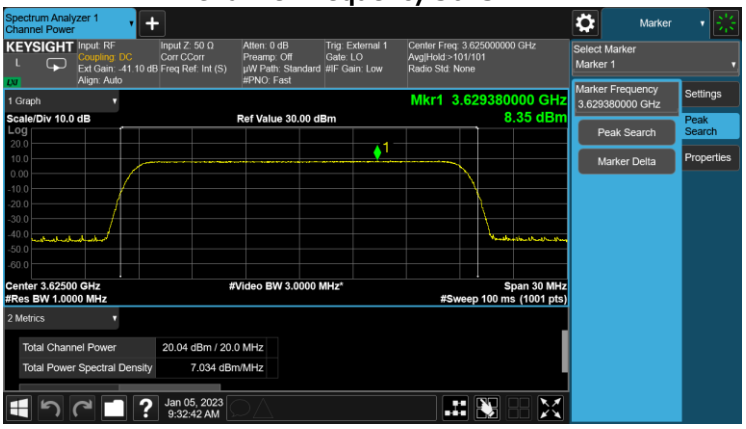
10MHz BW, TM1.1
Channel Frequency 3555MHz



10+10MHz BW, TM1.1
Channel Frequency 3685+3695MHz



20MHz BW, TM1.1
Channel Frequency 3625MHz



2.3 EIRP Compliance

Table 2.5 Maximum Total EIRP Measured (5G-NR)

Integrated Antenna

Transmit Signal Bandwidth	Maxi Output Power per Port* (dBm)	Maxi Total Conducted Output Power (dBm) for 4 Ports	Effective Average Antenna Gain (dBi	Total EIRP (dBm/W)/10 MHz	EIRP Bandwidth Correction for /10 MHz	Total EIRP (dBm/10MHz	Total EIRP Limit (dBm/10 MHz Cat A	Results
20 MHz	20.32	26.34	5.50	31.84/1.53	-3.01	28.83	30	Pass
30 MHz	22.79	28.81	5.50	34.31/2.70	-4.77	29.54	30	Pass
40 MHz	23.03	29.05	5.50	34.55/2.85	-6.02	28.53	30	Pass
50 MHz	24.09	30.11	5.50	35.61/3.64	-6.99	28.62	30	Pass
60 MHz	24.05	30.07	5.50	35.57/3.61	-7.78	27.79	30	Pass
70 MHz	24.18	30.20	5.50	35.70/3.72	-8.45	27.25	30	Pass
80 MHz	24.17	30.19	5.50	35.69/3.71	-9.03	26.66	30	Pass
90 MHz	24.21	30.23	5.50	35.73/3.74	-9.54	26.19	30	Pass
100 MHz	24.20	30.22	5.50	35.72/3.73	-10.0	25.72	30	Pass
20+100 MHz	24.17	30.19	5.50	35.69/	-10.79	24.9	30	Pass
50+100 MHz	24.00	30.02	5.50	35.52/	-11.76	23.76	30	Pass

The sample calculation for the maximum EIRP as follows,

The maximum Conducted Output Power per port = 24.21 dBm
The maximum Total Conducted Output Power (4X MIMO) = 24.21 + 10 x log (4) = 30.23 dBm
The maximum total EIRP = 30.23 + 5.50 (antenna gain) = 35.73 dBm.
Correction for /10MHz = 35.73 dBm – 10 x log (9) = 26.19 dBm

Table 2.6 Maximum Total EIRP Measured (LTE)

Integrated Antenna

Transmit Signal Bandwidth	Maxi Output Power per Port* (dBm)	Maxi Total Conducted Output Power (dBm) for 4 Ports	Effective Average Antenna Gain (dBi	Total EIRP (dBm/W)/10 MHz	EIRP Bandwidth Correction for /10 MHz	Total EIRP (dBm/10MHz	Total EIRP Limit (dBm/10 MHz Cat A	Results
10 MHz	17.06	23.08	5.50	28.58/0.72	-0	28.58	30	Pass
20 MHz	20.42	26.44	5.50	31.94/1.56	-3.01	28.93	30	Pass
10+10 MHz	20.27	26.29	5.50	31.79/1.51	-3.01	28.78	30	Pass

The sample calculation for the maximum EIRP as follows,

The maximum Conducted Output Power per port = 20.42 dBm
The maximum Total Conducted Output Power (4X MIMO) = 20.42 + 10 x log (4) = 26.44 dBm
The maximum total EIRP = 26.44 + 5.50 (antenna gain) = 31.94 dBm.
Correction for /10MHz = 31.94 dBm – 10 x log (2) = 28.93 dBm

Table 2.7 Maximum Total EIRP Measured (5G-NR)

Commscope External Antenna

Transmit Signal Bandwidth	Maxi Output Power per Port* (dBm)	Maxi Total Conducted Output Power (dBm) for 4 Ports	Effective Antenna Gain (dBi)	Total EIRP (dBm/W)	EIRP Bandwidth Correction for /10 MHz	Total EIRP dBm/10MHz	Total EIRP Limit (dBm/10MHz) Cat A	Results
20 MHz	20.32	26.34	5.2	31.54/1.43	-3.01	28.53	30	Pass
30 MHz	22.79	28.81	5.2	34.01/2.52	-4.77	29.24	30	Pass
40 MHz	23.03	29.05	5.2	34.25/2.66	-6.02	28.23	30	Pass
50 MHz	24.09	30.11	5.2	35.31/3.40	-6.99	28.32	30	Pass
60 MHz	24.05	30.07	5.2	35.27/3.37	-7.78	27.49	30	Pass
70 MHz	24.18	30.20	5.2	35.40/3.47	-8.45	26.95	30	Pass
80 MHz	24.17	30.19	5.2	35.39/3.46	-9.03	26.36	30	Pass
90 MHz	24.21	30.23	5.2	35.43/3.49	-9.54	25.89	30	Pass
100 MHz	24.20	30.22	5.2	35.42/3.48	-10.0	25.42	30	Pass
20+100 MHz	24.17	30.19	5.2	35.39/3.46	-10.79	24.60	30	Pass
50+100 MHz	24.00	30.02	5.2	35.22/3.33	-11.76	23.46	30	Pass

The sample calculation for the maximum EIRP as follows,

The maximum Conducted Output Power per port = 24.21 dBm
The maximum Total Conducted Output Power (4X MIMO) = 24.21 + 10 x log (4) = 30.23 dBm
The maximum total EIRP = 30.23 + 5.20 (antenna gain) = 35.43 dBm.
Correction for /10MHz = 35.43 dBm – 10 x log (9) = 25.89 dBm

Table 2.8 Maximum Total EIRP Measured (LTE)

Commscope External Antenna

Transmit Signal Bandwidth	Maxi Output Power per Port* (dBm)	Maxi Total Conducted Output Power (dBm) for 4 Ports)	Effective Antenna Gain (dBi	Total EIRP (dBm/W)	EIRP Bandwidth Correction for /10 MHz	Total EIRP (dBm/10MHz	Total EIRP Limit (dBm/10MHz) Cat A	Results
10 MHz	17.06	23.08	5.2	28.28/0.67	-0	28.28	30	Pass
20 MHz	20.42	26.44	5.2	31.64/1.46	-3.01	28.63	30	Pass
10+10 MHz	20.27	26.29	5.2	31.49/1.41	-3.01	28.28	30	Pass

The sample calculation for the maximum EIRP as follows,

The maximum Conducted Output Power per port = 20.42 dBm
The maximum Total Conducted Output Power (4X MIMO) = 20.42 + 10 x log (4) = 26.44 dBm
The maximum total EIRP = 26.44 + 5.20 (antenna gain) = 31.64 dBm.
Correction for /10MHz = 31.64 dBm – 10 x log (2) = 28.63 dBm

2.4 Peak-to-Average Power Ratio (PAPR)

The Peak-to-Average Power Ratio (PAPR) was evaluated per ANSI C63.26. The PAPR values of all carriers measured are below 13dB.

Table 2.4.1 Peak to Average Power Ratio (5G-NR)

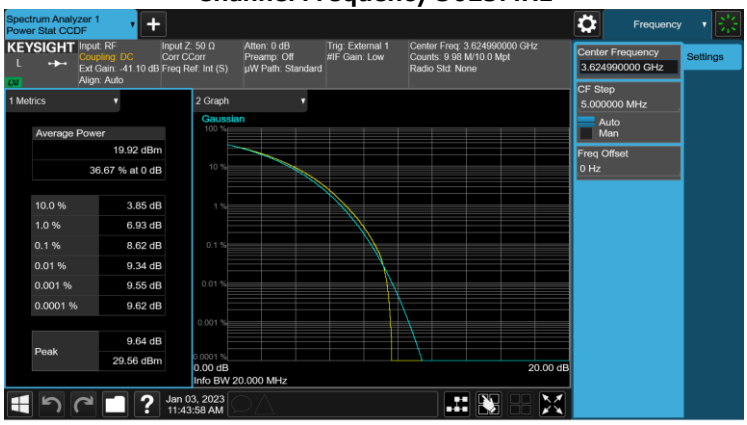
Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	PAR at 0.1% Limit - 13 dB
3.1	64QAM	1	3560	20	8.61
3.2	QPSK/16QAM	1	3625	20	**8.62**
3.1a	256QAM	1	3690	20	8.60
3.1	64QAM	1	3565	30	8.54
3.2	QPSK/16QAM	1	3625	30	8.60
3.1a	256QAM	1	3685	30	**8.66**
3.1	64QAM	0	3570	40	8.39
3.2	QPSK/16QAM	1	3625	40	**8.62**
3.1a	256QAM	1	3680	40	8.62
3.1	64QAM	0	3575	50	8.59
3.2	QPSK/16QAM	1	3625	50	8.57
3.1a	256QAM	1	3675	50	**8.68**
3.1	64QAM	1	3580	60	**8.55**
3.2	QPSK/16QAM	1	3625	60	8.54
3.1a	256QAM	1	3670	60	8.43
3.1	64QAM	1	3585	70	8.49
3.2	QPSK/16QAM	1	3625	70	**8.57**
3.1a	256QAM	1	3665	70	8.44
3.1	64QAM	0	3590	80	**8.57**
3.2	QPSK/16QAM	1	3625	80	8.41
3.1a	256QAM	1	3660	80	8.43
3.1	64QAM	1	3595	90	**8.43**
3.2	QPSK/16QAM	1	3625	90	8.37
3.1a	256QAM	1	3655	90	8.10
3.1	64QAM	1	3600	100	8.16
3.2	QPSK/16QAM	1	3625	100	**8.29**
3.1a	256QAM	0	3650	100	8.13
3.1	64QAM	1	3560+3650	20+100	8.59+8.61
3.1a	256QAM	0	3575+3650	50+100	8.47

Table 2.4.2 Peak to Average Power Ratio (LTE)

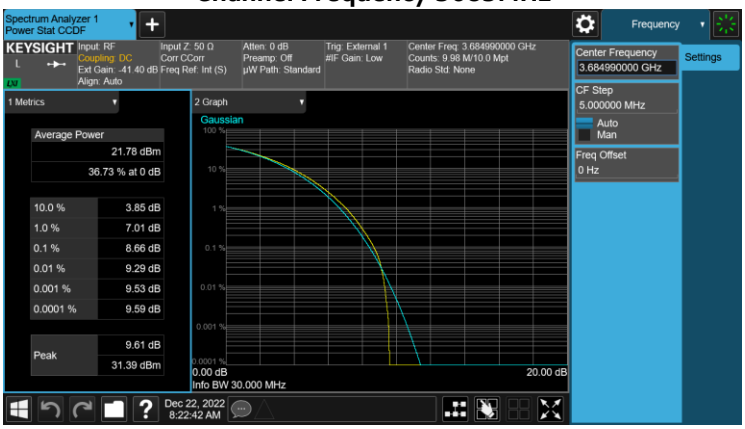
Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	PAR at 0.1% Limit - 13 dB
3.1	64QAM	3	3555	10	**8.30**
3.2	QPSK/16QAM	0	3625	10	8.29
3.1a	256QAM	1	3695	10	8.04
3.2	QPSK/16QAM	3	3555+3565	10+10	8.35
3.2	QPSK/16QAM	1	3555+3695	10+10	**8.66**
3.1	64QAM	0	3620+3630	10+10	8.30
3.1a	256QAM	1	3685+3695	10+10	8.33
3.1	64QAM	3	3560	20	**8.37**
3.2	QPSK/16QAM	3	3625	20	8.27
3.1a	256QAM	1	3690	20	8.28

2.4.1 5G-NR Plots

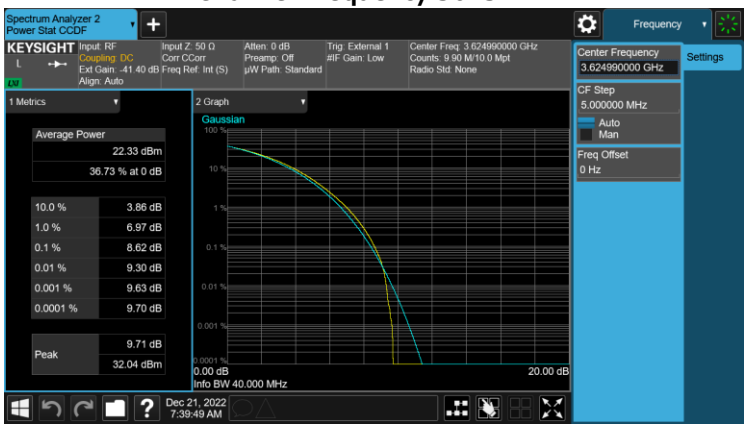
20MHz BW, TM3.2
Channel Frequency 3625MHz



30MHz BW, TM3.1a
Channel Frequency 3685MHz



40MHz BW, TM3.2
Channel Frequency 3625MHz



50MHz BW, TM3.1a
Channel Frequency 3675MHz

60MHz BW, TM3.1
Channel Frequency 3580MHz

70MHz BW, TM3.2
Channel Frequency 3625MHz

80MHz BW, TM3.1
Channel Frequency 3590MHz

90MHz BW, TM3.1
Channel Frequency 3595MHz

100MHz BW, TM3.2
Channel Frequency 3625MHz

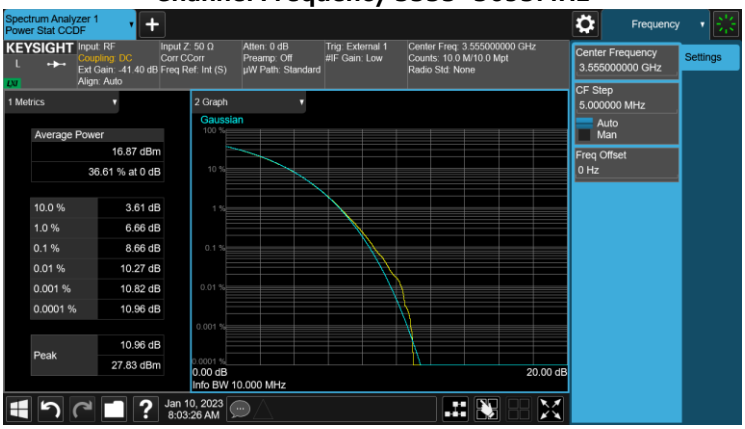
20+100MHz BW, TM3.1
Channel Frequency 3560+3650MHz

50+100MHz BW, TM3.1a
Channel Frequency 3575+3650MHz

2.4.2 LTE Plots

10MHz BW, TM3.1
Channel Frequency 3555MHz

10+10MHz BW, TM3.2
Channel Frequency 3555+3695MHz



20MHz BW, TM3.1
Channel Frequency 3560MHz

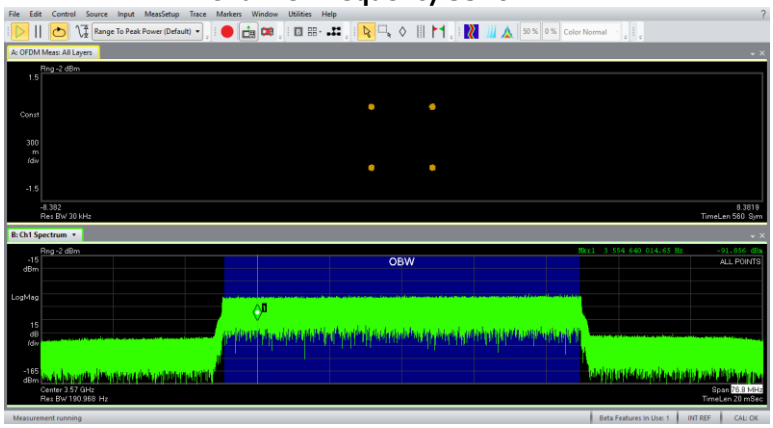
3. FCC Section 2.1047 - Modulation Characteristics

3.1 Modulation Characteristics

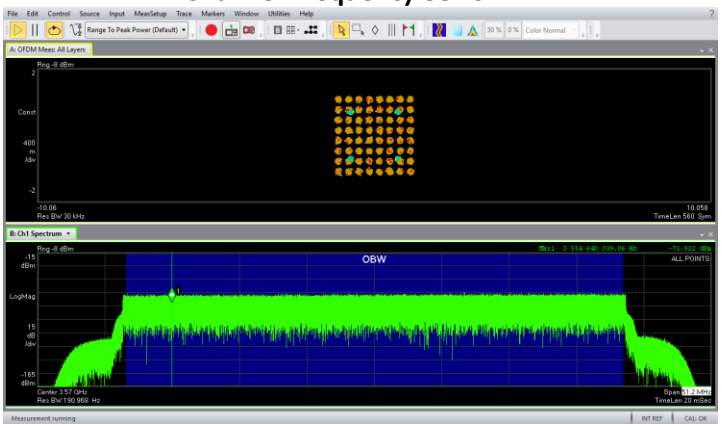
The RF signal at the antenna port was demodulated and verified for correctness of the modulation signal used before each test was performed.

3.1.1 Modulation Characteristics – Plots

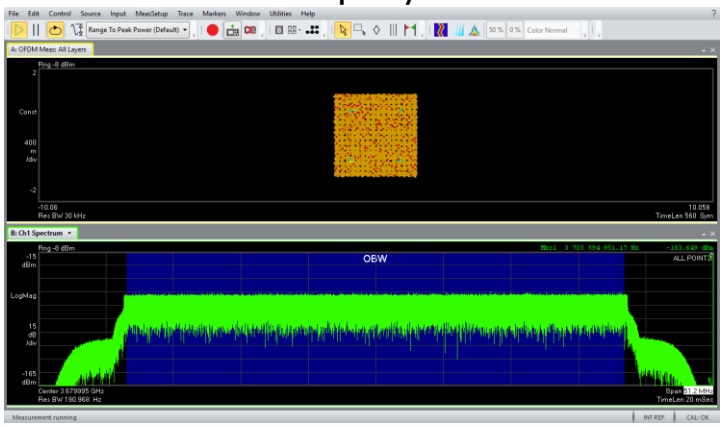
Modulation QPSK TM1.1
Channel Frequency 3570MHz



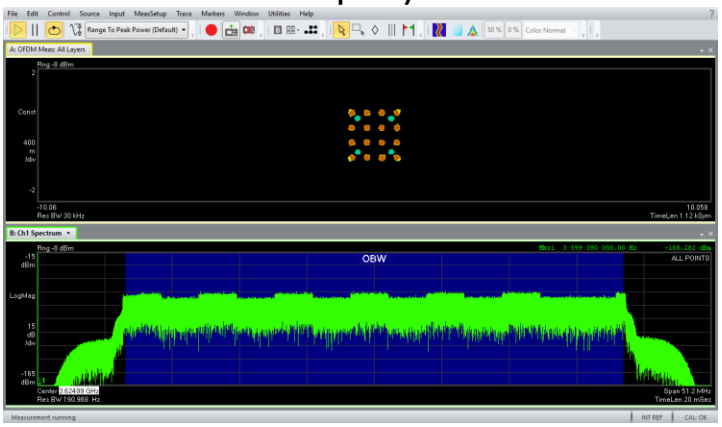
Modulation 64QAM TM3.1
Channel Frequency 3570MHz



Modulation 256QAM TM3.1a
Channel Frequency 3570MHz



Modulation QPSK/16QAM TM3.2
Channel Frequency 3625MHz



4. FCC Section 2.1049 – Occupied Bandwidth/Edge of Band Emissions

4.1 Occupied Bandwidth

In 47CFR 2.1049 the FCC requires:

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

This required measurement is the 99% Occupied Bandwidth, also called the designated signal bandwidth and needs to be within the parameters of the products specified emissions designator. During these measurements it is customary to evaluate the Edge of Band emissions at block/band edges.

Part 96.41e(3) specified that the fundamental emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The transmitted signal occupied bandwidth was measured using a Keysight MXA Signal Analyzer. All emissions were within the parameters as required.

Table 4.1.1 AWPQY AWPQZ 99% Occupied Bandwidth (5G-NR)

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Occupied BW MHz
3.1	64QAM	1	3560	20	**18.812**
3.2	QPSK/16QAM	1	3625	20	18.049
3.1a	256QAM	1	3690	20	18.684
3.1	64QAM	1	3565	30	28.018
3.2	QPSK/16QAM	1	3625	30	27.880
3.1a	256QAM	1	3685	30	**28.084**
3.1	64QAM	0	3570	40	**38.239**
3.2	QPSK/16QAM	1	3625	40	37.939
3.1a	256QAM	1	3680	40	37.556
3.1	64QAM	0	3575	50	47.138
3.2	QPSK/16QAM	1	3625	50	47.578
3.1a	256QAM	1	3675	50	**47.582**
3.1	64QAM	1	3580	60	**58.055**
3.2	QPSK/16QAM	1	3625	60	57.596
3.1a	256QAM	1	3670	60	57.463
3.1	64QAM	1	3585	70	66.760
3.2	QPSK/16QAM	1	3625	70	**67.417**
3.1a	256QAM	1	3665	70	66.939
3.1	64QAM	0	3590	80	**77.238**
3.2	QPSK/16QAM	1	3625	80	76.910
3.1a	256QAM	1	3660	80	76.796
3.1	64QAM	1	3595	90	87.204
3.2	QPSK/16QAM	1	3625	90	87.076
3.1a	256QAM	1	3655	90	**87.297**

3.1	64QAM	1	3600	100	**97.220**
3.2	QPSK/16QAM	1	3625	100	97.122
3.1a	256QAM	0	3650	100	96.699
3.1	64QAM	1	3560+3650	20+100	18.171+96.902
3.1a	256QAM	0	3575+3650	50+100	146.43

Table 4.1.2 AWPQY AWPQZ 26dB Emission Bandwidth (5G-NR)

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Occupied BW MHz
3.1	64QAM	1	3560	20	20.27
3.2	QPSK/16QAM	1	3625	20	19.10
3.1a	256QAM	1	3690	20	**20.36**
3.1	64QAM	1	3565	30	29.95
3.2	QPSK/16QAM	1	3625	30	28.75
3.1a	256QAM	1	3685	30	**30.14**
3.1	64QAM	0	3570	40	**39.99**
3.2	QPSK/16QAM	1	3625	40	39.14
3.1a	256QAM	1	3680	40	39.99
3.1	64QAM	0	3575	50	**49.99**
3.2	QPSK/16QAM	1	3625	50	49.86
3.1a	256QAM	1	3675	50	49.75
3.1	64QAM	1	3580	60	**60.20**
3.2	QPSK/16QAM	1	3625	60	59.28
3.1a	256QAM	1	3670	60	59.82
3.1	64QAM	1	3585	70	**69.99**
3.2	QPSK/16QAM	1	3625	70	69.97
3.1a	256QAM	1	3665	70	69.87
3.1	64QAM	0	3590	80	80.02
3.2	QPSK/16QAM	1	3625	80	79.89
3.1a	256QAM	1	3660	80	**80.35**
3.1	64QAM	1	3595	90	90.06
3.2	QPSK/16QAM	1	3625	90	89.88
3.1a	256QAM	1	3655	90	**90.14**
3.1	64QAM	1	3600	100	**100.3**
3.2	QPSK/16QAM	1	3625	100	100.0
3.1a	256QAM	0	3650	100	100.3
3.1	64QAM	1	3560+3650	20+100	19.14+100.0
3.1a	256QAM	0	3575+3650	50+100	150.0

Table 4.1.3 AWPQY AWPQZ 99% Occupied Bandwidth (LTE)

Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Occupied BW MHz
3.1	64QAM	3	3555	10	**9.8300**
3.2	QPSK/16QAM	0	3625	10	8.9858
3.1a	256QAM	1	3695	10	9.7680
3.2	QPSK/16QAM	3	3555+3565	10+10	19.209
3.2	QPSK/16QAM	1	3555+3695	10+10	9.5513+9.4003
3.1	64QAM	0	3620+3630	10+10	18.815
3.1a	256QAM	1	3685+3695	10+10	**19.225**
3.1	64QAM	3	3560	20	18.256
3.2	QPSK/16QAM	3	3625	20	17.890
3.1a	256QAM	1	3690	20	**18.333**

Table 4.1.4 AWPQY AWPQZ 26dB Emission Bandwidth (LTE)

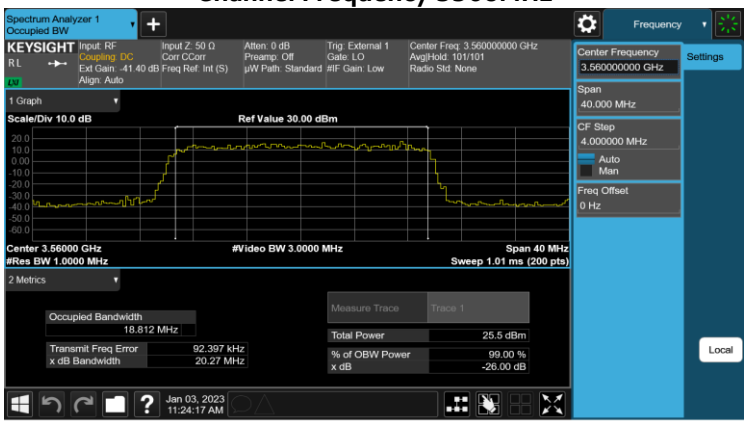
Test Model	Modulation	TX Port	Channel Frequency MHz	Signal BW MHz	Occupied BW MHz
3.1	64QAM	3	3555	10	**11.12**
3.2	QPSK/16QAM	0	3625	10	9.326
3.1a	256QAM	1	3695	10	10.96
3.2	QPSK/16QAM	3	3555+3565	10+10	20.83
3.2	QPSK/16QAM	1	3555+3695	10+10	**11.11+11.03**
3.1	64QAM	0	3620+3630	10+10	19.40
3.1a	256QAM	1	3685+3695	10+10	21.18
3.1	64QAM	3	3560	20	20.12
3.2	QPSK/16QAM	3	3625	20	18.34
3.1a	256QAM	1	3690	20	**20.23**

4.1.1 Occupied Bandwidth – Plots

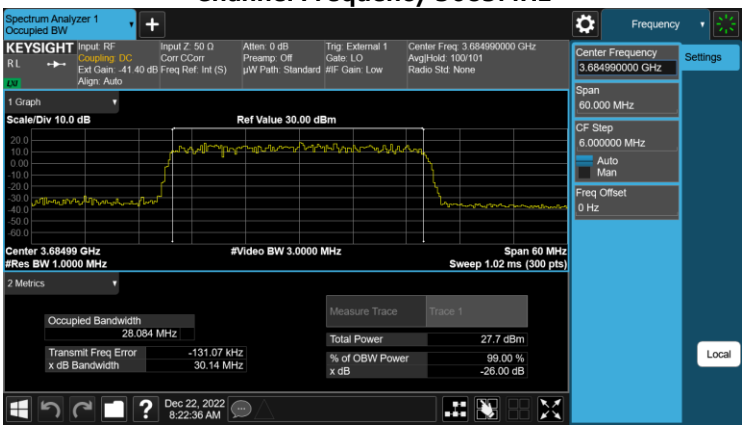
NOTE: Only the plots which give the widest bandwidth for each configuration evaluated are used in this report. The full suite of raw data resides at the MH, New Jersey location.

4.1.1.1 99% Occupied Bandwidth Plots (5G-NR)

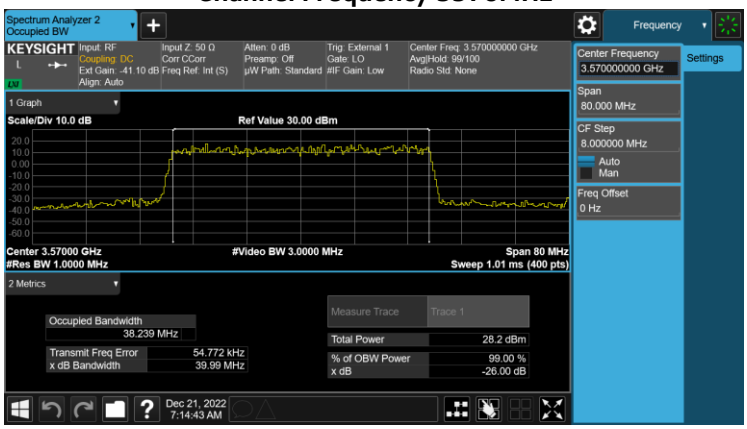
20MHz BW, TM3.1
Channel Frequency 3560MHz



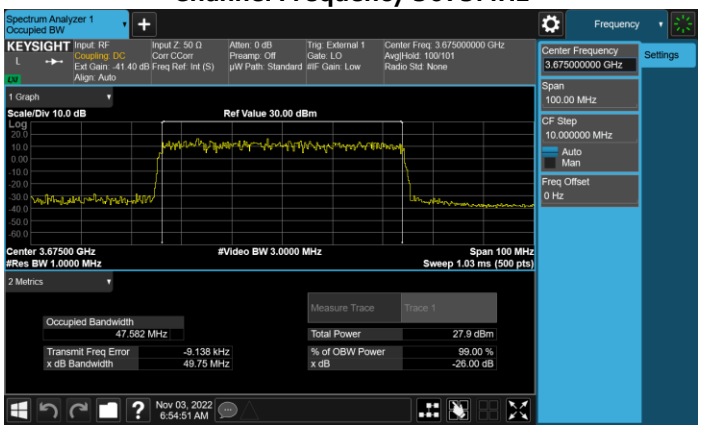
30MHz BW, TM3.1a
Channel Frequency 3685MHz



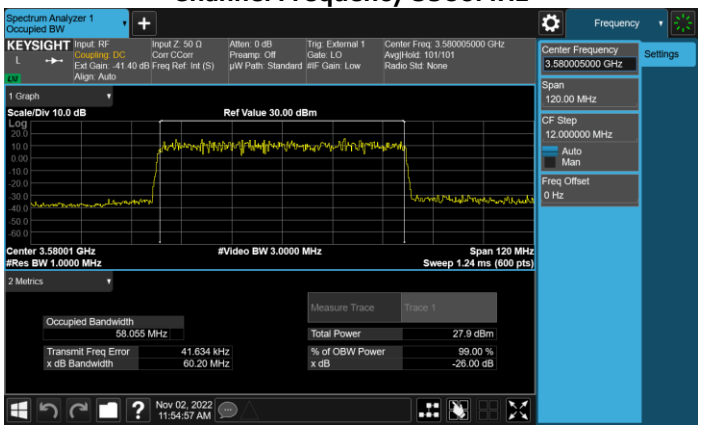
40MHz BW, TM3.1
Channel Frequency 3570MHz



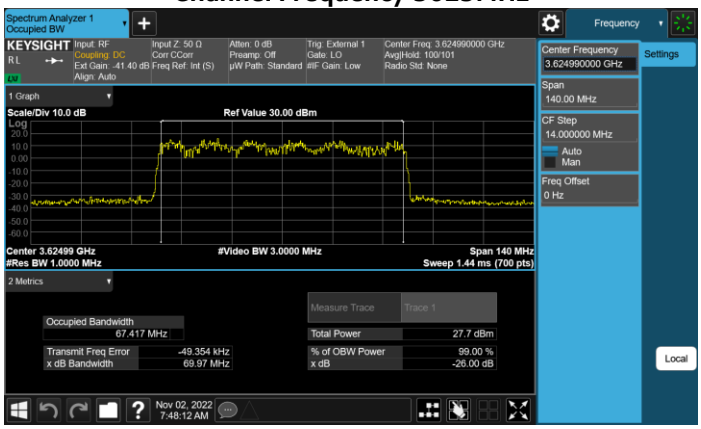
50MHz BW, TM3.1a
Channel Frequency 3675MHz



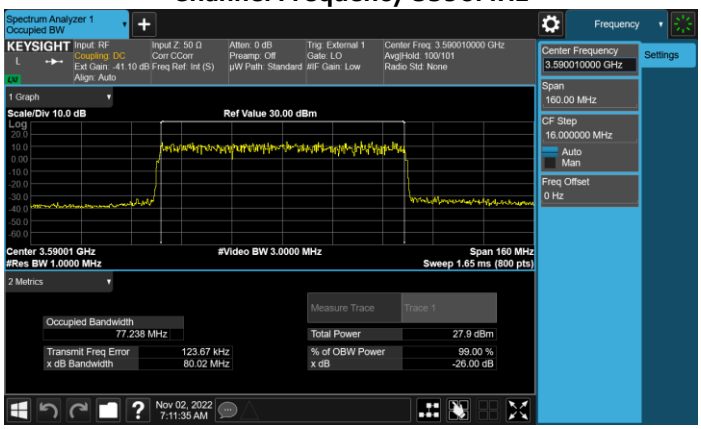
60MHz BW, TM3.1
Channel Frequency 3580MHz



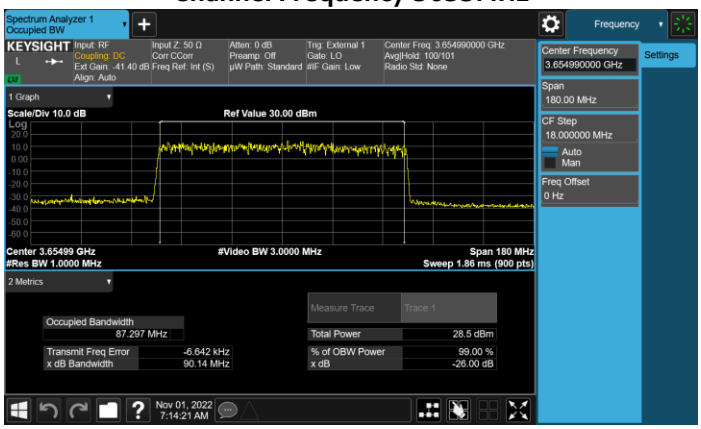
70MHz BW, TM3.2
Channel Frequency 3625MHz



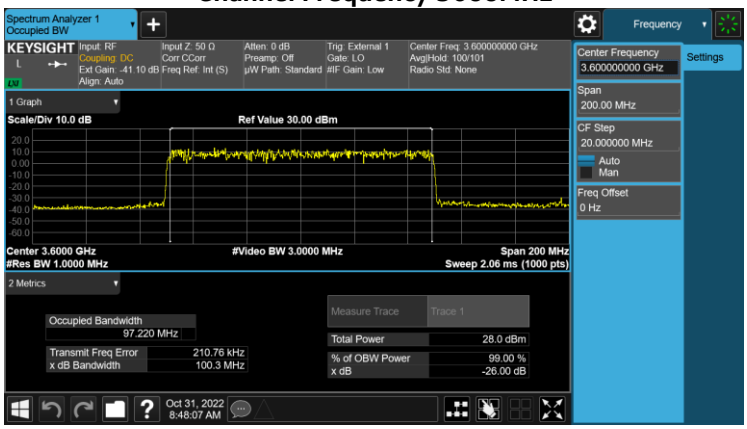
80MHz BW, TM3.1
Channel Frequency 3590MHz



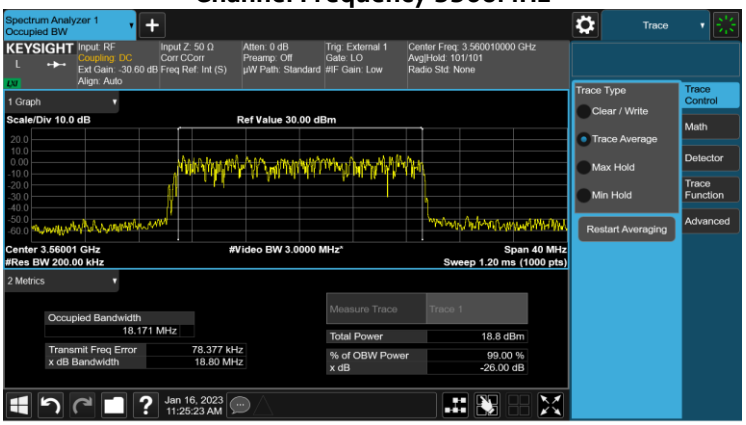
90MHz BW, TM3.1a
Channel Frequency 3655MHz



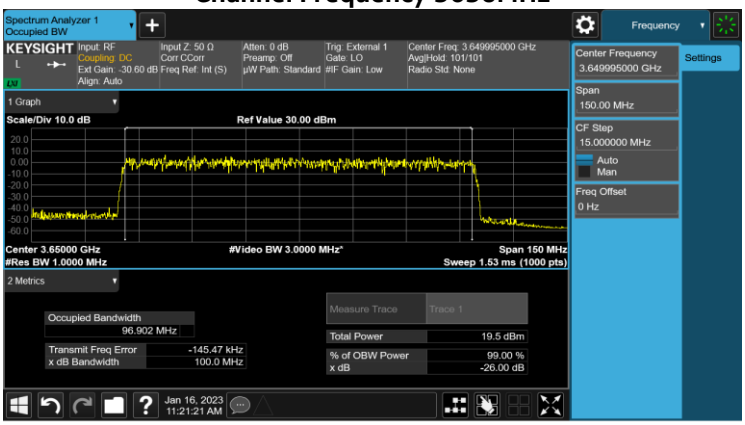
100MHz BW, TM3.1
Channel Frequency 3600MHz



20+100MHz BW, TM3.1
Channel Frequency 3560MHz



20+100MHz BW, TM3.1
Channel Frequency 3650MHz



50+100MHz BW, TM3.1
Channel Frequency 3560+3650MHz