

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



Applicant: Telit Communications S.p.A.
Via Stazione di Prosecco 5/b 34010 Sgonico - Trieste, Italy

Manufacturer: Telit Wireless Solutions. Co. Ltd.
13th Fl., Shinyoung Securities Bld, 6, Gukjegeumyung-ro 8-gil,
Yeongdeungpo-gu, Seoul, 07330, South Korea

Product Name: 5G Radio Module

Brand Name: Telit Cinterion or 

Model No.: FN920C04-WW

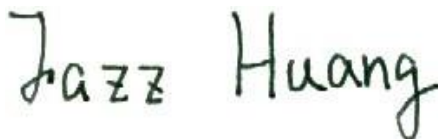
Report Number: TERF2410003184ER

FCC ID RI7FN920C04WW

Date of EUT Received: October 24, 2024

Date of Test: October 29, 2024 ~ April 10, 2025

Issue Date: April 14, 2025



Approved By _____

Jazz Huang

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26-2015 and the energy emitted by the sample EUT comply with FCC rule part 2, § 96.

The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2410003184ER	00	Original	March 21, 2025	Karen Huang	
TERF2410003184ER	01	Update test result	April 14, 2025	Karen Huang	*

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.

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1 GENERAL PRODUCT INFORMATION

1.1 Product Description

Product Name:	5G Radio Module
Brand Name:	Telit Cinterion or 
Model No.:	FN920C04-WW
Hardware Version:	1.10
Firmware Version:	M0V.060001
EUT Series No.:	355411761007558, 355411761006303, 355411761003276
Power Supply:	3.3Vdc
Test Software (Name/Version)	Connect with Callbox

1.2 Antenna Designation

Antenna Type	Antenna Model No.
Monopole	TG.55.8113
Note: Transmission frequencies in this test report are only available by the above antenna(s).	

LTE Band	Frequency (MHz)	Peak Gain (dBi)	Insertion Loss	Final Gain (dBi)
LTE Band 42	3400~3600	1.51	0.6	0.91
LTE Band 43	3600~3800	1.51	0.6	0.91
LTE Band 48	3550~3700	1.51	0.6	0.91

5G NR Band	Frequency (MHz)	Peak Gain (dBi)	Insertion Loss	Final Gain (dBi)
n48	3550 ~ 3700	1.51	0.6	0.91

Note: Antenna information is provided by the applicant.

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1.3 Operation Frequencies

LTE Band 48			
BW (MHz)	Operation Frequency (MHz)		
5	3552.5	-	3697.5
10	3555.0	-	3695.0
15	3557.5	-	3692.5
20	3560.0	-	3690.0
LTE Band 42 Part 96			
BW (MHz)	Operation Frequency (MHz)		
5	3552.5	-	3597.5
10	3555.0	-	3595.0
15	3557.5	-	3592.5
20	3560.0	-	3590.0
LTE Band 43 Part 96			
BW (MHz)	Operation Frequency (MHz)		
5	3602.5	-	3697.5
10	3605.0	-	3695.0
15	3607.5	-	3692.5
20	3610.0	-	3690.0
NR Band 48			
BW (MHz)	Operation Frequency (MHz)		
10	3555.0	-	3695.0
15	3557.5	-	3692.5
20	3560.0	-	3690.0

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1.4 Maximum ERP/EIRP

LTE Band	BW	Frequency		Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
48	5	3552.5	3697.5	QPSK	22.05	EIRP	0.160	4.4949	4M49G7D
				16QAM	21.31	EIRP	0.135	4.4839	4M48D7W
				64QAM	20.47	EIRP	0.111	4.4910	4M49D7W
				256QAM	17.11	EIRP	0.051	4.4953	4M50D7W
48	10	3555.0	3695.0	QPSK	22.51	EIRP	0.178	8.9733	8M97G7D
				16QAM	21.33	EIRP	0.136	8.9891	8M99D7W
				64QAM	20.44	EIRP	0.111	9.0032	9M00D7W
				256QAM	17.18	EIRP	0.052	9.0136	9M01D7W
48	15	3557.5	3692.5	QPSK	22.27	EIRP	0.169	13.4400	13M4G7D
				16QAM	21.39	EIRP	0.138	13.4640	13M5D7W
				64QAM	20.68	EIRP	0.117	13.4490	13M4D7W
				256QAM	17.13	EIRP	0.052	13.4770	13M5D7W
48	20	3560.0	3690.0	QPSK	22.13	EIRP	0.163	17.9820	18M0G7D
				16QAM	21.29	EIRP	0.135	17.9220	17M9D7W
				64QAM	20.59	EIRP	0.115	17.9220	17M9D7W
				256QAM	17.14	EIRP	0.052	17.9300	17M9D7W
LTE Band	BW	Frequency		Modulation	ERP / EIRP (dBm/10MHz)		(W)	99%	Type of Emission
48	5	3552.5	3697.5	QPSK	22.05	EIRP	0.160	4.4949	4M49G7D
				16QAM	21.31	EIRP	0.135	4.4839	4M48D7W
				64QAM	20.47	EIRP	0.111	4.4910	4M49D7W
				256QAM	17.11	EIRP	0.051	4.4953	4M50D7W
48	10	3555.0	3695.0	QPSK	22.51	EIRP	0.178	8.9733	8M97G7D
				16QAM	21.33	EIRP	0.136	8.9891	8M99D7W
				64QAM	20.44	EIRP	0.111	9.0032	9M00D7W
				256QAM	17.18	EIRP	0.052	9.0136	9M01D7W
48	15	3557.5	3692.5	QPSK	20.51	EIRP	0.112	13.4400	13M4G7D
				16QAM	19.63	EIRP	0.092	13.4640	13M5D7W
				64QAM	18.92	EIRP	0.078	13.4490	13M4D7W
				256QAM	15.37	EIRP	0.034	13.4770	13M5D7W
48	20	3560.0	3690.0	QPSK	19.12	EIRP	0.082	17.9820	18M0G7D
				16QAM	18.28	EIRP	0.067	17.9220	17M9D7W
				64QAM	17.58	EIRP	0.057	17.9220	17M9D7W
				256QAM	14.13	EIRP	0.026	17.9300	17M9D7W

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5G NR Band n48_Part96_Uplink frequency band : 3550 to 3700 MHz									
Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
10	3555	3694.98	DFT-s PI/2 BPSK	21.48	22.39	0.173	8.6137	8613.7	8M61G7W
			DFT-s QPSK	21.39	22.30	0.170	8.6509	8650.9	8M65G7W
			DFT-s QAM	20.38	21.29	0.135	8.6421	8642.1	8M64D7W
			CP QPSK	20.26	21.17	0.131	8.6509	8650.9	8M65G7W
			CP QAM	19.39	20.30	0.107	8.6421	8642.1	8M64D7W
15	3557.52	3692.49	DFT-s PI/2 BPSK	21.36	22.27	0.169	12.915	12915.0	12M9G7W
			DFT-s QPSK	21.31	22.22	0.167	12.939	12939.0	12M9G7W
			DFT-s QAM	20.29	21.20	0.132	12.933	12933.0	12M9D7W
			CP QPSK	19.77	20.68	0.117	12.939	12939.0	12M9G7W
			CP QAM	19.25	20.16	0.104	12.933	12933.0	12M9D7W
20	3560.01	3690	DFT-s PI/2 BPSK	21.49	22.40	0.174	17.93	17930.0	17M9G7W
			DFT-s QPSK	21.42	22.33	0.171	17.938	17938.0	17M9G7W
			DFT-s QAM	20.18	21.09	0.129	17.944	17944.0	17M9D7W
			CP QPSK	19.85	20.76	0.119	17.938	17938.0	17M9G7W
			CP QAM	19.44	20.35	0.108	17.944	17944.0	17M9D7W

5G NR Band n48_Part96_Uplink frequency band : 3550 to 3700 MHz									
Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm/10MHz)	EIRP Average (dBm/10MHz)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
10	3555	3694.98	DFT-s PI/2 BPSK	21.48	22.39	0.173	8.6137	8613.7	8M61G7W
			DFT-s QPSK	21.39	22.30	0.170	8.6509	8650.9	8M65G7W
			DFT-s QAM	20.38	21.29	0.135	8.6421	8642.1	8M64D7W
			CP QPSK	20.26	21.17	0.131	8.6509	8650.9	8M65G7W
			CP QAM	19.39	20.30	0.107	8.6421	8642.1	8M64D7W
15	3557.52	3692.49	DFT-s PI/2 BPSK	19.60	20.51	0.112	12.915	12915.0	12M9G7W
			DFT-s QPSK	19.55	20.46	0.111	12.939	12939.0	12M9G7W
			DFT-s QAM	18.53	19.44	0.088	12.933	12933.0	12M9D7W
			CP QPSK	18.01	18.92	0.078	12.939	12939.0	12M9G7W
			CP QAM	17.49	18.40	0.069	12.933	12933.0	12M9D7W
20	3560.01	3690	DFT-s PI/2 BPSK	18.48	19.39	0.087	17.93	17930.0	17M9G7W
			DFT-s QPSK	18.41	19.32	0.086	17.938	17938.0	17M9G7W
			DFT-s QAM	17.17	18.08	0.064	17.944	17944.0	17M9D7W
			CP QPSK	16.84	17.75	0.060	17.938	17938.0	17M9G7W
			CP QAM	16.43	17.34	0.054	17.944	17944.0	17M9D7W

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1.5 Test Methodology of Applied Standards

FCC 47 CFR Part 2, Part 96E

ANSI C63.26-2015

ANSI/ITA C603-E.2016

KDB 971168 D01 Power Meas license Digital System v03r01

KDB 940660 D01 Part 96 CBRS Eqpt v02

KDB 412172 D01 Determining ERP and EIRP V01r01

1.6 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designa- tion number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	TW3702
		SAC 2		
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
Conducted G				
Note: Test site name is remarked on the equipment list in each section of this report as an indica- tion where measurements occurred in specific test site and address.				

1.7 Special Accessories

No special accessories were used during testing.

1.8 Equipment Modifications

There was no modifications incorporated into the EUT.

1.9 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Measurement at Antenna Port

The EUT is placed on a table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

The EUT is placed on a turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

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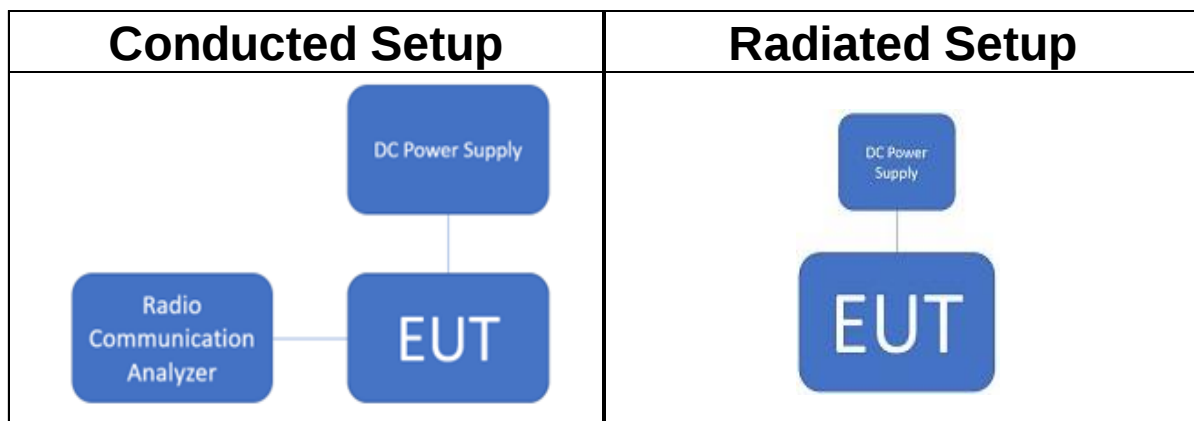
2.5 Final Amplifier Voltage and Current Information:

LTE Band 48

Test Mode	DC voltage (V)	DC current (mA)
LTE Band 48_20M QPSK	3.3	230

5G NR BAND n48		
CP-OFDM_SCS 30 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:10MHz Mod:256QAM	3.3	140
Bandwidth:15MHz Mod:256QAM	3.3	150
Bandwidth:20MHz Mod:256QAM	3.3	150

2.6 Test Configuration



Note: Radio Communication Analyzer is placed in remote side for radiated test.

2.7 Control Unit(s)

N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a) §96.41(b)	Maximum Power Output	Compliant
§2.1046, §96.41(b)	Maximum Power Density	Compliant
§2.1053, §96.41(e)	Field Strength Of Spurious Radiation	Compliant
§2.1051 §96.41(e)	Out Of Band Emission At Antenna	Compliant
§2.1049,(h)	Occupied Bandwidth	Compliant
§2.1055(a)	Frequency Stability	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Pre-Scan has been conducted to determine the worst-case scenario from all possible combinations among available modulations, data rates and antenna ports, the worst case configurations listed below for the final test.
3. The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.
4. The LTE power / Bandwidth / Channels / CBSD of B42/43 is the same as B48, so the test items will be covered by B48.

4.2 Measurement Configuration

LTE

Test Items				Max. Output Power												
Band	Test Channel			Bandwidth (MHz)						Modulation				RB #		
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full
48	v	v	v	-	-	v	v	v	v	v	v	v	v	v	v	v
Test Items				Frequency Stability												
48	-	v	-	-	-	-	v	-	-	v	-	-	-	-	-	v
Test Items				26dB and 99% Bandwidth												
Band	Test Channel			Bandwidth (MHz)						Modulation				RB #		
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full
48	v	v	v	-	-	v	v	v	v	v	v	v	v	-	-	v
Test Items				Peak-to-Average Ratio												
48	v	v	v	-	-	v	v	v	v	-	-	-	v	-	-	v
Test Items				Band Edge												
Band	Test Channel			Bandwidth (MHz)						Modulation				RB #		
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full
48	v	-	v	-	-	v	v	v	v	v	-	-	-	v	-	v
Test Items				Conducted Emission												
48	v	v	v	-	-	-	v	-	-	v	-	-	-	v	-	-
Test Items				Radiated Emission												
Band	Test Channel			Bandwidth (MHz)						Modulation				RB #		
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full
48	v	v	v	-	-	-	v	-	-	v	-	-	-	v	-	-

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Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM				Modulation CP-OFDM			RB #										
		L	M	H	5	10	15	20	25	30		40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Le#	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full				
Conducted Power	48 (part96)	v	v	v		v	v	v												v	v	v	v	v	v	v	v					v	v	v			v	
Fregency Stability			v																	v												v					v	
Occupied Bandwidth		v	v	v		v	v	v												v	v	v	v	v													v	
Bandedge																																						
Mask		v	v	v		v	v	v												v						v				v	v							v
Conducted Emission		v	v	v		v	v	v												v												v						
CCDF		v	v	v		v	v	v																														v
Radiated Emission		v	v	v				v												v												v						

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
Power Density	+/- 0.61 dB
RF Power Output	+/- 0.97 dB
ERP/ EIRP measurement	+/- 2.15 dB
	+/- 2.15 dB
Emission Bandwidth	+/- 1.38 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.77 dB
Peak to Average Ratio	+/- 0.97 dB
Frequency Stability vs. Temperature	+/- 1.48 Hz
Frequency Stability vs. Voltage	+/- 1.48 Hz
Temperature	+/- 0.6 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/-	1.89 dB	9kHz~30MHz
	+/-	4.15 dB	30MHz - 1000MHz
	+/-	3.43 dB	1GHz - 18GHz
	+/-	3.86 dB	18GHz - 40GHz
Polarization: Horizontal	+/-	1.89 dB	9kHz~30MHz
	+/-	4.02 dB	30MHz - 1000MHz
	+/-	3.43 dB	1GHz - 18GHz
	+/-	3.86 dB	18GHz - 40GHz
Radiated Spurious Emission	+/-	2 dB	33GHz-50GHz
	+/-	1.59 dB	50GHz-60GHz
	+/-	1.7 dB	60GHz-90GHz
	+/-	1.64 dB	90GHz-140GHz
	+/-	3.83 dB	140GHz-220GHz

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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6 MEASUREMENT EQUIPMENT USED

6.1 Conducted Measurement LTE

Conducted Emission Test Site: Conducted 4					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Attenuator	Mini-Circuits	BW-S10W2+	8	12/12/2023	12/11/2024
Attenuator	Mini-Circuits	BW-S10W2+	8	12/11/2024	12/10/2025
DC Block	Mini-Circuits	BLK-18-S+	12	12/12/2023	12/11/2024
DC Block	Mini-Circuits	BLK-18-S+	12	12/11/2024	12/10/2025
DC Power Supply	Gwinstek	SPS-3610	GEV856750	08/14/2024	08/13/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60240503	12/16/2024	12/15/2025
PXA Spectrum Analyzer	Keysight	N9030B	MY61330494	03/22/2024	03/21/2025
Radio Communication Analyzer	Anritsu	MT8821C	6262044670	08/23/2024	08/22/2025
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	12/12/2023	12/11/2024
Splitter	RF-LAMBDA	RFLT2W1G18G	11-JSPF412-018	12/11/2024	12/10/2025
Temperature Chamber	Giant Force	GTH-150-40-CP-AR	MAA0512-018	06/05/2024	06/04/2025
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R

NR

Conducted Emission Test Site: Conducted 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Attenuator	Mini-Circuits	BW-S10W2+	8	12/12/2023	12/11/2024
DC Block	Mini-Circuits	BLK-18-S+	4	12/12/2023	12/11/2024
Attenuator	Mini-Circuits	BW-S10W2+	8	12/11/2024	12/10/2025
DC Block	Mini-Circuits	BLK-18-S+	4	12/11/2024	12/10/2025
DC Power Supply	Gwinstek	SPS-3610	GEV856761	09/13/2024	09/12/2025
EXA Spectrum Analyzer	Agilent	N9010A	MY54200716	10/14/2024	10/13/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60240503	12/18/2023	12/17/2024
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60240503	12/16/2024	12/15/2025
PXA Spectrum Analyzer	Keysight	N9030B	MY61330494	03/22/2024	03/21/2025
Radio Communication Analyzer	KEYSIGHT	E7515B	MY601922462	06/02/2024	06/01/2025
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-017	12/12/2023	12/11/2024
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-017	12/11/2024	12/10/2025
Temperature Chamber	Giant Force	GTH-150-40-CP-AR	MAA0512-018	06/05/2024	06/04/2025
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R

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6.2 Radiated Measurement

LTE

Radiated Emission Test Site: SAC 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
4G High Pass Filter	WI	WHKX4.0	22	12/12/2023	12/11/2024
Attenuator	Mini-Circuits	BW-S10W2+	16	12/12/2023	12/11/2024
Band Reject Filter 3250-3750	Micro-Tronics	BRM15247	1	12/12/2023	12/11/2024
Bi-log Antenna	SCHWARZBECK	VULB9168	1208	07/17/2024	07/16/2025
Bi-log Antenna	SCHWARZBECK	VULB9168	378	08/09/2024	08/08/2025
Coaxial Cables	EMCI+Huber Suhner	EMC107-SM-SM- 1000 +SUCOFLEX 104PEA +EMC107-SM-SM- 1500 +SUCOFLEX 106	RX Cable 9K-18G (221110+MY4251/4 PEA+221106+76096 /6)	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062/ 2	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102+SUCOFLEX 106	TX Cable 30M-40G 23051/2+76096/6+2 2962/2	08/30/2024	08/29/2025
DC Power Supply	HILA	DP-3003N	11233K1019035	03/18/2024	03/17/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY63440386	02/06/2024	02/05/2025
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	07/10/2024	07/09/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	1441	09/23/2024	09/22/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	603	05/15/2024	05/14/2025
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/28/2023	12/27/2024
Network Analyzer	R&S	ZNB 40	101842	05/16/2024	05/15/2025
Pre-Amplifier	EMCI	EMC118A45SEE	980868	08/30/2024	08/29/2025
Pre-Amplifier	EMCI	EMC184045SEE	9080939	08/30/2024	08/29/2025
Pre-Amplifier	HP	8447D	2944A07676	08/30/2024	08/29/2025
Radio Communication Analyzer	Anritsu	MT8821C	6262044670	08/23/2024	08/22/2025
Site Cal	SGS	SAC 3	N/A	08/30/2024	08/29/2025
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

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Radiated Emission Test Site: SAC 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
4G High Pass Filter	WI	WHKX4.0	22	12/12/2023	12/11/2024
Attenuator	Mini-Circuits	BW-S10W2+	16	12/12/2023	12/11/2024
Band Reject Filter 3250-3750	Micro-Tronics	BRM15247	1	12/12/2023	12/11/2024
Bi-log Antenna	SCHWARZBECK	VULB9168	1208	07/17/2024	07/16/2025
Bi-log Antenna	SCHWARZBECK	VULB9168	378	08/09/2024	08/08/2025
Coaxial Cables	EMCI+Huber Suhner	EMC107-SM-SM- 1000 +SUCOFLEX 104PEA +EMC107-SM-SM- 1500 +SUCOFLEX 106	RX Cable 9K-18G (221110+MY4251/4 PEA+221106+76096 /6)	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062/ 2	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102+SUCOFLEX 106	TX Cable 30M-40G 23051/2+76096/6+2 2962/2	08/30/2024	08/29/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY63440386	02/06/2024	02/05/2025
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	07/10/2024	07/09/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	1441	09/23/2024	09/22/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	603	05/15/2024	05/14/2025
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/28/2023	12/27/2024
Network Analyzer	R&S	ZNB 40	101842	05/16/2024	05/15/2025
Pre-Amplifier	EMCI	EMC118A45SEE	980868	08/30/2024	08/29/2025
Pre-Amplifier	EMCI	EMC184045SEE	9080939	08/30/2024	08/29/2025
Pre-Amplifier	HP	8447D	2944A07676	08/30/2024	08/29/2025
Radio Communication Analyzer	KEYSIGHT	E7515B	MY59321566	02/15/2024	02/14/2025
Site Cal	SGS	SAC 3	N/A	08/30/2024	08/29/2025
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

Note: N.C.R refers to Not Calibrated Required.

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7 MAXIMUM OUTPUT POWER MEASUREMENT

7.1 Standard Applicable

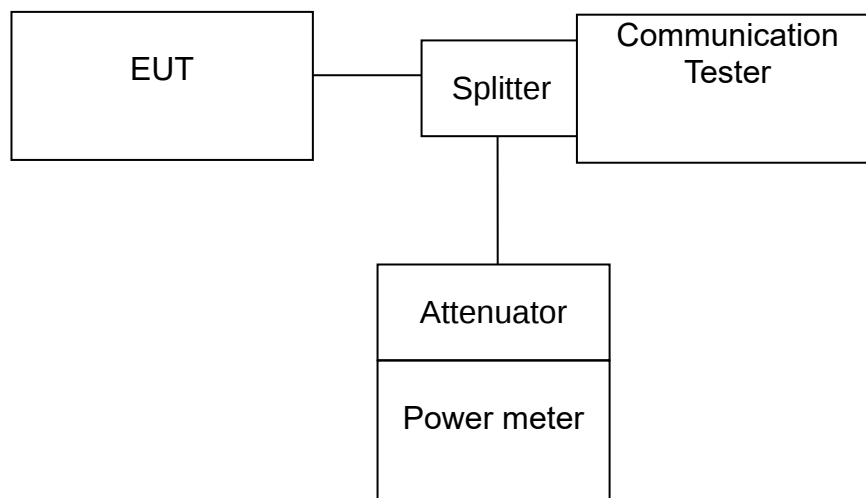
FCC §2.1046 & 96.41

- (a) FCC 96.41(a) Digital modulation. Systems operating in the Citizens Broadband Radio Service must use digital modulation techniques.
- (b) FCC 96.41(b) Power limits. Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):

Device	Maximum EIRP (dBm/10 MHz)
End User Device	23
Category A CBSD	30
Category B CBSD ¹	47

Category B CBSDs will only be authorized for use after an ESC is approved and commercially deployed consistent with §§96.15 and 96.67.

7.2 Test Set-up



Note: Measurement setup for testing on Antenna connector

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7.3 Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

Determining ERP and/or EIRP from conducted RF output power measurements

$$\text{ERP/EIRP} = \text{PMeas} + \text{GT-LC}$$

Where:

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

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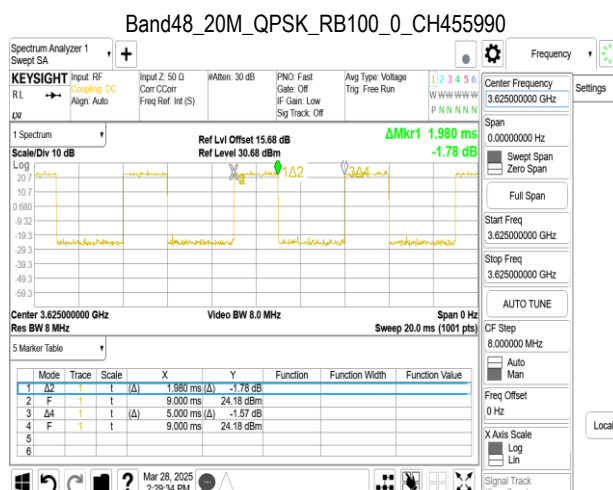
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7.4 Measurement Result:

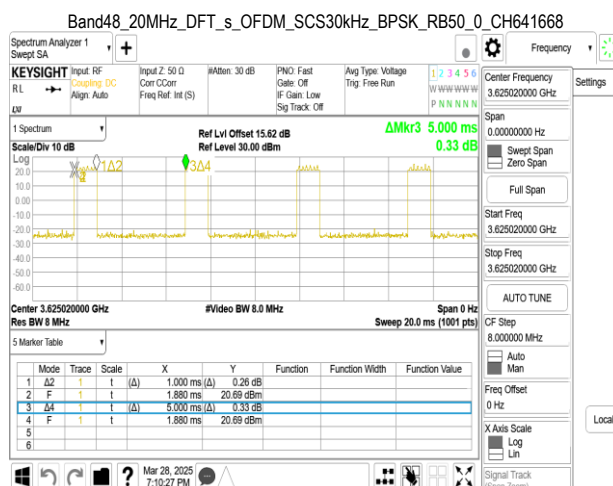
LTE

Mode	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)
(TDD)LTE_Band48_20MHz_QPSK	39.60	4.02



NR

Mode	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)
(TDD)NR_n48	20.00	6.99



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Antenna gain (dBi)		0.91					
LTE Band 48_Uplink frequency band : 3550 to 3700 MHz							
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)
5	55265	3552.5	QPSK	1	0	21.11	22.02
				1	24	20.80	21.71
				12	6	20.15	21.06
				25	0	20.03	20.94
	55990	3625	QPSK	1	0	20.72	21.63
				1	24	20.69	21.60
				12	6	19.97	20.88
				25	0	19.96	20.87
	56715	3697.5	QPSK	1	0	21.14	22.05
				1	24	21.08	21.99
				12	6	20.18	21.09
				25	0	20.18	21.09
5	55265	3552.5	16QAM	1	0	20.40	21.31
				1	24	20.25	21.16
				12	6	19.22	20.13
				25	0	19.06	19.97
	55990	3625	16QAM	1	0	20.09	21.00
				1	24	20.06	20.97
				12	6	19.03	19.94
				25	0	18.98	19.89
	56715	3697.5	16QAM	1	0	20.31	21.22
				1	24	20.27	21.18
				12	6	19.21	20.12
				25	0	19.17	20.08
5	55265	3552.5	64QAM	1	0	19.48	20.39
				1	24	19.47	20.38
				12	6	18.31	19.22
				25	0	18.20	19.11
	55990	3625	64QAM	1	0	19.40	20.31
				1	24	19.42	20.33
				12	6	18.30	19.21
				25	0	18.35	19.26
	56715	3697.5	64QAM	1	0	19.56	20.47
				1	24	19.49	20.40
				12	6	18.38	19.29
				25	0	18.32	19.23
5	55265	3552.5	256QAM	1	0	16.20	17.11
				1	24	16.14	17.05
				12	6	16.03	16.94
				25	0	15.98	16.89
	55990	3625	256QAM	1	0	16.13	17.04
				1	24	16.17	17.08
				12	6	16.06	16.97
				25	0	16.03	16.94
	56715	3697.5	256QAM	1	0	16.16	17.07
				1	24	16.07	16.98
				12	6	16.09	17.00
				25	0	16.00	16.91

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Antenna gain (dBi)		0.91					
LTE Band 48_Uplink frequency band : 3550 to 3700 MHz							
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)
10	55290	3555	QPSK	1	0	21.60	22.51
				1	49	21.06	21.97
				25	12	20.16	21.07
				50	0	20.11	21.02
	55990	3625	QPSK	1	0	20.80	21.71
				1	49	20.73	21.64
				25	12	19.98	20.89
				50	0	19.99	20.90
	56690	3695	QPSK	1	0	20.89	21.80
				1	49	20.78	21.69
				25	12	20.11	21.02
				50	0	20.09	21.00
10	55290	3555	16QAM	1	0	20.31	21.22
				1	49	20.31	21.22
				25	12	19.16	20.07
				50	0	19.14	20.05
	55990	3625	16QAM	1	0	20.20	21.11
				1	49	20.08	20.99
				25	12	19.03	19.94
				50	0	19.04	19.95
	56690	3695	16QAM	1	0	20.42	21.33
				1	49	20.40	21.31
				25	12	19.13	20.04
				50	0	19.12	20.03
10	55290	3555	64QAM	1	0	19.27	20.18
				1	49	19.40	20.31
				25	12	18.33	19.24
				50	0	18.19	19.10
	55990	3625	64QAM	1	0	19.41	20.32
				1	49	19.43	20.34
				25	12	18.37	19.28
				50	0	18.29	19.20
	56690	3695	64QAM	1	0	19.53	20.44
				1	49	19.47	20.38
				25	12	18.38	19.29
				50	0	18.29	19.20
10	55290	3555	256QAM	1	0	16.23	17.14
				1	49	16.15	17.06
				25	12	16.05	16.96
				50	0	16.09	17.00
	55990	3625	256QAM	1	0	16.05	16.96
				1	49	16.06	16.97
				25	12	16.00	16.91
				50	0	16.04	16.95
	56690	3695	256QAM	1	0	16.18	17.09
				1	49	16.05	16.96
				25	12	16.27	17.18
				50	0	16.08	16.99

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Antenna gain (dBi)		0.91					
LTE Band 48_Uplink frequency band : 3550 to 3700 MHz							
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)
15	55315	3557.5	QPSK	1	0	21.08	21.99
				1	74	21.25	22.16
				36	18	20.09	21.00
				75	0	20.09	21.00
	55990	3625	QPSK	1	0	21.11	22.02
				1	74	21.05	21.96
				36	18	20.00	20.91
				75	0	19.99	20.90
	56665	3692.5	QPSK	1	0	21.36	22.27
				1	74	21.34	22.25
				36	18	20.24	21.15
				75	0	20.21	21.12
15	55315	3557.5	16QAM	1	0	20.34	21.25
				1	74	20.29	21.20
				36	18	19.17	20.08
				75	0	19.08	19.99
	55990	3625	16QAM	1	0	20.39	21.30
				1	74	20.26	21.17
				36	18	19.06	19.97
				75	0	19.01	19.92
	56665	3692.5	16QAM	1	0	20.48	21.39
				1	74	20.45	21.36
				36	18	19.25	20.16
				75	0	19.19	20.10
15	55315	3557.5	64QAM	1	0	19.77	20.68
				1	74	19.70	20.61
				36	18	18.49	19.40
				75	0	18.36	19.27
	55990	3625	64QAM	1	0	19.48	20.39
				1	74	19.46	20.37
				36	18	18.44	19.35
				75	0	18.37	19.28
	56665	3692.5	64QAM	1	0	19.49	20.40
				1	74	19.51	20.42
				36	18	18.30	19.21
				75	0	18.24	19.15
15	55315	3557.5	256QAM	1	0	16.17	17.08
				1	74	16.14	17.05
				36	18	15.98	16.89
				75	0	15.97	16.88
	55990	3625	256QAM	1	0	16.22	17.13
				1	74	16.07	16.98
				36	18	16.04	16.95
				75	0	16.02	16.93
	56665	3692.5	256QAM	1	0	16.12	17.03
				1	74	16.10	17.01
				36	18	16.07	16.98
				75	0	16.03	16.94

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BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)
20	55340	3560	QPSK	1	0	21.21	22.12
				1	99	21.17	22.08
				50	25	20.12	21.03
				100	0	20.09	21.00
	55990	3625	QPSK	1	0	21.11	22.02
				1	99	21.09	22.00
				50	25	20.01	20.92
				100	0	20.00	20.91
	56640	3690	QPSK	1	0	21.22	22.13
				1	99	21.18	22.09
				50	25	20.28	21.19
				100	0	20.15	21.06
20	55340	3560	16QAM	1	0	20.29	21.20
				1	99	20.36	21.27
				50	25	19.15	20.06
				100	0	19.09	20.00
	55990	3625	16QAM	1	0	20.28	21.19
				1	99	20.22	21.13
				50	25	19.08	19.99
				100	0	18.98	19.89
	56640	3690	16QAM	1	0	20.38	21.29
				1	99	20.35	21.26
				50	25	19.23	20.14
				100	0	19.15	20.06
20	55340	3560	64QAM	1	0	19.68	20.59
				1	99	19.61	20.52
				50	25	18.28	19.19
				100	0	18.22	19.13
	55990	3625	64QAM	1	0	19.38	20.29
				1	99	19.47	20.38
				50	25	18.34	19.25
				100	0	18.29	19.20
	56640	3690	64QAM	1	0	19.48	20.39
				1	99	19.39	20.30
				50	25	18.35	19.26
				100	0	18.32	19.23
20	55340	3560	256QAM	1	0	16.16	17.07
				1	99	15.93	16.84
				50	25	16.03	16.94
				100	0	16.07	16.98
	55990	3625	256QAM	1	0	16.23	17.14
				1	99	16.01	16.92
				50	25	16.15	17.06
				100	0	16.03	16.94
	56640	3690	256QAM	1	0	16.16	17.07
				1	99	15.97	16.88
				50	25	16.00	16.91
				100	0	16.03	16.94

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Antenna gain (dBi)		0.91							
LTE Band 48_Uplink frequency band : 3550 to 3700 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm/10MHz)	EIRP Average (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dBm/10MHz)
5	55265	3552.5	QPSK	1	0	21.11	22.02	23	-0.98
				1	24	20.80	21.71	23	-1.29
				12	6	20.15	21.06	23	-1.94
				25	0	20.03	20.94	23	-2.06
	55990	3625	QPSK	1	0	20.72	21.63	23	-1.37
				1	24	20.69	21.60	23	-1.4
				12	6	19.97	20.88	23	-2.12
				25	0	19.96	20.87	23	-2.13
	56715	3697.5	QPSK	1	0	21.14	22.05	23	-0.95
				1	24	21.08	21.99	23	-1.01
				12	6	20.18	21.09	23	-1.91
				25	0	20.18	21.09	23	-1.91
5	55265	3552.5	16QAM	1	0	20.40	21.31	23	-1.69
				1	24	20.25	21.16	23	-1.84
				12	6	19.22	20.13	23	-2.87
				25	0	19.06	19.97	23	-3.03
	55990	3625	16QAM	1	0	20.09	21.00	23	-2
				1	24	20.06	20.97	23	-2.03
				12	6	19.03	19.94	23	-3.06
				25	0	18.98	19.89	23	-3.11
	56715	3697.5	16QAM	1	0	20.31	21.22	23	-1.78
				1	24	20.27	21.18	23	-1.82
				12	6	19.21	20.12	23	-2.88
				25	0	19.17	20.08	23	-2.92
5	55265	3552.5	64QAM	1	0	19.48	20.39	23	-2.61
				1	24	19.47	20.38	23	-2.62
				12	6	18.31	19.22	23	-3.78
				25	0	18.20	19.11	23	-3.89
	55990	3625	64QAM	1	0	19.40	20.31	23	-2.69
				1	24	19.42	20.33	23	-2.67
				12	6	18.30	19.21	23	-3.79
				25	0	18.35	19.26	23	-3.74
	56715	3697.5	64QAM	1	0	19.56	20.47	23	-2.53
				1	24	19.49	20.40	23	-2.6
				12	6	18.38	19.29	23	-3.71
				25	0	18.32	19.23	23	-3.77
5	55265	3552.5	256QAM	1	0	16.20	17.11	23	-5.89
				1	24	16.14	17.05	23	-5.95
				12	6	16.03	16.94	23	-6.06
				25	0	15.98	16.89	23	-6.11
	55990	3625	256QAM	1	0	16.13	17.04	23	-5.96
				1	24	16.17	17.08	23	-5.92
				12	6	16.06	16.97	23	-6.03
				25	0	16.03	16.94	23	-6.06
	56715	3697.5	256QAM	1	0	16.16	17.07	23	-5.93
				1	24	16.07	16.98	23	-6.02
				12	6	16.09	17.00	23	-6
				25	0	16.00	16.91	23	-6.09

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Antenna gain (dBi)		0.91							
LTE Band 48_Uplink frequency band : 3550 to 3700 MHz									
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm/10MHz)	EIRP Average (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dBm/10MHz)
10	55290	3555	QPSK	1	0	21.60	22.51	23	-0.49
				1	49	21.06	21.97	23	-1.03
				25	12	20.16	21.07	23	-1.93
				50	0	20.11	21.02	23	-1.98
	55990	3625	QPSK	1	0	20.80	21.71	23	-1.29
				1	49	20.73	21.64	23	-1.36
				25	12	19.98	20.89	23	-2.11
				50	0	19.99	20.90	23	-2.1
	56690	3695	QPSK	1	0	20.89	21.80	23	-1.2
				1	49	20.78	21.69	23	-1.31
				25	12	20.11	21.02	23	-1.98
				50	0	20.09	21.00	23	-2
10	55290	3555	16QAM	1	0	20.31	21.22	23	-1.78
				1	49	20.31	21.22	23	-1.78
				25	12	19.16	20.07	23	-2.93
				50	0	19.14	20.05	23	-2.95
	55990	3625	16QAM	1	0	20.20	21.11	23	-1.89
				1	49	20.08	20.99	23	-2.01
				25	12	19.03	19.94	23	-3.06
				50	0	19.04	19.95	23	-3.05
	56690	3695	16QAM	1	0	20.42	21.33	23	-1.67
				1	49	20.40	21.31	23	-1.69
				25	12	19.13	20.04	23	-2.96
				50	0	19.12	20.03	23	-2.97
10	55290	3555	64QAM	1	0	19.27	20.18	23	-2.82
				1	49	19.40	20.31	23	-2.69
				25	12	18.33	19.24	23	-3.76
				50	0	18.19	19.10	23	-3.9
	55990	3625	64QAM	1	0	19.41	20.32	23	-2.68
				1	49	19.43	20.34	23	-2.66
				25	12	18.37	19.28	23	-3.72
				50	0	18.29	19.20	23	-3.8
	56690	3695	64QAM	1	0	19.53	20.44	23	-2.56
				1	49	19.47	20.38	23	-2.62
				25	12	18.38	19.29	23	-3.71
				50	0	18.29	19.20	23	-3.8
10	55290	3555	256QAM	1	0	16.23	17.14	23	-5.86
				1	49	16.15	17.06	23	-5.94
				25	12	16.05	16.96	23	-6.04
				50	0	16.09	17.00	23	-6
	55990	3625	256QAM	1	0	16.05	16.96	23	-6.04
				1	49	16.06	16.97	23	-6.03
				25	12	16.00	16.91	23	-6.09
				50	0	16.04	16.95	23	-6.05
	56690	3695	256QAM	1	0	16.18	17.09	23	-5.91
				1	49	16.05	16.96	23	-6.04
				25	12	16.27	17.18	23	-5.82
				50	0	16.08	16.99	23	-6.01

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BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm/10MHz)	EIRP Average (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dBm/10MHz)
15	55315	3557.5	QPSK	1	0	19.32	20.23	23	-2.77
				1	74	19.49	20.40	23	-2.60
				36	18	18.33	19.24	23	-3.76
				75	0	18.33	19.24	23	-3.76
	55990	3625	QPSK	1	0	19.35	20.26	23	-2.74
				1	74	19.29	20.20	23	-2.80
				36	18	18.24	19.15	23	-3.85
				75	0	18.23	19.14	23	-3.86
	56665	3692.5	QPSK	1	0	19.60	20.51	23	-2.49
				1	74	19.58	20.49	23	-2.51
				36	18	18.48	19.39	23	-3.61
				75	0	18.45	19.36	23	-3.64
15	55315	3557.5	16QAM	1	0	18.58	19.49	23	-3.51
				1	74	18.53	19.44	23	-3.56
				36	18	17.41	18.32	23	-4.68
				75	0	17.32	18.23	23	-4.77
	55990	3625	16QAM	1	0	18.63	19.54	23	-3.46
				1	74	18.50	19.41	23	-3.59
				36	18	17.30	18.21	23	-4.79
				75	0	17.25	18.16	23	-4.84
	56665	3692.5	16QAM	1	0	18.72	19.63	23	-3.37
				1	74	18.69	19.60	23	-3.40
				36	18	17.49	18.40	23	-4.60
				75	0	17.43	18.34	23	-4.66
15	55315	3557.5	64QAM	1	0	18.01	18.92	23	-4.08
				1	74	17.94	18.85	23	-4.15
				36	18	16.73	17.64	23	-5.36
				75	0	16.60	17.51	23	-5.49
	55990	3625	64QAM	1	0	17.72	18.63	23	-4.37
				1	74	17.70	18.61	23	-4.39
				36	18	16.68	17.59	23	-5.41
				75	0	16.61	17.52	23	-5.48
	56665	3692.5	64QAM	1	0	17.73	18.64	23	-4.36
				1	74	17.75	18.66	23	-4.34
				36	18	16.54	17.45	23	-5.55
				75	0	16.48	17.39	23	-5.61
15	55315	3557.5	256QAM	1	0	14.41	15.32	23	-7.68
				1	74	14.38	15.29	23	-7.71
				36	18	14.22	15.13	23	-7.87
				75	0	14.21	15.12	23	-7.88
	55990	3625	256QAM	1	0	14.46	15.37	23	-7.63
				1	74	14.31	15.22	23	-7.78
				36	18	14.28	15.19	23	-7.81
				75	0	14.26	15.17	23	-7.83
	56665	3692.5	256QAM	1	0	14.36	15.27	23	-7.73
				1	74	14.34	15.25	23	-7.75
				36	18	14.31	15.22	23	-7.78
				75	0	14.27	15.18	23	-7.82

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Antenna gain (dBi)		0.91							
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BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm/10MHz)	EIRP Average (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dBm/10MHz)
20	55340	3560	QPSK	1	0	18.20	19.11	23	-3.89
				1	99	18.16	19.07	23	-3.93
				50	25	17.11	18.02	23	-4.98
				100	0	17.08	17.99	23	-5.01
	55990	3625	QPSK	1	0	18.10	19.01	23	-3.99
				1	99	18.08	18.99	23	-4.01
				50	25	17.00	17.91	23	-5.09
				100	0	16.99	17.90	23	-5.10
	56640	3690	QPSK	1	0	18.21	19.12	23	-3.88
				1	99	18.17	19.08	23	-3.92
				50	25	17.27	18.18	23	-4.82
				100	0	17.14	18.05	23	-4.95
20	55340	3560	16QAM	1	0	17.28	18.19	23	-4.81
				1	99	17.35	18.26	23	-4.74
				50	25	16.14	17.05	23	-5.95
				100	0	16.08	16.99	23	-6.01
	55990	3625	16QAM	1	0	17.27	18.18	23	-4.82
				1	99	17.21	18.12	23	-4.88
				50	25	16.07	16.98	23	-6.02
				100	0	15.97	16.88	23	-6.12
	56640	3690	16QAM	1	0	17.37	18.28	23	-4.72
				1	99	17.34	18.25	23	-4.75
				50	25	16.22	17.13	23	-5.87
				100	0	16.14	17.05	23	-5.95
20	55340	3560	64QAM	1	0	16.67	17.58	23	-5.42
				1	99	16.60	17.51	23	-5.49
				50	25	15.27	16.18	23	-6.82
				100	0	15.21	16.12	23	-6.88
	55990	3625	64QAM	1	0	16.37	17.28	23	-5.72
				1	99	16.46	17.37	23	-5.63
				50	25	15.33	16.24	23	-6.76
				100	0	15.28	16.19	23	-6.81
	56640	3690	64QAM	1	0	16.47	17.38	23	-5.62
				1	99	16.38	17.29	23	-5.71
				50	25	15.34	16.25	23	-6.75
				100	0	15.31	16.22	23	-6.78
20	55340	3560	256QAM	1	0	13.15	14.06	23	-8.94
				1	99	12.92	13.83	23	-9.17
				50	25	13.02	13.93	23	-9.07
				100	0	13.06	13.97	23	-9.03
	55990	3625	256QAM	1	0	13.22	14.13	23	-8.87
				1	99	13.00	13.91	23	-9.09
				50	25	13.14	14.05	23	-8.95
				100	0	13.02	13.93	23	-9.07
	56640	3690	256QAM	1	0	13.15	14.06	23	-8.94
				1	99	12.96	13.87	23	-9.13
				50	25	12.99	13.90	23	-9.10
				100	0	13.02	13.93	23	-9.07

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NR

5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm)			EIRP (dBm)		
Antenna Gain(dBi)			0.91		Channel (ARFCH)/ Frequency(MHz)			Channel (ARFCH)/ Frequency(MHz)		
BW (MHz)	SCS (kHz)	Modulation	RB Allocation	RB Offset	Low	Mid	High	Low	Mid	High
					637000	641668	646332	637000	641668	646332
					3555	3625.02	3694.98	3555	3625.02	3694.98
10	30	DFT-s PI/2 BPSK	1	1	21.25	21.48	21.26	22.16	22.39	22.17
			1	22	21.33	21.11	21.13	22.24	22.02	22.04
			12	6	21.42	21.15	21.24	22.33	22.06	22.15
			24	0	20.78	20.59	20.71	21.69	21.50	21.62
		DFT-s QPSK	1	1	21.20	21.27	21.23	22.11	22.18	22.14
			1	22	21.16	21.07	21.15	22.07	21.98	22.06
			12	6	21.39	21.16	21.22	22.30	22.07	22.13
			24	0	20.34	20.15	20.15	21.25	21.06	21.06
		DFT-s 16QAM	1	1	20.31	20.35	20.38	21.22	21.26	21.29
		DFT-s 64QAM	1	1	18.97	18.91	18.91	19.88	19.82	19.82
		DFT-s 256QAM	1	1	17.02	17.06	17.04	17.93	17.97	17.95
		CP QPSK	1	1	20.17	19.90	20.26	21.08	20.81	21.17
		CP 16QAM	1	1	19.39	19.28	19.28	20.30	20.19	20.19
		CP 64QAM	1	1	17.98	18.00	18.05	18.89	18.91	18.96
		CP 256QAM	1	1	15.31	15.35	15.35	16.22	16.26	16.26

5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm)			EIRP (dBm)		
Antenna Gain(dBi)			0.91		Channel (ARFCH)/ Frequency(MHz)			Channel (ARFCH)/ Frequency(MHz)		
BW (MHz)	SCS (kHz)	Modulation	RB Allocation	RB Offset	Low	Mid	High	Low	Mid	High
					637168	641668	646166	637168	641668	646166
					3557.52	3625.02	3692.49	3557.52	3625.02	3692.49
15	30	DFT-s PI/2 BPSK	1	1	20.99	21.36	21.02	21.90	22.27	21.93
			1	36	21.28	21.00	21.06	22.19	21.91	21.97
			18	9	21.29	21.03	21.06	22.20	21.94	21.97
			36	0	20.84	20.66	20.56	21.75	21.57	21.47
		DFT-s QPSK	1	1	21.02	21.31	21.15	21.93	22.22	22.06
			1	36	21.29	21.17	21.01	22.20	22.08	21.92
			18	9	21.30	21.12	21.05	22.21	22.03	21.96
			36	0	20.32	20.08	20.08	21.23	20.99	20.99
		DFT-s 16QAM	1	1	20.29	20.27	20.25	21.20	21.18	21.16
		DFT-s 64QAM	1	1	18.57	18.55	18.68	19.48	19.46	19.59
		DFT-s 256QAM	1	1	16.74	16.74	16.76	17.65	17.65	17.67
		CP QPSK	1	1	19.64	19.77	19.70	20.55	20.68	20.61
		CP 16QAM	1	1	19.25	19.20	19.20	20.16	20.11	20.11
		CP 64QAM	1	1	17.37	17.37	17.39	18.28	18.28	18.30
		CP 256QAM	1	1	14.26	14.28	14.34	15.17	15.19	15.25

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5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm)			EIRP (dBm)		
Antenna Gain(dBi)			0.91		Channel (ARFCH)/ Frequency(MHz)			Channel (ARFCH)/ Frequency(MHz)		
					Low	Mid	High	Low	Mid	High
BW (MHz)	SCS (kHz)	Modulation	RB Allocation	RB Offset	637334	641668	646000	637334	641668	646000
					3560.01	3625.02	3690	3560.01	3625.02	3690
20	30	DFT-s PI/2 BPSK	1	1	21.49	21.22	21.17	22.40	22.13	22.08
			1	49	21.18	20.97	21.04	22.09	21.88	21.95
			25	12	21.39	21.12	21.12	22.30	22.03	22.03
			50	0	20.84	20.63	20.56	21.75	21.54	21.47
		DFT-s QPSK	1	1	21.42	21.07	20.87	22.33	21.98	21.78
			1	49	21.16	21.06	20.90	22.07	21.97	21.81
			25	12	21.40	21.17	21.05	22.31	22.08	21.96
			50	0	20.32	20.08	20.02	21.23	20.99	20.93
		DFT-s 16QAM	1	1	20.18	20.17	20.18	21.09	21.08	21.09
		DFT-s 64QAM	1	1	18.89	18.87	18.89	19.80	19.78	19.80
		DFT-s 256QAM	1	1	16.66	16.68	16.67	17.57	17.59	17.58
		CP QPSK	1	1	19.57	19.85	19.69	20.48	20.76	20.60
		CP 16QAM	1	1	19.24	19.44	19.30	20.15	20.35	20.21
		CP 64QAM	1	1	17.82	17.96	17.89	18.73	18.87	18.80
		CP 256QAM	1	1	14.96	15.17	15.02	15.87	16.08	15.93

5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm/10MHz)			EIRP (dBm/10MHz)		
Antenna Gain(dBi)			0.91		Channel (ARFCH)/ Frequency(MHz)			Channel (ARFCH)/ Frequency(MHz)		
EIRP Limit (dBm)			23dBm/10MHz		Low	Mid	High	Low	Mid	High
BW (MHz)	SCS (kHz)	Modulation	RB Allocation	RB Offset	637000	641668	646332	637000	641668	646332
					3555	3625.02	3694.98	3555	3625.02	3694.98
10	30	DFT-s PI/2 BPSK	1	1	21.25	21.48	21.26	22.16	22.39	22.17
			1	22	21.33	21.11	21.13	22.24	22.02	22.04
			12	6	21.42	21.15	21.24	22.33	22.06	22.15
			24	0	20.78	20.59	20.71	21.69	21.50	21.62
		DFT-s QPSK	1	1	21.20	21.27	21.23	22.11	22.18	22.14
			1	22	21.16	21.07	21.15	22.07	21.98	22.06
			12	6	21.39	21.16	21.22	22.30	22.07	22.13
			24	0	20.34	20.15	20.15	21.25	21.06	21.06
		DFT-s 16QAM	1	1	20.31	20.35	20.38	21.22	21.26	21.29
		DFT-s 64QAM	1	1	18.97	18.91	18.91	19.88	19.82	19.82
		DFT-s 256QAM	1	1	17.02	17.06	17.04	17.93	17.97	17.95
		CP QPSK	1	1	20.17	19.90	20.26	21.08	20.81	21.17
		CP 16QAM	1	1	19.39	19.28	19.28	20.30	20.19	20.19
		CP 64QAM	1	1	17.98	18.00	18.05	18.89	18.91	18.96
		CP 256QAM	1	1	15.31	15.35	15.35	16.22	16.26	16.26

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5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm/10MHz)			EIRP (dBm/10MHz)		
Antenna Gain(dBi)		0.91			Channel (ARFCH)/ Frequency(MHz)			Channel (ARFCH)/ Frequency(MHz)		
EIRP Limit (dBm)		23dBm/10MHz			Low	Mid	High	Low	Mid	High
BW (MHz)	SCS (kHz)	Modulation	RB Allocation	RB Offset	637168	641668	646166	637168	641668	646166
					3557.52	3625.02	3692.49	3557.52	3625.02	3692.49
15	30	DFT-s PI/2 BPSK	1	1	19.23	19.60	19.26	20.14	20.51	20.17
			1	36	19.52	19.24	19.30	20.43	20.15	20.21
			18	9	19.53	19.27	19.30	20.44	20.18	20.21
			36	0	19.08	18.90	18.80	19.99	19.81	19.71
		DFT-s QPSK	1	1	19.26	19.55	19.39	20.17	20.46	20.30
			1	36	19.53	19.41	19.25	20.44	20.32	20.16
			18	9	19.54	19.36	19.29	20.45	20.27	20.20
			36	0	18.56	18.32	18.32	19.47	19.23	19.23
		DFT-s 16QAM	1	1	18.53	18.51	18.49	19.44	19.42	19.40
		DFT-s 64QAM	1	1	16.81	16.79	16.92	17.72	17.70	17.83
		DFT-s 256QAM	1	1	14.98	14.98	15.00	15.89	15.89	15.91
		CP QPSK	1	1	17.88	18.01	17.94	18.79	18.92	18.85
		CP 16QAM	1	1	17.49	17.44	17.44	18.40	18.35	18.35
		CP 64QAM	1	1	15.61	15.61	15.63	16.52	16.52	16.54
		CP 256QAM	1	1	12.50	12.52	12.58	13.41	13.43	13.49

5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm/10MHz)			EIRP (dBm/10MHz)		
Antenna Gain(dBi)		0.91			Channel (ARFCH)/ Frequency(MHz)			Channel (ARFCH)/ Frequency(MHz)		
EIRP Limit (dBm)		23dBm/10MHz			Low	Mid	High	Low	Mid	High
BW (MHz)	SCS (kHz)	Modulation	RB Allocation	RB Offset	637334	641668	646000	637334	641668	646000
					3560.01	3625.02	3690	3560.01	3625.02	3690
20	30	DFT-s PI/2 BPSK	1	1	18.48	18.21	18.16	19.39	19.12	19.07
			1	49	18.17	17.96	18.03	19.08	18.87	18.94
			25	12	18.38	18.11	18.11	19.29	19.02	19.02
			50	0	17.83	17.62	17.55	18.74	18.53	18.46
		DFT-s QPSK	1	1	18.41	18.06	17.86	19.32	18.97	18.77
			1	49	18.15	18.05	17.89	19.06	18.96	18.80
			25	12	18.39	18.16	18.04	19.30	19.07	18.95
			50	0	17.31	17.07	17.01	18.22	17.98	17.92
		DFT-s 16QAM	1	1	17.17	17.16	17.17	18.08	18.07	18.08
		DFT-s 64QAM	1	1	15.88	15.86	15.88	16.79	16.77	16.79
		DFT-s 256QAM	1	1	13.65	13.67	13.66	14.56	14.58	14.57
		CP QPSK	1	1	16.56	16.84	16.68	17.47	17.75	17.59
		CP 16QAM	1	1	16.23	16.43	16.29	17.14	17.34	17.20
		CP 64QAM	1	1	14.81	14.95	14.88	15.72	15.86	15.79
		CP 256QAM	1	1	11.95	12.16	12.01	12.86	13.07	12.92

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8 MAXIMUM POWER DENSITY MEASUREMENT

8.1 Standard Applicable

FCC §2.1046 & 96.41

- (a) FCC 96.41(a) Digital modulation. Systems operating in the Citizens Broadband Radio Service must use digital modulation techniques.
- (b) FCC 96.41(b) Power limits. Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):

Device	Maximum PSD (dBm/MHz)
End User Device	n/a
Category A CBSD	20
Category B CBSD ¹	37

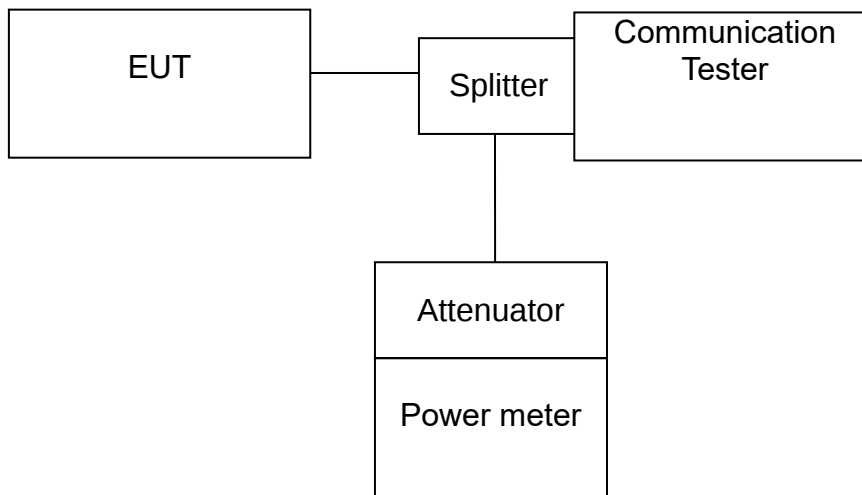
Category B CBSDs will only be authorized for use after an ESC is approved and commercially deployed consistent with §§96.15 and 96.67.

- (c) Power management. CBSDs and End User Devices shall limit their operating power to the minimum necessary for successful operations
- (1) CBSDs must support transmit power control capability and the capability to limit their maximum EIRP and the maximum EIRP of associated End User Devices in response to instructions from an SAS.
- (2) End User Devices shall include transmit power control capability and the capability to limit their maximum EIRP in response to instructions from their associated CBSDs.

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8.2 Test Set-up



Note: Measurement setup for testing on Antenna connector

8.3 Measurement Procedure

1. Set instrument center frequency to OBW center frequency.
2. Set span to at least 1.5 times the OBW.
3. Set the RBW to the specified reference bandwidth (often 1 MHz).
4. Set VBW $\geq 3 \times$ RBW.
5. Detector = RMS (power averaging).
6. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
7. Sweep time = auto couple.
8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
9. Use the peak marker function to determine the maximum amplitude level within the reference bandwidth (PSD).
10. Determine the EIRP by adding the effective antenna gain to the adjusted power level.

8.4 Measurement Result

N/A, this is an End user device.

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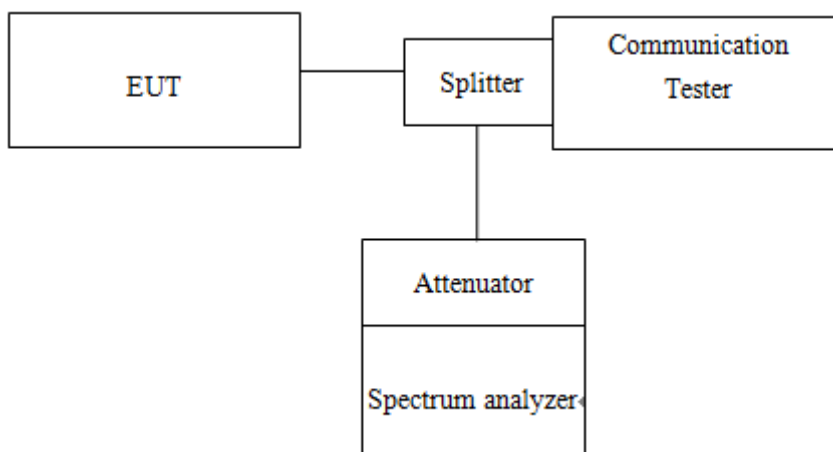
9 OCCUPIED BANDWIDTH MEASUREMENT

9.1 Standard Applicable

FCC Part 2.1049(h)

The occupied bandwidth 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.

9.2 Test Set-up



9.3 Measurement Procedure

99% & 26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1% ~ 5%, VBW ≥ 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

9.4 Measurement Result

LTE BAND 48 Channel bandwidth: 5MHz									
Freq. (MHz)	CH	99% BW (MHz)				26 dB BW (MHz)			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
3552.5	55265	4.4949	4.4809	4.4910	4.4945	5.306	5.066	5.135	4.978
3625.0	55990	4.4844	4.4839	4.4748	4.4953	4.982	5.134	4.958	5.058
3697.5	56715	4.4718	4.4730	4.4858	4.4683	5.049	5.058	5.066	5.043

LTE BAND 48 Channel bandwidth: 15MHz									
Freq. (MHz)	CH	99% BW (MHz)				26 dB BW (MHz)			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
3557.5	55315	13.4400	13.4570	13.4490	13.4770	14.710	14.870	15.890	15.090
3625.0	55990	13.3910	13.4640	13.4070	13.4760	14.360	13.960	14.370	14.070
3692.5	56665	13.3930	13.4370	13.4880	13.4640	14.210	15.330	15.360	14.310

LTE BAND 48 Channel bandwidth: 10MHz									
Freq. (MHz)	CH	99% BW (MHz)				26 dB BW (MHz)			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
3555.0	55290	8.9733	8.9800	9.0032	9.0136	10.110	10.190	10.630	10.050
3625.0	55990	8.9555	8.9355	8.9556	8.9547	9.578	9.319	9.532	9.547
3695.0	56690	8.9272	8.9891	8.9659	8.9451	9.490	9.514	9.663	9.423

LTE BAND 48 Channel bandwidth: 20MHz									
Freq. (MHz)	CH	99% BW (MHz)				26 dB BW (MHz)			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
3650.0	55340	17.9130	17.9220	17.9220	17.9300	19.540	19.510	19.610	20.160
3625.0	55990	17.9820	17.8420	17.8950	17.8590	19.180	18.700	18.650	18.820
3690.0	56640	17.9240	17.9210	17.8950	17.8670	18.770	18.660	19.020	20.160

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5G NR BAND n48_Part96 Channel bandwidth: 10MHz(3550 to 3700 MHz)											
DFT-S-OFDM_SCS 30 kHz											
Freq. (MHz)	CH	99% BW (MHz)					26 dB BW (MHz)				
		BPSK	QPSK	16QAM	64QAM	256QAM	BPSK	QPSK	16QAM	64QAM	256QAM
3555	637000	8.6137	8.6509	8.6182	8.6421	8.6033	9.8730	9.9210	10.0500	9.8660	9.7240
3625.02	641668	8.5262	8.5853	8.5443	8.5205	8.5739	9.5120	9.4380	9.3840	9.0890	9.4330
3694.98	646332	8.5409	8.5423	8.5234	8.6167	8.5574	9.5720	9.0480	9.4030	9.1730	9.1400
5G NR BAND n48_Part96 Channel bandwidth: 15MHz(3550 to 3700 MHz)											
DFT-S-OFDM_SCS 30 kHz											
Freq. (MHz)	CH	99% BW (MHz)					26 dB BW (MHz)				
		BPSK	QPSK	16QAM	64QAM	256QAM	BPSK	QPSK	16QAM	64QAM	256QAM
3557.52	637168	12.9150	12.9390	12.9330	12.9070	12.9130	14.1600	14.2400	14.3900	14.3700	14.4800
3625.02	641668	12.8100	12.9200	12.8150	12.8370	12.8870	13.6600	13.8300	13.8700	14.1000	13.4600
3692.49	646166	12.8340	12.9220	12.8650	12.9090	12.8300	13.6800	13.8200	13.6200	13.7100	14.1700
5G NR BAND n48_Part96 Channel bandwidth: 20MHz(3550 to 3700 MHz)											
DFT-S-OFDM_SCS 30 kHz											
Freq. (MHz)	CH	99% BW (MHz)					26 dB BW (MHz)				
		BPSK	QPSK	16QAM	64QAM	256QAM	BPSK	QPSK	16QAM	64QAM	256QAM
3560.01	637334	17.8650	17.9330	17.8810	17.9020	17.8790	19.4400	19.5800	19.4700	19.4700	19.4800
3625.02	641668	17.8180	17.8940	17.8130	17.8600	17.9210	18.6100	19.0000	18.6000	18.9700	19.0500
3690	646000	17.9300	17.9380	17.7710	17.9440	17.9140	18.9800	18.6900	18.9600	18.7900	18.7400

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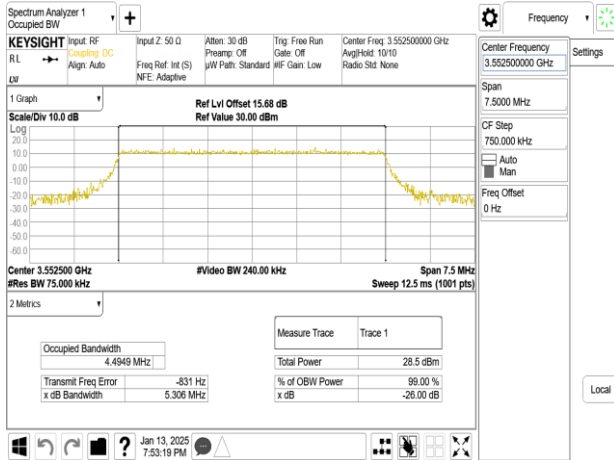
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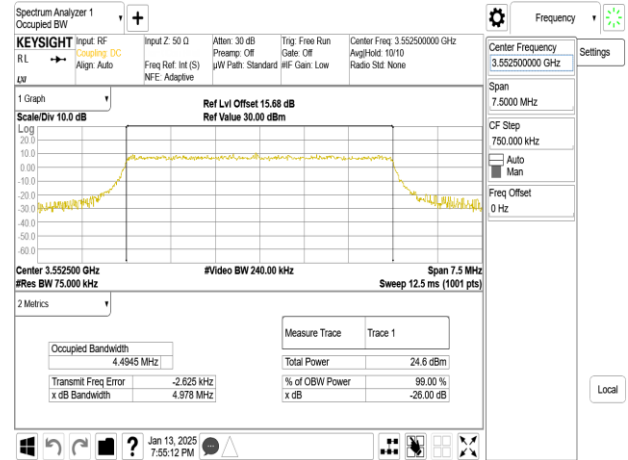
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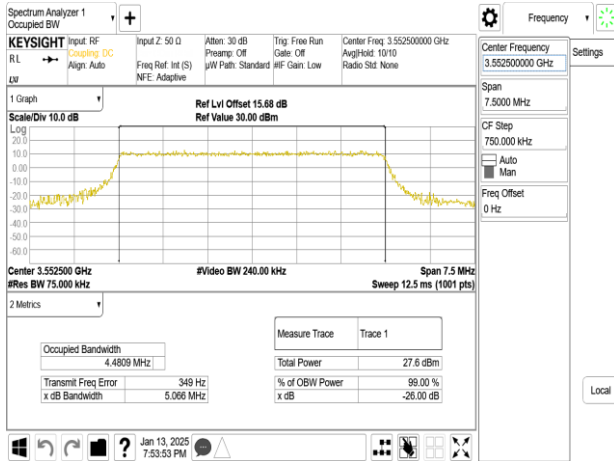
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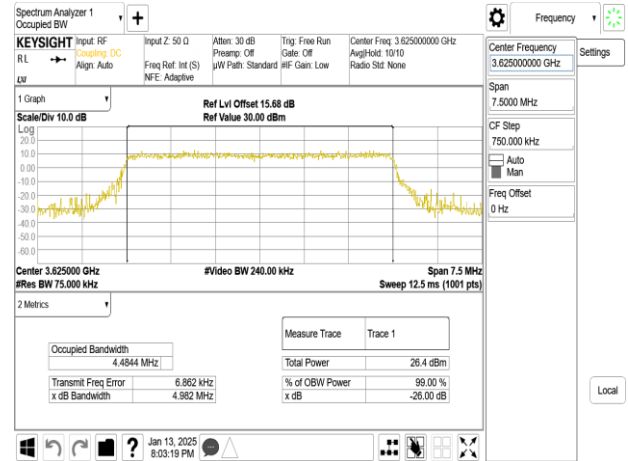
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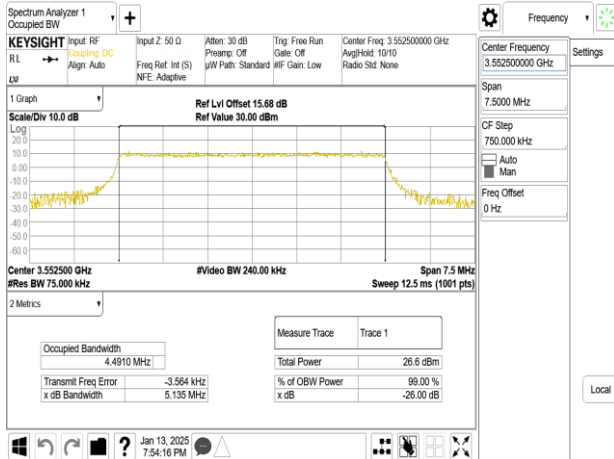
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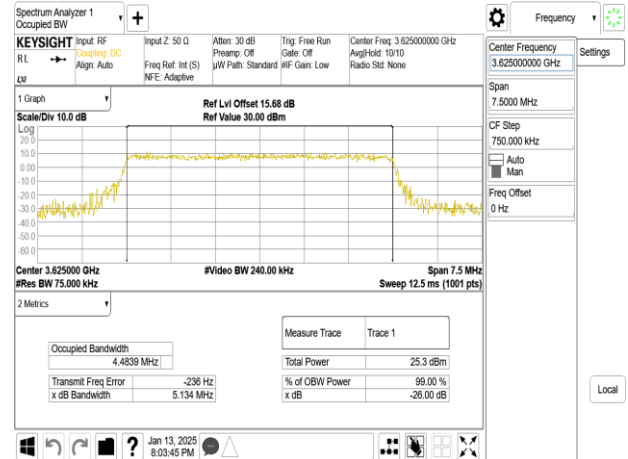
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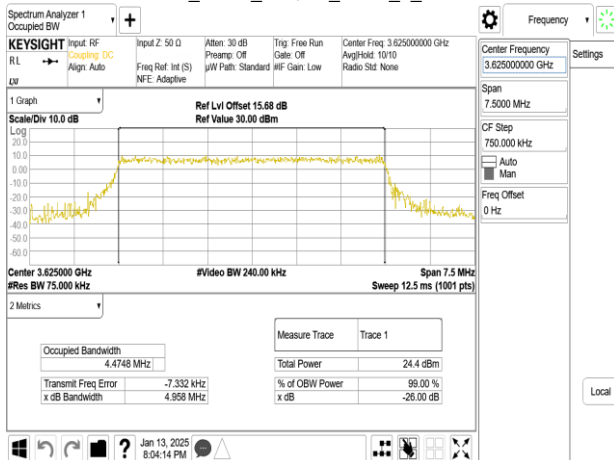


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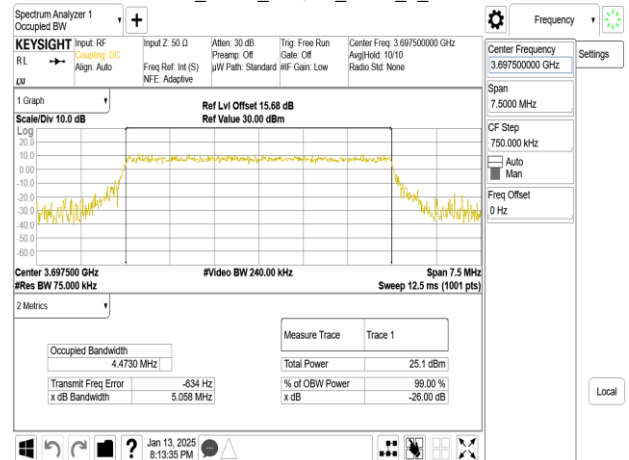
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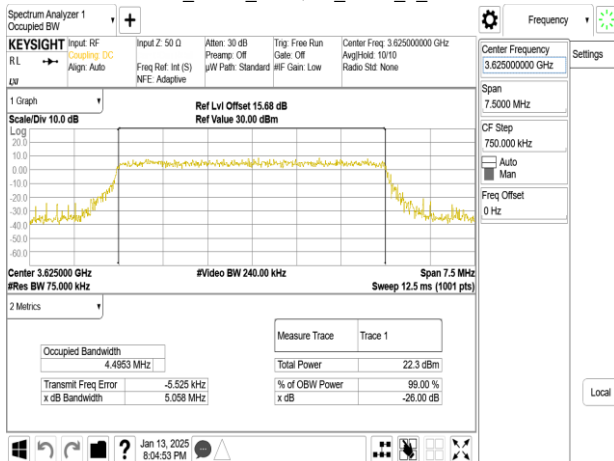
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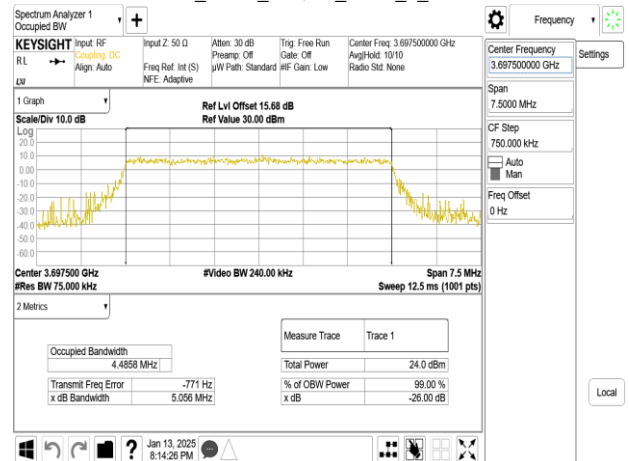
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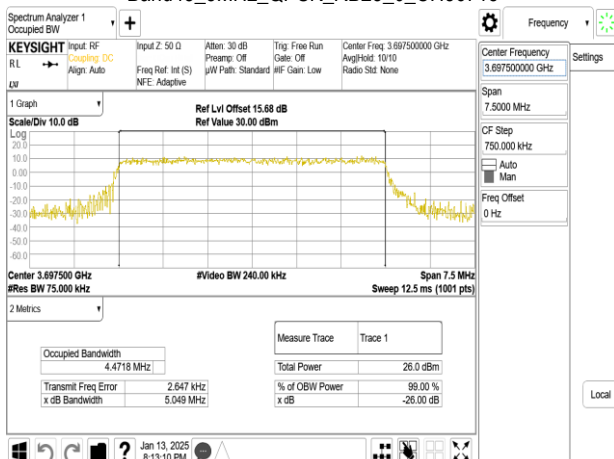
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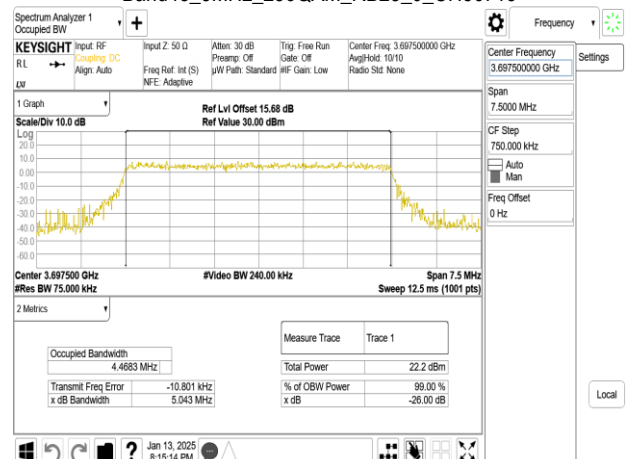
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Band48_5MHz_QPSK_RB25_0_CH56715



Band48_5MHz_256QAM_RB25_0_CH56715

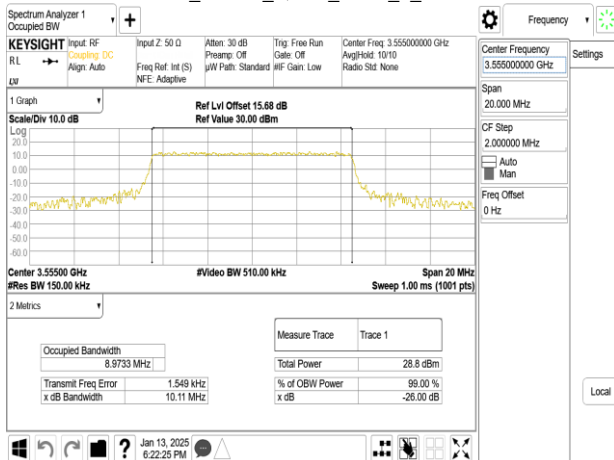


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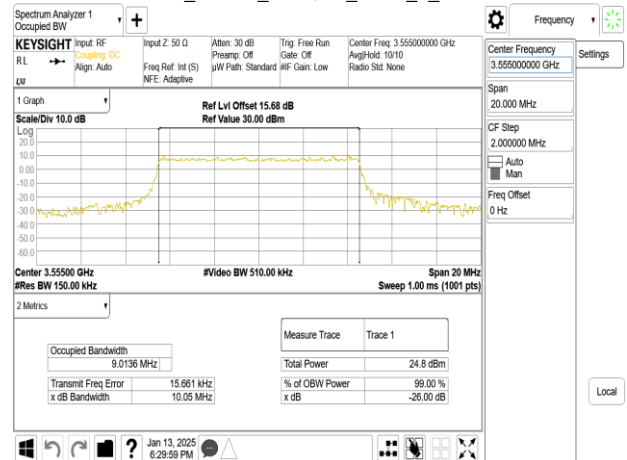
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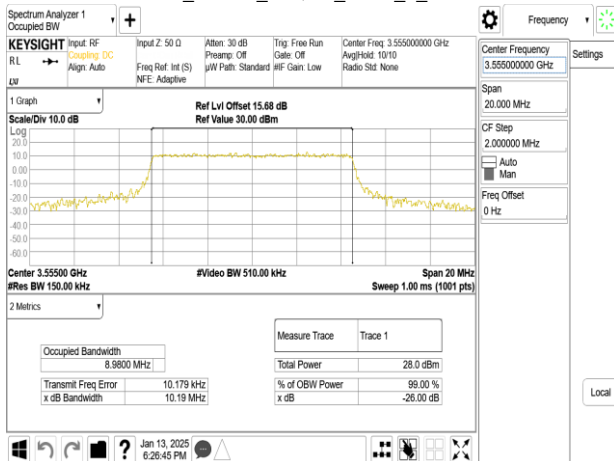
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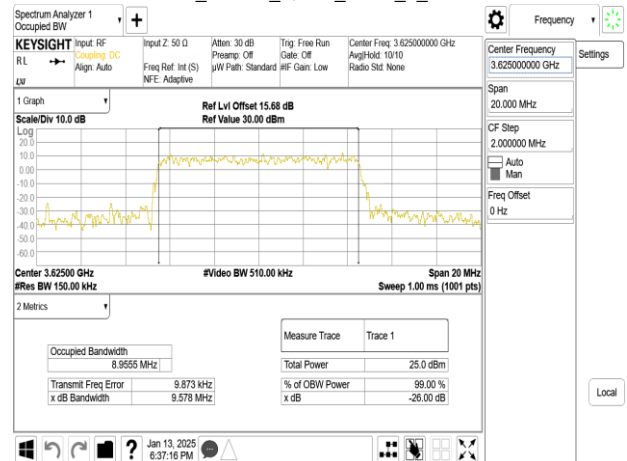
Band48_10MHz_256QAM_RB50_0_CH55290



Band48_10MHz_16QAM_RB50_0_CH55290



Band48_10MHz_QPSK_RB50_0_CH55990



Band48_10MHz_64QAM_RB50_0_CH55290



Band48_10MHz_16QAM_RB50_0_CH55990

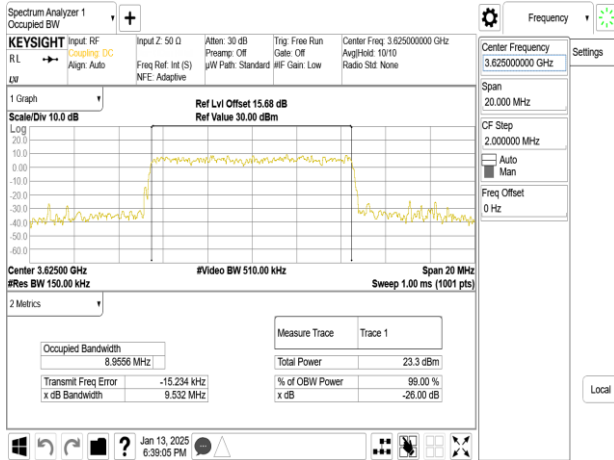


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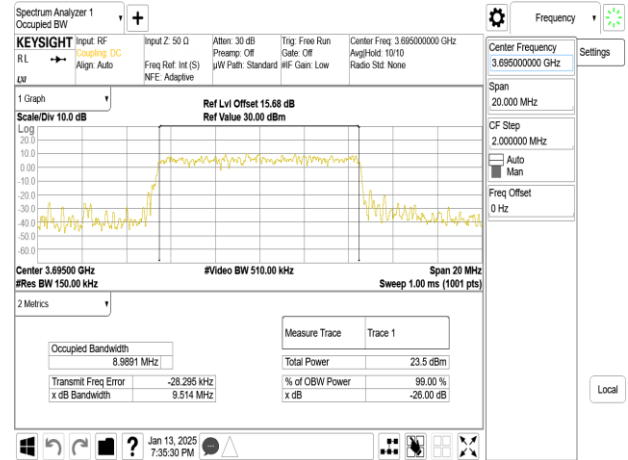
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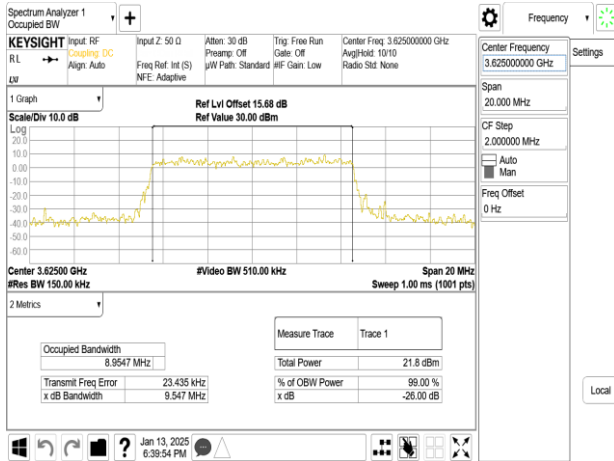
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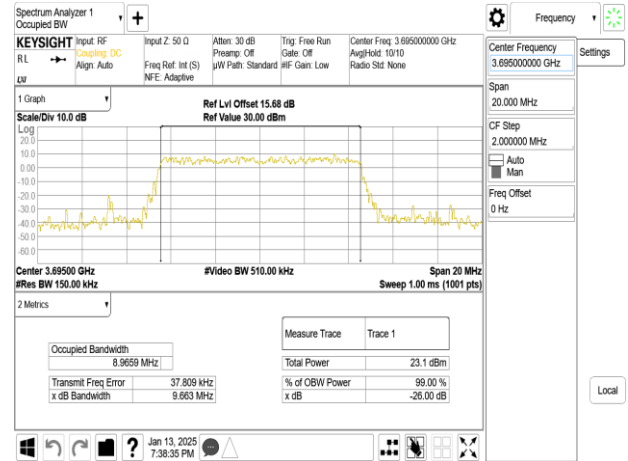
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Band48_10MHz_256QAM_RB50_0_CH55990



Band48_10MHz_64QAM_RB50_0_CH56690



Band48_10MHz_QPSK_RB50_0_CH56690



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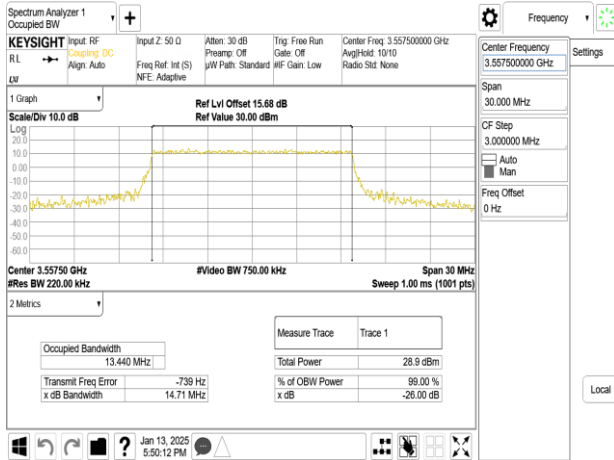


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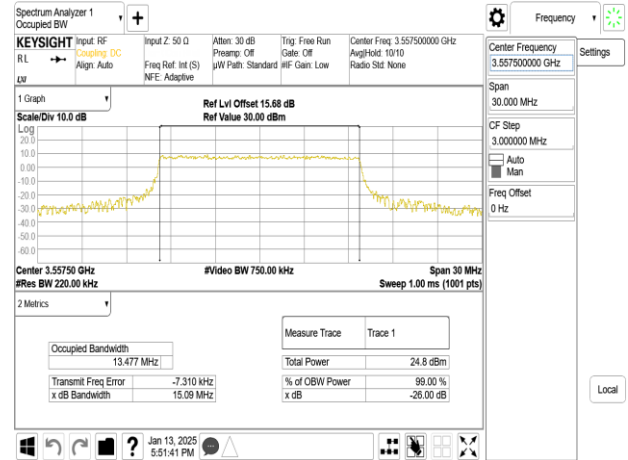
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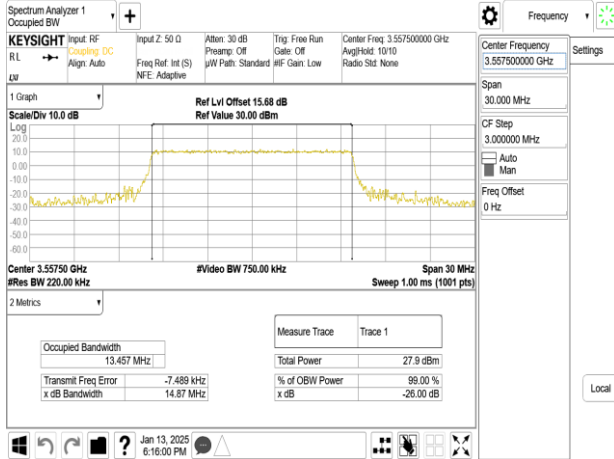
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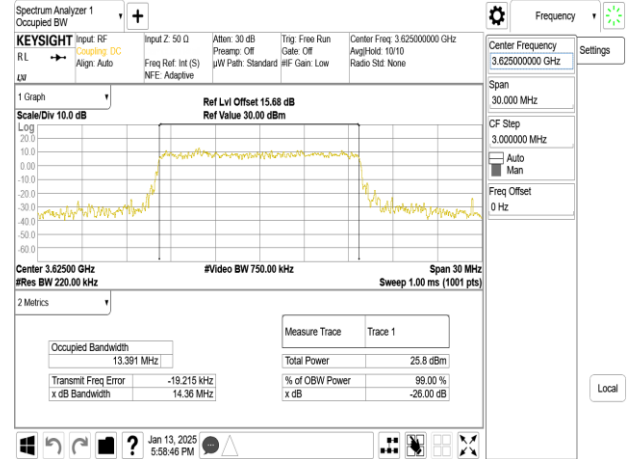
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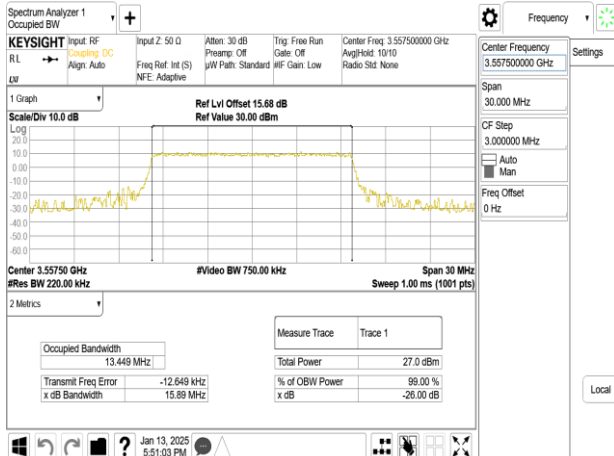
Band48_15MHz_16QAM_RB75_0_CH55315



Band48_15MHz_QPSK_RB75_0_CH55990



Band48_15MHz_64QAM_RB75_0_CH55315



Band48_15MHz_16QAM_RB75_0_CH55990

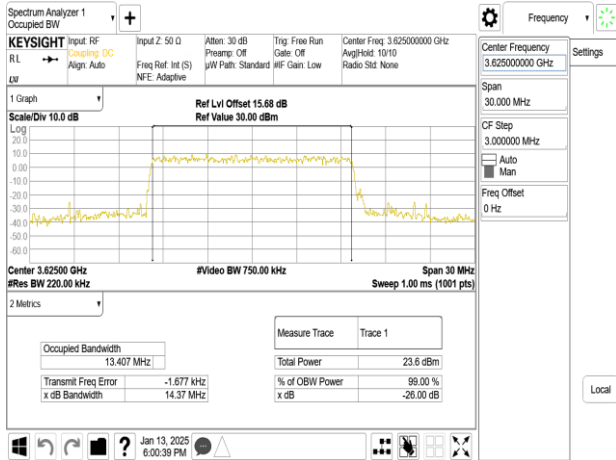


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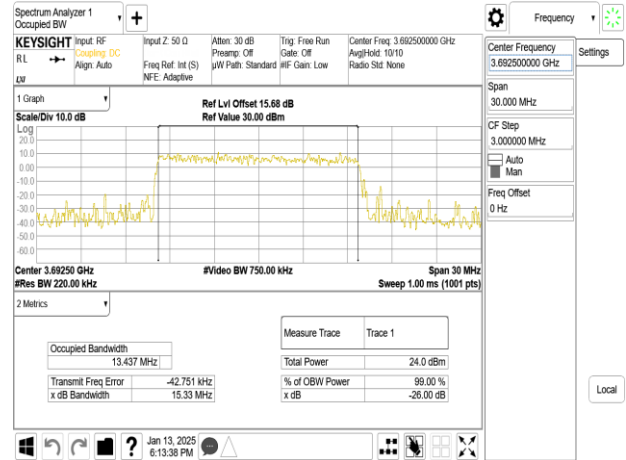
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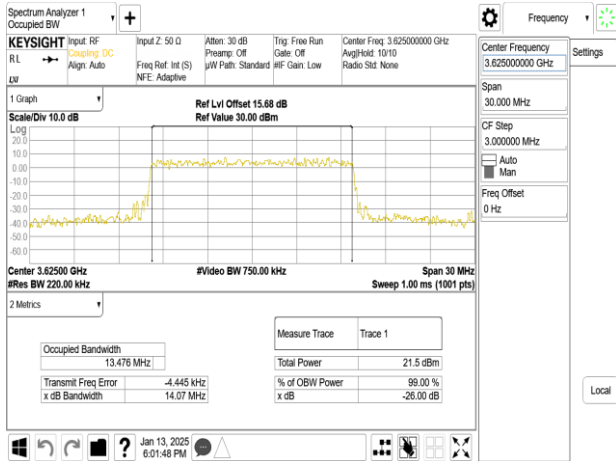
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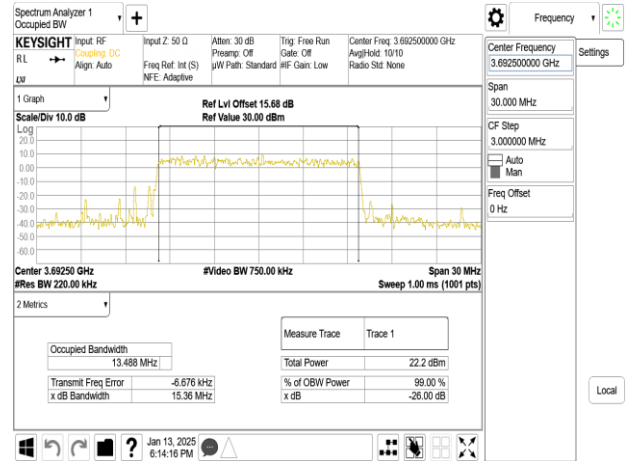
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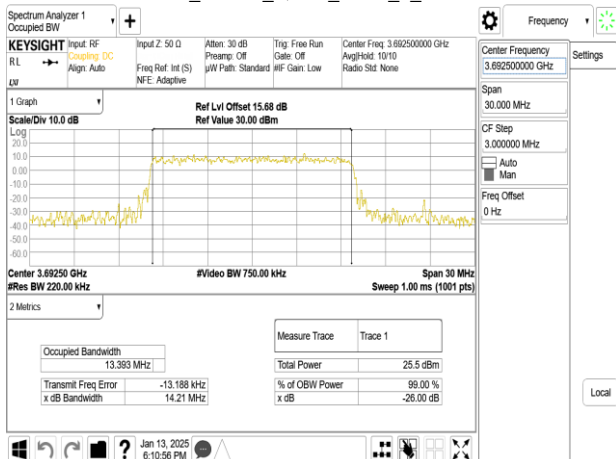
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Band48_15MHz_64QAM_RB75_0_CH56665



Band48_15MHz_QPSK_RB75_0_CH56665



Band48_15MHz_256QAM_RB75_0_CH56665

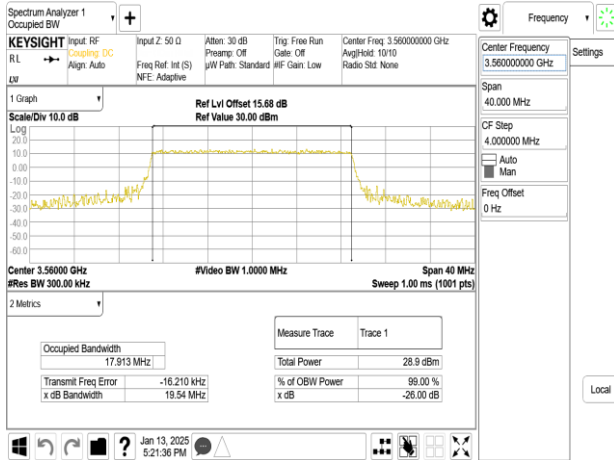


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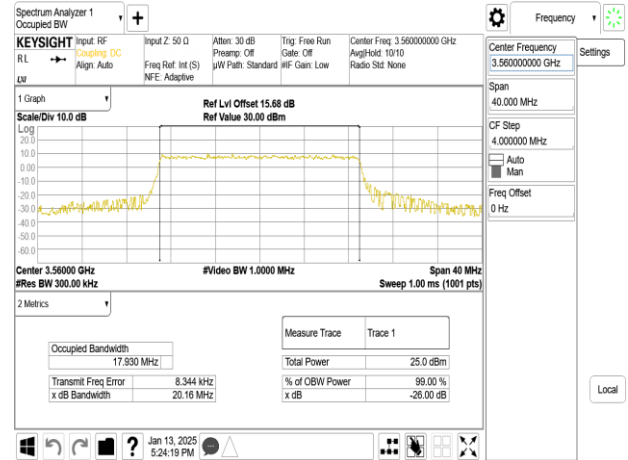
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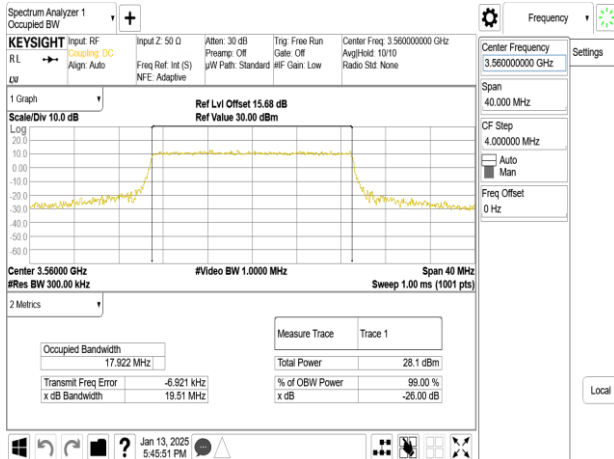
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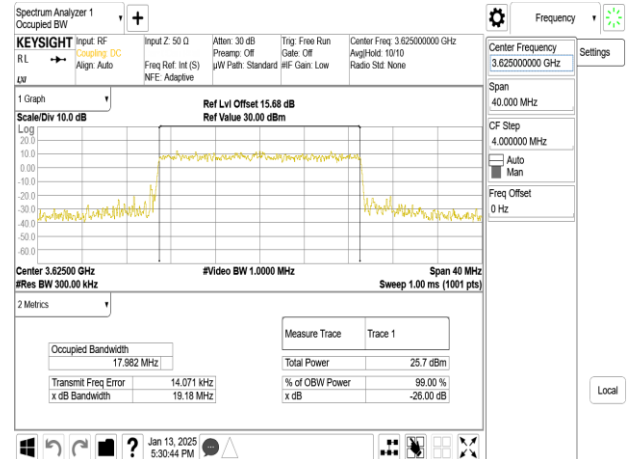
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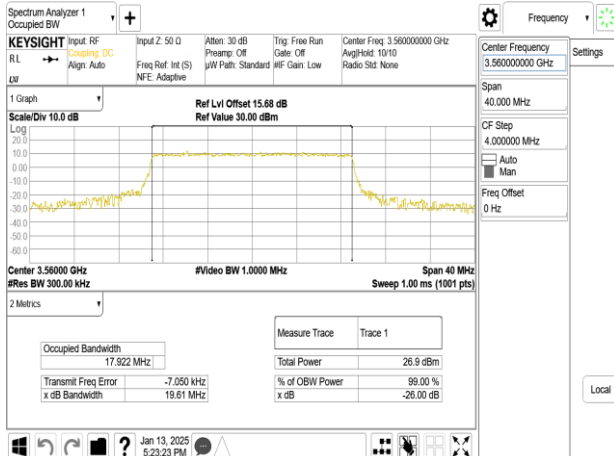
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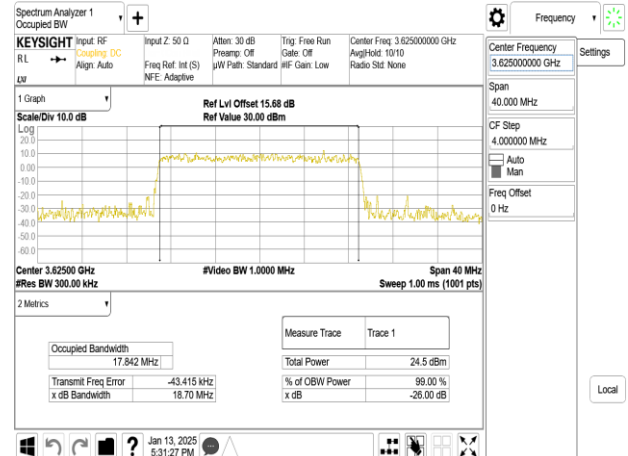
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Band48_20MHz_64QAM_RB100_0_CH55340



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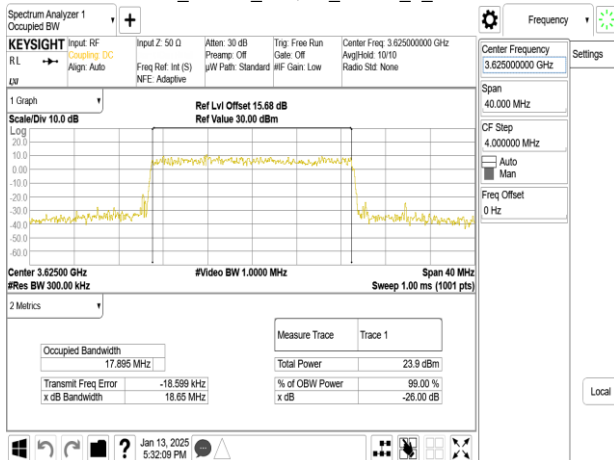


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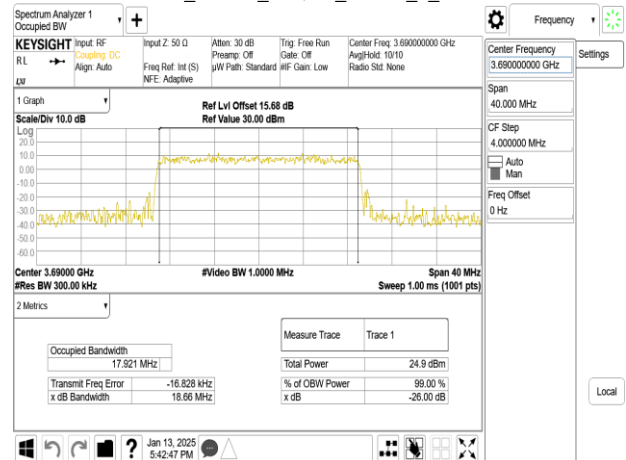
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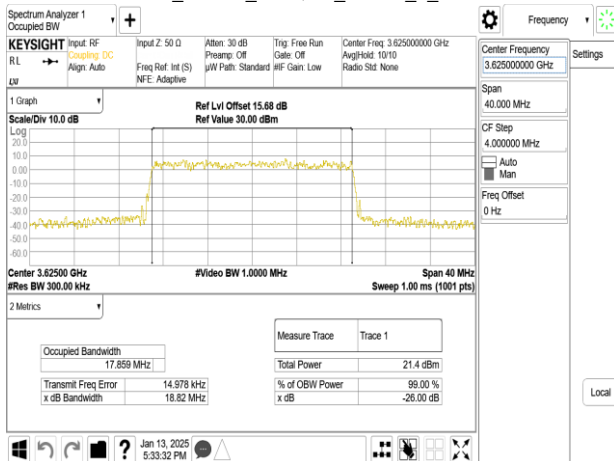
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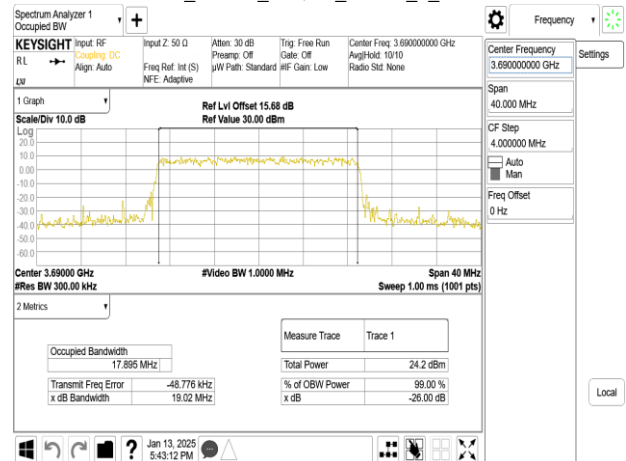
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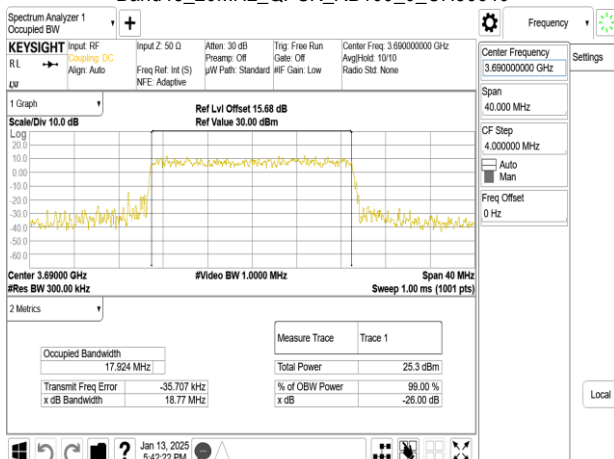
Band48_20MHz_256QAM_RB100_0_CH55990



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Band48_20MHz_QPSK_RB100_0_CH56640



Band48_20MHz_256QAM_RB100_0_CH56640

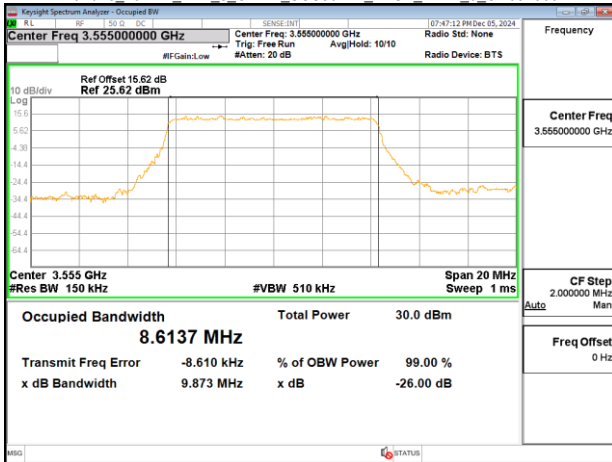


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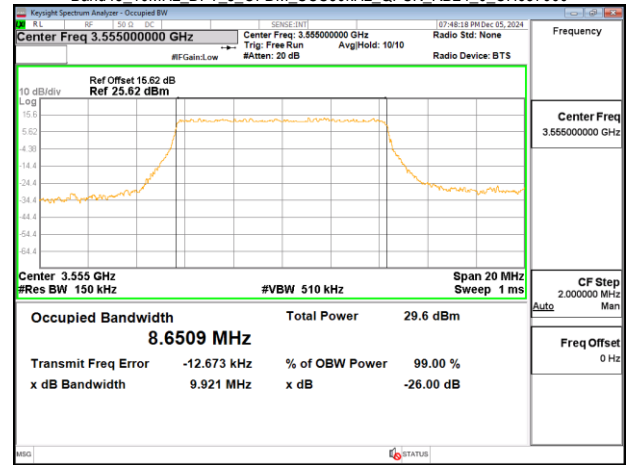
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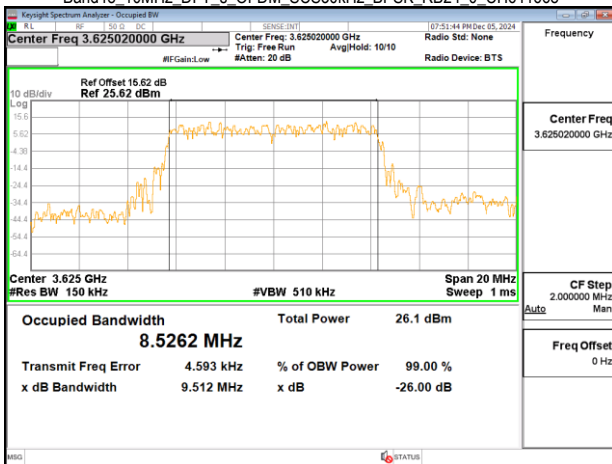
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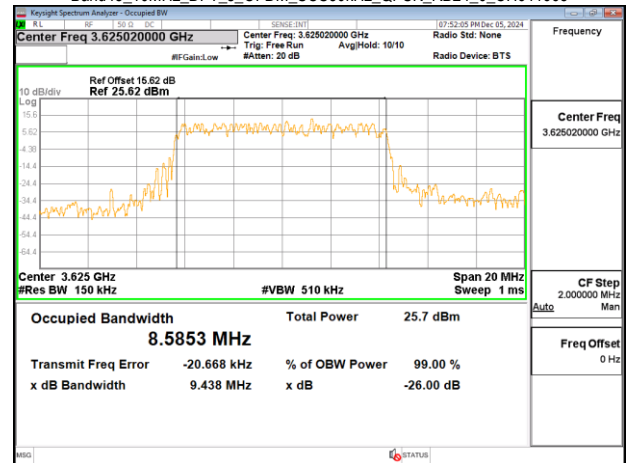
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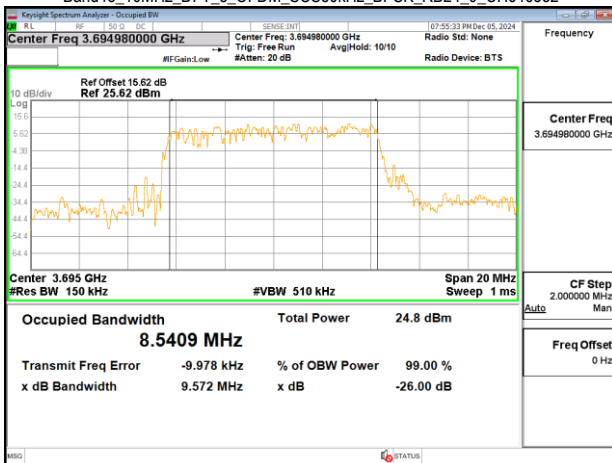
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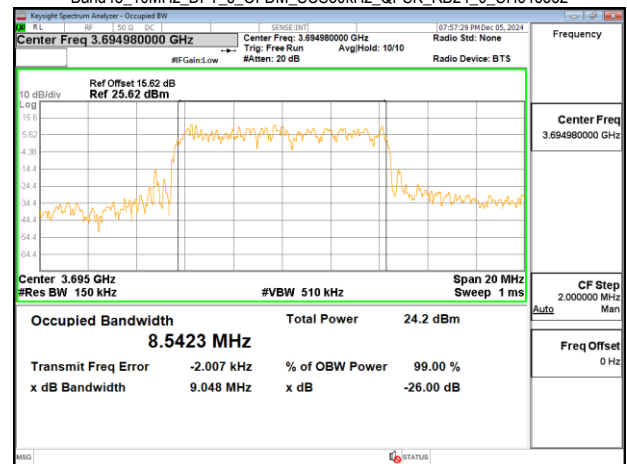
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Band48_10MHz_DFT_s_OFDM_SCS30kHz_BPSK_RB24_0_CH646332



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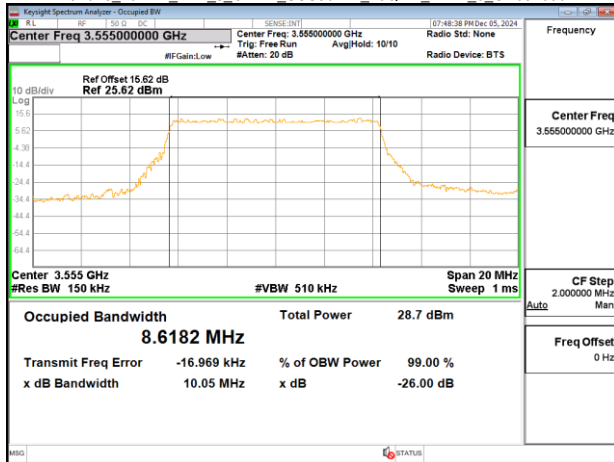


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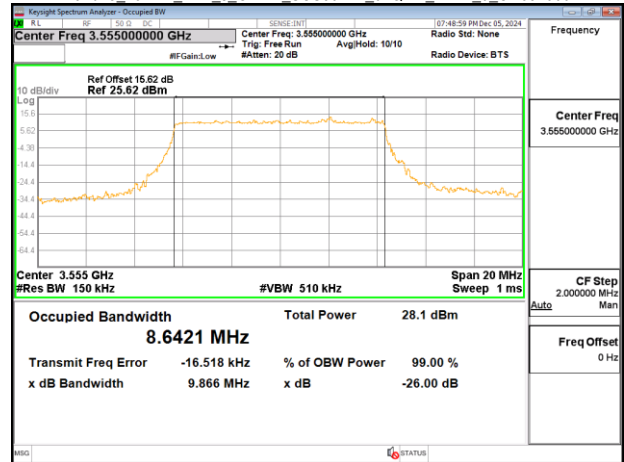
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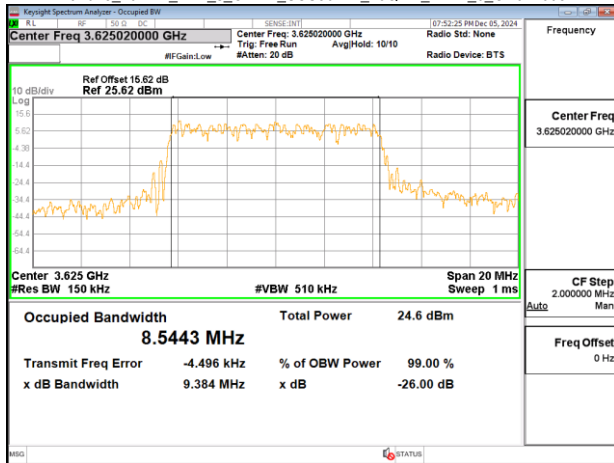
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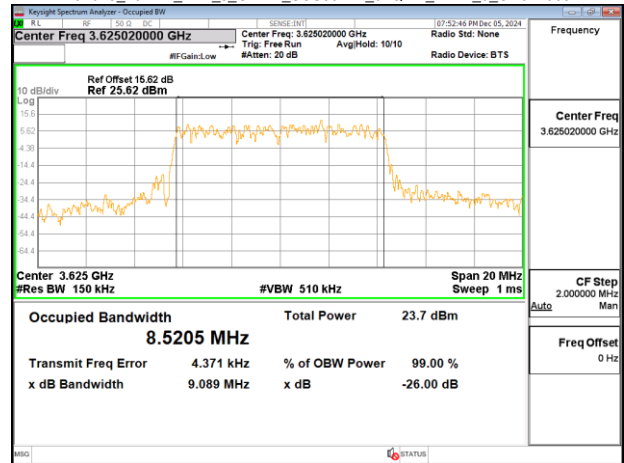
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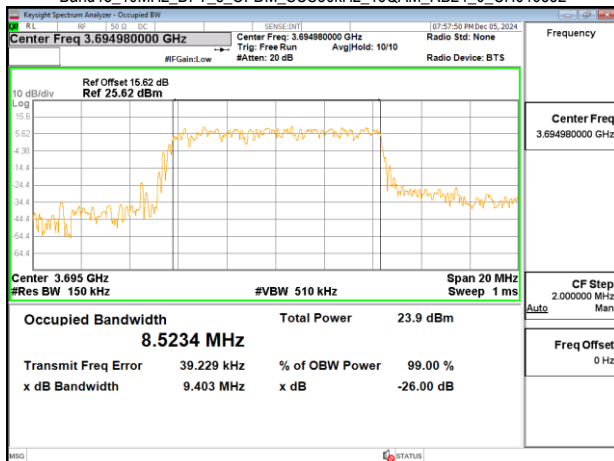
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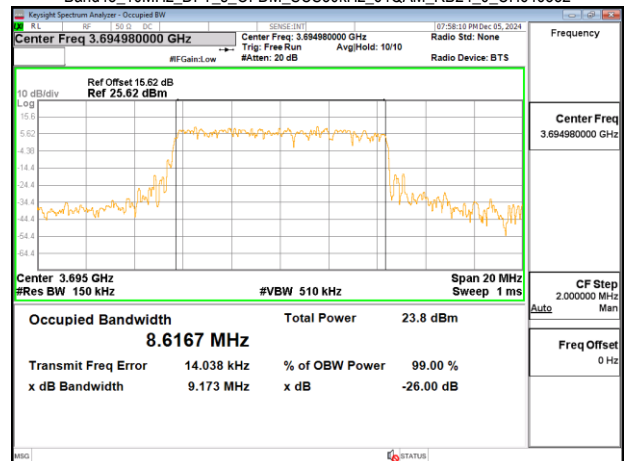
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Band48_10MHz_DFT_s_OFDM_SCS30kHz_16QAM_RB24_0_CH646332



Band48_10MHz_DFT_s_OFDM_SCS30kHz_64QAM_RB24_0_CH646332



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