

**ELECTROMAGNETIC EMISSIONS  
COMPLIANCE REPORT**

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**Product Name:** 5G Radio Module

**Brand Name:** Telit Cinterion or 

**Model No.:** FE912C04-NA

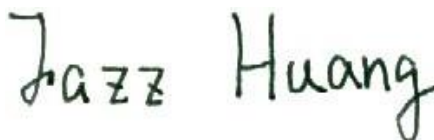
**Report Number:** TERF2411003769ER

**FCC ID** RI7FE912C04NA

**Date of EUT Received:** November 26, 2024

**Date of Test:** November 27, 2024 ~ March 27, 2025

**Issue Date:** March 27, 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
TERF2411003769ER	00	Original	March 11, 2025	Yuri Tsai	
TERF2411003769ER	01	Update test result	March 27, 2025	Yuri Tsai	*

### Note:

- 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.:	FE912C04-NA
Hardware Version:	1.00
Firmware Version:	M0V.010001
EUT Series No.:	357752690013650 / 357752690013656
Power Supply:	3.8 Vdc
Test Software (Name/Version)	Connect with callbox

### 1.2 Antenna Designation

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

LTE Band	Frequency (MHz)	Antenna Gain (dBi)	TLB Line Loss (dB)	Final Gain (dBi)
B48	3550 ~ 3700	1.51	1.1	0.41

5G NR Band	Frequency (MHz)	Antenna Gain (dBi)	TLB Line Loss (dB)	Final Gain (dBi)
n48	3550 ~ 3700	1.51	1.1	0.41

**Note:** Antenna information is provided by the applicant.

### 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

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	22.25	EIRP	0.168	4.4957	4M50G7D
				16QAM	21.60	EIRP	0.145	4.4821	4M48D7W
				64QAM	20.25	EIRP	0.106	4.4863	4M49D7W
				256QAM	17.52	EIRP	<b>0.056</b>	4.4863	4M49D7W
48	10	3555.0	3695.0	QPSK	22.37	EIRP	0.173	8.9801	8M98G7D
				16QAM	21.61	EIRP	<b>0.145</b>	8.9721	8M97D7W
				64QAM	20.55	EIRP	0.114	8.9755	8M98D7W
				256QAM	17.43	EIRP	0.055	8.9953	9M00D7W
48	15	3557.5	3692.5	QPSK	22.46	EIRP	0.176	13.4490	13M4G7D
				16QAM	21.60	EIRP	0.145	13.4430	13M4D7W
				64QAM	20.54	EIRP	0.113	13.4620	13M5D7W
				256QAM	17.50	EIRP	0.056	13.4710	13M5D7W
48	20	3560.0	3690.0	QPSK	22.52	EIRP	<b>0.179</b>	17.9650	18M0G7D
				16QAM	21.51	EIRP	0.142	17.9200	17M9D7W
				64QAM	20.57	EIRP	<b>0.114</b>	17.9710	18M0D7W
				256QAM	17.00	EIRP	0.050	17.9270	17M9D7W
LTE Band	BW	Frequency		Modulation	ERP / EIRP (dBm/10MHz)		(W)	99%	Type of Emission
48	5	3552.5	3697.5	QPSK	22.25	EIRP	0.168	4.4957	4M50G7D
				16QAM	21.60	EIRP	0.145	4.4821	4M48D7W
				64QAM	20.25	EIRP	0.106	4.4863	4M49D7W
				256QAM	17.52	EIRP	<b>0.056</b>	4.4863	4M49D7W
48	10	3555.0	3695.0	QPSK	22.37	EIRP	<b>0.173</b>	8.9801	8M98G7D
				16QAM	21.61	EIRP	<b>0.145</b>	8.9721	8M97D7W
				64QAM	20.55	EIRP	<b>0.114</b>	8.9755	8M98D7W
				256QAM	17.43	EIRP	0.055	8.9953	9M00D7W
48	15	3557.5	3692.5	QPSK	20.70	EIRP	0.117	13.4490	13M4G7D
				16QAM	19.84	EIRP	0.096	13.4430	13M4D7W
				64QAM	18.78	EIRP	0.075	13.4620	13M5D7W
				256QAM	15.74	EIRP	0.037	13.4710	13M5D7W
48	20	3560.0	3690.0	QPSK	19.51	EIRP	0.089	17.9650	18M0G7D
				16QAM	18.50	EIRP	0.071	17.9200	17M9D7W
				64QAM	17.56	EIRP	0.057	17.9710	18M0D7W
				256QAM	13.99	EIRP	0.025	17.9270	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	22.39	22.80	0.191	8.6105	8610.5	8M61G7W
			DFT-s QPSK	22.33	22.74	0.188	8.6358	8635.8	8M64G7W
			DFT-s QAM	21.24	21.65	0.146	8.6729	8672.9	8M67D7W
			CP QPSK	21.41	21.82	0.152	8.6358	8635.8	8M64G7W
			CP QAM	20.90	21.31	0.135	8.6729	8672.9	8M67D7W
15	3557.52	3692.49	DFT-s PI/2 BPSK	22.41	22.82	0.191	12.915	12915.0	12M9G7W
			DFT-s QPSK	22.39	22.80	0.191	12.963	12963.0	13M0G7W
			DFT-s QAM	21.34	21.75	0.150	12.925	12925.0	12M9D7W
			CP QPSK	21.18	21.59	0.144	12.963	12963.0	13M0G7W
			CP QAM	20.43	20.84	0.121	12.925	12925.0	12M9D7W
20	3560.01	3690	DFT-s PI/2 BPSK	22.58	22.99	0.199	17.904	17904.0	17M9G7W
			DFT-s QPSK	22.57	22.98	0.199	17.942	17942.0	17M9G7W
			DFT-s QAM	21.59	22.00	0.158	17.897	17897.0	17M9D7W
			CP QPSK	21.24	21.65	0.146	17.942	17942.0	17M9G7W
			CP QAM	20.33	20.74	0.119	17.897	17897.0	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	22.39	22.80	0.191	8.6105	8610.5	8M61G7W
			DFT-s QPSK	22.33	22.74	0.188	8.6358	8635.8	8M64G7W
			DFT-s QAM	21.24	21.65	0.146	8.6729	8672.9	8M67D7W
			CP QPSK	21.41	21.82	0.152	8.6358	8635.8	8M64G7W
			CP QAM	20.90	21.31	0.135	8.6729	8672.9	8M67D7W
15	3557.52	3692.49	DFT-s PI/2 BPSK	20.65	21.06	0.128	12.915	12915.0	12M9G7W
			DFT-s QPSK	20.63	21.04	0.127	12.963	12963.0	13M0G7W
			DFT-s QAM	19.58	19.99	0.100	12.925	12925.0	12M9D7W
			CP QPSK	19.42	19.83	0.096	12.963	12963.0	13M0G7W
			CP QAM	18.67	19.08	0.081	12.925	12925.0	12M9D7W
20	3560.01	3690	DFT-s PI/2 BPSK	19.57	19.98	0.100	17.904	17904.0	17M9G7W
			DFT-s QPSK	19.56	19.97	0.099	17.942	17942.0	17M9G7W
			DFT-s QAM	18.58	18.99	0.079	17.897	17897.0	17M9D7W
			CP QPSK	18.23	18.64	0.073	17.942	17942.0	17M9G7W
			CP QAM	17.32	17.73	0.059	17.897	17897.0	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				
<b>Note:</b> 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.				

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### 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.

## 2.5 Final Amplifier Voltage and Current Information:

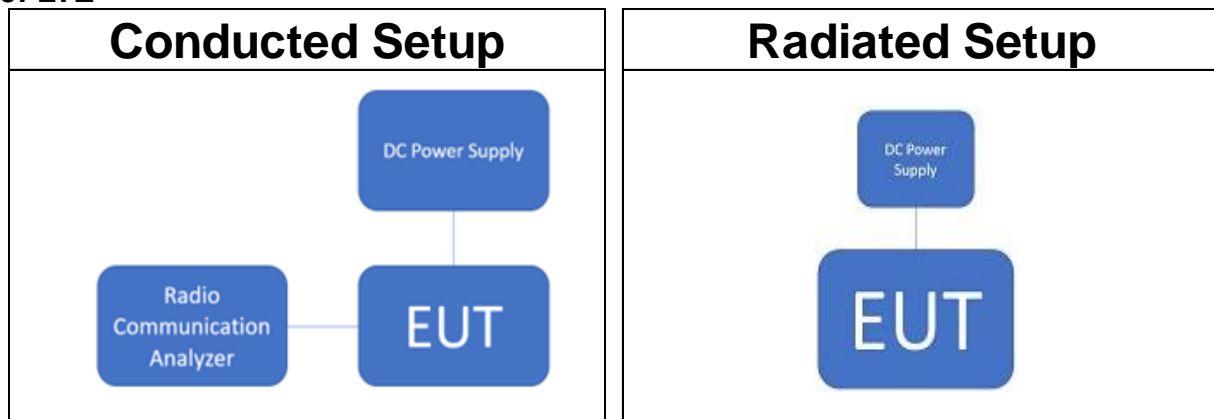
### LTE Band 48

Test Mode	DC voltage (V)	DC current (mA)
LTE Band 48_20M QPSK	3.8	200

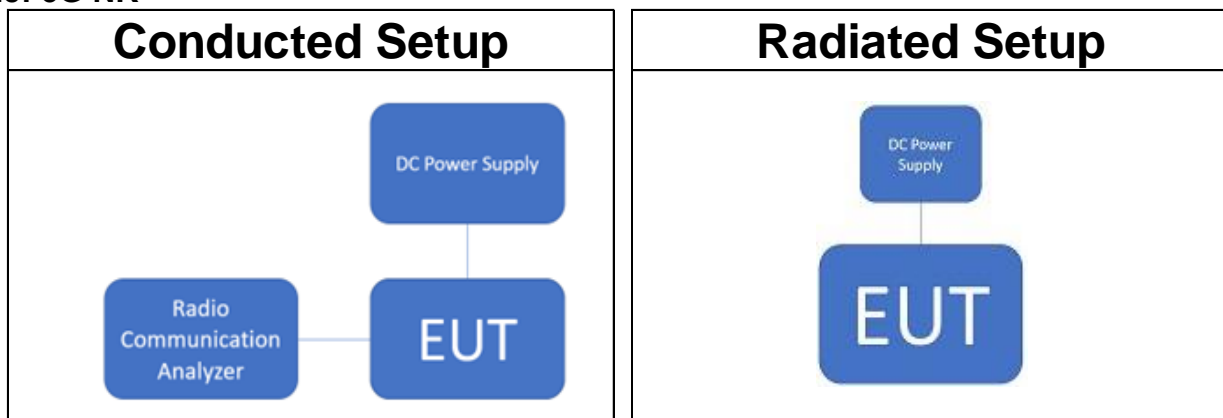
5G NR BAND n48		
CP-OFDM_SCS 30 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:10MHz Mod:256QAM	3.8	452
Bandwidth:15MHz Mod:256QAM	3.8	471
Bandwidth:20MHz Mod:256QAM	3.8	464

## 2.6 Test Configuration

Mode: LTE



Mode: 5G NR



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

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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
§96.41(g)	PEAK TO AVERAGE RATIO	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.

### 4.2 Measurement Configuration

Mode: 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	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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**Mode: 5G NR**

5G NR Band	SCS	Test Channel	Channel Bandwidth (MHz)	Modulation	Resource Block Allocation	
					RBs allocated	RB Offset
n48	30K	637334	20	DFT-s PI/2 BPSK	1	1
n48	30K	641668	20	DFT-s PI/2 BPSK	1	1
n48	30K	646000	20	DFT-s PI/2 BPSK	1	1

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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

Mode: 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	SPD-3606	GEW923151	05/16/2024	05/15/2025
DC Power Supply	Gwinstek	SPS-3610	GEV856750	08/14/2024	08/13/2025
PXA Spectrum Analyzer	Agilent	N9030A	MY53120760	04/24/2024	04/23/2025
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

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## Mode: 5G NR

Conducted Emission Test Site: Conducted 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	21	12/12/2023	12/11/2024
4G High Pass Filter	WI	WHKX4.0	21	12/11/2024	12/10/2025
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	Agilent	N9030A	MY53120760	04/24/2024	04/23/2025
PXA Spectrum Analyzer	Keysight	N9030B	MY61330494	03/22/2024	03/21/2025
PXA Spectrum Analyzer	Keysight	N9010B	MY60242392	12/24/2024	12/23/2025
Radio Communication Analyzer	KEYSIGHT	E7515B	MY59321566	02/15/2024	02/14/2025
Radio Communication Analyzer	KEYSIGHT	E7515B	MY60191250	02/17/2025	02/16/2026
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-017	12/11/2024	12/10/2025
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-017	12/12/2023	12/11/2024
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

Mode: 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	12/11/2024	12/10/2025
Attenuator	Mini-Circuits	BW-S10W2+	16	12/11/2024	12/10/2025
Band Reject Filter 3250-3750	Micro-Tronics	BRM15247	1	12/11/2024	12/10/2025
Band Reject Filter 800-1000	EWT	EWT-54-0037	M3R	12/11/2024	12/10/2025
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	185	08/15/2024	08/14/2025
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	6262044751	11/04/2024	11/03/2025
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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## Mode: 5G NR

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	12/11/2024	12/10/2025
Attenuator	Mini-Circuits	BW-S10W2+	16	12/11/2024	12/10/2025
Band Reject Filter 3300-3900	WI	WRCGV3400/3800- 3300/3900-40/12SS	1	12/11/2024	12/10/2025
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	185	08/15/2024	08/14/2025
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	MY59321561	07/11/2024	07/10/2025
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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## 7 MAXIMUM OUTPUT POWER MEASUREMENT

### 7.1 Standard Applicable

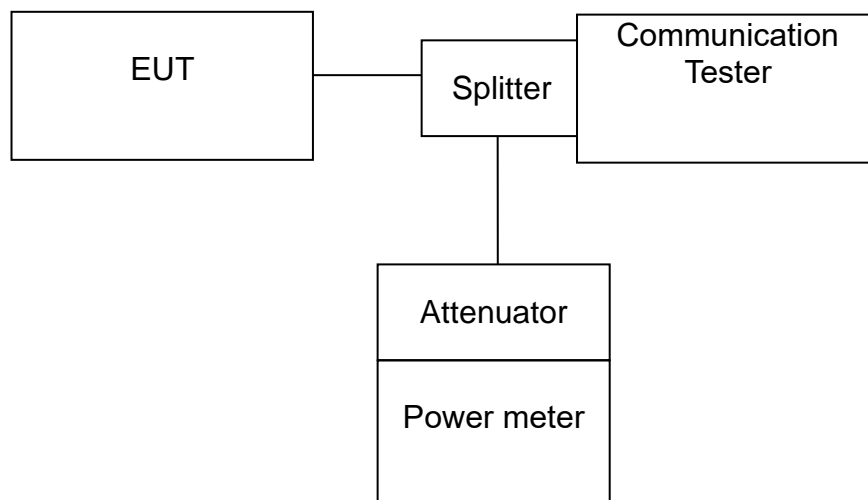
FCC §2.1046 & 96.41

- (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 <sup>1</sup>	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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## 7.4 Measurement Result:

Mode: LTE

Antenna gain (dBi)		0.41					
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	21.32	21.73
				1	24	21.31	21.72
				12	6	20.40	20.81
				25	0	20.37	20.78
	55990	3625	QPSK	1	0	21.52	21.93
				1	24	21.45	21.86
				12	6	20.55	20.96
				25	0	20.52	20.93
	56715	3697.5	QPSK	1	0	21.84	22.25
				1	24	21.82	22.23
				12	6	20.81	21.22
				25	0	20.80	21.21
5	55265	3552.5	16QAM	1	0	20.66	21.07
				1	24	20.60	21.01
				12	6	19.47	19.88
				25	0	19.42	19.83
	55990	3625	16QAM	1	0	20.57	20.98
				1	24	20.57	20.98
				12	6	19.55	19.96
				25	0	19.53	19.94
	56715	3697.5	16QAM	1	0	21.19	21.60
				1	24	21.18	21.59
				12	6	19.89	20.30
				25	0	19.85	20.26
5	55265	3552.5	64QAM	1	0	19.45	19.86
				1	24	19.48	19.89
				12	6	18.42	18.83
				25	0	18.39	18.80
	55990	3625	64QAM	1	0	19.84	20.25
				1	24	19.59	20.00
				12	6	18.55	18.96
				25	0	18.57	18.98
	56715	3697.5	64QAM	1	0	19.70	20.11
				1	24	19.70	20.11
				12	6	18.88	19.29
				25	0	18.89	19.30
5	55265	3552.5	256QAM	1	0	16.52	16.93
				1	24	16.46	16.87
				12	6	16.42	16.83
				25	0	16.37	16.78
	55990	3625	256QAM	1	0	16.73	17.14
				1	24	16.70	17.11
				12	6	16.56	16.97
				25	0	16.53	16.94
	56715	3697.5	256QAM	1	0	17.11	17.52
				1	24	17.01	17.42
				12	6	16.93	17.34
				25	0	16.90	17.31

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Antenna gain (dBi)		0.41					
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	21.33	21.74
				1	49	21.19	21.60
				25	12	20.42	20.83
				50	0	20.39	20.80
	55990	3625	QPSK	1	0	21.57	21.98
				1	49	21.51	21.92
				25	12	20.53	20.94
				50	0	20.55	20.96
	56690	3695	QPSK	1	0	21.96	22.37
				1	49	21.93	22.34
				25	12	20.88	21.29
				50	0	20.92	21.33
10	55290	3555	16QAM	1	0	20.72	21.13
				1	49	20.71	21.12
				25	12	19.44	19.85
				50	0	19.41	19.82
	55990	3625	16QAM	1	0	20.85	21.26
				1	49	20.95	21.36
				25	12	19.55	19.96
				50	0	19.56	19.97
	56690	3695	16QAM	1	0	21.20	21.61
				1	49	21.19	21.60
				25	12	20.04	20.45
				50	0	19.85	20.26
10	55290	3555	64QAM	1	0	19.61	20.02
				1	49	19.31	19.72
				25	12	18.45	18.86
				50	0	18.45	18.86
	55990	3625	64QAM	1	0	19.97	20.38
				1	49	19.84	20.25
				25	12	18.61	19.02
				50	0	18.54	18.95
	56690	3695	64QAM	1	0	20.14	20.55
				1	49	20.13	20.54
				25	12	19.04	19.45
				50	0	18.86	19.27
10	55290	3555	256QAM	1	0	16.39	16.80
				1	49	16.36	16.77
				25	12	16.40	16.81
				50	0	16.38	16.79
	55990	3625	256QAM	1	0	16.66	17.07
				1	49	16.58	16.99
				25	12	16.58	16.99
				50	0	16.54	16.95
	56690	3695	256QAM	1	0	17.02	17.43
				1	49	17.01	17.42
				25	12	17.00	17.41
				50	0	16.96	17.37

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Antenna gain (dBi)		0.41					
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	21.55	21.96
				1	74	21.40	21.81
				36	18	20.43	20.84
				75	0	20.39	20.80
	55990	3625	QPSK	1	0	21.82	22.23
				1	74	21.67	22.08
				36	18	20.60	21.01
				75	0	20.56	20.97
	56665	3692.5	QPSK	1	0	22.05	22.46
				1	74	22.02	22.43
				36	18	21.08	21.49
				75	0	20.84	21.25
15	55315	3557.5	16QAM	1	0	20.49	20.90
				1	74	20.57	20.98
				36	18	19.42	19.83
				75	0	19.38	19.79
	55990	3625	16QAM	1	0	20.75	21.16
				1	74	20.73	21.14
				36	18	19.61	20.02
				75	0	19.55	19.96
	56665	3692.5	16QAM	1	0	21.19	21.60
				1	74	21.18	21.59
				36	18	19.94	20.35
				75	0	19.89	20.30
15	55315	3557.5	64QAM	1	0	19.44	19.85
				1	74	19.35	19.76
				36	18	18.44	18.85
				75	0	18.34	18.75
	55990	3625	64QAM	1	0	19.72	20.13
				1	74	19.63	20.04
				36	18	18.60	19.01
				75	0	18.60	19.01
	56665	3692.5	64QAM	1	0	20.13	20.54
				1	74	20.01	20.42
				36	18	19.00	19.41
				75	0	18.97	19.38
15	55315	3557.5	256QAM	1	0	16.43	16.84
				1	74	16.29	16.70
				36	18	16.38	16.79
				75	0	16.39	16.80
	55990	3625	256QAM	1	0	16.80	17.21
				1	74	16.60	17.01
				36	18	16.60	17.01
				75	0	16.55	16.96
	56665	3692.5	256QAM	1	0	17.09	17.50
				1	74	16.96	17.37
				36	18	17.02	17.43
				75	0	16.94	17.35

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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	21.58	21.99
				1	99	21.27	21.68
				50	25	20.37	20.78
				100	0	20.31	20.72
	55990	3625	QPSK	1	0	21.86	22.27
				1	99	21.80	22.21
				50	25	20.63	21.04
				100	0	20.50	20.91
	56640	3690	QPSK	1	0	22.11	22.52
				1	99	22.08	22.49
				50	25	21.04	21.45
				100	0	20.95	21.36
20	55340	3560	16QAM	1	0	20.60	21.01
				1	99	20.21	20.62
				50	25	19.42	19.83
				100	0	19.34	19.75
	55990	3625	16QAM	1	0	20.69	21.10
				1	99	20.74	21.15
				50	25	19.62	20.03
				100	0	19.54	19.95
	56640	3690	16QAM	1	0	21.10	21.51
				1	99	21.09	21.50
				50	25	20.08	20.49
				100	0	20.02	20.43
20	55340	3560	64QAM	1	0	19.54	19.95
				1	99	19.42	19.83
				50	25	18.43	18.84
				100	0	18.29	18.70
	55990	3625	64QAM	1	0	19.79	20.20
				1	99	19.74	20.15
				50	25	18.63	19.04
				100	0	18.50	18.91
	56640	3690	64QAM	1	0	20.16	20.57
				1	99	20.15	20.56
				50	25	19.07	19.48
				100	0	18.97	19.38
20	55340	3560	256QAM	1	0	16.41	16.82
				1	99	16.02	16.43
				50	25	16.37	16.78
				100	0	16.34	16.75
	55990	3625	256QAM	1	0	16.59	17.00
				1	99	16.42	16.83
				50	25	16.58	16.99
				100	0	16.52	16.93
	56640	3690	256QAM	1	0	16.26	16.67
				1	99	16.43	16.84
				50	25	16.37	16.78
				100	0	16.41	16.82

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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)
5	55265	3552.5	QPSK	1	0	21.32	21.73	23	-1.27
				1	24	21.31	21.72	23	-1.28
				12	6	20.40	20.81	23	-2.19
				25	0	20.37	20.78	23	-2.22
	55990	3625	QPSK	1	0	21.52	21.93	23	-1.07
				1	24	21.45	21.86	23	-1.14
				12	6	20.55	20.96	23	-2.04
				25	0	20.52	20.93	23	-2.07
	56715	3697.5	QPSK	1	0	21.84	22.25	23	-0.75
				1	24	21.82	22.23	23	-0.77
				12	6	20.81	21.22	23	-1.78
				25	0	20.80	21.21	23	-1.79
5	55265	3552.5	16QAM	1	0	20.66	21.07	23	-1.93
				1	24	20.60	21.01	23	-1.99
				12	6	19.47	19.88	23	-3.12
				25	0	19.42	19.83	23	-3.17
	55990	3625	16QAM	1	0	20.57	20.98	23	-2.02
				1	24	20.57	20.98	23	-2.02
				12	6	19.55	19.96	23	-3.04
				25	0	19.53	19.94	23	-3.06
	56715	3697.5	16QAM	1	0	21.19	21.60	23	-1.4
				1	24	21.18	21.59	23	-1.41
				12	6	19.89	20.30	23	-2.7
				25	0	19.85	20.26	23	-2.74
5	55265	3552.5	64QAM	1	0	19.45	19.86	23	-3.14
				1	24	19.48	19.89	23	-3.11
				12	6	18.42	18.83	23	-4.17
				25	0	18.39	18.80	23	-4.2
	55990	3625	64QAM	1	0	19.84	20.25	23	-2.75
				1	24	19.59	20.00	23	-3
				12	6	18.55	18.96	23	-4.04
				25	0	18.57	18.98	23	-4.02
	56715	3697.5	64QAM	1	0	19.70	20.11	23	-2.89
				1	24	19.70	20.11	23	-2.89
				12	6	18.88	19.29	23	-3.71
				25	0	18.89	19.30	23	-3.7
5	55265	3552.5	256QAM	1	0	16.52	16.93	23	-6.07
				1	24	16.46	16.87	23	-6.13
				12	6	16.42	16.83	23	-6.17
				25	0	16.37	16.78	23	-6.22
	55990	3625	256QAM	1	0	16.73	17.14	23	-5.86
				1	24	16.70	17.11	23	-5.89
				12	6	16.56	16.97	23	-6.03
				25	0	16.53	16.94	23	-6.06
	56715	3697.5	256QAM	1	0	17.11	17.52	23	-5.48
				1	24	17.01	17.42	23	-5.58
				12	6	16.93	17.34	23	-5.66
				25	0	16.90	17.31	23	-5.69

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Antenna gain (dBi)		0.41							
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	21.33	21.74	23	-1.26
				1	49	21.19	21.60	23	-1.4
				25	12	20.42	20.83	23	-2.17
				50	0	20.39	20.80	23	-2.2
	55990	3625	QPSK	1	0	21.57	21.98	23	-1.02
				1	49	21.51	21.92	23	-1.08
				25	12	20.53	20.94	23	-2.06
				50	0	20.55	20.96	23	-2.04
	56690	3695	QPSK	1	0	21.96	22.37	23	-0.63
				1	49	21.93	22.34	23	-0.66
				25	12	20.88	21.29	23	-1.71
				50	0	20.92	21.33	23	-1.67
10	55290	3555	16QAM	1	0	20.72	21.13	23	-1.87
				1	49	20.71	21.12	23	-1.88
				25	12	19.44	19.85	23	-3.15
				50	0	19.41	19.82	23	-3.18
	55990	3625	16QAM	1	0	20.85	21.26	23	-1.74
				1	49	20.95	21.36	23	-1.64
				25	12	19.55	19.96	23	-3.04
				50	0	19.56	19.97	23	-3.03
	56690	3695	16QAM	1	0	21.20	21.61	23	-1.39
				1	49	21.19	21.60	23	-1.4
				25	12	20.04	20.45	23	-2.55
				50	0	19.85	20.26	23	-2.74
10	55290	3555	64QAM	1	0	19.61	20.02	23	-2.98
				1	49	19.31	19.72	23	-3.28
				25	12	18.45	18.86	23	-4.14
				50	0	18.45	18.86	23	-4.14
	55990	3625	64QAM	1	0	19.97	20.38	23	-2.62
				1	49	19.84	20.25	23	-2.75
				25	12	18.61	19.02	23	-3.98
				50	0	18.54	18.95	23	-4.05
	56690	3695	64QAM	1	0	20.14	20.55	23	-2.45
				1	49	20.13	20.54	23	-2.46
				25	12	19.04	19.45	23	-3.55
				50	0	18.86	19.27	23	-3.73
10	55290	3555	256QAM	1	0	16.39	16.80	23	-6.2
				1	49	16.36	16.77	23	-6.23
				25	12	16.40	16.81	23	-6.19
				50	0	16.38	16.79	23	-6.21
	55990	3625	256QAM	1	0	16.66	17.07	23	-5.93
				1	49	16.58	16.99	23	-6.01
				25	12	16.58	16.99	23	-6.01
				50	0	16.54	16.95	23	-6.05
	56690	3695	256QAM	1	0	17.02	17.43	23	-5.57
				1	49	17.01	17.42	23	-5.58
				25	12	17.00	17.41	23	-5.59
				50	0	16.96	17.37	23	-5.63

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Antenna gain (dBi)		0.41							
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)
15	55315	3557.5	QPSK	1	0	19.79	20.20	23	-2.80
				1	74	19.64	20.05	23	-2.95
				36	18	18.67	19.08	23	-3.92
				75	0	18.63	19.04	23	-3.96
	55990	3625	QPSK	1	0	20.06	20.47	23	-2.53
				1	74	19.91	20.32	23	-2.68
				36	18	18.84	19.25	23	-3.75
				75	0	18.80	19.21	23	-3.79
	56665	3692.5	QPSK	1	0	20.29	20.70	23	-2.30
				1	74	20.26	20.67	23	-2.33
				36	18	19.32	19.73	23	-3.27
				75	0	19.08	19.49	23	-3.51
15	55315	3557.5	16QAM	1	0	18.73	19.14	23	-3.86
				1	74	18.81	19.22	23	-3.78
				36	18	17.66	18.07	23	-4.93
				75	0	17.62	18.03	23	-4.97
	55990	3625	16QAM	1	0	18.99	19.40	23	-3.60
				1	74	18.97	19.38	23	-3.62
				36	18	17.85	18.26	23	-4.74
				75	0	17.79	18.20	23	-4.80
	56665	3692.5	16QAM	1	0	19.43	19.84	23	-3.16
				1	74	19.42	19.83	23	-3.17
				36	18	18.18	18.59	23	-4.41
				75	0	18.13	18.54	23	-4.46
15	55315	3557.5	64QAM	1	0	17.68	18.09	23	-4.91
				1	74	17.59	18.00	23	-5.00
				36	18	16.68	17.09	23	-5.91
				75	0	16.58	16.99	23	-6.01
	55990	3625	64QAM	1	0	17.96	18.37	23	-4.63
				1	74	17.87	18.28	23	-4.72
				36	18	16.84	17.25	23	-5.75
				75	0	16.84	17.25	23	-5.75
	56665	3692.5	64QAM	1	0	18.37	18.78	23	-4.22
				1	74	18.25	18.66	23	-4.34
				36	18	17.24	17.65	23	-5.35
				75	0	17.21	17.62	23	-5.38
15	55315	3557.5	256QAM	1	0	14.67	15.08	23	-7.92
				1	74	14.53	14.94	23	-8.06
				36	18	14.62	15.03	23	-7.97
				75	0	14.63	15.04	23	-7.96
	55990	3625	256QAM	1	0	15.04	15.45	23	-7.55
				1	74	14.84	15.25	23	-7.75
				36	18	14.84	15.25	23	-7.75
				75	0	14.79	15.20	23	-7.80
	56665	3692.5	256QAM	1	0	15.33	15.74	23	-7.26
				1	74	15.20	15.61	23	-7.39
				36	18	15.26	15.67	23	-7.33
				75	0	15.18	15.59	23	-7.41

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Antenna gain (dBi)		0.41							
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)
20	55340	3560	QPSK	1	0	18.57	18.98	23	-4.02
				1	99	18.26	18.67	23	-4.33
				50	25	17.36	17.77	23	-5.23
				100	0	17.30	17.71	23	-5.29
	55990	3625	QPSK	1	0	18.85	19.26	23	-3.74
				1	99	18.79	19.20	23	-3.80
				50	25	17.62	18.03	23	-4.97
				100	0	17.49	17.90	23	-5.10
	56640	3690	QPSK	1	0	19.10	19.51	23	-3.49
				1	99	19.07	19.48	23	-3.52
				50	25	18.03	18.44	23	-4.56
				100	0	17.94	18.35	23	-4.65
20	55340	3560	16QAM	1	0	17.59	18.00	23	-5.00
				1	99	17.20	17.61	23	-5.39
				50	25	16.41	16.82	23	-6.18
				100	0	16.33	16.74	23	-6.26
	55990	3625	16QAM	1	0	17.68	18.09	23	-4.91
				1	99	17.73	18.14	23	-4.86
				50	25	16.61	17.02	23	-5.98
				100	0	16.53	16.94	23	-6.06
	56640	3690	16QAM	1	0	18.09	18.50	23	-4.50
				1	99	18.08	18.49	23	-4.51
				50	25	17.07	17.48	23	-5.52
				100	0	17.01	17.42	23	-5.58
20	55340	3560	64QAM	1	0	16.53	16.94	23	-6.06
				1	99	16.41	16.82	23	-6.18
				50	25	15.42	15.83	23	-7.17
				100	0	15.28	15.69	23	-7.31
	55990	3625	64QAM	1	0	16.78	17.19	23	-5.81
				1	99	16.73	17.14	23	-5.86
				50	25	15.62	16.03	23	-6.97
				100	0	15.49	15.90	23	-7.10
	56640	3690	64QAM	1	0	17.15	17.56	23	-5.44
				1	99	17.14	17.55	23	-5.45
				50	25	16.06	16.47	23	-6.53
				100	0	15.96	16.37	23	-6.63
20	55340	3560	256QAM	1	0	13.40	13.81	23	-9.19
				1	99	13.01	13.42	23	-9.58
				50	25	13.36	13.77	23	-9.23
				100	0	13.33	13.74	23	-9.26
	55990	3625	256QAM	1	0	13.58	13.99	23	-9.01
				1	99	13.41	13.82	23	-9.18
				50	25	13.57	13.98	23	-9.02
				100	0	13.51	13.92	23	-9.08
	56640	3690	256QAM	1	0	13.25	13.66	23	-9.34
				1	99	13.42	13.83	23	-9.17
				50	25	13.36	13.77	23	-9.23
				100	0	13.40	13.81	23	-9.19

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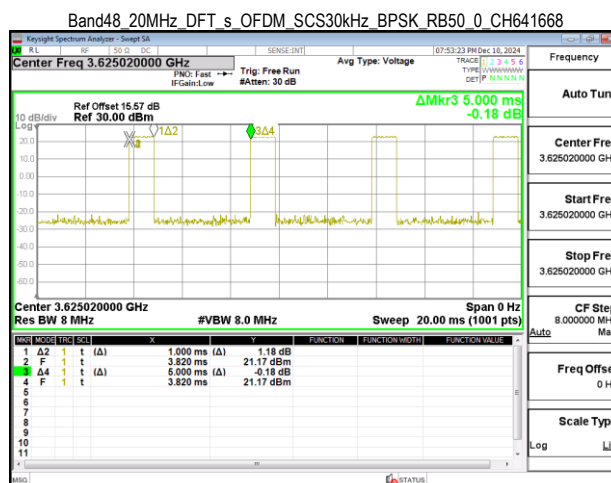
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Mode	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log ( 1/Duty Cycle )
(TDD)NR_n48	20.00	6.99



5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm)			EIRP (dBm)		
Antenna Gain(dBi)			0.41		Channel (ARFCH)/ Frequency(MHz)			Channel (ARFCH)/ Frequency(MHz)		
					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	22.39	22.13	22.10	22.80	22.54	22.51
			1	22	22.08	22.16	22.25	22.49	22.57	22.66
			12	6	22.18	22.26	22.11	22.59	22.67	22.52
			24	0	22.27	22.28	22.26	22.68	22.69	22.67
		DFT-s QPSK	1	1	22.17	22.17	22.20	22.58	22.58	22.61
			1	22	22.33	22.26	22.32	22.74	22.67	22.73
			12	6	22.22	22.26	22.24	22.63	22.67	22.65
			24	0	21.77	21.79	21.76	22.18	22.20	22.17
		DFT-s 16QAM	1	1	21.20	21.21	21.24	21.61	21.62	21.65
		DFT-s 64QAM	1	1	20.21	20.29	20.23	20.62	20.70	20.64
		DFT-s 256QAM	1	1	17.94	17.90	17.86	18.35	18.31	18.27
		CP QPSK	1	1	21.41	21.33	21.29	21.82	21.74	21.70
		CP 16QAM	1	1	20.90	20.89	20.86	21.31	21.30	21.27
		CP 64QAM	1	1	19.08	19.05	19.07	19.49	19.46	19.48
		CP 256QAM	1	1	16.24	16.24	16.26	16.65	16.65	16.67

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5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm)			EIRP (dBm)		
Antenna Gain(dBi)			0.41		Channel (ARFCH)/ Frequency(MHz)			Channel (ARFCH)/ Frequency(MHz)		
					Low	Mid	High	Low	Mid	High
BW (MHz)	SCS (kHz)	Modulation	RB Allocation	RB Offset	637168 3557.52	641668 3625.02	646166 3692.49	637168 3557.52	641668 3625.02	646166 3692.49
15	30	DFT-s PI/2 BPSK	1	1	21.95	22.41	21.88	22.36	<b>22.82</b>	22.29
			1	36	22.39	21.91	22.38	22.80	22.32	22.79
			18	9	22.38	22.36	22.39	22.79	22.77	22.80
			36	0	22.37	22.38	22.37	22.78	22.79	22.78
		DFT-s QPSK	1	1	21.72	21.71	21.71	22.13	22.12	22.12
			1	36	22.36	22.25	22.31	22.77	22.66	22.72
			18	9	22.37	22.39	22.39	22.78	<b>22.80</b>	<b>22.80</b>
			36	0	21.83	21.87	21.82	22.24	22.28	22.23
		DFT-s	1	1	21.30	21.27	21.34	21.71	21.68	<b>21.75</b>
		DFT-s	1	1	19.86	19.87	19.93	20.27	20.28	20.34
		DFT-s	1	1	18.08	17.94	17.93	18.49	18.35	18.34
		CP QPSK	1	1	21.18	20.63	20.54	<b>21.59</b>	21.04	20.95
		CP	1	1	19.66	20.28	20.43	20.07	20.69	<b>20.84</b>
		CP	1	1	18.96	18.95	18.96	19.37	19.36	19.37
		CP	1	1	16.07	16.06	16.15	16.48	16.47	16.56

5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm)			EIRP (dBm)		
Antenna Gain(dBi)			0.41		Channel (ARFCH)/ Frequency(MHz)			Channel (ARFCH)/ Frequency(MHz)		
					Low	Mid	High	Low	Mid	High
BW (MHz)	SCS (kHz)	Modulation	RB Allocation	RB Offset	637334 3560.01	641668 3625.02	646000 3690	637334 3560.01	641668 3625.02	646000 3690
20	30	DFT-s PI/2 BPSK	1	1	22.57	22.10	<b>22.58</b>	22.98	22.51	<b>22.99</b>
			1	49	22.55	22.55	22.10	22.96	22.96	22.51
			25	12	22.40	22.40	22.39	22.81	22.81	22.80
			50	0	22.40	22.41	22.40	22.81	22.82	22.81
		DFT-s QPSK	1	1	22.26	22.15	22.18	22.67	22.56	22.59
			1	49	21.97	22.57	22.51	22.38	<b>22.98</b>	22.92
			25	12	22.39	22.40	22.41	22.80	22.81	22.82
			50	0	21.89	21.87	21.90	22.30	22.28	22.31
		DFT-s	1	1	21.51	21.59	21.59	21.92	<b>22.00</b>	<b>22.00</b>
		DFT-s	1	1	20.01	20.11	20.10	20.42	20.52	20.51
		DFT-s	1	1	17.95	17.97	17.85	18.36	18.38	18.26
		CP QPSK	1	1	20.86	21.24	20.91	21.27	<b>21.65</b>	21.32
		CP	1	1	20.16	20.33	20.14	20.57	<b>20.74</b>	20.55
		CP	1	1	19.01	19.14	19.03	19.42	19.55	19.44
		CP	1	1	15.90	15.98	15.89	16.31	16.39	16.30

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5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm/10MHz)			EIRP (dBm/10MHz)		
Antenna Gain(dBi)		0.41			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	22.39	22.13	22.10	22.80	22.54	22.51
			1	22	22.08	22.16	22.25	22.49	22.57	22.66
			12	6	22.18	22.26	22.11	22.59	22.67	22.52
			24	0	22.27	22.28	22.26	22.68	22.69	22.67
		DFT-s QPSK	1	1	22.17	22.17	22.20	22.58	22.58	22.61
			1	22	22.33	22.26	22.32	22.74	22.67	22.73
			12	6	22.22	22.26	22.24	22.63	22.67	22.65
			24	0	21.77	21.79	21.76	22.18	22.20	22.17
		DFT-s 16QAM	1	1	21.20	21.21	21.24	21.61	21.62	21.65
		DFT-s 64QAM	1	1	20.21	20.29	20.23	20.62	20.70	20.64
		DFT-s 256QAM	1	1	17.94	17.90	17.86	18.35	18.31	18.27
		CP QPSK	1	1	21.41	21.33	21.29	21.82	21.74	21.70
		CP 16QAM	1	1	20.90	20.89	20.86	21.31	21.30	21.27
		CP 64QAM	1	1	19.08	19.05	19.07	19.49	19.46	19.48
		CP 256QAM	1	1	16.24	16.24	16.26	16.65	16.65	16.67

5G NR Band n48_part96: 3550 to 3700 MHz					Conducted Average (dBm/10MHz)			EIRP (dBm/10MHz)		
Antenna Gain(dBi)		0.41			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	20.19	20.65	20.12	20.60	21.06	20.53
			1	36	20.63	20.15	20.62	21.04	20.56	21.03
			18	9	20.62	20.60	20.63	21.03	21.01	21.04
			36	0	20.61	20.62	20.61	21.02	21.03	21.02
		DFT-s QPSK	1	1	19.96	19.95	19.95	20.37	20.36	20.36
			1	36	20.60	20.49	20.55	21.01	20.90	20.96
			18	9	20.61	20.63	20.63	21.02	21.04	21.04
			36	0	20.07	20.11	20.06	20.48	20.52	20.47
		DFT-s 16QAM	1	1	19.54	19.51	19.58	19.95	19.92	19.99
		DFT-s 64QAM	1	1	18.10	18.11	18.17	18.51	18.52	18.58
		DFT-s 256QAM	1	1	16.32	16.18	16.17	16.73	16.59	16.58
		CP QPSK	1	1	19.42	18.87	18.78	19.83	19.28	19.19
		CP 16QAM	1	1	17.90	18.52	18.67	18.31	18.93	19.08
		CP 64QAM	1	1	17.20	17.19	17.20	17.61	17.60	17.61
		CP 256QAM	1	1	14.31	14.30	14.39	14.72	14.71	14.80

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Antenna Gain(dBi)		0.41			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	19.56	19.09	19.57	19.97	19.50	<b>19.98</b>
			1	49	19.54	19.54	19.09	19.95	19.95	19.50
			25	12	19.39	19.39	19.38	19.80	19.80	19.79
			50	0	19.39	19.40	19.39	19.80	19.81	19.80
		DFT-s QPSK	1	1	19.25	19.14	19.17	19.66	19.55	19.58
			1	49	18.96	19.56	19.50	19.37	<b>19.97</b>	19.91
			25	12	19.38	19.39	19.40	19.79	19.80	19.81
			50	0	18.88	18.86	18.89	19.29	19.27	19.30
		DFT-s 16QAM	1	1	18.50	18.58	18.58	18.91	<b>18.99</b>	<b>18.99</b>
		DFT-s 64QAM	1	1	17.00	17.10	17.09	17.41	17.51	17.50
		DFT-s 256QAM	1	1	14.94	14.96	14.84	15.35	15.37	15.25
		CP QPSK	1	1	17.85	18.23	17.90	18.26	<b>18.64</b>	18.31
		CP 16QAM	1	1	17.15	17.32	17.13	17.56	<b>17.73</b>	17.54
		CP 64QAM	1	1	16.00	16.13	16.02	16.41	16.54	16.43
		CP 256QAM	1	1	12.89	12.97	12.88	13.30	13.38	13.29

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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 <sup>1</sup>	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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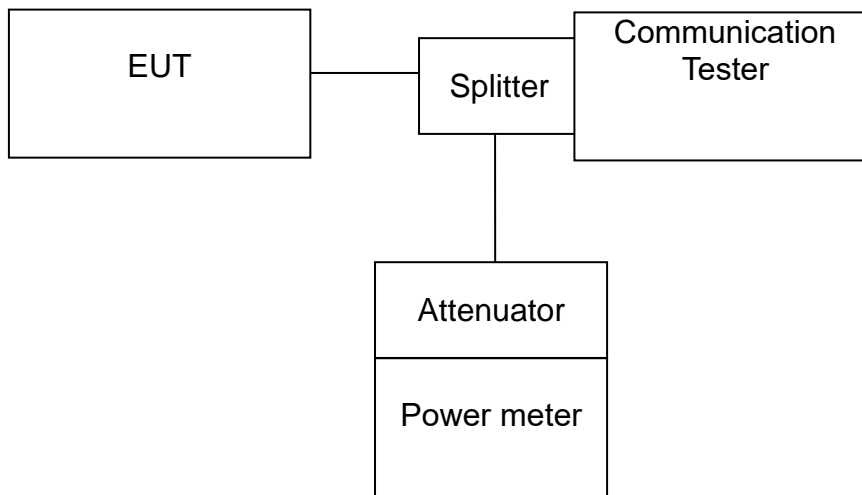
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## 8.2 Test Set-up



**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

### Peak Power Density Results:

N/A, this is an End user device.

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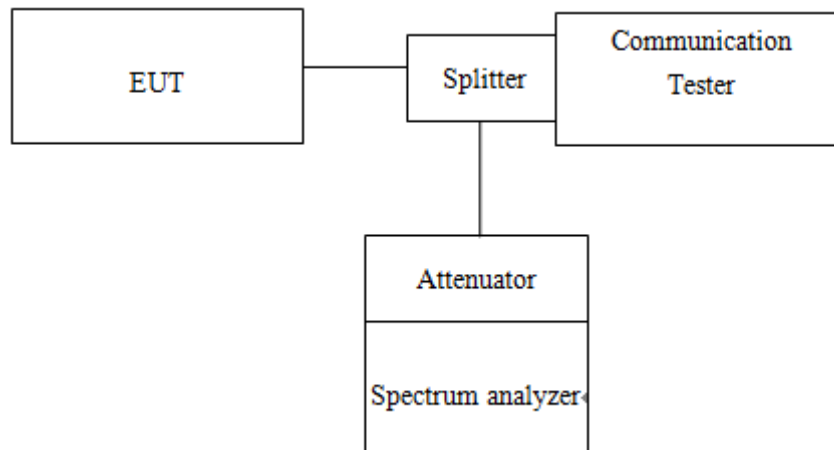
## 9 OCCUPIED BANDWIDTH MEASUREMENT

### 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

#### Mode: LTE

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	4.4957	4.4821	4.4854	4.4863	5.269	5.183	5.499	5.013
3625.0	55990	4.4841	4.4787	4.4863	4.4669	5.015	5.068	5.224	5.086
3697.5	56715	4.4712	4.4773	4.4715	4.4845	5.102	5.032	4.959	4.946

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	13.4490	13.4430	13.4620	13.4710	15.130	15.130	15.010	15.020
3625.0	55990	13.4270	13.4200	13.4000	13.3910	14.700	14.140	14.300	14.380
3692.5	56665	13.3710	13.3730	13.4300	13.4270	14.580	14.640	14.150	14.730

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	8.9760	8.9721	8.9755	8.9884	10.450	10.630	10.490	10.130
3625.0	55990	8.9801	8.9355	8.9118	8.9953	9.365	9.297	9.367	9.459
3695.0	56690	8.9520	8.9159	8.9134	8.9194	9.641	9.636	9.576	9.684

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	17.9200	17.9200	17.9710	17.9270	19.710	19.630	19.690	19.630
3625.0	55990	17.9280	17.9000	17.9210	17.8690	19.080	18.840	18.630	18.970
3690.0	56640	17.9650	17.9050	17.9620	17.7730	18.980	18.630	18.800	18.890

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## Mode: 5G NR

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	8.5754	8.6348	8.6729	8.6307	8.6172	9.7380	9.8800	9.9660	9.9120	9.7270
3625.02	641668	8.5798	8.5608	8.4935	8.4719	8.5813	9.6920	9.4800	9.5260	9.5980	9.3280
3694.98	646332	8.6105	8.6358	8.5278	8.5702	8.5994	9.4510	9.4740	9.3430	9.1460	9.2060
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	12.8970	12.9630	12.9040	12.8960	12.9190	14.0900	14.4200	14.1400	14.3100	14.4000
3625.02	641668	12.9150	12.8910	12.9250	12.9150	12.8250	14.0200	14.0100	13.8900	14.0600	13.9700
3692.49	646166	12.9090	12.9060	12.8610	12.8240	12.8890	14.0900	14.3300	13.9000	13.5700	13.7700
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	17.8950	17.9420	17.8640	17.8970	17.8890	19.3500	19.5200	19.4100	19.6200	19.3500
3625.02	641668	17.9040	17.8820	17.7370	17.8450	17.7670	18.8900	18.7500	18.9900	18.9200	18.9700
3690	646000	17.8920	17.8640	17.8010	17.8780	17.8810	18.9100	18.9100	18.7800	19.0800	18.8900

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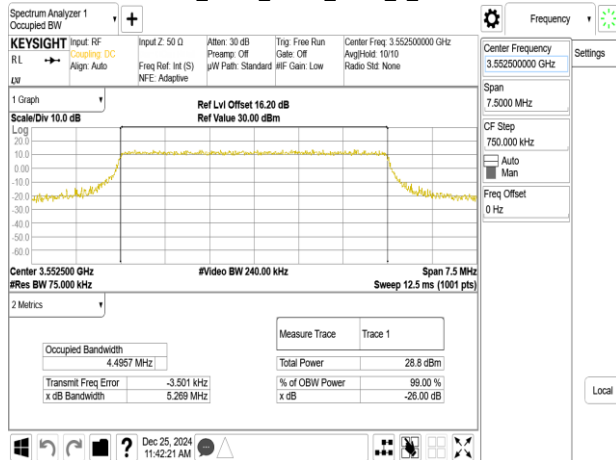
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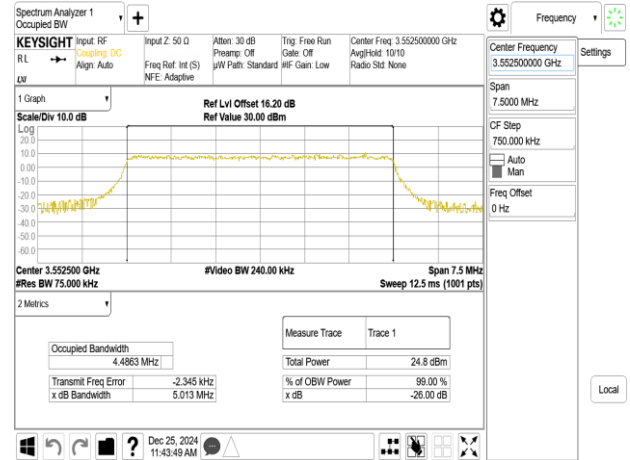
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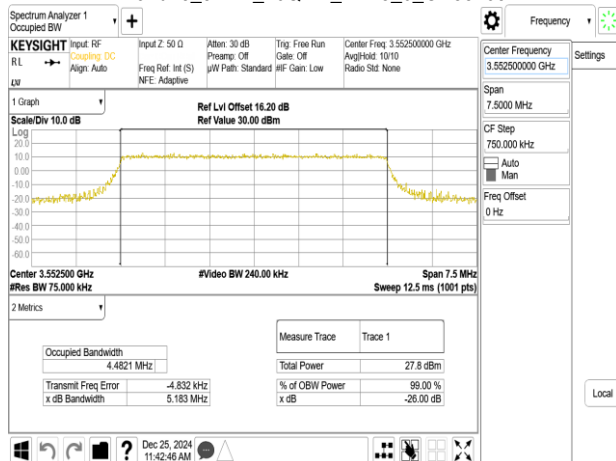
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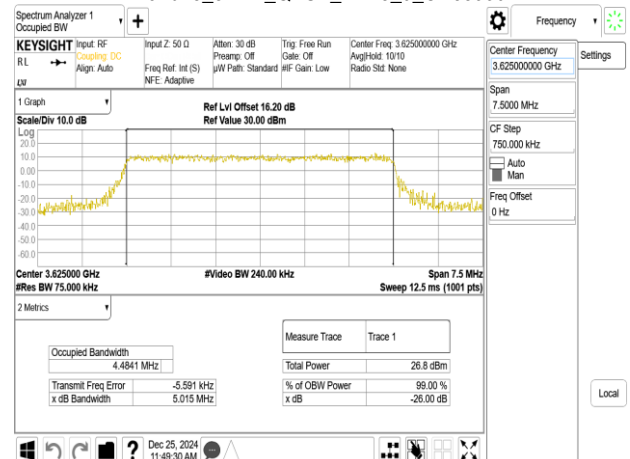
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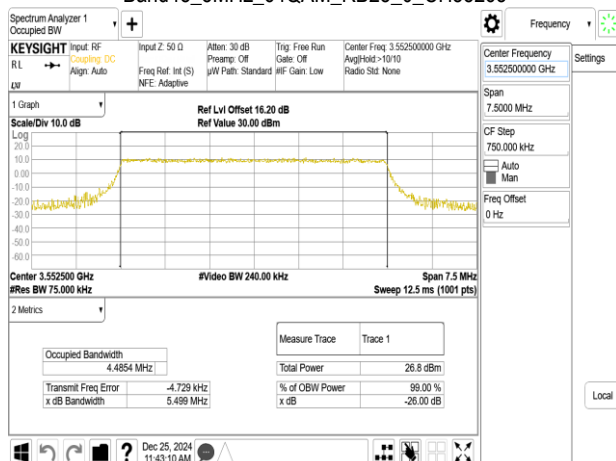
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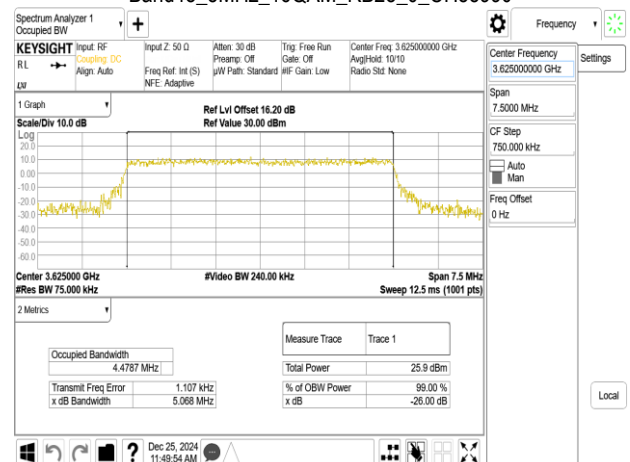
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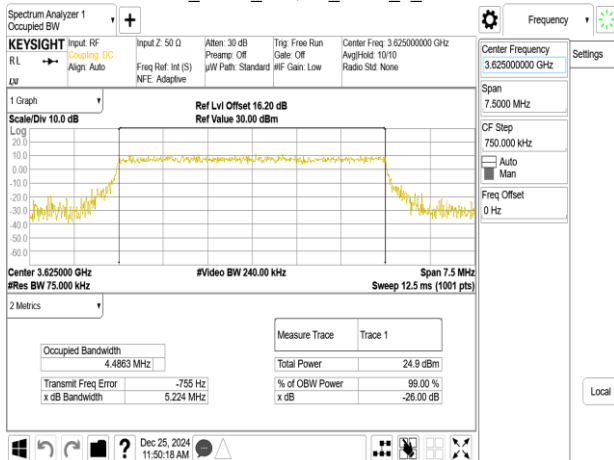


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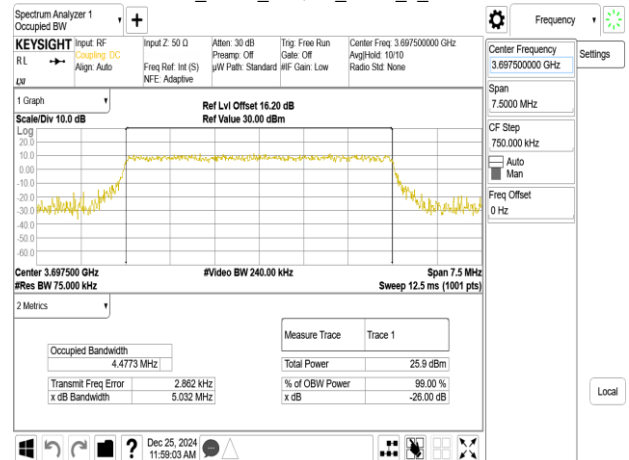
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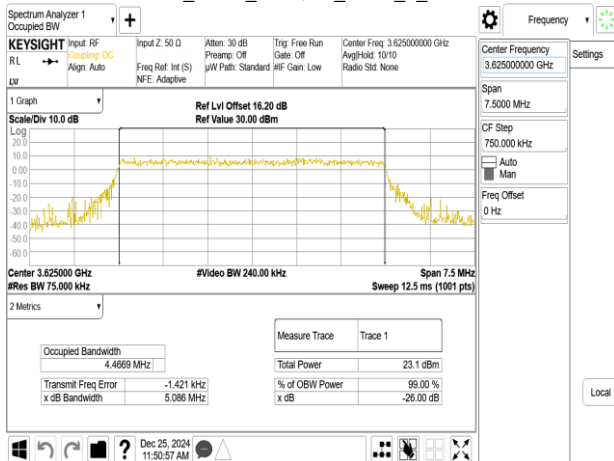
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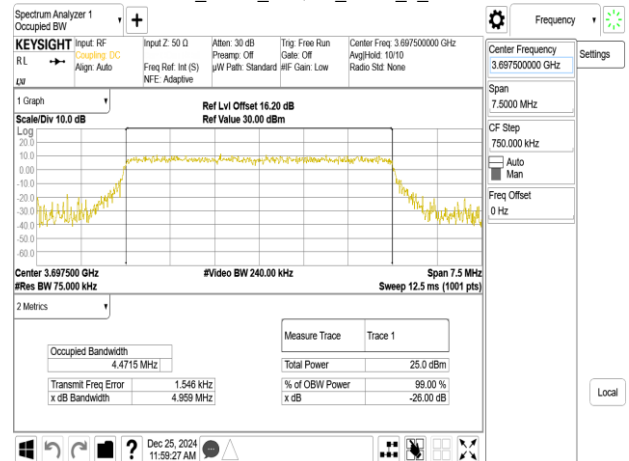
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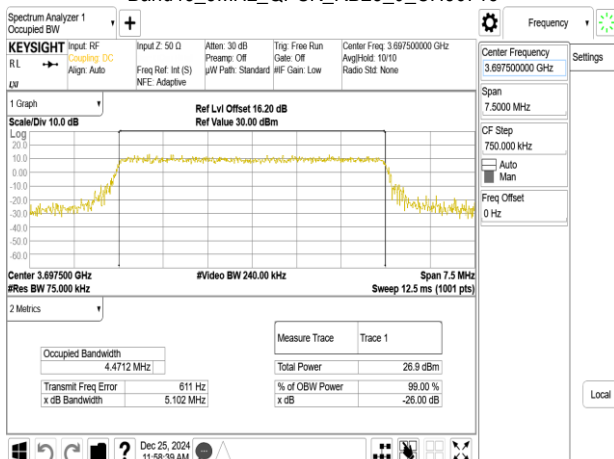
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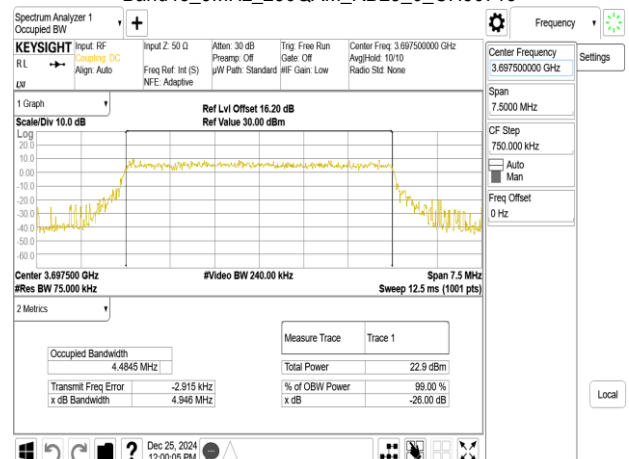
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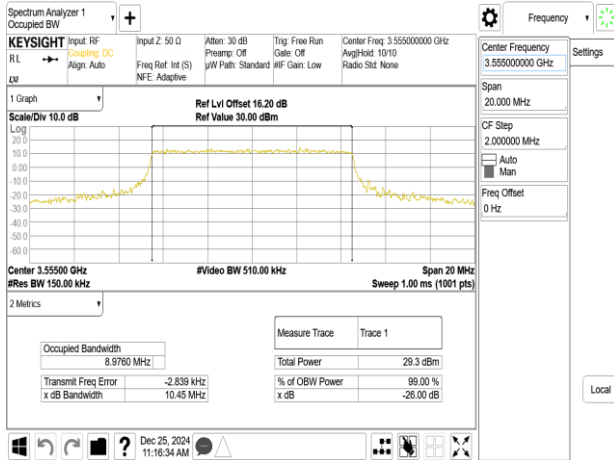


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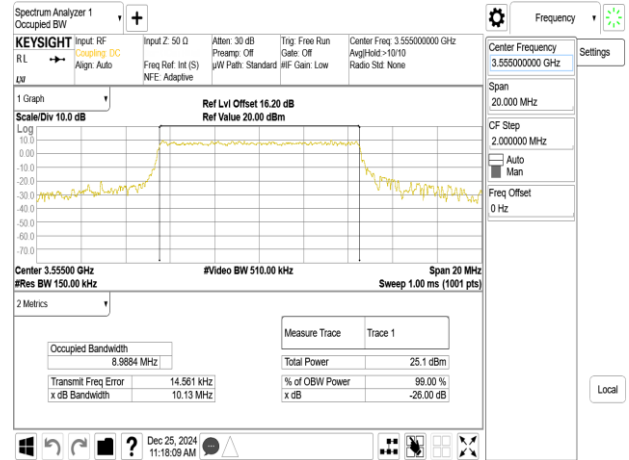
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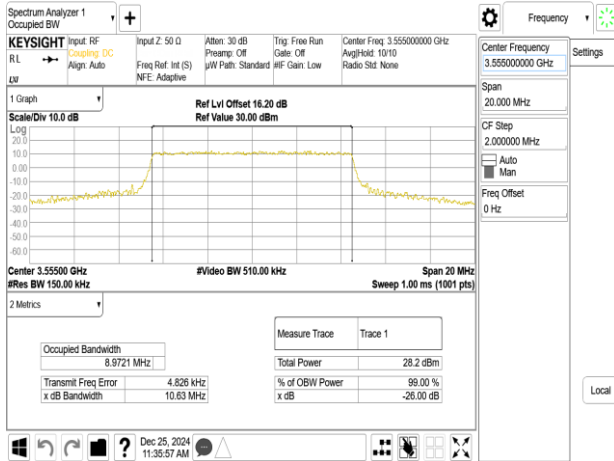
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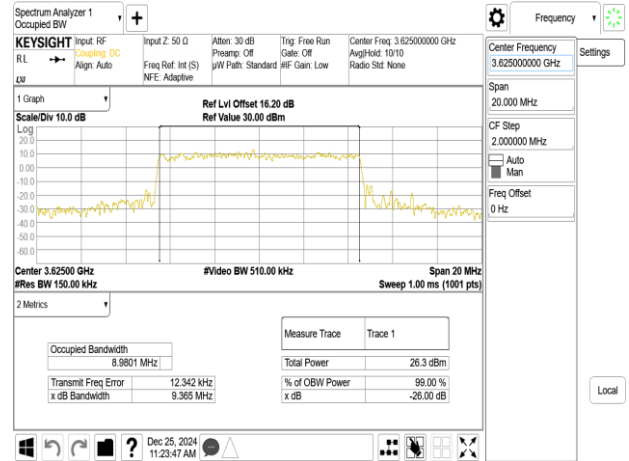
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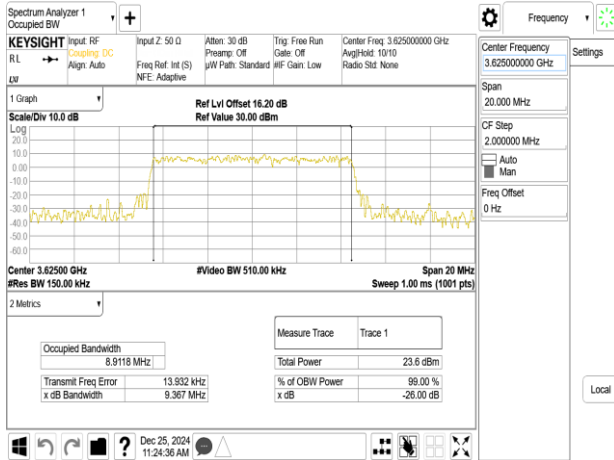
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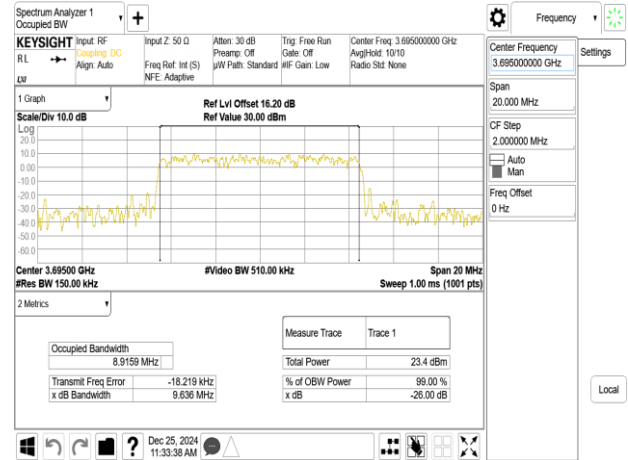
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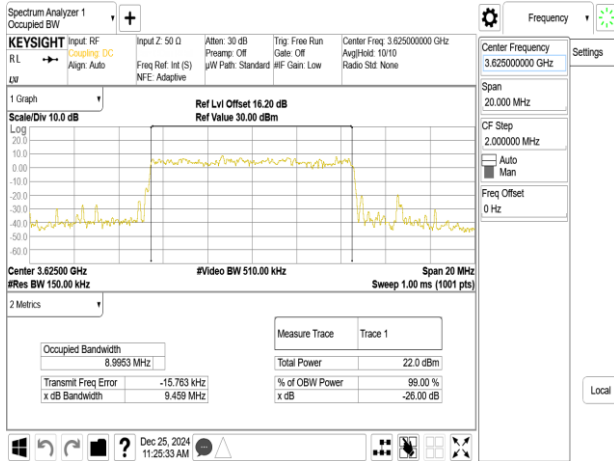
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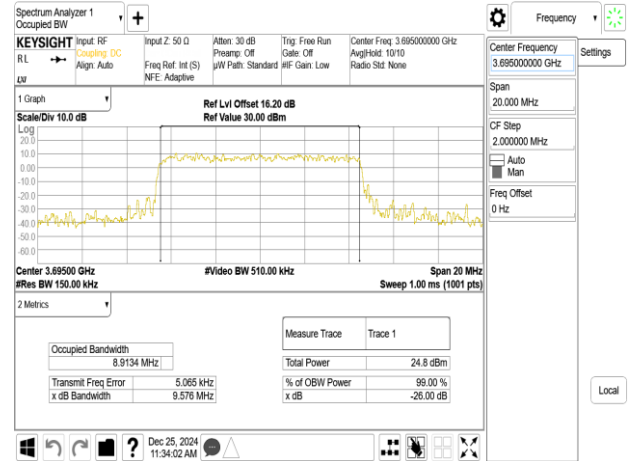
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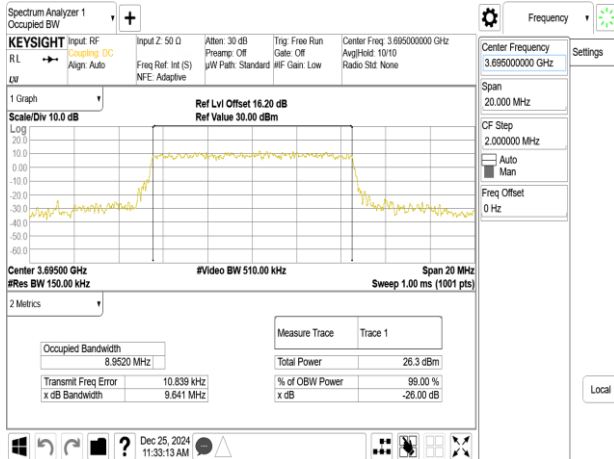
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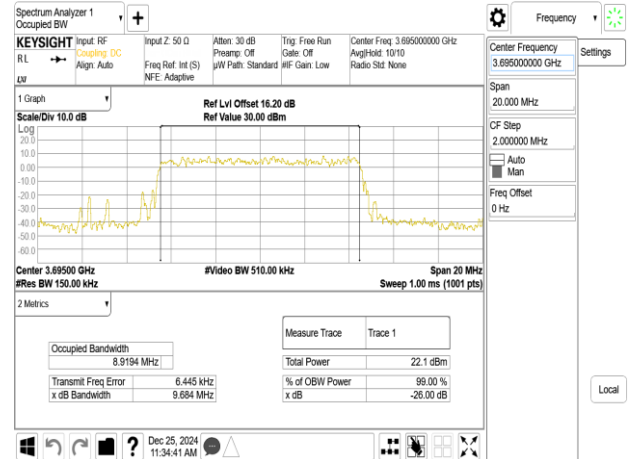
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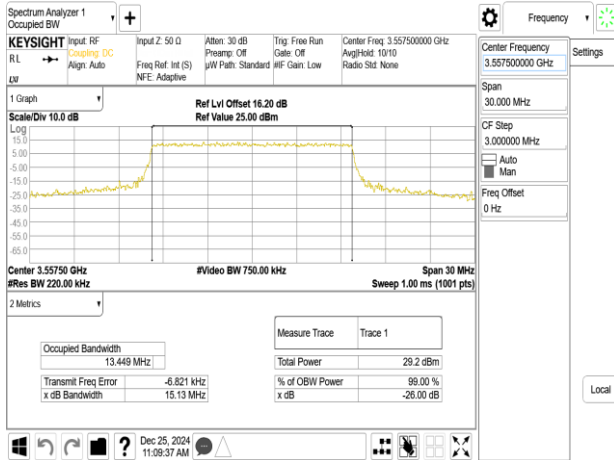
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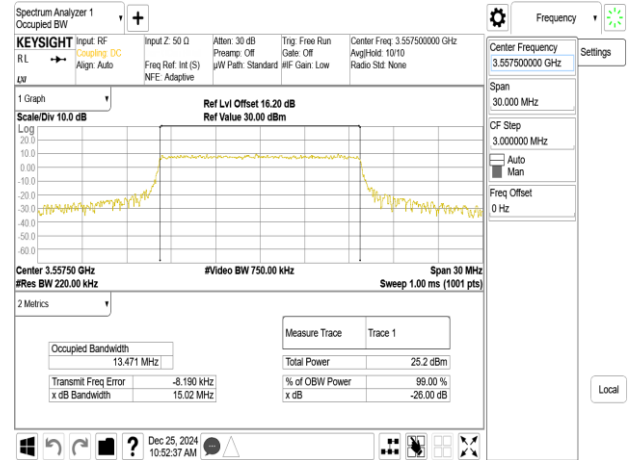
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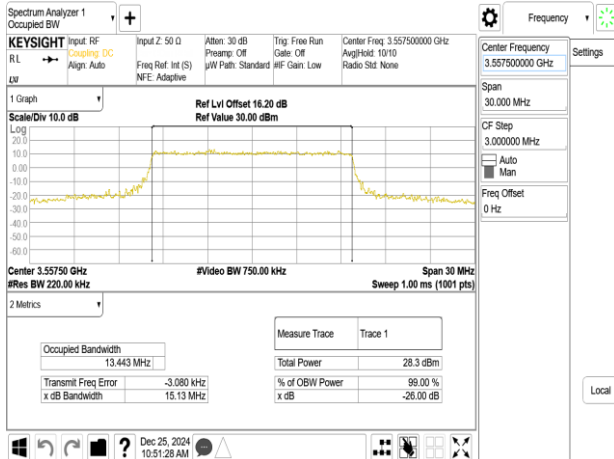
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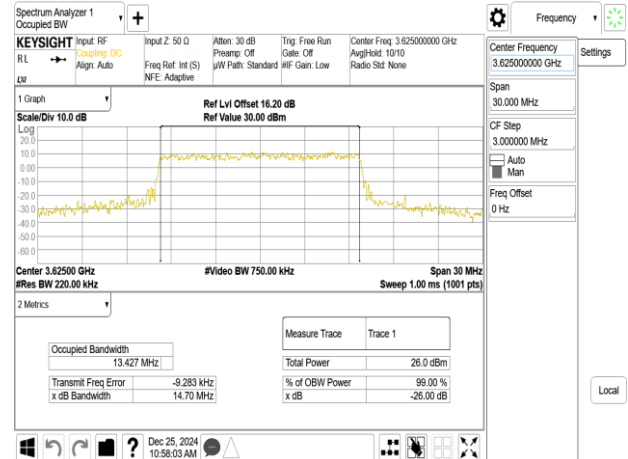
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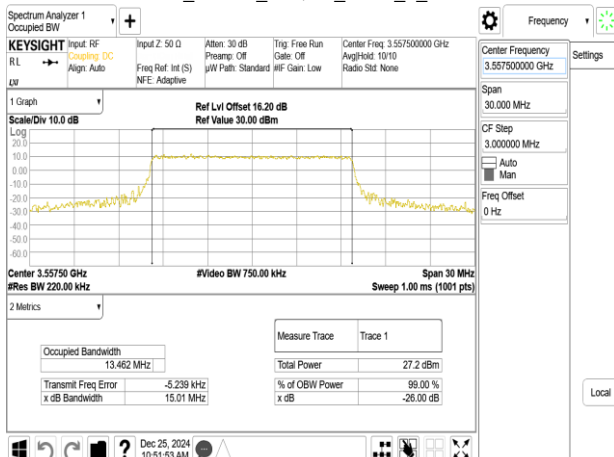
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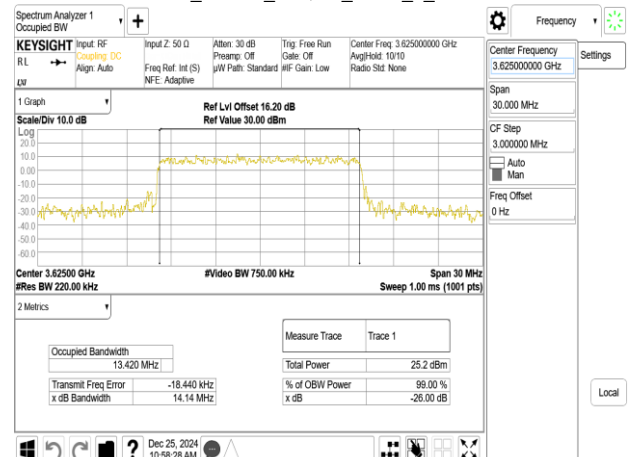
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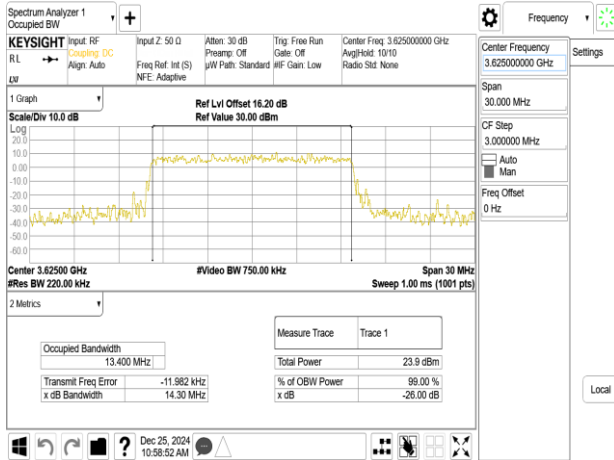


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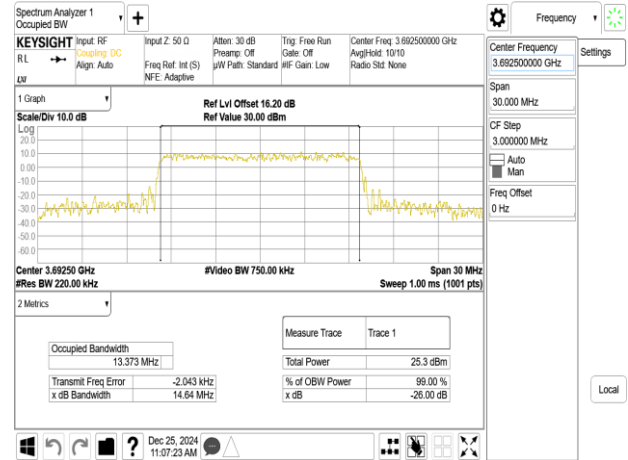
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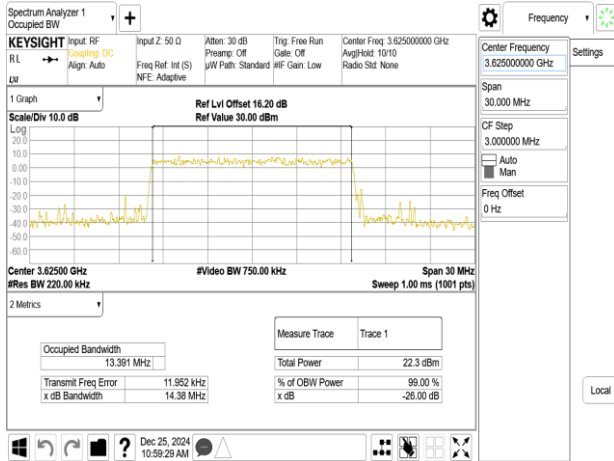
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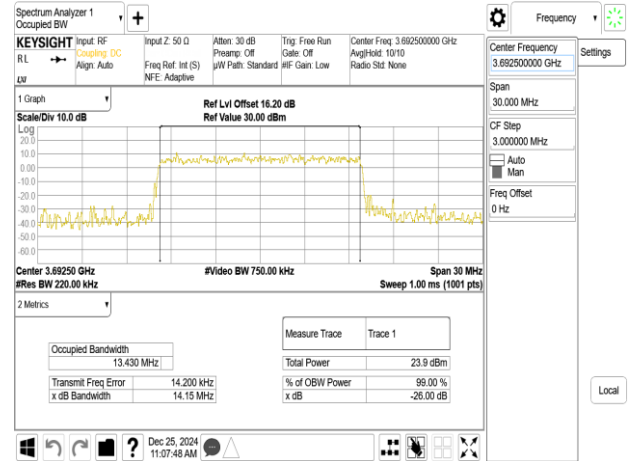
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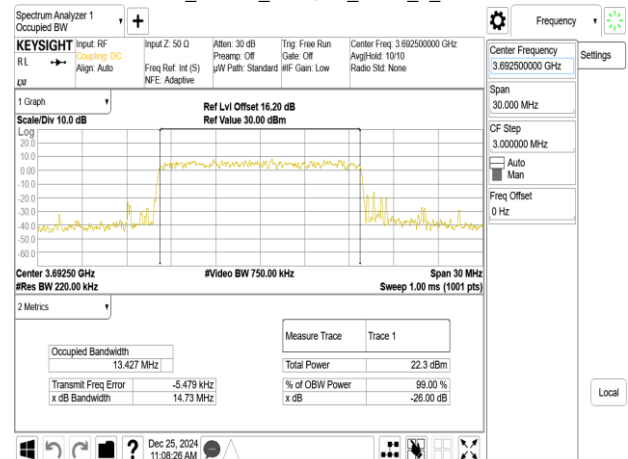
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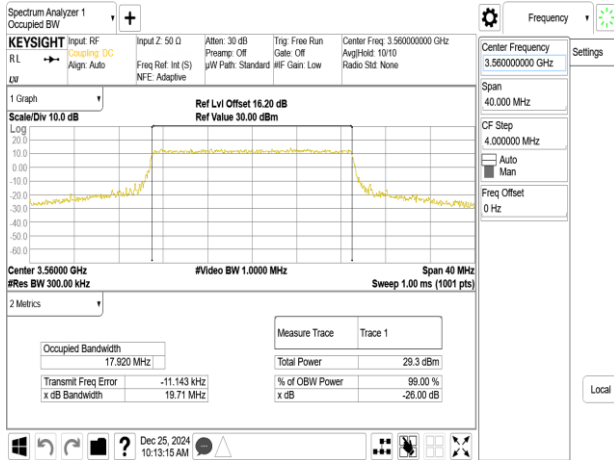


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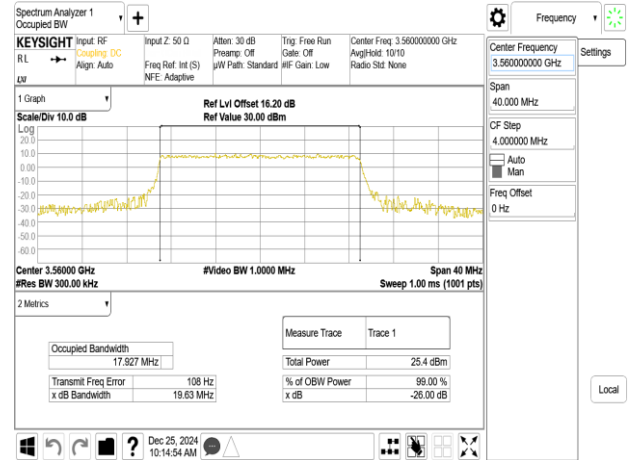
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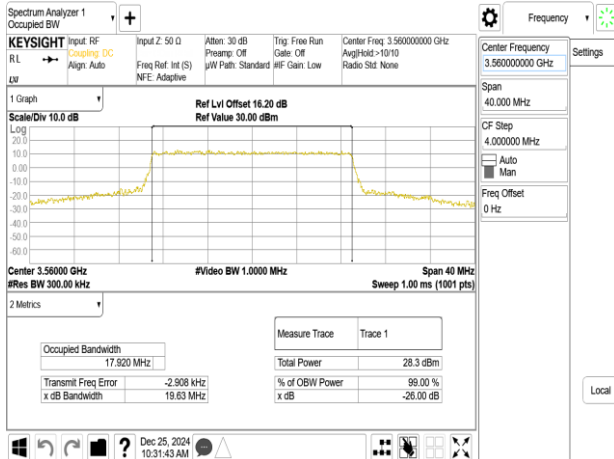
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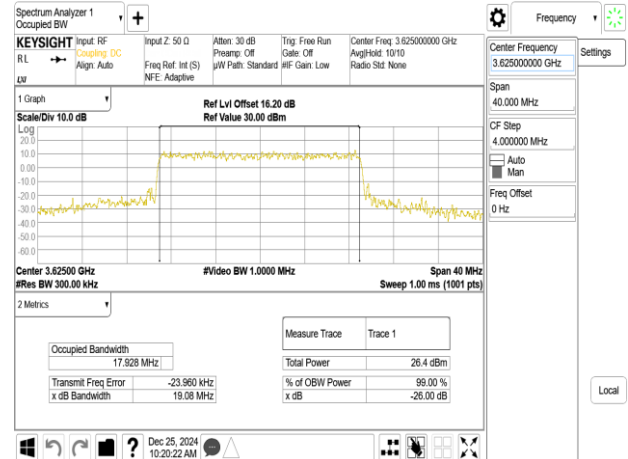
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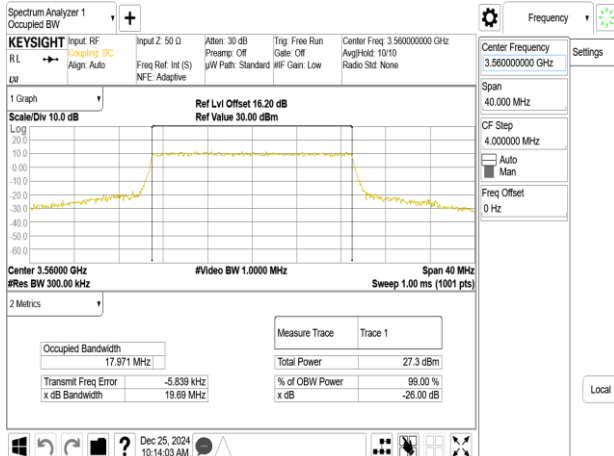
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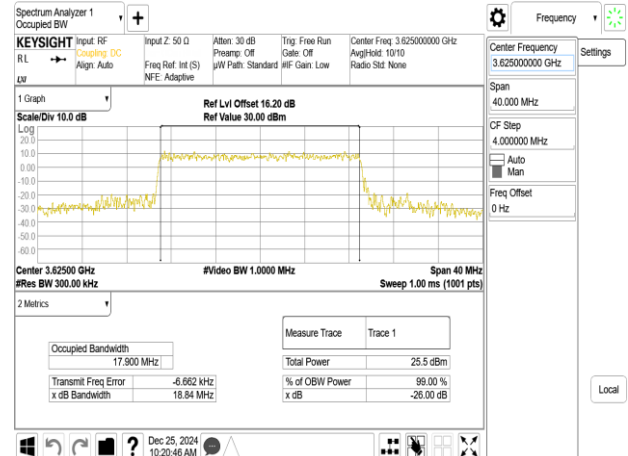
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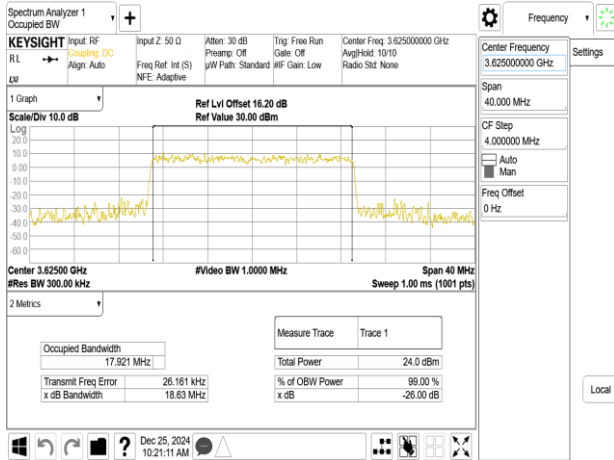


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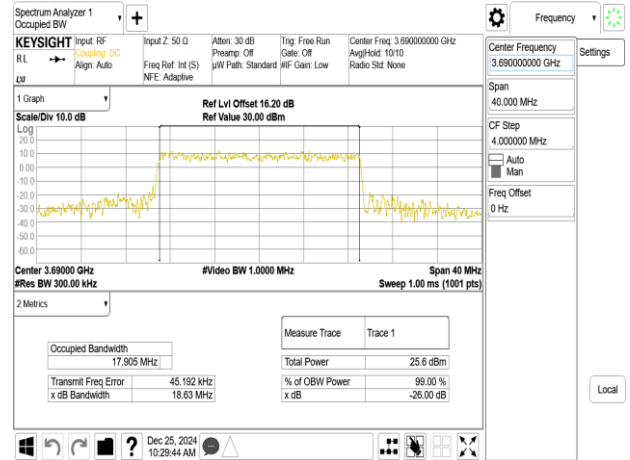
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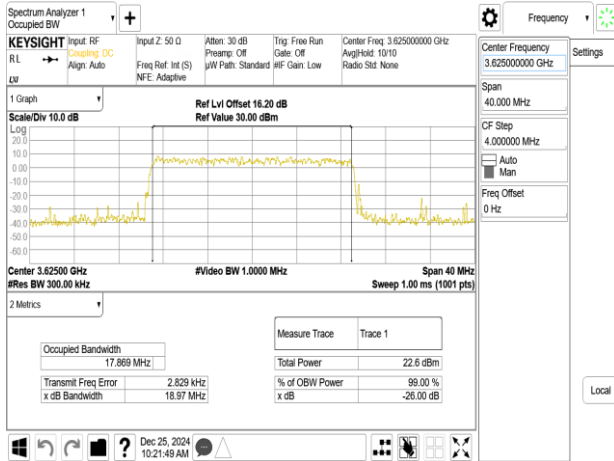
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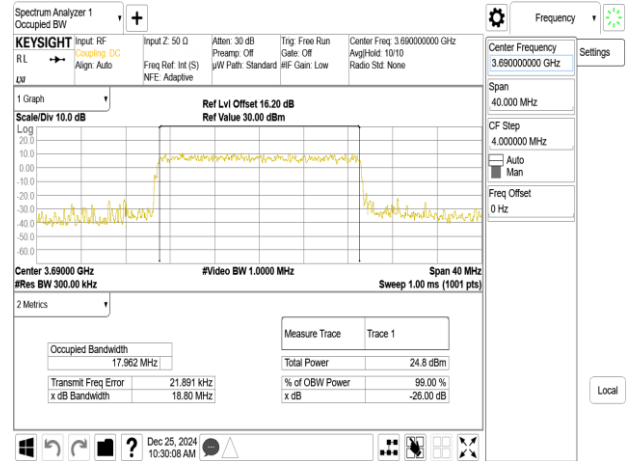
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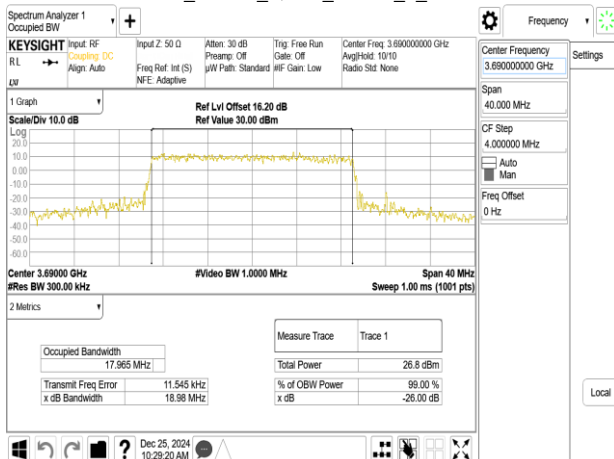
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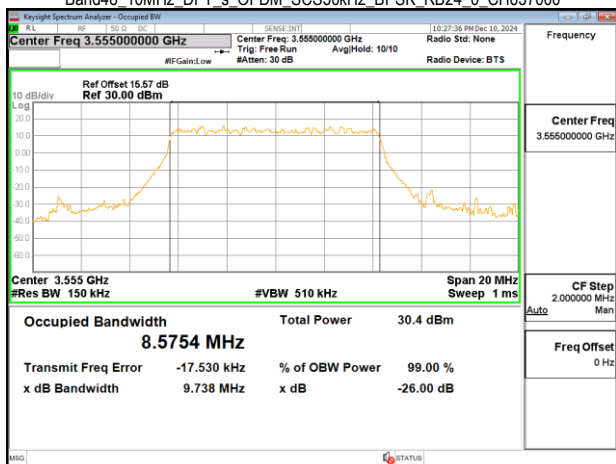


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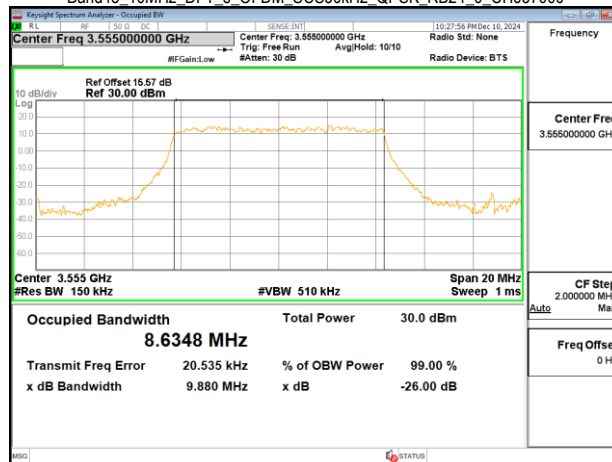
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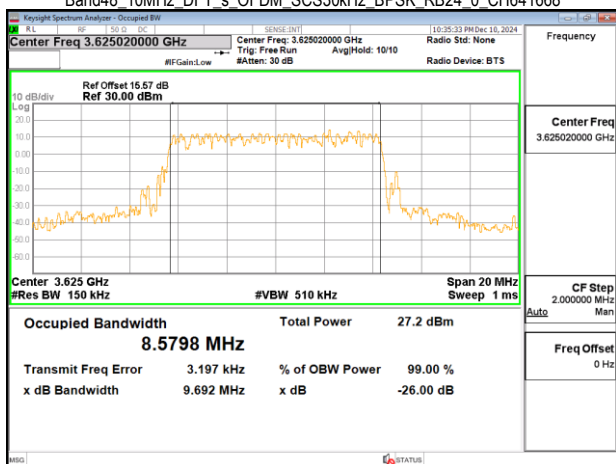
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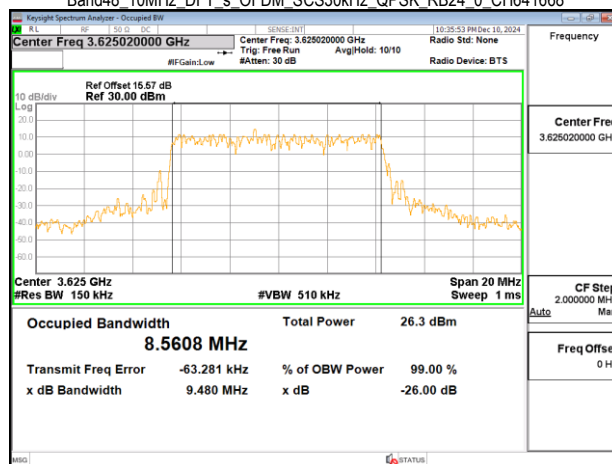
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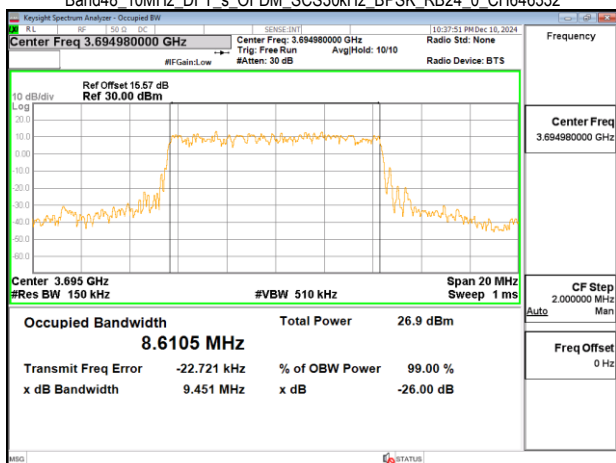
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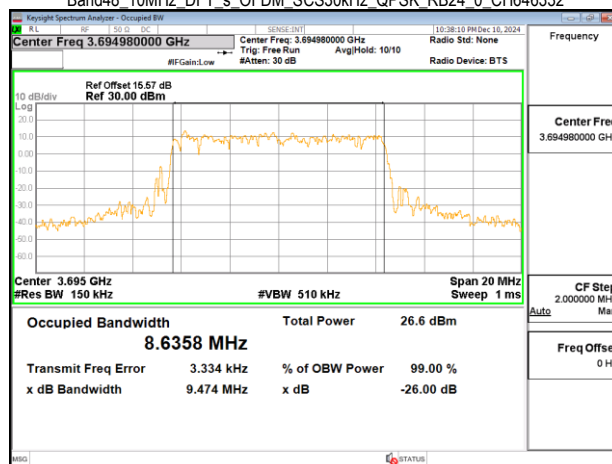
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Band48 10MHz DFT s OFDM SCS30kHz BPSK RB24 0 CH646332



Band48 10MHz DFT s OFDM SCS30kHz QPSK RB24 0 CH646332

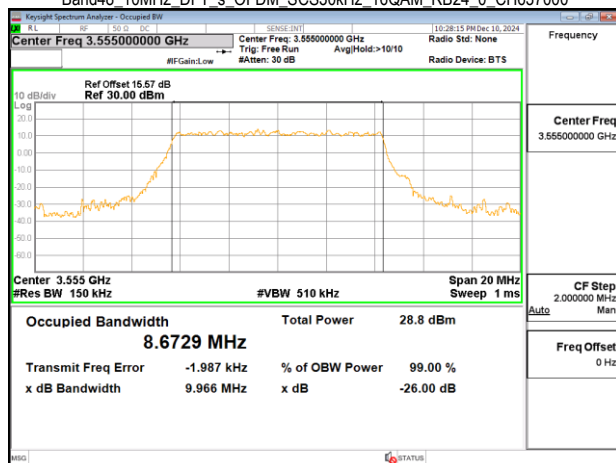


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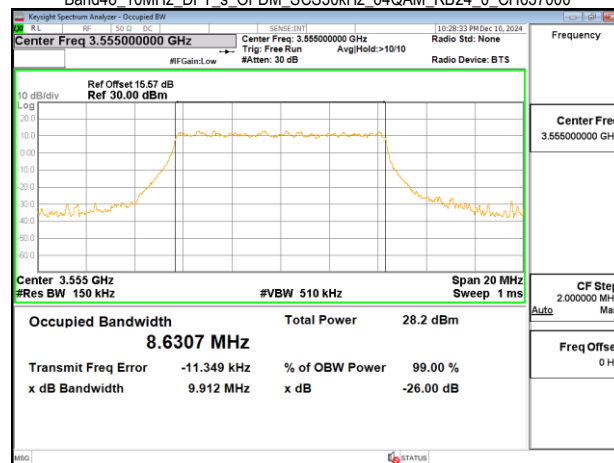
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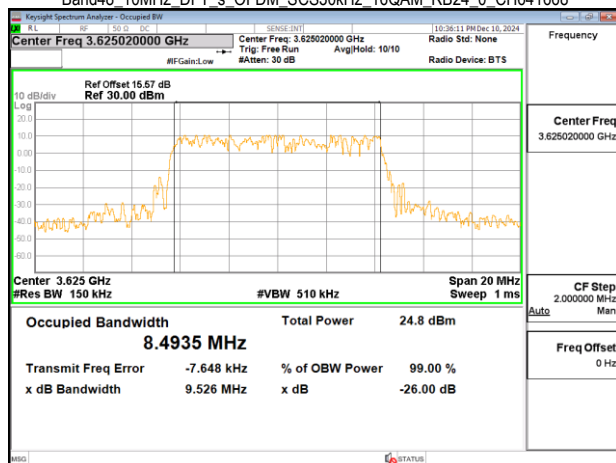
Band48 10MHz DFT s OFDM SCS30kHz 16QAM RB24\_0 CH637000



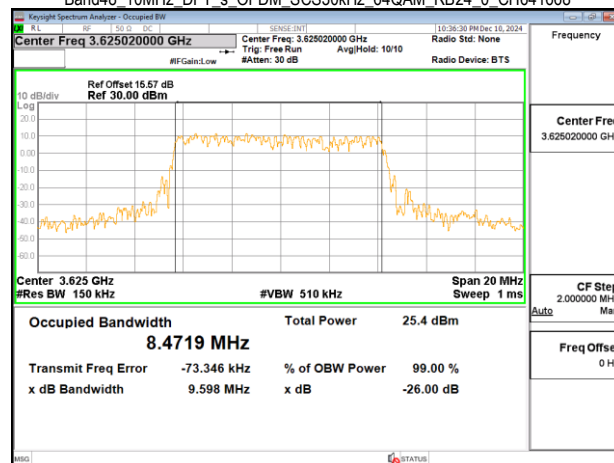
Band48 10MHz DFT s OFDM SCS30kHz 64QAM RB24\_0 CH637000



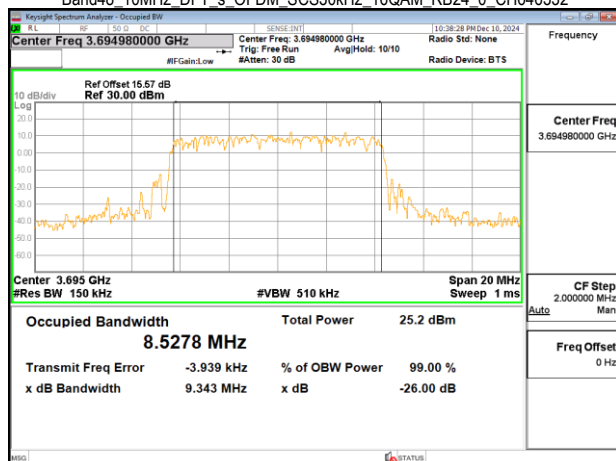
Band48 10MHz DFT s OFDM SCS30kHz 16QAM RB24\_0 CH641668



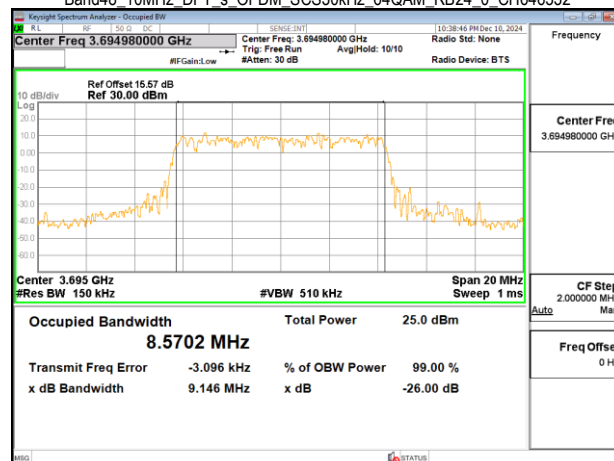
Band48 10MHz DFT s OFDM SCS30kHz 64QAM RB24\_0 CH641668



Band48 10MHz DFT s OFDM SCS30kHz 16QAM RB24\_0 CH646332



Band48 10MHz DFT s OFDM SCS30kHz 64QAM RB24\_0 CH646332



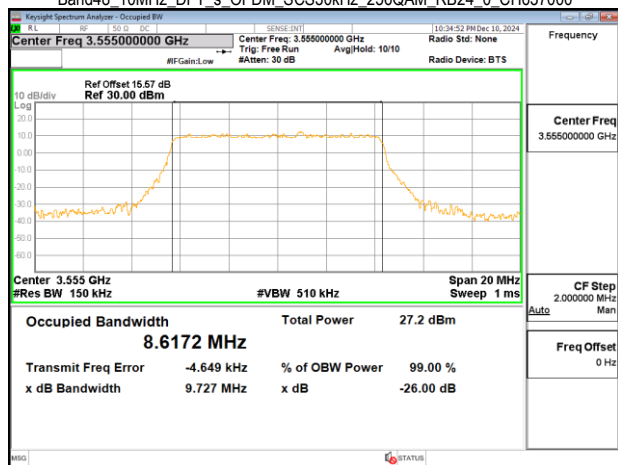
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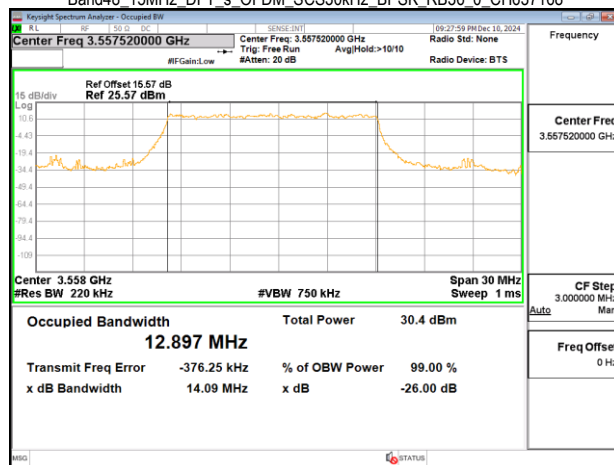
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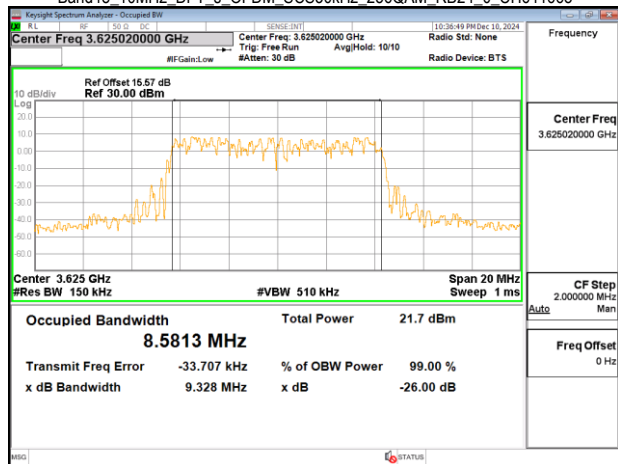
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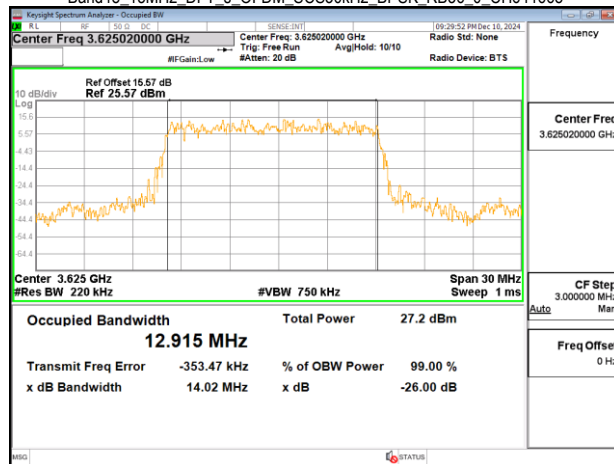
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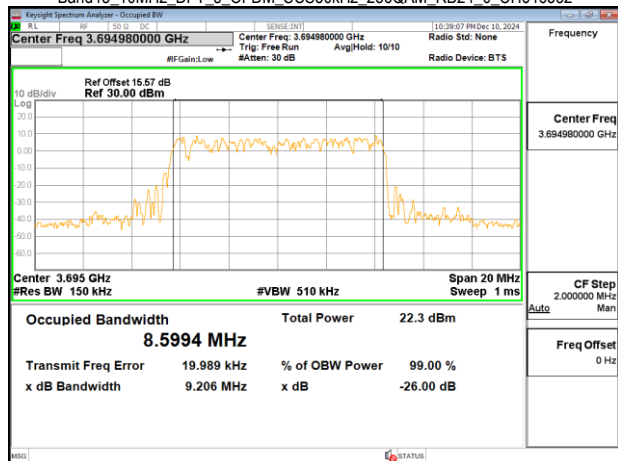
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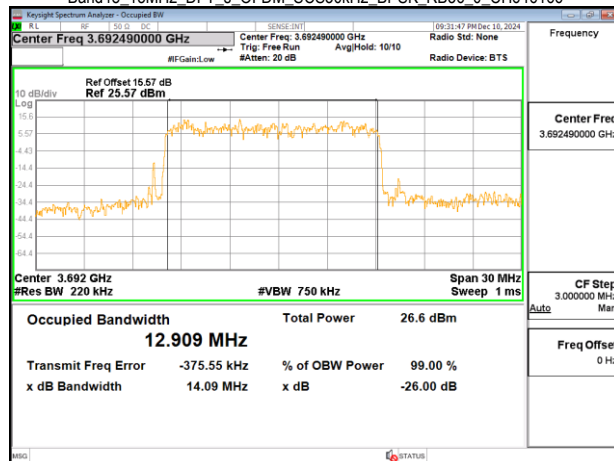
Band48 15MHz DFT s OFDM SCS30kHz BPSK RB36\_0 CH641668



Band48 10MHz DFT s OFDM SCS30kHz 256QAM RB24\_0 CH646332



Band48 15MHz DFT s OFDM SCS30kHz BPSK RB36\_0 CH646166



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