

ELECTROMAGNETIC EMISSIONS
COMPLIANCE REPORT

Applicant: Motive Technologies, Inc.
55 Hawthorne St. Suite #400, San Francisco, CA 94105

Manufacturer: Motive Technologies, Inc.
55 Hawthorne St. Suite #400, San Francisco, CA 94105

Product Name: Asset Gateway Mini

Brand Name: Motive

Model No.: AG-31

Model Difference: N/A

Report Number: TERF2304000922ER

FCC ID 2AQM7-AG31

IC: 24516-AG31

Issue Date: May 18, 2023

Date of Test: April 19, 2023 ~ May 4, 2023

Date of EUT Received: April 19, 2023

Approved By _____

Blue Yang

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, 24E & 27 C and ISED RSS-Gen, 130, 133, 139.

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
TERF2304000922ER	00	Original	May 18, 2023	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:	Asset Gateway Mini
Brand Name:	Motive
Model No.:	AG-31
Model Difference:	N/A
Hardware Version:	NRF9160-SICA-B1A-R7
Firmware Version:	mfw_nrf9160_1.3.3
EUT Series No.:	ACEA11DD131354
Power Supply:	6V
Test Software (Name/Version)	Tera Term / 4.73

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1.2 Frequency Range

Cat-M1 Band 2		
BW (MHz)	Operation Frequency (MHz)	
1.4	1850.7	- 1909.3
3	1851.5	- 1908.5
5	1852.5	- 1907.5
10	1855.0	- 1905.0
15	1857.5	- 1902.5
20	1860.0	- 1900.0
Cat-M1 Band 4		
BW (MHz)	Operation Frequency (MHz)	
1.4	1710.7	- 1754.3
3	1711.5	- 1753.5
5	1712.5	- 1752.5
10	1715.0	- 1750.0
15	1717.5	- 1747.5
20	1720.0	- 1745.0
Cat-M1 Band 12		
BW (MHz)	Operation Frequency (MHz)	
1.4	699.7	- 715.3
3	700.5	- 714.5
5	701.5	- 713.5
10	704.0	- 711.0

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1.3 Antenna Designation

Antenna Type	Modulation	Frequency (MHz)			Peak Antenna Gain (dBi)
IFA	Cat-M1 Band 2	1850	~	1910	4.99
	Cat-M1 Band 4	1710	~	1755	3.12
	Cat-M1 Band 12	699	~	716	3.68

Note: Antenna information is provided by the applicant.

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1.4 Type of Emission & Max ERP/EIRP Power Measurement Result:

Cat-M1 Band	BW	Frequency		Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
					ERP	EIRP			
2	1.4	1850.7	1909.3	QPSK	27.83	EIRP	0.607	1.0893	1M09G7D
				16QAM	26.64	EIRP	0.461	0.9603	960KD7W
2	3	1851.5	1908.5	QPSK	27.82	EIRP	0.605	1.1251	1M13G7D
				16QAM	26.66	EIRP	0.463	1.0373	1M04D7W
2	5	1852.5	1907.5	QPSK	27.79	EIRP	0.601	1.1894	1M19G7D
				16QAM	27.11	EIRP	0.514	1.1057	1M11D7W
2	10	1855.0	1905.0	QPSK	27.85	EIRP	0.610	1.2922	1M29G7D
				16QAM	27.14	EIRP	0.518	1.2267	1M23D7W
2	15	1857.5	1902.5	QPSK	27.86	EIRP	0.611	1.446	1M45G7D
				16QAM	27.11	EIRP	0.514	1.332	1M33D7W
2	20	1860.0	1900.0	QPSK	27.87	EIRP	0.612	1.587	1M59G7D
				16QAM	27.13	EIRP	0.516	1.480	1M48D7W
Cat-M1 Band	BW	Frequency		Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
					ERP	EIRP			
4	1.4	1710.7	1754.3	QPSK	25.89	EIRP	0.388	1.0892	1M09G7D
				16QAM	24.80	EIRP	0.302	0.9451	945KD7W
4	3	1711.5	1753.5	QPSK	26.02	EIRP	0.400	1.1211	1M12G7D
				16QAM	24.84	EIRP	0.305	1.0236	1M02D7W
4	5	1712.5	1752.5	QPSK	25.95	EIRP	0.394	1.1838	1M18G7D
				16QAM	25.28	EIRP	0.337	1.1056	1M11D7W
4	10	1715.0	1750.0	QPSK	25.95	EIRP	0.394	1.2916	1M29G7D
				16QAM	25.27	EIRP	0.337	1.2084	1M21D7W
4	15	1717.5	1747.5	QPSK	25.98	EIRP	0.396	1.4153	1M42G7D
				16QAM	25.32	EIRP	0.340	1.2992	1M30D7W
4	20	1720.0	1745.0	QPSK	26.08	EIRP	0.406	1.5685	1M57G7D
				16QAM	25.39	EIRP	0.346	1.4348	1M43D7W
Cat-M1 Band	BW	Frequency		Modulation	ERP / EIRP (dBm)		(W)	99%	Type of Emission
					ERP	EIRP			
12	1.4	699.7	715.3	QPSK	24.22	ERP	0.264	1.0883	1M09G7D
				16QAM	24.20	ERP	0.263	0.9461	946KD7W
12	3	700.5	714.5	QPSK	24.29	ERP	0.269	1.1189	1M12G7D
				16QAM	23.19	ERP	0.208	1.0170	1M02D7W
12	5	701.5	713.5	QPSK	24.40	ERP	0.275	1.1740	1M17G7D
				16QAM	24.42	ERP	0.277	1.0981	1M10D7W
12	10	704.0	711.0	QPSK	24.28	ERP	0.268	1.2881	1M29G7D
				16QAM	24.47	ERP	0.280	1.1915	1M19D7W

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1.5 Test Methodology of Applied Standards

FCC 47 CFR Part 2, 24E, 27C.
 ISED RSS-130 Issue 2 Feb. 2019,
 ISED RSS-133 Issue 6, Amendment 1 Jan. 18, 2018,
 ISED RSS-139 Issue 3 July 16, 2015
 ANSI C63.26-2015
 KDB971168 D01 Power Meas license Digital System v03r01
 TS 151 010-1 is used to set, and measure the output power.

1.6 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation 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 indication 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*6m*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 mobile device 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:

Cat-M1 Band 2

Test mode	DC voltage (V)	DC current (mA)
LTE Band 2_20M QPSK	6	75

Cat-M1 Band 4

Test mode	DC voltage (V)	DC current (mA)
LTE Band 4_20M QPSK	6	81

Cat-M1 Band 12

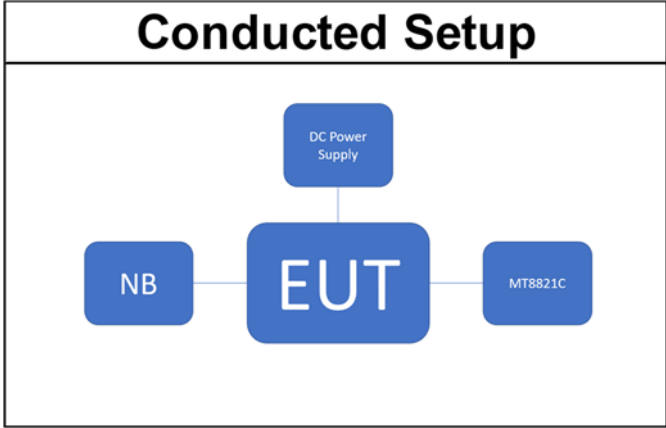
Test mode	DC voltage (V)	DC current (mA)
LTE Band 5_10M QPSK	6	83

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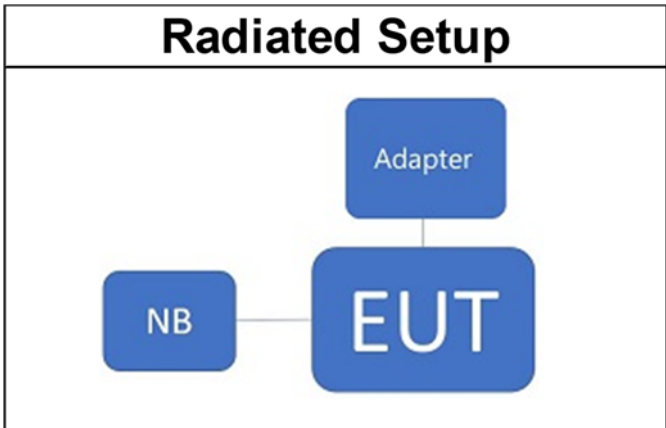
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2.6 Test Configuration

2.6.1 Conducted Emission at the Antenna Port



2.6.2 Radiated Emission



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

2.6.3 Equipment used for test

Conducted Emission Test Site: Conducted 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Notebook	Lenovo	L480	PF-1S9NT5	N/A	N/A
Radiated Emission Test Site: SAC 2					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Adapter	N/A	XY012-120100	N/A	N/A	N/A
Notebook	Lenovo	L480	PF-1D07MD	N/A	N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	IC Rules	Description Of Test	Result
§2.1046(a)	RSS-GEN §6.12	RF Power Output	Compliant
§24.232(c) §27.50(c)(9) §27.50(d)(4)	RSS-130 §4.6 RSS-133 §6.4 RSS-139 §6.5	ERP/ EIRP measurement	Compliant
§2.1049(h)	RSS-GEN §6.7	99% & 26dB Occupied Bandwidth	Compliant
§2.1051 §24.238(a) §27.53(g) §27.53(h)	RSS-GEN §6.13 RSS-130 §4.7 RSS-133 §6.5 RSS-139 §6.6	Out of Band Emissions at Antenna Terminals and Band Edge / Emission mask requirements	Compliant
§2.1053 §24.238(a) §27.53(g) §27.53(h)	RSS-GEN §6.13 RSS-130 §4.7 RSS-133 §6.5 RSS-139 §6.6	Field Strength of Spurious Radiation	Compliant
§24.232(d) §27.50(B)	RSS-130 §4.6.1 RSS-133 §6.4 RSS-139 §6.4	Peak to Average Ratio	Compliant
§2.1055(a)(1) §24.235 §27.54	RSS-130 §4.5 RSS-133 §6.3 RSS-139 §6.5	Frequency Stability	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 The Worst Test Modes and Configuration

1. The EUT has been tested under operating condition.
2. 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.

Test Items				Max. Output Power											
Band	Test Channel			Bandwidth (MHz)						Modulation		RB #			
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	
2	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
4	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
12	V	V	V	V	V	V	V	-	-	V	V	V	V	V	V
Test Items				Frequency Stability											
2	-	V	-				V			V	-	-	-	-	V
4	-	V	-				V			V	-	-	-	-	V
12	-	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	1	Half	Full	
2	V	V	V	V	V	V	V	V	V	V	V	-	-	V	
4	V	V	V	V	V	V	V	V	V	V	V	-	-	V	
12	V	V	V	V	V	V	V	-	-	V	V	-	-	V	
Test Items				Peak-to-Average Ratio											
2	V	V	V	V	V	V	V	V	V	V	V	-	-	V	
4	V	V	V	V	V	V	V	V	V	V	V	-	-	V	
12	V	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	1	Half	Full	
2	V	-	V	V	V	V	V	V	V	V	-	V	V	V	
4	V	-	V	V	V	V	V	V	V	V	-	V	V	V	
12	V	-	V	V	V	V	V	-	-	V	-	V	V	V	
Test Items				Conducted Emission											
2	V	V	V	V	V	V	V	V	V	V	V	-	V	-	-
4	V	V	V	V	V	V	V	V	V	V	V	-	V	-	-
12	V	V	V	V	V	V	V	-	-	V	-	V	-	-	

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Test Items				Radiated Emission										
Band	Test Channel			Bandwidth (MHz)						Modulation		RB #		
	L	M	H	1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full
2	v	v	v						v	v		v		
4	v	v	v							v	v	v		
12	v	v	v				v	-	-		v	v		

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4.2 Cat M1

M1 Band 2

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
FREQUENCY STABILITY	18650 to 19150	18900	10MHz	QPSK,	Full RB
OCCUPIED BANDWIDTH	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM	Full RB
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM	Full RB
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM	Full RB
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM	Full RB
PEAK TO AVERAGE RATIO	18607 to 19193	18607, 18900, 19193	1.4MHz	16QAM	Full RB
	18615 to 19185	18615, 18900, 19185	3MHz	16QAM	Full RB
	18625 to 19175	18625, 18900, 19175	5MHz	16QAM	Full RB
	18650 to 19150	18650, 18900, 19150	10MHz	16QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	16QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	16QAM	Full RB
BAND EDGE	18607 to 19193	18607, 19193	1.4MHz	QPSK,	1RB/0,6 RB Offset Full RB
	18615 to 19185	18615, 19185	3MHz	QPSK,	1RB/0,6 RB Offset Full RB
	18625 to 19175	18625, 19175	5MHz	QPSK,	1RB/0,6 RB Offset Full RB
	18650 to 19150	18650, 19150	10MHz	QPSK,	1RB/0,6 RB Offset Full RB
	18675 to 19125	18675, 19125	15MHz	QPSK,	1RB/0,6 RB Offset Full RB
	18700 to 19100	18700, 19100	20MHz	QPSK,	1RB/0,6 RB Offset Full RB
CONDCUDED EMISSION	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,	1 RB, 0 RB Offest
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK,	1 RB, 0 RB Offest
	18625 to 19175	18625, 18900, 19175	5MHz	QPSK,	1 RB, 0 RB Offest
	18650 to 19150	18650, 18900, 19150	10MHz	QPSK,	1 RB, 0 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK,	1 RB, 0 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMISSION	18700 to 19100	18700, 18900, 19100	20MHz	QPSK	1 RB, 0 RB Offest

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M1 Band 4

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
EIRP	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
FREQUENCY STABILITY	20000 to 20350	20175	10MHz	QPSK,	Full RB
OCCUPIED BANDWIDTH	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK, 16QAM	Full RB
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK, 16QAM	Full RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	Full RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	Full RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	Full RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	Full RB
PEAK TO AVERAGE RATIO	19957 to 19393	19957, 20175, 19393	1.4MHz	16QAM	Full RB
	19965 to 22385	19965, 20175, 22385	3MHz	16QAM	Full RB
	19975 to 20375	19975, 20175, 20375	5MHz	16QAM	Full RB
	20000 to 20350	20000, 20175, 20350	10MHz	16QAM	Full RB
	20025 to 20325	20025, 20175, 20325	15MHz	16QAM	Full RB
	20050 to 20300	20050, 20175, 20300	20MHz	16QAM	Full RB
BAND EDGE	19957 to 19393	19957, 19393	1.4MHz	QPSK,	1RB/0,6 RB Offset Full RB
	19965 to 22385	19965, 22385	3MHz	QPSK,	1RB/0,6 RB Offset Full RB
	19975 to 20375	19975, 20375	5MHz	QPSK,	1RB/0,6 RB Offset Full RB
	20000 to 20350	20000, 20350	10MHz	QPSK,	1RB/0,6 RB Offset Full RB
	20025 to 20325	20025, 20325	15MHz	QPSK,	1RB/0,6 RB Offset Full RB
	20050 to 20300	20050, 20300	20MHz	QPSK,	1RB/0,6 RB Offset Full RB
CONDCUDED EMISSION	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK,	1 RB, 0 RB Offest
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK,	1 RB, 0 RB Offest
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK,	1 RB, 0 RB Offest
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK,	1 RB, 0 RB Offest
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK,	1 RB, 0 RB Offest
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMIS- SION	20050 to 20300	20050, 20175, 20300	20MHz	QPSK,	1 RB, 0 RB Offest

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M1 Band 12

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	1RB/0,6 RB Offset Full RB
FREQUENCY STABILITY	23060 to 23130	23095	10MHz	QPSK,	Full RB
OCCUPIED BANDWIDTH	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	Full RB
PEAK TO AVERAGE RATIO	23017 to 23173	23017, 23095, 23173	1.4MHz	16QAM	Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	16QAM	Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	16QAM	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	16QAM	Full RB
BAND EDGE	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK,	1RB/0,6 RB Offset Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK,	1RB/0,6 RB Offset Full RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK,	1RB/0,6 RB Offset Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK,	1RB/0,6 RB Offset Full RB
CONDUCTED EMISSION	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK,	1 RB, 0 RB Offest
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK,	1 RB, 0 RB Offest
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK,	1 RB, 0 RB Offest
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMISSION	23060 to 23130	23060, 23095, 23130	10MHz	16QAM	1 RB, 0 RB Offest

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Power Output	+/- 1 dB
ERP/ EIRP measurement	+/- 2.93 dB
	+/- 2.93 dB
Emission Bandwidth	+/- 1.53 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 1.68 dB
Peak to Average Ratio	+/- 1 dB
Frequency Stability vs. Temperature	+/- 1.53 Hz
Frequency Stability vs. Voltage	+/- 1.53 Hz
Temperature	+/- 0.7 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty		
Polarization: Vertical	+/- 2.8 dB	9kHz~30MHz
	+/- 4.82 dB	30MHz - 1000MHz
	+/- 4.37 dB	1GHz - 18GHz
	+/- 4.21 dB	18GHz - 40GHz
Polarization: Horizontal	+/- 2.8 dB	9kHz~30MHz
	+/- 4.54 dB	30MHz - 1000MHz
	+/- 4.37 dB	1GHz - 18GHz
	+/- 4.21 dB	18GHz - 40GHz

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

Conducted Emission Test Site: Conducted 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
PXA Spectrum Analyzer	Keysight	N9030B	MY61330494	03/20/2023	03/19/2024
Radio Communication Analyzer	Anritsu	MT8821C	6262044751	10/24/2022	10/23/2023
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R
Temperature Chamber	Giant Force	GTH-150-40-CP-AR	MAA0512-018	05/24/2022	05/23/2023
DC Power Supply	Agilent	E3640A	MY40005907	10/07/2022	10/06/2023
Attenuator	Mini-Circuit	BW-S10W2+	2	12/13/2022	12/12/2023
DC Block	Mini-Circuits	BLK-18-S+	1	12/13/2022	12/12/2023
Power Divider	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-017	12/13/2022	12/12/2023

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6.2 Radiated Measurement

Radiated Emission Test Site: SAC 2					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Bi-log Antenna	SCHWARZBECK	VULB9168	1208	07/07/2022	07/06/2023
Horn Antenna	RF SPIN	DRH18-E	210303A18-ES	02/24/2023	02/23/2024
Bi-log Antenna	SCHWARZBECK	VULB9168	9168-1278	03/09/2023	03/08/2024
Horn Antenna	SCHWARZBECK	BBHA9120D	603	05/16/2022	05/15/2023
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/30/2022	12/29/2023
Horn Antenna	SCHWARZBECK	BBHA9170	185	08/22/2022	08/21/2023
Test Software	Audix	e3	Ver. 9.210322	N.C.R	N.C.R
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60242392	12/20/2022	12/19/2023
Signal Generator	R&S	SMBV100A	263084	12/29/2022	12/28/2023
Radio Communication Analyer	Anritsu	MT8821C	6261786084	01/16/2023	01/15/2024
Pre-Amplifier	EMCI	EMC330N	980826	08/31/2022	08/30/2023
Pre-Amplifier	EMCI	EMC118A45SEE	980867	08/31/2022	08/30/2023
Pre-Amplifier	EMCI	EMC184045B	980135	10/27/2022	10/26/2023
Bandreject Filter 635-920	Micro-Tronics	WI	4	12/13/2022	12/12/2023
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	12/13/2022	12/12/2023
3.2GHz High Pass Filter	WI	WHKX10-2624-80SS	3	12/13/2022	12/12/2023
Coaxial Cables	EMCI	EMCCFD400-NM-NM-10000	RX Cable below 1G (220238)	08/31/2022	08/30/2023
Coaxial Cables	EMCI	EMC104-SM-SM-600	RX Cable below 1G (220237)	08/31/2022	08/30/2023
Coaxial Cables	EMCI	EMC105-SM-SM-2000	RX Cable below 1G (220910)	08/31/2022	08/30/2023
Coaxial Cables	EMCI	EMC104-SM-SM-10000	RX Cable above 1G (220236)	08/31/2022	08/30/2023
Coaxial Cables	EMCI	EMC105-SM-SM-1000	RX Cable above 1G (201211)	08/31/2022	08/30/2023
Coaxial Cables	EMCI	EMC105-SM-SM-1500	RX Cable above 1G (220906)	08/31/2022	08/30/2023
Coaxial Cables	EMCI	EMC105-SM-SM-2000	RX Cable above 1G (220909)	08/31/2022	08/30/2023
Coaxial Cables	EMCI	EMCCFD400-NM-NM-10000	RX Cable below 30M (220238)	08/31/2022	08/30/2023
Coaxial Cables	EMCI	EMC105-SM-SM-2000	RX Cable below 30M (220910)	08/31/2022	08/30/2023
Site Cal	SGS	SAC 2	N/A	08/31/2022	08/30/2023

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7 MAXIMUM OUTPUT POWER

7.1 Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

7.2 FCC ERP/EIRP LIMIT

According to FCC §2.1046

FCC 24.232(c)

Mobile and portable stations are limited to 2 W EIRP.

FCC 27.50(c)

(9) Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP.

(10) Portable stations (hand-held devices) are limited to 3 watts ERP.

FCC 27.50(d)

(4) Mobile, and portable (hand-held) stations operating in the 1710-1755 MHz, 1695-1710 MHz and 1755-1780 MHz bands are limited to 1W EIRP.

(7) Mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band are limited to 2 watts EIRP.

RSS-130 §4.6

The e.r.p. shall not exceed 3 watts for mobile equipment, fixed subscriber equipment and portable equipment operating in the Band 617-652 and 663-698MHz.

RSS-133 §6.4

The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510.

According to section 5.1.2 of SRSP-510, Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p. The equipment shall employ means to limit the power to the minimum necessary for successful communication.

RSS-139 §6.5

The equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters in the Bands 1710-1780MHz shall not exceed one watt.

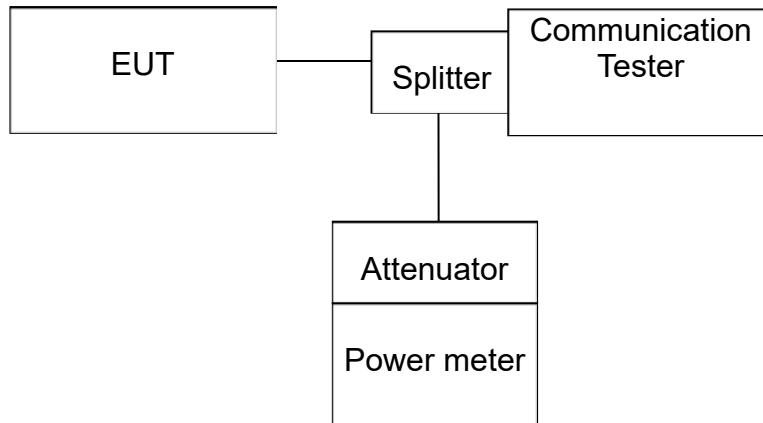
RSS-130 §4.6

The e.r.p. shall not exceed 3 watts for mobile equipment, fixed subscriber equipment and portable equipment.

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7.3 Test Set-up



Note: Measurement setup for testing on Antenna connector

7.4 Output Power Measurement Applicable Guidance

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. TS 151 010-1 is reference to conduct the measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCDMA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results. Wall bands conducted average power is obtained from the simulator telecommunication test set.

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

$$ERP/EIRP = P_{Meas} + GT - LC$$

Where:

- ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P_{Meas} , typically dBW or dBm);
- P_{Meas} = 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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7.6 Measurement Result

Antenna gain (dBi)		4.99								
Cat-M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	18607	1850.7	QPSK	1	0	0	22.84	27.83	33	-5.17
				1	5	0	22.75	27.74	33	-5.26
				6	0	0	20.86	25.85	33	-7.15
	18900	1880	QPSK	1	0	0	22.81	27.80	33	-5.2
				1	5	0	22.73	27.72	33	-5.28
				6	0	0	20.90	25.89	33	-7.11
	19193	1909.3	QPSK	1	0	0	22.74	27.73	33	-5.27
				1	5	0	22.73	27.72	33	-5.28
				6	0	0	20.92	25.91	33	-7.09
1.4	18607	1850.7	16QAM	1	0	0	21.65	26.64	33	-6.36
				1	5	0	21.64	26.63	33	-6.37
				5	0	0	20.76	25.75	33	-7.25
	18900	1880	16QAM	1	0	0	21.60	26.59	33	-6.41
				1	5	0	21.58	26.57	33	-6.43
				5	0	0	20.82	25.81	33	-7.19
	19193	1909.3	16QAM	1	0	0	21.64	26.63	33	-6.37
				1	5	0	21.63	26.62	33	-6.38
				5	0	0	20.82	25.81	33	-7.19

Antenna gain (dBi)		4.99								
Cat-M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	18615	1851.5	QPSK	1	0	0	22.83	27.82	33	-5.18
				1	5	0	22.81	27.80	33	-5.2
				6	0	0	20.82	25.81	33	-7.19
	18900	1880	QPSK	1	0	0	22.80	27.79	33	-5.21
				1	5	0	22.72	27.71	33	-5.29
				6	0	0	20.90	25.89	33	-7.11
	19185	1908.5	QPSK	1	0	1	22.73	27.72	33	-5.28
				1	5	1	22.72	27.71	33	-5.29
				6	0	1	20.98	25.97	33	-7.03
3	18615	1851.5	16QAM	1	0	0	21.67	26.66	33	-6.34
				1	5	0	21.66	26.65	33	-6.35
				5	0	0	20.73	25.72	33	-7.28
	18900	1880	16QAM	1	0	0	21.56	26.55	33	-6.45
				1	5	0	21.61	26.60	33	-6.4
				5	0	0	20.69	25.68	33	-7.32
	19185	1908.5	16QAM	1	0	1	21.61	26.60	33	-6.4
				1	5	1	21.60	26.59	33	-6.41
				5	0	1	20.83	25.82	33	-7.18

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Antenna gain (dBi)		4.99								
Cat-M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	18625	1852.5	QPSK	1	0	0	22.80	27.79	33	-5.21
				1	5	0	22.73	27.72	33	-5.28
				6	0	0	21.86	26.85	33	-6.15
	18900	1880	QPSK	1	0	0	22.78	27.77	33	-5.23
				1	5	0	22.70	27.69	33	-5.31
				6	0	0	21.64	26.63	33	-6.37
	19175	1907.5	QPSK	1	0	3	22.63	27.62	33	-5.38
				1	5	3	22.62	27.61	33	-5.39
				6	0	3	21.91	26.90	33	-6.1
5	18625	1852.5	16QAM	1	0	0	22.09	27.08	33	-5.92
				1	5	0	22.12	27.11	33	-5.89
				5	0	0	20.97	25.96	33	-7.04
	18900	1880	16QAM	1	0	0	22.03	27.02	33	-5.98
				1	5	0	22.06	27.05	33	-5.95
				5	0	0	20.85	25.84	33	-7.16
	19175	1907.5	16QAM	1	0	3	22.05	27.04	33	-5.96
				1	5	3	22.07	27.06	33	-5.94
				5	0	3	21.02	26.01	33	-6.99
Antenna gain (dBi)		4.99								
Cat-M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	18650	1855	QPSK	1	0	0	22.86	27.85	33	-5.15
				1	5	0	22.81	27.80	33	-5.2
				6	0	0	21.84	26.83	33	-6.17
	18900	1880	QPSK	1	0	0	22.69	27.68	33	-5.32
				1	5	0	22.68	27.67	33	-5.33
				6	0	0	21.84	26.83	33	-6.17
	19150	1905	QPSK	1	0	7	22.66	27.65	33	-5.35
				1	5	7	22.65	27.64	33	-5.36
				6	0	7	21.91	26.90	33	-6.1
10	18650	1855	16QAM	1	0	0	22.15	27.14	33	-5.86
				1	5	0	22.07	27.06	33	-5.94
				5	0	0	21.75	26.74	33	-6.26
	18900	1880	16QAM	1	0	0	22.03	27.02	33	-5.98
				1	5	0	22.05	27.04	33	-5.96
				5	0	0	21.78	26.77	33	-6.23
	19150	1905	16QAM	1	0	7	22.12	27.11	33	-5.89
				1	5	7	22.14	27.13	33	-5.87
				5	0	7	21.86	26.85	33	-6.15

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Antenna gain (dBi)		4.99								
Cat-M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
15	18675	1857.5	QPSK	1	0	0	22.77	27.76	33	-5.24
				1	5	0	22.73	27.72	33	-5.28
				6	0	0	22.74	27.73	33	-5.27
	18900	1880	QPSK	1	0	0	22.72	27.71	33	-5.29
				1	5	0	22.71	27.70	33	-5.3
				6	0	0	22.70	27.69	33	-5.31
	19125	1902.5	QPSK	1	0	11	22.87	27.86	33	-5.14
				1	5	11	22.66	27.65	33	-5.35
				6	0	11	22.65	27.64	33	-5.36
15	18675	1857.5	16QAM	1	0	0	22.02	27.01	33	-5.99
				1	5	0	22.04	27.03	33	-5.97
				5	0	0	21.83	26.82	33	-6.18
	18900	1880	16QAM	1	0	0	22.05	27.04	33	-5.96
				1	5	0	21.96	26.95	33	-6.05
				5	0	0	21.87	26.86	33	-6.14
	19125	1902.5	16QAM	1	0	11	22.12	27.11	33	-5.89
				1	5	11	22.05	27.04	33	-5.96
				5	0	11	22.04	27.03	33	-5.97
Antenna gain (dBi)		4.99								
Cat-M1 Band 2_Uplink frequency band : 1850 to 1910 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
20	18700	1860	QPSK	1	0	0	22.76	27.75	33	-5.25
				1	5	0	22.73	27.72	33	-5.28
				6	0	0	22.71	27.70	33	-5.3
	18900	1880	QPSK	1	0	0	22.73	27.72	33	-5.28
				1	5	0	22.64	27.63	33	-5.37
				6	0	0	22.63	27.62	33	-5.38
	19100	1900	QPSK	1	0	15	22.88	27.87	33	-5.13
				1	5	15	22.67	27.66	33	-5.34
				6	0	15	22.66	27.65	33	-5.35
20	18700	1860	16QAM	1	0	0	22.01	27.00	33	-6
				1	5	0	22.03	27.02	33	-5.98
				5	0	0	21.91	26.90	33	-6.1
	18900	1880	16QAM	1	0	0	22.07	27.06	33	-5.94
				1	5	0	22.09	27.08	33	-5.92
				5	0	0	22.00	26.99	33	-6.01
	19100	1900	16QAM	1	0	15	22.14	27.13	33	-5.87
				1	5	15	22.08	27.07	33	-5.93
				5	0	15	22.13	27.12	33	-5.88

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Antenna gain (dBi)		3.12								
Cat-M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
1.4	19957	1710.7	QPSK	1	0	0	22.71	25.83	30	-4.17
				1	5	0	22.68	25.80	30	-4.2
				6	0	0	20.77	23.89	30	-6.11
	20175	1732.5	QPSK	1	0	0	22.69	25.81	30	-4.19
				1	5	0	22.68	25.80	30	-4.2
				6	0	0	20.77	23.89	30	-6.11
	20393	1754.3	QPSK	1	0	0	22.77	25.89	30	-4.11
				1	5	0	22.73	25.85	30	-4.15
				6	0	0	20.87	23.99	30	-6.01
1.4	19957	1710.7	16QAM	1	0	0	21.55	24.67	30	-5.33
				1	5	0	21.51	24.63	30	-5.37
				5	0	0	20.55	23.67	30	-6.33
	20175	1732.5	16QAM	1	0	0	21.58	24.70	30	-5.3
				1	5	0	21.57	24.69	30	-5.31
				5	0	0	20.63	23.75	30	-6.25
	20393	1754.3	16QAM	1	0	0	21.68	24.80	30	-5.2
				1	5	0	21.54	24.66	30	-5.34
				5	0	0	20.83	23.95	30	-6.05
Antenna gain (dBi)		3.12								
Cat-M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
3	19965	1711.5	QPSK	1	0	0	22.70	25.82	30	-4.18
				1	5	0	22.63	25.75	30	-4.25
				6	0	0	22.59	25.71	30	-4.29
	20175	1732.5	QPSK	1	0	0	22.74	25.86	30	-4.14
				1	5	0	22.62	25.74	30	-4.26
				6	0	0	20.77	23.89	30	-6.11
	20385	1753.5	QPSK	1	0	1	22.90	26.02	30	-3.98
				1	5	1	22.81	25.93	30	-4.07
				6	0	1	20.86	23.98	30	-6.02
3	19965	1711.5	16QAM	1	0	0	21.58	24.70	30	-5.3
				1	5	0	21.55	24.67	30	-5.33
				5	0	0	20.56	23.68	30	-6.32
	20175	1732.5	16QAM	1	0	0	21.62	24.74	30	-5.26
				1	5	0	21.61	24.73	30	-5.27
				5	0	0	20.62	23.74	30	-6.26
	20385	1753.5	16QAM	1	0	1	21.72	24.84	30	-5.16
				1	5	1	21.61	24.73	30	-5.27
				5	0	1	20.72	23.84	30	-6.16

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Antenna gain (dBi)		3.12								
Cat-M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
5	19975	1712.5	QPSK	1	0	0	22.61	25.73	30	-4.27
				1	5	0	22.57	25.69	30	-4.31
				6	0	0	21.63	24.75	30	-5.25
	20175	1732.5	QPSK	1	0	0	22.67	25.79	30	-4.21
				1	5	0	22.63	25.75	30	-4.25
				6	0	0	21.70	24.82	30	-5.18
	20375	1752.5	QPSK	1	0	3	22.83	25.95	30	-4.05
				1	5	3	22.80	25.92	30	-4.08
				6	0	3	21.79	24.91	30	-5.09
5	19975	1712.5	16QAM	1	0	0	22.01	25.13	30	-4.87
				1	5	0	22.06	25.18	30	-4.82
				5	0	0	20.78	23.90	30	-6.1
	20175	1732.5	16QAM	1	0	0	22.00	25.12	30	-4.88
				1	5	0	22.04	25.16	30	-4.84
				5	0	0	20.87	23.99	30	-6.01
	20375	1752.5	16QAM	1	0	3	22.16	25.28	30	-4.72
				1	5	3	22.08	25.20	30	-4.8
				5	0	3	20.83	23.95	30	-6.05
Antenna gain (dBi)		3.12								
Cat-M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
10	20000	1715	QPSK	1	0	0	22.57	25.69	30	-4.31
				1	5	0	22.55	25.67	30	-4.33
				6	0	0	21.59	24.71	30	-5.29
	20175	1732.5	QPSK	1	0	0	22.66	25.78	30	-4.22
				1	5	0	22.63	25.75	30	-4.25
				6	0	0	21.70	24.82	30	-5.18
	20350	1750	QPSK	1	0	7	22.83	25.95	30	-4.05
				1	5	7	22.76	25.88	30	-4.12
				6	0	7	21.82	24.94	30	-5.06
10	20000	1715	16QAM	1	0	0	22.01	25.13	30	-4.87
				1	5	0	22.05	25.17	30	-4.83
				5	0	0	21.70	24.82	30	-5.18
	20175	1732.5	16QAM	1	0	0	21.99	25.11	30	-4.89
				1	5	0	22.03	25.15	30	-4.85
				5	0	0	21.89	25.01	30	-4.99
	20350	1750	16QAM	1	0	7	22.12	25.24	30	-4.76
				1	5	7	22.15	25.27	30	-4.73
				5	0	7	21.91	25.03	30	-4.97

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Antenna gain (dBi)		3.12								
Cat-M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
15	20025	1717.5	QPSK	1	0	0	22.71	25.83	30	-4.17
				1	5	0	22.68	25.80	30	-4.2
				6	0	0	22.70	25.82	30	-4.18
	20175	1732.5	QPSK	1	0	0	22.67	25.79	30	-4.21
				1	5	0	22.66	25.78	30	-4.22
				6	0	0	22.65	25.77	30	-4.23
	20325	1747.5	QPSK	1	0	11	22.86	25.98	30	-4.02
				1	5	11	22.85	25.97	30	-4.03
				6	0	11	22.85	25.97	30	-4.03
15	20025	1717.5	16QAM	1	0	0	22.05	25.17	30	-4.83
				1	5	0	21.97	25.09	30	-4.91
				5	0	0	21.84	24.96	30	-5.04
	20175	1732.5	16QAM	1	0	0	22.13	25.25	30	-4.75
				1	5	0	22.04	25.16	30	-4.84
				5	0	0	21.82	24.94	30	-5.06
	20325	1747.5	16QAM	1	0	11	22.20	25.32	30	-4.68
				1	5	11	22.11	25.23	30	-4.77
				5	0	11	21.90	25.02	30	-4.98
Antenna gain (dBi)		3.12								
Cat-M1 Band 4_Uplink frequency band : 1710 to 1755 MHz										
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
20	20050	1720	QPSK	1	0	0	22.66	25.78	30	-4.22
				1	5	0	22.65	25.77	30	-4.23
				6	0	0	22.63	25.75	30	-4.25
	20175	1732.5	QPSK	1	0	0	22.60	25.72	30	-4.28
				1	5	0	22.57	25.69	30	-4.31
				6	0	0	22.59	25.71	30	-4.29
	20300	1745	QPSK	1	0	15	22.96	26.08	30	-3.92
				1	5	15	22.87	25.99	30	-4.01
				6	0	15	22.84	25.96	30	-4.04
20	20050	1720	16QAM	1	0	0	21.98	25.10	30	-4.9
				1	5	0	21.91	25.03	30	-4.97
				5	0	0	21.80	24.92	30	-5.08
	20175	1732.5	16QAM	1	0	0	22.04	25.16	30	-4.84
				1	5	0	22.08	25.20	30	-4.8
				5	0	0	21.73	24.85	30	-5.15
	20300	1745	16QAM	1	0	15	22.27	25.39	30	-4.61
				1	5	15	22.20	25.32	30	-4.68
				5	0	15	21.97	25.09	30	-4.91

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Antenna gain (dBi)		3.68									
Cat-M1 Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	ERP Limit (dBm)	Margin (dB)
1.4	23017	699.7	QPSK	1	0	0	22.69	24.22	26.37	34.77	-10.55
				1	5	0	22.68	24.21	26.36	34.77	-10.56
				6	0	0	20.85	22.38	24.53	34.77	-12.39
	23095	707.5	QPSK	1	0	0	22.58	24.11	26.26	34.77	-10.66
				1	5	0	22.57	24.10	26.25	34.77	-10.67
				6	0	0	20.69	22.22	24.37	34.77	-12.55
	23173	715.5	QPSK	1	0	0	22.68	24.21	26.36	34.77	-10.56
				1	5	0	22.67	24.20	26.35	34.77	-10.57
				6	0	0	20.68	22.21	24.36	34.77	-12.56
1.4	23017	699.7	16QAM	1	0	0	21.64	23.17	25.32	34.77	-11.60
				1	5	0	21.63	23.16	25.31	34.77	-11.61
				5	0	0	20.78	22.31	24.46	34.77	-12.46
	23095	707.5	16QAM	1	0	0	21.76	23.29	25.44	34.77	-11.48
				1	5	0	21.45	22.98	25.13	34.77	-11.79
				5	0	0	20.65	22.18	24.33	34.77	-12.59
	23173	715.5	16QAM	1	0	0	22.67	24.20	26.35	34.77	-10.57
				1	5	0	22.66	24.19	26.34	34.77	-10.58
				5	0	0	21.67	23.20	25.35	34.77	-11.57

Antenna gain (dBi)		3.68									
Cat-M1 Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	ERP Limit (dBm)	Margin (dB)
3	23025	700.5	QPSK	1	0	0	22.76	24.29	26.44	34.77	-10.48
				1	5	0	22.68	24.21	26.36	34.77	-10.56
				6	0	0	20.85	22.38	24.53	34.77	-12.39
	23095	707.5	QPSK	1	0	0	22.64	24.17	26.32	34.77	-10.60
				1	5	0	22.56	24.09	26.24	34.77	-10.68
				6	0	0	20.77	22.30	24.45	34.77	-12.47
	23165	714.5	QPSK	1	0	1	22.60	24.13	26.28	34.77	-10.64
				1	5	1	20.60	22.13	24.28	34.77	-12.64
				6	0	1	20.72	22.25	24.40	34.77	-12.52
3	23025	700.5	16QAM	1	0	0	21.59	23.12	25.27	34.77	-11.65
				1	5	0	21.66	23.19	25.34	34.77	-11.58
				5	0	0	20.77	22.30	24.45	34.77	-12.47
	23095	707.5	16QAM	1	0	0	21.59	23.12	25.27	34.77	-11.65
				1	5	0	21.58	23.11	25.26	34.77	-11.66
				5	0	0	20.69	22.22	24.37	34.77	-12.55
	23165	714.5	16QAM	1	0	1	21.50	23.03	25.18	34.77	-11.74
				1	5	1	21.48	23.01	25.16	34.77	-11.76
				5	0	1	20.65	22.18	24.33	34.77	-12.59

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Antenna gain (dBi)		3.68									
Cat-M1 Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	ERP Limit (dBm)	Margin (dB)
5	23035	701.5	QPSK	1	0	0	22.87	24.40	26.55	34.77	-10.37
				1	5	0	22.81	24.34	26.49	34.77	-10.43
				6	0	0	21.88	23.41	25.56	34.77	-11.36
	23095	707.5	QPSK	1	0	0	22.64	24.17	26.32	34.77	-10.60
				1	5	0	22.62	24.15	26.30	34.77	-10.62
				6	0	0	21.63	23.16	25.31	34.77	-11.61
	23155	713.5	QPSK	1	0	3	22.67	24.20	26.35	34.77	-10.57
				1	5	3	22.66	24.19	26.34	34.77	-10.58
				6	0	3	21.68	23.21	25.36	34.77	-11.56
5	23035	701.5	16QAM	1	0	0	22.89	24.42	26.57	34.77	-10.35
				1	5	0	22.80	24.33	26.48	34.77	-10.44
				5	0	0	20.93	22.46	24.61	34.77	-12.31
	23095	707.5	16QAM	1	0	0	22.78	24.31	26.46	34.77	-10.46
				1	5	0	22.80	24.33	26.48	34.77	-10.44
				5	0	0	20.83	22.36	24.51	34.77	-12.41
	23155	713.5	16QAM	1	0	3	22.75	24.28	26.43	34.77	-10.49
				1	5	3	22.75	24.28	26.43	34.77	-10.49
				5	0	3	20.74	22.27	24.42	34.77	-12.50

Antenna gain (dBi)		3.68									
Cat-M1 Band 12_Uplink frequency band : 699 to 716 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Index	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	ERP Limit (dBm)	Margin (dB)
10	23060	704	QPSK	1	0	0	22.75	24.28	26.43	34.77	-10.49
				1	5	0	22.73	24.26	26.41	34.77	-10.51
				6	0	0	21.77	23.30	25.45	34.77	-11.47
	23095	707.5	QPSK	1	0	0	22.72	24.25	26.40	34.77	-10.52
				1	5	0	22.71	24.24	26.39	34.77	-10.53
				6	0	0	21.71	23.24	25.39	34.77	-11.53
	23130	711	QPSK	1	0	7	22.66	24.19	26.34	34.77	-10.58
				1	5	7	22.65	24.18	26.33	34.77	-10.59
				6	0	7	21.68	23.21	25.36	34.77	-11.56
10	23060	704	16QAM	1	0	0	22.94	24.47	26.62	34.77	-10.30
				1	5	0	22.84	24.37	26.52	34.77	-10.40
				5	0	0	21.90	23.43	25.58	34.77	-11.34
	23095	707.5	16QAM	1	0	0	22.77	24.30	26.45	34.77	-10.47
				1	5	0	22.80	24.33	26.48	34.77	-10.44
				5	0	0	21.80	23.33	25.48	34.77	-11.44
	23130	711	16QAM	1	0	7	22.74	24.27	26.42	34.77	-10.50
				1	5	7	22.73	24.26	26.41	34.77	-10.51
				5	0	7	21.79	23.32	25.47	34.77	-11.45

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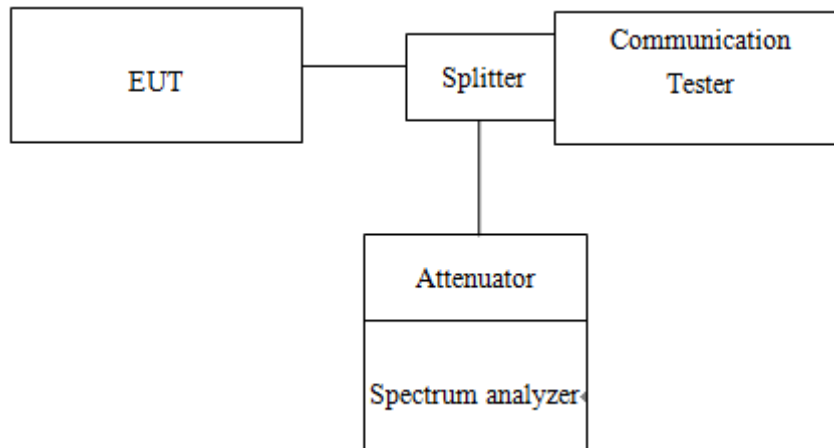
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8 OCCUPIED BANDWIDTH MEASUREMENT

8.1 Standard Applicable

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.

8.2 Test Set-up



8.3 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%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

99% Bandwidth with detector sample

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW, -20dBc display line was placed on the screen (or 20dB bandwidth). Set RBW to 99% bandwidth, RBW= 1% ~ 5%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

8.4 Measurement Result

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Cat-M1 BAND 2 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1850.7	18607	1.0893	0.9518	1.319	1.294
1880.0	18900	1.0876	0.9558	1.317	1.291
1909.3	19193	1.0857	0.9603	1.328	1.309

Cat-M1 BAND 2 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1851.5	18615	1.1207	1.0148	1.375	1.353
1880.0	18900	1.1251	1.0354	1.392	1.509
1908.5	19185	1.1228	1.0438	1.352	1.368

Cat-M1 BAND 2 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1852.5	18625	1.1799	1.1004	1.451	1.404
1880.0	18900	1.1814	1.0996	1.487	1.399
1907.5	19175	1.1894	1.1057	1.454	1.446

Cat-M1 BAND 2 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1855.0	18650	1.2887	1.2267	1.792	1.590
1880.0	18900	1.2818	1.2157	1.817	1.894
1905.0	19150	1.2922	1.2155	1.928	1.972

Cat-M1 BAND 2 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1857.5	18675	1.419	1.280	2.40	1.75
1880.0	18900	1.446	1.304	2.51	1.93
1902.5	19125	1.431	1.332	2.76	1.97

Cat-M1 BAND 2 Channel bandwidth: 20MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1860.0	18700	1.577	1.475	2.53	1.95
1880.0	18900	1.569	1.429	2.62	2.08
1900.0	19100	1.587	1.480	2.79	2.34

Cat-M1 BAND 4 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1710.7	19957	1.0868	0.9432	1.330	1.294
1732.5	20175	1.0866	0.9446	1.305	1.307
1754.3	20393	1.0892	0.9451	1.305	1.285

Cat-M1 BAND 4 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1711.5	19965	1.1129	1.0173	1.372	1.545
1732.5	20175	1.1180	1.0222	1.372	1.510
1753.5	20385	1.1211	1.0236	1.368	1.365

Cat-M1 BAND 4 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1712.5	19975	1.1837	1.0868	1.432	1.445
1732.5	20175	1.1838	1.0821	1.457	1.441
1752.5	20375	1.1732	1.1056	1.450	1.403

Cat-M1 BAND 4 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1715.0	20000	1.2774	1.2084	1.717	1.549
1732.5	20175	1.2740	1.2035	1.709	1.581
1750.0	20350	1.2916	1.1936	1.586	1.563

Cat-M1 BAND 4 Channel bandwidth: 15MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1717.5	20025	1.408	1.290	2.26	1.76
1732.5	20175	1.415	1.289	2.16	1.68
1747.5	20325	1.397	1.299	2.26	1.74

Cat-M1 BAND 4 Channel bandwidth: 20MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
1720.0	20050	1.555	1.431	2.46	1.90
1732.5	20175	1.548	1.435	2.42	1.83
1745.0	20300	1.569	1.415	2.46	1.83

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Cat-M1 BAND 12 Channel bandwidth: 1.4MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
699.7	23017	1.0883	0.9461	1.314	1.285
707.5	23095	1.0841	0.9396	1.308	1.258
715.3	23173	1.0856	0.9455	1.317	1.265

Cat-M1 BAND 12 Channel bandwidth: 3MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
700.5	23025	1.1146	1.0170	1.375	1.430
707.5	23095	1.1149	1.0153	1.388	1.388
714.5	23165	1.1189	1.0111	1.367	1.345

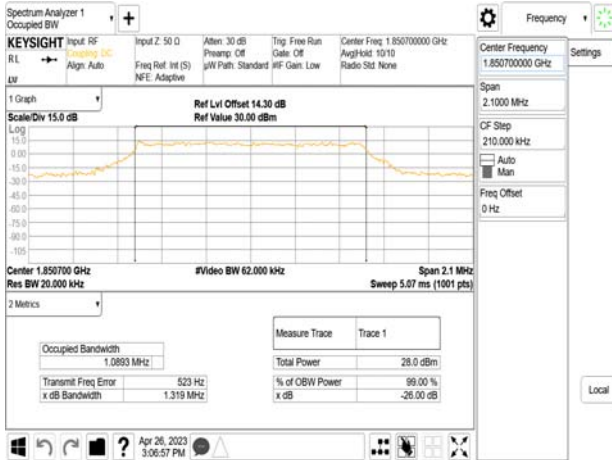
Cat-M1 BAND 12 Channel bandwidth: 5MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
701.5	23035	1.1613	1.0981	1.435	1.422
707.5	23095	1.1740	1.0940	1.444	1.467
713.5	23155	1.1579	1.0960	1.432	1.408

Cat-M1 BAND 12 Channel bandwidth: 10MHz					
Freq. (MHz)	CH	99% BW (MHz)		26 dB BW (MHz)	
		QPSK	16QAM	QPSK	16QAM
704.0	23060	1.2641	1.1915	1.572	1.517
707.5	23095	1.2708	1.1882	1.686	1.529
711.0	23130	1.2881	1.1654	1.581	1.519

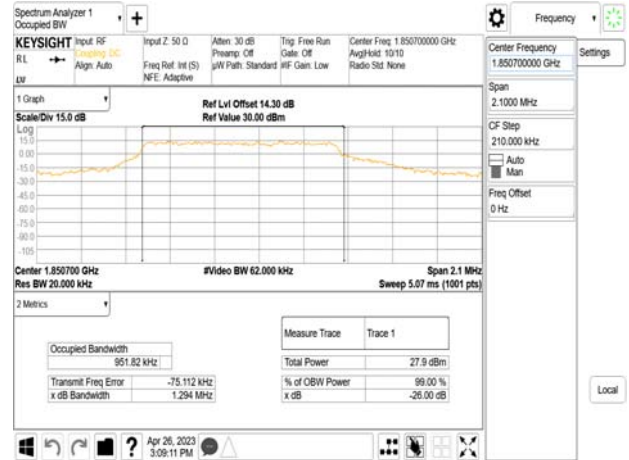
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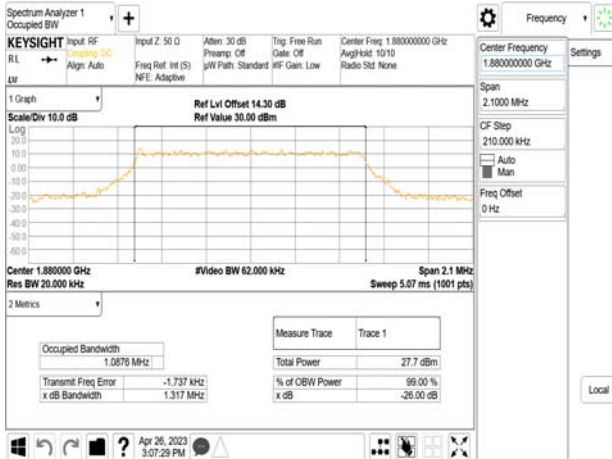
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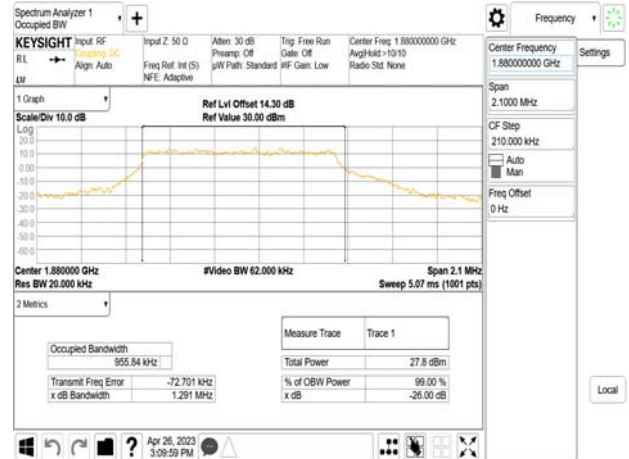
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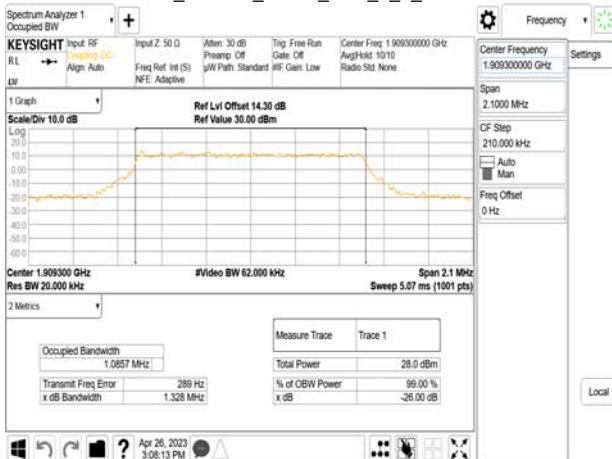
Band2_1.4MHz_QPSK_RB6_0_0_CH18900



Band2_1.4MHz_16QAM_RB5_0_0_CH18900



Band2_1.4MHz_QPSK_RB6_0_0_CH19193



Band2_1.4MHz_16QAM_RB5_0_0_CH19193



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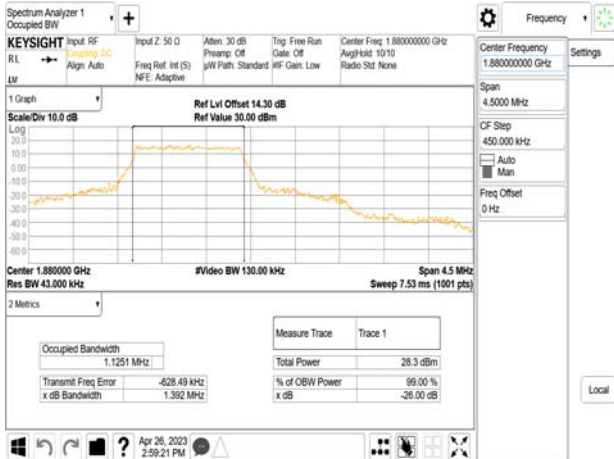
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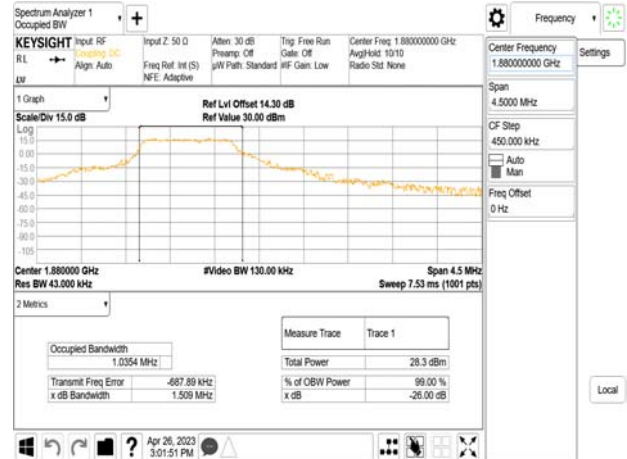
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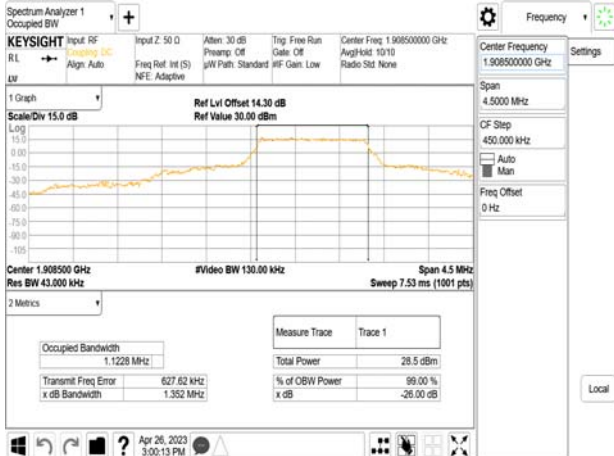
Band2_3MHz_QPSK_RB6_0_0_CH18900



Band2_3MHz_16QAM_RB5_0_0_CH18900



Band2_3MHz_QPSK_RB6_0_1_CH19185



Band2_3MHz_16QAM_RB5_0_1_CH19185



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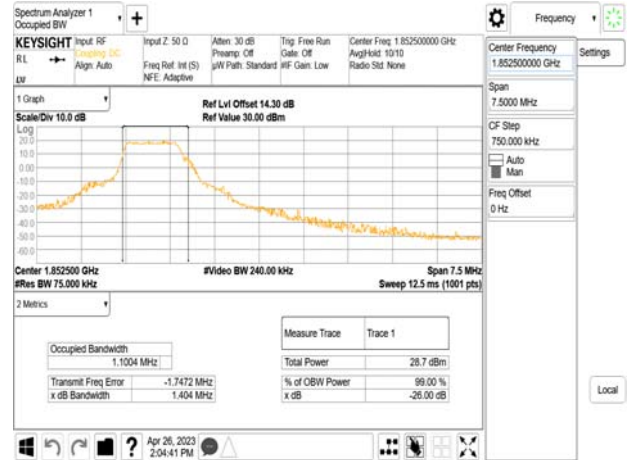
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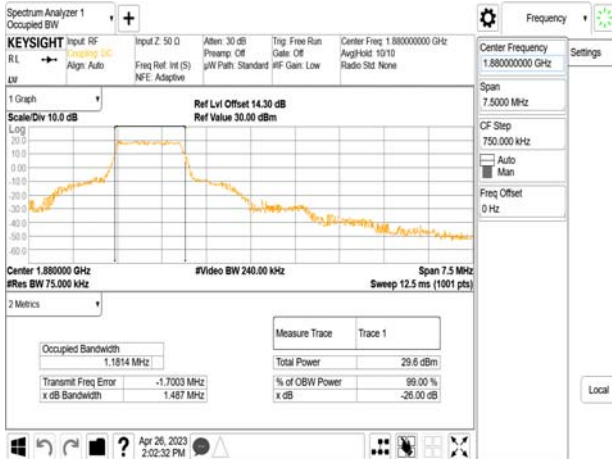
Band2_5MHz_QPSK_RB6_0_0_CH18625



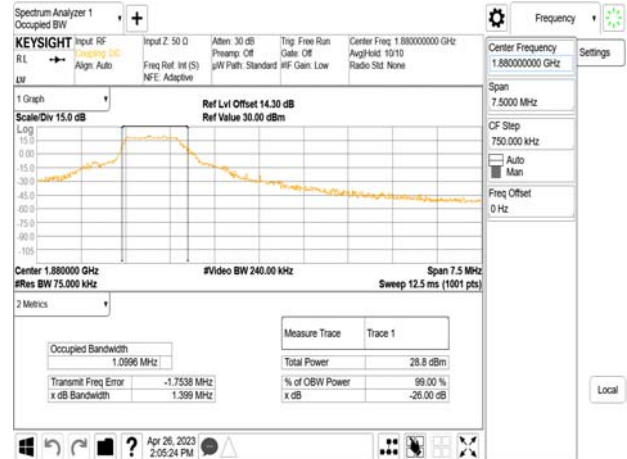
Band2_5MHz_16QAM_RB5_0_0_CH18625



Band2_5MHz_QPSK_RB6_0_0_CH18900



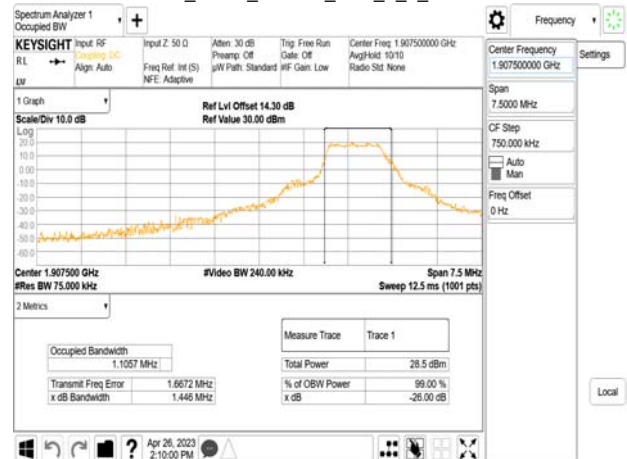
Band2_5MHz_16QAM_RB5_0_0_CH18900



Band2_5MHz_QPSK_RB6_0_3_CH19175



Band2_5MHz_16QAM_RB5_0_3_CH19175

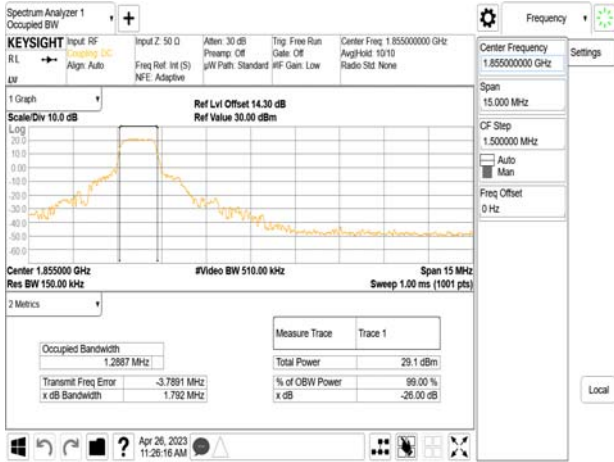


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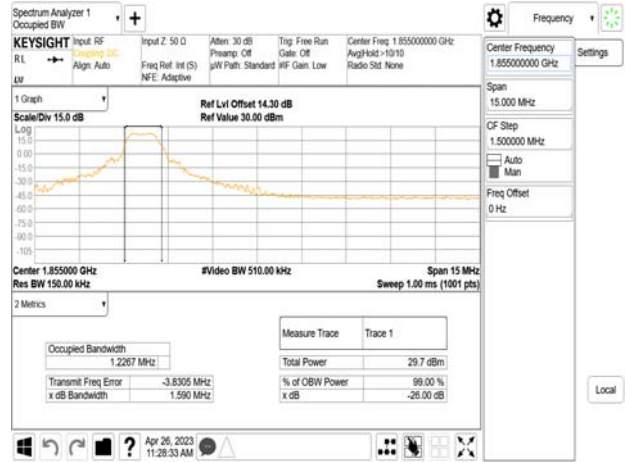
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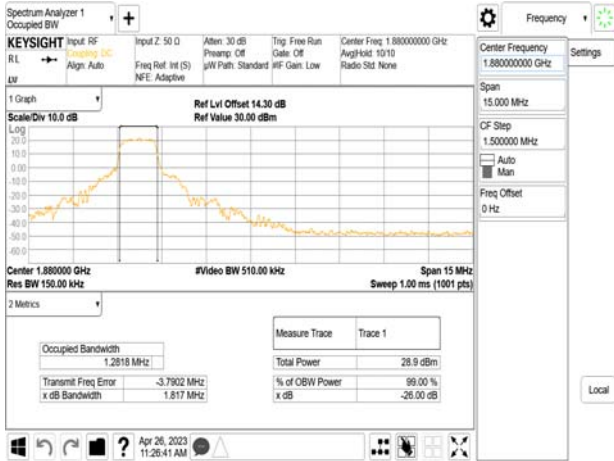
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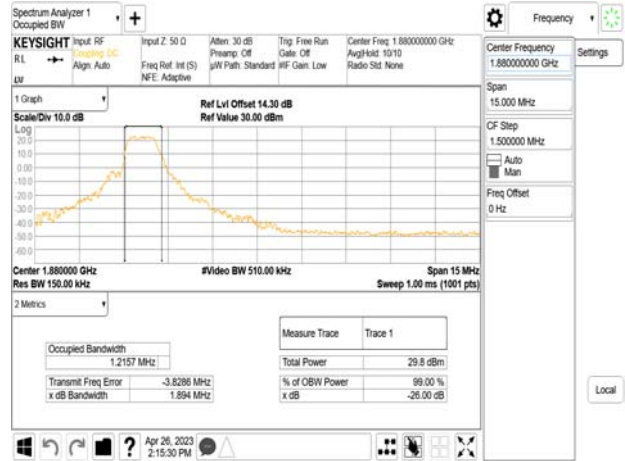
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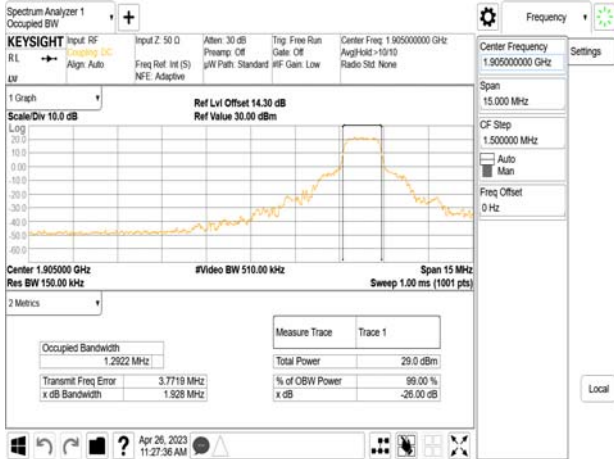
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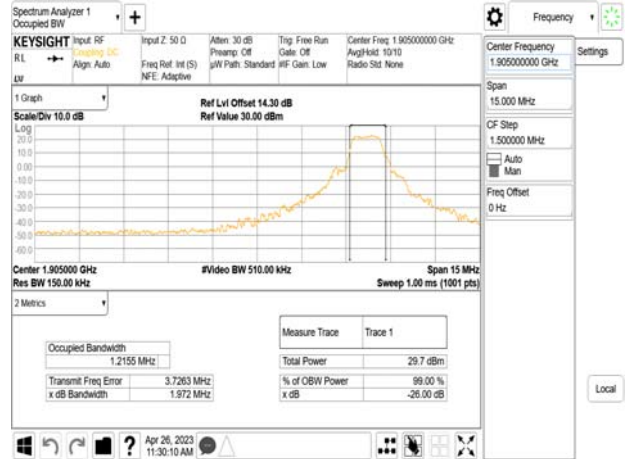
Band2_10MHz_16QAM_RB5_0_0_CH18900



Band2_10MHz_QPSK_RB6_0_7_CH19150



Band2_10MHz_16QAM_RB5_0_7_CH19150

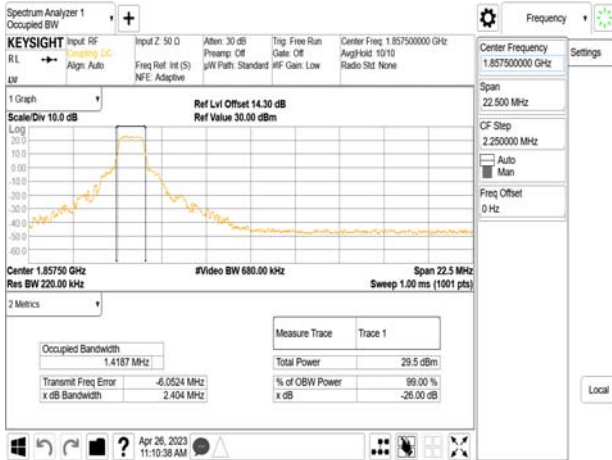


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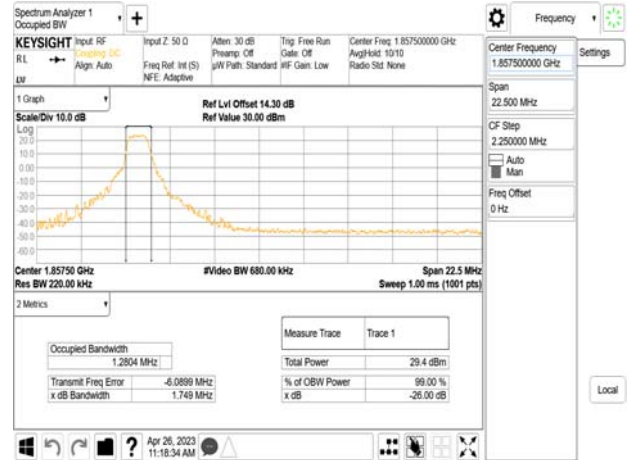
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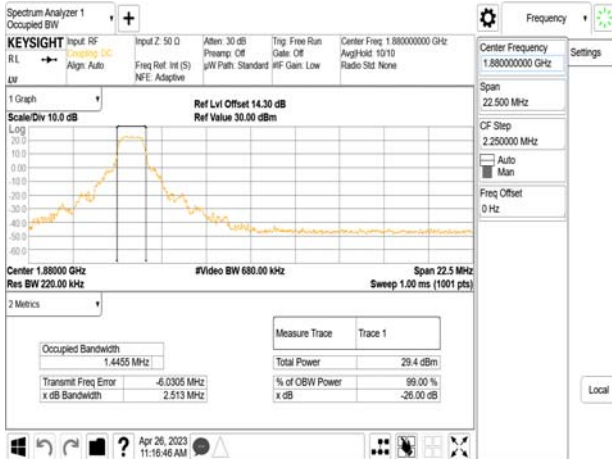
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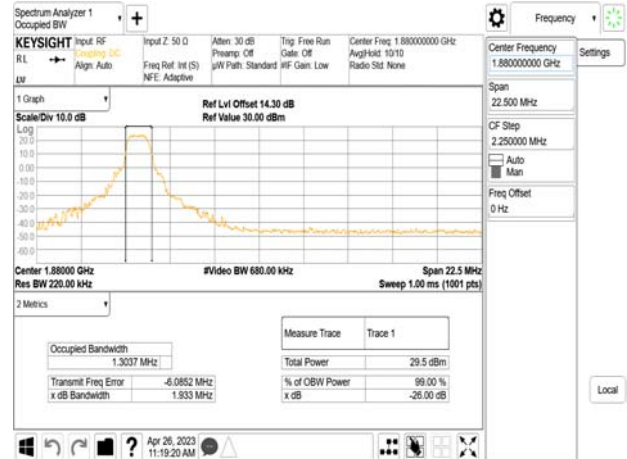
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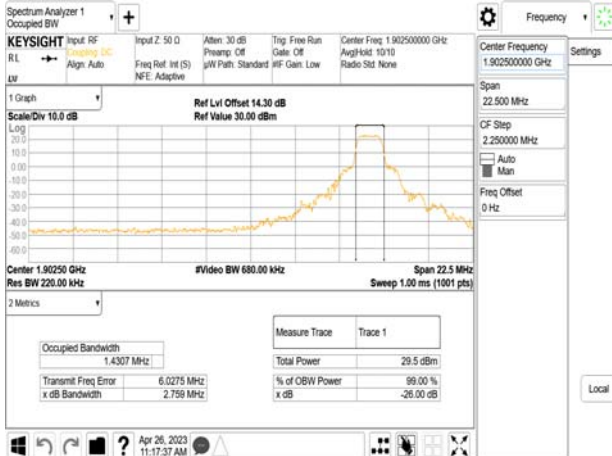
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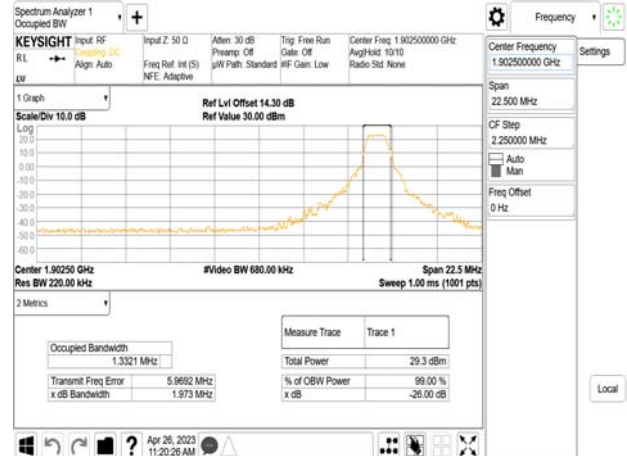
Band2_15MHz_16QAM_RB5_0_0_CH18900



Band2_15MHz_QPSK_RB6_0_11_CH19125



Band2_15MHz_16QAM_RB5_0_11_CH19125

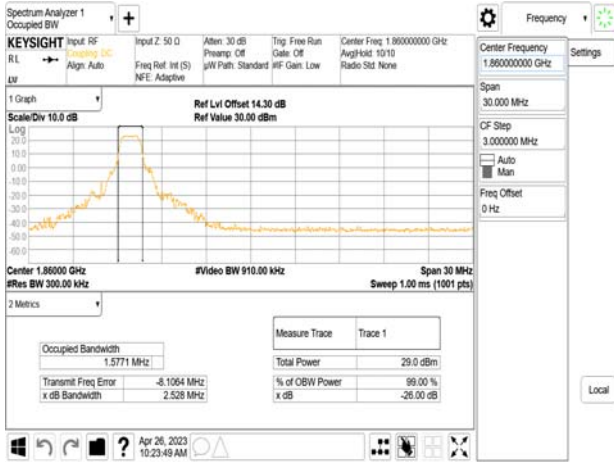


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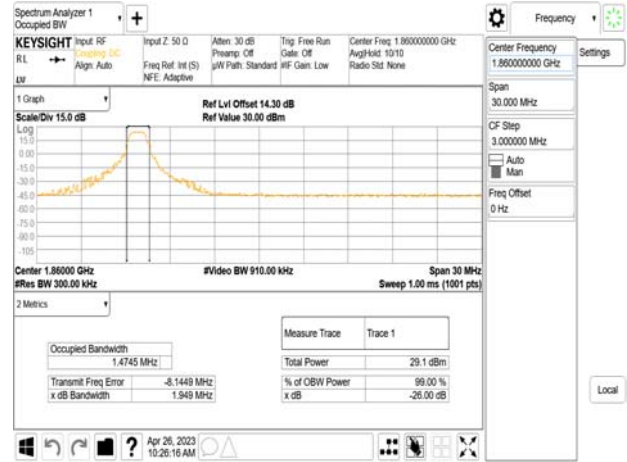
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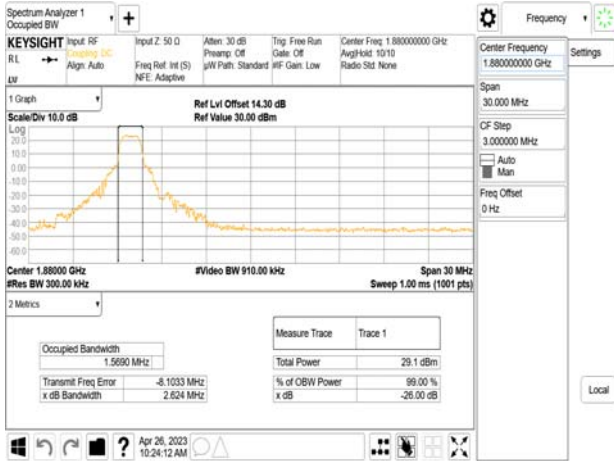
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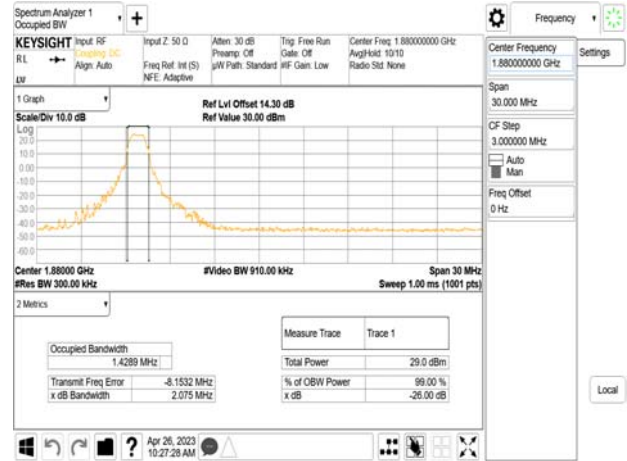
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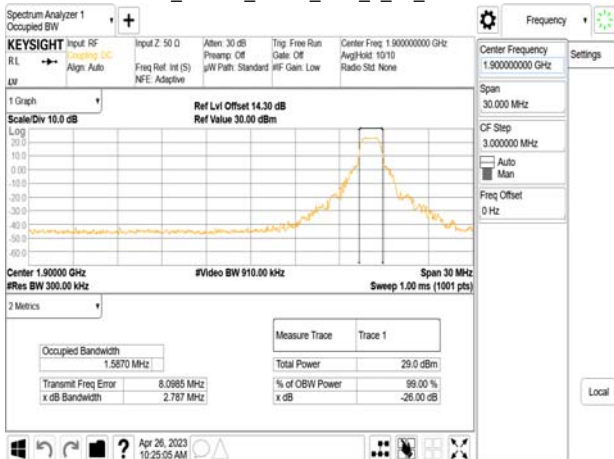
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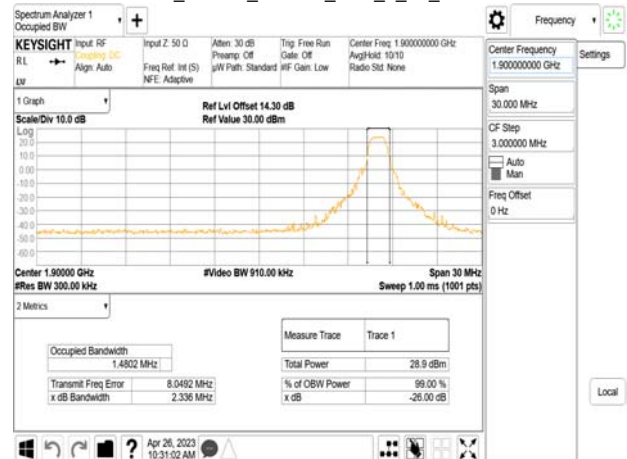
Band2_20MHz_16QAM_RB5_0_0_CH18900



Band2_20MHz_QPSK_RB6_0_15_CH19100



Band2_20MHz_16QAM_RB5_0_15_CH19100

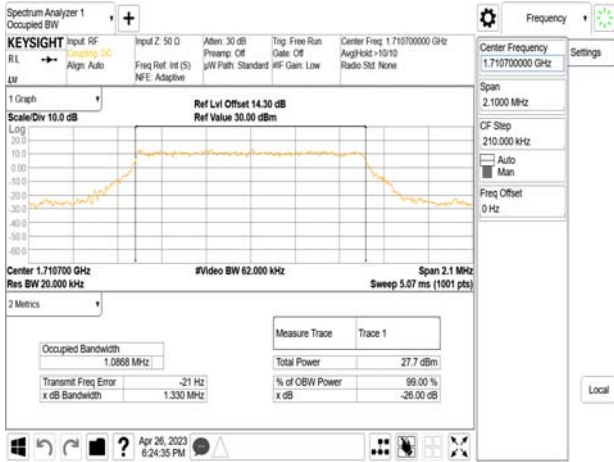


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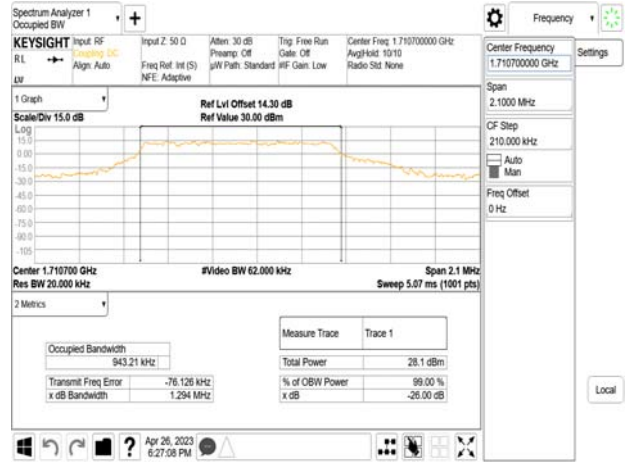
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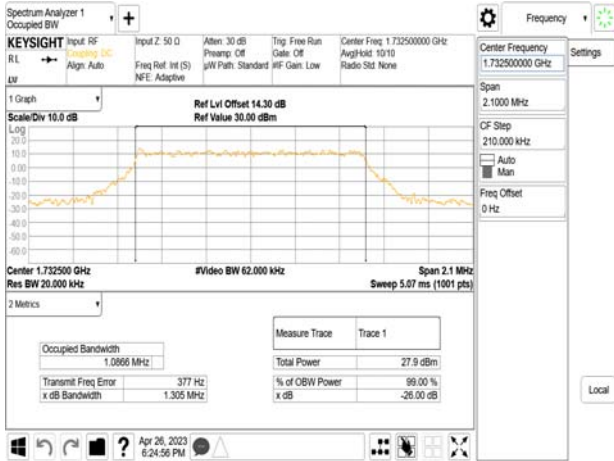
Band4_1.4MHz_QPSK_RB6_0_0_CH19957



Band4_1.4MHz_16QAM_RB5_0_0_CH19957



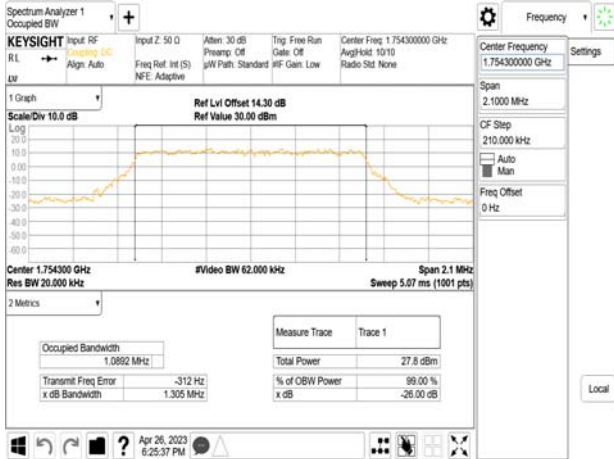
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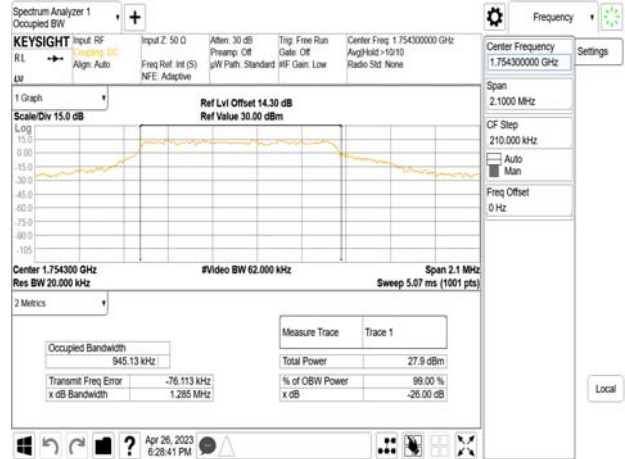
Band4_1.4MHz_16QAM_RB5_0_0_CH20175



Band4_1.4MHz_QPSK_RB6_0_0_CH20393



Band4_1.4MHz_16QAM_RB5_0_0_CH20393

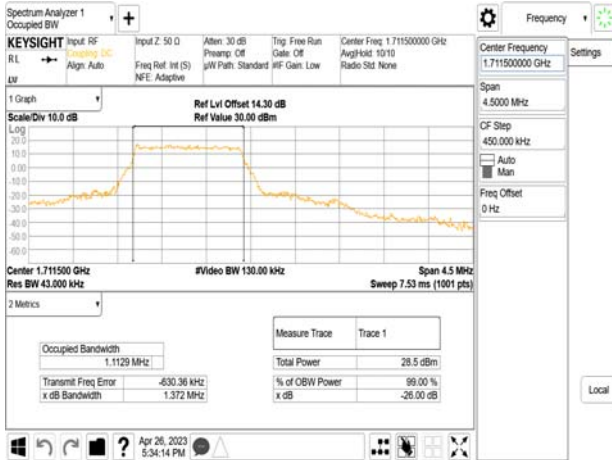


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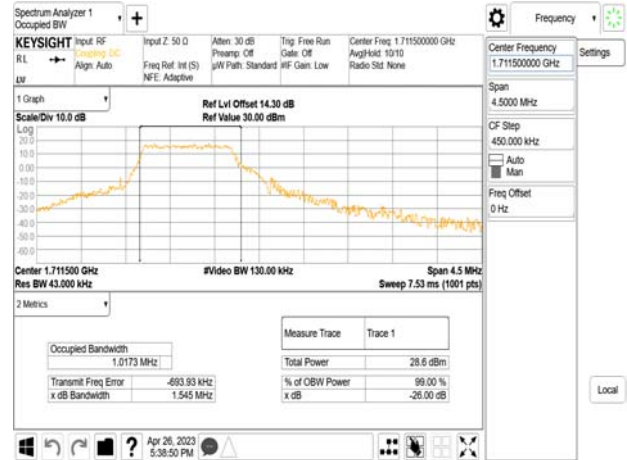
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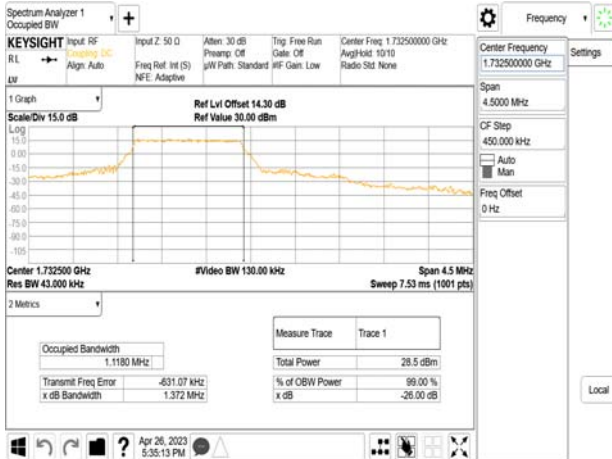
Band4_3MHz_QPSK_RB6_0_0_CH19965



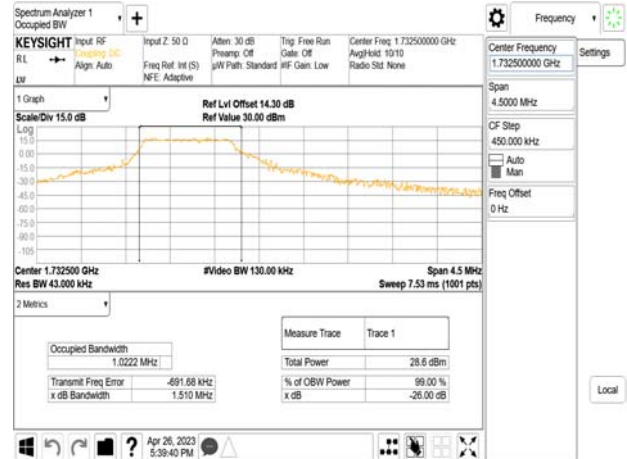
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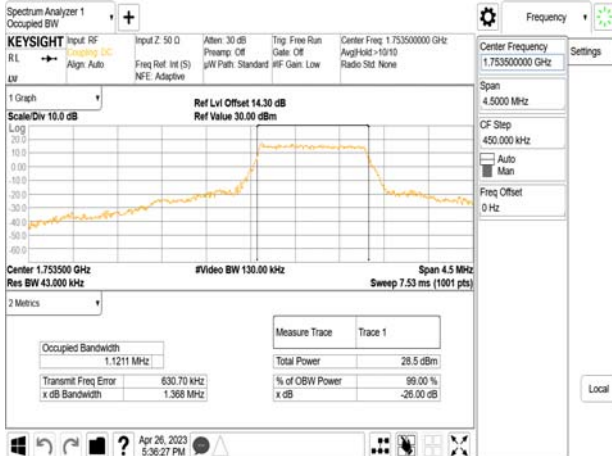
Band4_3MHz_QPSK_RB6_0_0_CH20175



Band4_3MHz_16QAM_RB5_0_0_CH20175



Band4_3MHz_QPSK_RB6_0_1_CH20385



Band4_3MHz_16QAM_RB5_0_1_CH20385



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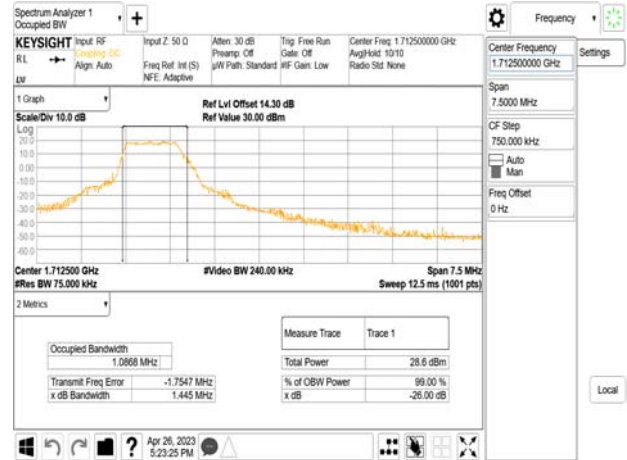
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Band4_5MHz_QPSK_RB6_0_0_CH19975



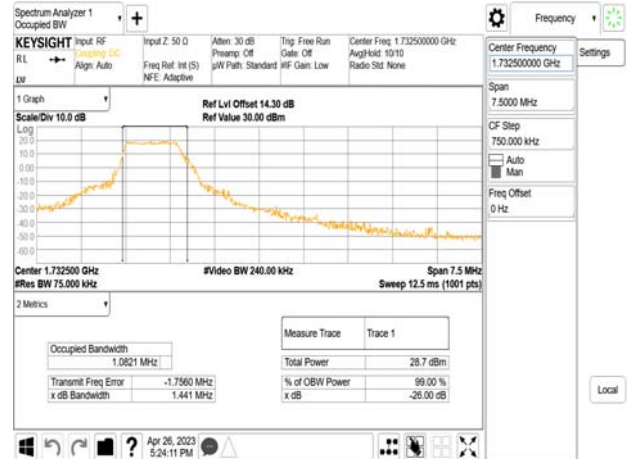
Band4_5MHz_16QAM_RB5_0_0_CH19975



Band4_5MHz_QPSK_RB6_0_0_CH20175



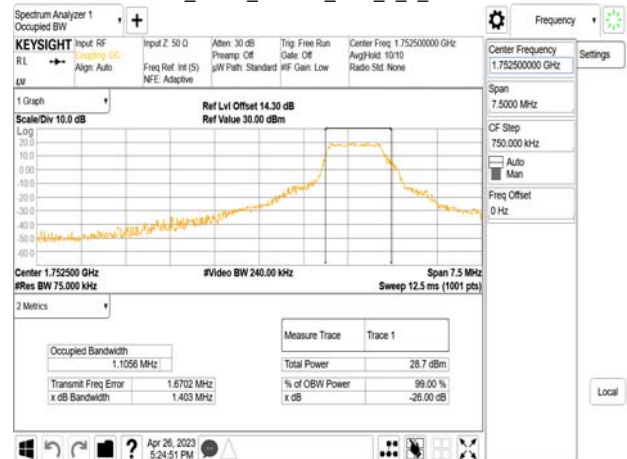
Band4_5MHz_16QAM_RB5_0_0_CH20175



Band4_5MHz_QPSK_RB6_0_3_CH20375



Band4_5MHz_16QAM_RB5_0_3_CH20375

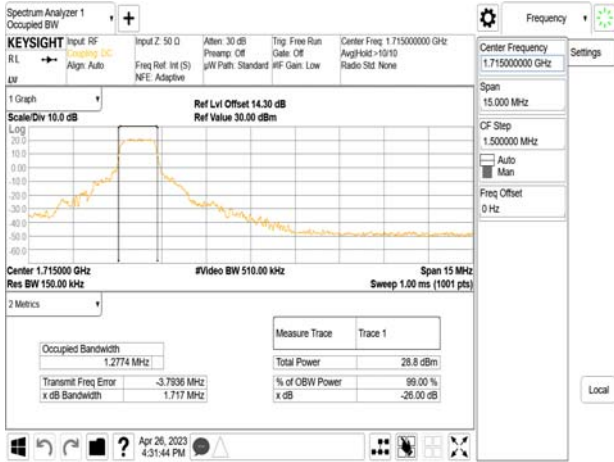


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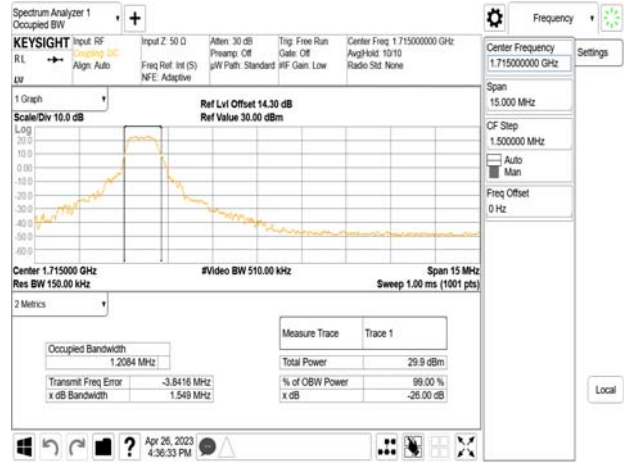
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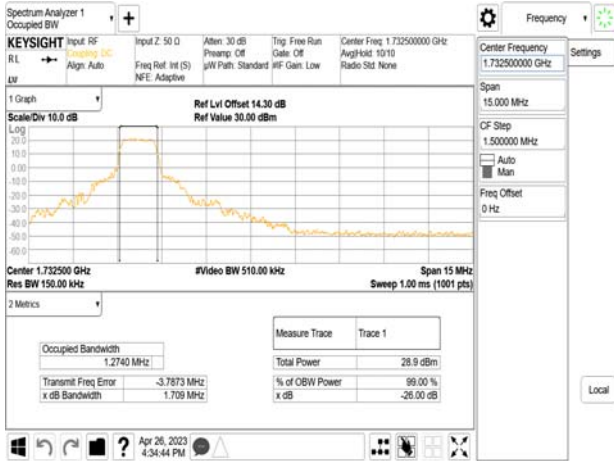
Band4_10MHz_QPSK_RB6_0_0_CH20000



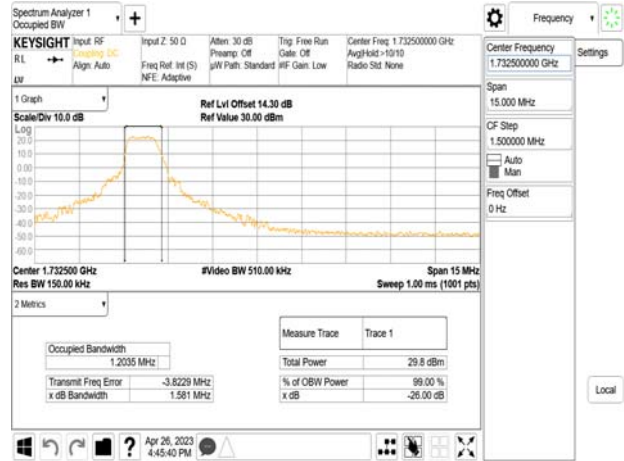
Band4_10MHz_16QAM_RB5_0_0_CH20000



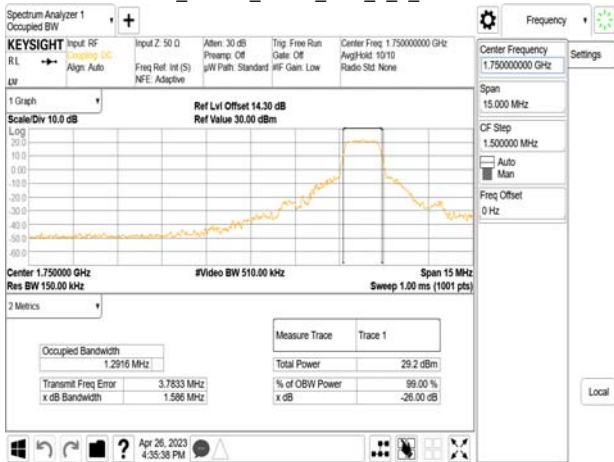
Band4_10MHz_QPSK_RB6_0_0_CH20175



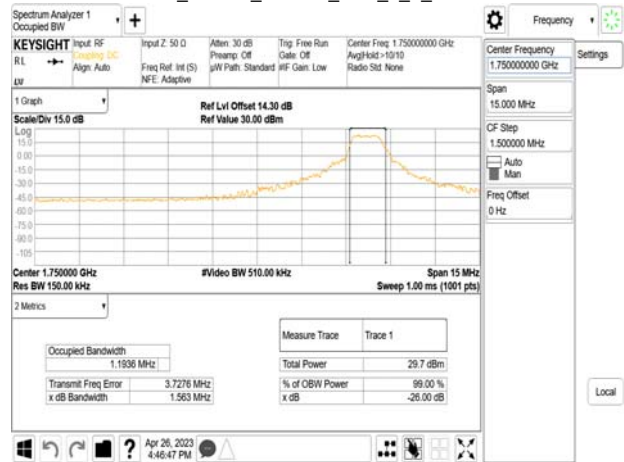
Band4_10MHz_16QAM_RB5_0_0_CH20175



Band4_10MHz_QPSK_RB6_0_7_CH20350



Band4_10MHz_16QAM_RB5_0_7_CH20350

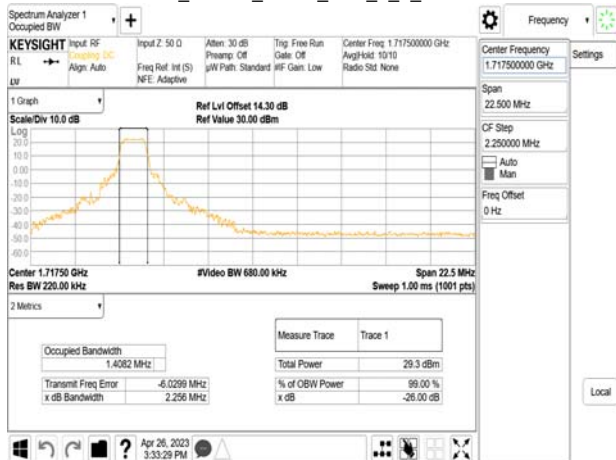


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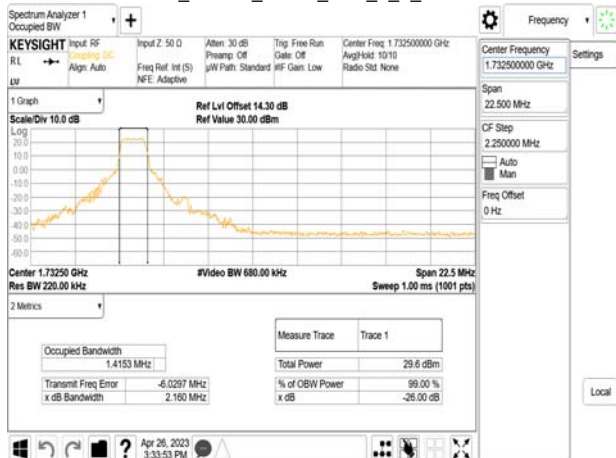
Band4_15MHz_QPSK_RB6_0_0_CH20025



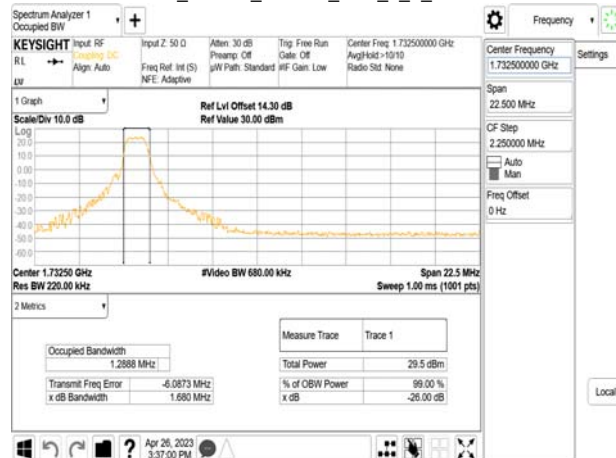
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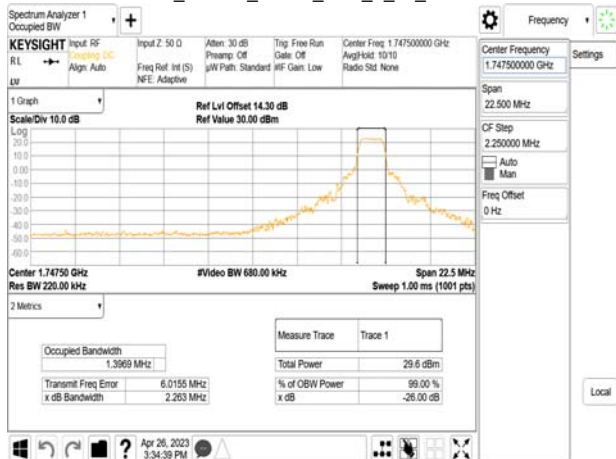
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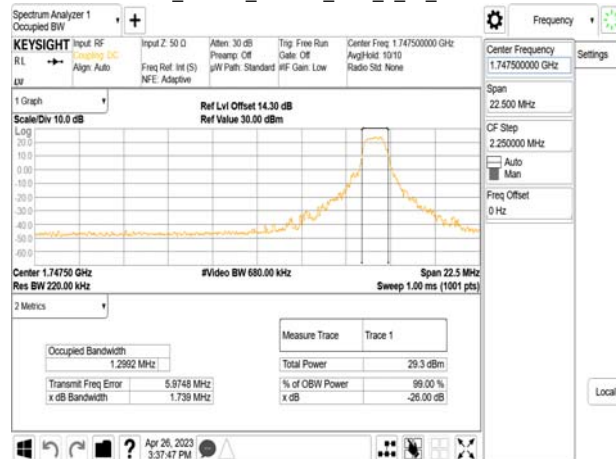
Band4_15MHz_16QAM_RB5_0_0_CH20175



Band4_15MHz_QPSK_RB6_0_11_CH20325



Band4_15MHz_16QAM_RB5_0_11_CH20325

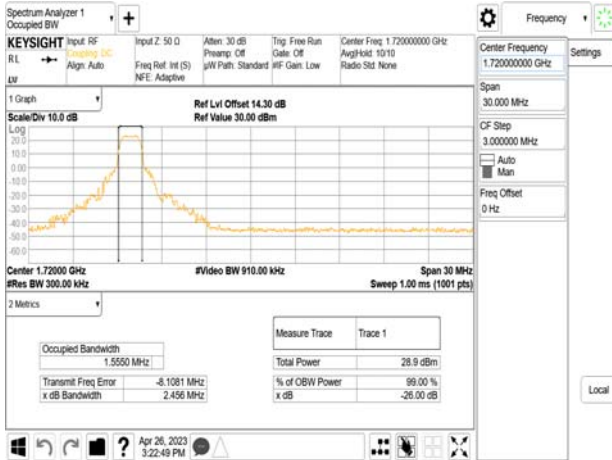


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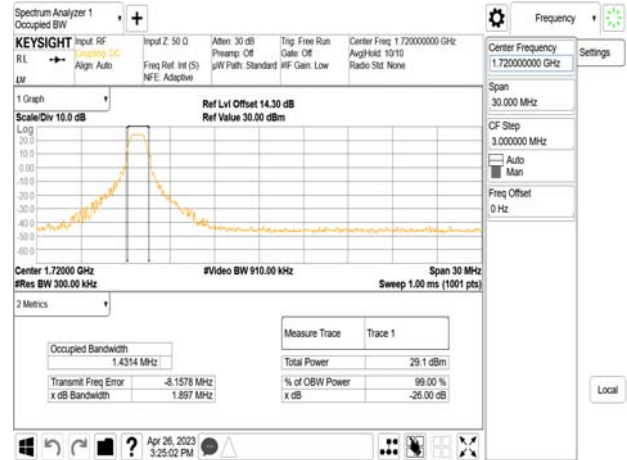
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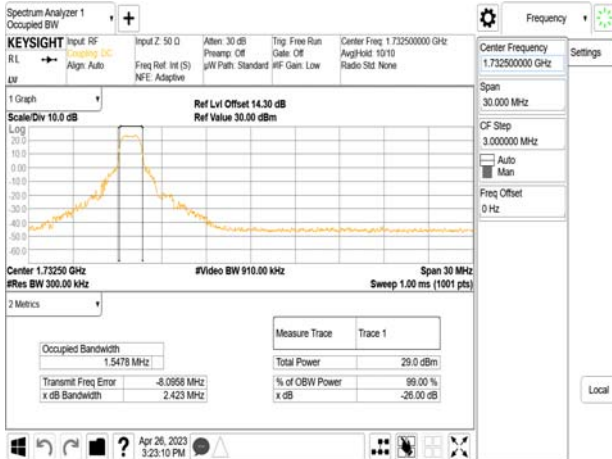
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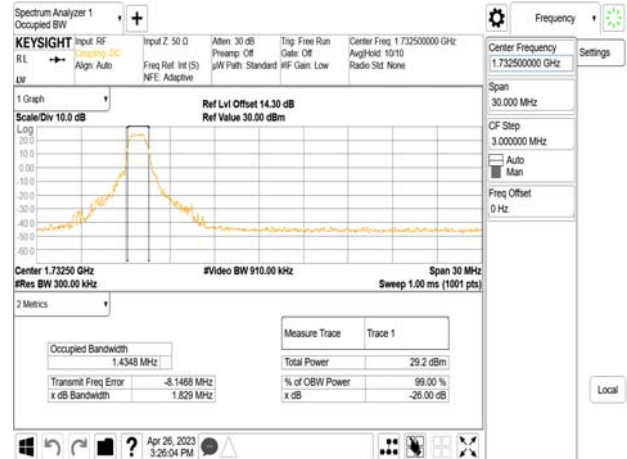
Band4_20MHz_16QAM_RB5_0_0_CH20050



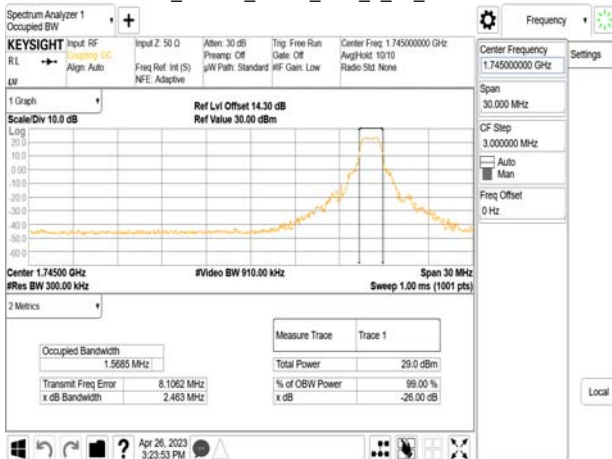
Band4_20MHz_QPSK_RB6_0_0_CH20175



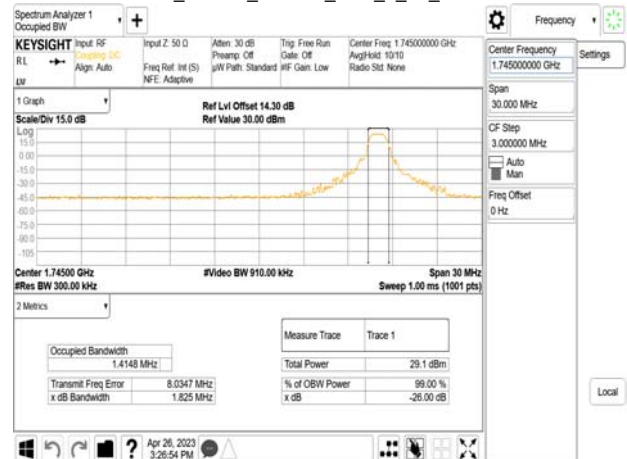
Band4_20MHz_16QAM_RB5_0_0_CH20175



Band4_20MHz_QPSK_RB6_0_15_CH20300



Band4_20MHz_16QAM_RB5_0_15_CH20300

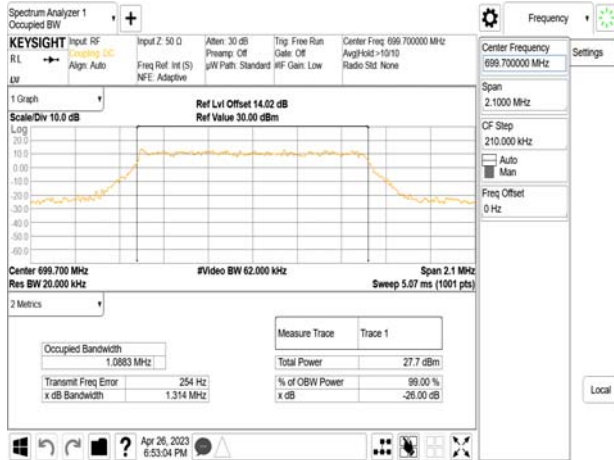


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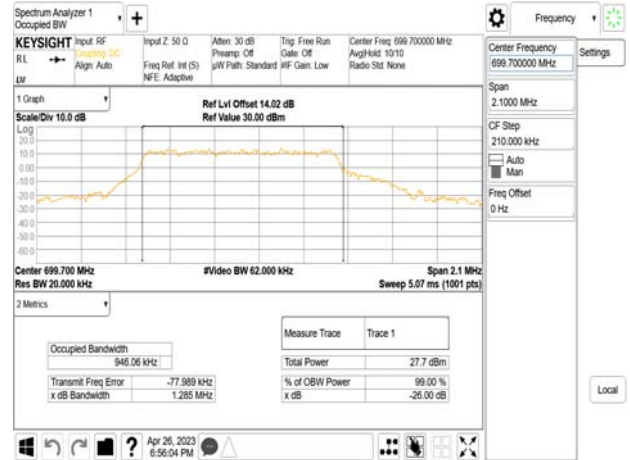
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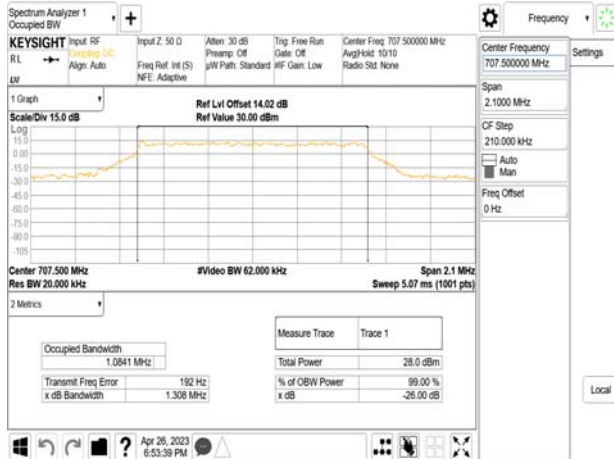
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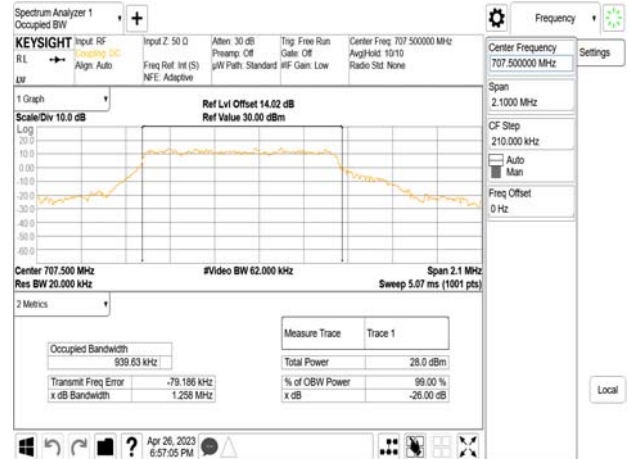
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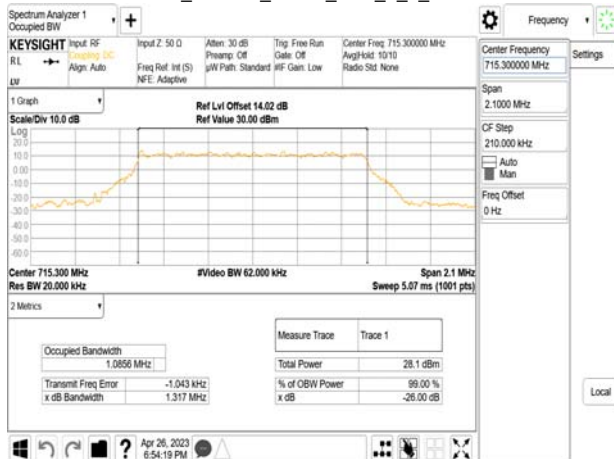
Band12_1.4MHz_QPSK_RB6_0_0_CH23095



Band12_1.4MHz_16QAM_RB5_0_0_CH23095



Band12_1.4MHz_QPSK_RB6_0_0_CH23173



Band12_1.4MHz_16QAM_RB5_0_0_CH23173



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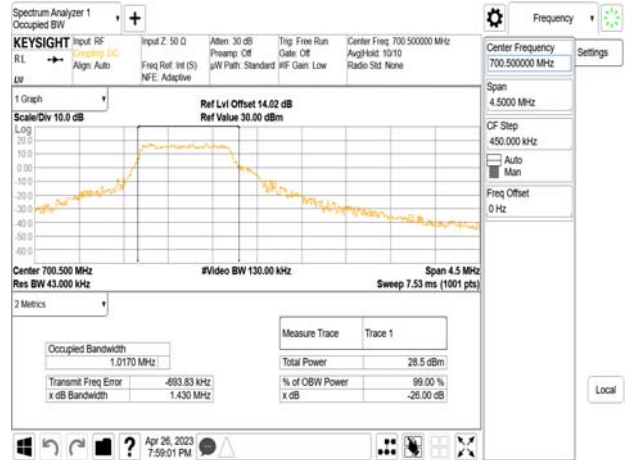
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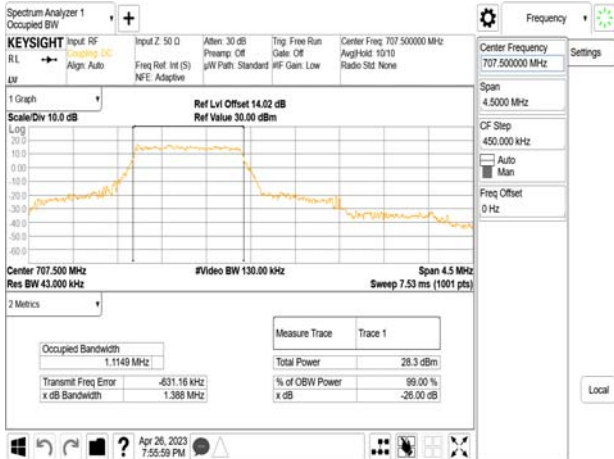
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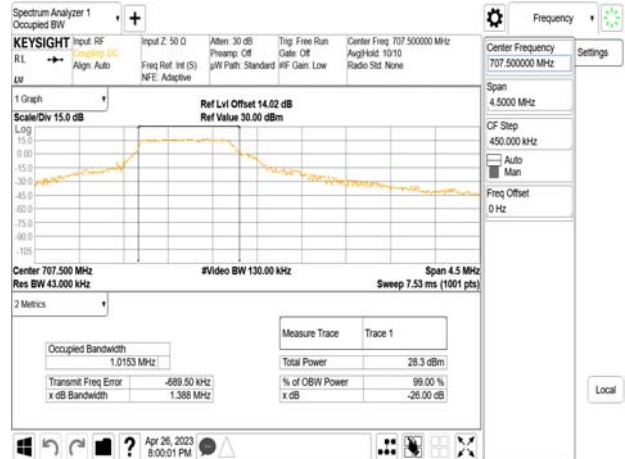
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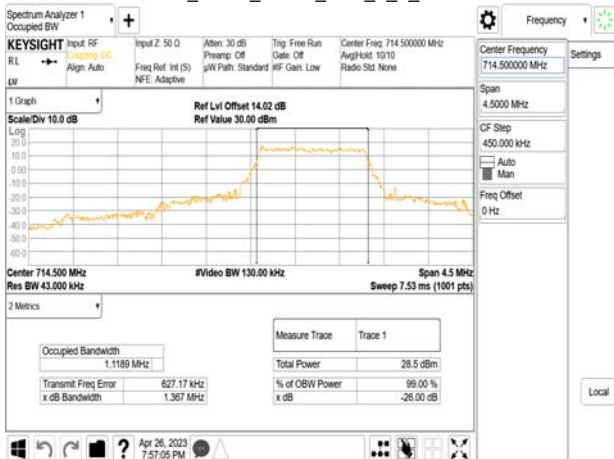
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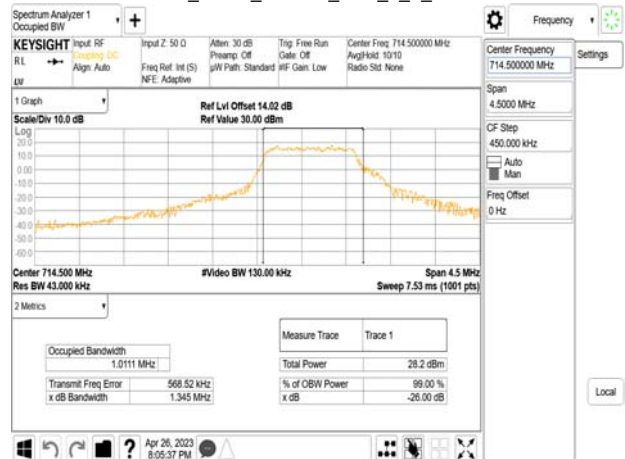
Band12_3MHz_16QAM_RB5_0_0_CH23095



Band12_3MHz_QPSK_RB6_0_1_CH23165



Band12_3MHz_16QAM_RB5_0_1_CH23165

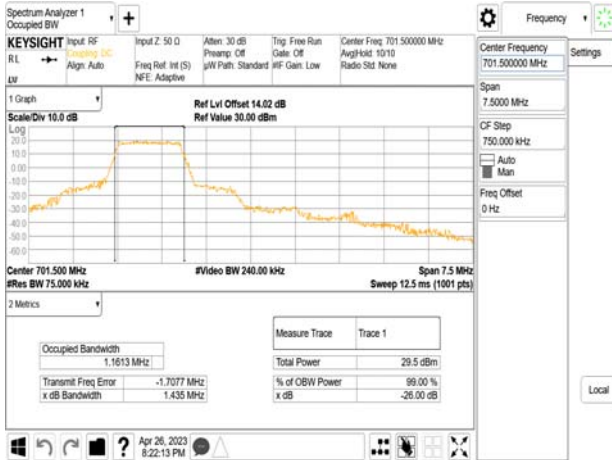


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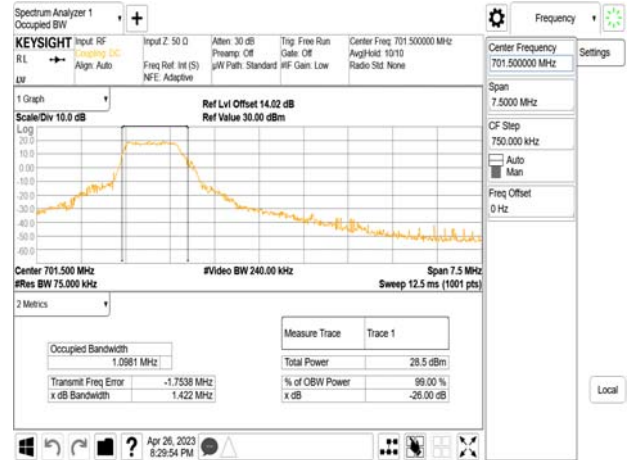
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Band12_5MHz_QPSK_RB6_0_0_CH23035



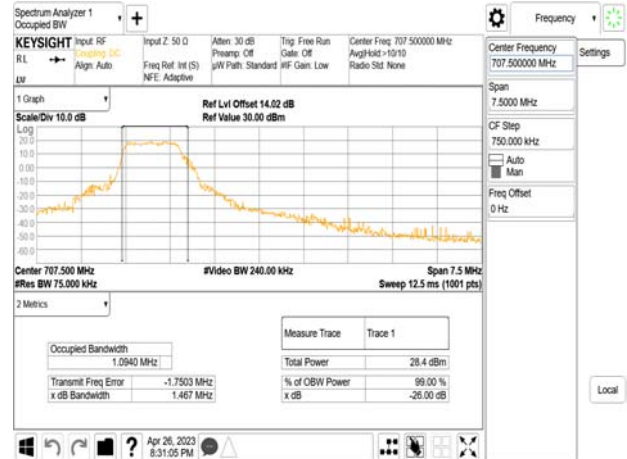
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Band12_5MHz_QPSK_RB6_0_0_CH23095



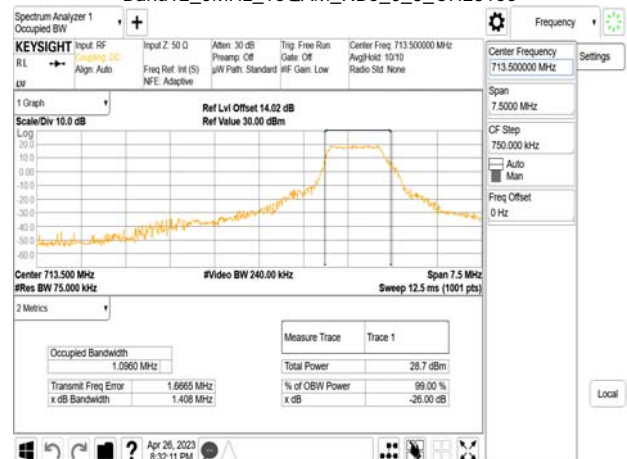
Band12_5MHz_16QAM_RB5_0_0_CH23095



Band12_5MHz_QPSK_RB6_0_3_CH23155



Band12_5MHz_16QAM_RB5_0_3_CH23155

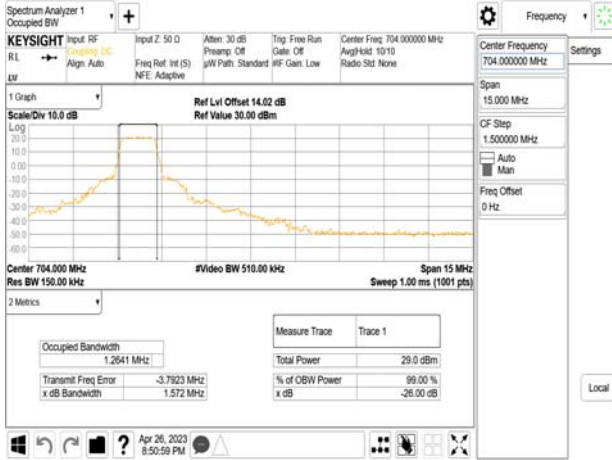


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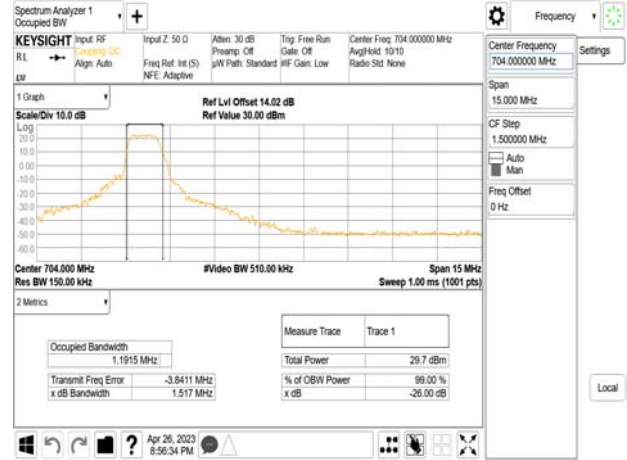
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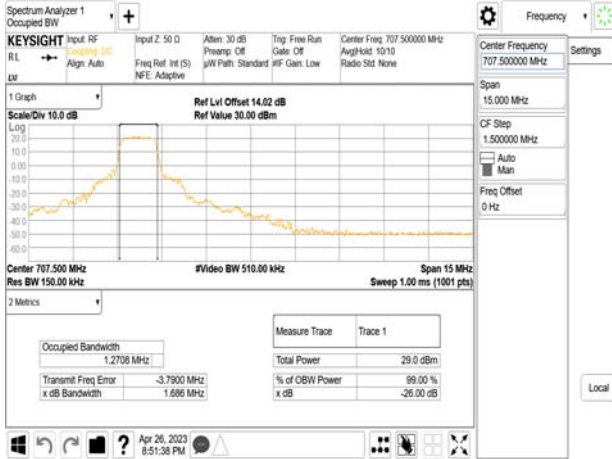
Band12_10MHz_QPSK_RB6_0_0_CH23060



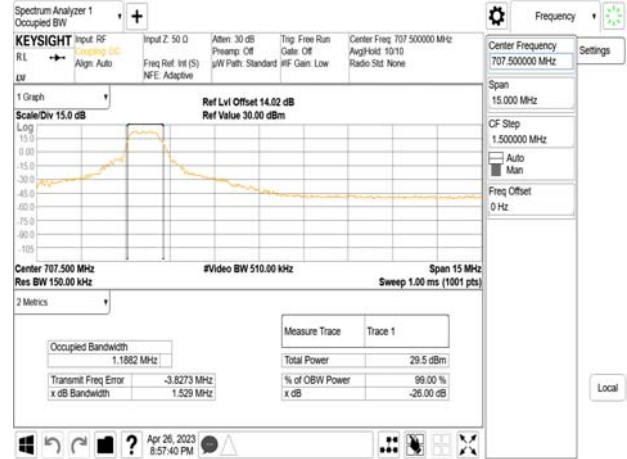
Band12_10MHz_16QAM_RB5_0_0_CH23060



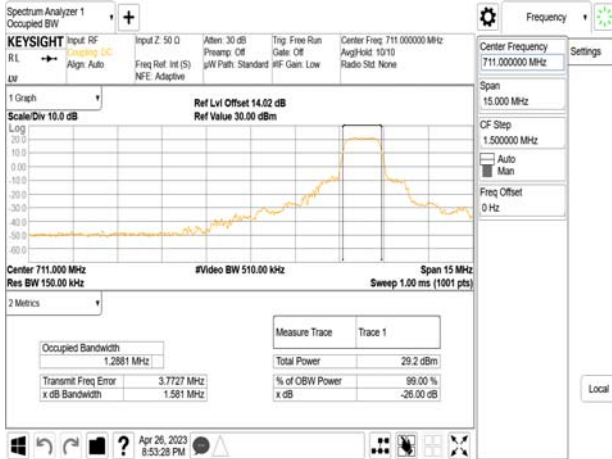
Band12_10MHz_QPSK_RB6_0_0_CH23095



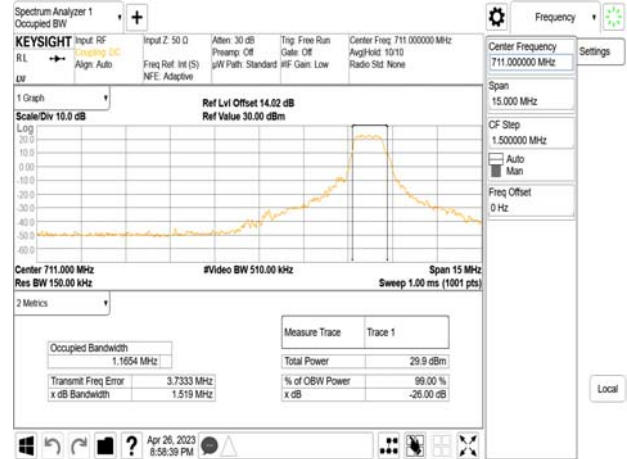
Band12_10MHz_16QAM_RB5_0_0_CH23095



Band12_10MHz_QPSK_RB6_0_7_CH23130



Band12_10MHz_16QAM_RB5_0_7_CH23130



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9 OUT OF BAND EMISSION AT ANTENNA TERMINALS

9.1 Standard Applicable

FCC§24.238(a), §27.53(h)

RSS-130 §4.7, RSS-133 §6.5.1, RSS-139 §6.6

Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

FCC §27.53(g)

Compliance for operations in the 600 MHz, 698-746 MHz, 746-758 MHz and the 776-788 MHz band with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

ISED RSS-130 §4.7.1

Compliance for operations in the 617-652 MHz, 663-698 MHz, 698-756 MHz and the 777-787 MHz band, the unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dBW), by at least $43 + 10 \log_{10} p$ (watts), dB. However, in the 100 kHz band immediately outside of the equipment's frequency block range, a resolution bandwidth of 30 kHz may be employed.

ISED RSS-133 §6.5.1

Equipment shall comply with the limits in (i) and (ii) below.

- i. In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts).
- ii. After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

FCC §27.53(h)(1)

(h) *AWS emission limits*—(1) *General protection levels*. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

RSS-139 §6.6

In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block, Footnote 2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output

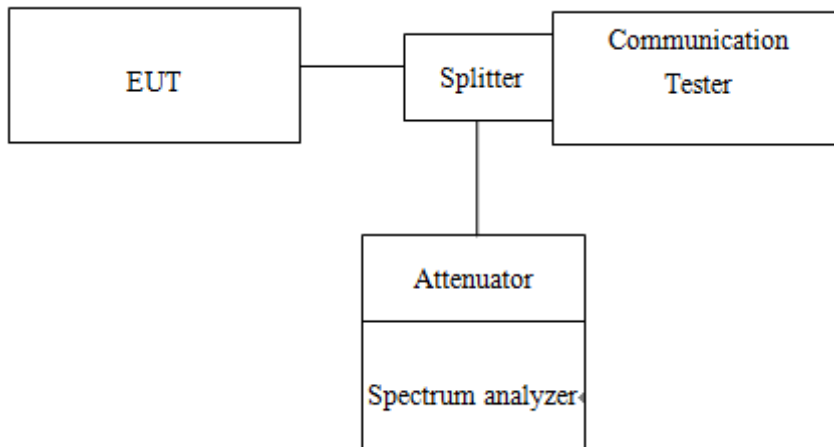
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power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.

After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least $43 + 10 \log_{10} p$ (watts) dB.

9.2 Test SET-UP



9.3 Measurement Procedure

9.3.1 Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 1MHz & VBW = 1MHz on Spectrum.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

9.3.2 Band Edge

1. To connect Antenna Port of EUT to Spectrum.
2. The band edge of low and high channels for the highest RF powers was measured. Setting $RBW \geq 1\% EBW$.
3. Allow trace to fully stabilize
4. Repeat above procedures until all default test channel measured were complete.

9.4 Band Edge Measurement Result:

Refer to next pages.

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Band Edge_Band2_1.4MHz_QPSK_RB1_0_0_CH18607



Band Edge_Band2_1.4MHz_QPSK_RB6_0_0_CH19193



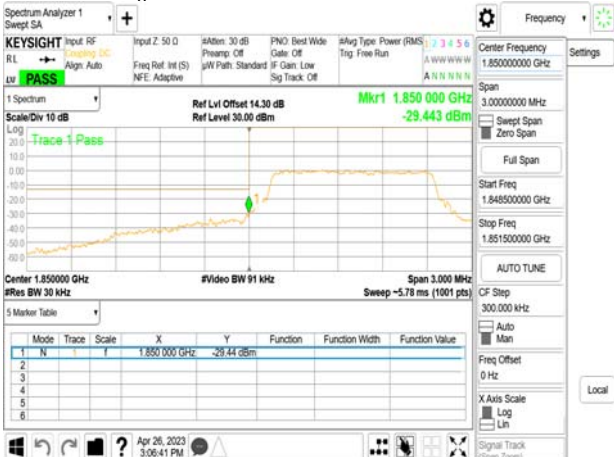
Band Edge_Band2_1.4MHz_QPSK_RB1_5_0_CH19193



Band Edge_Band2_3MHz_QPSK_RB1_0_0_CH18615



Band Edge_Band2_1.4MHz_QPSK_RB6_0_0_CH18607



Band Edge_Band2_3MHz_QPSK_RB1_5_1_CH19185



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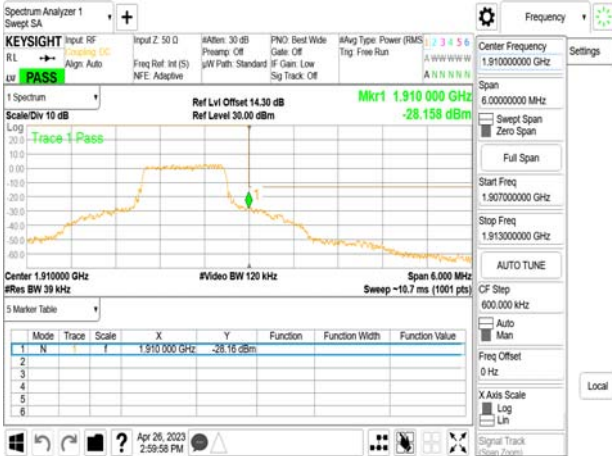
Band Edge_Band2_3MHz_OPSK_RB6_0_0_CH18615



Band Edge_Band2_5MHz_OPSK_RB1_5_3_CH19175



Band Edge_Band2_3MHz_OPSK_RB6_0_1_CH19185



Band Edge_Band2_5MHz_OPSK_RB6_0_0_CH18625



Band Edge_Band2_5MHz_OPSK_RB1_0_0_CH18625



Band Edge_Band2_5MHz_OPSK_RB6_0_3_CH19175



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