



REPORT No.: SZ24100188W04

TEST REPORT

APPLICANT : Rhino Mobility LLC

PRODUCT NAME : Module

MODEL NAME : M3501

BRAND NAME : RHINO

FCC ID : 2AUOUM3501

STANDARD(S) : 47 CFR Part 2
47 CFR Part 96

RECEIPT DATE : 2024-10-28

TEST DATE : 2024-11-06 to 2024-12-20

ISSUE DATE : 2025-01-08

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DIRECTORY

1. Technical Information	3
1.1. Applicant and Manufacturer Information	3
1.2. Equipment Under Test (EUT) Description	3
1.3. Maximum E.R.P./E.I.R.P. and Emission Designator	4
1.4. Test Standards and Results	5
1.5. Environmental Conditions	6
2. 47 CFR Part 2, Part 96 Requirements	7
2.1. Transmitter Conducted Output Power and E.R.P./E.I.R.P.	7
2.2. Occupied Bandwidth	17
2.3. Frequency Stability	28
2.4. Peak to Average Ratio	30
2.5. Conducted Spurious Emissions	41
2.6. Band Edge	46
2.7. Radiated Spurious Emissions	52
2.8. End User Device Additional Requirements (CBSD Protocol)	58
Annex A Test Uncertainty	60
Annex B Testing Laboratory Information	61

Change History		
Version	Date	Reason for change
1.0	2025-01-08	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Rhino Mobility LLC
Applicant Address:	8 The Green, Suite A, Dover, Delaware, 19901, USA
Manufacturer:	Rhino Mobility LLC
Manufacturer Address:	8 The Green, Suite A, Dover, Delaware, 19901, USA

1.2. Equipment Under Test (EUT) Description

Product Name:	Module	
Sample No.:	2#, 7#	
Hardware Version:	SM3501_V1.0	
Software Version:	M3501(001)_20250109	
Modulation Type:	QPSK, 16QAM, 64QAM, 256QAM	
Operation Band:	Band 48	
Carrier Aggregation(UL):	Not Support	
Frequency Range:	LTE Band 48	Tx: 3550MHz–3700MHz
		Rx: 3550MHz–3700MHz
Channel Bandwidth	LTE Band 48	5MHz, 10MHz, 15MHz, 20MHz
Antenna Type:	PIFA Antenna	
Antenna Gain:	LTE Band 48	-0.42dBi

Note 1: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



1.3. Maximum E.R.P./E.I.R.P. and Emission Designator

LTE Band 48	Maximum E.R.P./E.I.R.P. (W)				Emission Designator (99%OBW)			
BW (MHz)	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
20	0.180	0.145	0.146	0.056	17M9G7D	17M9W7D	17M9W7D	17M9W7D
15	0.179	0.142	0.142	0.056	13M4G7D	13M4W7D	13M4W7D	13M4W7D
10	0.179	0.138	0.143	0.056	8M97G7D	8M95W7D	8M96W7D	8M95W7D
5	0.179	0.143	0.143	0.056	4M49G7D	4M48W7D	4M48W7D	4M49W7D



1.4. Test Standards and Results

The objective of the report is to perform testing according to Part 2 and Part 96 for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 96	CITIZENS BROADBAND RADIO SERVICE

Test detailed items/section required by FCC rules and results are as below:

Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
2.1046, 96.41(b)	Transmitter Conducted Output Power and ERP/EIRP	Dec. 31, 2024 Jan. 02, 2025	Shen Biaohong Gan Jing	PASS	No deviation
2.1049	Occupied Bandwidth	Dec. 09, 2024	Gan Jing	PASS	No deviation
96.41(g)	Peak -Average Ratio	Dec. 09, 2024	Gan Jing	PASS	No deviation
2.1055	Frequency Stability	Dec. 31, 2024	Gan Jing	PASS	No deviation
2.1051, 96.41(e)	Conducted Spurious Emissions	Dec. 09, 2024	Gan Jing	PASS	No deviation
2.1051, 96.41(e)	Band Edge	Dec. 09, 2024	Gan Jing	PASS	No deviation
2.1053, 96.41(e)	Radiated Spurious Emissions	Dec. 12, 2024	Li Hanbin	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in KDB 971168 D01 v03 and ANSI/TIA-603-E-2016.

Note 2: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 3: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.



1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15-35
Relative Humidity (%):	30-60
Atmospheric Pressure (kPa):	86-106

2.47 CFR Part 2, Part 96 Requirements

2.1. Transmitter Conducted Output Power and E.R.P./E.I.R.P.

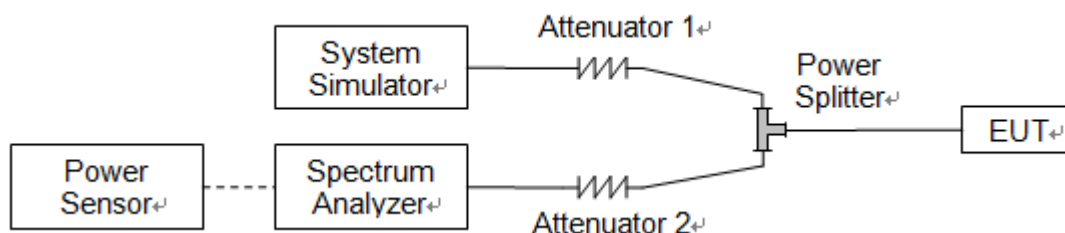
2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

The maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the table as below. paragraph

Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD ¹	47	37

2.1.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.



2.1.3. Test procedure

KDB 971168 D01v03 Section 5.2 and ANSI/TIA-603-E-2016.

$EIRP \text{ (dBm)} = \text{Conducted Output Power (dBm)} + \text{Antenna Gain (dBi)}$

$ERP \text{ (dBm)} = EIPR \text{ (dBm)} - 2.15$

**2.1.4.Result****Conducted Output Power:**

LTE Band 48						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				55340	55990	56640
Frequency (MHz)				3560	3625	3690
20	QPSK	1	0	22.84	22.98	22.89
20	QPSK	1	49	22.79	22.88	22.82
20	QPSK	1	99	22.79	22.80	22.85
20	QPSK	50	0	21.74	21.99	21.95
20	QPSK	50	24	21.80	21.73	21.75
20	QPSK	50	50	21.83	21.70	21.84
20	QPSK	100	0	21.73	21.85	21.70
20	16QAM	1	0	21.89	22.03	22.00
20	16QAM	1	49	21.69	21.76	21.83
20	16QAM	1	99	21.82	21.52	21.68
20	16QAM	50	0	20.79	20.67	20.74
20	16QAM	50	24	20.62	20.59	20.69
20	16QAM	50	50	20.75	20.69	20.87
20	16QAM	100	0	20.73	20.82	20.75
20	64QAM	1	0	21.91	21.80	21.85
20	64QAM	1	49	21.78	21.92	21.96
20	64QAM	1	99	22.05	21.96	21.94
20	64QAM	50	0	20.67	20.92	20.56
20	64QAM	50	24	20.65	20.82	20.71
20	64QAM	50	50	20.69	20.71	20.58
20	64QAM	100	0	20.81	20.79	20.71
20	256QAM	1	0	17.89	17.70	17.79
20	256QAM	1	49	17.75	17.75	17.66
20	256QAM	1	99	17.83	17.60	17.86
20	256QAM	50	0	17.71	17.55	17.57
20	256QAM	50	24	17.43	17.41	17.49
20	256QAM	50	50	17.70	17.53	17.51
20	256QAM	100	0	17.62	17.57	17.44



LTE Band 48						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				55315	55990	56665
Frequency (MHz)				3557.5	3625	3692.5
15	QPSK	1	0	22.88	22.95	22.86
15	QPSK	1	37	22.87	22.86	22.86
15	QPSK	1	74	22.68	22.88	22.76
15	QPSK	36	0	21.74	21.97	21.72
15	QPSK	36	20	21.60	21.68	21.84
15	QPSK	36	39	21.72	21.77	21.71
15	QPSK	75	0	21.66	21.60	21.78
15	16QAM	1	0	21.79	21.93	21.89
15	16QAM	1	37	21.68	21.61	21.66
15	16QAM	1	74	21.73	21.67	21.69
15	16QAM	36	0	20.62	20.65	20.63
15	16QAM	36	20	20.71	20.79	20.73
15	16QAM	36	39	20.73	20.80	20.86
15	16QAM	75	0	20.82	20.70	20.79
15	64QAM	1	0	21.81	21.87	21.76
15	64QAM	1	37	21.86	21.95	21.77
15	64QAM	1	74	21.89	21.94	21.86
15	64QAM	36	0	20.63	20.87	20.64
15	64QAM	36	20	20.65	20.72	20.83
15	64QAM	36	39	20.79	20.63	20.58
15	64QAM	75	0	20.76	20.63	20.81
15	256QAM	1	0	17.71	17.78	17.74
15	256QAM	1	37	17.64	17.62	17.78
15	256QAM	1	74	17.90	17.72	17.77
15	256QAM	36	0	17.72	17.43	17.66
15	256QAM	36	20	17.50	17.53	17.59
15	256QAM	36	39	17.60	17.43	17.47
15	256QAM	75	0	17.57	17.68	17.58



LTE Band 48						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				55290	55990	56690
Frequency (MHz)				3555	3625	3695
10	QPSK		0	22.93	22.96	22.93
10	QPSK	1	25	22.95	22.77	22.75
10	QPSK	1	49	22.76	22.91	22.71
10	QPSK	25	0	21.71	21.96	21.91
10	QPSK	25	12	21.64	21.63	21.81
10	QPSK	25	25	21.71	21.67	21.63
10	QPSK	50	0	21.77	21.71	21.67
10	16QAM	1	0	21.82	21.77	21.79
10	16QAM	1	25	21.58	21.79	21.76
10	16QAM	1	49	21.59	21.65	21.72
10	16QAM	25	0	20.62	20.78	20.79
10	16QAM	25	12	20.66	20.71	20.65
10	16QAM	25	25	20.86	20.82	20.86
10	16QAM	50	0	20.82	20.79	20.88
10	64QAM		0	21.90	21.89	21.70
10	64QAM	1	25	21.97	21.87	21.95
10	64QAM	1	49	21.82	21.85	21.88
10	64QAM	25	0	20.78	20.80	20.53
10	64QAM	25	12	20.72	20.75	20.66
10	64QAM	25	25	20.61	20.83	20.73
10	64QAM	50	0	20.78	20.77	20.81
10	256QAM	1	0	17.67	17.90	17.69
10	256QAM	1	25	17.77	17.68	17.75
10	256QAM	1	49	17.82	17.67	17.69
10	256QAM	25	0	17.69	17.61	17.56
10	256QAM	25	12	17.36	17.40	17.44
10	256QAM	25	25	17.56	17.50	17.56
10	256QAM	50	0	17.43	17.61	17.64



LTE Band 48						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				55265	55990	56175
Frequency (MHz)				3552.5	3625	3697.5
5	QPSK	1	0	22.84	22.94	22.82
5	QPSK	1	12	22.76	22.89	22.81
5	QPSK	1	24	22.81	22.83	22.70
5	QPSK	12	0	21.84	21.81	21.93
5	QPSK	12	7	21.82	21.64	21.68
5	QPSK	12	13	21.75	21.68	21.76
5	QPSK	25	0	21.65	21.73	21.64
5	16QAM	1	0	21.90	21.98	21.97
5	16QAM	1	12	21.70	21.79	21.73
5	16QAM	1	24	21.68	21.60	21.65
5	16QAM	12	0	20.55	20.76	20.73
5	16QAM	12	7	20.55	20.67	20.67
5	16QAM	12	13	20.76	20.85	20.66
5	16QAM	25	0	20.69	20.63	20.77
5	64QAM	1	0	21.77	21.95	21.90
5	64QAM	1	12	21.87	21.92	21.87
5	64QAM	1	24	21.96	21.83	21.84
5	64QAM	12	0	20.67	20.92	20.54
5	64QAM	12	7	20.83	20.79	20.78
5	64QAM	12	13	20.71	20.84	20.71
5	64QAM	25	0	20.74	20.71	20.69
5	256QAM	1	0	17.68	17.86	17.71
5	256QAM	1	12	17.63	17.72	17.63
5	256QAM	1	24	17.84	17.66	17.90
5	256QAM	12	0	17.61	17.59	17.69
5	256QAM	12	7	17.53	17.50	17.52
5	256QAM	12	13	17.69	17.51	17.62
5	256QAM	25	0	17.48	17.51	17.59

**Effective Radiated Power and Effective Isotropic Radiated Power:**

LTE Band 48				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				55340		55990		56640	
Frequency (MHz)				3560		3625		3690	
				dBm	W	dBm	W	dBm	W
20	QPSK	1	0	22.42	0.175	22.56	0.180	22.47	0.177
20	QPSK	1	49	22.37	0.173	22.46	0.176	22.40	0.174
20	QPSK	1	99	22.37	0.173	22.38	0.173	22.43	0.175
20	QPSK	50	0	21.32	0.136	21.57	0.144	21.53	0.142
20	QPSK	50	24	21.38	0.137	21.31	0.135	21.33	0.136
20	QPSK	50	50	21.41	0.138	21.28	0.134	21.42	0.139
20	QPSK	100	0	21.31	0.135	21.43	0.139	21.28	0.134
20	16QAM	1	0	21.47	0.140	21.61	0.145	21.58	0.144
20	16QAM	1	49	21.27	0.134	21.34	0.136	21.41	0.138
20	16QAM	1	99	21.40	0.138	21.10	0.129	21.26	0.134
20	16QAM	50	0	20.37	0.109	20.25	0.106	20.32	0.108
20	16QAM	50	24	20.20	0.105	20.17	0.104	20.27	0.106
20	16QAM	50	50	20.33	0.108	20.27	0.106	20.45	0.111
20	16QAM	100	0	20.31	0.107	20.40	0.110	20.33	0.108
20	64QAM	1	0	21.49	0.141	21.38	0.137	21.43	0.139
20	64QAM	1	49	21.36	0.137	21.50	0.141	21.54	0.143
20	64QAM	1	99	21.63	0.146	21.54	0.143	21.52	0.142
20	64QAM	50	0	20.25	0.106	20.50	0.112	20.14	0.103
20	64QAM	50	24	20.23	0.105	20.40	0.110	20.29	0.107
20	64QAM	50	50	20.27	0.106	20.29	0.107	20.16	0.104
20	64QAM	100	0	20.39	0.109	20.37	0.109	20.29	0.107
20	256QAM	1	0	17.47	0.056	17.28	0.053	17.37	0.055
20	256QAM	1	49	17.33	0.054	17.33	0.054	17.24	0.053
20	256QAM	1	99	17.41	0.055	17.18	0.052	17.44	0.055
20	256QAM	50	0	17.29	0.054	17.13	0.052	17.15	0.052
20	256QAM	50	24	17.01	0.050	16.99	0.050	17.07	0.051
20	256QAM	50	50	17.28	0.053	17.11	0.051	17.09	0.051
20	256QAM	100	0	17.20	0.052	17.15	0.052	17.02	0.050



LTE Band 48				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				55315		55990		56665	
Frequency (MHz)				3557.5		3625		3692.5	
				dBm	W	dBm	W	dBm	W
15	QPSK	1	0	22.46	0.176	22.53	0.179	22.44	0.175
15	QPSK	1	37	22.45	0.176	22.44	0.175	22.44	0.175
15	QPSK	1	74	22.26	0.168	22.46	0.176	22.34	0.171
15	QPSK	36	0	21.32	0.136	21.55	0.143	21.30	0.135
15	QPSK	36	20	21.18	0.131	21.26	0.134	21.42	0.139
15	QPSK	36	39	21.30	0.135	21.35	0.136	21.29	0.135
15	QPSK	75	0	21.24	0.133	21.18	0.131	21.36	0.137
15	16QAM	1	0	21.37	0.137	21.51	0.142	21.47	0.140
15	16QAM	1	37	21.26	0.134	21.19	0.132	21.24	0.133
15	16QAM	1	74	21.31	0.135	21.25	0.133	21.27	0.134
15	16QAM	36	0	20.20	0.105	20.23	0.105	20.21	0.105
15	16QAM	36	20	20.29	0.107	20.37	0.109	20.31	0.107
15	16QAM	36	39	20.31	0.107	20.38	0.109	20.44	0.111
15	16QAM	75	0	20.40	0.110	20.28	0.107	20.37	0.109
15	64QAM	1	0	21.39	0.138	21.45	0.140	21.34	0.136
15	64QAM	1	37	21.44	0.139	21.53	0.142	21.35	0.136
15	64QAM	1	74	21.47	0.140	21.52	0.142	21.44	0.139
15	64QAM	36	0	20.21	0.105	20.45	0.111	20.22	0.105
15	64QAM	36	20	20.23	0.105	20.30	0.107	20.41	0.110
15	64QAM	36	39	20.37	0.109	20.21	0.105	20.16	0.104
15	64QAM	75	0	20.34	0.108	20.21	0.105	20.39	0.109
15	256QAM	1	0	17.29	0.054	17.36	0.054	17.32	0.054
15	256QAM	1	37	17.22	0.053	17.20	0.052	17.36	0.054
15	256QAM	1	74	17.48	0.056	17.30	0.054	17.35	0.054
15	256QAM	36	0	17.30	0.054	17.01	0.050	17.24	0.053
15	256QAM	36	20	17.08	0.051	17.11	0.051	17.17	0.052
15	256QAM	36	39	17.18	0.052	17.01	0.050	17.05	0.051
15	256QAM	75	0	17.15	0.052	17.26	0.053	17.16	0.052



LTE Band 48				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				55290		55990		56690	
Frequency (MHz)				3555		3625		3695	
				dBm	W	dBm	W	dBm	W
10	QPSK	1	0	22.51	0.178	22.54	0.179	22.51	0.178
10	QPSK	1	25	22.53	0.179	22.35	0.172	22.33	0.171
10	QPSK	1	49	22.34	0.171	22.49	0.177	22.29	0.169
10	QPSK	25	0	21.29	0.135	21.54	0.143	21.49	0.141
10	QPSK	25	12	21.22	0.132	21.21	0.132	21.39	0.138
10	QPSK	25	25	21.29	0.135	21.25	0.133	21.21	0.132
10	QPSK	50	0	21.35	0.136	21.29	0.135	21.25	0.133
10	16QAM	1	0	21.40	0.138	21.35	0.136	21.37	0.137
10	16QAM	1	25	21.16	0.131	21.37	0.137	21.34	0.136
10	16QAM	1	49	21.17	0.131	21.23	0.133	21.30	0.135
10	16QAM	25	0	20.20	0.105	20.36	0.109	20.37	0.109
10	16QAM	25	12	20.24	0.106	20.29	0.107	20.23	0.105
10	16QAM	25	25	20.44	0.111	20.40	0.110	20.44	0.111
10	16QAM	50	0	20.40	0.110	20.37	0.109	20.46	0.111
10	64QAM	1	0	21.48	0.141	21.47	0.140	21.28	0.134
10	64QAM	1	25	21.55	0.143	21.45	0.140	21.53	0.142
10	64QAM	1	49	21.40	0.138	21.43	0.139	21.46	0.140
10	64QAM	25	0	20.36	0.109	20.38	0.109	20.11	0.103
10	64QAM	25	12	20.30	0.107	20.33	0.108	20.24	0.106
10	64QAM	25	25	20.19	0.104	20.41	0.110	20.31	0.107
10	64QAM	50	0	20.36	0.109	20.35	0.108	20.39	0.109
10	256QAM	1	0	17.25	0.053	17.48	0.056	17.27	0.053
10	256QAM	1	25	17.35	0.054	17.26	0.053	17.33	0.054
10	256QAM	1	49	17.40	0.055	17.25	0.053	17.27	0.053
10	256QAM	25	0	17.27	0.053	17.19	0.052	17.14	0.052
10	256QAM	25	12	16.94	0.049	16.98	0.050	17.02	0.050
10	256QAM	25	25	17.14	0.052	17.08	0.051	17.14	0.052
10	256QAM	50	0	17.01	0.050	17.19	0.052	17.22	0.053



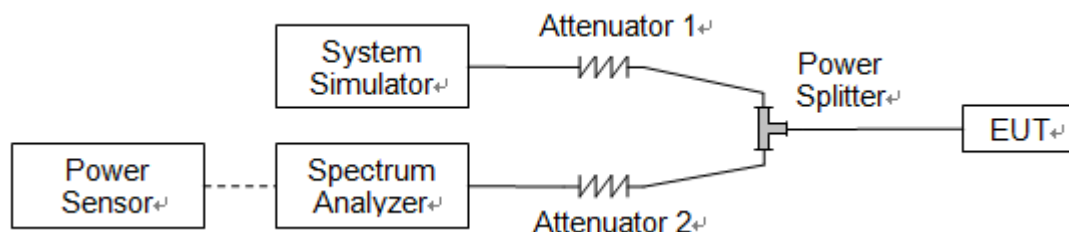
LTE Band 48				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				55265		55990		56175	
Frequency (MHz)				3552.5		3625		3697.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	22.42	0.175	22.52	0.179	22.40	0.174
5	QPSK	1	12	22.34	0.171	22.47	0.177	22.39	0.173
5	QPSK	1	24	22.39	0.173	22.41	0.174	22.28	0.169
5	QPSK	12	0	21.42	0.139	21.39	0.138	21.51	0.142
5	QPSK	12	7	21.40	0.138	21.22	0.132	21.26	0.134
5	QPSK	12	13	21.33	0.136	21.26	0.134	21.34	0.136
5	QPSK	25	0	21.23	0.133	21.31	0.135	21.22	0.132
5	16QAM	1	0	21.48	0.141	21.56	0.143	21.55	0.143
5	16QAM	1	12	21.28	0.134	21.37	0.137	21.31	0.135
5	16QAM	1	24	21.26	0.134	21.18	0.131	21.23	0.133
5	16QAM	12	0	20.13	0.103	20.34	0.108	20.31	0.107
5	16QAM	12	7	20.13	0.103	20.25	0.106	20.25	0.106
5	16QAM	12	13	20.34	0.108	20.43	0.110	20.24	0.106
5	16QAM	25	0	20.27	0.106	20.21	0.105	20.35	0.108
5	64QAM	1	0	21.35	0.136	21.53	0.142	21.48	0.141
5	64QAM	1	12	21.45	0.140	21.50	0.141	21.45	0.140
5	64QAM	1	24	21.54	0.143	21.41	0.138	21.42	0.139
5	64QAM	12	0	20.25	0.106	20.50	0.112	20.12	0.103
5	64QAM	12	7	20.41	0.110	20.37	0.109	20.36	0.109
5	64QAM	12	13	20.29	0.107	20.42	0.110	20.29	0.107
5	64QAM	25	0	20.32	0.108	20.29	0.107	20.27	0.106
5	256QAM	1	0	17.26	0.053	17.44	0.055	17.29	0.054
5	256QAM	1	12	17.21	0.053	17.30	0.054	17.21	0.053
5	256QAM	1	24	17.42	0.055	17.24	0.053	17.48	0.056
5	256QAM	12	0	17.19	0.052	17.17	0.052	17.27	0.053
5	256QAM	12	7	17.11	0.051	17.08	0.051	17.10	0.051
5	256QAM	12	13	17.27	0.053	17.09	0.051	17.20	0.052
5	256QAM	25	0	17.06	0.051	17.09	0.051	17.17	0.052

2.2. Occupied Bandwidth

2.2.1. Requirement

According to FCC section 2.1049, 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 radiated by a given emission. Occupied bandwidth is also known as the 99% emission bandwidth.

2.2.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.2.3. Test procedure

KDB 971168 D01v03 Section 4.1 and ANSI/TIA-603-E-2016.

**2.2.4.Test Result**

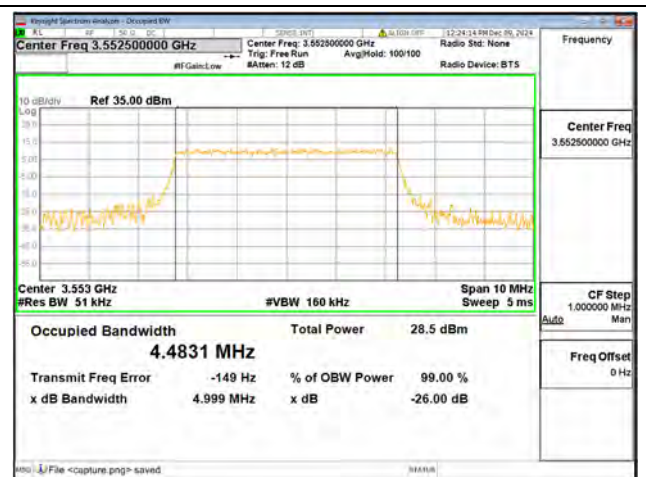
LTE Band	BW(MHz)	Channel Level	Channel	Frequency (MHz)	Modulation	99% BW (MHz)	26dB BW (MHz)	P/F
B48	5	Low	55265	3552.5	QPSK	4.4910	5.0187	PASS
B48	5	Low	55265	3552.5	16QAM	4.4831	4.9992	PASS
B48	5	Low	55265	3552.5	64QAM	4.4807	4.9899	PASS
B48	5	Low	55265	3552.5	256QAM	4.4888	4.9829	PASS
B48	5	Mid	55990	3625	QPSK	4.4860	5.0351	PASS
B48	5	Mid	55990	3625	16QAM	4.4722	4.8485	PASS
B48	5	Mid	55990	3625	64QAM	4.4702	4.9724	PASS
B48	5	Mid	55990	3625	256QAM	4.4844	4.9788	PASS
B48	5	High	56715	3697.5	QPSK	4.4918	5.0466	PASS
B48	5	High	56715	3697.5	16QAM	4.4842	4.9255	PASS
B48	5	High	56715	3697.5	64QAM	4.4731	4.9557	PASS
B48	5	High	56715	3697.5	256QAM	4.4819	4.9850	PASS
B48	10	Low	55290	3555	QPSK	8.9671	10.0343	PASS
B48	10	Low	55290	3555	16QAM	8.9411	9.6948	PASS
B48	10	Low	55290	3555	64QAM	8.9557	10.2679	PASS
B48	10	Low	55290	3555	256QAM	8.9462	9.7492	PASS
B48	10	Mid	55990	3625	QPSK	8.9429	9.7107	PASS
B48	10	Mid	55990	3625	16QAM	8.9187	10.0100	PASS
B48	10	Mid	55990	3625	64QAM	8.9516	9.4670	PASS
B48	10	Mid	55990	3625	256QAM	8.9495	9.7901	PASS
B48	10	High	56690	3695	QPSK	8.9177	9.6789	PASS
B48	10	High	56690	3695	16QAM	8.9545	10.0986	PASS
B48	10	High	56690	3695	64QAM	8.9276	9.5304	PASS
B48	10	High	56690	3695	256QAM	8.9444	9.7664	PASS
B48	15	Low	55315	3557.5	QPSK	13.408	14.484	PASS
B48	15	Low	55315	3557.5	16QAM	13.388	14.862	PASS
B48	15	Low	55315	3557.5	64QAM	13.429	14.726	PASS
B48	15	Low	55315	3557.5	256QAM	13.399	14.561	PASS
B48	15	Mid	55990	3625	QPSK	13.405	14.304	PASS
B48	15	Mid	55990	3625	16QAM	13.400	14.438	PASS
B48	15	Mid	55990	3625	64QAM	13.401	14.369	PASS
B48	15	Mid	55990	3625	256QAM	13.401	14.310	PASS
B48	15	High	56665	3692.5	QPSK	13.393	15.147	PASS



B48	15	High	56665	3692.5	16QAM	13.441	14.283	PASS
B48	15	High	56665	3692.5	64QAM	13.430	14.377	PASS
B48	15	High	56665	3692.5	256QAM	13.411	14.020	PASS
B48	20	Low	55340	3560	QPSK	17.871	19.447	PASS
B48	20	Low	55340	3560	16QAM	17.906	19.277	PASS
B48	20	Low	55340	3560	64QAM	17.885	19.337	PASS
B48	20	Low	55340	3560	256QAM	17.866	19.658	PASS
B48	20	Mid	55990	3625	QPSK	17.901	19.332	PASS
B48	20	Mid	55990	3625	16QAM	17.874	18.826	PASS
B48	20	Mid	55990	3625	64QAM	17.854	18.864	PASS
B48	20	Mid	55990	3625	256QAM	17.850	18.937	PASS
B48	20	High	56640	3690	QPSK	17.920	18.987	PASS
B48	20	High	56640	3690	16QAM	17.829	18.880	PASS
B48	20	High	56640	3690	64QAM	17.856	18.580	PASS
B48	20	High	56640	3690	256QAM	17.841	18.849	PASS



B48 / 5MHz / QPSK/ Low CH



B48 / 5MHz / 16QAM/ Low CH



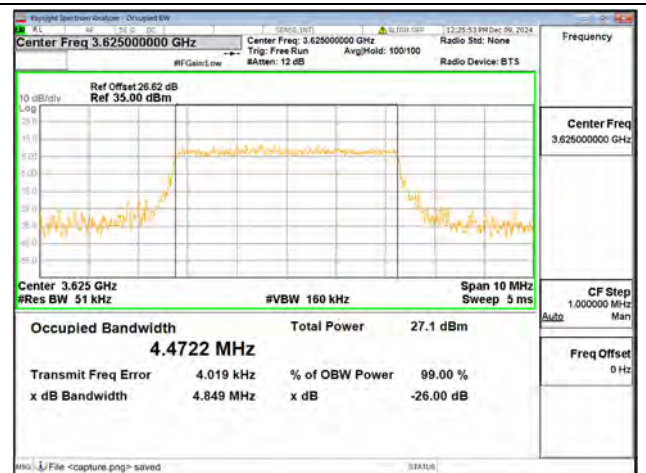
B48 / 5MHz / 64QAM/ Low CH



B48 / 5MHz / 256QAM/ Low CH



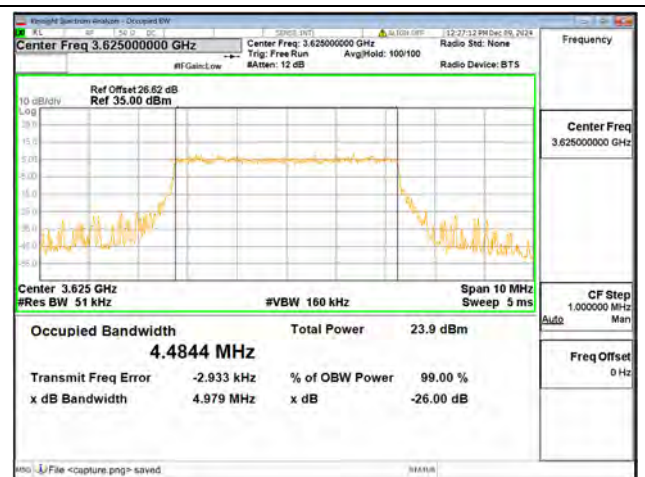
B48 / 5MHz / QPSK/ Mid CH



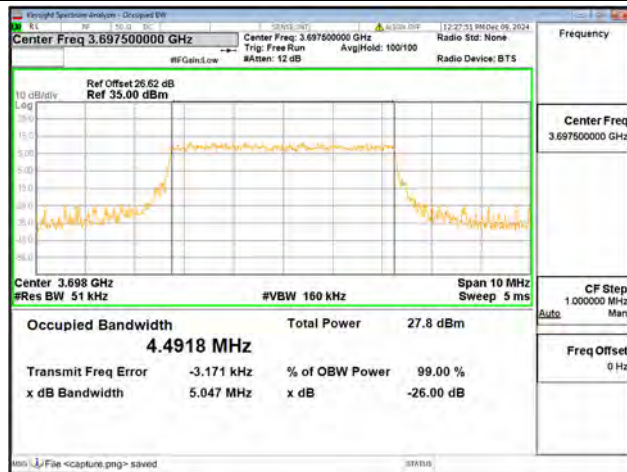
B48 / 5MHz / 16QAM/ Mid CH



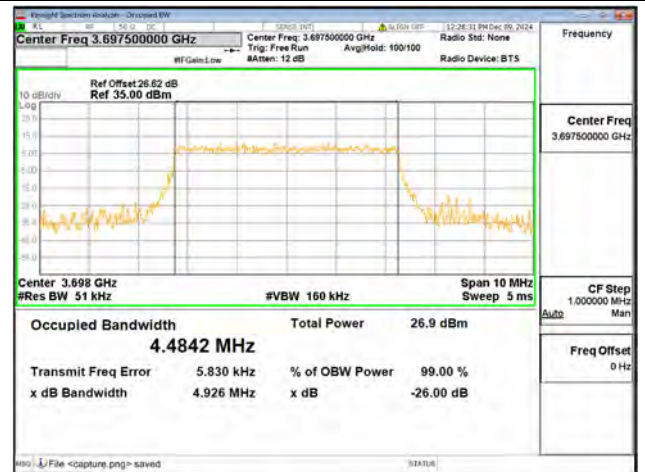
B48 / 5MHz / 64QAM/ Mid CH



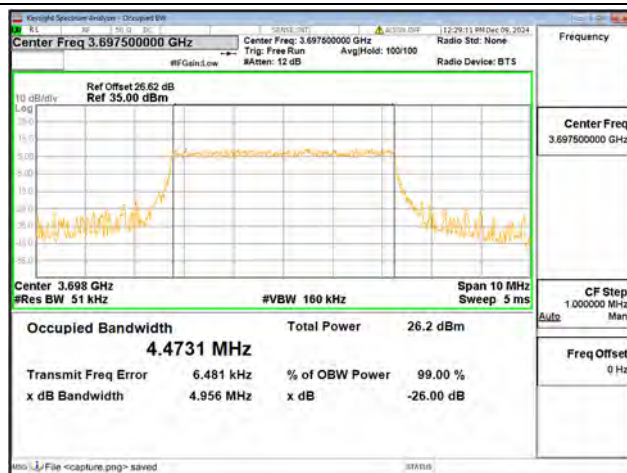
B48 / 5MHz / 256QAM/ Mid CH



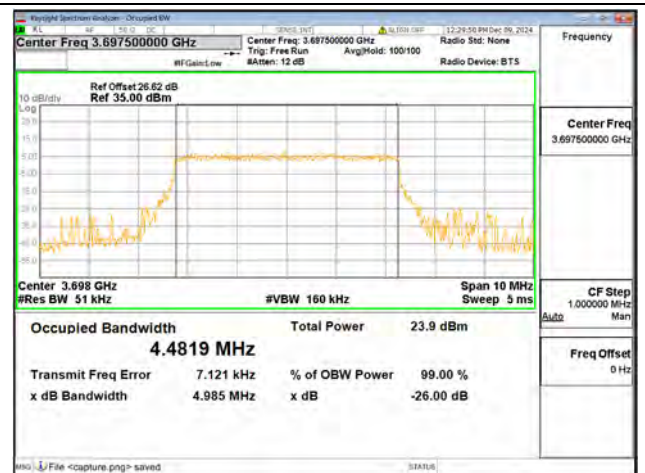
B48 / 5MHz / QPSK/ High CH



B48 / 5MHz / 16QAM/ High CH



B48 / 5MHz / 64QAM/ High CH



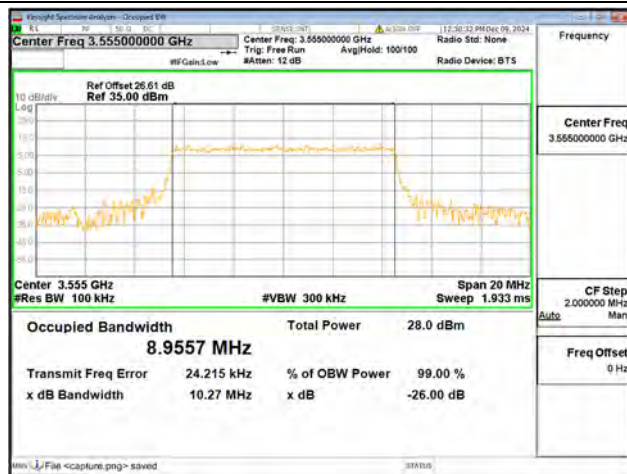
B48 / 5MHz / 256QAM/ High CH



B48 / 10MHz / QPSK/ Low CH



B48 / 10MHz / 16QAM/ Low CH



B48 / 10MHz / 64QAM/ Low CH



B48 / 10MHz / 256QAM/ Low CH



B48 / 10MHz / QPSK/ Mid CH



B48 / 10MHz / 16QAM/ Mid CH



B48 / 10MHz / 64QAM/ Mid CH



B48 / 10MHz / 256QAM/ Mid CH



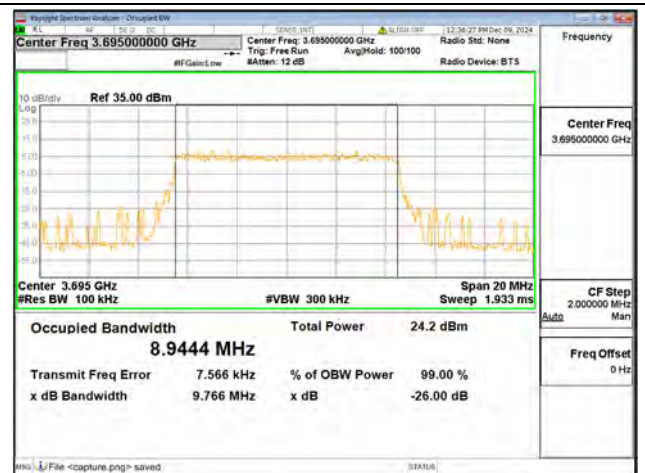
B48 / 10MHz / QPSK/ High CH



B48 / 10MHz / 16QAM/ High CH



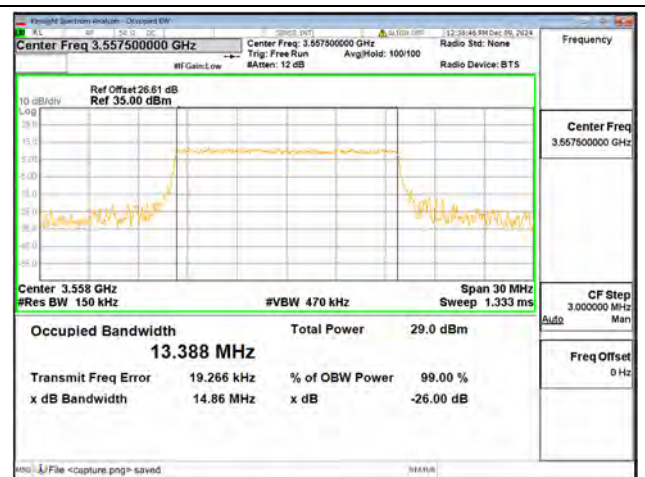
B48 / 10MHz / 64QAM/ High CH



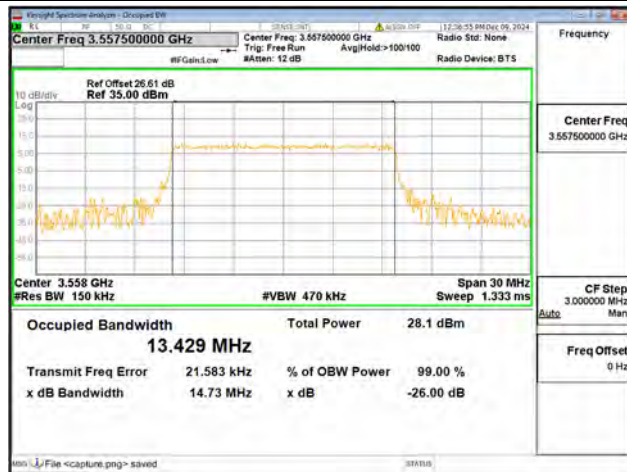
B48 / 10MHz / 256QAM/ High CH



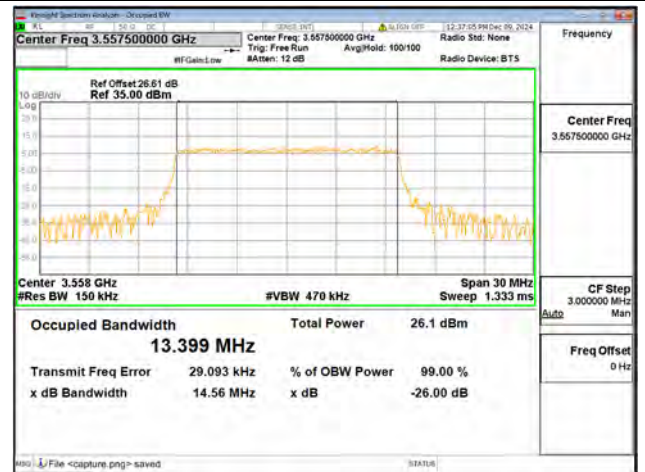
B48 / 15MHz / QPSK/ Low CH



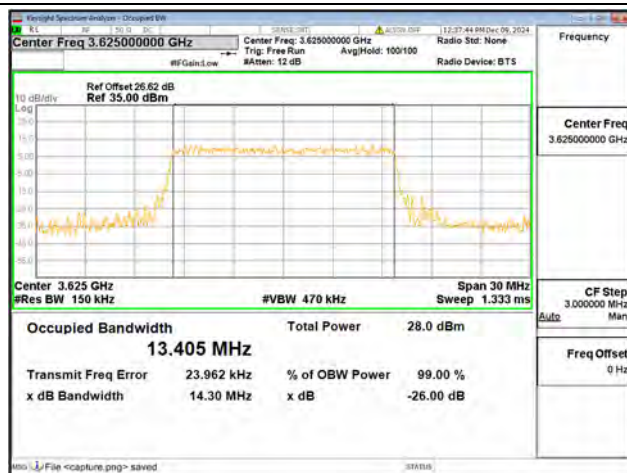
B48 / 15MHz / 16QAM/ Low CH



B48 / 15MHz / 64QAM/ Low CH



B48 / 15MHz / 256QAM/ Low CH



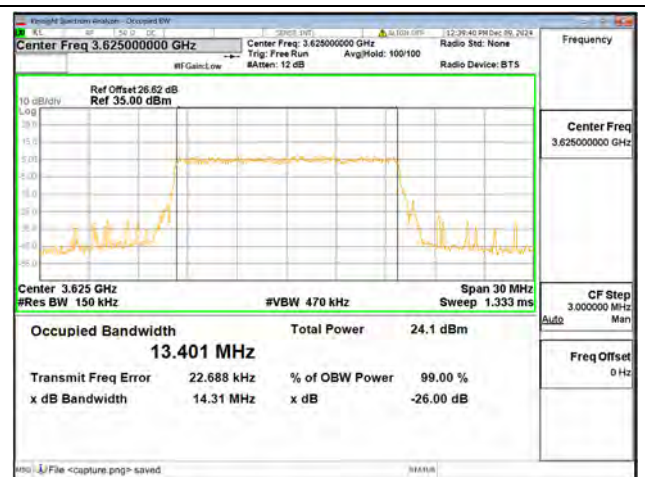
B48 / 15MHz / QPSK/ Mid CH



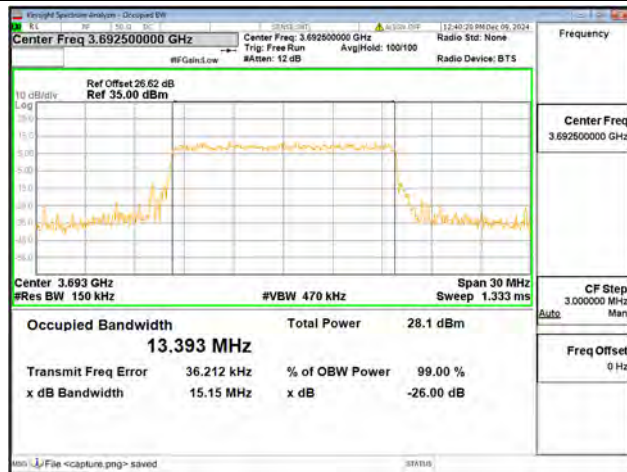
B48 / 15MHz / 16QAM/ Mid CH



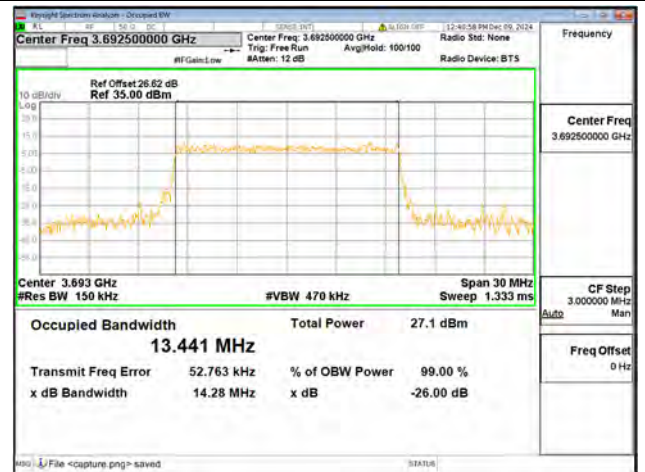
B48 / 15MHz / 64QAM/ Mid CH



B48 / 15MHz / 256QAM/ Mid CH



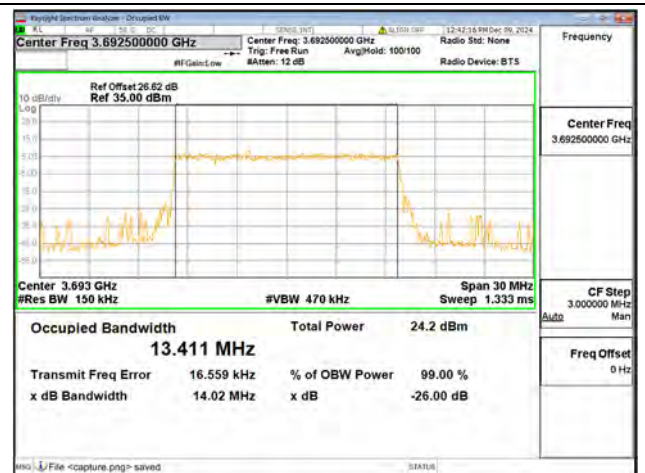
B48 / 15MHz / QPSK/ High CH



B48 / 15MHz / 16QAM/ High CH



B48 / 15MHz / 64QAM/ High CH



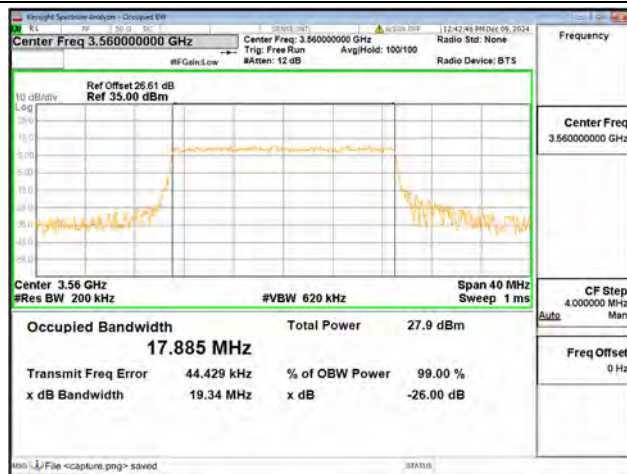
B48 / 15MHz / 256QAM/ High CH



B48 / 20MHz / QPSK/ Low CH



B48 / 20MHz / 16QAM/ Low CH



B48 / 20MHz / 64QAM/ Low CH



B48 / 20MHz / 256QAM/ Low CH



B48 / 20MHz / QPSK/ Mid CH



B48 / 20MHz / 16QAM/ Mid CH



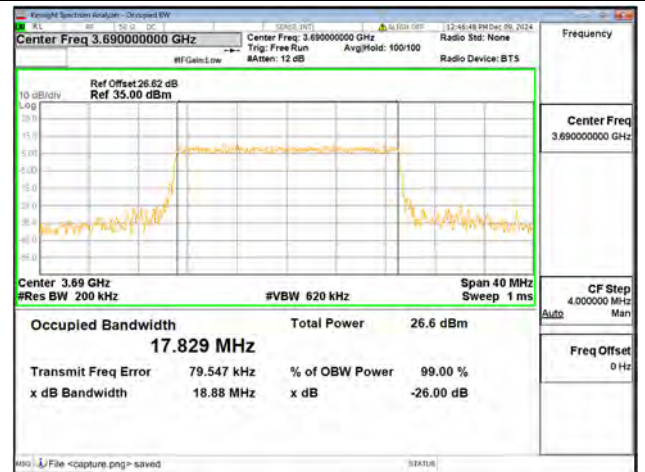
B48 / 20MHz / 64QAM/ Mid CH



B48 / 20MHz / 256QAM/ Mid CH



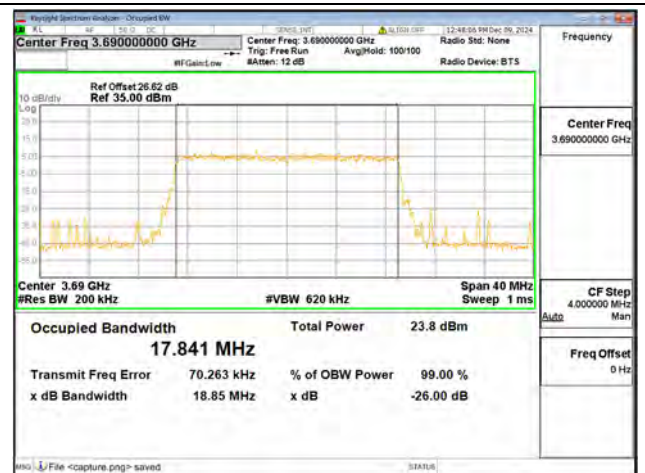
B48 / 20MHz / QPSK/ High CH



B48 / 20MHz / 16QAM/ High CH



B48 / 20MHz / 64QAM/ High CH



B48 / 20MHz / 256QAM/ High CH

2.3. Frequency Stability

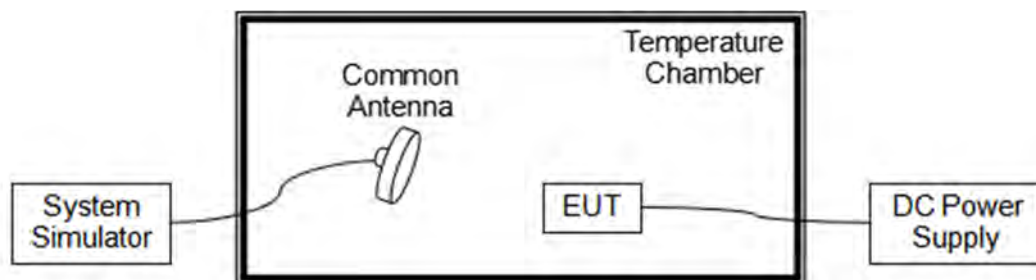
2.3.1. Requirement

According to FCC section 2.1055 & 90.213, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

- (a) The temperature is varied from -30°C to $+50^{\circ}\text{C}$ at intervals of not more than 10°C .
- (b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

Note: The operating temperature of EUT is from -10°C to 55°C , which are specified by the applicant.

2.3.2. Test Description



The EUT which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power. A call is established between the EUT and the SS via a Common Antenna.

2.3.3. Test procedure

KDB 971168 D01v03 Section 9.0 and ANSI/TIA-603-E-2016.



2.3.4.Test Result

The nominal, highest and lowest extreme voltages are separately 3.85V, 4.30V and 3.50V, which are specified by the applicant; the normal temperature here used is 20°C.

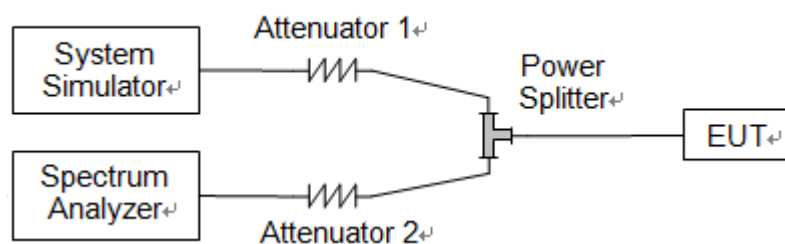
LTE Band 48, 256QAM, QPSK, Channel 55990, Frequency 3625.0MHz					
Limit =Within Authorized Band					
Voltage (%)	Power (VDC)	Temp(°C)	Fre. Dev.(Hz)	Deviation (ppm)	Result
Normal	3.85	+20(Ref)	16	0.004	PASS
Normal		-10	20	0.006	
Normal		0	-1	0.000	
Normal		+10	17	0.005	
Normal		+20	-11	-0.003	
Normal		+30	15	0.004	
Normal		+40	13	0.004	
Normal		+50	-16	-0.004	
Normal		+55	1	0.000	
High	4.30	+20	16	0.004	
BATT.ENDPOINT	3.50	+20	13	0.004	

2.4. Peak to Average Radio

2.4.1. Requirement

According to FCC 96.41(g), the peak-to-average power ratio (PAPR) of any CBSD transmitter output power must not exceed 13 dB.

2.4.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.4.3. Test procedure

KDB 971168 D01v03 Section 5.7 and ANSI/TIA-603-E-2016.

2.4.4. Test Result

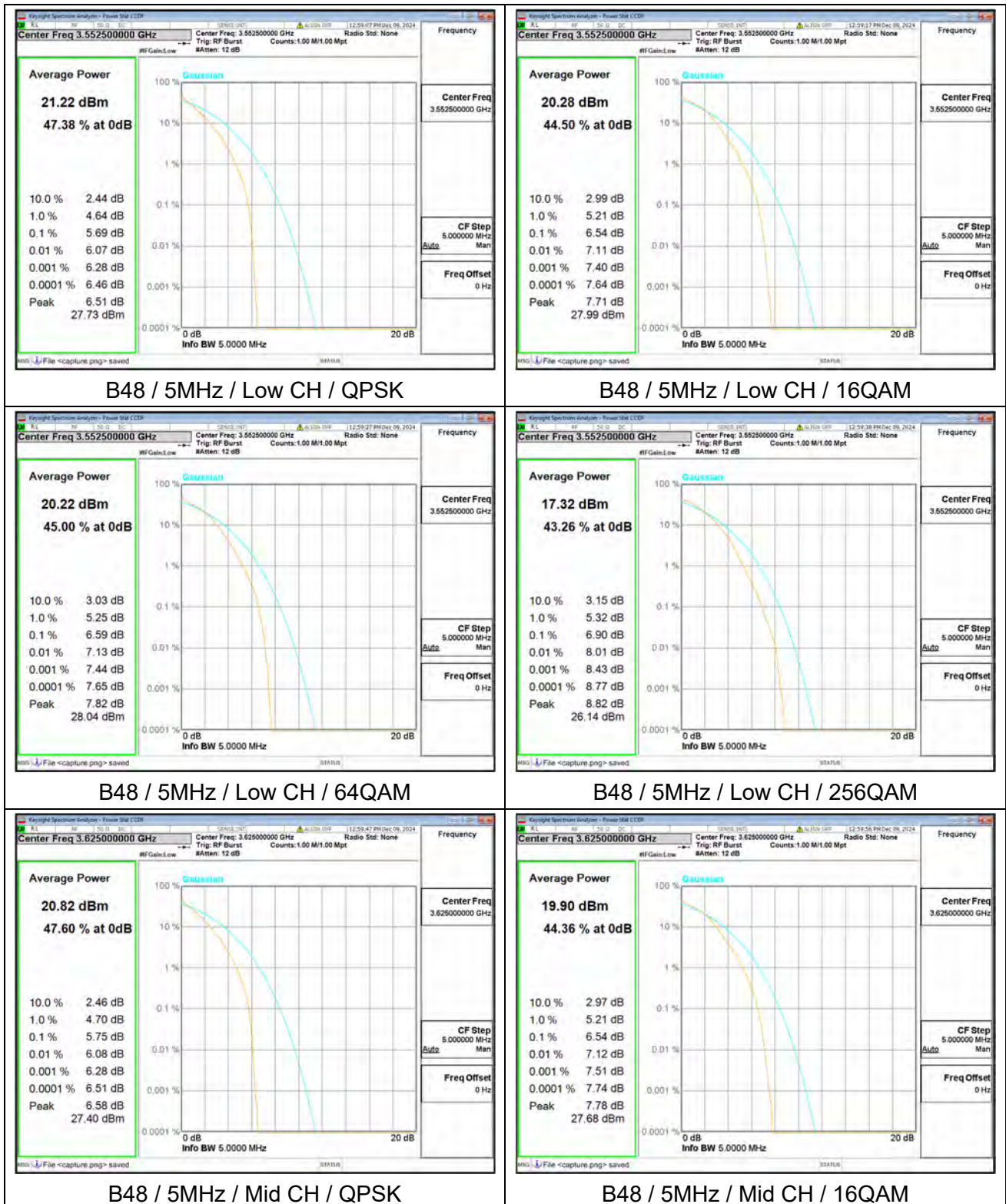


LTE Band	BW(MHz)	Channel Level	Channel	Frequency (MHz)	Modulation	Peak to Average Radio(dB)	P/F
B48	5	Low	55265	3552.5	QPSK	5.69	PASS
B48	5	Low	55265	3552.5	16QAM	6.54	PASS
B48	5	Low	55265	3552.5	64QAM	6.59	PASS
B48	5	Low	55265	3552.5	256QAM	6.90	PASS
B48	5	Mid	55990	3625	QPSK	5.75	PASS
B48	5	Mid	55990	3625	16QAM	6.54	PASS
B48	5	Mid	55990	3625	64QAM	6.80	PASS
B48	5	Mid	55990	3625	256QAM	6.95	PASS
B48	5	High	56715	3697.5	QPSK	5.76	PASS
B48	5	High	56715	3697.5	16QAM	6.60	PASS
B48	5	High	56715	3697.5	64QAM	6.85	PASS
B48	5	High	56715	3697.5	256QAM	6.98	PASS
B48	10	Low	55290	3555	QPSK	5.71	PASS
B48	10	Low	55290	3555	16QAM	6.51	PASS
B48	10	Low	55290	3555	64QAM	6.87	PASS
B48	10	Low	55290	3555	256QAM	6.87	PASS
B48	10	Mid	55990	3625	QPSK	5.71	PASS
B48	10	Mid	55990	3625	16QAM	6.47	PASS
B48	10	Mid	55990	3625	64QAM	6.95	PASS
B48	10	Mid	55990	3625	256QAM	5.39	PASS
B48	10	High	56690	3695	QPSK	5.66	PASS
B48	10	High	56690	3695	16QAM	6.50	PASS
B48	10	High	56690	3695	64QAM	6.91	PASS
B48	10	High	56690	3695	256QAM	6.96	PASS
B48	15	Low	55315	3557.5	QPSK	5.56	PASS
B48	15	Low	55315	3557.5	16QAM	6.44	PASS
B48	15	Low	55315	3557.5	64QAM	6.73	PASS
B48	15	Low	55315	3557.5	256QAM	6.89	PASS
B48	15	Mid	55990	3625	QPSK	5.58	PASS
B48	15	Mid	55990	3625	16QAM	6.45	PASS
B48	15	Mid	55990	3625	64QAM	6.82	PASS
B48	15	Mid	55990	3625	256QAM	6.87	PASS
B48	15	High	56665	3692.5	QPSK	5.62	PASS
B48	15	High	56665	3692.5	16QAM	6.51	PASS
B48	15	High	56665	3692.5	64QAM	6.88	PASS



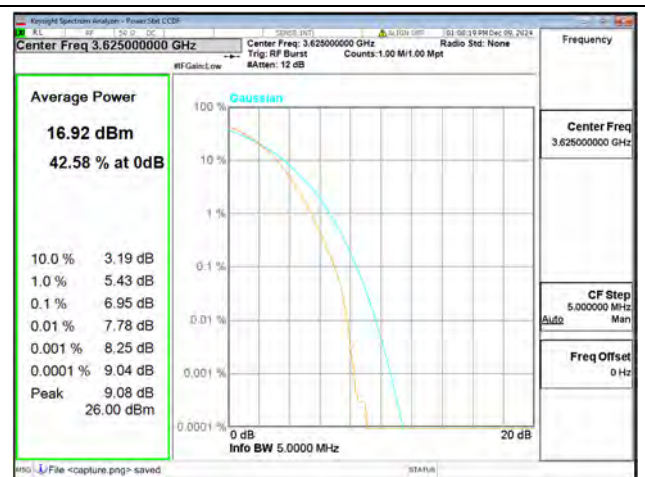
REPORT No.: SZ24100188W04

B48	15	High	56665	3692.5	256QAM	6.87	PASS
B48	20	Low	55340	3560	QPSK	5.59	PASS
B48	20	Low	55340	3560	16QAM	6.41	PASS
B48	20	Low	55340	3560	64QAM	6.78	PASS
B48	20	Low	55340	3560	256QAM	6.87	PASS
B48	20	Mid	55990	3625	QPSK	5.59	PASS
B48	20	Mid	55990	3625	16QAM	6.43	PASS
B48	20	Mid	55990	3625	64QAM	6.82	PASS
B48	20	Mid	55990	3625	256QAM	6.77	PASS
B48	20	High	56640	3690	QPSK	5.60	PASS
B48	20	High	56640	3690	16QAM	6.46	PASS
B48	20	High	56640	3690	64QAM	7.18	PASS
B48	20	High	56640	3690	256QAM	6.87	PASS

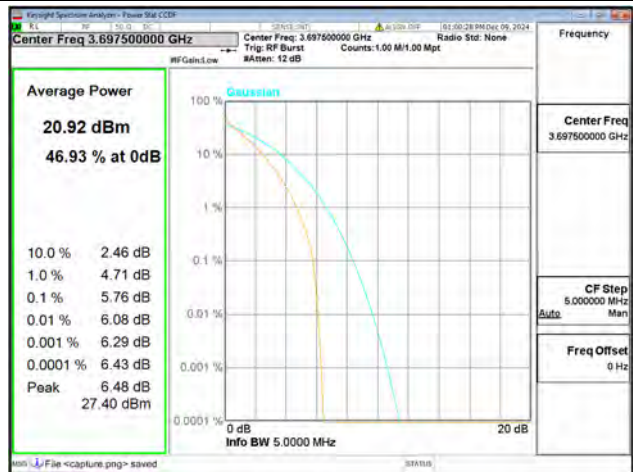




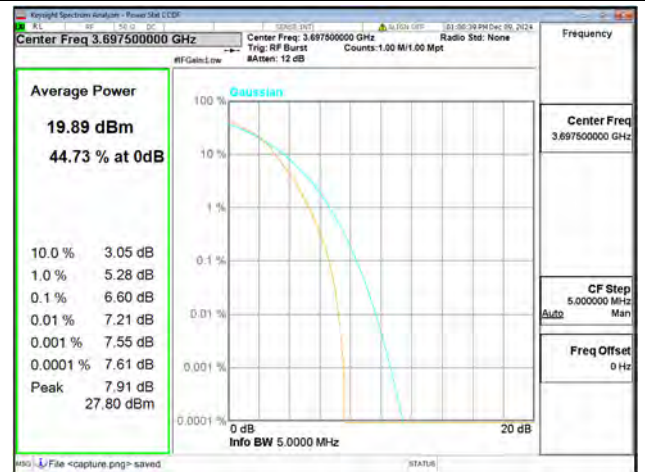
B48 / 5MHz / Mid CH / 64QAM



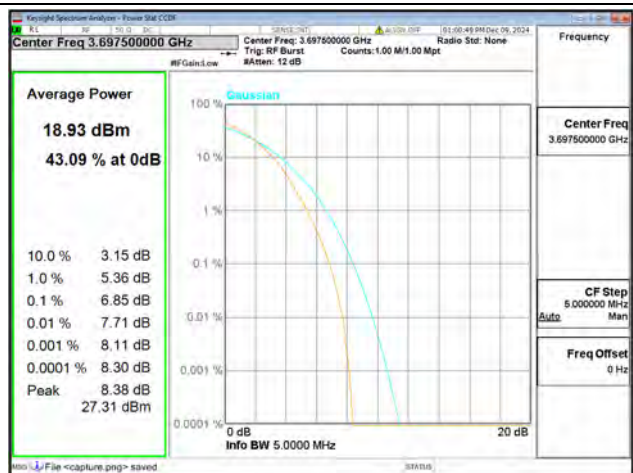
B48 / 5MHz / Mid CH / 256QAM



B48 / 5MHz / High CH / QPSK



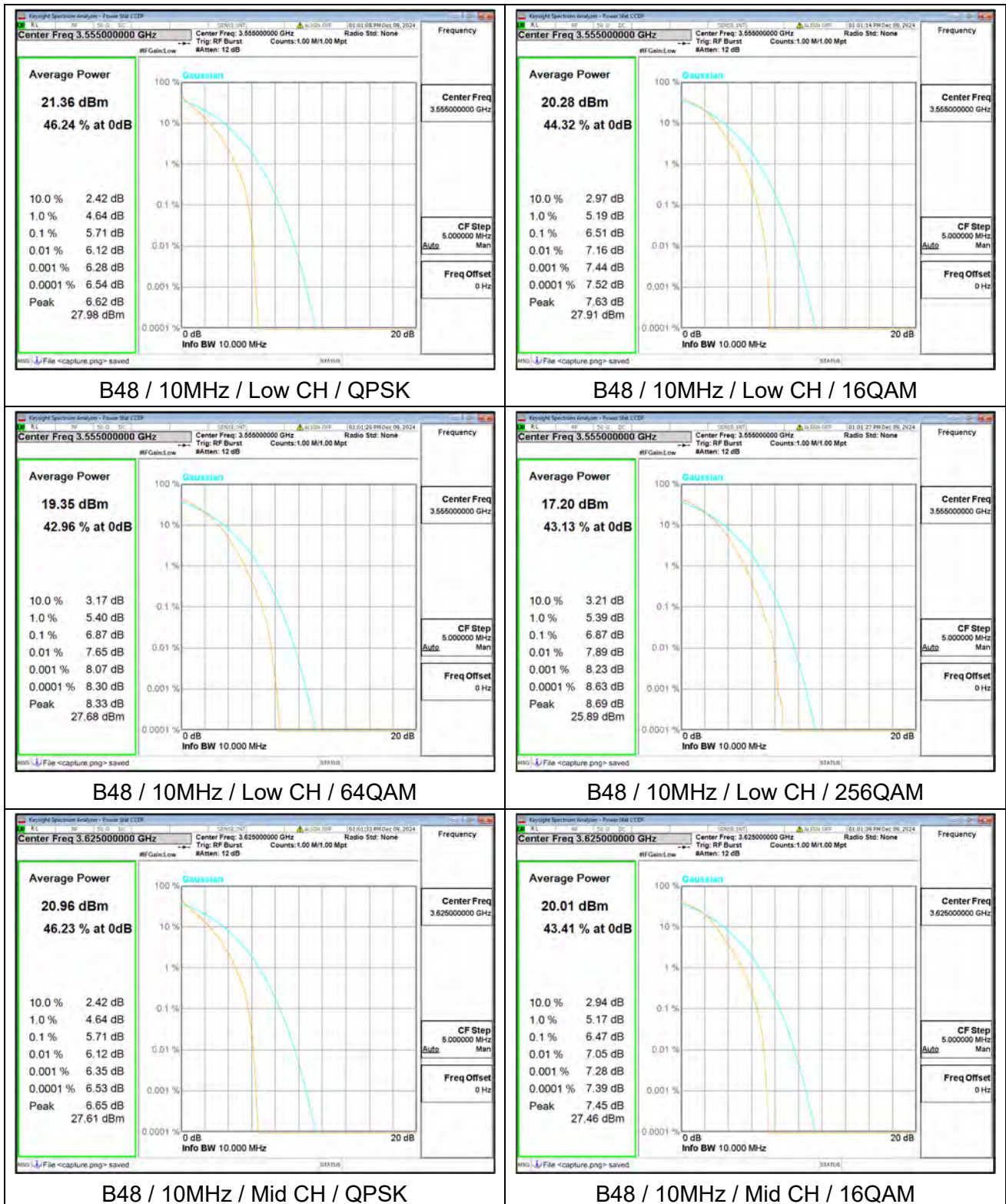
B48 / 5MHz / High CH / 16QAM

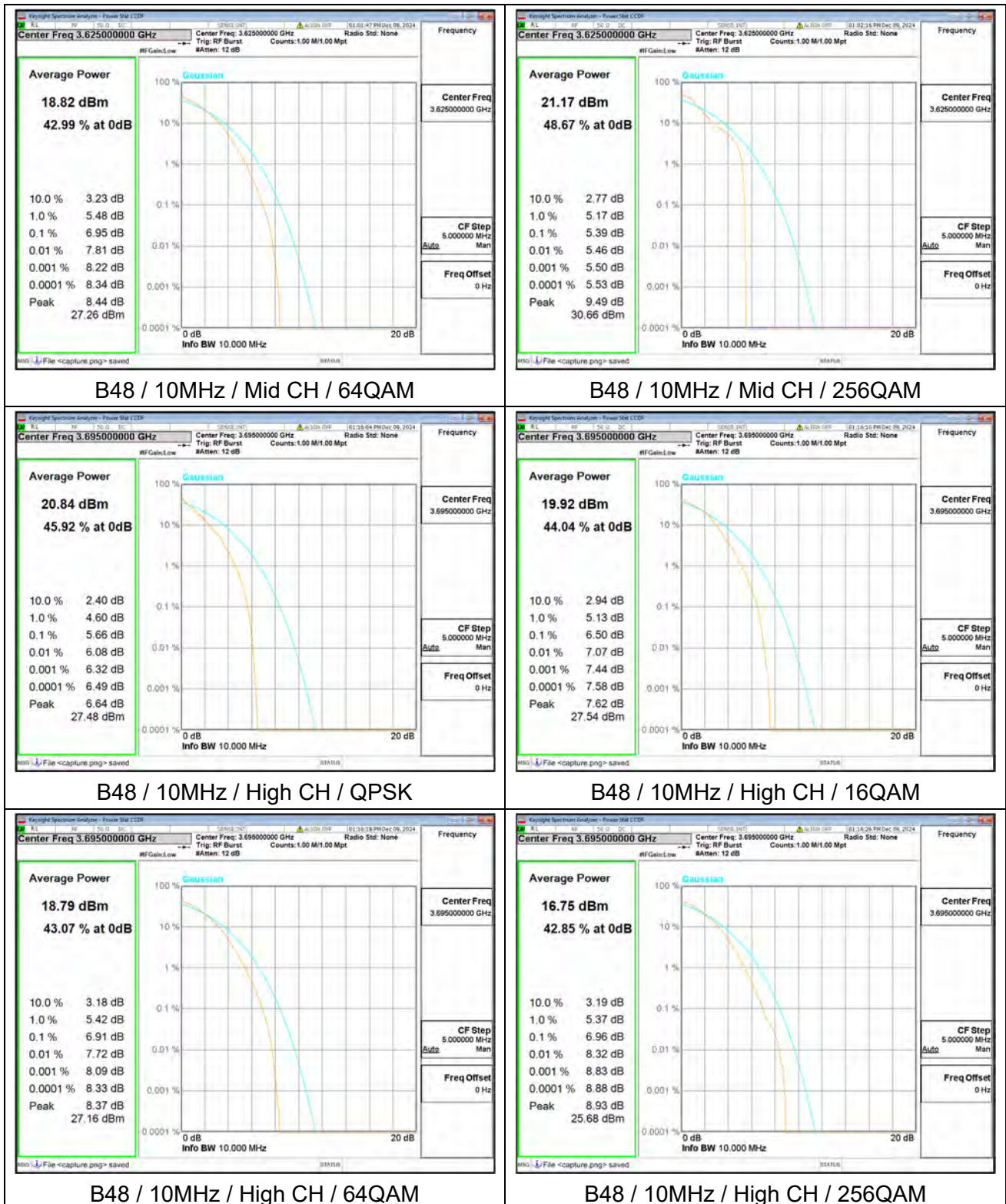


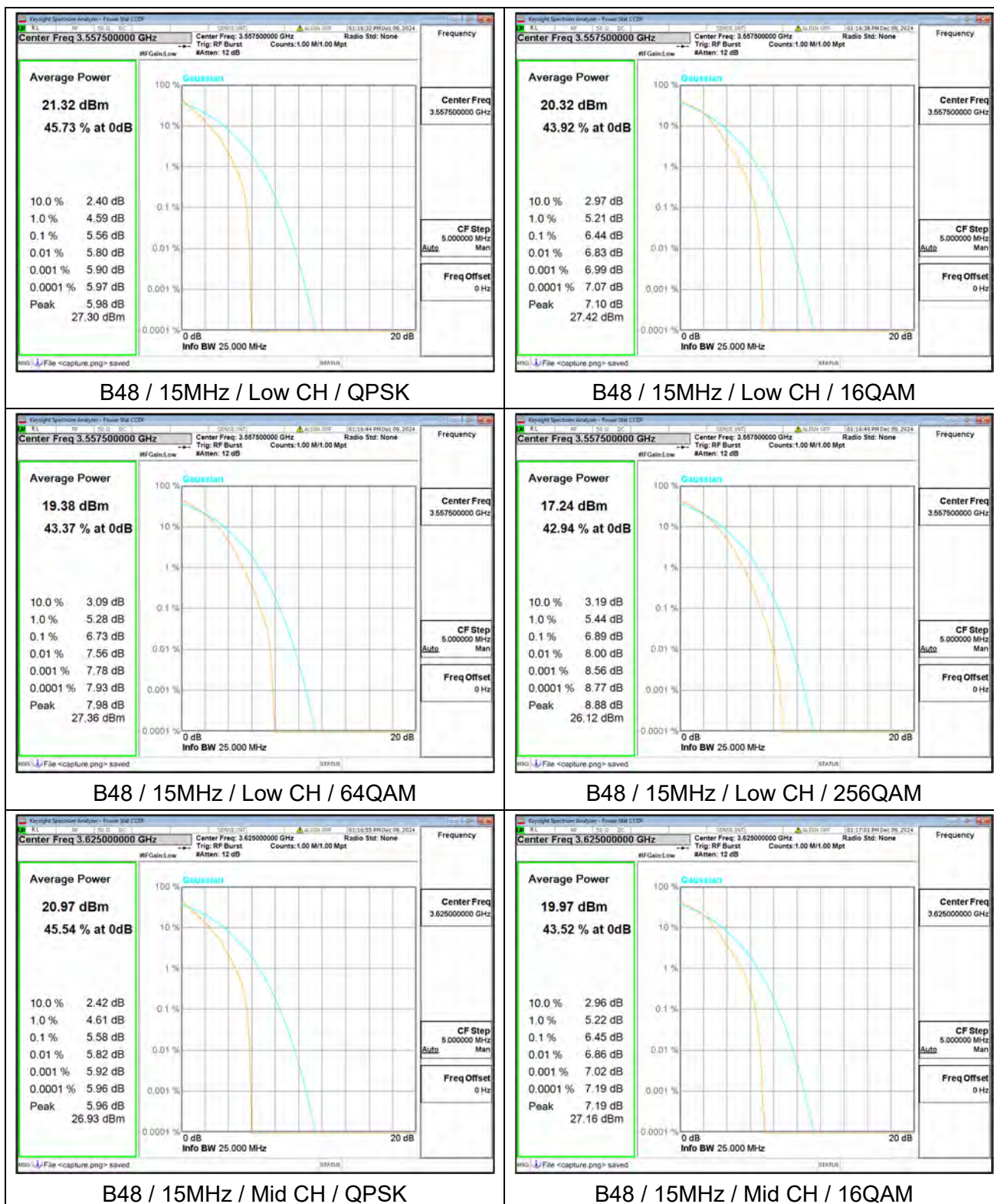
B48 / 5MHz / High CH / 64QAM

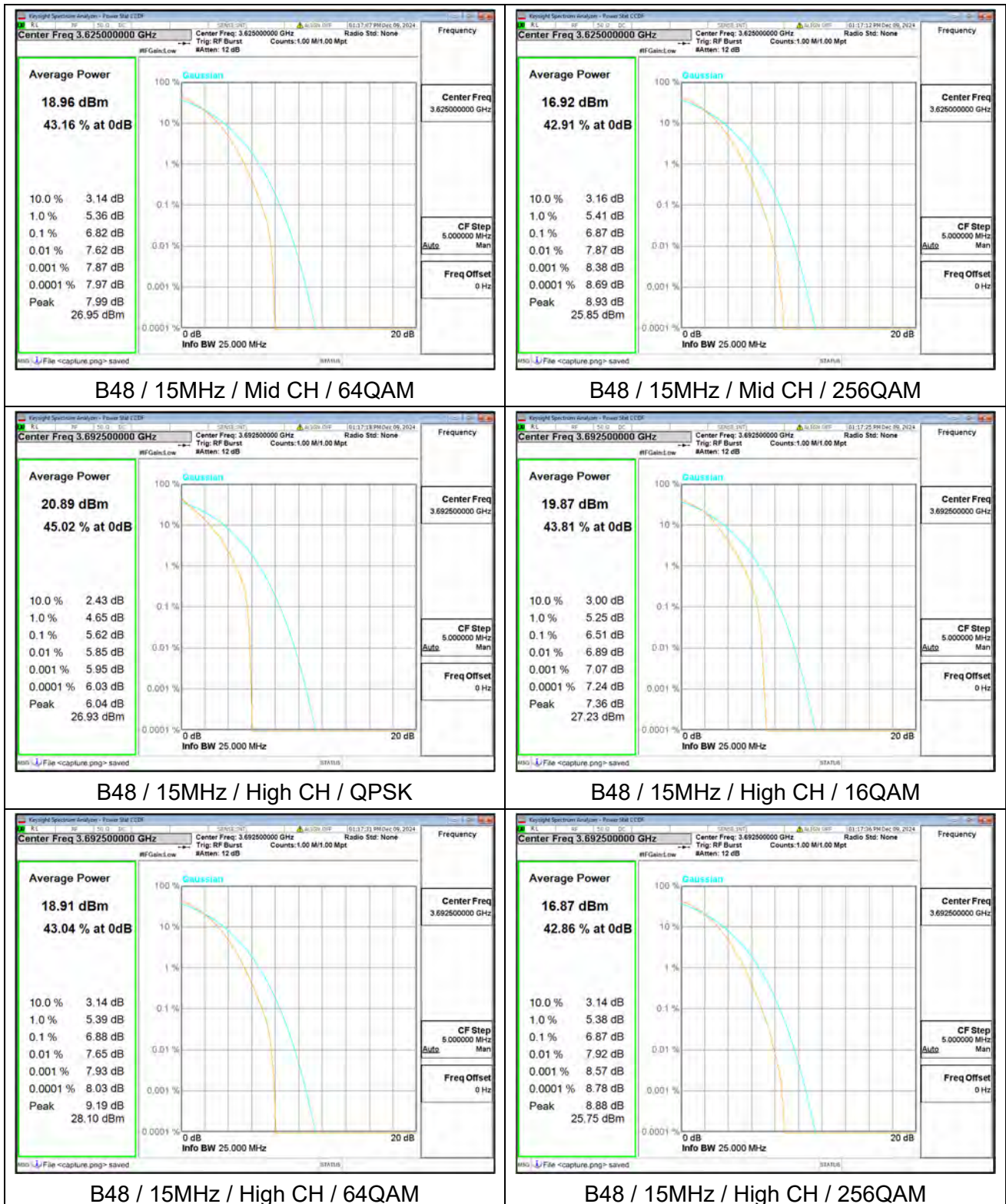


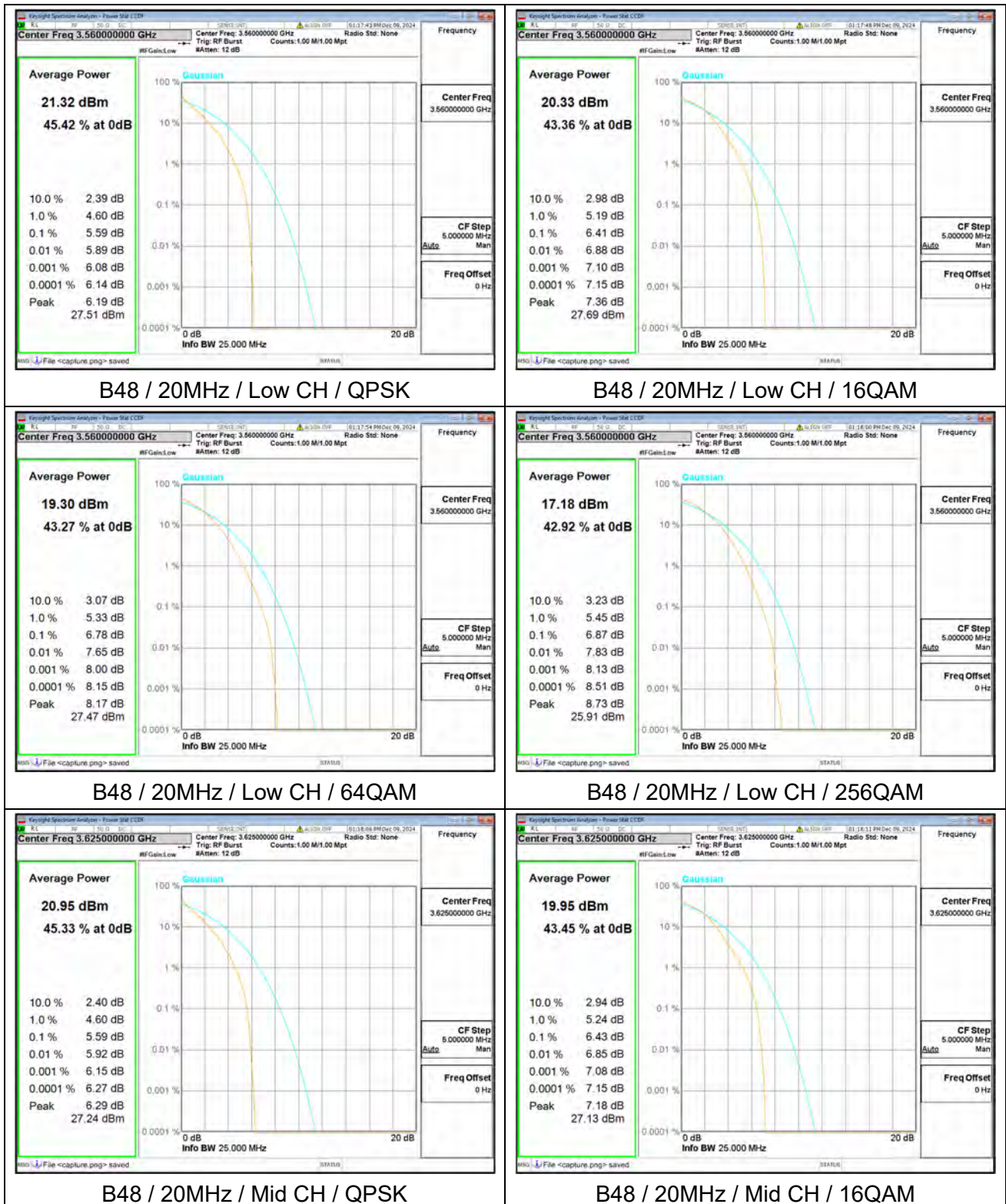
B48 / 5MHz / High CH / 256QAM





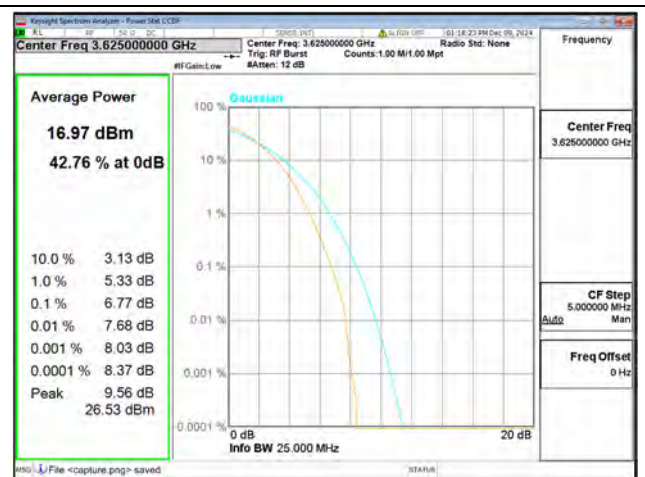




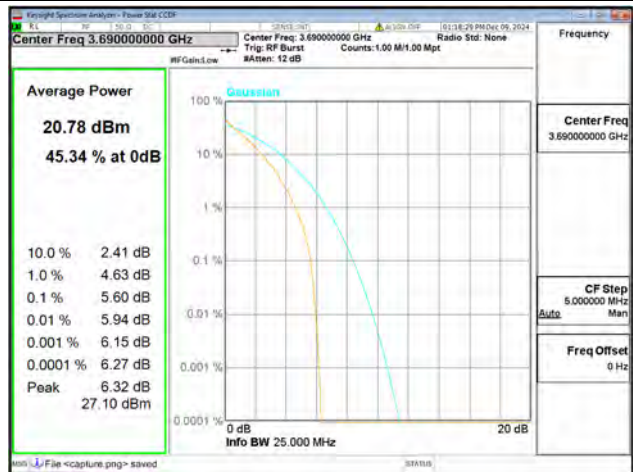




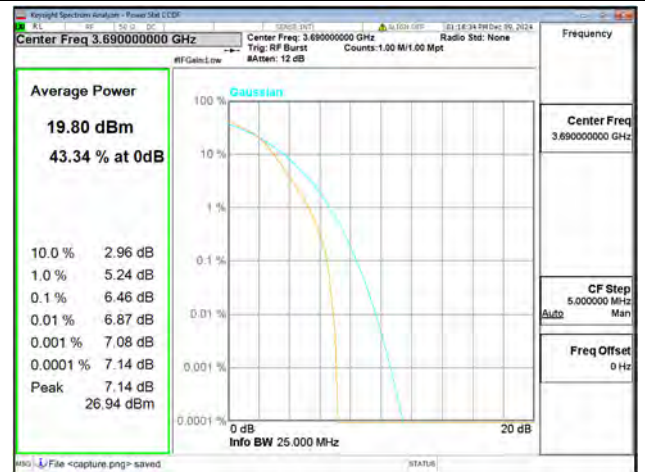
B48 / 20MHz / Mid CH / 64QAM



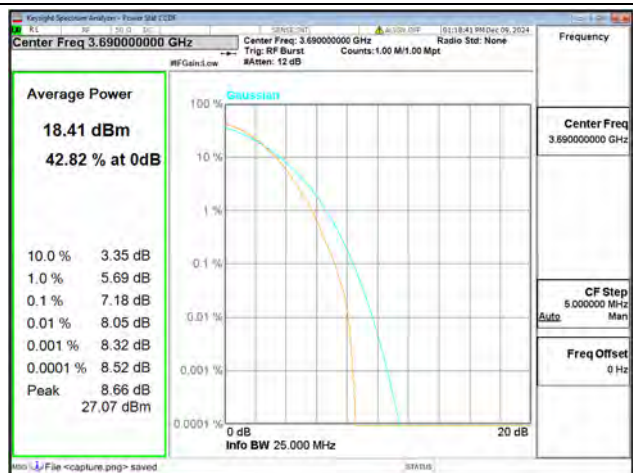
B48 / 20MHz / Mid CH / 256QAM



B48 / 20MHz / High CH / QPSK



B48 / 20MHz / High CH / 16QAM



B48 / 20MHz / High CH / 64QAM

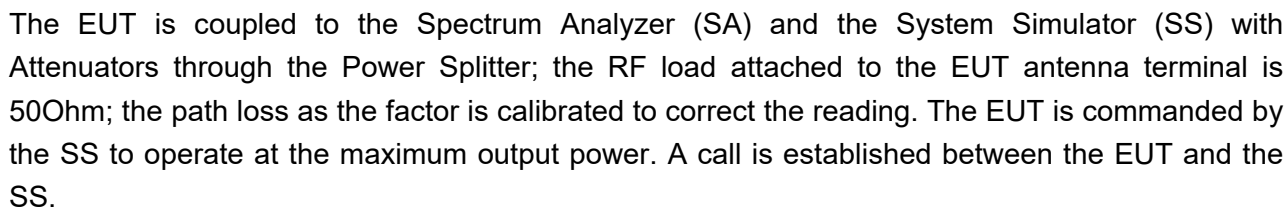


B48 / 20MHz / High CH / 256QAM



2.5.1.Requirement

2.5.2. Test Description

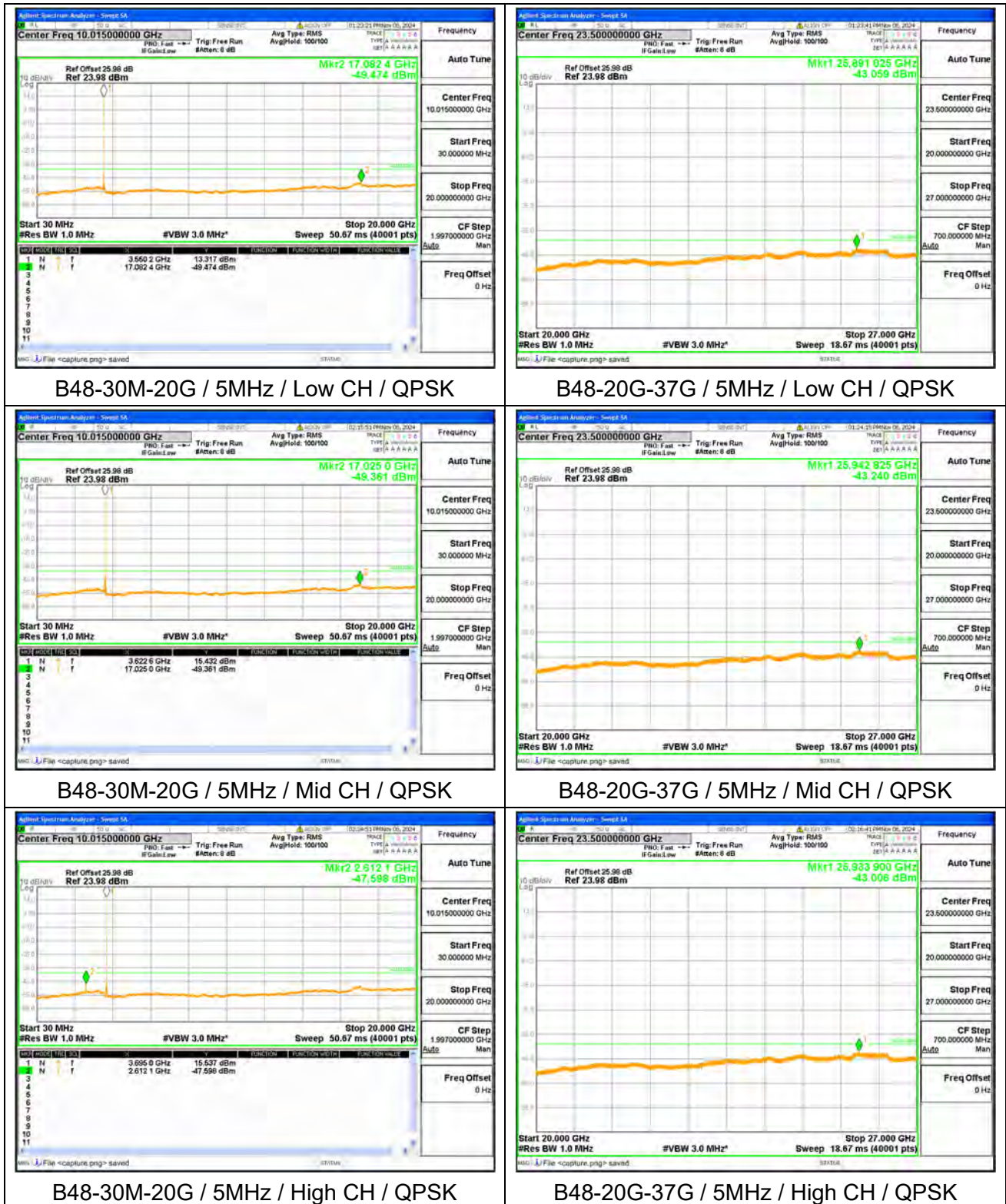


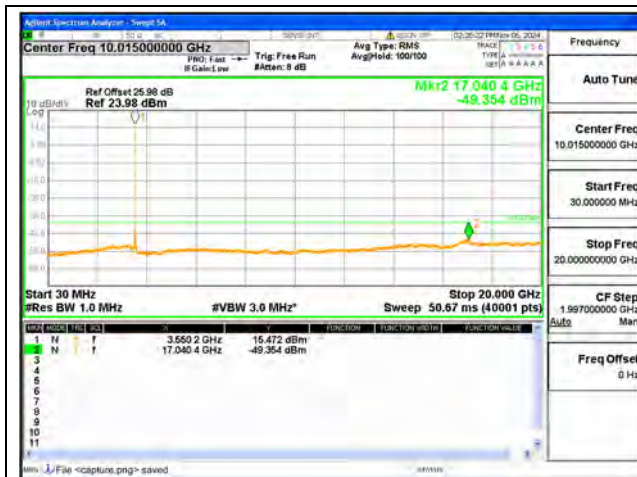
2.5.1. Test procedure

KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

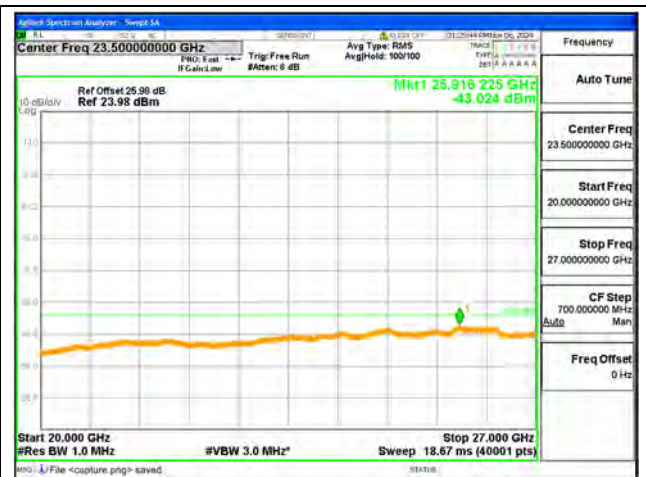


2.5.2. Test Result

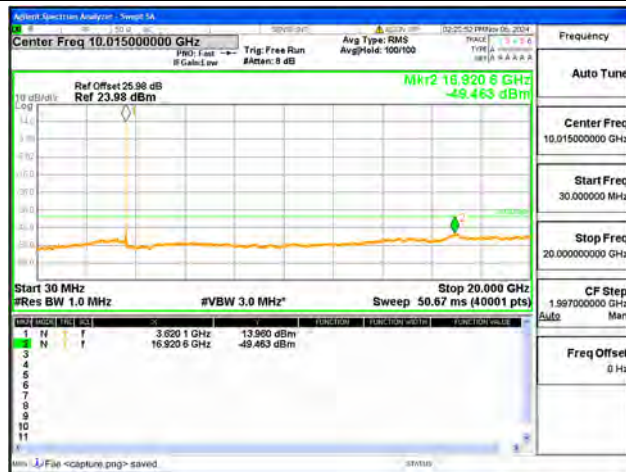




B48-30M-20G / 10MHz / Low CH / QPSK



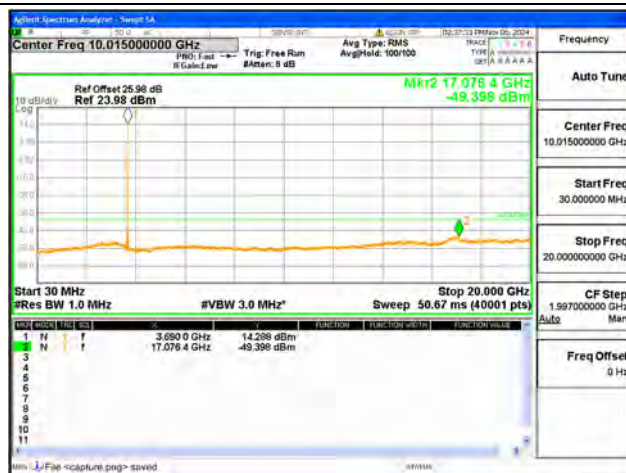
B48-20G-37G / 10MHz / Low CH / QPSK



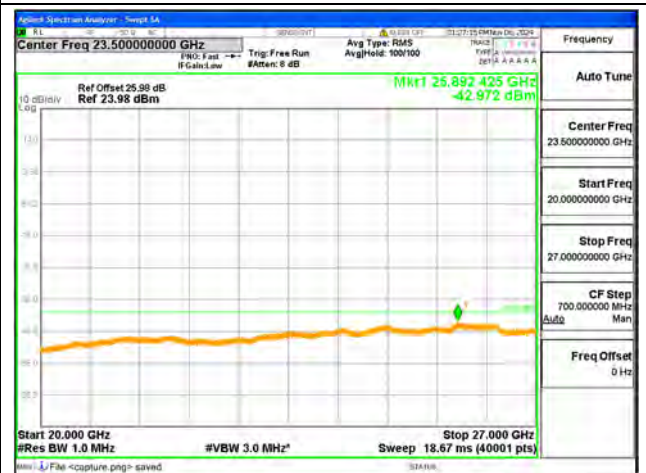
B48-30M-20G / 10MHz / Mid CH / QPSK



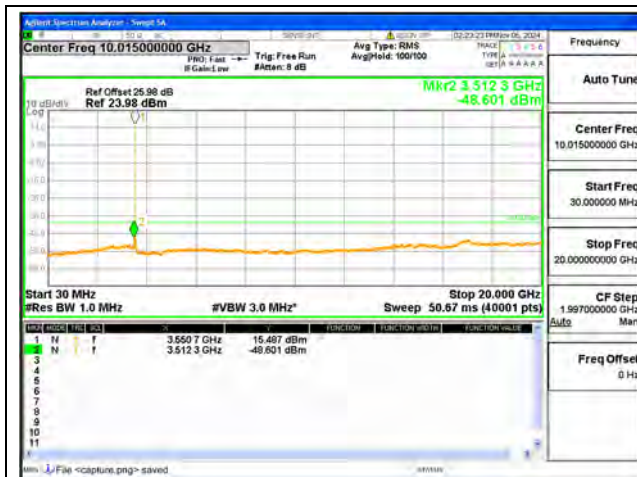
B48-20G-37G / 10MHz / Mid CH / QPSK



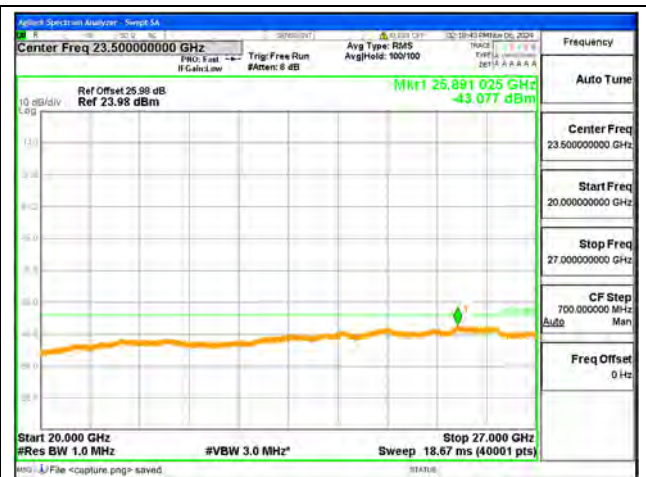
B48-30M-20G / 10MHz / High CH / QPSK



B48-20G-37G / 10MHz / High CH / QPSK



B48-30M-20G / 15MHz / Low CH / QPSK



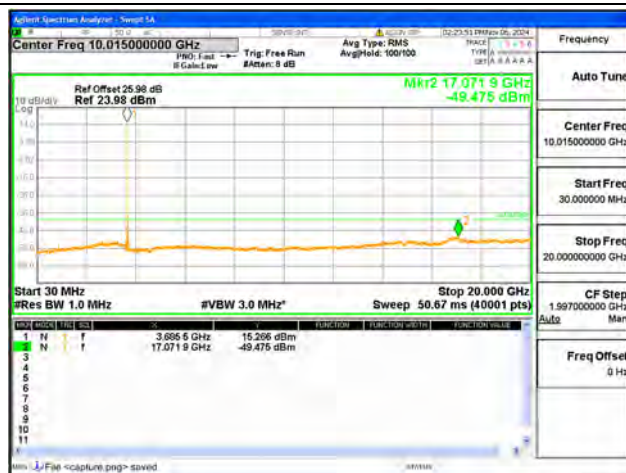
B48-20G-37G / 15MHz / Low CH / QPSK



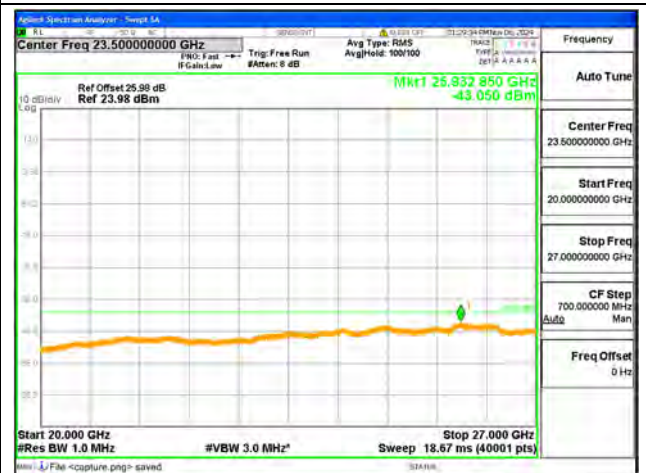
B48-30M-20G / 15MHz / Mid CH / QPSK



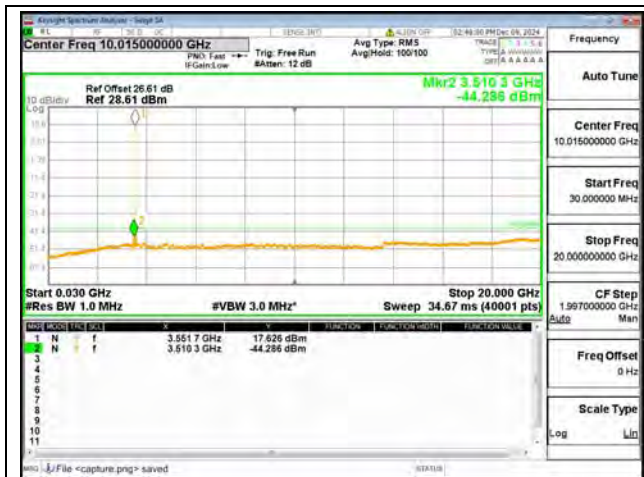
B48-20G-37G / 15MHz / Mid CH / QPSK



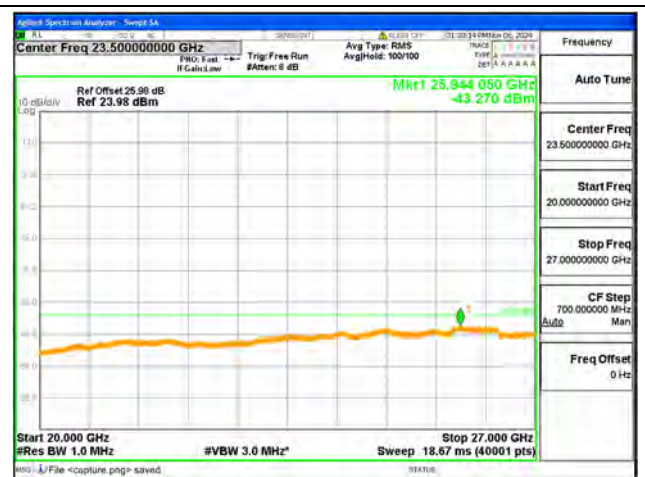
B48-30M-20G / 15MHz / High CH / QPSK



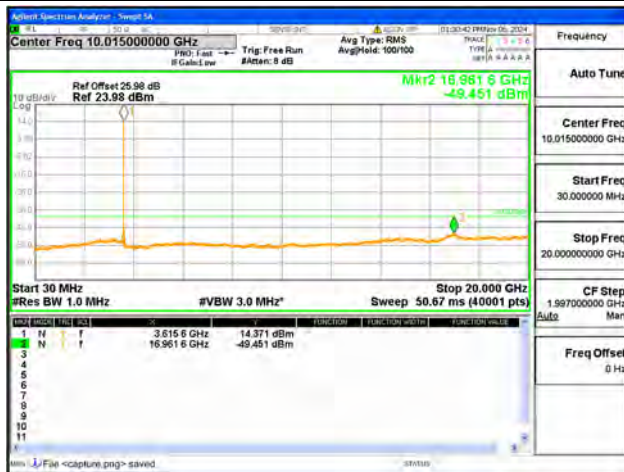
B48-20G-37G / 15MHz / High CH / QPSK



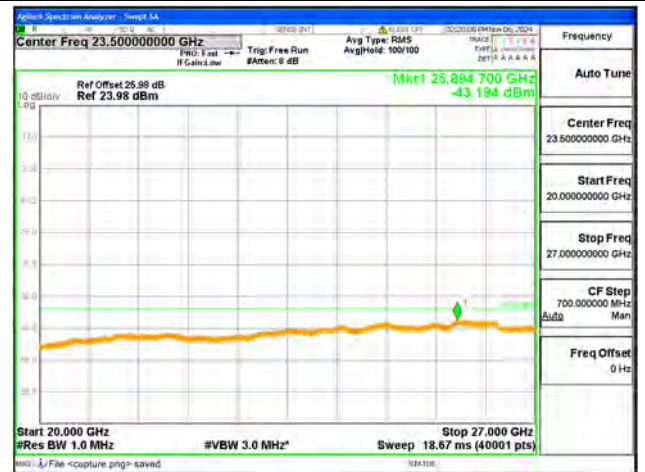
B48-30M-20G / 20MHz / Low CH / QPSK



B48-20G-37G / 20MHz / Low CH / QPSK



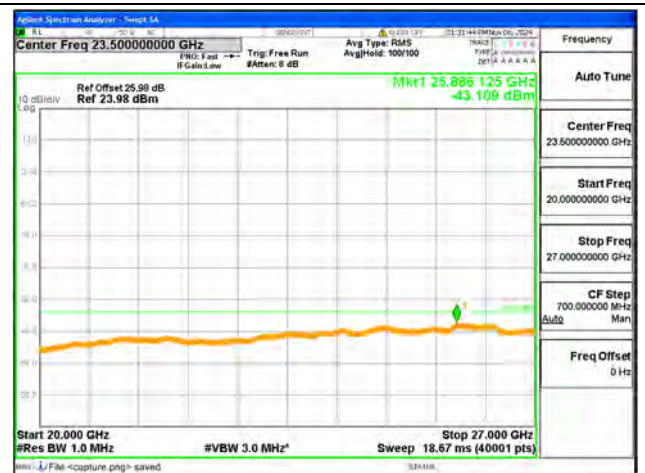
B48-30M-20G / 20MHz / Mid CH / QPSK



B48-20G-37G / 20MHz / Mid CH / QPSK



B48-30M-20G / 20MHz / High CH / QPSK



B48-20G-37G / 20MHz / High CH / QPSK



2.6. Band Edge

2.6.1. Requirement

Part 96.41(e)(1)(i)

For channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz.

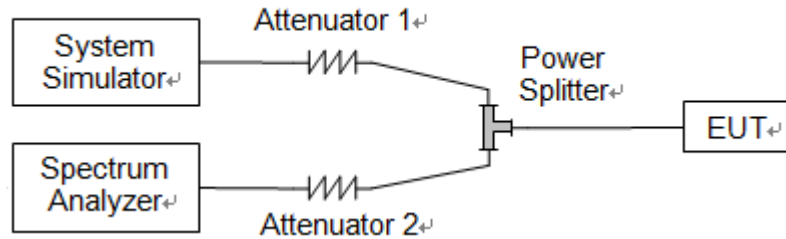
Part 96.41(e)(1)(ii)

For channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz.

Part 96.41(e)(2)

For CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

2.6.2. Test Description



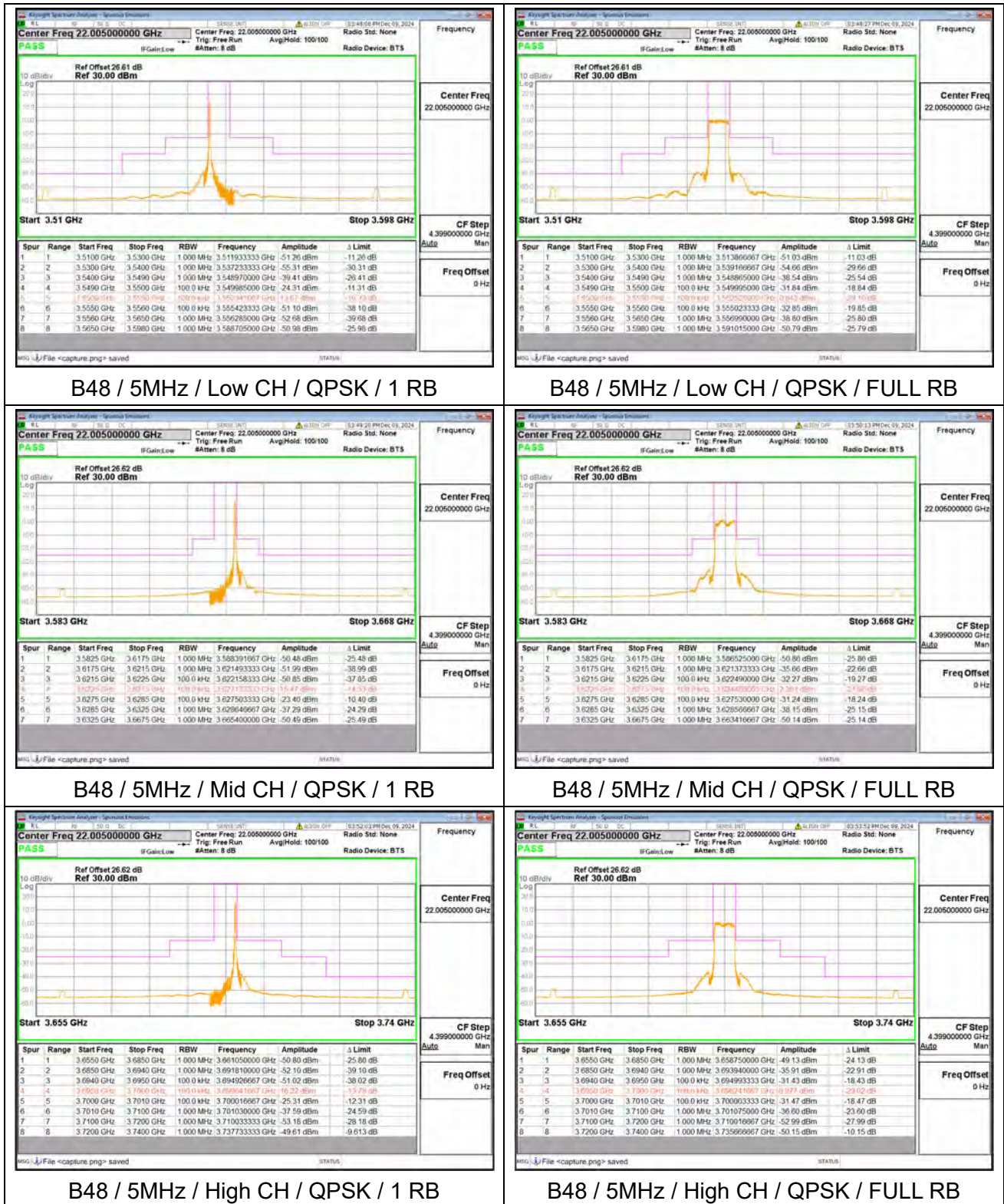
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

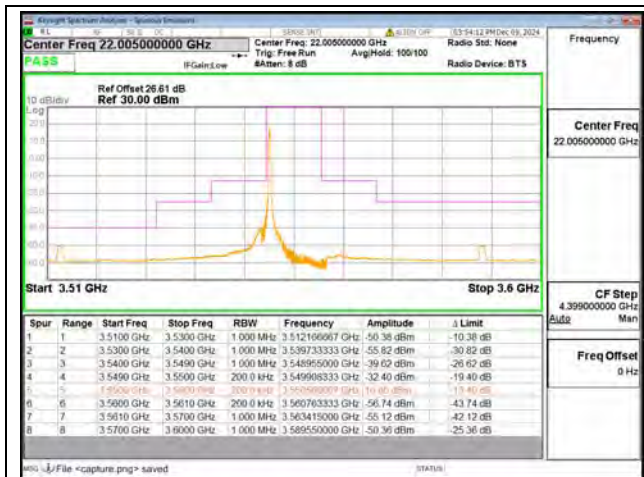
2.6.3. Test procedure

KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

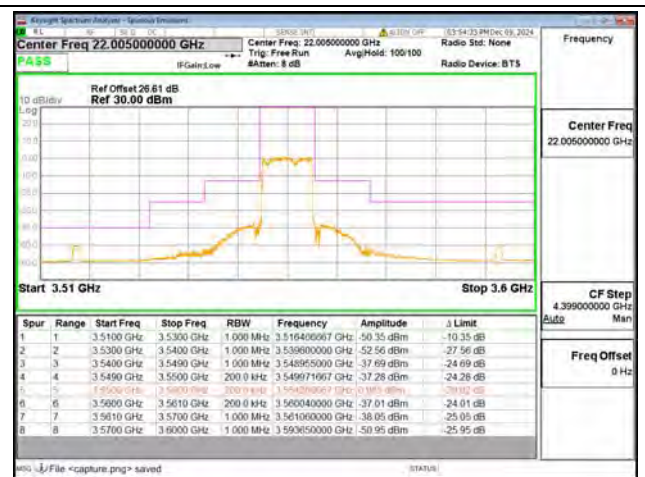


2.6.4. Test Result

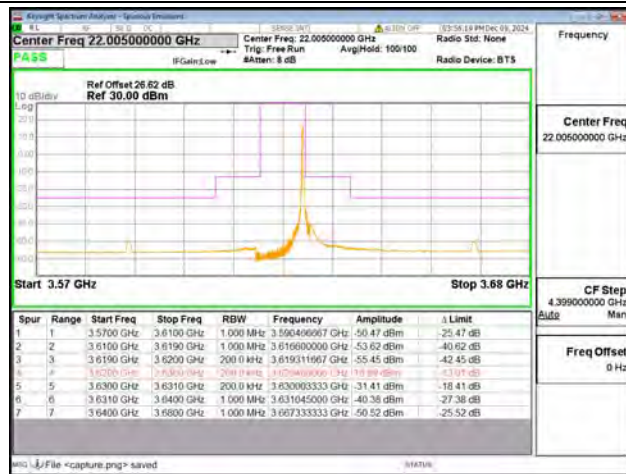




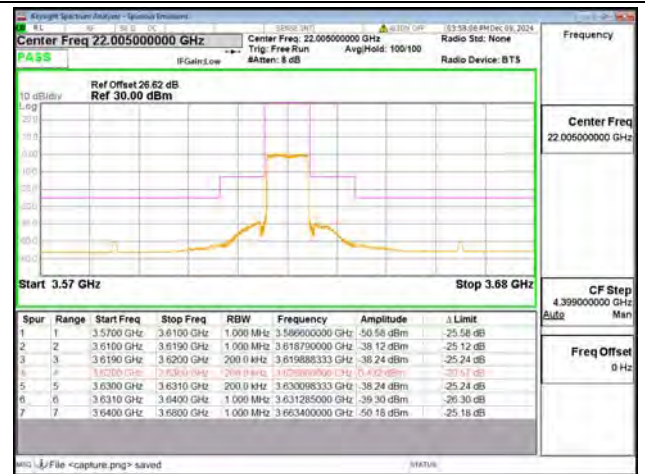
B48 / 10MHz / Low CH / QPSK / 1 RB



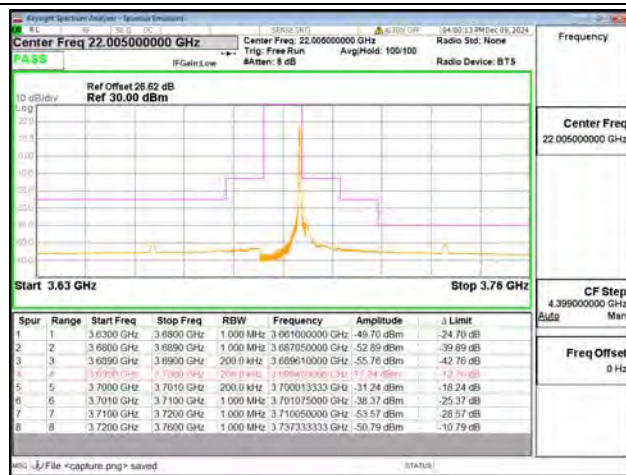
B48 / 10MHz / Low CH / QPSK / FULL RB



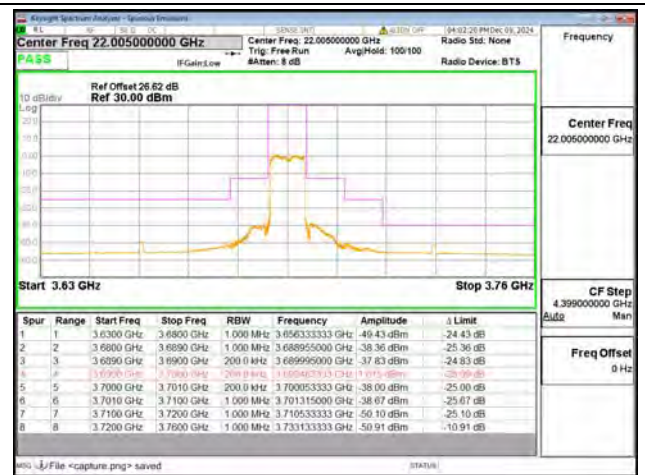
B48 / 10MHz / Mid CH / QPSK / 1 RB



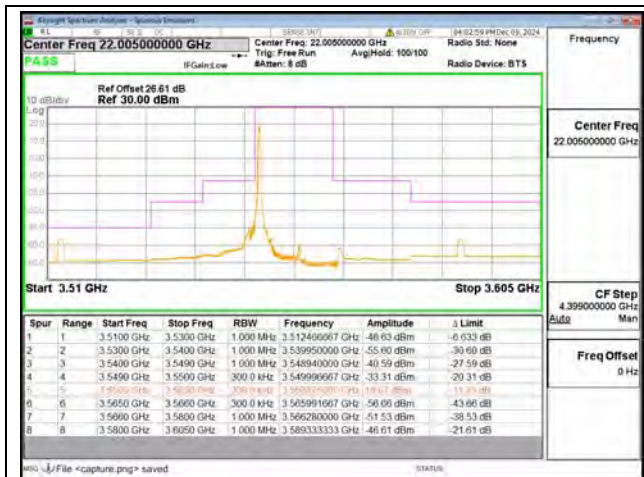
B48 / 10MHz / Mid CH / QPSK / FULL RB



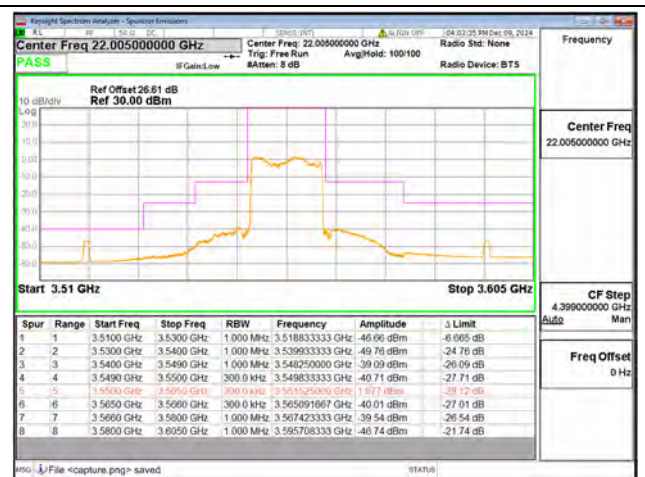
B48 / 10MHz / High CH / QPSK / 1 RB



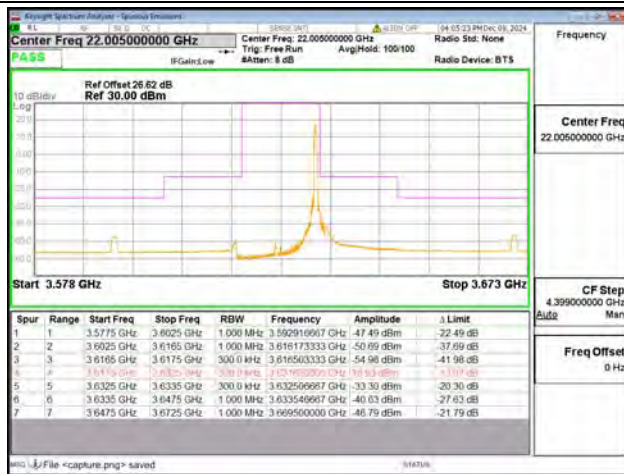
B48 / 10MHz / High CH / QPSK / FULL RB



B48 / 15MHz / Low CH / QPSK / 1 RB



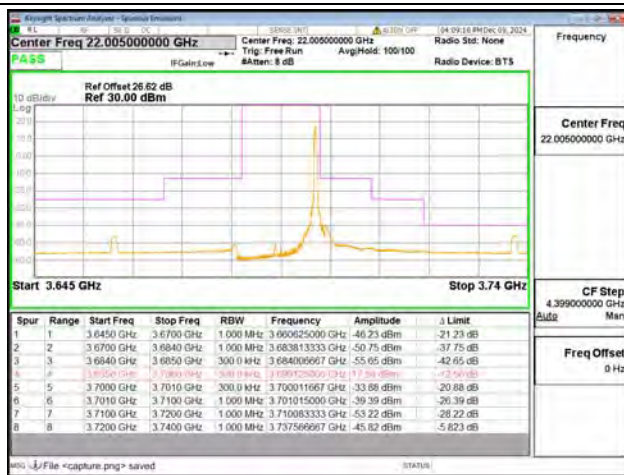
B48 / 15MHz / Low CH / QPSK / FULL RB



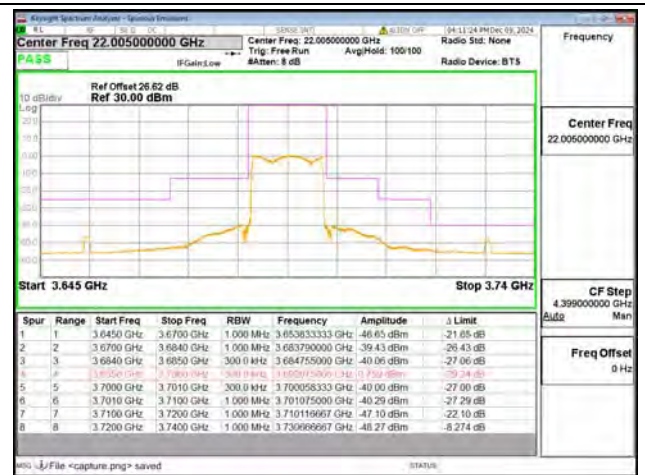
B48 / 15MHz / Mid CH / QPSK / 1 RB



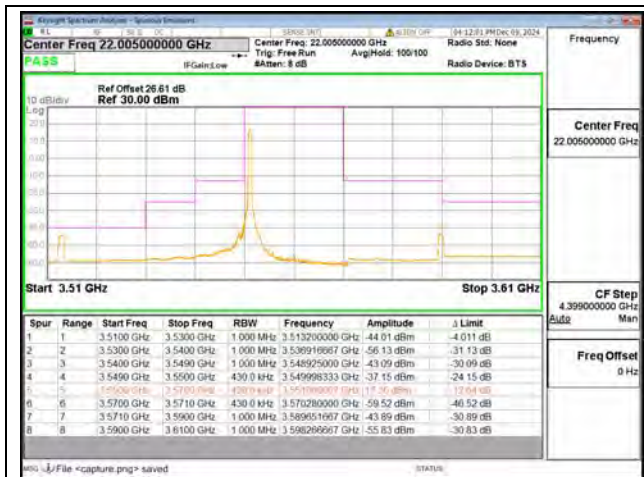
B48 / 15MHz / Mid CH / QPSK / FULL RB



B48 / 15MHz / High CH / QPSK / 1 RB



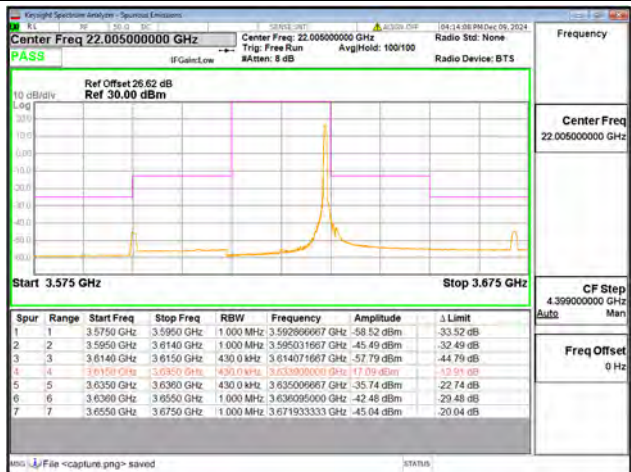
B48 / 15MHz / High CH / QPSK / FULL RB



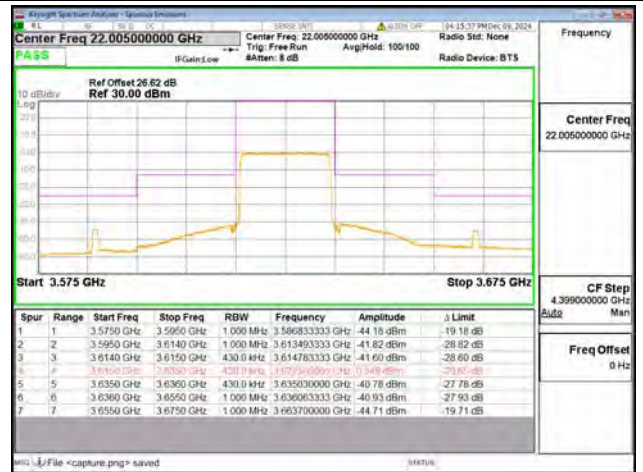
B48 / 20MHz / Low CH / QPSK / 1 RB



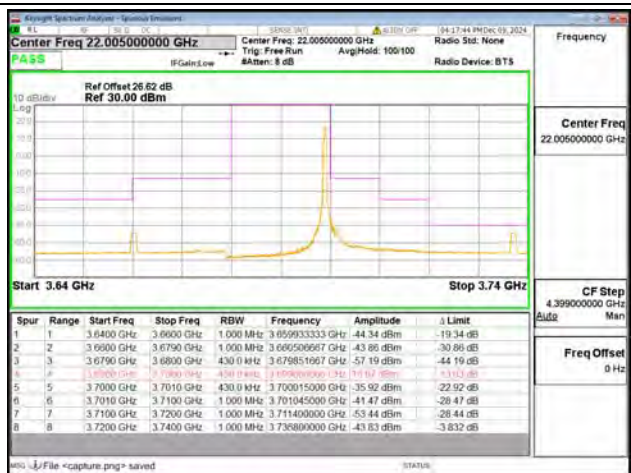
B48 / 20MHz / Low CH / QPSK / FULL RB



B48 / 20MHz / Mid CH / QPSK / 1 RB



B48 / 20MHz / Mid CH / QPSK / FULL RB



B48 / 20MHz / High CH / QPSK / 1 RB



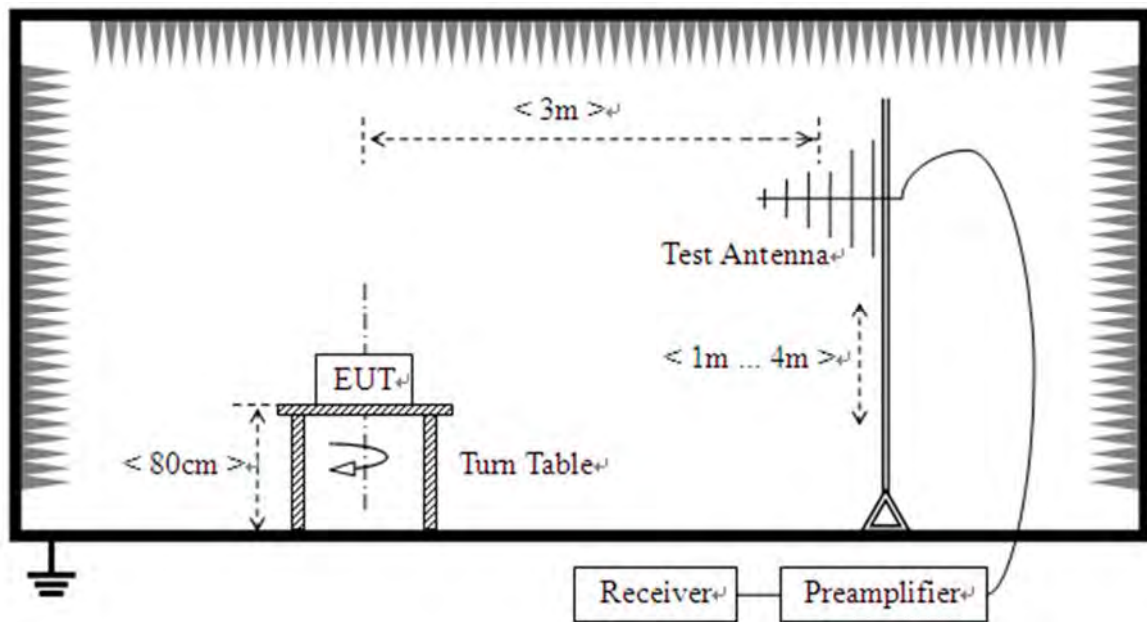
B48 / 20MHz / High CH / QPSK / FULL RB

2.7. Radiated Spurious Emissions

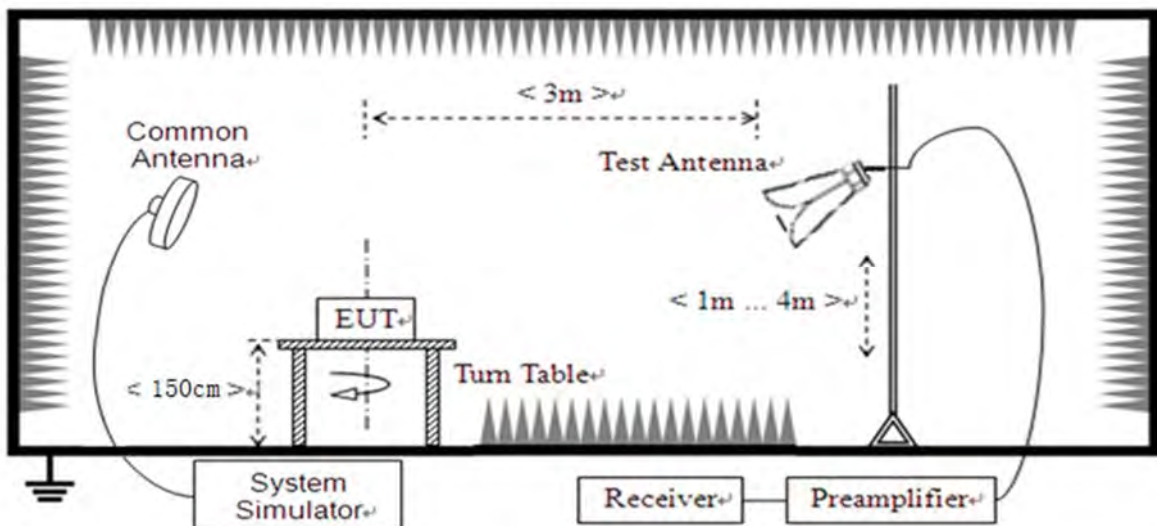
2.7.1. Requirement

The power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz .

2.7.2. Test Description



(For the test frequency from 30MHz to 1GHz)



(For the test frequency above 1GHz)



The EUT is located in a 3m Full-Anechoic Chamber, the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading.

A call is established between the EUT and the SS via a Common Antenna. The EUT is commanded by the SS to operate at the maximum and minimum output power, and only the test result of the maximum output power was recorded.

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground and the Turn Table is actuated to turn from 0° to 360° to determine the maximum value of the radiated power. The emission levels at both horizontal and vertical polarizations should be tested. The Filters consists of Notch Filters and High Pass Filter.

Note: when doing measurements above 1GHz, the EUT has been within the 3dB cone width of the horn antenna during horizontal antenna.

2.7.3.Test procedure

KDB 971168 D01v03 Section 5.8 and ANSI/TIA-603-E-2016.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements.



2.7.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested to verify the out of band emissions.

The substitution corrections are obtained as described below:

$$A_{\text{SUBST}} = P_{\text{SUBST_TX}} - P_{\text{SUBST_RX}} - L_{\text{SUBST_CABLES}} + G_{\text{SUBST_TX_ANT}}$$

$$A_{\text{TOT}} = L_{\text{CABLES}} + A_{\text{SUBST}}$$

Where A_{SUBST} is the final substitution correction including receive antenna gain.

$P_{\text{SUBST_TX}}$ is signal generator level,

$P_{\text{SUBST_RX}}$ is receiver level,

$L_{\text{SUBST_CABLES}}$ is cable losses including TX cable,

$G_{\text{SUBST_TX_ANT}}$ is substitution antenna gain.

A_{TOT} is total correction factor including cable loss and substitution correction

During the test, the data of A_{TOT} was added in the test spectrum analyze, so spectrum analyze reading is the final values which contain the data of A_{TOT} .

Note1: The power of the EUT transmitting frequency should be ignored.

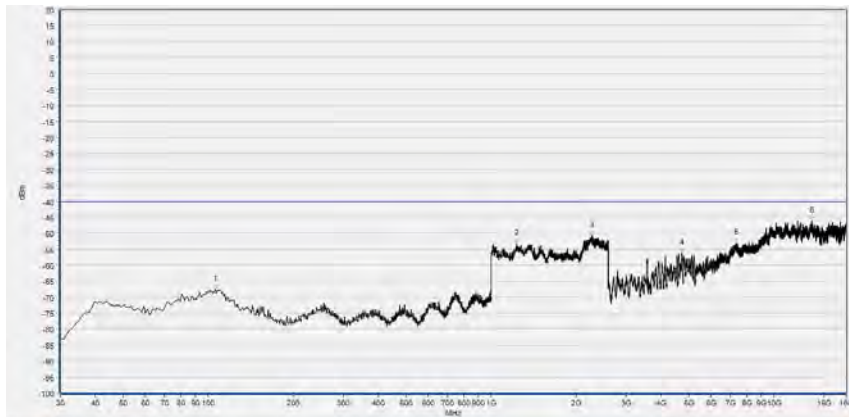
Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note3: All bandwidth and modulation were considered and evaluated respectively by performing full test for each band, only the worst cases (Max Bandwidth and QPSK mode) were recorded in this test report.

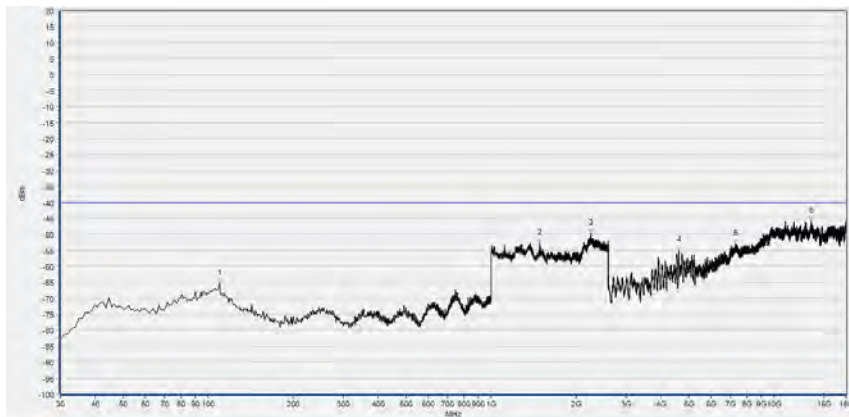
Note 4: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

Note5: The amplitude of emissions(18GHz to 10th harmonics) which are attenuated more than 20 dB below the limit are not be reported.

LTE Band 48, 20MHz BW, Low Channel, QPSK

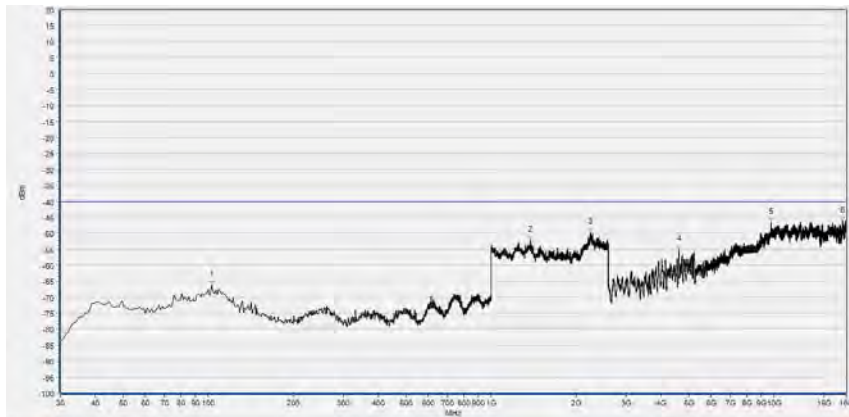


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	105.736	-67.67	-40.00	Horizontal	PASS
2	1230.631	-53.41	-40.00	Horizontal	PASS
3	2276.476	-50.91	-40.00	Horizontal	PASS
4	4734.867	-56.28	-40.00	Horizontal	PASS
5	7337.988	-53.10	-40.00	Horizontal	PASS
6	13597.800	-46.07	-40.00	Horizontal	PASS

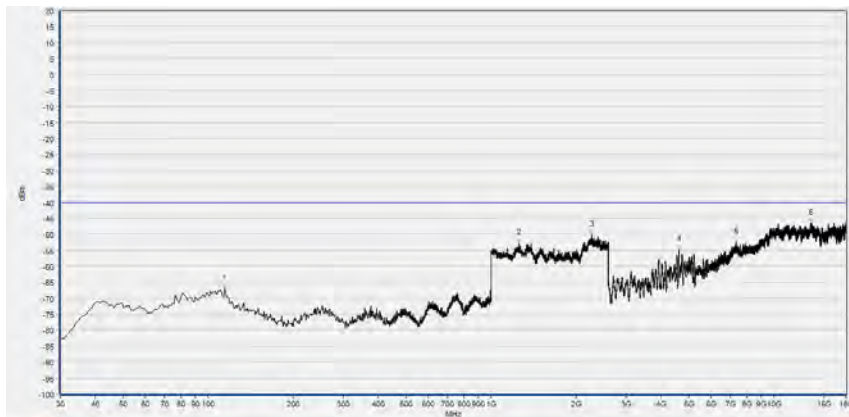


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	109.620	-65.42	-40.00	Vertical	PASS
2	1488.488	-52.81	-40.00	Vertical	PASS
3	2252.452	-49.65	-40.00	Vertical	PASS
4	4614.723	-55.00	-40.00	Vertical	PASS
5	7310.262	-53.12	-40.00	Vertical	PASS
6	13576.235	-45.82	-40.00	Vertical	PASS

LTE Band 48, 20MHz BW, Mid Channel, QPSK

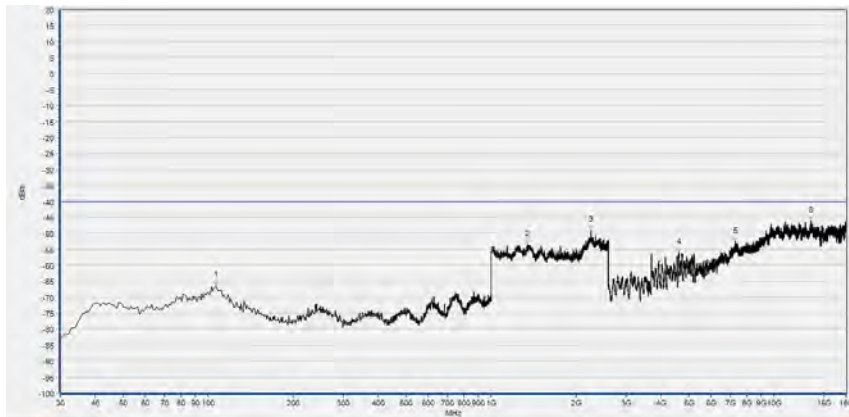


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	102.823	-66.21	-40.00	Horizontal	PASS
2	1379.580	-52.21	-40.00	Horizontal	PASS
3	2249.249	-49.64	-40.00	Horizontal	PASS
4	4614.723	-55.00	-40.00	Horizontal	PASS
5	9780.916	-46.63	-40.00	Horizontal	PASS
6	17479.376	-46.22	-40.00	Horizontal	PASS

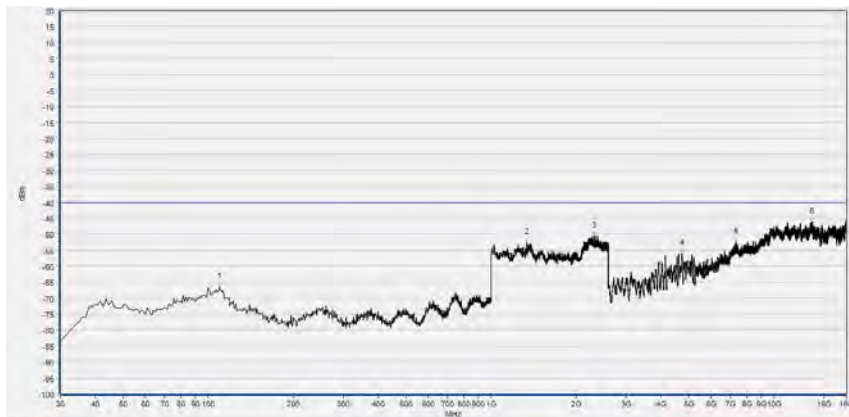


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	114.474	-66.94	-40.00	Vertical	PASS
2	1253.053	-52.89	-40.00	Vertical	PASS
3	2266.867	-50.07	-40.00	Vertical	PASS
4	4617.804	-54.89	-40.00	Vertical	PASS
5	7341.068	-52.45	-40.00	Vertical	PASS
6	13542.348	-46.63	-40.00	Vertical	PASS

LTE Band 48, 20MHz BW, High Channel, QPSK



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	106.707	-66.58	-40.00	Horizontal	PASS
2	1349.149	-53.58	-40.00	Horizontal	PASS
3	2254.054	-48.99	-40.00	Horizontal	PASS
4	4617.804	-56.07	-40.00	Horizontal	PASS
5	7294.859	-52.68	-40.00	Horizontal	PASS
6	13573.155	-46.16	-40.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	109.620	-66.49	-40.00	Vertical	PASS
2	1337.938	-52.62	-40.00	Vertical	PASS
3	2310.110	-50.56	-40.00	Vertical	PASS
4	4737.948	-55.89	-40.00	Vertical	PASS
5	7344.149	-52.41	-40.00	Vertical	PASS
6	13597.800	-46.21	-40.00	Vertical	PASS



2.8. End User Device Additional Requirements (CBSD Protocol)

2.8.1. Requirement

According to FCC section Part 96.47,

- (a) End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation. An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.
- (b) Any device operated at higher power than specified for End User Devices in Part 96.41 will be classified as, and subject to, the operational requirements of a CBSD.

2.8.2. Test Description

End user device additional requirements (CBSD Protocol) are tested per the test procedures listed below. During testing, the EUT is connected to a certified CBSD (kingsignal LBS7320 FCC ID: 2AVFNLBS7320) as a companion device to show compliance with Part 96.47. End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation. An End User Device must discontinue operations, change frequencies, or change its operation power level within 10 seconds of receiving instructions from its associated CBSD.

2.8.3. Test Procedure

KDB 940660 D01 Part 96 CBRS Eqpt v02.

2.8.4. Test Result

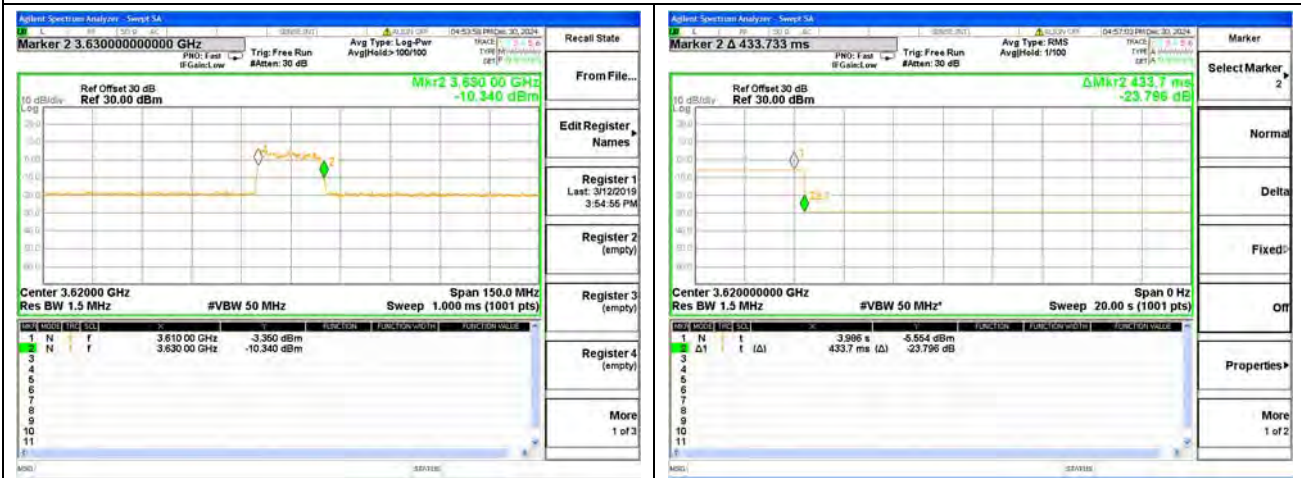
The EUT was connected via an RF cable to a certified CBSD and spectrum analyzer
Test Graph 1:

- a. Setup frequency with 3610MHz - 3630MHz
- b. Check EUT Tx frequency.
- c. Disable AP service and check EUT stop transmission within 10s.

Test Graph 2:

- a. Setup frequency with 3660MHz - 3680MHz
- b. Check EUT Tx frequency.
- c. Disable AP service and check EUT stop transmission within 10s

Test Graph 1

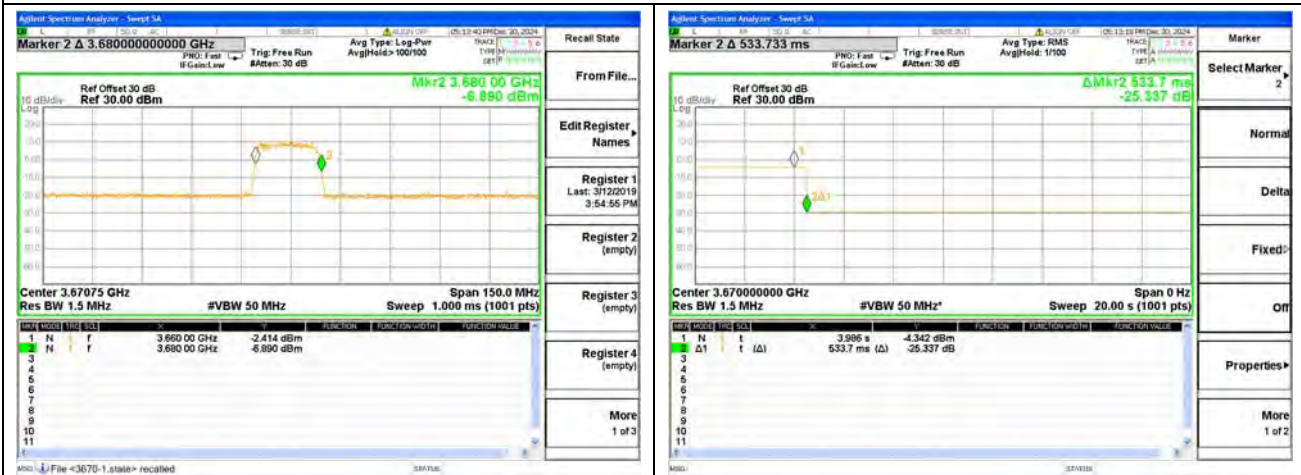


Note:

Marker 1: CBSD sends instructions to discontinue LTE operations.

Marker 2: EUT discontinues operation

Test Graph 2



Note:

Marker 1: CBSD sends instructions to discontinue LTE operations.

Marker 2: EUT discontinues operation



Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test Items	Uncertainty
Output Power	± 2.22 dB
Bandwidth	$\pm 5\%$
Conducted Spurious Emission	± 2.77 dB
Band Edge	± 2.77 dB
Equivalent Isotropic Radiated Power	± 2.22 dB
Radiated Spurious Emissions	± 6 dB

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



Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.



4. Test Equipment Utilized

4.1 Conducted Test Equipment

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Signal Analyzer	MY51511149	N9020A	Agilent	2024.06.19	2025.06.18
Communication Test Station	6200995016	MT8820C	Anritsu	2024.09.11	2025.09.10
Temperature Chamber	S022177101 00089002	KMT-36LF 1A0	KOMEG	2024.09.11	2025.09.10

4.2 List of Software Used

Description	Manufacturer	Software Version
MOR-2023E Test System	MORLAB	V7.99
MORLAB EMCR	MORLAB	V1.2

**4.3 Radiated Test Equipment**

Equipment	Serial No.	Type	Manufacturer	Cal. Date	Due Date
System Simulator	152038	CMW500	R&S	2024.09.11	2025.09.10
Receiver	MY56060145	N9020A	Agilent	2024.05.30	2025.05.29
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2024.06.22	2025.06.21
Test Antenna - Horn	9120D-963	BBHA 9120D	Schwarzbeck	2024.06.22	2025.06.21
RF Coaxial Cable (DC-18GHz)	MRE001	PE330	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE002	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-18GHz)	MRE003	CLU18	Pasternack	2024.05.30	2025.05.29
RF Coaxial Cable (DC-40GHz)	22290045	QA360-40-KK- 0.5	Qualwave	2024.07.03	2025.07.02
RF Coaxial Cable (DC-40GHz)	22290046	QA360-40-KK F-2	Qualwave	2024.07.03	2025.07.02
Preamplifier (10MHz-6GHz)	46732	S10M100L380 2	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (2GHz-18GHz)	61171/61172	S020180L320 3	LUCIX CORP.	2024.05.30	2025.05.29
Preamplifier (18GHz-40GHz)	DS77209	DCLNA0118-4 0C-S	Decentest	2024.05.30	2025.05.29
Notch Filter	N/A	WRCGV -LTE B48	Wainwright	N/A	N/A
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09

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