REPORT No. : SZ22070206W05

TEST REPORT

APPLICANT	:	Reliance Communications LLC
PRODUCT NAME	:	Orbic Speed 5G
MODEL NAME	:	R500L5S6
BRAND NAME	:	Orbic
FCC ID	:	2ABGH-R500L5S6
STANDARD(S)	:	47 CFR Part 2 47 CFR Part 96
RECEIPT DATE	:	2021-06-10
TEST DATE	:	2021-09-16 to 2021-09-30
ISSUE DATE	:	2022-08-15

Edited by: Peng Mi (Rapporteur)

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DIRECTORY

Change History		
Version	Date	Reason for change
1.0	2022-08-15	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Reliance Communications LLC
Applicant Address:	1560 Fifth Ave BayShore, NY 11706
Manufacturer:	Unimaxcomm
Manufacturer Address:	Room 602, Floor 6th, Building B, Software Park T3,Hi-Tech Park South, Nanshan District, Shenzhen, P.R. China

1.2. Equipment Under Test (EUT) Description

Product Name:	Orbic Speed 5G	
Sample No.:	7#	
Hardware Version:	V1.2	
Software Version:	ORB500L5S6_V1.0.6_BVT-NA	
Modulation Type:	QPSK, 16QAM, 64QAM	
Operation Band:	Band 48	
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	1.70dBi
Accessory Information:	Battery	
	Brand Name:	Orbic
	Model No.:	BTE-4401
	Serial No.:	N/A
	Capacity:	4400mAh
	Rated Voltage:	3.80V
	Charge Limit:	4.35V
	Manufacturer:	HUIZHOU DXDRAGON INC

Accessory Information:	AC Adapter	
	Brand Name:	Orbic
	Model No.:	TPA-23A050200UU01
	Serial No.:	N/A
	Rated Output:	5V⎓2A
	Rated Input:	100-240V~50/60Hz, 0.3A
	Manufacturer:	Dongguan summer electronics Co., LTD

Note 1: This test report is variant from the original report (Report No.: SZ22050178W05, FCC ID: 2ABGH-R500L5S6), based on the similarity between before, only changed the applicant address and enble LTE B17 by software. However, there is no other evaluation for LTE B17 due to the band is completely covered by LTE B12 and its power level setting also same as LTE B12. The changes do not affect the results in this report.

Note 2: 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	QPSK	16QAM	64QAM
20	0.340	0.282	0.282	18M1G7D	18M0W7D	18M1W7D
15	0.330	0.281	0.278	13M5G7D	13M5W7D	13M5W7D
10	0.334	0.280	0.279	8M98G7D	8M99W7D	8M99W7D
5	0.329	0.279	0.274	4M50G7D	4M52W7D	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	Sep. 30, 2021	Liang Yumei Gao Jianrou	PASS$_{Note1}$	No deviation
2.1049	Occupied Bandwidth	Sep. 17, 2021	Li Huaijie	PASS$_{Note1}$	No deviation
96.41(g)	Peak -Average Ratio	Sep. 17, 2021	Li Huaijie	PASS$_{Note1}$	No deviation
2.1055	Frequency Stability	Sep. 18, 2021	Li Huaijie	PASS$_{Note1}$	No deviation
2.1051, 96.41(e)	Conducted Spurious Emissions	Sep. 17, 2021	Li Huaijie	PASS$_{Note1}$	No deviation
2.1051, 96.41(e)	Band Edge	Sep. 16, 2021	Li Huaijie	PASS$_{Note1}$	No deviation
2.1051, 96.41(e)	Radiated Spurious Emissions	Sep. 16, 2021	Gao Jianrou	PASS$_{Note1}$	No deviation

Note 1: The test results of these test items in this report refer to the test report (Report No.: SZ22050178W05).

Note 2: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 and ANSI/TIA-603-E-2016.

Note 3: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The Ref offset 5.5dB means the cable loss is 5.5dB.

Note 4: 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 5: 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.

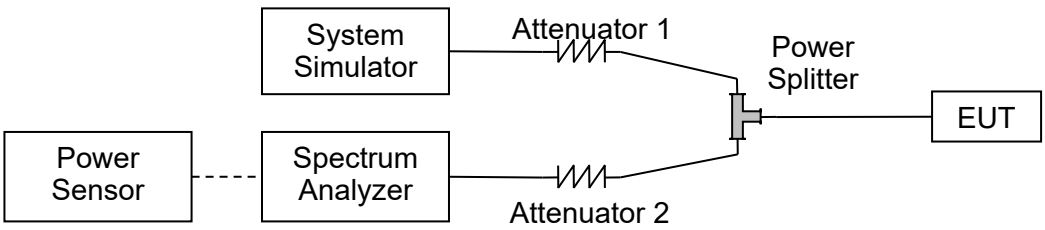
2.1.1. Requirement

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 (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)
ERP (dBm) = EIPR (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	23.31	23.41	23.31
20	QPSK	1	49	23.13	23.21	23.08
20	QPSK	1	99	23.10	23.00	23.19
20	QPSK	50	0	22.20	22.31	22.19
20	QPSK	50	24	22.10	22.15	22.17
20	QPSK	50	50	22.16	22.26	22.13
20	QPSK	100	0	22.13	22.12	22.03
20	16QAM	1	0	22.31	22.21	22.26
20	16QAM	1	49	22.18	22.06	22.17
20	16QAM	1	99	22.20	22.10	22.09
20	16QAM	50	0	22.15	22.13	21.90
20	16QAM	50	24	22.09	22.05	21.93
20	16QAM	50	50	22.01	22.18	22.06
20	16QAM	100	0	22.12	22.23	22.03
20	64QAM	1	0	22.40	22.28	22.21
20	64QAM	1	49	22.37	22.45	22.20
20	64QAM	1	99	22.30	22.39	22.18
20	64QAM	50	0	21.34	21.62	21.44
20	64QAM	50	24	21.36	21.22	21.54
20	64QAM	50	50	21.42	21.20	21.33
20	64QAM	100	0	21.22	21.33	21.21

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	23.20	23.30	23.20
15	QPSK	1	37	23.02	23.10	22.97
15	QPSK	1	74	22.99	22.89	23.08
15	QPSK	36	0	22.09	22.20	22.08
15	QPSK	36	20	21.99	22.04	22.06
15	QPSK	36	39	22.05	22.15	22.02
15	QPSK	75	0	22.02	22.01	21.92
15	16QAM	1	0	22.20	22.10	22.15
15	16QAM	1	37	22.07	21.95	22.06
15	16QAM	1	74	22.09	21.99	21.98
15	16QAM	36	0	22.04	22.02	21.79
15	16QAM	36	20	21.98	21.94	21.82
15	16QAM	36	39	21.90	22.07	21.95
15	16QAM	75	0	22.01	22.12	21.92
15	64QAM	1	0	22.29	22.17	22.10
15	64QAM	1	37	22.26	22.34	22.09
15	64QAM	1	74	22.19	22.28	22.07
15	64QAM	36	0	21.23	21.51	21.33
15	64QAM	36	20	21.25	21.11	21.43
15	64QAM	36	39	21.31	21.09	21.22
15	64QAM	75	0	21.11	21.22	21.10

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	23.08	23.18	23.08
10	QPSK	1	25	22.90	22.98	22.85
10	QPSK	1	49	22.87	22.77	22.96
10	QPSK	25	0	21.97	22.08	21.96
10	QPSK	25	12	21.87	21.92	21.94
10	QPSK	25	25	21.93	22.03	21.90
10	QPSK	50	0	21.90	21.89	21.80
10	16QAM	1	0	22.08	21.98	22.03
10	16QAM	1	25	21.95	21.83	21.94
10	16QAM	1	49	21.97	21.87	21.86
10	16QAM	25	0	21.92	21.90	21.67
10	16QAM	25	12	21.86	21.82	21.70
10	16QAM	25	25	21.78	21.95	21.83
10	16QAM	50	0	21.89	22.00	21.80
10	64QAM	1	0	22.17	22.05	21.98
10	64QAM	1	25	22.14	22.22	21.97
10	64QAM	1	49	22.07	22.16	21.95
10	64QAM	25	0	21.11	21.39	21.21
10	64QAM	25	12	21.13	20.99	21.31
10	64QAM	25	25	21.19	20.97	21.10
10	64QAM	50	0	20.99	21.10	20.98

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	22.96	23.06	22.96
5	QPSK	1	12	22.78	22.86	22.73
5	QPSK	1	24	22.75	22.65	22.84
5	QPSK	12	0	21.85	21.96	21.84
5	QPSK	12	7	21.75	21.80	21.82
5	QPSK	12	13	21.81	21.91	21.78
5	QPSK	25	0	21.78	21.77	21.68
5	16QAM	1	0	21.96	21.86	21.91
5	16QAM	1	12	21.83	21.71	21.82
5	16QAM	1	24	21.85	21.75	21.74
5	16QAM	12	0	21.80	21.78	21.55
5	16QAM	12	7	21.74	21.70	21.58
5	16QAM	12	13	21.66	21.83	21.71
5	16QAM	25	0	21.77	21.88	21.68
5	64QAM	1	0	22.05	21.93	21.86
5	64QAM	1	12	22.02	22.10	21.85
5	64QAM	1	24	21.95	22.04	21.83
5	64QAM	12	0	20.99	21.27	21.09
5	64QAM	12	7	21.01	20.87	21.19
5	64QAM	12	13	21.07	20.85	20.98
5	64QAM	25	0	20.87	20.98	20.86

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	25.27	0.337	25.25	0.335	25.31	0.340
20	QPSK	1	49	25.04	0.319	25.23	0.333	25.24	0.334
20	QPSK	1	99	24.97	0.314	25.24	0.334	25.29	0.338
20	QPSK	50	0	24.17	0.261	24.39	0.275	24.41	0.276
20	QPSK	50	24	24.23	0.265	24.24	0.265	24.14	0.259
20	QPSK	50	50	24.18	0.262	24.38	0.274	24.17	0.261
20	QPSK	100	0	24.17	0.261	24.17	0.261	24.18	0.262
20	16QAM	1	0	24.14	0.259	24.34	0.272	24.24	0.265
20	16QAM	1	49	24.18	0.262	24.22	0.264	24.12	0.258
20	16QAM	1	99	24.17	0.261	24.14	0.259	24.22	0.264
20	16QAM	50	0	24.24	0.265	24.24	0.265	24.47	0.280
20	16QAM	50	24	24.17	0.261	24.45	0.279	24.24	0.265
20	16QAM	50	50	24.21	0.264	24.51	0.282	24.21	0.264
20	16QAM	100	0	24.24	0.265	24.44	0.278	24.28	0.268
20	64QAM	1	0	24.13	0.259	24.19	0.262	24.22	0.264
20	64QAM	1	49	24.20	0.263	24.31	0.270	24.50	0.282
20	64QAM	1	99	24.24	0.265	24.26	0.267	24.26	0.267
20	64QAM	50	0	24.17	0.261	24.23	0.265	24.15	0.260
20	64QAM	50	24	24.29	0.269	24.39	0.275	24.24	0.265
20	64QAM	50	50	24.18	0.262	24.38	0.274	24.30	0.269
20	64QAM	100	0	24.20	0.263	24.48	0.281	24.12	0.258

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	24.97	0.314	25.00	0.316	25.07	0.321
15	QPSK	1	37	24.87	0.307	25.18	0.330	25.07	0.321
15	QPSK	1	74	24.87	0.307	25.16	0.328	25.00	0.316
15	QPSK	36	0	23.97	0.249	24.34	0.272	24.39	0.275
15	QPSK	36	20	24.14	0.259	24.39	0.275	24.35	0.272
15	QPSK	36	39	24.28	0.268	24.42	0.277	24.38	0.274
15	QPSK	75	0	24.13	0.259	24.44	0.278	24.41	0.276
15	16QAM	1	0	24.04	0.254	24.25	0.266	24.19	0.262
15	16QAM	1	37	24.15	0.260	24.42	0.277	24.25	0.266
15	16QAM	1	74	24.23	0.265	24.34	0.272	24.09	0.256
15	16QAM	36	0	24.17	0.261	24.41	0.276	24.28	0.268
15	16QAM	36	20	24.04	0.254	24.35	0.272	24.24	0.265
15	16QAM	36	39	24.24	0.265	24.48	0.281	24.28	0.268
15	16QAM	75	0	24.03	0.253	24.49	0.281	24.28	0.268
15	64QAM	1	0	24.20	0.263	24.20	0.263	24.08	0.256
15	64QAM	1	37	24.23	0.265	24.34	0.272	24.21	0.264
15	64QAM	1	74	24.17	0.261	24.27	0.267	24.55	0.285
15	64QAM	36	0	24.09	0.256	24.33	0.271	24.29	0.269
15	64QAM	36	20	24.18	0.262	24.44	0.278	24.22	0.264
15	64QAM	36	39	24.24	0.265	24.43	0.277	24.28	0.268
15	64QAM	75	0	24.17	0.261	24.44	0.278	24.32	0.270

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	24.84	0.305	25.09	0.323	25.05	0.320
10	QPSK	1	25	24.97	0.314	25.14	0.327	25.00	0.316
10	QPSK	1	49	24.88	0.308	25.01	0.317	25.24	0.334
10	QPSK	25	0	24.95	0.313	24.39	0.275	24.23	0.265
10	QPSK	25	12	24.14	0.259	24.38	0.274	24.23	0.265
10	QPSK	25	25	24.17	0.261	24.47	0.280	24.27	0.267
10	QPSK	50	0	24.24	0.265	24.51	0.282	24.25	0.266
10	16QAM	1	0	24.04	0.254	23.86	0.243	24.26	0.267
10	16QAM	1	25	24.11	0.258	23.95	0.248	24.09	0.256
10	16QAM	1	49	24.14	0.259	23.91	0.246	24.22	0.264
10	16QAM	25	0	24.24	0.265	23.94	0.248	24.40	0.275
10	16QAM	25	12	23.97	0.249	23.91	0.246	24.34	0.272
10	16QAM	25	25	24.04	0.254	23.98	0.250	24.47	0.280
10	16QAM	50	0	24.08	0.256	23.94	0.248	24.36	0.273
10	64QAM	1	0	24.17	0.261	24.29	0.269	24.23	0.265
10	64QAM	1	25	24.17	0.261	24.41	0.276	24.28	0.268
10	64QAM	1	49	24.11	0.258	24.30	0.269	24.19	0.262
10	64QAM	25	0	24.23	0.265	24.44	0.278	24.32	0.270
10	64QAM	25	12	24.15	0.260	24.41	0.276	24.32	0.270
10	64QAM	25	25	24.17	0.261	24.45	0.279	24.29	0.269
10	64QAM	50	0	24.23	0.265	24.42	0.277	24.38	0.274

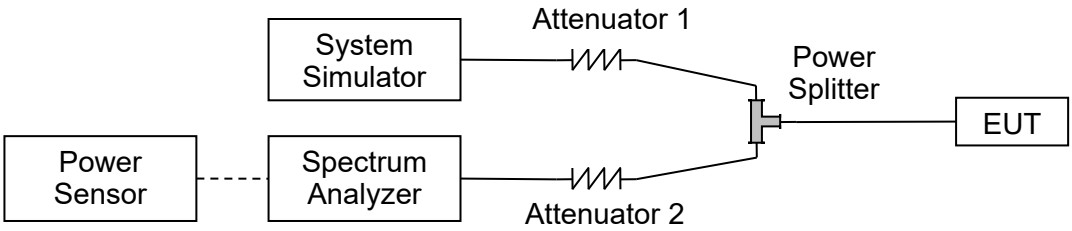
LTE Band 48				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				55265		55990		56175	
Frequency (MHz)				3552.5		3625		3697.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	24.84	0.305	24.94	0.312	25.14	0.327
5	QPSK	1	12	24.94	0.312	25.09	0.323	25.17	0.329
5	QPSK	1	24	25.14	0.327	25.00	0.316	24.87	0.307
5	QPSK	12	0	24.24	0.265	24.32	0.270	24.45	0.279
5	QPSK	12	7	24.17	0.261	24.45	0.279	24.51	0.282
5	QPSK	12	13	24.04	0.254	24.45	0.279	24.57	0.286
5	QPSK	25	0	24.17	0.261	24.46	0.279	24.59	0.288
5	16QAM	1	0	24.24	0.265	24.29	0.269	24.14	0.259
5	16QAM	1	12	24.19	0.262	24.46	0.279	24.30	0.269
5	16QAM	1	24	24.04	0.254	24.32	0.270	24.15	0.260
5	16QAM	12	0	24.23	0.265	23.87	0.244	24.27	0.267
5	16QAM	12	7	24.08	0.256	23.82	0.241	24.38	0.274
5	16QAM	12	13	24.11	0.258	23.95	0.248	24.31	0.270
5	16QAM	25	0	24.19	0.262	23.83	0.242	24.38	0.274
5	64QAM	1	0	24.23	0.265	24.14	0.259	24.16	0.261
5	64QAM	1	12	24.17	0.261	24.35	0.272	24.25	0.266
5	64QAM	1	24	24.23	0.265	24.20	0.263	24.11	0.258
5	64QAM	12	0	24.11	0.258	24.38	0.274	24.19	0.262
5	64QAM	12	7	24.15	0.260	23.86	0.243	24.37	0.274
5	64QAM	12	13	24.23	0.265	23.85	0.243	24.25	0.266
5	64QAM	25	0	24.16	0.261	23.85	0.243	24.34	0.272

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.

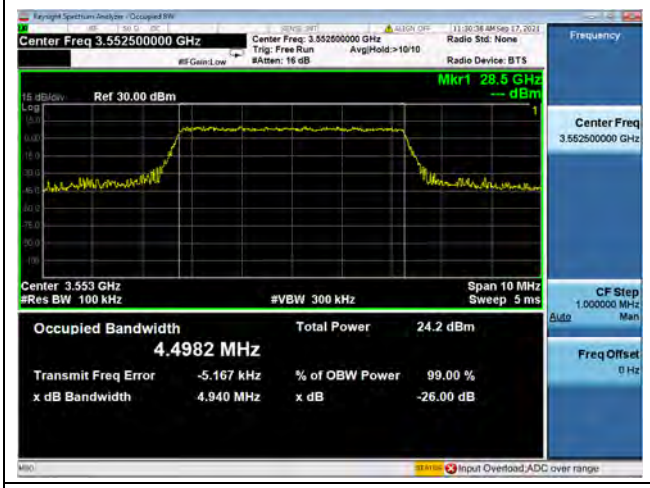
2.2.3.Test procedure

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

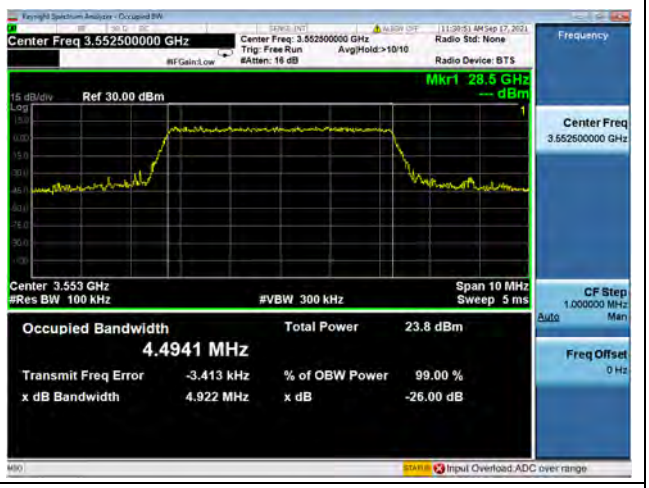
2.2.4.Test Result

LTE Band 48				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
5	Low	QPSK	4.50	4.94
	Low	16QAM	4.49	4.92
	Low	64QAM	4.49	4.95
	Mid	QPSK	4.48	4.95
	Mid	16QAM	4.50	4.86
	Mid	64QAM	4.48	4.78
	High	QPSK	4.47	4.88
	High	16QAM	4.52	4.85
	High	64QAM	4.49	4.85
10	Low	QPSK	8.98	9.80
	Low	16QAM	8.99	9.73
	Low	64QAM	8.99	9.72
	Mid	QPSK	8.96	9.50
	Mid	16QAM	8.98	9.45
	Mid	64QAM	8.99	9.58
	High	QPSK	8.98	9.54
	High	16QAM	8.97	9.62
	High	64QAM	8.99	9.77
15	Low	QPSK	13.47	14.62
	Low	16QAM	13.50	14.58
	Low	64QAM	13.47	14.63
	Mid	QPSK	13.47	14.39
	Mid	16QAM	13.45	14.23
	Mid	64QAM	13.45	14.20
	High	QPSK	13.43	14.17
	High	16QAM	13.48	14.07
	High	64QAM	13.52	14.53
20	Low	QPSK	18.11	22.41
	Low	16QAM	18.09	21.56
	Low	64QAM	18.12	22.55
	Mid	QPSK	18.05	21.03
	Mid	16QAM	17.97	20.01
	Mid	64QAM	18.10	21.66
	High	QPSK	18.03	21.07
	High	16QAM	18.04	20.71
	High	64QAM	18.05	20.69

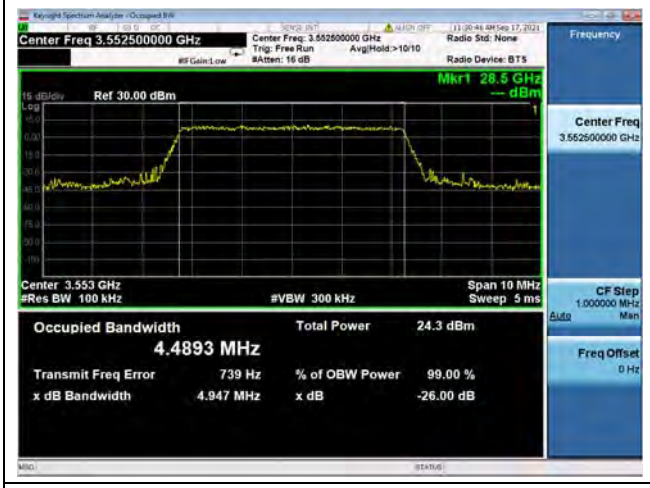
Band48 / 5MHz / Low CH / QPSK



Band48 / 5MHz / Low CH / 16QAM

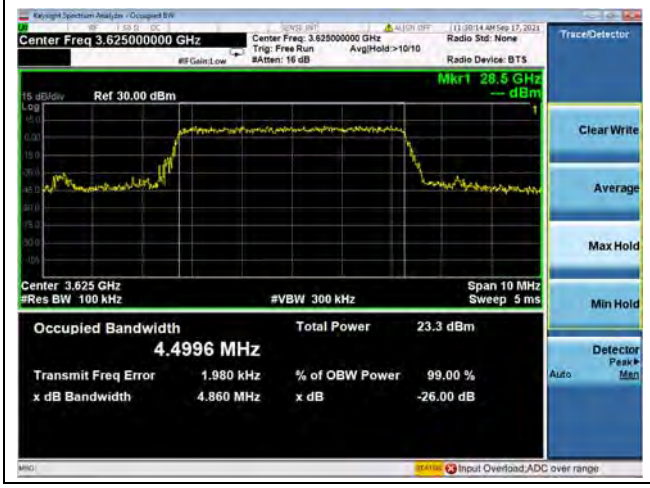


Band48 / 5MHz / Low CH / 64QAM

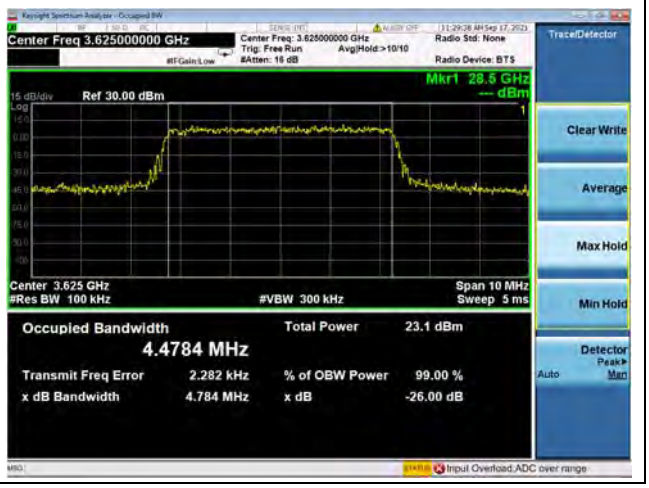


Band48 / 5MHz / Mid CH / QPSK

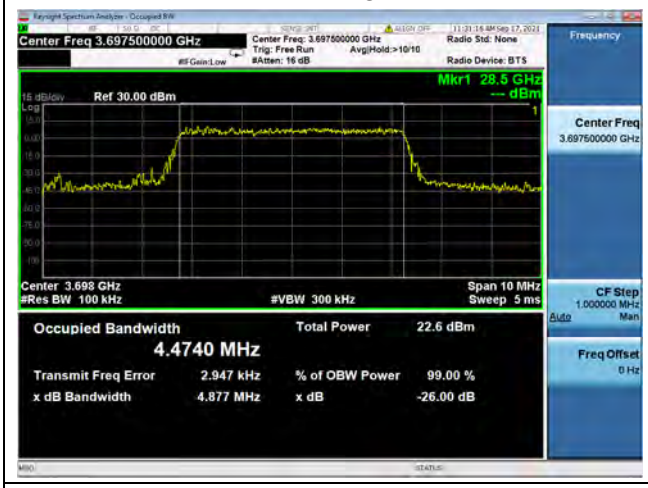
Band48 / 5MHz / Mid CH / 16QAM



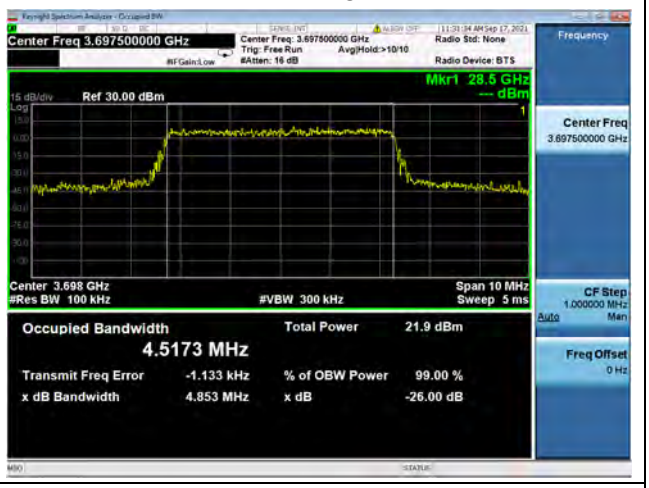
Band48 / 5MHz / Mid CH / 64QAM



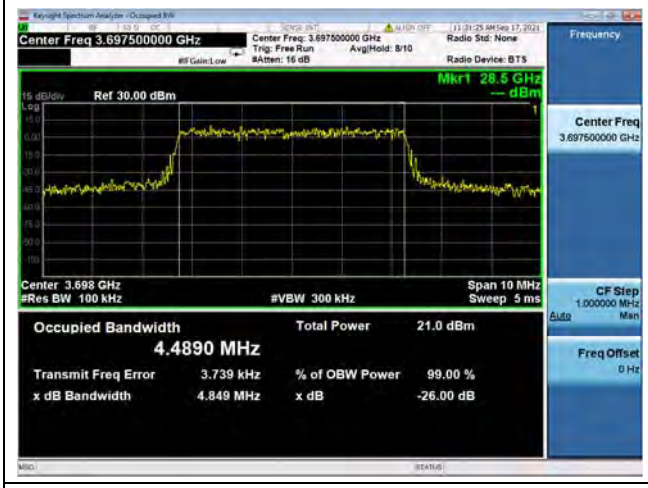
Band48 / 5MHz / High CH / QPSK



Band48 / 5MHz / High CH / 16QAM

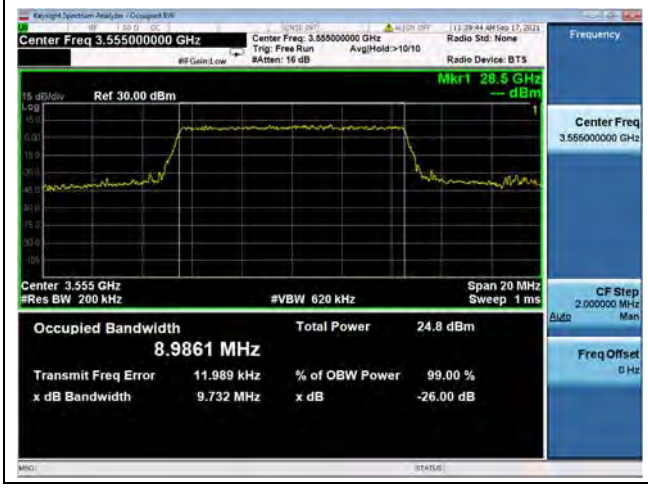


Band48 / 5MHz / High CH / 64QAM



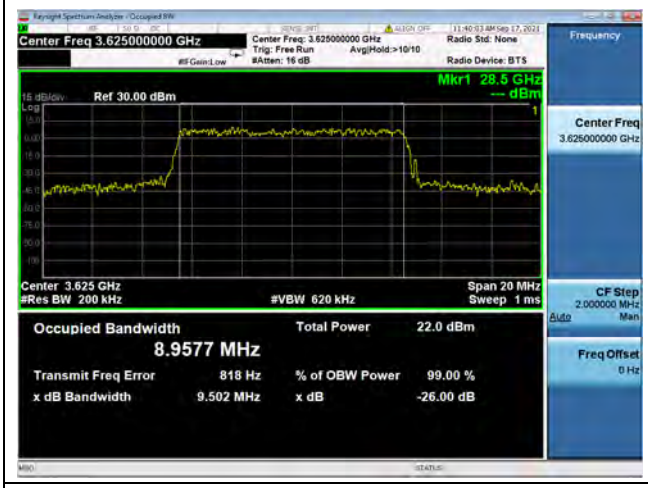
Band48 / 10MHz / Low CH / QPSK

Band48 / 10MHz / Low CH / 16QAM

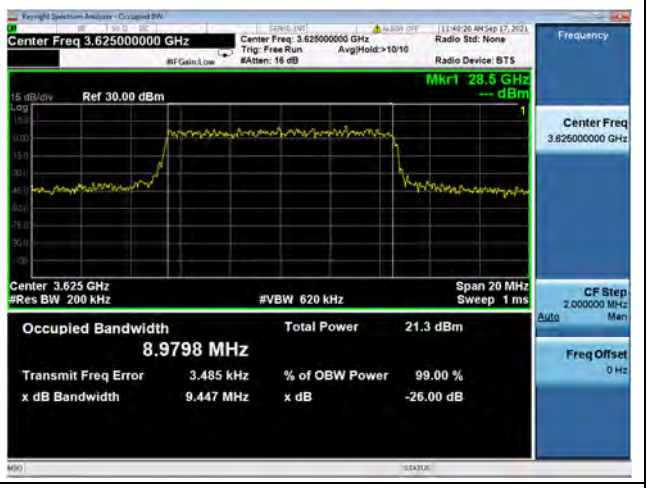


Band48 / 10MHz / Low CH / 64QAM

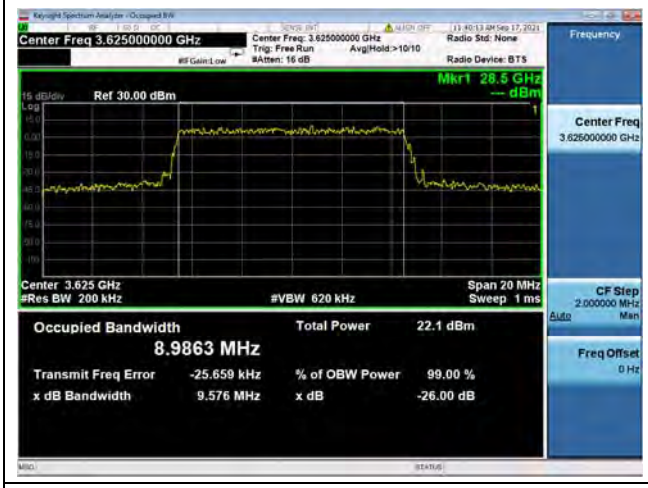
Band48 / 10MHz / Mid CH / QPSK



Band48 / 10MHz / Mid CH / 16QAM



Band48 / 10MHz / Mid CH / 64QAM



Band48 / 10MHz / High CH / QPSK

Band48 / 10MHz / High CH / 16QAM

Band48 / 10MHz / High CH / 64QAM

Band48 / 15MHz / Low CH / QPSK

Band48 / 15MHz / Low CH / 16QAM

Band48 / 15MHz / Low CH / 64QAM

Band48 / 15MHz / Mid CH / QPSK

Band48 / 15MHz / Mid CH / 16QAM

Band48 / 15MHz / Mid CH / 64QAM

Band48 / 15MHz / High CH / QPSK

Band48 / 15MHz / High CH / 16QAM

Band48 / 15MHz / High CH / 64QAM

Band48 / 20MHz / Low CH / QPSK

Band48 / 20MHz / Low CH / 16QAM

Band48 / 20MHz / Low CH / 64QAM

Band48 / 20MHz / Mid CH / QPSK

Band48 / 20MHz / Mid CH / 16QAM

Band48 / 20MHz / Mid CH / 64QAM

Band48 / 20MHz / High CH / QPSK

Band48 / 20MHz / High CH / 16QAM

Band48 / 20MHz / High CH / 64QAM

2.3. Frequency Stability

2.3.1.Requirement

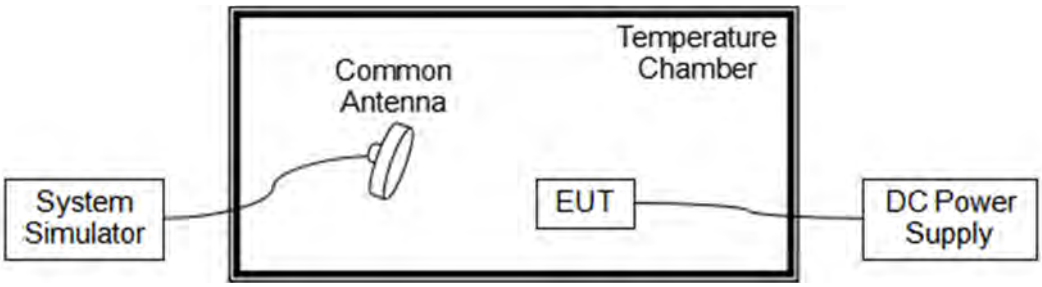
According to FCC section 2.1055 & 90.213, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°C to +50°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 0°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, 4.40V and 3.55V, which are specified by the applicant; the normal temperature here used is 20°C.

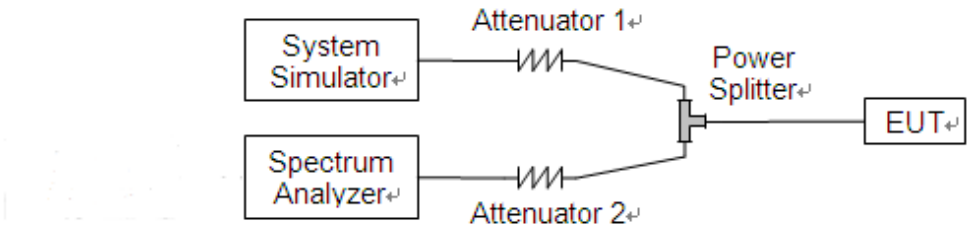
LTE Band 48, QPSK, Channel 55990, Frequency 3625.0MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
Normal	3.80	+20(Ref)	-18	-0.005	PASS
Normal		0	17	0.005	
Normal		+10	-19	-0.005	
Normal		+20	16	0.004	
Normal		+30	15	0.004	
Normal		+40	-54	-0.015	
Normal		+50	45	0.012	
Normal		+55	-31	-0.009	
High	4.20	+20	-48	-0.013	
BATT.ENDPOINT	3.60	+20	21	0.006	

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.

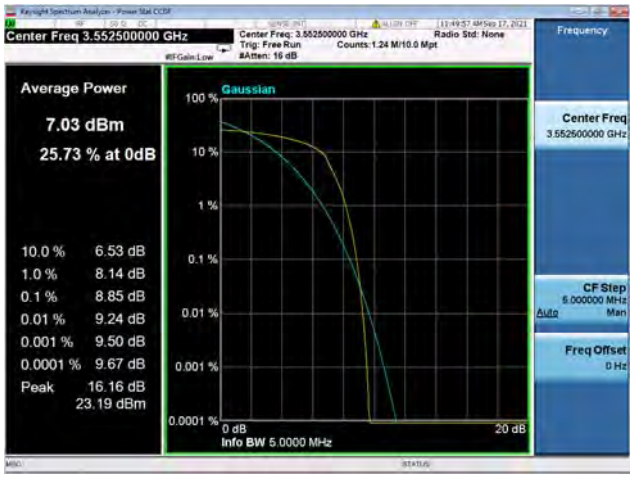
2.4.4.Test Result

MORLAB
Shenzhen Morlab Communications Technology Co., Ltd.
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China
Tel: 86-755-36698555 Fax: 86-755-36698525
Http://www.morlab.cn E-mail: service@morlab.cn

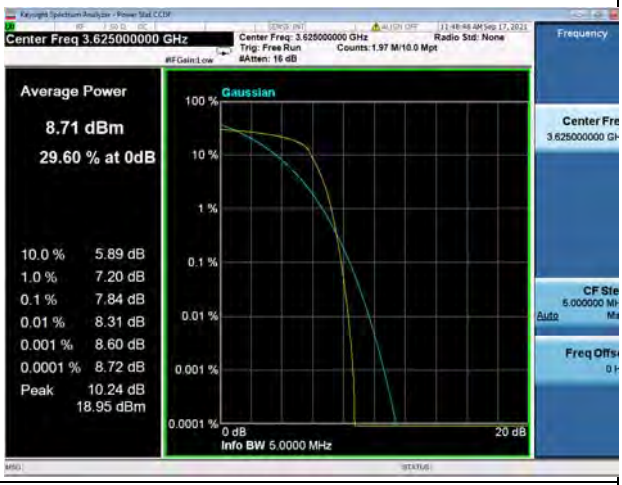
BW(MHz)	Channel Level	Modulation	PAR Radio(dB)	Limit(dB)	Verdict
5	Low	QPSK	7.86	<=13	PASS
	Low	16QAM	8.34	<=13	PASS
	Low	64QAM	8.85	<=13	PASS
	Mid	QPSK	7.84	<=13	PASS
	Mid	16QAM	7.83	<=13	PASS
	Mid	64QAM	8.28	<=13	PASS
	High	QPSK	7.93	<=13	PASS
	High	16QAM	7.88	<=13	PASS
	High	64QAM	8.20	<=13	PASS
10	Low	QPSK	8.71	<=13	PASS
	Low	16QAM	7.23	<=13	PASS
	Low	64QAM	9.30	<=13	PASS
	Mid	QPSK	9.21	<=13	PASS
	Mid	16QAM	8.98	<=13	PASS
	Mid	64QAM	9.73	<=13	PASS
	High	QPSK	7.97	<=13	PASS
	High	16QAM	9.21	<=13	PASS
	High	64QAM	9.26	<=13	PASS
15	Low	QPSK	8.32	<=13	PASS
	Low	16QAM	7.57	<=13	PASS
	Low	64QAM	9.55	<=13	PASS
	Mid	QPSK	7.50	<=13	PASS
	Mid	16QAM	7.64	<=13	PASS
	Mid	64QAM	8.49	<=13	PASS
	High	QPSK	8.27	<=13	PASS
	High	16QAM	7.57	<=13	PASS
	High	64QAM	8.49	<=13	PASS
20	Low	QPSK	7.95	<=13	PASS
	Low	16QAM	7.53	<=13	PASS
	Low	64QAM	8.05	<=13	PASS
	Mid	QPSK	5.83	<=13	PASS
	Mid	16QAM	7.73	<=13	PASS
	Mid	64QAM	7.28	<=13	PASS
	High	QPSK	7.56	<=13	PASS
	High	16QAM	7.77	<=13	PASS
	High	64QAM	8.24	<=13	PASS
Band48 / 5MHz / Low CH / QPSK			Band48 / 5MHz / Low CH / 16QAM		

Band48 / 5MHz / Low CH / 64QAM

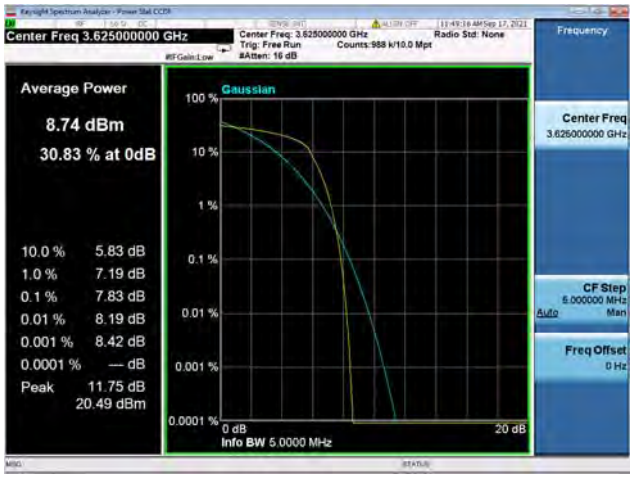
Band48 / 5MHz / Mid CH / QPSK



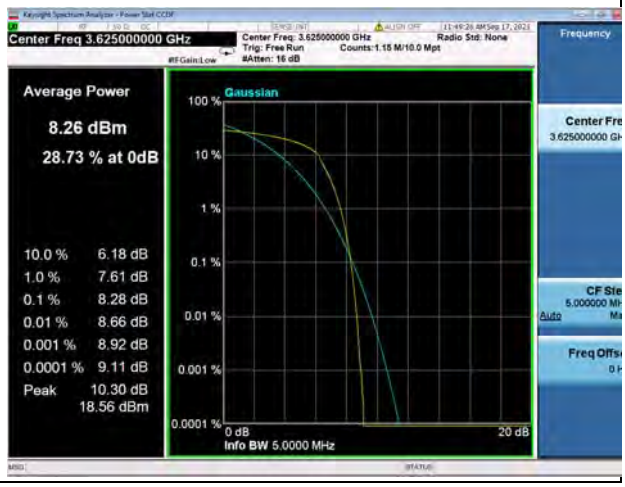
Band48 / 5MHz / Mid CH / 16QAM



Band48 / 5MHz / Mid CH / 64QAM



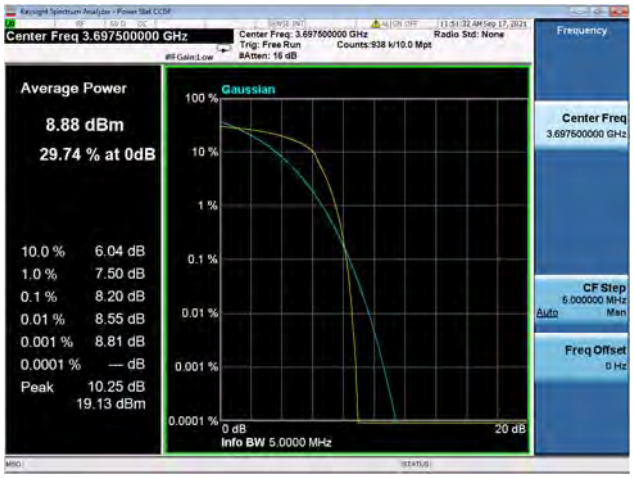
Band48 / 5MHz / High CH / QPSK



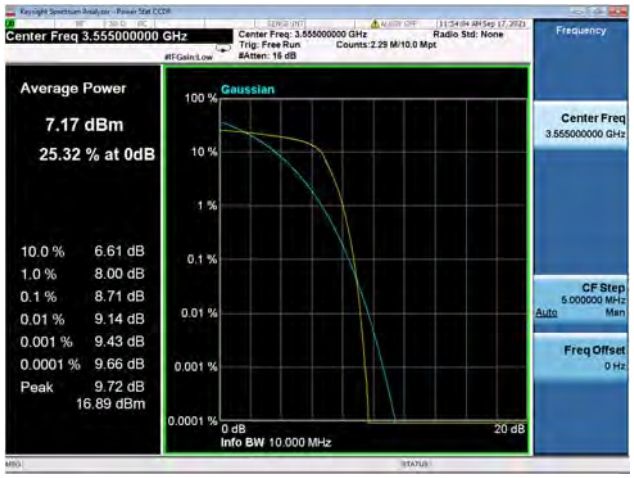
Band48 / 5MHz / High CH / 16QAM

Band48 / 5MHz / High CH / 64QAM

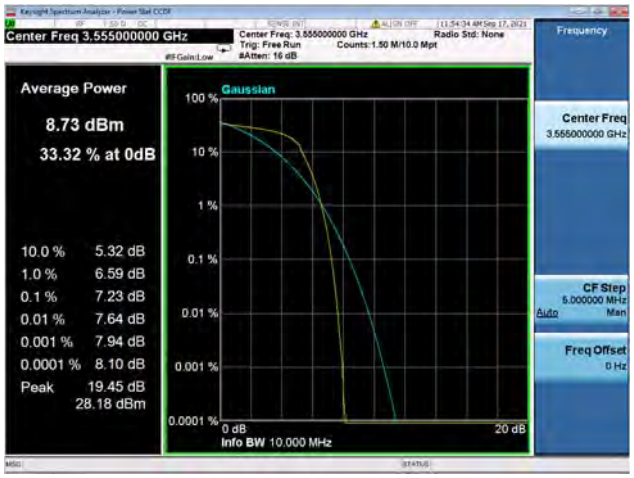
Band48 / 10MHz / Low CH / QPSK



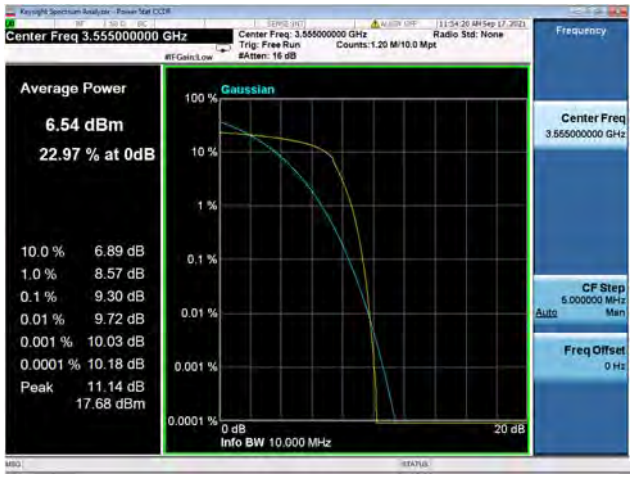
Band48 / 10MHz / Low CH / 16QAM



Band48 / 10MHz / Low CH / 64QAM



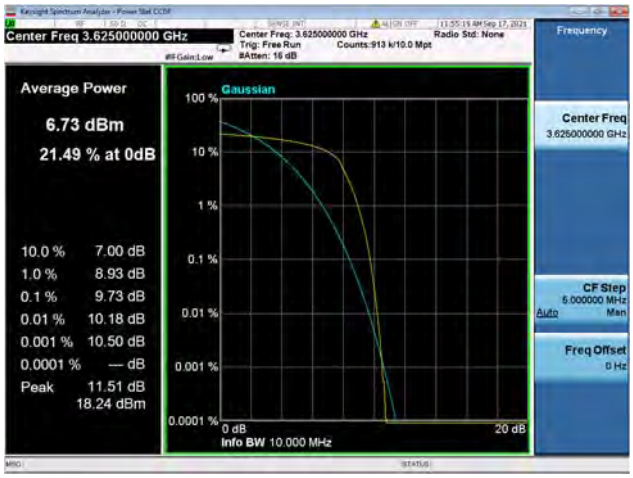
Band48 / 10MHz / Mid CH / QPSK



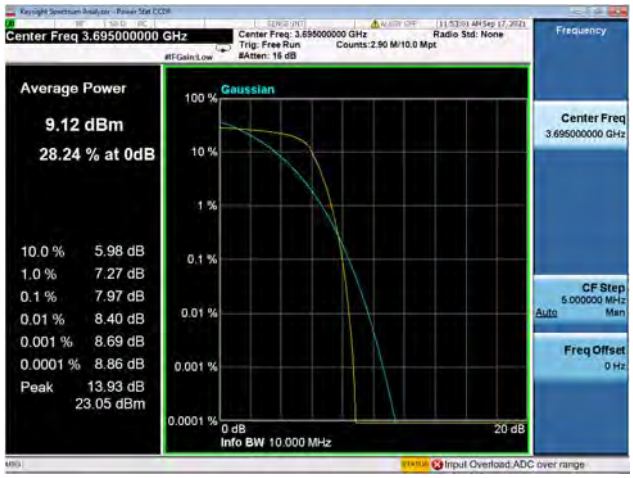
Band48 / 10MHz / Mid CH / 16QAM

Band48 / 10MHz / Mid CH / 64QAM

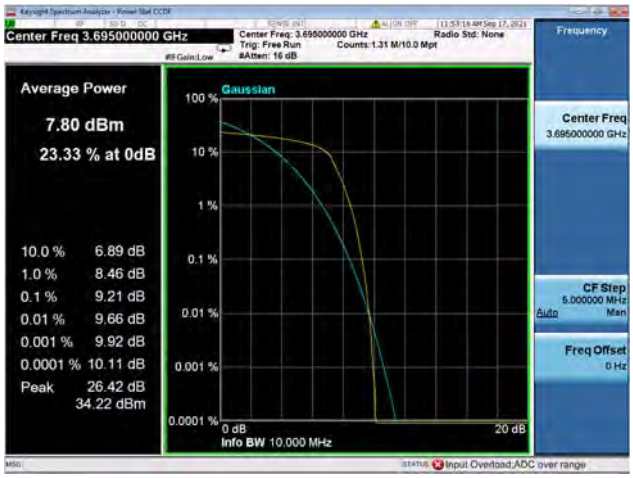
Band48 / 10MHz / High CH / QPSK



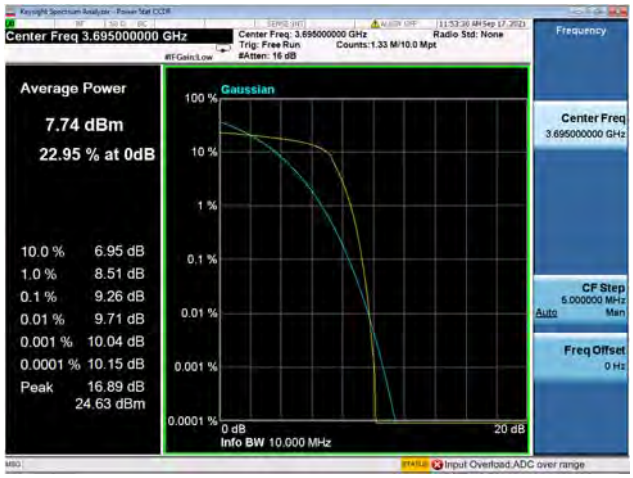
Band48 / 10MHz / High CH / 16QAM



Band48 / 10MHz / High CH / 64QAM



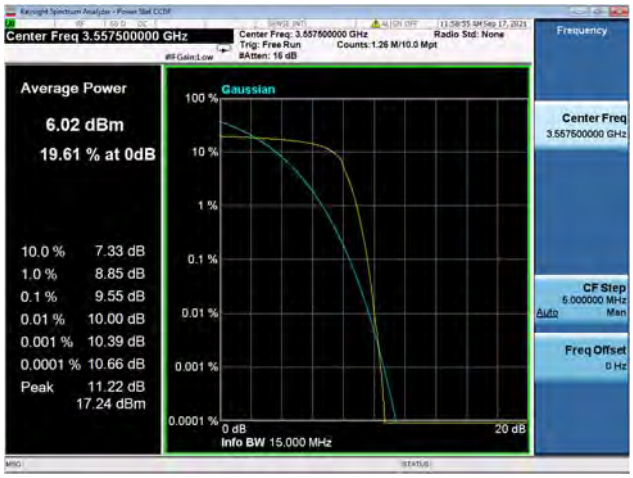
Band48 / 15MHz / Low CH / 64QAM



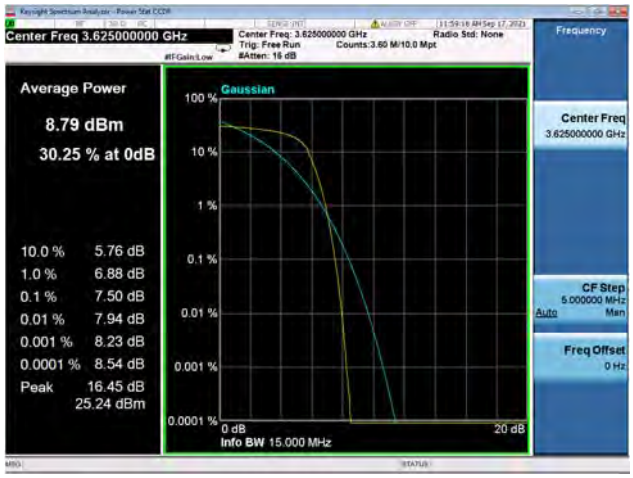
Band48 / 15MHz / Low CH / QPSK	Band48 / 15MHz / Low CH / 16QAM

Band48 / 15MHz / Low CH / 64QAM

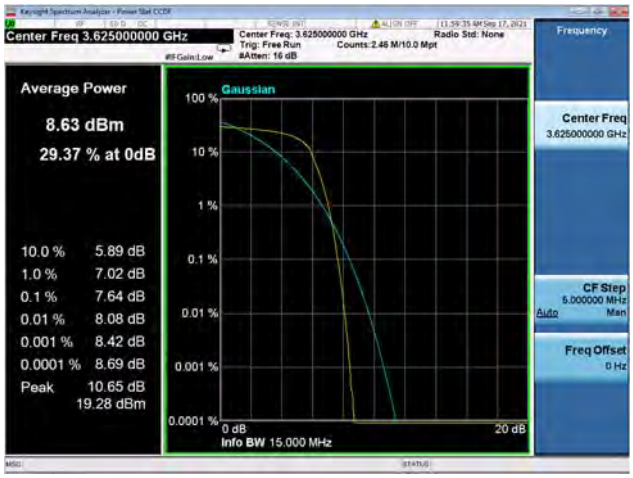
Band48 / 15MHz / Mid CH / QPSK



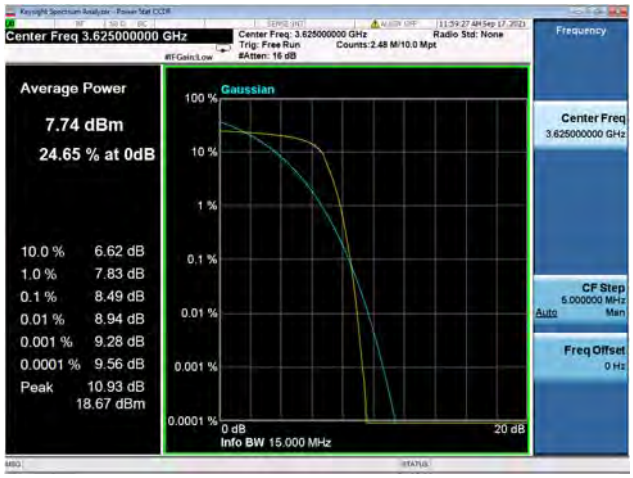
Band48 / 15MHz / Mid CH / 16QAM



Band48 / 15MHz / Mid CH / 64QAM



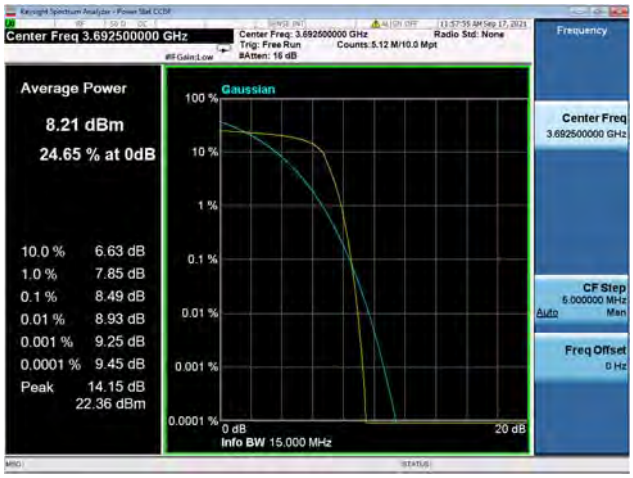
Band48 / 15MHz / High CH / QPSK



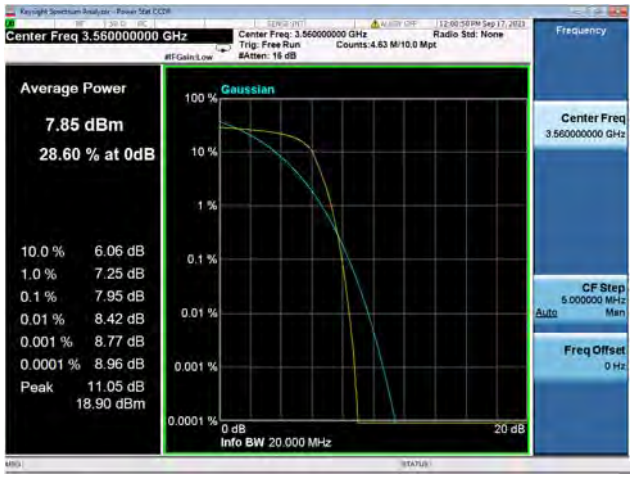
Band48 / 15MHz / High CH / 16QAM

Band48 / 15MHz / High CH / 64QAM

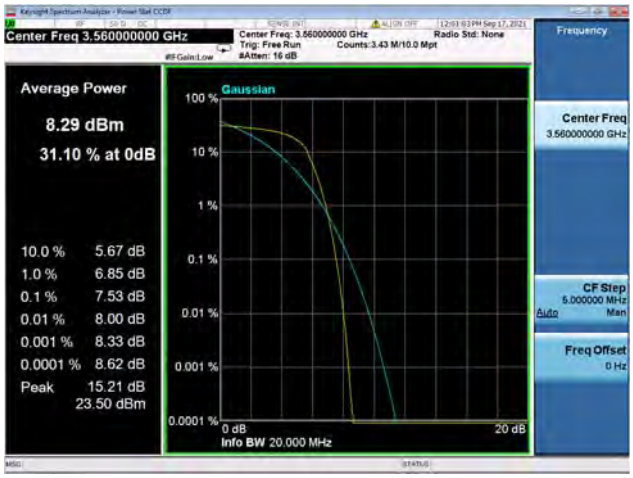
Band48 / 20MHz / Low CH / QPSK



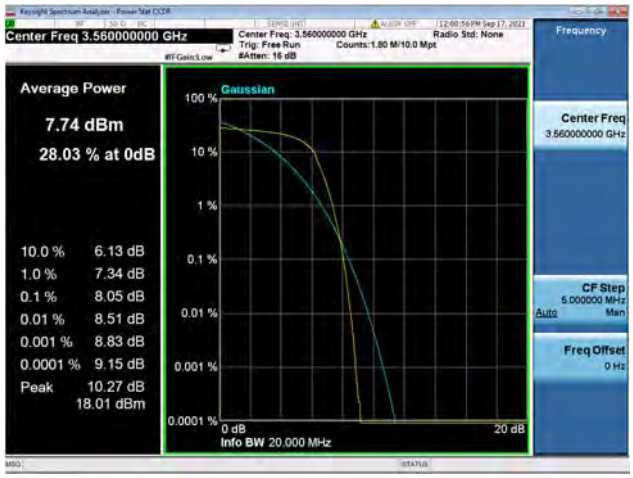
Band48 / 20MHz / Low CH / 16QAM



Band48 / 20MHz / Low CH / 64QAM

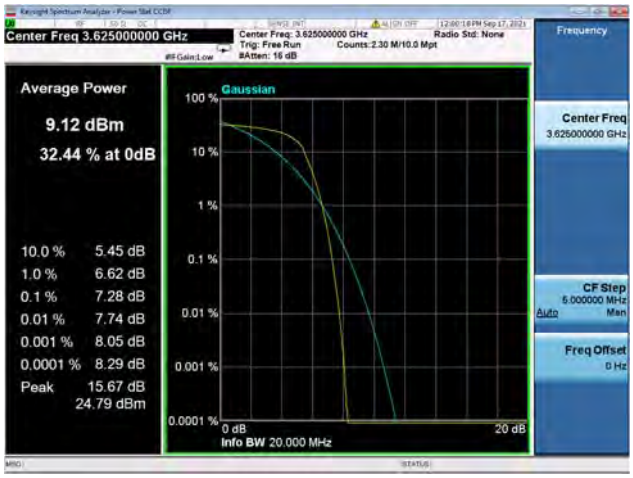


Band48 / 20MHz / Mid CH / QPSK

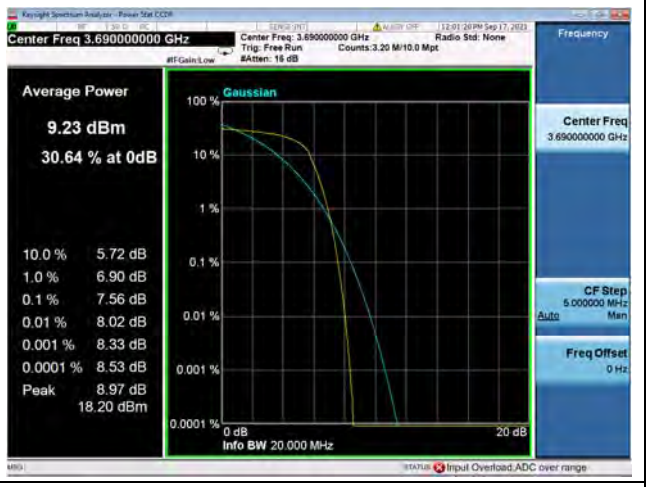


Band48 / 20MHz / Mid CH / 16QAM

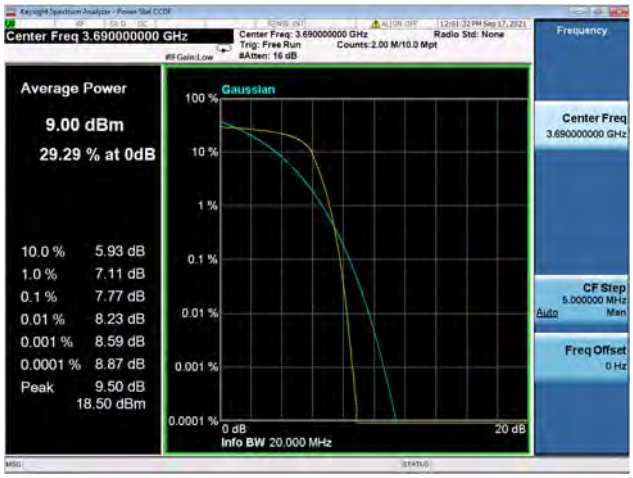
Band48 / 20MHz / Mid CH / 64QAM



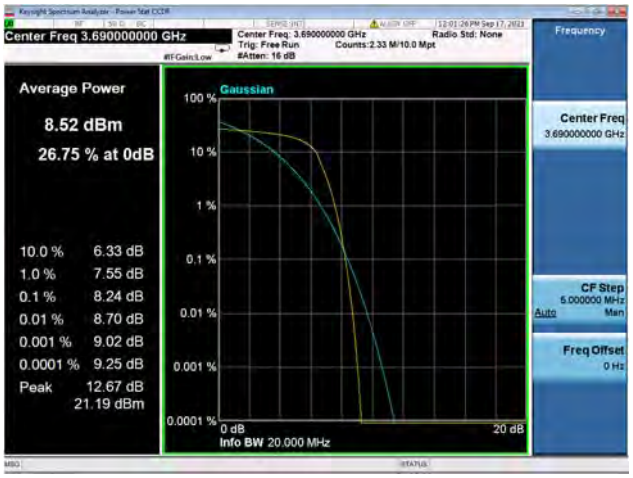
Band48 / 20MHz / High CH / QPSK



Band48 / 20MHz / High CH / 16QAM



Band48 / 20MHz / High CH / 64QAM

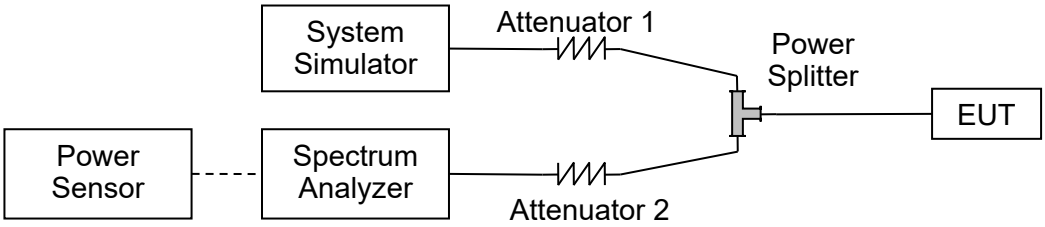


2.5. Conducted Spurious Emissions

2.5.1.Requirement

According to FCC section 96.41(e), the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

2.5.2.Test Description



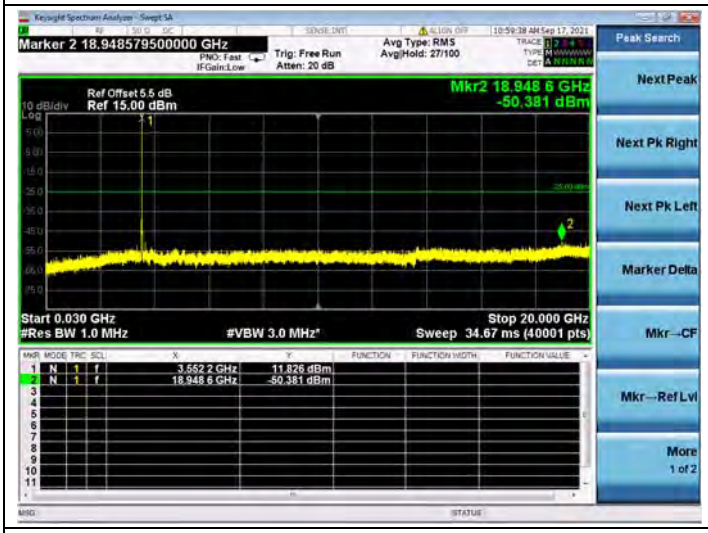
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

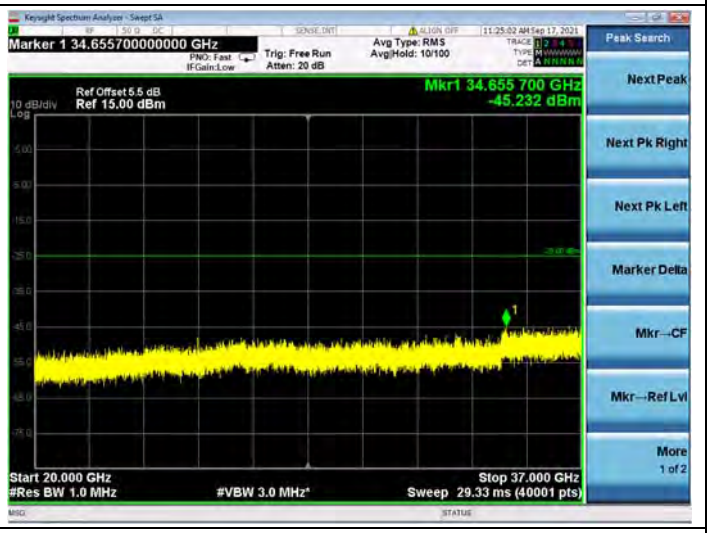
2.5.1.Test procedure

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

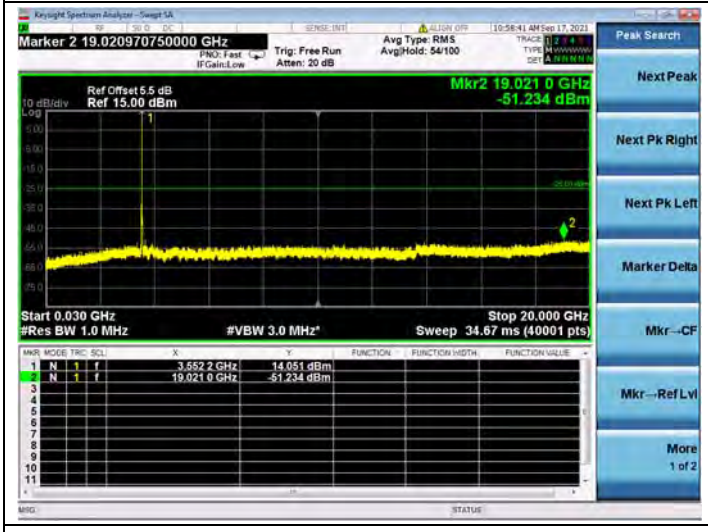
2.5.2.Test Result

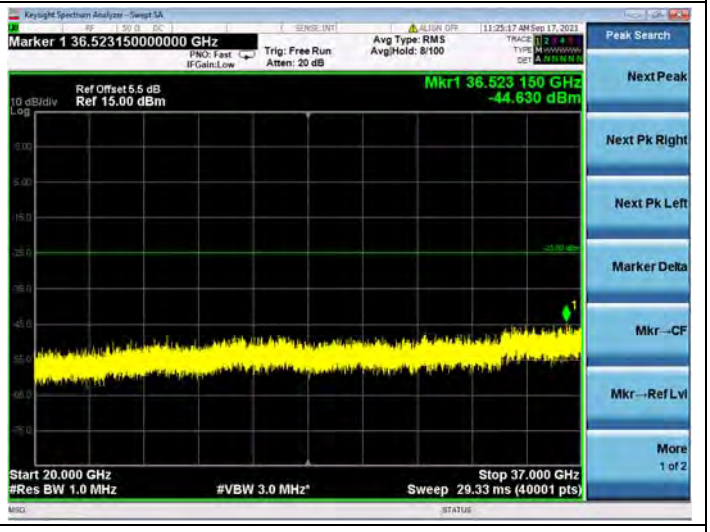
Band 48 / 5MHz / Low CH / QPSK



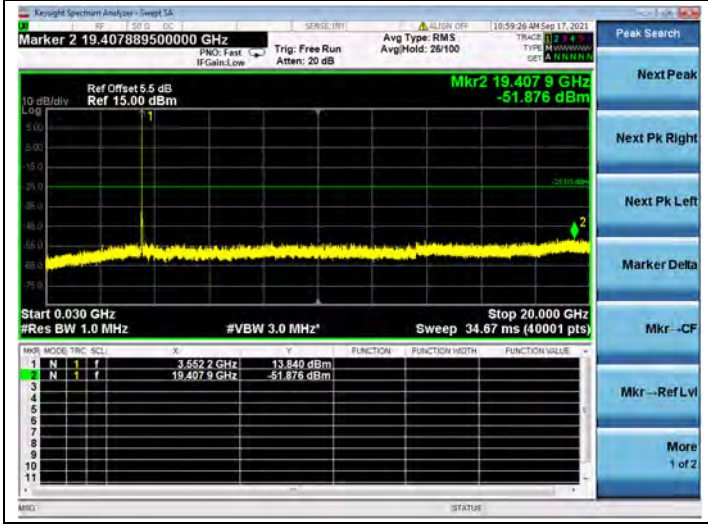


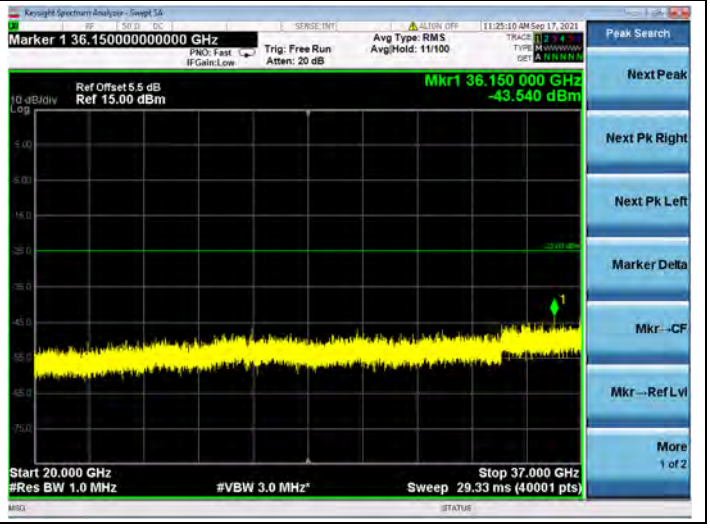
Band 48 / 5MHz / Low CH / 16QAM



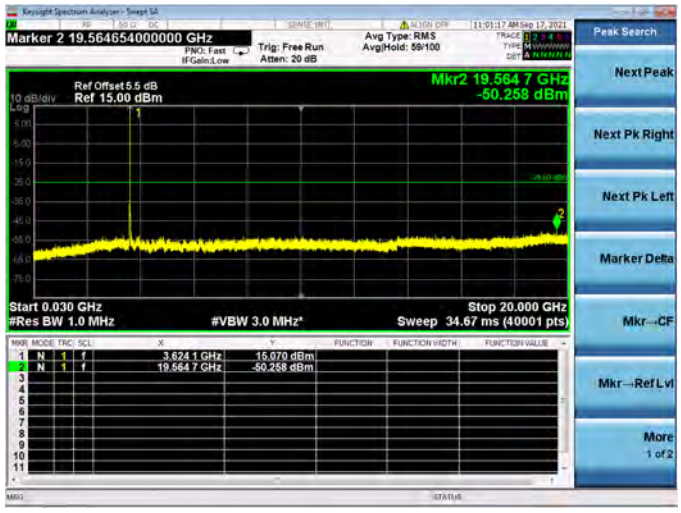


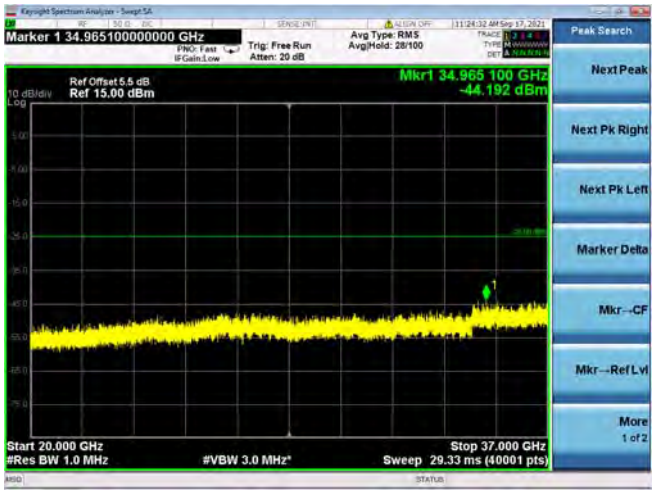
Band 48 / 5MHz / Low CH / 64QAM



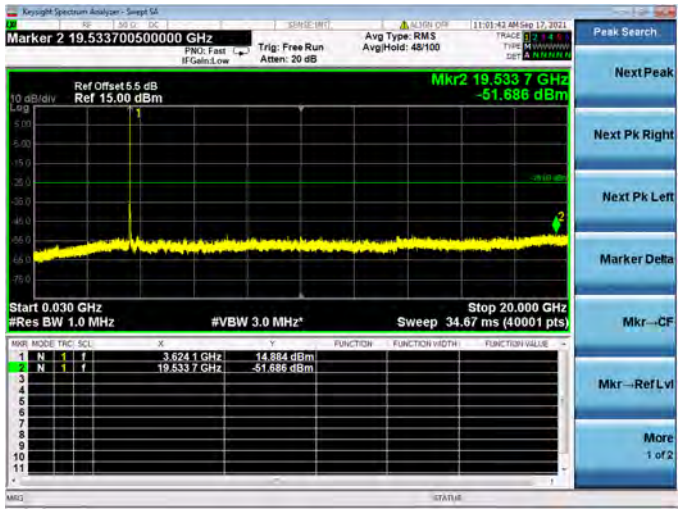


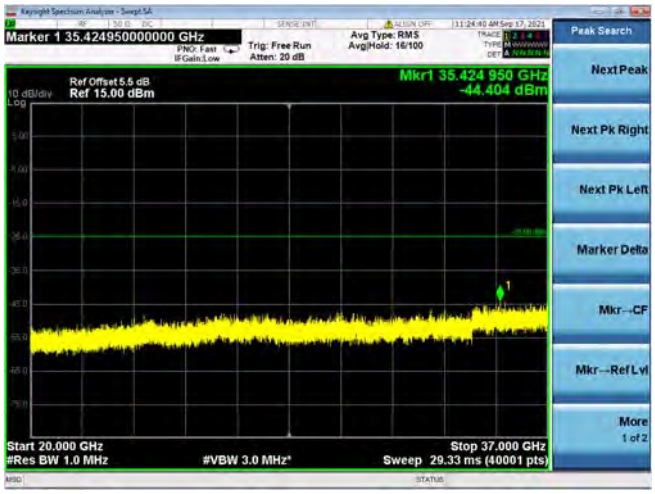
Band 48 / 5MHz / Mid CH / QPSK



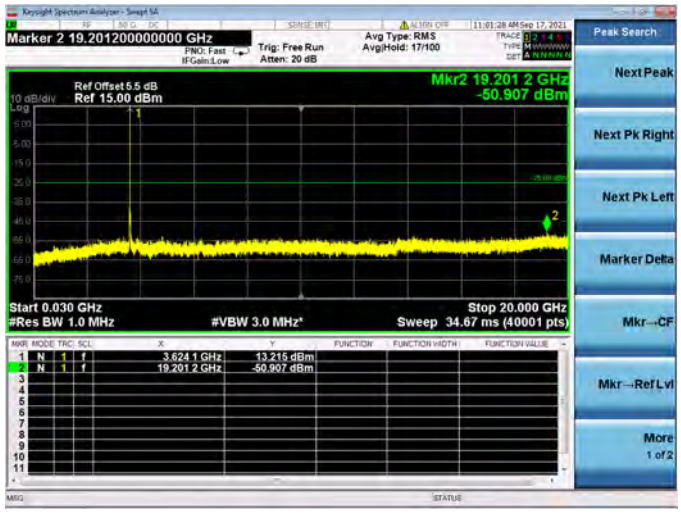


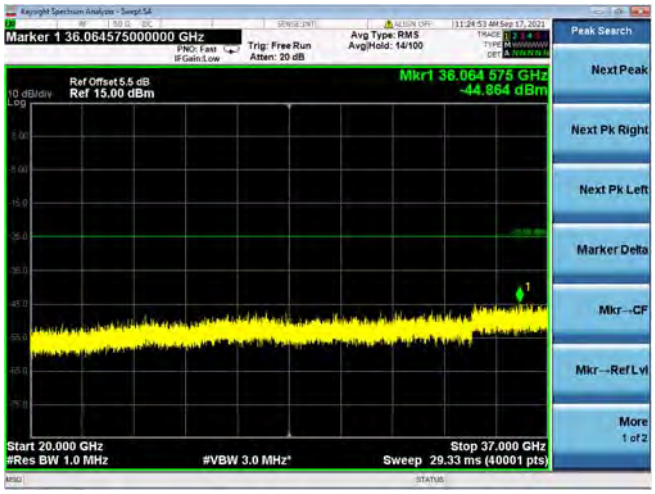
Band 48 / 5MHz / Mid CH / 16QAM

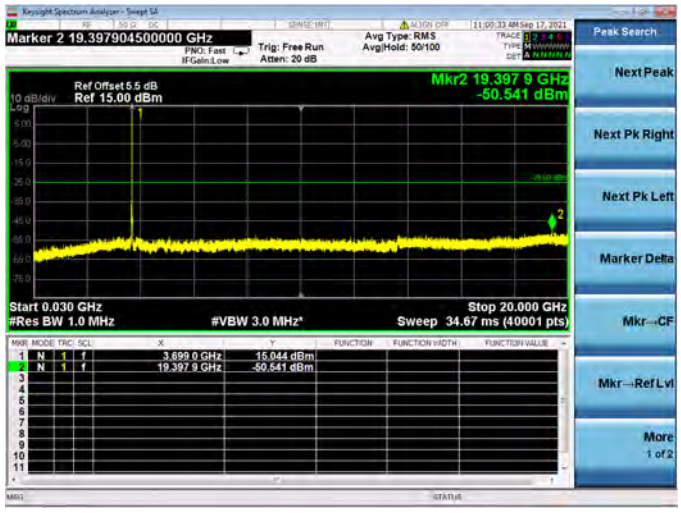
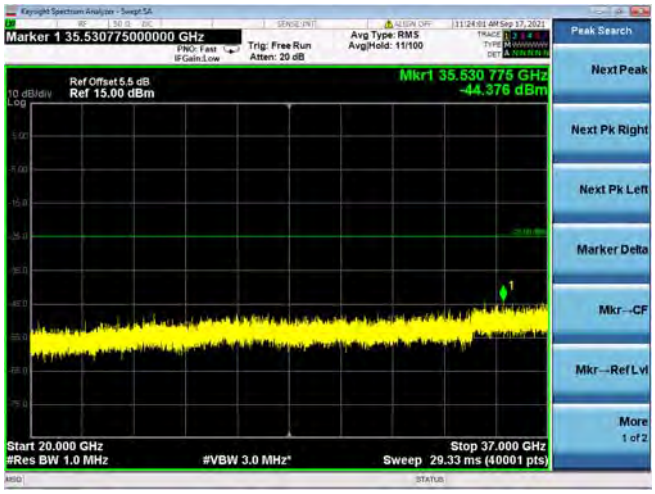
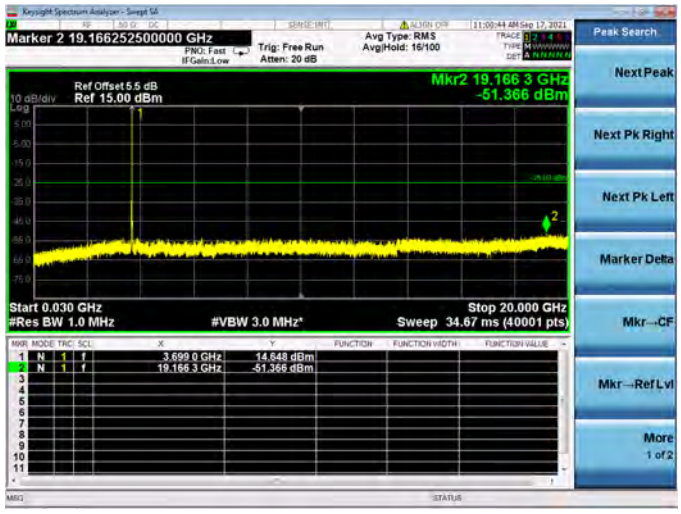
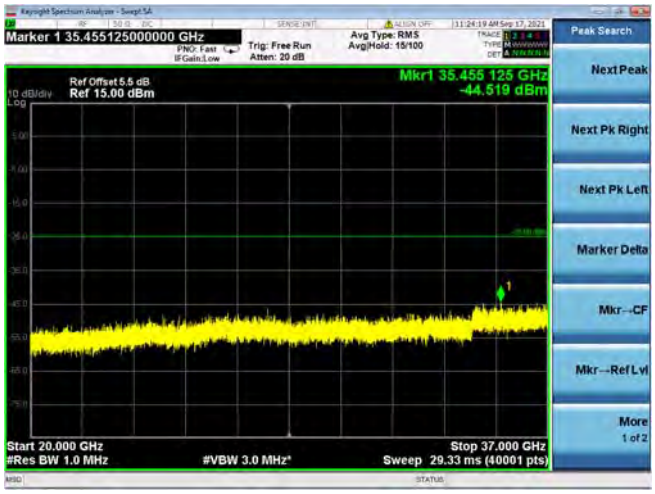
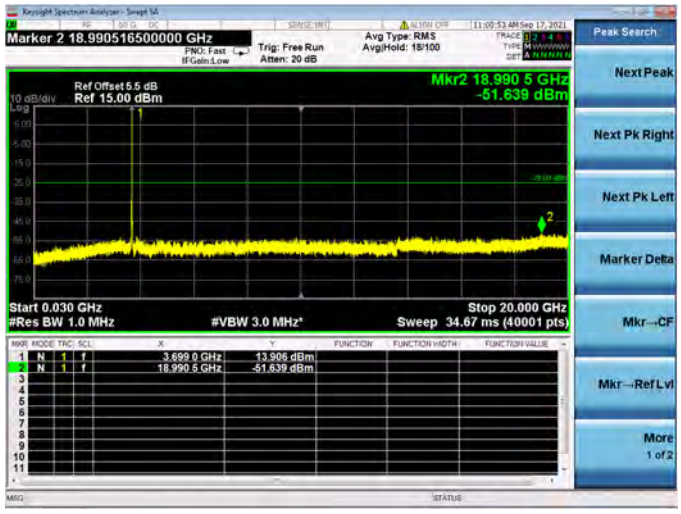
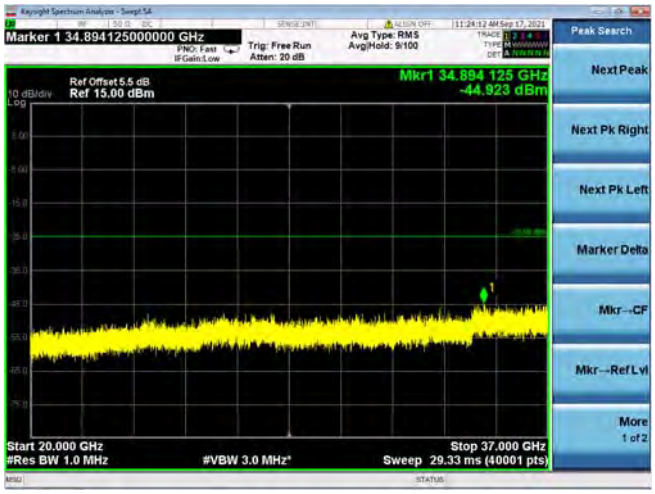




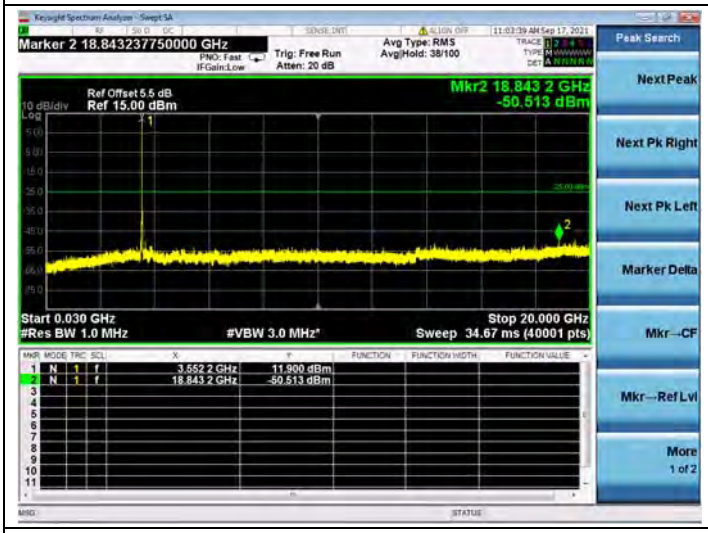
Band 48 / 5MHz / Mid CH / 64QAM

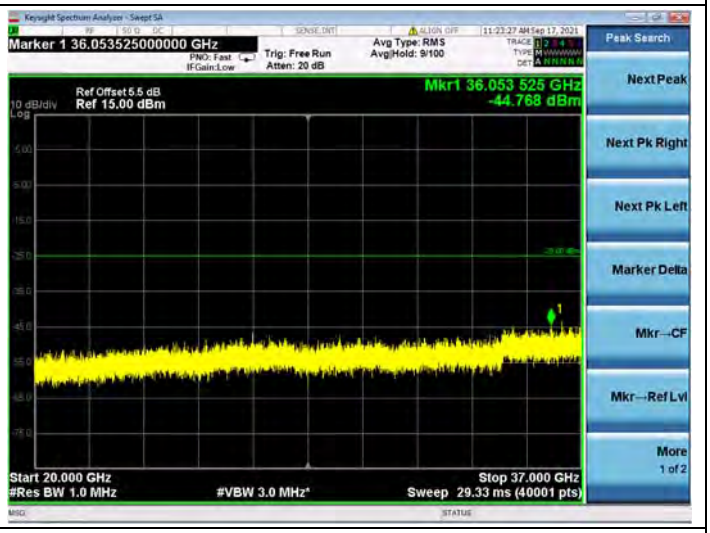




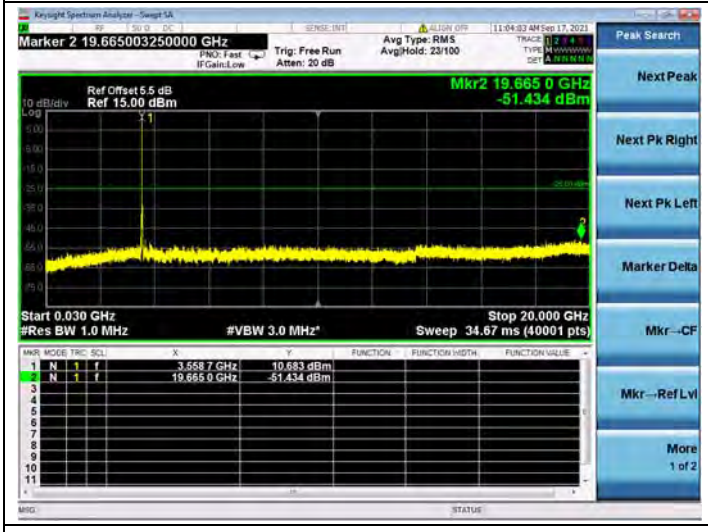
Band 48 / 5MHz / High CH / QPSK	
	
Band 48 / 5MHz / High CH / 16QAM	
	
Band 48 / 5MHz / High CH / 64QAM	
	

Band 48 / 10MHz / Low CH / QPSK

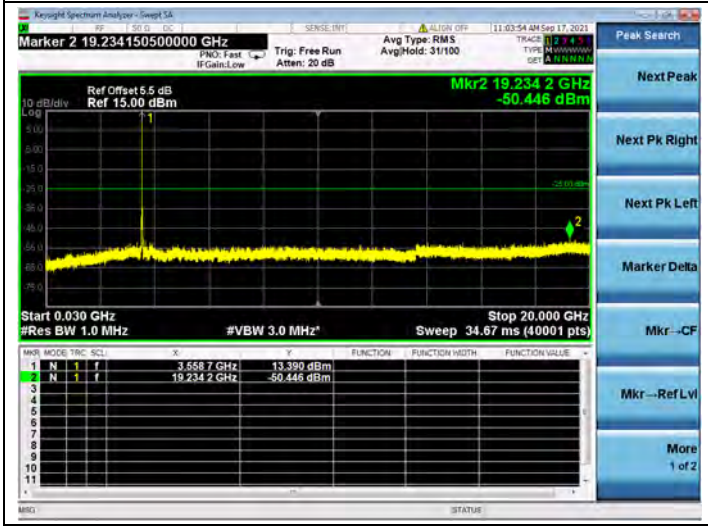


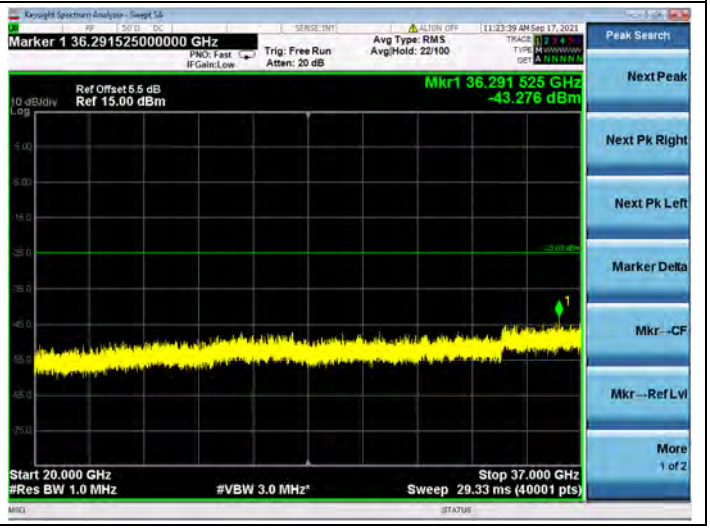


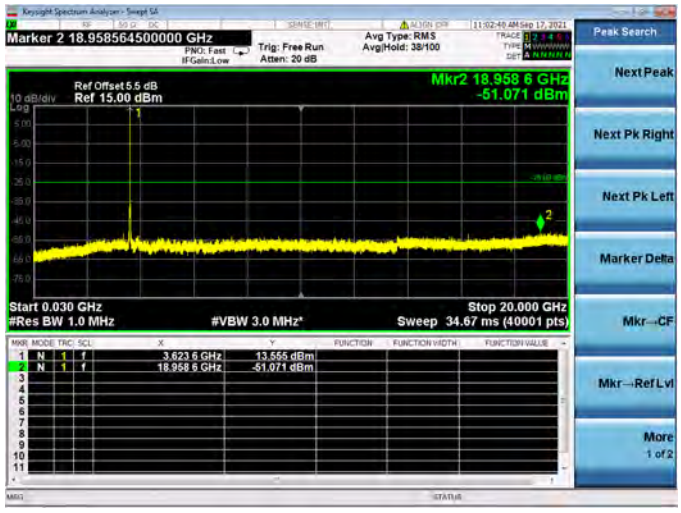
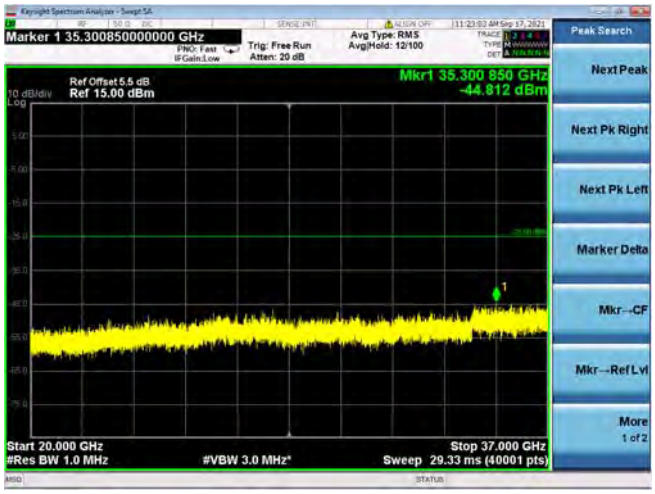
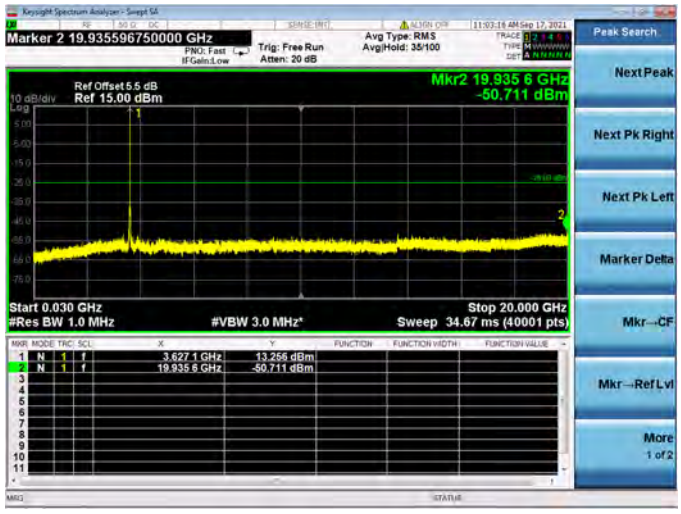
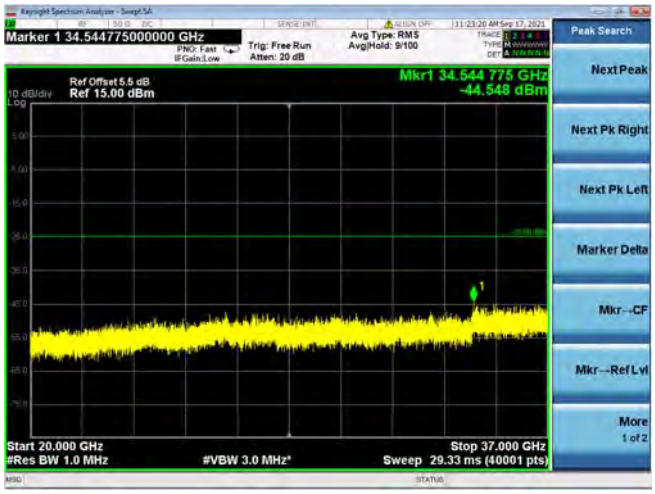
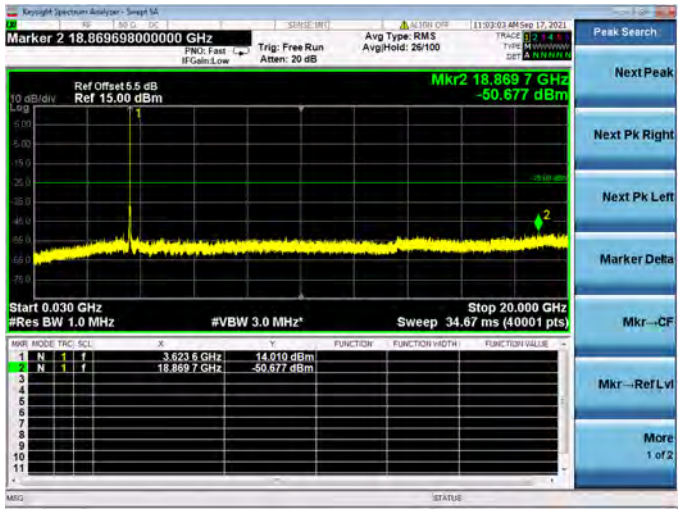
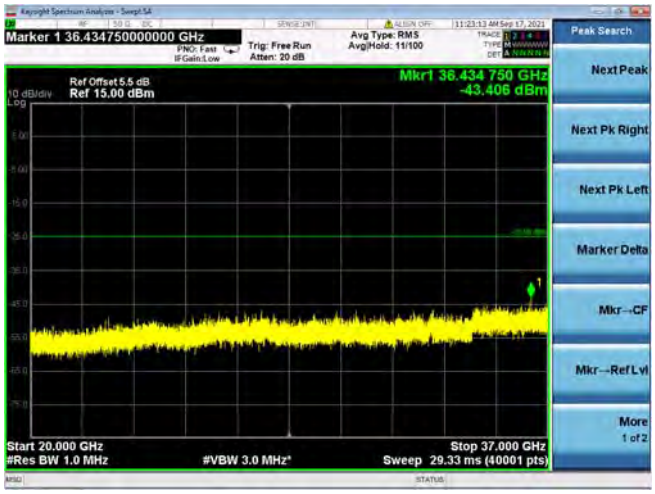
Band 48 / 10MHz / Low CH / 16QAM



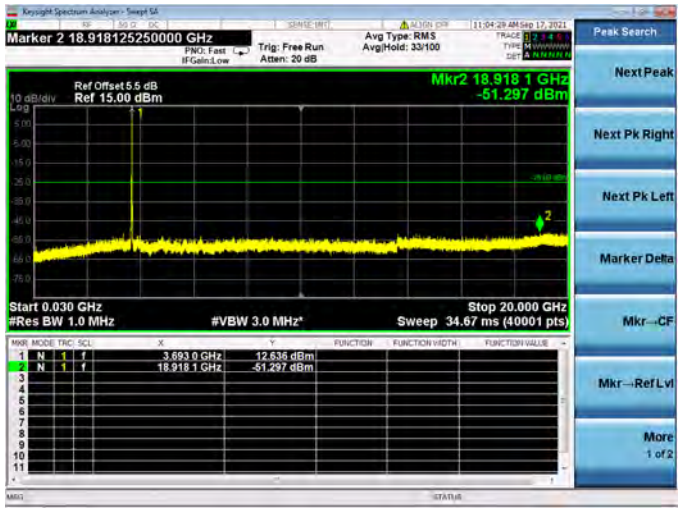
Band 48 / 10MHz / Low CH / 64QAM

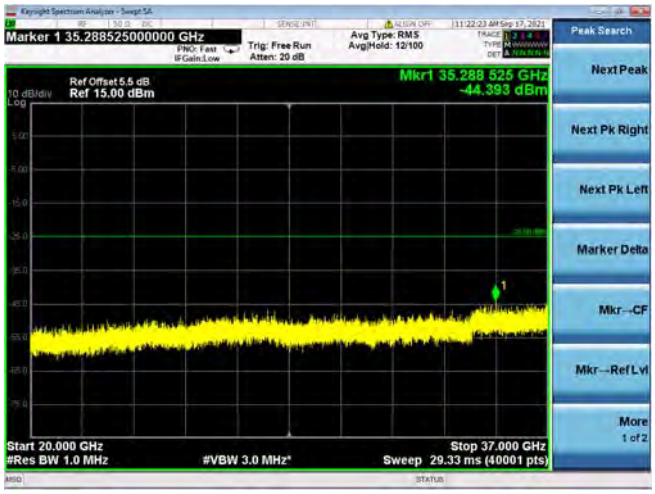




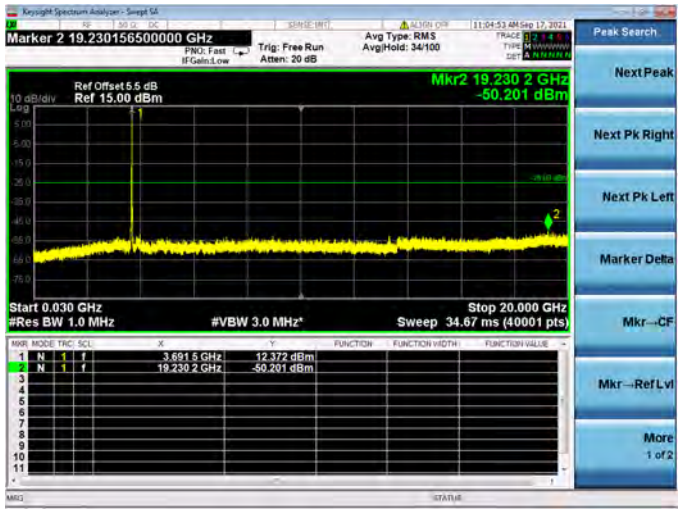
Band 48 / 10MHz / Mid CH / QPSK	
	
Band 48 / 10MHz / Mid CH / 16QAM	
	
Band 48 / 10MHz / Mid CH / 64QAM	
	

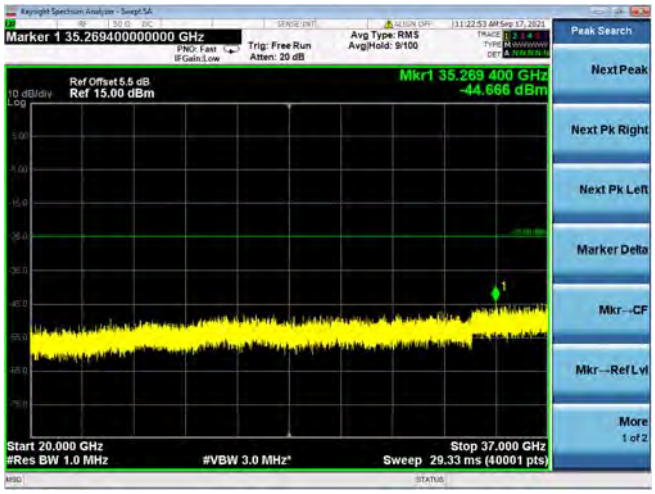
Band 48 / 10MHz / High CH / QPSK



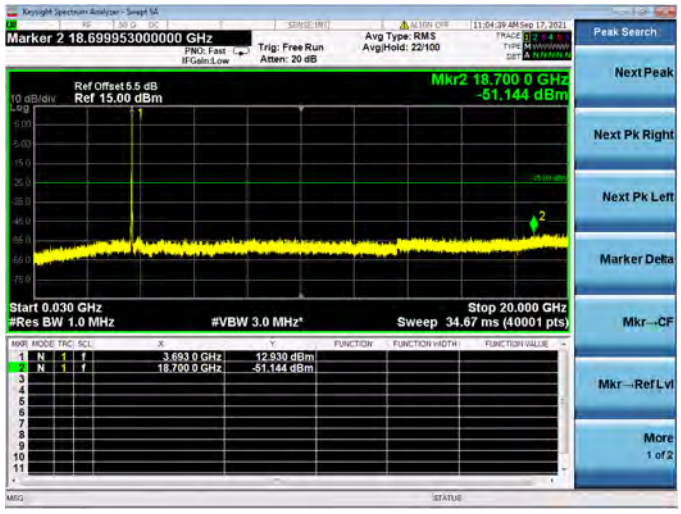


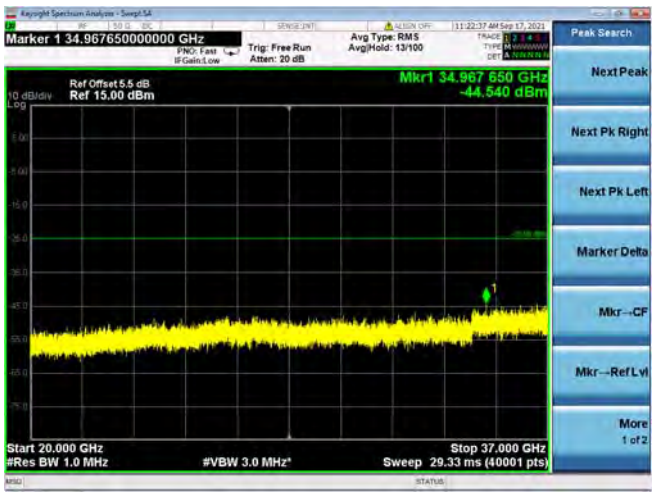
Band 48 / 10MHz / High CH / 16QAM



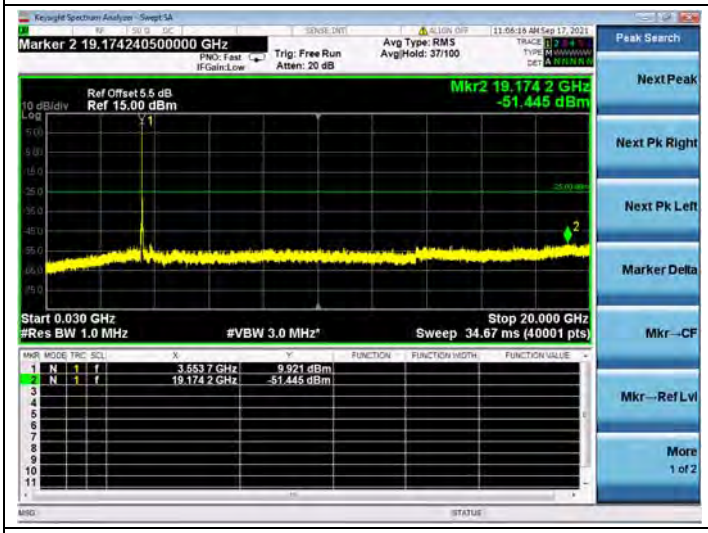


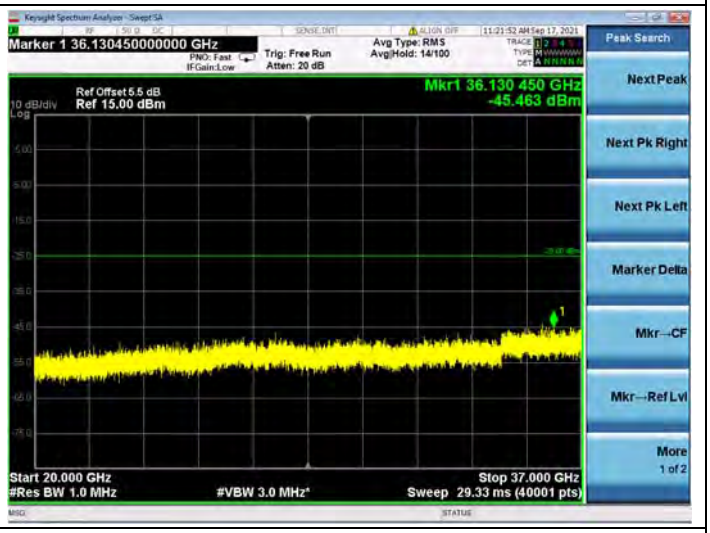
Band 48 / 10MHz / High CH / 64QAM



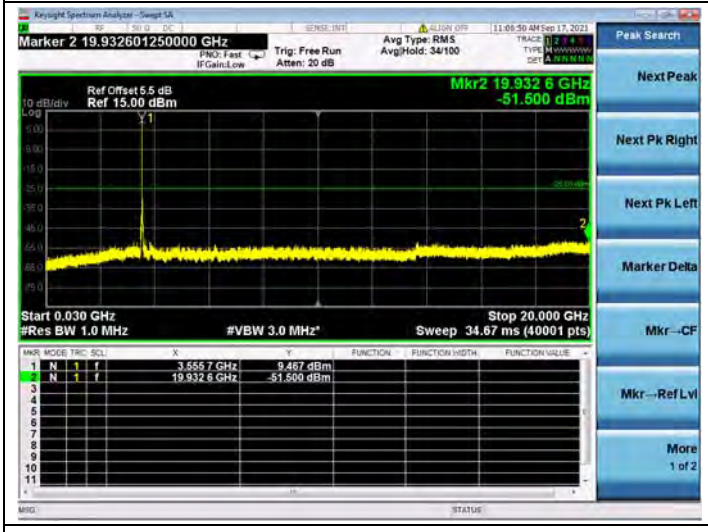


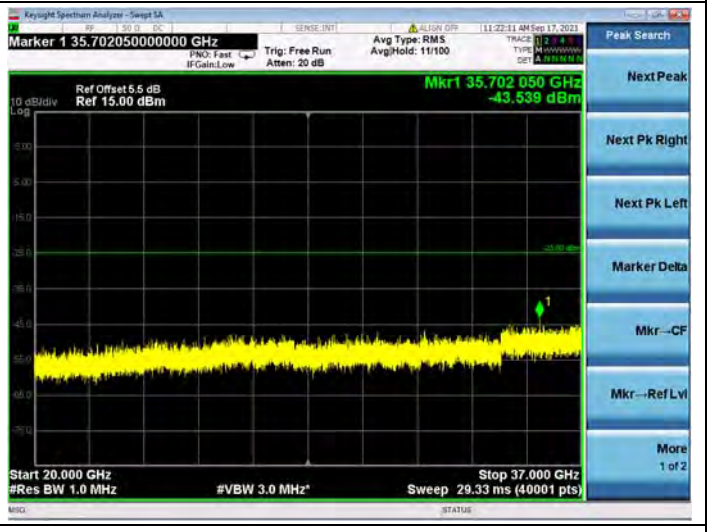
Band 48 / 15MHz / Low CH / QPSK



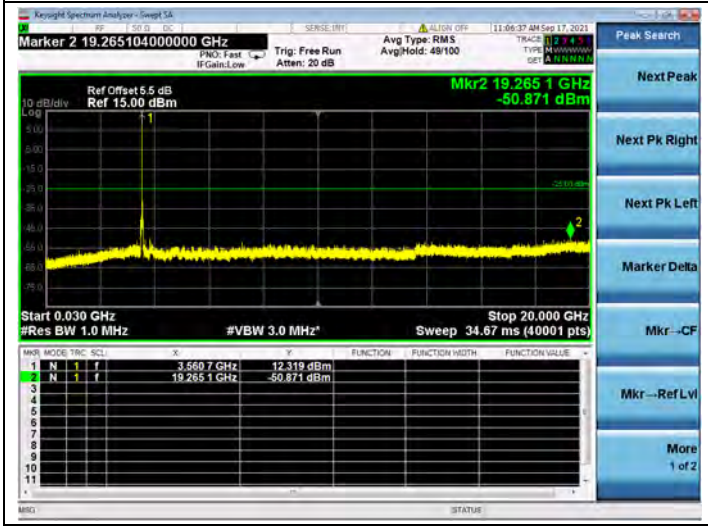


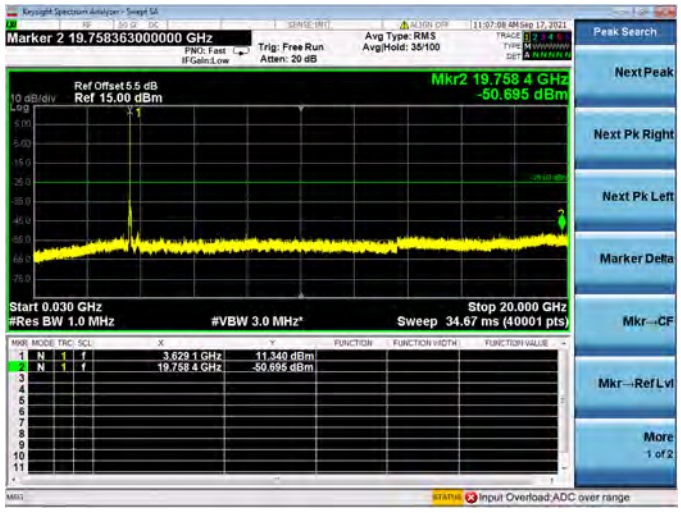
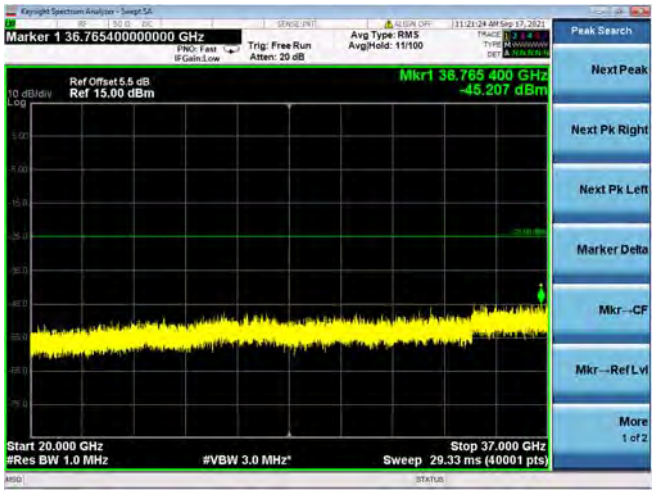
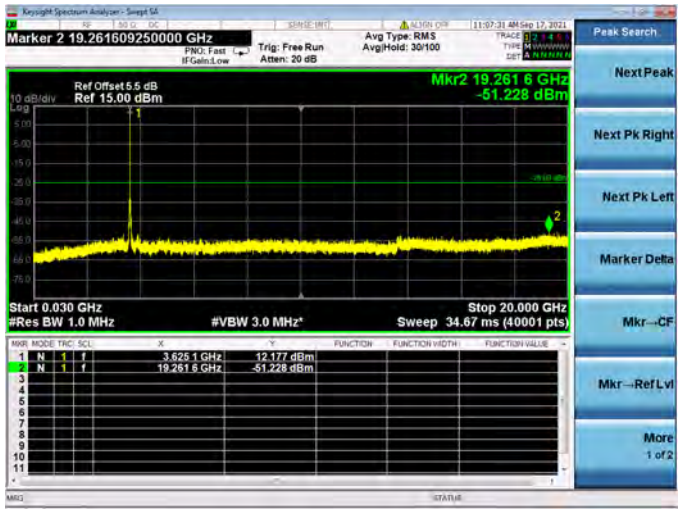
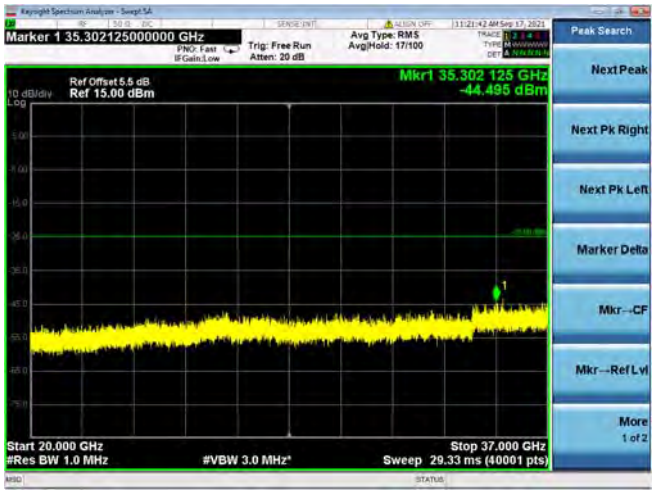
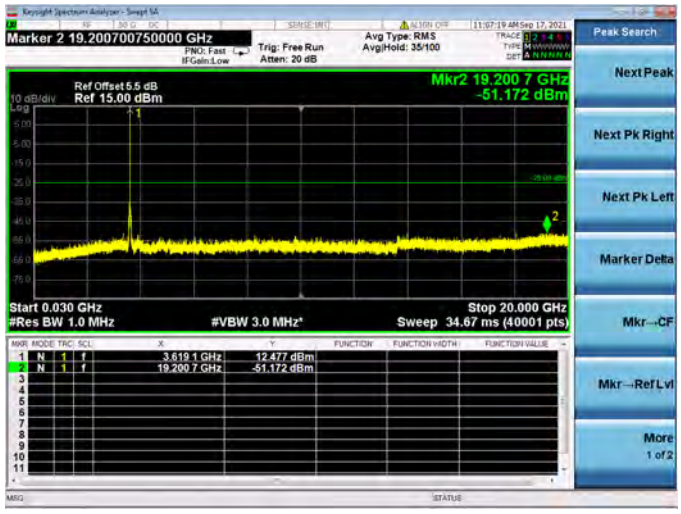
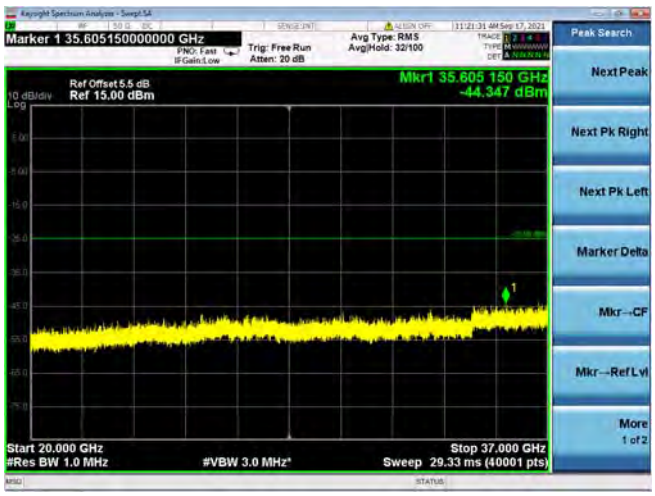
Band 48 / 15MHz / Low CH / 16QAM



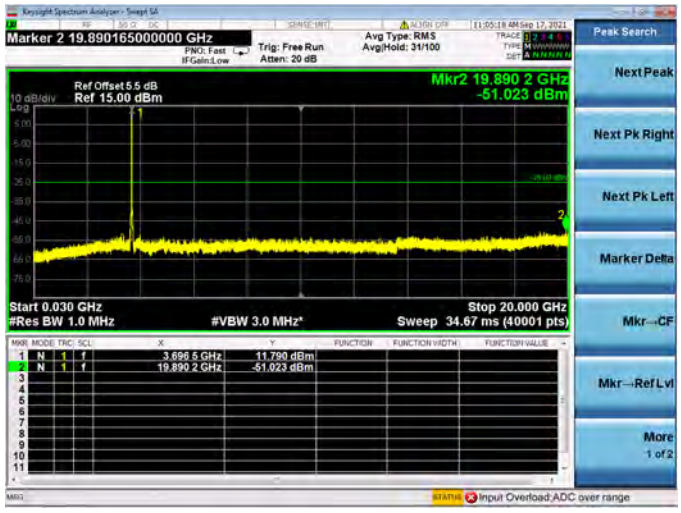


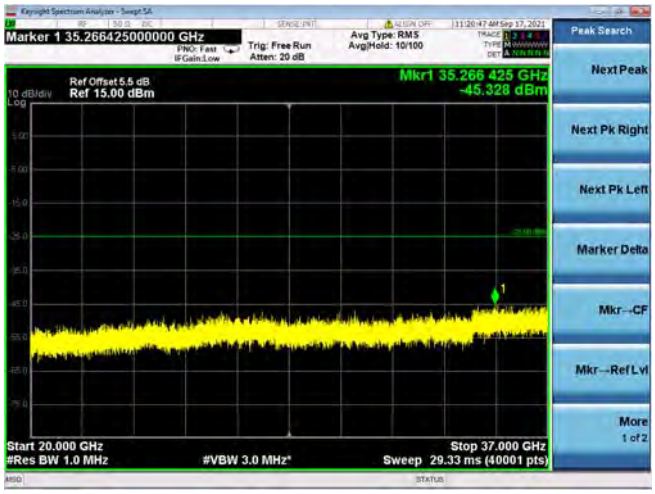
Band 48 / 15MHz / Low CH / 64QAM



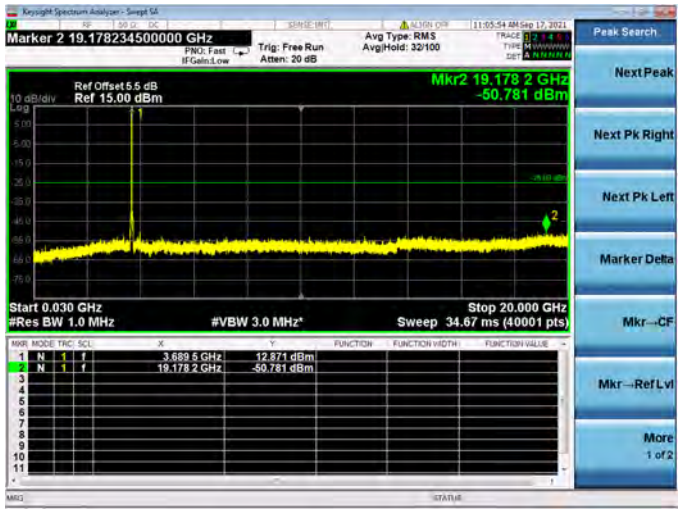
Band 48 / 15MHz / Mid CH / QPSK	
	
Band 48 / 15MHz / Mid CH / 16QAM	
	
Band 48 / 15MHz / Mid CH / 64QAM	
	

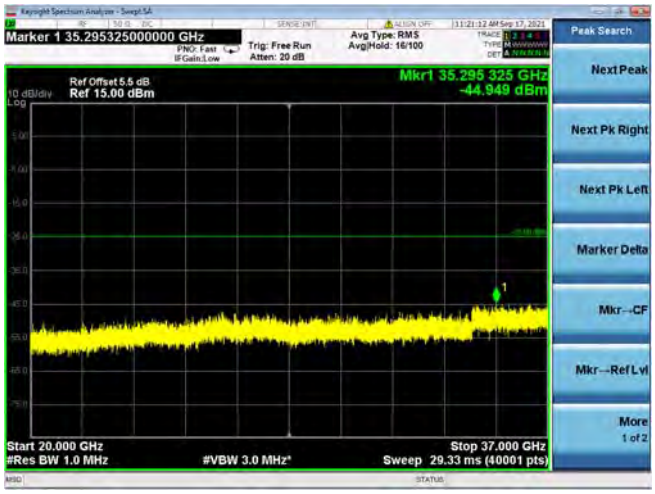
Band 48 / 15MHz / High CH / QPSK



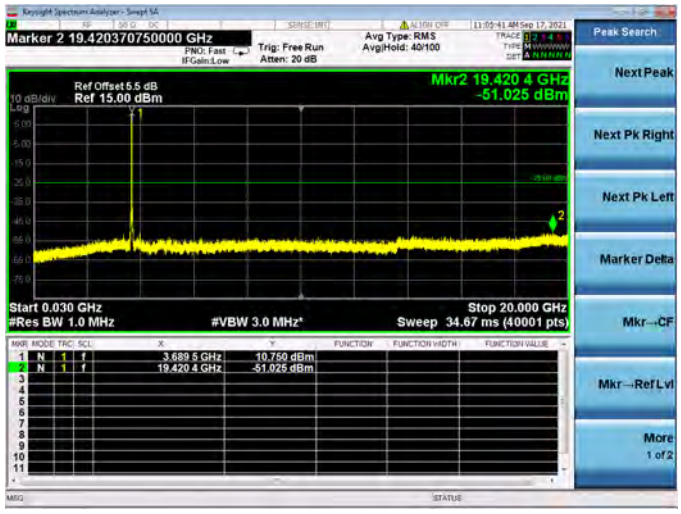


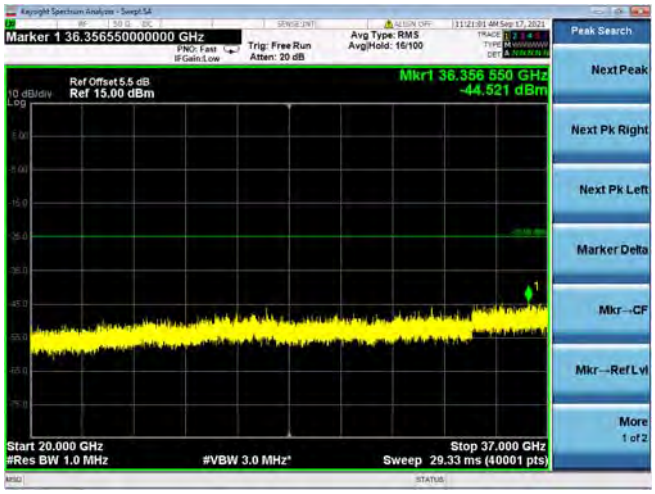
Band 48 / 15MHz / High CH / 16QAM



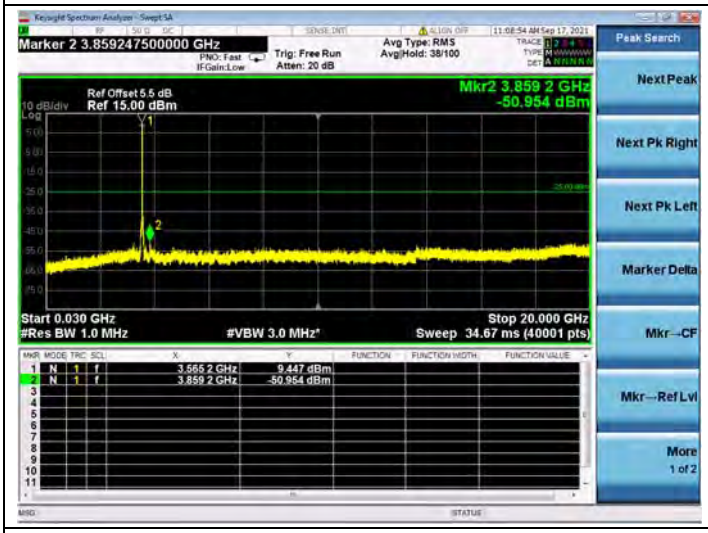


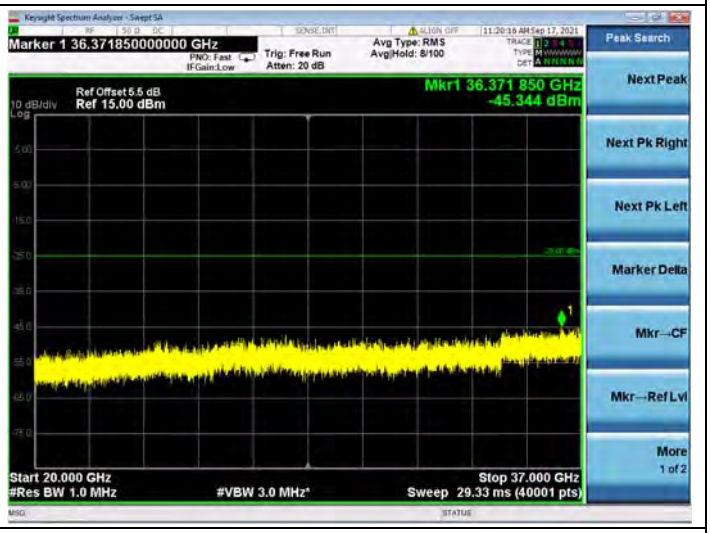
Band 48 / 15MHz / High CH / 64QAM



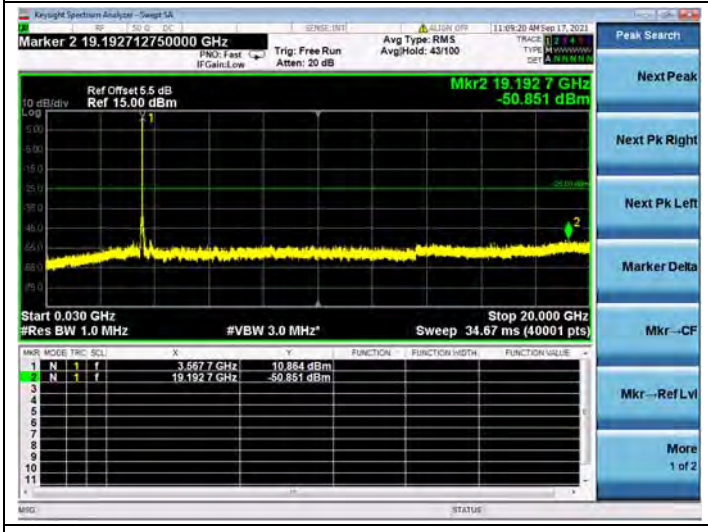


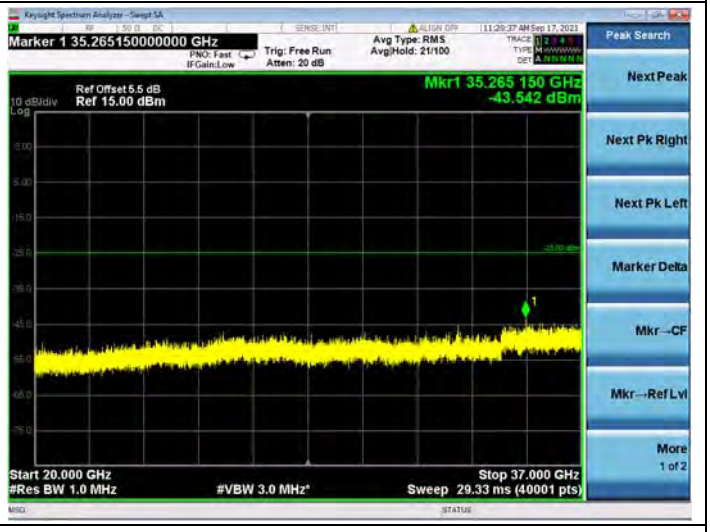
Band 48 / 20MHz / Low CH / QPSK



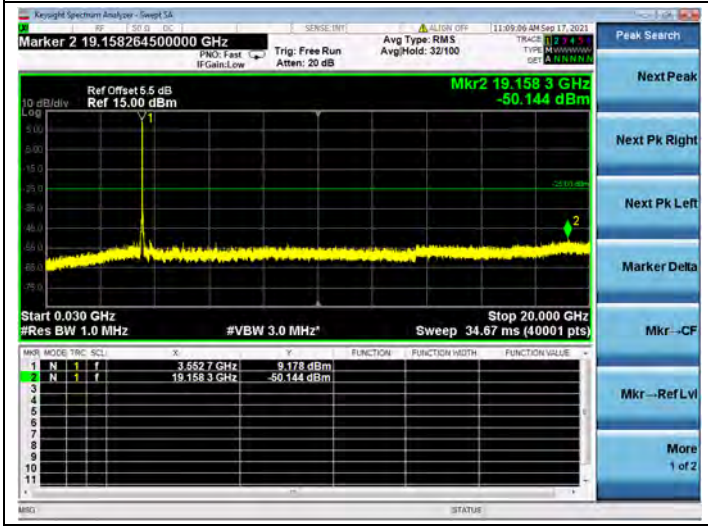


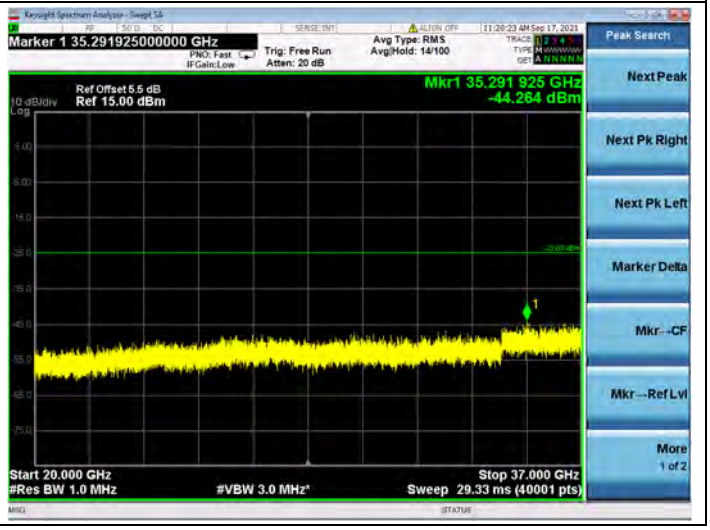
Band 48 / 20MHz / Low CH / 16QAM

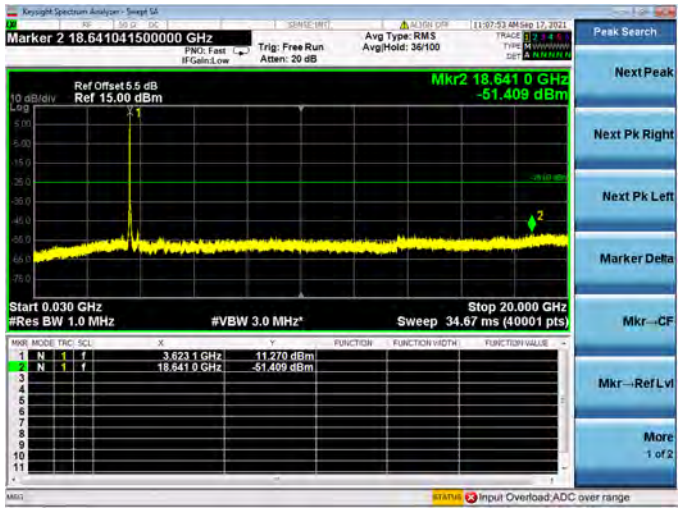
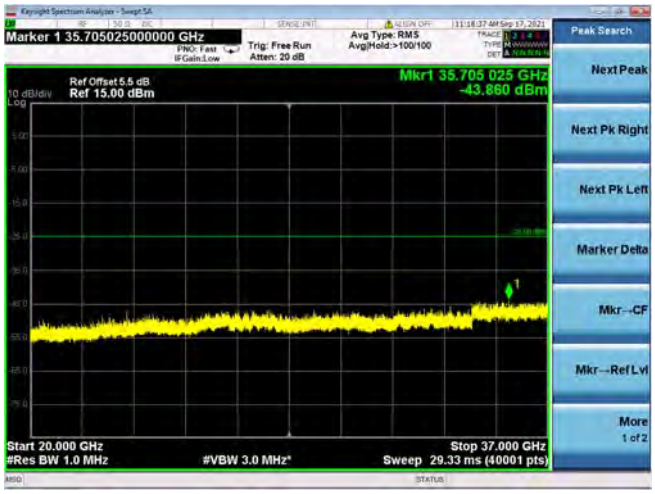
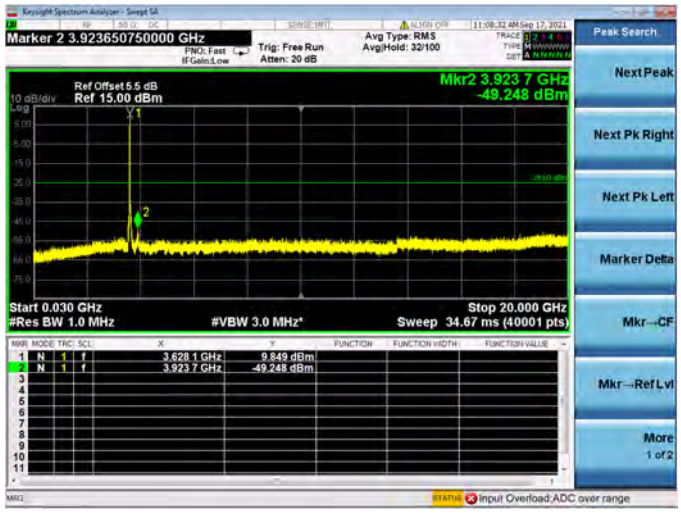
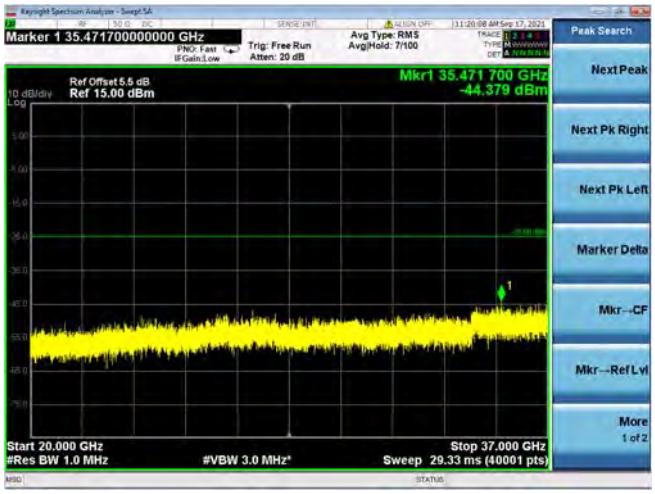
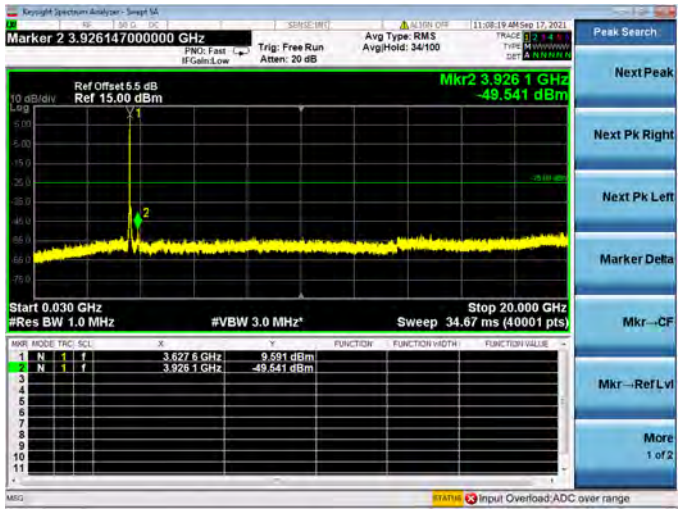
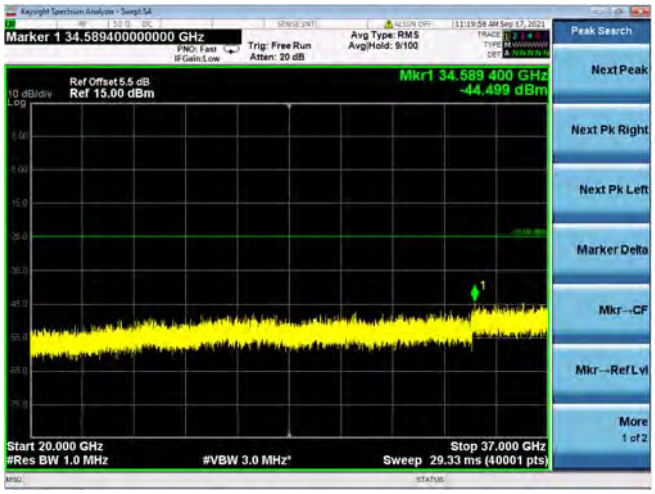




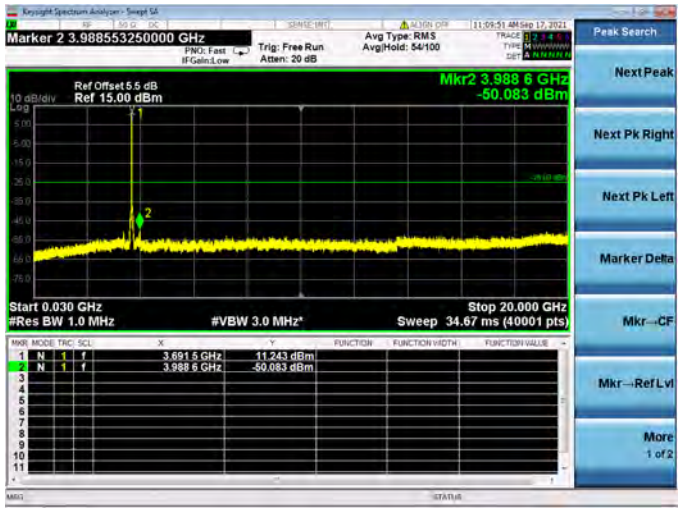
Band 48 / 20MHz / Low CH / 64QAM

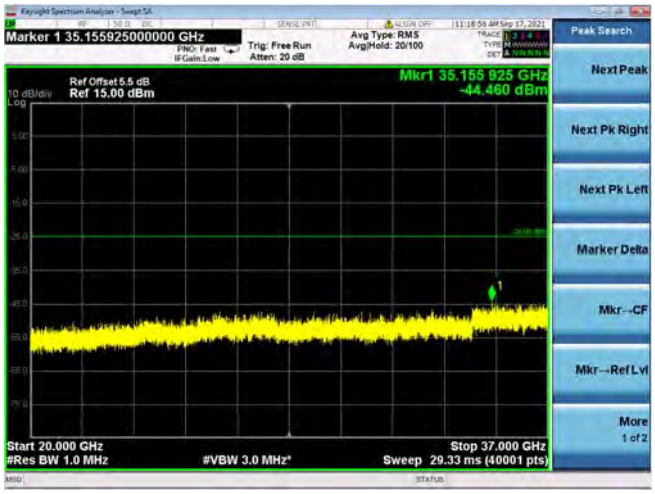




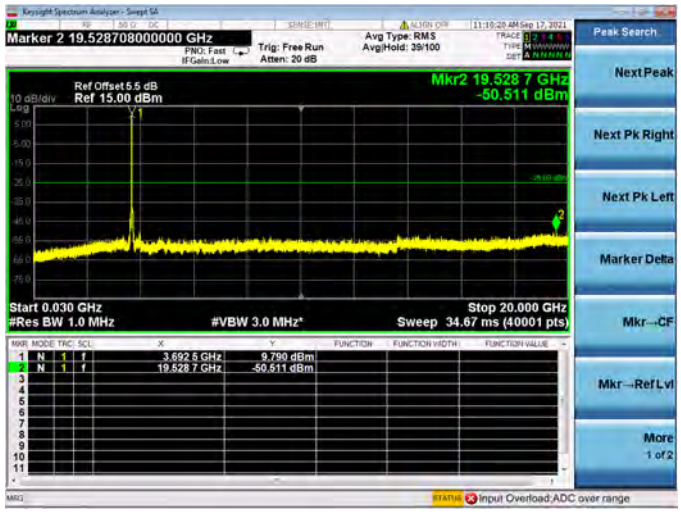
Band 48 / 20MHz / Mid CH / QPSK	
	
Band 48 / 20MHz / Mid CH / 16QAM	
	
Band 48 / 20MHz / Mid CH / 64QAM	
	

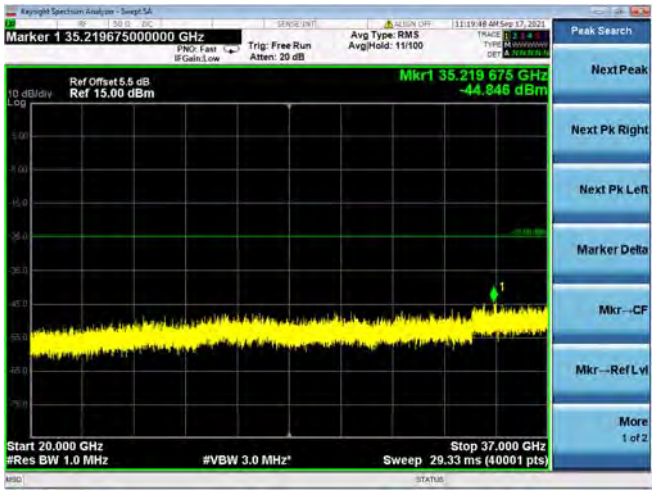
Band 48 / 20MHz / High CH / QPSK



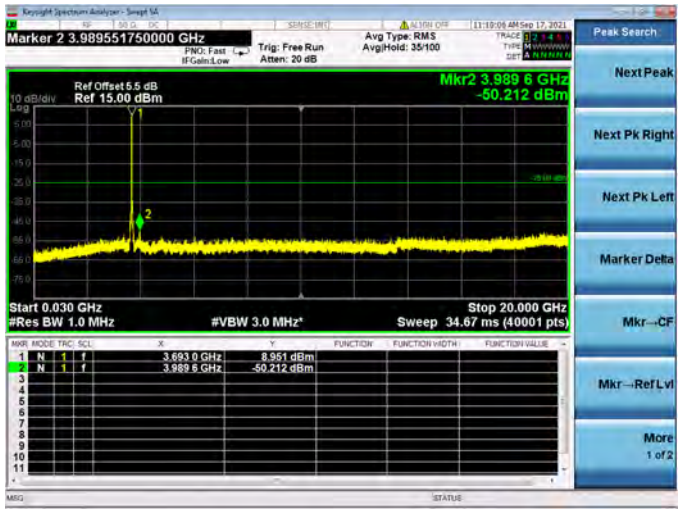


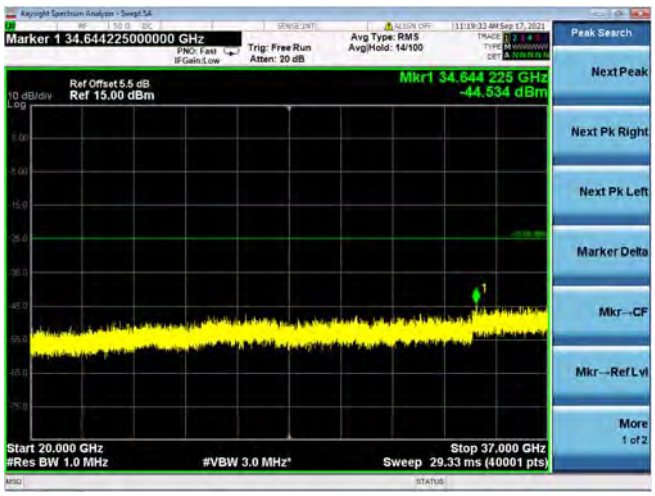
Band 48 / 20MHz / High CH / 16QAM





Band 48 / 20MHz / High CH / 64QAM



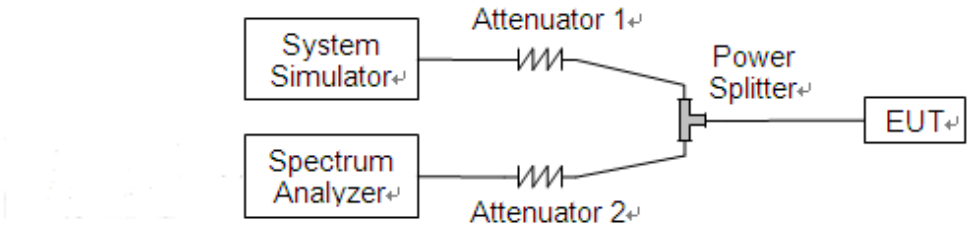


2.6. Band Edge

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 −40dBm/MHz.

2.6.2.Test Description

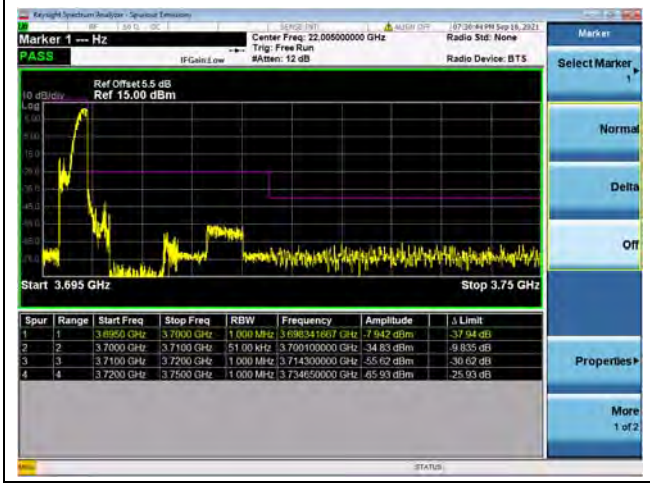
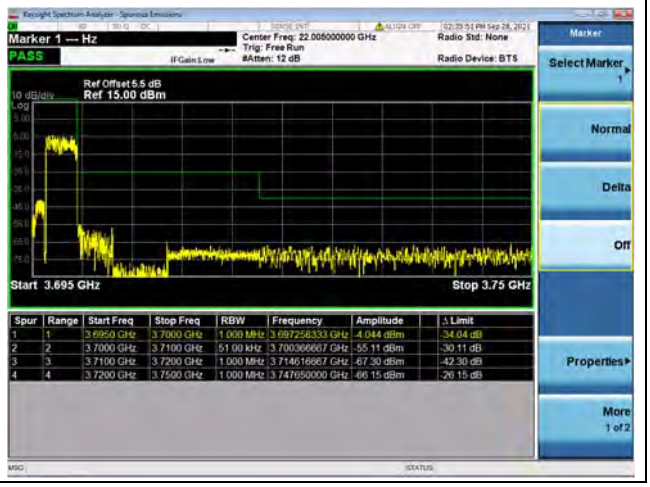


The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

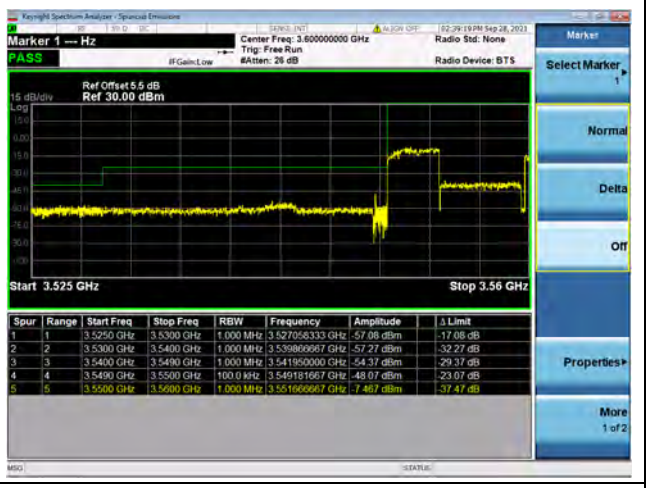
2.6.4.Test Result

Band48 / 5MHz / Low CH / QPSK / 1 RB	Band48 / 5MHz / Low CH / QPSK / FULL RB
	
Band48 / 5MHz / High CH / QPSK / 1 RB	**Band48 / 5MHz / High CH / QPSK / FULL RB**
	

Band48 / 10MHz / Low CH / QPSK / 1 RB

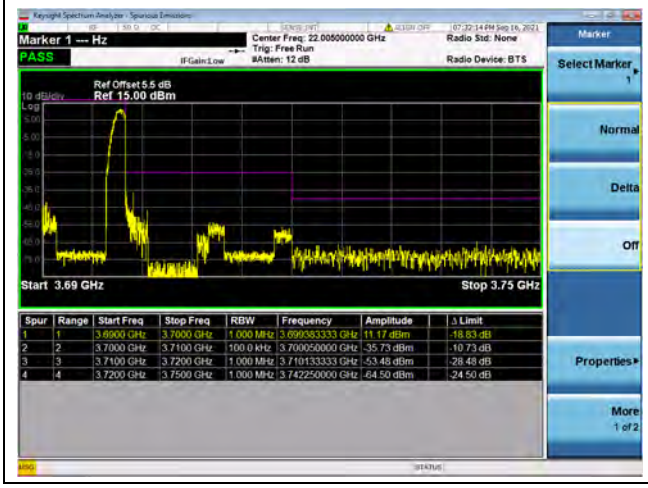
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5250 GHz	3.5300 GHz	1.000 MHz	3.527058333 GHz	-54.53 dBm	-14.53 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.537500000 GHz	-50.08 dBm	-25.08 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.540390000 GHz	-50.85 dBm	-25.85 dB
4	4	3.5490 GHz	3.5500 GHz	100.0 kHz	3.549930000 GHz	-34.09 dBm	-9.091 dB
5	5	3.5500 GHz	3.5600 GHz	1.000 MHz	3.550566667 GHz	-17.75 dBm	-12.25 dB

Band48 / 10MHz / Low CH / QPSK / FULL RB



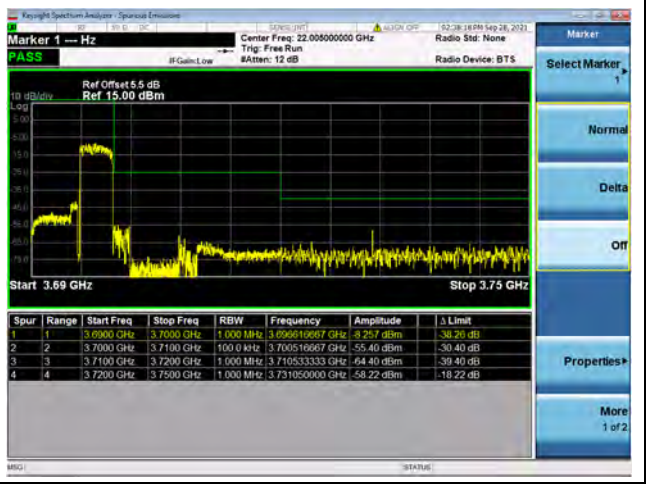
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5250 GHz	3.5300 GHz	1.000 MHz	3.527058333 GHz	-57.08 dBm	-17.08 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.539866667 GHz	-57.27 dBm	-32.27 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.541950000 GHz	-54.37 dBm	-29.37 dB
4	4	3.5490 GHz	3.5500 GHz	100.0 kHz	3.549181667 GHz	-48.07 dBm	-23.07 dB
5	5	3.5500 GHz	3.5600 GHz	1.000 MHz	3.551666667 GHz	-7.467 dBm	-37.47 dB

Band48 / 10MHz / High CH / QPSK / 1 RB



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6900 GHz	3.7000 GHz	1.000 MHz	3.699383333 GHz	11.17 dBm	-18.83 dB
2	2	3.7000 GHz	3.7100 GHz	100.0 kHz	3.700050000 GHz	-35.73 dBm	-10.73 dB
3	3	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710133333 GHz	-53.48 dBm	-28.48 dB
4	4	3.7200 GHz	3.7500 GHz	1.000 MHz	3.742250000 GHz	-64.50 dBm	-24.50 dB

Band48 / 10MHz / High CH / QPSK / FULL RB



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6900 GHz	3.7000 GHz	1.000 MHz	3.699616667 GHz	-8.257 dBm	-38.26 dB
2	2	3.7000 GHz	3.7100 GHz	100.0 kHz	3.700516667 GHz	-55.40 dBm	-30.40 dB
3	3	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710533333 GHz	-64.40 dBm	-39.40 dB
4	4	3.7200 GHz	3.7500 GHz	1.000 MHz	3.731050000 GHz	-58.22 dBm	-18.22 dB

Band48 / 15MHz / Low CH / QPSK / 1 RB

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5250 GHz	3.5300 GHz	1.000 MHz	3.529283333 GHz	-53.55 dBm	-13.55 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.535066667 GHz	-52.90 dBm	-27.90 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548085000 GHz	-45.83 dBm	-20.83 dB
4	4	3.5490 GHz	3.5500 GHz	150.0 kHz	3.549940000 GHz	-31.58 dBm	-6.577 dB
5	5	3.5500 GHz	3.5650 GHz	1.000 MHz	3.550850000 GHz	19.03 dBm	-10.97 dB

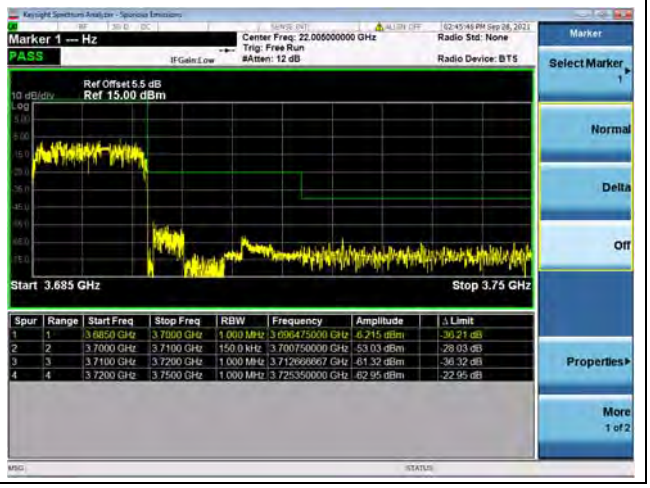
Band48 / 15MHz / Low CH / QPSK / FULL RB

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5250 GHz	3.5300 GHz	1.000 MHz	3.527183333 GHz	-46.24 dBm	-6.240 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.531350000 GHz	-46.09 dBm	-21.09 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548580000 GHz	-40.79 dBm	-15.79 dB
4	4	3.5490 GHz	3.5500 GHz	150.0 kHz	3.549963333 GHz	-33.17 dBm	-8.172 dB
5	5	3.5500 GHz	3.5650 GHz	1.000 MHz	3.563075000 GHz	11.11 dBm	-18.89 dB

Band48 / 15MHz / High CH / QPSK / 1 RB

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6850 GHz	3.7000 GHz	1.000 MHz	3.699075000 GHz	11.18 dBm	-18.82 dB
2	2	3.7000 GHz	3.7100 GHz	150.0 kHz	3.700733333 GHz	-42.54 dBm	-17.54 dB
3	3	3.7100 GHz	3.7200 GHz	1.000 MHz	3.712533333 GHz	-53.44 dBm	-28.44 dB
4	4	3.7200 GHz	3.7500 GHz	1.000 MHz	3.747900000 GHz	-66.00 dBm	-26.00 dB

Band48 / 15MHz / High CH / QPSK / FULL RB



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6850 GHz	3.7000 GHz	1.000 MHz	3.696475000 GHz	-6.215 dBm	-36.21 dB
2	2	3.7000 GHz	3.7100 GHz	150.0 kHz	3.700750000 GHz	-53.03 dBm	-28.03 dB
3	3	3.7100 GHz	3.7200 GHz	1.000 MHz	3.712666667 GHz	-61.32 dBm	-36.32 dB
4	4	3.7200 GHz	3.7500 GHz	1.000 MHz	3.725350000 GHz	-62.95 dBm	-22.95 dB

Band48 / 20MHz / Low CH / QPSK / 1 RB

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5250 GHz	3.5300 GHz	1.000 MHz	3.528966667 GHz	-52.94 dBm	-12.94 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.533000000 GHz	-54.76 dBm	-29.76 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.544140000 GHz	-44.34 dBm	-19.34 dB
4	4	3.5490 GHz	3.5500 GHz	200.0 kHz	3.549635000 GHz	-59.74 dBm	-34.74 dB
5	5	3.5500 GHz	3.5700 GHz	1.000 MHz	3.551200000 GHz	18.93 dBm	-11.07 dB

Band48 / 20MHz / Low CH / QPSK / FULL RB

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5250 GHz	3.5300 GHz	1.000 MHz	3.527775000 GHz	-58.23 dBm	-18.23 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.538166667 GHz	-48.51 dBm	-23.51 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.547230000 GHz	-42.52 dBm	-17.52 dB
4	4	3.5490 GHz	3.5500 GHz	200.0 kHz	3.549986667 GHz	-35.47 dBm	-10.47 dB
5	5	3.5500 GHz	3.5700 GHz	1.000 MHz	3.562900000 GHz	8.487 dBm	-21.51 dB

Band48 / 20MHz / High CH / QPSK / 1 RB

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6800 GHz	3.7000 GHz	1.000 MHz	3.698833333 GHz	11.59 dBm	-18.41 dB
2	2	3.7000 GHz	3.7100 GHz	200.0 kHz	3.705850000 GHz	-47.68 dBm	-22.68 dB
3	3	3.7100 GHz	3.7200 GHz	1.000 MHz	3.713933333 GHz	-55.12 dBm	-30.12 dB
4	4	3.7200 GHz	3.7500 GHz	1.000 MHz	3.726750000 GHz	-66.32 dBm	-26.32 dB

Band48 / 20MHz / High CH / QPSK / FULL RB

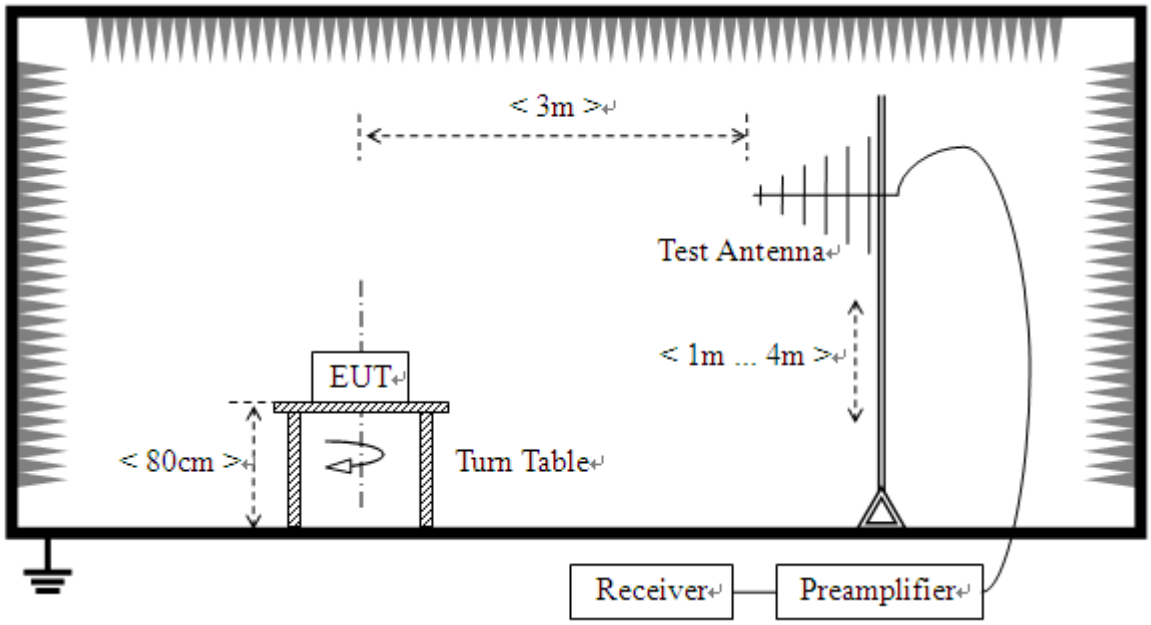
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6800 GHz	3.7000 GHz	1.000 MHz	3.697733333 GHz	5.817 dBm	-24.18 dB
2	2	3.7000 GHz	3.7100 GHz	200.0 kHz	3.703866667 GHz	-44.54 dBm	-19.54 dB
3	3	3.7100 GHz	3.7200 GHz	1.000 MHz	3.711983333 GHz	-44.01 dBm	-19.01 dB
4	4	3.7200 GHz	3.7500 GHz	1.000 MHz	3.748900000 GHz	-65.03 dBm	-25.03 dB

2.7. Radiated Spurious Emissions

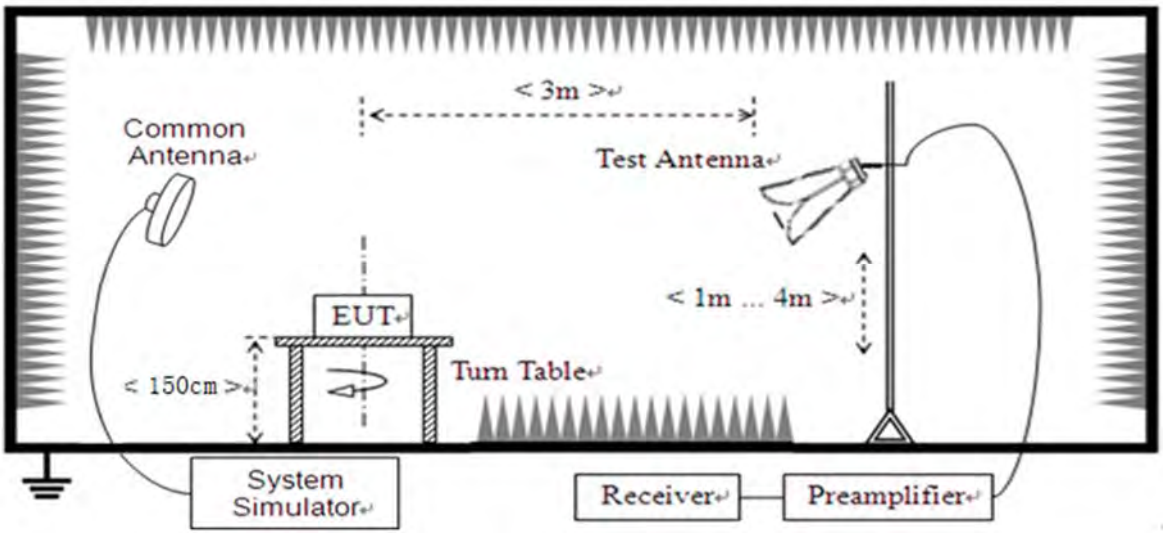
2.7.1.Requirement

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 to1GHz)



(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:

$A_{SUBST} = P_{SUBST\_TX} - P_{SUBST\_RX} - L_{SUBST\_CABLES} + G_{SUBST\_TX\_ANT}$

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

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

P_{SUBST_TX} is signal generator level,

P_{SUBST_RX} is receiver level,

L_{SUBST_CABLES} is cable losses including TX cable,

$G_{SUBST\_TX\_ANT}$ 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}.

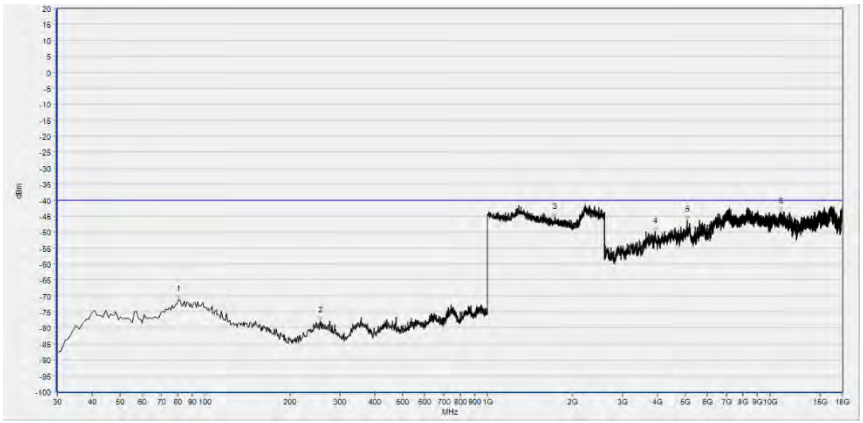
Note1: The power of the EUT transmitting frequency should be ignored.

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.

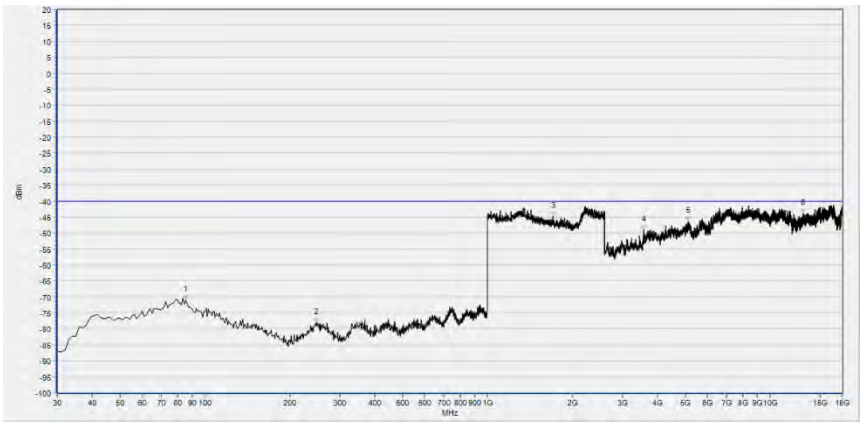
Note3: All bandwidth and modulation were considered and evaluated respectively by performing full test for each band, only the worst cases (Max Bandwidth and QPSK mode) were recorded in this test report.

Note4: N/A means the frequency is the basic frequency or the base station frequency, they are no need to verdict.

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

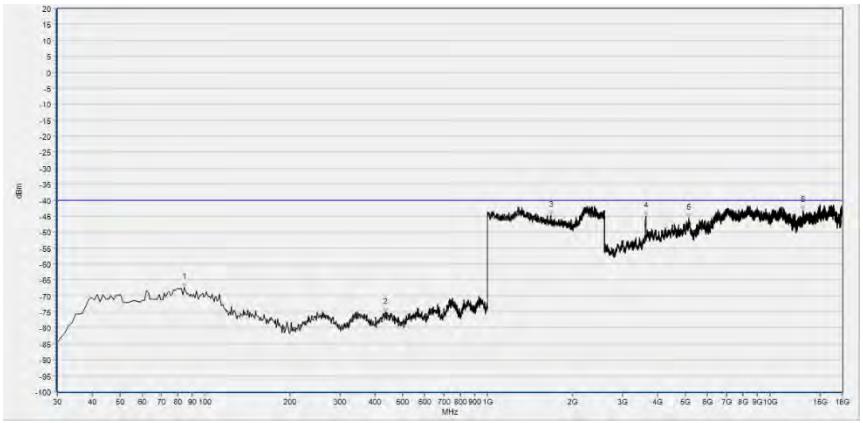


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.490	-71.11	-40.00	Horizontal	PASS
2	257.207	-77.80	-40.00	Horizontal	PASS
3	1731.932	-45.49	-40.00	Horizontal	PASS
4	3927.746	-49.91	-40.00	Horizontal	PASS
5	5082.977	-46.29	-40.00	Horizontal	PASS
6	10933.067	-43.68	-40.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	85.345	-71.01	-40.00	Vertical	PASS
2	247.497	-78.17	-40.00	Vertical	PASS
3	1707.908	-44.90	-40.00	Vertical	PASS
4	3576.555	-49.12	-40.00	Vertical	PASS
5	5138.428	-46.44	-40.00	Vertical	PASS
6	13077.175	-44.00	-40.00	Vertical	PASS

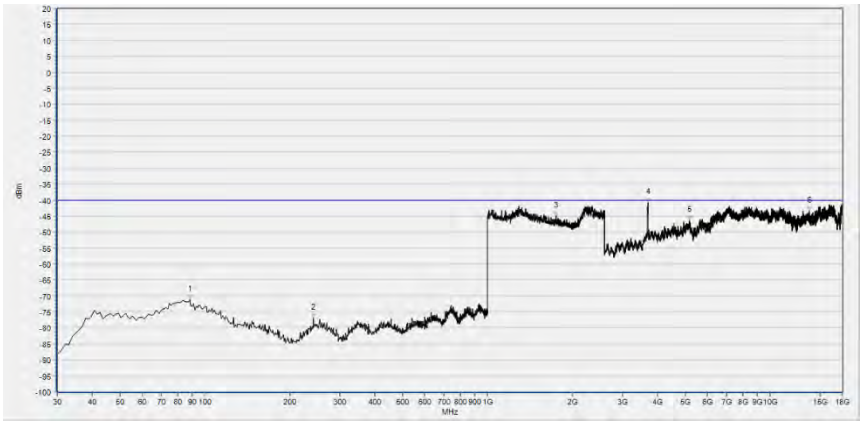
LTE Band 48, 20MHz BW, Mid Channel, QPSK



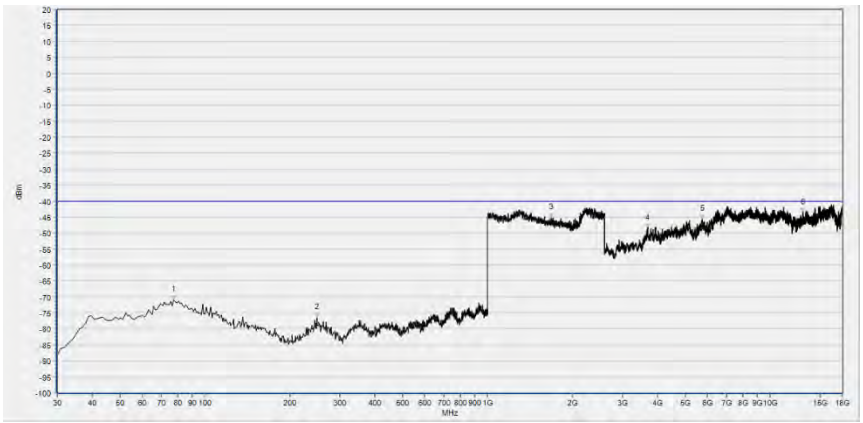
No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	84.374	-67.28	-40.00	Horizontal	PASS
2	435.866	-75.23	-40.00	Horizontal	PASS
3	1674.274	-44.78	-40.00	Horizontal	PASS
4	3628.926	-45.11	-40.00	Horizontal	N/A
5	5166.153	-45.63	-40.00	Horizontal	PASS
6	13089.498	-43.20	-40.00	Horizontal	PASS

No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	78.549	-69.55	-40.00	Vertical	PASS
2	265.946	-77.81	-40.00	Vertical	PASS
3	1869.670	-45.07	-40.00	Vertical	PASS
4	3678.216	-48.81	-40.00	Vertical	PASS
5	5181.556	-45.91	-40.00	Vertical	PASS
6	11767.914	-43.04	-40.00	Vertical	PASS

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



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	88.258	-71.11	-40.00	Horizontal	PASS
2	241.672	-77.08	-40.00	Horizontal	PASS
3	1744.745	-45.12	-40.00	Horizontal	PASS
4	3696.699	-40.71	-40.00	Horizontal	PASS
5	5178.476	-46.45	-40.00	Horizontal	PASS
6	13757.992	-43.53	-40.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	77.578	-71.03	-40.00	Vertical	PASS
2	248.468	-76.58	-40.00	Vertical	PASS
3	1679.079	-45.36	-40.00	Vertical	PASS
4	3681.296	-48.71	-40.00	Vertical	N/A
5	5745.309	-45.74	-40.00	Vertical	PASS
6	13074.095	-43.60	-40.00	Vertical	PASS

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	±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 C63.10-2013and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
EXA Signal Analzyer	MY51511149	N9020A	Agilent	2021.07.26	2022.07.25
USB Power Sensor	MY54210011	U2021XA	Agilent	2020.10.23	2021.10.22
System Simulator	6200995016	MT8820C	Anritsu	2020.10.28	2021.10.27
System Simulator	6261830572	MT8821C	Anritsu	2021.02.25	2022.02.24
Temperature Chamber	20171112102	HZ-2019	Dongguan Lixian Instrument Technology Co., Ltd	2020.10.26	2021.10.25

4.2 List of Software Used

Description	Manufacturer	Software Version
Morlab FCC Test System	MORLAB	V2.8
MORLAB EMCR V1.2	MORLAB	V1.0

4.3 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
System Simulator	152038	CMW500	R&S	2020.11.19	2021.11.18
System Simulator	6200995016	MT8820C	Anritsu	2020.10.28	2021.10.27
Receiver	MY54130016	N9038A	Agilent	2021.07.16	2022.07.15
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2019.07.26	2022.07.25
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2019.07.26	2022.07.25
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-40GHz)	CB05	EMC05	Morlab	N/A	N/A
1-18GHz pre-Amplifier	61171/61172	S020180L3203	Tonscend	2021.07.16	2022.07.15
18-26.5GHz pre-Amplifier	46732	S10M100L3802	Tonscend	2021.07.16	2022.07.15
26-40GHz pre-Amplifier	56774	S40M400L4002	Tonscend	2021.07.16	2022.07.15
Notch Filter	N/A	WRCGV -LTE B48	Wainwright	2021.07.16	2022.07.15
Anechoic Chamber	N/A	9m*6m*6m	CRT	2019.07.13	2022.07.12

END OF REPORT