TEST REPORT

APPLICANT	:	Acer Incorporated
PRODUCT NAME	:	Acer Connect
MODEL NAME	:	M3
BRAND NAME	:	Acer
FCC ID	:	HLZM3
STANDARD(S)	:	47 CFR Part 2 47 CFR Part 96
RECEIPT DATE	:	2022-11-10
TEST DATE	:	2022-11-14 to 2022-12-26
ISSUE DATE	:	2023-03-06

Edited by: Peng Mi (Rapporteur)

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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 ····· 24
2.3. Frequency Stability ····· 32
2.4. Peak to Average Radio ····· 34
2.5. Conducted Spurious Emissions ····· 42
2.6. Band Edge ····· 55
2.7. Radiated Spurious Emissions ····· 61
Annex A Test Uncertainty ····· 70
Annex B Testing Laboratory Information ····· 71

Change History		
Version	Date	Reason for change
1.0	2023-03-06	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Acer Incorporated
Applicant Address:	8F, 88, Sec. 1, Xintai 5th Rd. Xizhi, New Taipei City 221 Taiwan
Manufacturer:	Acer Incorporated
Manufacturer Address:	8F, 88, Sec. 1, Xintai 5th Rd. Xizhi, New Taipei City 221 Taiwan

1.2. Equipment Under Test (EUT) Description

Product Name:	Acer Connect	
Sample No.:	9#,11#	
Hardware Version:	L30-MB-V1.1	
Software Version:	ASW2106_UN_1201_T0054	
Modulation Type:	QPSK, 16QAM, 64QAM	
Operation Band:	Band 42 / 48	
Frequency Range:	LTE Band 42	Tx: 3550MHz–3600MHz
		Rx: 3550MHz–3600MHz
	LTE Band 48	Tx: 3550MHz–3700MHz
		Rx: 3550MHz–3700MHz
Channel Bandwidth	LTE Band 42	5MHz, 10MHz, 15MHz, 20MHz
	LTE Band 48	5MHz, 10MHz, 15MHz, 20MHz
Antenna Type:	PIFA Antenna	
Antenna Gain:	LTE Band 42	1.88dBi
	LTE Band 48	1.90dBi
Accessory Information:	Battery	
	Brand Name:	N/A
	Model No.:	765395
	Serial No.:	N/A
	Capacity:	6500mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
	Manufacturer:	Huizhou Highpower Technology Co., Ltd.

Note 1: There is no test for LTE B42 due to the band is completely covered by LTE B48 and its power level setting also same as LTE B48.

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 42	**Maximum E.R.P./E.I.R.P. (W)**		
BW(MHz)	QPSK	16QAM	64QAM
20	0.184	0.145	0.148
15	0.181	0.145	0.148
10	0.183	0.147	0.146
5	0.182	0.146	0.142

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	0.193	0.154	0.152	18M0G7D	17M9W7D	18M0W7D
15	0.191	0.156	0.156	13M5G7D	13M5W7D	13M5W7D
10	0.188	0.158	0.151	8M97G7D	8M98W7D	9M00W7D
5	0.185	0.161	0.153	4M50G7D	4M50W7D	4M51W7D

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	Nov. 25, 2022	Chen Hao	PASS	No deviation
2.1049	Occupied Bandwidth	Nov. 18, 2022	Li Huaijie	PASS	No deviation
96.41(g)	Peak -Average Ratio	Nov. 17, 2022	Li Huaijie	PASS	No deviation
2.1055	Frequency Stability	Nov. 17, 2022	Li Huaijie	PASS	No deviation
2.1051, 96.41(e)	Conducted Spurious Emissions	Nov. 17, 2022	Li Huaijie	PASS	No deviation
2.1051, 96.41(e)	Band Edge	Nov. 17, 2022	Li Huaijie	PASS	No deviation
2.1051, 96.41(e)	Radiated Spurious Emissions	Dec. 26, 2022	Gao Jianrou	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 and ANSI/TIA-603-E-2016.

Note 2: 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 3: 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 4: 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

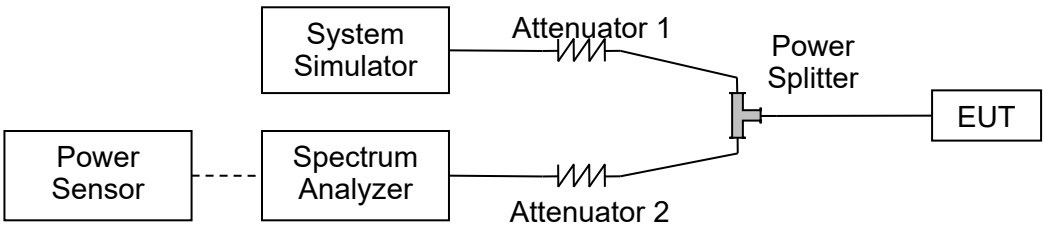
According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current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

Additional requirement, the maximum effective isotropic radiated power (EIRP) limit for 15MHz bandwidth is 24.76dBm, and for 20MHz bandwidth is 26.00dBm.

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 42						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				43190	43340	43490
Frequency (MHz)				3590	3575	3590
20	QPSK	1	0	20.73	20.76	20.74
20	QPSK	1	49	20.66	20.75	20.53
20	QPSK	1	99	20.59	20.47	20.71
20	QPSK	50	0	19.70	19.75	19.62
20	QPSK	50	24	19.47	19.67	19.47
20	QPSK	50	50	19.66	19.63	19.59
20	QPSK	100	0	19.64	19.68	19.66
20	16QAM	1	0	19.67	19.72	19.67
20	16QAM	1	49	19.69	19.65	19.52
20	16QAM	1	99	19.43	19.53	19.63
20	16QAM	50	0	18.70	18.78	18.69
20	16QAM	50	24	18.60	18.73	18.63
20	16QAM	50	50	18.66	18.65	18.73
20	16QAM	100	0	18.56	18.53	18.48
20	64QAM	1	0	19.78	19.81	19.63
20	64QAM	1	49	19.58	19.59	19.58
20	64QAM	1	99	19.48	19.55	19.46
20	64QAM	50	0	18.57	18.85	18.58
20	64QAM	50	24	18.40	18.54	18.50
20	64QAM	50	50	18.52	18.42	18.66
20	64QAM	100	0	18.56	18.68	18.74

LTE Band 42						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				43165	43340	43515
Frequency (MHz)				3557.5	3575	3592.5
15	QPSK	1	0	20.68	20.70	20.67
15	QPSK	1	37	20.66	20.56	20.57
15	QPSK	1	74	20.62	20.46	20.42
15	QPSK	36	0	19.60	19.72	19.62
15	QPSK	36	20	19.65	19.56	19.49
15	QPSK	36	39	19.59	19.59	19.56
15	QPSK	75	0	19.45	19.49	19.48
15	16QAM	1	0	19.70	19.71	19.63
15	16QAM	1	37	19.66	19.53	19.61
15	16QAM	1	74	19.72	19.67	19.44
15	16QAM	36	0	18.70	18.71	18.74
15	16QAM	36	20	18.78	18.76	18.73
15	16QAM	36	39	18.51	18.68	18.70
15	16QAM	75	0	18.62	18.59	18.81
15	64QAM	1	0	19.77	19.70	19.83
15	64QAM	1	37	19.54	19.44	19.77
15	64QAM	1	74	19.71	19.49	19.69
15	64QAM	36	0	18.88	18.60	18.83
15	64QAM	36	20	18.70	18.76	18.54
15	64QAM	36	39	18.42	18.48	18.67
15	64QAM	75	0	18.81	18.41	18.60

LTE Band 42						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				43140	43340	43540
Frequency (MHz)				3555	3575	3595
10	QPSK		0	20.69	20.74	20.61
10	QPSK	1	25	20.58	20.67	20.67
10	QPSK	1	49	20.66	20.68	20.51
10	QPSK	25	0	19.70	19.76	19.61
10	QPSK	25	12	19.64	19.57	19.58
10	QPSK	25	25	19.63	19.56	19.68
10	QPSK	50	0	19.68	19.55	19.68
10	16QAM	1	0	19.74	19.78	19.73
10	16QAM	1	25	19.47	19.80	19.60
10	16QAM	1	49	19.53	19.67	19.44
10	16QAM	25	0	18.77	18.80	18.60
10	16QAM	25	12	18.60	18.67	18.71
10	16QAM	25	25	18.66	18.61	18.73
10	16QAM	50	0	18.71	18.54	18.45
10	64QAM	1	0	19.66	19.75	19.74
10	64QAM	1	25	19.43	19.52	19.64
10	64QAM	1	49	19.62	19.50	19.50
10	64QAM	25	0	18.69	18.75	18.77
10	64QAM	25	12	18.67	18.70	18.70
10	64QAM	25	25	18.49	18.50	18.71
10	64QAM	50	0	18.46	18.41	18.63

LTE Band 42						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				43115	43340	43565
Frequency (MHz)				3552.5	3575	3597.5
5	QPSK	1	0	20.59	20.72	20.71
5	QPSK	1	12	20.54	20.65	20.67
5	QPSK	1	24	20.66	20.53	20.50
5	QPSK	12	0	19.74	19.79	19.77
5	QPSK	12	7	19.54	19.76	19.55
5	QPSK	12	13	19.70	19.62	19.48
5	QPSK	25	0	19.61	19.64	19.50
5	16QAM	1	0	19.76	19.70	19.77
5	16QAM	1	12	19.66	19.73	19.68
5	16QAM	1	24	19.50	19.48	19.40
5	16QAM	12	0	18.81	18.81	18.52
5	16QAM	12	7	18.58	18.65	18.57
5	16QAM	12	13	18.58	18.80	18.71
5	16QAM	25	0	18.50	18.68	18.65
5	64QAM	1	0	19.65	19.55	19.60
5	64QAM	1	12	19.53	19.51	19.49
5	64QAM	1	24	19.35	19.60	19.38
5	64QAM	12	0	18.88	18.64	18.87
5	64QAM	12	7	18.76	18.50	18.59
5	64QAM	12	13	18.43	18.70	18.59
5	64QAM	25	0	18.59	18.62	18.65

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	20.63	20.95	20.54
20	QPSK	1	49	20.58	20.70	20.61
20	QPSK	1	99	20.44	20.55	20.55
20	QPSK	50	0	19.78	19.72	19.50
20	QPSK	50	24	19.78	19.76	19.59
20	QPSK	50	50	19.89	19.78	19.74
20	QPSK	100	0	19.61	19.67	19.62
20	16QAM	1	0	19.58	19.97	19.68
20	16QAM	1	49	19.61	19.53	19.88
20	16QAM	1	99	19.47	19.98	19.69
20	16QAM	50	0	18.97	18.81	18.62
20	16QAM	50	24	18.96	18.94	18.96
20	16QAM	50	50	18.83	18.99	18.68
20	16QAM	100	0	18.90	19.03	19.02
20	64QAM	1	0	19.79	19.92	19.68
20	64QAM	1	49	19.67	19.88	19.49
20	64QAM	1	99	19.79	19.77	19.52
20	64QAM	50	0	18.48	18.74	18.66
20	64QAM	50	24	18.53	18.89	18.52
20	64QAM	50	50	18.54	18.74	18.43
20	64QAM	100	0	18.63	18.82	18.55

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	20.75	20.91	20.44
15	QPSK	1	37	20.76	20.56	20.61
15	QPSK	1	74	20.52	20.36	20.68
15	QPSK	36	0	19.70	19.70	19.30
15	QPSK	36	20	19.82	19.88	19.75
15	QPSK	36	39	19.77	19.87	19.61
15	QPSK	75	0	19.49	19.56	19.45
15	16QAM	1	0	19.70	19.94	19.58
15	16QAM	1	37	19.64	19.47	20.02
15	16QAM	1	74	19.65	20.01	19.49
15	16QAM	36	0	18.81	18.65	18.71
15	16QAM	36	20	19.00	19.04	18.91
15	16QAM	36	39	19.03	18.90	18.57
15	16QAM	75	0	18.89	19.12	18.85
15	64QAM	1	0	19.98	20.04	19.61
15	64QAM	1	37	19.56	19.94	19.69
15	64QAM	1	74	19.96	19.86	19.70
15	64QAM	36	0	18.65	18.91	18.68
15	64QAM	36	20	18.58	18.82	18.35
15	64QAM	36	39	18.52	18.69	18.33
15	64QAM	75	0	18.63	18.82	18.55

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	20.65	20.85	20.67
10	QPSK	1	25	20.63	20.43	20.56
10	QPSK	1	49	20.37	20.48	20.37
10	QPSK	25	0	19.80	19.74	19.60
10	QPSK	25	12	19.95	19.69	19.59
10	QPSK	25	25	19.71	19.75	19.71
10	QPSK	50	0	19.71	19.85	19.51
10	16QAM	1	0	19.70	19.80	19.50
10	16QAM	1	25	19.75	19.36	19.92
10	16QAM	1	49	19.53	20.10	19.85
10	16QAM	25	0	19.17	18.84	18.52
10	16QAM	25	12	19.08	18.93	18.91
10	16QAM	25	25	18.69	18.93	18.49
10	16QAM	50	0	18.91	18.90	18.90
10	64QAM	1	0	19.88	19.79	19.59
10	64QAM	1	25	19.59	19.90	19.46
10	64QAM	1	49	19.79	19.79	19.57
10	64QAM	25	0	18.49	18.57	18.68
10	64QAM	25	12	18.67	18.89	18.64
10	64QAM	25	25	18.34	18.75	18.47
10	64QAM	50	0	18.63	18.82	18.55

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	20.66	20.78	20.45
5	QPSK	1	12	20.44	20.61	20.65
5	QPSK	1	24	20.50	20.45	20.49
5	QPSK	12	0	19.81	19.86	19.48
5	QPSK	12	7	19.74	19.89	19.63
5	QPSK	12	13	19.84	19.76	19.68
5	QPSK	25	0	19.43	19.80	19.74
5	16QAM	1	0	19.47	20.16	19.55
5	16QAM	1	12	19.76	19.69	19.71
5	16QAM	1	24	19.28	19.90	19.72
5	16QAM	12	0	18.88	18.69	18.74
5	16QAM	12	7	19.01	19.03	18.90
5	16QAM	12	13	18.71	18.80	18.54
5	16QAM	25	0	19.10	19.13	19.12
5	64QAM	1	0	19.69	19.88	19.53
5	64QAM	1	12	19.62	19.95	19.45
5	64QAM	1	24	19.85	19.70	19.60
5	64QAM	12	0	18.68	18.74	18.67
5	64QAM	12	7	18.43	19.00	18.46
5	64QAM	12	13	18.56	18.80	18.58
5	64QAM	25	0	18.63	18.82	18.55

Effective Radiated Power and Effective Isotropic Radiated Power:

LTE Band 42				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				41690		42590		43490	
Frequency (MHz)				3410		3500		3590	
				dBm	W	dBm	W	dBm	W
20	QPSK	1	0	22.61	0.182	22.64	0.184	22.62	0.183
20	QPSK	1	49	22.54	0.179	22.63	0.183	22.41	0.174
20	QPSK	1	99	22.47	0.177	22.35	0.172	22.59	0.182
20	QPSK	50	0	21.58	0.144	21.63	0.146	21.50	0.141
20	QPSK	50	24	21.35	0.136	21.55	0.143	21.35	0.136
20	QPSK	50	50	21.54	0.143	21.51	0.142	21.47	0.140
20	QPSK	100	0	21.52	0.142	21.56	0.143	21.54	0.143
20	16QAM	1	0	21.55	0.143	21.60	0.145	21.55	0.143
20	16QAM	1	49	21.57	0.144	21.53	0.142	21.40	0.138
20	16QAM	1	99	21.31	0.135	21.41	0.138	21.51	0.142
20	16QAM	50	0	20.58	0.114	20.66	0.116	20.57	0.114
20	16QAM	50	24	20.48	0.112	20.61	0.115	20.51	0.112
20	16QAM	50	50	20.54	0.113	20.53	0.113	20.61	0.115
20	16QAM	100	0	20.44	0.111	20.41	0.110	20.36	0.109
20	64QAM	1	0	21.66	0.147	21.69	0.148	21.51	0.142
20	64QAM	1	49	21.46	0.140	21.47	0.140	21.46	0.140
20	64QAM	1	99	21.36	0.137	21.43	0.139	21.34	0.136
20	64QAM	50	0	20.45	0.111	20.73	0.118	20.46	0.111
20	64QAM	50	24	20.28	0.107	20.42	0.110	20.38	0.109
20	64QAM	50	50	20.40	0.110	20.30	0.107	20.54	0.113
20	64QAM	100	0	20.44	0.111	20.56	0.114	20.62	0.115

LTE Band 42				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				41665		42590		43515	
Frequency (MHz)				3407.5		3500		3592.5	
				dBm	W	dBm	W	dBm	W
15	QPSK	1	0	22.56	0.180	22.58	0.181	22.55	0.180
15	QPSK	1	37	22.54	0.179	22.44	0.175	22.45	0.176
15	QPSK	1	74	22.50	0.178	22.34	0.171	22.30	0.170
15	QPSK	36	0	21.48	0.141	21.60	0.145	21.50	0.141
15	QPSK	36	20	21.53	0.142	21.44	0.139	21.37	0.137
15	QPSK	36	39	21.47	0.140	21.47	0.140	21.44	0.139
15	QPSK	75	0	21.33	0.136	21.37	0.137	21.36	0.137
15	16QAM	1	0	21.58	0.144	21.59	0.144	21.51	0.142
15	16QAM	1	37	21.54	0.143	21.41	0.138	21.49	0.141
15	16QAM	1	74	21.60	0.145	21.55	0.143	21.32	0.136
15	16QAM	36	0	20.58	0.114	20.59	0.115	20.62	0.115
15	16QAM	36	20	20.66	0.116	20.64	0.116	20.61	0.115
15	16QAM	36	39	20.39	0.109	20.56	0.114	20.58	0.114
15	16QAM	75	0	20.50	0.112	20.47	0.111	20.69	0.117
15	64QAM	1	0	21.65	0.146	21.58	0.144	21.71	0.148
15	64QAM	1	37	21.42	0.139	21.32	0.136	21.65	0.146
15	64QAM	1	74	21.59	0.144	21.37	0.137	21.57	0.144
15	64QAM	36	0	20.76	0.119	20.48	0.112	20.71	0.118
15	64QAM	36	20	20.58	0.114	20.64	0.116	20.42	0.110
15	64QAM	36	39	20.30	0.107	20.36	0.109	20.55	0.114
15	64QAM	75	0	20.69	0.117	20.29	0.107	20.48	0.112

LTE Band 42				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				41640		42590		43540	
Frequency (MHz)				3405		3500		3595	
				dBm	W	dBm	W	dBm	W
10	QPSK	1	0	22.57	0.181	22.62	0.183	22.49	0.177
10	QPSK	1	25	22.46	0.176	22.55	0.180	22.55	0.180
10	QPSK	1	49	22.54	0.179	22.56	0.180	22.39	0.173
10	QPSK	25	0	21.58	0.144	21.64	0.146	21.49	0.141
10	QPSK	25	12	21.52	0.142	21.45	0.140	21.46	0.140
10	QPSK	25	25	21.51	0.142	21.44	0.139	21.56	0.143
10	QPSK	50	0	21.56	0.143	21.43	0.139	21.56	0.143
10	16QAM	1	0	21.62	0.145	21.66	0.147	21.61	0.145
10	16QAM	1	25	21.35	0.136	21.68	0.147	21.48	0.141
10	16QAM	1	49	21.41	0.138	21.55	0.143	21.32	0.136
10	16QAM	25	0	20.65	0.116	20.68	0.117	20.48	0.112
10	16QAM	25	12	20.48	0.112	20.55	0.114	20.59	0.115
10	16QAM	25	25	20.54	0.113	20.49	0.112	20.61	0.115
10	16QAM	50	0	20.59	0.115	20.42	0.110	20.33	0.108
10	64QAM	1	0	21.54	0.143	21.63	0.146	21.62	0.145
10	64QAM	1	25	21.31	0.135	21.40	0.138	21.52	0.142
10	64QAM	1	49	21.50	0.141	21.38	0.137	21.38	0.137
10	64QAM	25	0	20.57	0.114	20.63	0.116	20.65	0.116
10	64QAM	25	12	20.55	0.114	20.58	0.114	20.58	0.114
10	64QAM	25	25	20.37	0.109	20.38	0.109	20.59	0.115
10	64QAM	50	0	20.34	0.108	20.29	0.107	20.51	0.112

LTE Band 42				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				41615		42590		43565	
Frequency (MHz)				3402.5		3500		3597.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	22.47	0.177	22.60	0.182	22.59	0.182
5	QPSK	1	12	22.42	0.175	22.53	0.179	22.55	0.180
5	QPSK	1	24	22.54	0.179	22.41	0.174	22.38	0.173
5	QPSK	12	0	21.62	0.145	21.67	0.147	21.65	0.146
5	QPSK	12	7	21.42	0.139	21.64	0.146	21.43	0.139
5	QPSK	12	13	21.58	0.144	21.50	0.141	21.36	0.137
5	QPSK	25	0	21.49	0.141	21.52	0.142	21.38	0.137
5	16QAM	1	0	21.64	0.146	21.58	0.144	21.65	0.146
5	16QAM	1	12	21.54	0.143	21.61	0.145	21.56	0.143
5	16QAM	1	24	21.38	0.137	21.36	0.137	21.28	0.134
5	16QAM	12	0	20.69	0.117	20.69	0.117	20.40	0.110
5	16QAM	12	7	20.46	0.111	20.53	0.113	20.45	0.111
5	16QAM	12	13	20.46	0.111	20.68	0.117	20.59	0.115
5	16QAM	25	0	20.38	0.109	20.56	0.114	20.53	0.113
5	64QAM	1	0	21.53	0.142	21.43	0.139	21.48	0.141
5	64QAM	1	12	21.41	0.138	21.39	0.138	21.37	0.137
5	64QAM	1	24	21.23	0.133	21.48	0.141	21.26	0.134
5	64QAM	12	0	20.76	0.119	20.52	0.113	20.75	0.119
5	64QAM	12	7	20.64	0.116	20.38	0.109	20.47	0.111
5	64QAM	12	13	20.31	0.107	20.58	0.114	20.47	0.111
5	64QAM	25	0	20.47	0.111	20.50	0.112	20.53	0.113

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	22.53	0.179	22.85	0.193	22.44	0.175
20	QPSK	1	49	22.48	0.177	22.60	0.182	22.51	0.178
20	QPSK	1	99	22.34	0.171	22.45	0.176	22.45	0.176
20	QPSK	50	0	21.68	0.147	21.62	0.145	21.40	0.138
20	QPSK	50	24	21.68	0.147	21.66	0.147	21.49	0.141
20	QPSK	50	50	21.79	0.151	21.68	0.147	21.64	0.146
20	QPSK	100	0	21.51	0.142	21.57	0.144	21.52	0.142
20	16QAM	1	0	21.48	0.141	21.87	0.154	21.58	0.144
20	16QAM	1	49	21.51	0.142	21.43	0.139	21.78	0.151
20	16QAM	1	99	21.37	0.137	21.88	0.154	21.59	0.144
20	16QAM	50	0	20.87	0.122	20.71	0.118	20.52	0.113
20	16QAM	50	24	20.86	0.122	20.84	0.121	20.86	0.122
20	16QAM	50	50	20.73	0.118	20.89	0.123	20.58	0.114
20	16QAM	100	0	20.80	0.120	20.93	0.124	20.92	0.124
20	64QAM	1	0	21.69	0.148	21.82	0.152	21.58	0.144
20	64QAM	1	49	21.57	0.144	21.78	0.151	21.39	0.138
20	64QAM	1	99	21.69	0.148	21.67	0.147	21.42	0.139
20	64QAM	50	0	20.38	0.109	20.64	0.116	20.56	0.114
20	64QAM	50	24	20.43	0.110	20.79	0.120	20.42	0.110
20	64QAM	50	50	20.44	0.111	20.64	0.116	20.33	0.108
20	64QAM	100	0	20.53	0.113	20.72	0.118	20.45	0.111

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	22.65	0.184	22.81	0.191	22.34	0.171
15	QPSK	1	37	22.66	0.185	22.46	0.176	22.51	0.178
15	QPSK	1	74	22.42	0.175	22.26	0.168	22.58	0.181
15	QPSK	36	0	21.60	0.145	21.60	0.145	21.20	0.132
15	QPSK	36	20	21.72	0.149	21.78	0.151	21.65	0.146
15	QPSK	36	39	21.67	0.147	21.77	0.150	21.51	0.142
15	QPSK	75	0	21.39	0.138	21.46	0.140	21.35	0.136
15	16QAM	1	0	21.60	0.145	21.84	0.153	21.48	0.141
15	16QAM	1	37	21.54	0.143	21.37	0.137	21.92	0.156
15	16QAM	1	74	21.55	0.143	21.91	0.155	21.39	0.138
15	16QAM	36	0	20.71	0.118	20.55	0.114	20.61	0.115
15	16QAM	36	20	20.90	0.123	20.94	0.124	20.81	0.121
15	16QAM	36	39	20.93	0.124	20.80	0.120	20.47	0.111
15	16QAM	75	0	20.79	0.120	21.02	0.126	20.75	0.119
15	64QAM	1	0	21.88	0.154	21.94	0.156	21.51	0.142
15	64QAM	1	37	21.46	0.140	21.84	0.153	21.59	0.144
15	64QAM	1	74	21.86	0.153	21.76	0.150	21.60	0.145
15	64QAM	36	0	20.55	0.114	20.81	0.121	20.58	0.114
15	64QAM	36	20	20.48	0.112	20.72	0.118	20.25	0.106
15	64QAM	36	39	20.42	0.110	20.59	0.115	20.23	0.105
15	64QAM	75	0	20.53	0.113	20.72	0.118	20.45	0.111

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	22.55	0.180	22.75	0.188	22.57	0.181
10	QPSK	1	25	22.53	0.179	22.33	0.171	22.46	0.176
10	QPSK	1	49	22.27	0.169	22.38	0.173	22.27	0.169
10	QPSK	25	0	21.70	0.148	21.64	0.146	21.50	0.141
10	QPSK	25	12	21.85	0.153	21.59	0.144	21.49	0.141
10	QPSK	25	25	21.61	0.145	21.65	0.146	21.61	0.145
10	QPSK	50	0	21.61	0.145	21.75	0.150	21.41	0.138
10	16QAM	1	0	21.60	0.145	21.70	0.148	21.40	0.138
10	16QAM	1	25	21.65	0.146	21.26	0.134	21.82	0.152
10	16QAM	1	49	21.43	0.139	22.00	0.158	21.75	0.150
10	16QAM	25	0	21.07	0.128	20.74	0.119	20.42	0.110
10	16QAM	25	12	20.98	0.125	20.83	0.121	20.81	0.121
10	16QAM	25	25	20.59	0.115	20.83	0.121	20.39	0.109
10	16QAM	50	0	20.81	0.121	20.80	0.120	20.80	0.120
10	64QAM	1	0	21.78	0.151	21.69	0.148	21.49	0.141
10	64QAM	1	25	21.49	0.141	21.80	0.151	21.36	0.137
10	64QAM	1	49	21.69	0.148	21.69	0.148	21.47	0.140
10	64QAM	25	0	20.39	0.109	20.47	0.111	20.58	0.114
10	64QAM	25	12	20.57	0.114	20.79	0.120	20.54	0.113
10	64QAM	25	25	20.24	0.106	20.65	0.116	20.37	0.109
10	64QAM	50	0	20.53	0.113	20.72	0.118	20.45	0.111

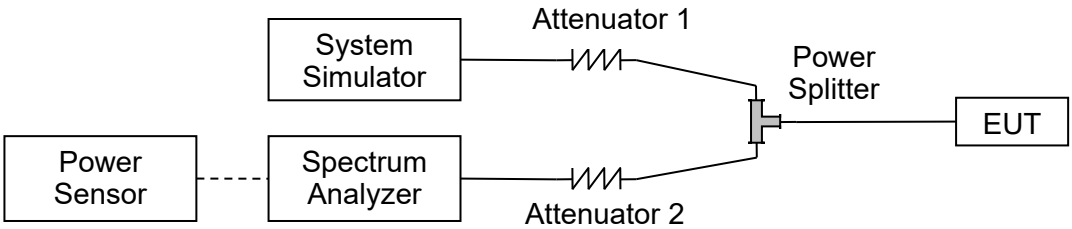
LTE Band 48				Measured E.I.R.P.					
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.		Middle Ch. / Freq.		High Ch. / Freq.	
Channel				55265		55990		56175	
Frequency (MHz)				3552.5		3625		3697.5	
				dBm	W	dBm	W	dBm	W
5	QPSK	1	0	22.56	0.180	22.68	0.185	22.35	0.172
5	QPSK	1	12	22.34	0.171	22.51	0.178	22.55	0.180
5	QPSK	1	24	22.40	0.174	22.35	0.172	22.39	0.173
5	QPSK	12	0	21.71	0.148	21.76	0.150	21.38	0.137
5	QPSK	12	7	21.64	0.146	21.79	0.151	21.53	0.142
5	QPSK	12	13	21.74	0.149	21.66	0.147	21.58	0.144
5	QPSK	25	0	21.33	0.136	21.70	0.148	21.64	0.146
5	16QAM	1	0	21.37	0.137	22.06	0.161	21.45	0.140
5	16QAM	1	12	21.66	0.147	21.59	0.144	21.61	0.145
5	16QAM	1	24	21.18	0.131	21.80	0.151	21.62	0.145
5	16QAM	12	0	20.78	0.120	20.59	0.115	20.64	0.116
5	16QAM	12	7	20.91	0.123	20.93	0.124	20.80	0.120
5	16QAM	12	13	20.61	0.115	20.70	0.117	20.44	0.111
5	16QAM	25	0	21.00	0.126	21.03	0.127	21.02	0.126
5	64QAM	1	0	21.59	0.144	21.78	0.151	21.43	0.139
5	64QAM	1	12	21.52	0.142	21.85	0.153	21.35	0.136
5	64QAM	1	24	21.75	0.150	21.60	0.145	21.50	0.141
5	64QAM	12	0	20.58	0.114	20.64	0.116	20.57	0.114
5	64QAM	12	7	20.33	0.108	20.90	0.123	20.36	0.109
5	64QAM	12	13	20.46	0.111	20.70	0.117	20.48	0.112
5	64QAM	25	0	20.53	0.113	20.72	0.118	20.45	0.111

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



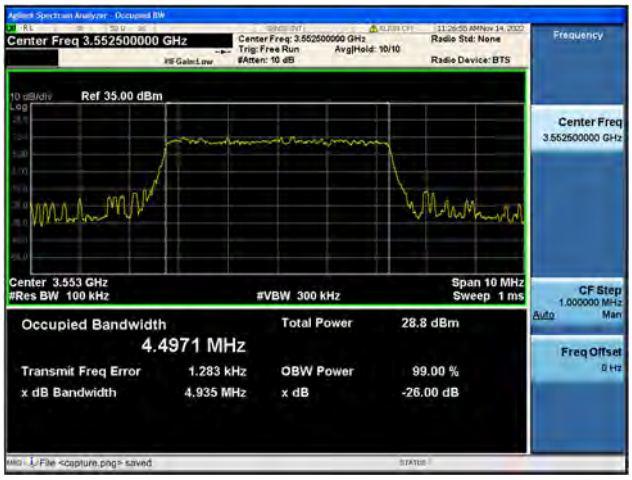
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

2.2.3.Test procedure

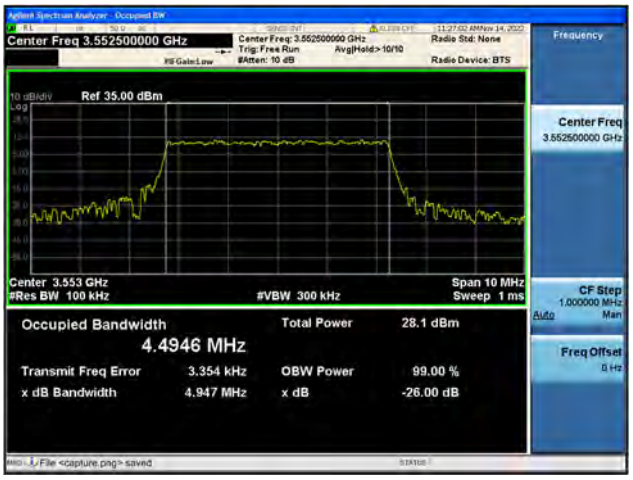
KDB 971168 D01v03 Section 4.1 and ANSI/TIA-603-E-2016.

2.2.4.Test Result

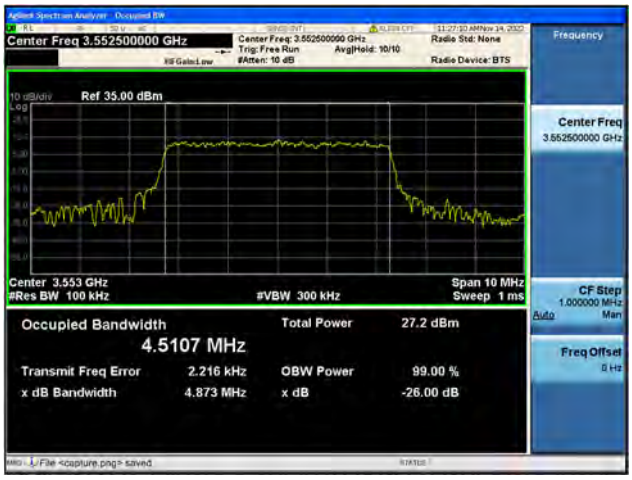
LTE Band 48				
BW(MHz)	Channel Level	Modulation	99% BW(MHz)	26dB BW(MHz)
5	Low	QPSK	4.50	4.94
	Low	16QAM	4.49	4.95
	Low	64QAM	4.51	4.87
	Mid	QPSK	4.50	4.84
	Mid	16QAM	4.49	5.06
	Mid	64QAM	4.49	4.81
	High	QPSK	4.50	4.93
	High	16QAM	4.50	4.89
	High	64QAM	4.49	4.80
10	Low	QPSK	8.97	9.75
	Low	16QAM	8.98	10.26
	Low	64QAM	9.00	10.58
	Mid	QPSK	8.97	9.56
	Mid	16QAM	8.98	9.70
	Mid	64QAM	8.99	10.06
	High	QPSK	8.96	9.80
	High	16QAM	8.98	9.83
	High	64QAM	8.98	10.68
15	Low	QPSK	13.47	15.43
	Low	16QAM	13.50	15.27
	Low	64QAM	13.48	14.68
	Mid	QPSK	13.48	15.04
	Mid	16QAM	13.44	14.40
	Mid	64QAM	13.40	14.57
	High	QPSK	13.45	14.98
	High	16QAM	13.41	14.86
	High	64QAM	13.43	15.35
20	Low	QPSK	17.94	20.05
	Low	16QAM	17.93	19.49
	Low	64QAM	17.95	19.79
	Mid	QPSK	17.93	19.34
	Mid	16QAM	17.94	19.39
	Mid	64QAM	17.96	19.31
	High	QPSK	17.96	19.75
	High	16QAM	17.93	19.27
	High	64QAM	17.96	19.28



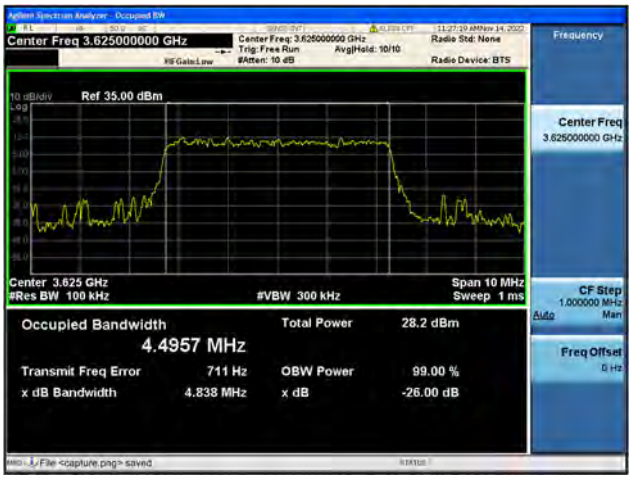
Band48 / 5MHz / QPSK/ Low CH



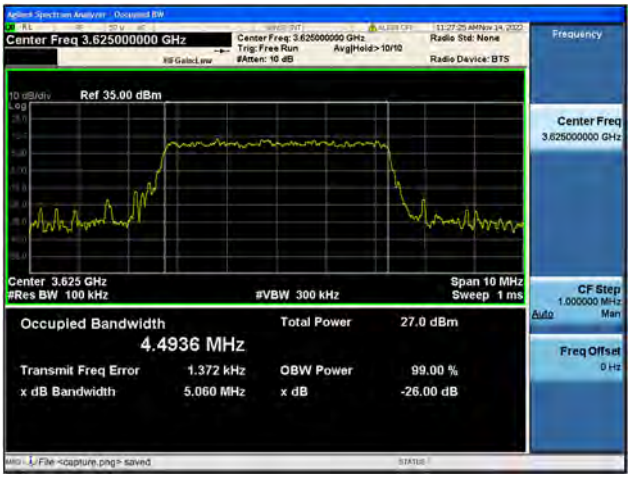
Band48 / 5MHz / 16QAM/ Low CH



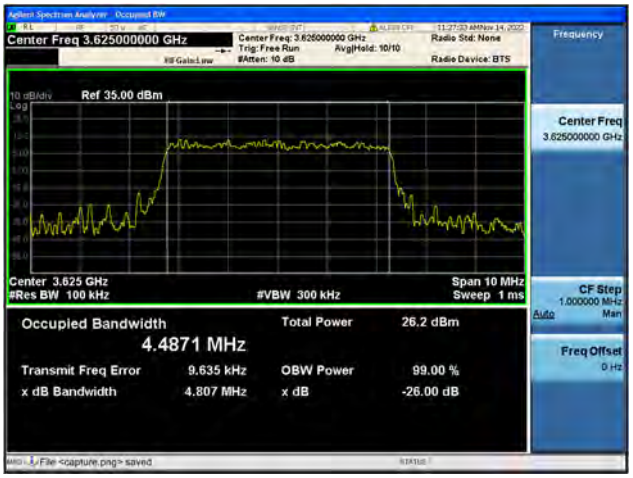
Band48 / 5MHz / 64QAM/ Low CH



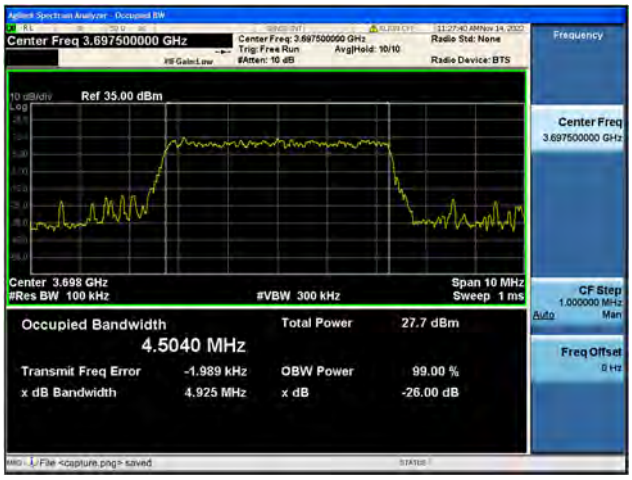
Band48 / 5MHz / QPSK/ Mid CH



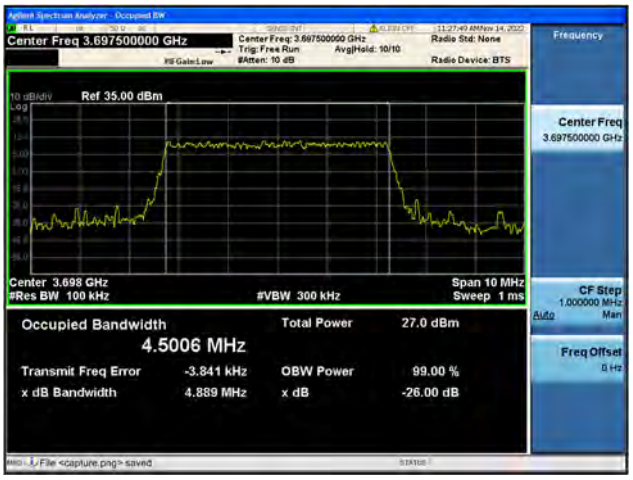
Band48 / 5MHz / 16QAM/ Mid CH



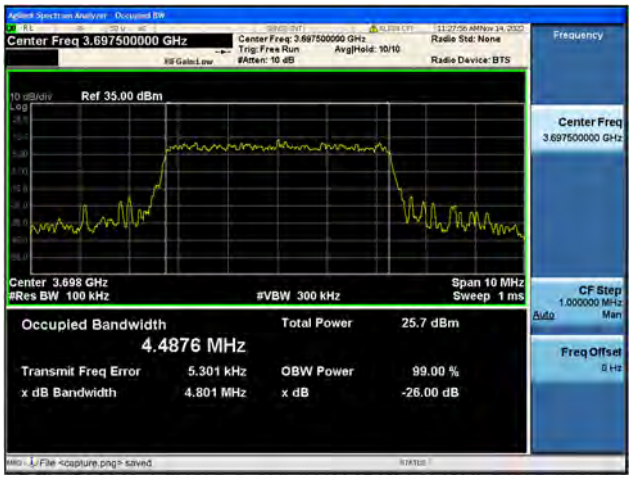
Band48 / 5MHz / 64QAM/ Mid CH



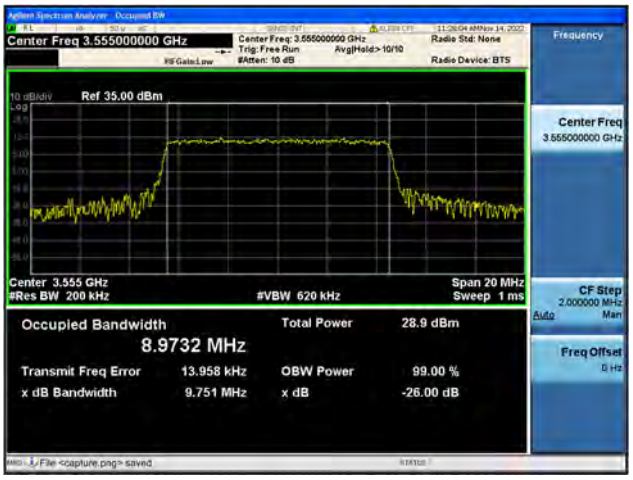
Band48 / 5MHz / QPSK/ High CH



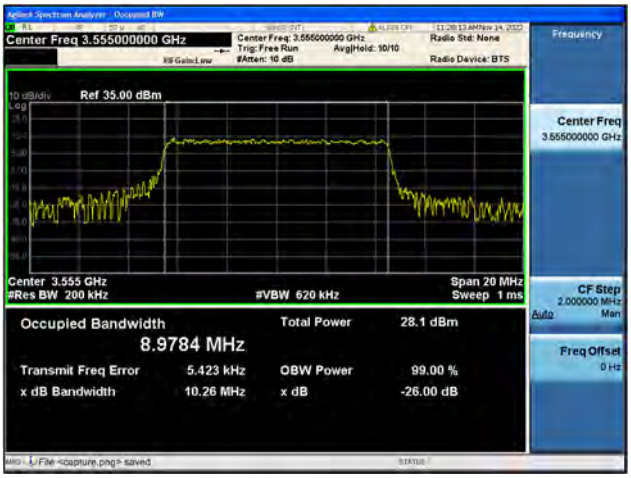
Band48 / 5MHz / 16QAM/ High CH



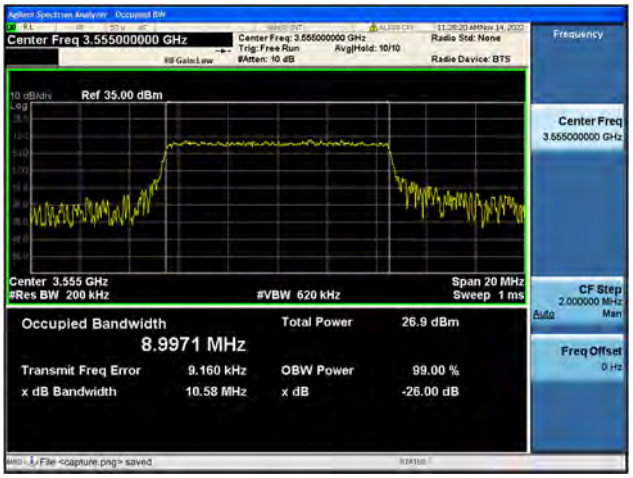
Band48 / 5MHz / 64QAM/ High CH



Band48 / 10MHz / QPSK/ Low CH

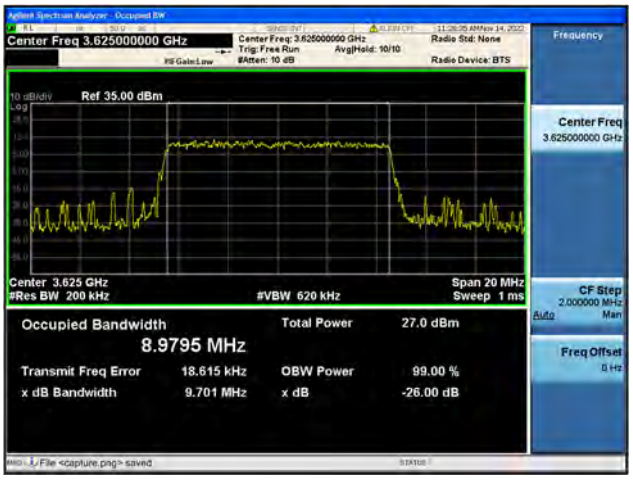


Band48 / 10MHz / 16QAM/ Low CH

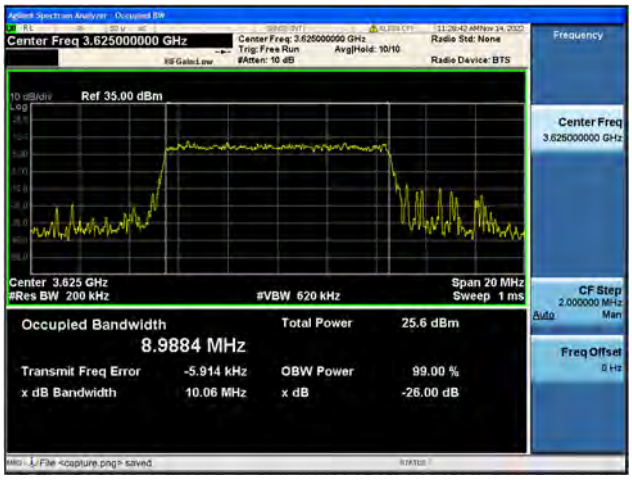


Band48 / 10MHz / 64QAM/ Low CH

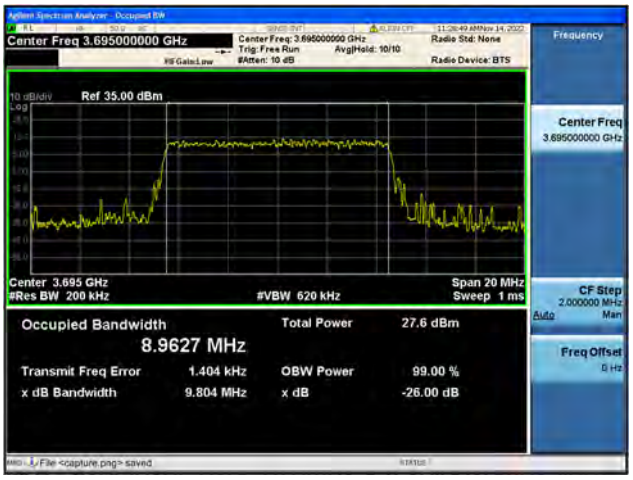
Band48 / 10MHz / QPSK/ Mid CH



Band48 / 10MHz / 16QAM/ Mid CH

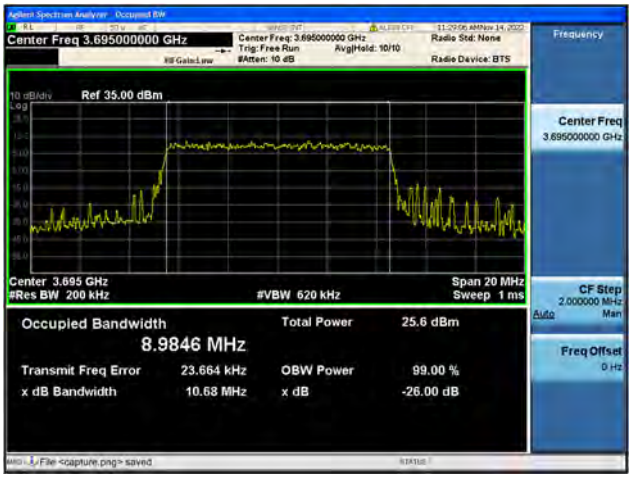


Band48 / 10MHz / 64QAM/ Mid CH



Band48 / 10MHz / QPSK/ High CH

Band48 / 10MHz / 16QAM/ High CH

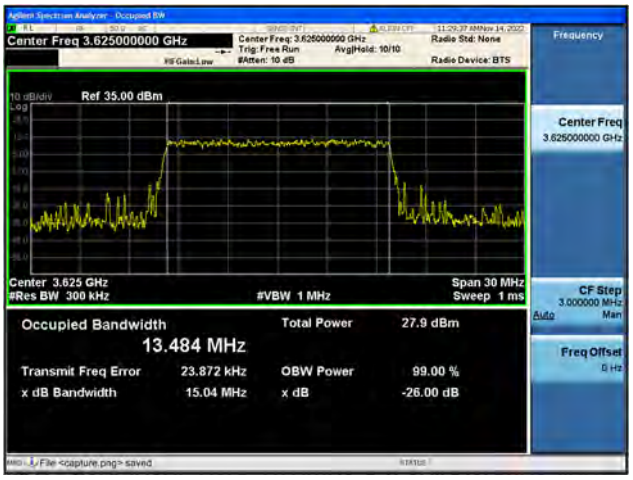


Band48 / 10MHz / 64QAM/ High CH

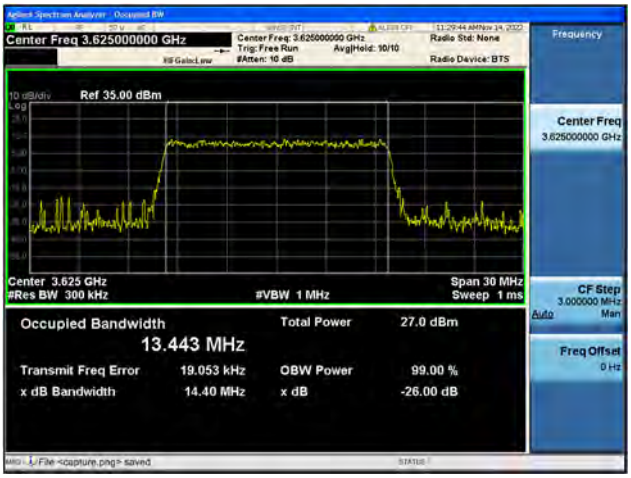
Band48 / 15MHz / QPSK/ Low CH

Band48 / 15MHz / 16QAM/ Low CH

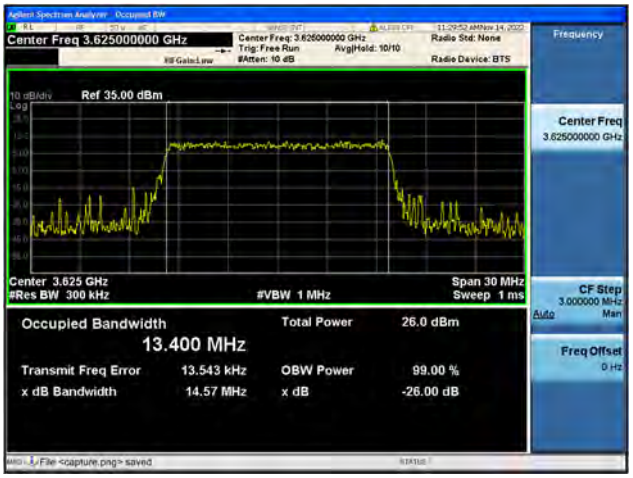
Band48 / 15MHz / 64QAM/ Low CH



Band48 / 15MHz / QPSK/ Mid CH

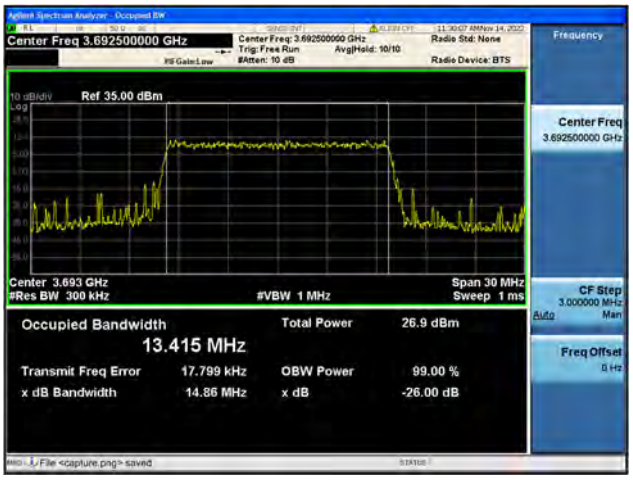


Band48 / 15MHz / 16QAM/ Mid CH

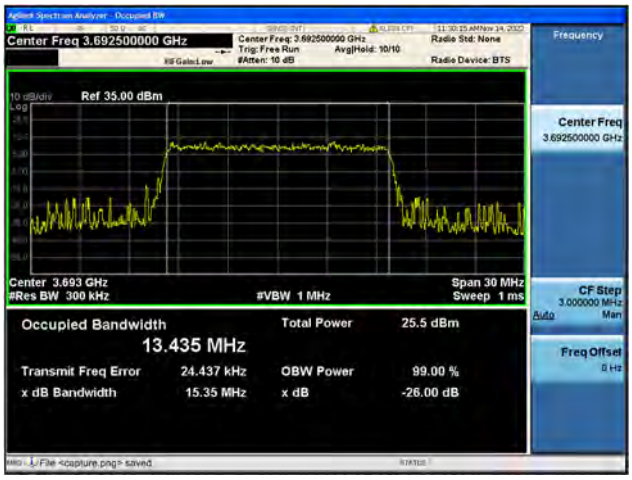


Band48 / 15MHz / 64QAM/ Mid CH

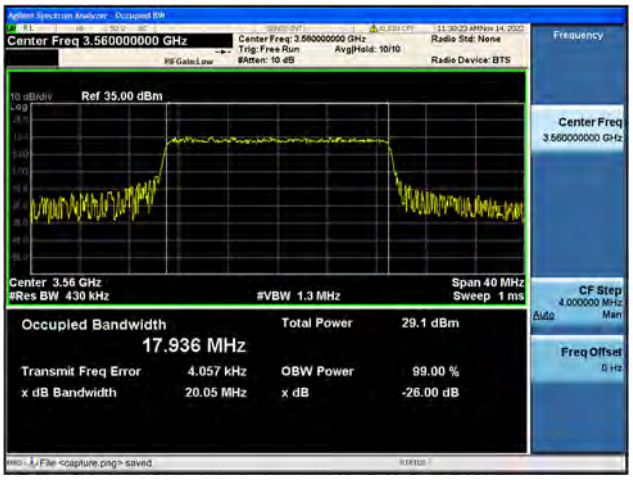
Band48 / 15MHz / QPSK/ High CH



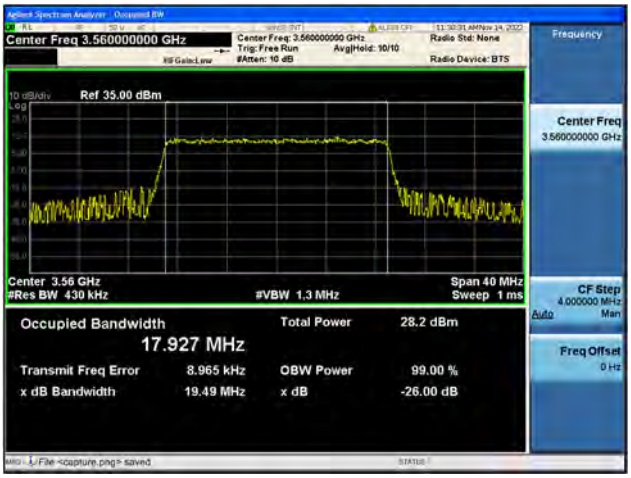
Band48 / 15MHz / 16QAM/ High CH



Band48 / 15MHz / 64QAM/ High CH



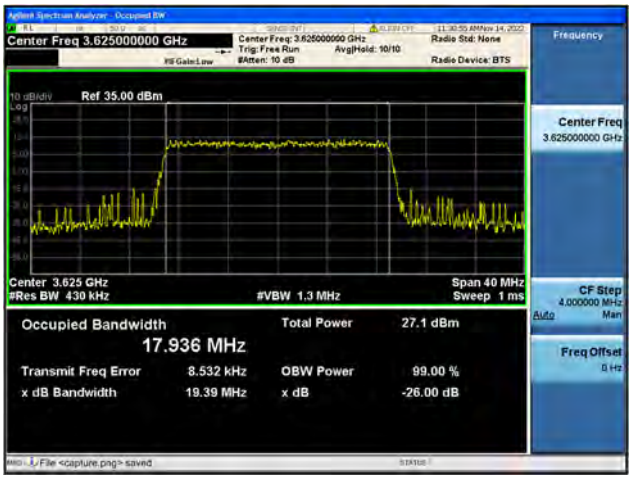
Band48 / 20MHz / QPSK/ Low CH



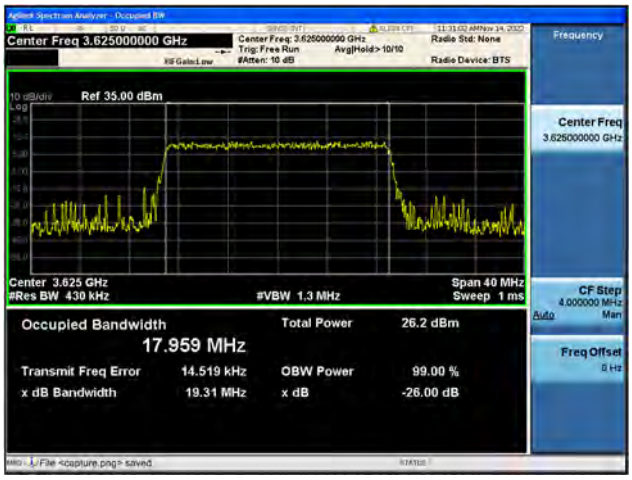
Band48 / 20MHz / 16QAM/ Low CH

Band48 / 20MHz / 64QAM/ Low CH

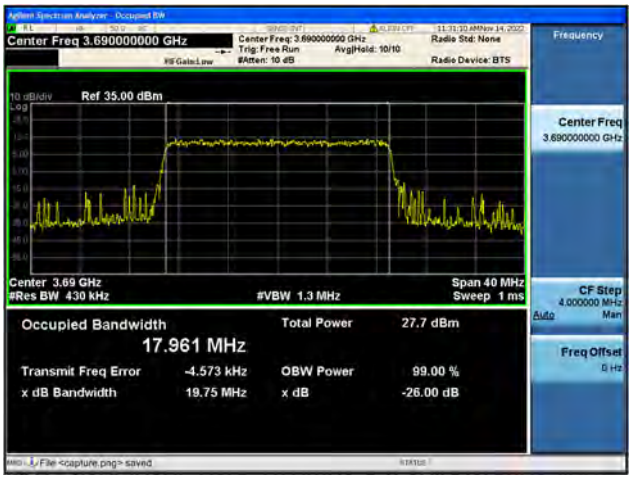
Band48 / 20MHz / QPSK/ Mid CH



Band48 / 20MHz / 16QAM/ Mid CH

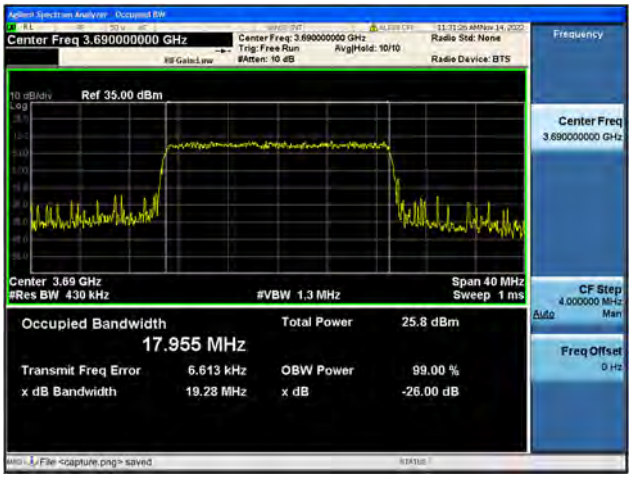


Band48 / 20MHz / 64QAM/ Mid CH



Band48 / 20MHz / QPSK/ High CH

Band48 / 20MHz / 16QAM/ High CH



Band48 / 20MHz / 64QAM/ High CH

2.3. Frequency Stability

2.3.1.Requirement

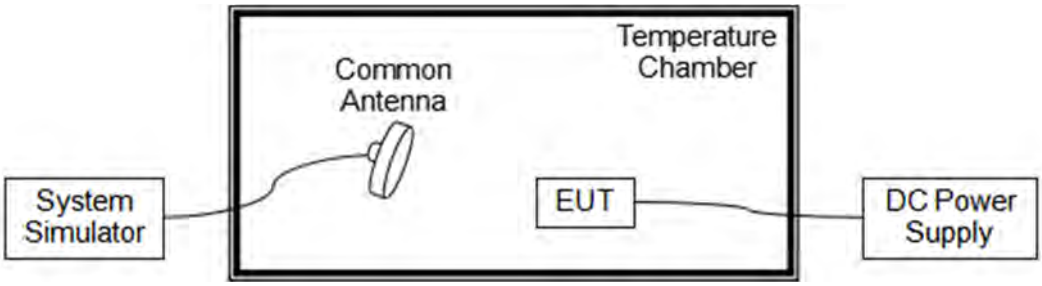
According to FCC section 2.1055 & 90.213, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

(a) The temperature is varied from -30°C to +50°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 45°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 3.65V, which are specified by the applicant; the normal temperature here used is 20°C.

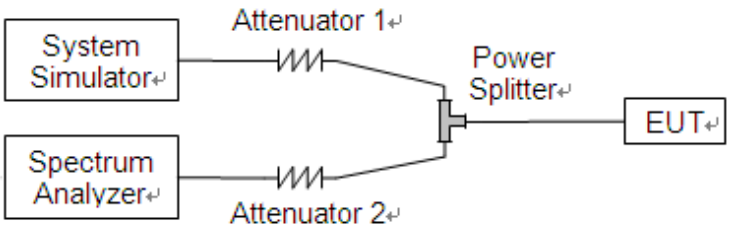
LTE Band 48, QPSK, Channel 55990, Frequency 3625.0MHz Limit =Within Authorized Band					
Voltage (%)	**Power (VDC)**	**Temp(°C)**	**Fre. Dev.(Hz)**	**Deviation (ppm)**	**Result**
Normal	3.85	+20(Ref)	26	0.007	PASS
Normal		0	-34	-0.009	
Normal		+10	51	0.014	
Normal		+20	-31	-0.009	
Normal		+30	-21	-0.006	
Normal		+40	-16	-0.004	
Normal		+45	-49	-0.014	
High	4.40	+20	40	0.011	
BATT.ENDPOINT	3.65	+20	-46	-0.013	

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



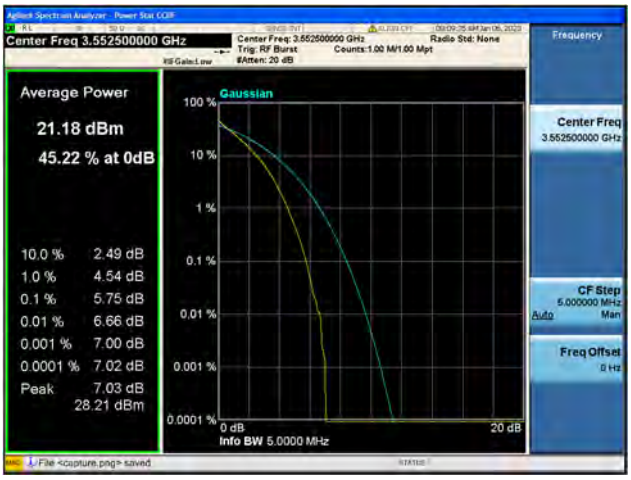
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum 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 48					
BW(MHz)	**Channel Level**	**Modulation**	**PAR Radio(dB)**	**Limit(dB)**	**Verdict**
5	Low	QPSK	5.75	<=13	PASS
	Low	16QAM	6.32	<=13	PASS
	Low	64QAM	7.99	<=13	PASS
	Mid	QPSK	5.72	<=13	PASS
	Mid	16QAM	6.29	<=13	PASS
	Mid	64QAM	7.29	<=13	PASS
	High	QPSK	5.83	<=13	PASS
	High	16QAM	6.42	<=13	PASS
	High	64QAM	7.51	<=13	PASS
10	Low	QPSK	5.66	<=13	PASS
	Low	16QAM	6.32	<=13	PASS
	Low	64QAM	6.68	<=13	PASS
	Mid	QPSK	5.72	<=13	PASS
	Mid	16QAM	6.37	<=13	PASS
	Mid	64QAM	6.67	<=13	PASS
	High	QPSK	5.77	<=13	PASS
	High	16QAM	6.38	<=13	PASS
	High	64QAM	6.66	<=13	PASS
15	Low	QPSK	5.62	<=13	PASS
	Low	16QAM	6.30	<=13	PASS
	Low	64QAM	6.62	<=13	PASS
	Mid	QPSK	5.72	<=13	PASS
	Mid	16QAM	6.32	<=13	PASS
	Mid	64QAM	6.63	<=13	PASS
	High	QPSK	5.72	<=13	PASS
	High	16QAM	6.36	<=13	PASS
	High	64QAM	6.64	<=13	PASS
20	Low	QPSK	5.71	<=13	PASS
	Low	16QAM	6.45	<=13	PASS
	Low	64QAM	6.59	<=13	PASS
	Mid	QPSK	5.80	<=13	PASS
	Mid	16QAM	6.49	<=13	PASS
	Mid	64QAM	6.62	<=13	PASS
	High	QPSK	5.75	<=13	PASS
	High	16QAM	6.50	<=13	PASS
	High	64QAM	6.62	<=13	PASS

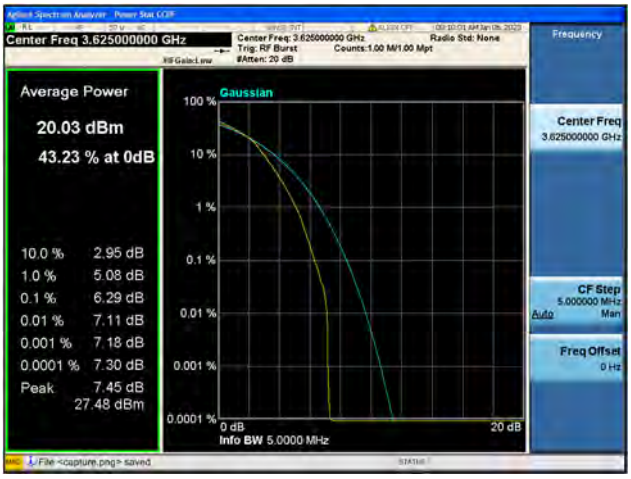


Band48 / 5MHz / Low CH / QPSK

Band48 / 5MHz / Low CH / 16QAM

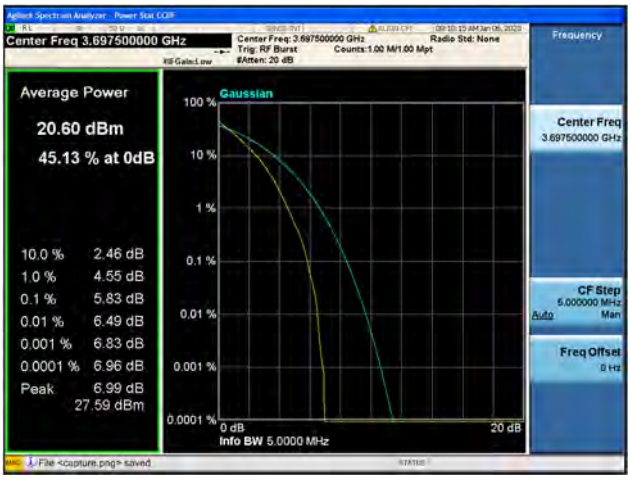
Band48 / 5MHz / Low CH / 64QAM

Band48 / 5MHz / Mid CH / QPSK



Band48 / 5MHz / Mid CH / 16QAM

Band48 / 5MHz / Mid CH / 64QAM



Band48 / 5MHz / High CH / QPSK

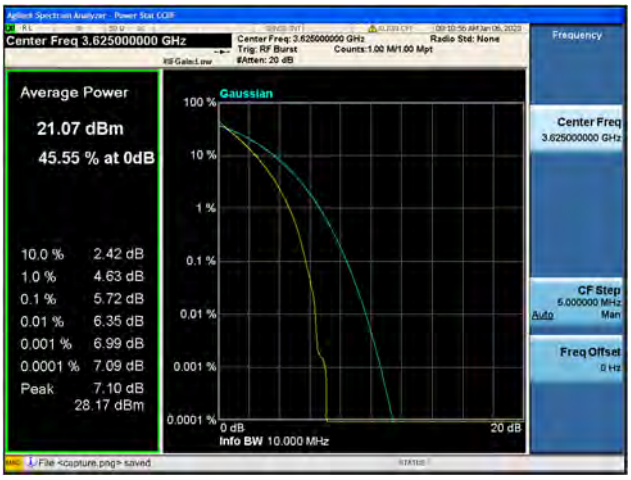
Band48 / 5MHz / High CH / 16QAM

Band48 / 5MHz / High CH / 64QAM

Band48 / 10MHz / Low CH / QPSK

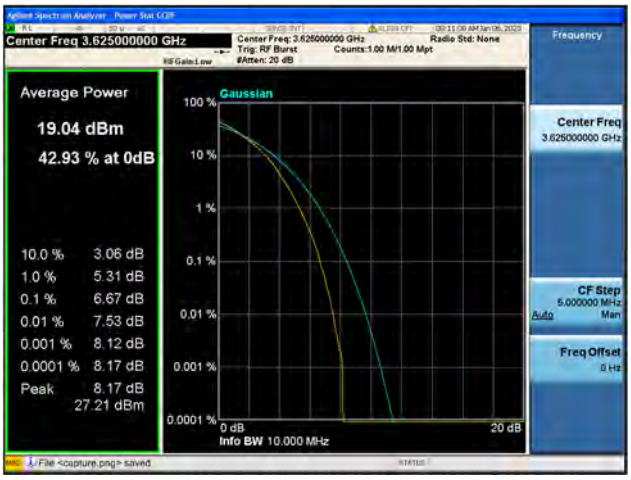
Band48 / 10MHz / Low CH / 16QAM

Band48 / 10MHz / Low CH / 64QAM



Band48 / 10MHz / Mid CH / QPSK

Band48 / 10MHz / Mid CH / 16QAM

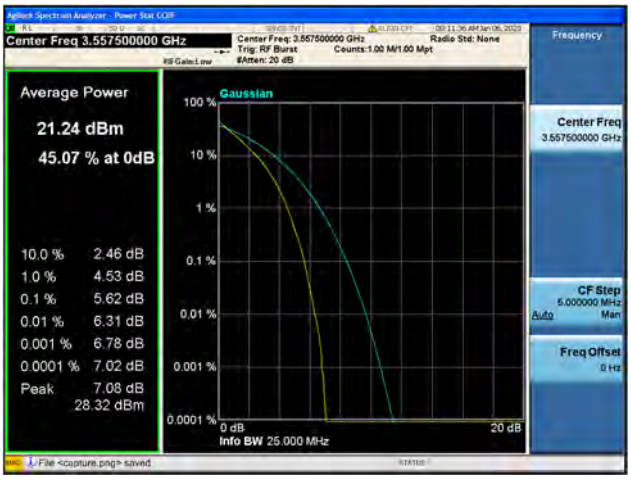


Band48 / 10MHz / Mid CH / 64QAM

Band48 / 10MHz / High CH / QPSK

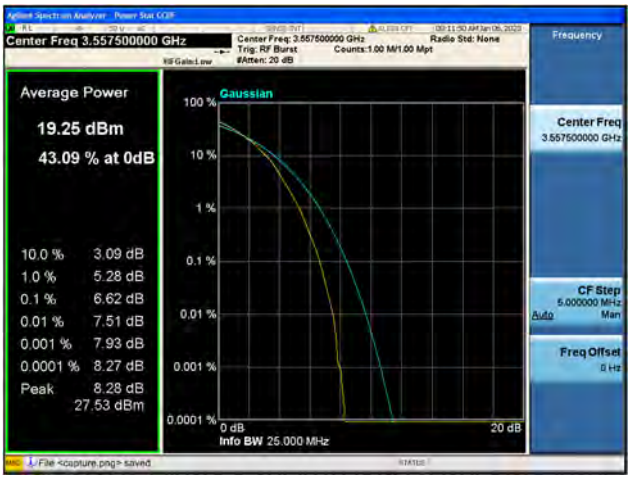
Band48 / 10MHz / High CH / 16QAM

Band48 / 10MHz / High CH / 64QAM



Band48 / 15MHz / Low CH / QPSK

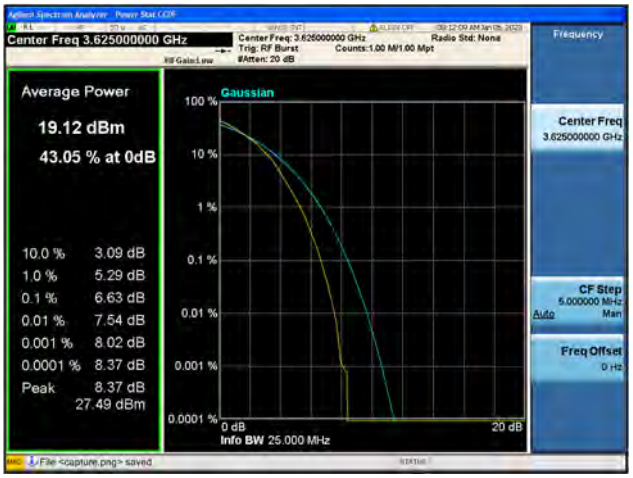
Band48 / 15MHz / Low CH / 16QAM



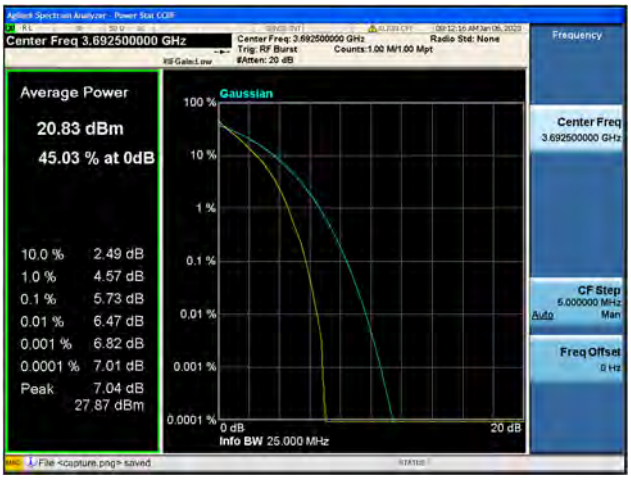
Band48 / 15MHz / Low CH / 64QAM

Band48 / 15MHz / Mid CH / QPSK

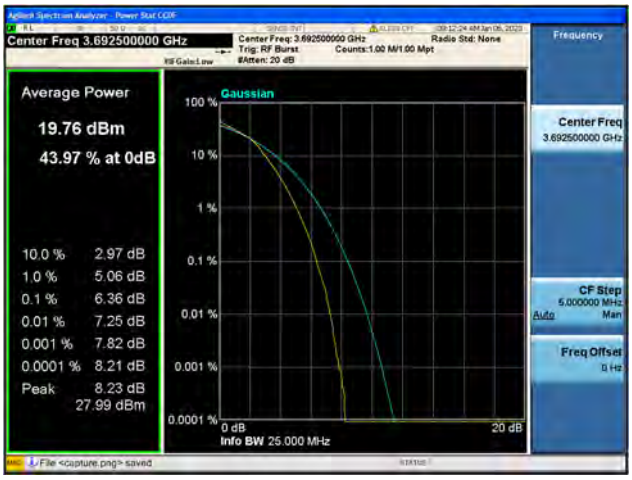
Band48 / 15MHz / Mid CH / 16QAM



Band48 / 15MHz / Mid CH / 64QAM



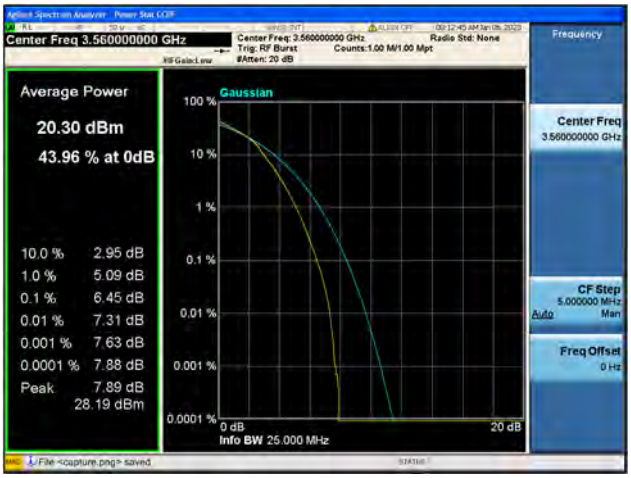
Band48 / 15MHz / High CH / QPSK



Band48 / 15MHz / High CH / 16QAM

Band48 / 15MHz / High CH / 64QAM

Band48 / 20MHz / Low CH / QPSK

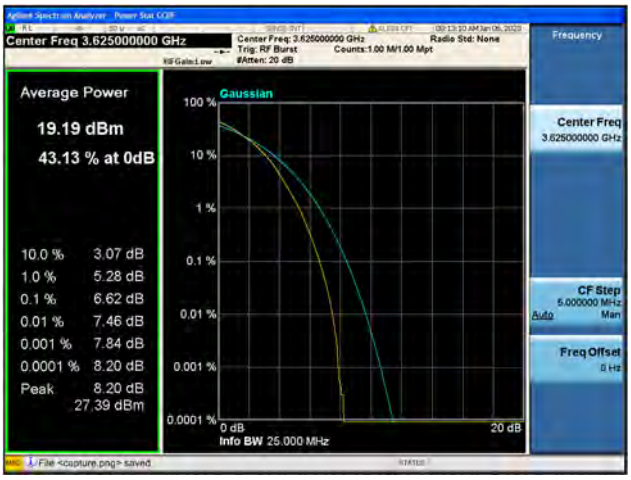


Band48 / 20MHz / Low CH / 16QAM

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

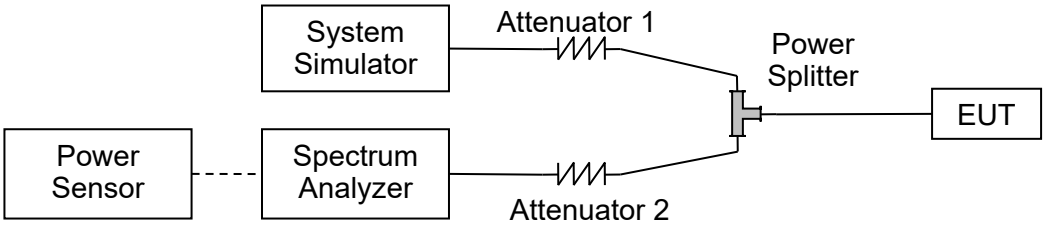
Band48 / 20MHz / High CH / 64QAM

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

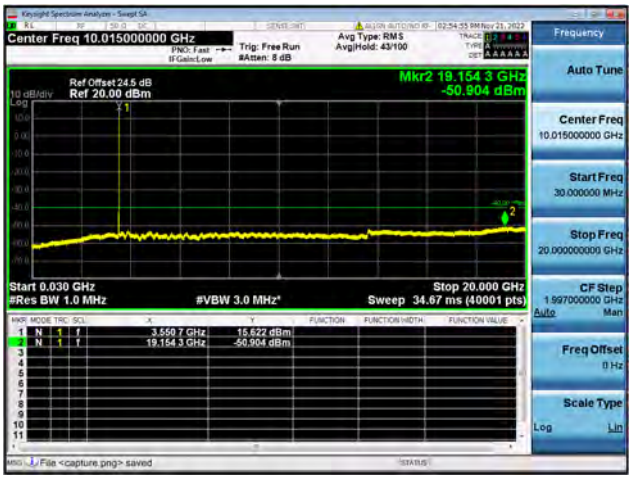


The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

2.5.1.Test procedure

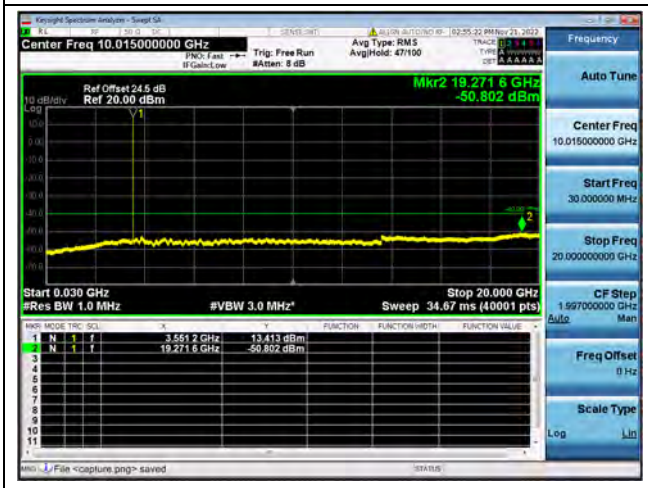
KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

2.5.2.Test Result



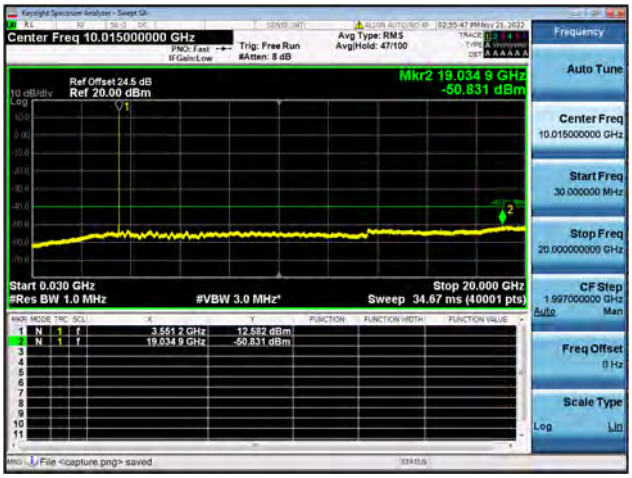
Band48-30M-20G / 5MHz / Low CH / QPSK

Band48-20G-37G / 5MHz / Low CH / QPSK



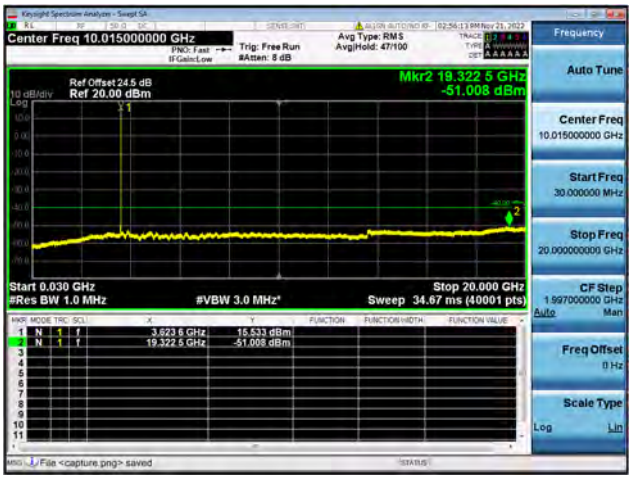
Band48-30M-20G / 5MHz / Low CH / 16QAM

Band48-20G-37G / 5MHz / Low CH / 16QAM



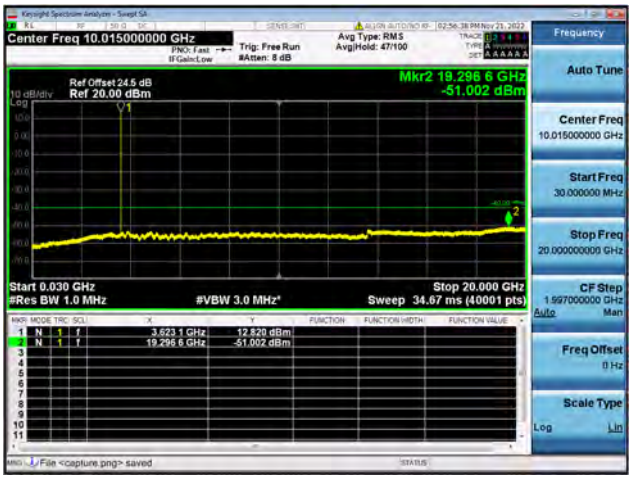
Band48-30M-20G / 5MHz / Low CH / 64QAM

Band48-20G-37G / 5MHz / Low CH / 64QAM



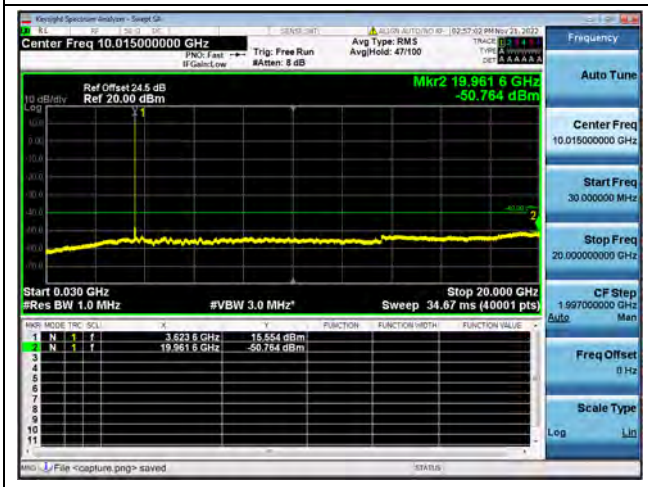
Band48-30M-20G / 5MHz / Mid CH / QPSK

Band48-20G-37G / 5MHz / Mid CH / QPSK



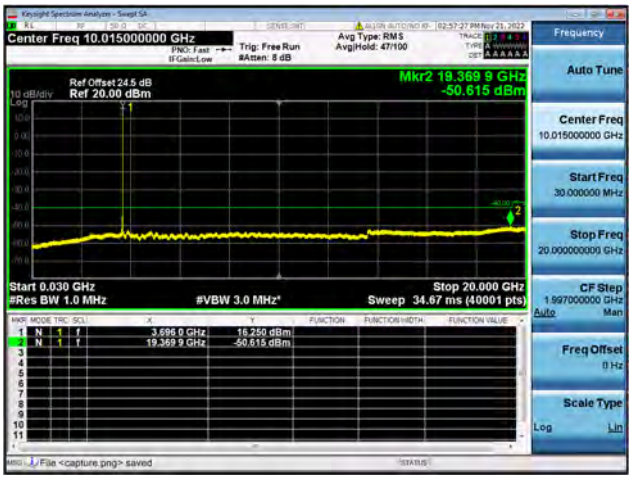
Band48-30M-20G / 5MHz / Mid CH / 16QAM

Band48-20G-37G / 5MHz / Mid CH / 16QAM



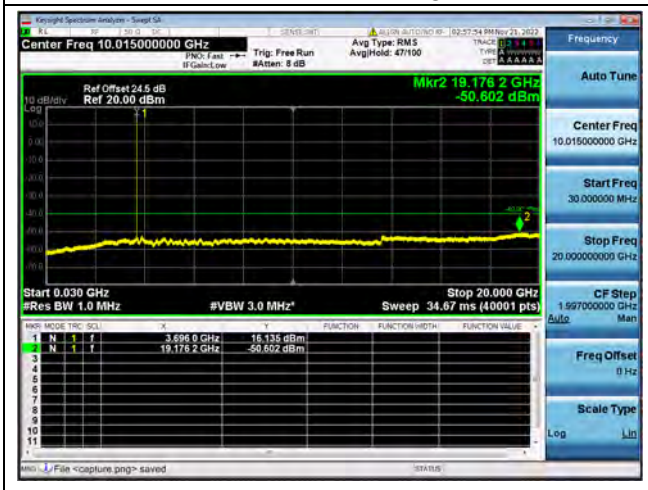
Band48-30M-20G / 5MHz / Mid CH / 64QAM

Band48-20G-37G / 5MHz / Mid CH / 64QAM



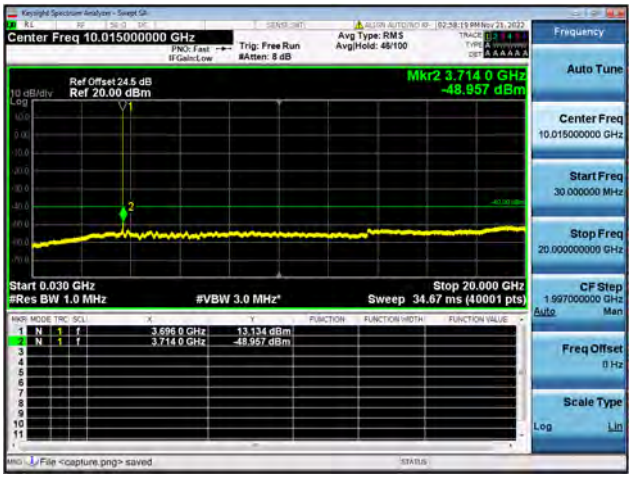
Band48-30M-20G / 5MHz / High CH / QPSK

Band48-20G-37G / 5MHz / High CH / QPSK



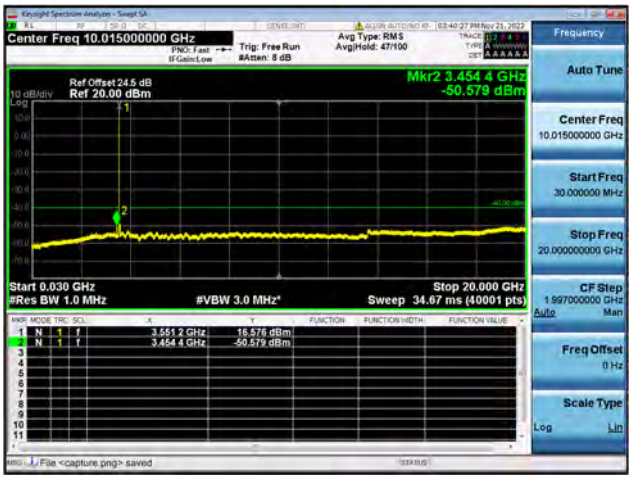
Band48-30M-20G / 5MHz / High CH / 16QAM

Band48-20G-37G / 5MHz / High CH / 16QAM



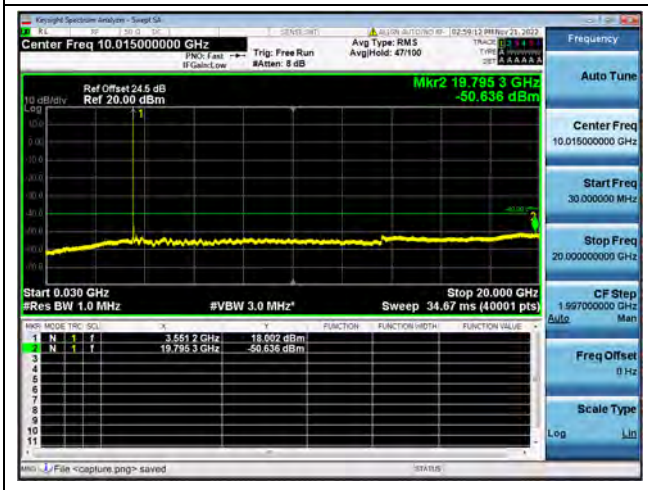
Band48-30M-20G / 5MHz / High CH / 64QAM

Band48-20G-37G / 5MHz / High CH / 64QAM



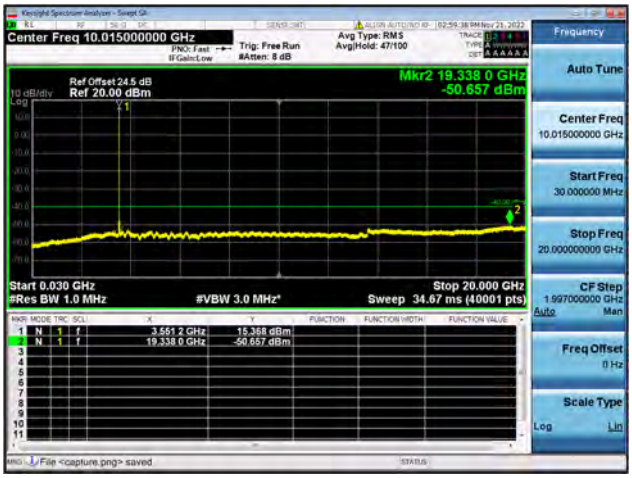
Band48-30M-20G / 10MHz / Low CH / QPSK

Band48-20G-37G / 10MHz / Low CH / QPSK



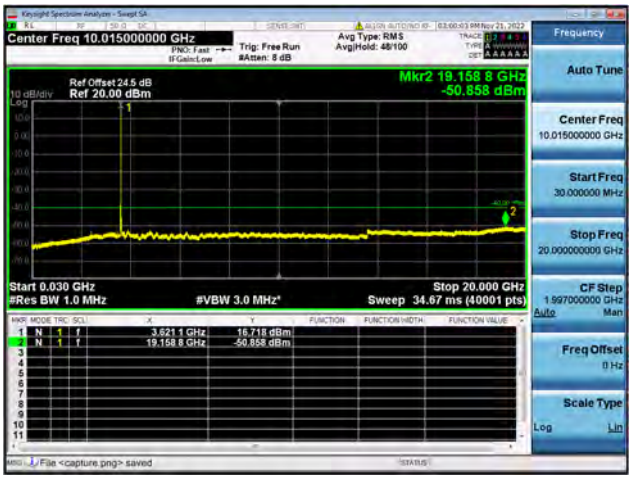
Band48-30M-20G / 10MHz / Low CH / 16QAM

Band48-20G-37G / 10MHz / Low CH / 16QAM



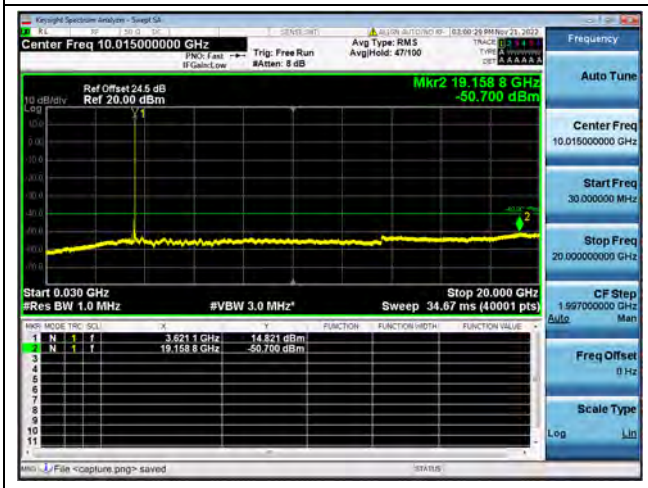
Band48-30M-20G / 10MHz / Low CH / 64QAM

Band48-20G-37G / 10MHz / Low CH / 64QAM



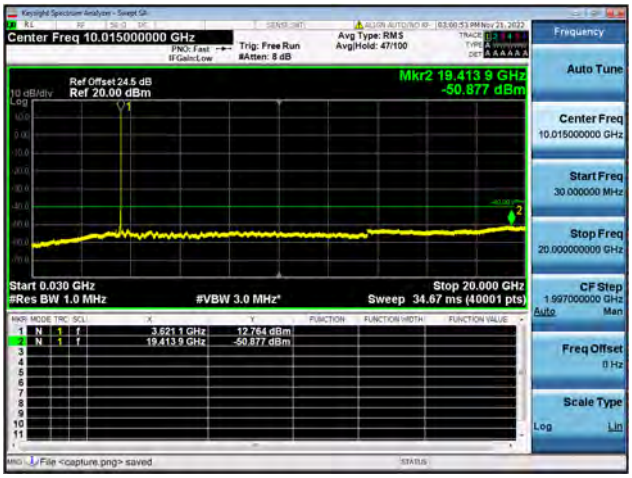
Band48-30M-20G / 10MHz / Mid CH / QPSK

Band48-20G-37G / 10MHz / Mid CH / QPSK



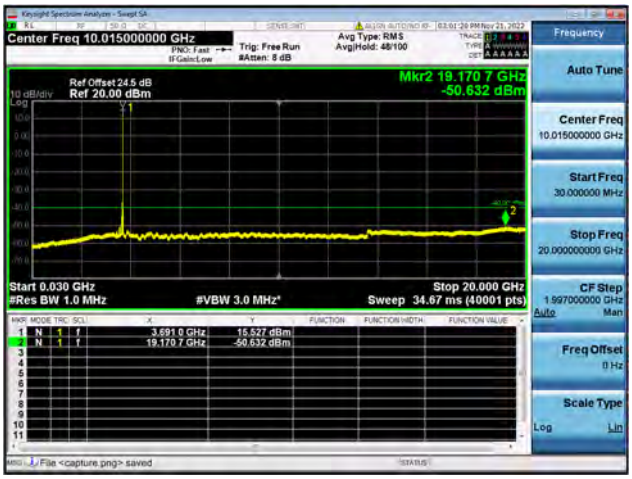
Band48-30M-20G / 10MHz / Mid CH / 16QAM

Band48-20G-37G / 10MHz / Mid CH / 16QAM



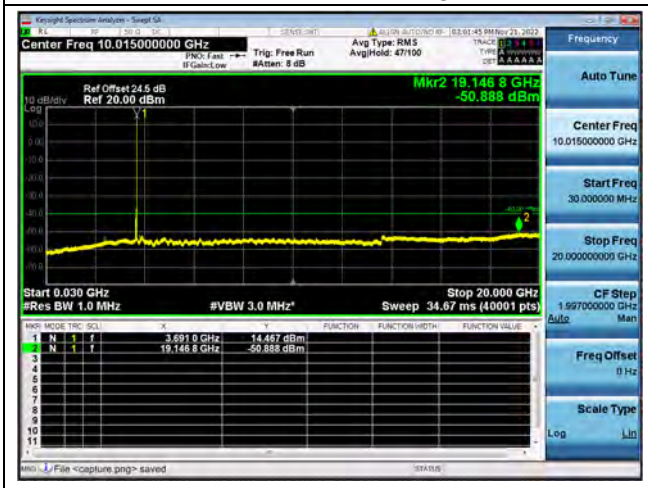
Band48-30M-20G / 10MHz / Mid CH / 64QAM

Band48-20G-37G / 10MHz / Mid CH / 64QAM



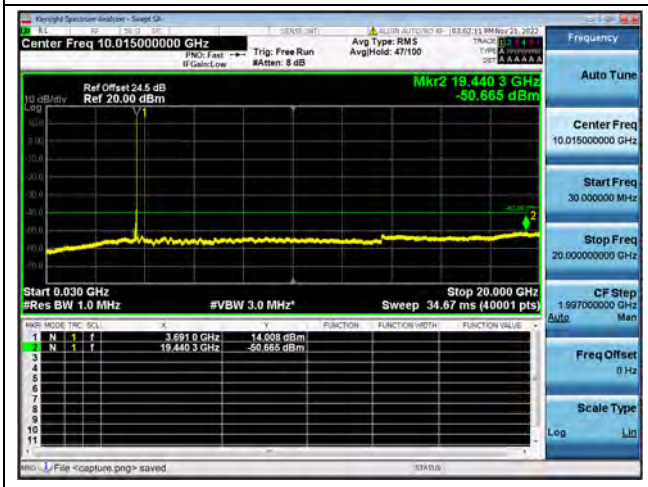
Band48-30M-20G / 10MHz / High CH / QPSK

Band48-20G-37G / 10MHz / High CH / QPSK



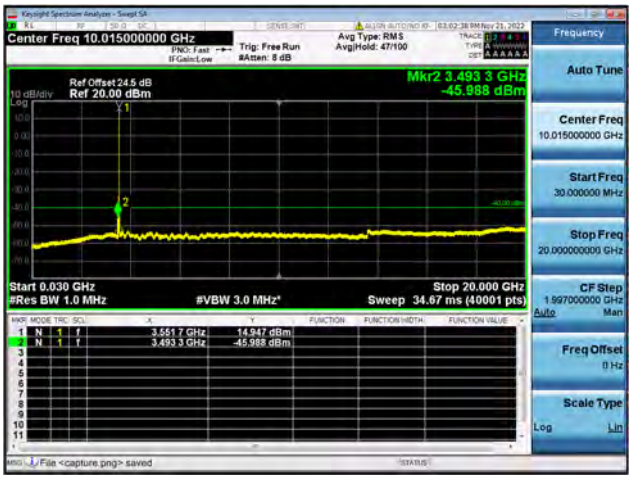
Band48-30M-20G / 10MHz / High CH / 16QAM

Band48-20G-37G / 10MHz / High CH / 16QAM



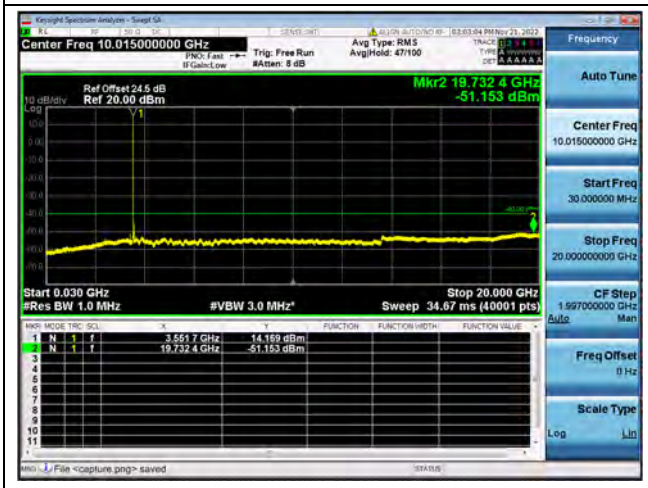
Band48-30M-20G / 10MHz / High CH / 64QAM

Band48-20G-37G / 10MHz / High CH / 64QAM



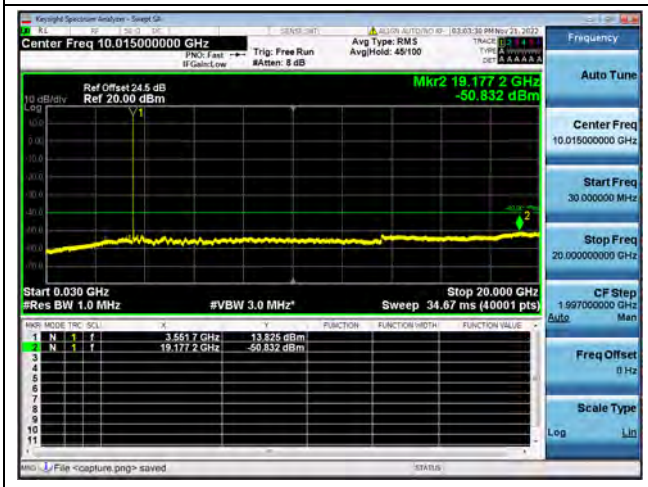
Band48-30M-20G / 15MHz / Low CH / QPSK

Band48-20G-37G / 15MHz / Low CH / QPSK



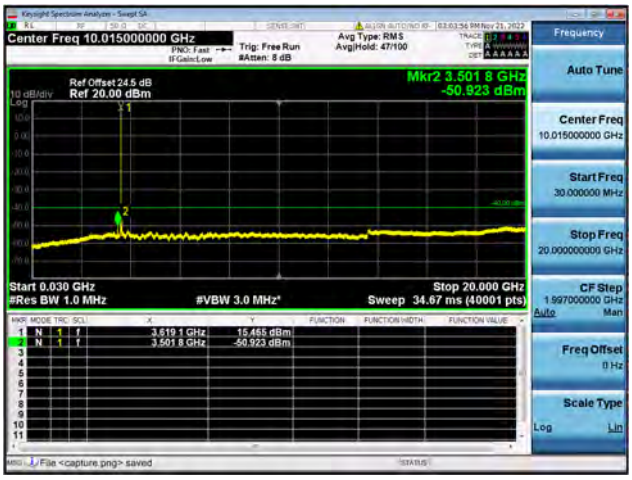
Band48-30M-20G / 15MHz / Low CH / 16QAM

Band48-20G-37G / 15MHz / Low CH / 16QAM



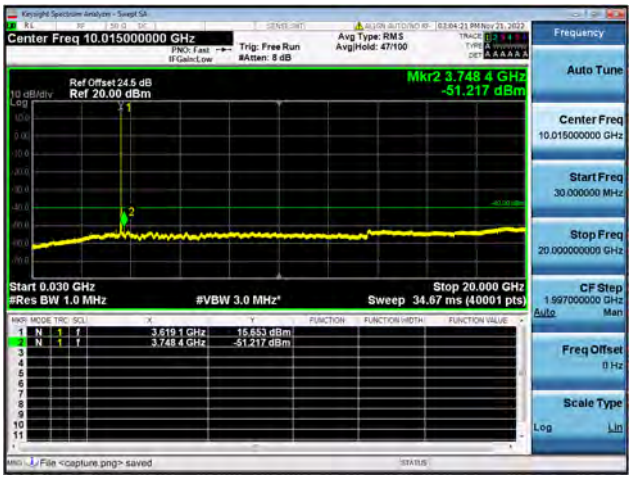
Band48-30M-20G / 15MHz / Low CH / 64QAM

Band48-20G-37G / 15MHz / Low CH / 64QAM



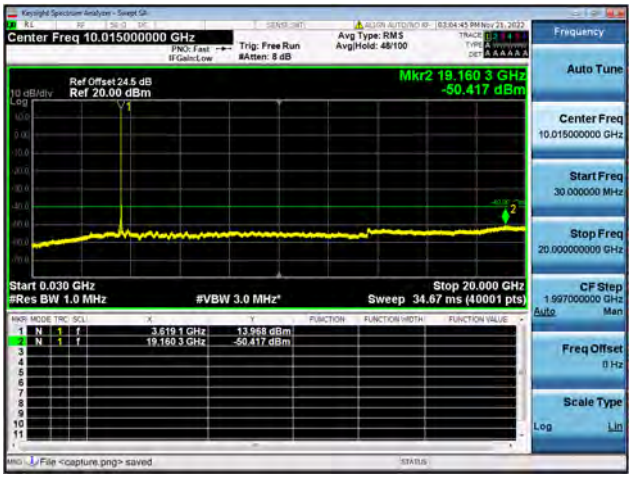
Band48-30M-20G / 15MHz / Mid CH / QPSK

Band48-20G-37G / 15MHz / Mid CH / QPSK



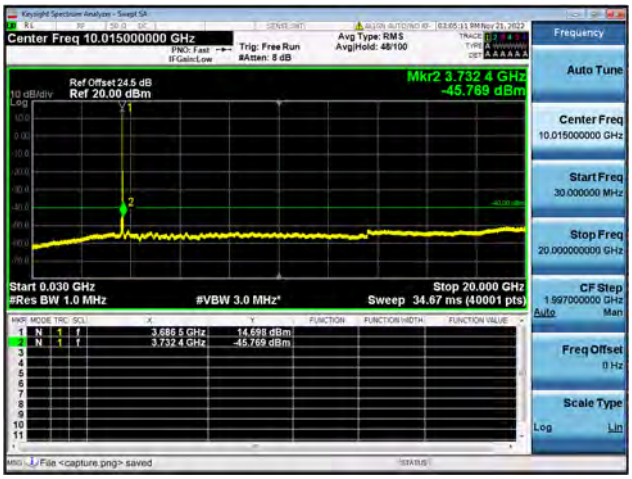
Band48-30M-20G / 15MHz / Mid CH / 16QAM

Band48-20G-37G / 15MHz / Mid CH / 16QAM



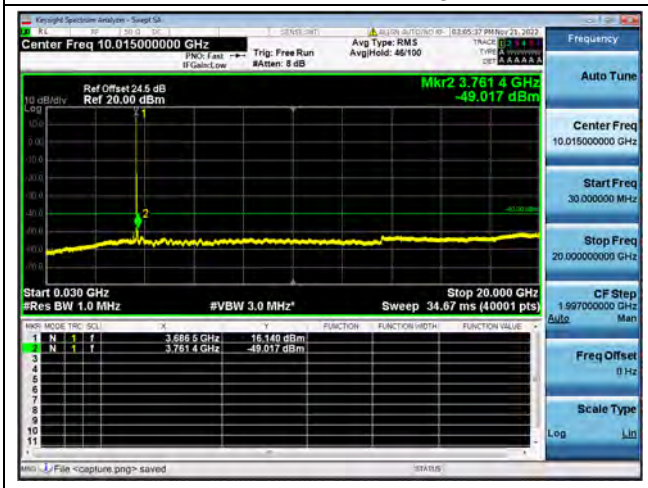
Band48-30M-20G / 15MHz / Mid CH / 64QAM

Band48-20G-37G / 15MHz / Mid CH / 64QAM



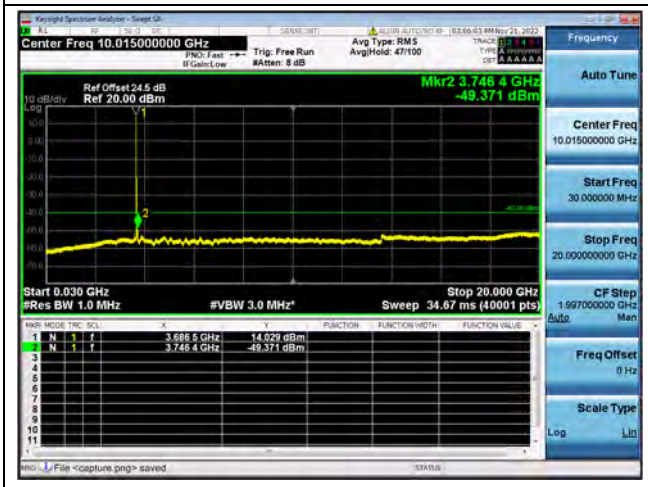
Band48-30M-20G / 15MHz / High CH / QPSK

Band48-20G-37G / 15MHz / High CH / QPSK



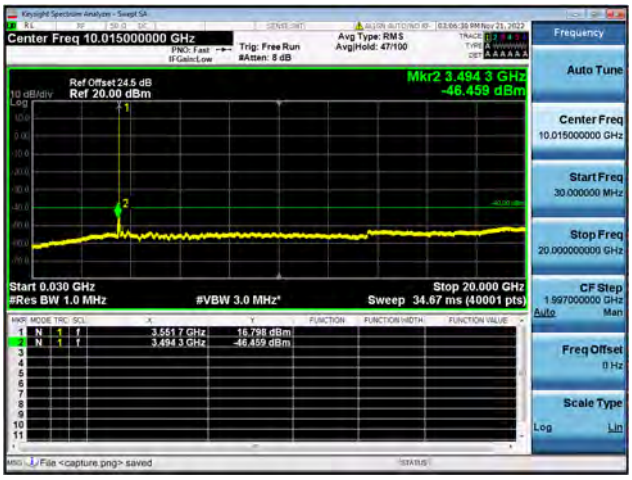
Band48-30M-20G / 15MHz / High CH / 16QAM

Band48-20G-37G / 15MHz / High CH / 16QAM



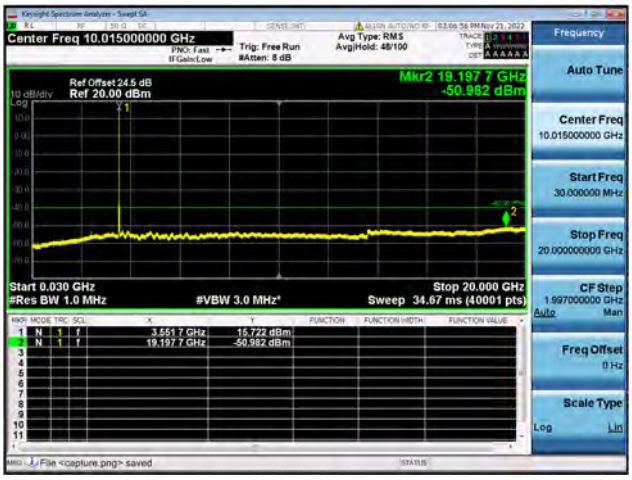
Band48-30M-20G / 15MHz / High CH / 64QAM

Band48-20G-37G / 15MHz / High CH / 64QAM



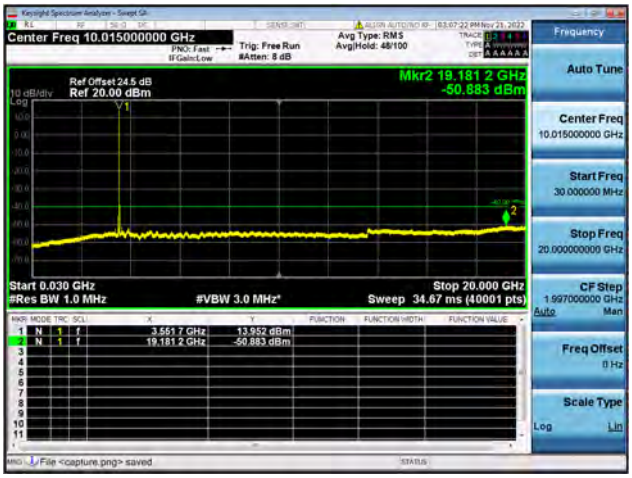
Band48-30M-20G / 20MHz / Low CH / QPSK

Band48-20G-37G / 20MHz / Low CH / QPSK



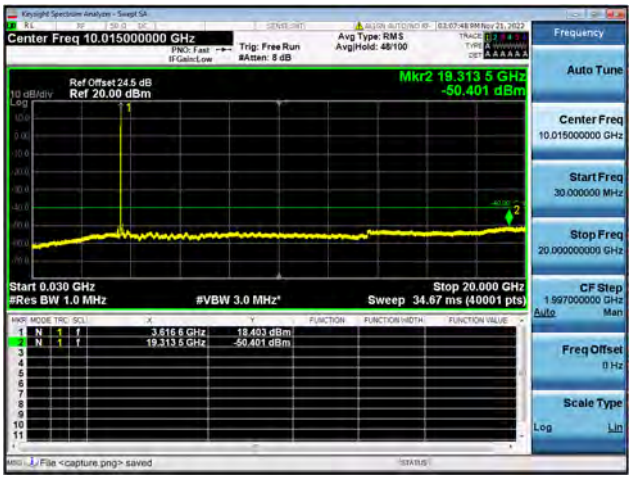
Band48-30M-20G / 20MHz / Low CH / 16QAM

Band48-20G-37G / 20MHz / Low CH / 16QAM



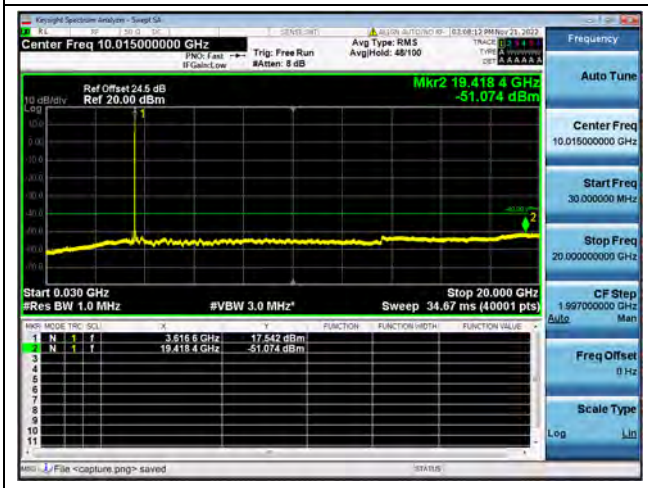
Band48-30M-20G / 20MHz / Low CH / 64QAM

Band48-20G-37G / 20MHz / Low CH / 64QAM



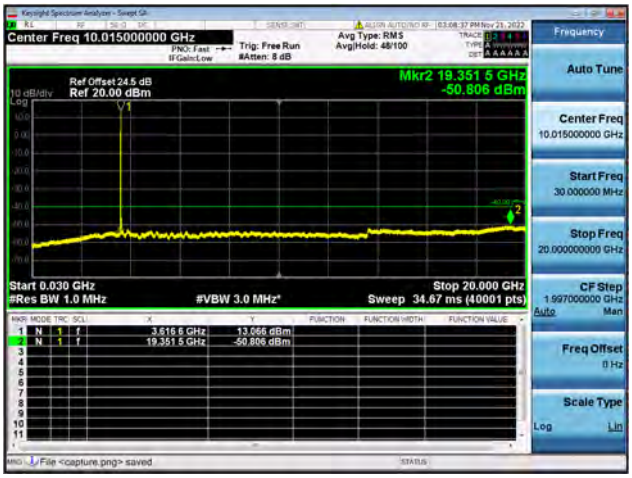
Band48-30M-20G / 20MHz / Mid CH / QPSK

Band48-20G-37G / 20MHz / Mid CH / QPSK



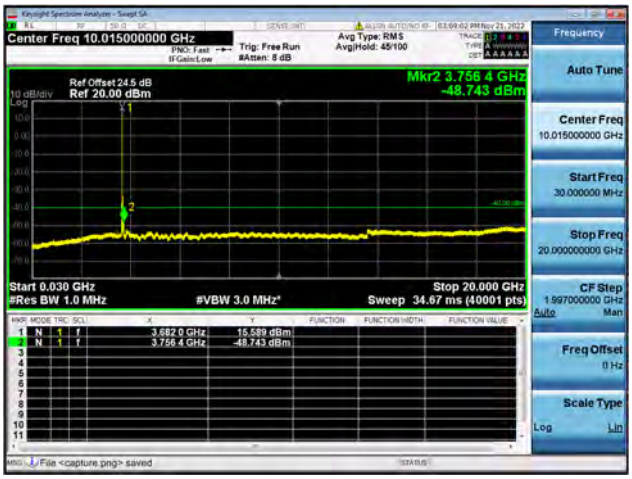
Band48-30M-20G / 20MHz / Mid CH / 16QAM

Band48-20G-37G / 20MHz / Mid CH / 16QAM



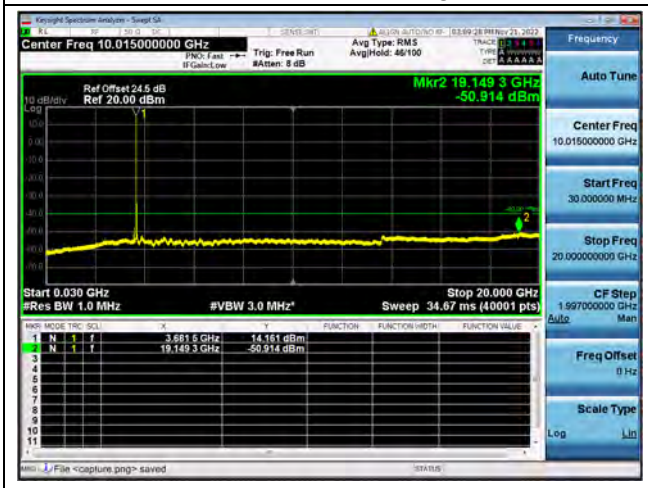
Band48-30M-20G / 20MHz / Mid CH / 64QAM

Band48-20G-37G / 20MHz / Mid CH / 64QAM



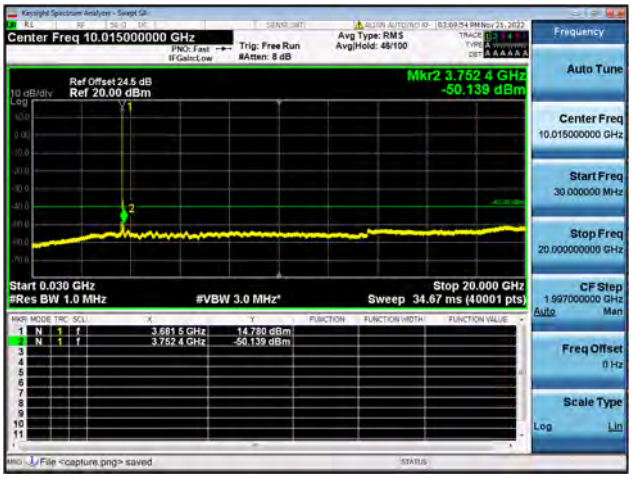
Band48-30M-20G / 20MHz / High CH / QPSK

Band48-20G-37G / 20MHz / High CH / QPSK



Band48-30M-20G / 20MHz / High CH / 16QAM

Band48-20G-37G / 20MHz / High CH / 16QAM



Band48-30M-20G / 20MHz / High CH / 64QAM

Band48-20G-37G / 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.

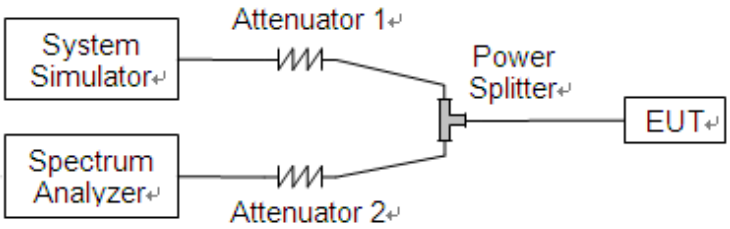
Part 96.41(e)(1)(ii)

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

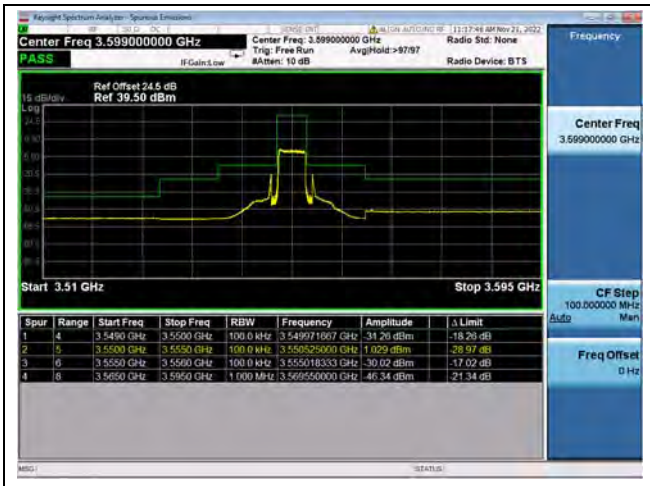


The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

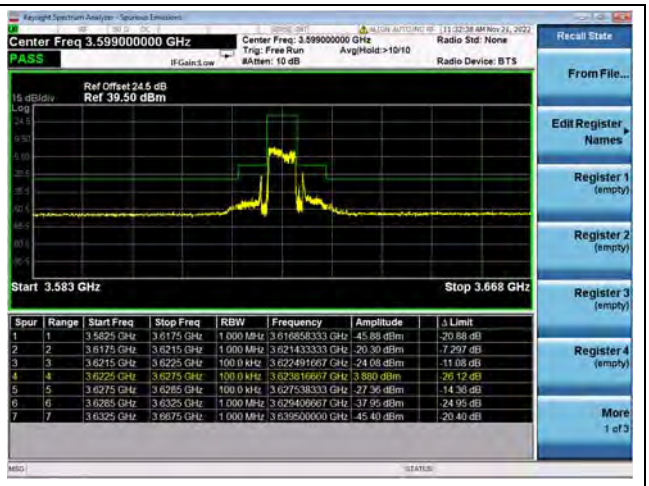
2.6.3.Test procedure

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

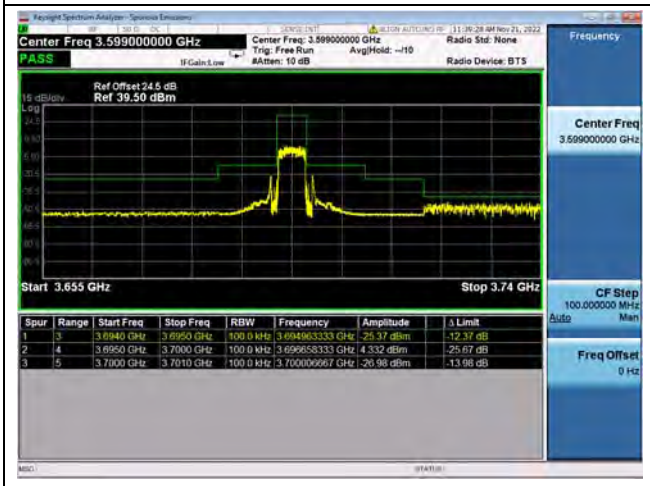
2.6.4.Test Result



Band48 / 5MHz / Low CH / QPSK / FULL RB



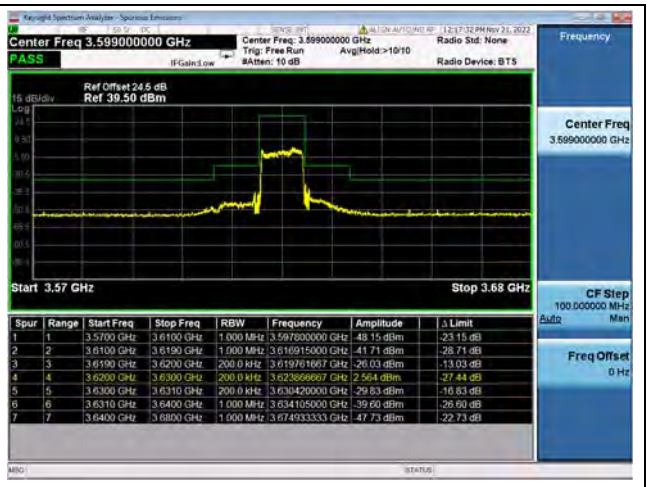
Band48 / 5MHz / Mid CH / QPSK / FULL RB



Band48 / 5MHz / High CH / QPSK / FULL RB

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	4	3.5490 GHz	3.5500 GHz	200.0 kHz	3.549936667 GHz	-35.94 dBm	-22.94 dB
2	5	3.5500 GHz	3.5600 GHz	200.0 kHz	3.553816667 GHz	0.355 dBm	-29.65 dB
3	6	3.5600 GHz	3.5610 GHz	200.0 kHz	3.560271667 GHz	-34.13 dBm	-21.13 dB
4	8	3.5700 GHz	3.6000 GHz	1.000 MHz	3.570400000 GHz	-35.26 dBm	-10.26 dB

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



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5700 GHz	3.6100 GHz	1.000 MHz	3.597800000 GHz	-48.15 dBm	-23.15 dB
2	2	3.6100 GHz	3.6190 GHz	1.000 MHz	3.616915000 GHz	-41.71 dBm	-28.71 dB
3	3	3.6190 GHz	3.6200 GHz	200.0 kHz	3.619761667 GHz	-26.03 dBm	-13.03 dB
4	4	3.6200 GHz	3.6300 GHz	200.0 kHz	3.623866667 GHz	2.564 dBm	-27.44 dB
5	5	3.6300 GHz	3.6310 GHz	200.0 kHz	3.630420000 GHz	-29.83 dBm	-16.83 dB
6	6	3.6310 GHz	3.6400 GHz	1.000 MHz	3.634105000 GHz	-39.60 dBm	-26.60 dB
7	7	3.6400 GHz	3.6800 GHz	1.000 MHz	3.674933333 GHz	-47.73 dBm	-22.73 dB

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

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6300 GHz	3.6800 GHz	1.000 MHz	3.678500000 GHz	-49.75 dBm	-24.75 dB
2	2	3.6800 GHz	3.6890 GHz	1.000 MHz	3.688565000 GHz	-32.64 dBm	-19.64 dB
3	3	3.6890 GHz	3.6900 GHz	200.0 kHz	3.689500000 GHz	-27.56 dBm	-14.56 dB
4	4	3.6900 GHz	3.7000 GHz	200.0 kHz	3.699283333 GHz	5.081 dBm	-24.92 dB
5	5	3.7000 GHz	3.7010 GHz	200.0 kHz	3.700305000 GHz	-25.65 dBm	-12.65 dB
6	6	3.7010 GHz	3.7100 GHz	200.0 kHz	3.702140000 GHz	-33.53 dBm	-20.53 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710033333 GHz	-48.50 dBm	-23.50 dB
8	8	3.7200 GHz	3.7600 GHz	1.000 MHz	3.751933333 GHz	-48.22 dBm	-8.219 dB

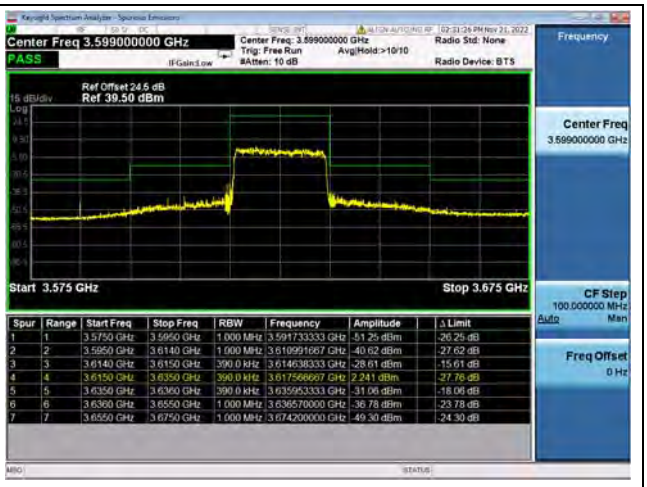
Band48 / 10MHz / High CH / QPSK / FULL RB

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

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

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

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



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

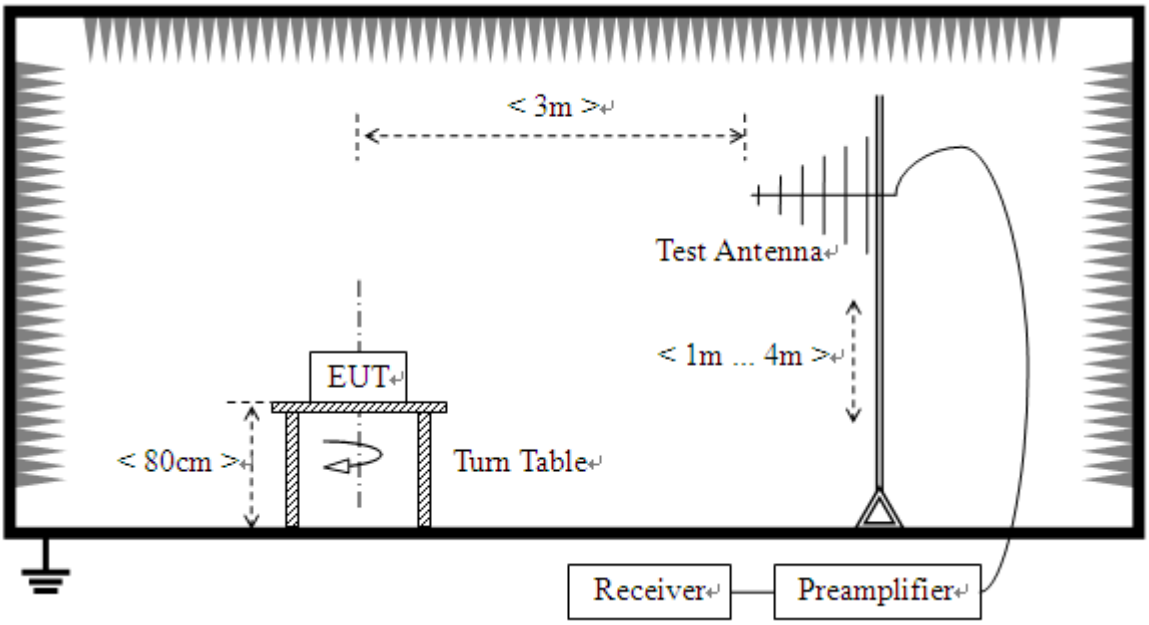
Band48 / 20MHz / High CH / QPSK / FULL RB

2.7. Radiated Spurious Emissions

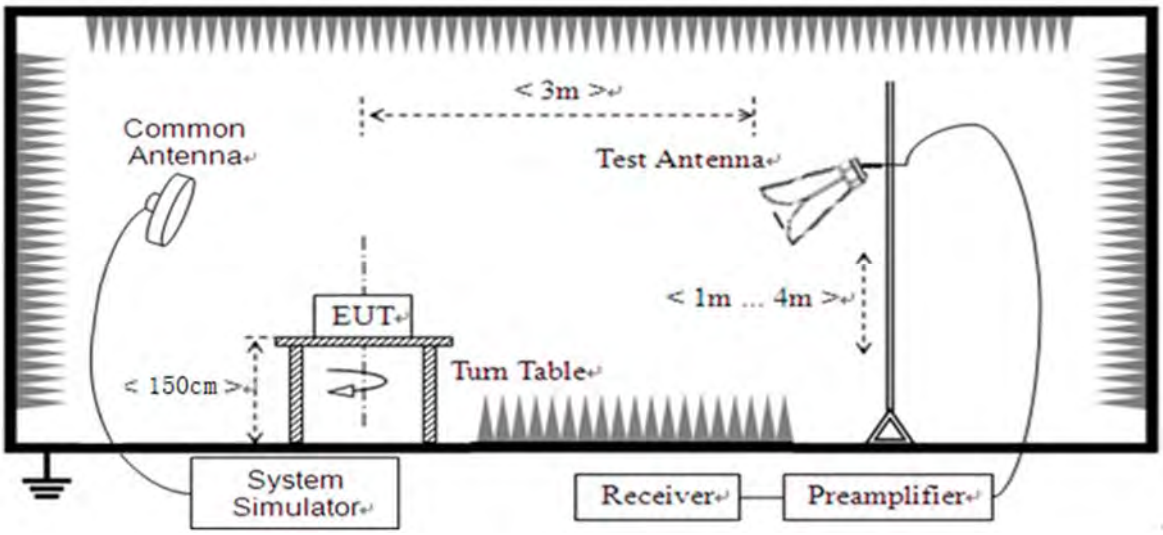
2.7.1.Requirement

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 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.

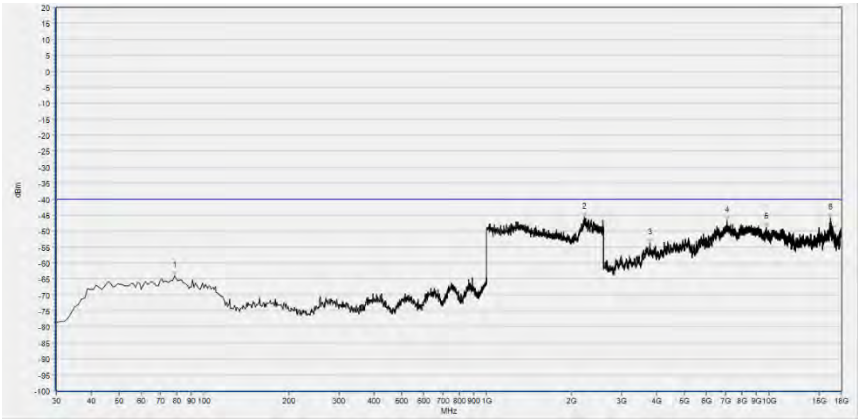
Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

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 42, 20MHz BW, Low Channel, QPSK

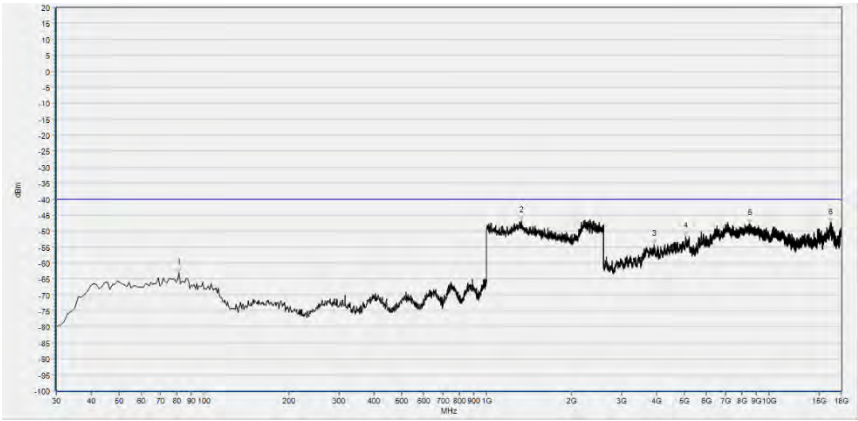
No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	66.897	-65.85	-40.00	Horizontal	PASS
2	2302.102	-46.34	-40.00	Horizontal	PASS
3	3404.041	-50.78	-40.00	Horizontal	N/A
4	4744.109	-53.35	-40.00	Horizontal	PASS
5	9060.052	-46.88	-40.00	Horizontal	PASS
6	10581.876	-47.16	-40.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	78.549	-64.08	-40.00	Vertical	PASS
2	2223.624	-45.67	-40.00	Vertical	PASS
3	3786.037	-53.82	-40.00	Vertical	PASS
4	7091.538	-46.89	-40.00	Vertical	PASS
5	9759.352	-48.77	-40.00	Vertical	PASS
6	16530.546	-45.94	-40.00	Vertical	PASS

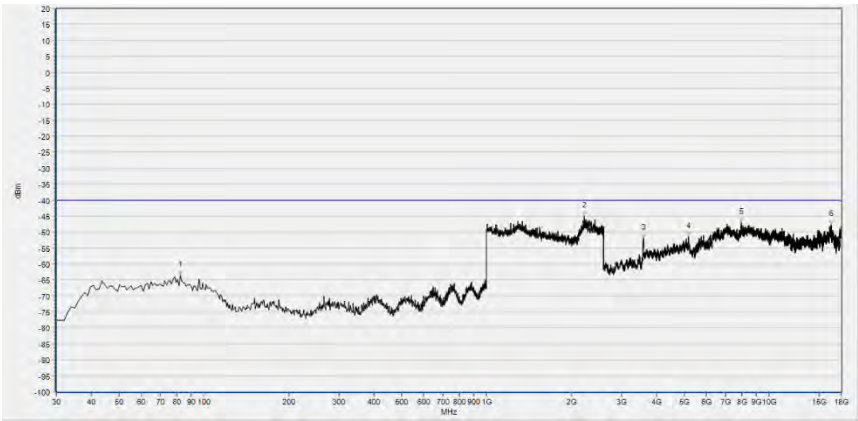
LTE Band 42, 20MHz BW, Mid Channel, QPSK

No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	67.868	-64.20	-40.00	Horizontal	PASS
2	2334.134	-46.22	-40.00	Horizontal	PASS
3	3499.540	-54.09	-40.00	Horizontal	N/A
4	7091.538	-47.57	-40.00	Horizontal	PASS
5	10353.911	-48.98	-40.00	Horizontal	PASS
6	16478.176	-47.69	-40.00	Horizontal	PASS

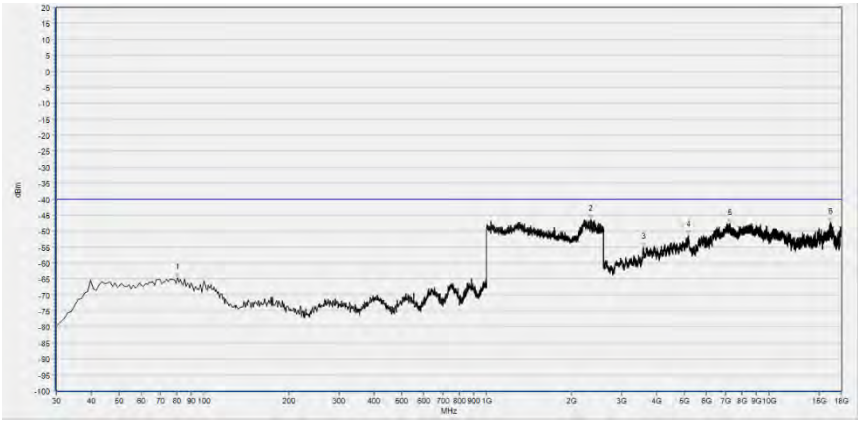


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	81.461	-63.13	-40.00	Vertical	PASS
2	1331.532	-46.85	-40.00	Vertical	PASS
3	3927.746	-54.21	-40.00	Vertical	PASS
4	5055.251	-51.83	-40.00	Vertical	PASS
5	8573.315	-47.61	-40.00	Vertical	PASS
6	16533.627	-47.51	-40.00	Vertical	PASS

LTE Band 42, 20MHz BW, High Channel, QPSK

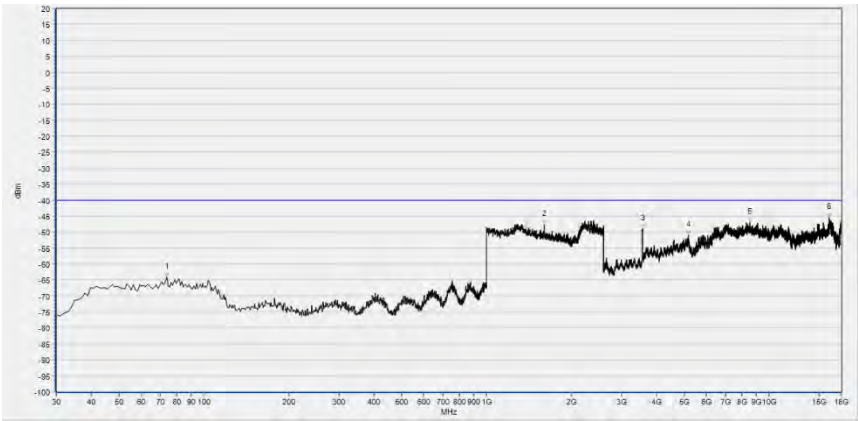


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	82.432	-63.68	-40.00	Horizontal	PASS
2	2215.616	-44.97	-40.00	Horizontal	PASS
3	3588.878	-51.89	-40.00	Horizontal	N/A
4	5184.637	-51.40	-40.00	Horizontal	PASS
5	7981.836	-47.09	-40.00	Horizontal	PASS
6	16549.030	-47.67	-40.00	Horizontal	PASS

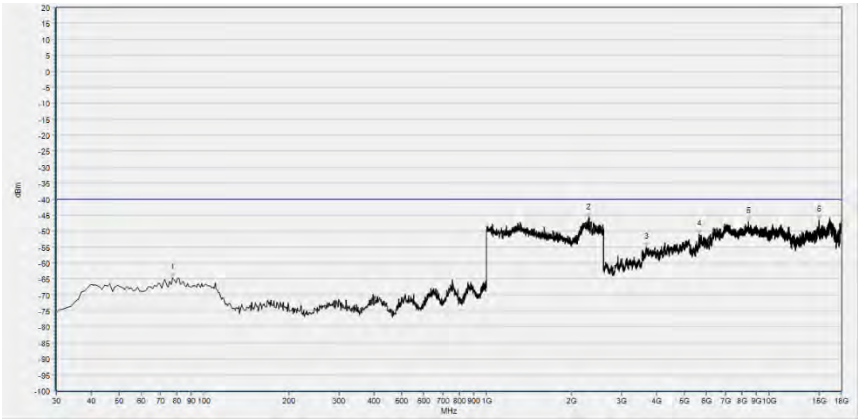


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.490	-64.76	-40.00	Vertical	PASS
2	2335.736	-46.39	-40.00	Vertical	PASS
3	3585.797	-54.98	-40.00	Vertical	PASS
4	5193.879	-51.39	-40.00	Vertical	PASS
5	7254.811	-47.61	-40.00	Vertical	PASS
6	16533.627	-47.32	-40.00	Vertical	PASS

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

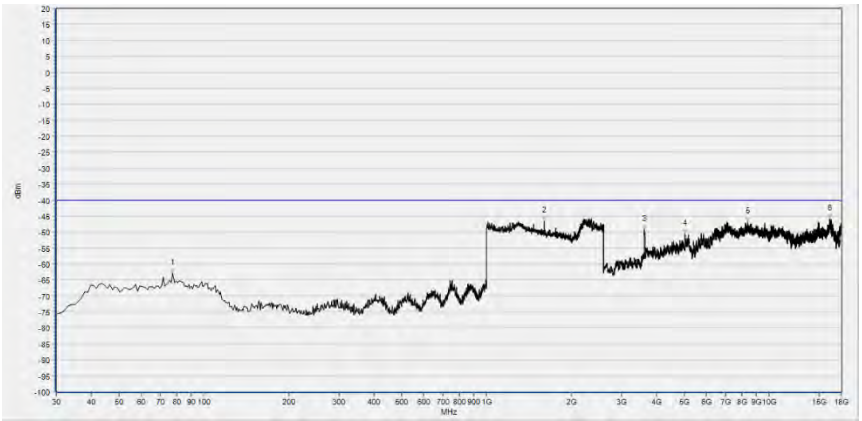


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	73.694	-64.31	-40.00	Horizontal	PASS
2	1600.601	-47.67	-40.00	Horizontal	PASS
3	3567.313	-48.96	-40.00	Horizontal	N/A
4	5184.637	-51.01	-40.00	Horizontal	PASS
5	8573.315	-47.14	-40.00	Horizontal	PASS
6	16314.903	-45.40	-40.00	Horizontal	PASS

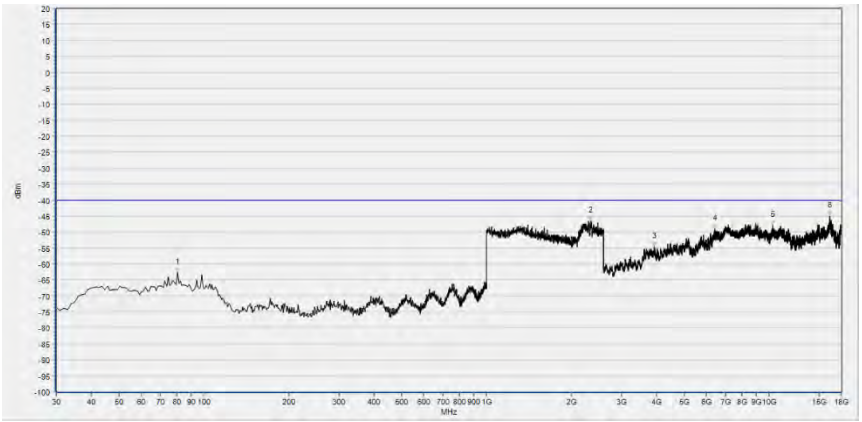


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	77.578	-64.66	-40.00	Vertical	PASS
2	2302.102	-45.89	-40.00	Vertical	PASS
3	3687.457	-55.00	-40.00	Vertical	PASS
4	5662.132	-51.15	-40.00	Vertical	PASS
5	8465.493	-47.06	-40.00	Vertical	PASS
6	15017.964	-46.64	-40.00	Vertical	PASS

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

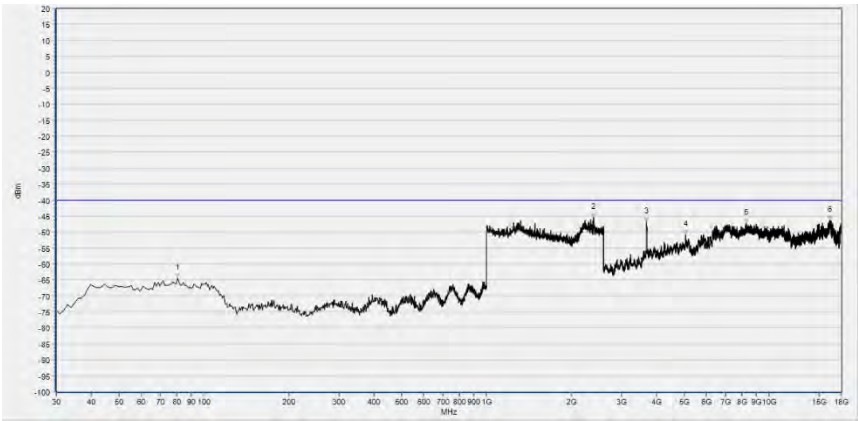


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	77.578	-62.94	-40.00	Horizontal	PASS
2	1600.601	-46.55	-40.00	Horizontal	PASS
3	3619.684	-49.23	-40.00	Horizontal	N/A
4	5049.090	-50.64	-40.00	Horizontal	PASS
5	8416.203	-46.89	-40.00	Horizontal	PASS
6	16394.999	-46.02	-40.00	Horizontal	PASS

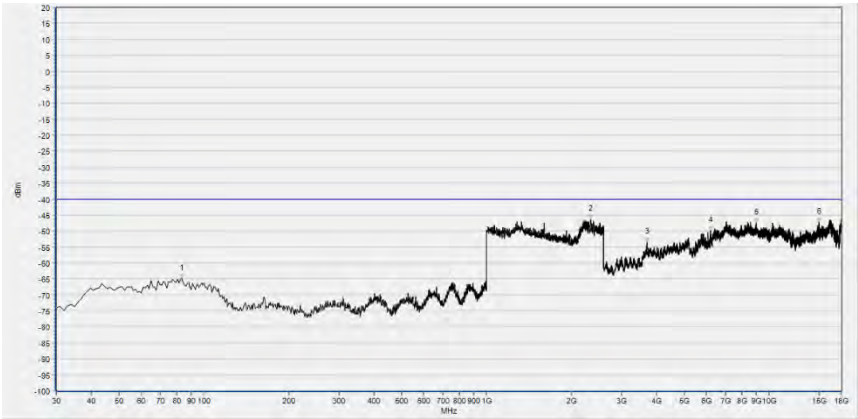


No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.490	-62.66	-40.00	Vertical	PASS
2	2340.541	-46.64	-40.00	Vertical	PASS
3	3933.907	-54.73	-40.00	Vertical	PASS
4	6438.448	-48.99	-40.00	Vertical	PASS
5	10286.137	-47.93	-40.00	Vertical	PASS
6	16382.677	-44.99	-40.00	Vertical	PASS

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



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	80.490	-64.52	-40.00	Horizontal	PASS
2	2398.198	-45.51	-40.00	Horizontal	PASS
3	3687.457	-46.86	-40.00	Horizontal	N/A
4	5067.574	-50.84	-40.00	Horizontal	PASS
5	8308.382	-47.18	-40.00	Horizontal	PASS
6	16385.757	-46.34	-40.00	Horizontal	PASS



No.	Fre.(MHz)	PK (dBm)	Limit (dBm)	Antenna	Verdict
1	83.403	-65.01	-40.00	Vertical	PASS
2	2337.337	-46.44	-40.00	Vertical	PASS
3	3696.699	-53.61	-40.00	Vertical	PASS
4	6207.401	-49.99	-40.00	Vertical	PASS
5	8989.198	-47.57	-40.00	Vertical	PASS
6	15008.722	-47.21	-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 Analyzer	MY51511149	N9020A	Agilent	2022.07.04	2023.07.03
Communication Test Station	6200995016	MT8820C	Anritsu	2022.10.11	2023.10.10
Temperature Chamber	20171112102	HZ-2019	Dongguan Lixian Instrument Technology Co., Ltd	2022.10.10	2023.10.09

4.2 List of Software Used

Description	Manufacturer	Software Version
Morlab FCC Test System	MORLAB	V3.1
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	2022.10.11	2023.10.10
System Simulator	MY48364176	8960-E5515C	Agilent	2022.03.01	2023.02.28
Receiver	MY54130016	N9038A	Agilent	2022.07.07	2023.07.06
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2022.05.25	2025.05.24
Test Antenna - Horn	9120D-963	BBHA 9120D	Schwarzbeck	2022.05.23	2025.05.24
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	2022.07.08	2023.07.07
18-26.5GHz pre-Amplifier	46732	S10M100L3802	Tonscend	2022.07.08	2023.07.07
26-40GHz pre-Amplifier	56774	S40M400L4002	Tonscend	2022.07.08	2023.07.07
Notch Filter	N/A	WRCGV -LTE B48	Wainwright	2022.07.08	2023.07.07
Anechoic Chamber	N/A	9m*6m*6m	CRT	2022.05.10	2025.05.09

END OF REPORT