TEST REPORT

APPLICANT	:	Nubia Technology Co.,Ltd
PRODUCT NAME	:	NX619J
MODEL NAME	:	NX619J
BRAND NAME	:	NUBIA
FCC ID	:	2AHJO-NX619J
STANDARD(S)	:	47 CFR Part 27, Subpart H&L&M
RECEIPT DATE		2018-11-22
TEST DATE	:	2018-11-23 to 2019-01-21
ISSUE DATE	:	2019-01-22

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MORLAB

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Change History		
Version	**Date**	**Reason for change**
1.0	2019-01-22	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Nubia Technology Co.,Ltd
Applicant Address:	10/F, Tower A, Hans Innovation Mansion, North Ring Rd., No.9018, High-Tech Park, Nanshan District, Shenzhen, China
Manufacturer:	Nubia Technology Co.,Ltd
Manufacturer Address:	10/F, Tower A, Hans Innovation Mansion, North Ring Rd., No.9018, High-Tech Park, Nanshan District, Shenzhen, China

1.2. Equipment Under Test (EUT) Description

Product Name:	NX619J	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	NX619J_V1AMB	
Software Version:	NX619J_ENCommon_V1.07	
Modulation Type:	QPSK, 16QAM,64QAM	
Operation Band:	Band 66	
Frequency Range:	LTE Band 66	Tx: 1710MHz -1780MHz
		Rx: 2110MHz -2200MHz
Channel Bandwidth	LTE Band 66	1.4MHz, 3 MHz, 5 MHz, 10MHz, 15 MHz, 20 MHz
Emission Designator:	1M09G7D (LTE Band 66, QPSK, BW 1.4MHz) 1M09W7D (LTE Band 66, 16QAM, BW 1.4MHz) 1M09W7D (LTE Band 66, 64QAM, BW 1.4MHz) 2M70G7D (LTE Band 66, QPSK, BW 3MHz) 2M70W7D (LTE Band 66, 16QAM, BW 3MHz) 2M70 W7D (LTE Band 66, 64QAM, BW 3MHz) 4M49G7D (LTE Band 66, QPSK, BW 5MHz) 4M50W7D (LTE Band 66, 16QAM, BW 5MHz) 4M50W7D (LTE Band 66, 64QAM, BW 5MHz) 8M97G7D (LTE Band 66, QPSK, BW 10MHz) 8M96W7D (LTE Band 66, 16QAM, BW 10MHz) 8M97W7D (LTE Band 66, 64QAM, BW 10MHz) 13M46G7D (LTE Band 66, QPSK, BW 15MHz)	

	13M47W7D (LTE Band 66, 16QAM, BW 15MHz) 13M44W7D (LTE Band 66, 64QAM, BW 15MHz) 17M93G7D (LTE Band 66, QPSK, BW 20MHz) 17M94W7D (LTE Band 66, 16QAM, BW 20MHz) 17M97W7D (LTE Band 66, 64QAM, BW 20MHz)	
Antenna Type:	PIFA Antenna	
Antenna Gain: (Top Antenna)	LTE Band 66	1.43 dBi
Antenna Gain: (Bottom Antenna)	LTE Band 66	1.47 dBi
Accessory Information::	Battery	
	Brand Name:	ATL
	Model No.:	Li3937T44P6h886639
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	3800mAh
	Rated Voltage:	3.85V
	Charge Limit:	4.4V
Accessory Information:	AC Adapter	
	Brand Name:	CHENYANG
	Model No.:	CYNBY090200-A00
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V～ 50/60Hz 0.5A
	Rated Output:	5V⎓3.0A; 9V⎓2.0A;12V⎓1.5A
Accessory Information:	AC Adapter 2	
	Brand Name:	XINSPOWER
	Model No.:	Q183
	Serial No.:	(N/A, marked #1 by test site)
	Rated Input:	100-240V ～ 50/60Hz 0.5A
	Rated Output:	3.6-6V⎓3.0A; 6-9V⎓2.0A;9-12V⎓1.5A

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

1.3. Test Standards and Results

The objective of the report is to perform testing according to Part 2 and Part 27 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 27	Miscellaneous Wireless Communications Services

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

Section	Description	Test Date	Test Engineer	Result
2.1046	Transmitter Conducted Output Power	Jan 17, 2019	Gao Mingzhou	PASS
2.1049	Occupied Bandwidth	Dec 21, 2018	Gao Mingzhou	PASS
2.1055,27.54	Frequency Stability	Dec 22, 2018	Gao Mingzhou	PASS
27.50(d)(5)	Peak to Average Radio	Dec 21&22, 2018	Gao Mingzhou	PASS
2.1051, 27.53(g)(h)(m)(4)	Conducted Spurious Emissions	Jan 17, 2019	Gao Mingzhou	PASS
2.1051, 27.53(g)(h)(m)(4)	Band Edge	Dec 25, 2018	Gao Mingzhou	PASS
,27.50(c)(10) 27.50(d)(4), 27.50(h)(2)	Equivalent Isotropic Radiated Power	Dec 01, 2018	Wang Dalong	PASS
2.1051, 27.53(g)(h)(m)(4)	Radiated Spurious Emissions	Dec 01&02, 2018	Wang Dalong	PASS
Note: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 (Oct 27, 2017) and ANSI/TIA-603-E-2016.				

1.4. 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

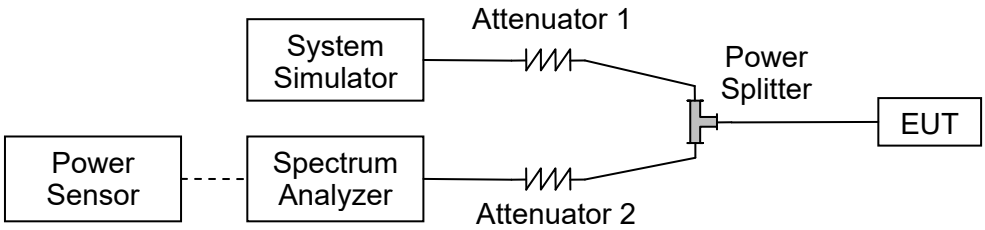
2. 47 CFR Part 2,and 27H&L&M Requirements

2.1. Transmitter Conducted Output Power

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).

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.

2.1.4. Result

Top Antenna (Down Power):

LTE Band66						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				132072	132322	132572
Frequency (MHz)				1720	1745	1770
20	QPSK	1	0	18.34	18.13	18.01
20	QPSK	1	49	18.04	17.97	17.58
20	QPSK	1	99	17.99	17.81	17.52
20	QPSK	50	0	17.20	17.21	17.04
20	QPSK	50	24	17.13	17.15	16.96
20	QPSK	50	50	17.27	17.08	16.74
20	QPSK	100	0	17.09	17.12	16.83
20	16QAM	1	0	17.55	17.89	17.57
20	16QAM	1	49	17.23	17.63	17.24
20	16QAM	1	99	17.15	17.57	17.08
20	16QAM	50	0	16.34	16.31	16.09
20	16QAM	50	24	16.22	16.23	16.00
20	16QAM	50	50	16.17	16.19	15.89
20	16QAM	100	0	16.16	16.18	15.99
20	64QAM	1	0	17.08	17.13	17.05
20	64QAM	1	49	16.96	16.97	16.89
20	64QAM	1	99	16.76	16.76	16.71
20	64QAM	50	0	16.35	16.39	16.32
20	64QAM	50	24	16.29	16.30	16.25
20	64QAM	50	50	16.13	16.20	16.17
20	64QAM	100	0	16.02	16.10	16.05
Channel				132047	132322	132597
Frequency (MHz)				1717.5	1745	1772.5
15	QPSK	1	0	18.11	18.02	18.14
15	QPSK	1	37	18.08	18.12	18.19
15	QPSK	1	74	17.97	17.91	18.02
15	QPSK	36	0	16.83	16.95	16.87
15	QPSK	36	20	16.92	16.90	16.82
15	QPSK	36	39	16.98	17.03	17.07
15	QPSK	75	0	17.06	17.03	16.86
15	16QAM	1	0	17.08	17.05	16.91

15	16QAM	1	37	16.89	16.63	16.86
15	16QAM	1	74	16.86	16.66	16.86
15	16QAM	36	0	16.71	16.75	16.65
15	16QAM	36	20	16.88	16.86	16.79
15	16QAM	36	39	16.69	16.86	16.66
15	16QAM	75	0	16.70	16.83	16.65
15	64QAM	1	0	16.45	16.48	16.31
15	64QAM	1	37	16.32	16.46	16.31
15	64QAM	1	74	16.38	16.43	16.33
15	64QAM	36	0	16.40	16.49	16.48
15	64QAM	36	20	16.42	16.33	16.41
15	64QAM	36	39	16.40	16.38	16.33
15	64QAM	75	0	16.44	16.46	16.33

Channel				132022	132322	132622
Frequency (MHz)				1715	1745	1775
10	QPSK	1	0	17.95	18.16	17.93
10	QPSK	1	25	17.97	18.05	18.02
10	QPSK	1	49	17.93	18.03	18.08
10	QPSK	25	0	16.98	16.92	16.91
10	QPSK	25	12	17.06	16.85	16.87
10	QPSK	25	25	16.97	16.90	16.97
10	QPSK	50	0	16.97	17.07	17.05
10	16QAM	1	0	16.91	17.00	17.01
10	16QAM	1	25	17.02	16.95	16.90
10	16QAM	1	49	16.89	17.05	17.04
10	16QAM	25	0	16.84	16.87	16.72
10	16QAM	25	12	16.67	16.75	16.89
10	16QAM	25	25	16.69	16.63	16.64
10	16QAM	50	0	16.77	16.72	16.69
10	64QAM	1	0	16.46	16.44	16.48
10	64QAM	1	25	16.38	16.32	16.49
10	64QAM	1	49	16.33	16.49	16.48
10	64QAM	25	0	16.43	16.46	16.36
10	64QAM	25	12	16.32	16.37	16.45
10	64QAM	25	25	16.41	16.35	16.45
10	64QAM	50	0	16.34	16.42	16.37

Channel				131997	132322	132647
Frequency (MHz)				1712.5	1745	1777.5
5	QPSK	1	0	18.05	17.98	17.97
5	QPSK	1	12	17.95	17.92	18.13
5	QPSK	1	24	18.11	18.08	18.06
5	QPSK	12	0	18.11	18.02	18.14
5	QPSK	12	7	16.99	17.07	16.92
5	QPSK	12	13	16.94	16.81	16.91
5	QPSK	25	0	17.10	16.85	16.85
5	16QAM	1	0	16.96	16.94	16.81
5	16QAM	1	12	16.89	17.04	16.95
5	16QAM	1	24	16.90	17.04	16.90
5	16QAM	12	0	16.66	16.89	16.73
5	16QAM	12	7	16.77	16.73	16.88
5	16QAM	12	13	16.70	16.82	16.65
5	16QAM	25	0	16.81	16.75	16.70
5	64QAM	1	0	16.47	16.40	16.49
5	64QAM	1	12	16.31	16.37	16.50
5	64QAM	1	24	16.47	16.32	16.45
5	64QAM	12	0	16.43	16.42	16.38
5	64QAM	12	7	16.36	16.44	16.36
5	64QAM	12	13	16.34	16.41	16.43
5	64QAM	25	0	16.30	16.42	16.43

Channel				131987	132322	132657
Frequency (MHz)				1711.5	1745	1778.5
3	QPSK	1	0	17.95	18.16	17.93
3	QPSK	1	8	17.97	18.05	18.02
3	QPSK	1	14	17.93	18.03	18.08
3	QPSK	8	0	16.93	17.00	17.08
3	QPSK	8	4	17.02	16.95	16.87
3	QPSK	8	7	17.07	16.84	17.03
3	QPSK	15	0	16.82	16.89	16.85
3	16QAM	1	0	16.92	16.92	16.95
3	16QAM	1	8	16.94	16.93	16.85
3	16QAM	1	14	16.62	16.73	16.69
3	16QAM	8	0	16.72	16.61	16.63

3	16QAM	8	4	16.64	16.80	16.68
3	16QAM	8	7	16.87	16.64	16.83
3	16QAM	15	0	16.32	16.46	16.31
3	64QAM	1	0	16.38	16.43	16.33
3	64QAM	1	8	16.40	16.49	16.48
3	64QAM	1	14	16.46	16.44	16.48
3	64QAM	8	0	16.38	16.32	16.49
3	64QAM	8	4	16.33	16.49	16.48
3	64QAM	8	7	16.02	16.29	16.19
3	64QAM	15	0	15.89	15.99	15.89
Channel				131979	132322	132665
Frequency (MHz)				1710.7	1745	1779.3
1.4	QPSK	1	0	17.92	18.05	18.14
1.4	QPSK	1	3	18.07	18.00	18.02
1.4	QPSK	1	5	17.92	18.04	18.05
1.4	QPSK	3	0	17.02	16.95	16.90
1.4	QPSK	3	1	16.89	17.05	17.04
1.4	QPSK	3	3	16.92	17.01	16.93
1.4	QPSK	6	0	16.86	16.82	16.80
1.4	16QAM	1	0	16.89	17.04	16.95
1.4	16QAM	1	3	16.72	16.77	16.85
1.4	16QAM	1	5	16.68	16.87	16.83
1.4	16QAM	3	0	16.75	16.87	16.64
1.4	16QAM	3	1	16.68	16.67	16.69
1.4	16QAM	3	3	16.47	16.32	16.45
1.4	16QAM	6	0	16.30	16.44	16.31
1.4	64QAM	1	0	16.42	16.40	16.42
1.4	64QAM	1	3	16.43	16.44	16.33
1.4	64QAM	1	5	16.38	16.32	16.49
1.4	64QAM	3	0	16.40	16.32	16.34
1.4	64QAM	3	1	16.39	16.49	16.49
1.4	64QAM	3	3	16.37	16.37	16.37
1.4	64QAM	6	0	16.47	16.30	16.40

Bottom Antenna (Full Power):

LTE Band66						
BW [MHz]	Modulation	RB Size	RB Offset	Average Power Low Ch. / Freq.	Average Power Middle Ch. / Freq.	Average Power High Ch. / Freq.
Channel				132072	132322	132572
Frequency (MHz)				1720	1745	1770
20	QPSK	1	0	22.98	22.80	22.71
20	QPSK	1	49	22.83	22.71	22.71
20	QPSK	1	99	22.74	22.54	22.21
20	QPSK	50	0	21.65	21.97	21.83
20	QPSK	50	24	21.81	21.93	21.90
20	QPSK	50	50	21.98	21.97	21.60
20	QPSK	100	0	21.73	21.77	21.75
20	16QAM	1	0	21.99	21.93	21.73
20	16QAM	1	49	21.68	21.89	21.93
20	16QAM	1	99	21.82	21.97	21.92
20	16QAM	50	0	21.62	21.63	21.68
20	16QAM	50	24	21.60	21.69	21.67
20	16QAM	50	50	21.63	21.63	21.69
20	16QAM	100	0	21.61	21.62	21.62
20	64QAM	1	0	21.64	21.61	21.65
20	64QAM	1	49	21.60	21.68	21.61
20	64QAM	1	99	21.67	21.69	21.69
20	64QAM	50	0	20.87	20.96	20.89
20	64QAM	50	24	20.77	20.81	20.88
20	64QAM	50	50	20.72	20.74	20.92
20	64QAM	100	0	20.93	20.73	20.76
Channel				132047	132322	132597
Frequency (MHz)				1717.5	1745	1772.5
15	QPSK	1	0	22.97	22.82	22.52
15	QPSK	1	37	22.85	22.89	22.73
15	QPSK	1	74	22.89	22.58	22.21
15	QPSK	36	0	21.81	21.99	21.78
15	QPSK	36	20	21.78	21.98	21.87
15	QPSK	36	39	21.73	21.89	21.73
15	QPSK	75	0	21.61	21.80	21.95
15	16QAM	1	0	21.68	21.64	21.64

15	16QAM	1	37	21.68	21.66	21.62
15	16QAM	1	74	21.67	21.67	21.63
15	16QAM	36	0	21.64	21.64	21.69
15	16QAM	36	20	21.61	21.62	21.66
15	16QAM	36	39	21.63	21.61	21.62
15	16QAM	75	0	21.68	21.65	21.60
15	64QAM	1	0	21.65	21.61	21.64
15	64QAM	1	37	21.60	21.63	21.64
15	64QAM	1	74	21.70	21.69	21.62
15	64QAM	36	0	20.91	20.76	20.81
15	64QAM	36	20	20.94	20.75	20.81
15	64QAM	36	39	20.75	20.78	20.74
15	64QAM	75	0	20.88	20.99	20.79

Channel				132022	132322	132622
Frequency (MHz)				1715	1745	1775
10	QPSK	1	0	22.87	22.72	22.36
10	QPSK	1	25	22.69	22.86	22.89
10	QPSK	1	49	22.87	22.64	22.18
10	QPSK	25	0	21.76	21.93	21.78
10	QPSK	25	12	21.83	21.90	21.91
10	QPSK	25	25	21.77	21.65	21.64
10	QPSK	50	0	21.88	21.95	21.75
10	16QAM	1	0	21.91	21.94	21.86
10	16QAM	1	25	21.71	21.92	21.90
10	16QAM	1	49	21.92	21.81	21.82
10	16QAM	25	0	21.68	21.64	21.65
10	16QAM	25	12	21.66	21.66	21.62
10	16QAM	25	25	21.65	21.69	21.67
10	16QAM	50	0	21.68	21.68	21.61
10	64QAM	1	0	21.69	21.63	21.62
10	64QAM	1	25	21.67	21.67	21.65
10	64QAM	1	49	21.61	21.66	21.65
10	64QAM	25	0	20.75	20.88	20.76
10	64QAM	25	12	20.97	20.93	20.87
10	64QAM	25	25	20.78	20.73	20.77
10	64QAM	50	0	20.93	20.73	20.76

Channel				131997	132322	132647
Frequency (MHz)				1712.5	1745	1777.5
5	QPSK	1	0	22.86	22.70	22.24
5	QPSK	1	12	22.96	22.58	22.67
5	QPSK	1	24	22.90	22.73	22.25
5	QPSK	12	0	21.87	21.76	21.66
5	QPSK	12	7	21.72	21.61	21.64
5	QPSK	12	13	21.99	21.93	21.73
5	QPSK	25	0	21.70	21.87	21.62
5	16QAM	1	0	21.70	21.82	21.73
5	16QAM	1	12	21.99	21.94	21.86
5	16QAM	1	24	21.82	21.95	21.74
5	16QAM	12	0	21.62	21.65	21.61
5	16QAM	12	7	21.62	21.62	21.70
5	16QAM	12	13	21.61	21.67	21.69
5	16QAM	25	0	21.63	21.68	21.68
5	64QAM	1	0	21.67	21.65	21.62
5	64QAM	1	12	21.65	21.63	21.65
5	64QAM	1	24	21.61	21.67	21.60
5	64QAM	12	0	20.82	20.70	20.79
5	64QAM	12	7	20.85	20.93	20.77
5	64QAM	12	13	20.70	20.72	20.75
5	64QAM	25	0	20.92	20.87	20.94

Channel				131987	132322	132657
Frequency (MHz)				1711.5	1745	1778.5
3	QPSK	1	0	22.83	22.66	22.15
3	QPSK	1	8	22.81	22.72	22.80
3	QPSK	1	14	22.74	22.77	22.79
3	QPSK	8	0	21.95	21.76	22.00
3	QPSK	8	4	21.75	21.83	21.69
3	QPSK	8	7	22.00	21.69	21.72
3	QPSK	15	0	21.73	21.90	21.87
3	16QAM	1	0	21.90	21.71	21.81
3	16QAM	1	8	21.61	21.90	21.80
3	16QAM	1	14	21.98	21.75	21.84
3	16QAM	8	0	21.68	21.62	21.60

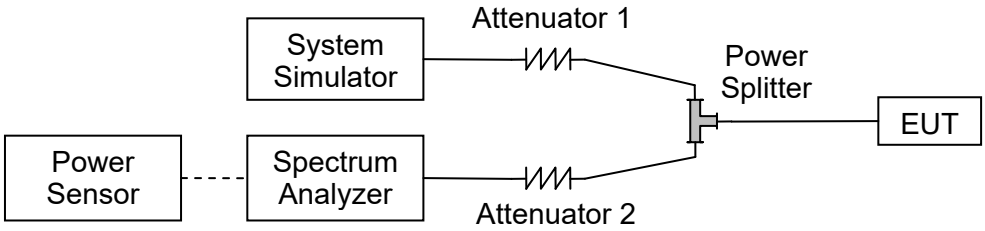
3	16QAM	8	4	21.69	21.67	21.62
3	16QAM	8	7	21.69	21.67	21.69
3	16QAM	15	0	21.68	21.61	21.60
3	64QAM	1	0	21.61	21.66	21.67
3	64QAM	1	8	21.60	21.61	21.70
3	64QAM	1	14	21.60	21.67	21.65
3	64QAM	8	0	20.83	20.94	20.92
3	64QAM	8	4	20.78	20.96	20.85
3	64QAM	8	7	20.75	20.94	20.83
3	64QAM	15	0	20.78	20.94	20.71
Channel				131979	132322	132665
Frequency (MHz)				1710.7	1745	1779.3
1.4	QPSK	1	0	22.73	22.50	21.99
1.4	QPSK	1	3	22.81	22.71	22.84
1.4	QPSK	1	5	22.78	22.71	22.80
1.4	QPSK	3	0	21.79	21.70	21.73
1.4	QPSK	3	1	21.65	21.93	21.69
1.4	QPSK	3	3	21.88	21.60	21.98
1.4	QPSK	6	0	21.88	21.85	21.65
1.4	16QAM	1	0	21.83	21.97	21.86
1.4	16QAM	1	3	21.86	21.92	21.97
1.4	16QAM	1	5	21.64	21.61	21.67
1.4	16QAM	3	0	21.65	21.63	21.69
1.4	16QAM	3	1	21.66	21.69	21.66
1.4	16QAM	3	3	21.70	21.61	21.64
1.4	16QAM	6	0	21.63	21.67	21.63
1.4	64QAM	1	0	20.92	20.90	20.88
1.4	64QAM	1	3	20.99	20.89	20.96
1.4	64QAM	1	5	20.96	20.93	20.76
1.4	64QAM	3	0	20.80	20.72	20.80
1.4	64QAM	3	1	20.83	20.88	20.86
1.4	64QAM	3	3	20.72	20.91	20.73
1.4	64QAM	6	0	20.92	20.90	20.88

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 66, BW: 1.4MHz					
Channel	Frequency (MHz)	QPSK		16QAM	
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
131979	1710.7	1.090	1.233	1.090	1.243
132322	1745	1.084	1.229	1.092	1.247
132665	1779.3	1.090	1.233	1.092	1.237

LTE Band 66, BW: 1.4MHz					
Channel	Frequency (MHz)	64QAM			
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)		
131979	1710.7	1.088	1.236		
132322	1745	1.087	1.232		
132665	1779.3	1.086	1.237		
LTE Band66, BW: 3MHz					
Channel	Frequency (MHz)	QPSK		16QAM	
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
131987	1711.5	2.689	2.960	2.690	2.994
132322	1745	2.690	2.986	2.692	2.994
132657	1778.5	2.689	2.978	2.696	2.987
LTE Band66, BW: 3MHz					
Channel	Frequency (MHz)	64QAM			
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)		
131987	1711.5	2.697	2.977		
132322	1745	2.699	2.984		
132657	1778.5	2.701	2.973		
LTE Band 66, BW: 5MHz					
Channel	Frequency (MHz)	QPSK		16QAM	
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
131997	1712.5	4.476	4.936	4.488	4.969
132322	1745	4.490	4.970	4.495	4.907
132647	1777.5	4.485	4.919	4.491	4.938
LTE Band 66, BW: 5MHz					
Channel	Frequency (MHz)	64QAM			
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)		
131997	1712.5	4.504	4.982		
132322	1745	4.496	4.963		
132647	1777.5	4.502	4.963		
LTE Band 66, BW: 10MHz					
Channel	Frequency	QPSK		16QAM	

	(MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
132022	1715	8.959	9.740	8.941	9.678
132322	1745	8.966	9.732	8.958	9.672
132622	1775	8.980	9.785	8.959	9.715
LTE Band 66, BW: 10MHz					
Channel	Frequency (MHz)	64QAM			
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)		
132022	1715	8.971	9.800		
132322	1745	8.969	9.780		
132622	1775	8.973	9.788		
LTE Band 66, BW: 15MHz					
Channel	Frequency (MHz)	QPSK		16QAM	
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
132047	1717.5	13.460	14.58	13.443	14.54
132322	1745	13.448	14.55	13.433	14.65
132597	1902.5	13.430	14.49	13.473	14.53
LTE Band 66, BW: 15MHz					
Channel	Frequency (MHz)	64QAM			
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)		
132047	1717.5	13.425	14.73		
132322	1745	13.441	14.73		
132597	1902.5	13.425	14.58		
LTE Band 66, BW: 20MHz					
Channel	Frequency (MHz)	QPSK		16QAM	
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)
132072	1720	17.904	19.45	17.944	19.30
132322	1745	17.925	19.37	17.941	19.38
132572	1770	17.916	19.23	17.927	19.39

LTE Band 66, BW: 20MHz					
Channel	Frequency (MHz)	64QAM			
		99% Bandwidth (MHz)	26dB Bandwidth (MHz)		
132072	1720	17.922	19.41		
132322	1745	17.940	19.50		
132572	1770	17.972	19.42		

LTE Band 2 99%&26dB Bandwidth

1.4MHz/QPSK/Low CH

1.4MHz/16QAM/Low CH

1.4MHz/QPSK/Mid CH

1.4MHz/16QAM/Mid CH

1.4MHz/QPSK/High CH

1.4MHz/16QAM/High CH

3MHz/QPSK/Low CH

3MHz/16QAM/Low CH

3MHz/QPSK/Mid CH

3MHz/16QAM/Mid CH

3MHz/QPSK/High CH

3MHz/16QAM/High CH

5MHz/QPSK/Low CH

5MHz/16QAM/Low CH

5MHz/QPSK/Mid CH

5MHz/16QAM/Mid CH

5MHz/QPSK/High CH

5MHz/16QAM/High CH

10MHz/QPSK/Low CH

10MHz/16QAM/Low CH

10MHz/QPSK/Mid CH

10MHz/16QAM/Mid CH

10MHz/QPSK/High CH

10MHz/16QAM/High CH

15MHz/QPSK/Low CH

15MHz/16QAM/Low CH

15MHz/QPSK/Mid CH

15MHz/16QAM/Mid CH

15MHz/QPSK/High CH

15MHz/16QAM/High CH

20MHz/QPSK/Low CH

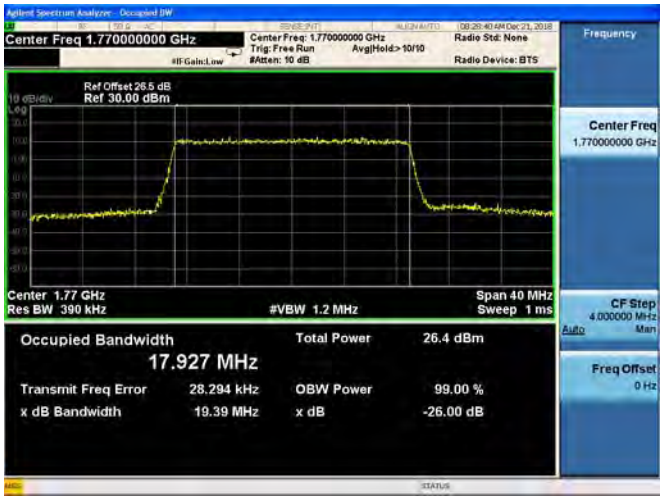
20MHz/16QAM/Low CH

20MHz/QPSK/Mid CH

20MHz/16QAM/Mid CH

20MHz/QPSK/High CH

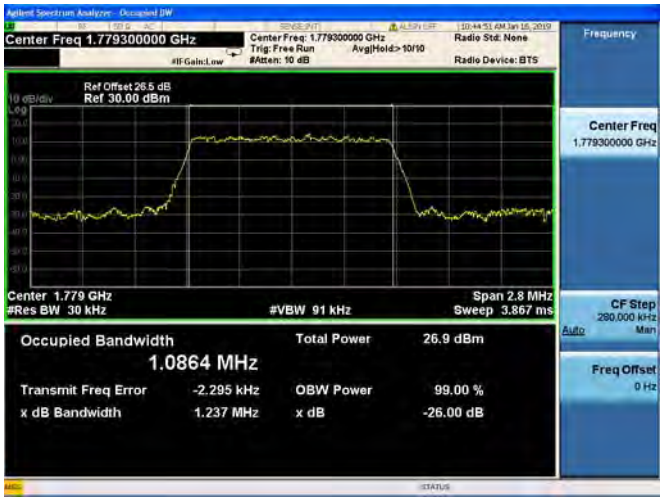
20MHz/16QAM/High CH



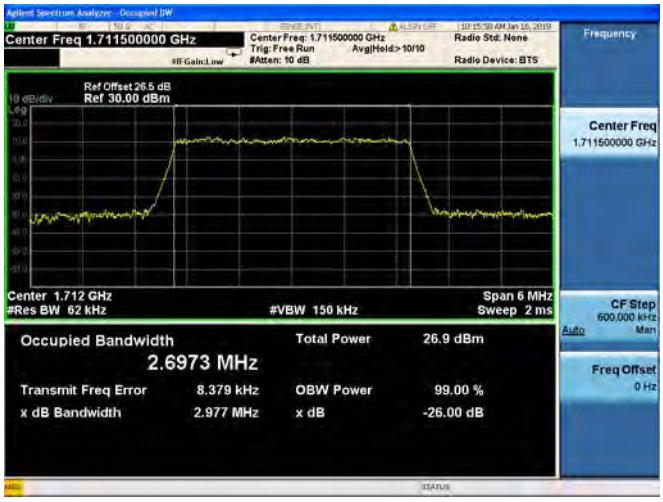
1.4MHz/64QAM/Low CH

1.4MHz/64QAM/Mid CH

1.4MHz/64QAM/High CH



3MHz/64QAM/Low CH



3MHz/64QAM/Mid CH

3MHz/64QAM/High CH

5MHz/64QAM/Low CH

5MHz/64QAM/Mid CH

5MHz/64QAM/High CH

10MHz/64QAM/Low CH

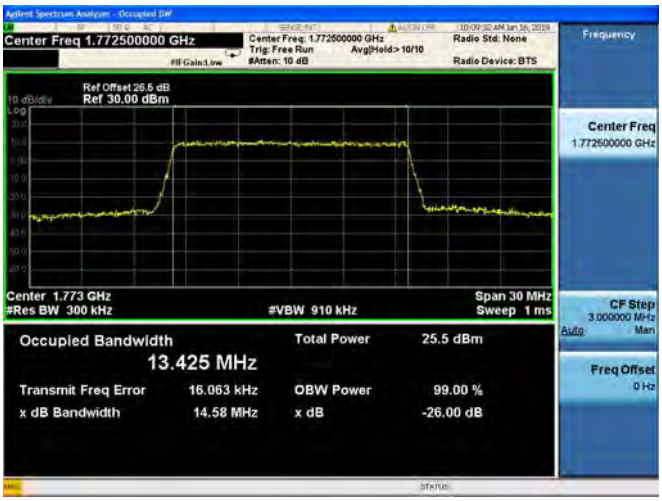
10MHz/64QAM/Mid CH

10MHz/64QAM/High CH

15MHz/64QAM/Low CH

15MHz/64QAM/Mid CH

15MHz/64QAM/High CH



20MHz/64QAM/Low CH

20MHz/64QAM/Mid CH	20MHz/64QAM/High CH

2.3. Frequency Stability

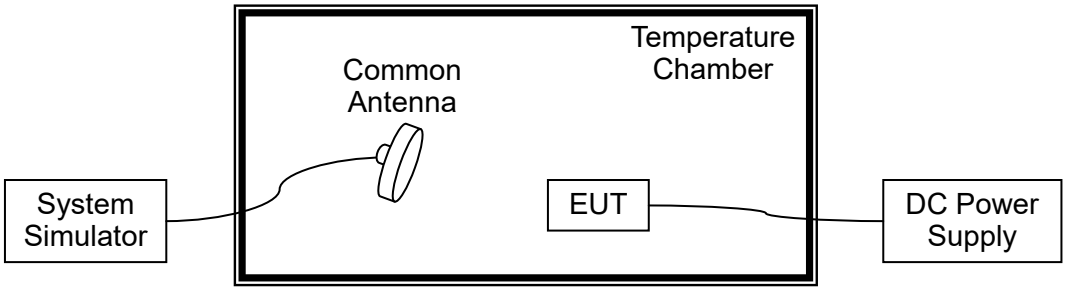
2.3.1. Requirement

According to FCC section 2.1055 & 27.54&24.235, 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.

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 3.8VDC, 4.35VDC and 3.5VDC, which are specified by the applicant; the normal temperature here used is 20°C.

LTE Band 66, QPSK, Channel 132322, Frequency 1745MHz Limit =1745 MHz*1ppm=1745Hz					
Voltage (%)	**Power (VDC)**	**Temp (°C)**	**Fre. Dev. (Hz)**	**Deviation (ppm)**	**Result**
100	3.8	-30	25	0.014	PASS
100		-20	-83	-0.048	
100		-10	-77	-0.044	
100		0	-47	-0.027	
100		+10	-68	-0.039	
100		+20	54	0.031	
100		+30	25	0.014	
100		+40	23	0.013	
100		+50	26	0.015	
115	4.35	+20	46	0.026	
85	3.5	+20	-32	-0.018	

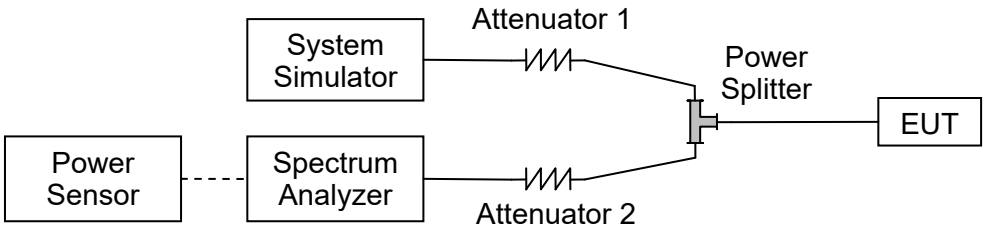
2.4. Peak to Average Radio

2.4.1. Requirement

According to FCC section 27.50(d)(5), the peak to average ratio (PAR) of the transmission may not exceed 13dB.

2.4.2. Test Description

A. Test Set:



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

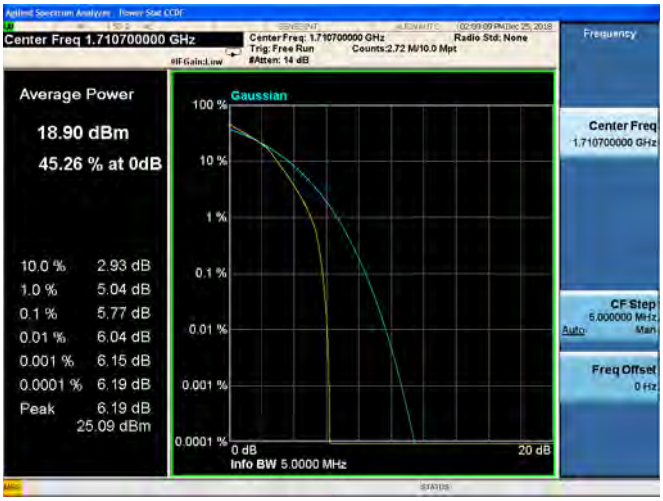
Record the maximum PAPR level associated with a probability of 0.1%.

LTE Band 66, BW: 1.4MHz				
Channel	Frequency (MHz)	Peak to Average Radio(dB)		
		QPSK	16QAM	64QAM
131979	1710.7	4.76	5.77	4.84
132322	1745	4.99	6.05	4.88
132665	1779.3	4.66	5.62	4.53
LTE Band 66, BW: 3MHz				
Channel	Frequency (MHz)	Peak to Average Radio(dB)		
		QPSK	16QAM	64QAM
131987	1711.5	4.60	5.83	4.58
132322	1745	5.23	6.06	4.81
132657	1778.5	4.58	5.76	4.50
LTE Band 66, BW: 5MHz				
Channel	Frequency (MHz)	Peak to Average Radio(dB)		
		QPSK	16QAM	64QAM
131997	1712.5	4.75	5.79	4.69
132322	1745	4.89	5.99	4.94
132647	1777.5	4.76	5.80	4.64
LTE Band 66, BW: 10MHz				
Channel	Frequency (MHz)	Peak to Average Radio(dB)		
		QPSK	16QAM	64QAM
132022	1715	4.75	5.03	4.72
132322	1745	4.87	6.00	4.85
132622	1775	4.88	5.88	4.84
LTE Band 66, BW: 15MHz				
Channel	Frequency (MHz)	Peak to Average Radio(dB)		
		QPSK	16QAM	64QAM
132047	1717.5	4.74	5.76	4.60
132322	1745	4.82	5.79	4.87
132597	1902.5	4.77	5.87	4.64
LTE Band 66, BW: 20MHz				
Channel	Frequency (MHz)	Peak to Average Radio(dB)		
		QPSK	16QAM	64QAM
132072	1720	5.81	4.64	4.62
132322	1745	4.74	5.56	4.86
132572	1770	4.83	5.93	4.85

LTE Band 2 Peak to Average Radio

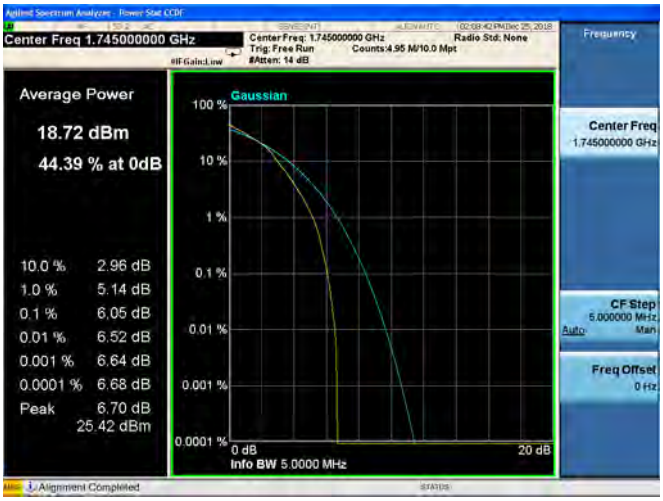
1.4MHz/QPSK/Low CH

1.4MHz/16QAM/Low CH

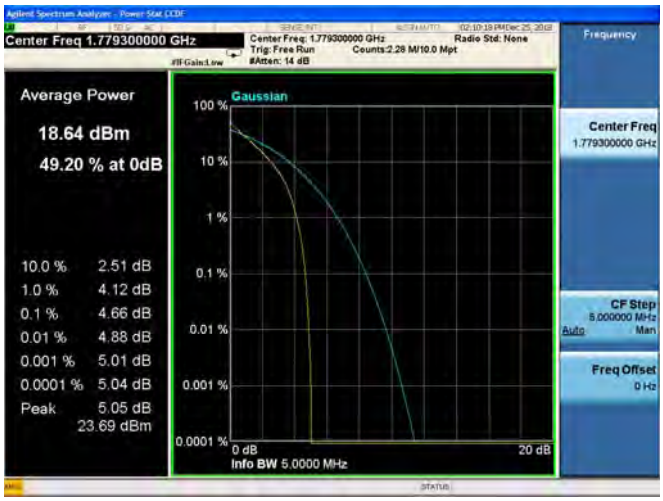


1.4MHz/QPSK/Mid CH

1.4MHz/16QAM/Mid CH

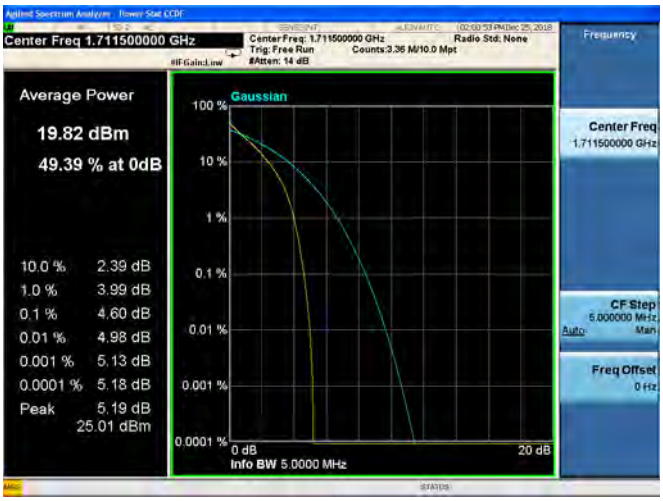


1.4MHz/QPSK/High CH

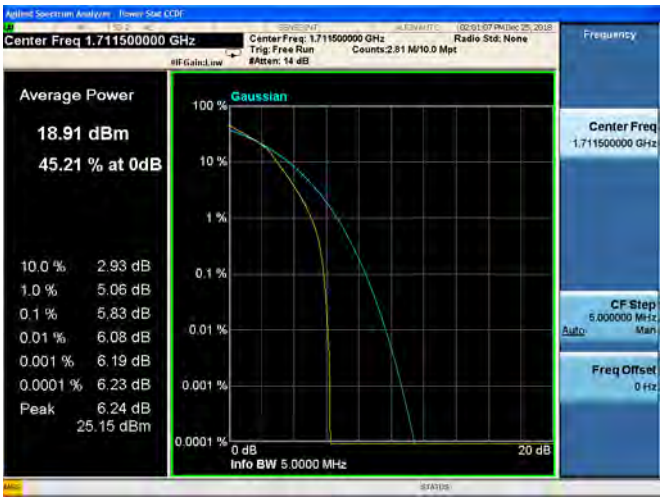


1.4MHz/16QAM/High CH

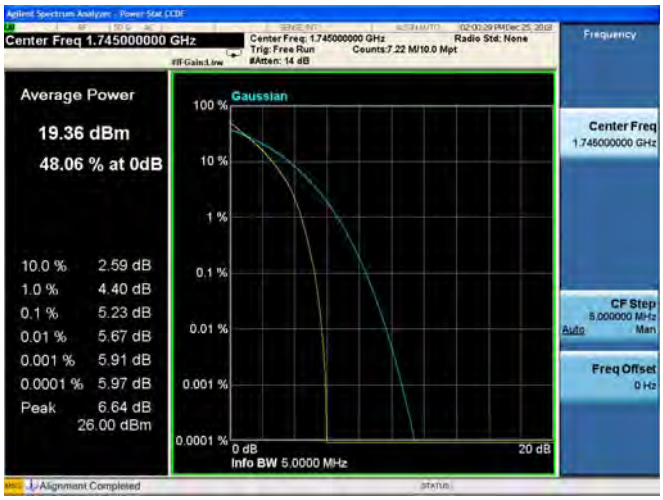
3MHz/QPSK/Low CH



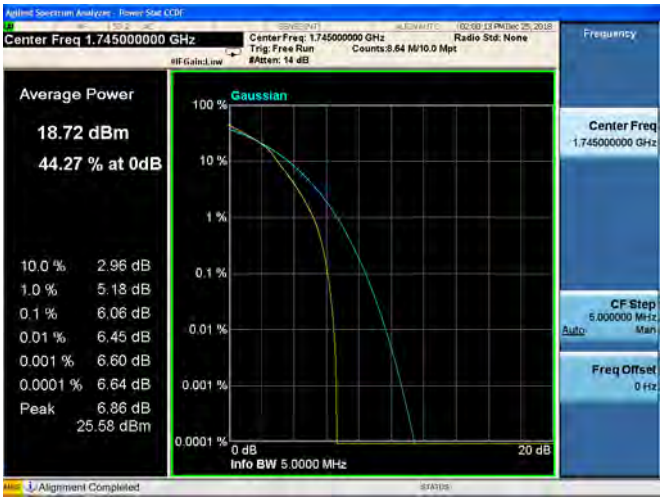
3MHz/16QAM/Low CH



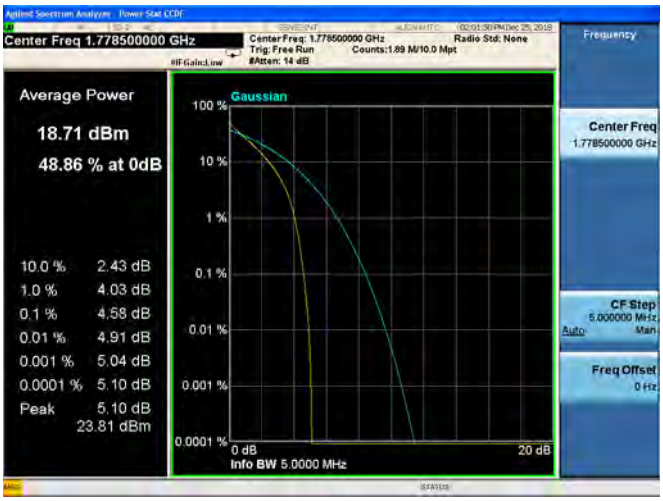
3MHz/QPSK/Mid CH



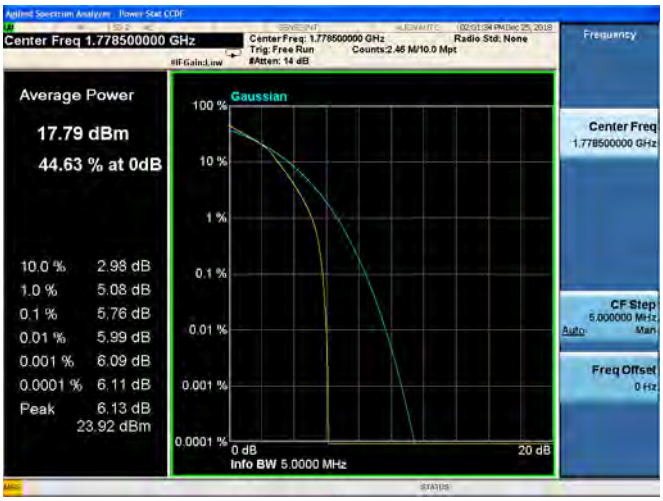
3MHz/16QAM/Mid CH



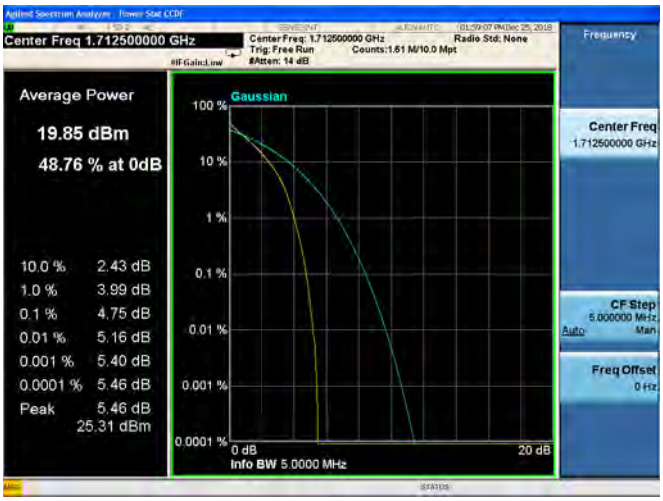
3MHz/QPSK/High CH



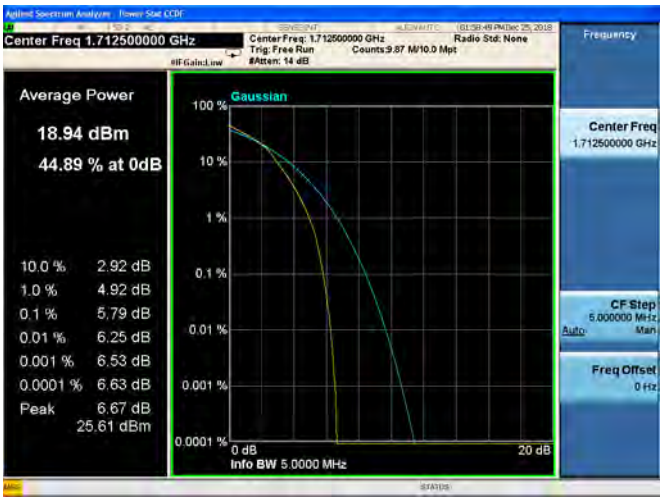
3MHz/16QAM/High CH



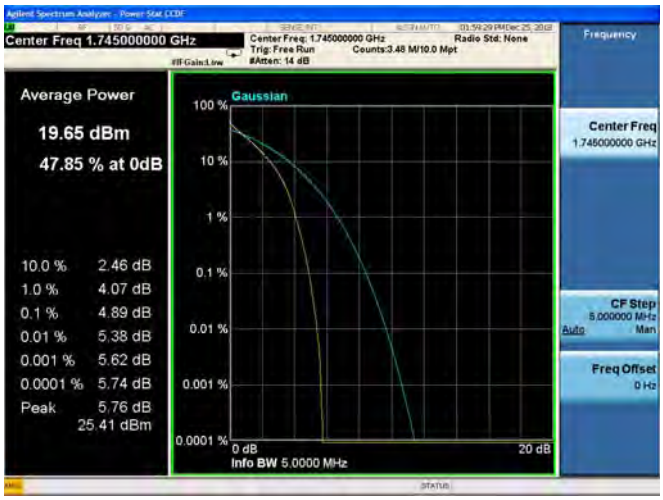
5MHz/QPSK/Low CH



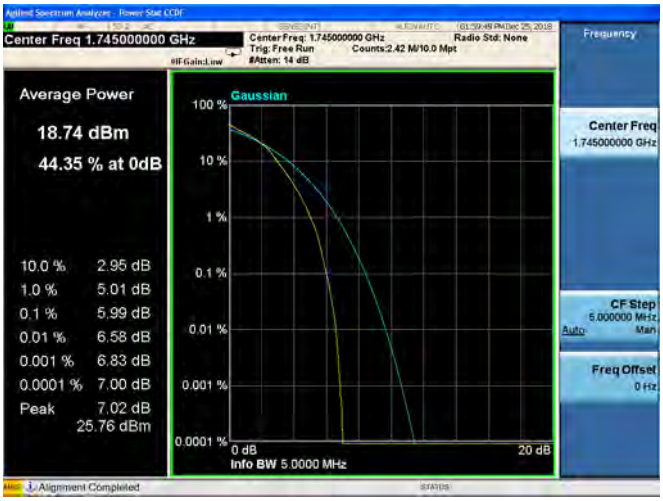
5MHz/16QAM/Low CH



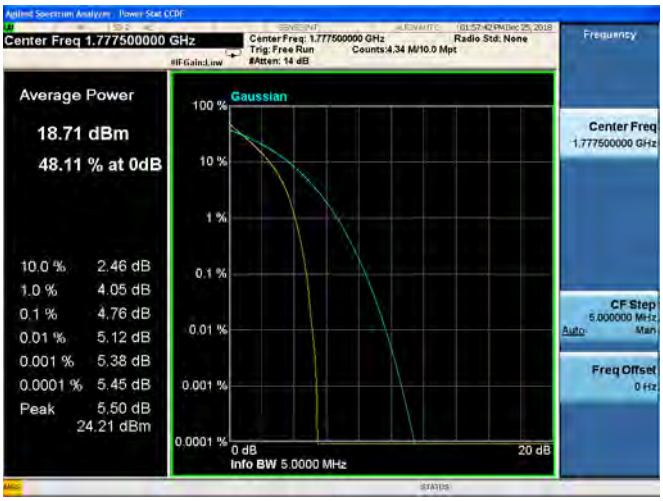
5MHz/QPSK/Mid CH



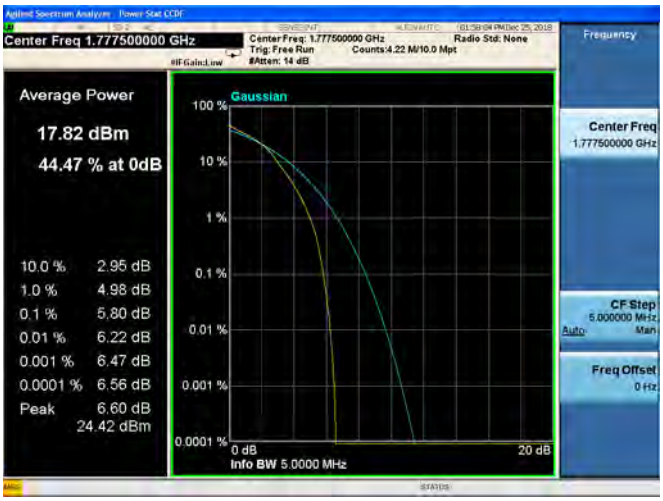
5MHz/16QAM/Mid CH



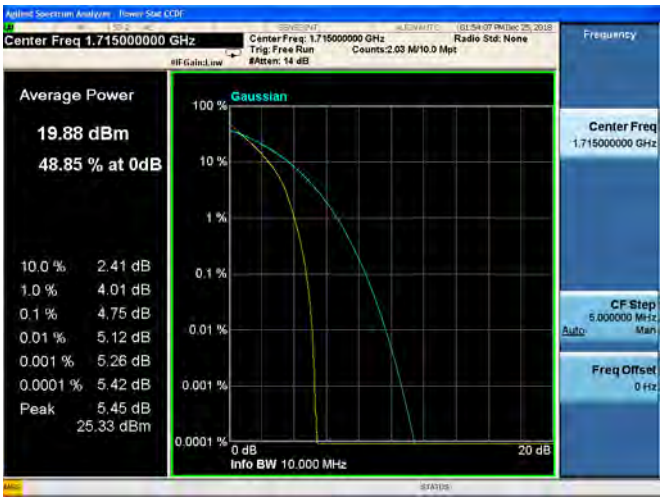
5MHz/QPSK/High CH



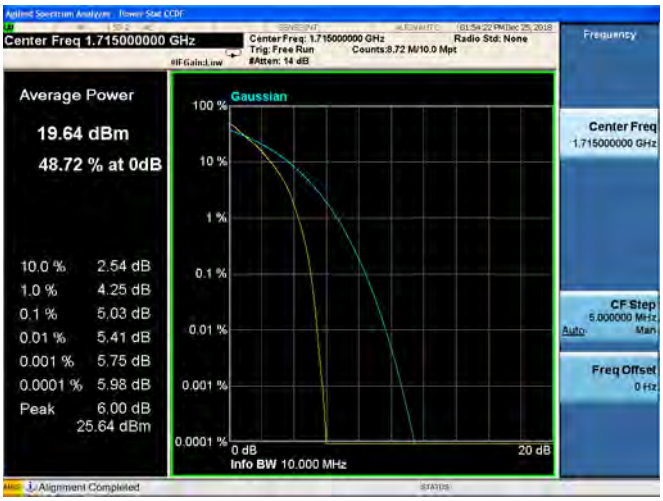
5MHz/16QAM/High CH



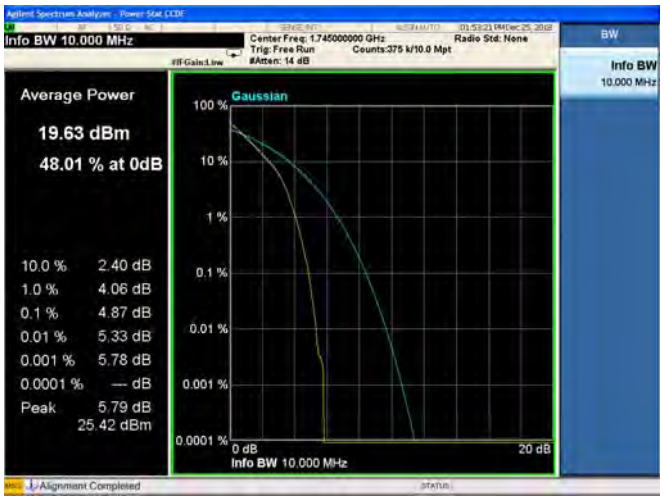
10MHz/QPSK/Low CH



10MHz/16QAM/Low CH



10MHz/QPSK/Mid CH



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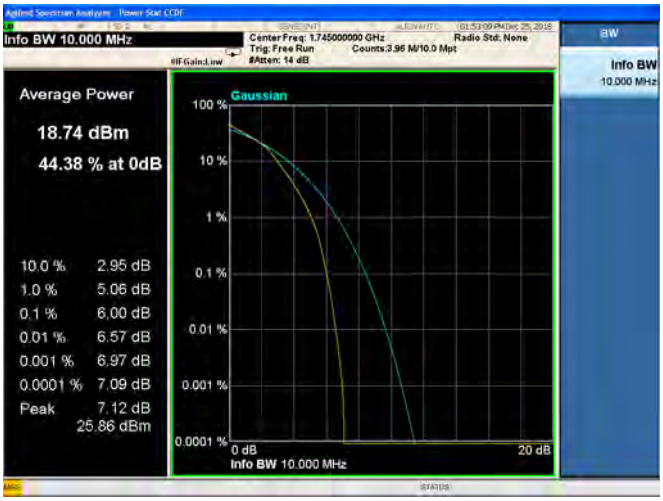
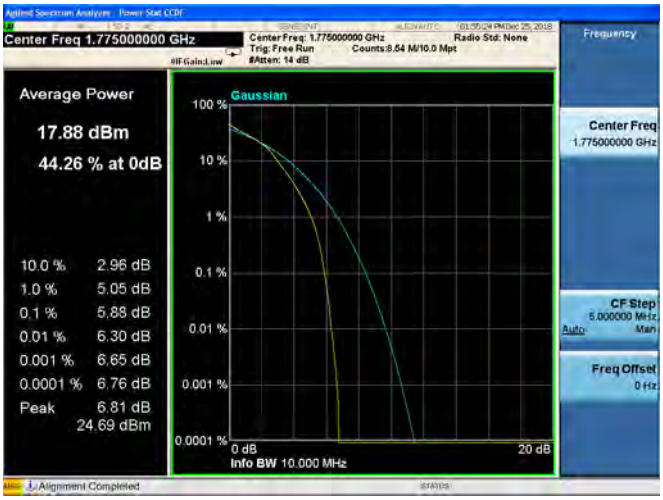
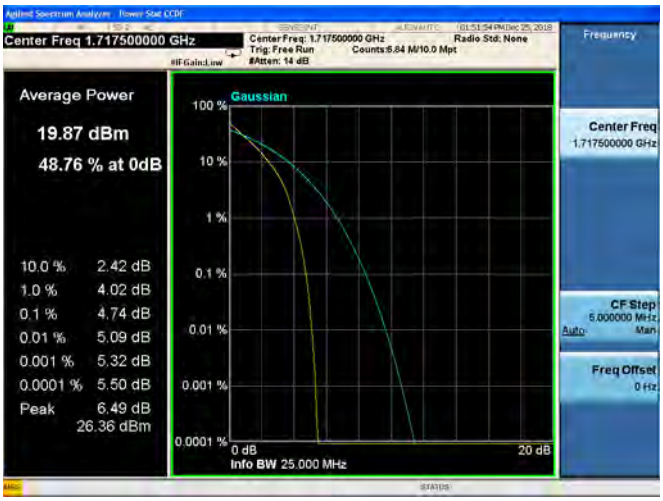


10MHz/QPSK/High CH

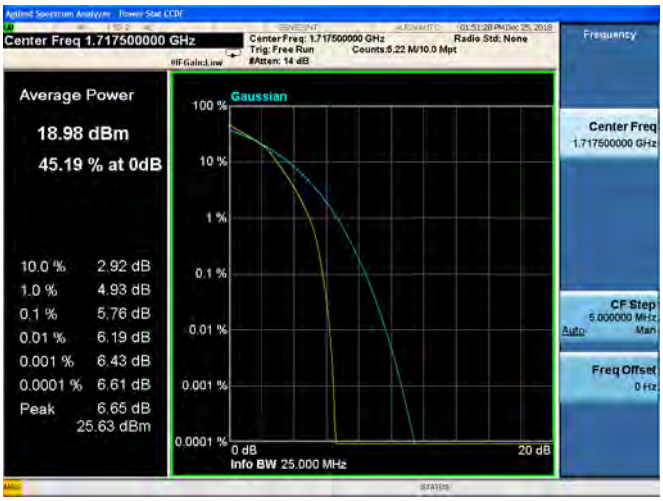
10MHz/16QAM/High CH



15MHz/QPSK/Low CH



15MHz/16QAM/Low CH



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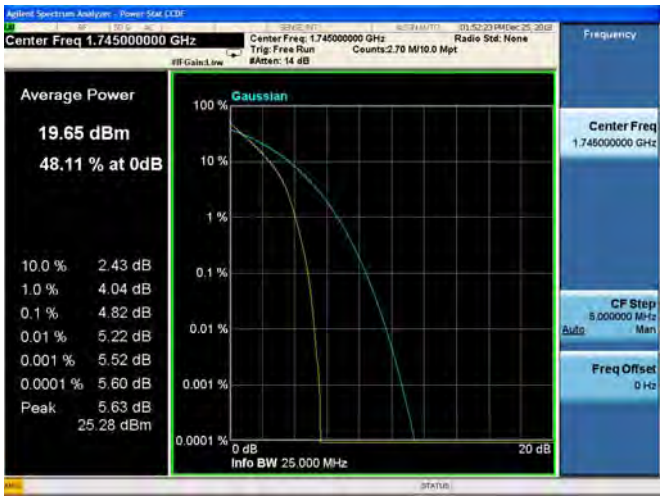

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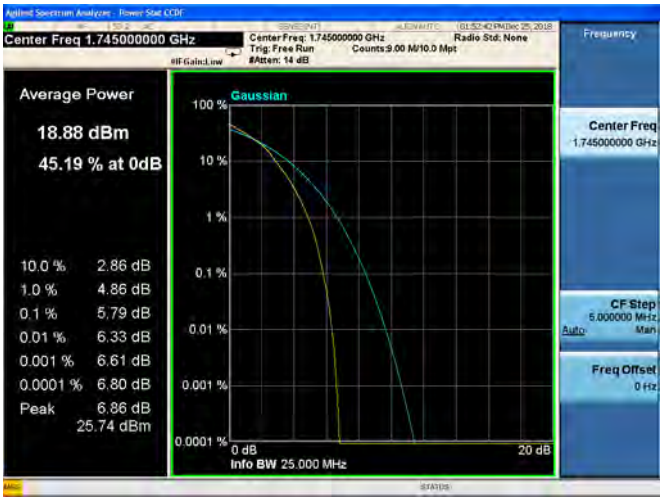
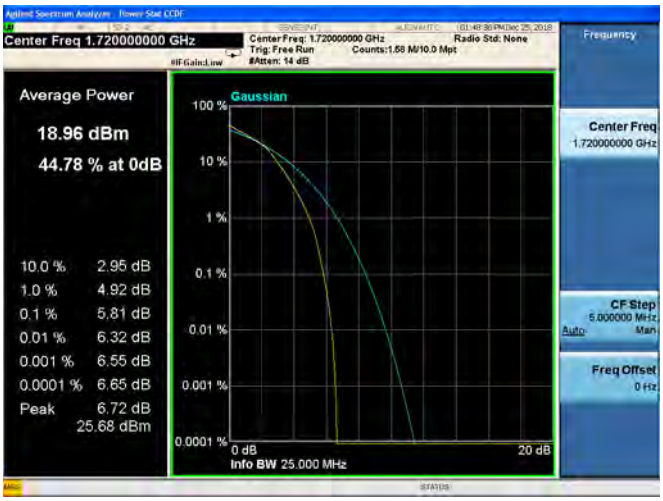


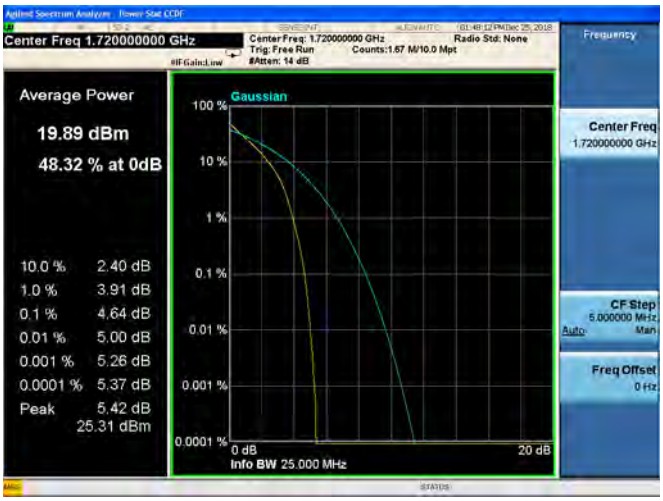
15MHz/QPSK/High CH

15MHz/16QAM/High CH

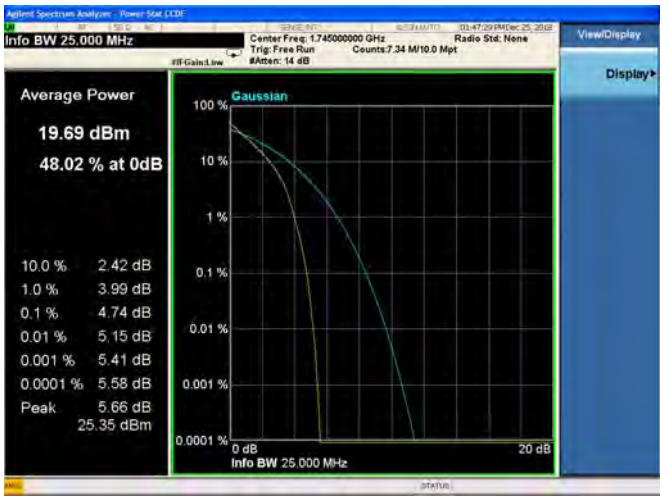
20MHz/QPSK/Low CH



20MHz/16QAM/Low CH



20MHz/QPSK/Mid CH



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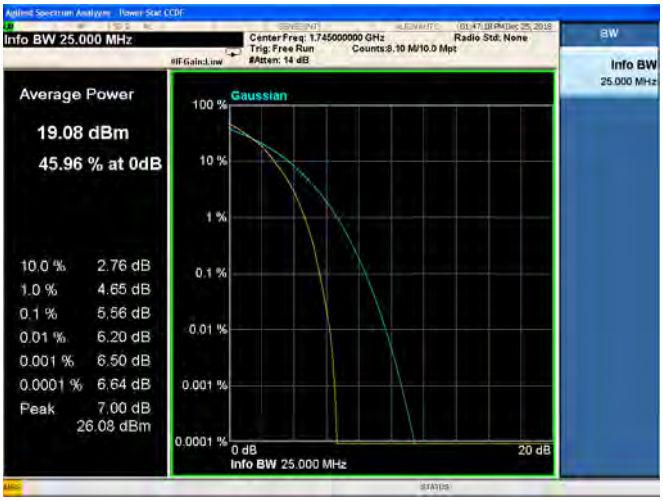
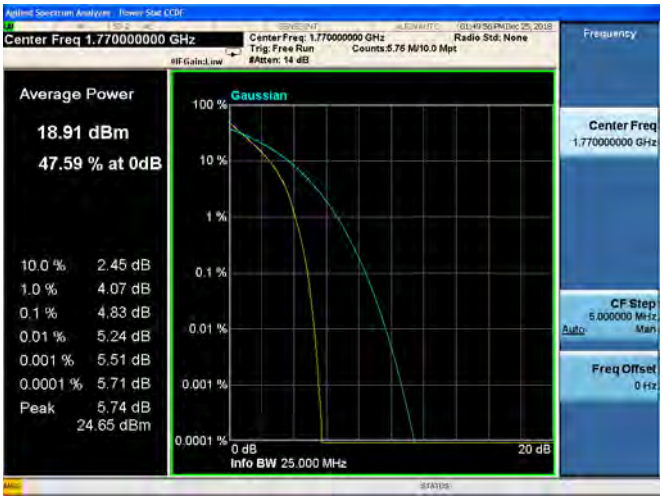
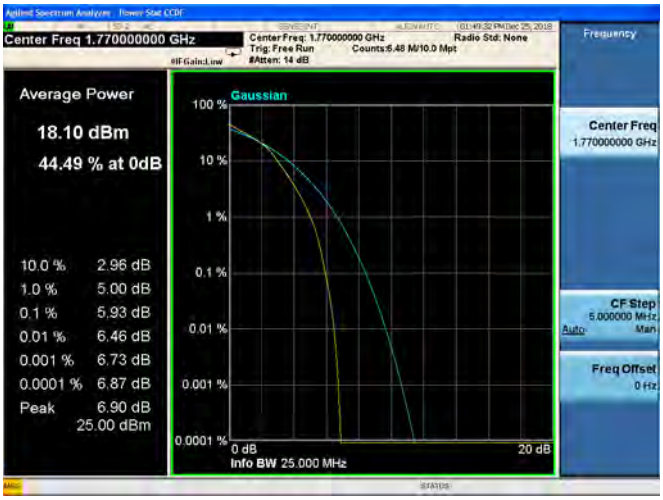


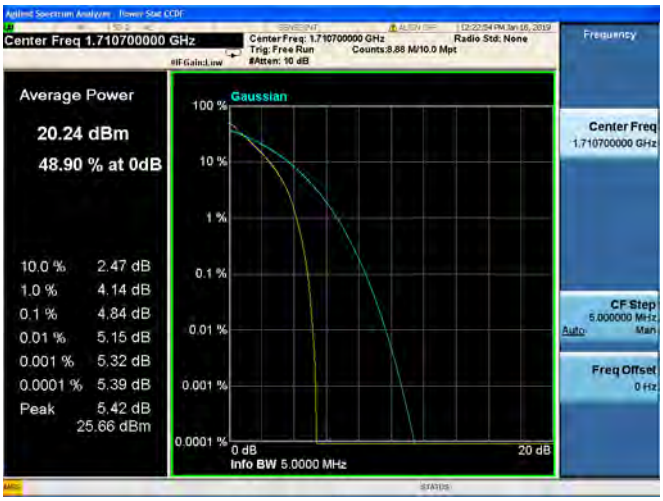
20MHz/QPSK/High CH



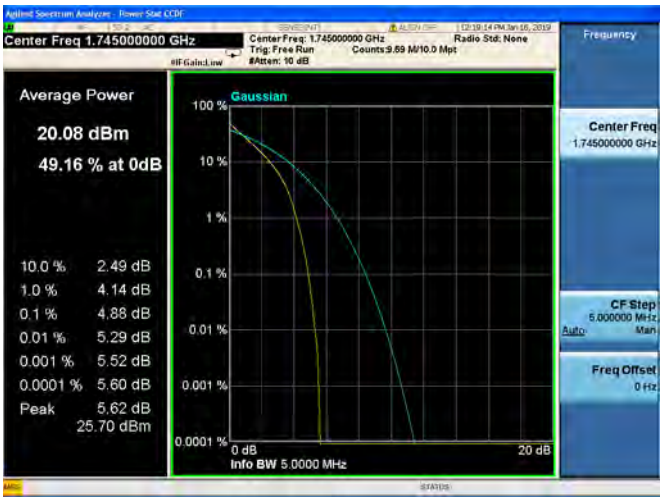
20MHz/16QAM/High CH



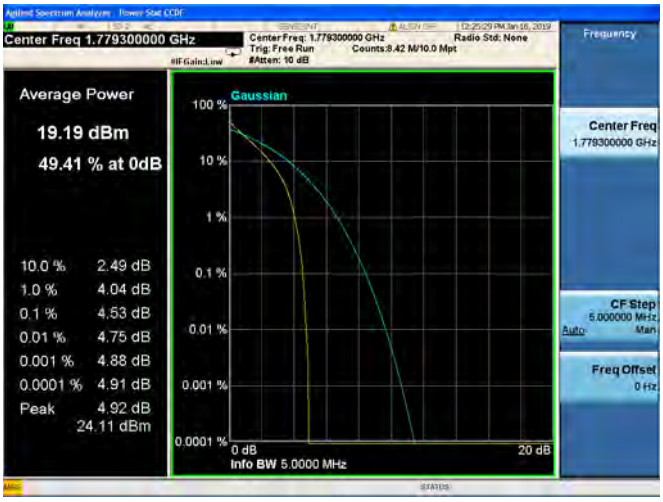
1.4MHz/64QAM/Low CH



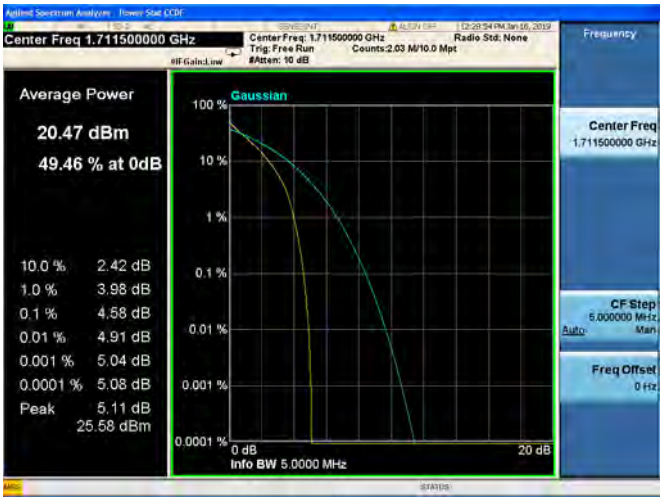
1.4MHz/64QAM/Mid CH



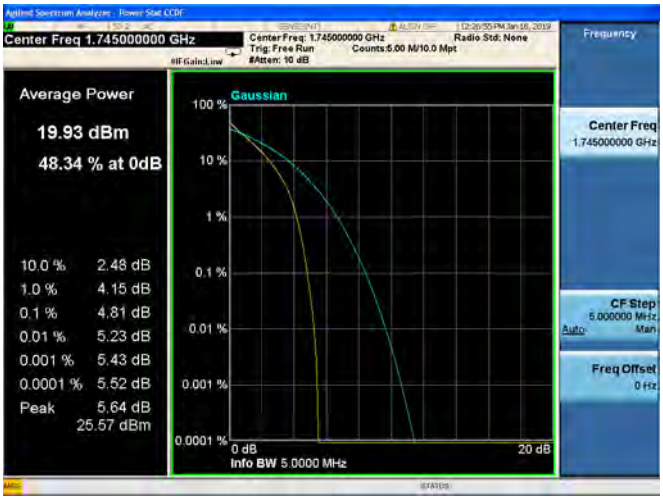
1.4MHz/64QAM/High CH



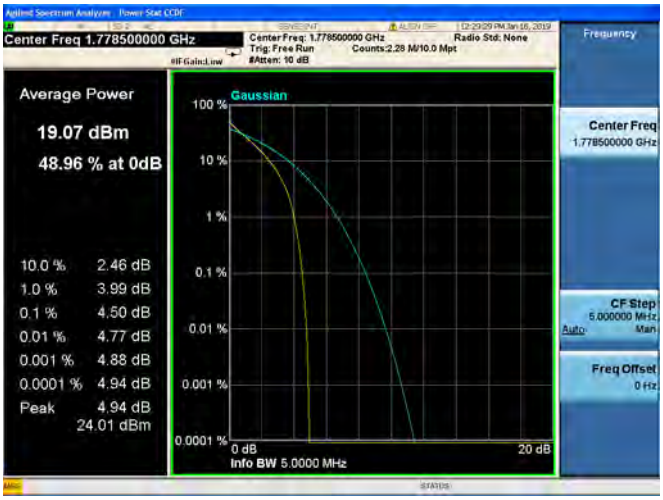
3MHz/64QAM/Low CH



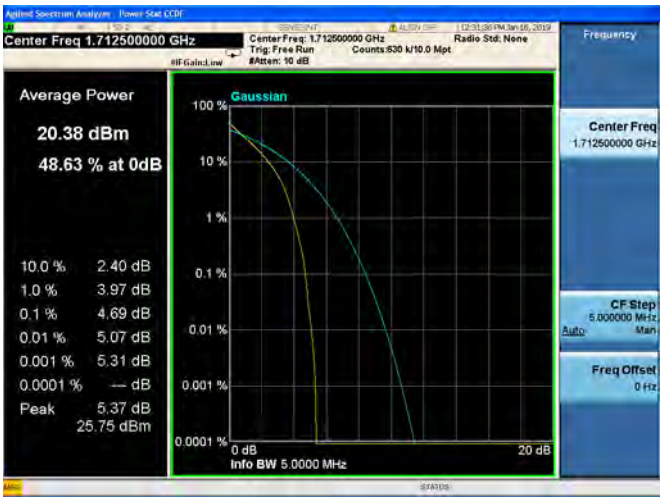
3MHz/64QAM/Mid CH



3MHz/64QAM/High CH

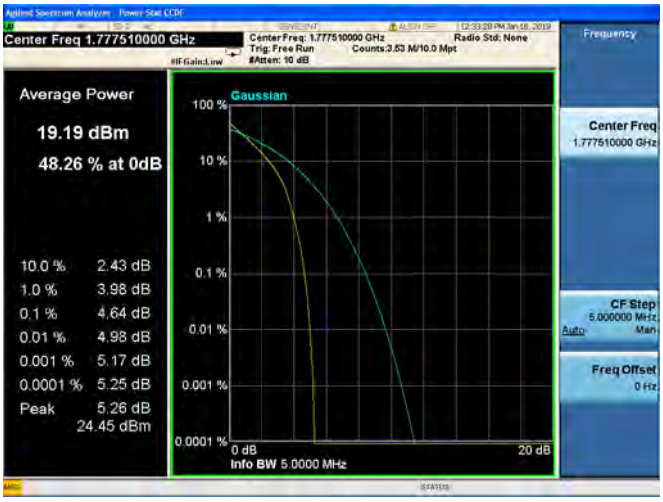


5MHz/64QAM/Low CH

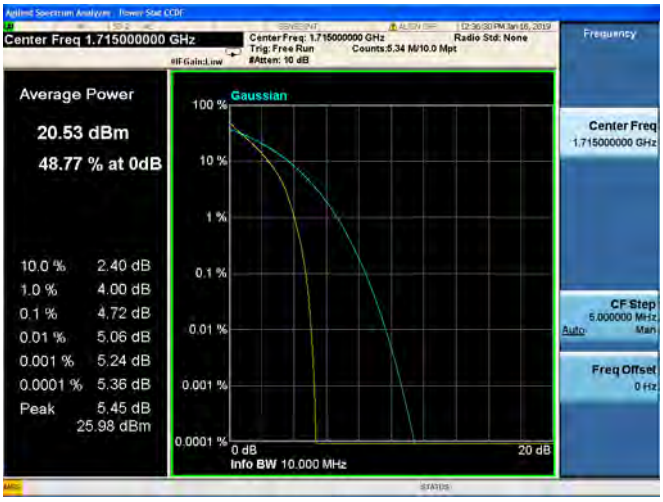


5MHz/64QAM/Mid CH

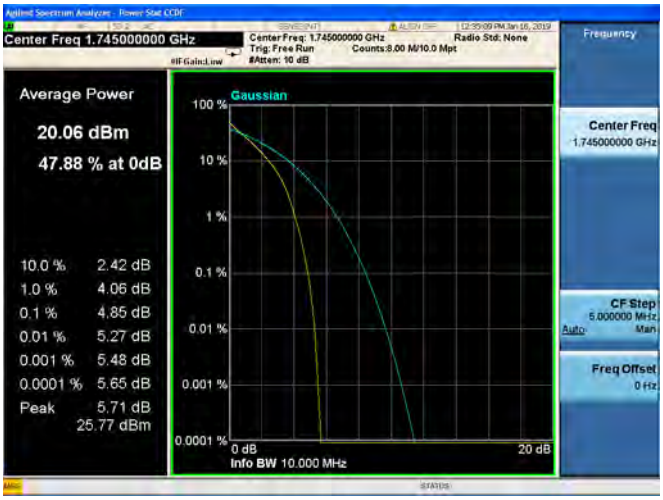
5MHz/64QAM/High CH



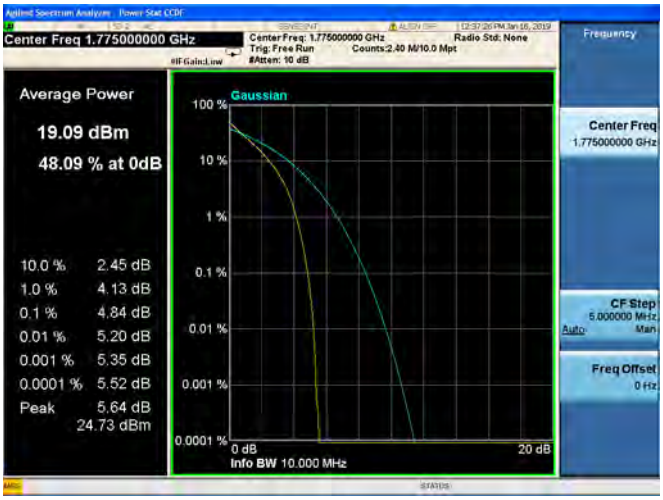
10MHz/64QAM/Low CH



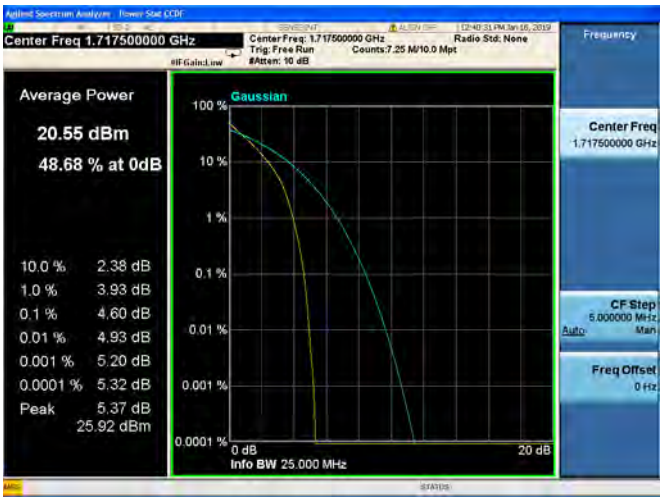
10MHz/64QAM/Mid CH



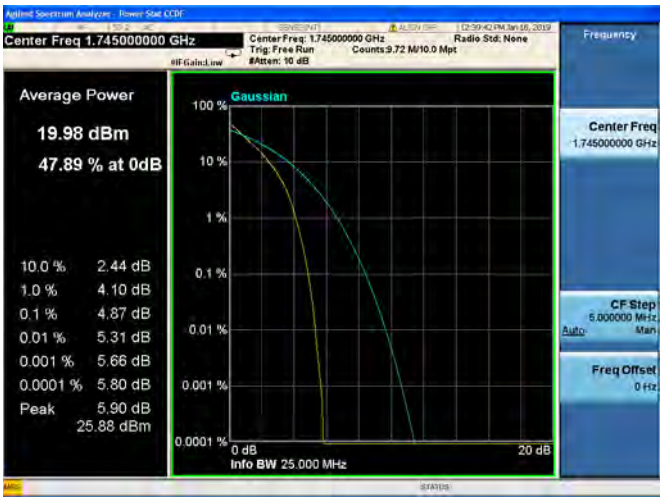
10MHz/64QAM/High CH



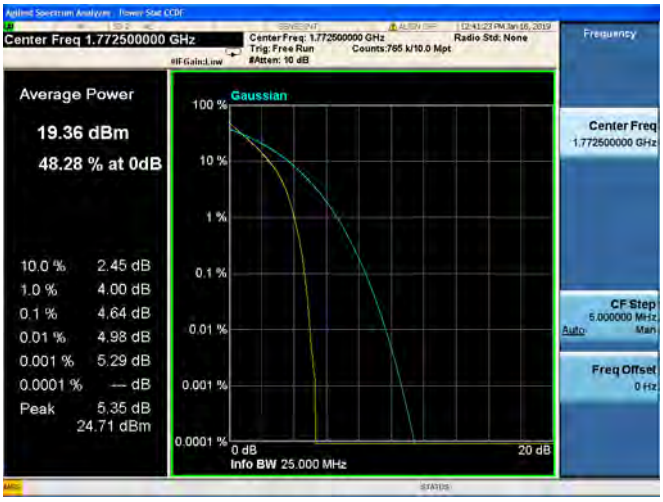
15MHz/64QAM/Low CH



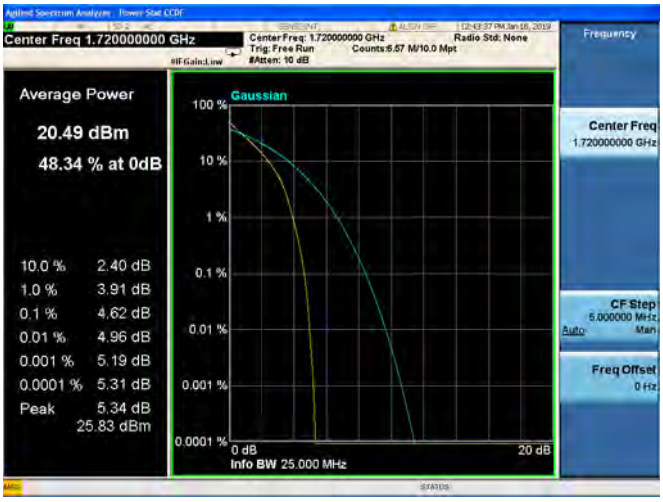
15MHz/64QAM/Mid CH

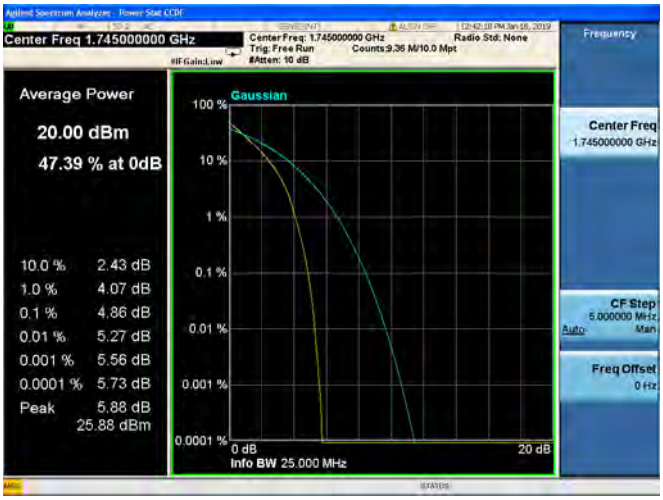
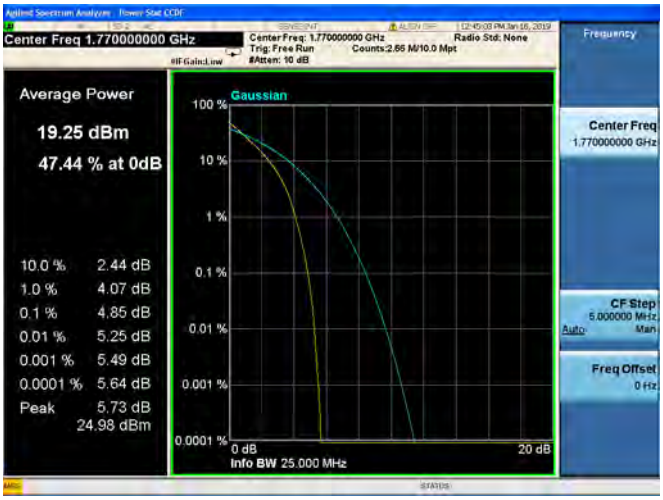


15MHz/64QAM/High CH



20MHz/64QAM/Low CH



20MHz/64QAM/Mid CH	20MHz/64QAM/High CH
	

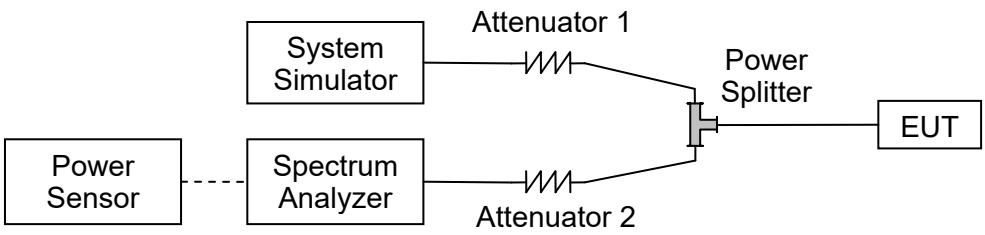
2.5. Conducted Spurious Emissions

2.5.1. Requirement

According to FCC section 2.1051, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

Additional requirement for LTE Band 7:
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 55 + 10 log(P) dB. This calculated to be -25dBm.

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.

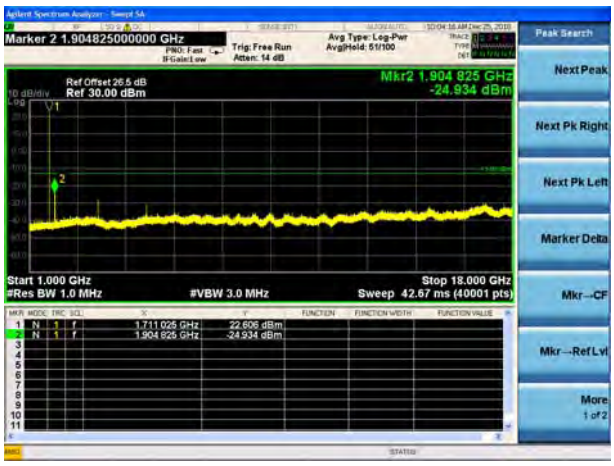
2.5.3. Test procedure

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

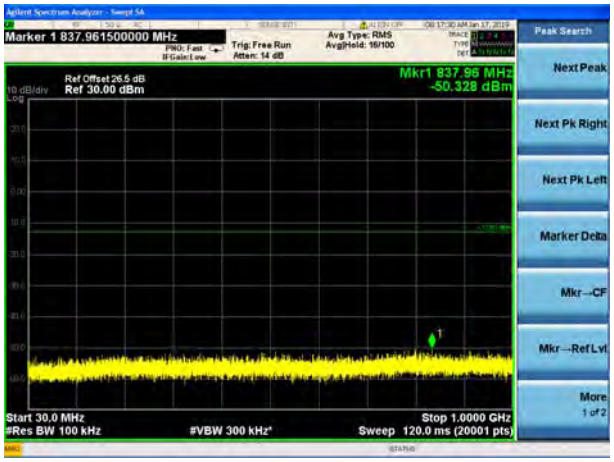
2.5.4. Test Result

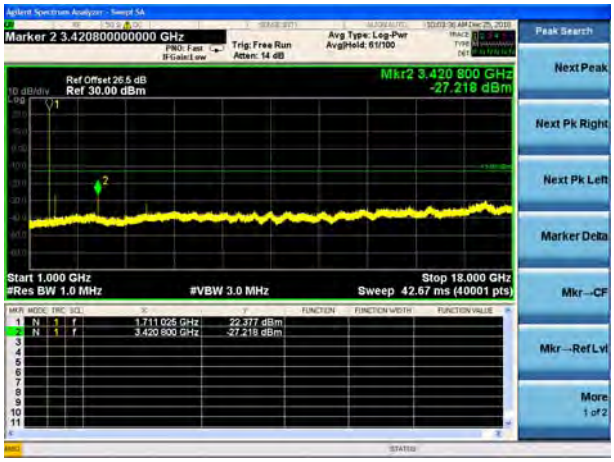
LTE Band 66 1.4MHz BW Low Channel

QPSK



16QAM





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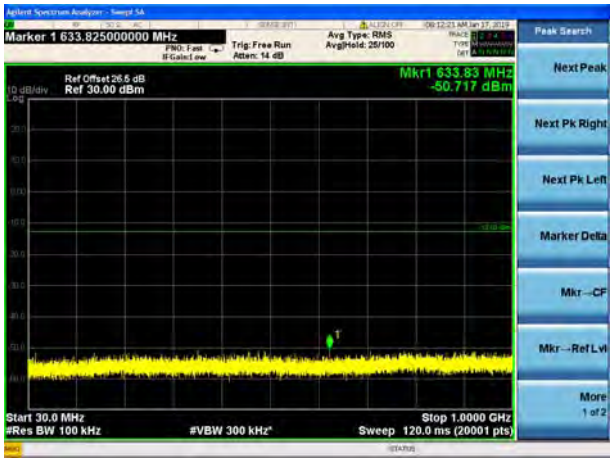
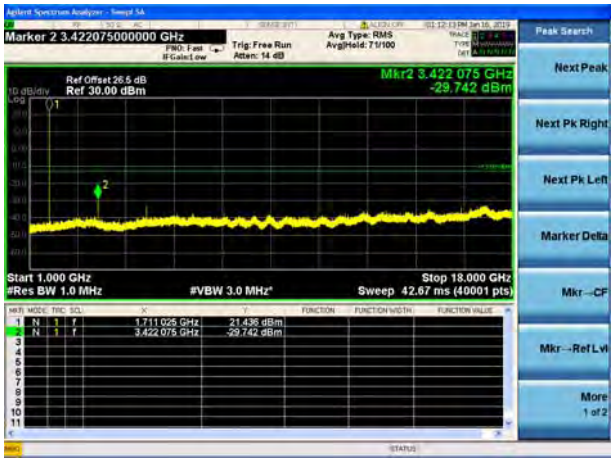
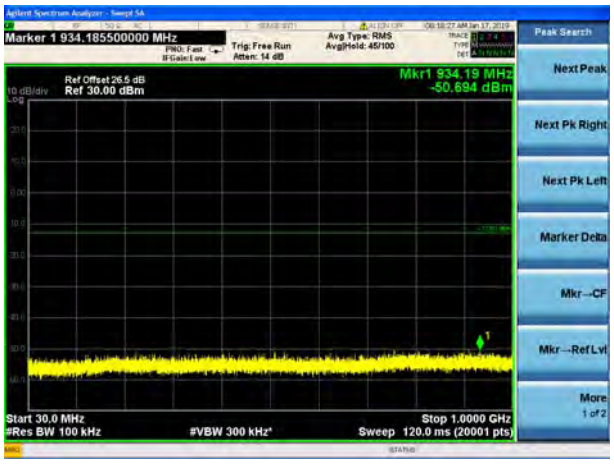
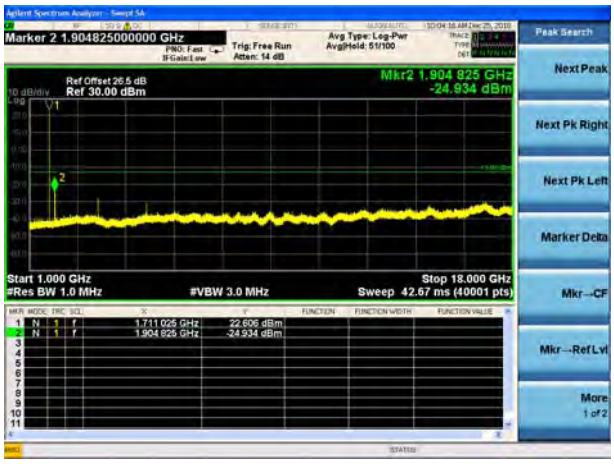




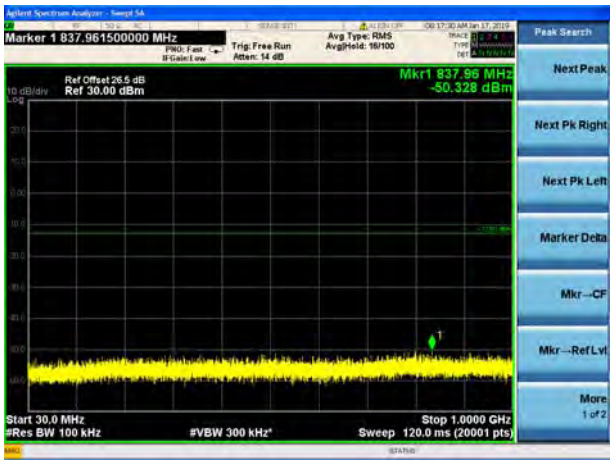
LTE Band 66 1.4MHz BW Mid Channel

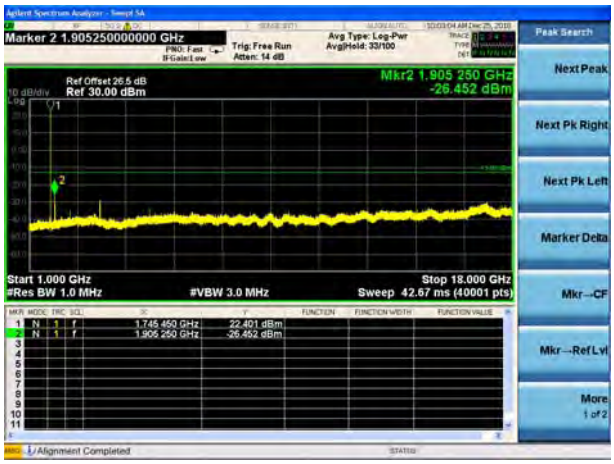
QPSK



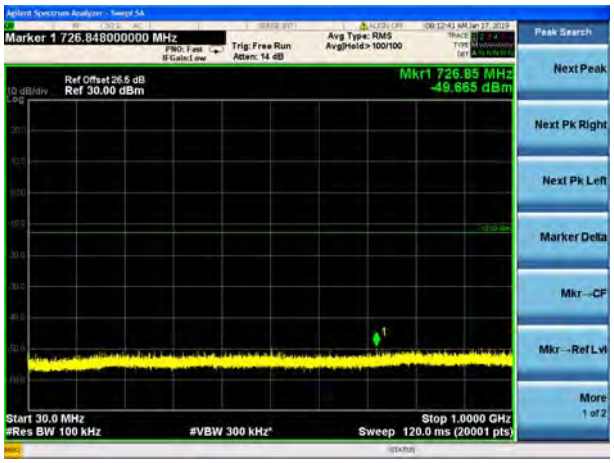


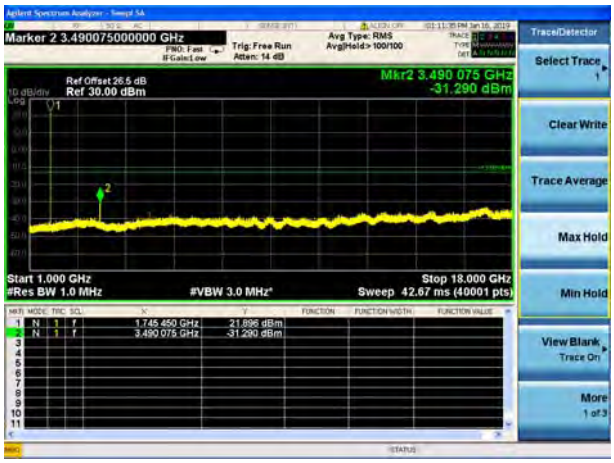
16QAM





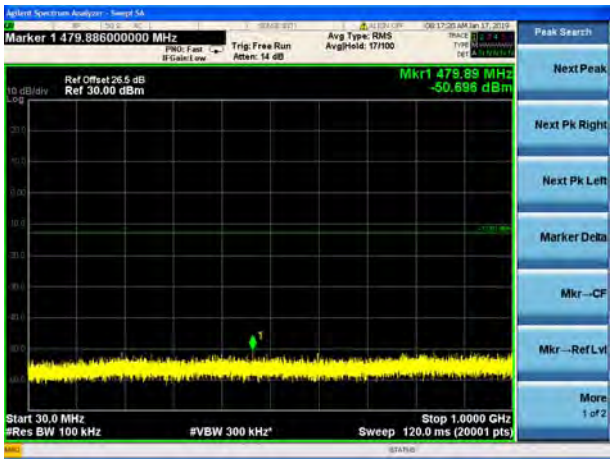
64QAM

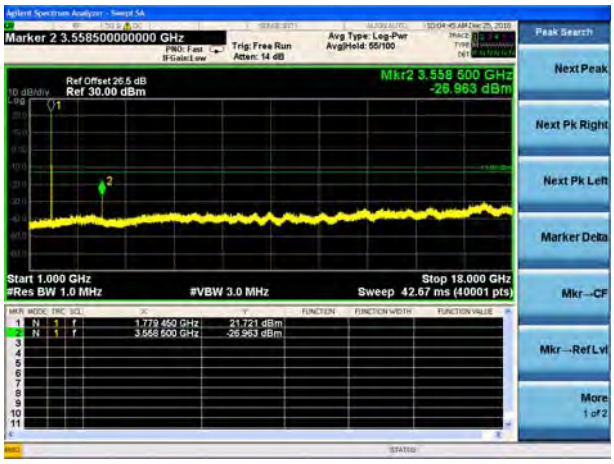




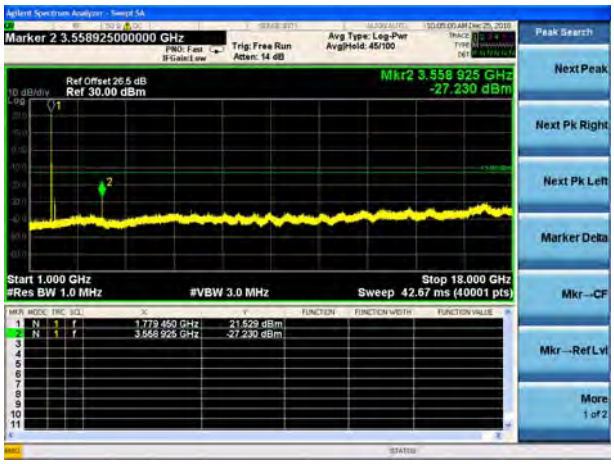
LTE Band 66 1.4MHz BW High Channel

QPSK

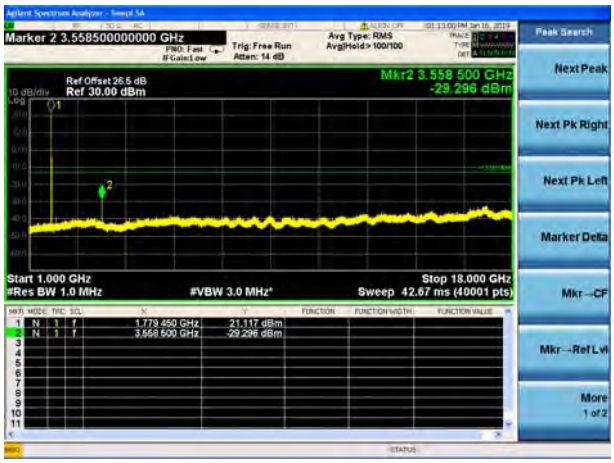




16QAM

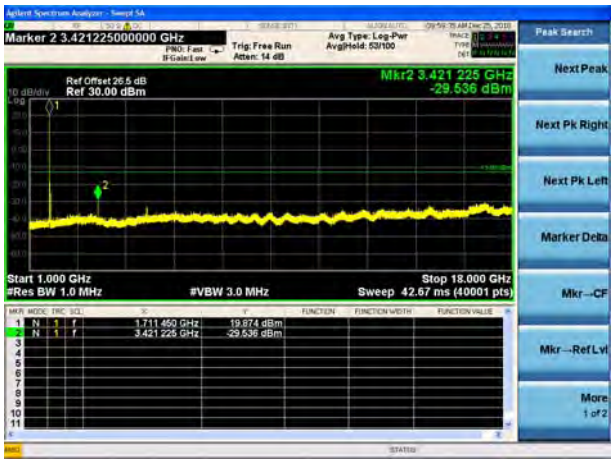


64QAM

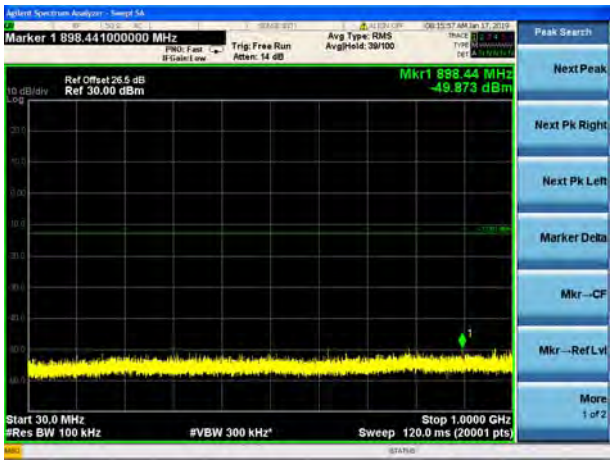


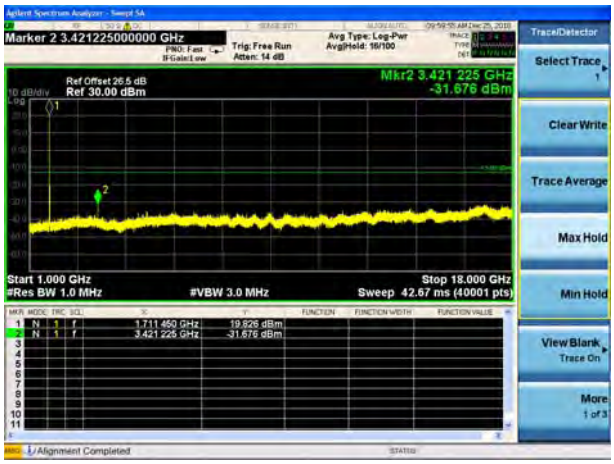
LTE Band 66 3MHz BW Low Channel

QPSK



16QAM





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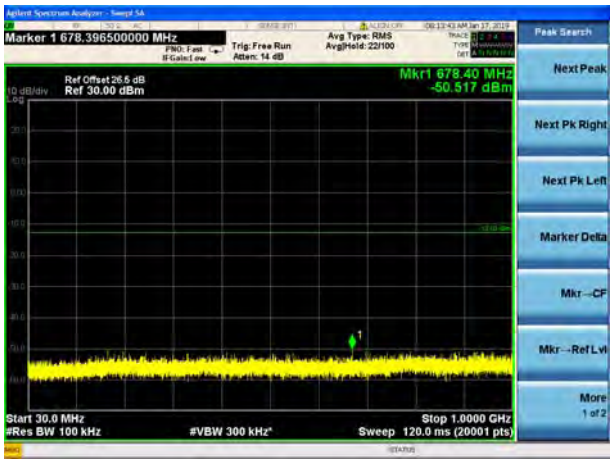
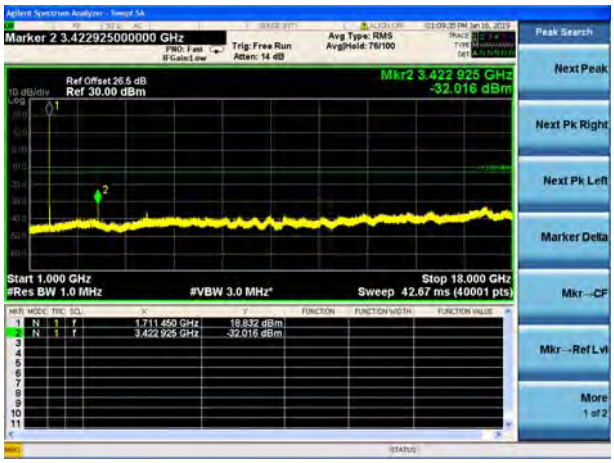
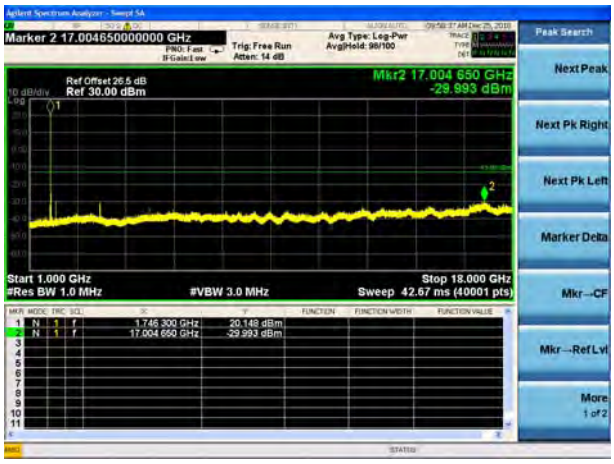




LTE Band 66 3MHz BW Mid Channel

QPSK



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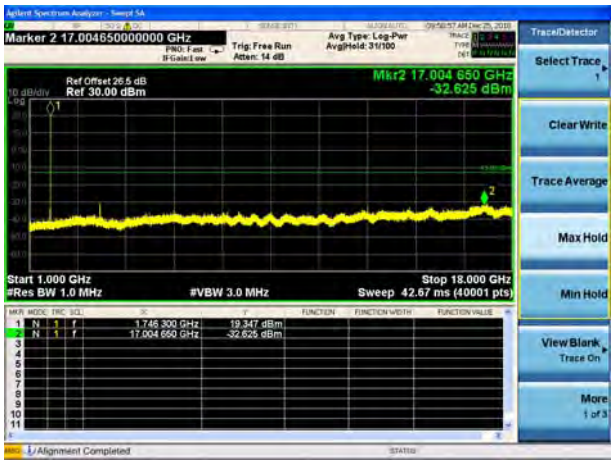

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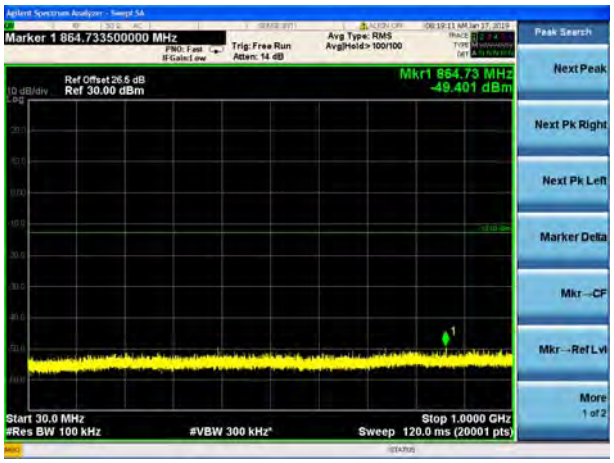
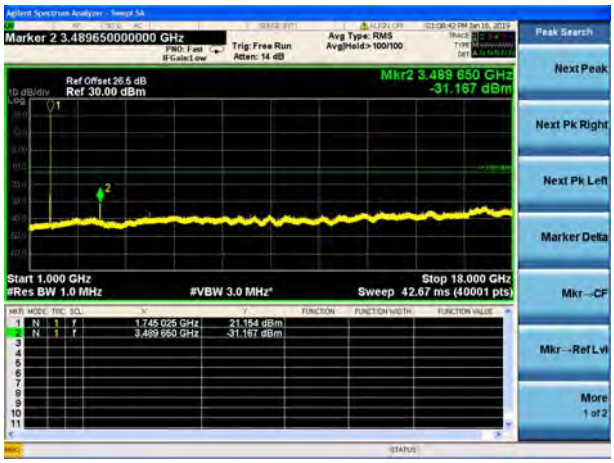
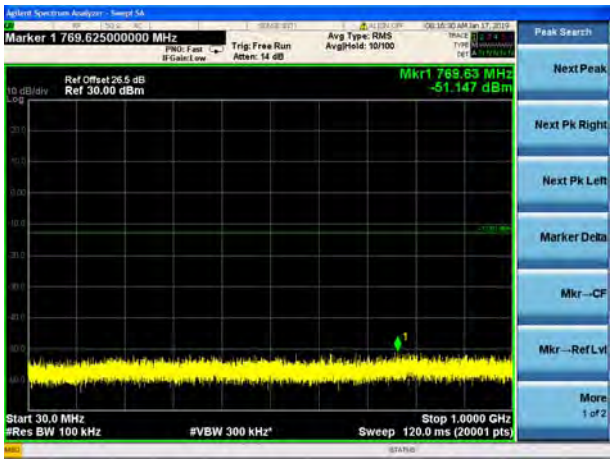
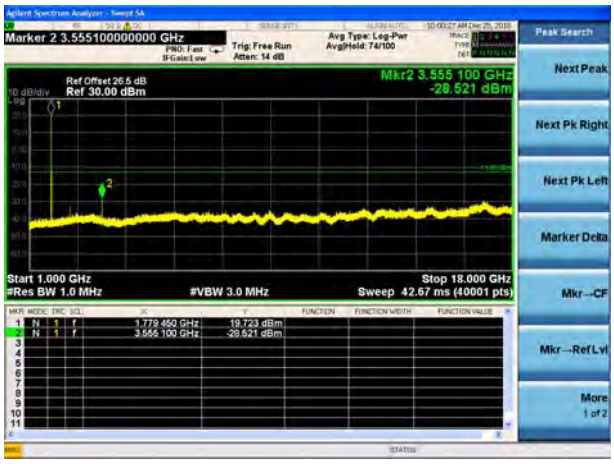




LTE Band 66 3MHz BW High Channel

QPSK





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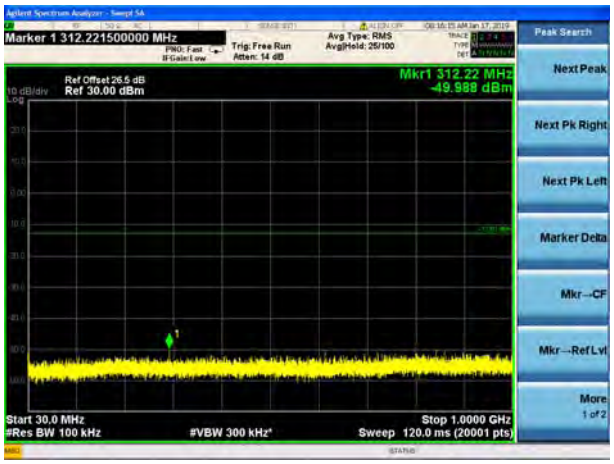

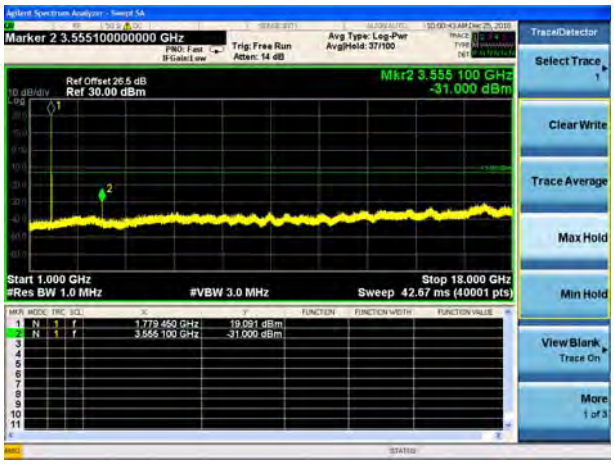

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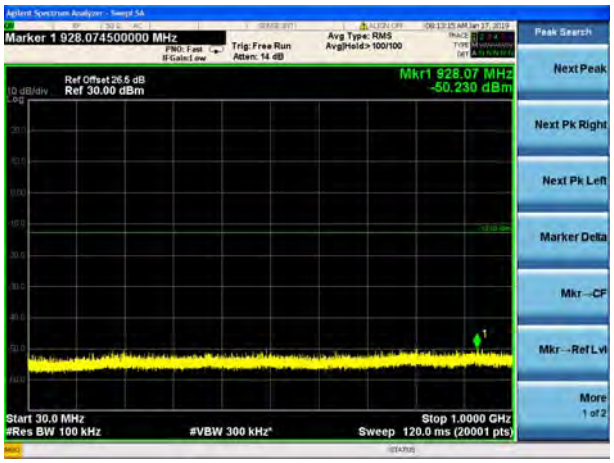
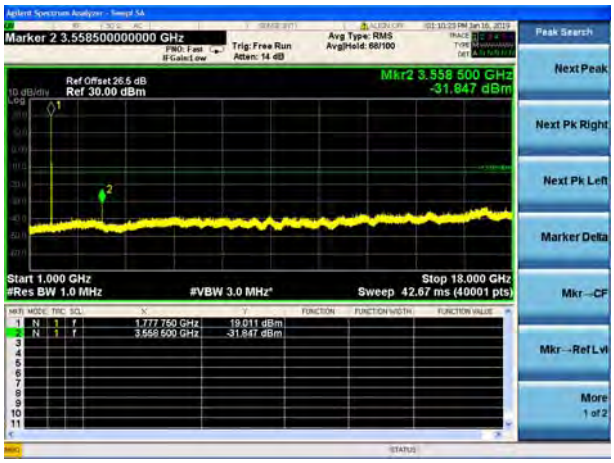
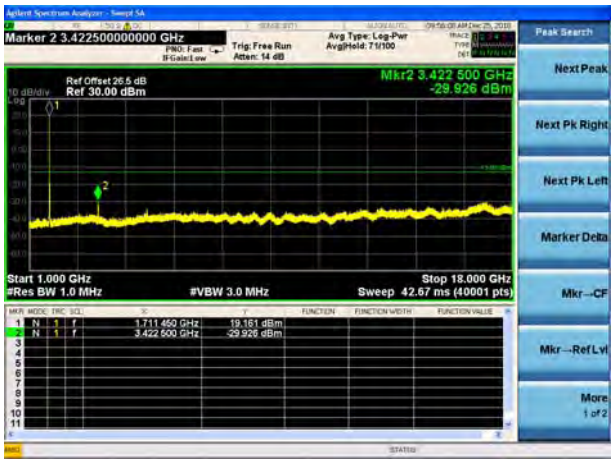




LTE Band 66 5MHz BW Low Channel

QPSK



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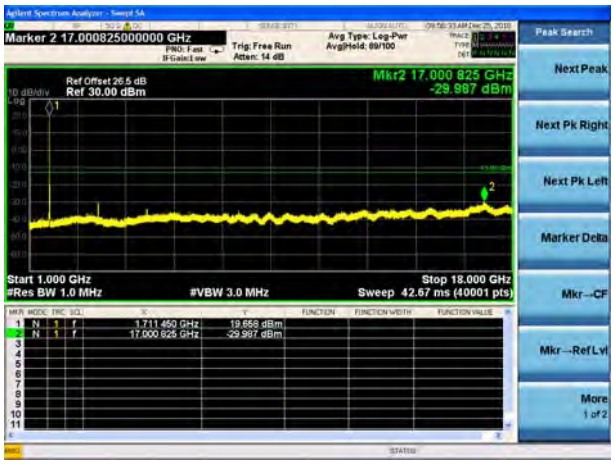

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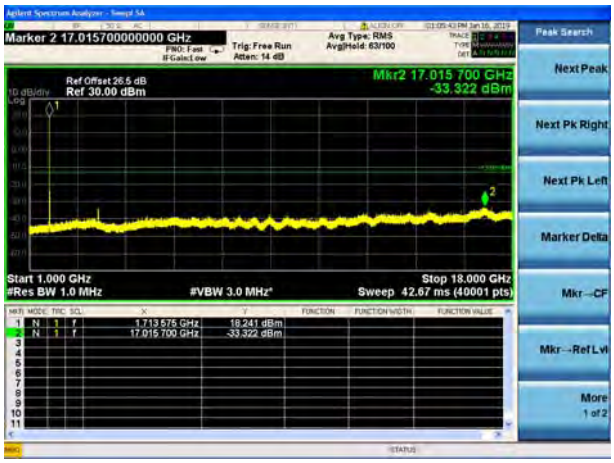
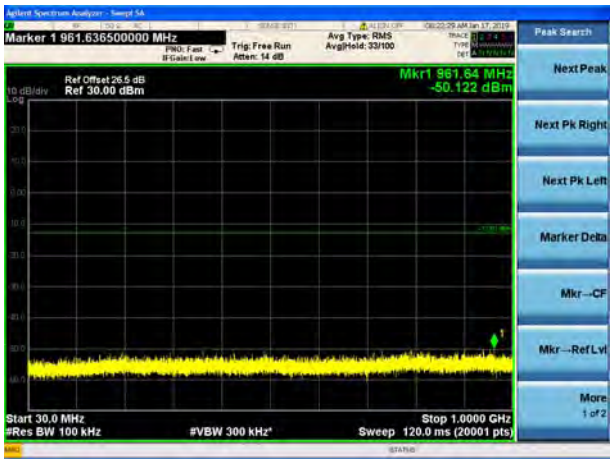
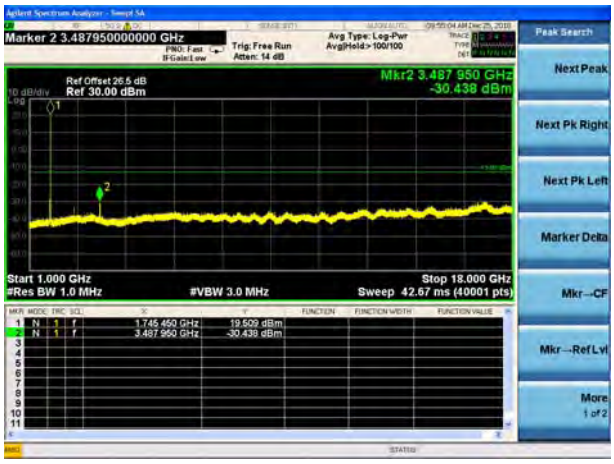


LTE Band 66 5MHz BW Mid Channel

QPSK





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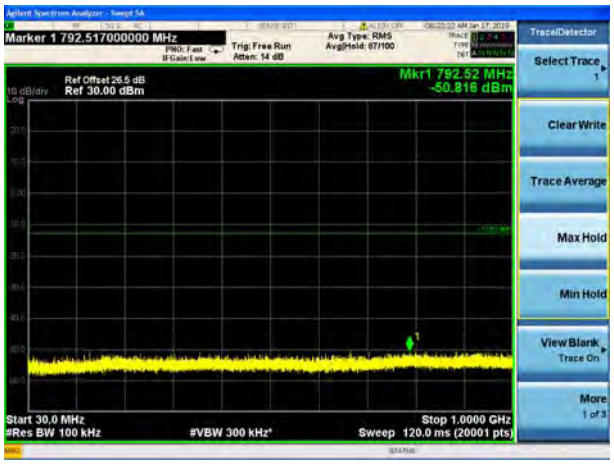

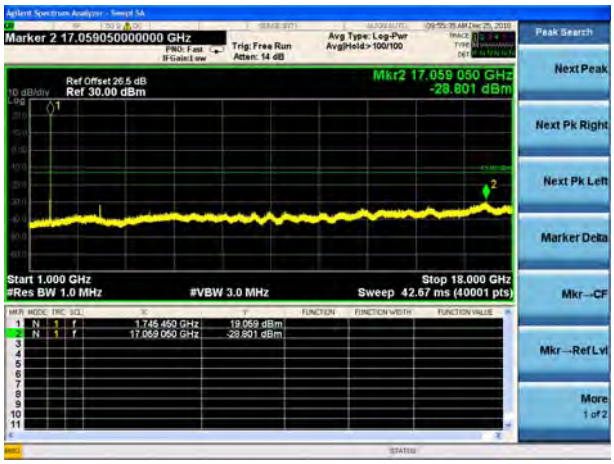

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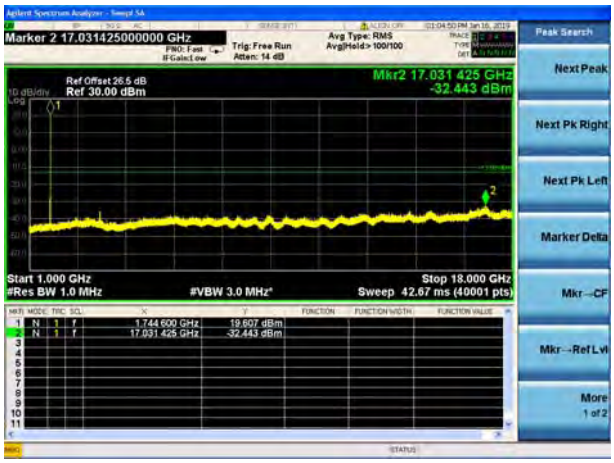
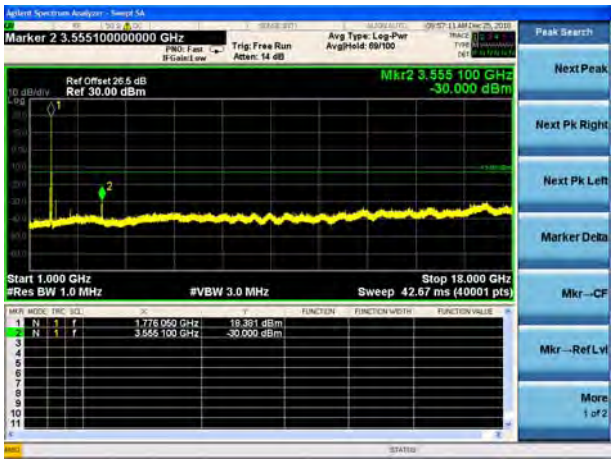


LTE Band 66 5MHz BW High Channel

QPSK



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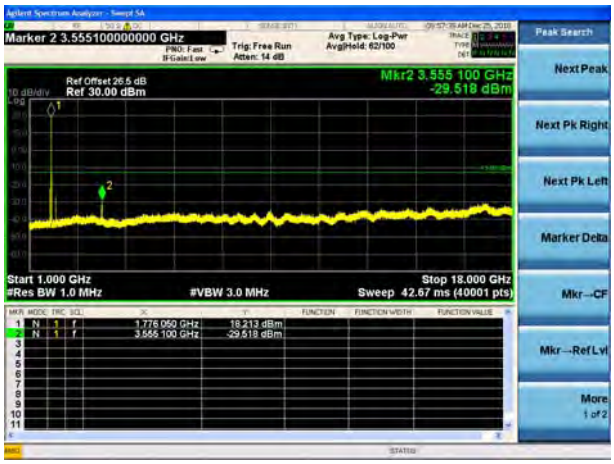

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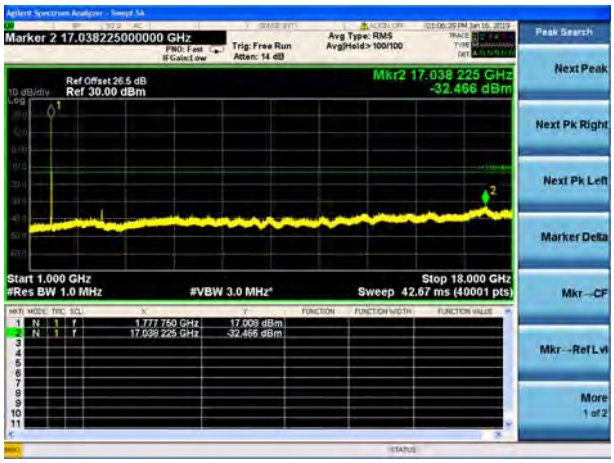
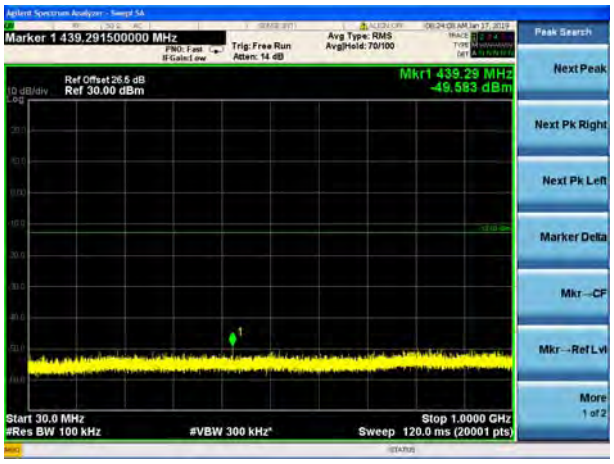
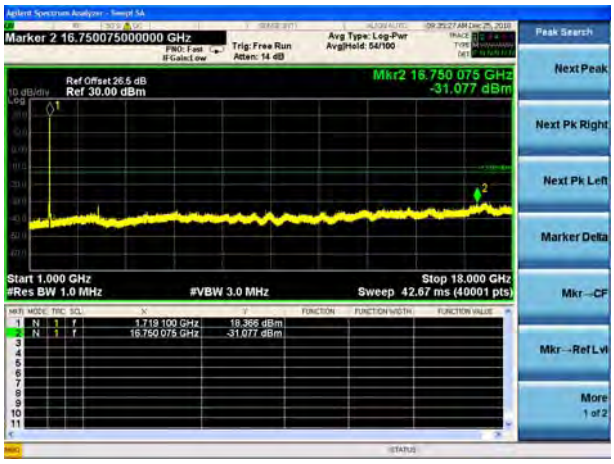


LTE Band 66 10MHz BW Low Channel

QPSK





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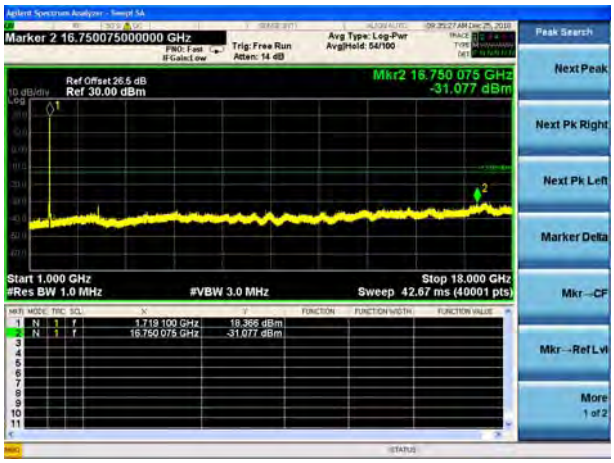

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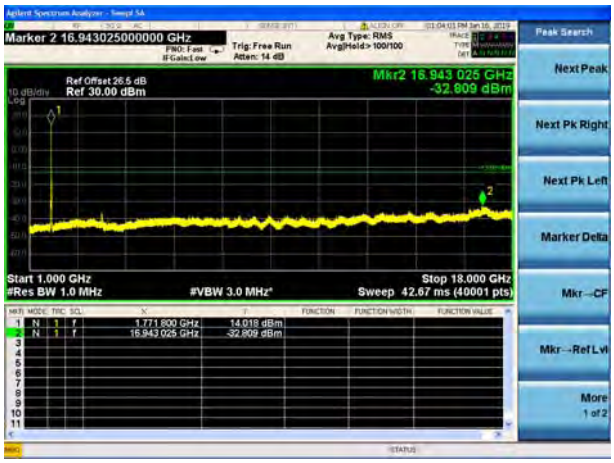
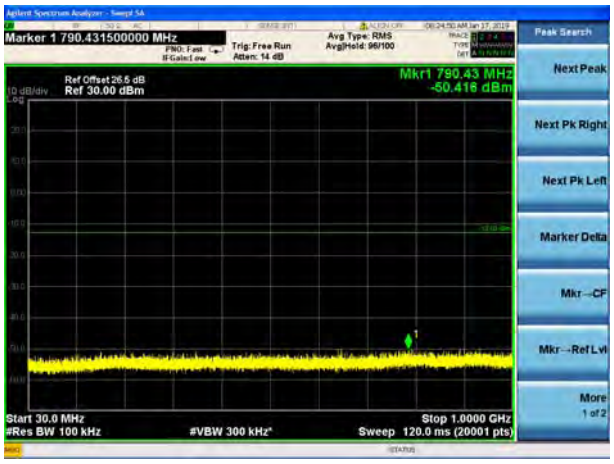
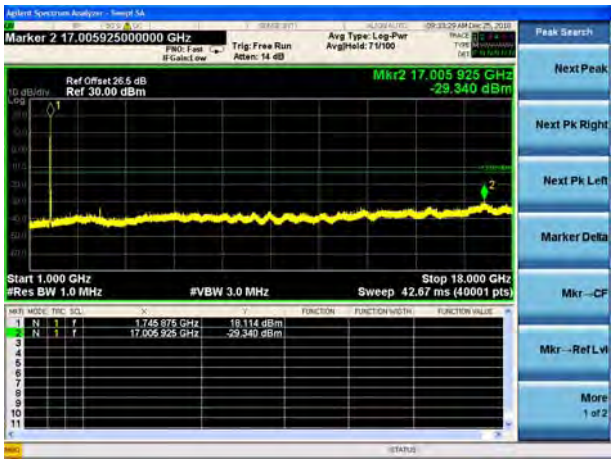


LTE Band 66 10MHz BW Mid Channel

QPSK





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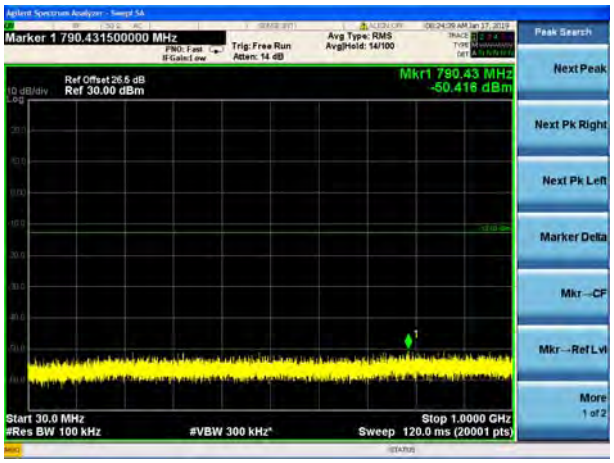

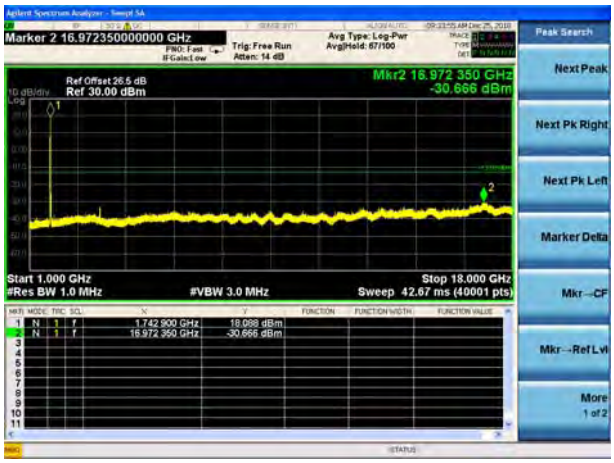

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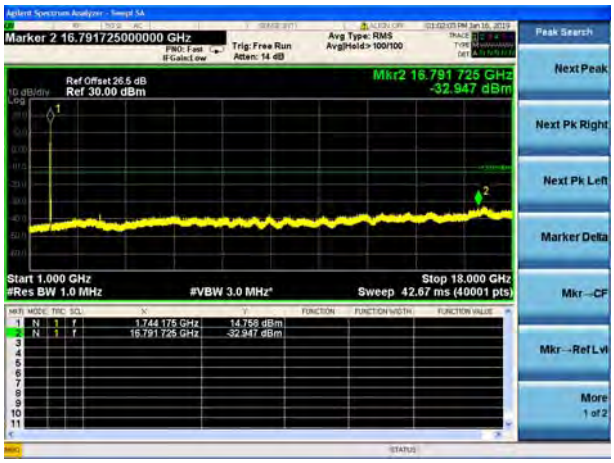
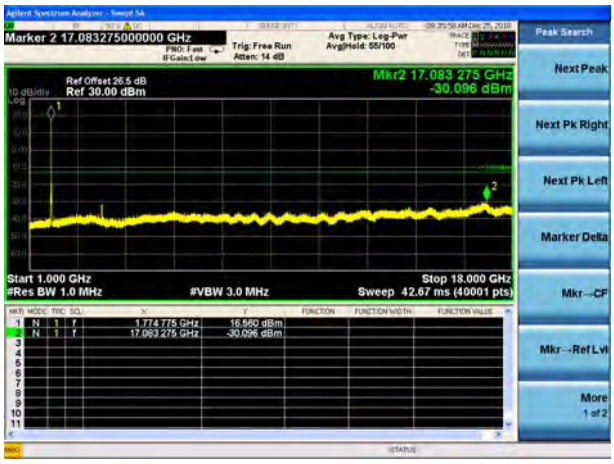


LTE Band 66 10MHz BW High Channel

QPSK



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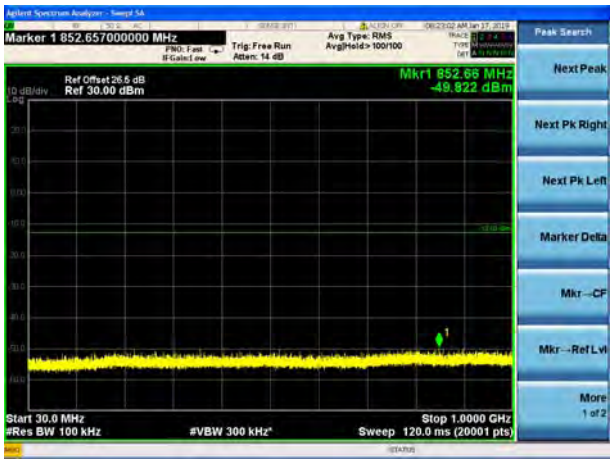

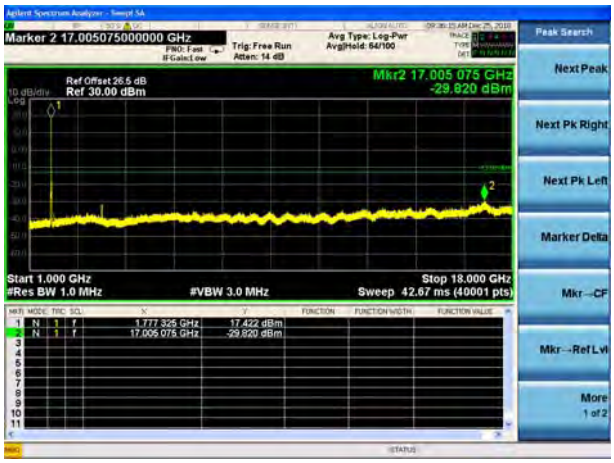

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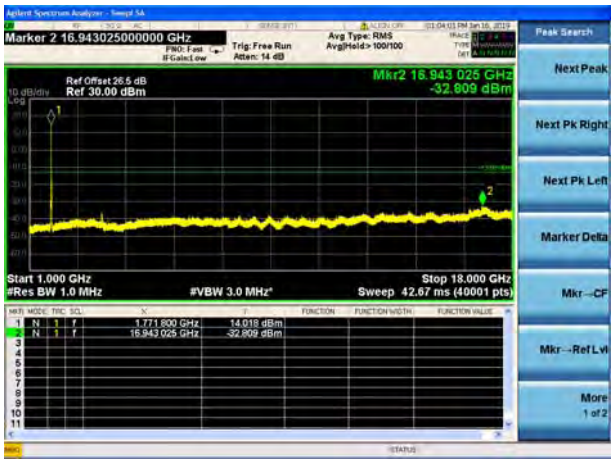
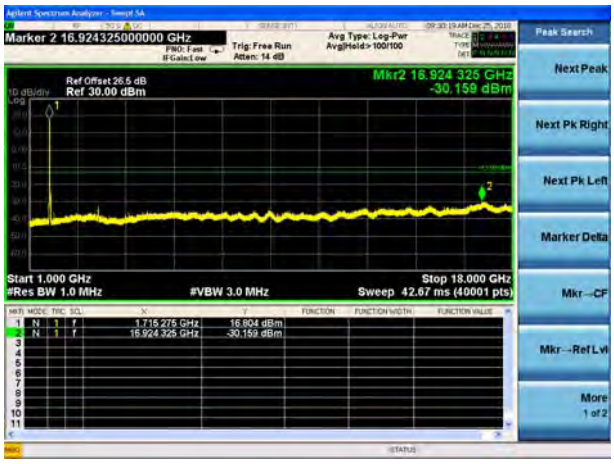


LTE Band 66 15MHz BW Low Channel

QPSK



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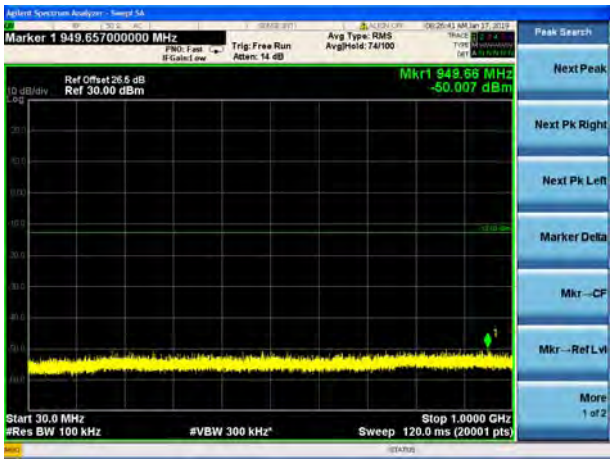

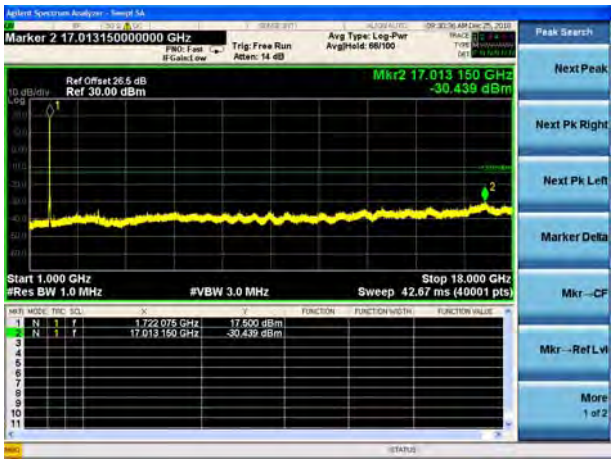

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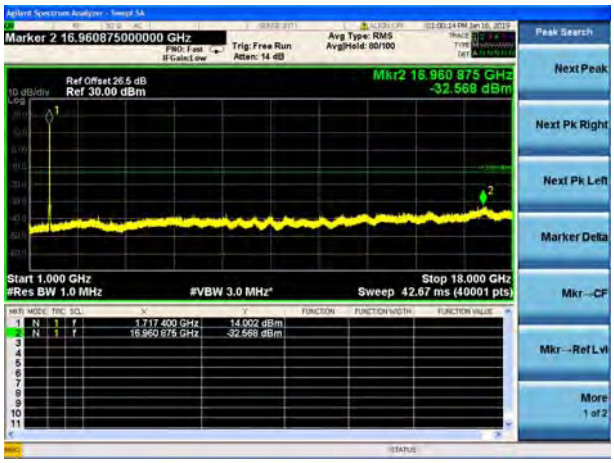
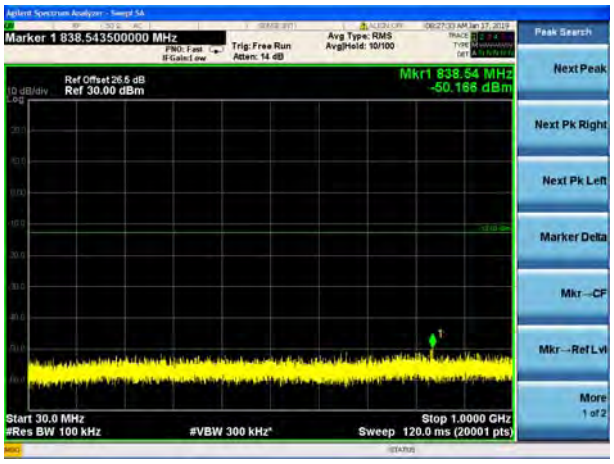
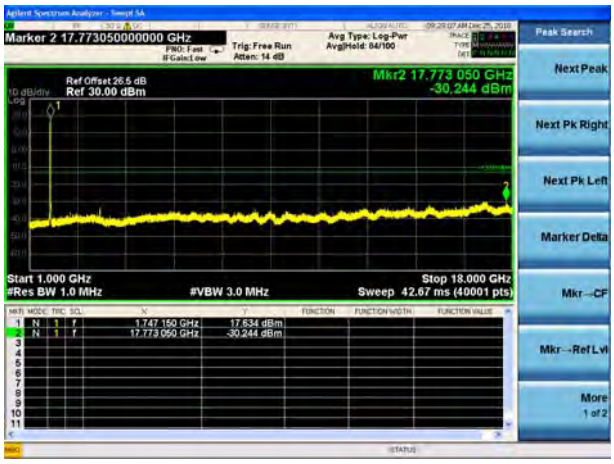


LTE Band 66 15MHz BW Mid Channel

QPSK





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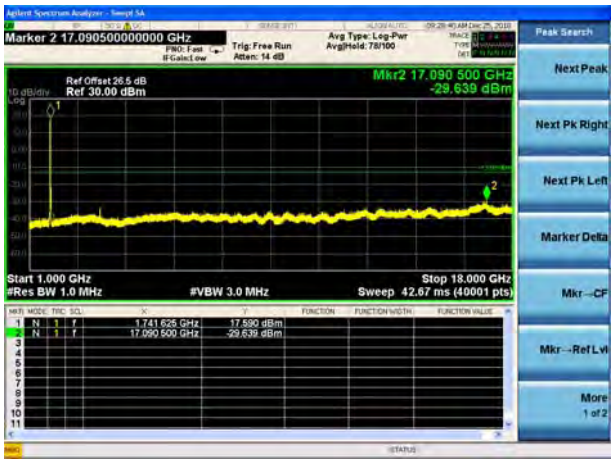

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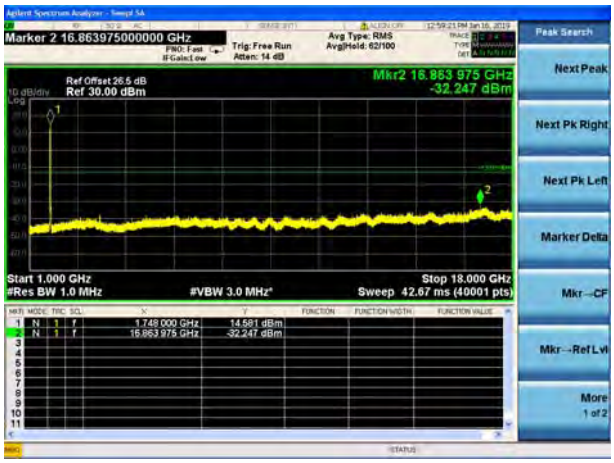
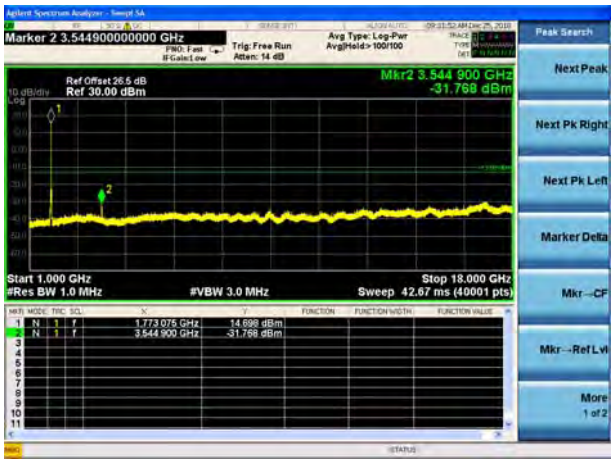


LTE Band 66 15MHz BW High Channel

QPSK



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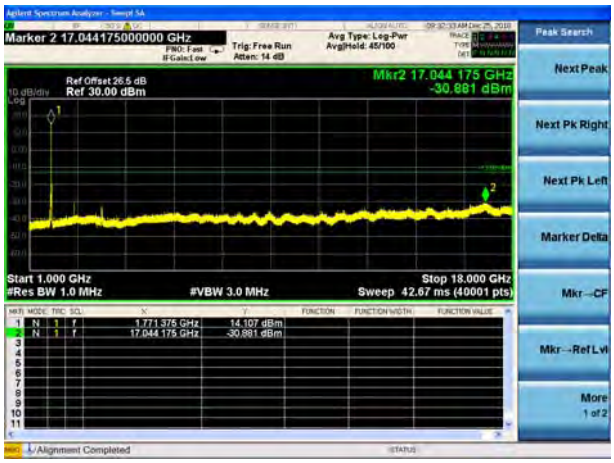

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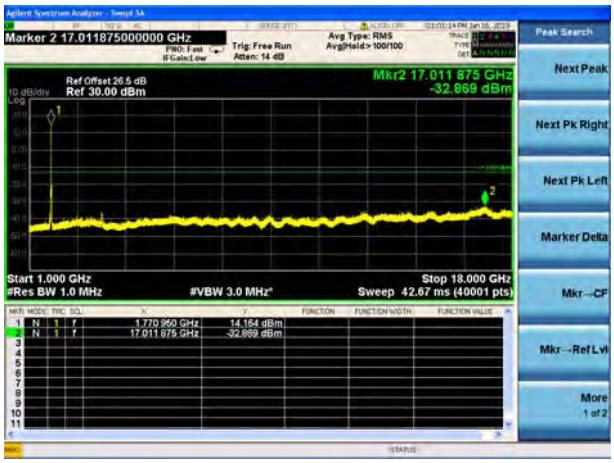
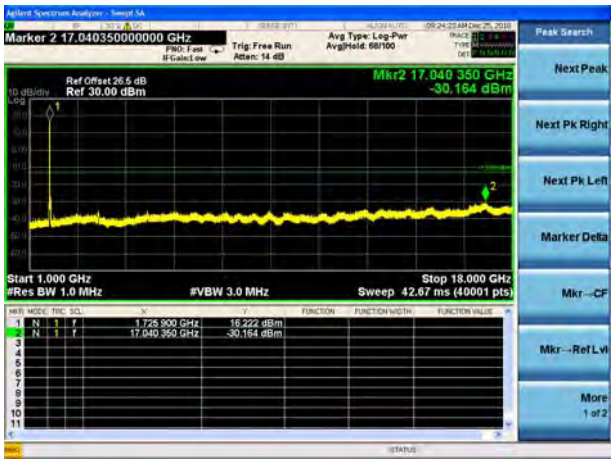


LTE Band 66 20MHz BW Low Channel

QPSK



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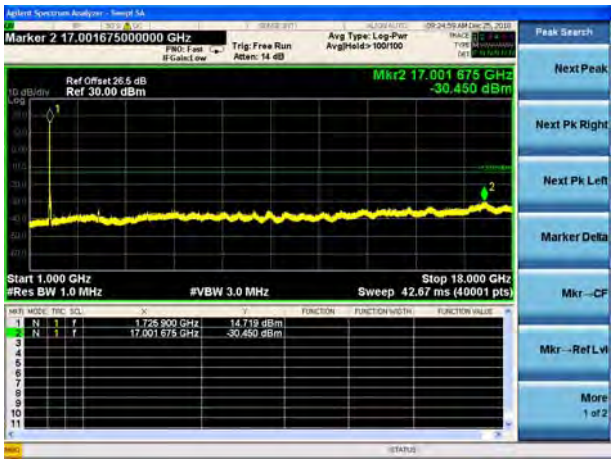

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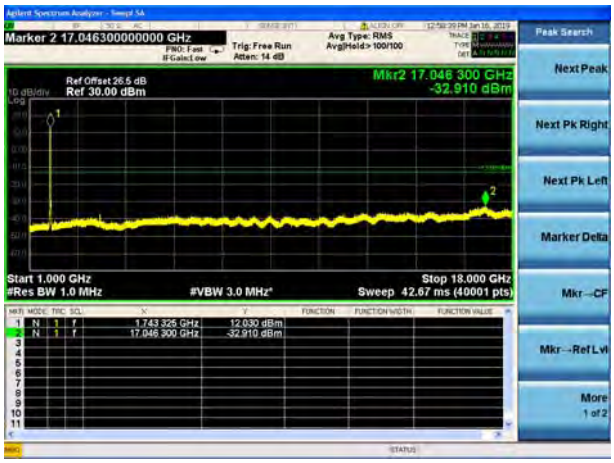
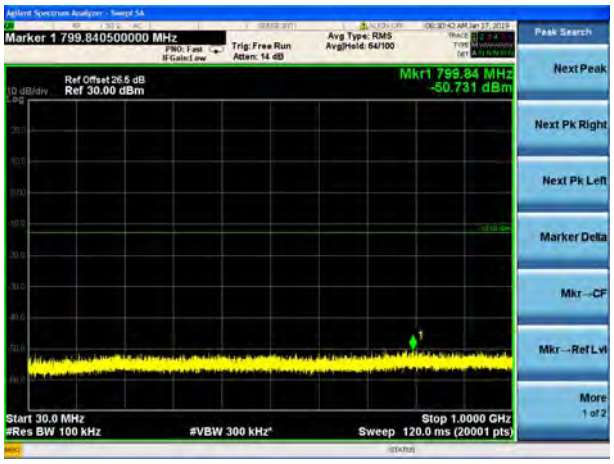
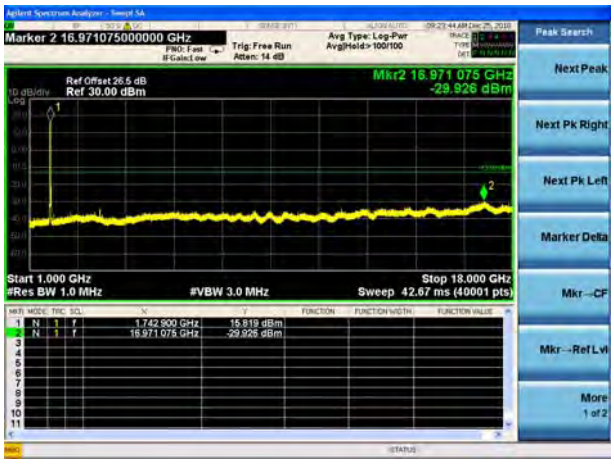


LTE Band 66 20MHz BW Mid Channel

QPSK





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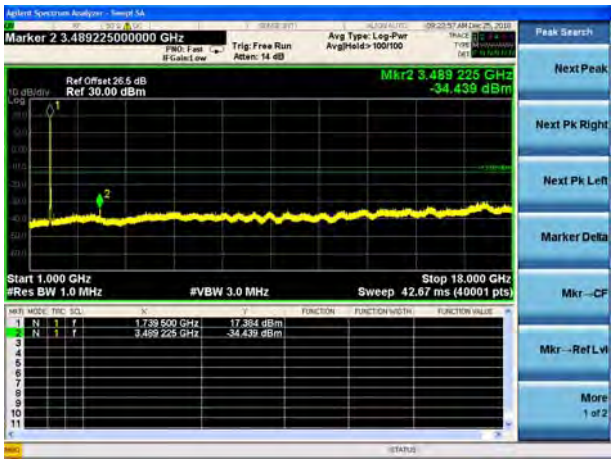

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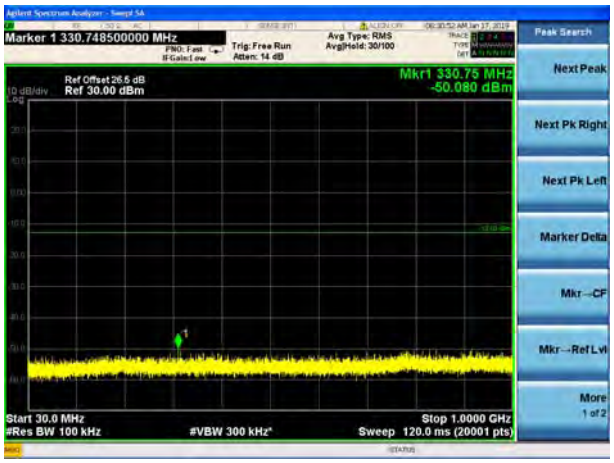
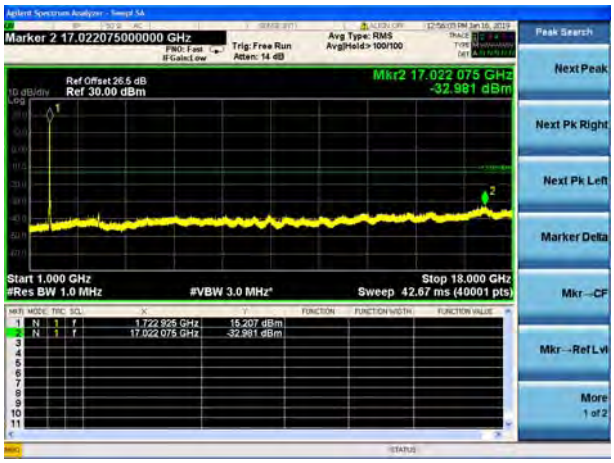
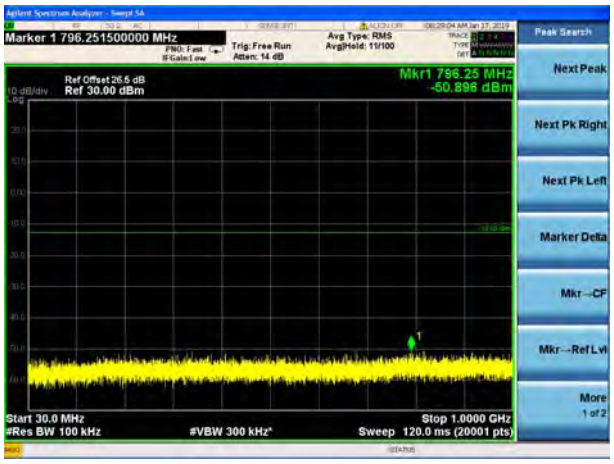
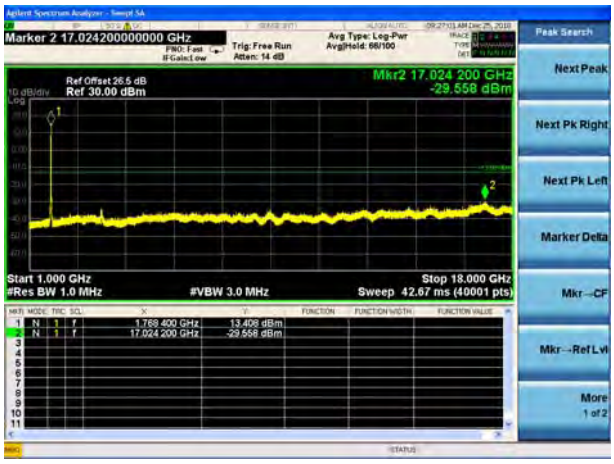




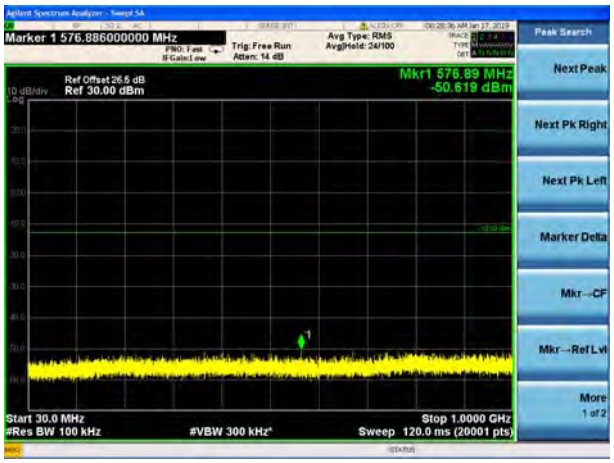
LTE Band 66 20MHz BW High Channel

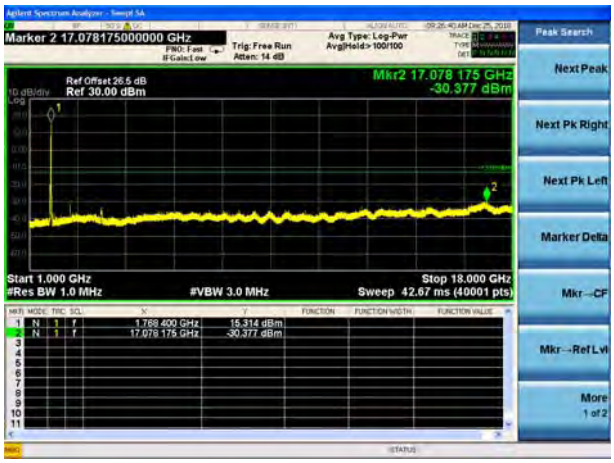
QPSK



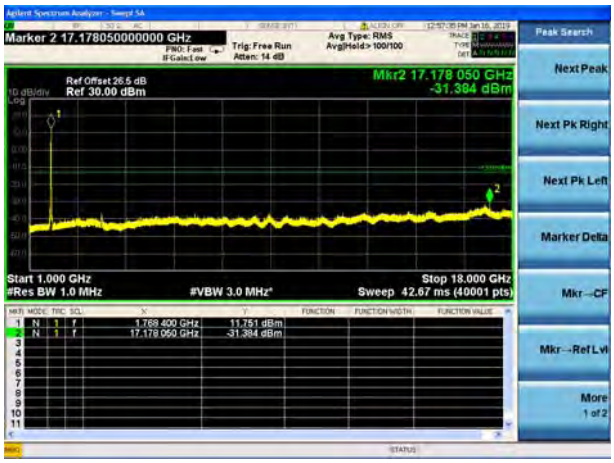


16QAM





16QAM



2.6. Band Edge

2.6.1. Requirement

According to FCC section 22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

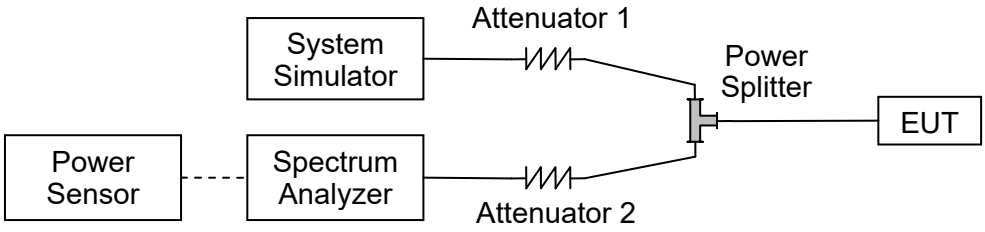
According to FCC section 24.238(a),The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to FCC section 27.53(g), For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

According to FCC section 27.53(h), For operations in the 1710–1755MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

According to FCC section 27.53(m) (4), For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

2.6.2. Test Description



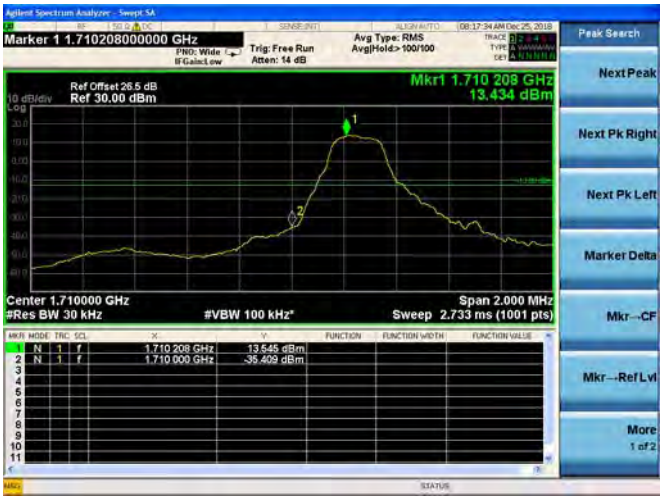
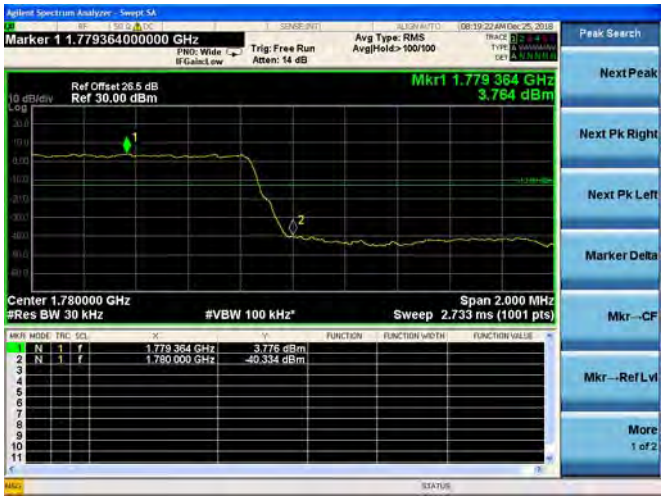
The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum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

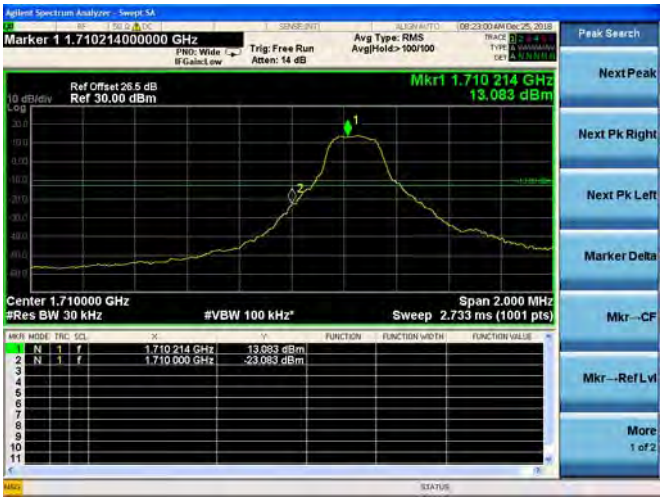
The center frequency of spectrum is the band edge frequency and span is 2MHz, Record the max trace into the test report.

LTE Band 66					
Channel Bandwidth: 1.4MHz					
Channel	131979	1RB	Channel	131979	FULL RB
					
Channel Bandwidth: 1.4MHz					
Channel	132665	1RB	Channel	132665	FULL RB
					

LTE Band 66

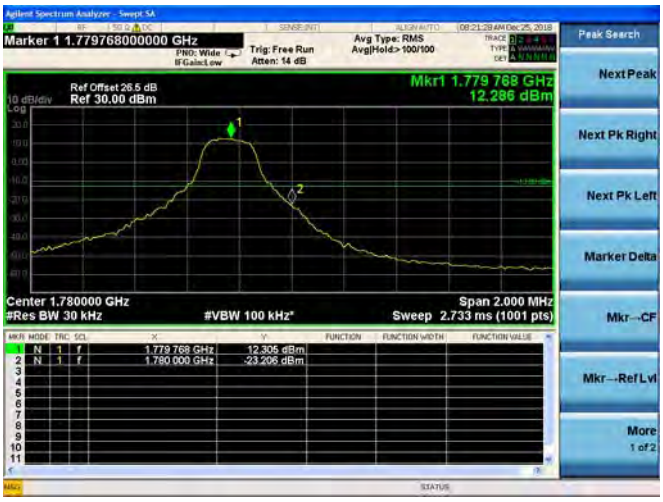
Channel Bandwidth: 3MHz

Channel	131987	1RB	Channel	131987	FULL RB



Channel Bandwidth: 3MHz

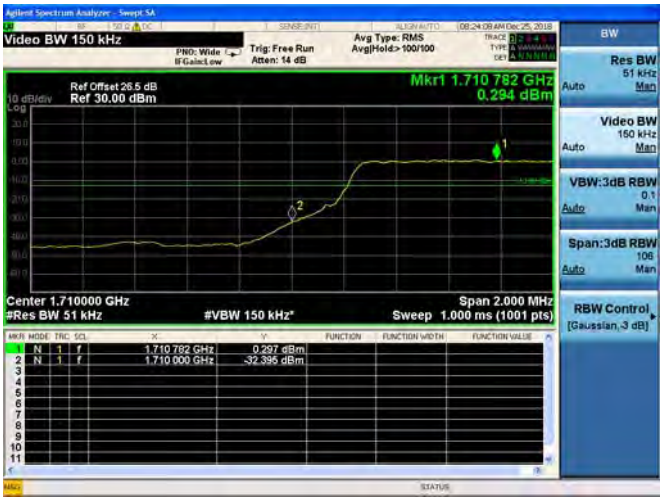
Channel	132657	1RB	Channel	132657	FULL RB



LTE Band 66

Channel Bandwidth: 5MHz

Channel	131997	1RB	Channel	131997	FULL RB



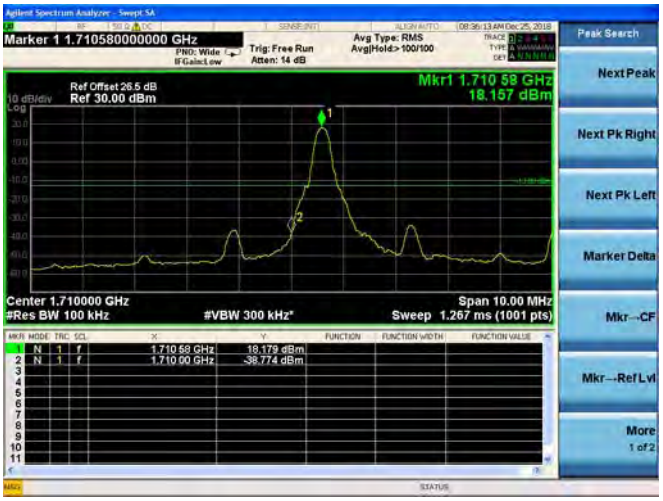
Channel Bandwidth: 5MHz

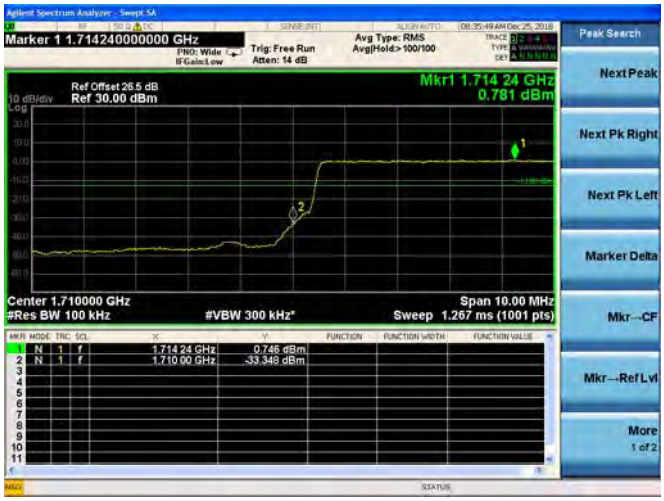
Channel	131997	1RB	Channel	131997	FULL RB

LTE Band 66

Channel Bandwidth: 10MHz

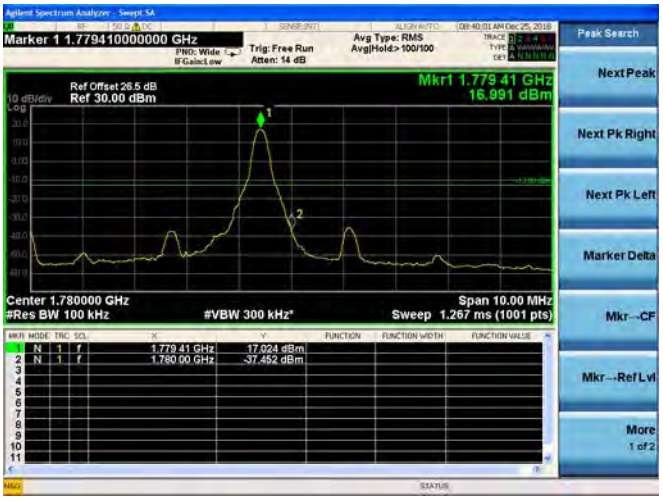
Channel	132022	1RB	Channel	132022	FULL RB

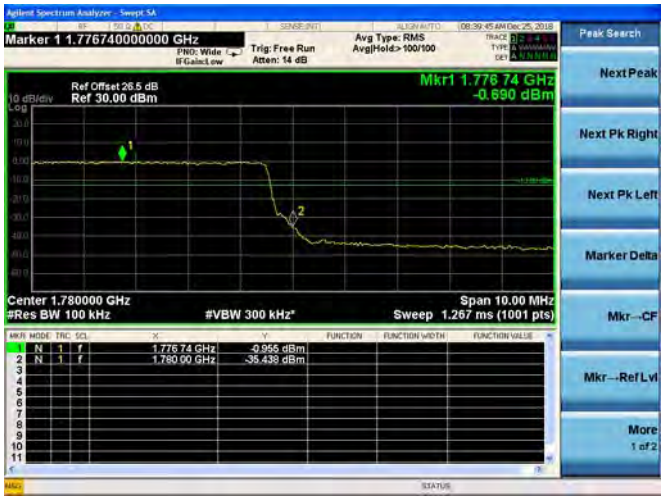




Channel Bandwidth: 10MHz

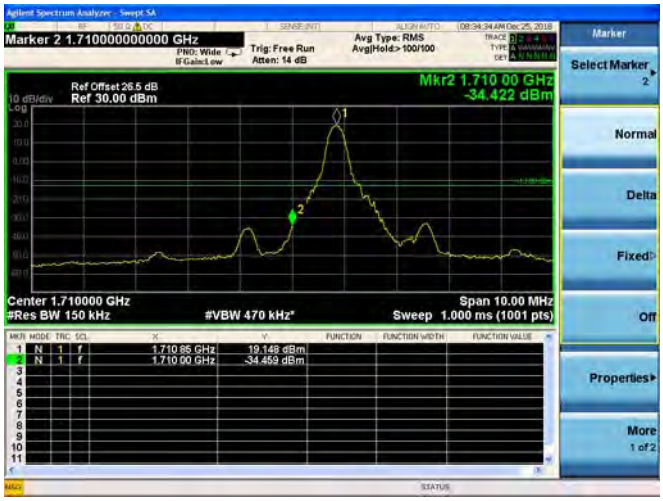
Channel	132622	1RB	Channel	132622	FULL RB





LTE Band 66

Channel Bandwidth: 15MHz

Channel	132047	1RB	Channel	132047	FULL RB
					

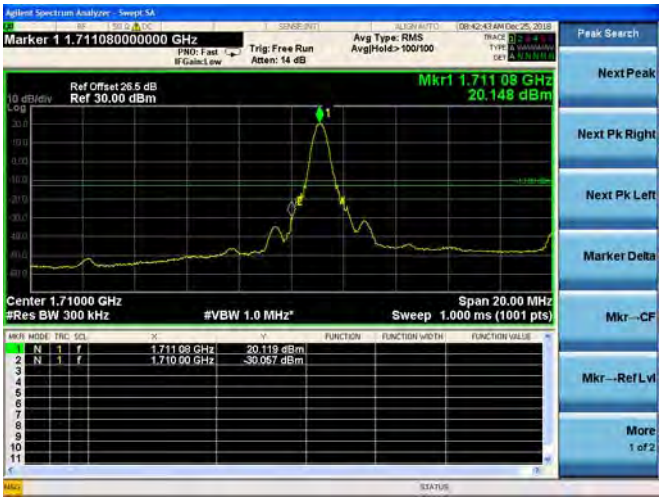
Channel Bandwidth: 15MHz

Channel	132597	1RB	Channel	132597	FULL RB

LTE Band 66

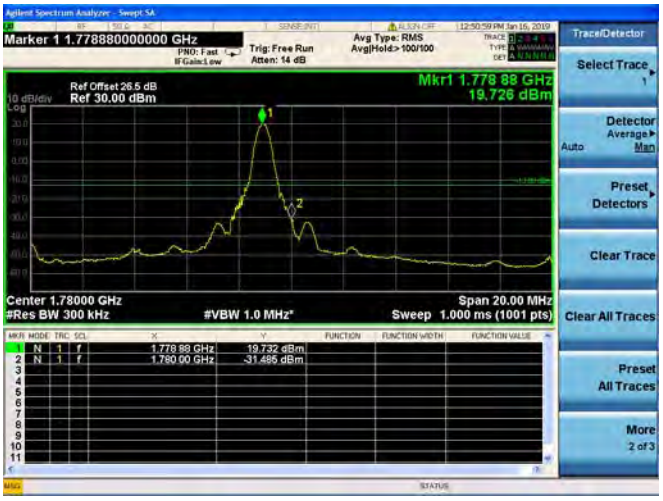
Channel Bandwidth: 20MHz

Channel	132072	1RB	Channel	132072	FULL RB



Channel Bandwidth: 20MHz

Channel	132572	1RB	Channel	132572	FULL RB

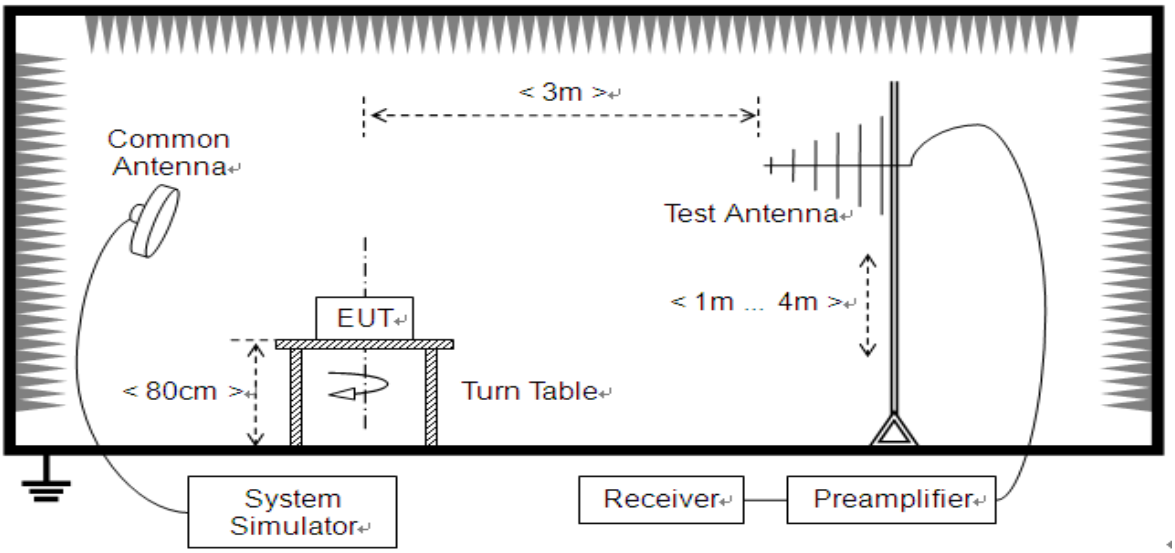


2.7. Transmitter Radiated Power (EIRP/ERP)

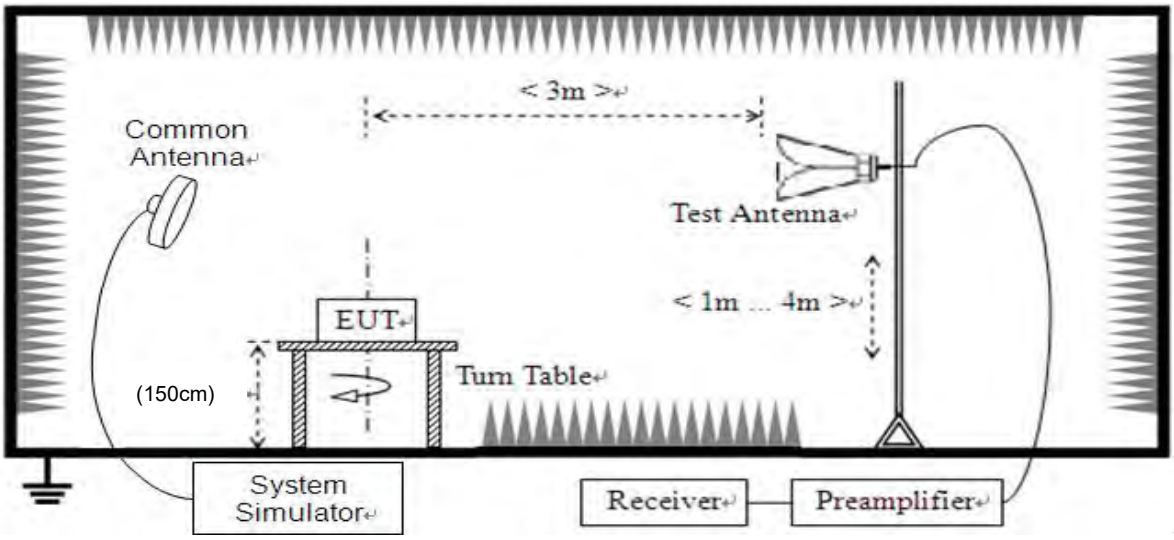
2.7.1. Requirement

According to FCC section 24.232 (c) for LTE Band 2, Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.
According to FCC section 27.50 (d) for LTE Band 4, fixed, mobile and portable (hand-held) stations in the 1710-1755MHz band are limited to 1wat EIRP.
According to FCC section22.913 (a.2) for LTE Band 5, the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.
According to FCC section 27.50 (h) for LTE Band 7, Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.
According to FCC section 27.50 (c) for LTE Band 12/17,66, Portable stations (hand-held devices) operating in the 704-716MHz band are limited to 3watts ERP.

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.

2.7.3. Test procedure

KDB 971168 D01v03 Section 51&5.2 and ANSI/TIA-603-E-2016.

2.7.4. Test Result

The EUT was verified under all configurations (RB size and offset) and the worst case radiated power reported for each modulation/channel bandwidth.

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.

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}.

Note: Both horizontal and vertical polarizations of the test antenna are evaluated respectively, only the worst data (horizontal) were recorded in this report.

LTE Band66:Top Antenna						
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.	Middle Ch. / Freq.	High Ch. / Freq.
Channel				132072	132322	132572
Frequency (MHz)				1720	1745	1770
20	QPSK	1	0	19.77	19.56	19.44
20	QPSK	1	49	19.47	19.4	19.01
20	QPSK	1	99	19.42	19.24	18.95
20	QPSK	50	0	18.63	18.64	18.47
20	QPSK	50	24	18.56	18.58	18.39
20	QPSK	50	50	18.7	18.51	18.17
20	QPSK	100	0	18.52	18.55	18.26
20	16QAM	1	0	18.98	19.32	19
20	16QAM	1	49	18.66	19.06	18.67
20	16QAM	1	99	18.58	19	18.51
20	16QAM	50	0	17.77	17.74	17.52
20	16QAM	50	24	17.65	17.66	17.43
20	16QAM	50	50	17.6	17.62	17.32
20	16QAM	100	0	17.59	17.61	17.42
20	64QAM	1	0	18.51	18.56	18.48
20	64QAM	1	49	18.39	18.4	18.32
20	64QAM	1	99	18.19	18.19	18.14
20	64QAM	50	0	17.78	17.82	17.75
20	64QAM	50	24	17.72	17.73	17.68
20	64QAM	50	50	17.56	17.63	17.6
20	64QAM	100	0	17.45	17.53	17.48
Channel				132047	132322	132597
Frequency (MHz)				1717.5	1745	1772.5
15	QPSK	1	0	19.54	19.45	19.57
15	QPSK	1	37	19.51	19.55	19.62
15	QPSK	1	74	19.4	19.34	19.45
15	QPSK	36	0	18.26	18.38	18.3
15	QPSK	36	20	18.35	18.33	18.25
15	QPSK	36	39	18.41	18.46	18.5
15	QPSK	75	0	18.49	18.46	18.29
15	16QAM	1	0	18.51	18.48	18.34
15	16QAM	1	37	18.32	18.06	18.29

15	16QAM	1	74	18.29	18.09	18.29
15	16QAM	36	0	18.14	18.18	18.08
15	16QAM	36	20	18.31	18.29	18.22
15	16QAM	36	39	18.12	18.29	18.09
15	16QAM	75	0	18.13	18.26	18.08
15	64QAM	1	0	17.88	17.91	17.74
15	64QAM	1	37	17.75	17.89	17.74
15	64QAM	1	74	17.81	17.86	17.76
15	64QAM	36	0	17.83	17.92	17.91
15	64QAM	36	20	17.85	17.76	17.84
15	64QAM	36	39	17.83	17.81	17.76
15	64QAM	75	0	17.87	17.89	17.76

Channel				132022	132322	132622
Frequency (MHz)				1715	1745	1775
10	QPSK	1	0	19.38	19.59	19.36
10	QPSK	1	25	19.4	19.48	19.45
10	QPSK	1	49	19.36	19.46	19.51
10	QPSK	25	0	18.41	18.35	18.34
10	QPSK	25	12	18.49	18.28	18.3
10	QPSK	25	25	18.4	18.33	18.4
10	QPSK	50	0	18.4	18.5	18.48
10	16QAM	1	0	18.34	18.43	18.44
10	16QAM	1	25	18.45	18.38	18.33
10	16QAM	1	49	18.32	18.48	18.47
10	16QAM	25	0	18.27	18.3	18.15
10	16QAM	25	12	18.1	18.18	18.32
10	16QAM	25	25	18.12	18.06	18.07
10	16QAM	50	0	18.2	18.15	18.12
10	64QAM	1	0	17.89	17.87	17.91
10	64QAM	1	25	17.81	17.75	17.92
10	64QAM	1	49	17.76	17.92	17.91
10	64QAM	25	0	17.86	17.89	17.79
10	64QAM	25	12	17.75	17.8	17.88
10	64QAM	25	25	17.84	17.78	17.88
10	64QAM	50	0	17.77	17.85	17.8
Channel				131997	132322	132647
Frequency (MHz)				1712.5	1745	1778.5

5	QPSK	1	0	19.48	19.41	19.4
5	QPSK	1	12	19.38	19.35	19.56
5	QPSK	1	24	19.54	19.51	19.49
5	QPSK	12	0	19.54	19.45	19.57
5	QPSK	12	7	18.42	18.5	18.35
5	QPSK	12	13	18.37	18.24	18.34
5	QPSK	25	0	18.53	18.28	18.28
5	16QAM	1	0	18.39	18.37	18.24
5	16QAM	1	12	18.32	18.47	18.38
5	16QAM	1	24	18.33	18.47	18.33
5	16QAM	12	0	18.09	18.32	18.16
5	16QAM	12	7	18.2	18.16	18.31
5	16QAM	12	13	18.13	18.25	18.08
5	16QAM	25	0	18.24	18.18	18.13
5	64QAM	1	0	17.9	17.83	17.92
5	64QAM	1	12	17.74	17.8	17.93
5	64QAM	1	24	17.9	17.75	17.88
5	64QAM	12	0	17.86	17.85	17.81
5	64QAM	12	7	17.79	17.87	17.79
5	64QAM	12	13	17.77	17.84	17.86
5	64QAM	25	0	17.73	17.85	17.86

Channel				131987	132322	132657
Frequency (MHz)				1711.5	1745	1778.5
3	QPSK	1	0	19.38	19.59	19.36
3	QPSK	1	8	19.4	19.48	19.45
3	QPSK	1	14	19.36	19.46	19.51
3	QPSK	8	0	18.36	18.43	18.51
3	QPSK	8	4	18.45	18.38	18.3
3	QPSK	8	7	18.5	18.27	18.46
3	QPSK	15	0	18.25	18.32	18.28
3	16QAM	1	0	18.35	18.35	18.38
3	16QAM	1	8	18.37	18.36	18.28
3	16QAM	1	14	18.05	18.16	18.12
3	16QAM	8	0	18.15	18.04	18.06
3	16QAM	8	4	18.07	18.23	18.11
3	16QAM	8	7	18.3	18.07	18.26
3	16QAM	15	0	17.75	17.89	17.74

3	64QAM	1	0	17.81	17.86	17.76
3	64QAM	1	8	17.83	17.92	17.91
3	64QAM	1	14	17.89	17.87	17.91
3	64QAM	8	0	17.81	17.75	17.92
3	64QAM	8	4	17.76	17.92	17.91
3	64QAM	8	7	17.45	17.72	17.62
3	64QAM	15	0	17.32	17.42	17.32
Channel				131979	132322	132665
Frequency (MHz)				1710.7	1745	1779.3
1.4	QPSK	1	0	19.35	19.48	19.57
1.4	QPSK	1	3	19.5	19.43	19.45
1.4	QPSK	1	5	19.35	19.47	19.48
1.4	QPSK	3	0	18.45	18.38	18.33
1.4	QPSK	3	1	18.32	18.48	18.47
1.4	QPSK	3	3	18.35	18.44	18.36
1.4	QPSK	6	0	18.29	18.25	18.23
1.4	16QAM	1	0	18.32	18.47	18.38
1.4	16QAM	1	3	18.15	18.2	18.28
1.4	16QAM	1	5	18.11	18.3	18.26
1.4	16QAM	3	0	18.18	18.3	18.07
1.4	16QAM	3	1	18.11	18.1	18.12
1.4	16QAM	3	3	17.9	17.75	17.88
1.4	16QAM	6	0	17.73	17.87	17.74
1.4	64QAM	1	0	17.85	17.83	17.85
1.4	64QAM	1	3	17.86	17.87	17.76
1.4	64QAM	1	5	17.81	17.75	17.92
1.4	64QAM	3	0	17.83	17.75	17.77
1.4	64QAM	3	1	17.82	17.92	17.92
1.4	64QAM	3	3	17.8	17.8	17.8
1.4	64QAM	6	0	17.9	17.73	17.83

LTE Band66:Bottom Antenna						
BW [MHz]	Modulation	RB Size	RB Offset	Low Ch. / Freq.	Middle Ch. / Freq.	High Ch. / Freq.
Channel				132072	132322	132572
Frequency (MHz)				1720	1745	1770
20	QPSK	1	0	24.45	24.27	24.18

20	QPSK	1	49	24.3	24.18	24.18
20	QPSK	1	99	24.21	24.01	23.68
20	QPSK	50	0	23.12	23.44	23.3
20	QPSK	50	24	23.28	23.4	23.37
20	QPSK	50	50	23.45	23.44	23.07
20	QPSK	100	0	23.2	23.24	23.22
20	16QAM	1	0	23.46	23.4	23.2
20	16QAM	1	49	23.15	23.36	23.4
20	16QAM	1	99	23.29	23.44	23.39
20	16QAM	50	0	23.09	23.1	23.15
20	16QAM	50	24	23.07	23.16	23.14
20	16QAM	50	50	23.1	23.1	23.16
20	16QAM	100	0	23.08	23.09	23.09
20	64QAM	1	0	23.11	23.08	23.12
20	64QAM	1	49	23.07	23.15	23.08
20	64QAM	1	99	23.14	23.16	23.16
20	64QAM	50	0	22.34	22.43	22.36
20	64QAM	50	24	22.24	22.28	22.35
20	64QAM	50	50	22.19	22.21	22.39
20	64QAM	100	0	22.4	22.2	22.23
Channel				132047	132322	132597
Frequency (MHz)				1717.5	1745	1772.5
15	QPSK	1	0	24.44	24.29	23.99
15	QPSK	1	37	24.32	24.36	24.2
15	QPSK	1	74	24.36	24.05	23.68
15	QPSK	36	0	23.28	23.46	23.25
15	QPSK	36	20	23.25	23.45	23.34
15	QPSK	36	39	23.2	23.36	23.2
15	QPSK	75	0	23.08	23.27	23.42
15	16QAM	1	0	23.15	23.11	23.11
15	16QAM	1	37	23.15	23.13	23.09
15	16QAM	1	74	23.14	23.14	23.1
15	16QAM	36	0	23.11	23.11	23.16
15	16QAM	36	20	23.08	23.09	23.13
15	16QAM	36	39	23.1	23.08	23.09
15	16QAM	75	0	23.15	23.12	23.07
15	64QAM	1	0	23.12	23.08	23.11
15	64QAM	1	37	23.07	23.1	23.11

15	64QAM	1	74	23.17	23.16	23.09
15	64QAM	36	0	22.38	22.23	22.28
15	64QAM	36	20	22.41	22.22	22.28
15	64QAM	36	39	22.22	22.25	22.21
15	64QAM	75	0	22.35	22.46	22.26

Channel				132022	132322	132622
Frequency (MHz)				1715	1745	1775
10	QPSK	1	0	24.34	24.19	23.83
10	QPSK	1	25	24.16	24.33	24.36
10	QPSK	1	49	24.34	24.11	23.65
10	QPSK	25	0	23.23	23.4	23.25
10	QPSK	25	12	23.3	23.37	23.38
10	QPSK	25	25	23.24	23.12	23.11
10	QPSK	50	0	23.35	23.42	23.22
10	16QAM	1	0	23.38	23.41	23.33
10	16QAM	1	25	23.18	23.39	23.37
10	16QAM	1	49	23.39	23.28	23.29
10	16QAM	25	0	23.15	23.11	23.12
10	16QAM	25	12	23.13	23.13	23.09
10	16QAM	25	25	23.12	23.16	23.14
10	16QAM	50	0	23.15	23.15	23.08
10	64QAM	1	0	23.16	23.1	23.09
10	64QAM	1	25	23.14	23.14	23.12
10	64QAM	1	49	23.08	23.13	23.12
10	64QAM	25	0	22.22	22.35	22.23
10	64QAM	25	12	22.44	22.4	22.34
10	64QAM	25	25	22.25	22.2	22.24
10	64QAM	50	0	22.4	22.2	22.23
Channel				131997	132322	132647
Frequency (MHz)				1712.5	1745	1778.5
5	QPSK	1	0	24.33	24.17	23.71
5	QPSK	1	12	24.43	24.05	24.14
5	QPSK	1	24	24.37	24.2	23.72
5	QPSK	12	0	23.34	23.23	23.13
5	QPSK	12	7	23.19	23.08	23.11
5	QPSK	12	13	23.46	23.4	23.2
5	QPSK	25	0	23.17	23.34	23.09

5	16QAM	1	0	23.17	23.29	23.2
5	16QAM	1	12	23.46	23.41	23.33
5	16QAM	1	24	23.29	23.42	23.21
5	16QAM	12	0	23.09	23.12	23.08
5	16QAM	12	7	23.09	23.09	23.17
5	16QAM	12	13	23.08	23.14	23.16
5	16QAM	25	0	23.1	23.15	23.15
5	64QAM	1	0	23.14	23.12	23.09
5	64QAM	1	12	23.12	23.1	23.12
5	64QAM	1	24	23.08	23.14	23.07
5	64QAM	12	0	22.29	22.17	22.26
5	64QAM	12	7	22.32	22.4	22.24
5	64QAM	12	13	22.17	22.19	22.22
5	64QAM	25	0	22.39	22.34	22.41

Channel				131987	132322	132657
Frequency (MHz)				1711.5	1745	1778.5
3	QPSK	1	0	24.3	24.13	23.62
3	QPSK	1	8	24.28	24.19	24.27
3	QPSK	1	14	24.21	24.24	24.26
3	QPSK	8	0	23.42	23.23	23.47
3	QPSK	8	4	23.22	23.3	23.16
3	QPSK	8	7	23.47	23.16	23.19
3	QPSK	15	0	23.2	23.37	23.34
3	16QAM	1	0	23.37	23.18	23.28
3	16QAM	1	8	23.08	23.37	23.27
3	16QAM	1	14	23.45	23.22	23.31
3	16QAM	8	0	23.15	23.09	23.07
3	16QAM	8	4	23.16	23.14	23.09
3	16QAM	8	7	23.16	23.14	23.16
3	16QAM	15	0	23.15	23.08	23.07
3	64QAM	1	0	23.08	23.13	23.14
3	64QAM	1	8	23.07	23.08	23.17
3	64QAM	1	14	23.07	23.14	23.12
3	64QAM	8	0	22.3	22.41	22.39
3	64QAM	8	4	22.25	22.43	22.32
3	64QAM	8	7	22.22	22.41	22.3
3	64QAM	15	0	22.25	22.41	22.18

Channel				131979	132322	132665
Frequency (MHz)				1710.7	1745	1779.3
1.4	QPSK	1	0	24.2	23.97	23.46
1.4	QPSK	1	3	24.28	24.18	24.31
1.4	QPSK	1	5	24.25	24.18	24.27
1.4	QPSK	3	0	23.26	23.17	23.2
1.4	QPSK	3	1	23.12	23.4	23.16
1.4	QPSK	3	3	23.35	23.07	23.45
1.4	QPSK	6	0	23.35	23.32	23.12
1.4	16QAM	1	0	23.3	23.44	23.33
1.4	16QAM	1	3	23.33	23.39	23.44
1.4	16QAM	1	5	23.11	23.08	23.14
1.4	16QAM	3	0	23.12	23.1	23.16
1.4	16QAM	3	1	23.13	23.16	23.13
1.4	16QAM	3	3	23.17	23.08	23.11
1.4	16QAM	6	0	23.1	23.14	23.1
1.4	64QAM	1	0	22.39	22.37	22.35
1.4	64QAM	1	3	22.46	22.36	22.43
1.4	64QAM	1	5	22.43	22.4	22.23
1.4	64QAM	3	0	22.27	22.19	22.27
1.4	64QAM	3	1	22.3	22.35	22.33
1.4	64QAM	3	3	22.19	22.38	22.2
1.4	64QAM	6	0	22.39	22.37	22.35

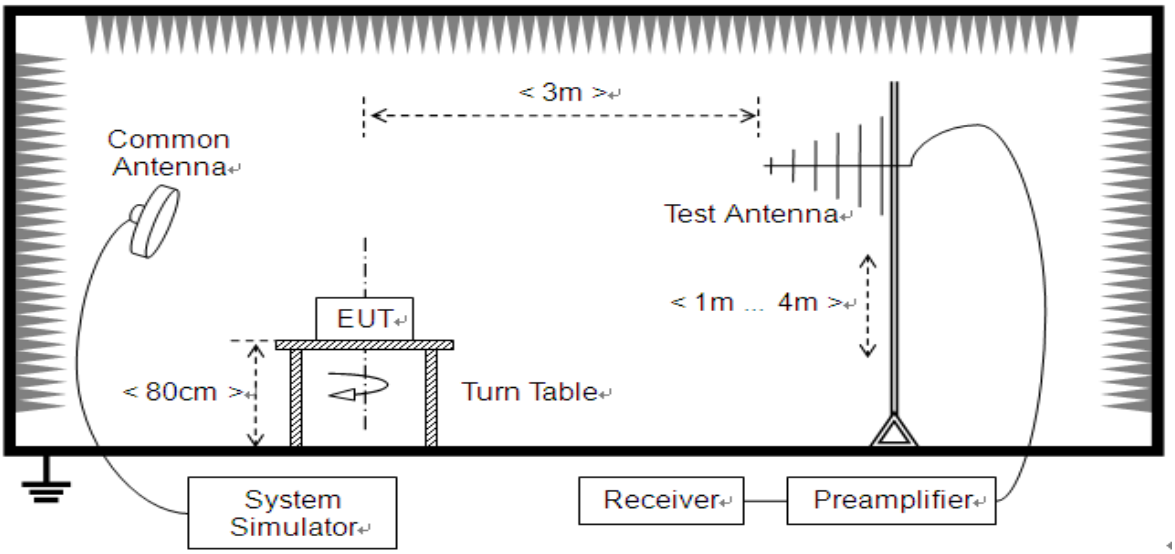
2.8. Radiated Spurious Emissions

2.8.1. Requirement

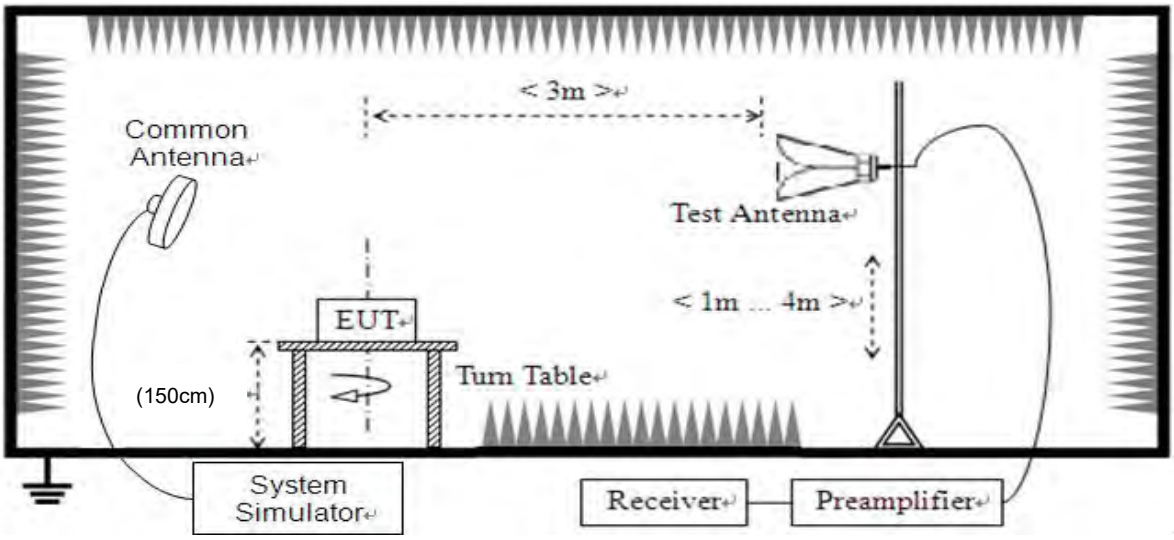
According to FCC section 2.1051, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P)dB. This calculated to be -13dBm.

Additional requirement for LTE Band 7:
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 55 + 10 log(P) dB. This calculated to be -25dBm.

2.8.2. 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.

2.8.3. Test procedure

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

2.8.4. Test Result

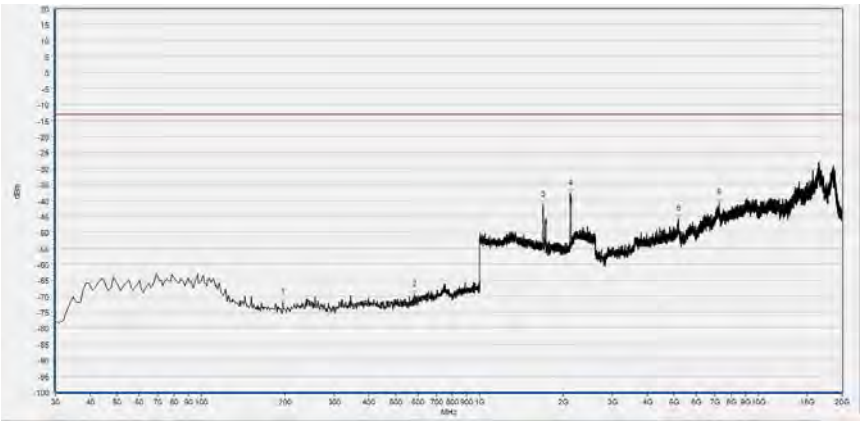
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. Test Antenna height is varied from 1m to 4m above the ground, and the Turn Table is actuated to turn from 0° to 360°, both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

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

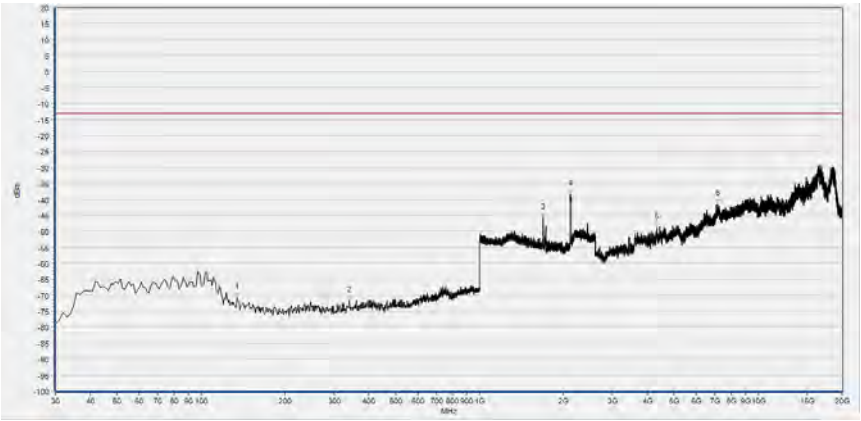
Note2: All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note3: All bandwidth and test channel were considered and evaluated respectively by performing full test for each band, only the worst cases were recorded in this test report.

LTE Band 66 20MHz BW, Low Channel, QPSK

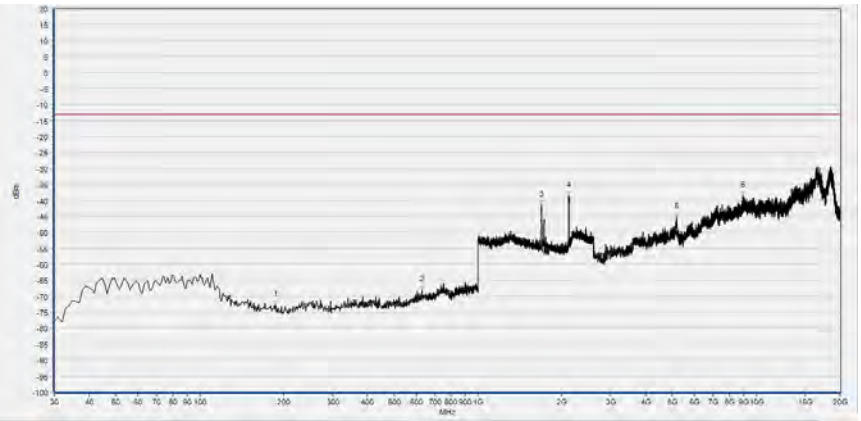


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	197.007	-72.10	-13.00	Horizontal	PASS
2	583.453	-69.59	-13.00	Horizontal	PASS
3	1693.147	-41.37	-13.00	Horizontal	N.A
4	2114.957	-37.91	-13.00	Horizontal	N.A
5	5164.027	-46.01	-13.00	Horizontal	PASS
6	7226.271	-40.83	-13.00	Horizontal	PASS

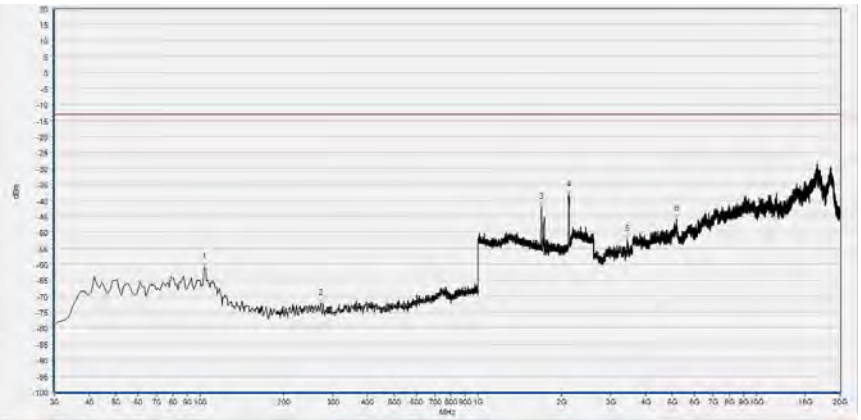


No.	Freq(MHz)	Peak	limit PK	Antenna	Verdict
1	134.865	-70.66	-13.00	Vertical	PASS
2	340.711	-71.56	-13.00	Vertical	PASS
3	1692.346	-45.69	-13.00	Vertical	N.A
4	2118.159	-38.24	-13.00	Vertical	N.A
5	4331.589	-48.80	-13.00	Vertical	PASS
6	7168.261	-41.44	-13.00	Vertical	PASS

LTE Band 66 20MHz BW, Low Channel, 16QAM

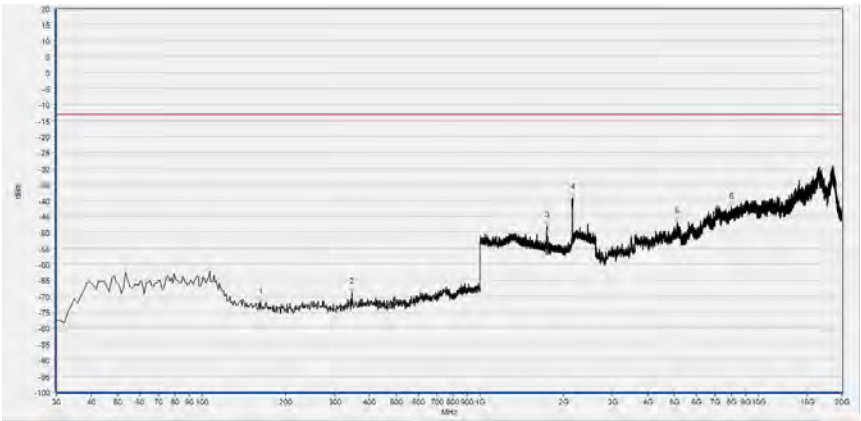


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	187.297	-72.72	-13.00	Horizontal	PASS
2	628.118	-67.95	-13.00	Horizontal	PASS
3	1690.745	-41.52	-13.00	Horizontal	N.A
4	2116.558	-38.45	-13.00	Horizontal	N.A
5	5178.530	-45.32	-13.00	Horizontal	PASS
6	8952.059	-38.54	-13.00	Horizontal	PASS

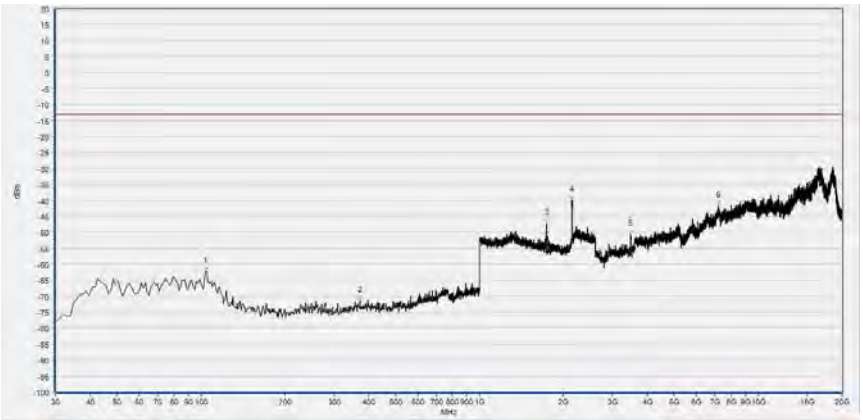


Num.	Freq(MHz)	Peak	limit PK	Antenna	Verdict
1	103.794	-60.91	-13.00	Vertical	PASS
2	271.772	-72.38	-13.00	Vertical	PASS
3	1691.546	-42.12	-13.00	Vertical	N.A
4	2116.558	-38.24	-13.00	Vertical	N.A
5	3444.041	-52.08	-13.00	Vertical	PASS
6	5169.828	-45.82	-13.00	Vertical	PASS

LTE Band 66 20MHz BW, Mid Channel, QPSK

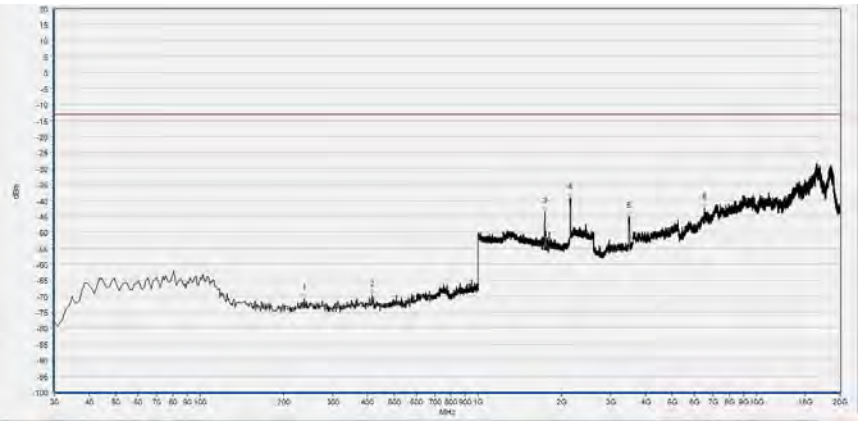


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	163.023	-71.94	-13.00	Vertical	PASS
2	346.537	-68.71	-13.00	Vertical	PASS
3	1737.169	-47.86	-13.00	Vertical	N.A
4	2150.175	-39.20	-13.00	Vertical	N.A
5	5111.819	-46.84	-13.00	Vertical	PASS
6	8003.601	-42.01	-13.00	Vertical	PASS

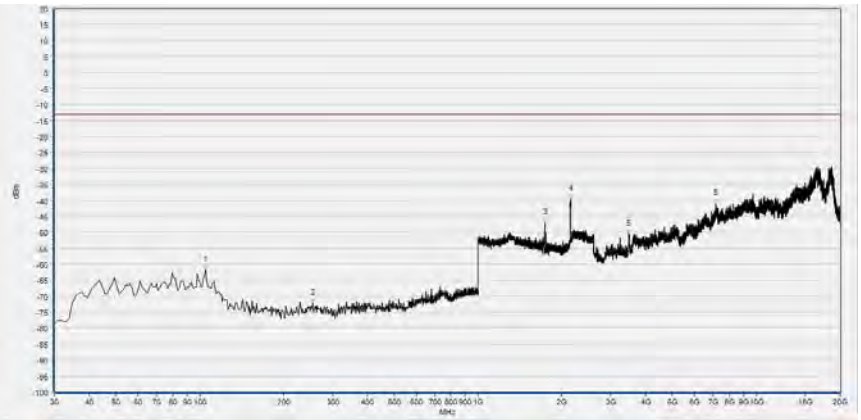


No.	Freq(MHz)	Peak	limit PK	Antenna	Verdict
1	103.794	-62.34	-13.00	Vertical	PASS
2	371.782	-71.42	-13.00	Vertical	PASS
3	1737.169	-47.22	-13.00	Vertical	N.A
4	2142.171	-39.82	-13.00	Vertical	N.A
5	3484.647	-50.64	-13.00	Vertical	PASS
6	7211.769	-41.57	-13.00	Vertical	PASS

LTE Band 66 20MHz BW, Mid Channel, 16QAM

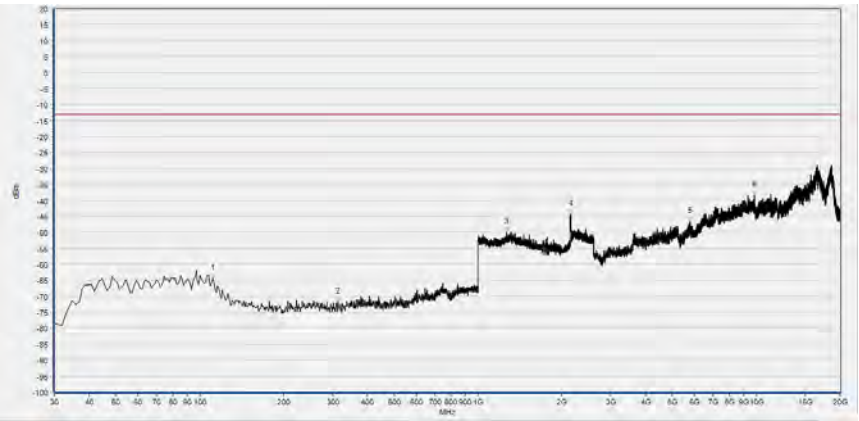


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	237.788	-70.67	-13.00	Horizontal	PASS
2	415.475	-69.68	-13.00	Horizontal	PASS
3	1736.368	-43.46	-13.00	Horizontal	N.A
4	2139.770	-39.15	-13.00	Horizontal	N.A
5	3478.846	-45.13	-13.00	Horizontal	PASS
6	6515.653	-42.34	-13.00	Horizontal	PASS

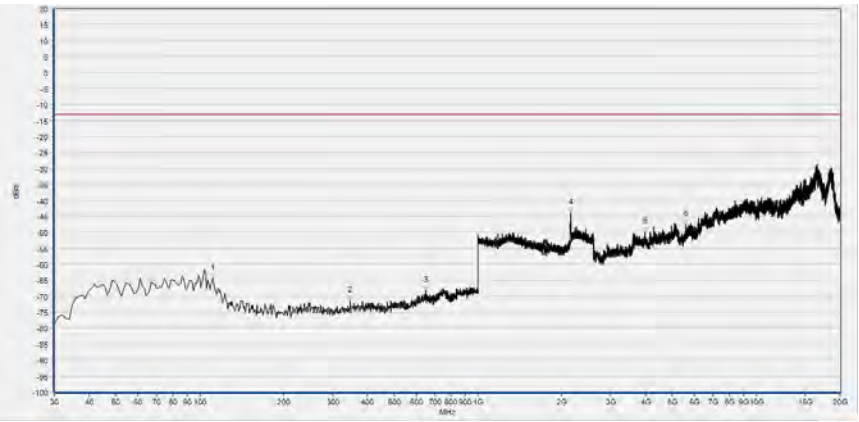


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	104.765	-61.76	-13.00	Vertical	PASS
2	254.294	-72.36	-13.00	Vertical	PASS
3	1737.169	-47.04	-13.00	Vertical	N/A
4	2150.175	-39.66	-13.00	Vertical	N/A
5	3481.747	-50.57	-13.00	Vertical	PASS
6	7156.659	-40.90	-13.00	Vertical	PASS

LTE Band 66 20MHz BW, High Channel, QPSK

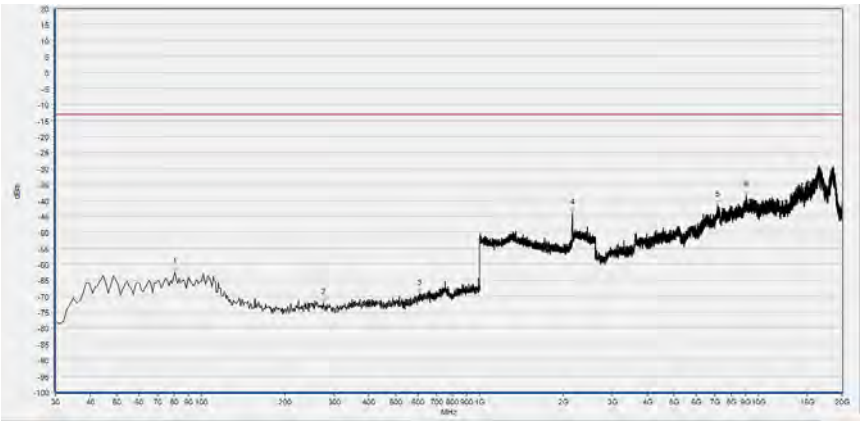


No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	111.562	-64.49	-13.00	Horizontal	PASS
2	313.524	-71.77	-13.00	Horizontal	PASS
3	1264.932	-49.99	-13.00	Horizontal	PASS
4	2153.377	-44.28	-13.00	Horizontal	N.A
5	5773.129	-46.59	-13.00	Horizontal	PASS
6	9836.706	-38.29	-13.00	Horizontal	PASS

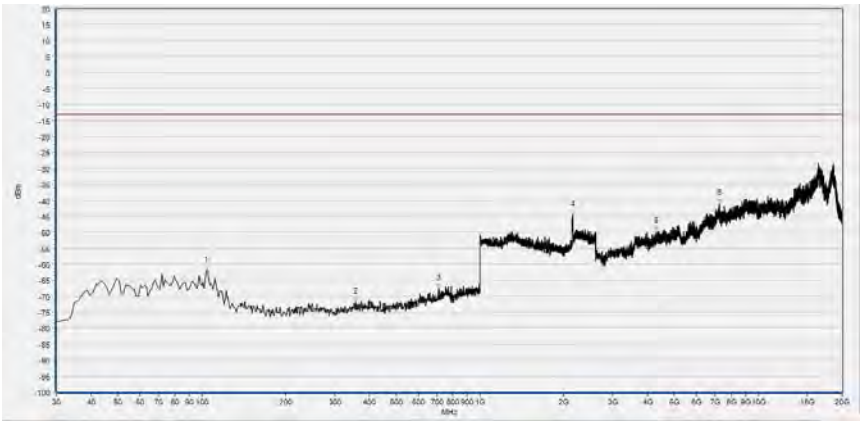


No.	Freq(MHz)	Peak	limit PK	Antenna	Verdict
1	111.562	-64.50	-13.00	Vertical	PASS
2	347.508	-71.29	-13.00	Vertical	PASS
3	648.509	-68.35	-13.00	Vertical	PASS
4	2154.177	-44.02	-13.00	Vertical	N.A
5	3977.730	-49.84	-13.00	Vertical	PASS
6	5590.398	-47.47	-13.00	Vertical	PASS

LTE Band 66 20MHz BW, High Channel, 16QAM



No.	Fre. (MHz)	Peak	Limit(PK)	Antenna	Verdict
1	80.490	-62.46	-13.00	Horizontal	PASS
2	275.656	-71.99	-13.00	Horizontal	PASS
3	609.670	-69.13	-13.00	Horizontal	PASS
4	2154.177	-43.96	-13.00	Horizontal	N.A
5	7171.162	-41.46	-13.00	Horizontal	PASS
6	9041.974	-38.29	-13.00	Horizontal	PASS



Num.	Freq(MHz)	Peak	limit PK	Antenna	Verdict
1	103.794	-62.04	-13.00	Vertical	PASS
2	356.246	-71.89	-13.00	Vertical	PASS
3	709.680	-67.65	-13.00	Vertical	PASS
4	2153.377	-44.67	-13.00	Vertical	N.A
5	4311.285	-49.76	-13.00	Vertical	PASS
6	7226.271	-41.10	-13.00	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. Morlab Laboratory
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. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

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

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2018.04.17	2019.04.16
Attenuator 1	(N/A.)	10dB	Resnet	2018.04.17	2019.04.16
Attenuator 2	(N/A.)	3dB	Resnet	2018.04.17	2019.04.16
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2018.11.06	2019.11.05
USB Power Sensor	MY54210011	U2021XA	Agilent	2018.04.17	2019.04.16
System Simulator	152038	CMW500	R&S	2018.05.08	2019.05.07
RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial cable	CB02	RF02	Morlab	N/A	N/A
SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Temperature Chamber	(N/A)	HUT705P	CHONGQING HANBA EXPERIMENTAL EQUIPMENT CO.,LTD	2018.04.17	2019.04.16
Computer	T430i	Think Pad	Lenovo	N/A	N/A

4.2 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
System Simulator	152038	CMW500	R&S	2018.08.04	2019.08.03
Receiver	MY54130016	N9038A	Agilent	2018.05.18	2019.05.17
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2018.03.03	2019.03.02
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2018.08.06	2019.08.05
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2018.08.02	2019.08.01
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
1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
Notch Filter	N/A	WRCGV-W Band 66	Wainwright	2018.12.01	2019.11.30
Anechoic Chamber	N/A	9m*6m*6m	CRT	2017.11.19	2020.11.18

END OF REPORT