

Test Report

FCC ID: 2AR73-H1

Date of issue: Jun. 02, 2019

Report Number:	MTi181217E100
Sample Description:	Wind IoT
Model(s):	H1
Applicant:	Wind Mobility Technology (Beijing) Co., Ltd.
Address:	11603, 13th floor, Building 1, No. 2, Nanzhugan Hutong, Dongcheng District, Beijing
Date of Test:	Dec. 05, 2018 to Jun. 02, 2019

Shenzhen Microtest Co., Ltd.
<http://www.mtitest.com>

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Test Result Certification

Applicant's name: Wind Mobility Technology (Beijing) Co., Ltd.

Address: 11603, 13th floor, Building 1, No. 2, Nanzhugan Hutong, Dongcheng District, Beijing

Manufacture's name: Shenzhen Qudong Intelligent Technology Co., Ltd.

Address: C426, Kechuang Park, No. 131, Yu'an Second Road, Bao'an District, Shenzhen, China

Product name: Wind IoT

Trademark: N/A

Model name: H1

Standards: FCC CFR 47 Part 24E, Part 27

Test Procedure: ANSI C63.26:2015
ANSI/TIA-603-E-2016
KDB 971168 D01 Power Meas License Digital Systems v03r01

This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by:



Demi Mu

Jun. 02, 2019

Reviewed by:



Blue Zheng

Jun. 02, 2019

Approved by:



Smith Chen

Jun. 02, 2019

1 General information

1.1 Feature of equipment under test (EUT)

Product name:	Wind IoT
Model name:	H1
Serial model:	N/A
Difference in series models:	N/A
Operating frequency range:	LTE FDD Band 2: 1850.7 - 1909.3MHz LTE FDD Band 4: 1710.7 - 1754.3MHz LTE FDD Band 12: 699.7- 715.3MHz
Modulation type:	QPSK,16QAM
Antenna type:	Integral Antenna
Antenna gain:	LTE FDD Band 2: 4.5dBi LTE FDD Band 4: 4.5dBi LTE FDD Band 12: 4.5dBi
Power supply:	DC 36V from DC power supply
Battery:	N/A
Adapter information:	N/A
Hardware Version:	WB-CZ-H1_V1.2
Software Version:	VER.09.1825

1.2 Test frequency channel

LTE Band	Channel	Channel Bandwidth (MHz)	Channel No.	Frequency (MHz)
LTE Band 2	Low	1.4	18607	1850.7
		3	18615	1851.5
		5	18625	1852.5
		10	18650	1855
		15	18675	1857.5
		20	18700	1860
	Middle	1.4/3/5/10/15/20	18900	1880
	High	1.4	19193	1909.3
		3	19185	1908.5
		5	19175	1907.5
		10	19150	1905
		15	19125	1902.5
		20	19100	1900

LTE Band 4	Low	1.4	19957	1710.7
		3	19965	1711.5
		5	19975	1712.5
		10	20000	1715
		15	20025	1717.5
		20	20050	1720
	Middle	1.4/3/5/10/15/20	20175	1732.5
	High	1.4	20393	1754.3
		3	20385	1753.5
		5	20375	1752.5
		10	20350	1750
		15	20325	1747.5
20		20300	1745	

LTE Band 12	Low	1.4	23017	699.7
		3	23025	700.5
		5	23035	701.5
		10	23060	704
	Middle	1.4/3/5/10	23095	707.5
	High	1.4	23173	715.3
		3	23165	714.5
		5	23155	713.5
		10	23130	711

1.3 EUT operation mode

LTE band 2	Keep the EUT in data communicating mode on LTE band 2. (LTE band2(1.4MHz), LTE band2(3MHz), LTE band2(5MHz), LTE band2(10MHz), LTE band2(15MHz), LTE band2(20MHz))
LTE band 4	Keep the EUT in data communicating mode on LTE band 4. (LTE band 4(1.4MHz), LTE band 4(3MHz), LTE band 4(5MHz), LTE band 4(10MHz), LTE band 4(15MHz), LTE band 4(20MHz))
LTE band 12	Keep the EUT in data communicating mode on LTE band 5. (LTE band 5(1.4MHz), LTE band 5(3MHz),LTE band5(5MHz), LTE band 5(10MHz))
Note: Only the worst case data were shown in the report.	

1.4 Ancillary equipment list

Equipment	Model	S/N	Manufacturer	Certificate type
DC power supply	QJ3020E	015170	QJE	/

2 Summary of test results

Item	FCC Part No.	Description of Test	Result
1	part2.1046 Part 24.232 (c) Part 27.50 (d)(4) Part 27.50(c)	RF Output Power	Pass
2	part 24.232(c.2) part 27.50(b)(10) part 27.50(c)(10) part 27.50(d)(4)	Radiated Power (ERP/EIRP)	Pass
3	Part 24.232 (d)	Peak-to-Average Ratio	Pass
4	Part 2.1049 Part 24.238(b) Part 27.53(g) Part 27.53(h) Part 27.53(m)	99% and -26 dB Occupied Bandwidth	Pass
5	part 2.1051 part 24.238(a) part 24.53(c) part 27.53 (g)(h)	Spurious emissions at antenna terminals	Pass
6	part 2.1051 part 24.238(a) part 27.53(c)(2)(4) part 27.53(g) part 27.53(h)	Band edge at antenna terminals	Pass
7	Part 2.1053 Part 24.238 (a) Part 27.53 (g) Part 27.53 (h) Part 27.53(m)	Field strength of spurious radiation measurement	Pass
8	Part 24.235 Part 27.54 Part 2.1055(a)(1)(b) Part 2.1055(d)(2)	Frequency Stability for Temperature & Voltage	Pass

3 Test facilities and accreditations

3.1 TEST LABORATORY

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China
FCC Registration No.:	448573

3.2 ENVIRONMENTAL CONDITIONS

Temperature:	20°C~30°C
Humidity	30%~70%
Atmospheric pressure	98kPa~101kPa

3.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty for a Level of Confidence of 95 %, $U=2xUc(y)$

RF frequency	1 x 10 ⁻⁷
RF power, conducted	± 1 dB
Conducted emission(150kHz~30MHz)	± 2.5 dB
Radiated emission(30MHz~1GHz)	± 4.2 dB
Radiated emission (above 1GHz)	± 4.3 dB
Temperature	±1 degree
Humidity	± 5 %

3.4 TEST SOFTWARE

Software Name	Manufacturer	Model	Version
RF Test System	Farad	LZ-RF	Lz_Rf 3A3

4 LIST OF TEST EQUIPMENT

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E001	Spectrum Analyzer	Agilent	E4407B	MY41441082	2018/09/18	2019/09/17
MTI-E002	CMU 200 universal radio communication tester	Rohde&schwarz	CMU 200	114587	2018/09/18	2019/09/17
MTI-E004	EMI Test Receiver	Rohde&schwarz	ESPI	1000314	2018/09/18	2019/09/17
MTI-E006	Broadband antenna	schwarabeck	VULB9163	872	2018/09/18	2019/09/17
MTI-E007	Horn antenna	schwarabeck	BBHA9120D	1201	2018/09/18	2019/09/17
MTI-E014	amplifier	America	8447D	3113A06150	2018/09/18	2019/09/17
MTI-E015	Conduction Immunity Signal Generator	Schloder	CDG6000	126A1343/2015	2018/09/18	2019/09/17
MTI-E016	Coupled decoupling network	Schloder	CDA M2/M3	A2210332/2015	2018/09/18	2019/09/17
MTI-E032	Comprehensive test instrument	Rohde&schwarz	CMW500	124192	2018/09/18	2019/09/17
MTI-E034	amplifier	Agilent	8449B	3008A02400	2018/09/18	2019/09/17
MTI-E040	Spectrum analyzer	Agilent	N9020A	MY49100060	2018/09/18	2019/09/17
MTI-E041	Signal generator	Agilent	N5182A	MY49060455	2018/09/18	2019/09/17
MTI-E042	Analog signal generator	Agilent	E4421B	GB40051240	2018/09/18	2019/09/17
MTI-E043	Power probe	Dare Instruments	RPR3006W	16100054SN016	2018/09/18	2019/09/17
MTI-E047	10dB attenuator	Mini-Circuits	UNAT-10+	15542	2018/09/18	2019/09/17
MTI-E049	spectrum analyzer	Rohde&schwarz	FSP-38	100019	2018/09/18	2019/09/17
MTI-E050	PSG Signal generator	Agilent	E8257D	MY46520873	2018/09/18	2019/09/17
MTI-E051	Active Loop Antenna 9kHz - 30MHz	Schwarzbeek	FMZB 1519 B	00044	2018/09/18	2019/09/17
MTI-E052	18-40GHz amplifier	Chengdu step Micro Technology	ZLNA-18-40G-21	1608001	2018/09/18	2019/09/17
MTI-E053	15-40G Antenna	Schwarzbeek	BBHA9170	BBHA9170582	2018/09/18	2019/09/17
MTI-E020	Thermometer	/	HTC-1	/	2018/09/18	2019/09/17

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

5 Test result

5.1 RF output power

5.1.1 Limit

For FCC Part 24.232(c):

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

For FCC Part 27.50(d):

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 1 Watt.

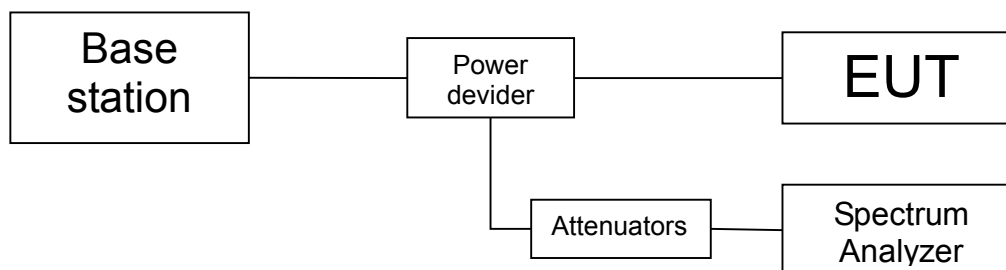
For FCC Part 27.50(c):

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 3 Watts.

5.1.2 Test procedure

- 1) The EUT's RF output port was connected to base station.
- 2) A call is set up by the SS according to the generic call set up procedure.
- 3) Set EUT at maximum power level through base station by power level command.
- 4) Measure the maximum output power of EUT at each frequency band and mode by base station.
- 5) The EUT was set up for the max output power with pseudo random data modulation.
- 6) These measurements were done at 3 frequencies (bottom, middle and top of operational frequency range) for each bandwidth.

5.1.3 Test setup



5.1.4 Test results

The following table shows the conducted power measured:

LTE Band 2:

5.1.4.1 Channel Bandwidth: 1.4 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band2	1.4MHz	18607	1850.7	QPSK	1	Low	22.28
					1	Mid	22.25
					1	High	22.17
					3	Low	21.83
					3	High	21.86
					6	Low	21.78
				16QAM	1	Low	21.62
					1	Mid	21.24
					1	High	21.16
					3	Low	20.85
					3	High	20.75
					6	Low	20.65
	1.4MHz	18900	1880.0	QPSK	1	Low	22.14
					1	Mid	22.17
					1	High	22.02
					3	Low	22.06
					3	High	21.91
					6	Low	21.84
				16QAM	1	Low	21.66
					1	Mid	21.42
					1	High	21.21
					3	Low	21.14
					3	High	20.82
					6	Low	20.67
1.4MHz	19193	1909.3	QPSK	1	Low	22.02	
				1	Mid	22.13	
				1	High	22.14	
				3	Low	21.96	
				3	High	21.72	
				6	Low	21.41	

				16QAM	1	Low	21.52
					1	Mid	21.37
					1	High	21.28
					3	Low	21.12
					3	High	20.93
					6	Low	20.84

5.1.4.2 Channel Bandwidth: 3 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band2	3.0 MHz	18615	1851.5	QPSK	1	Low	22.19
					1	Mid	22.15
					1	High	22.15
					8	Low	21.86
					8	High	21.74
					15	Low	21.25
				16QAM	1	Low	21.15
					1	Mid	21.07
					1	High	20.98
					8	Low	20.77
					8	High	20.58
					15	Low	20.14
	3.0 MHz	18900	1880.0	QPSK	1	Low	22.28
					1	Mid	22.21
					1	High	22.13
					8	Low	22.02
					8	High	21.86
					15	Low	21.50
				16QAM	1	Low	21.34
					1	Mid	21.27
					1	High	21.13
					8	Low	20.93
					8	High	20.72
					15	Low	20.48
3.0 MHz	19185	1908.5	QPSK	1	Low	22.22	
				1	Mid	22.13	
				1	High	22.14	
				8	Low	21.81	
				8	High	21.68	
				15	Low	21.32	
			16QAM	1	Low	21.04	
				1	Mid	21.01	
				1	High	20.85	
				8	Low	20.66	
				8	High	20.45	
				15	Low	20.18	

5.1.4.3 Channel Bandwidth: 5 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band2	5.0 MHz	18625	1852.5	QPSK	1	Low	22.17
					1	Mid	22.15
					1	High	22.08
					12	Low	21.84
					12	High	21.66
					25	Low	21.21
				16QAM	1	Low	21.14
					1	Mid	21.09
					1	High	21.07
					12	Low	20.84
					12	High	20.64
					25	Low	20.15
	5.0 MHz	18900	1880.0	QPSK	1	Low	22.39
					1	Mid	22.36
					1	High	22.15
					12	Low	22.03
					12	High	21.87
					25	Low	21.45
				16QAM	1	Low	21.40
					1	Mid	21.28
					1	High	21.13
					12	Low	21.05
					12	High	20.82
					25	Low	20.44
	5.0 MHz	19175	1907.5	QPSK	1	Low	22.10
					1	Mid	22.04
					1	High	21.87
12					Low	21.77	
12					High	21.59	
25					Low	21.21	
16QAM				1	Low	21.14	
				1	Mid	21.06	
				1	High	20.81	
				12	Low	20.79	
				12	High	20.54	
				25	Low	20.09	

5.1.4.4 Channel Bandwidth: 10 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band2	10.0 MHz	18650	1855.0	QPSK	1	Low	22.20
					1	Mid	22.11
					1	High	21.90
					25	Low	21.81
					25	High	21.57
					50	Low	21.25
				16QAM	1	Low	21.32
					1	Mid	21.26
					1	High	21.10
					25	Low	20.96
					25	High	20.63
					50	Low	20.21
	10.0 MHz	18900	1880.0	QPSK	1	Low	22.38
					1	Mid	22.33
					1	High	22.21
					25	Low	22.06
					25	High	21.86
					50	Low	21.43
				16QAM	1	Low	21.26
					1	Mid	21.15
					1	High	21.05
					25	Low	20.88
					25	High	20.64
					50	Low	20.39
	10.0 MHz	19150	1905.0	QPSK	1	Low	22.26
					1	Mid	22.25
					1	High	21.97
25					Low	21.84	
25					High	21.58	
50					Low	21.12	
16QAM				1	Low	21.22	
				1	Mid	21.22	
				1	High	21.06	
				25	Low	20.86	
				25	High	20.61	
				50	Low	20.26	

5.1.4.5 Channel Bandwidth: 15 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band2	15.0 MHz	18675	1857.5	QPSK	1	Low	22.25
					1	Mid	22.18
					1	High	22.06
					36	Low	21.87
					36	High	21.65
					75	Low	21.53
				16QAM	1	Low	21.35
					1	Mid	21.24
					1	High	21.05
					36	Low	20.88
					36	High	20.52
					75	Low	20.32
	15.0 MHz	18900	1880.0	QPSK	1	Low	22.38
					1	Mid	22.26
					1	High	22.23
					36	Low	22.05
					36	High	21.82
					75	Low	21.59
				16QAM	1	Low	21.24
					1	Mid	21.11
					1	High	21.02
					36	Low	20.89
					36	High	20.72
					75	Low	20.51
	15.0 MHz	19125	1902.5	QPSK	1	Low	22.36
					1	Mid	22.21
					1	High	22.03
36					Low	21.87	
36					High	21.63	
75					Low	21.36	
16QAM				1	Low	21.24	
				1	Mid	21.37	
				1	High	21.29	
				36	Low	21.02	
				36	High	20.76	
				75	Low	20.24	

5.1.4.6 Channel Bandwidth: 20 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band2	20.0 MHz	18700	1860.0	QPSK	1	Low	22.23
					1	Mid	22.13
					1	High	22.12
					50	Low	21.45
					50	High	21.63
					100	Low	21.25
				16QAM	1	Low	21.27
					1	Mid	21.14
					1	High	21.01
					50	Low	20.84
					50	High	20.61
					100	Low	20.45
	20.0 MHz	18900	1880.0	QPSK	1	Low	22.55
					1	Mid	22.37
					1	High	22.12
					50	Low	21.45
					50	High	21.71
					100	Low	21.43
				16QAM	1	Low	21.35
					1	Mid	21.36
					1	High	21.14
					50	Low	20.25
					50	High	20.35
					100	Low	20.39
	20.0 MHz	19100	1900.0	QPSK	1	Low	22.41
					1	Mid	22.45
					1	High	22.36
50					Low	21.35	
50					High	21.56	
100					Low	21.21	
16QAM				1	Low	21.47	
				1	Mid	21.34	
				1	High	21.45	
				50	Low	20.89	
				50	High	20.45	
				100	Low	20.15	

LTE Band 4:

5.1.4.7 Channel Bandwidth: 1.4 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band4	1.4MHz	19957	1710.7	QPSK	1	Low	22.13
					1	Mid	22.11
					1	High	22.09
					3	Low	21.84
					3	High	21.77
					6	Low	21.65
				16QAM	1	Low	21.70
					1	Mid	21.72
					1	High	21.58
					3	Low	21.35
					3	High	21.14
					6	Low	21.02
	1.4MHz	20175	1732.5	QPSK	1	Low	22.21
					1	Mid	22.13
					1	High	22.06
					3	Low	21.81
					3	High	21.72
					6	Low	21.44
				16QAM	1	Low	21.37
					1	Mid	21.34
					1	High	21.29
					3	Low	21.24
					3	High	21.16
					6	Low	20.86
1.4MHz	20393	1754.3	QPSK	1	Low	22.19	
				1	Mid	22.08	
				1	High	22.34	
				3	Low	21.89	
				3	High	21.77	
				6	Low	21.63	
			16QAM	1	Low	21.57	
				1	Mid	21.38	
				1	High	21.31	
				3	Low	21.25	
				3	High	21.06	
				6	Low	20.39	

5.1.4.8 Channel Bandwidth: 3 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band4	3.0 MHz	19965	1711.5	QPSK	1	Low	22.30
					1	Mid	22.29
					1	High	22.25
					8	Low	22.36
					8	High	21.28
					15	Low	21.43
				16QAM	1	Low	21.97
					1	Mid	21.80
					1	High	21.74
					8	Low	21.62
					8	High	21.52
					15	Low	20.86
	3.0 MHz	20175	1732.5	QPSK	1	Low	22.37
					1	Mid	22.31
					1	High	22.19
					8	Low	22.09
					8	High	21.69
					15	Low	21.50
				16QAM	1	Low	22.04
					1	Mid	22.00
					1	High	21.86
					8	Low	21.60
					8	High	21.51
					15	Low	20.60
	3.0 MHz	20385	1753.5	QPSK	1	Low	22.45
					1	Mid	22.32
					1	High	22.21
8					Low	22.04	
8					High	21.58	
15					Low	21.35	
16QAM				1	Low	21.51	
				1	Mid	21.45	
				1	High	21.33	
				8	Low	21.16	
				8	High	21.97	
				15	Low	20.58	

5.1.4.9 Channel Bandwidth: 5 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band4	5.0 MHz	19975	1712.5	QPSK	1	Low	22.39
					1	Mid	22.54
					1	High	22.18
					12	Low	21.87
					12	High	21.64
					25	Low	21.35
		16QAM	1	Low	21.39		
			1	Mid	21.32		
			1	High	21.15		
			12	Low	21.21		
			12	High	20.82		
			25	Low	20.47		
	5.0 MHz	20175	1732.5	QPSK	1	Low	22.44
					1	Mid	22.29
					1	High	22.25
					12	Low	21.85
					12	High	21.32
					25	Low	21.49
		16QAM	1	Low	21.14		
			1	Mid	21.35		
			1	High	21.21		
			12	Low	21.07		
			12	High	20.25		
			25	Low	20.62		
	5.0 MHz	20375	1752.5	QPSK	1	Low	22.35
					1	Mid	22.46
					1	High	22.45
12					Low	21.54	
12					High	21.17	
25					Low	21.25	
16QAM		1	Low	21.86			
		1	Mid	21.36			
		1	High	21.76			
		12	Low	21.41			
		12	High	21.45			
		25	Low	20.81			

5.1.4.10 Channel Bandwidth: 10 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band4	10.0 MHz	20000	1715.0	QPSK	1	Low	22.25
					1	Mid	22.30
					1	High	22.15
					25	Low	21.47
					25	High	21.12
					50	Low	21.39
		16QAM	1	Low	22.00		
			1	Mid	21.96		
			1	High	21.47		
			25	Low	21.37		
			25	High	21.25		
			50	Low	20.25		
	10.0 MHz	20175	1732.5	QPSK	1	Low	22.40
					1	Mid	22.23
					1	High	22.04
					25	Low	21.78
					25	High	21.71
					50	Low	21.47
		16QAM	1	Low	22.06		
			1	Mid	22.02		
			1	High	21.81		
			25	Low	21.45		
			25	High	21.35		
			50	Low	20.53		
10.0 MHz	20350	1750.0	QPSK	1	Low	22.52	
				1	Mid	22.46	
				1	High	22.39	
				25	Low	21.35	
				25	High	21.74	
				50	Low	21.14	
	16QAM	1	Low	22.16			
		1	Mid	22.45			
		1	High	21.85			
		25	Low	21.48			
		25	High	21.36			
		50	Low	20.58			

5.1.4.11 Channel Bandwidth: 15 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band4	15.0 MHz	20025	1717.5	QPSK	1	Low	22.30
					1	Mid	22.35
					1	High	22.06
					36	Low	21.72
					36	High	21.67
					75	Low	21.38
				16QAM	1	Low	21.94
					1	Mid	21.87
					1	High	21.74
					36	Low	21.35
					36	High	21.37
					75	Low	20.39
	15.0 MHz	20175	1732.5	QPSK	1	Low	22.39
					1	Mid	22.24
					1	High	22.11
					36	Low	21.83
					36	High	21.45
					75	Low	21.52
				16QAM	1	Low	22.25
					1	Mid	22.09
					1	High	21.86
					36	Low	21.53
					36	High	21.23
					75	Low	20.25
	15.0 MHz	20325	1747.5	QPSK	1	Low	22.53
					1	Mid	22.52
					1	High	22.48
36					Low	21.84	
36					High	21.73	
75					Low	21.55	
16QAM				1	Low	22.08	
				1	Mid	22.00	
				1	High	21.89	
				36	Low	21.53	
				36	High	21.33	
				75	Low	20.83	

5.1.4.12 Channel Bandwidth: 20 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band4	20.0 MHz	20050	1720.0	QPSK	1	Low	22.34
					1	Mid	22.25
					1	High	22.12
					50	Low	21.45
					50	High	21.82
					100	Low	21.38
				16QAM	1	Low	21.36
					1	Mid	21.62
					1	High	21.25
					50	Low	21.40
					50	High	21.29
					100	Low	20.45
	20.0 MHz	20175	1732.5	QPSK	1	Low	22.59
					1	Mid	22.40
					1	High	22.33
					50	Low	22.23
					50	High	22.07
					100	Low	21.57
				16QAM	1	Low	21.74
					1	Mid	21.54
					1	High	21.62
					50	Low	21.56
					50	High	21.42
					100	Low	20.82
	20.0 MHz	20300	1745.0	QPSK	1	Low	22.16
					1	Mid	22.35
					1	High	22.32
50					Low	22.26	
50					High	22.12	
100					Low	21.54	
16QAM				1	Low	22.11	
				1	Mid	22.08	
				1	High	21.93	
				50	Low	21.55	
				50	High	21.40	
				100	Low	20.54	

LTE Band 12:

5.1.4.13 Channel Bandwidth: 1.4 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band 12	1.4MHz	23017	699.7	QPSK	1	Low	22.51
					1	Mid	22.36
					1	High	22.31
					3	Low	22.11
					3	High	22.08
					6	Low	21.69
				16QAM	1	Low	21.44
					1	Mid	21.41
					1	High	21.37
					3	Low	21.12
					3	High	21.04
					6	Low	20.73
	1.4MHz	23095	707.5	QPSK	1	Low	22.56
					1	Mid	22.48
					1	High	22.39
					3	Low	22.11
					3	High	22.09
					6	Low	21.76
				16QAM	1	Low	21.71
					1	Mid	21.65
					1	High	21.57
					3	Low	21.23
					3	High	21.19
					6	Low	20.75
	1.4MHz	23173	715.3	QPSK	1	Low	22.40
					1	Mid	22.34
					1	High	22.30
3					Low	22.03	
3					High	21.96	
6					Low	21.63	
16QAM				1	Low	21.35	
				1	Mid	21.23	
				1	High	21.18	
				3	Low	21.04	
				3	High	21.01	
				6	Low	20.70	

5.1.4.14 Channel Bandwidth: 3 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band 12	3.0 MHz	23025	700.5	QPSK	1	Low	22.61
					1	Mid	22.37
					1	High	22.49
					8	Low	22.25
					8	High	22.41
					15	Low	21.25
				16QAM	1	Low	21.76
					1	Mid	21.25
					1	High	21.12
					8	Low	21.36
					8	High	21.21
					15	Low	20.88
	3.0 MHz	23095	707.5	QPSK	1	Low	22.74
					1	Mid	22.70
					1	High	22.65
					8	Low	22.46
					8	High	22.32
					15	Low	21.17
				16QAM	1	Low	21.25
					1	Mid	21.55
					1	High	21.43
					8	Low	21.29
					8	High	21.47
					15	Low	20.76
	3.0 MHz	23165	714.5	QPSK	1	Low	22.58
					1	Mid	22.42
					1	High	22.40
8					Low	22.52	
8					High	20.97	
15					Low	21.64	
16QAM				1	Low	21.61	
				1	Mid	21.45	
				1	High	21.48	
				8	Low	21.15	
				8	High	21.35	
				15	Low	20.58	

5.1.4.15 Channel Bandwidth: 5 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band 12	5.0 MHz	23035	701.5	QPSK	1	Low	22.70
					1	Mid	22.54
					1	High	22.57
					12	Low	22.21
					12	High	22.47
					25	Low	21.75
				16QAM	1	Low	21.69
					1	Mid	21.65
					1	High	21.50
					12	Low	21.42
					12	High	21.37
					25	Low	20.79
	5.0 MHz	23095	707.5	QPSK	1	Low	22.74
					1	Mid	22.72
					1	High	22.64
					12	Low	22.47
					12	High	22.31
					25	Low	21.71
				16QAM	1	Low	21.80
					1	Mid	21.67
					1	High	21.65
					12	Low	21.46
					12	High	21.35
					25	Low	20.87
	5.0 MHz	23155	713.5	QPSK	1	Low	22.62
					1	Mid	22.48
					1	High	22.41
12					Low	22.14	
12					High	22.03	
25					Low	21.55	
16QAM				1	Low	21.71	
				1	Mid	21.58	
				1	High	21.56	
				12	Low	21.23	
				12	High	21.15	
				25	Low	20.60	

5.1.4.16 Channel Bandwidth: 10 MHz

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)
					RB Size	RB Offset	
Band 12	10.0 MHz	23060	704	QPSK	1	Low	22.73
					1	Mid	22.67
					1	High	22.61
					25	Low	22.44
					25	High	22.41
					50	Low	21.78
		16QAM	1	Low	21.90		
			1	Mid	21.85		
			1	High	21.76		
			25	Low	21.44		
			25	High	21.39		
			50	Low	20.75		
	10.0 MHz	23095	707.5	QPSK	1	Low	22.84
					1	Mid	22.81
					1	High	22.74
					25	Low	22.51
					25	High	22.46
					50	Low	21.72
		16QAM	1	Low	21.71		
			1	Mid	21.64		
			1	High	21.59		
			25	Low	21.43		
			25	High	21.36		
			50	Low	20.75		
	10.0 MHz	23130	711	QPSK	1	Low	22.71
					1	Mid	22.72
					1	High	22.66
25					Low	22.55	
25					High	22.51	
50					Low	21.66	
16QAM		1	Low	21.89			
		1	Mid	21.84			
		1	High	21.75			
		25	Low	21.65			
		25	High	21.48			
		50	Low	20.62			

5.2 Radiated Power (ERP/EIRP)

5.2.1 Limit

- 1) 27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.
- 2) 27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.
- 3) 27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.
- 4) 27.50(h) The following power limits shall apply in the BRS and EBS:
(2) 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.
- 5) 27.50(a)(3):For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth.

5.2.2 Test procedure

- 6) The EUT was placed on an non-conductive turntable using a nonconductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
- 7) During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.
- 8) ERP in frequency band below 1GHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$

- 9) EIRP in frequency band above 1GHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

- 10) The worse case was relating to the conducted output power.

5.2.3 Test setup

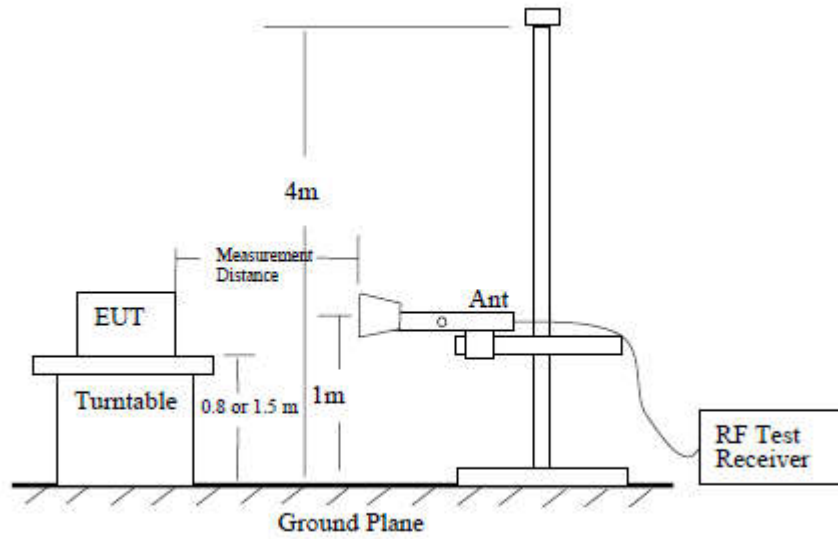


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

5.2.4 Test results

Radiated Spurious Measurement:
LTE Band 2

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1850.7	-2.56	3.76	28.24	21.94	156.315	Horizontal	Pass
		1880	-2.45	3.91	28.22	21.25	133.352	Horizontal	Pass
		1909.3	-2.15	3.93	28.21	22.19	165.577	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	-2.37	3.76	28.24	22.11	162.555	Horizontal	Pass
		1880	-2.19	3.91	28.22	22.15	164.059	Horizontal	Pass
		1909.3	-2.87	3.93	28.20	21.29	134.586	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	-2.37	3.77	28.23	22.31	170.216	Horizontal	Pass
		1880	-2.94	3.91	28.24	21.28	134.276	Horizontal	Pass
		1908.5	-2.25	3.94	28.25	22.07	161.065	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-2.49	3.77	28.23	21.90	154.882	Horizontal	Pass
		1880	-2.76	3.91	28.24	21.39	137.721	Horizontal	Pass
		1908.5	-2.63	3.94	28.25	21.68	147.231	Horizontal	Pass
5.0MHz Band QPSK	25/0	1852.5	-2.11	3.77	28.31	22.43	174.985	Horizontal	Pass
		1880	-2.53	3.91	28.22	21.28	134.276	Horizontal	Pass
		1907.5	-2.03	3.94	28.21	22.23	167.109	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1852.5	-2.81	3.77	28.31	21.73	148.936	Horizontal	Pass
		1880	-2.33	3.91	28.22	21.98	157.761	Horizontal	Pass
		1907.5	-2.23	3.94	28.2	22.13	163.305	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	-2.06	3.79	28.33	22.45	175.792	Horizontal	Pass
		1880	-2.19	3.95	28.22	22.08	161.436	Horizontal	Pass
		1905	-2.21	3.97	28.19	22.01	158.855	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1855	-2.68	3.79	28.33	21.83	152.405	Horizontal	Pass
		1880	-2.84	3.95	28.22	21.74	149.279	Horizontal	Pass
		1905	-2.97	3.97	28.19	21.85	153.109	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	-2.98	3.79	28.34	21.35	136.458	Horizontal	Pass
		1880	-2.94	3.95	28.22	21.33	135.831	Horizontal	Pass
		1902.5	-2.35	3.97	28.18	21.15	130.317	Horizontal	Pass
15.0MHz	75/0	1857.5	-2.30	3.79	28.34	22.45	175.792	Horizontal	Pass

Band 16 QAM		1880	-2.01	3.95	28.22	22.26	168.267	Horizontal	Pass
		1902.5	-2.30	3.97	28.18	21.36	136.773	Horizontal	Pass
20.0MHz Band QPSK	100/0	1860	-2.28	3.81	28.35	22.26	168.267	Horizontal	Pass
		1880	-2.77	3.96	28.22	21.45	139.637	Horizontal	Pass
		1900	-2.24	4.00	28.16	21.74	149.279	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1860	-2.68	3.81	28.35	21.58	143.880	Horizontal	Pass
		1880	-2.40	3.96	28.22	21.87	153.815	Horizontal	Pass
		1900	-2.10	4.00	28.16	22.09	161.808	Horizontal	Pass

Radiated Power (EIRP) for Band 2									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
			1.4MHz Band QPSK	6/0	1850.7	-2.58	3.76	28.24	
1880	-2.48	3.91	28.22		21.84	152.757	Vertical	Pass	
1909.3	-2.21	3.93	28.2		22.06	160.694	Vertical	Pass	
1.4MHz Band 16 QAM	6/0	1850.7	-2.01	3.76	28.24	22.45	175.792	Vertical	Pass
1880		-2.34	3.91	28.22	21.91	155.239	Vertical	Pass	
1909.3		-2.90	3.93	28.2	21.34	136.144	Vertical	Pass	
3.0MHz Band QPSK	15/0	1851.5	-2.91	3.77	28.23	21.45	139.637	Vertical	Pass
1880		-2.30	3.91	28.24	22.05	160.325	Vertical	Pass	
1908.5		-2.81	3.94	28.25	21.21	132.130	Vertical	Pass	
3.0MHz Band 16 QAM	15/0	1851.5	-2.79	3.77	28.23	21.64	145.881	Vertical	Pass
1880		-2.70	3.91	28.24	21.39	137.721	Vertical	Pass	
1908.5		-2.92	3.94	28.25	21.31	135.207	Vertical	Pass	
5.0MHz Band QPSK	25/0	1852.5	-2.12	3.77	28.31	22.42	174.582	Vertical	Pass
1880		-2.42	3.91	28.22	21.80	151.356	Vertical	Pass	
1907.5		-2.26	3.94	28.2	22.05	160.325	Vertical	Pass	
5.0MHz Band 16 QAM	25/0	1852.5	-2.92	3.77	28.31	21.45	139.637	Vertical	Pass
1880		-2.78	3.91	28.22	21.53	142.233	Vertical	Pass	
1907.5		-2.30	3.94	28.2	21.28	134.276	Vertical	Pass	
10.0MHz Band QPSK	50/0	1855	-2.27	3.79	28.33	22.24	167.494	Vertical	Pass
1880		-2.03	3.95	28.22	22.36	172.187	Vertical	Pass	
1905		-2.94	3.97	28.19	21.25	133.352	Vertical	Pass	
10.0MHz Band 16 QAM	50/0	1855	-2.70	3.79	28.33	21.85	153.109	Vertical	Pass
1880		-2.88	3.95	28.22	21.36	136.773	Vertical	Pass	
1905		-2.93	3.97	28.19	21.45	139.637	Vertical	Pass	

15.0MHz Band QPSK	75/0	1857.5	-2.30	3.79	28.34	22.25	167.880	Vertical	Pass
		1880	-2.72	3.95	28.22	21.55	142.889	Vertical	Pass
		1902.5	-2.87	3.97	28.18	21.48	140.605	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1857.5	-2.24	3.79	28.34	22.30	169.824	Vertical	Pass
		1880	-2.72	3.95	28.22	21.44	139.316	Vertical	Pass
		1902.5	-2.00	3.97	28.18	22.21	166.341	Vertical	Pass
20.0MHz Band QPSK	100/0	1860	-2.61	3.81	28.35	21.25	133.352	Vertical	Pass
		1880	-2.71	3.96	28.22	21.55	142.889	Vertical	Pass
		1900	-2.45	4	28.16	21.72	148.594	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1860	-2.49	3.81	28.35	22.08	161.436	Vertical	Pass
		1880	-2.98	3.96	28.22	21.45	139.637	Vertical	Pass
		1900	-2.69	4	28.16	21.46	139.959	Vertical	Pass

LTE Band 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	-2.05	3.12	27.58	22.42	174.129	Horizontal	Pass
		1732.5	-2.49	3.27	27.61	21.31	153.162	Horizontal	Pass
		1754.3	-2.31	3.29	27.63	22.29	159.489	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-2.72	3.12	27.58	21.74	149.156	Horizontal	Pass
		1732.5	-2.12	3.27	27.61	22.25	166.610	Horizontal	Pass
		1754.3	-2.69	3.29	27.63	21.64	146.211	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	-2.97	3.13	27.61	21.51	141.615	Horizontal	Pass
		1732.5	-2.75	3.27	27.61	21.59	144.073	Horizontal	Pass
		1753.5	-2.76	3.3	27.62	21.56	143.121	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-2.99	3.13	27.61	21.45	141.037	Horizontal	Pass
		1732.5	-2.85	3.27	27.61	21.25	140.956	Horizontal	Pass
		1753.5	-2.94	3.3	27.62	21.38	137.489	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	-2.13	3.13	27.63	22.36	172.536	Horizontal	Pass
		1732.5	-2.33	3.27	27.61	22.74	159.027	Horizontal	Pass
		1752.5	-2.12	3.3	27.6	22.18	165.343	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-2.13	3.13	27.63	22.37	172.646	Horizontal	Pass
		1732.5	-2.90	3.27	27.61	21.25	139.425	Horizontal	Pass
		1752.5	-2.49	3.3	27.6	21.88	151.552	Horizontal	Pass

10.0MHz	Band QPSK	50/0	1715	-2.56	3.15	27.64	21.45	156.079	Horizontal	Pass
			1732.5	-2.93	3.31	27.61	21.25	137.055	Horizontal	Pass
			1750	-2.68	3.33	27.59	21.51	143.916	Horizontal	Pass
10.0MHz	Band 16 QAM	50/0	1715	-2.78	3.15	27.64	21.73	148.185	Horizontal	Pass
			1732.5	-2.39	3.31	27.61	21.90	155.239	Horizontal	Pass
			1750	-2.72	3.33	27.59	21.54	142.540	Horizontal	Pass
15.0MHz	Band QPSK	75/0	1717.5	-2.69	3.15	27.65	21.81	151.864	Horizontal	Pass
			1732.5	-2.49	3.31	27.61	21.51	151.722	Horizontal	Pass
			1747.5	-2.91	3.33	27.57	21.33	135.716	Horizontal	Pass
15.0MHz	Band 16 QAM	75/0	1717.5	-2.01	3.15	27.65	22.35	177.341	Horizontal	Pass
			1732.5	-2.01	3.31	27.61	22.29	169.410	Horizontal	Pass
			1747.5	-2.00	3.33	27.57	22.25	167.437	Horizontal	Pass
20.0MHz	Band QPSK	100/0	1720	-2.90	3.17	27.66	21.54	144.235	Horizontal	Pass
			1732.5	-2.87	3.32	27.61	21.42	138.739	Horizontal	Pass
			1745	-2.11	3.36	27.56	22.09	161.627	Horizontal	Pass
20.0MHz	Band 16 QAM	100/0	1720	-2.12	3.17	27.66	22.74	172.609	Horizontal	Pass
			1732.5	-2.02	3.32	27.61	22.27	168.705	Horizontal	Pass
			1745	-2.22	3.36	27.56	21.36	157.864	Horizontal	Pass

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	-2.69	3.12	27.58	21.54	142.561	Vertical	Pass
		1732.5	-2.06	3.27	27.61	22.28	169.044	Vertical	Pass
		1754.3	-2.22	3.29	27.63	22.36	172.187	Vertical	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-2.08	3.12	27.58	22.38	172.982	Vertical	Pass
		1732.5	-2.23	3.27	27.61	22.41	174.181	Vertical	Pass
		1754.3	-2.96	3.29	27.63	21.38	137.404	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	-2.33	3.13	27.61	22.14	163.682	Vertical	Pass
		1732.5	-2.59	3.27	27.61	21.75	149.624	Vertical	Pass
		1753.5	-2.14	3.3	27.62	22.25	167.880	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-2.18	3.13	27.61	22.30	169.824	Vertical	Pass
		1732.5	-2.56	3.27	27.61	21.36	136.773	Vertical	Pass
		1753.5	-2.27	3.3	27.62	22.05	160.325	Vertical	Pass
5.0MHz Band	25/0	1712.5	-2.93	3.13	27.63	21.57	143.549	Vertical	Pass
		1732.5	-2.77	3.27	27.61	21.74	149.279	Vertical	Pass

QPSK		1752.5	-2.52	3.3	27.6	21.78	150.661	Vertical	Pass
5.0MHz	Band 16 25/0	1712.5	-2.85	3.13	27.63	21.25	133.352	Vertical	Pass
QAM		1732.5	-2.26	3.27	27.61	22.08	161.436	Vertical	Pass
		1752.5	-2.85	3.3	27.6	21.45	139.637	Vertical	Pass
10.0MHz	Band 50/0	1715	-2.66	3.15	27.64	21.45	139.637	Vertical	Pass
QPSK		1732.5	-2.35	3.31	27.61	21.95	156.675	Vertical	Pass
		1750	-2.52	3.33	27.59	21.28	134.276	Vertical	Pass
10.0MHz	Band 16 50/0	1715	-2.04	3.15	27.64	22.45	175.792	Vertical	Pass
QAM		1732.5	-2.90	3.31	27.61	21.36	136.773	Vertical	Pass
		1750	-2.72	3.33	27.59	21.54	142.561	Vertical	Pass
15.0MHz	Band 75/0	1717.5	-2.07	3.15	27.65	22.45	175.792	Vertical	Pass
QPSK		1732.5	-2.33	3.31	27.61	21.97	157.398	Vertical	Pass
		1747.5	-2.29	3.33	27.57	21.95	156.675	Vertical	Pass
15.0MHz	Band 16 75/0	1717.5	-2.44	3.15	27.65	22.06	160.694	Vertical	Pass
QAM		1732.5	-2.41	3.31	27.61	21.89	154.525	Vertical	Pass
		1747.5	-2.38	3.33	27.57	21.25	133.352	Vertical	Pass
20.0MHz	Band 100/0	1720	-2.35	3.17	27.66	22.45	175.792	Vertical	Pass
QPSK		1732.5	-2.26	3.32	27.61	22.03	159.588	Vertical	Pass
		1745	-2.45	3.36	27.56	21.36	136.773	Vertical	Pass
20.0MHz	Band 16 100/0	1720	-2.38	3.17	27.66	22.74	187.932	Vertical	Pass
QAM		1732.5	-2.30	3.32	27.61	21.25	133.352	Vertical	Pass
		1745	-3.00	3.36	27.56	21.27	133.968	Vertical	Pass

LTE Band 12

Radiated Power (ERP) for Band 12											
Mode	RB/RB SIZE	Frequency	Result							Polarization Of Max. ERP	Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)			
1.4MHz Band QPSK	6/0	699.7	7.34	2.01	19.68	2.15	22.25	167.880	Horizontal	Pass	
		707.5	7.81	2.01	19.77	2.15	23.41	219.280	Horizontal	Pass	
		715.3	7.64	2.02	19.82	2.15	23.29	213.304	Horizontal	Pass	
1.4MHz Band 16 QAM	6/0	699.7	7.79	2.01	19.68	2.15	23.36	216.770	Horizontal	Pass	
		707.5	7.77	2.01	19.77	2.15	23.38	217.771	Horizontal	Pass	
		715.3	7.36	2.02	19.82	2.15	23.01	199.986	Horizontal	Pass	
3.0MHz Band QPSK	15/0	700.5	7.45	2.01	19.7	2.15	22.99	199.067	Horizontal	Pass	
		707.5	7.63	2.01	19.77	2.15	23.45	221.309	Horizontal	Pass	
		714.5	7.16	2.02	19.81	2.15	22.80	190.546	Horizontal	Pass	
3.0MHz Band 16 QAM	15/0	700.5	7.80	2.01	19.7	2.15	23.58	228.034	Horizontal	Pass	
		707.5	7.86	2.01	19.77	2.15	23.47	222.331	Horizontal	Pass	
		714.5	7.72	2.02	19.81	2.15	23.51	224.388	Horizontal	Pass	
5.0MHz Band QPSK	25/0	710.5	7.66	2.01	19.71	2.15	23.27	212.324	Horizontal	Pass	
		707.5	7.64	2.01	19.77	2.15	23.24	210.863	Horizontal	Pass	
		713.5	7.43	2.02	19.79	2.15	23.25	211.349	Horizontal	Pass	
5.0MHz Band 16 QAM	25/0	710.5	7.18	2.01	19.71	2.15	22.36	172.187	Horizontal	Pass	
		707.5	7.10	2.01	19.77	2.15	22.45	175.792	Horizontal	Pass	
		713.5	7.05	2.02	19.79	2.15	22.67	184.927	Horizontal	Pass	
10.0MHz Band QPSK	50/0	704	7.57	2.01	19.73	2.15	23.25	211.349	Horizontal	Pass	
		707.5	7.08	2.01	19.77	2.15	22.69	185.780	Horizontal	Pass	
		711	7.60	2.02	19.78	2.15	23.25	211.349	Horizontal	Pass	
10.0MHz Band 16 QAM	50/0	704	7.33	2.01	19.73	2.15	22.36	172.187	Horizontal	Pass	
		707.5	7.49	2.01	19.77	2.15	23.45	221.309	Horizontal	Pass	
		711	7.44	2.02	19.78	2.15	23.27	212.324	Horizontal	Pass	

Radiated Power (ERP) for Band 12										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. ERP Average (dBm)	Max. ERP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	699.7	7.25	2.01	19.68	2.15	22.45	175.792	Vertical	Pass
		707.5	8.00	2.01	19.77	2.15	23.61	229.615	Vertical	Pass
		715.3	7.33	2.02	19.82	2.15	22.56	180.302	Vertical	Pass
1.4MHz Band 16 QAM	6/0	699.7	7.19	2.01	19.68	2.15	22.71	186.638	Vertical	Pass
		707.5	7.75	2.01	19.77	2.15	23.41	219.280	Vertical	Pass
		715.3	7.03	2.02	19.82	2.15	22.68	185.353	Vertical	Pass
3.0MHz Band QPSK	15/0	700.5	7.61	2.01	19.7	2.15	23.25	211.349	Vertical	Pass
		707.5	7.32	2.01	19.77	2.15	22.93	196.336	Vertical	Pass
		714.5	7.32	2.02	19.81	2.15	22.35	171.791	Vertical	Pass
3.0MHz Band 16 QAM	15/0	700.5	7.26	2.01	19.7	2.15	22.80	190.546	Vertical	Pass
		707.5	7.72	2.01	19.77	2.15	23.45	221.309	Vertical	Pass
		714.5	7.02	2.02	19.81	2.15	22.66	184.502	Vertical	Pass
5.0MHz Band QPSK	25/0	710.5	7.11	2.01	19.71	2.15	22.25	167.880	Vertical	Pass
		707.5	7.58	2.01	19.77	2.15	23.19	208.449	Vertical	Pass
		713.5	7.55	2.02	19.79	2.15	23.15	206.538	Vertical	Pass
5.0MHz Band 16 QAM	25/0	710.5	7.67	2.01	19.71	2.15	23.45	221.309	Vertical	Pass
		707.5	7.67	2.01	19.77	2.15	23.28	212.814	Vertical	Pass
		713.5	7.93	2.02	19.79	2.15	23.21	209.411	Vertical	Pass
10.0MHz Band QPSK	50/0	704	7.25	2.01	19.73	2.15	22.82	191.426	Vertical	Pass
		707.5	7.81	2.01	19.77	2.15	23.42	219.786	Vertical	Pass
		711	7.68	2.02	19.78	2.15	23.22	209.894	Vertical	Pass
10.0MHz Band 16 QAM	50/0	704	7.29	2.01	19.73	2.15	22.86	193.197	Vertical	Pass
		707.5	7.33	2.01	19.77	2.15	22.35	171.791	Vertical	Pass
		711	7.78	2.02	19.78	2.15	23.37	217.270	Vertical	Pass

5.3 Peak-to-Average Ratio

5.3.1 Limit

Not exceed 13 dB

5.3.2 Test procedure

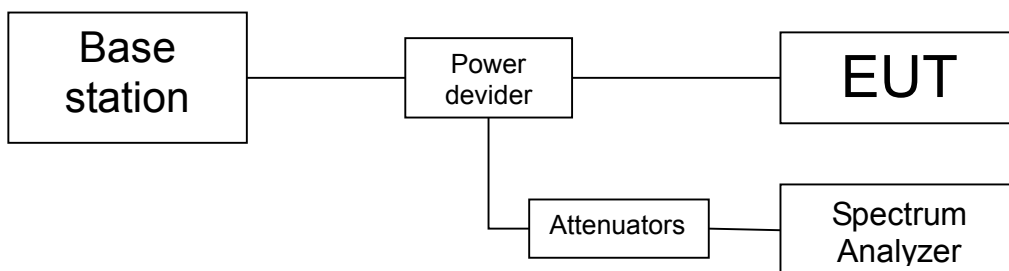
FCC: CFR Part 24.232 (d),

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

According to KDB 971168 5.7.1:

- a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- b) Set resolution/measurement bandwidth \geq signal's occupied bandwidth;
- c) Set the number of counts to a value that stabilizes the measured CCDF curve;
- d) Set the measurement interval to 1 ms
- e) Record the maximum PAPR level associated with a probability of 0.1%

5.3.3 Test setup



5.3.4 Test results

Note: All mode has been tested, only worst data shown in this report.

LTE Band 2, Middle Channel

BW(MHz)	Modulation	RB Size	RB Offset	PAPR
20	QPSK	100	0	5.16
	16QAM	100	0	6.02

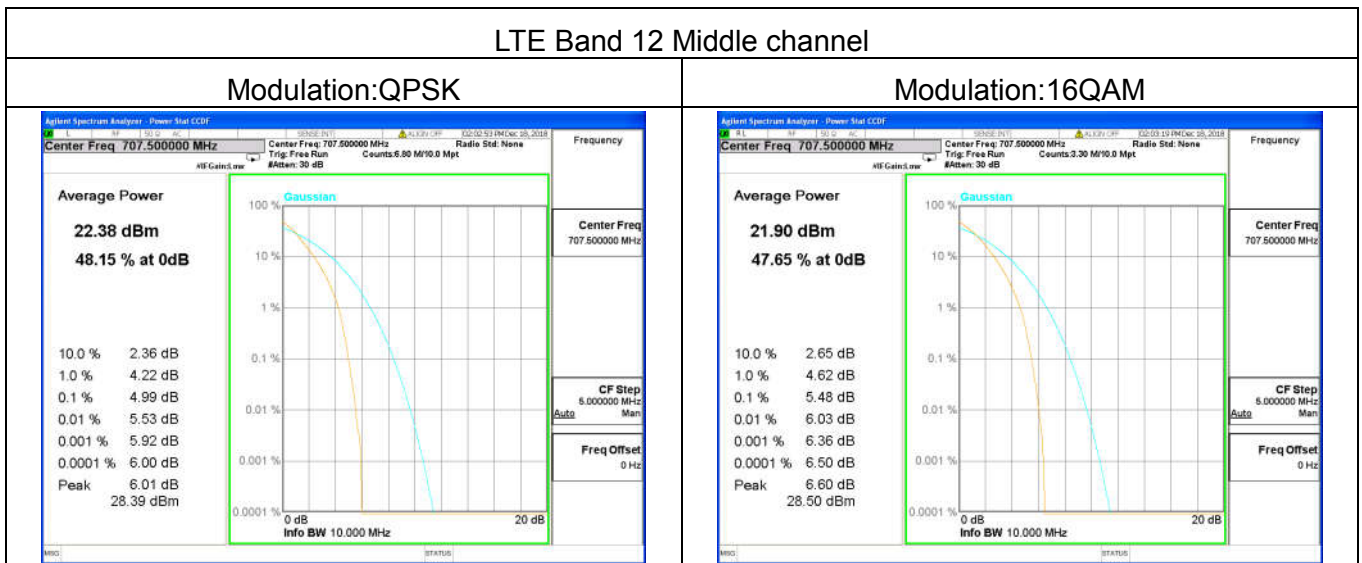
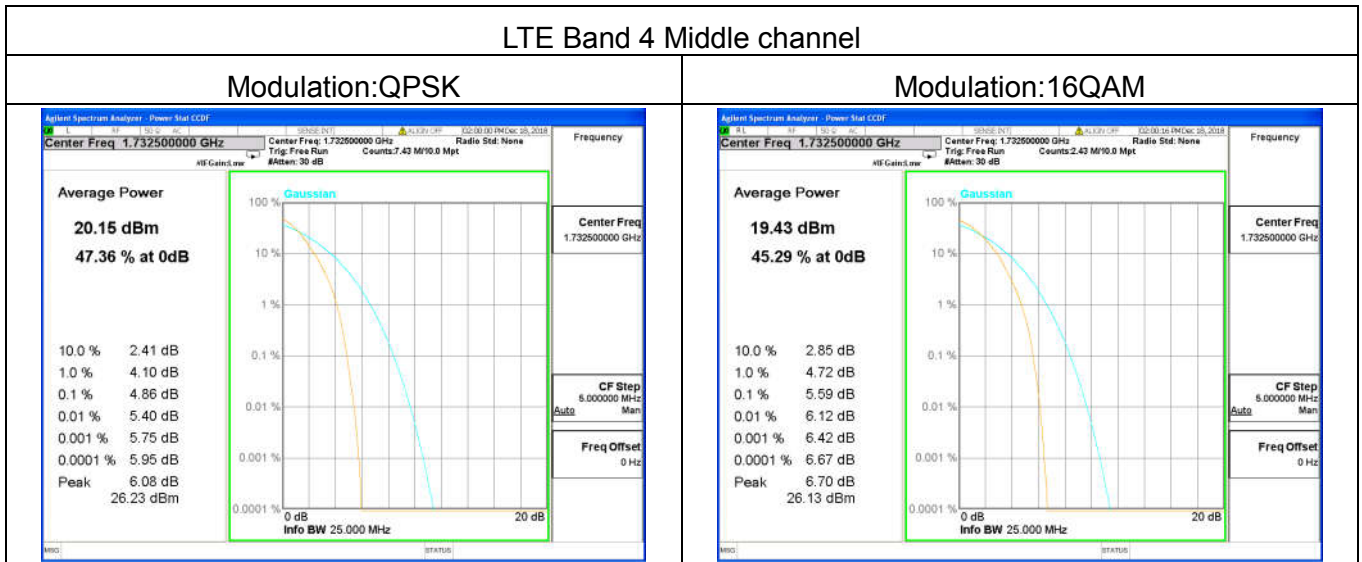
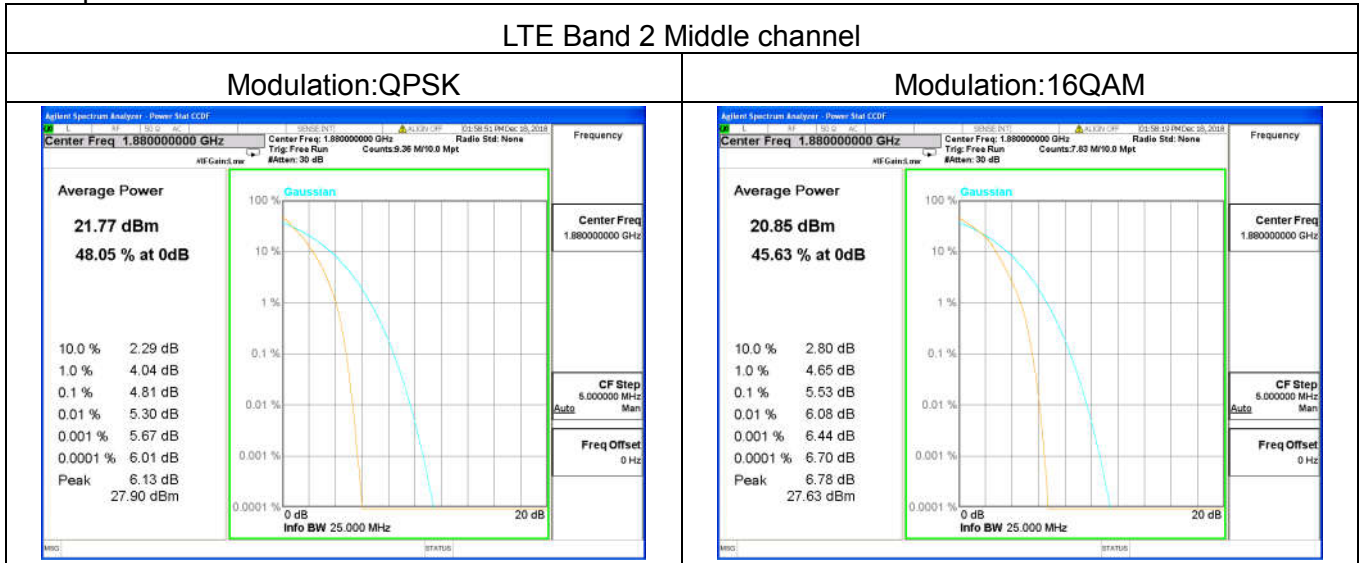
LTE Band 4, Middle Channel

BW(MHz)	Modulation	RB Size	RB Offset	PAPR
20	QPSK	100	0	6.18
	16QAM	100	0	6.99

LTE Band 12, Middle Channel

BW(MHz)	Modulation	RB Size	RB Offset	PAPR
10	QPSK	50	0	4.97
	16QAM	50	0	5.73

Test plots



5.4 99% and -26 dB Occupied Bandwidth

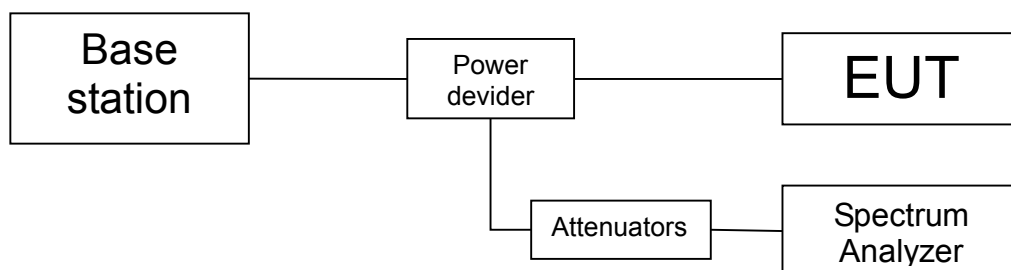
5.4.1 Limit

N/A

5.4.2 Test procedure

1. The EUT' RF output port was connected to Spectrum Analyzer and Base Station via power divider.
2. Spectrum analyzer's occupied bandwidth measure function was used to measure 99% bandwidth and -26dBc bandwidth

5.4.3 Test setup



5.4.4 Test results

Note 1: all modes of RB configurations have been tested, and only worst configuration data listed.
LTE Band 2

BW(MHz)	Channel	QPSK		16QAM	
		99% OBW (MHz)	26dB Bandwidth (MHz)	99% OBW (MHz)	26dB Bandwidth (MHz)
1.4	Low	1.0841	1.287	1.0867	1.284
	Middle	1.0841	1.299	1.0860	1.275
	High	1.0920	1.269	1.0877	1.294
3	Low	2.6824	2.917	2.6794	2.935
	Middle	2.6909	2.940	2.6819	2.963
	High	2.6839	2.940	1.6819	2.938
5	Low	4.4619	4.963	4.4668	4.862
	Middle	4.4622	4.899	4.4748	4.953
	High	4.4668	4.894	4.4718	4.919
10	Low	8.9266	9.654	8.9304	9.668
	Middle	8.9407	9.818	8.9300	9.610
	High	8.9144	9.577	8.9248	9.652
15	Low	13.405	14.46	13.416	14.50
	Middle	13.395	14.56	13.410	14.50
	High	13.340	14.44	13.372	14.44
20	Low	17.825	19.27	17.868	19.06
	Middle	17.834	19.04	17.869	18.96
	High	17.750	18.90	17.756	18.87

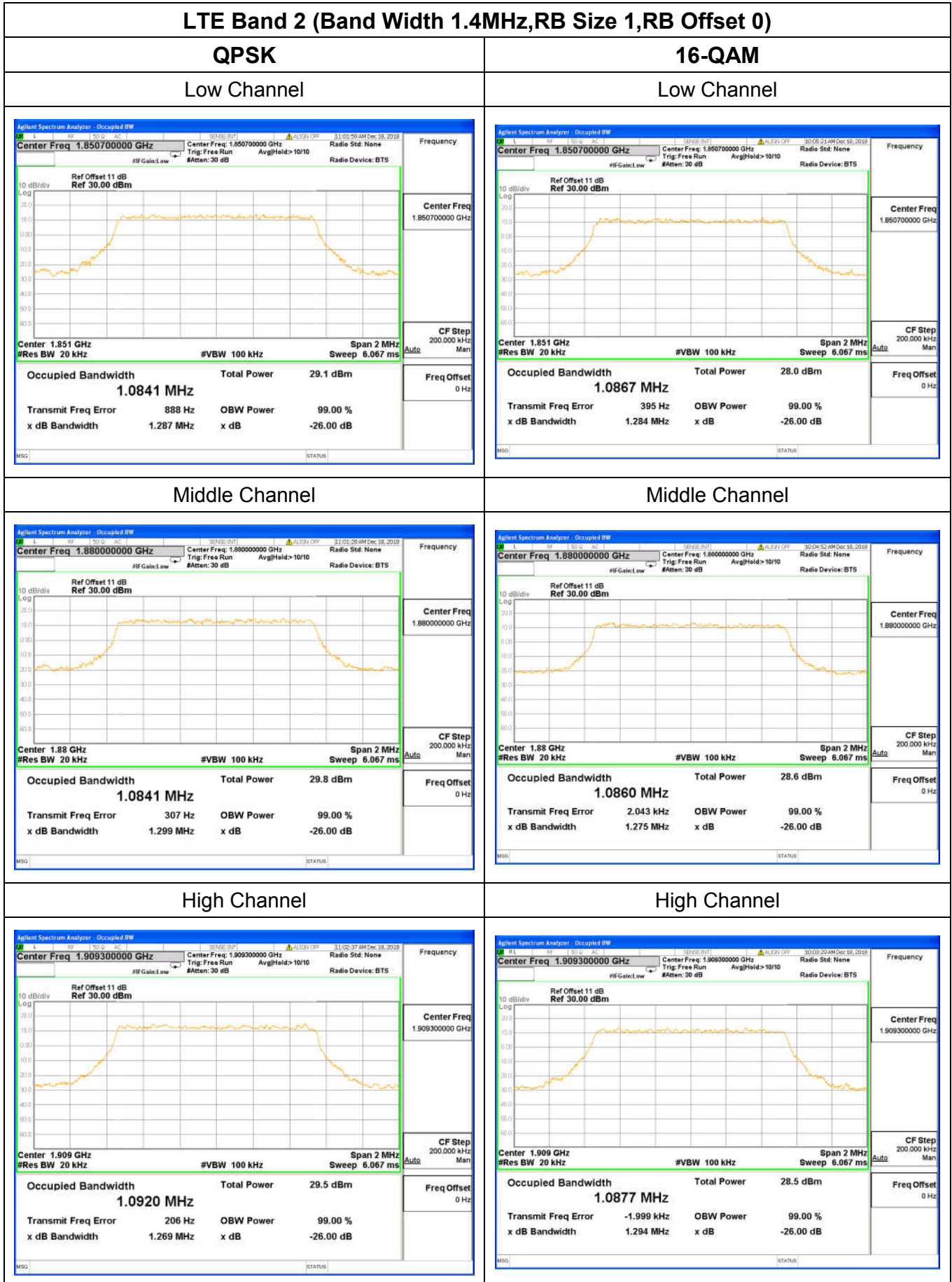
LTE Band 4

BW(MHz)	Channel	QPSK		16QAM	
		99% OBW (MHz)	26dB Bandwidth (MHz)	99% OBW (MHz)	26dB Bandwidth (MHz)
1.4	Low	1.0835	1.254	1.0870	1.282
	Middle	1.0925	1.262	1.0855	1.257
	High	1.0851	1.294	1.0867	1.261
3	Low	2.6849	2.932	2.6807	2.928
	Middle	2.6824	2.917	2.6809	2.915
	High	2.6918	2.909	2.6831	2.926
5	Low	4.4727	4.832	4.4738	4.913
	Middle	4.4815	4.962	4.4618	4.906
	High	4.4595	4.849	4.4723	4.894
10	Low	8.9370	9.665	8.9321	9.680
	Middle	8.9119	9.538	8.9141	9.595
	High	8.9318	9.710	8.9362	9.634
15	Low	13.432	14.36	13.421	14.45
	Middle	13.369	14.35	13.335	14.42
	High	13.408	14.57	13.440	14.41
20	Low	17.817	18.87	17.820	18.96
	Middle	17.735	18.83	17.749	18.83
	High	17.947	19.35	17.904	19.25

LTE Band 12

BW(MHz)	Channel	QPSK		16QAM	
		99% OBW (MHz)	26dB Bandwidth (MHz)	99% OBW (MHz)	26dB Bandwidth (MHz)
1.4	Low	1.0827	1.260	1.0881	1.278
	Middle	1.0909	1.257	1.0842	1.260
	High	1.0855	1.284	1.0824	1.269
3	Low	2.6895	2.925	2.6834	2.930
	Middle	2.6797	2.908	2.6747	2.907
	High	2.6926	2.914	2.6870	2.944
5	Low	4.4890	4.965	4.4794	4.876
	Middle	4.4627	4.851	4.4495	4.893
	High	4.4816	4.935	4.4910	4.951
10	Low	8.9360	9.694	8.9467	9.615
	Middle	8.8669	9.483	8.8703	9.460
	High	8.9575	9.737	8.9464	9.649

Test plots



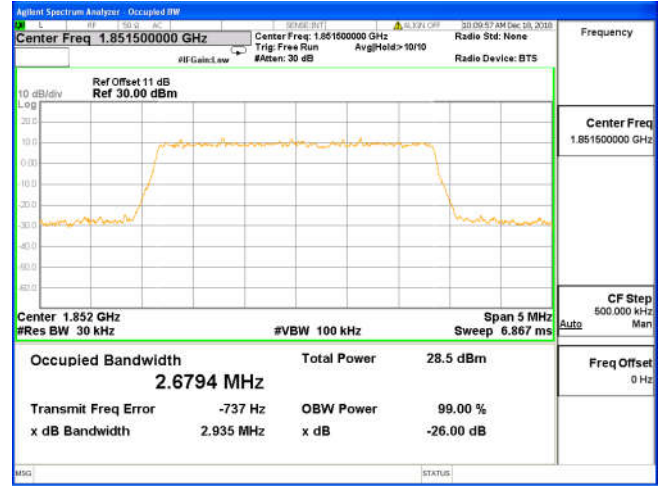
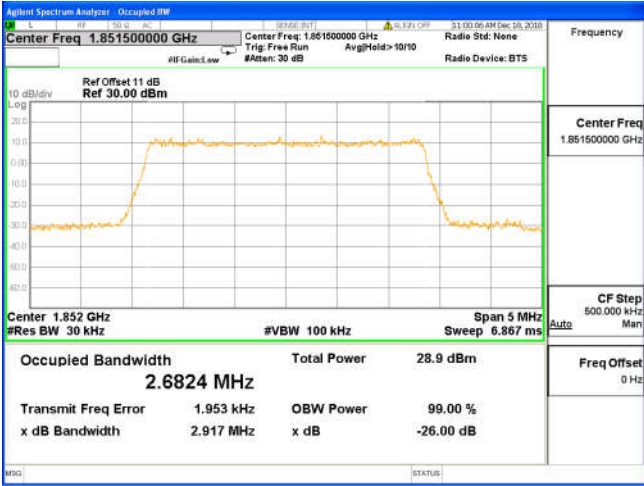
LTE Band 2 (Band Width 3MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

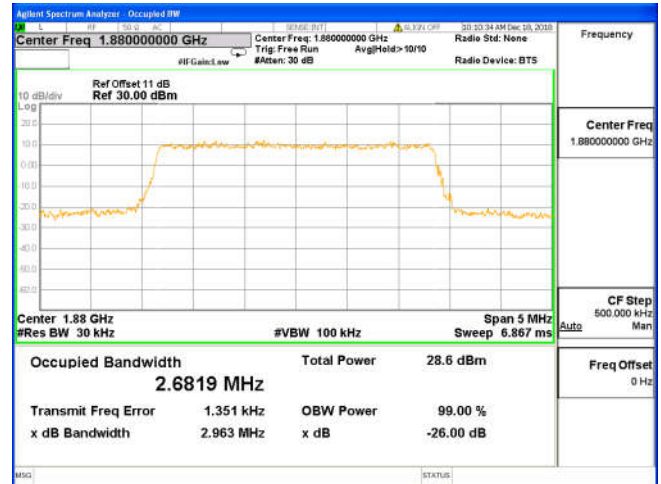
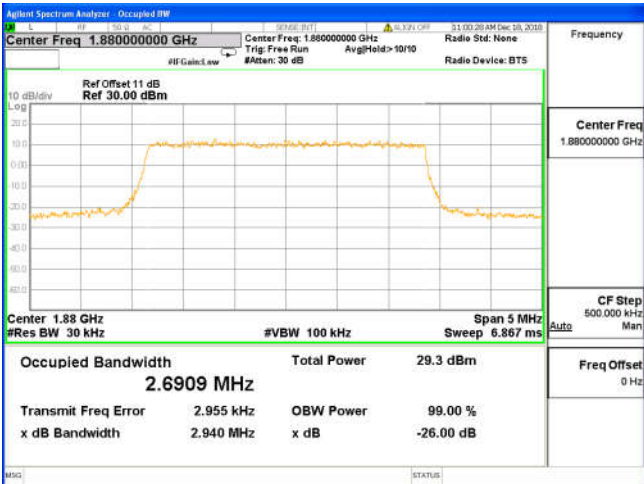
Low Channel

Low Channel



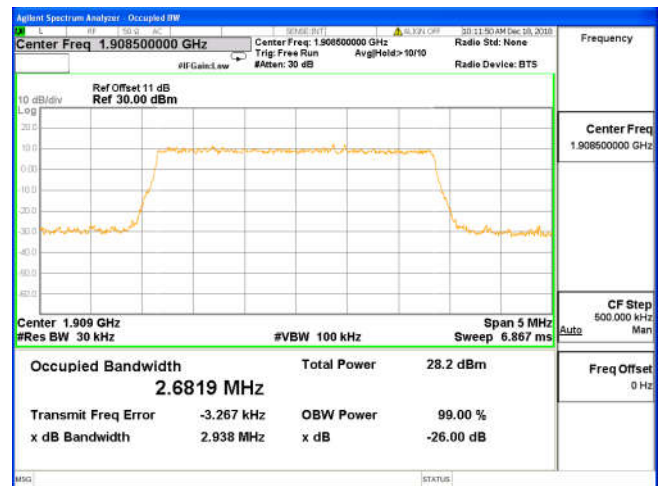
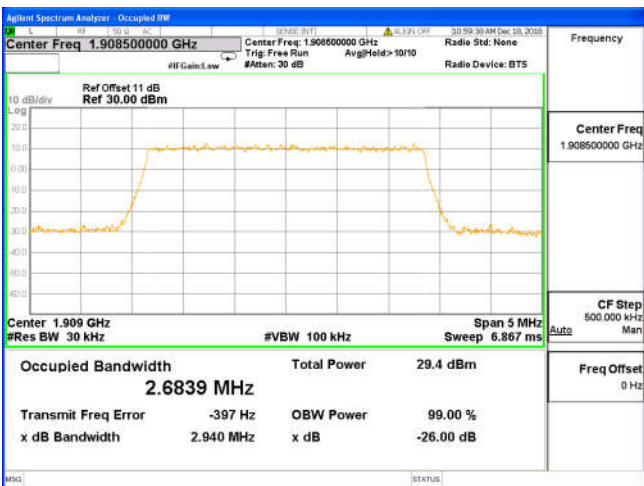
Middle Channel

Middle Channel



High Channel

High Channel



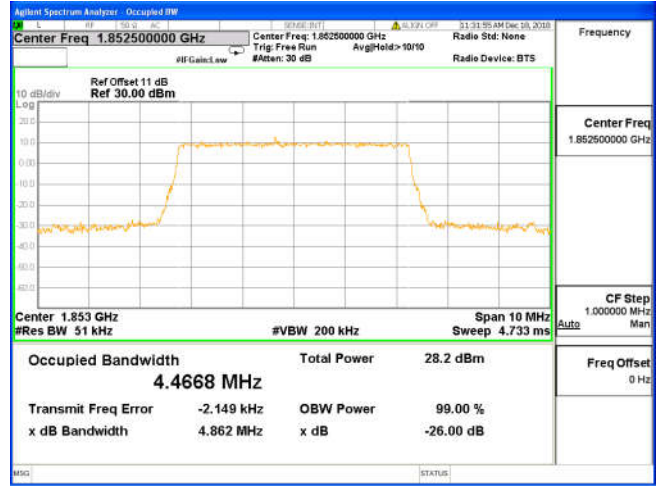
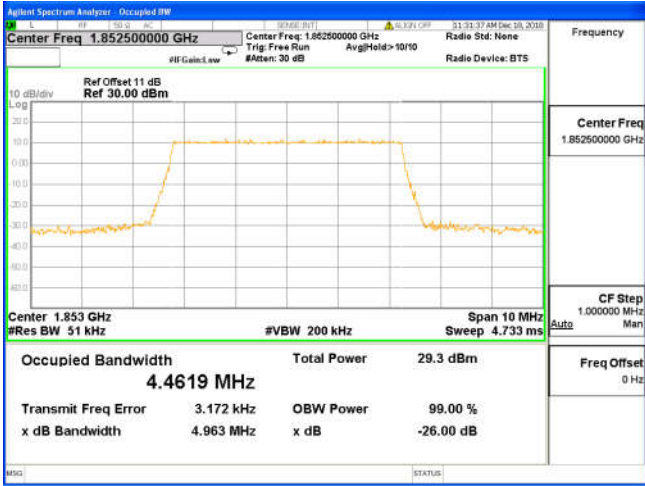
LTE Band 2 (Band Width 5MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

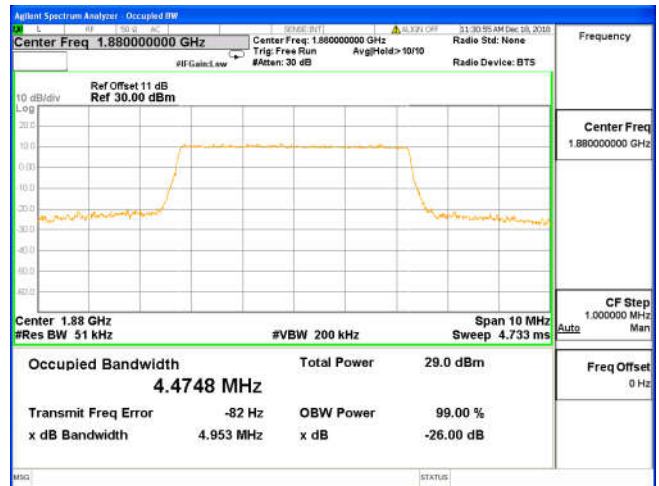
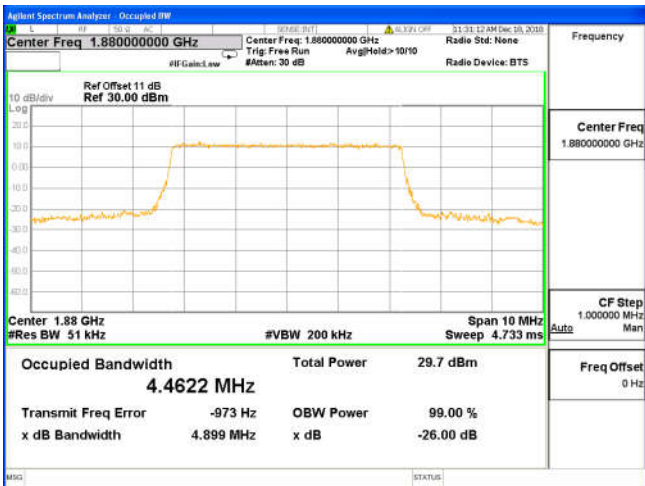
Low Channel

Low Channel



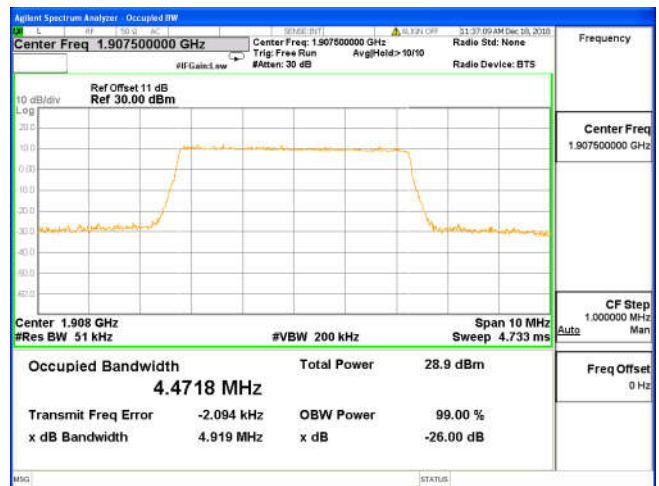
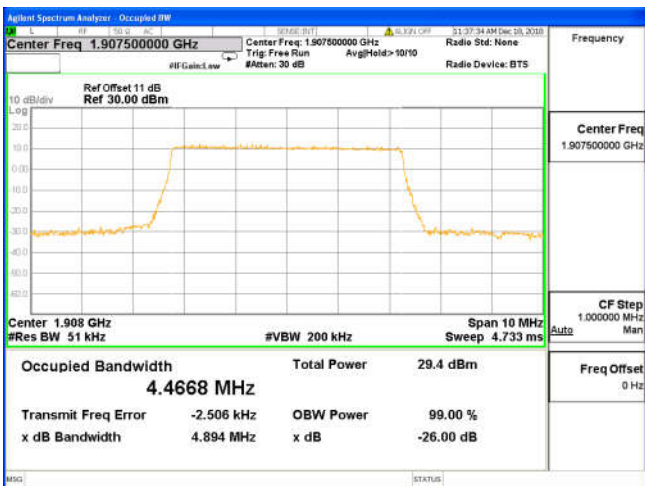
Middle Channel

Middle Channel



High Channel

High Channel



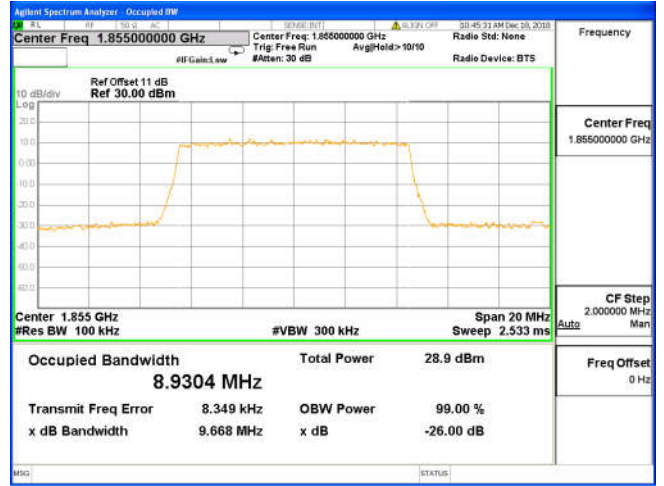
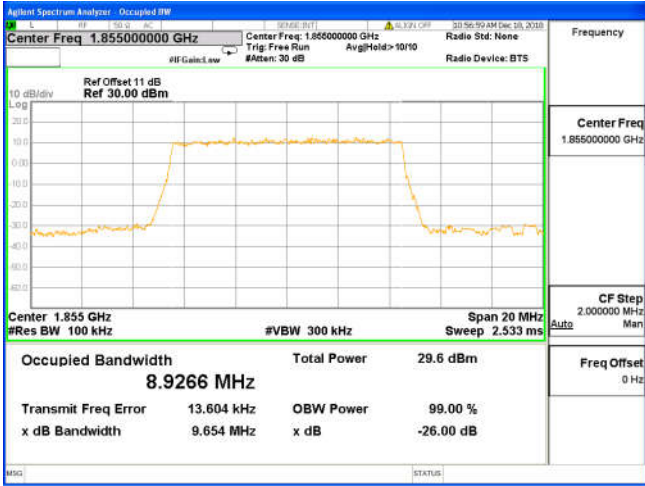
LTE Band 2 (Band Width 10MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

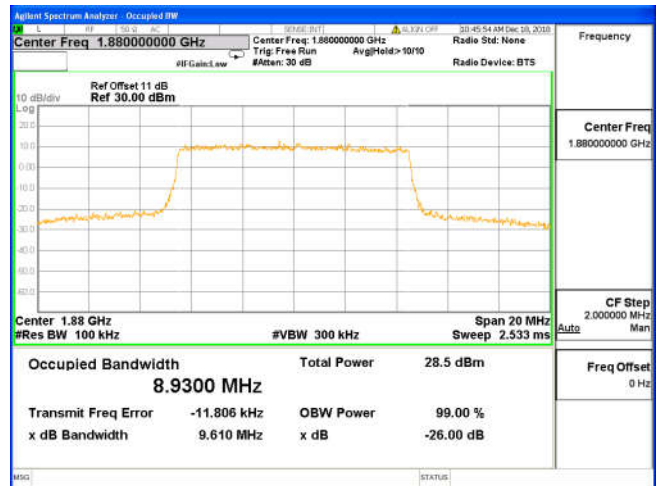
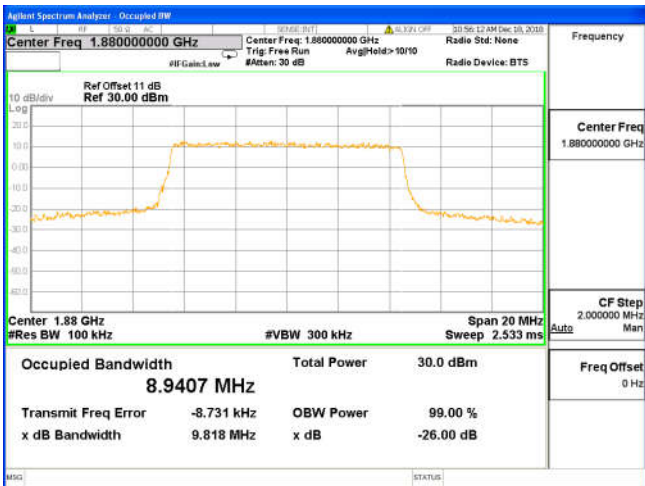
Low Channel

Low Channel



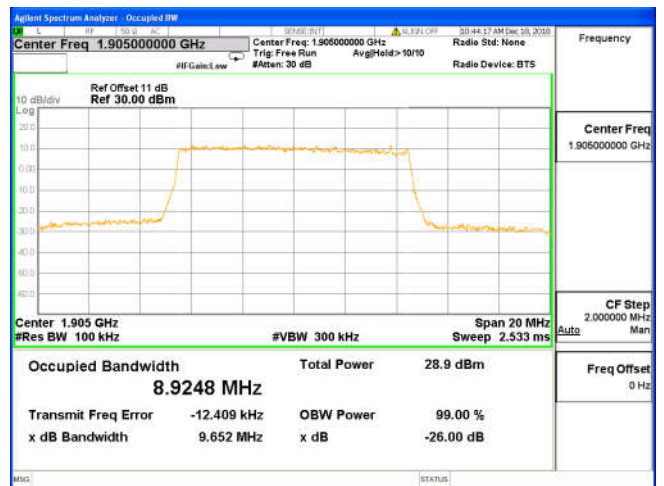
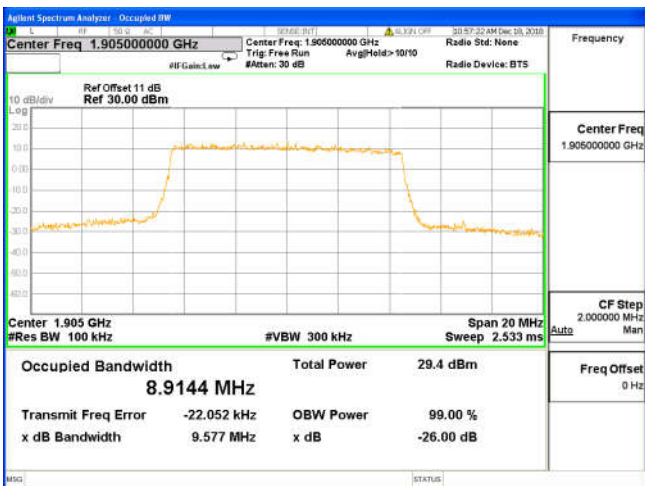
Middle Channel

Middle Channel



High Channel

High Channel



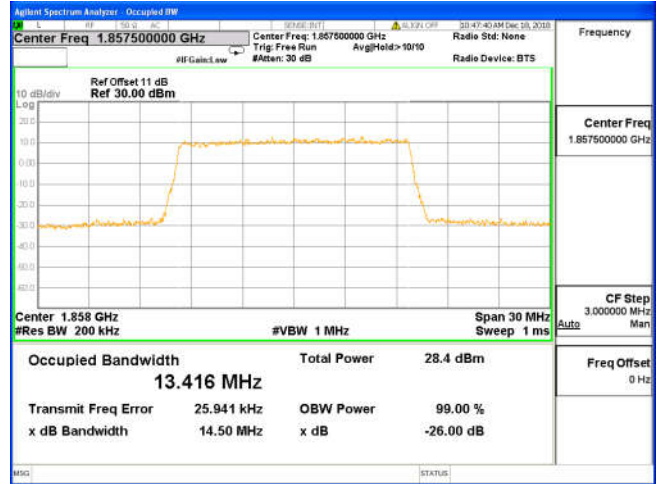
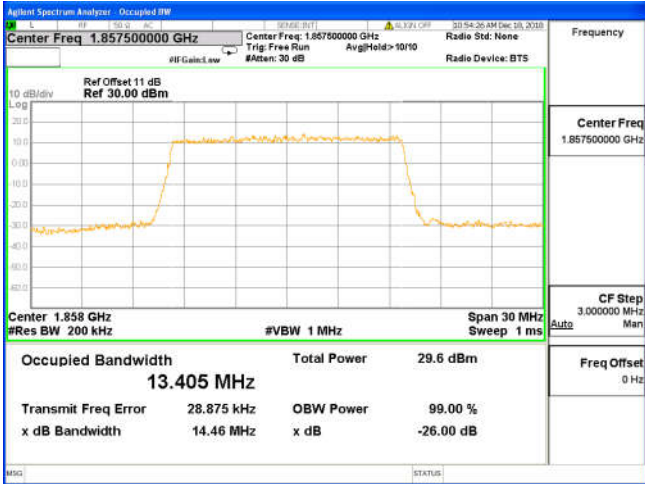
LTE Band 2 (Band Width 15MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

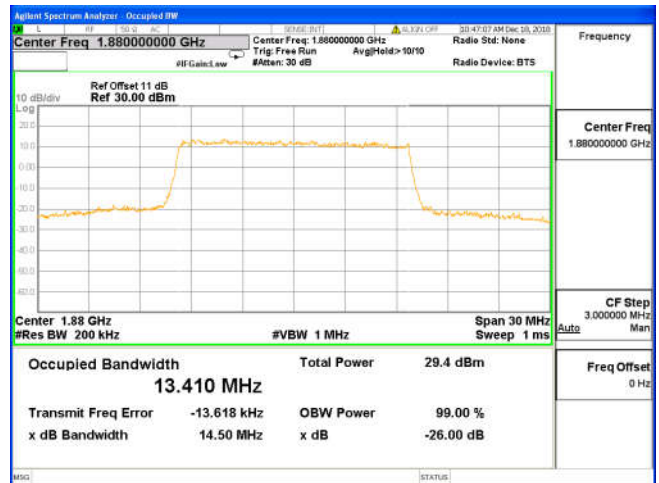
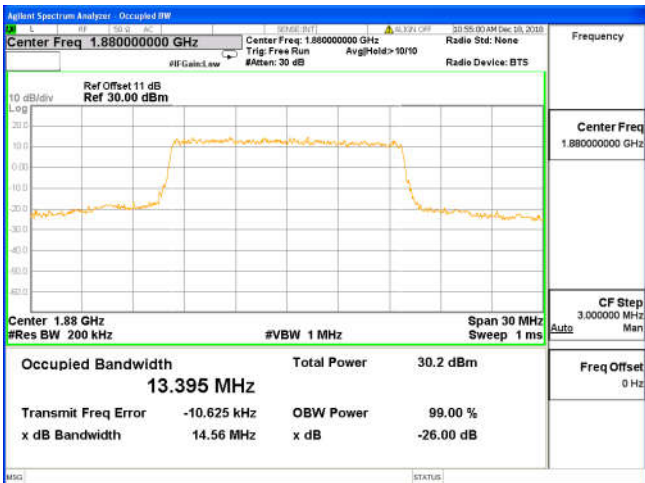
Low Channel

Low Channel



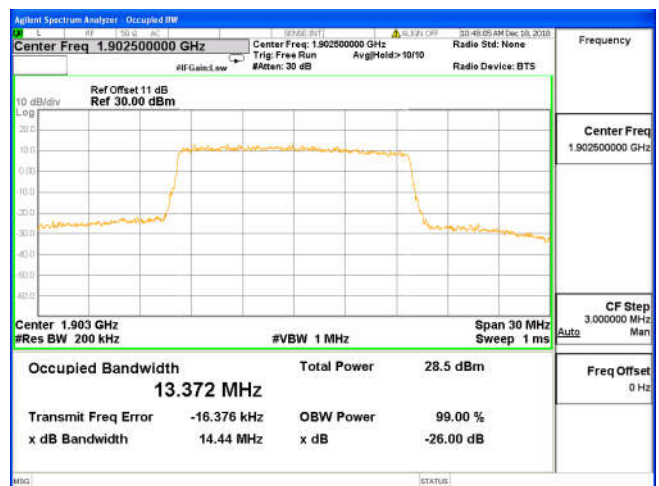
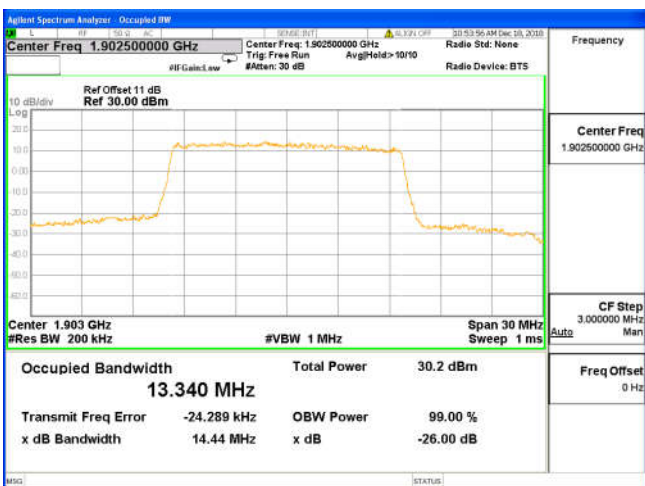
Middle Channel

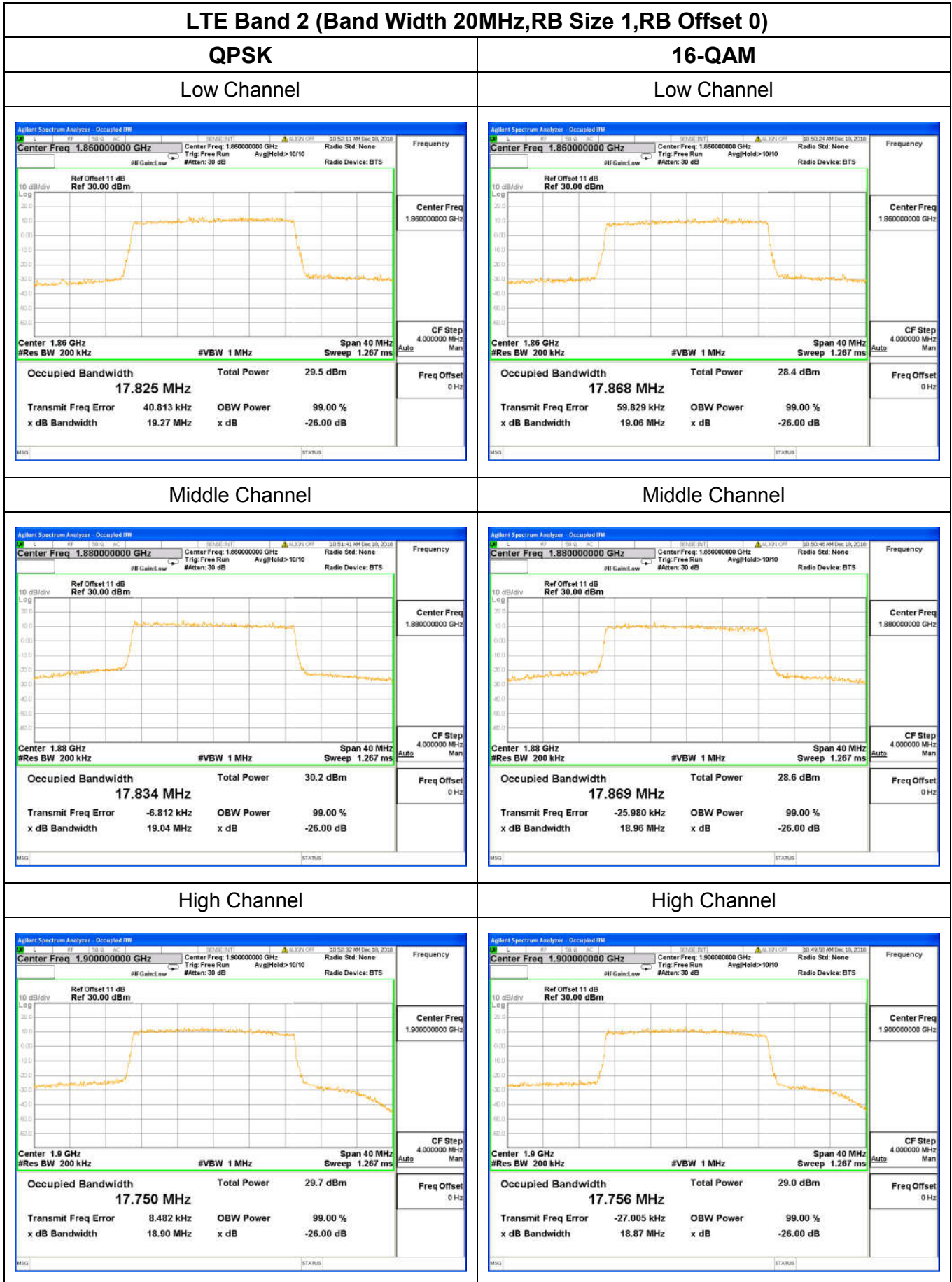
Middle Channel

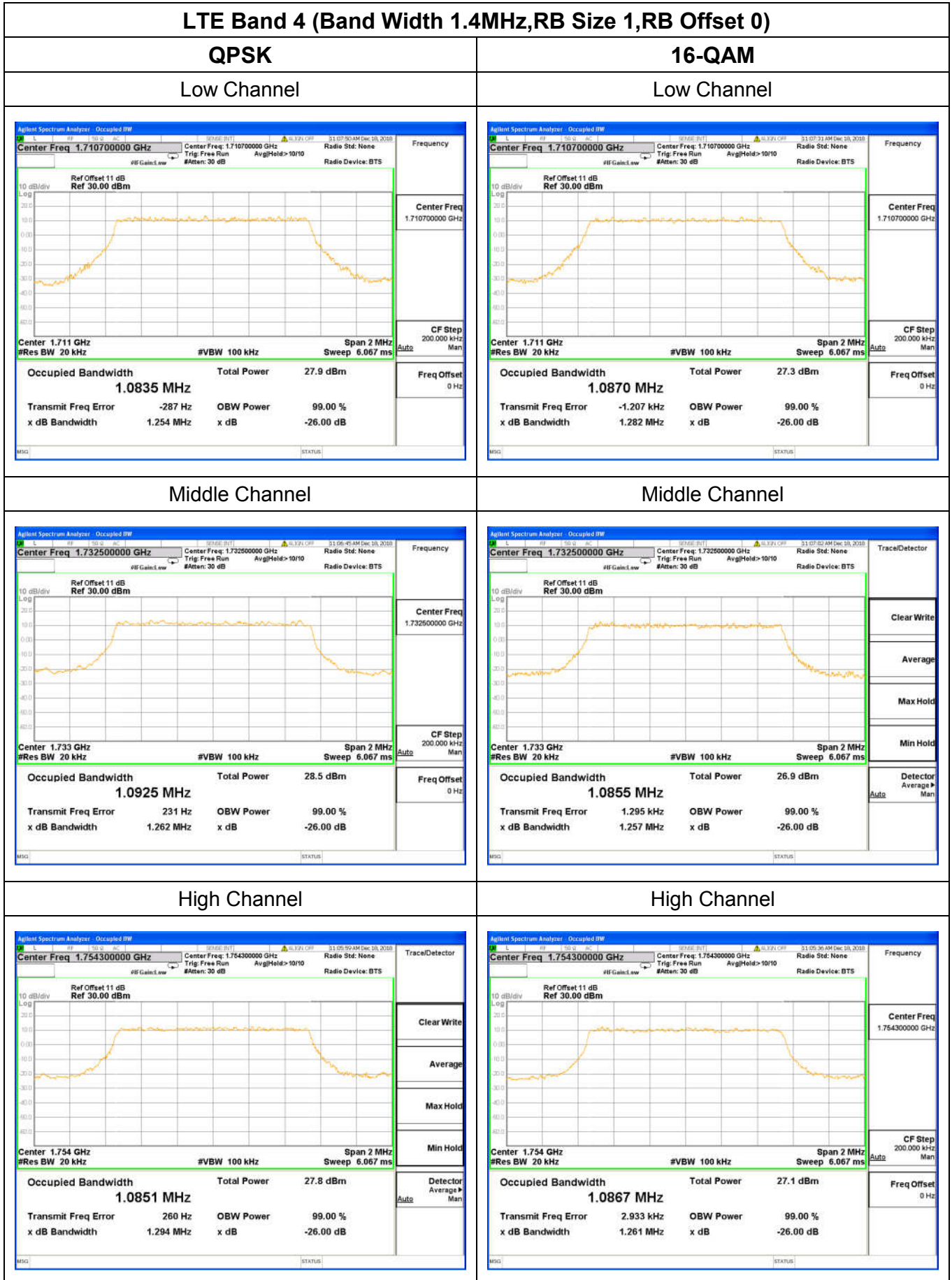


High Channel

High Channel







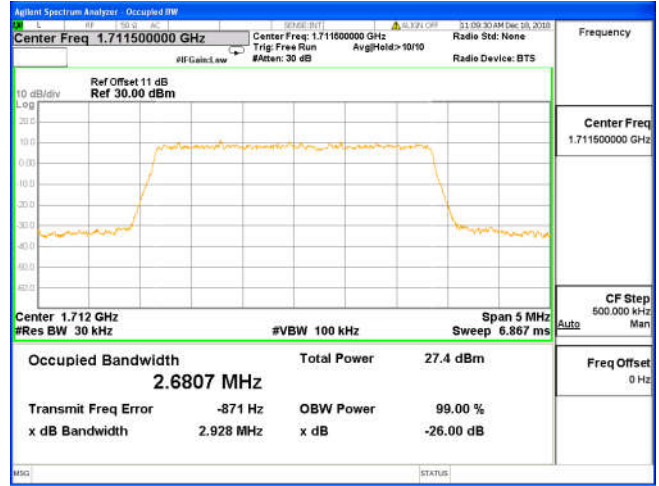
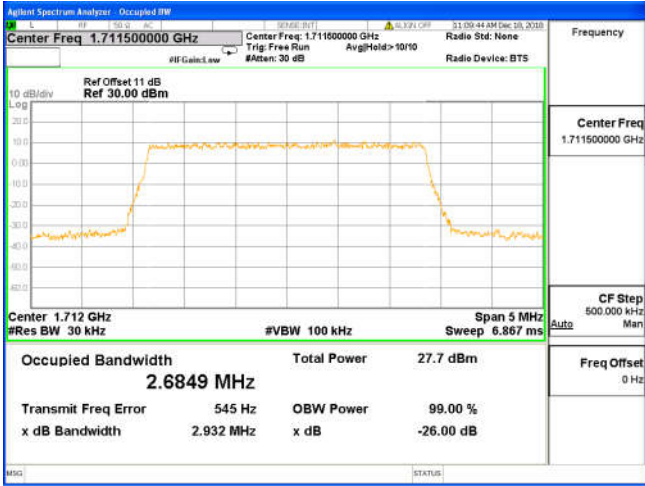
LTE Band 4 (Band Width 3MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

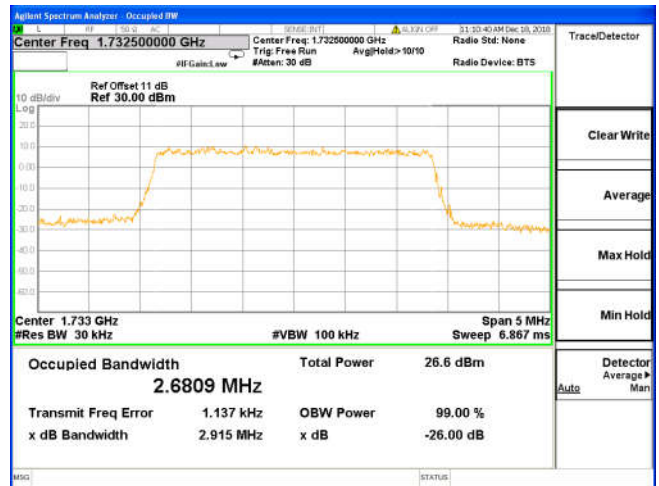
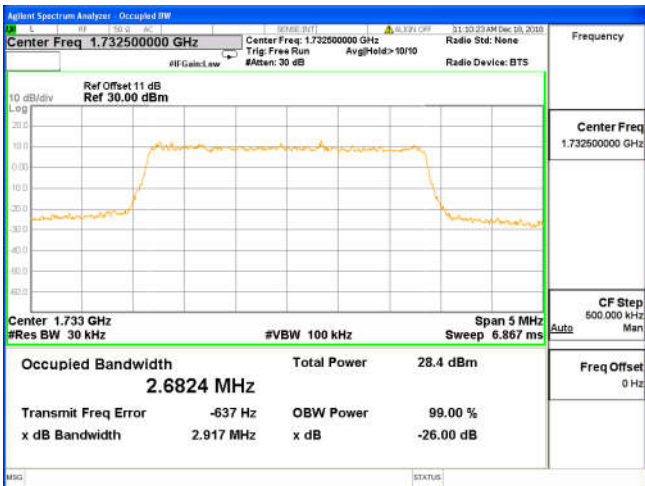
Low Channel

Low Channel



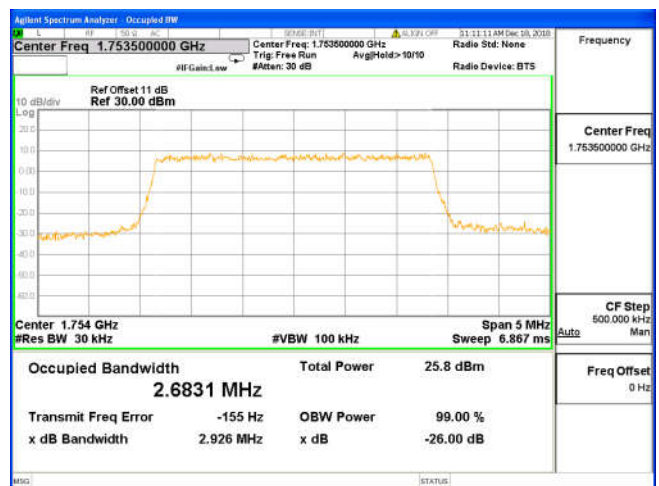
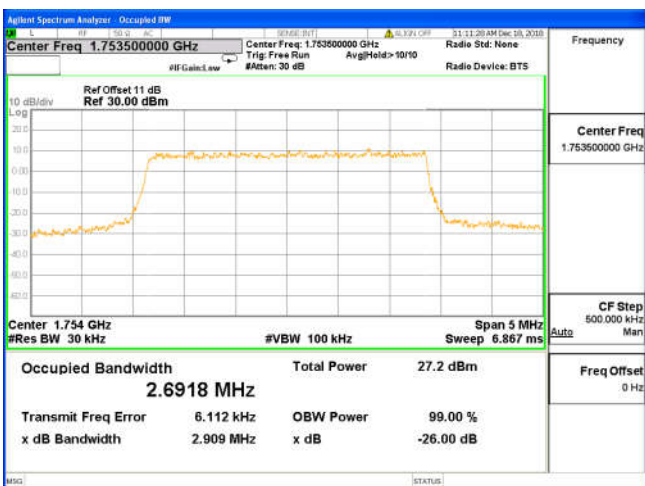
Middle Channel

Middle Channel



High Channel

High Channel



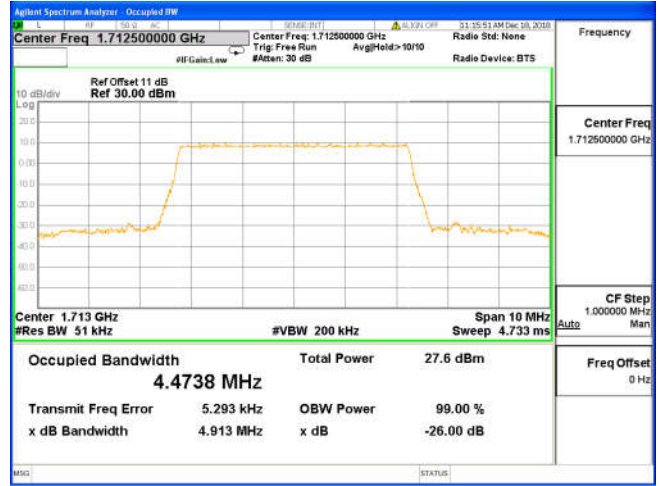
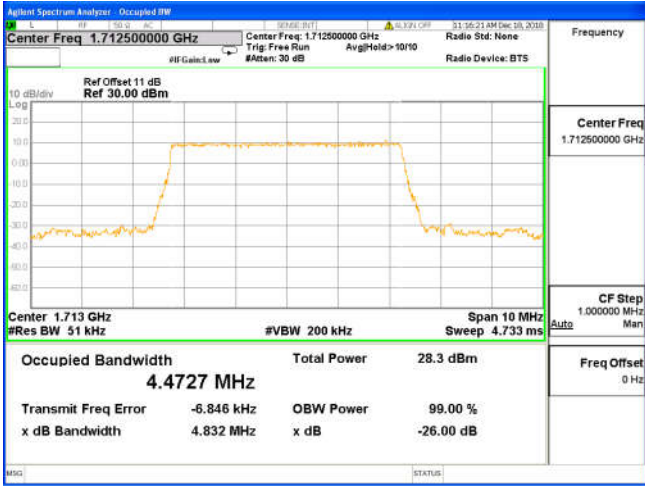
LTE Band 4 (Band Width 5MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

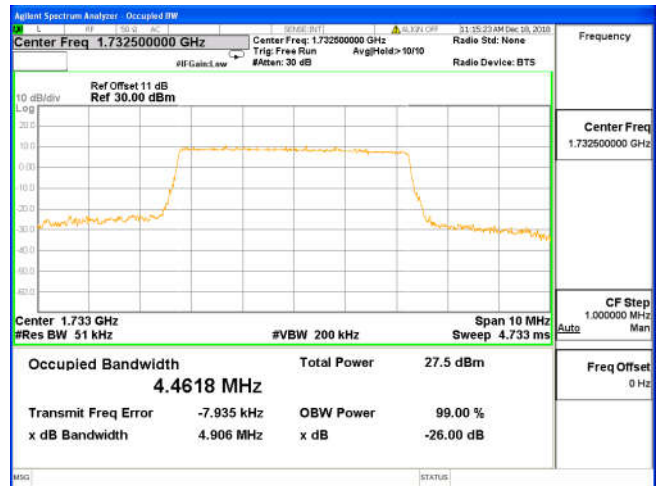
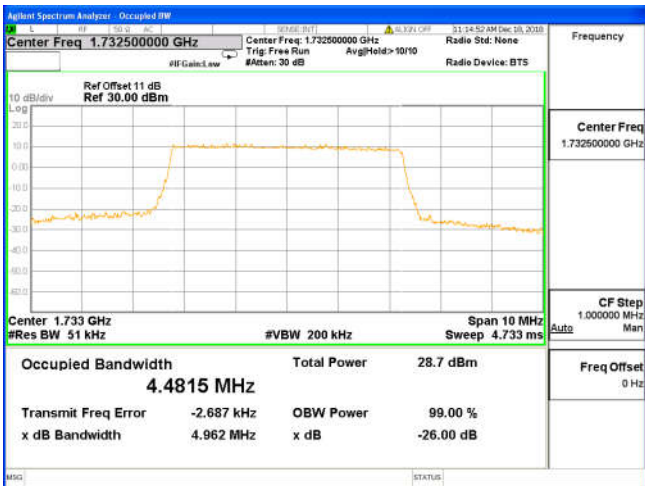
Low Channel

Low Channel



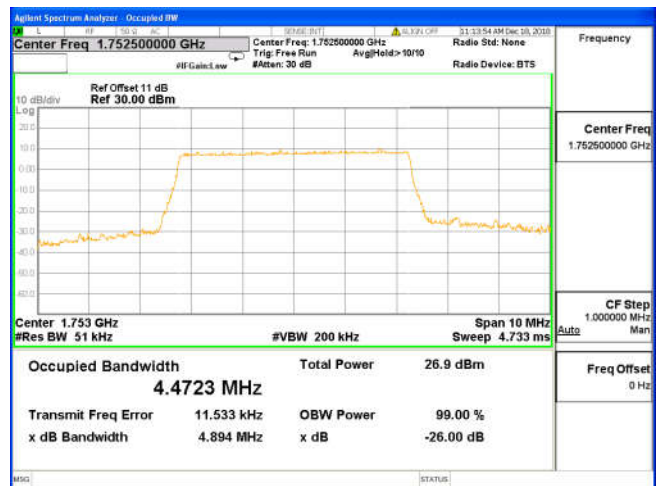
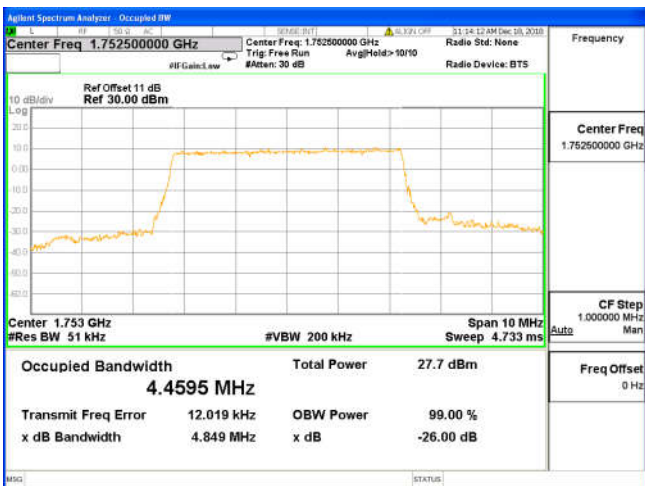
Middle Channel

Middle Channel



High Channel

High Channel



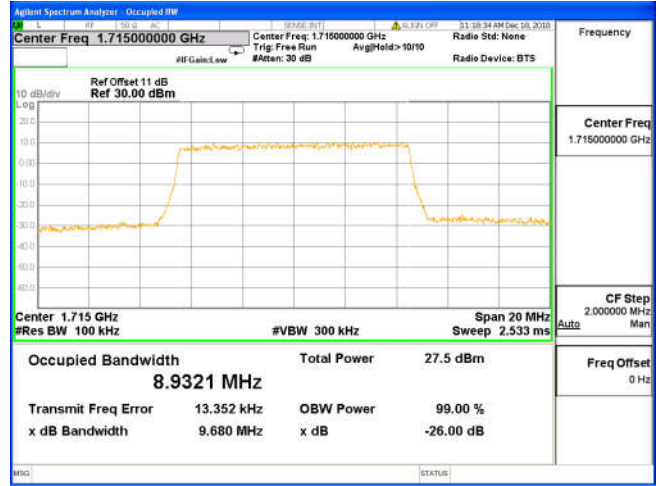
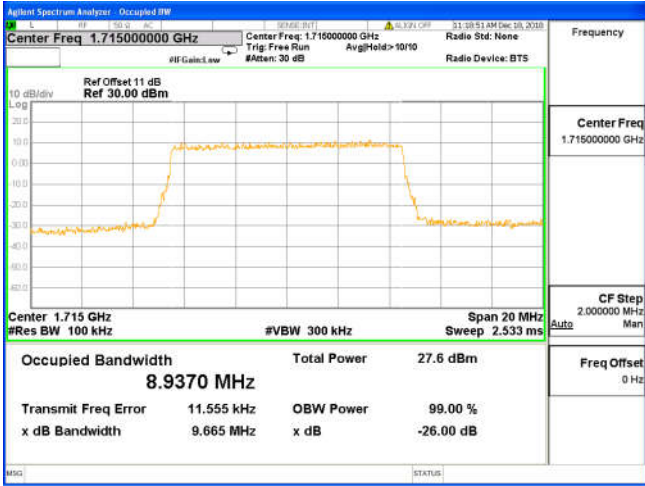
LTE Band 4 (Band Width 10MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

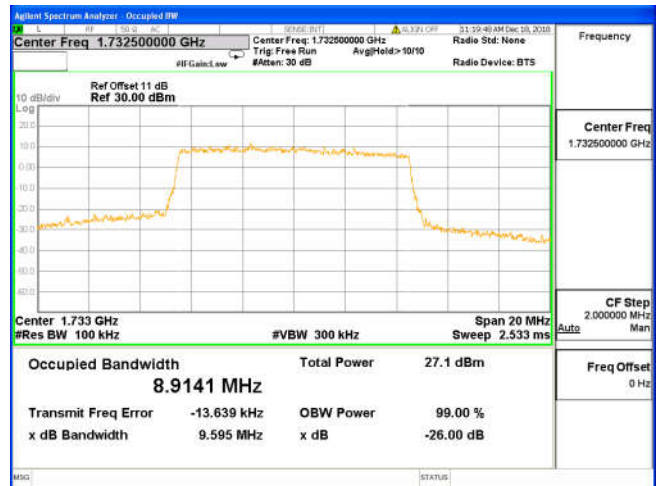
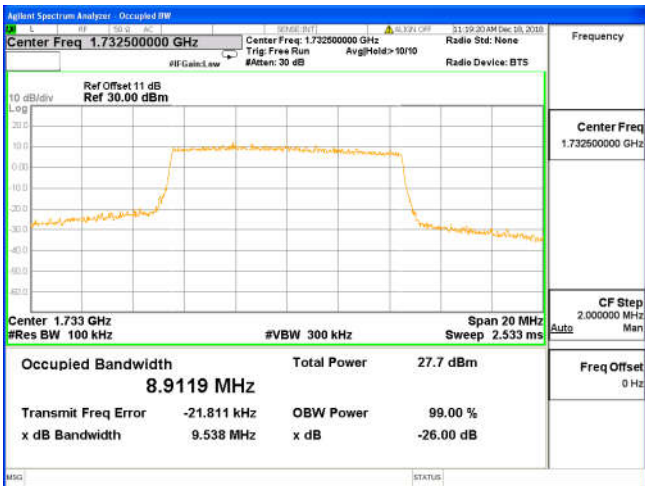
Low Channel

Low Channel



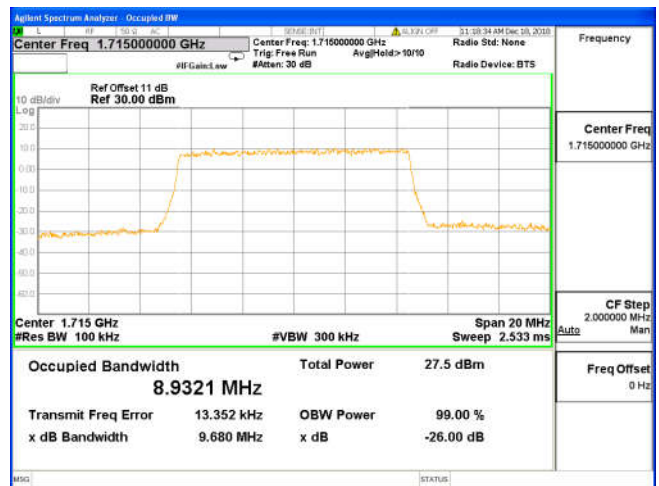
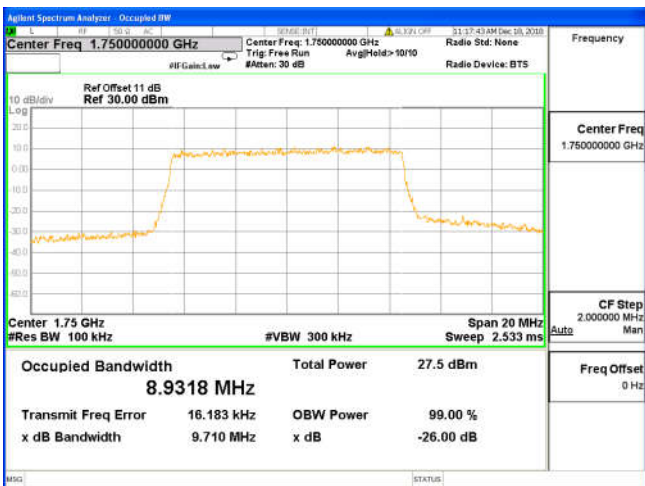
Middle Channel

Middle Channel



High Channel

High Channel



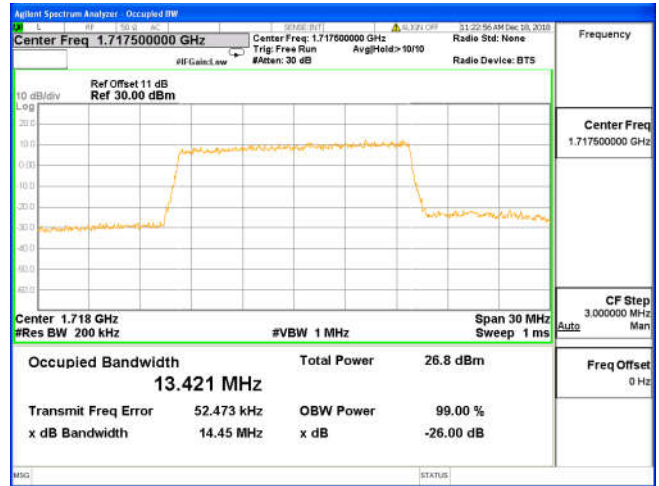
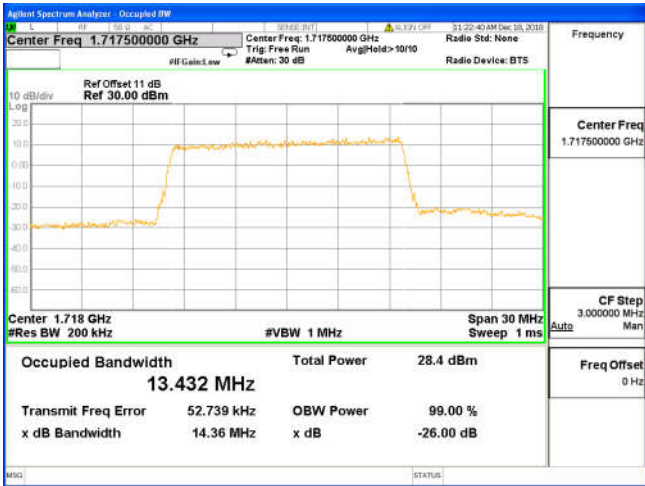
LTE Band 4 (Band Width 15MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

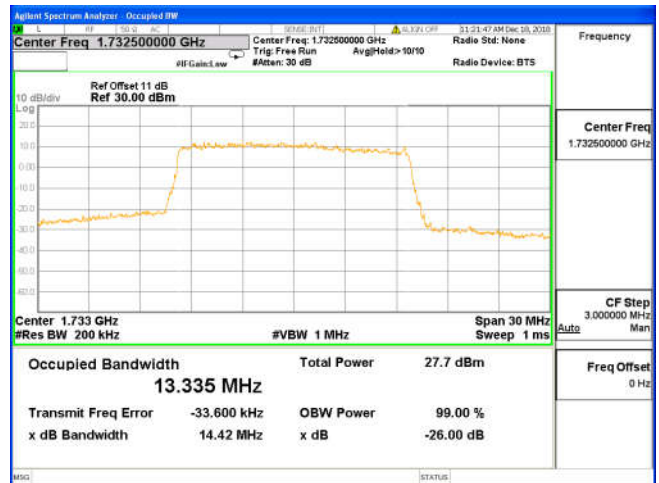
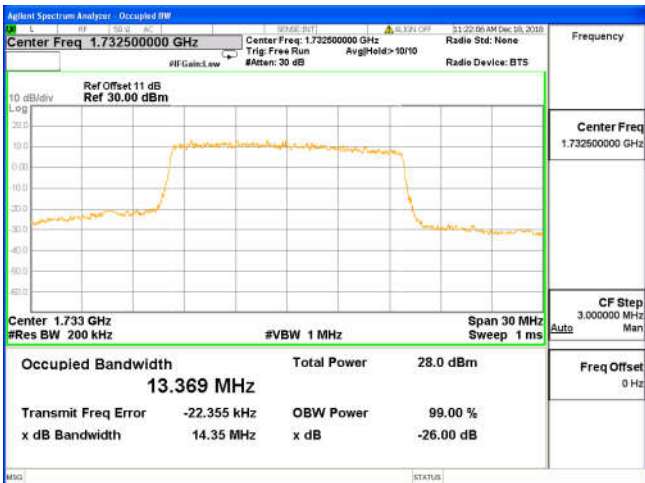
Low Channel

Low Channel



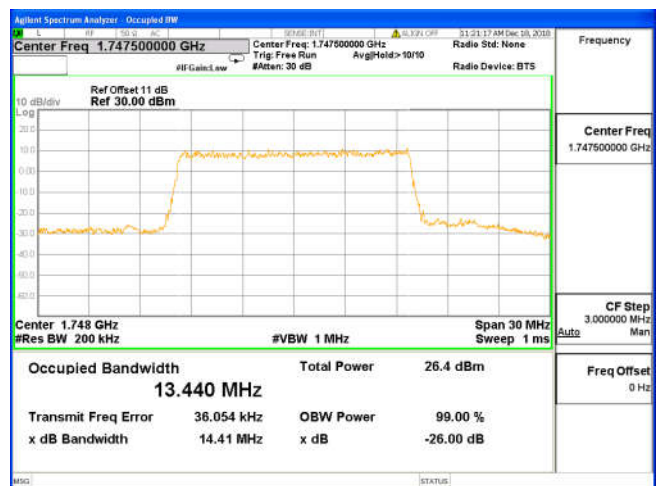
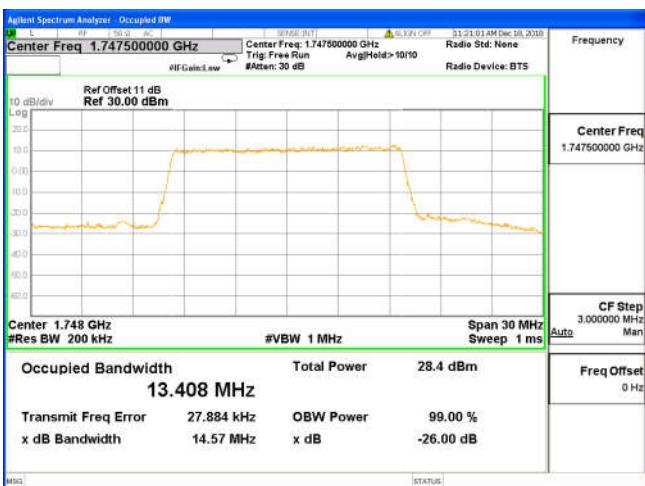
Middle Channel

Middle Channel



High Channel

High Channel





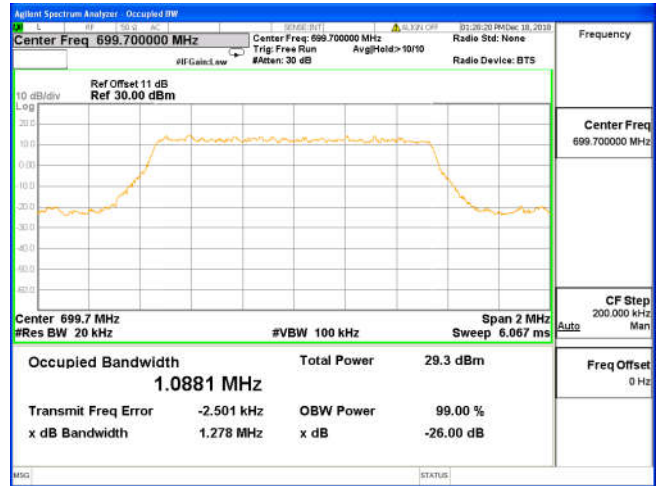
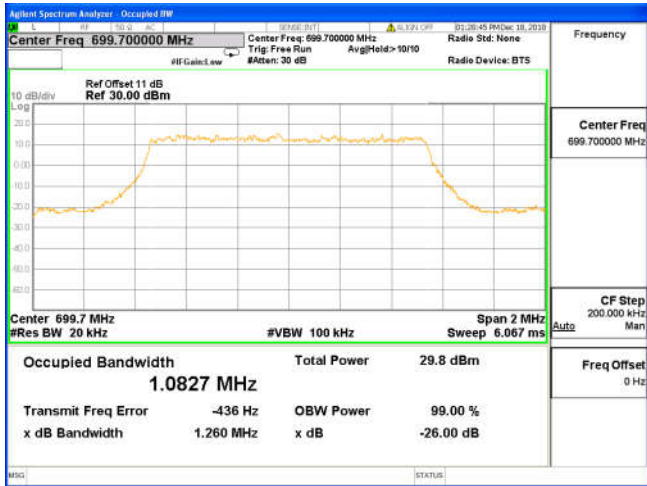
LTE Band 12 (Band Width 1.4MHz, RB Size 1, RB Offset 0)

QPSK

16-QAM

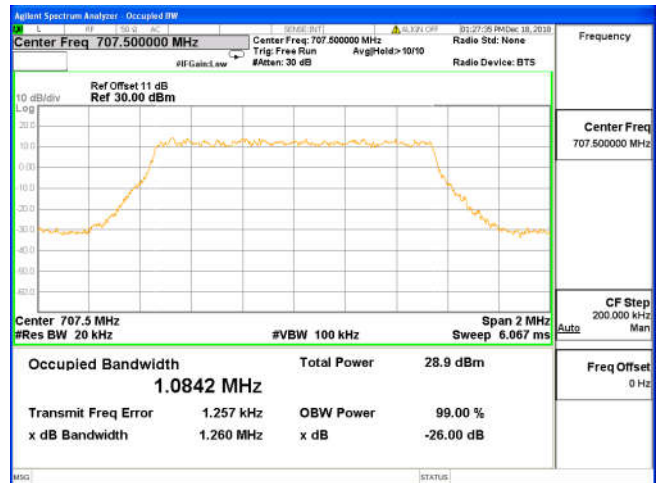
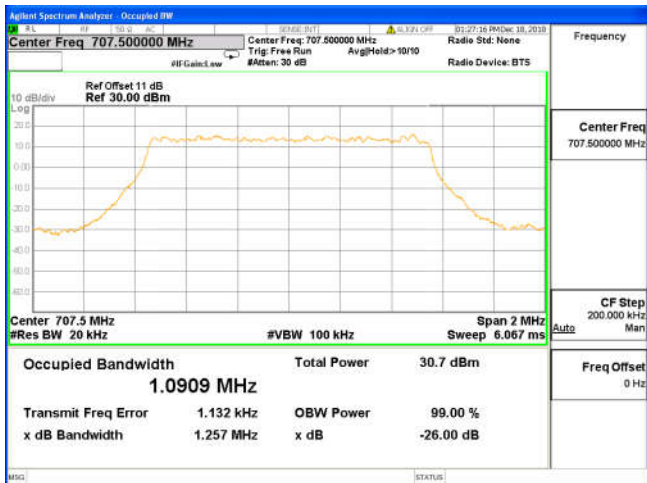
Low Channel

Low Channel



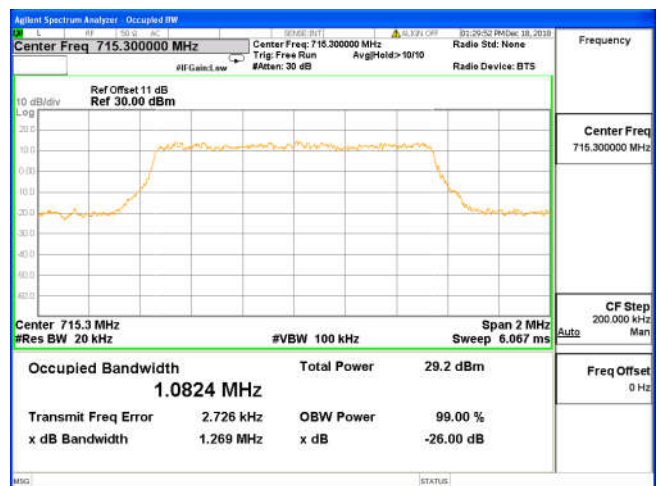
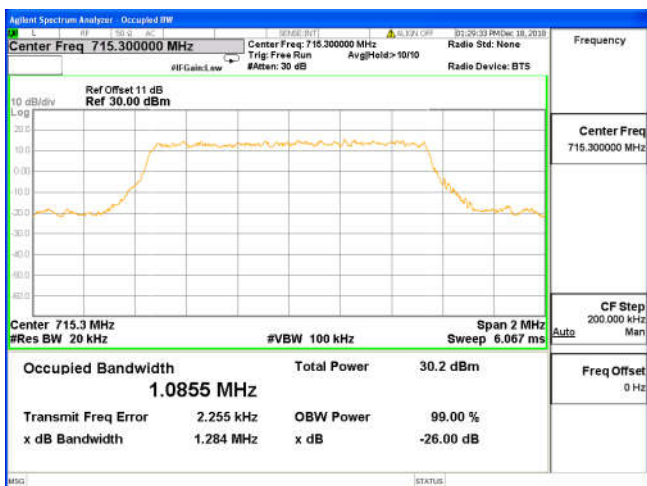
Middle Channel

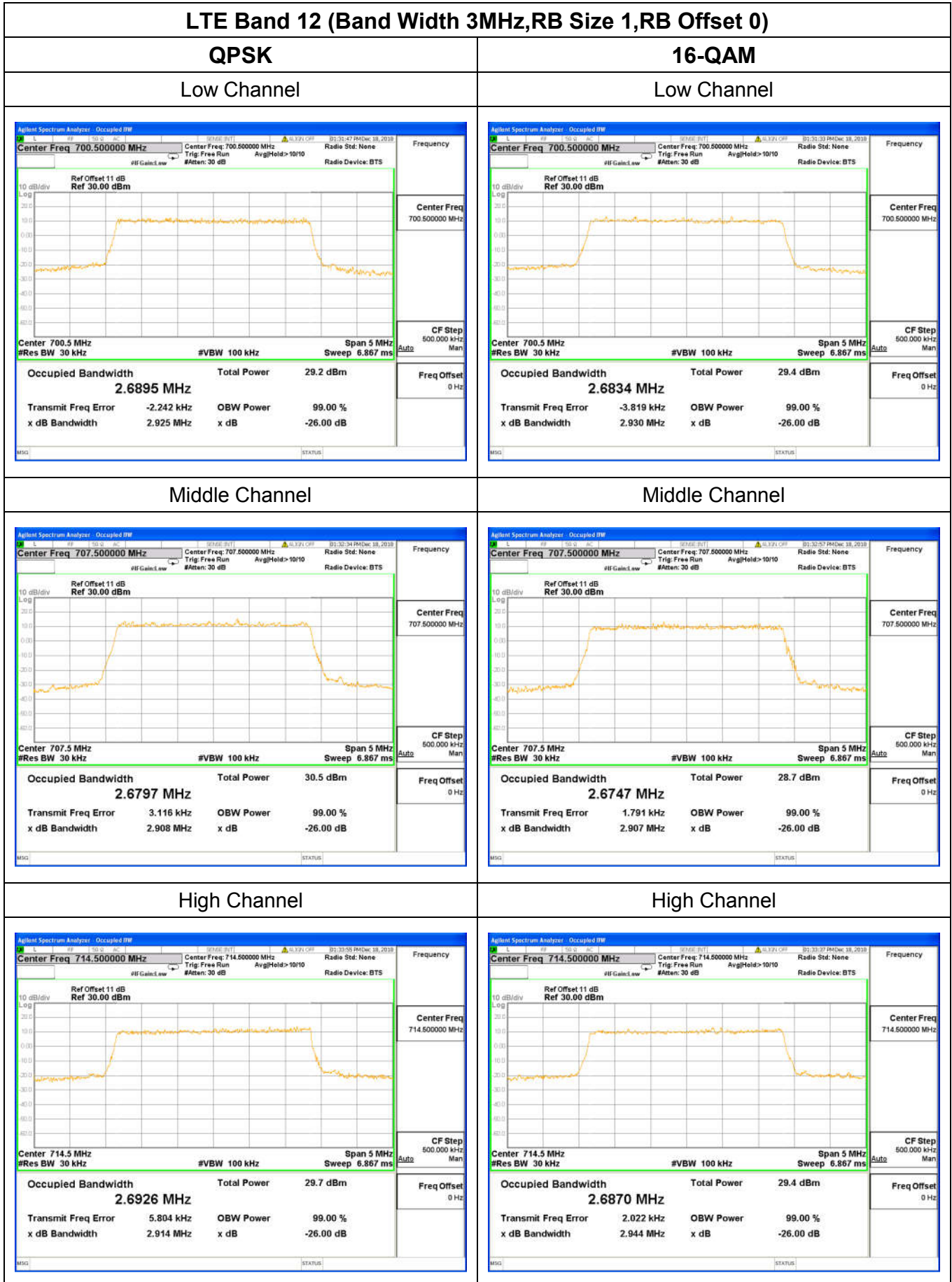
Middle Channel



High Channel

High Channel

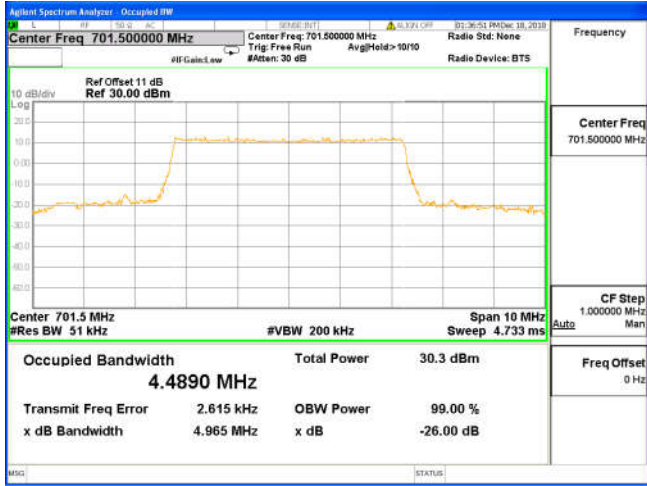




LTE Band 12 (Band Width 5MHz, RB Size 1, RB Offset 0)

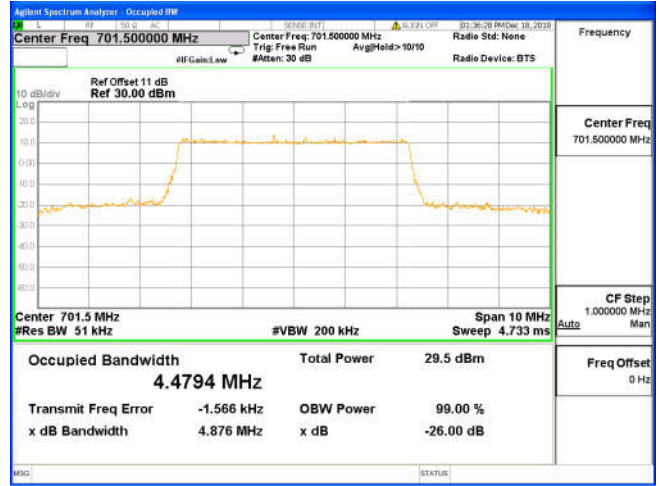
QPSK

Low Channel

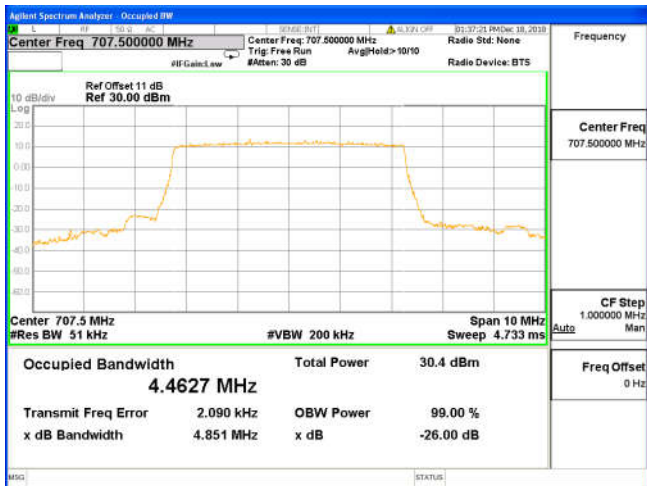


16-QAM

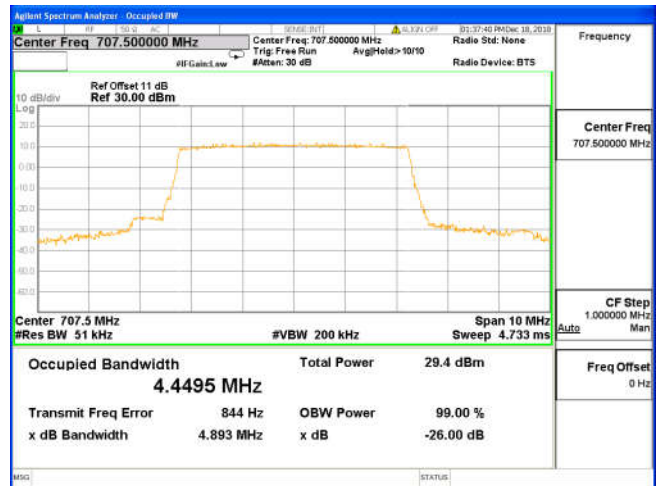
Low Channel



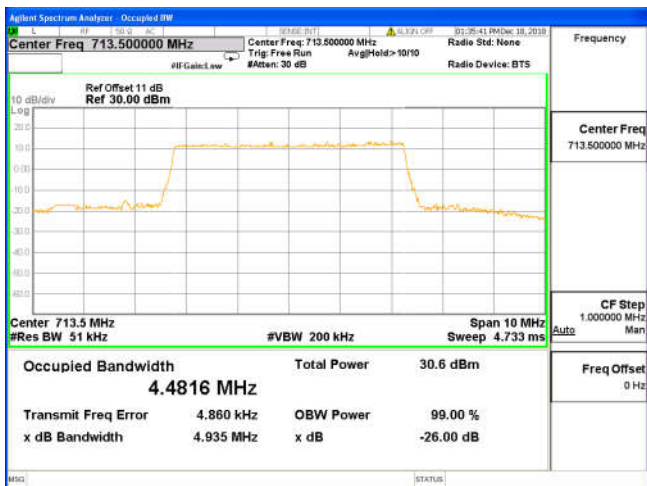
Middle Channel



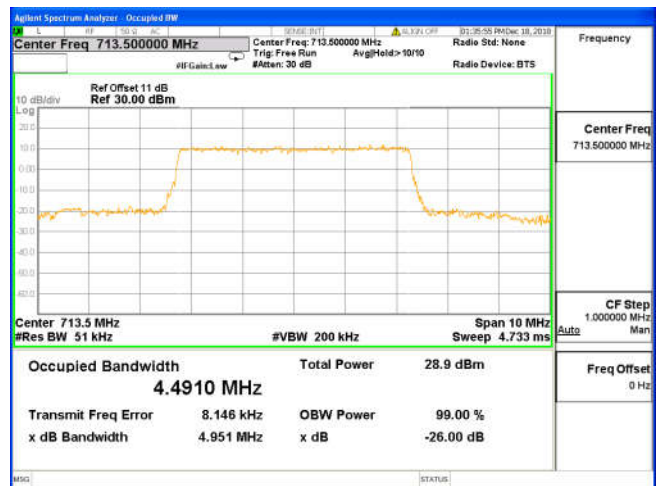
Middle Channel



High Channel



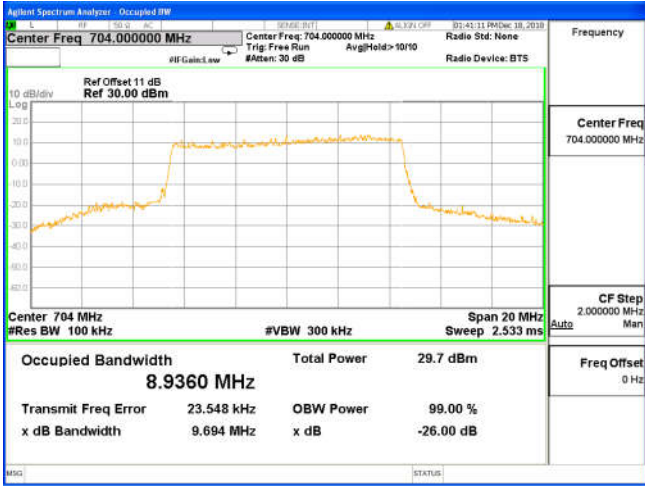
High Channel



LTE Band 12 (Band Width 10MHz, RB Size 1, RB Offset 0)

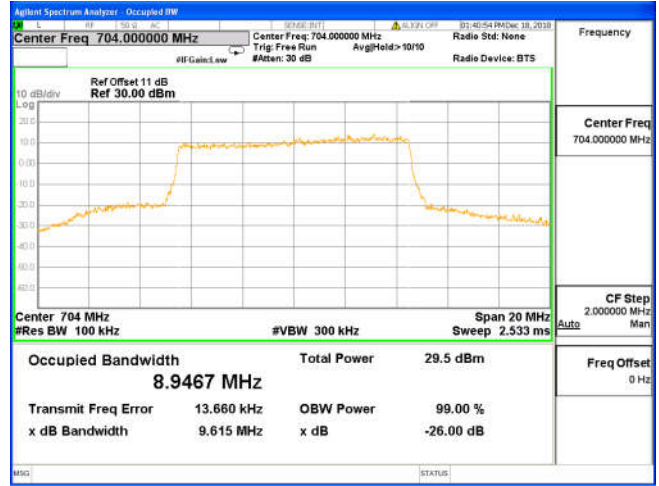
QPSK

Low Channel

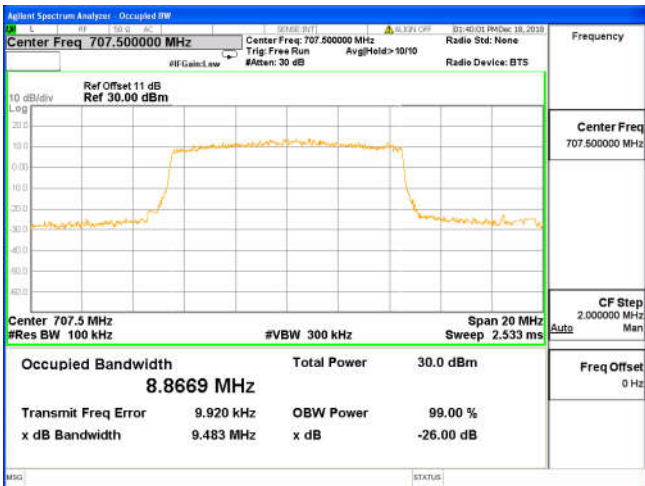


16-QAM

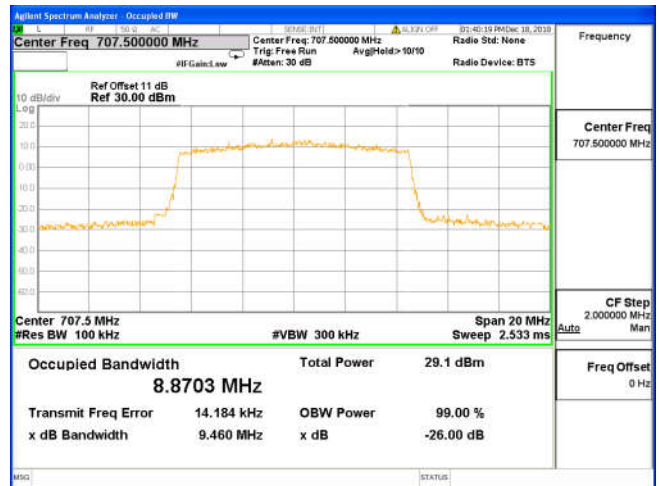
Low Channel



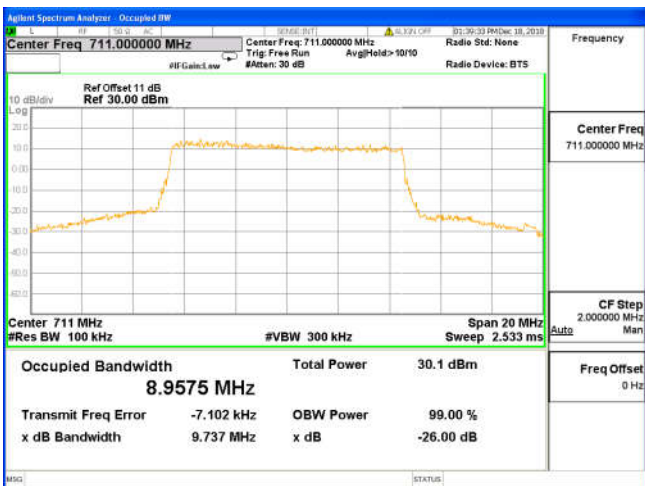
Middle Channel



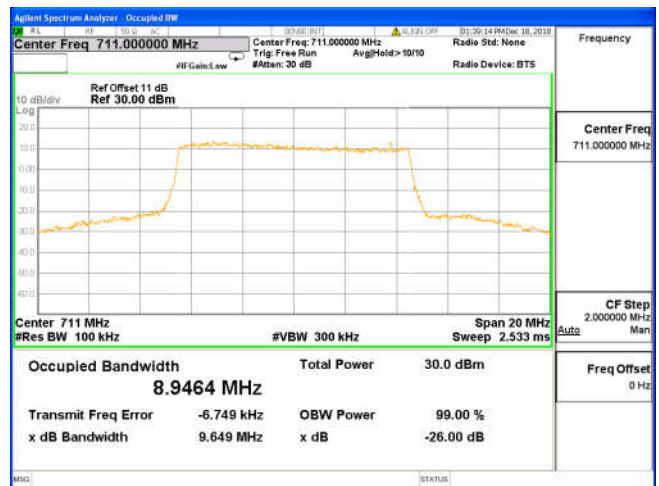
Middle Channel



High Channel



High Channel



5.5 Spurious emissions at antenna terminals

5.5.1 Limit

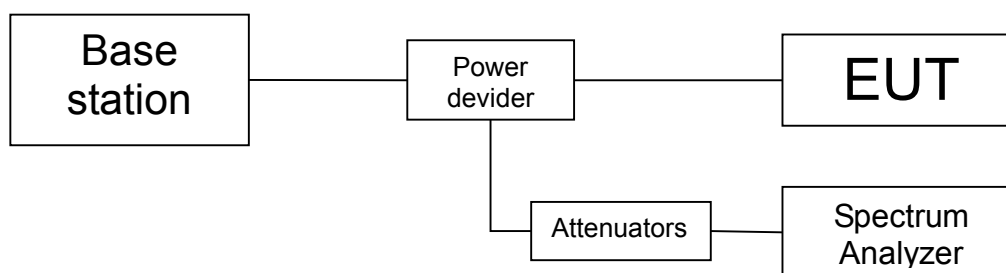
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB (-13 dBm).

Band7: 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.

5.5.2 Test procedure

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.
4. Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.

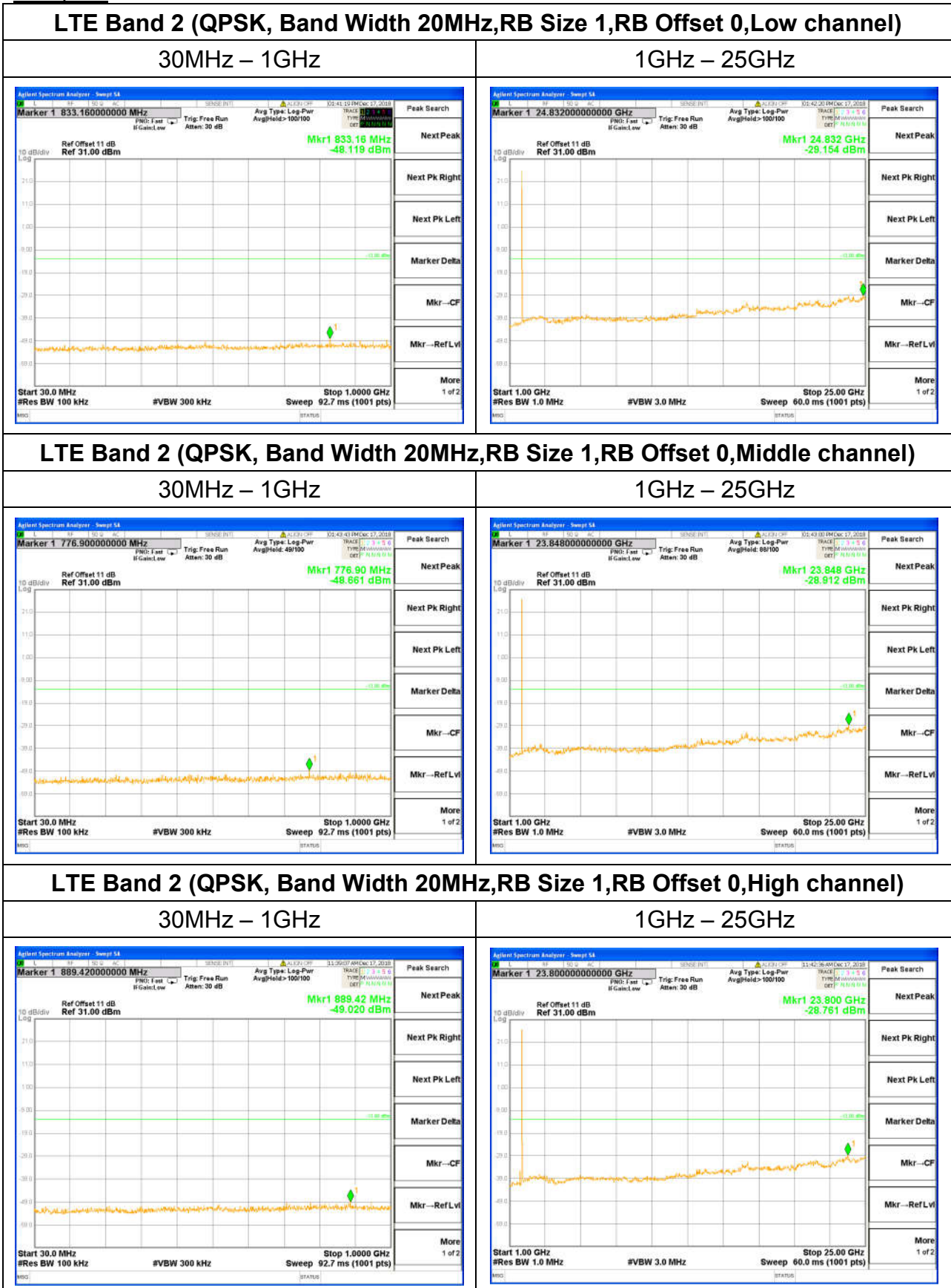
5.5.3 Test setup



5.5.4 Test results

Note: All mode has been tested, only worst data shown in this report.

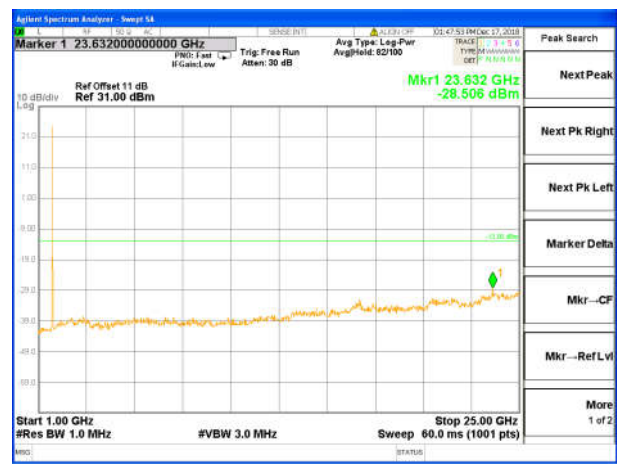
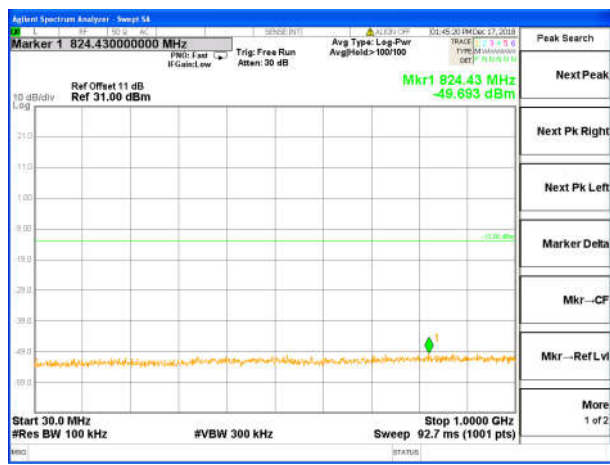
Test plots



LTE Band 4 (QPSK, Band Width 20MHz, RB Size 1, RB Offset 0, Low channel)

30MHz – 1GHz

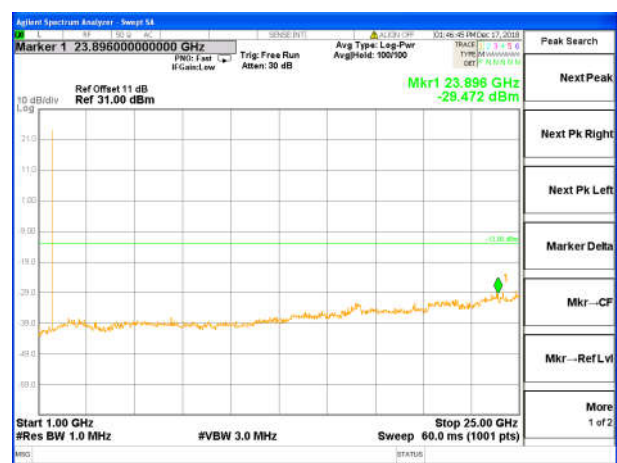
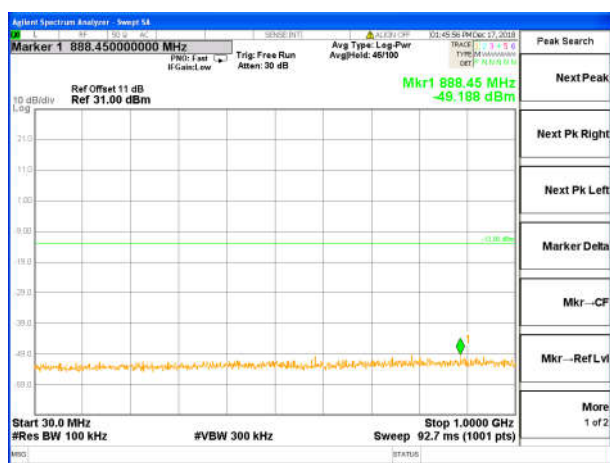
1GHz – 25GHz



LTE Band 4 (QPSK, Band Width 20MHz, RB Size 1, RB Offset 0, Middle channel)

30MHz – 1GHz

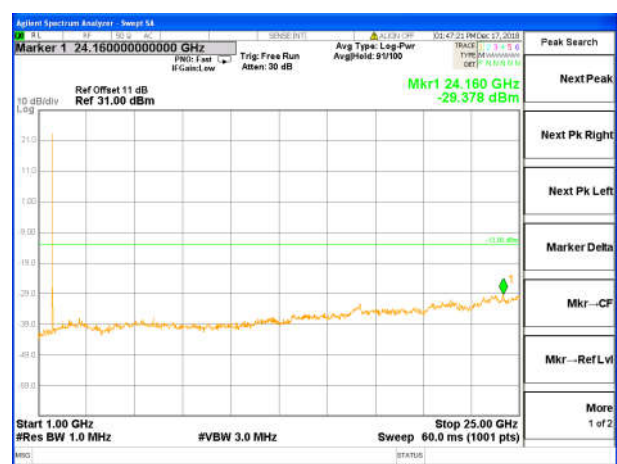
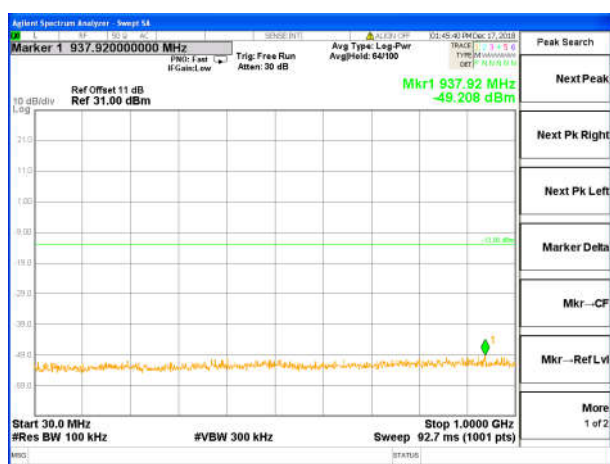
1GHz – 25GHz



LTE Band 4 (QPSK, Band Width 20MHz, RB Size 1, RB Offset 0, High channel)

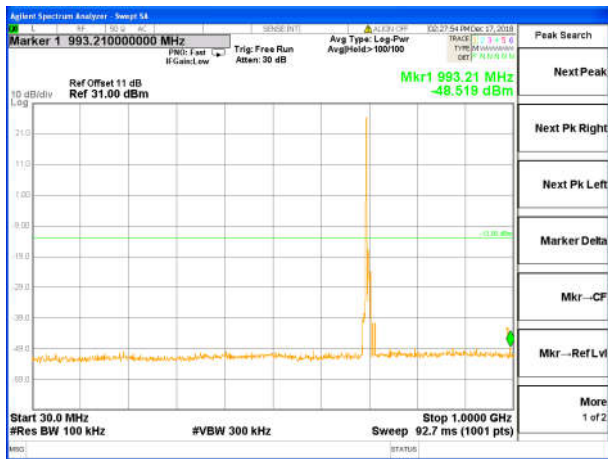
30MHz – 1GHz

1GHz – 25GHz

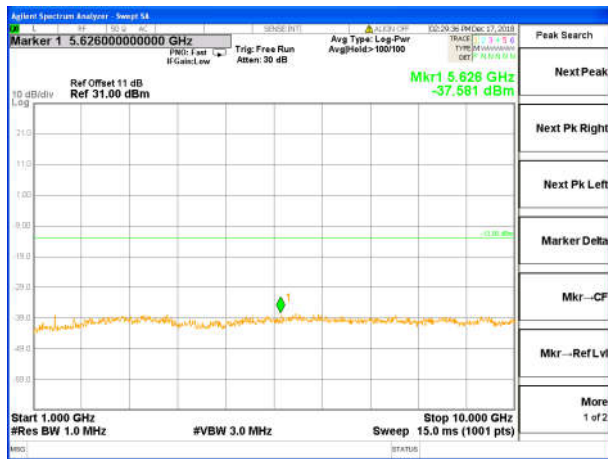


LTE Band 12 (QPSK, Band Width 10MHz, RB Size 1, RB Offset 0, Low channel)

30MHz – 1GHz

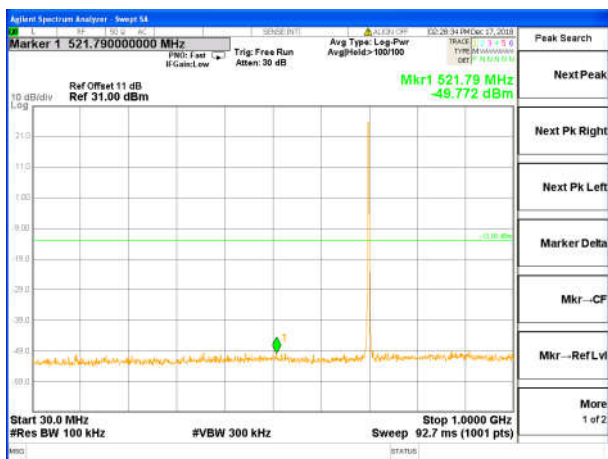


1GHz – 10GHz

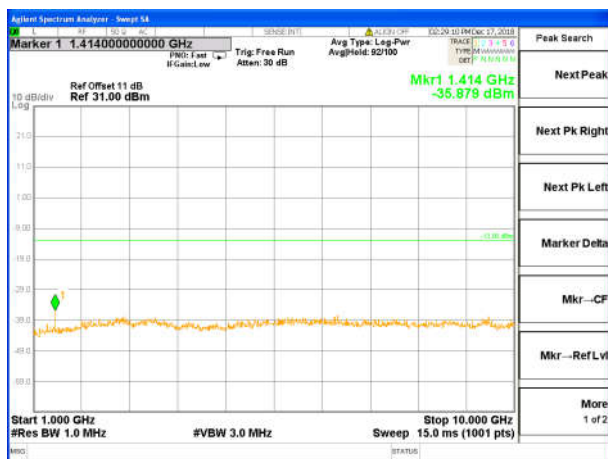


LTE Band 12 (QPSK, Band Width 10MHz, RB Size 1, RB Offset 0, Middle channel)

30MHz – 1GHz

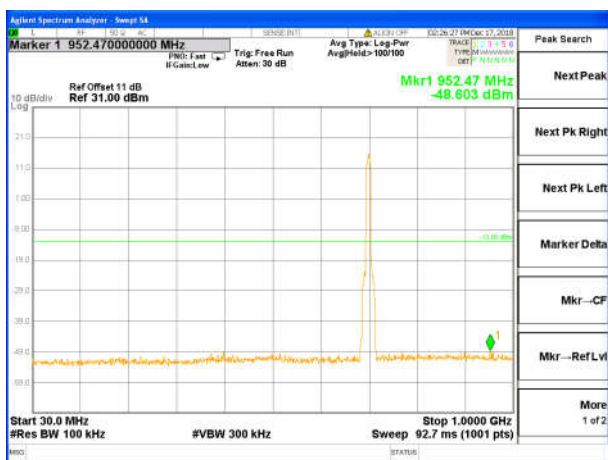


1GHz – 10GHz

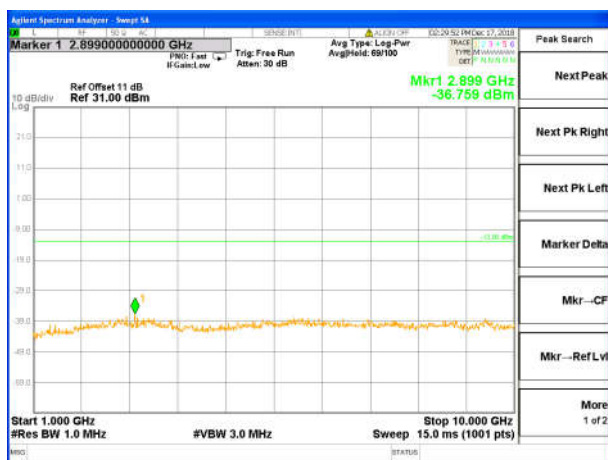


LTE Band 12 (QPSK, Band Width 10MHz, RB Size 1, RB Offset 0, High channel)

30MHz – 1GHz



1GHz – 10GHz



5.6 Band edge at antenna terminals

5.6.1 Limit

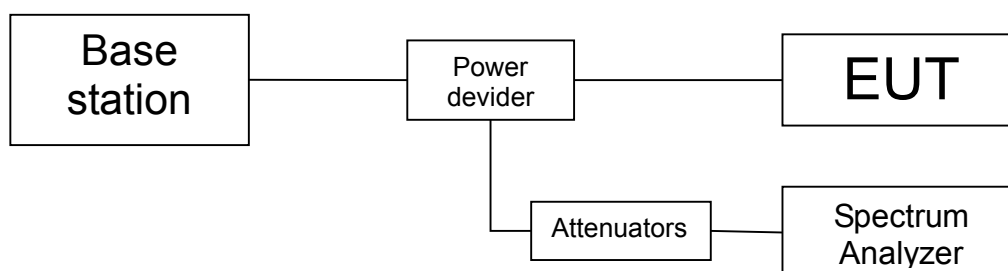
The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

5.6.2 Test procedure

1. The testing follows FCC KDB 971168 v03 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 - = $P(W) - [43 + 10\log(P)]$ (dB)
 - = $[30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 - = -13dBm.

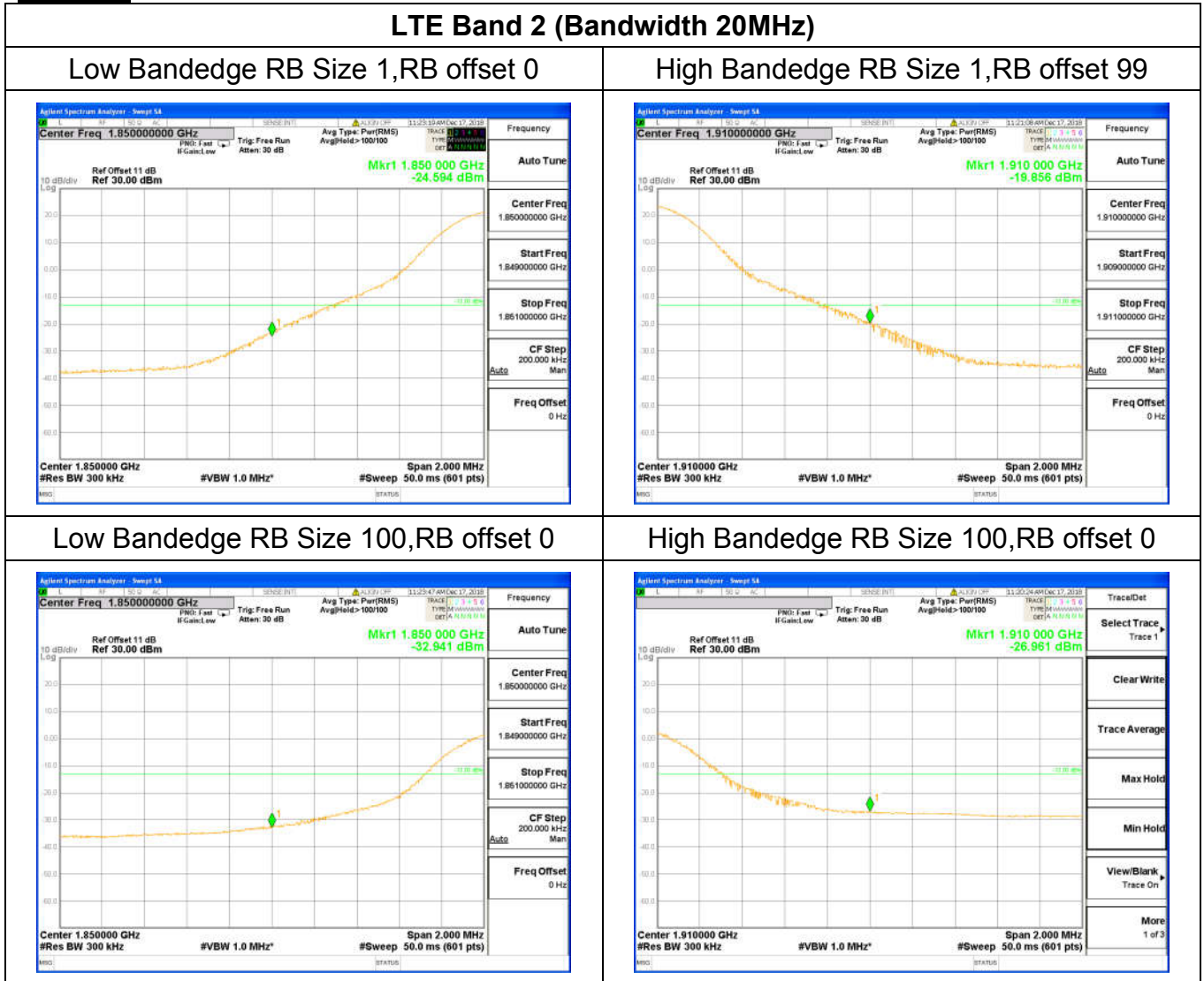
5.6.3 Test setup



5.6.4 Test results

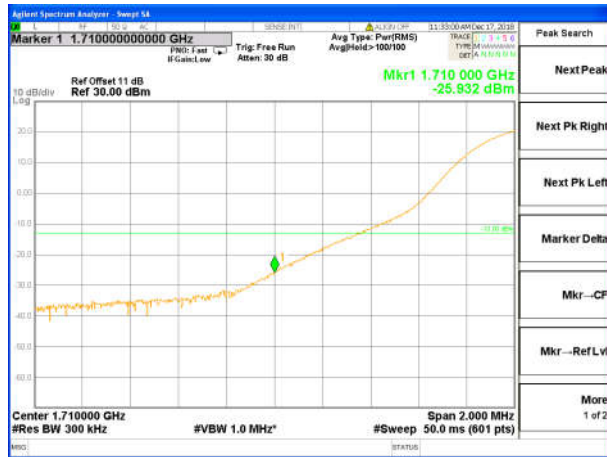
Note: All mode has been tested, only worst data shown in this report.

Test plots

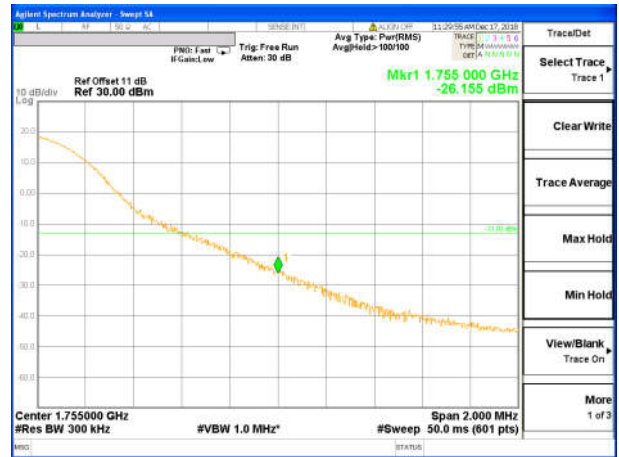


LTE Band 4 (Bandwidth 20MHz)

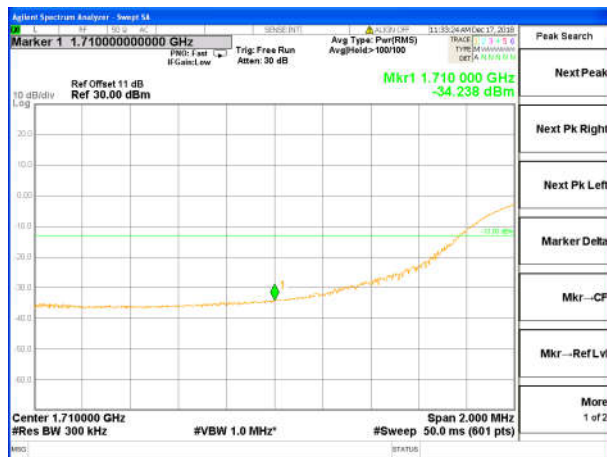
Low Bandedge RB Size 1, RB offset 0



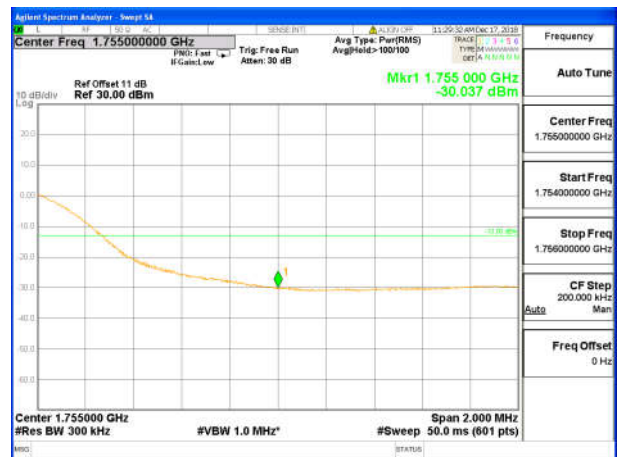
High Bandedge RB Size 1, RB offset 99



Low Bandedge RB Size 100, RB offset 0

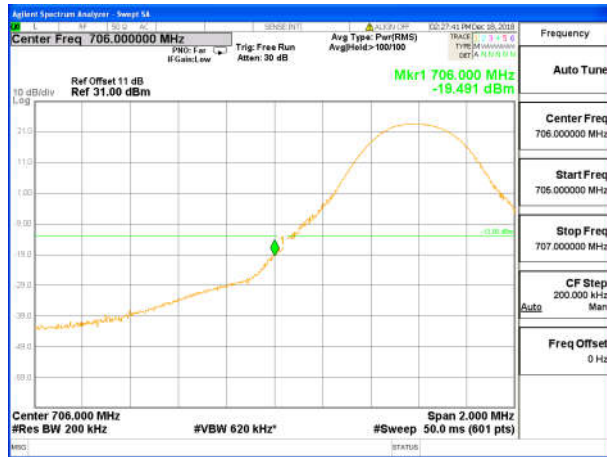


High Bandedge RB Size 100, RB offset 0

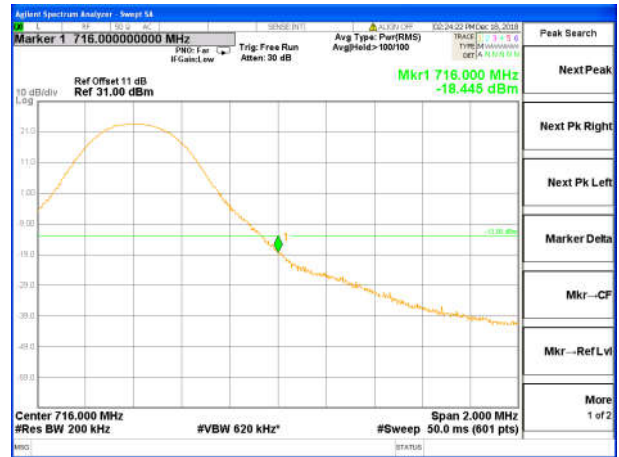


LTE Band 12 (Bandwidth 10MHz)

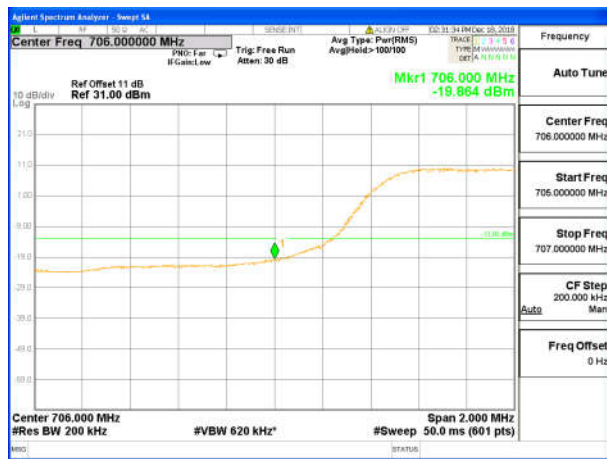
Low Bandedge RB Size 1, RB offset 0



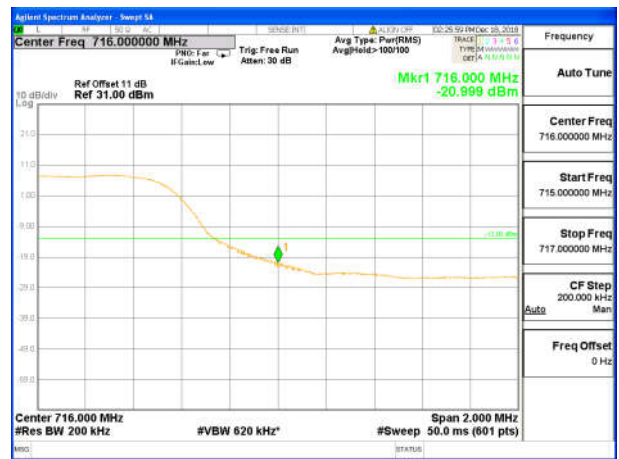
High Bandedge RB Size 1, RB offset 49



Low Bandedge RB Size 50, RB offset 0



High Bandedge RB Size 50, RB offset 0



5.7 Field strength of spurious radiation measurement

5.7.1 Limit

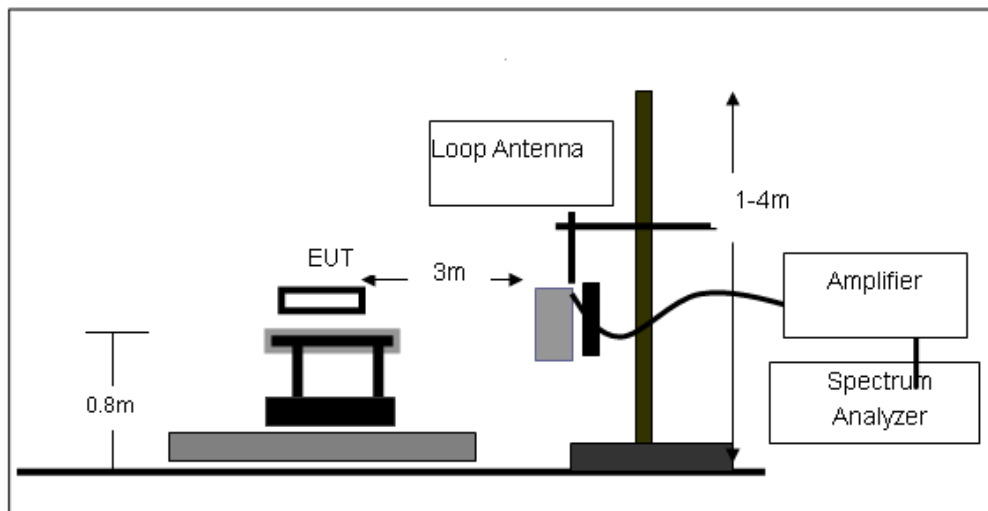
LTE Band 2, LTE Band 4, LTE Band 12: -13dBm,

5.7.2 Test procedure

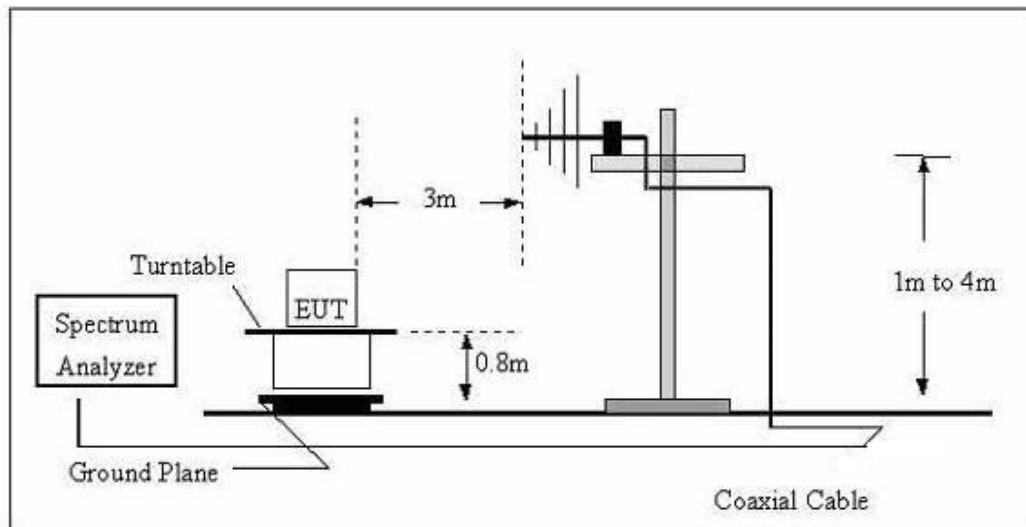
1. The EUT was placed on a non-conductive turntable using a nonconductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.
3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.
4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. $ERP / EIRP = S.G. \text{ output (dBm)} + \text{Antenna Gain(dB/dBi)} - \text{Cable Loss (dB)}$.

5.7.3 Test setup

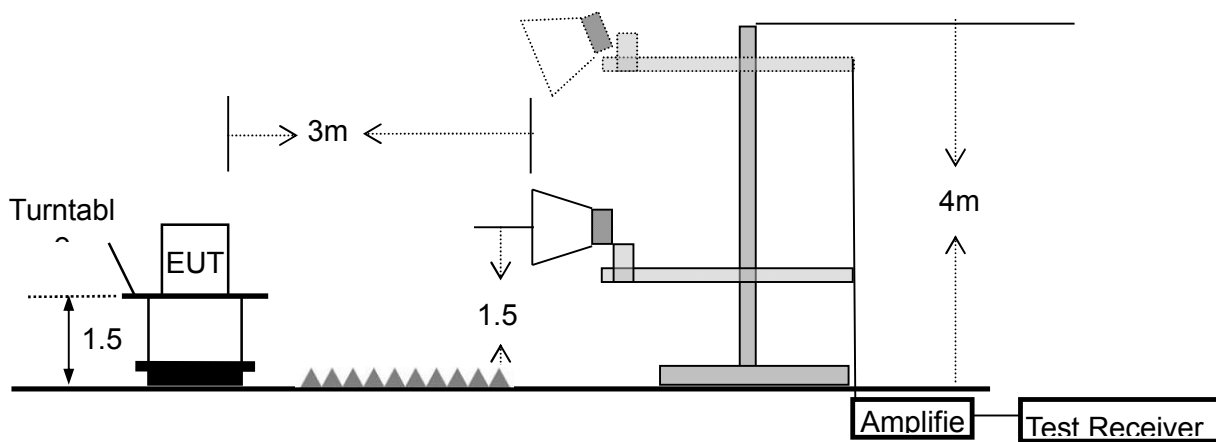
Radiated emission test-up frequency below 30MHz



Radiated emission test-up frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



5.7.4 Test results

Note: All the configuration was tested and only the worse case was reported

LTE Band 2 (30MHz – 20GHz)

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Result
1	277.0935	-64.83	16.13	-48.70	-13	-35.70	Pass
2	410.3824	-64.97	19.5	-45.47	-13	-32.47	Pass
3	603.5392	-63.13	21.6	-41.53	-13	-28.53	Pass
4	12404.81	-65.06	13.15	-51.91	-13	-38.91	Pass
5	14905.81	-57.88	16.21	-41.67	-13	-28.67	Pass
6	15851.7	-60.62	4.08	-56.54	-13	-43.54	Pass
7	18639.4	-58.83	12.35	-46.48	-13	-33.48	Pass
8	18857.5	-60.60	10.36	-50.24	-13	-37.24	Pass

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Result
1	100.2286	-64.32	14.67	-49.65	-13	-36.65	Pass
2	148.441	-64.73	12.37	-52.36	-13	-39.36	Pass
3	478.8455	-62.36	20.86	-41.50	-13	-28.50	Pass
4	11282.57	-60.00	9.96	-50.04	-13	-37.04	Pass
5	12340.68	-61.88	11.01	-50.87	-13	-37.87	Pass
6	12965.93	-62.33	12.01	-50.32	-13	-37.32	Pass
7	17965.3	-60.98	10.36	-50.62	-13	-37.62	Pass
8	17984.9	-59.11	11.52	-47.59	-13	-34.59	Pass

LTE Band 4 (30MHz – 18GHz)

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Result
1	369.4045	-63.93	18.49	-45.44	-13	-32.44	Pass
2	459.1143	-62.89	20.47	-42.42	-13	-29.42	Pass
3	656.53	-61.90	22.16	-39.74	-13	-26.74	Pass
4	12741.48	-62.62	11.68	-50.94	-13	-37.94	Pass
5	14008.02	-59.84	17.12	-42.72	-13	-29.72	Pass
6	14505.01	-57.82	16.65	-41.17	-13	-28.17	Pass
7	17521.14	-58.96	15.98	-42.98	-13	-29.98	Pass
8	17634.09	-59.71	17.32	-42.39	-13	-29.39	Pass

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Result
1	212.2694	-63.86	14.34	-49.52	-13	-36.52	Pass
2	325.5957	-64.76	17.34	-47.42	-13	-34.42	Pass
3	431.0316	-63.21	19.91	-43.30	-13	-30.30	Pass
4	13783.57	-60.16	16.67	-43.49	-13	-30.49	Pass
5	14232.47	-58.77	17.11	-41.66	-13	-28.66	Pass
6	14905.81	-58.10	16.21	-41.89	-13	-28.89	Pass
7	17102.02	-58.10	16.34	-41.76	-13	-28.76	Pass
8	17235.61	-53.53	17.42	-36.11	-13	-23.11	Pass

LTE Band 12 (30MHz – 18G)

No.	Frequency(MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Result
1	293.0842	-62.20	16.51	-45.69	-13	-32.69	Pass
2	810.2653	-60.55	24.15	-36.40	-13	-23.40	Pass
3	958.7943	-61.17	25.98	-35.19	-13	-22.19	Pass
4	11298.6	-63.57	12.03	-51.54	-13	-38.54	Pass
5	12693.39	-64.60	13.48	-51.12	-13	-38.12	Pass
6	12869.74	-64.78	13.64	-51.14	-13	-38.14	Pass

No.	Frequency (MHz)	Reading Level(dBm)	Correct Factor(dB)	Measurement (dBm)	Limit (dBm)	Margin	Result
1	325.5957	-64.65	17.34	-47.31	-13	-34.31	Pass
2	478.8455	-63.83	20.86	-42.97	-13	-29.97	Pass
3	919.2866	-61.76	25.64	-36.12	-13	-23.12	Pass
4	14232.47	-59.01	17.11	-41.90	-13	-28.90	Pass
5	14905.81	-58.70	16.21	-42.49	-13	-29.49	Pass
6	15274.55	-55.86	4.15	-51.71	-13	-38.71	Pass

5.8 Frequency Stability

5.8.1 Limit

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d) (2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 32.4VDC and 41.4VDC, with a nominal voltage of 36VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance from -5.4% to 10.8%. For the purposes of measuring frequency stability these voltage limits are to be used.

5.8.2 Test procedure

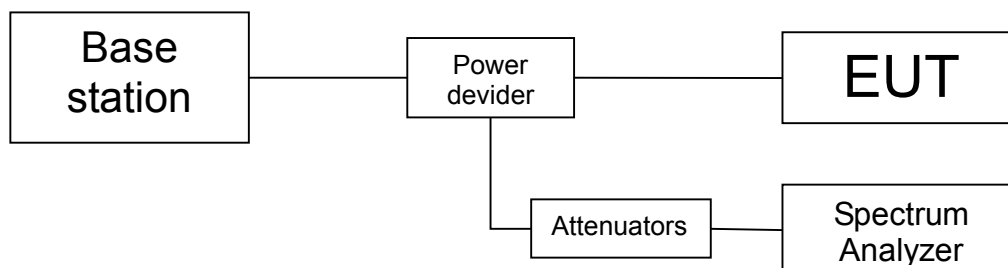
Test Procedures for Temperature Variation:

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

Test Procedures for Voltage Variation

1. The testing follows FCC KDB 971168 v03r01 Section 9.0.
2. The EUT was placed in a temperature chamber at 25±5° C and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

5.8.3 Test setup



5.8.4 Test results

LTE Band 2

For Temperature Variation:

Temperature(°C)	Test channels(MHz)	Deviation (Hz)	Deviation (ppm)	Limit(ppm)	Result
50	1880	10.63	0.006	2.5	Pass
40		21.47	0.011		Pass
30		21.25	0.011		Pass
20		23.91	0.013		Pass
10		19.86	0.011		Pass
0		19.31	0.010		Pass
-10		17.79	0.009		Pass
-20		22.24	0.012		Pass
-30		17.51	0.009		Pass

For Voltage Variation

Voltage(Volt)	Test channels(MHz)	Deviation (Hz)	Deviation (ppm)	Limit(ppm)	Result
32.4	1880	17.34	0.009	2.5	Pass
36		21.61	0.011		Pass
41.4		15.52	0.008		Pass

LTE Band 4

For Temperature Variation:

Temperature(°C)	Test channels(MHz)	Deviation (Hz)	Deviation (ppm)	Limit(ppm)	Result
50	1732.5	13.37	0.008	2.5	Pass
40		19.21	0.011		Pass
30		14.77	0.009		Pass
20		20.98	0.012		Pass
10		24.36	0.014		Pass
0		23.35	0.013		Pass
-10		17.57	0.010		Pass
-20		19.23	0.011		Pass
-30		11.72	0.007		Pass

For Voltage Variation

Voltage(Volt)	Test channels(MHz)	Deviation (Hz)	Deviation (ppm)	Limit(ppm)	Result
32.4	1732.5	15.58	0.009	2.5	Pass
36		22.14	0.013		Pass
41.4		19.12	0.011		Pass

LTE Band 12

For Temperature Variation:

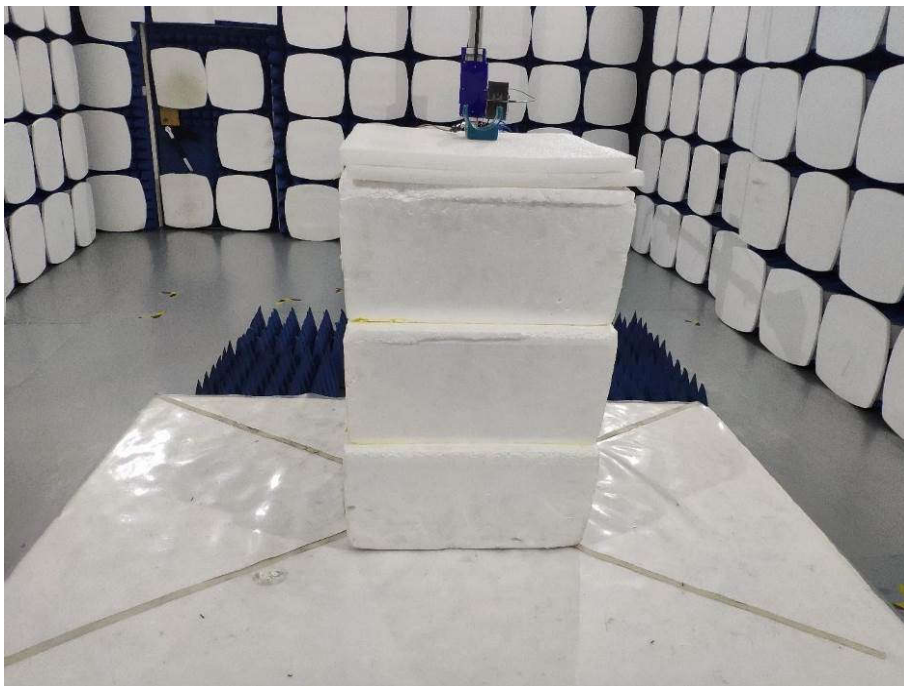
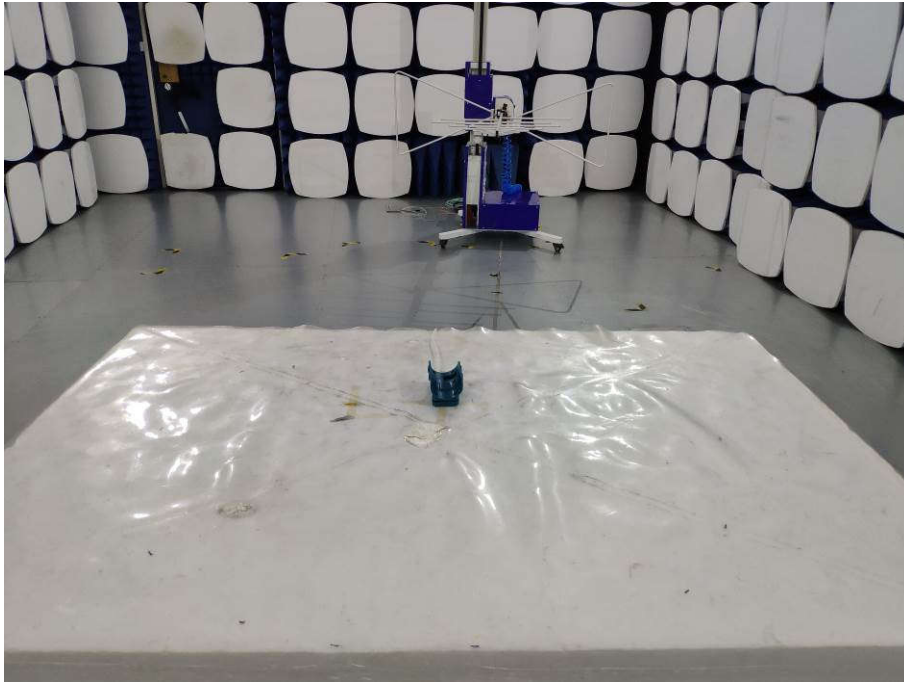
Temperature(°C)	Test channels(MHz)	Deviation (Hz)	Deviation (ppm)	Limit(ppm)	Result
50	836.5	12.27	0.015	2.5	Pass
40		20.22	0.024		Pass
30		17.52	0.021		Pass
20		24.49	0.029		Pass
10		25.62	0.031		Pass
0		25.23	0.030		Pass
-10		21.47	0.026		Pass
-20		22.57	0.027		Pass
-30		16.19	0.019		Pass

For Voltage Variation

Voltage(Volt)	Test channels(MHz)	Deviation (Hz)	Deviation (ppm)	Limit(ppm)	Result
32.4	836.5	16.94	0.020	2.5	Pass
36		15.21	0.018		Pass
41.4		17.29	0.021		Pass

Photographs of the Test Setup

Radiated emission



Photographs of the EUT

See the APPENDIX 1: EUT PHOTO in the report No.: MTi181217E098-1.

----END OF REPORT----