



REPORT No.: SZ15100009W02

FCC RF TEST REPORT

APPLICANT : TCL Communication Ltd.
PRODUCT NAME : Mobile WIFI Router
MODEL NAME : Y859ND
TRADE NAME : ALCATEL ONETOUCH
BRAND NAME : ALCATEL ONETOUCH
FCC ID : 2ACCJB035
STANDARD(S) : 47 CFR Part 22, Subpart H
47 CFR Part 24, Subpart E
47 CFR Part 27, Subpart H&L&M
ISSUE DATE : 2015-11-02



SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.

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Change History		
Issue	Date	Reason for change
1.0	2015-11-02	First edition

**TEST REPORT DECLARATION**

Applicant	TCL Communication Ltd.
Applicant Address	5F, C-Tower, No.232, Liangjing Road, Zhangjiang High-tech Park, Pudong, Shanghai, China
Manufacturer	TCL Mobile Communication Co. Ltd. Huizhou
Manufacturer Address	70 Huifeng 4rd., ZhongKai High-Technology Development District, Huizhou, Guangdong, PRC. 516006
Product Name	Mobile WIFI Router
Model Name	Y859ND
Brand Name	ALCATEL ONETOUCH
HW Version	V2.0
SW Version	Y859_00_03.28_17
Test Standards	47 CFR Part 22, Subpart H 47 CFR Part 24, Subpart E 47 CFR Part 27, Subpart H&L&M
Test Date	2015-10-10 to 2015-10-29
Test Result	PASS

Tested by : Zou Jian
Zou Jian(Test Engineer)

Reviewed by : Qiu Xiaojun
Qiu Xiaojun(RF Manager)

Approved by : Zeng Dexin
Zeng Dexin(Chief Engineer)



1. GENERAL INFORMATION

1.1 EUT Description

EUT Type: Mobile WIFI Router
Serial No.: (n.a, marked #1 by test site)
Hardware Version.....: V2.0
Software Version..... Y859_00_03.28_17
Applicant: TCL Communication Ltd.
5F, C-Tower, No.232, Liangjing Road, Zhangjiang High-tech Park,
Pudong, Shanghai, China
Manufacturer: TCL Mobile Communication Co. Ltd. Huizhou
70 Huifeng 4rd., ZhongKai High-Technology Development District,
Huizhou, Guangdong, PRC. 516006
Modulation Type.....: LTE Band 2: QPSK, 16QAM
LTE Band 5: QPSK, 16QAM
LTE Band 7: QPSK, 16QAM
LTE Band 17: QPSK, 16QAM
Tx Frequency Range.....: LTE Band 2: 1850MHz ~1910MHz
LTE Band 5: 824MHz ~ 849MHz
LTE Band 7: 2500MHz ~ 2570MHz
LTE Band 17: 704MHz ~ 716MHz
Rx Frequency Range: LTE Band 2: 1930MHz ~ 1990MHz
LTE Band 5: 869MHz ~ 894MHz
LTE Band 7: 2620MHz ~ 2690MHz
LTE Band 17: 734MHz ~ 746MHz
Emission Designator: 1M11G7D (LTE Band 2, QPSK, BW 1.4MHz)
1M11W7D (LTE Band 2, 16QAM, BW 1.4MHz)
2M72G7D (LTE Band 2, QPSK, BW 3MHz)
2M72 W7D (LTE Band 2, 16QAM, BW 3MHz)
4M52G7D (LTE Band 2, QPSK, BW 5MHz)
4M51 W7D (LTE Band 2, 16QAM, BW 5MHz)
9M00G7D (LTE Band 2, QPSK, BW 10MHz)
8M99W7D (LTE Band 2, 16QAM, BW 10MHz)
13M51G7D (LTE Band 2, QPSK, BW 15MHz)
13M49W7D (LTE Band 2, 16QAM, BW 15MHz)
17M99G7D (LTE Band 2, QPSK, BW 20MHz)
18M00W7D (LTE Band 2, 16QAM, BW 20MHz)
1M10G7D (LTE Band 5, QPSK, BW 1.4MHz)



- 1M10W7D (LTE Band 5, 16QAM, BW 1.4MHz)
- 2M71G7D (LTE Band 5, QPSK, BW 3MHz)
- 2M72W7D (LTE Band 5, 16QAM, BW 3MHz)
- 4M51G7D (LTE Band 5, QPSK, BW 5MHz)
- 4M50W7D (LTE Band 5, 16QAM, BW 5MHz)
- 9M00G7D (LTE Band 5, QPSK, BW 10MHz)
- 9M00W7D (LTE Band 5, 16QAM, BW 10MHz)
- 4M51G7D (LTE Band 7, QPSK, BW 5MHz)
- 4M51W7D (LTE Band 7, 16QAM, BW 5MHz)
- 9M00G7D (LTE Band 7, QPSK, BW 10MHz)
- 8M99W7D (LTE Band 7, 16QAM, BW 10MHz)
- 13M46G7D (LTE Band 7, QPSK, BW 15MHz)
- 13M48W7D (LTE Band 7, 16QAM, BW 15MHz)
- 17M97G7D (LTE Band 7, QPSK, BW 20MHz)
- 18M00W7D (LTE Band 7, 16QAM, BW 20MHz)
- 4M52G7D (LTE Band 17, QPSK, BW 5MHz)
- 4M53W7D (LTE Band 17, 16QAM, BW 5MHz)
- 8M97G7D (LTE Band 17, QPSK, BW 10MHz)
- 8M98W7D (LTE Band 17, 16QAM, BW 10MHz)

Antenna Type.....: PIFA Antenna
 Power Supply..... 3.8V DC Power

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2 and Part 22, Part 24, 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 22 (10-1-09 Edition)	Public Mobile Services
3	47 CFR Part 24 (10-1-09 Edition)	Personal Communications Services
4	47 CFR Part 27	Miscellaneous Wireless Communications Services



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

No.	Section	Description	Result
1	2.1046	Transmitter Conducted Output Power	<u>PASS</u>
2	24.232(d), 27.50(d)(5)	Occupied Bandwidth	<u>PASS</u>
3	2.1049, 22.917 24.238, 27.53(g)	Frequency Stability	<u>PASS</u>
4	2.1055, 22.355 24.235, 27.54	Peak to Average Ratio	<u>PASS</u>
5	2.1051, 2.1057 24.238, 27.53(g)	Conducted Spurious Emissions	<u>PASS</u>
6	2.1051, 2.1057, 22.917, 24.238, 27.53(g)(h), 27.53(m)(4)	Band Edge	<u>PASS</u>
7	22.913, 24.232, 27.50(d)(4)	Equivalent Isotropic Radiated Power	<u>PASS</u>
8	2.1053, 2.1057, 22.917, 24.238, 27.53(g)	Radiated Spurious Emissions	<u>PASS</u>

1.3 Facilities and Accreditations

1.3.1 Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at FL.1, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China 518101. The test site is constructed in conformance with the requirements of TIA/EIA 603.D: 2010, ANSI C63.4: 2009 and CISPR Publication 22: 2010. The FCC registration number is 695796.

1.3.2 Test Environment Conditions

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

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

2. 47 CFR PART 2, PART 22H & 24E & 27L REQUIREMENTS

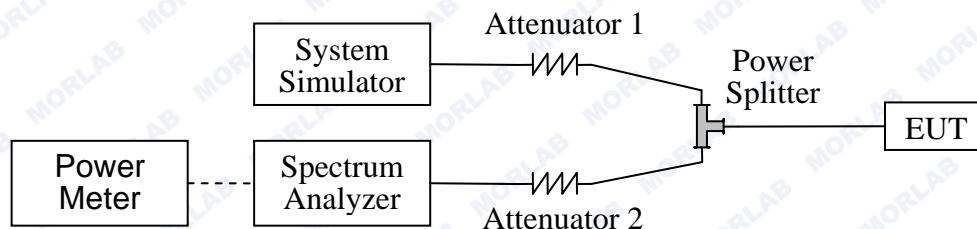
2.1 Transmitter Conducted Output Power

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

Test Setup:



The EUT, which is powered by the Battery, 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.

Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Rohde& Schwarz	CMW500	1201.0002k5 0/124534/wk	2015.02.26	2016.02.25
Spectrum Analyzer	Rohde& Schwarz	FSL	10246	2015.02.26	2016.02.25
Spectrum Analyzer	Agilent	E4445A	MY44200685	2015.02.26	2016.02.25
Power Meter	Agilent	E4418B	GB43318055	2015.02.26	2016.02.25
Power Meter	Agilent	E4418B	GB43318055	2015.02.26	2016.02.25
Power Sensor	Agilent	8482A	MY41091706	2015.02.26	2016.02.25
Power Splitter	Weinschel	1506A	NW521	2015.02.26	2016.02.25
Attenuator 1	Resnet	20dB	(n.a.)	2015.02.26	2016.02.25
Attenuator 2	Resnet	3dB	(n.a.)	2015.02.26	2016.02.25

2.1.3 Test Results



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 2	20MHz	L 18700	1860	QPSK	1	0	22.72
					1	49	22.62
					1	99	22.87
					50	0	22.24
					50	25	21.85
					50	49	21.84
				100	0	21.86	
				16-QAM	1	0	21.57
					1	49	21.76
					1	99	21.99
					50	0	21.96
					50	25	21.97
		50	49		21.95		
		M 18900	1880	QPSK	1	0	22.85
					1	49	22.86
					1	99	23.89
					50	0	22.03
					50	25	22.10
					50	49	22.18
				100	0	22.22	
				16-QAM	1	0	22.02
					1	49	22.37
					1	99	22.51
					50	0	22.54
50	25				22.49		
50	49	22.01					
H 19100	1900	QPSK	1	0	22.79		
			1	49	22.74		
			1	99	22.58		
			50	0	22.27		
			50	25	22.15		
			50	49	22.13		
		100	0	22.20			
		16-QAM	1	0	22.74		
			1	49	22.70		
			1	99	22.66		
			50	0	22.65		
			50	25	22.59		
50	49		22.48				
100	0	21.32					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 2	15MHz	L 18675	1857.5	QPSK	1	0	22.72
					1	37	22.62
					1	74	22.87
					36	0	22.24
					36	18	21.85
					36	35	21.84
				16-QAM	75	0	21.86
					1	0	21.57
					1	37	21.76
					1	74	21.99
					36	0	21.96
					36	18	21.97
		M 18900	1880	QPSK	36	35	21.95
					75	0	21.07
					1	0	22.85
					1	37	22.86
					1	74	23.89
					36	0	22.03
				16-QAM	36	18	22.10
					36	35	22.18
					75	0	22.22
					1	0	22.02
					1	37	22.37
					1	74	22.51
		H 19125	1902.5	QPSK	36	0	22.54
					36	18	22.49
					36	35	22.01
					75	0	21.27
					1	0	22.79
					1	37	22.74
16-QAM	1			74	22.58		
	36			0	22.27		
	36			18	22.15		
	36			35	22.13		
	75			0	22.20		
	1			0	22.74		
1	37	22.70					
1	74	22.66					
36	0	22.65					
36	18	22.59					
36	35	22.48					
75	0	21.32					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 2	10MHz	L 18650	1855	QPSK	1	0	21.89
					1	24	21.85
					1	49	21.86
					25	0	21.81
					25	12	21.83
					25	24	21.86
				16-QAM	50	0	21.87
					1	0	22.22
					1	24	22.21
					1	49	22.18
					25	0	22.10
					25	12	22.05
		M 18900	1880	QPSK	25	24	21.95
					50	0	20.92
					1	0	22.83
					1	24	22.98
					1	49	22.96
					25	0	22.04
				16-QAM	25	12	22.05
					25	24	22.13
					50	0	22.16
					1	0	22.29
					1	24	22.33
					1	49	22.31
		H 19150	1905	QPSK	25	0	22.33
					25	12	22.30
					25	24	22.34
					50	0	21.25
					1	0	22.81
					1	24	22.78
16-QAM	1			49	22.77		
	25			0	22.19		
	25			12	22.15		
	25			24	22.14		
	50			0	22.17		
	1			0	21.50		
16-QAM	1	24	21.48				
	1	49	21.39				
	25	0	21.35				
	25	12	21.32				
	25	24	21.28				
	50	0	21.15				



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 2	5MHz	L 18625	1852.5	QPSK	1	0	22.98
					1	12	22.95
					1	24	22.91
					12	0	22.88
					12	6	22.67
					12	11	22.54
				25	0	21.83	
				16-QAM	1	0	22.71
					1	12	22.68
					1	24	22.55
					12	0	21.95
					12	6	21.87
		12	11		21.56		
		M 18900	1880	QPSK	1	0	22.84
					1	12	22.64
					1	24	22.55
					12	0	22.04
					12	6	21.89
					12	11	21.69
				25	0	22.04	
				16-QAM	1	0	21.71
					1	12	21.69
					1	24	21.57
					12	0	21.64
					12	6	21.58
		12	11		21.52		
		25	0	21.08			
		H 19175	1907.5	QPSK	1	0	22.18
					1	12	22.21
					1	24	22.29
12	0				22.36		
12	6				22.28		
12	11				22.02		
25	0			21.04			
16-QAM	1			0	22.27		
	1			12	22.22		
	1			24	22.25		
	12			0	21.98		
	12			6	21.65		
	12	11	21.48				
25	0	21.13					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 2	3MHz	L 18615	1851.5	QPSK	1	0	22.76
					1	7	22.68
					1	14	22.81
					8	0	22.79
					8	4	22.53
					8	7	22.06
				15	0	21.90	
				16-QAM	1	0	22.15
					1	7	22.18
					1	14	22.22
					8	0	21.88
					8	4	21.55
		8	7		21.08		
		M 18900	1880	QPSK	1	0	22.20
					1	7	22.19
					1	14	22.20
					8	0	22.02
					8	4	21.98
					8	7	21.86
				15	0	22.15	
				16-QAM	1	0	22.20
					1	7	22.33
					1	14	22.44
					8	0	22.56
					8	4	22.24
		8	7		22.01		
		H 19185	1908.5	QPSK	1	0	22.97
					1	7	22.66
					1	14	22.94
					8	0	22.86
8	4				22.54		
8	7				22.44		
15	0			22.08			
16-QAM	1			0	21.70		
	1			7	21.84		
	1			14	22.28		
	8			0	22.21		
	8			4	22.15		
	8	7	22.18				
15	0	21.16					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)				
					RB Size	RB Offset					
LTE Band 2	1.4MHz	L 18607	1850.7	QPSK	1	0	22.77				
					1	2	22.81				
					1	5	22.72				
					3	0	22.86				
					3	1	22.88				
					3	2	22.89				
				16-QAM	6	0	21.84				
					1	0	22.21				
					1	2	22.12				
					1	5	22.23				
					3	0	22.26				
					3	1	22.18				
		M 18900	1880	QPSK	3	2	22.11				
					6	0	20.91				
					1	0	22.91				
					1	2	22.86				
					1	5	22.93				
					3	0	23.13				
				16-QAM	3	1	23.10				
					3	2	23.11				
					6	0	22.16				
					1	0	22.25				
					1	2	21.96				
					1	5	22.02				
		H 19193	1909.3	QPSK	3	0	23.14				
					3	2	23.12				
					3	5	23.11				
					6	0	22.16				
					1	0	22.01				
					1	2	23.11				
16-QAM	1			5	22.91						
	3			0	23.10						
	3			1	23.08						
	3			2	22.96						
	6			0	22.25						
	1			0	21.91						
				16-QAM	1	2	21.77				
					1	5	21.83				
					3	0	21.77				
					3	1	21.62				
									3	2	21.59
									6	0	21.35



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 5	10MHz	L 20450	829	QPSK	1	0	23.19
					1	24	23.22
					1	49	23.19
					25	0	22.25
					25	12	22.15
					25	24	22.16
				16-QAM	50	0	22.39
					1	0	22.72
					1	24	22.68
					1	49	22.46
					25	0	22.89
					25	12	22.67
		M 20525	836.5	QPSK	25	24	22.45
					50	0	21.37
					1	0	23.10
					1	24	23.10
					1	49	23.04
					25	0	22.22
				16-QAM	25	12	22.20
					25	24	22.19
					50	0	22.27
					1	0	22.23
					1	24	22.36
					1	49	22.37
H 20600	844	QPSK	25	0	22.41		
			25	12	22.37		
			25	24	22.23		
			50	0	21.26		
			1	0	23.08		
			1	24	23.03		
		16-QAM	1	49	23.02		
			25	0	22.10		
			25	12	22.14		
			25	24	22.16		
			50	0	22.13		
			1	0	21.76		
1	24	21.69					
1	49	21.81					
25	0	21.76					
25	12	21.48					
25	24	21.36					
50	0	21.11					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 5	5MHz	L 20425	826.5	QPSK	1	0	23.21
					1	12	23.20
					1	24	23.02
					12	0	23.18
					12	6	23.09
					12	11	22.99
				25	0	22.28	
				16-QAM	1	0	23.58
					1	12	23.35
					1	24	23.22
					12	0	22.66
					12	6	22.39
		12	11		22.18		
		M 20525	836.5	QPSK	1	0	21.80
					1	12	21.84
					1	24	21.77
					12	0	21.33
					12	6	21.21
					12	11	21.19
				25	0	21.18	
				16-QAM	1	0	21.80
					1	12	21.77
					1	24	21.91
					12	0	22.01
					12	6	21.92
		12	11		21.52		
		25	0	21.30			
		H 20625	846.5	QPSK	1	0	23.15
					1	12	23.18
					1	24	23.21
12	0				23.22		
12	6				23.19		
12	11				23.05		
25	0			22.24			
16-QAM	1			0	22.58		
	1			12	22.50		
	1			24	22.48		
	12			0	22.35		
	12			6	22.16		
	12	11	21.98				
25	0	21.24					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 5	3MHz	L 20415	825.5	QPSK	1	0	23.36
					1	7	23.36
					1	14	23.33
					8	0	23.21
					8	4	23.15
					8	7	22.85
				15	0	22.42	
				16-QAM	1	0	22.70
					1	7	22.61
					1	14	22.59
					8	0	22.67
					8	4	22.56
		8	7		22.24		
		M 20525	836.5	QPSK	1	0	23.02
					1	7	22.99
					1	14	23.07
					8	0	23.10
					8	4	22.96
					8	7	22.36
				15	0	22.18	
				16-QAM	1	0	22.20
					1	7	22.14
					1	14	22.20
					8	0	22.33
					8	4	22.21
		8	7		21.78		
		H 20635	847.5	QPSK	1	0	23.09
					1	7	23.06
					1	14	23.11
					8	0	23.05
8	4				22.89		
8	7				22.77		
15	0			22.15			
16-QAM	1			0	21.97		
	1			7	21.92		
	1			14	21.99		
	8			0	21.88		
	8			4	21.73		
	8	7	21.45				
15	0	21.12					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 5	1.4MHz	L 20407	824.7	QPSK	1	0	23.33
					1	2	23.37
					1	5	23.35
					3	0	23.35
					3	1	23.33
					3	2	23.31
				16-QAM	6	0	22.35
					1	0	22.67
					1	2	22.65
					1	5	22.69
					3	0	22.52
					3	1	22.39
		M 20525	836.5	QPSK	3	2	22.22
					6	0	21.27
					1	0	23.17
					1	2	23.20
					1	5	23.15
					3	0	23.17
				16-QAM	3	1	23.18
					3	2	23.19
					6	0	22.20
					1	0	22.33
					1	2	22.28
					1	5	22.30
		H 20643	848.3	QPSK	3	0	22.45
					3	2	22.31
					3	5	21.66
					6	0	21.18
					1	0	23.14
					1	2	23.07
16-QAM	1			5	23.13		
	3			0	23.14		
	3			1	23.12		
	3			2	23.12		
	6			0	22.21		
	1			0	21.97		
16-QAM	1	2	21.90				
	1	5	21.88				
	3	0	21.78				
	3	1	21.64				
	3	2	21.23				
	6	0	21.19				



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)	
					RB Size	RB Offset		
LTE Band 7	20MHz	L 20850	2510	QPSK	1	0	22.64	
					1	49	22.56	
					1	99	22.46	
					50	0	21.71	
					50	25	21.66	
					50	49	21.50	
				16-QAM	100	0	21.53	
					1	0	21.28	
					1	49	21.18	
					1	99	21.15	
					50	0	21.36	
					50	25	21.12	
		M 21100	2535	QPSK	2535	50	49	21.03
						100	0	20.66
						1	0	22.20
						1	49	22.23
						1	99	22.24
						50	0	21.51
				16-QAM	50	25	21.38	
					50	49	21.24	
					100	0	21.27	
					1	0	21.31	
					1	49	21.19	
					1	99	21.28	
		H 21350	2560	QPSK	2560	50	0	21.34
						50	25	20.96
						50	49	20.54
						100	0	20.69
						1	0	22.16
						1	49	22.51
16-QAM	1			99	22.65			
	50			0	21.70			
	50			25	21.53			
	50			49	21.46			
	100			0	21.39			
	1			0	21.00			
1	49	21.16						
1	99	21.23						
50	0	21.08						
50	25	21.01						
50	49	20.99						
100	0	20.92						



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)	
					RB Size	RB Offset		
LTE Band 7	15MHz	L 20825	2507.5	QPSK	1	0	22.63	
					1	37	22.47	
					1	74	22.69	
					36	0	21.73	
					36	18	21.69	
					36	35	21.56	
				16-QAM	75	0	21.62	
					1	0	21.85	
					1	37	21.82	
					1	74	21.73	
					36	0	21.63	
					36	18	21.58	
		M 21100	2535	QPSK	2535	36	35	21.44
						75	0	20.74
						1	0	21.96
						1	37	22.09
						1	74	22.15
						36	0	22.02
				16-QAM	36	18	22.10	
					36	35	22.28	
					75	0	21.49	
					1	0	21.21	
					1	37	21.28	
					1	74	21.28	
		H 21375	2562.5	QPSK	2562.5	36	0	21.32
						36	18	21.24
						36	35	21.80
						75	0	20.69
						1	0	22.30
						1	37	22.46
16-QAM	1			74	22.64			
	36			0	22.31			
	36			18	22.29			
	36			35	22.12			
	75			0	21.57			
	1			0	20.91			
1	37	21.02						
1	74	21.03						
36	0	21.08						
36	18	21.13						
36	35	21.14						
75	0	20.52						



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 7	10MHz	L 20800	2505	QPSK	1	0	22.65
					1	24	22.55
					1	49	22.48
					25	0	21.70
					25	12	21.69
					25	24	21.59
				16-QAM	50	0	21.63
					1	0	21.93
					1	24	21.81
					1	49	21.76
					25	0	21.94
					25	12	21.64
		M 21100	2535	QPSK	25	24	21.55
					50	0	20.83
					1	0	22.09
					1	24	21.44
					1	49	22.15
					25	0	21.36
				16-QAM	25	12	21.35
					25	24	21.26
					50	0	21.20
					1	0	21.33
					1	24	21.32
					1	49	21.30
		H 21400	2565	QPSK	25	0	21.34
					25	12	21.22
					25	24	21.16
					50	0	20.26
					1	0	22.41
					1	24	22.48
16-QAM	1			49	22.59		
	25			0	21.51		
	25			12	21.49		
	25			24	21.50		
	50			0	21.43		
	1			0	21.41		
1	24	21.40					
1	49	21.42					
25	0	21.50					
25	12	21.52					
25	24	21.53					
50	0	20.55					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)	
					RB Size	RB Offset		
LTE Band 7	5MHz	L 20775	2502.5	QPSK	1	0	22.65	
					1	12	22.66	
					1	24	22.64	
					12	0	22.67	
					12	6	22.68	
					12	11	21.62	
				16-QAM	25	0	21.68	
					1	0	21.87	
					1	12	21.85	
					1	24	21.82	
					12	0	21.89	
					12	6	21.77	
		M 21100	2535	QPSK	2535	12	11	21.63
						25	0	20.74
						1	0	22.19
						1	12	22.18
						1	24	22.16
						12	0	21.23
				16-QAM	12	6	21.22	
					12	11	21.21	
					25	0	21.27	
					1	0	21.06	
					1	12	21.05	
					1	24	21.08	
		H 21425	2567.5	QPSK	2567.5	12	0	21.11
						12	6	21.14
						12	11	21.10
						25	0	20.25
						1	0	22.57
						1	12	22.55
				16-QAM	1	24	22.56	
					12	0	21.52	
					12	6	21.52	
					12	11	21.52	
					25	0	21.53	
					1	0	21.21	
16-QAM	1	12	21.12					
	1	24	21.35					
	12	0	21.22					
	12	6	21.21					
	12	11	21.00					
	25	0	20.61					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 17	10MHz	L 23780	709	QPSK	1	0	23.13
					1	24	23.27
					1	49	23.04
					25	0	22.22
					25	12	22.21
					25	24	22.35
				50	0	22.28	
				16-QAM	1	0	22.41
					1	24	22.48
					1	49	22.44
					25	0	22.48
					25	12	22.37
		25	24		22.12		
		M 23790	710	QPSK	1	0	23.13
					1	24	23.11
					1	49	22.99
					25	0	22.31
					25	12	22.28
					25	24	22.18
				50	0	22.27	
				16-QAM	1	0	22.29
					1	24	22.23
					1	49	22.19
					25	0	22.15
					25	12	22.10
		25	24		22.01		
		50	0	21.34			
		H 23800	711	QPSK	1	0	23.21
					1	24	23.10
					1	49	23.14
25	0				22.25		
25	12				22.22		
25	24				22.17		
50	0			22.31			
16-QAM	1			0	22.05		
	1			24	21.94		
	1			49	21.85		
	25			0	22.06		
	25			12	21.95		
	25	24	21.74				
50	0	21.33					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 17	5MHz	L 23755	706.5	QPSK	1	0	22.37
					1	12	22.43
					1	24	22.48
					12	0	22.27
					12	6	22.26
					12	11	22.27
				16-QAM	25	0	22.31
					1	0	22.36
					1	12	22.39
					1	24	22.45
					12	0	22.44
					12	6	22.34
		M 23790	710	QPSK	12	11	22.33
					25	0	22.29
					1	0	23.21
					1	12	23.21
					1	24	23.06
					12	0	22.29
				16-QAM	12	6	22.20
					12	11	22.16
					25	0	22.32
					1	0	22.11
					1	12	22.10
					1	24	22.04
		H 23825	713.5	QPSK	12	0	22.15
					12	6	22.15
					12	11	22.14
					25	0	22.16
					1	0	23.15
					1	12	23.08
				16-QAM	1	24	23.05
					12	0	22.18
					12	6	22.15
					12	11	22.14
					25	0	22.16
					1	0	21.91
16-QAM	1	12	21.87				
	1	24	21.83				
	12	0	22.02				
	12	6	22.14				
	12	11	22.15				
	25	0	21.16				



2.2 Occupied Bandwidth

2.2.1 Definition

According to FCC section 2.1049 and 27.53(g), 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

See section 2.1.2 of this report.

2.2.3 Test Results

LTE Band 2

Low channel:

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	1.1045	1.1021	18615	1851.5	2.7183	2.7076
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	1.321	1.320	18615	1851.5	2.996	3.004

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	4.5205	4.5148	18650	1855.0	8.9731	8.9974
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	5.057	5.031	18650	1855.0	9.965	9.948

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18675	1857.5	13.507	13.466	18700	1860.0	17.976	18.004
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18675	1857.5	14.86	14.68	18700	1860.0	19.51	19.58



Middle channel:

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	1.1005	1.1053	18900	1880.0	2.7161	2.7187

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	1.304	1.329	18900	1880.0	3.003	3.003

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	4.5193	4.5142	18900	1880.0	8.9980	8.9948

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	4.998	5.057	18900	1880.0	9.966	9.926

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	13.412	13.458	18900	1880.0	17.931	17.930

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	14.68	14.73	18900	1880.0	19.67	19.54



High channel:

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
19192	1909.2	1.1084	1.1010	19184	1908.4	2.7129	2.7050

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
19192	1909.2	1.286	1.319	19184	1908.4	2.999	3.003

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
19175	1907.5	4.5051	4.5137	19150	1905.0	8.9914	8.9867

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
19175	1907.5	4.988	4.997	19150	1905.0	9.932	9.977

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
19125	1902.5	13.472	13.492	19100	1900.0	17.988	17.990

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
19125	1902.5	14.80	14.75	19100	1900.0	19.57	19.69

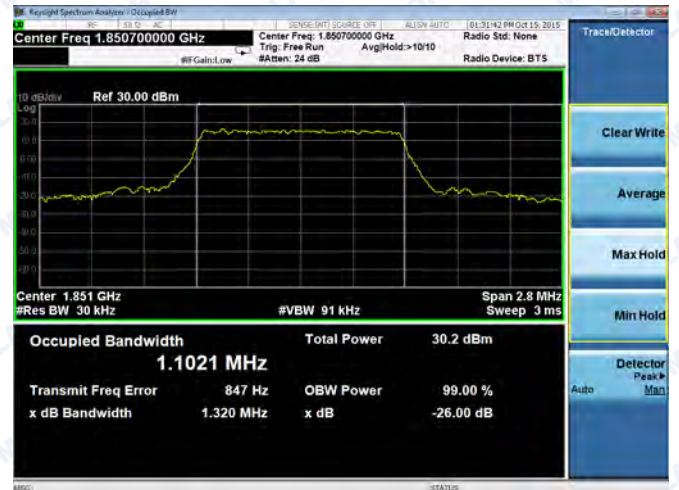


Low channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

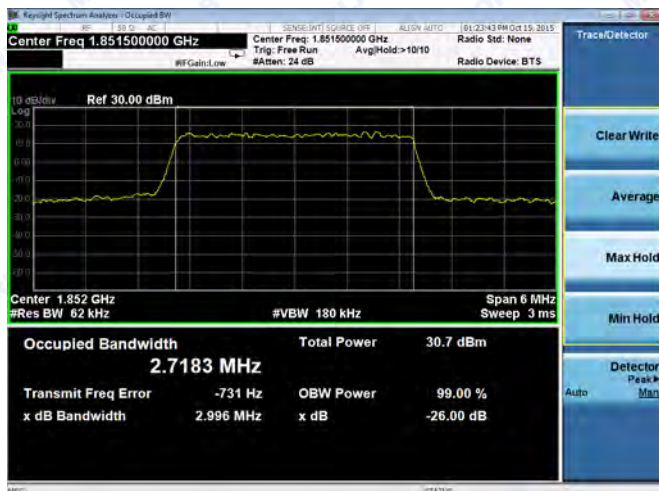
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM

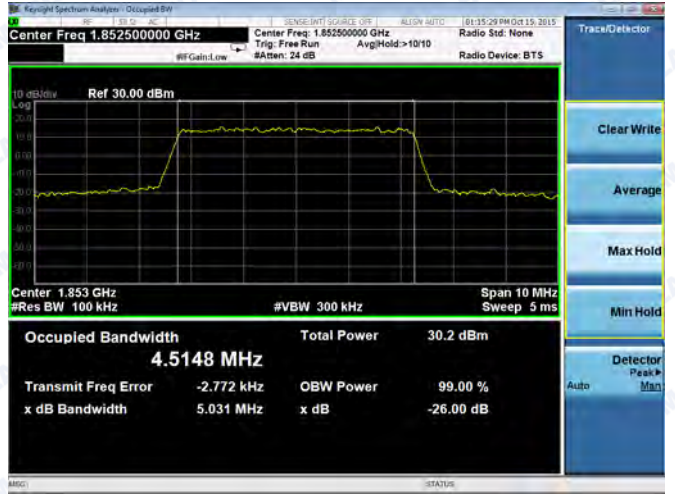




Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM

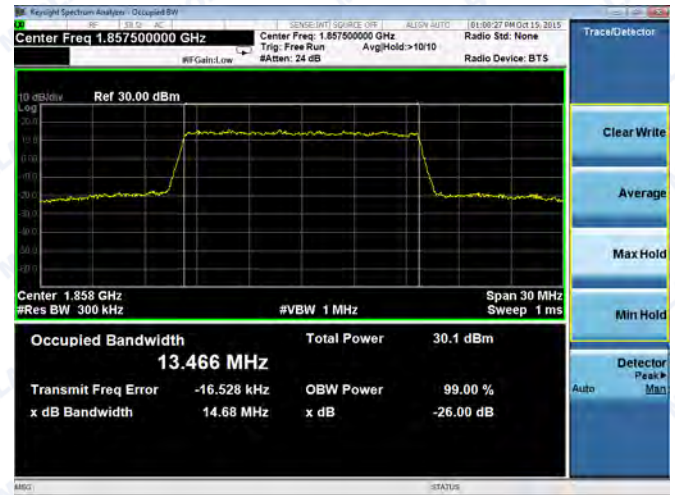
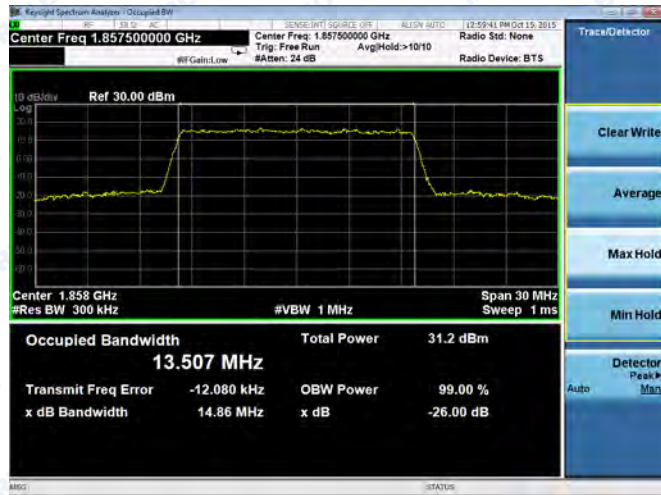




Spectrum Plot of Worst Value

15MHz/QPSK

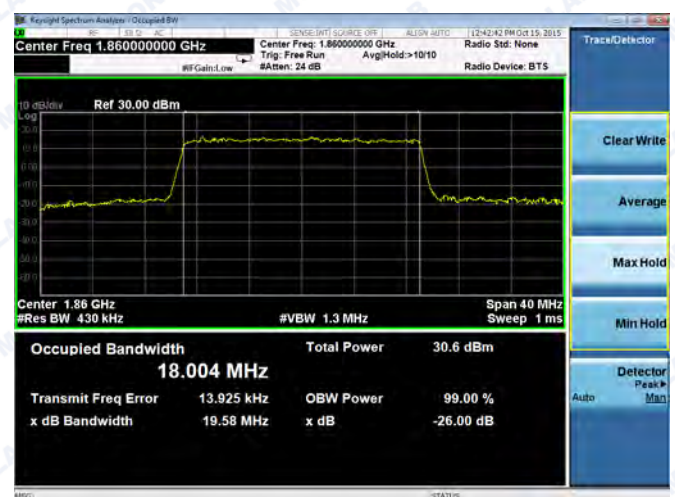
15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM





Middle channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

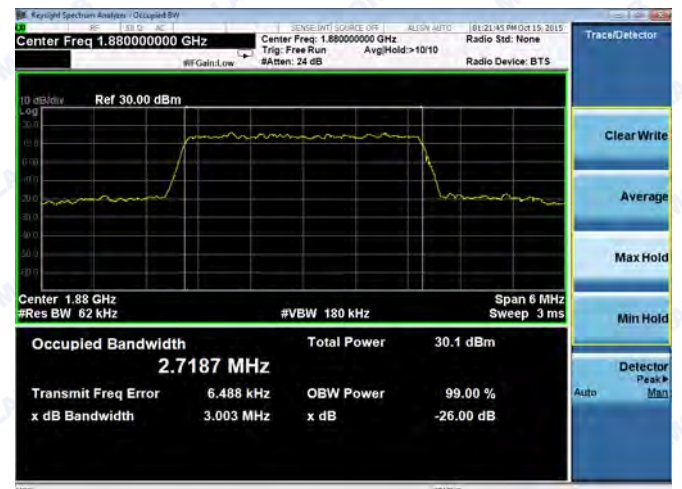
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM

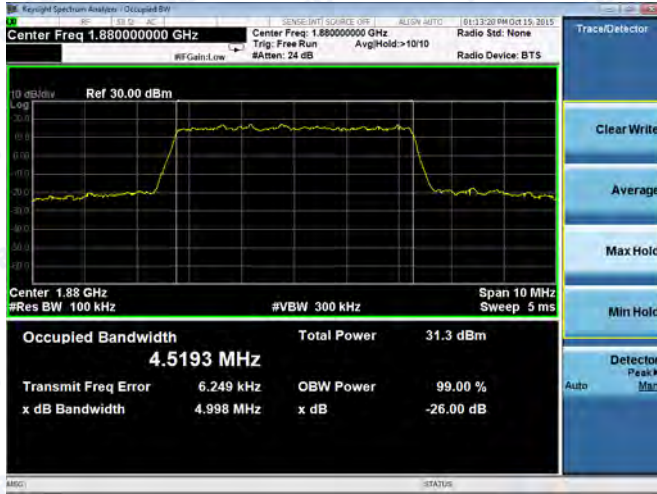




Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM

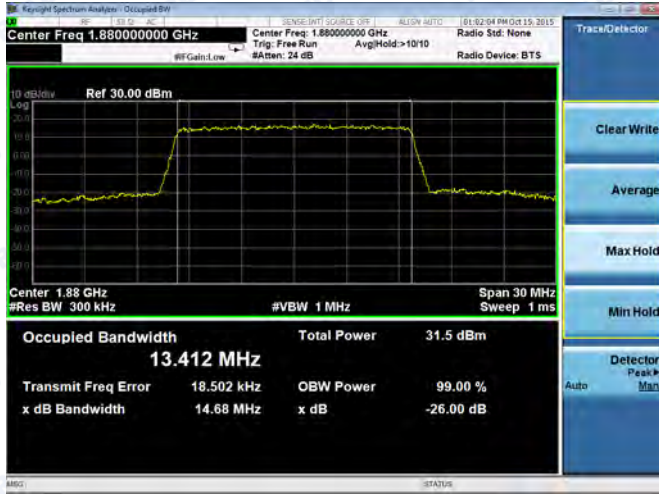




Spectrum Plot of Worst Value

15MHz/QPSK

15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM



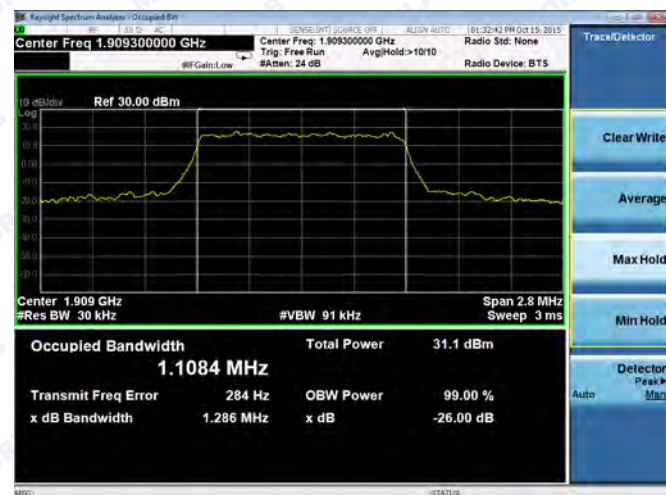


High channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

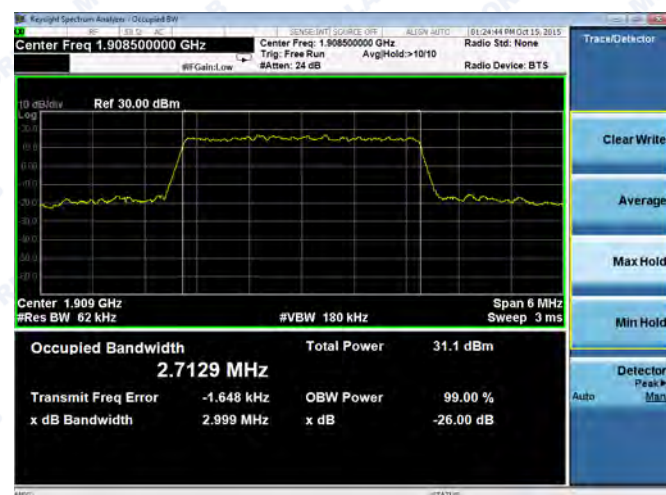
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM

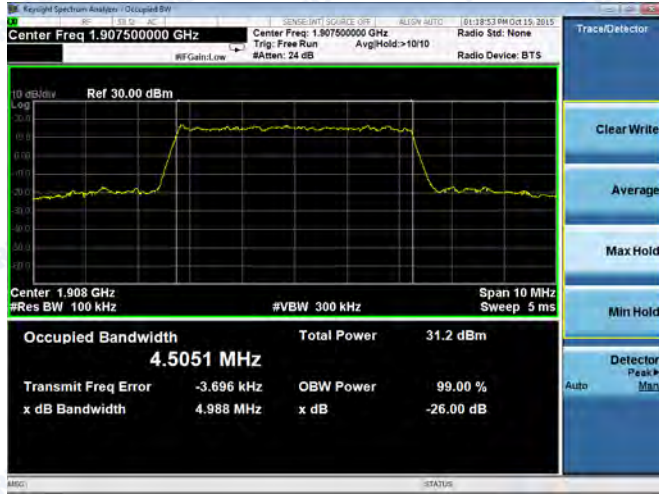




Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM

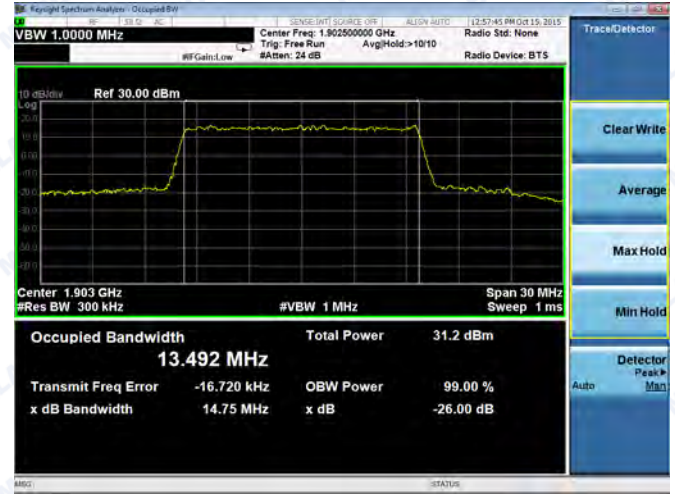




Spectrum Plot of Worst Value

15MHz/QPSK

15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM





LTE Band 5

Low channel:

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	1.1029	1.0954	20415	825.5	2.7147	2.7046

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20407	824.7	1.314	1.280	20415	825.5	2.990	2.998

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	4.5122	4.5074	20450	829.0	8.9908	9.0012

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20425	826.5	5.042	5.026	20450	829.0	9.974	9.914

Middle channel:

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20525	836.5	1.0962	1.015	20525	836.5	2.7127	2.7177

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20525	836.5	1.286	1.312	20525	836.5	2.994	3.007



Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20525	836.5	4.5067	4.5019	20525	836.5	9.0038	8.9857
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20525	836.5	4.988	5.025	20525	836.5	9.993	9.911

High channel:

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20643	848.3	1.0978	1.0962	20635	847.5	2.7074	2.7001
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20643	848.3	1.278	1.306	20635	847.5	3.006	2.995

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20625	846.5	4.4969	4.5039	20600	844.0	9.0045	9.0033
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20625	846.5	4.988	4.987	20600	844.0	9.982	9.969

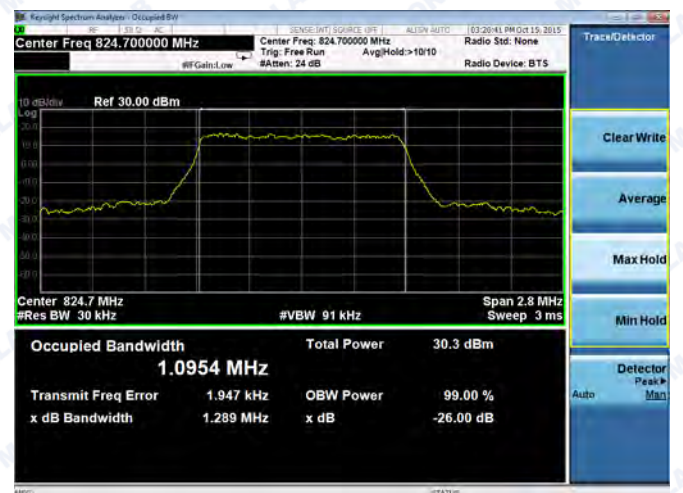


Low channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM





Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM





Middle channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

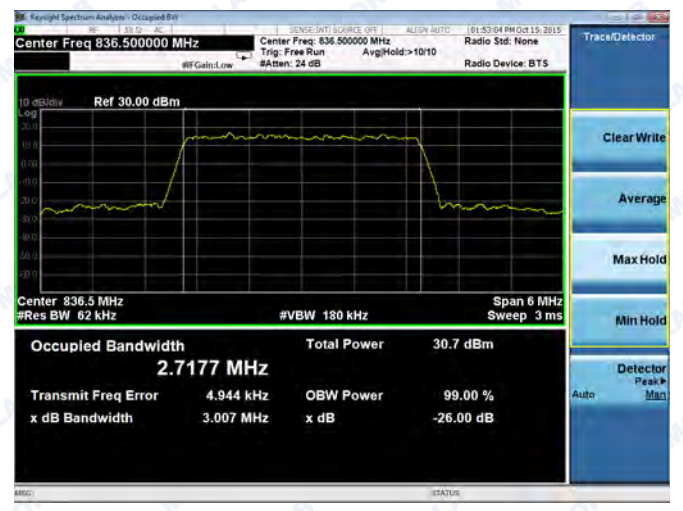
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM

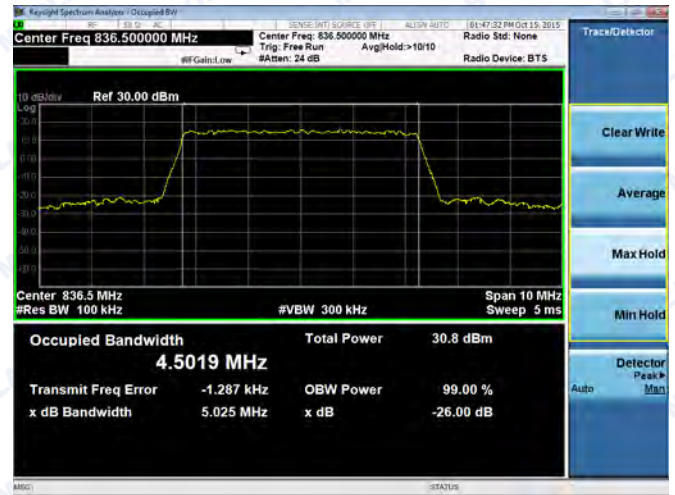
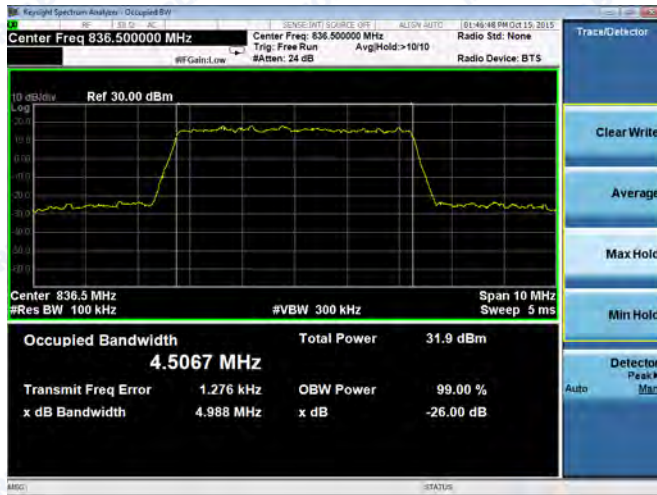




Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM





High channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

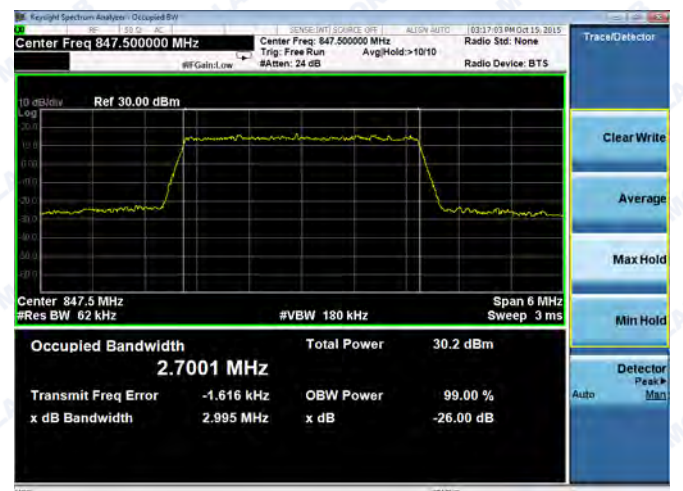
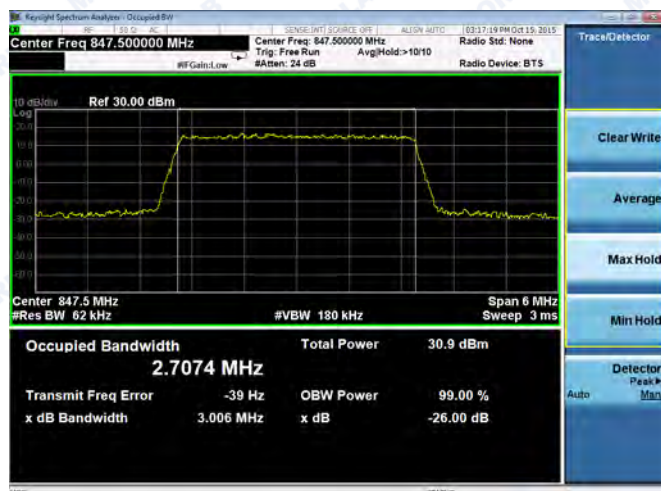
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM





Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM





LTE Band 7

Low channel:

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20775	2502.5	4.5140	4.5104	20800	2505.0	8.9802	8.9900
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20775	2502.5	5.021	5.009	20800	2505.0	9.865	9.851

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20825	2507.5	13.426	13.426	20850	2510.0	17.908	17.913
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20825	2507.5	14.70	14.68	20850	2510.0	19.63	19.48

Middle channel:

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
21100	2535.0	4.5075	4.5076	21100	2535.0	8.9891	8.9921
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
21100	2535.0	5.000	5.036	21100	2535.0	10.04	9.874



Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
21100	2535.0	13.455	13.452	21100	2535.0	17.951	17.999
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
21100	2535.0	14.69	14.68	21100	2535.0	19.46	19.54

High channel:

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
21425	2567.5	4.5052	4.5133	21400	2565.0	9.0009	8.9732
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
21425	2567.5	4.963	5.000	21400	2565.0	9.852	9.823

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
21375	2562.5	13.430	13.475	21350	2560.0	17.973	17.944
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
21375	2562.5	14.77	14.72	21350	2560.0	19.68	19.53



Low channel:

Spectrum Plot of Worst Value

5MHz/QPSK

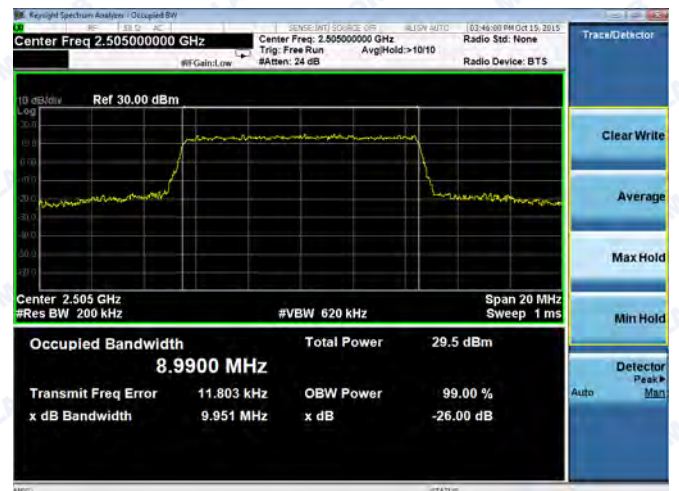
5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM

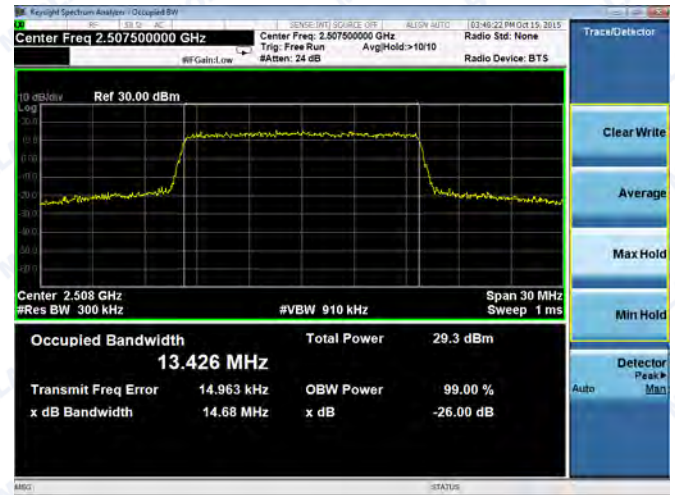
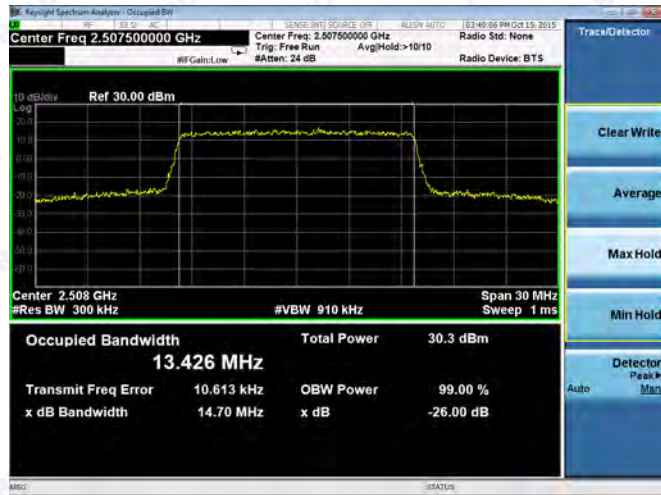




Spectrum Plot of Worst Value

15MHz/QPSK

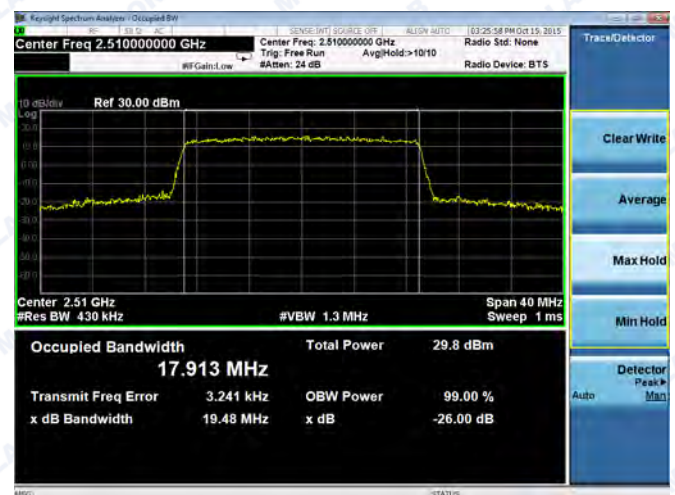
15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM





Middle channel:

Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM





Spectrum Plot of Worst Value

15MHz/QPSK

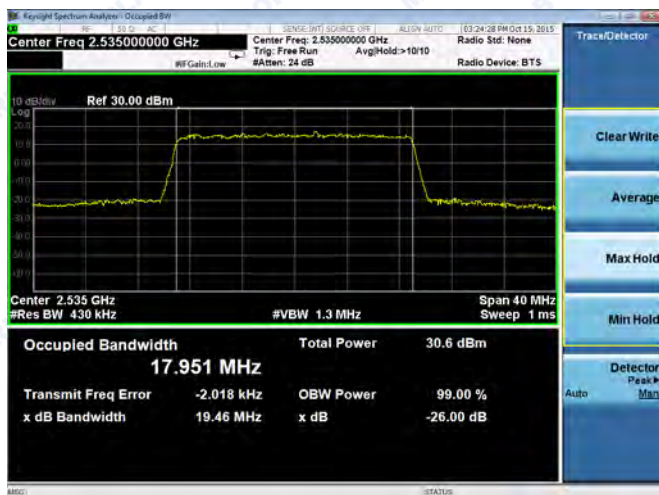
15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM





High channel:

Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM

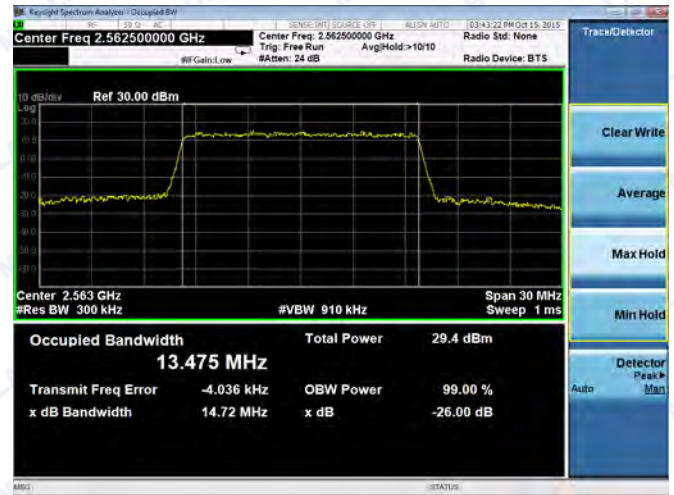
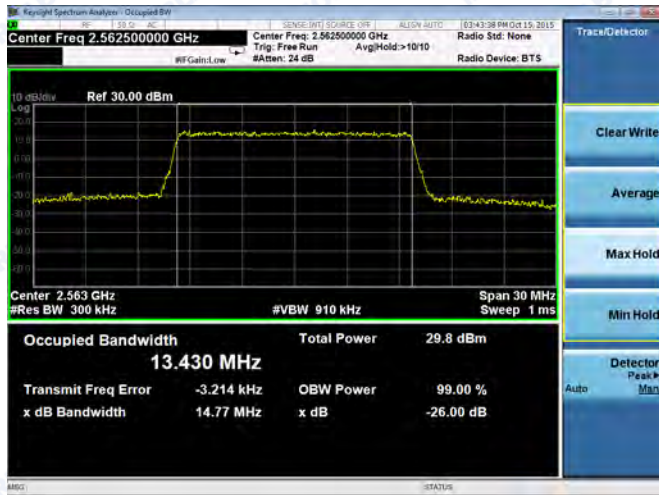




Spectrum Plot of Worst Value

15MHz/QPSK

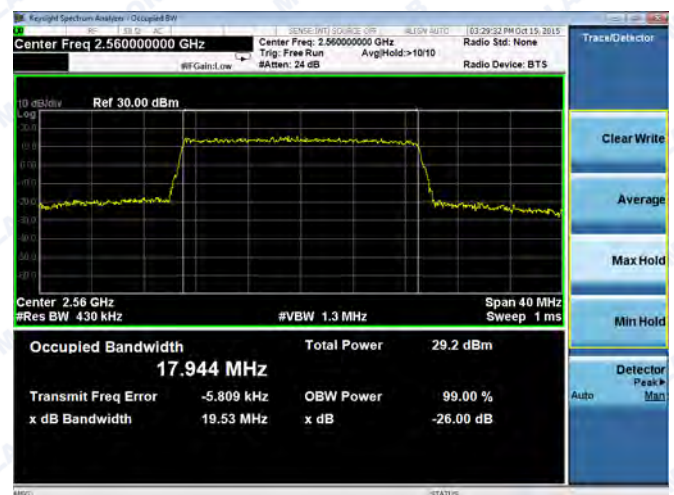
15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM





LTE Band 17

Low channel:

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
23755	706.5	4.5202	4.5273	23780	709.0	8.9693	8.9793

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
23755	706.5	5.028	4.993	23780	709.0	9.889	9.854

Middle channel:

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
23790	710	4.5122	4.5041	23790	710	8.9686	8.9508

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
23790	710	4.964	5.002	23790	710	9.880	9.792

High channel:

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
23825	713.5	4.5036	4.5105	23800	711	8.9626	8.9484

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
23825	713.5	4.963	4.996	23800	711	9.907	9.846

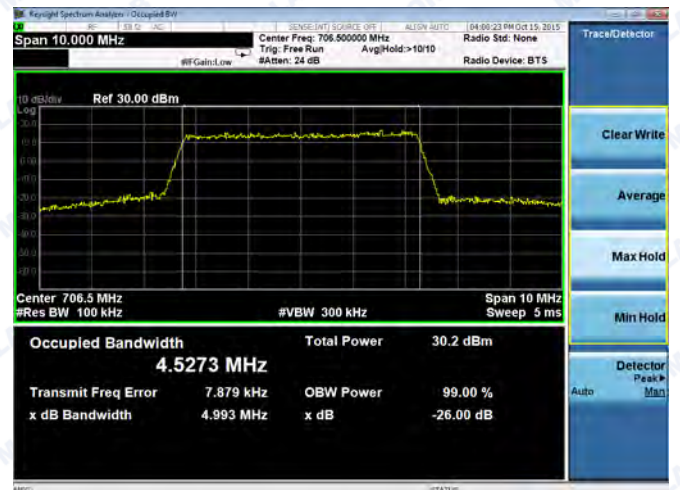


Low channel:

Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM





Middle channel:

Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM



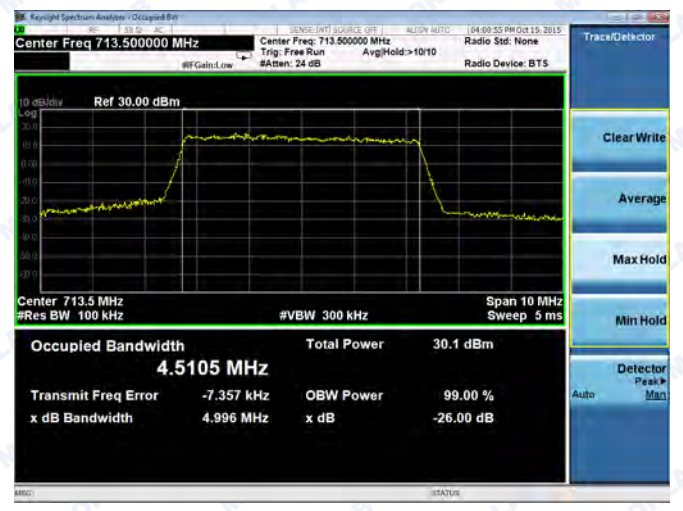
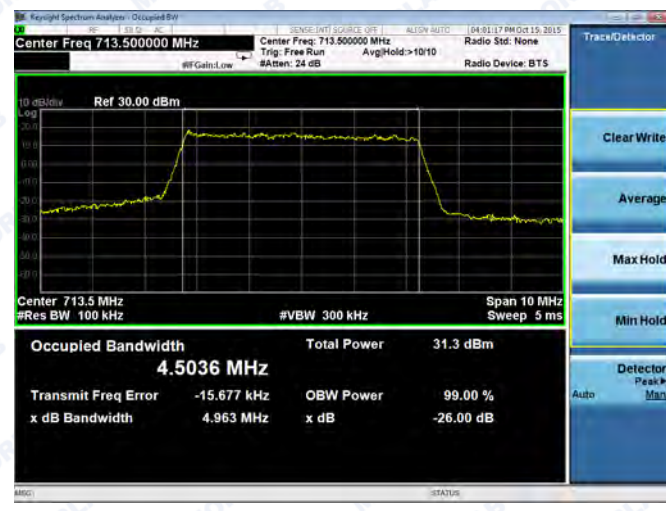


High channel:

Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM



2.3 Frequency Stability

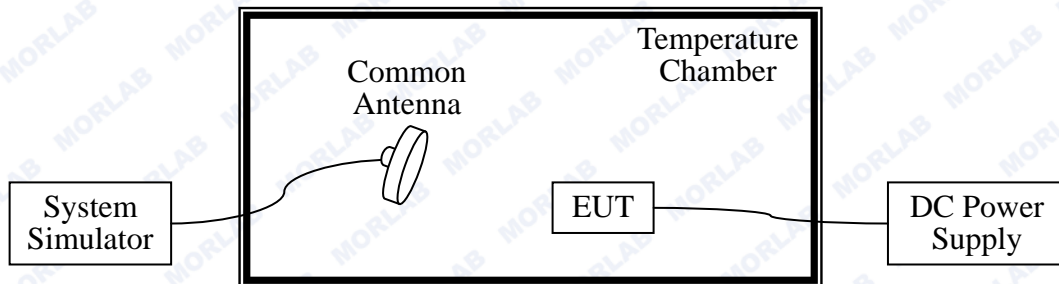
2.3.1 Requirement

According to FCC section 2.1055 and FCC section 27.54, 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

Test Setup:



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.

Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Rohde& Schwarz	CMW500	1201.0002k5 0/124534/wk	2015.02.26	2016.02.25
DC Power Supply	Good Will	GPS-3030DD	EF920938	2015.02.26	2016.02.25
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2015.02.26	2016.02.25



2.3.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.2VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is 20°C. The frequency deviation limit is ±2.5ppm.

The testing was performed using one RB and Bandwidth setting for each band.

LTE Band 2 – QPSK - Channel 18900 – Frequency 1880.0MHz – RB 6/0				
Limit: 1880.0MHz*1ppm=1880.0Hz				
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Result
100	4.2	-30	8.49	PASS
100		-20	15.73	
100		-10	9.44	
100		0	8.39	
100		+10	9.13	
100		+20	5.1	
100		+30	-15.27	
100		+40	6.94	
100		+50	7.05	
115		3.8	+20	
85	3.6	+20	6.33	

LTE Band 5 – QPSK - Channel 20525 – Frequency 836.5MHz – RB 6/0				
Limit: 836.5 MHz*2.5ppm=2091.25Hz				
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Result
100	4.2	-30	7.5	PASS
100		-20	-3.55	
100		-10	-3.59	
100		0	5.87	
100		+10	-0.22	
100		+20	7.74	
100		+30	4.6	
100		+40	6.79	
100		+50	-3.99	
115		3.8	+20	
85	3.6	+20	-3.4	



TE Band 7 – QPSK - Channel 21100 – Frequency 2535MHz – RB 25/0				
Limit: 2535MHz*2.5ppm=6337.5Hz				
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Result
100	4.2	-30	15.09	<u>PASS</u>
100		-20	-7.13	
100		-10	12.36	
100		0	14.27	
100		+10	13.09	
100		+20	12.01	
100		+30	-8.36	
100		+40	13.36	
100		+50	12.31	
115		3.8	+20	
85	3.6	+20	15.44	

TE Band 17 – QPSK - Channel 23790 – Frequency 710MHz – RB 25/0				
Limit: 710MHz*2.5ppm=1775Hz				
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Result
100	4.2	-30	6.8	<u>PASS</u>
100		-20	12.15	
100		-10	-10.64	
100		0	5.61	
100		+10	7.46	
100		+20	6.37	
100		+30	-12.82	
100		+40	6.86	
100		+50	8.75	
115		3.8	+20	
85	3.6	+20	10.11	



2.4 Peak to Average Ratio

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

See section 2.1.2 of this report.

2.4.3 Test Result

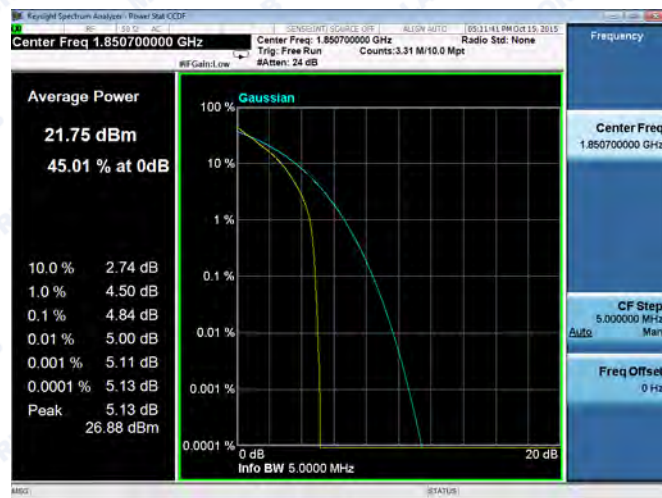
Record the maximum PAPR level associated with a probability of 0.1%.



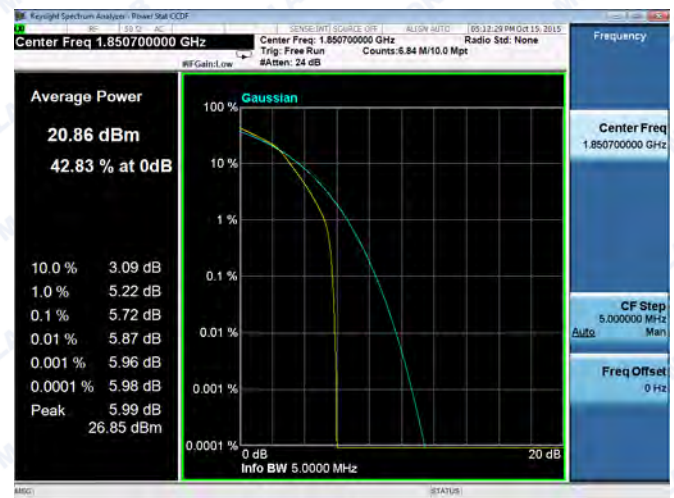
LTE Band 2 Low channel							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	4.84	5.72	18615	1851.5	5.23	6.10

Spectrum Plot of Worst Value (Low channel)

1.4MHz/QPSK

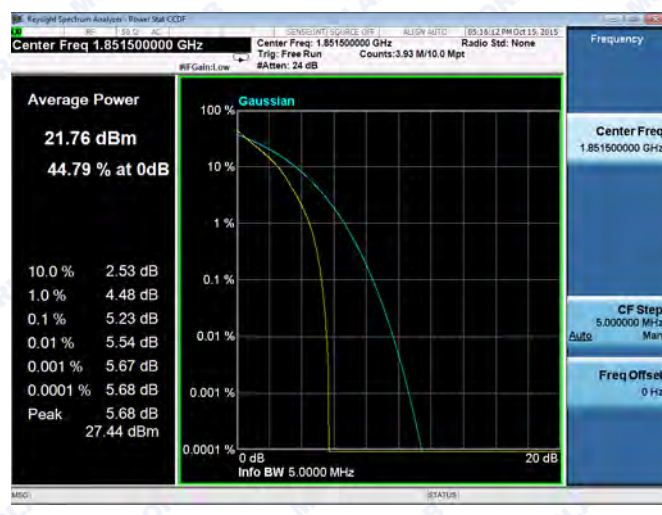


1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK



3MHz/16QAM



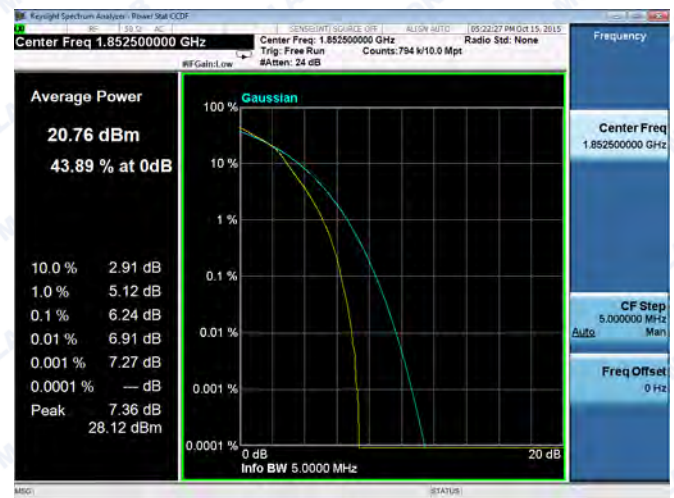
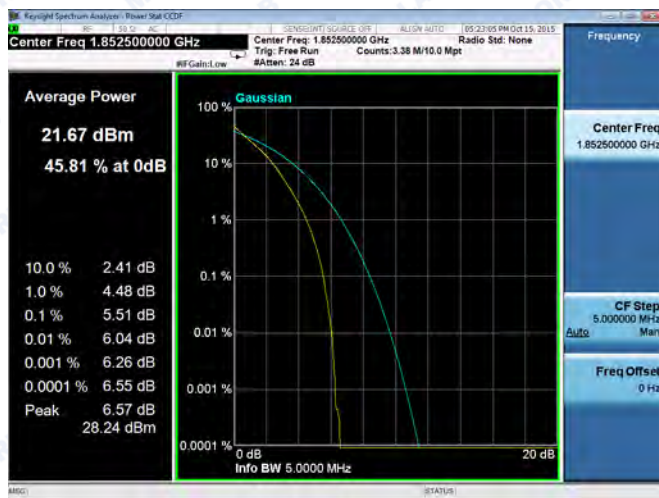


LTE Band 2 Low channel							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	5.51	6.24	18650	1855.0	6.10	6.84

Spectrum Plot of Worst Value

5MHz/QPSK

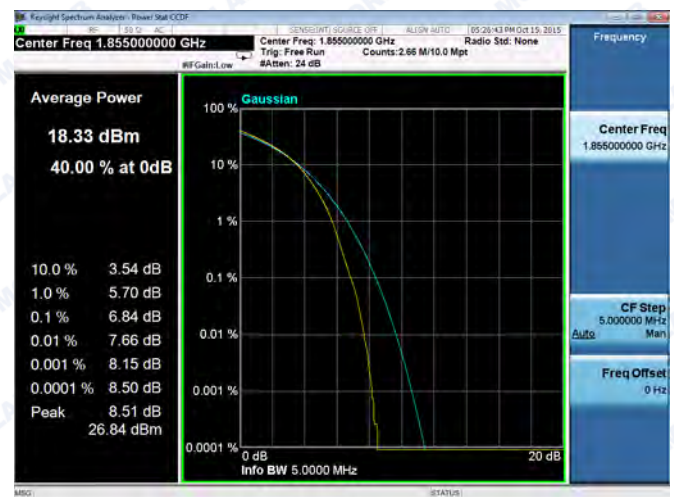
5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM

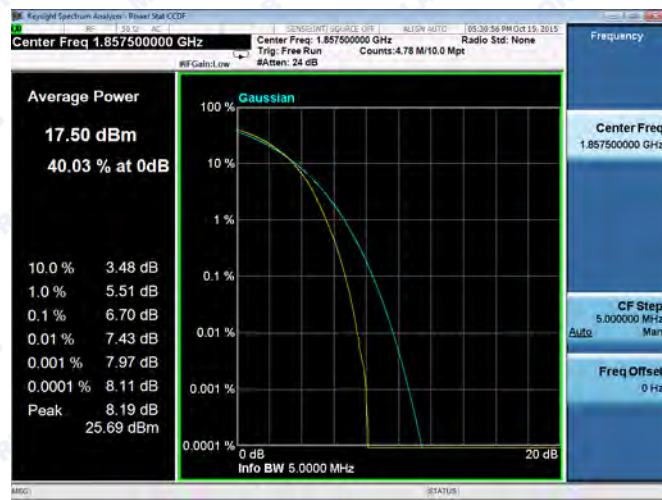




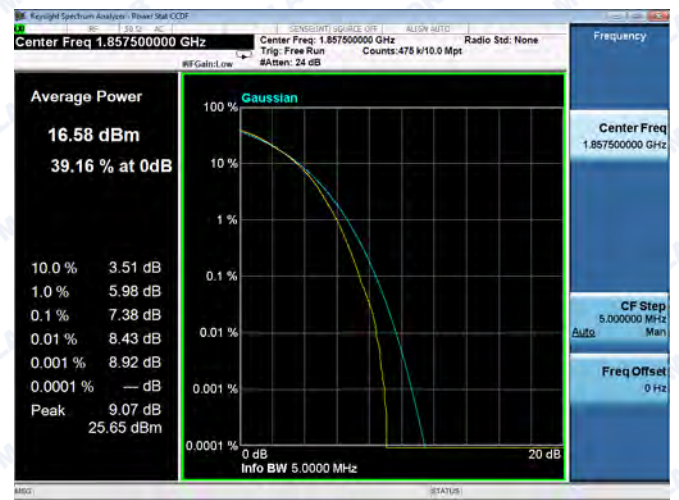
LTE Band 2 Low channel							
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18675	1857.5	6.70	7.38	18700	1860.0	7.13	7.64

Spectrum Plot of Worst Value

15MHz/QPSK

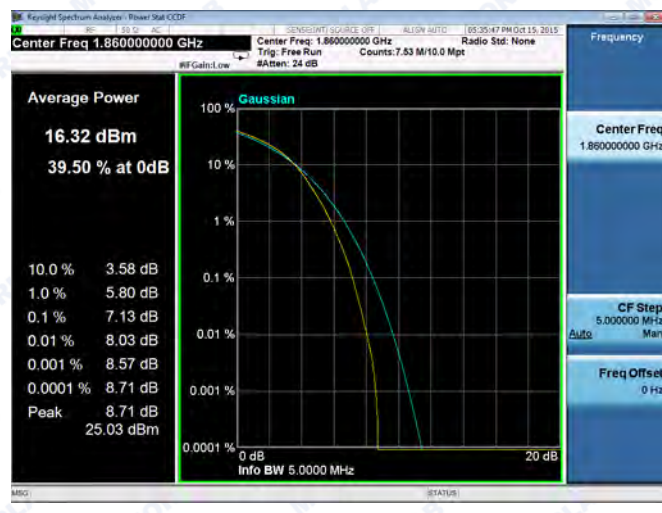


15MHz/16QAM

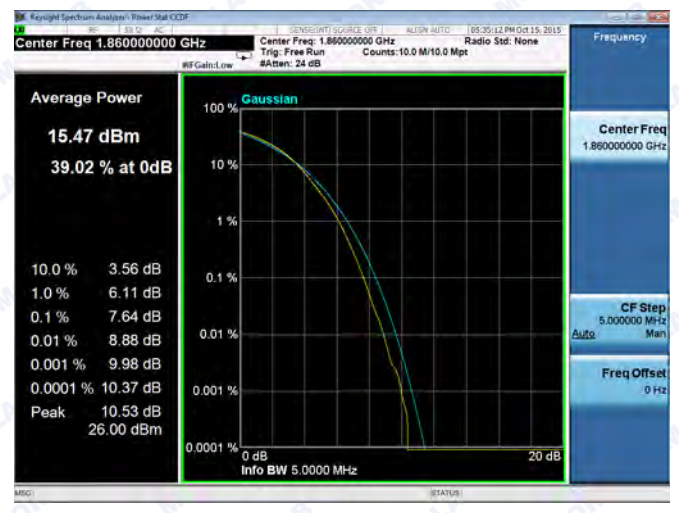


Spectrum Plot of Worst Value

20MHz/QPSK



20MHz/16QAM



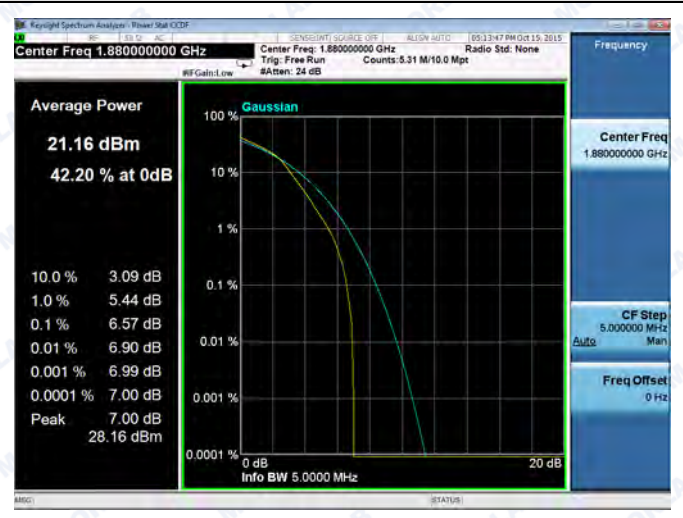


LTE Band 2 Middle channel							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	5.7	6.57	18900	1880.0	5.81	6.66

Spectrum Plot of Worst Value

1.4MHz/QPSK

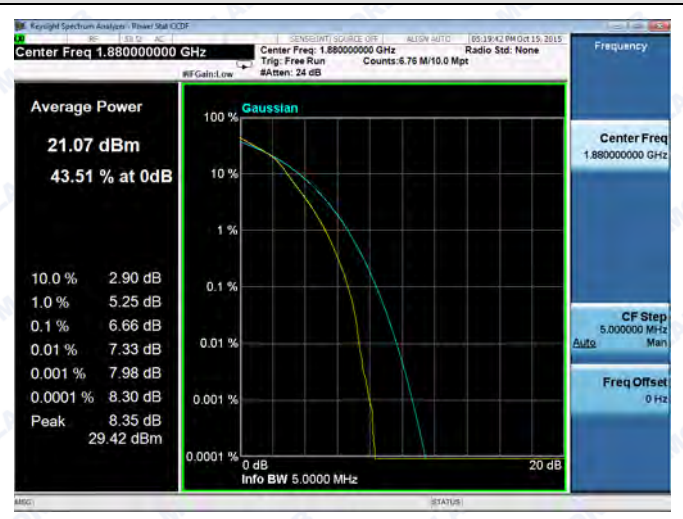
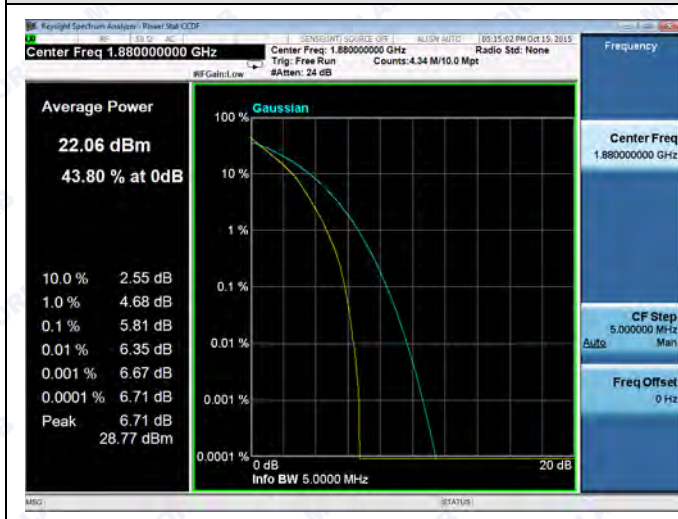
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

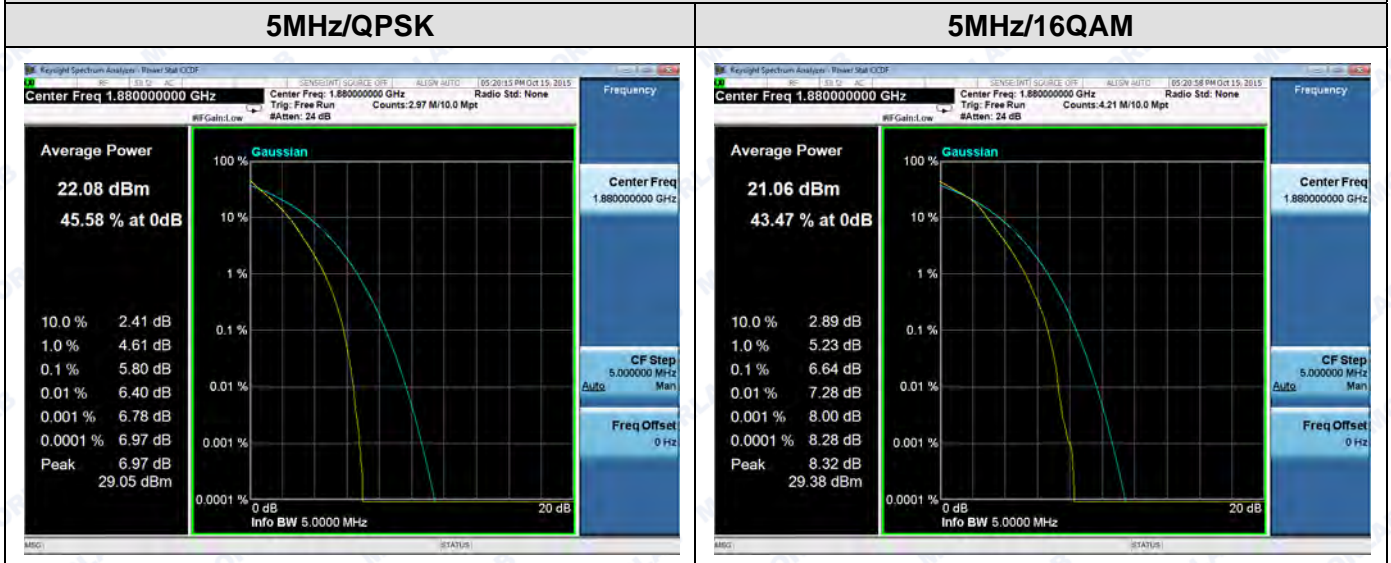
3MHz/16QAM





LTE Band 2 Middle channel							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	5.80	6.64	18900	1880.0	6.13	6.97

Spectrum Plot of Worst Value



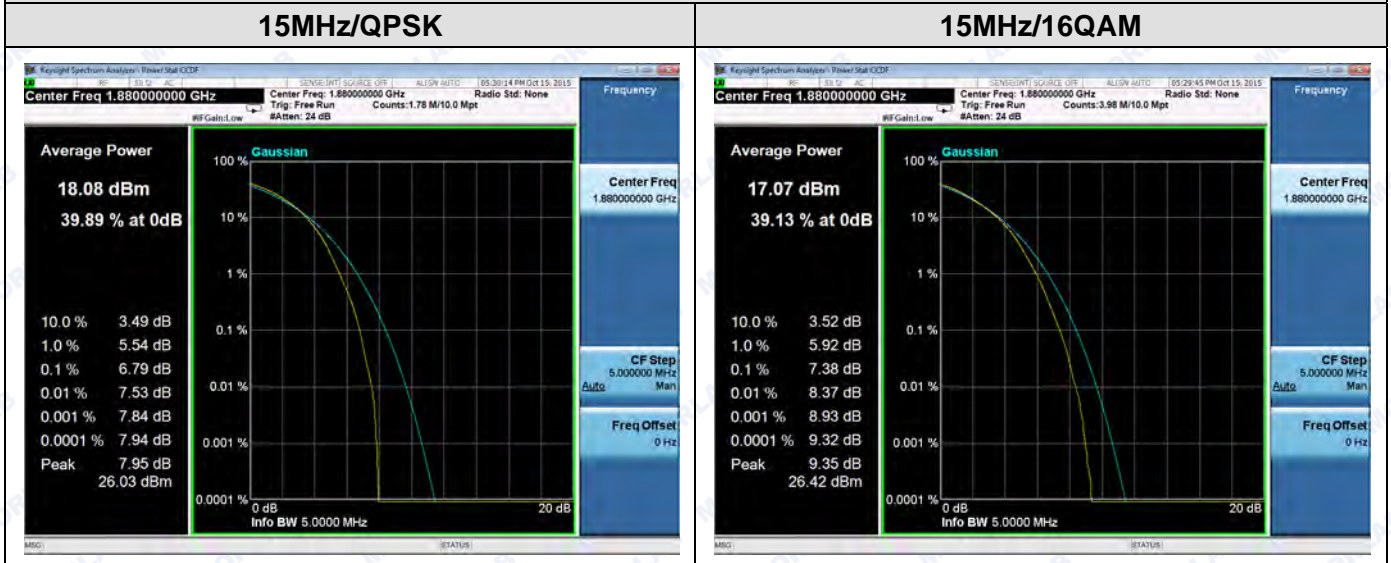
Spectrum Plot of Worst Value



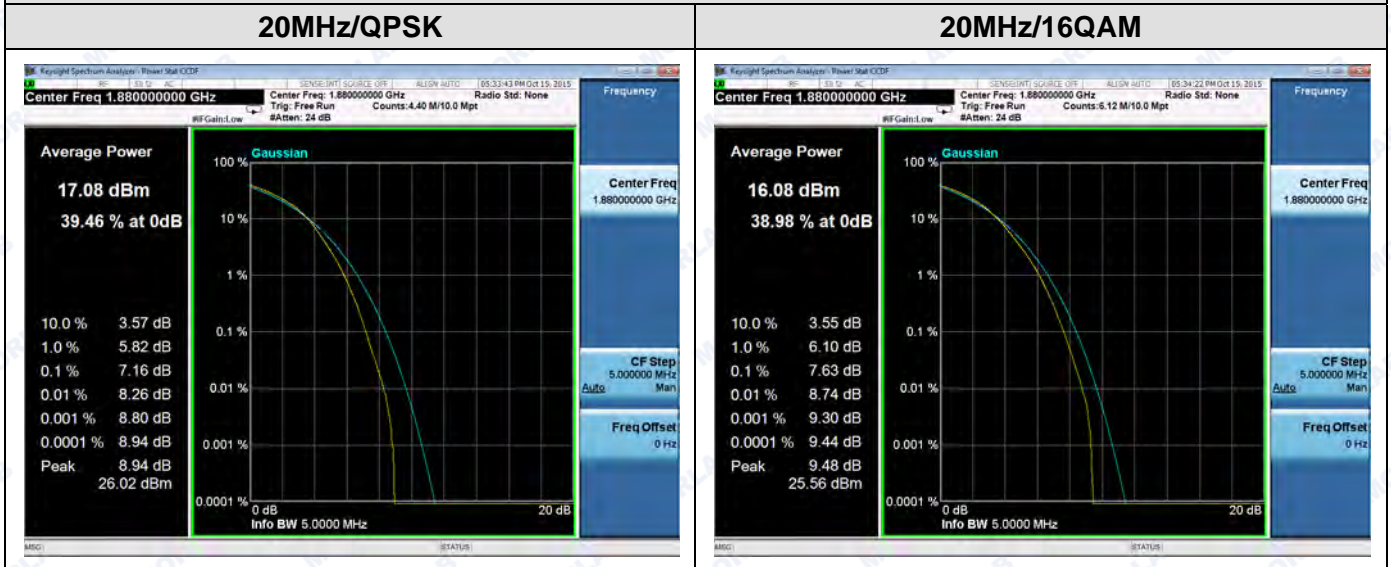


LTE Band 2 Middle channel							
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	6.79	7.38	18900	1880.0	7.16	7.63

Spectrum Plot of Worst Value



Spectrum Plot of Worst Value



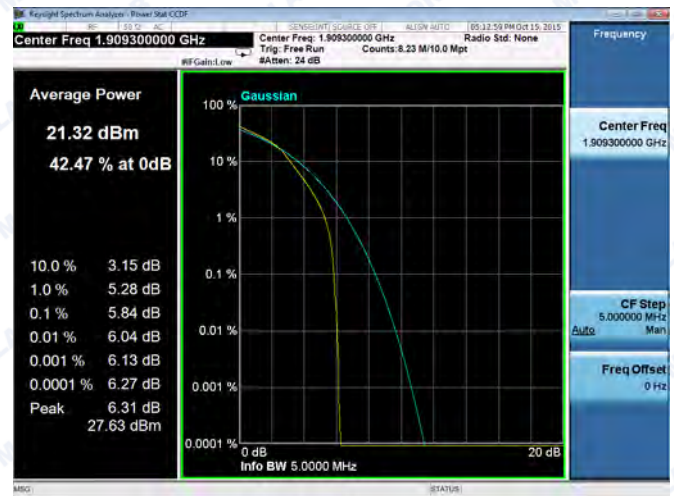


LTE Band 2 High channel							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19193	1909.3	4.81	5.84	19185	1908.5	5.41	6.28

Spectrum Plot of Worst Value

1.4MHz/QPSK

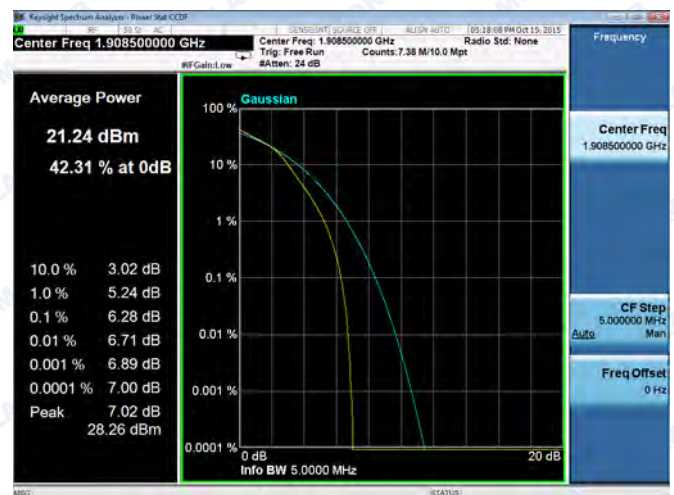
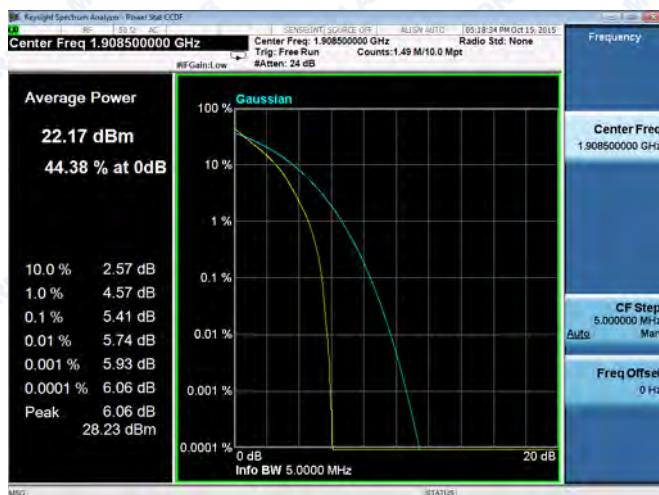
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM



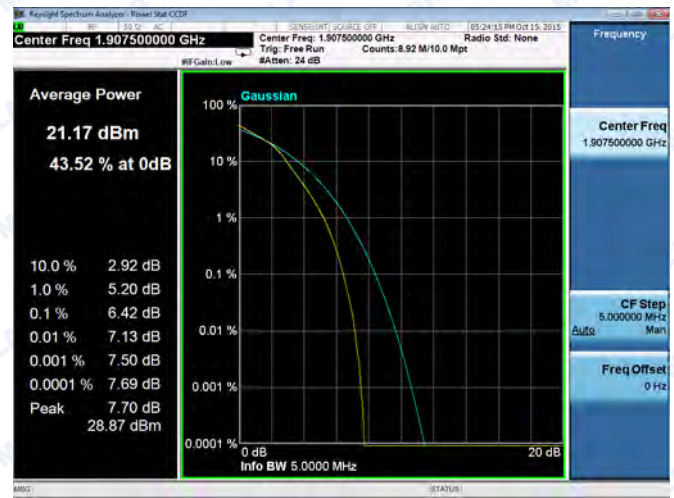
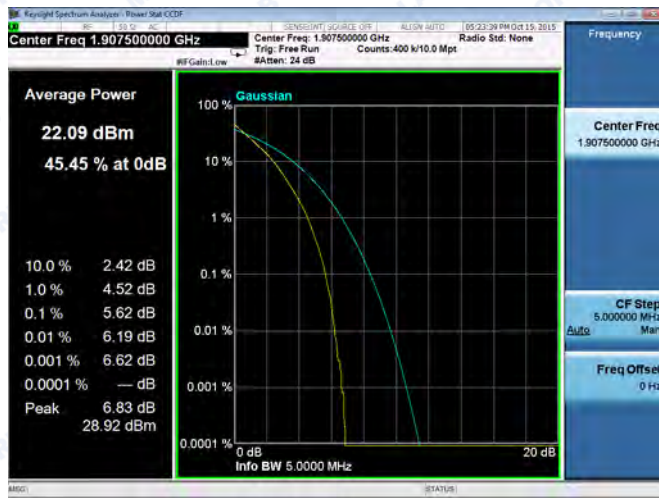


LTE Band 2 High channel							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19175	1907.5	5.62	6.42	19150	1905.0	6.19	6.93

Spectrum Plot of Worst Value

5MHz/QPSK

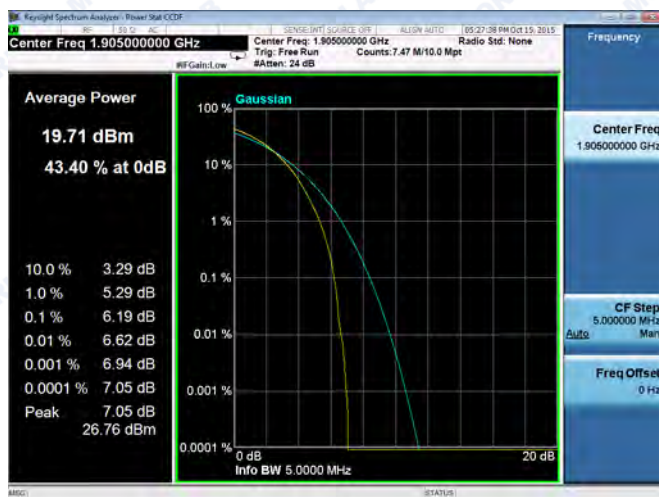
5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM



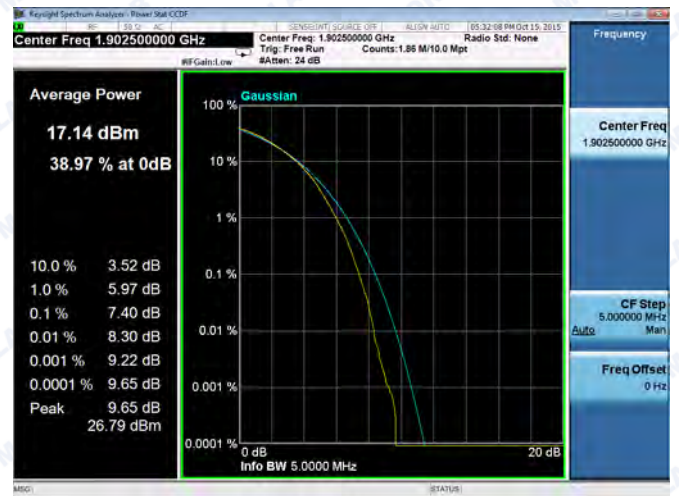
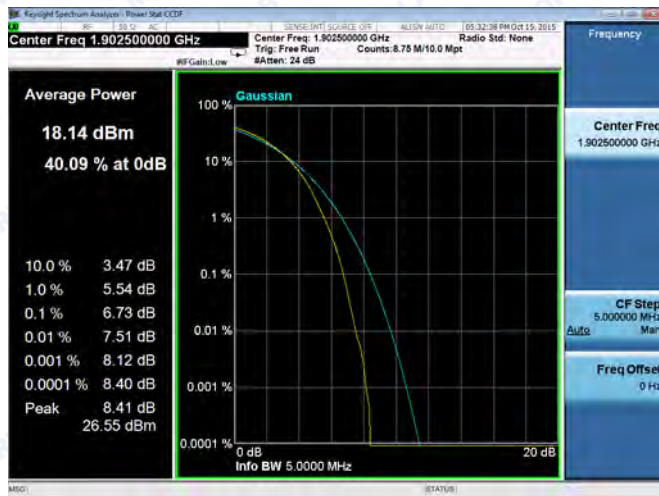


LTE Band 2 High channel							
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19125	1902.5	6.73	7.40	19100	1900.0	7.05	7.54

Spectrum Plot of Worst Value

15MHz/QPSK

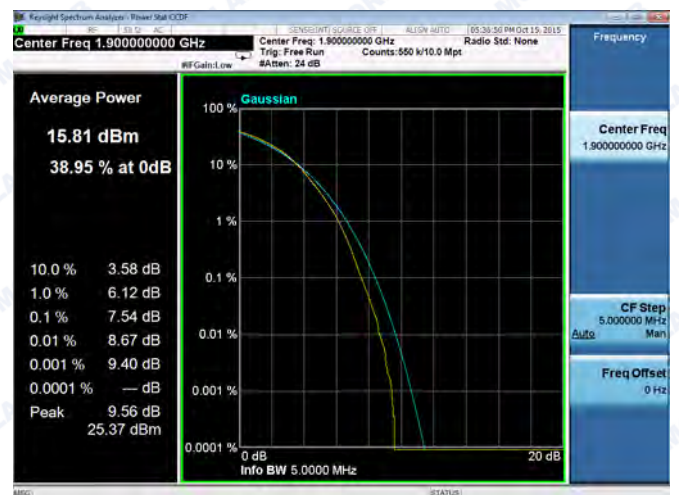
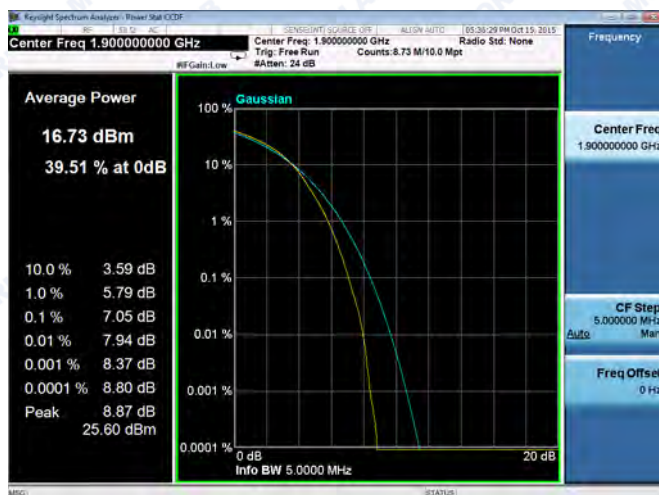
15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM





2.5 Conducted Spurious Emissions

2.5.1 Test Requirement

According to FCC section 2.1051 and 27.53(g), 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.

2.5.2 Test Procedure

See section 2.1.2 of this report.

Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.

2.5.3 Test Result

Compliant. See attached pots.

