



REPORT No.: SZ16030092W05

# FCC RF TEST REPORT

**APPLICANT** : Shenzhen Sang Fei Consumer Communications Co., Ltd

**PRODUCT NAME** : Mobile Phone

**MODEL NAME** : Philips S326

**TRADE NAME** : PHILIPS

**BRAND NAME** : PHILIPS

**FCC ID** : VQRCTS326

**STANDARD(S)** : 47 CFR Part 24, Subpart E  
47 CFR Part 27, Subpart L&M

**ISSUE DATE** : 2016-04-20



**SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.**

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Change History		
Issue	Date	Reason for change
1.0	2016-04-20	First edition

**TEST REPORT DECLARATION**

Applicant	Shenzhen Sang Fei Consumer Communications Co., Ltd
Applicant Address	11, Science And Technology Road, Shenzhen Hi-tech Industrial Park, Nanshan District, Shenzhen City, 518057, Guangdong, PEOPLE'S REPUBLIC OF CHINA
Manufacturer	Shenzhen Sang Fei Consumer Communications Co., Ltd
Manufacturer Address	11, Science And Technology Road, Shenzhen Hi-tech Industrial Park, Nanshan District, Shenzhen City, 518057, Guangdong, PEOPLE'S REPUBLIC OF CHINA
Product Name	Mobile Phone
Model Name	Philips S326
Brand Name	PHILIPS
HW Version	F1-FS086-MB-V3.0
SW Version	S326_T9830L_1610_V01A_AR
Test Standards	47 CFR Part 24, Subpart E 47 CFR Part 27, Subpart L&M
Test Date	2016-03-25 to 2016-04-09
Test Result	PASS

Tested by : Zou Jian  
Zou Jian

Reviewed by : Qiu Xiaojun  
Qiu Xiaojun

Approved by : Peng Huarui  
Peng Huarui





# 1. GENERAL INFORMATION

## 1.1 EUT Description

EUT Type .....: Mobile Phone  
Serial No. ....: (n.a, marked #1 by test site)  
Hardware Version.....: F1-FS086-MB-V3.0  
Software Version..... S326\_T9830L\_1610\_V01A\_AR  
Applicant .....: Shenzhen Sang Fei Consumer Communications Co., Ltd  
11,Science And Technology Road, Shenzhen Hi-tech Industrial  
Park, Nanshan District, Shenzhen City, 518057, Guangdong,  
PEOPLE'S REPUBLIC OF CHINA  
Manufacturer .....: Shenzhen Sang Fei Consumer Communications Co., Ltd  
11,Science And Technology Road, Shenzhen Hi-tech Industrial  
Park, Nanshan District, Shenzhen City, 518057, Guangdong,  
PEOPLE'S REPUBLIC OF CHINA  
Modulation Type.....: LTE Band 2: QPSK, 16QAM  
LTE Band 4: QPSK, 16QAM  
LTE Band 7: QPSK, 16QAM  
Tx Frequency Range.....: LTE Band 2: 1850MHz ~1910MHz  
LTE Band 4: 1710MHz ~1755MHz  
LTE Band 7: 2500MHz ~ 2570MHz  
Rx Frequency Range .....: LTE Band 2: 1930MHz ~ 1990MHz  
LTE Band 4: 2110MHz ~ 2155MHz  
LTE Band 7: 2620MHz ~ 2690MHz  
Emission Designator .....: 1M12G7D (LTE Band 2, QPSK, BW 1.4MHz)  
1M14W7D (LTE Band 2, 16QAM, BW 1.4MHz)  
2M75G7D (LTE Band 2, QPSK, BW 3MHz)  
2M77 W7D (LTE Band 2, 16QAM, BW 3MHz)  
4M55G7D (LTE Band 2, QPSK, BW 5MHz)  
4M55W7D (LTE Band 2, 16QAM, BW 5MHz)  
9M03G7D (LTE Band 2, QPSK, BW 10MHz)  
9M03W7D (LTE Band 2, 16QAM, BW 10MHz)  
13M52G7D (LTE Band 2, QPSK, BW 15MHz)  
13M52W7D (LTE Band 2, 16QAM, BW 15MHz)  
18M11G7D (LTE Band 2, QPSK, BW 20MHz)  
18M08W7D (LTE Band 2, 16QAM, BW 20MHz)  
1M12G7D (LTE Band 4, QPSK, BW 1.4MHz)  
1M13W7D (LTE Band 4, 16QAM, BW 1.4MHz)



- 2M75G7D (LTE Band 4, QPSK, BW 3MHz)
- 2M77W7D (LTE Band 4, 16QAM, BW 3MHz)
- 4M54G7D (LTE Band 4, QPSK, BW 5MHz)
- 4M55W7D (LTE Band 4, 16QAM, BW 5MHz)
- 9M02G7D (LTE Band 4, QPSK, BW 10MHz)
- 9M03W7D (LTE Band 4, 16QAM, BW 10MHz)
- 13M50G7D (LTE Band 4, QPSK, BW 15MHz)
- 13M50W7D (LTE Band 4, 16QAM, BW 15MHz)
- 17M77G7D (LTE Band 4, QPSK, BW 20MHz)
- 17M80W7D (LTE Band 4, 16QAM, BW 20MHz)
- 4M54G7D (LTE Band 7, QPSK, BW 5MHz)
- 4M55W7D (LTE Band 7, 16QAM, BW 5MHz)
- 9M03G7D (LTE Band 7, QPSK, BW 10MHz)
- 9M04W7D (LTE Band 7, 16QAM, BW 10MHz)
- 13M53G7D (LTE Band 7, QPSK, BW 15MHz)
- 13M54W7D (LTE Band 7, 16QAM, BW 15MHz)
- 18M04G7D (LTE Band 7, QPSK, BW 20MHz)
- 18M06W7D (LTE Band 7, 16QAM, BW 20MHz)

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 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
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, 24.238, 27.53(g)	Frequency Stability	<u>PASS</u>
4	2.1055, 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, 24.238, 27.53(g)(h), 27.53(m)(4)	Band Edge	<u>PASS</u>
7	24.232, 27.50(d)(4)	Equivalent Isotropic Radiated Power	<u>PASS</u>
8	2.1053, 2.1057, 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 24E & 27 REQUIREMENTS

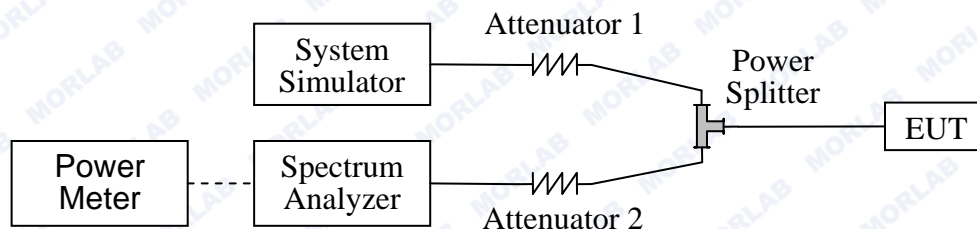
### 2.1 Transmitter Conducted Output Power

#### 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	2016.03.02	2017.03.01
Spectrum Analyzer	Rohde& Schwarz	FSL	10246	2016.03.02	2017.03.01
Spectrum Analyzer	Agilent	E4445A	MY44200685	2016.03.02	2017.03.01
Power Meter	Agilent	E4418B	GB43318055	2016.03.02	2017.03.01
Power Meter	Agilent	E4418B	GB43318055	2016.03.02	2017.03.01
Power Sensor	Agilent	8482A	MY41091706	2016.03.02	2017.03.01
Power Splitter	Weinschel	1506A	NW521	2016.03.02	2017.03.01
Attenuator 1	Resnet	20dB	(n.a.)	2016.03.02	2017.03.01
Attenuator 2	Resnet	3dB	(n.a.)	2016.03.02	2017.03.01

#### 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	21.22
					1	49	21.05
					1	99	21.57
					50	0	20.34
					50	25	20.41
					50	49	20.67
				100	0	20.46	
				16-QAM	1	0	20.95
					1	49	20.89
					1	99	21.00
					50	0	21.05
					50	25	20.99
		50	49		21.10		
		M 18900	1880	QPSK	1	0	21.65
					1	49	21.53
					1	99	21.48
					50	0	20.75
					50	25	20.69
					50	49	20.40
				100	0	20.78	
				16-QAM	1	0	21.49
					1	49	21.37
					1	99	21.31
					50	0	21.21
50	25				21.28		
50	49	21.19					
100	0	20.88					
H 19100	1900	QPSK	1	0	21.37		
			1	49	21.54		
			1	99	21.38		
			50	0	20.53		
			50	25	20.59		
			50	49	20.82		
		100	0	20.92			
		16-QAM	1	0	21.41		
			1	49	21.47		
			1	99	21.24		
			50	0	21.22		
			50	25	21.51		
50	49		21.46				
100	0	20.80					



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	20.26
					1	37	21.22
					1	74	20.50
					36	0	20.38
					36	18	20.29
					36	35	20.44
				75	0	20.36	
				16-QAM	1	0	19.96
					1	37	20.01
					1	74	19.98
					36	0	20.12
					36	18	20.22
		36	35		20.16		
		M 18900	1880	QPSK	75	0	20.19
					1	0	20.43
					1	37	21.50
					1	74	20.39
					36	0	20.92
					36	18	20.99
				16-QAM	36	35	20.64
					75	0	20.82
					1	0	20.39
					1	37	20.44
					1	74	20.33
					36	0	20.51
		H 19125	1902.5	QPSK	36	18	20.43
					36	35	20.39
					75	0	20.95
					1	0	20.29
					1	37	21.66
1	74				20.41		
16-QAM	36			0	20.56		
	36			18	20.69		
	36			35	20.77		
	75			0	20.68		
	1			0	20.11		
	1			37	20.21		
1	74	20.10					
36	0	20.23					
36	18	20.34					
36	35	20.50					
75	0	20.56					





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	20.66				
					1	24	21.02				
					1	49	20.68				
					25	0	20.48				
					25	12	20.51				
					25	24	20.52				
				16-QAM	50	0	20.50				
					1	0	20.32				
					1	24	20.29				
					1	49	20.34				
					25	0	20.25				
					25	12	20.31				
		M 18900	1880	QPSK	25	24	20.36				
					50	0	20.41				
					1	0	21.18				
					1	24	21.47				
					1	49	20.67				
					25	0	20.64				
				16-QAM	25	12	20.52				
					25	24	21.10				
					50	0	20.95				
					1	0	20.63				
					1	24	21.01				
					1	49	20.77				
		H 19150	1905	QPSK	25	0	20.84				
					25	12	21.03				
					25	24	20.94				
					50	0	21.06				
					1	0	21.03				
					1	24	21.62				
16-QAM	1			49	21.09						
	25			0	20.89						
	25			12	20.97						
	25			24	21.06						
	50			0	21.14						
	1			0	20.29						
				16-QAM	1	24	21.08				
					1	49	20.34				
					25	0	20.57				
					25	12	20.49				
									25	24	21.01
									50	0	21.16



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	21.11
					1	12	21.16
					1	24	20.90
					12	0	20.38
					12	6	20.94
					12	11	20.87
				25	0	20.66	
				16-QAM	1	0	20.83
					1	12	20.68
					1	24	20.74
					12	0	20.98
					12	6	20.88
		12	11		20.61		
		M 18900	1880	QPSK	1	0	21.04
					1	12	21.50
					1	24	21.30
					12	0	21.25
					12	6	20.88
					12	11	20.94
				25	0	20.90	
				16-QAM	1	0	20.25
					1	12	20.21
					1	24	20.62
					12	0	20.56
					12	6	20.41
		12	11		20.49		
		25	0	20.95			
		H 19175	1907.5	QPSK	1	0	21.39
					1	12	21.41
					1	24	21.20
12	0				20.91		
12	6				20.84		
12	11				20.89		
25	0			20.88			
16-QAM	1			0	20.56		
	1			12	20.61		
	1			24	20.60		
	12			0	20.55		
	12			6	20.37		
	12	11	20.46				
25	0	21.05					





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	21.06
					1	7	21.33
					1	14	20.83
					8	0	20.78
					8	4	20.71
					8	7	20.69
				15	0	20.87	
				16-QAM	1	0	21.05
					1	7	21.01
					1	14	20.85
					8	0	20.83
					8	4	20.79
		8	7		20.94		
		M 18900	1880	QPSK	1	0	21.16
					1	7	21.38
					1	14	21.36
					8	0	21.23
					8	4	21.26
					8	7	20.93
				15	0	20.88	
				16-QAM	1	0	21.16
					1	7	21.41
					1	14	21.46
					8	0	21.46
					8	4	21.37
		8	7		21.52		
		15	0	21.24			
		H 19185	1908.5	QPSK	1	0	21.36
					1	7	21.63
					1	14	21.46
8	0				21.39		
8	4				21.34		
8	7				21.67		
15	0			21.11			
16-QAM	1			0	20.74		
	1			7	20.59		
	1			14	20.77		
	8			0	20.62		
	8			4	20.58		
	8	7	20.94				
15	0	21.23					



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	21.09
					1	2	21.13
					1	5	21.17
					3	0	21.24
					3	1	21.11
					3	2	21.03
				16-QAM	6	0	20.77
					1	0	20.78
					1	2	20.66
					1	5	20.84
					3	0	20.94
					3	1	20.97
		M 18900	1880	QPSK	3	2	20.79
					3	0	20.68
					1	0	21.39
					1	2	21.38
					1	5	21.36
					3	0	21.53
				16-QAM	3	1	21.43
					3	2	21.26
					6	0	20.99
					1	0	20.82
					1	2	20.89
					1	5	20.67
		H 19193	1909.3	QPSK	3	0	20.72
					3	2	20.79
					3	5	20.63
					6	0	21.20
					1	0	21.64
					1	2	21.61
16-QAM	1			5	21.58		
	3			0	21.51		
	3			1	21.49		
	3			2	21.65		
	6			0	21.23		
	1			0	21.19		
1	2	21.11					
1	5	21.00					
3	0	21.01					
3	1	20.93					
3	2	20.88					
6	0	21.29					





Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 4	20MHz	L 20050	1720.0	QPSK	1	0	21.39
					1	49	21.05
					1	99	21.47
					50	0	20.03
					50	25	20.11
					50	49	20.07
				16-QAM	100	0	20.03
					1	0	20.05
					1	49	20.79
					1	99	20.19
					50	0	18.95
					50	25	18.26
		M 20175	1732.5	QPSK	50	49	19.23
					100	0	19.52
					1	0	21.96
					1	49	21.21
					1	99	21.01
					50	0	20.06
				16-QAM	50	25	20.28
					50	49	19.77
					100	0	20.02
					1	0	21.71
					1	49	21.01
					1	99	21.59
		H 20300	1745.0	QPSK	50	0	17.61
					50	25	18.69
					50	49	18.61
					100	0	19.72
					1	0	20.71
					1	49	20.93
16-QAM	1			99	20.93		
	50			0	19.86		
	50			25	19.83		
	50			49	20.24		
	100			0	19.78		
	1			0	20.76		
16-QAM	1	49	20.97				
	1	99	20.00				
	50	0	20.44				
	50	25	19.53				
	50	49	20.55				
	100	0	19.27				



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)				
					RB Size	RB Offset					
LTE Band 4	15MHz	L 20025	1717.5	QPSK	1	0	19.67				
					1	37	20.98				
					1	74	20.85				
					36	0	20.25				
					36	18	20.76				
					36	35	20.89				
				16-QAM	75	0	20.33				
					1	0	20.51				
					1	37	20.69				
					1	74	20.53				
					36	0	20.66				
					36	18	20.67				
		M 20175	1732.5	QPSK	36	35	20.88				
					75	0	19.78				
					1	0	19.91				
					1	37	20.74				
					1	74	19.73				
					36	0	20.24				
				16-QAM	36	18	20.31				
					36	35	20.01				
					75	0	20.24				
					1	0	19.86				
					1	37	20.72				
					1	74	19.71				
		H 20325	1747.5	QPSK	36	0	20.11				
					36	18	20.03				
					36	35	19.89				
					75	0	19.91				
					1	0	19.72				
					1	37	21.25				
				16-QAM	1	74	20.19				
					36	0	20.12				
					36	18	20.23				
					36	35	20.25				
					75	0	19.99				
					1	0	20.84				
				16-QAM	1	37	20.93				
					1	74	20.82				
					36	0	20.75				
					36	18	20.71				
									36	35	20.69
									75	0	19.44





Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)	
					RB Size	RB Offset		
LTE Band 4	10MHz	L 20000	1715.0	QPSK	1	0	21.04	
					1	24	21.09	
					1	49	20.68	
					25	0	20.55	
					25	12	21.03	
					25	24	20.78	
				16-QAM	50	0	20.63	
					1	0	20.74	
					1	24	20.89	
					1	49	20.94	
					25	0	20.82	
					25	12	20.71	
		M 20175	1732.5	QPSK	1732.5	25	24	20.64
						50	0	19.99
						1	0	21.07
						1	24	21.20
						1	49	20.38
						25	0	20.62
				16-QAM	25	12	20.56	
					25	24	20.40	
					50	0	20.60	
					1	0	20.65	
					1	24	21.12	
					1	49	20.37	
		H 20350	1750.0	QPSK	1750.0	25	0	20.38
						25	12	20.63
						25	24	20.43
						50	0	20.29
						1	0	20.99
						1	24	21.27
16-QAM	1			49	21.12			
	25			0	20.86			
	25			12	20.79			
	25			24	20.96			
	50			0	20.72			
	1			0	20.36			
1	24	20.56						
1	49	20.49						
25	0	20.67						
25	12	20.61						
25	24	20.45						
50	0	20.17						



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 4	5MHz	L 19975	1712.5	QPSK	1	0	20.82
					1	12	21.08
					1	24	20.92
					12	0	20.44
					12	6	20.56
					12	11	20.44
				16-QAM	25	0	20.50
					1	0	20.59
					1	12	20.87
					1	24	20.67
					12	0	20.63
					12	6	20.48
		M 20175	1732.5	QPSK	12	11	20.58
					25	0	19.97
					1	0	21.04
					1	12	21.02
					1	24	20.67
					12	0	20.53
				16-QAM	12	6	20.44
					12	11	20.32
					25	0	20.53
					1	0	20.06
					1	12	20.17
					1	24	19.87
		H 20375	1752.5	QPSK	12	0	20.21
					12	6	20.36
					12	11	20.34
					25	0	20.21
					1	0	20.92
					1	12	21.07
16-QAM	1			24	20.64		
	12			0	20.55		
	12			6	20.61		
	12			11	20.41		
	25			0	20.48		
	1			0	20.87		
				16-QAM	1	12	20.94
					1	24	20.99
					12	0	20.81
					12	6	20.74
					12	11	20.96
					25	0	19.92
					25	0	19.92





Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 4	3MHz	L 19965	1711.5	QPSK	1	0	20.78
					1	7	20.92
					1	14	20.84
					8	0	20.91
					8	4	20.96
					8	7	20.84
				16-QAM	15	0	20.50
					1	0	20.61
					1	7	20.65
					1	14	20.78
					8	0	20.79
					8	4	20.84
		M 20175	1732.5	QPSK	8	7	20.77
					8	0	20.10
					15	0	20.90
					1	0	20.83
					1	7	20.69
					1	14	20.74
				16-QAM	8	4	20.63
					8	7	20.84
					8	0	20.55
					15	0	20.99
					1	0	20.82
					1	7	20.64
		H 20385	1753.5	QPSK	1	14	20.64
					8	0	20.73
					8	4	20.61
					8	7	20.55
					15	0	20.23
					1	0	20.78
16-QAM	1			7	20.95		
	1			14	20.88		
	8			0	20.69		
	8			4	20.72		
	8			7	20.61		
	15			0	20.46		
1	0	20.31					
1	7	20.27					
1	14	20.12					
8	0	20.26					
8	4	20.34					
8	7	20.38					
15	0	19.90					



Band	Band Width	Channel	Freq.(MHz)	Modulation	RB Configuration		Average Power (dBm)
					RB Size	RB Offset	
LTE Band 4	1.4MHz	L 19957	1710.7	QPSK	1	0	20.79
					1	2	20.84
					1	5	20.89
					3	0	20.91
					3	1	20.93
					3	2	20.48
				6	0	20.45	
				16-QAM	1	0	20.54
					1	2	20.60
					1	5	20.69
					3	0	20.47
					3	1	20.55
		3	2		20.53		
		M 20175	1732.5	QPSK	1	0	21.18
					1	2	21.10
					1	5	20.85
					3	0	21.04
					3	1	20.97
					3	2	20.81
				6	0	20.51	
				16-QAM	1	0	20.12
					1	2	20.35
					1	5	20.26
					3	0	20.27
					3	2	20.19
		3	5		20.33		
		H 20393	1754.3	QPSK	1	0	20.77
					1	2	20.85
					1	5	20.91
					3	0	20.93
					3	1	20.86
					3	2	21.03
				6	0	20.43	
				16-QAM	1	0	20.34
					1	2	20.26
					1	5	20.57
3	0				20.39		
3	1				20.46		
3	2	20.47					
6	0	19.91					





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	21.38	
					1	49	21.42	
					1	99	20.87	
					50	0	21.17	
					50	25	21.20	
					50	49	20.52	
				16-QAM	100	0	20.84	
					1	0	21.13	
					1	49	21.16	
					1	99	20.65	
					50	0	20.77	
					50	25	20.69	
		M 21100	2535	QPSK	2535	50	49	20.81
						100	0	20.29
						1	0	21.33
						1	49	22.06
						1	99	21.51
						50	0	21.18
				16-QAM	50	25	21.23	
					50	49	21.12	
					100	0	21.41	
					1	0	21.17	
					1	49	21.93	
					1	99	21.21	
		H 21350	2560	QPSK	2560	50	0	21.25
						50	25	21.18
						50	49	21.16
						100	0	21.04
						1	0	20.84
						1	49	21.07
16-QAM	1			99	21.17			
	50			0	20.17			
	50			25	20.75			
	50			49	20.87			
	100			0	20.47			
	1			0	20.90			
1	49	21.13						
1	99	21.22						
50	0	21.27						
50	25	21.34						
50	49	21.39						
100	0	20.09						



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	20.91
					1	37	21.35
					1	74	20.41
					36	0	20.66
					36	18	20.78
					36	35	20.91
				75	0	21.39	
				16-QAM	1	0	21.31
					1	37	21.12
					1	74	21.18
					36	0	21.33
					36	18	21.23
		36	35		21.37		
		M 21100	2535	QPSK	1	0	20.95
					1	37	21.93
					1	74	20.98
					36	0	20.86
					36	18	20.76
					36	35	21.11
				75	0	21.49	
				16-QAM	1	0	21.78
					1	37	21.99
					1	74	21.86
					36	0	21.83
					36	18	21.44
		36	35		21.43		
		H 21375	2562.5	QPSK	1	0	20.21
					1	37	21.48
					1	74	20.57
					36	0	20.44
36	18				20.56		
36	35				20.61		
75	0			20.36			
16-QAM	1			0	20.28		
	1			37	21.55		
	1			74	21.41		
	36			0	21.43		
	36			18	21.31		
	36	35	21.27				
75	0	19.99					



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	20.66				
					1	24	20.51				
					1	49	20.48				
					25	0	20.39				
					25	12	20.66				
					25	24	20.79				
				16-QAM	50	0	20.55				
					1	0	21.01				
					1	24	21.03				
					1	49	20.99				
					25	0	20.97				
					25	12	20.96				
		M 21100	2535	QPSK	2535	25	24	20.88			
						50	0	20.79			
						1	0	21.55			
						1	24	21.79			
						1	49	21.74			
						25	0	21.56			
				16-QAM	25	12	21.61				
					25	24	21.81				
					50	0	21.43				
					1	0	20.75				
					1	24	20.64				
					1	49	20.84				
		H 21400	2565	QPSK	2565	25	0	20.89			
						25	12	20.65			
						25	24	20.51			
						50	0	20.44			
						1	0	21.01			
						1	24	20.59			
16-QAM	1			49	20.78						
	25			0	21.11						
	25			12	21.13						
	25			24	21.24						
	50			0	20.96						
	1			0	20.78						
				16-QAM	1	24	20.89				
					1	49	20.96				
					25	0	21.03				
					25	12	21.07				
									25	24	20.86
									50	0	20.74





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	21.52	
					1	12	21.87	
					1	24	21.67	
					12	0	21.25	
					12	6	21.51	
					12	11	21.45	
				16-QAM	25	0	21.30	
					1	0	21.36	
					1	12	21.85	
					1	24	21.74	
					12	0	21.63	
					12	6	21.68	
		M 21100	2535	QPSK	2535	12	11	21.72
						25	0	20.77
						1	0	21.70
						1	12	22.06
						1	24	21.86
						12	0	21.39
				16-QAM	12	6	21.44	
					12	11	21.49	
					25	0	21.52	
					1	0	20.94	
					1	12	21.05	
					1	24	21.14	
		H 21425	2567.5	QPSK	2567.5	12	0	21.26
						12	6	21.10
						12	11	20.85
						25	0	21.09
						1	0	21.23
						1	12	21.42
16-QAM	1			24	21.02			
	12			0	20.87			
	12			6	20.74			
	12			11	20.69			
	25			0	20.88			
	1			0	20.89			
1	12	21.33						
1	24	21.21						
12	0	21.26						
12	6	21.15						
12	11	21.08						
25	0	20.51						



## 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	1.1089	1.1352	18615	1851.5	2.7355	2.7369
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	1.494	1.557	18615	1851.5	3.331	3.563

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	4.5361	4.5365	18650	1855.0	8.9926	9.0303
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	5.278	5.204	18650	1855.0	10.01	10.02

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	13.455	13.515	18700	1860.0	18.030	18.084
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	15.32	15.08	18700	1860.0	20.37	20.42



**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	1.1193	1.1181	18900	1880.0	2.7482	2.7687

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	1.462	1.474	18900	1880.0	3.385	3.382

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	4.5422	4.5381	18900	1880.0	9.0107	9.0080

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	5.231	5.352	18900	1880.0	10.15	10.21

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	13.504	13.472	18900	1880.0	18.045	18.084

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	15.13	14.99	18900	1880.0	20.40	20.46





**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	1.1166	1.1131	19184	1908.4	2.7368	2.7551

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	1.526	1.561	19184	1908.4	3.406	3.576

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	4.5448	4.5497	19150	1905.0	9.0267	9.0213

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	5.358	5.325	19150	1905.0	10.19	10.45

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	13.523	13.513	19100	1900.0	18.105	18.078

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	15.52	14.81	19100	1900.0	20.10	20.25



Low channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

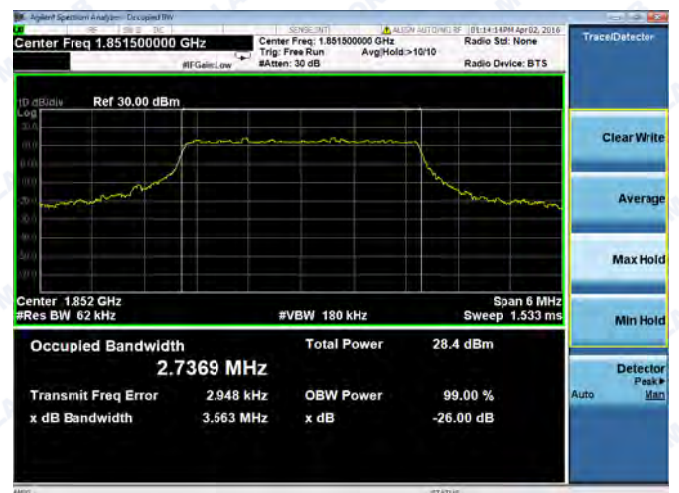
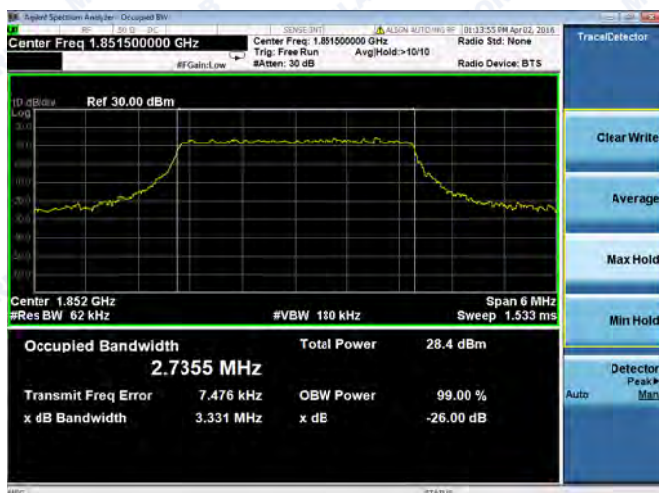
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM



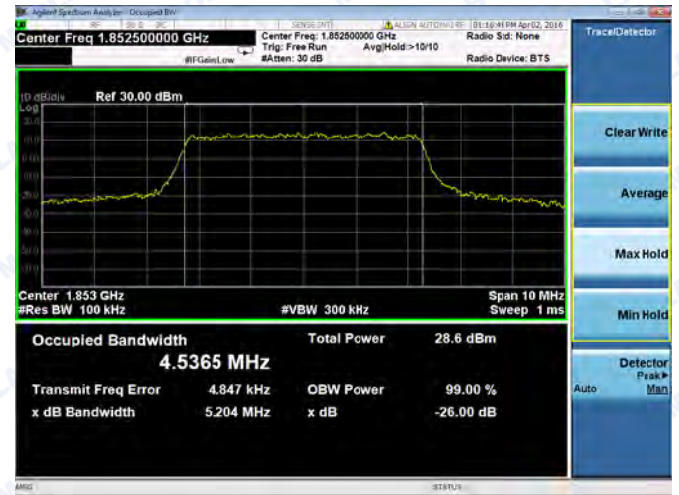




**Spectrum Plot of Worst Value**

**5MHz/QPSK**

**5MHz/16QAM**



**Spectrum Plot of Worst Value**

**10MHz/QPSK**

**10MHz/16QAM**



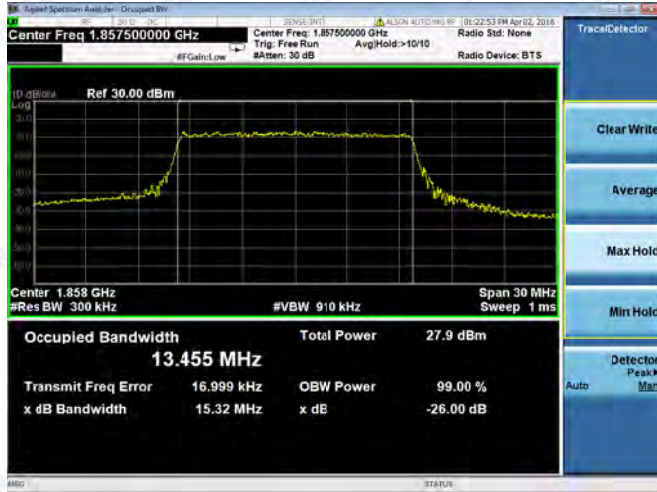




### Spectrum Plot of Worst Value

#### 15MHz/QPSK

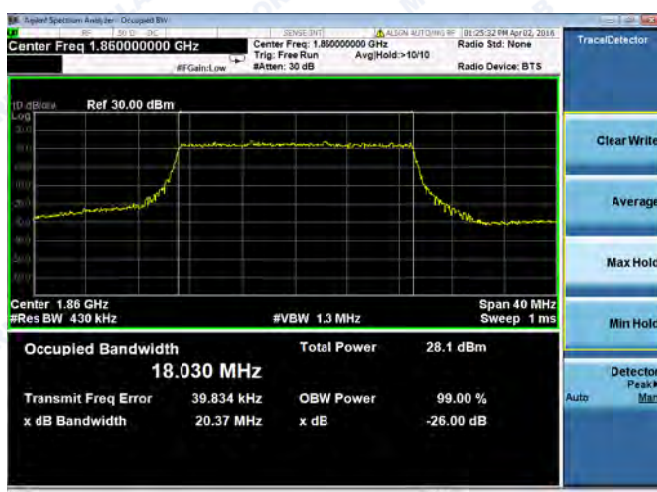
#### 15MHz/16QAM



### Spectrum Plot of Worst Value

#### 20MHz/QPSK

#### 20MHz/16QAM



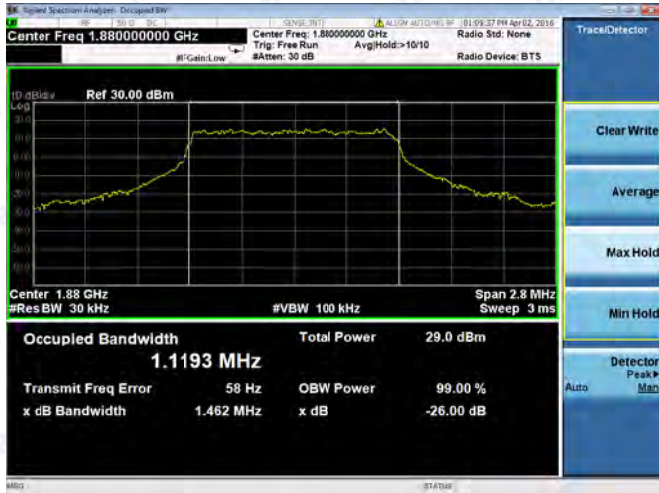


Middle channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM



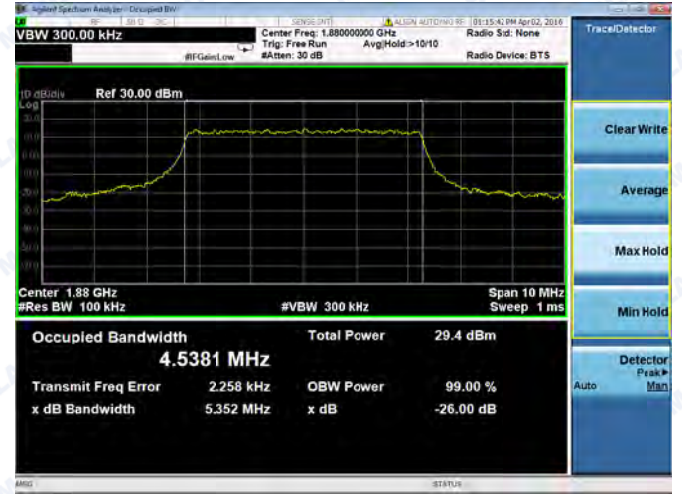
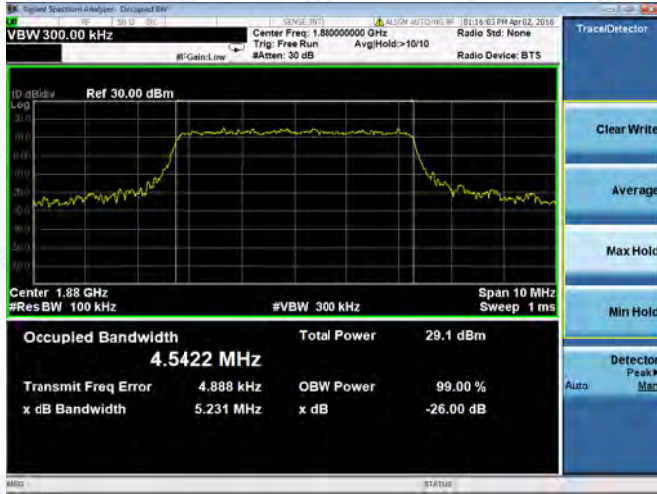




**Spectrum Plot of Worst Value**

**5MHz/QPSK**

**5MHz/16QAM**



**Spectrum Plot of Worst Value**

**10MHz/QPSK**

**10MHz/16QAM**



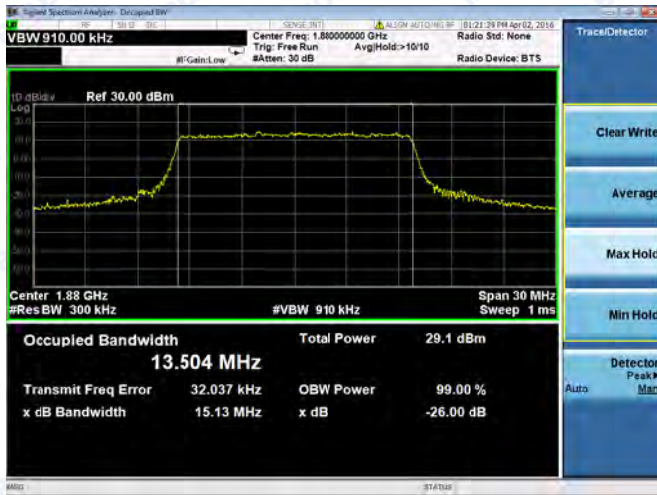




**Spectrum Plot of Worst Value**

**15MHz/QPSK**

**15MHz/16QAM**



**Spectrum Plot of Worst Value**

**20MHz/QPSK**

**20MHz/16QAM**





High channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

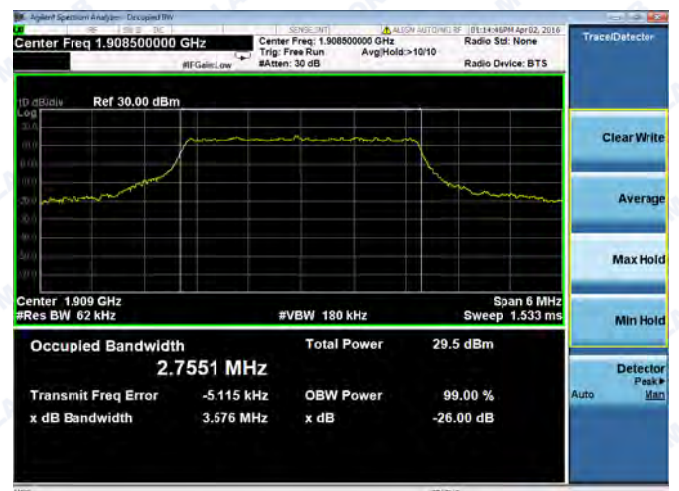
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM



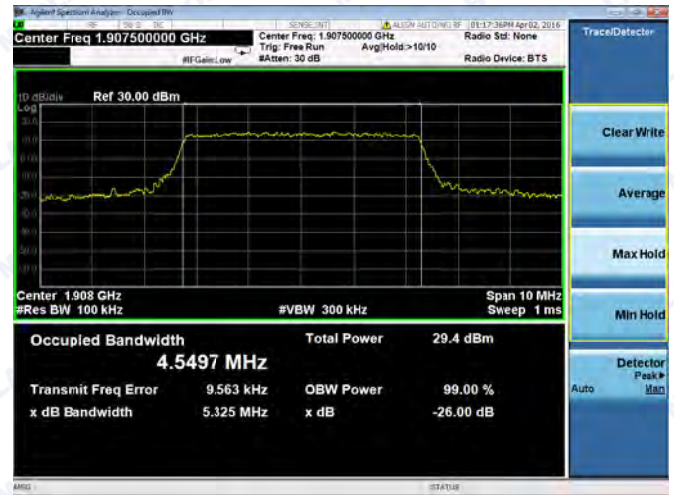




**Spectrum Plot of Worst Value**

**5MHz/QPSK**

**5MHz/16QAM**



**Spectrum Plot of Worst Value**

**10MHz/QPSK**

**10MHz/16QAM**



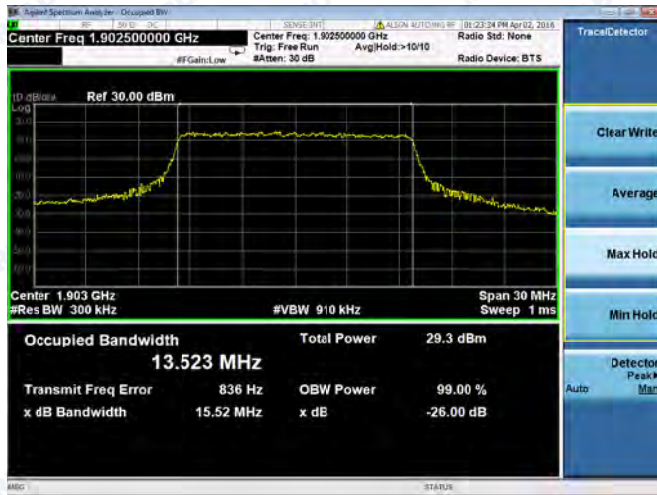




**Spectrum Plot of Worst Value**

**15MHz/QPSK**

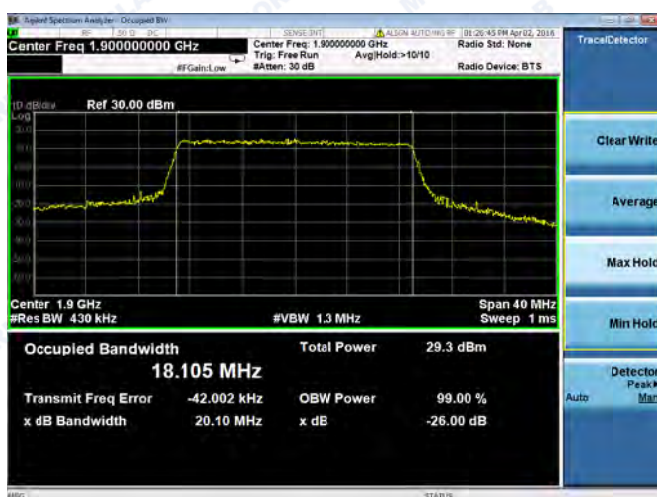
**15MHz/16QAM**



**Spectrum Plot of Worst Value**

**20MHz/QPSK**

**20MHz/16QAM**





**LTE Band 4**

**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
19957	1710.7	1.1151	1.1200	19965	1711.5	2.7387	2.7383

Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	1.477	1.568	19965	1711.5	3.335	3.583

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	4.5371	4.5380	20000	1715.0	8.9939	9.0175

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	5.205	5.173	20000	1715.0	10.01	10.12

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	13.436	13.485	20050	1720.0	17.733	17.801

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	15.17	15.09	20050	1720.0	23.44	23.45



**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
20175	1732.5	1.1074	1.1310	20175	1732.5	2.7497	2.7675
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	1.459	1.534	20175	1732.5	3.393	3.377

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	4.5352	4.5359	20175	1732.5	9.0224	9.0175
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	5.201	5.373	20175	1732.5	10.18	10.19

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	13.499	13.503	20175	1732.5	17.771	17.744
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20175	1732.5	15.11	14.94	20175	1732.5	21.63	23.74





**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
20392	1754.2	1.1144	1.1137	20384	1753.4	2.7399	2.7554
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20392	1754.2	1.479	1.499	20384	1753.4	3.432	3.540

Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20375	1752.5	4.5305	4.5519	20350	1750.0	9.0188	9.0291
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20375	1752.5	5.374	5.294	20350	1750.0	10.21	10.52

Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20325	1747.5	13.487	13.494	20300	1745.0	17.770	17.746
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20325	1747.5	15.25	14.79	20300	1745.0	19.51	21.54



Low channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM



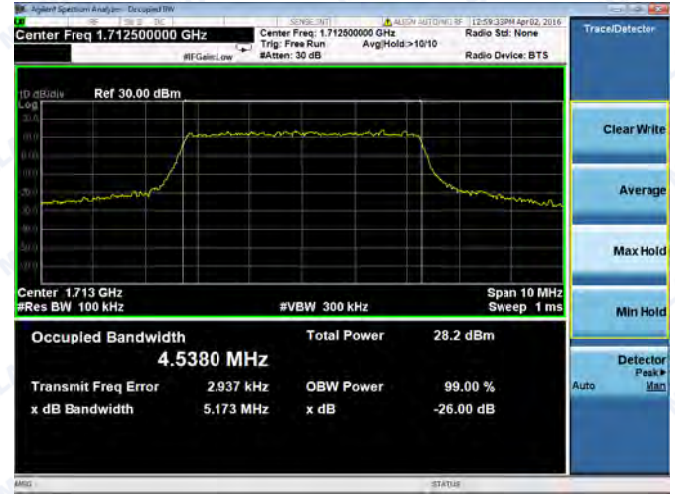
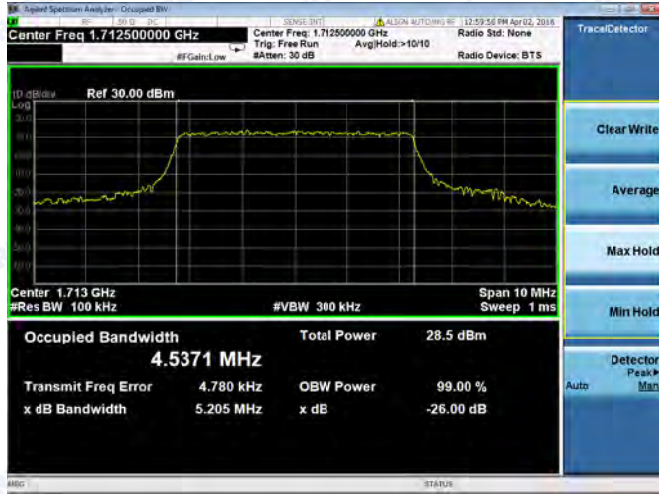




**Spectrum Plot of Worst Value**

**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



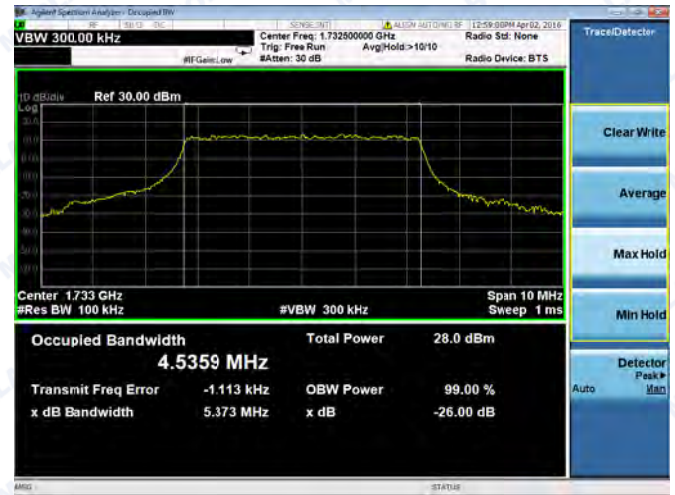




Spectrum Plot of Worst Value

5MHz/QPSK

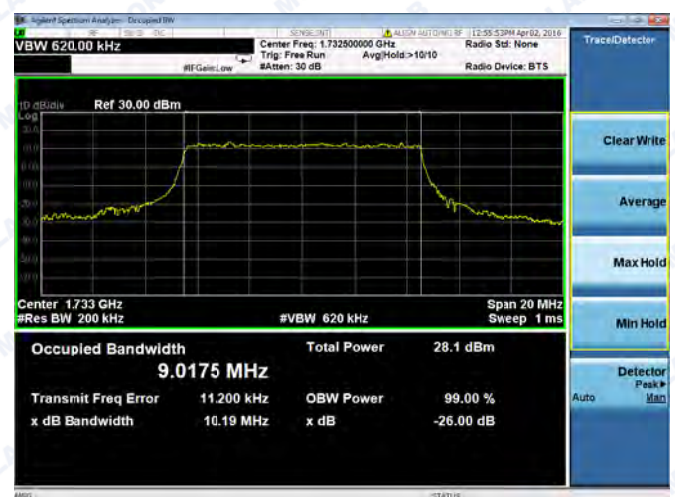
5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM



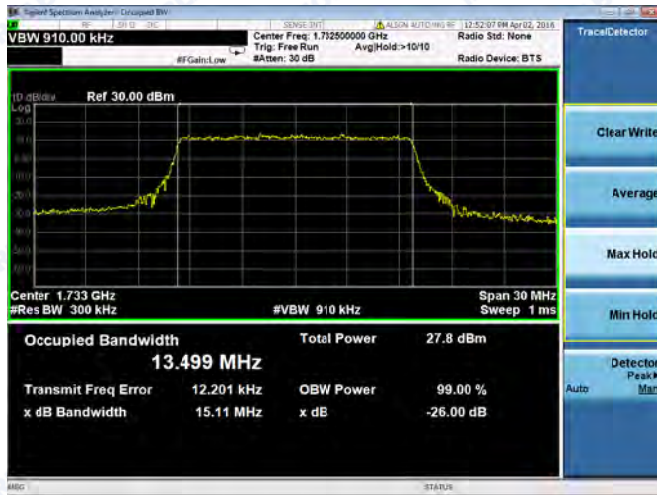




Spectrum Plot of Worst Value

15MHz/QPSK

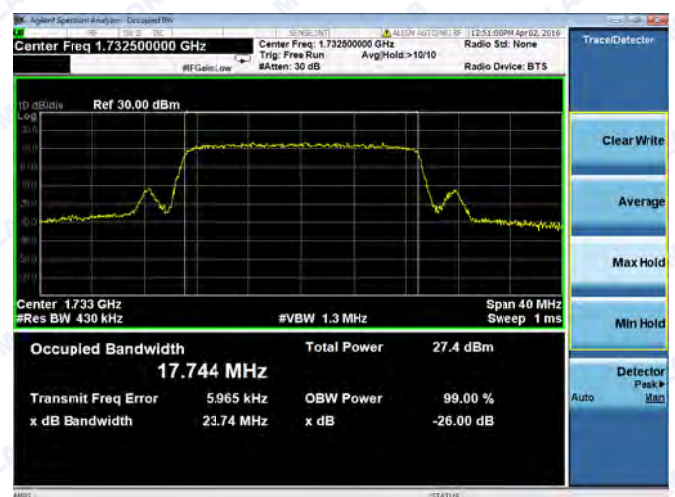
15MHz/16QAM



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



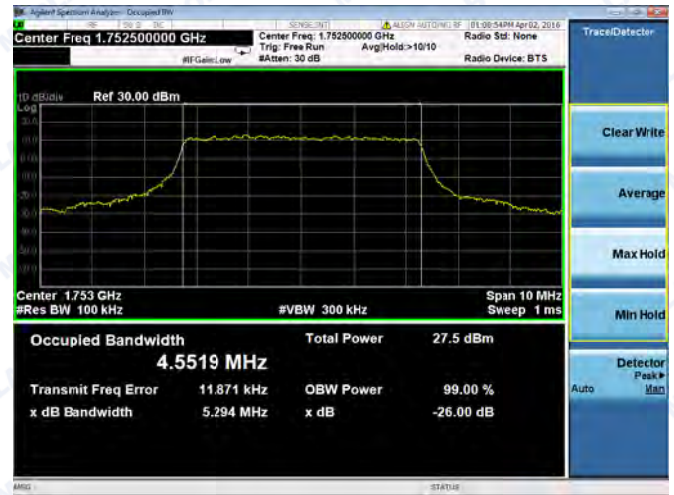




Spectrum Plot of Worst Value

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 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	4.5366	4.5405	20800	2505.0	9.0056	9.0368

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	5.240	5.219	20800	2505.0	10.19	10.18

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	13.462	13.541	20850	2510.0	18.006	18.055

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	15.04	15.15	20850	2510.0	20.11	20.01

**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	4.5359	4.5463	21100	2535.0	9.0312	9.0112

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	5.257	5.360	21100	2535.0	10.12	10.30



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	13.525	13.516	21100	2535.0	18.035	18.028
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	15.25	14.93	21100	2535.0	20.17	20.01

**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	4.5394	4.5476	21400	2565.0	9.0246	9.0212
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	5.394	5.276	21400	2565.0	10.10	10.42

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	13.519	13.511	21350	2560.0	18.039	18.053
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	15.52	14.82	21350	2560.0	19.95	20.06





Low channel:

Spectrum Plot of Worst Value

5MHz/QPSK

5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM

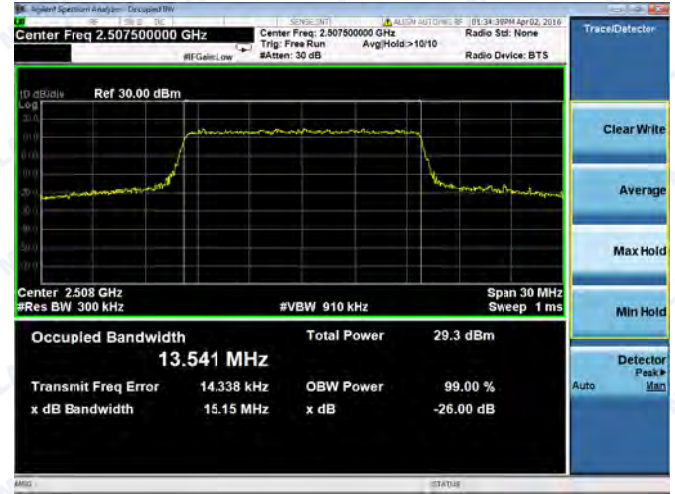
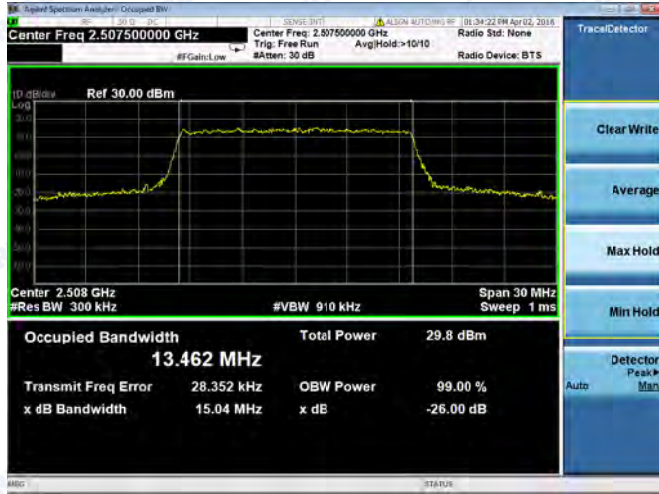




Spectrum Plot of Worst Value

15MHz/QPSK

15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM







Middle channel:

Spectrum Plot of Worst Value

5MHz/QPSK

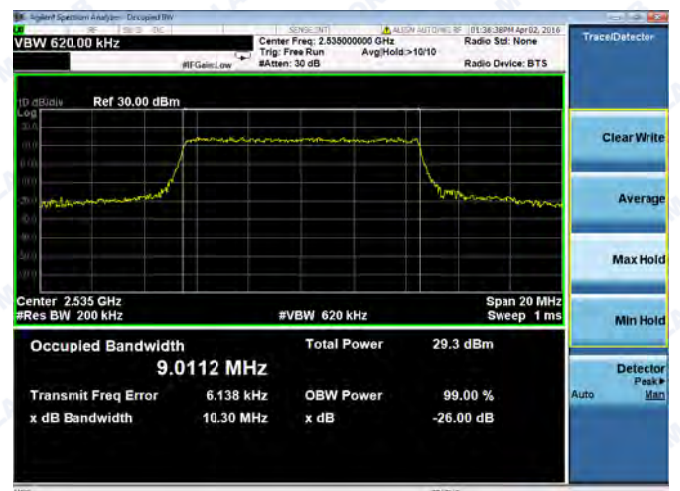
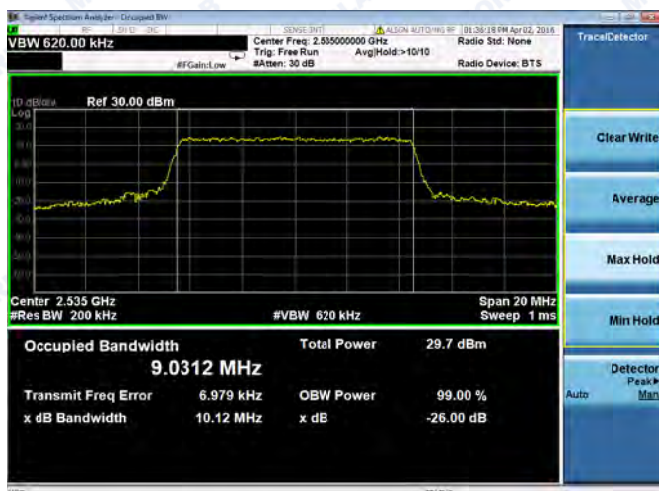
5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM



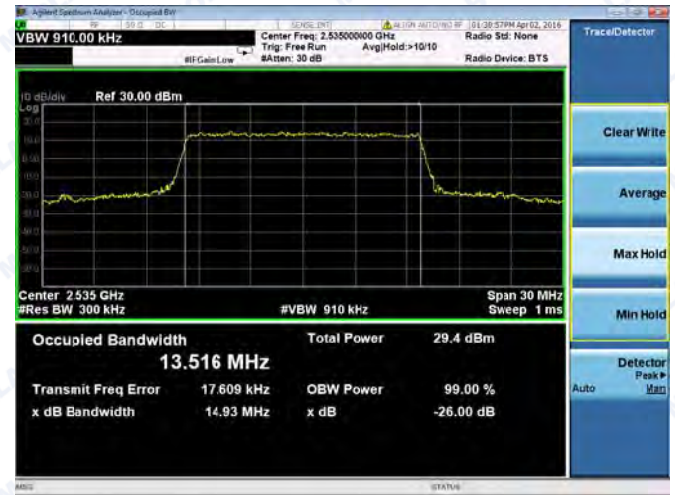




Spectrum Plot of Worst Value

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



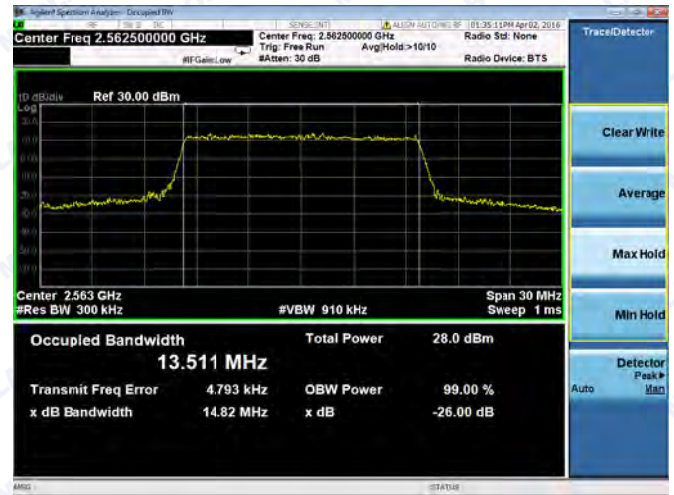
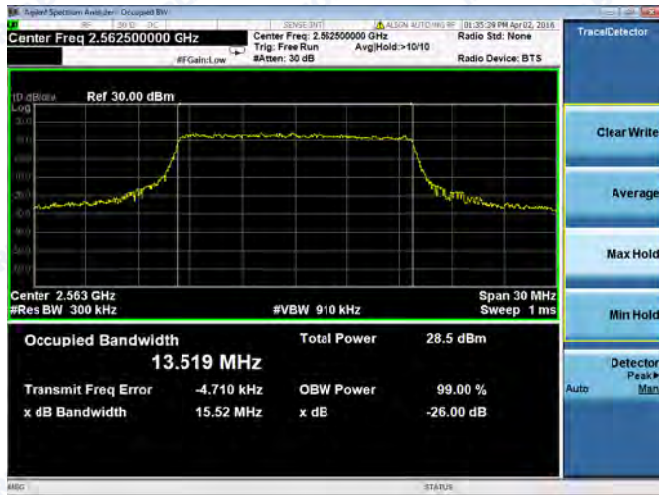




Spectrum Plot of Worst Value

15MHz/QPSK

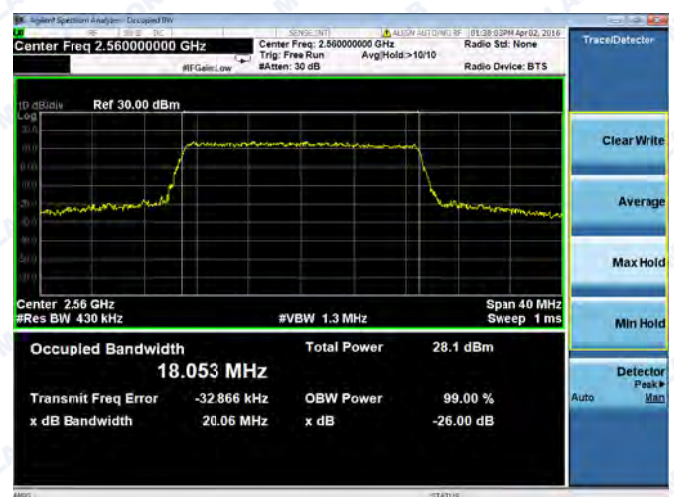
15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM





## 2.3 Frequency Stability

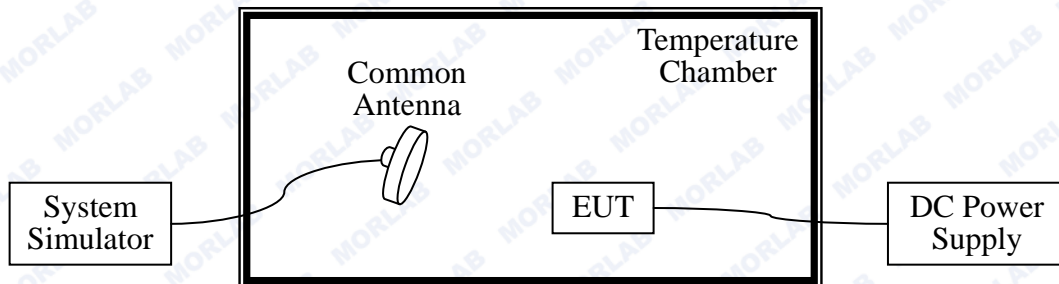
### 2.3.1 Requirement

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	2016.03.02	2017.03.01
DC Power Supply	Good Will	GPS-3030DD	EF920938	2016.03.02	2017.03.01
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2016.03.02	2017.03.01



**2.3.3 Test Verdict**

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.35VDC and 3.4VDC, 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	3.8	-30	11.65	PASS
100		-20	-10.57	
100		-10	8.92	
100		0	10.83	
100		+10	9.65	
100		+20	8.57	
100		+30	-11.8	
100		+40	9.92	
100		+50	8.87	
115		4.35	+20	
85	3.4	+20	12.00	

LTE Band 4 – QPSK - Channel 20175 – Frequency 1732.5MHz – RB 6/0				
Limit: 1732.5MHz*2.5ppm=4331.25Hz				
Voltage (%)	Power (VDC)	Temp (°C)	Fre. Dev. (Hz)	Result
100	3.8	-30	6.43	PASS
100		-20	-4.62	
100		-10	-4.66	
100		0	4.8	
100		+10	1.29	
100		+20	6.67	
100		+30	3.53	
100		+40	-5.72	
100		+50	-5.06	
115		4.35	+20	
85	3.4	+20	-4.47	





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	3.8	-30	13.34	<u>PASS</u>
100		-20	-8.88	
100		-10	10.61	
100		0	-12.52	
100		+10	11.34	
100		+20	10.26	
100		+30	-10.11	
100		+40	11.61	
100		+50	10.56	
115		4.35	+20	
85	3.4	+20	13.69	



## **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%.

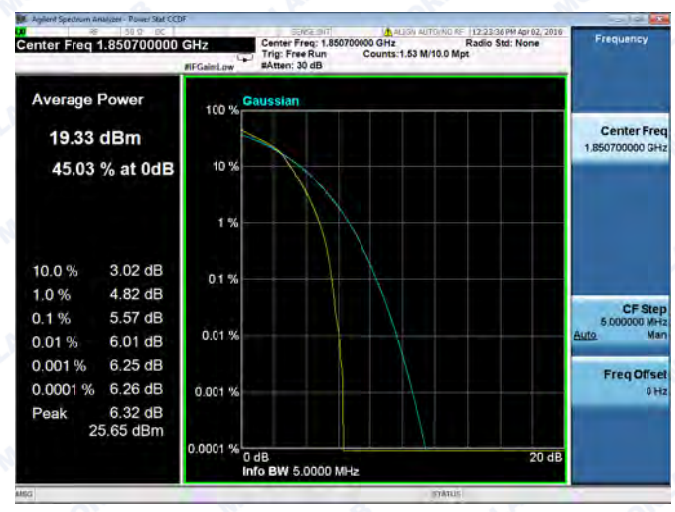
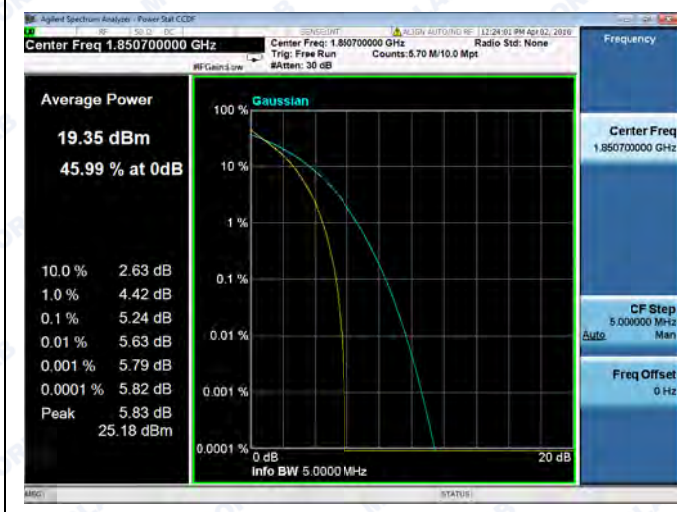


LTE Band 2 Low channel							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	5.24	5.57	18615	1851.5	5.32	5.74

Spectrum Plot of Worst Value (Low channel)

1.4MHz/QPSK

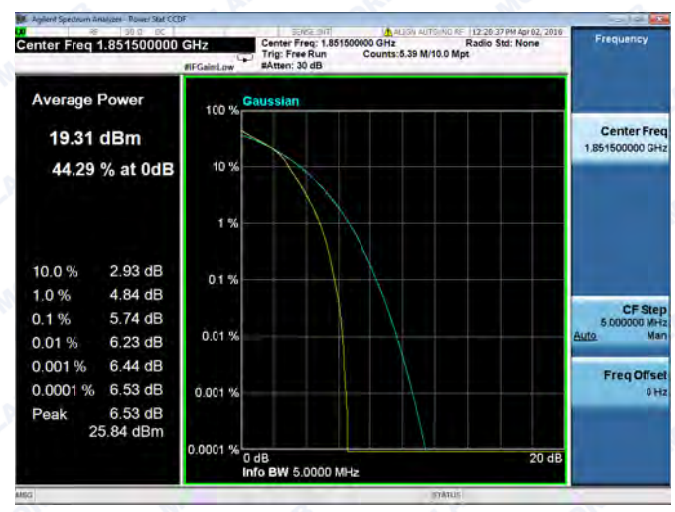
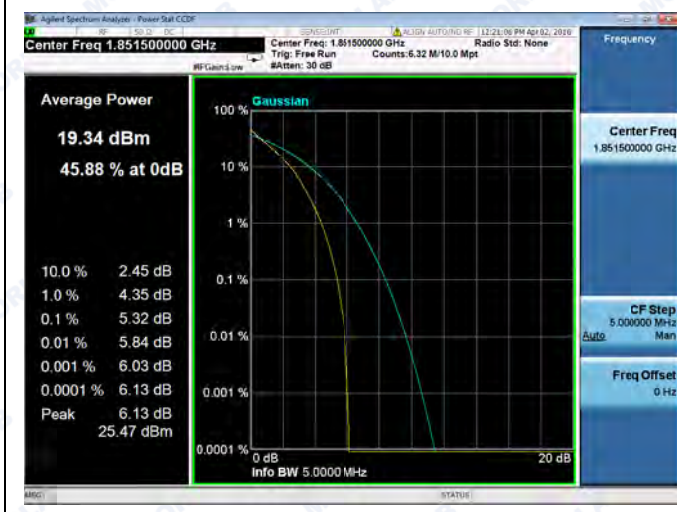
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM





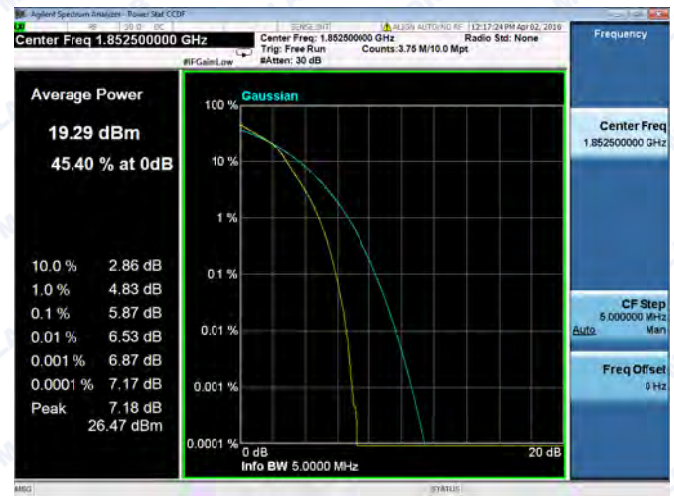
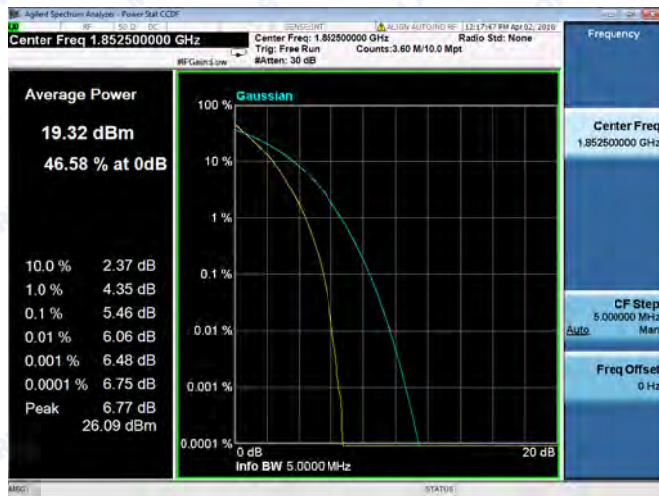


LTE Band 2 Low channel							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	5.46	5.87	18650	1855.0	4.65	5.99

Spectrum Plot of Worst Value

5MHz/QPSK

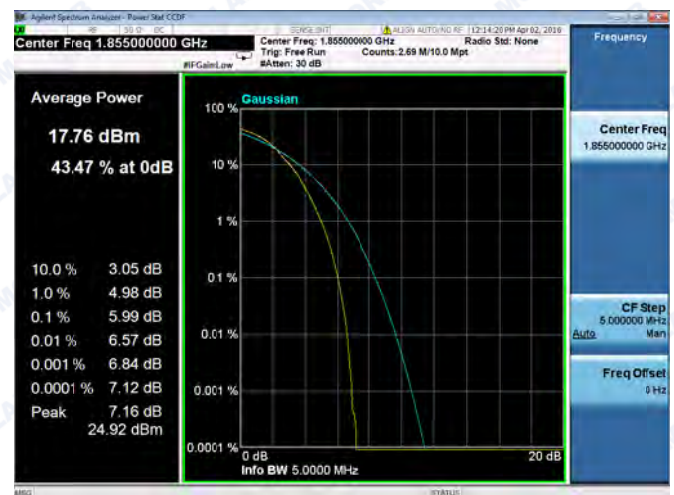
5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

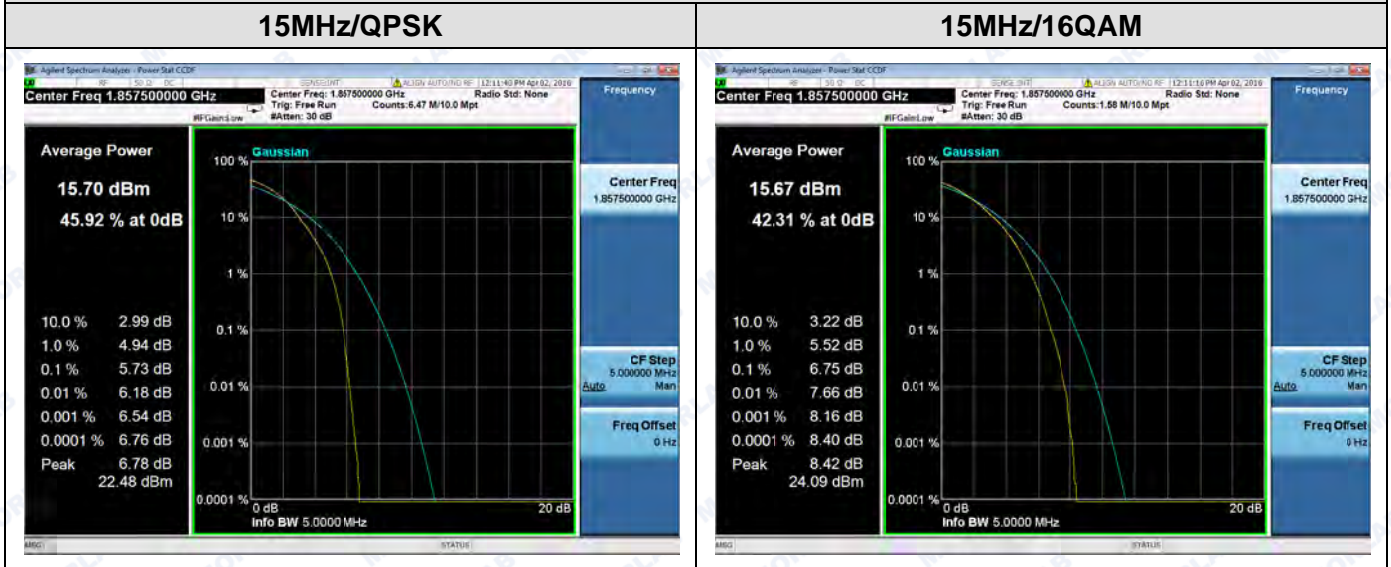
10MHz/16QAM



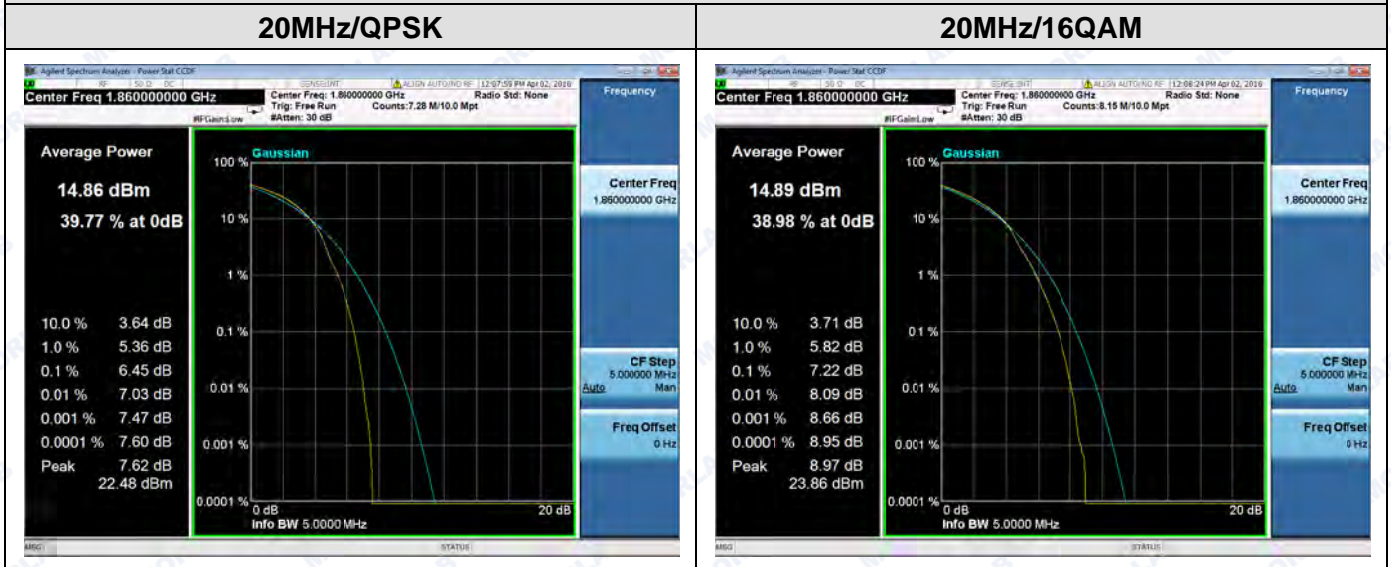


LTE Band 2 Low channel							
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18675	1857.5	5.73	6.75	18700	1860.0	6.45	7.22

Spectrum Plot of Worst Value



Spectrum Plot of Worst Value





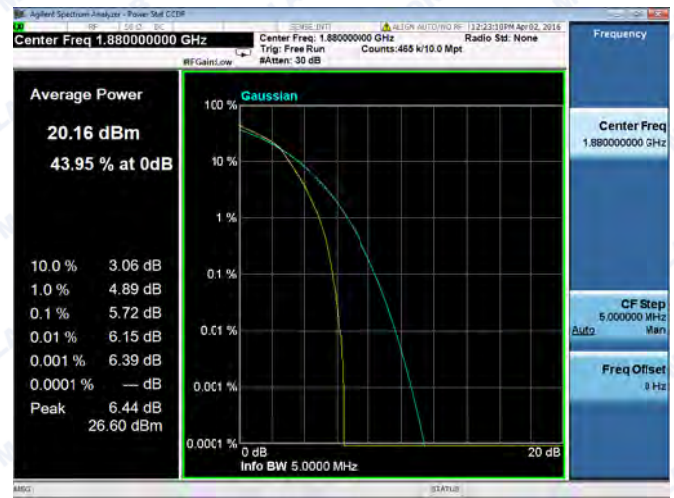


LTE Band 2 Middle channel							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	5.43	5.72	18900	1880.0	5.58	5.94

Spectrum Plot of Worst Value

1.4MHz/QPSK

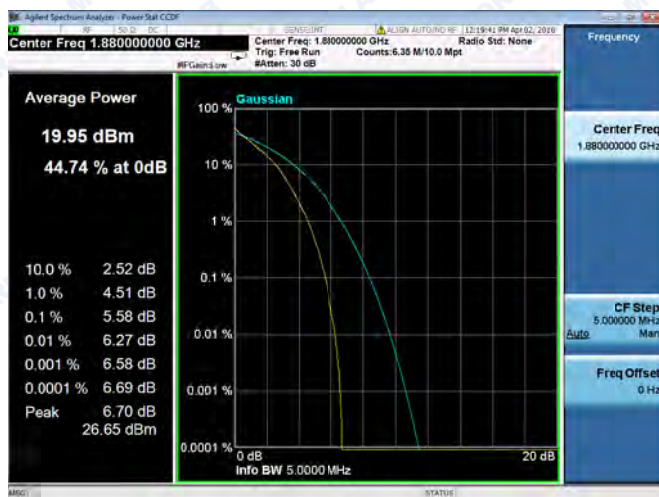
1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM





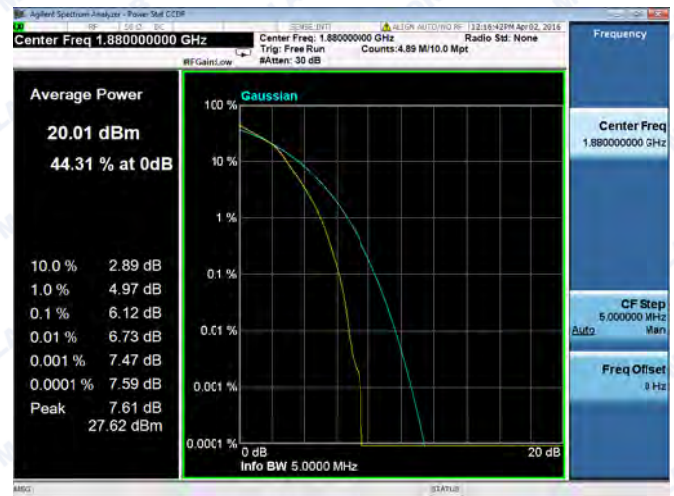
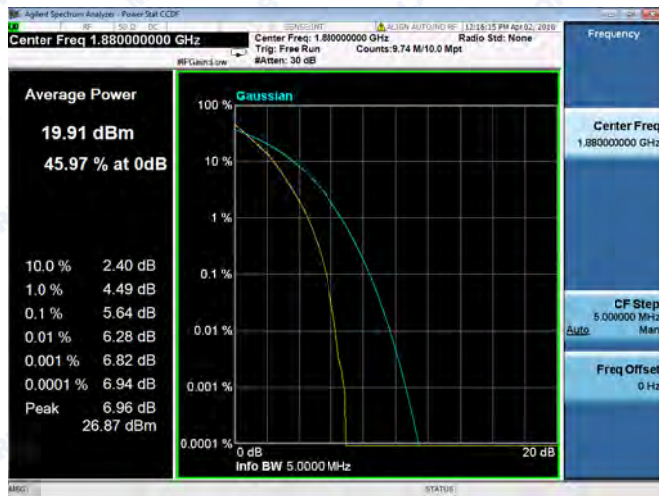


LTE Band 2 Middle channel							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	5.64	6.12	18900	1880.0	4.68	6.10

Spectrum Plot of Worst Value

5MHz/QPSK

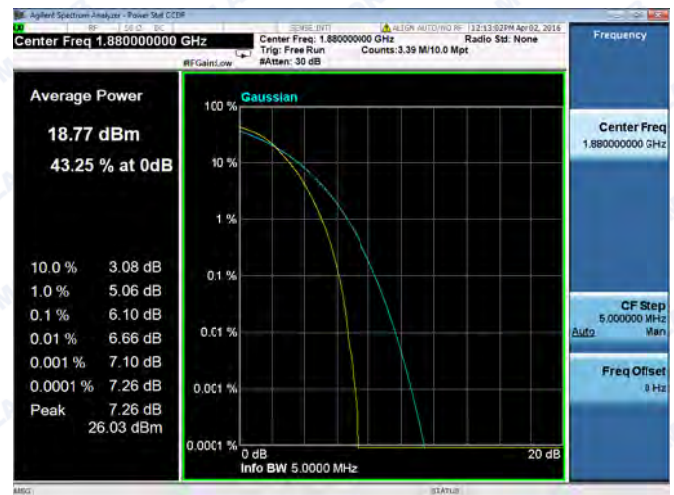
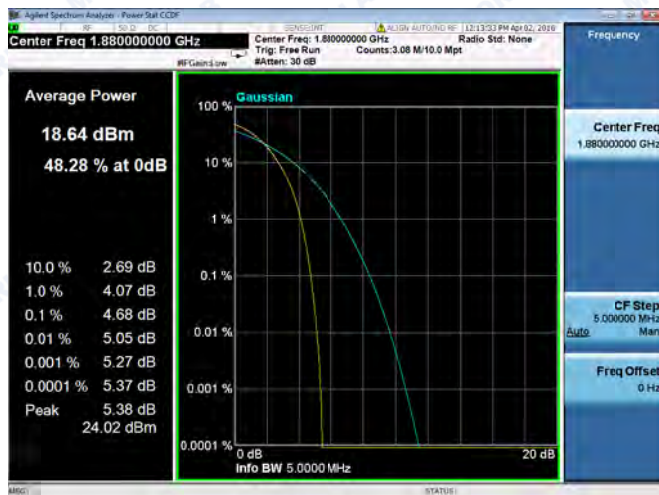
5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

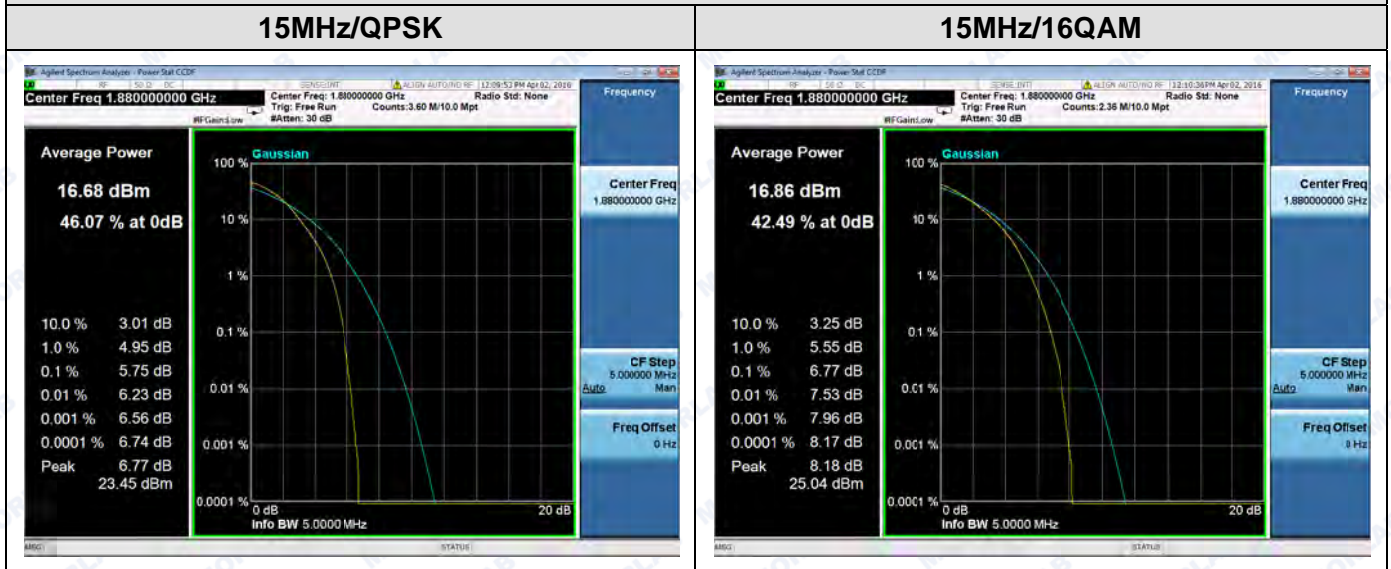
10MHz/16QAM



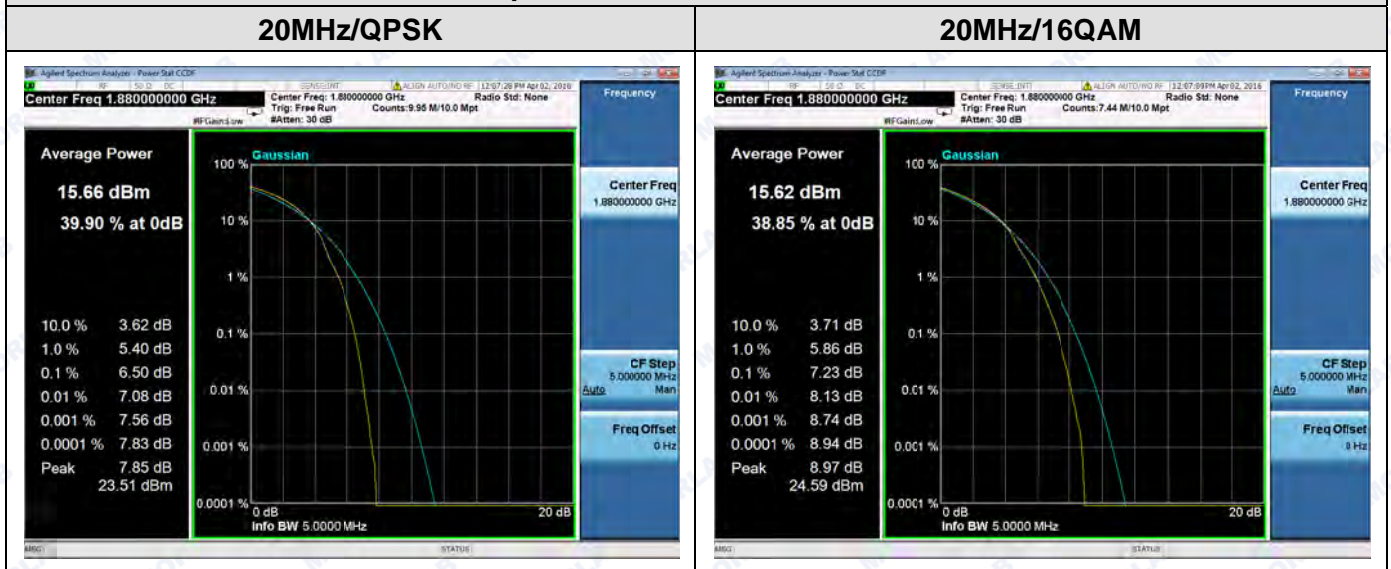


LTE Band 2 Middle channel							
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18900	1880.0	5.75	6.77	18900	1880.0	6.50	7.23

Spectrum Plot of Worst Value



Spectrum Plot of Worst Value

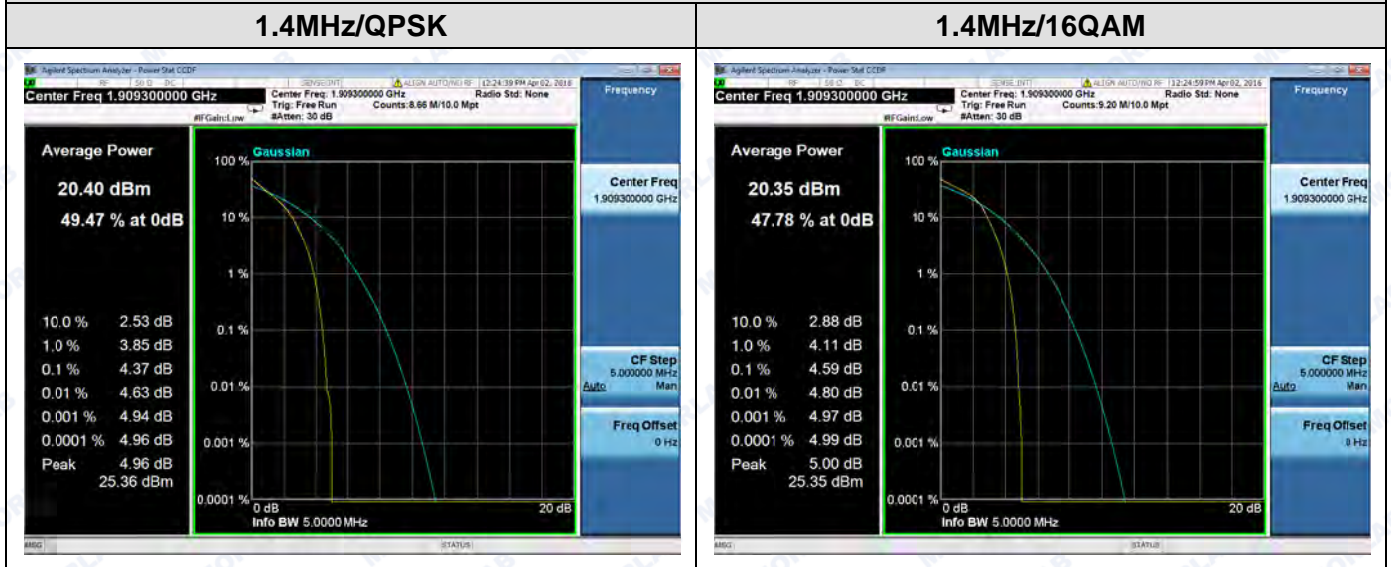




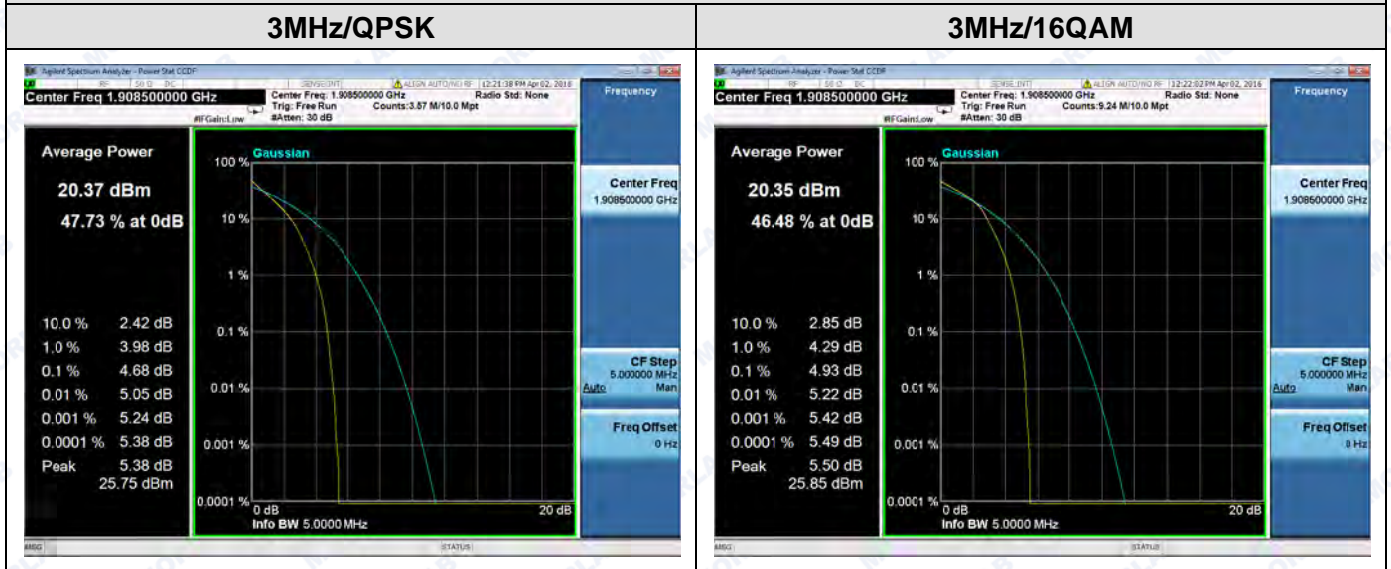


LTE Band 2 High channel							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19193	1909.3	4.37	4.59	19185	1908.5	4.68	4.93

Spectrum Plot of Worst Value



Spectrum Plot of Worst Value





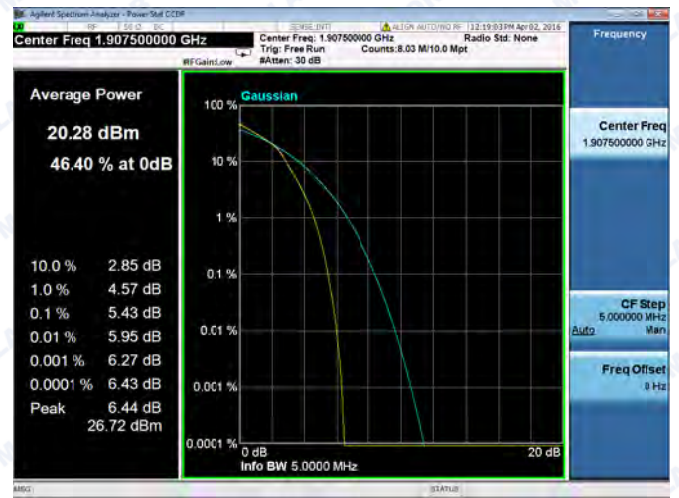
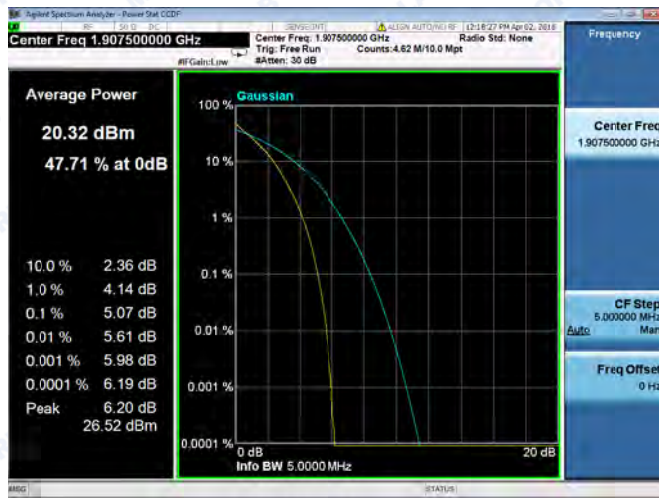


LTE Band 2 High channel							
Channel Bandwidth: 5MHz				Channel Bandwidth: 10MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19175	1907.5	5.07	5.43	19150	1905.0	4.64	5.97

Spectrum Plot of Worst Value

5MHz/QPSK

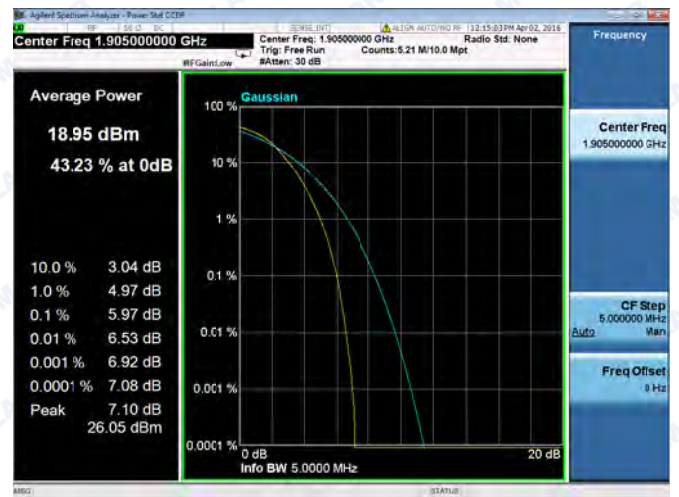
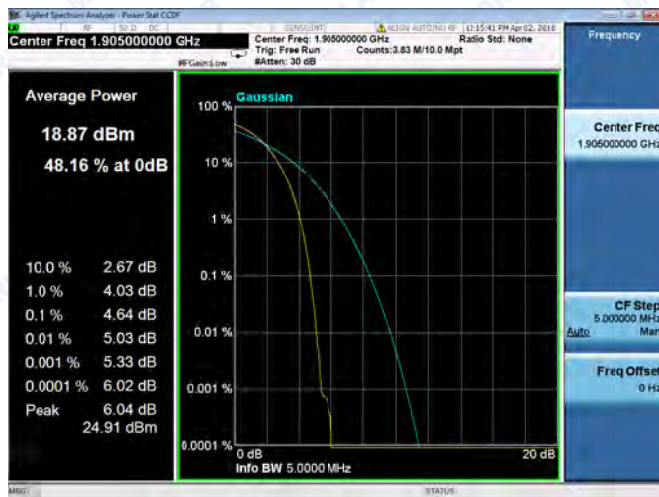
5MHz/16QAM



Spectrum Plot of Worst Value

10MHz/QPSK

10MHz/16QAM



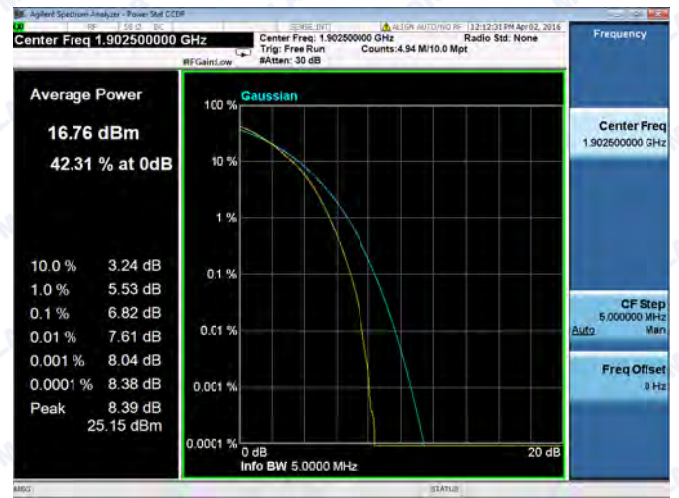
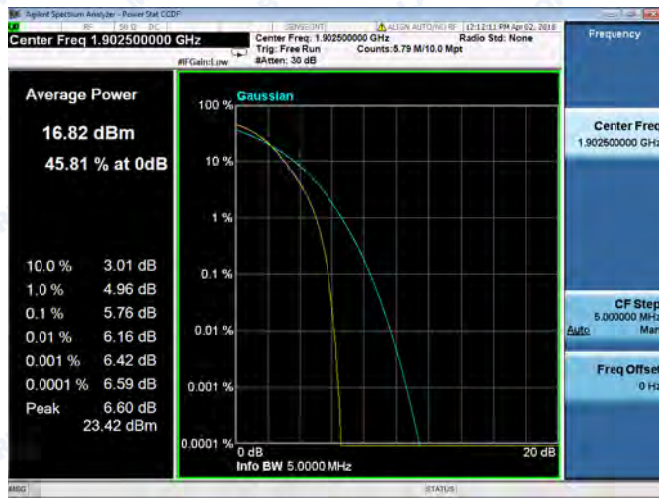


LTE Band 2 High channel							
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19125	1902.5	5.76	6.82	19100	1900.0	6.47	7.08

Spectrum Plot of Worst Value

15MHz/QPSK

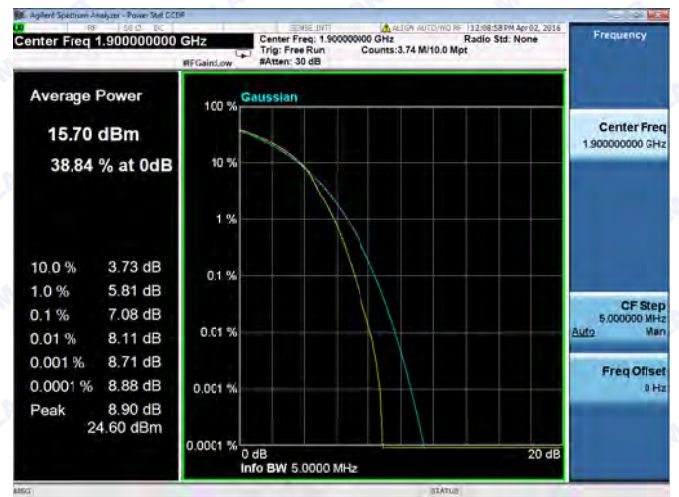
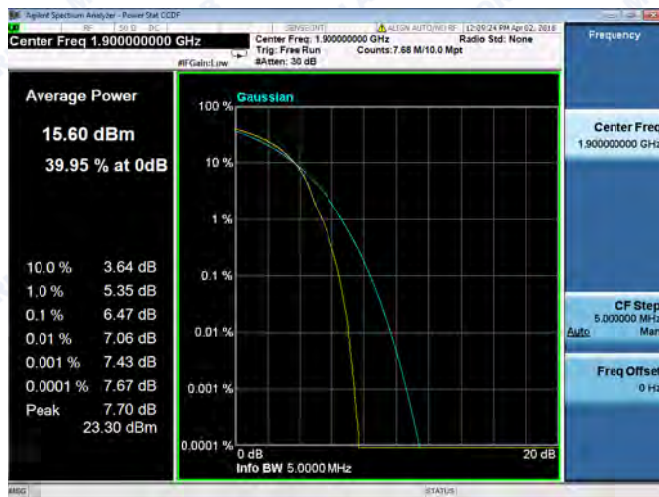
15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK

20MHz/16QAM





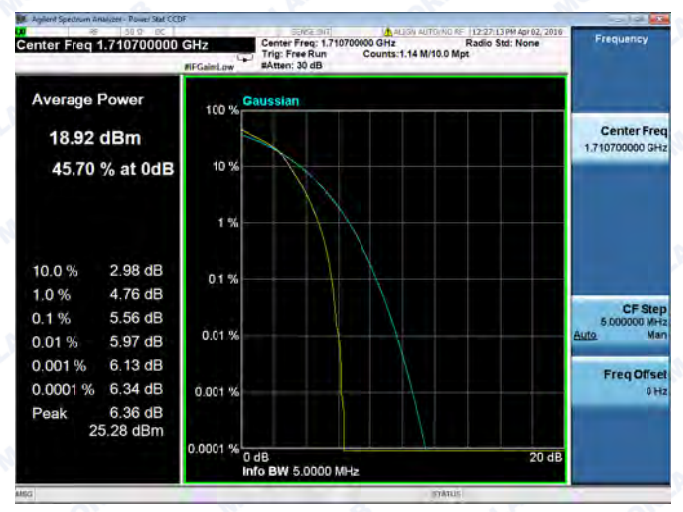
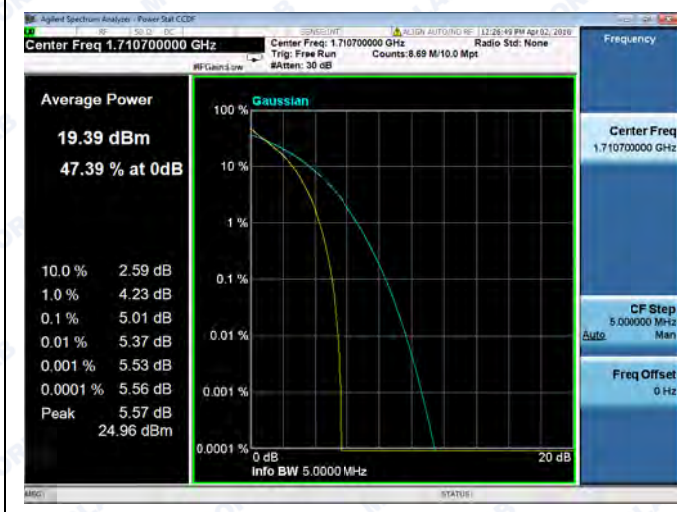


LTE Band 4 Low channel							
Channel Bandwidth: 1.4MHz				Channel Bandwidth: 3MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	5.01	5.56	19965	1711.5	5.11	5.74

Spectrum Plot of Worst Value (Low channel)

1.4MHz/QPSK

1.4MHz/16QAM



Spectrum Plot of Worst Value

3MHz/QPSK

3MHz/16QAM

