

FCC TEST REPORT



Issued to

GUANGDONG OPPO MOBILE TELECOMMUNICATIONS CORP.,LTD

For

Mobile Phone

Model Name: OPPO R831L
Trade Name: OPPO
Brand Name: OPPO
FCC ID : R9C-R831L
Standard: 47 CFR Part 27, Subpart L
Test date: 2014-5-14 to 2014-6-4
Issue date: 2014-6-9

By

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Date 2014.6.9

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Date 2014.6.9



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Date 2014.6.9

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Change History		
Issue	Date	Reason for change
1.0	Jun 9, 2014	First edition



1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2 and Part 27 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 27	Miscellaneous Wireless Communications Services

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

No.	Section	Description	Result
1	2.1046	Transmitter Conducted Output Power	<u>PASS</u>
2	27.50(d)(5)	Occupied Bandwidth	<u>PASS</u>
3	2.1049,27.53(g)	Frequency Stability	<u>PASS</u>
4	2.1055, 27.54	Peak to Average Radio	<u>PASS</u>
5	2.1051,2.105727.53(g)	Conducted Spurious Emissions	<u>PASS</u>
6	2.1051,2.1057 27.53(g)(h)	Band Edge	<u>PASS</u>
7	27.50(d)(4)	Equivalent Isotropic Radiated Power	<u>PASS</u>
8	2.1053,2.1057 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 3/F, Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055 P. R. China. 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 27L REQUIREMENTS

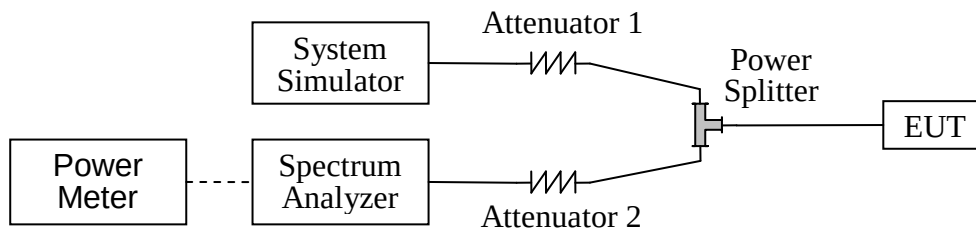
2.1 Transmitter Conducted Output Power

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

1. Test Setup:



The EUT, which is powered 5V DC power (USB port), is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Rohde& Schwarz	CMW500	1201.0002k50 /124534/wk	2014.02.26	2015.02.25
Spectrum Analyzer	Rohde& Schwarz	FSL	10246	2014.02.26	2015.02.25
Spectrum Analyzer	Agilent	E4445A	MY44200685	2014.02.26	2015.02.25
Power Meter	Agilent	E4418B	GB43318055	2014.02.26	2015.02.25
Power Meter	Agilent	E4418B	GB43318055	2014.02.26	2015.02.25
Power Sensor	Agilent	8482A	MY41091706	2014.02.26	2015.02.25
Power Splitter	Weinschel	1506A	NW521	2014.02.26	2015.02.25
Attenuator 1	Resnet	20dB	(n.a.)	2014.02.26	2015.02.25



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Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Attenuator 2	Resnet	3dB	(n.a.)	2014.02.26	2015.02.25

2.1.3 Test Results

LTE BAND 4

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
20MHz	L 20050	1720.0	QPSK	1	0	23.17
				1	49	23.08
				1	99	23.07
				50	0	23.08
				50	25	22.97
				50	49	22.97
				100	0	22.88
			16-QAM	1	0	23.10
				1	49	23.18
				1	99	23.15
				50	0	23.04
				50	25	23.04
				50	49	23.03
				100	0	22.89
	M 20175	1732.5	QPSK	1	0	23.26
				1	49	23.16
				1	99	23.18
				50	0	23.12
				50	25	23.10
				50	49	23.09
				100	0	22.98
			16-QAM	1	0	23.15
				1	49	23.14
				1	99	23.18
				50	0	23.11
				50	25	23.17
				50	49	23.14
				100	0	22.97
	H 20300	1745.0	QPSK	1	0	23.18
				1	49	23.08
				1	99	23.07
				50	0	23.15
				50	25	23.10
				50	49	23.08
				100	0	22.94
			16-QAM	1	0	23.18



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				1	49	23.15
				1	99	23.16
				50	0	23.10
				50	25	23.04
				50	49	23.05
				100	0	22.96

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
15MHz	L 20025	1717.5	QPSK	1	0	23.11
				1	37	23.08
				1	74	23.10
				36	0	23.08
				36	18	23.07
				36	35	23.07
				75	0	22.95
			16-QAM	1	0	23.10
				1	37	23.08
				1	74	23.05
				36	0	23.04
				36	18	23.04
				36	35	23.03
				75	0	22.88
	M 20175	1732.5	QPSK	1	0	23.12
				1	37	23.11
				1	74	23.18
				36	0	23.06
				36	18	23.01
				36	35	23.09
				75	0	23.02
			16-QAM	1	0	23.14
				1	37	23.15
				1	74	23.19
				36	0	23.12
				36	18	23.17
				36	35	23.14
				75	0	22.95
	H 20325	1747.5	QPSK	1	0	23.11
				1	37	23.08
				1	74	23.05
				36	0	23.04
				36	18	23.00



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				36	35	23.08
				75	0	23.01
			16-QAM	1	0	23.10
				1	37	23.15
				1	74	23.16
				36	0	23.05
				36	18	23.04
				36	35	23.05
				75	0	22.91

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
10MHz	L 20000	1715.0	QPSK	1	0	23.12
				1	24	23.18
				1	49	23.10
				25	0	22.88
				25	12	22.87
				25	24	22.87
				50	0	22.75
			16-QAM	1	0	23.51
				1	24	23.48
				1	49	23.45
				25	0	23.05
				25	12	23.06
				25	24	23.03
				50	0	22.81
	M 20175	1732.5	QPSK	1	0	23.16
				1	24	23.10
				1	49	23.18
				25	0	23.15
				25	12	23.11
				25	24	23.09
				50	0	22.65
			16-QAM	1	0	23.04
				1	24	23.04
				1	49	23.06
				25	0	23.00
				25	12	23.05
				25	24	23.04
				50	0	23.15
	H	1750.0	QPSK	1	0	23.16
				1	24	23.18



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	20350			1	49	23.02
				25	0	23.08
				25	12	23.10
				25	24	23.09
				50	0	23.01
			16-QAM	1	0	23.08
				1	24	23.05
				1	49	23.06
				25	0	22.96
				25	12	22.94
				25	24	22.93
				50	0	22.90

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
05MHz	L 19975	1712.5	QPSK	1	0	22.92
				1	12	22.98
				1	24	22.90
				12	0	22.88
				12	6	22.87
				12	11	22.87
				25	0	22.75
			16-QAM	1	0	22.51
				1	12	22.48
				1	24	22.45
				12	0	22.05
				12	6	22.06
				12	11	22.03
				25	0	21.80
	M 20175	1732.5	QPSK	1	0	22.45
				1	12	22.41
				1	24	22.47
				12	0	22.15
				12	6	22.16
				12	11	22.09
				25	0	21.98
			16-QAM	1	0	22.41
				1	12	22.54
				1	24	22.46
				12	0	22.30
				12	6	22.25
				12	11	22.24
				25	0	21.15
	H	1752.5	QPSK	1	0	22.61



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	20375			1	12	22.58
				1	24	22.53
				12	0	22.28
				12	6	22.21
				12	11	22.19
				25	0	22.05
			16-QAM	1	0	22.68
				1	12	22.65
				1	24	22.56
				12	0	22.16
				12	6	22.24
				12	11	22.15
				25	0	21.90

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
3MHz	L 19965	1711.5	QPSK	1	0	22.92
				1	7	22.84
				1	14	22.91
				8	0	22.88
				8	4	22.85
				8	7	22.87
				15	0	22.76
			16-QAM	1	0	22.51
				1	7	22.49
				1	14	22.45
				8	0	22.15
				8	4	22.16
				8	7	22.13
				15	0	21.88
	M 20175	1732.5	QPSK	1	0	22.44
				1	7	22.41
				1	14	22.46
				8	0	22.15
				8	4	22.10
				8	7	22.08
				15	0	21.98
			16-QAM	1	0	22.41
				1	7	22.54
				1	14	22.46
			16-QAM	8	0	22.31
				8	4	22.26
				8	7	22.23



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	H 20385	1753.5	QPSK	15	0	21.15
				1	0	22.61
				1	7	22.58
				1	14	22.53
				8	0	22.28
				8	4	22.21
				8	7	22.19
				15	0	22.05
			16-QAM	1	0	22.69
				1	7	22.64
				1	14	22.58
				8	0	22.16
				8	4	22.19
				8	7	22.16
				15	0	21.94

LTE BAND 4 (Continue)

Band Width	Channel	Freq.(MHZ)	Modulation	RB Configuration		Average Power (dBm)
				RB Size	RB Offset	
1.4MHz	L 19957	1710.7	QPSK	1	0	22.90
				1	2	22.81
				1	5	22.84
				3	0	22.84
				3	1	22.86
				3	2	22.80
				6	0	22.75
			16-QAM	1	0	22.50
				1	2	22.49
				1	5	22.44
				3	0	22.07
				3	1	22.06
				3	2	22.03
				6	0	21.85
	M 20175	1732.5	QPSK	1	0	22.48
				1	2	22.47
				1	5	22.41
				3	0	22.19
				3	1	22.16
				3	2	22.09
				6	0	21.94
			16-QAM	1	0	22.46
				1	2	22.54
				1	5	22.48
				3	0	22.30



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				3	2	22.27
				3	5	22.29
				6	0	21.15
	H 20393	1754.3	QPSK	1	0	22.61
				1	2	22.58
				1	5	22.53
				3	0	22.28
				3	1	22.18
				3	2	22.24
				6	0	22.05
				1	0	22.71
			16-QAM	1	2	22.65
				1	5	22.60
				3	0	22.19
				3	1	22.25
				3	2	22.17
				6	0	21.84

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 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	1.0959	1.0957	19965	1711.5	2.7052	2.6962
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	1.281	1.282	19965	1711.5	2.973	2.980

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	4.5050	4.5040	20000	1715.0	8.9978	8.9818
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	4.960	4.942	20000	1715.0	9.826	9.867



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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	13.474	13.481	20050	1720.0	17.963	17.939
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	14.52	14.53	20050	1720.0	19.27	19.16

**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	1.0992	1.0904	20175	1732.5	2.7045	2.6990
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	1.309	1.280	20175	1732.5	2.987	2.968

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	4.5018	4.4988	20175	1732.5	8.9628	8.9603
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	4.947	4.968	20175	1732.5	9.921	9.799

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	13.429	13.402	20175	1732.5	17.913	17.892
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	14.42	14.37	20175	1732.5	19.34	19.07

**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	1.1018	1.0914	20384	1753.4	2.7028	2.7009
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	1.278	1.275	20384	1753.4	2.966	2.987

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	4.5110	4.5221	20350	1750.0	8.9965	8.9888
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	4.986	4.981	20350	1750.0	9.909	9.703

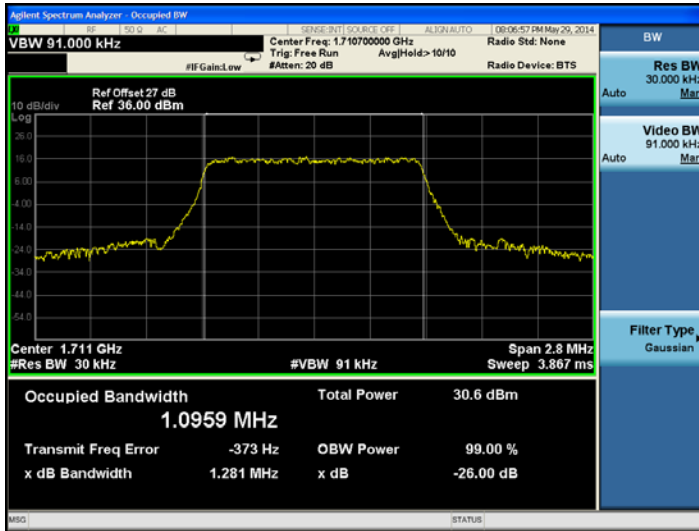
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	99% Bandwidth (MHz)		Channel	Frequency (MHz)	99% Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20325	1747.5	13.499	13.430	20300	1745.0	17.954	17.925
Channel Bandwidth: 15MHz				Channel Bandwidth: 20MHz			
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		Channel	Frequency (MHz)	26dB Bandwidth(MHz)	
		QPSK	16QAM			QPSK	16QAM
20325	1747.5	14.57	14.43	20300	1745.0	19.07	19.16



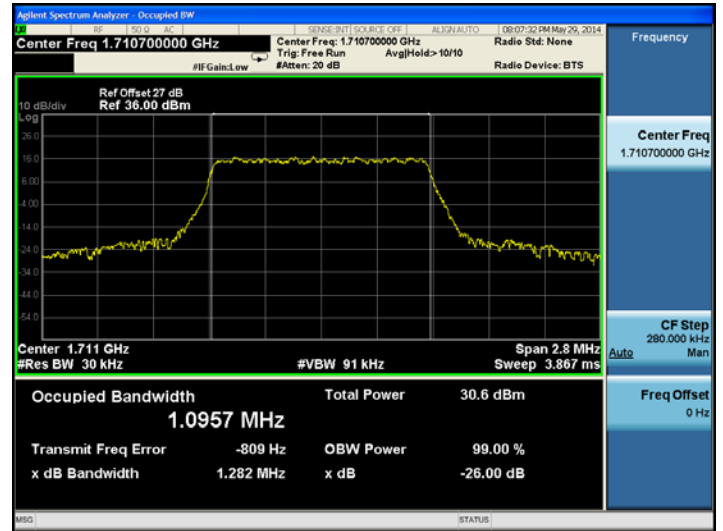
Low channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

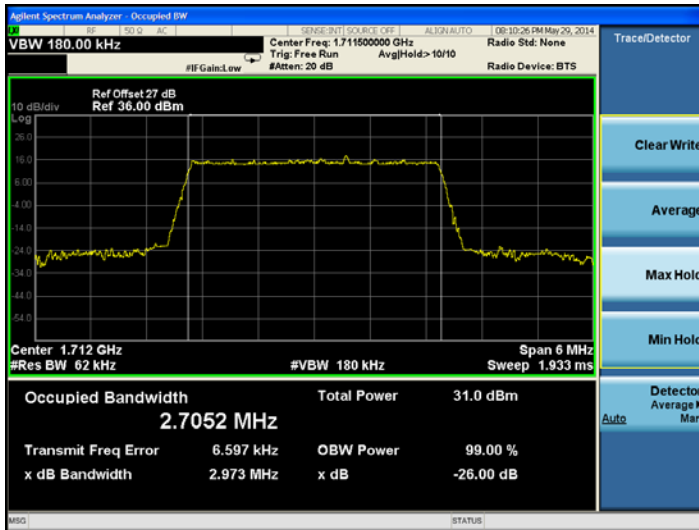


1.4MHz/16QAM

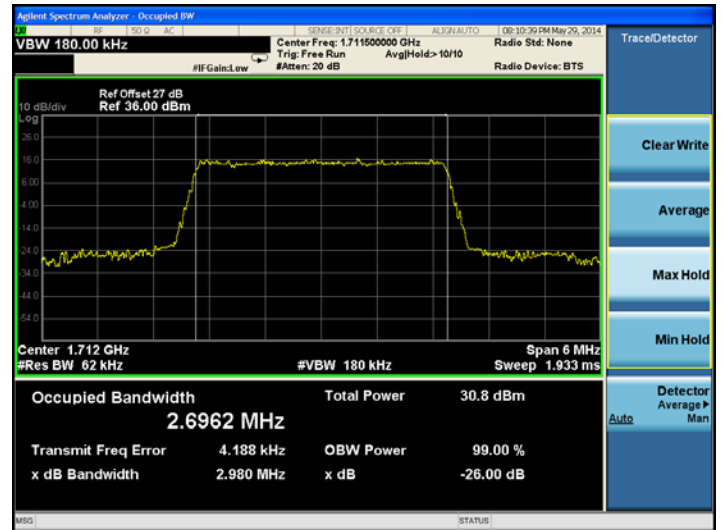


Spectrum Plot of Worst Value

3MHz/QPSK



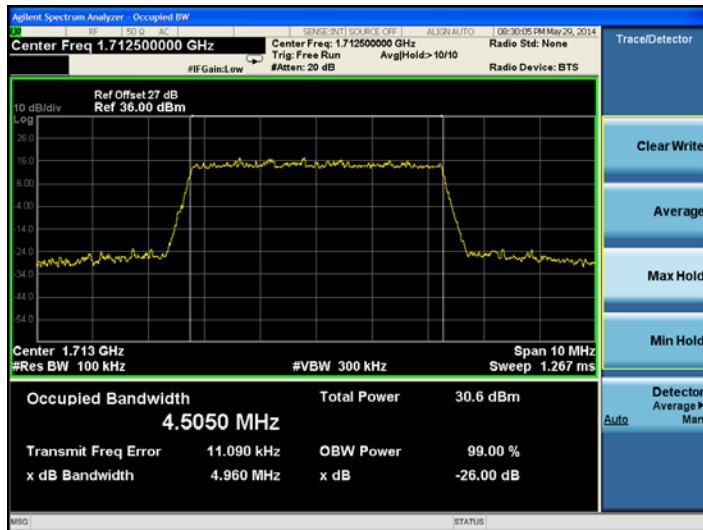
3MHz/16QAM



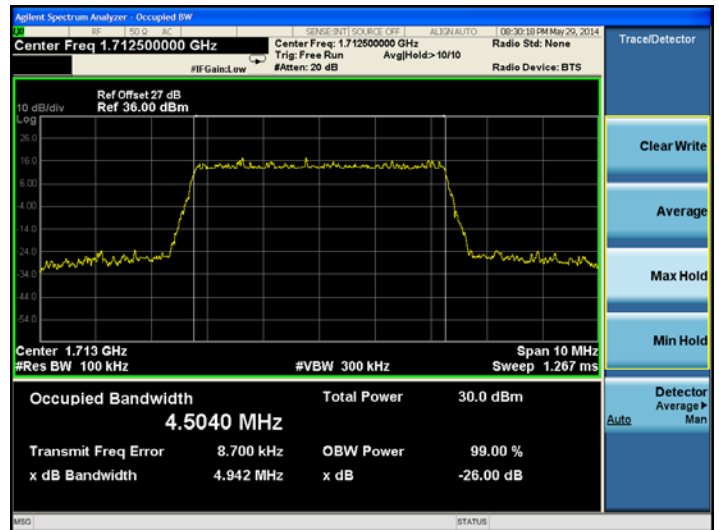


Spectrum Plot of Worst Value

5MHz/QPSK

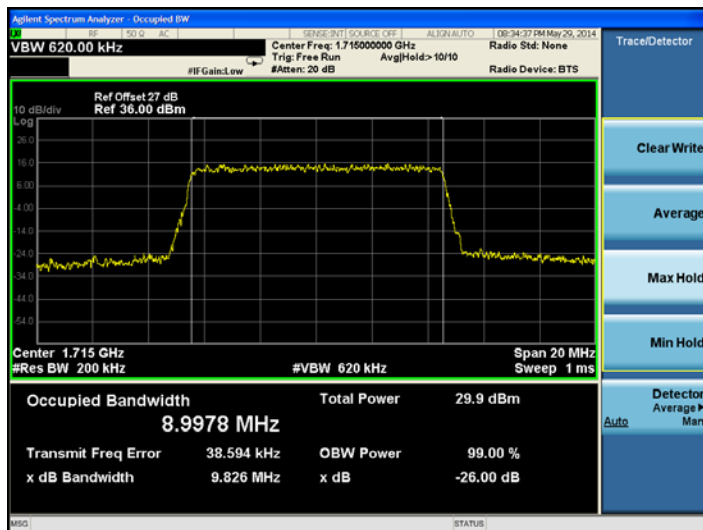


5MHz/16QAM

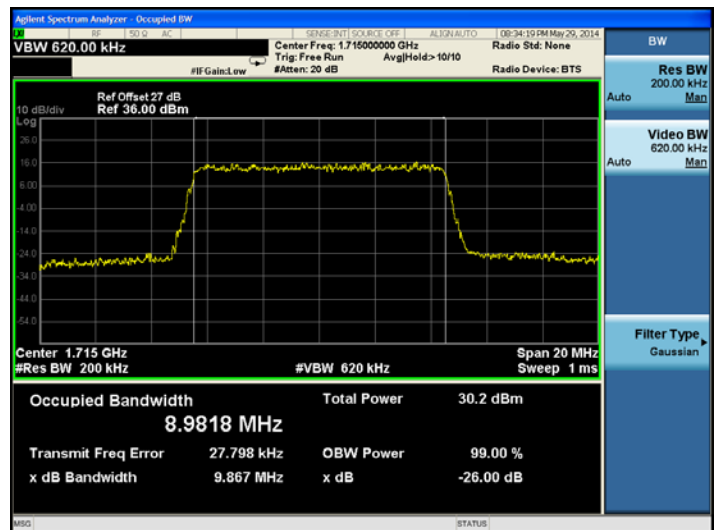


Spectrum Plot of Worst Value

10MHz/QPSK



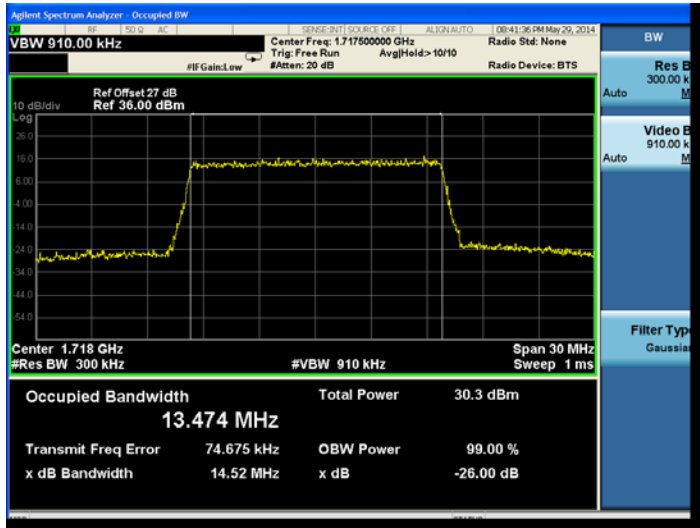
10MHz/16QAM



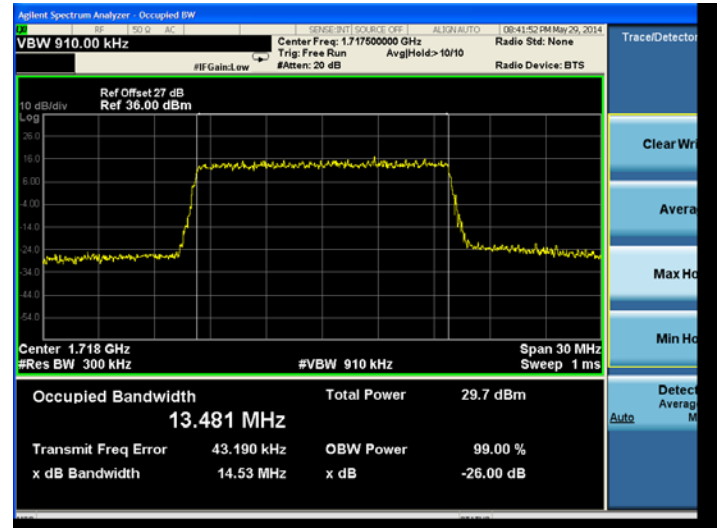


Spectrum Plot of Worst Value

15MHz/QPSK

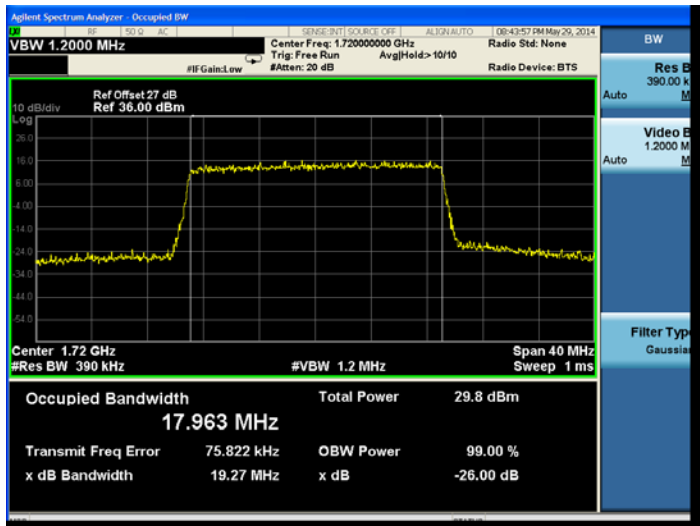


15MHz/16QAM

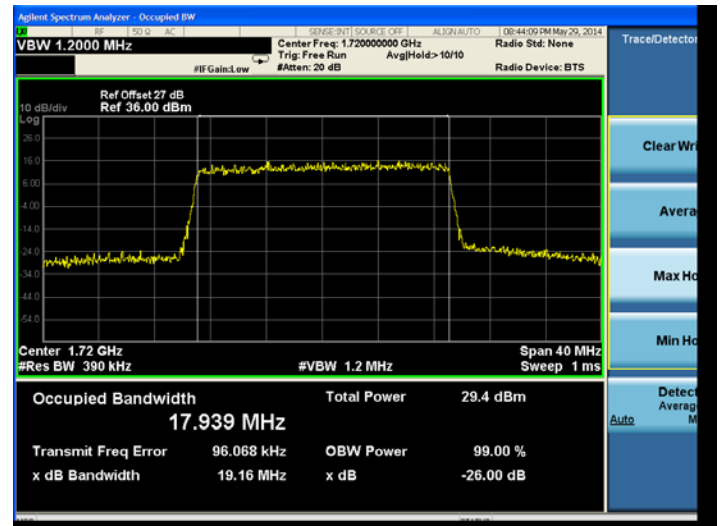


Spectrum Plot of Worst Value

20MHz/QPSK



20MHz/16QAM

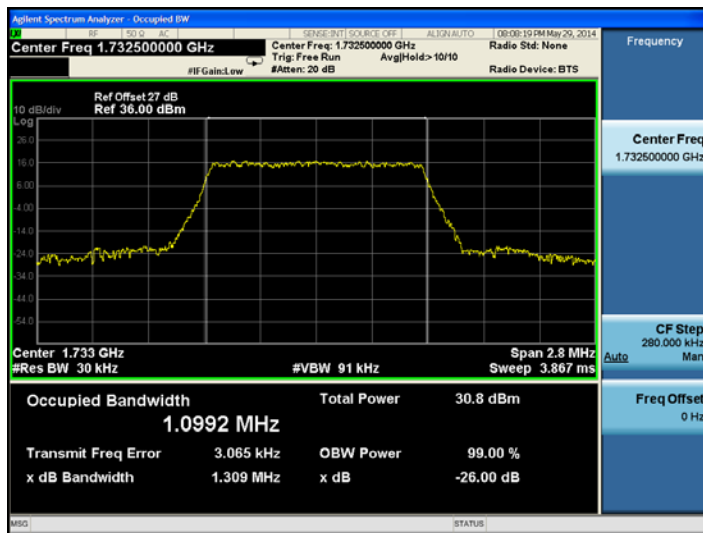




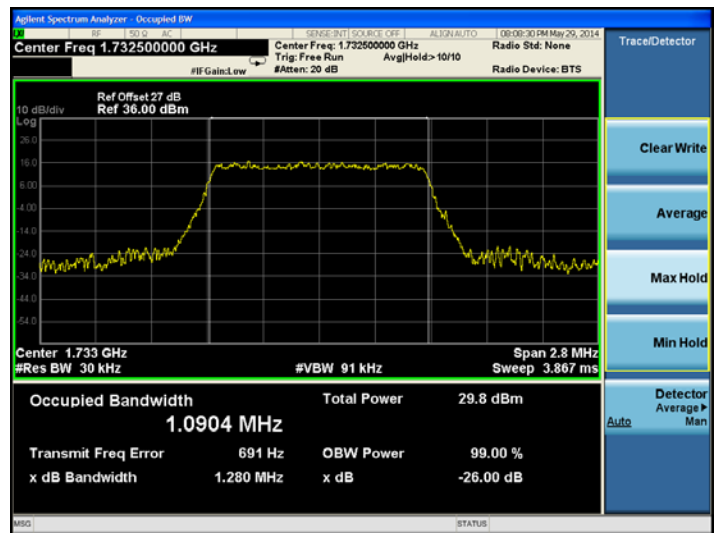
Middle channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

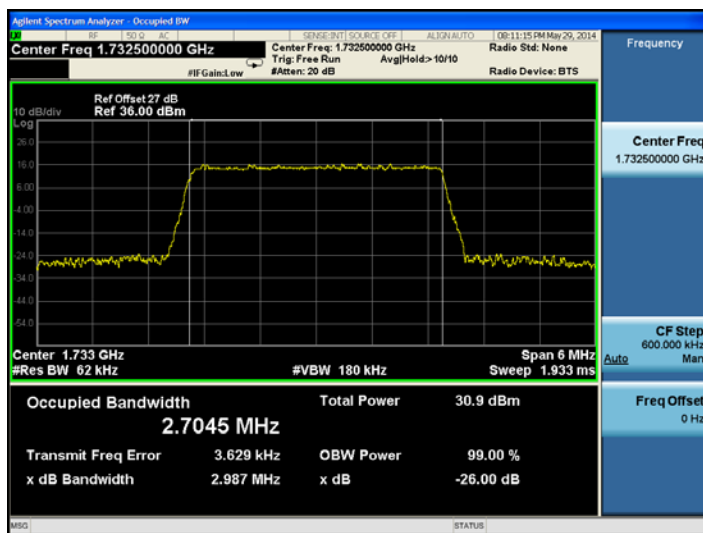


1.4MHz/16QAM

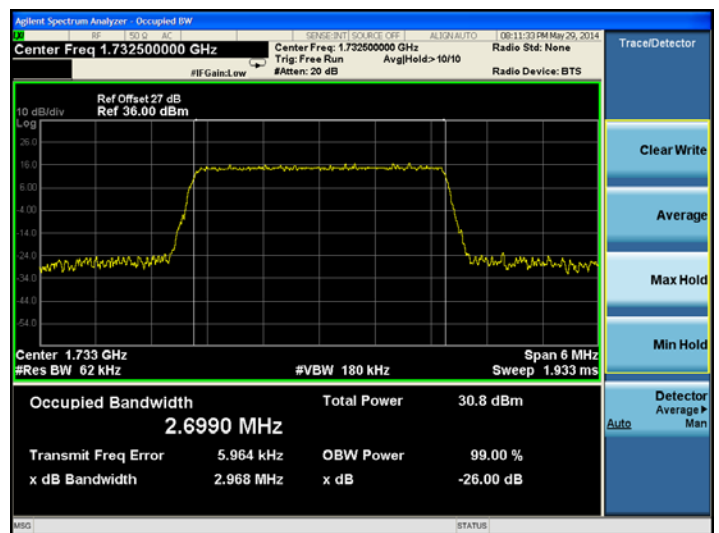


Spectrum Plot of Worst Value

3MHz/QPSK



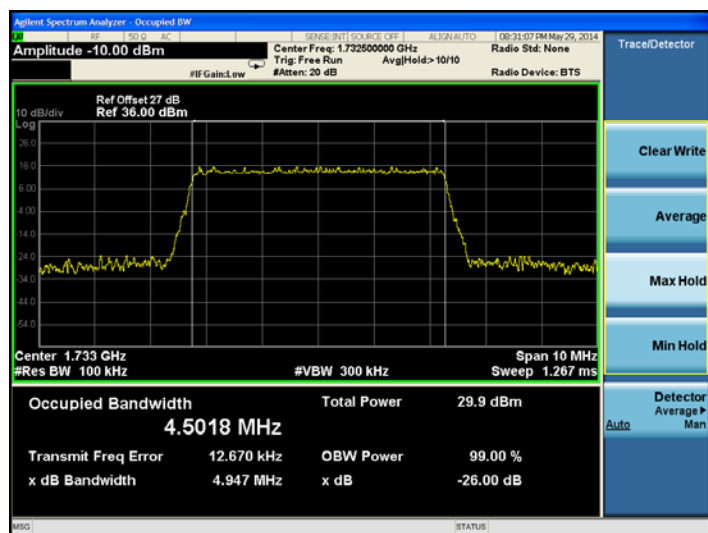
3MHz/16QAM



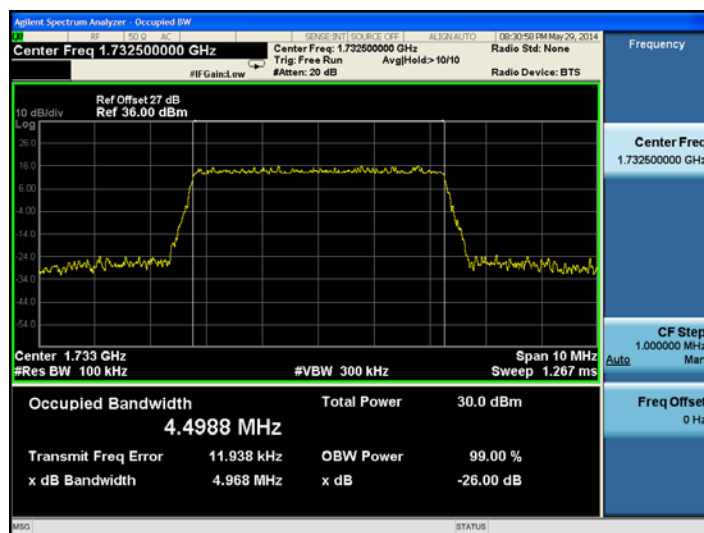


Spectrum Plot of Worst Value

5MHz/QPSK

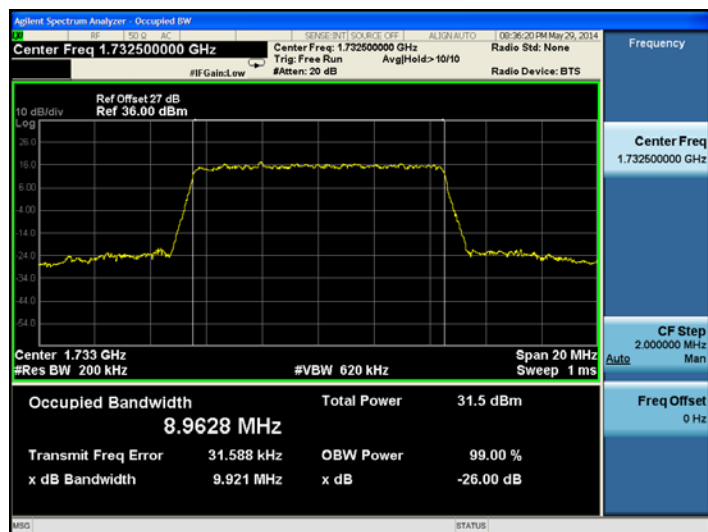


5MHz/16QAM

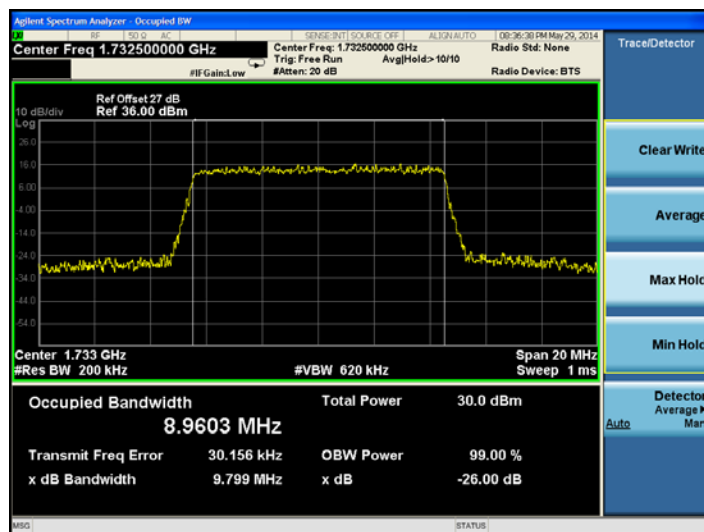


Spectrum Plot of Worst Value

10MHz/QPSK



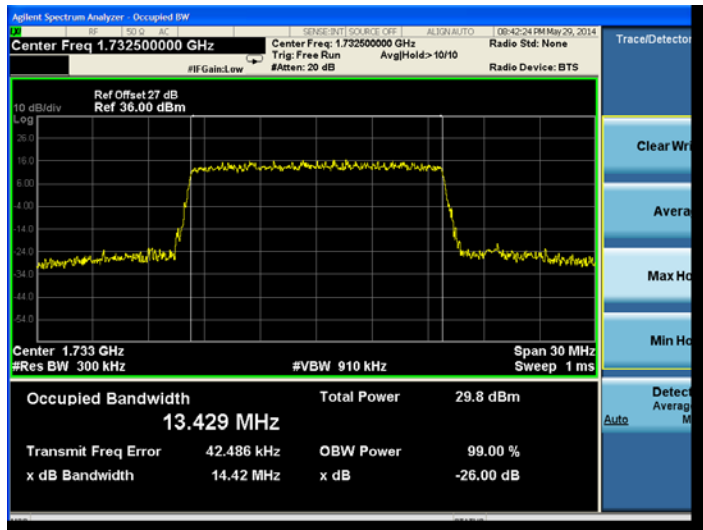
10MHz/16QAM



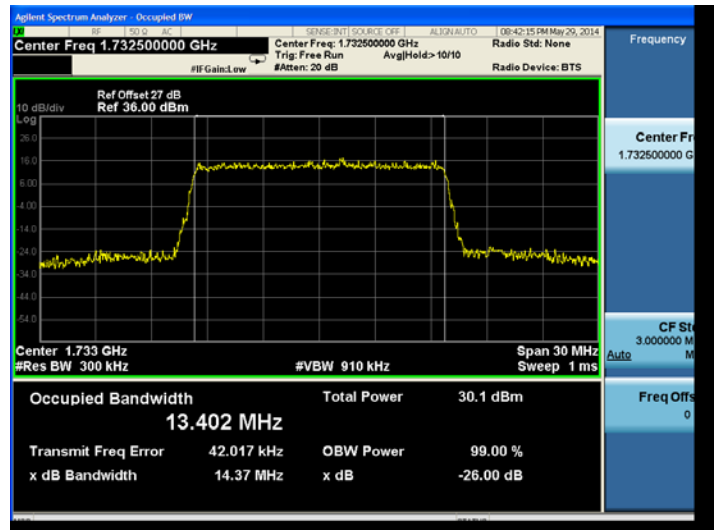


Spectrum Plot of Worst Value

15MHz/QPSK

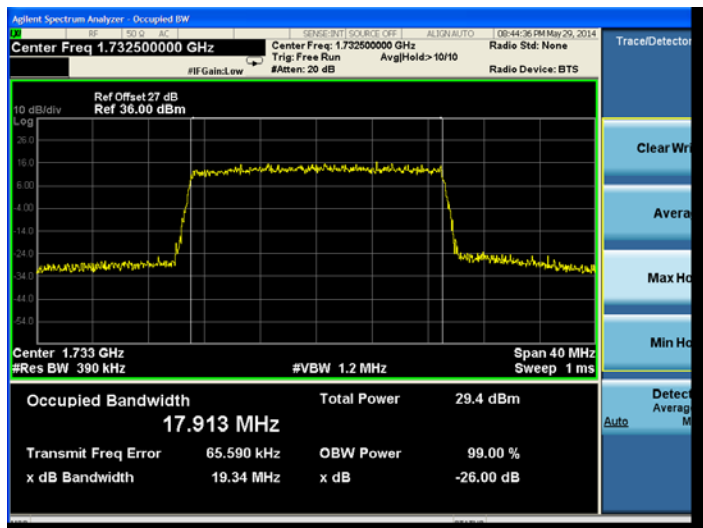


15MHz/16QAM

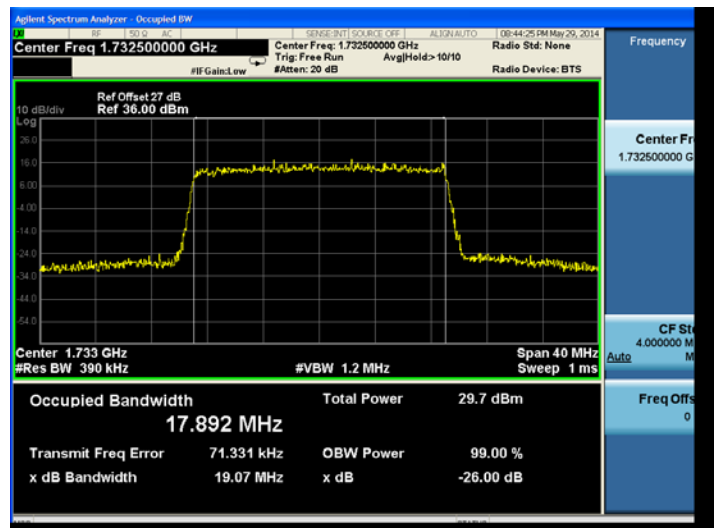


Spectrum Plot of Worst Value

20MHz/QPSK



20MHz/16QAM

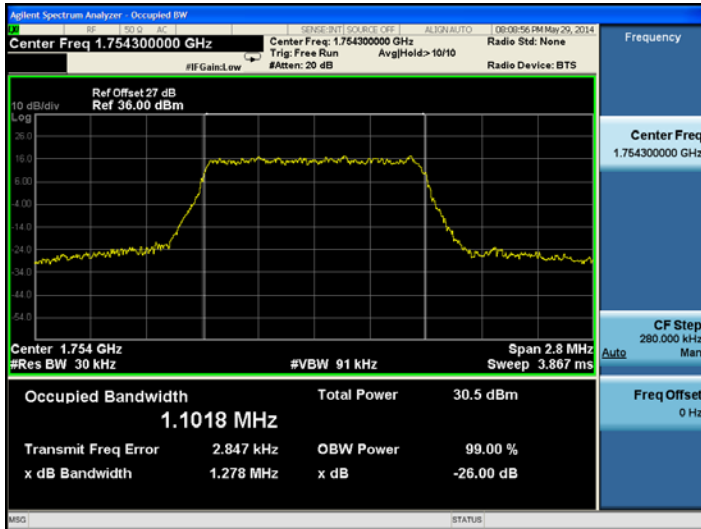




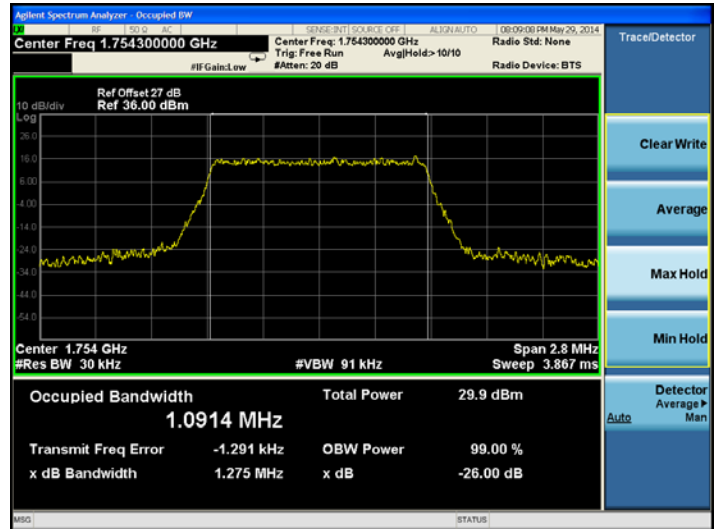
High channel:

Spectrum Plot of Worst Value

1.4MHz/QPSK

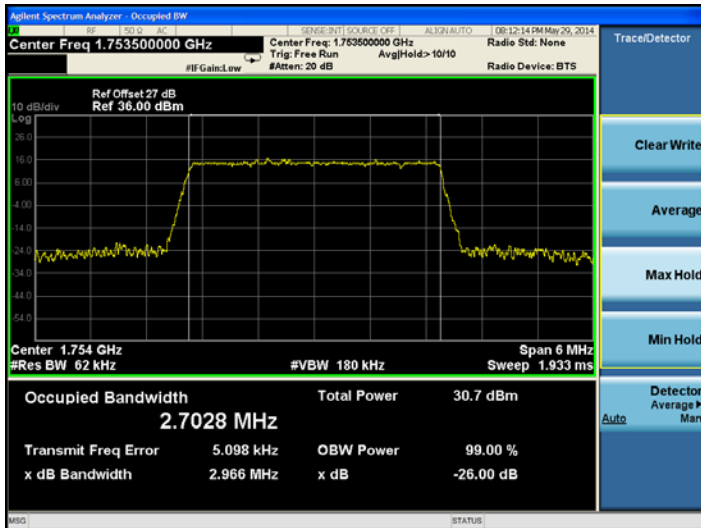


1.4MHz/16QAM

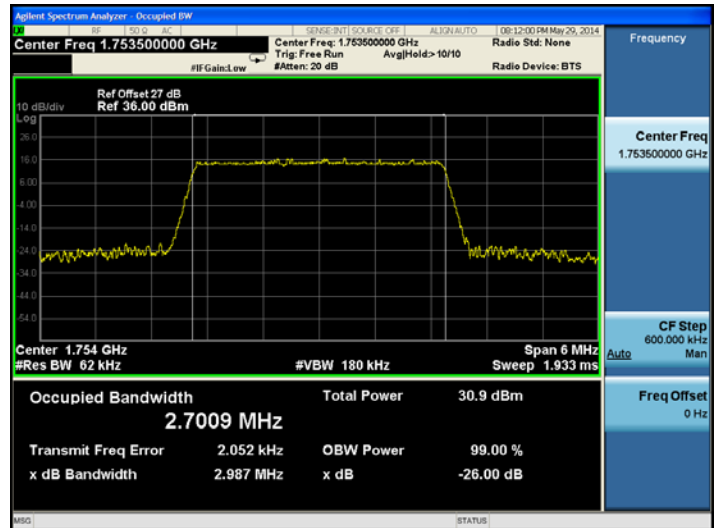


Spectrum Plot of Worst Value

3MHz/QPSK



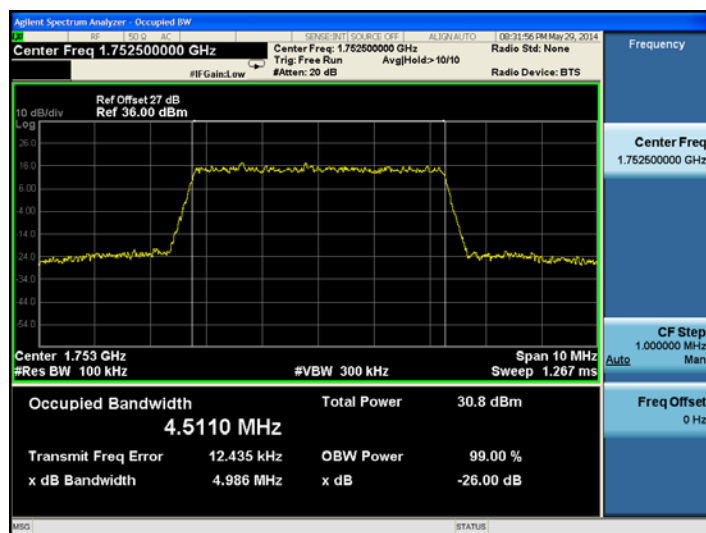
3MHz/16QAM



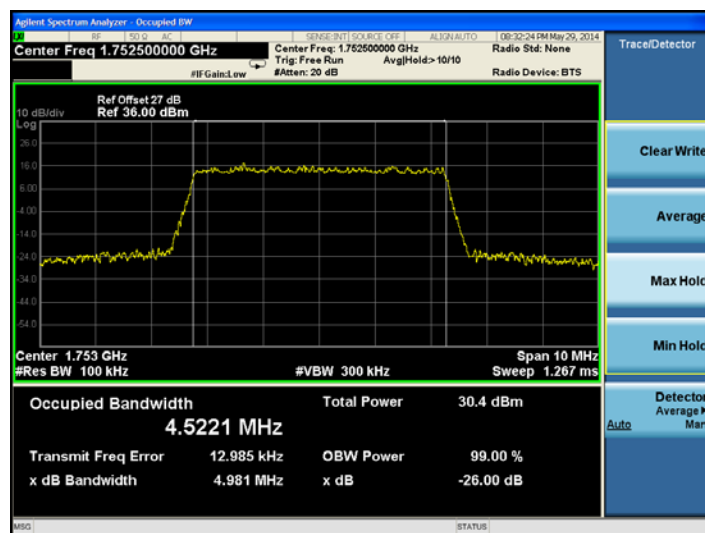


Spectrum Plot of Worst Value

5MHz/QPSK

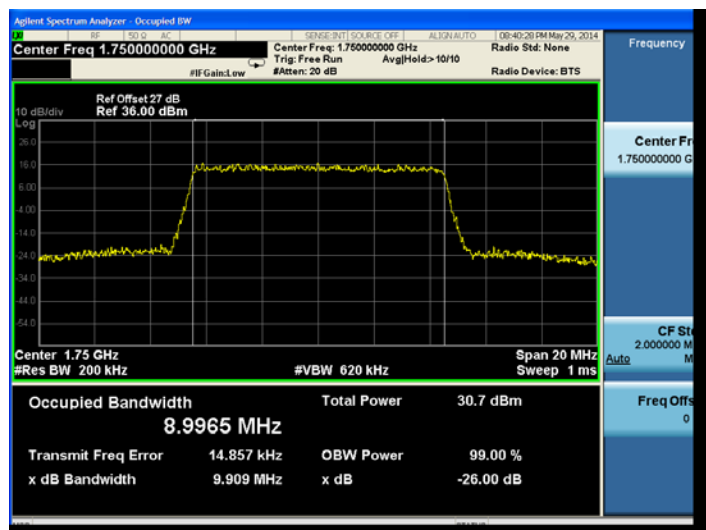


5MHz/16QAM

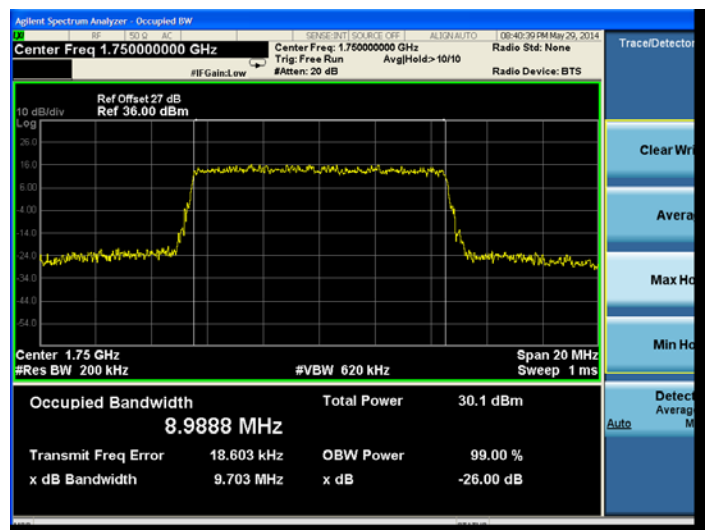


Spectrum Plot of Worst Value

10MHz/QPSK



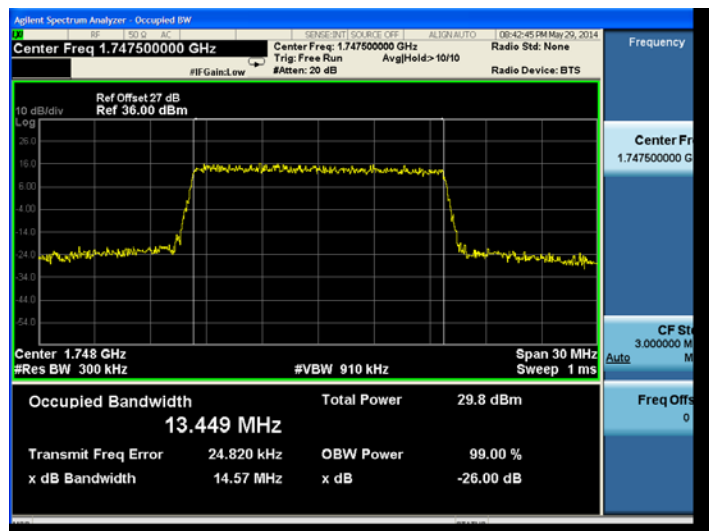
10MHz/16QAM



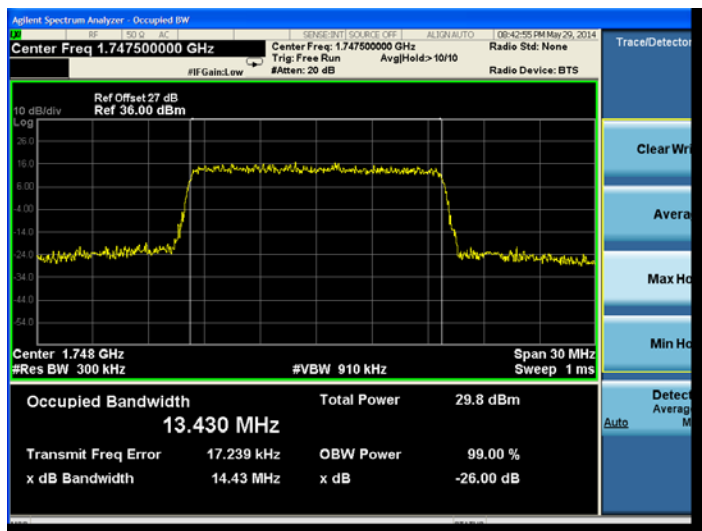


Spectrum Plot of Worst Value

15MHz/QPSK

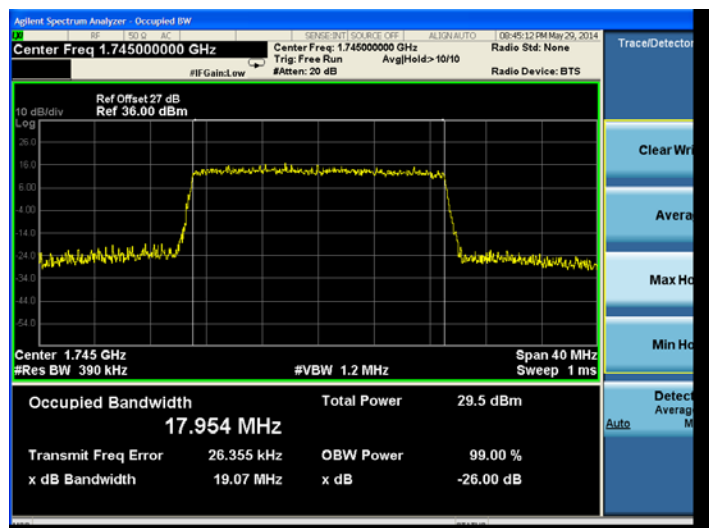


15MHz/16QAM

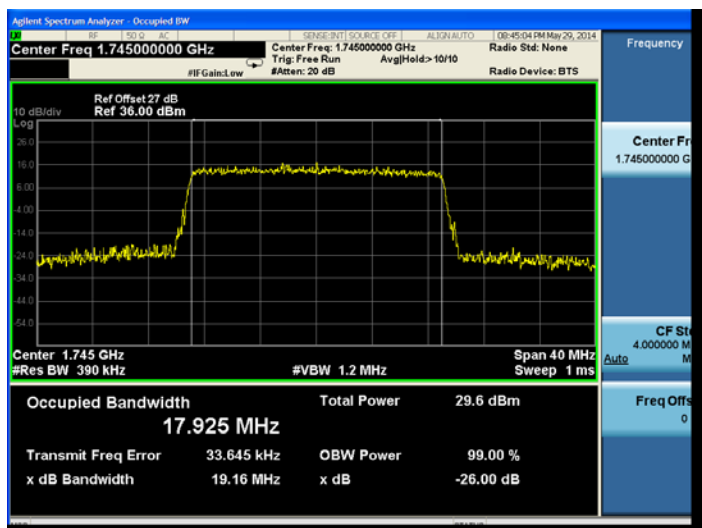


Spectrum Plot of Worst Value

20MHz/QPSK



20MHz/16QAM



2.3 Frequency Stability

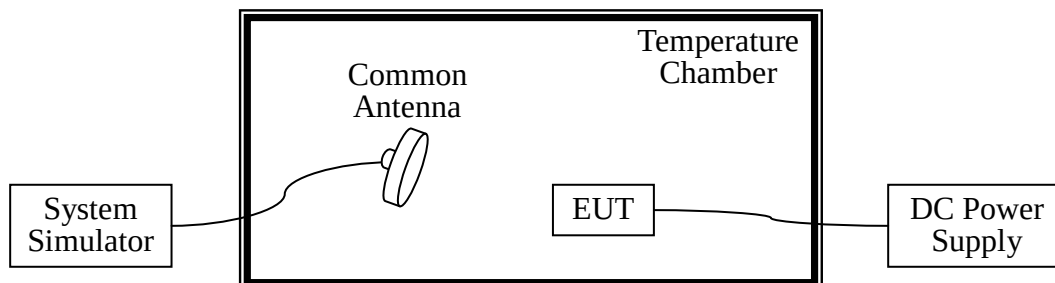
2.3.1 Requirement

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:

- The temperature is varied from -30°C to +50°C at intervals of not more than 10°C.
- 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

1. 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.

2. Equipments List:

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
System Simulator	Rohde& Schwarz	CMW500	1201.0002k5 0/124534/wk	2014.02.26	2015.02.25
DC Power Supply	Good Will	GPS-3030DD	EF920938	2014.02.26	2015.02.25
Temperature Chamber	YinHe Experimental Equip.	HL4003T	(n.a.)	2014.02.26	2015.02.25

2.3.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.35VDC 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 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	12.56	<u>PASS</u>
100		-20	11.66	
100		-10	10.50	
100		0	11.74	
100		+10	11.56	
100		+20	9.48	
100		+30	-10.89	
100		+40	10.83	
100		+50	12.62	
115	4.35	+20	11.12	
85	3.6	+20	12.52	

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 4:

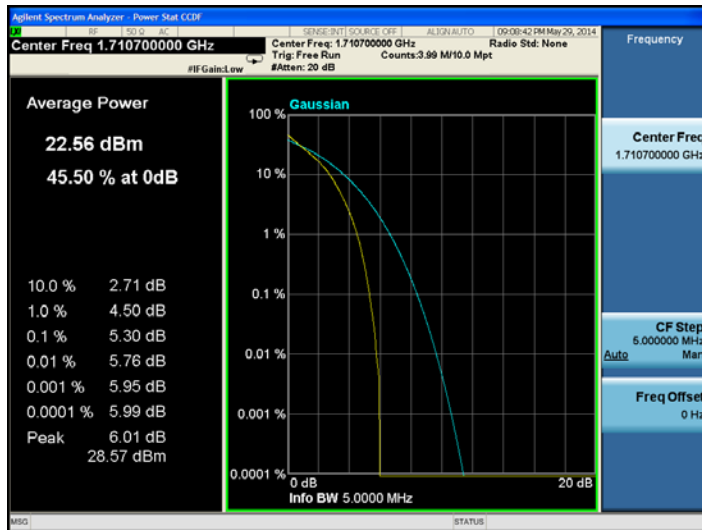
Low channel:

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	5.30	6.15	19965	1771.5	5.57	6.40
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
19975	1712.5	5.66	6.51	20000	1715.0	6.13	6.90
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
20025	1717.5	6.75	7.33	20050	1720.0	7.15	7.58

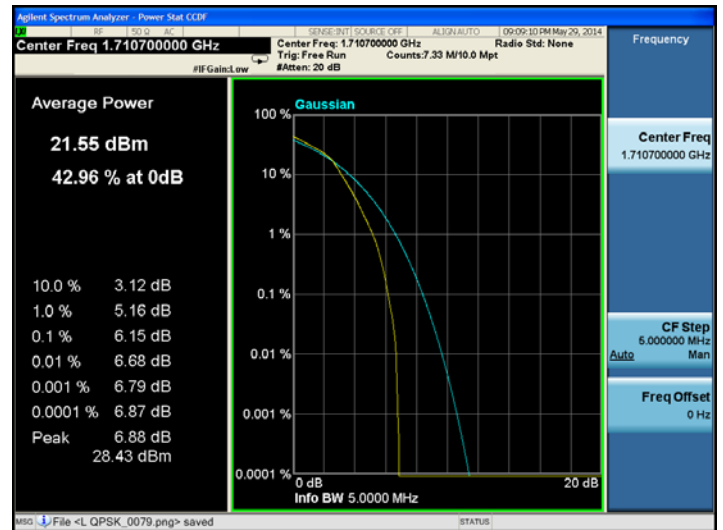


Spectrum Plot of Worst Value (Low channel)

1.4MHz/QPSK

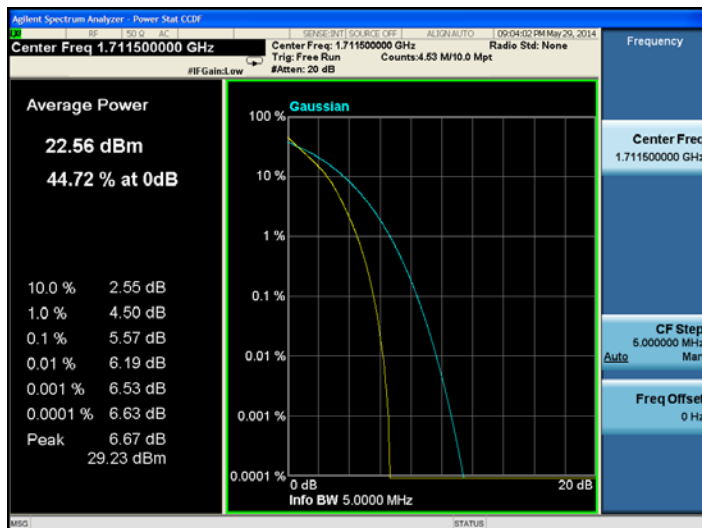


1.4MHz/16QAM

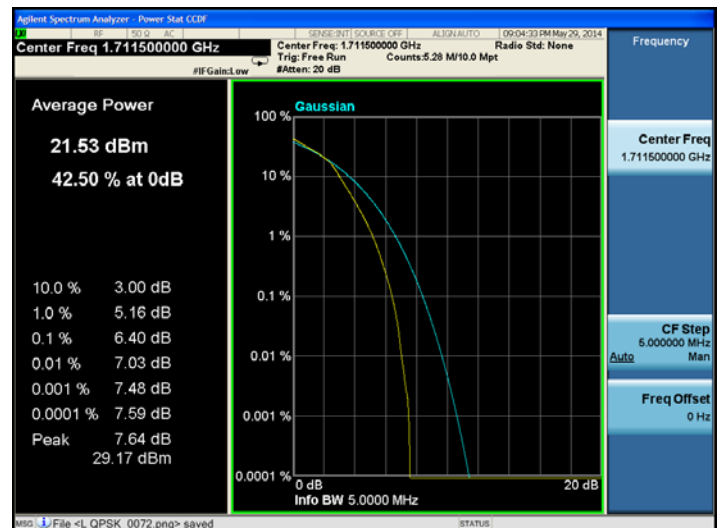


Spectrum Plot of Worst Value

3MHz/QPSK

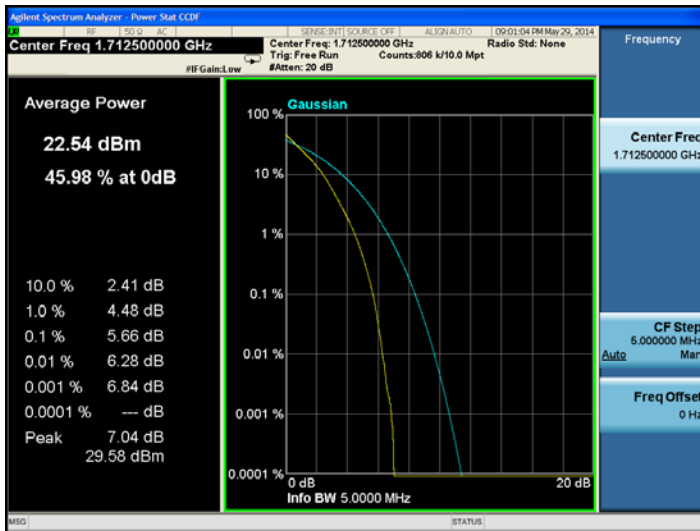


3MHz/16QAM

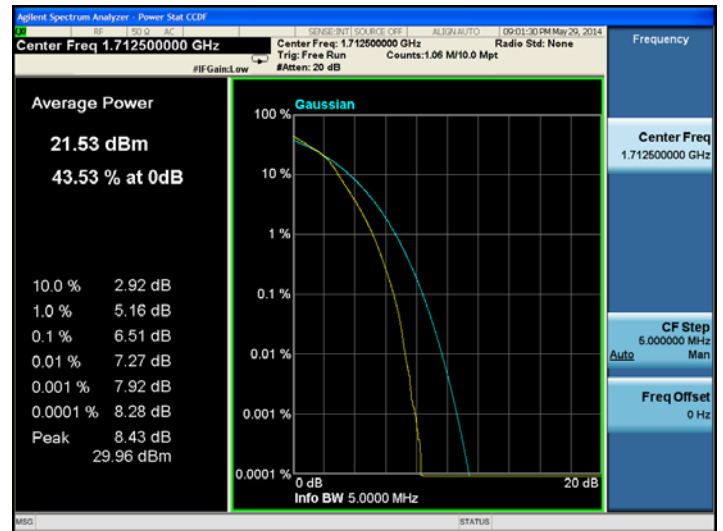


Spectrum Plot of Worst Value

5MHz/QPSK

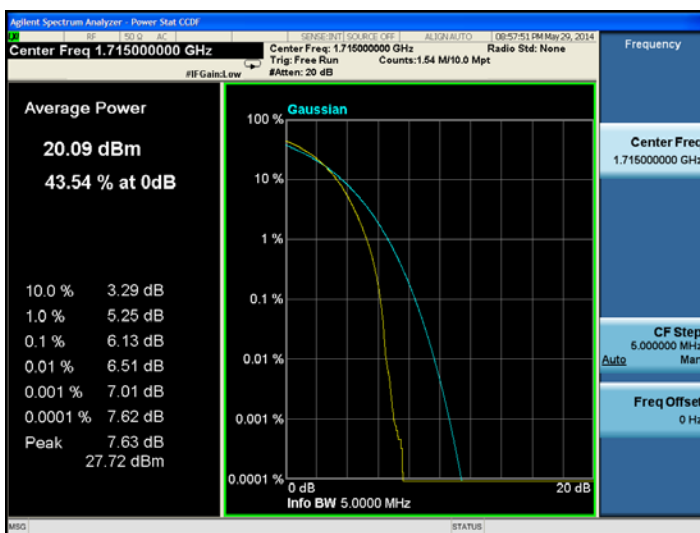


5MHz/16QAM

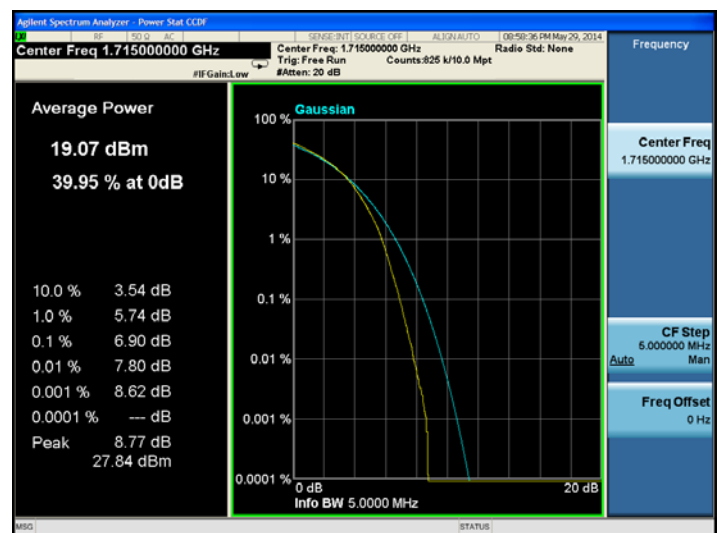


Spectrum Plot of Worst Value

10MHz/QPSK

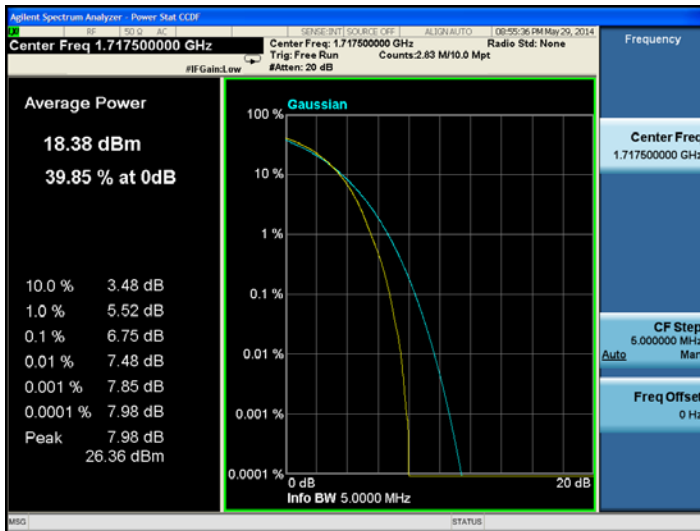


10MHz/16QAM

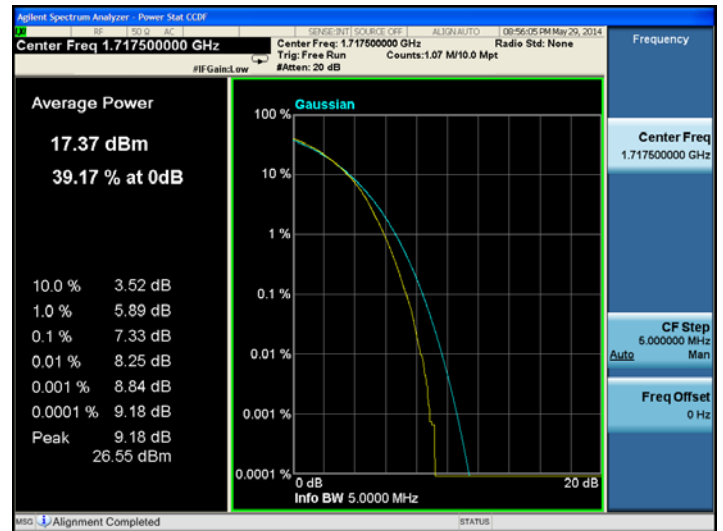


Spectrum Plot of Worst Value

15MHz/QPSK

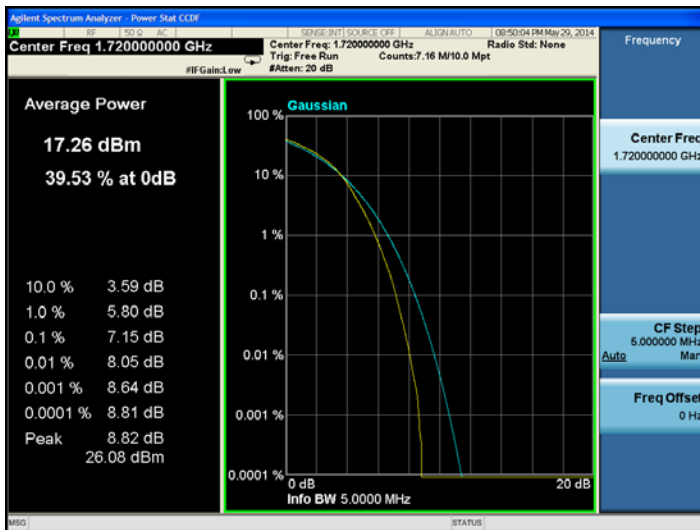


15MHz/16QAM

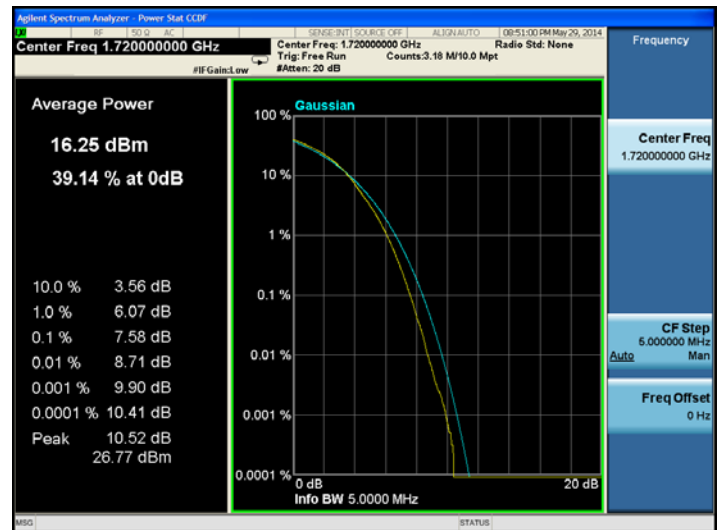


Spectrum Plot of Worst Value

20MHz/QPSK



20MHz/16QAM



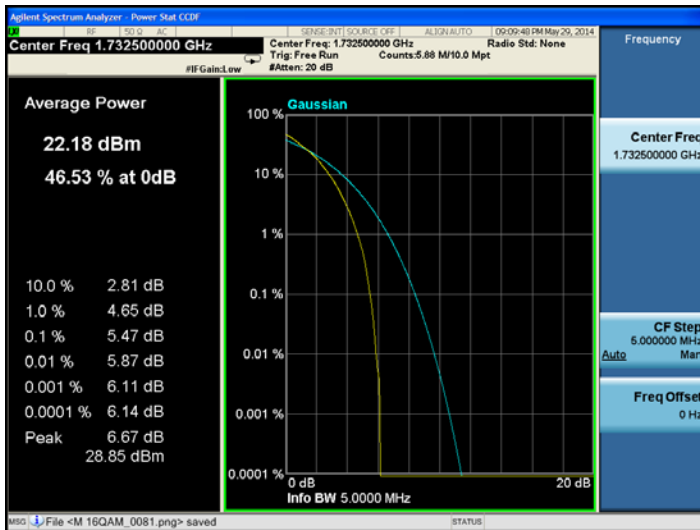
**Middle channel:**

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
20175	1732.5	5.47	5.98	20175	1732.5	5.31	6.16
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
20175	1732.5	6.56	5.97	20175	1732.5	6.52	6.74
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
20175	1732.5	6.72	7.38	20175	1732.5	7.07	7.46

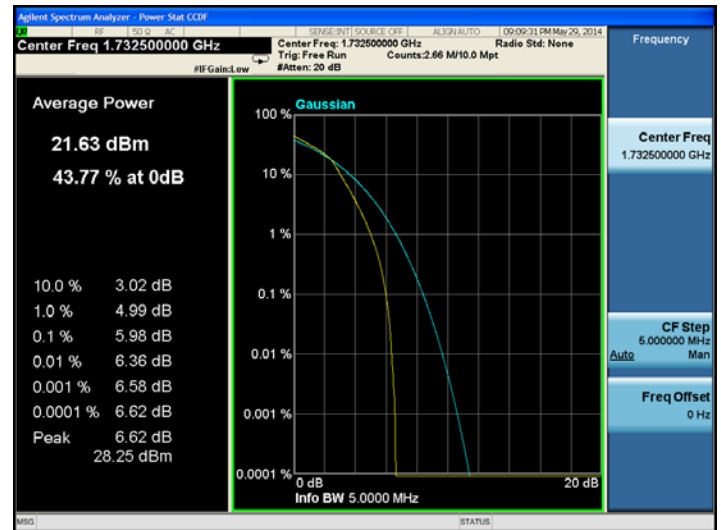


Spectrum Plot of Worst Value

1.4MHz/QPSK

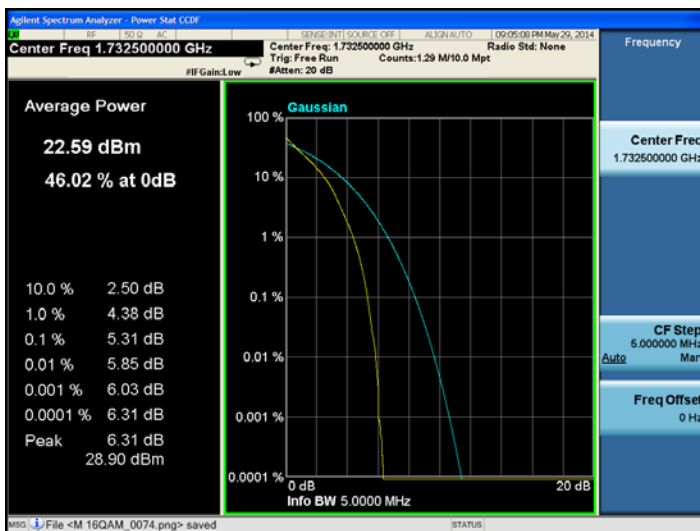


1.4MHz/16QAM

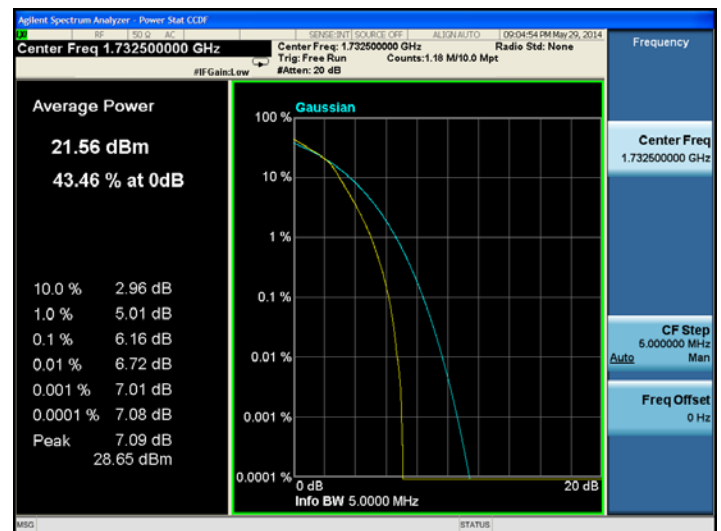


Spectrum Plot of Worst Value

3MHz/QPSK

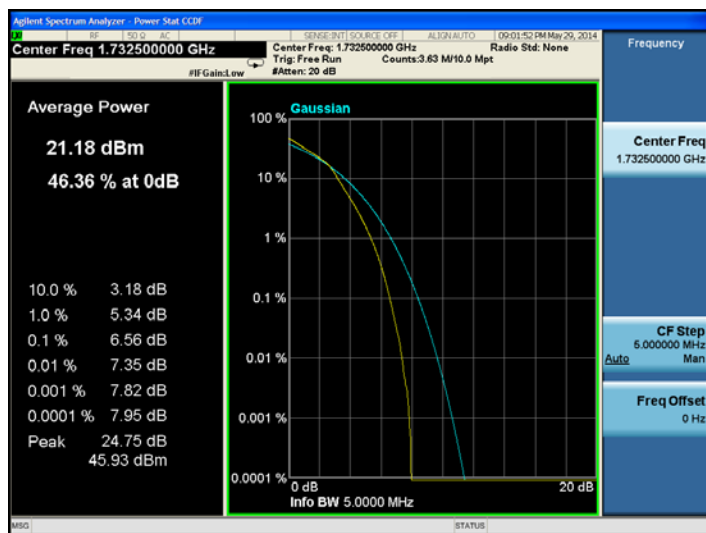


3MHz/16QAM

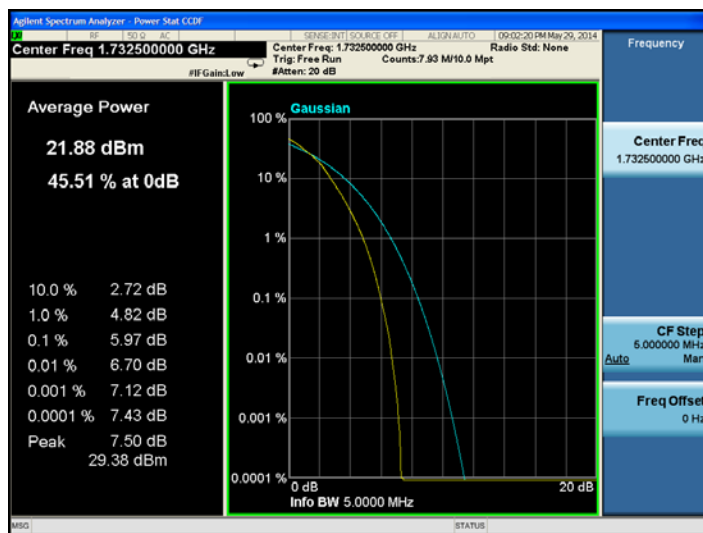


Spectrum Plot of Worst Value

5MHz/QPSK

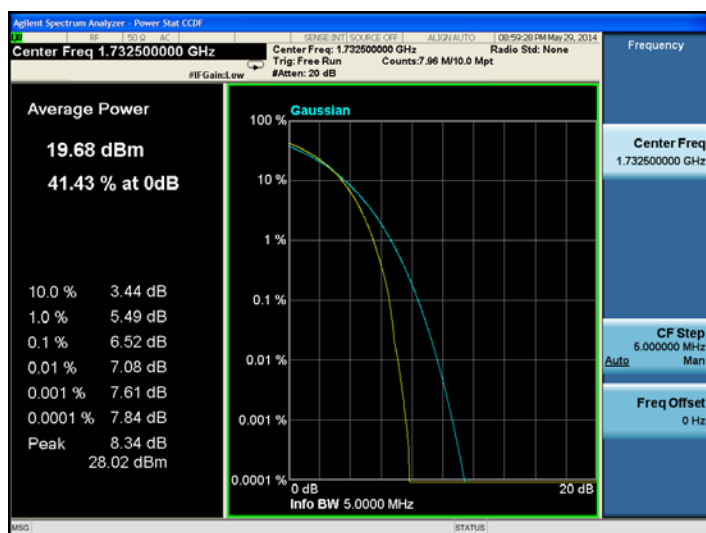


5MHz/16QAM

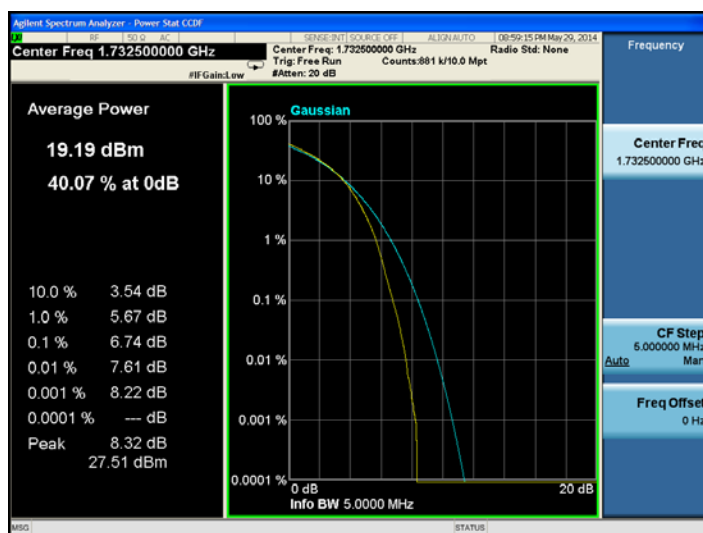


Spectrum Plot of Worst Value

10MHz/QPSK

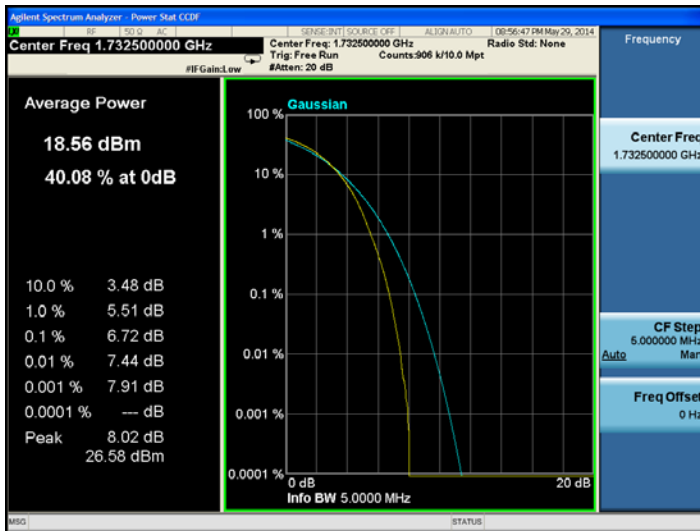


10MHz/16QAM

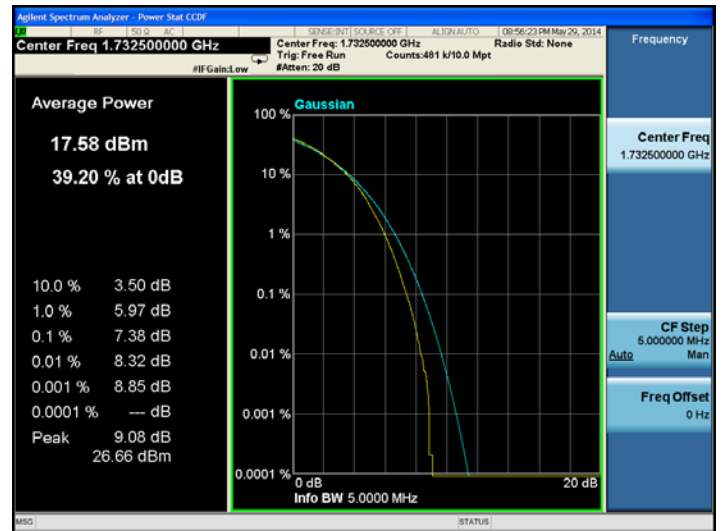


Spectrum Plot of Worst Value

15MHz/QPSK

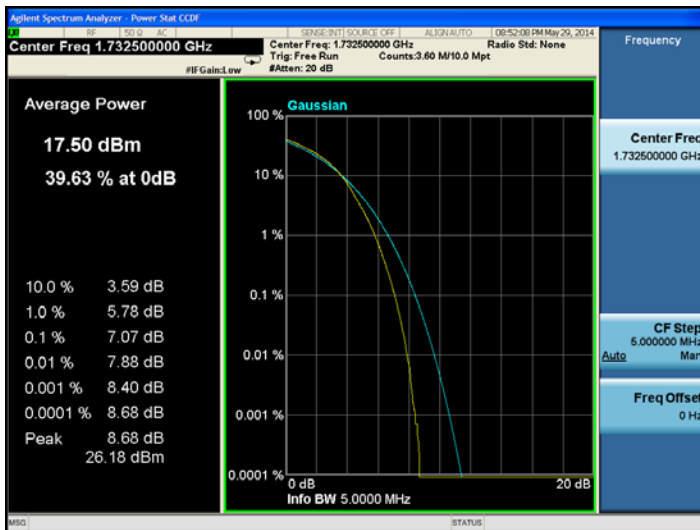


15MHz/16QAM

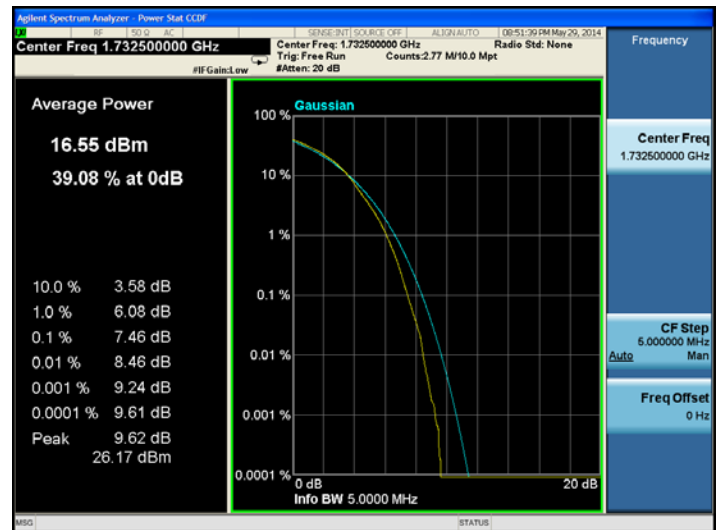


Spectrum Plot of Worst Value

20MHz/QPSK



20MHz/16QAM



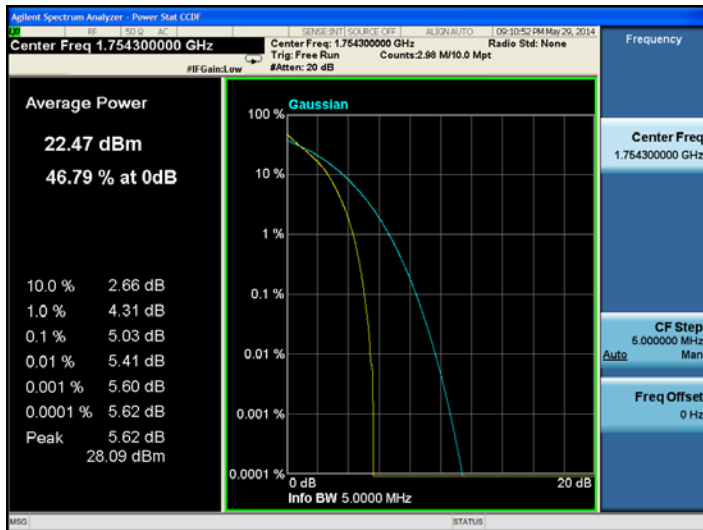
**High channel:**

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
20392	1754.2	5.03	5.87	20384	1753.4	5.24	6.11
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
20375	1752.5	5.43	6.22	20350	1750.0	6.15	6.80
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
20325	1747.5	6.77	7.31	20300	1745.0	7.18	7.07

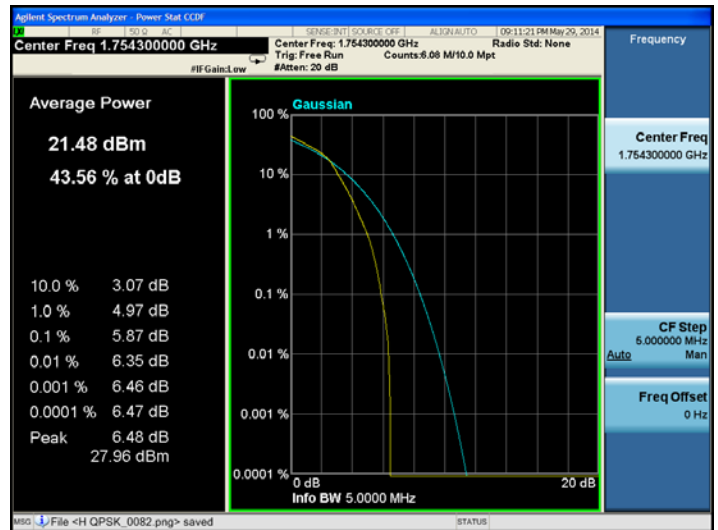


Spectrum Plot of Worst Value

1.4MHz/QPSK

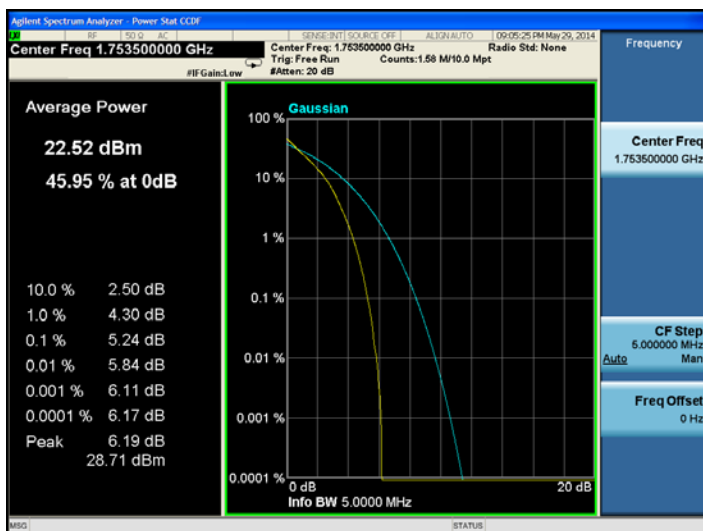


1.4MHz/16QAM

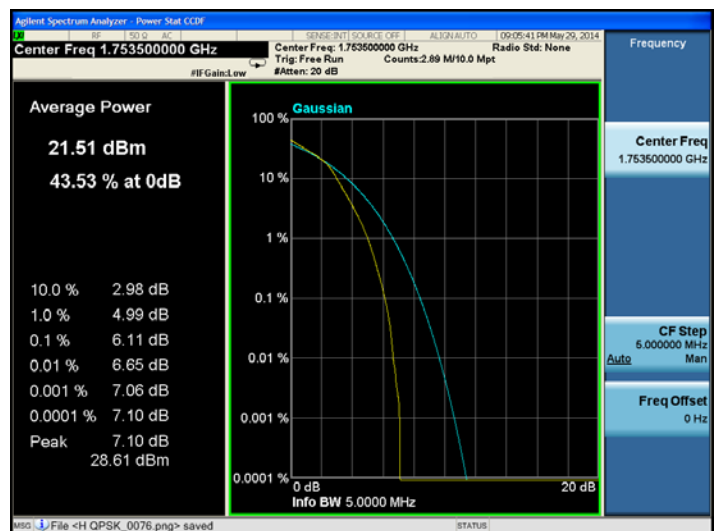


Spectrum Plot of Worst Value

3MHz/QPSK



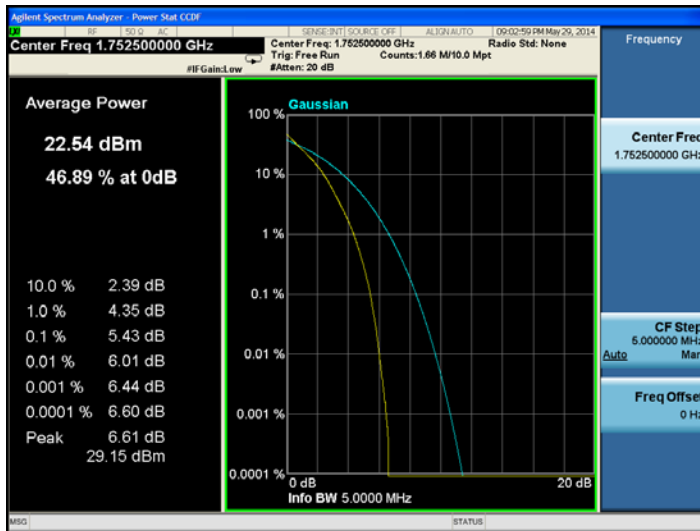
3MHz/16QAM



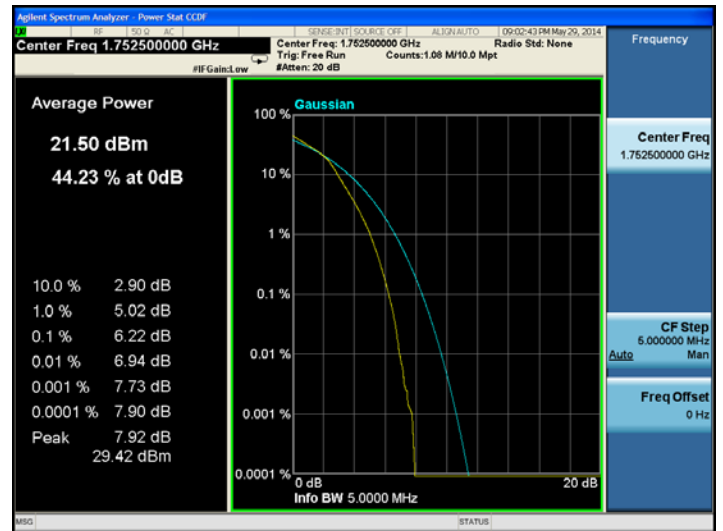


Spectrum Plot of Worst Value

5MHz/QPSK



5MHz/16QAM

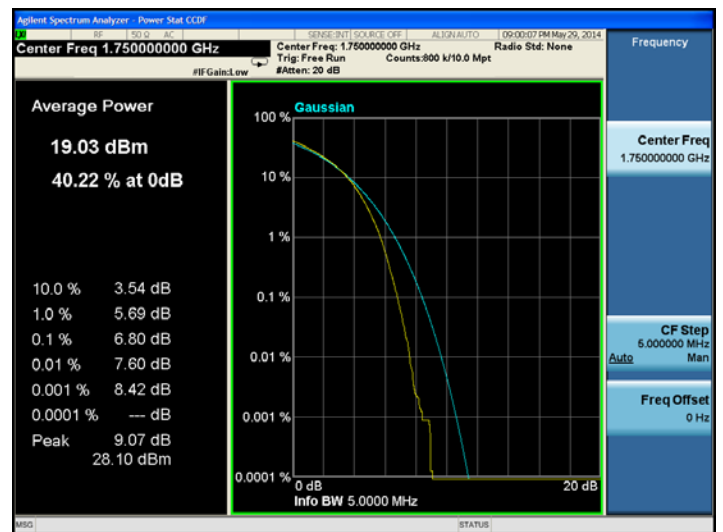


Spectrum Plot of Worst Value

10MHz/QPSK



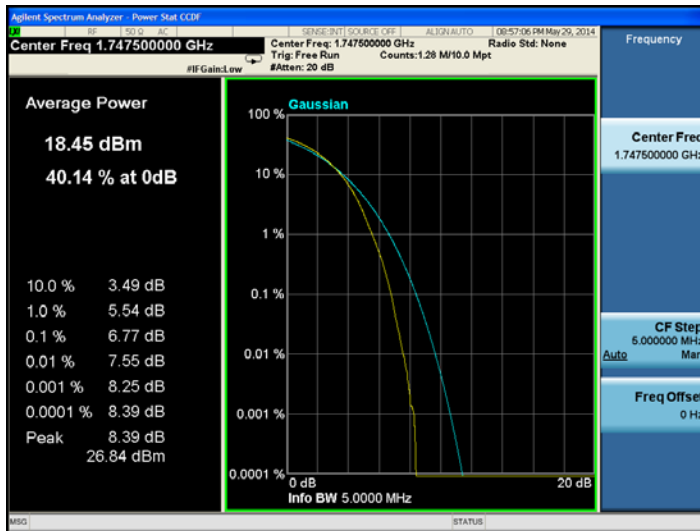
10MHz/16QAM



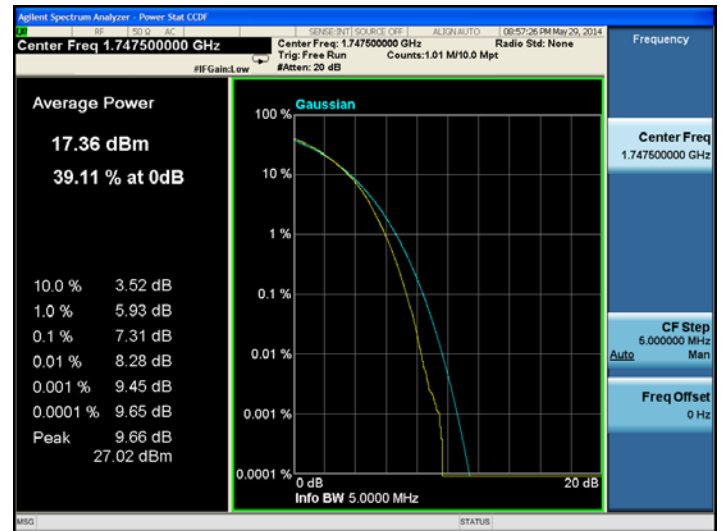


Spectrum Plot of Worst Value

15MHz/QPSK

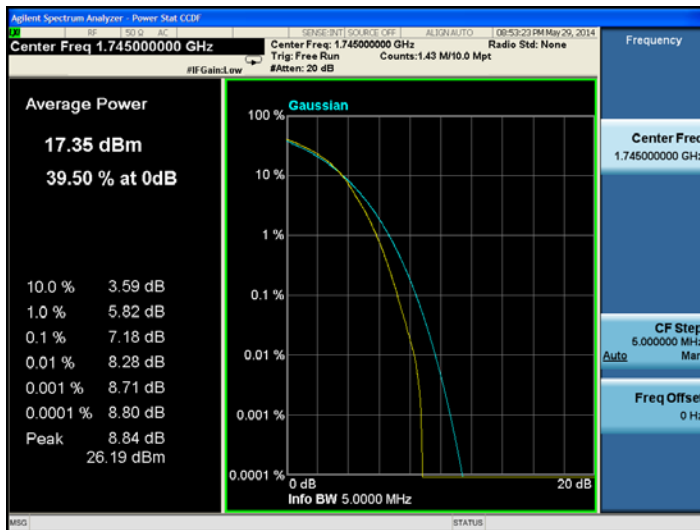


15MHz/16QAM



Spectrum Plot of Worst Value

20MHz/QPSK



20MHz/16QAM

