

FCC REPORT

FCC Class II Permissive Change

Applicant Name:
SAMSUNG Electronics Co.,Ltd.**Date of Issue:**
January 09, 2018**Address:**
129, Samsung-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, 16677, Rep. of Korea**Test Site/Location:**
HCT CO., LTD.,
74, Seoicheon-ro 578beon-gil, Majang-myeon,
Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA**Report No.:** HCT-RF-1801-FC003**FCC ID:** A3LSLS-BD106Q**APPLICANT:** SAMSUNG Electronics Co.,Ltd.**FCC Model:** SLS-BD106Q
EUT Type: RRH(Remote Radio Head)
Frequency Range: 2 496 MHz ~ 2 690 MHz
Tx Output Power: 70 W (17.5 W * 4)**Emission Designator**

Mode	Tx Frequency (MHz)	Emission Designator	
		QPSK (G7D)	16QAM/64QAM (W7D)
LTE (15 MHz)	2 496 ~ 2 690	13M7G7D	13M7W7D
LTE (20 MHz)	2 496 ~ 2 690	-	-

※ 20 MHz Band emission designator can be found in previously issued report

FCC Rule Part(s): FCC CFR 47 Part 2, Part 27**Data of Test:** December 12, 2017 ~ December 22, 2017**Note:** Refer to existing report 'HCTR1208FR08', HCTR1211FR02' and
'HCTR1302FR26' for data not included.**Engineering Statement:**

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of FCC Part 27 of the FCC Rules under normal use and maintenance.

**Report prepared by : Kyung Soo Kang**
Engineer of Telecommunication testing center**Approved by : Jong Seok Lee**
Manager of Telecommunication testing center

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1801-FC003	January 09, 2018	- First Approval Report

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1. GENERAL INFORMATION

1.1. CLIENT INFORMATION

Company	Samsung Electronics Co., Ltd.
Contact Point	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Contact person	Name: Hwan Youl Kim / Principal Research Engineer E-mail : hwanyoul.kim@samsung.com

1.2. PRODUCT INFORMATION

EUT Type	RRH(Remote Radio Head)																
Power Supply	-48 VDC																
Emission Designator	<table border="1"> <thead> <tr> <th rowspan="2">Mode</th><th rowspan="2">Tx Frequency (MHz)</th><th colspan="2">Emission Designator</th></tr> <tr> <th>QPSK (G7D)</th><th>16QAM/64QAM (W7D)</th></tr> </thead> <tbody> <tr> <td>LTE (15 MHz)</td><td>2 496 ~ 2 690</td><td>13M7G7D</td><td>13M7W7D</td></tr> <tr> <td>LTE (20 MHz)</td><td>2 496 ~ 2 690</td><td>-</td><td>-</td></tr> </tbody> </table>	Mode	Tx Frequency (MHz)	Emission Designator		QPSK (G7D)	16QAM/64QAM (W7D)	LTE (15 MHz)	2 496 ~ 2 690	13M7G7D	13M7W7D	LTE (20 MHz)	2 496 ~ 2 690	-	-	※ 20 MHz Band emission designator can be found in previously issued report	
Mode	Tx Frequency (MHz)			Emission Designator													
		QPSK (G7D)	16QAM/64QAM (W7D)														
LTE (15 MHz)	2 496 ~ 2 690	13M7G7D	13M7W7D														
LTE (20 MHz)	2 496 ~ 2 690	-	-														
Frequency Range	2 496 MHz ~ 2 690 MHz																
Conducted Output Power	70 W (17.5 W * 4 for 15 MHz Bandwidth)																
Channel Bandwidths	LTE Band 41, 15 MHz / 20 MHz Bandwidth																
Modulation Type	QPSK, 16QAM, 64QAM																
Antenna Specification	Manufacturer does not provide an antenna.																

2. FACILITIES AND ACCREDITATIONS

2.1. FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version: 2014) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 07, 2015 (Registration Number: 90661).

2.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

3. TEST SPECIFICATIONS

3.1. STANDARDS

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 2, Part 27

SECTION	TEST ITEMS	RESULTS
§2.1046, §27.50	Conducted Output Power	Compliant
§2.1049	Occupied Bandwidth	Compliant
§2.1051, §27.53	Spurious Emissions at Antenna Terminals	Compliant
§2.1053, §27.53	Radiated Spurious Emissions.	Compliant
§2.1055, §27.54	Frequency Stability	Compliant

3.2. MODE OF OPERATION DURING THE TEST

The EUT is operated in a manner representative of the typical usage of the equipment.

During all testing, system components were manipulated within the confines of typical usage to maximize each emission. All LTE modulation (QPSK, 16QAM, 64QAM) modes were tested.

3.3. MAXIMUM MEASUREMENT UNCERTAINTY

The value of the measurement uncertainty for the measurement of each parameter.

Coverage factor $k = 2$, Confidence levels of 95 %

Description	Condition	Uncertainty
Conducted RF Output Power	-	± 0.72 dB
Occupied Bandwidth	OBW ≤ 20 MHz	± 52 kHz
Spurious Emissions at Antenna Terminals	-	± 1.08 dB
Radiated Spurious Emissions	$f \leq 1$ GHz	± 4.80 dB
	$f > 1$ GHz	± 6.07 dB
Frequency Stability	-	$\pm 1.22 \times 10^{-6}$

3.4. STANDARDS ENVIRONMENTAL TEST CONDITIONS

Temperature :	+ 15 °C to + 35 °C
Relative humidity:	30 % to 60 %
Air pressure	860 mbar to 1 060 mbar

4. TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Agilent	N9020A / Spectrum Analyzer	09/15/2017	Annual	MY46471250
Weinschel	67-30-33 / Fixed Attenuator	02/09/2017	Annual	CC7264
Weinschel	67-30-33 / Fixed Attenuator	02/09/2017	Annual	BU5347
Weinschel	67-30-33 / Fixed Attenuator	09/14/2017	Annual	N/A
Weinschel	67-30-33 / Fixed Attenuator	09/14/2017	Annual	N/A
Rohde&Schwarz	ATT / 10dB Attenuator	08/21/2017	Annual	N/A
KIKUSUI	PWR800L / DC Power Supply	03/28/2017	Annual	RE001154
KIKUSUI	PWR800L / DC Power Supply	07/18/2017	Annual	RK000880
NANGYEUL CO., LTD.	NY-THR18750 / Temperature and Humidity Chamber	10/21/2017	Annual	NY-2009012201A
Audix	AM4000 / Antenna Position Tower	N/A	N/A	N/A
Innco system	CT0800 / Turn Table	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Rohde & Schwarz	Loop Antenna	04/19/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	06/30/2017	Biennial	9120D-1300
Rohde & Schwarz	FSP / Spectrum Analyzer	09/21/2017	Annual	836650/016
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/27/2017	Annual	101068-SZ
Wainwright Instruments	WHKX10-900-1000-15000-40SS	07/21/2017	Annual	5
CERNEX	CBLU1183540 / Power Amplifier	01/25/2017	Annual	24614
CERNEX	CBL06185030 / Power Amplifier	01/25/2017	Annual	24615

5. CONDUCTED OUTPUT POWER

Test Requirements:

§ 2.1046 Measurements required: RF power output:

- (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 § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.
- (b) For single sideband, independent sideband, and single channel, controlled carrier radio telephone transmitters, the procedure specified in paragraph (a) of this section shall be employed and, in addition, the transmitter shall be modulated during the test as specified and as applicable in § 2.1046 (b) (1-5). In all tests, the input level of the modulating signal shall be such as to develop rated peak envelope power or carrier power, as appropriate, for the transmitter.
- (c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

§ 27.50 Power limits and duty cycle

- (h) The following power limits shall apply in the BRS and EBS:
 - (1) Main, booster and base stations.
 - (i) The maximum EIRP of a main, booster or base station shall not exceed $33 \text{ dBW} + 10\log(X/Y) \text{ dBW}$, where X is the actual channel width in MHz and Y is either 6 MHz if prior to transition or the station is in the MBS following transition or 5.5 MHz if the station is in the LBS and UBS following transition, except as provided in paragraph (h)(1)(ii) of this section.
 - (ii) If a main or booster station sectorizes or otherwise uses one or more transmitting antennas with a non-omnidirectional horizontal plane radiation pattern, the maximum EIRP in dBW in a given direction shall be determined by the following formula: $\text{EIRP} = 33 \text{ dBW} + 10 \log(X/Y) \text{ dBW} + 10 \log(360/\text{beamwidth}) \text{ dBW}$, where X is the actual channel width in MHz, Y is either (i) 6 MHz if prior to transition or the station is in the MBS following transition or (ii) 5.5 MHz if the station is in the LBS and UBS following transition, and beamwidth is the total horizontal plane beamwidth of the individual transmitting antenna for the station or any sector measured at the half-power points.

Test Procedures:

According to FCC §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 § 2.1033(c). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

- 1) The radio frequency load attached to the EUT antenna terminal was 50 Ohm. The loss of the cables the test system is calibrated to correct the reading.
- 2) The spectrum analyzer was set to RMS Detector function and Average mode.
- 3) The resolution bandwidth of the spectrum analyzer was comparable to the emission bandwidth.
- 4) The conducted emission level is measured at each antenna port and then summed mathematically to determine the total emission level from the device.

Note:

- 1) Maximum ERP is sufficient level to pass the limit.
- 2) Sum data is in a tolerance of specification provided from manufacturer.

RF Output power tolerance: ± 1 dB (each port)

Maximum output power for one port: 22.029 W (42.43 dBm + 1 dB)

Maximum output sum power: $22.029\text{ W} \times 4 = 88.116\text{ W}$

Measured sum maximum power: 80.736 W

The measured value is lower than the specification value.

Test Results:

15 MHz / 1 Carrier (7.5 W)

Test Data at Downlink Port 0

Mod.	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
QPSK	Low	2503.50	38.73	7.464
	Middle	2593.00	39.00	7.943
	High	2682.50	38.19	6.592
16QAM	Low	2503.50	38.47	7.031
	Middle	2593.00	39.05	8.035
	High	2682.50	38.45	6.998
64QAM	Low	2503.50	38.71	7.430
	Middle	2593.00	39.02	7.980
	High	2682.50	38.49	7.063

Test Data at Downlink Port 1

Mod.	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
QPSK	Low	2503.50	38.37	6.871
	Middle	2593.00	38.86	7.691
	High	2682.50	38.92	7.798
16QAM	Low	2503.50	38.51	7.096
	Middle	2593.00	38.99	7.925
	High	2682.50	38.59	7.228
64QAM	Low	2503.50	38.31	6.776
	Middle	2593.00	38.75	7.499
	High	2682.50	38.66	7.345

Test Data at Downlink Port 2

Mod.	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
QPSK	Low	2503.50	38.20	6.607
	Middle	2593.00	38.86	7.691
	High	2682.50	38.73	7.464
16QAM	Low	2503.50	38.25	6.683
	Middle	2593.00	38.84	7.656
	High	2682.50	38.91	7.780
64QAM	Low	2503.50	38.39	6.902
	Middle	2593.00	39.12	8.166
	High	2682.50	38.72	7.447

Test Data at Downlink Port 3

Mod.	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
QPSK	Low	2503.50	38.43	6.966
	Middle	2593.00	39.11	8.147
	High	2682.50	38.83	7.638
16QAM	Low	2503.50	38.58	7.211
	Middle	2593.00	39.21	8.337
	High	2682.50	38.95	7.852
64QAM	Low	2503.50	38.42	6.950
	Middle	2593.00	39.11	8.147
	High	2682.50	38.93	7.816

Sum Data of Port 0, Port 1, Port 2 and Port 3

Mod.	Channel	Frequency (MHz)	Measured Output Power (W)
QPSK	Low	2503.50	27.908
	Middle	2593.00	31.472
	High	2682.50	29.492
16QAM	Low	2503.50	28.021
	Middle	2593.00	31.953
	High	2682.50	29.858
64QAM	Low	2503.50	28.058
	Middle	2593.00	31.792
	High	2682.50	29.671

20 MHz + 15 MHz / 2 Carriers (10 W + 7.5 W)

Test Data at Downlink Port 0

Mod.	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
QPSK	Low	2513.50	42.65	18.408
	Middle	2593.00	43.03	20.091
	High	2672.50	42.93	19.634
16QAM	Low	2513.50	42.82	19.143
	Middle	2593.00	42.84	19.231
	High	2672.50	42.88	19.409
64QAM	Low	2513.50	42.92	19.588
	Middle	2593.00	43.04	20.137
	High	2672.50	42.99	19.907

Test Data at Downlink Port 1

Mod.	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
QPSK	Low	2513.50	42.84	19.231
	Middle	2593.00	42.91	19.543
	High	2672.50	42.98	19.861
16QAM	Low	2513.50	42.83	19.187
	Middle	2593.00	42.88	19.409
	High	2672.50	43.06	20.230
64QAM	Low	2513.50	42.94	19.679
	Middle	2593.00	43.02	20.045
	High	2672.50	42.94	19.679

Test Data at Downlink Port 2

Mod.	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
QPSK	Low	2513.50	43.08	20.324
	Middle	2593.00	42.88	19.409
	High	2672.50	43.02	20.045
16QAM	Low	2513.50	43.00	19.953
	Middle	2593.00	42.97	19.815
	High	2672.50	43.05	20.184
64QAM	Low	2513.50	42.96	19.770
	Middle	2593.00	43.04	20.137
	High	2672.50	43.00	19.953

Test Data at Downlink Port 3

Mod.	Channel	Frequency (MHz)	Measured Output Power	
			(dBm)	(W)
QPSK	Low	2513.50	42.83	19.187
	Middle	2593.00	43.02	20.045
	High	2672.50	43.03	20.091
16QAM	Low	2513.50	42.64	18.365
	Middle	2593.00	42.73	18.750
	High	2672.50	42.38	17.298
64QAM	Low	2513.50	43.09	20.370
	Middle	2593.00	43.10	20.417
	High	2672.50	43.01	19.999

Sum Data of Port 0, Port 1, Port 2 and Port 3

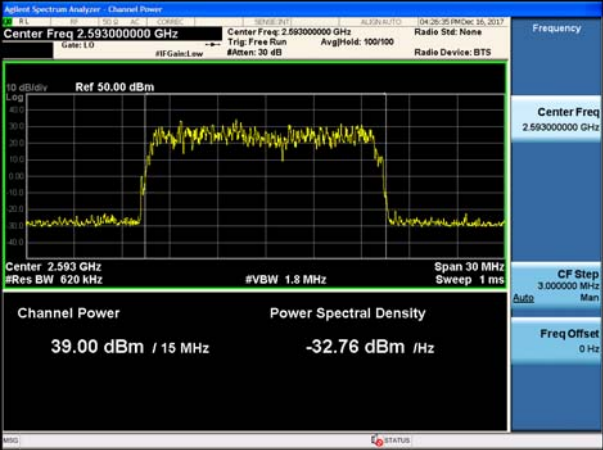
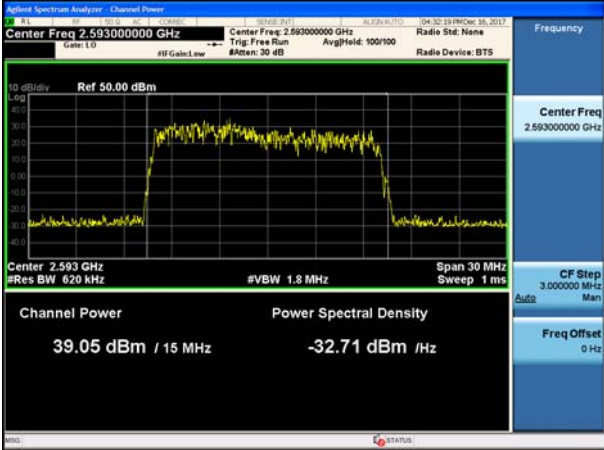
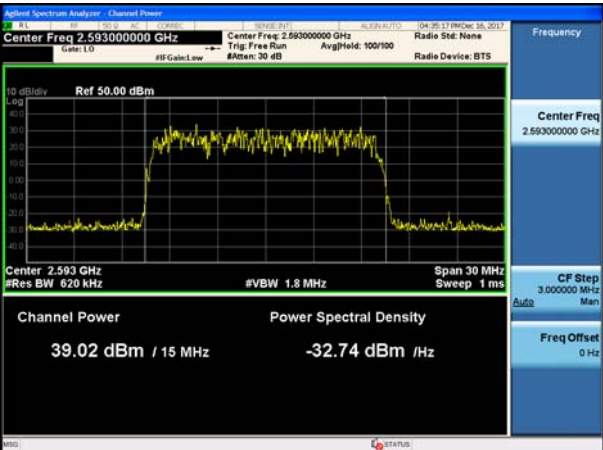
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QPSK	Low	2513.50	77.150
	Middle	2593.00	79.088
	High	2672.50	79.631
16QAM	Low	2513.50	76.648
	Middle	2593.00	77.205
	High	2672.50	77.121
64QAM	Low	2513.50	79.407
	Middle	2593.00	80.736
	High	2672.50	79.538

Note:

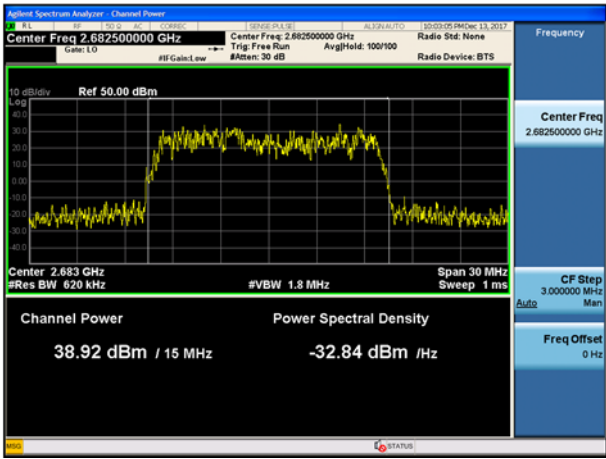
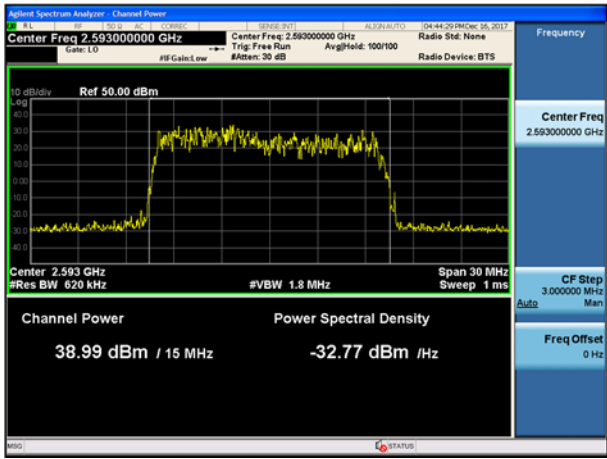
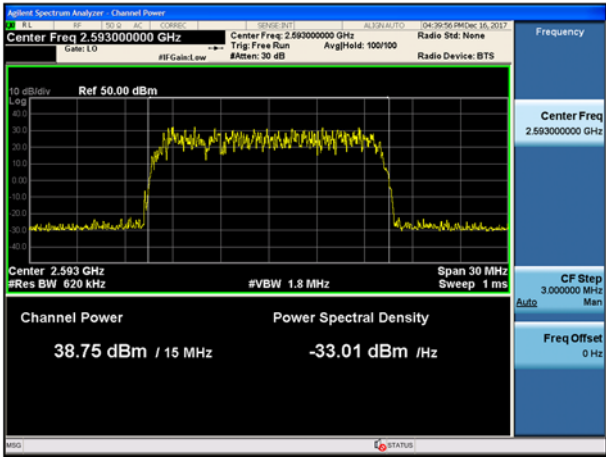
This test report only contains the worst case plot data for each port and modulation.

15 MHz / 1 Carrier (7.5 W)

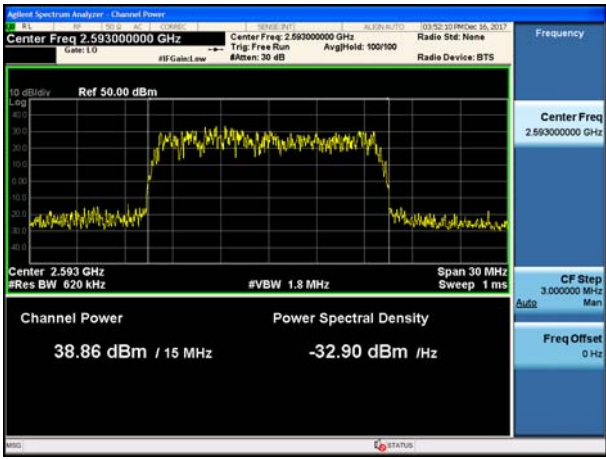
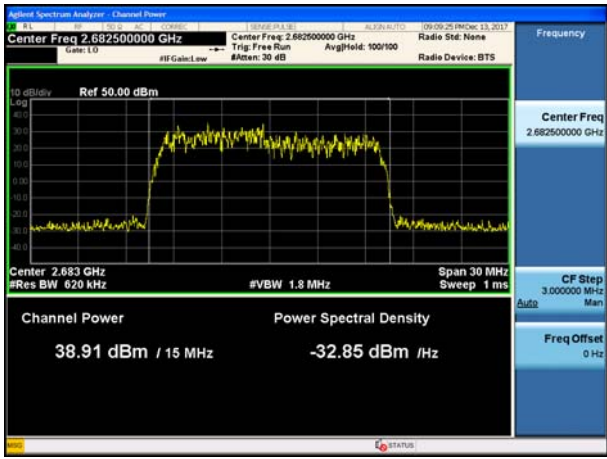
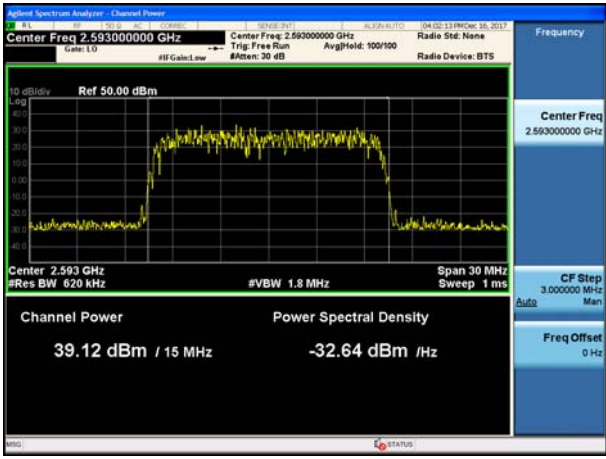
Plot Data for Output Port 0 (Conducted Output Power)

Mod.	Channel	Mod.	Channel
QPSK	Middle	16QAM	Middle
			
Mod.	Channel		
64QAM	Middle		
			

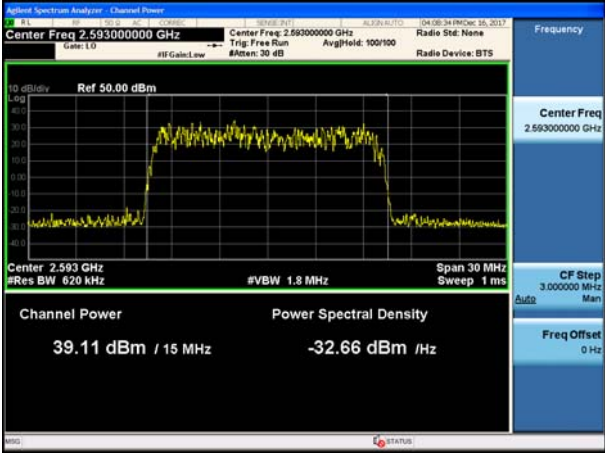
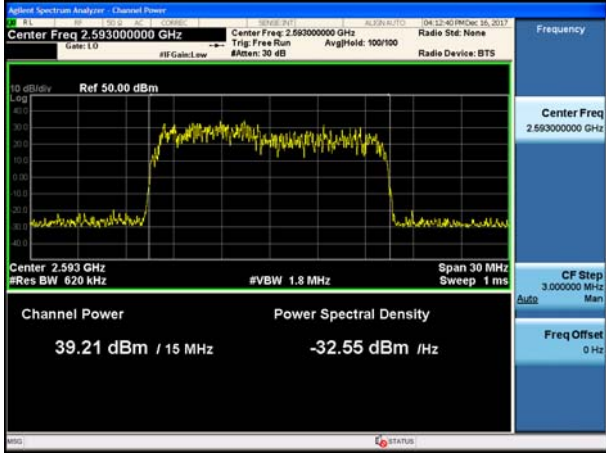
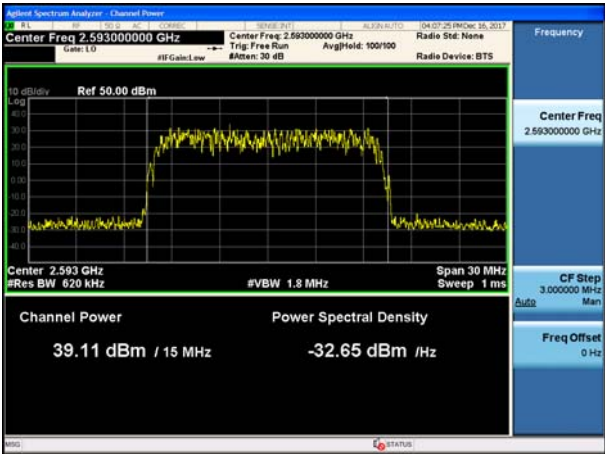
Plot Data for Output Port 1 (Conducted Output Power)

Mod.	Channel	Mod.	Channel
QPSK	High	16QAM	Middle
			
Mod.	Channel		
64QAM	Middle		

Plot Data for Output Port 2 (Conducted Output Power)

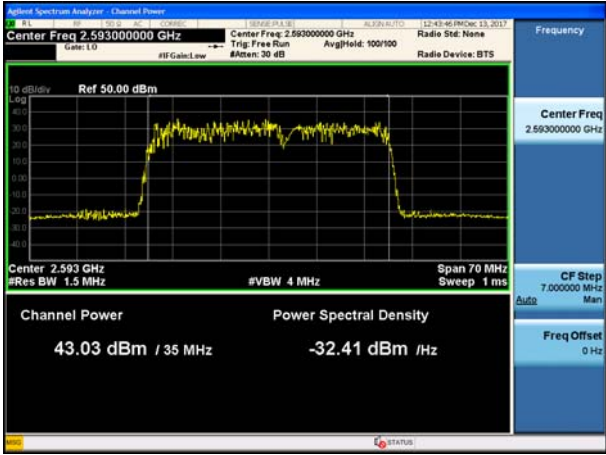
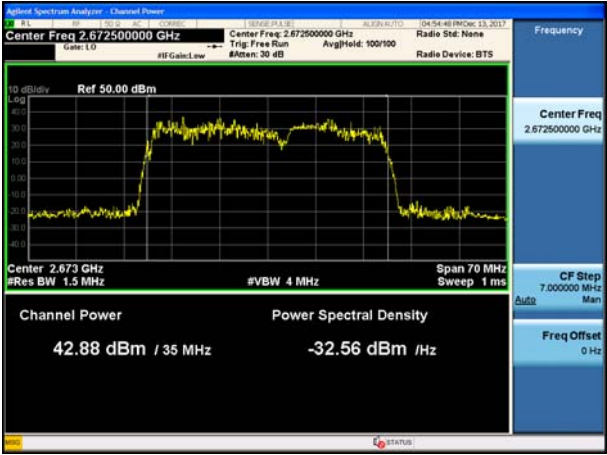
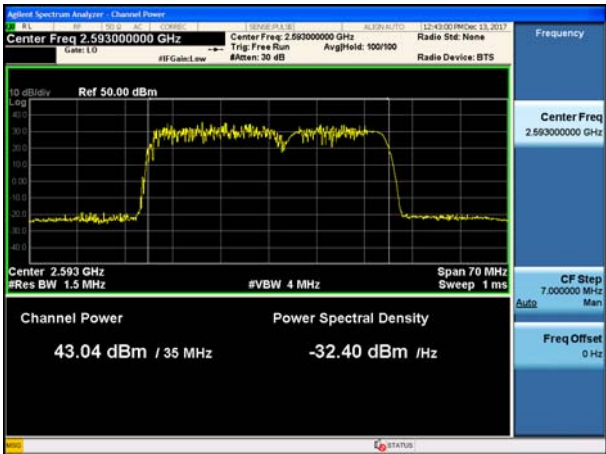
Mod.	Channel	Mod.	Channel
QPSK	Middle	16QAM	High
			
Mod.	Channel		
64QAM	Middle		

Plot Data for Output Port 3 (Conducted Output Power)

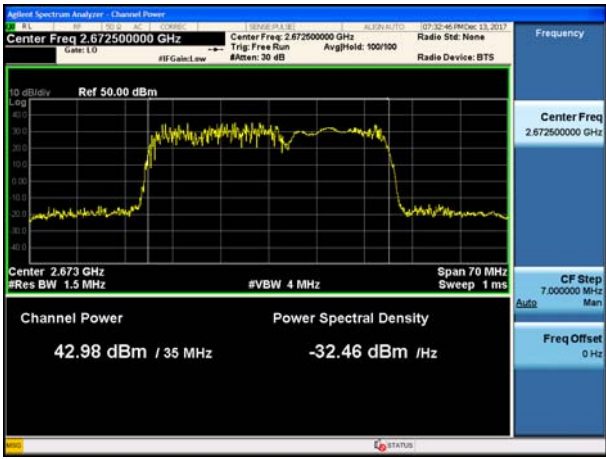
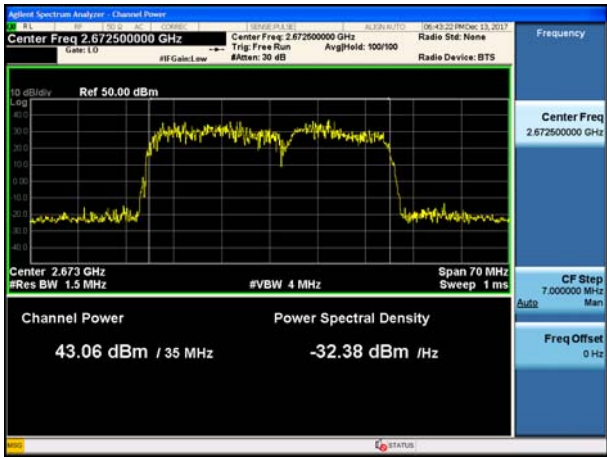
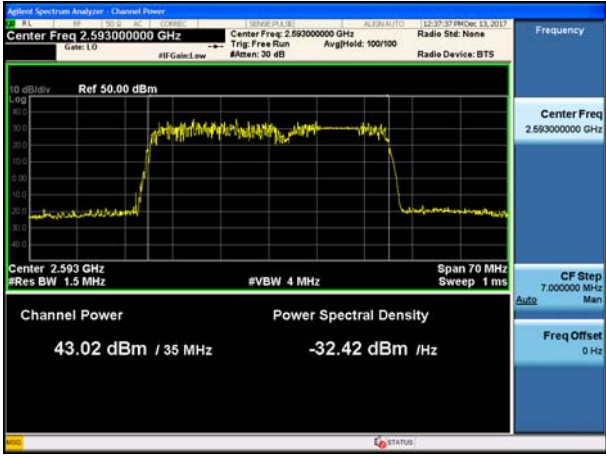
Mod.	Channel	Mod.	Channel
QPSK	Middle	16QAM	Middle
			
Mod.	Channel		
64QAM	Middle		

20 MHz + 15 MHz / 2 Carriers (10 W + 7.5 W)

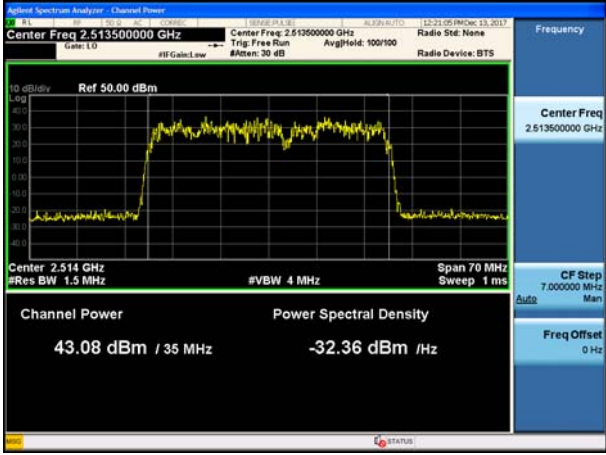
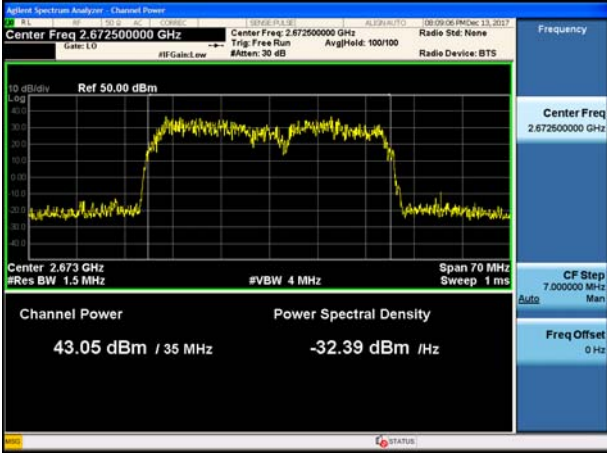
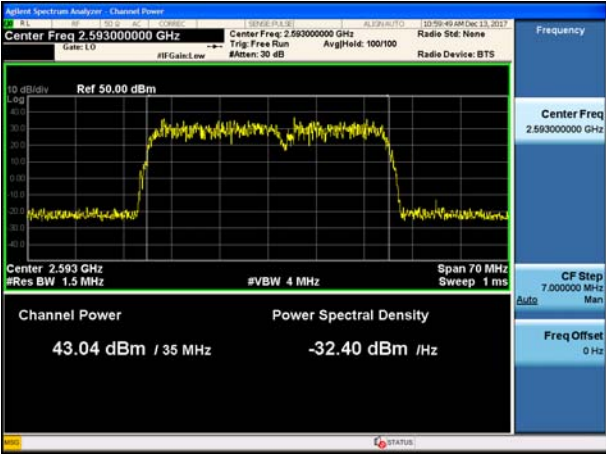
Plot Data for Output Port 0 (Conducted Output Power)

Mod.	Channel	Mod.	Channel
QPSK	Middle	16QAM	High
			
Mod.	Channel		
64QAM	Middle		

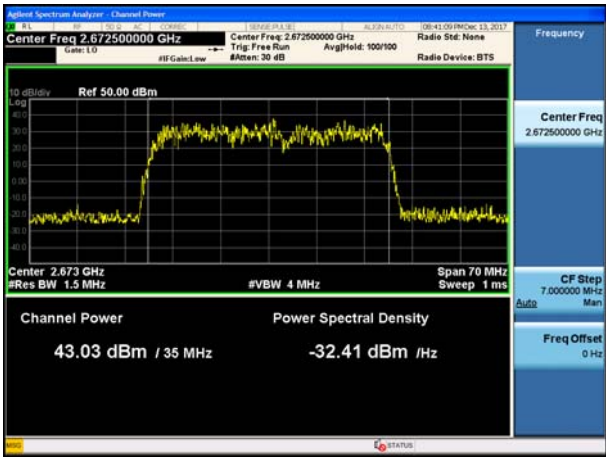
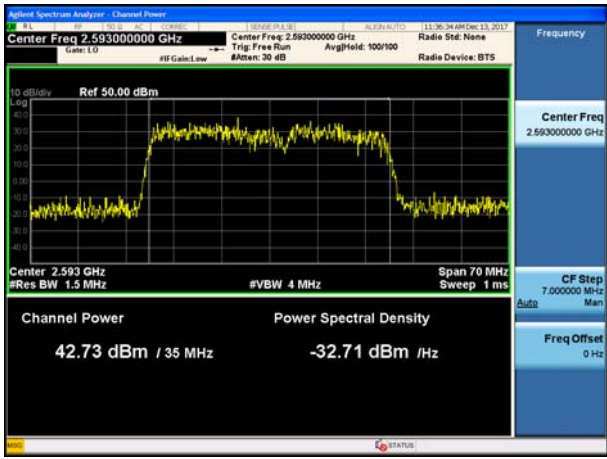
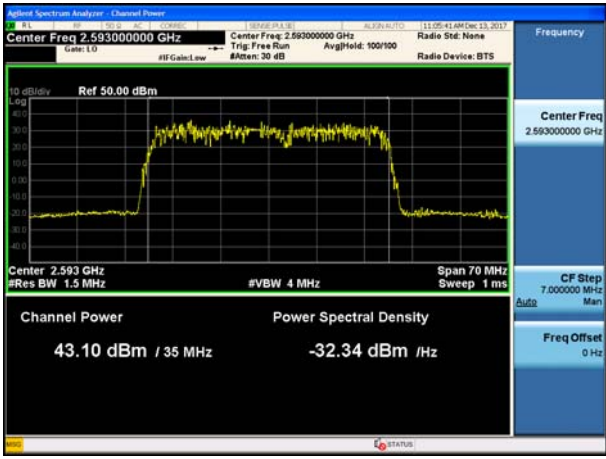
Plot Data for Output Port 1 (Conducted Output Power)

Mod.	Channel	Mod.	Channel
QPSK	High	16QAM	High
 Center Freq 2.672500000 GHz Center 2.673 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Channel Power 42.98 dBm / 35 MHz Power Spectral Density -32.46 dBm / Hz		 Center Freq 2.672500000 GHz Center 2.673 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Channel Power 43.06 dBm / 35 MHz Power Spectral Density -32.38 dBm / Hz	
Mod.	Channel		
64QAM	Middle		
 Center Freq 2.593000000 GHz Center 2.593 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Channel Power 43.02 dBm / 35 MHz Power Spectral Density -32.42 dBm / Hz			

Plot Data for Output Port 2 (Conducted Output Power)

Mod.	Channel	Mod.	Channel
QPSK	Low	16QAM	High
 Center Freq 2.513500000 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Man Channel Power 43.08 dBm / 35 MHz Power Spectral Density -32.36 dBm / Hz Freq Offset 0 Hz		 Center Freq 2.672500000 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Man Channel Power 43.05 dBm / 35 MHz Power Spectral Density -32.39 dBm / Hz Freq Offset 0 Hz	
Mod.	Channel		
64QAM	Middle		
 Center Freq 2.593000000 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Man Channel Power 43.04 dBm / 35 MHz Power Spectral Density -32.40 dBm / Hz Freq Offset 0 Hz			

Plot Data for Output Port 3 (Conducted Output Power)

Mod.	Channel	Mod.	Channel
QPSK	High	16QAM	Middle
			
Mod.	Channel		
64QAM	Middle		
			

6. OCCUPIED BANDWIDTH

Test Requirements:

§ 2.1049 Measurements required: Occupied bandwidth.

The occupied bandwidth, that 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 shall be measured under the following conditions as applicable:

- (g) Transmitters in which the modulating baseband comprises not more than three independent channels—when modulated by the full complement of signals for which the transmitter is rated. The level of modulation for each channel should be set to that prescribed in rule parts applicable to the services for which the transmitter is intended. If specific modulation levels are not set forth in the rules, the tests should provide the manufacturer's maximum rated condition.
- (h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

Test Procedures:

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation. The EUT was connected to a spectrum analyzer enabled with an occupied bandwidth function via its antenna port. Measurements were performed to determine the occupied bandwidth in accordance with FCC Part 2.1049. The occupied bandwidth was measured from the fundamental emission at the bottom, middle and top channels. The occupied bandwidth was measured using the built in occupied bandwidth function of the spectrum analyzer. It was set to measure the bandwidth where 99% of the signal power was contained. The analyzer automatically configures the measurement bandwidths to make an accurate measurement based on the channel bandwidth and channel spacing of the EUT.

Test Results:

15 MHz / 1 Carrier (7.5 W)

Test Data at Downlink Port 0

Mod.	Channel	Frequency (MHz)	Measured Bandwidth (MHz)
QPSK	Low	2503.50	13.381
	Middle	2593.00	13.663
	High	2682.50	13.417
16QAM	Low	2503.50	13.381
	Middle	2593.00	13.605
	High	2682.50	13.253
64QAM	Low	2503.50	13.653
	Middle	2593.00	13.681
	High	2682.50	13.590

Test Data at Downlink Port 1

Mod.	Channel	Frequency (MHz)	Measured Bandwidth (MHz)
QPSK	Low	2503.50	13.470
	Middle	2593.00	13.656
	High	2682.50	13.506
16QAM	Low	2503.50	13.563
	Middle	2593.00	13.617
	High	2682.50	13.295
64QAM	Low	2503.50	13.465
	Middle	2593.00	13.432
	High	2682.50	13.581

Test Data at Downlink Port 2

Mod.	Channel	Frequency (MHz)	Measured Bandwidth (MHz)
QPSK	Low	2503.50	13.466
	Middle	2593.00	13.537
	High	2682.50	13.360
16QAM	Low	2503.50	13.436
	Middle	2593.00	13.671
	High	2682.50	13.345
64QAM	Low	2503.50	13.731
	Middle	2593.00	13.559
	High	2682.50	13.720

Test Data at Downlink Port 3

Mod.	Channel	Frequency (MHz)	Measured Bandwidth (MHz)
QPSK	Low	2503.50	13.559
	Middle	2593.00	13.625
	High	2682.50	13.409
16QAM	Low	2503.50	13.674
	Middle	2593.00	13.591
	High	2682.50	13.345
64QAM	Low	2503.50	13.529
	Middle	2593.00	13.548
	High	2682.50	13.720

20 MHz + 15 MHz / 2 Carriers (10 W + 7.5 W)

Test Data at Downlink Port 0

Mod.	Channel	Frequency (MHz)	Measured Bandwidth (MHz)
QPSK	Low	2513.50	33.506
	Middle	2593.00	33.662
	High	2672.50	33.646
16QAM	Low	2513.50	33.603
	Middle	2593.00	33.845
	High	2672.50	33.178
64QAM	Low	2513.50	33.469
	Middle	2593.00	33.762
	High	2672.50	33.410

Test Data at Downlink Port 1

Mod.	Channel	Frequency (MHz)	Measured Bandwidth (MHz)
QPSK	Low	2513.50	33.514
	Middle	2593.00	33.296
	High	2672.50	33.235
16QAM	Low	2513.50	33.142
	Middle	2593.00	33.856
	High	2672.50	33.692
64QAM	Low	2513.50	33.261
	Middle	2593.00	33.495
	High	2672.50	33.125

Test Data at Downlink Port 2

Mod.	Channel	Frequency (MHz)	Measured Bandwidth (MHz)
QPSK	Low	2513.50	33.383
	Middle	2593.00	33.243
	High	2672.50	33.193
16QAM	Low	2513.50	33.528
	Middle	2593.00	33.003
	High	2672.50	32.649
64QAM	Low	2513.50	33.354
	Middle	2593.00	33.396
	High	2672.50	32.778

Test Data at Downlink Port 3

Mod.	Channel	Frequency (MHz)	Measured Bandwidth (MHz)
QPSK	Low	2513.50	33.486
	Middle	2593.00	33.211
	High	2672.50	32.757
16QAM	Low	2513.50	33.166
	Middle	2593.00	33.509
	High	2672.50	32.766
64QAM	Low	2513.50	33.214
	Middle	2593.00	33.130
	High	2672.50	33.400

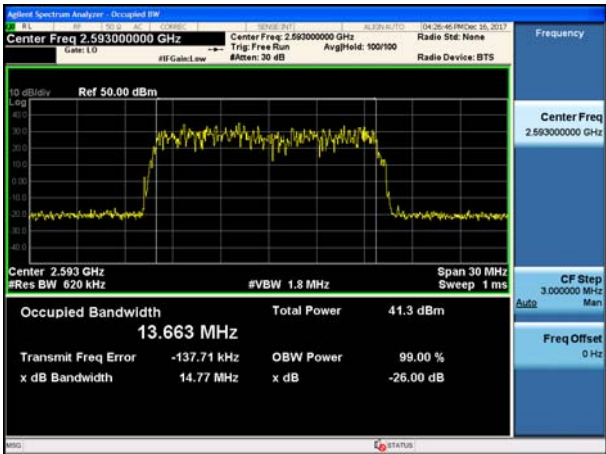
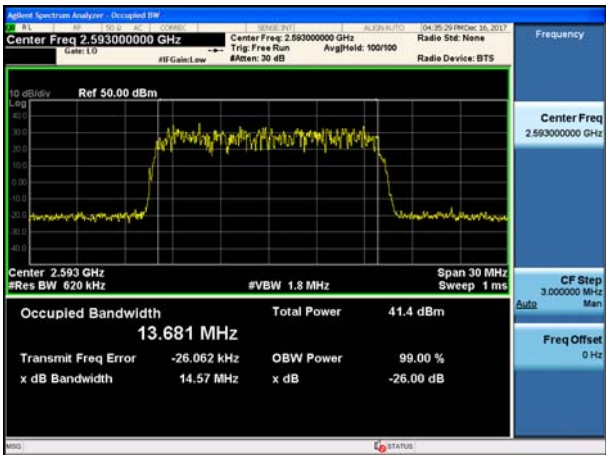
Note:

This test report only contains the worst case plot data for each port and modulation.

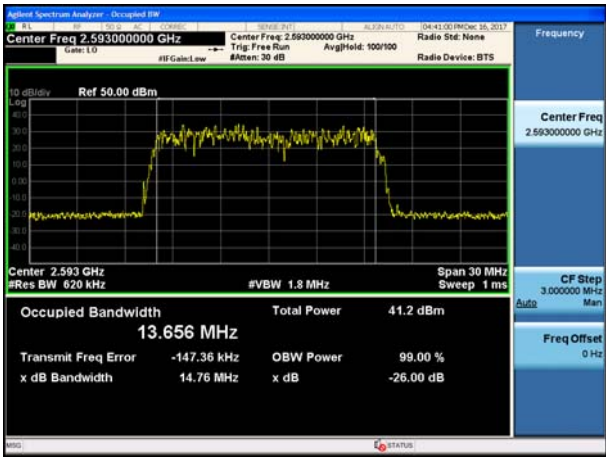
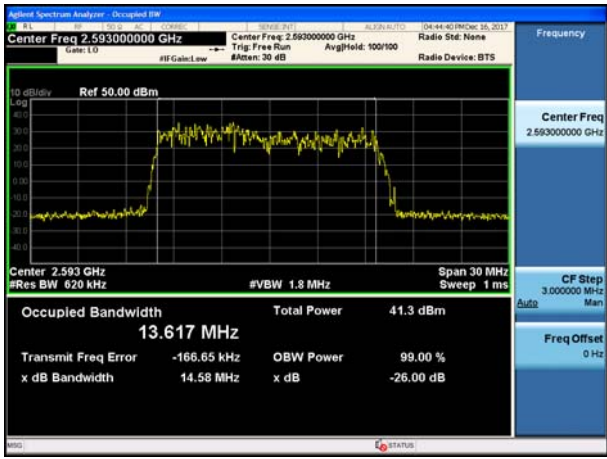
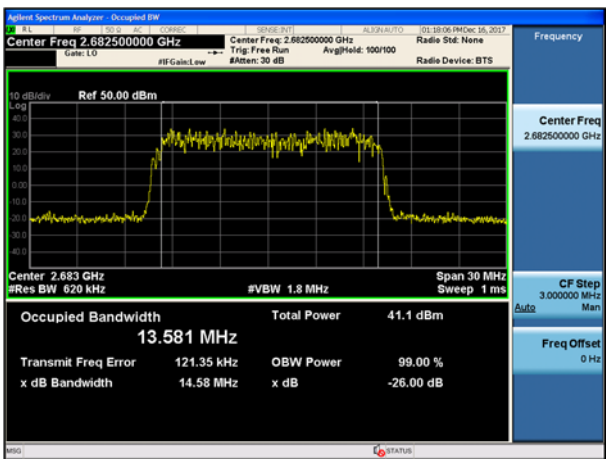
OCCUPIED BANDWIDTH

15 MHz / 1 Carrier (7.5 W)

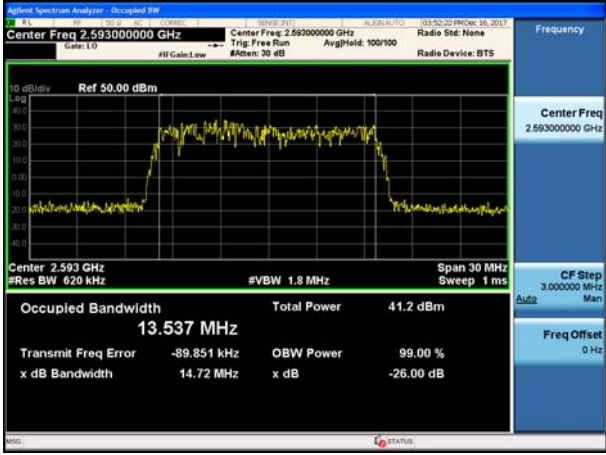
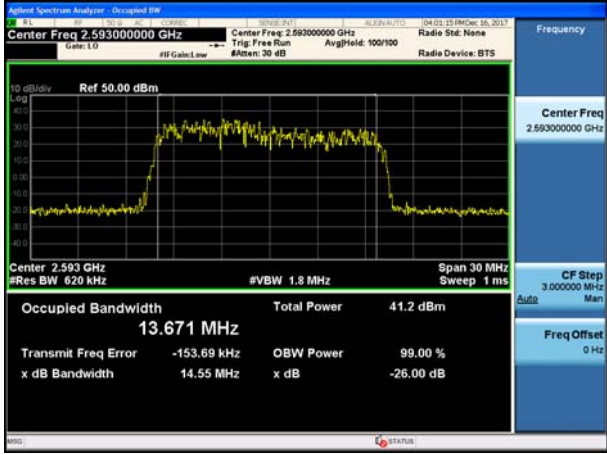
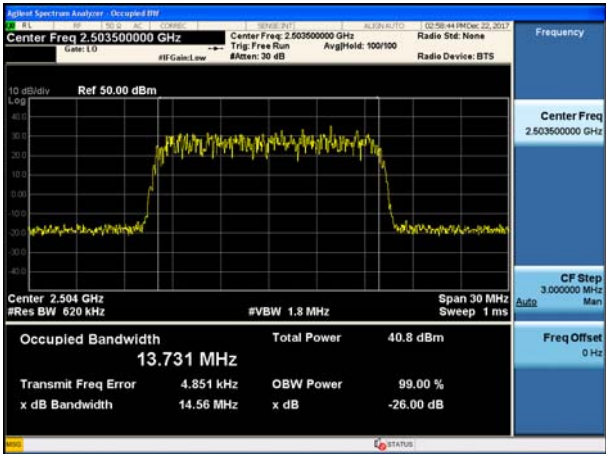
Plot Data for Output Port 0

Mod.	Channel	Mod.	Channel
QPSK	Middle	16QAM	Middle
 Center Freq 2.593000000 GHz Center Freq 2.593000000 GHz Center 2.593 GHz #Res BW 620 kHz #VBW 1.8 MHz Span 30 MHz Sweep 1 ms CF Step 3.000000 MHz Auto Man Frequency Center Freq 2.593000000 GHz Occupied Bandwidth 13.663 MHz Total Power 41.3 dBm Transmit Freq Error -137.71 kHz OBW Power 99.00 % x dB Bandwidth 14.77 MHz x dB -26.00 dB Freq Offset 0 Hz		 Center Freq 2.593000000 GHz Center Freq 2.593000000 GHz Center 2.593 GHz #Res BW 620 kHz #VBW 1.8 MHz Span 30 MHz Sweep 1 ms CF Step 3.000000 MHz Auto Man Frequency Center Freq 2.593000000 GHz Occupied Bandwidth 13.605 MHz Total Power 41.3 dBm Transmit Freq Error -236.66 kHz OBW Power 99.00 % x dB Bandwidth 14.47 MHz x dB -26.00 dB Freq Offset 0 Hz	
Mod.	Channel		
64QAM	Middle		
 Center Freq 2.593000000 GHz Center Freq 2.593000000 GHz Center 2.593 GHz #Res BW 620 kHz #VBW 1.8 MHz Span 30 MHz Sweep 1 ms CF Step 3.000000 MHz Auto Man Frequency Center Freq 2.593000000 GHz Occupied Bandwidth 13.681 MHz Total Power 41.4 dBm Transmit Freq Error -26.062 kHz OBW Power 99.00 % x dB Bandwidth 14.57 MHz x dB -26.00 dB Freq Offset 0 Hz			

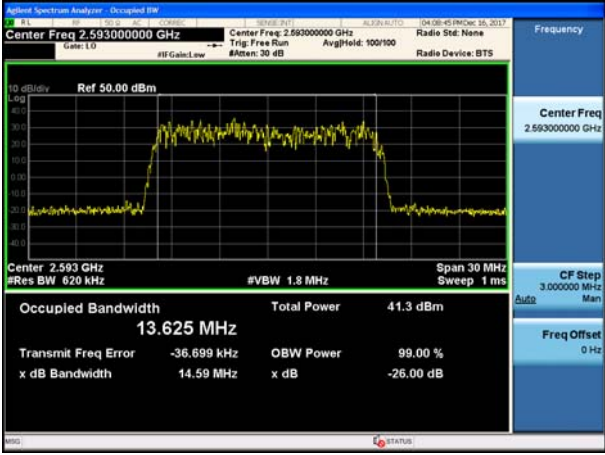
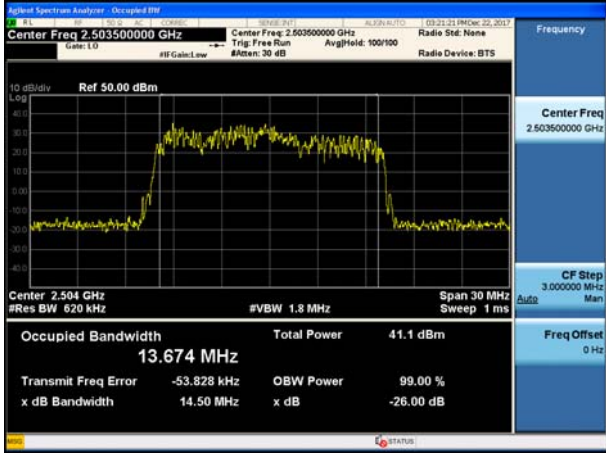
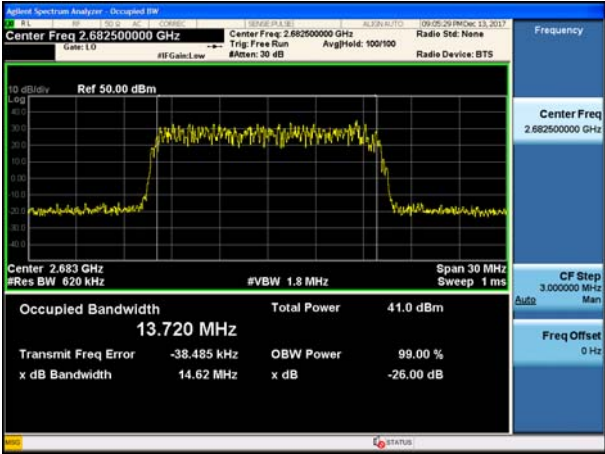
Plot Data for Output Port 1

Mod.	Channel	Mod.	Channel
QPSK	Middle	16QAM	Middle
 Center Freq 2.593000000 GHz Center Freq 2.593000000 GHz Center 2.593 GHz Occupied Bandwidth 13.656 MHz Total Power 41.2 dBm Transmit Freq Error -147.36 kHz OBW Power 99.00 % x dB Bandwidth 14.76 MHz x dB -26.00 dB		 Center Freq 2.593000000 GHz Center Freq 2.593000000 GHz Center 2.593 GHz Occupied Bandwidth 13.617 MHz Total Power 41.3 dBm Transmit Freq Error -166.65 kHz OBW Power 99.00 % x dB Bandwidth 14.58 MHz x dB -26.00 dB	
Mod.	Channel		
64QAM	High		
 Center Freq 2.682500000 GHz Center Freq 2.682500000 GHz Center 2.683 GHz Occupied Bandwidth 13.581 MHz Total Power 41.1 dBm Transmit Freq Error 121.35 kHz OBW Power 99.00 % x dB Bandwidth 14.58 MHz x dB -26.00 dB			

Plot Data for Output Port 2

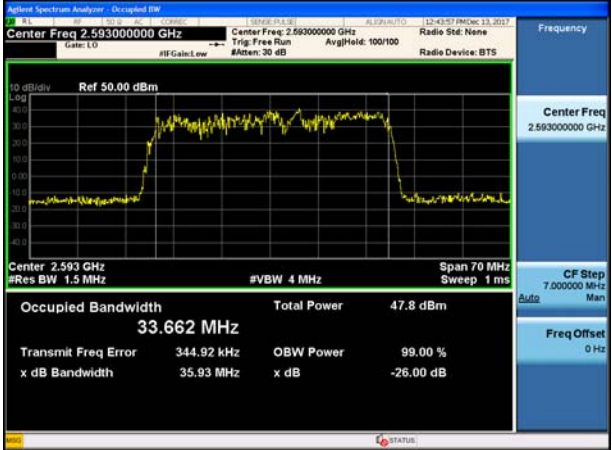
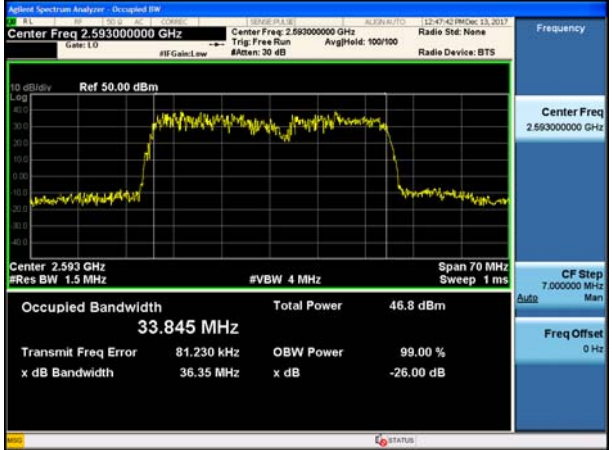
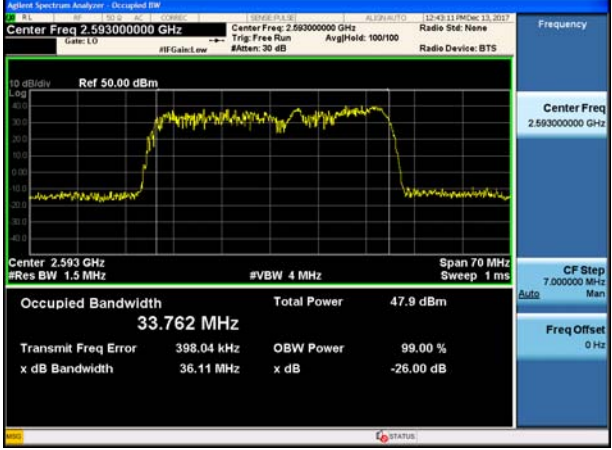
Mod.	Channel	Mod.	Channel
QPSK	Middle	16QAM	Middle
 Center Freq 2.593000000 GHz #Res BW 620 kHz #VBW 1.8 MHz Span 30 MHz Sweep 1 ms CF Step 3.000000 MHz Man Occupied Bandwidth 13.537 MHz Total Power 41.2 dBm Transmit Freq Error -89.851 kHz OBW Power 99.00 % x dB Bandwidth 14.72 MHz x dB -26.00 dB		 Center Freq 2.593000000 GHz #Res BW 620 kHz #VBW 1.8 MHz Span 30 MHz Sweep 1 ms CF Step 3.000000 MHz Man Occupied Bandwidth 13.671 MHz Total Power 41.2 dBm Transmit Freq Error -153.69 kHz OBW Power 99.00 % x dB Bandwidth 14.55 MHz x dB -26.00 dB	
Mod.	Channel		
64QAM	Low		
 Center Freq 2.503500000 GHz #Res BW 620 kHz #VBW 1.8 MHz Span 30 MHz Sweep 1 ms CF Step 3.000000 MHz Man Occupied Bandwidth 13.731 MHz Total Power 40.8 dBm Transmit Freq Error 4.851 kHz OBW Power 99.00 % x dB Bandwidth 14.56 MHz x dB -26.00 dB			

Plot Data for Output Port 3

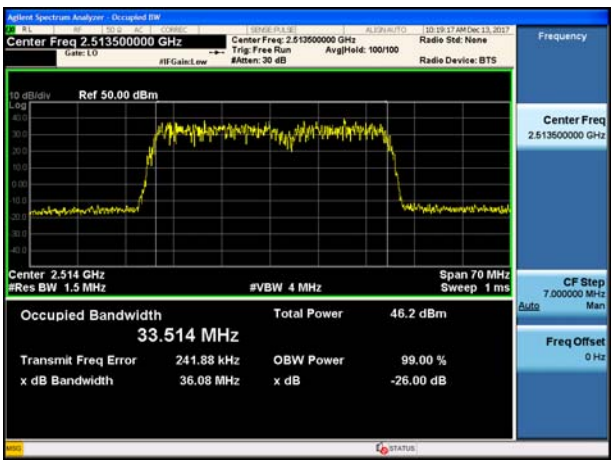
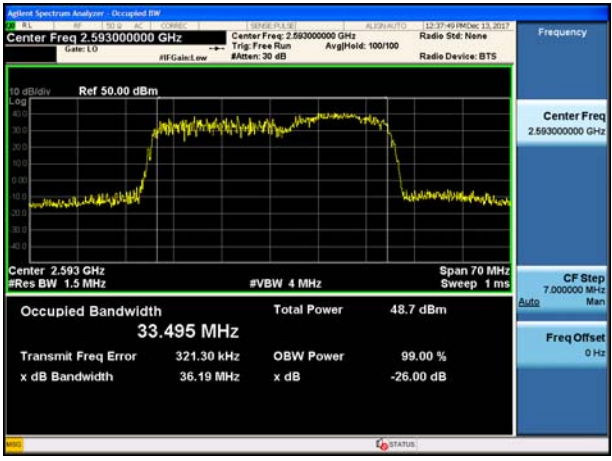
Mod.	Channel	Mod.	Channel
QPSK	Middle	16QAM	Low
 Center Freq 2.593000000 GHz Occupied Bandwidth 13.625 MHz Total Power 41.3 dBm Transmit Freq Error -36.699 kHz x dB Bandwidth 14.59 MHz		 Center Freq 2.503500000 GHz Occupied Bandwidth 13.674 MHz Total Power 41.1 dBm Transmit Freq Error -53.828 kHz x dB Bandwidth 14.50 MHz	
Mod.	Channel		
64QAM	High		
 Center Freq 2.682500000 GHz Occupied Bandwidth 13.720 MHz Total Power 41.0 dBm Transmit Freq Error -38.485 kHz x dB Bandwidth 14.62 MHz			

20 MHz + 15 MHz / 2 Carriers (10 W + 7.5 W)

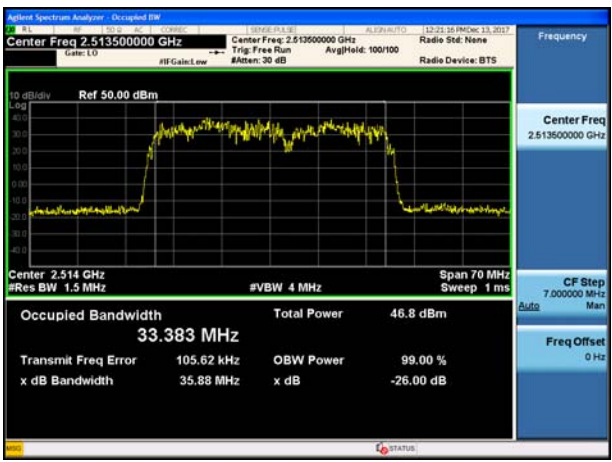
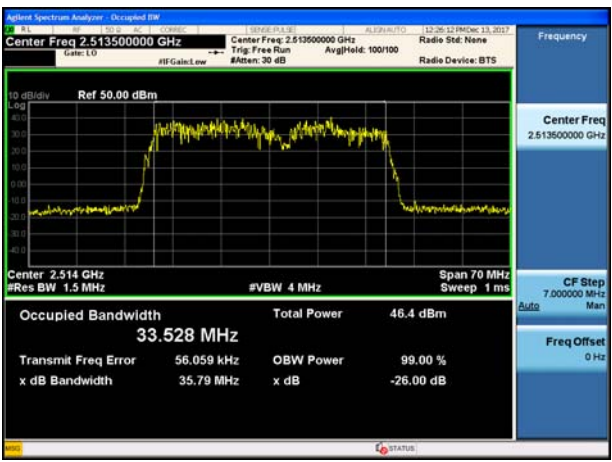
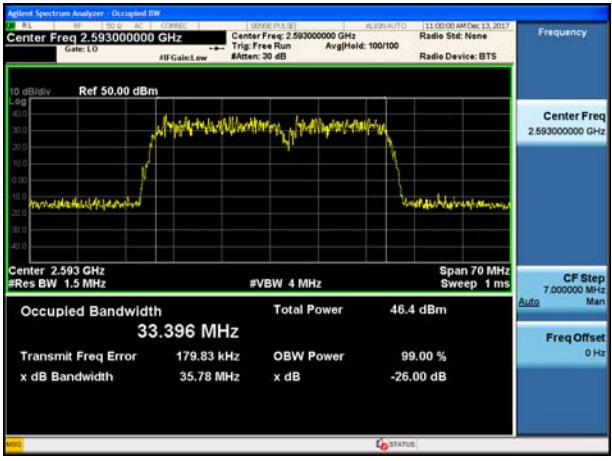
Plot Data for Output Port 0

Mod.	Channel	Mod.	Channel
QPSK	Middle	16QAM	Middle
 Center Freq 2.593000000 GHz Center 2.593 GHz Res BW 1.5 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Occupied Bandwidth 33.662 MHz Total Power 47.8 dBm Transmit Freq Error 344.92 kHz OBW Power 99.00 % x dB Bandwidth 35.93 MHz x dB -26.00 dB		 Center Freq 2.593000000 GHz Center 2.593 GHz Res BW 1.5 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Occupied Bandwidth 33.845 MHz Total Power 46.8 dBm Transmit Freq Error 81.230 kHz OBW Power 99.00 % x dB Bandwidth 36.35 MHz x dB -26.00 dB	
Mod.	Channel		
64QAM	Middle		
 Center Freq 2.593000000 GHz Center 2.593 GHz Res BW 1.5 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Occupied Bandwidth 33.762 MHz Total Power 47.9 dBm Transmit Freq Error 398.04 kHz OBW Power 99.00 % x dB Bandwidth 36.11 MHz x dB -26.00 dB			

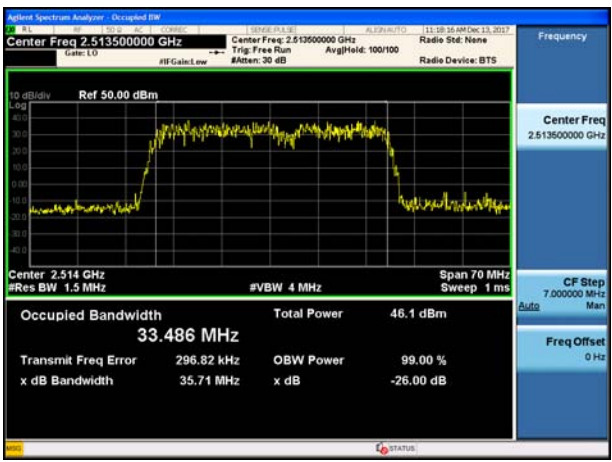
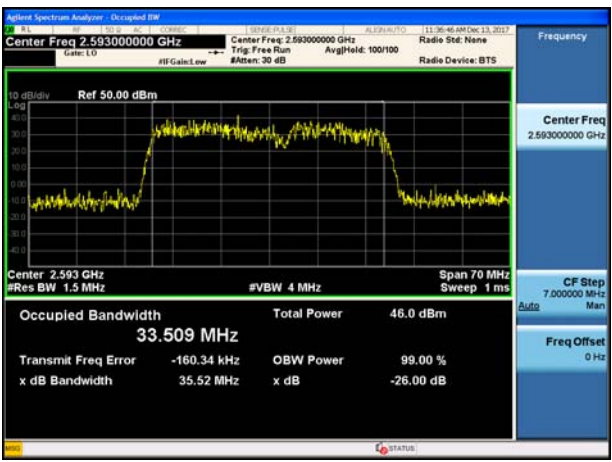
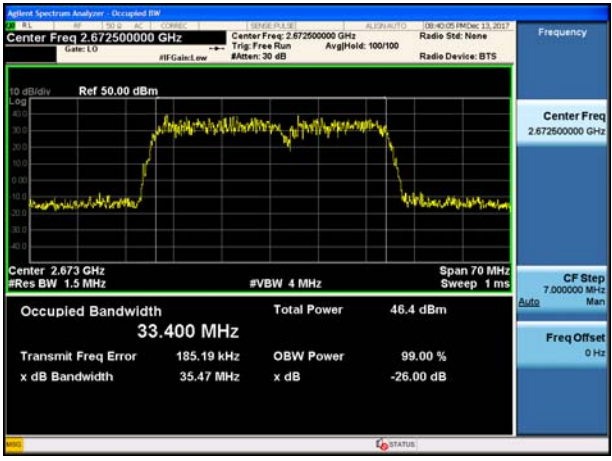
Plot Data for Output Port 1

Mod.	Channel	Mod.	Channel
QPSK	Low	16QAM	Middle
 Center Freq 2.514 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Man Audio Occupied Bandwidth 33.514 MHz Total Power 46.2 dBm Transmit Freq Error 241.88 kHz OBW Power 99.00 % x dB Bandwidth 36.08 MHz x dB -26.00 dB		 Center Freq 2.593 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Man Audio Occupied Bandwidth 33.856 MHz Total Power 47.0 dBm Transmit Freq Error -31.162 kHz OBW Power 99.00 % x dB Bandwidth 35.92 MHz x dB -26.00 dB	
Mod.	Channel		
64QAM	Middle		
 Center Freq 2.593 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Man Audio Occupied Bandwidth 33.495 MHz Total Power 48.7 dBm Transmit Freq Error 321.30 kHz OBW Power 99.00 % x dB Bandwidth 36.19 MHz x dB -26.00 dB			

Plot Data for Output Port 2

Mod.	Channel	Mod.	Channel
QPSK	Low	16QAM	Low
 Center Freq 2.514 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Man Freq Offset 0 Hz Occupied Bandwidth 33.383 MHz Total Power 46.8 dBm Transmit Freq Error 105.62 kHz OBW Power 99.00 % x dB Bandwidth 35.88 MHz x dB -26.00 dB		 Center Freq 2.513500000 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Man Freq Offset 0 Hz Occupied Bandwidth 33.528 MHz Total Power 46.4 dBm Transmit Freq Error 56.059 kHz OBW Power 99.00 % x dB Bandwidth 35.79 MHz x dB -26.00 dB	
Mod.	Channel		
64QAM	Middle	 Center Freq 2.593000000 GHz #Res BW 1.5 MHz #VBW 4 MHz Span 70 MHz Sweep 1 ms CF Step 7.000000 MHz Man Freq Offset 0 Hz Occupied Bandwidth 33.396 MHz Total Power 46.4 dBm Transmit Freq Error 179.83 kHz OBW Power 99.00 % x dB Bandwidth 35.78 MHz x dB -26.00 dB	

Plot Data for Output Port 3

Mod.	Channel	Mod.	Channel
QPSK	Low	16QAM	Middle
 Center Freq: 2.513500000 GHz Occupied Bandwidth: 33.486 MHz Total Power: 46.1 dBm		 Center Freq: 2.593000000 GHz Occupied Bandwidth: 33.509 MHz Total Power: 46.0 dBm	
Mod.	Channel		
64QAM	High	 Center Freq: 2.672500000 GHz Occupied Bandwidth: 33.400 MHz Total Power: 46.4 dBm	

7. SPURIOUS EMISSION AT ANTENNA TERMINAL

Test Requirements:

§ 2.1051 Measurements required: Spurious emissions at antenna terminals:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

§ 27.53 Emission limits.

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(1) Prior to the transition, and thereafter, solely within the MBS, for analog operations with an EIRP in excess of -9 dBW, the signal shall be attenuated at the channel edges by at least 38 dB relative to the peak visual carrier, then linearly sloping from that level to at least 60 dB of attenuation at 1 MHz below the lower band edge and 0.5 MHz above the upper band edge, and attenuated at least 60 dB at all other frequencies.

(2) For digital base stations, the attenuation shall be not less than $43 + 10 \log (P)$ dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Provided that a documented interference complaint cannot be mutually resolved between the parties prior to the applicable deadline, then the following additional attenuation requirements shall apply:

Test Procedures:

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

The resolution bandwidth of the spectrum analyzer was set at 100 KHz (Under 1 GHz), 1MHz (Above 1 GHz). Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Notes:

- 1) In 9 KHz-150 KHz and 150 KHz-30 MHz bands, RBW was reduced to 1% and 10% of the reference bandwidth for measuring unwanted emission level(typically, 100KHz if the authorized frequency band is below 1GHz) and power was integrated. (1% = +20 dB, 10% = +10 dB)
- 2) Due to 4x4 MIMO operation, limit is -19.02dBm ($-13\text{dBm} - 10 \cdot \log(4)$) per FCC KDB 662911D01v02r01.

Conducted Spurious Emissions

15 MHz / 1 Carrier (7.5 W)

Test Result for Output Port 0

Mod.	Channel	Frequency (MHz)	Measured Level (dBm)					
			9 kHz ~ 150 kHz	150 kHz~ 30 MHz	30 MHz ~ 1 GHz	1 GHz ~ 2.491 GHz	2.695 GHz ~ 12.75 GHz	12.75 GHz ~ 26.5 GHz
QPSK	Low	1932.50	-27.679	-30.355	-51.684	-25.288	-34.755	-26.717
	Middle	1962.50	-34.881	-34.669	-51.086	-27.898	-34.065	-24.853
	High	1992.50	-34.850	-36.949	-51.810	-27.650	-27.225	-24.217
16QAM	Low	1932.50	-28.640	-30.070	-51.655	-25.755	-33.950	-25.666
	Middle	1962.50	-35.685	-35.745	-50.325	-27.558	-34.196	-24.012
	High	1992.50	-35.119	-36.057	-51.967	-27.897	-26.758	-24.438
64QAM	Low	1932.50	-28.969	-30.660	-52.037	-25.619	-34.594	-26.604
	Middle	1962.50	-34.860	-34.582	-49.741	-28.107	-33.578	-24.422
	High	1992.50	-33.419	-36.439	-52.027	-28.508	-29.684	-24.733

Test Result for Output Port 1

Mod.	Channel	Frequency (MHz)	Measured Level (dBm)					
			9 kHz ~ 150 kHz	150 kHz~ 30 MHz	30 MHz ~ 1 GHz	1 GHz ~ 2.491 GHz	2.695 GHz ~ 12.75 GHz	12.75 GHz ~ 26.5 GHz
QPSK	Low	1932.50	-30.003	-30.163	-51.537	-24.637	-33.910	-26.592
	Middle	1962.50	-33.717	-36.594	-51.198	-27.754	-33.267	-25.077
	High	1992.50	-34.153	-37.637	-51.501	-28.753	-28.578	-24.439
16QAM	Low	1932.50	-27.228	-29.863	-51.508	-25.012	-34.930	-26.686
	Middle	1962.50	-32.894	-36.195	-51.073	-27.720	-32.555	-23.905
	High	1992.50	-35.219	-35.235	-52.065	-28.739	-30.965	-24.150
64QAM	Low	1932.50	-28.695	-31.032	-51.939	-25.032	-33.273	-26.911
	Middle	1962.50	-34.454	-36.762	-50.865	-27.140	-33.543	-24.114
	High	1992.50	-35.785	-36.906	-52.055	-28.997	-30.023	-24.775

Test Result for Output Port 2

Mod.	Channel	Frequency (MHz)	Measured Level (dBm)					
			9 kHz ~ 150 kHz	150 kHz~ 30 MHz	30 MHz ~ 1 GHz	1 GHz ~ 2.491 GHz	2.695 GHz ~ 12.75 GHz	12.75 GHz ~ 26.5 GHz
QPSK	Low	1932.50	-28.561	-29.190	-51.906	-23.060	-35.050	-26.739
	Middle	1962.50	-34.869	-36.603	-49.918	-28.471	-32.718	-24.469
	High	1992.50	-32.960	-35.890	-52.545	-28.515	-27.584	-24.341
16QAM	Low	1932.50	-27.754	-31.088	-51.698	-23.264	-33.522	-26.228
	Middle	1962.50	-35.426	-36.607	-51.169	-28.534	-33.703	-23.823
	High	1992.50	-33.291	-36.428	-52.180	-28.698	-29.574	-24.595
64QAM	Low	1932.50	-29.731	-30.947	-51.789	-24.395	-34.210	-26.364
	Middle	1962.50	-35.086	-35.011	-50.532	-28.638	-32.679	-24.364
	High	1992.50	-33.252	-37.089	-52.227	-29.094	-22.786	-24.534

Test Result for Output Port 3

Mod.	Channel	Frequency (MHz)	Measured Level (dBm)					
			9 kHz ~ 150 kHz	150 kHz~ 30 MHz	30 MHz ~ 1 GHz	1 GHz ~ 2.491 GHz	2.695 GHz ~ 12.75 GHz	12.75 GHz ~ 26.5 GHz
QPSK	Low	1932.50	-27.683	-30.618	-51.892	-22.772	-33.844	-26.746
	Middle	1962.50	-36.121	-37.131	-50.531	-27.836	-30.986	-24.589
	High	1992.50	-34.282	-37.376	-51.886	-28.696	-25.586	-24.418
16QAM	Low	1932.50	-28.440	-29.778	-51.805	-23.054	-33.713	-26.819
	Middle	1962.50	-33.550	-36.422	-50.342	-27.810	-32.650	-24.619
	High	1992.50	-33.068	-36.604	-52.502	-28.254	-22.456	-24.124
64QAM	Low	1932.50	-29.527	-29.277	-52.128	-24.166	-33.738	-26.425
	Middle	1962.50	-34.174	-38.072	-50.040	-28.704	-32.631	-24.178
	High	1992.50	-36.378	-36.988	-52.068	-28.650	-27.567	-24.531

20 MHz + 15 MHz / 2 Carriers (10 W + 7.5 W)

Test Result for Output Port 0

Mod.	Channel	Frequency (MHz)	Measured Level (dBm)					
			9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 1 GHz	1 GHz ~ 2.491 GHz	2.695 GHz ~ 12.75 GHz	12.75 GHz ~ 26.5 GHz
QPSK	Low	1932.50	-34.573	-36.279	-52.216	-25.509	-32.150	-24.435
	Middle	1962.50	-33.538	-35.457	-48.234	-27.244	-30.874	-23.930
	High	1992.50	-33.725	-37.376	-49.962	-28.905	-23.051	-24.637
16QAM	Low	1932.50	-34.067	-35.118	-52.202	-25.142	-31.923	-24.323
	Middle	1962.50	-33.223	-36.245	-49.114	-27.702	-31.208	-24.844
	High	1992.50	-33.336	-35.881	-50.309	-28.375	-22.105	-24.537
64QAM	Low	1932.50	-33.937	-35.510	-52.311	-25.319	-31.966	-23.520
	Middle	1962.50	-35.957	-35.328	-48.731	-27.265	-31.696	-24.494
	High	1992.50	-32.794	-35.697	-49.643	-28.896	-24.095	-24.079

Test Result for Output Port 1

Mod.	Channel	Frequency (MHz)	Measured Level (dBm)					
			9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 1 GHz	1 GHz ~ 2.491 GHz	2.695 GHz ~ 12.75 GHz	12.75 GHz ~ 26.5 GHz
QPSK	Low	1932.50	-32.865	-37.402	-52.301	-25.349	-31.883	-24.503
	Middle	1962.50	-33.540	-36.019	-48.174	-25.830	-25.096	-24.883
	High	1992.50	-35.118	-35.575	-50.189	-28.412	-24.256	-23.876
16QAM	Low	1932.50	-33.736	-36.795	-51.776	-24.272	-31.357	-24.002
	Middle	1962.50	-33.199	-37.350	-47.605	-27.686	-25.728	-24.464
	High	1992.50	-34.312	-36.945	-50.438	-28.746	-23.270	-24.054
64QAM	Low	1932.50	-32.815	-35.215	-52.467	-24.791	-31.758	-24.305
	Middle	1962.50	-33.319	-35.137	-48.737	-26.750	-28.736	-24.399
	High	1992.50	-33.509	-35.149	-49.358	-28.273	-24.824	-24.491

Test Result for Output Port 2

Mod.	Channel	Frequency (MHz)	Measured Level (dBm)					
			9 kHz ~ 150 kHz	150 kHz~ 30 MHz	30 MHz ~ 1 GHz	1 GHz ~ 2.491 GHz	2.695 GHz ~ 12.75 GHz	12.75 GHz ~ 26.5 GHz
QPSK	Low	1932.50	-34.974	-35.555	-52.402	-25.214	-32.021	-24.043
	Middle	1962.50	-33.132	-35.833	-48.771	-27.473	-29.694	-24.443
	High	1992.50	-33.489	-37.790	-50.823	-28.827	-22.517	-24.822
16QAM	Low	1932.50	-33.558	-35.778	-52.503	-24.667	-32.330	-24.483
	Middle	1962.50	-34.596	-35.703	-48.364	-27.191	-31.250	-24.700
	High	1992.50	-34.396	-37.916	-50.073	-28.810	-23.406	-24.251
64QAM	Low	1932.50	-33.794	-37.651	-52.499	-25.132	-31.823	-24.350
	Middle	1962.50	-34.480	-35.719	-48.316	-27.833	-31.496	-24.407
	High	1992.50	-34.588	-36.790	-50.680	-28.663	-22.024	-23.352

Test Result for Output Port 3

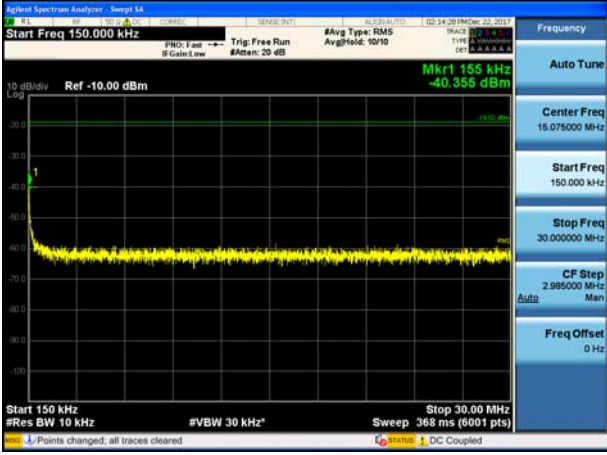
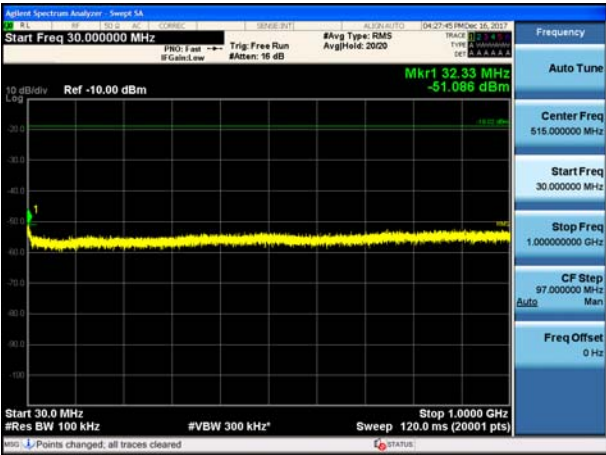
Mod.	Channel	Frequency (MHz)	Measured Level (dBm)					
			9 kHz ~ 150 kHz	150 kHz~ 30 MHz	30 MHz ~ 1 GHz	1 GHz ~ 2.491 GHz	2.695 GHz ~ 12.75 GHz	12.75 GHz ~ 26.5 GHz
QPSK	Low	1932.50	-33.883	-37.911	-52.520	-23.104	-31.528	-24.351
	Middle	1962.50	-33.306	-35.936	-47.725	-27.520	-31.284	-23.980
	High	1992.50	-34.306	-37.157	-50.018	-28.605	-23.784	-23.936
16QAM	Low	1932.50	-34.094	-35.647	-52.466	-24.040	-31.352	-24.478
	Middle	1962.50	-32.672	-36.494	-47.958	-27.955	-30.901	-24.033
	High	1992.50	-32.976	-35.831	-49.807	-28.263	-22.437	-24.353
64QAM	Low	1932.50	-34.109	-35.482	-52.498	-23.365	-32.132	-23.774
	Middle	1962.50	-33.735	-35.586	-48.379	-28.157	-28.809	-24.209
	High	1992.50	-34.041	-36.292	-49.651	-28.846	-22.801	-24.299

Note:

This test report only contains the worst case plot data for each port and modulation.

15 MHz / 1 Carrier (7.5 W)

Plot Data for Output Port 0_QPSK

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
			
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
			
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	High channel
			

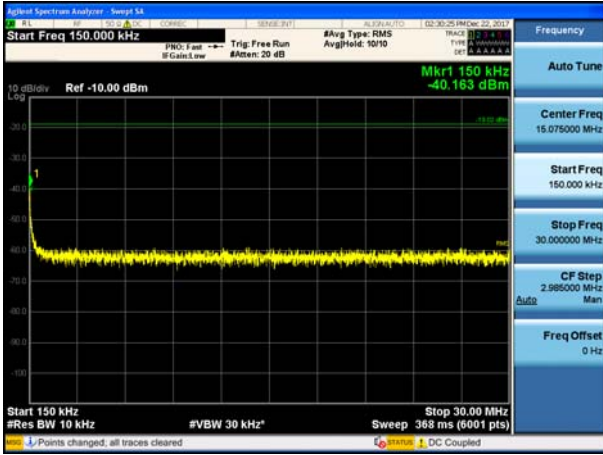
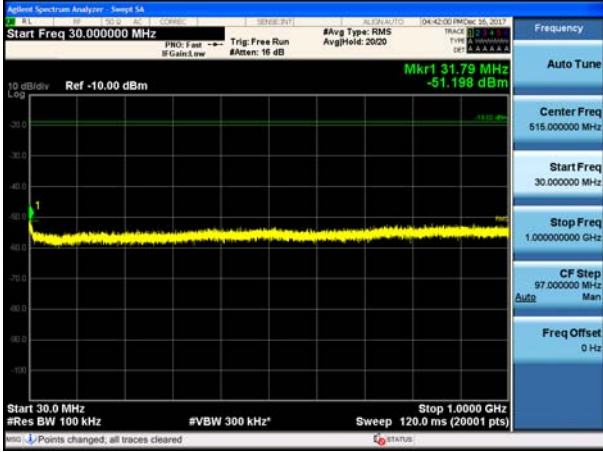
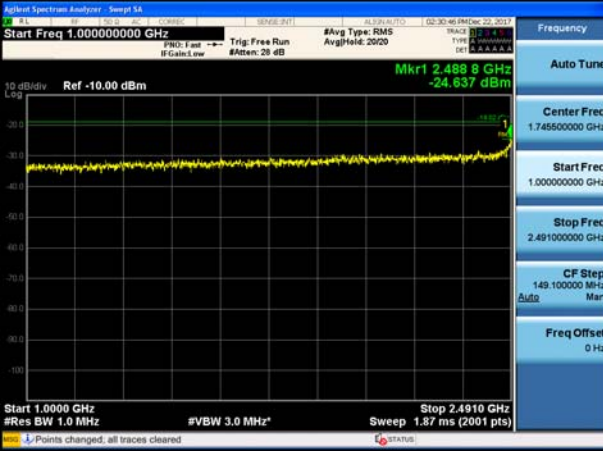
Plot Data for Output Port 0_16QAM

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Middle channel

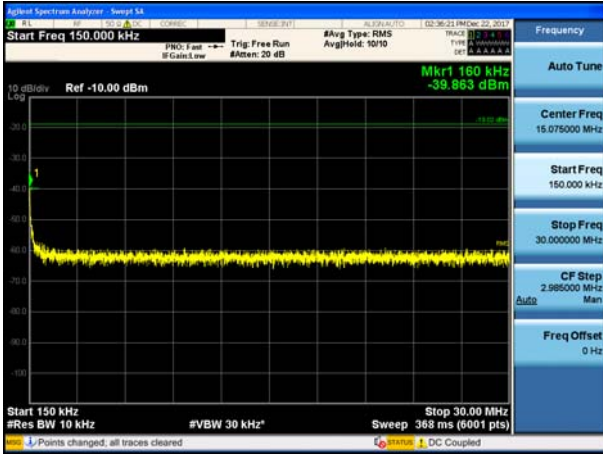
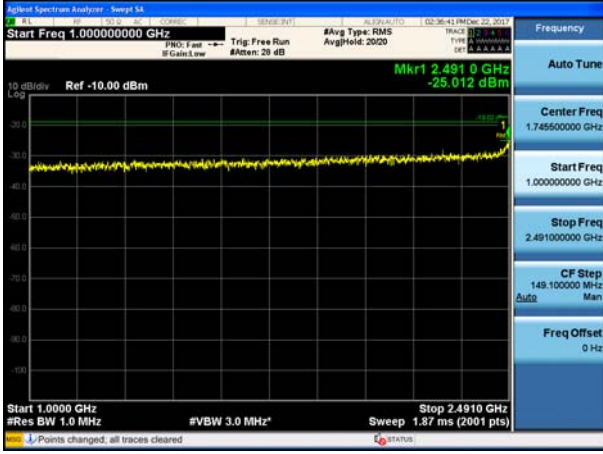
Plot Data for Output Port 0_64QAM

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Middle channel

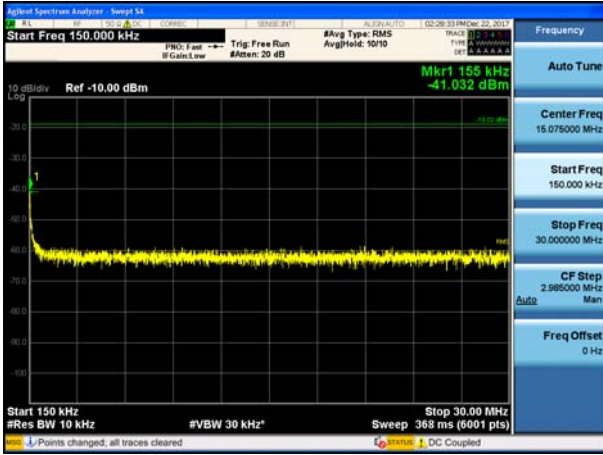
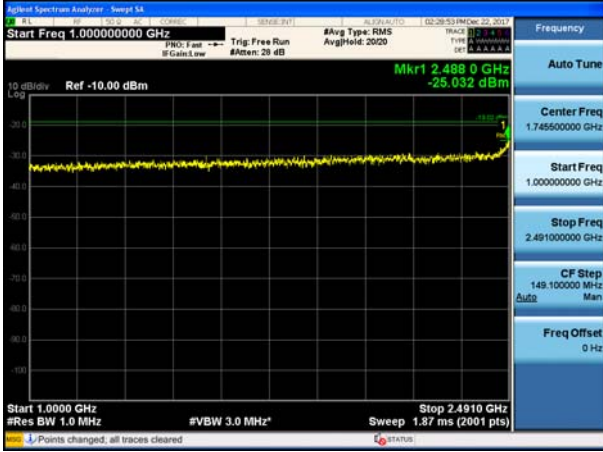
Plot Data for Output Port 1_QPSK

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
			
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
			
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	High channel
			

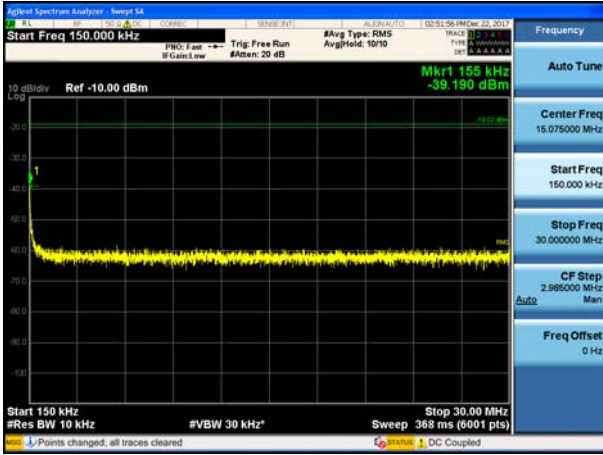
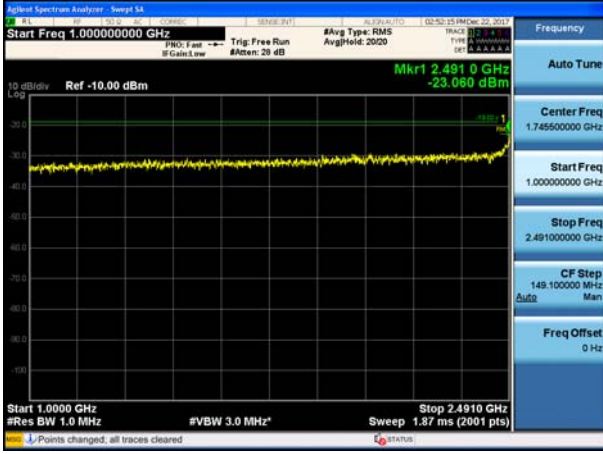
Plot Data for Output Port 1_16QAM

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
			
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
			
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Middle channel
			

Plot Data for Output Port 1_64QAM

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
			
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
			
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Middle channel
			

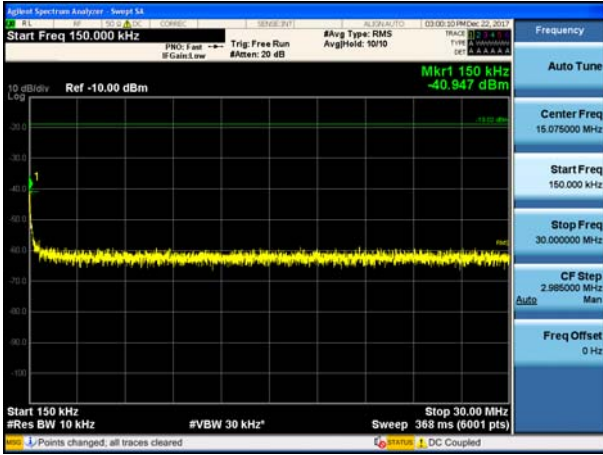
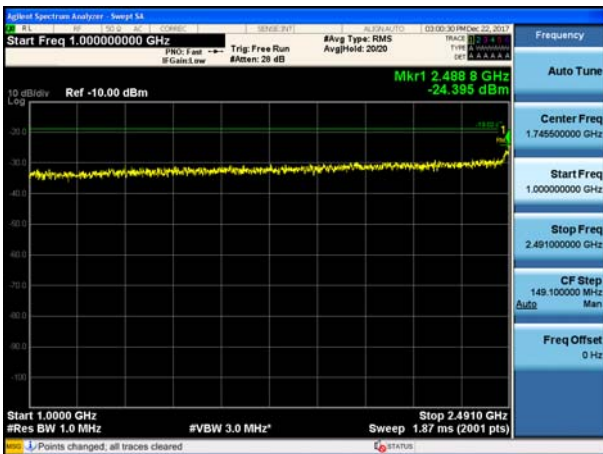
Plot Data for Output Port 2_QPSK

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
			
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
			
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	High channel
			

Plot Data for Output Port 2_16QAM

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Middle channel

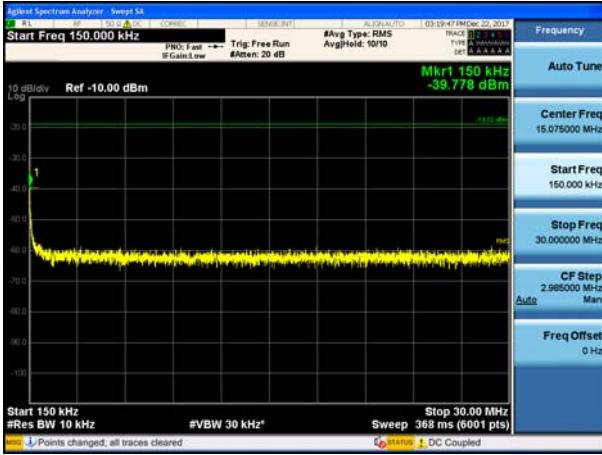
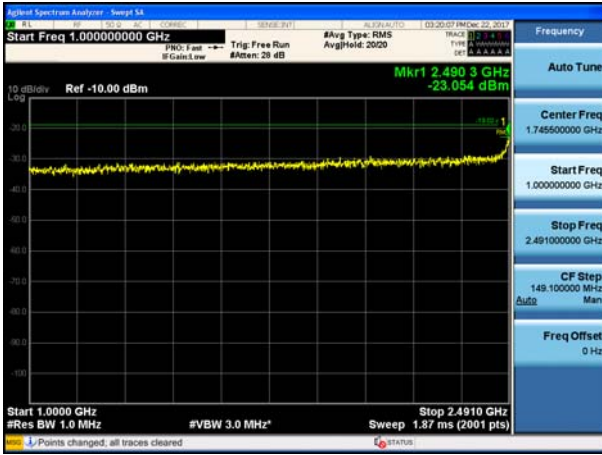
Plot Data for Output Port 2_64QAM

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
 Start Freq 9.000 kHz #Res BW 1.0 kHz #VBW 3.0 kHz* Sweep 174 ms (1001 pts)		 Start Freq 150.000 kHz #Res BW 10 kHz #VBW 30 kHz* Sweep 368 ms (6001 pts)	
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
 Start Freq 30.000000 MHz #Res BW 100 kHz #VBW 300 kHz* Sweep 120.0 ms (20001 pts)		 Start Freq 1.000000000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 1.87 ms (2001 pts)	
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Middle channel
 Start Freq 2.695000000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 18.67 ms (40001 pts)		 Start Freq 12.750000000 GHz #Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 34.67 ms (40001 pts)	

Plot Data for Output Port 3_QPSK

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	High channel

Plot Data for Output Port 3_16QAM

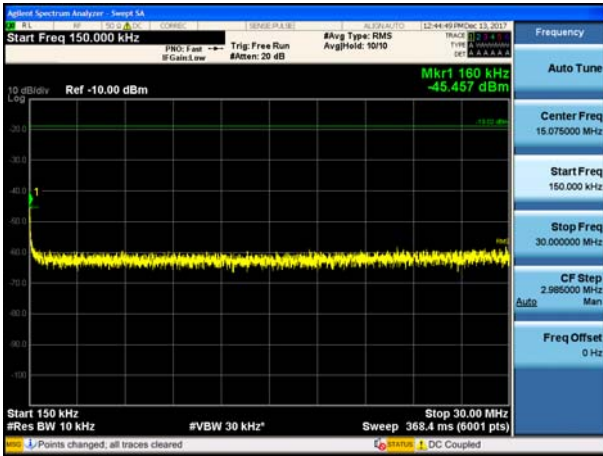
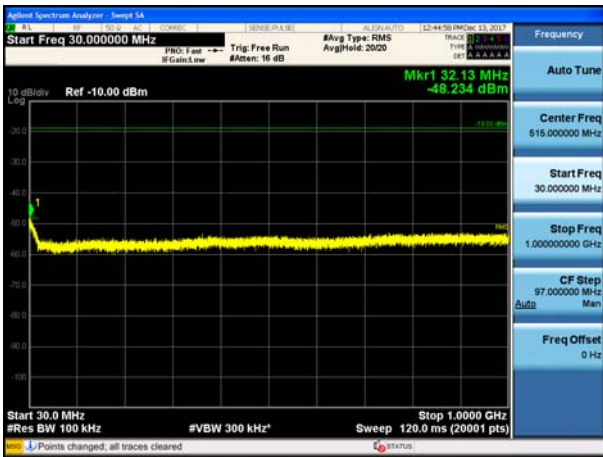
9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
			
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
			
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	High channel
			

Plot Data for Output Port 3_64QAM

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Low channel
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Middle channel

20 MHz + 15 MHz / 2 Carriers (10 W + 7.5 W)

Plot Data for Output Port 0_QPSK

9 kHz ~ 150 kHz	Middle channel	150 kHz ~ 30 MHz	Middle channel
			
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
			
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Middle channel
			

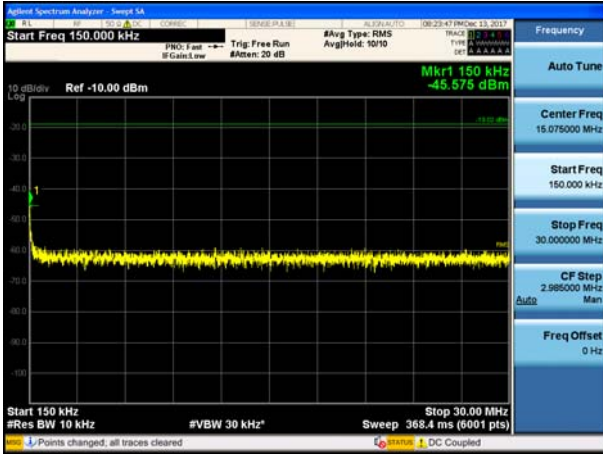
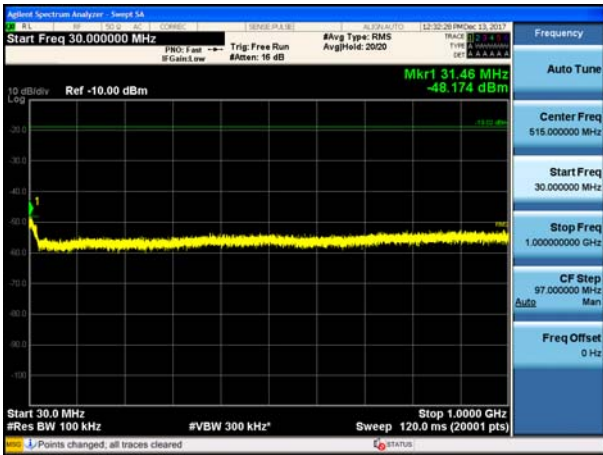
Plot Data for Output Port 0_16QAM

9 kHz ~ 150 kHz	Middle channel	150 kHz ~ 30 MHz	Low channel
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Low channel

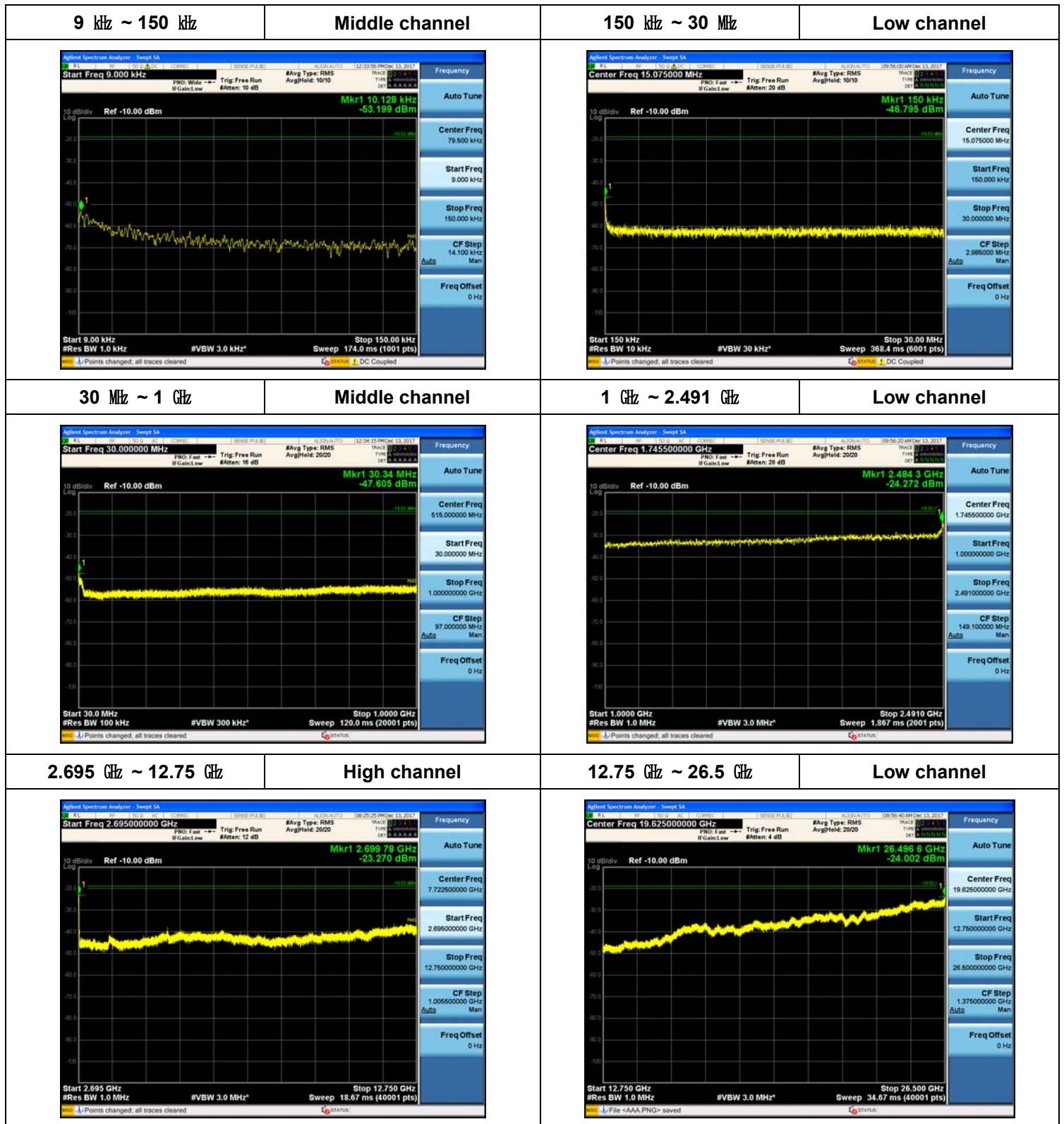
Plot Data for Output Port 0_64QAM

9 kHz ~ 150 kHz	High channel	150 kHz ~ 30 MHz	Middle channel
Agilent Spectrum Analyzer - Sweep 54 Start Freq 9.000 kHz #Avg Type: RMS AvgHeld: 10/10 #VBW 3.0 kHz* Sweep 174.0 ms (1001 pts) #Res BW 1.0 kHz #Points changed, all traces cleared #DC Coupled	Agilent Spectrum Analyzer - Sweep 54 Start Freq 150.000 kHz #Avg Type: RMS AvgHeld: 10/10 #VBW 30 kHz* Sweep 368.4 ms (6001 pts) #Res BW 10 kHz #Points changed, all traces cleared #DC Coupled		
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
Agilent Spectrum Analyzer - Sweep 54 Start Freq 30.000000 MHz #Avg Type: RMS AvgHeld: 20/20 #VBW 300 kHz* Sweep 120.0 ms (2001 pts) #Res BW 100 kHz #Points changed, all traces cleared	Agilent Spectrum Analyzer - Sweep 54 Start Freq 1.00000000 GHz #Avg Type: RMS AvgHeld: 20/20 #VBW 3.0 MHz* Sweep 1.867 ms (2001 pts) #Res BW 1.0 MHz #Points changed, all traces cleared		
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Low channel
Agilent Spectrum Analyzer - Sweep 54 Start Freq 2.695000000 GHz #Avg Type: RMS AvgHeld: 20/20 #VBW 3.0 MHz* Sweep 18.67 ms (40001 pts) #Res BW 1.0 MHz #Points changed, all traces cleared	Agilent Spectrum Analyzer - Sweep 54 Start Freq 12.75000000 GHz #Avg Type: RMS AvgHeld: 20/20 #VBW 3.0 MHz* Sweep 34.67 ms (40001 pts) #Res BW 1.0 MHz File <AAA.PNG> saved		

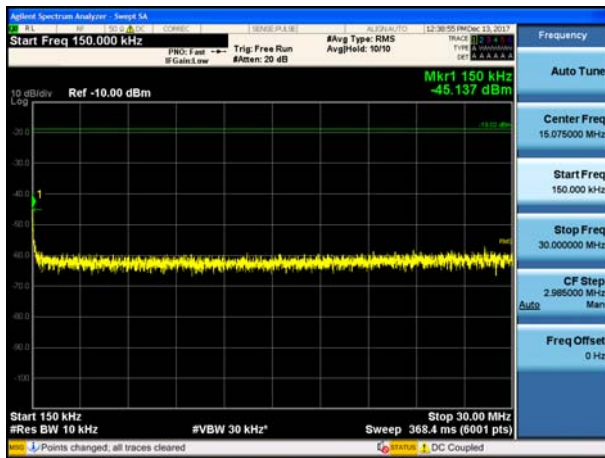
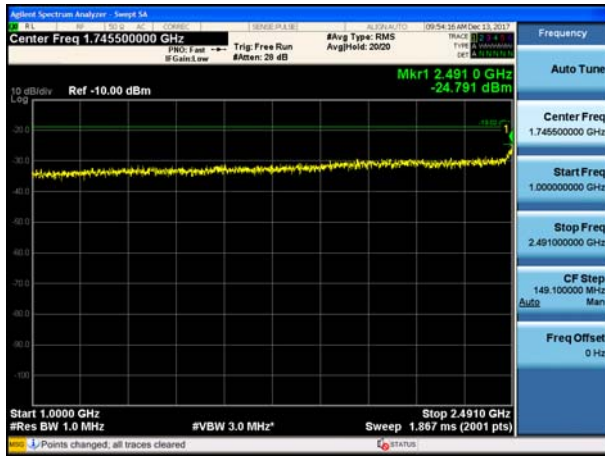
Plot Data for Output Port 1_QPSK

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	High channel
			
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
			
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	High channel
			

Plot Data for Output Port 1_16QAM



Plot Data for Output Port 1_64QAM

9 kHz ~ 150 kHz	Low channel	150 kHz ~ 30 MHz	Middle channel
			
30 MHz ~ 1 GHz	Middle channel	1 GHz ~ 2.491 GHz	Low channel
			
2.695 GHz ~ 12.75 GHz	High channel	12.75 GHz ~ 26.5 GHz	Low channel
			