FCC CFR47 PART 27
CERTIFICATION TEST REPORT
FCC ID: 2AKWZ-F840

Product:	3G/4G fixed wireless phone
Trade Mark:	Cocomm
Model Number:	F840
Family Model:	N/A
Report No.:	S18111302202E006

Prepared for

CO-COMM SERVICIOS TELECOMUNICACIONES S.L.

Lisboa 20, Las Rozas P.O. Box 28232, Madrid, Spain

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name ..... :	CO-COMM SERVICIOS TELECOMUNICACIONES S.L.
Address ..... :	Lisboa 20, Las Rozas P.O. Box 28232, Madrid, Spain
Manufacturer's Name ..... :	CO-COMM SERVICIOS TELECOMUNICACIONES S.L.
Address ..... :	Lisboa 20, Las Rozas P.O. Box 28232, Madrid, Spain
Product name..... :	3G/4G fixed wireless phone
Model and/or type reference ...:	F840
Family Model:	N/A
Standards..... :	FCC CFR 47 Part 27
Test procedure ..... :	ANSI C63.26:2015
	ANSI/TIA-603-E-2016

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

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Date of Test .....

Date (s) of performance of tests ..... 14 Nov. 2018 ~ 24 Dec. 2018

Date of Issue ..... 25 Dec. 2018

Test Result ..... **Pass**

Testing Engineer : Eileen Liu.

(Eileen Liu)

Technical Manager : Jason chen

(Jason Chen)

Authorized Signatory : Sam . Chen

(Sam Chen)

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

Product Designation:	3G/4G fixed wireless phone
Trade Mark	Cocomm
Model Name	F840
FCC ID:	2AKWZ-F840
Frequency Bands:	U.S. Bands: ☒LTE FDD Band 4,7
Frequency Range:	LTE FDD Band 4 Uplink: 1710MHz-1755MHz, Downlink: 2110MHz-2155MHz LTE FDD Band 7 Uplink: 2500MHz-2570MHz, Downlink: 2620MHz-2690MHz
Type of Modulation:	QPSK/16QAM
Antenna:	FPCB Antenna
Antenna gain:	Band 4: 5.25dBi Band 7: 4.06dBi
Power Supply:	DC 3.7V from Battery or DC 5V from Adapter
Battery parameter:	DC 3.7V/4000mAh
Adapter:	Model: S008ACU0500150 Input: 100-240V~50/60Hz 250mA Output: 5V⎓1500mA
Extreme Vol. Limits:	DC 3.2V to 4.3V (Nominal DC 3.7V)$_{Note}$
HW Version	2.0
SW Version	F840vCO130.0.1
** Note: The High Voltage 4.3V and Low Voltage 3.2V was declared by manufacturer, The EUT couldn't be operate normally with higher or lower voltage.	

1.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AKWZ-F840** filing to comply with the FCC Part 27.

1.3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI/TIA-603-E-2016, FCC CFR 47 Part 2, Part 27, ANSI C63.26:2015.

1.4 TEST FACILITY

The test site used to collect the radiated data is located at:

ShenZhen NTEK Testing Technology Co., Ltd.

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R.China.

The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.26:2015& ANSI C63.4: 2014.

FCC Registration No.:463705

IC Registration No.:9270A-1,

CNAS Registration No.:L5516

1.5 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

1.6 WORST-CASE CONFIGURATION AND MODE

The worst-case scenario for all measurements is based on the investigation results.

The device has LTE Bands of: Band 4, Band 7

The RB Size was selected to measure for peak or average ERP and EIRP, which was based on the conducted power verification baseline data.

For the fundamental investigation of radiated emissions, the EUT is investigated for vertical and horizontal antenna orientations and X Y and Z orientations of the EUT alone. After the investigations the worst case was determined to be at X orientation for all LTE bands.

2. SYSTEM TEST CONFIGURATION

2.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

2.3 CONFIGURATION OF EUT SYSTEM

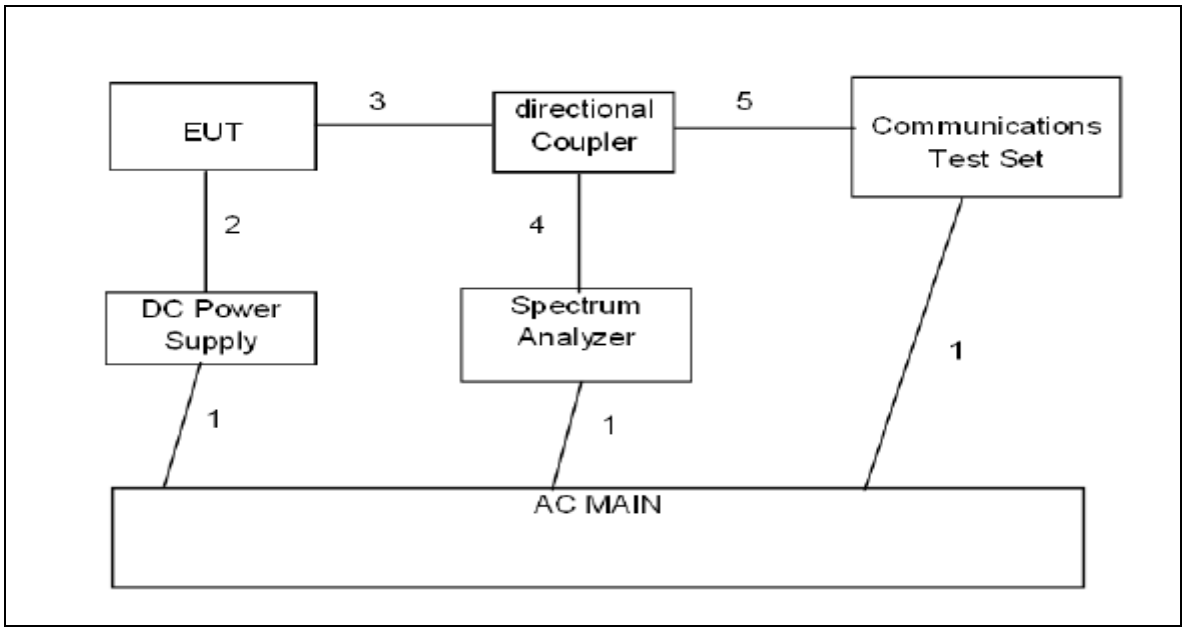
Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	Series No.	Note
1	3G/4G fixed wireless phone	F840	N/A	EUT

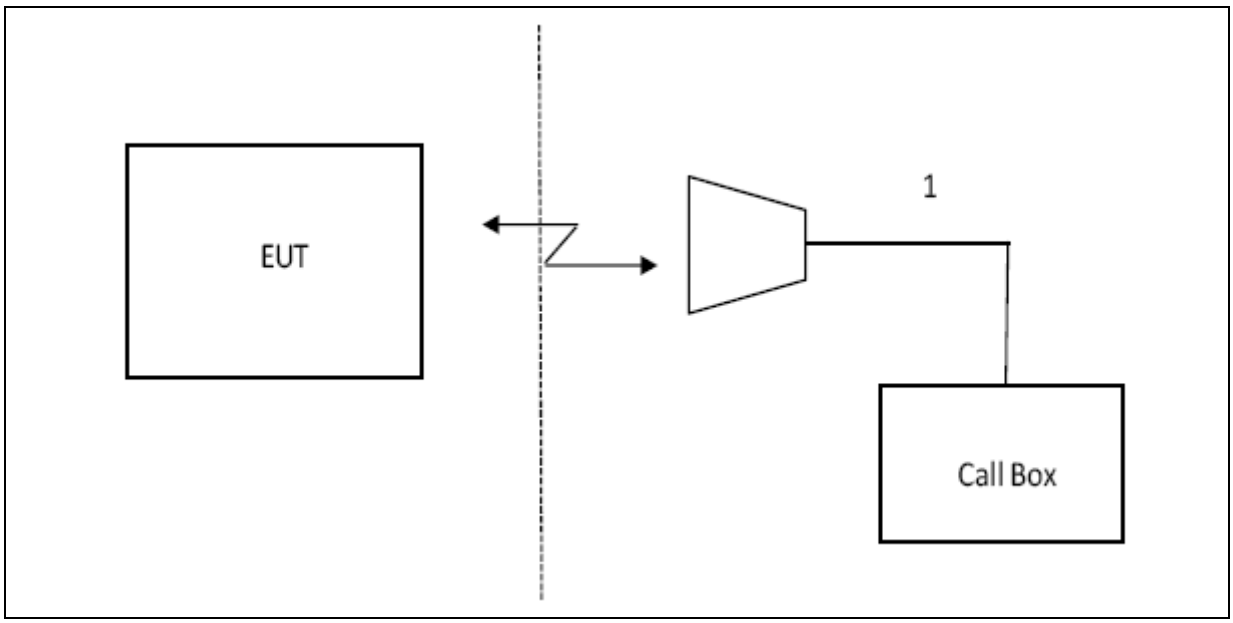
Note: All the accessories have been used during the test.
the following "EUT" in setup diagram means EUT system.

2.4 TEST SETUP

CONDUCTED SETUP DIAGRAM FOR TESTS



RADIATED SETUP DIAGRAM FOR TESTS



3.TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	NEXT CAL. DATE
SPECTRUM ANALYZER	AGILENT	N9020A	MY49100060	2019.10.07
TEST RECEIVER	R&S	ESCI	101318	2019.05.18
COMMUNICATION TESTER	R&S	CMU200	117858	2019.05.18
COMMUNICATION TESTER	R&S	CMW500	148500	2019.05.18
TEST RECEIVER	R&S	FCKL1528	A0304230	2019.05.18
LISN	SCHWARZBECK	NSLK8127	A0304233	2019.05.18
CLIMATE CHAMBER	ALBATROSS	--	--	2019.05.18
Loop Antenna	Daze	ZN30900N	SEL0097	2019.05.18
Bilogical Antenna	A.H. Systems Inc.	SAS-521-4	N/A	2019.05.18
Horn Antenna	EM	EM-AH-10180	2011071402	2019.05.18
DC Power Source	N/A	PS-6005D	20170402923	2019.05.18

4. OUTPUT POWER

4.1 OUTPUT POWER MEASUREMENT

LTE Measurement Procedure:

All LTE bands conducted power peak and average are obtained from the CMW500 telecommunication test set. The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of “NS_01”.3

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
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NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

4.2 LTE BAND 4

OUTPUT POWER FOR LTE BAND 4 (1.4MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 4	1.4MHz	19957	1710.7	QPSK	1	Low	22.82	26.06
					1	Mid	22.88	26.06
					1	High	22.81	26.01
					3	Low	22.86	26.59
					3	High	22.85	26.53
					6	Low	21.81	26.88
				16QAM	1	Low	21.79	25.85
					1	Mid	21.85	25.87
					1	High	21.79	25.74
					3	Low	21.89	26.60
					3	High	21.89	26.44
					6	Low	20.76	26.64
	1.4MHz	20175	1732.5	QPSK	1	Low	22.38	26.87
					1	Mid	22.38	26.95
					1	High	22.36	26.92
					3	Low	22.53	27.40
					3	High	22.50	27.32
					6	Low	21.37	27.13
				16QAM	1	Low	21.56	26.33
					1	Mid	21.58	26.40
					1	High	21.54	26.36
					3	Low	21.54	27.37
					3	High	21.52	27.35
					6	Low	20.47	27.31
	1.4MHz	20393	1754.3	QPSK	1	Low	22.08	25.43
					1	Mid	22.07	25.46
					1	High	22.02	25.45
					3	Low	22.13	25.94
					3	High	22.08	25.85
					6	Low	21.05	26.46
				16QAM	1	Low	21.04	25.23
					1	Mid	21.04	25.23
					1	High	21.00	25.19
					3	Low	21.28	25.80
					3	High	21.28	25.86
					6	Low	19.97	26.17

OUTPUT POWER FOR LTE BAND 4 (3.0MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 4	3.0 MHz	19965	1711.5	QPSK	1	Low	22.80	25.87
					1	Mid	22.77	25.82
					1	High	22.72	25.81
					8	Low	21.89	26.53
					8	High	21.86	26.47
					15	Low	21.81	27.34
				16QAM	1	Low	22.20	26.03
					1	Mid	22.17	25.99
					1	High	22.09	25.95
					8	Low	20.93	26.59
					8	High	20.98	26.56
					15	Low	20.89	27.34
	3.0 MHz	20175	1732.5	QPSK	1	Low	22.37	26.64
					1	Mid	22.38	26.81
					1	High	22.35	26.66
					8	Low	21.49	27.42
					8	High	21.47	27.45
					15	Low	21.47	27.84
				16QAM	1	Low	21.44	26.37
					1	Mid	21.44	26.51
					1	High	21.40	26.36
					8	Low	20.61	26.86
					8	High	20.58	26.70
					15	Low	20.59	27.60
	3.0 MHz	20385	1753.5	QPSK	1	Low	22.16	25.39
					1	Mid	22.10	25.38
					1	High	21.99	25.34
					8	Low	21.25	26.11
					8	High	21.17	25.95
					15	Low	21.14	26.53
				16QAM	1	Low	21.27	25.11
					1	Mid	21.20	25.15
					1	High	21.12	25.14
					8	Low	20.14	25.84
					8	High	20.05	25.78
					15	Low	20.04	26.14

OUTPUT POWER FOR LTE BAND 4 (5.0MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 4	5.0 MHz	19975	1712.5	QPSK	1	Low	22.81	26.18
					1	Mid	22.56	26.07
					1	High	22.68	26.08
					12	Low	21.71	26.42
					12	High	21.77	26.43
					25	Low	21.77	27.23
				16QAM	1	Low	21.67	25.72
					1	Mid	21.54	25.66
					1	High	21.53	25.64
					12	Low	20.73	26.47
					12	High	20.79	26.40
					25	Low	20.85	27.28
	5.0 MHz	20175	1732.5	QPSK	1	Low	22.44	26.72
					1	Mid	22.41	26.97
					1	High	22.37	26.89
					12	Low	21.52	26.98
					12	High	21.50	27.04
					25	Low	21.47	27.62
				16QAM	1	Low	21.54	26.58
					1	Mid	21.54	26.87
					1	High	21.47	26.78
					12	Low	20.56	27.17
					12	High	20.55	27.23
					25	Low	20.54	27.96
	5.0 MHz	20375	1752.5	QPSK	1	Low	22.35	25.50
					1	Mid	22.23	25.35
					1	High	22.04	25.30
					12	Low	21.31	26.29
					12	High	21.16	26.04
					25	Low	21.19	26.97
				16QAM	1	Low	21.57	25.44
					1	Mid	21.45	25.31
					1	High	21.27	25.21
					12	Low	20.29	25.97
					12	High	20.14	25.89
					25	Low	20.16	26.60

OUTPUT POWER FOR LTE BAND 4 (10.0MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 4	10.0 MHz	20000	1715.0	QPSK	1	Low	22.28	25.68
					1	Mid	22.60	25.68
					1	High	22.64	25.83
					25	Low	21.65	26.47
					25	High	21.69	26.50
					50	Low	21.75	27.06
				16QAM	1	Low	21.73	25.90
					1	Mid	21.94	25.90
					1	High	21.99	26.03
					25	Low	20.72	26.34
					25	High	20.77	26.38
					50	Low	20.79	27.09
	10.0 MHz	20175	1732.5	QPSK	1	Low	22.49	26.46
					1	Mid	22.43	26.78
					1	High	22.44	26.66
					25	Low	21.50	27.47
					25	High	21.46	27.61
					50	Low	21.50	27.63
				16QAM	1	Low	21.54	26.24
					1	Mid	21.48	26.53
					1	High	21.48	26.42
					25	Low	20.64	27.33
					25	High	20.62	27.52
					50	Low	20.59	27.86
	10.0 MHz	20350	1750.0	QPSK	1	Low	22.46	26.01
					1	Mid	22.37	25.56
					1	High	22.08	25.36
					25	Low	21.42	26.42
					25	High	21.22	26.02
					50	Low	21.33	26.86
				16QAM	1	Low	21.60	25.68
					1	Mid	21.45	25.30
					1	High	21.20	25.11
					25	Low	20.40	26.42
					25	High	20.20	26.12
					50	Low	20.29	26.45

OUTPUT POWER FOR LTE BAND 4 (15.0MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 4	15.0 MHz	20025	1717.5	QPSK	1	Low	22.46	25.73
					1	Mid	22.67	25.78
					1	High	22.56	26.12
					36	Low	21.65	26.45
					36	High	21.75	26.64
					75	Low	21.77	27.62
				16QAM	1	Low	21.89	25.90
					1	Mid	21.91	25.93
					1	High	21.95	26.30
					36	Low	20.69	26.56
					36	High	20.75	26.79
					75	Low	20.82	27.10
	15.0 MHz	20175	1732.5	QPSK	1	Low	22.58	26.23
					1	Mid	22.43	26.70
					1	High	22.49	26.53
					36	Low	21.58	27.36
					36	High	21.52	27.50
					75	Low	21.58	28.00
				16QAM	1	Low	21.92	26.10
					1	Mid	21.86	26.56
					1	High	21.88	26.39
					36	Low	20.59	27.28
					36	High	20.54	27.49
					75	Low	20.58	27.69
	15.0 MHz	20325	1747.5	QPSK	1	Low	22.51	26.44
					1	Mid	22.43	25.77
					1	High	22.11	25.37
					36	Low	21.57	26.85
					36	High	21.44	26.27
					75	Low	21.53	27.42
				16QAM	1	Low	21.65	26.00
					1	Mid	21.54	25.48
					1	High	21.24	25.10
					36	Low	20.58	26.98
					36	High	20.32	26.32
					75	Low	20.43	27.08

OUTPUT POWER FOR LTE BAND 4 (20.0MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 4	20.0 MHz	20050	1720.0	QPSK	1	Low	22.48	25.75
					1	Mid	22.65	25.85
					1	High	22.54	26.50
					50	Low	21.72	26.56
					50	High	21.63	26.94
					100	Low	21.66	27.31
				16QAM	1	Low	21.70	25.64
					1	Mid	21.89	25.79
					1	High	21.85	26.42
					50	Low	20.73	26.69
					50	High	20.67	26.97
					100	Low	20.73	27.40
	20.0 MHz	20175	1732.5	QPSK	1	Low	22.59	26.12
					1	Mid	22.43	26.78
					1	High	22.40	26.42
					50	Low	21.60	27.27
					50	High	21.55	27.44
					100	Low	21.54	27.73
				16QAM	1	Low	21.94	26.10
					1	Mid	21.95	26.81
					1	High	21.92	26.45
					50	Low	20.68	27.25
					50	High	20.63	27.43
					100	Low	20.61	27.72
	20.0 MHz	20300	1745.0	QPSK	1	Low	22.53	26.73
					1	Mid	22.52	25.99
					1	High	22.12	25.33
					50	Low	21.55	27.17
					50	High	21.38	26.38
					100	Low	21.44	27.37
				16QAM	1	Low	21.94	26.97
					1	Mid	21.72	26.19
					1	High	21.34	25.48
					50	Low	20.61	27.11
					50	High	20.33	26.31
					100	Low	20.42	27.29

4.3 LTE BAND 7

OUTPUT POWER FOR LTE BAND 7 (5.0MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 7	5.0MHz	20775	2502.5	QPSK	1	Low	21.99	26.58
					1	Mid	21.74	26.64
					1	High	21.89	26.86
					12	Low	20.58	26.49
					12	High	20.98	26.70
					25	Low	20.71	27.03
				16QAM	1	Low	20.66	25.87
					1	Mid	20.58	25.94
					1	High	20.87	26.27
					12	Low	19.57	26.51
					12	High	20.00	26.97
					25	Low	19.80	27.23
	5.0MHz	21100	2535.0	QPSK	1	Low	21.70	26.37
					1	Mid	21.66	26.43
					1	High	21.62	26.46
					12	Low	20.75	26.37
					12	High	20.70	26.45
					25	Low	20.67	26.97
				16QAM	1	Low	20.82	26.30
					1	Mid	20.75	26.33
					1	High	20.74	26.41
					12	Low	19.75	26.53
					12	High	19.68	26.57
					25	Low	19.74	27.28
	5.0MHz	21425	2567.5	QPSK	1	Low	21.43	25.60
					1	Mid	20.98	25.35
					1	High	21.50	25.38
					12	Low	20.12	26.07
					12	High	20.19	25.94
					25	Low	20.13	26.46
				16QAM	1	Low	20.74	25.52
					1	Mid	20.34	25.31
					1	High	20.81	25.30
					12	Low	19.14	25.60
					12	High	19.23	25.63
					25	Low	19.15	26.77

OUTPUT POWER FOR LTE BAND 7 (10.0MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 7	10.0 MHz	20800	2505.0	QPSK	1	Low	21.41	25.91
					1	Mid	22.00	26.29
					1	High	21.89	26.33
					25	Low	20.64	26.65
					25	High	20.99	27.09
					50	Low	20.89	27.22
				16QAM	1	Low	20.77	26.22
					1	Mid	20.87	26.58
					1	High	20.97	26.65
					25	Low	19.75	26.64
					25	High	19.89	27.01
					50	Low	19.85	27.49
	10.0 MHz	21100	2535.0	QPSK	1	Low	21.60	26.13
					1	Mid	21.66	26.23
					1	High	21.71	26.37
					25	Low	20.75	27.05
					25	High	20.72	27.08
					50	Low	20.74	26.98
				16QAM	1	Low	20.63	25.78
					1	Mid	20.69	25.88
					1	High	20.75	25.98
					25	Low	19.87	26.85
					25	High	19.85	26.90
					50	Low	19.83	27.35
	10.0 MHz	21400	2565.0	QPSK	1	Low	20.83	25.61
					1	Mid	20.91	25.54
					1	High	20.95	25.37
					25	Low	19.92	26.04
					25	High	20.12	25.88
					50	Low	20.02	26.10
				16QAM	1	Low	20.01	24.94
					1	Mid	20.14	24.96
					1	High	20.19	24.87
					25	Low	18.95	25.96
					25	High	19.12	26.01
					50	Low	19.04	26.15

OUTPUT POWER FOR LTE BAND 7 (15.0MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 7	15.0 MHz	20825	2507.5	QPSK	1	Low	21.69	26.06
					1	Mid	21.85	26.36
					1	High	21.80	26.18
					36	Low	21.00	26.85
					36	High	20.97	27.00
					75	Low	20.87	27.85
				16QAM	1	Low	21.09	26.35
					1	Mid	21.87	26.65
					1	High	21.59	26.52
					36	Low	20.05	27.02
					36	High	20.29	27.19
					75	Low	19.88	27.42
	15.0 MHz	21100	2535.0	QPSK	1	Low	21.64	25.98
					1	Mid	21.67	26.15
					1	High	21.78	26.35
					36	Low	20.81	26.86
					36	High	20.79	27.01
					75	Low	20.82	27.58
				16QAM	1	Low	21.06	25.83
					1	Mid	21.10	25.97
					1	High	21.20	26.12
					36	Low	19.84	26.94
					36	High	19.80	27.06
					75	Low	19.80	27.12
	15.0 MHz	21375	2562.5	QPSK	1	Low	21.18	25.85
					1	Mid	20.76	25.55
					1	High	21.16	25.42
					36	Low	19.99	26.12
					36	High	20.03	26.02
					75	Low	19.99	26.52
				16QAM	1	Low	20.36	25.22
					1	Mid	20.27	24.90
					1	High	20.43	25.00
					36	Low	19.01	26.38
					36	High	19.09	26.29
					75	Low	19.05	26.40

OUTPUT POWER FOR LTE BAND 7 (20.0MHZ)

Band	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power(dBm)	Peak Power(dBm)
					RB Size	RB Offset		
Band 7	20.0 MHz	20850	2510.0	QPSK	1	Low	21.68	26.20
					1	Mid	21.69	26.41
					1	High	21.54	26.22
					50	Low	20.89	27.08
					50	High	20.54	27.01
					100	Low	20.98	27.38
				16QAM	1	Low	21.97	26.00
					1	Mid	21.59	26.30
					1	High	21.33	26.12
					50	Low	20.25	27.30
					50	High	20.21	27.23
					100	Low	20.36	28.00
	20.0 MHz	21100	2535.0	QPSK	1	Low	21.68	26.07
					1	Mid	21.67	26.30
					1	High	21.82	26.47
					50	Low	20.77	26.78
					50	High	20.81	26.97
					100	Low	20.84	27.32
				16QAM	1	Low	21.25	26.03
					1	Mid	21.27	26.27
					1	High	21.43	26.45
					50	Low	19.84	26.86
					50	High	19.86	27.02
					100	Low	19.86	27.29
	20.0 MHz	21350	2560.0	QPSK	1	Low	21.64	26.05
					1	Mid	20.82	25.43
					1	High	21.22	25.36
					50	Low	20.22	26.31
					50	High	19.98	26.10
					100	Low	20.07	26.57
				16QAM	1	Low	21.02	26.30
					1	Mid	20.07	25.76
					1	High	20.47	25.63
					50	Low	19.20	26.28
					50	High	19.00	25.87
					100	Low	19.12	26.47

5. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

MODES TESTED

LTE Band 4

□ LTE Band 7

RESULTS

PASS

Test results:

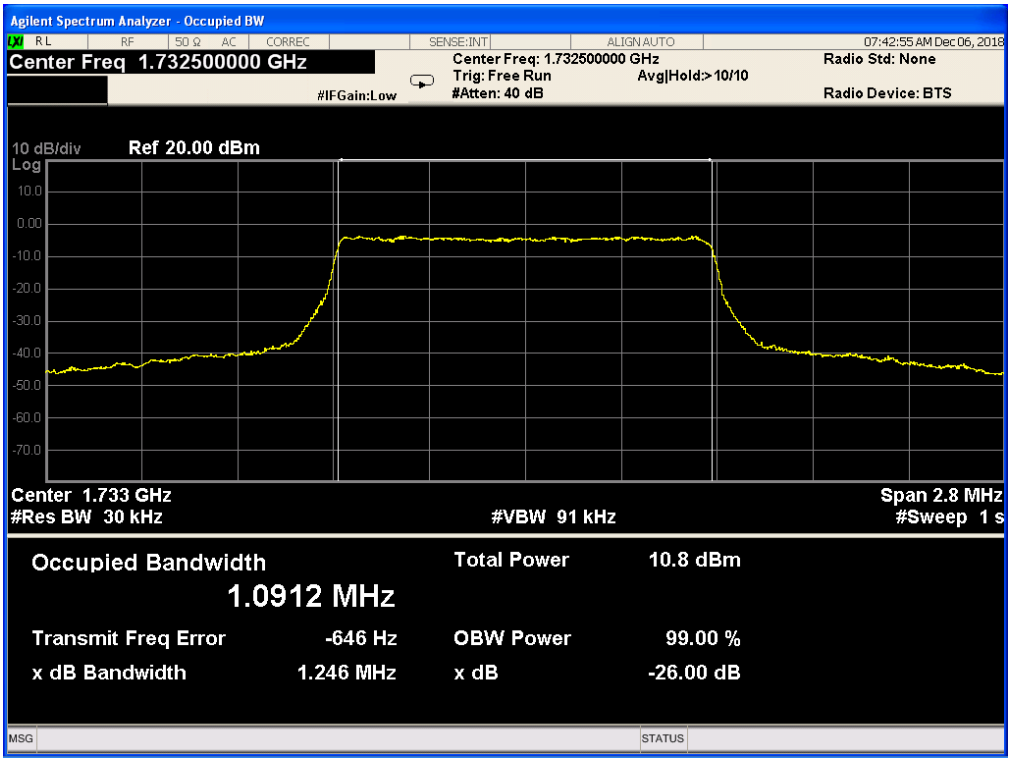
Band	Mode	RB Size/RB Offset	Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26dBc Occupied Bandwidth (MHz)
LTE Band 4	1.4MHz BAND QPSK	6/0	1732.5	1.09	1.25
	1.4MHz BAND 16QAM	6/0	1732.5	1.09	1.26
	3.0MHz BAND QPSK	15/0	1732.5	2.69	2.90
	3.0MHz BAND 16QAM	15/0	1732.5	2.69	2.90
	5.0MHz BAND QPSK	25/0	1732.5	4.50	4.89
	5.0MHz BAND 16QAM	25/0	1732.5	4.50	4.85
	10.0MHz BAND QPSK	50/0	1732.5	8.97	9.54
	10.0MHz BAND 16QAM	50/0	1732.5	8.96	9.53
	15.0MHz BAND QPSK	75/0	1732.5	13.46	14.27
	15.0MHz BAND 16QAM	75/0	1732.5	13.46	14.27
	20.0MHz BAND QPSK	100/0	1732.5	17.95	19.04
	20.0MHz BAND 16QAM	100/0	1732.5	17.95	19.04

Band	Mode	RB Size/RB Offset	Frequency (MHz)	99% Occupied Bandwidth (MHz)	-26dBc Occupied Bandwidth (MHz)
LTE Band 7	5.0MHz BAND QPSK	25/0	2535.0	4.50	4.84
	5.0MHz BAND 16QAM	25/0	2535.0	4.50	4.83
	10.0MHz BAND QPSK	50/0	2535.0	8.97	9.54
	10.0MHz BAND 16QAM	50/0	2535.0	8.96	9.51
	15.0MHz BAND QPSK	75/0	2535.0	13.47	14.24
	15.0MHz BAND 16QAM	75/0	2535.0	13.47	14.25
	20.0MHz BAND QPSK	100/0	2535.0	17.99	19.02
	20.0MHz BAND 16QAM	100/0	2535.0	17.99	19.02

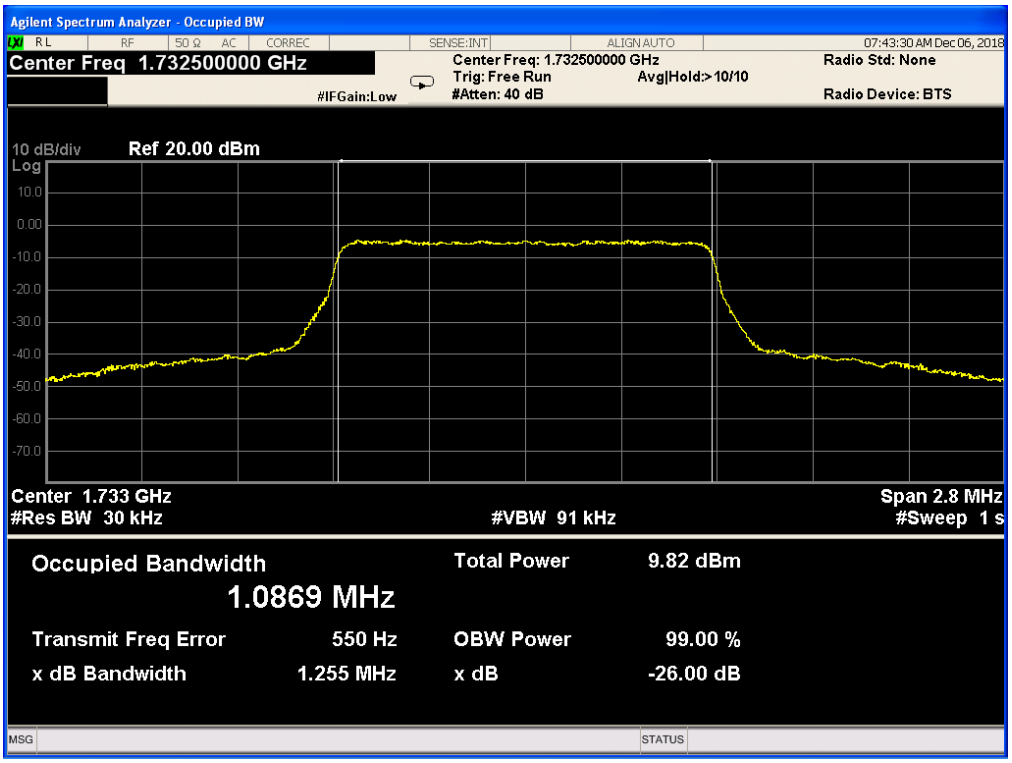
Note: This test was only measured at maximum RB allocation and at CENTER of band for each LTE BW

5.1 LTE BAND 4

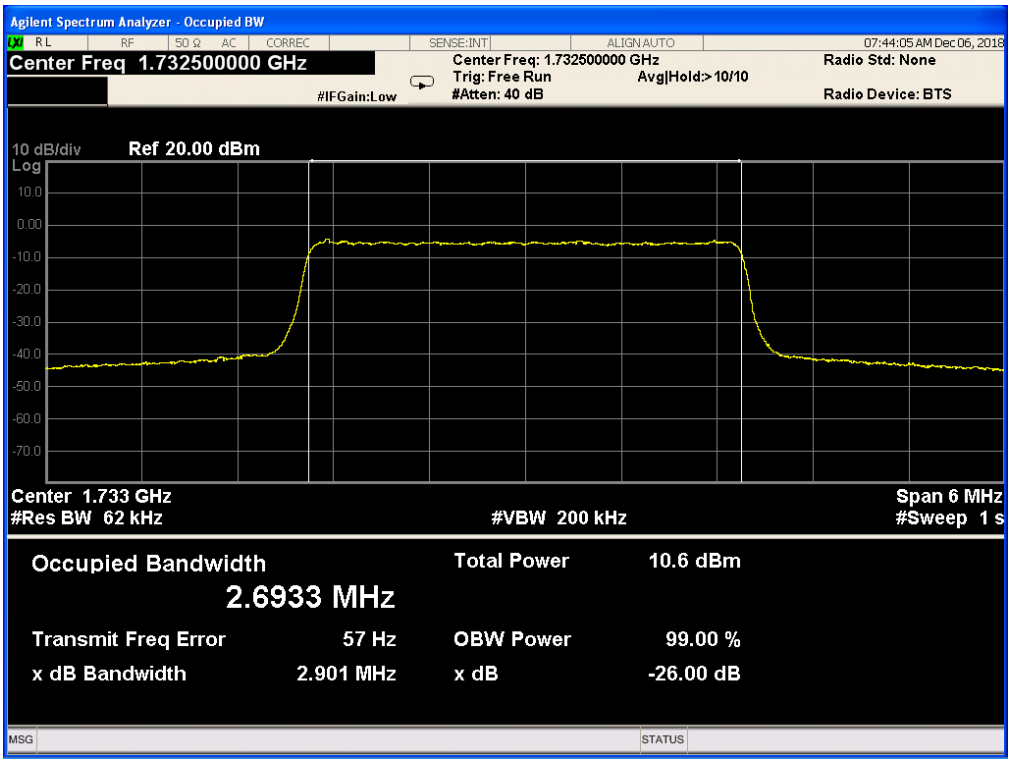
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 1.4,NO. RB 6,RB POS. Low,QPSK



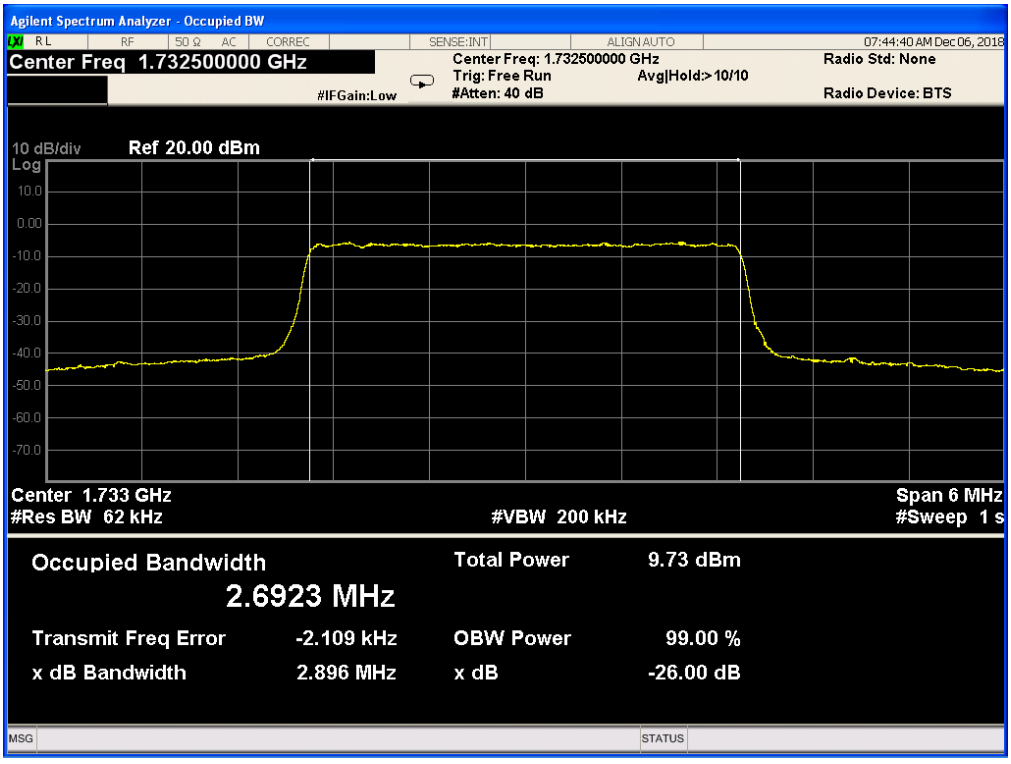
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 1.4,NO. RB 6,RB POS. Low,16-QAM



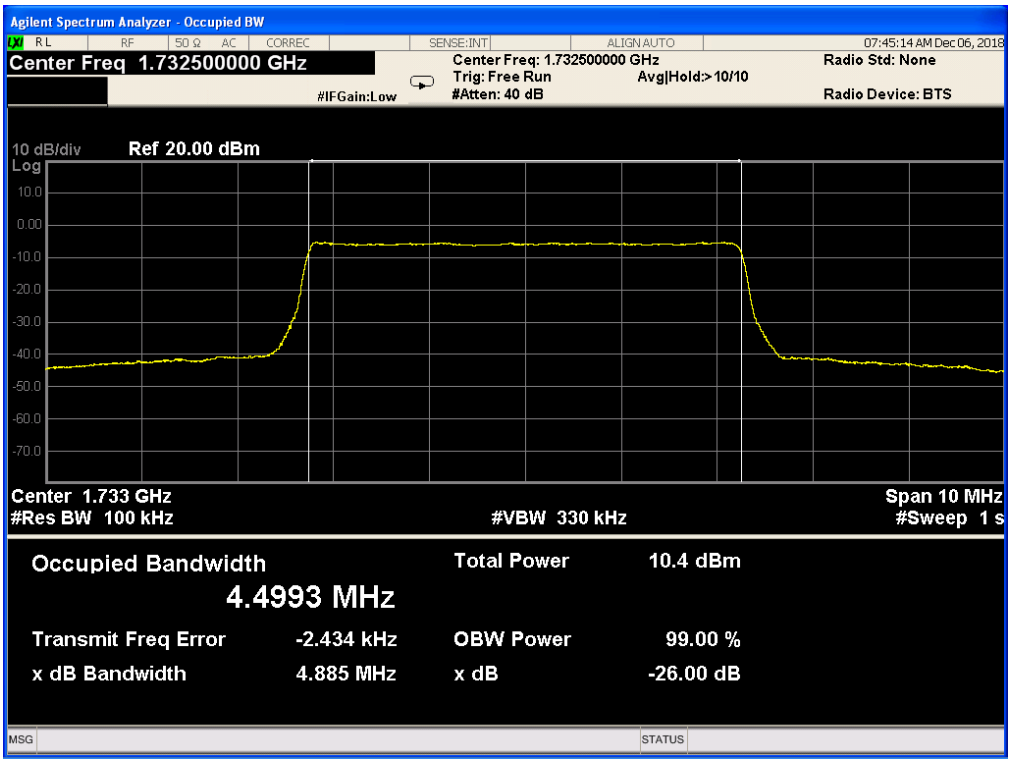
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



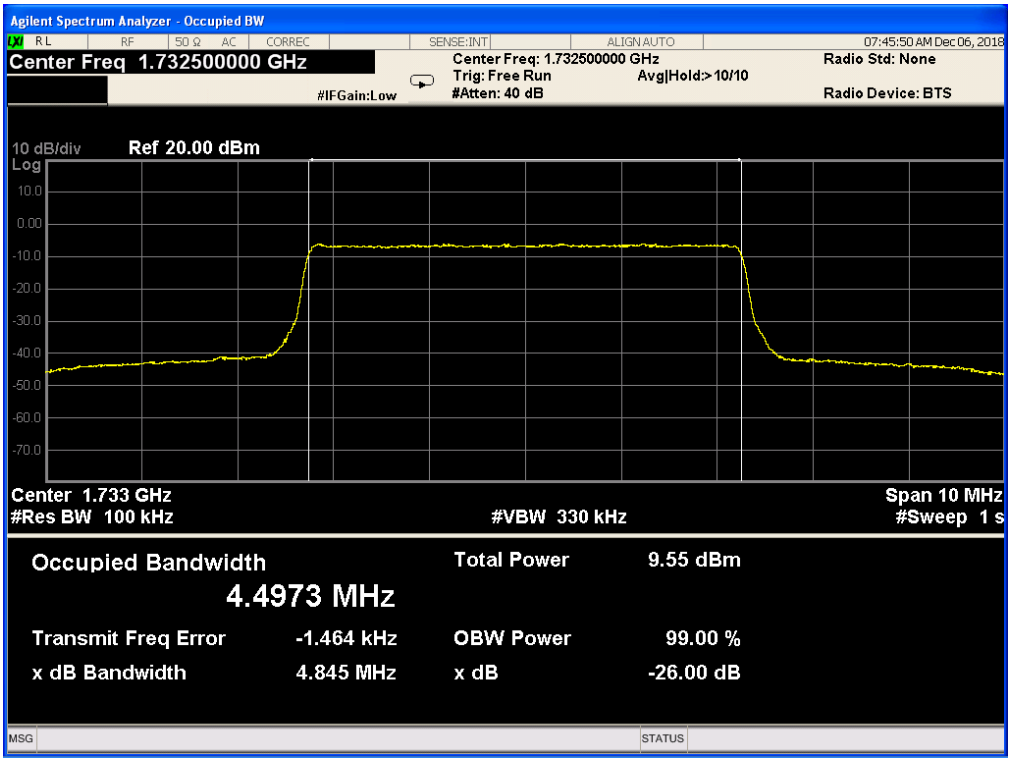
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 3.0,NO. RB 15,RB POS. Low,16-QAM



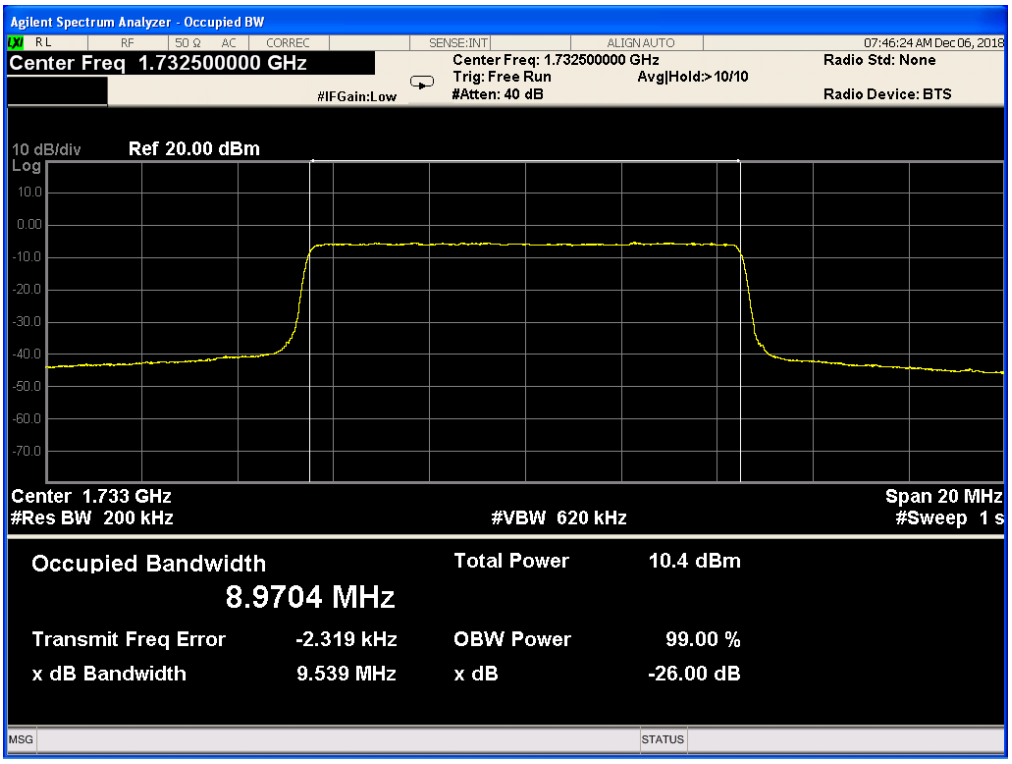
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



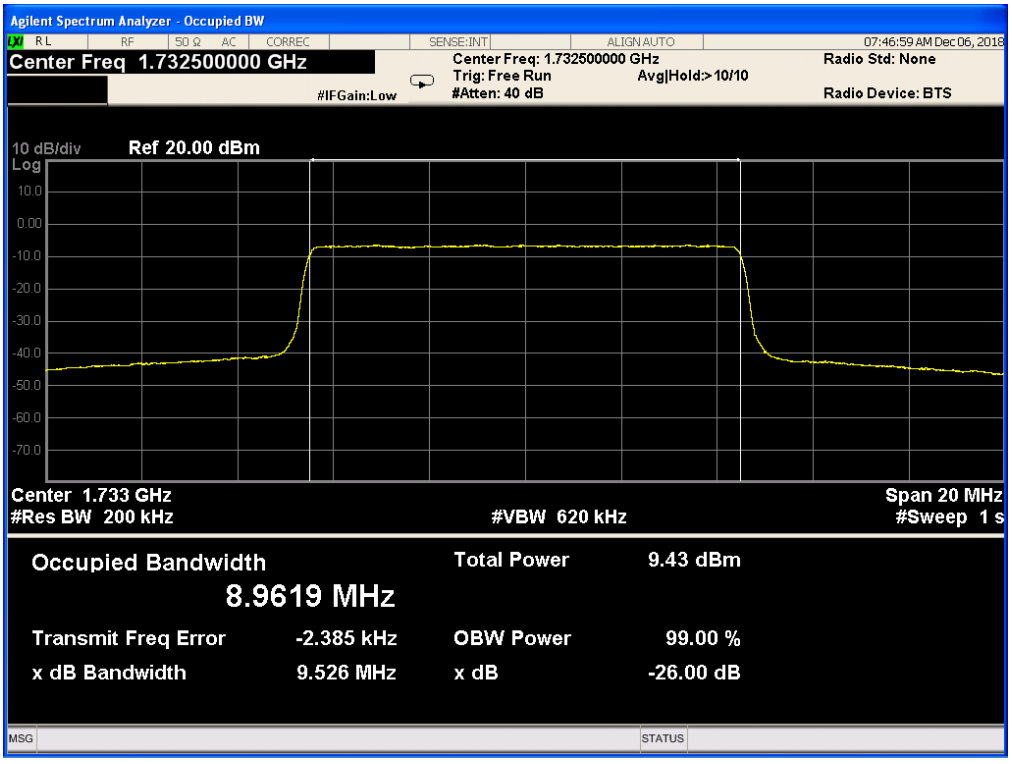
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



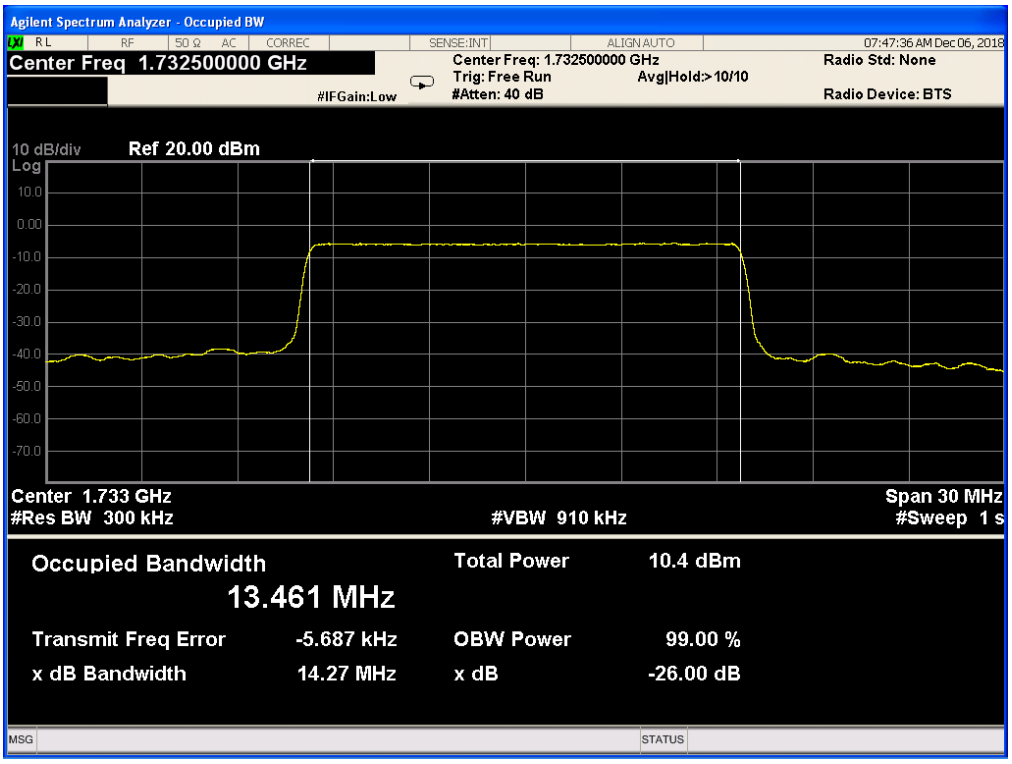
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 10.0,NO. RB 50,RB POS. Low,QPSK



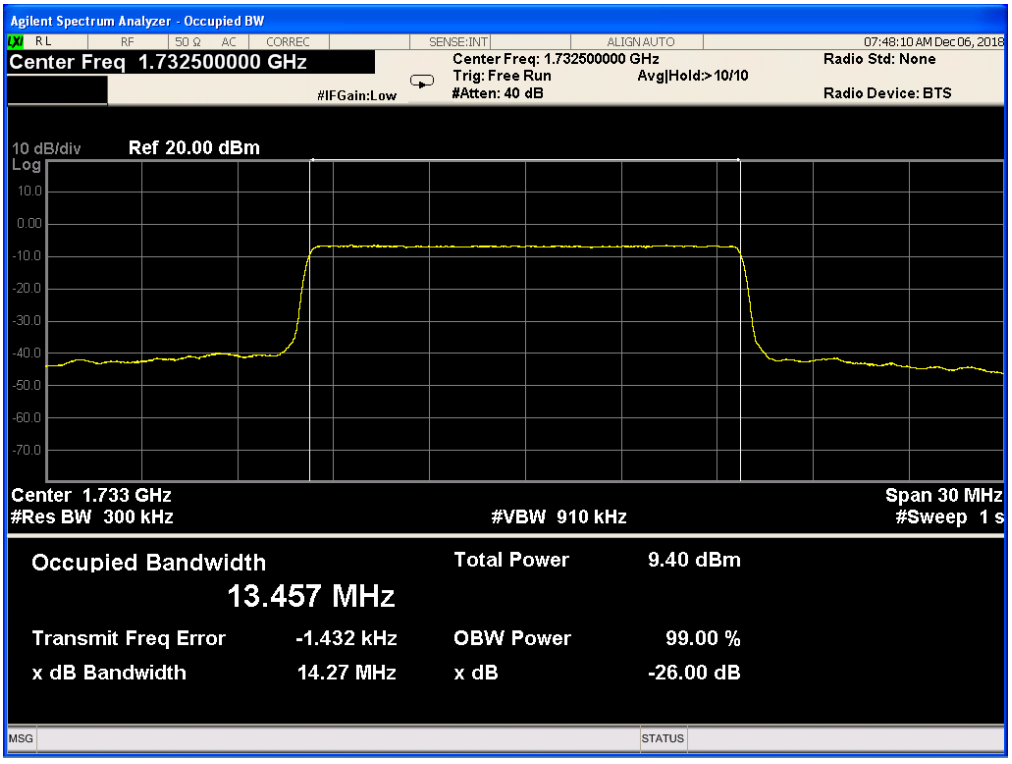
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



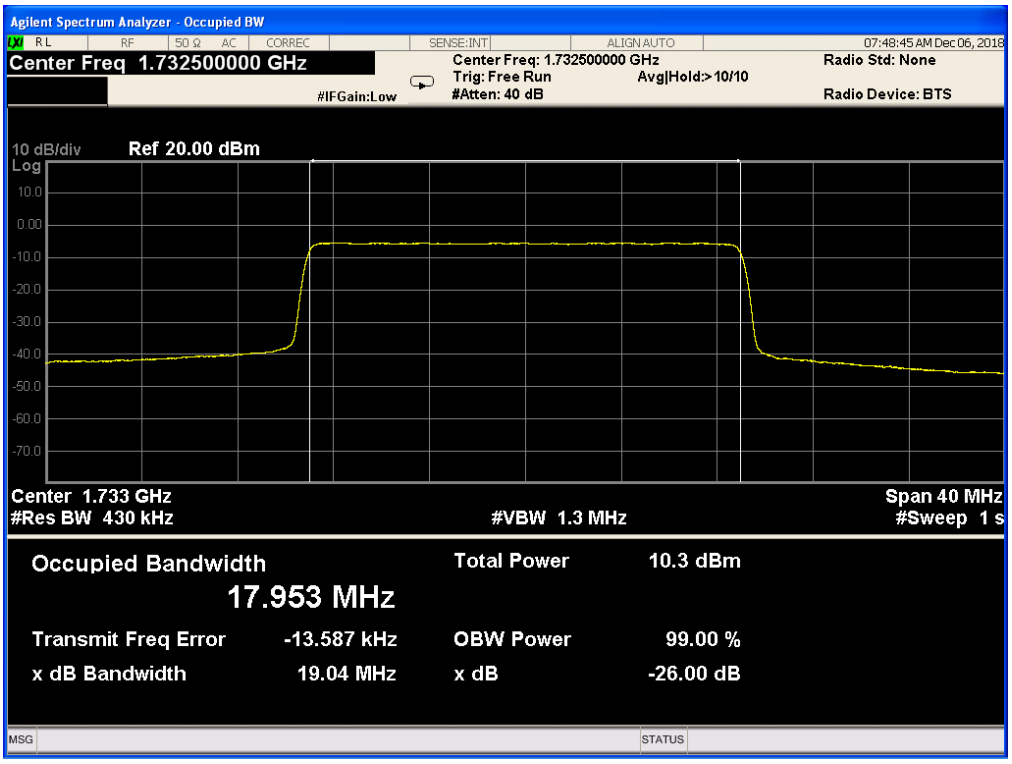
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



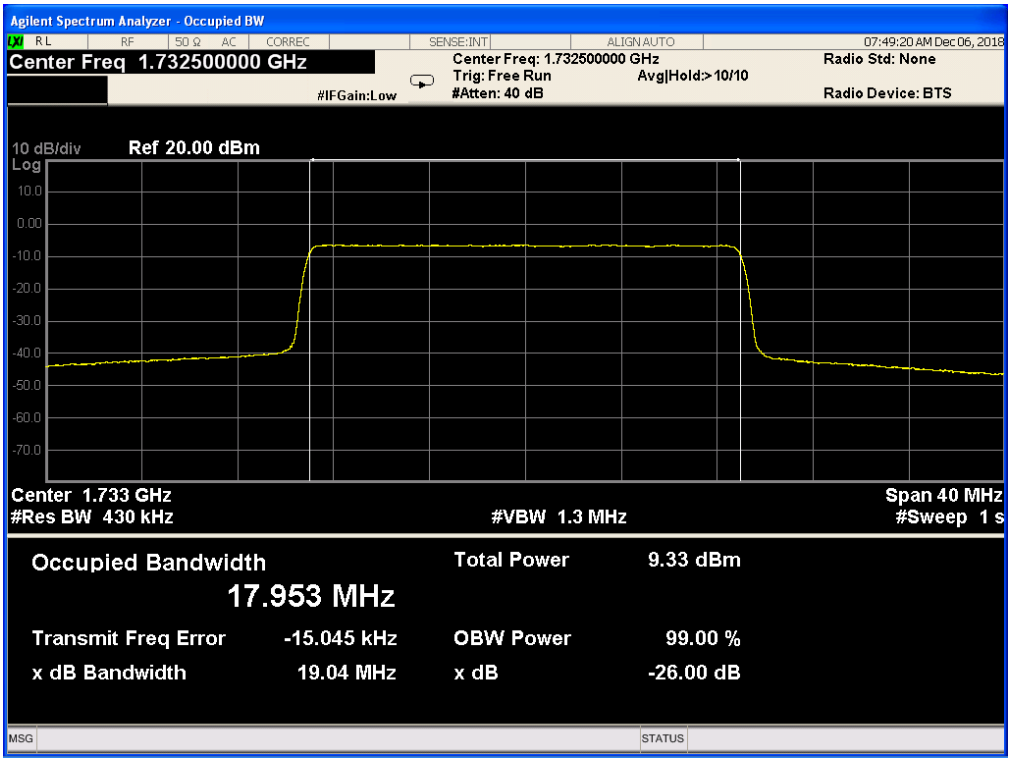
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 15.0,NO. RB 75,RB POS. Low,16-QAM



Band 4,UL Channel 20175,UL Frequency 1732.5,BW 20.0,NO. RB 100,RB POS. Low,QPSK

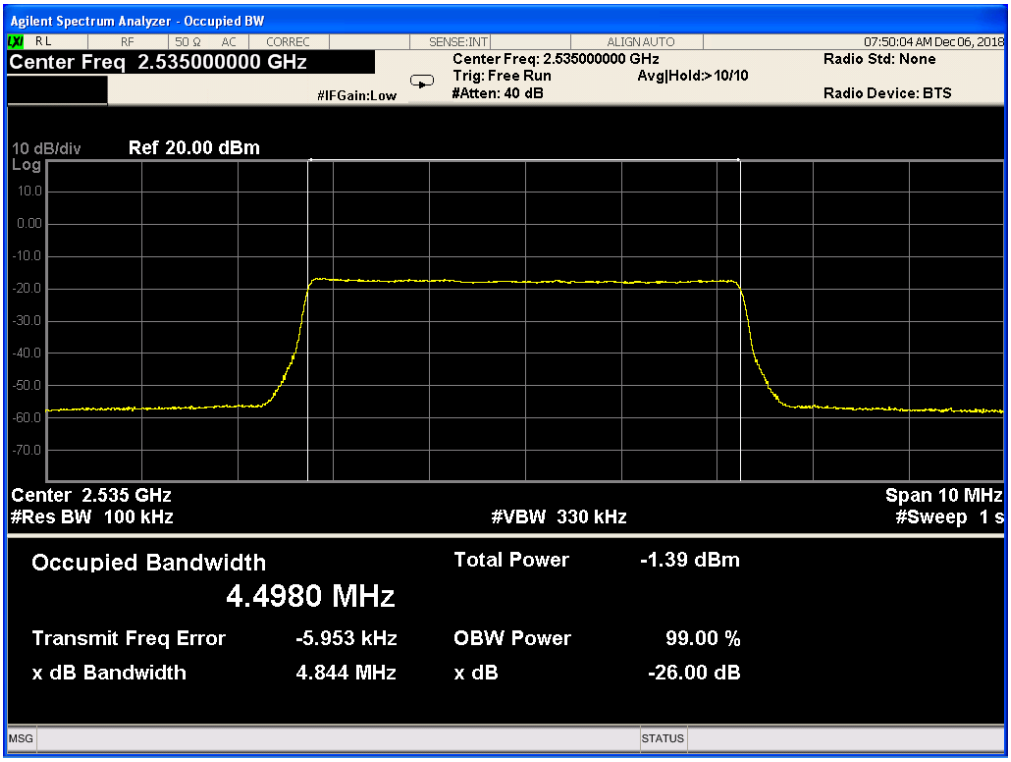


Band 4,UL Channel 20175,UL Frequency 1732.5,BW 20.0,NO. RB 100,RB POS. Low,16-QAM

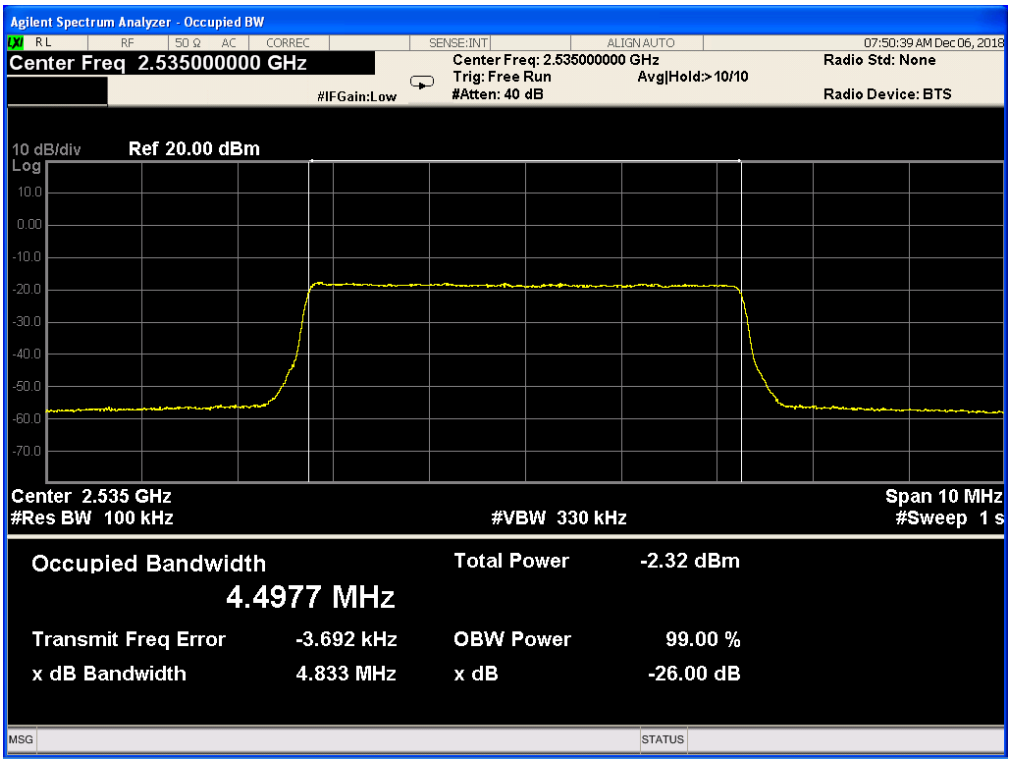


5.2 LTE BAND 7

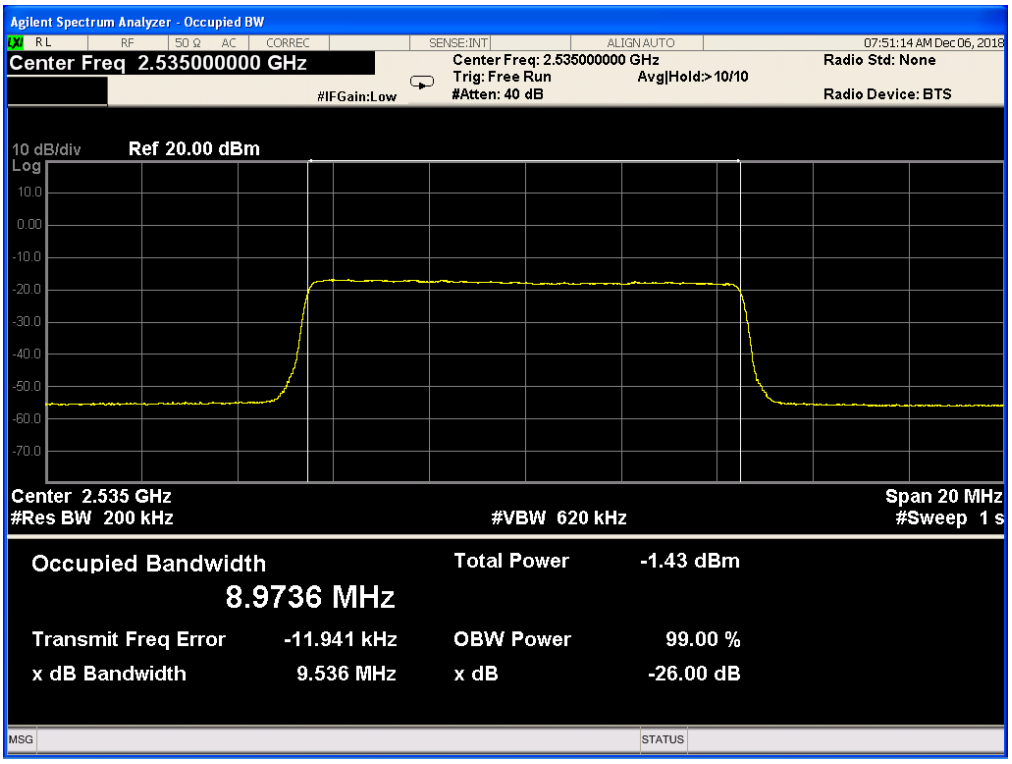
Band 7,UL Channel 21100,UL Frequency 2535.0,BW 5.0,NO. RB 25,RB POS. Low,QPSK



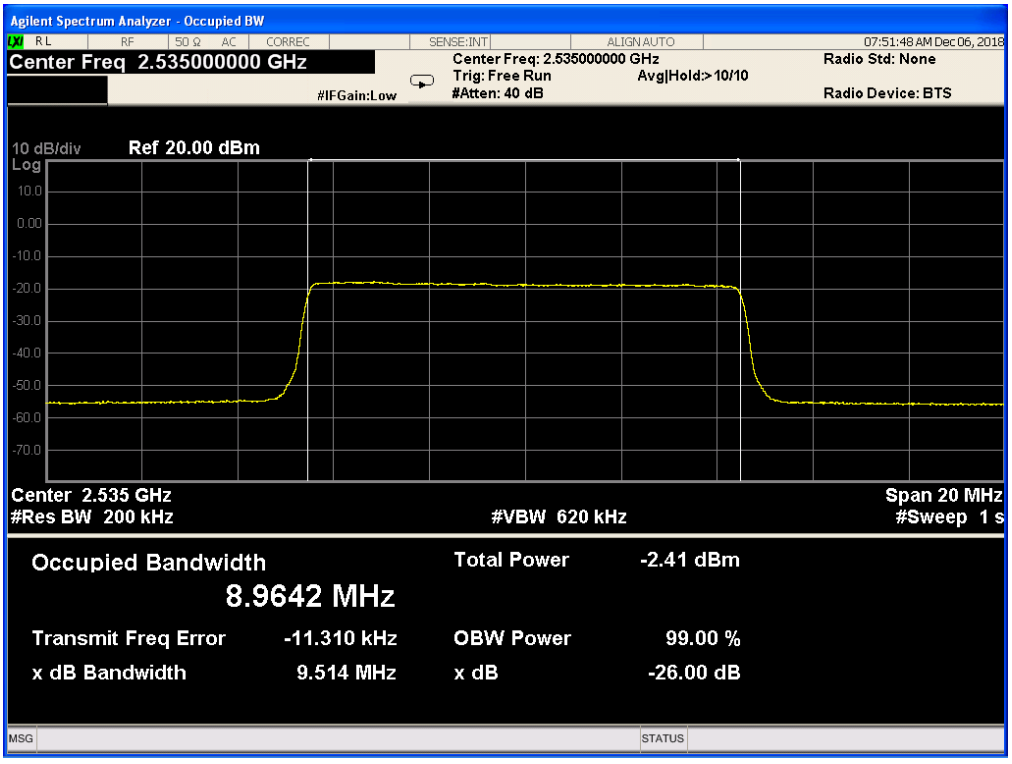
Band 7,UL Channel 21100,UL Frequency 2535.0,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



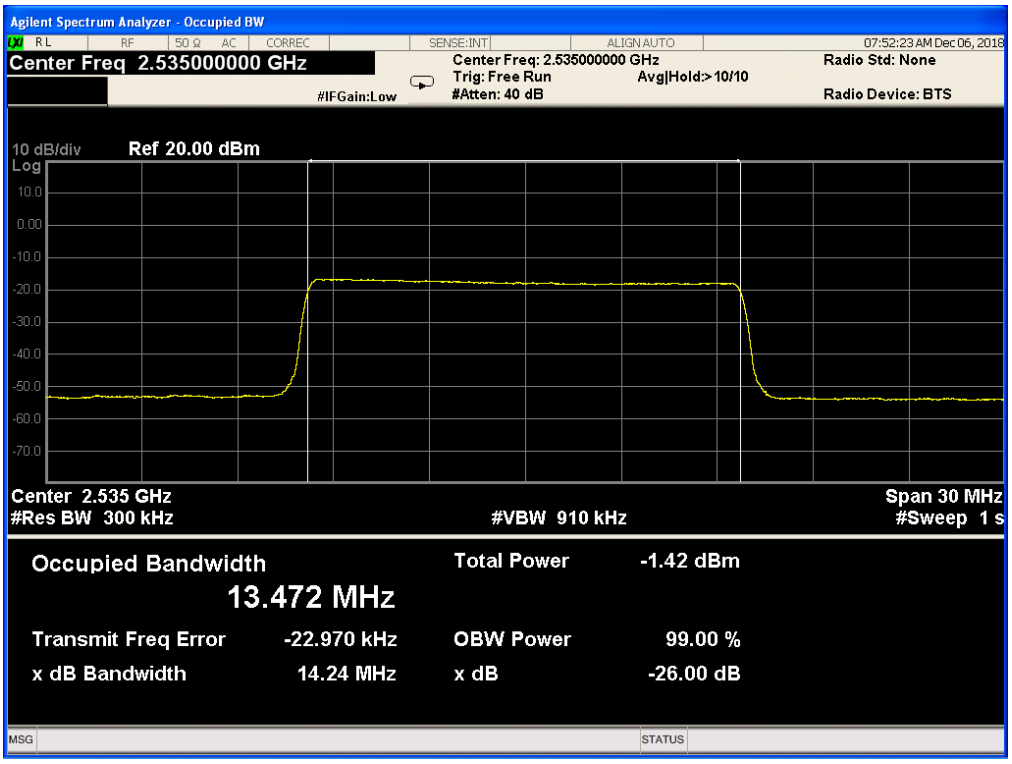
Band 7,UL Channel 21100,UL Frequency 2535.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



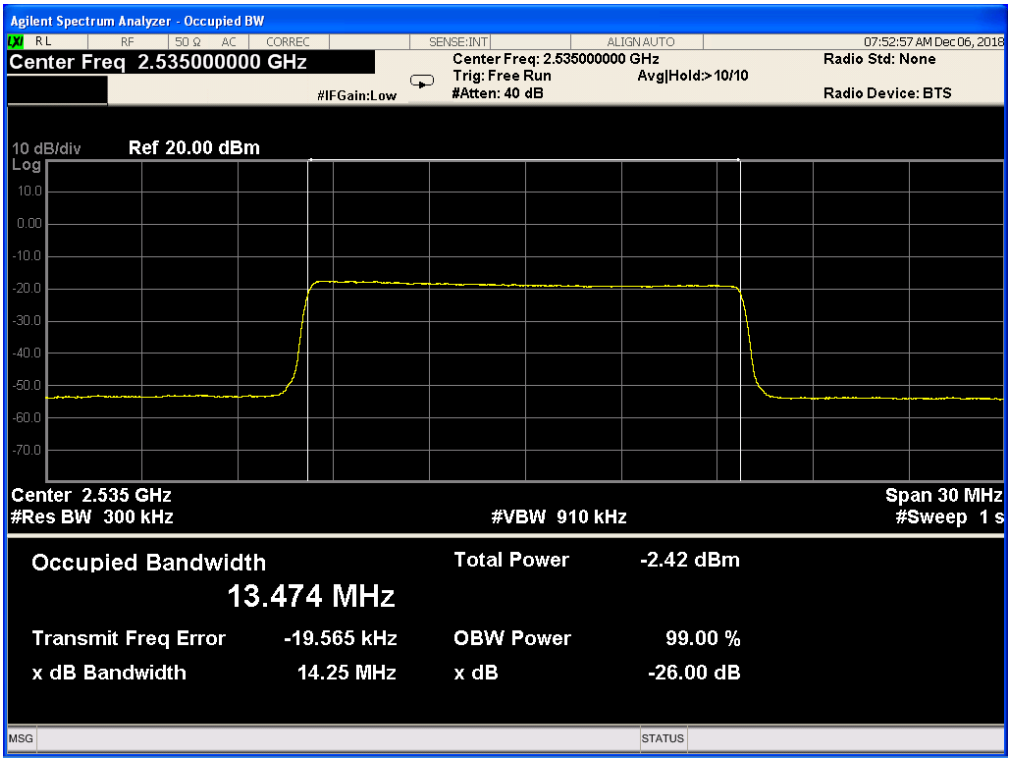
Band 7,UL Channel 21100,UL Frequency 2535.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



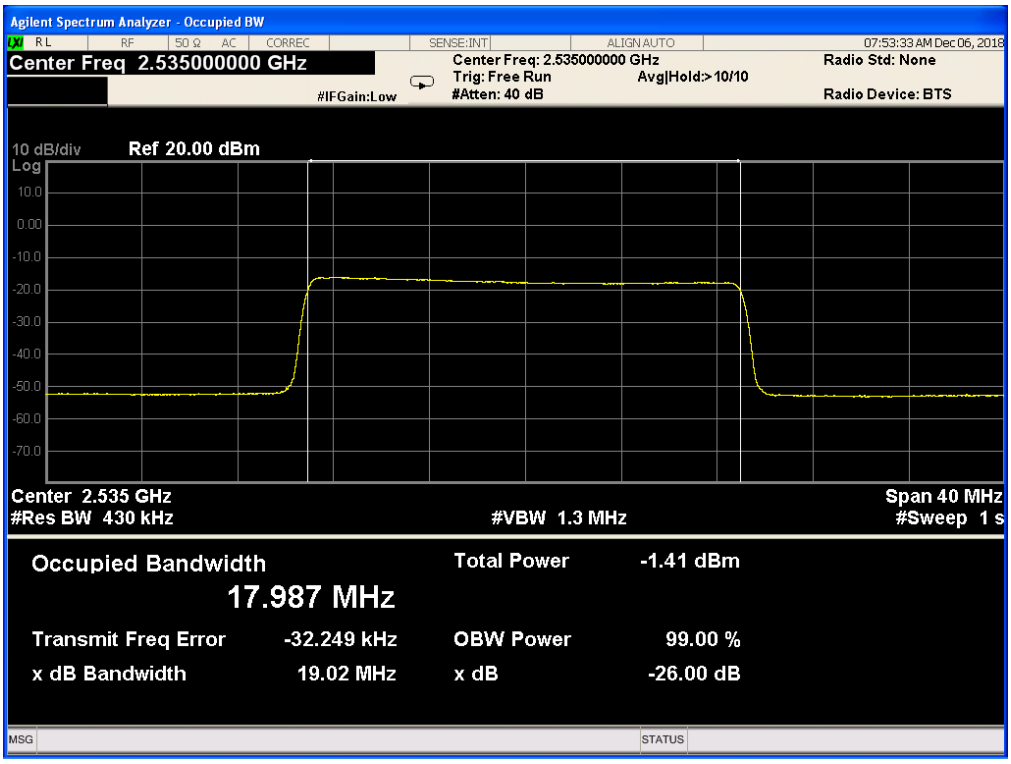
Band 7,UL Channel 21100,UL Frequency 2535.0,BW 15.0,NO. RB 75,RB POS. Low,QPSK



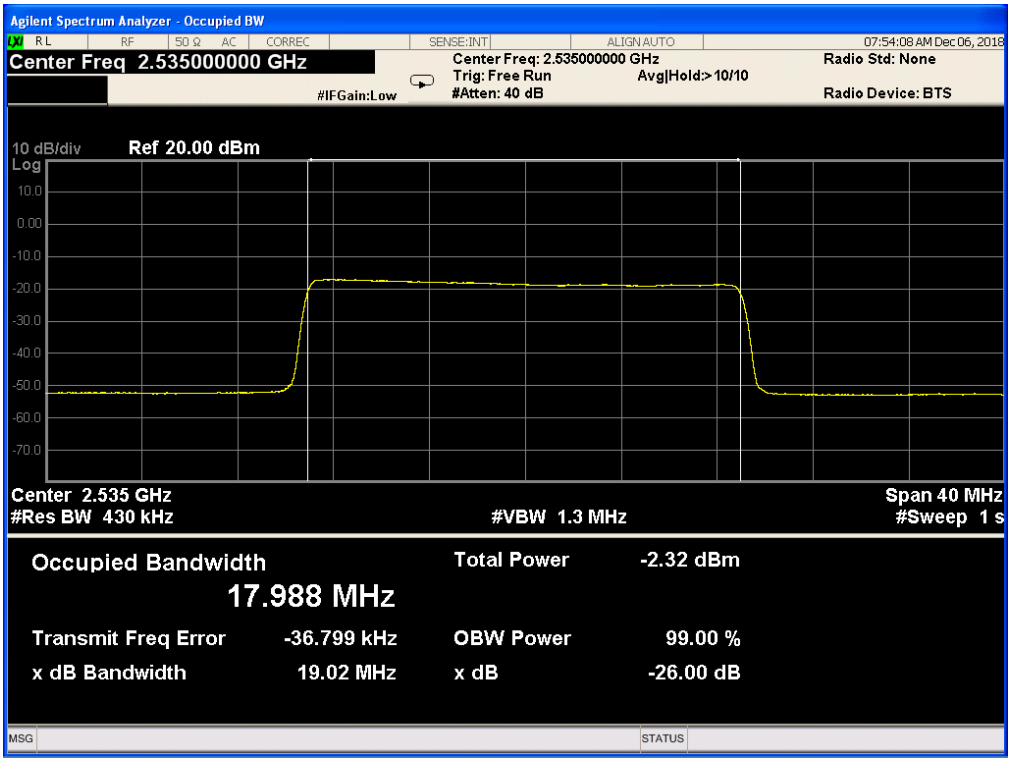
Band 7,UL Channel 21100,UL Frequency 2535.0,BW 15.0,NO. RB 75,RB POS. Low,16-QAM



Band 7,UL Channel 21100,UL Frequency 2535.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



Band 7,UL Channel 21100,UL Frequency 2535.0,BW 20.0,NO. RB 100,RB POS. Low,16-QAM



6. BANDEDGE AND EMISSION MASK

RULE PART(S)

FCC: §2.1051,§27.53

LIMITS

FCC:§27.53

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

(m)(4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.Show citation box.

(m)(6) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

TEST PROCEDURE

The transmitter output was connected to a CMW500Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:
Set the spectrum analyzer span to include the block edge frequency (704, 716, 824, 849, 1710 and 1755, 1850 and 1910MHz)
Set a marker to point the corresponding band edge frequency in each test case.
Set display line at -13 dBm
Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

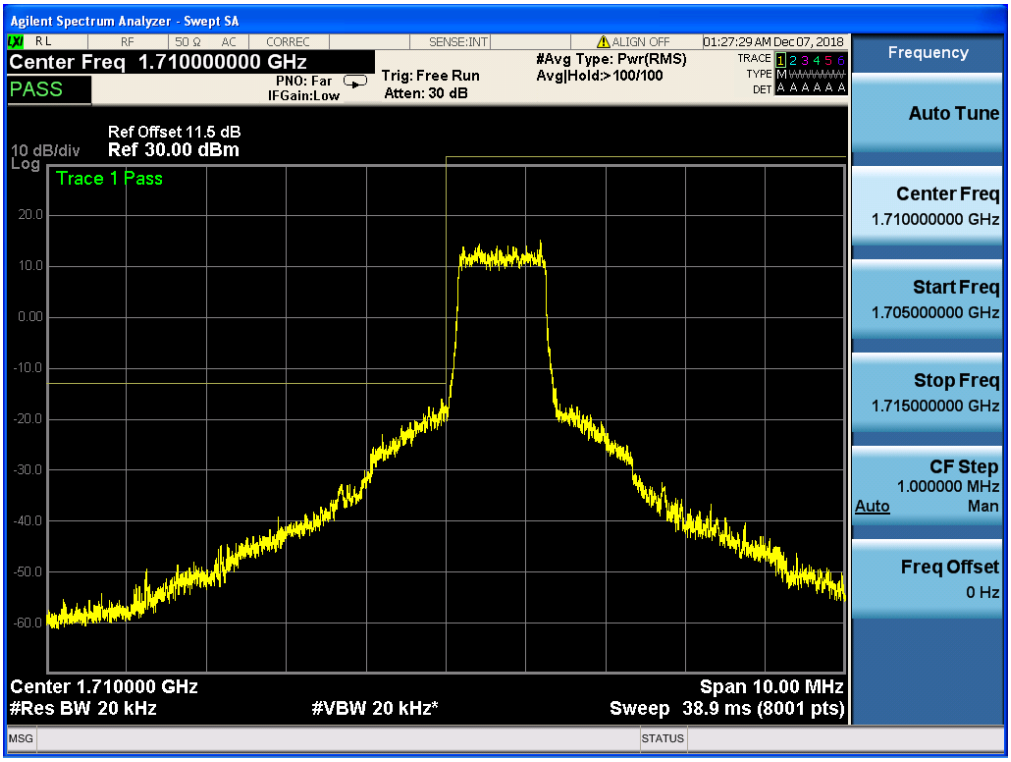
LTE Band 4
□ LTE Band 7

RESULTS

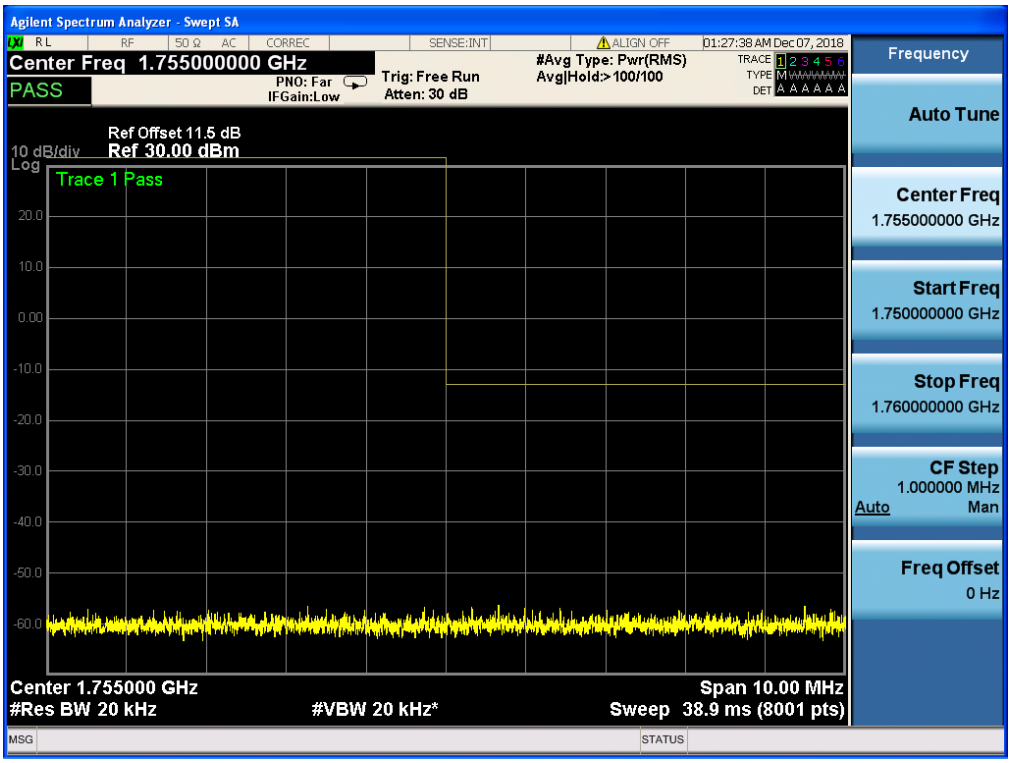
Pass

6.1 LTE BAND 4

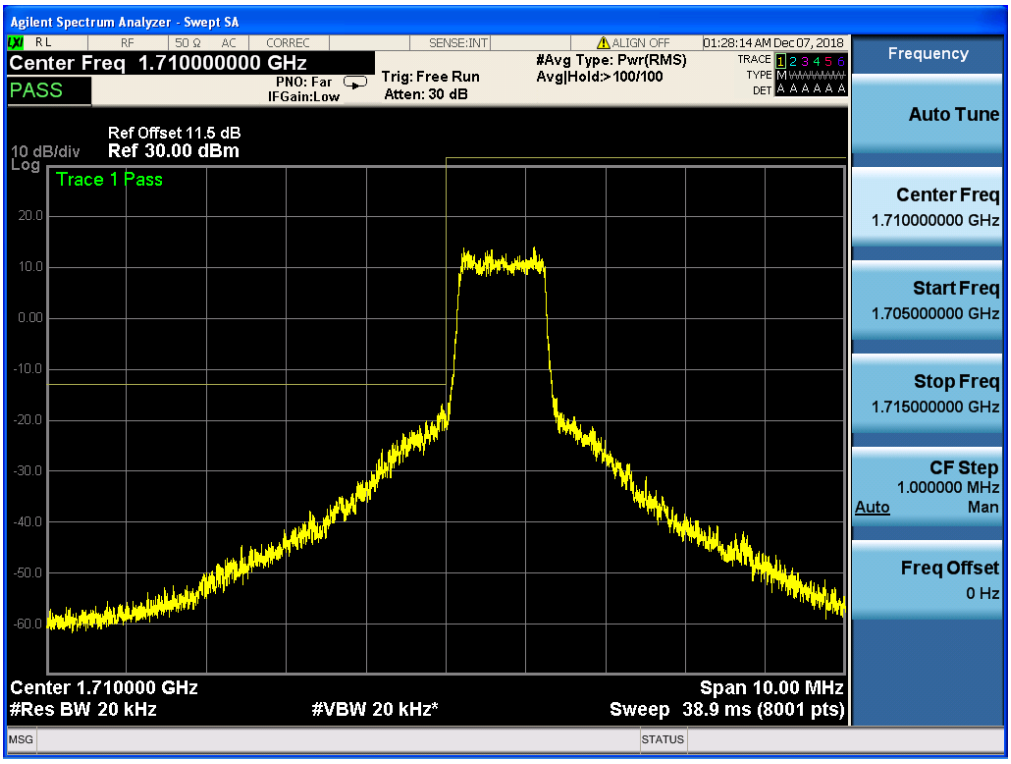
Band 4,UL Channel 19957,UL Frequency 1710.7,BW 1.4,NO. RB 6,RB POS. Low,QPSK



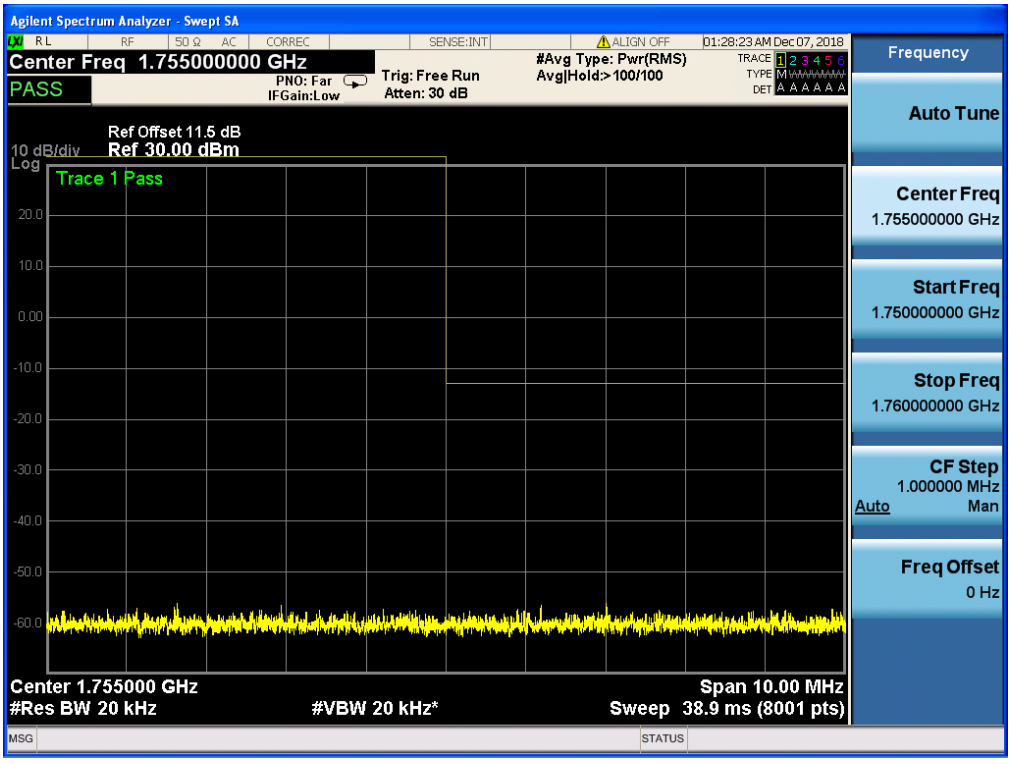
Band 4,UL Channel 19957,UL Frequency 1710.7,BW 1.4,NO. RB 6,RB POS. Low,QPSK



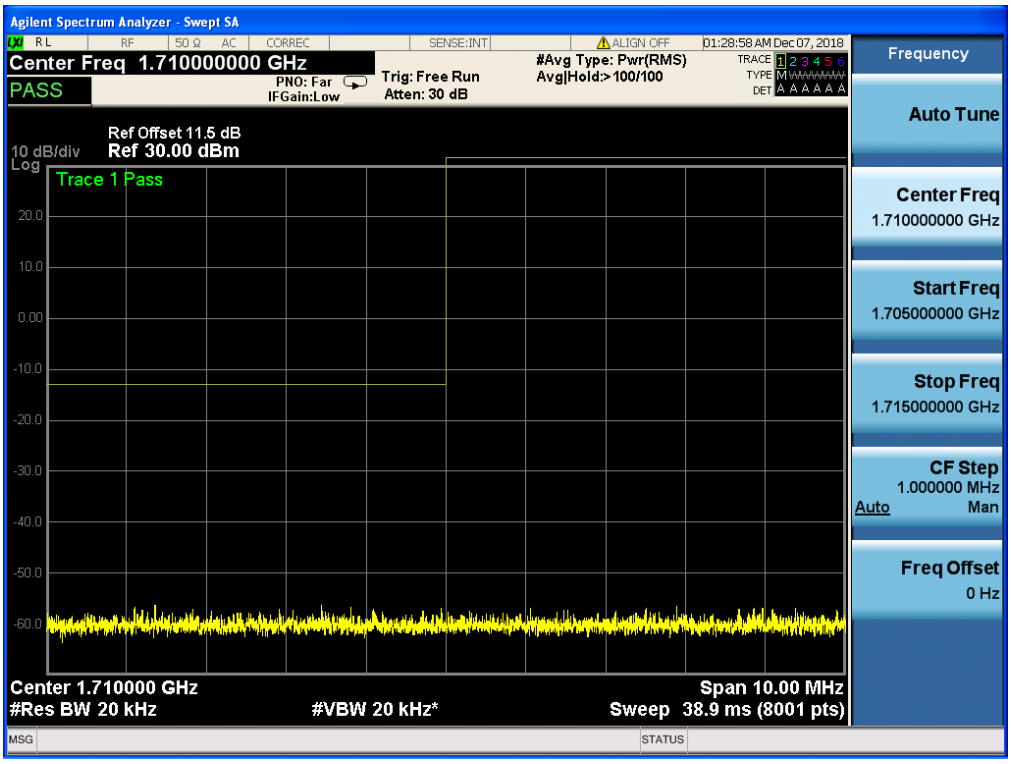
Band 4,UL Channel 19957,UL Frequency 1710.7,BW 1.4,NO. RB 6,RB POS. Low,16QAM



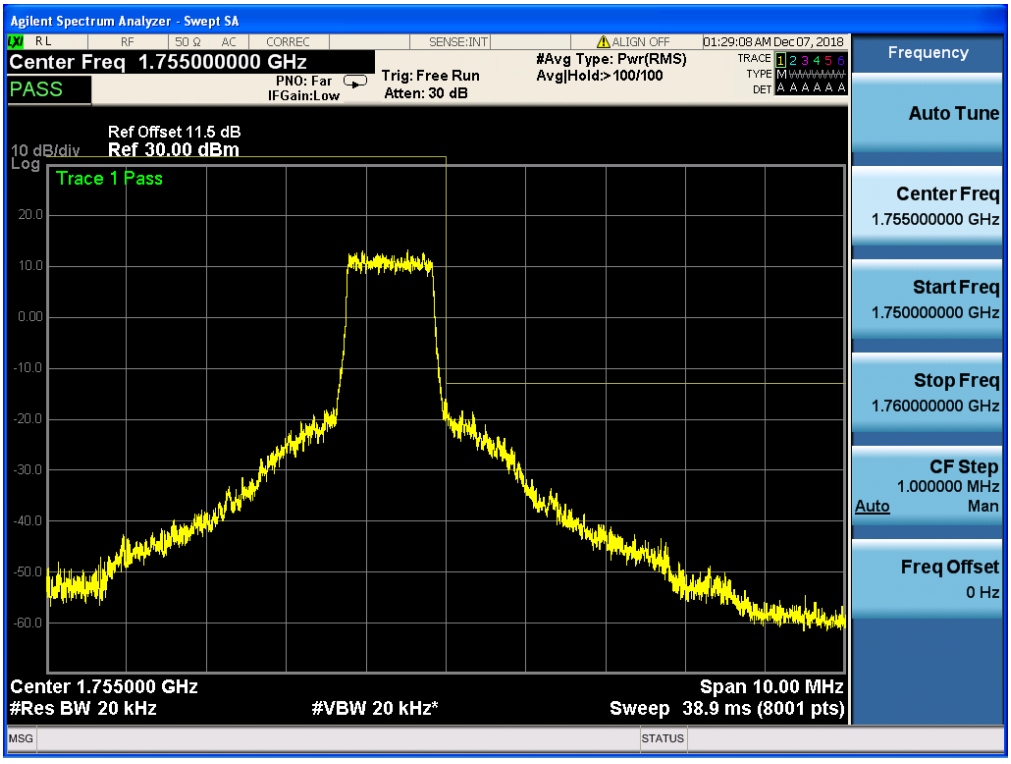
Band 4,UL Channel 19957,UL Frequency 1710.7,BW 1.4,NO. RB 6,RB POS. Low,16QAM



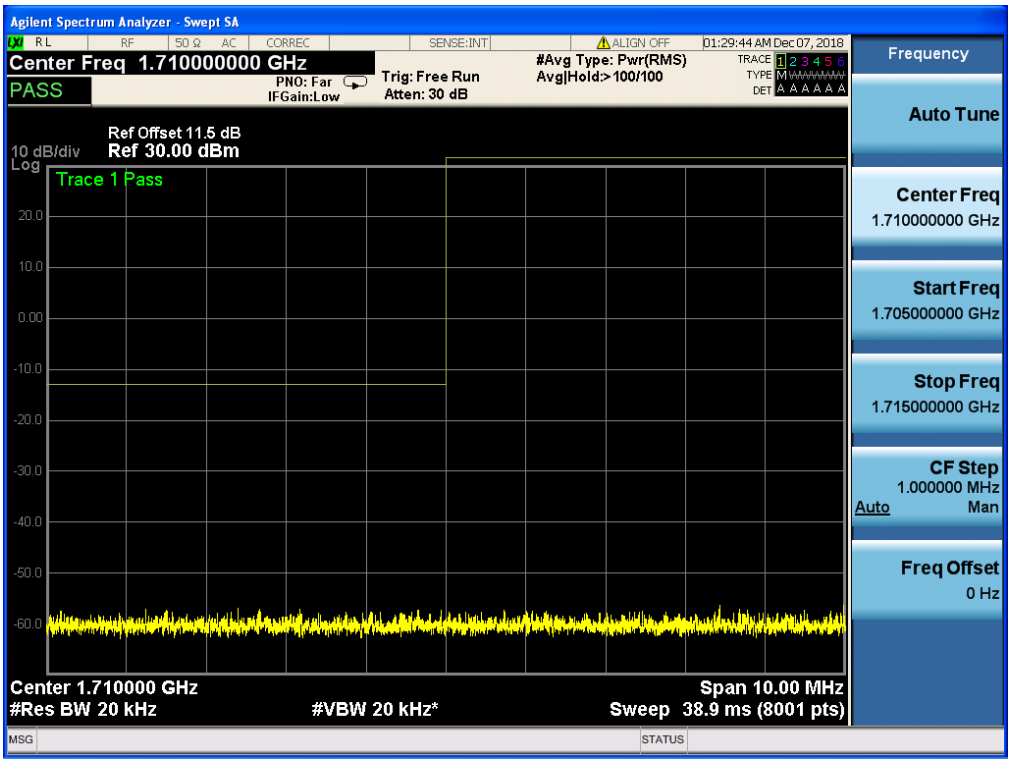
Band 4,UL Channel 20393,UL Frequency 1754.3,BW 1.4,NO. RB 6,RB POS. Low,QPSK



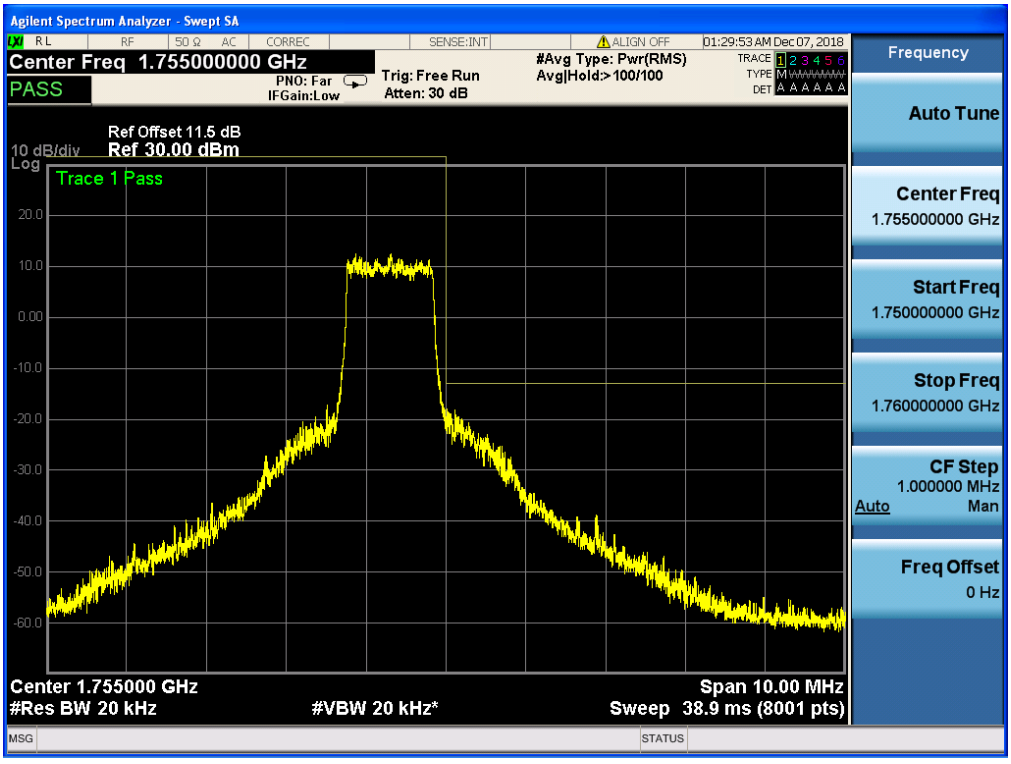
Band 4,UL Channel 20393,UL Frequency 1754.3,BW 1.4,NO. RB 6,RB POS. Low,QPSK



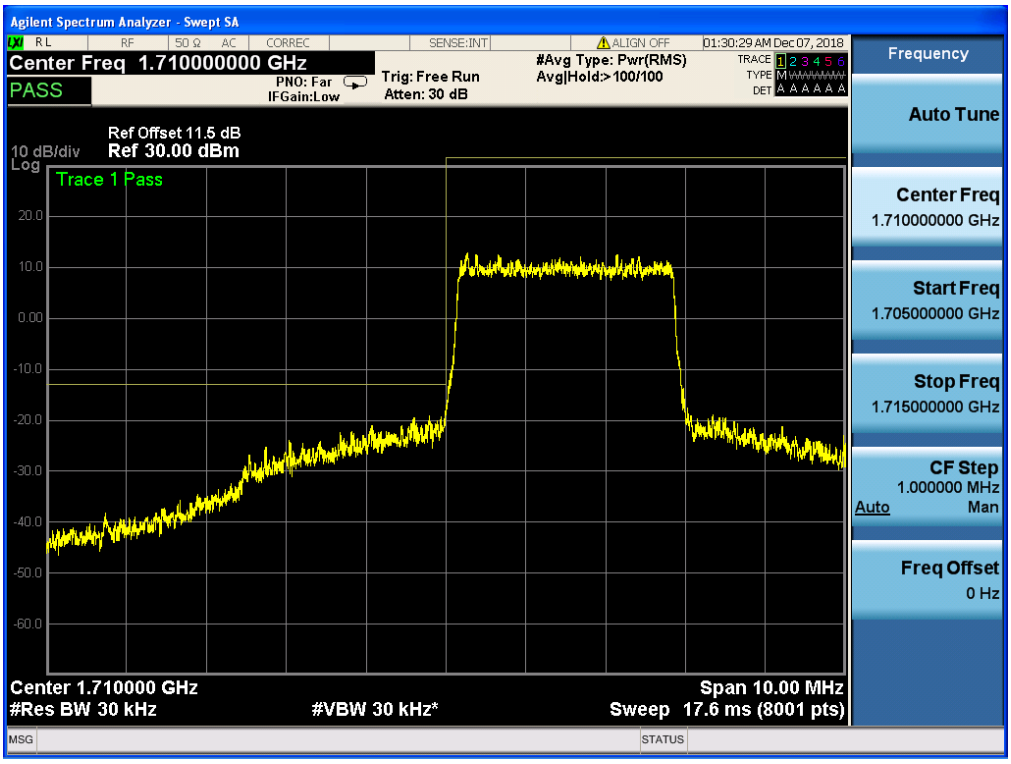
Band 4,UL Channel 20393,UL Frequency 1754.3,BW 1.4,NO. RB 6,RB POS. Low,16QAM



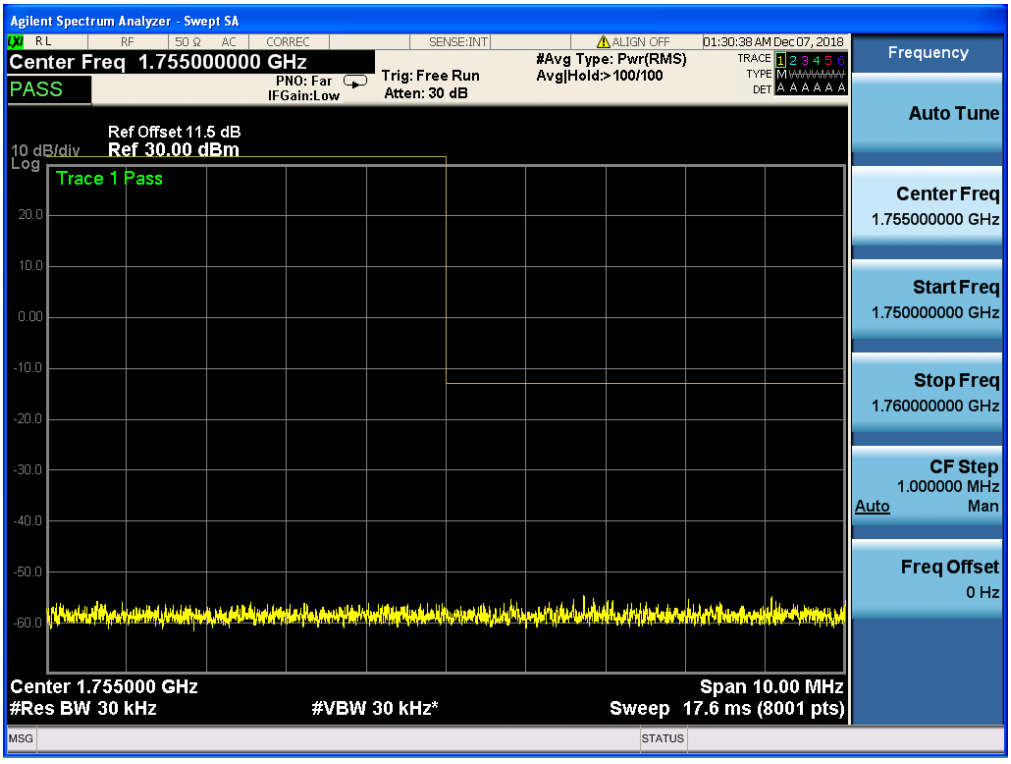
Band 4,UL Channel 20393,UL Frequency 1754.3,BW 1.4,NO. RB 6,RB POS. Low,16QAM



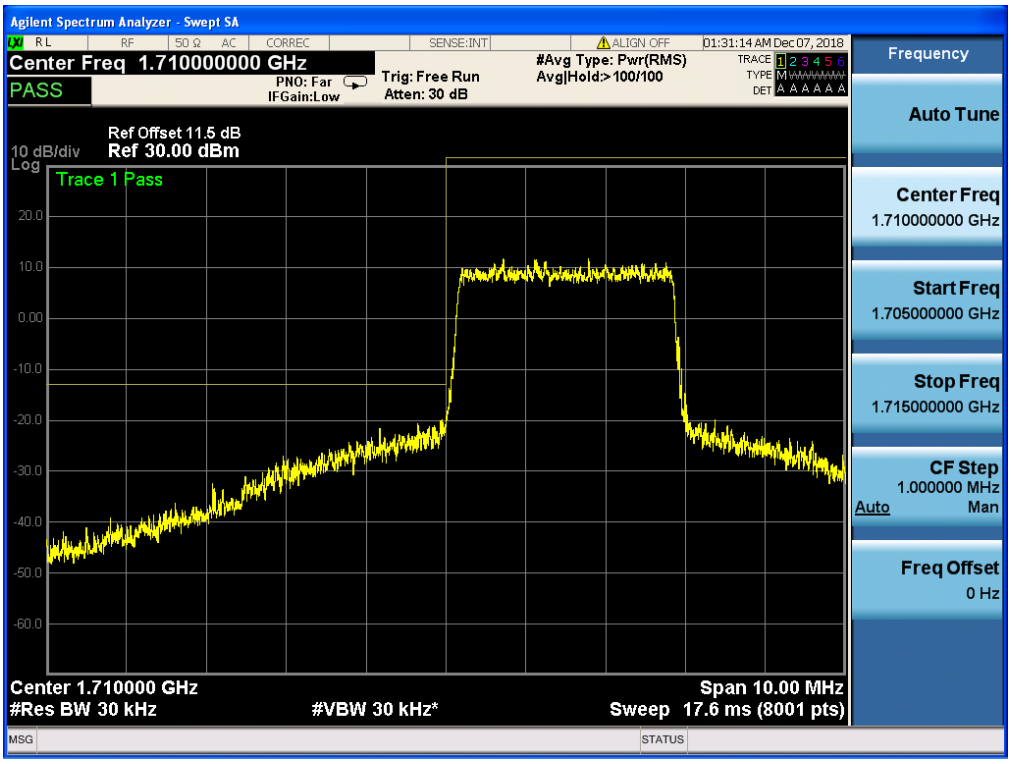
Band 4,UL Channel 19965,UL Frequency 1711.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



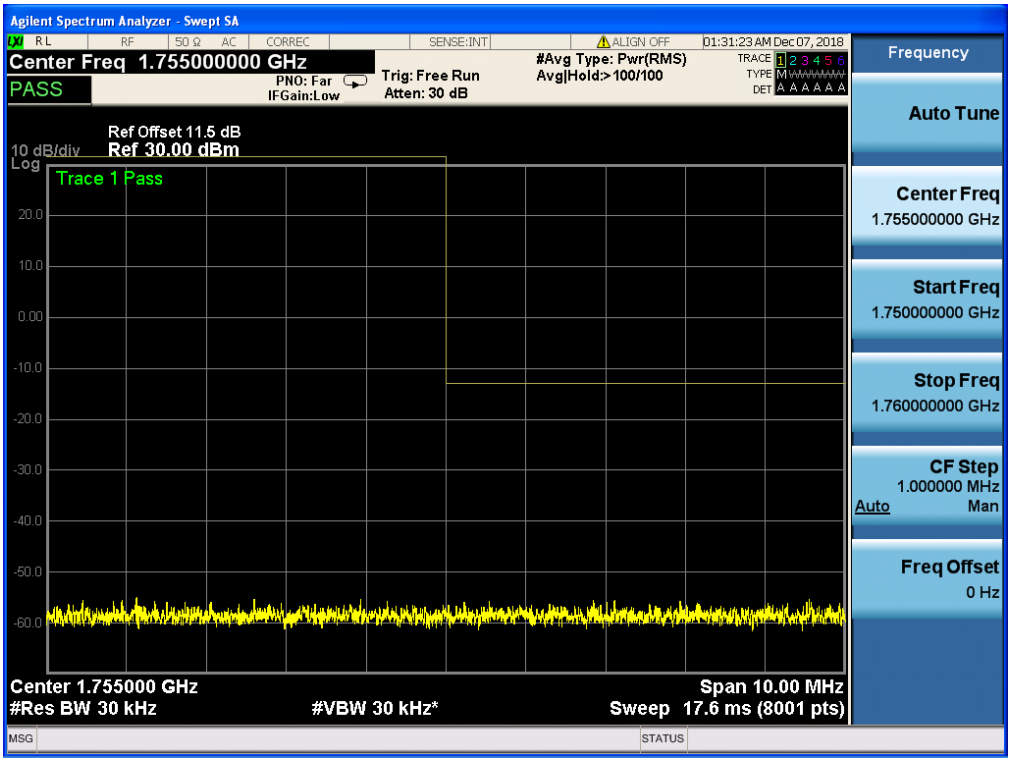
Band 4,UL Channel 19965,UL Frequency 1711.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



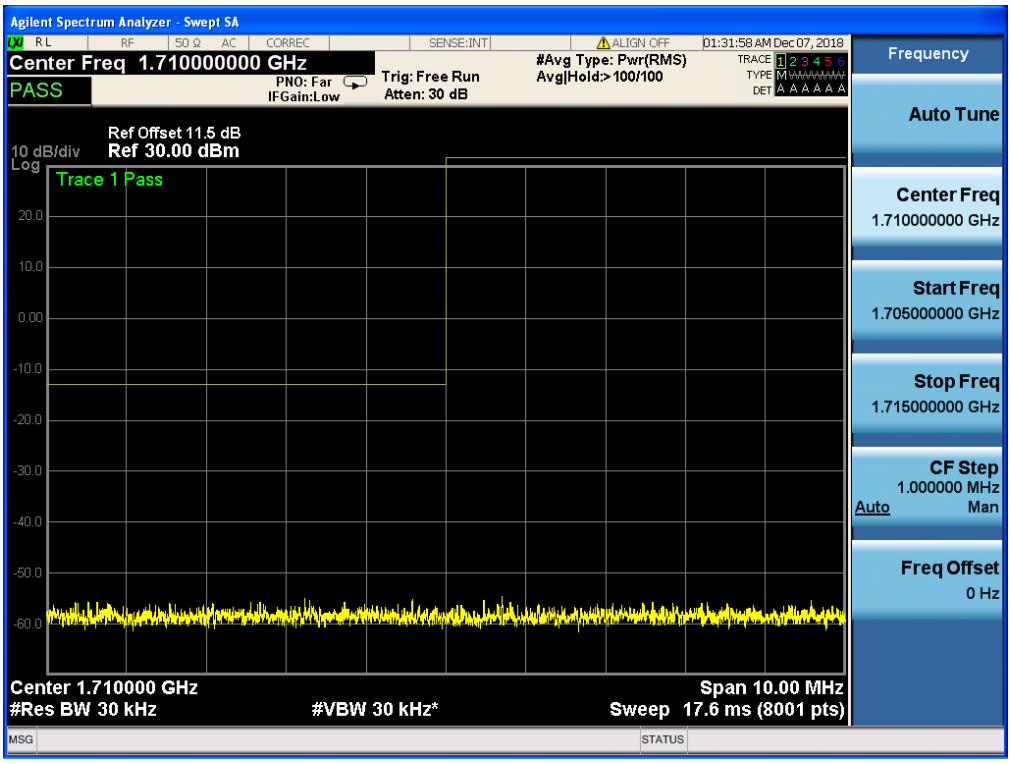
Band 4,UL Channel 19965,UL Frequency 1711.5,BW 3.0,NO. RB 15,RB POS. Low,16QAM



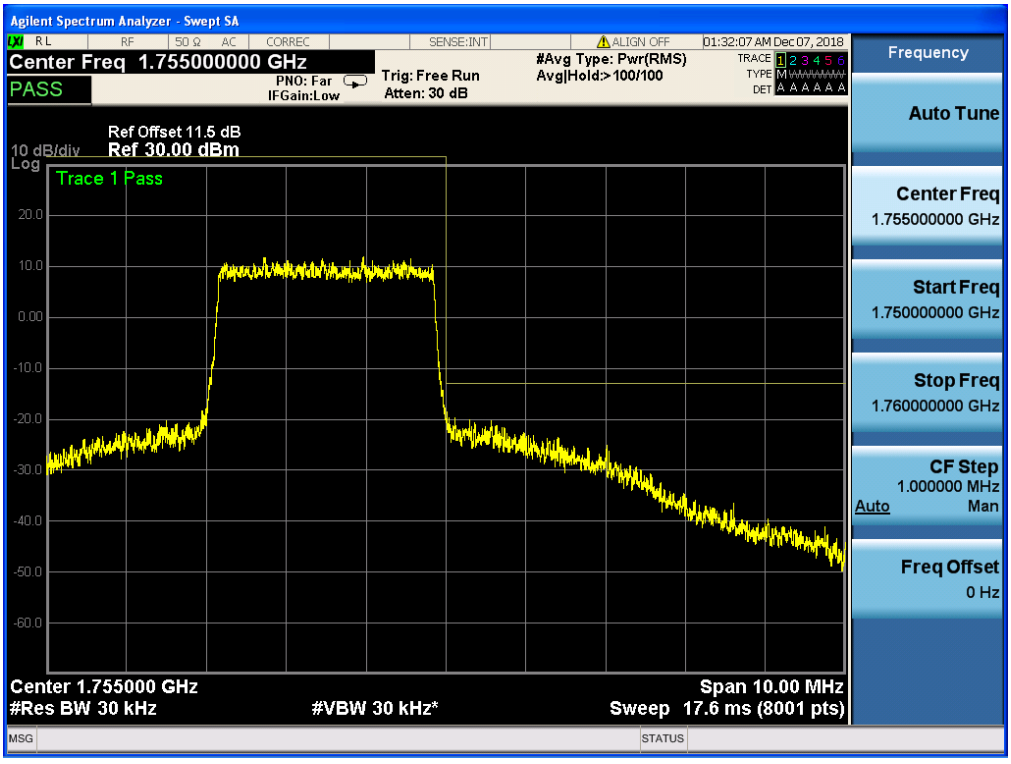
Band 4,UL Channel 19965,UL Frequency 1711.5,BW 3.0,NO. RB 15,RB POS. Low,16QAM



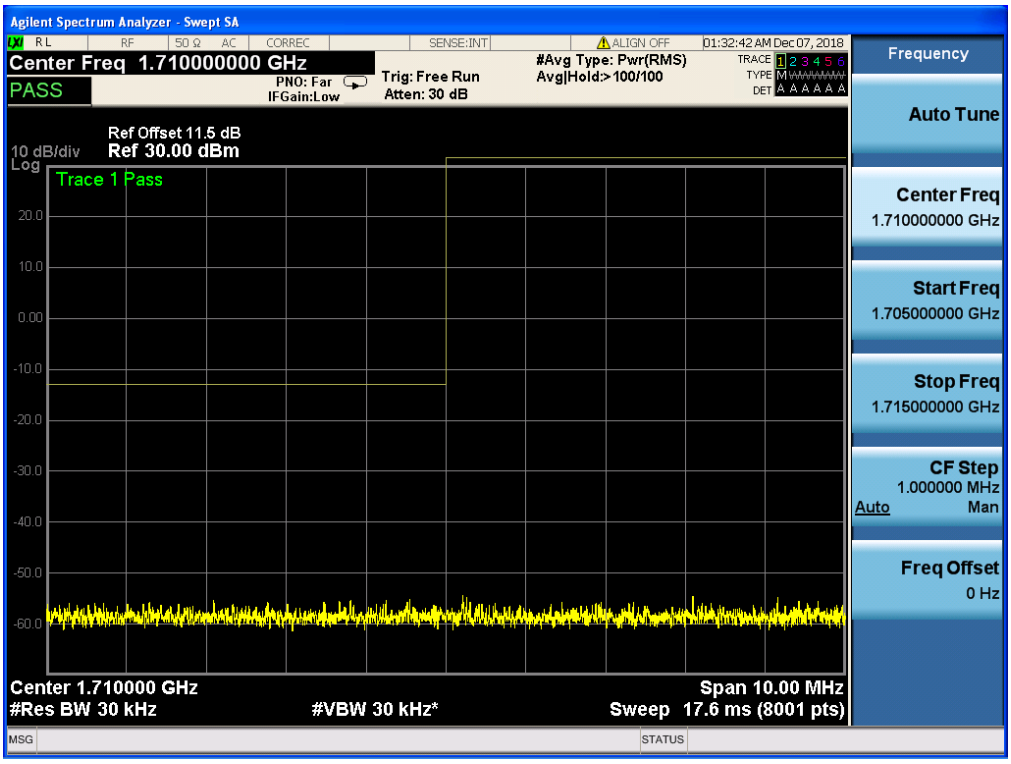
Band 4,UL Channel 20385,UL Frequency 1753.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



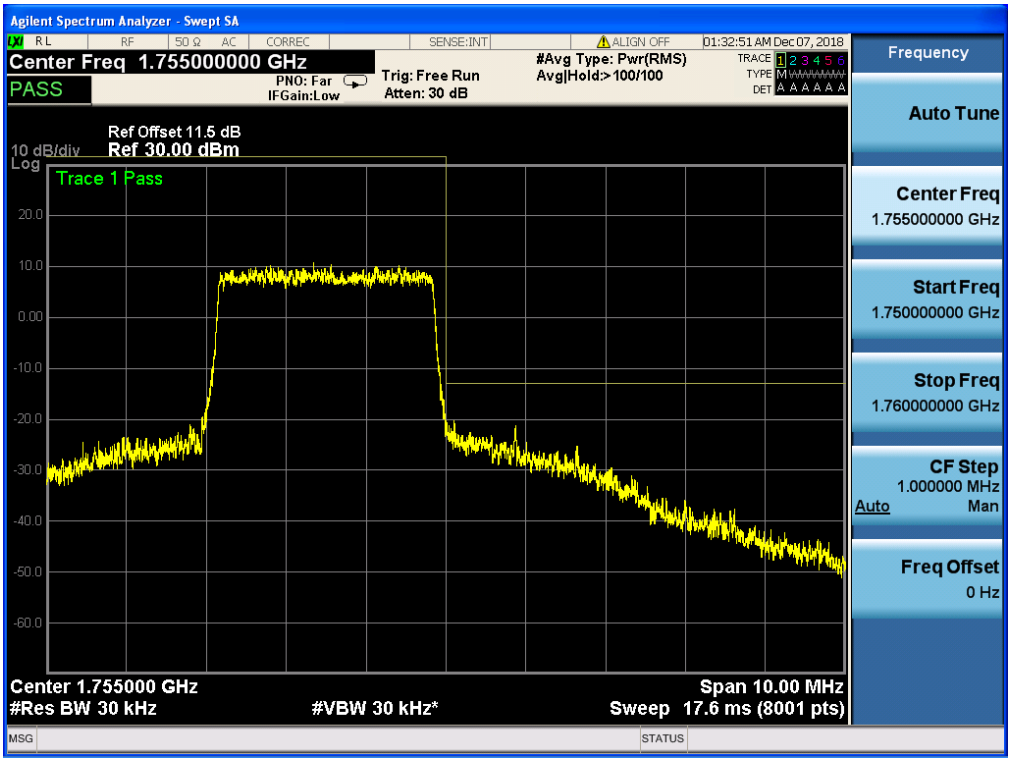
Band 4,UL Channel 20385,UL Frequency 1753.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



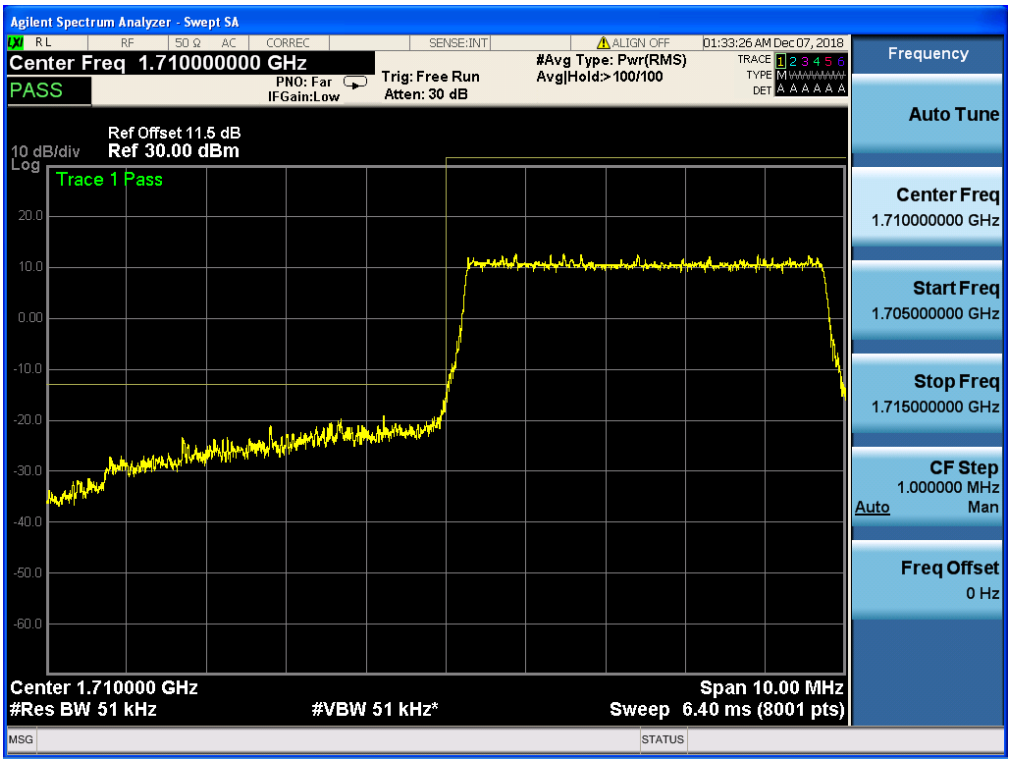
Band 4,UL Channel 20385,UL Frequency 1753.5,BW 3.0,NO. RB 15,RB POS. Low,16QAM



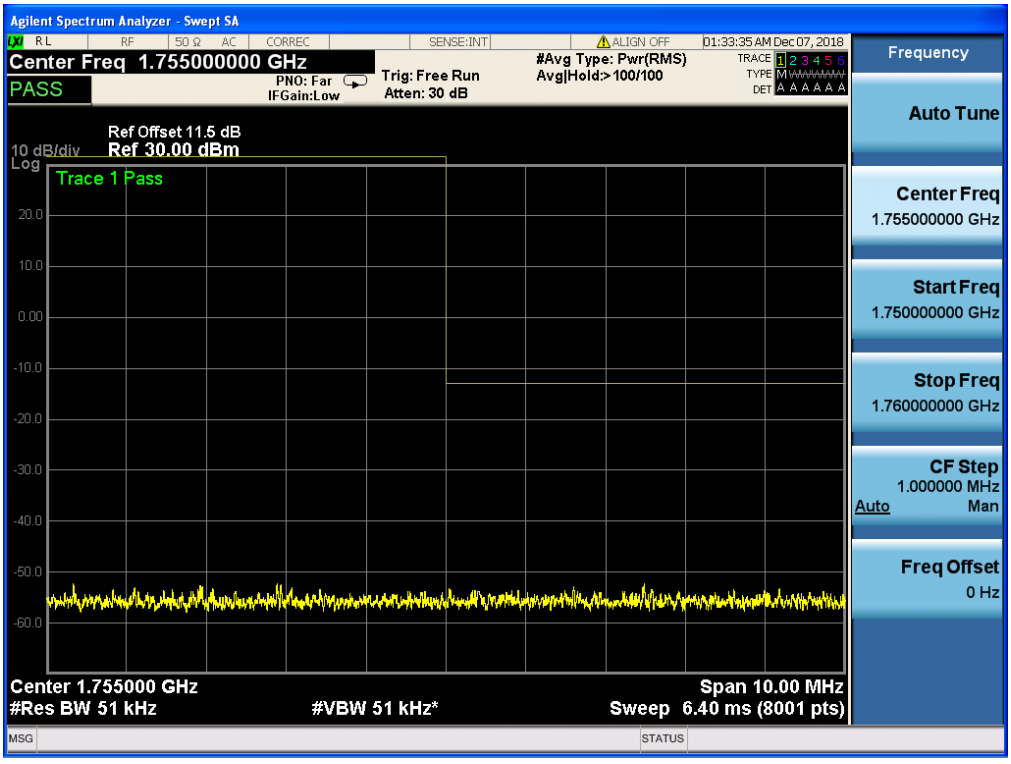
Band 4,UL Channel 20385,UL Frequency 1753.5,BW 3.0,NO. RB 15,RB POS. Low,16QAM



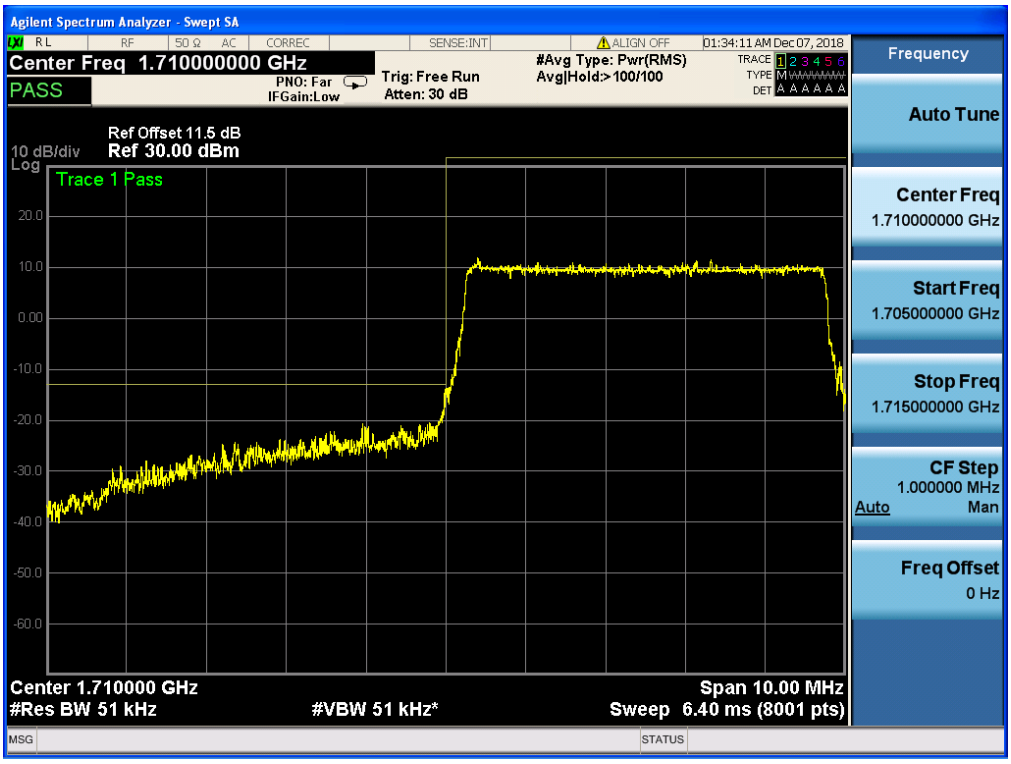
Band 4,UL Channel 19975,UL Frequency 1712.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



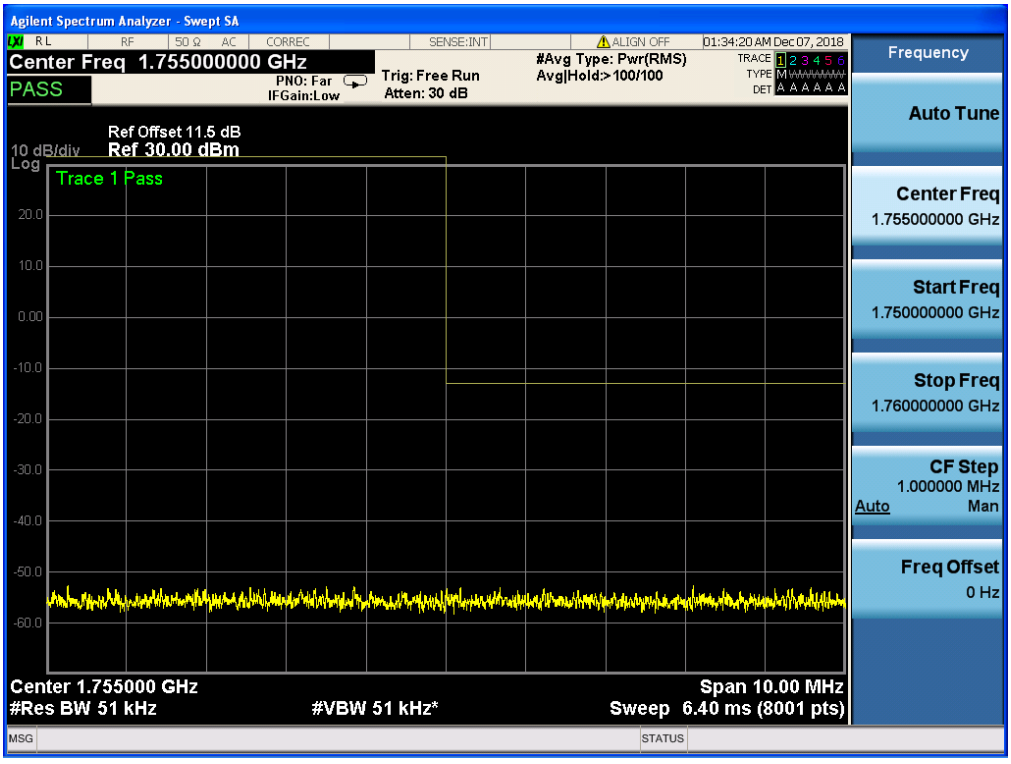
Band 4,UL Channel 19975,UL Frequency 1712.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



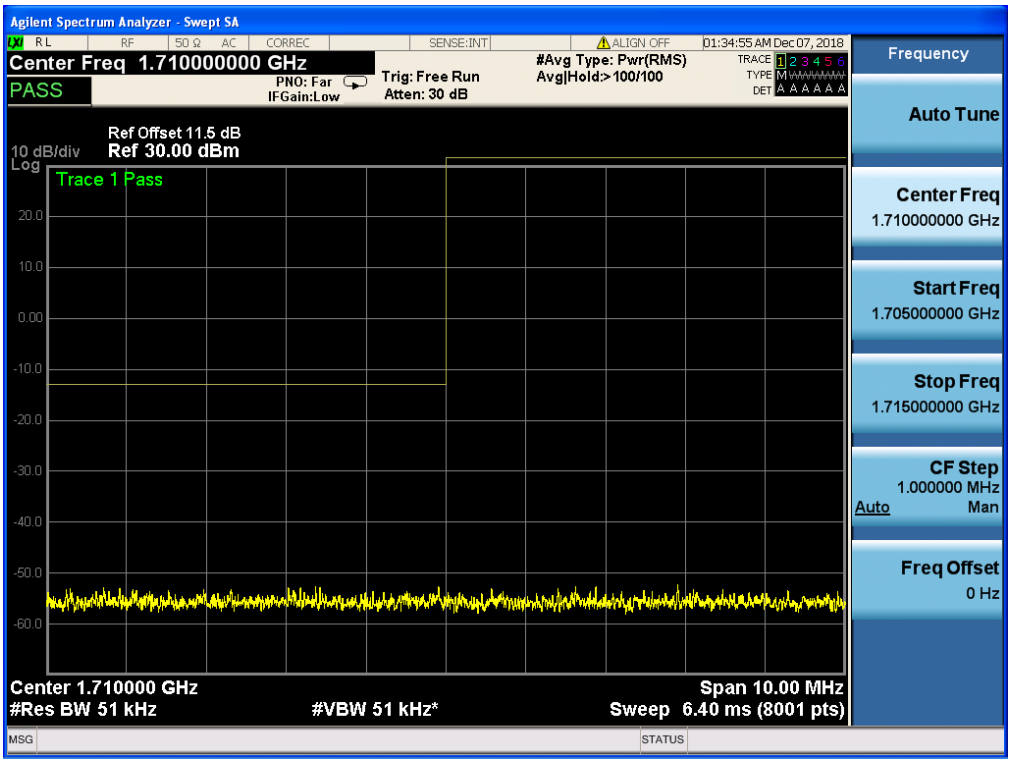
Band 4,UL Channel 19975,UL Frequency 1712.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



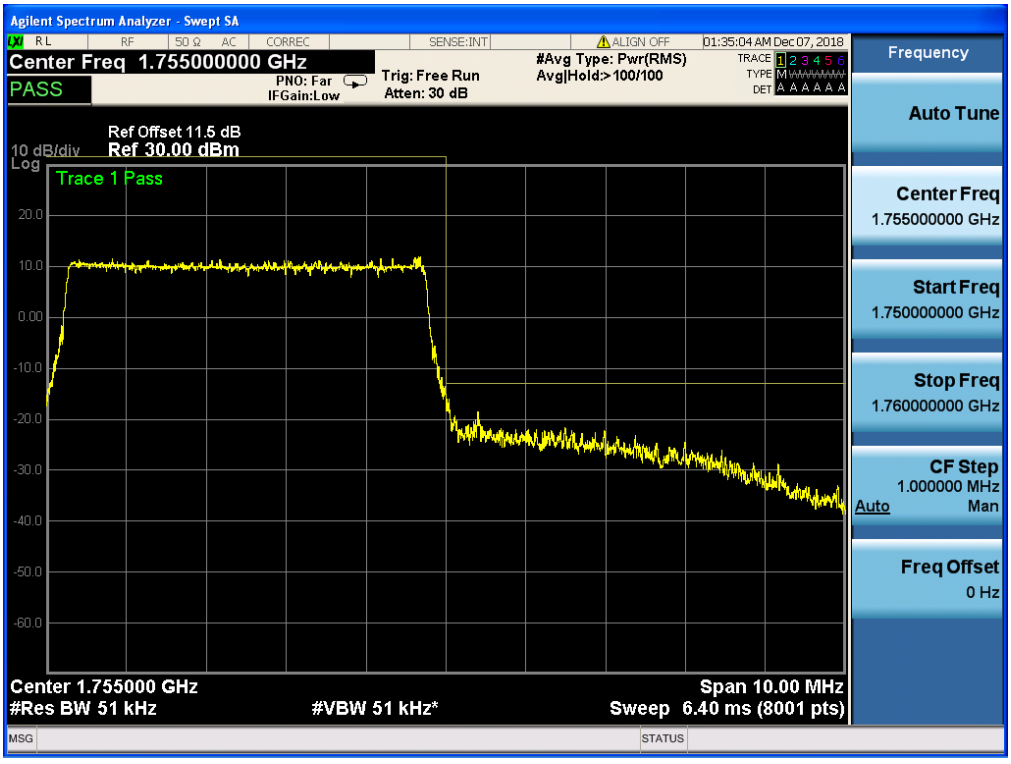
Band 4,UL Channel 19975,UL Frequency 1712.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



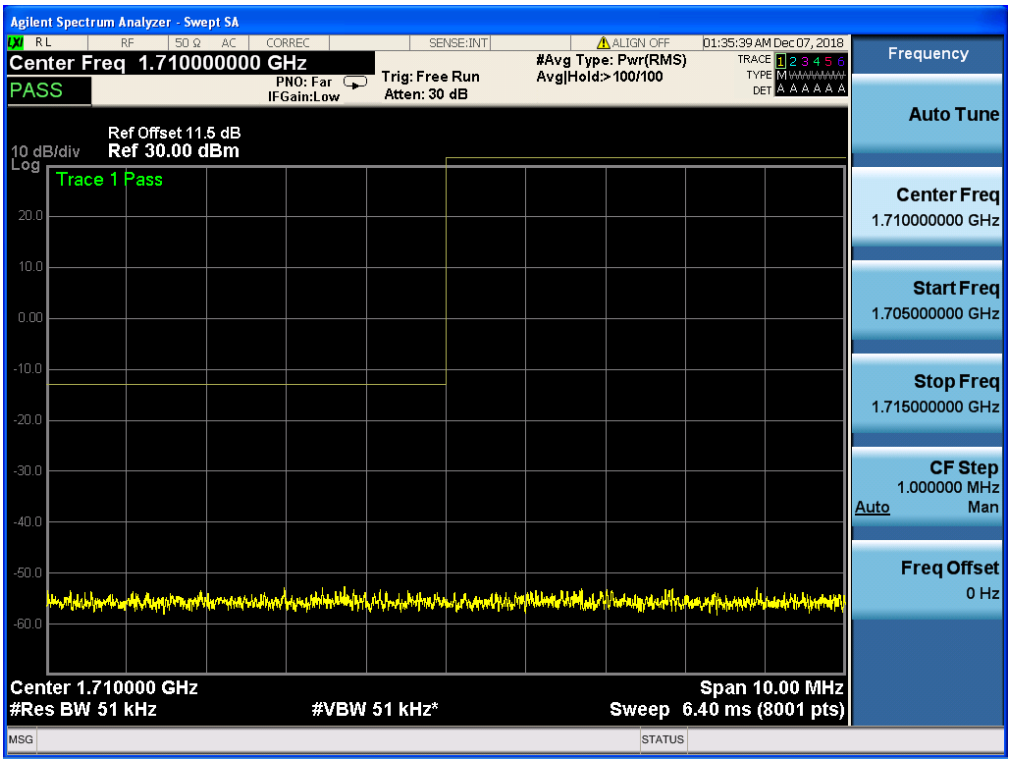
Band 4,UL Channel 20375,UL Frequency 1752.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



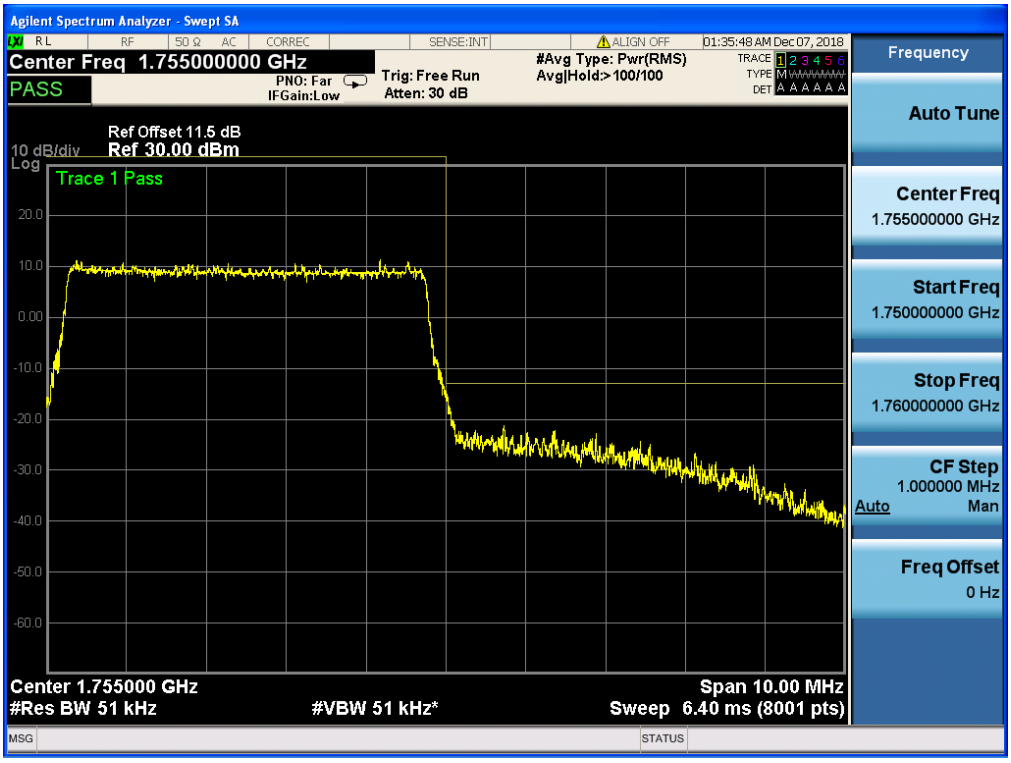
Band 4,UL Channel 20375,UL Frequency 1752.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



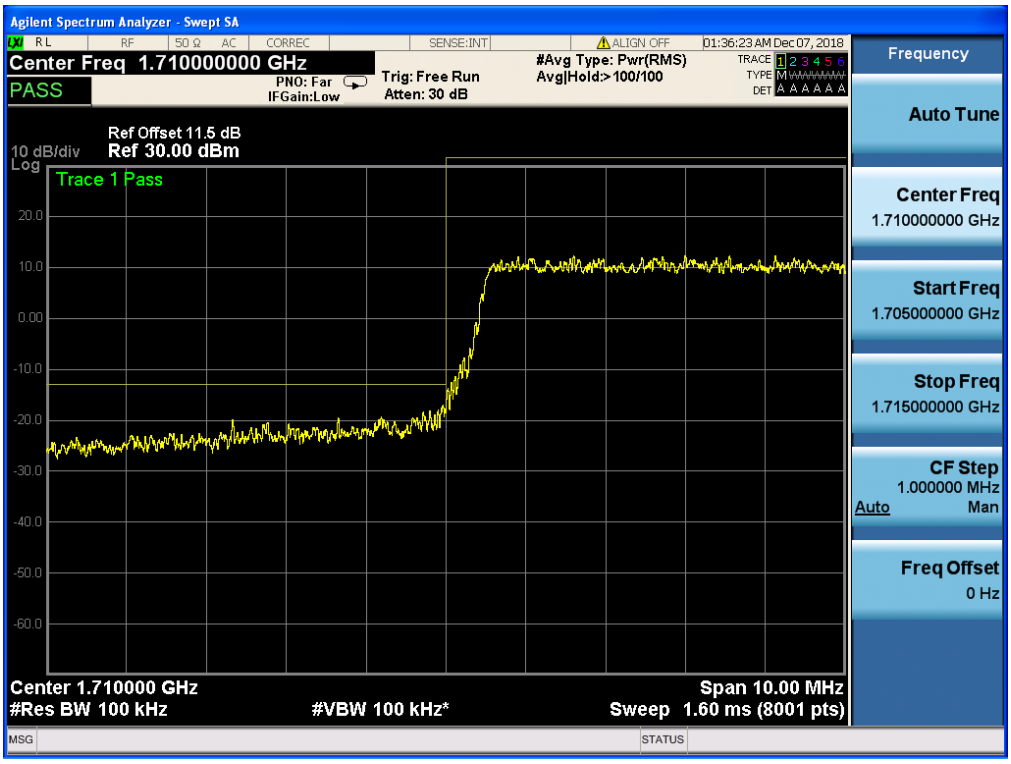
Band 4,UL Channel 20375,UL Frequency 1752.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



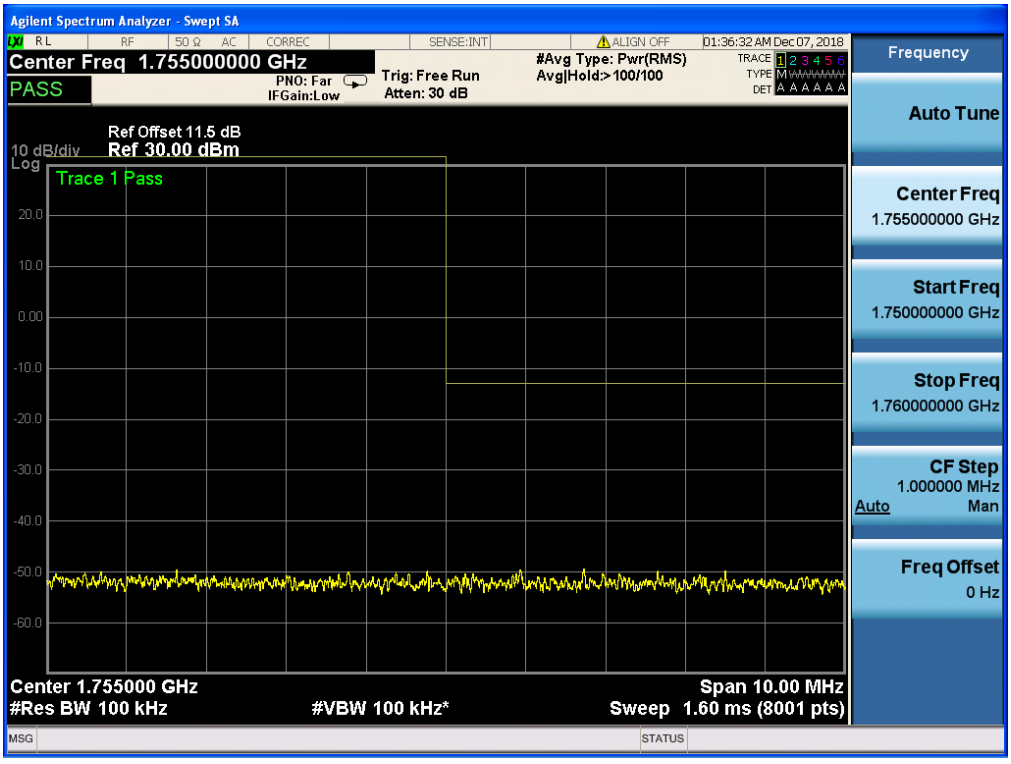
Band 4,UL Channel 20375,UL Frequency 1752.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



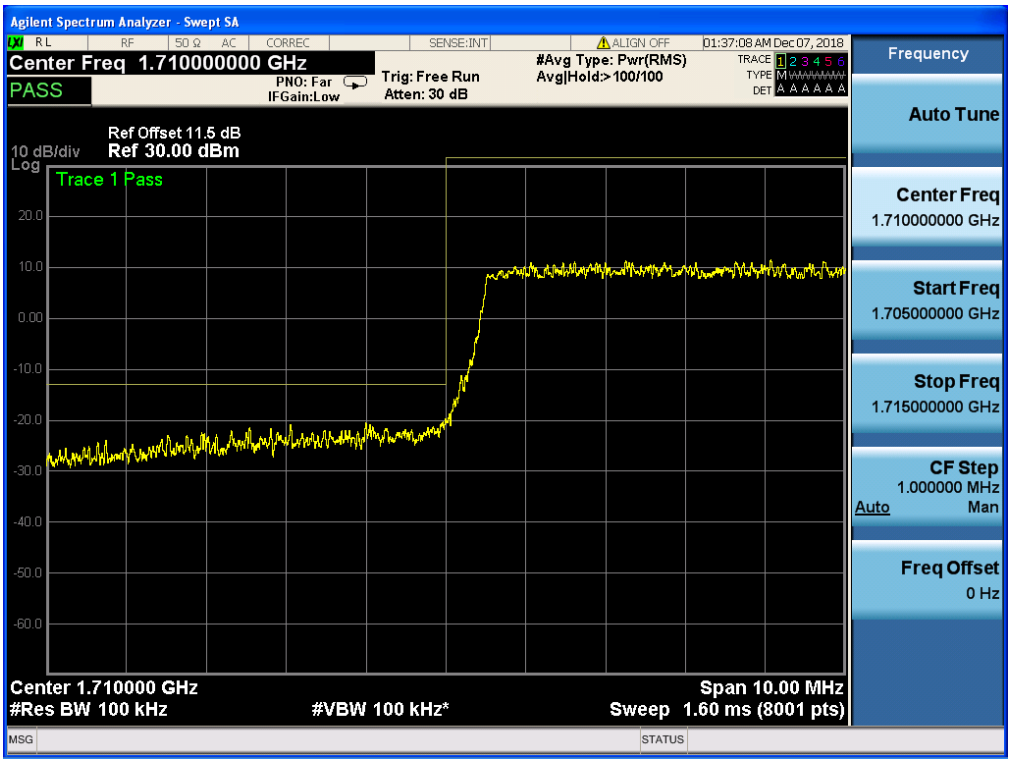
Band 4,UL Channel 20000,UL Frequency 1715.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



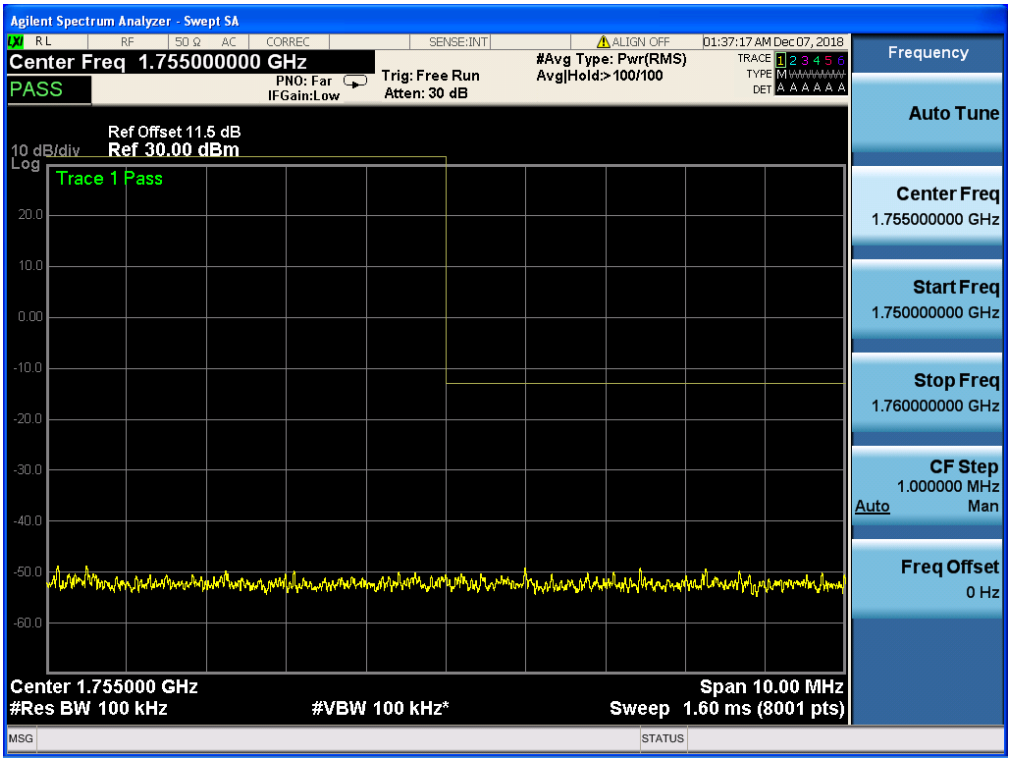
Band 4,UL Channel 20000,UL Frequency 1715.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



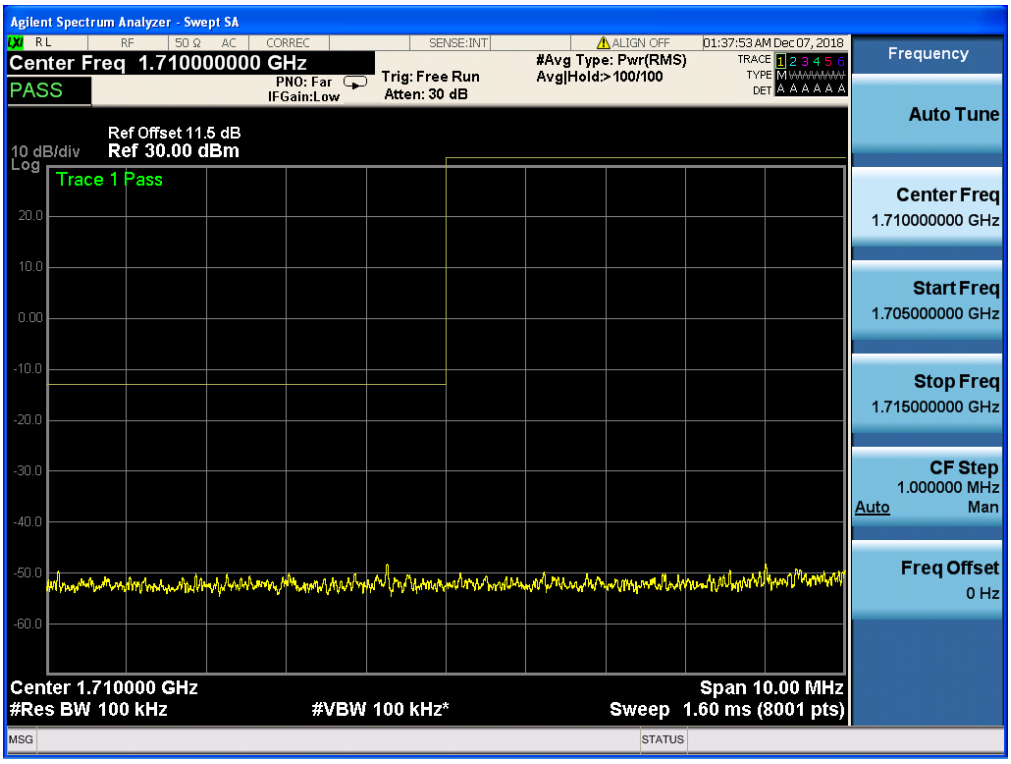
Band 4,UL Channel 20000,UL Frequency 1715.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



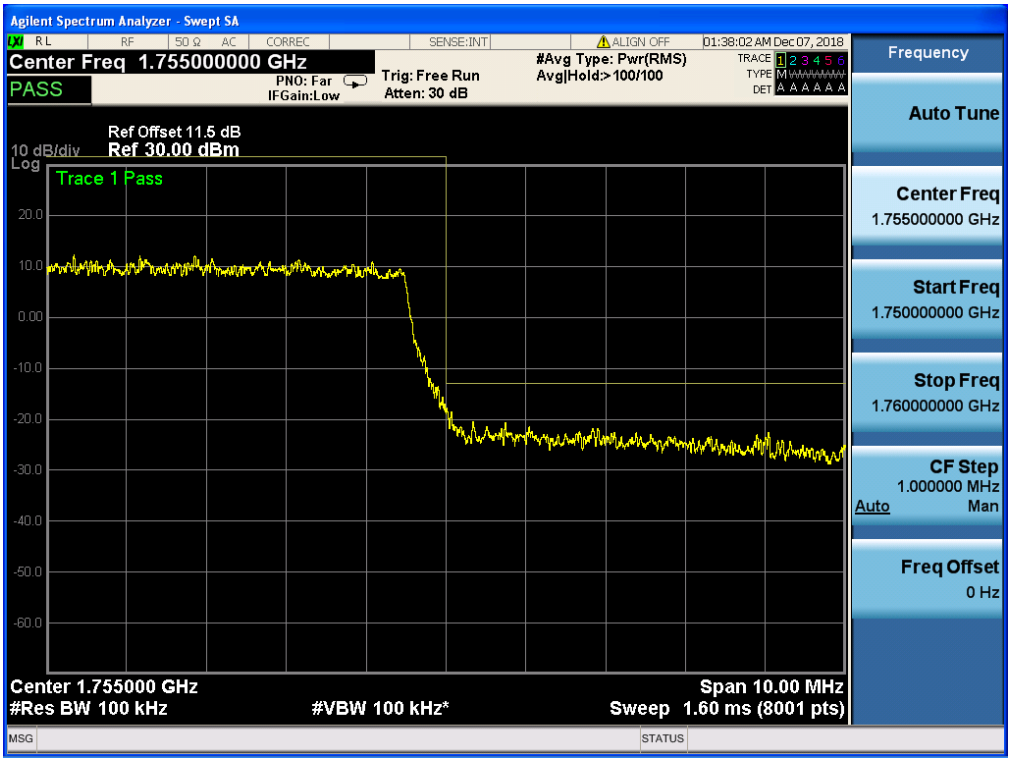
Band 4,UL Channel 20000,UL Frequency 1715.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



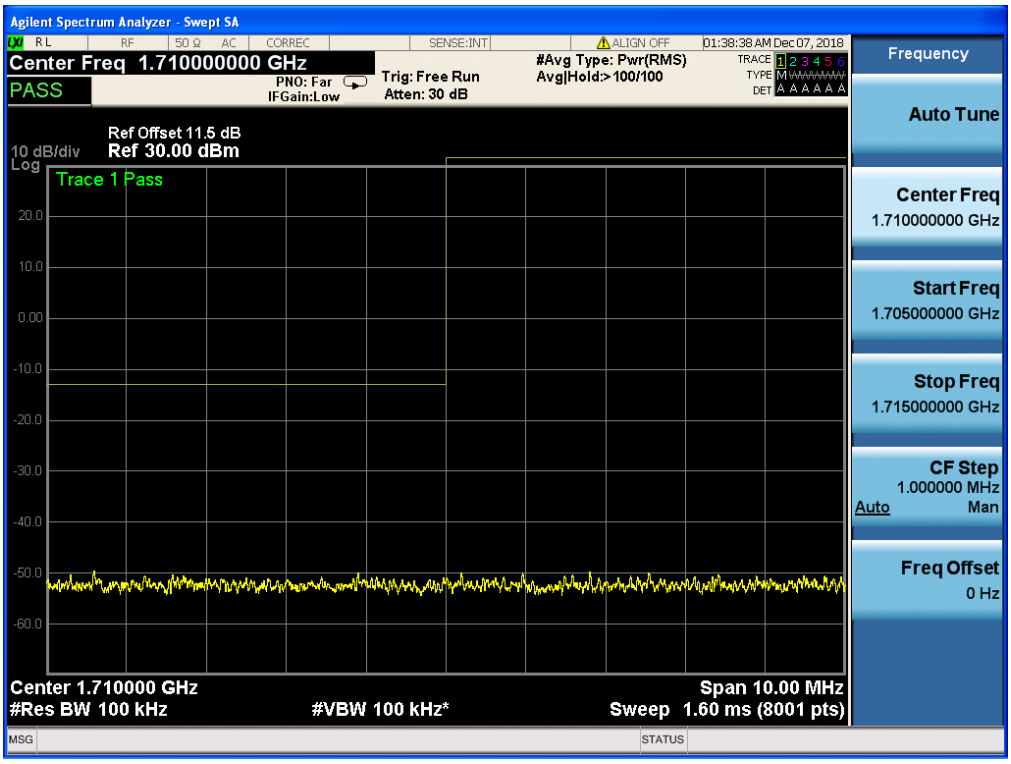
Band 4,UL Channel 20350,UL Frequency 1750.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



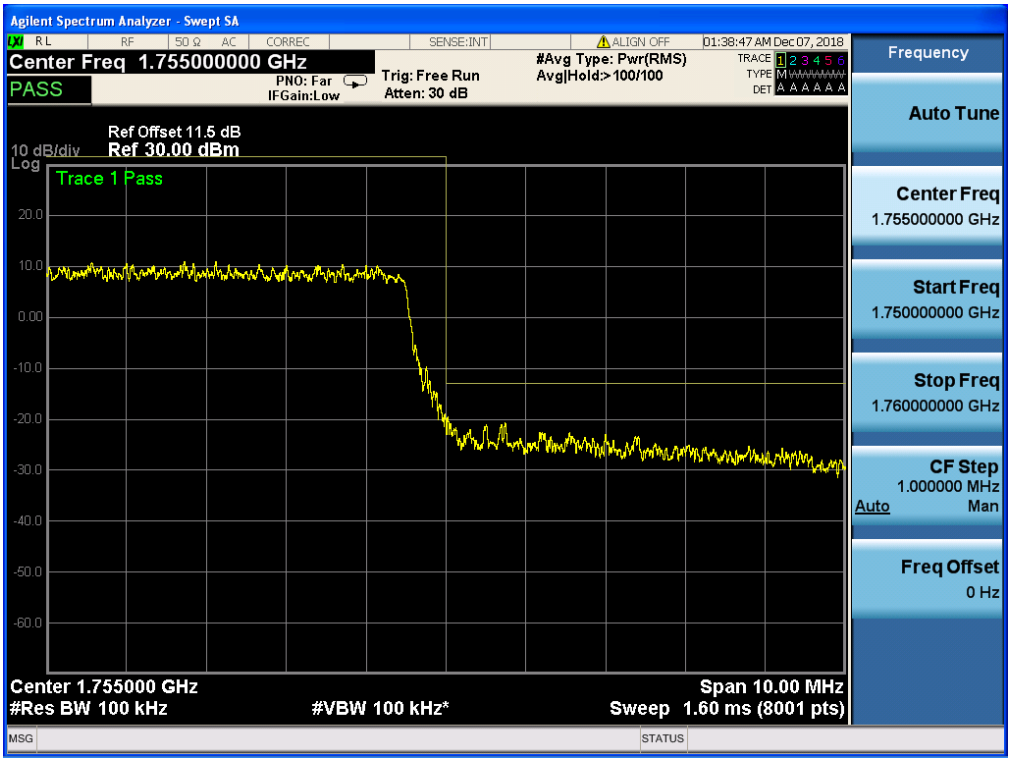
Band 4,UL Channel 20350,UL Frequency 1750.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



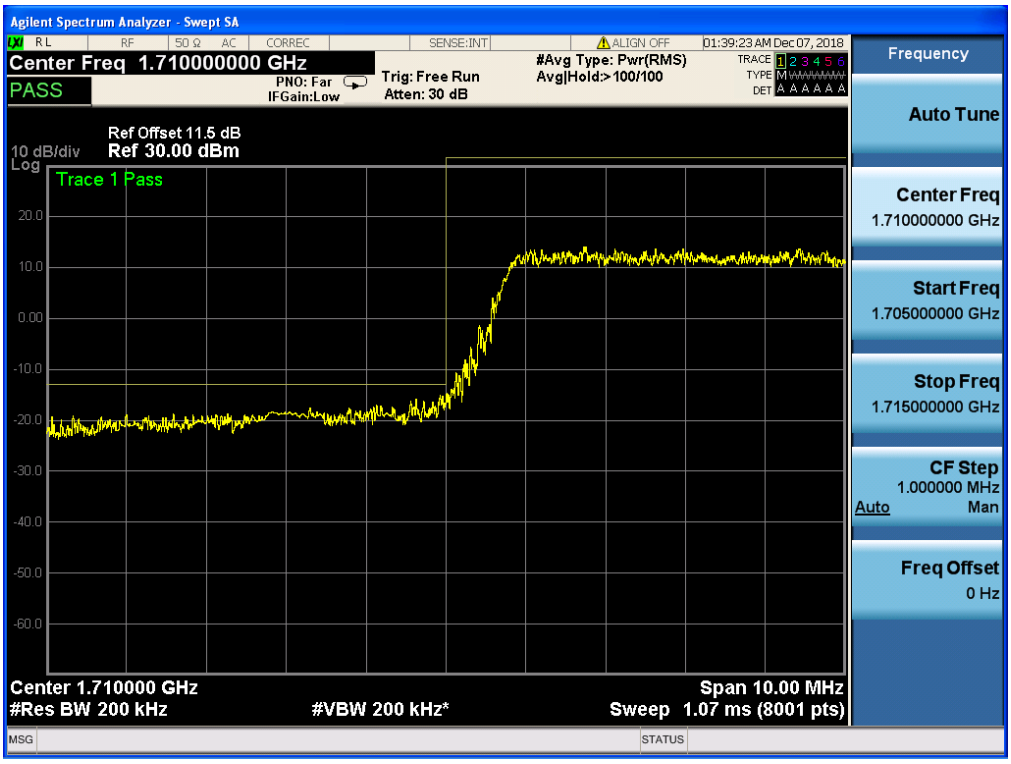
Band 4,UL Channel 20350,UL Frequency 1750.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



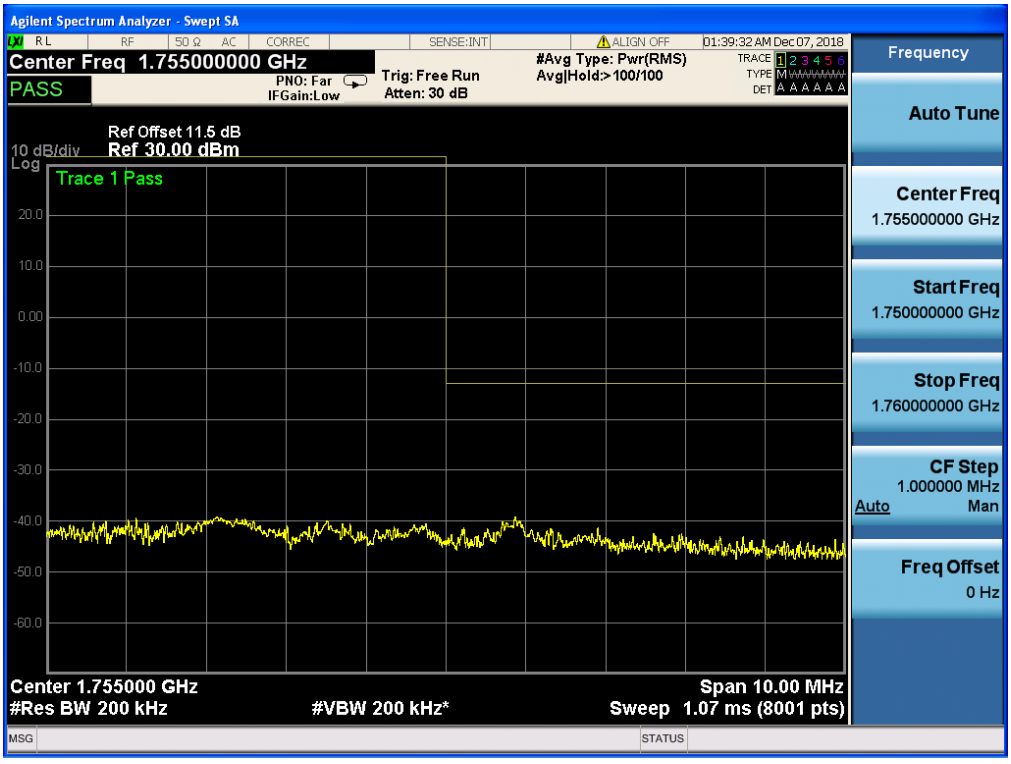
Band 4,UL Channel 20350,UL Frequency 1750.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



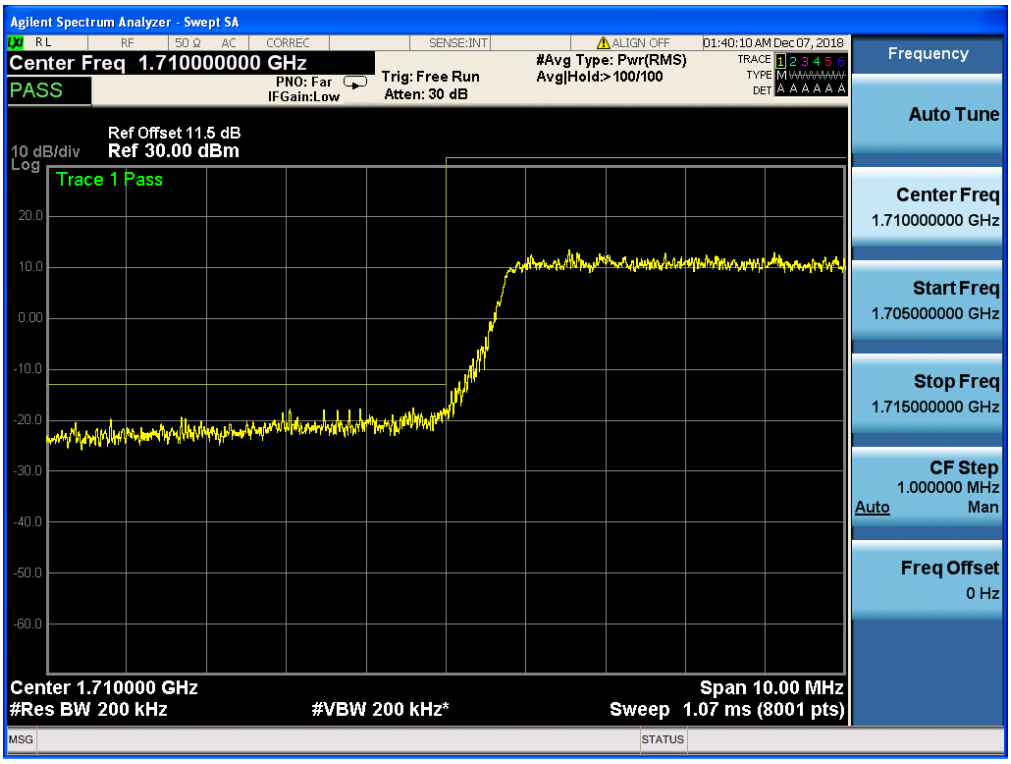
Band 4,UL Channel 20025,UL Frequency 1717.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



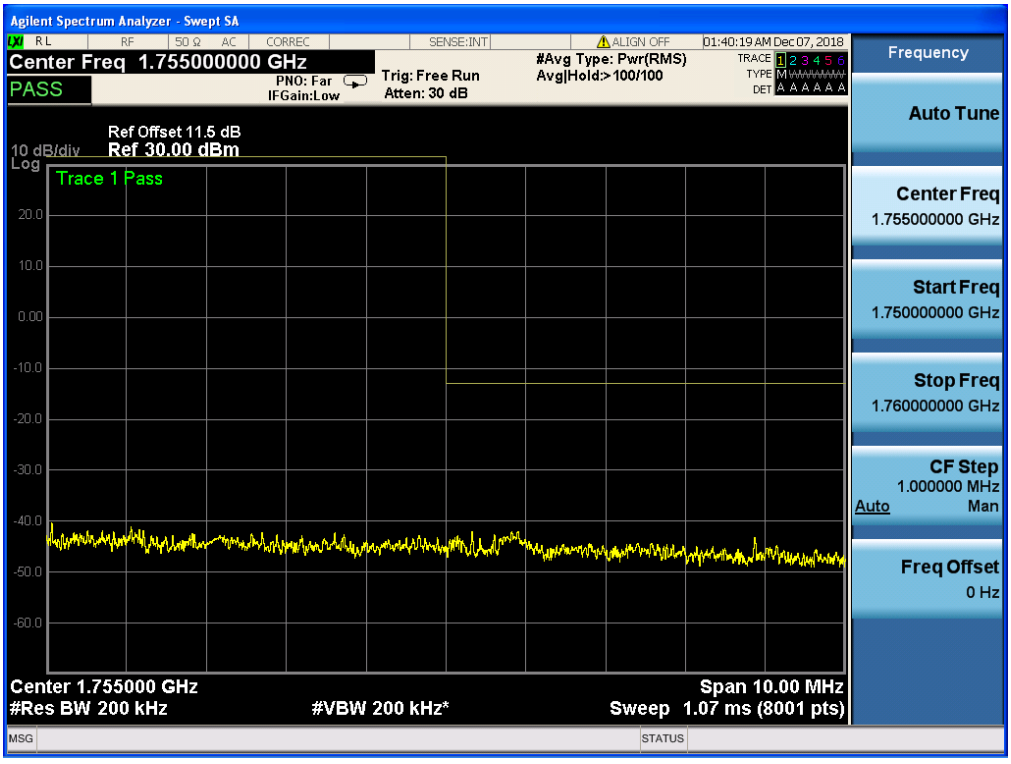
Band 4,UL Channel 20025,UL Frequency 1717.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



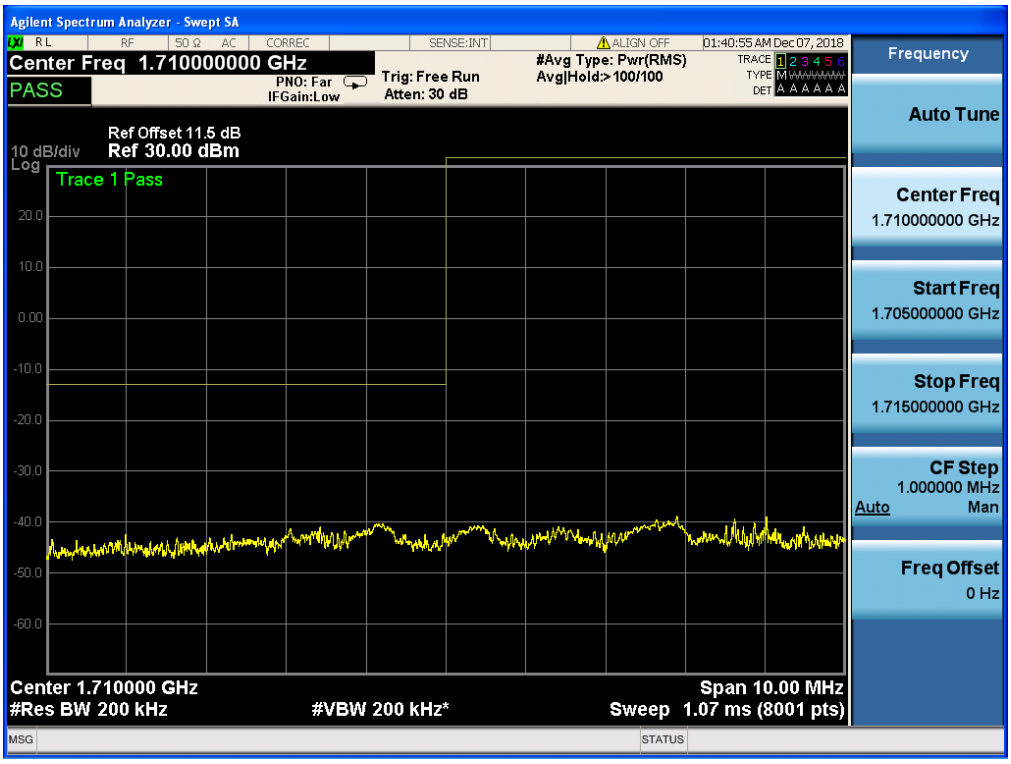
Band 4,UL Channel 20025,UL Frequency 1717.5,BW 15.0,NO. RB 75,RB POS. Low,16QAM



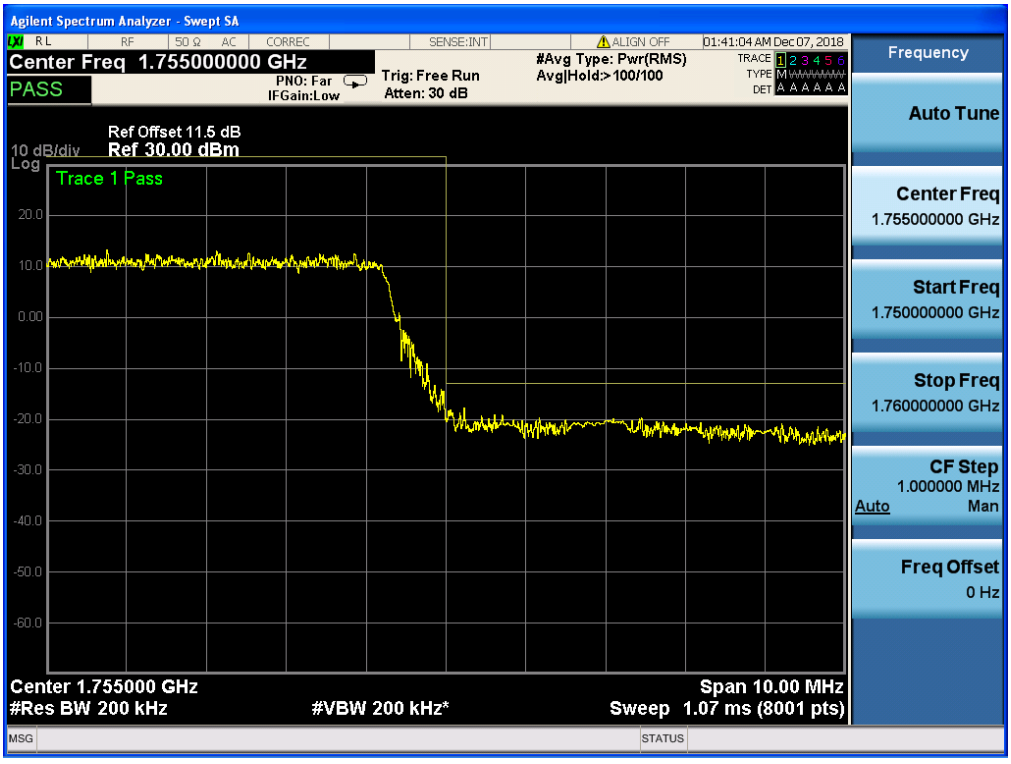
Band 4,UL Channel 20025,UL Frequency 1717.5,BW 15.0,NO. RB 75,RB POS. Low,16QAM



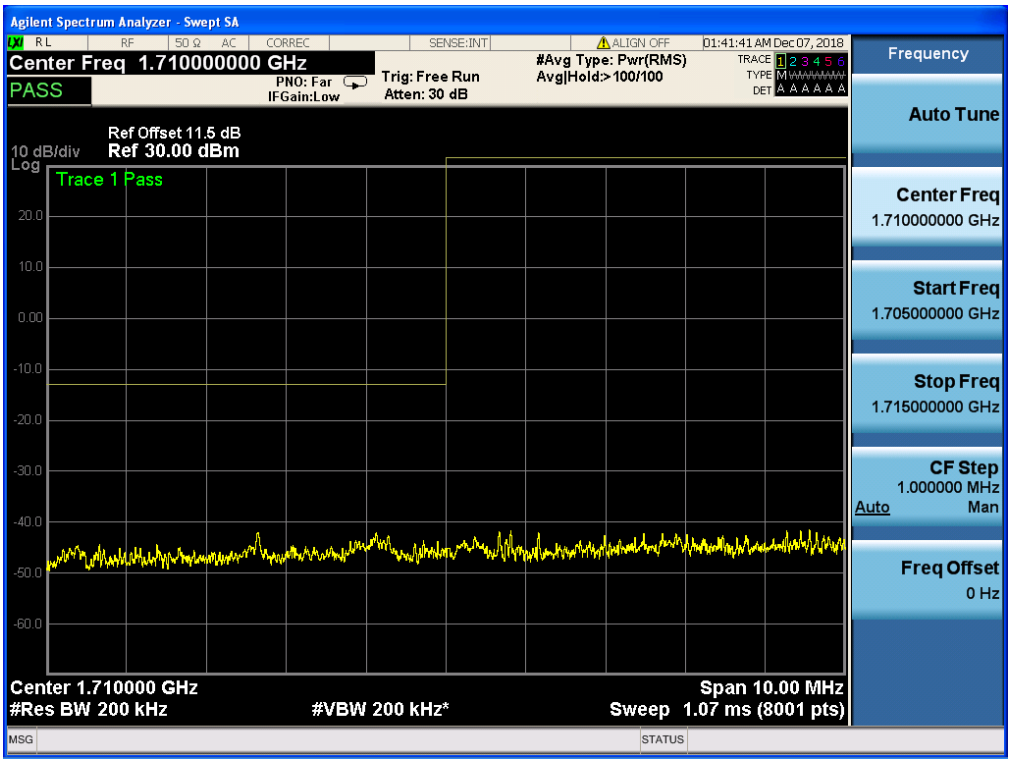
Band 4,UL Channel 20325,UL Frequency 1747.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



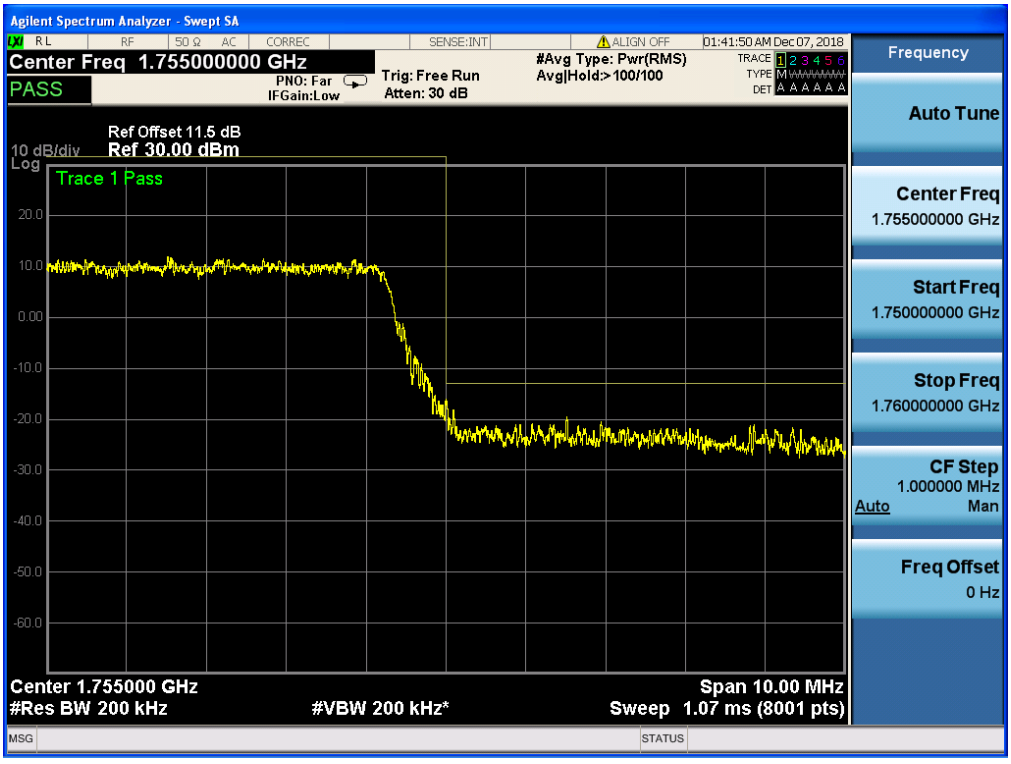
Band 4,UL Channel 20325,UL Frequency 1747.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



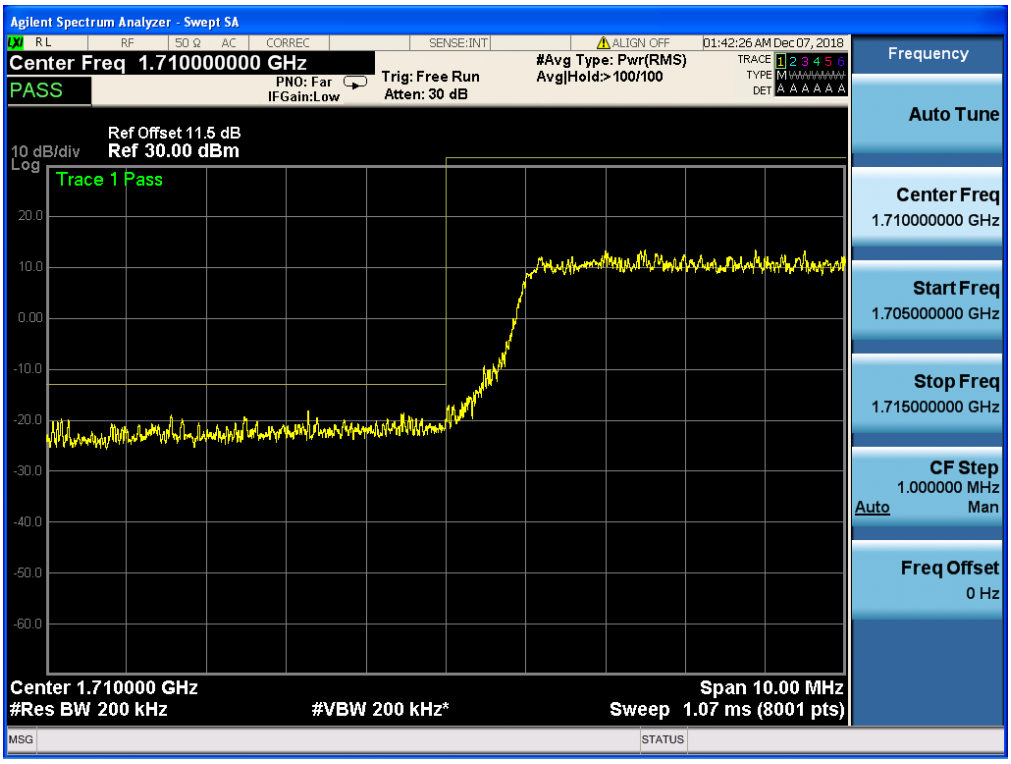
Band 4,UL Channel 20325,UL Frequency 1747.5,BW 15.0,NO. RB 75,RB POS. Low,16QAM



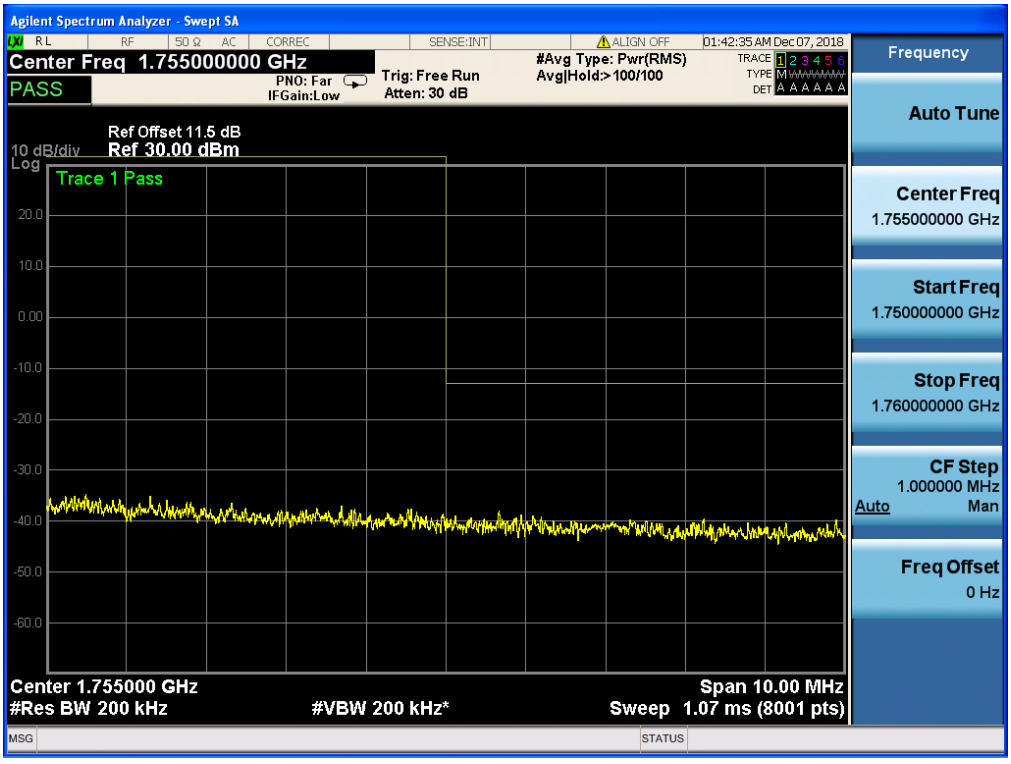
Band 4,UL Channel 20325,UL Frequency 1747.5,BW 15.0,NO. RB 75,RB POS. Low,16QAM



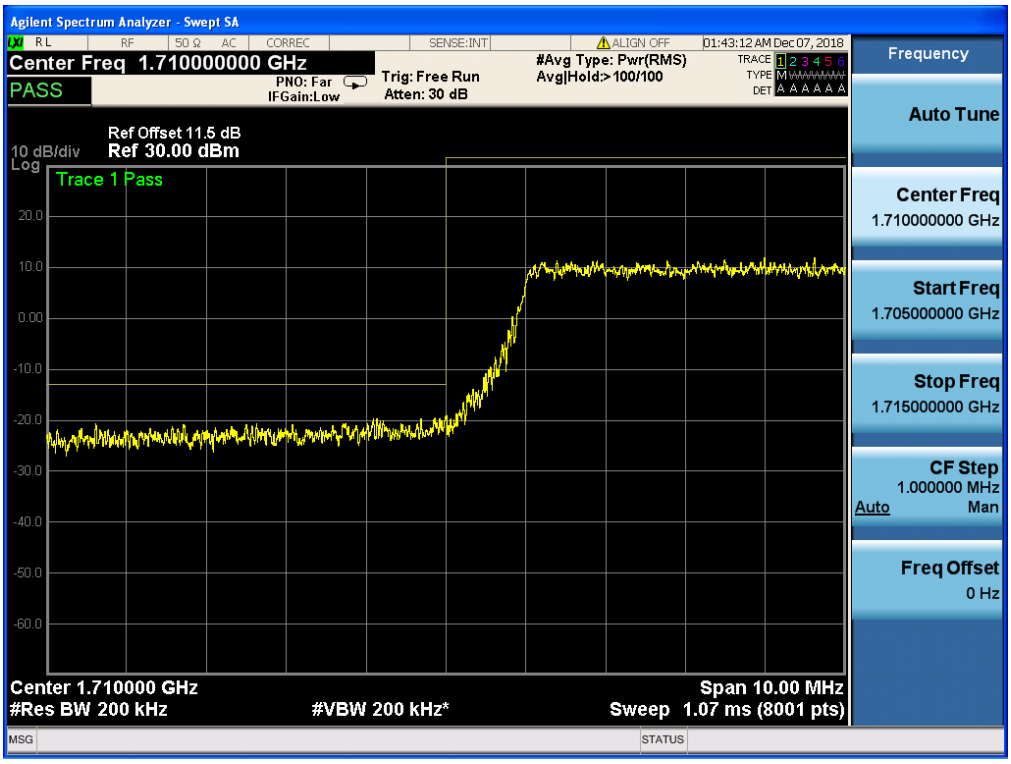
Band 4,UL Channel 20050,UL Frequency 1720.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



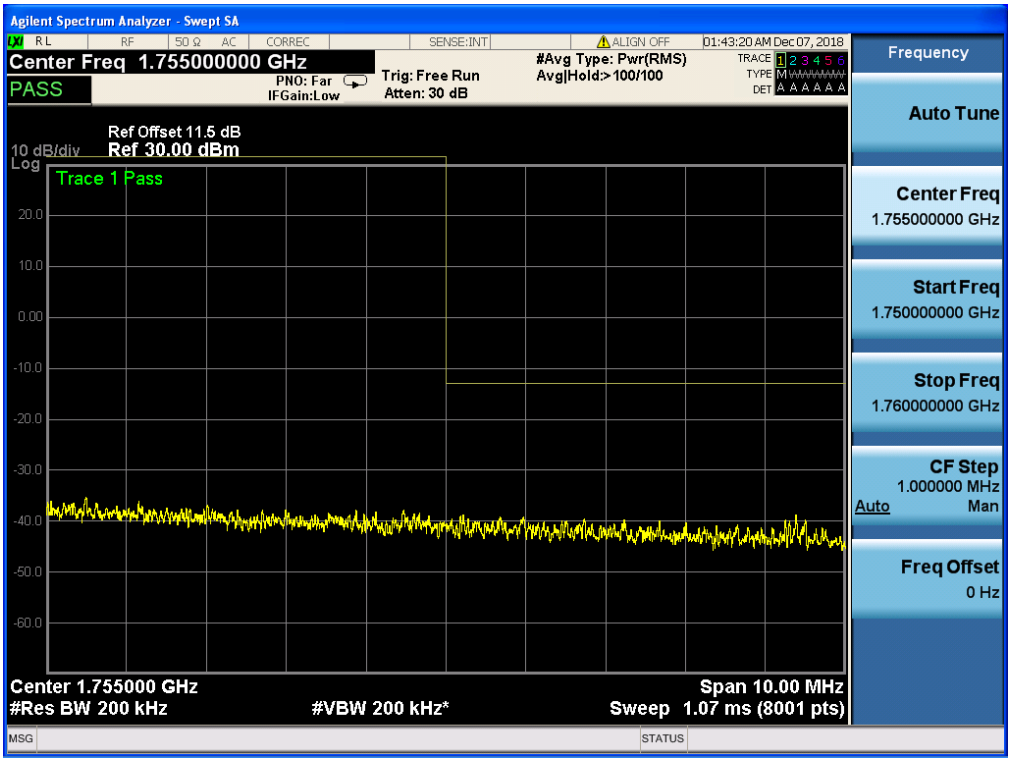
Band 4,UL Channel 20050,UL Frequency 1720.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



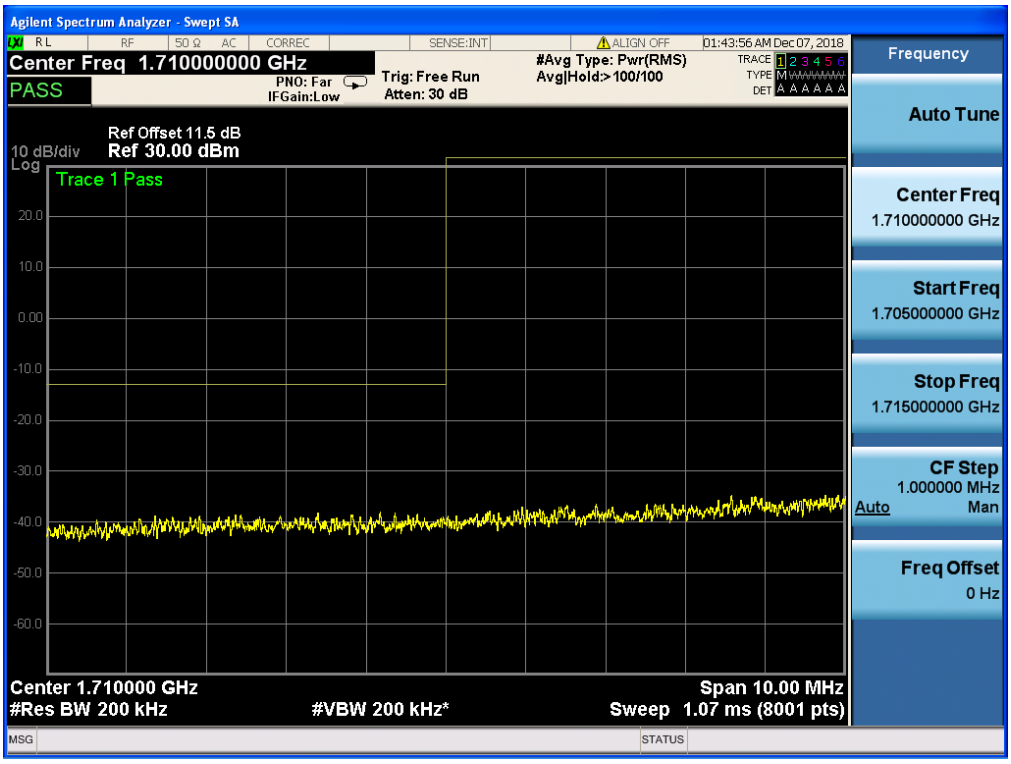
Band 4,UL Channel 20050,UL Frequency 1720.0,BW 20.0,NO. RB 100,RB POS. Low,16QAM



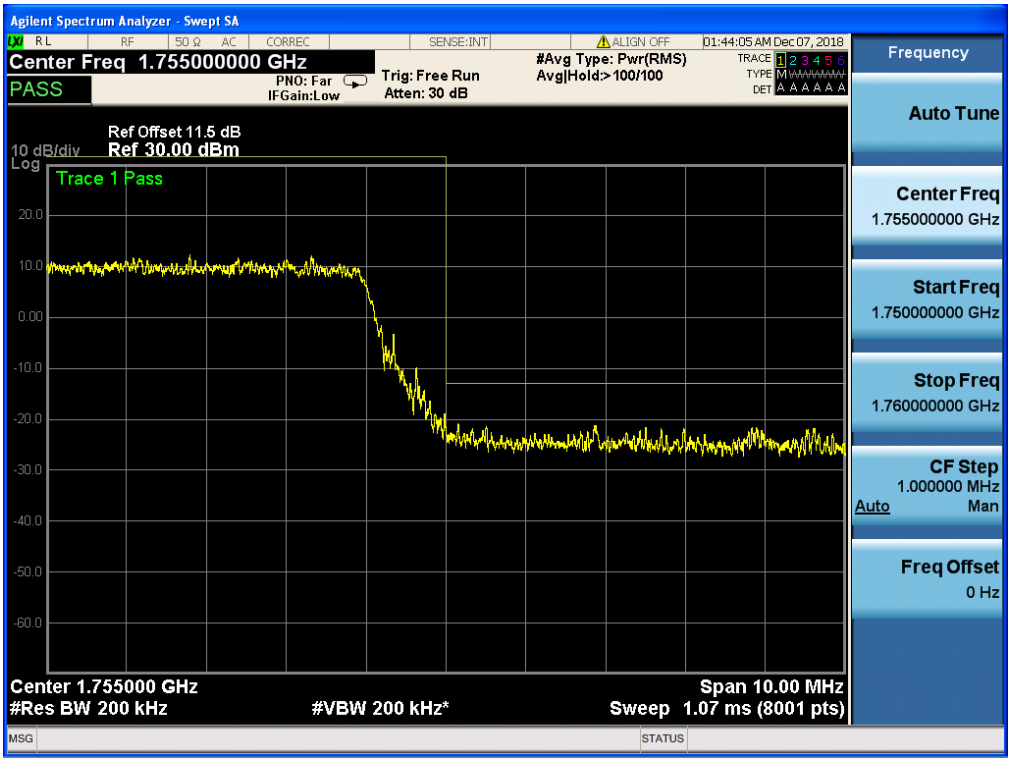
Band 4,UL Channel 20050,UL Frequency 1720.0,BW 20.0,NO. RB 100,RB POS. Low,16QAM



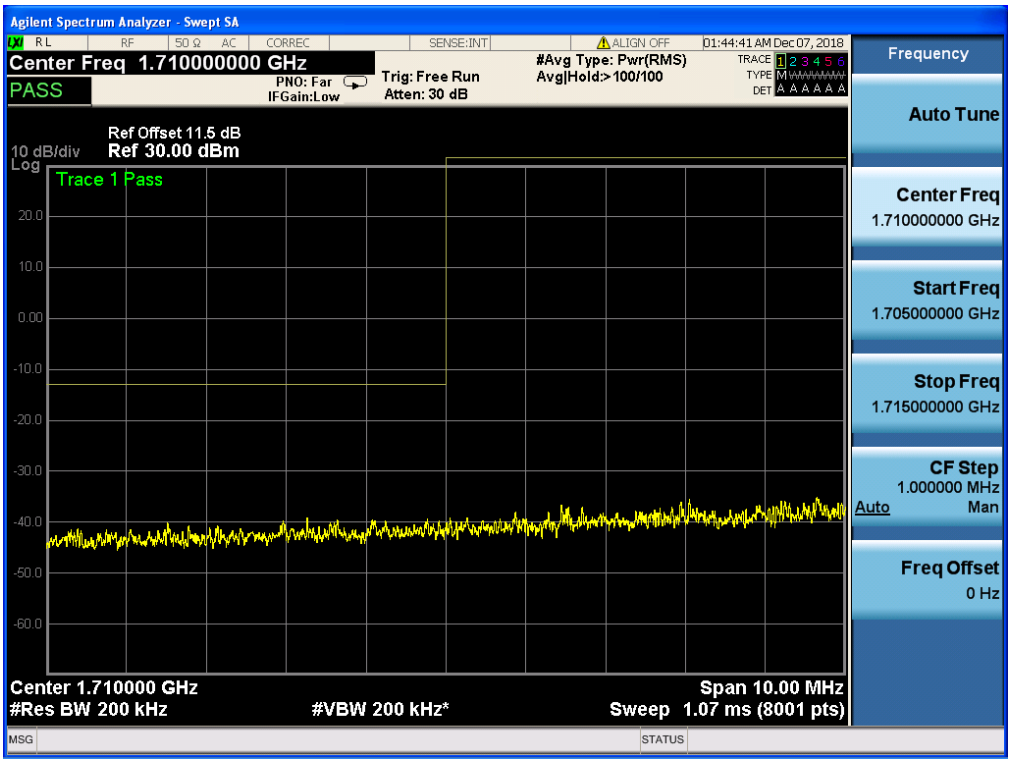
Band 4,UL Channel 20300,UL Frequency 1745.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



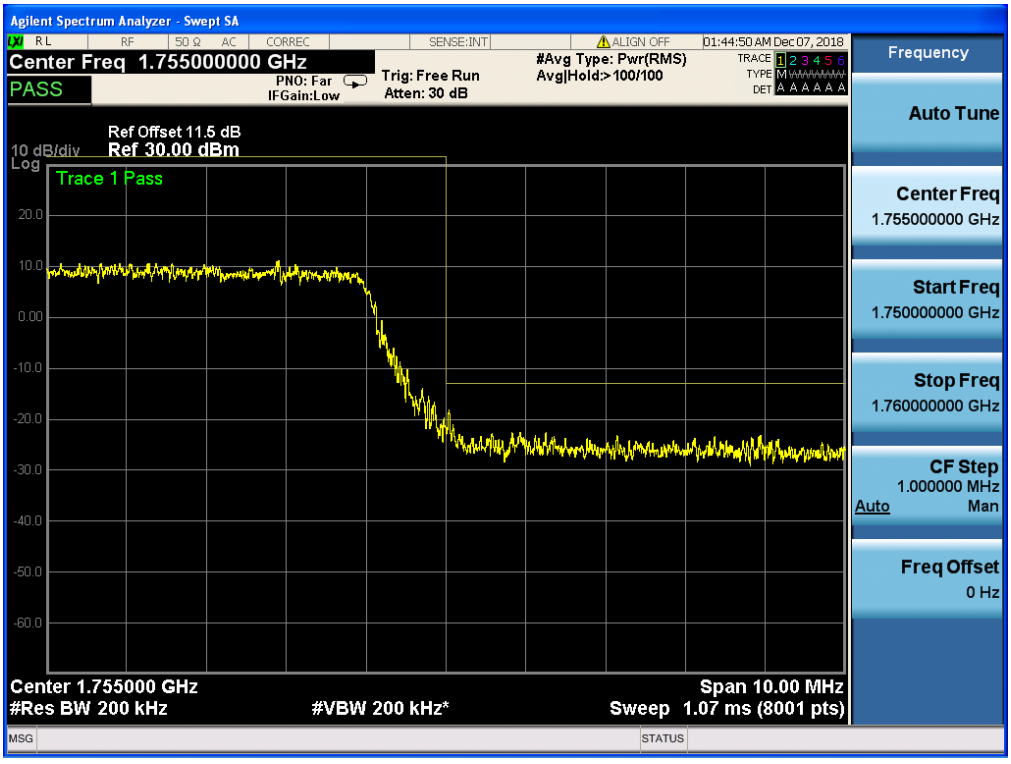
Band 4,UL Channel 20300,UL Frequency 1745.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



Band 4,UL Channel 20300,UL Frequency 1745.0,BW 20.0,NO. RB 100,RB POS. Low,16QAM

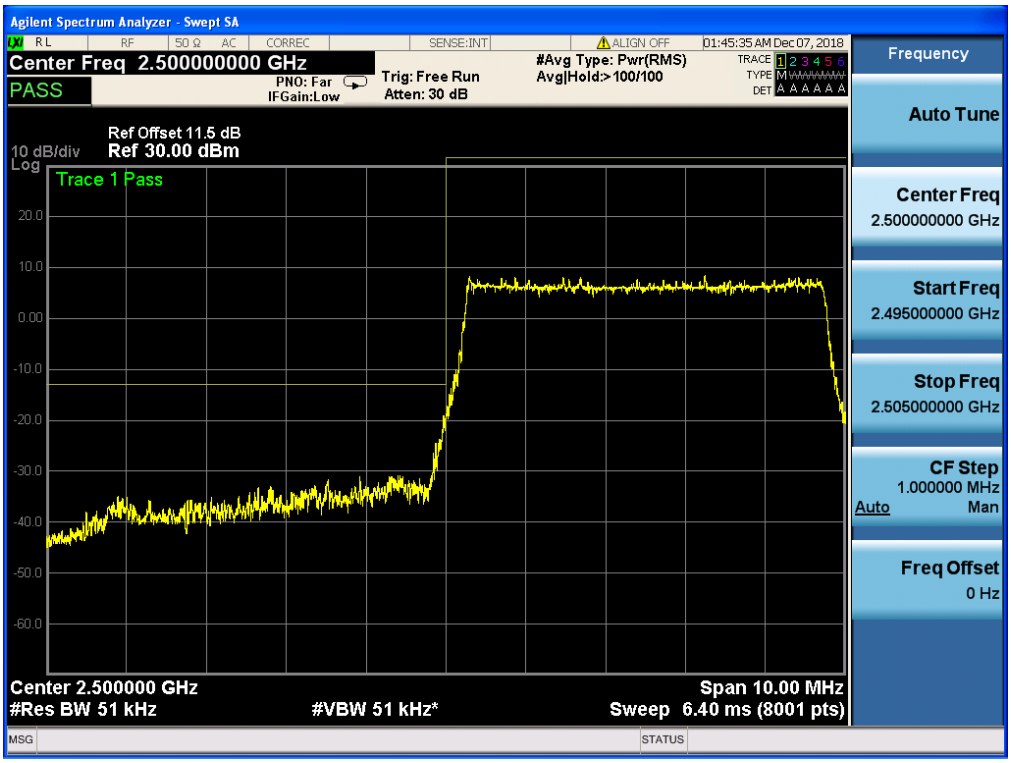


Band 4,UL Channel 20300,UL Frequency 1745.0,BW 20.0,NO. RB 100,RB POS. Low,16QAM

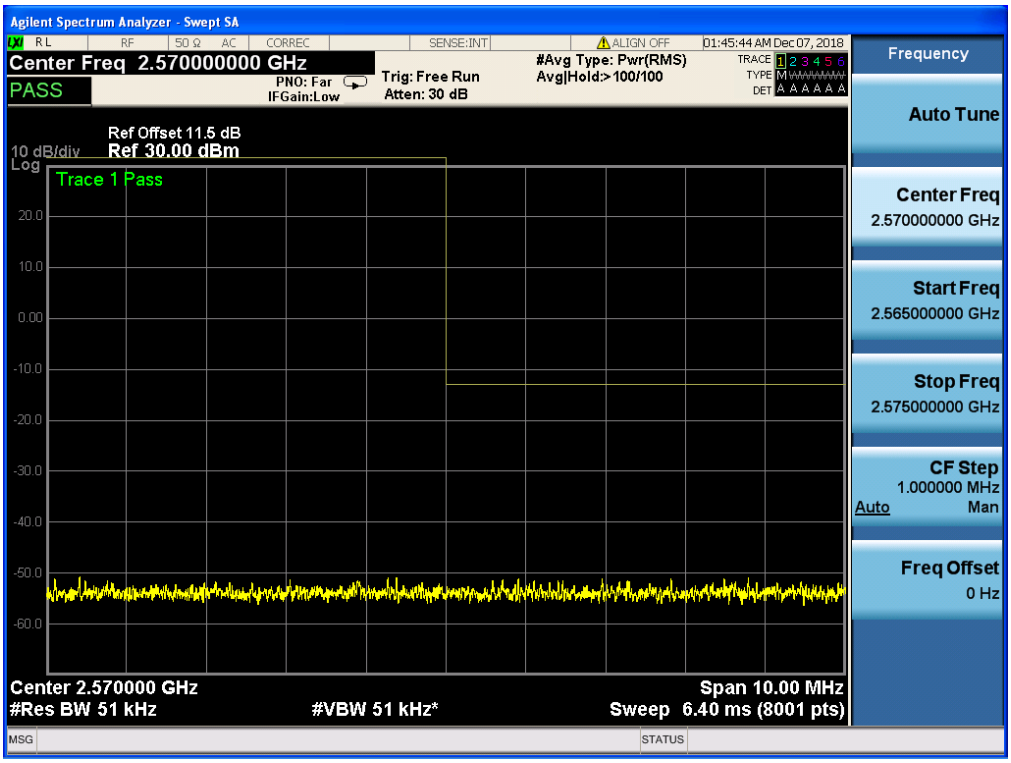


6.2 LTE BAND 7

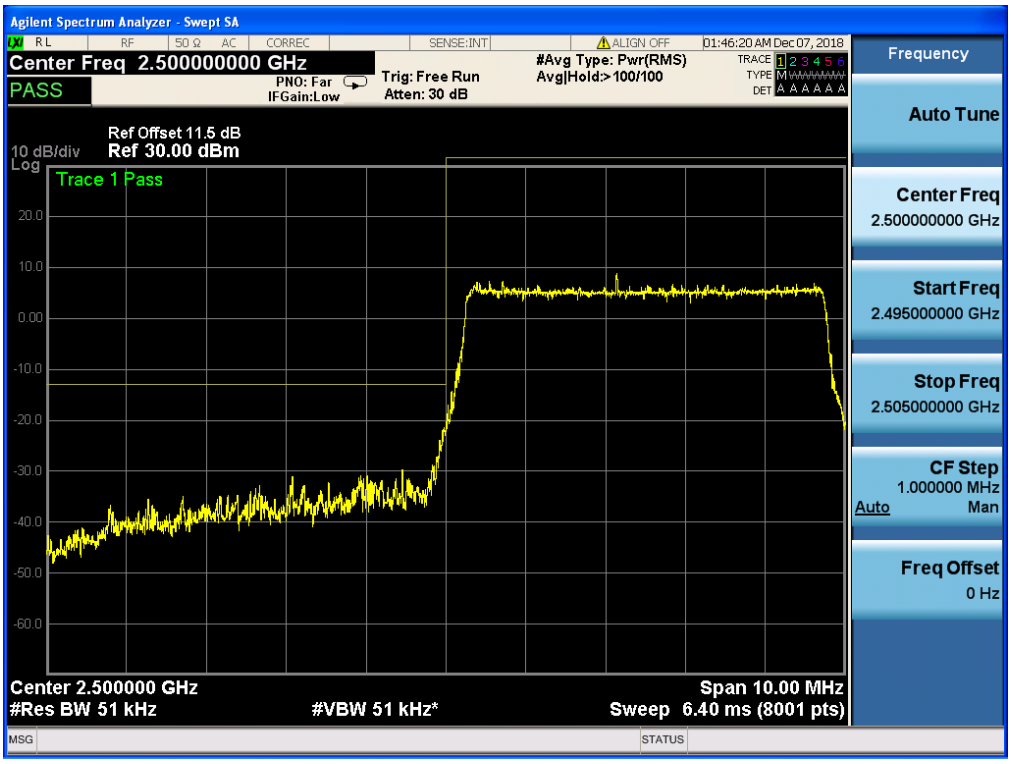
Band 7,UL Channel 20775,UL Frequency 2502.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



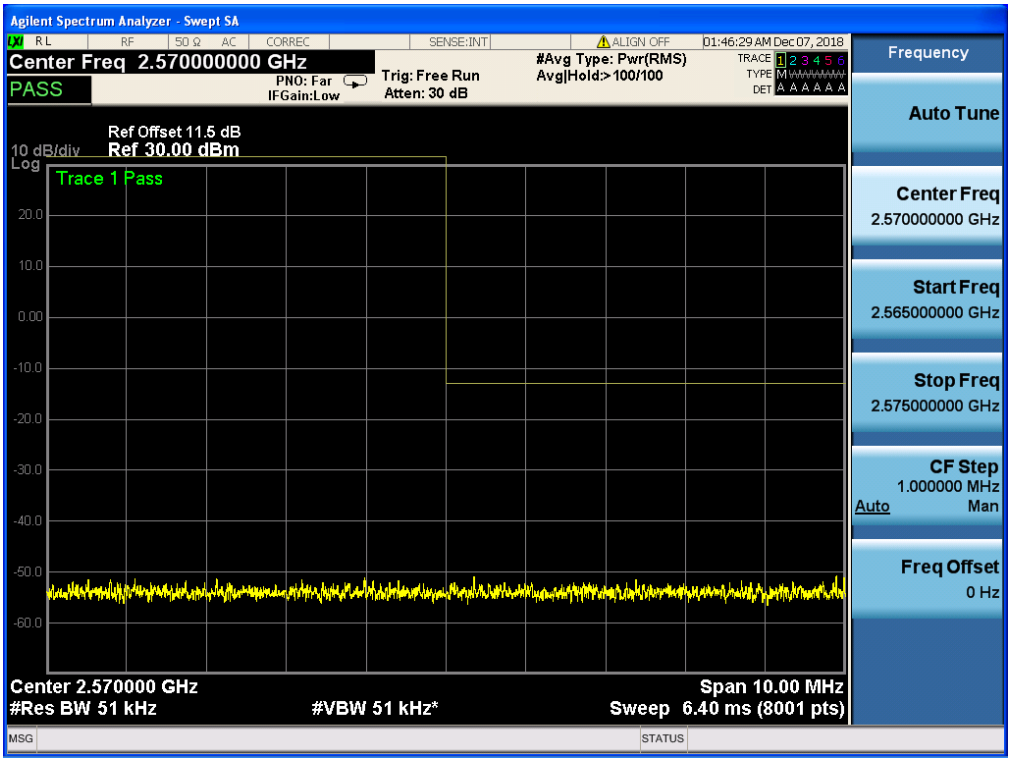
Band 7,UL Channel 20775,UL Frequency 2502.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



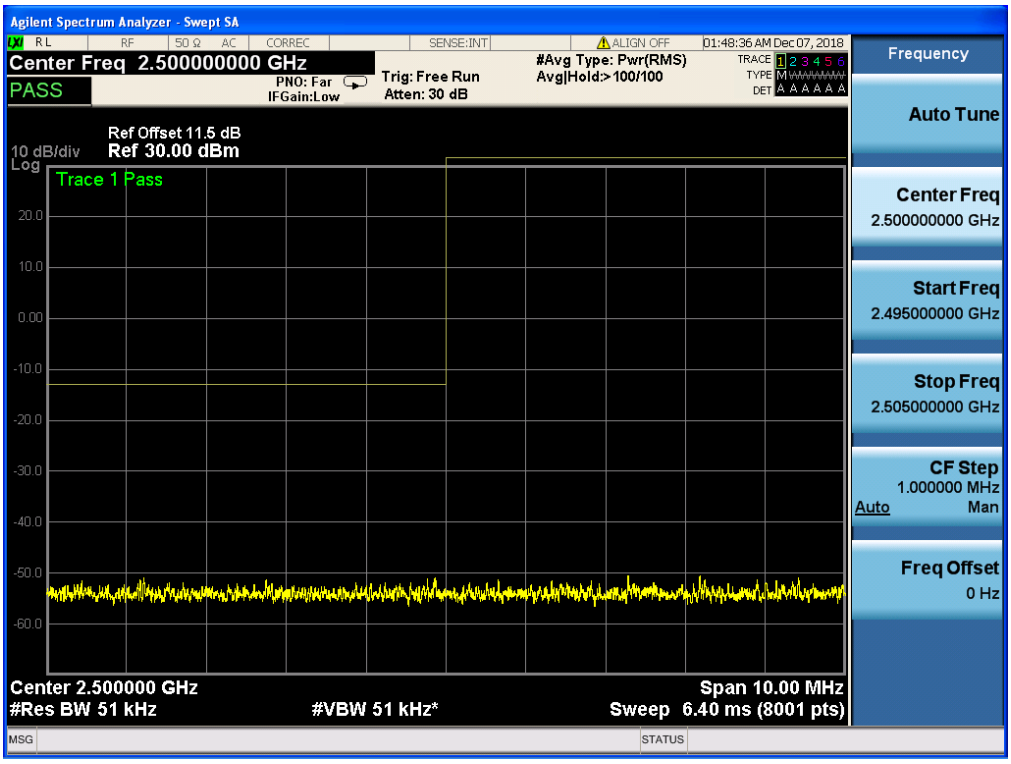
Band 7,UL Channel 20775,UL Frequency 2502.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



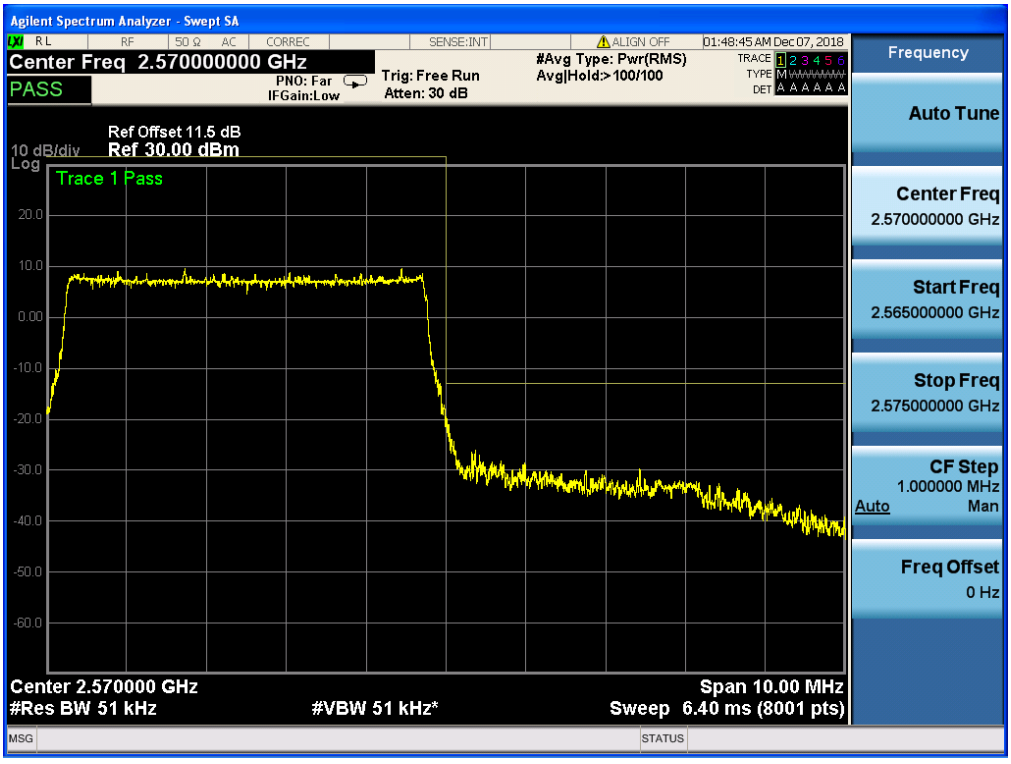
Band 7,UL Channel 20775,UL Frequency 2502.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



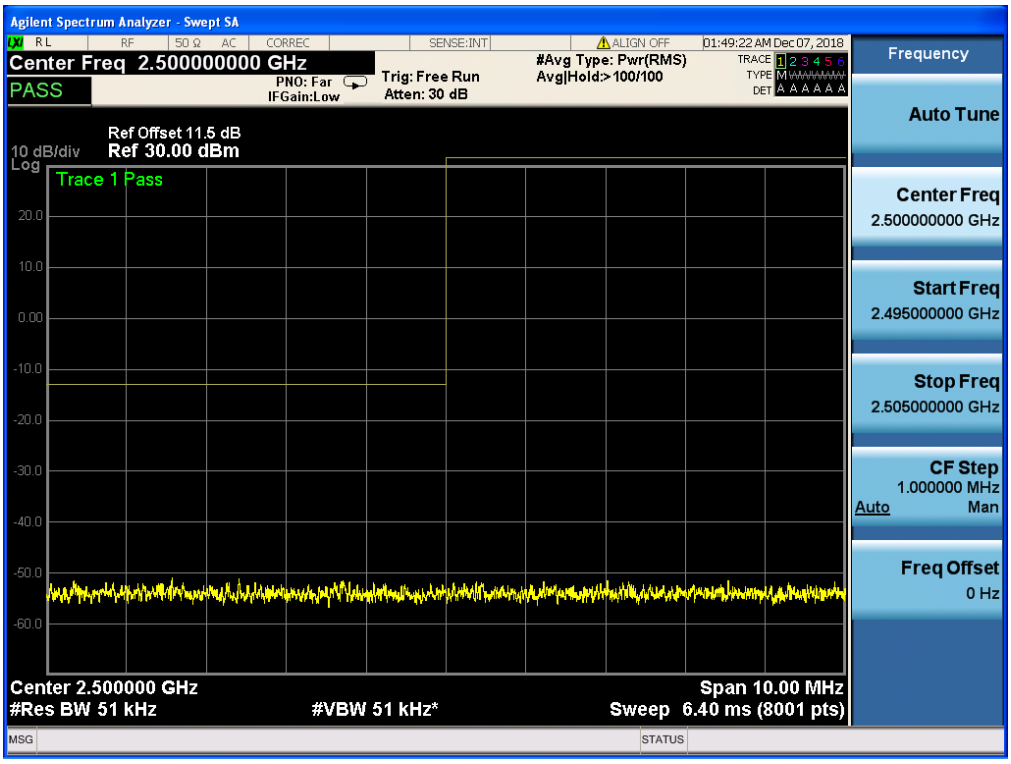
Band 7,UL Channel 21425,UL Frequency 2567.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



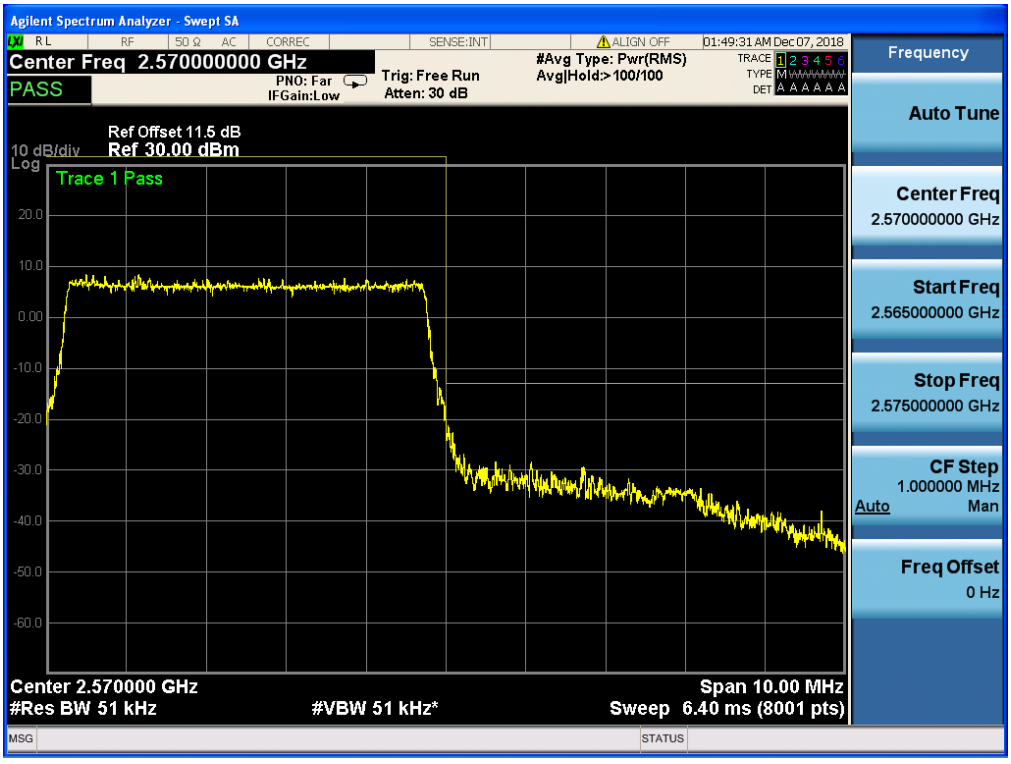
Band 7,UL Channel 21425,UL Frequency 2567.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



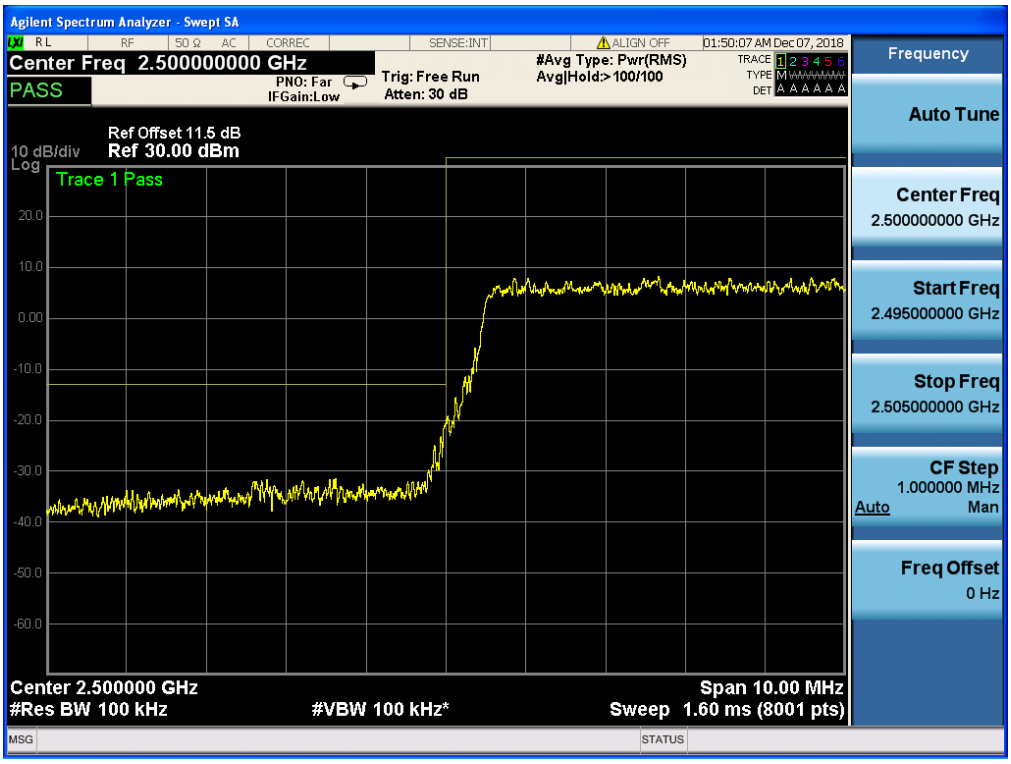
Band 7,UL Channel 21425,UL Frequency 2567.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



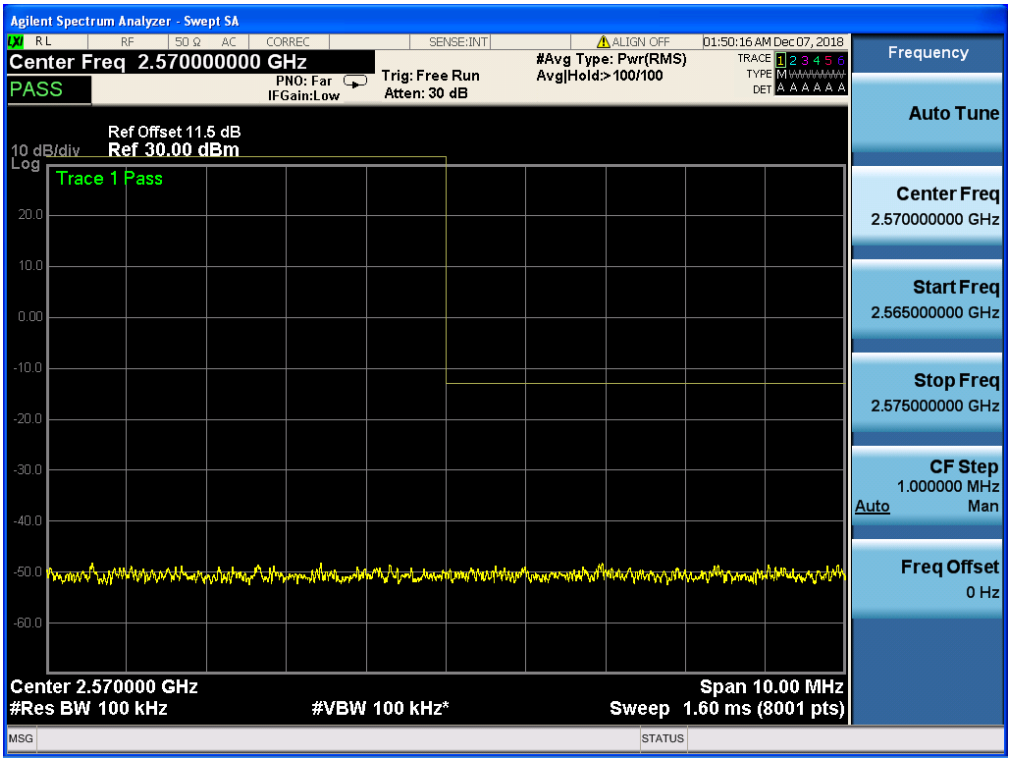
Band 7,UL Channel 21425,UL Frequency 2567.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



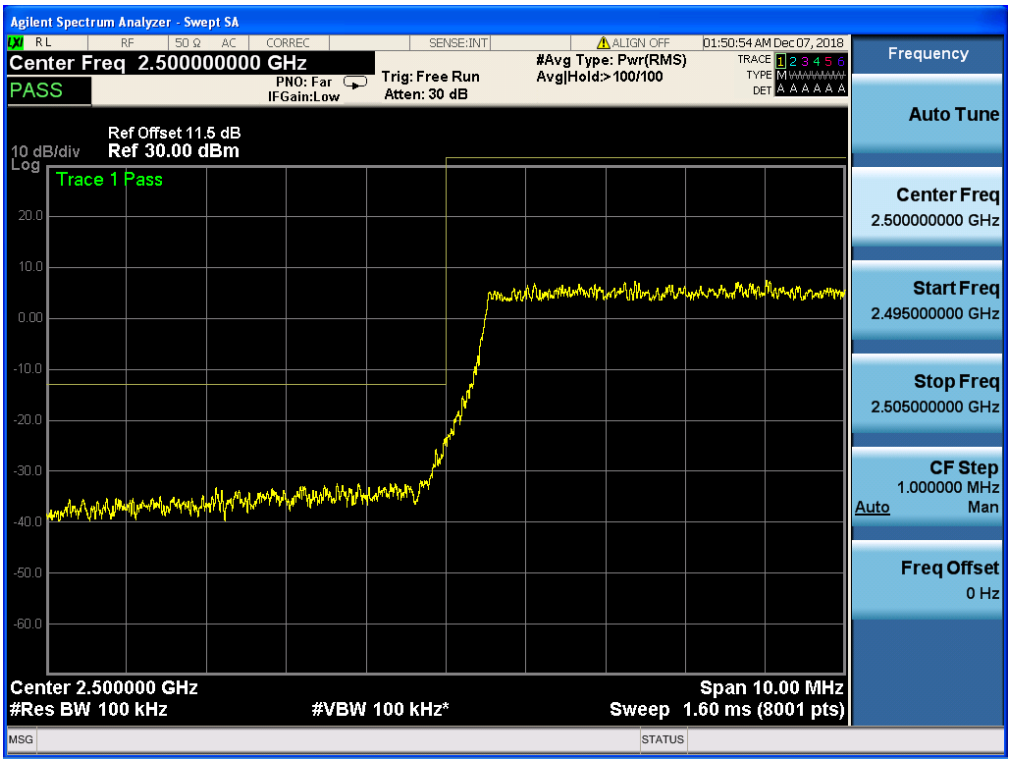
Band 7,UL Channel 20800,UL Frequency 2505.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



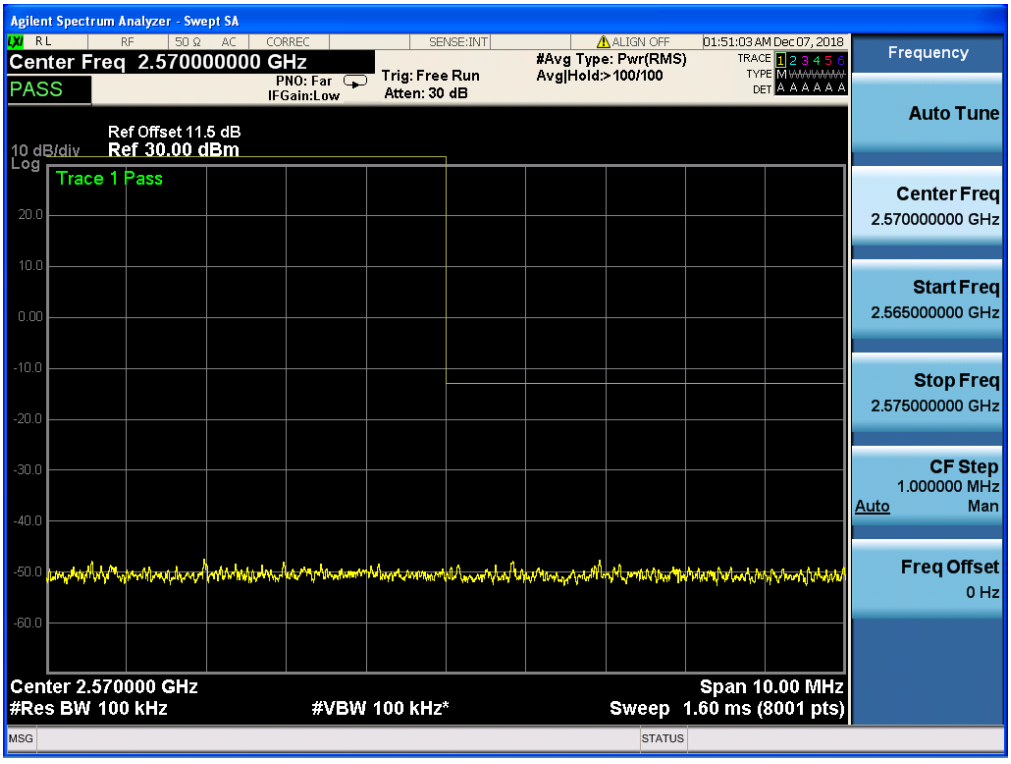
Band 7,UL Channel 20800,UL Frequency 2505.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



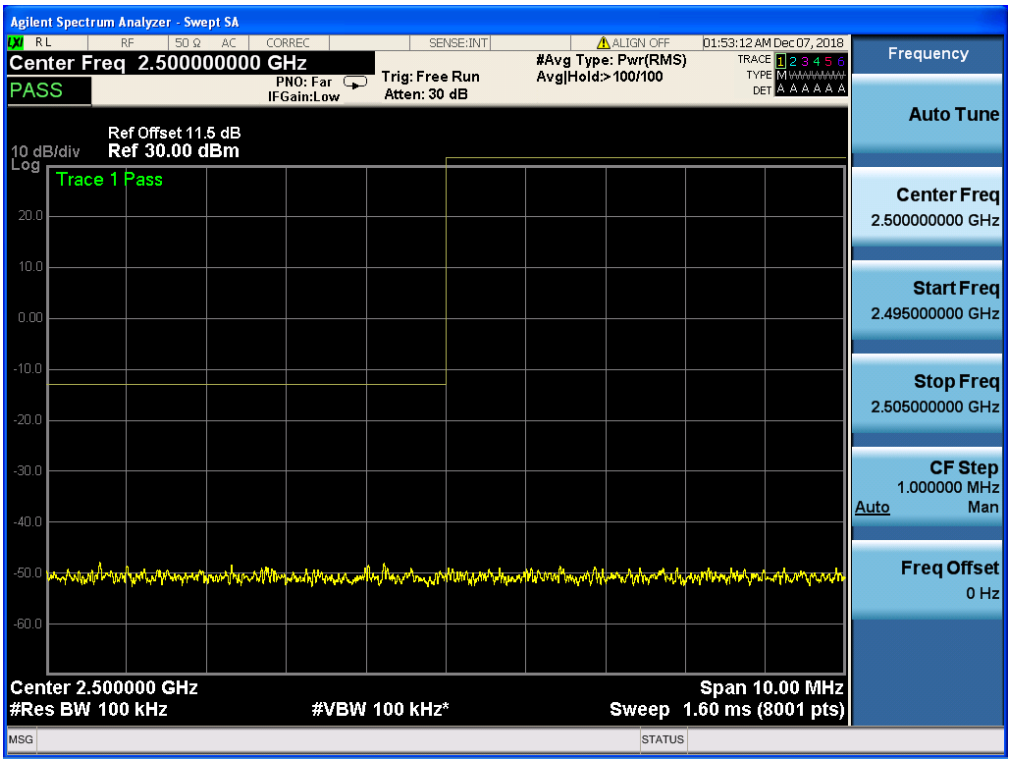
Band 7,UL Channel 20800,UL Frequency 2505.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



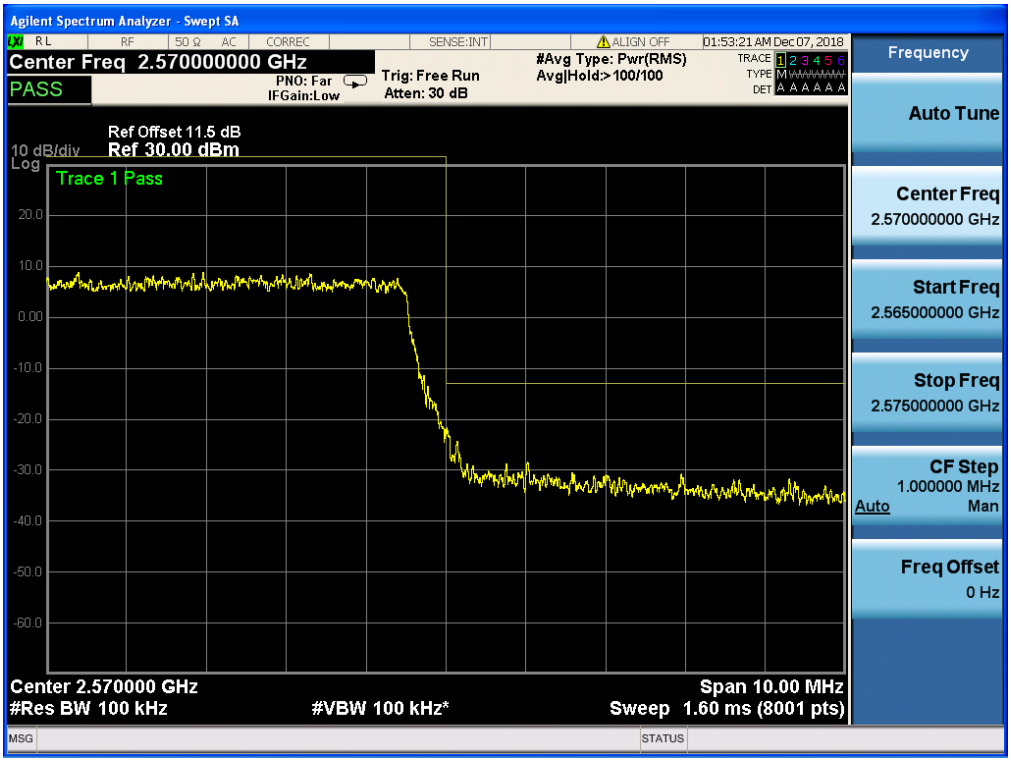
Band 7,UL Channel 20800,UL Frequency 2505.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



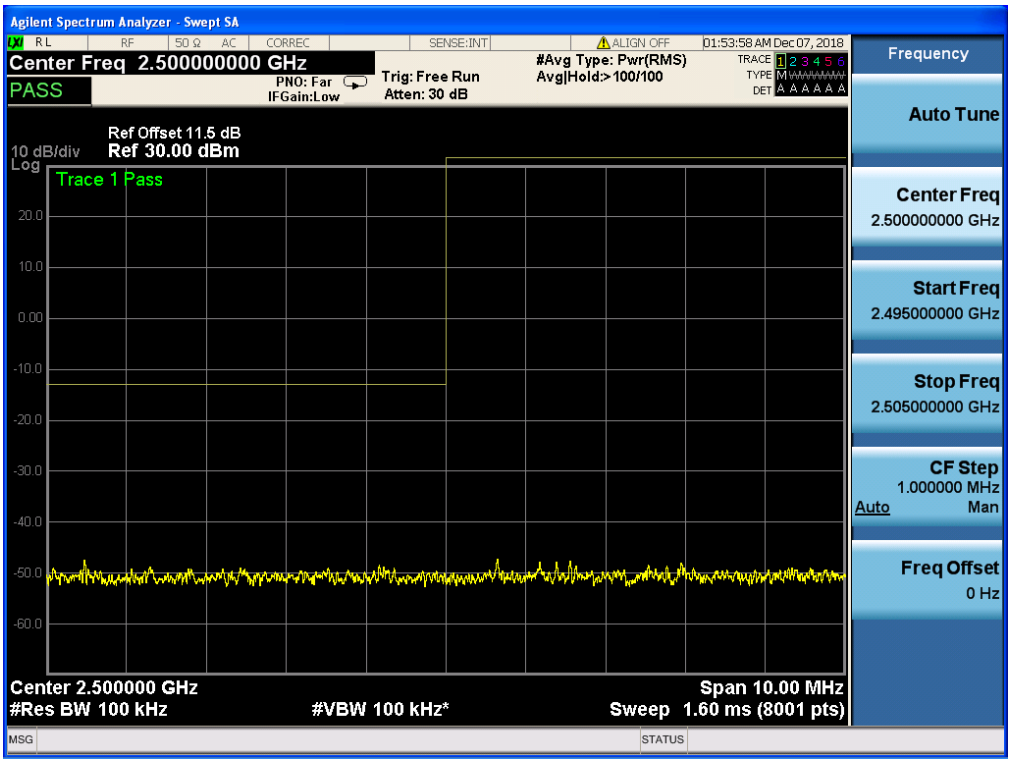
Band 7,UL Channel 21400,UL Frequency 2565.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



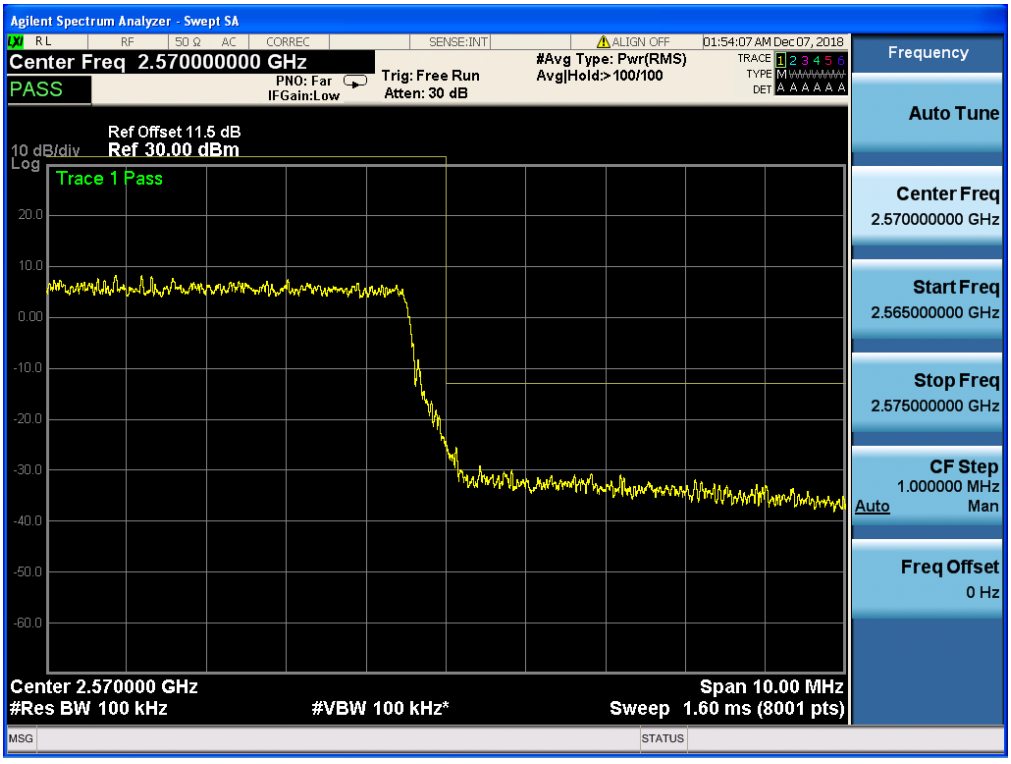
Band 7,UL Channel 21400,UL Frequency 2565.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



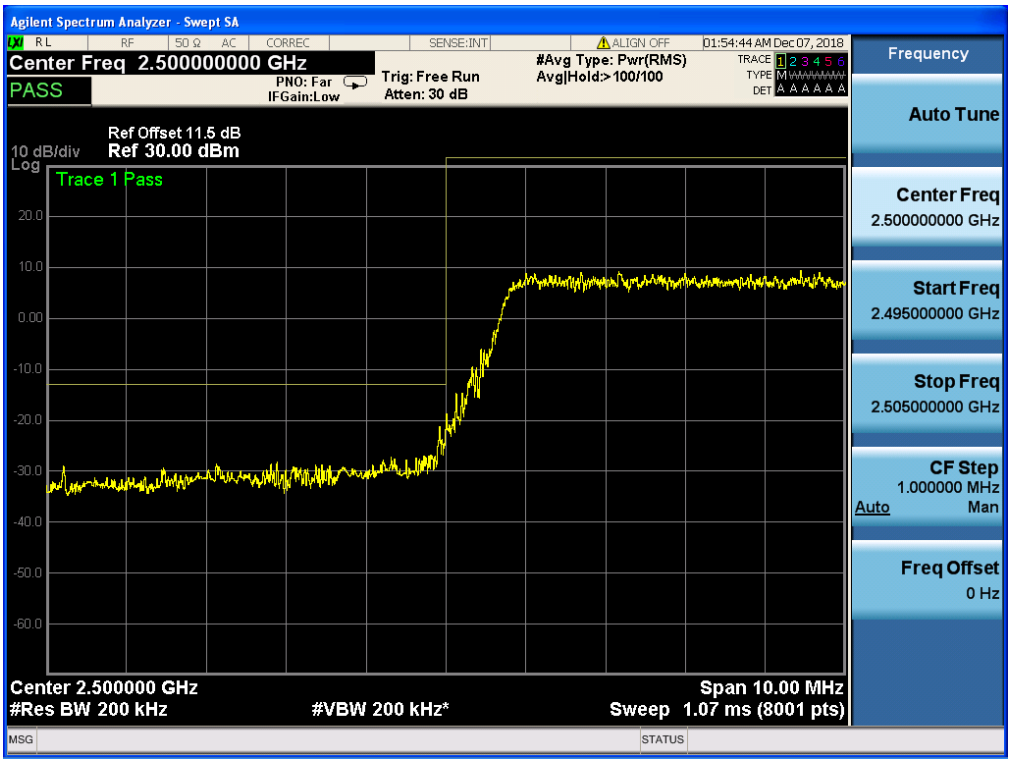
Band 7,UL Channel 21400,UL Frequency 2565.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



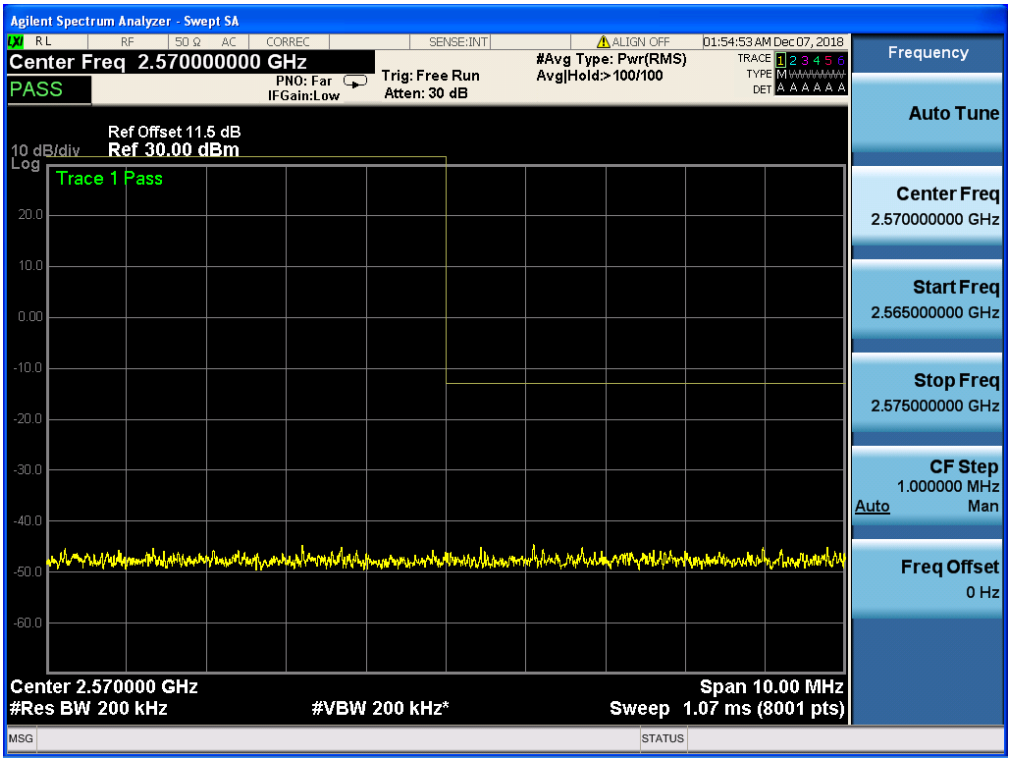
Band 7,UL Channel 21400,UL Frequency 2565.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



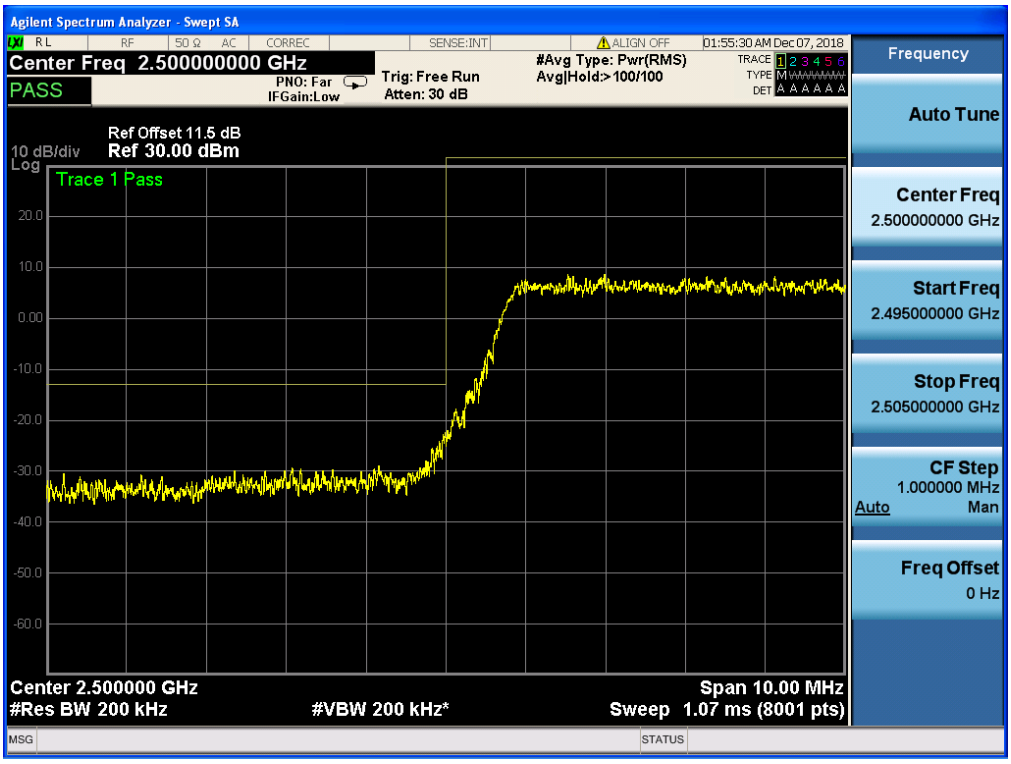
Band 7,UL Channel 20825,UL Frequency 2507.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



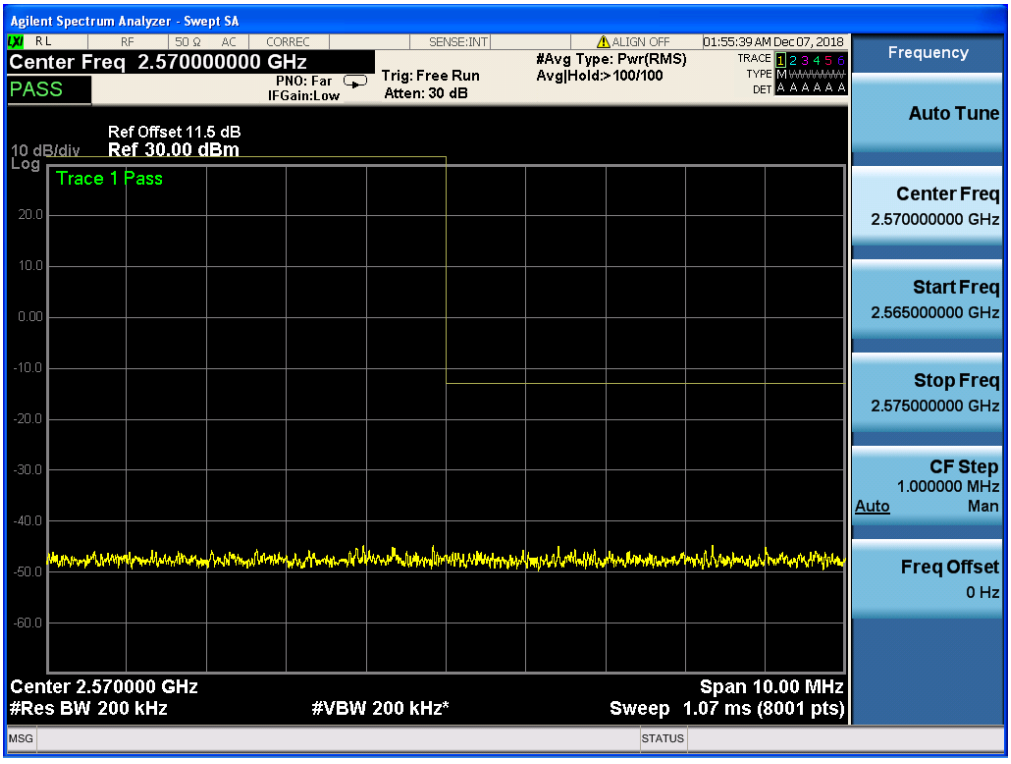
Band 7,UL Channel 20825,UL Frequency 2507.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



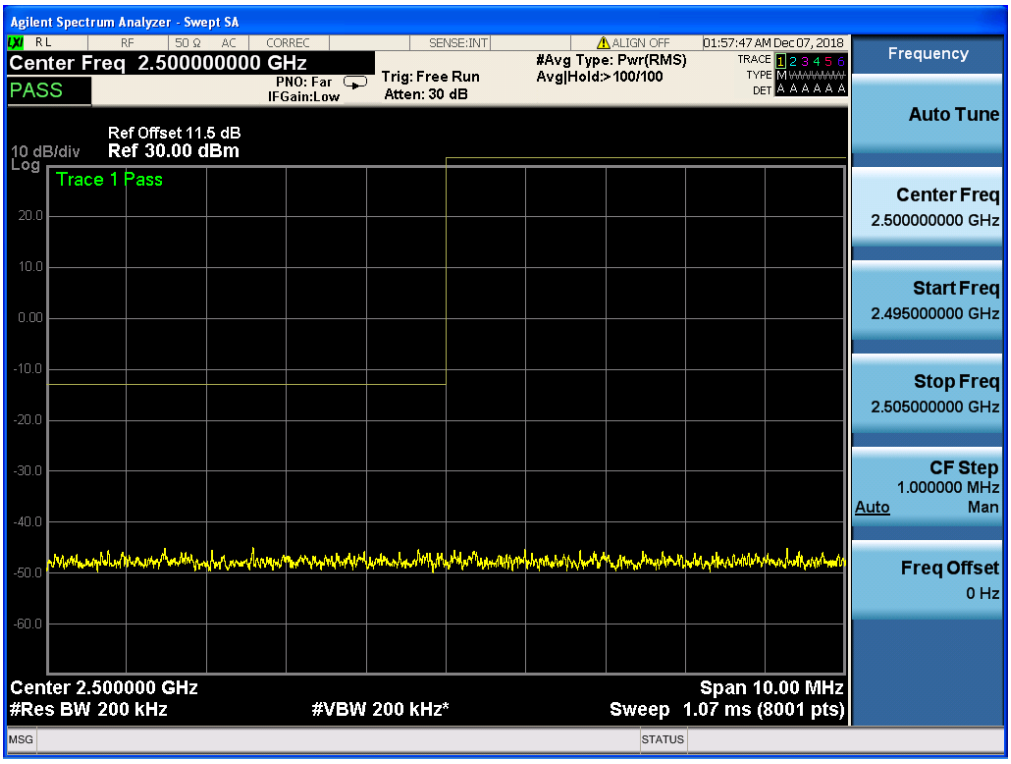
Band 7,UL Channel 20825,UL Frequency 2507.5,BW 15.0,NO. RB 75,RB POS. Low,16QAM



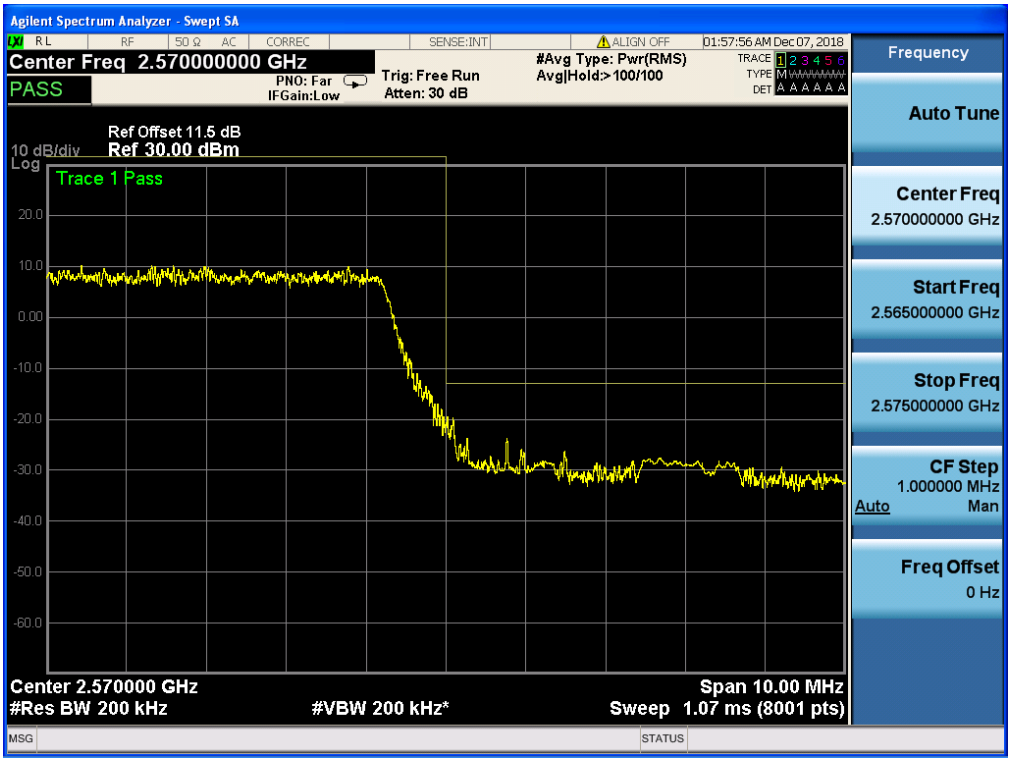
Band 7,UL Channel 20825,UL Frequency 2507.5,BW 15.0,NO. RB 75,RB POS. Low,16QAM



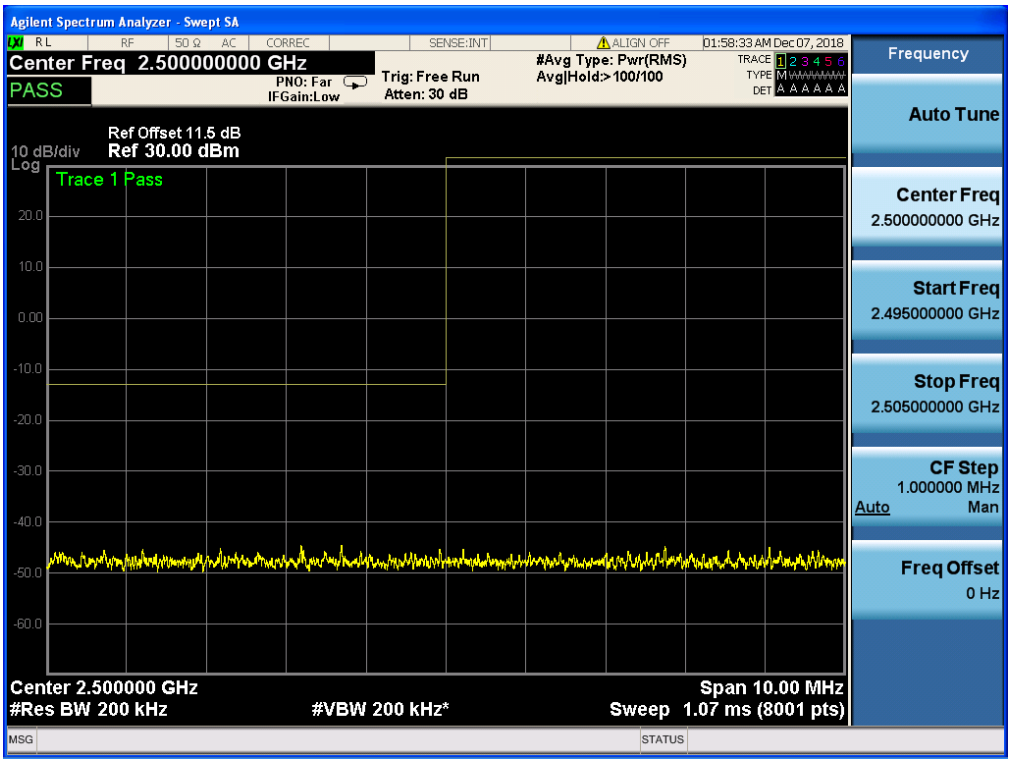
Band 7,UL Channel 21375,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



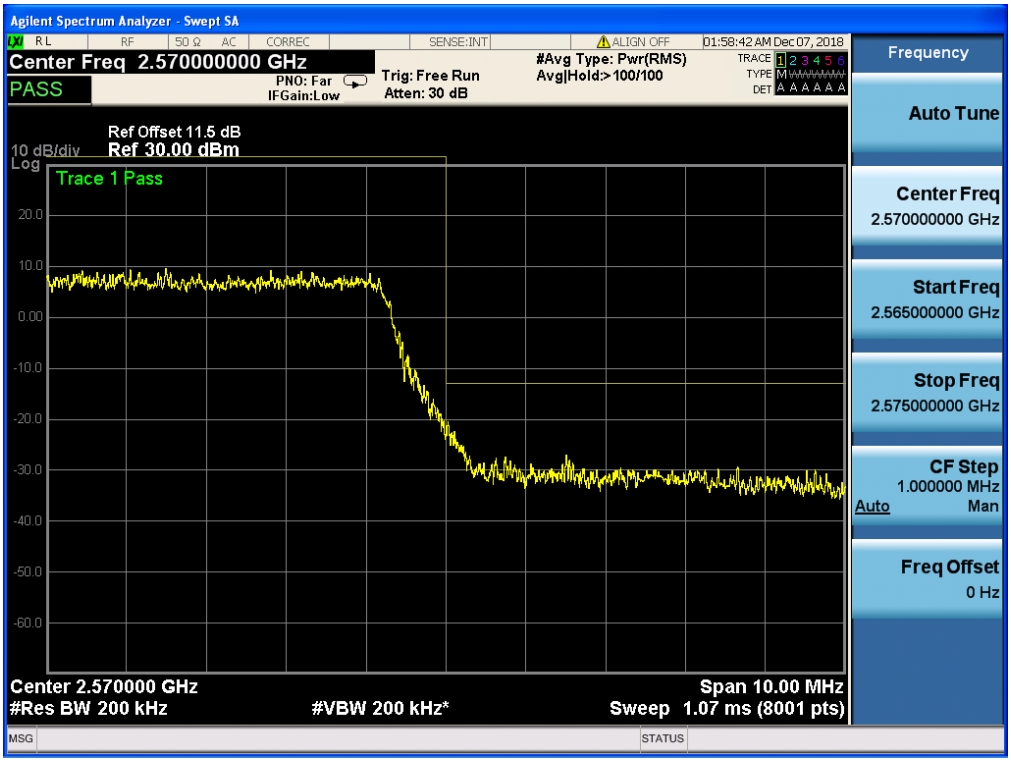
Band 7,UL Channel 21375,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



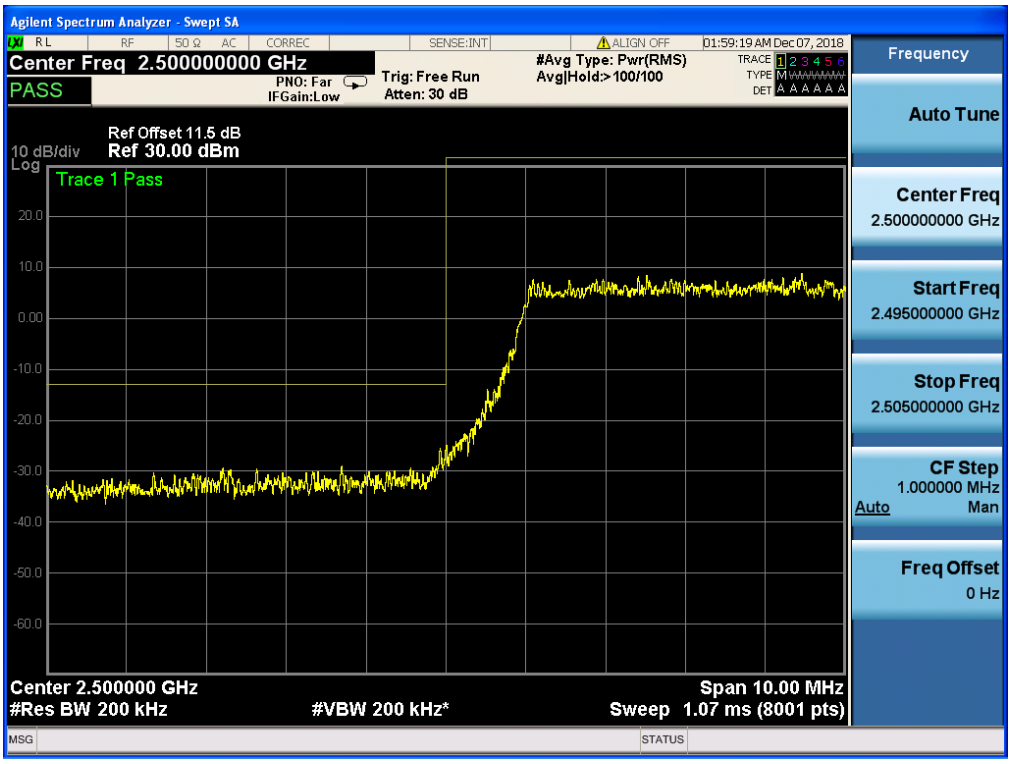
Band 7,UL Channel 21375,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,16QAM



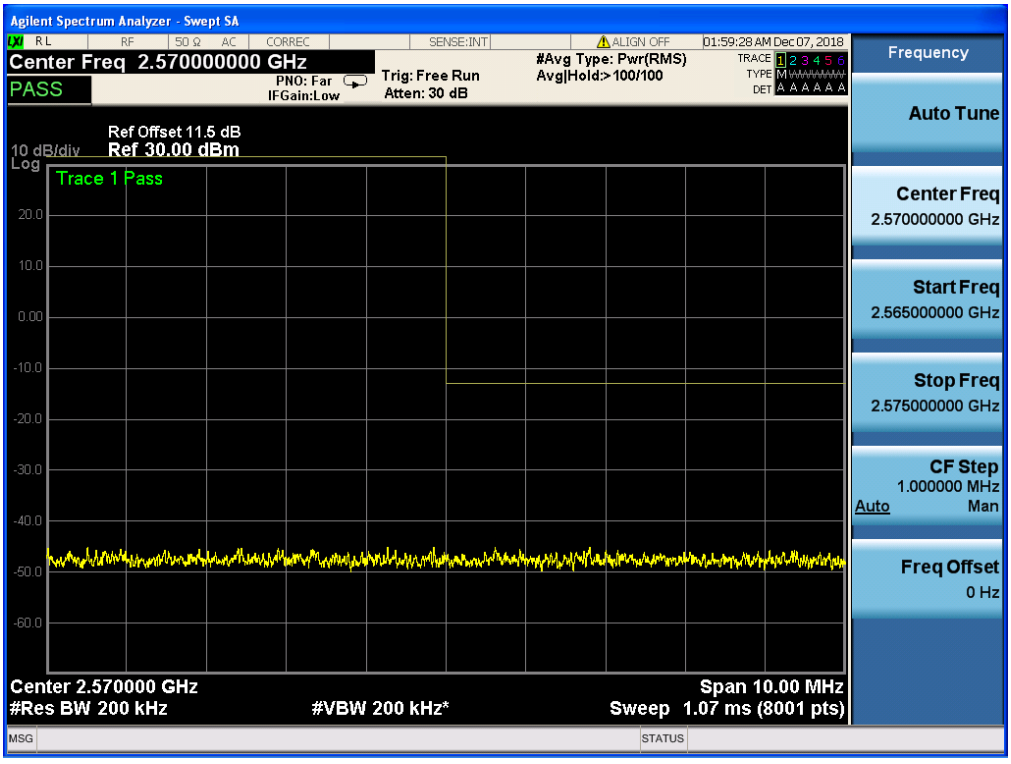
Band 7,UL Channel 21375,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,16QAM



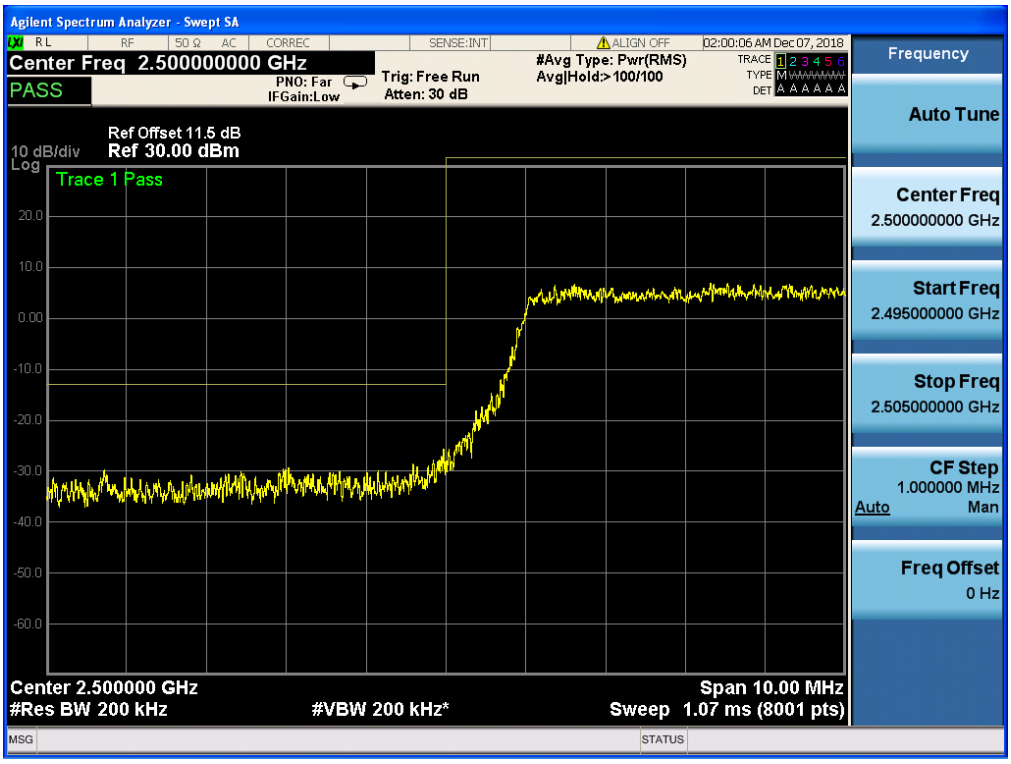
Band 7,UL Channel 20850,UL Frequency 2510.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



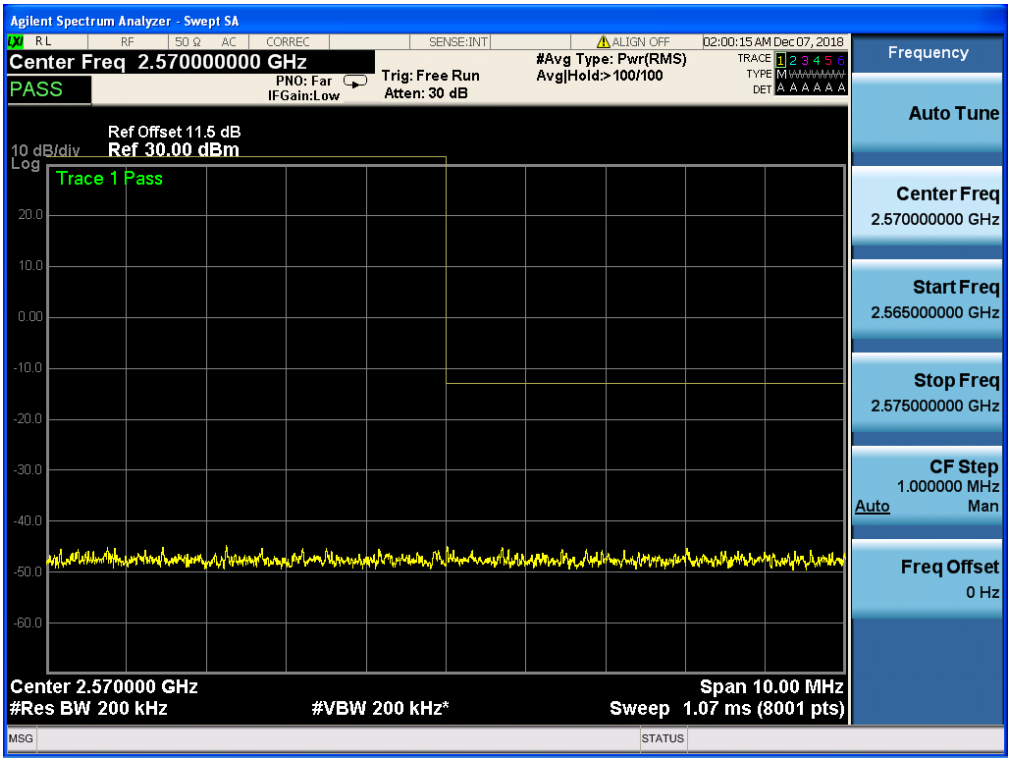
Band 7,UL Channel 20850,UL Frequency 2510.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



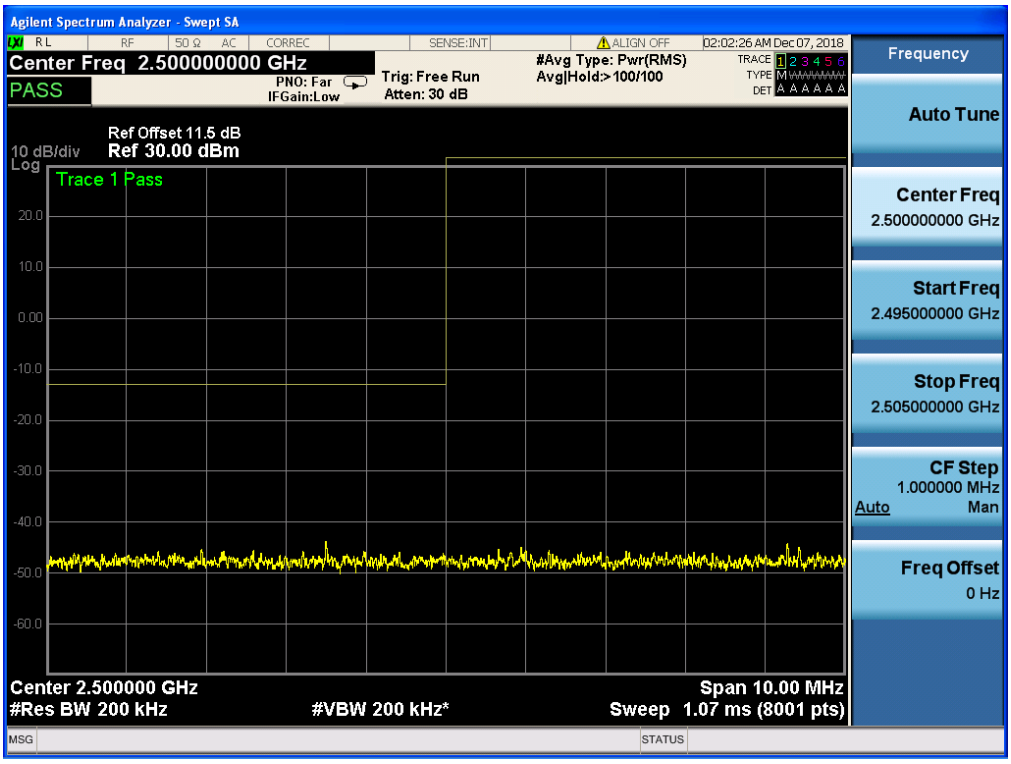
Band 7,UL Channel 20850,UL Frequency 2510.0,BW 20.0,NO. RB 100,RB POS. Low,16QAM



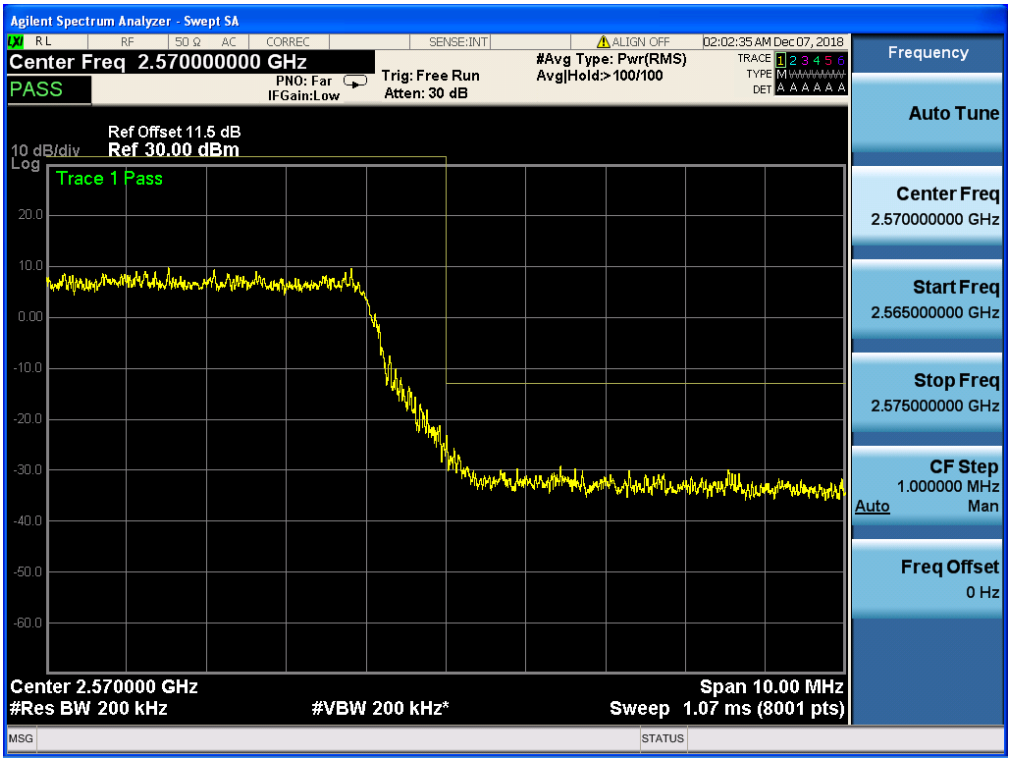
Band 7,UL Channel 20850,UL Frequency 2510.0,BW 20.0,NO. RB 100,RB POS. Low,16QAM



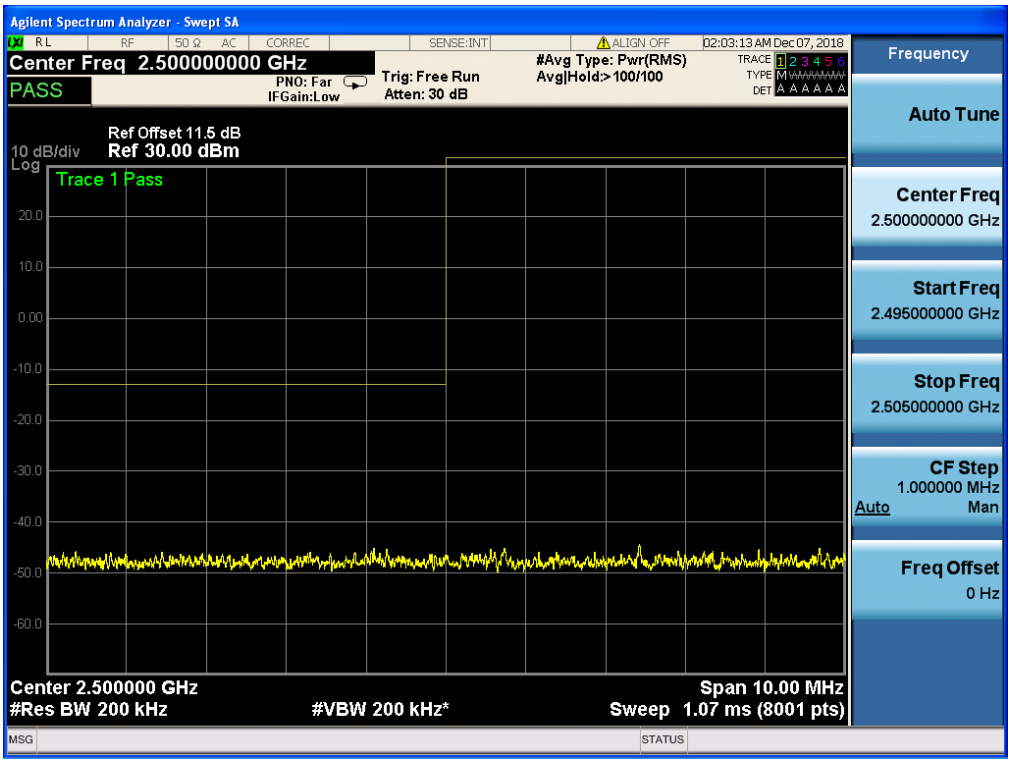
Band 7,UL Channel 21350,UL Frequency 2560.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



Band 7,UL Channel 21350,UL Frequency 2560.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



Band 7,UL Channel 21350,UL Frequency 2560.0,BW 20.0,NO. RB 100,RB POS. Low,16QAM



Band 7,UL Channel 21350,UL Frequency 2560.0,BW 20.0,NO. RB 100,RB POS. Low,16QAM