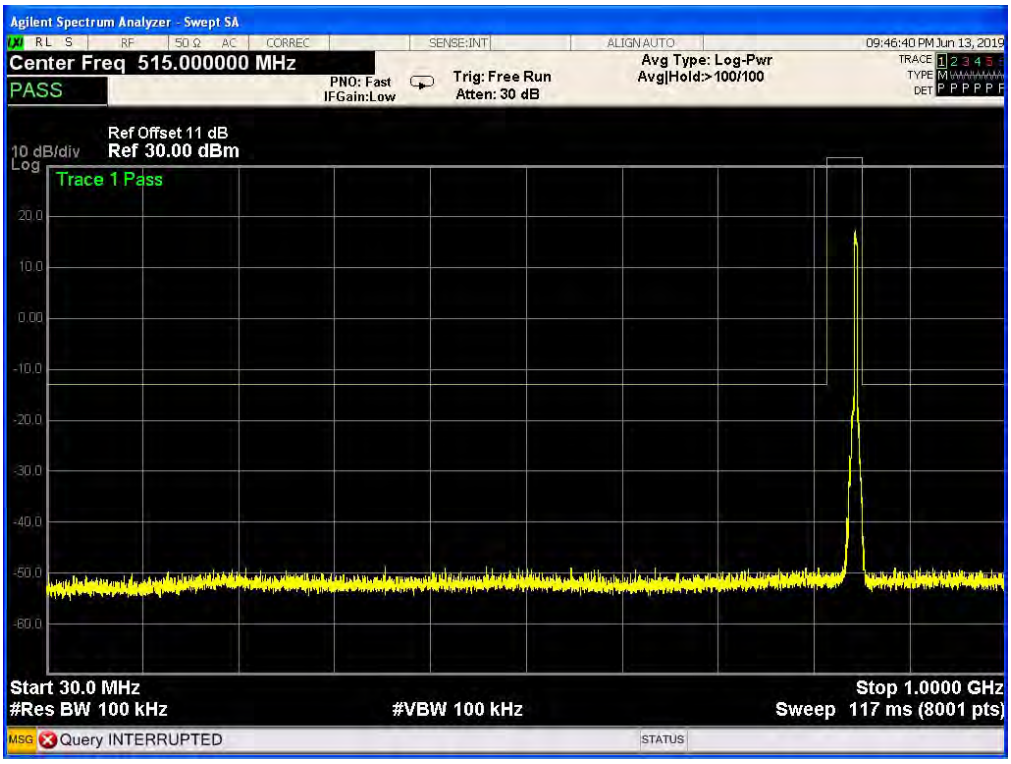
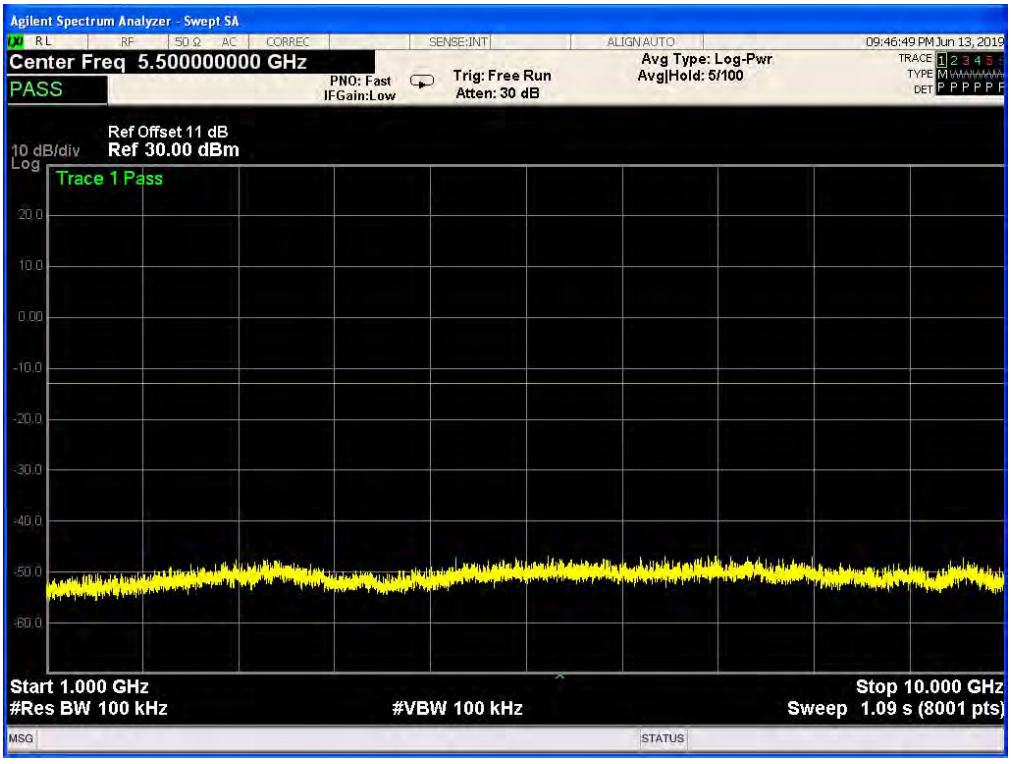
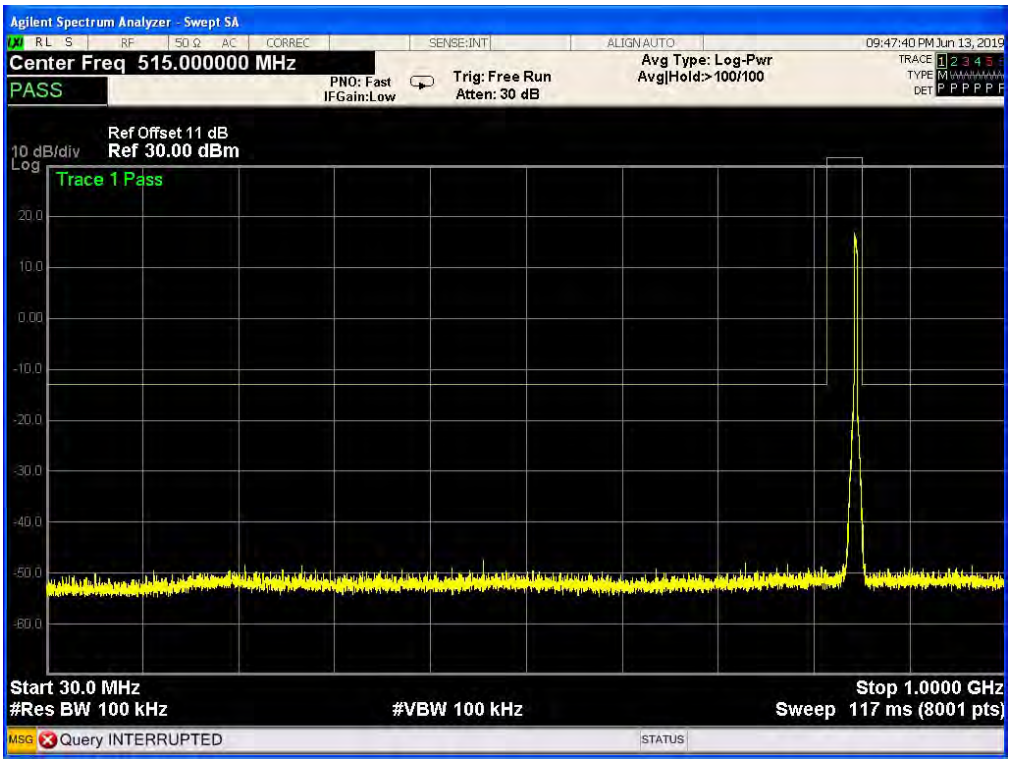
Band 5,UL Channel 20635,UL Frequency 847.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



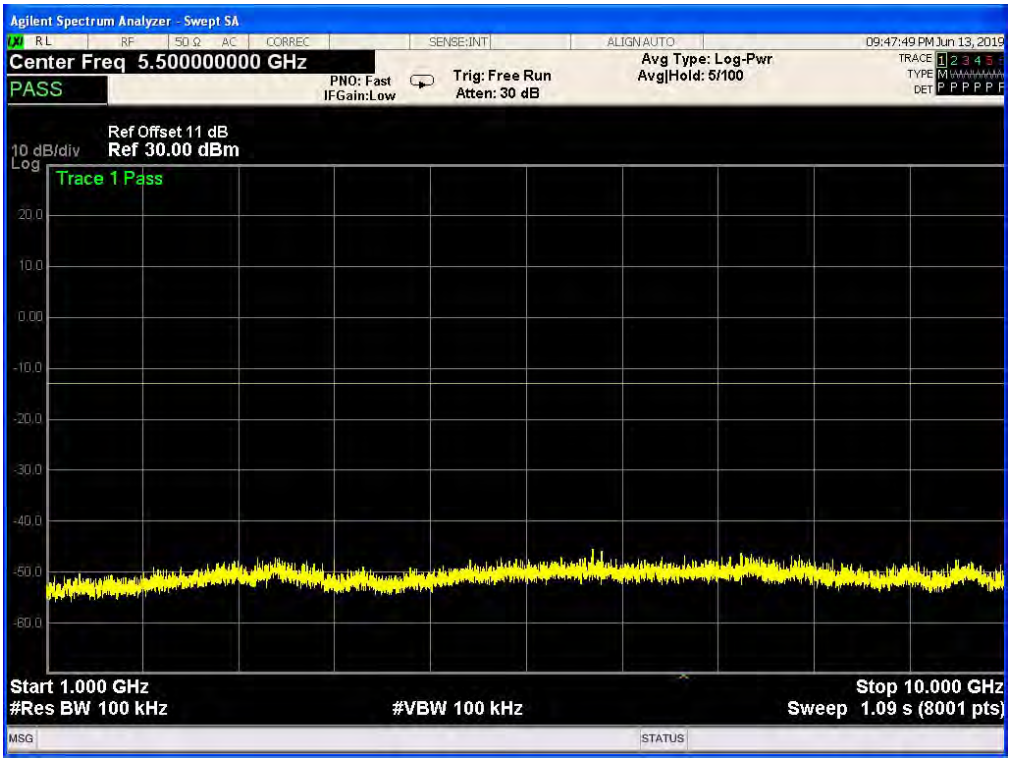
Band 5,UL Channel 20635,UL Frequency 847.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



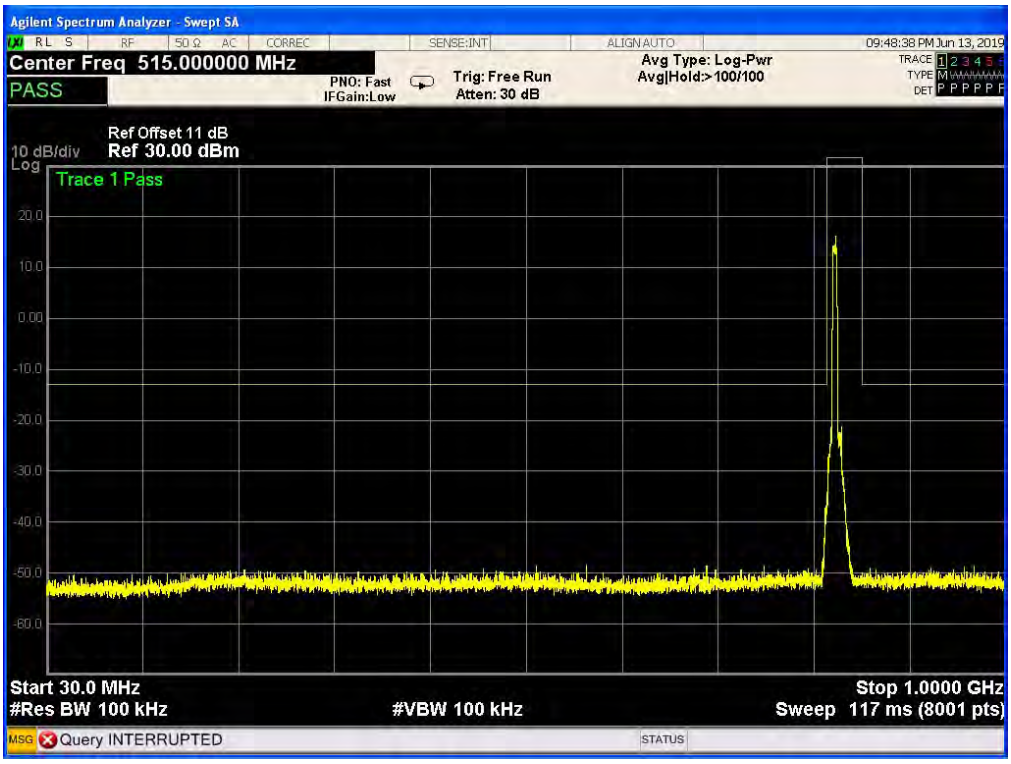
Band 5,UL Channel 20635,UL Frequency 847.5,BW 3.0,NO. RB 15,RB POS. Low,16-QAM



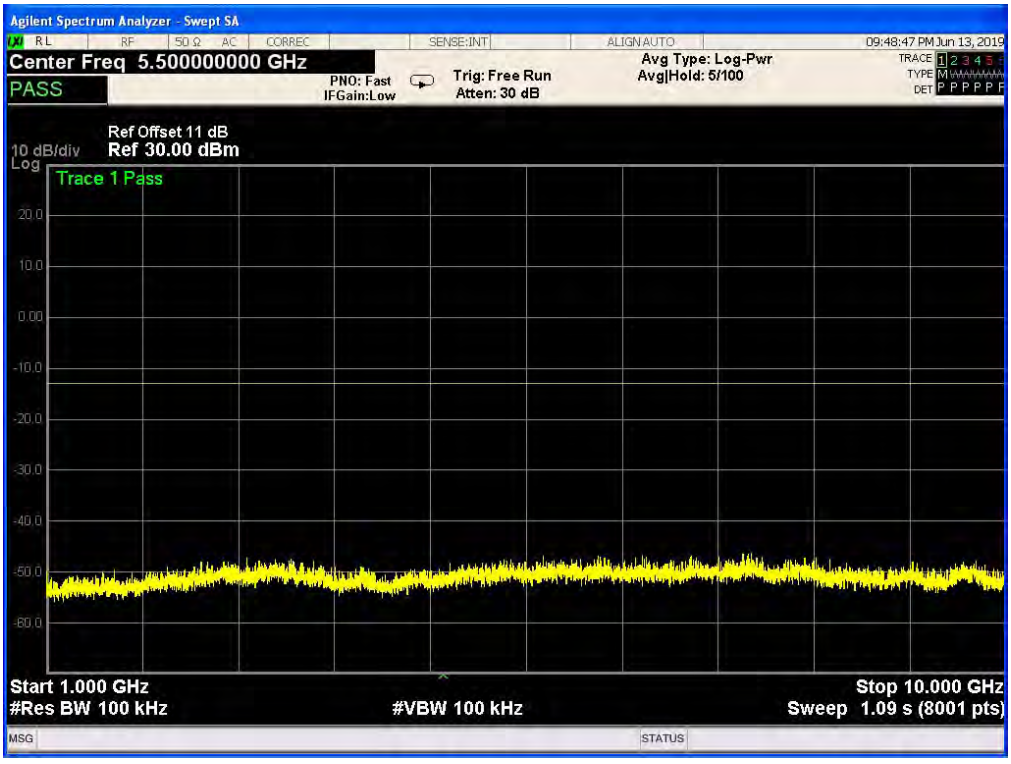
Band 5,UL Channel 20635,UL Frequency 847.5,BW 3.0,NO. RB 15,RB POS. Low,16-QAM



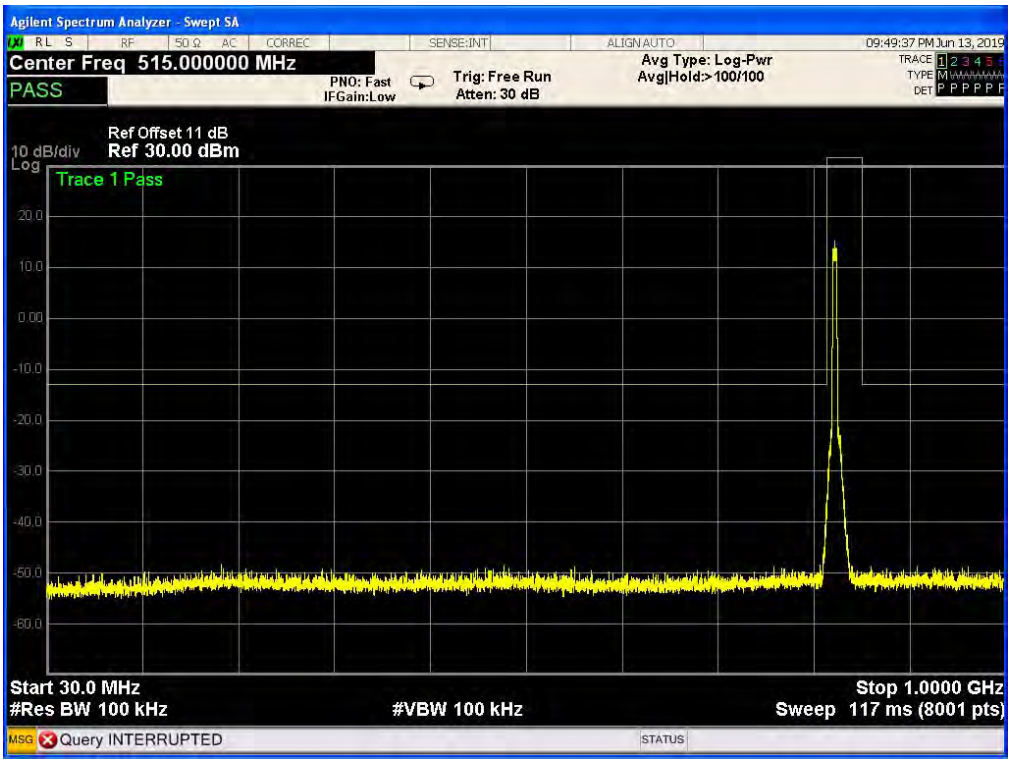
Band 5,UL Channel 20425,UL Frequency 826.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



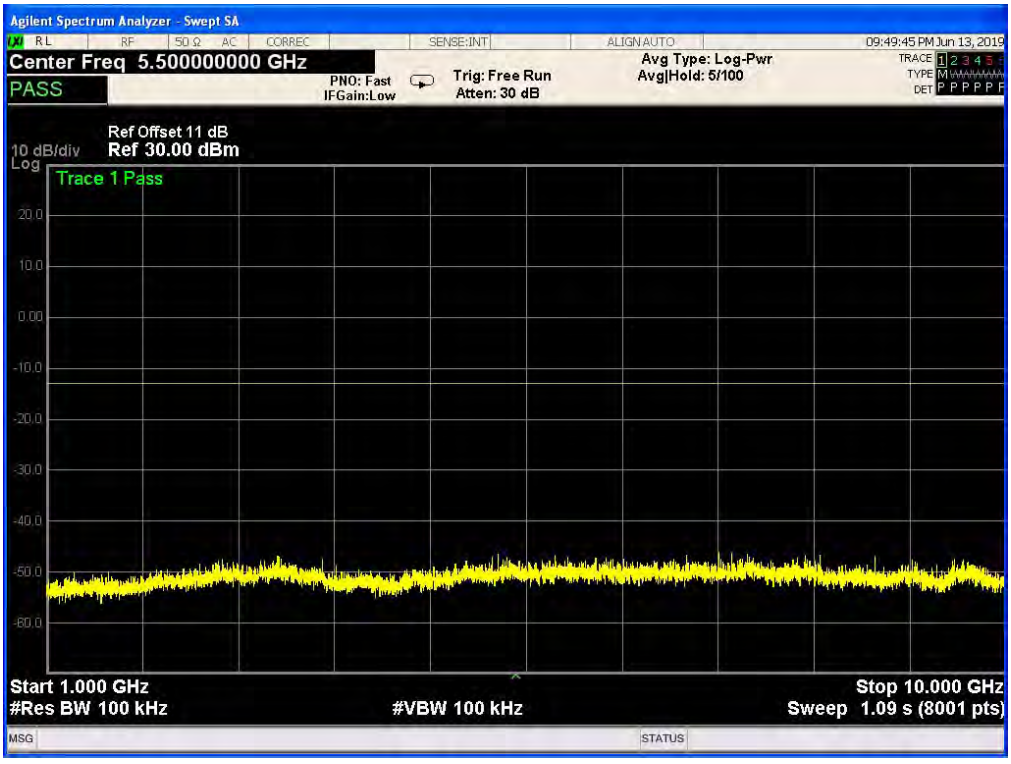
Band 5,UL Channel 20425,UL Frequency 826.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



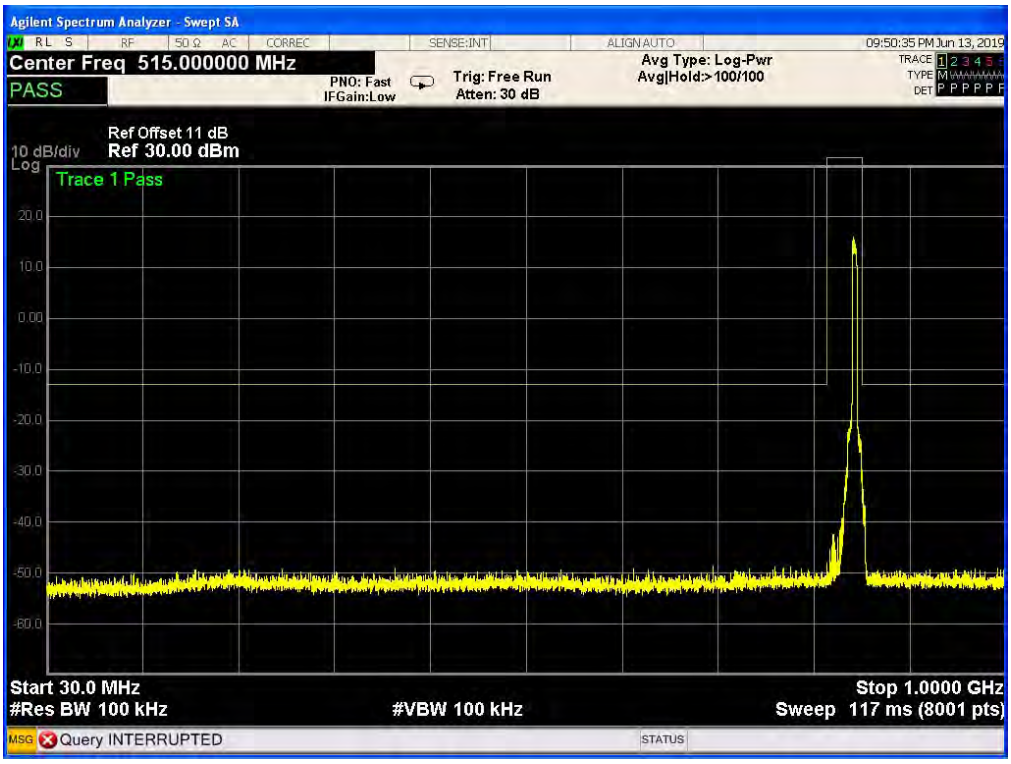
Band 5,UL Channel 20425,UL Frequency 826.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



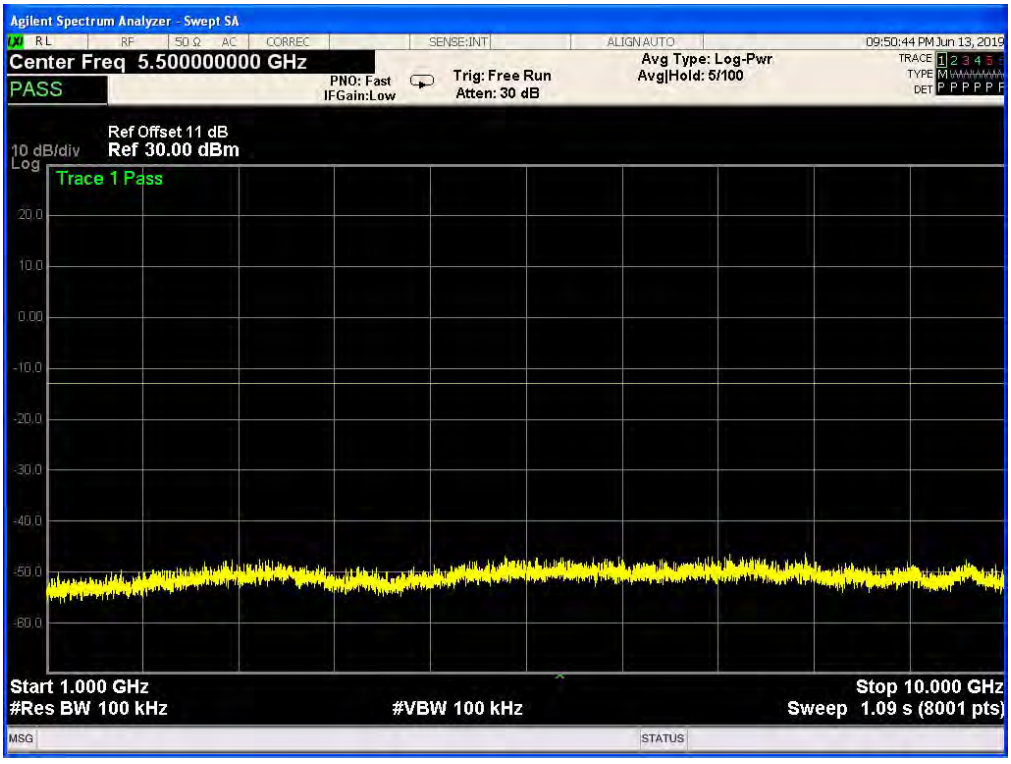
Band 5,UL Channel 20425,UL Frequency 826.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



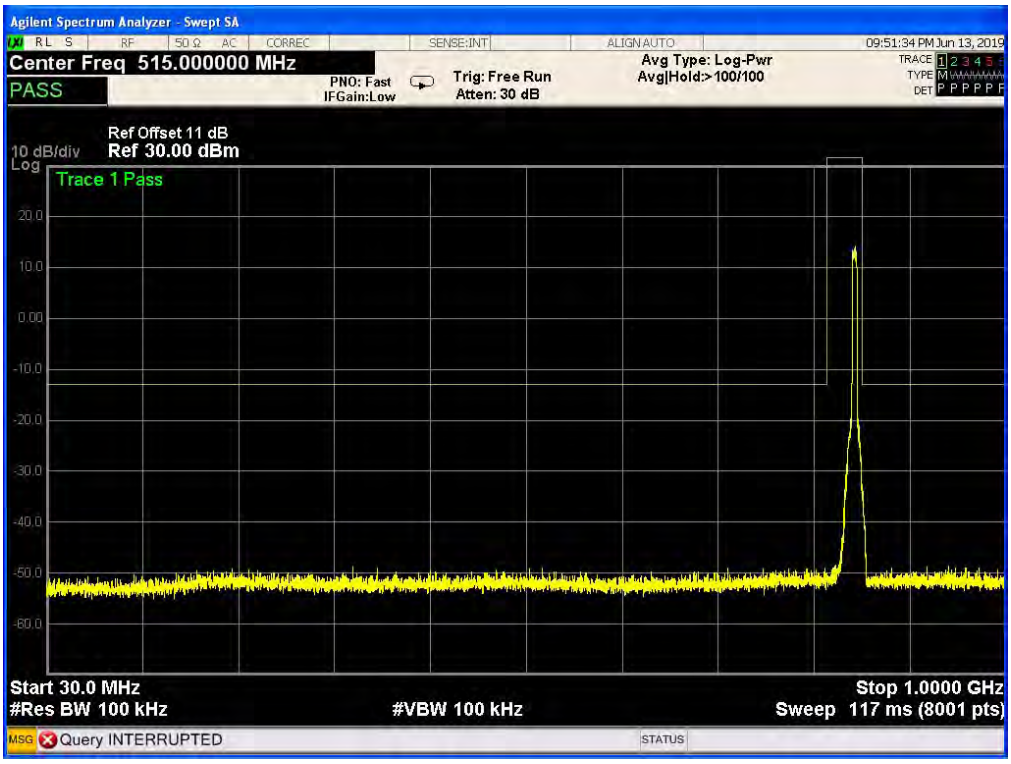
Band 5,UL Channel 20625,UL Frequency 846.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



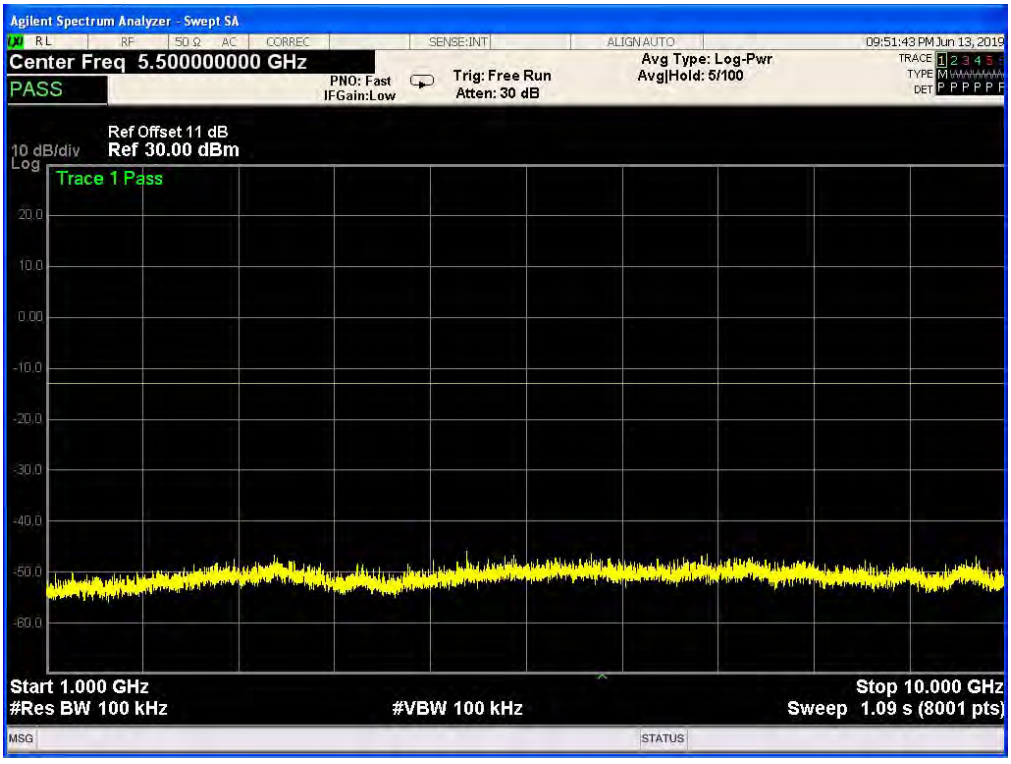
Band 5,UL Channel 20625,UL Frequency 846.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



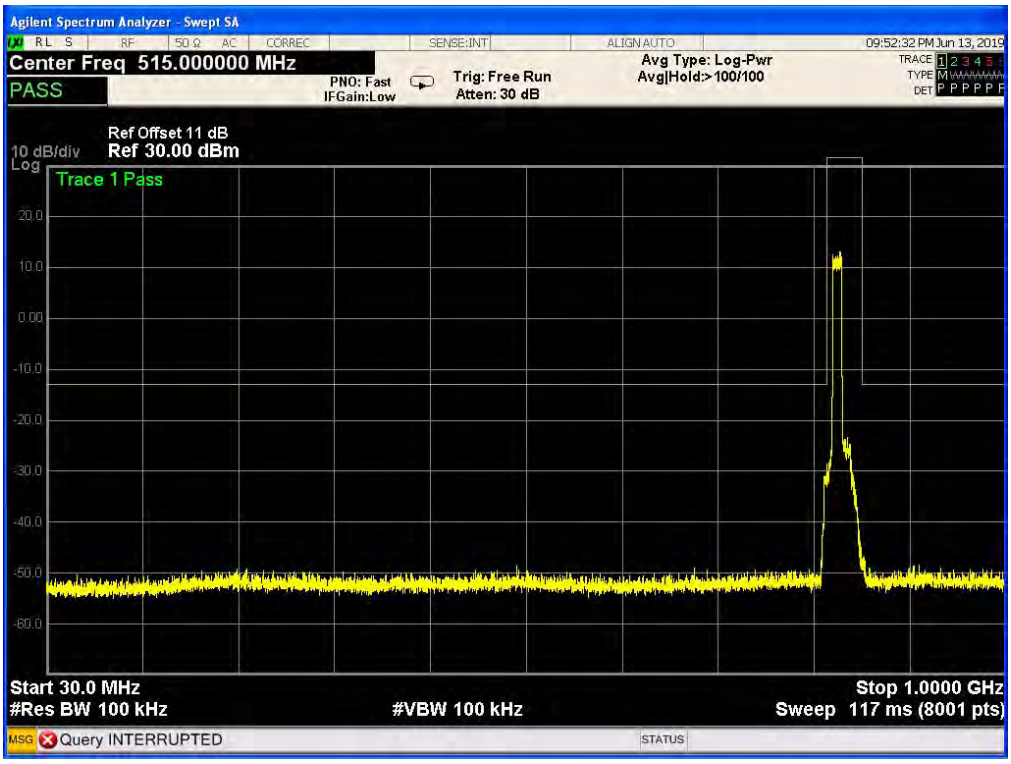
Band 5,UL Channel 20625,UL Frequency 846.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



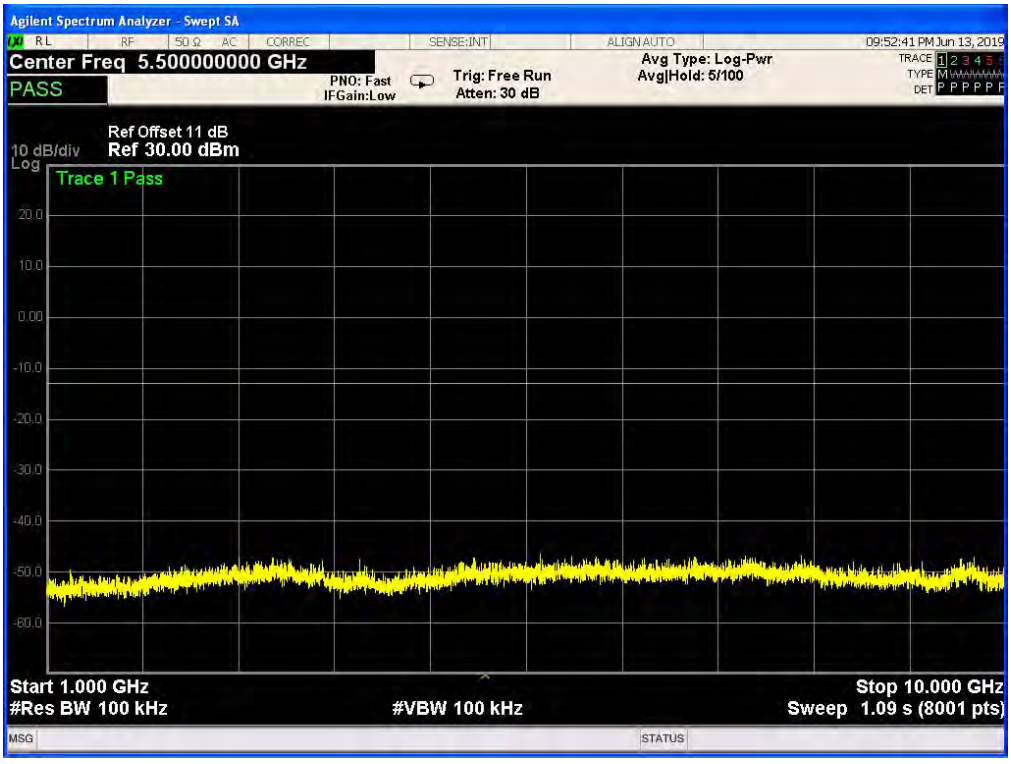
Band 5,UL Channel 20625,UL Frequency 846.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



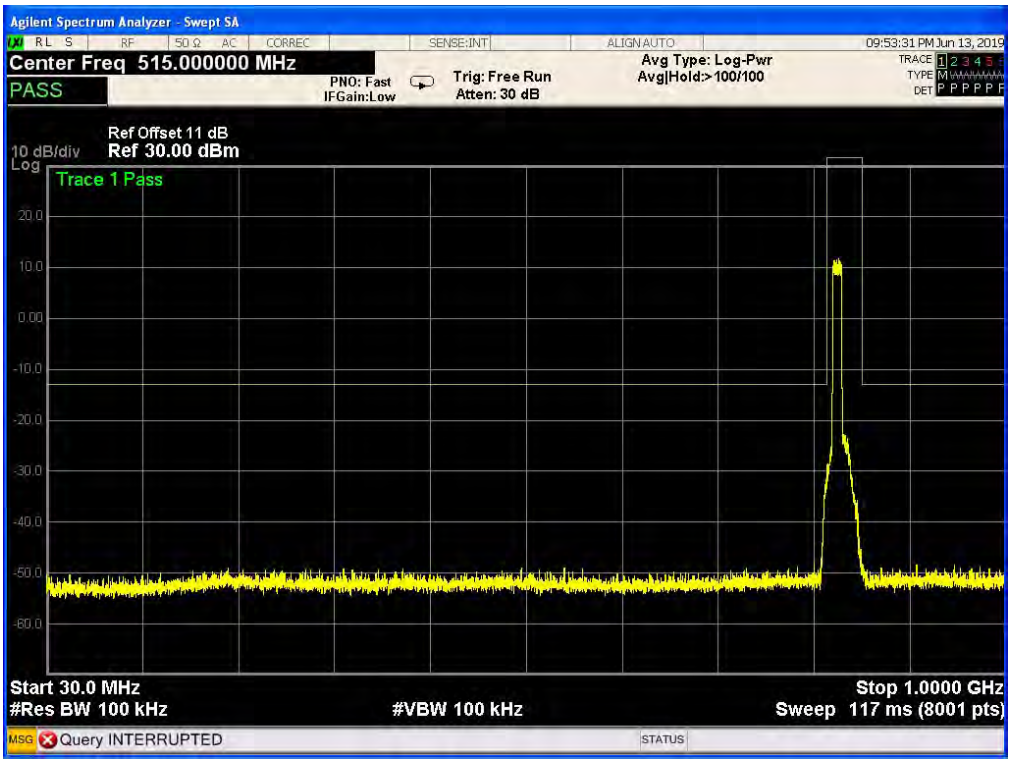
Band 5,UL Channel 20450,UL Frequency 829.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



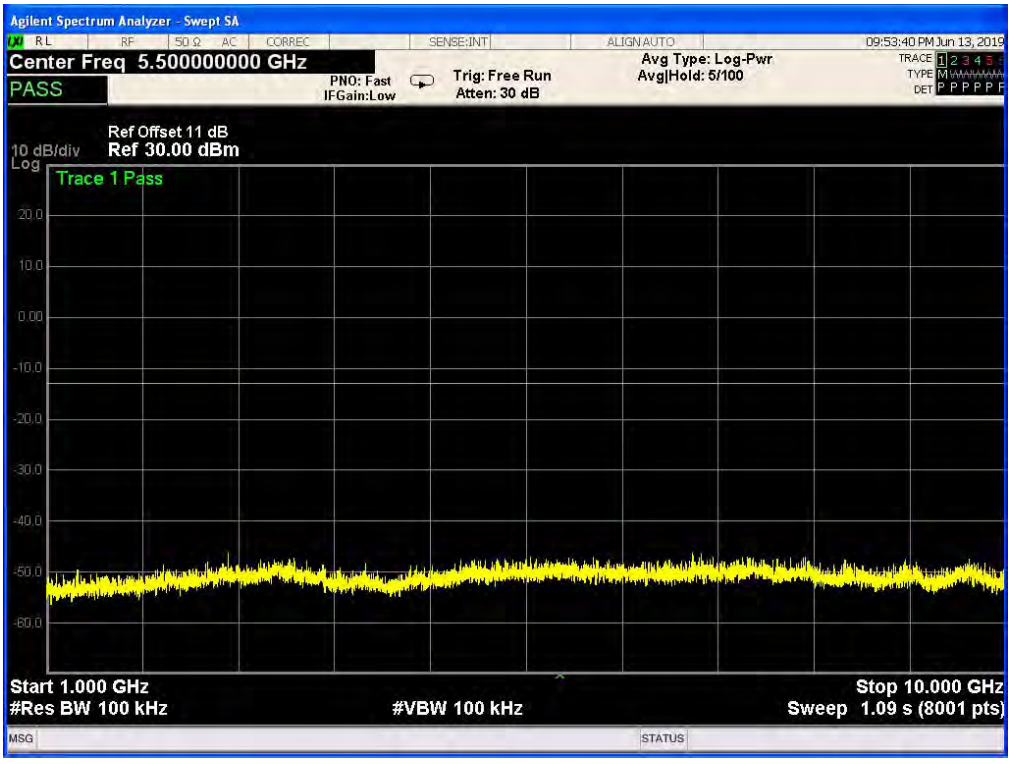
Band 5,UL Channel 20450,UL Frequency 829.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



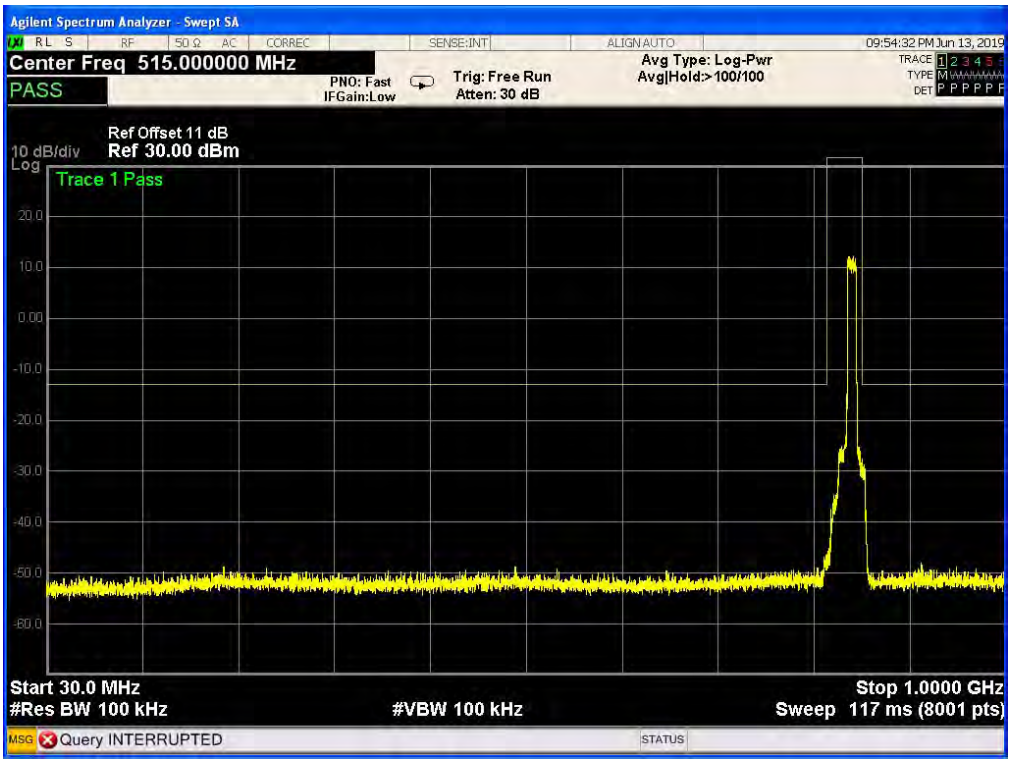
Band 5,UL Channel 20450,UL Frequency 829.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



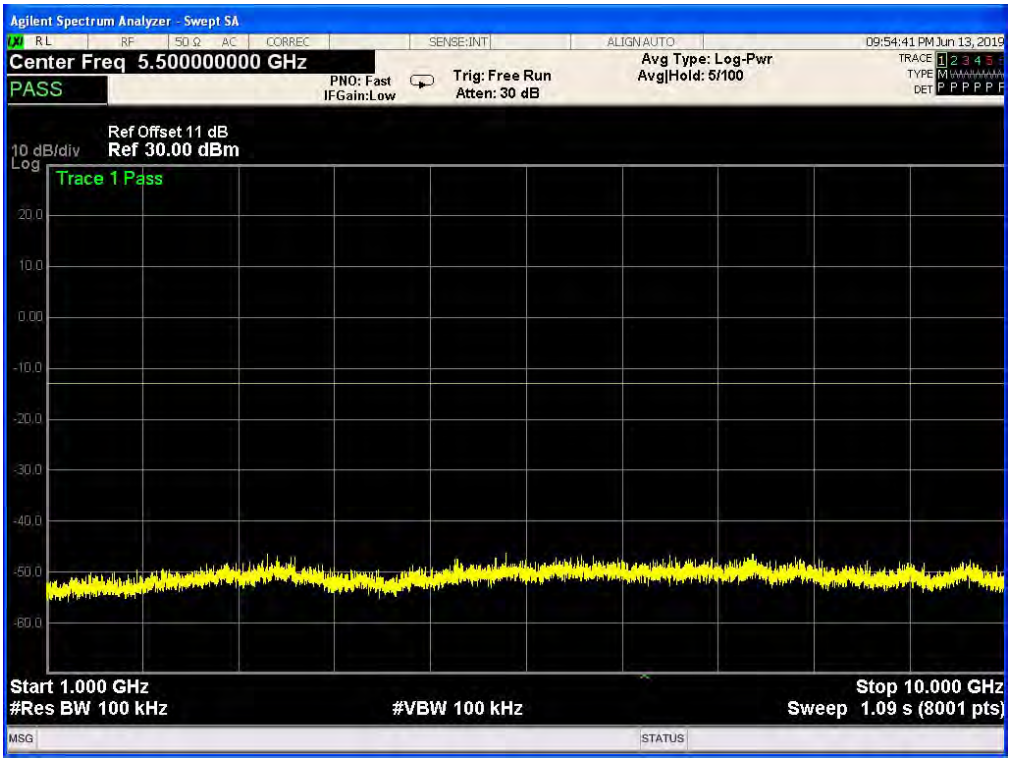
Band 5,UL Channel 20450,UL Frequency 829.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



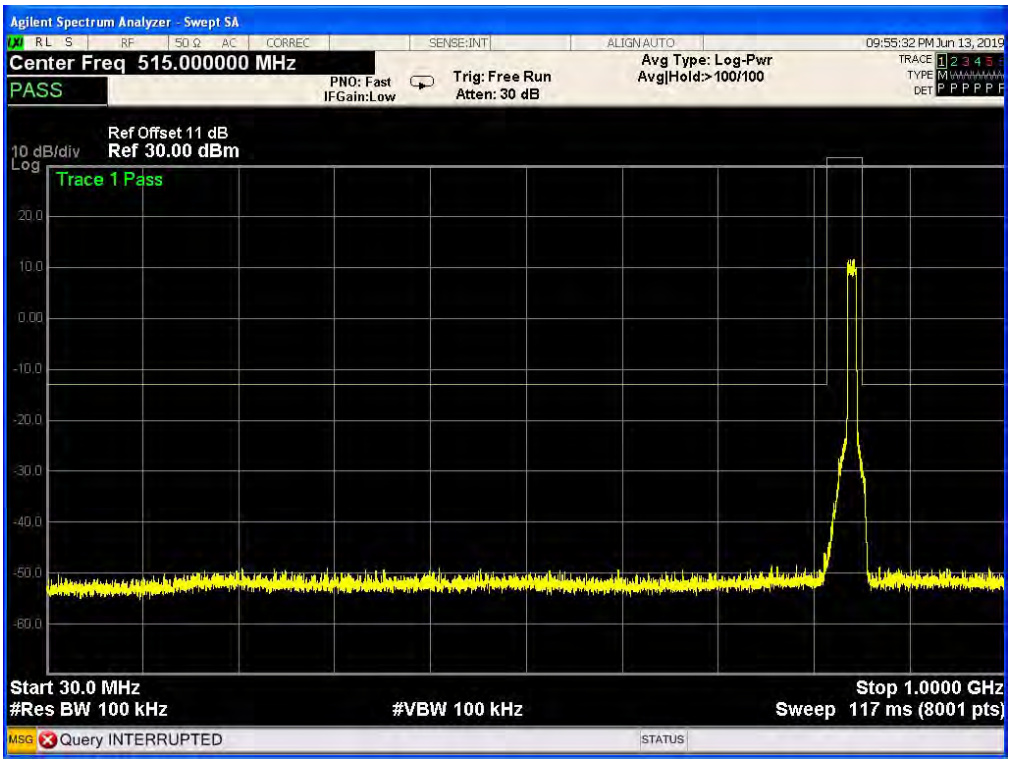
Band 5,UL Channel 20600,UL Frequency 844.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



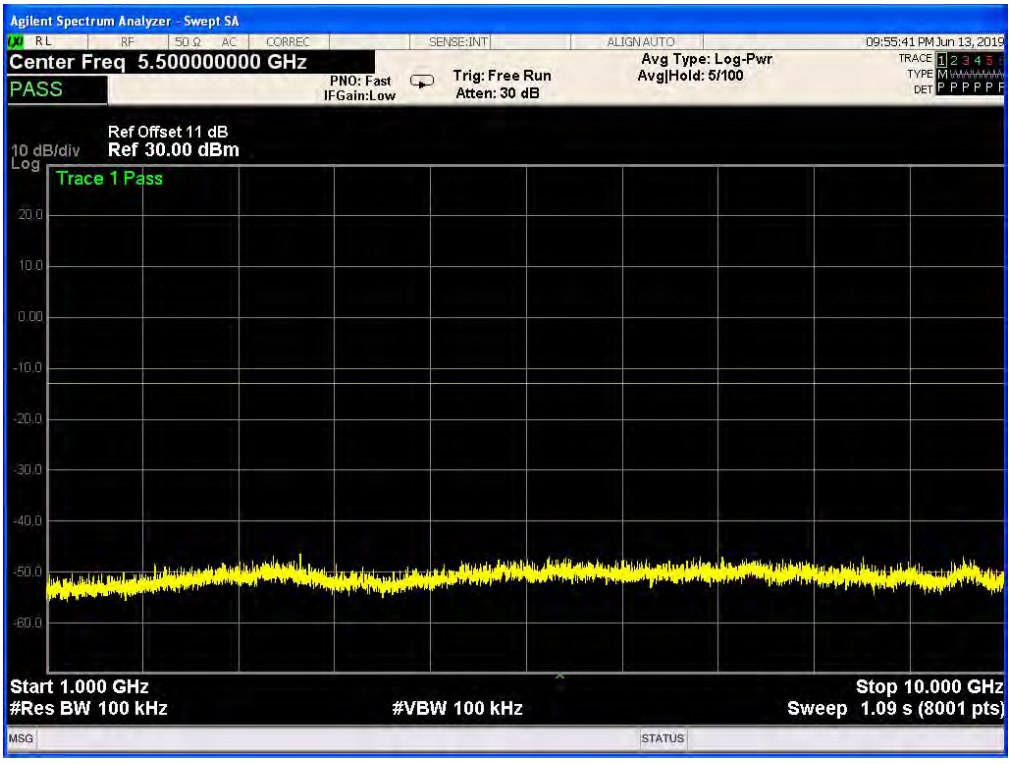
Band 5,UL Channel 20600,UL Frequency 844.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



Band 5,UL Channel 20600,UL Frequency 844.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM

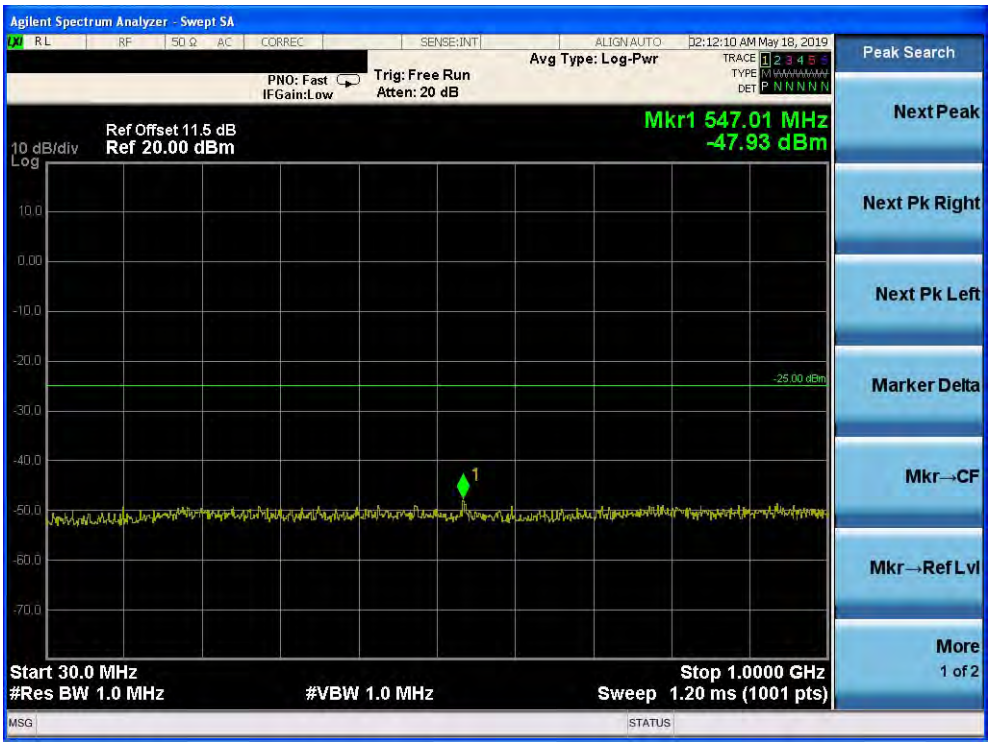


Band 5,UL Channel 20600,UL Frequency 844.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM

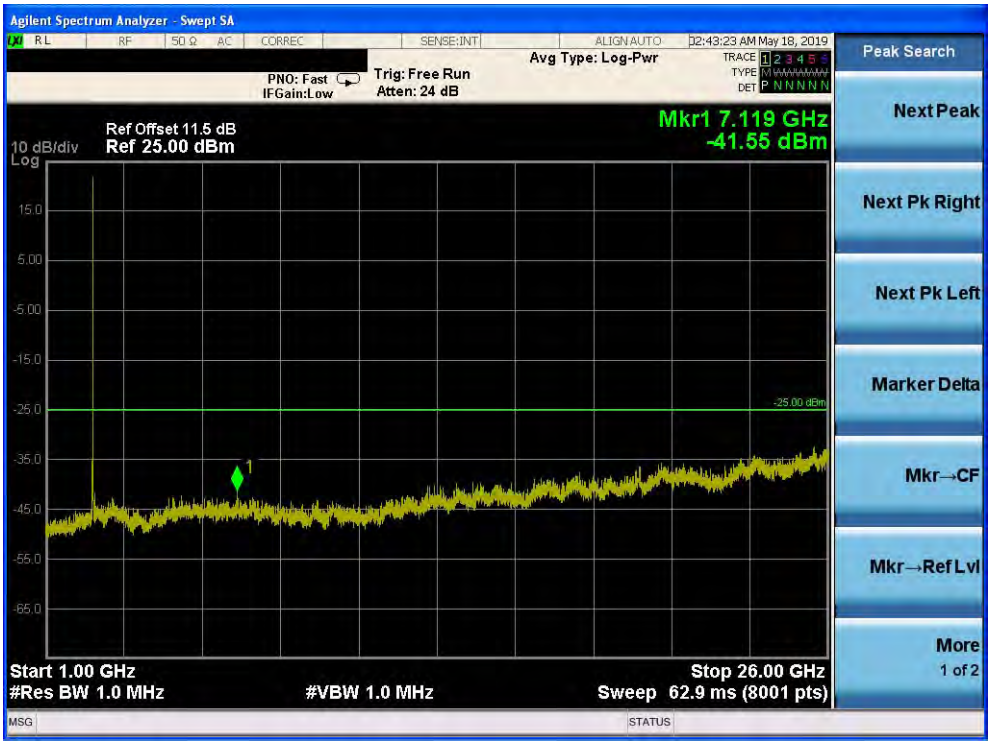


7.4 LTE BAND 7

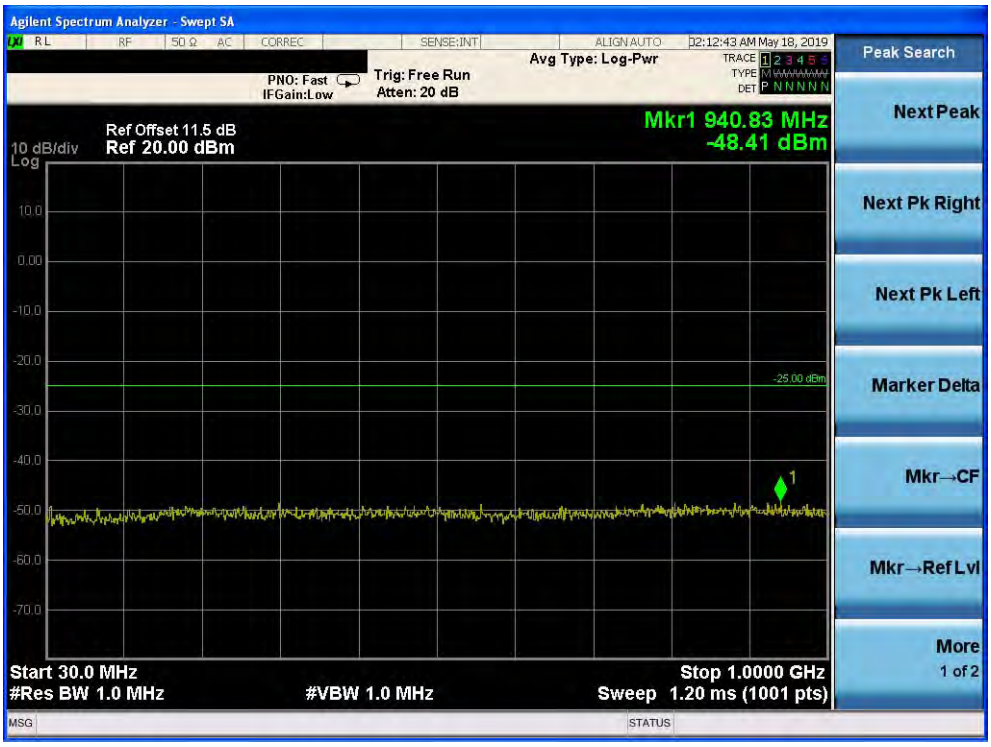
Band 7,UL Channel 20775,UL Frequency 2502.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



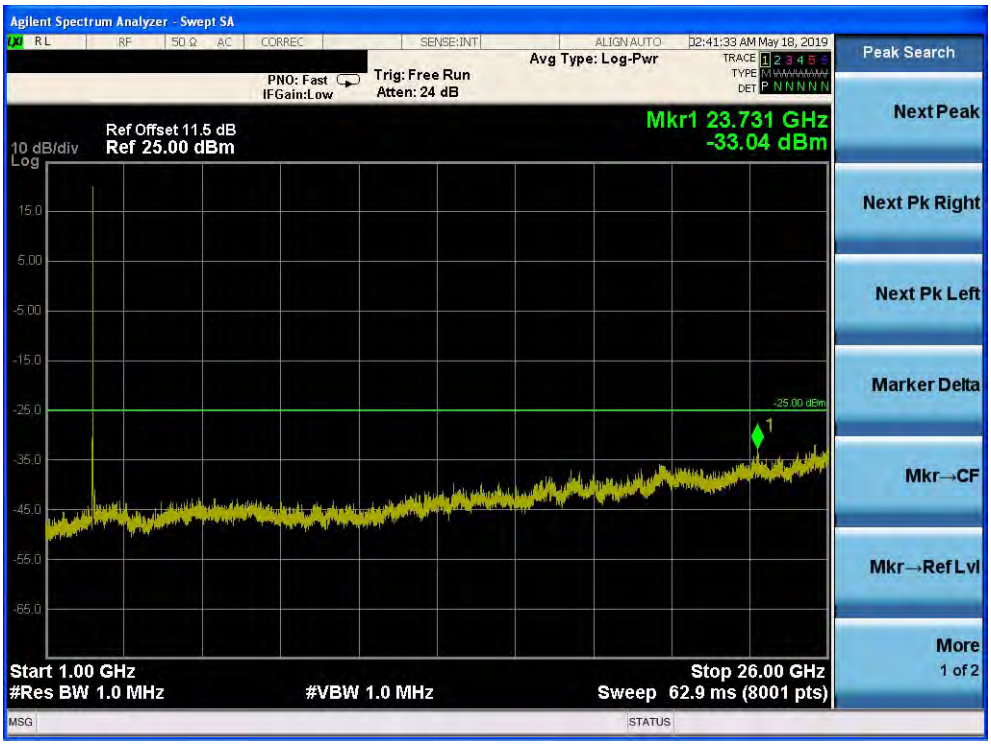
Band 7,UL Channel 20775,UL Frequency 2502.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



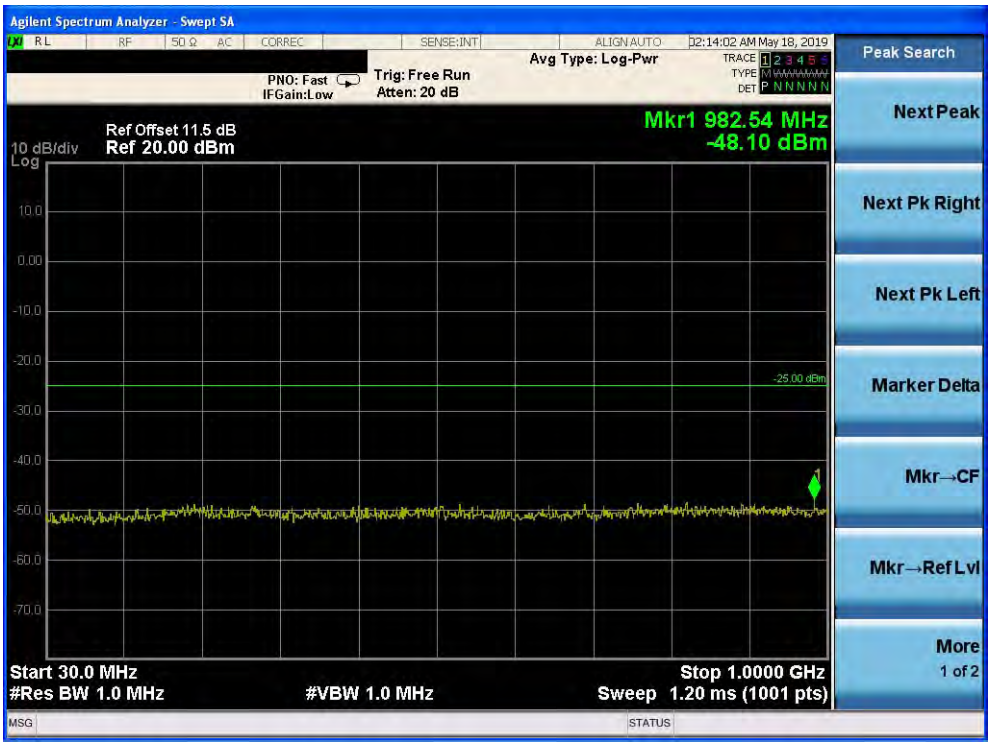
Band 7,UL Channel 20775,UL Frequency 2502.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



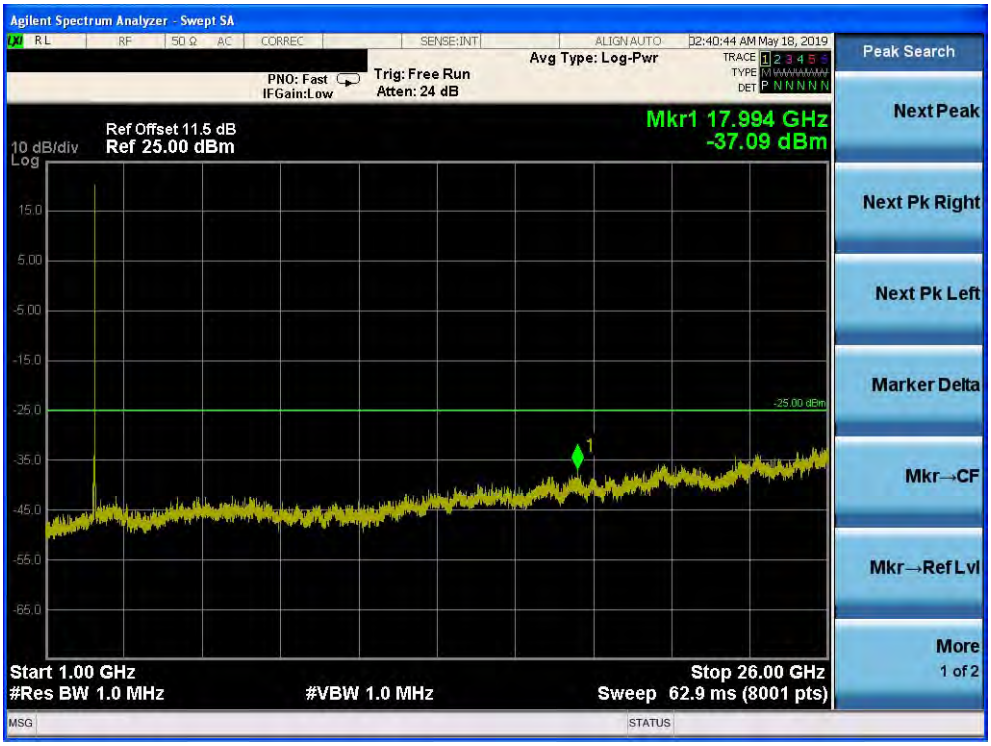
Band 7,UL Channel 20775,UL Frequency 2502.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



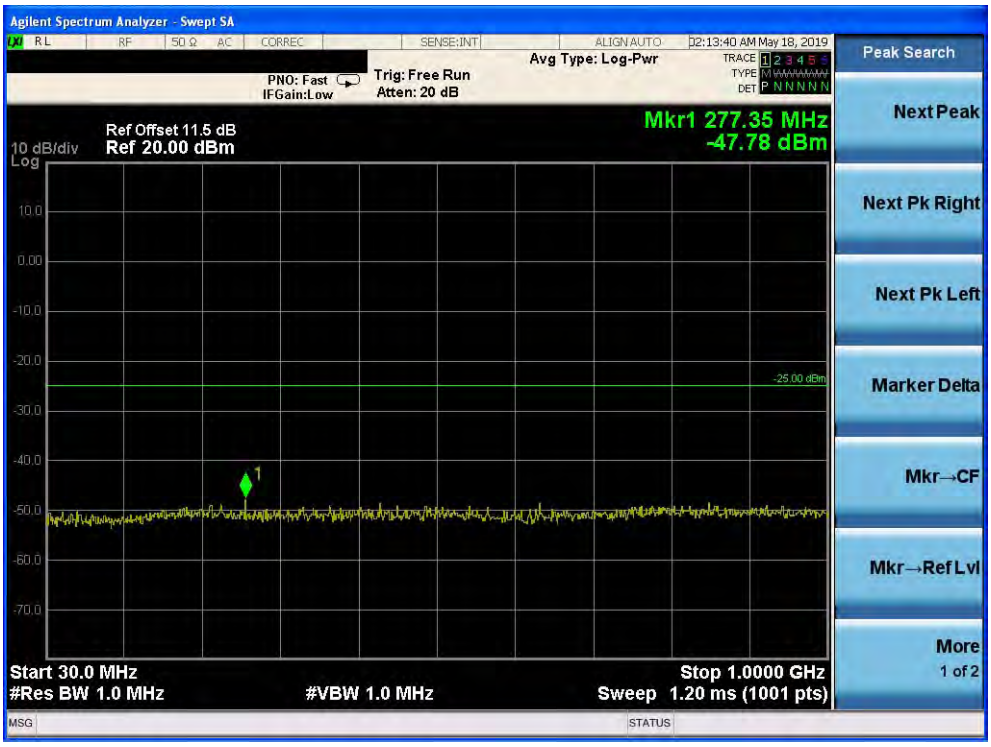
Band 7,UL Channel 21425,UL Frequency 2567.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



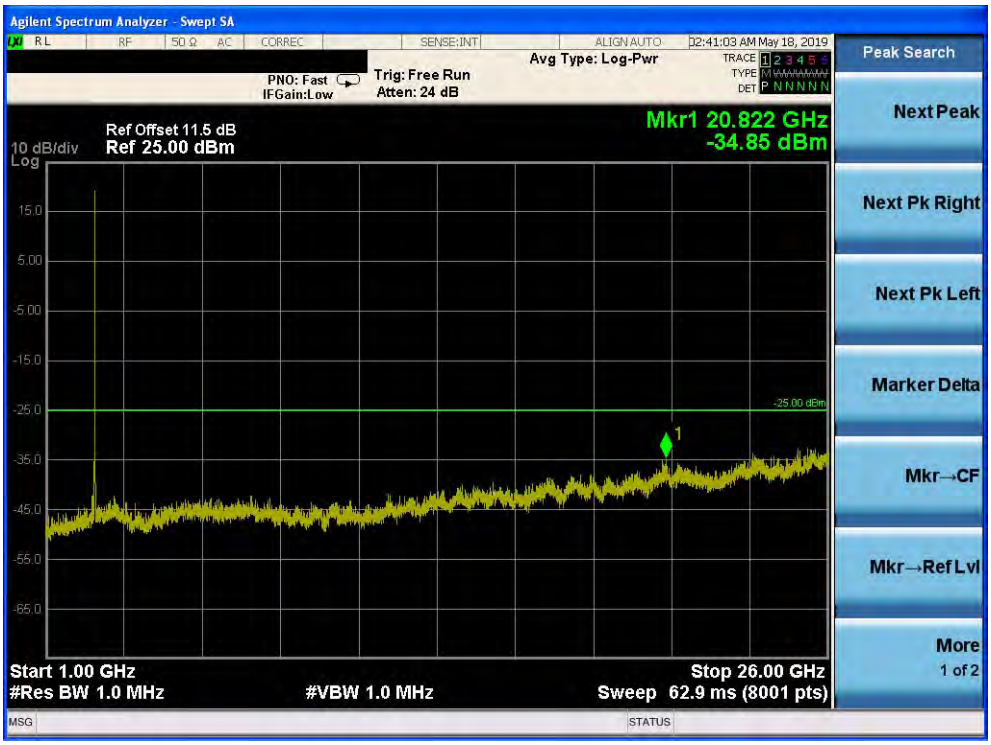
Band 7,UL Channel 21425,UL Frequency 2567.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



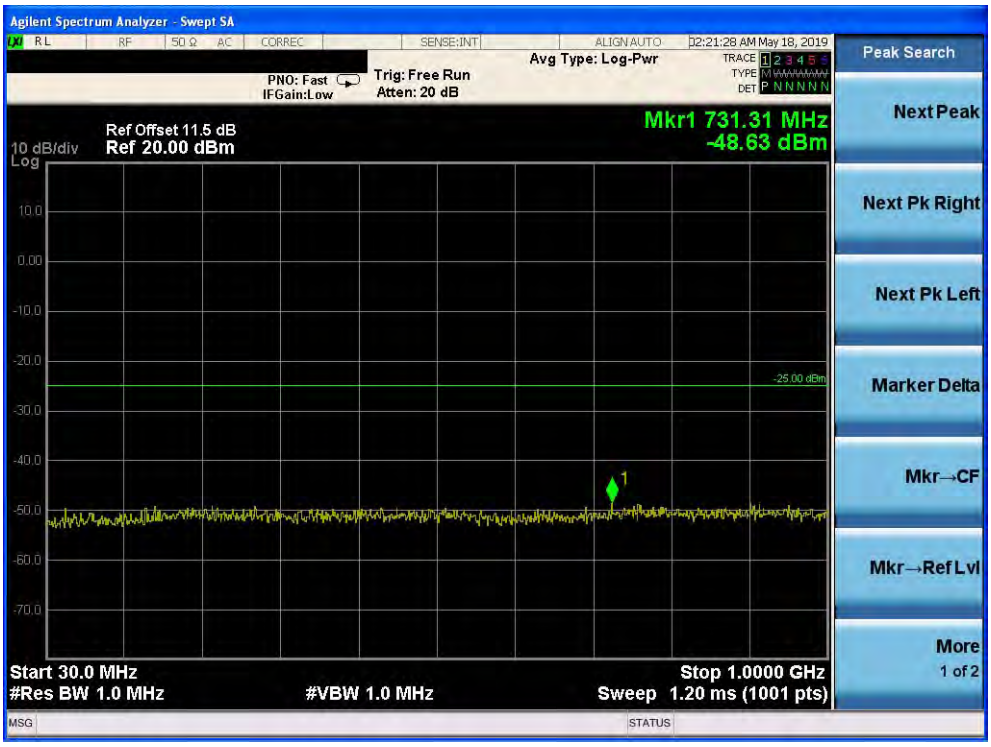
Band 7,UL Channel 21425,UL Frequency 2567.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



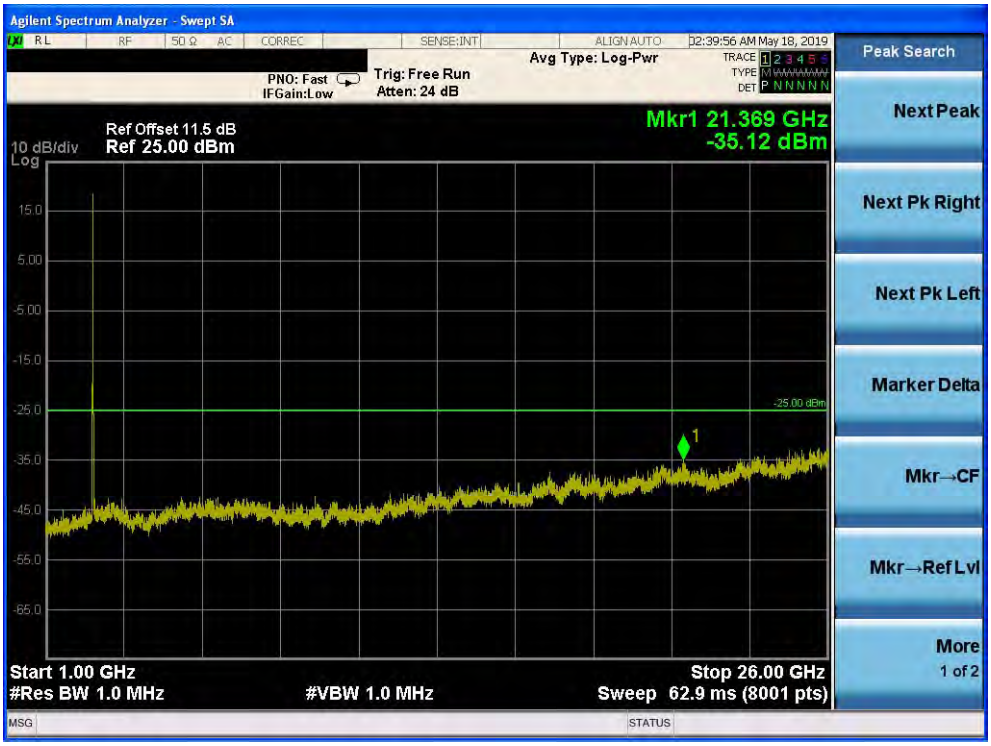
Band 7,UL Channel 21425,UL Frequency 2567.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



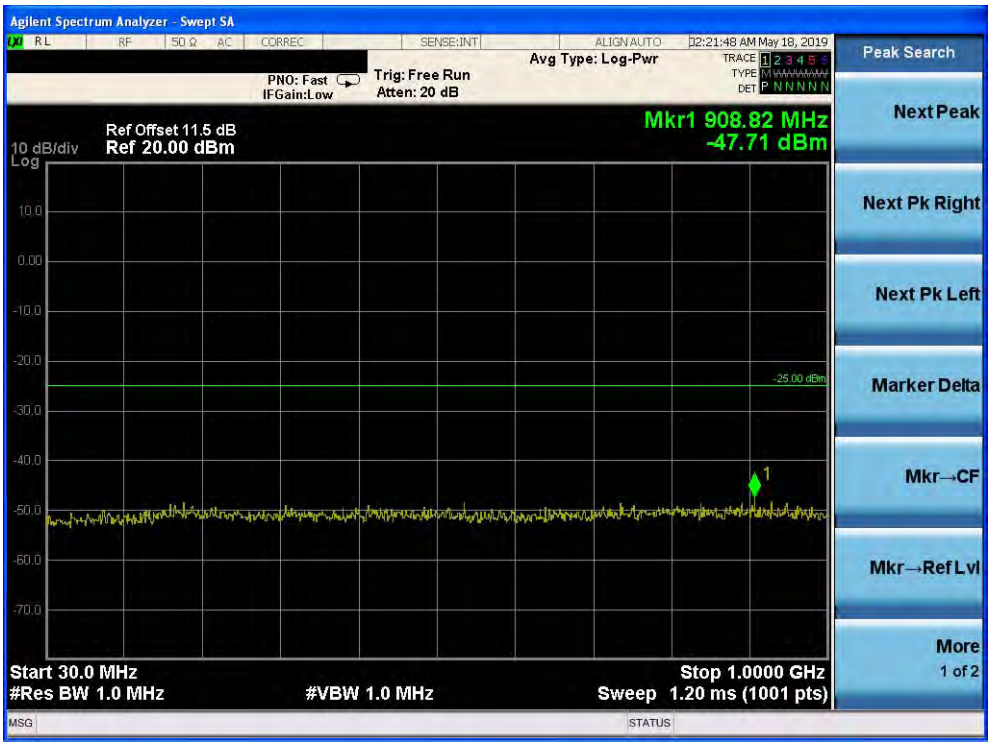
Band 7,UL Channel 20800,UL Frequency 2505.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



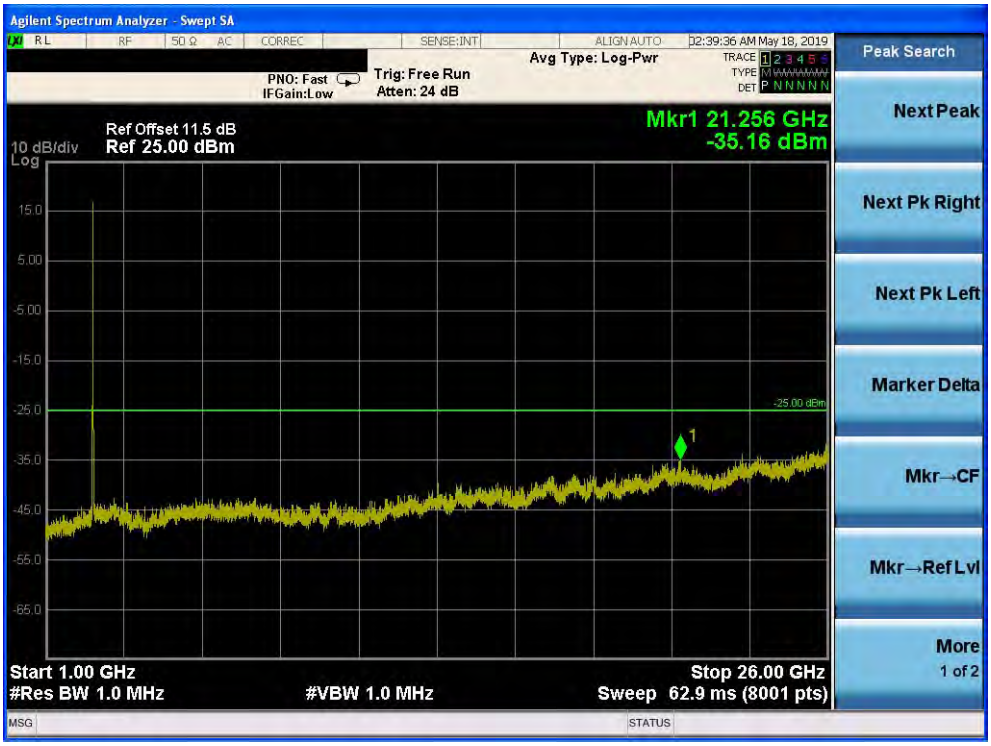
Band 7,UL Channel 20800,UL Frequency 2505.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



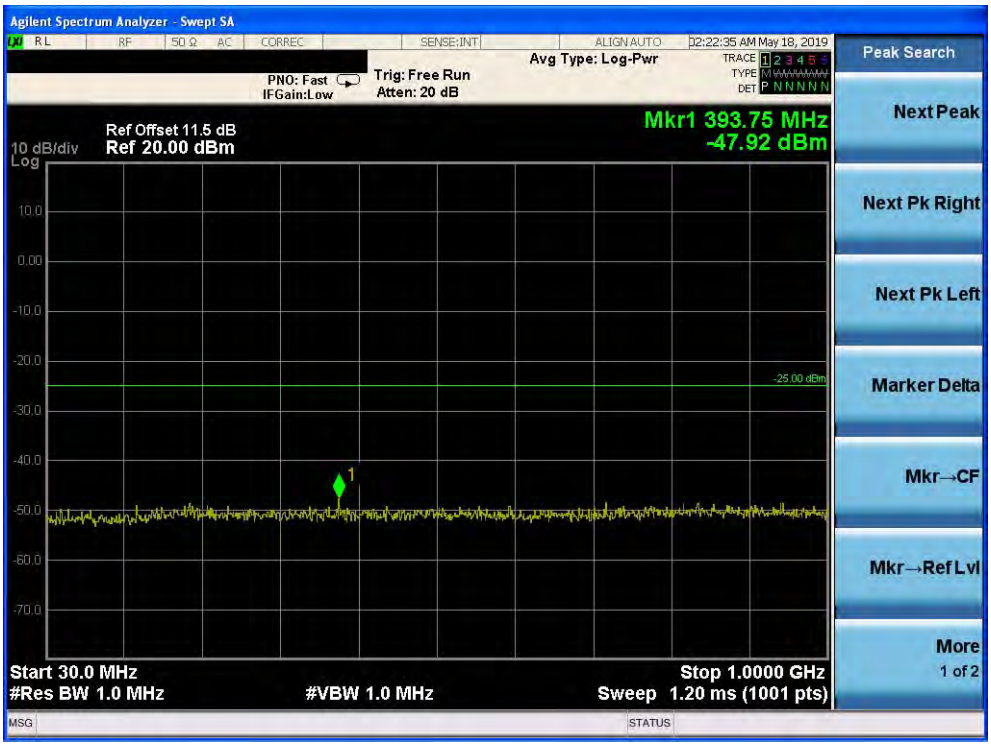
Band 7,UL Channel 20800,UL Frequency 2505.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



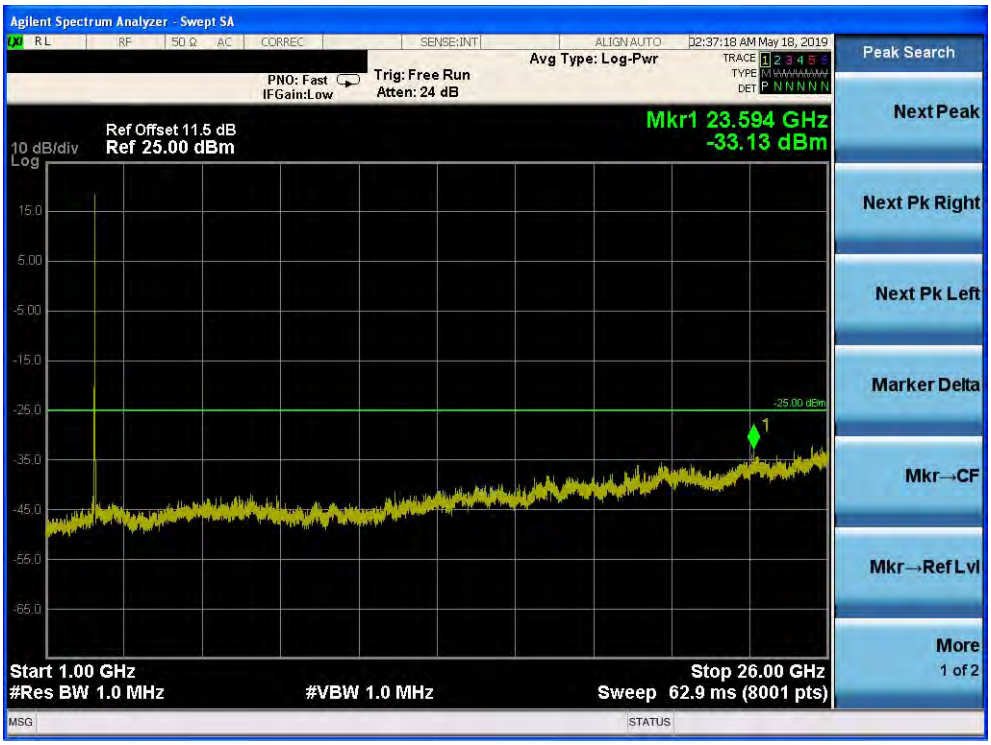
Band 7,UL Channel 20800,UL Frequency 2505.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



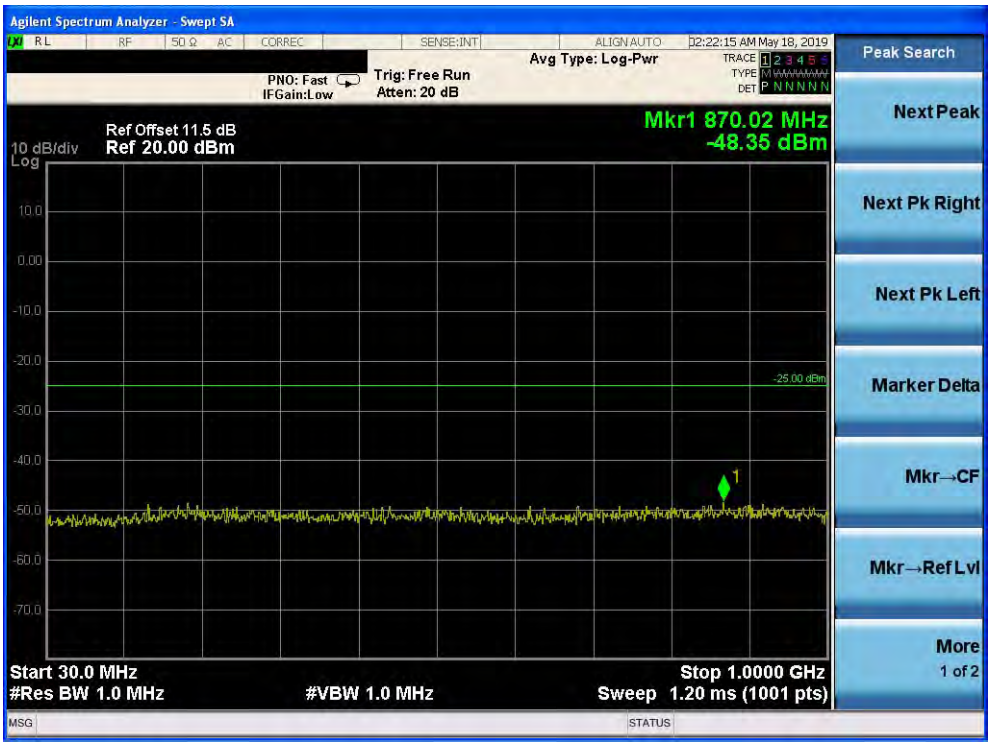
Band 7,UL Channel 21400,UL Frequency 2565.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



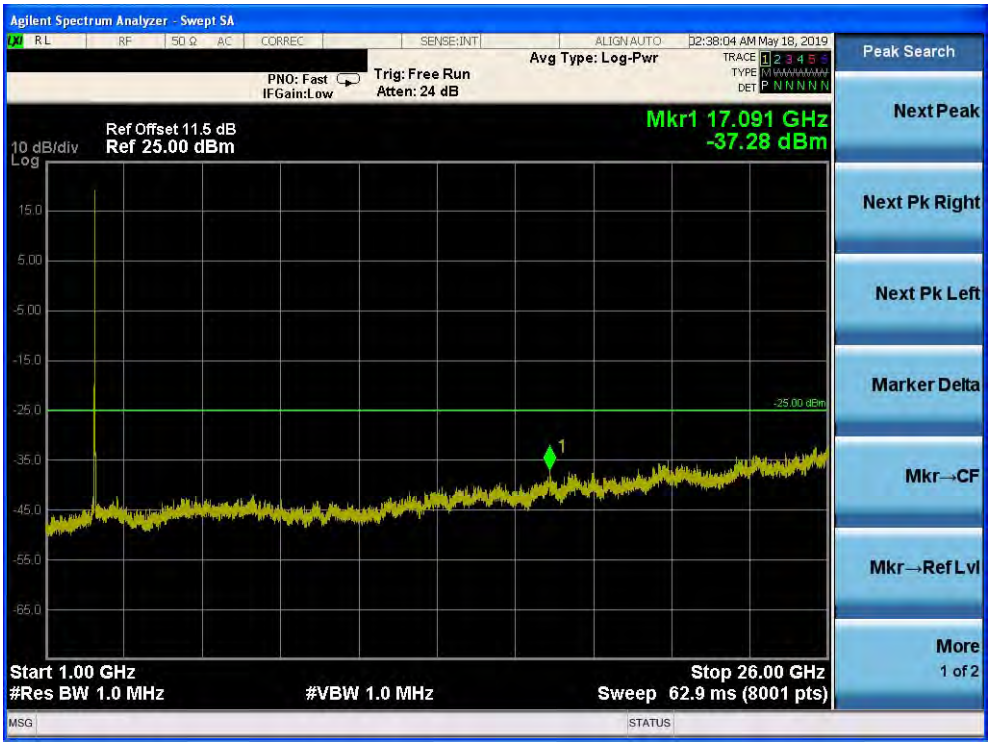
Band 7,UL Channel 21400,UL Frequency 2565.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



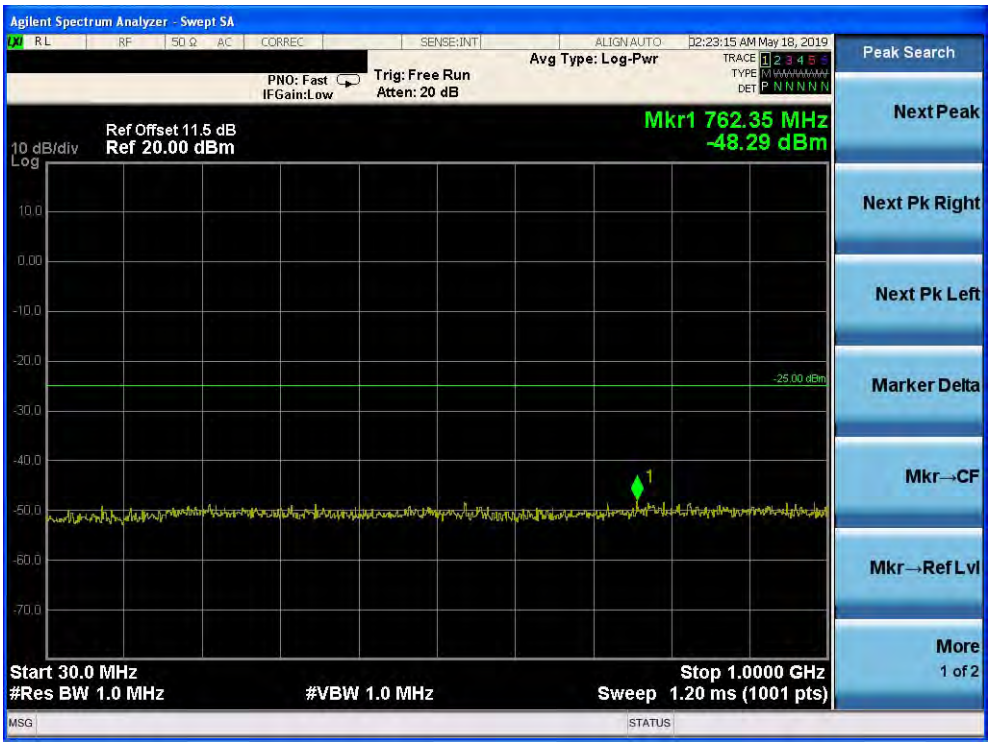
Band 7,UL Channel 21400,UL Frequency 2565.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



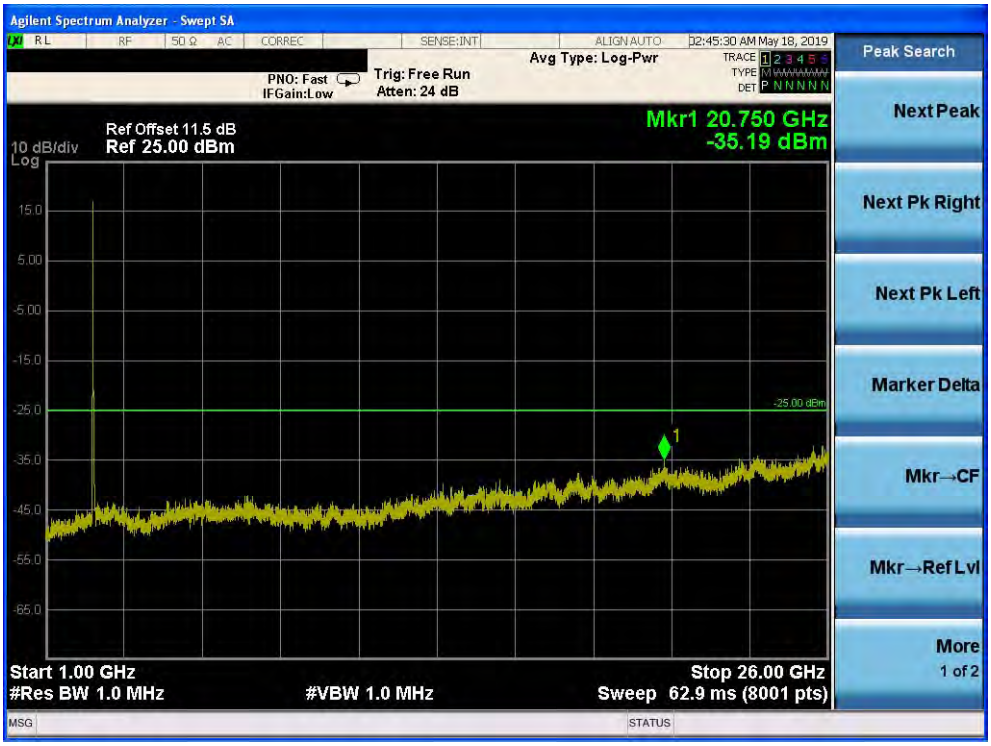
Band 7,UL Channel 21400,UL Frequency 2565.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



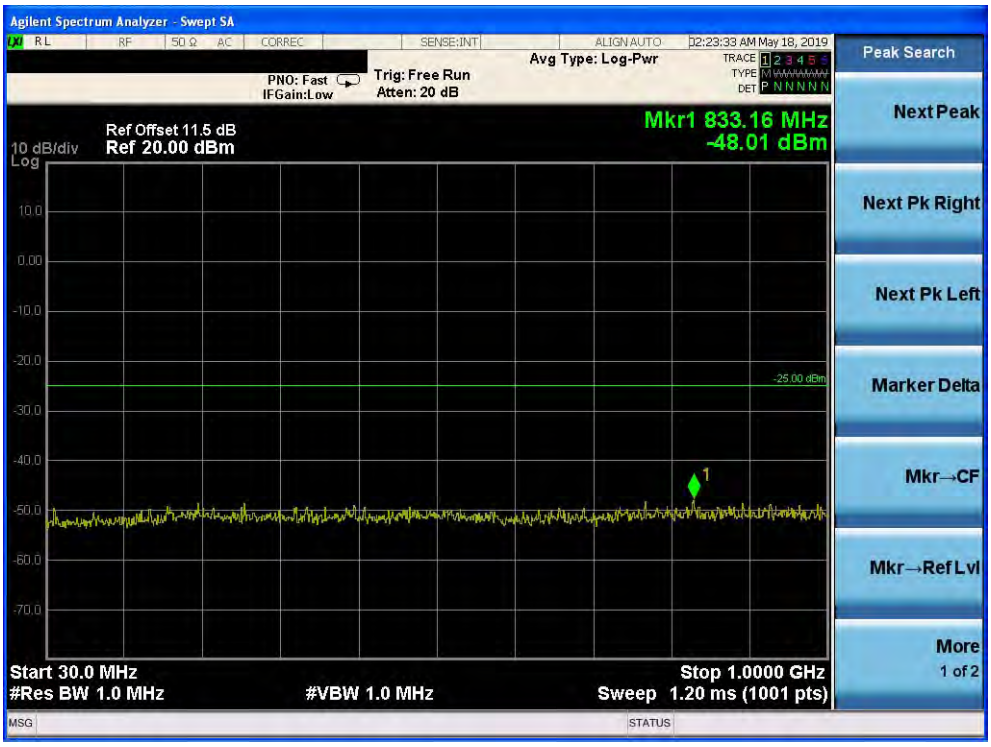
Band 7,UL Channel 20825,UL Frequency 2507.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



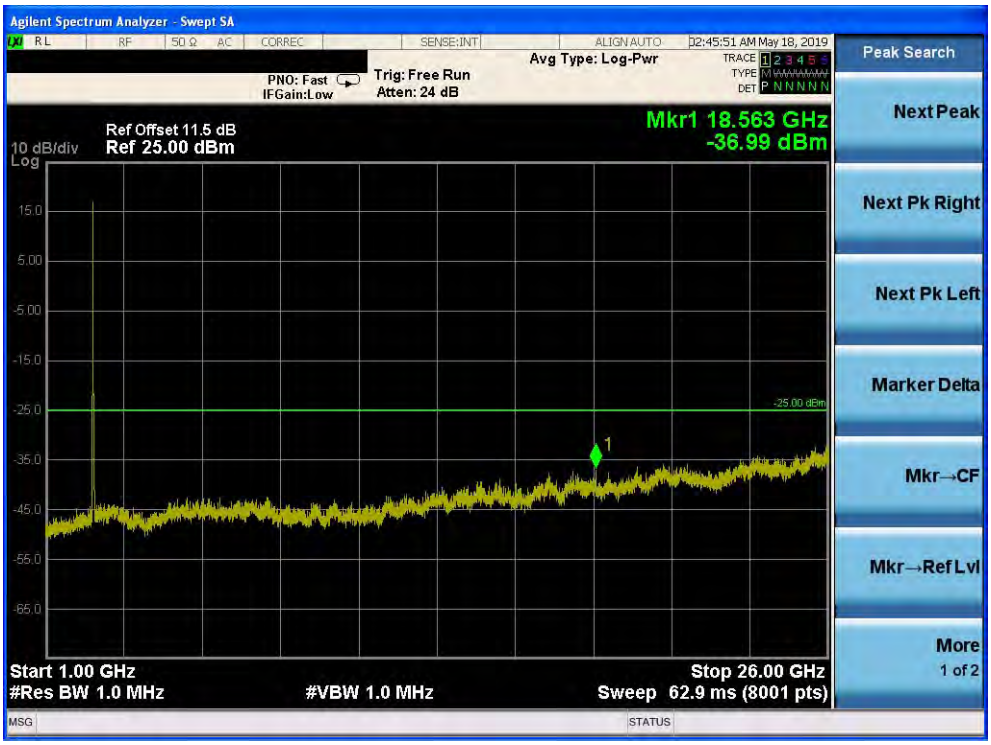
Band 7,UL Channel 20825,UL Frequency 2507.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



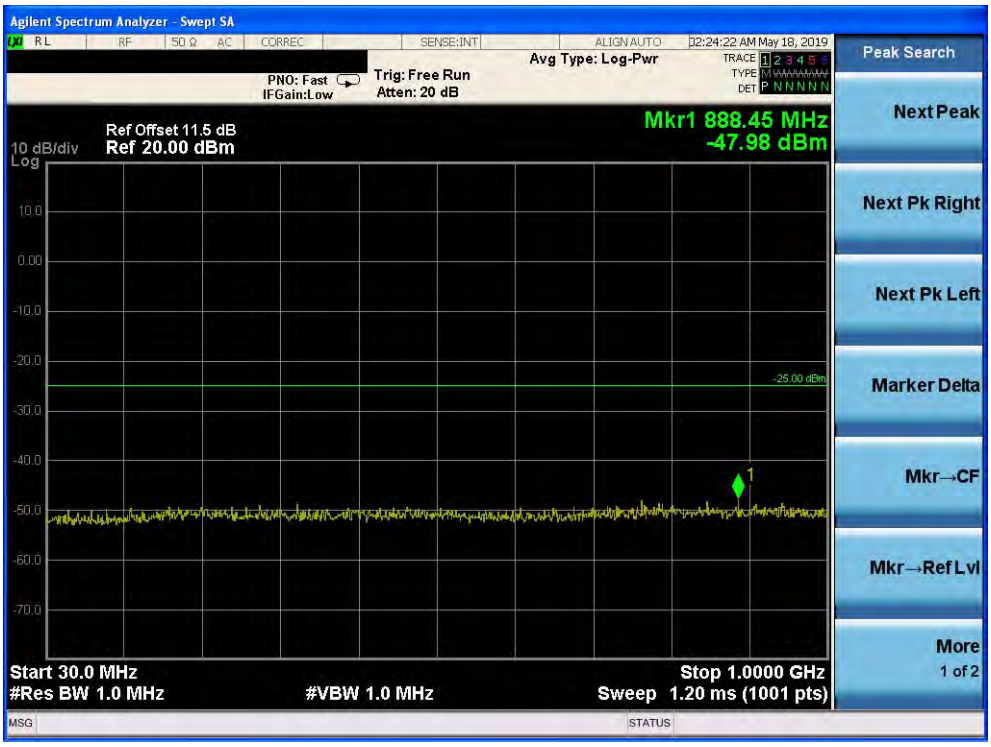
Band 7,UL Channel 20825,UL Frequency 2507.5,BW 15.0,NO. RB 75,RB POS. Low,16-QAM



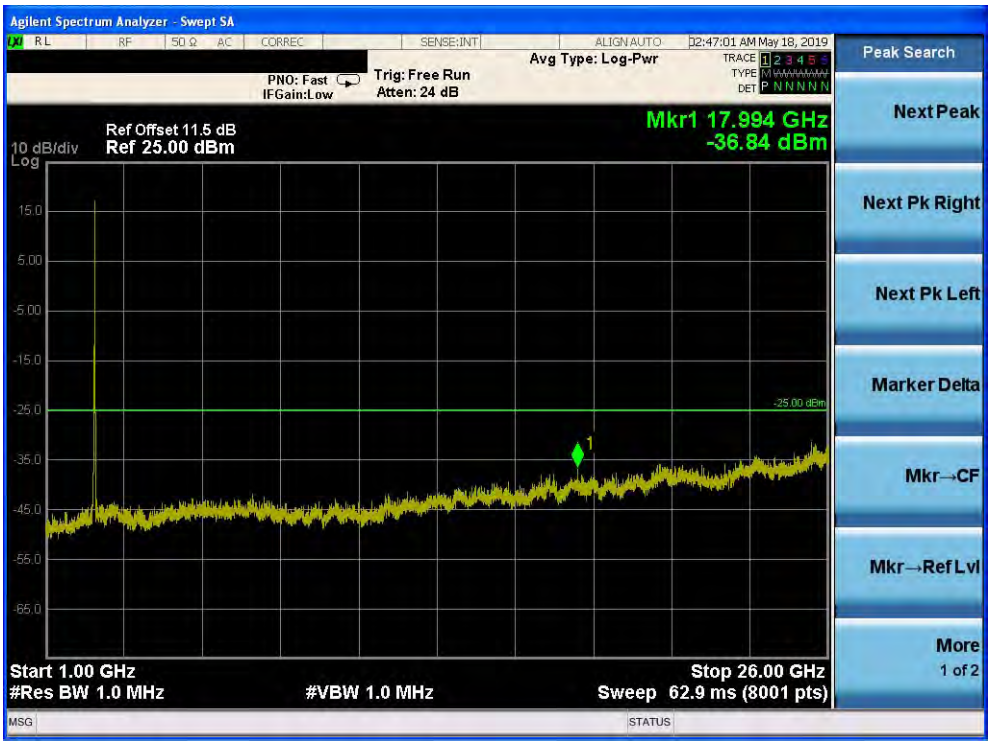
Band 7,UL Channel 20825,UL Frequency 2507.5,BW 15.0,NO. RB 75,RB POS. Low,16-QAM



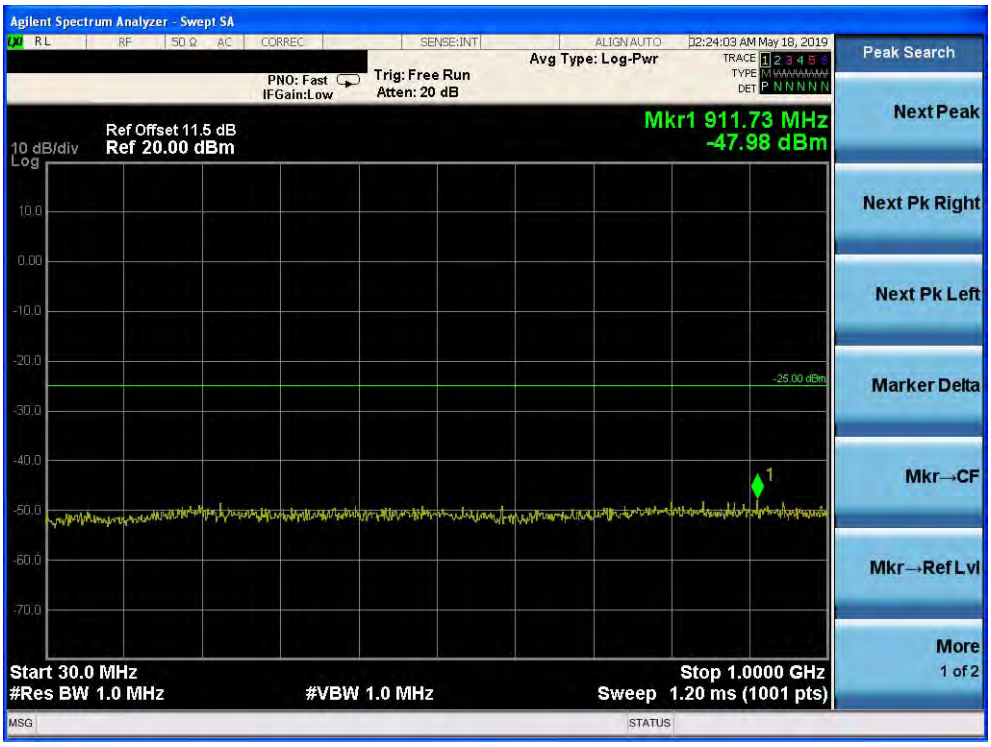
Band 7,UL Channel 21375,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



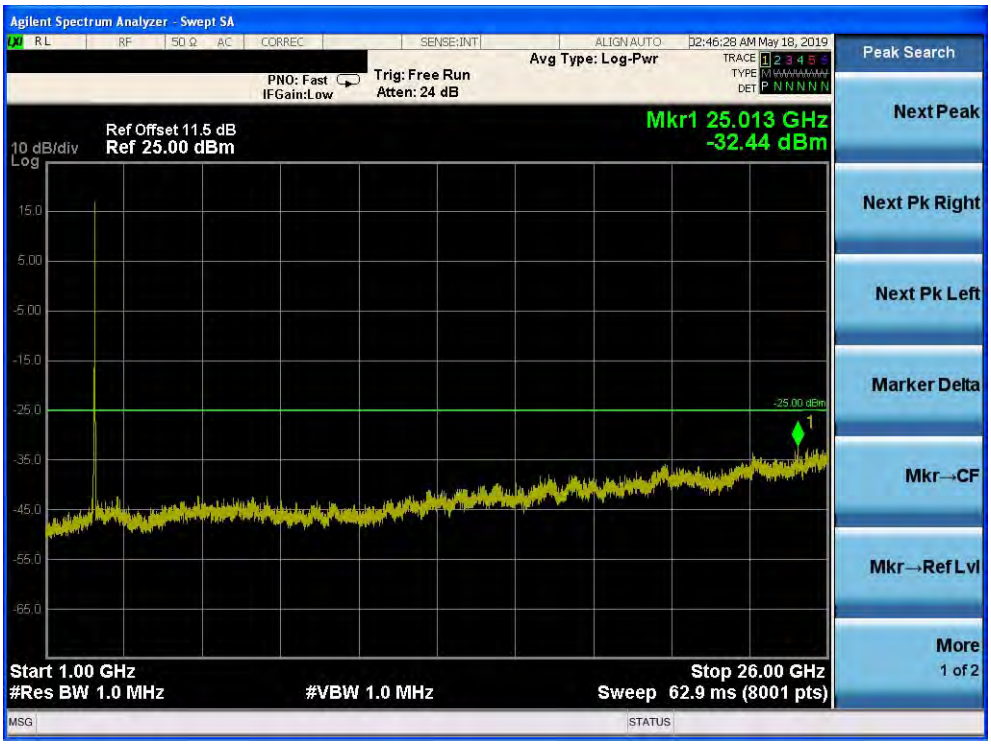
Band 7,UL Channel 21375,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



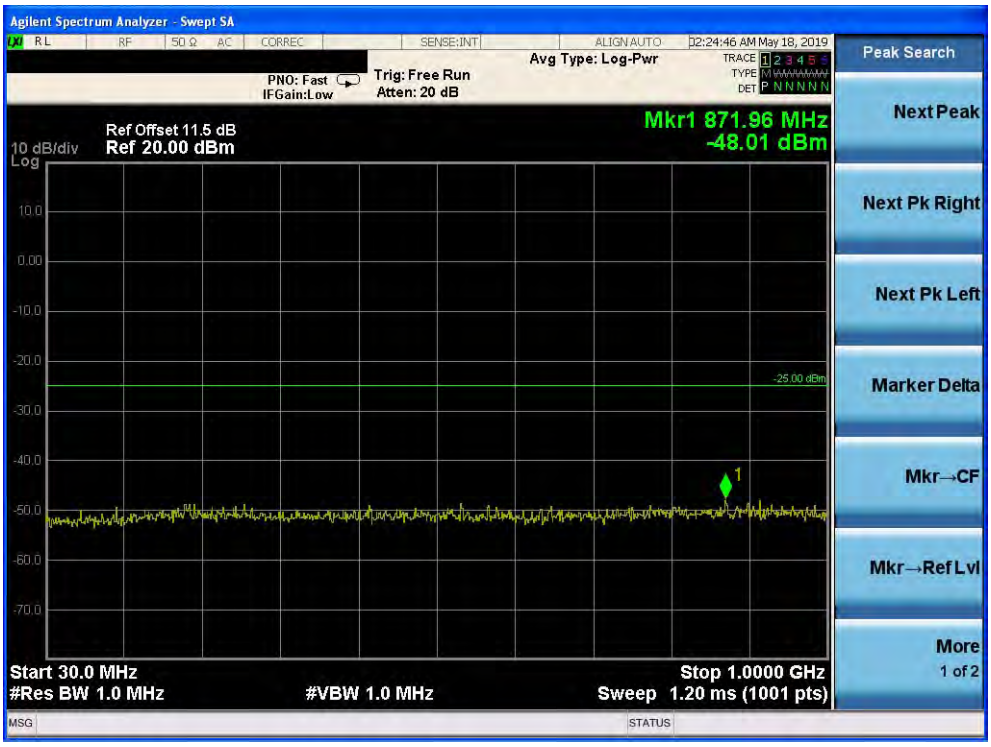
Band 7,UL Channel 21375,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,16-QAM



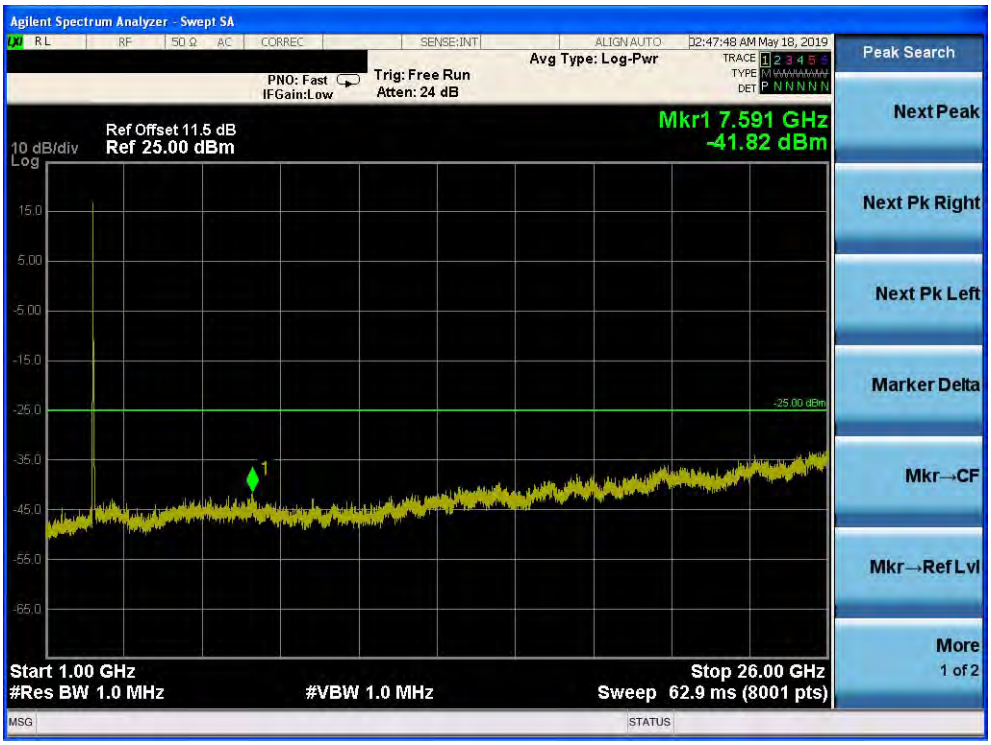
Band 7,UL Channel 21375,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,16-QAM



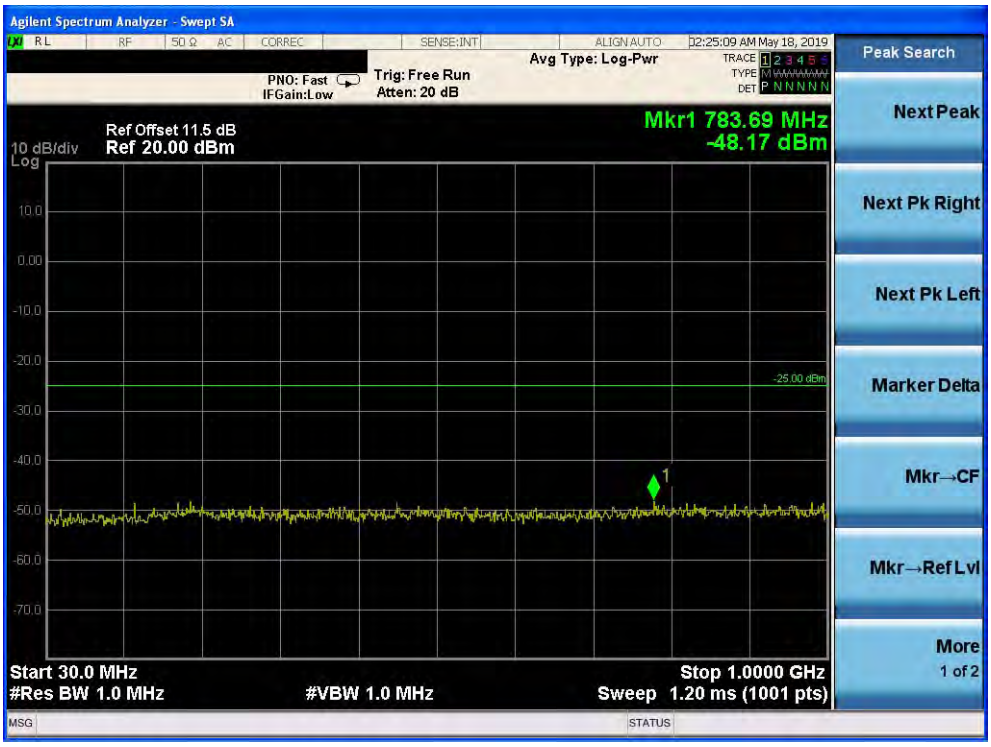
Band 7,UL Channel 20850,UL Frequency 2510.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



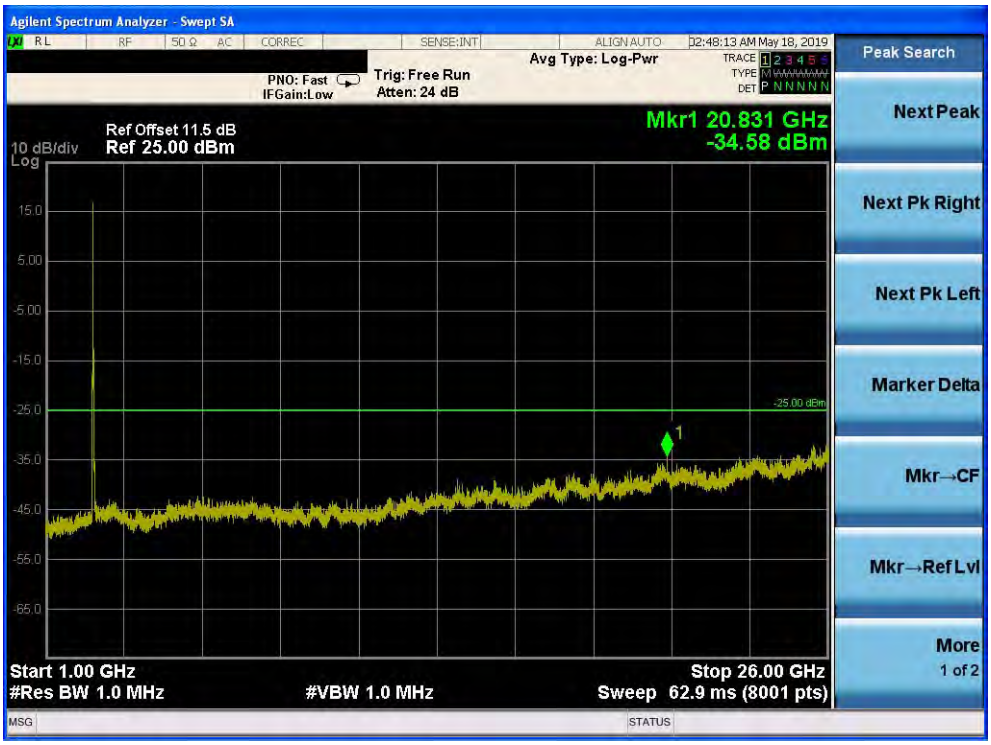
Band 7,UL Channel 20850,UL Frequency 2510.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



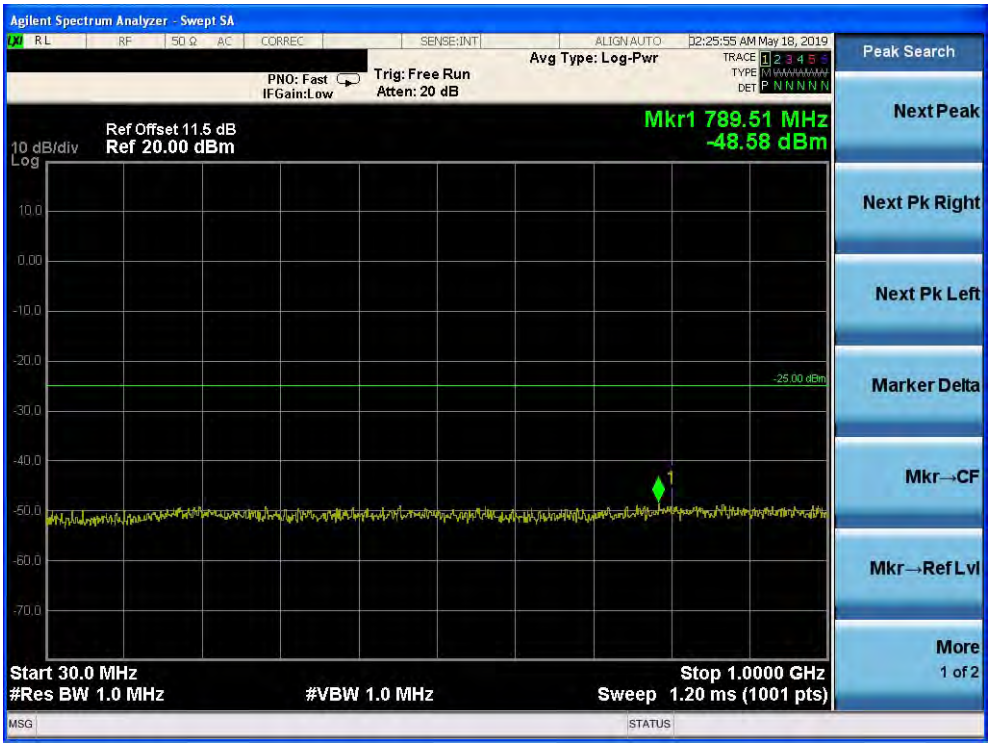
Band 7,UL Channel 20850,UL Frequency 2510.0,BW 20.0,NO. RB 100,RB POS. Low,16-QAM



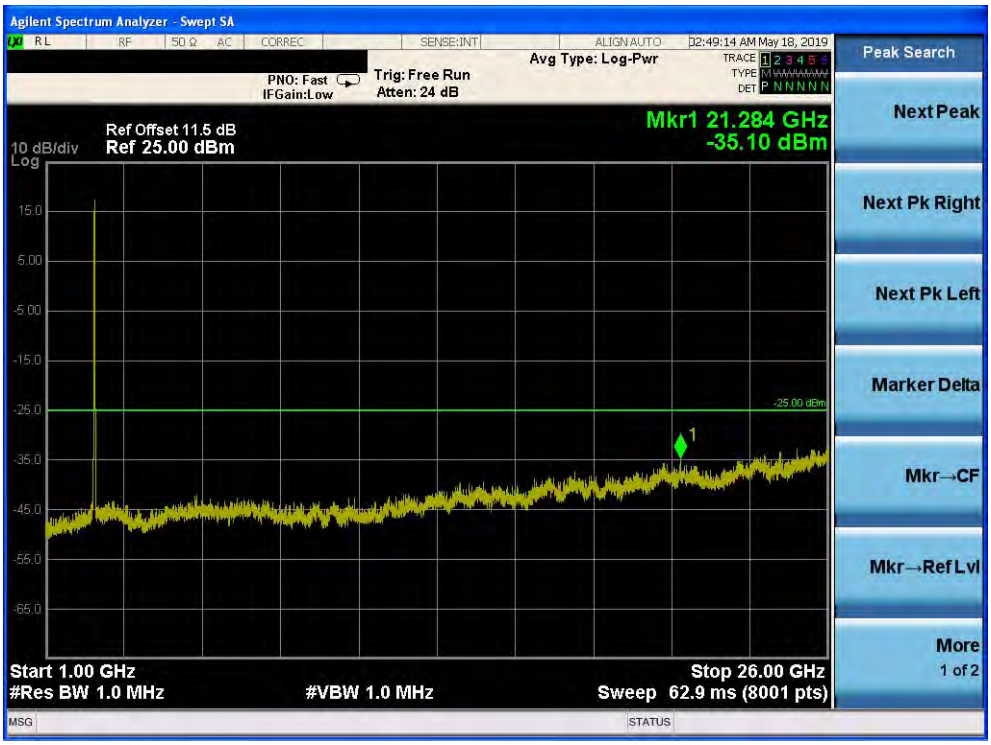
Band 7,UL Channel 20850,UL Frequency 2510.0,BW 20.0,NO. RB 100,RB POS. Low,16-QAM



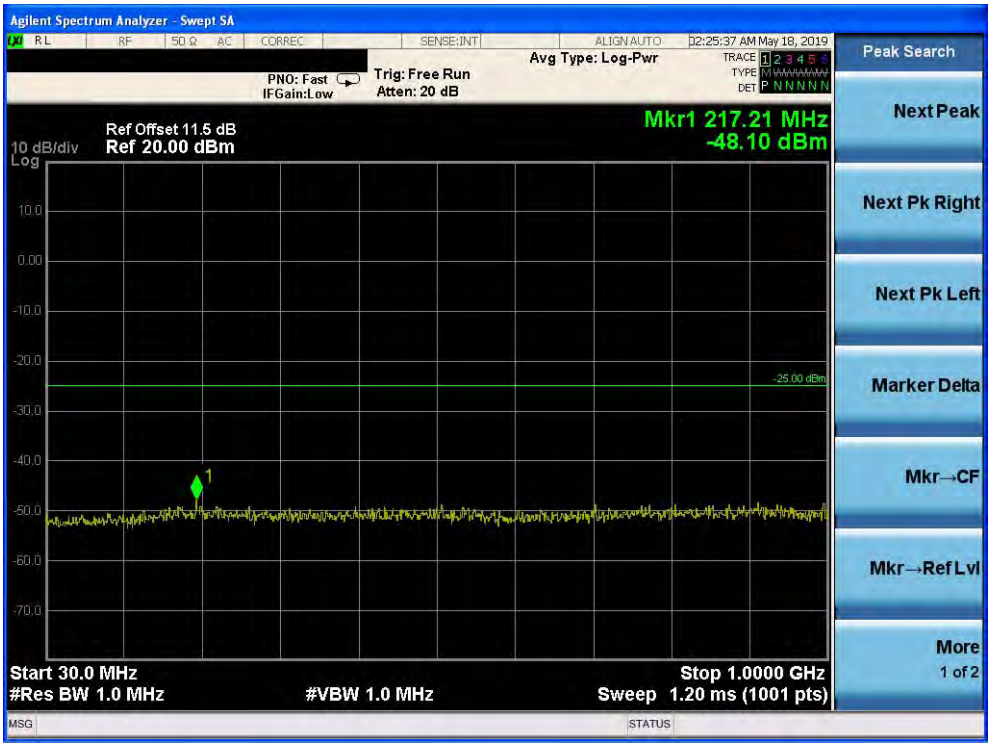
Band 7,UL Channel 21350,UL Frequency 2560.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



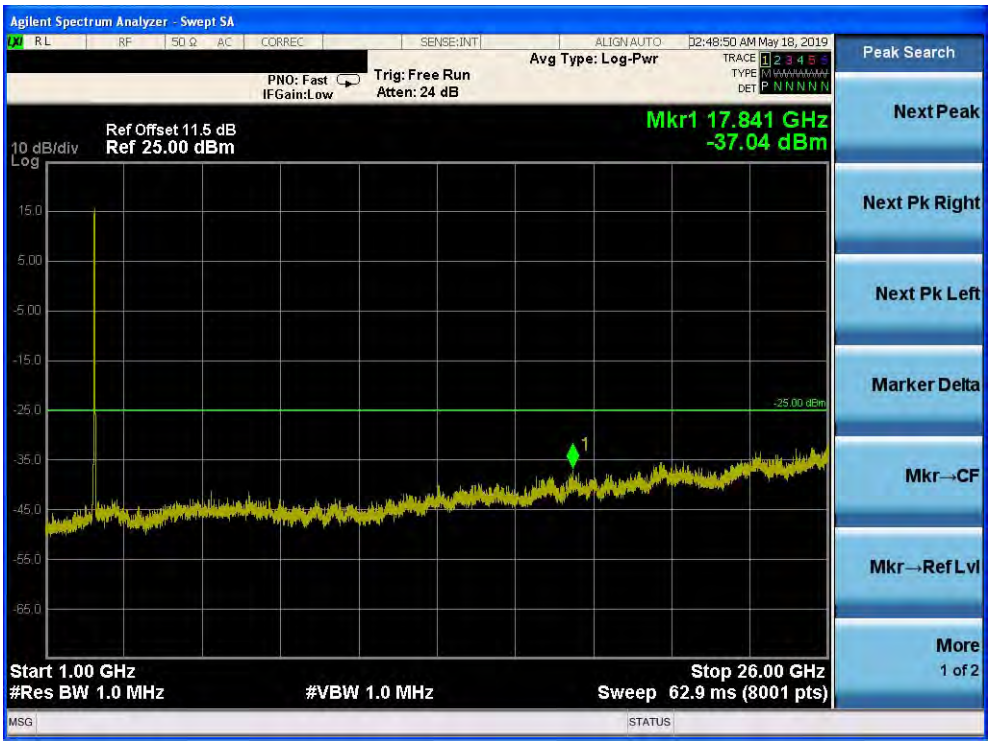
Band 7,UL Channel 21350,UL Frequency 2560.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



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

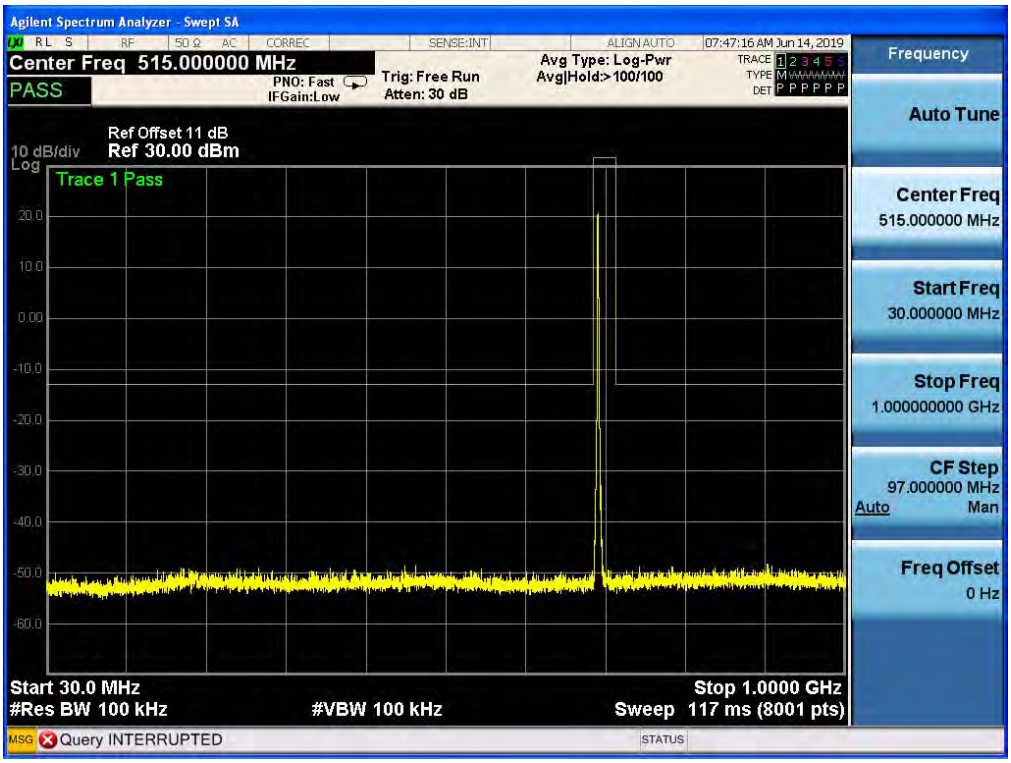


Band 7,UL Channel 21350,UL Frequency 2560.0,BW 20.0,NO. RB 100,RB POS. Low,16-QAM

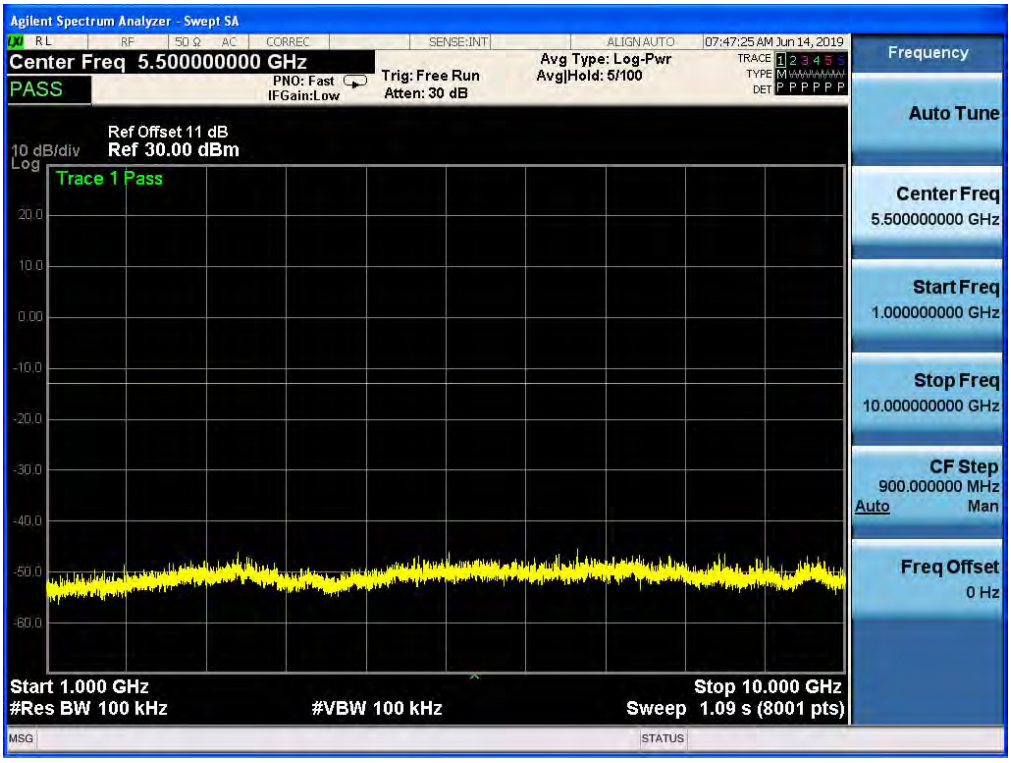


7.5 LTE BAND 12

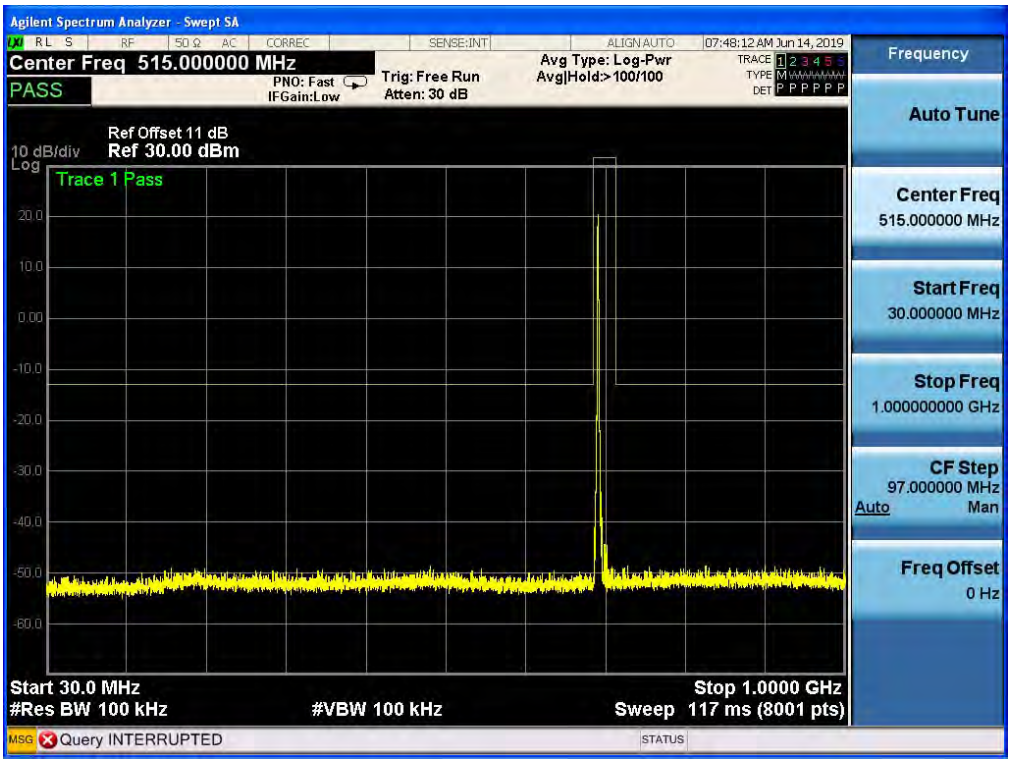
Band 12,UL Channel 23017,UL Frequency 699.7,BW 1.4,NO. RB 6,RB POS. Low,QPSK



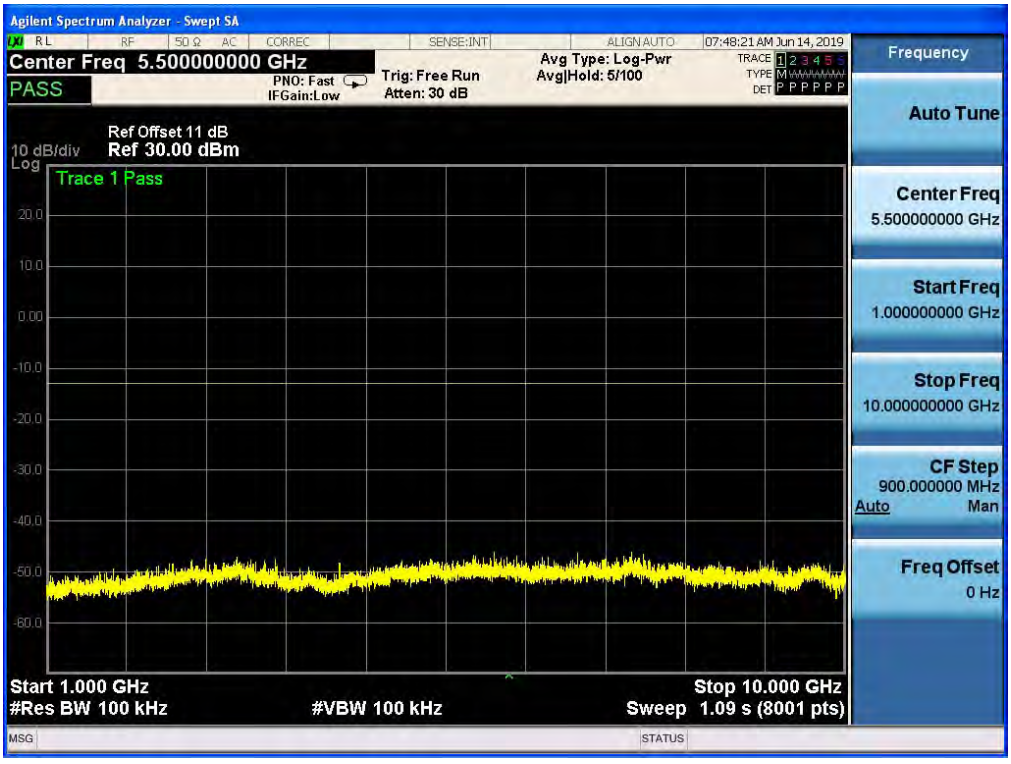
Band 12,UL Channel 23017,UL Frequency 699.7,BW 1.4,NO. RB 6,RB POS. Low,QPSK



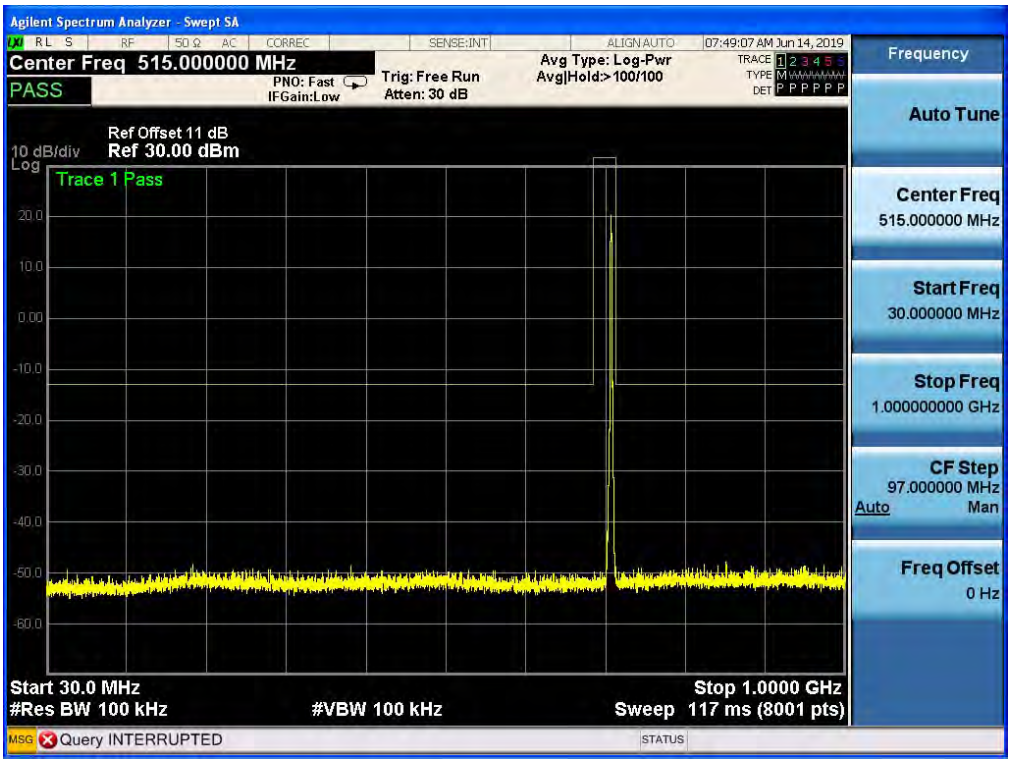
Band 12,UL Channel 23017,UL Frequency 699.7,BW 1.4,NO. RB 6,RB POS. Low,16-QAM



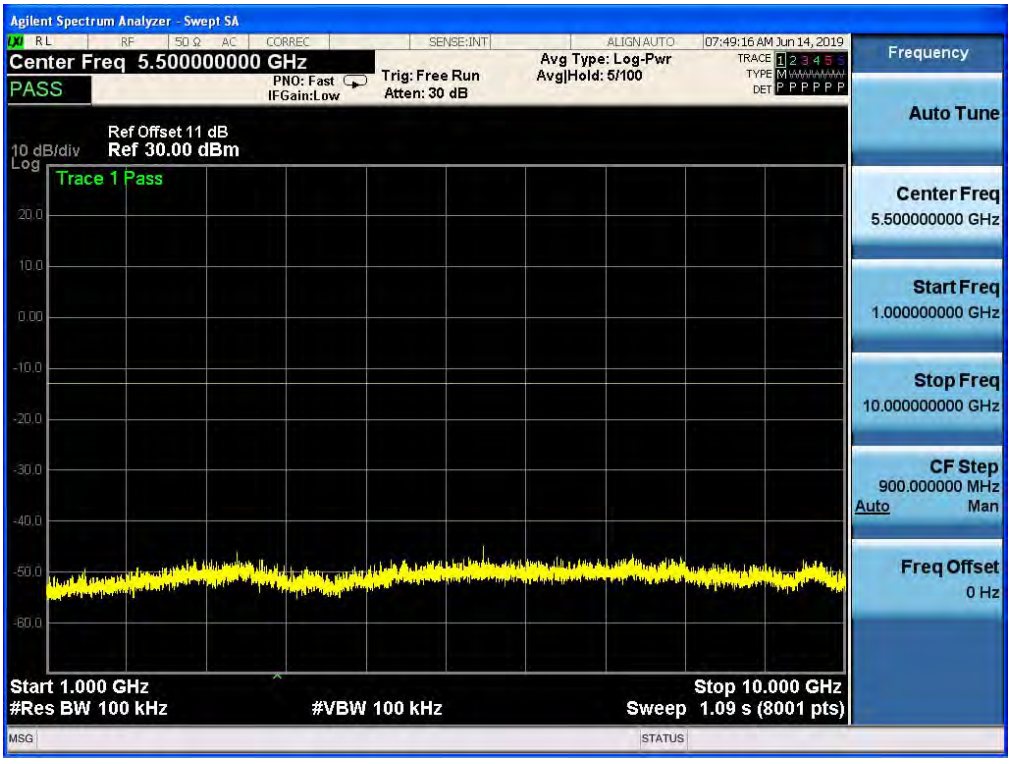
Band 12,UL Channel 23017,UL Frequency 699.7,BW 1.4,NO. RB 6,RB POS. Low,16-QAM



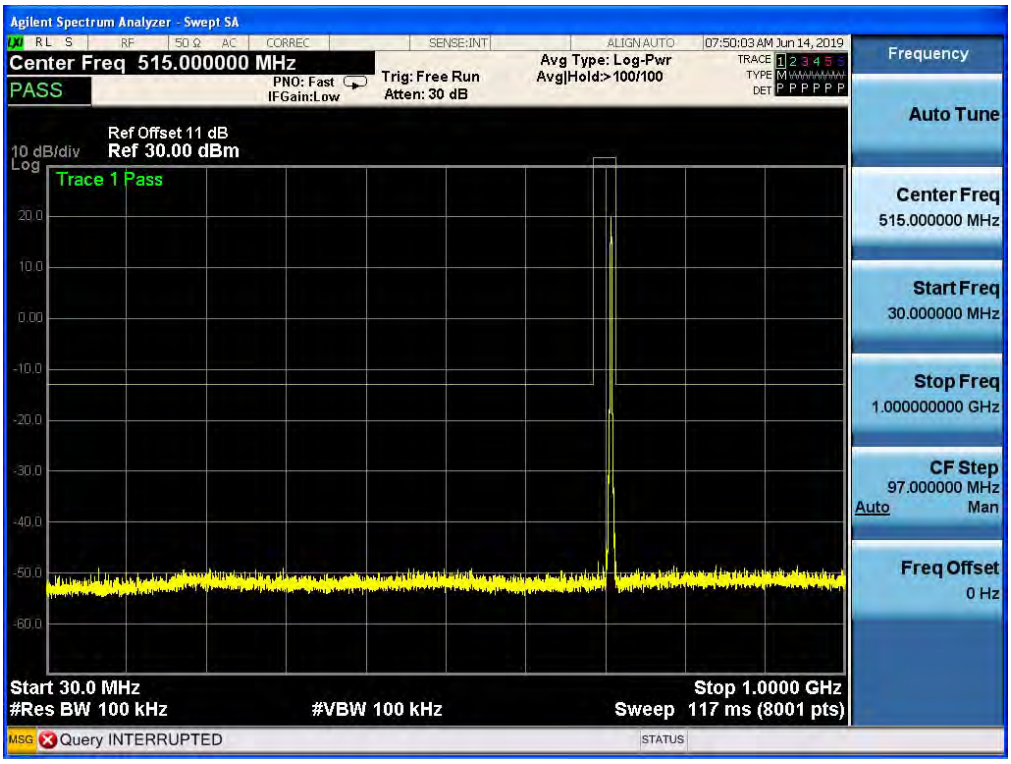
Band 12,UL Channel 23173,UL Frequency 715.3,BW 1.4,NO. RB 6,RB POS. Low,QPSK



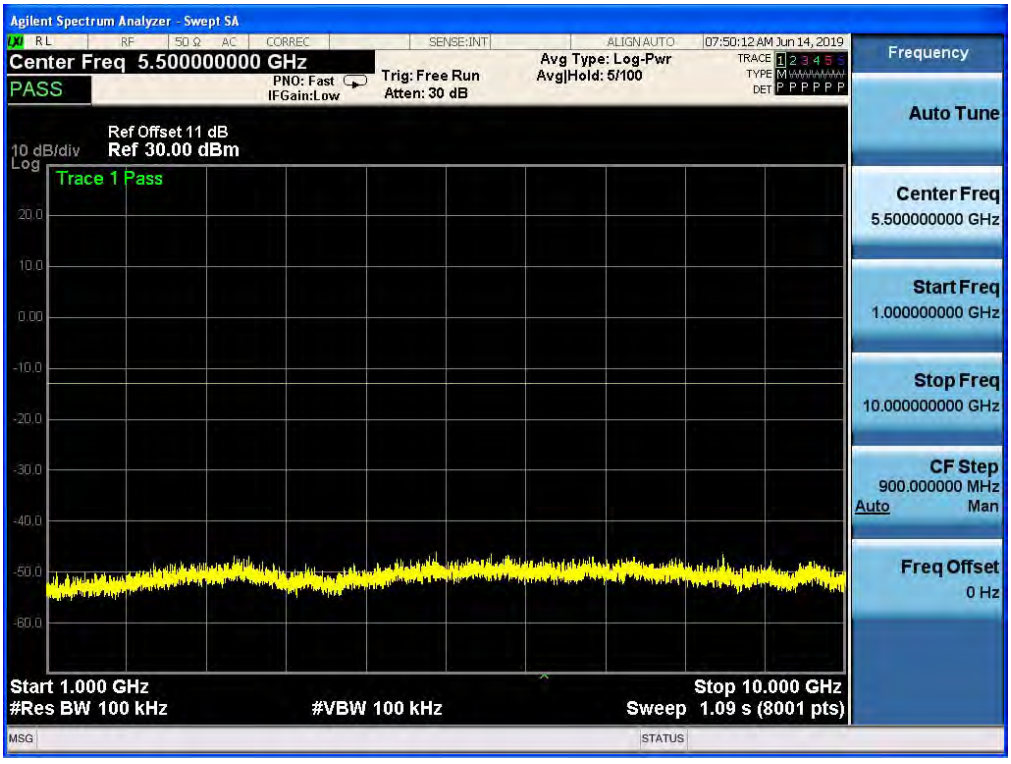
Band 12,UL Channel 23173,UL Frequency 715.3,BW 1.4,NO. RB 6,RB POS. Low,QPSK



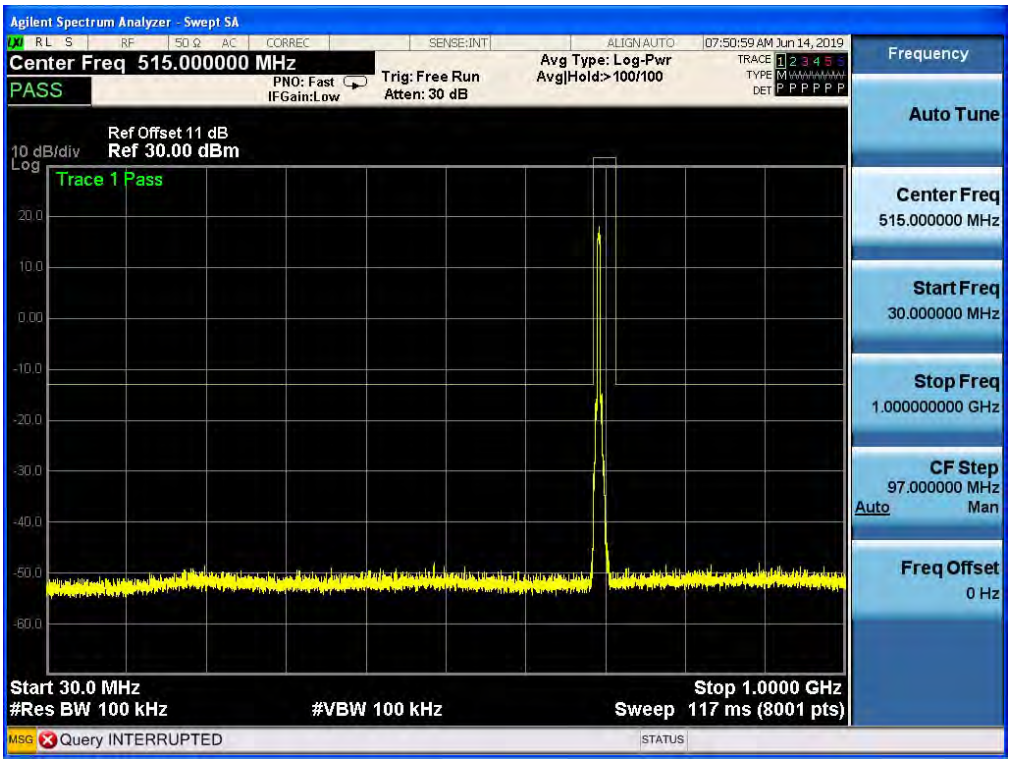
Band 12,UL Channel 23173,UL Frequency 715.3,BW 1.4,NO. RB 6,RB POS. Low,16-QAM



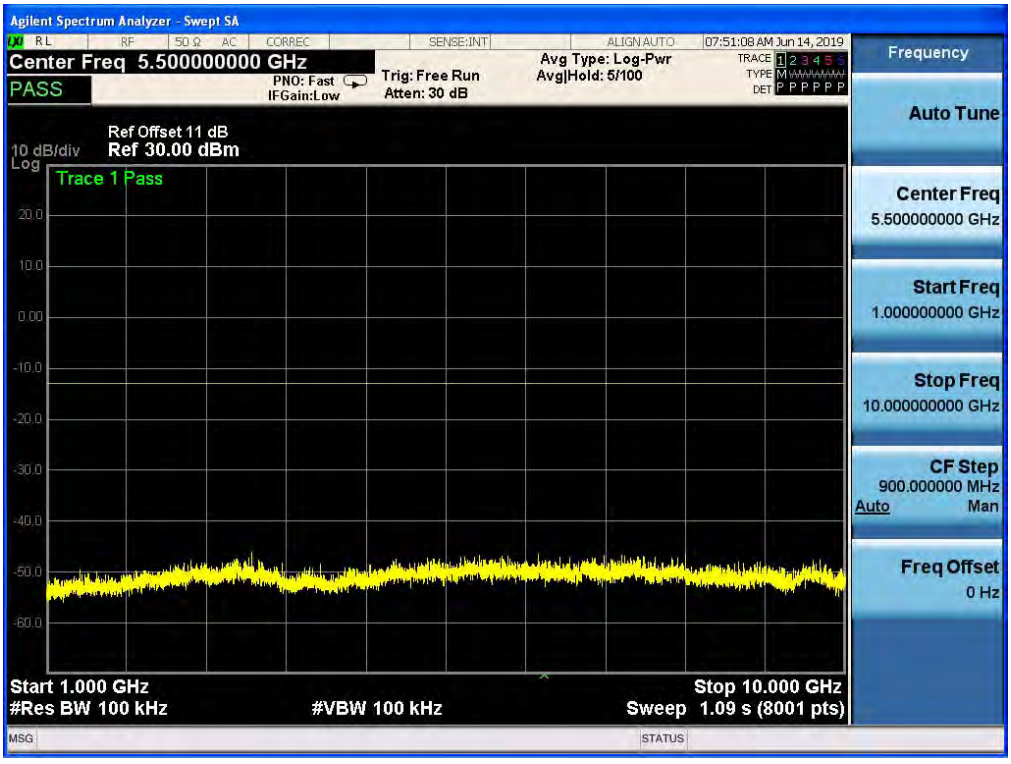
Band 12,UL Channel 23173,UL Frequency 715.3,BW 1.4,NO. RB 6,RB POS. Low,16-QAM



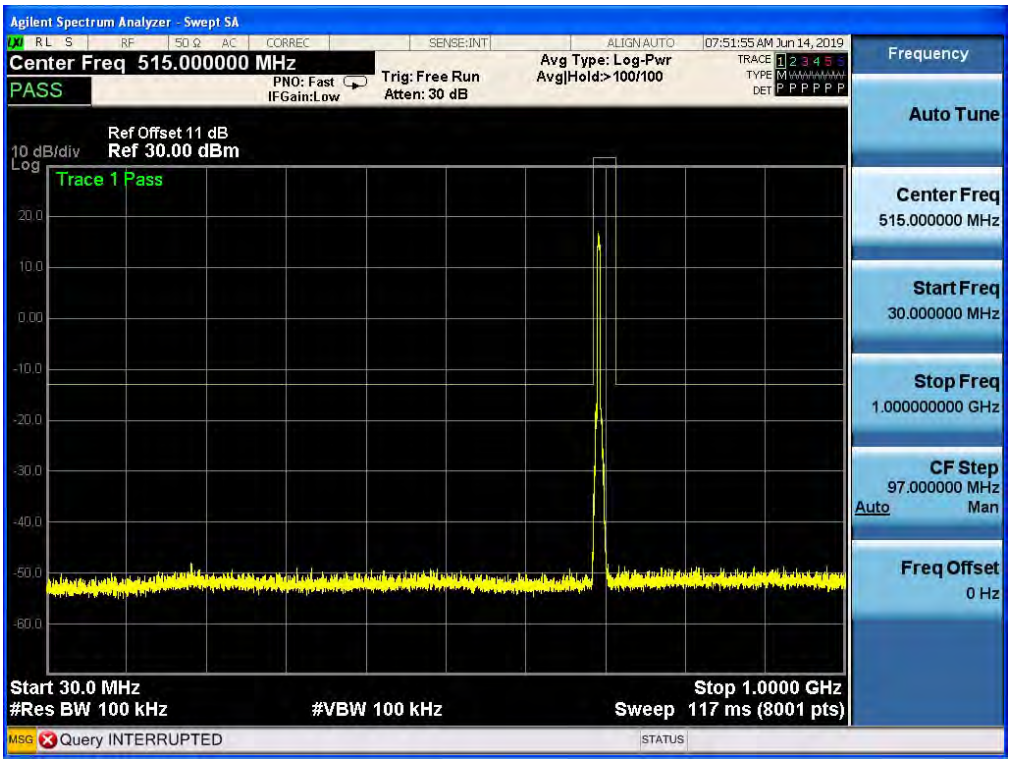
Band 12,UL Channel 23025,UL Frequency 700.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



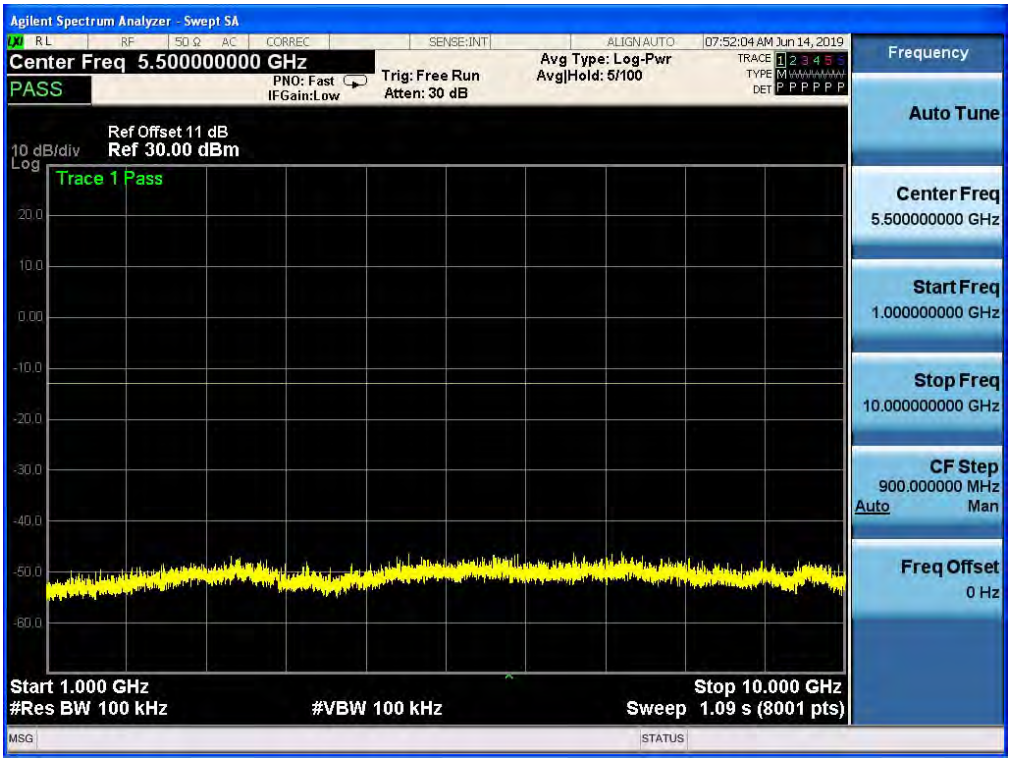
Band 12,UL Channel 23025,UL Frequency 700.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



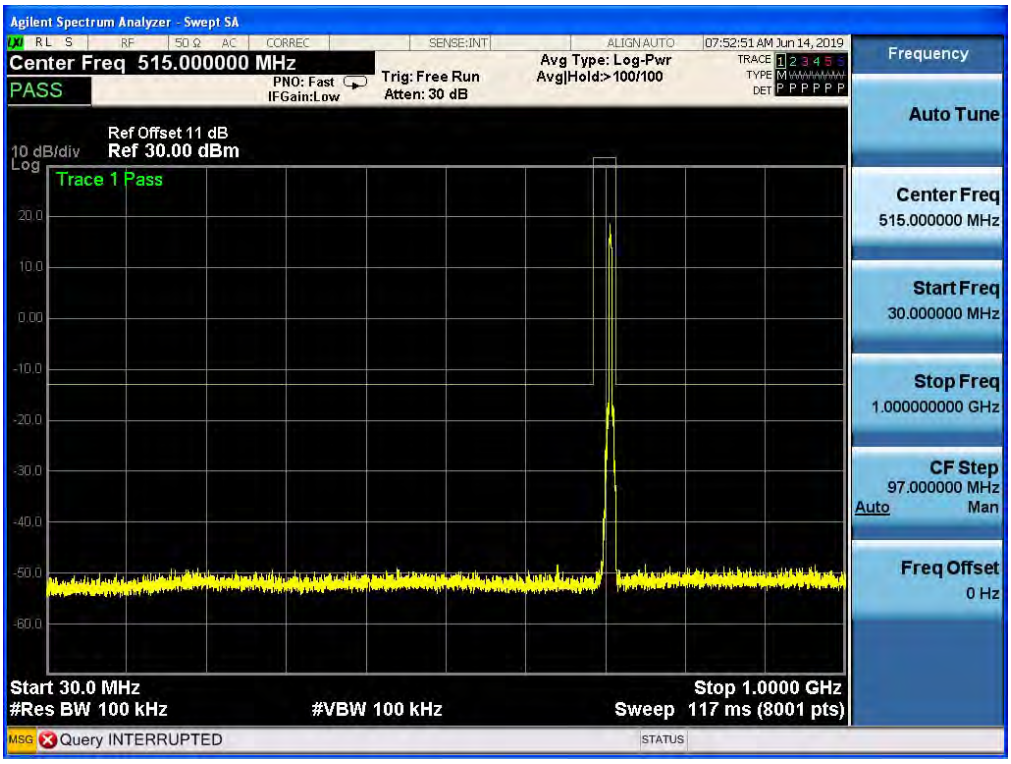
Band 12,UL Channel 23025,UL Frequency 700.5,BW 3.0,NO. RB 15,RB POS. Low,16-QAM



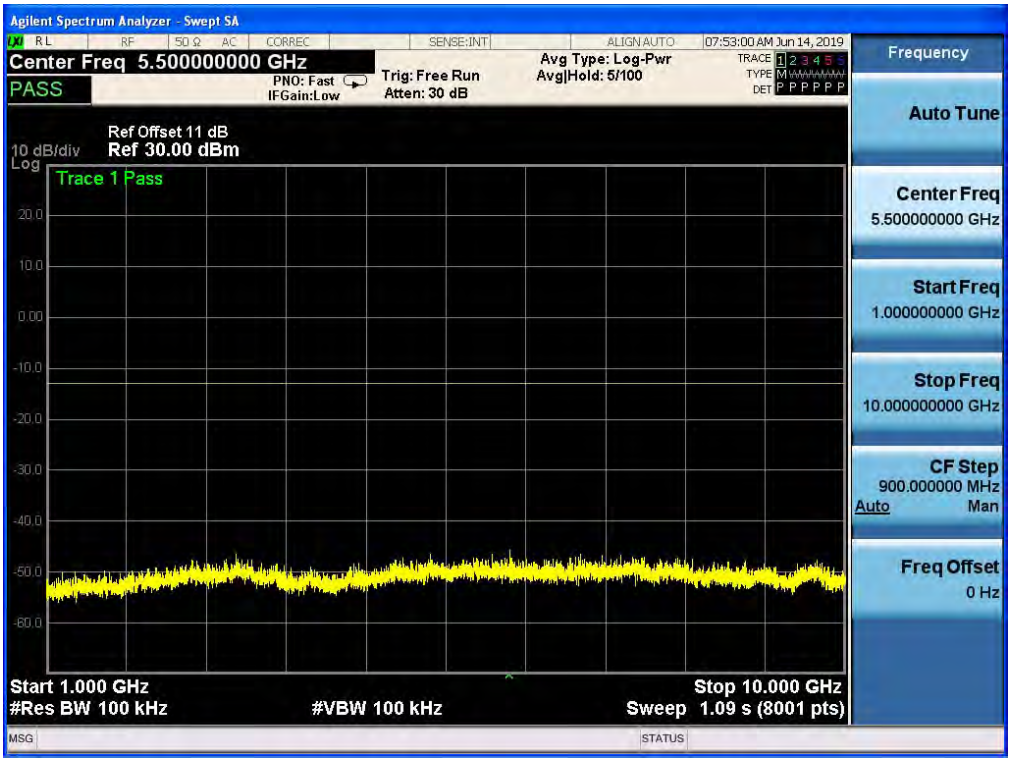
Band 12,UL Channel 23025,UL Frequency 700.5,BW 3.0,NO. RB 15,RB POS. Low,16-QAM



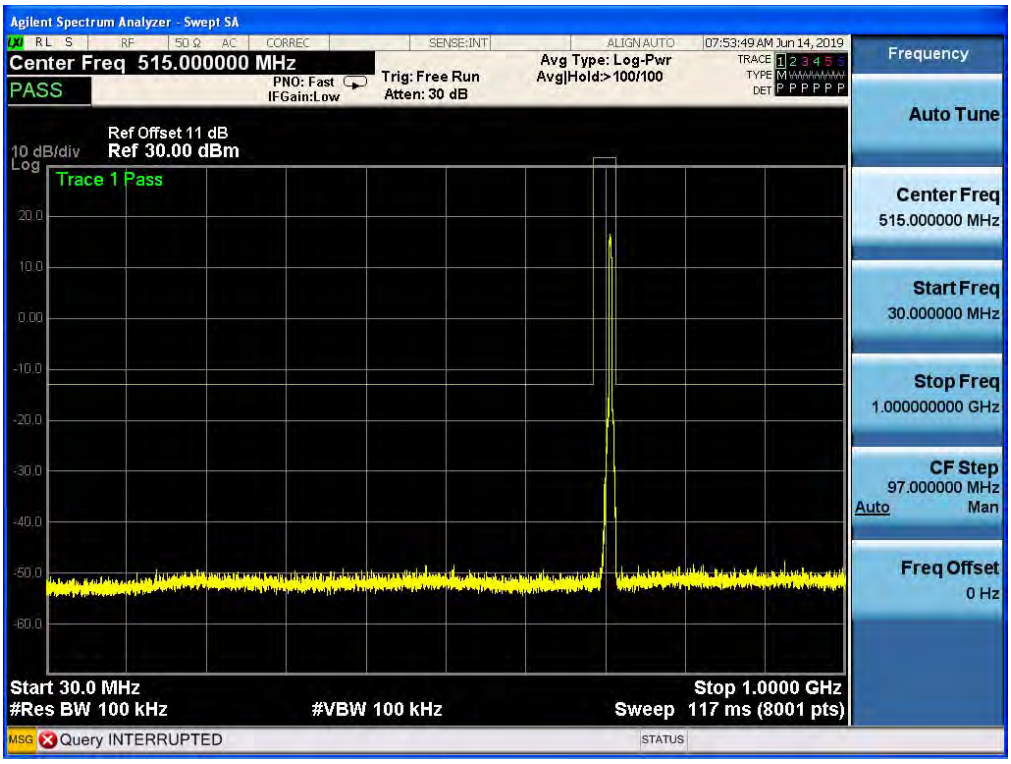
Band 12,UL Channel 23165,UL Frequency 714.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



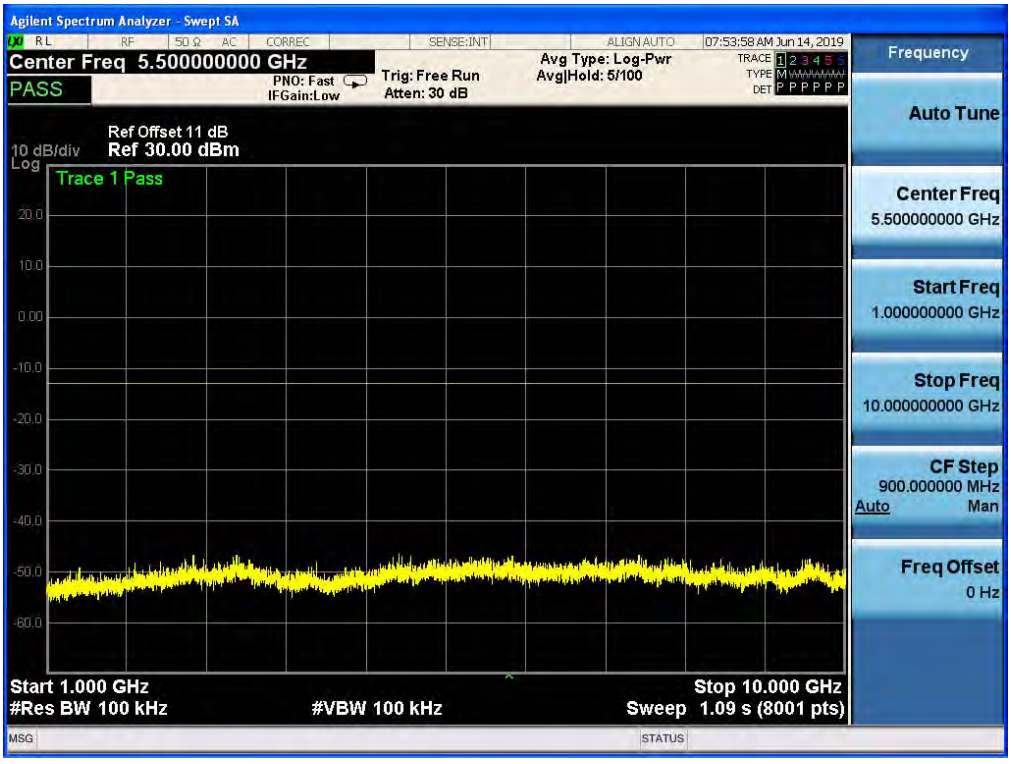
Band 12,UL Channel 23165,UL Frequency 714.5,BW 3.0,NO. RB 15,RB POS. Low,QPSK



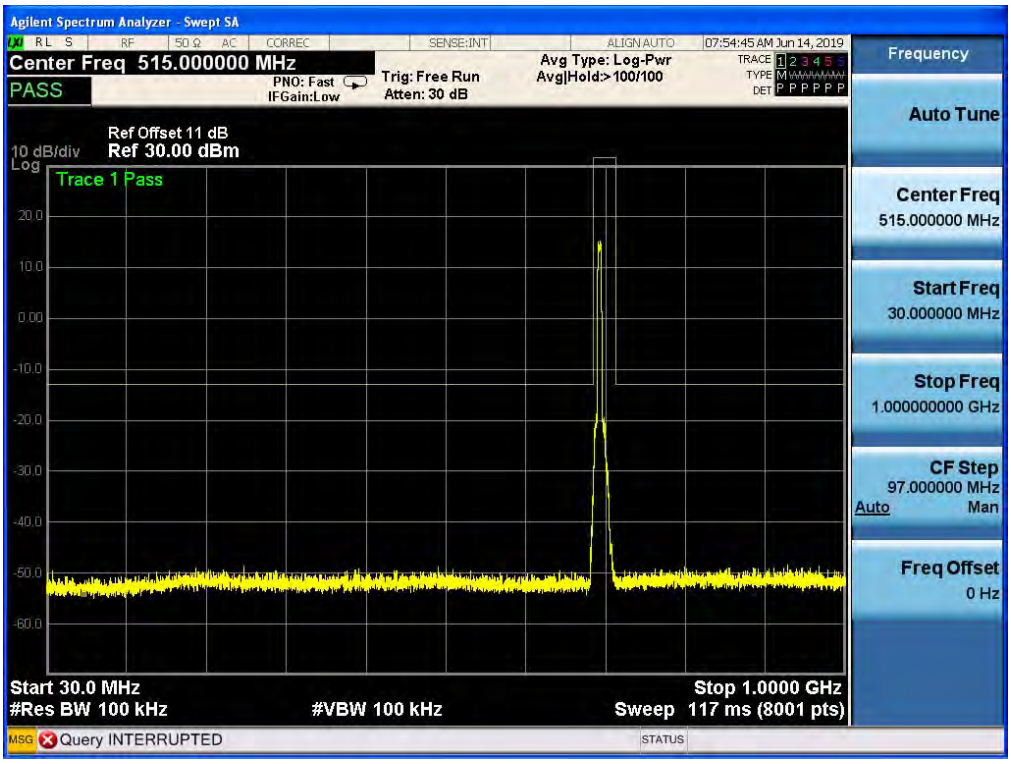
Band 12,UL Channel 23165,UL Frequency 714.5,BW 3.0,NO. RB 15,RB POS. Low,16-QAM



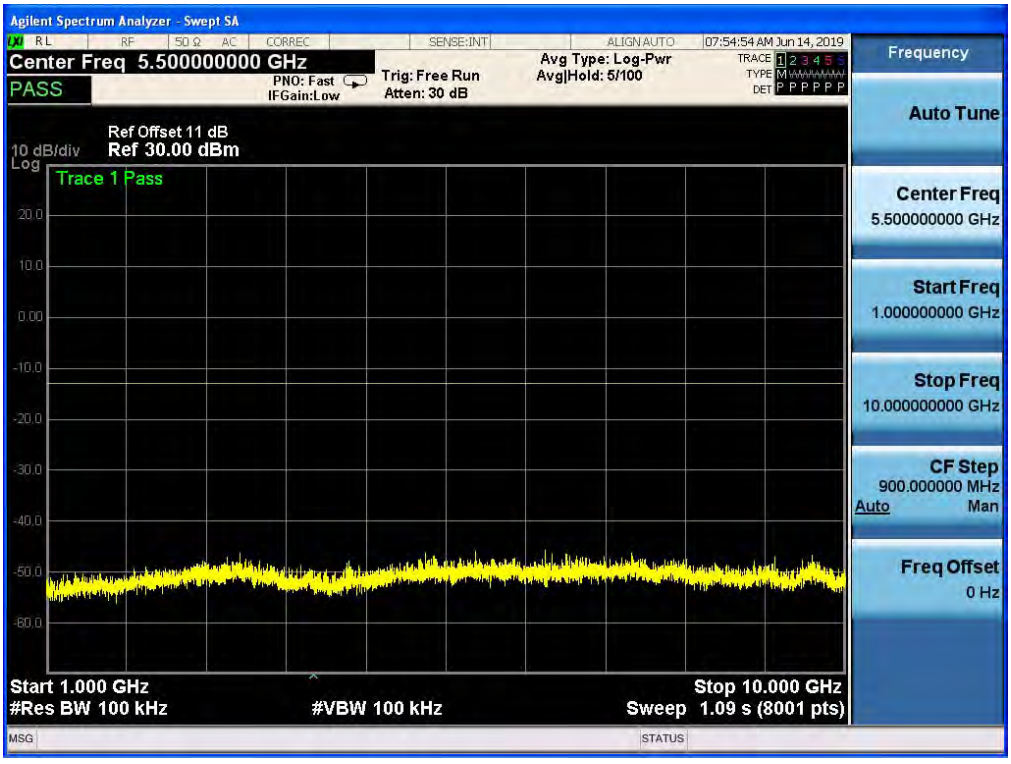
Band 12,UL Channel 23165,UL Frequency 714.5,BW 3.0,NO. RB 15,RB POS. Low,16-QAM



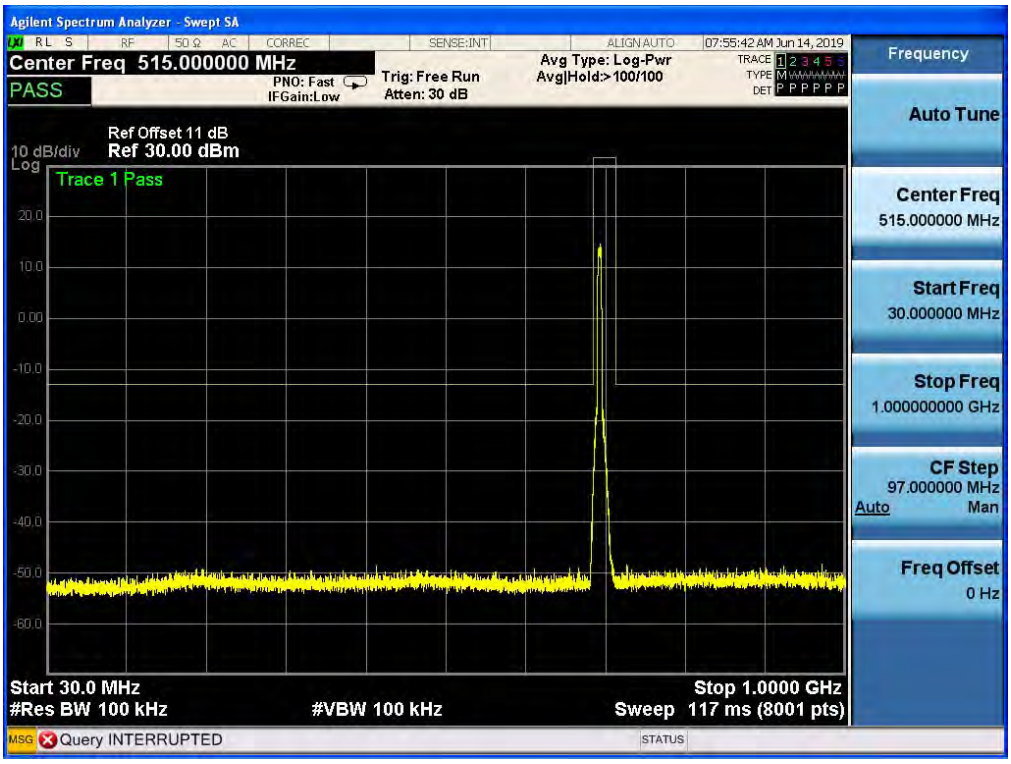
Band 12,UL Channel 23035,UL Frequency 701.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



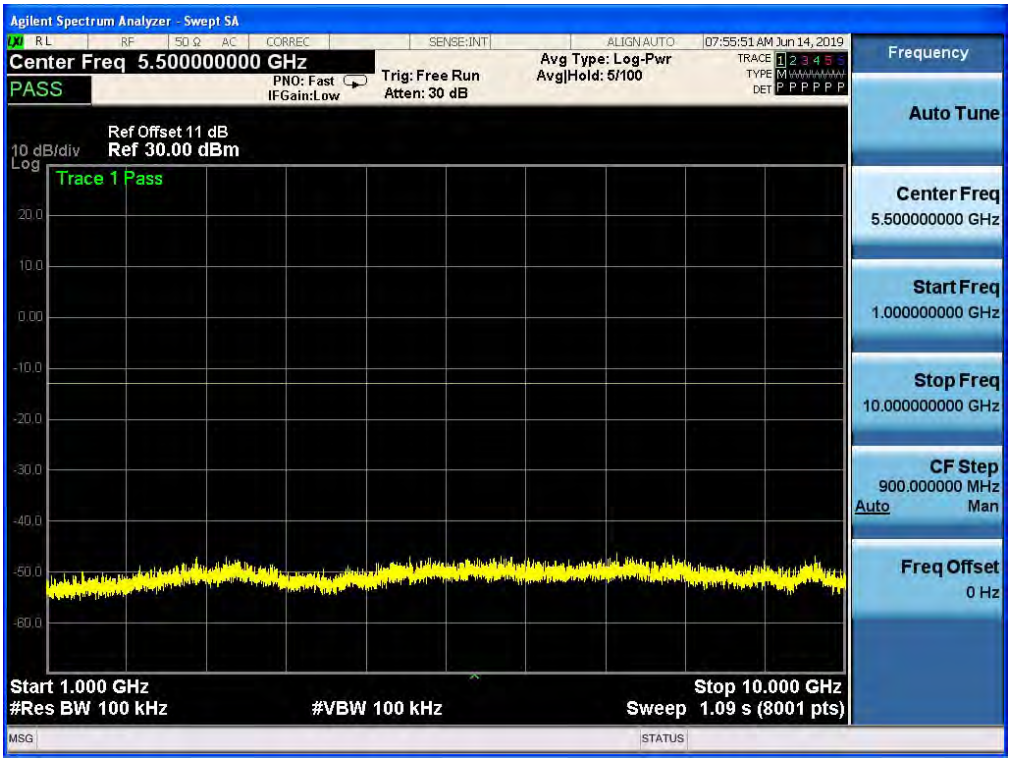
Band 12,UL Channel 23035,UL Frequency 701.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



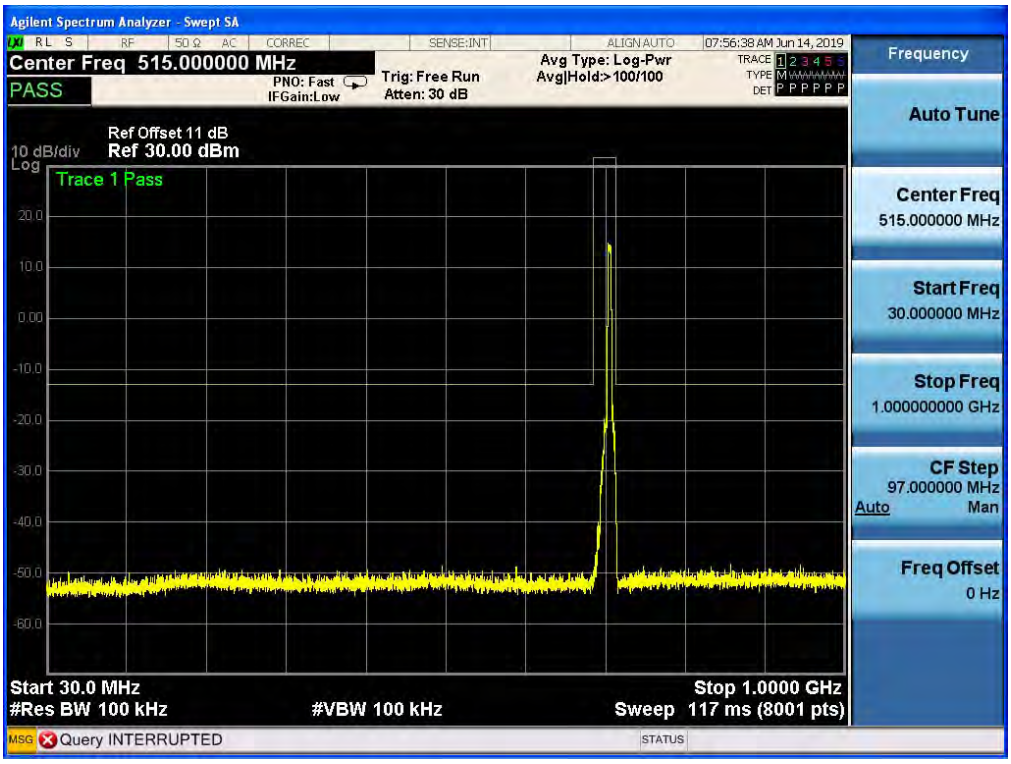
Band 12,UL Channel 23035,UL Frequency 701.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



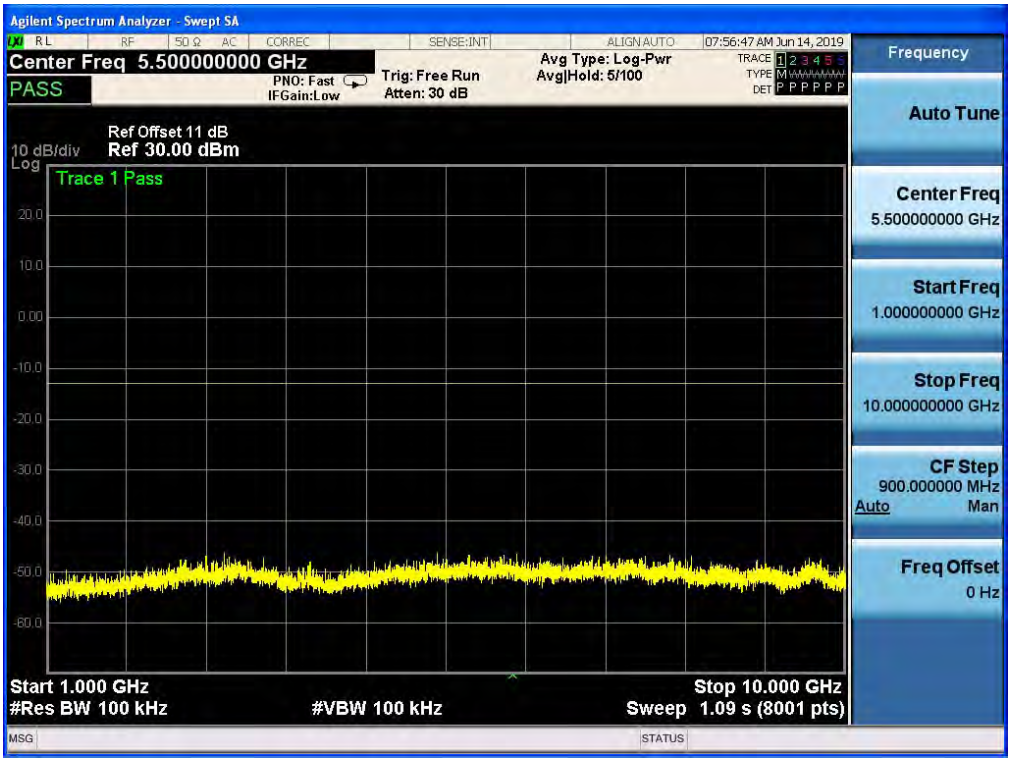
Band 12,UL Channel 23035,UL Frequency 701.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



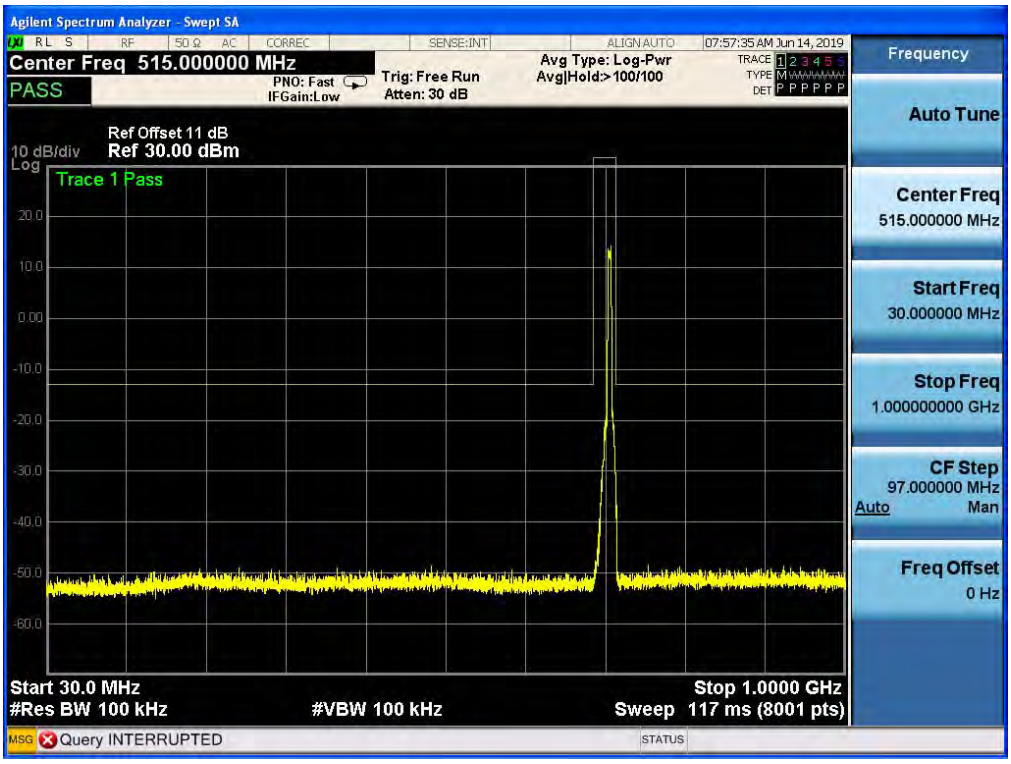
Band 12,UL Channel 23155,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



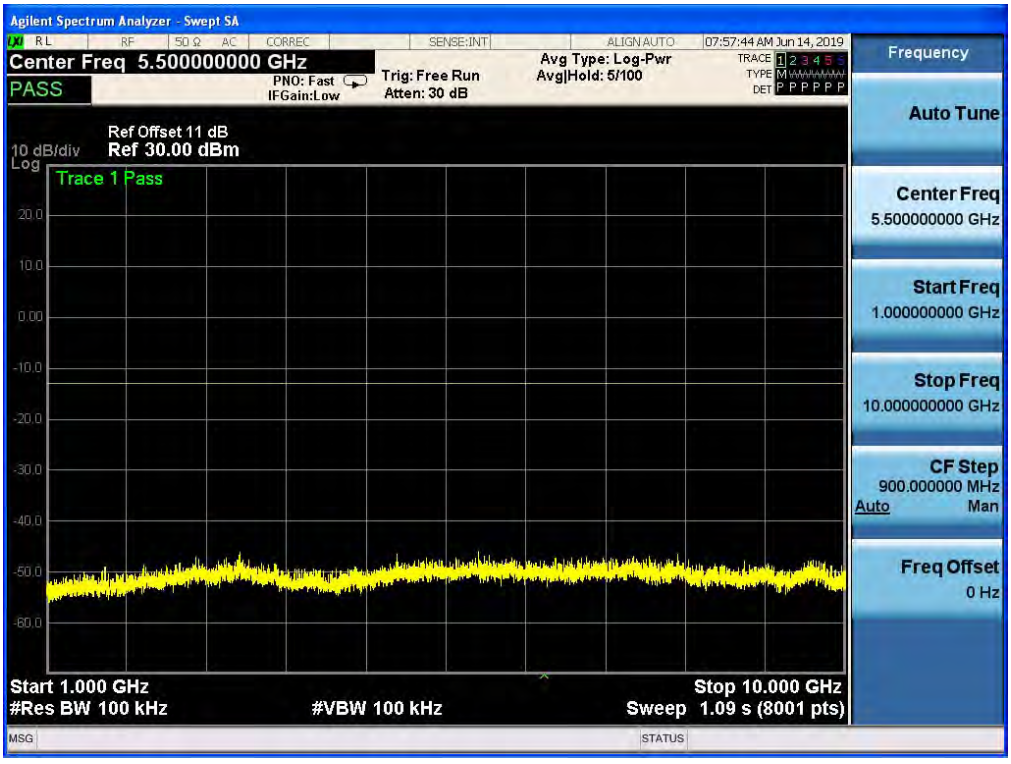
Band 12,UL Channel 23155,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



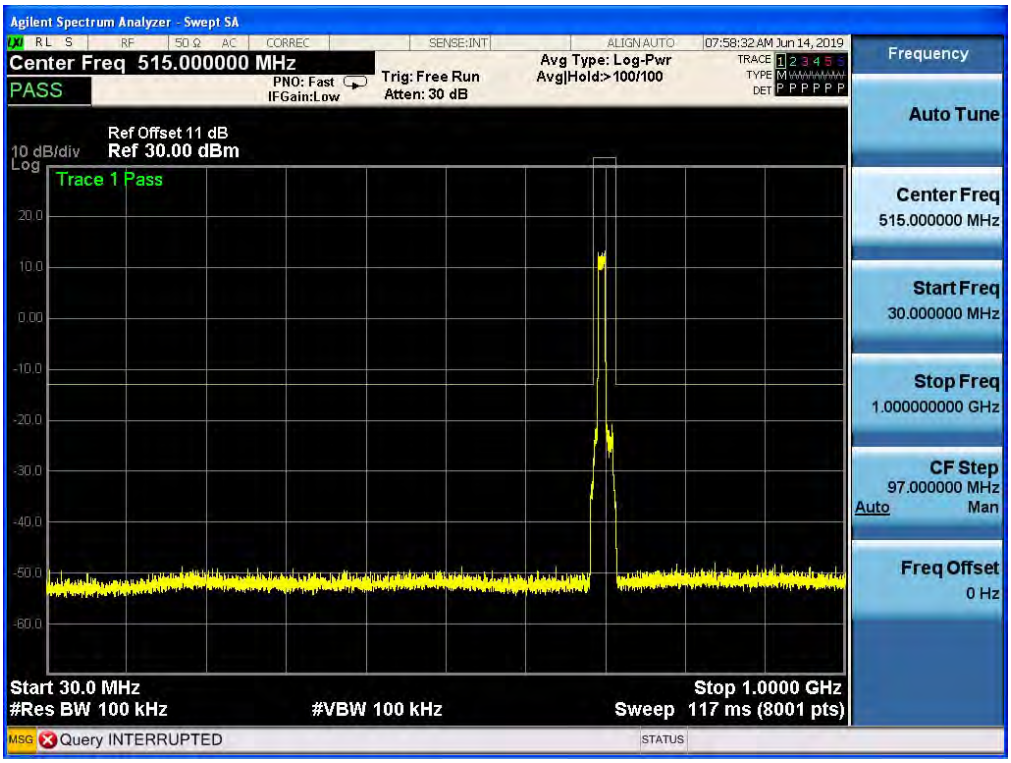
Band 12,UL Channel 23155,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



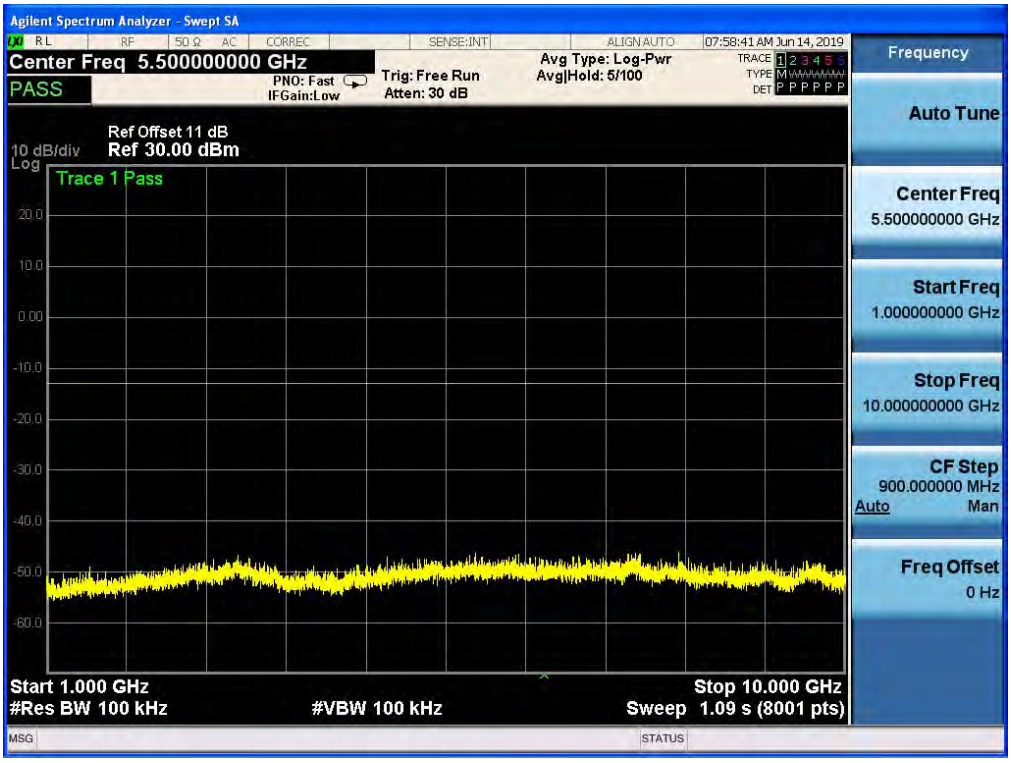
Band 12,UL Channel 23155,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



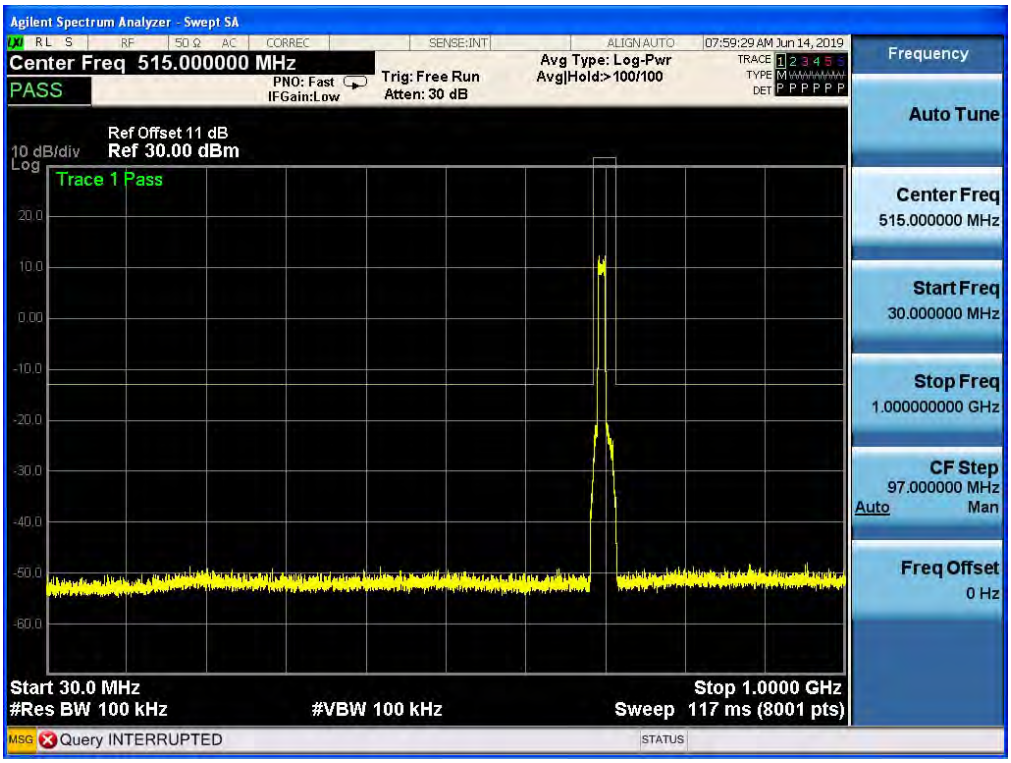
Band 12,UL Channel 23060,UL Frequency 704.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



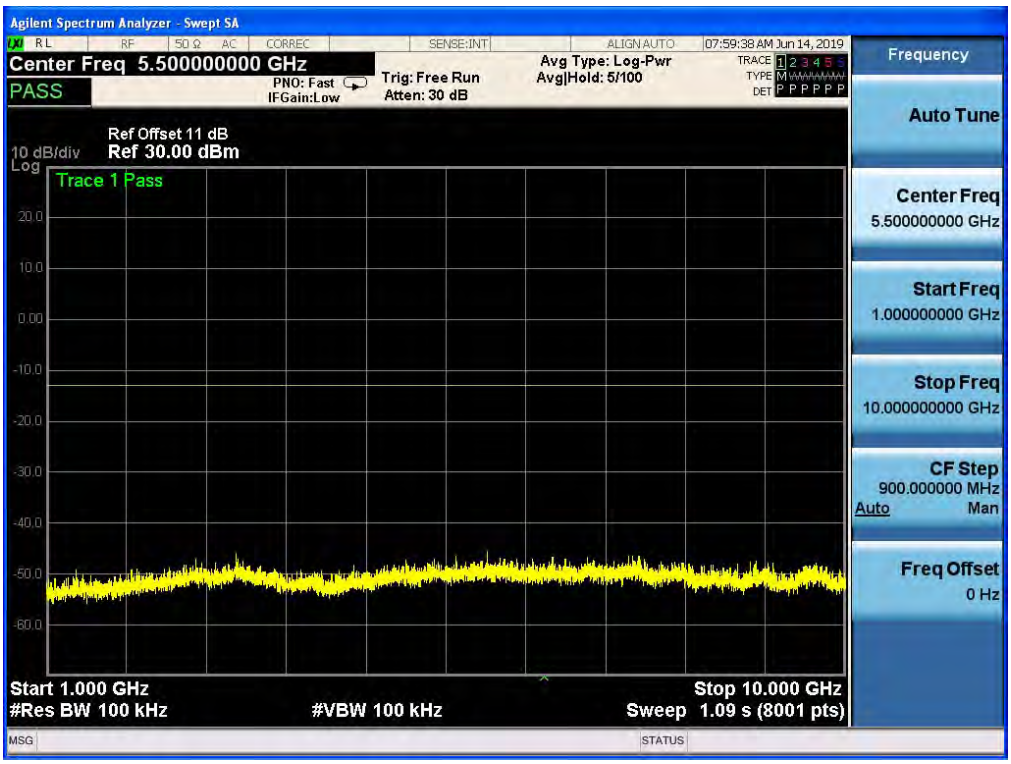
Band 12,UL Channel 23060,UL Frequency 704.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



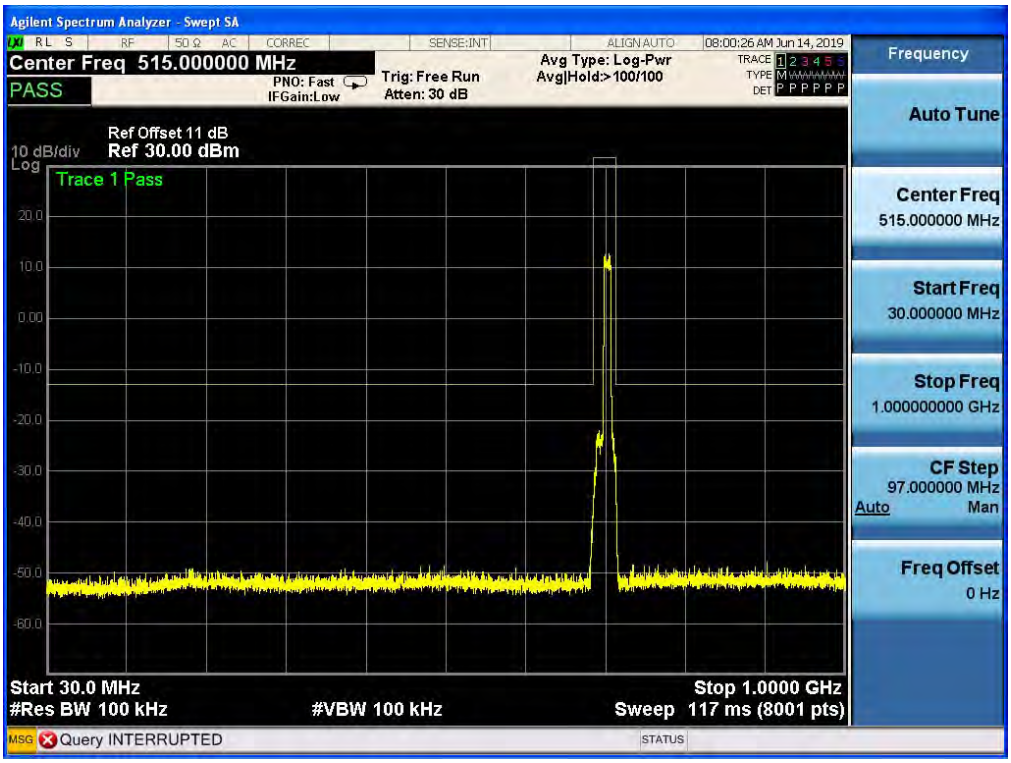
Band 12,UL Channel 23060,UL Frequency 704.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



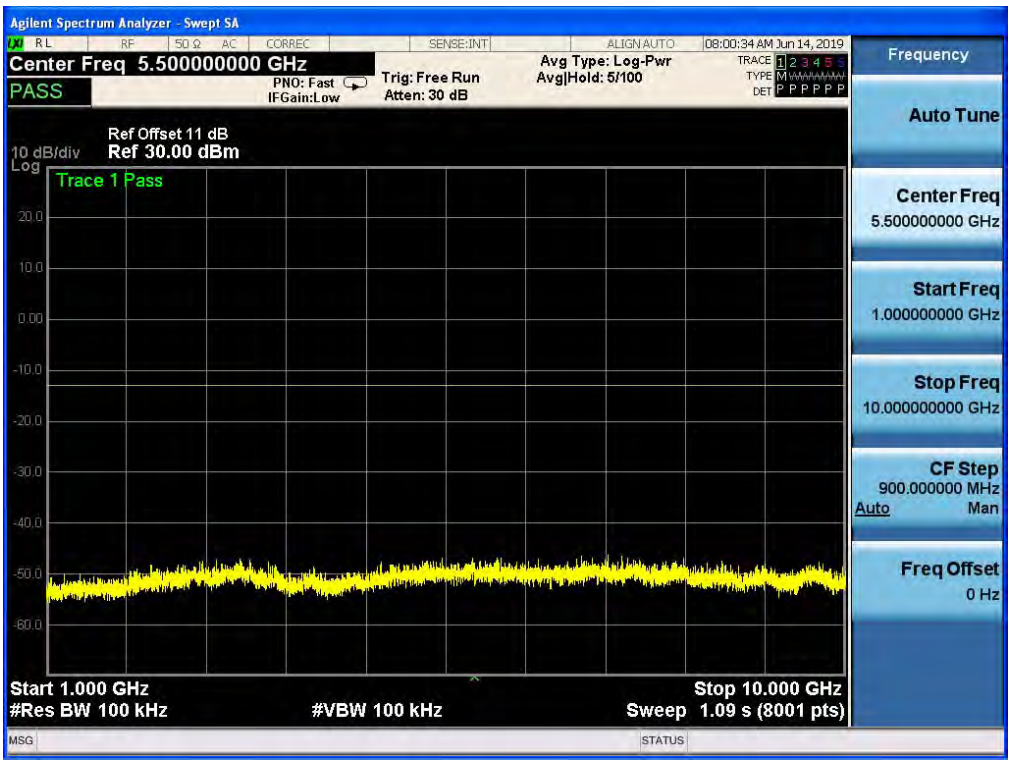
Band 12,UL Channel 23060,UL Frequency 704.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



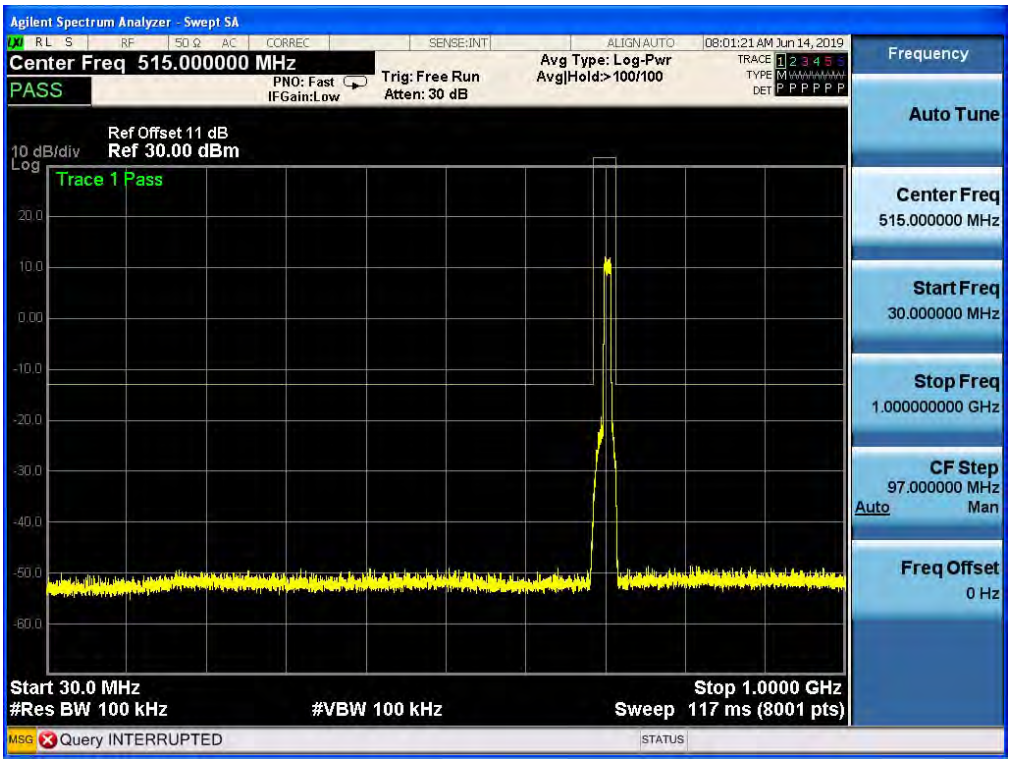
Band 12,UL Channel 23130,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



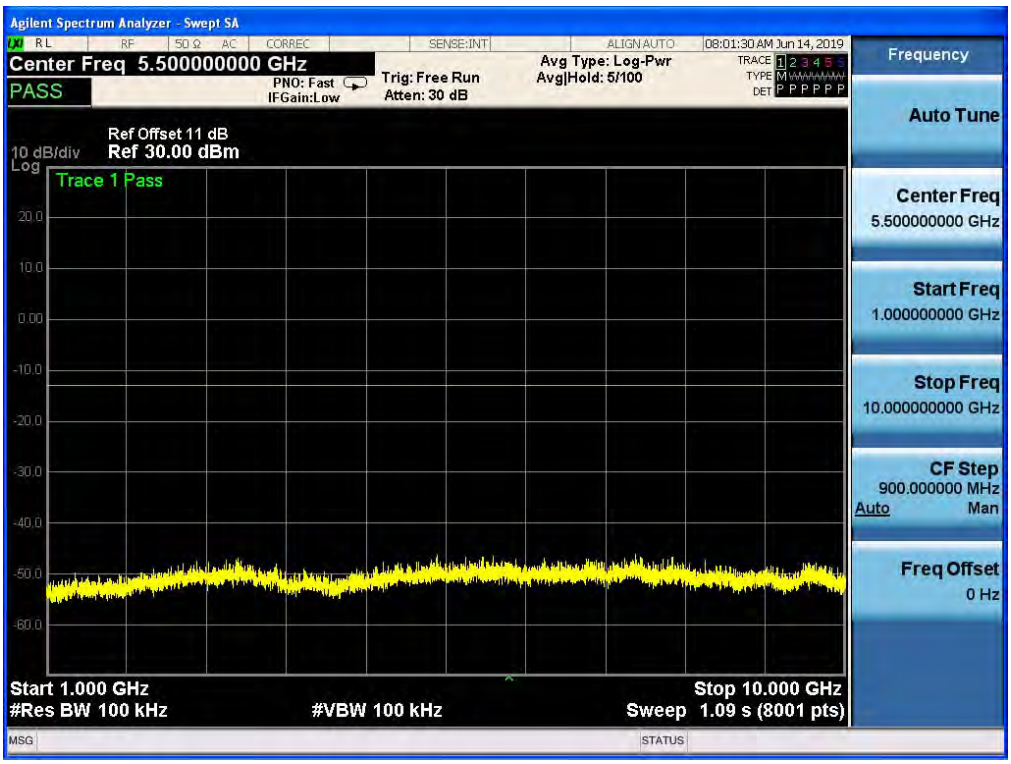
Band 12,UL Channel 23130,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



Band 12,UL Channel 23130,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM

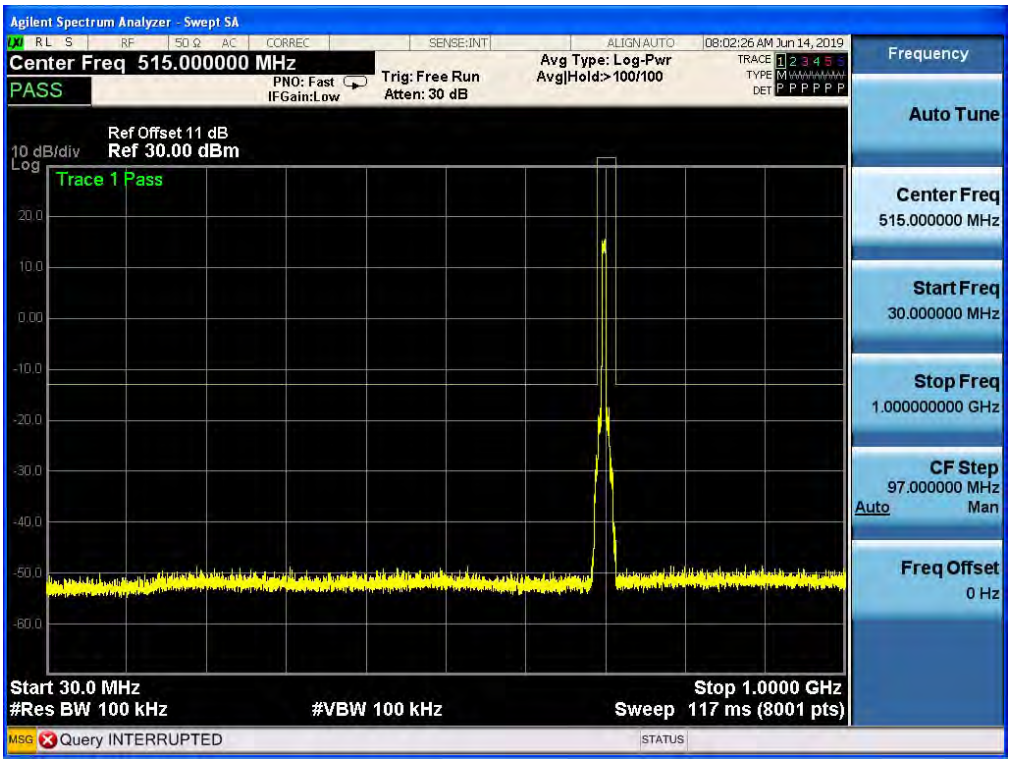


Band 12,UL Channel 23130,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM

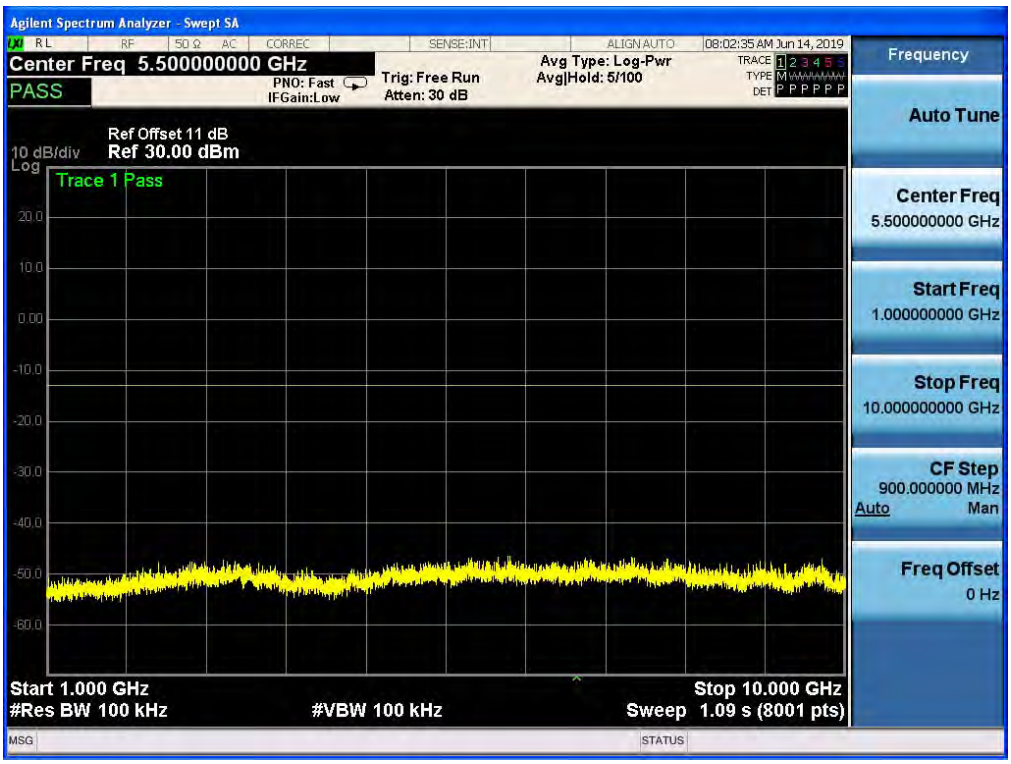


7.6LTE BAND 17

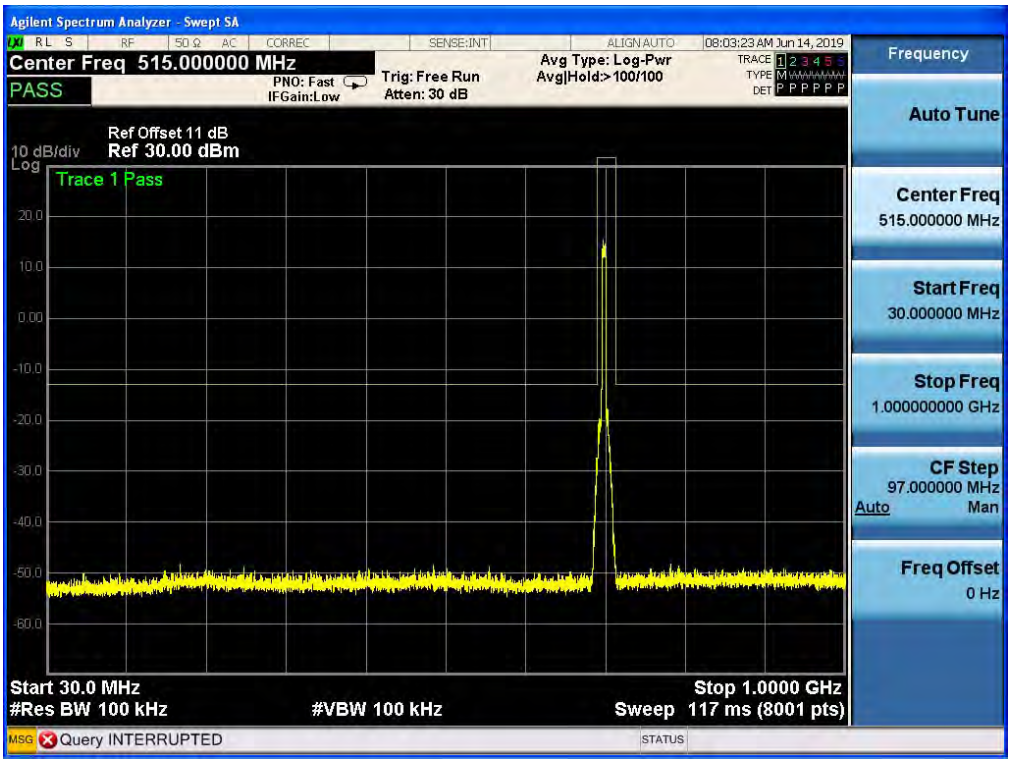
Band 17,UL Channel 23755,UL Frequency 706.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



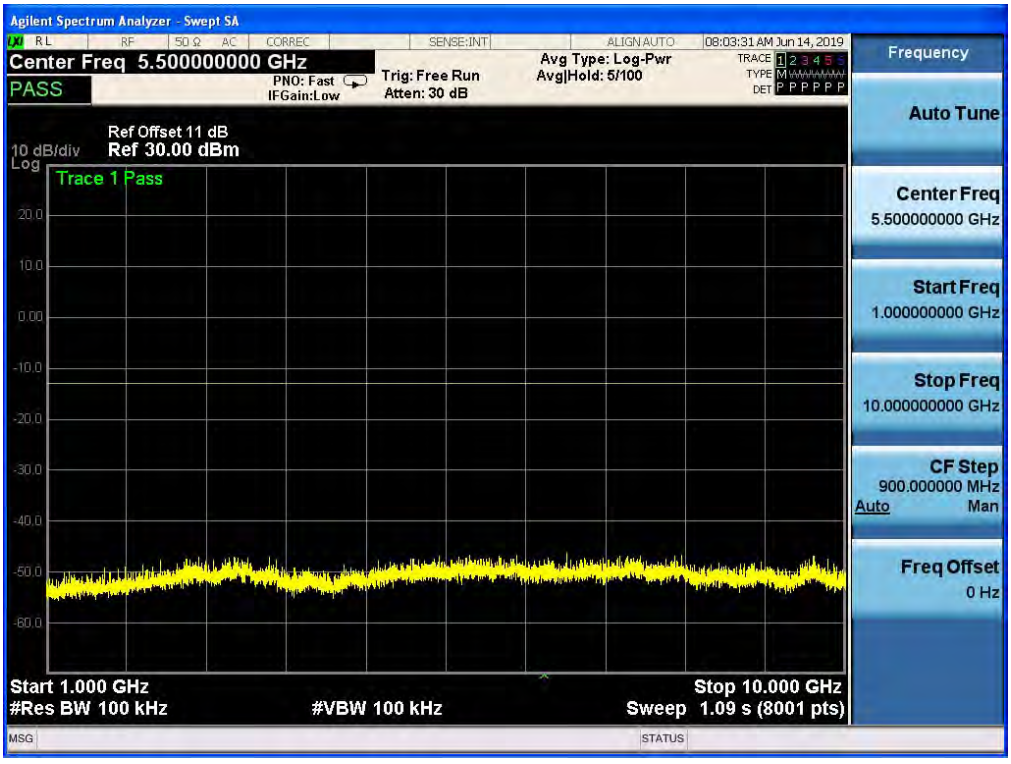
Band 17,UL Channel 23755,UL Frequency 706.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



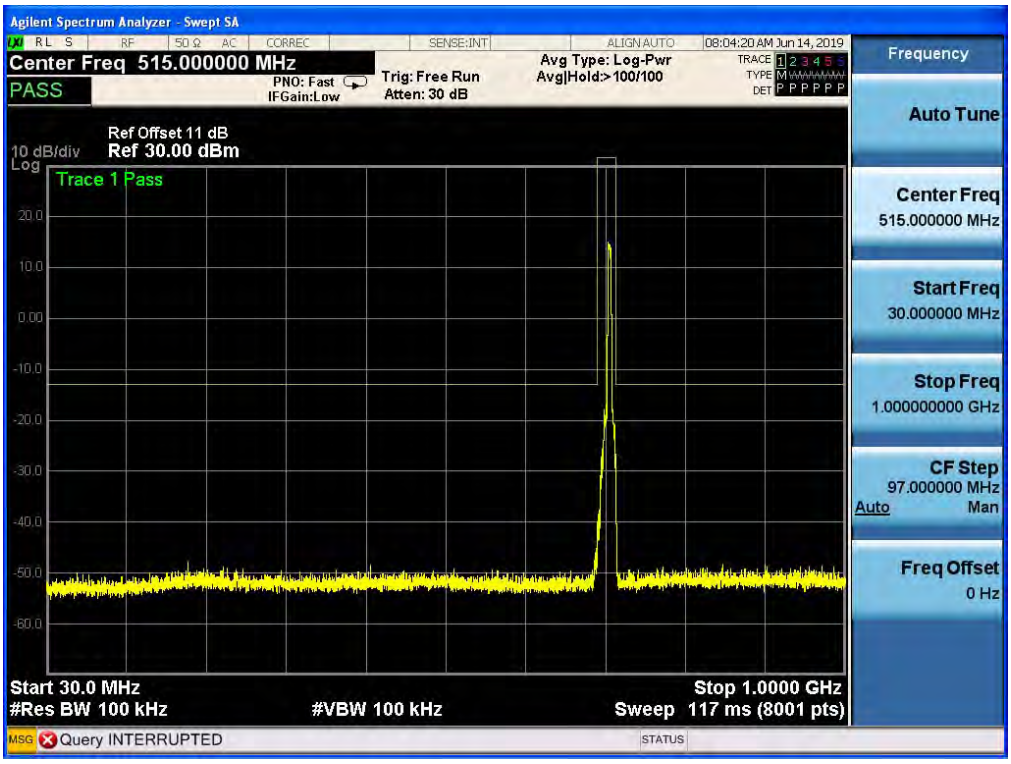
Band 17,UL Channel 23755,UL Frequency 706.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



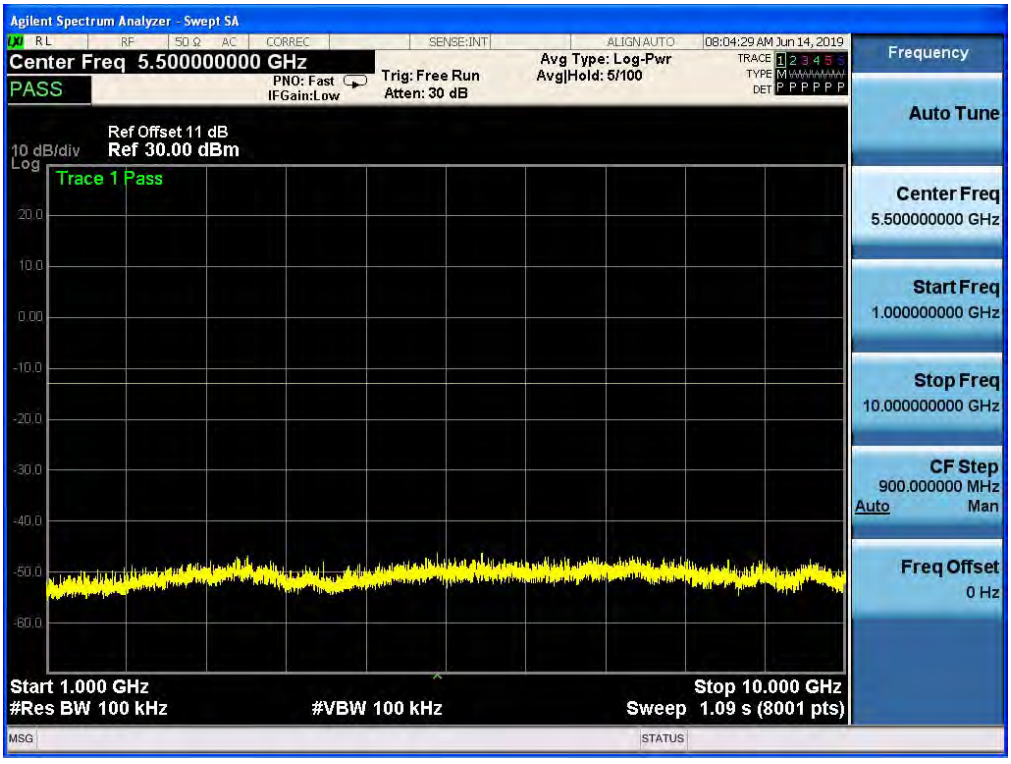
Band 17,UL Channel 23755,UL Frequency 706.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



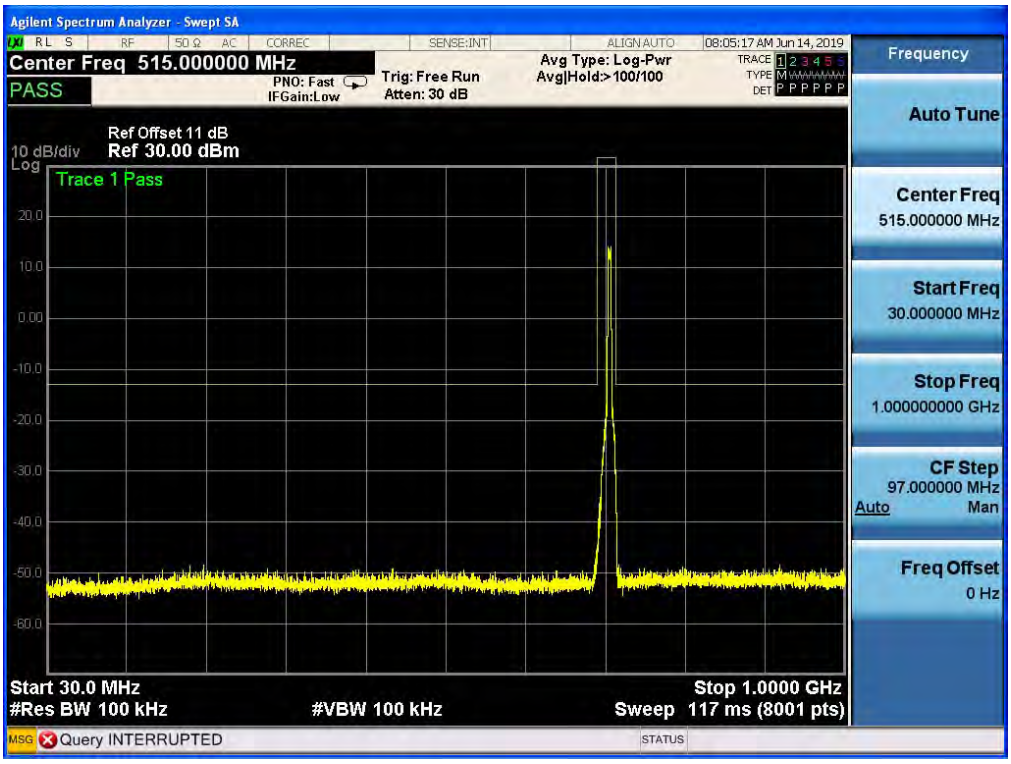
Band 17,UL Channel 23825,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



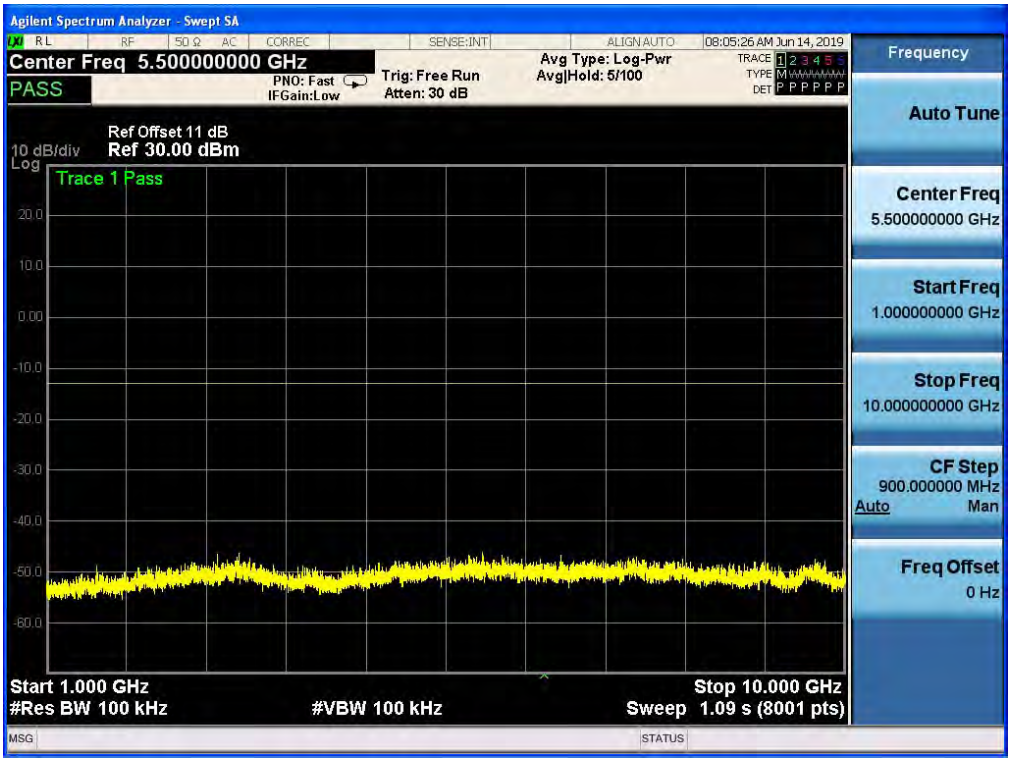
Band 17,UL Channel 23825,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



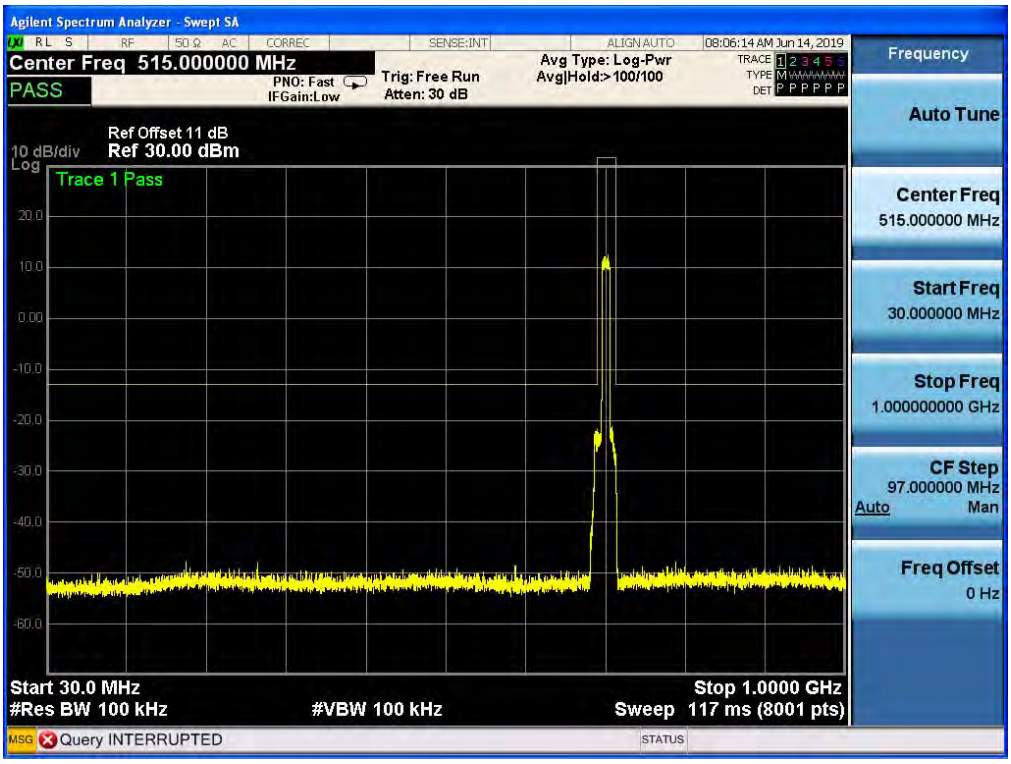
Band 17,UL Channel 23825,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



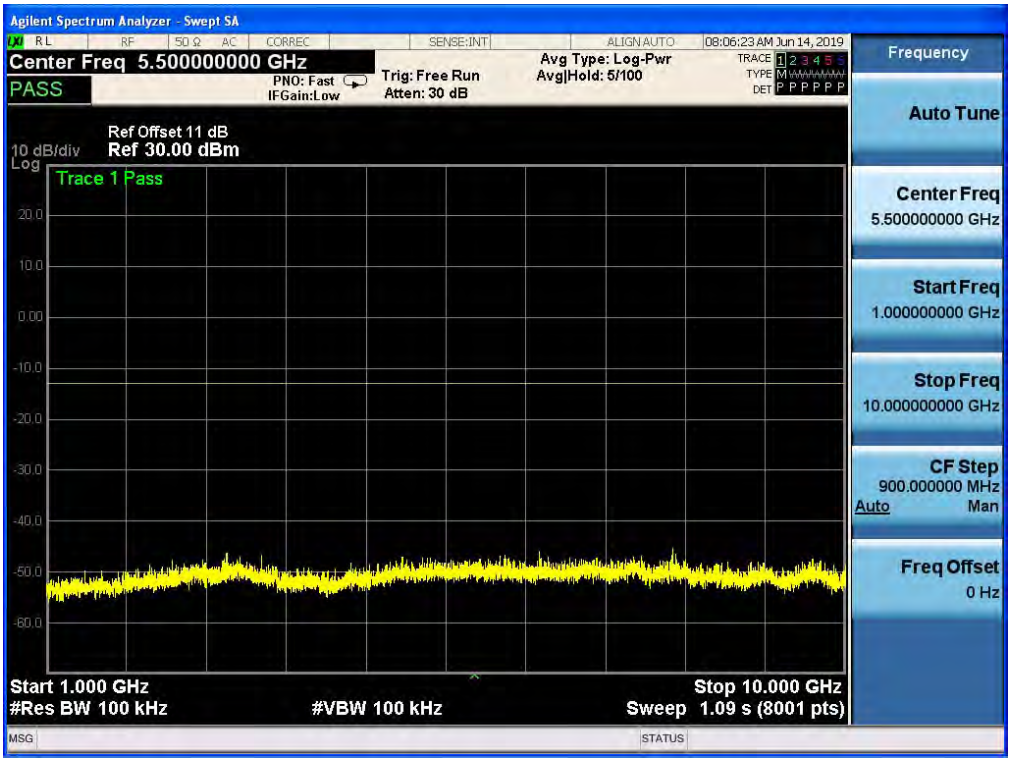
Band 17,UL Channel 23825,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,16-QAM



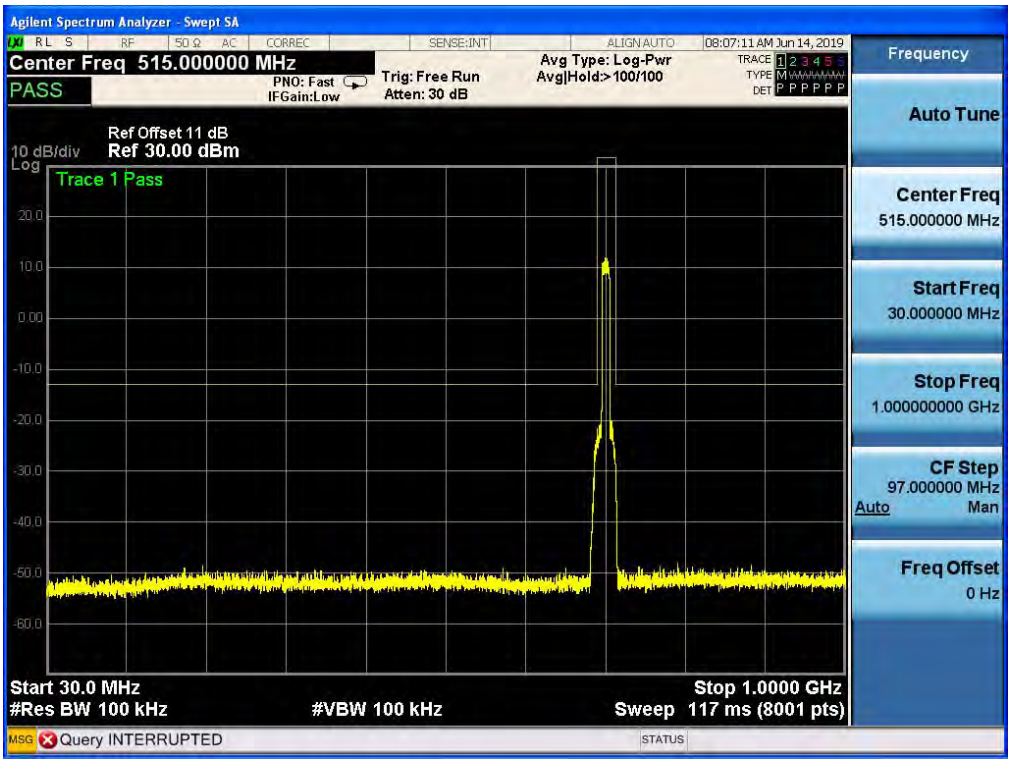
Band 17,UL Channel 23780,UL Frequency 709.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



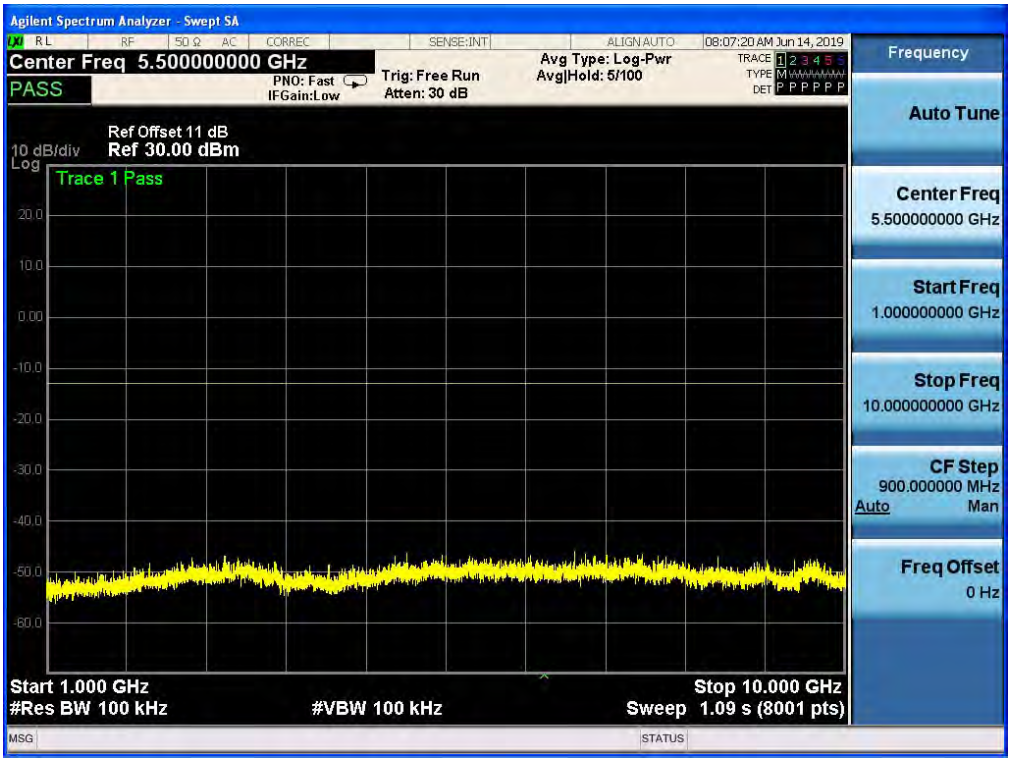
Band 17,UL Channel 23780,UL Frequency 709.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



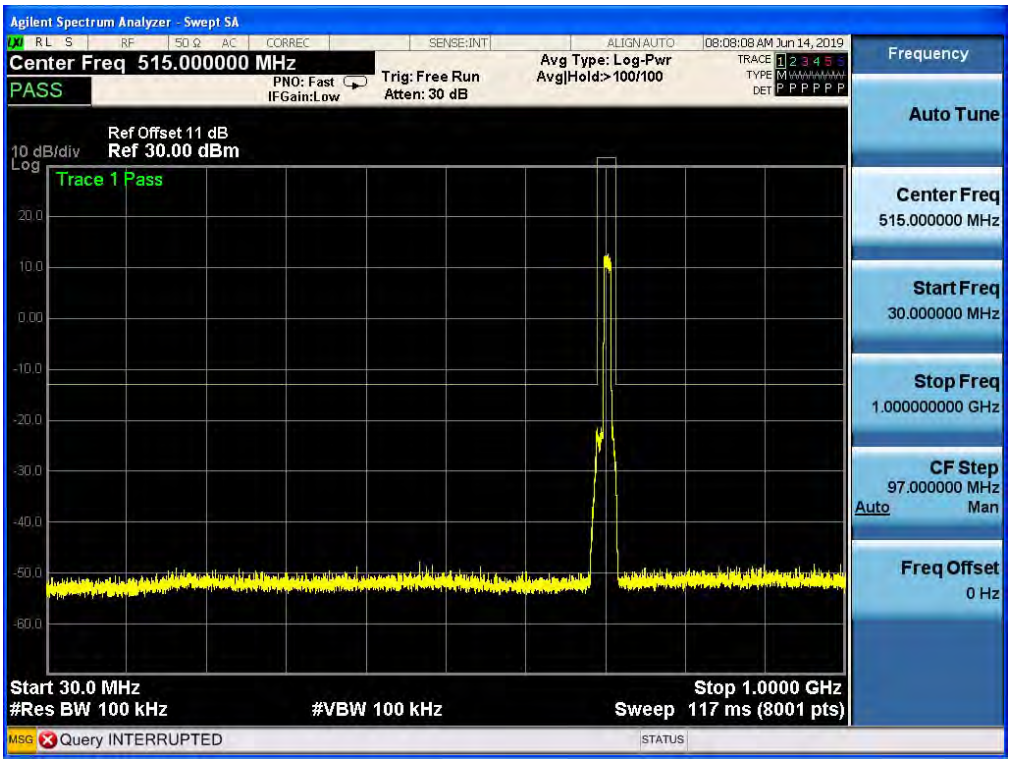
Band 17,UL Channel 23780,UL Frequency 709.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



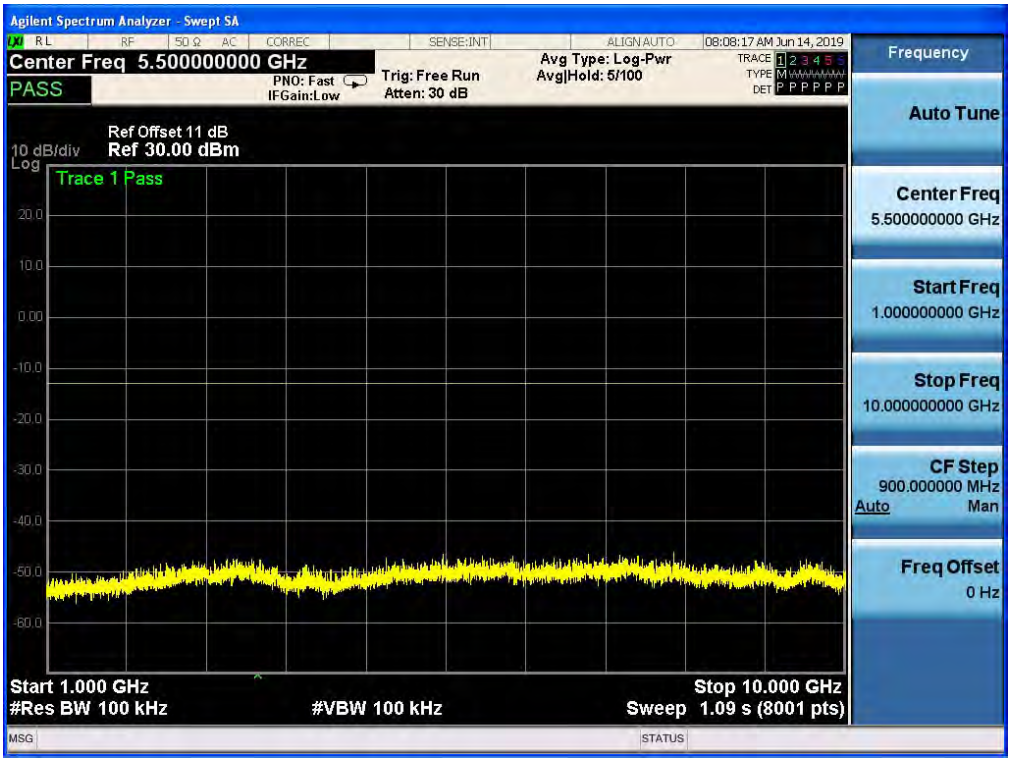
Band 17,UL Channel 23780,UL Frequency 709.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



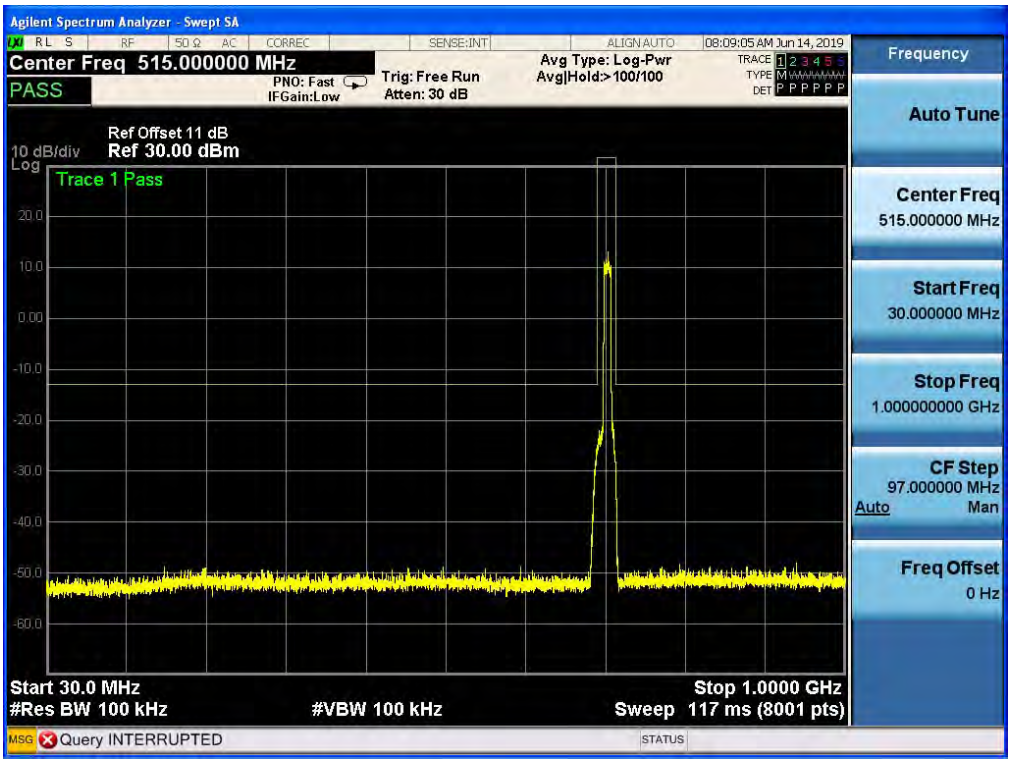
Band 17,UL Channel 23800,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



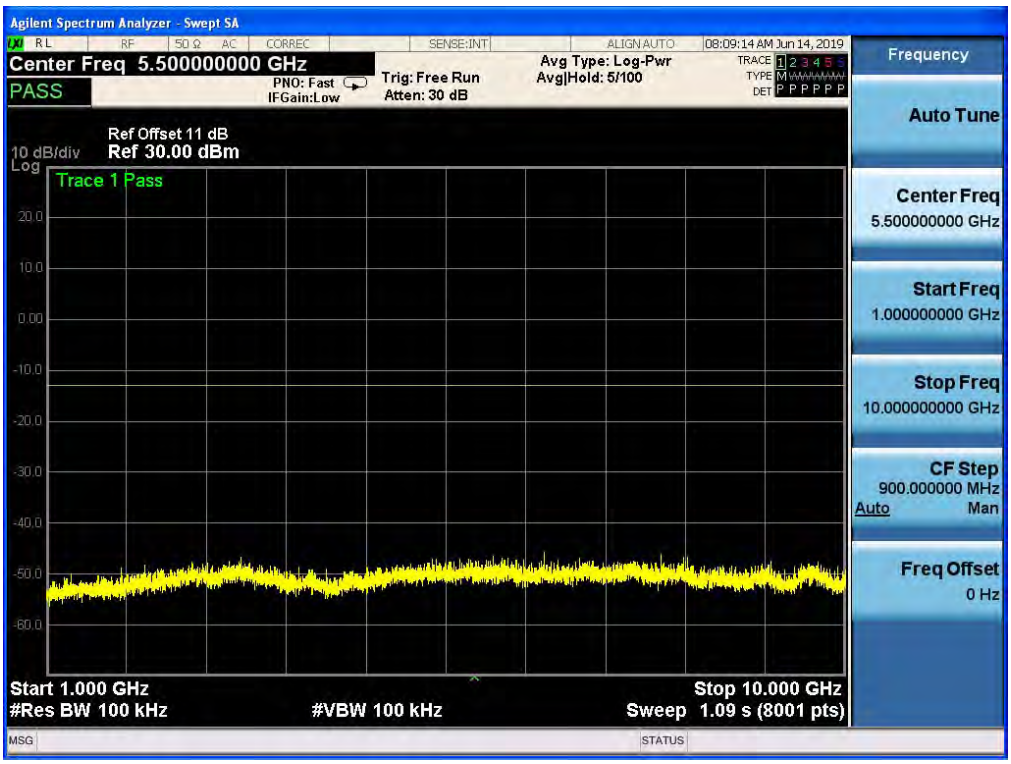
Band 17,UL Channel 23800,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



Band 17,UL Channel 23800,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



Band 17,UL Channel 23800,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,16-QAM



8. RADIATED MEASUREMENT

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232 and §27.50

LIMITS:

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.
27.50 (c) (10) the following power and antenna height requirements apply to stations transmitting in the 698–746 MHz band, the portable stations (hand-held devices) are limited to 3 watts ERP.
27.50 (b)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.
27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

TEST PROCEDURE

ANSI/TIA-603-E Clause 2.2.17
KDB 971168 v02r01 RF power output using broadband peak and average power meter method.
KDB 971168 D01 Power Meas License Digital Systems v02r01, “Measurement Guidance for Certification of Licensed Digital Transmitters”

MODES TESTED

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 7
LTE Band 12
LTE Band 17

RESULTS

Pass

8.2 LTE BAND 2

Radiated Power (EIRP) for Band 2									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz BW QPSK	6/0	1850.7	-2.62	3.76	28.24	21.86	153.587	Vertical	Pass
		1880	-2.00	3.91	28.22	22.31	170.138	Vertical	Pass
		1909.3	-2.03	3.93	28.20	22.24	167.350	Vertical	Pass
1.4MHz BW 16 QAM	6/0	1850.7	-3.39	3.76	28.24	21.09	128.516	Vertical	Pass
		1880	-3.60	3.91	28.22	20.71	117.662	Vertical	Pass
		1909.3	-3.39	3.93	28.20	20.88	122.568	Vertical	Pass
3.0MHz BW QPSK	15/0	1851.5	-2.33	3.77	28.23	22.13	163.221	Vertical	Pass
		1880	-1.86	3.91	28.24	22.47	176.685	Vertical	Pass
		1908.5	-1.95	3.94	28.25	22.36	172.052	Vertical	Pass
3.0MHz BW 16 QAM	15/0	1851.5	-2.87	3.77	28.23	21.59	144.278	Vertical	Pass
		1880	-2.80	3.91	28.24	21.53	142.326	Vertical	Pass
		1908.5	-3.08	3.94	28.25	21.23	132.851	Vertical	Pass
5.0MHz BW QPSK	25/0	1852.5	-2.38	3.77	28.31	22.16	164.580	Vertical	Pass
		1880	-2.10	3.91	28.22	22.21	166.473	Vertical	Pass
		1907.5	-2.14	3.94	28.20	22.12	163.102	Vertical	Pass
5.0MHz BW 16 QAM	25/0	1852.5	-3.50	3.77	28.31	21.04	127.026	Vertical	Pass
		1880	-3.03	3.91	28.22	21.28	134.358	Vertical	Pass
		1907.5	-2.84	3.94	28.20	21.42	138.816	Vertical	Pass
10.0MHz BW QPSK	50/0	1855	-2.14	3.79	28.33	22.40	173.796	Vertical	Pass
		1880	-2.40	3.95	28.22	21.87	153.910	Vertical	Pass
		1905	-1.92	3.97	28.19	22.30	169.661	Vertical	Pass
10.0MHz BW 16 QAM	50/0	1855	-3.15	3.79	28.33	21.39	137.574	Vertical	Pass
		1880	-3.18	3.95	28.22	21.09	128.524	Vertical	Pass
		1905	-3.30	3.97	28.19	20.92	123.602	Vertical	Pass
15.0MHz BW QPSK	75/0	1857.5	-2.91	3.79	28.34	21.64	145.879	Vertical	Pass
		1880	-1.86	3.95	28.22	22.41	174.203	Vertical	Pass
		1902.5	-1.59	3.97	28.18	22.62	182.759	Vertical	Pass
15.0MHz BW 16 QAM	75/0	1857.5	-3.83	3.79	28.34	20.72	118.101	Vertical	Pass
		1880	-2.75	3.95	28.22	21.52	141.975	Vertical	Pass
		1902.5	-3.44	3.97	28.18	20.77	119.502	Vertical	Pass

20.0MHz BW QPSK	100/0	1860	-2.45	3.81	28.35	22.09	161.808	Vertical	Pass
		1880	-1.48	3.96	28.22	**22.78**	189.671	Vertical	Pass
		1900	-2.17	4.00	28.16	21.99	158.125	Vertical	Pass
20.0MHz BW 16 QAM	100/0	1860	-2.29	3.81	28.35	**22.25**	167.880	Vertical	Pass
		1880	-2.38	3.96	28.22	21.88	154.170	Vertical	Pass
		1900	-2.25	4	28.16	21.91	155.239	Vertical	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Radiated Power (EIRP) for Band 2									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz BW QPSK	6/0	1850.7	-2.77	3.76	28.24	21.71	148.318	Horizontal	Pass
		1880	-1.87	3.91	28.22	22.44	175.416	Horizontal	Pass
		1909.3	-2.51	3.93	28.20	21.76	149.980	Horizontal	Pass
1.4MHz BW 16 QAM	6/0	1850.7	-3.29	3.76	28.24	21.19	131.633	Horizontal	Pass
		1880	-3.77	3.91	28.22	20.54	113.262	Horizontal	Pass
		1909.3	-3.57	3.93	28.20	20.70	117.412	Horizontal	Pass
3.0MHz BW QPSK	15/0	1851.5	-2.61	3.77	28.23	21.85	153.111	Horizontal	Pass
		1880	-2.72	3.91	28.24	21.61	145.027	Horizontal	Pass
		1908.5	-2.27	3.94	28.25	22.04	159.830	Horizontal	Pass
3.0MHz BW 16 QAM	15/0	1851.5	-3.41	3.77	28.23	21.05	127.483	Horizontal	Pass
		1880	-3.22	3.91	28.24	21.11	129.224	Horizontal	Pass
		1908.5	-3.80	3.94	28.25	20.51	112.431	Horizontal	Pass
5.0MHz BW QPSK	25/0	1852.5	-2.66	3.77	28.31	21.88	154.315	Horizontal	Pass
		1880	-2.52	3.91	28.22	21.79	151.094	Horizontal	Pass
		1907.5	-2.08	3.94	28.20	22.18	165.014	Horizontal	Pass
5.0MHz BW 16 QAM	25/0	1852.5	-3.57	3.77	28.31	20.97	125.070	Horizontal	Pass
		1880	-2.76	3.91	28.22	21.55	142.727	Horizontal	Pass
		1907.5	-3.56	3.94	28.20	20.70	117.370	Horizontal	Pass
10.0MHz BW QPSK	50/0	1855	-2.86	3.79	28.33	21.68	147.265	Horizontal	Pass
		1880	-2.21	3.95	28.22	22.06	160.526	Horizontal	Pass
		1905	-2.11	3.97	28.19	22.11	162.572	Horizontal	Pass
10.0MHz BW 16 QAM	50/0	1855	-3.61	3.79	28.33	20.93	123.958	Horizontal	Pass
		1880	-3.40	3.95	28.22	20.87	122.133	Horizontal	Pass
		1905	-3.40	3.97	28.19	20.82	120.897	Horizontal	Pass
15.0MHz BW QPSK	75/0	1857.5	-2.89	3.79	28.34	21.66	146.588	Horizontal	Pass
		1880	-2.45	3.95	28.22	21.82	151.959	Horizontal	Pass
		1902.5	-2.10	3.97	28.18	22.11	162.585	Horizontal	Pass
15.0MHz BW 16 QAM	75/0	1857.5	-3.59	3.79	28.34	20.96	124.649	Horizontal	Pass
		1880	-3.67	3.95	28.22	20.60	114.730	Horizontal	Pass
		1902.5	-3.47	3.97	28.18	20.74	118.594	Horizontal	Pass
20.0MHz BW	100/ 0	1860	-1.93	3.81	28.35	**22.61**	182.390	Horizontal	Pass
		1880	-2.49	3.96	28.22	21.77	150.314	Horizontal	Pass

QPSK		1900	-2.08	4.00	28.16	22.08	161.436	Horizontal	Pass
20.0MHz BW 16 QAM	100/0	1860	-2.62	3.81	28.35	21.92	155.597	Horizontal	Pass
		1880	-2.91	3.96	28.22	21.35	136.458	Horizontal	Pass
		1900	-2.66	4.00	28.16	21.5	141.254	Horizontal	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

8.3 LTE BAND 4

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	-1.69	3.12	27.58	22.77	189.319	Horizontal	Pass
		1732.5	-1.78	3.27	27.61	22.56	180.439	Horizontal	Pass
		1754.3	-1.42	3.29	27.63	22.92	196.101	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	-1.81	3.13	27.61	22.67	184.972	Horizontal	Pass
		1732.5	-1.58	3.27	27.61	22.76	188.969	Horizontal	Pass
		1753.5	-1.50	3.3	27.62	22.82	191.311	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	-1.48	3.13	27.63	23.02	200.464	Horizontal	Pass
		1732.5	-1.18	3.27	27.61	23.16	206.812	Horizontal	Pass
		1752.5	-1.24	3.3	27.6	23.06	202.109	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	-1.52	3.15	27.64	22.97	198.203	Horizontal	Pass
		1732.5	-1.51	3.31	27.61	22.79	190.055	Horizontal	Pass
		1750	-1.41	3.33	27.59	22.85	192.966	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	-1.83	3.15	27.65	22.67	184.890	Horizontal	Pass
		1732.5	-1.41	3.31	27.61	22.89	194.537	Horizontal	Pass
		1747.5	-1.43	3.33	27.57	22.81	190.980	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	-1.65	3.17	27.66	22.84	192.112	Horizontal	Pass
		1732.5	-1.42	3.32	27.61	22.87	193.564	Horizontal	Pass
		1745	-1.53	3.36	27.56	22.67	184.769	Horizontal	Pass
1.4MHz Band QPSK	6/0	1710.7	-1.64	3.12	27.58	22.82	191.350	Vertical	Pass
		1732.5	-1.58	3.27	27.61	22.76	188.681	Vertical	Pass
		1754.3	-1.56	3.29	27.63	22.78	189.627	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	-1.62	3.13	27.61	22.86	193.144	Vertical	Pass
		1732.5	-1.44	3.27	27.61	22.90	195.018	Vertical	Pass
		1753.5	-1.60	3.3	27.62	22.72	187.214	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	-1.36	3.13	27.63	23.14	206.141	Vertical	Pass
		1732.5	-1.27	3.27	27.61	23.07	202.577	Vertical	Pass
		1752.5	-1.19	3.3	27.6	23.11	204.471	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	-1.63	3.15	27.64	22.86	193.016	Vertical	Pass
		1732.5	-1.48	3.31	27.61	22.82	191.537	Vertical	Pass
		1750	-1.41	3.33	27.59	22.85	192.852	Vertical	Pass

15.0MHz Band QPSK	75/0	1717.5	-1.76	3.15	27.65	22.74	187.852	Vertical	Pass
		1732.5	-1.36	3.31	27.61	22.94	196.924	Vertical	Pass
		1747.5	-1.30	3.33	27.57	22.94	196.613	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	-1.27	3.17	27.66	**23.22**	209.725	Vertical	Pass
		1732.5	-1.45	3.32	27.61	22.84	192.179	Vertical	Pass
		1745	-1.42	3.36	27.56	22.78	189.847	Vertical	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Radiated Power (EIRP) for Band 4									
Mode	RB/RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	1710.7	-2.54	3.12	27.58	21.92	155.589	Horizontal	Pass
		1732.5	-2.41	3.27	27.61	21.93	155.826	Horizontal	Pass
		1754.3	-2.53	3.29	27.63	21.81	151.863	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-3.33	3.13	27.61	21.15	130.439	Horizontal	Pass
		1732.5	-3.19	3.27	27.61	21.15	130.386	Horizontal	Pass
		1753.5	-3.10	3.3	27.62	21.22	132.292	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-3.47	3.13	27.63	21.03	126.828	Horizontal	Pass
		1732.5	-3.34	3.27	27.61	21.00	125.797	Horizontal	Pass
		1752.5	-2.35	3.3	27.6	21.95	156.625	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1715	-2.70	3.15	27.64	21.79	151.029	Horizontal	Pass
		1732.5	-2.40	3.31	27.61	21.90	154.801	Horizontal	Pass
		1750	-2.61	3.33	27.59	21.65	146.148	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1717.5	-2.54	3.15	27.65	21.96	156.886	Horizontal	Pass
		1732.5	-2.37	3.31	27.61	21.93	155.900	Horizontal	Pass
		1747.5	-2.27	3.33	27.57	21.97	157.244	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1720	-2.79	3.17	27.66	21.70	148.060	Horizontal	Pass
		1732.5	-2.57	3.32	27.61	21.72	148.548	Horizontal	Pass
		1745	-2.40	3.36	27.56	21.80	151.453	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1710.7	-2.59	3.12	27.58	21.87	153.981	Vertical	Pass
		1732.5	-2.46	3.27	27.61	21.88	154.046	Vertical	Pass
		1754.3	-2.47	3.29	27.63	21.87	153.767	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1711.5	-3.18	3.13	27.61	21.30	134.774	Vertical	Pass
		1732.5	-3.13	3.27	27.61	21.21	132.181	Vertical	Pass
		1753.5	-3.06	3.3	27.62	21.26	133.715	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1712.5	-3.39	3.13	27.63	21.11	129.159	Vertical	Pass
		1732.5	-3.17	3.27	27.61	21.17	131.036	Vertical	Pass
		1752.5	-3.29	3.3	27.6	21.01	126.302	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1715	-2.58	3.15	27.64	21.91	155.160	Vertical	Pass
		1732.5	-2.37	3.31	27.61	21.93	155.871	Vertical	Pass
		1750	-2.56	3.33	27.59	21.70	147.815	Vertical	Pass
15.0MHz Band	75/0	1717.5	-2.73	3.15	27.65	21.77	150.309	Vertical	Pass
		1732.5	-2.58	3.31	27.61	21.72	148.653	Vertical	Pass

16 QAM		1747.5	-2.59	3.33	27.57	21.65	146.264	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1720	-2.65	3.17	27.66	21.84	152.922	Vertical	Pass
		1732.5	-2.49	3.32	27.61	21.80	151.415	Vertical	Pass
		1745	-2.19	3.36	27.56	**22.01**	158.973	Vertical	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

8.4 LTE BAND 5

Radiated Power (ERP) for Band 5										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz BW QPSK	6/0	824.7	3.45	2.01	19.68	2.15	18.97	78.910	Vertical	Pass
		836.5	3.23	2.01	19.77	2.15	18.84	76.640	Vertical	Pass
		848.3	3.39	2.02	19.82	2.15	19.04	80.231	Vertical	Pass
1.4MHz BW 16 QAM	6/0	824.7	2.21	2.01	19.68	2.15	17.73	59.284	Vertical	Pass
		836.5	2.38	2.01	19.77	2.15	17.99	62.909	Vertical	Pass
		848.3	2.01	2.02	19.82	2.15	17.66	58.337	Vertical	Pass
3.0MHz BW QPSK	15/0	825.5	2.96	2.01	19.70	2.15	18.50	70.825	Vertical	Pass
		836.5	3.33	2.01	19.77	2.15	18.94	78.350	Vertical	Pass
		847.5	3.04	2.02	19.81	2.15	18.68	73.726	Vertical	Pass
3.0MHz BW 16 QAM	15/0	825.5	1.78	2.01	19.70	2.15	17.32	53.962	Vertical	Pass
		836.5	1.42	2.01	19.77	2.15	17.03	50.480	Vertical	Pass
		847.5	2.20	2.02	19.81	2.15	17.84	60.819	Vertical	Pass
5.0MHz BW QPSK	25/0	826.5	2.57	2.01	19.71	2.15	18.12	64.862	Vertical	Pass
		836.5	3.58	2.01	19.77	2.15	19.19	82.967	Vertical	Pass
		846.5	2.75	2.02	19.79	2.15	18.37	68.686	Vertical	Pass
5.0MHz BW 16 QAM	25/0	826.5	2.26	2.01	19.71	2.15	17.81	60.342	Vertical	Pass
		836.5	1.34	2.01	19.77	2.15	16.95	49.569	Vertical	Pass
		846.5	2.16	2.02	19.79	2.15	17.78	59.934	Vertical	Pass
10.0MHz BW QPSK	50/0	829	3.46	2.01	19.73	2.15	19.03	79.983	Vertical	Pass
		836.5	3.74	2.01	19.77	2.15	19.35	86.099	Vertical	Pass
		844	3.92	2.02	19.78	2.15	**19.53**	89.743	Vertical	Pass
10.0MHz BW 16 QAM	50/0	829	4	2.01	19.73	2.15	**19.57**	90.573	Vertical	Pass
		836.5	2.99	2.01	19.77	2.15	18.6	72.444	Vertical	Pass
		844	2.89	2.02	19.78	2.15	18.5	70.795	Vertical	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Radiated Power (ERP) for Band 5										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz BW QPSK	6/0	824.7	3.22	2.01	19.68	2.15	18.74	74.858	Horizontal	Pass
		836.5	2.09	2.01	19.77	2.15	17.70	58.891	Horizontal	Pass
		848.3	3.09	2.02	19.82	2.15	18.74	74.752	Horizontal	Pass
1.4MHz BW 16 QAM	6/0	824.7	2.25	2.01	19.68	2.15	17.77	59.855	Horizontal	Pass
		836.5	1.39	2.01	19.77	2.15	17.00	50.119	Horizontal	Pass
		848.3	1.45	2.02	19.82	2.15	17.10	51.339	Horizontal	Pass
3.0MHz BW QPSK	15/0	825.5	2.55	2.01	19.70	2.15	18.09	64.418	Horizontal	Pass
		836.5	2.24	2.01	19.77	2.15	17.85	60.941	Horizontal	Pass
		847.5	2.96	2.02	19.81	2.15	18.60	72.485	Horizontal	Pass
3.0MHz BW 16 QAM	15/0	825.5	1.50	2.01	19.70	2.15	17.04	50.540	Horizontal	Pass
		836.5	1.38	2.01	19.77	2.15	16.99	49.992	Horizontal	Pass
		847.5	1.56	2.02	19.81	2.15	17.20	52.426	Horizontal	Pass
5.0MHz BW QPSK	25/0	826.5	2.60	2.01	19.71	2.15	18.15	65.239	Horizontal	Pass
		836.5	1.70	2.01	19.77	2.15	17.31	53.869	Horizontal	Pass
		846.5	2.93	2.02	19.79	2.15	18.55	71.675	Horizontal	Pass
5.0MHz BW 16 QAM	25/0	826.5	1.26	2.01	19.71	2.15	16.81	47.961	Horizontal	Pass
		836.5	1.34	2.01	19.77	2.15	16.95	49.542	Horizontal	Pass
		846.5	1.86	2.02	19.79	2.15	17.48	55.959	Horizontal	Pass
10.0MHz BW QPSK	50/0	829	3.47	2.01	19.73	2.15	19.04	80.168	Horizontal	Pass
		836.5	3.46	2.01	19.77	2.15	19.07	80.724	Horizontal	Pass
		844	3.39	2.02	19.78	2.15	19	79.433	Horizontal	Pass
10.0MHz BW 16 QAM	50/0	829	2.48	2.01	19.73	2.15	18.05	63.826	Horizontal	Pass
		836.5	2.36	2.01	19.77	2.15	17.97	62.661	Horizontal	Pass
		844	2.57	2.02	19.78	2.15	18.18	65.766	Horizontal	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

8.5 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz BW QPSK	25/0	2502.5	-3.67	4.54	27.75	19.54	89.913	Vertical	Pass
		2535	-3.33	4.69	27.72	19.70	93.219	Vertical	Pass
		2567.5	-3.48	4.71	27.71	19.52	89.524	Vertical	Pass
5.0MHz BW 16 QAM	25/0	2502.5	-4.76	4.54	27.75	18.45	70.046	Vertical	Pass
		2535	-4.55	4.69	27.72	18.48	70.448	Vertical	Pass
		2567.5	-4.49	4.71	27.71	18.51	70.997	Vertical	Pass
10.0MHz BW QPSK	50/0	2505	-3.32	4.55	27.76	19.89	97.517	Vertical	Pass
		2535	-3.11	4.69	27.72	19.92	98.285	Vertical	Pass
		2565	-2.60	4.72	27.70	20.38	109.262	Vertical	Pass
10.0MHz BW 16 QAM	50/0	2505	-4.27	4.55	27.76	18.94	78.363	Vertical	Pass
		2535	-4.05	4.69	27.72	18.98	79.139	Vertical	Pass
		2565	-4.33	4.72	27.70	18.65	73.330	Vertical	Pass
15.0MHz BW QPSK	75/0	2507.5	-3.52	4.55	27.77	19.70	93.280	Vertical	Pass
		2535	-2.82	4.69	27.72	20.21	104.878	Vertical	Pass
		2562.5	-3.05	4.72	27.69	19.92	98.287	Vertical	Pass
15.0MHz BW 16 QAM	75/0	2507.5	-4.31	4.55	27.77	18.91	77.803	Vertical	Pass
		2535	-3.61	4.69	27.72	19.42	87.406	Vertical	Pass
		2562.5	-3.85	4.72	27.69	19.12	81.613	Vertical	Pass
20.0MHz BW QPSK	100/ 0	2510	-1.71	4.57	27.78	**21.50**	141.254	Vertical	Pass
		2535	-2.24	4.73	27.72	20.75	118.850	Vertical	Pass
		2560	-2.49	4.75	27.68	20.44	110.662	Vertical	Pass
20.0MHz BW 16 QAM	100/ 0	2510	-2.37	4.57	27.78	20.84	121.339	Vertical	Pass
		2535	-2.03	4.73	27.72	20.96	124.738	Vertical	Pass
		2560	-1.9	4.75	27.68	**21.03**	126.765	Vertical	Pass

Note:

SG Level= Signal generator output

Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

Radiated Power (EIRP) for Band 7									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz BW QPSK	25/0	2502.5	-3.76	4.54	27.75	19.45	88.127	Horizontal	Pass
		2535	-3.46	4.69	27.72	19.57	90.587	Horizontal	Pass
		2567.5	-3.74	4.71	27.71	19.26	84.249	Horizontal	Pass
5.0MHz BW 16 QAM	25/0	2502.5	-4.78	4.54	27.75	18.43	69.689	Horizontal	Pass
		2535	-4.78	4.69	27.72	18.25	66.896	Horizontal	Pass
		2567.5	-4.53	4.71	27.71	18.47	70.249	Horizontal	Pass
10.0MHz BW QPSK	50/0	2505	-3.09	4.55	27.76	20.12	102.836	Horizontal	Pass
		2535	-3.19	4.69	27.72	19.84	96.404	Horizontal	Pass
		2565	-3.10	4.72	27.7	19.88	97.290	Horizontal	Pass
10.0MHz BW 16 QAM	50/0	2505	-4.80	4.55	27.76	18.41	69.382	Horizontal	Pass
		2535	-3.46	4.69	27.72	19.57	90.514	Horizontal	Pass
		2565	-3.88	4.72	27.7	19.10	81.230	Horizontal	Pass
15.0MHz BW QPSK	75/0	2507.5	-3.55	4.55	27.77	19.67	92.626	Horizontal	Pass
		2535	-3.30	4.69	27.72	19.73	94.037	Horizontal	Pass
		2562.5	-3.77	4.72	27.69	19.20	83.173	Horizontal	Pass
15.0MHz BW 16 QAM	75/0	2507.5	-3.96	4.55	27.77	19.26	84.360	Horizontal	Pass
		2535	-4.18	4.69	27.72	18.85	76.651	Horizontal	Pass
		2562.5	-4.47	4.72	27.69	18.50	70.845	Horizontal	Pass
20.0MHz BW QPSK	100/ 0	2510	-3.14	4.57	27.78	20.07	101.720	Horizontal	Pass
		2535	-2.94	4.73	27.72	20.05	101.251	Horizontal	Pass
		2560	-3.41	4.75	27.68	19.52	89.616	Horizontal	Pass
20.0MHz BW 16 QAM	100/ 0	2510	-4.41	4.57	27.78	18.80	75.865	Horizontal	Pass
		2535	-4.81	4.73	27.72	18.18	65.703	Horizontal	Pass
		2560	-4.33	4.75	27.68	18.60	72.474	Horizontal	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

8.6 LTE BAND 12

Radiated Power (ERP) for Band 12										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	699.7	6.42	1.91	19.21	2.15	21.57	143.501	Vertical	Pass
		707.5	6.38	1.91	19.26	2.15	21.58	144.034	Vertical	Pass
		715.3	6.27	1.93	19.34	2.15	21.53	142.183	Vertical	Pass
3.0MHz Band QPSK	15/0	700.5	6.17	1.91	19.21	2.15	21.32	135.632	Vertical	Pass
		707.5	6.25	1.91	19.26	2.15	21.45	139.759	Vertical	Pass
		714.5	6.28	1.93	19.34	2.15	21.54	142.680	Vertical	Pass
5.0MHz Band QPSK	25/0	701.5	6.48	1.91	19.23	2.15	21.65	146.162	Vertical	Pass
		707.5	6.44	1.91	19.26	2.15	21.64	145.723	Vertical	Pass
		713.5	6.12	1.92	19.33	2.15	21.38	137.438	Vertical	Pass
10.0MHz Band QPSK	50/0	704	6.28	1.91	19.25	2.15	21.47	140.301	Vertical	Pass
		707.5	6.13	1.91	19.26	2.15	21.33	135.704	Vertical	Pass
		711	6.33	1.92	19.32	2.15	21.58	143.988	Vertical	Pass
1.4MHz Band QPSK	6/0	699.7	6.45	1.91	19.21	2.15	21.60	144.582	Horizontal	Pass
		707.5	6.42	1.91	19.26	2.15	21.62	145.352	Horizontal	Pass
		715.3	6.40	1.93	19.34	2.15	21.66	146.511	Horizontal	Pass
3.0MHz Band QPSK	15/0	700.5	6.39	1.91	19.21	2.15	21.54	142.558	Horizontal	Pass
		707.5	6.24	1.91	19.26	2.15	21.44	139.361	Horizontal	Pass
		714.5	6.44	1.93	19.34	2.15	21.70	147.755	Horizontal	Pass
5.0MHz Band QPSK	25/0	701.5	6.58	1.91	19.23	2.15	21.75	149.669	Horizontal	Pass
		707.5	6.59	1.91	19.26	2.15	21.79	151.048	Horizontal	Pass
		713.5	6.14	1.92	19.33	2.15	21.40	137.906	Horizontal	Pass
10.0MHz Band QPSK	50/0	704	6.35	1.91	19.25	2.15	21.54	142.575	Horizontal	Pass
		707.5	6.31	1.91	19.26	2.15	21.51	141.448	Horizontal	Pass
		711	6.63	1.92	19.32	2.15	**21.88**	154.305	Horizontal	Pass

Radiated Power (EIRP) for Band 12										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band 16 QAM	6/0	699.7	5.12	1.91	19.21	2.15	20.27	106.525	Vertical	Pass
		707.5	4.93	1.91	19.26	2.15	20.13	103.074	Vertical	Pass
		715.3	4.89	1.93	19.34	2.15	20.15	103.593	Vertical	Pass
3.0MHz Band 16 QAM	15/0	700.5	5.40	1.91	19.21	2.15	20.55	113.551	Vertical	Pass
		707.5	5.37	1.91	19.26	2.15	20.57	114.013	Vertical	Pass
		714.5	5.38	1.93	19.34	2.15	20.64	115.919	Vertical	Pass
5.0MHz Band 16 QAM	25/0	701.5	5.29	1.91	19.23	2.15	20.46	111.259	Vertical	Pass
		707.5	5.48	1.91	19.26	2.15	20.68	116.966	Vertical	Pass
		713.5	5.40	1.92	19.33	2.15	20.66	116.539	Vertical	Pass
10.0MHz Band 16 QAM	50/0	704	5.61	1.91	19.25	2.15	20.80	120.133	Vertical	Pass
		707.5	5.47	1.91	19.26	2.15	20.67	116.794	Vertical	Pass
		711	5.52	1.92	19.32	2.15	20.77	119.417	Vertical	Pass
1.4MHz Band 16 QAM	6/0	699.7	5.20	1.91	19.21	2.15	20.35	108.270	Horizontal	Pass
		707.5	5.21	1.91	19.26	2.15	20.41	109.800	Horizontal	Pass
		715.3	5.03	1.93	19.34	2.15	20.29	106.898	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	700.5	5.45	1.91	19.21	2.15	20.60	114.919	Horizontal	Pass
		707.5	5.32	1.91	19.26	2.15	20.52	112.806	Horizontal	Pass
		714.5	5.49	1.93	19.34	2.15	20.75	118.922	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	701.5	5.40	1.91	19.23	2.15	20.57	114.131	Horizontal	Pass
		707.5	5.58	1.91	19.26	2.15	20.78	119.665	Horizontal	Pass
		713.5	5.45	1.92	19.33	2.15	20.71	117.636	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	704	5.68	1.91	19.25	2.15	**20.87**	122.320	Horizontal	Pass
		707.5	5.45	1.91	19.26	2.15	20.65	116.111	Horizontal	Pass
		711	5.58	1.92	19.32	2.15	20.83	121.108	Horizontal	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

8.7 LTE BAND 17

Radiated Power (ERP) for Band 17										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	706.5	6.82	1.91	19.23	2.15	21.99	157.974	Vertical	Pass
		710	6.71	1.91	19.26	2.15	21.91	155.328	Vertical	Pass
		713.5	6.73	1.92	19.33	2.15	21.99	158.015	Vertical	Pass
10.0MHz Band QPSK	50/0	709	6.95	1.91	19.25	2.15	22.14	163.650	Vertical	Pass
		710	6.99	1.91	19.26	2.15	22.19	165.432	Vertical	Pass
		711	6.71	1.92	19.32	2.15	21.96	157.119	Vertical	Pass
5.0MHz Band QPSK	25/0	706.5	6.93	1.91	19.23	2.15	22.10	162.159	Vertical	Pass
		710	6.77	1.91	19.26	2.15	21.97	157.302	Vertical	Pass
		713.5	6.78	1.92	19.33	2.15	22.04	159.783	Vertical	Pass
10.0MHz Band QPSK	50/0	709	6.91	1.91	19.25	2.15	22.10	162.157	Vertical	Pass
		710	7.02	1.91	19.26	2.15	**22.22**	166.617	Vertical	Pass
		711	6.66	1.92	19.32	2.15	21.91	155.133	Vertical	Pass

Radiated Power (ERP) for Band 17										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Antenna Gain (dB)	Correction (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band 16 QAM	25/0	706.5	5.42	1.91	19.23	2.15	20.59	114.484	Vertical	Pass
		710	5.39	1.91	19.26	2.15	20.59	114.620	Vertical	Pass
		713.5	5.33	1.92	19.33	2.15	20.59	114.430	Vertical	Pass
10.0MHz Band 16 QAM	50/0	709	5.31	1.91	19.25	2.15	20.50	112.295	Vertical	Pass
		710	5.21	1.91	19.26	2.15	20.41	109.870	Vertical	Pass
		711	5.24	1.92	19.32	2.15	20.49	111.929	Vertical	Pass
5.0MHz Band 16 QAM	25/0	706.5	5.32	1.91	19.23	2.15	20.49	111.874	Horizontal	Pass
		710	5.39	1.91	19.26	2.15	20.59	114.597	Horizontal	Pass
		713.5	5.34	1.92	19.33	2.15	20.60	114.768	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	709	5.29	1.91	19.25	2.15	20.48	111.727	Horizontal	Pass
		710	5.50	1.91	19.26	2.15	**20.70**	117.563	Horizontal	Pass
		711	5.17	1.92	19.32	2.15	20.42	110.205	Horizontal	Pass

Note:
SG Level= Signal generator output
Max. EIRP Average (dBm)= Antenna Gain(dB)+ SG Level (dBm)- Cable Loss(dBm)

9. SPURIOUS RADIATION EMISSION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238 and §27.53

LIMIT

§22.917 (e) and §24.238 (a): Out of band emissions. 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.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. 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. 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. 100 kHz or 1 percent of emission bandwidth, as specified). 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.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz 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. 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 MHz or 1 percent of emission bandwidth, as specified). 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.

The unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth in the 1 MHz band immediately outside and adjacent to the channel edge of the equipment. Beyond the 1 MHz band immediately outside the channel edge of the equipment, a resolution bandwidth of 1 MHz shall be employed. A narrower resolution bandwidth is allowed to be used provided that the measured power is integrated over the full required measurement bandwidth of 1 MHz or 1% of the occupied bandwidth as applicable.

The power of any unwanted emissions measured from the channel edge of the equipment shall be attenuated below the transmitter power, P (dBW), as follows:
a. for base station and subscriber equipment, other than mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB; and
b. for mobile subscriber equipment, the attenuation shall not be less than 43 + 10 Log10 (p), dB at the channel edges and 55 + 10 Log10 (p) at 5.5 MHz away and beyond the channel edges where p in (a) and (b) is the transmitter power measured in watts.

MODES TESTED

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 7
LTE Band 12
LTE Band 17

RESULTS

PASS

9.1 LTE BAND 2

QPSK EIRP POWER FOR LTE BAND 2 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1850.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3701.4	-51.82	4.04	33.51	-22.35	-13	-9.35	Horizontal
3701.4	-53.88	4.04	33.51	-24.41	-13	-11.41	Vertical
5552.1	-56.39	5.24	35.84	-25.79	-13	-12.79	Vertical
5552.1	-67.12	5.24	35.84	-36.52	-13	-23.52	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-52.90	4.04	33.56	-23.38	-13	-10.38	Horizontal
3760	-53.99	4.04	33.56	-24.47	-13	-11.47	Vertical
5640	-54.47	5.24	35.91	-23.80	-13	-10.80	Vertical
5640	-56.15	5.24	35.91	-25.48	-13	-12.48	Horizontal
Test Results for High Channel 1909.3MHz							
3818.6	-53.24	4.04	34.00	-23.28	-13	-10.28	Horizontal
3818.6	-55.32	4.04	34.00	-25.36	-13	-12.36	Vertical
5727.9	-56.94	5.24	36.04	-26.14	-13	-13.14	Vertical
5727.9	-56.35	5.24	36.04	-25.55	-13	-12.55	Horizontal

QPSK EIRP POWER FOR LTE BAND 2 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 1860MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3720	-57.10	4.07	33.54	-27.63	-13	-14.63	Horizontal
3720	-51.51	4.07	33.54	-22.04	-13	-9.04	Vertical
5580	-58.57	5.28	35.86	-27.99	-13	-14.99	Vertical
5580	-59.37	5.28	35.86	-28.79	-13	-15.79	Horizontal
Test Results for Mid Channel 1880MHz							
3760	-56.79	4.04	33.56	-27.27	-13	-14.27	Horizontal
3760	-53.52	4.04	33.56	-24.00	-13	-11.00	Vertical
5640	-57.58	5.24	35.91	-26.91	-13	-13.91	Vertical
5640	-58.44	5.24	35.91	-27.77	-13	-14.77	Horizontal
Test Results for High Channel 1900MHz							
3800	-55.25	4.04	34.00	-25.29	-13	-12.29	Horizontal
3800	-56.22	4.04	34.00	-26.26	-13	-13.26	Vertical
5700	-57.50	5.24	36.04	-26.70	-13	-13.70	Vertical
5700	-56.10	5.24	36.04	-25.30	-13	-12.30	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

9.2 LTE BAND 4

QPSK EIRP POWER FOR LTE BAND 4 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3421.4	-58.05	4.02	29.80	-32.27	-13	-19.27	Horizontal
3421.4	-55.37	4.02	29.80	-29.59	-13	-16.59	Vertical
5132.1	-59.86	5.24	35.84	-29.26	-13	-16.26	Vertical
5132.1	-60.30	5.24	35.84	-29.70	-13	-16.70	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-49.67	4.03	30.00	-23.70	-13	-10.70	Horizontal
3465	-53.44	4.03	30.00	-27.47	-13	-14.47	Vertical
5197.5	-56.69	5.25	35.86	-26.08	-13	-13.08	Vertical
5197.5	-54.81	5.25	35.86	-24.20	-13	-11.20	Horizontal
Test Results for High Channel 1754.3MHz							
3508.6	-49.34	4.05	30.01	-23.38	-13	-10.38	Horizontal
3508.6	-55.27	4.05	30.01	-29.31	-13	-16.31	Vertical
5262.9	-55.22	5.26	35.86	-24.62	-13	-11.62	Vertical
5262.9	-52.79	5.26	35.86	-22.19	-13	-9.19	Horizontal

QPSK EIRP POWER FOR LTE BAND 4 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 1720MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3440	-55.44	4.02	29.80	-29.66	-13	-16.66	Horizontal
3440	-55.37	4.02	29.80	-29.59	-13	-16.59	Vertical
5160	-58.04	5.24	35.84	-27.44	-13	-14.44	Vertical
5160	-61.13	5.24	35.84	-30.53	-13	-17.53	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465	-48.84	4.03	30.00	-22.87	-13	-9.87	Horizontal
3465	-52.58	4.03	30.00	-26.61	-13	-13.61	Vertical
5197.5	-58.76	5.25	35.86	-28.15	-13	-15.15	Vertical
5197.5	-57.75	5.25	35.86	-27.14	-13	-14.14	Horizontal
Test Results for High Channel 1745MHz							
3490	-51.90	2.91	27.68	-27.13	-13	-14.13	Horizontal
3490	-53.22	2.91	27.68	-28.45	-13	-15.45	Vertical
5235	-57.24	5.26	35.86	-26.64	-13	-13.64	Vertical
5235	-56.04	5.26	35.86	-25.44	-13	-12.44	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

9.3 LTE BAND 5

QPSK EIRP POWER FOR LTE BAND 5 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 824.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1649.4	-55.54	2.78	27.50	-30.82	-13	-17.82	Horizontal
1649.4	-50.12	2.78	27.50	-25.40	-13	-12.40	Vertical
2474.1	-53.26	2.90	27.80	-28.36	-13	-15.36	Vertical
2474.1	-54.47	2.90	27.80	-29.57	-13	-16.57	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-56.52	2.80	27.48	-31.84	-13	-18.84	Horizontal
1673	-54.48	2.80	27.48	-29.80	-13	-16.80	Vertical
2509.5	-56.92	2.91	27.70	-32.13	-13	-19.13	Vertical
2509.5	-52.85	2.91	27.70	-28.06	-13	-15.06	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-54.41	2.82	27.43	-29.80	-13	-16.80	Horizontal
1696.6	-54.48	2.82	27.43	-29.87	-13	-16.87	Vertical
2544.9	-49.98	2.92	27.74	-25.16	-13	-12.16	Vertical
2544.9	-56.53	2.92	27.74	-31.71	-13	-18.71	Horizontal

QPSK EIRP POWER FOR LTE BAND 5 (10MHZ BANDWIDTH)

Test Results for Low Channel 829MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1658	-54.47	2.78	27.50	-29.75	-13	-16.75	Horizontal
1658	-56.59	2.78	27.50	-31.87	-13	-18.87	Vertical
2487	-56.86	2.90	27.80	-31.96	-13	-18.96	Vertical
2487	-49.97	2.90	27.80	-25.07	-13	-12.07	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-53.65	2.80	27.48	-28.97	-13	-15.97	Horizontal
1673	-56.65	2.80	27.48	-31.97	-13	-18.97	Vertical
2509.5	-57.74	2.91	27.70	-32.95	-13	-19.95	Vertical
2509.5	-56.58	2.91	27.70	-31.79	-13	-18.79	Horizontal
Test Results for High Channel 844MHz							
1688	-55.58	2.82	27.43	-30.97	-13	-17.97	Horizontal
1688	-56.59	2.82	27.43	-31.98	-13	-18.98	Vertical
2532	-55.58	2.92	27.74	-30.76	-13	-17.76	Vertical
2532	-56.63	2.92	27.74	-31.81	-13	-18.81	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

9.4 LTE BAND 7

QPSK EIRP POWER FOR LTE BAND 7 (5.0MHZ BANDWIDTH)

Test Results for Low Channel 2502.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5005	-63.65	5.23	35.81	-33.07	-25	-8.07	Horizontal
5005	-62.54	5.23	35.81	-31.96	-25	-6.96	Vertical
7507.5	-62.67	5.67	36.85	-31.49	-25	-6.49	Vertical
7507.5	-63.74	5.67	36.85	-32.56	-25	-7.56	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-62.62	5.23	35.82	-32.03	-25	-7.03	Horizontal
5070	-61.64	5.23	35.82	-31.05	-25	-6.05	Vertical
7605	-61.41	5.67	36.85	-30.23	-25	-5.23	Vertical
7605	-63.26	5.67	36.85	-32.08	-25	-7.08	Horizontal
Test Results for High Channel 2567.5MHz							
5135	-70.85	5.24	35.83	-40.26	-25	-15.26	Horizontal
5135	-69.93	5.24	35.83	-39.34	-25	-14.34	Vertical
7702.5	-62.64	5.68	36.87	-31.45	-25	-6.45	Vertical
7702.5	-67.74	5.68	36.87	-36.55	-25	-11.55	Horizontal

QPSK EIRP POWER FOR LTE BAND 7 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 2510MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5020	-63.65	5.23	35.82	-33.06	-25	-8.06	Horizontal
5020	-62.42	5.23	35.82	-31.83	-25	-6.83	Vertical
7530	-63.62	5.67	36.86	-32.43	-25	-7.43	Vertical
7530	-64.78	5.67	36.86	-33.59	-25	-8.59	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-63.26	5.23	35.82	-32.67	-25	-7.67	Horizontal
5070	-62.51	5.23	35.82	-31.92	-25	-6.92	Vertical
7605	-60.95	5.67	36.85	-29.77	-25	-4.77	Vertical
7605	-64.28	5.67	36.85	-33.10	-25	-8.10	Horizontal
Test Results for High Channel 2560MHz							
5120	-62.21	5.24	35.83	-31.62	-25	-6.62	Horizontal
5120	-61.61	5.24	35.83	-31.02	-25	-6.02	Vertical
7680	-62.64	5.70	36.88	-31.46	-25	-6.46	Vertical
7680	-63.64	5.70	36.88	-32.46	-25	-7.46	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

9.5 LTE BAND 12

QPSK EIRP POWER FOR LTE BAND 12 (1.4MHZ BANDWIDTH)

Test Results for Low Channel 699.7MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1399.4	-47.65	2.60	27.20	-23.05	-13	-10.05	Horizontal
1399.4	-49.02	2.60	27.20	-24.42	-13	-11.42	Vertical
2099.1	-48.36	2.85	27.54	-23.67	-13	-10.67	Vertical
2099.1	-48.40	2.85	27.54	-23.71	-13	-10.71	Horizontal
Test Results For Mid Channel 707.5MHz							
1415	-50.54	2.61	27.28	-25.87	-13	-12.87	Horizontal
1415	-48.14	2.61	27.28	-23.47	-13	-10.47	Vertical
2122.5	-46.72	2.87	27.59	-22.00	-13	-9.00	Vertical
2122.5	-50.76	2.87	27.59	-26.04	-13	-13.04	Horizontal
Test Results for High Channel 715.3MHz							
1430.6	-50.83	2.63	27.28	-26.18	-13	-13.18	Horizontal
1430.6	-55.25	2.63	27.28	-30.60	-13	-17.60	Vertical
2145.9	-52.04	2.88	27.60	-27.32	-13	-14.32	Vertical
2145.9	-49.44	2.88	27.60	-24.72	-13	-11.72	Horizontal

QPSK EIRP POWER FOR LTE BAND 12 (10MHZ BANDWIDTH)

Test Results for Low Channel 704MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1408	-47.90	2.61	27.26	-23.25	-13	-10.25	Horizontal
1408	-51.06	2.61	27.26	-26.41	-13	-13.41	Vertical
2112	-49.96	2.87	27.58	-25.25	-13	-12.25	Vertical
2112	-50.77	2.87	27.58	-26.06	-13	-13.06	Horizontal
Test Results for Mid Channel 707.5MHz							
1415	-49.22	2.61	27.28	-24.55	-13	-11.55	Horizontal
1415	-53.16	2.61	27.28	-28.49	-13	-15.49	Vertical
2122.5	-51.72	2.87	27.59	-27.00	-13	-14.00	Vertical
2122.5	-51.22	2.87	27.59	-26.50	-13	-13.50	Horizontal
Test Results for High Channel 711MHz							
1422	-53.08	2.62	27.28	-28.42	-13	-15.42	Horizontal
1422	-48.26	2.62	27.28	-23.60	-13	-10.60	Vertical
2133	-51.36	2.87	27.60	-26.63	-13	-13.63	Vertical
2133	-50.97	2.87	27.60	-26.24	-13	-13.24	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

9.6 LTE BAND 17

QPSK EIRP POWER FOR LTE BAND 17 (5MHZ BANDWIDTH)

Test Results for Low Channel 706.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1413	-49.11	2.61	27.28	-24.44	-13	-11.44	Horizontal
1413	-46.95	2.61	27.28	-22.28	-13	-9.28	Vertical
2119.5	-49.47	2.87	27.59	-24.75	-13	-11.75	Vertical
2119.5	-49.13	2.87	27.59	-24.41	-13	-11.41	Horizontal
Test Results For Mid Channel 710MHz							
1420	-47.68	2.62	27.30	-23.00	-13	-10.00	Horizontal
1420	-50.44	2.62	27.30	-25.76	-13	-12.76	Vertical
2130	-51.16	2.87	27.62	-26.41	-13	-13.41	Vertical
2130	-53.81	2.87	27.62	-29.06	-13	-16.06	Horizontal
Test Results for High Channel 713.5MHz							
1427	-50.74	2.66	27.28	-26.12	-13	-13.12	Horizontal
1427	-52.19	2.66	27.28	-27.57	-13	-14.57	Vertical
2140.5	-49.31	2.88	27.60	-24.59	-13	-11.59	Vertical
2140.5	-48.01	2.88	27.60	-23.29	-13	-10.29	Horizontal

QPSK EIRP POWER FOR LTE BAND 17 (10MHZ BANDWIDTH)

Test Results for Low Channel 709MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1418	-51.64	2.62	27.30	-26.96	-13	-13.96	Horizontal
1418	-49.50	2.62	27.30	-24.82	-13	-11.82	Vertical
2127	-50.67	2.87	27.62	-25.92	-13	-12.92	Vertical
2127	-53.76	2.87	27.62	-29.01	-13	-16.01	Horizontal
Test Results for Mid Channel 710MHz							
1420	-51.20	2.62	27.30	-26.52	-13	-13.52	Horizontal
1420	-48.71	2.62	27.30	-24.03	-13	-11.03	Vertical
2130	-53.07	2.87	27.62	-28.32	-13	-15.32	Vertical
2130	-48.65	2.87	27.62	-23.90	-13	-10.90	Horizontal
Test Results for High Channel 711MHz							
1422	-57.97	2.62	27.30	-33.29	-13	-20.29	Horizontal
1422	-50.30	2.62	27.30	-25.62	-13	-12.62	Vertical
2133	-49.25	2.87	27.62	-24.50	-13	-11.50	Vertical
2133	-52.20	2.87	27.62	-27.45	-13	-14.45	Horizontal

Note: PMea(dBm)= Power(dBm)+ ARpl (dBm)

. Over Limit= : PMea(dBm)-Limit(dBm)

. We test both H direction and V direction, recorded worst case direction.

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

Temp. = −30° to +50°C

Voltage =low voltage, DC 3.6V, Normal, DC 3.7V and High voltage, DC DC 4.3V.

Frequency Stability vs Temperature:

The EUT is place inside a temperature chamber. The temperature is set to -30ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

MODES TESTED

LTE Band 2

LTE Band 4

LTE Band 5

LTE Band 7

LTE Band 12

LTE Band 17

RESULTS

See the following pages.

10.1 LTE BAND 2

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	1880	-14.7	-0.007819	2.5
3.7	1880	-14.8	-0.007872	2.5
4.3	1880	-14.3	-0.007606	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	-14.7	-0.007819	2.5
Extreme (50C)	1880	-15.6	-0.008298	2.5
Extreme (40C)	1880	-15.7	-0.008351	2.5
Extreme (30C)	1880	-14.8	-0.007872	2.5
Extreme (10C)	1880	-14.3	-0.007606	2.5
Extreme (0C)	1880	-12.2	-0.006489	2.5
Extreme (-10C)	1880	-11.9	-0.006330	2.5
Extreme (-20C)	1880	-11.1	-0.005904	2.5
Extreme (-30C)	1880	-11.8	-0.006277	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	1880	-13.6	-0.007234	2.5
3.7	1880	-13.0	-0.006915	2.5
4.3	1880	-13.2	-0.007021	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 18900 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	-13.9	-0.007394	2.5
Extreme (50C)	1880	-15.1	-0.008032	2.5
Extreme (40C)	1880	-14.7	-0.007819	2.5
Extreme (30C)	1880	-13.2	-0.007021	2.5
Extreme (10C)	1880	-13.8	-0.007340	2.5
Extreme (0C)	1880	-12.7	-0.006755	2.5
Extreme (-10C)	1880	-12.1	-0.006436	2.5
Extreme (-20C)	1880	-11.9	-0.006330	2.5
Extreme (-30C)	1880	-11.2	-0.005957	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.2 LTE BAND 4

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	1732.5	-14.4	-0.008312	2.5
3.7	1732.5	-14.3	-0.008254	2.5
4.3	1732.5	-14.4	-0.008312	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 QPSK, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	-14.4	-0.008312	2.5
Extreme (50C)	1732.5	-14.1	-0.008139	2.5
Extreme (40C)	1732.5	-14.8	-0.008543	2.5
Extreme (30C)	1732.5	-14.8	-0.008543	2.5
Extreme (10C)	1732.5	-14.1	-0.008139	2.5
Extreme (0C)	1732.5	-14.3	-0.008254	2.5
Extreme (-10C)	1732.5	-14.6	-0.008427	2.5
Extreme (-20C)	1732.5	-14.8	-0.008543	2.5
Extreme (-30C)	1732.5	-14.2	-0.008196	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	1732.5	-16.7	-0.009639	2.5
3.7	1732.5	-16.9	-0.009755	2.5
4.3	1732.5	-16.7	-0.009639	2.5

Frequency error vs. Temperature

Temperature [°C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 4 16QAM, (CH 20175 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1732.5	-16.8	-0.009697	2.5
Extreme (50C)	1732.5	-16.8	-0.009697	2.5
Extreme (40C)	1732.5	-16.3	-0.009408	2.5
Extreme (30C)	1732.5	-16.6	-0.009582	2.5
Extreme (10C)	1732.5	-16.2	-0.009351	2.5
Extreme (0C)	1732.5	-15.9	-0.009177	2.5
Extreme (-10C)	1732.5	-16.1	-0.009293	2.5
Extreme (-20C)	1732.5	-16.7	-0.009639	2.5
Extreme (-30C)	1732.5	-16.6	-0.009582	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.3 LTE BAND 5

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.2	836.5	-10.9	-0.013030	2.5
3.7	836.5	-10.5	-0.012552	2.5
4.3	836.5	-11.1	-0.013270	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 QPSK, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	-10.6	-0.012672	2.5
Extreme (50C)	836.5	-11.6	-0.013867	2.5
Extreme (40C)	836.5	-11.1	-0.013270	2.5
Extreme (30C)	836.5	-10.9	-0.013030	2.5
Extreme (10C)	836.5	-10.8	-0.012911	2.5
Extreme (0C)	836.5	-9.7	-0.011596	2.5
Extreme (-10C)	836.5	-11.3	-0.013509	2.5
Extreme (-20C)	836.5	-14.1	-0.016856	2.5
Extreme (-30C)	836.5	-15.3	-0.018290	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.2	836.5	-14.3	-0.017095	2.5
3.7	836.5	-14.5	-0.017334	2.5
4.3	836.5	-14.9	-0.017812	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 5 16QAM, (CH 20525 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	836.5	-14.8	-0.017693	2.5
Extreme (50C)	836.5	-15.9	-0.019008	2.5
Extreme (40C)	836.5	-15.9	-0.019008	2.5
Extreme (30C)	836.5	-15.1	-0.018051	2.5
Extreme (10C)	836.5	-14.3	-0.017095	2.5
Extreme (0C)	836.5	-13.3	-0.015900	2.5
Extreme (-10C)	836.5	-15.1	-0.018051	2.5
Extreme (-20C)	836.5	-14.9	-0.017812	2.5
Extreme (-30C)	836.5	-13.8	-0.016497	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.4 LTE BAND 7

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	2535	-10.6	-0.004181	2.5
3.7	2535	-11.0	-0.004339	2.5
4.3	2535	-11.4	-0.004497	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 QPSK, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	-11.3	-0.004458	2.5
Extreme (50C)	2535	-14.1	-0.005562	2.5
Extreme (40C)	2535	-16.2	-0.006391	2.5
Extreme (30C)	2535	-11.2	-0.004418	2.5
Extreme (10C)	2535	-10.8	-0.004260	2.5
Extreme (0C)	2535	-9.9	-0.003905	2.5
Extreme (-10C)	2535	-13.1	-0.005168	2.5
Extreme (-20C)	2535	-11.6	-0.004576	2.5
Extreme (-30C)	2535	-14.7	-0.005799	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	2535	-10.5	-0.004142	2.5
3.7	2535	-10.9	-0.004300	2.5
4.3	2535	-10.9	-0.004300	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 7 16QAM, (CH 21100 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2535	-10.2	-0.004024	2.5
Extreme (50C)	2535	-11.7	-0.004615	2.5
Extreme (40C)	2535	-13.2	-0.005207	2.5
Extreme (30C)	2535	-10.3	-0.004063	2.5
Extreme (10C)	2535	-10.4	-0.004103	2.5
Extreme (0C)	2535	-11.1	-0.004379	2.5
Extreme (-10C)	2535	-11.9	-0.004694	2.5
Extreme (-20C)	2535	-11.5	-0.004536	2.5
Extreme (-30C)	2535	-12.2	-0.004813	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.5 LTE BAND 12

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.2	707.5	-16.6	-0.006548	2.5
3.7	707.5	-16.8	-0.006627	2.5
4.3	707.5	-16.4	-0.006469	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	707.5	-16.3	-0.006430	2.5
Extreme (50C)	707.5	-16.1	-0.006351	2.5
Extreme (40C)	707.5	-16.2	-0.006391	2.5
Extreme (30C)	707.5	-16.2	-0.006391	2.5
Extreme (10C)	707.5	-15.8	-0.006233	2.5
Extreme (0C)	707.5	-16.9	-0.006667	2.5
Extreme (-10C)	707.5	-17.1	-0.006746	2.5
Extreme (-20C)	707.5	-16.6	-0.006548	2.5
Extreme (-30C)	707.5	-16.7	-0.006588	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 16QAM, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.2	707.5	-14.5	-0.005720	2.5
3.7	707.5	-14.8	-0.005838	2.5
4.3	707.5	-14.9	-0.005878	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 12 QPSK, (CH 23095 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	707.5	-14.2	-0.005602	2.5
Extreme (50C)	707.5	-14.7	-0.005799	2.5
Extreme (40C)	707.5	-14.2	-0.005602	2.5
Extreme (30C)	707.5	-15.3	-0.006036	2.5
Extreme (10C)	707.5	-14.4	-0.005680	2.5
Extreme (0C)	707.5	-15.1	-0.005957	2.5
Extreme (-10C)	707.5	-13.9	-0.005483	2.5
Extreme (-20C)	707.5	-13.5	-0.005325	2.5
Extreme (-30C)	707.5	-14.2	-0.005602	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

10.6 LTE BAND 17

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.2	710.0	-5.2	-0.007350	2.5
3.7	710.0	-5.8	-0.008198	2.5
4.3	710.0	-5.4	-0.007633	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710.0	-5.6	-0.007915	2.5
Extreme (50C)	710.0	-6.4	-0.009046	2.5
Extreme (40C)	710.0	-5.9	-0.008339	2.5
Extreme (30C)	710.0	-6.7	-0.009470	2.5
Extreme (10C)	710.0	-6.1	-0.008622	2.5
Extreme (0C)	710.0	-3.5	-0.004947	2.5
Extreme (-10C)	710.0	-5.9	-0.008339	2.5
Extreme (-20C)	710.0	-5.5	-0.007774	2.5
Extreme (-30C)	710.0	-6.2	-0.008763	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 16QAM, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.2	710.0	-11.6	-0.016396	2.5
3.7	710.0	-11	-0.015548	2.5
4.3	710.0	-11.2	-0.015830	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH 23790 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710.0	-10.9	-0.015406	2.5
Extreme (50C)	710.0	-11.7	-0.016537	2.5
Extreme (40C)	710.0	-11.1	-0.015689	2.5
Extreme (30C)	710.0	-11.2	-0.015830	2.5
Extreme (10C)	710.0	-11.3	-0.015972	2.5
Extreme (0C)	710.0	-10.8	-0.015265	2.5
Extreme (-10C)	710.0	-11.8	-0.016678	2.5
Extreme (-20C)	710.0	-11.4	-0.016113	2.5
Extreme (-30C)	710.0	-10.9	-0.015406	2.5

***Note:** Frequency error measurements were made by using the build-in capability of the Wireless Communication Test Set.

11. Peak-to-Average Ratio

11.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

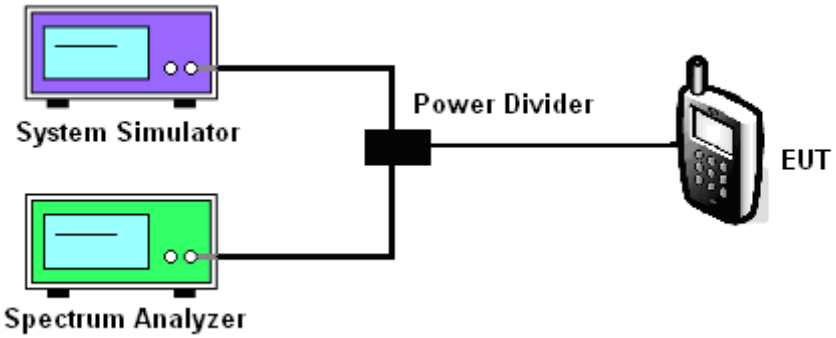
11.2 Measuring Instruments

See list of measuring instruments of this test report.

11.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. For GSM/EGPRS operating modes:
   a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.
   b. Set EUT in maximum power output, and triggered the burst signal.
   c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.
4. For UMTS operating modes:
   a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
   b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.

11.4 Test Setup



MODES TESTED

LTE Band 2
LTE Band 4
LTE Band 5
LTE Band 7
LTE Band 12
LTE Band 17

BAND	CHANNEL	Frequency [MHz]	BANDWIDTH	NO. RB	RB POS.	MODULATION	PAR [dB]
2	18900	1880.0	1.4	1	Low	QPSK	4.86
2	18900	1880.0	1.4	1	Low	16-QAM	5.53
2	18900	1880.0	3.0	1	Low	QPSK	4.82
2	18900	1880.0	3.0	1	Low	16-QAM	5.83
2	18900	1880.0	5.0	1	Low	QPSK	4.78
2	18900	1880.0	5.0	1	Low	16-QAM	5.74
2	18900	1880.0	10.0	1	Low	QPSK	4.50
2	18900	1880.0	10.0	1	Low	16-QAM	5.39
2	18900	1880.0	15.0	1	Low	QPSK	4.17
2	18900	1880.0	15.0	1	Low	16-QAM	4.93
2	18900	1880.0	20.0	1	Low	QPSK	3.65
2	18900	1880.0	20.0	1	Low	16-QAM	4.59
4	20175	1732.5	1.4	1	Low	QPSK	4.32
4	20175	1732.5	1.4	1	Low	16-QAM	4.84
4	20175	1732.5	3.0	1	Low	QPSK	4.18
4	20175	1732.5	3.0	1	Low	16-QAM	4.97
4	20175	1732.5	5.0	1	Low	QPSK	4.30
4	20175	1732.5	5.0	1	Low	16-QAM	5.08
4	20175	1732.5	10.0	1	Low	QPSK	4.05
4	20175	1732.5	10.0	1	Low	16-QAM	4.89