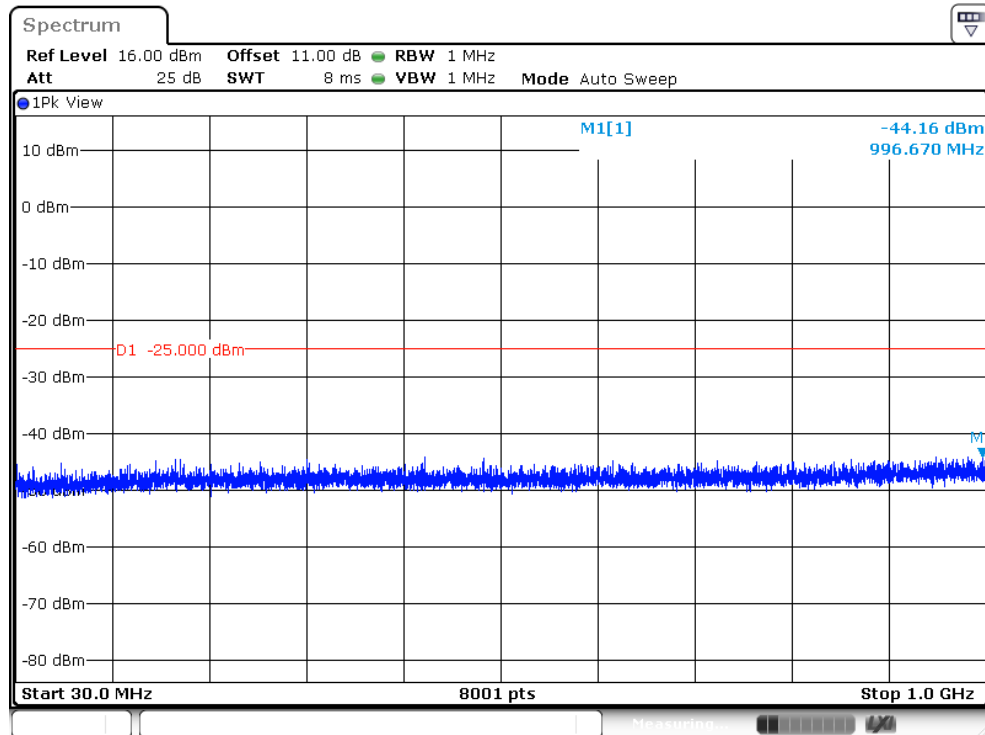
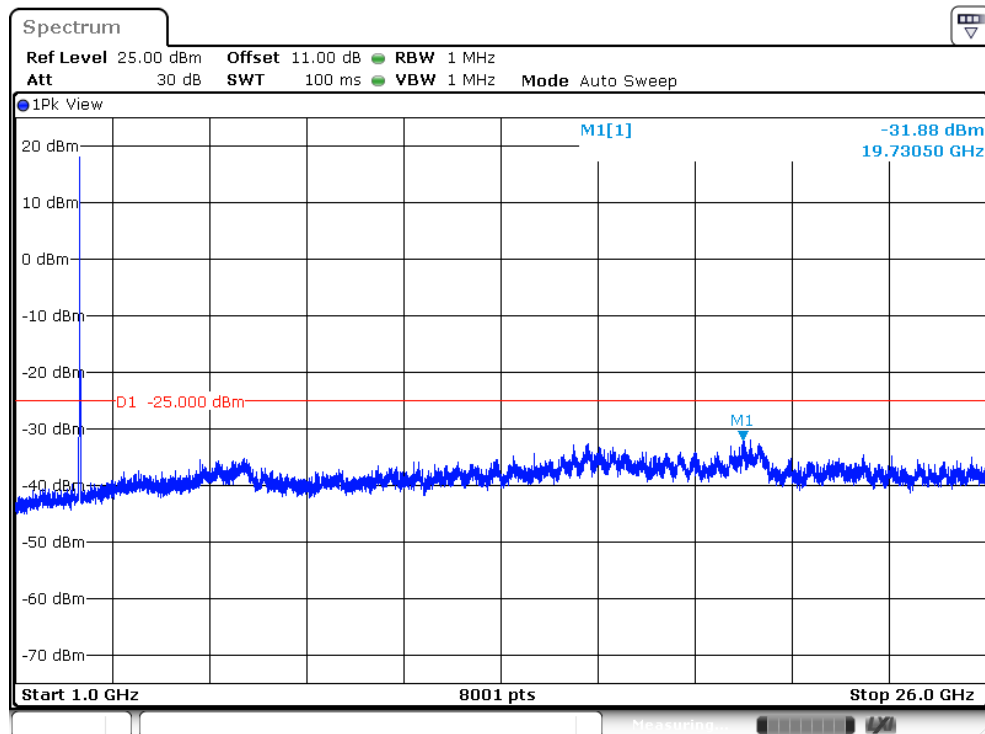


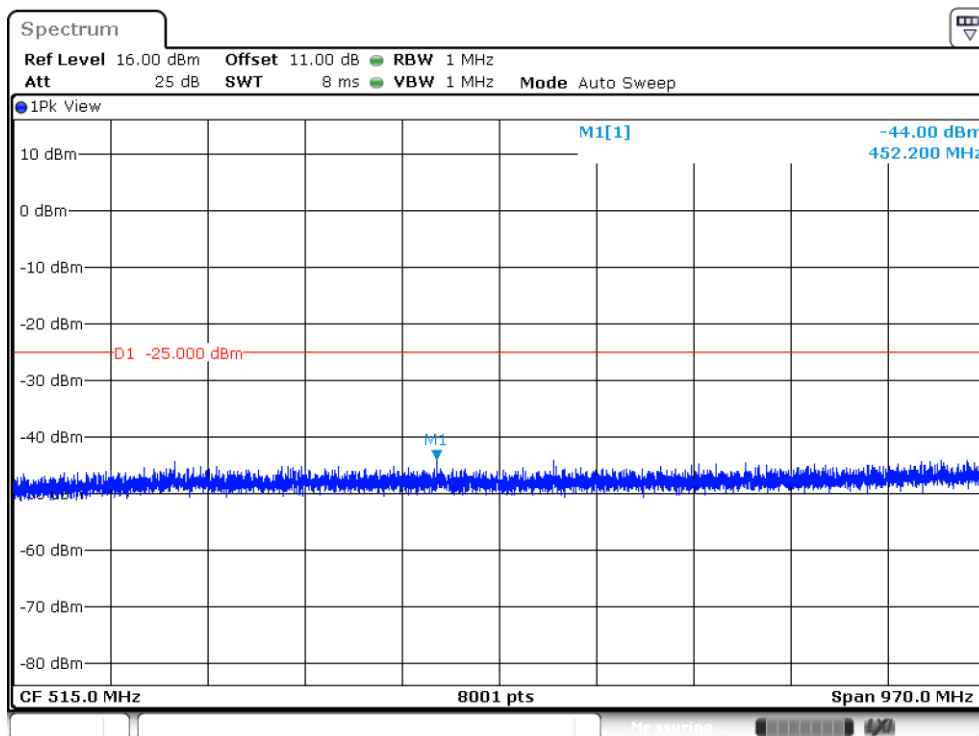
Band 41, UL Channel 41190, UL Frequency 2650.0, BW 10.0, NO. RB 50, RB POS. Low, 16-QAM



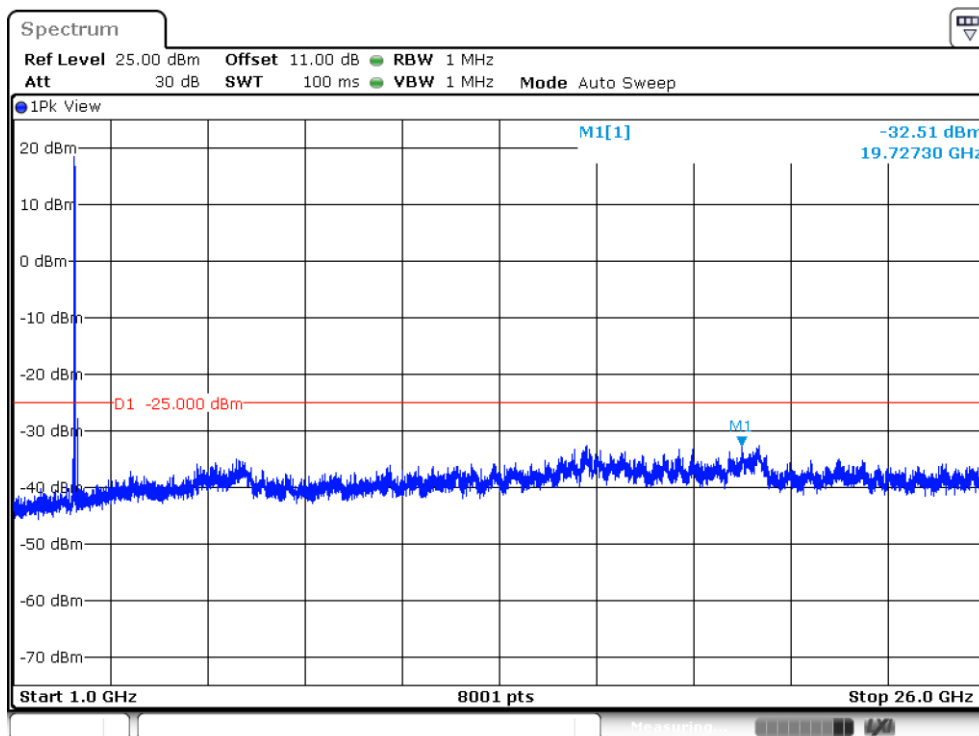
Band 41, UL Channel 41190, UL Frequency 2650.0, BW 10.0, NO. RB 50, RB POS. Low, 16-QAM



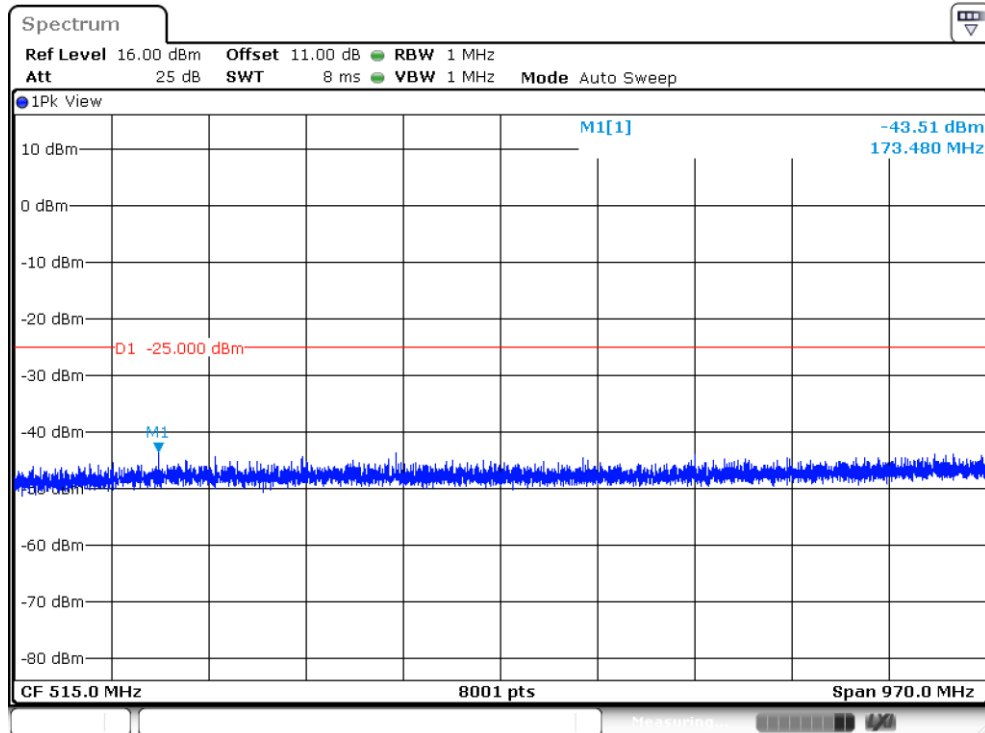
Band 41, UL Channel 40315, UL Frequency 2562.5, BW 15.0, NO. RB 1, RB POS. Low, QPSK



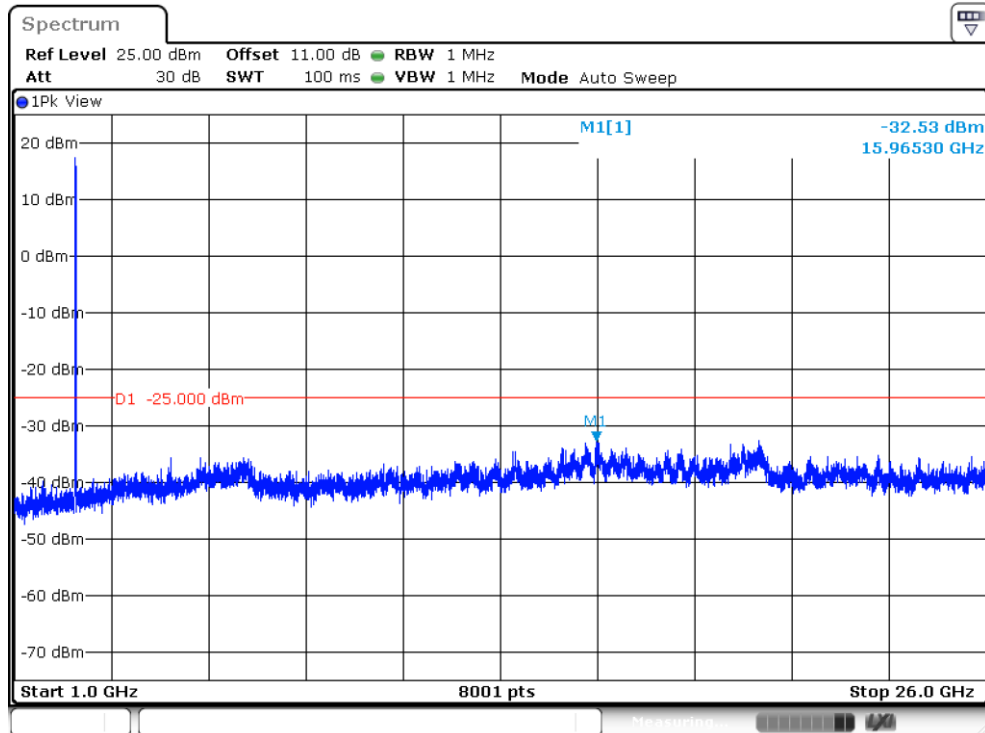
Band 41, UL Channel 40315, UL Frequency 2562.5, BW 15.0, NO. RB 1, RB POS. Low, QPSK



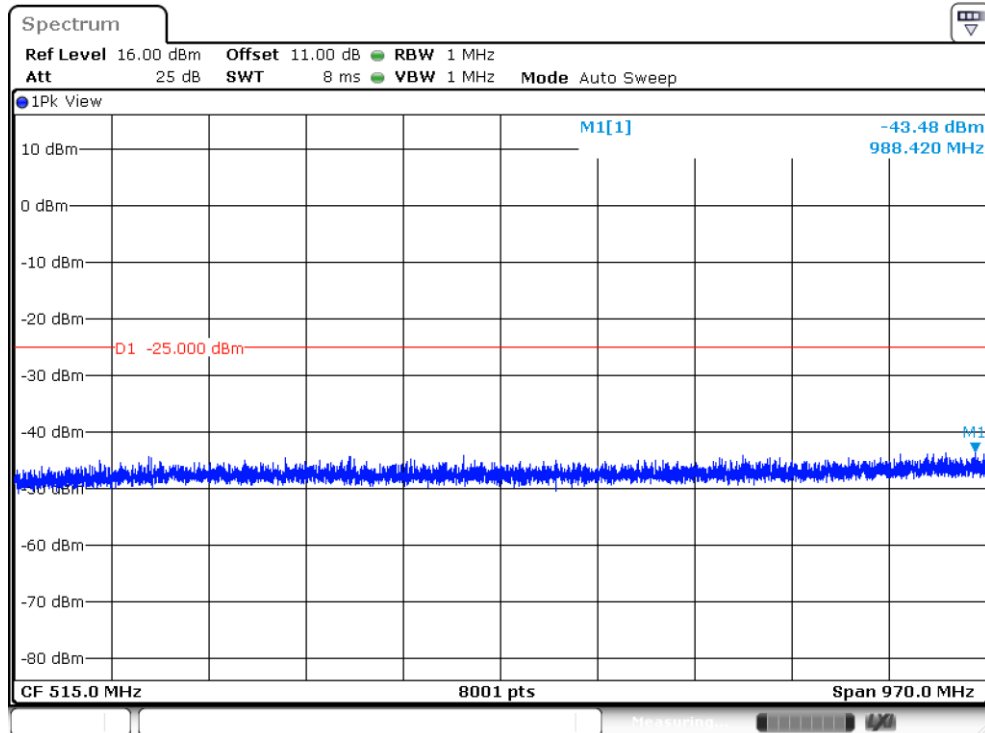
Band 41, UL Channel 40315, UL Frequency 2562.5, BW 15.0, NO. RB 1, RB POS. Low, 16-QAM



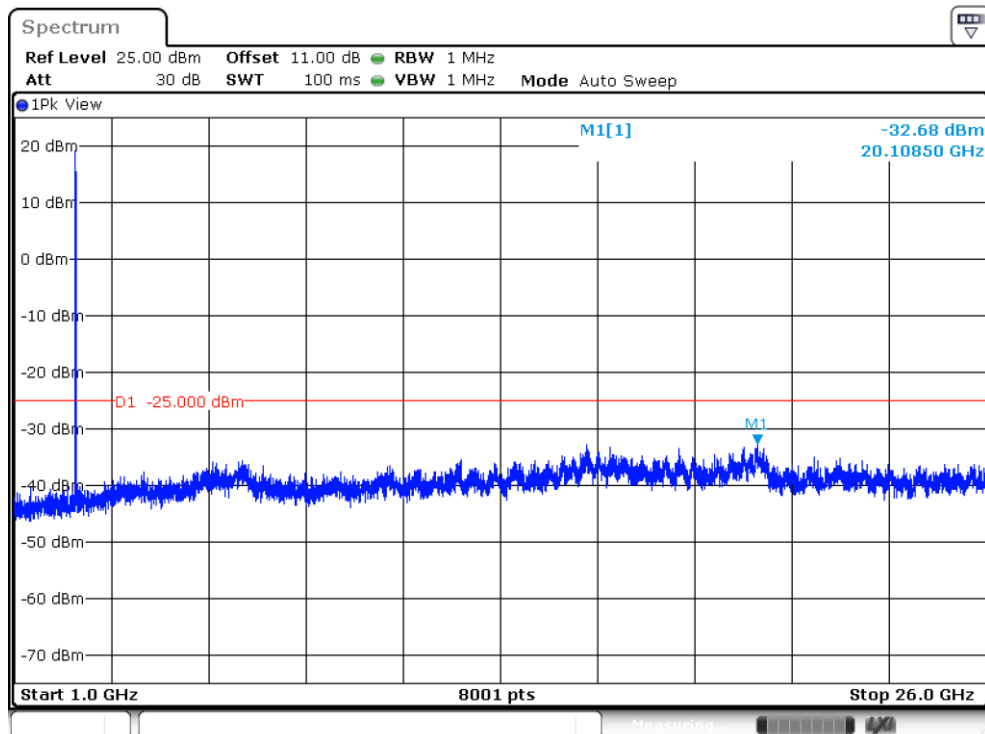
Band 41, UL Channel 40315, UL Frequency 2562.5, BW 15.0, NO. RB 1, RB POS. Low, 16-QAM



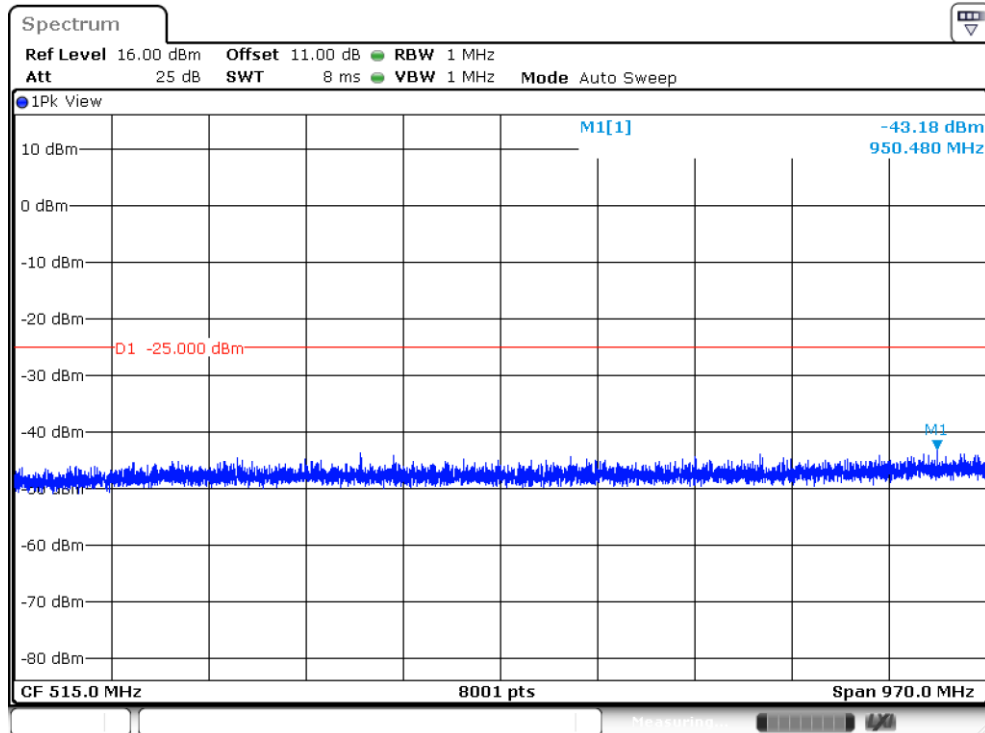
Band 41,UL Channel 40315,UL Frequency 2562.5,BW 15.0,NO. RB 36,RB POS. Low,QPSK



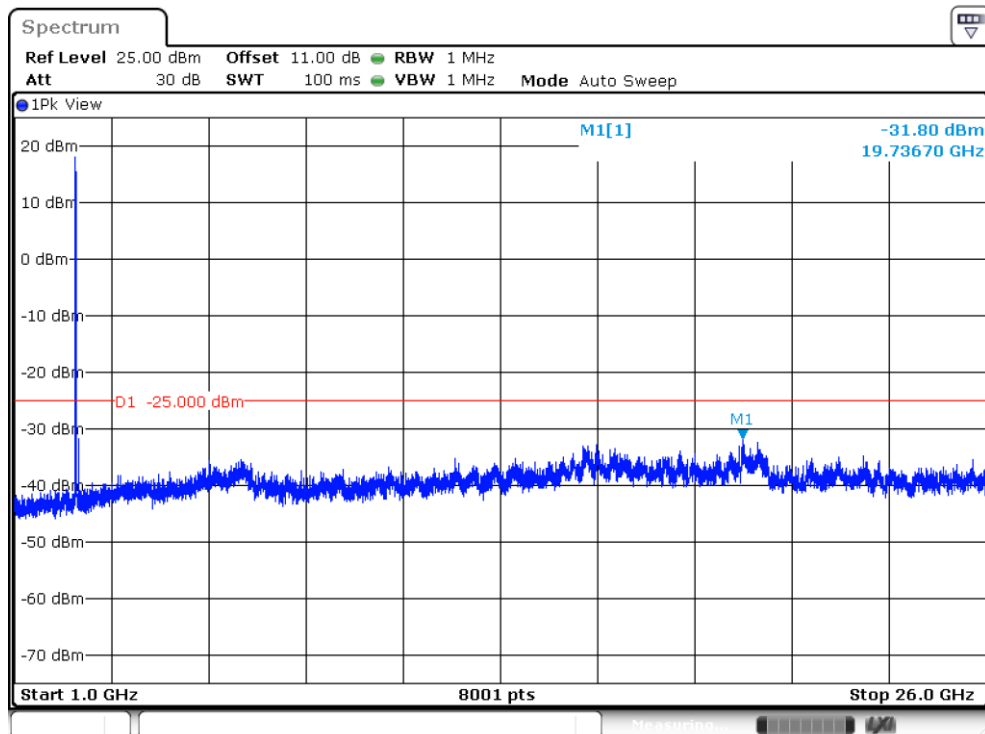
Band 41,UL Channel 40315,UL Frequency 2562.5,BW 15.0,NO. RB 36,RB POS. Low,QPSK



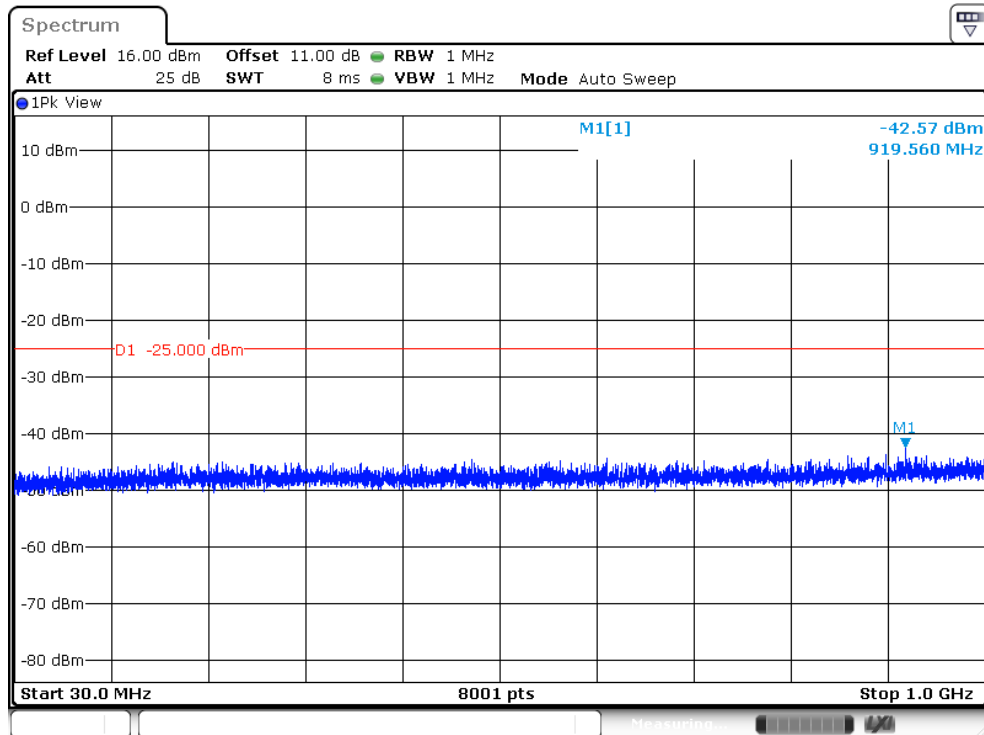
Band 41, UL Channel 40315, UL Frequency 2562.5, BW 15.0, NO. RB 36, RB POS. Low, 16-QAM



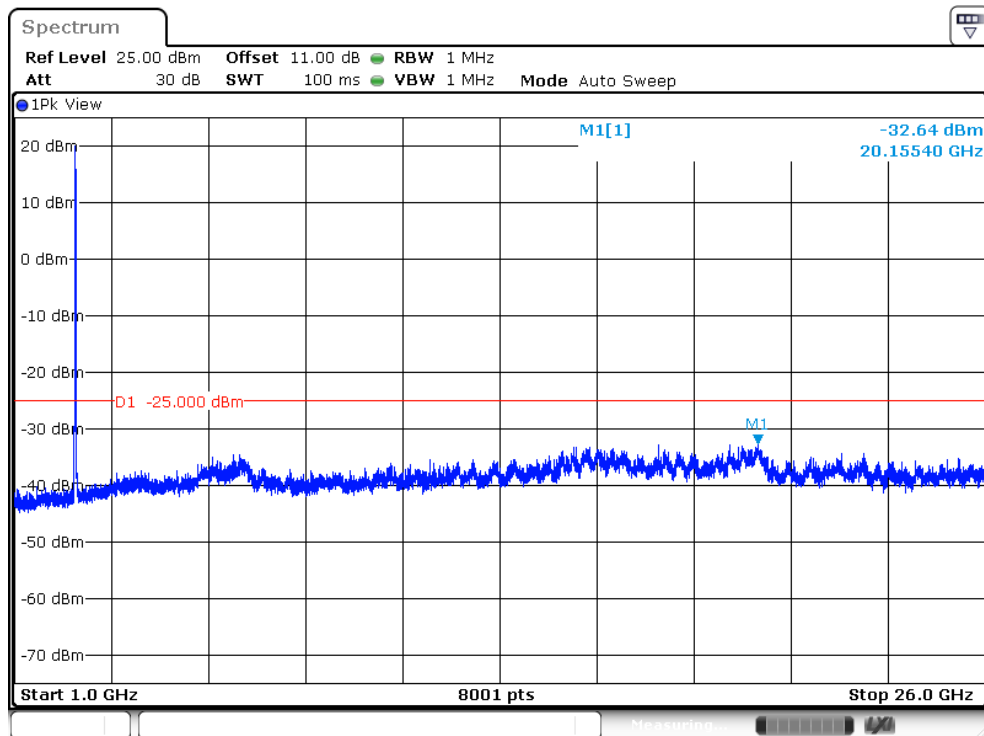
Band 41, UL Channel 40315, UL Frequency 2562.5, BW 15.0, NO. RB 36, RB POS. Low, 16-QAM



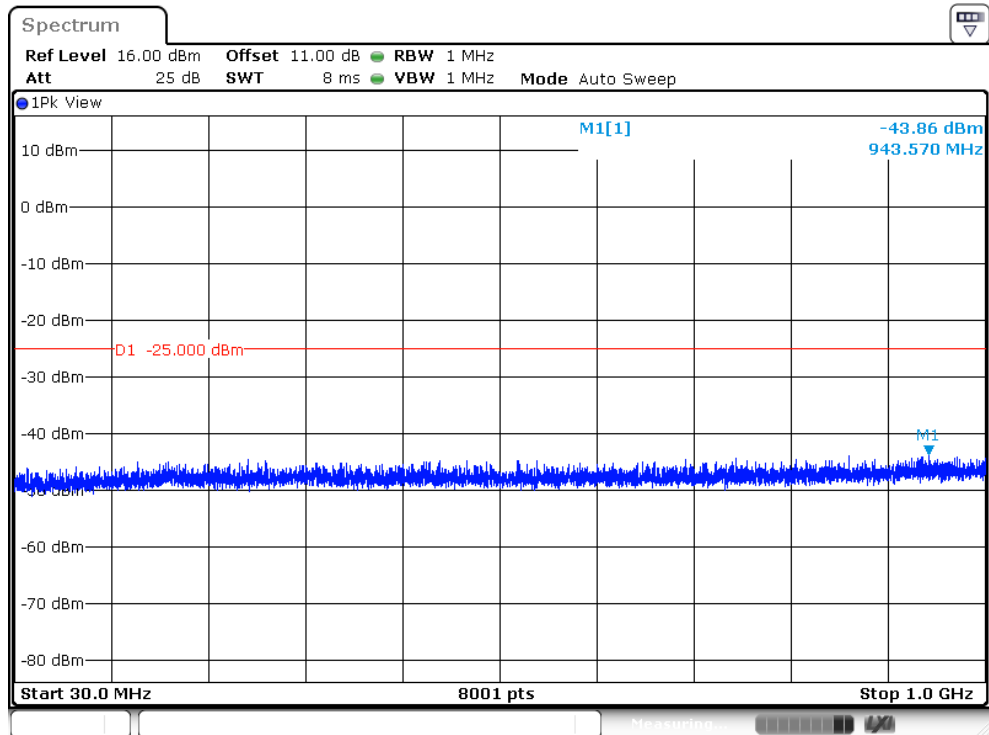
Band 41,UL Channel 40315,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



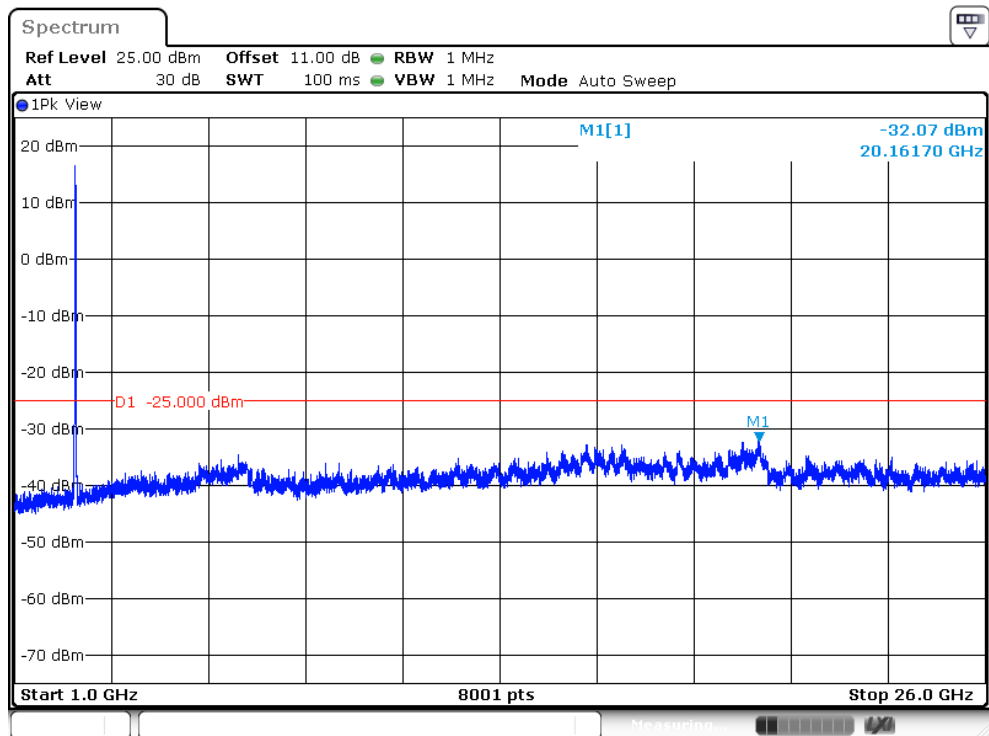
Band 41,UL Channel 40315,UL Frequency 2562.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



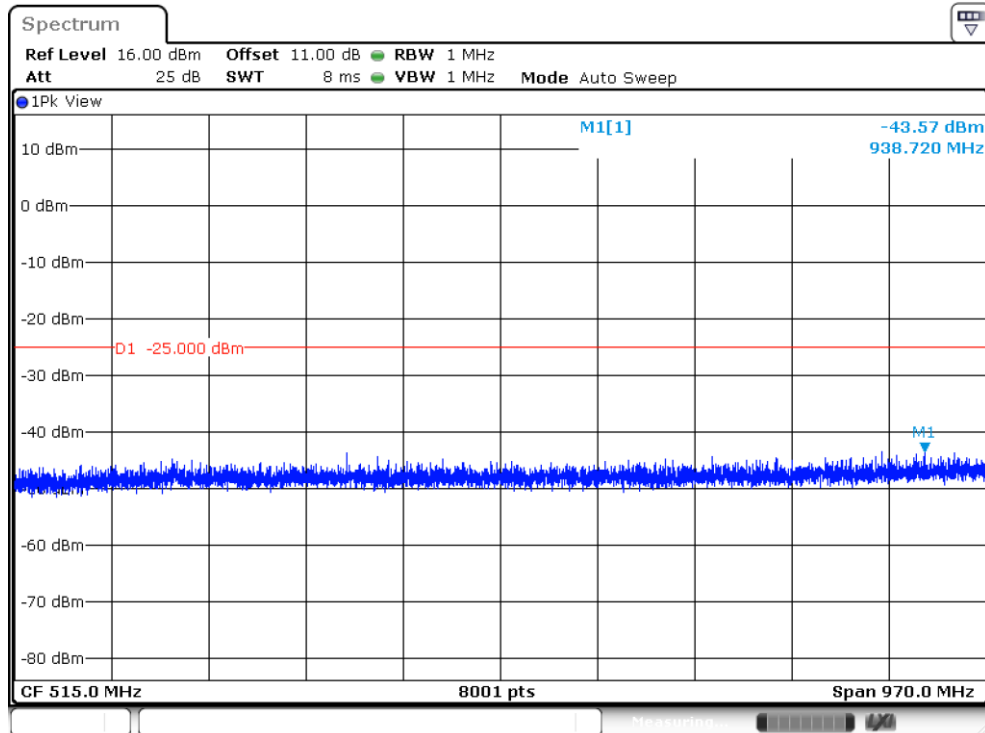
Band 41, UL Channel 40315, UL Frequency 2562.5, BW 15.0, NO. RB 75, RB POS. Low, 16-QAM



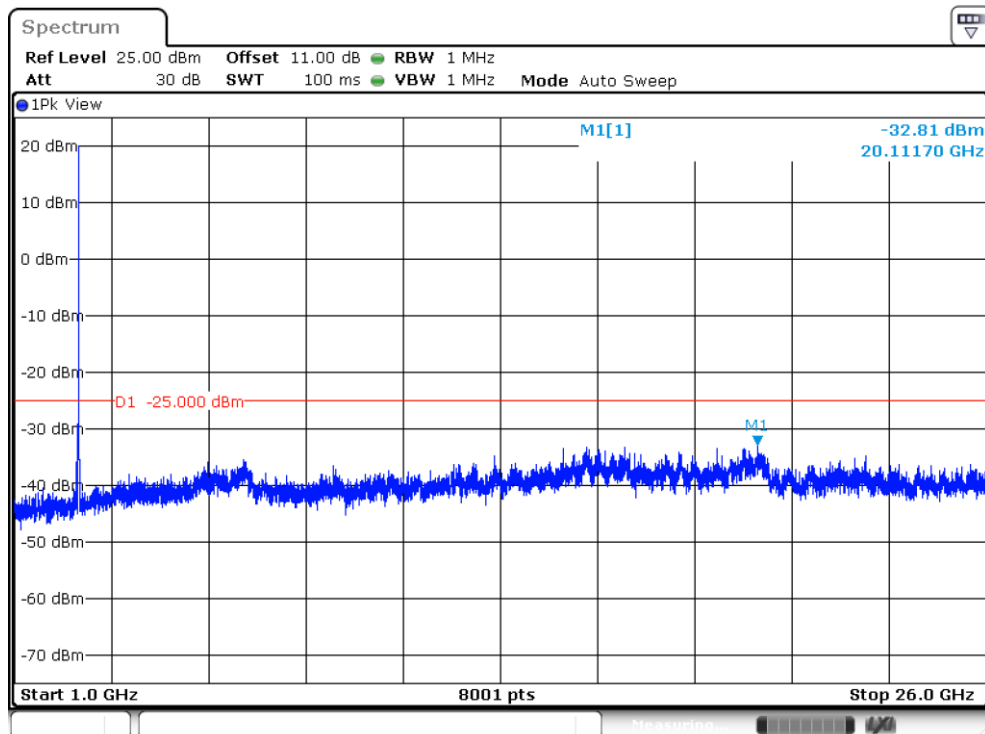
Band 41, UL Channel 40315, UL Frequency 2562.5, BW 15.0, NO. RB 75, RB POS. Low, 16-QAM



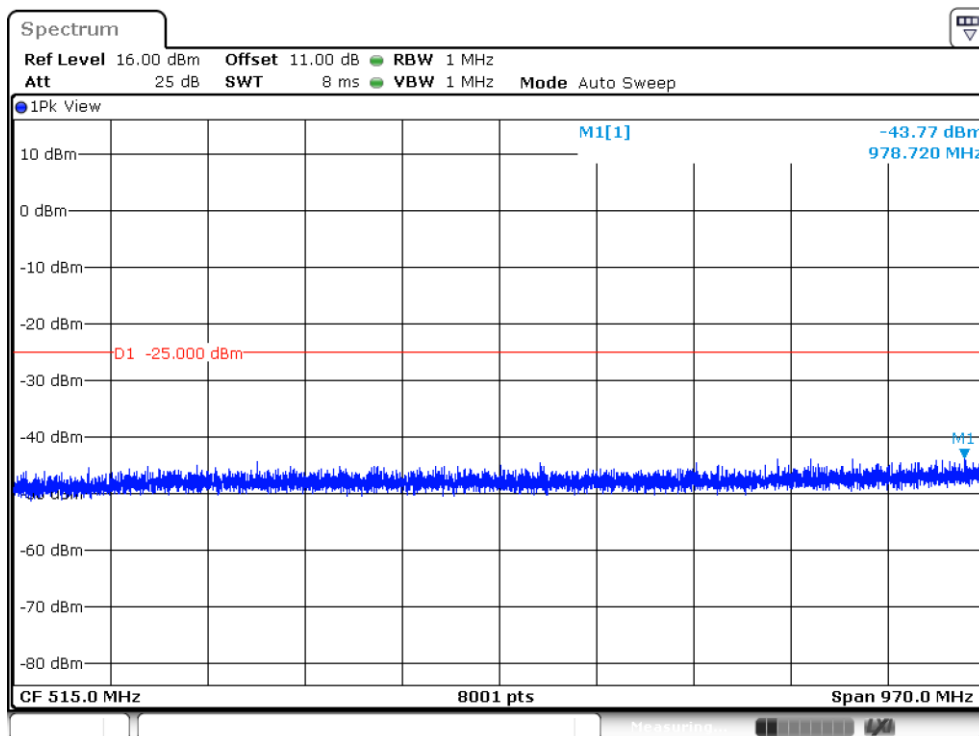
Band 41, UL Channel 41165, UL Frequency 2647.5, BW 15.0, NO. RB 1, RB POS. Low, QPSK



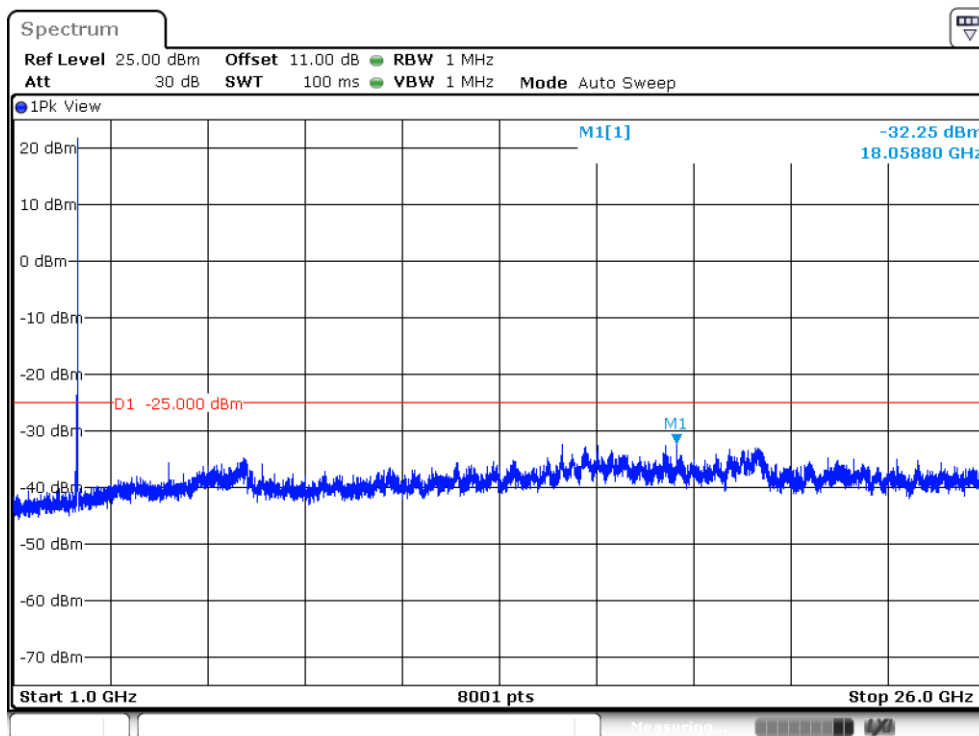
Band 41, UL Channel 41165, UL Frequency 2647.5, BW 15.0, NO. RB 1, RB POS. Low, QPSK



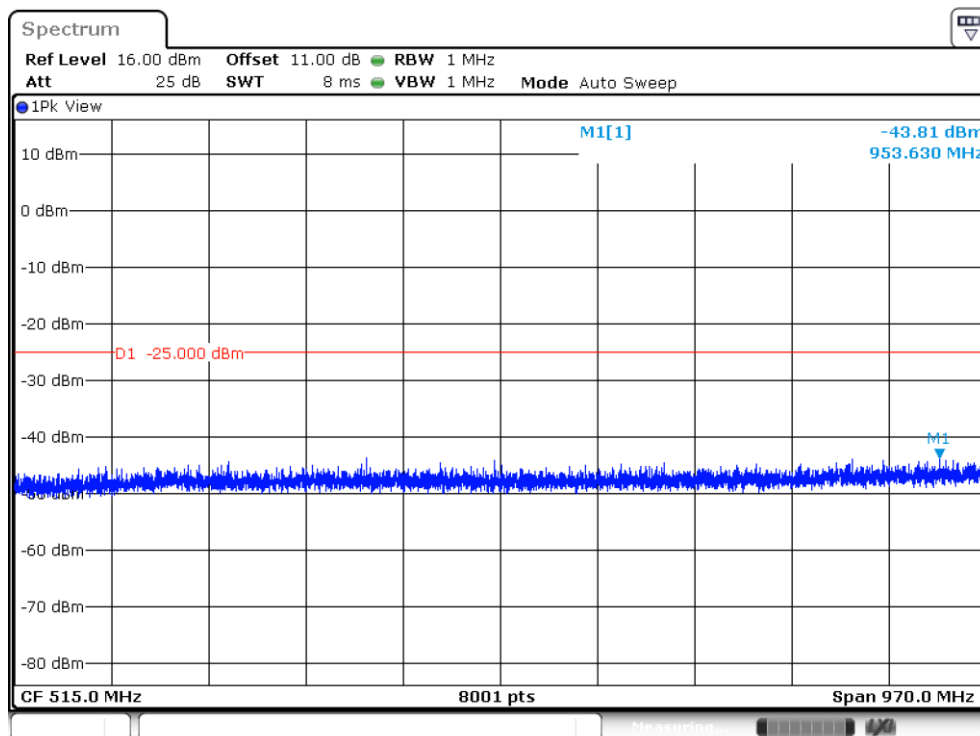
Band 41, UL Channel 41165, UL Frequency 2647.5, BW 15.0, NO. RB 1, RB POS. Low, 16-QAM



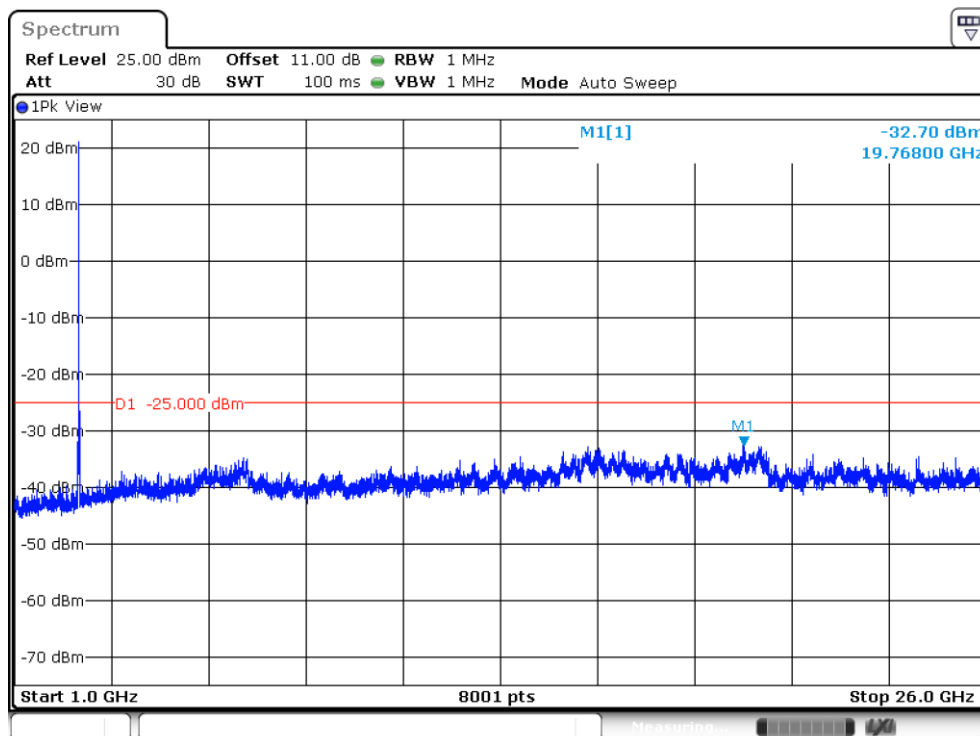
Band 41, UL Channel 41165, UL Frequency 2647.5, BW 15.0, NO. RB 1, RB POS. Low, 16-QAM



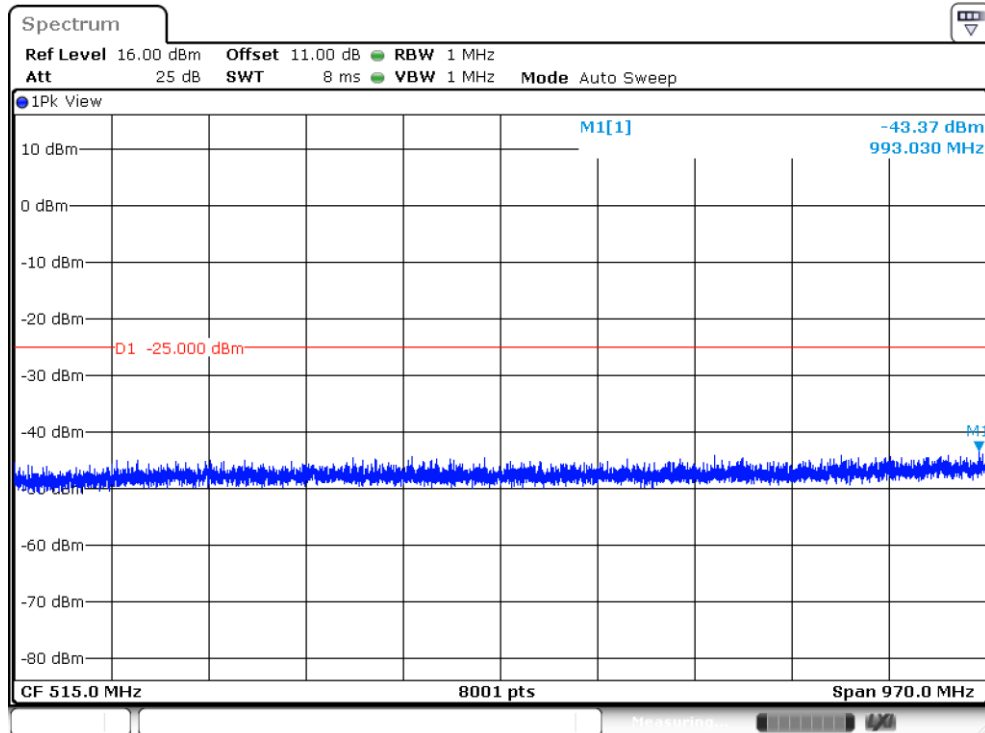
Band 41,UL Channel 41165,UL Frequency 2647.5,BW 15.0,NO. RB 36,RB POS. Low,QPSK



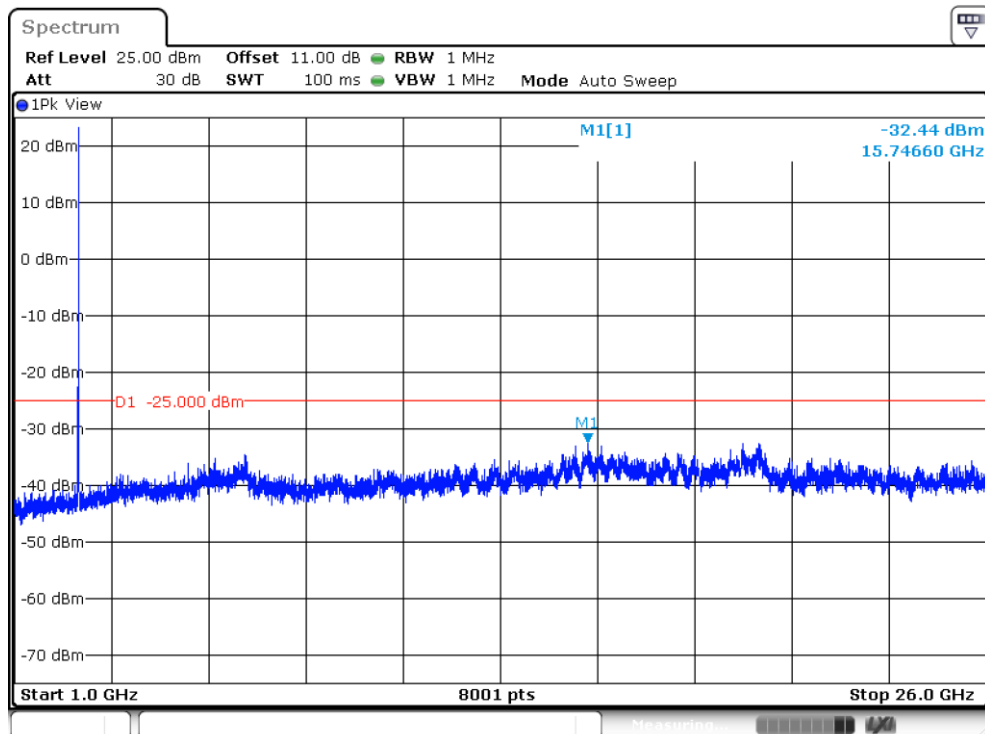
Band 41,UL Channel 41165,UL Frequency 2647.5,BW 15.0,NO. RB 36,RB POS. Low,QPSK



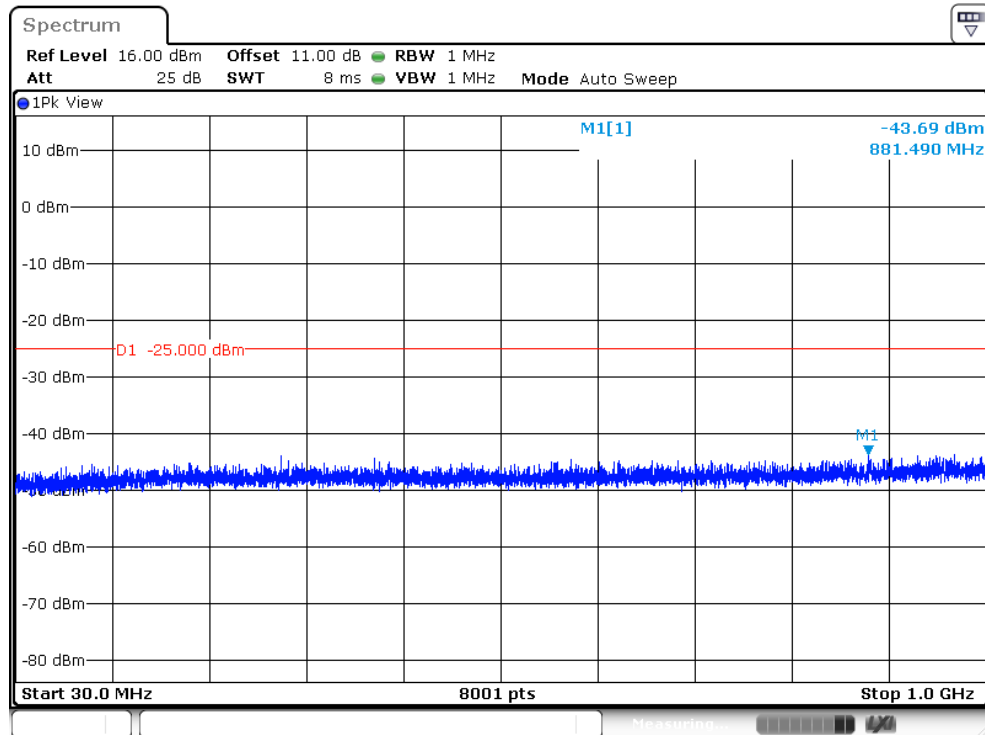
Band 41, UL Channel 41165, UL Frequency 2647.5, BW 15.0, NO. RB 36, RB POS. Low, 16-QAM



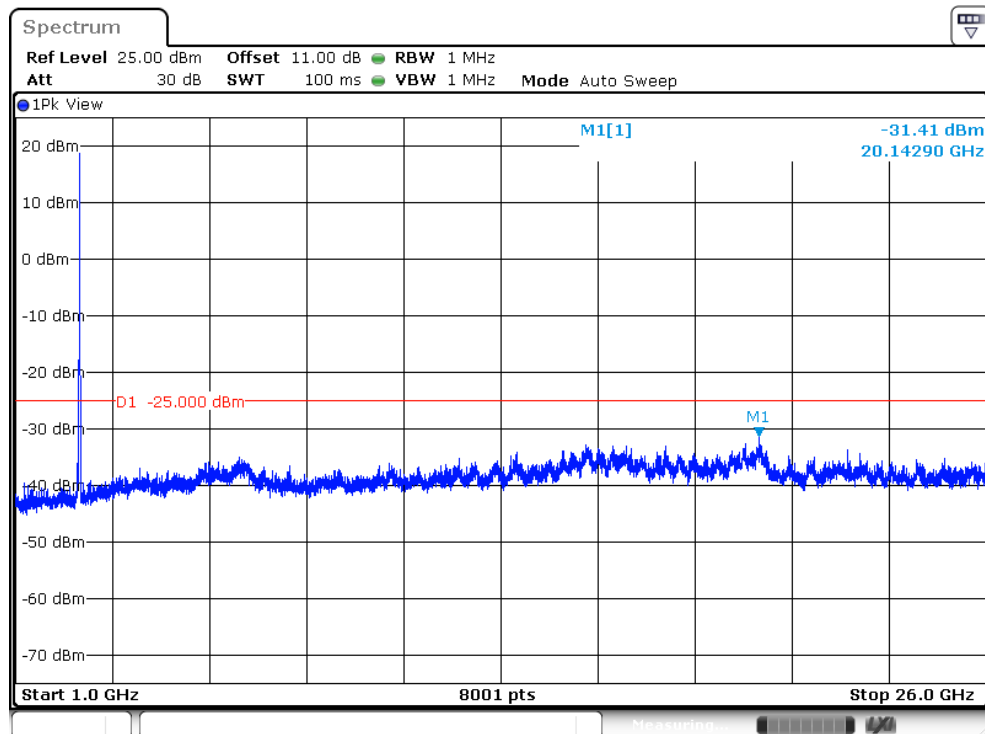
Band 41, UL Channel 41165, UL Frequency 2647.5, BW 15.0, NO. RB 36, RB POS. Low, 16-QAM



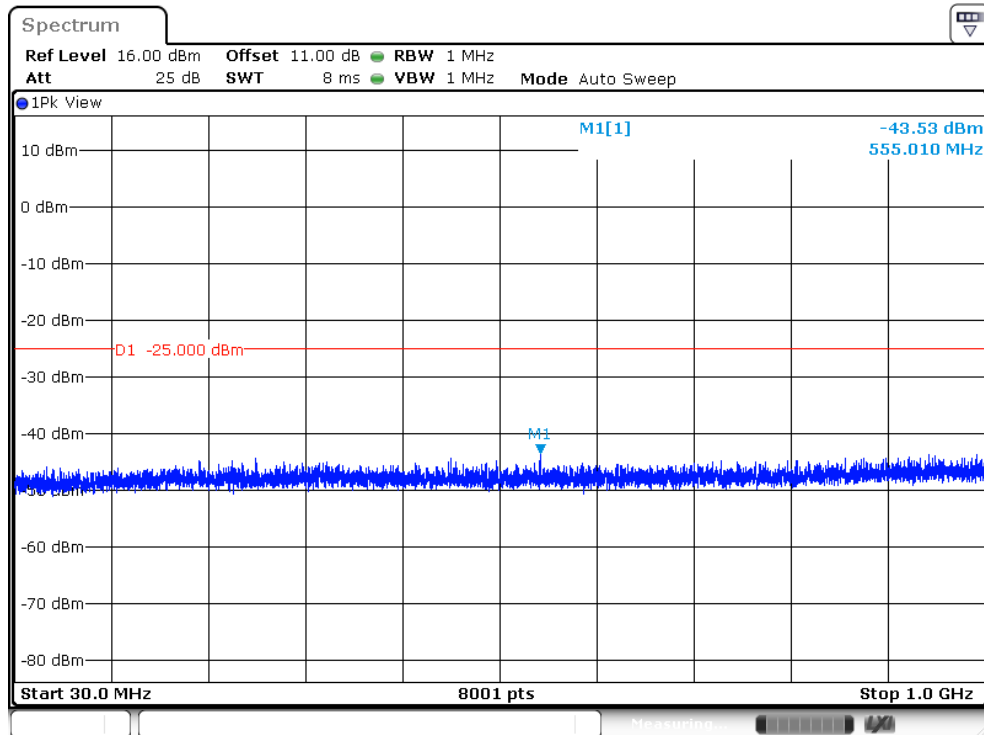
Band 41,UL Channel 41165,UL Frequency 2647.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



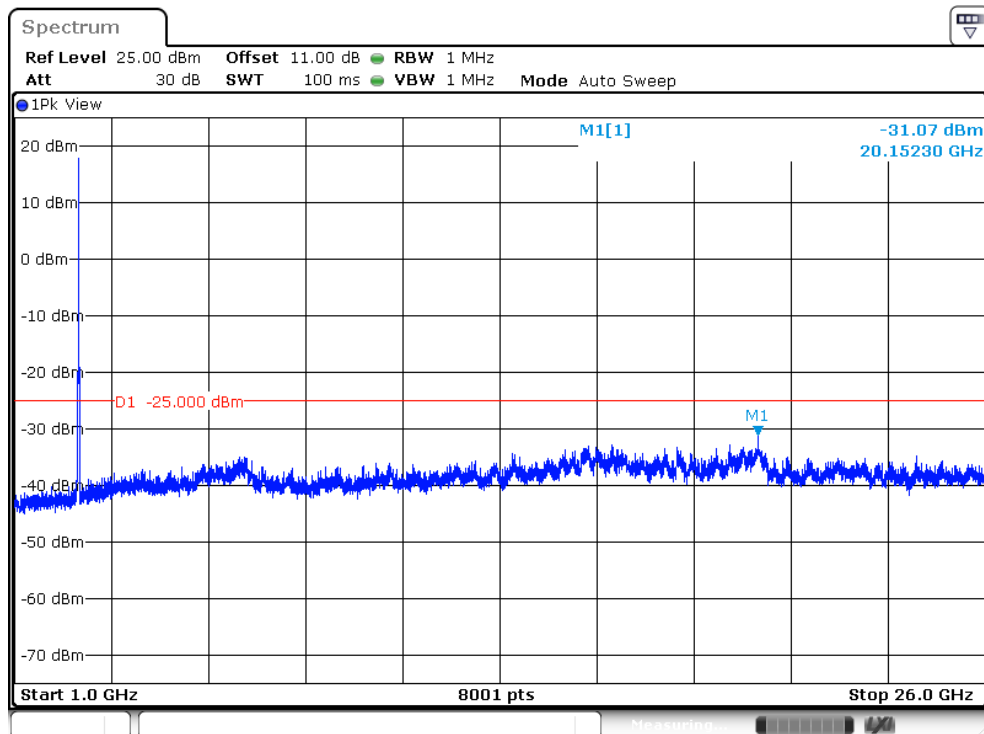
Band 41,UL Channel 41165,UL Frequency 2647.5,BW 15.0,NO. RB 75,RB POS. Low,QPSK



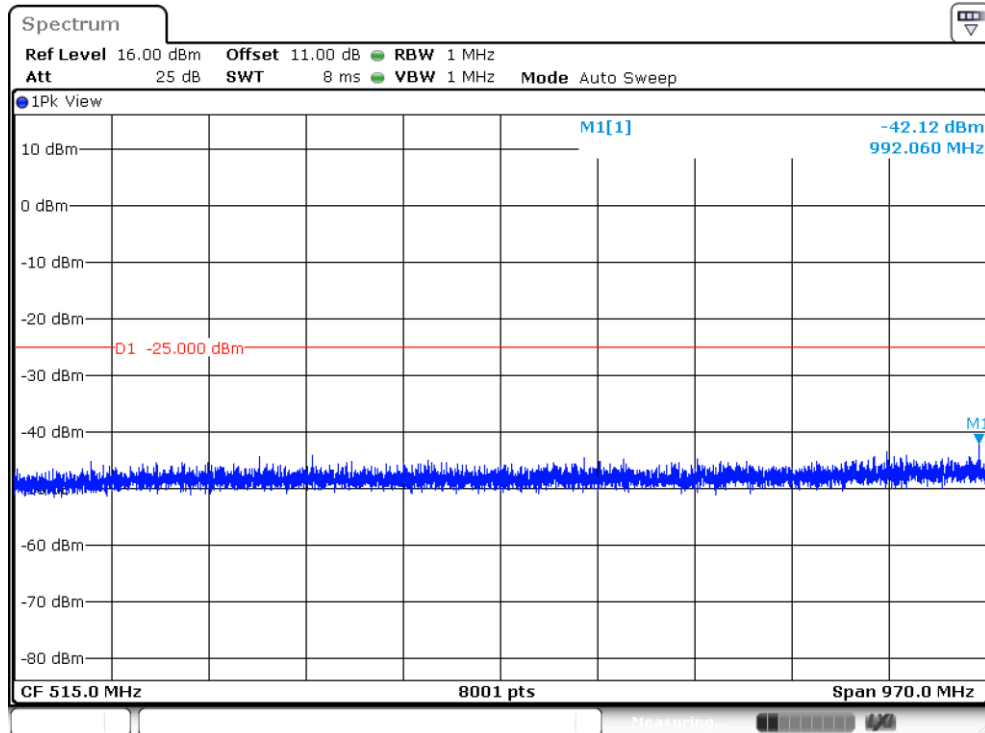
Band 41, UL Channel 41165, UL Frequency 2647.5, BW 15.0, NO. RB 75, RB POS. Low, 16-QAM



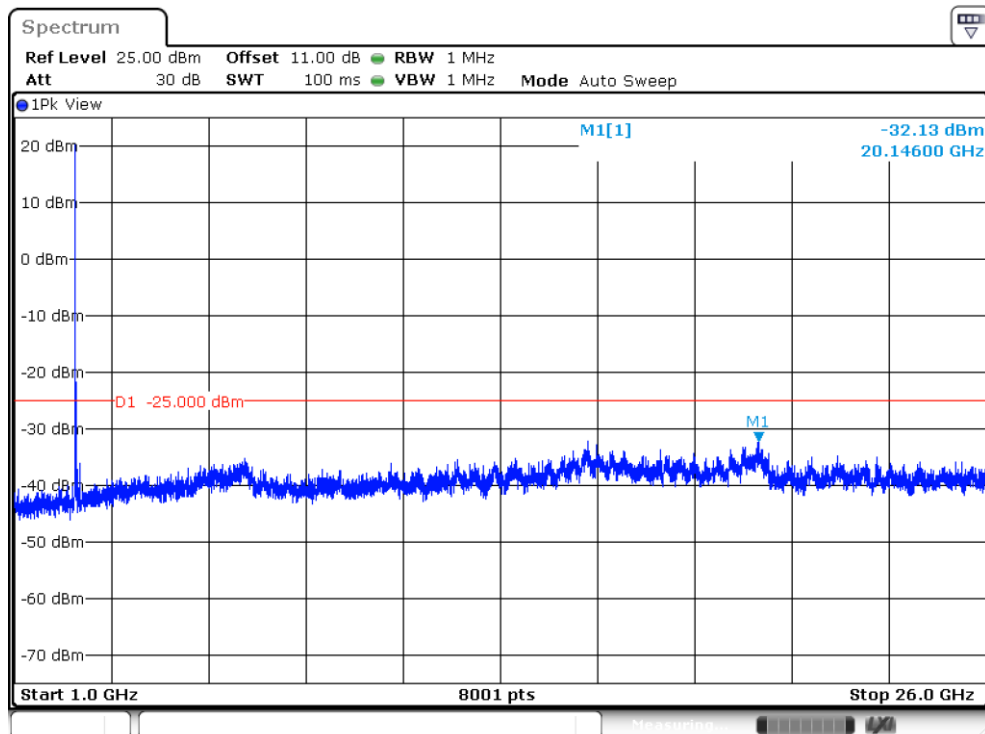
Band 41, UL Channel 41165, UL Frequency 2647.5, BW 15.0, NO. RB 75, RB POS. Low, 16-QAM



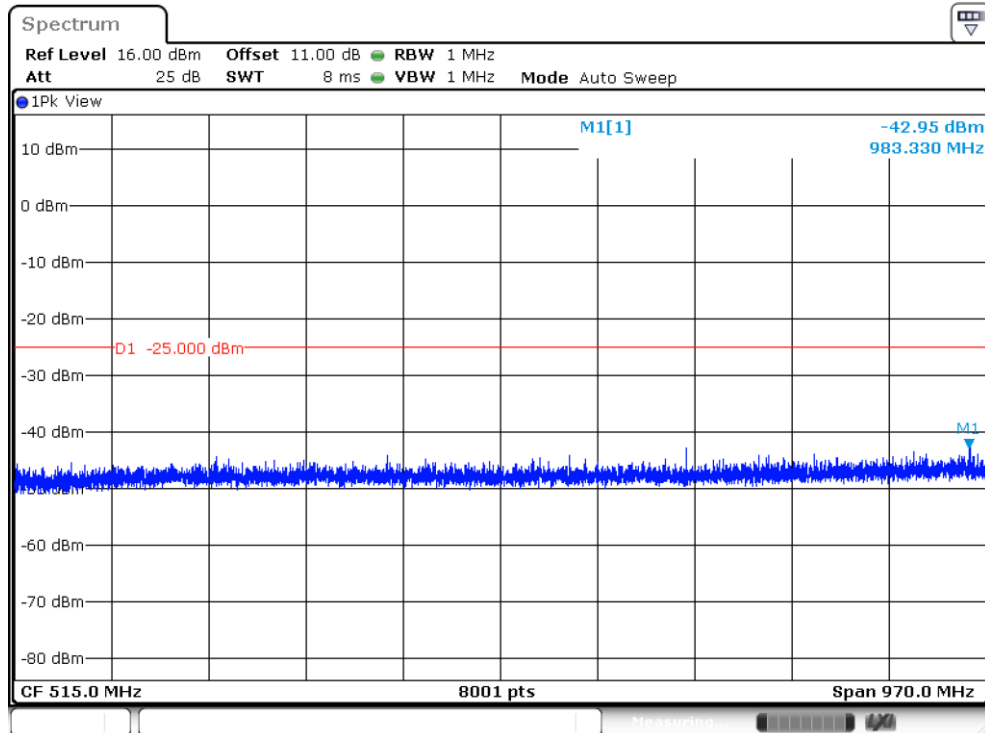
Band 41, UL Channel 40340, UL Frequency 2565.0, BW 20.0, NO. RB 1, RB POS. Low, QPSK



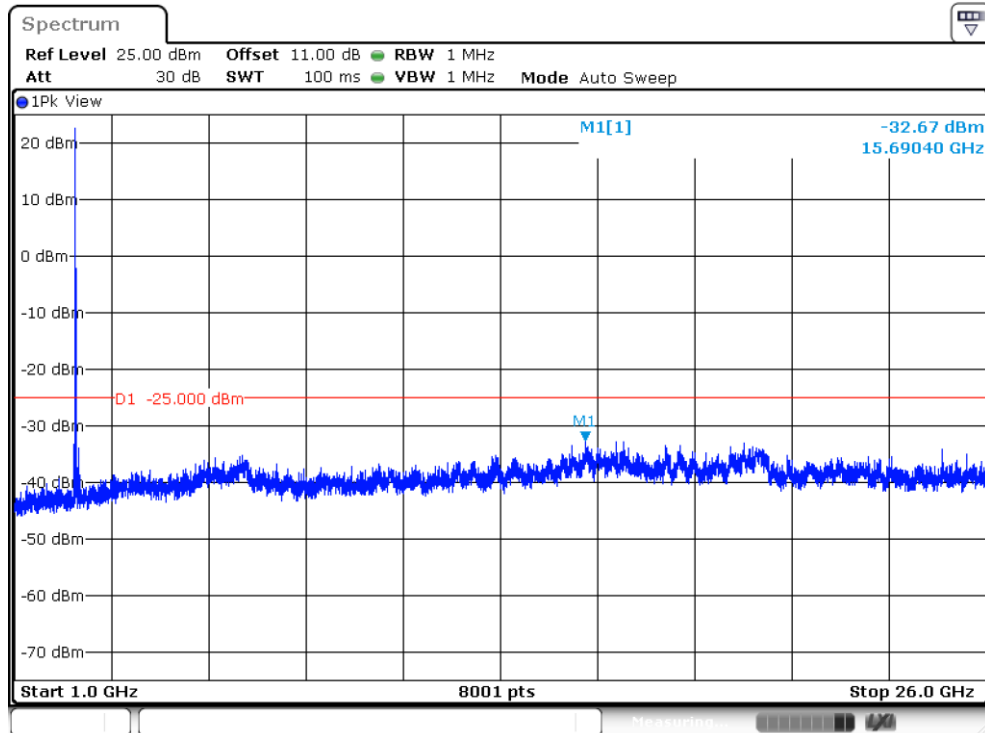
Band 41, UL Channel 40340, UL Frequency 2565.0, BW 20.0, NO. RB 1, RB POS. Low, QPSK



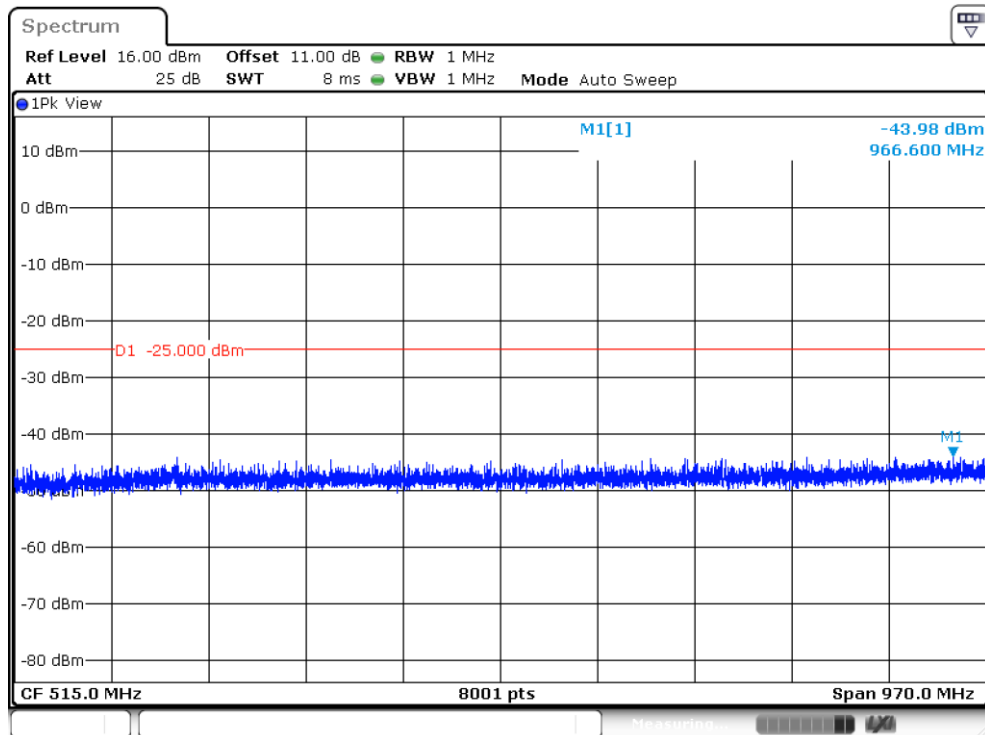
Band 41, UL Channel 40340, UL Frequency 2565.0, BW 20.0, NO. RB 1, RB POS. Low, 16-QAM



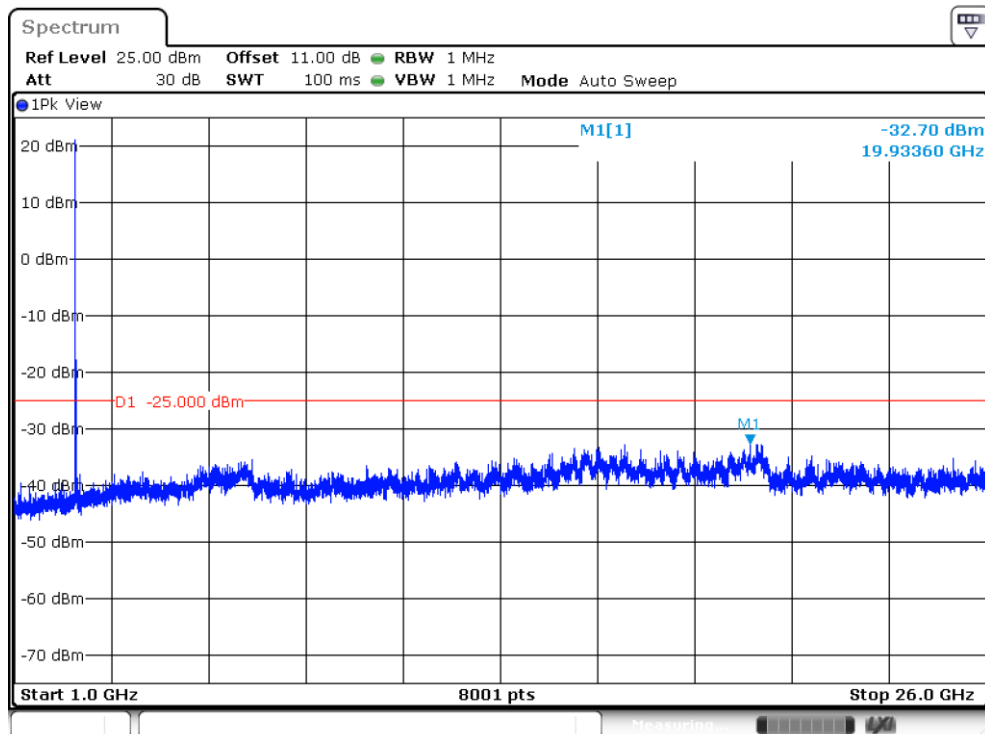
Band 41, UL Channel 40340, UL Frequency 2565.0, BW 20.0, NO. RB 1, RB POS. Low, 16-QAM



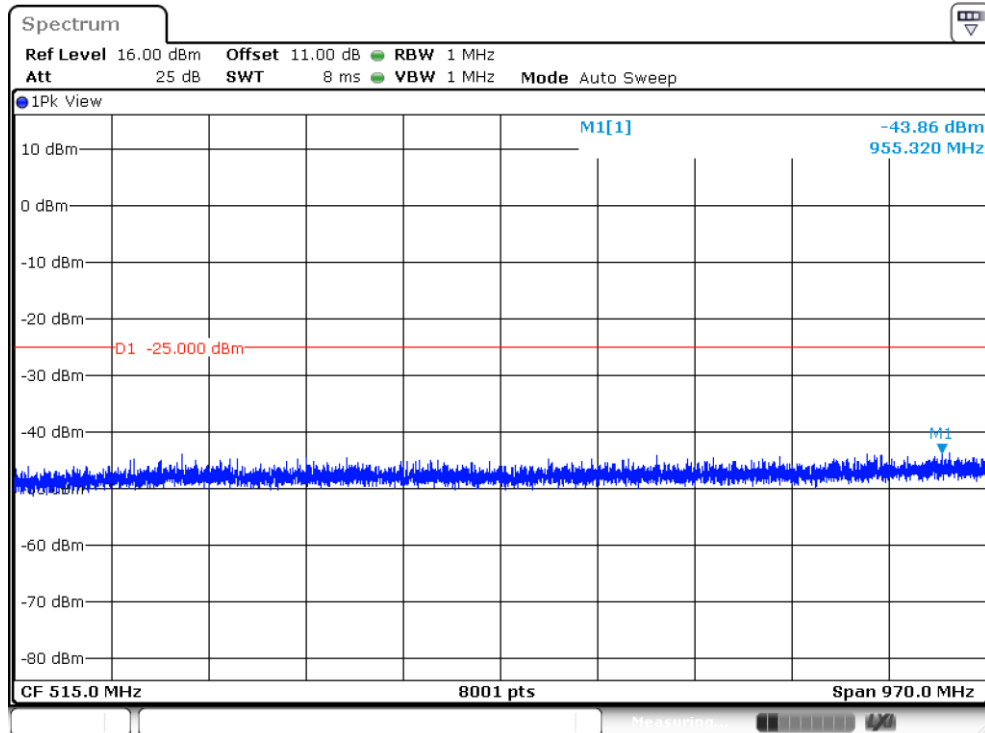
Band 41,UL Channel 40340,UL Frequency 2565.0,BW 20.0,NO. RB 50,RB POS. Low,QPSK



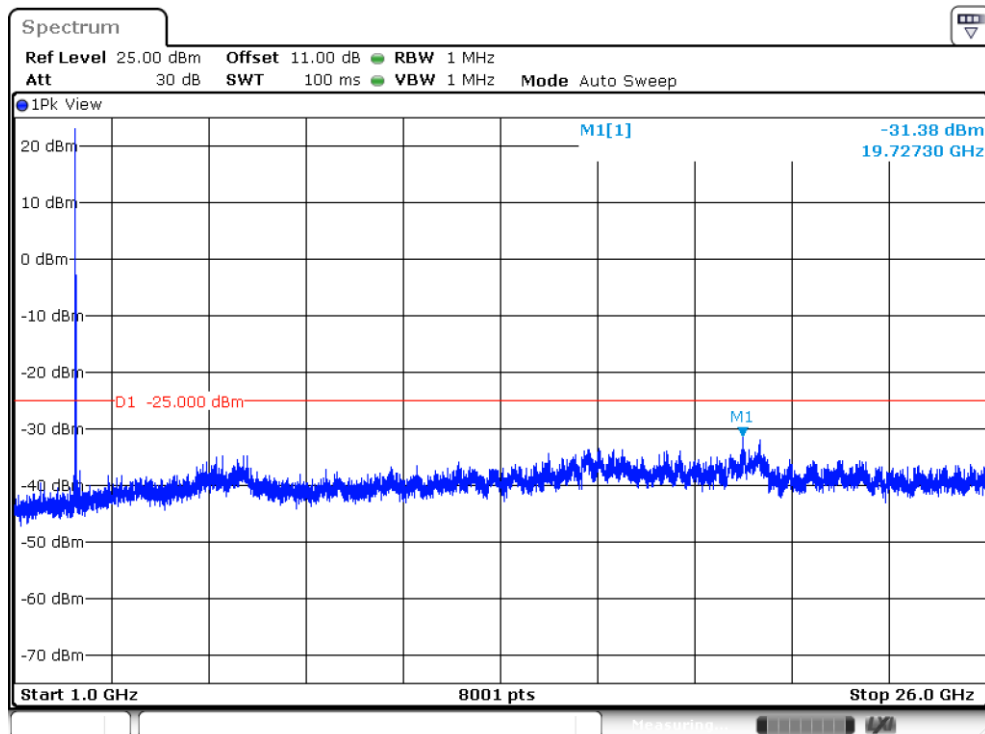
Band 41,UL Channel 40340,UL Frequency 2565.0,BW 20.0,NO. RB 50,RB POS. Low,QPSK



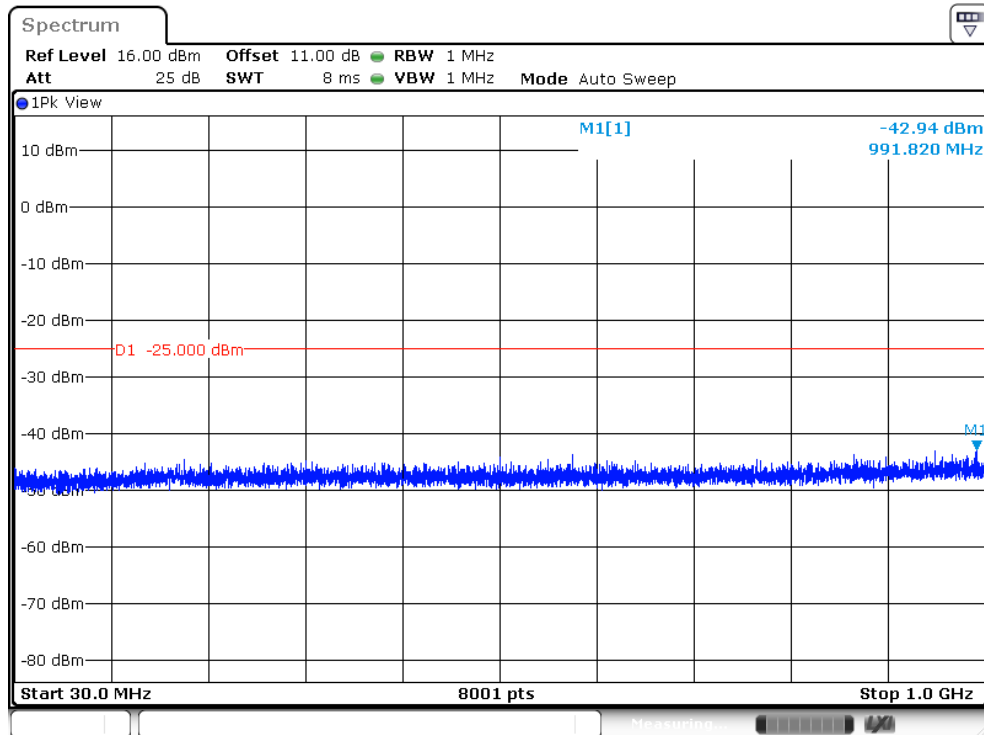
Band 41, UL Channel 40340, UL Frequency 2565.0, BW 20.0, NO. RB 50, RB POS. Low, 16-QAM



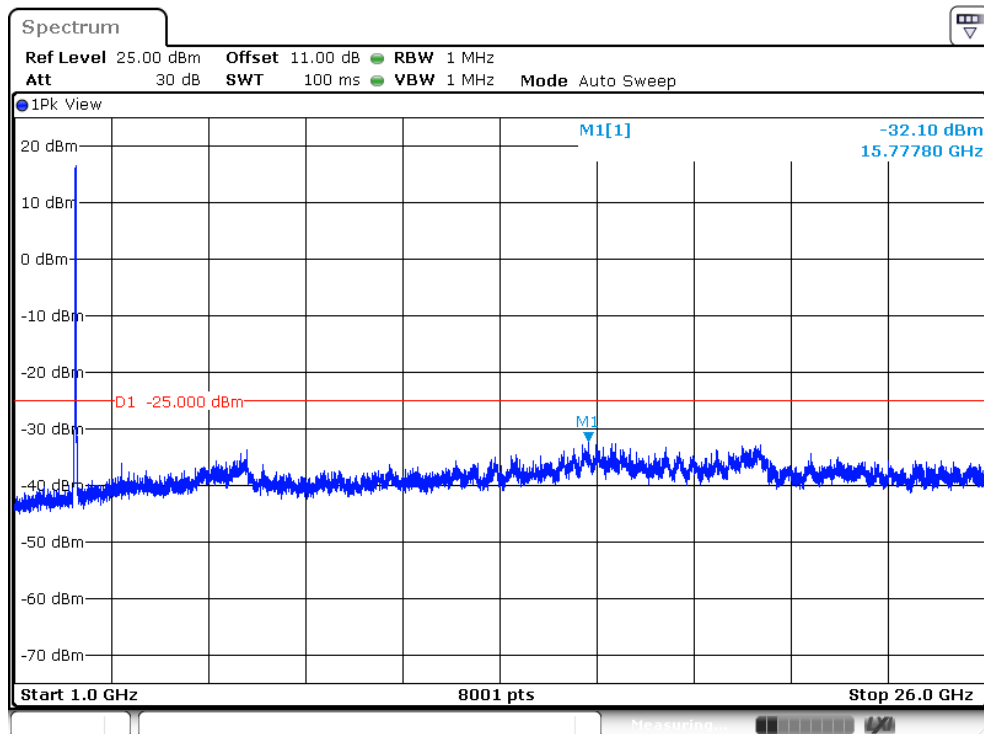
Band 41, UL Channel 40340, UL Frequency 2565.0, BW 20.0, NO. RB 50, RB POS. Low, 16-QAM



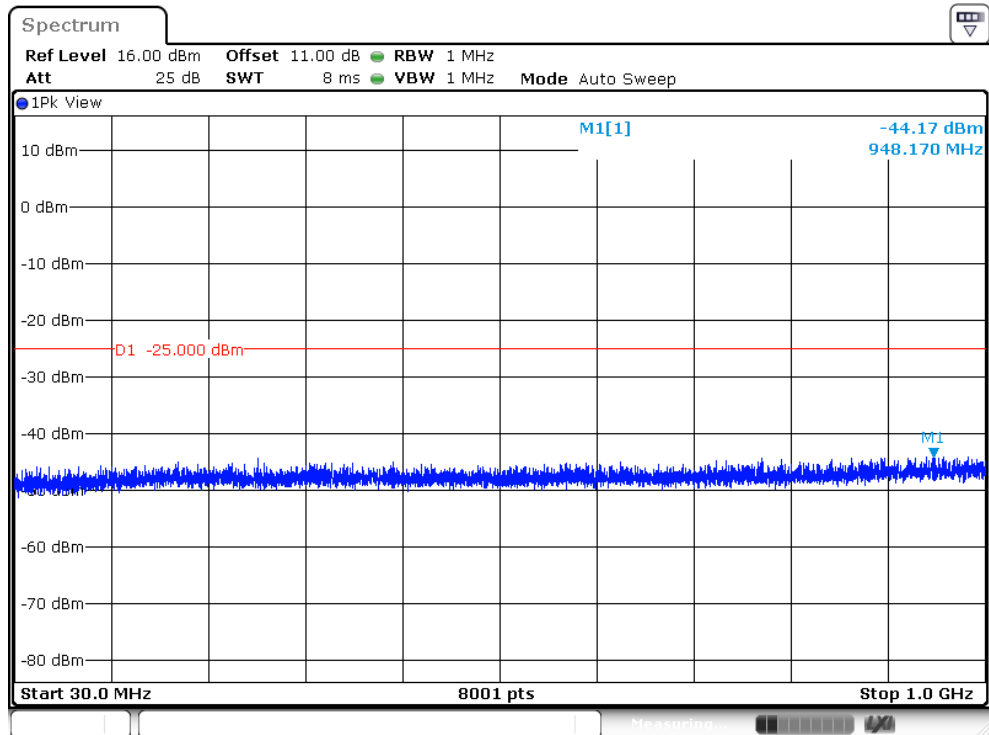
Band 41,UL Channel 40340,UL Frequency 2565.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



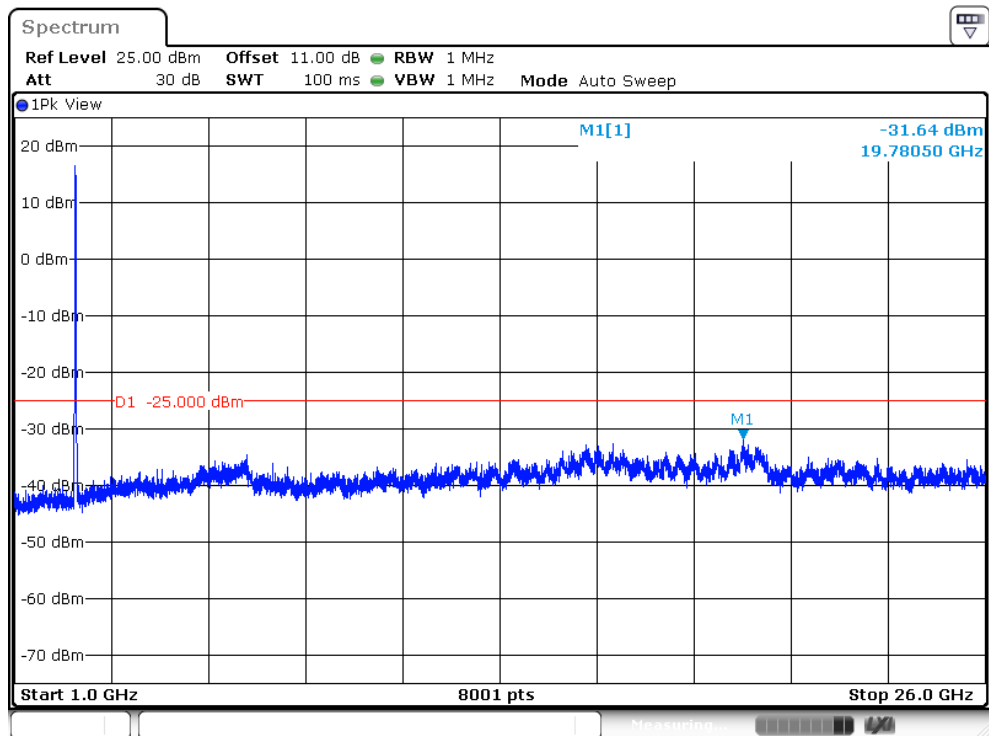
Band 41,UL Channel 40340,UL Frequency 2565.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



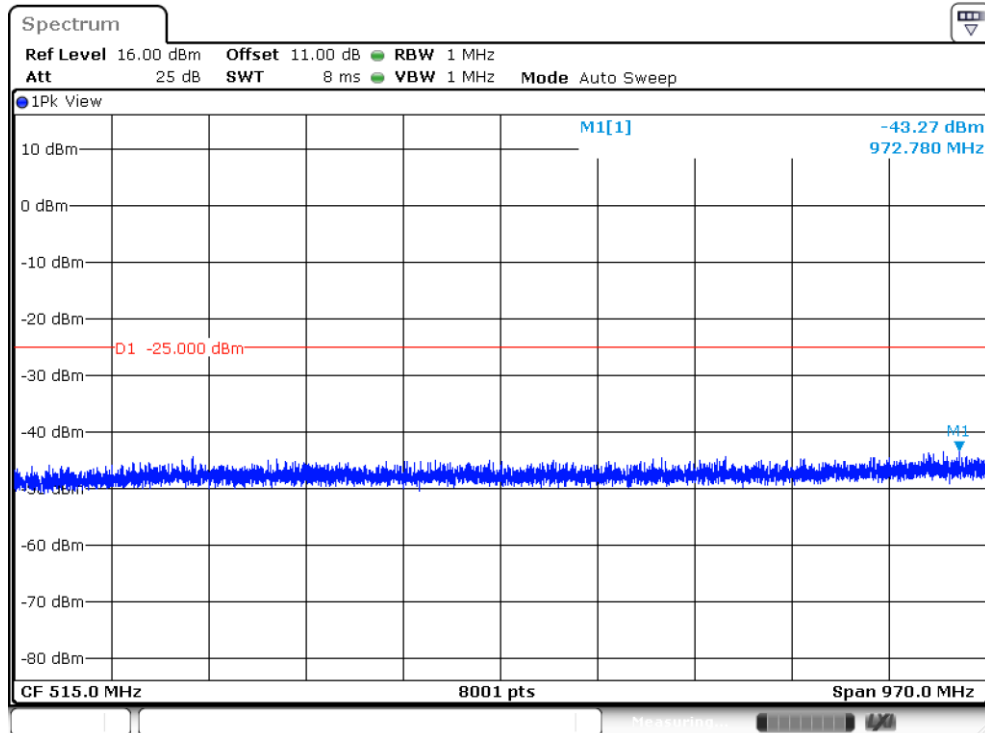
Band 41, UL Channel 40340, UL Frequency 2565.0, BW 20.0, NO. RB 100, RB POS. Low, 16-QAM



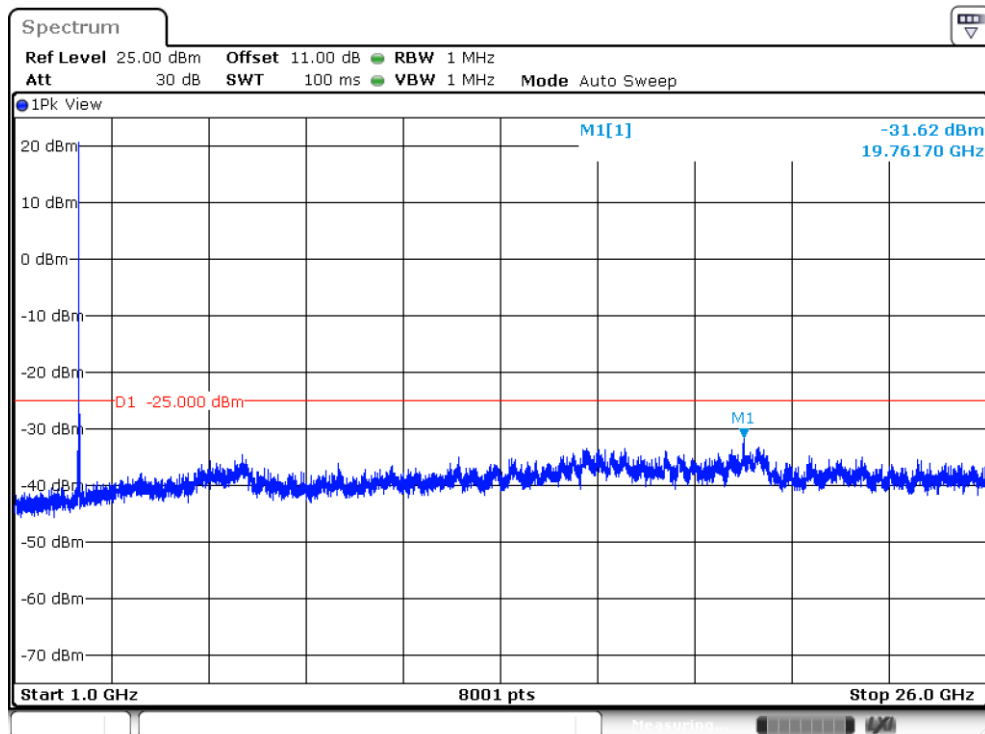
Band 41, UL Channel 40340, UL Frequency 2565.0, BW 20.0, NO. RB 100, RB POS. Low, 16-QAM



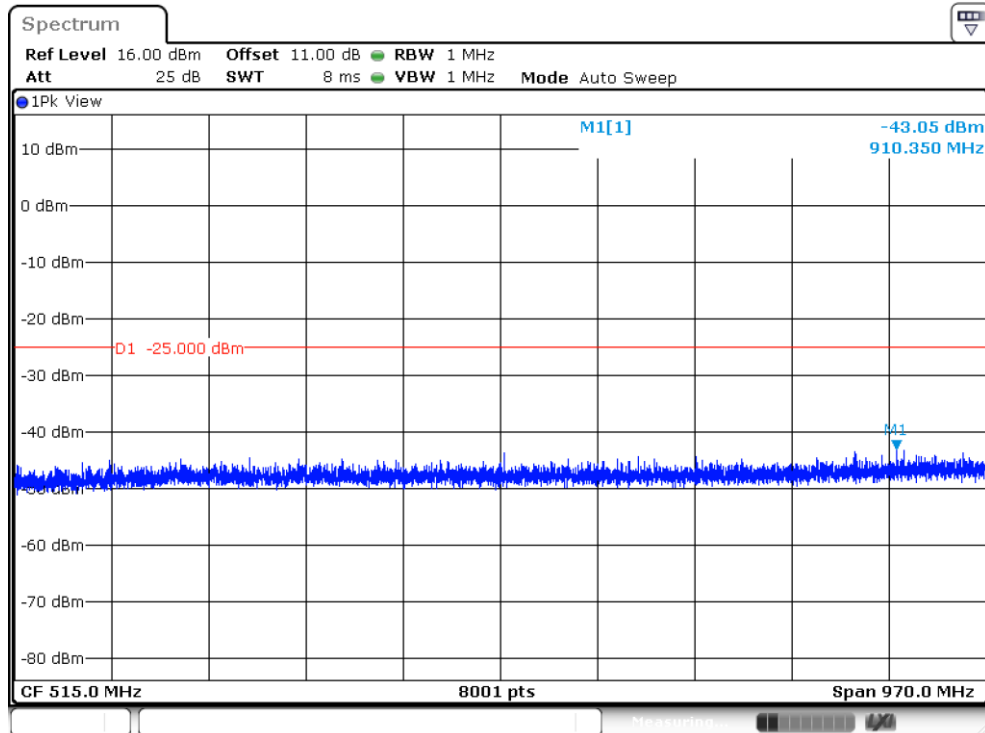
Band 41, UL Channel 41140, UL Frequency 2645.0, BW 20.0, NO. RB 1, RB POS. Low, QPSK



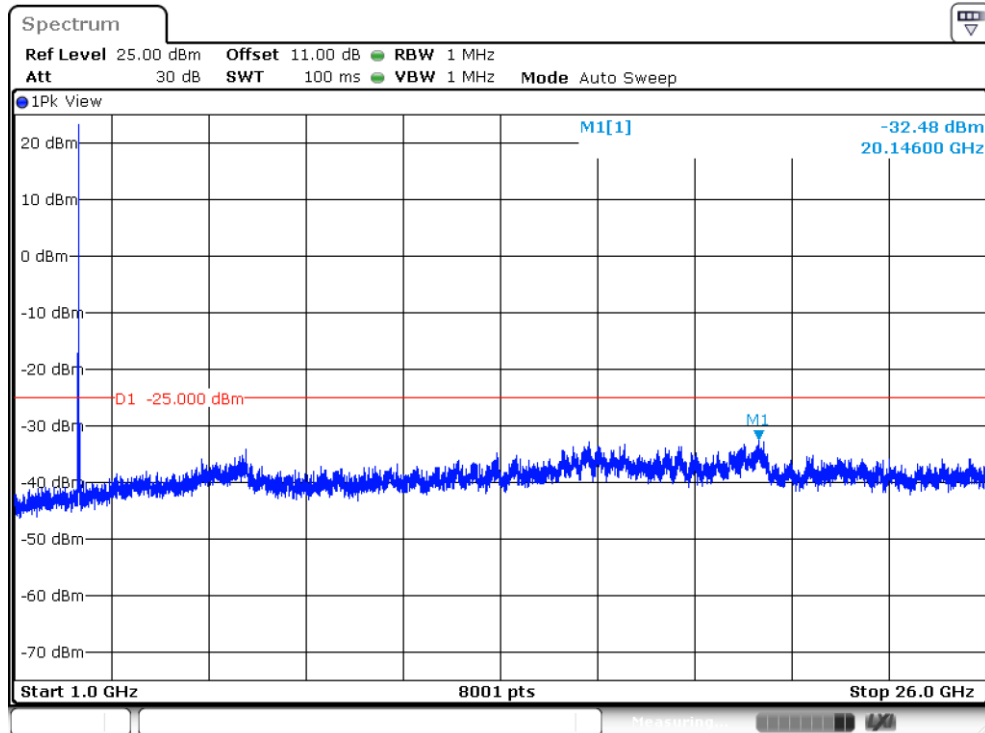
Band 41, UL Channel 41140, UL Frequency 2645.0, BW 20.0, NO. RB 1, RB POS. Low, QPSK



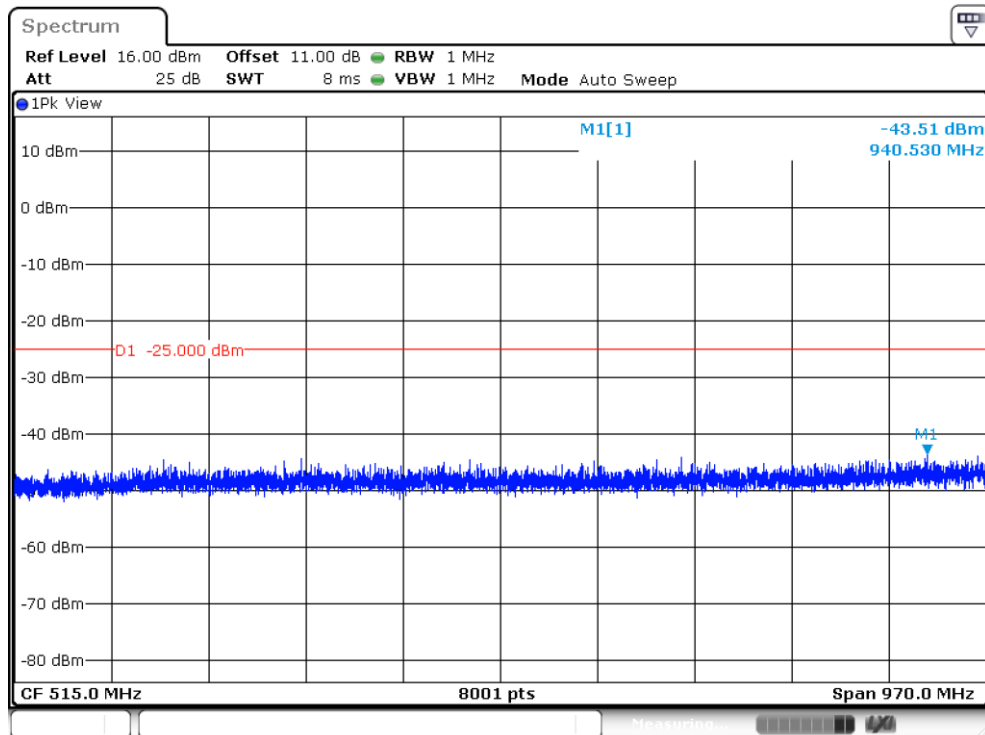
Band 41, UL Channel 41140, UL Frequency 2645.0, BW 20.0, NO. RB 1, RB POS. Low, 16-QAM



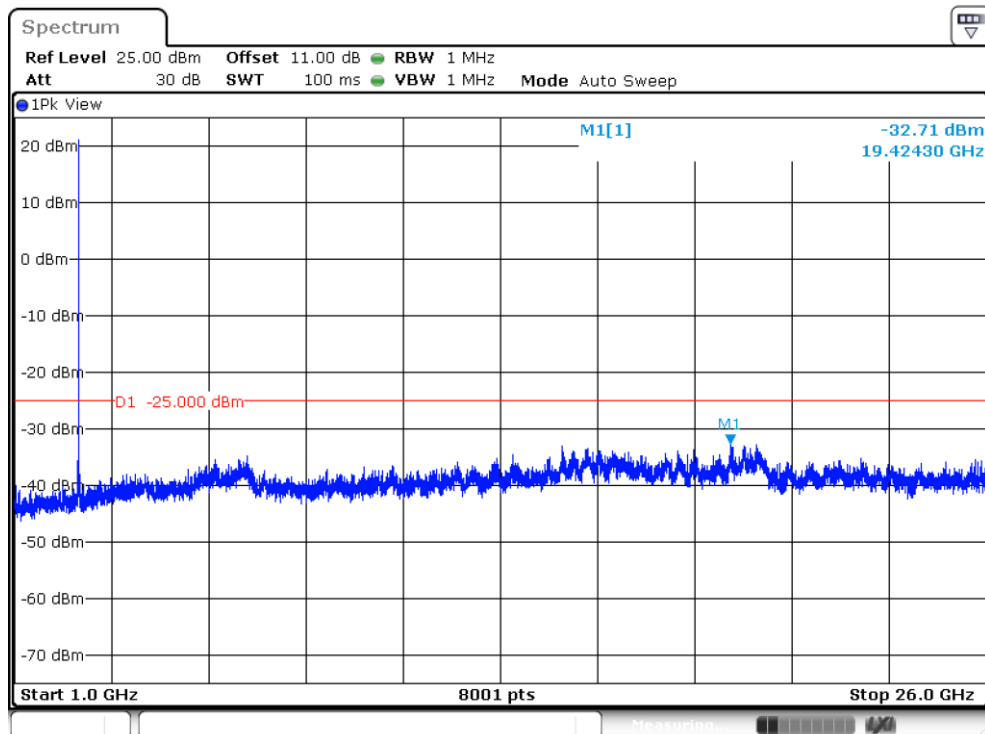
Band 41, UL Channel 41140, UL Frequency 2645.0, BW 20.0, NO. RB 1, RB POS. Low, 16-QAM



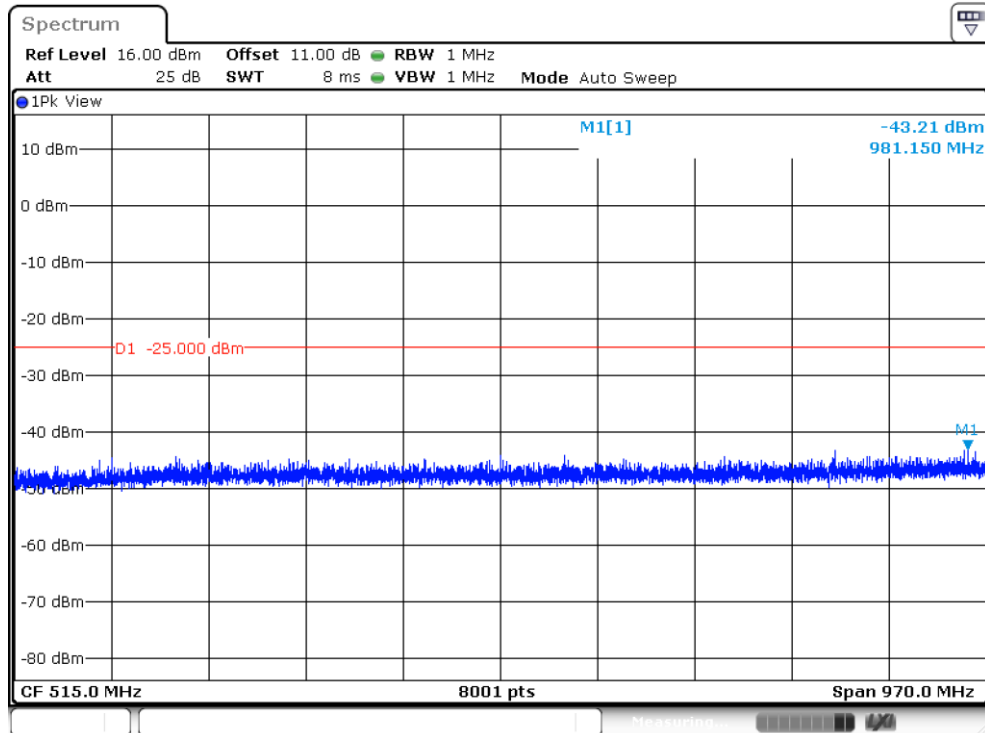
Band 41,UL Channel 41140,UL Frequency 2645.0,BW 20.0,NO. RB 50,RB POS. Low,QPSK



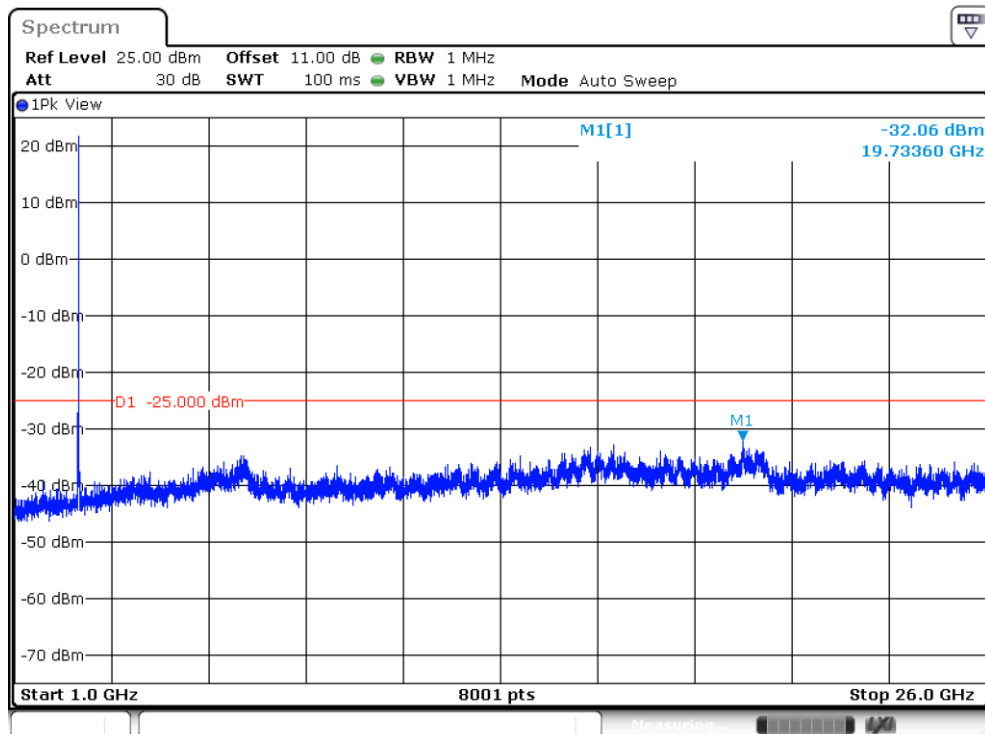
Band 41,UL Channel 41140,UL Frequency 2645.0,BW 20.0,NO. RB 50,RB POS. Low,QPSK



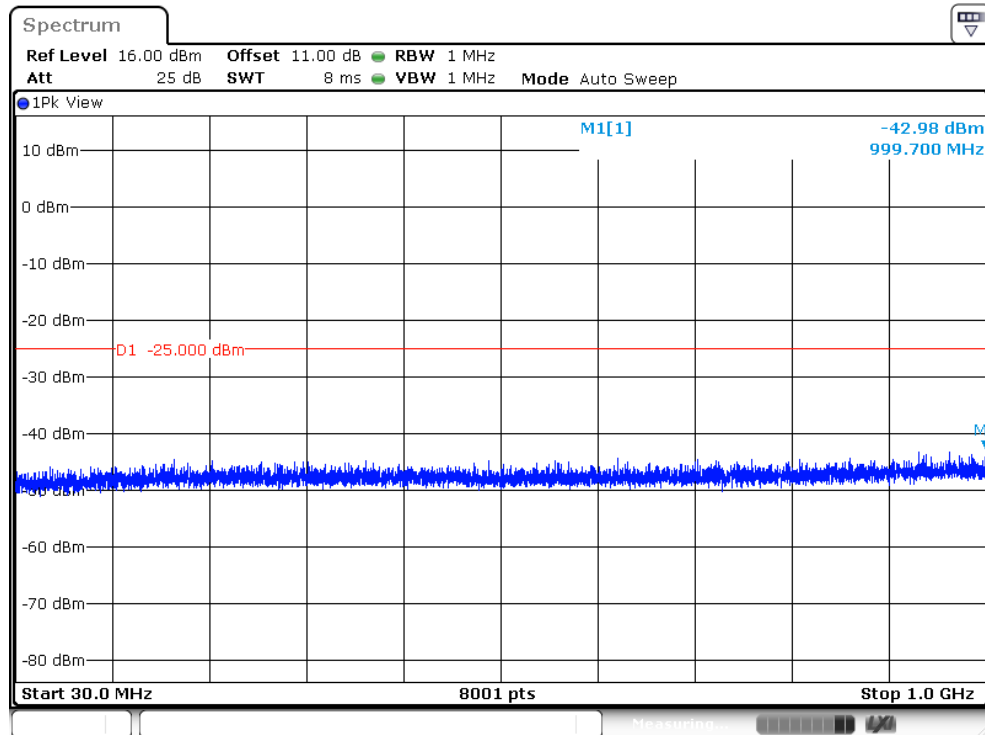
Band 41, UL Channel 41140, UL Frequency 2645.0, BW 20.0, NO. RB 50, RB POS. Low, 16-QAM



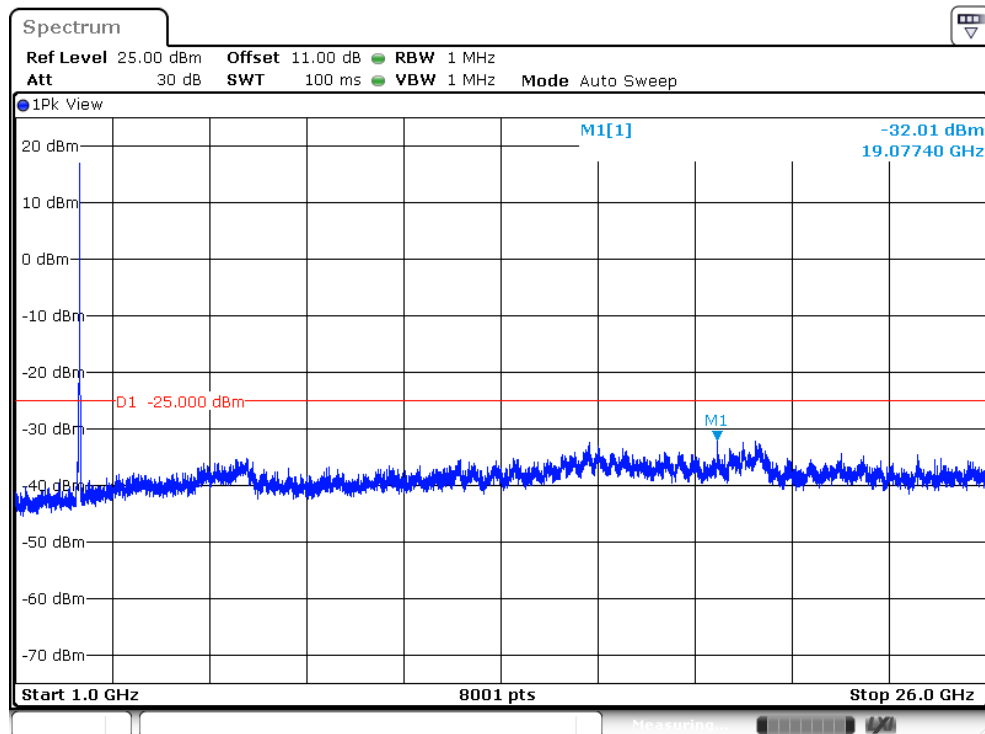
Band 41, UL Channel 41140, UL Frequency 2645.0, BW 20.0, NO. RB 50, RB POS. Low, 16-QAM



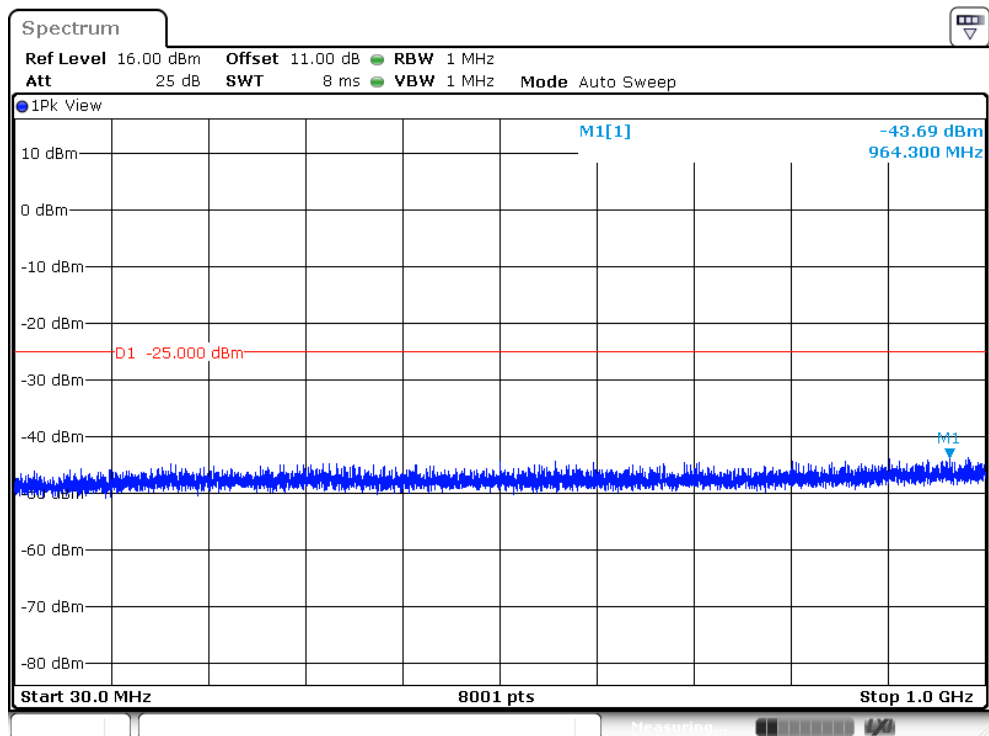
Band 41,UL Channel 41140,UL Frequency 2645.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



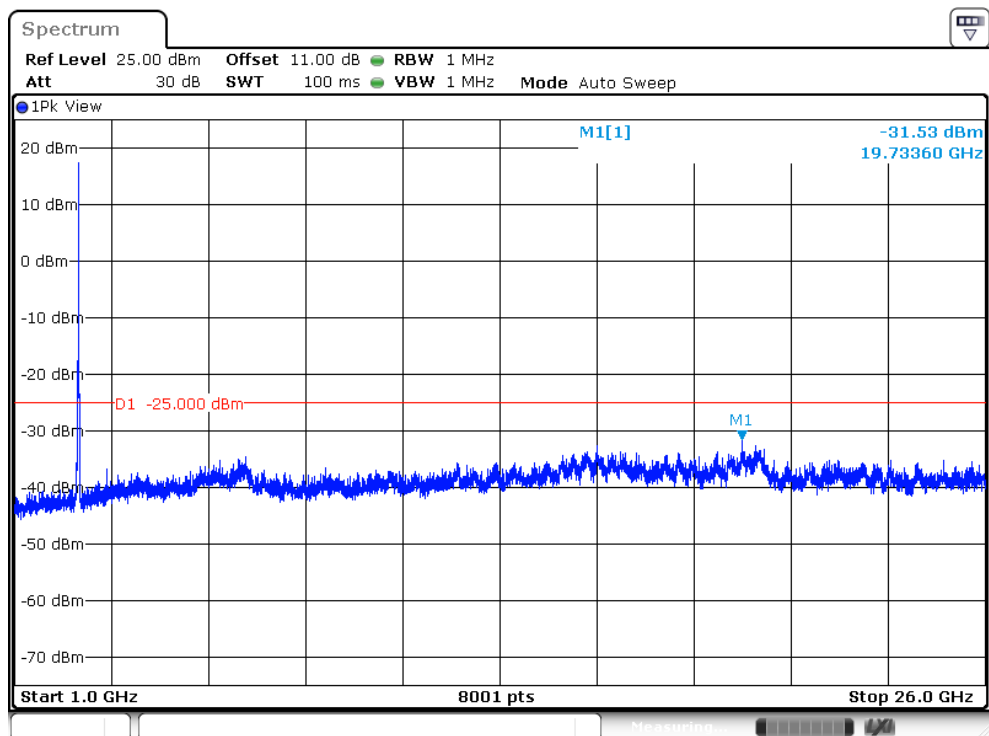
Band 41,UL Channel 41140,UL Frequency 2645.0,BW 20.0,NO. RB 100,RB POS. Low,QPSK



Band 41, UL Channel 41140, UL Frequency 2645.0, BW 20.0, NO. RB 100, RB POS. Low, 16-QAM



Band 41, UL Channel 41140, UL Frequency 2645.0, BW 20.0, NO. RB 100, RB POS. Low, 16-QAM



8. Radiated Measurement

8.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §27.50

LIMITS:

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 5

LTE Band 41

RESULTS

PASS

8.2 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 Band QPSK	6/0	824.7	4.55	2.01	19.68	2.15	20.07	101.655	Vertical	Pass
		836.5	4.33	2.01	19.77	2.15	19.94	98.731	Vertical	Pass
		848.3	4.49	2.02	19.82	2.15	20.14	103.358	Vertical	Pass
1.4MHz Band 16 QAM	6/0	824.7	3.31	2.01	19.68	2.15	18.83	76.372	Vertical	Pass
		836.5	3.48	2.01	19.77	2.15	19.09	81.043	Vertical	Pass
		848.3	3.11	2.02	19.82	2.15	18.76	75.153	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	4.06	2.01	19.70	2.15	19.60	91.241	Vertical	Pass
		836.5	4.43	2.01	19.77	2.15	20.04	100.935	Vertical	Pass
		847.5	4.14	2.02	19.81	2.15	19.78	94.977	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	2.88	2.01	19.70	2.15	18.42	69.516	Vertical	Pass
		836.5	2.52	2.01	19.77	2.15	18.13	65.030	Vertical	Pass
		847.5	3.30	2.02	19.81	2.15	18.94	78.350	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	3.67	2.01	19.71	2.15	19.22	83.559	Vertical	Pass
		836.5	4.68	2.01	19.77	2.15	20.29	106.882	Vertical	Pass
		846.5	3.85	2.02	19.79	2.15	19.47	88.485	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	3.36	2.01	19.71	2.15	18.91	77.736	Vertical	Pass
		836.5	2.44	2.01	19.77	2.15	18.05	63.857	Vertical	Pass
		846.5	3.26	2.02	19.79	2.15	18.88	77.210	Vertical	Pass
10.0MHz z Band QPSK	50/0	829	5.02	2.01	19.73	2.15	20.59	114.551	Vertical	Pass
		836.5	4.40	2.01	19.77	2.15	20.01	100.210	Vertical	Pass
		844	4.02	2.02	19.78	2.15	19.63	91.732	Vertical	Pass
10.0MHz z Band 16 QAM	50/0	829	4.78	2.01	19.73	2.15	20.35	108.393	Vertical	Pass
		836.5	4.54	2.01	19.77	2.15	20.15	103.514	Vertical	Pass
		844	4.83	2.02	19.78	2.15	20.44	110.662	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	Freque ncy	Result							Conclu sion
			SG Level (dBm)	Cable Loss (dBm)	Anten na Gain (dB)	Corre ction (dB)	Max. EIRP Averag e (dBm)	Max. EIRP Averag e (mW)	Polarizati on Of Max. ERP	
1.4MHz Band QPSK	6/0	824.7	4.32	2.01	19.68	2.15	19.84	96.436	Horizontal	Pass
		836.5	3.19	2.01	19.77	2.15	18.80	75.866	Horizontal	Pass
		848.3	4.19	2.02	19.82	2.15	19.84	96.299	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	3.35	2.01	19.68	2.15	18.87	77.109	Horizontal	Pass
		836.5	2.49	2.01	19.77	2.15	18.10	64.565	Horizontal	Pass
		848.3	2.55	2.02	19.82	2.15	18.20	66.138	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	3.65	2.01	19.70	2.15	19.19	82.987	Horizontal	Pass
		836.5	3.34	2.01	19.77	2.15	18.95	78.507	Horizontal	Pass
		847.5	4.06	2.02	19.81	2.15	19.70	93.379	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	2.60	2.01	19.70	2.15	18.14	65.109	Horizontal	Pass
		836.5	2.48	2.01	19.77	2.15	18.09	64.403	Horizontal	Pass
		847.5	2.66	2.02	19.81	2.15	18.30	67.538	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	3.70	2.01	19.71	2.15	19.25	84.043	Horizontal	Pass
		836.5	2.80	2.01	19.77	2.15	18.41	69.397	Horizontal	Pass
		846.5	4.03	2.02	19.79	2.15	19.65	92.335	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	2.36	2.01	19.71	2.15	17.91	61.785	Horizontal	Pass
		836.5	2.44	2.01	19.77	2.15	18.05	63.822	Horizontal	Pass
		846.5	2.96	2.02	19.79	2.15	18.58	72.090	Horizontal	Pass
10.0MH z Band QPSK	50/0	829	4.32	2.01	19.73	2.15	19.89	97.499	Horizontal	Pass
		836.5	3.56	2.01	19.77	2.15	19.17	82.693	Horizontal	Pass
		844	3.49	2.02	19.78	2.15	19.10	81.216	Horizontal	Pass
10.0MH z Band 16 QAM	50/0	829	4.34	2.01	19.73	2.15	19.91	97.949	Horizontal	Pass
		836.5	3.97	2.01	19.77	2.15	19.58	90.782	Horizontal	Pass
		844	3.83	2.02	19.78	2.15	19.44	87.902	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 41

Radiated Power (EIRP) for Band 41									
Mode	RB/ RB SIZE	Frequency	Result						Conclusio n
			SG Level (dBm)	Cable Loss (dBm)	Antenn a Gain (dB)	Max. EIRP Avera ge (dBm)	Max. EIRP	Polarizati on Of Max. ERP	
							Average (mW)		
5.0MHz Band QPSK	25/0	2557.5	-2.97	4.54	27.75	20.24	105.736	Horizontal	Pass
		2605	-3.34	4.69	27.72	19.69	93.043	Horizontal	Pass
		2652.5	-2.72	4.71	27.71	20.28	106.726	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2557.5	-4.16	4.54	27.75	19.05	80.332	Horizontal	Pass
		2605	-3.98	4.69	27.72	19.05	80.335	Horizontal	Pass
		2652.5	-3.79	4.71	27.71	19.21	83.299	Horizontal	Pass
10.0MH z Band QPSK	50/0	2560	-3.23	4.55	27.76	19.98	99.615	Horizontal	Pass
		2605	-2.62	4.69	27.72	20.41	109.980	Horizontal	Pass
		2650	-2.85	4.72	27.7	20.13	103.057	Horizontal	Pass
10.0MH z Band 16 QAM	50/0	2560	-4.31	4.55	27.76	18.90	77.594	Horizontal	Pass
		2605	-3.09	4.69	27.72	19.94	98.553	Horizontal	Pass
		2650	-3.43	4.72	27.7	19.55	90.180	Horizontal	Pass
15.0MH z Band QPSK	75/0	2562.5	-2.49	4.55	27.77	20.73	118.375	Horizontal	Pass
		2605	-2.89	4.69	27.72	20.14	103.277	Horizontal	Pass
		2648.5	-3.10	4.72	27.69	19.87	96.949	Horizontal	Pass
15.0MH z Band 16 QAM	75/0	2562.5	-4.06	4.55	27.77	19.16	82.508	Horizontal	Pass
		2605	-3.87	4.69	27.72	19.16	82.389	Horizontal	Pass
		2648.5	-3.24	4.72	27.69	19.73	93.995	Horizontal	Pass
20.0MH z Band QPSK	100/ 0	2565	-2.32	4.57	27.78	20.89	122.744	Horizontal	Pass
		2605	-2.72	4.73	27.72	20.27	106.409	Horizontal	Pass
		2645	-2.59	4.75	27.68	20.34	108.253	Horizontal	Pass
20.0MH z Band 16 QAM	100/ 0	2565	-2.30	4.57	27.78	20.91	123.310	Horizontal	Pass
		2605	-2.47	4.73	27.72	20.52	112.720	Horizontal	Pass
		2645	-2.69	4.75	27.68	20.24	105.682	Horizontal	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 41									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cable Loss (dBm)	Anten na Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Averag e (mW)	Polarizati on Of Max. ERP	
5.0MHz Band QPSK	25/0	2557.5	-2.51	4.54	27.75	20.70	117.593	Vertical	Pass
		2605	-2.74	4.69	27.72	20.29	106.836	Vertical	Pass
		2652.5	-2.88	4.71	27.71	20.12	102.817	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2557.5	-3.74	4.54	27.75	19.47	88.415	Vertical	Pass
		2605	-3.58	4.69	27.72	19.45	88.196	Vertical	Pass
		2652.5	-3.97	4.71	27.71	19.03	79.907	Vertical	Pass
10.0MH z Band QPSK	50/0	2560	-2.84	4.55	27.76	20.37	108.948	Vertical	Pass
		2605	-2.79	4.69	27.72	20.24	105.594	Vertical	Pass
		2650	-2.28	4.72	27.7	20.70	117.514	Vertical	Pass
10.0MH z Band 16 QAM	50/0	2560	-3.92	4.55	27.76	19.29	84.951	Vertical	Pass
		2605	-3.81	4.69	27.72	19.22	83.473	Vertical	Pass
		2650	-3.63	4.72	27.7	19.35	86.014	Vertical	Pass
15.0MH z Band QPSK	75/0	2562.5	-2.42	4.55	27.77	20.80	120.093	Vertical	Pass
		2605	-2.71	4.69	27.72	20.32	107.668	Vertical	Pass
		2648.5	-2.64	4.72	27.69	20.33	107.808	Vertical	Pass
15.0MH z Band 16 QAM	75/0	2562.5	-3.51	4.55	27.77	19.71	93.574	Vertical	Pass
		2605	-3.30	4.69	27.72	19.73	93.966	Vertical	Pass
		2648.5	-3.48	4.72	27.69	19.49	88.871	Vertical	Pass
20.0MH z Band QPSK	100/0	2565	-2.82	4.57	27.78	20.39	109.482	Vertical	Pass
		2605	-2.47	4.73	27.72	20.52	112.777	Vertical	Pass
		2645	-2.08	4.75	27.68	20.85	121.521	Vertical	Pass
20.0MH z Band 16 QAM	100/0	2565	-2.40	4.57	27.78	20.81	120.504	Vertical	Pass
		2605	-2.94	4.73	27.72	20.05	101.158	Vertical	Pass
		2645	-2.74	4.75	27.68	20.19	104.472	Vertical	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, §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 $43 + 10 \log_{10}(P)$ 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 $43 + 10 \log_{10}(p)$, dB; and
- b. for mobile subscriber equipment, the attenuation shall not be less than $43 + 10 \log_{10}(p)$, dB at the channel edges and $55 + 10 \log_{10}(p)$ 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 5

LTE Band 41

RESULTS

PASS

9.1 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	-50.52	2.78	27.50	-25.80	-13	-12.80	Horizontal
1649.4	-55.70	2.78	27.50	-30.98	-13	-17.98	Vertical
2474.1	-54.64	2.90	27.80	-29.74	-13	-16.74	Vertical
2474.1	-53.33	2.90	27.80	-28.43	-13	-15.43	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-51.24	2.78	27.48	-26.54	-13	-13.54	Horizontal
1673	-49.61	2.78	27.48	-24.91	-13	-11.91	Vertical
2509.5	-51.77	2.91	27.70	-26.98	-13	-13.98	Vertical
2509.5	-51.80	2.91	27.70	-27.01	-13	-14.01	Horizontal
Test Results for High Channel 848.3MHz							
1696.6	-52.22	2.78	27.43	-27.57	-13	-14.57	Horizontal
1696.6	-53.72	2.78	27.43	-29.07	-13	-16.07	Vertical
2544.9	-50.23	2.92	27.74	-25.41	-13	-12.41	Vertical
2544.9	-52.15	2.92	27.74	-27.33	-13	-14.33	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	-53.48	2.78	27.50	-28.76	-13	-15.76	Horizontal
1658	-50.20	2.78	27.50	-25.48	-13	-12.48	Vertical
2487	-54.65	2.90	27.80	-29.75	-13	-16.75	Vertical
2487	-52.40	2.90	27.80	-27.50	-13	-14.50	Horizontal
Test Results For Mid Channel 836.5MHz							
1673	-51.45	2.78	27.48	-26.75	-13	-13.75	Horizontal
1673	-51.54	2.78	27.48	-26.84	-13	-13.84	Vertical
2509.5	-55.40	2.91	27.70	-30.61	-13	-17.61	Vertical
2509.5	-52.65	2.91	27.70	-27.86	-13	-14.86	Horizontal
Test Results for High Channel 844MHz							
1688	-54.95	2.78	27.43	-30.30	-13	-17.30	Horizontal
1688	-49.63	2.78	27.43	-24.98	-13	-11.98	Vertical
2532	-50.26	2.92	27.74	-25.44	-13	-12.44	Vertical
2532	-51.63	2.92	27.74	-26.81	-13	-13.81	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(dBm)-Limit(dBm)

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

9.2 LTE BAND 41

QPSK EIRP POWER FOR LTE BAND 41 (5MHZ BANDWIDTH)

Test Results for Low Channel 2557.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5115	-53.27	2.63	27.26	-28.64	-25	-15.64	Horizontal
5115	-51.21	2.63	27.26	-26.58	-25	-13.58	Vertical
7672.5	-54.41	2.67	27.58	-29.50	-25	-16.50	Vertical
7672.5	-56.30	2.67	27.58	-31.39	-25	-18.39	Horizontal
Test Results for Mid Channel 2605MHz							
5210	-44.84	2.62	27.28	-20.18	-25	-7.18	Horizontal
5210	-49.31	2.62	27.28	-24.65	-25	-11.65	Vertical
7815	-53.10	2.85	27.62	-28.33	-25	-15.33	Vertical
7815	-50.66	2.85	27.62	-25.89	-25	-12.89	Horizontal
Test Results for High Channel 2652.5MHz							
5305	-44.71	2.64	27.28	-20.07	-25	-7.07	Horizontal
5305	-51.80	2.64	27.28	-27.16	-25	-14.16	Vertical
7957.5	-51.58	2.85	27.70	-26.73	-25	-13.73	Vertical
7957.5	-49.97	2.85	27.70	-25.12	-25	-12.12	Horizontal

QPSK EIRP POWER FOR LTE BAND 41 (20.0MHZ BANDWIDTH)

Test Results for Low Channel 2565MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5130	-52.89	2.63	27.30	-28.22	-25	-15.22	Horizontal
5130	-47.71	2.63	27.30	-23.04	-25	-10.04	Vertical
7695	-53.40	2.67	27.62	-28.45	-25	-15.45	Vertical
7695	-56.20	2.67	27.62	-31.25	-25	-18.25	Horizontal
Test Results for Mid Channel 2605MHz							
5210	-52.37	2.62	27.33	-27.66	-25	-14.66	Horizontal
5210	-49.14	2.62	27.33	-24.43	-25	-11.43	Vertical
7815	-54.17	2.85	27.67	-29.35	-25	-16.35	Vertical
7815	-54.48	2.85	27.67	-29.66	-25	-16.66	Horizontal
Test Results for High Channel 2645MHz							
5290	-50.96	2.64	27.33	-26.27	-25	-13.27	Horizontal
5290	-52.91	2.64	27.33	-28.22	-25	-15.22	Vertical
7935	-53.87	2.85	27.67	-29.05	-25	-16.05	Vertical
7935	-50.85	2.85	27.67	-26.03	-25	-13.03	Horizontal

Note: P_{Mea}(dBm)= Power(dBm)+ AR_{pl} (dBm)

. Over Limit= : P_{Mea}(dBm)-Limit(dBm)

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

10. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §27.54

LIMITS

§27.54 - 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 3.2V, Normal, DC 3.85V and High voltage, DC 4.4V.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to -30°C 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 +50°C is reached.

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 5

LTE Band 41

RESULTS

See the following pages.

10.1 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	-0.7	-0.000778	2.5
3.85	836.5	-4.1	-0.004877	2.5
4.4	836.5	5.5	0.006563	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	-1.2	-0.001407	2.5
Extreme (50C)	836.5	-4.2	-0.005003	2.5
Extreme (40C)	836.5	-3.2	-0.003811	2.5
Extreme (30C)	836.5	-2.2	-0.002624	2.5
Extreme (10C)	836.5	2.3	0.002765	2.5
Extreme (0C)	836.5	3.4	0.004094	2.5
Extreme (-10C)	836.5	5.8	0.006877	2.5
Extreme (-20C)	836.5	-3.4	-0.004075	2.5
Extreme (-30C)	836.5	-5.9	-0.007003	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	-1.4	-0.001652	2.5
3.85	836.5	-4.2	-0.005003	2.5
4.4	836.5	-5.6	-0.006641	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	-2.6	-0.003102	2.5
Extreme (50C)	836.5	-5.0	-0.005935	2.5
Extreme (40C)	836.5	-3.1	-0.003733	2.5
Extreme (30C)	836.5	8.3	0.009878	2.5
Extreme (10C)	836.5	5.2	0.006198	2.5
Extreme (0C)	836.5	4.4	0.005236	2.5
Extreme (-10C)	836.5	-3.1	-0.003749	2.5
Extreme (-20C)	836.5	-3.7	-0.004438	2.5
Extreme (-30C)	836.5	-3.7	-0.004419	2.5

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

10.2 LTE BAND 41

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
QPSK, (CH 40740 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	2605	3.8	0.005220	2.5
3.85	2605	5.7	0.007830	2.5
4.4	2605	-2.6	-0.003571	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
QPSK, (CH 40740 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2605	-5.7	-0.002188	2.5
Extreme (50C)	2605	-4.6	-0.001766	2.5
Extreme (40C)	2605	-4.8	-0.001843	2.5
Extreme (30C)	2605	3.2	0.001228	2.5
Extreme (10C)	2605	2.3	0.000898	2.5
Extreme (0C)	2605	-7.0	-0.002693	2.5
Extreme (-10C)	2605	-5.5	-0.002111	2.5
Extreme (-20C)	2605	-4.1	-0.001574	2.5
Extreme (-30C)	2605	-2.9	-0.001113	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
16QAM, (CH 40740 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	2605	3.5	0.001344	2.5
3.85	2605	-4.9	-0.001881	2.5
4.4	2605	4.2	0.001612	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
16QAM, (CH 40740 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2605	-5.8	-0.002226	2.5
Extreme (50C)	2605	-6.5	-0.002495	2.5
Extreme (40C)	2605	-4.0	-0.001536	2.5
Extreme (30C)	2605	-5.8	-0.002226	2.5
Extreme (10C)	2605	4.1	0.001574	2.5
Extreme (0C)	2605	5.3	0.002035	2.5
Extreme (-10C)	2605	5.8	0.002226	2.5
Extreme (-20C)	2605	3.0	0.001152	2.5
Extreme (-30C)	2605	-2.5	-0.000960	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.

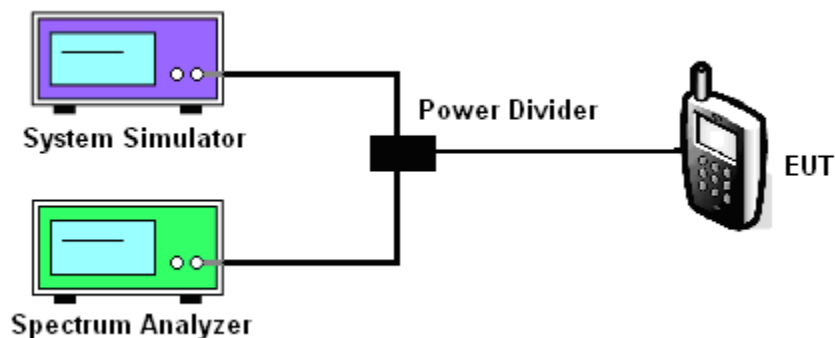
11.2 Measuring Instruments

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

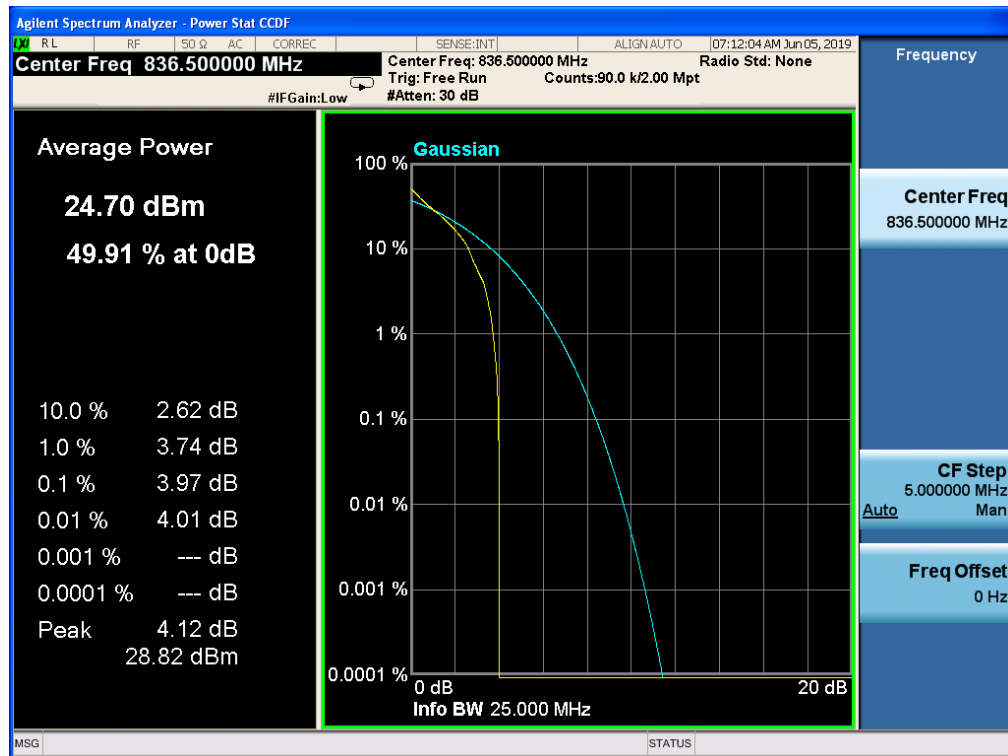
LTE Band 5

LTE Band 41

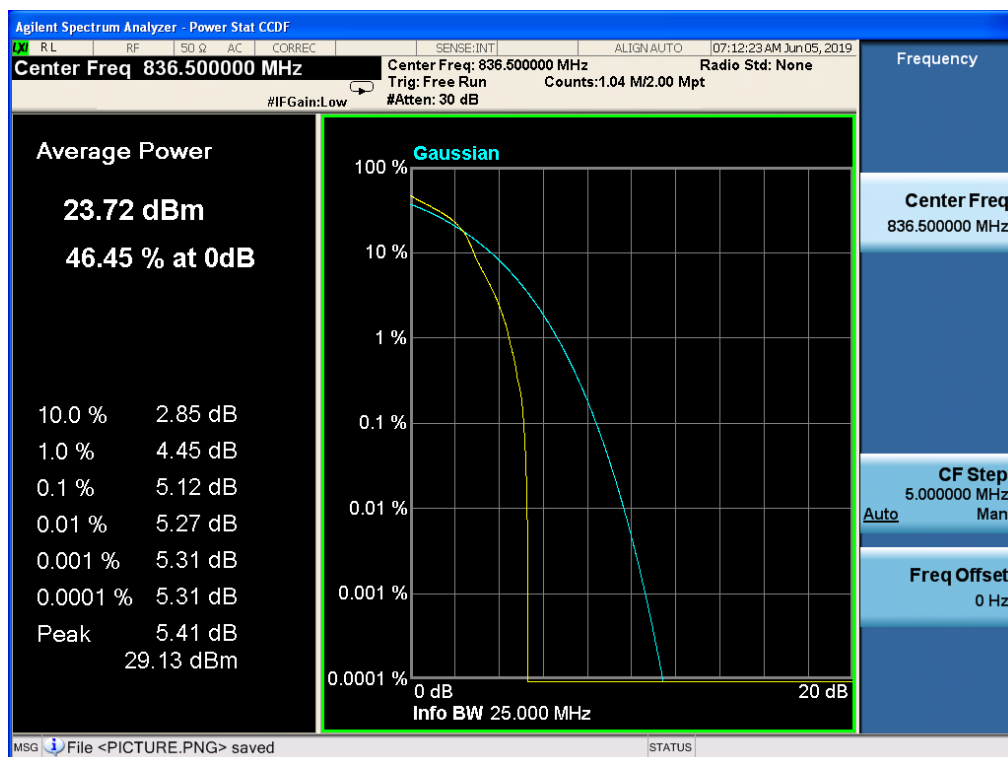
BAND	CHANNEL	Frequency [MHz]	BANDWIDTH	NO. RB	RB POS.	MODULATION	PAR [dB]
5	20525	836.5	1.4	1	Low	QPSK	3.97
5	20525	836.5	1.4	1	Low	16-QAM	5.12
5	20525	836.5	3.0	1	Low	QPSK	3.99
5	20525	836.5	3.0	1	Low	16-QAM	4.99
5	20525	836.5	5.0	1	Low	QPSK	4.22
5	20525	836.5	5.0	1	Low	16-QAM	4.95
5	20525	836.5	10.0	1	Low	QPSK	3.88
5	20525	836.5	10.0	1	Low	16-QAM	4.87
41	40740	2605.0	5.0	1	Low	QPSK	3.30
41	40740	2605.0	5.0	1	Low	16-QAM	3.51
41	40740	2605.0	10.0	1	Low	QPSK	3.06
41	40740	2605.0	10.0	1	Low	16-QAM	3.97
41	40740	2605.0	15.0	1	Low	QPSK	4.32
41	40740	2605.0	15.0	1	Low	16-QAM	3.66
41	40740	2605.0	20.0	1	Low	QPSK	4.20
41	40740	2605.0	20.0	1	Low	16-QAM	4.00

11.5 LTE BAND 5

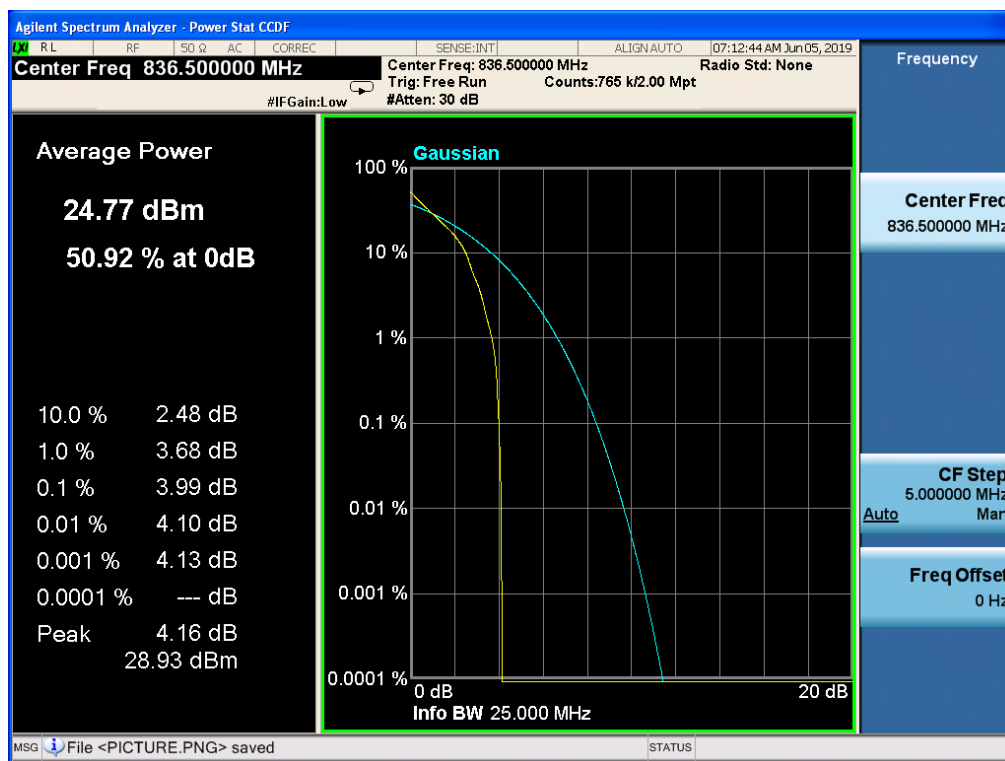
Band 5, UL Channel 20525, UL Frequency 836.5, BW 1.4, NO. RB 1, RB POS. Low, QPSK



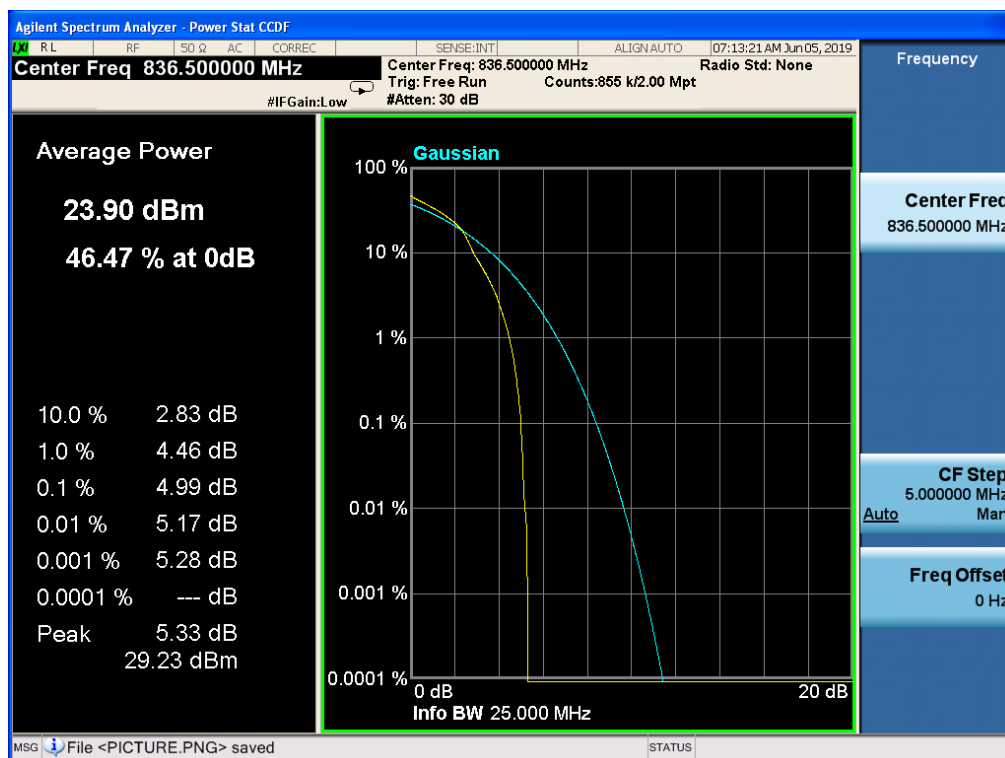
Band 5, UL Channel 20525, UL Frequency 836.5, BW 1.4, NO. RB 1, RB POS. Low, 16-QAM



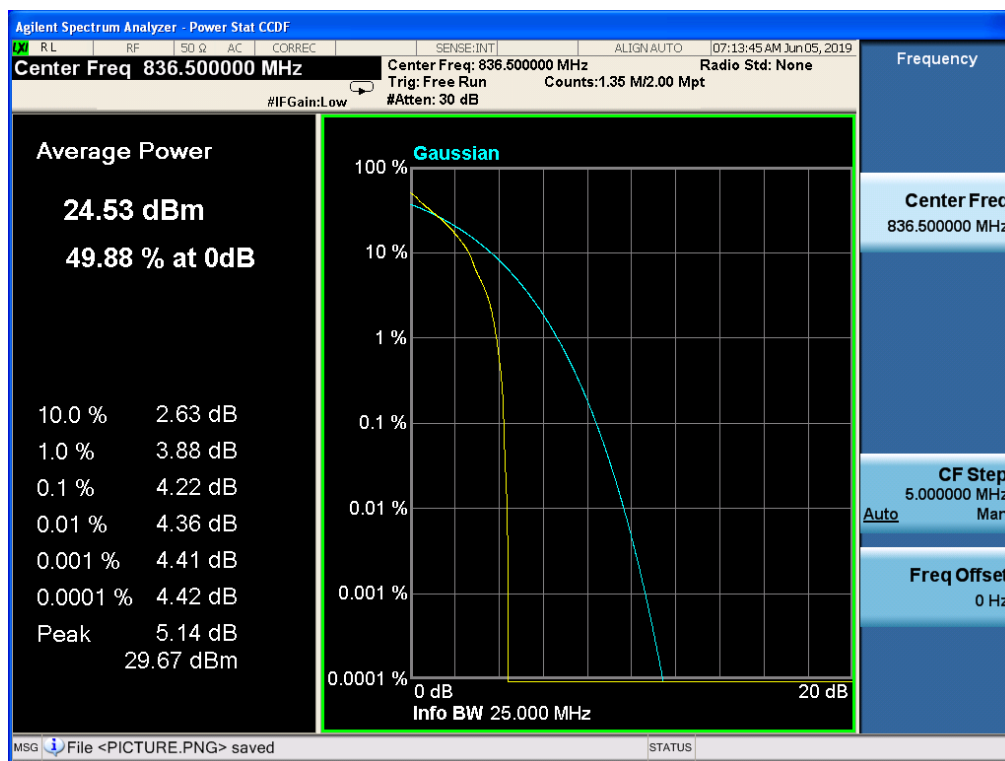
Band 5, UL Channel 20525, UL Frequency 836.5, BW 3.0, NO. RB 1, RB POS. Low, QPSK



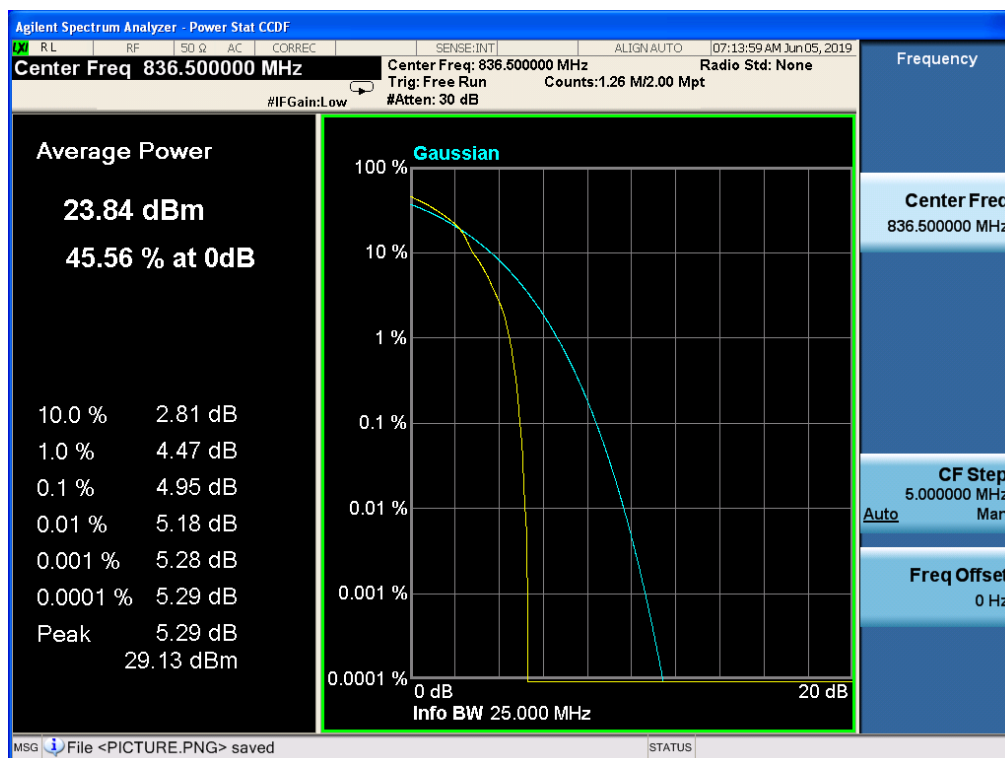
Band 5, UL Channel 20525, UL Frequency 836.5, BW 3.0, NO. RB 1, RB POS. Low, 16-QAM



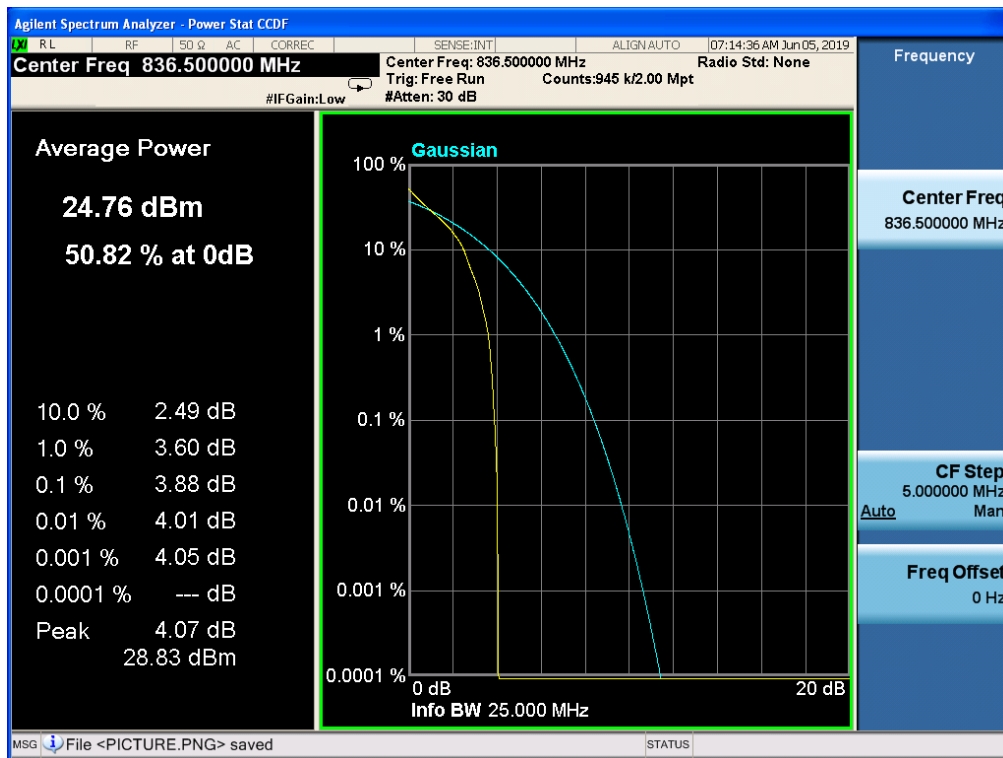
Band 5, UL Channel 20525, UL Frequency 836.5, BW 5.0, NO. RB 1, RB POS. Low, QPSK



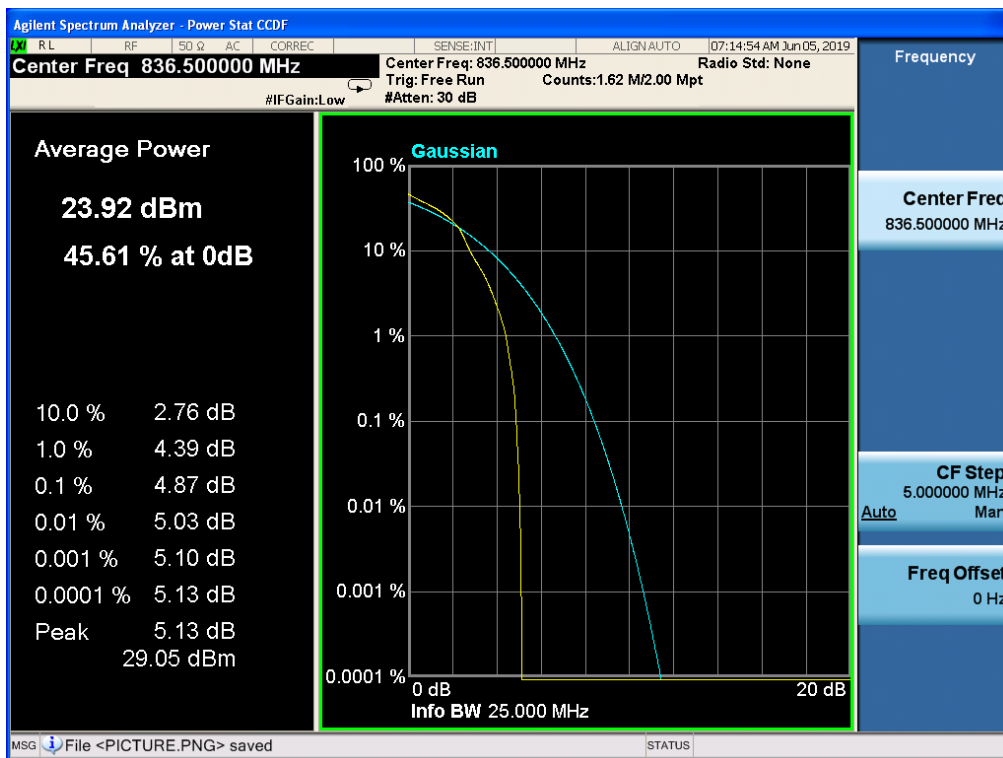
Band 5, UL Channel 20525, UL Frequency 836.5, BW 5.0, NO. RB 1, RB POS. Low, 16-QAM



Band 5, UL Channel 20525, UL Frequency 836.5, BW 10.0, NO. RB 1, RB POS. Low, QPSK

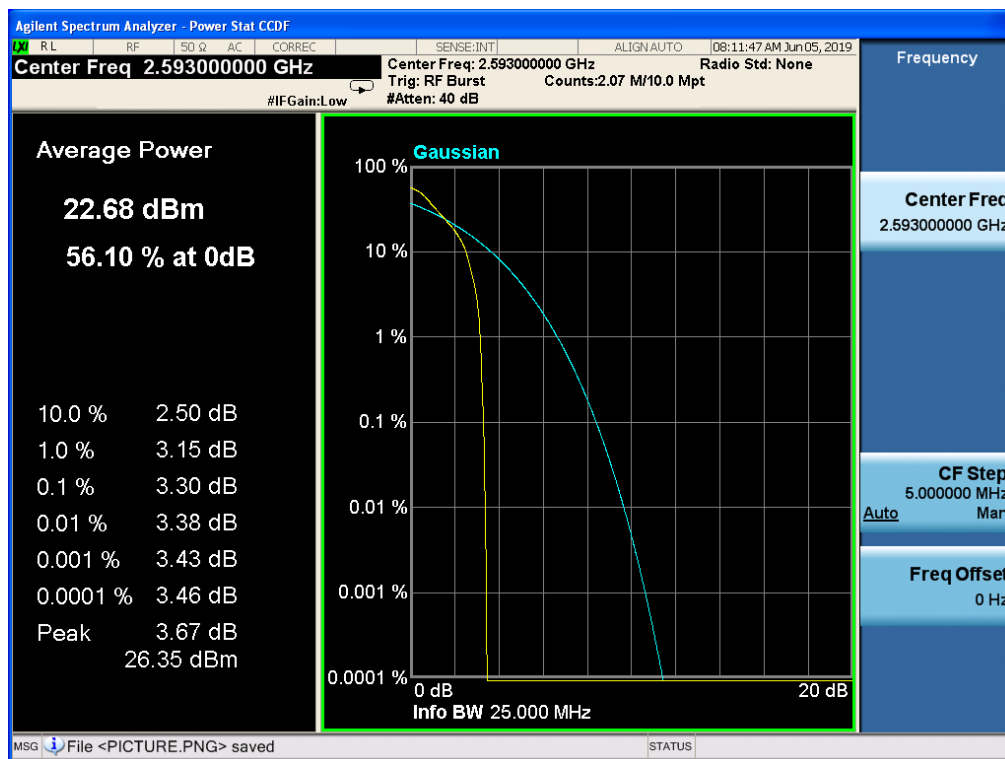


Band 5, UL Channel 20525, UL Frequency 836.5, BW 10.0, NO. RB 1, RB POS. Low, 16-QAM

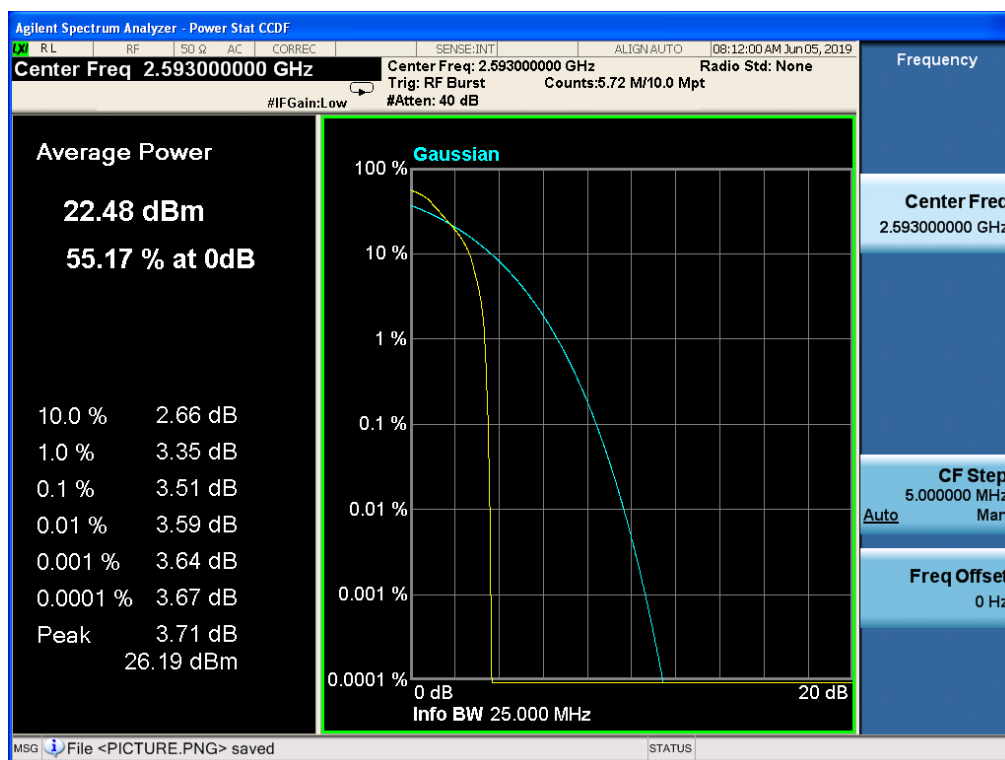


11.6 LTE BAND 41

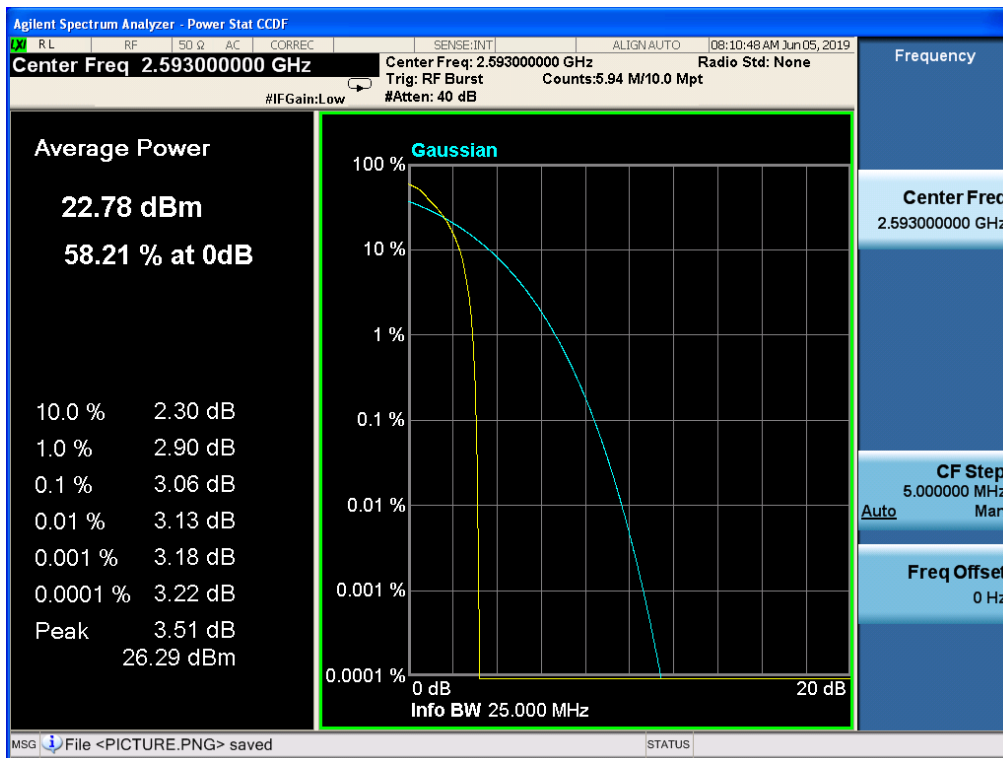
Band 41, UL Channel 40740, UL Frequency 2605.0, BW 5.0, NO. RB 1, RB POS. Low, QPSK



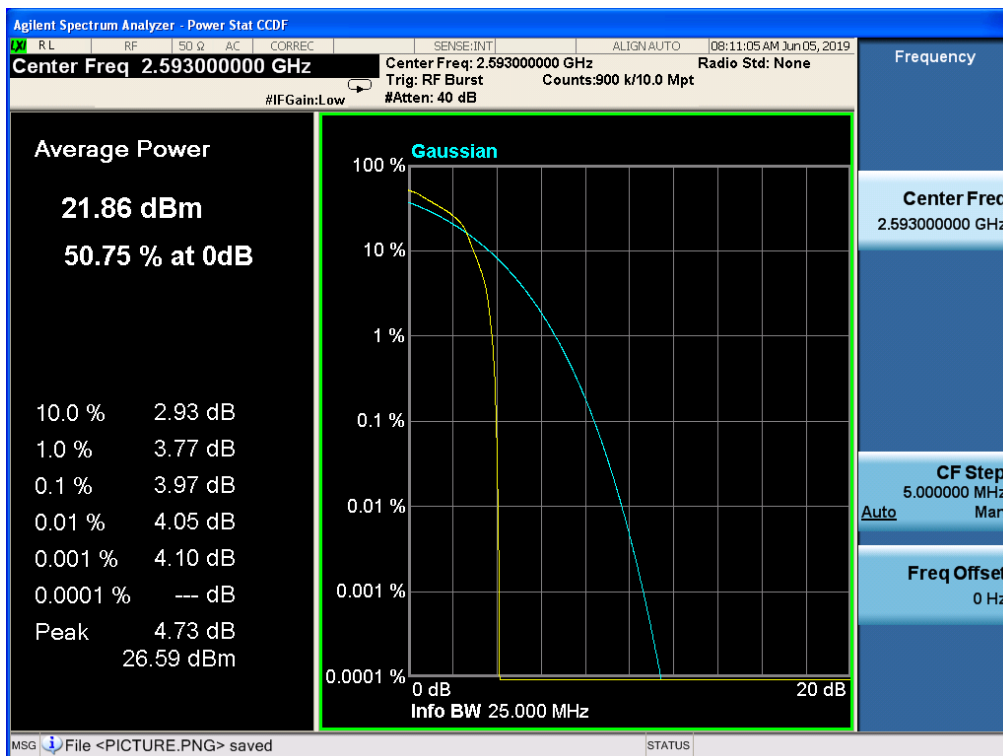
Band 41, UL Channel 40740, UL Frequency 2605.0, BW 5.0, NO. RB 1, RB POS. Low, 16-QAM



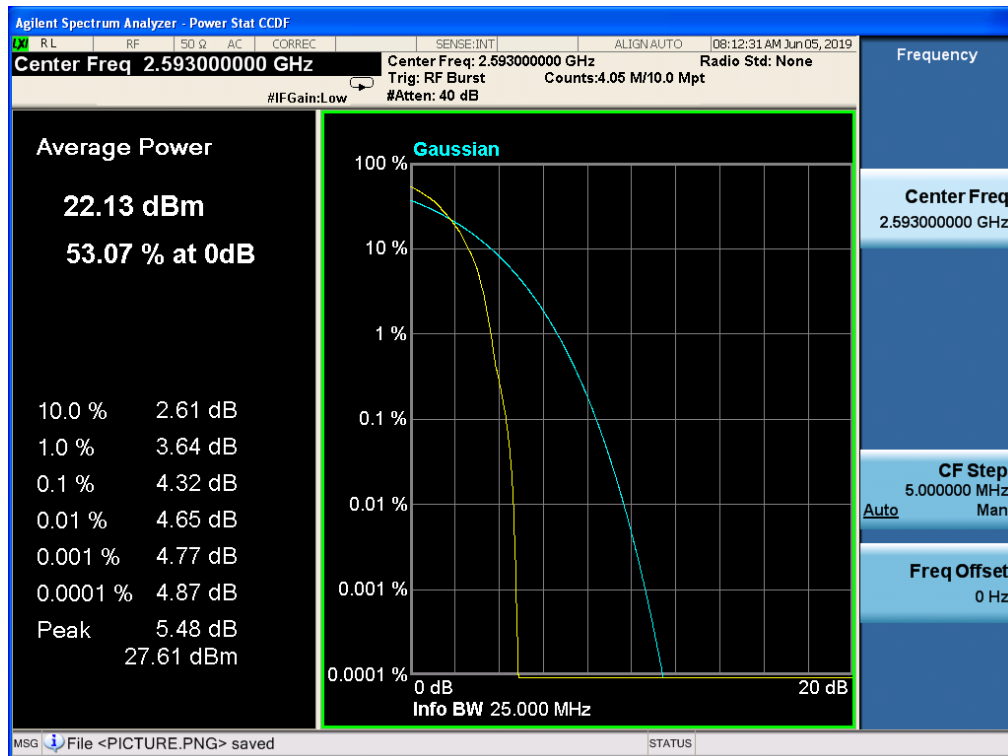
Band 41, UL Channel 40740, UL Frequency 2605.0, BW 10.0, NO. RB 1, RB POS. Low, QPSK



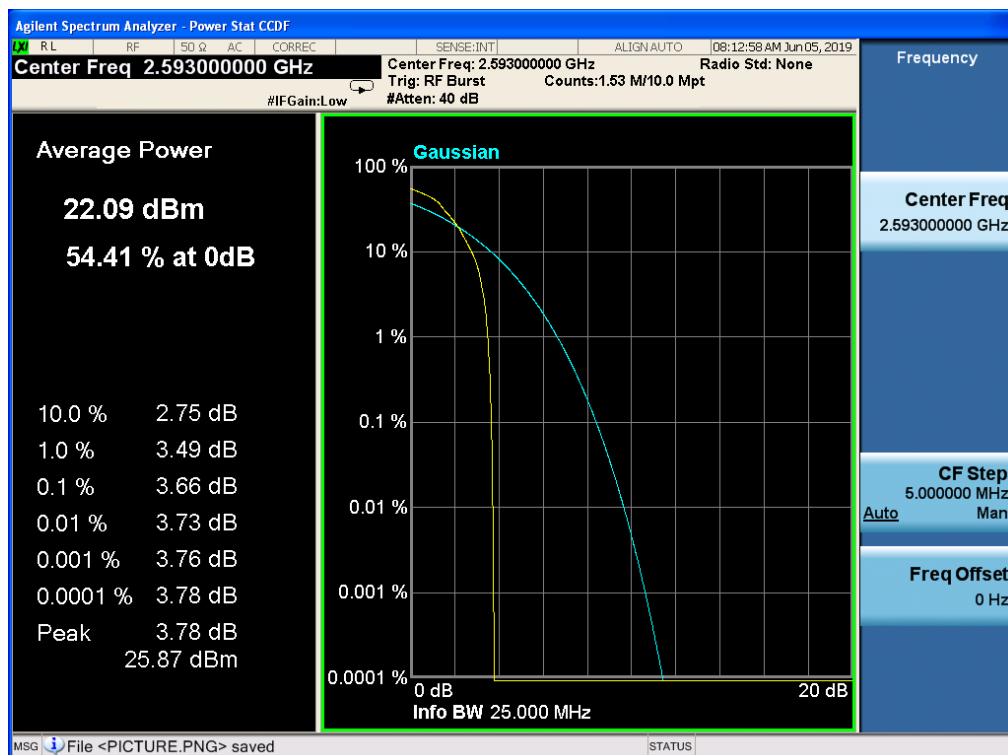
Band 41, UL Channel 40740, UL Frequency 2605.0, BW 10.0, NO. RB 1, RB POS. Low, 16-QAM



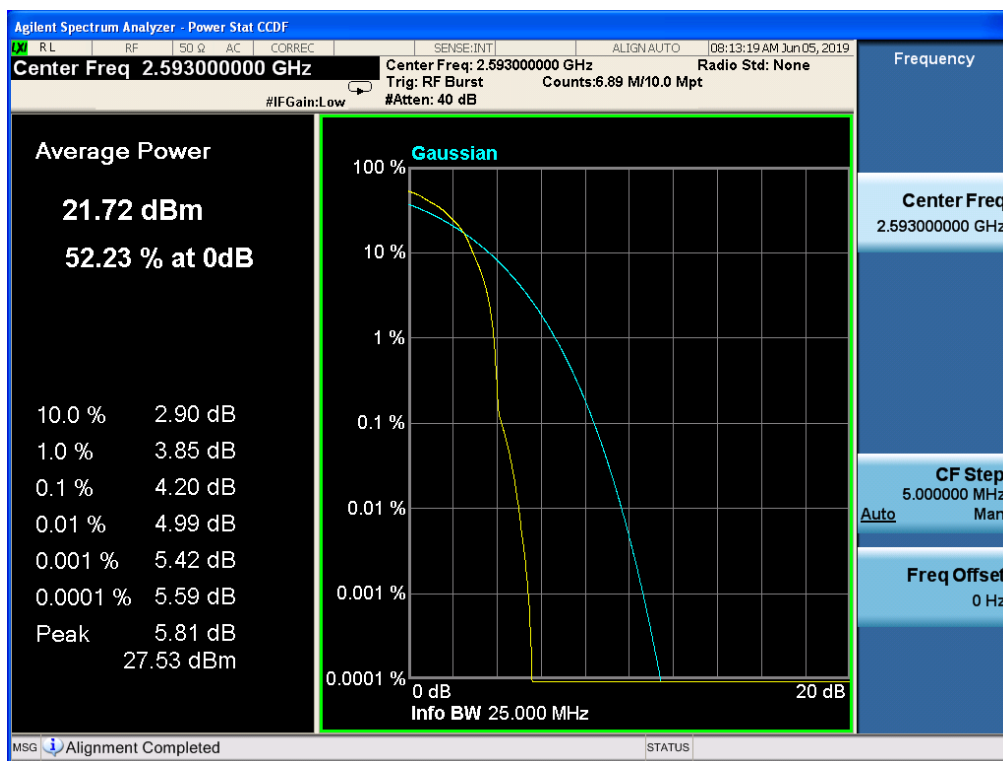
Band 41,UL Channel 40740,UL Frequency 2605.0,BW 15.0,NO. RB 1,RB POS. Low,QPSK



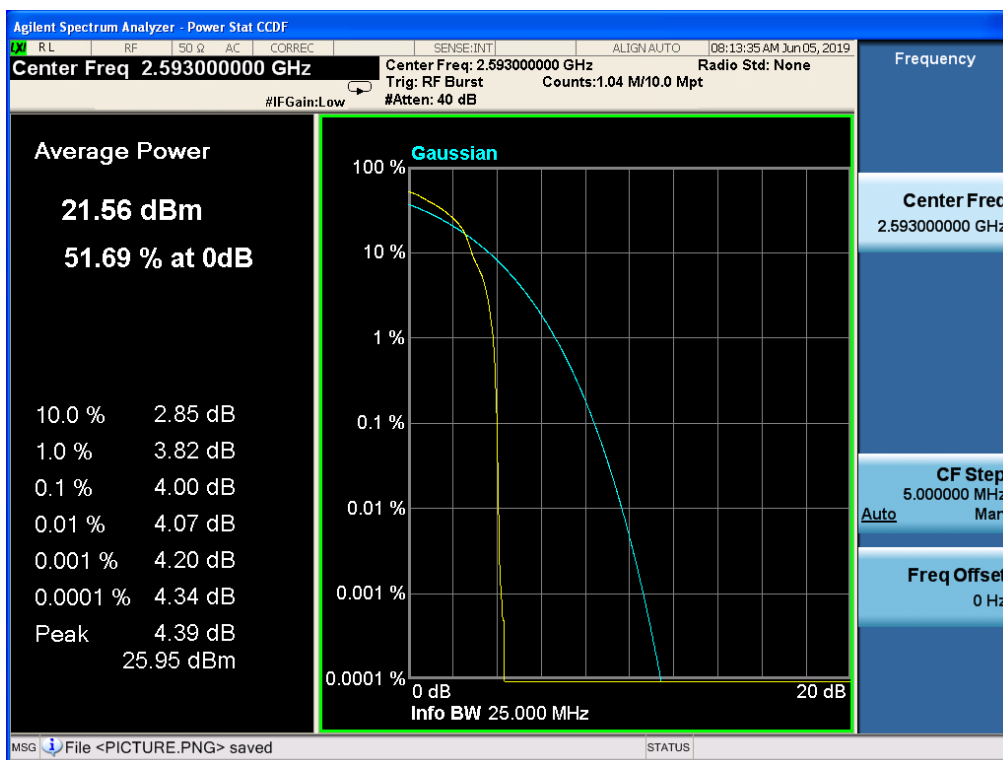
Band 41,UL Channel 40740,UL Frequency 2605.0,BW 15.0,NO. RB 1,RB POS. Low,16-QAM



Band 41, UL Channel 40740, UL Frequency 2605.0, BW 20.0, NO. RB 1, RB POS. Low, QPSK



Band 41, UL Channel 40740, UL Frequency 2605.0, BW 20.0, NO. RB 1, RB POS. Low, 16-QAM



----END OF REPORT----