

QPSK		1745	-0.65	3.36	27.56	23.55	226.464	Horizontal	Pass
20.0MH	100/0	1720	-2.10	3.17	27.66	22.39	173.380	Horizontal	Pass
z Band		1732.5	-2.05	3.32	27.61	22.24	167.494	Horizontal	Pass
16 QAM		1745	-1.89	3.36	27.56	22.31	170.216	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 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	7.66	2.01	19.68	2.15	23.18	207.970	Vertical	Pass
		836.5	7.80	2.01	19.77	2.15	23.41	219.280	Vertical	Pass
		848.3	7.72	2.02	19.82	2.15	23.37	217.270	Vertical	Pass
1.4MHz Band 16 QAM	6/0	824.7	6.71	2.01	19.68	2.15	22.23	167.109	Vertical	Pass
		836.5	6.73	2.01	19.77	2.15	22.34	171.396	Vertical	Pass
		848.3	6.64	2.02	19.82	2.15	22.29	169.434	Vertical	Pass
3.0MHz Band QPSK	15/0	825.5	7.53	2.01	19.70	2.15	23.07	202.768	Vertical	Pass
		836.5	7.50	2.01	19.77	2.15	23.11	204.644	Vertical	Pass
		847.5	7.63	2.02	19.81	2.15	23.27	212.324	Vertical	Pass
3.0MHz Band 16 QAM	15/0	825.5	6.80	2.01	19.70	2.15	22.34	171.396	Vertical	Pass
		836.5	6.67	2.01	19.77	2.15	22.28	169.044	Vertical	Pass
		847.5	6.55	2.02	19.81	2.15	22.19	165.577	Vertical	Pass
5.0MHz Band QPSK	25/0	826.5	7.52	2.01	19.71	2.15	23.07	202.768	Vertical	Pass
		836.5	7.50	2.01	19.77	2.15	23.11	204.644	Vertical	Pass
		846.5	7.44	2.02	19.79	2.15	23.06	202.302	Vertical	Pass
5.0MHz Band 16 QAM	25/0	826.5	6.60	2.01	19.71	2.15	22.15	164.059	Vertical	Pass
		836.5	6.57	2.01	19.77	2.15	22.18	165.196	Vertical	Pass
		846.5	6.59	2.02	19.79	2.15	22.21	166.341	Vertical	Pass
10.0MHz z Band QPSK	50/0	829	7.78	2.01	19.73	2.15	23.35	216.272	Vertical	Pass
		836.5	7.67	2.01	19.77	2.15	23.28	212.814	Vertical	Pass
		844	7.63	2.02	19.78	2.15	23.24	210.863	Vertical	Pass
10.0MHz z Band 16 QAM	50/0	829	6.85	2.01	19.73	2.15	22.42	174.582	Vertical	Pass
		836.5	6.55	2.01	19.77	2.15	22.16	164.437	Vertical	Pass
		844	6.66	2.02	19.78	2.15	22.27	168.655	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	7.46	2.01	19.68	2.15	22.98	198.609	Horizontal	Pass
		836.5	7.43	2.01	19.77	2.15	23.04	201.372	Horizontal	Pass
		848.3	7.36	2.02	19.82	2.15	23.01	199.986	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	824.7	6.45	2.01	19.68	2.15	21.97	157.398	Horizontal	Pass
		836.5	6.13	2.01	19.77	2.15	21.74	149.279	Horizontal	Pass
		848.3	6.24	2.02	19.82	2.15	21.89	154.525	Horizontal	Pass
3.0MHz Band QPSK	15/0	825.5	7.31	2.01	19.70	2.15	22.85	192.752	Horizontal	Pass
		836.5	7.38	2.01	19.77	2.15	22.99	199.067	Horizontal	Pass
		847.5	7.29	2.02	19.81	2.15	22.93	196.336	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	825.5	6.25	2.01	19.70	2.15	21.79	151.008	Horizontal	Pass
		836.5	6.23	2.01	19.77	2.15	21.84	152.757	Horizontal	Pass
		847.5	6.19	2.02	19.81	2.15	21.83	152.405	Horizontal	Pass
5.0MHz Band QPSK	25/0	826.5	7.13	2.01	19.71	2.15	22.68	185.353	Horizontal	Pass
		836.5	7.15	2.01	19.77	2.15	22.76	188.799	Horizontal	Pass
		846.5	7.19	2.02	19.79	2.15	22.81	190.985	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	826.5	6.29	2.01	19.71	2.15	21.84	152.757	Horizontal	Pass
		836.5	6.08	2.01	19.77	2.15	21.69	147.571	Horizontal	Pass
		846.5	6.15	2.02	19.79	2.15	21.77	150.314	Horizontal	Pass
10.0MH z Band QPSK	50/0	829	7.47	2.01	19.73	2.15	23.04	201.372	Horizontal	Pass
		836.5	7.30	2.01	19.77	2.15	22.91	195.434	Horizontal	Pass
		844	7.20	2.02	19.78	2.15	22.81	190.985	Horizontal	Pass
10.0MH z Band 16 QAM	50/0	829	6.09	2.01	19.73	2.15	21.66	146.555	Horizontal	Pass
		836.5	6.12	2.01	19.77	2.15	21.73	148.936	Horizontal	Pass
		844	6.04	2.02	19.78	2.15	21.65	146.218	Horizontal	Pass

Note:

SG Level= Signal generator output

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

8.4 LTE BAND 7

Radiated Power (EIRP) for Band 7									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cabl e Loss (dBm)	Antenn a Gain (dB)	Max. EIRP Averag e (dBm)	Max. EIRP Averag e (mW)	Polarizati on Of Max. ERP	
5.0MHz Band QPSK	25/0	2502.5	0.44	4.54	27.75	23.65	231.739	Vertical	Pass
		2535	0.68	4.69	27.72	23.71	234.963	Vertical	Pass
		2567.5	0.69	4.71	27.71	23.69	233.884	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2502.5	-0.70	4.54	27.75	22.51	178.238	Vertical	Pass
		2535	-0.40	4.69	27.72	22.63	183.231	Vertical	Pass
		2567.5	-0.32	4.71	27.71	22.68	185.353	Vertical	Pass
10.0MH z Band QPSK	50/0	2505	0.40	4.55	27.76	23.61	229.615	Vertical	Pass
		2535	0.55	4.69	27.72	23.58	228.034	Vertical	Pass
		2565	0.49	4.72	27.70	23.47	222.331	Vertical	Pass
10.0MH z Band 16 QAM	50/0	2505	-0.77	4.55	27.76	22.44	175.388	Vertical	Pass
		2535	-0.57	4.69	27.72	22.46	176.198	Vertical	Pass
		2565	-0.45	4.72	27.70	22.53	179.061	Vertical	Pass
15.0MH z Band QPSK	75/0	2507.5	0.39	4.55	27.77	23.61	229.615	Vertical	Pass
		2535	0.56	4.69	27.72	23.59	228.560	Vertical	Pass
		2562.5	0.74	4.72	27.69	23.71	234.963	Vertical	Pass
15.0MH z Band 16 QAM	75/0	2507.5	-0.65	4.55	27.77	22.57	180.717	Vertical	Pass
		2535	-0.65	4.69	27.72	22.38	172.982	Vertical	Pass
		2562.5	-0.58	4.72	27.69	22.39	173.380	Vertical	Pass
20.0MH z Band QPSK	100/0	2510	0.20	4.57	27.78	23.41	219.280	Vertical	Pass
		2535	0.47	4.73	27.72	23.46	221.820	Vertical	Pass
		2560	0.58	4.75	27.68	23.51	224.388	Vertical	Pass
20.0MH z Band 16 QAM	100/0	2510	-0.85	4.57	27.78	22.36	172.187	Vertical	Pass
		2535	-0.51	4.73	27.72	22.48	177.011	Vertical	Pass
		2560	-0.41	4.75	27.68	22.52	178.649	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)	Cabl e Loss (dBm)	Antenn a Gain (dB)	Max. EIRP Averag e (dBm)	Max. EIRP Averag e (mW)	Polarizati on Of Max. ERP	
5.0MHz Band QPSK	25/0	2502.5	0.06	4.54	27.75	23.27	212.324	Horizontal	Pass
		2535	0.32	4.69	27.72	23.35	216.272	Horizontal	Pass
		2567.5	0.37	4.71	27.71	23.37	217.270	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2502.5	-0.94	4.54	27.75	22.27	168.655	Horizontal	Pass
		2535	-0.87	4.69	27.72	22.16	164.437	Horizontal	Pass
		2567.5	-0.89	4.71	27.71	22.11	162.555	Horizontal	Pass
10.0MH z Band QPSK	50/0	2505	-0.03	4.55	27.76	23.18	207.970	Horizontal	Pass
		2535	0.08	4.69	27.72	23.11	204.644	Horizontal	Pass
		2565	0.11	4.72	27.70	23.09	203.704	Horizontal	Pass
10.0MH z Band 16 QAM	50/0	2505	-1.09	4.55	27.76	22.12	162.930	Horizontal	Pass
		2535	-1.08	4.69	27.72	21.95	156.675	Horizontal	Pass
		2565	-0.91	4.72	27.70	22.07	161.065	Horizontal	Pass
15.0MH z Band QPSK	75/0	2507.5	-0.09	4.55	27.77	23.13	205.589	Horizontal	Pass
		2535	0.23	4.69	27.72	23.26	211.836	Horizontal	Pass
		2562.5	0.27	4.72	27.69	23.24	210.863	Horizontal	Pass
15.0MH z Band 16 QAM	75/0	2507.5	-1.21	4.55	27.77	22.01	158.855	Horizontal	Pass
		2535	-1.06	4.69	27.72	21.97	157.398	Horizontal	Pass
		2562.5	-0.98	4.72	27.69	21.99	158.125	Horizontal	Pass
20.0MH z Band QPSK	100/ 0	2510	0.08	4.57	27.78	23.29	213.304	Horizontal	Pass
		2535	0.32	4.73	27.72	23.31	214.289	Horizontal	Pass
		2560	0.29	4.75	27.68	23.22	209.894	Horizontal	Pass
20.0MH z Band 16 QAM	100/ 0	2510	-1.05	4.57	27.78	22.16	164.437	Horizontal	Pass
		2535	-0.94	4.73	27.72	22.05	160.325	Horizontal	Pass
		2560	-0.76	4.75	27.68	22.17	164.816	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 38

Radiated Power (EIRP) for Band 38									
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 Band QPSK	25/0	2572.5	-2.12	4.95	27.79	20.67	116.683	Vertical	Pass
		2595	-2.64	4.88	27.71	20.55	113.611	Vertical	Pass
		2617.5	-2.58	4.93	27.95	21.23	132.768	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2572.5	-2.37	4.81	27.73	20.72	118.124	Vertical	Pass
		2595	-2.47	4.95	27.81	20.50	112.123	Vertical	Pass
		2617.5	-2.59	5.03	27.69	20.72	117.941	Vertical	Pass
10.0MHz Band QPSK	50/0	2575	-2.98	5.01	27.86	20.64	115.894	Vertical	Pass
		2595	-2.60	5.00	27.65	20.65	116.143	Vertical	Pass
		2615	-2.67	4.87	27.89	20.42	110.030	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2575	-2.71	4.77	27.78	20.97	125.043	Vertical	Pass
		2595	-2.38	4.87	27.87	20.30	107.201	Vertical	Pass
		2615	-2.56	4.94	27.77	20.32	107.695	Vertical	Pass
15.0MHz Band QPSK	75/0	2577.5	-2.90	4.89	27.88	20.44	110.584	Vertical	Pass
		2595	-2.32	4.87	27.84	20.54	113.252	Vertical	Pass
		2612.5	-2.52	4.92	27.93	20.23	105.404	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2577.5	-2.53	4.75	27.78	20.51	112.412	Vertical	Pass
		2595	-2.53	4.98	27.82	20.70	117.375	Vertical	Pass
		2612.5	-2.60	4.95	27.83	20.77	119.413	Vertical	Pass
20.0MHz Band QPSK	100/0	2580	-2.53	4.86	27.80	21.07	128.053	Vertical	Pass
		2595	-2.37	4.79	27.83	20.94	124.146	Vertical	Pass
		2610	-2.68	4.89	27.87	20.33	107.872	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2580	-2.87	4.95	27.73	20.08	101.842	Vertical	Pass
		2595	-2.88	4.91	27.71	20.66	116.406	Vertical	Pass
		2610	-2.81	4.96	27.92	20.60	114.787	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 38									
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 Band QPSK	25/0	2572.5	-2.12	4.95	27.79	20.23	105.365	Horizontal	Pass
		2595	-2.64	4.88	27.71	20.87	122.242	Horizontal	Pass
		2617.5	-2.58	4.93	27.95	20.22	105.153	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2572.5	-2.37	4.81	27.73	20.14	103.385	Horizontal	Pass
		2595	-2.47	4.95	27.81	20.00	100.039	Horizontal	Pass
		2617.5	-2.59	5.03	27.69	20.68	116.984	Horizontal	Pass
10.0MHz Band QPSK	50/0	2575	-2.98	5.01	27.86	20.61	115.103	Horizontal	Pass
		2595	-2.60	5.00	27.65	20.89	122.847	Horizontal	Pass
		2615	-2.67	4.87	27.89	20.09	102.072	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2575	-2.71	4.77	27.78	20.23	105.373	Horizontal	Pass
		2595	-2.38	4.87	27.87	20.06	101.352	Horizontal	Pass
		2615	-2.56	4.94	27.77	19.92	98.162	Horizontal	Pass
15.0MHz Band QPSK	75/0	2577.5	-2.90	4.89	27.88	20.49	112.073	Horizontal	Pass
		2595	-2.32	4.87	27.84	20.67	116.652	Horizontal	Pass
		2612.5	-2.52	4.92	27.93	20.41	109.807	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2577.5	-2.53	4.75	27.78	20.87	122.045	Horizontal	Pass
		2595	-2.53	4.98	27.82	20.93	123.759	Horizontal	Pass
		2612.5	-2.60	4.95	27.83	20.31	107.518	Horizontal	Pass
20.0MHz Band QPSK	100/0	2580	-2.53	4.86	27.80	20.85	121.488	Horizontal	Pass
		2595	-2.37	4.79	27.83	19.94	98.621	Horizontal	Pass
		2610	-2.68	4.89	27.87	20.73	118.269	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	2580	-2.87	4.95	27.73	20.56	113.637	Horizontal	Pass
		2595	-2.88	4.91	27.71	20.66	116.286	Horizontal	Pass
		2610	-2.81	4.96	27.92	20.44	110.733	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 40

Radiated Power (EIRP) for Band 40 (2305-2320MHz)									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cabl e Loss (dBm)	Antenn a Gain (dB)	Max. EIRP Averag e (dBm)	Max. EIRP Averag e (mW)	Polarizati on Of Max. ERP	
5.0MHz Band QPSK	25/0	2307.5	-2.02	4.95	27.87	19.95	98.969	Horizontal	Pass
		2312.5	-2.05	5.02	27.77	20.23	105.427	Horizontal	Pass
		2317.5	-2.08	4.97	27.90	20.61	115.196	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2307.5	-2.25	4.98	27.77	20.46	111.245	Horizontal	Pass
		2312.5	-2.27	4.97	27.83	20.38	109.093	Horizontal	Pass
		2317.5	-2.19	4.82	27.81	19.96	98.976	Horizontal	Pass
10.0MH z Band QPSK	50/0	2310	-2.45	4.89	27.61	20.36	108.632	Horizontal	Pass
		2312.5	-2.06	4.82	27.79	20.63	115.578	Horizontal	Pass
		2315	-2.30	4.94	27.80	20.20	104.717	Horizontal	Pass
10.0MH z Band 16 QAM	50/0	2310	-2.32	4.81	27.64	20.30	107.124	Horizontal	Pass
		2312.5	-2.32	4.98	27.63	19.92	98.172	Horizontal	Pass
		2315	-2.28	5.00	27.89	20.65	116.116	Horizontal	Pass
15.0MH z Band QPSK	75/0	2312.5	-2.27	5.00	27.88	20.71	117.761	Horizontal	Pass
15.0MH z Band 16 QAM	75/0	2312.5	-2.42	4.75	27.86	20.39	109.396	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 40 (2305-2320MHz)									
Mode	RB/ RB SIZE	Frequency	Result						Conclusion
			SG Level (dBm)	Cabl e Loss (dBm)	Antenn a Gain (dB)	Max. EIRP Averag e (dBm)	Max. EIRP Averag e (mW)	Polarizati on Of Max. ERP	
5.0MHz Band QPSK	25/0	2307.5	-2.02	4.95	27.87	20.87	122.240	Vertical	Pass
		2312.5	-2.05	5.02	27.77	20.73	118.421	Vertical	Pass
		2317.5	-2.08	4.97	27.90	21.19	131.539	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2307.5	-2.25	4.98	27.77	20.34	108.154	Vertical	Pass
		2312.5	-2.27	4.97	27.83	21.16	130.634	Vertical	Pass
		2317.5	-2.19	4.82	27.81	20.54	113.158	Vertical	Pass
10.0MH z Band QPSK	50/0	2310	-2.45	4.89	27.61	20.85	121.604	Vertical	Pass
		2312.5	-2.06	4.82	27.79	20.32	107.740	Vertical	Pass
		2315	-2.30	4.94	27.80	20.23	105.552	Vertical	Pass
10.0MH z Band 16 QAM	50/0	2310	-2.32	4.81	27.64	20.66	116.319	Vertical	Pass
		2312.5	-2.32	4.98	27.63	20.33	107.937	Vertical	Pass
		2315	-2.28	5.00	27.89	20.41	109.985	Vertical	Pass
15.0MH z Band QPSK	75/0	2312.5	-2.27	5.00	27.88	20.49	112.063	Vertical	Pass
15.0MH z Band 16 QAM	75/0	2312.5	-2.42	4.75	27.86	20.68	117.066	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 40 (2345-2360MHz)									
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 Band QPSK	25/0	2347.5	-2.02	4.92	27.59	20.33	107.777	Horizontal	Pass
		2352.5	-2.18	4.95	27.72	20.07	101.527	Horizontal	Pass
		2357.5	-2.05	4.81	27.78	20.90	123.096	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2347.5	-2.14	4.98	27.68	20.31	107.489	Horizontal	Pass
		2352.5	-2.31	4.77	27.72	20.76	119.128	Horizontal	Pass
		2357.5	-2.11	4.84	27.78	19.97	99.362	Horizontal	Pass
10.0MHz Band QPSK	50/0	2350	-2.26	4.83	27.68	20.41	109.986	Horizontal	Pass
		2352.5	-2.20	4.78	27.72	20.24	105.664	Horizontal	Pass
		2355	-2.49	5.03	27.78	20.33	107.912	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	2350	-2.22	4.92	27.68	20.72	118.130	Horizontal	Pass
		2352.5	-2.15	4.94	27.72	20.08	101.908	Horizontal	Pass
		2355	-2.34	4.93	27.78	20.11	102.550	Horizontal	Pass
15.0MHz Band QPSK	75/0	2352.5	-2.31	4.86	27.68	20.66	116.416	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	2352.5	-2.28	4.83	27.68	20.69	117.196	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 40(2345-2360MHz)									
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 Band QPSK	25/0	2347.5	-2.02	4.92	27.59	21.24	133.013	Vertical	Pass
		2352.5	-2.18	4.95	27.72	20.79	120.041	Vertical	Pass
		2357.5	-2.05	4.81	27.78	21.42	138.550	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2347.5	-2.14	4.98	27.68	20.17	104.098	Vertical	Pass
		2352.5	-2.31	4.77	27.72	20.86	121.854	Vertical	Pass
		2357.5	-2.11	4.84	27.78	20.39	109.295	Vertical	Pass
10.0MHz Band QPSK	50/0	2350	-2.26	4.83	27.68	20.05	101.108	Vertical	Pass
		2352.5	-2.20	4.78	27.72	21.02	126.423	Vertical	Pass
		2355	-2.49	5.03	27.78	20.35	108.481	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2350	-2.22	4.92	27.68	20.51	112.456	Vertical	Pass
		2352.5	-2.15	4.94	27.72	20.87	122.274	Vertical	Pass
		2355	-2.34	4.93	27.78	20.99	125.547	Vertical	Pass
15.0MHz Band QPSK	75/0	2352.5	-2.31	4.86	27.68	20.98	125.436	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2352.5	-2.28	4.83	27.68	20.69	117.190	Vertical	Pass

Note:

SG Level= Signal generator output

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

8.7 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	2498.5	-1.58	4.75	27.68	20.64	115.762	Horizontal	Pass
		2593	-2.34	4.75	27.72	20.07	101.628	Horizontal	Pass
		2687.5	-1.60	4.78	27.78	20.17	103.924	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	2498.5	-2.56	4.75	27.68	20.02	100.524	Horizontal	Pass
		2593	-2.56	4.75	27.72	20.75	118.731	Horizontal	Pass
		2687.5	-2.02	4.78	27.78	20.77	119.275	Horizontal	Pass
10.0MH z Band QPSK	50/0	2501	-2.57	4.75	27.68	20.15	103.609	Horizontal	Pass
		2593	-2.70	4.75	27.72	20.84	121.413	Horizontal	Pass
		2685	-2.13	4.78	27.78	20.05	101.092	Horizontal	Pass
10.0MH z Band 16 QAM	50/0	2501	-2.02	4.75	27.68	20.15	103.440	Horizontal	Pass
		2593	-2.68	4.75	27.72	20.28	106.774	Horizontal	Pass
		2685	-2.38	4.77	27.78	20.50	112.244	Horizontal	Pass
15.0MH z Band QPSK	75/0	2503.5	-2.48	4.75	27.68	19.89	97.393	Horizontal	Pass
		2593	-2.36	4.75	27.72	20.00	100.094	Horizontal	Pass
		2682.5	-2.55	4.78	27.78	20.53	113.048	Horizontal	Pass
15.0MH z Band 16 QAM	75/0	2503.5	-2.20	4.75	27.68	20.81	120.389	Horizontal	Pass
		2593	-1.96	4.75	27.72	21.01	126.119	Horizontal	Pass
		2682.5	-2.55	4.77	27.78	20.17	104.075	Horizontal	Pass
20.0MH z Band QPSK	100/ 0	2506	-2.60	4.75	27.68	19.93	98.461	Horizontal	Pass
		2593	-2.47	4.75	27.72	20.14	103.312	Horizontal	Pass
		2680	-2.81	4.78	27.78	20.54	113.292	Horizontal	Pass
20.0MH z Band 16 QAM	100/ 0	2506	-2.32	4.75	27.68	19.99	99.855	Horizontal	Pass
		2593	-2.66	4.75	27.72	20.96	124.828	Horizontal	Pass
		2680	-2.28	4.77	27.78	20.84	121.439	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	2572.5	-1.58	4.75	27.68	21.35	136.430	Vertical	Pass
		2595	-2.34	4.75	27.72	20.63	115.491	Vertical	Pass
		2617.5	-1.60	4.78	27.78	21.40	137.927	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2572.5	-2.56	4.75	27.68	20.37	108.973	Vertical	Pass
		2595	-2.56	4.75	27.72	20.41	109.844	Vertical	Pass
		2617.5	-2.02	4.78	27.78	20.98	125.359	Vertical	Pass
10.0MH z Band QPSK	50/0	2575	-2.57	4.75	27.68	20.36	108.669	Vertical	Pass
		2595	-2.70	4.75	27.72	20.27	106.441	Vertical	Pass
		2615	-2.13	4.78	27.78	20.87	122.072	Vertical	Pass
10.0MH z Band 16 QAM	50/0	2575	-2.02	4.75	27.68	20.91	123.430	Vertical	Pass
		2595	-2.68	4.75	27.72	20.29	107.018	Vertical	Pass
		2615	-2.38	4.77	27.78	20.63	115.627	Vertical	Pass
15.0MH z Band QPSK	75/0	2577.5	-2.48	4.75	27.68	20.45	110.999	Vertical	Pass
		2595	-2.36	4.75	27.72	20.61	115.070	Vertical	Pass
		2612.5	-2.55	4.78	27.78	20.45	110.891	Vertical	Pass
15.0MH z Band 16 QAM	75/0	2577.5	-2.20	4.75	27.68	20.73	118.255	Vertical	Pass
		2595	-1.96	4.75	27.72	21.01	126.197	Vertical	Pass
		2612.5	-2.55	4.77	27.78	20.46	111.047	Vertical	Pass
20.0MH z Band QPSK	100/0	2580	-2.60	4.75	27.68	20.33	107.939	Vertical	Pass
		2595	-2.47	4.75	27.72	20.50	112.095	Vertical	Pass
		2610	-2.81	4.78	27.78	20.19	104.532	Vertical	Pass
20.0MH z Band 16 QAM	100/0	2580	-2.32	4.75	27.68	20.61	115.042	Vertical	Pass
		2595	-2.66	4.75	27.72	20.31	107.379	Vertical	Pass
		2610	-2.28	4.77	27.78	20.73	118.225	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, §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 $43 + 10 \log_{10}(P)$ 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 4
LTE Band 5
LTE Band 7
LTE Band 38
LTE Band 40
LTE Band 41

RESULTS

PASS

9.1 LTE BAND 4

QPSK EIRP POWER FOR LTE BAND 4 (5.0MHZ BANDWIDTH)

Test Results for Low Channel 1712.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
3425	-53.41	4.02	29.80	-27.63	-13	-14.63	Horizontal
3425	-56.56	4.02	29.80	-30.78	-13	-17.78	Vertical
5137.5	-58.34	5.24	35.84	-27.74	-13	-14.74	Vertical
5137.5	-68.44	5.24	35.84	-37.84	-13	-24.84	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-55.75	4.03	30.00	-29.78	-13	-16.78	Horizontal
3465.0	-55.24	4.03	30.00	-29.27	-13	-16.27	Vertical
5197.5	-56.82	5.25	35.86	-26.21	-13	-13.21	Vertical
5197.5	-58.86	5.25	35.86	-28.25	-13	-15.25	Horizontal
Test Results for High Channel 1754.3MHz							
3505	-54.23	4.05	30.01	-28.27	-13	-15.27	Horizontal
3505	-57.73	4.05	30.01	-31.77	-13	-18.77	Vertical
5257.5	-58.66	5.26	35.86	-28.06	-13	-15.06	Vertical
5257.5	-57.95	5.26	35.86	-27.35	-13	-14.35	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
3440.0	-58.56	4.02	29.80	-32.78	-13	-19.78	Horizontal
3440.0	-53.41	4.02	29.80	-27.63	-13	-14.63	Vertical
5160.0	-59.68	5.24	35.84	-29.08	-13	-16.08	Vertical
5160.0	-62.62	5.24	35.84	-32.02	-13	-19.02	Horizontal
Test Results for Mid Channel 1732.5MHz							
3465.0	-58.78	4.03	30.00	-32.81	-13	-19.81	Horizontal
3465.0	-54.74	4.03	30.00	-28.77	-13	-15.77	Vertical
5197.5	-59.79	5.25	35.86	-29.18	-13	-16.18	Vertical
5197.5	-60.40	5.25	35.86	-29.79	-13	-16.79	Horizontal
Test Results for High Channel 1745MHz							
2490.0	-57.33	2.91	27.68	-32.56	-13	-19.56	Horizontal
3490.0	-58.63	2.91	27.68	-33.86	-13	-20.86	Vertical
5235.0	-59.49	5.26	35.86	-28.89	-13	-15.89	Vertical
5235.0	-57.18	5.26	35.86	-26.58	-13	-13.58	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 5

QPSK EIRP POWER FOR LTE BAND 5 (5.0MHZ BANDWIDTH)

Test Results for Low Channel 826.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
1653	-50.41	2.78	27.50	-25.69	-13	-12.69	Horizontal
1653	-50.68	2.78	27.50	-25.96	-13	-12.96	Vertical
2479.5	-52.29	2.90	27.80	-27.39	-13	-14.39	Vertical
2479.5	-50.13	2.90	27.80	-25.23	-13	-12.23	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-49.38	2.78	27.48	-24.68	-13	-11.68	Horizontal
1673.0	-48.88	2.78	27.48	-24.18	-13	-11.18	Vertical
2509.5	-47.61	2.91	27.70	-22.82	-13	-9.82	Vertical
2509.5	-47.96	2.91	27.70	-23.17	-13	-10.17	Horizontal
Test Results for High Channel 846.5MHz							
1693	-47.16	2.78	27.43	-22.51	-13	-9.51	Horizontal
1693	-48.85	2.78	27.43	-24.20	-13	-11.20	Vertical
2539.5	-49.11	2.92	27.74	-24.29	-13	-11.29	Vertical
2539.5	-49.98	2.92	27.74	-25.16	-13	-12.16	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
1658.0	-50.11	2.78	27.50	-25.39	-13	-12.39	Horizontal
1658.0	-49.36	2.78	27.50	-24.64	-13	-11.64	Vertical
2487.0	-48.87	2.90	27.80	-23.97	-13	-10.97	Vertical
2487.0	-48.12	2.90	27.80	-23.22	-13	-10.22	Horizontal
Test Results For Mid Channel 836.5MHz							
1673.0	-51.42	2.78	27.48	-26.72	-13	-13.72	Horizontal
1673.0	-48.67	2.78	27.48	-23.97	-13	-10.97	Vertical
2509.5	-53.62	2.91	27.70	-28.83	-13	-15.83	Vertical
2509.5	-51.12	2.91	27.70	-26.33	-13	-13.33	Horizontal
Test Results for High Channel 844MHz							
1688.0	-53.24	2.78	27.43	-28.59	-13	-15.59	Horizontal
1688.0	-50.58	2.78	27.43	-25.93	-13	-12.93	Vertical
2532.0	-48.63	2.92	27.74	-23.81	-13	-10.81	Vertical
2532.0	-47.67	2.92	27.74	-22.85	-13	-9.85	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.

9.3 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
5005.0	-55.64	5.23	35.81	-25.06	-13	-12.06	Horizontal
5005.0	-57.82	5.23	35.81	-27.24	-13	-14.24	Vertical
7507.5	-59.53	5.67	36.85	-28.35	-13	-15.35	Vertical
7507.5	-70.69	5.67	36.85	-39.51	-13	-26.51	Horizontal
Test Results for Mid Channel 2535MHz							
5070.0	-57.50	5.23	35.82	-26.91	-13	-13.91	Horizontal
5070.0	-56.76	5.23	35.82	-26.17	-13	-13.17	Vertical
7605.0	-58.74	5.67	36.85	-27.56	-13	-14.56	Vertical
7605.0	-59.90	5.67	36.85	-28.72	-13	-15.72	Horizontal
Test Results for High Channel 2567.5MHz							
5135.0	-57.14	5.24	35.83	-26.55	-13	-13.55	Horizontal
5135.0	-57.71	5.24	35.83	-27.12	-13	-14.12	Vertical
7702.5	-59.92	5.68	36.87	-28.73	-13	-15.73	Vertical
7702.5	-59.81	5.68	36.87	-28.62	-13	-15.62	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	-61.38	5.23	35.82	-30.79	-13	-17.79	Horizontal
5020	-54.97	5.23	35.82	-24.38	-13	-11.38	Vertical
7530	-61.84	5.67	36.86	-30.65	-13	-17.65	Vertical
7530	-63.60	5.67	36.86	-32.41	-13	-19.41	Horizontal
Test Results for Mid Channel 2535MHz							
5070	-59.25	5.23	35.82	-28.66	-13	-15.66	Horizontal
5070	-56.43	5.23	35.82	-25.84	-13	-12.84	Vertical
7605	-61.31	5.67	36.85	-30.13	-13	-17.13	Vertical
7605	-61.42	5.67	36.85	-30.24	-13	-17.24	Horizontal
Test Results for High Channel 2560MHz							
5120	-58.38	5.24	35.83	-27.79	-13	-14.79	Horizontal
5120	-59.80	5.24	35.83	-29.21	-13	-16.21	Vertical
7680	-61.88	5.70	36.88	-30.70	-13	-17.70	Vertical
7680	-59.74	5.70	36.88	-28.56	-13	-15.56	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.

9.4 LTE BAND 38

QPSK EIRP POWER FOR LTE BAND 38 (5MHZ BANDWIDTH)

Test Results for Low Channel 2572.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5145	-52.86	4.01	27.50	-29.37	-13	-16.37	Horizontal
5145	-57.81	4.01	27.50	-34.32	-13	-21.32	Vertical
7717.5	-57.21	5.09	27.80	-34.50	-13	-21.50	Vertical
7717.5	-55.26	5.09	27.80	-32.56	-13	-19.56	Horizontal
Test Results For Mid Channel 2595MHz							
5190	-53.02	4.10	27.48	-29.64	-13	-16.64	Horizontal
5190	-51.98	4.10	27.48	-28.60	-13	-15.60	Vertical
7785	-54.79	5.42	27.70	-32.51	-13	-19.51	Vertical
7785	-53.30	5.42	27.70	-31.01	-13	-18.01	Horizontal
Test Results for High Channel 2617.5MHz							
5234	-53.68	4.11	27.43	-30.36	-13	-17.36	Horizontal
5234	-55.19	4.11	27.43	-31.87	-13	-18.87	Vertical
7851	-52.13	5.31	27.74	-29.70	-13	-16.70	Vertical
7851	-52.86	5.31	27.74	-30.43	-13	-17.43	Horizontal

QPSK EIRP POWER FOR LTE BAND 38 (20MHZ BANDWIDTH)

Test Results for Low Channel 2580MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5160	-54.53	3.89	27.50	-30.92	-13	-17.92	Horizontal
5160	-52.76	3.89	27.50	-29.16	-13	-16.16	Vertical
7740	-57.43	5.33	27.80	-34.96	-13	-21.96	Vertical
7740	-55.18	5.33	27.80	-32.70	-13	-19.70	Horizontal
Test Results for Mid Channel 2595MHz							
5190	-53.95	4.10	27.48	-30.57	-13	-17.57	Horizontal
5190	-53.59	4.10	27.48	-30.21	-13	-17.21	Vertical
7785	-56.83	5.42	27.70	-34.55	-13	-21.55	Vertical
7785	-55.15	5.42	27.70	-32.87	-13	-19.87	Horizontal
Test Results for High Channel 2610MHz							
5220	-56.31	4.01	27.43	-32.89	-13	-19.89	Horizontal
5220	-51.92	4.01	27.43	-28.50	-13	-15.50	Vertical
7830	-53.13	5.34	27.74	-30.73	-13	-17.73	Vertical
7830	-54.41	5.34	27.74	-32.00	-13	-19.00	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.

9.5 LTE BAND 40

QPSK EIRP POWER FOR LTE BAND 40 (2305-2320MHz) (5.0MHZ BANDWIDTH)

Test Results for Low Channel 2307.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4615	-53.48	4.04	33.51	-24.01	-13	-11.01	Horizontal
4615	-55.24	4.04	33.51	-25.77	-13	-12.77	Vertical
6922.5	-58.01	5.24	35.84	-27.41	-13	-14.41	Vertical
6922.5	-68.34	5.24	35.84	-37.74	-13	-24.74	Horizontal
Test Results for Mid Channel 2312.5MHz							
4625	-54.17	4.04	33.56	-24.65	-13	-11.65	Horizontal
4625	-54.63	4.04	33.56	-25.11	-13	-12.11	Vertical
6937.5	-57.00	5.24	35.91	-26.33	-13	-13.33	Vertical
6937.5	-57.74	5.24	35.91	-27.07	-13	-14.07	Horizontal
Test Results for High Channel 2317.5MHz							
4635	-55.25	4.04	34.00	-25.29	-13	-12.29	Horizontal
4635	-56.78	4.04	34.00	-26.82	-13	-13.82	Vertical
6952.5	-59.94	5.24	36.04	-29.14	-13	-16.14	Vertical
6952.5	-58.01	5.24	36.04	-27.21	-13	-14.21	Horizontal

QPSK EIRP POWER FOR LTE BAND 40 (10.0MHZ BANDWIDTH)

Test Results for Low Channel 2310MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4620	-57.93	4.07	33.54	-28.46	-13	-15.46	Horizontal
4620	-53.38	4.07	33.54	-23.91	-13	-10.91	Vertical
6930	-60.33	5.28	35.86	-29.75	-13	-16.75	Vertical
6930	-62.32	5.28	35.86	-31.74	-13	-18.74	Horizontal
Test Results for Mid Channel 2312.5MHz							
4625	-57.79	4.04	33.56	-28.27	-13	-15.27	Horizontal
4625	-55.24	4.04	33.56	-25.72	-13	-12.72	Vertical
6937.5	-60.00	5.24	35.91	-29.33	-13	-16.33	Vertical
6937.5	-59.82	5.24	35.91	-29.15	-13	-16.15	Horizontal
Test Results for High Channel 2315MHz							
4630	-57.28	4.04	34.00	-27.32	-13	-14.32	Horizontal
4630	-59.31	4.04	34.00	-29.35	-13	-16.35	Vertical
6945	-59.59	5.24	36.04	-28.79	-13	-15.79	Vertical
6945	-57.36	5.24	36.04	-26.56	-13	-13.56	Horizontal

QPSK EIRP POWER FOR LTE BAND 40 (2345-2360MHz) (5.0MHZ BANDWIDTH)

Test Results for Low Channel 2347.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4695	-55.20	4.04	33.51	-25.73	-13	-12.73	Horizontal
4695	-58.15	4.04	33.51	-28.68	-13	-15.68	Vertical
7042.5	-60.76	5.24	35.84	-30.16	-13	-17.16	Vertical
7042.5	-69.95	5.24	35.84	-39.35	-13	-26.35	Horizontal
Test Results for Mid Channel 2352.5MHz							
4705	-56.38	4.04	33.56	-26.86	-13	-13.86	Horizontal
4705	-57.84	4.04	33.56	-28.32	-13	-15.32	Vertical
7057.5	-57.05	5.24	35.91	-26.38	-13	-13.38	Vertical
7057.5	-60.25	5.24	35.91	-29.58	-13	-16.58	Horizontal
Test Results for High Channel 2357.5MHz							
4715	-55.55	4.04	34.00	-25.59	-13	-12.59	Horizontal
4715	-59.02	4.04	34.00	-29.06	-13	-16.06	Vertical
7072.5	-60.21	5.24	36.04	-29.41	-13	-16.41	Vertical
7072.5	-60.29	5.24	36.04	-29.49	-13	-16.49	Horizontal

QPSK EIRP POWER FOR LTE BAND 40 (10.0MHZ BANDWIDTH)

Test Results for Low Channel 2350MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4700	-61.32	4.07	33.54	-31.85	-13	-18.85	Horizontal
4700	-54.35	4.07	33.54	-24.88	-13	-11.88	Vertical
7050	-62.59	5.28	35.86	-32.01	-13	-19.01	Vertical
7050	-63.28	5.28	35.86	-32.70	-13	-19.70	Horizontal
Test Results for Mid Channel 2352.5MHz							
4705	-60.05	4.04	33.56	-30.53	-13	-17.53	Horizontal
4705	-57.13	4.04	33.56	-27.61	-13	-14.61	Vertical
7057.5	-61.44	5.24	35.91	-30.77	-13	-17.77	Vertical
7057.5	-62.70	5.24	35.91	-32.03	-13	-19.03	Horizontal
Test Results for High Channel 2355MHz							
4710	-57.86	4.04	34	-27.90	-13	-14.90	Horizontal
4710	-60.95	4.04	34	-30.99	-13	-17.99	Vertical
7065	-62.09	5.24	36.04	-31.29	-13	-18.29	Vertical
7065	-60.41	5.24	36.04	-29.61	-13	-16.61	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.

9.6 LTE BAND 41

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

Test Results for Low Channel 2498.5MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
4997	-52.86	3.92	27.50	-29.28	-13	-16.28	Horizontal
4997	-57.81	3.92	27.50	-34.23	-13	-21.23	Vertical
7495.5	-57.21	5.35	27.80	-34.76	-13	-21.76	Vertical
7495.5	-55.26	5.35	27.80	-32.81	-13	-19.81	Horizontal
Test Results for Mid Channel 2593MHz							
5186	-53.02	4.21	27.48	-29.75	-13	-16.75	Horizontal
5186	-51.98	4.21	27.48	-28.72	-13	-15.72	Vertical
7779	-54.79	5.27	27.70	-32.35	-13	-19.35	Vertical
7779	-53.30	5.27	27.70	-30.86	-13	-17.86	Horizontal
Test Results for High Channel 2687.5MHz							
5375	-53.68	4.11	27.43	-30.37	-13	-17.37	Horizontal
5375	-55.19	4.11	27.43	-31.87	-13	-18.87	Vertical
8062.5	-52.13	5.44	27.74	-29.83	-13	-16.83	Vertical
8062.5	-52.86	5.44	27.74	-30.56	-13	-17.56	Horizontal

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

Test Results for Low Channel 2506MHz							
Frequency(MHz)	SG Level(dBm)	Cable Loss(dB)	Antenna Gain(dB)	Absolute Level(dBm)	Limit (dBm)	Margin(dBm)	Polarity
5012	-54.53	4.12	27.50	-31.15	-13	-18.15	Horizontal
5012	-52.76	4.12	27.50	-29.38	-13	-16.38	Vertical
7518	-57.43	5.41	27.80	-35.05	-13	-22.05	Vertical
7518	-55.18	5.41	27.80	-32.79	-13	-19.79	Horizontal
Test Results for Mid Channel 2593MHz							
5186	-53.95	4.21	27.48	-30.68	-13	-17.68	Horizontal
5186	-53.59	4.21	27.48	-30.32	-13	-17.32	Vertical
7779	-56.83	5.27	27.70	-34.40	-13	-21.40	Vertical
7779	-55.15	5.27	27.70	-32.72	-13	-19.72	Horizontal
Test Results for High Channel 2680MHz							
5360	-56.31	3.95	27.43	-32.84	-13	-19.84	Horizontal
5360	-51.92	3.95	27.43	-28.44	-13	-15.44	Vertical
8040	-53.13	5.22	27.74	-30.61	-13	-17.61	Vertical
8040	-54.41	5.22	27.74	-31.88	-13	-18.88	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, §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 $+50^{\circ}\text{C}$

Voltage = low voltage, DC 3.2V, Normal, DC 3.8V and High voltage, DC DC 4.2V.

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 $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 4
LTE Band 5
LTE Band 7
LTE Band 38
LTE Band 40
LTE Band 41

RESULTS

See the following pages.

10.1 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	10.2	0.005887	2.5
3.8	1732.5	6	0.003463	2.5
4.2	1732.5	5.3	0.003059	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	-10.3	-0.005945	2.5
Extreme (50C)	1732.5	3.6	0.002078	2.5
Extreme (40C)	1732.5	5.9	0.003405	2.5
Extreme (30C)	1732.5	-7.5	-0.004329	2.5
Extreme (10C)	1732.5	-11	-0.006349	2.5
Extreme (0C)	1732.5	-12.3	-0.007100	2.5
Extreme (-10C)	1732.5	-9.6	-0.005541	2.5
Extreme (-20C)	1732.5	-7.5	-0.004329	2.5
Extreme (-30C)	1732.5	-5.5	-0.003175	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	5.2	0.003001	2.5
3.8	1732.5	-5.6	-0.003232	2.5
4.2	1732.5	3	0.001732	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	10	0.005772	2.5
Extreme (50C)	1732.5	12.1	0.006984	2.5
Extreme (40C)	1732.5	10	0.005772	2.5
Extreme (30C)	1732.5	11.1	0.006407	2.5
Extreme (10C)	1732.5	-6.9	-0.003983	2.5
Extreme (0C)	1732.5	-11.4	-0.006580	2.5
Extreme (-10C)	1732.5	8.5	0.004906	2.5
Extreme (-20C)	1732.5	7.9	0.004560	2.5
Extreme (-30C)	1732.5	8	0.004618	2.5

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

10.2 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	9	0.010759	2.5
3.8	836.5	8.5	0.010161	2.5
4.2	836.5	7.7	0.009205	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	-6.9	-0.008249	2.5
Extreme (50C)	836.5	-10.1	-0.012074	2.5
Extreme (40C)	836.5	-11.4	-0.013628	2.5
Extreme (30C)	836.5	5.2	0.006216	2.5
Extreme (10C)	836.5	5.9	0.007053	2.5
Extreme (0C)	836.5	3.7	0.004423	2.5
Extreme (-10C)	836.5	-4.5	-0.005380	2.5
Extreme (-20C)	836.5	6.7	0.008010	2.5
Extreme (-30C)	836.5	3.3	0.003945	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	6.6	0.007890	2.5
3.8	836.5	7.4	0.008846	2.5
4.2	836.5	-11.3	-0.013509	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	12.4	0.014824	2.5
Extreme (50C)	836.5	6.7	0.008010	2.5
Extreme (40C)	836.5	9.5	0.011357	2.5
Extreme (30C)	836.5	-8.5	-0.010161	2.5
Extreme (10C)	836.5	-6.4	-0.007651	2.5
Extreme (0C)	836.5	10.2	0.012194	2.5
Extreme (-10C)	836.5	5.6	0.006695	2.5
Extreme (-20C)	836.5	8.3	0.009922	2.5
Extreme (-30C)	836.5	10.4	0.012433	2.5

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

10.3 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	-8.2	-0.003235	2.5
3.8	2535	6.7	0.002643	2.5
4.2	2535	9.3	0.003669	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	6.5	0.002564	2.5
Extreme (50C)	2535	8.1	0.003195	2.5
Extreme (40C)	2535	-10	-0.003945	2.5
Extreme (30C)	2535	-11.2	-0.004418	2.5
Extreme (10C)	2535	-8.9	-0.003511	2.5
Extreme (0C)	2535	-5.6	-0.002209	2.5
Extreme (-10C)	2535	10.5	0.004142	2.5
Extreme (-20C)	2535	12.4	0.004892	2.5
Extreme (-30C)	2535	8.7	0.003432	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	-11.4	-0.004497	2.5
3.8	2535	-8.5	-0.003353	2.5
4.2	2535	6.9	0.002722	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	6.4	0.002525	2.5
Extreme (50C)	2535	7	0.002761	2.5
Extreme (40C)	2535	7.8	0.003077	2.5
Extreme (30C)	2535	8.1	0.003195	2.5
Extreme (10C)	2535	-11.2	-0.004418	2.5
Extreme (0C)	2535	-8.9	-0.003511	2.5
Extreme (-10C)	2535	-9.3	-0.003669	2.5
Extreme (-20C)	2535	4.1	0.001617	2.5
Extreme (-30C)	2535	6.5	0.002564	2.5

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

10.4 LTE BAND 38

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 38 QPSK, (CH 38000 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	2595	10	0.003854	2.5
3.8	2595	9	0.003468	2.5
4.2	2595	6.3	0.002428	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 38 QPSK, (CH 38000 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2595	-5.6	-0.002158	2.5
Extreme (50C)	2595	-9	-0.003468	2.5
Extreme (40C)	2595	-10.2	-0.003931	2.5
Extreme (30C)	2595	-4.6	-0.001773	2.5
Extreme (10C)	2595	-5.3	-0.002042	2.5
Extreme (0C)	2595	5.7	0.002197	2.5
Extreme (-10C)	2595	-4.2	-0.001618	2.5
Extreme (-20C)	2595	7.4	0.002852	2.5
Extreme (-30C)	2595	-5.3	-0.002042	2.5

16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 38 16QAM, (CH 38000 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.2	2595	6.3	0.002428	2.5
3.8	2595	-8.1	-0.003121	2.5
4.2	2595	4.7	0.001811	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 38 QPSK, (CH 38000 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2595	10.9	0.004200	2.5
Extreme (50C)	2595	6.4	0.002466	2.5
Extreme (40C)	2595	8.7	0.003353	2.5
Extreme (30C)	2595	-6.2	-0.002389	2.5
Extreme (10C)	2595	-6.8	-0.002620	2.5
Extreme (0C)	2595	9.7	0.003738	2.5
Extreme (-10C)	2595	-5.7	-0.002197	2.5
Extreme (-20C)	2595	4.8	0.001850	2.5
Extreme (-30C)	2595	11.6	0.004470	2.5

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

10.5 LTE BAND 40

(2305-2320MHz)QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 QPSK, (CH 38775 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.6	2312.5	8.6	0.003719	2.5
3.8	2312.5	7.4	0.003200	2.5
4.4	2312.5	5.9	0.002551	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 QPSK, (CH 38775 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2312.5	-5.6	-0.002422	2.5
Extreme (50C)	2312.5	-9.3	-0.004022	2.5
Extreme (40C)	2312.5	-10.2	-0.004411	2.5
Extreme (30C)	2312.5	4.9	0.002119	2.5
Extreme (10C)	2312.5	7.6	0.003286	2.5
Extreme (0C)	2312.5	9.1	0.003935	2.5
Extreme (-10C)	2312.5	-6.3	-0.002724	2.5
Extreme (-20C)	2312.5	6.4	0.002768	2.5
Extreme (-30C)	2312.5	-3.2	-0.001384	2.5

(2305-2320MHz)16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 16QAM, (CH 38775 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.6	2312.5	5.8	0.002508	2.5
3.8	2312.5	6.1	0.002638	2.5
4.4	2312.5	10.2	0.004411	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 16QAM, (CH 38775 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2312.5	10.2	0.004411	2.5
Extreme (50C)	2312.5	4.8	0.002076	2.5
Extreme (40C)	2312.5	10.5	0.004541	2.5
Extreme (30C)	2312.5	-6.3	-0.002724	2.5
Extreme (10C)	2312.5	-7.1	-0.003070	2.5
Extreme (0C)	2312.5	-6.3	-0.002724	2.5
Extreme (-10C)	2312.5	6.7	0.002897	2.5
Extreme (-20C)	2312.5	10.1	0.004368	2.5
Extreme (-30C)	2312.5	7.5	0.003243	2.5

(2345-2360MHz)QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 QPSK, (CH 39175 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.6	2352.5	10.1	0.004293	2.5
3.8	2352.5	7.4	0.003146	2.5
4.4	2352.5	6.2	0.002635	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 QPSK, (CH 39175 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2352.5	-5.5	-0.002338	2.5
Extreme (50C)	2352.5	9.3	0.003953	2.5
Extreme (40C)	2352.5	-8.4	-0.003571	2.5
Extreme (30C)	2352.5	3.4	0.001445	2.5
Extreme (10C)	2352.5	4.6	0.001955	2.5
Extreme (0C)	2352.5	7.9	0.003358	2.5
Extreme (-10C)	2352.5	2.6	0.001105	2.5
Extreme (-20C)	2352.5	-5.9	-0.002508	2.5
Extreme (-30C)	2352.5	5.7	0.002423	2.5

(2345-2360MHz)16QAM, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 16QAM, (CH 39175 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.6	2352.5	5.7	0.002423	2.5
3.8	2352.5	-6.4	-0.002721	2.5
4.4	2352.5	-3.7	-0.001573	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 40 16QAM, (CH 39175 RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	2352.5	10.2	0.004336	2.5
Extreme (50C)	2352.5	7.4	0.003146	2.5
Extreme (40C)	2352.5	8.2	0.003486	2.5
Extreme (30C)	2352.5	-7.6	-0.003231	2.5
Extreme (10C)	2352.5	10.4	0.004421	2.5
Extreme (0C)	2352.5	5.3	0.002253	2.5
Extreme (-10C)	2352.5	-6.2	-0.002635	2.5
Extreme (-20C)	2352.5	-1.7	-0.000723	2.5
Extreme (-30C)	2352.5	4.9	0.002083	2.5

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

10.6 LTE BAND 41

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 40620 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	2593.0	10.3	0.003954	2.5
3.8	2593.0	7.3	0.002802	2.5
4.4	2593.0	5.3	0.002035	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH 40620 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2593.0	-5.3	-0.002035	2.5
Extreme (50C)	2593.0	-9.4	-0.003608	2.5
Extreme (40C)	2593.0	-1.3	-0.000499	2.5
Extreme (30C)	2593.0	6.3	0.002418	2.5
Extreme (10C)	2593.0	5.6	0.002150	2.5
Extreme (0C)	2593.0	4.3	0.001651	2.5
Extreme (-10C)	2593.0	2.9	0.001113	2.5
Extreme (-20C)	2593.0	-3.7	-0.001420	2.5
Extreme (-30C)	2593.0	5.5	0.002111	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 40620 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.2	2593.0	-3.6	-0.001382	2.5
3.8	2593.0	5.4	0.002073	2.5
4.4	2593.0	-7.6	-0.002917	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH 40620 RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	2593.0	10.4	0.003992	2.5
Extreme (50C)	2593.0	-7.3	-0.002802	2.5
Extreme (40C)	2593.0	6.4	0.002457	2.5
Extreme (30C)	2593.0	-7.2	-0.002764	2.5
Extreme (10C)	2593.0	-3.3	-0.001267	2.5
Extreme (0C)	2593.0	-1.8	-0.000691	2.5
Extreme (-10C)	2593.0	4.6	0.001766	2.5
Extreme (-20C)	2593.0	6.6	0.002534	2.5
Extreme (-30C)	2593.0	7.4	0.002841	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.

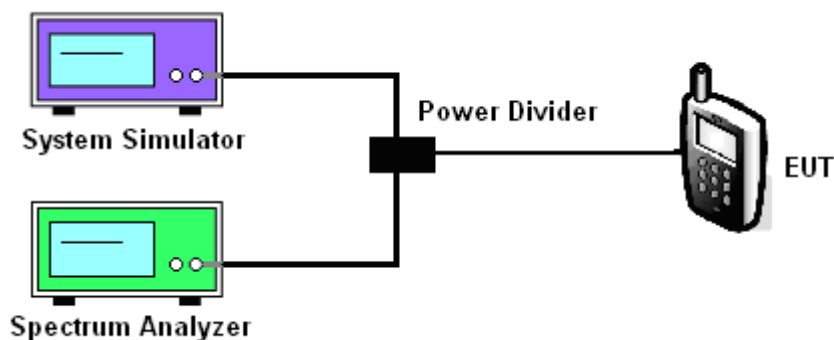
11.2 Measuring Instruments

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 4
 LTE Band 5
 LTE Band 7
 LTE Band 38
 LTE Band 40
 LTE Band 41

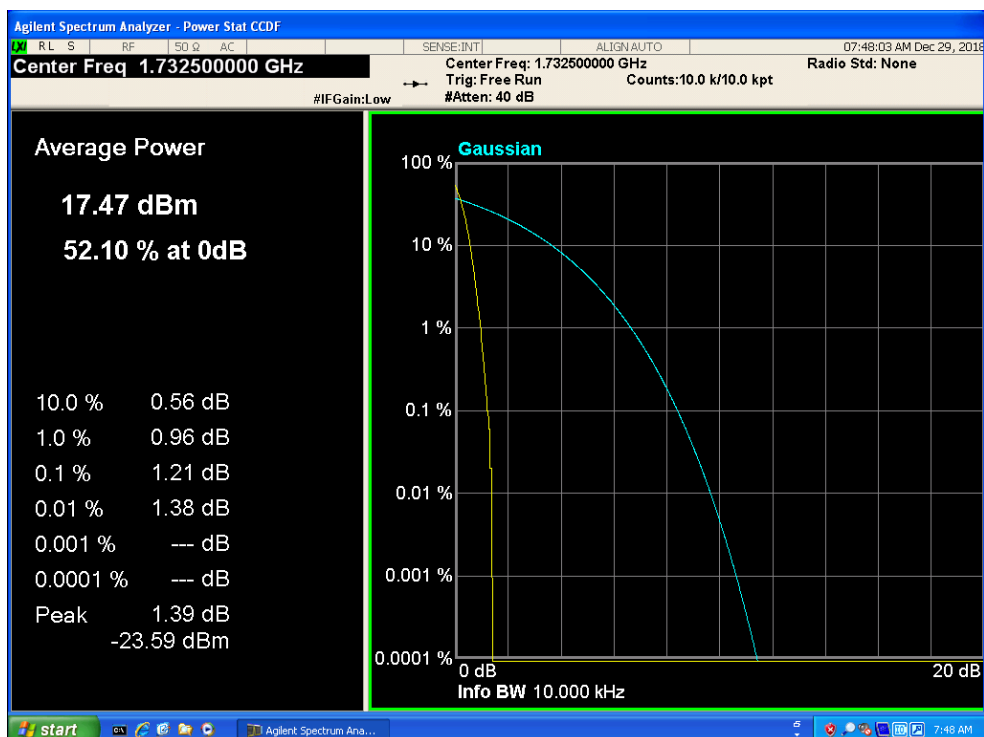
BAND	CHANNEL	Frequency [MHz]	BANDWIDTH	NO. RB	RB POS.	MODULATION	PAR [dB]
4	20175	1732.5	1.4	1	Low	QPSK	1.21
4	20175	1732.5	1.4	1	Low	16-QAM	2.70
4	20175	1732.5	3.0	1	Low	QPSK	4.60
4	20175	1732.5	3.0	1	Low	16-QAM	1.73
4	20175	1732.5	5.0	1	Low	QPSK	5.02
4	20175	1732.5	5.0	1	Low	16-QAM	5.44
4	20175	1732.5	10.0	1	Low	QPSK	1.60
4	20175	1732.5	10.0	1	Low	16-QAM	5.24
4	20175	1732.5	15.0	1	Low	QPSK	5.18
4	20175	1732.5	15.0	1	Low	16-QAM	6.12
4	20175	1732.5	20.0	1	Low	QPSK	2.35
4	20175	1732.5	20.0	1	Low	16-QAM	2.00
5	20525	836.5	1.4	1	Low	QPSK	3.98
5	20525	836.5	1.4	1	Low	16-QAM	4.66
5	20525	836.5	3.0	1	Low	QPSK	3.91
5	20525	836.5	3.0	1	Low	16-QAM	4.77
5	20525	836.5	5.0	1	Low	QPSK	4.68
5	20525	836.5	5.0	1	Low	16-QAM	4.81
5	20525	836.5	10.0	1	Low	QPSK	4.45
5	20525	836.5	10.0	1	Low	16-QAM	4.94
7	21100	2535.0	5.0	1	Low	QPSK	3.65

7	21100	2535.0	5.0	1	Low	16-QAM	5.53
7	21100	2535.0	10.0	1	Low	QPSK	4.59
7	21100	2535.0	10.0	1	Low	16-QAM	4.76
7	21100	2535.0	15.0	1	Low	QPSK	4.89
7	21100	2535.0	15.0	1	Low	16-QAM	5.87
7	21100	2535.0	20.0	1	Low	QPSK	4.89
7	21100	2535.0	20.0	1	Low	16-QAM	4.56
38	38000	2595.0	5.0	1	Low	QPSK	4.51
38	38000	2595.0	5.0	1	Low	16-QAM	6.28
38	38000	2595.0	10.0	1	Low	QPSK	3.52
38	38000	2595.0	10.0	1	Low	16-QAM	5.85
38	38000	2595.0	15.0	1	Low	QPSK	4.48
38	38000	2595.0	15.0	1	Low	16-QAM	6.24
38	38000	2595.0	20.0	1	Low	QPSK	3.57
38	38000	2595.0	20.0	1	Low	16-QAM	6.30
40	38775	2312.5	5.0	1	Low	QPSK	5.27
40	38775	2312.5	5.0	1	Low	16-QAM	6.29
40	38775	2312.5	10.0	1	Low	QPSK	5.35
40	38775	2312.5	10.0	1	Low	16-QAM	6.24
40	38775	2312.5	15.0	1	Low	QPSK	6.41
40	38775	2312.5	15.0	1	Low	16-QAM	6.39
40	39175	2352.5	5.0	1	Low	QPSK	5.55

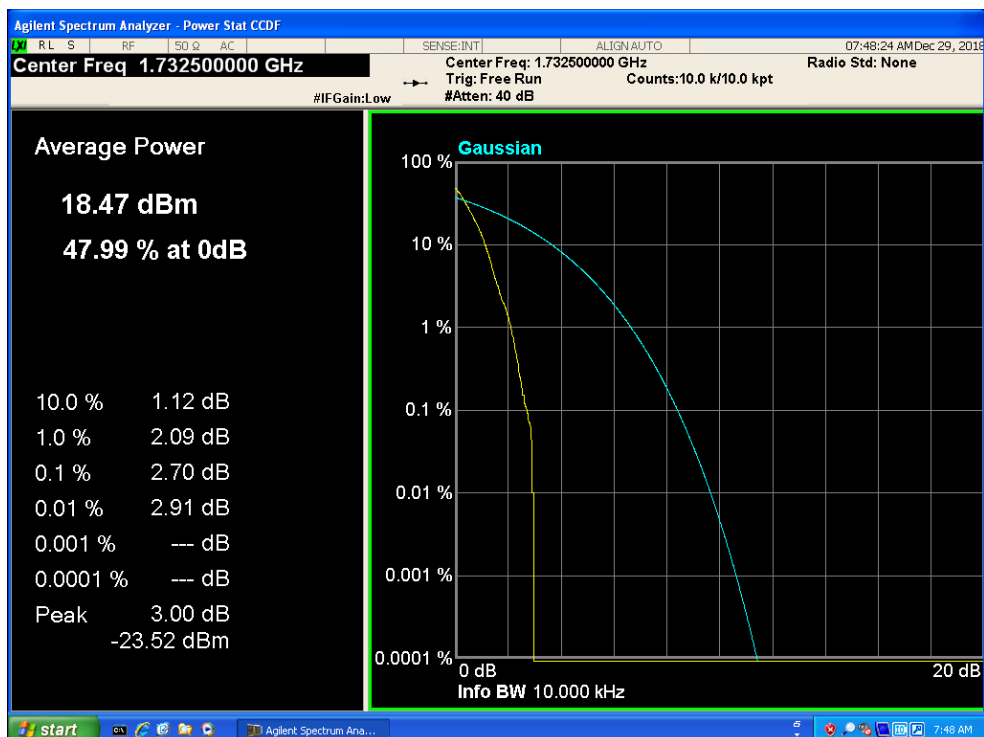
40	39175	2352.5	5.0	1	Low	16-QAM	6.24
40	39175	2352.5	10.0	1	Low	QPSK	5.42
40	39175	2352.5	10.0	1	Low	16-QAM	5.29
40	39175	2352.5	15.0	1	Low	QPSK	5.17
40	39175	2352.5	15.0	1	Low	16-QAM	6.11
41	40620	2593.0	5.0	1	Low	QPSK	5.75
41	40620	2593.0	5.0	1	Low	16-QAM	5.32
41	40620	2593.0	10.0	1	Low	QPSK	3.92
41	40620	2593.0	10.0	1	Low	16-QAM	5.93
41	40620	2593.0	15.0	1	Low	QPSK	4.58
41	40620	2593.0	15.0	1	Low	16-QAM	6.29
41	40620	2593.0	20.0	1	Low	QPSK	4.00
41	40620	2593.0	20.0	1	Low	16-QAM	4.31

11.5 LTE BAND 4

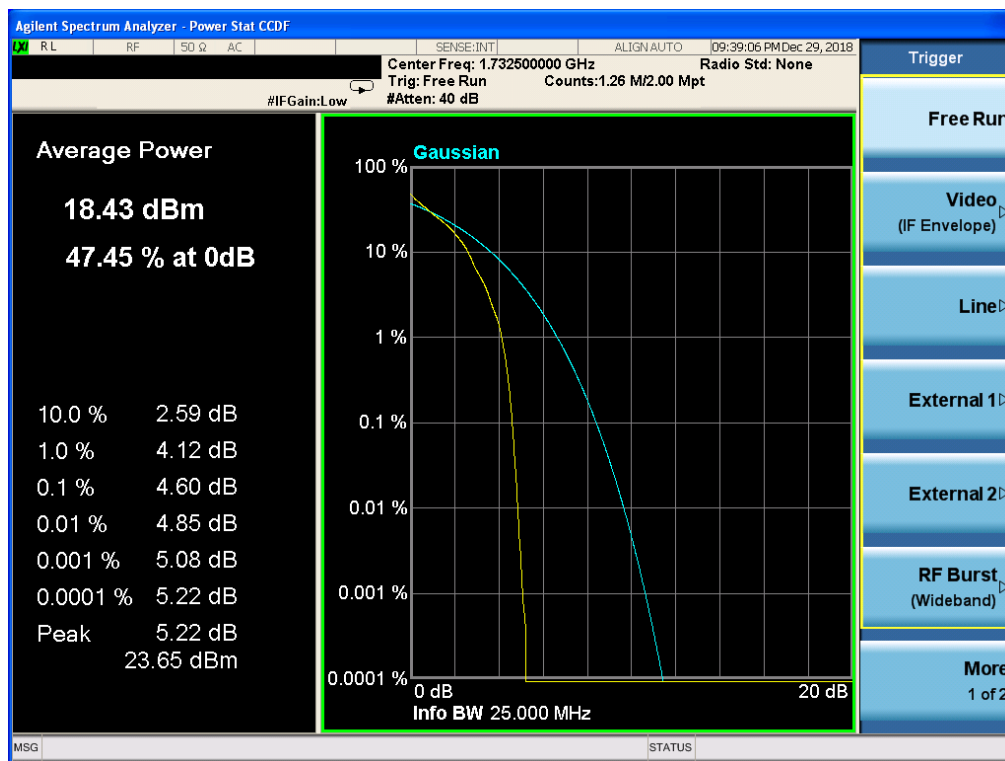
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 1.4, NO. RB 1, RB POS. Low, QPSK



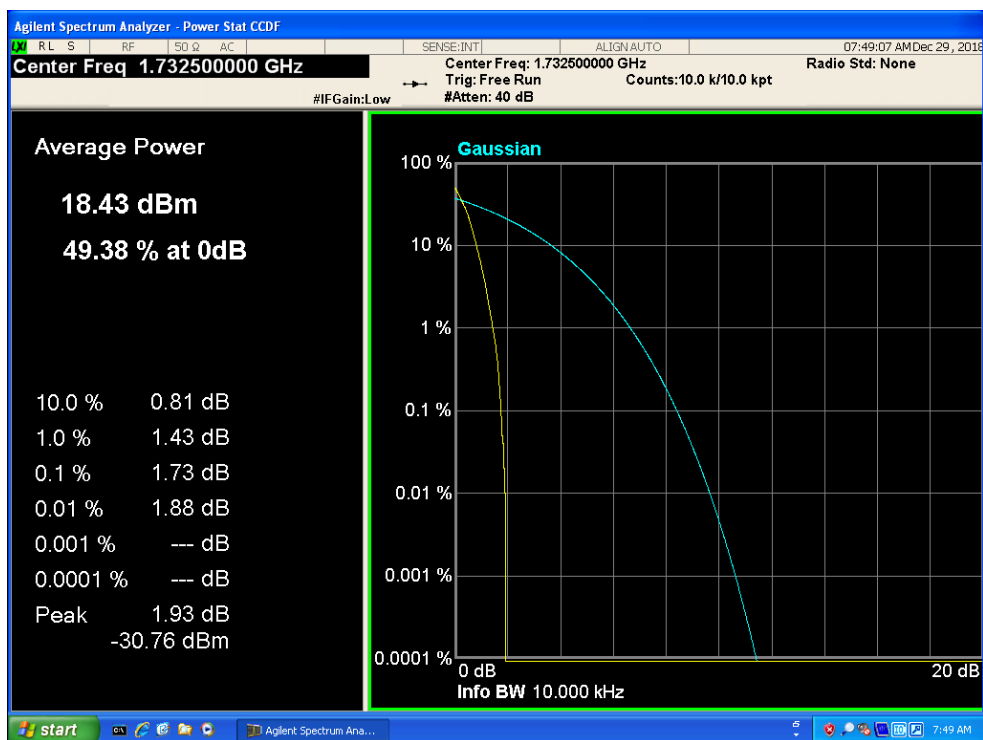
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 1.4, NO. RB 1, RB POS. Low, 16-QAM



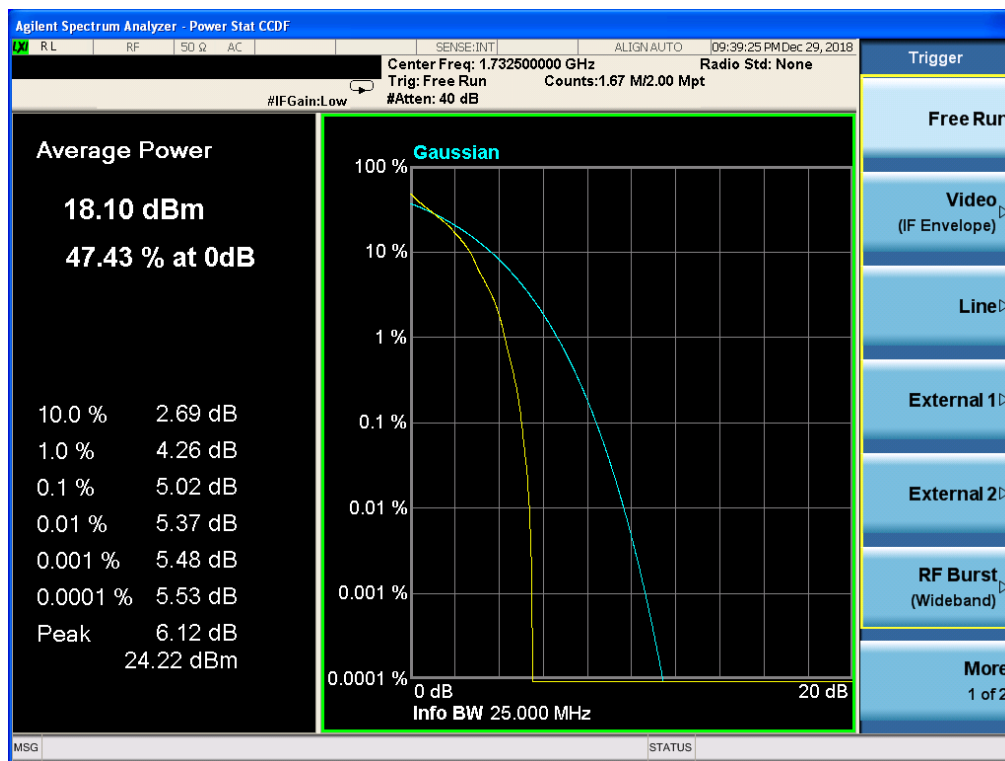
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 3.0, NO. RB 1, RB POS. Low, QPSK



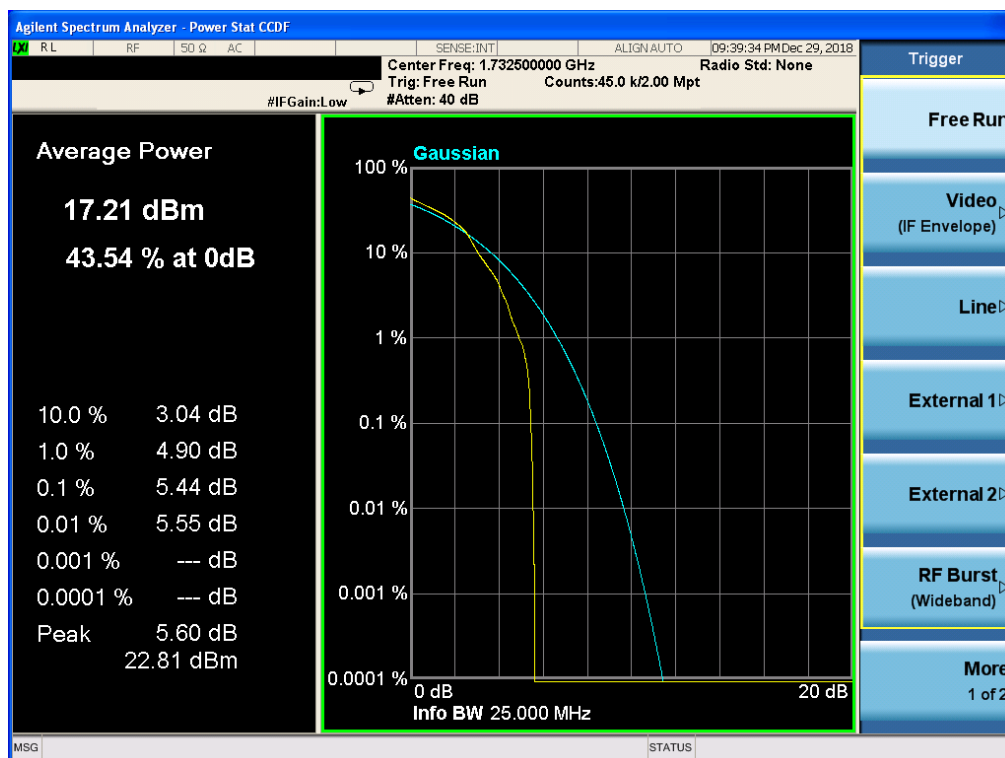
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 3.0, NO. RB 1, RB POS. Low, 16-QAM



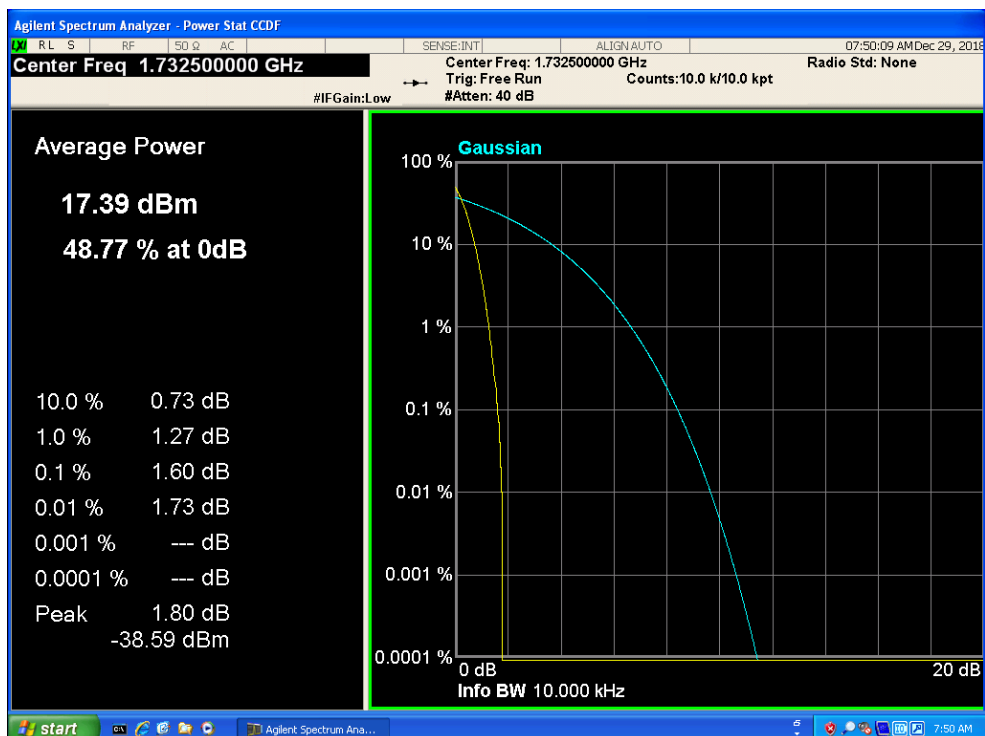
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 5.0, NO. RB 1, RB POS. Low, QPSK



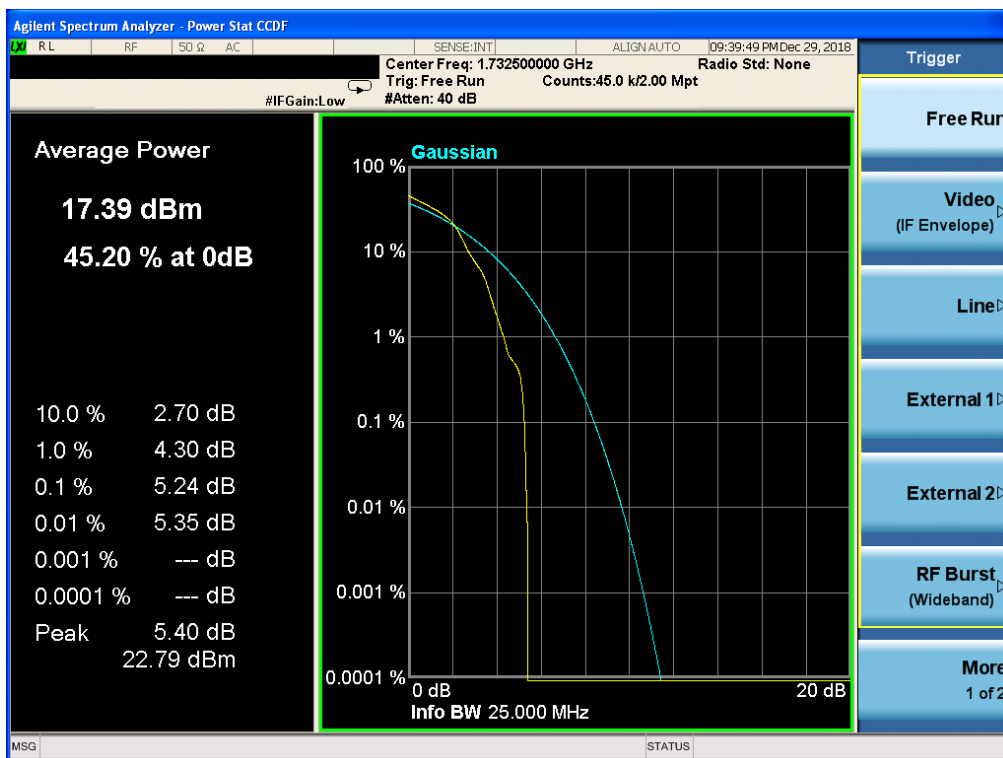
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 5.0, NO. RB 1, RB POS. Low, 16-QAM



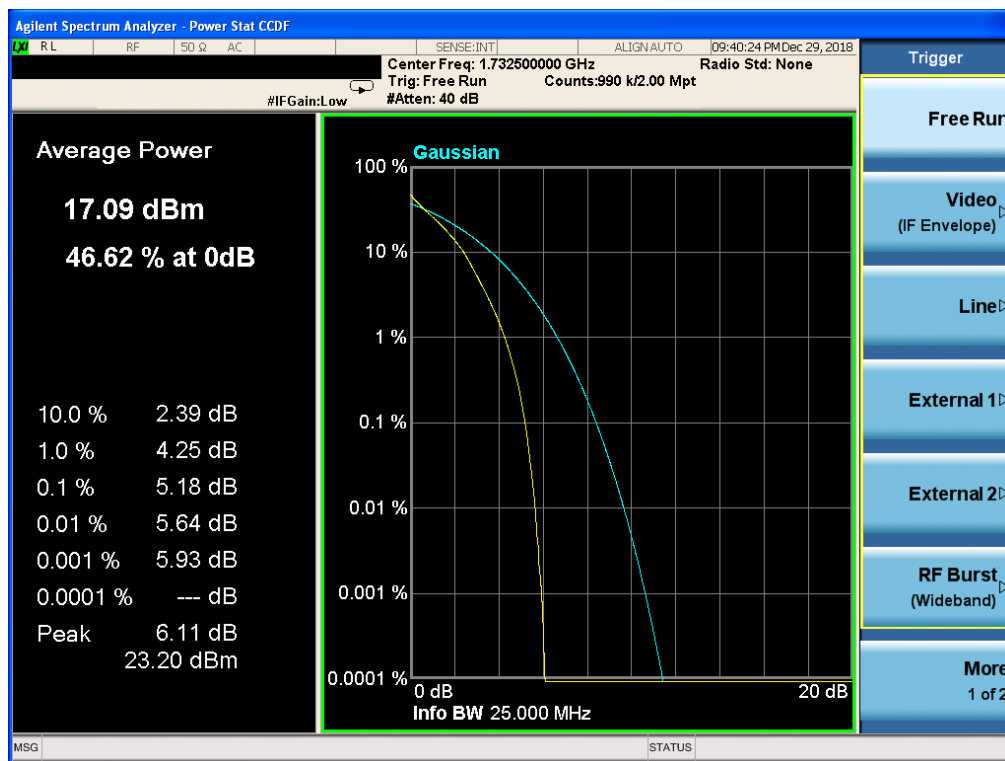
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 10.0, NO. RB 1, RB POS. Low, QPSK



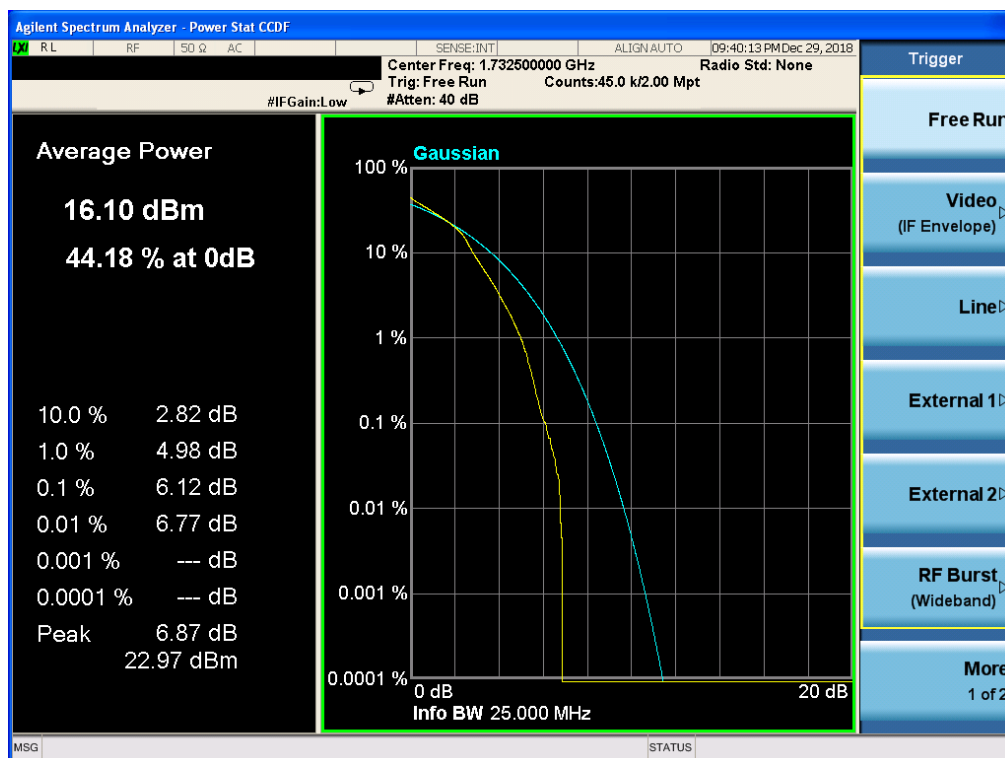
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 10.0, NO. RB 1, RB POS. Low, 16-QAM



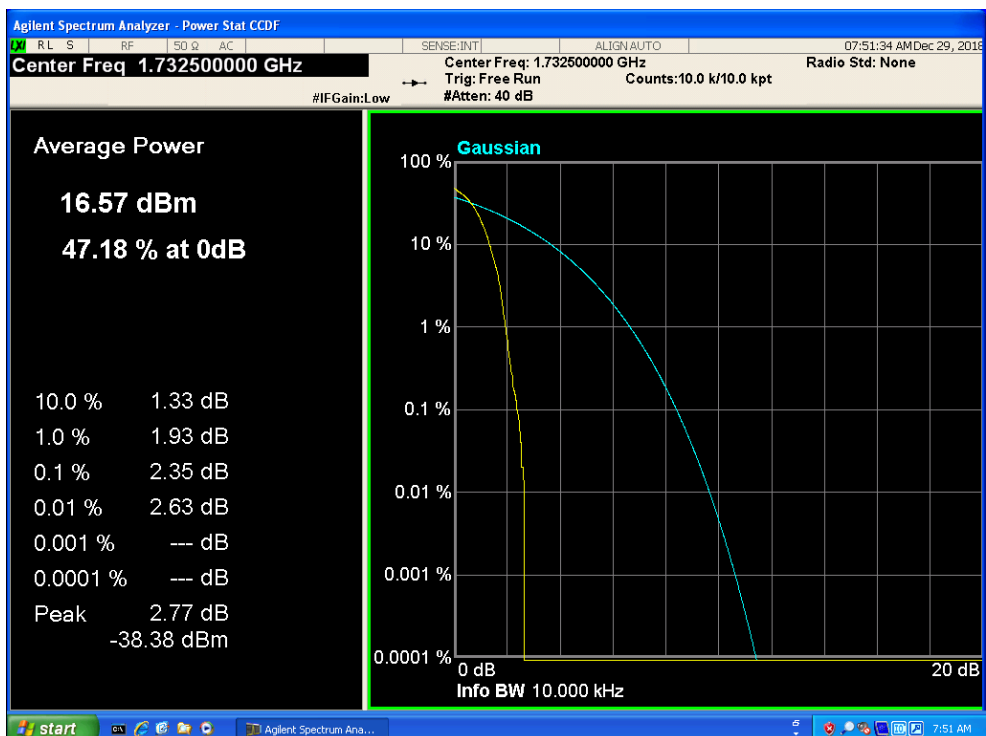
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 15.0, NO. RB 1, RB POS. Low, QPSK



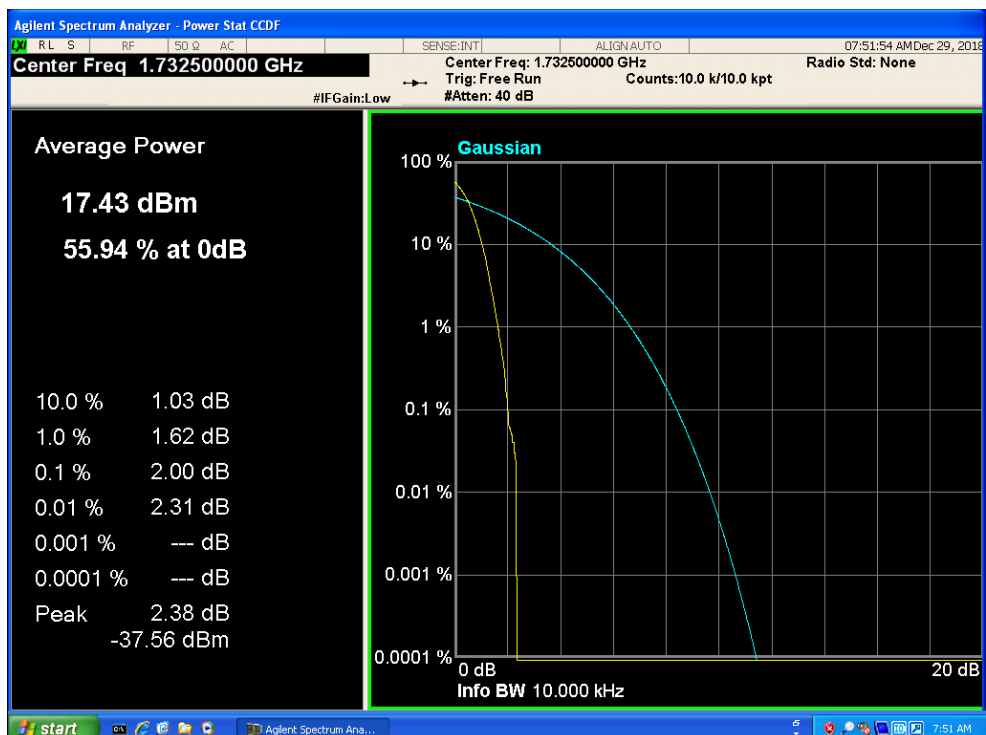
Band 4, UL Channel 20175, UL Frequency 1732.5, BW 15.0, NO. RB 1, RB POS. Low, 16-QAM



Band 4, UL Channel 20175, UL Frequency 1732.5, BW 20.0, NO. RB 1, RB POS. Low, QPSK

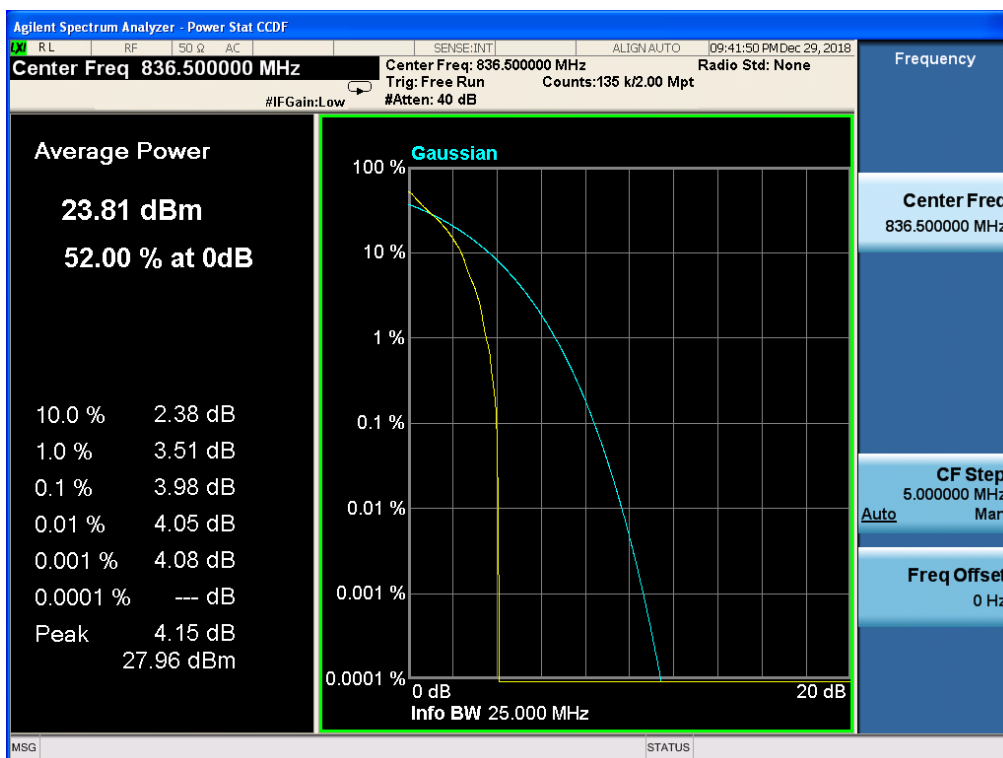


Band 4, UL Channel 20175, UL Frequency 1732.5, BW 20.0, NO. RB 1, RB POS. Low, 16-QAM

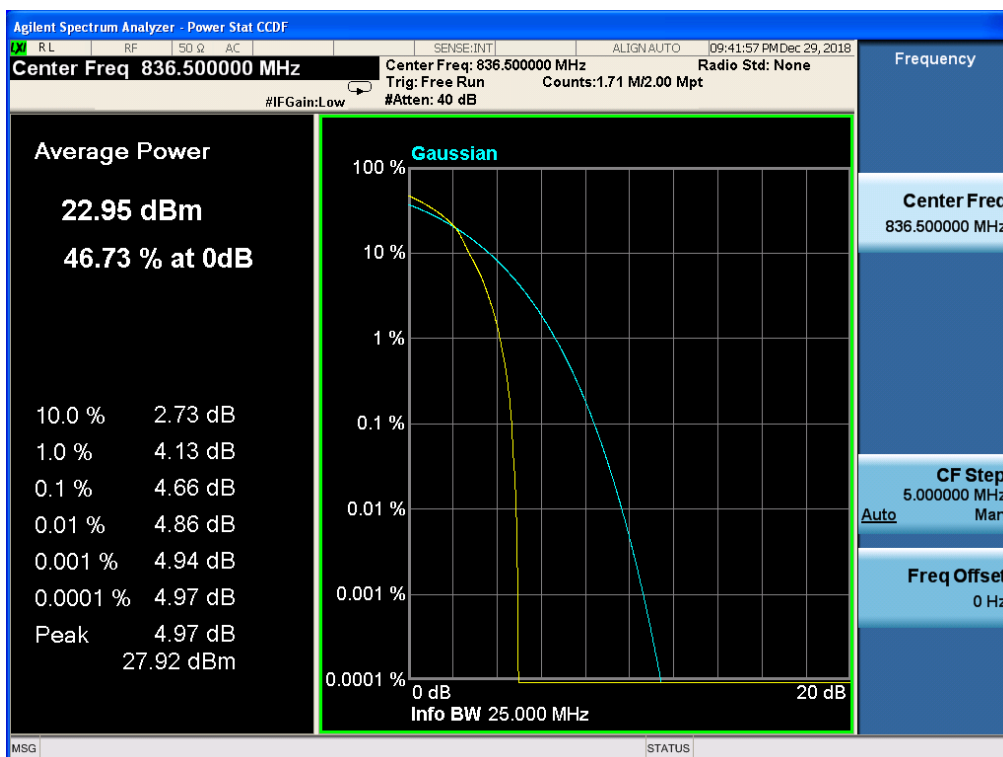


11.6 LTE BAND 5

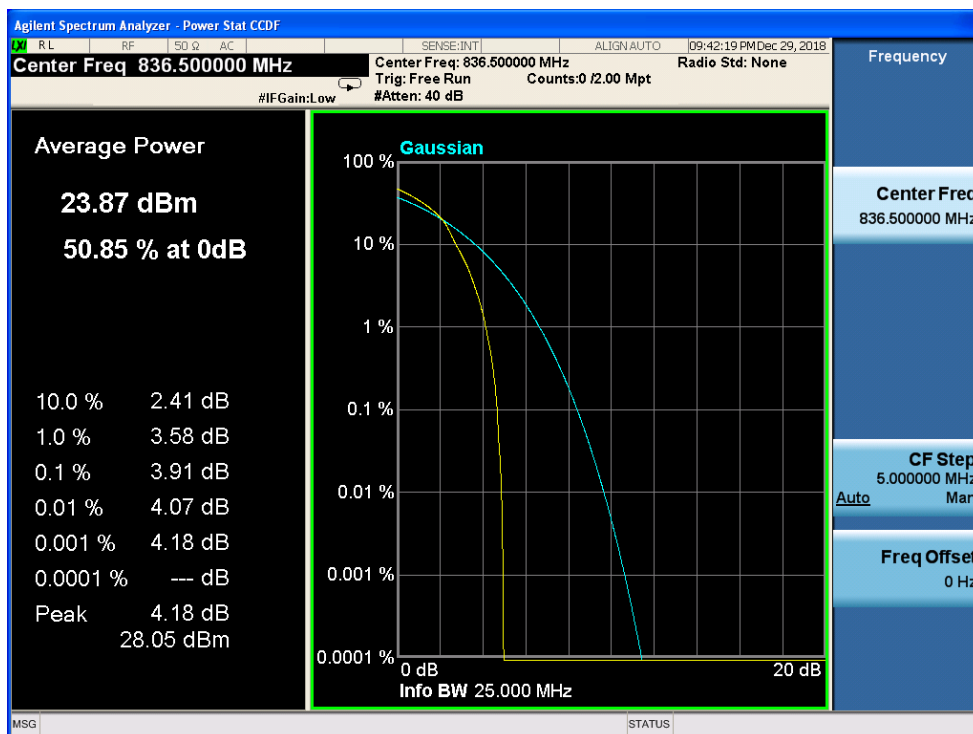
Band 5, UL Channel 20525, UL Frequency 836.5, BW 1.4, NO. RB 1, RB POS. Low, QPSK



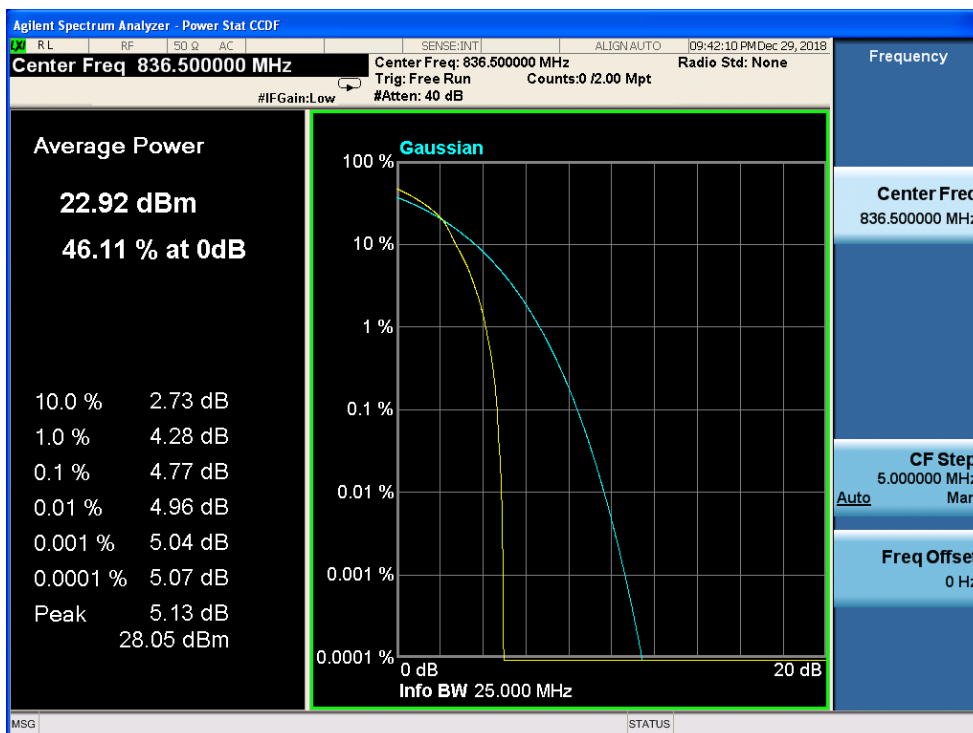
Band 5, UL Channel 20525, UL Frequency 836.5, BW 1.4, NO. RB 1, RB POS. Low, 16-QAM



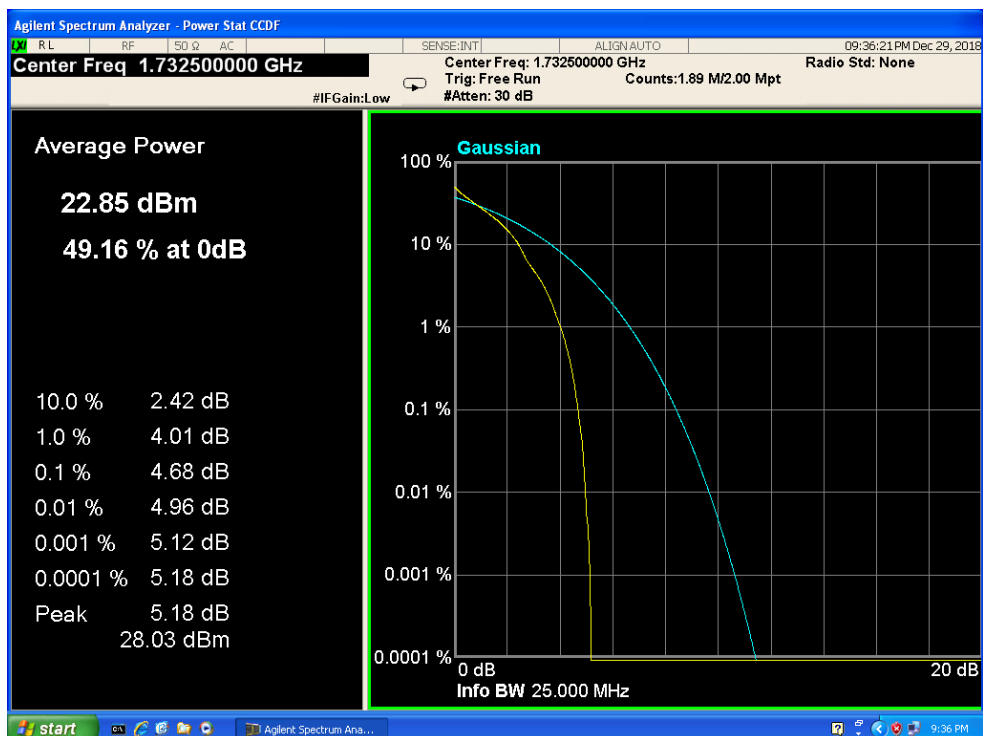
Band 5, UL Channel 20525, UL Frequency 836.5, BW 3.0, NO. RB 1, RB POS. Low, QPSK



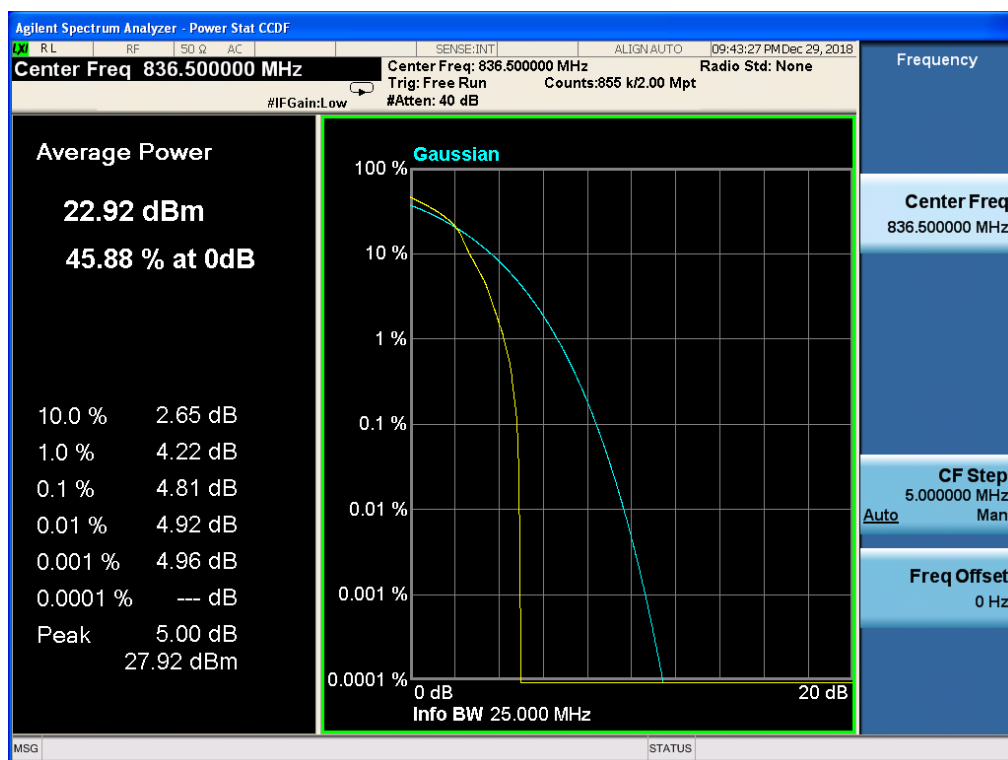
Band 5, UL Channel 20525, UL Frequency 836.5, BW 3.0, NO. RB 1, RB POS. Low, 16-QAM



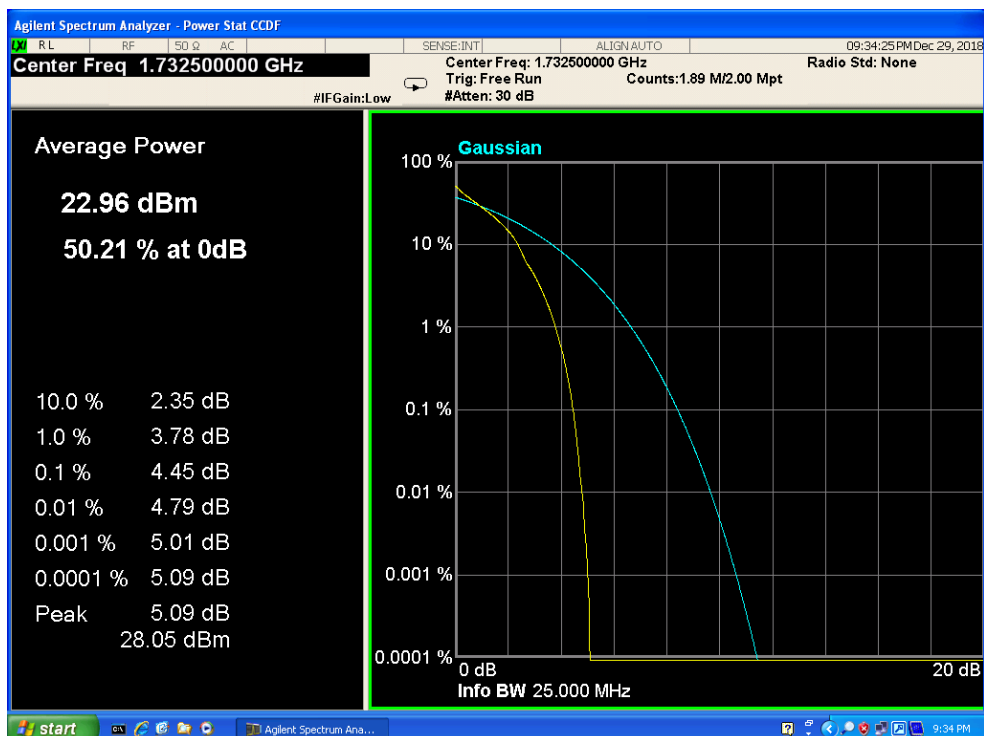
Band 5, UL Channel 20525, UL Frequency 836.5, BW 5.0, NO. RB 1, RB POS. Low, QPSK



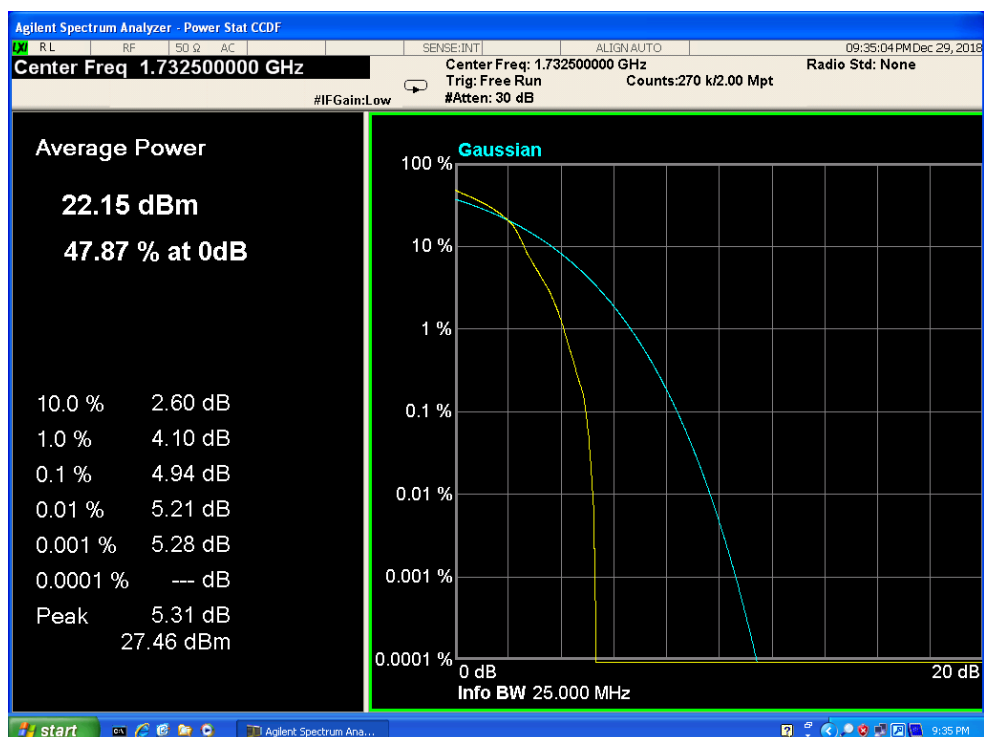
Band 5, UL Channel 20525, UL Frequency 836.5, BW 5.0, NO. RB 1, RB POS. Low, 16-QAM



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

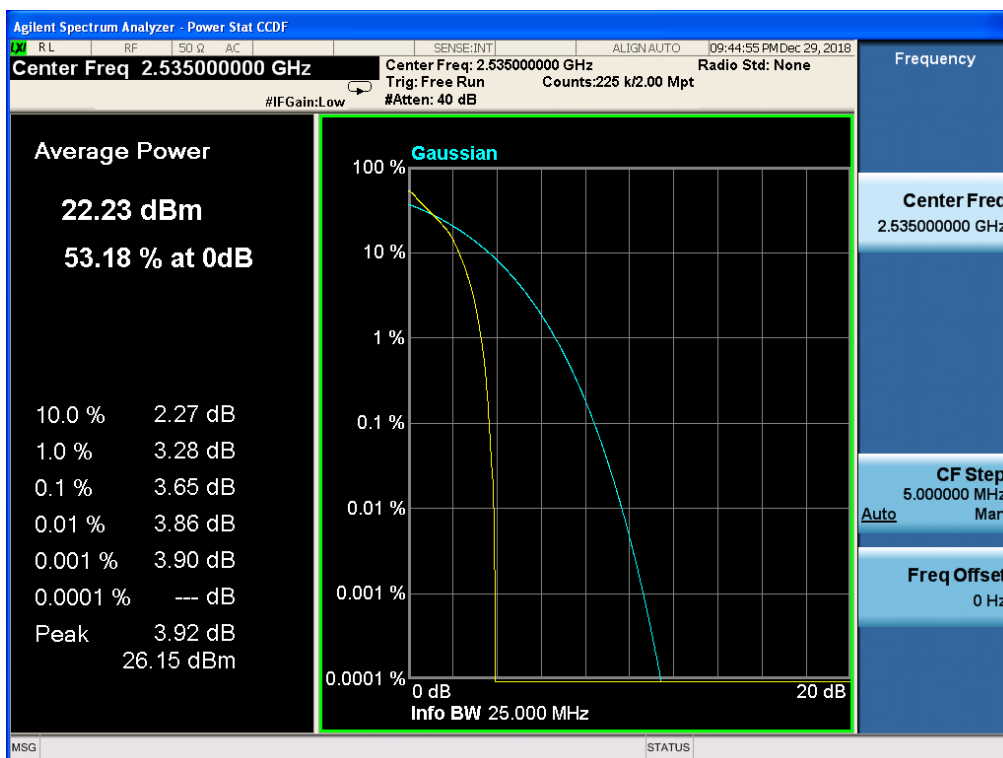


Band 5, UL Channel 20525, UL Frequency 836.5, BW 10.0, NO. RB 1, RB POS. Low, 16-QAM



11.7 LTE BAND 7

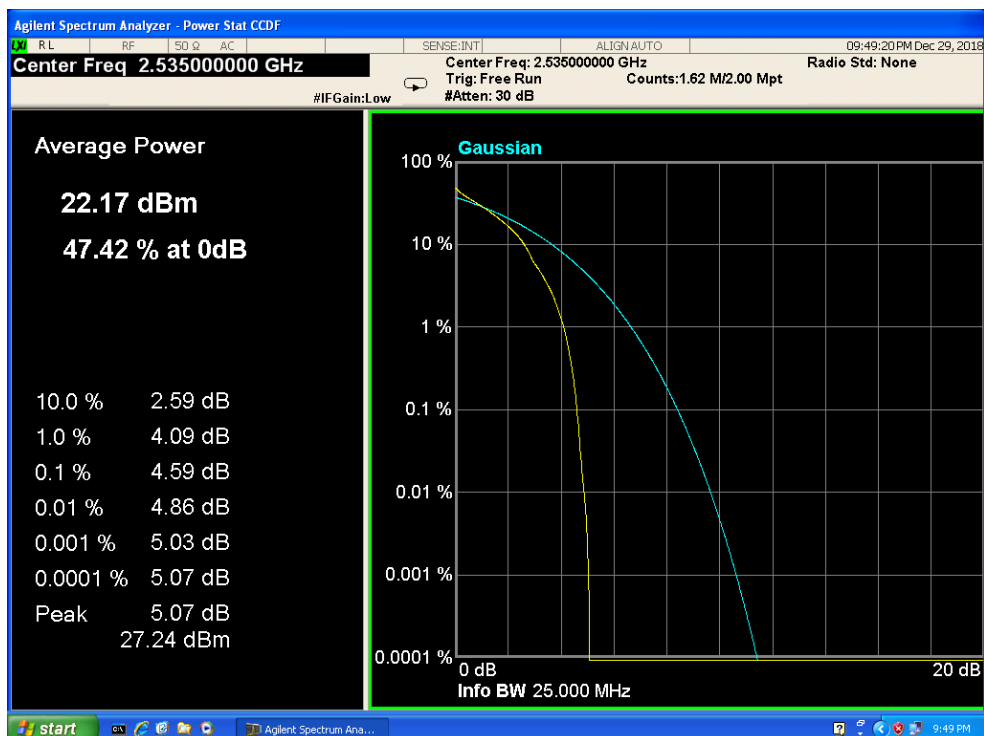
Band 7, UL Channel 21100, UL Frequency 2535.0, BW 5.0, NO. RB 25, RB POS. Low, QPSK



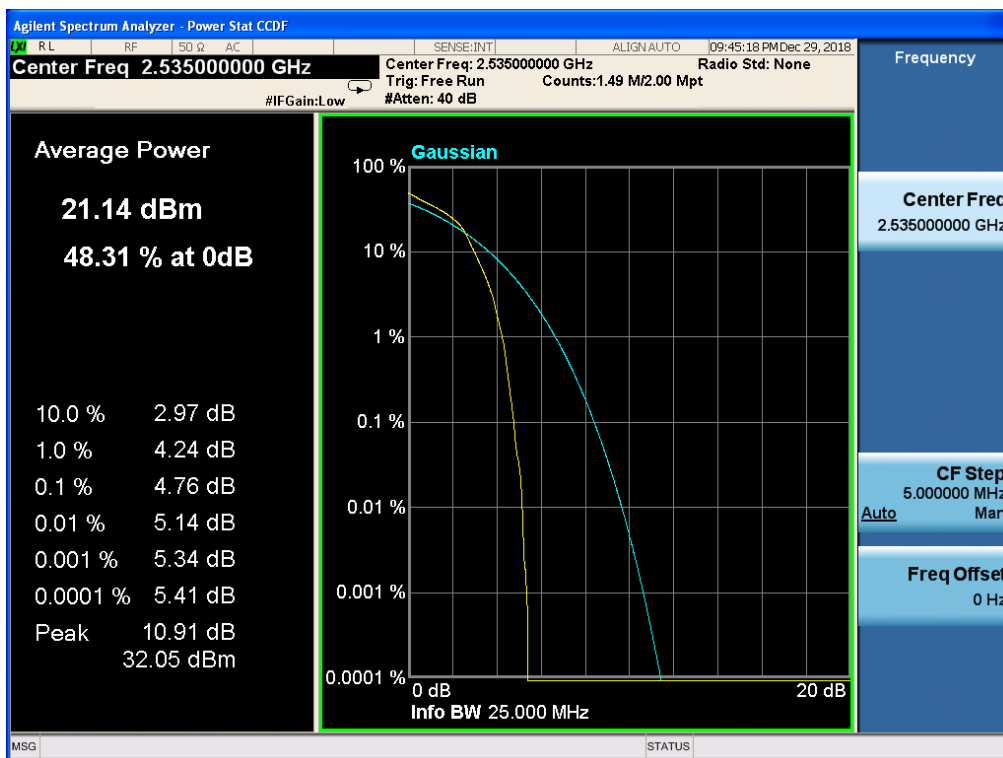
Band 7, UL Channel 21100, UL Frequency 2535.0, BW 5.0, NO. RB 25, RB POS. Low, 16-QAM



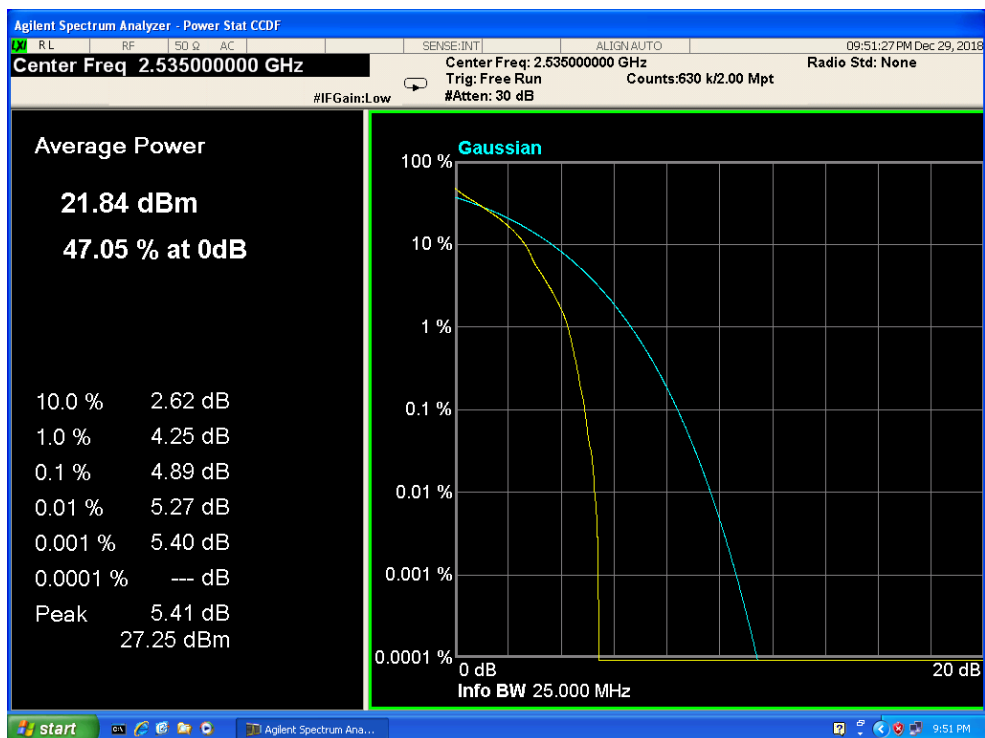
Band 7, UL Channel 21100, UL Frequency 2535.0, BW 10.0, NO. RB 50, RB POS. Low, QPSK



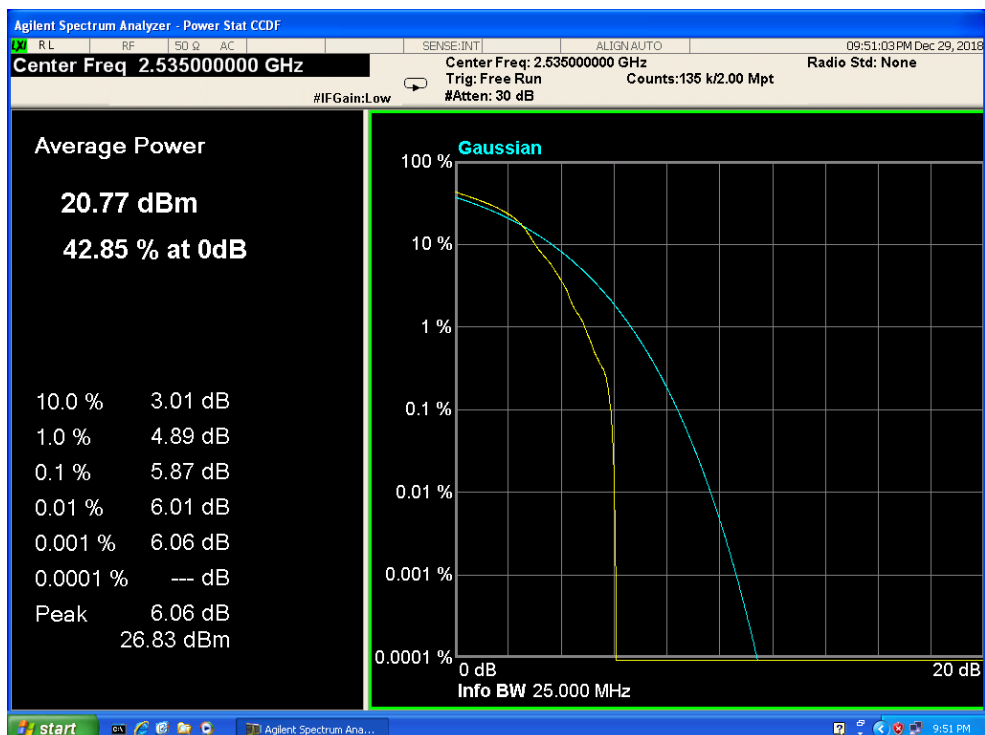
Band 7, UL Channel 21100, UL Frequency 2535.0, BW 10.0, NO. RB 1, RB POS. Low, 16-QAM



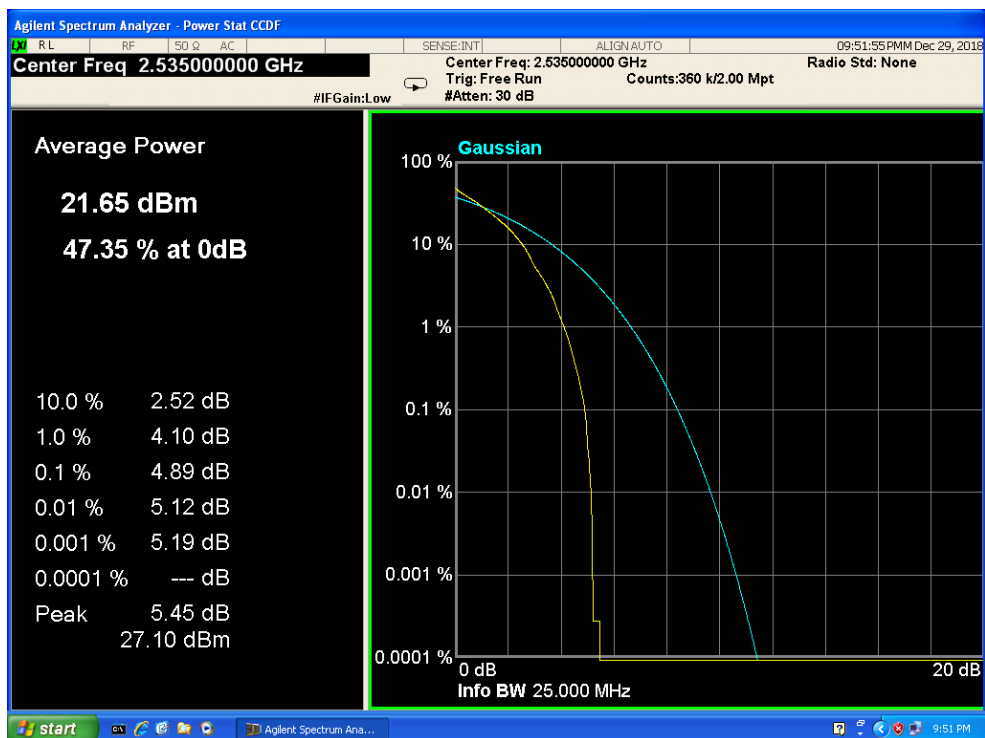
Band 7, UL Channel 21100, UL Frequency 2535.0, BW 15.0, NO. RB 1, RB POS. Low, QPSK



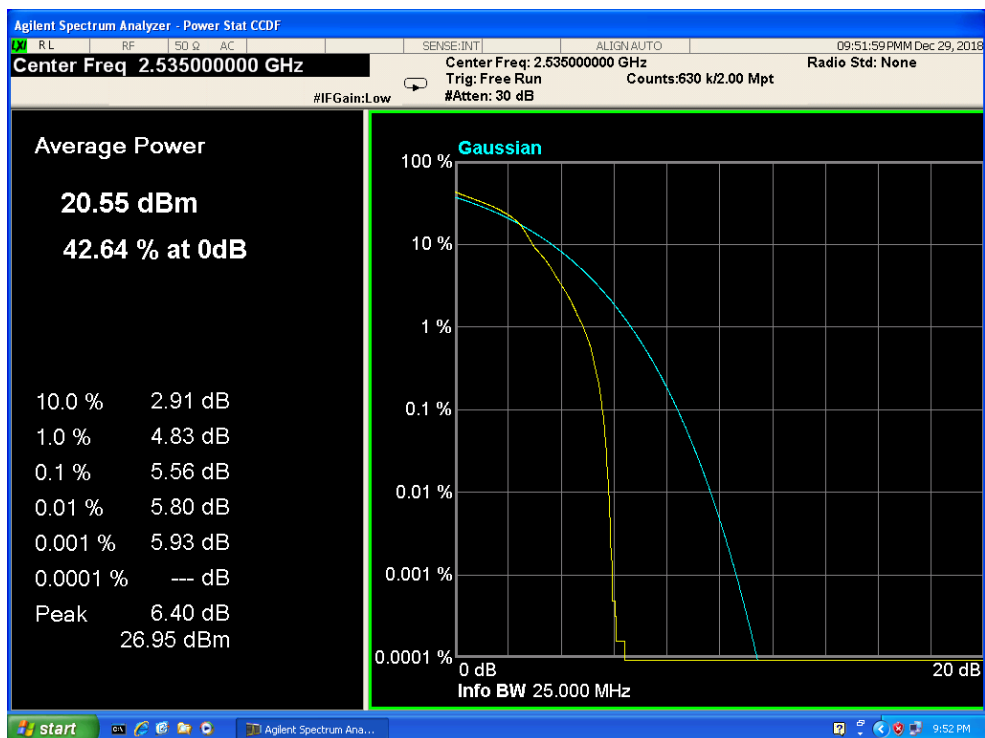
Band 7, UL Channel 21100, UL Frequency 2535.0, BW 15.0, NO. RB 1, RB POS. Low, 16-QAM



Band 7, UL Channel 21100, UL Frequency 2535.0, BW 20.0, NO. RB 1, RB POS. Low, QPSK

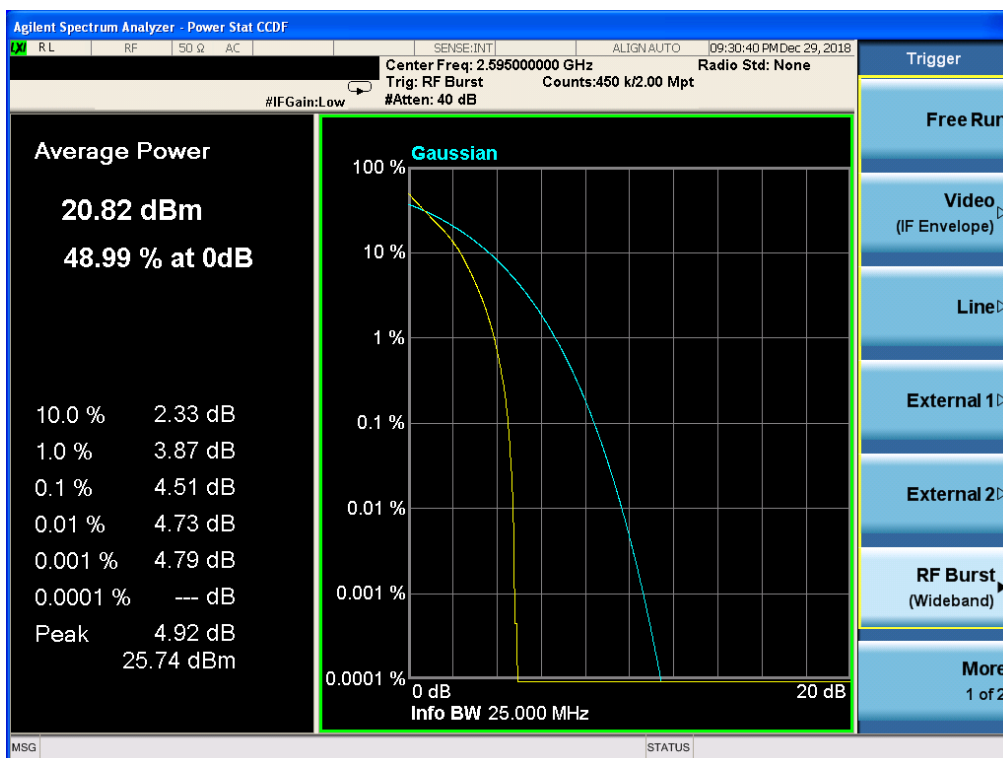


Band 7, UL Channel 21100, UL Frequency 2535.0, BW 20.0, NO. RB 1, RB POS. Low, 16-QAM

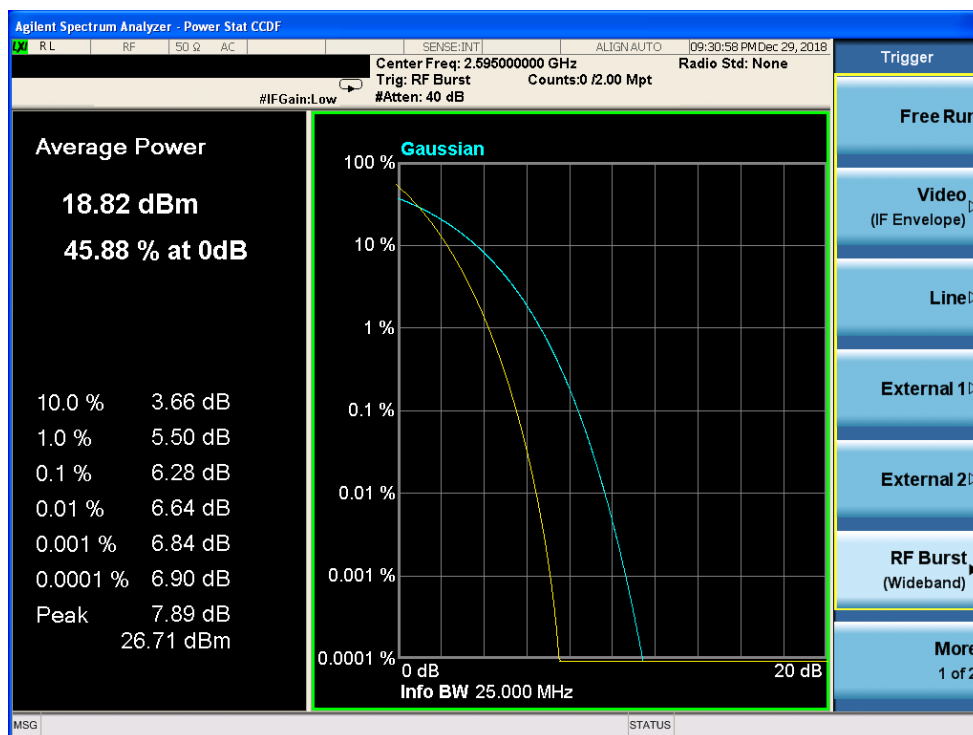


11.8 LTE BAND 38

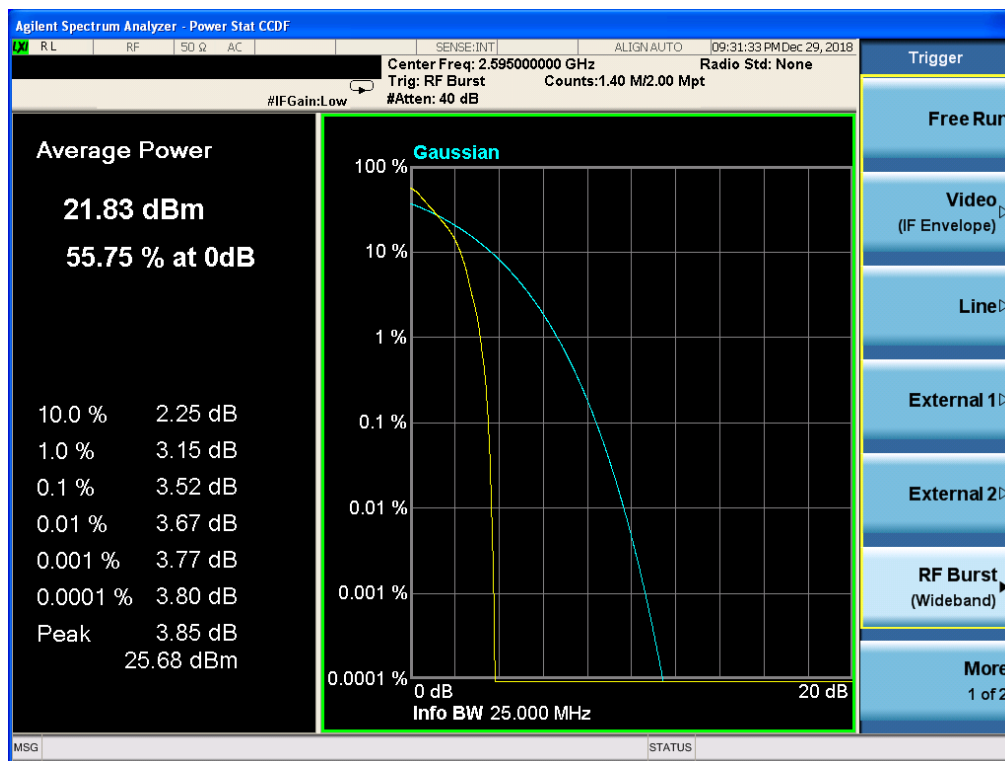
Band 38, UL Channel 38000, UL Frequency 2595.0, BW 5.0, NO. RB 1, RB POS. Low, QPSK



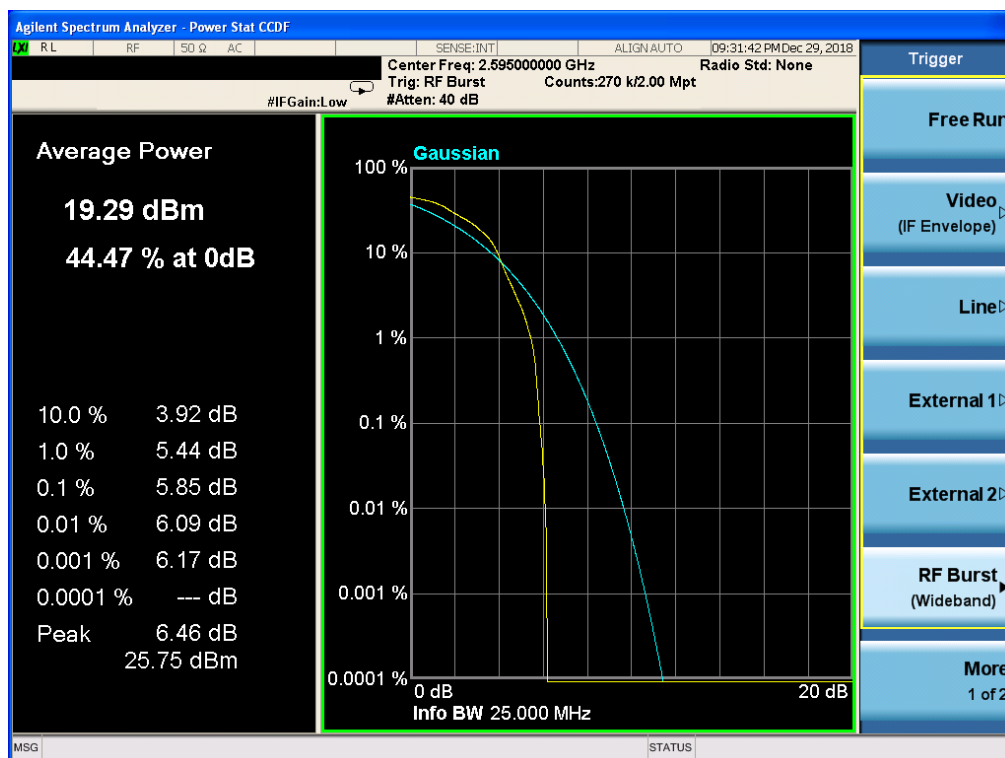
Band 38, UL Channel 38000, UL Frequency 2595.0, BW 5.0, NO. RB 1, RB POS. Low, 16-QAM



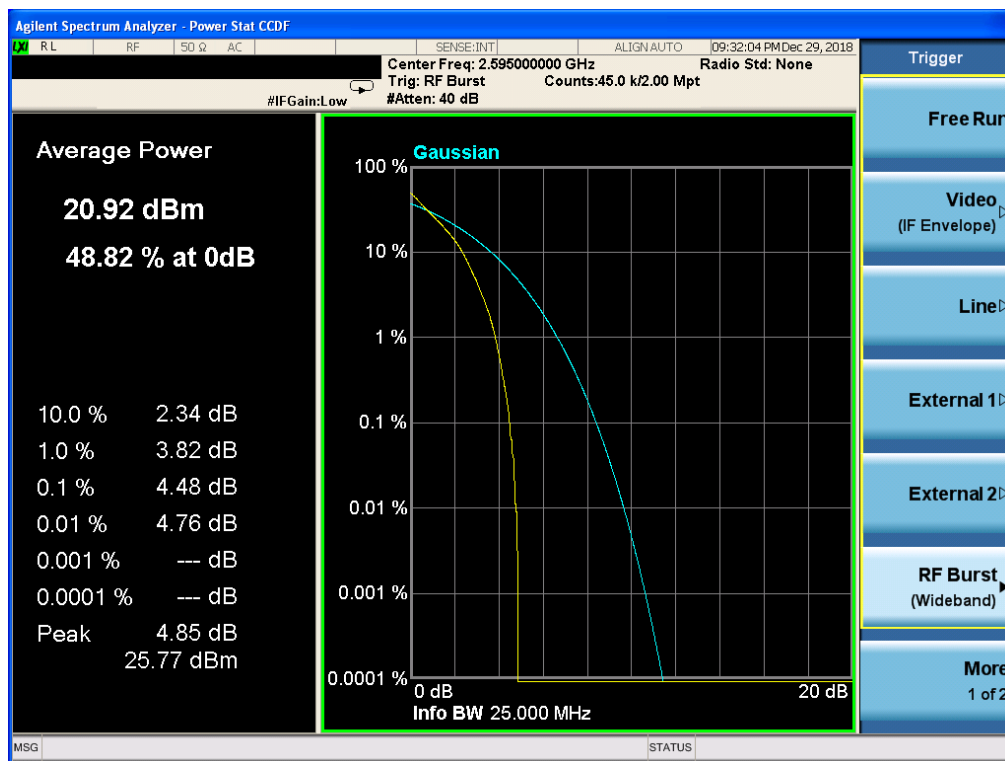
Band 38, UL Channel 38000, UL Frequency 2595.0, BW 10.0, NO. RB 1, RB POS. Low, QPSK



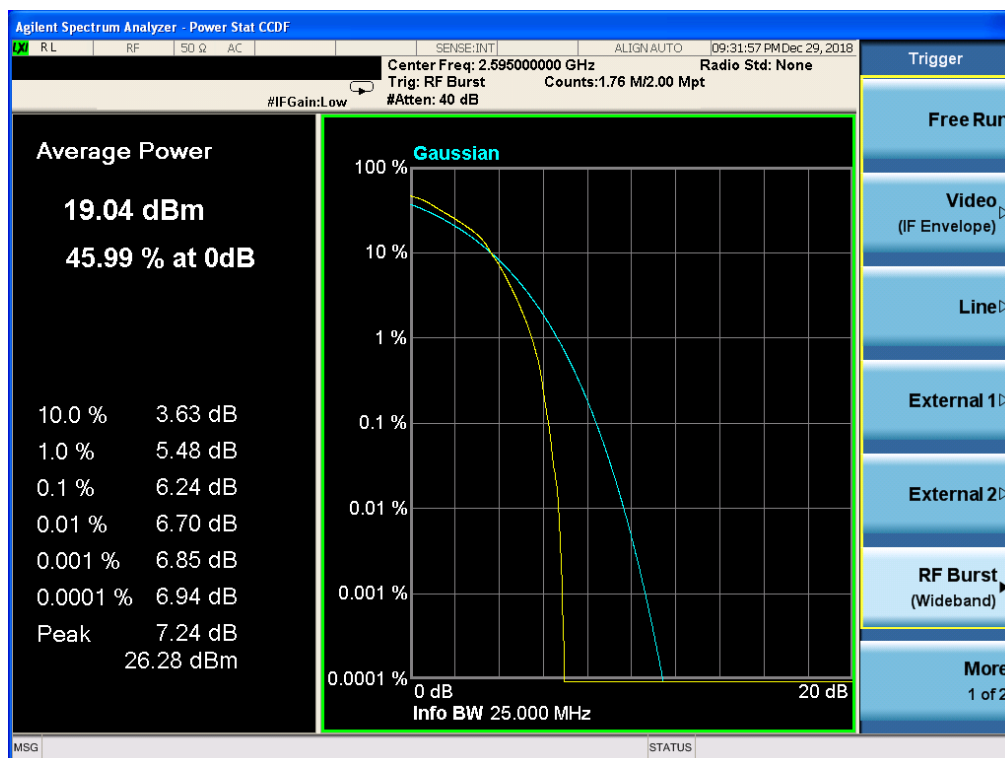
Band 38, UL Channel 38000, UL Frequency 2595.0, BW 10.0, NO. RB 1, RB POS. Low, 16-QAM



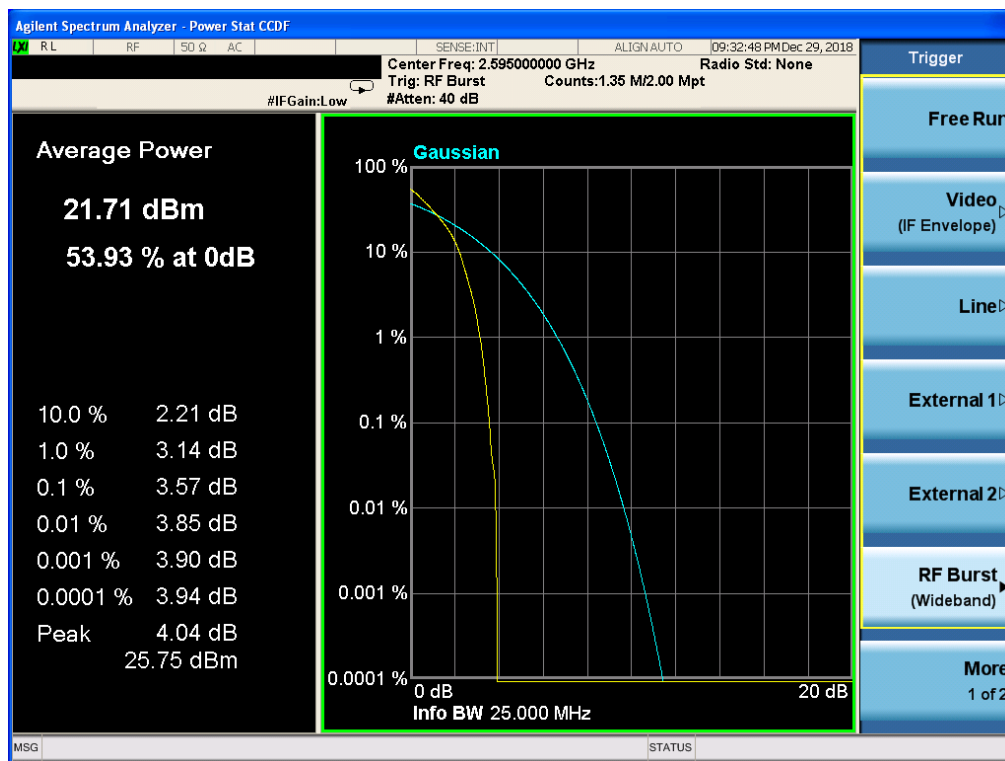
Band 38, UL Channel 38000, UL Frequency 2595.0, BW 15.0, NO. RB 1, RB POS. Low, QPSK



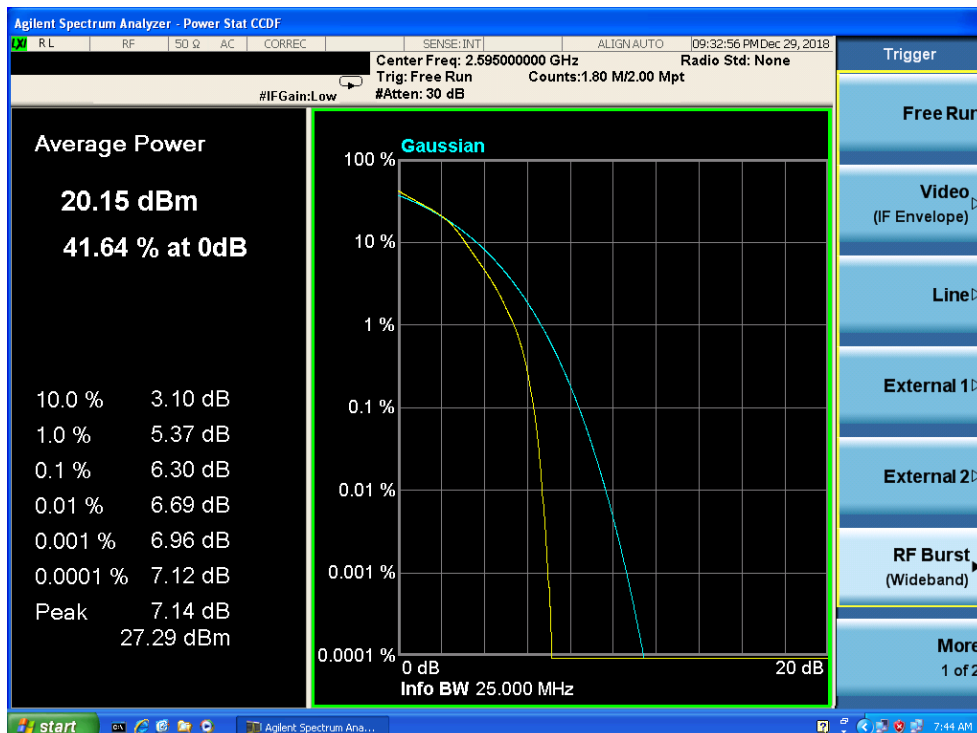
Band 38, UL Channel 38000, UL Frequency 2595.0, BW 15.0, NO. RB 1, RB POS. Low, 16-QAM



Band 38, UL Channel 38000, UL Frequency 2595.0, BW 20.0, NO. RB 1, RB POS. Low, QPSK

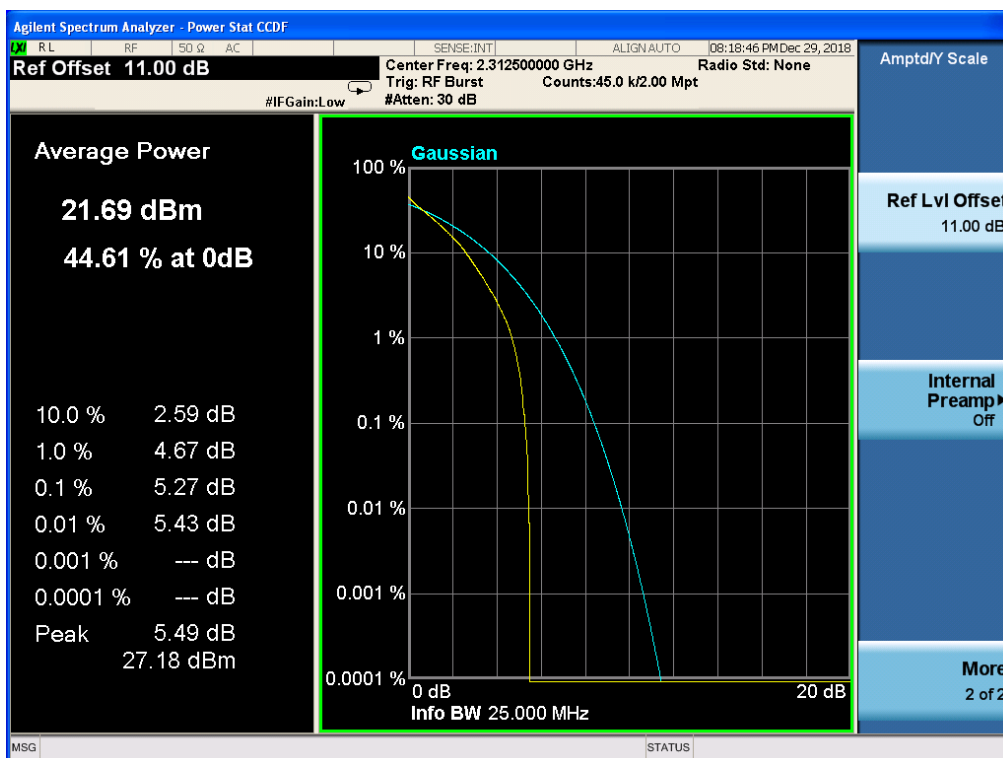


Band 38, UL Channel 38000, UL Frequency 2595.0, BW 20.0, NO. RB 1, RB POS. Low, 16-QAM

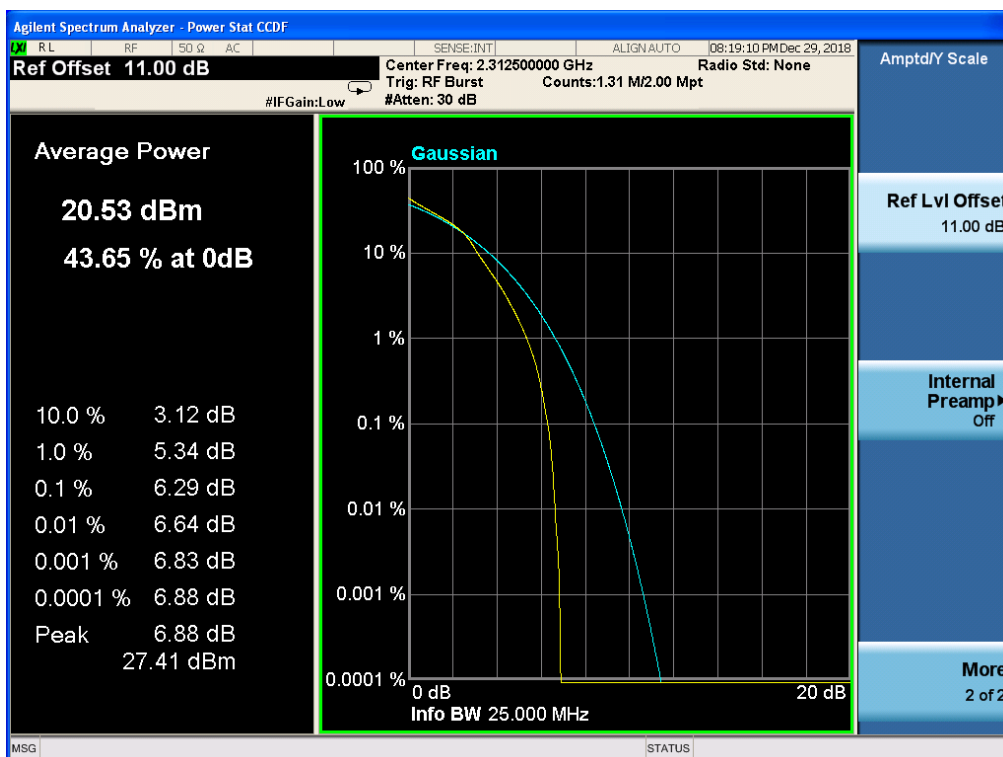


11.9 LTE BAND 40(2305-2320MHz)

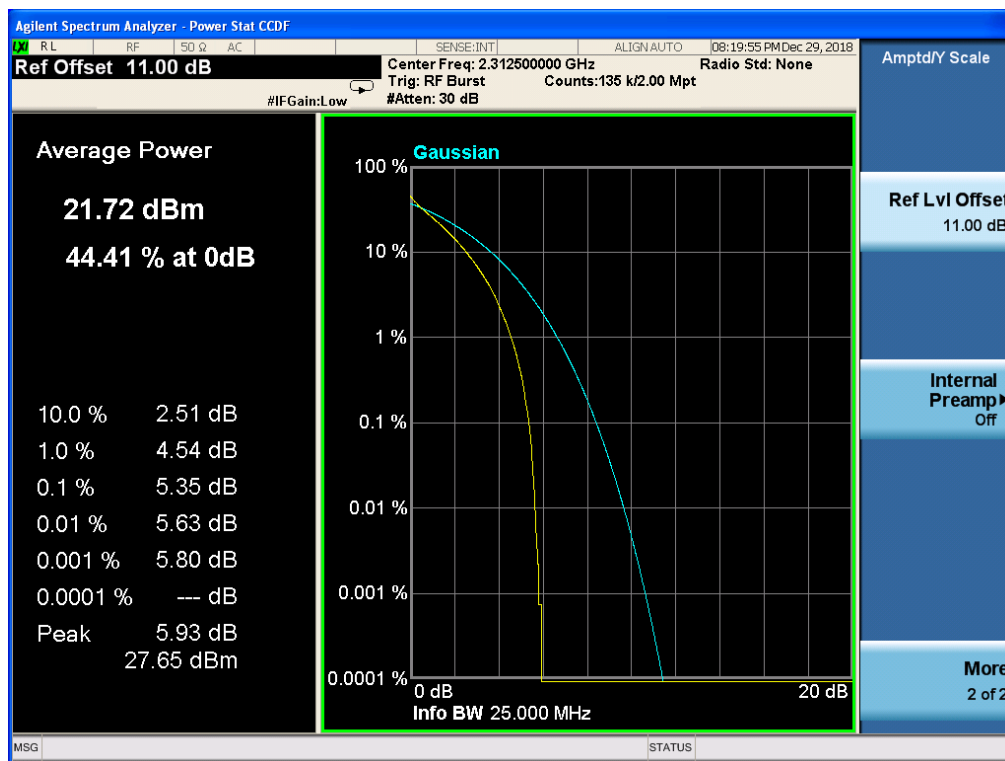
Band 40, UL Channel 38775, UL Frequency 2312.5, BW 5.0, NO. RB 1, RB POS. Low, QPSK



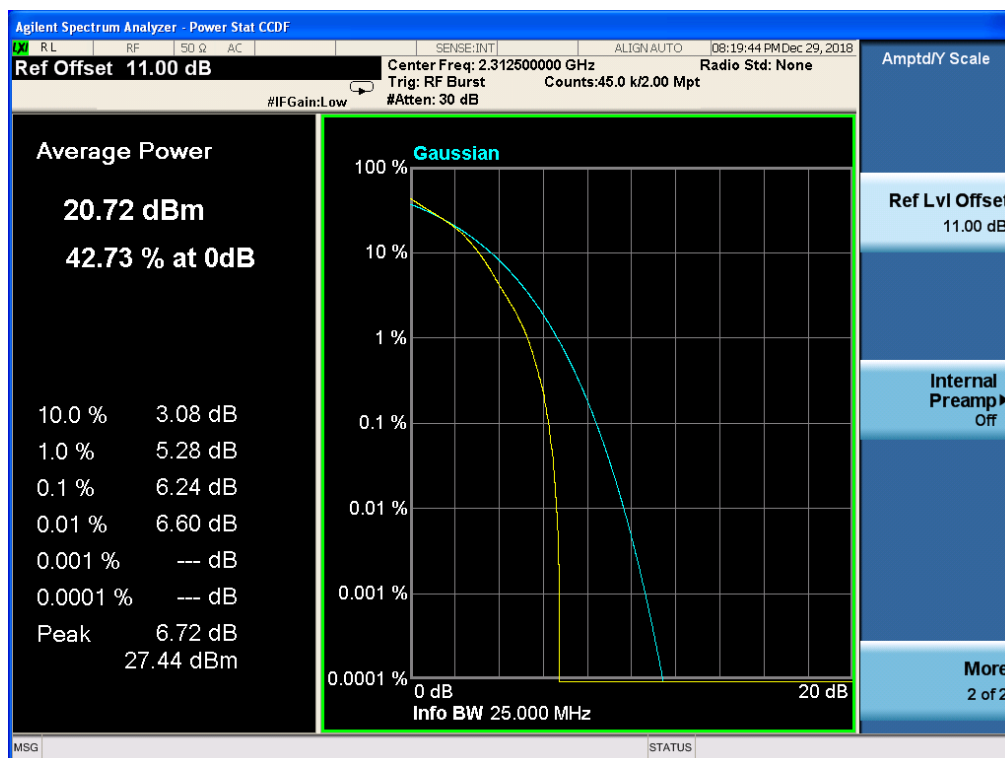
Band 40, UL Channel 38775, UL Frequency 2312.5, BW 5.0, NO. RB 1, RB POS. Low, 16-QAM



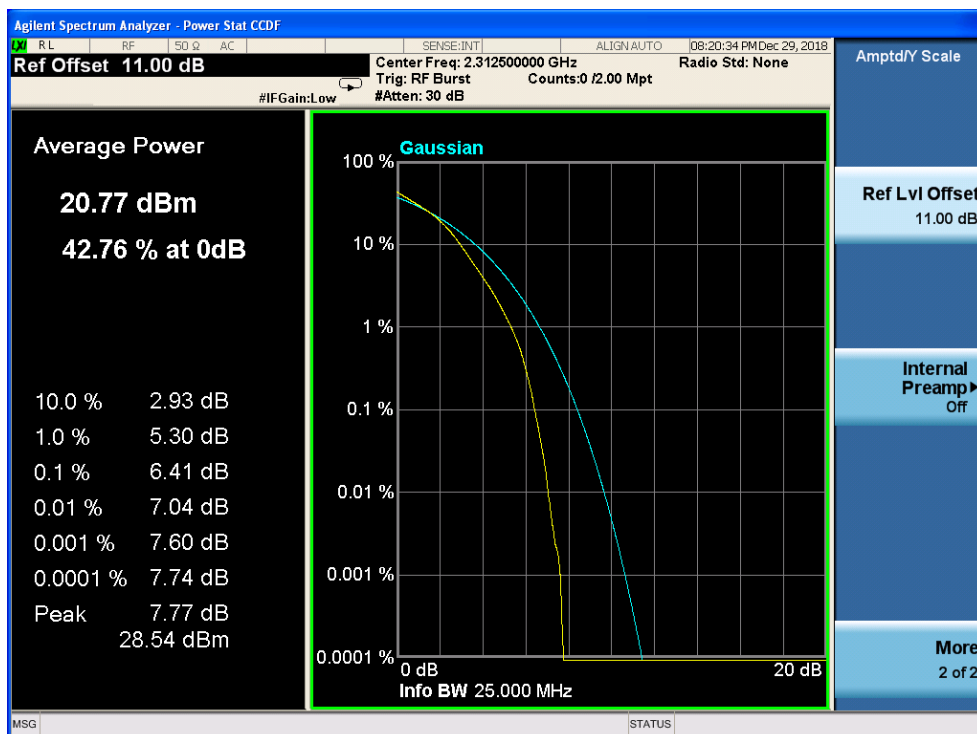
Band 40,UL Channel 38775,UL Frequency 2312.5,BW 10.0,NO. RB 1,RB POS. Low,QPSK



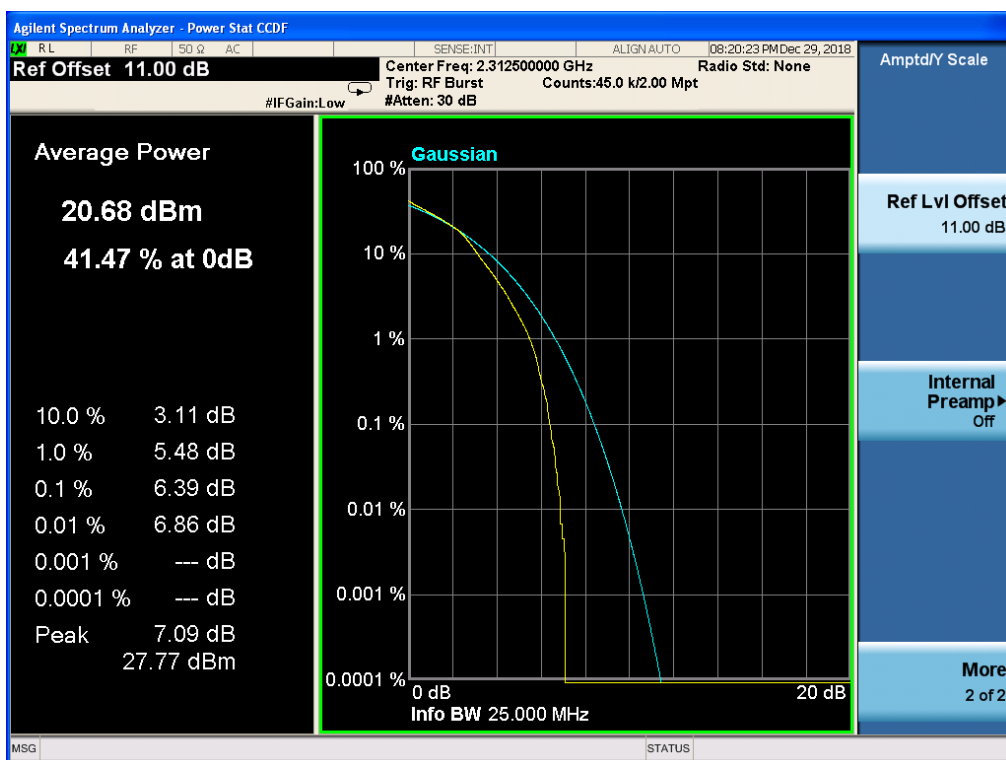
Band 40,UL Channel 38775,UL Frequency 2312.5,BW 10.0,NO. RB 1,RB POS. Low,16-QAM



Band 40,UL Channel 38775,UL Frequency 2312.5,BW 15.0,NO. RB 1,RB POS. Low,QPSK



Band 40,UL Channel 38775,UL Frequency 2312.5,BW 15.0,NO. RB 1,RB POS. Low,16-QAM



11.10 LTE BAND 40(2345-2360MHz)

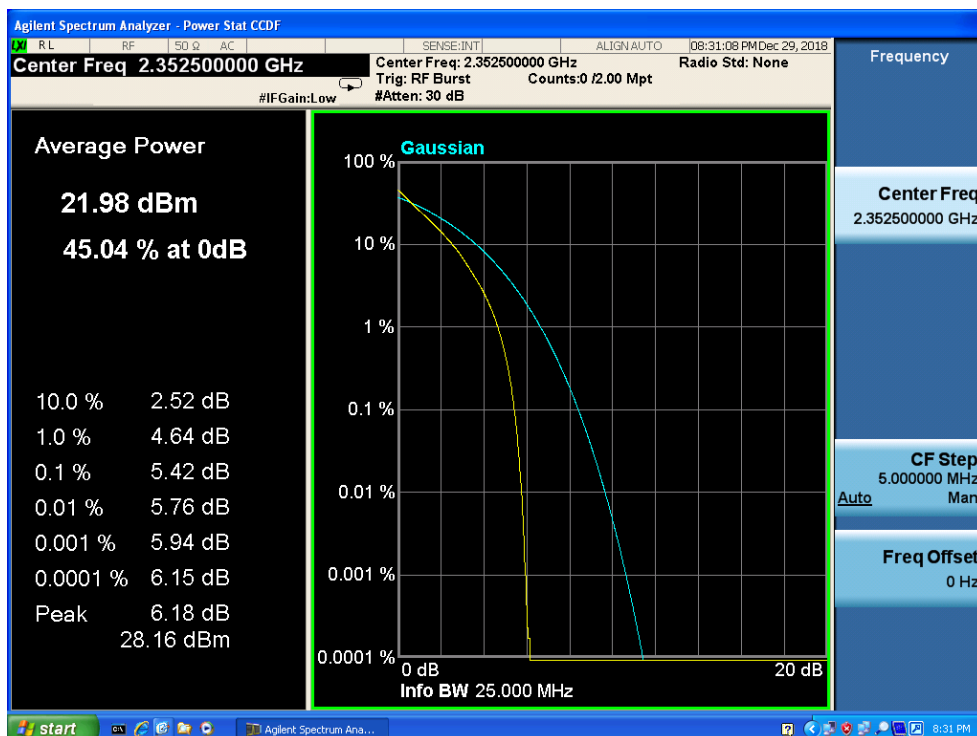
Band 40, UL Channel 39175, UL Frequency 2352.5, BW 5.0, NO. RB 1, RB POS. Low, QPSK



Band 40, UL Channel 39175, UL Frequency 2352.5, BW 5.0, NO. RB 1, RB POS. Low, 16-QAM



Band 40, UL Channel 39175, UL Frequency 2352.5, BW 10.0, NO. RB 1, RB POS. Low, QPSK



Band 40, UL Channel 39175, UL Frequency 2352.5, BW 10.0, NO. RB 1, RB POS. Low, 16-QAM



Band 40, UL Channel 39175, UL Frequency 2352.5, BW 15.0, NO. RB 1, RB POS. Low, QPSK

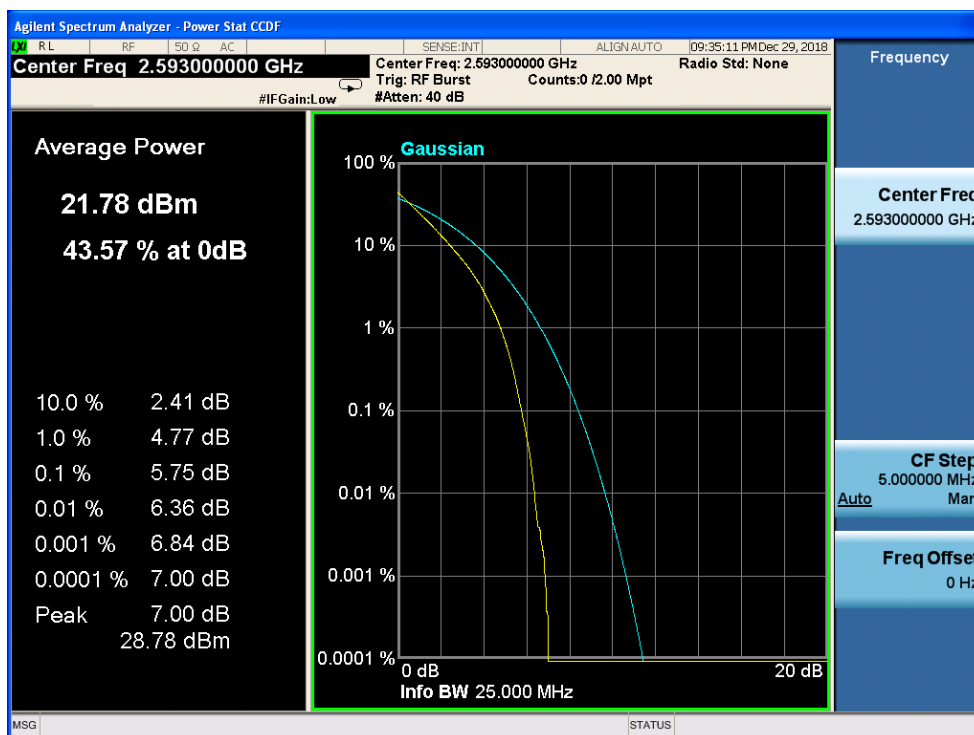


Band 40, UL Channel 39175, UL Frequency 2352.5, BW 15.0, NO. RB 1, RB POS. Low, 16-QAM

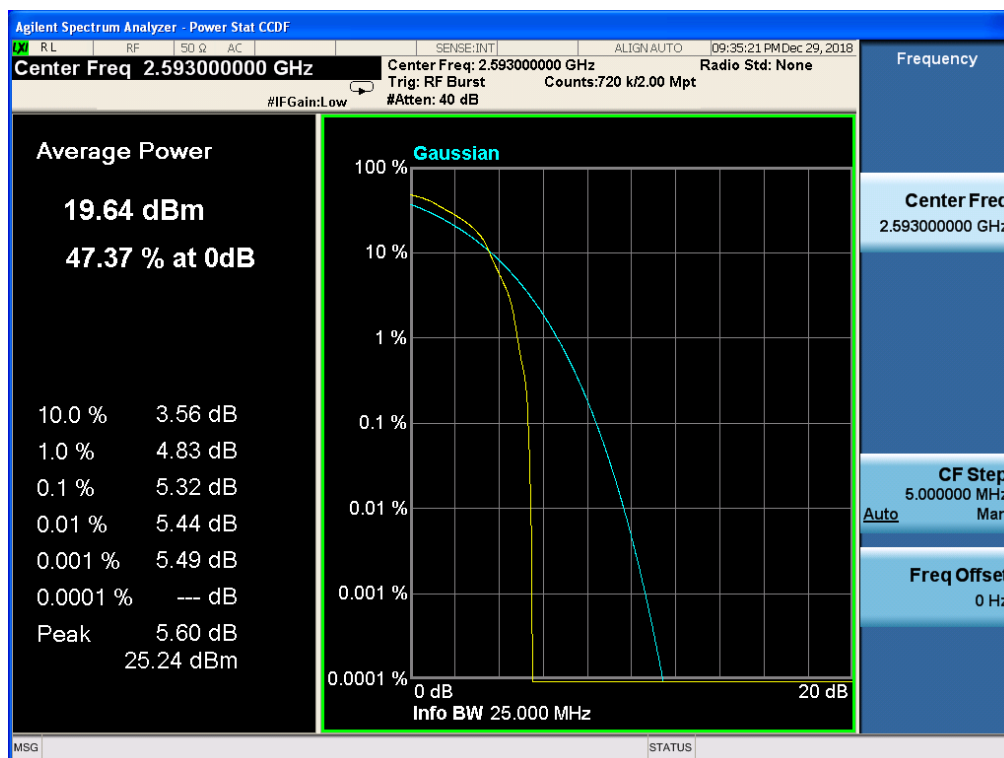


11.11 LTE BAND 41

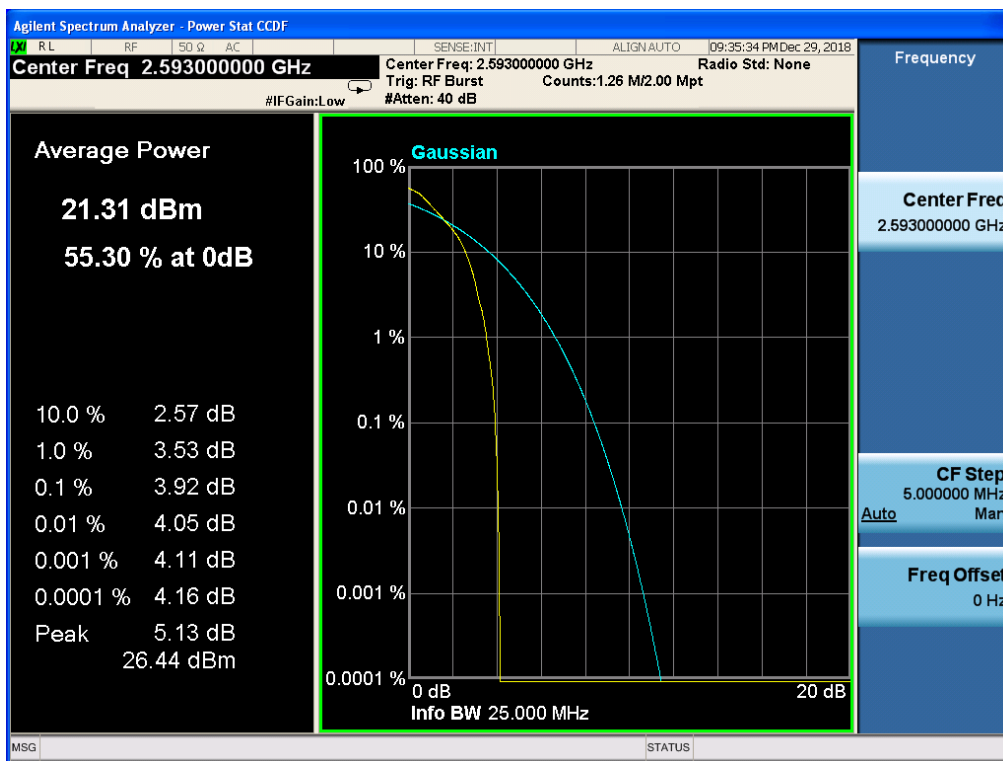
Band 41, UL Channel 40620, UL Frequency 2593.0, BW 5.0, NO. RB 1, RB POS. Low, QPSK



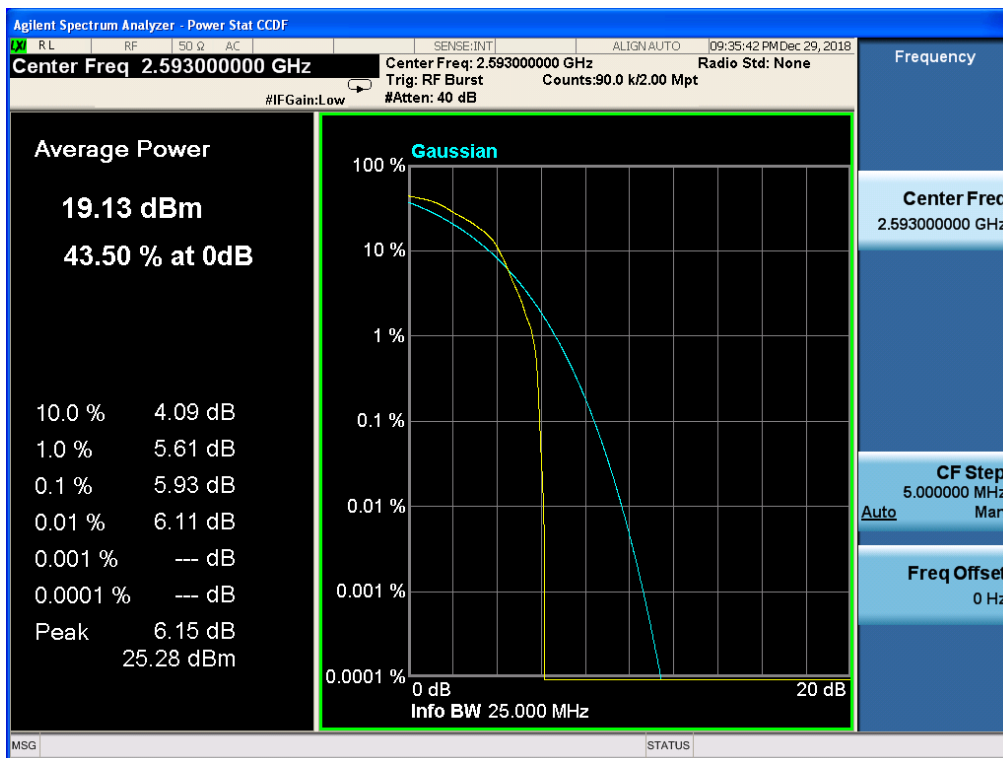
Band 41, UL Channel 40620, UL Frequency 2593.0, BW 5.0, NO. RB 1, RB POS. Low, 16-QAM



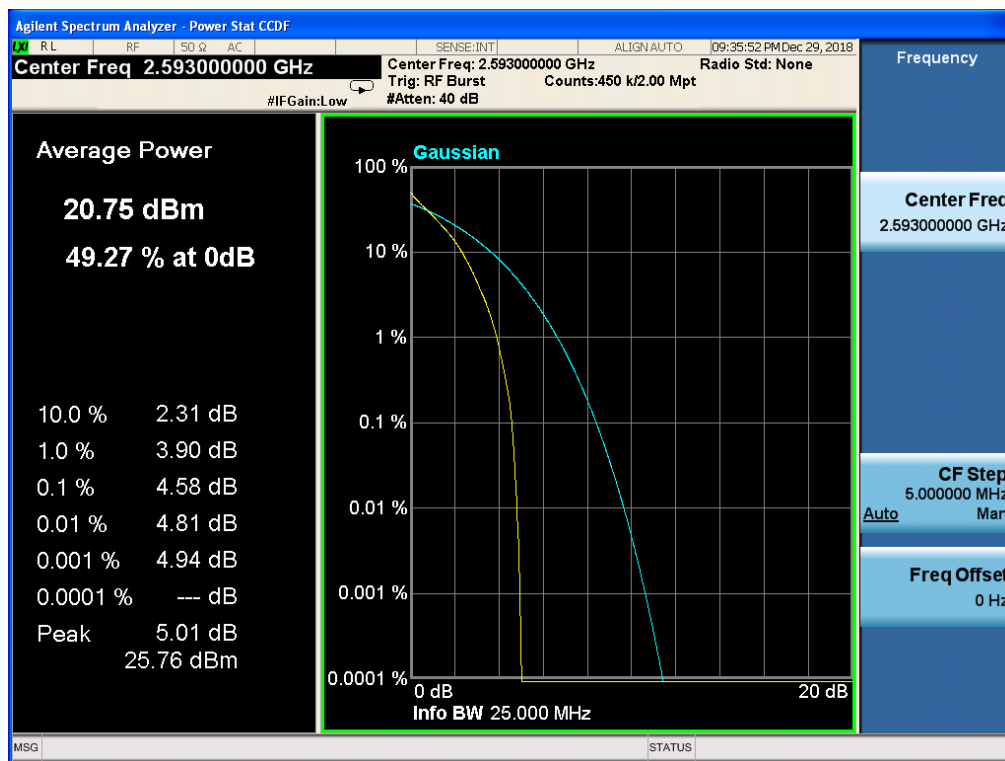
Band 41, UL Channel 40620, UL Frequency 2593.0, BW 10.0, NO. RB 1, RB POS. Low, QPSK



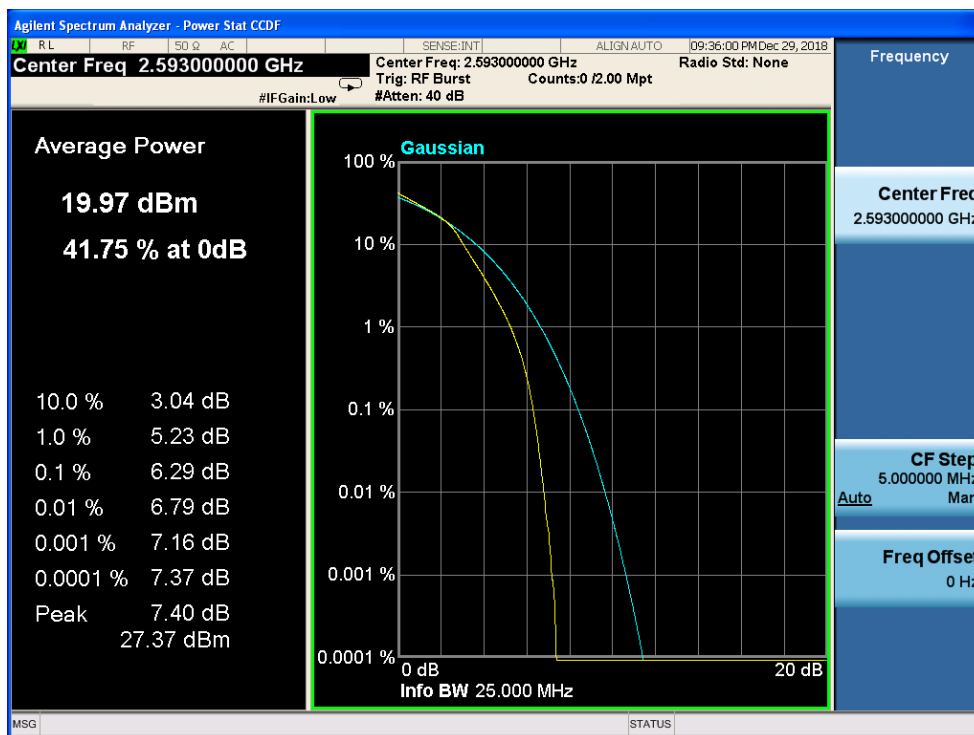
Band 41, UL Channel 40620, UL Frequency 2593.0, BW 10.0, NO. RB 1, RB POS. Low, 16-QAM



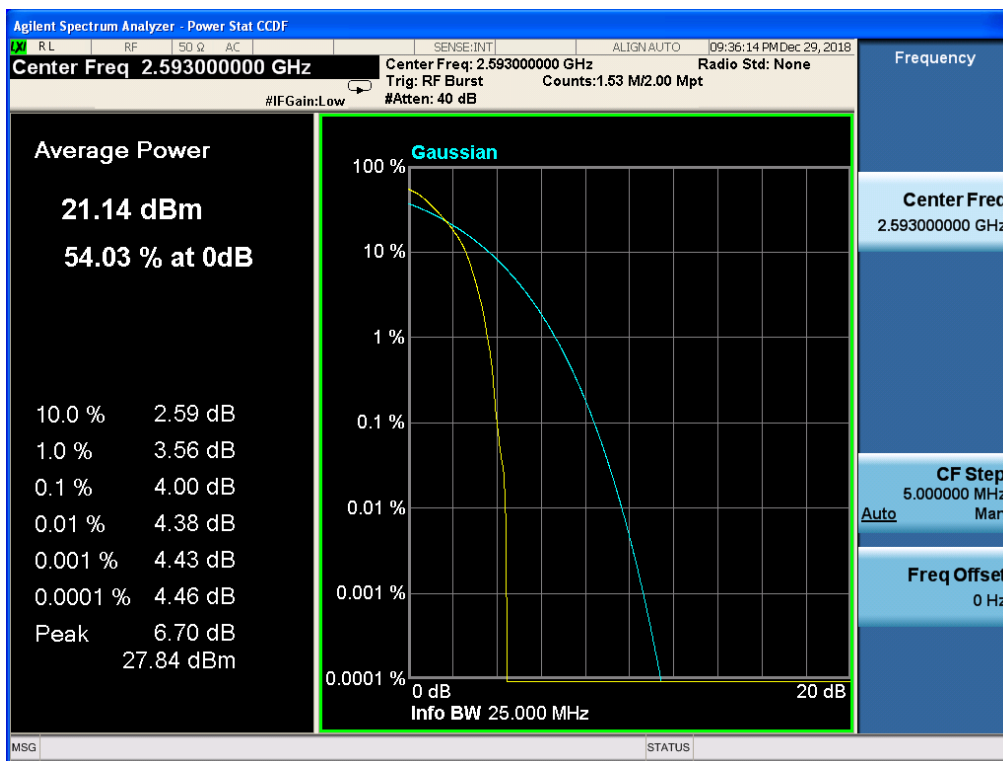
Band 41, UL Channel 40620, UL Frequency 2593.0, BW 15.0, NO. RB 1, RB POS. Low, QPSK



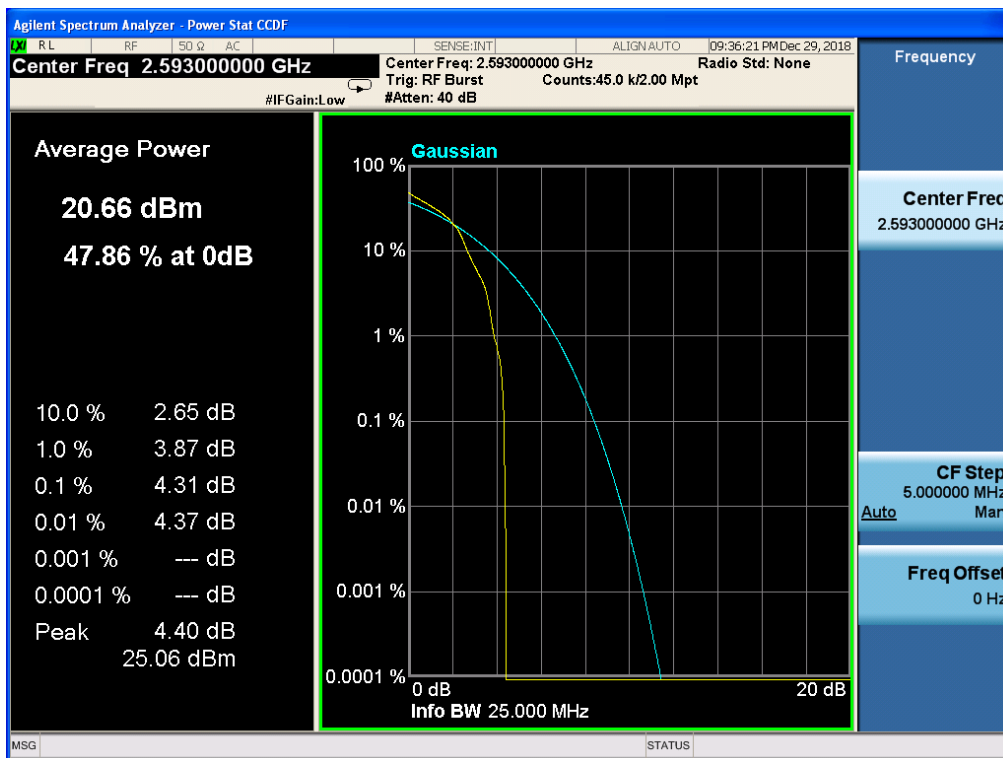
Band 41, UL Channel 40620, UL Frequency 2593.0, BW 15.0, NO. RB 1, RB POS. Low, 16-QAM



Band 41, UL Channel 40620, UL Frequency 2593.0, BW 20.0, NO. RB 1, RB POS. Low, QPSK



Band 41, UL Channel 40620, UL Frequency 2593.0, BW 20.0, NO. RB 1, RB POS. Low, 16-QAM



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