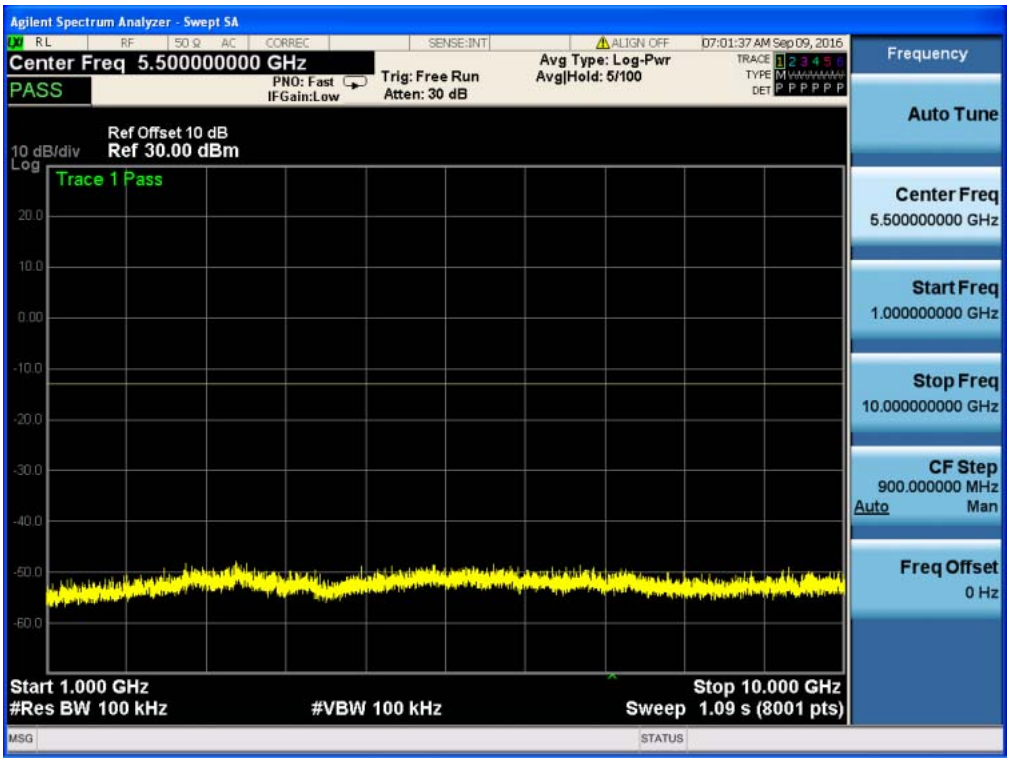
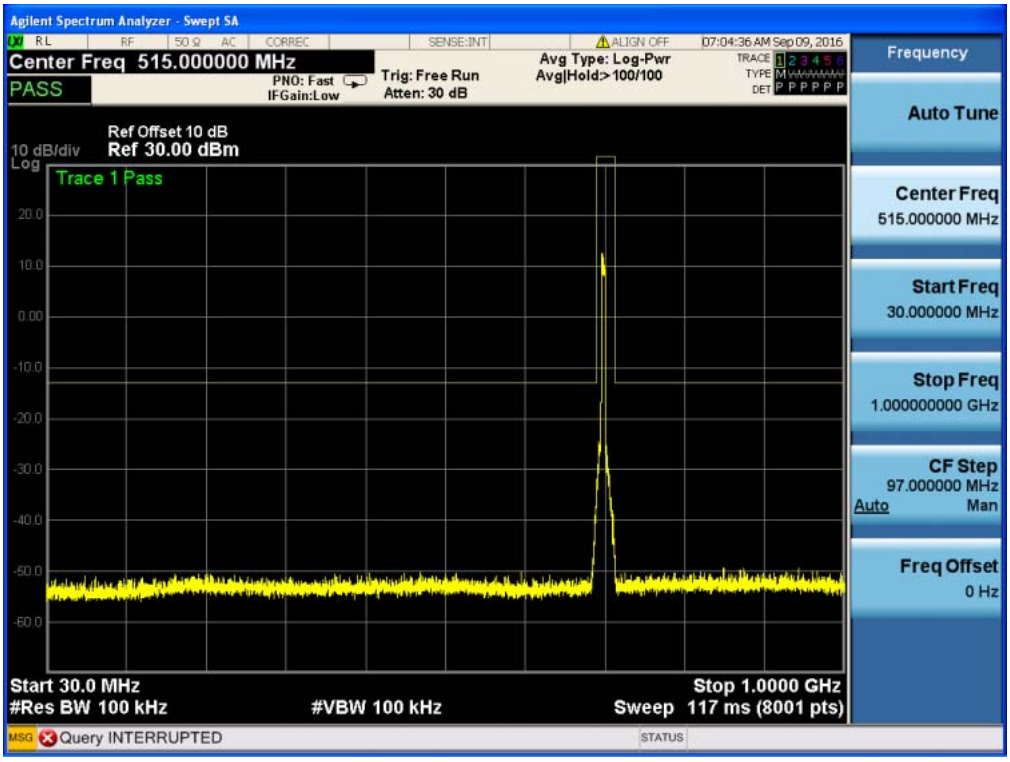
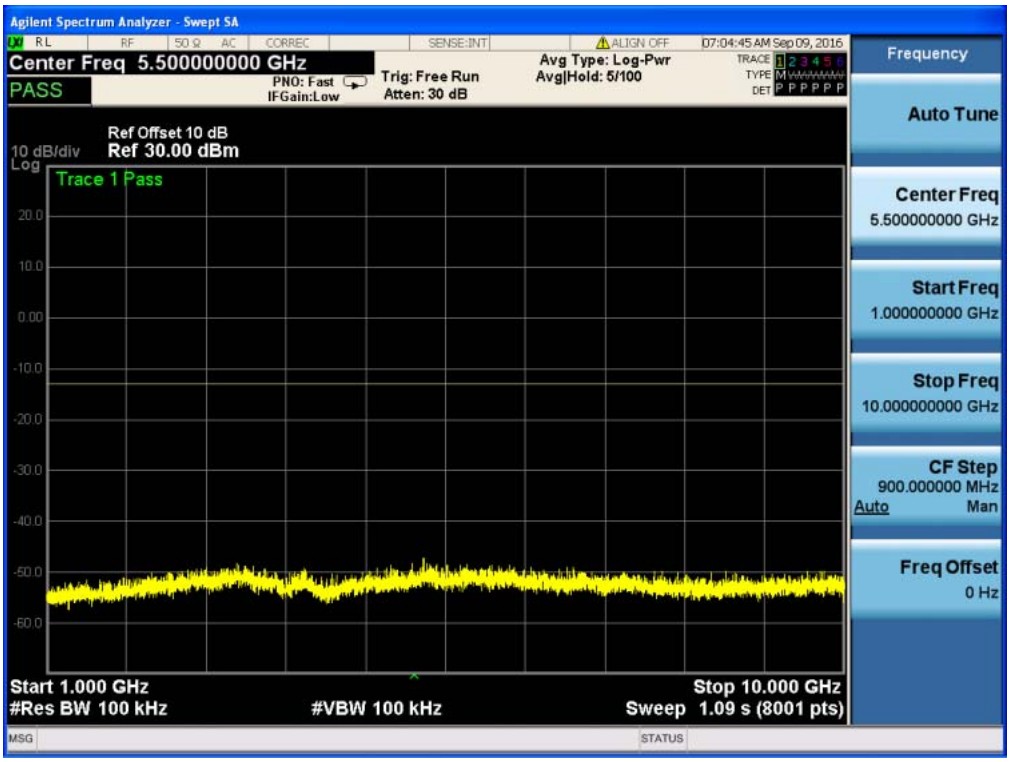
Band 17,UL Channel 23755,UL Frequency 706.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



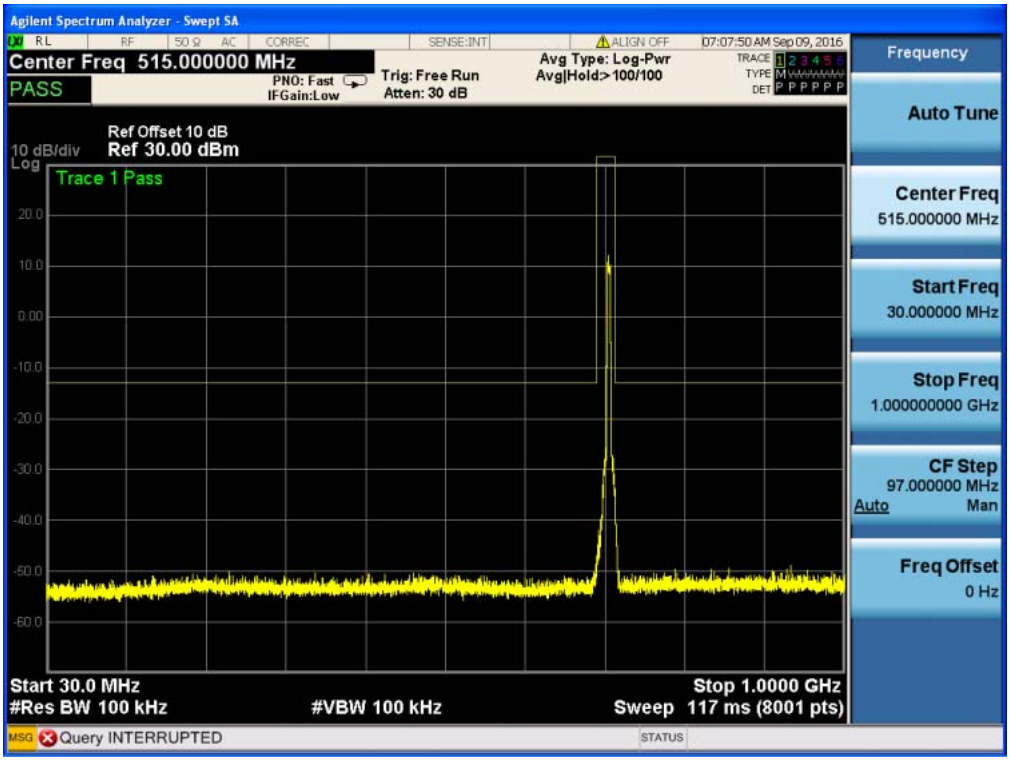
Band 17,UL Channel 23755,UL Frequency 706.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



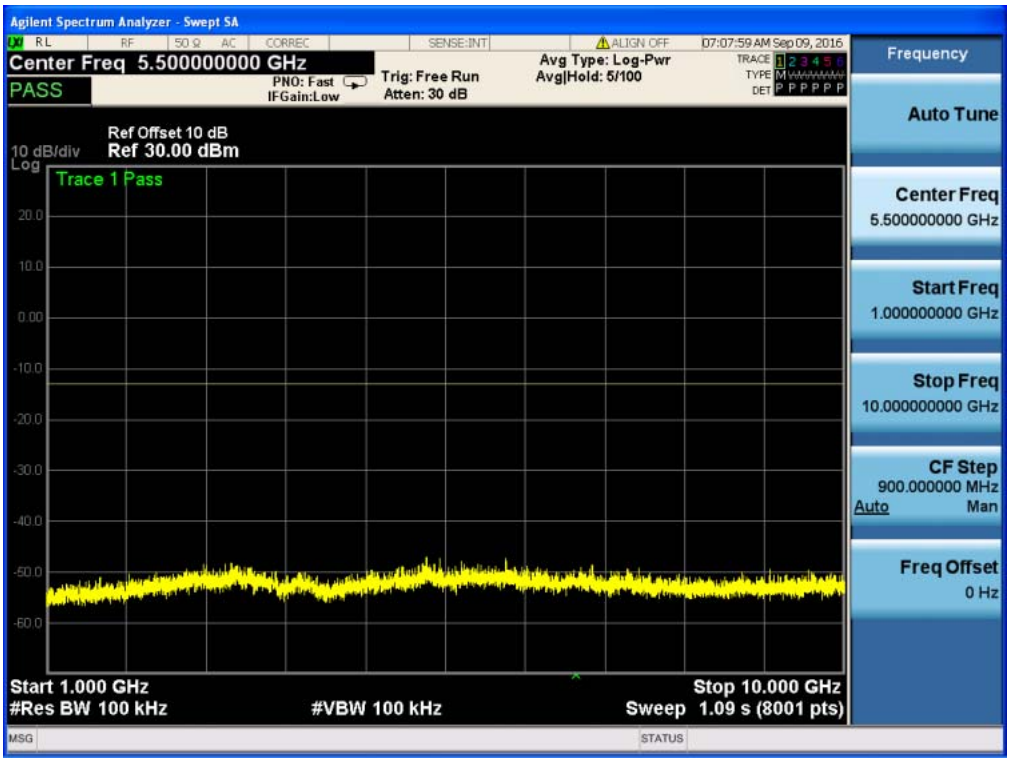
Band 17,UL Channel 23755,UL Frequency 706.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



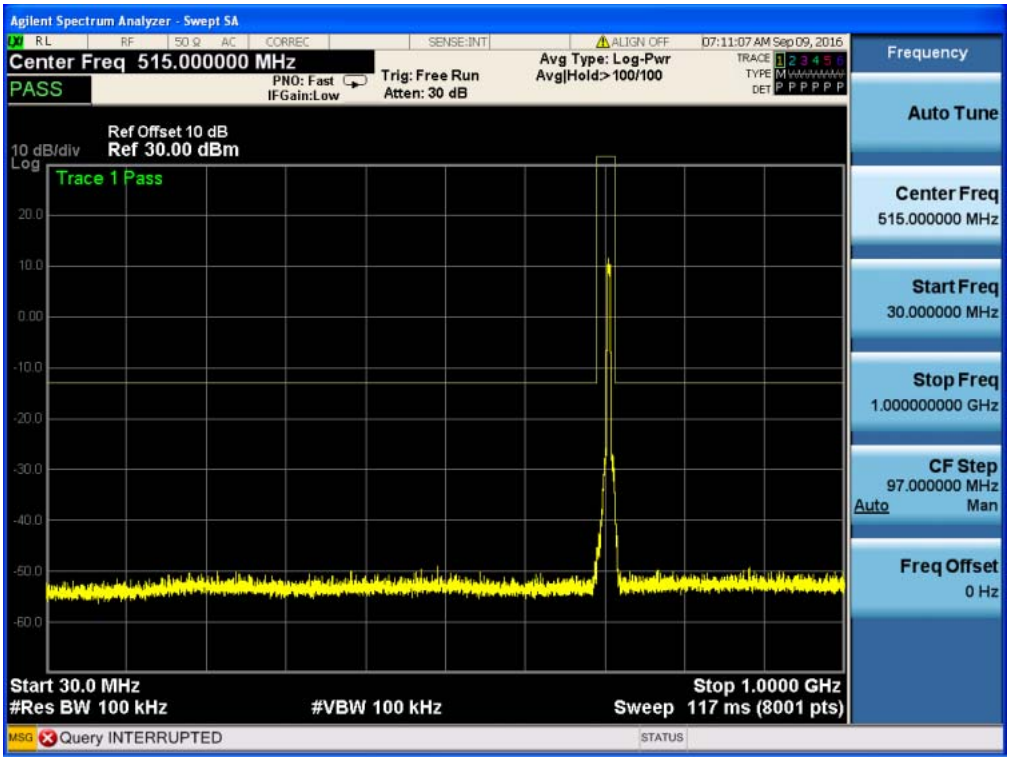
Band 17,UL Channel 23825,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



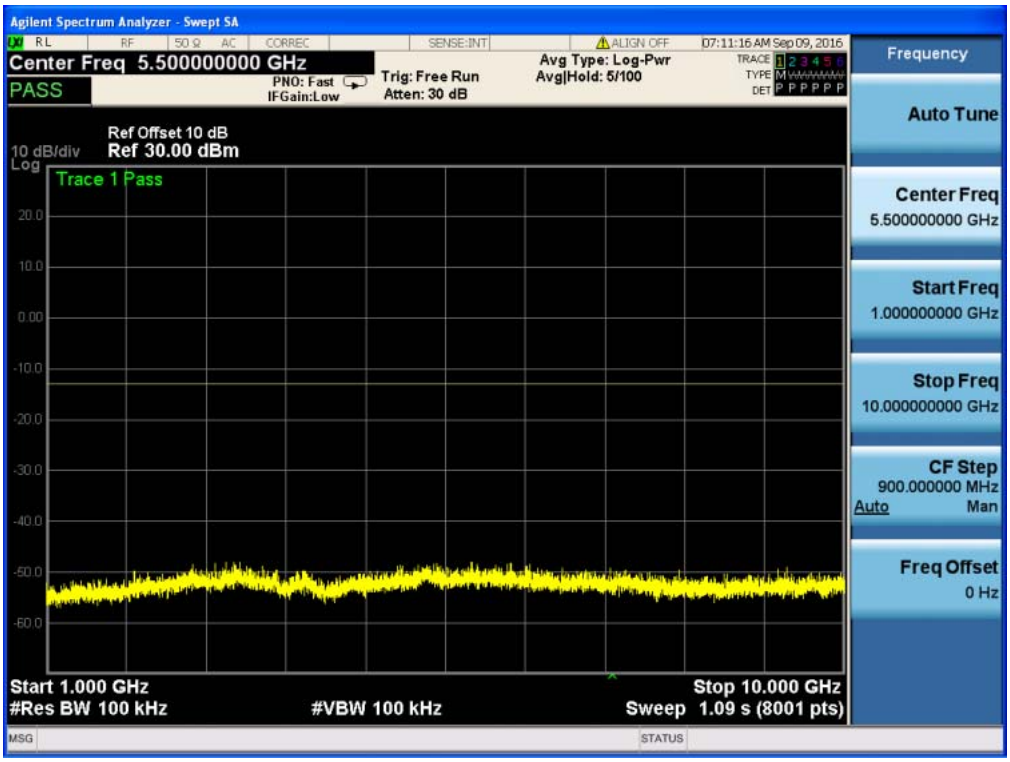
Band 17,UL Channel 23825,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,QPSK



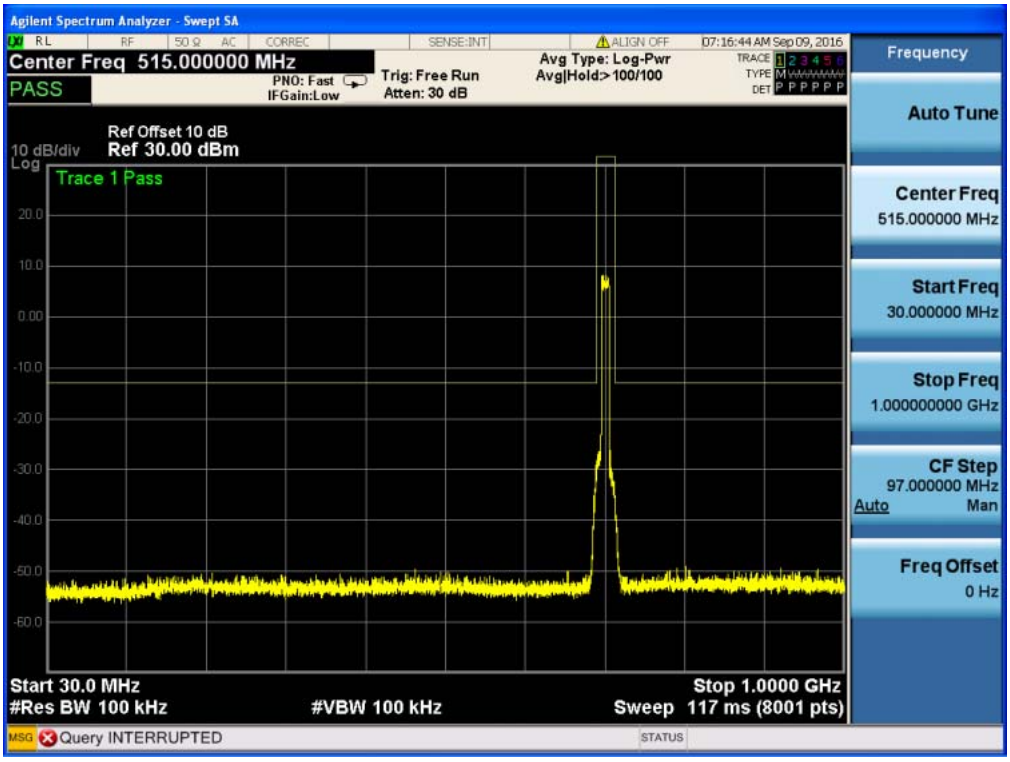
Band 17,UL Channel 23825,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



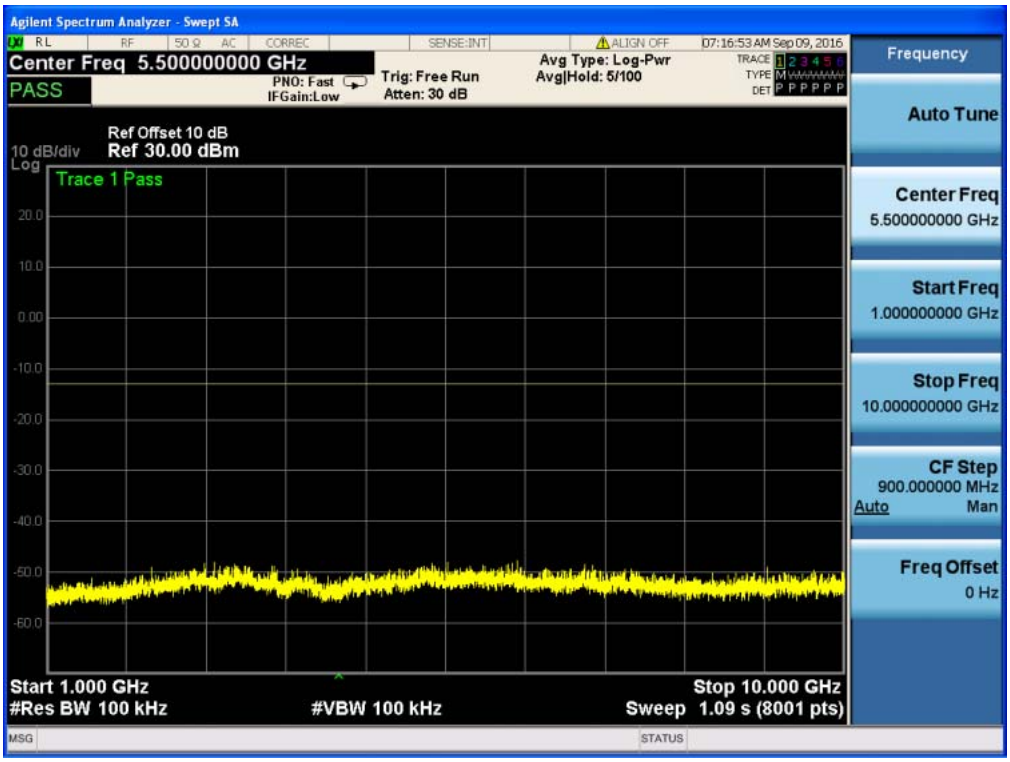
Band 17,UL Channel 23825,UL Frequency 713.5,BW 5.0,NO. RB 25,RB POS. Low,16QAM



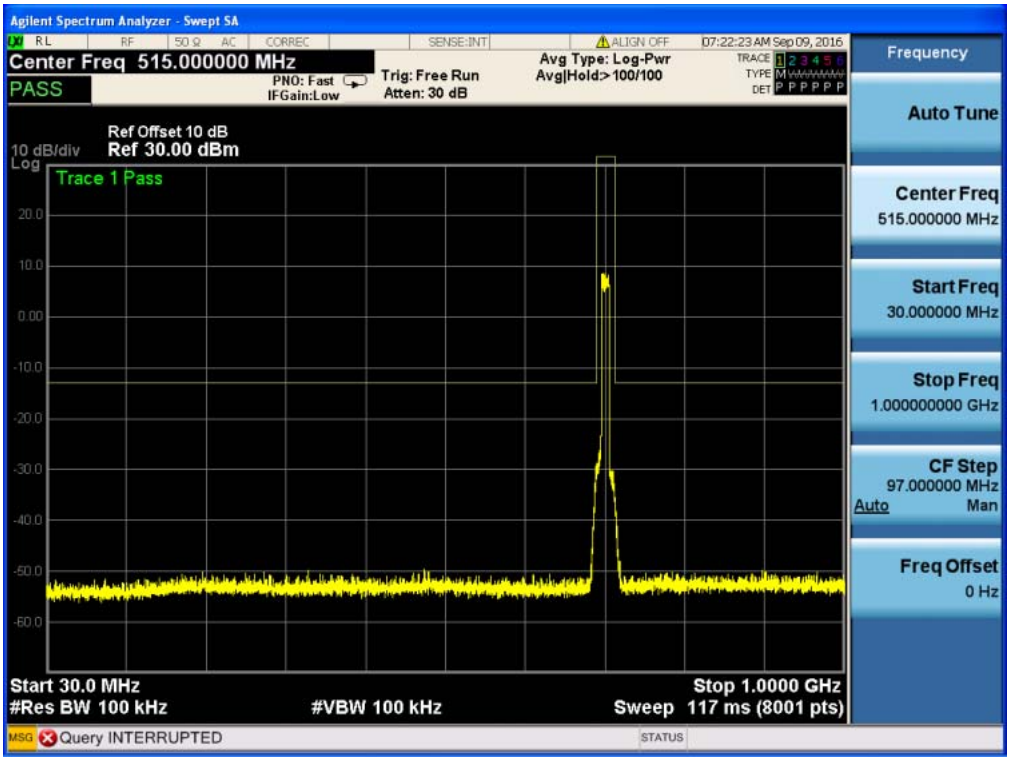
Band 17,UL Channel 23780,UL Frequency 709.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



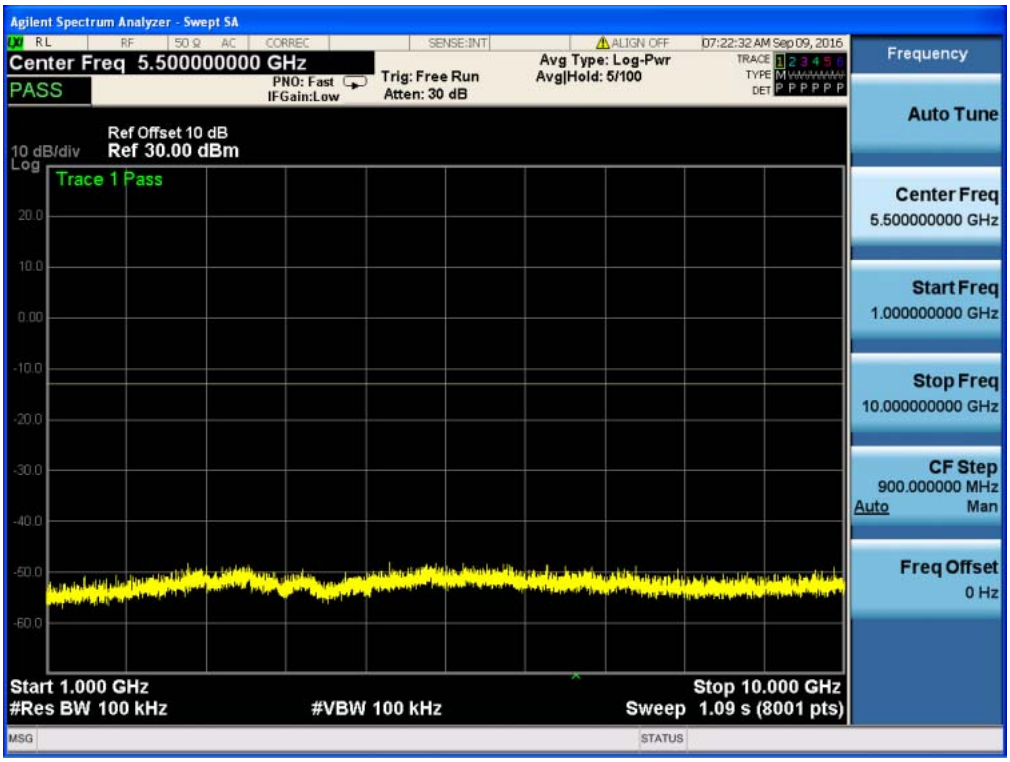
Band 17,UL Channel 23780,UL Frequency 709.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



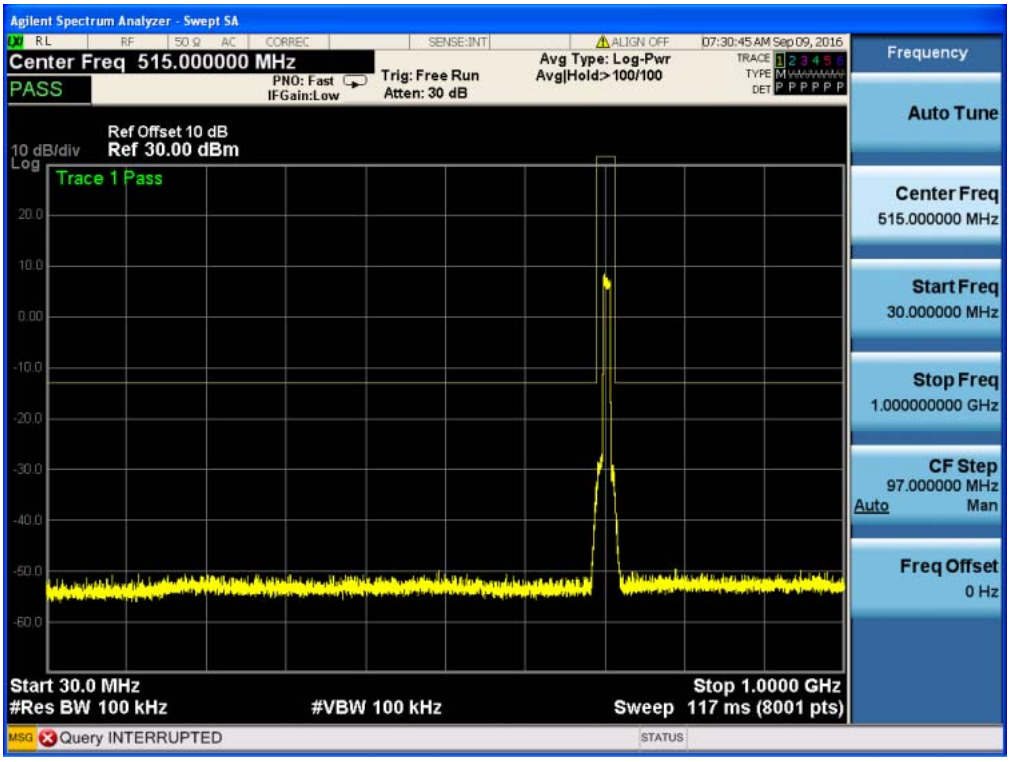
Band 17,UL Channel 23780,UL Frequency 709.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



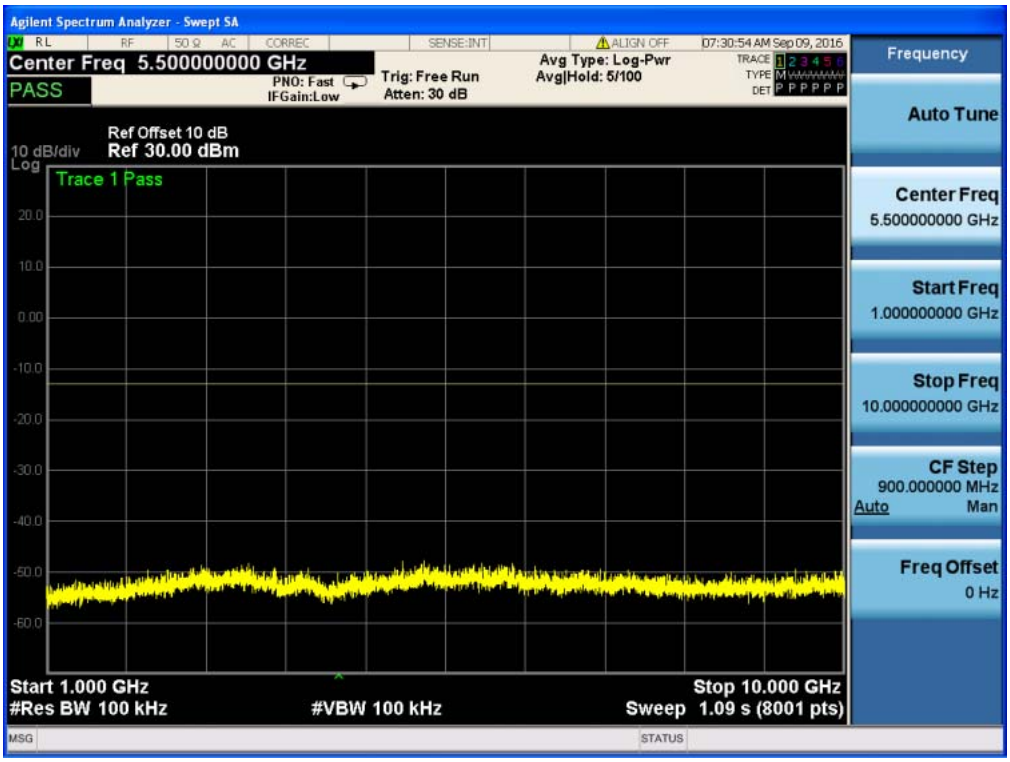
Band 17,UL Channel 23780,UL Frequency 709.0,BW 10.0,NO. RB 50,RB POS. Low,16QAM



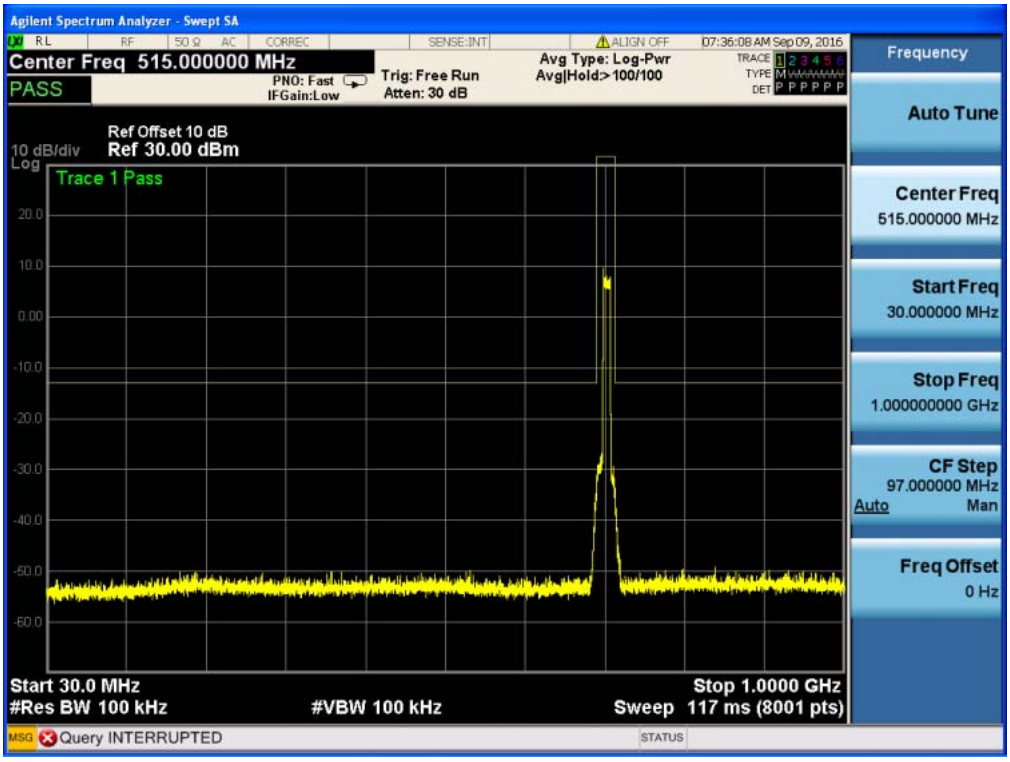
Band 17,UL Channel 23800,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



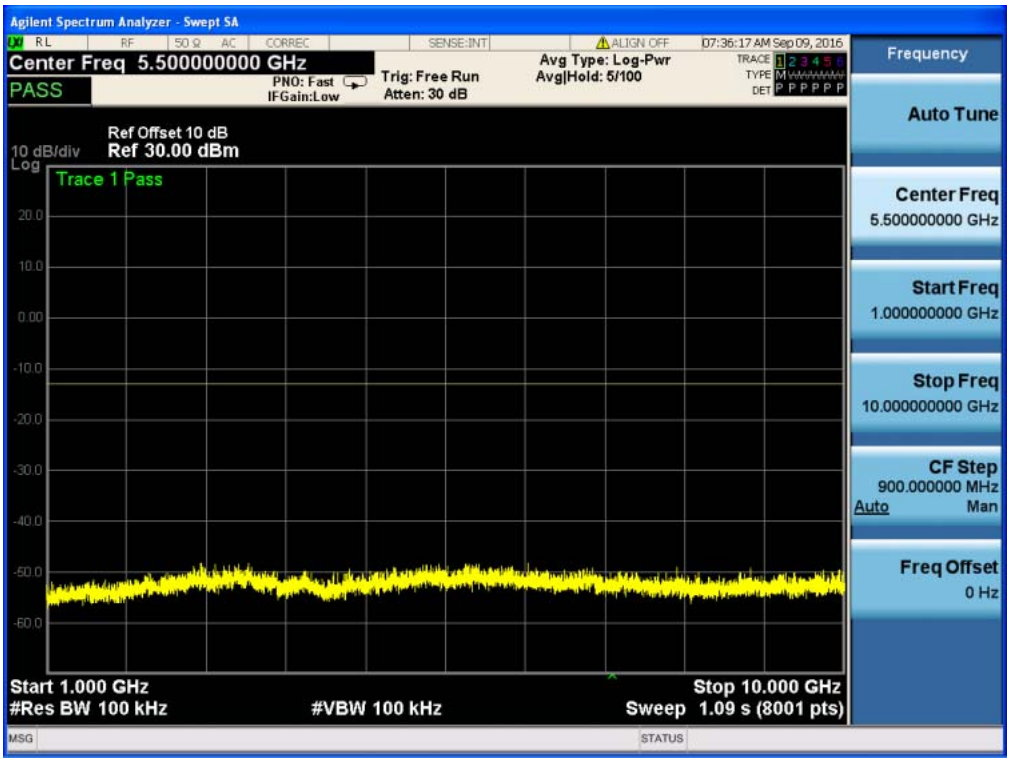
Band 17,UL Channel 23800,UL Frequency 711.0,BW 10.0,NO. RB 50,RB POS. Low,QPSK



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



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



9. Radiated Spurious Emission

9.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

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

LIMITS:

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

TEST PROCEDURE

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

MODES TESTED

LTE Band 2
LTE Band 4
LTE Band 7
LTE Band 17

RESULTS

9.1.2 LTE BAND 2

EIRP POWER FOR LTE BAND 2

Radiated Power (EIRP) for Band 2										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna (dB)	Max. Average (dBm)	Max. Average (mW)		
1.4MHz Band QPSK	6/0	1850.7	-25.67	3.76	-48.53	-4.72	23.82	240.991	Horizontal	Pass
		1880	-28.24	3.91	-50.53	-4.59	22.97	198.153	Horizontal	Pass
		1909.3	-27.61	3.93	-50.53	-4.38	23.37	217.270	Horizontal	Pass
1.4MHz Band 16 QAM	6/0	1850.7	-25.72	3.76	-48.53	-4.72	23.77	238.232	Horizontal	Pass
		1880	-28.03	3.91	-50.53	-4.59	23.18	207.970	Horizontal	Pass
		1909.3	-28.19	3.93	-50.53	-4.38	22.79	190.108	Horizontal	Pass
3.0MHz Band QPSK	15/0	1851.5	-26.48	3.77	-48.49	-4.72	22.96	197.697	Horizontal	Pass
		1880	-28.03	3.91	-50.51	-4.59	23.16	207.014	Horizontal	Pass
		1908.5	-27.49	3.94	-50.52	-4.38	23.47	222.331	Horizontal	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-25.67	3.77	-48.49	-4.7	23.75	237.137	Horizontal	Pass
		1880	-27.81	3.91	-50.51	-4.53	23.32	214.783	Horizontal	Pass
		1908.5	-27.94	3.94	-50.52	-4.35	22.99	199.067	Horizontal	Pass
5.0MHz Band QPSK	25/0	1851.5	-25.37	3.77	-48.49	-4.7	24.05	254.097	Horizontal	Pass
		1880	-27.66	3.91	-50.51	-4.53	23.47	222.331	Horizontal	Pass
		1908.5	-27.78	3.94	-50.52	-4.35	23.15	206.538	Horizontal	Pass
5.0MHz Band 16 QAM	25/0	1851.5	-26.21	3.77	-48.49	-4.72	23.23	210.378	Horizontal	Pass
		1880	-28.24	3.91	-50.51	-4.59	22.95	197.242	Horizontal	Pass
		1908.5	-27.6	3.94	-50.52	-4.38	23.36	216.770	Horizontal	Pass
10.0MHz Band QPSK	50/0	1855	-25.57	3.79	-48.49	-4.72	23.85	242.661	Horizontal	Pass
		1880	-27.68	3.95	-50.51	-4.59	23.47	222.331	Horizontal	Pass
		1905	-28	3.97	-50.52	-4.38	22.93	196.336	Horizontal	Pass
10.0MHz Band 16 QAM	50/0	1855	-26.6	3.79	-48.49	-4.72	22.82	191.426	Horizontal	Pass
		1880	-28.19	3.95	-50.51	-4.59	22.96	197.697	Horizontal	Pass
		1905	-27.43	3.97	-50.52	-4.38	23.5	223.872	Horizontal	Pass
15.0MHz Band QPSK	75/0	1857.5	-25.6	3.79	-48.49	-4.72	23.82	240.991	Horizontal	Pass
		1880	-27.84	3.95	-50.51	-4.59	23.31	214.289	Horizontal	Pass
		1902.5	-28.07	3.97	-50.52	-4.38	22.86	193.197	Horizontal	Pass
15.0MHz Band 16 QAM	75/0	1857.5	-26.41	3.79	-48.49	-4.72	23.01	199.986	Horizontal	Pass
		1880	-27.6	3.95	-50.51	-4.59	23.55	226.464	Horizontal	Pass
		1902.5	-27.46	3.97	-50.52	-4.38	23.47	222.331	Horizontal	Pass
20.0MHz Band QPSK	100/0	1860	-26.27	3.81	-48.42	-4.68	23.02	200.447	Horizontal	Pass
		1880	-27.87	3.96	-50.47	-4.55	23.19	208.449	Horizontal	Pass
		1900	-27.48	4	-50.46	-4.33	23.31	214.289	Horizontal	Pass
20.0MHz Band 16 QAM	100/0	1860	-26.12	3.81	-48.42	-4.68	23.17	207.491	Horizontal	Pass
		1880	-27.84	3.96	-50.47	-4.55	23.22	209.894	Horizontal	Pass
		1900	-27.48	4	-50.46	-4.33	23.31	214.289	Horizontal	Pass

Radiated Power (EIRP) for Band 2										
Mode	RB/ RB SIZE	Frequency	Result							Conclusion
			PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1850.7	-26.53	3.8	-48.53	-4.72	22.96	197.697	Vertical	Pass
		1880	-29.1	3.9	-50.53	-4.59	22.11	162.555	Vertical	Pass
		1909.3	-28.47	3.9	-50.53	-4.38	22.51	178.238	Vertical	Pass
1.4MHz Band 16 QAM	6/0	1850.7	-26.58	3.8	-48.53	-4.72	22.91	195.434	Vertical	Pass
		1880	-28.89	3.9	-50.53	-4.59	22.32	170.608	Vertical	Pass
		1909.3	-29.05	3.9	-50.53	-4.38	21.93	155.955	Vertical	Pass
3.0MHz Band QPSK	15/0	1851.5	-27.34	3.8	-48.49	-4.72	22.1	162.181	Vertical	Pass
		1880	-28.89	3.9	-50.51	-4.59	22.3	169.824	Vertical	Pass
		1908.5	-28.35	3.9	-50.52	-4.38	22.61	182.390	Vertical	Pass
3.0MHz Band 16 QAM	15/0	1851.5	-26.53	3.8	-48.49	-4.7	22.89	194.536	Vertical	Pass
		1880	-28.67	3.9	-50.51	-4.53	22.46	176.198	Vertical	Pass
		1908.5	-28.8	3.9	-50.52	-4.35	22.13	163.305	Vertical	Pass
5.0MHz Band QPSK	25/0	1851.5	-26.23	3.8	-48.49	-4.7	23.19	208.449	Vertical	Pass
		1880	-28.52	3.9	-50.51	-4.53	22.61	182.390	Vertical	Pass
		1908.5	-28.64	3.9	-50.52	-4.35	22.29	169.434	Vertical	Pass
5.0MHz Band 16 QAM	25/0	1851.5	-27.07	3.8	-48.49	-4.72	22.37	172.584	Vertical	Pass
		1880	-29.1	3.9	-50.51	-4.59	22.09	161.808	Vertical	Pass
		1908.5	-28.46	3.9	-50.52	-4.38	22.5	177.828	Vertical	Pass
10.0MHz Band QPSK	50/0	1855	-26.43	3.8	-48.49	-4.72	22.99	199.067	Vertical	Pass
		1880	-28.54	4	-50.51	-4.59	22.61	182.390	Vertical	Pass
		1905	-28.86	4	-50.52	-4.38	22.07	161.065	Vertical	Pass
10.0MHz Band 16 QAM	50/0	1855	-27.46	3.8	-48.49	-4.72	21.96	157.036	Vertical	Pass
		1880	-29.05	4	-50.51	-4.59	22.1	162.181	Vertical	Pass
		1905	-28.29	4	-50.52	-4.38	22.64	183.654	Vertical	Pass
15.0MHz Band QPSK	75/0	1857.5	-26.46	3.8	-48.49	-4.72	22.96	197.697	Vertical	Pass
		1880	-28.7	4	-50.51	-4.59	22.45	175.792	Vertical	Pass
		1902.5	-28.93	4	-50.52	-4.38	22	158.489	Vertical	Pass
15.0MHz Band 16 QAM	75/0	1857.5	-27.27	3.8	-48.49	-4.72	22.15	164.059	Vertical	Pass
		1880	-28.46	4	-50.51	-4.59	22.69	185.780	Vertical	Pass
		1902.5	-28.32	4	-50.52	-4.38	22.61	182.390	Vertical	Pass
20.0MHz Band QPSK	100/0	1860	-27.13	3.8	-48.42	-4.68	22.16	164.437	Vertical	Pass
		1880	-28.73	4	-50.47	-4.55	22.33	171.002	Vertical	Pass
		1900	-28.34	4	-50.46	-4.33	22.45	175.792	Vertical	Pass
20.0MHz Band 16 QAM	100/0	1860	-26.98	3.8	-48.42	-4.68	22.31	170.216	Vertical	Pass
		1880	-28.7	4	-50.47	-4.55	22.36	172.187	Vertical	Pass
		1900	-28.34	4	-50.46	-4.33	22.45	175.792	Vertical	Pass

9.1.3 LTE BAND 4

EIRP POWER FOR LTE BAND 4

Radiated Power (EIRP) for Band 4										
Mode	RB/RB SIZE	Frequency	Result						Polarization Of Max. ERP	Conclusion
			PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)		
1.4MHz Band QPSK	6/0	1710.7	-27.87	3.12	-49.17	-5.36	23.54	225.944	Horizontal	Pass
		1732.5	-30.44	3.27	-51.17	-5.23	22.69	185.780	Horizontal	Pass
		1754.3	-29.81	3.29	-51.17	-5.02	23.09	203.704	Horizontal	Pass
1.4MHz Band 16	6/0	1710.7	-27.92	3.12	-49.17	-5.36	23.49	223.357	Horizontal	Pass
		1732.5	-30.23	3.27	-51.17	-5.23	22.9	194.984	Horizontal	Pass
		1754.3	-30.39	3.29	-51.17	-5.02	22.51	178.238	Horizontal	Pass
3.0MHz Band QPSK	15/0	1711.5	-28.68	3.13	-49.13	-5.36	22.68	185.353	Horizontal	Pass
		1732.5	-30.23	3.27	-51.15	-5.23	22.88	194.089	Horizontal	Pass
		1753.5	-29.69	3.3	-51.16	-5.02	23.19	208.449	Horizontal	Pass
3.0MHz Band 16	15/0	1711.5	-27.87	3.13	-49.13	-5.34	23.47	222.331	Horizontal	Pass
		1732.5	-30.01	3.27	-51.15	-5.17	23.04	201.372	Horizontal	Pass
		1753.5	-30.14	3.3	-51.16	-4.99	22.71	186.638	Horizontal	Pass
5.0MHz Band QPSK	25/0	1712.5	-27.57	3.13	-49.13	-5.34	23.77	238.232	Horizontal	Pass
		1732.5	-29.86	3.27	-51.15	-5.17	23.19	208.449	Horizontal	Pass
		1752.5	-29.98	3.3	-51.16	-4.99	22.87	193.642	Horizontal	Pass
5.0MHz Band 16	25/0	1712.5	-28.41	3.13	-49.13	-5.36	22.95	197.242	Horizontal	Pass
		1732.5	-30.44	3.27	-51.15	-5.23	22.67	184.927	Horizontal	Pass
		1752.5	-29.8	3.3	-51.16	-5.02	23.08	203.236	Horizontal	Pass
10.0MHz Band QPSK	50/0	1715	-27.77	3.15	-49.13	-5.36	23.57	227.510	Horizontal	Pass
		1732.5	-29.88	3.31	-51.15	-5.23	23.19	208.449	Horizontal	Pass
		1750	-30.2	3.33	-51.16	-5.02	22.65	184.077	Horizontal	Pass
10.0MHz Band 16	50/0	1715	-28.8	3.15	-49.13	-5.36	22.54	179.473	Horizontal	Pass
		1732.5	-30.39	3.31	-51.15	-5.23	22.68	185.353	Horizontal	Pass
		1750	-29.63	3.33	-51.16	-5.02	23.22	209.894	Horizontal	Pass
15.0MHz Band QPSK	75/0	1717.5	-27.8	3.15	-49.13	-5.36	23.54	225.944	Horizontal	Pass
		1732.5	-30.04	3.31	-51.15	-5.23	23.03	200.909	Horizontal	Pass
		1747.5	-30.27	3.33	-51.16	-5.02	22.58	181.134	Horizontal	Pass
15.0MHz Band 16	75/0	1717.5	-28.61	3.15	-49.13	-5.36	22.73	187.499	Horizontal	Pass
		1732.5	-29.8	3.31	-51.15	-5.23	23.27	212.324	Horizontal	Pass
		1747.5	-29.66	3.33	-51.16	-5.02	23.19	208.449	Horizontal	Pass
20.0MHz Band QPSK	100/0	1720	-28.47	3.17	-49.06	-5.32	22.74	187.932	Horizontal	Pass
		1732.5	-30.07	3.32	-51.11	-5.19	22.91	195.434	Horizontal	Pass
		1745	-29.68	3.36	-51.1	-4.97	23.03	200.909	Horizontal	Pass
20.0MHz Band 16	100/0	1720	-28.32	3.17	-49.06	-5.32	22.89	194.536	Horizontal	Pass
		1732.5	-30.04	3.32	-51.11	-5.19	22.94	196.789	Horizontal	Pass
		1745	-29.68	3.36	-51.1	-4.97	23.03	200.909	Horizontal	Pass

Radiated Power (EIRP) for Band 4										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
1.4MHz Band QPSK	6/0	1710.7	-28.26	3.12	-49.17	-5.36	23.15	206.538	Vertical	Pass
		1732.5	-30.83	3.27	-51.17	-5.23	22.3	169.824	Vertical	Pass
		1754.3	-30.2	3.29	-51.17	-5.02	22.7	186.209	Vertical	Pass
1.4MHz Band 16	6/0	1710.7	-28.31	3.12	-49.17	-5.36	23.1	204.174	Vertical	Pass
		1732.5	-30.62	3.27	-51.17	-5.23	22.51	178.238	Vertical	Pass
		1754.3	-30.78	3.29	-51.17	-5.02	22.12	162.930	Vertical	Pass
3.0MHz Band QPSK	15/0	1711.5	-29.07	3.13	-49.13	-5.36	22.29	169.434	Vertical	Pass
		1732.5	-30.62	3.27	-51.15	-5.23	22.49	177.419	Vertical	Pass
		1753.5	-30.08	3.3	-51.16	-5.02	22.8	190.546	Vertical	Pass
3.0MHz Band 16	15/0	1711.5	-28.26	3.13	-49.13	-5.34	23.08	203.236	Vertical	Pass
		1732.5	-30.4	3.27	-51.15	-5.17	22.65	184.077	Vertical	Pass
		1753.5	-30.53	3.3	-51.16	-4.99	22.32	170.608	Vertical	Pass
5.0MHz Band QPSK	25/0	1712.5	-27.96	3.13	-49.13	-5.34	23.38	217.771	Vertical	Pass
		1732.5	-30.25	3.27	-51.15	-5.17	22.8	190.546	Vertical	Pass
		1752.5	-30.37	3.3	-51.16	-4.99	22.48	177.011	Vertical	Pass
5.0MHz Band 16	25/0	1712.5	-28.8	3.13	-49.13	-5.36	22.56	180.302	Vertical	Pass
		1732.5	-30.83	3.27	-51.15	-5.23	22.28	169.044	Vertical	Pass
		1752.5	-30.19	3.3	-51.16	-5.02	22.69	185.780	Vertical	Pass
10.0MHz Band QPSK	50/0	1715	-28.16	3.15	-49.13	-5.36	23.18	207.970	Vertical	Pass
		1732.5	-30.27	3.31	-51.15	-5.23	22.8	190.546	Vertical	Pass
		1750	-30.59	3.33	-51.16	-5.02	22.26	168.267	Vertical	Pass
10.0MHz Band 16	50/0	1715	-29.19	3.15	-49.13	-5.36	22.15	164.059	Vertical	Pass
		1732.5	-30.78	3.31	-51.15	-5.23	22.29	169.434	Vertical	Pass
		1750	-30.02	3.33	-51.16	-5.02	22.83	191.867	Vertical	Pass
15.0MHz Band QPSK	75/0	1717.5	-28.19	3.15	-49.13	-5.36	23.15	206.538	Vertical	Pass
		1732.5	-30.43	3.31	-51.15	-5.23	22.64	183.654	Vertical	Pass
		1747.5	-30.66	3.33	-51.16	-5.02	22.19	165.577	Vertical	Pass
15.0MHz Band 16	75/0	1717.5	-29	3.15	-49.13	-5.36	22.34	171.396	Vertical	Pass
		1732.5	-30.19	3.31	-51.15	-5.23	22.88	194.089	Vertical	Pass
		1747.5	-30.05	3.33	-51.16	-5.02	22.8	190.546	Vertical	Pass
20.0MHz Band QPSK	100/0	1720	-28.86	3.17	-49.06	-5.32	22.35	171.791	Vertical	Pass
		1732.5	-30.46	3.32	-51.11	-5.19	22.52	178.649	Vertical	Pass
		1745	-30.07	3.36	-51.1	-4.97	22.64	183.654	Vertical	Pass
20.0MHz Band	100/0	1720	-28.71	3.17	-49.06	-5.32	22.5	177.828	Vertical	Pass
		1732.5	-30.43	3.32	-51.11	-5.19	22.55	179.887	Vertical	Pass

9.1.3 LTE BAND 7

EIRP POWER FOR LTE BAND 7

Radiated Power (EIRP) for Band 7										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna Gain (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2502.5	-24.35	4.54	-47.75	-3.94	22.8	190.546	Horizonta	Pass
		2535	-26.66	4.69	-49.75	-3.81	22.21	166.341	Horizonta	Pass
		2567.5	-25.23	4.71	-49.75	-3.6	23.41	219.280	Horizonta	Pass
5.0MHz Band 16	25/0	2502.5	-24.06	4.54	-47.75	-3.94	23.09	203.704	Horizonta	Pass
		2535	-26.14	4.69	-49.75	-3.81	22.73	187.499	Horizonta	Pass
		2567.5	-25.12	4.71	-49.75	-3.6	23.52	224.905	Horizonta	Pass
10.0MHz Band	50/0	2505	-23.89	4.55	-47.71	-3.94	23.21	209.411	Horizonta	Pass
		2535	-25.75	4.69	-49.73	-3.81	23.1	204.174	Horizonta	Pass
		2565	-25.57	4.72	-49.74	-3.6	23.05	201.837	Horizonta	Pass
10.0MHz Band	50/0	2505	-23.97	4.55	-47.71	-3.92	23.11	204.644	Horizonta	Pass
		2535	-25.58	4.69	-49.73	-3.75	23.21	209.411	Horizonta	Pass
		2565	-25.09	4.72	-49.74	-3.57	23.5	223.872	Horizonta	Pass
15.0MHz Band	75/0	2507.5	-23.96	4.55	-47.71	-3.92	23.12	205.116	Horizonta	Pass
		2535	-25.6	4.69	-49.73	-3.75	23.19	208.449	Horizonta	Pass
		2562.5	-25.34	4.72	-49.74	-3.57	23.25	211.349	Horizonta	Pass
15.0MHz Band	75/0	2507.5	-23.87	4.55	-47.71	-3.94	23.23	210.378	Horizonta	Pass
		2535	-25.61	4.69	-49.73	-3.81	23.24	210.863	Horizonta	Pass
		2562.5	-25.4	4.72	-49.74	-3.6	23.22	209.894	Horizonta	Pass
20.0MHz Band	100/0	2510	-23.88	4.57	-47.71	-3.94	23.2	208.930	Horizonta	Pass
		2535	-25.66	4.73	-49.73	-3.81	23.15	206.538	Horizonta	Pass
		2560	-25.49	4.75	-49.74	-3.6	23.1	204.174	Horizonta	Pass
20.0MHz Band	100/0	2510	-23.96	4.57	-47.71	-3.94	23.12	205.116	Horizonta	Pass
		2535	-25.58	4.73	-49.73	-3.81	23.23	210.378	Horizonta	Pass
		2560	-25.46	4.75	-49.74	-3.6	23.13	205.589	Horizonta	Pass

Radiated Power (EIRP) for Band 7										
Mode	RB/RB SIZE	Frequency	Result							Conclusion
			PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna (dB)	Max. EIRP Average (dBm)	Max. EIRP Average (mW)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	2502.5	-24.8	4.54	-47.8	-3.94	22.33	171.002	Vertical	Pass
		2535	-27.1	4.69	-49.8	-3.81	21.74	149.279	Vertical	Pass
		2567.5	-25.7	4.71	-49.8	-3.6	22.94	196.789	Vertical	Pass
5.0MHz Band 16 QAM	25/0	2502.5	-24.5	4.54	-47.8	-3.94	22.62	182.810	Vertical	Pass
		2535	-26.6	4.69	-49.8	-3.81	22.26	168.267	Vertical	Pass
		2567.5	-25.6	4.71	-49.8	-3.6	23.05	201.837	Vertical	Pass
10.0MHz Band QPSK	50/0	2505	-24.4	4.55	-47.7	-3.94	22.74	187.932	Vertical	Pass
		2535	-26.2	4.69	-49.7	-3.81	22.63	183.231	Vertical	Pass
		2565	-26	4.72	-49.7	-3.6	22.58	181.134	Vertical	Pass
10.0MHz Band 16 QAM	50/0	2505	-24.4	4.55	-47.7	-3.92	22.64	183.654	Vertical	Pass
		2535	-26.1	4.69	-49.7	-3.75	22.74	187.932	Vertical	Pass
		2565	-25.6	4.72	-49.7	-3.57	23.03	200.909	Vertical	Pass
15.0MHz Band QPSK	75/0	2507.5	-24.4	4.55	-47.7	-3.92	22.65	184.077	Vertical	Pass
		2535	-26.1	4.69	-49.7	-3.75	22.72	187.068	Vertical	Pass
		2562.5	-25.8	4.72	-49.7	-3.57	22.78	189.671	Vertical	Pass
15.0MHz Band 16 QAM	75/0	2507.5	-24.3	4.55	-47.7	-3.94	22.76	188.799	Vertical	Pass
		2535	-26.1	4.69	-49.7	-3.81	22.77	189.234	Vertical	Pass
		2562.5	-25.9	4.72	-49.7	-3.6	22.75	188.365	Vertical	Pass
20.0MHz Band QPSK	100/0	2510	-24.4	4.57	-47.7	-3.94	22.73	187.499	Vertical	Pass
		2535	-26.1	4.73	-49.7	-3.81	22.68	185.353	Vertical	Pass
		2560	-26	4.75	-49.7	-3.6	22.63	183.231	Vertical	Pass
20.0MHz Band 16 QAM	100/0	2510	-24.4	4.57	-47.7	-3.94	22.65	184.077	Vertical	Pass
		2535	-26.1	4.73	-49.7	-3.81	22.76	188.799	Vertical	Pass
		2560	-25.9	4.75	-49.7	-3.6	22.66	184.502	Vertical	Pass

9.1.4 LTE BAND 17

EIRP POWER FOR LTE BAND 17

Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result								Conclusion
			PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna Gain (dB)	ectio (dB)	ERP (dBm)	ERP (W)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	706.5	-27.43	1.44	-53	0.7	2.15	21.7	147.231	Horizonta	Pass
		710	-27.94	1.46	-53	0.76	2.15	21.1	128.529	Horizonta	Pass
		713.5	-26.70	1.46	-53	0.8	2.15	22.3	169.434	Horizonta	Pass
5.0MHz Band 16	25/0	706.5	-27.14	1.44	-53	0.7	2.15	22	157.398	Horizonta	Pass
		710	-27.42	1.46	-53	0.76	2.15	21.6	144.877	Horizonta	Pass
		713.5	-26.59	1.46	-53	0.8	2.15	22.4	173.780	Horizonta	Pass
10.0MHz Band	50/0	709	-26.78	1.46	-53	0.72	2.15	22.1	161.808	Horizonta	Pass
		710	-26.89	1.46	-53	0.72	2.15	22	157.761	Horizonta	Pass
		711	-26.94	1.46	-53	0.72	2.15	21.9	155.955	Horizonta	Pass
10.0MHz Band	50/0	709	-26.88	1.46	-53	0.72	2.15	22	158.125	Horizonta	Pass
		710	-26.78	1.46	-53	0.72	2.15	22.1	161.808	Horizonta	Pass
		711	-26.49	1.46	-53	0.72	2.15	22.4	172.982	Horizonta	Pass

Radiated Power (ERP) for Band 17											
Mode	RB/RB SIZE	Frequency	Result								Conclusion
			PMea (dBm)	Pcl (dB)	PAg (dB)	Ga Antenna Gain (dB)	ectio (dB)	ERP (dBm)	ERP (W)	Polarization Of Max. ERP	
5.0MHz Band QPSK	25/0	706.5	-27.52	1.44	-53.4	0.7	2.15	21.59	144.212	Vertical	Pass
		710	-28.03	1.46	-53.4	0.76	2.15	21	125.893	Vertical	Pass
		713.5	-26.79	1.46	-53.4	0.8	2.15	22.2	165.959	Vertical	Pass
5.0MHz Band 16	25/0	706.5	-27.23	1.44	-53.4	0.7	2.15	21.88	154.170	Vertical	Pass
		710	-27.51	1.46	-53.4	0.76	2.15	21.52	141.906	Vertical	Pass
		713.5	-26.68	1.46	-53.4	0.8	2.15	22.31	170.216	Vertical	Pass
10.0MHz Band	50/0	709	-26.87	1.46	-53.2	0.72	2.15	22	158.489	Vertical	Pass
		710	-26.98	1.46	-53.2	0.72	2.15	21.89	154.525	Vertical	Pass
		711	-27.03	1.46	-53.2	0.72	2.15	21.84	152.757	Vertical	Pass
10.0MHz	50/0	709	-26.97	1.46	-53.2	0.72	2.15	21.9	154.882	Vertical	Pass
		710	-26.87	1.46	-53.2	0.72	2.15	22	158.489	Vertical	Pass

10.0 FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

LIMIT

§22.917 (e) and §24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

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

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

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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

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

MODES TESTED

LTE Band 2
LTE Band 4
LTE Band 7
LTE Band 17

RESULTS

10.1.2. LTE BAND 2

QPSK EIRP POWER FOR LTE BAND 2 (1.4.0MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz						
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3701.4	-33.25	12.42	-20.83	-13	-7.83	Horizontal
3701.4	-34.74	12.42	-22.32	-13	-9.32	Vertical
5552.1	-37.95	14.12	-23.83	-13	-10.83	Vertical
5552.1	-36.59	14.12	-22.47	-13	-9.47	Horizontal
Test Results for Mid Channel 1732.5MHz						
3760	-34.51	11.76	-22.75	-13	-9.75	Horizontal
3760	-36.91	11.76	-25.15	-13	-12.15	Vertical
5640	-35.57	14.56	-21.01	-13	-8.01	Vertical
5640	-36.11	14.56	-21.55	-13	-8.55	Horizontal
Test Results for High Channel 1754.3MHz						
3818.6	-32.23	11.87	-20.36	-13	-7.36	Horizontal
3818.6	-35.56	11.87	-23.69	-13	-10.69	Vertical
5727.9	-38.88	14.66	-24.22	-13	-11.22	Vertical
5727.9	-34.56	14.66	-19.9	-13	-6.9	Horizontal

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

Test Results for Low Channel 1710.7MHz						
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3720	-32.69	12.42	-20.27	-13	-7.27	Horizontal
3720	-33.45	12.42	-21.03	-13	-8.03	Vertical
5580	-35.74	14.12	-21.62	-13	-8.62	Vertical
5580	-35.58	14.12	-21.46	-13	-8.46	Horizontal
Test Results for Mid Channel 1732.5MHz						
3760	-34.46	11.76	-22.7	-13	-9.7	Horizontal
3760	-35.51	11.76	-23.75	-13	-10.75	Vertical
5640	-33.96	14.56	-19.4	-13	-6.4	Vertical
5640	-35.52	14.56	-20.96	-13	-7.96	Horizontal
Test Results for High Channel 1754.3MHz						
3800	-34.97	11.87	-23.1	-13	-10.1	Horizontal
3800	-34.52	11.87	-22.65	-13	-9.65	Vertical
5700	-38.02	14.66	-23.36	-13	-10.36	Vertical
5700	-33.06	14.66	-18.4	-13	-5.4	Horizontal

10.1.3. LTE BAND 4

QPSK EIRP POWER FOR LTE BAND 4 (1.4.0MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz						
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3421.4	-33	12.42	-20.58	-13	-7.58	Horizontal
3421.4	-36.91	12.42	-24.49	-13	-11.49	Vertical
5132.1	-35.41	14.12	-21.29	-13	-8.29	Vertical
5132.1	-35.57	14.12	-21.45	-13	-8.45	Horizontal
Test Results for Mid Channel 1732.5MHz						
3465	-36.95	11.76	-25.19	-13	-12.19	Horizontal
3465	-33.64	11.76	-21.88	-13	-8.88	Vertical
5197.5	-34.45	14.56	-19.89	-13	-6.89	Vertical
5197.5	-37.79	14.56	-23.23	-13	-10.23	Horizontal
Test Results for High Channel 1754.3MHz						
3508.6	-34.58	11.87	-22.71	-13	-9.71	Horizontal
3508.6	-33.69	11.87	-21.82	-13	-8.82	Vertical
5262.9	-38.81	14.66	-24.15	-13	-11.15	Vertical
5262.9	-33.65	14.66	-18.99	-13	-5.99	Horizontal

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

Test Results for Low Channel 1710.7MHz						
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit （dBm）	Margin(dBm)	Polarity
3440	-36.59	12.42	-24.17	-13	-11.17	Horizontal
3440	-35.51	12.42	-23.09	-13	-10.09	Vertical
5160	-36.52	14.12	-22.4	-13	-9.4	Vertical
5160	-34.44	14.12	-20.32	-13	-7.32	Horizontal
Test Results for Mid Channel 1732.5MHz						
3465	-36.59	11.76	-24.83	-13	-11.83	Horizontal
3465	-35.08	11.76	-23.32	-13	-10.32	Vertical
5197.5	-33.96	14.56	-19.4	-13	-6.4	Vertical
5197.5	-35.56	14.56	-21	-13	-8	Horizontal
Test Results for High Channel 1754.3MHz						
2490	-34.85	11.87	-22.98	-13	-9.98	Horizontal
3490	-34.01	11.87	-22.14	-13	-9.14	Vertical
5235	-38.85	14.66	-24.19	-13	-11.19	Vertical
5235	-36.94	14.66	-22.28	-13	-9.28	Horizontal

10.1.3. LTE BAND 7

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

Test Results for Low Channel 1710.7MHz						
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5005	-43.46	12.42	-31.04	-25	-6.04	Horizontal
5005	-44.59	12.42	-32.17	-25	-7.17	Vertical
7507.5	-45.85	14.12	-31.73	-25	-6.73	Vertical
7507.5	-44.74	14.12	-30.62	-25	-5.62	Horizontal
Test Results for Mid Channel 1732.5MHz						
5070	-46.96	11.76	-35.2	-25	-10.2	Horizontal
5070	-45.81	11.76	-34.05	-25	-9.05	Vertical
7605	-45.46	14.56	-30.9	-25	-5.9	Vertical
7605	-47.11	14.56	-32.55	-25	-7.55	Horizontal
Test Results for High Channel 1754.3MHz						
5135	-45.52	11.87	-33.65	-25	-8.65	Horizontal
5135	-44.15	11.87	-32.28	-25	-7.28	Vertical
7702.5	-48.85	14.66	-34.19	-25	-9.19	Vertical
7702.5	-46.96	14.66	-32.3	-25	-7.3	Horizontal

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

Test Results for Low Channel 1710.7MHz						
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit （dBm）	Margin(dBm)	Polarity
5020	-45.64	12.42	-33.22	-25	-8.22	Horizontal
5020	-44.41	12.42	-31.99	-25	-6.99	Vertical
7530	-45.59	14.12	-31.47	-25	-6.47	Vertical
7530	-46.76	14.12	-32.64	-25	-7.64	Horizontal
Test Results for Mid Channel 1732.5MHz						
5070	-45.59	11.76	-33.83	-25	-8.83	Horizontal
5070	-46.95	11.76	-35.19	-25	-10.19	Vertical
7605	-49.41	14.56	-34.85	-25	-9.85	Vertical
7605	-46.77	14.56	-32.21	-25	-7.21	Horizontal
Test Results for High Channel 1754.3MHz						
5120	-43.52	11.87	-31.65	-25	-6.65	Horizontal
5120	-43.12	11.87	-31.25	-25	-6.25	Vertical
7680	-48.85	14.66	-34.19	-25	-9.19	Vertical
7680	-46.45	14.66	-31.79	-25	-6.79	Horizontal

10.1.4. LTE BAND 17

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

Test Results for Low Channel 1710.7MHz						
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1413	-33.56	12.42	-21.14	-13	-8.14	Horizontal
1413	-34.74	12.42	-22.32	-13	-9.32	Vertical
2119.5	-35.59	14.12	-21.47	-13	-8.47	Vertical
2119.5	-34.65	14.12	-20.53	-13	-7.53	Horizontal
Test Results for Mid Channel 1732.5MHz						
1420	-35.85	11.76	-24.09	-13	-11.09	Horizontal
1420	-36.62	11.76	-24.86	-13	-11.86	Vertical
2130	-34.47	14.56	-19.91	-13	-6.91	Vertical
2130	-36.59	14.56	-22.03	-13	-9.03	Horizontal
Test Results for High Channel 1754.3MHz						
1427	-33.12	11.87	-21.25	-13	-8.25	Horizontal
1427	-32.28	11.87	-20.41	-13	-7.41	Vertical
2140.5	-35.58	14.66	-20.92	-13	-7.92	Vertical
2140.5	-33.62	14.66	-18.96	-13	-5.96	Horizontal

QPSK EIRP POWER FOR LTE BAND 17 (10.0MHZ BANDWIDTH)

Test Results for Low Channel 1710.7MHz						
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit （dBm）	Margin(dBm)	Polarity
1418	-34.46	12.42	-22.04	-13	-9.04	Horizontal
1418	-32.85	12.42	-20.43	-13	-7.43	Vertical
2127	-35.59	14.12	-21.47	-13	-8.47	Vertical
2127	-34.41	14.12	-20.29	-13	-7.29	Horizontal
Test Results for Mid Channel 1732.5MHz						
1420	-35.22	11.76	-23.46	-13	-10.46	Horizontal
1420	-33.62	11.76	-21.86	-13	-8.86	Vertical
2130	-36.96	14.56	-22.4	-13	-9.4	Vertical
2130	-37.48	14.56	-22.92	-13	-9.92	Horizontal
Test Results for High Channel 1754.3MHz						
1422	-33.64	11.87	-21.77	-13	-8.77	Horizontal
1422	-33.66	11.87	-21.79	-13	-8.79	Vertical
2133	-36.45	14.66	-21.79	-13	-8.79	Vertical
2133	-33.52	14.66	-18.86	-13	-5.86	Horizontal

11. FREQUENCY STABILITY

RULE PART(S)

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

LIMITS

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

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

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

Temp. = −30° to +50°C

Voltage =low voltage, 3.4VDC, Normal, 3.8VDC and High voltage, 4.3VDC.

Frequency Stability vs Temperature:

The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:

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

MODES TESTED

LTE Band 2

LTE Band 4

LTE Band 7

LTE Band 17

RESULTS

See the following pages.

11.1.1. LTE BAND 2

QPSK, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH *18900* RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.6	1880	-4.8	-0.002557	2.5
3.8	1880	-5.1	-0.002739	2.5
4.4	1880	-18.5	-0.009846	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 QPSK, (CH *18900* RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	6.1	0.003226	2.5
Extreme (50C)	1880	5.7	0.003036	2.5
Extreme (40C)	1880	7.4	0.003949	2.5
Extreme (30C)	1880	4	0.002108	2.5
Extreme (10C)	1880	5.9	0.00315	2.5
Extreme (0C)	1880	-5.2	-0.002793	2.5
Extreme (-10C)	1880	2.9	0.001567	2.5
Extreme (-20C)	1880	-3.9	-0.002077	2.5
Extreme (-30C)	1880	3.8	0.002001	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH *18900* RB size 100 RB Offset 0 20MHz BANDWIDTH)				
3.6	1880	-4.5	-0.002394	2.5
3.8	1880	-5.6	-0.002979	2.5
4.4	1880	-15.3	-0.008138	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 2 16QAM, (CH *18900* RB size 100 RB Offset 0 20MHz BANDWIDTH)				
Normal (25C)	1880	6.5	0.003457	2.5
Extreme (50C)	1880	4.8	0.002553	2.5
Extreme (40C)	1880	-4.1	-0.002181	2.5
Extreme (30C)	1880	-5.5	-0.002926	2.5
Extreme (10C)	1880	-4.9	-0.002606	2.5
Extreme (0C)	1880	-4.7	-0.002500	2.5
Extreme (-10C)	1880	3.6	0.001915	2.5
Extreme (-20C)	1880	5.2	0.002766	2.5
Extreme (-30C)	1880	-4.3	-0.002287	2.5

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

11.1.2. LTE BAND 4

QPSK, (20MHz 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)				
3.6	1732.5	5	0.002882	2.5
3.8	1732.5	4.8	0.002799	2.5
4.4	1732.5	-9.7	-0.00559	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	4	0.002312	2.5
Extreme (50C)	1732.5	6	0.003476	2.5
Extreme (40C)	1732.5	6.5	0.003765	2.5
Extreme (30C)	1732.5	-3.3	-0.001899	2.5
Extreme (10C)	1732.5	-3	-0.001759	2.5
Extreme (0C)	1732.5	5.6	0.003237	2.5
Extreme (-10C)	1732.5	4.8	0.002774	2.5
Extreme (-20C)	1732.5	6.4	0.003699	2.5
Extreme (-30C)	1732.5	6.4	0.003707	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)				
3.6	1732.5	5.5	0.003175	2.5
3.8	1732.5	4.1	0.002367	2.5
4.4	1732.5	-6.7	-0.003867	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	5.2	0.003001	2.5
Extreme (50C)	1732.5	3.6	0.002078	2.5
Extreme (40C)	1732.5	-4.9	-0.002828	2.5
Extreme (30C)	1732.5	-5.1	-0.002944	2.5
Extreme (10C)	1732.5	2.8	0.001616	2.5
Extreme (0C)	1732.5	7.9	0.004560	2.5
Extreme (-10C)	1732.5	-5.1	-0.002944	2.5
Extreme (-20C)	1732.5	-3.7	-0.002136	2.5
Extreme (-30C)	1732.5	-4.6	-0.002655	2.5

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

11.1.3. 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)				
3.6	2535	10.8	0.004266	2.5
3.8	2535	8.3	0.003256	2.5
4.4	2535	12.1	0.004791	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	8.9	0.003504	2.5
Extreme (50C)	2535	9.8	0.00386	2.5
Extreme (40C)	2535	8.2	0.00325	2.5
Extreme (30C)	2535	7.2	0.002833	2.5
Extreme (10C)	2535	10	0.003939	2.5
Extreme (0C)	2535	10.5	0.004142	2.5
Extreme (-10C)	2535	-5.9	-0.002327	2.5
Extreme (-20C)	2535	6.7	0.002643	2.5
Extreme (-30C)	2535	5.2	0.002051	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)				
3.6	2535	8.6	0.003393	2.5
3.8	2535	-4.7	-0.001854	2.5
4.4	2535	1.9	0.000750	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	-8.5	-0.003353	2.5
Extreme (50C)	2535	10.3	0.004063	2.5
Extreme (40C)	2535	8.6	0.003393	2.5
Extreme (30C)	2535	4.4	0.001736	2.5
Extreme (10C)	2535	-6.9	-0.002722	2.5
Extreme (0C)	2535	8.1	0.003195	2.5
Extreme (-10C)	2535	-7.3	-0.002880	2.5
Extreme (-20C)	2535	4.2	0.001657	2.5
Extreme (-30C)	2535	4.7	0.001854	2.5

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

11.1.4. LTE BAND 17

QPSK, (10MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH *23790* RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.6	710	5.9	0.008321	2.5
3.8	710	6.2	0.008744	2.5
4.4	710	3.1	0.004312	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 QPSK, (CH *23790* RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710	5.4	0.007606	2.5
Extreme (50C)	710	2.8	0.003944	2.5
Extreme (40C)	710	-4.6	-0.006479	2.5
Extreme (30C)	710	-10.7	-0.015070	2.5
Extreme (10C)	710	-8.3	-0.011690	2.5
Extreme (0C)	710	5.7	0.008028	2.5
Extreme (-10C)	710	6.2	0.008732	2.5
Extreme (-20C)	710	9.1	0.012817	2.5
Extreme (-30C)	710	-4.6	-0.006479	2.5

16QAM, (20MHz BANDWIDTH)

Frequency error vs. Voltage

Voltage [Vdc]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 16QAM, (CH *23790* RB size 50 RB Offset 0 10MHz BANDWIDTH)				
3.6	710	5.6	0.007887	2.5
3.8	710	4.9	0.006901	2.5
4.4	710	6.3	0.008873	2.5

Frequency error vs. Temperature

Temperature [° C]	Frequency [MHz]	Frequency* Error[Hz]	Frequency Error[ppm]	Limit [ppm]
BAND 17 16QAM, (CH *23790* RB size 50 RB Offset 0 10MHz BANDWIDTH)				
Normal (25C)	710	7.1	0.010000	2.5
Extreme (50C)	710	5.1	0.007183	2.5
Extreme (40C)	710	-5.9	-0.008310	2.5
Extreme (30C)	710	-3.6	-0.005070	2.5
Extreme (10C)	710	-7.8	-0.010986	2.5
Extreme (0C)	710	6.9	0.009718	2.5
Extreme (-10C)	710	6.6	0.009296	2.5
Extreme (-20C)	710	5.2	0.007324	2.5
Extreme (-30C)	710	5.7	0.008028	2.5

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

12. Peak-to-Average Ratio

12.1.1 DESCRIPTION OF THE PAR MEASUREMENT

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

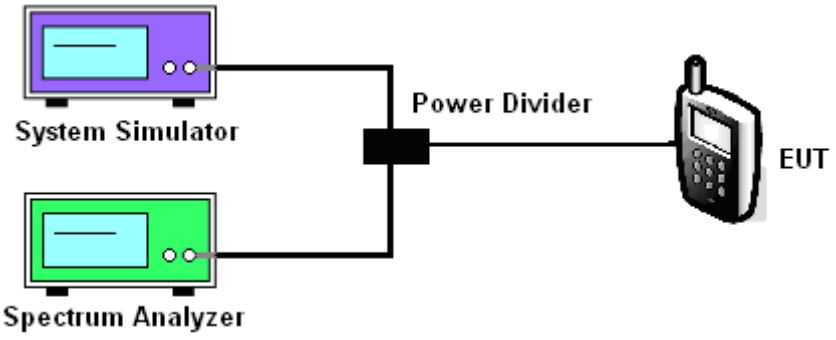
12.1.2 MEASURING INSTRUMENTS

See list of measuring instruments of this test report.

12.1.3 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 %.

12.1.4 TEST SETUP

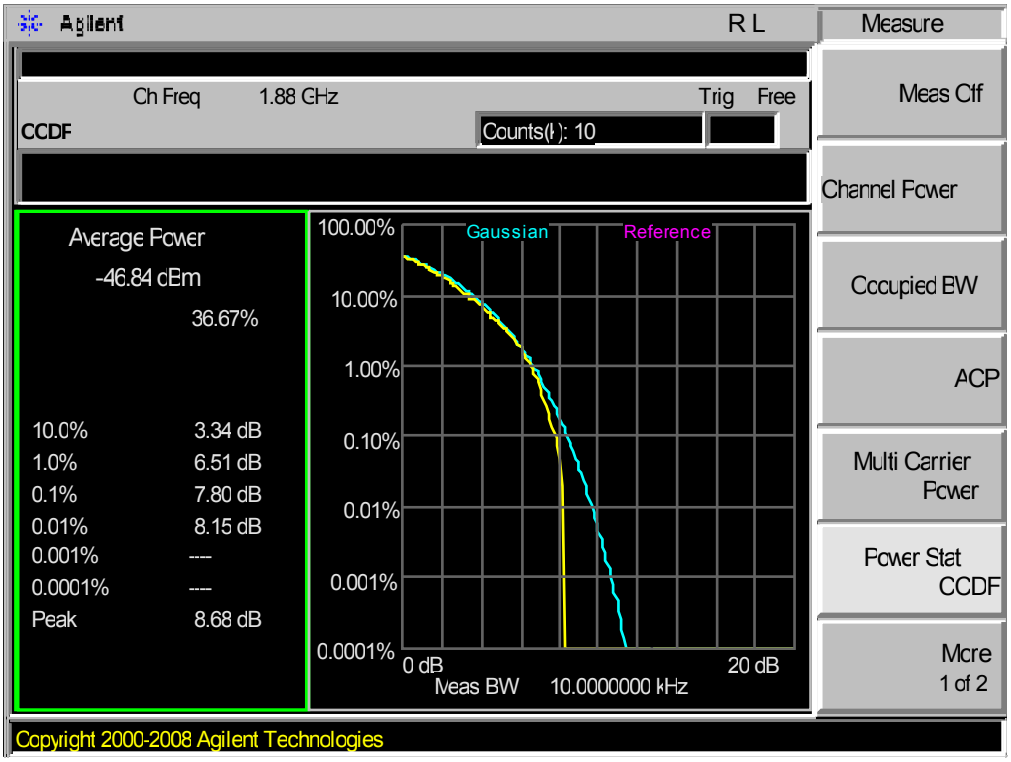


BAND	CHANNEL	Frequency [MHz]	BANDWIDTH	NO. RB	RB POS.	MODULATION	PAR [dB]
2	18900	1880.0	1.4	1	Low	QPSK	7.80
2	18900	1880.0	1.4	1	Low	16QAM	7.73
2	18900	1880.0	3.0	1	Low	QPSK	2.14
2	18900	1880.0	3.0	1	Low	16QAM	2.16
2	18900	1880.0	5.0	1	Low	QPSK	1.68
2	18900	1880.0	5.0	1	Low	16QAM	1.52
2	18900	1880.0	10.0	1	Low	QPSK	1.87
2	18900	1880.0	10.0	1	Low	16QAM	2.08
2	18900	1880.0	15.0	1	Low	QPSK	1.55
2	18900	1880.0	15.0	1	Low	16QAM	1.88
2	18900	1880.0	20.0	1	Low	QPSK	1.85
2	18900	1880.0	20.0	1	Low	16QAM	2.25
4	20175	1732.5	1.4	1	Low	QPSK	8.30
4	20175	1732.5	1.4	1	Low	16QAM	9.45
4	20175	1732.5	3.0	1	Low	QPSK	4.22
4	20175	1732.5	3.0	1	Low	16QAM	4.10
4	20175	1732.5	5.0	1	Low	QPSK	1.52
4	20175	1732.5	5.0	1	Low	16QAM	1.57
4	20175	1732.5	10.0	1	Low	QPSK	1.50
4	20175	1732.5	10.0	1	Low	16QAM	1.59
4	20175	1732.5	15.0	1	Low	QPSK	1.29

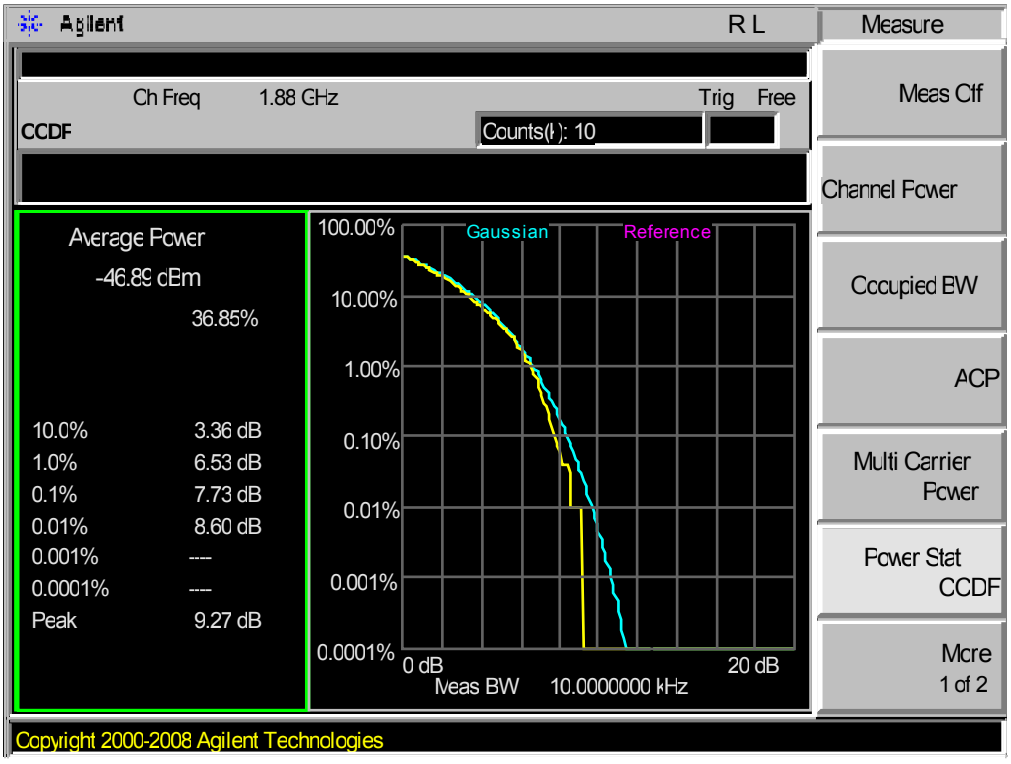
4	20175	1732.5	15.0	1	Low	16QAM	1.37
4	20175	1732.5	20.0	1	Low	QPSK	1.80
4	20175	1732.5	20.0	1	Low	16QAM	1.73
7	21100	2535.0	5.0	1	Low	QPSK	1.92
7	21100	2535.0	5.0	1	Low	16QAM	2.08
7	21100	2535.0	10.0	1	Low	QPSK	1.73
7	21100	2535.0	10.0	1	Low	16QAM	2.00
7	21100	2535.0	15.0	1	Low	QPSK	1.75
7	21100	2535.0	15.0	1	Low	16QAM	1.61
7	21100	2535.0	20.0	1	Low	QPSK	1.32
7	21100	2535.0	20.0	1	Low	16QAM	1.43
17	23790	710.0	5.0	1	Low	QPSK	2.70
17	23790	710.0	5.0	1	Low	16QAM	2.55
17	23790	710.0	10.0	1	Low	QPSK	2.30
17	23790	710.0	10.0	1	Low	16QAM	2.73

12.1.5. LTE BAND 2

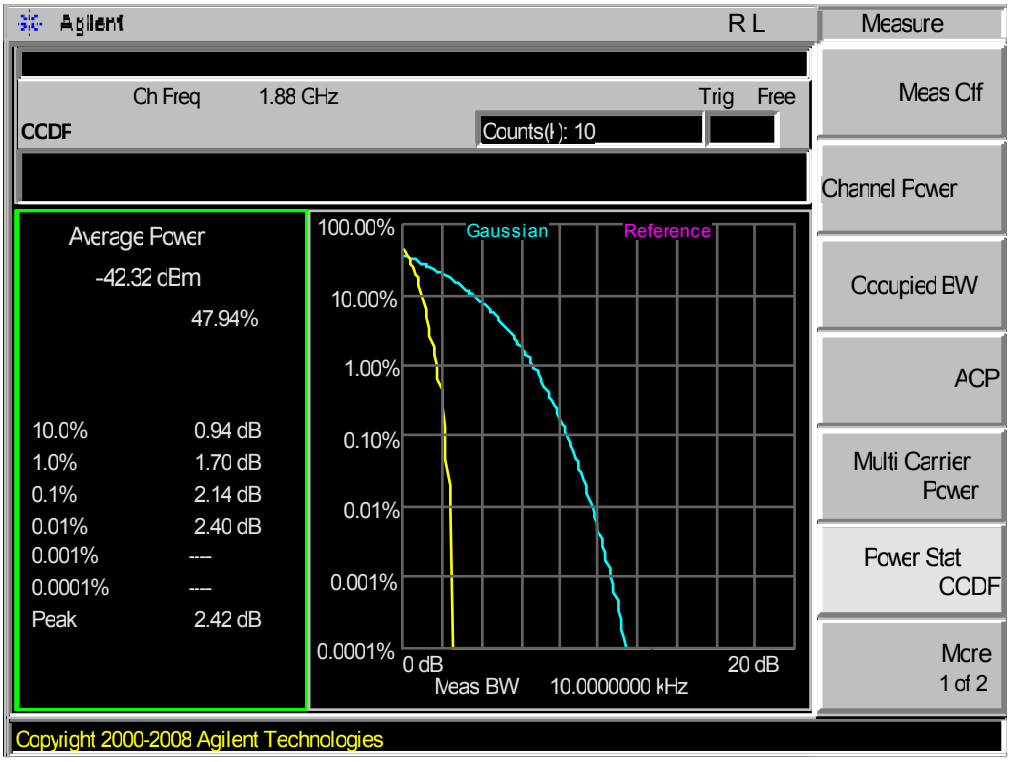
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 1.4,NO. RB 1,RB POS. Low,QPSK



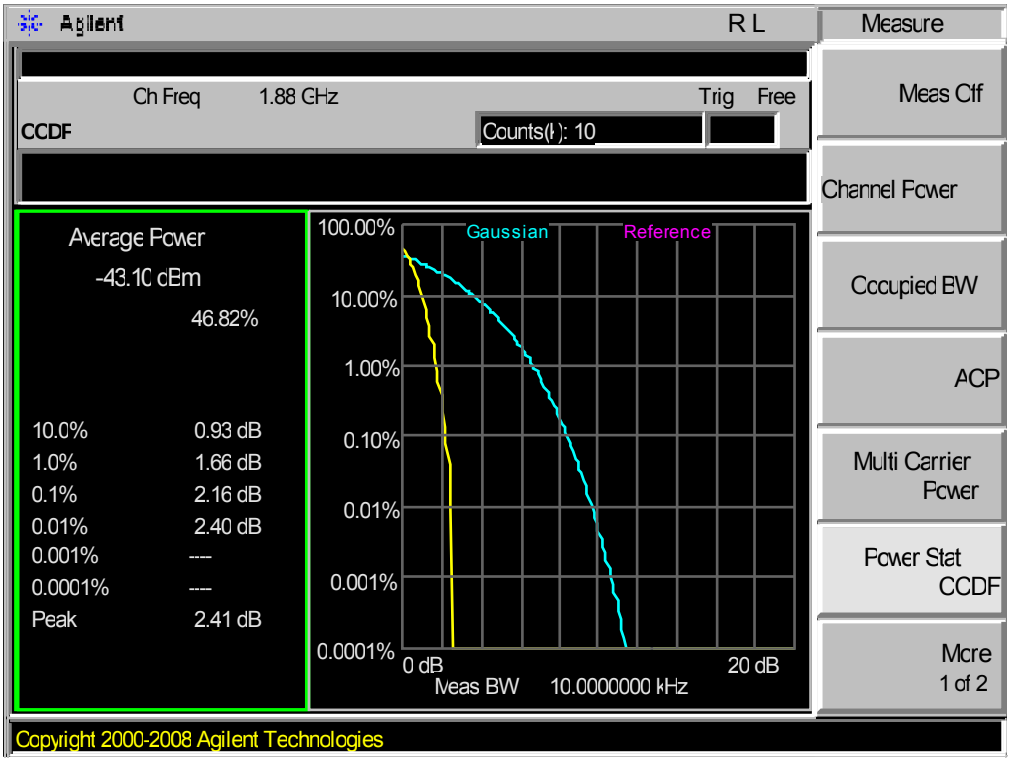
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 1.4,NO. RB 1,RB POS. Low,16QAM



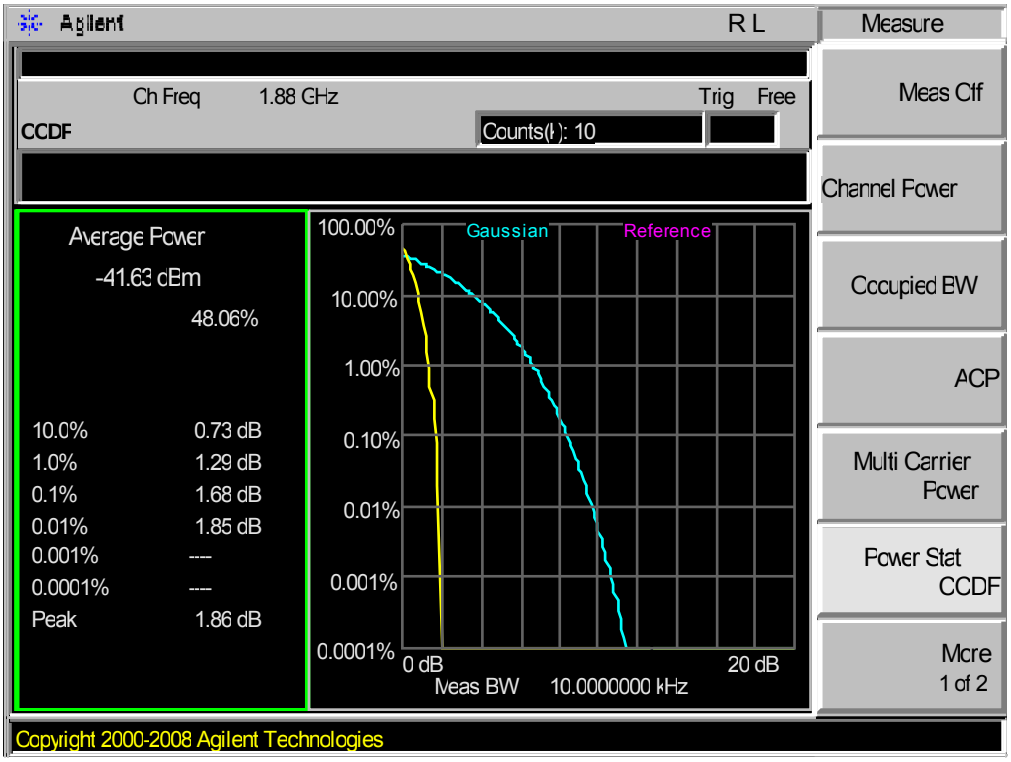
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 3.0,NO. RB 1,RB POS. Low,QPSK



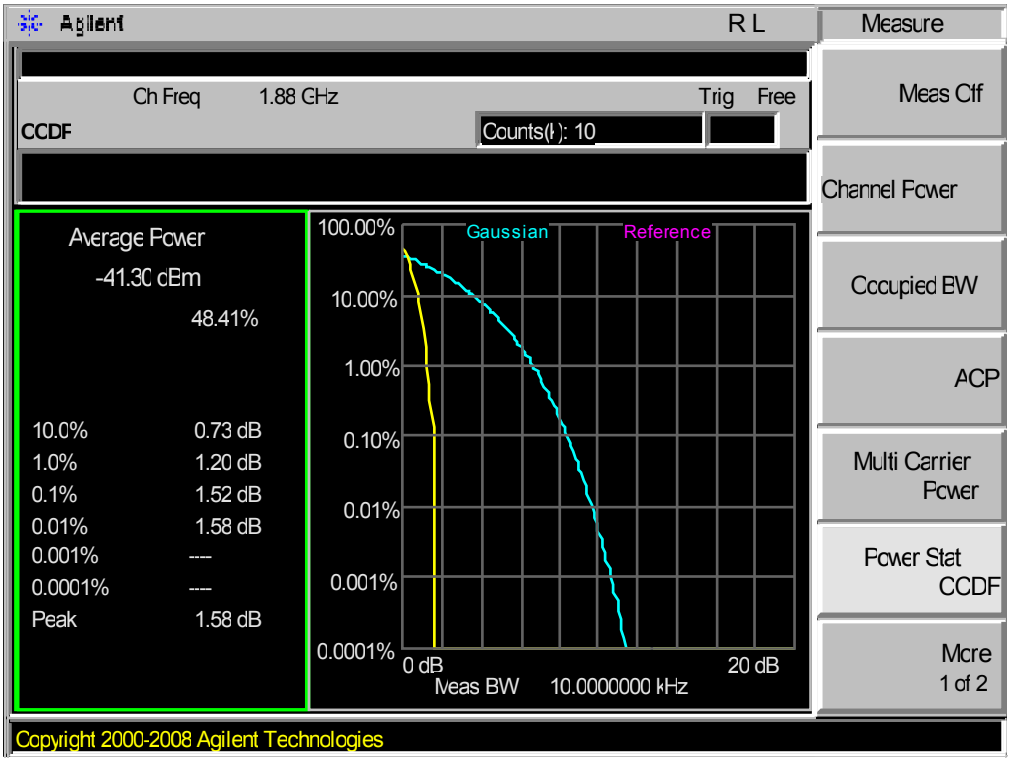
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 3.0,NO. RB 1,RB POS. Low,16QAM



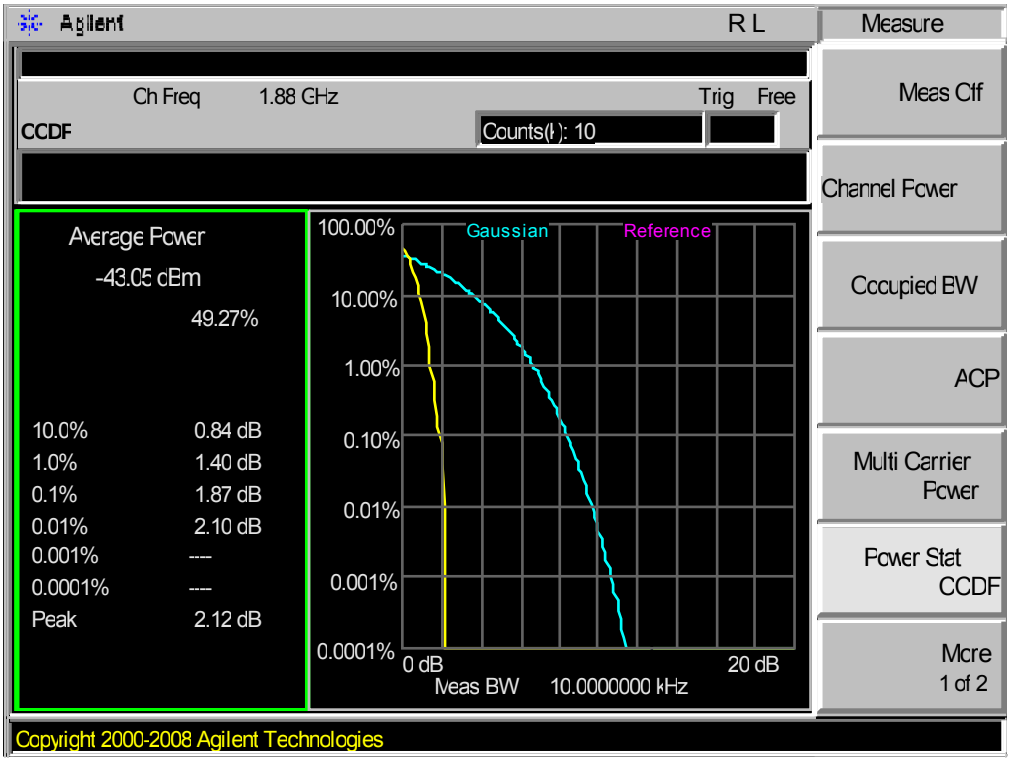
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 5.0,NO. RB 1,RB POS. Low,QPSK



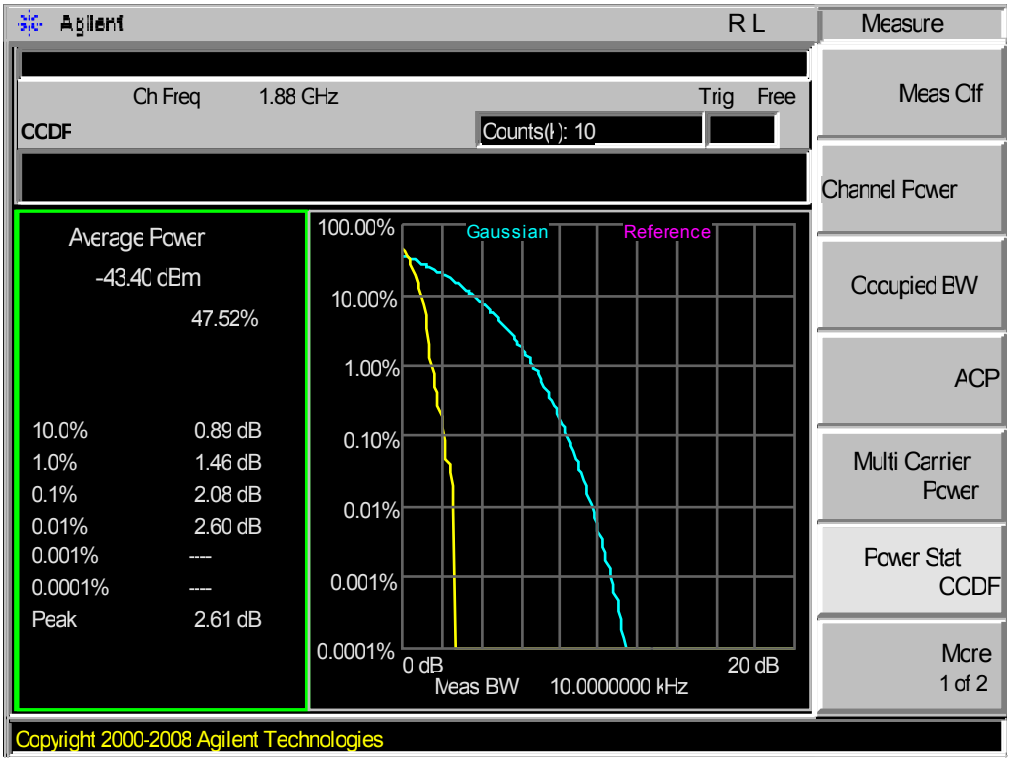
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 5.0,NO. RB 1,RB POS. Low,16QAM



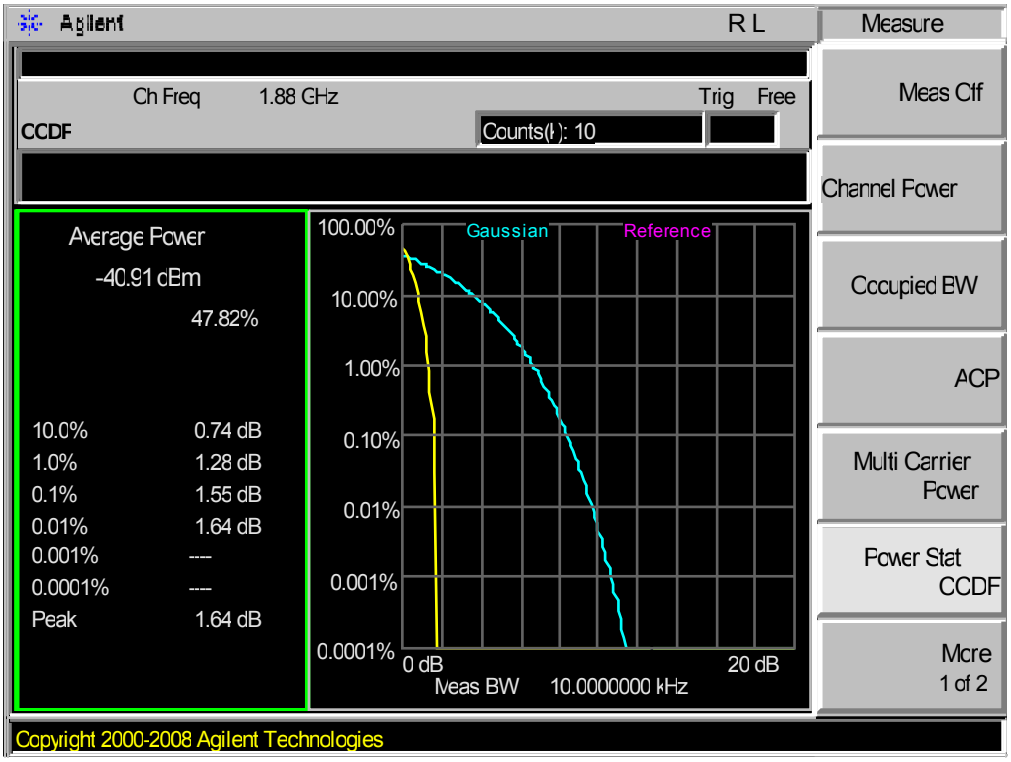
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 10.0,NO. RB 1,RB POS. Low,QPSK



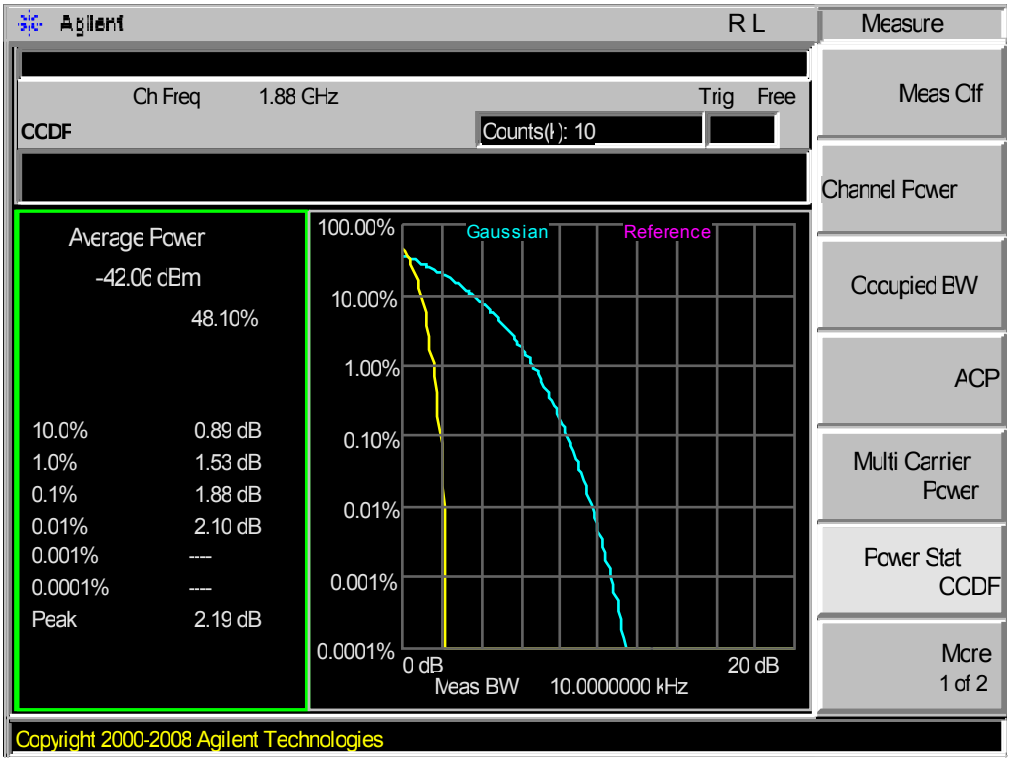
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 10.0,NO. RB 1,RB POS. Low,16QAM



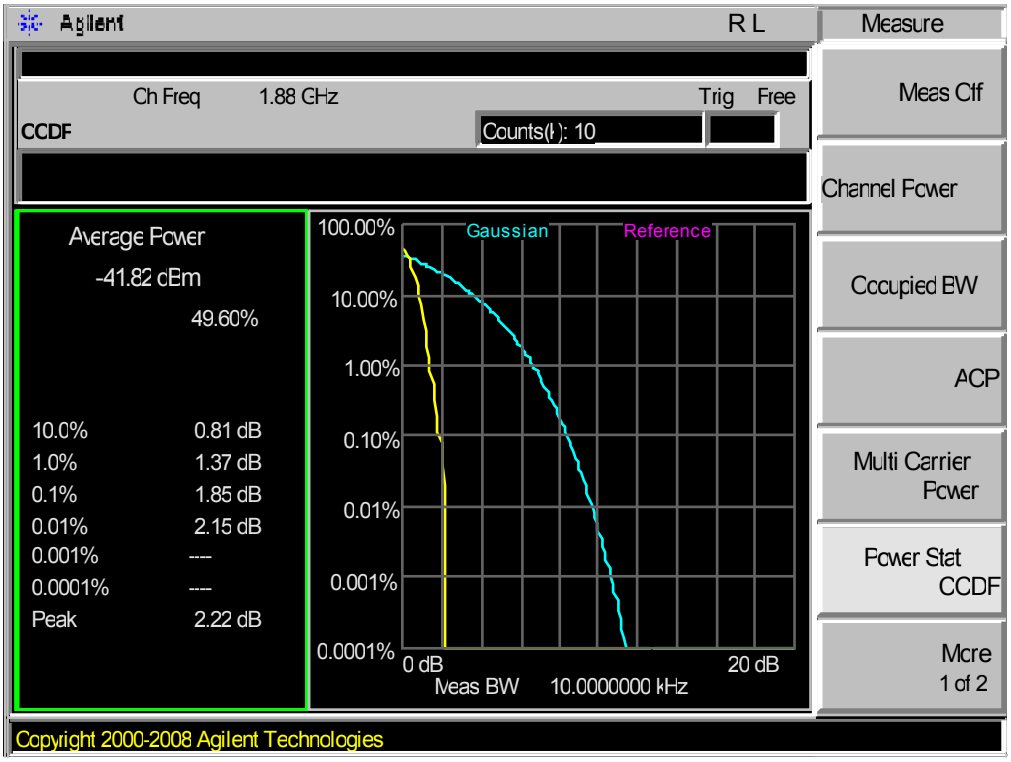
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 15.0,NO. RB 1,RB POS. Low,QPSK



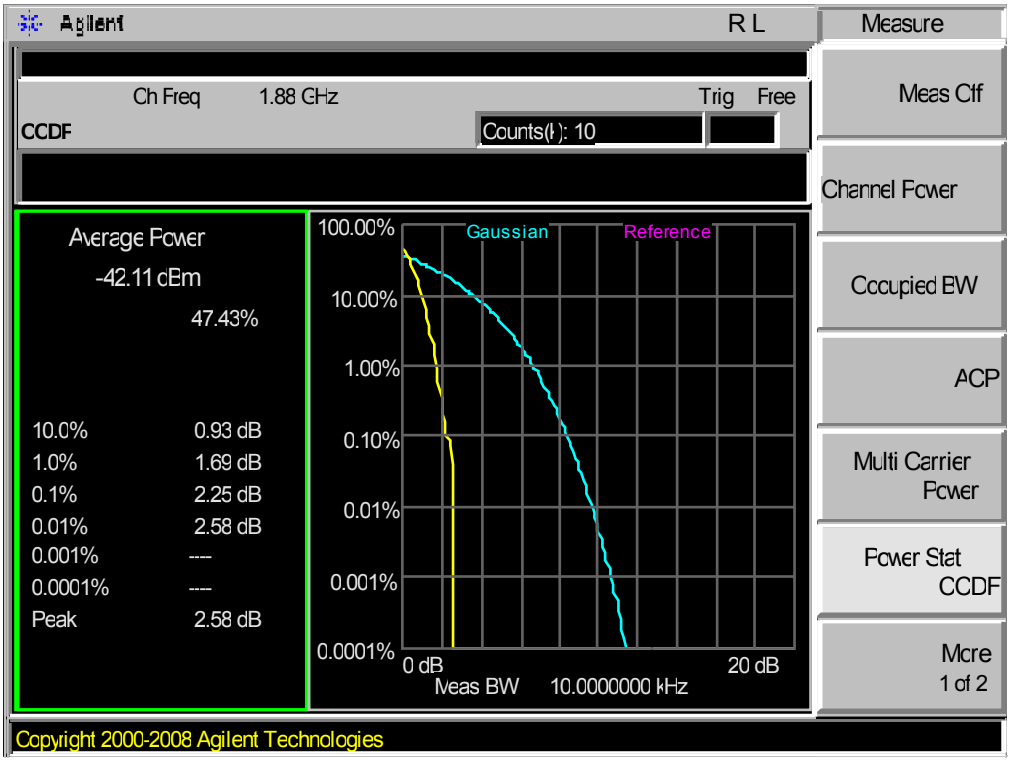
Band 2,UL Channel 18900,UL Frequency 1880.0,BW 15.0,NO. RB 1,RB POS. Low,16QAM



Band 2,UL Channel 18900,UL Frequency 1880.0,BW 20.0,NO. RB 1,RB POS. Low,QPSK

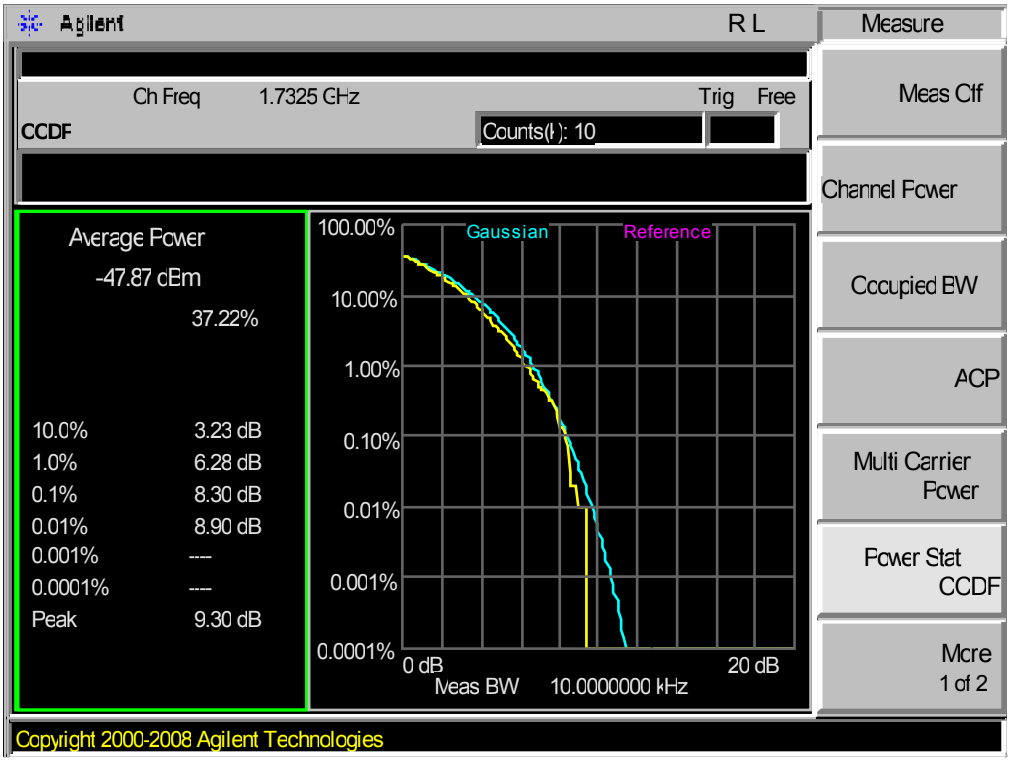


Band 2,UL Channel 18900,UL Frequency 1880.0,BW 20.0,NO. RB 1,RB POS. Low,16QAM



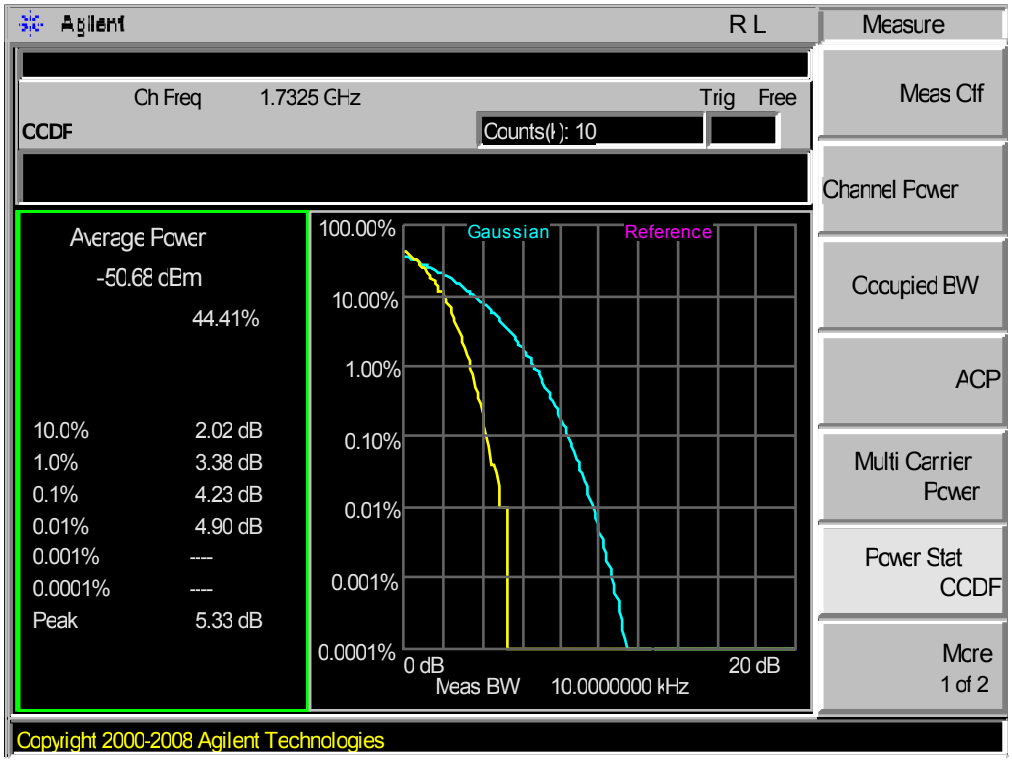
12.1.6. LTE BAND 4

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

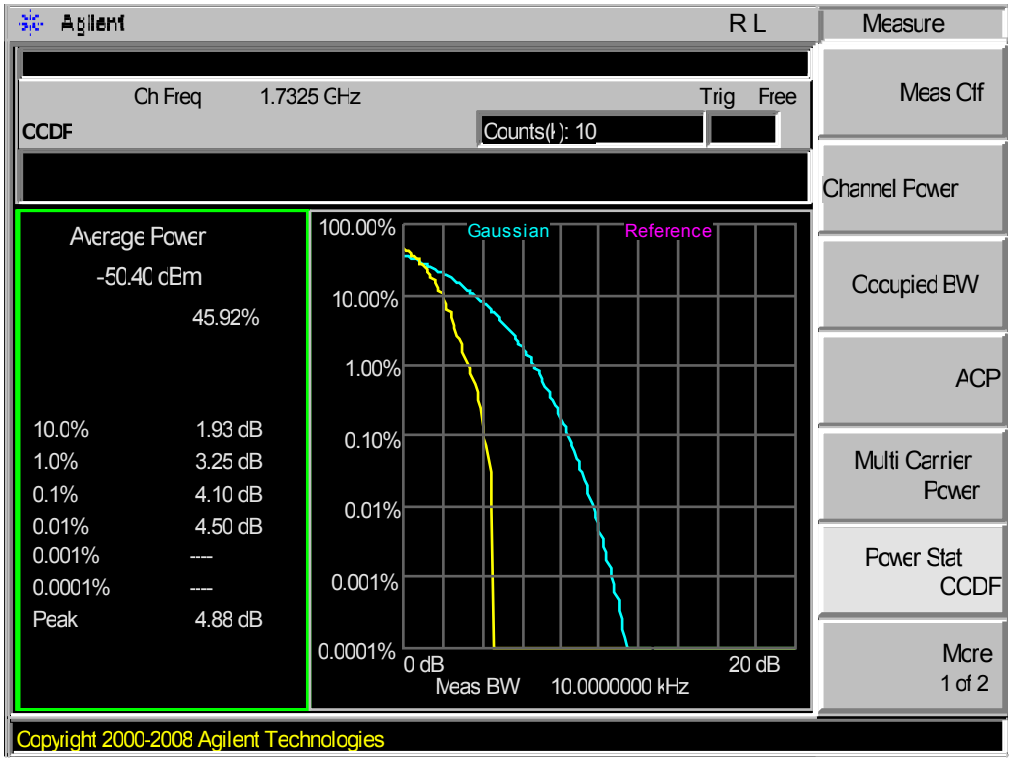


Band 4,UL Channel 20175,UL Frequency 1732.5,BW 1.4,NO. RB 1,RB POS. Low,16QAM

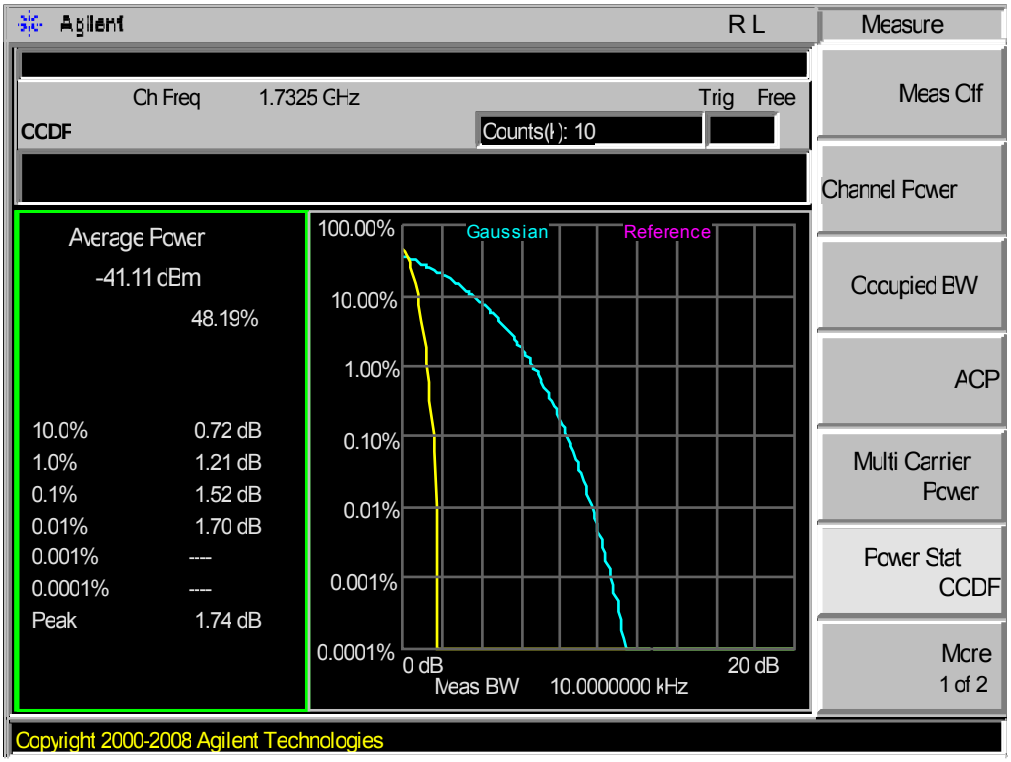
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 3.0,NO. RB 1,RB POS. Low,QPSK



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

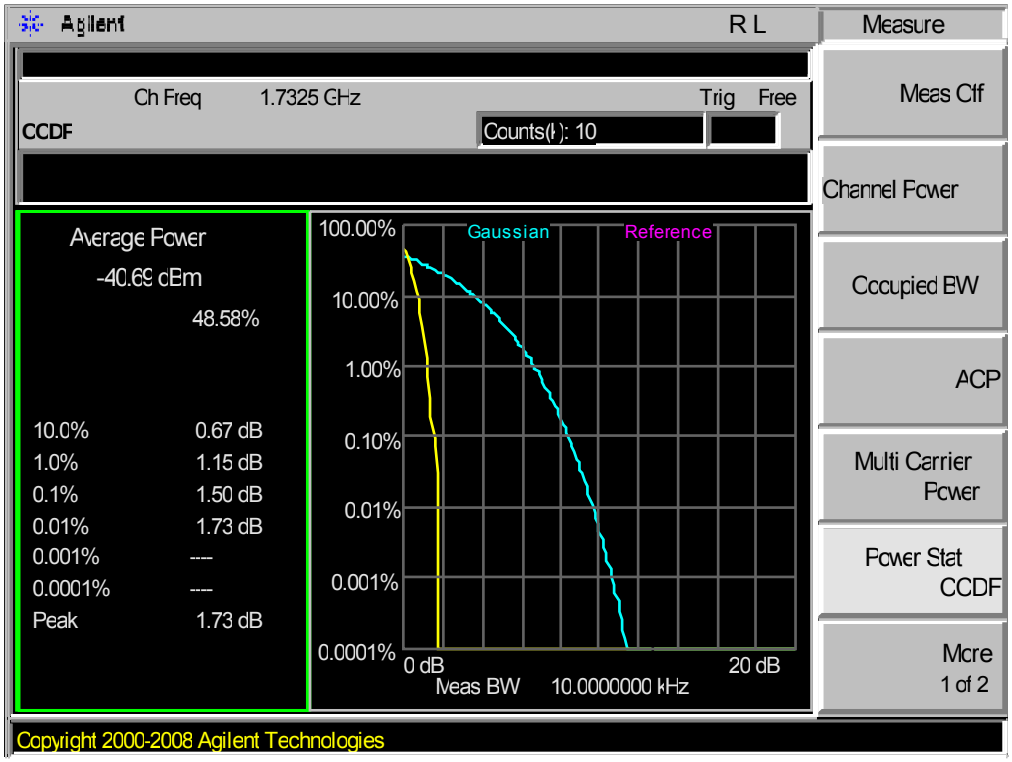


Band 4,UL Channel 20175,UL Frequency 1732.5,BW 5.0,NO. RB 1,RB POS. Low,QPSK

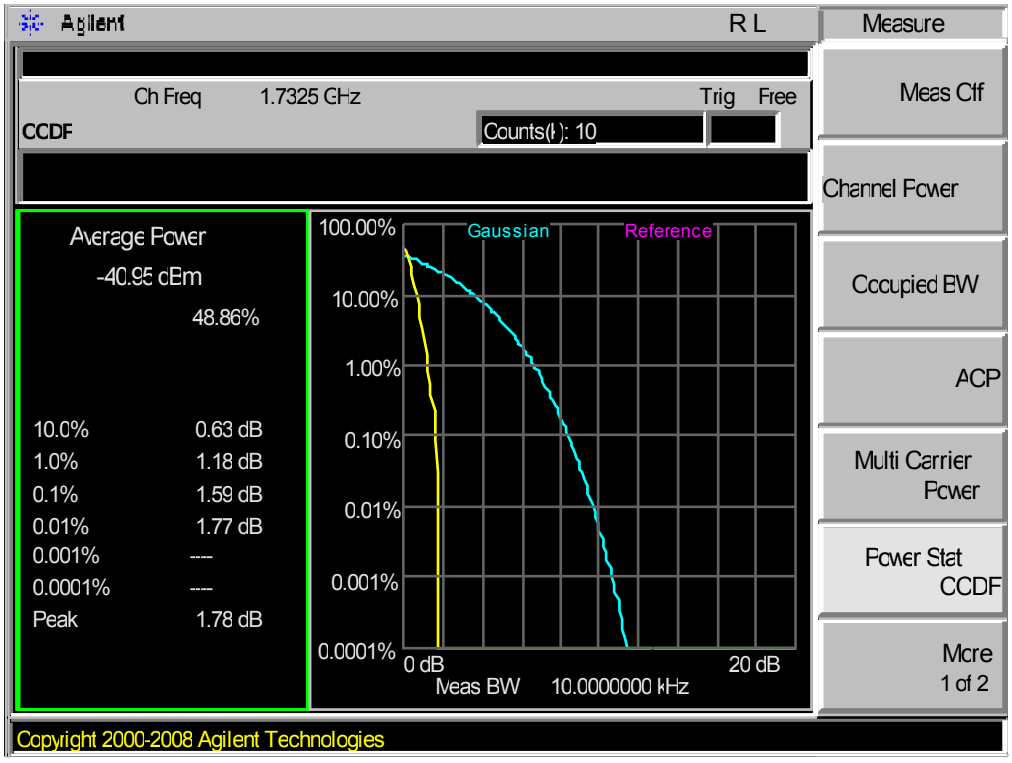


Band 4,UL Channel 20175,UL Frequency 1732.5,BW 5.0,NO. RB 1,RB POS. Low,16QAM

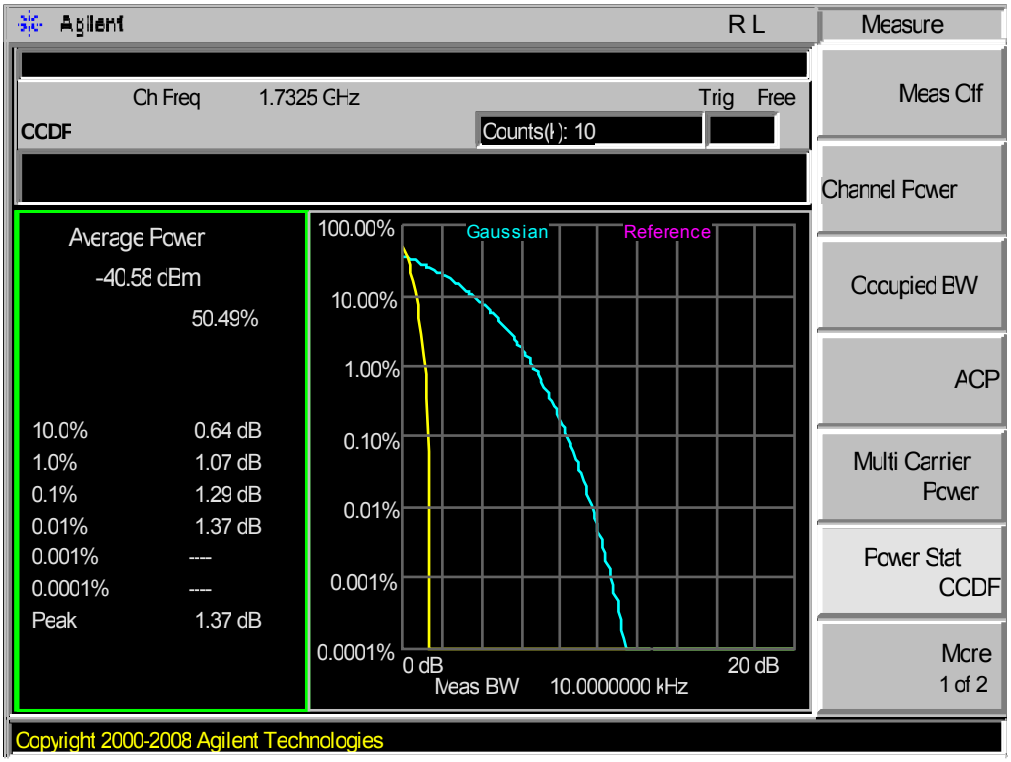
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 10.0,NO. RB 1,RB POS. Low,QPSK



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

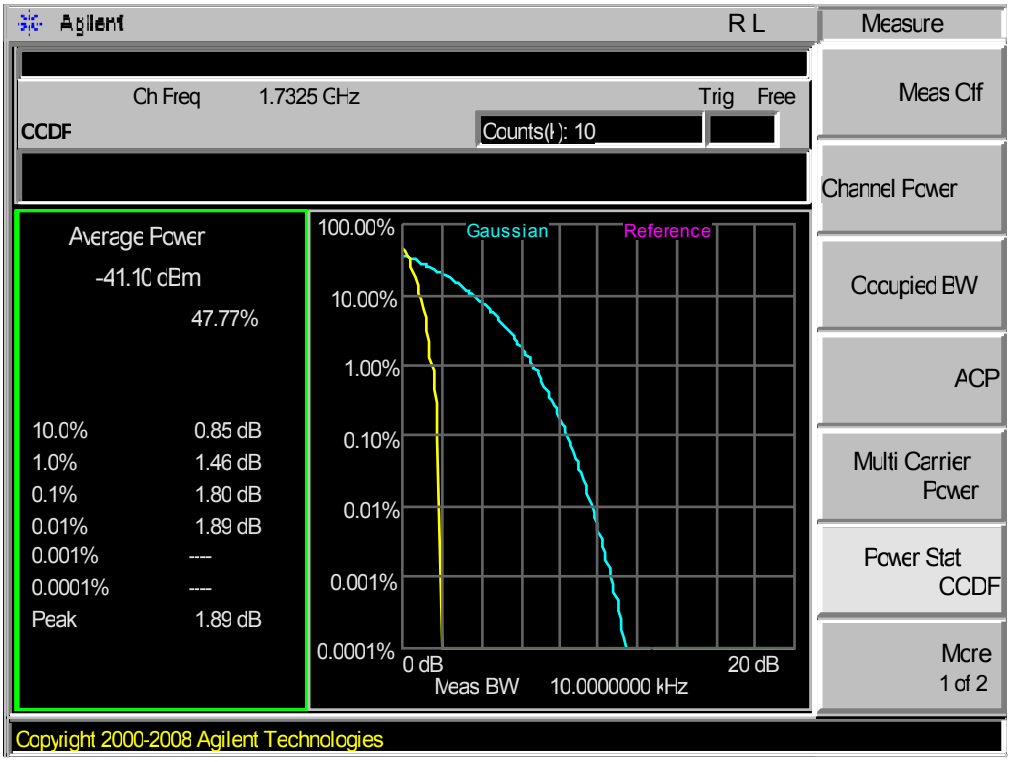


Band 4,UL Channel 20175,UL Frequency 1732.5,BW 15.0,NO. RB 1,RB POS. Low,QPSK



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

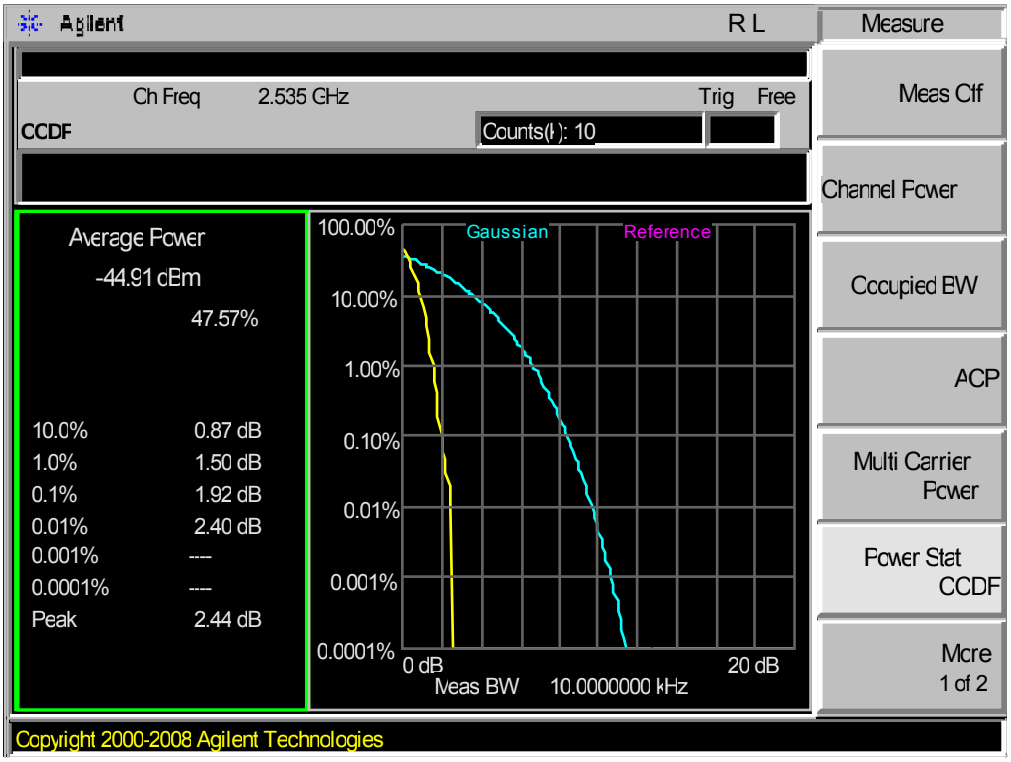
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 20.0,NO. RB 1,RB POS. Low,QPSK



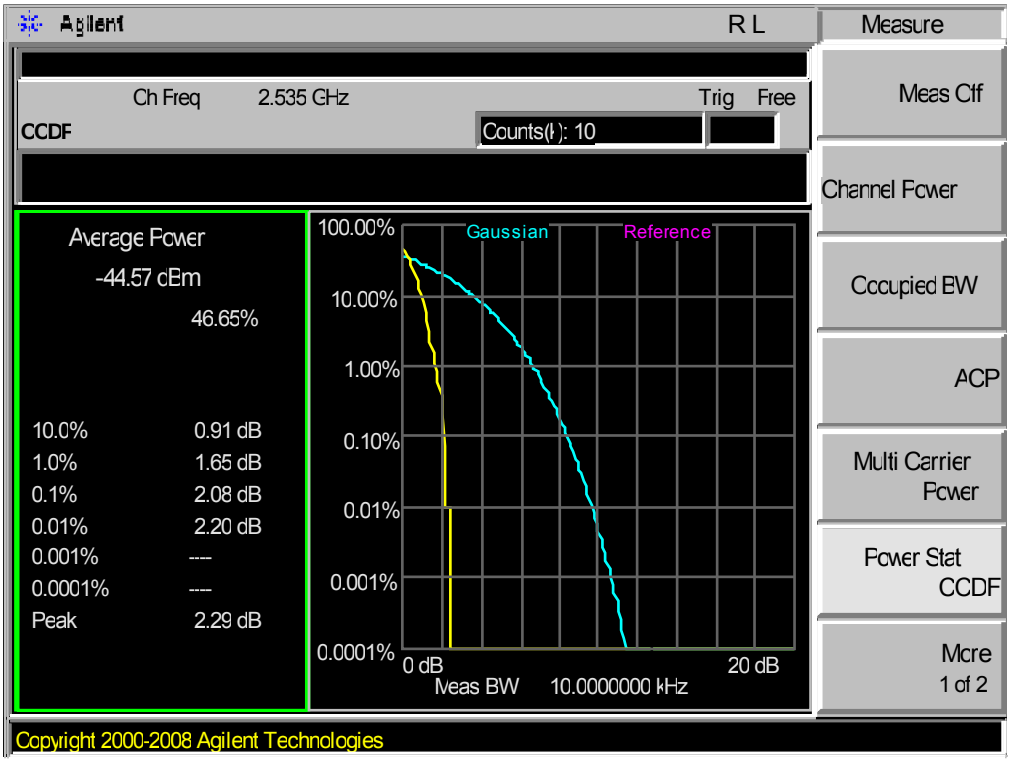
Band 4,UL Channel 20175,UL Frequency 1732.5,BW 20.0,NO. RB 1,RB POS. Low,16QAM

12.1.6. LTE BAND 7

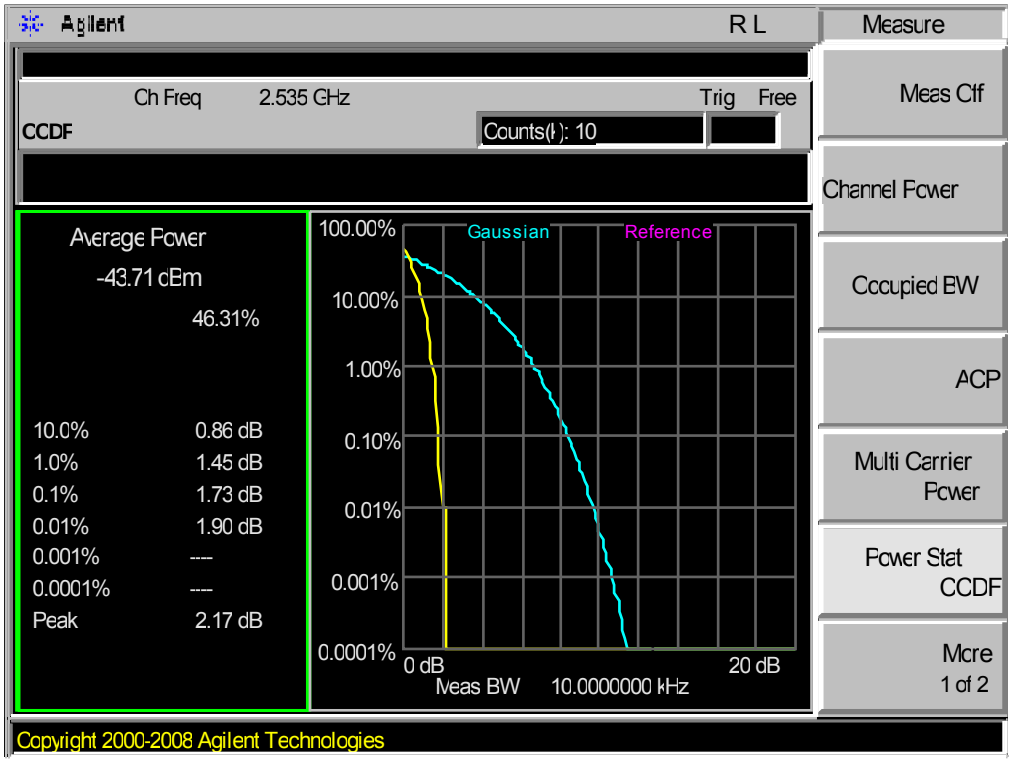
Band 7,UL Channel 18900,UL Frequency 2315.0,BW 5.0,NO. RB 1,RB POS. Low,QPSK



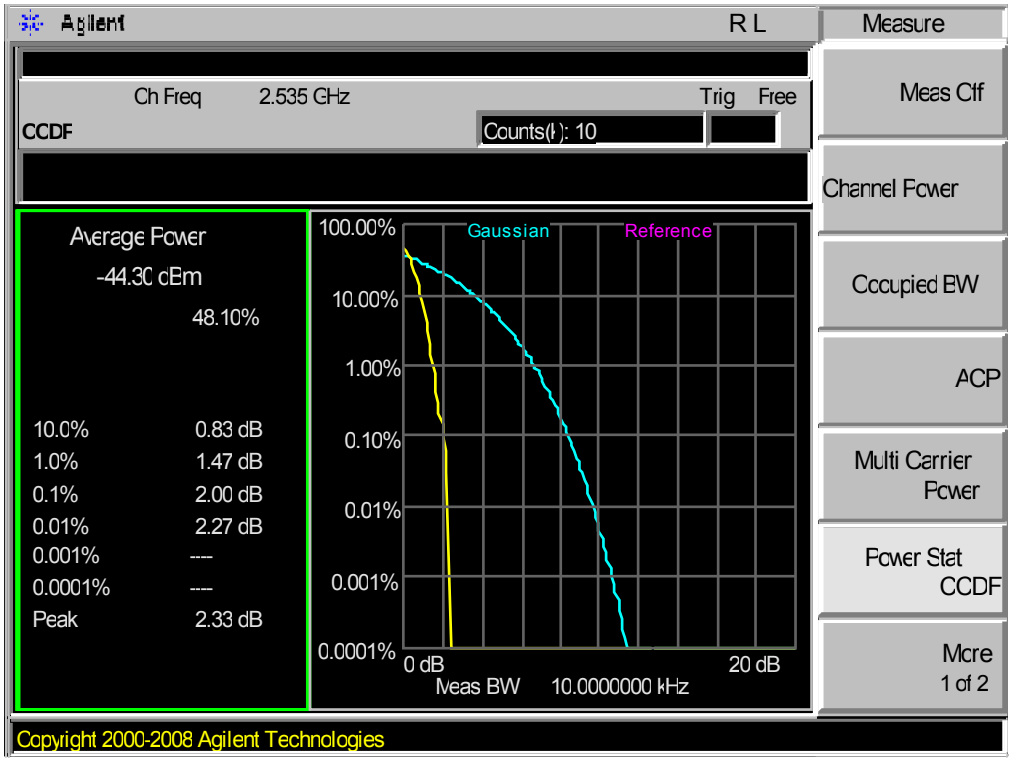
Band 7,UL Channel 18900,UL Frequency 2315.0,BW 5.0,NO. RB 1,RB POS. Low,16QAM



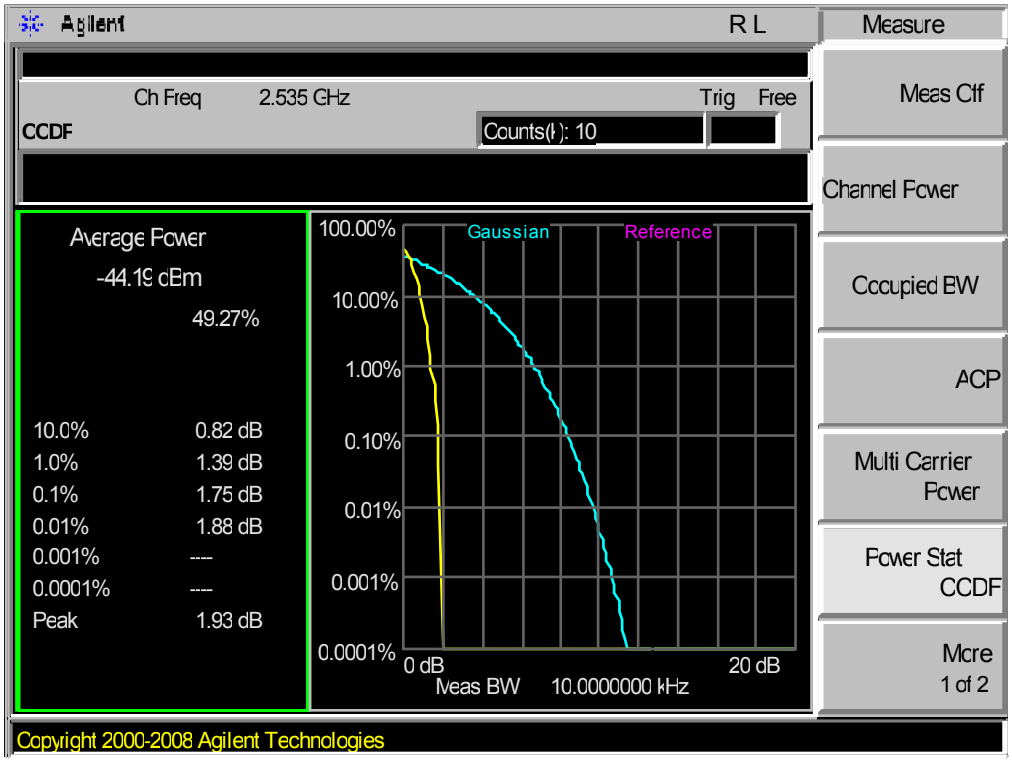
Band 7,UL Channel 18900,UL Frequency 2315.0,BW 10.0,NO. RB 1,RB POS. Low,QPSK



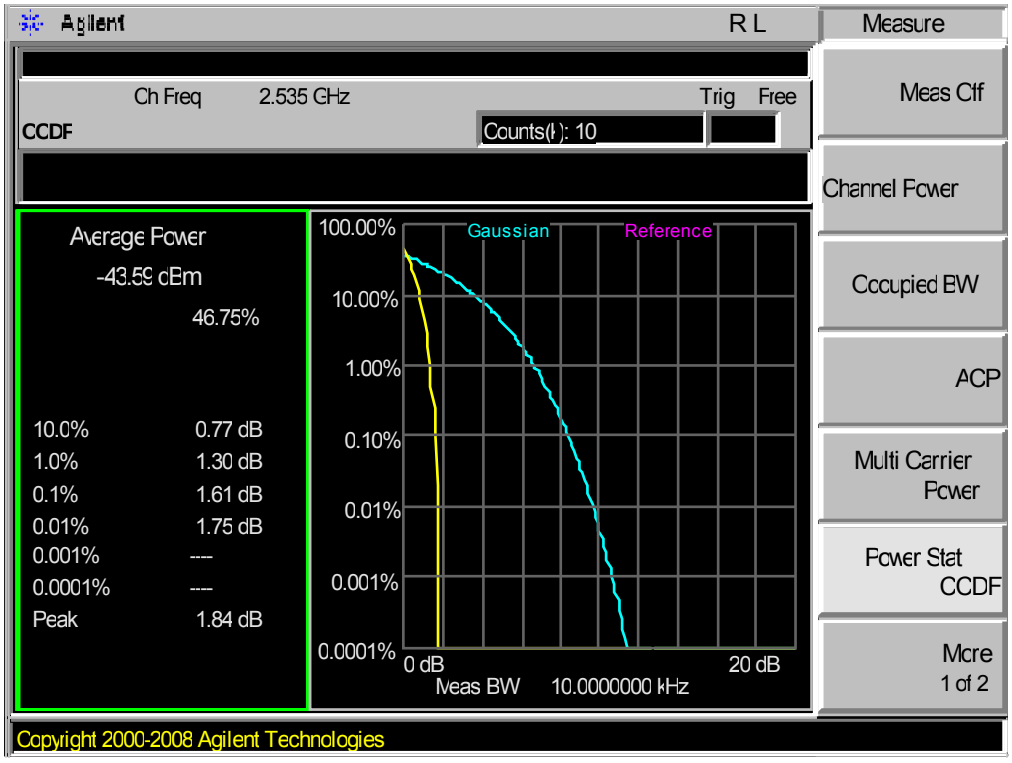
Band 7,UL Channel 18900,UL Frequency 2315.0,BW 10.0,NO. RB 1,RB POS. Low,16QAM



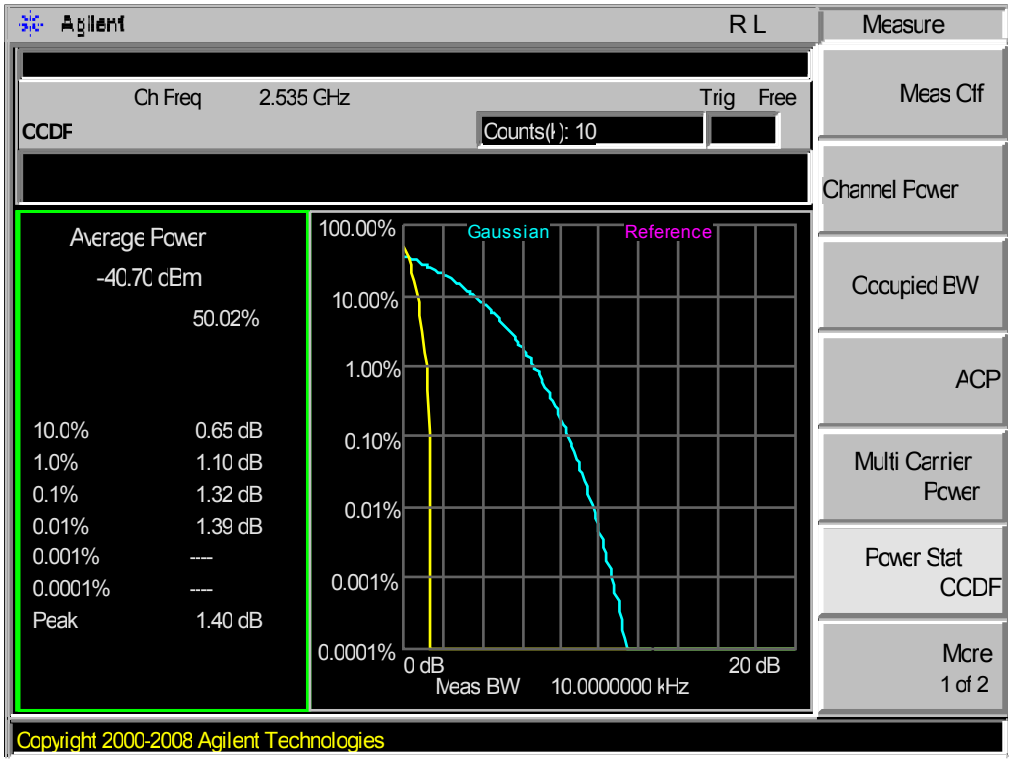
Band 7,UL Channel 18900,UL Frequency 2315.0,BW 15.0,NO. RB 1,RB POS. Low,QPSK



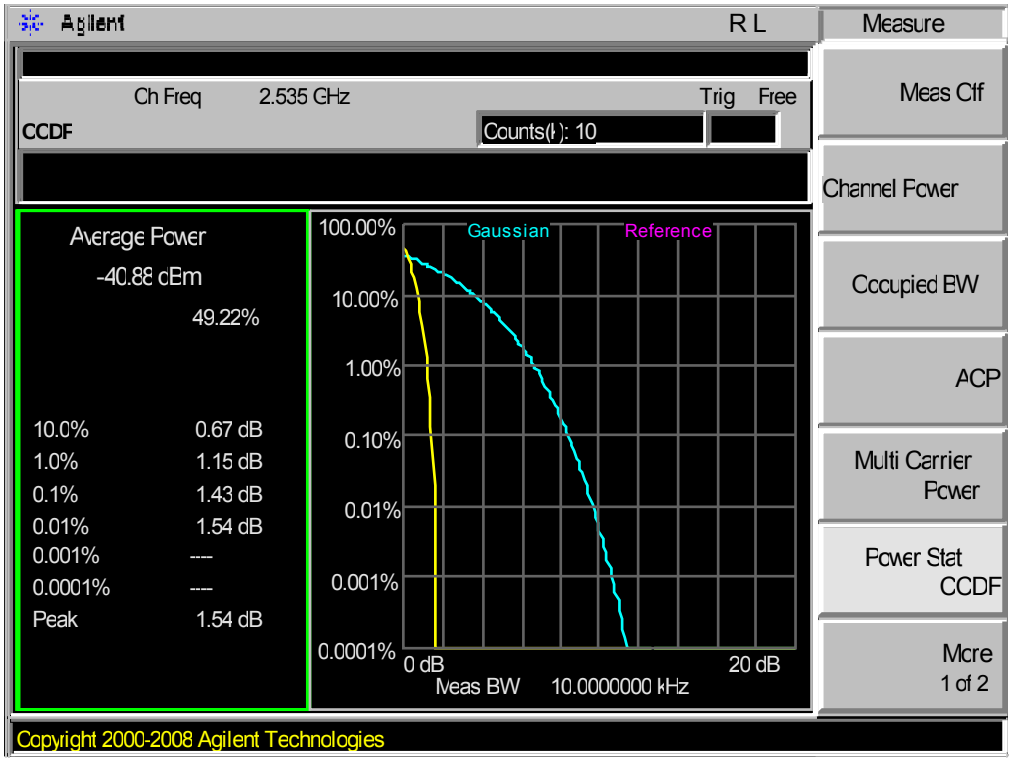
Band 7,UL Channel 18900,UL Frequency 2315.0,BW 15.0,NO. RB 1,RB POS. Low,16QAM



Band 7,UL Channel 18900,UL Frequency 2315.0,BW 20.0,NO. RB 1,RB POS. Low,QPSK

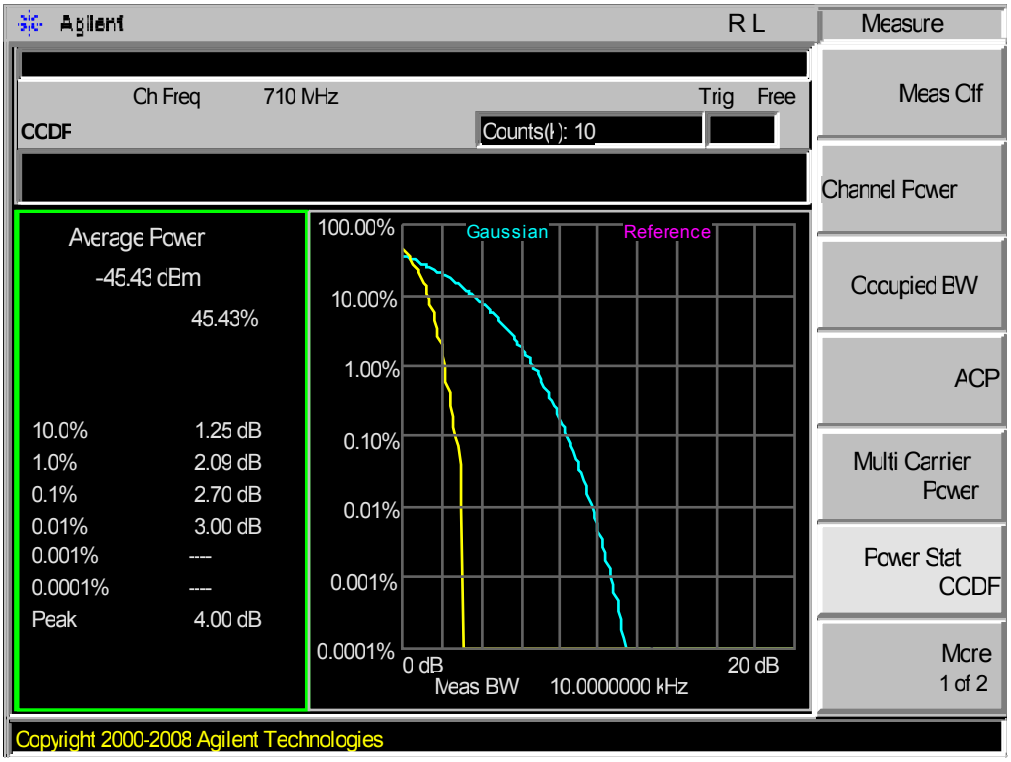


Band 7,UL Channel 18900,UL Frequency 2315.0,BW 20.0,NO. RB 1,RB POS. Low,16QAM

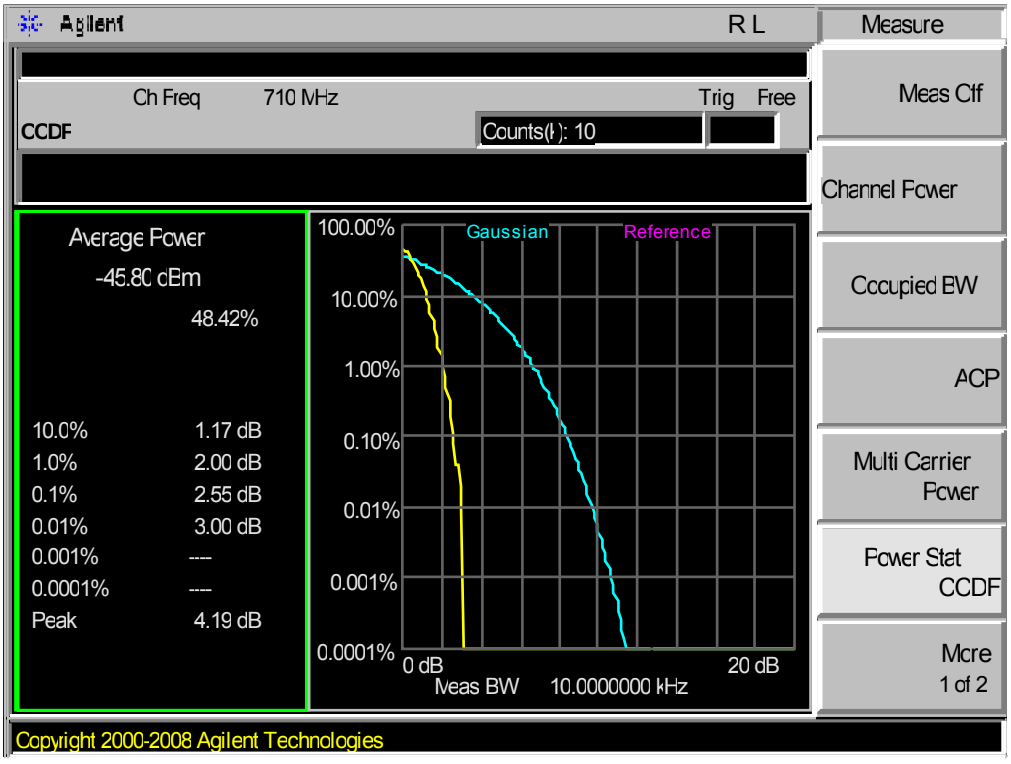


12.1.7. LTE BAND 17

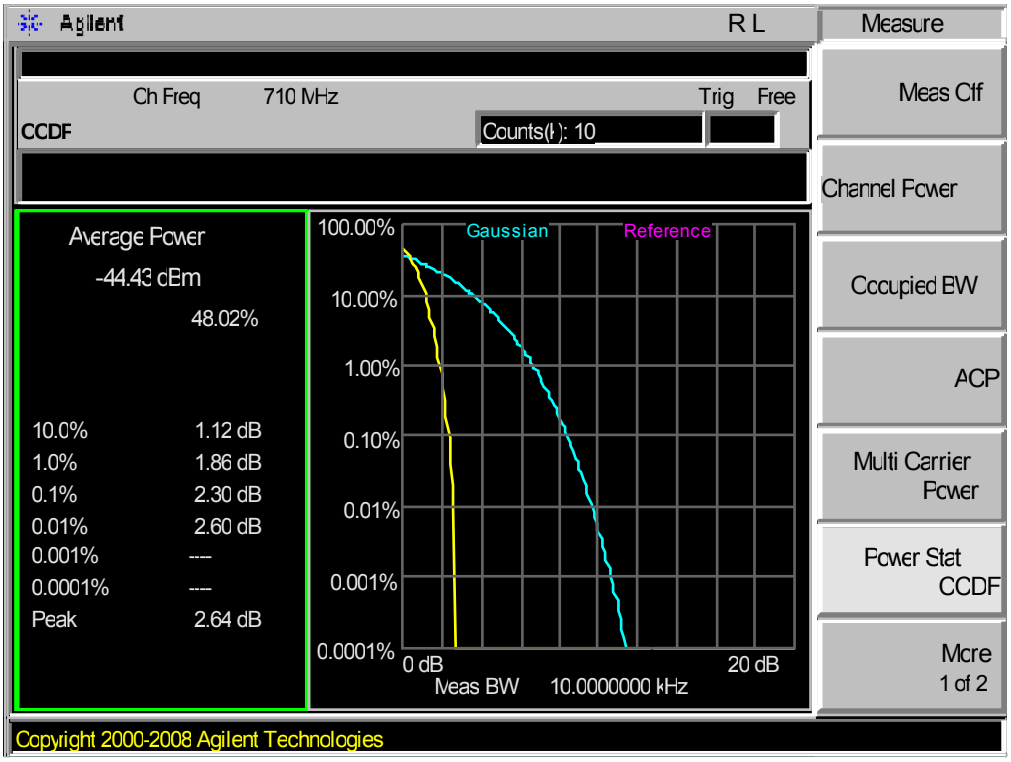
Band 17,UL Channel 23790,UL Frequency 710.0,BW 5.0,NO. RB 1,RB POS. Low,QPSK



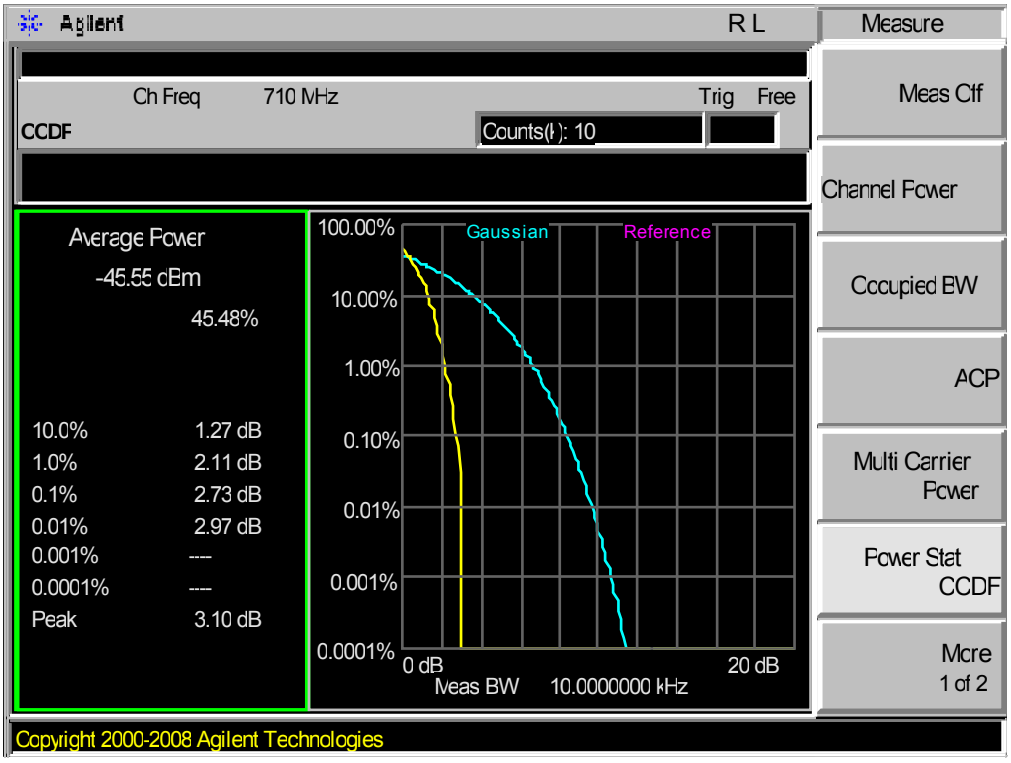
Band 17,UL Channel 23790,UL Frequency 710.0,BW 5.0,NO. RB 1,RB POS. Low,16QAM



Band 17,UL Channel 23790,UL Frequency 710.0,BW 10.0,NO. RB 1,RB POS. Low,QPSK



Band 17,UL Channel 23790,UL Frequency 710.0,BW 10.0,NO. RB 1,RB POS. Low,16QAM



APPENDIX IV

PHOTOGRAPHS OF TEST SETUP

RADIATED SPURIOUS EMISSION

----END OF REPORT----