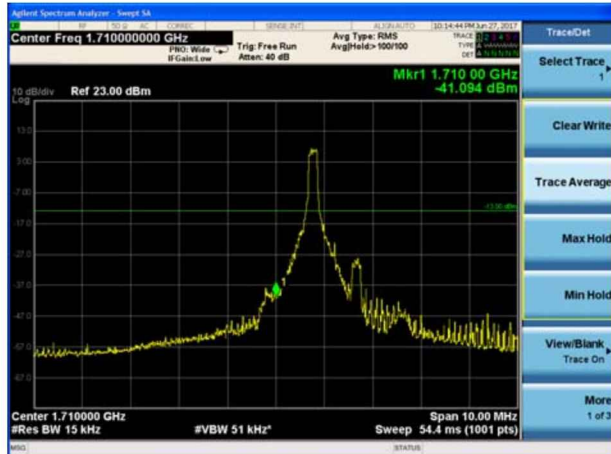
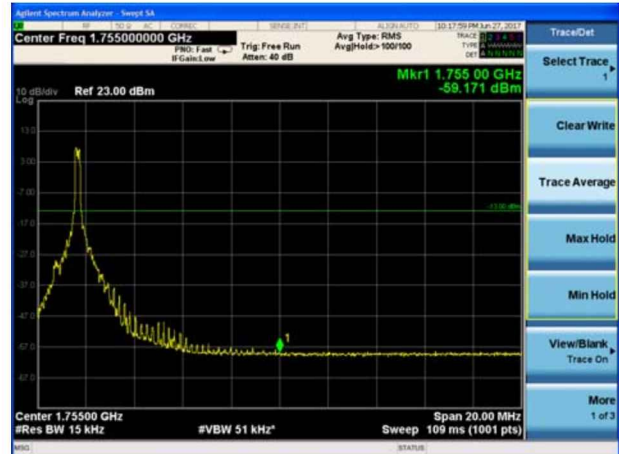




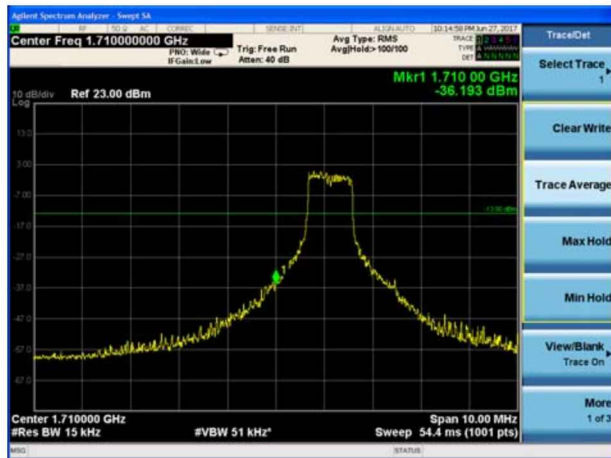
LTE Band 4 16QAM 10MHz CH-Low, 1 RB



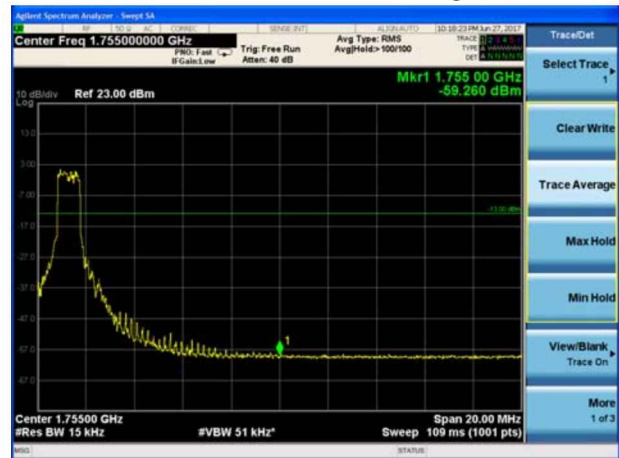
LTE Band 4 16QAM 10MHz CH-High, 1 RB



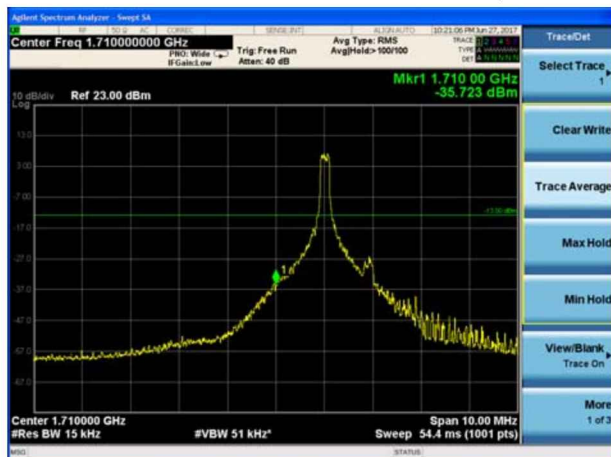
LTE Band 4 16QAM 10MHz CH-Low, 100%RB



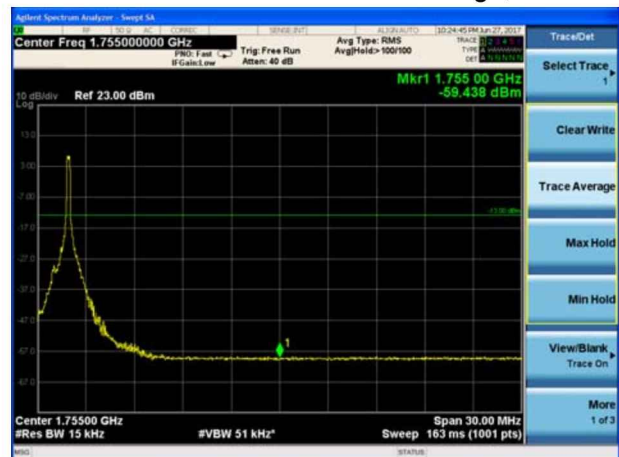
LTE Band 4 16QAM 10MHz CH-High, 100%RB



LTE Band 4 16QAM 15MHz CH-Low, 1 RB

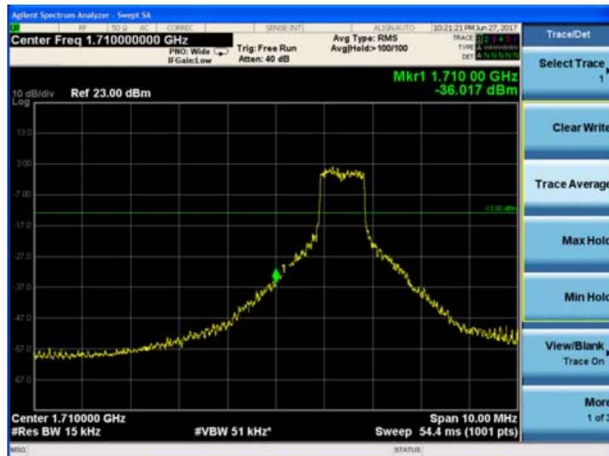


LTE Band 4 16QAM 15MHz CH-High, 1 RB





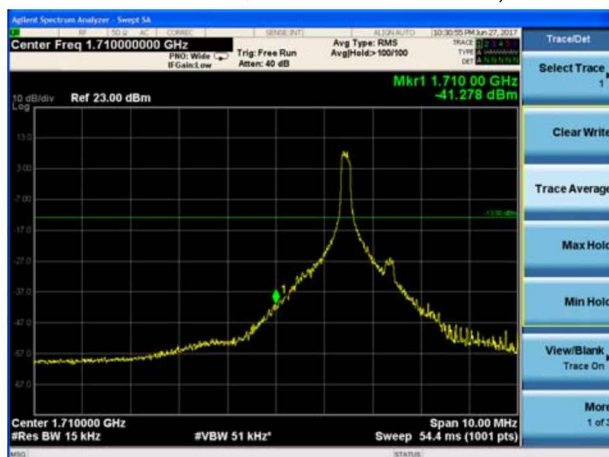
LTE Band 4 16QAM 15MHz CH-Low, 100%RB



LTE Band 4 16QAM 15MHz CH-High, 100%RB



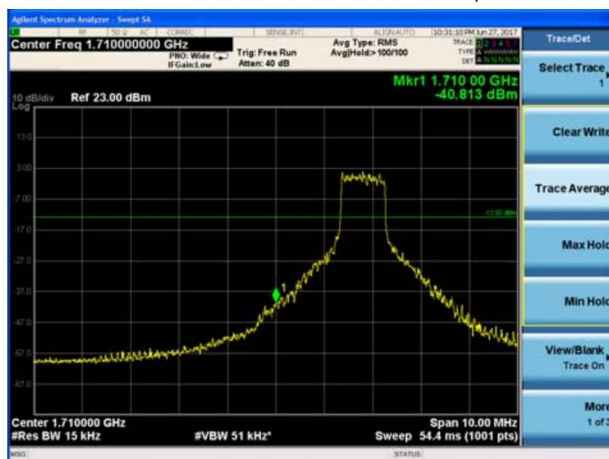
LTE Band 4 16QAM 20MHz CH-Low, 1 RB



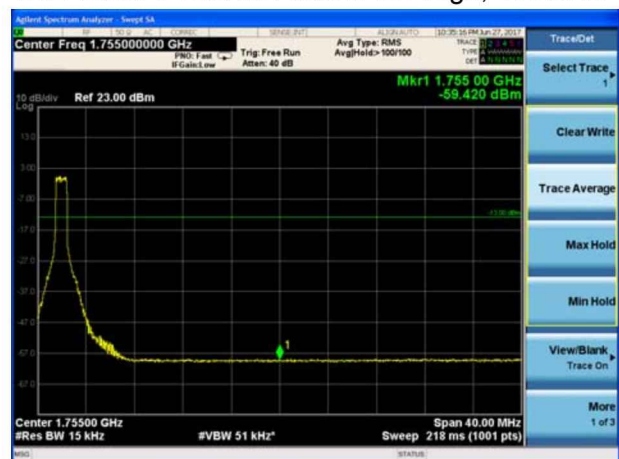
LTE Band 4 16QAM 20MHz CH-High, 1 RB



LTE Band 4 16QAM 20MHz CH-Low, 100%RB

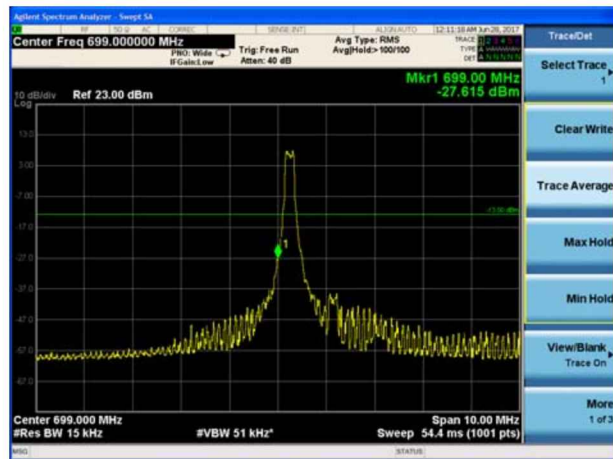


LTE Band 4 16QAM 20MHz CH-High, 100%RB

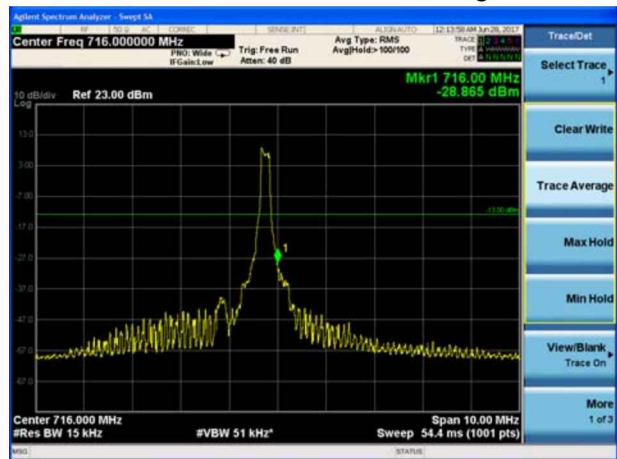




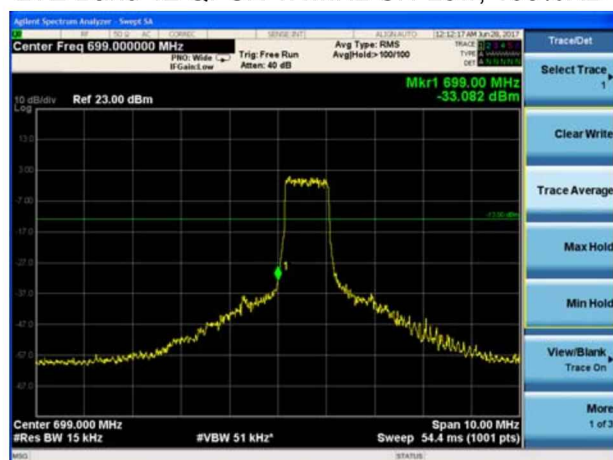
LTE Band 12 QPSK 1.4MHz CH-Low, 1 RB



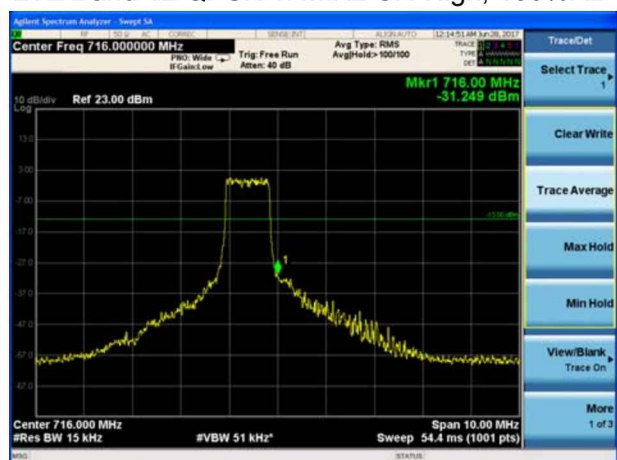
LTE Band 12 QPSK 1.4MHz CH-High, 1 RB



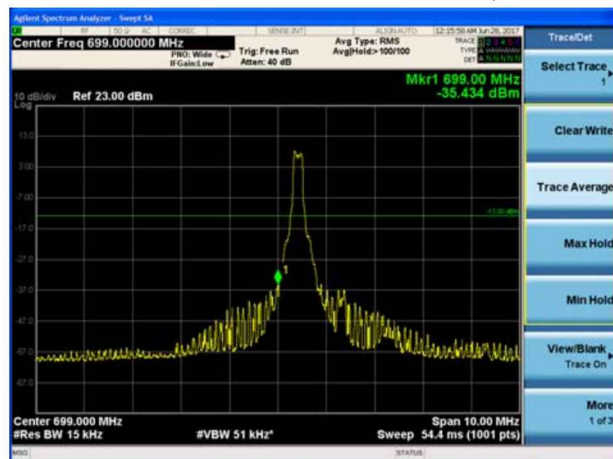
LTE Band 12 QPSK 1.4MHz CH-Low, 100%RB



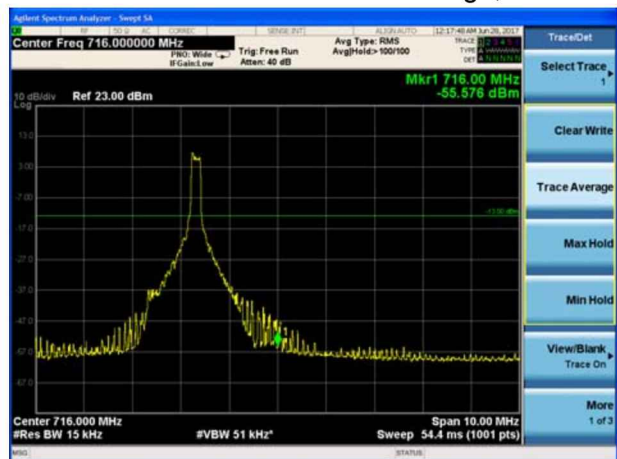
LTE Band 12 QPSK 1.4MHz CH-High, 100%RB



LTE Band 12 QPSK 3MHz CH-Low, 1 RB

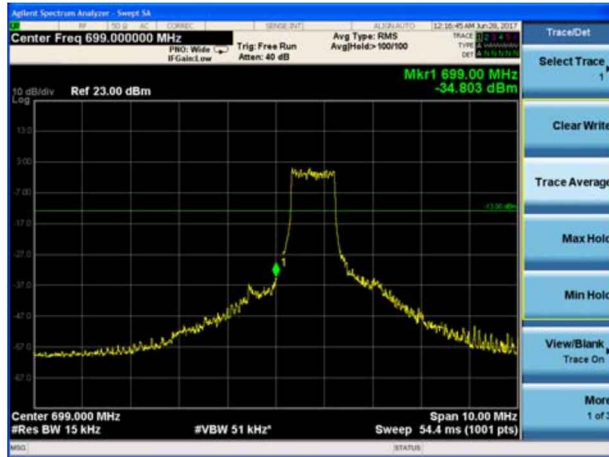


LTE Band 12 QPSK 3MHz CH-High, 1 RB

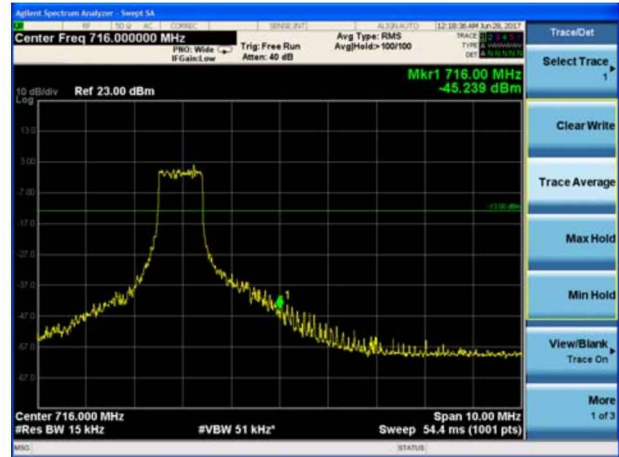




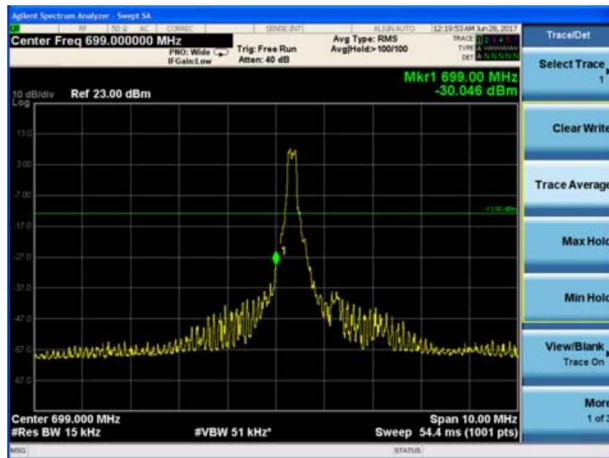
LTE Band 12 QPSK 3MHz CH-Low, 100%RB



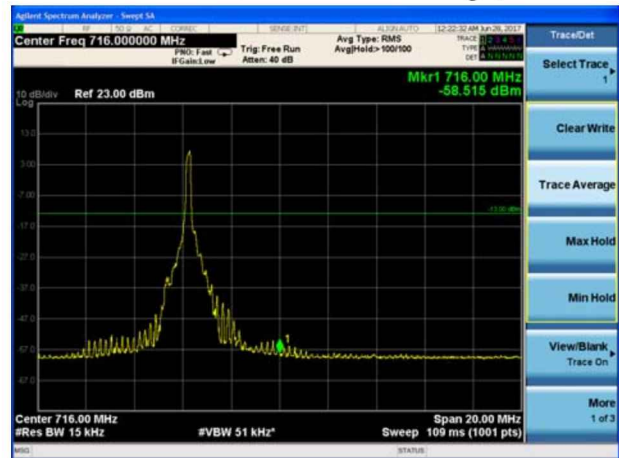
LTE Band 12 QPSK 3MHz CH-High, 100%RB



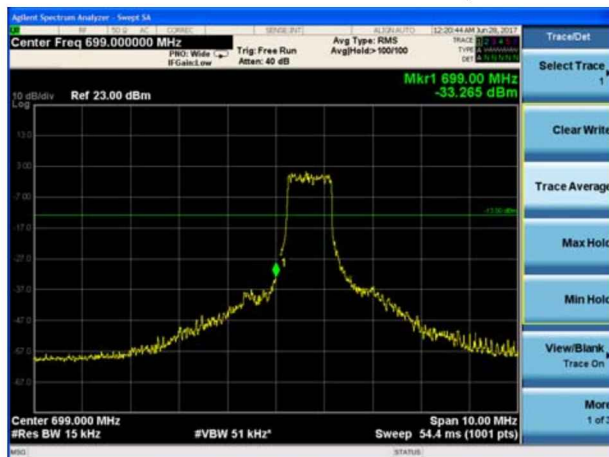
LTE Band 12 QPSK 5MHz CH-Low, 1 RB



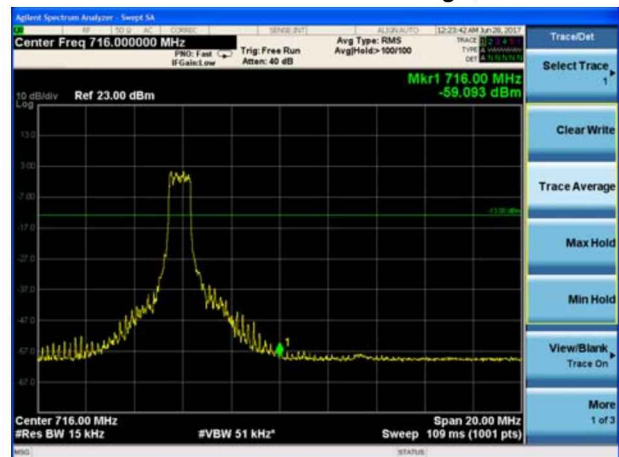
LTE Band 12 QPSK 5MHz CH-High, 1 RB



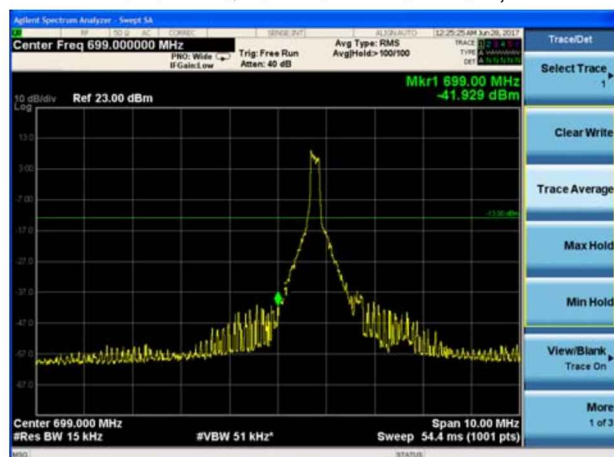
LTE Band 12 QPSK 5MHz CH-Low, 100%RB



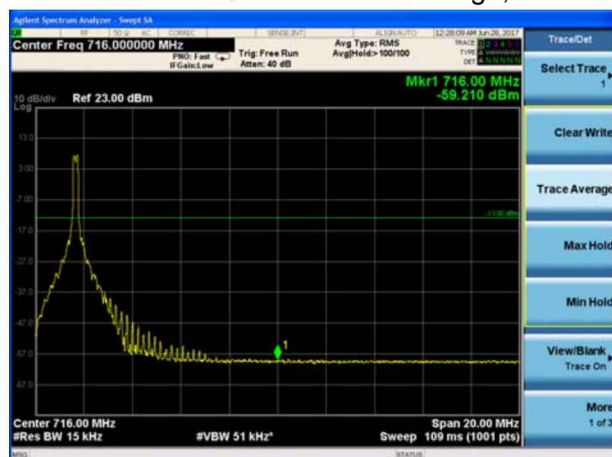
LTE Band 12 QPSK 5MHz CH-High, 100%RB



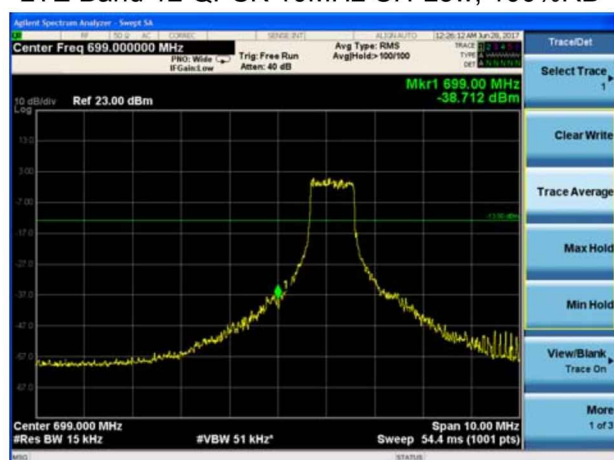
LTE Band 12 QPSK 10MHz CH-Low, 1 RB



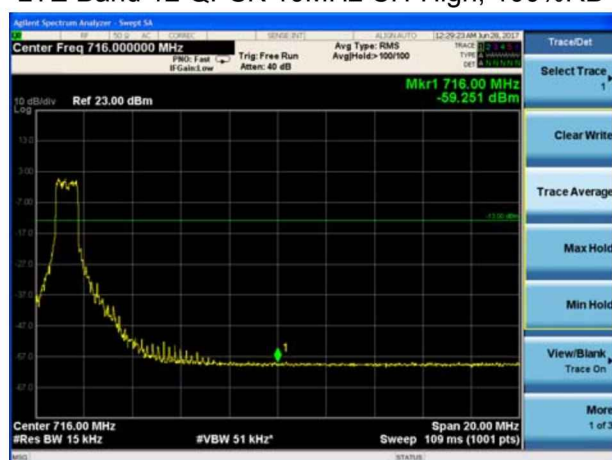
LTE Band 12 QPSK 10MHz CH-High, 1 RB



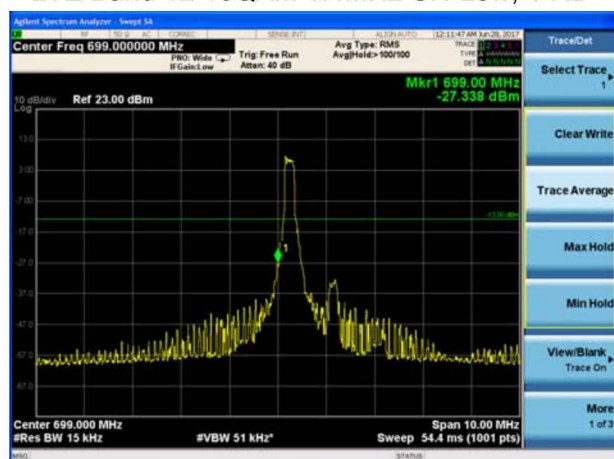
LTE Band 12 QPSK 10MHz CH-Low, 100%RB



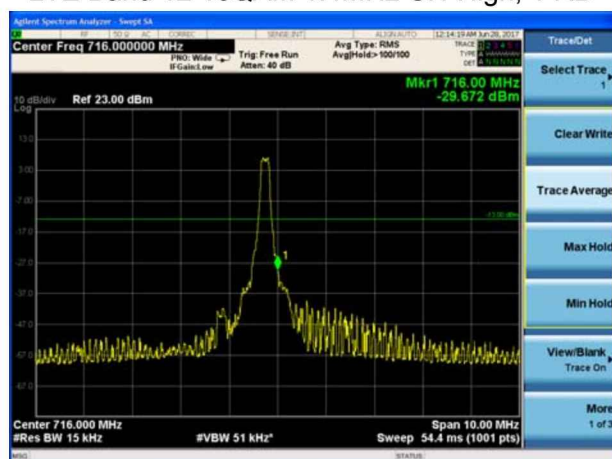
LTE Band 12 QPSK 10MHz CH-High, 100%RB



LTE Band 12 16QAM 1.4MHz CH-Low, 1 RB

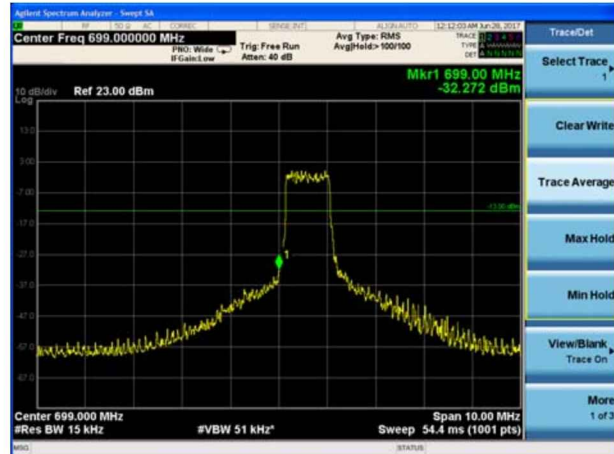


LTE Band 12 16QAM 1.4MHz CH-High, 1 RB

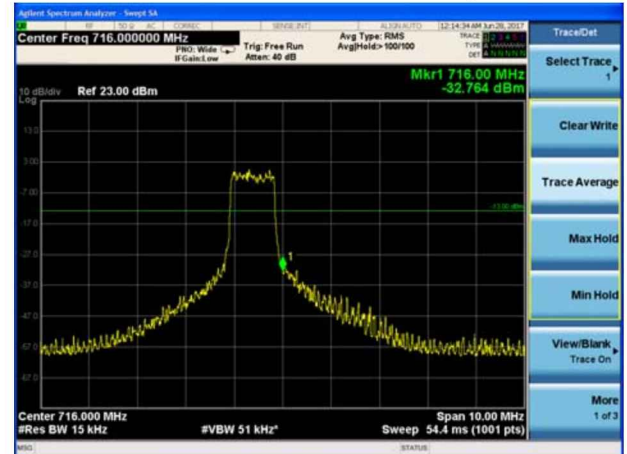




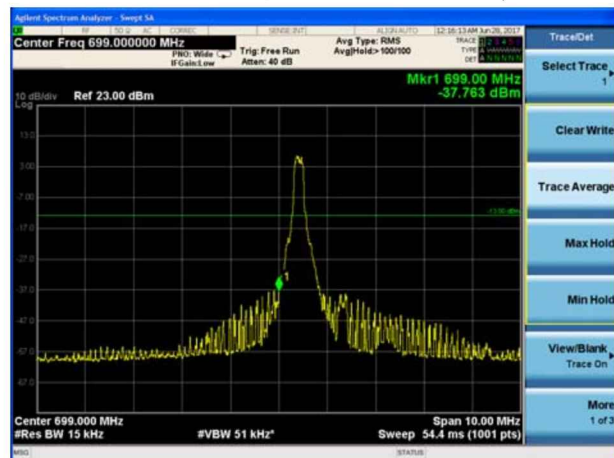
LTE Band 12 16QAM 1.4MHz CH-Low, 100%RB



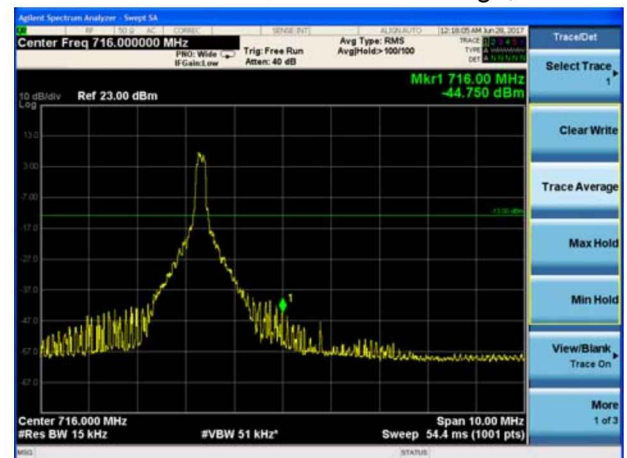
LTE Band 12 16QAM 1.4MHz CH-High, 100%RB



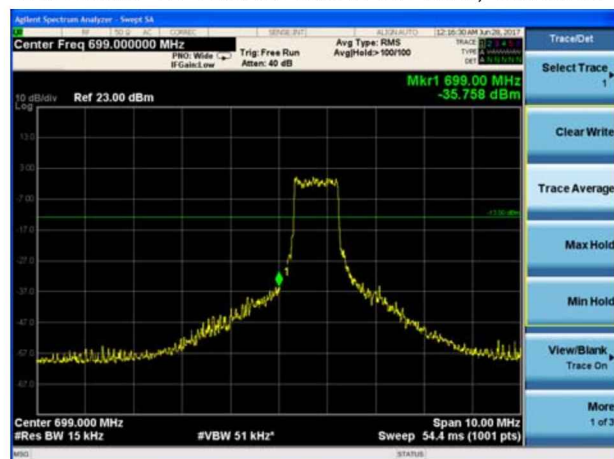
LTE Band 12 16QAM 3MHz CH-Low, 1 RB



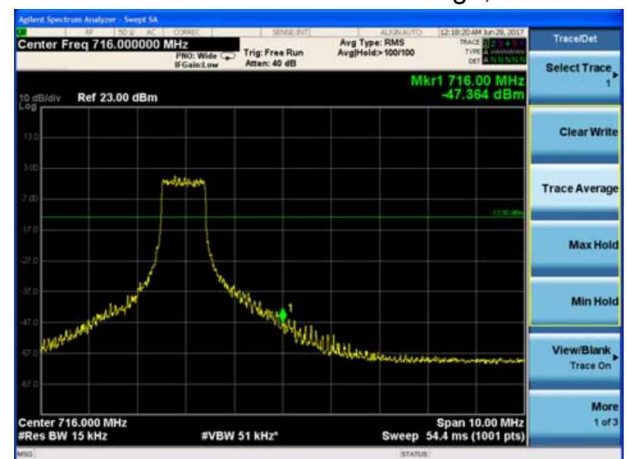
LTE Band 12 16QAM 3MHz CH-High, 1 RB



LTE Band 12 16QAM 3MHz CH-Low, 100%RB

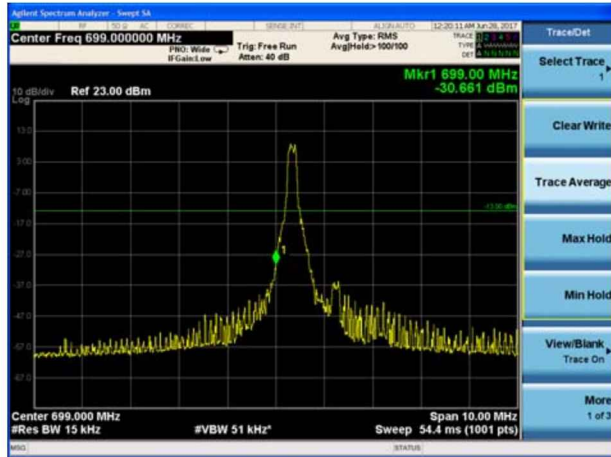


LTE Band 12 16QAM 3MHz CH-High, 100%RB

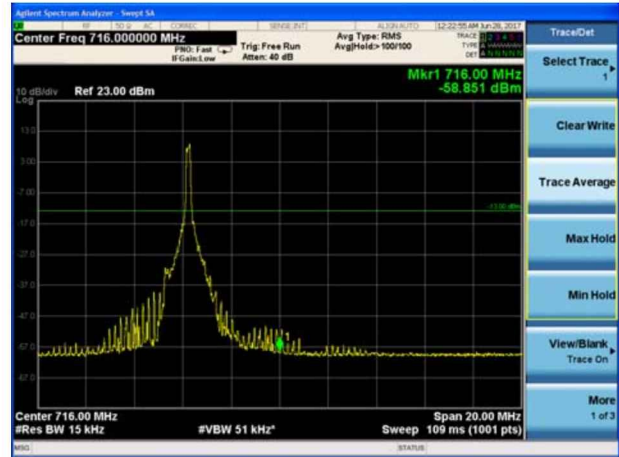




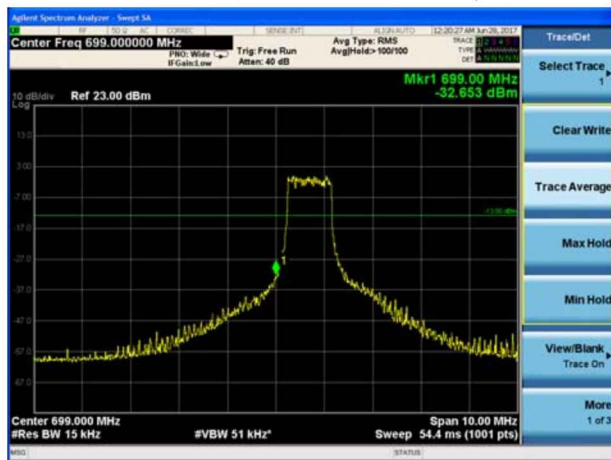
LTE Band 12 16QAM 5MHz CH-Low, 1 RB



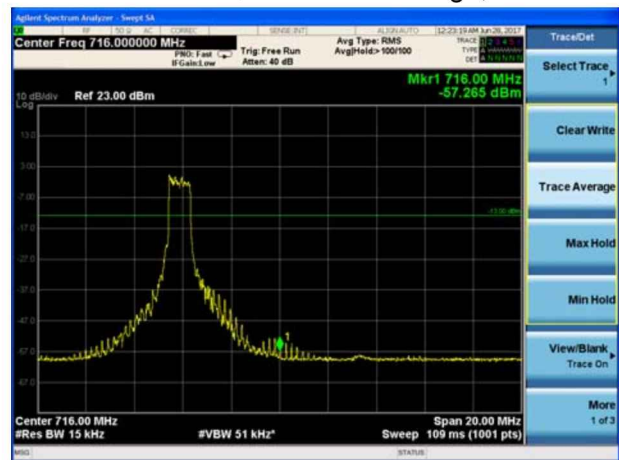
LTE Band 12 16QAM 5MHz CH-High, 1 RB



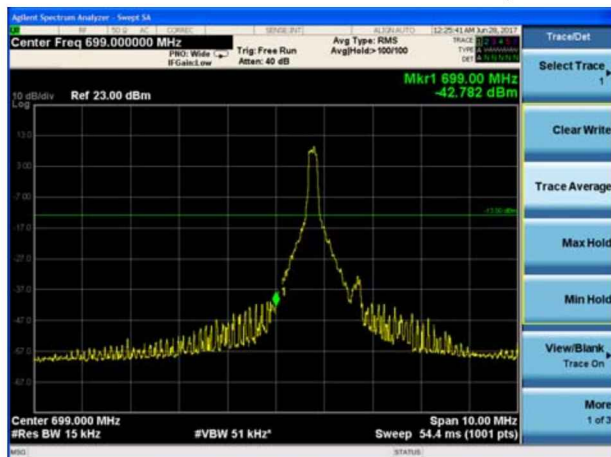
LTE Band 12 16QAM 5MHz CH-Low, 100%RB



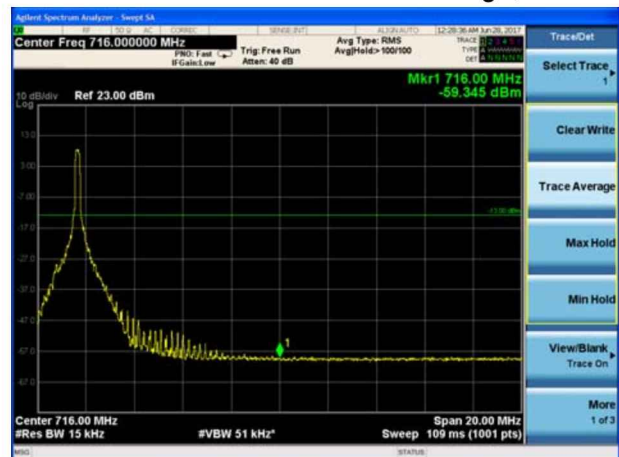
LTE Band 12 16QAM 5MHz CH-High, 100%RB



LTE Band 12 16QAM 10MHz CH-Low, 1 RB

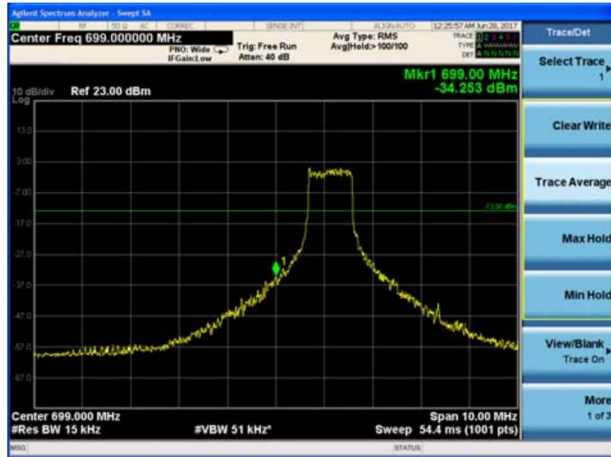


LTE Band 12 16QAM 10MHz CH-High, 1 RB

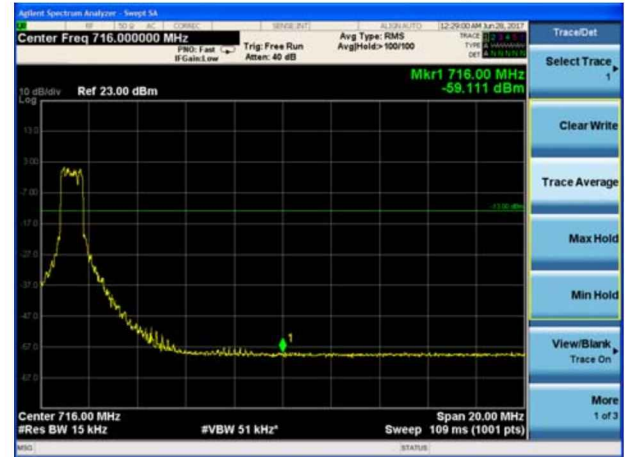




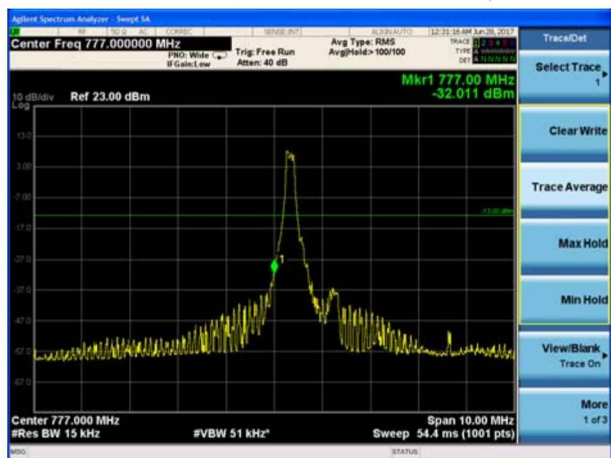
LTE Band 12 16QAM 10MHz CH-Low, 100%RB



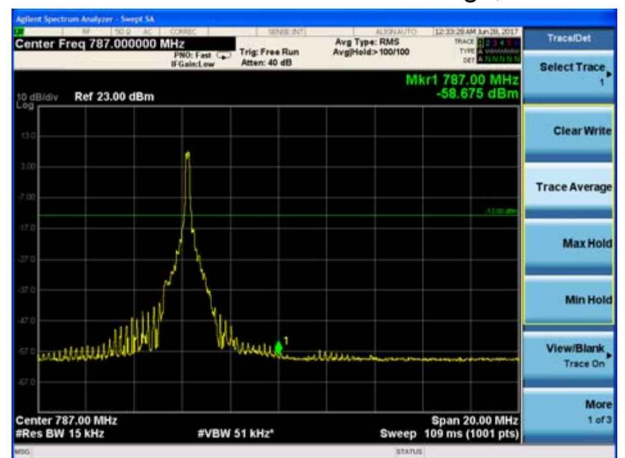
LTE Band 12 16QAM 10MHz CH-High, 100%RB



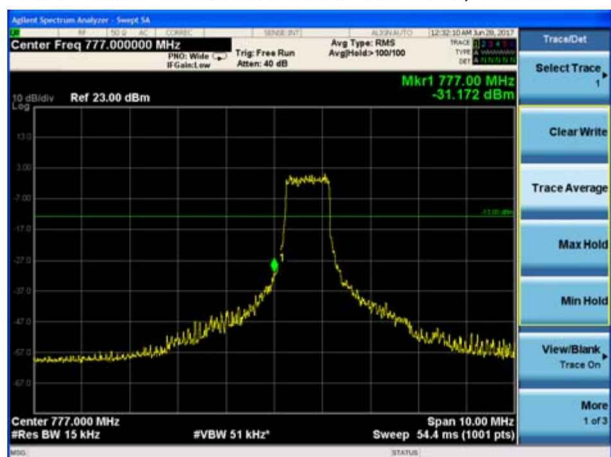
LTE Band 13 QPSK 5MHz CH-Low, 1 RB



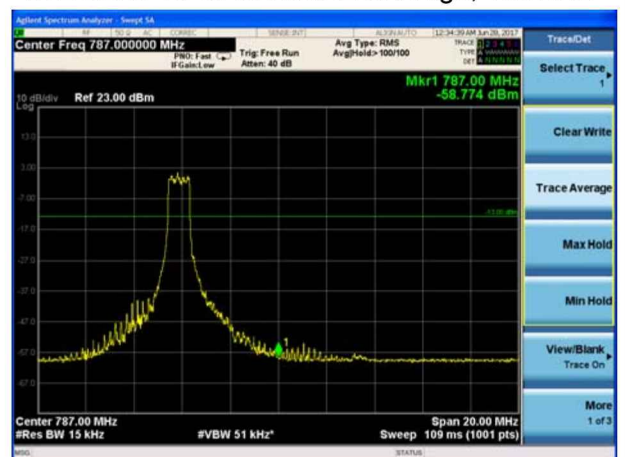
LTE Band 13 QPSK 5MHz CH-High, 1 RB



LTE Band 13 QPSK 5MHz CH-Low, 100%RB



LTE Band 13 QPSK 5MHz CH-High, 100%RB



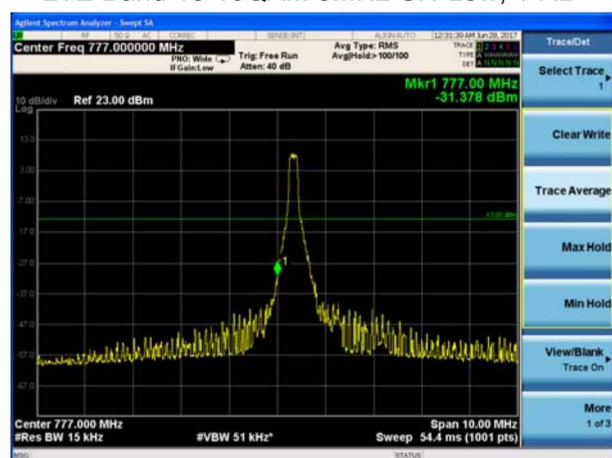
LTE Band 13 QPSK 10MHz CH- L/H, 1 RB



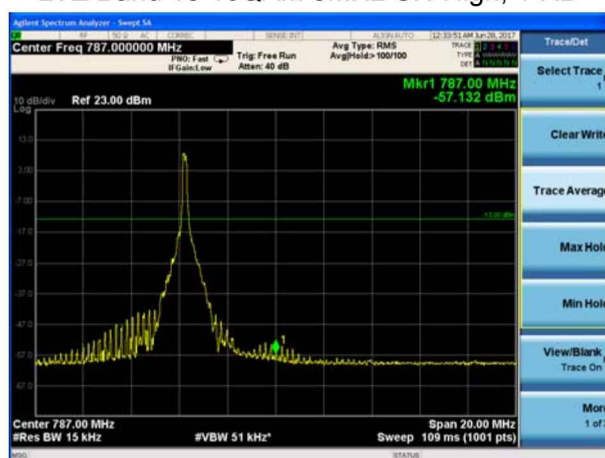
LTE Band 13 QPSK 10MHz CH- L/H, 100%RB



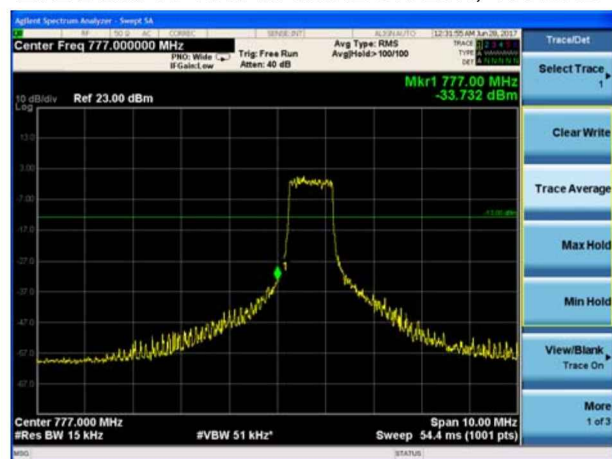
LTE Band 13 16QAM 5MHz CH-Low, 1 RB



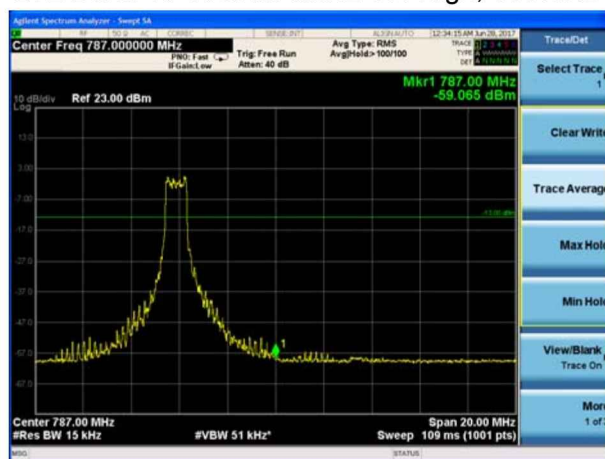
LTE Band 13 16QAM 5MHz CH-High, 1 RB



LTE Band 13 16QAM 5MHz CH-Low, 100%RB



LTE Band 13 16QAM 5MHz CH-High, 100%RB





LTE Band 13 16QAM 10MHz CH- L/H, 1 RB



LTE Band 13 16QAM 10MHz CH- L/H, 100%RB



4.5 Peak-to-Average Power Ratio (PAPR)

Ambient condition

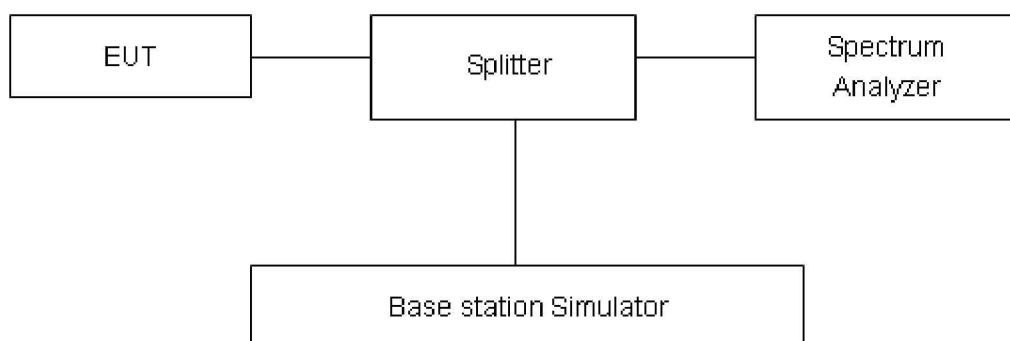
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

Measure the total peak power and record as PPk. And measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

$$\text{PAPR (dB)} = \text{PPk (dBm)} - \text{PAvg (dBm)}.$$

Test Setup



Limits

Rule Part 27.50(d)(5) Equipment employed must be authorized in accordance with the provisions of 24.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.4$ dB.

Test Results



LTE Band 4								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	19957	1710.7	31.96	22.13	9.83	≤13	PASS
		20175	1732.5	33.37	22.09	11.28	≤13	PASS
		20393	1754.3	33.44	22.23	11.21	≤13	PASS
	3	19965	1711.5	31.88	22.16	9.72	≤13	PASS
		20175	1732.5	33.56	22.13	11.43	≤13	PASS
		20385	1753.5	32.09	22.26	9.83	≤13	PASS
	5	19975	1712.5	31.94	22.14	9.80	≤13	PASS
		20175	1732.5	32.06	22.12	9.94	≤13	PASS
		20375	1752.5	31.86	22.24	9.62	≤13	PASS
	10	20000	1715	31.79	22.22	9.57	≤13	PASS
		20175	1732.5	31.69	22.14	9.55	≤13	PASS
		20350	1750	31.89	22.28	9.61	≤13	PASS
	15	20025	1717.5	30.24	22.20	8.04	≤13	PASS
		20175	1732.5	30.77	22.10	8.67	≤13	PASS
		20325	1747.5	30.54	22.23	8.31	≤13	PASS
	20	20050	1720	30.75	22.17	8.58	≤13	PASS
		20175	1732.5	30.92	22.05	8.87	≤13	PASS
		20300	1745	31.12	22.19	8.93	≤13	PASS
16QAM	1.4	19957	1710.7	32.53	22.06	10.47	≤13	PASS
		20175	1732.5	34.13	22.03	12.10	≤13	PASS
		20393	1754.3	34.20	22.21	11.99	≤13	PASS
	3	19965	1711.5	32.51	22.09	10.42	≤13	PASS
		20175	1732.5	33.94	22.07	11.87	≤13	PASS
		20385	1753.5	32.81	22.24	10.57	≤13	PASS
	5	19975	1712.5	32.31	22.07	10.24	≤13	PASS
		20175	1732.5	32.62	22.03	10.59	≤13	PASS
		20375	1752.5	32.71	22.19	10.52	≤13	PASS
	10	20000	1715	31.15	22.10	9.05	≤13	PASS
		20175	1732.5	32.14	22.08	10.06	≤13	PASS
		20350	1750	31.87	22.23	9.64	≤13	PASS
	15	20025	1717.5	30.96	22.07	8.89	≤13	PASS
		20175	1732.5	30.68	22.03	8.65	≤13	PASS
		20325	1747.5	31.66	22.19	9.47	≤13	PASS
	20	20050	1720	30.59	22.05	8.54	≤13	PASS
		20175	1732.5	31.17	21.99	9.18	≤13	PASS
		20300	1745	30.98	22.16	8.82	≤13	PASS

LTE Band 12								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	1.4	23017	699.7	32.45	22.48	9.97	≤13	PASS
		23095	707.5	32.63	22.66	9.97	≤13	PASS
		23173	715.3	32.75	22.64	10.11	≤13	PASS
	3	23025	700.5	32.77	22.56	10.21	≤13	PASS
		23095	707.5	32.56	22.68	9.88	≤13	PASS
		23165	714.5	34.26	22.68	11.58	≤13	PASS
	5	23035	701.5	32.64	22.54	10.10	≤13	PASS
		23095	707.5	32.27	22.64	9.63	≤13	PASS
		23155	713.5	32.24	22.63	9.61	≤13	PASS
	10	23060	704	31.83	22.51	9.32	≤13	PASS
		23095	707.5	31.88	22.59	9.29	≤13	PASS
		23130	711	31.69	22.59	9.10	≤13	PASS
16QAM	1.4	23017	699.7	33.33	22.71	10.62	≤13	PASS
		23095	707.5	34.21	22.90	11.31	≤13	PASS
		23173	715.3	33.52	22.79	10.73	≤13	PASS
	3	23025	700.5	33.37	22.74	10.63	≤13	PASS
		23095	707.5	33.51	22.95	10.56	≤13	PASS
		23165	714.5	34.84	22.83	12.01	≤13	PASS
	5	23035	701.5	32.95	22.71	10.24	≤13	PASS
		23095	707.5	33.75	22.90	10.85	≤13	PASS
		23155	713.5	33.08	22.79	10.29	≤13	PASS
	10	23060	704	32.98	22.69	10.29	≤13	PASS
		23095	707.5	32.03	22.86	9.17	≤13	PASS
		23130	711	32.54	22.76	9.78	≤13	PASS

LTE Band 13								
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Limit (dB)	Conclusion
QPSK	5	23205	779.5	32.47	22.80	9.67	≤13	PASS
		23230	782	32.64	22.68	9.96	≤13	PASS
		23255	784.5	33.47	22.67	10.80	≤13	PASS
	10	23230	782	32.46	22.77	9.69	≤13	PASS
16QAM	5	23205	779.5	31.94	21.84	10.10	≤13	PASS
		23230	782	32.23	22.19	10.04	≤13	PASS
		23255	784.5	32.85	21.93	10.92	≤13	PASS
	10	23230	782	32.68	22.95	9.73	≤13	PASS

4.6 Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -40°C to +85°C in 10°C step size.

(1)With all power removed, the temperature was decreased to -10°C and permitted to stabilize for three hours.

(2)Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -40°C to +85°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

2. Frequency Stability (Voltage Variation)

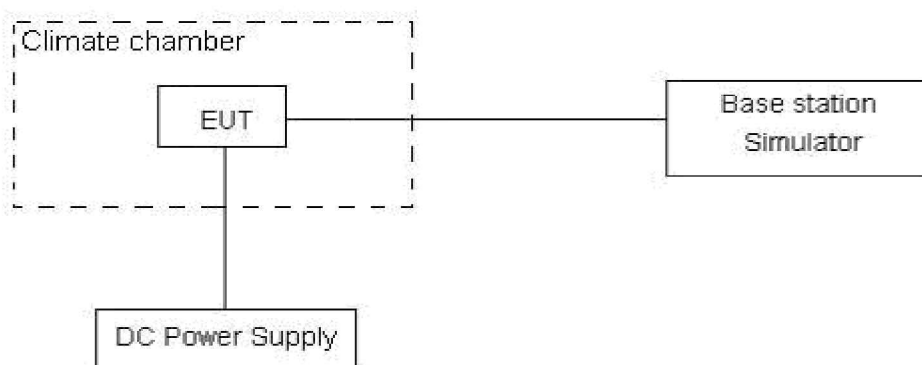
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 3.3 V and 4.3 V, with a nominal voltage of 3.8V.

Test setup



Limits

No specific frequency stability requirements in part 27.54

Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor $k = 3$, $U=0.01\text{ppm}$.