

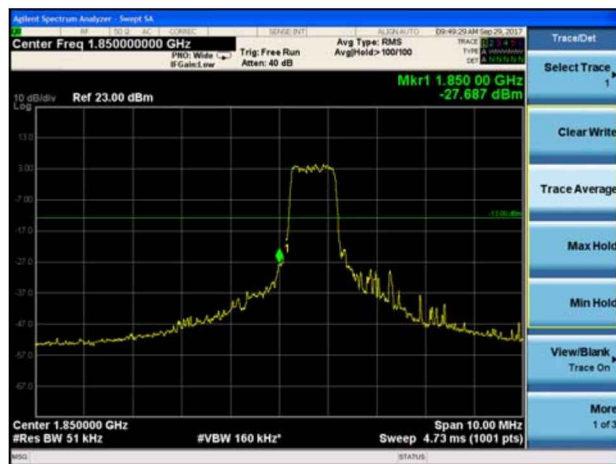
LTE Band 2 5MHz 16QAM 1RB CH-Low



LTE Band 2 5MHz 16QAM 1RB CH-High



LTE Band 2 5MHz 16QAM 100%RB CH-Low



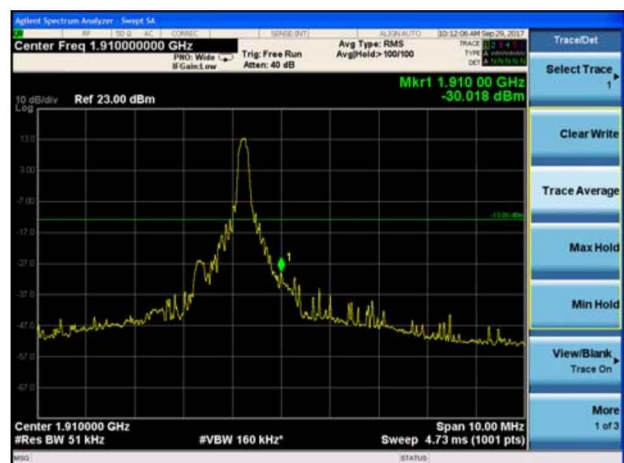
LTE Band 2 5MHz 16QAM 100%RB CH-High



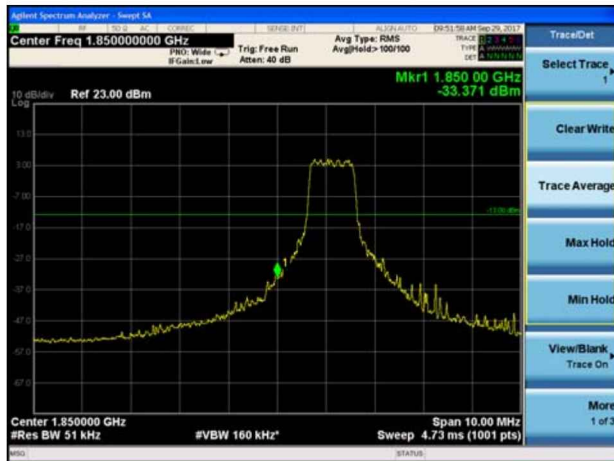
LTE Band 2 10MHz 16QAM 1RB CH-Low



LTE Band 2 10MHz 16QAM 1RB CH-High



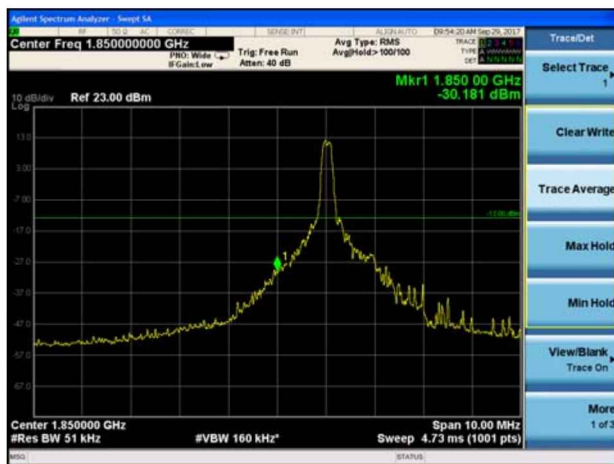
LTE Band 2 10MHz 16QAM 100%RB CH-Low



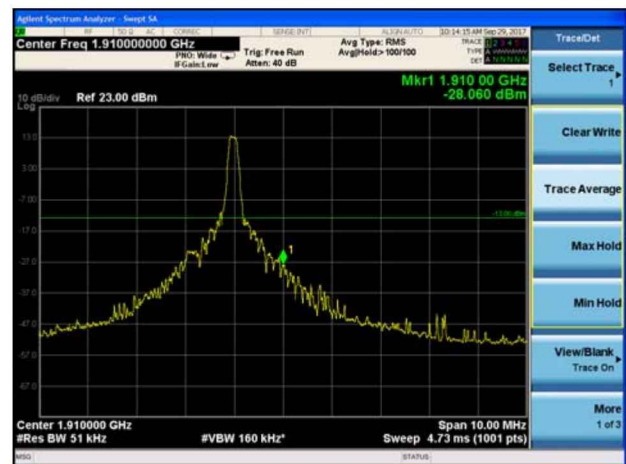
LTE Band 2 10MHz 16QAM 100%RB CH-High



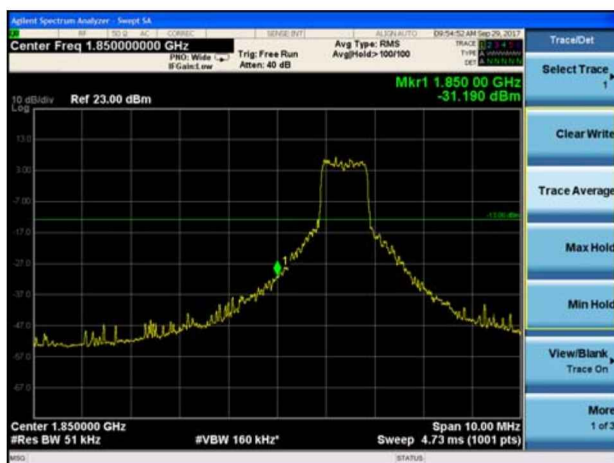
LTE Band 2 15MHz 16QAM 1RB CH-Low



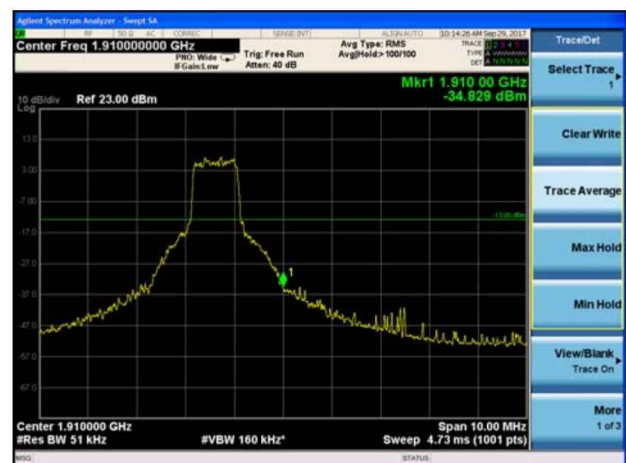
LTE Band 2 15MHz 16QAM 1RB CH-High



LTE Band 2 15MHz 16QAM 100%RB CH-Low

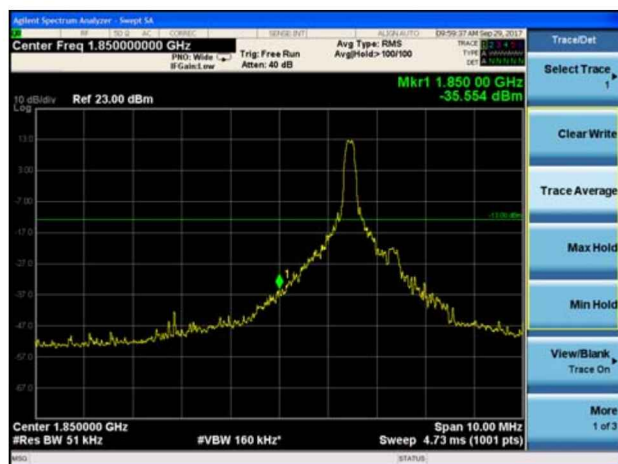


LTE Band 2 15MHz 16QAM 100%RB CH-High

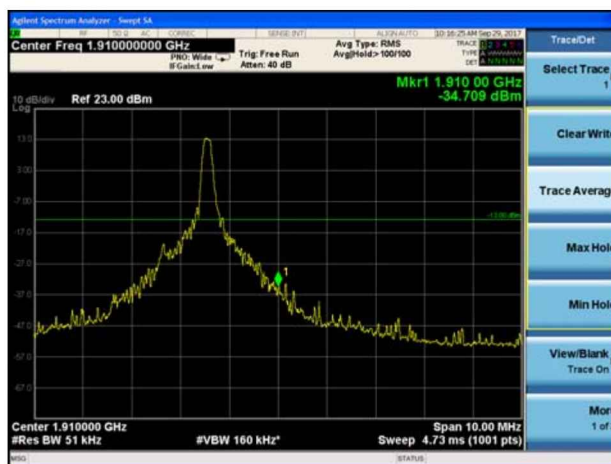




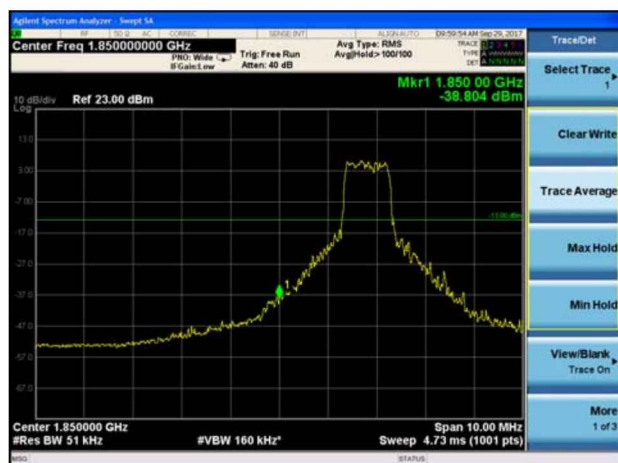
LTE Band 2 20MHz 16QAM 1RB CH-Low



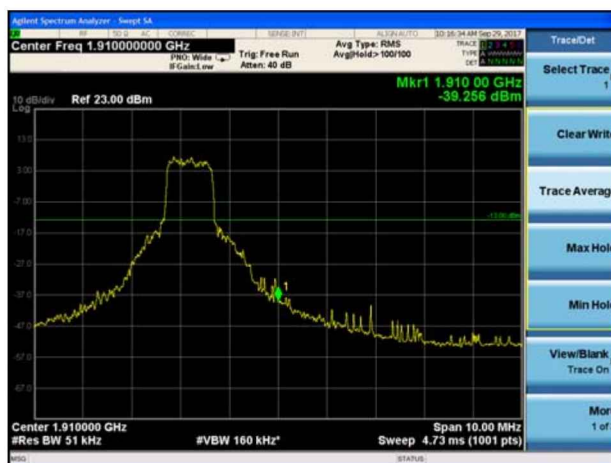
LTE Band 2 20MHz 16QAM 1RB CH-High



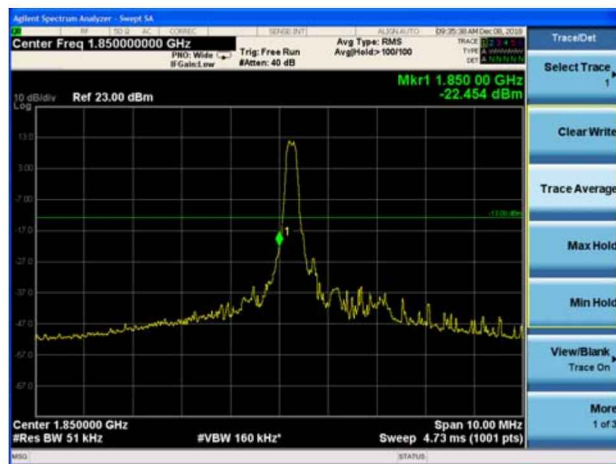
LTE Band 2 20MHz 16QAM 100%RB CH-Low



LTE Band 2 20MHz 16QAM 100%RB CH-High



LTE Band 25 1.4MHz QPSK 1RB CH-Low



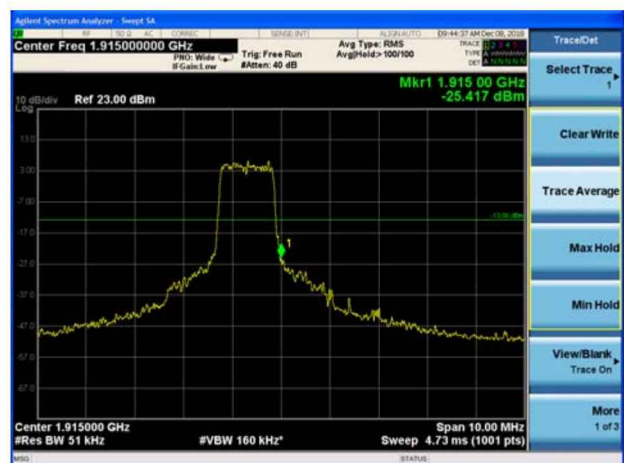
LTE Band 25 1.4MHz QPSK 1RB CH-High



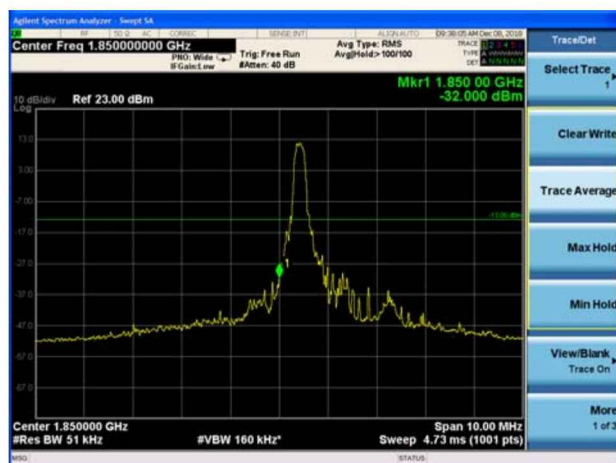
LTE Band 25 1.4MHz QPSK 100%RB CH-Low



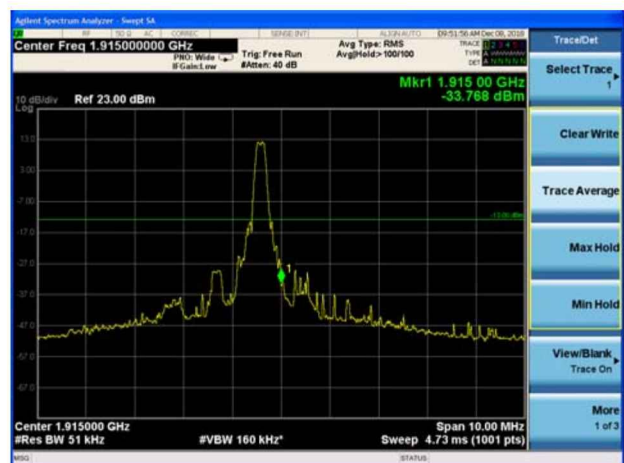
LTE Band 25 1.4MHz QPSK 100%RB CH-High



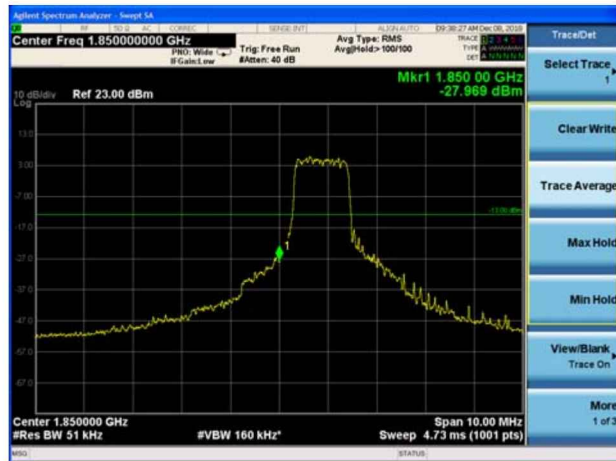
LTE Band 25 3MHz QPSK 1RB CH-Low



LTE Band 25 3MHz QPSK 1RB CH-High



LTE Band 25 3MHz QPSK 100%RB CH-Low



LTE Band 25 3MHz QPSK 100%RB CH-High



LTE Band 25 5MHz QPSK 1RB CH-Low



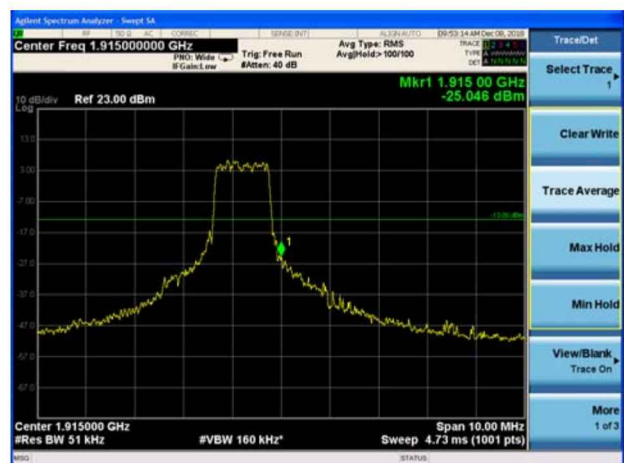
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LTE Band 25 5MHz QPSK 100%RB CH-Low



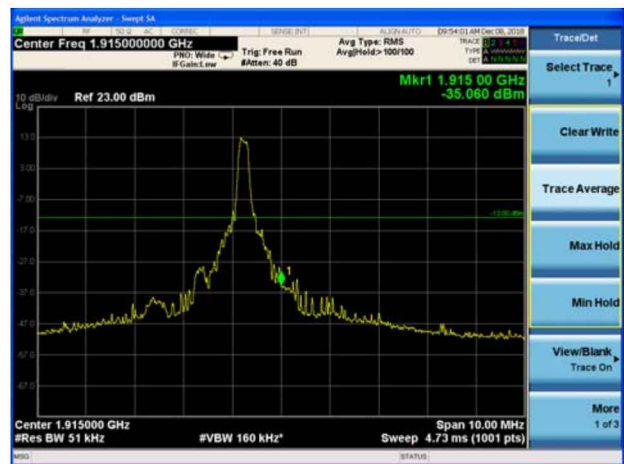
LTE Band 25 5MHz QPSK 100%RB CH-High



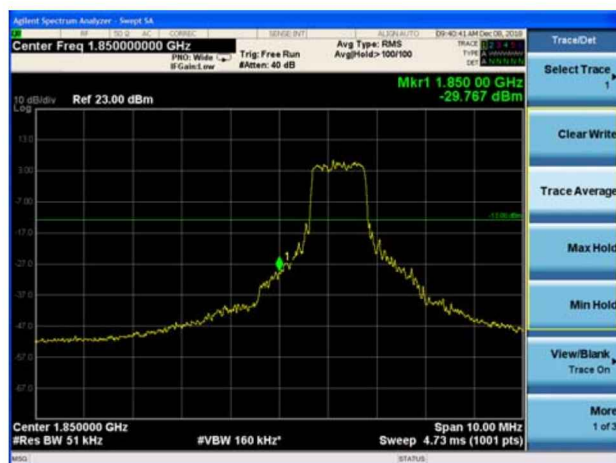
LTE Band 25 10MHz QPSK 1RB CH-Low



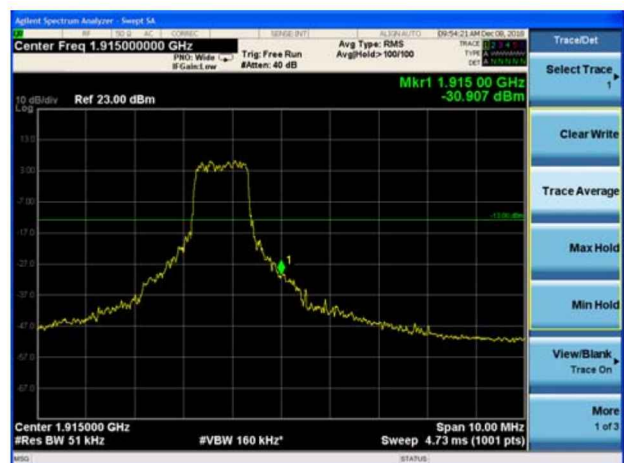
LTE Band 25 10MHz QPSK 1RB CH-High



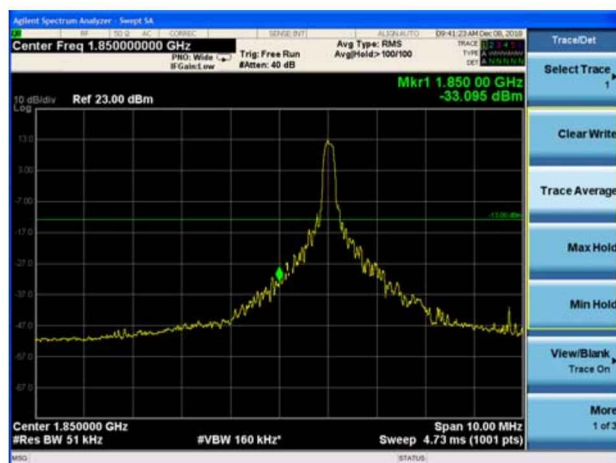
LTE Band 25 10MHz QPSK 100%RB CH-Low



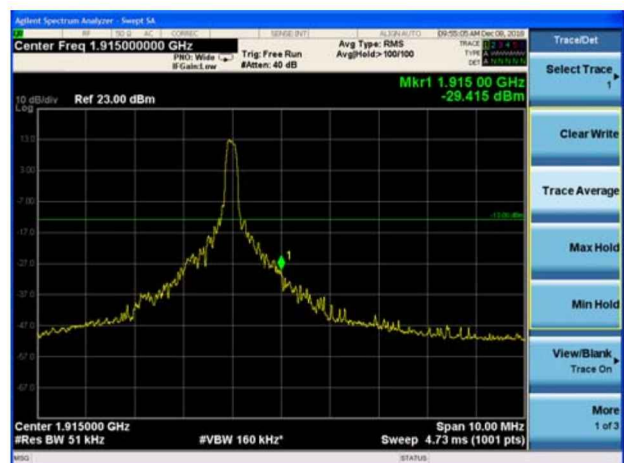
LTE Band 25 10MHz QPSK 100%RB CH-High



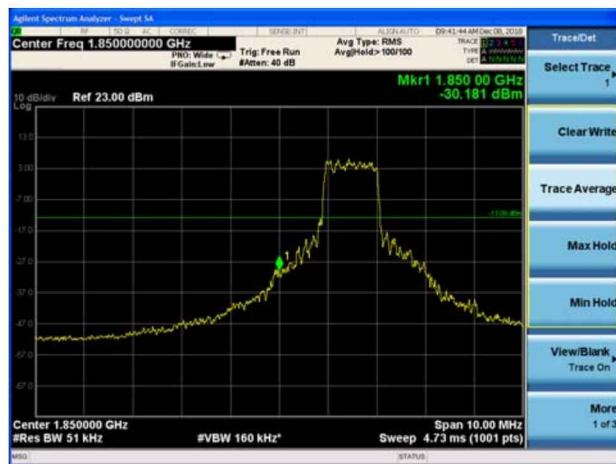
LTE Band 25 15MHz QPSK 1RB CH-Low



LTE Band 25 15MHz QPSK 1RB CH-High



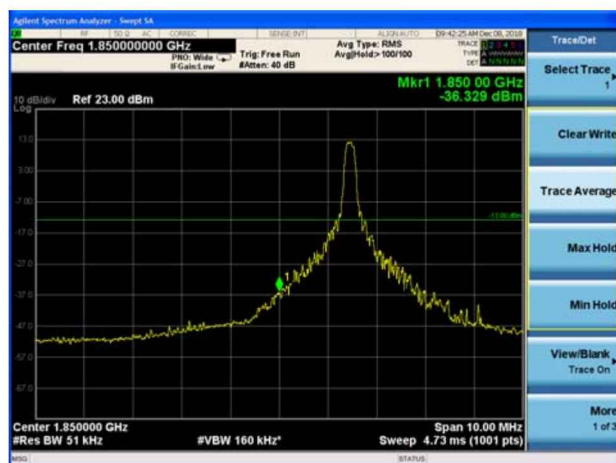
LTE Band 25 15MHz QPSK 100%RB CH-Low



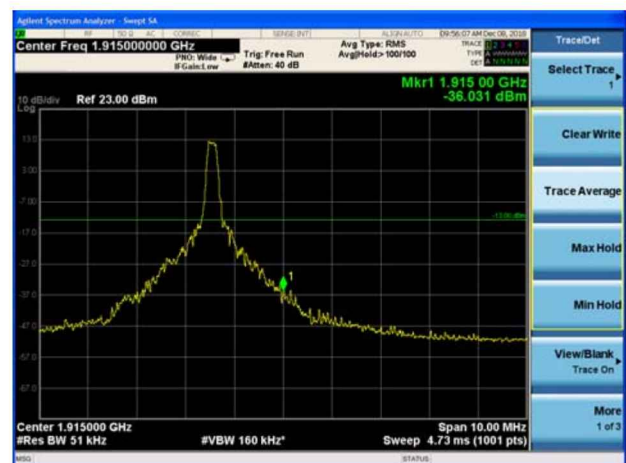
LTE Band 25 15MHz QPSK 100%RB CH-High



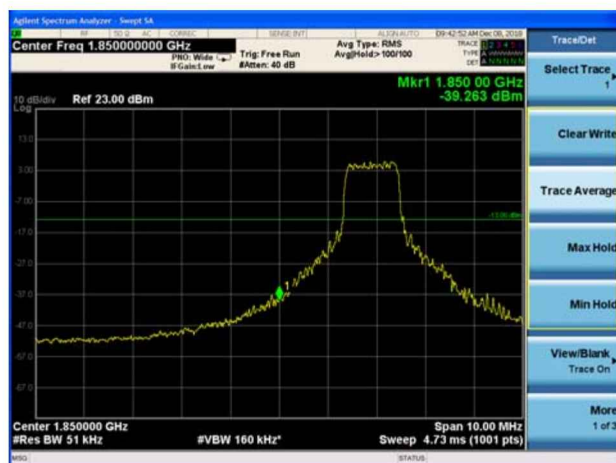
LTE Band 25 20MHz QPSK 1RB CH-Low



LTE Band 25 20MHz QPSK 1RB CH-High



LTE Band 25 20MHz QPSK 100%RB CH-Low



LTE Band 25 20MHz QPSK 100%RB CH-High



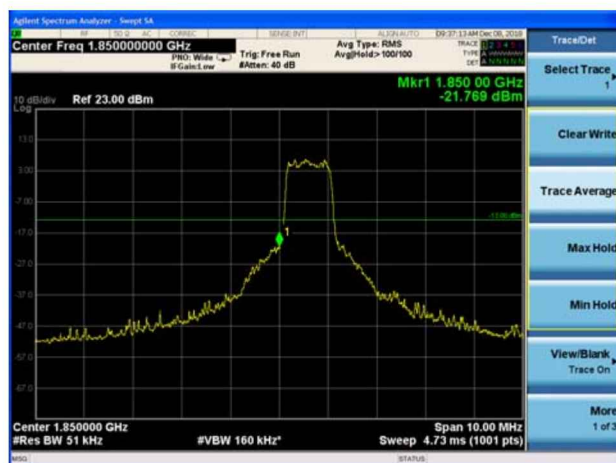
LTE Band 25 1.4MHz 16QAM 1RB CH-Low



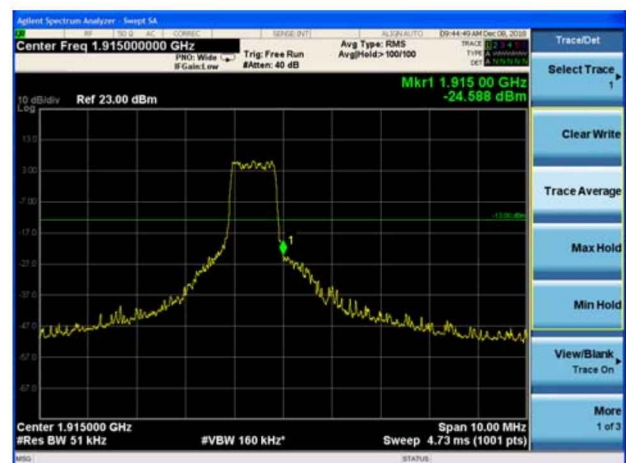
LTE Band 25 1.4MHz 16QAM 1RB CH-High



LTE Band 25 1.4MHz 16QAM 100%RB CH-Low



LTE Band 25 1.4MHz 16QAM 100%RB CH-High



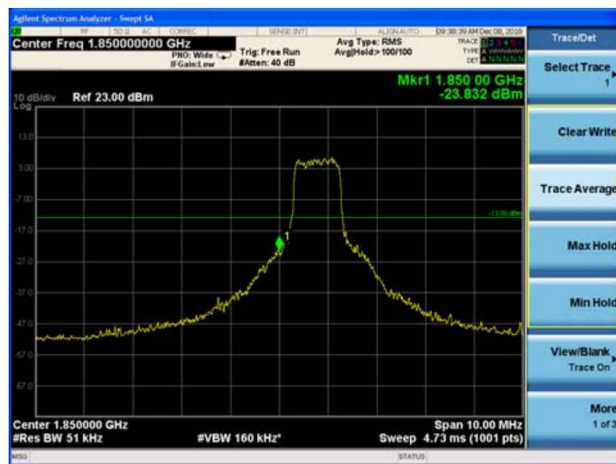
LTE Band 25 3MHz 16QAM 1RB CH-Low



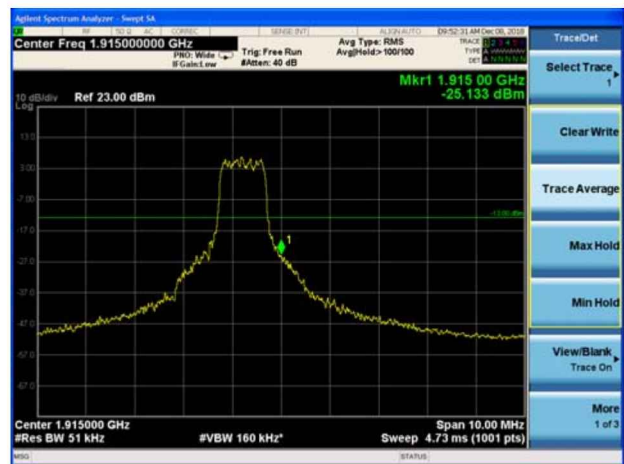
LTE Band 25 3MHz 16QAM 1RB CH-High



LTE Band 25 3MHz 16QAM 100%RB CH-Low



LTE Band 25 3MHz 16QAM 100%RB CH-High



LTE Band 25 5MHz 16QAM 1RB CH-Low



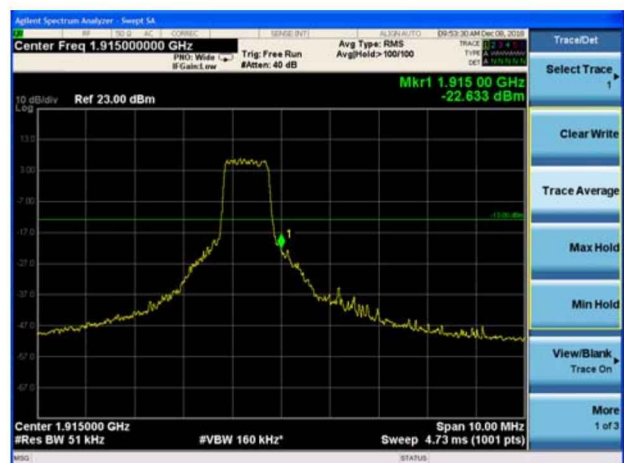
LTE Band 25 5MHz 16QAM 1RB CH-High



LTE Band 25 5MHz 16QAM 100%RB CH-Low



LTE Band 25 5MHz 16QAM 100%RB CH-High



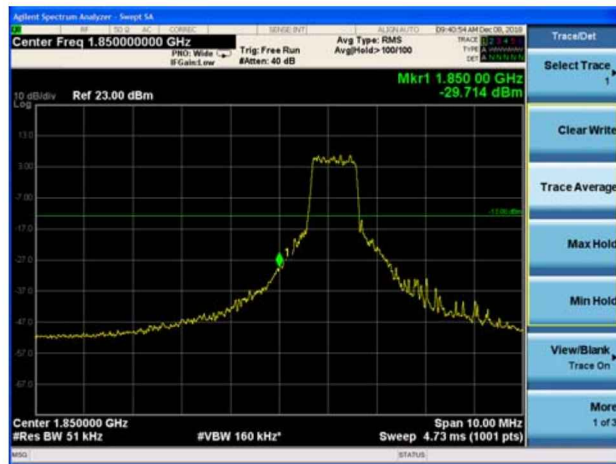
LTE Band 25 10MHz 16QAM 1RB CH-Low



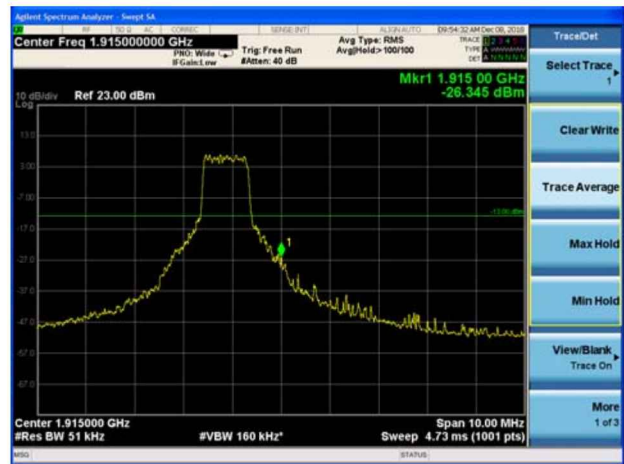
LTE Band 25 10MHz 16QAM 1RB CH-High



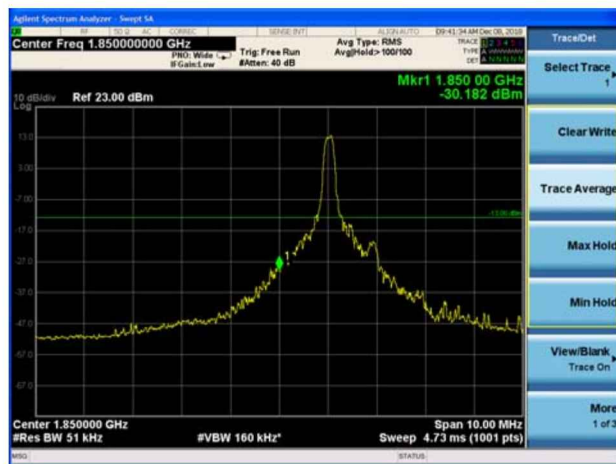
LTE Band 25 10MHz 16QAM 100%RB CH-Low



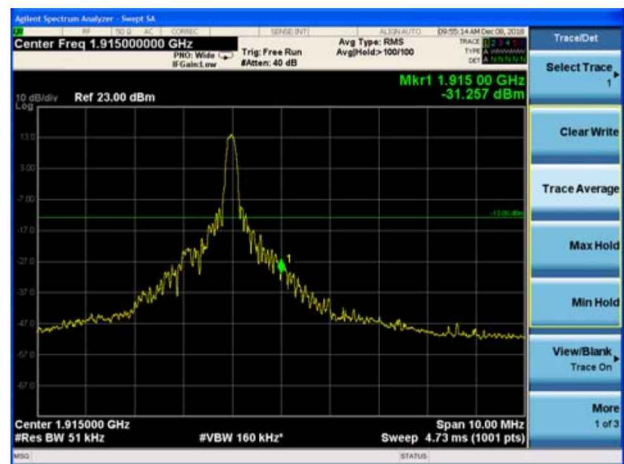
LTE Band 25 10MHz 16QAM 100%RB CH-High



LTE Band 25 15MHz 16QAM 1RB CH-Low



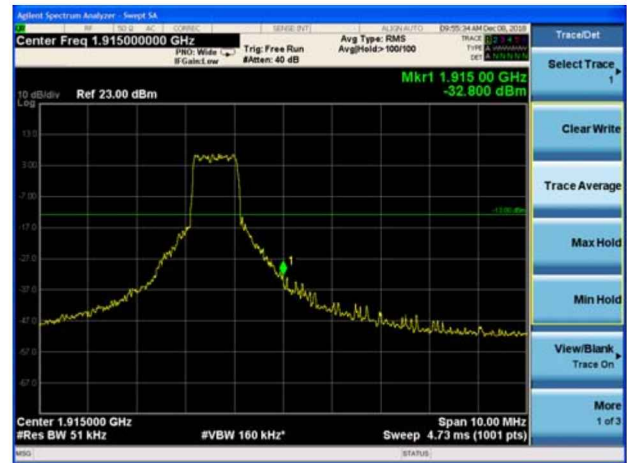
LTE Band 25 15MHz 16QAM 1RB CH-High



LTE Band 25 15MHz 16QAM 100%RB CH-Low



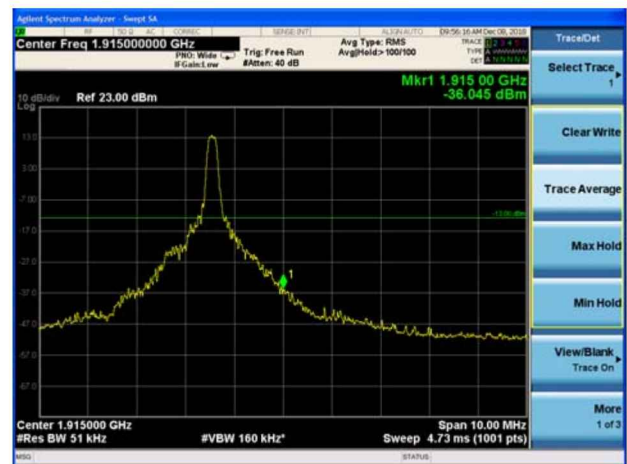
LTE Band 25 15MHz 16QAM 100%RB CH-High



LTE Band 25 20MHz 16QAM 1RB CH-Low



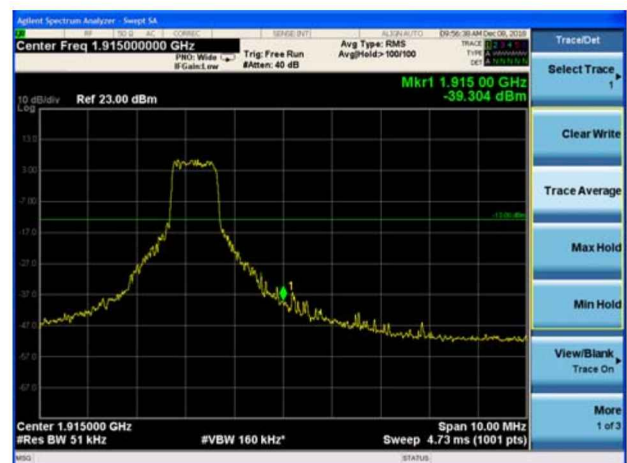
LTE Band 25 20MHz 16QAM 1RB CH-High



LTE Band 25 20MHz 16QAM 100%RB CH-Low



LTE Band 25 20MHz 16QAM 100%RB CH-High



5.5. Peak-to-Average Power Ratio (PAPR)

Ambient condition

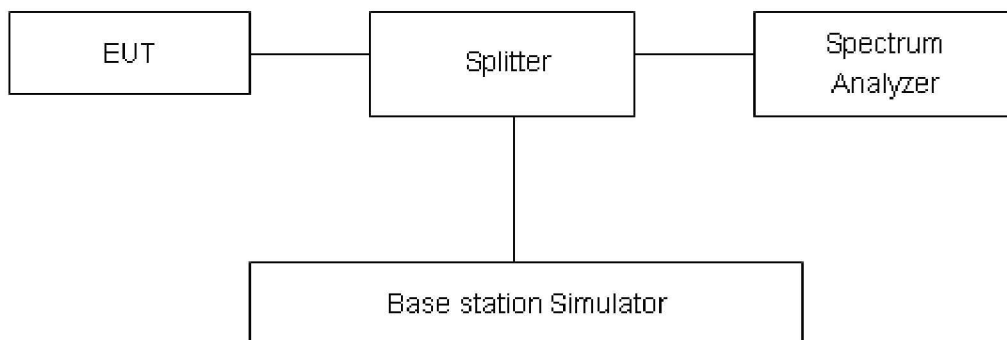
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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

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 in 24.232(d).

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

Mode	Channel	Frequency (MHz)	Peak(dBm)	Avg(dBm)	PAPR(dB)	Limit(dB)	Conclusion
GPRS 1900 (GMSK)	512	1850.2	30.38	29.42	0.96	≤13	PASS
	661	1880	30.34	29.32	1.02	≤13	PASS
	810	1909.8	30.21	29.16	1.05	≤13	PASS
EGPRS 1900 (8-PSK)	512	1850.2	26.46	25.57	0.89	≤13	PASS
	661	1880	26.36	25.45	0.91	≤13	PASS
	810	1909.8	26.23	25.38	0.85	≤13	PASS

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)		
				Peak(dBm)	Avg(dBm)	PAPR(dB)
Band2	1.4MHz	QPSK	18900/1880	33.29	23.55	9.74
		16QAM	18900/1880	34.38	23.72	10.66
	3MHz	QPSK	18900/1880	33.32	23.59	9.73
		16QAM	18900/1880	34.41	23.76	10.65
	5MHz	QPSK	18900/1880	32.76	23.58	9.18
		16QAM	18900/1880	33.88	23.72	10.16
	10MHz	QPSK	18900/1880	32.72	23.60	9.12
		16QAM	18900/1880	33.69	23.77	9.92
	15MHz	QPSK	18900/1880	31.57	23.56	8.01
		16QAM	18900/1880	32.69	23.72	8.97
	20MHz	QPSK	18900/1880	32.45	23.51	8.94
		16QAM	18900/1880	32.98	23.68	9.30

Mode	Bandwidth	Modulation	Channel/ Frequency(MHz)	Peak-to-Average Power Ratio (PAPR)		
				Peak(dBm)	Avg(dBm)	PAPR(dB)
LTE Band 25	1.4MHz	QPSK	26365/1882.5	26.72	18.35	8.37
		16QAM	26365/1882.5	27.37	18.11	9.26
	3MHz	QPSK	26365/1882.5	26.74	18.05	8.69
		16QAM	26365/1882.5	27.32	18.46	8.86
	5MHz	QPSK	26365/1882.5	26.80	19.35	7.45
		16QAM	26365/1882.5	27.45	19.60	7.85
	10MHz	QPSK	26365/1882.5	26.75	18.00	8.75
		16QAM	26365/1882.5	27.47	18.86	8.61
	15MHz	QPSK	26365/1882.5	26.75	19.01	7.74
		16QAM	26365/1882.5	27.46	18.44	9.02
	20MHz	QPSK	26365/1882.5	26.72	17.51	9.21
		16QAM	26365/1882.5	27.03	17.96	9.07

5.6.Frequency Stability

Ambient condition

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

Method of Measurement

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 0°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.

Frequency Stability (Voltage Variation)

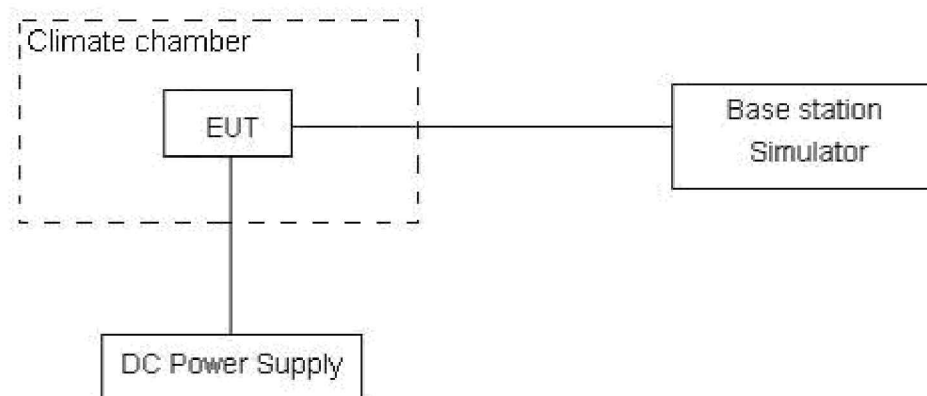
The frequency stability shall be measured with variation of primary supply voltage as follows:

(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

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

Measurement Uncertainty

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