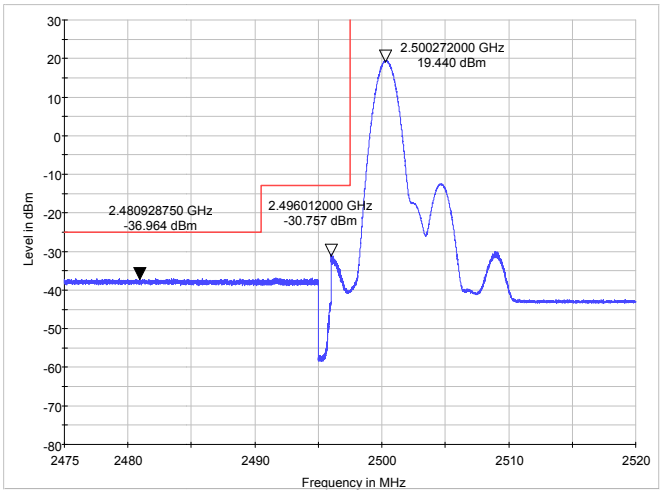
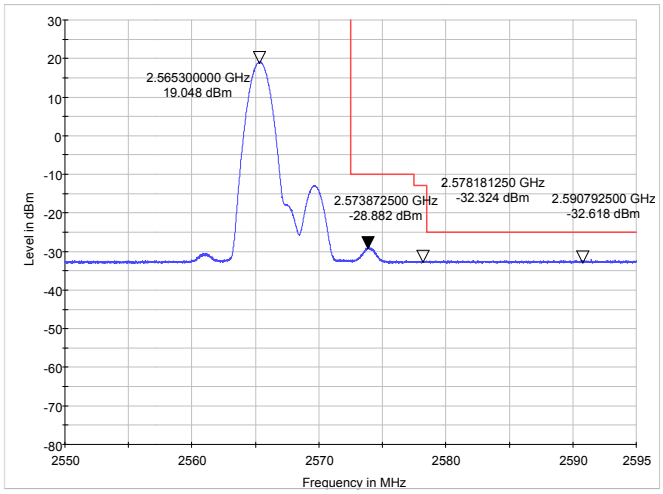
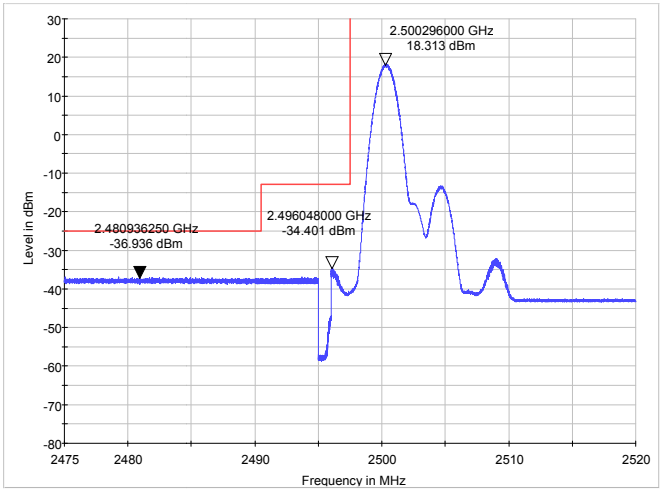
LTE Band 7 QPSK Bandwidth = 5MHz CH20775, RB 1



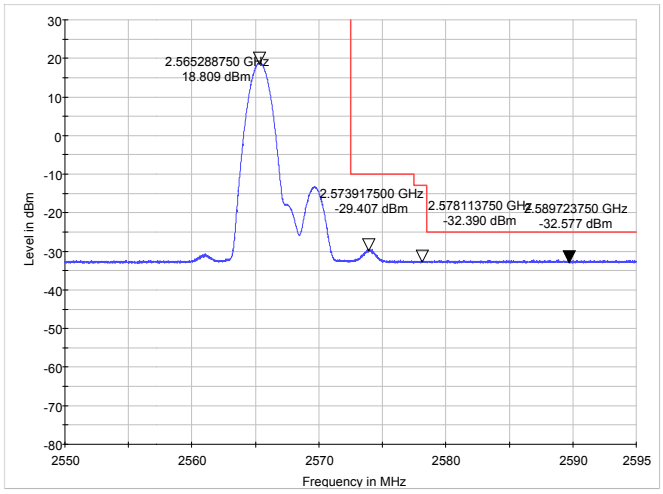
LTE Band 7 QPSK Bandwidth = 5MHz CH21425, RB 1



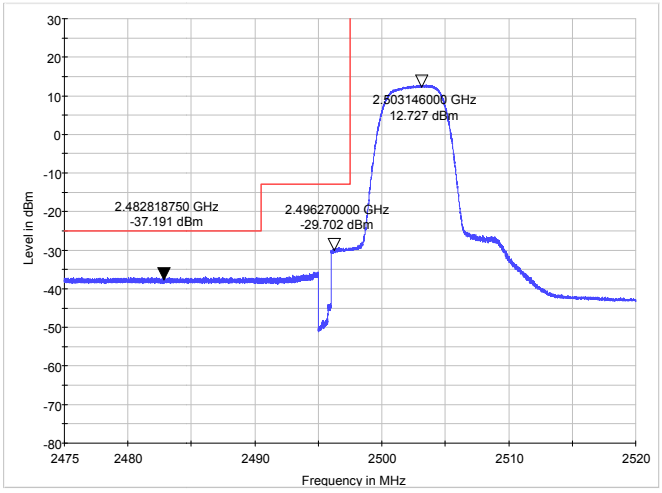
LTE Band 7 16QAM Bandwidth = 5MHz CH20775, RB 1



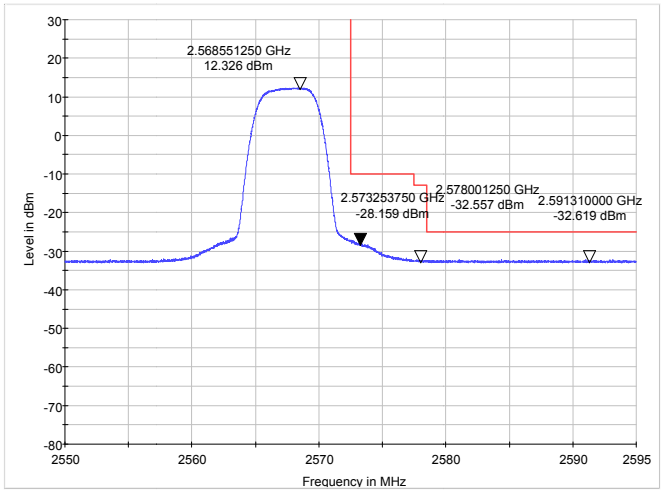
LTE Band 7 16QAM Bandwidth = 5MHz CH21425, RB 1



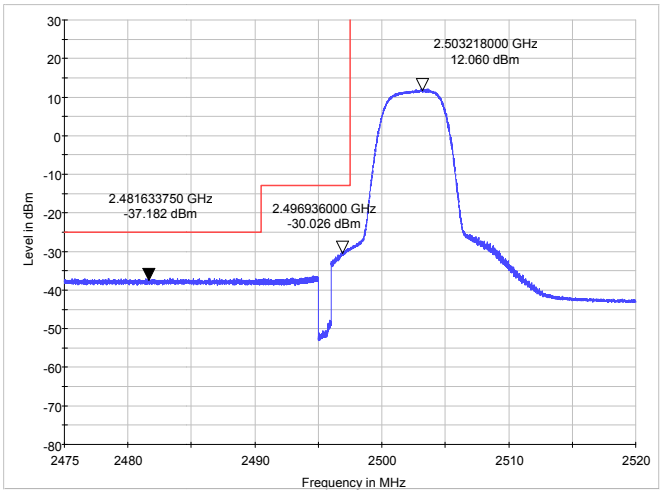
LTE Band 7 QPSK Bandwidth = 5MHz CH20775, RB 25



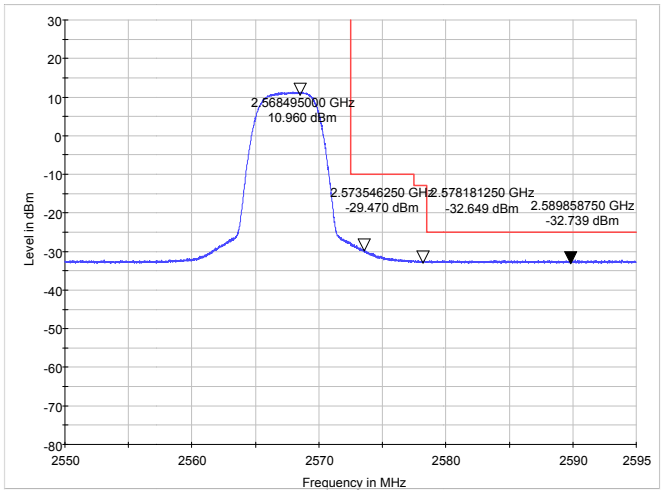
LTE Band 7 QPSK Bandwidth = 5MHz CH21425, RB 25



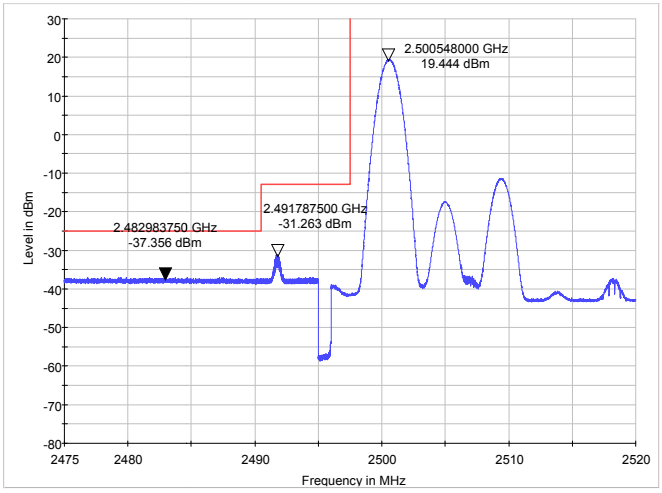
LTE Band 7 16QAM Bandwidth = 5MHz CH20775, RB 25



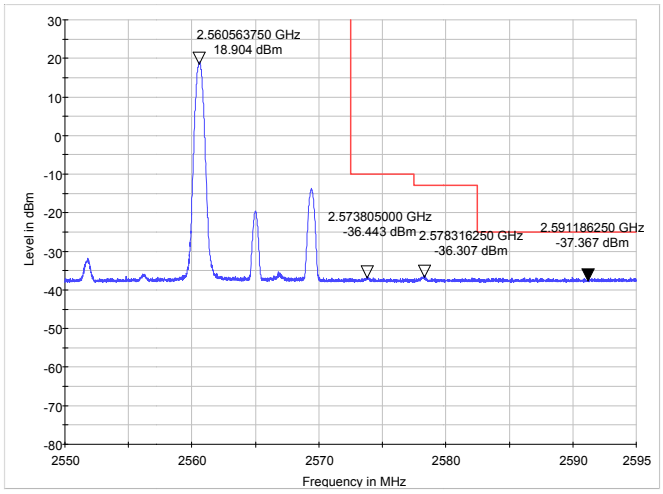
LTE Band 7 16QAM Bandwidth = 5MHz CH21425, RB 25



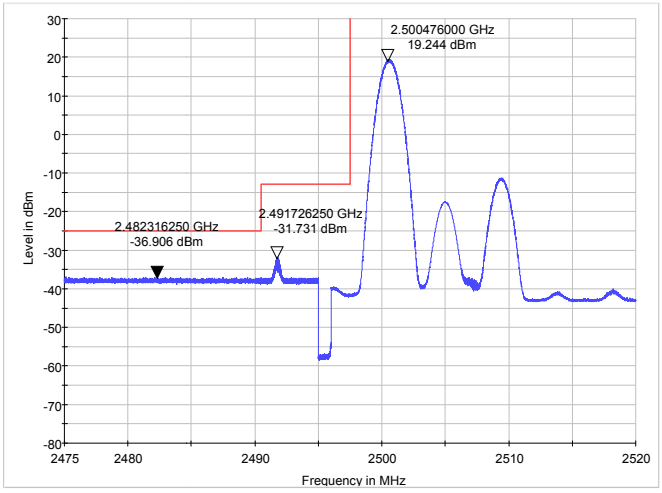
LTE Band 7 QPSK Bandwidth = 10MHz CH20800, RB 1



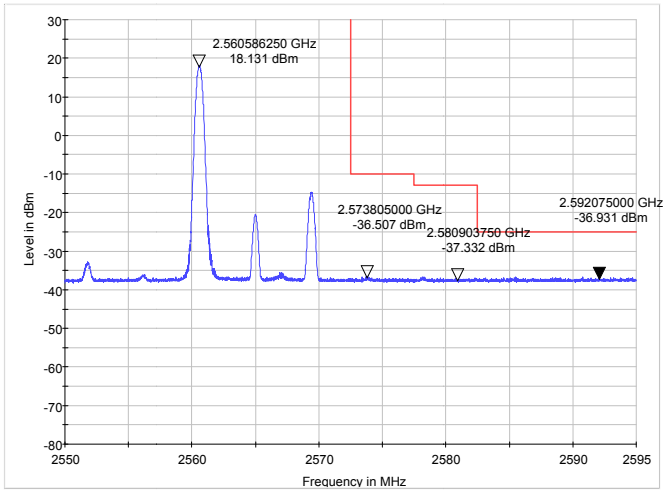
LTE Band 7 QPSK Bandwidth = 10MHz CH21400, RB 1



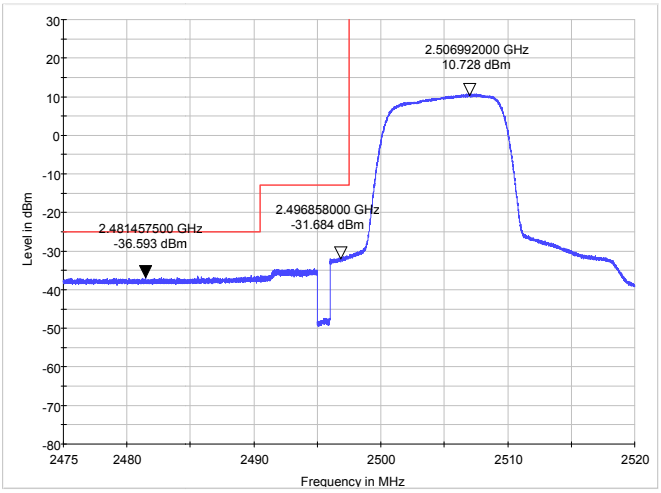
LTE Band 7 16QAM Bandwidth = 10MHz CH20800, RB 1



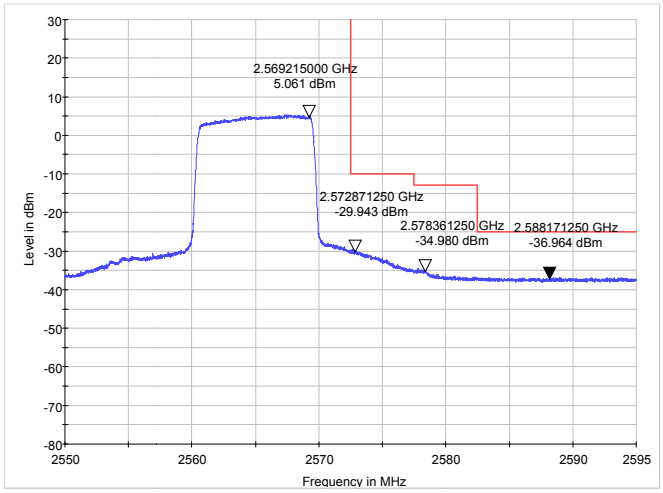
LTE Band 7 16QAM Bandwidth = 10MHz CH21400, RB 1



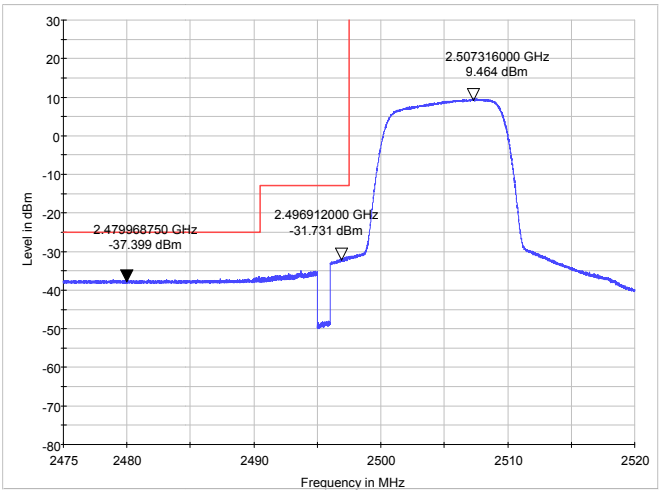
LTE Band 7 QPSK Bandwidth = 10MHz CH20800, RB 50



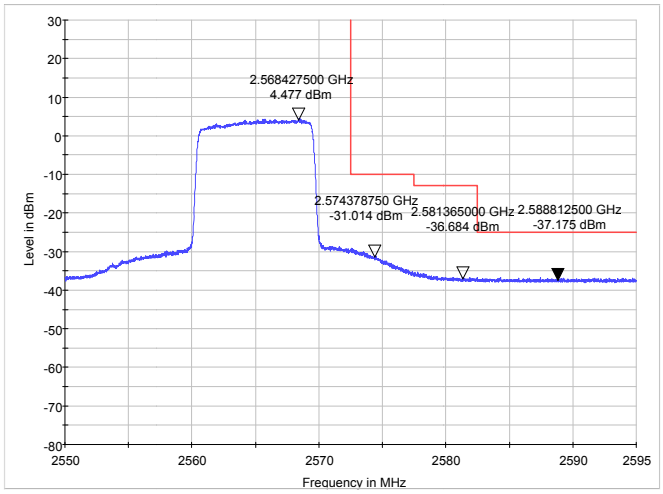
LTE Band 7 QPSK Bandwidth = 10MHz CH21400, RB 50



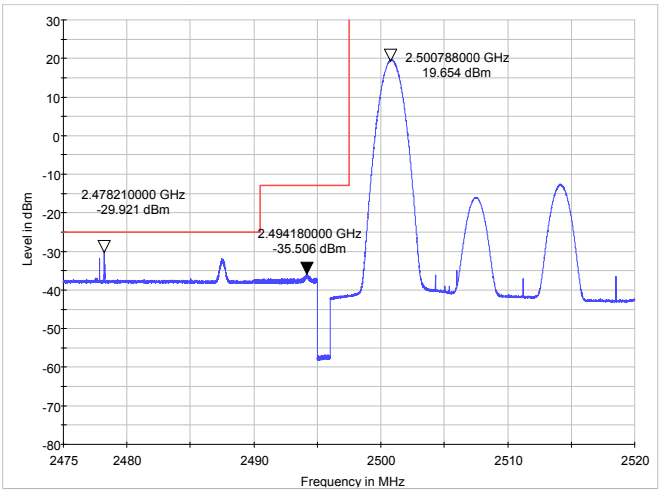
LTE Band 7 16QAM Bandwidth = 10MHz CH20800, RB 50



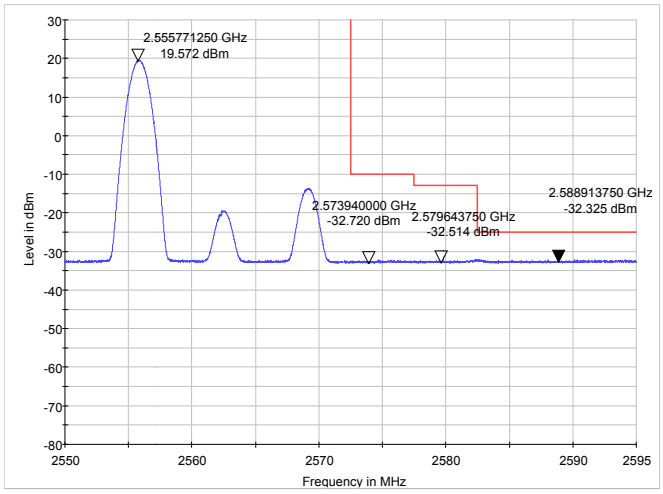
LTE Band 7 16QAM Bandwidth = 10MHz CH21400, RB 50



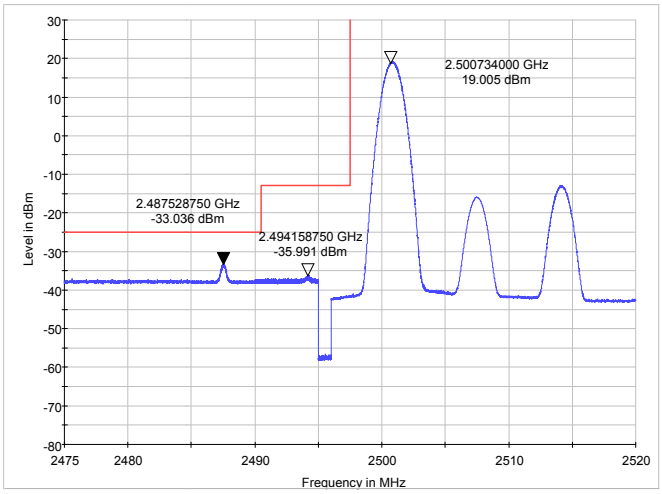
LTE Band 7 QPSK Bandwidth = 15MHz CH20825, RB 1



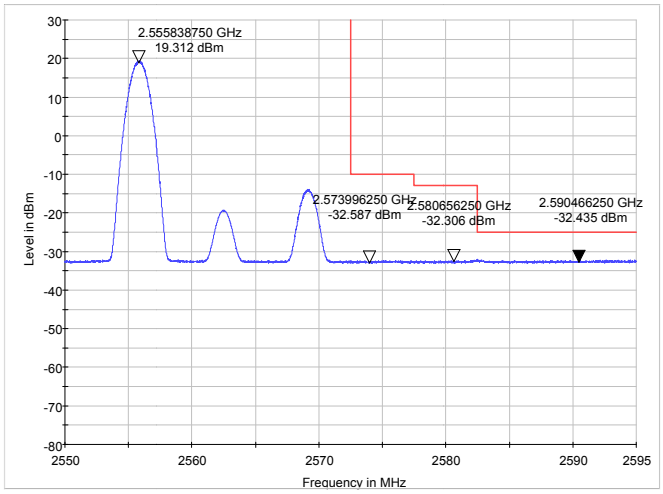
LTE Band 7 QPSK Bandwidth = 15MHz CH21375, RB 1



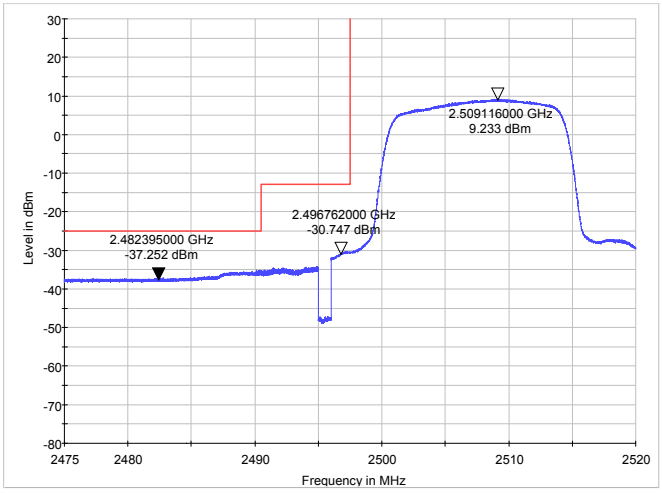
LTE Band 7 16QAM Bandwidth = 15MHz CH20825, RB 1



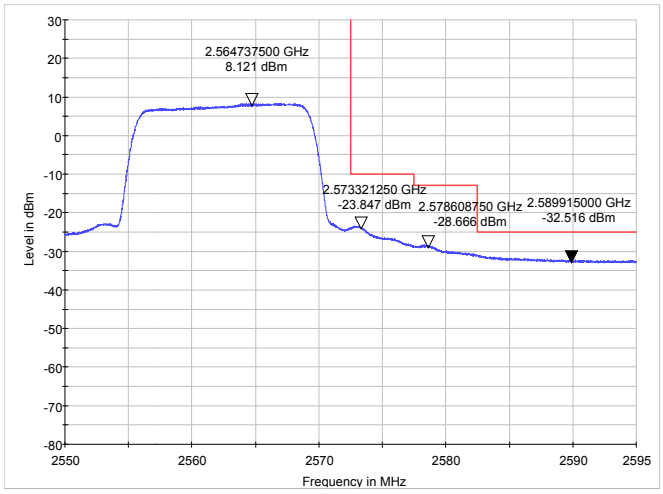
LTE Band 7 16QAM Bandwidth = 15MHz CH21375, RB 1



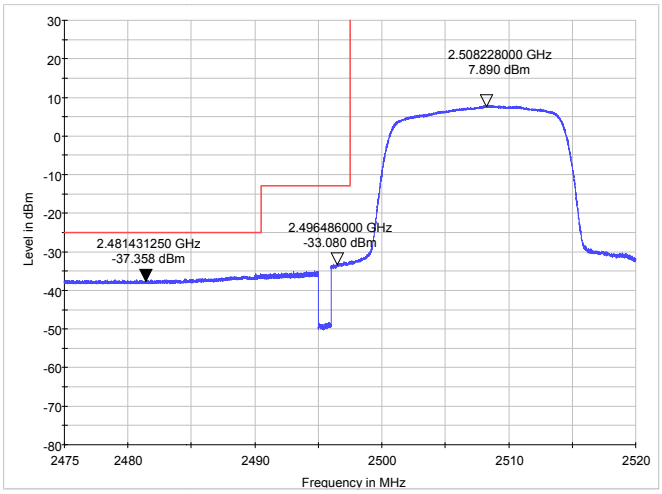
LTE Band 7 QPSK Bandwidth = 15MHz CH20825, RB 75



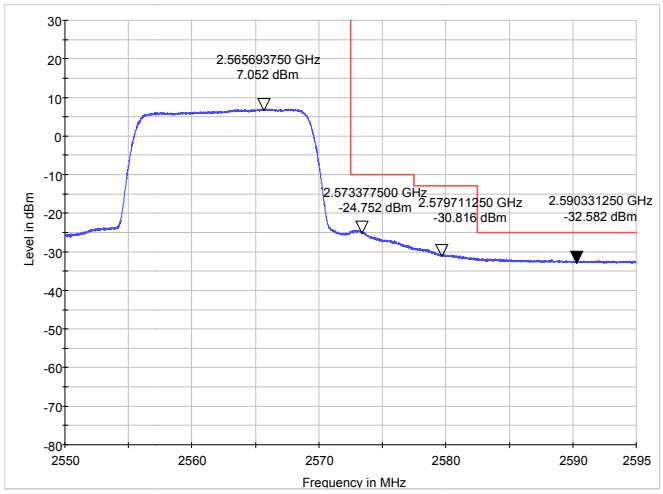
LTE Band 7 QPSK Bandwidth = 15MHz CH21375, RB 75



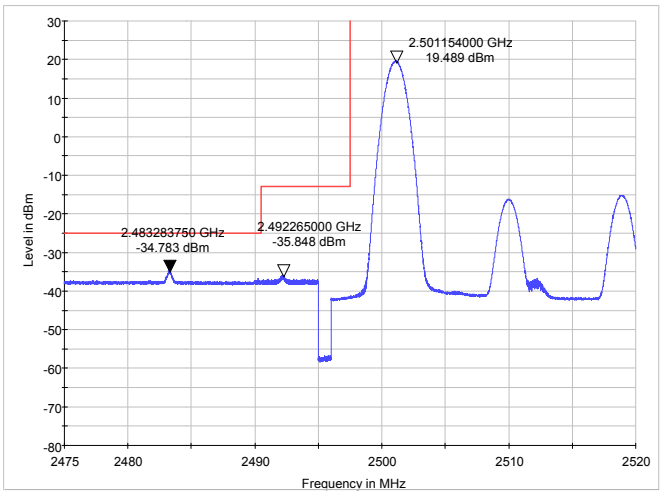
LTE Band 7 16QAM Bandwidth = 15MHz CH20825, RB 75



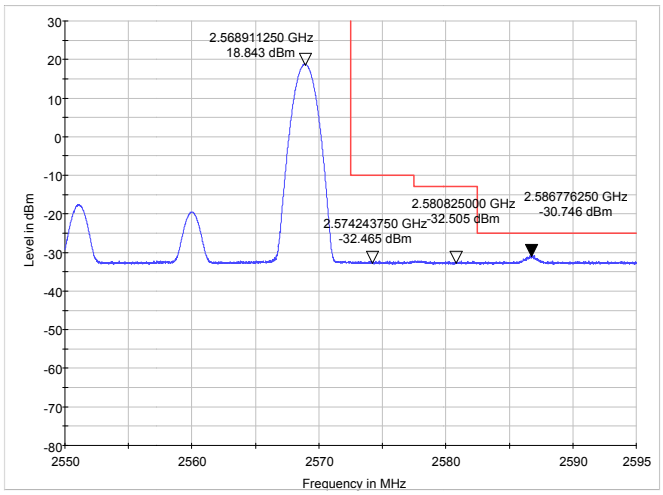
LTE Band 7 16QAM Bandwidth = 15MHz CH21375, RB 75



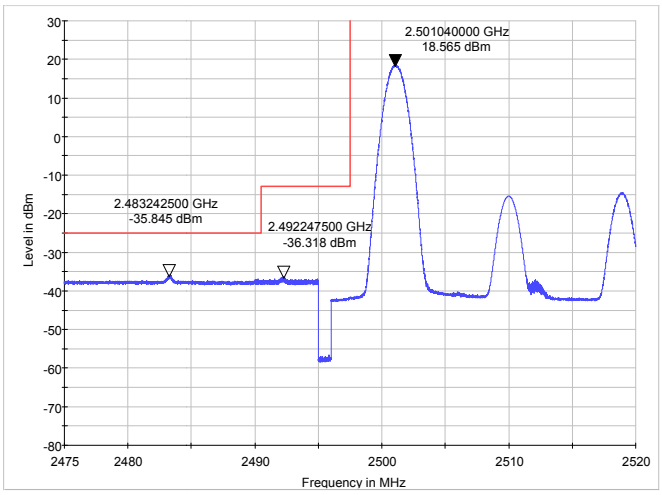
LTE Band 7 QPSK Bandwidth = 20MHz CH20850, RB 1



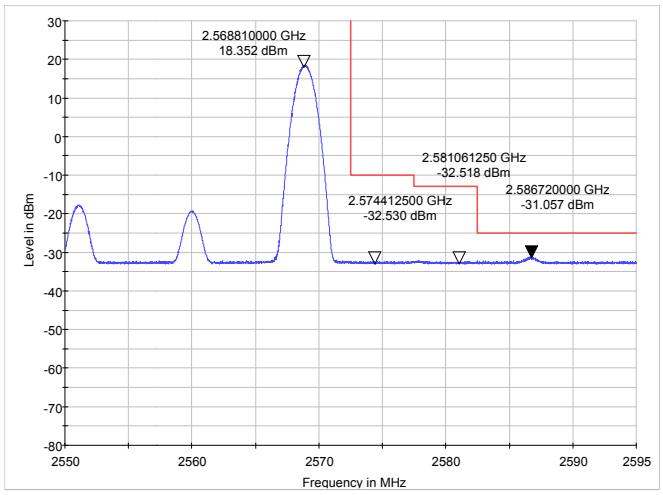
LTE Band 7 QPSK Bandwidth = 20MHz CH21350, RB 1



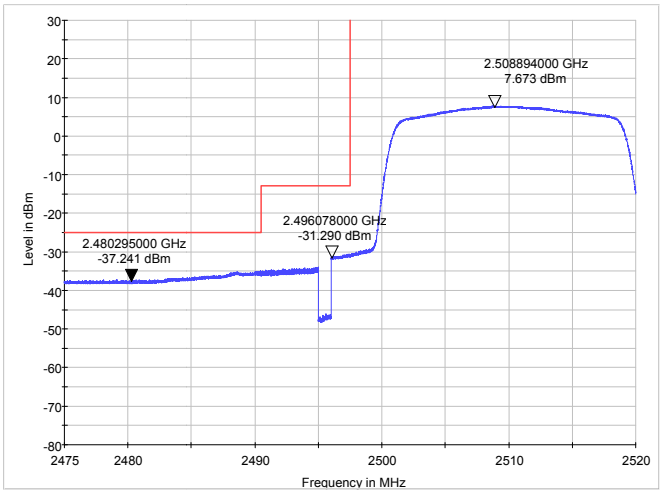
LTE Band 7 16QAM Bandwidth = 20MHz CH20850, RB 1



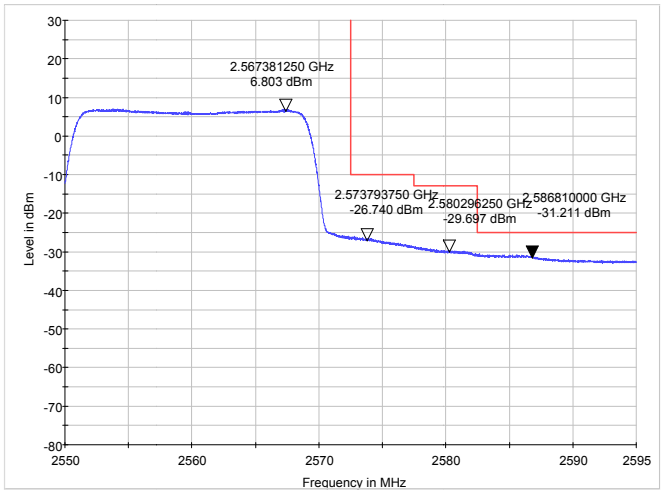
LTE Band 7 16QAM Bandwidth = 20MHz CH21350, RB 1



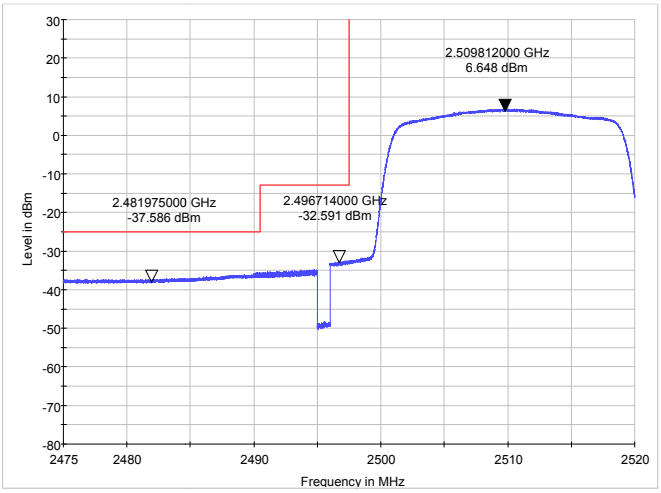
LTE Band 7 QPSK Bandwidth = 20MHz CH20850, RB 100



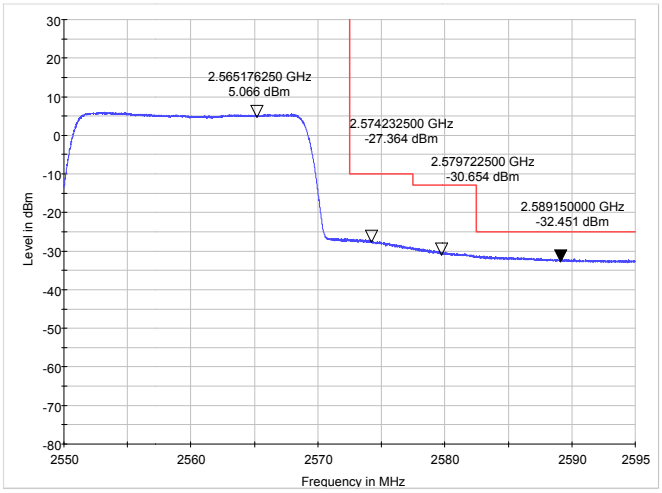
LTE Band 7 QPSK Bandwidth = 20MHz CH21350, RB 100



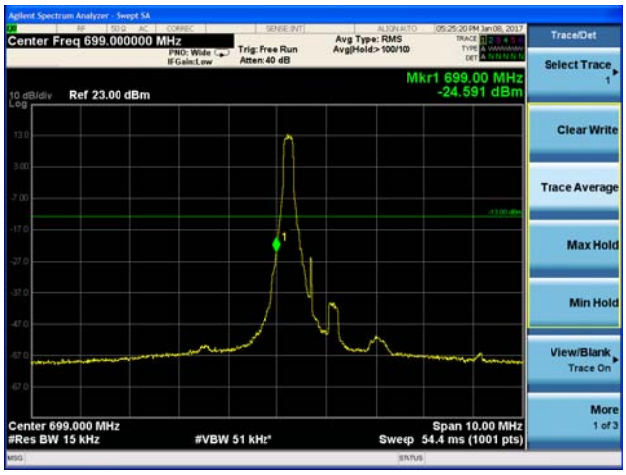
LTE Band 7 16QAM Bandwidth = 20MHz CH20850, RB 100



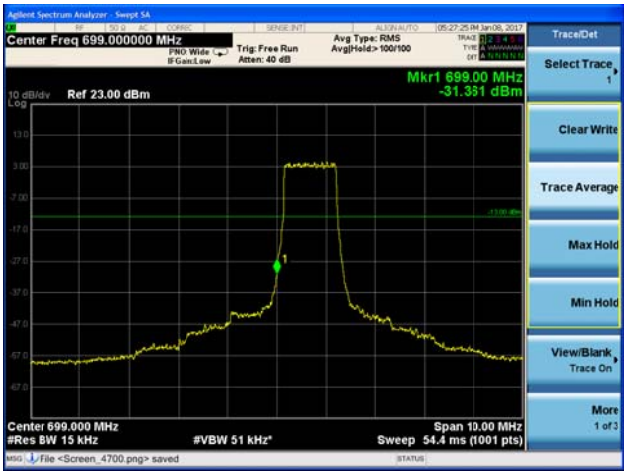
LTE Band 7 16QAM Bandwidth = 20MHz CH21350, RB 100



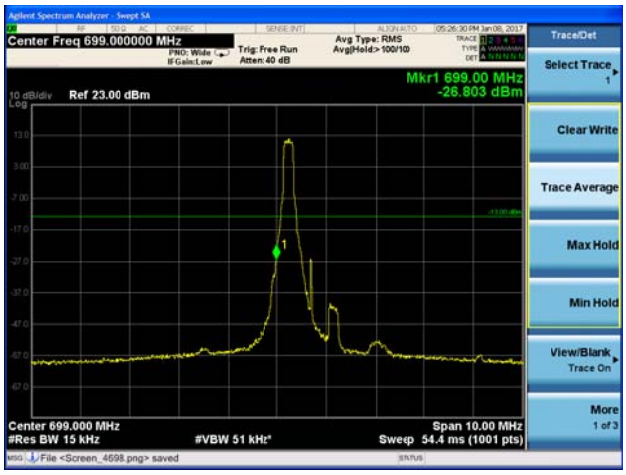
LTE Band 12 QPSK Bandwidth = 1.4MHz CH23017, RB 1



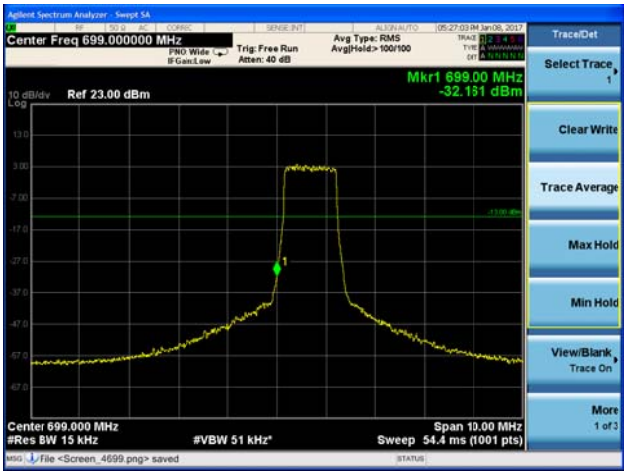
LTE Band 12 QPSK Bandwidth = 1.4MHz CH23017, RB 6

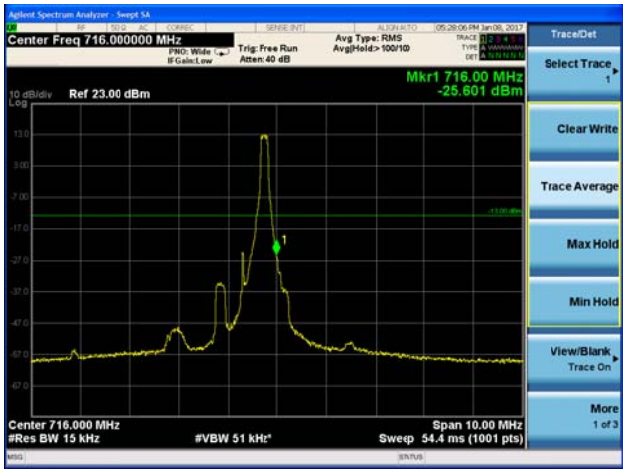
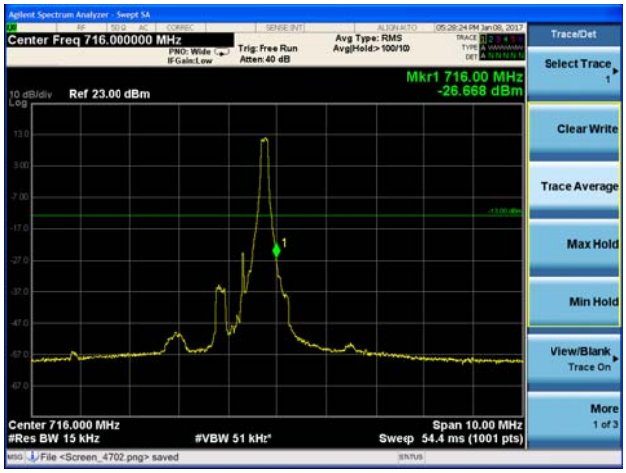
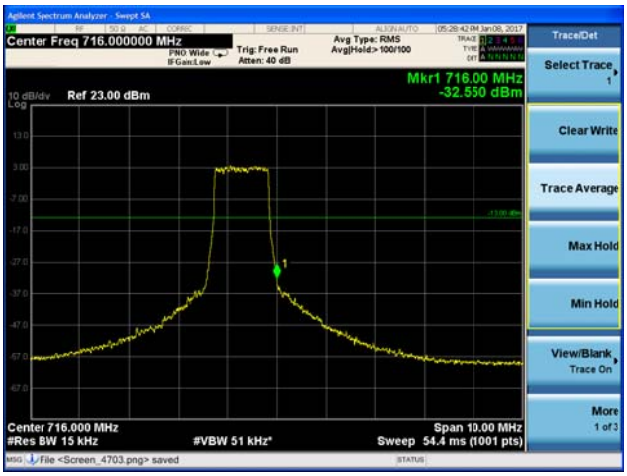
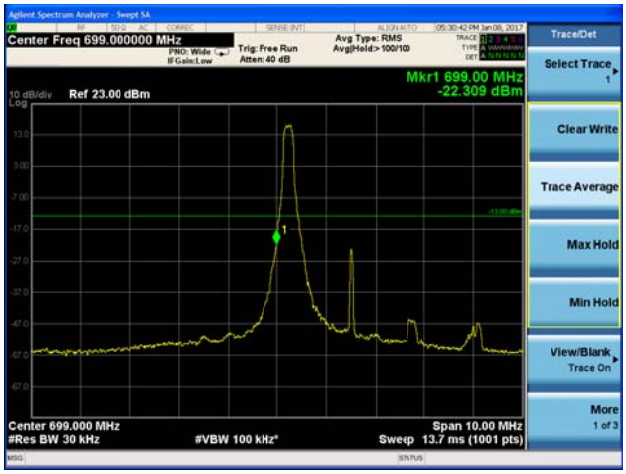


LTE Band 12 16QAM Bandwidth = 1.4MHz CH23017, RB 1

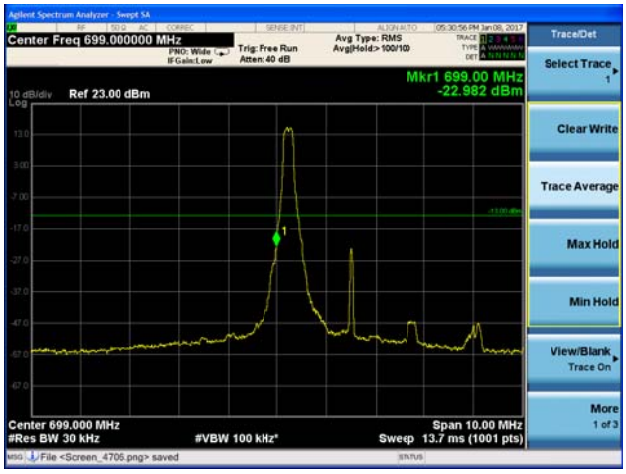


LTE Band 12 16QAM Bandwidth = 1.4MHz CH23017, RB 6

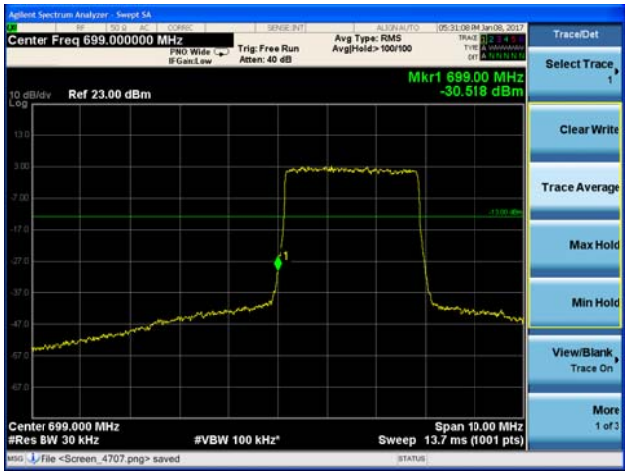


LTE Band 12 QPSK Bandwidth = 1.4MHz CH23173, RB 1	LTE Band 12 QPSK Bandwidth = 1.4MHz CH23173, RB 6
	
LTE Band 12 16QAM Bandwidth = 1.4MHz CH23173, RB 1	LTE Band 12 16QAM Bandwidth = 1.4MHz CH23173, RB 1
	
LTE Band 12 QPSK Bandwidth = 3MHz CH23025, RB 1	LTE Band 12 QPSK Bandwidth = 3MHz CH23025, RB 15
	

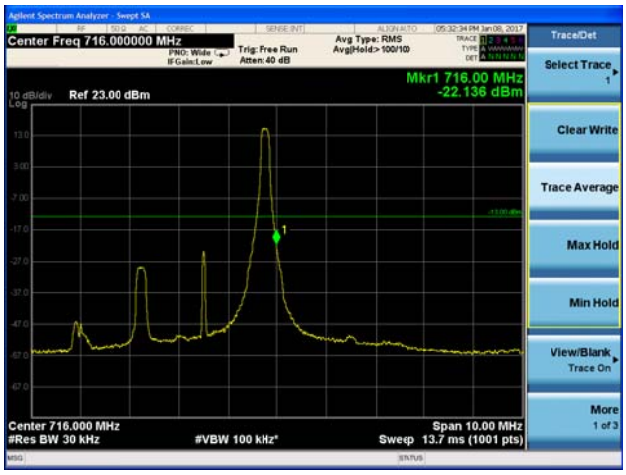
LTE Band 12 16QAM Bandwidth = 3MHz
CH23025, RB 1



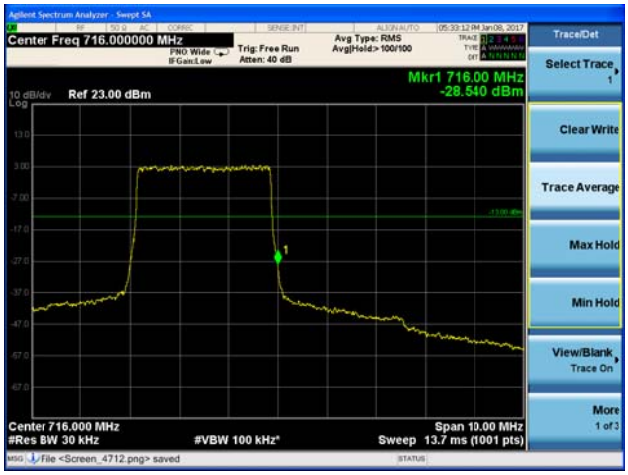
LTE Band 12 16QAM Bandwidth = 3MHz
CH23025, RB 15



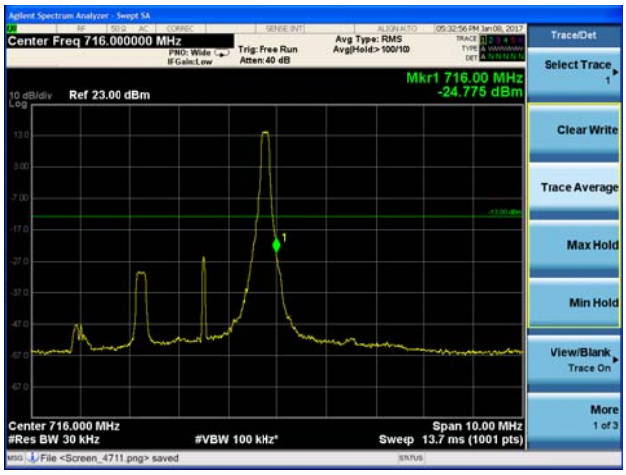
LTE Band 12 QPSK Bandwidth = 3MHz
CH23165, RB 1



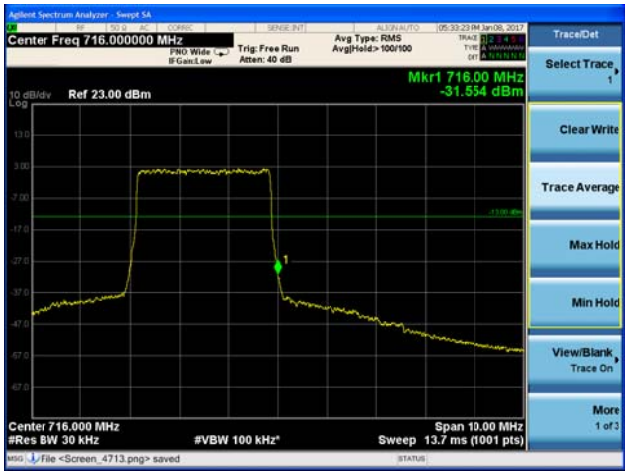
LTE Band 12 QPSK Bandwidth = 3MHz
CH23165, RB 15

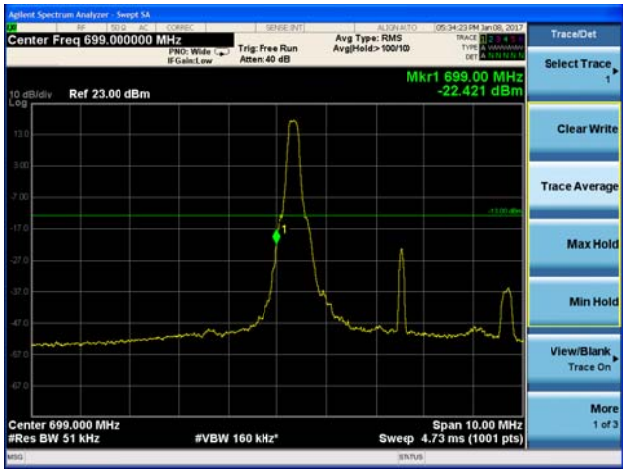
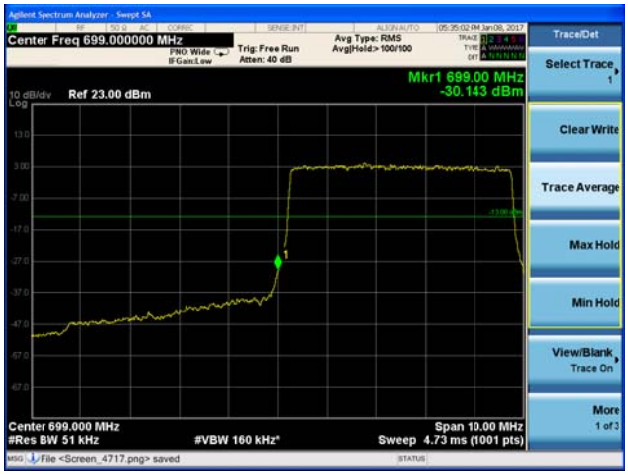
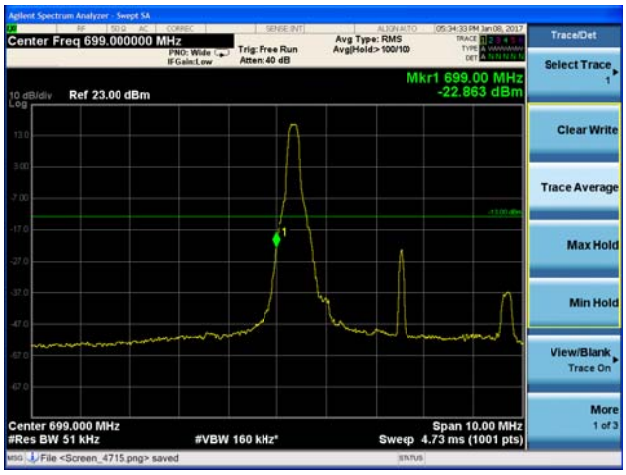
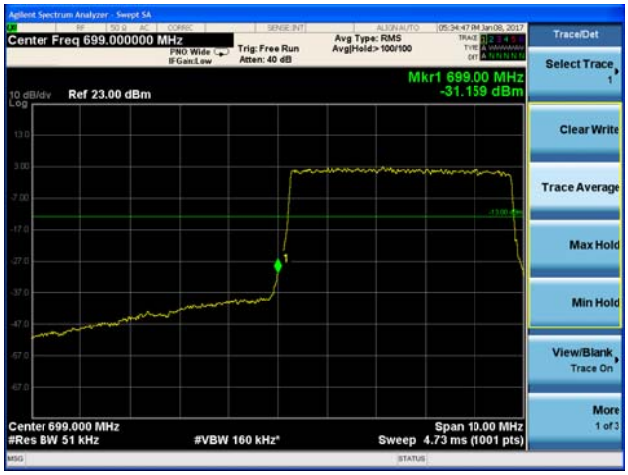
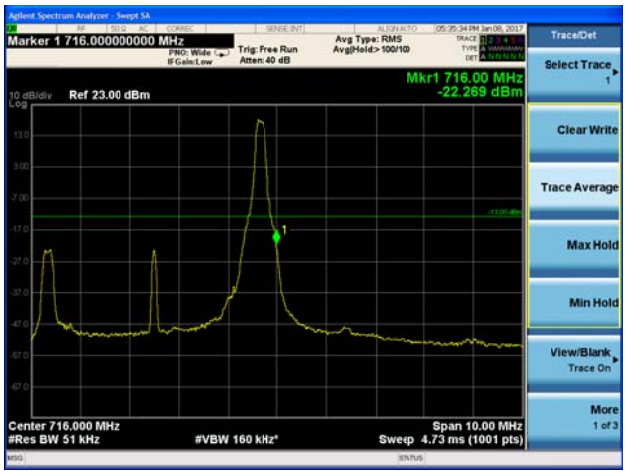


LTE Band 12 16QAM Bandwidth = 3MHz
CH23165, RB 1

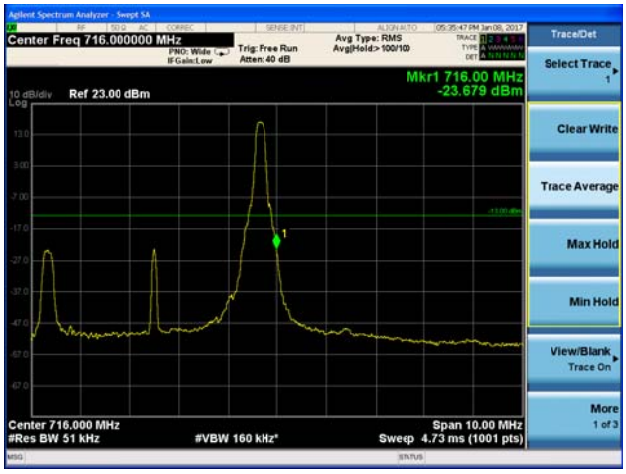


LTE Band 12 16QAM Bandwidth = 3MHz
CH23165, RB 15



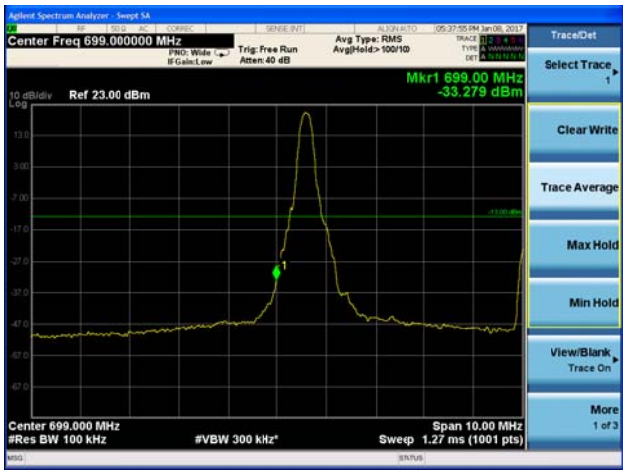
LTE Band 12 QPSK Bandwidth = 5MHz CH23035, RB 1	LTE Band 12 QPSK Bandwidth = 5MHz CH23035, RB 25
	
LTE Band 12 16QAM Bandwidth = 5MHz CH23035, RB 1	LTE Band 12 16QAM Bandwidth = 5MHz CH23035, RB 25
	
LTE Band 12 QPSK Bandwidth = 5MHz CH23155, RB 1	LTE Band 12 QPSK Bandwidth = 5MHz CH23155, RB 25
	

LTE Band 12 16QAM Bandwidth = 5MHz
CH23155, RB 1

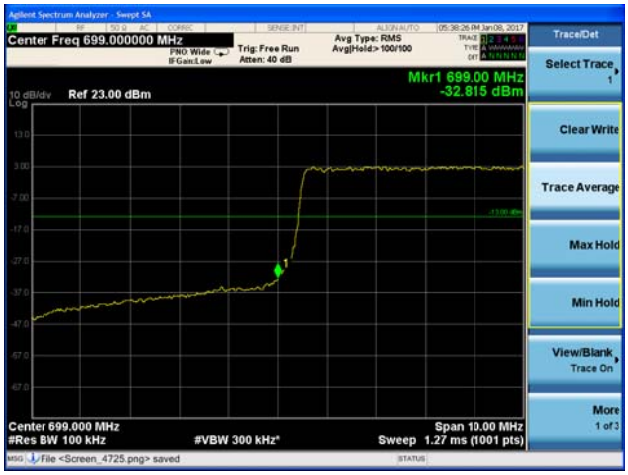


LTE Band 12 16QAM Bandwidth = 5MHz
CH23155, RB 25

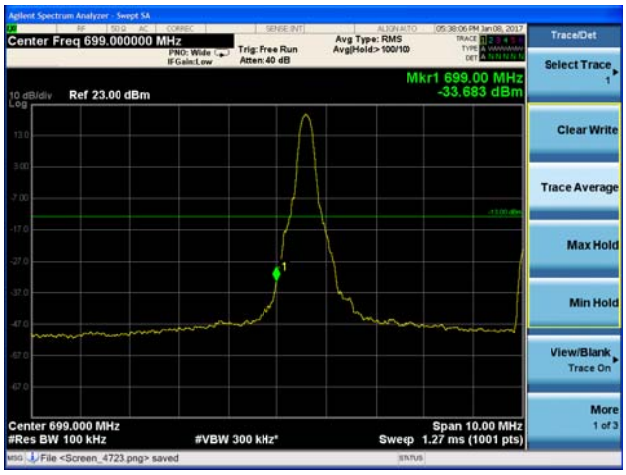
LTE Band 12 QPSK Bandwidth = 10MHz
CH23060, RB 1



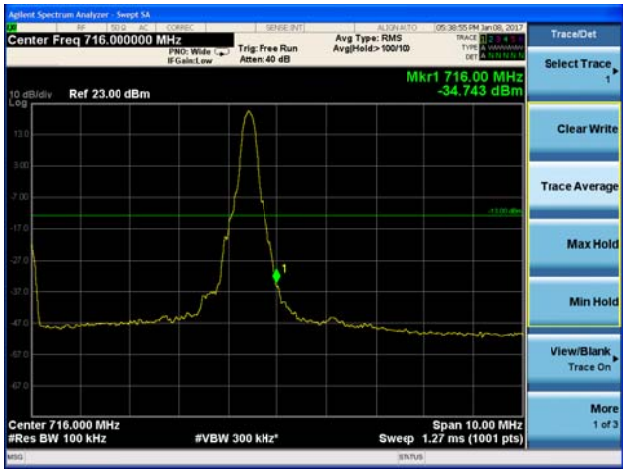
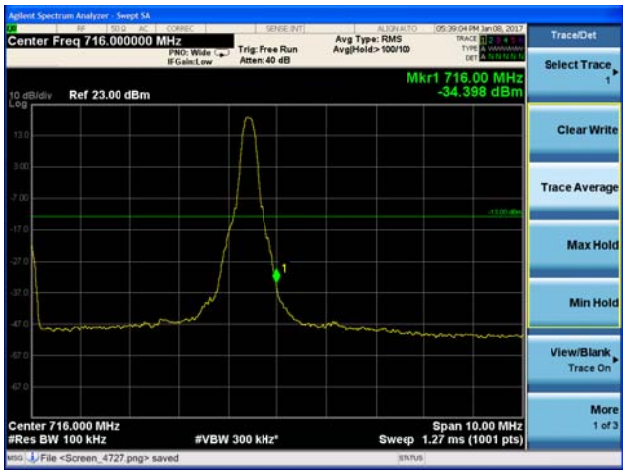
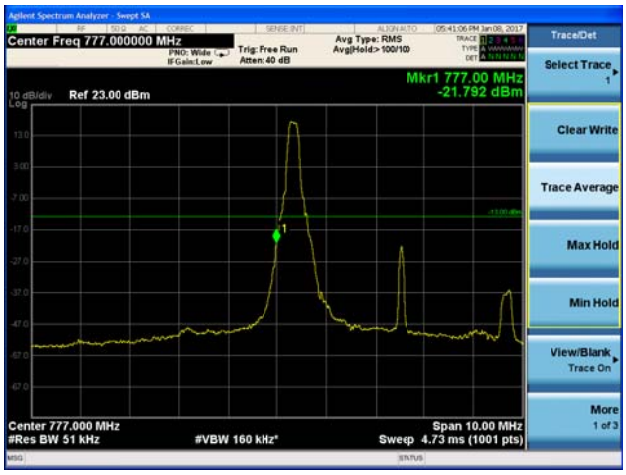
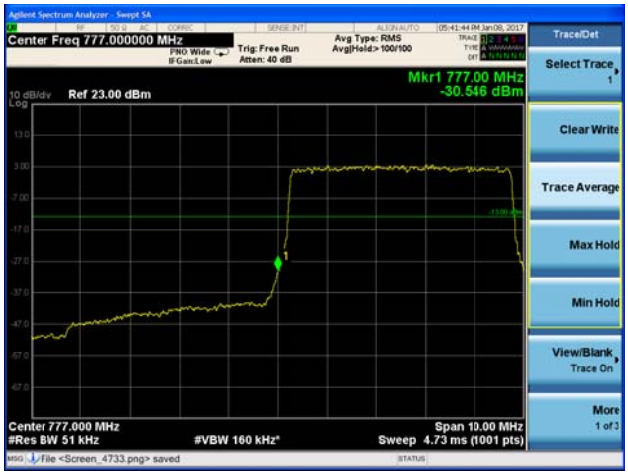
LTE Band 12 QPSK Bandwidth = 10MHz
CH23060, RB 50

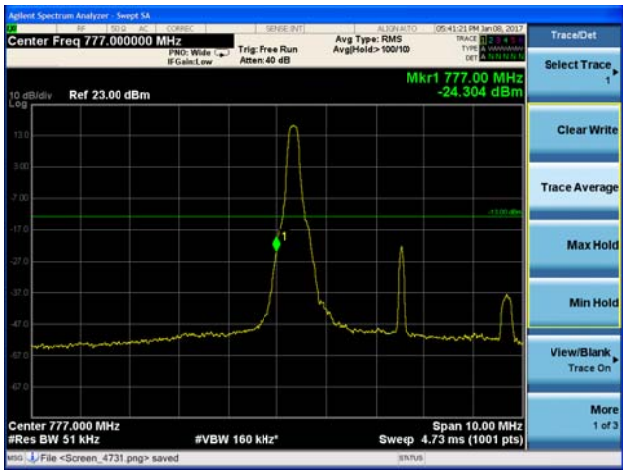


LTE Band 12 16QAM Bandwidth = 10MHz
CH23060, RB 1

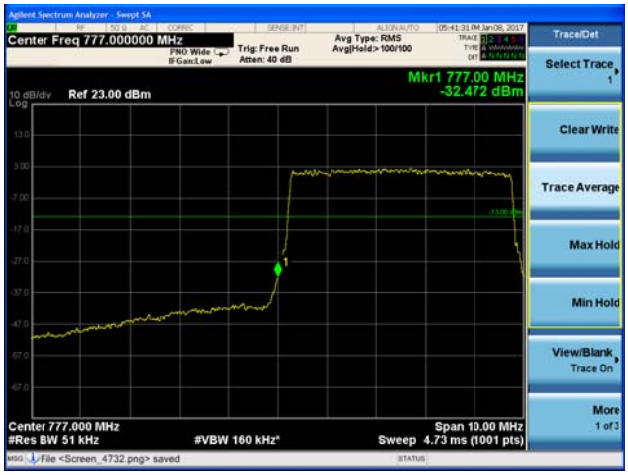


LTE Band 12 16QAM Bandwidth = 10MHz
CH23060, RB 50

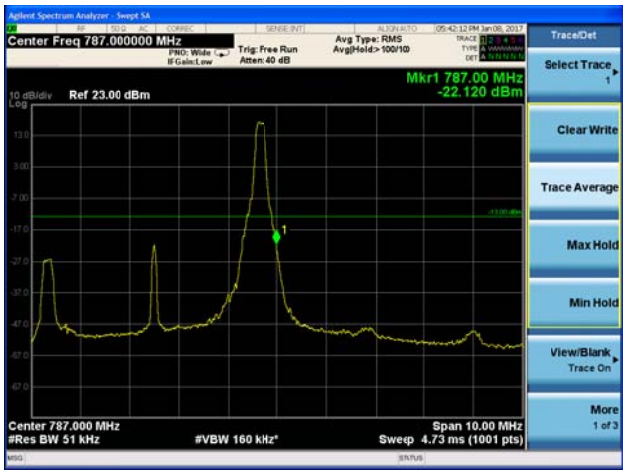
LTE Band 12 QPSK Bandwidth = 10MHz CH23130, RB 1	LTE Band 12 QPSK Bandwidth = 10MHz CH23130, RB 50
	
LTE Band 12 16QAM Bandwidth = 10MHz CH23130, RB 1	LTE Band 12 16QAM Bandwidth = 10MHz CH23130, RB 50
	
LTE Band 13 QPSK Bandwidth = 5MHz CH23205, RB 1	LTE Band 13 QPSK Bandwidth = 5MHz CH23205, RB 25
	
LTE Band 13 16QAM Bandwidth = 5MHz CH23205, RB 1	LTE Band 13 16QAM Bandwidth = 5MHz CH23205, RB 25



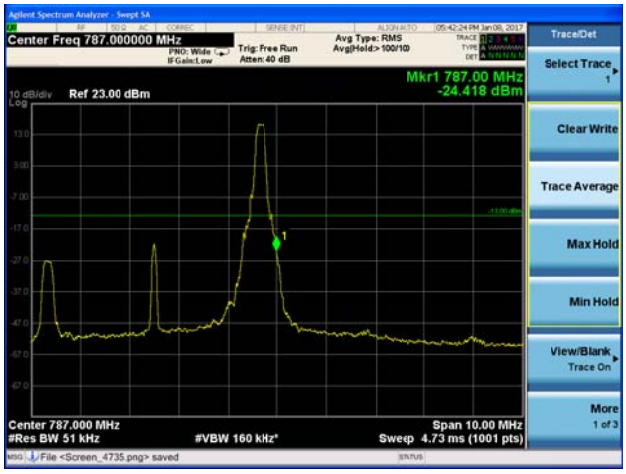
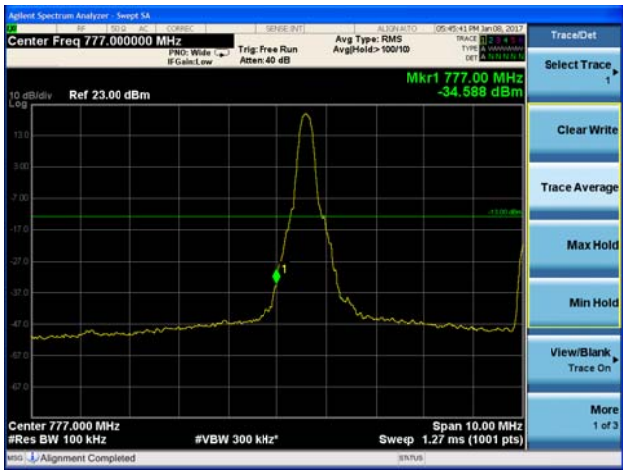
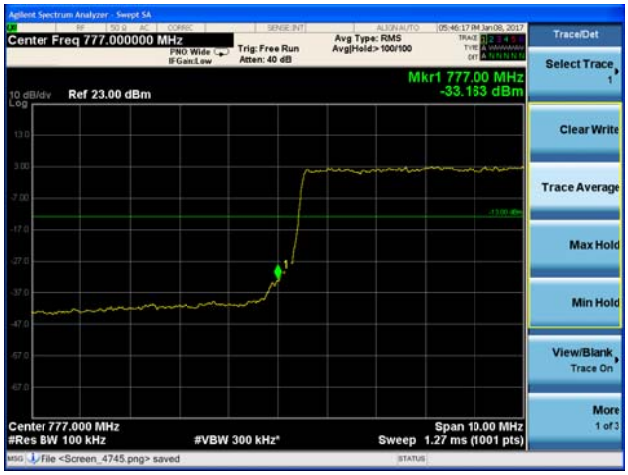
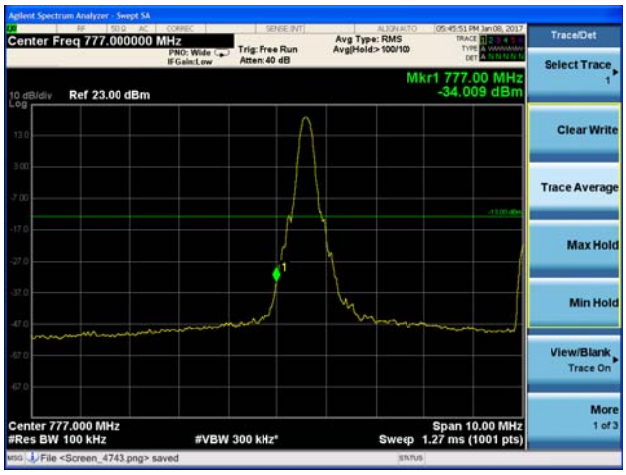
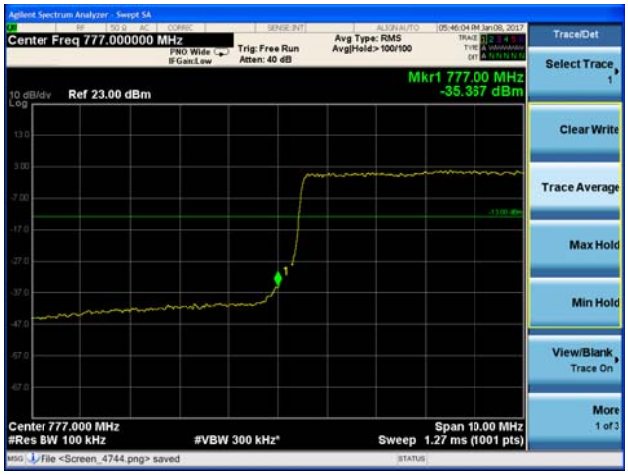
LTE Band 13 QPSK Bandwidth = 5MHz
CH23255, RB 1

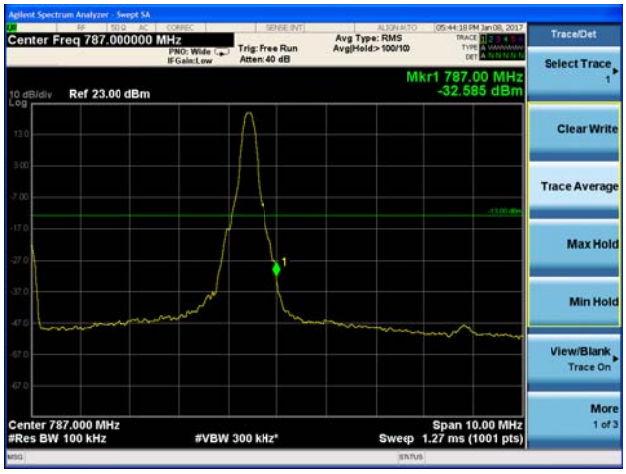
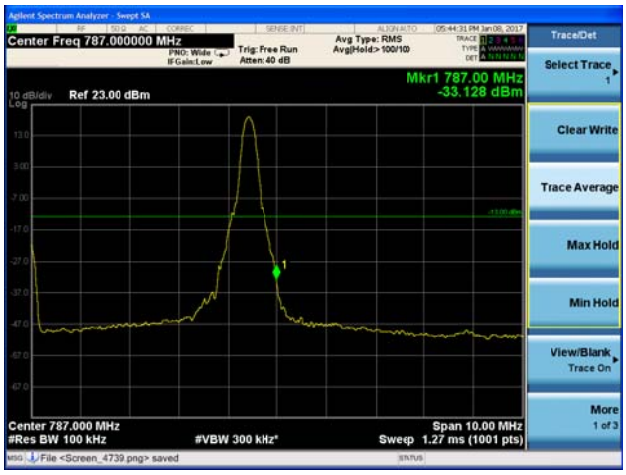


LTE Band 13 QPSK Bandwidth = 5MHz
CH23255, RB 25



LTE Band 13 QPSK Bandwidth = 5MHz
CH23255, RB 1

LTE Band 13 16QAM Bandwidth = 5MHz CH23255, RB 1	LTE Band 13 16QAM Bandwidth = 5MHz CH23255, RB 25
	
LTE Band 13 QPSK Bandwidth = 10MHz CH23230, RB 1	LTE Band 13 QPSK Bandwidth = 10MHz CH23230, RB 50
	
LTE Band 13 16QAM Bandwidth = 10MHz CH23230, RB 1	LTE Band 13 16QAM Bandwidth = 10MHz CH23230, RB 50
	

LTE Band 13 QPSK Bandwidth = 10MHz CH23230, RB 1	LTE Band 13 QPSK Bandwidth = 10MHz CH23230, RB 50
	
LTE Band 13 16QAM Bandwidth = 10MHz CH23230, RB 1	LTE Band 13 16QAM Bandwidth = 10MHz CH23230, RB 50
	

5.5 Peak-to-Average Power Ratio (PAPR)

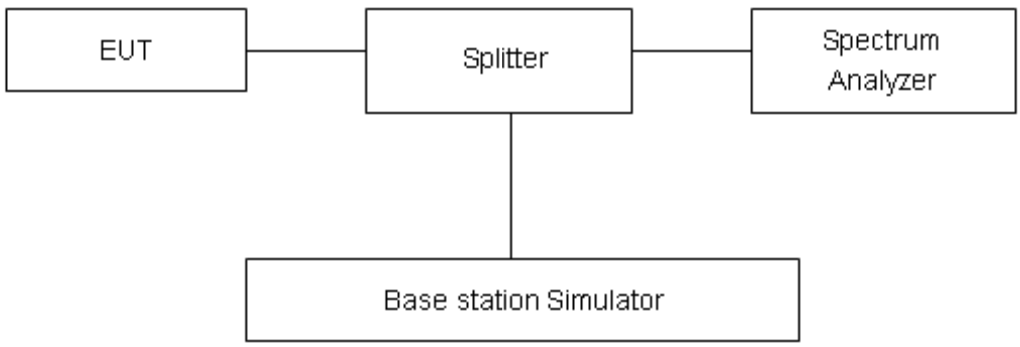
Ambient condition

Temperature	Relative humidity
21°C ~25°C	40%~60%

Methods of Measurement

Measure the total peak power and record as P_{Pk}. And measure the total average power and record as P_{Avg}. Both the peak and average power levels must be expressed in the same logarithmic units (*e.g.*, dBm). Determine the PAPR from:
PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm).

Test Setup



Limits

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.in Part27.50(d).

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for thenormal 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)	Conclusion
QPSK	1.4	19957	1710.7	27.38	22.34	5.04	PASS
		20175	1732.5	27.18	22.35	4.83	PASS
		20393	1754.3	26.89	22.40	4.49	PASS
	3	19965	1711.5	27.49	22.37	5.12	PASS
		20175	1732.5	27.32	22.39	4.93	PASS
		20385	1753.5	27.16	22.43	4.73	PASS
	5	19975	1712.5	27.47	22.35	5.12	PASS
		20175	1732.5	27.26	22.38	4.88	PASS
		20375	1752.5	27.14	22.41	4.73	PASS
	10	20000	1715	27.52	22.43	5.09	PASS
		20175	1732.5	27.28	22.40	4.88	PASS
		20350	1750	27.33	22.45	4.88	PASS
	15	20025	1717.5	27.47	22.41	5.06	PASS
		20175	1732.5	27.16	22.36	4.80	PASS
		20325	1747.5	27.32	22.40	4.92	PASS
	20	20050	1720	27.38	22.38	5.00	PASS
		20175	1732.5	28.01	22.31	5.70	PASS
		20300	1745	27.34	22.36	4.98	PASS
16QAM	1.4	19957	1710.7	27.19	21.29	5.90	PASS
		20175	1732.5	27.01	21.37	5.64	PASS
		20393	1754.3	26.83	21.40	5.43	PASS
	3	19965	1711.5	27.29	21.32	5.97	PASS
		20175	1732.5	27.17	21.41	5.76	PASS
		20385	1753.5	27.02	21.43	5.59	PASS
	5	19975	1712.5	27.19	21.30	5.89	PASS
		20175	1732.5	27.02	21.37	5.65	PASS
		20375	1752.5	26.92	21.38	5.54	PASS
	10	20000	1715	27.22	21.33	5.89	PASS
		20175	1732.5	27.11	21.42	5.69	PASS
		20350	1750	27.10	21.42	5.68	PASS
	15	20025	1717.5	27.17	21.30	5.87	PASS
		20175	1732.5	26.51	21.37	5.14	PASS
		20325	1747.5	27.14	21.38	5.76	PASS
	20	20050	1720	27.03	21.28	5.75	PASS
		20175	1732.5	26.23	21.33	4.90	PASS
		20300	1745	27.07	21.35	5.72	PASS

LTE Band 7							
Modulation	Bandwidth ((MHz))	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Conclusion
QPSK	5	20775	2502.5	27.64	22.53	5.11	PASS
		21100	2535	27.82	22.59	5.23	PASS
		21425	2567.5	27.70	22.59	5.11	PASS
	10	20800	2505	27.70	22.61	5.09	PASS
		21100	2535	27.86	22.61	5.25	PASS
		21400	2565	27.83	22.63	5.20	PASS
	15	20825	2507.5	27.85	22.59	5.26	PASS
		21100	2535	27.96	22.57	5.39	PASS
		21375	2562.5	27.91	22.58	5.33	PASS
	20	20850	2510	27.60	22.56	5.04	PASS
		21100	2535	27.70	22.52	5.18	PASS
		21350	2560	27.91	22.54	5.37	PASS
16QAM	5	20775	2502.5	27.77	21.82	5.95	PASS
		21100	2535	27.87	21.80	6.07	PASS
		21425	2567.5	27.81	21.81	6.00	PASS
	10	20800	2505	27.78	21.85	5.93	PASS
		21100	2535	27.84	21.85	5.99	PASS
		21400	2565	27.95	21.85	6.10	PASS
	15	20825	2507.5	27.78	21.82	5.96	PASS
		21100	2535	27.94	21.80	6.14	PASS
		21375	2562.5	27.96	21.81	6.15	PASS
	20	20850	2510	27.70	21.80	5.90	PASS
		21100	2535	27.58	21.76	5.82	PASS
		21350	2560	27.82	21.78	6.04	PASS

LTE Band 12							
Modulation	Bandwidth (MHz)	Channel	Frequency (MHz)	Peak (dBm)	Avg (dBm)	PAPR (dB)	Conclusion
QPSK	1.4	23017	699.7	26.98	21.87	5.11	PASS
		23095	707.5	27.35	21.93	5.42	PASS
		23173	715.3	27.13	21.92	5.21	PASS
	3	23025	700.5	27.11	21.96	5.15	PASS

		23095	707.5	27.36	21.98	5.38	PASS
		23165	714.5	27.25	21.97	5.28	PASS
	5	23035	701.5	27.16	21.94	5.22	PASS
		23095	707.5	27.23	21.94	5.29	PASS
		23155	713.5	27.11	21.92	5.19	PASS
	10	23060	704	27.31	21.91	5.40	PASS
		23095	707.5	27.14	21.89	5.25	PASS
		23130	711	27.03	21.88	5.15	PASS
16QAM	1.4	23017	699.7	26.77	20.82	5.95	PASS
		23095	707.5	27.09	20.83	6.26	PASS
		23173	715.3	26.94	20.83	6.11	PASS
	3	23025	700.5	26.91	20.86	6.05	PASS
		23095	707.5	27.16	20.88	6.28	PASS
		23165	714.5	26.99	20.85	6.14	PASS
	5	23035	701.5	26.90	20.83	6.07	PASS
		23095	707.5	26.98	20.83	6.15	PASS
		23155	713.5	26.82	20.81	6.01	PASS
	10	23060	704	27.03	20.81	6.22	PASS
		23095	707.5	26.90	20.79	6.11	PASS
		23130	711	26.82	20.78	6.04	PASS

LTE Band 13							
Modulation	**Bandwidth (MHz)**	**Channel**	**Frequency (MHz)**	**Peak (dBm)**	**Avg (dBm)**	**PAPR (dB)**	**Conclusion**
QPSK	5	23205	779.5	26.89	21.93	4.96	PASS
		23230	782	27.07	21.94	5.13	PASS
		23255	784.5	26.82	21.84	4.98	PASS
	10	23230	782	27.00	21.98	5.02	PASS
		23230	782	27.00	21.98	5.02	PASS
		23230	782	27.01	21.98	5.03	PASS
16QAM	5	23205	779.5	26.58	20.81	5.77	PASS
		23230	782	26.72	20.76	5.96	PASS
		23255	784.5	26.70	20.85	5.85	PASS
	10	23230	782	26.77	20.91	5.86	PASS
		23230	782	26.76	20.91	5.85	PASS
		23230	782	26.78	20.91	5.87	PASS

5.6 Frequency Stability

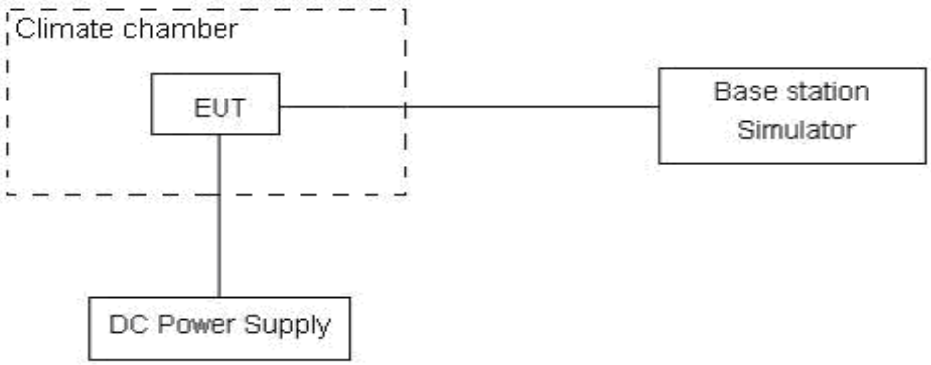
Ambient condition

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 -30°C to +50°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 -30°C to +50°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 3.65 V and 4.4 V, with a nominal voltage of 3.87V.

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=0.01ppm.

Test Result

Bandwidth	Test status	LTE Band 4 Channel 20175 Test Results (ppm)		
		QPSK	16QAM	Conclusion
1.4MHz	-30°C/3.87 V	0.00720	0.02319	PASS
	-20°C/3.87 V	-0.00040	0.00420	PASS
	-10°C/3.87 V	0.00446	0.00366	PASS
	0°C/3.87 V	0.00322	-0.00176	PASS
	10°C/3.87 V	0.00365	0.00032	PASS
	20°C/3.87 V	0.00296	-0.00027	PASS
	30°C/3.87 V	-0.00109	-0.00310	PASS
	40°C/3.87 V	0.00418	0.00076	PASS
	50°C/3.87 V	0.00108	0.00203	PASS
	20°C/4.4 V	0.00389	0.02781	PASS
	20°C/3.65 V	-0.00161	0.02793	PASS
3MHz	-30°C/3.87 V	0.00222	0.00266	PASS
	-20°C/3.87 V	-0.00135	0.00368	PASS
	-10°C/3.87 V	0.00288	0.00443	PASS
	0°C/3.87 V	-0.00157	-0.00052	PASS
	10°C/3.87 V	-0.00627	-0.00063	PASS
	20°C/3.87 V	-0.00104	0.00165	PASS
	30°C/3.87 V	0.00251	-0.00006	PASS
	40°C/3.87 V	-0.00226	0.00053	PASS
	50°C/3.87 V	-0.00358	0.00306	PASS
	20°C/4.4 V	0.00190	0.00289	PASS
	20°C/3.65 V	0.00231	0.00358	PASS
5MHz	-30°C/3.87 V	0.00285	-0.00214	PASS
	-20°C/3.87 V	0.00217	-0.00377	PASS
	-10°C/3.87 V	0.00280	-0.00327	PASS
	0°C/3.87 V	0.00347	-0.00241	PASS
	10°C/3.87 V	-0.00054	-0.00610	PASS
	20°C/3.87 V	0.00035	-0.00617	PASS
	30°C/3.87 V	0.00033	-0.00522	PASS
	40°C/3.87 V	0.00764	-0.00755	PASS
	50°C/3.87 V	0.00141	-0.00343	PASS
	20°C/4.4 V	0.00019	0.00438	PASS
	20°C/3.65 V	-0.00172	0.00016	PASS
10MHz	-30°C/3.87 V	0.00001	0.00446	PASS
	-20°C/3.87 V	0.00202	-0.00186	PASS
	-10°C/3.87 V	-0.00025	0.00841	PASS

	0°C/3.87 V	-0.00204	0.00215	PASS
	10°C/3.87 V	-0.00253	0.00207	PASS
	20°C/3.87 V	-0.00045	0.00139	PASS
	30°C/3.87 V	-0.00037	0.00286	PASS
	40°C/3.87 V	0.00103	0.00440	PASS
	50°C/3.87 V	-0.00129	0.00417	PASS
	20°C/4.4 V	-0.00154	0.00406	PASS
	20°C/3.65 V	-0.00177	0.00298	PASS
15MHz	-30°C/3.87 V	-0.00029	-0.00396	PASS
	-20°C/3.87 V	0.00293	0.00029	PASS
	-10°C/3.87 V	0.00366	0.00145	PASS
	0°C/3.87 V	-0.00100	-0.00150	PASS
	10°C/3.87 V	0.00191	0.00230	PASS
	20°C/3.87 V	0.00208	0.00639	PASS
	30°C/3.87 V	0.00150	0.00679	PASS
	40°C/3.87 V	0.00439	0.00627	PASS
	50°C/3.87 V	0.00842	0.00255	PASS
	20°C/4.4 V	0.00185	0.00148	PASS
	20°C/3.65 V	0.00210	-0.00059	PASS
20MHz	-30°C/3.87 V	0.00215	0.00673	PASS
	-20°C/3.87 V	0.00154	0.00714	PASS
	-10°C/3.87 V	0.00457	0.00661	PASS
	0°C/3.87 V	0.00217	-0.00061	PASS
	10°C/3.87 V	0.00190	0.00157	PASS
	20°C/3.87 V	-0.00035	-0.00414	PASS
	30°C/3.87 V	0.00304	0.00032	PASS
	40°C/3.87 V	0.00381	0.00154	PASS
	50°C/3.87 V	-0.00109	-0.00155	PASS
	20°C/4.4 V	0.00197	0.00243	PASS
	20°C/3.65 V	0.00880	0.00270	PASS

Bandwidth	Test status	LTE Band 7 Channel 21100 Test Results (ppm)		
		QPSK	16QAM	Conclusion
5MHz	-30°C/3.87 V	-0.00260	0.00230	PASS
	-20°C/3.87 V	-0.00426	0.00116	PASS
	-10°C/3.87 V	-0.00349	-0.00005	PASS
	0°C/3.87 V	-0.00041	0.00304	PASS
	10°C/3.87 V	-0.00450	0.00104	PASS
	20°C/3.87 V	-0.00241	0.00246	PASS
	30°C/3.87 V	-0.00401	0.00061	PASS
	40°C/3.87 V	-0.00301	0.00053	PASS
	50°C/3.87 V	0.00085	0.00259	PASS
	20°C/4.4 V	-0.00477	0.00125	PASS
	20°C/3.65 V	-0.00281	0.00222	PASS
10MHz	-30°C/3.87 V	-0.00135	0.00785	PASS
	-20°C/3.87 V	-0.00185	0.00753	PASS
	-10°C/3.87 V	-0.00228	-0.00019	PASS
	0°C/3.87 V	-0.00163	0.00011	PASS
	10°C/3.87 V	-0.00405	0.00042	PASS
	20°C/3.87 V	-0.00340	0.00105	PASS
	30°C/3.87 V	-0.00594	0.00162	PASS
	40°C/3.87 V	-0.00298	0.00057	PASS
	50°C/3.87 V	-0.00210	0.00260	PASS
	20°C/4.4 V	-0.00162	0.00832	PASS
	20°C/3.65 V	0.00853	0.00788	PASS
15MHz	-30°C/3.87 V	0.00188	0.00131	PASS
	-20°C/3.87 V	0.00541	-0.00199	PASS
	-10°C/3.87 V	0.00990	-0.00149	PASS
	0°C/3.87 V	0.01029	-0.00391	PASS
	10°C/3.87 V	0.00887	-0.00244	PASS
	20°C/3.87 V	0.00957	0.00893	PASS
	30°C/3.87 V	0.01241	0.00934	PASS
	40°C/3.87 V	0.00992	0.00644	PASS
	50°C/3.87 V	0.00971	0.00849	PASS
	20°C/4.4 V	0.00235	0.00128	PASS
	20°C/3.65 V	0.00084	0.00267	PASS
20MHz	-30°C/3.87 V	0.00009	0.00009	PASS
	-20°C/3.87 V	-0.00003	0.00101	PASS
	-10°C/3.87 V	-0.00098	-0.00141	PASS
	0°C/3.87 V	0.00045	0.00048	PASS

	10°C/3.87 V	0.00078	0.00099	PASS
	20°C/3.87 V	-0.00130	-0.00032	PASS
	30°C/3.87 V	0.00000	0.00137	PASS
	40°C/3.87 V	0.00008	0.00319	PASS
	50°C/3.87 V	-0.00018	0.00337	PASS
	20°C/4.4 V	-0.00262	-0.00026	PASS
	20°C/3.65 V	-0.00210	0.00892	PASS

Bandwidth	Test status	LTE Band 12 Channel 23095 Test Results (ppm)		
		QPSK	16QAM	Conclusion
1.4M	-30°C/3.87 V	-0.01168	-0.01179	PASS
	-20°C/3.87 V	0.01218	-0.00732	PASS
	-10°C/3.87 V	-0.01325	-0.00275	PASS
	0°C/3.87 V	-0.00042	-0.00831	PASS
	10°C/3.87 V	0.00688	0.00649	PASS
	20°C/3.87 V	0.00620	0.02558	PASS
	30°C/3.87 V	-0.00434	0.00662	PASS
	40°C/3.87 V	0.01404	-0.00261	PASS
	50°C/3.87 V	0.00348	-0.01388	PASS
	20°C/4.4 V	-0.00501	0.04962	PASS
	20°C/3.65 V	-0.01137	0.06267	PASS
3M	-30°C/3.87 V	-0.01248	-0.00289	PASS
	-20°C/3.87 V	-0.00921	-0.00653	PASS
	-10°C/3.87 V	-0.01026	-0.00668	PASS
	0°C/3.87 V	0.00546	-0.01640	PASS
	10°C/3.87 V	-0.01644	-0.00418	PASS
	20°C/3.87 V	-0.00282	0.00748	PASS
	30°C/3.87 V	-0.02177	-0.00254	PASS
	40°C/3.87 V	-0.00557	-0.00705	PASS
	50°C/3.87 V	-0.01643	-0.01173	PASS
	20°C/4.4 V	0.00264	-0.00004	PASS
	20°C/3.65 V	-0.00484	0.00035	PASS
5MHz	-30°C/3.87 V	-0.00601	0.00085	PASS
	-20°C/3.87 V	-0.00522	0.01191	PASS
	-10°C/3.87 V	0.00089	0.00664	PASS
	0°C/3.87 V	-0.00785	-0.00231	PASS
	10°C/3.87 V	-0.00149	0.00103	PASS
	20°C/3.87 V	0.00376	0.00931	PASS
	30°C/3.87 V	-0.00016	0.00297	PASS
	40°C/3.87 V	-0.00792	0.01572	PASS
	50°C/3.87 V	0.01393	0.00035	PASS
	20°C/4.4 V	-0.01018	0.01570	PASS
	20°C/3.65 V	0.01206	-0.00019	PASS
10MHz	-30°C/3.87 V	0.00962	-0.00432	PASS
	-20°C/3.87 V	-0.00294	0.00349	PASS
	-10°C/3.87 V	0.01187	0.01460	PASS
	0°C/3.87 V	0.00848	0.01365	PASS

	10°C/3.87 V	0.00107	0.01307	PASS
	20°C/3.87 V	0.01677	0.01271	PASS
	30°C/3.87 V	0.00976	0.01447	PASS
	40°C/3.87 V	0.01163	0.00697	PASS
	50°C/3.87 V	0.00400	0.01354	PASS
	20°C/4.4 V	-0.00024	-0.00074	PASS
	20°C/3.65 V	0.01504	-0.01122	PASS

Bandwidth	Test status	LTE Band 13 Channel 23230 Test Results (ppm)		
		QPSK	16QAM	Conclusion
5MHz	-30°C/3.87 V	-0.00933	-0.00186	PASS
	-20°C/3.87 V	-0.00862	0.00815	PASS
	-10°C/3.87 V	-0.00309	0.00338	PASS
	0°C/3.87 V	-0.01100	-0.00471	PASS
	10°C/3.87 V	-0.00524	-0.00169	PASS
	20°C/3.87 V	-0.00049	0.00580	PASS
	30°C/3.87 V	-0.00404	0.00006	PASS
	40°C/3.87 V	-0.01106	0.01160	PASS
	50°C/3.87 V	0.00871	-0.00231	PASS
	20°C/4.4 V	-0.01310	0.01158	PASS
	20°C/3.65 V	0.00701	-0.00279	PASS
10MHz	-30°C/3.87 V	0.00481	-0.00653	PASS
	-20°C/3.87 V	-0.00655	0.00053	PASS
	-10°C/3.87 V	0.00684	0.01059	PASS
	0°C/3.87 V	0.00378	0.00972	PASS
	10°C/3.87 V	-0.00292	0.00920	PASS
	20°C/3.87 V	0.01128	0.00887	PASS
	30°C/3.87 V	0.00494	0.01047	PASS
	40°C/3.87 V	0.00663	0.00368	PASS
	50°C/3.87 V	-0.00027	0.00963	PASS
	20°C/4.4 V	-0.00411	-0.00329	PASS
	20°C/3.65 V	0.00972	-0.01278	PASS

5.7 Spurious Emissions at Antenna Terminals

Ambient condition

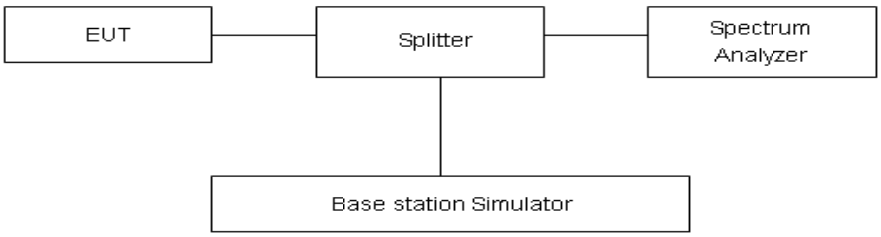
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used.RBW and VBW are set to 100 kHz for the carrier frequency, or RBW and VBW are set to 1MHz (other frequency), Sweep is set to ATUO.

Of those disturbances below (limit – 20 dB), the mark is not required for the EUT.

Test setup



Limits

LTE 13 Rule Part 27.53(f)For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

LTE -4/12 Rule Part 27.53(c) /Part 27.53(h) specifies that “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.”

LTE -7 Rule Part 27.53(m) 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(4) of this section.

LTE -4/12/13 Limit	-13 dBm
LTE -7 Limit	-25 dBm

Measurement Uncertainty

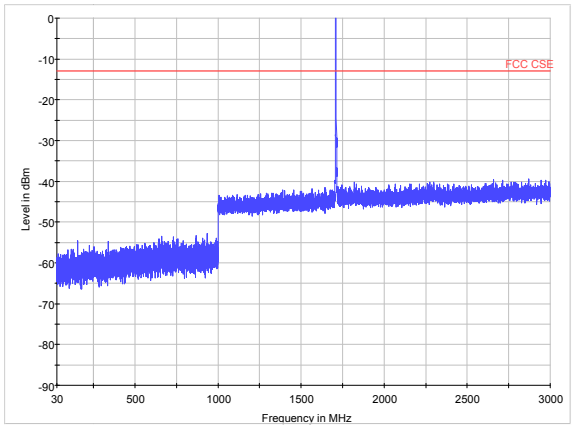
The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor *k* = 1.96.

Frequency	Uncertainty
100kHz-2GHz	0.684 dB
2GHz-12.75GHz	1.407 dB

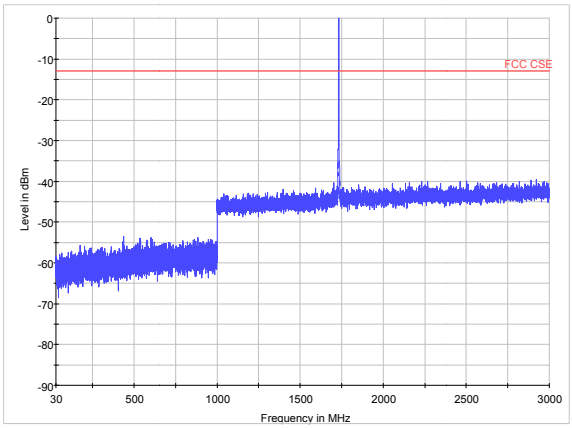
Test Result: PASS

If disturbances were found more than 20dB below limit line, the mark is not required for the EUT.
The signal beyond the limit is carrier in the following plots.

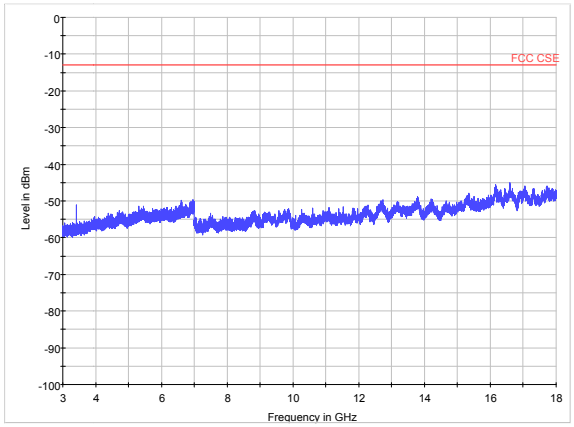
Mode	Frequency	Peak (dBm)	Limit (dBm)	Margin (dB)
LTE B7_5M_CHLOW_RB1_3-18GHz	1000.1	-38.07	-25.00	13.07
LTE B7_5M_CHMID_RB1_3-18GHz	10130.6	-41.40	-25.00	16.40
LTE B7_5M_CHHIGH_RB1_3-18GHz	10261.1	-42.10	-25.00	17.10
LTE B7_10M_CHLOW_RB1_3-18GHz	1000.2	-37.70	-25.00	12.70
LTE B7_10M_CHMID_RB1_3-18GHz	10121.6	-40.25	-25.00	15.25
LTE B7_10M_CHHIGH_RB1_3-18GHz	10242.0	-41.48	-25.00	16.48
LTE B7_15M_CHLOW_RB1_3-18GHz	1002.4	-38.16	-25.00	13.16
LTE B7_15M_CHMID_RB1_3-18GHz	10112.6	-39.88	-25.00	14.88
LTE B7_15M_CHHIGH_RB1_3-18GHz	10222.9	-42.48	-25.00	17.48
LTE B7_20M_CHLOW_RB1_3-18GHz	10035.0	-38.45	-25.00	13.45
LTE B7_20M_CHMID_RB1_3-18GHz	10104.8	-40.98	-25.00	15.98
LTE B7_20M_CHHIGH_RB1_3-18GHz	10203.8	-43.95	-25.00	18.95
LTE B12_1.4M_CHLOW_RB1_1-3GHz	1398.3	-31.57	-13.00	18.57
LTE B12_1.4M_CHMID_RB1_1-3GHz	1414.0	-29.91	-13.00	16.91
LTE B12_1.4M_CHHIGH_RB1_1-3GHz	1429.5	-30.68	-13.00	17.68
LTE B12_3M_CHLOW_RB1_1-3GHz	1398.5	-32.65	-13.00	19.65
LTE B12_3M_CHMID_RB1_1-3GHz	1412.5	-29.66	-13.00	16.66
LTE B12_3M_CHHIGH_RB1_1-3GHz	1426.5	-30.95	-13.00	17.95
LTE B12_5M_CHLOW_RB1_1-3GHz	1398.8	-32.30	-13.00	19.30
LTE B12_5M_CHMID_RB1_1-3GHz	1410.5	-30.27	-13.00	17.27
LTE B12_5M_CHHIGH_RB1_1-3GHz	1422.5	-32.59	-13.00	19.59
LTE B12_10M_CHMID_RB1_1-3GHz	1406.0	-30.85	-13.00	17.85
LTE B12_10M_CHHIGH_RB1_1-3GHz	1413.0	-30.51	-13.00	17.51
LTE B13_5M_CHLOW_RB1_1-3GHz	1554.5	-31.95	-13.00	18.95
LTE B13_5M_CHMID_RB1_1-3GHz	1559.8	-30.86	-13.00	17.86
LTE B13_5M_CHHIGH_RB1_1-3GHz	1564.8	-29.83	-13.00	16.83
LTE B13_10M_CHLOW_RB1_1-3GHz	1555.3	-31.26	-13.00	18.26
LTE B13_10M_CHMID_RB1_1-3GHz	1555.0	-31.36	-13.00	18.36
LTE B13_10M_CHHIGH_RB1_1-3GHz	1555.3	-31.26	-13.00	18.26



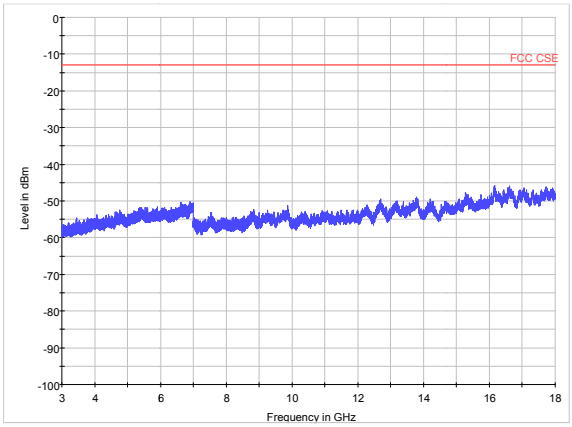
LTE Band 4 1.4MHz CH19957 30MHz~3GHz



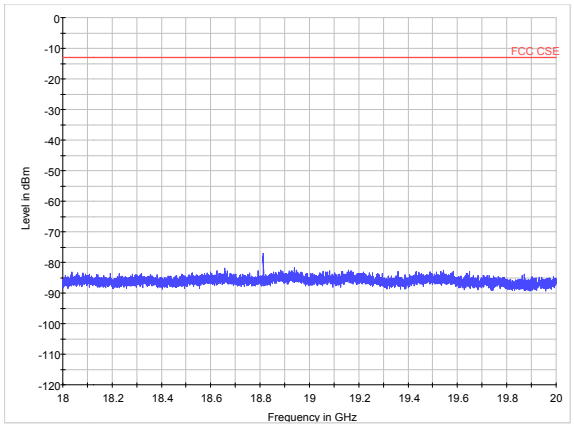
LTE Band 4 1.4MHz CH20175 30MHz~3GHz



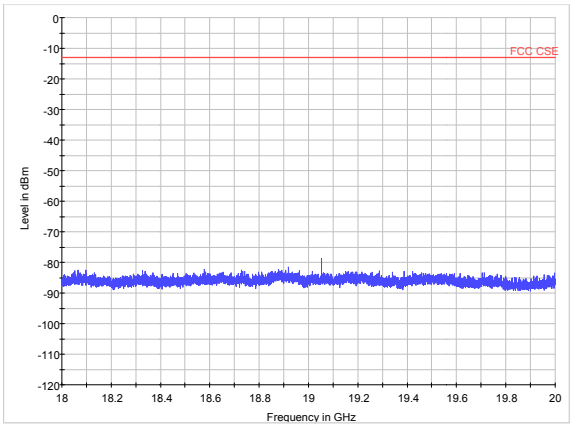
LTE Band 4 1.4MHz CH19957 3GHz~18GHz



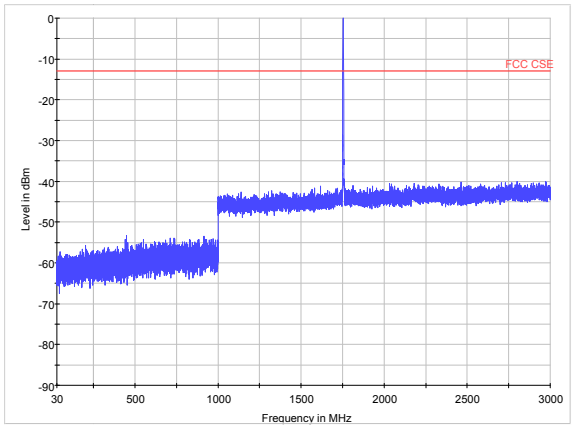
LTE Band 4 1.4MHz CH20175 3GHz~18GHz



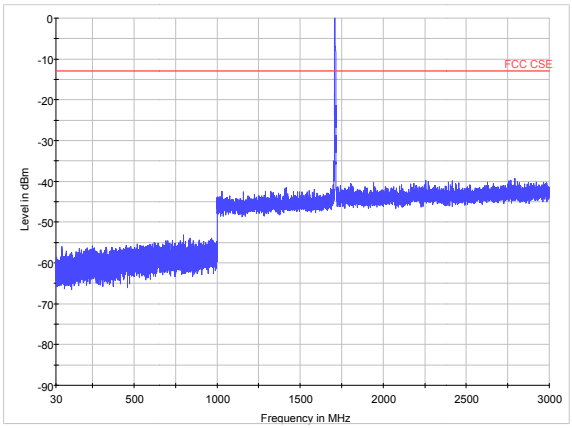
LTE Band 4 1.4MHz CH19957 18GHz~20GHz



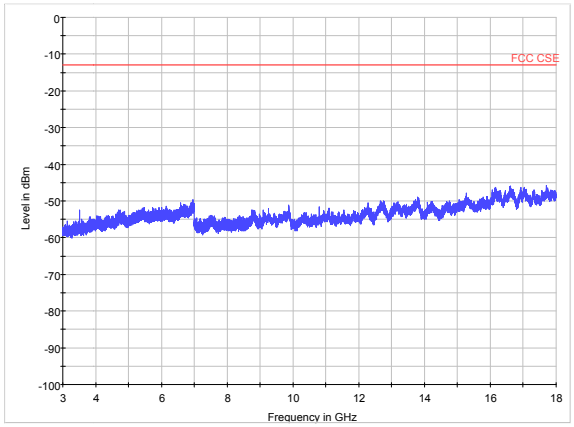
LTE Band 4 1.4MHz CH20175 18GHz~20GHz



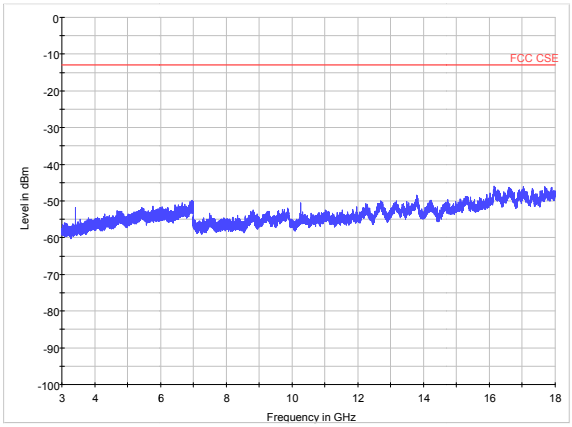
LTE Band 4 1.4MHz CH20393 30MHz~3GHz



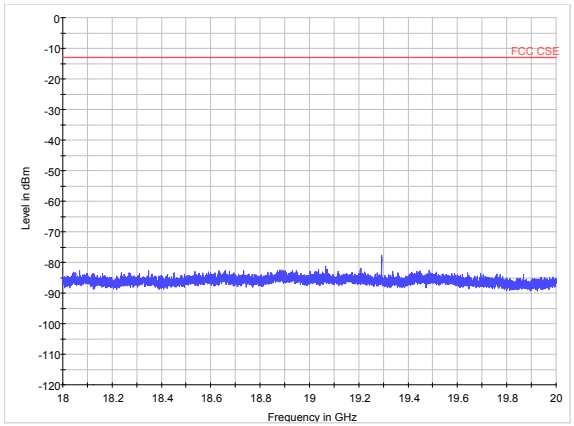
LTE Band 4 3MHz CH19965 30MHz~3GHz



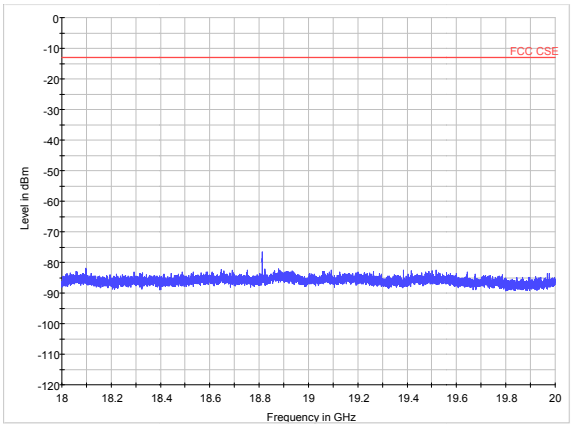
LTE Band 4 1.4MHz CH20393 3GHz~18GHz



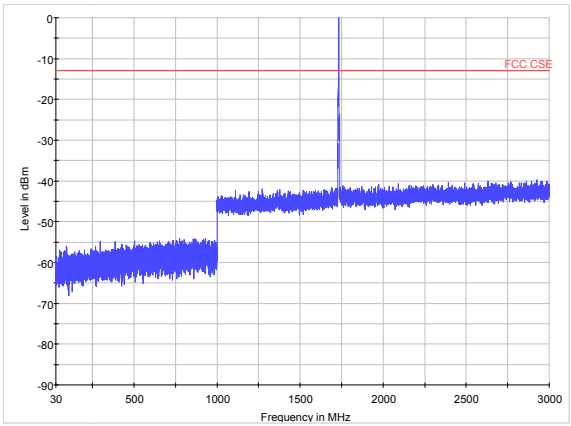
LTE Band 4 3MHz CH19965 3GHz~18GHz



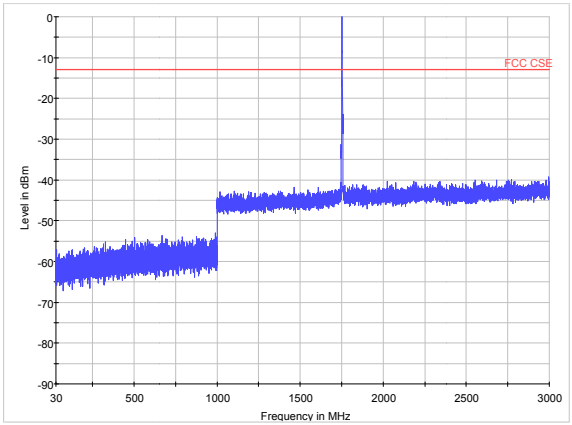
LTE Band 4 1.4MHz CH20393 18GHz~20GHz



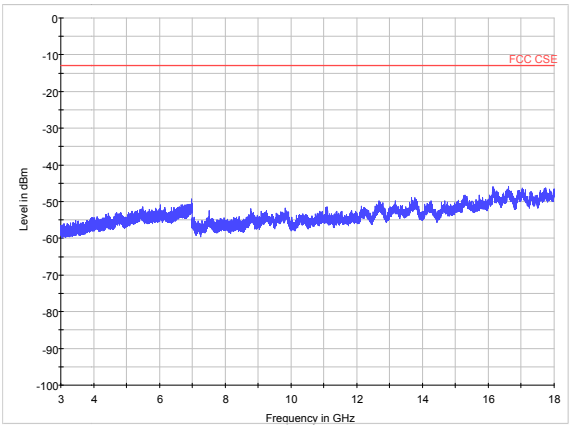
LTE Band 4 3MHz CH19965 18GHz~20GHz



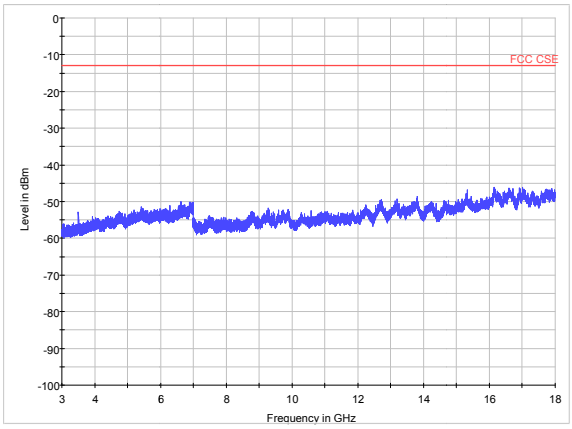
LTE Band 4 3MHz CH20175 30MHz~3GHz



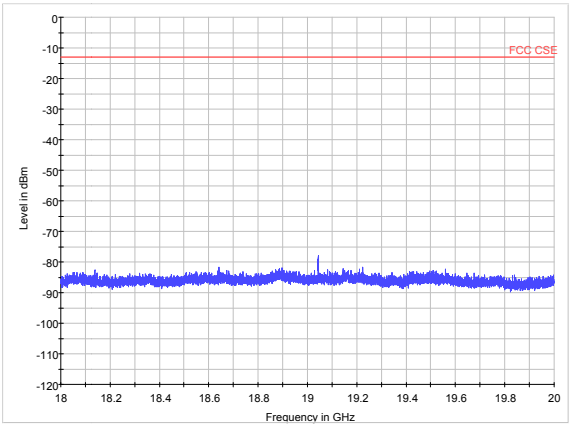
LTE Band 4 3MHz CH20385 30MHz~3GHz



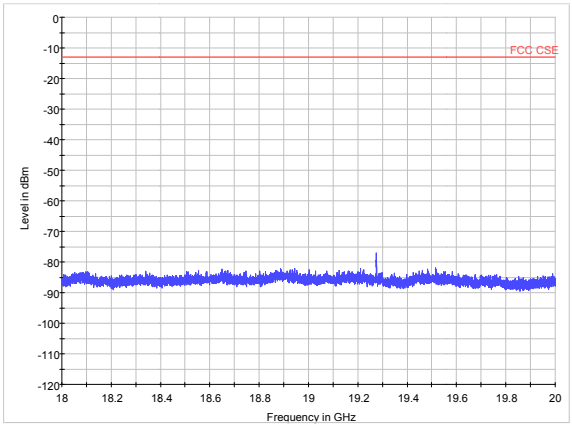
LTE Band 4 3MHz CH20175 3GHz~18GHz



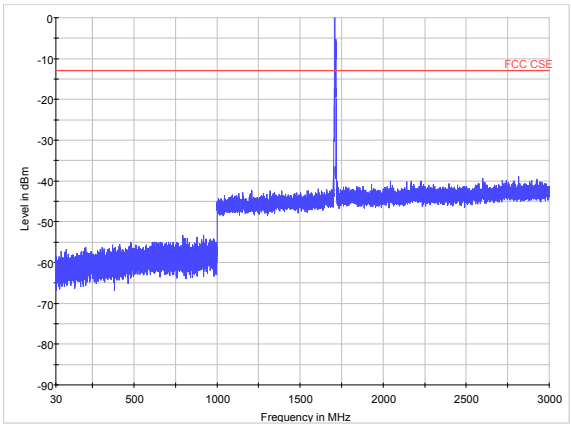
LTE Band 4 3MHz CH20385 3GHz~18GHz



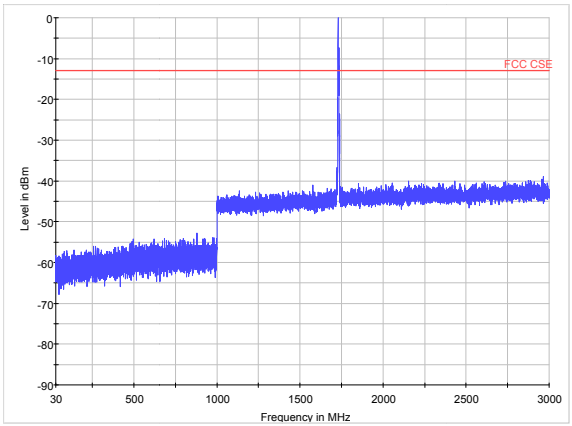
LTE Band 4 3MHz CH20175 18GHz~20GHz



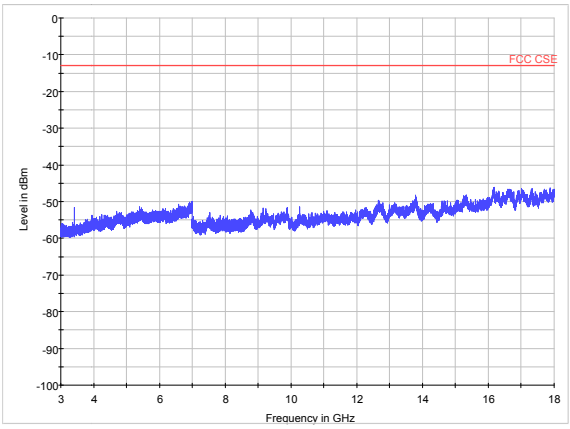
LTE Band 4 3MHz CH20385 18GHz~20GHz



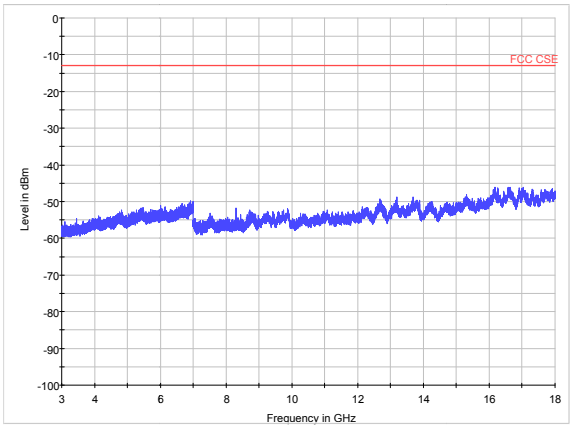
LTE Band 4 5MHz CH19975 30MHz~3GHz



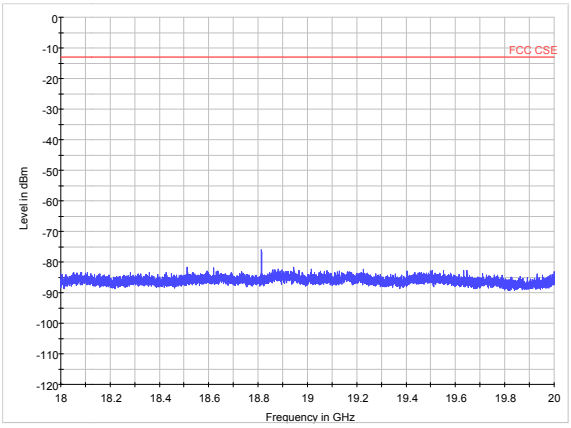
LTE Band 4 5MHz CH20175 30MHz~3GHz



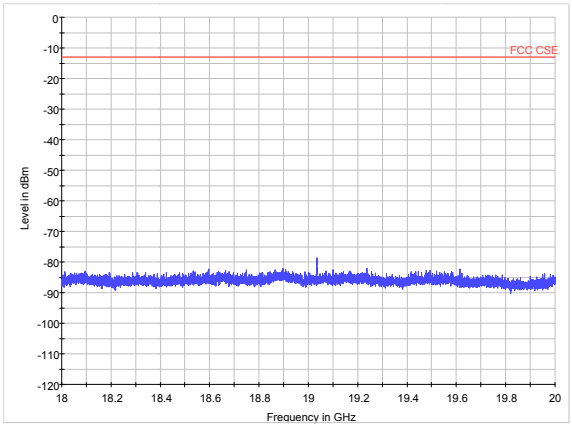
LTE Band 4 5MHz CH19975 3GHz~18GHz



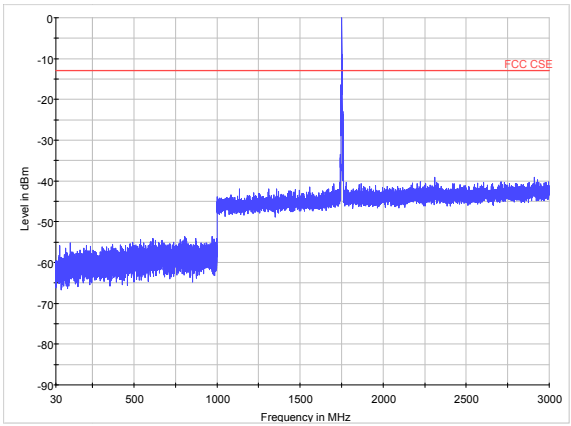
LTE Band 4 5MHz CH20175 3GHz~18GHz



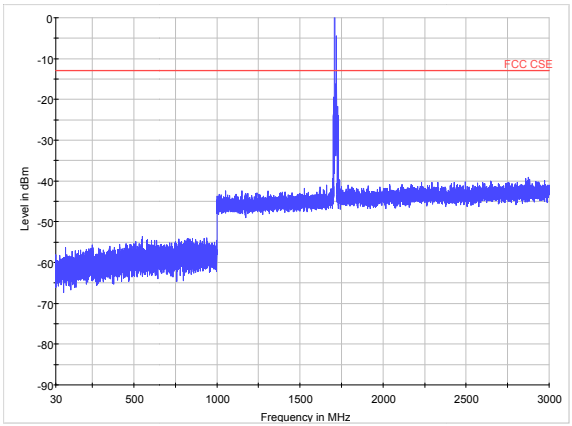
LTE Band 4 5MHz CH19975 18GHz~20GHz



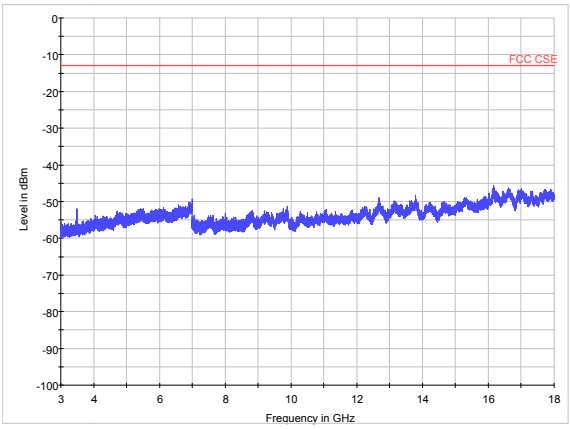
LTE Band 4 5MHz CH20175 18GHz~20GHz



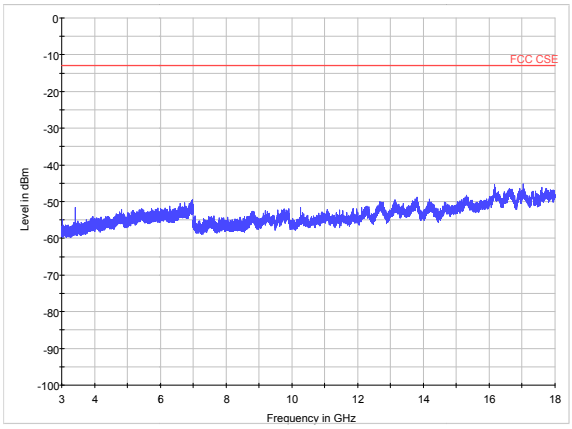
LTE Band 4 5MHz CH20375 30MHz~3GHz



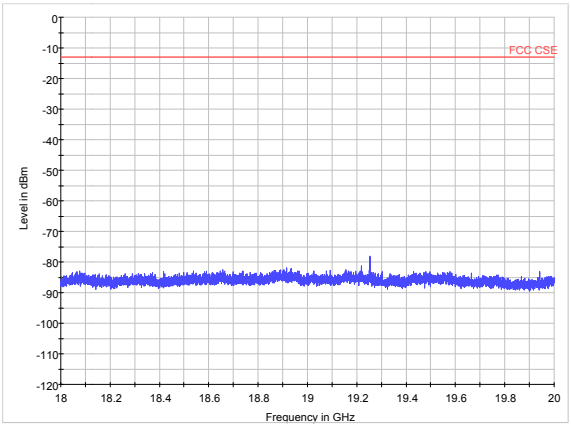
LTE Band 4 10MHz CH20000 30MHz~3GHz



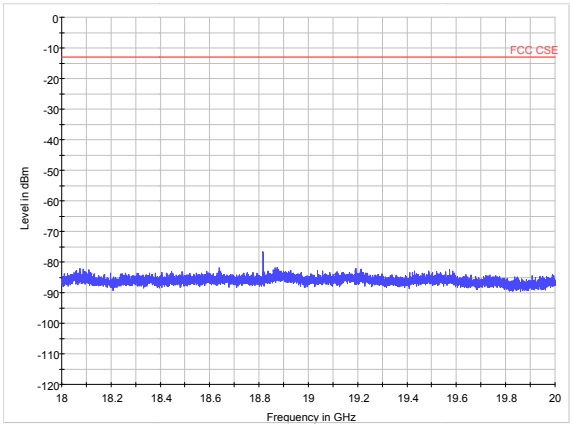
LTE Band 4 5MHz CH20375 3GHz~18GHz



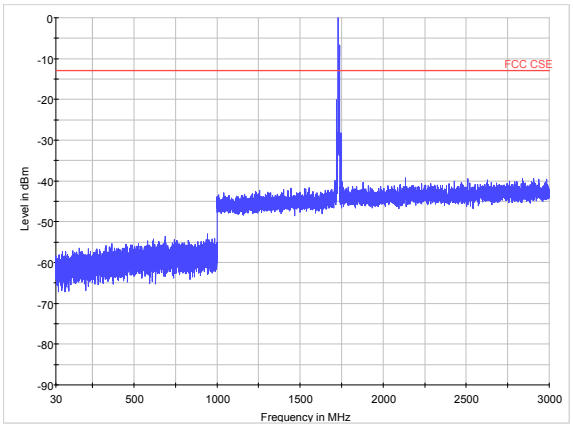
LTE Band 4 10MHz CH20000 3GHz~18GHz



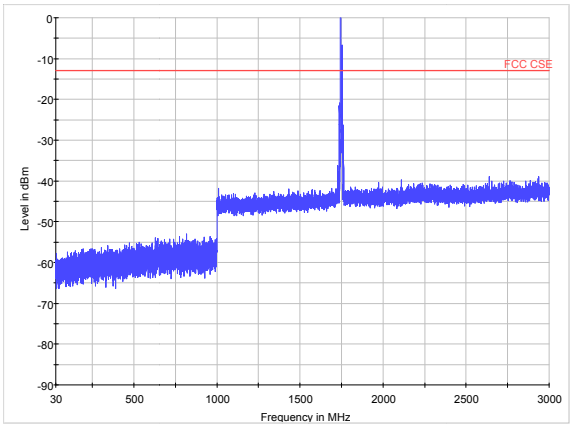
LTE Band 4 5MHz CH20375 18GHz~20GHz



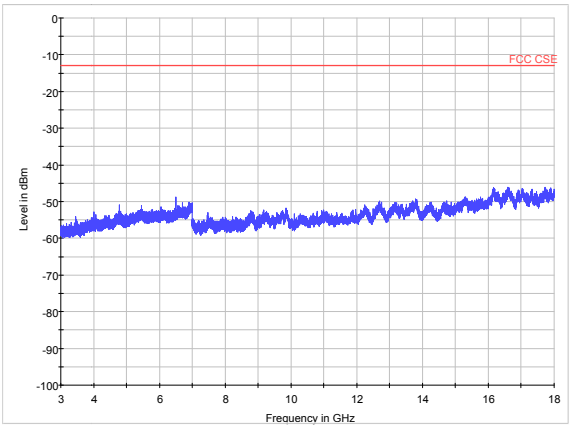
LTE Band 4 10MHz CH20000 18GHz~20GHz



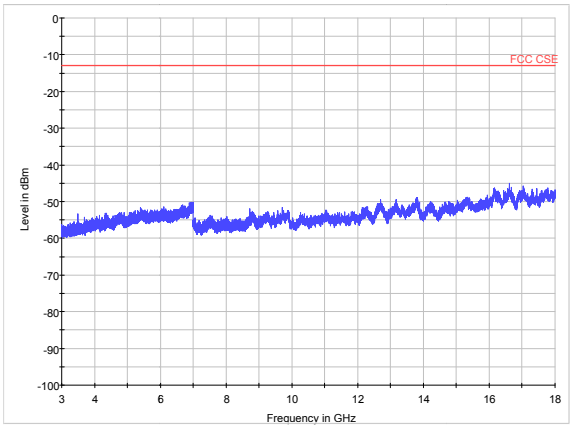
LTE Band 4 10MHz CH20175 30MHz~3GHz



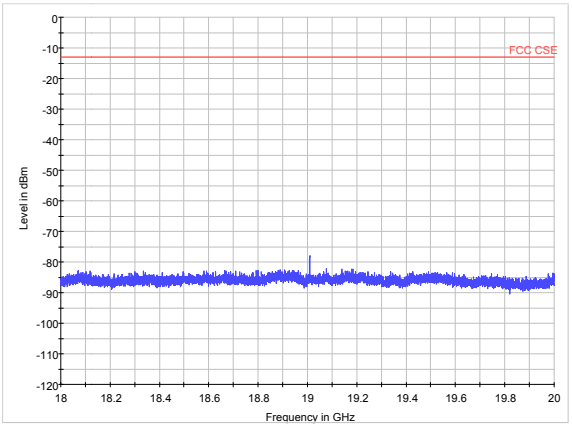
LTE Band 4 10MHz CH20350 30MHz~3GHz



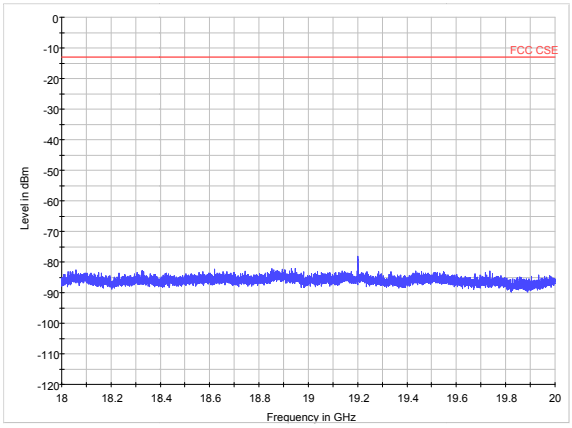
LTE Band 4 10MHz CH20175 3GHz~18GHz



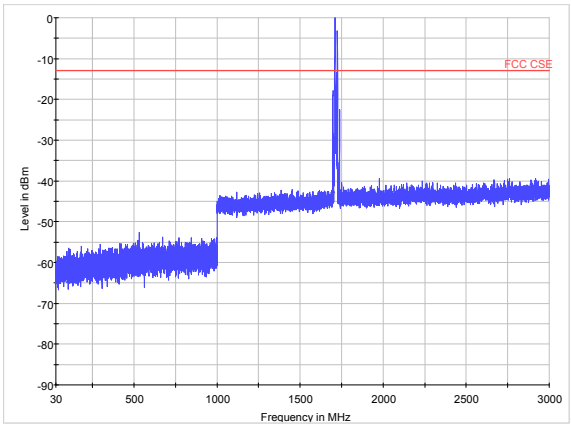
LTE Band 4 10MHz CH20350 3GHz~18GHz



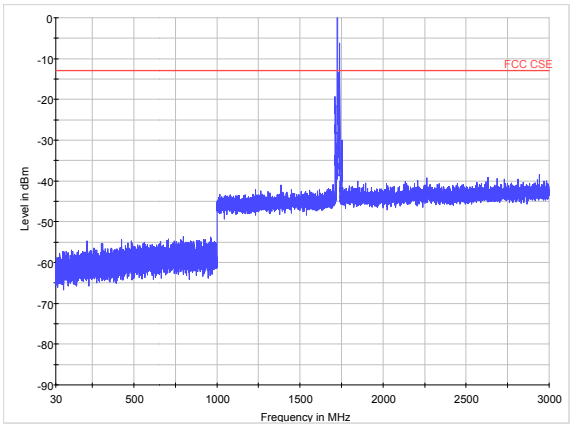
LTE Band 4 10MHz CH20175 18GHz~20GHz



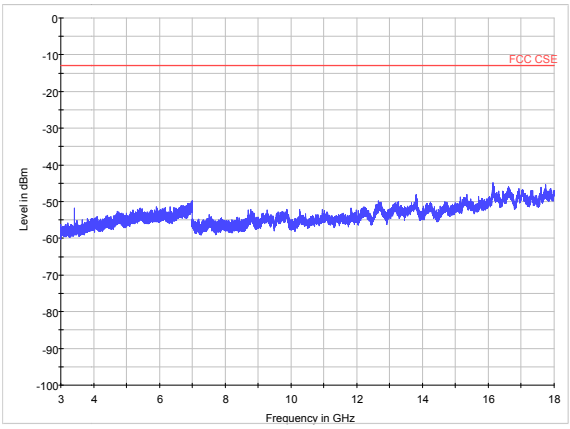
LTE Band 4 10MHz CH20350 18GHz~20GHz



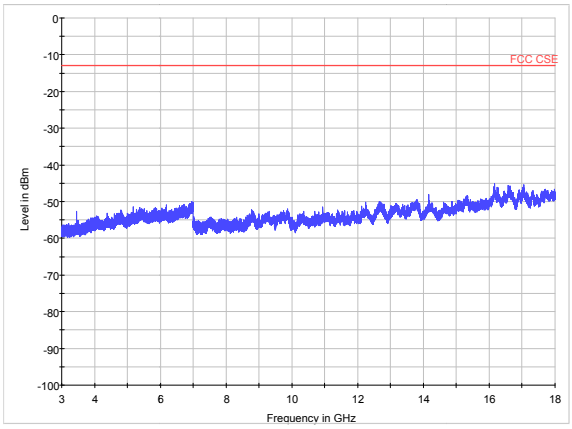
LTE Band 4 15MHz CH20025 30MHz~3GHz



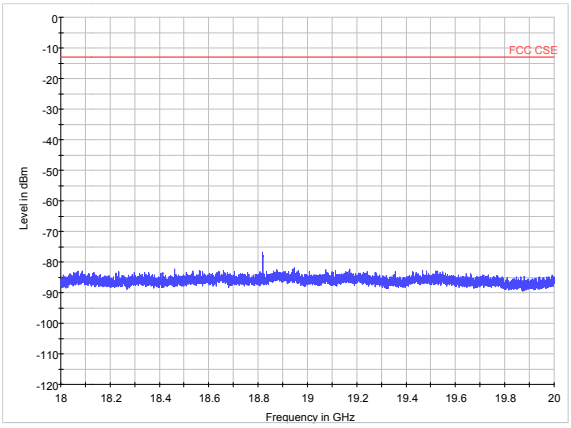
LTE Band 4 15MHz CH20175 30MHz~3GHz



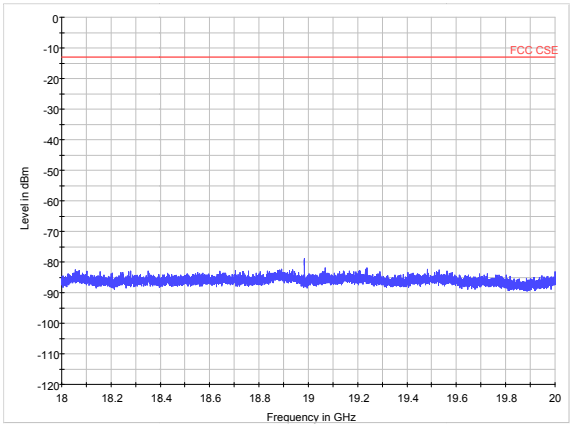
LTE Band 4 15MHz CH20025 3GHz~18GHz



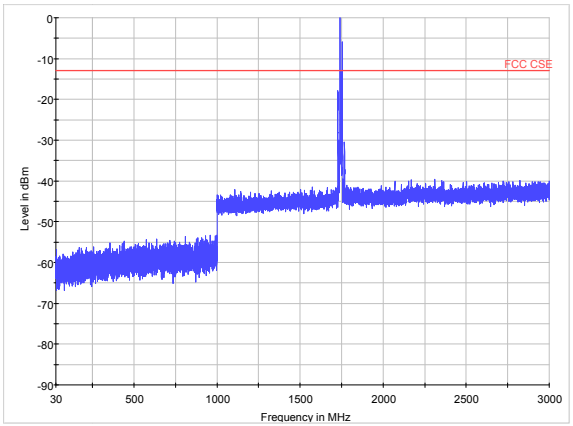
LTE Band 4 15MHz CH20175 3GHz~18GHz



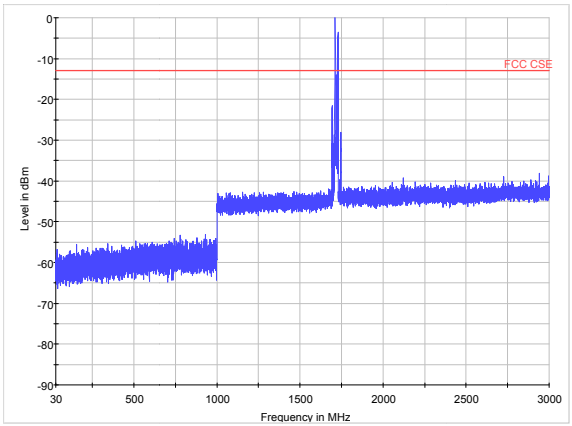
LTE Band 4 15MHz CH20025 18GHz~20GHz



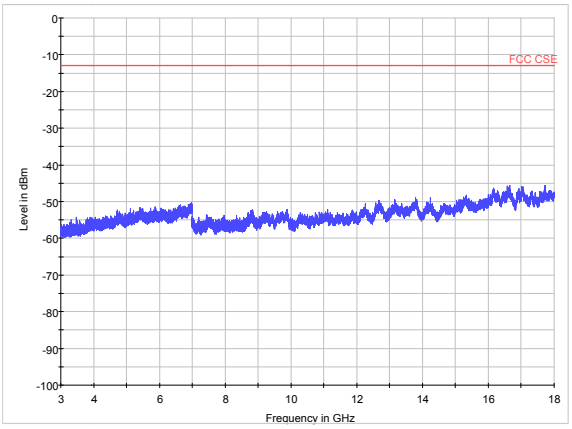
LTE Band 4 15MHz CH20175 18GHz~20GHz



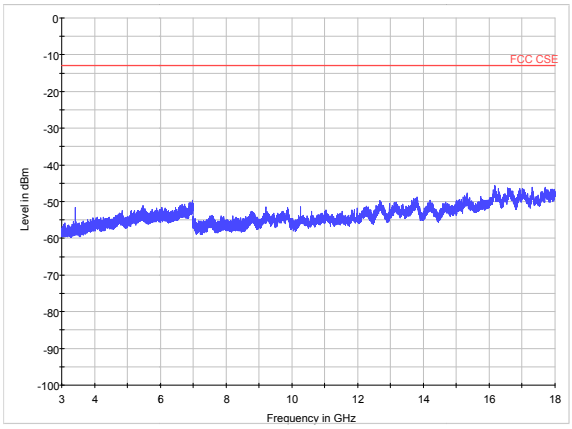
LTE Band 4 15MHz CH20325 30MHz~3GHz



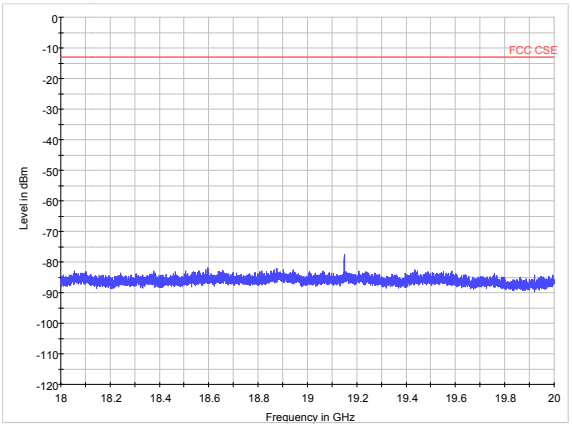
LTE Band 4 20MHz CH20050 30MHz~3GHz



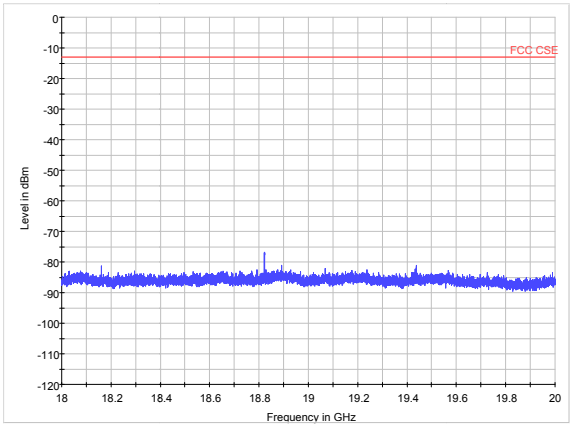
LTE Band 4 15MHz CH20325 3GHz~18GHz



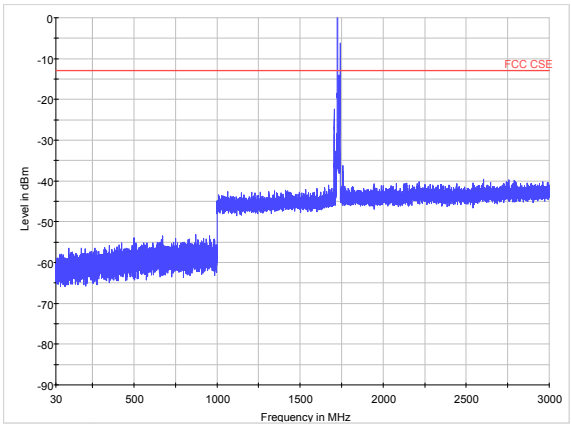
LTE Band 4 20MHz CH20050 3GHz~18GHz



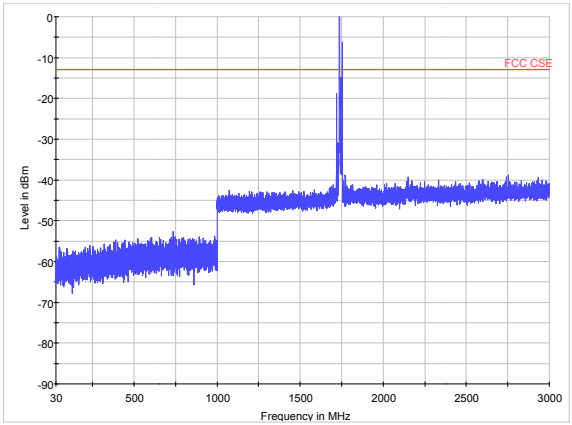
LTE Band 4 15MHz CH20325 18GHz~20GHz



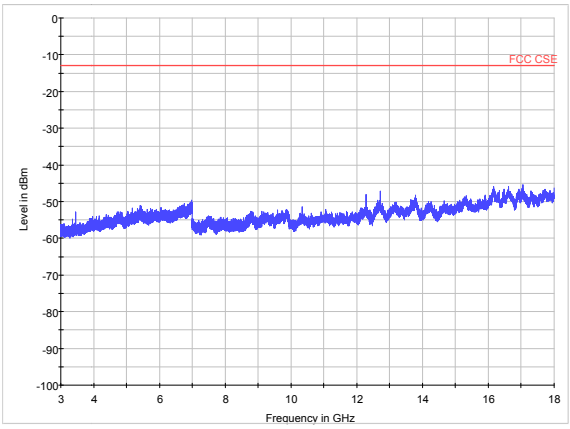
LTE Band 4 20MHz CH20050 18GHz~20GHz



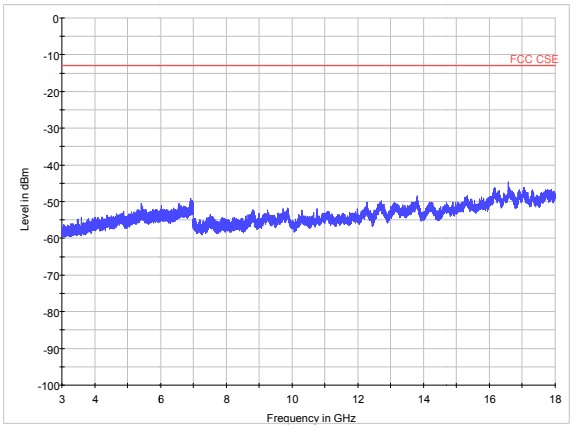
LTE Band 4 20MHz CH20175 30MHz~3GHz



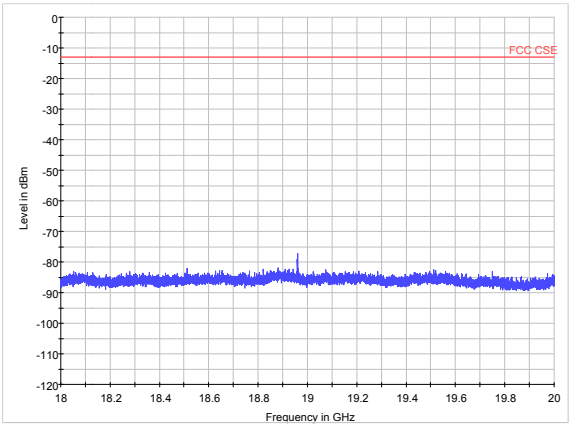
LTE Band 4 20MHz CH20300 30MHz~3GHz



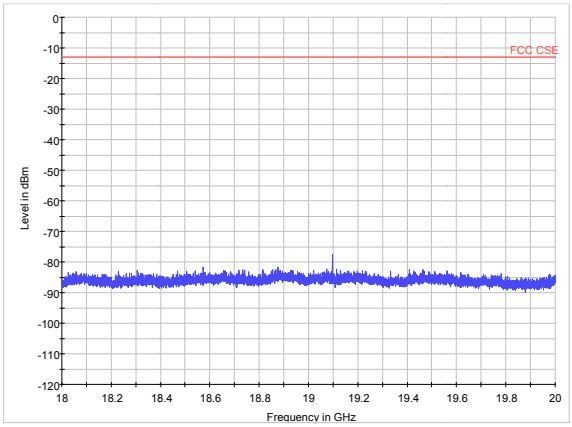
LTE Band 4 20MHz CH20175 3GHz~18GHz



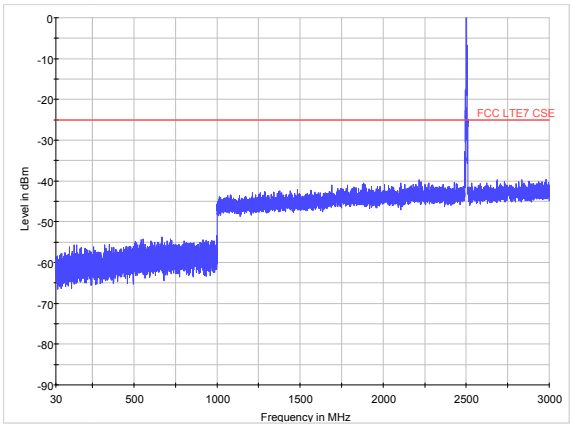
LTE Band 4 20MHz CH20300 3GHz~18GHz



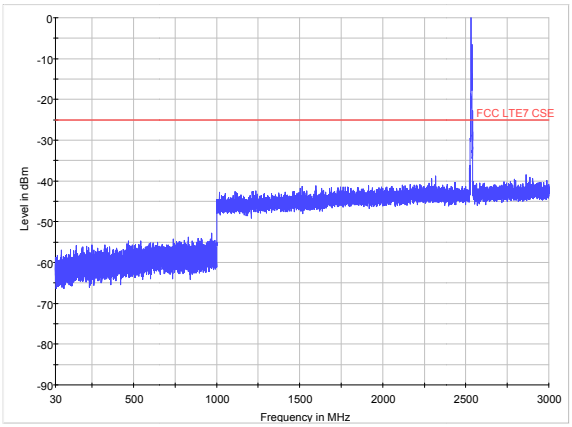
LTE Band 4 20MHz CH20175 18GHz~20GHz



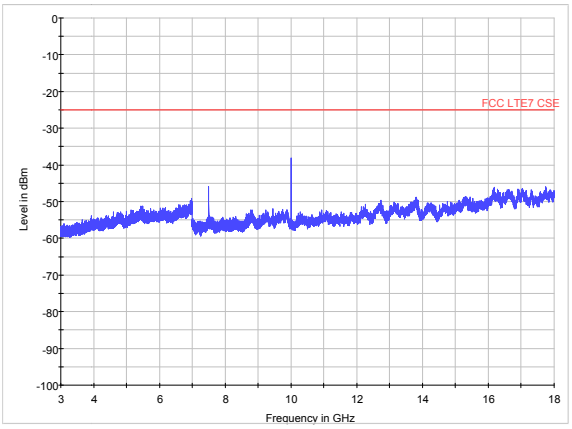
LTE Band 4 20MHz CH20300 18GHz~20GHz



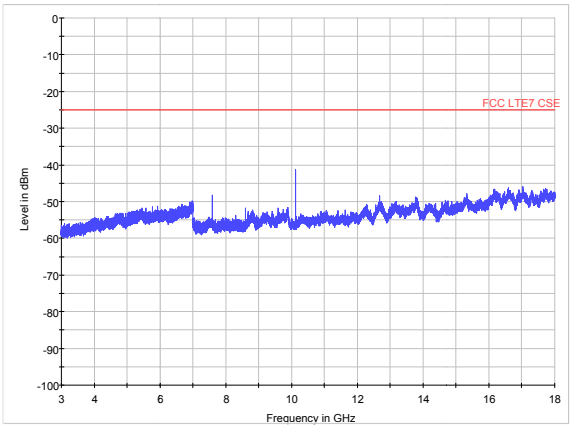
LTE Band 7 5MHz CH20775 30MHz~3GHz



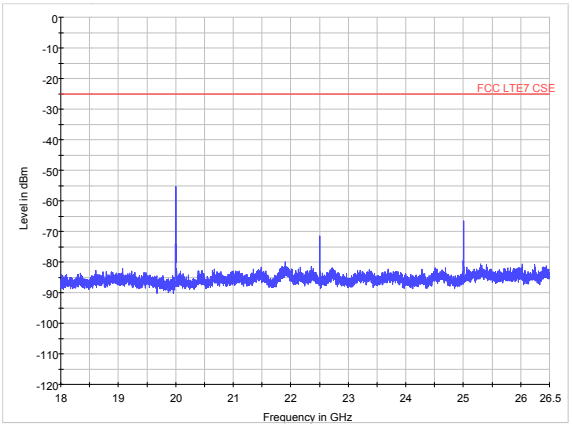
LTE Band 7 5MHz CH21100 30MHz~3GHz



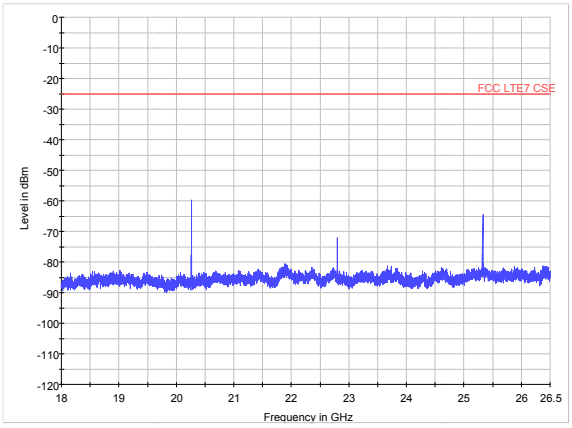
LTE Band 7 5MHz CH20775 3GHz~18GHz



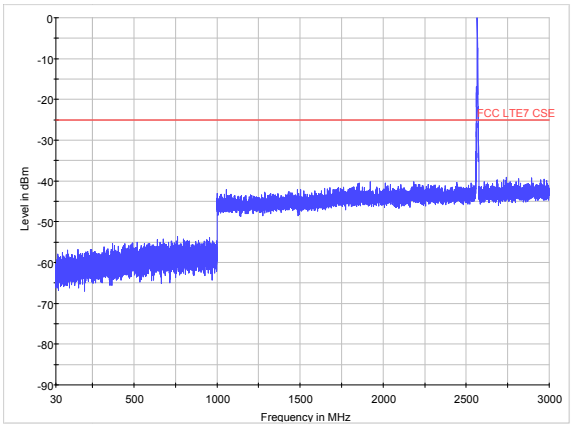
LTE Band 7 5MHz CH21100 3GHz~18GHz



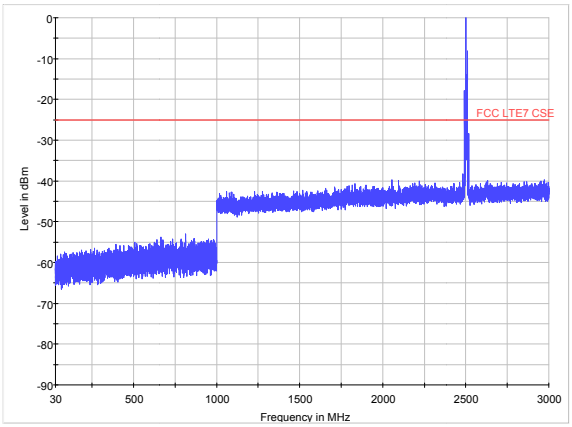
LTE Band 7 5MHz CH20775 18GHz~26.5GHz



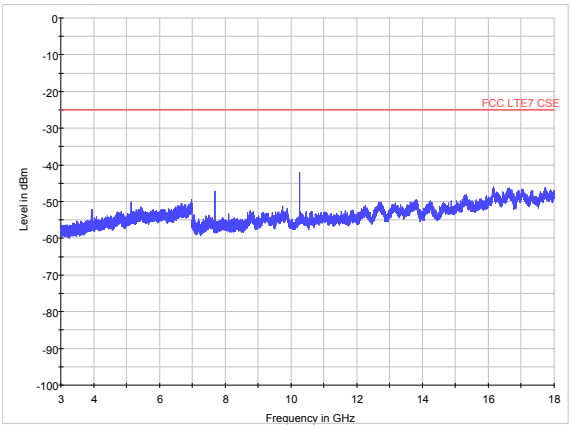
LTE Band 7 5MHz CH21100 18GHz~26.5GHz



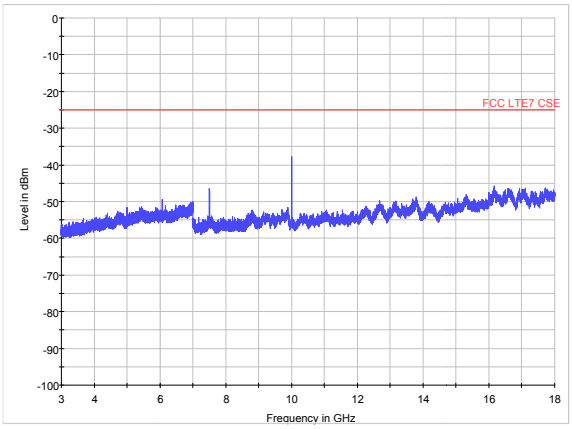
LTE Band 7 5MHz CH21425 30MHz~3GHz



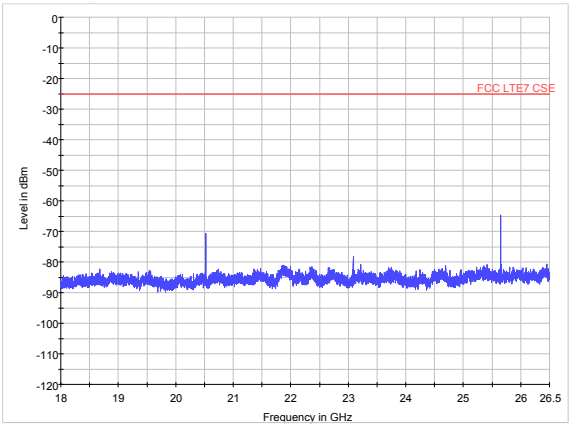
LTE Band 7 10MHz CH39700 30MHz~3GHz



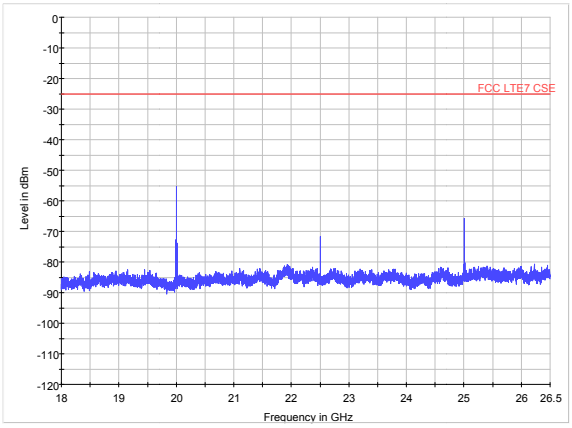
LTE Band 7 5MHz CH21425 3GHz~18GHz



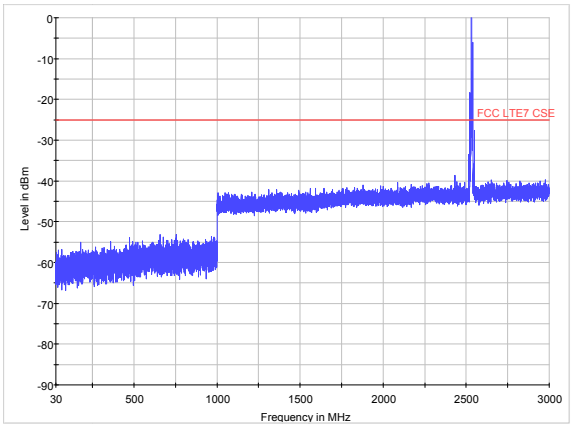
LTE Band 7 10MHz CH39700 3GHz~18GHz



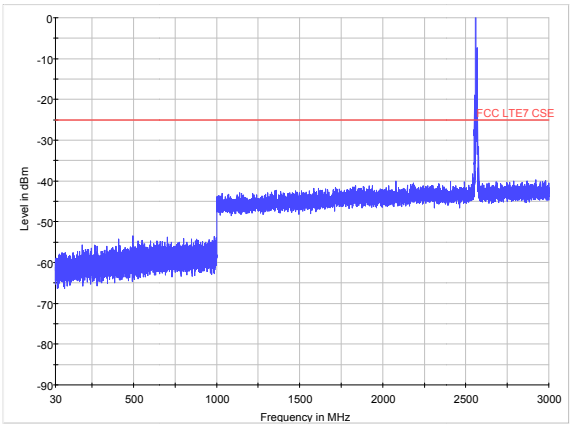
LTE Band 7 5MHz CH21425 18GHz~26.5GHz



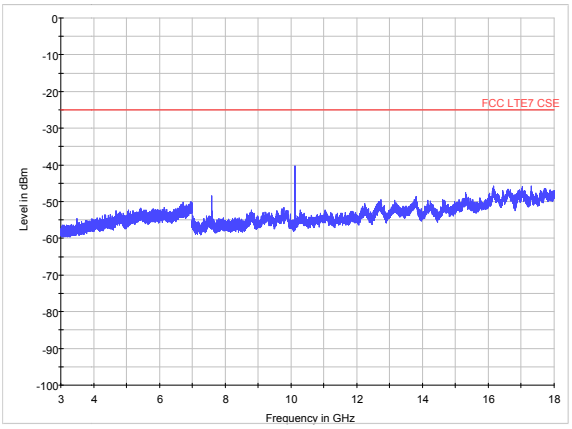
LTE Band 7 10MHz CH39700 18GHz~26.5GHz



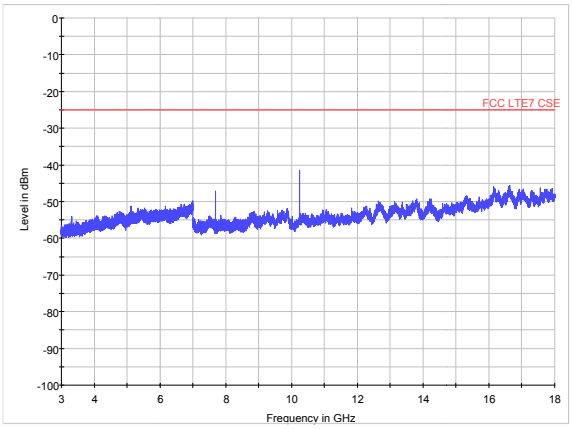
LTE Band 7 10MHz CH21100 30MHz~3GHz



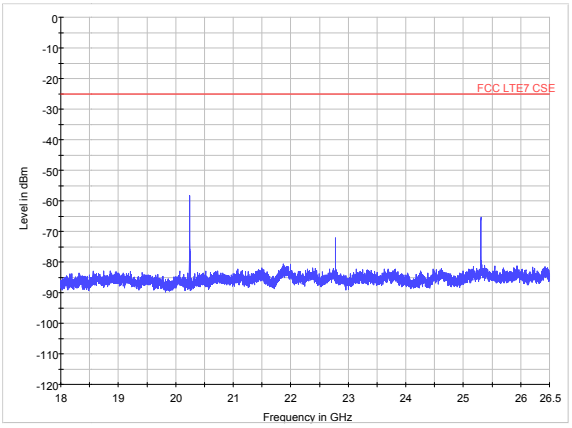
LTE Band 7 10MHz CH41540 30MHz~3GHz



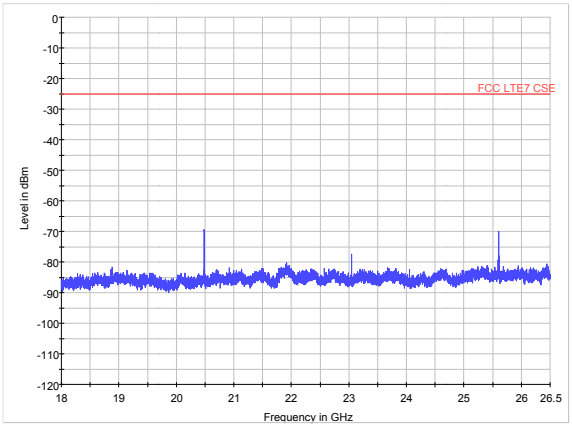
LTE Band 7 10MHz CH21100 3GHz~18GHz



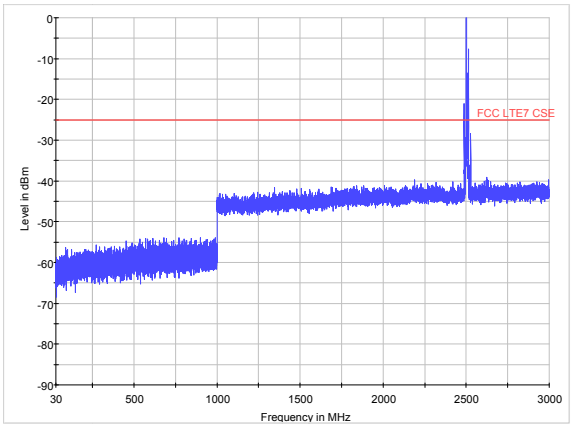
LTE Band 7 10MHz CH41540 3GHz~18GHz



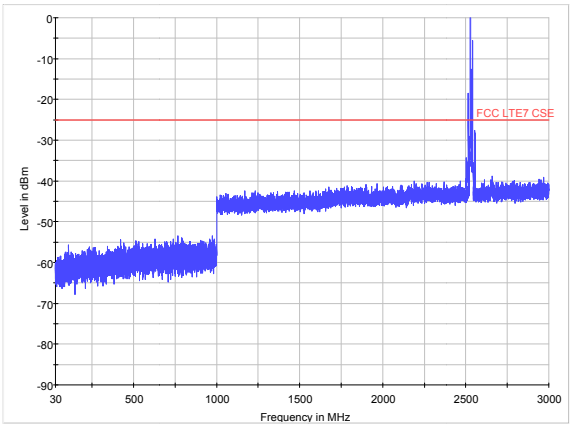
LTE Band 7 10MHz CH21100 18GHz~26.5GHz



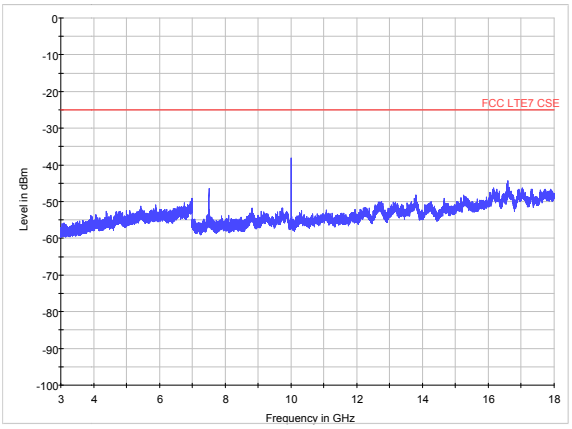
LTE Band 710MHz CH41540 18GHz~26.5GHz



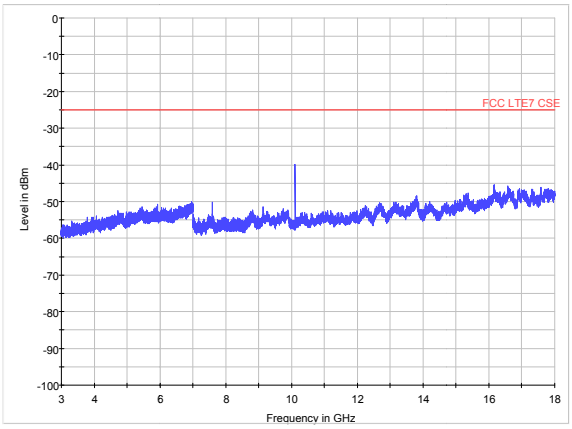
LTE Band 7 15MHz CH39725 30MHz~3GHz



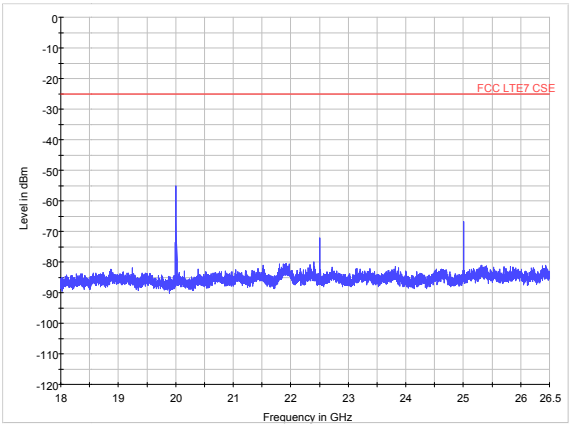
LTE Band 7 15MHz CH21100 30MHz~3GHz



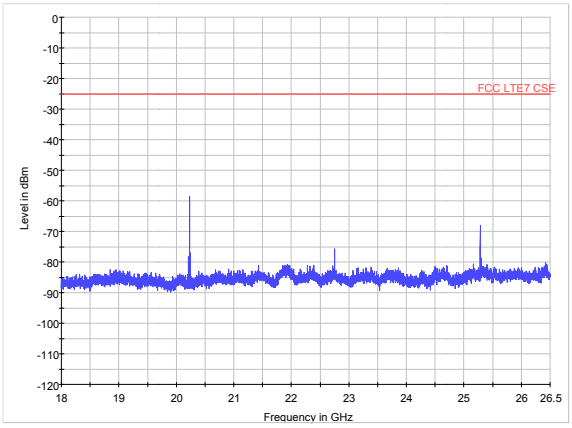
LTE Band 7 15MHz CH39725 3GHz~18GHz



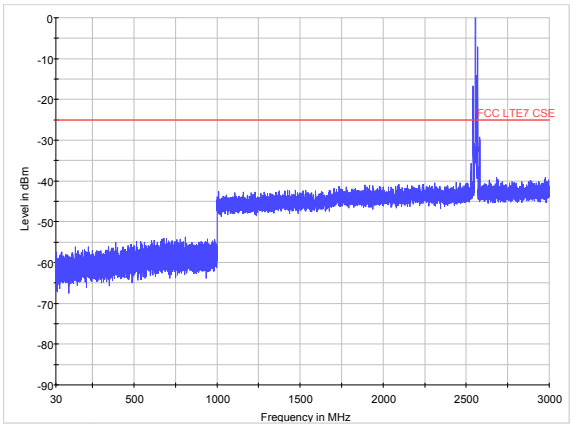
LTE Band 7 15MHz CH21100 3GHz~18GHz



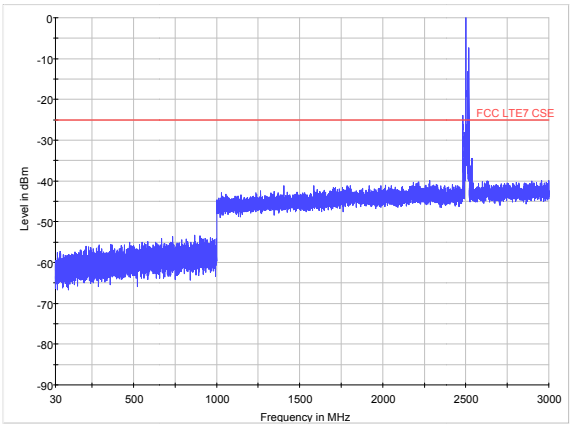
LTE Band 7 15MHz CH39725 18GHz~26.5GHz



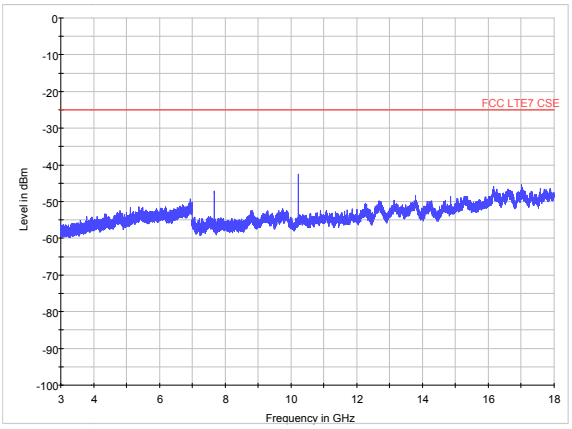
LTE Band 7 15MHz CH21100 18GHz~26.5GHz



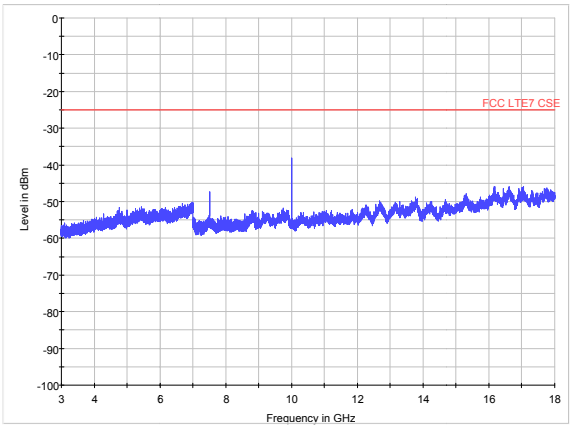
LTE Band 7 15MHz CH41515 30MHz~3GHz



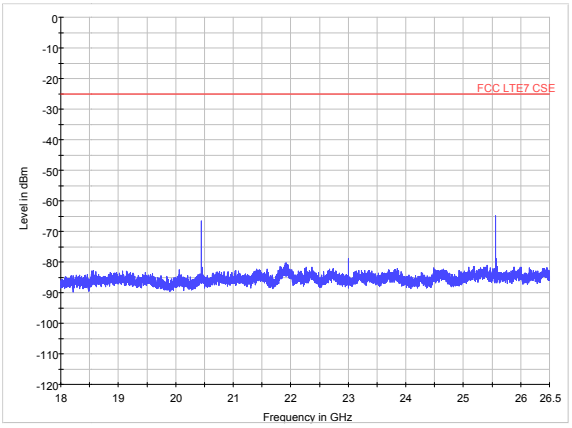
LTE Band 7 20MHz CH39750 30MHz~3GHz



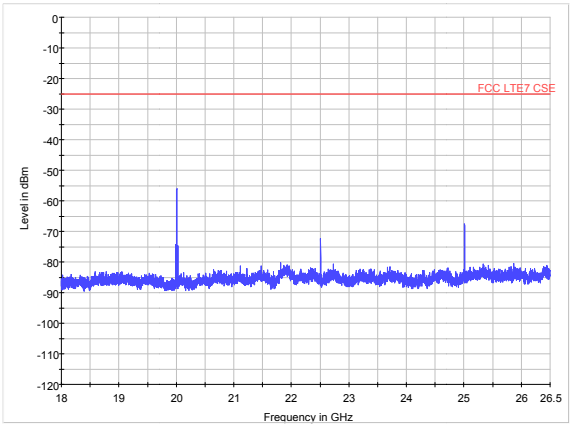
LTE Band 7 15MHz CH41515 3GHz~18GHz



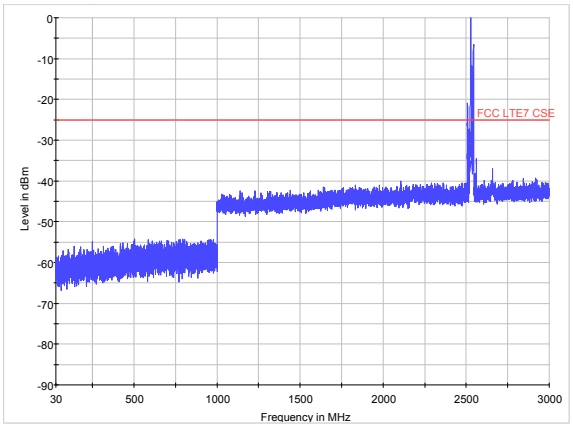
LTE Band 7 20MHz CH39750 3GHz~18GHz



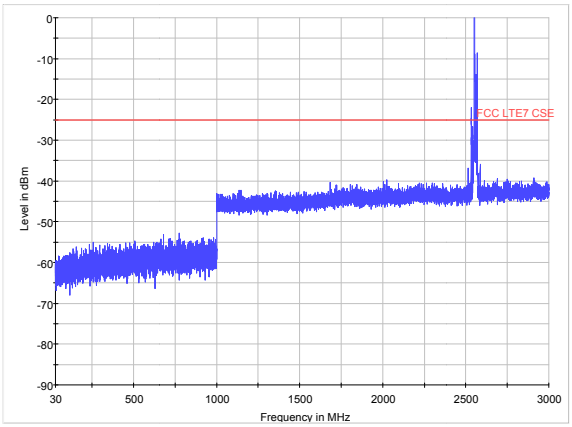
LTE Band 7 15MHz CH41515 18GHz~26.5GHz



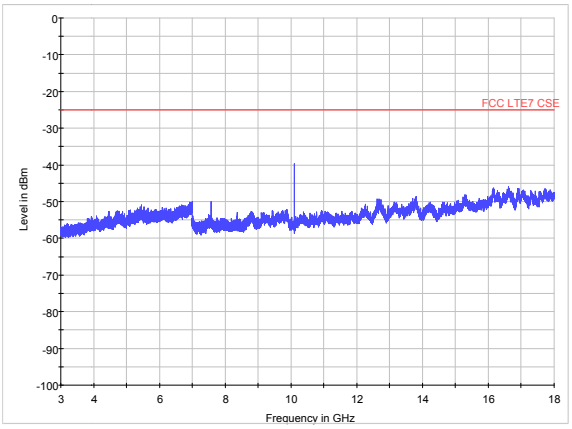
LTE Band 7 20MHz CH39750 18GHz~26.5GHz



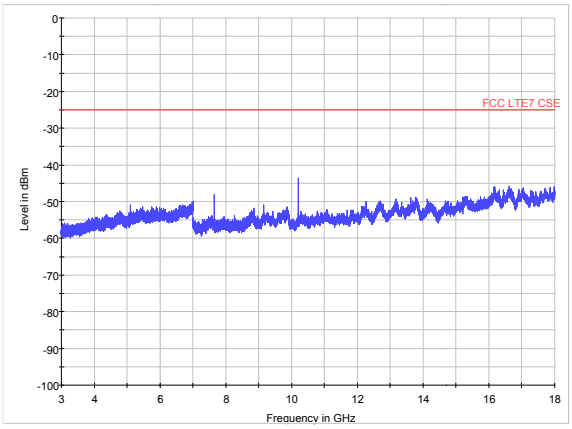
LTE Band 7 20MHz CH21100 30MHz~3GHz



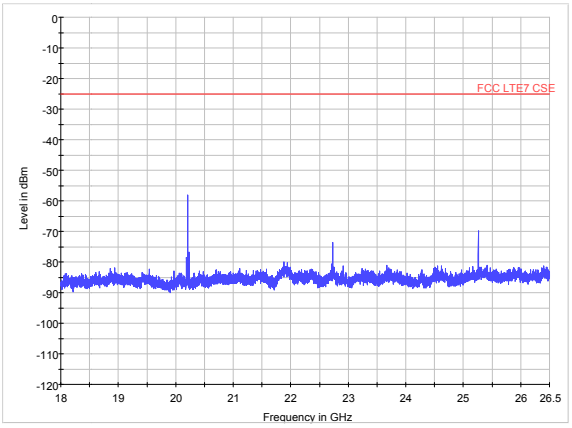
LTE Band 7 20MHz CH41490 30MHz~3GHz



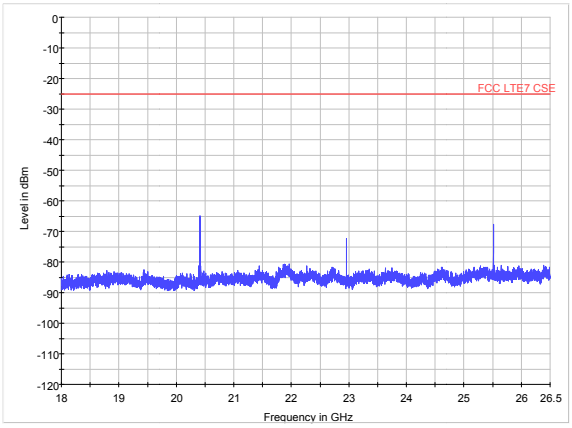
LTE Band 7 20MHz CH21100 3GHz~18GHz



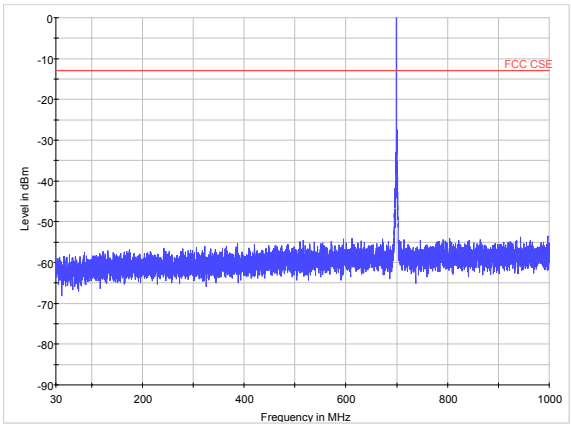
LTE Band 7 20MHz CH41490 3GHz~18GHz



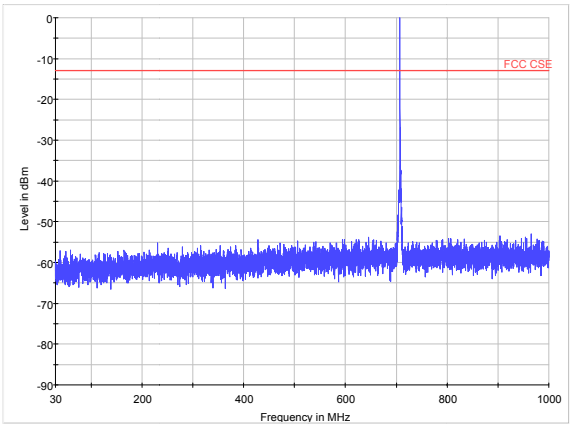
LTE Band 7 20MHz CH21100 18GHz~26.5GHz



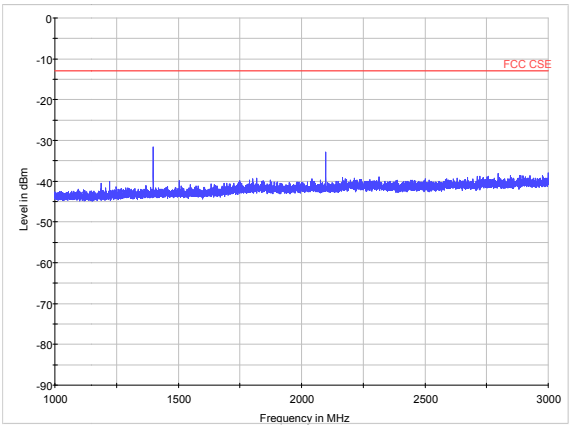
LTE Band 7 20MHz CH41490 18GHz~26.5GHz



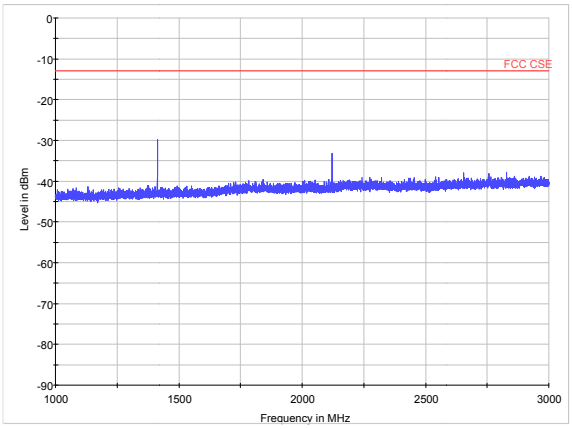
LTE Band 12 1.4MHz CH23017 30MHz~1.5GHz



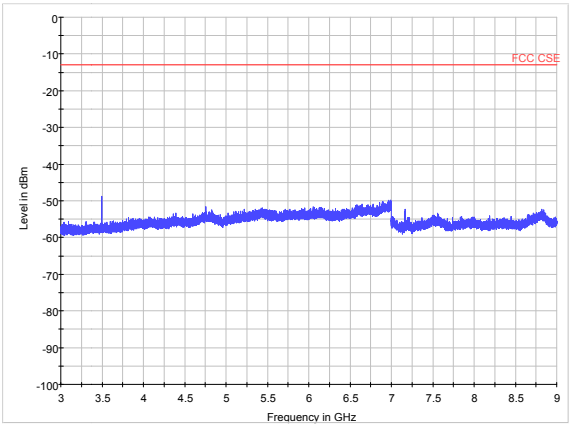
LTE Band 12 1.4MHz CH23095 30MHz~1.5GHz



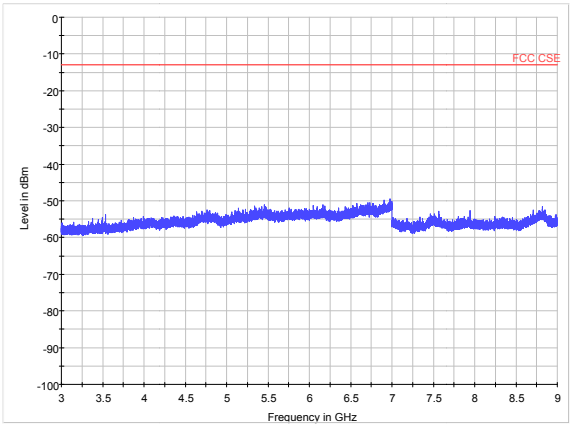
LTE Band 12 1.4MHz CH23017 1.5GHz~3GHz



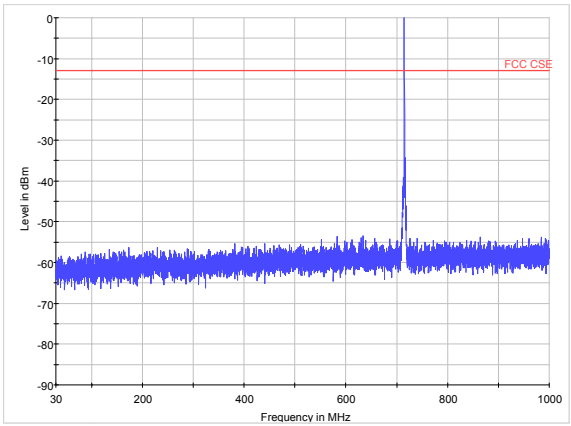
LTE Band 12 1.4MHz CH23095 1.5GHz~3GHz



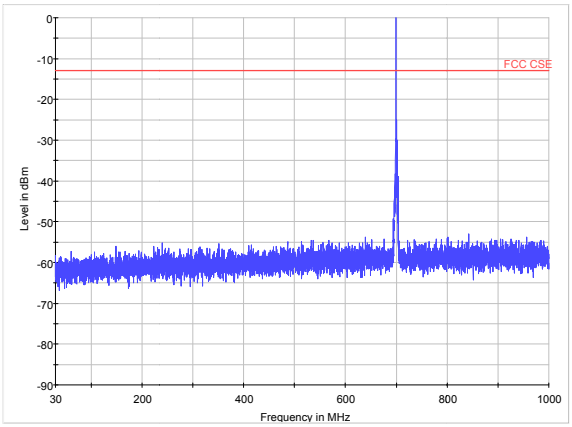
LTE Band 12 1.4MHz CH23017 3GHz~9GHz



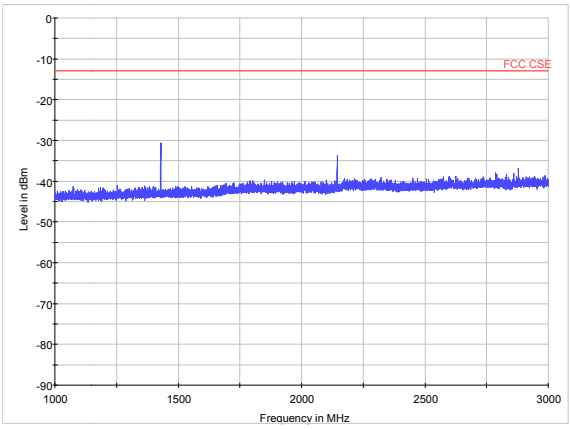
LTE Band 12 1.4MHz CH23095 3GHz~9GHz



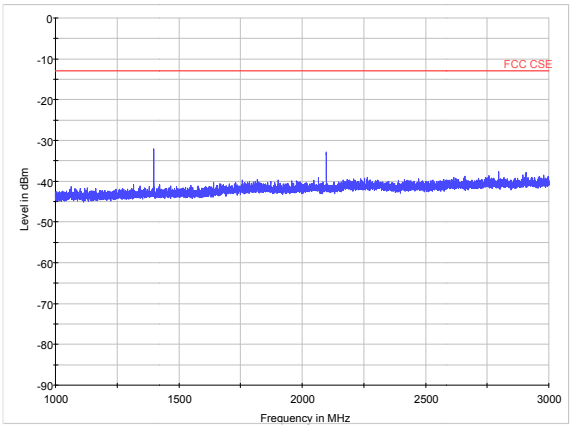
LTE Band 12 1.4MHz CH23173 30MHz~1GHz



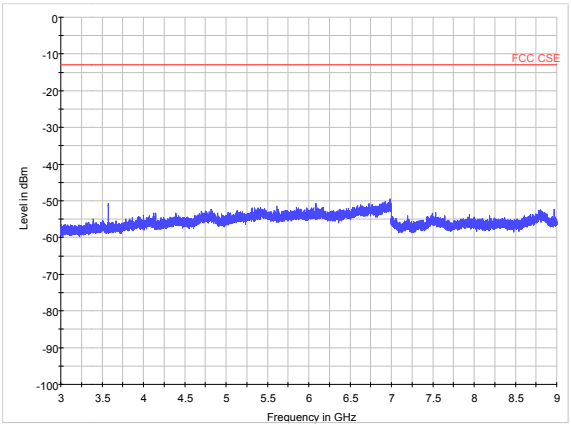
LTE Band 12 3MHz CH23025 30MHz~1GHz



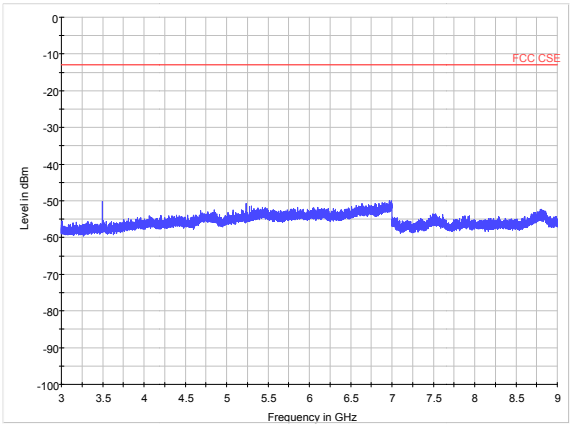
LTE Band 12 1.4MHz CH23173 1GHz~3GHz



LTE Band 12 3MHz CH23025 1GHz~3GHz



LTE Band 12 1.4MHz CH23173 3GHz~9GHz



LTE Band 12 3MHz CH23025 3GHz~9GHz