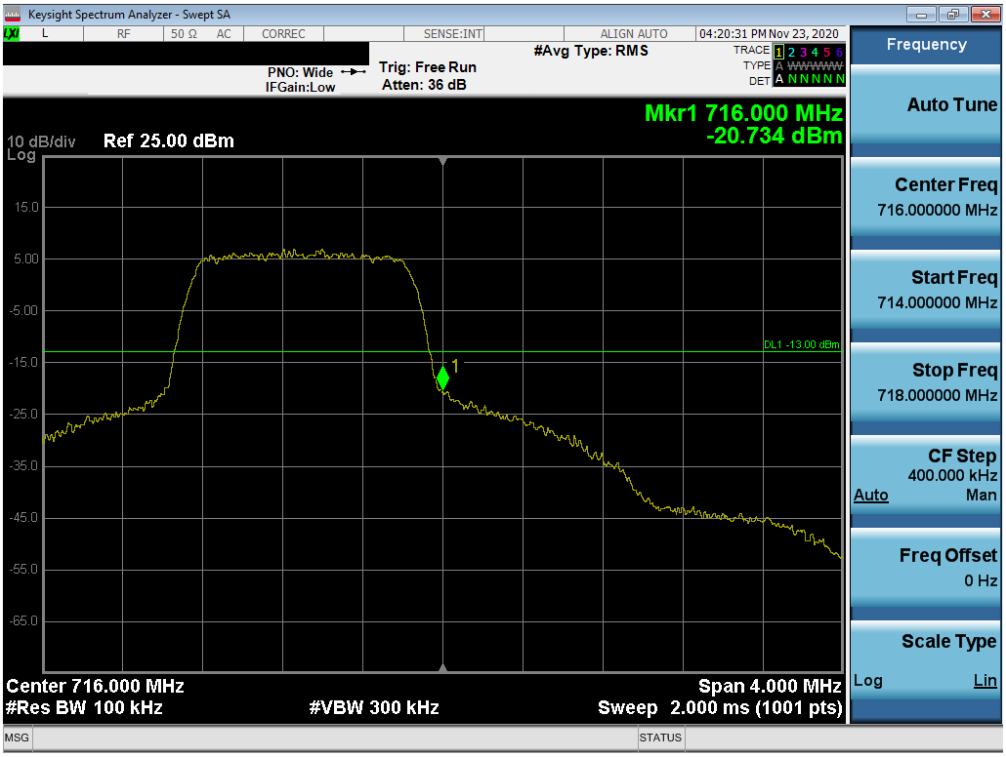
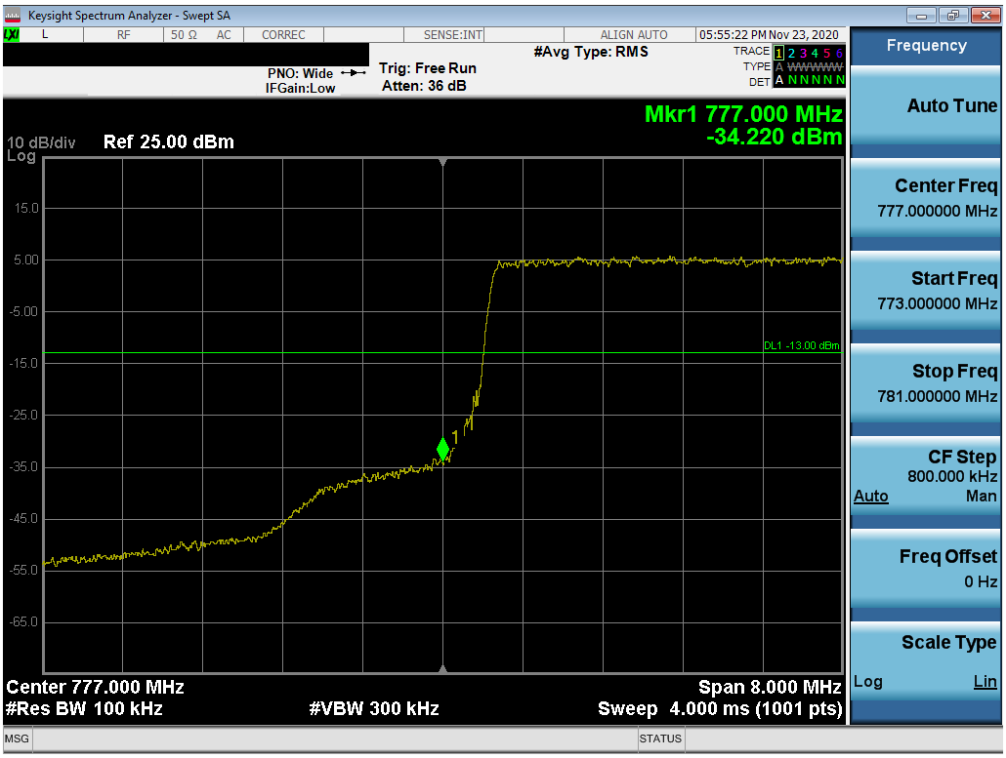
Plot 7-131. Lower Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)

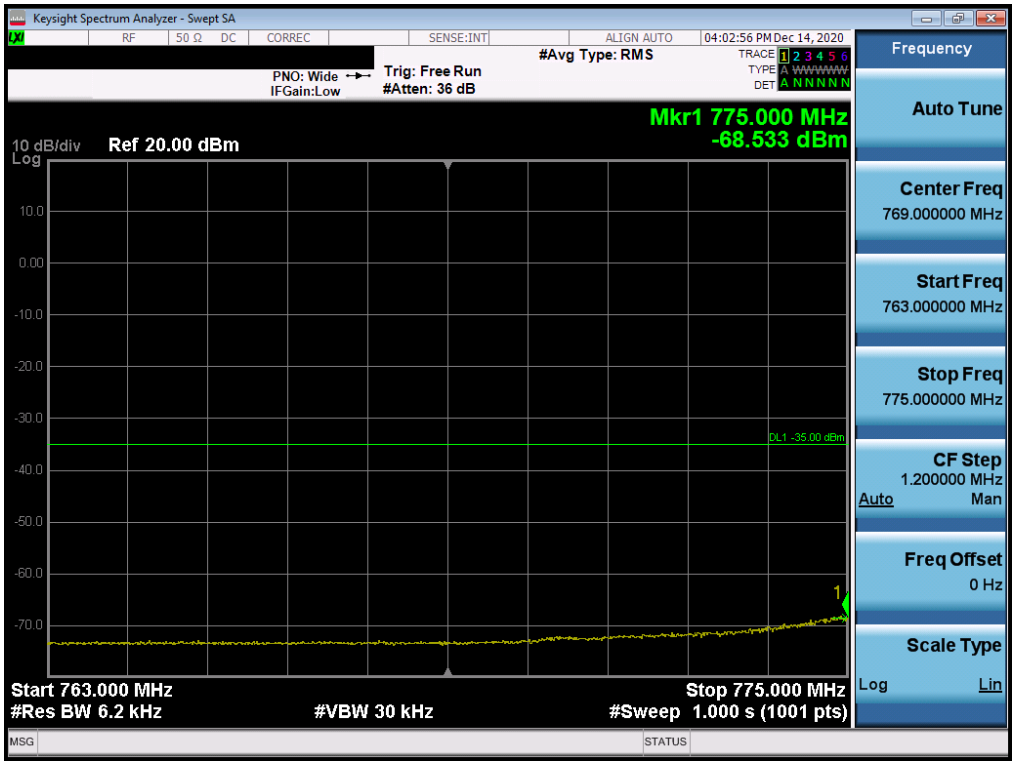


Plot 7-132. Upper Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)

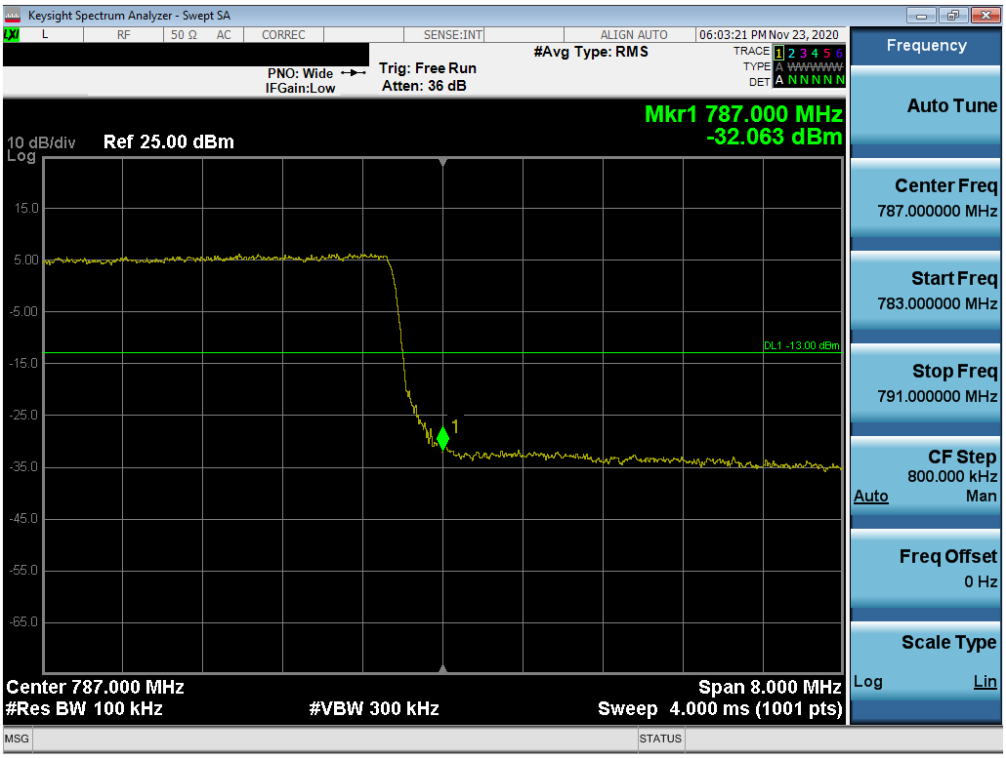
LTE Band 13



Plot 7-133. Lower Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)

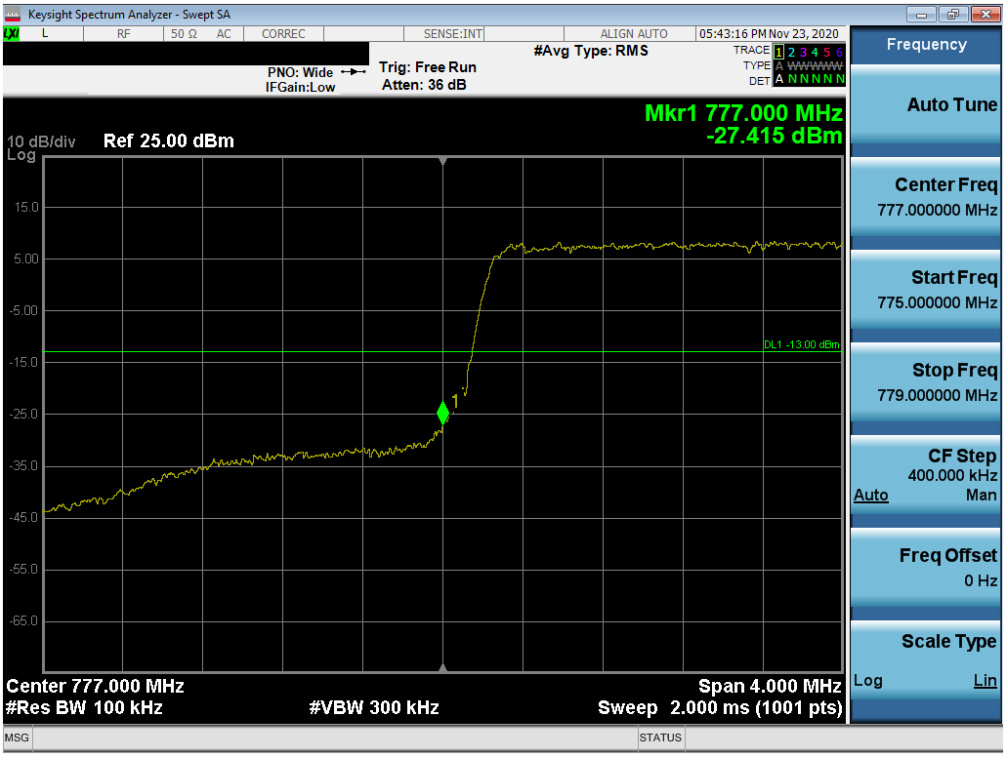


Plot 7-134. Lower Emission Mask Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)



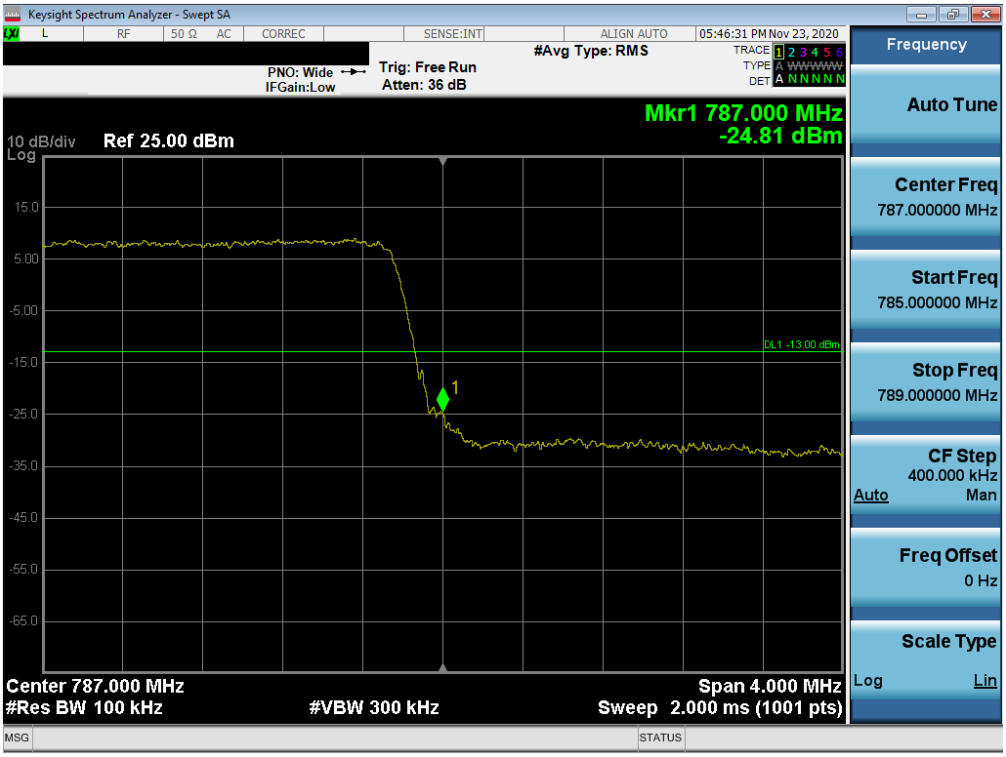
Plot 7-135. Upper Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)

Plot 7-136. Upper Emission Mask Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)

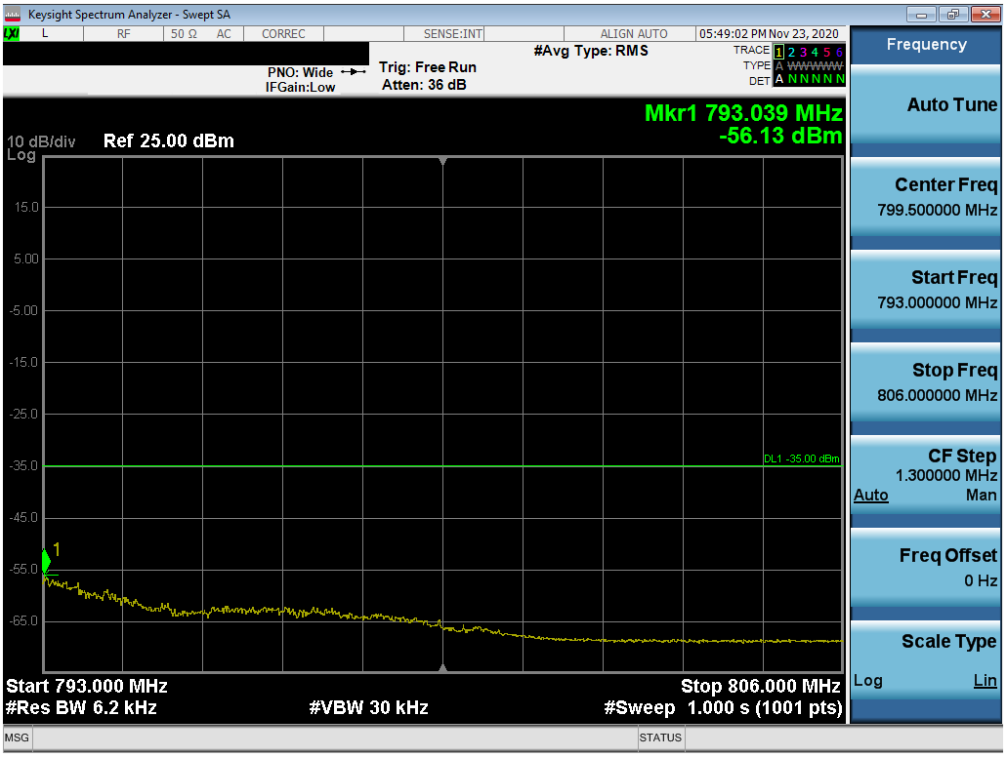


Plot 7-137. Lower Band Edge Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)

Plot 7-138. Lower Emission Mask Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)

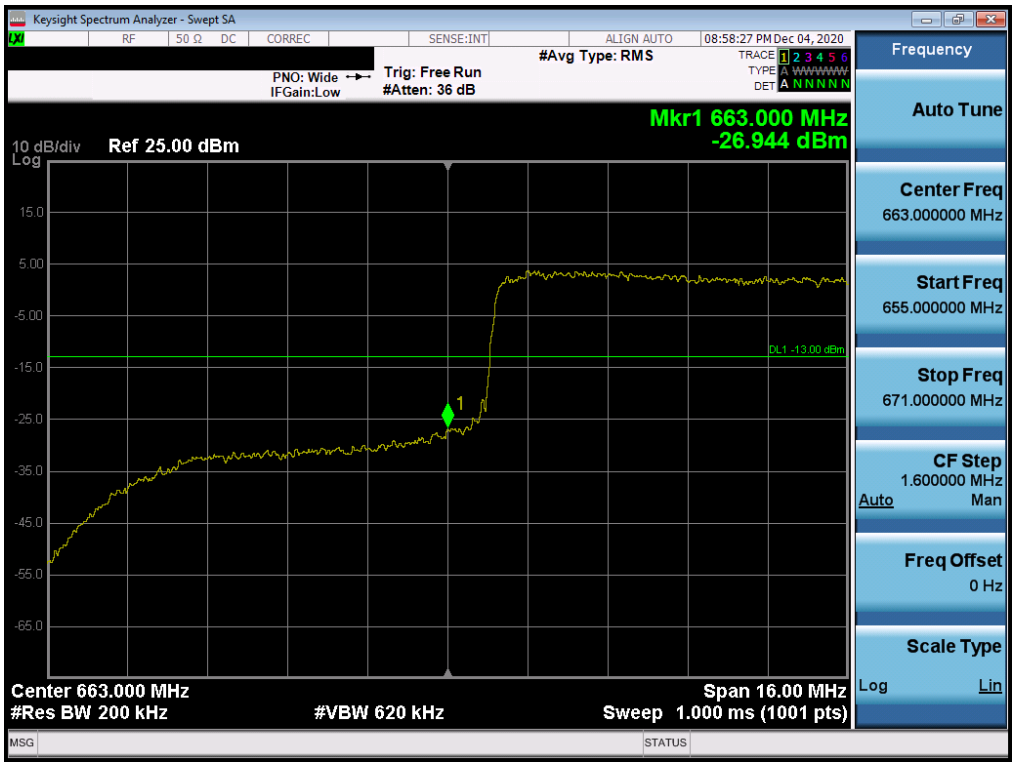


Plot 7-139. Upper Band Edge Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)

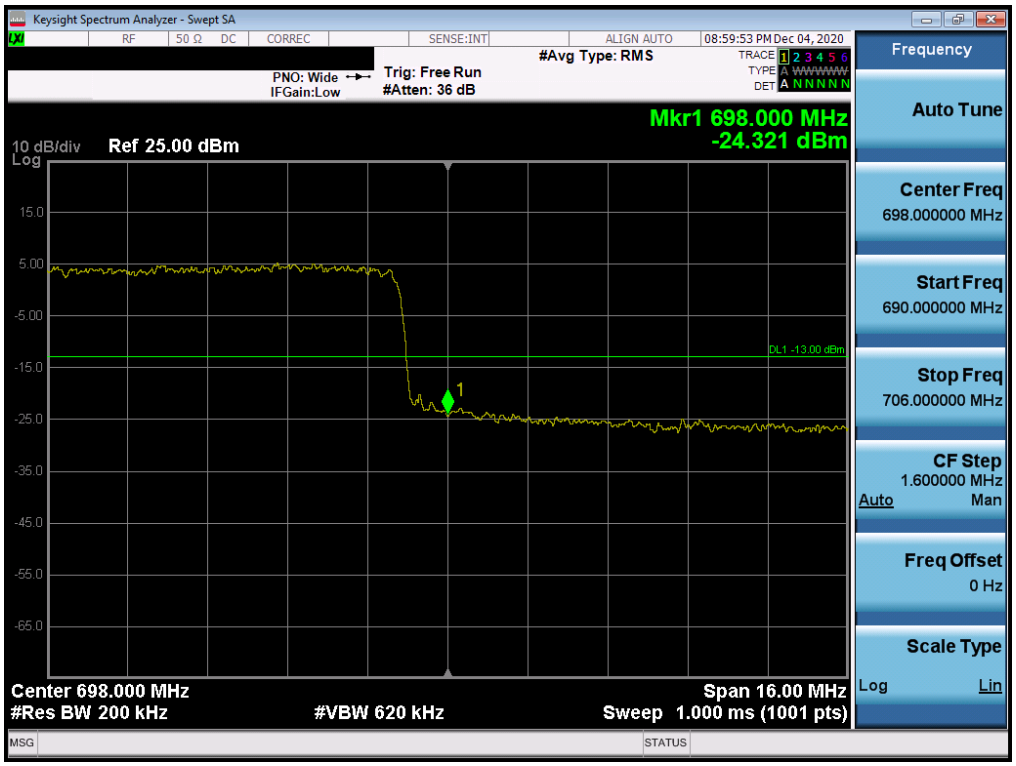


Plot 7-140. Upper Emission Mask Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)

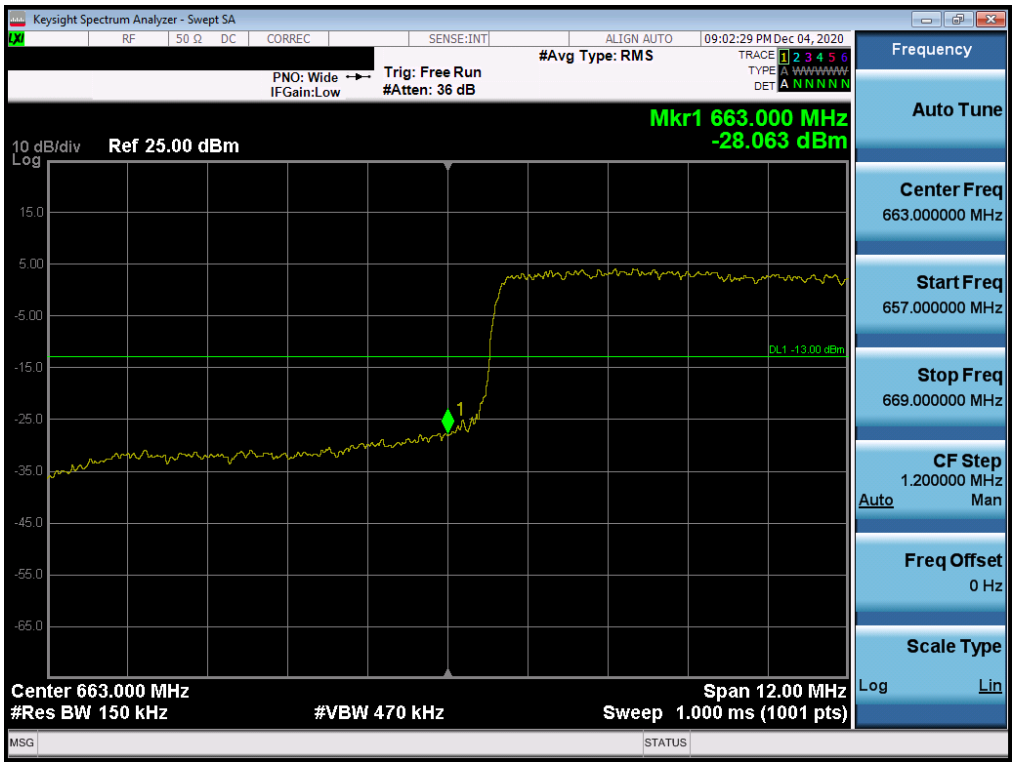
LTE Band 71



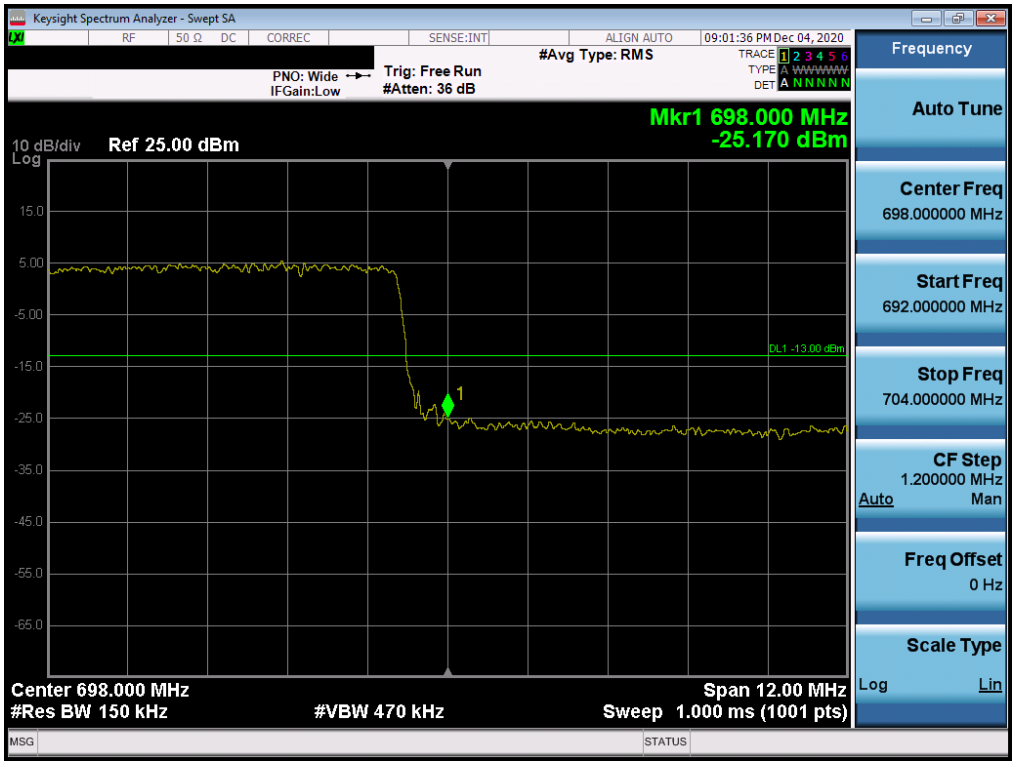
Plot 7-141. Lower Band Edge Plot (LTE Band 71 - 20MHz QPSK – Full RB Configuration)



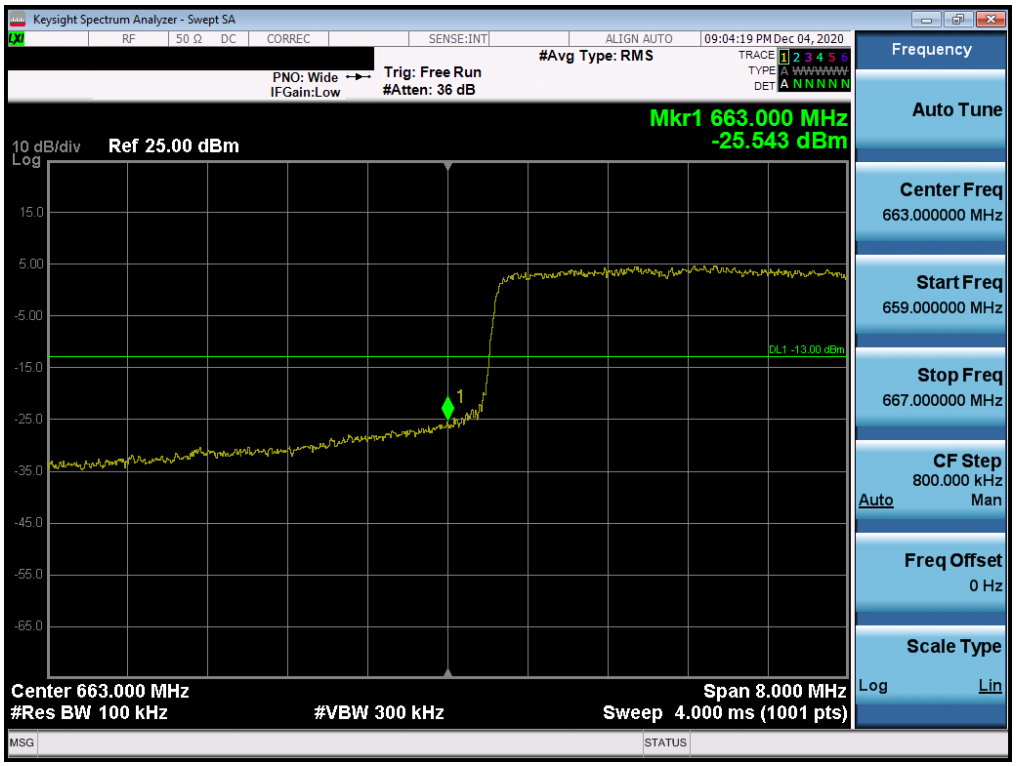
Plot 7-142. Upper Band Edge Plot (LTE Band 71 - 20MHz QPSK – Full RB Configuration)



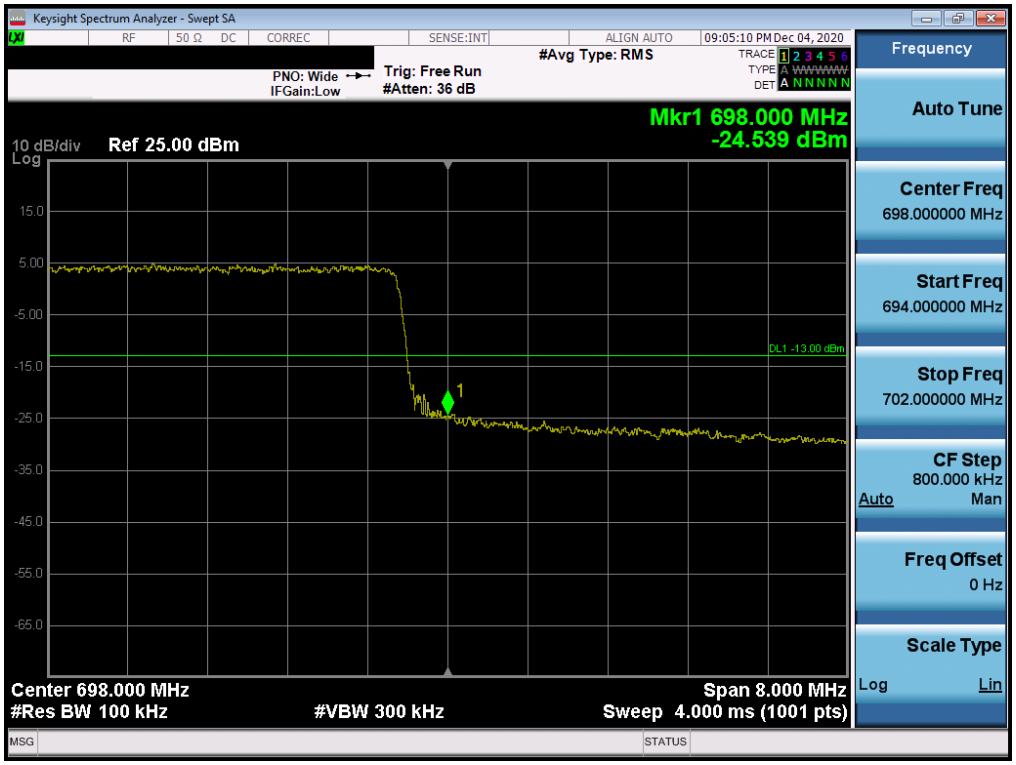
Plot 7-143. Lower Band Edge Plot (LTE Band 71 - 15MHz QPSK – Full RB Configuration)



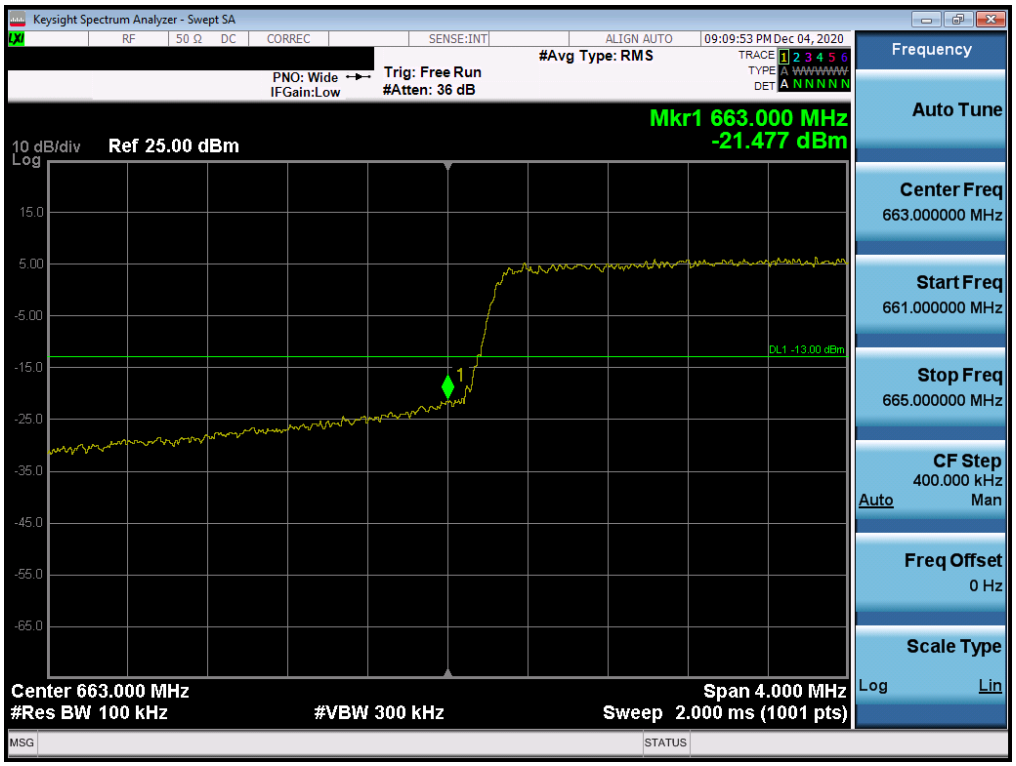
Plot 7-144. Upper Band Edge Plot (LTE Band 71 - 15MHz QPSK – Full RB Configuration)



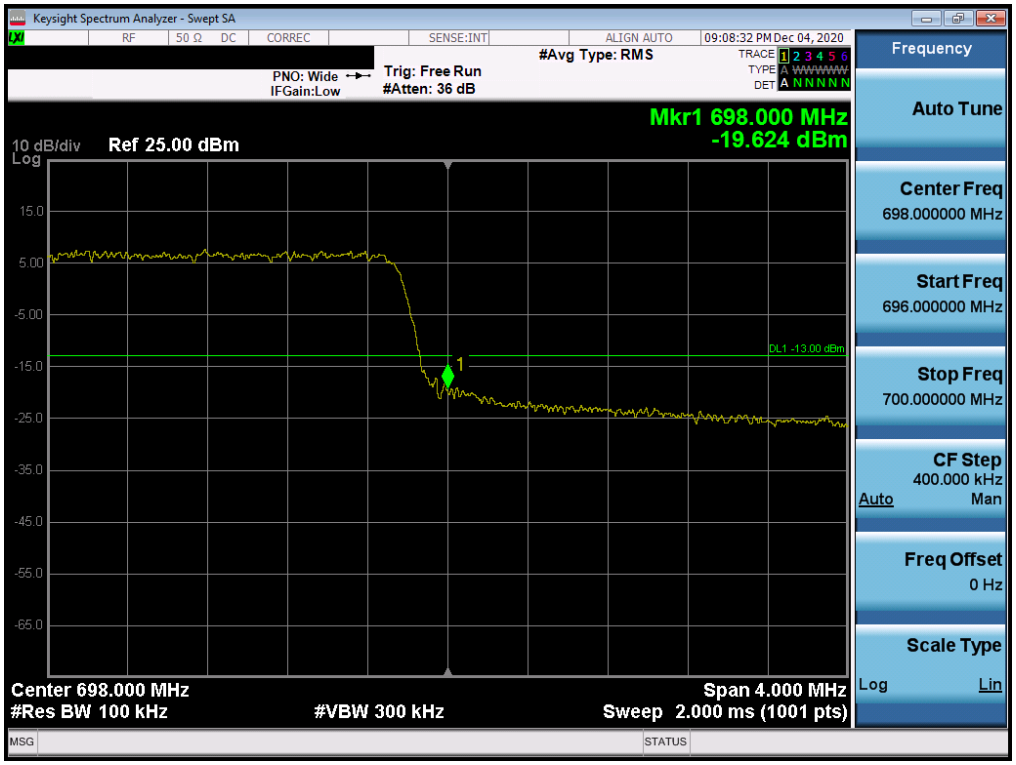
Plot 7-145. Lower Band Edge Plot (LTE Band 71 - 10MHz QPSK – Full RB Configuration)



Plot 7-146. Upper Band Edge Plot (LTE Band 71 - 10MHz QPSK – Full RB Configuration)

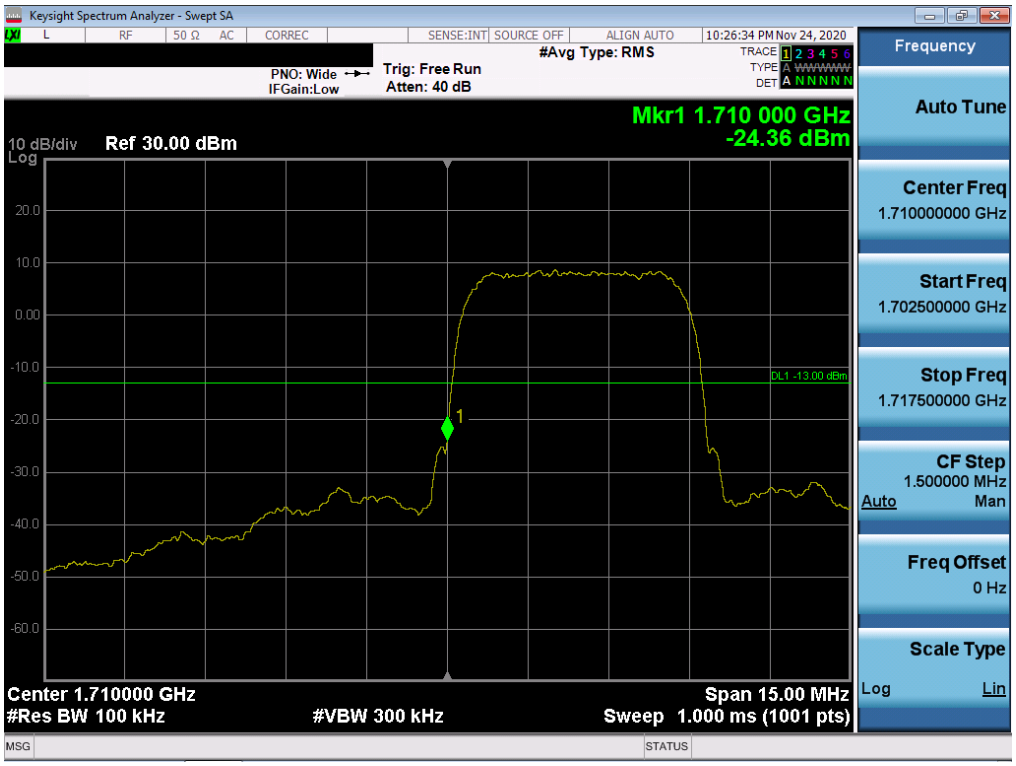


Plot 7-147. Lower Band Edge Plot (LTE Band 71 - 5MHz QPSK – Full RB Configuration)

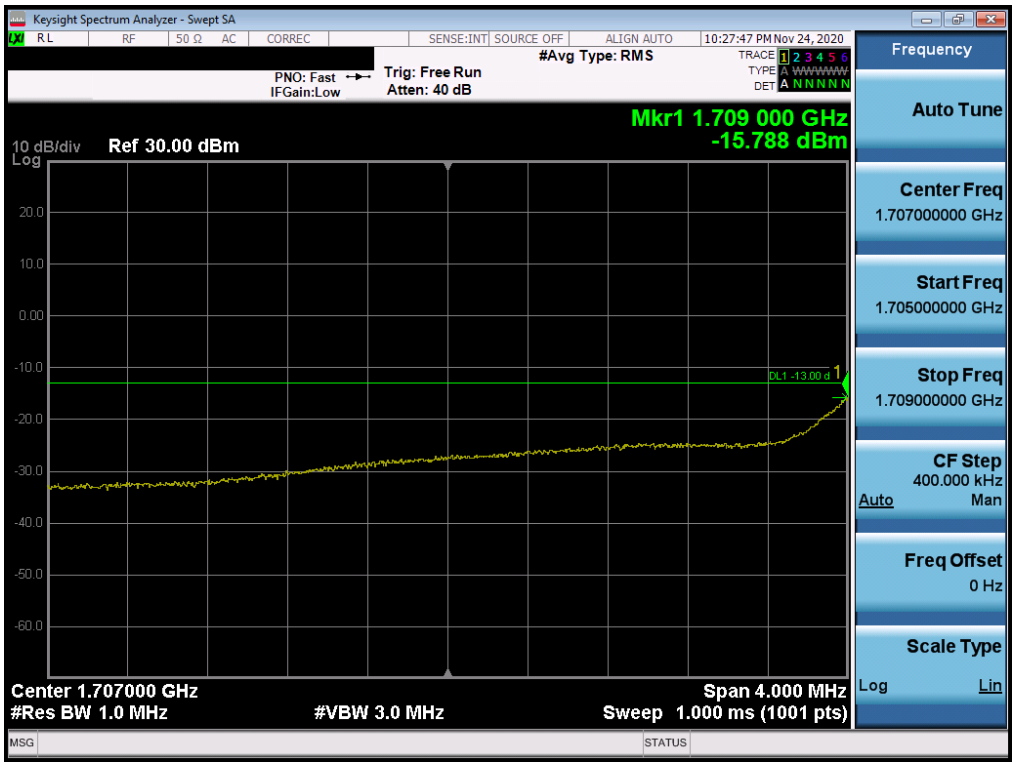


Plot 7-148. Upper Band Edge Plot (LTE Band 71 - 5MHz QPSK – Full RB Configuration)

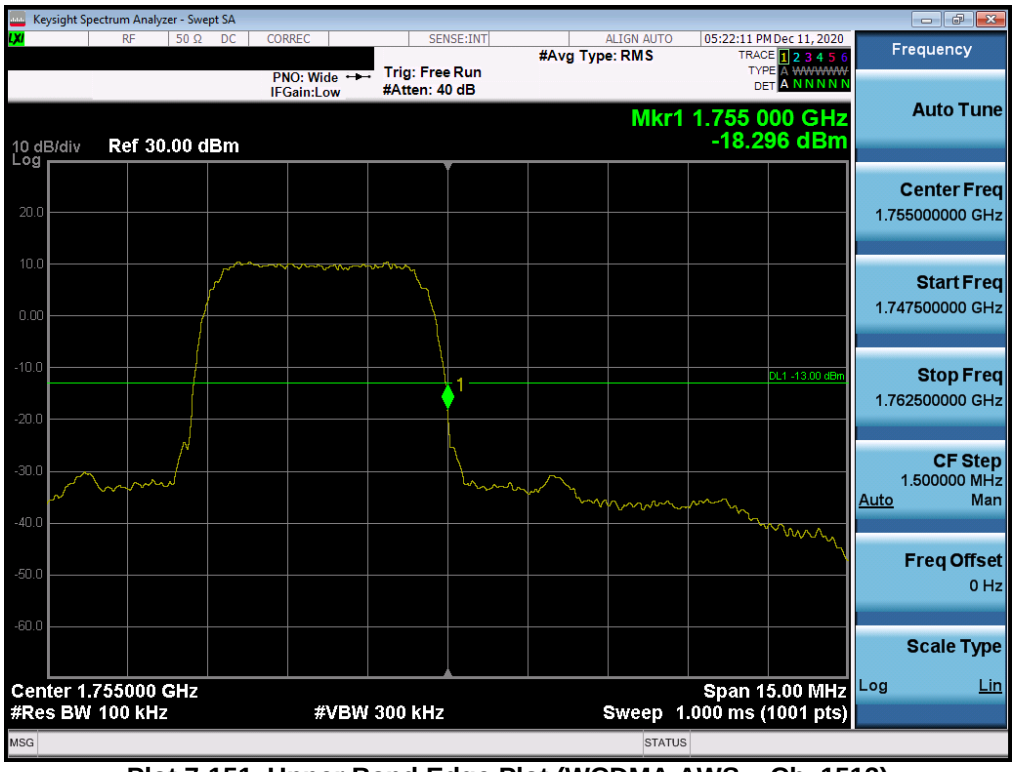
WCDMA AWS



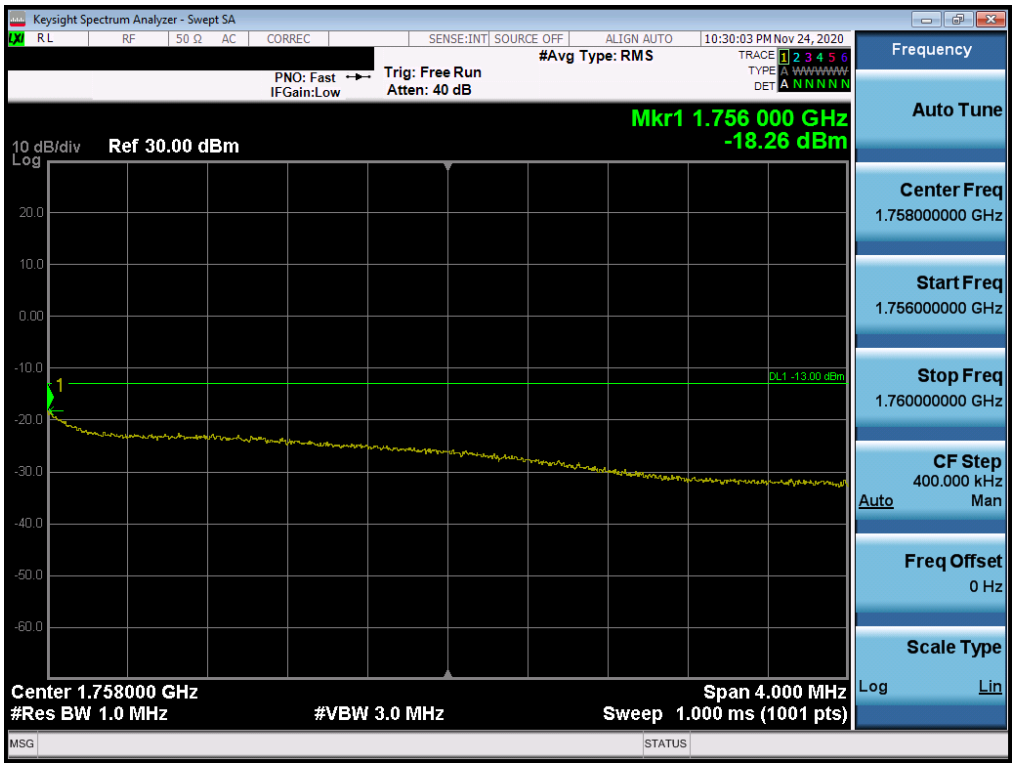
Plot 7-149. Lower Band Edge Plot (WCDMA AWS – Ch. 1312)



Plot 7-150. Lower Extended Band Edge Plot (WCDMA AWS – Ch. 1312)



Plot 7-151. Upper Band Edge Plot (WCDMA AWS – Ch. 1513)



Plot 7-152. Upper Extended Band Edge Plot (WCDMA AWS – Ch. 1513)

7.5 Peak-Average Ratio

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW ≥ OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

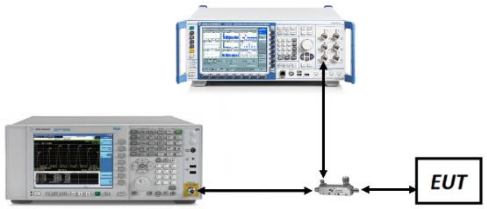
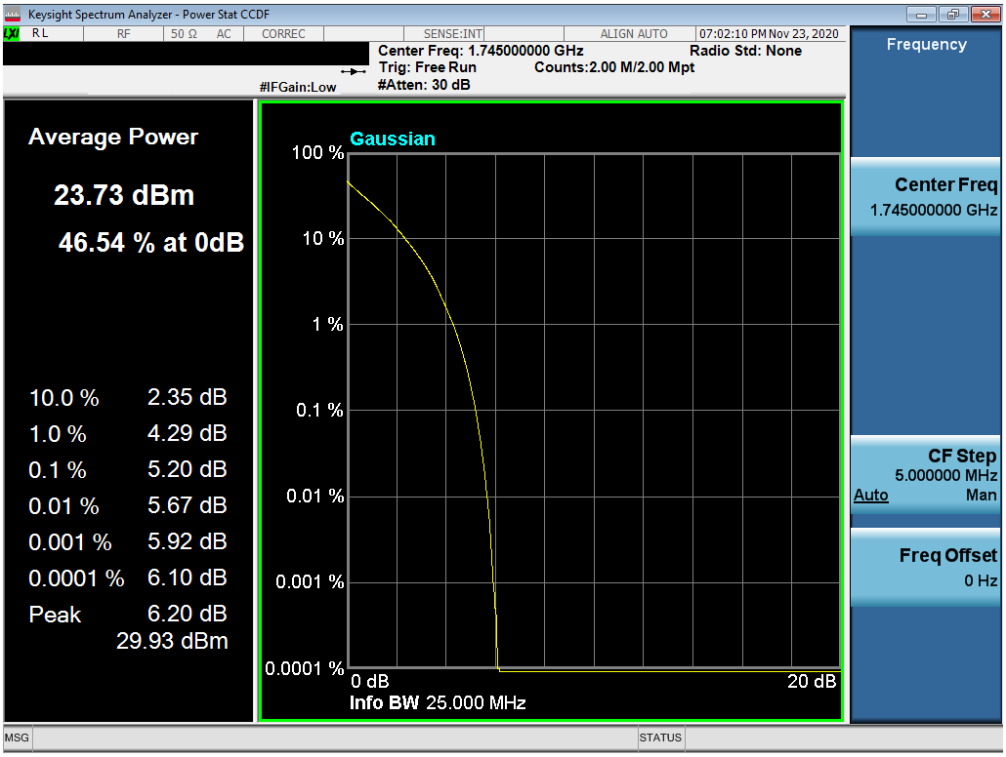


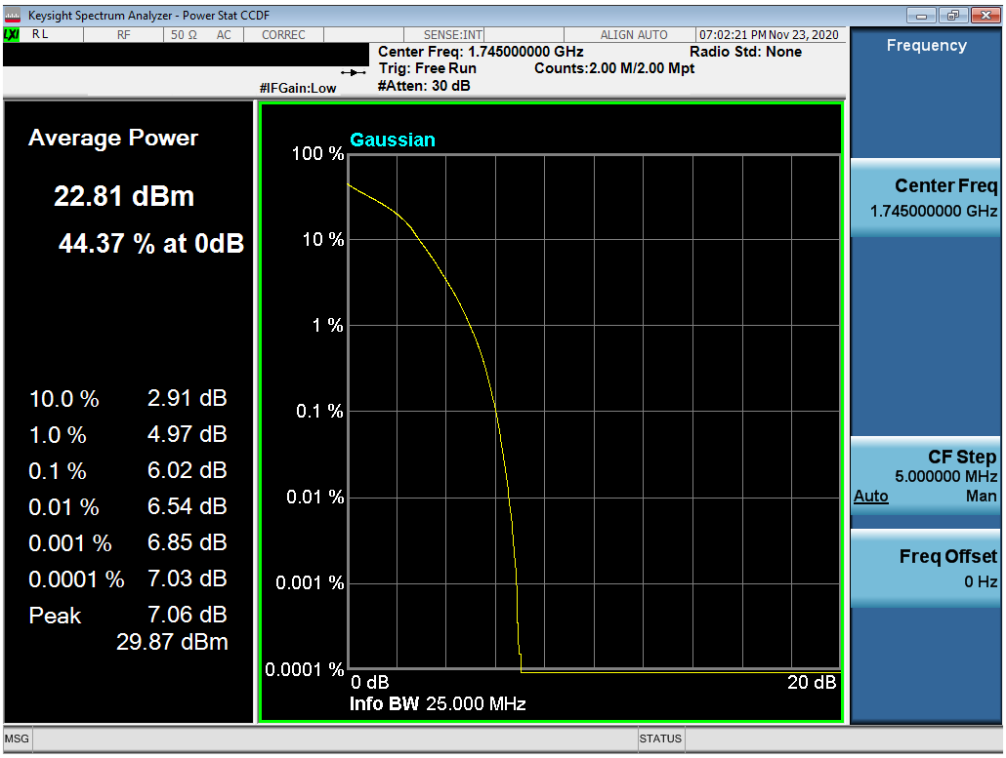
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

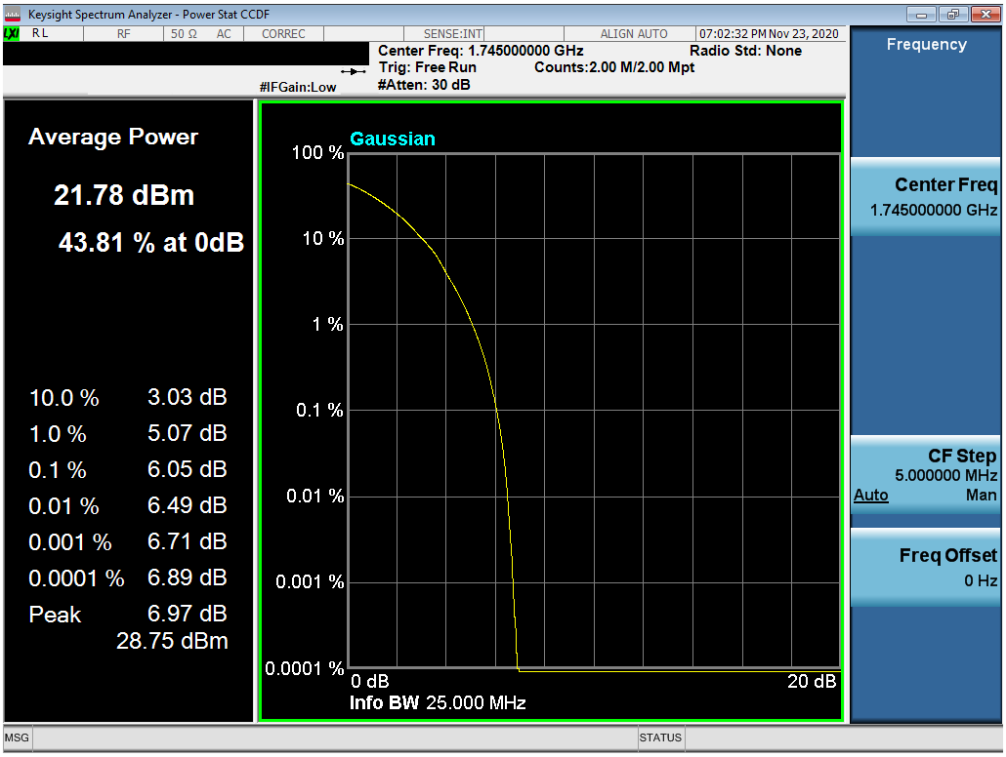
None.



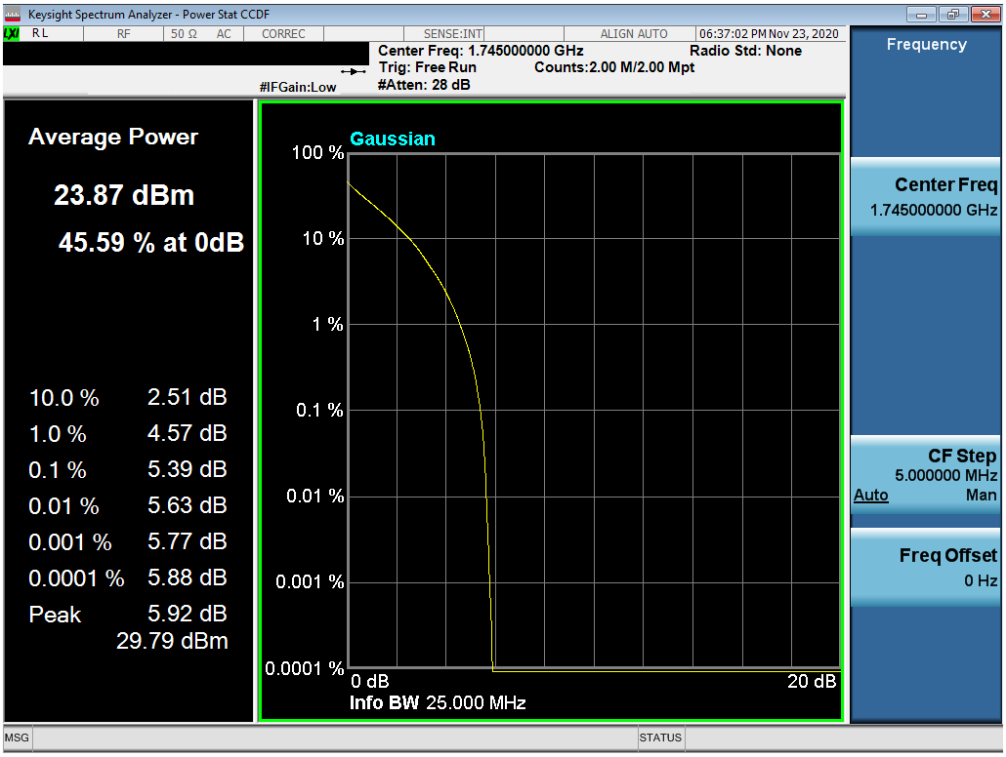
Plot 7-153. Peak-Average Ratio Plot (LTE Band 66/4 - 20MHz QPSK - Full RB Configuration)



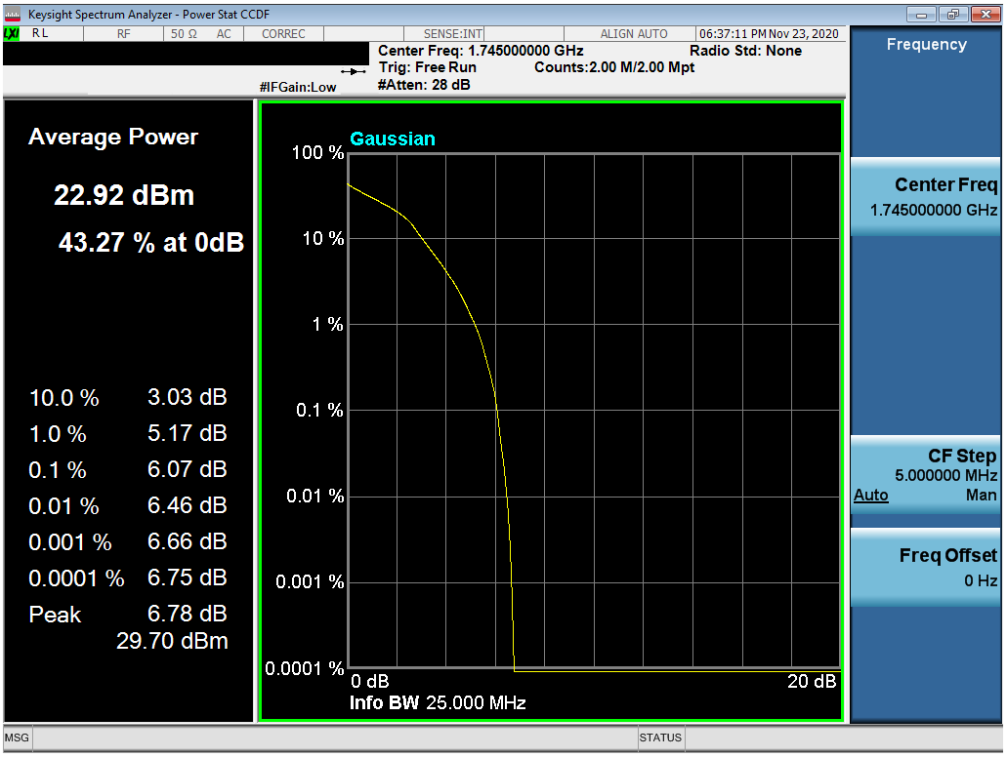
Plot 7-154. Peak-Average Ratio Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB Configuration)



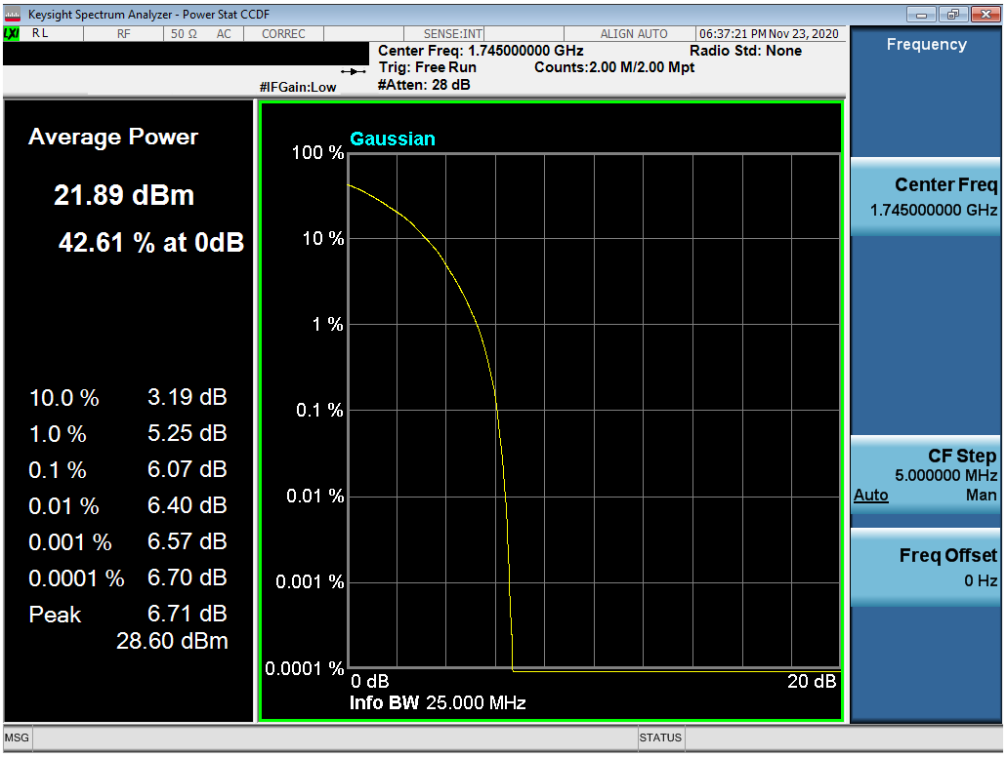
Plot 7-155. Peak-Average Ratio Plot (LTE Band 66/4 - 20MHz 64-QAM - Full RB Configuration)



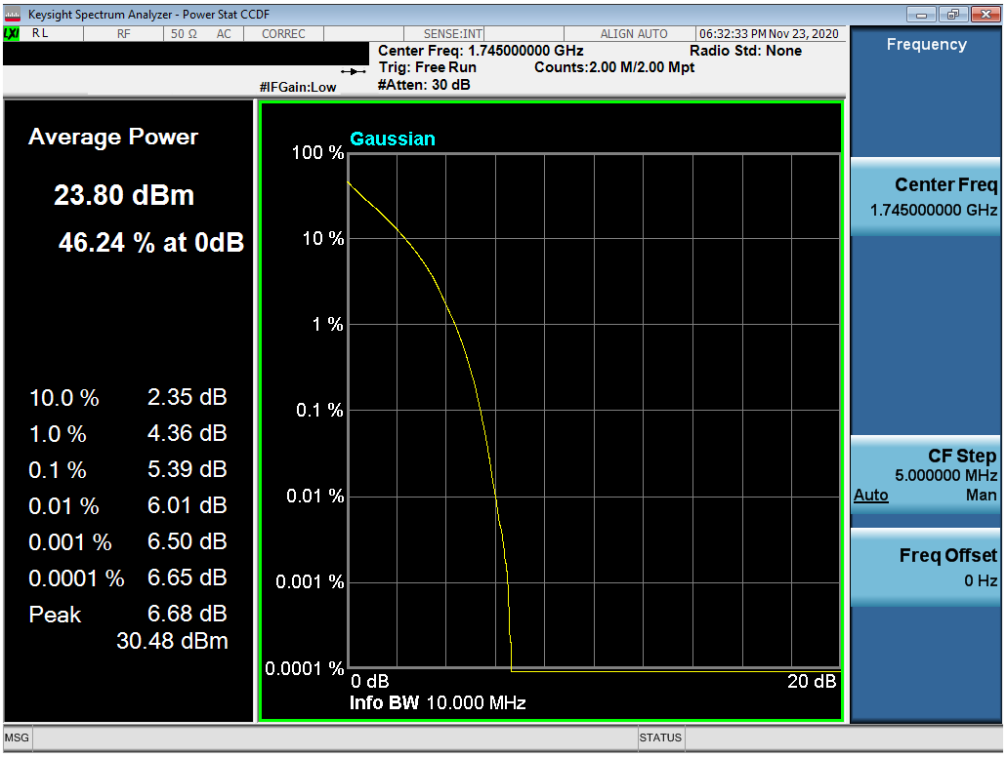
Plot 7-156. Peak-Average Ratio Plot (LTE Band 66/4 - 15MHz QPSK - Full RB Configuration)



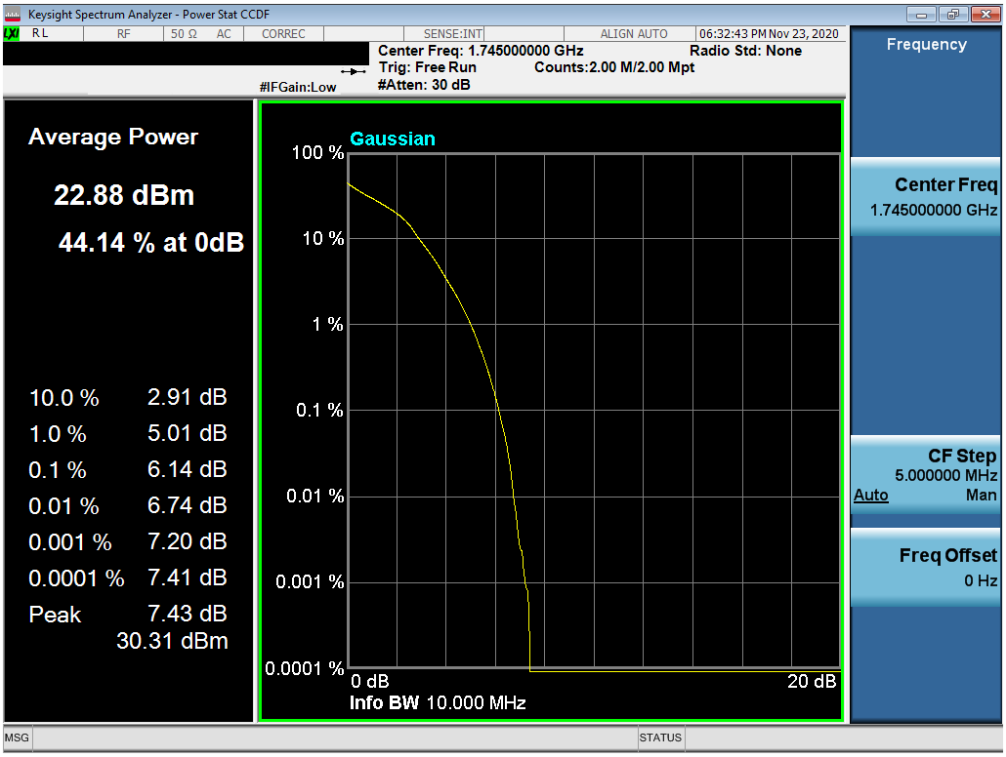
Plot 7-157. Peak-Average Ratio Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB Configuration)



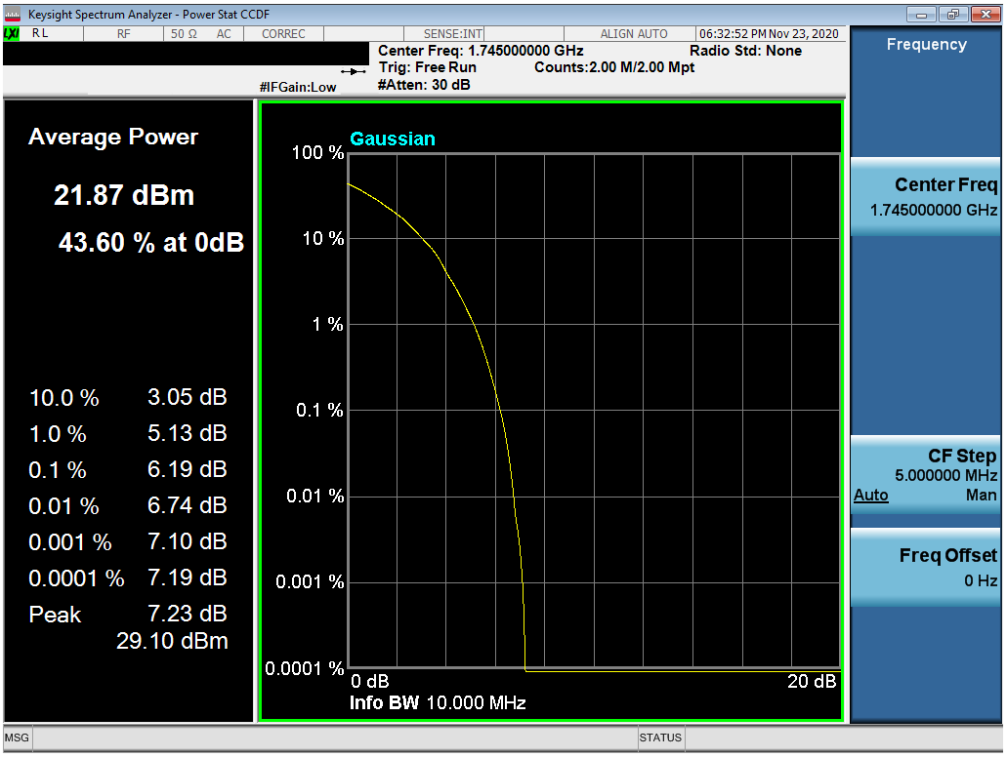
Plot 7-158. Peak-Average Ratio Plot (LTE Band 66/4 - 15MHz 64-QAM - Full RB Configuration)



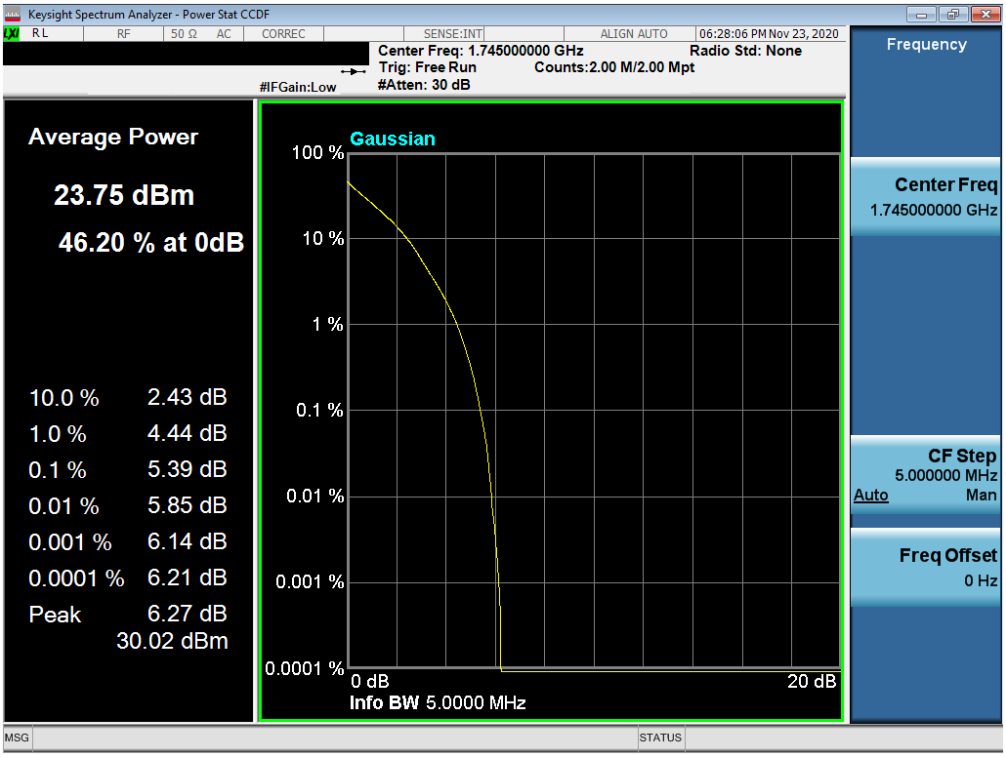
Plot 7-159 Peak-Average Ratio Plot (LTE Band 66/4 - 10MHz QPSK - Full RB Configuration)



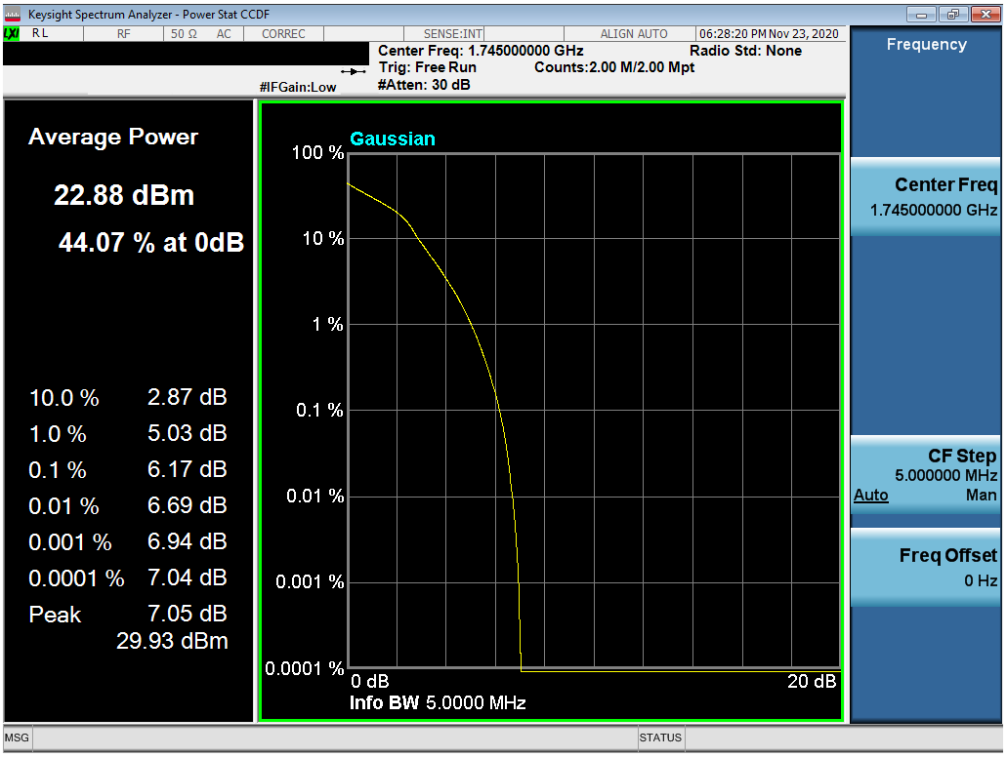
Plot 7-160. Peak-Average Ratio Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB Configuration)



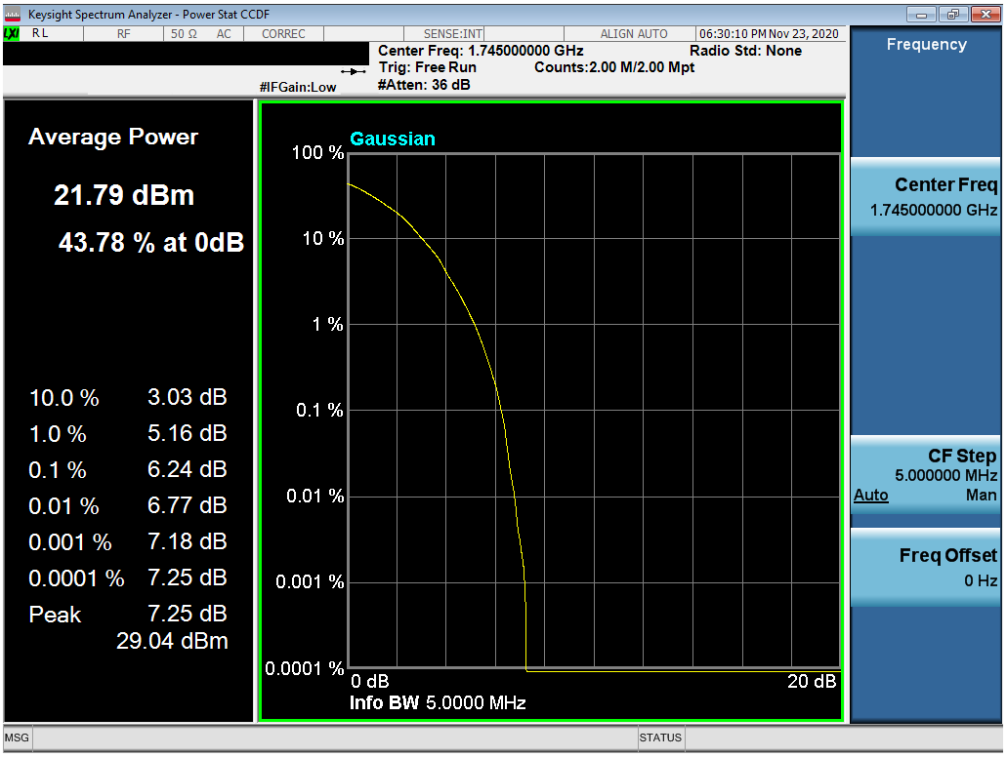
Plot 7-161. Peak-Average Ratio Plot (LTE Band 66/4 - 10MHz 64-QAM - Full RB Configuration)



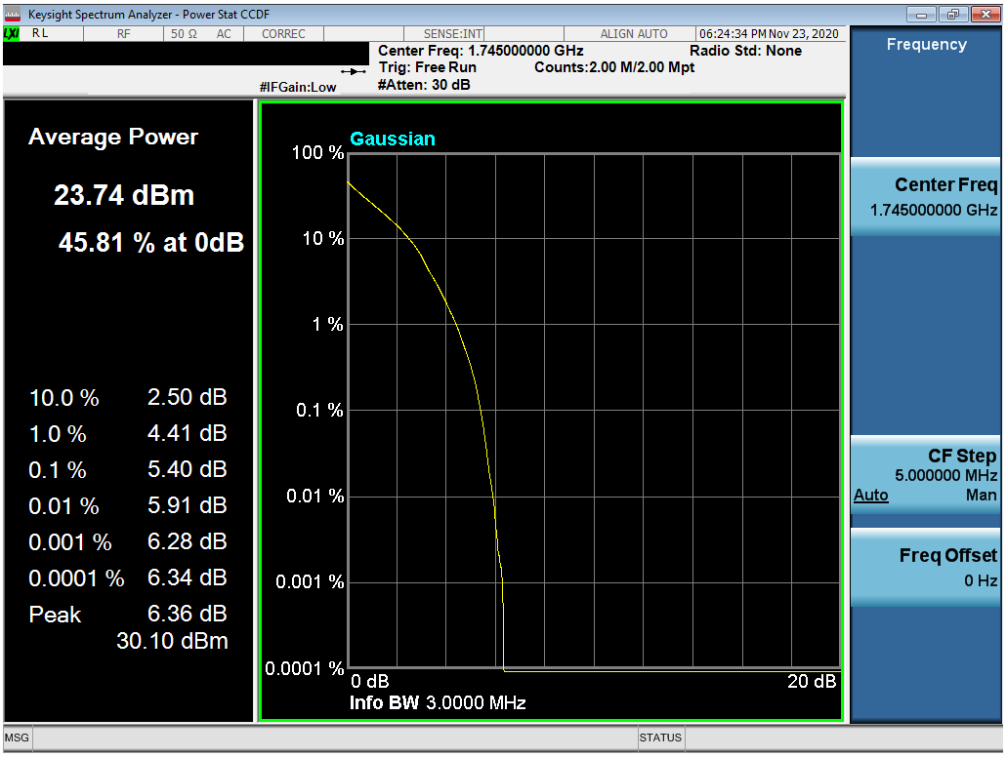
Plot 7-162. Peak-Average Ratio Plot (LTE Band 66/4 - 5MHz QPSK - Full RB Configuration)



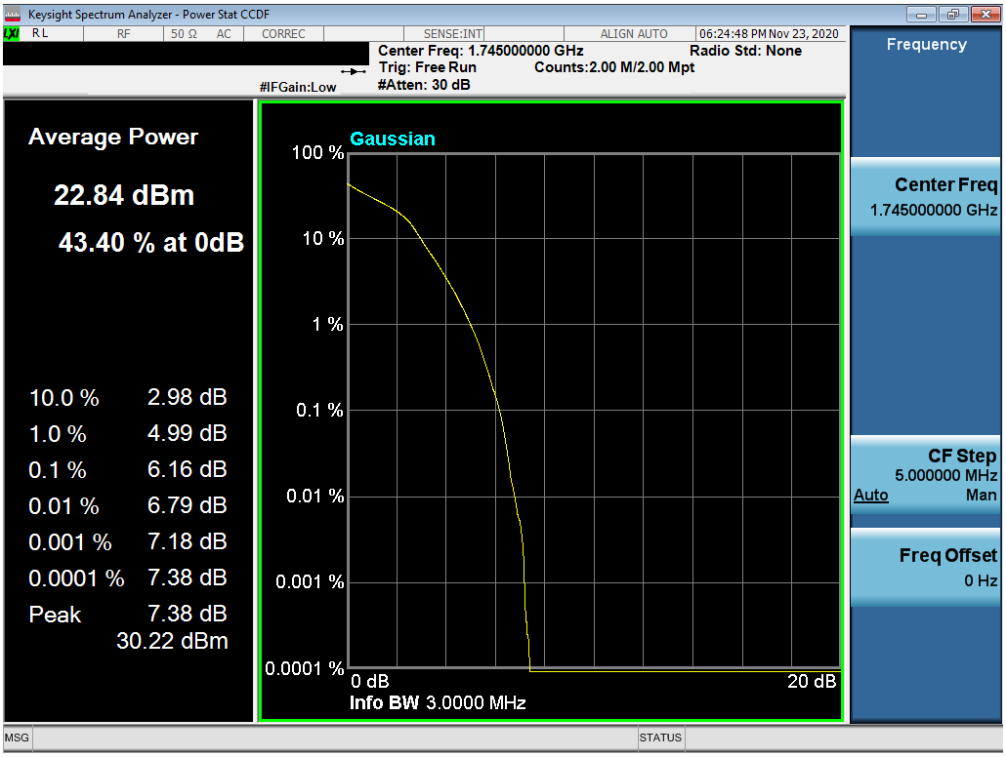
Plot 7-163. Peak-Average Ratio Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB Configuration)



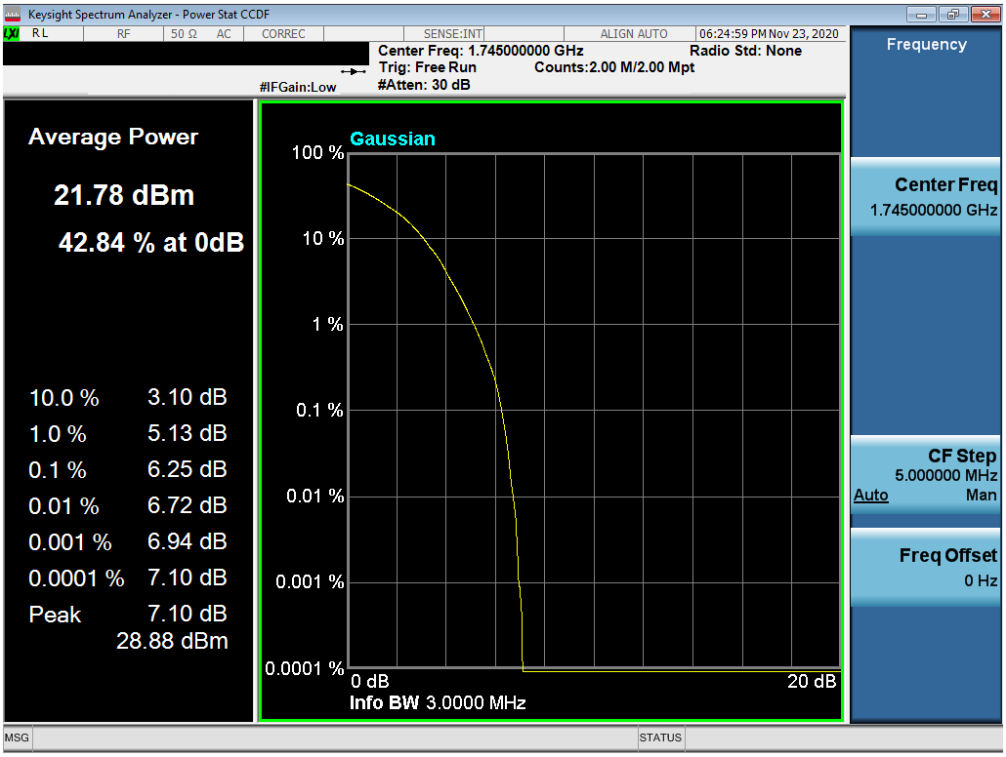
Plot 7-164. Peak-Average Ratio Plot (LTE Band 66/4 - 5MHz 64-QAM - Full RB Configuration)



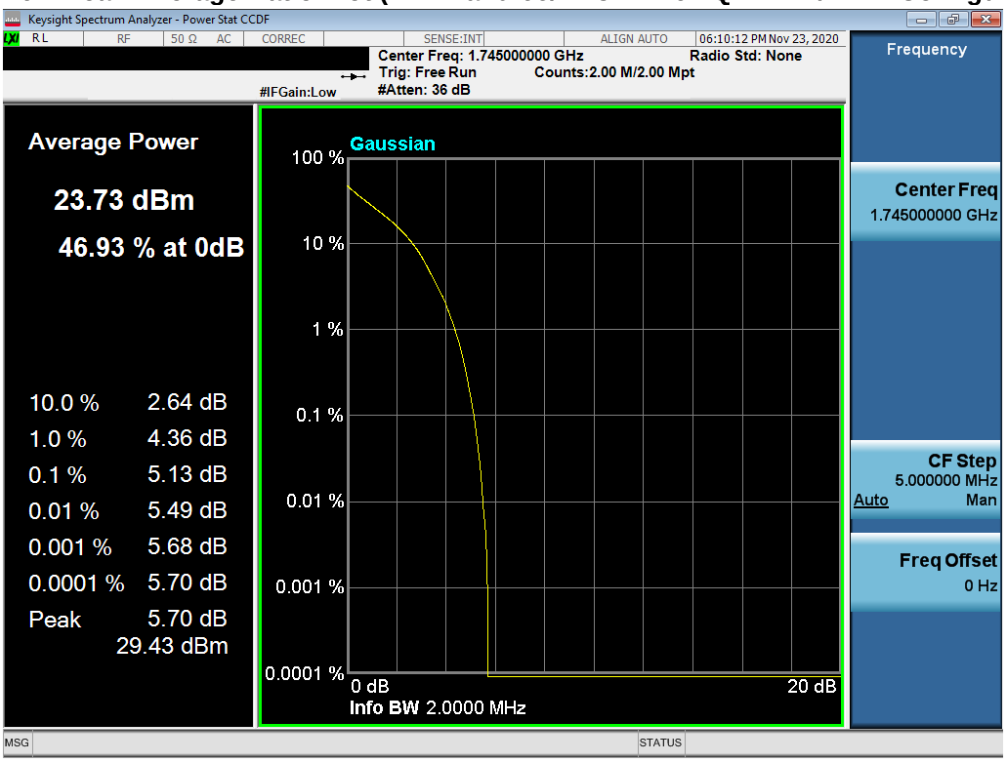
Plot 7-165. Peak-Average Ratio Plot (LTE Band 66/4 - 3MHz QPSK - Full RB Configuration)



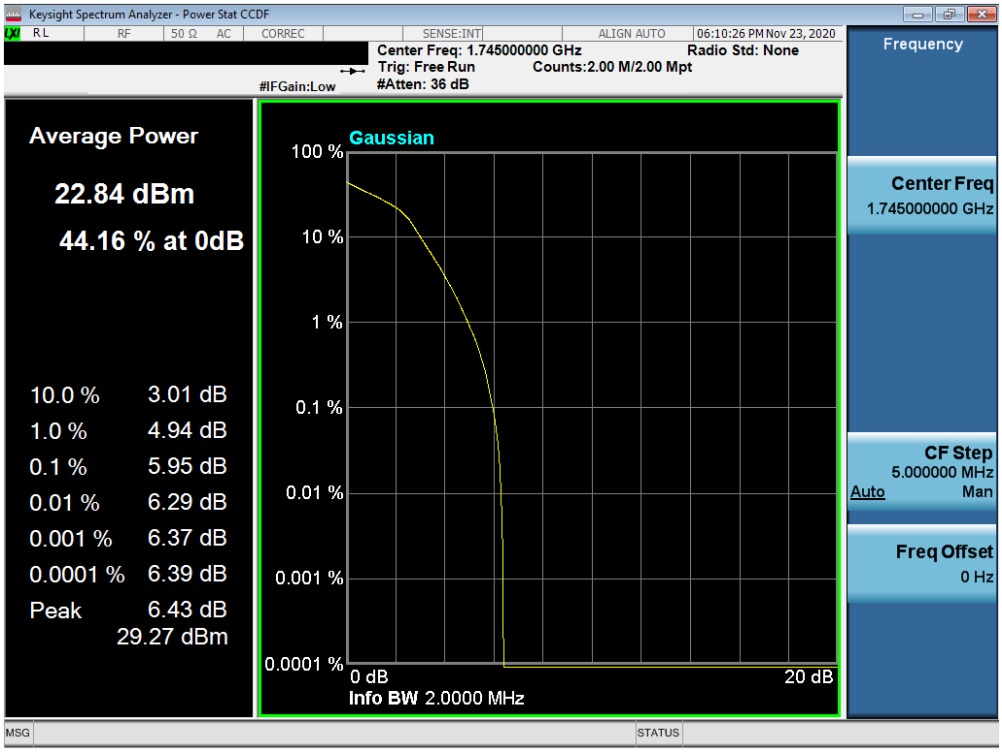
Plot 7-166. Peak-Average Ratio Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB Configuration)



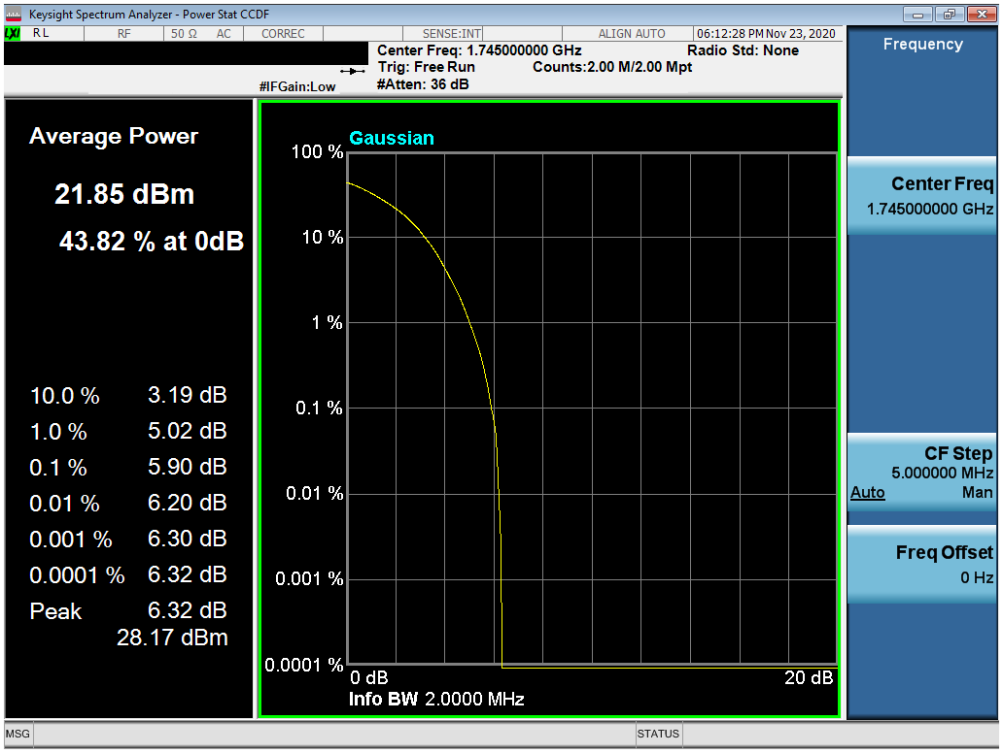
Plot 7-167. Peak-Average Ratio Plot (LTE Band 66/4 - 3MHz 64-QAM - Full RB Configuration)



Plot 7-168. Peak-Average Ratio Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

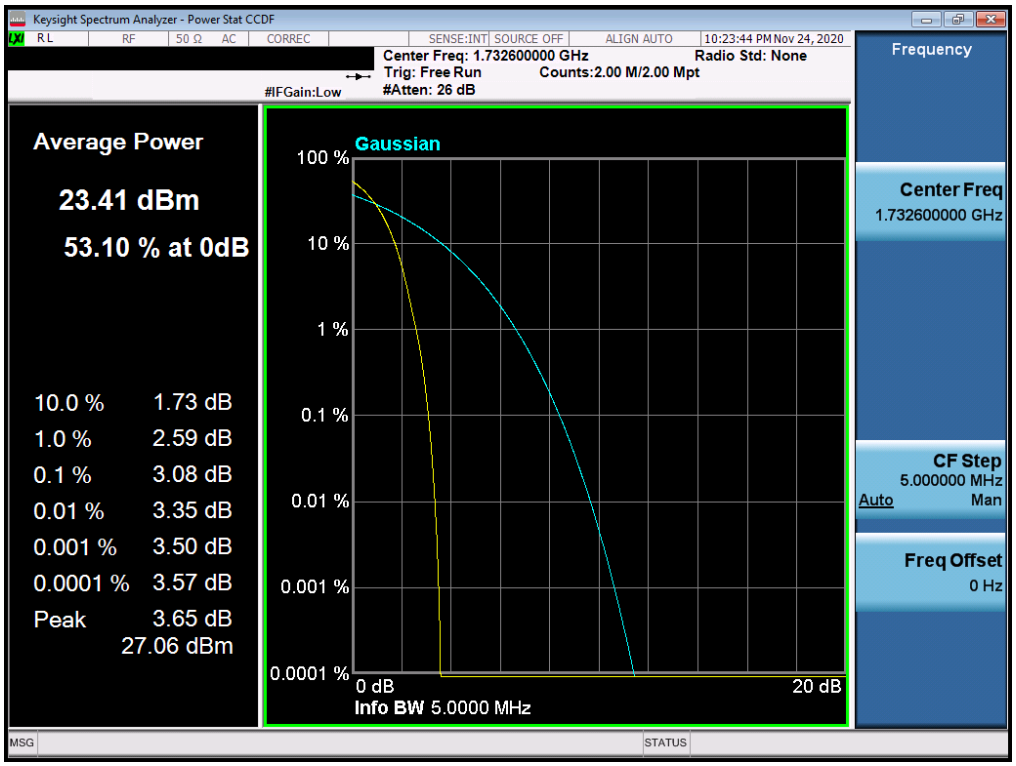


Plot 7-169. Peak-Average Ratio Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)



Plot 7-170. Peak-Average Ratio Plot (LTE Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

WCDMA AWS



Plot 7-171. Peak-Average Ratio Plot (WCDMA, Ch. 1413)

7.6 Radiated Power (EIRP)

Test Overview

Effective Radiated Power (ERP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

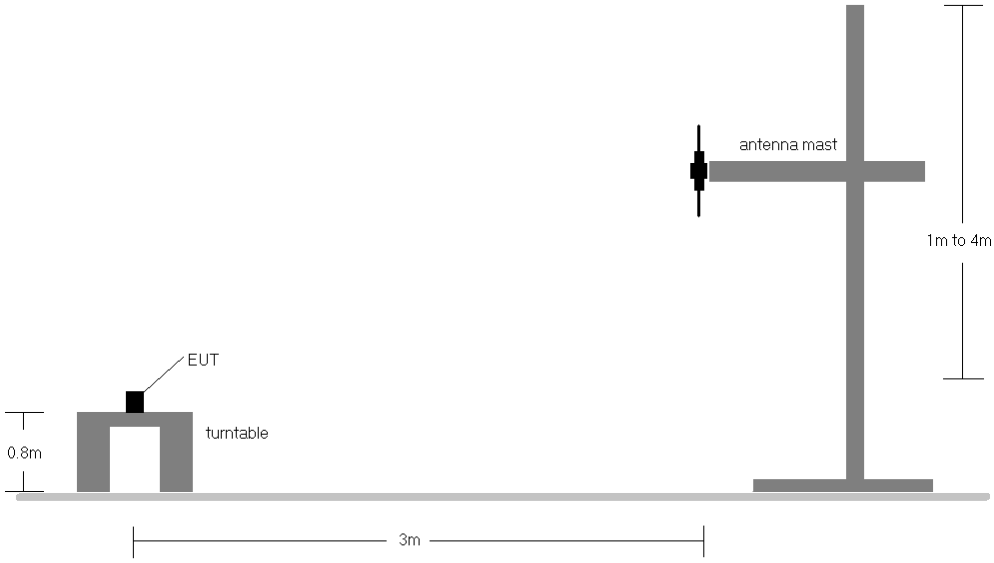


Figure 7-5. Radiated Test Setup <1GHz

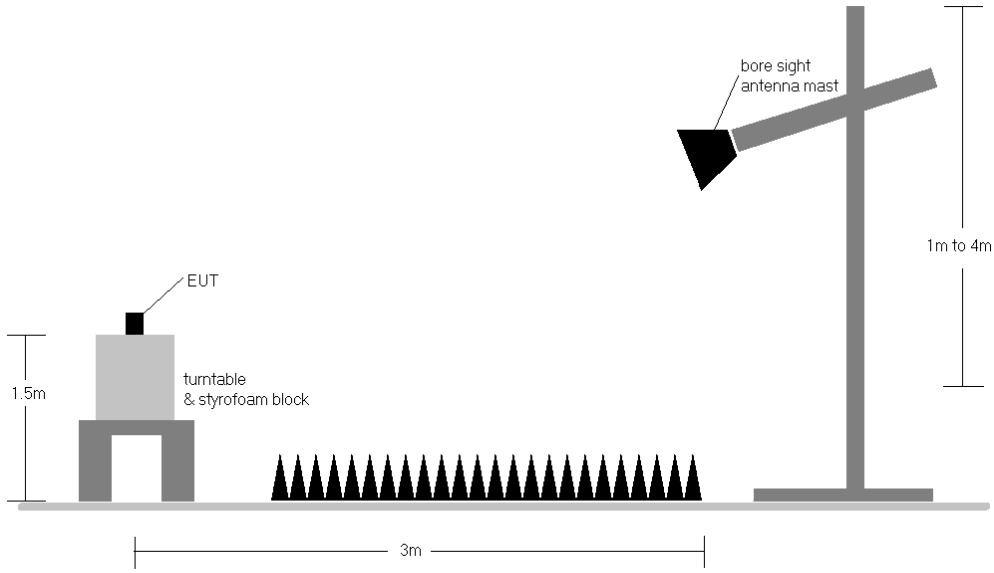


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

2) This unit was tested with its standard battery.

3) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	QPSK	1720.0	H	121.0	3.0	9.41	1 / 99	11.09	20.50	0.112	30.00	-9.50
		1745.0	H	135.0	6.0	9.26	1 / 99	13.27	22.53	0.179	30.00	-7.47
		1770.0	H	136.0	2.0	9.27	1 / 99	13.36	**22.63**	0.183	30.00	-7.37
	16-QAM	1720.0	H	121.0	3.0	9.41	1 / 99	10.09	19.50	0.089	30.00	-10.50
		1745.0	H	135.0	6.0	9.26	1 / 99	12.47	**21.73**	0.149	30.00	-8.27
		1770.0	H	136.0	2.0	9.27	1 / 99	12.39	21.66	0.146	30.00	-8.34
	64-QAM	1720.0	H	121.0	3.0	9.41	1 / 99	9.16	18.57	0.072	30.00	-11.43
		1745.0	H	135.0	6.0	9.26	1 / 99	11.60	**20.86**	0.122	30.00	-9.14
		1770.0	H	136.0	2.0	9.27	1 / 99	11.51	20.78	0.120	30.00	-9.22
15 MHz	QPSK	1717.5	H	121.0	3.0	9.43	1 / 36	10.92	20.35	0.108	30.00	-9.65
		1745.0	H	135.0	6.0	9.26	1 / 36	12.90	22.16	0.164	30.00	-7.84
		1772.5	H	136.0	2.0	9.27	1 / 36	13.41	**22.68**	0.185	30.00	-7.32
	16-QAM	1717.5	H	121.0	3.0	9.43	1 / 36	9.56	18.99	0.079	30.00	-11.01
		1745.0	H	135.0	6.0	9.26	1 / 36	12.39	**21.65**	0.146	30.00	-8.35
		1772.5	H	136.0	2.0	9.27	1 / 36	12.13	21.40	0.138	30.00	-8.60
	64-QAM	1717.5	H	121.0	3.0	9.43	1 / 36	8.52	17.95	0.062	30.00	-12.05
		1745.0	H	135.0	6.0	9.26	1 / 36	11.71	**20.97**	0.125	30.00	-9.03
		1772.5	H	136.0	2.0	9.27	1 / 36	11.53	20.80	0.120	30.00	-9.20
10 MHz	QPSK	1715.0	H	121.0	3.0	9.44	1 / 25	11.04	20.48	0.112	30.00	-9.52
		1745.0	H	135.0	6.0	9.26	1 / 25	12.98	22.24	0.168	30.00	-7.76
		1775.0	H	136.0	2.0	9.28	1 / 25	13.48	**22.76**	0.189	30.00	-7.24
	16-QAM	1715.0	H	121.0	3.0	9.44	1 / 25	9.97	19.41	0.087	30.00	-10.59
		1745.0	H	135.0	6.0	9.26	1 / 25	12.34	**21.60**	0.145	30.00	-8.40
		1775.0	H	136.0	2.0	9.28	1 / 25	12.15	21.43	0.139	30.00	-8.57
	64-QAM	1715.0	H	121.0	3.0	9.44	1 / 25	9.23	18.67	0.074	30.00	-11.33
		1745.0	H	135.0	6.0	9.26	1 / 25	11.38	**20.64**	0.116	30.00	-9.36
		1775.0	H	136.0	2.0	9.28	1 / 25	11.14	20.42	0.110	30.00	-9.58
5 MHz	QPSK	1712.5	H	121.0	3.0	9.46	1 / 12	11.12	20.58	0.114	30.00	-9.42
		1745.0	H	135.0	6.0	9.26	1 / 12	12.98	22.24	0.168	30.00	-7.76
		1777.5	H	136.0	2.0	9.28	1 / 12	13.54	**22.82**	0.191	30.00	-7.18
	16-QAM	1712.5	H	121.0	3.0	9.46	1 / 12	9.90	19.36	0.086	30.00	-10.64
		1745.0	H	135.0	6.0	9.26	1 / 12	12.32	**21.58**	0.144	30.00	-8.42
		1777.5	H	136.0	2.0	9.28	1 / 12	12.12	21.40	0.138	30.00	-8.60
	64-QAM	1712.5	H	121.0	3.0	9.46	1 / 12	9.15	18.61	0.073	30.00	-11.39
		1745.0	H	135.0	6.0	9.26	1 / 12	11.34	20.60	0.115	30.00	-9.40
		1777.5	H	136.0	2.0	9.28	1 / 12	11.50	**20.78**	0.120	30.00	-9.22
3 MHz	QPSK	1711.5	H	121.0	3.0	9.47	1 / 7	11.04	20.50	0.112	30.00	-9.50
		1745.0	H	135.0	6.0	9.26	1 / 7	13.07	22.33	0.171	30.00	-7.67
		1778.5	H	136.0	2.0	9.28	1 / 7	13.48	**22.77**	0.189	30.00	-7.23
	16-QAM	1711.5	H	121.0	3.0	9.47	1 / 7	10.01	19.47	0.089	30.00	-10.53
		1745.0	H	135.0	6.0	9.26	1 / 7	12.26	**21.52**	0.142	30.00	-8.48
		1778.5	H	136.0	2.0	9.28	1 / 7	12.15	21.44	0.139	30.00	-8.56
	64-QAM	1711.5	H	121.0	3.0	9.47	1 / 0	9.22	18.68	0.074	30.00	-11.32
		1745.0	H	135.0	6.0	9.26	1 / 7	11.17	20.43	0.110	30.00	-9.57
		1778.5	H	136.0	2.0	9.28	1 / 7	11.21	**20.50**	0.112	30.00	-9.50
1.4 MHz	QPSK	1710.7	H	121.0	3.0	9.47	1 / 2	11.01	20.48	0.112	30.00	-9.52
		1745.0	H	135.0	6.0	9.26	1 / 2	13.13	22.39	0.173	30.00	-7.61
		1779.3	H	136.0	2.0	9.29	1 / 2	13.32	**22.61**	0.182	30.00	-7.39
	16-QAM	1710.7	H	121.0	3.0	9.47	1 / 2	9.68	19.15	0.082	30.00	-10.85
		1745.0	H	135.0	6.0	9.26	1 / 2	12.31	**21.57**	0.144	30.00	-8.43
		1779.3	H	136.0	2.0	9.29	1 / 2	12.17	21.46	0.140	30.00	-8.54
	64-QAM	1710.7	H	121.0	3.0	9.47	1 / 2	8.64	18.11	0.065	30.00	-11.89
		1745.0	H	135.0	6.0	9.26	1 / 2	11.65	**20.91**	0.123	30.00	-9.09
		1779.3	H	136.0	2.0	9.29	1 / 2	11.29	20.58	0.114	30.00	-9.42
20 MHz	Opposite Pol.	1770.0	V	100.0	100.0	9.14	1 / 99	11.51	20.65	0.116	30.00	-9.35

Table 7-172. EIRP Data (LTE Band 66/4)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	704.0	V	142.0	318.0	4.58	1 / 25	16.80	21.38	0.137	36.99	-15.61	19.23	0.084	34.77	-15.54
		707.5	V	150.0	321.0	4.62	1 / 25	17.22	21.84	0.153	36.99	-15.15	19.69	0.093	34.77	-15.08
		711.0	V	147.0	322.0	4.67	1 / 25	17.54	**22.21**	0.166	36.99	-14.78	**20.06**	0.101	34.77	-14.71
	16-QAM	704.0	V	142.0	318.0	4.58	1 / 25	15.83	20.41	0.110	36.99	-16.58	18.26	0.067	34.77	-16.51
		707.5	V	150.0	321.0	4.62	1 / 25	16.22	20.84	0.121	36.99	-16.15	18.69	0.074	34.77	-16.08
		711.0	V	147.0	322.0	4.67	1 / 25	16.79	**21.46**	0.140	36.99	-15.53	**19.31**	0.085	34.77	-15.46
	64-QAM	704.0	V	142.0	318.0	4.58	1 / 25	14.73	19.31	0.085	36.99	-17.68	17.16	0.052	34.77	-17.61
		707.5	V	150.0	321.0	4.62	1 / 25	15.22	19.84	0.096	36.99	-17.15	17.69	0.059	34.77	-17.08
		711.0	V	147.0	322.0	4.67	1 / 25	15.84	**20.51**	0.112	36.99	-16.48	**18.36**	0.068	34.77	-16.41
5 MHz	QPSK	701.5	V	142.0	318.0	4.60	1 / 12	16.70	21.30	0.135	36.99	-15.69	19.15	0.082	34.77	-15.62
		707.5	V	150.0	321.0	4.62	1 / 12	17.10	21.72	0.149	36.99	-15.27	19.57	0.091	34.77	-15.20
		713.5	V	147.0	322.0	4.70	1 / 12	17.32	**22.02**	0.159	36.99	-14.97	**19.87**	0.097	34.77	-14.90
	16-QAM	701.5	V	142.0	318.0	4.60	1 / 12	15.92	20.52	0.113	36.99	-16.47	18.37	0.069	34.77	-16.40
		707.5	V	150.0	321.0	4.62	1 / 12	16.29	20.91	0.123	36.99	-16.08	18.76	0.075	34.77	-16.01
		713.5	V	147.0	322.0	4.70	1 / 12	16.78	**21.48**	0.140	36.99	-15.51	**19.33**	0.086	34.77	-15.44
	64-QAM	701.5	V	142.0	318.0	4.60	1 / 12	14.92	19.52	0.090	36.99	-17.47	17.37	0.055	34.77	-17.40
		707.5	V	150.0	321.0	4.62	1 / 12	15.38	20.00	0.100	36.99	-16.99	17.85	0.061	34.77	-16.92
		713.5	V	147.0	322.0	4.70	1 / 12	15.93	**20.63**	0.116	36.99	-16.36	**18.48**	0.070	34.77	-16.29
3 MHz	QPSK	700.5	V	142.0	318.0	4.59	1 / 7	16.72	21.31	0.135	36.99	-15.68	19.16	0.082	34.77	-15.61
		707.5	V	150.0	321.0	4.62	1 / 7	17.08	21.70	0.148	36.99	-15.29	19.55	0.090	34.77	-15.22
		714.5	V	147.0	322.0	4.71	1 / 7	17.34	**22.05**	0.160	36.99	-14.94	**19.90**	0.098	34.77	-14.87
	16-QAM	700.5	V	142.0	318.0	4.59	1 / 7	15.92	20.51	0.112	36.99	-16.48	18.36	0.069	34.77	-16.41
		707.5	V	150.0	321.0	4.62	1 / 7	16.28	20.90	0.123	36.99	-16.09	18.75	0.075	34.77	-16.02
		714.5	V	147.0	322.0	4.71	1 / 7	16.83	**21.54**	0.142	36.99	-15.45	**19.39**	0.087	34.77	-15.38
	64-QAM	700.5	V	142.0	318.0	4.59	1 / 7	14.87	19.46	0.088	36.99	-17.53	17.31	0.054	34.77	-17.46
		707.5	V	150.0	321.0	4.62	1 / 7	15.37	19.99	0.100	36.99	-17.00	17.84	0.061	34.77	-16.93
		714.5	V	147.0	322.0	4.71	1 / 7	16.00	**20.71**	0.118	36.99	-16.28	**18.56**	0.072	34.77	-16.21
1.4 MHz	QPSK	699.7	V	142.0	318.0	4.56	1 / 2	16.59	21.15	0.130	36.99	-15.84	19.00	0.079	34.77	-15.77
		707.5	V	150.0	321.0	4.62	1 / 2	17.01	21.63	0.146	36.99	-15.36	19.48	0.089	34.77	-15.29
		715.3	V	147.0	322.0	4.72	1 / 2	17.20	**21.92**	0.155	36.99	-15.07	**19.77**	0.095	34.77	-15.00
	16-QAM	699.7	V	142.0	318.0	4.56	1 / 2	15.76	20.32	0.108	36.99	-16.67	18.17	0.066	34.77	-16.60
		707.5	V	150.0	321.0	4.62	1 / 2	16.20	20.82	0.121	36.99	-16.17	18.67	0.074	34.77	-16.10
		715.3	V	147.0	322.0	4.72	1 / 2	16.65	**21.37**	0.137	36.99	-15.62	**19.22**	0.083	34.77	-15.55
	64-QAM	699.7	V	142.0	318.0	4.56	1 / 2	14.78	19.34	0.086	36.99	-17.65	17.19	0.052	34.77	-17.58
		707.5	V	150.0	321.0	4.62	1 / 2	15.25	19.87	0.097	36.99	-17.12	17.72	0.059	34.77	-17.05
		715.3	V	147.0	322.0	4.72	1 / 2	15.86	**20.58**	0.114	36.99	-16.41	**18.43**	0.070	34.77	-16.34
10 MHz	Opposite Pol.	711.0	H	150.0	132.0	4.62	1 / 25	9.58	14.20	0.026	36.99	-22.79	12.05	0.016	34.77	-22.72

Table 7-173. ERP Data (LTE Band 12)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	782.0	H	221.0	286.0	5.89	1 / 49	16.95	**22.84**	0.192	36.99	-14.15	**20.69**	0.117	34.77	-14.08
	16-QAM	782.0	H	221.0	286.0	5.89	1 / 49	15.87	**21.76**	0.150	36.99	-15.23	**19.61**	0.091	34.77	-15.16
	64-QAM	782.0	H	221.0	286.0	5.89	1 / 49	14.69	**20.58**	0.114	36.99	-16.41	**18.43**	0.070	34.77	-16.34
5 MHz	QPSK	779.5	H	221.0	286.0	5.82	1 / 12	16.54	22.35	0.172	36.99	-14.64	20.20	0.105	34.77	-14.57
		782.0	H	221.0	286.0	5.89	1 / 12	16.90	**22.79**	0.190	36.99	-14.20	**20.64**	0.116	34.77	-14.13
		784.5	H	221.0	286.0	5.92	1 / 12	16.49	22.41	0.174	36.99	-14.58	20.26	0.106	34.77	-14.51
	16-QAM	779.5	H	221.0	286.0	5.82	1 / 12	15.45	21.26	0.134	36.99	-15.73	19.11	0.082	34.77	-15.66
		782.0	H	221.0	286.0	5.89	1 / 12	15.71	**21.60**	0.145	36.99	-15.39	**19.45**	0.088	34.77	-15.32
		784.5	H	221.0	286.0	5.92	1 / 12	15.40	21.32	0.136	36.99	-15.67	19.17	0.083	34.77	-15.60
	64-QAM	779.5	H	221.0	286.0	5.82	1 / 12	14.22	20.03	0.101	36.99	-16.96	17.88	0.061	34.77	-16.89
		782.0	H	221.0	286.0	5.89	1 / 12	14.52	**20.41**	0.110	36.99	-16.58	**18.26**	0.067	34.77	-16.51
		784.5	H	221.0	286.0	5.92	1 / 12	14.15	20.07	0.102	36.99	-16.92	17.92	0.062	34.77	-16.85
10 MHz	Opposite Pol.	784.5	V	131.0	344.0	5.89	1 / 24	15.64	21.53	0.142	36.99	-15.46	19.38	0.087	34.77	-15.39

Table 7-174. ERP Data (LTE Band 13)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
20 MHz	QPSK	673.0	V	160.0	336.0	4.09	1 / 50	15.60	19.69	0.093	36.99	-17.30	17.54	0.057	34.77	-17.23
		680.5	V	160.0	329.0	4.24	1 / 50	15.66	**19.90**	0.098	36.99	-17.09	**17.75**	0.060	34.77	-17.03
		688.0	V	152.0	330.0	4.48	1 / 50	15.17	19.65	0.092	36.99	-17.34	17.50	0.056	34.77	-17.27
	16-QAM	673.0	V	160.0	336.0	4.09	1 / 50	14.73	18.82	0.076	36.99	-18.17	16.67	0.046	34.77	-18.10
		680.5	V	160.0	329.0	4.24	1 / 50	14.90	**19.14**	0.082	36.99	-17.85	**16.99**	0.050	34.77	-17.79
		688.0	V	152.0	330.0	4.48	1 / 50	14.27	18.75	0.075	36.99	-18.24	16.60	0.046	34.77	-18.17
	64-QAM	673.0	V	160.0	336.0	4.09	1 / 50	13.76	17.85	0.061	36.99	-19.14	15.70	0.037	34.77	-19.07
		680.5	V	160.0	329.0	4.24	1 / 50	13.78	**18.02**	0.063	36.99	-18.97	**15.87**	0.039	34.77	-18.91
		688.0	V	152.0	330.0	4.48	1 / 50	13.16	17.64	0.058	36.99	-19.35	15.49	0.035	34.77	-19.28
15 MHz	QPSK	670.5	V	160.0	336.0	3.96	1 / 36	15.57	19.53	0.090	36.99	-17.46	17.38	0.055	34.77	-17.39
		680.5	V	160.0	329.0	4.24	1 / 36	15.54	**19.78**	0.095	36.99	-17.21	**17.63**	0.058	34.77	-17.15
		690.5	V	152.0	330.0	4.41	1 / 36	15.11	19.52	0.090	36.99	-17.47	17.37	0.055	34.77	-17.40
	16-QAM	670.5	V	160.0	336.0	3.96	1 / 36	15.01	18.97	0.079	36.99	-18.02	16.82	0.048	34.77	-17.95
		680.5	V	160.0	329.0	4.24	1 / 36	15.01	**19.25**	0.084	36.99	-17.74	**17.10**	0.051	34.77	-17.68
		690.5	V	152.0	330.0	4.41	1 / 36	14.40	18.81	0.076	36.99	-18.18	16.66	0.046	34.77	-18.11
	64-QAM	670.5	V	160.0	336.0	3.96	1 / 36	13.82	17.78	0.060	36.99	-19.21	15.63	0.037	34.77	-19.14
		680.5	V	160.0	329.0	4.24	1 / 36	14.58	**18.82**	0.076	36.99	-18.17	**16.67**	0.046	34.77	-18.11
		690.5	V	152.0	330.0	4.41	1 / 36	12.41	16.82	0.048	36.99	-20.17	14.67	0.029	34.77	-20.10
10 MHz	QPSK	668.0	V	160.0	336.0	3.82	1 / 25	15.93	19.76	0.095	36.99	-17.23	17.61	0.058	34.77	-17.16
		680.5	V	160.0	329.0	4.24	1 / 25	15.84	**20.08**	0.102	36.99	-16.91	**17.93**	0.062	34.77	-16.85
		693.0	V	152.0	330.0	4.44	1 / 25	15.51	19.95	0.099	36.99	-17.04	17.80	0.060	34.77	-16.97
	16-QAM	668.0	V	160.0	336.0	3.82	1 / 49	15.45	19.28	0.085	36.99	-17.71	17.13	0.052	34.77	-17.64
		680.5	V	160.0	329.0	4.24	1 / 49	15.26	**19.50**	0.089	36.99	-17.49	**17.35**	0.054	34.77	-17.43
		693.0	V	152.0	330.0	4.44	1 / 0	14.80	19.24	0.084	36.99	-17.75	17.09	0.051	34.77	-17.68
	64-QAM	668.0	V	160.0	336.0	3.82	1 / 25	14.16	17.99	0.063	36.99	-19.00	15.84	0.038	34.77	-18.93
		680.5	V	160.0	329.0	4.24	1 / 25	14.37	**18.61**	0.073	36.99	-18.38	**16.46**	0.044	34.77	-18.32
		693.0	V	152.0	330.0	4.44	1 / 25	12.94	17.38	0.055	36.99	-19.61	15.23	0.033	34.77	-19.54
5 MHz	QPSK	665.5	V	160.0	336.0	3.79	1 / 12	16.04	19.83	0.096	36.99	-17.16	17.68	0.059	34.77	-17.09
		680.5	V	160.0	329.0	4.24	1 / 12	15.95	**20.19**	0.104	36.99	-16.80	**18.04**	0.064	34.77	-16.74
		695.5	V	152.0	330.0	4.58	1 / 12	15.43	20.00	0.100	36.99	-16.99	17.85	0.061	34.77	-16.92
	16-QAM	665.5	V	160.0	336.0	3.79	1 / 12	15.44	19.23	0.084	36.99	-17.76	17.08	0.051	34.77	-17.69
		680.5	V	160.0	329.0	4.24	1 / 12	15.27	**19.51**	0.089	36.99	-17.48	**17.36**	0.054	34.77	-17.42
		695.5	V	152.0	330.0	4.58	1 / 12	14.55	19.12	0.082	36.99	-17.87	16.97	0.050	34.77	-17.80
	64-QAM	665.5	V	160.0	336.0	3.79	1 / 0	14.08	17.87	0.061	36.99	-19.12	15.72	0.037	34.77	-19.05
		680.5	V	160.0	329.0	4.24	1 / 0	14.22	**18.46**	0.070	36.99	-18.53	**16.31**	0.043	34.77	-18.47
		695.5	V	152.0	330.0	4.58	1 / 0	12.67	17.24	0.053	36.99	-19.75	15.09	0.032	34.77	-19.68
20 MHz	Opposite Pol.	680.5	H	303.0	284.0	4.24	1 / 50	15.05	19.29	0.085	36.99	-17.70	17.14	0.052	34.77	-17.64

Table 7-175. ERP Data (LTE Band 71)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA1700	V	117	73	11.66	9.46	21.12	0.129	30.00	-8.88
1732.60	WCDMA1700	V	107	58	13.42	9.34	**22.76**	**0.189**	30.00	-7.24
1752.60	WCDMA1700	V	120	88	10.95	9.24	20.19	0.104	30.00	-9.81
1732.60	WCDMA1700	H	139	4	12.96	9.34	22.30	0.170	30.00	-7.70

Table 7-176. EIRP Data (WCDMA AWS)

7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the direct field strength calculation method described in KDB 971168 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

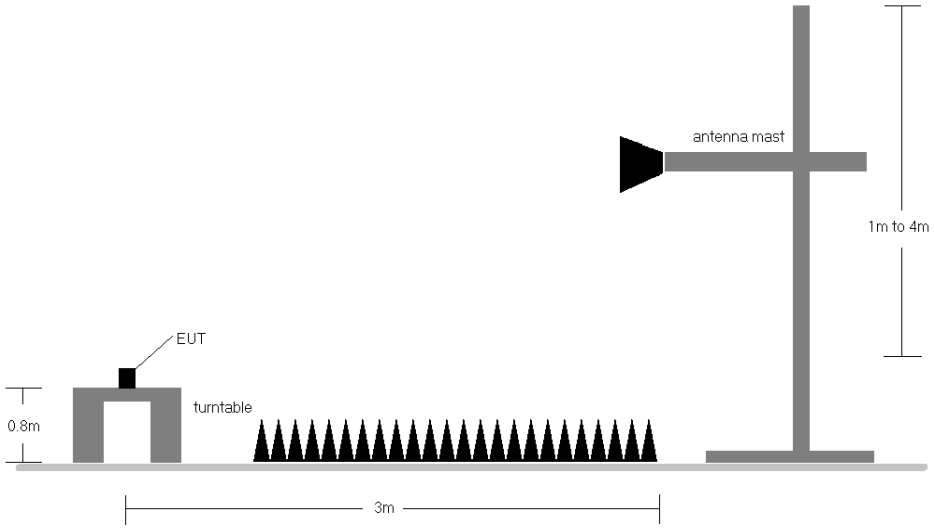


Figure 7-7. Test Instrument & Measurement Setup

Test Notes

1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
   b) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
   d) EIRP (dBm) = E(dBµV/m) + 20logD – 104.8; where D is the measurement distance in meters.

2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.

3) This unit was tested with its standard battery.

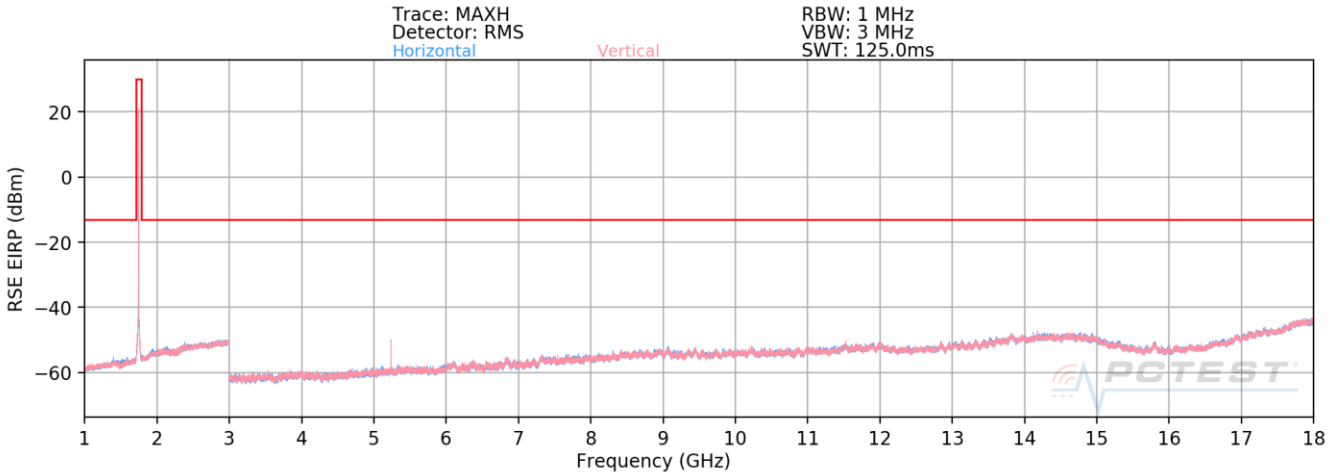
4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

5) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

6) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

7) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

LTE Band 66/4



Plot 7-177. Radiated Spurious Plot (LTE Band 66/4)

Bandwidth (MHz):	20
Frequency (MHz):	1720.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3440.0	V	148	129	-72.81	1.49	35.68	-59.57	-13.00	-46.57
5160.0	V	116	359	-67.76	4.45	43.69	-51.57	-13.00	-38.57
6880.0	V	-	-	-79.24	8.34	36.10	-59.16	-13.00	-46.16
8600.0	V	-	-	-79.05	11.25	39.20	-56.06	-13.00	-43.06
10320.0	V	-	-	-79.34	11.29	38.95	-56.31	-13.00	-43.31

Table 7-2. Radiated Spurious Data (LTE Band 66/4 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1745.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.0	V	115	126	-70.85	1.30	37.45	-57.81	-13.00	-44.81
5235.0	V	115	365	-66.36	4.65	45.29	-49.97	-13.00	-36.97
6980.0	V	-	-	-78.53	7.11	35.58	-59.68	-13.00	-46.68
8725.0	V	-	-	-79.45	10.88	38.43	-56.82	-13.00	-43.82
10470.0	V	-	-	-79.49	11.94	39.45	-55.81	-13.00	-42.81

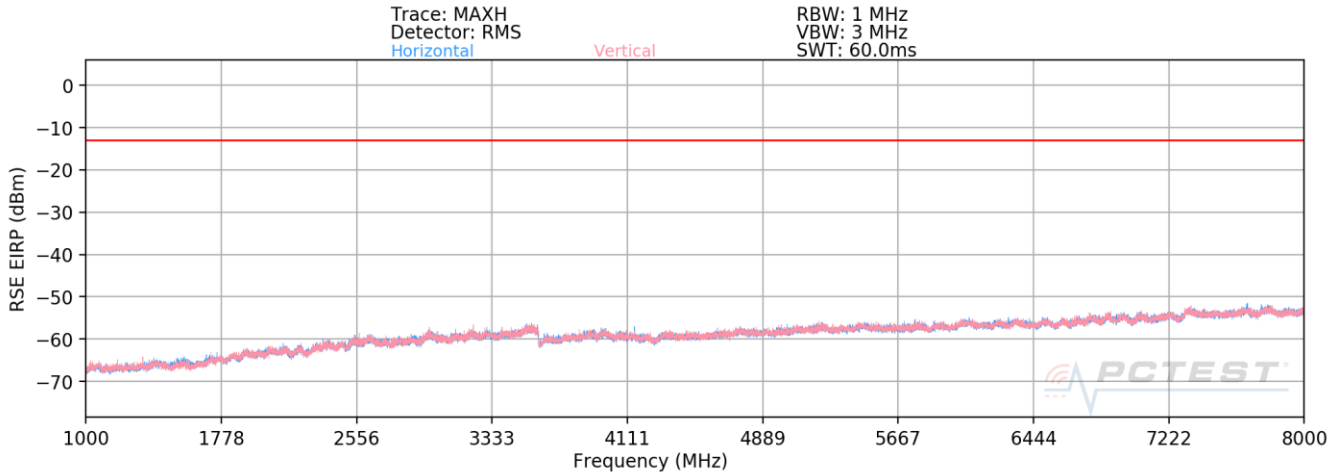
Table 7-3. Radiated Spurious Data (LTE Band 66/4 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1770.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3540.00	V	118	125	-68.65	1.18	39.53	-55.73	-13.00	-42.73
5310.00	V	115	26	-66.30	4.35	45.05	-50.20	-13.00	-37.20
7080.00	V	-	-	-78.63	7.22	35.59	-59.67	-13.00	-46.67
8850.00	V	-	-	-79.16	10.86	38.70	-56.56	-13.00	-43.56
10620.00	V	-	-	-79.55	12.43	39.88	-55.38	-13.00	-42.38

Table 7-4. Radiated Spurious Data (LTE Band 66/4 – High Channel)

LTE Band 12



Plot 7-178. Radiated Spurious Plot (LTE Band 12)

Bandwidth (MHz):	10
Frequency (MHz):	704.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1408.0	V	286	118	-77.50	-5.13	24.37	-70.89	-13.00	-57.89
2112.0	V	-	-	-80.37	-2.84	23.79	-71.47	-13.00	-58.47
2816.0	V	-	-	-80.23	-1.59	25.18	-70.08	-13.00	-57.08
3520.0	V	-	-	-80.08	1.09	28.01	-67.24	-13.00	-54.24

Table 7-5. Radiated Spurious Data (LTE Band 12 – Low Channel)

Bandwidth (MHz):	10
Frequency (MHz):	707.5
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1415.0	V	370	56	-76.79	-5.23	24.98	-70.28	-13.00	-57.28
2122.5	V	-	-	-80.62	-2.90	23.48	-71.78	-13.00	-58.78
2830.0	V	-	-	-80.09	-1.52	25.39	-69.87	-13.00	-56.87
3537.5	V	-	-	-79.99	1.24	28.25	-67.00	-13.00	-54.00

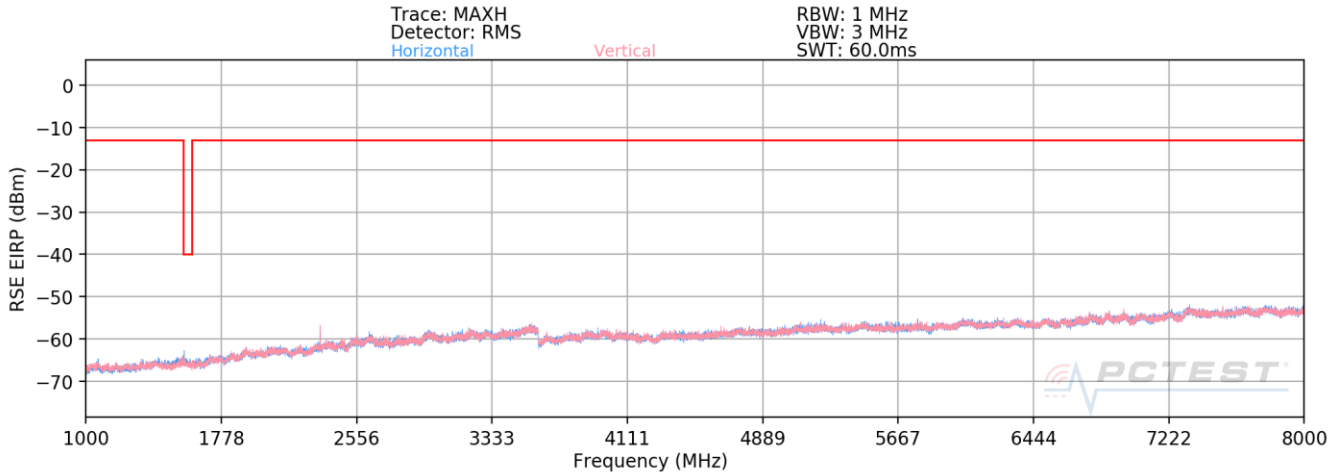
Table 7-6. Radiated Spurious Data (LTE Band 12 – Mid Channel)

Bandwidth (MHz):	10
Frequency (MHz):	711.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1422.0	V	365	98	-80.39	-5.25	21.36	-73.90	-13.00	-60.90
2133.0	V	-	-	-79.98	-3.02	24.00	-71.26	-13.00	-58.26
2844.0	V	-	-	-79.85	-1.41	25.74	-69.52	-13.00	-56.52
3555.0	V	-	-	-79.73	1.20	28.47	-66.79	-13.00	-53.79

Table 7-7. Radiated Spurious Data (LTE Band 12 – High Channel)

LTE Band 13



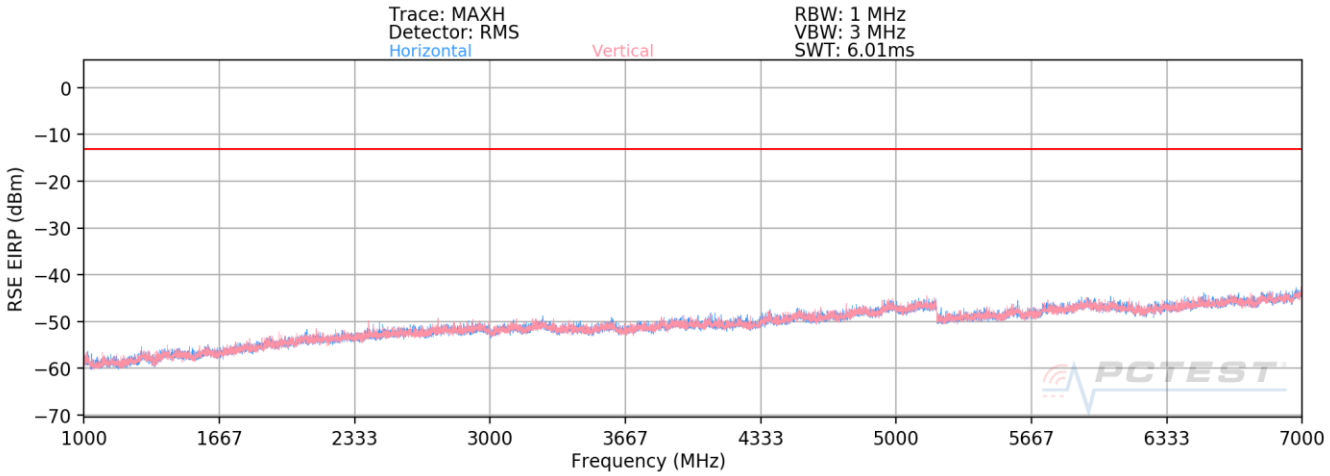
Plot 7-179. Radiated Spurious Plot (LTE Band 13)

Bandwidth (MHz):	10
Frequency (MHz):	782.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1564.0	H	178	177	-74.31	-5.03	27.66	-67.60	-40.00	-27.60
2346.0	H	193	167	-72.84	-2.56	31.60	-63.66	-13.00	-50.66
3128.0	H	-	-	-76.76	-0.17	30.07	-65.19	-13.00	-52.19
3910.0	H	-	-	-78.75	2.71	30.96	-64.30	-13.00	-51.30
4692.0	H	-	-	-78.35	2.65	31.30	-63.95	-13.00	-50.95

Plot 7-180. Radiated Spurious Data (LTE Band 13)

LTE Band 71



Plot 7-181. Radiated Spurious Plot (LTE Band 71)

Bandwidth (MHz):	20
Frequency (MHz):	673.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1346.0	V	136	300	-74.24	-1.44	31.32	-63.94	-13.00	-50.94
2019.0	V	155	358	-77.67	3.39	32.72	-62.54	-13.00	-49.54
2692.0	V	-	-	-80.87	5.50	31.63	-63.63	-13.00	-50.63
3365.0	V	-	-	-80.95	7.01	33.06	-62.20	-13.00	-49.20
4038.0	V	-	-	-82.25	8.10	32.85	-62.41	-13.00	-49.41

Table 7-8. Radiated Spurious Data (LTE Band 71 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	680.5
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1361.0	V	122	184	-74.88	-0.94	31.18	-64.08	-13.00	-51.08
2041.5	V	107	190	-76.29	3.35	34.06	-61.20	-13.00	-48.20
2722.0	V	-	-	-80.48	6.08	32.60	-62.66	-13.00	-49.66
3402.5	V	-	-	-81.66	7.42	32.76	-62.50	-13.00	-49.50
4083.0	V	-	-	-83.20	8.48	32.28	-62.98	-13.00	-49.98

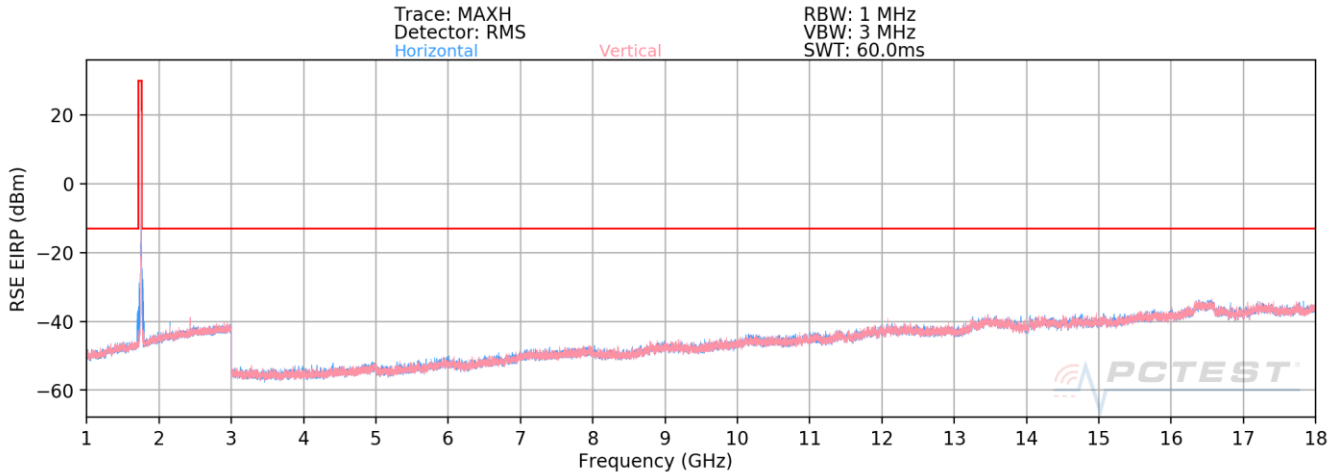
Table 7-9. Radiated Spurious Data (LTE Band 71 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	688.0
RB / Offset:	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1376.0	V	144	317	-76.01	-0.41	30.58	-64.68	-13.00	-51.68
2064.0	V	101	182	-77.30	4.08	33.78	-61.48	-13.00	-48.48
2752.0	V	-	-	-81.50	6.27	31.77	-63.49	-13.00	-50.49
3440.0	V	-	-	-81.06	7.66	33.60	-61.66	-13.00	-48.66
4128.0	V	-	-	-82.11	8.09	32.98	-62.28	-13.00	-49.28

Table 7-10. Radiated Spurious Data (LTE Band 71 – High Channel)

WCDMA AWS



Plot 7-182. Radiated Spurious Plot (WCDMA AWS)

Mode:	WCDMA RMC
Channel:	1312
Frequency (MHz):	1712.4

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3424.8	H	400	328	-80.13	7.44	34.31	-60.95	-13.00	-47.95
5137.2	H	-	-	-81.04	10.57	36.53	-58.73	-13.00	-45.73
6849.6	H	-	-	-82.43	14.29	38.86	-56.40	-13.00	-43.40
8562.0	H	-	-	-83.45	17.01	40.56	-54.69	-13.00	-41.69

7-11. Radiated Spurious Data (WCDMA AWS – Low Channel)

Mode:	WCDMA RMC
Channel:	1413
Frequency (MHz):	1732.6

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3465.2	H	260	256	-80.02	7.29	34.27	-60.99	-13.00	-47.99
5197.8	H	-	-	-80.92	10.41	36.49	-58.77	-13.00	-45.77
6930.4	H	-	-	-82.14	14.20	39.06	-56.20	-13.00	-43.20
8663.0	H	-	-	-83.43	17.97	41.54	-53.72	-13.00	-40.72

Table 7-12. Radiated Spurious Data (WCDMA AWS – Mid Channel)

Mode:	WCDMA RMC
Channel:	1513
Frequency (MHz):	1752.6

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3505.2	H	265	40	-80.55	7.80	34.25	-61.01	-13.00	-48.01
5257.8	H	-	-	-82.31	10.75	35.44	-59.82	-13.00	-46.82
7010.4	H	-	-	-82.46	15.20	39.74	-55.51	-13.00	-42.51
8763.0	H	-	-	-82.91	17.05	41.14	-54.12	-13.00	-41.12

Table 7-13. Radiated Spurious Data (WCDMA AWS – High Channel)

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

Frequency Stability / Temperature Variation

LTE Band 66/4

OPERATING FREQUENCY:	1,745,000,000	Hz
CHANNEL:	132322	
REFERENCE VOLTAGE:	4.4V	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.4V	+ 20 (Ref)	1,744,999,943	0	0.0000000
100 %		- 30	1,744,999,791	-152	-0.0000087
100 %		- 20	1,744,999,931	-12	-0.0000007
100 %		- 10	1,745,000,052	109	0.0000062
100 %		0	1,744,999,677	-266	-0.0000152
100 %		+ 10	1,744,999,776	-167	-0.0000096
100 %		+ 20	1,745,000,048	105	0.0000060
100 %		+ 30	1,744,999,962	19	0.0000011
100 %		+ 40	1,744,999,779	-164	-0.0000094
100 %		+ 50	1,745,000,024	81	0.0000046
85 %		+ 20	1,744,999,867	-76	-0.0000044
BATT. ENDPOINT	2.5V	+ 20	1,744,999,770	-173	-0.0000099

Table 7-9. LTE Band 66/4 Frequency Stability Data

Note:
Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

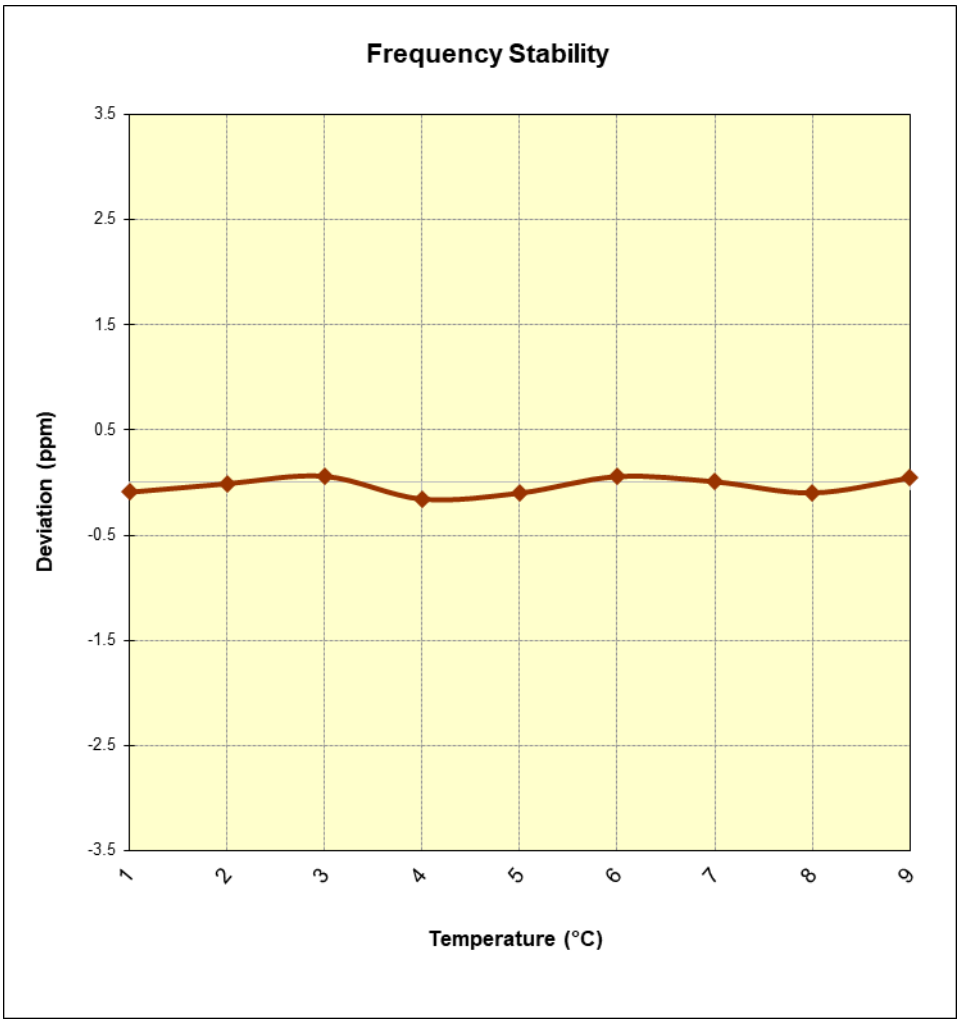


Table 7-9. LTE Band 66/4 Frequency Stability Chart

Frequency Stability / Temperature Variation

LTE Band 12

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	
REFERENCE VOLTAGE:	4.4V	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.4V	+ 20 (Ref)	707,499,949	0	0.0000000
100 %		- 30	707,500,178	229	0.0000324
100 %		- 20	707,500,186	237	0.0000335
100 %		- 10	707,500,108	159	0.0000225
100 %		0	707,499,713	-236	-0.0000334
100 %		+ 10	707,500,036	87	0.0000123
100 %		+ 20	707,500,079	130	0.0000184
100 %		+ 30	707,500,057	108	0.0000153
100 %		+ 40	707,499,938	-11	-0.0000016
100 %		+ 50	707,499,944	-5	-0.0000007
85 %		+ 20	707,499,933	-16	-0.0000023
BATT. ENDPOINT	2.5V	+ 20	707,499,970	21	0.0000030

Table 7-9. LTE Band 12 Frequency Stability Data

Note:
Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

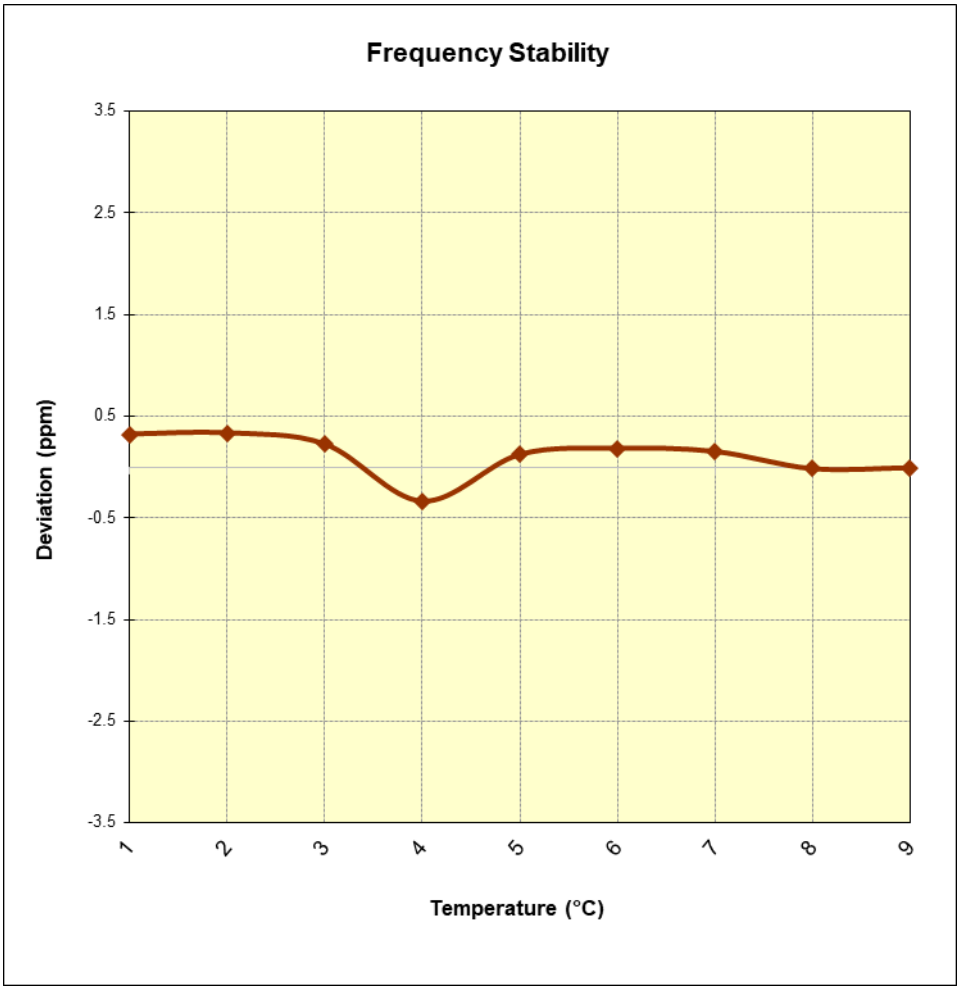


Table 7-9. LTE Band 12 Frequency Stability Chart

Frequency Stability / Temperature Variation

LTE Band 13

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	
REFERENCE VOLTAGE:	4.4V	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.4V	+ 20 (Ref)	782,000,187	0	0.0000000
100 %		- 30	781,999,994	-193	-0.0000247
100 %		- 20	781,999,825	-362	-0.0000463
100 %		- 10	782,000,257	70	0.0000090
100 %		0	782,000,128	-59	-0.0000075
100 %		+ 10	782,000,329	142	0.0000182
100 %		+ 20	782,000,183	-4	-0.0000005
100 %		+ 30	782,000,203	16	0.0000020
100 %		+ 40	782,000,493	306	0.0000391
100 %		+ 50	782,000,007	-180	-0.0000230
85 %		+ 20	782,000,119	-68	-0.0000087
BATT. ENDPOINT	2.5V	+ 20	782,000,096	-91	-0.0000116

Table 7-9. LTE Band 13 Frequency Stability Data

Note:
Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

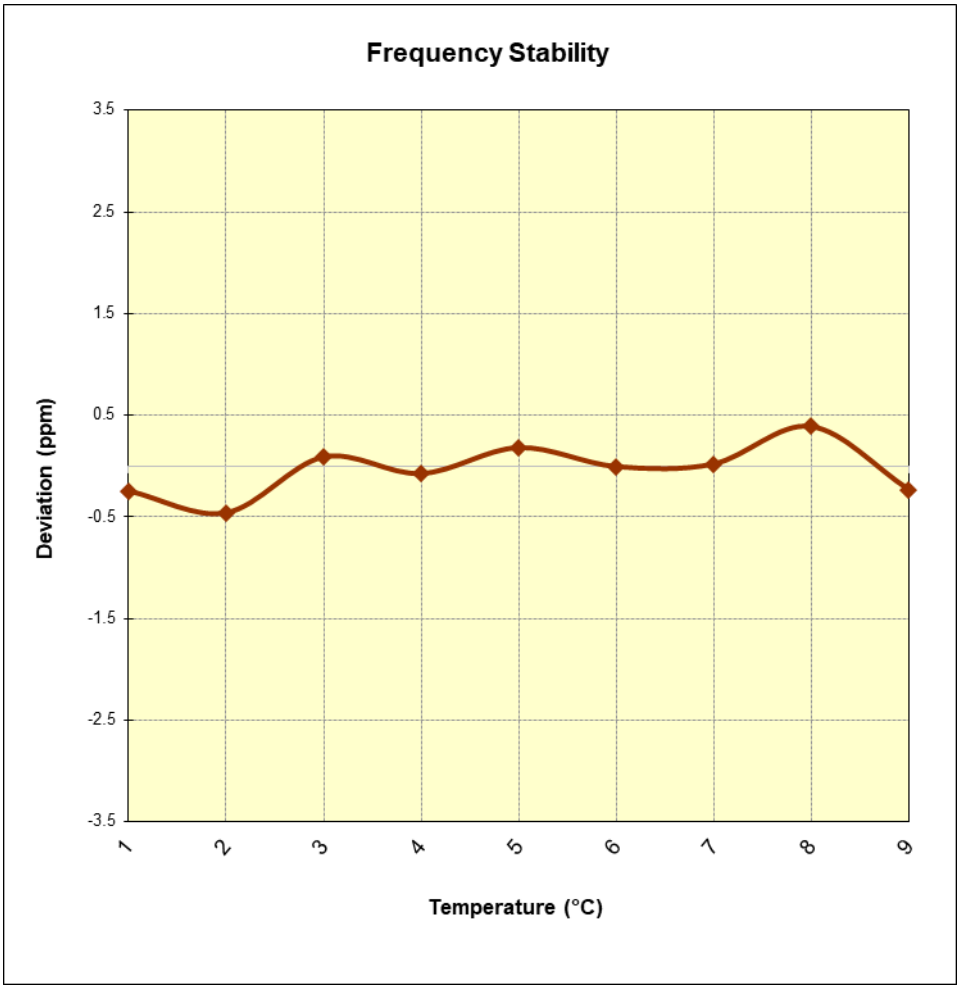


Table 7-9. LTE Band 13 Frequency Stability Chart

Frequency Stability / Temperature Variation

LTE Band 71

OPERATING FREQUENCY:	680,500,000	Hz
CHANNEL:	133297	
REFERENCE VOLTAGE:	4.4V	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.4V	+ 20 (Ref)	680,499,900	0	0.0000000
100 %		- 30	680,500,081	181	0.0000266
100 %		- 20	680,499,647	-253	-0.0000372
100 %		- 10	680,499,871	-29	-0.0000043
100 %		0	680,499,561	-339	-0.0000498
100 %		+ 10	680,499,796	-104	-0.0000153
100 %		+ 20	680,499,623	-277	-0.0000407
100 %		+ 30	680,499,585	-315	-0.0000463
100 %		+ 40	680,499,826	-74	-0.0000109
100 %		+ 50	680,500,001	101	0.0000148
85 %		+ 20	680,499,543	-357	-0.0000525
BATT. ENDPOINT	2.5V	+ 20	680,499,929	29	0.0000043

Table 7-9. LTE Band 71 Frequency Stability Data

Note:
Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

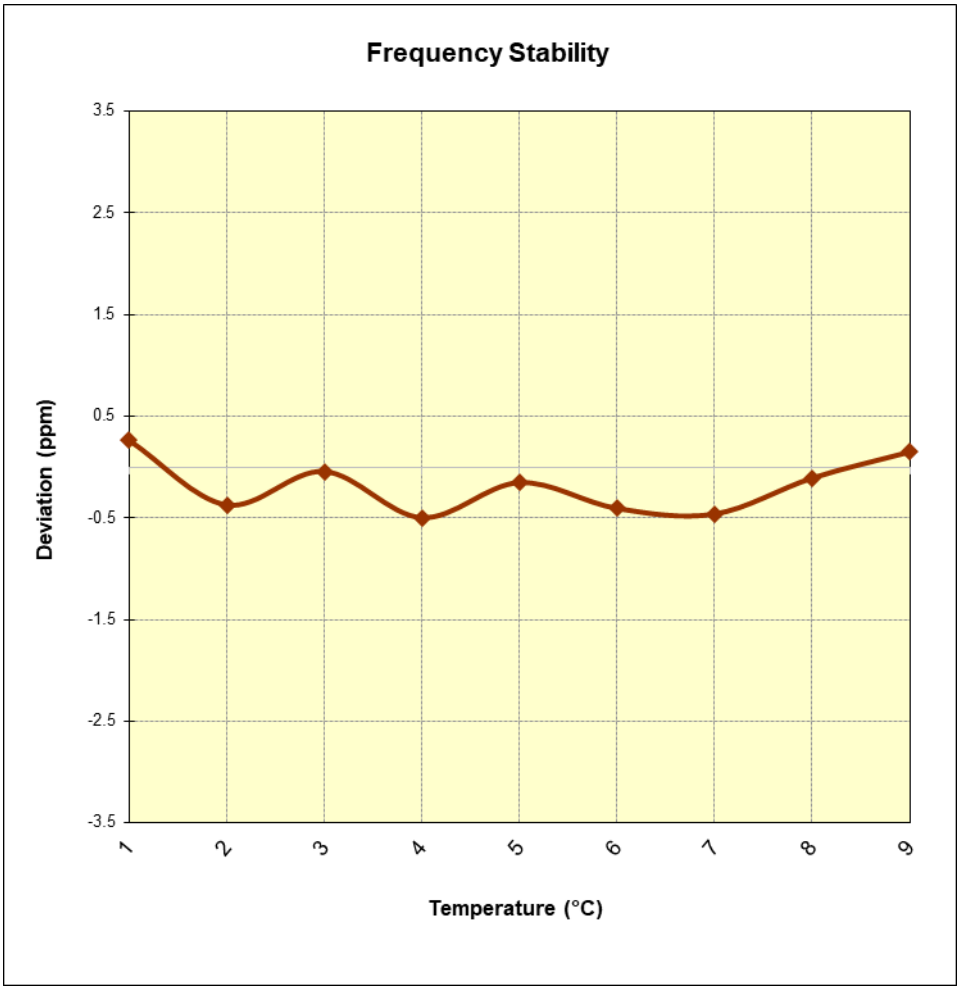


Table 7-9. LTE Band 71 Frequency Stability Chart

WCDMA AWS

OPERATING FREQUENCY:	1,732,600,000	Hz
CHANNEL:	1413	
REFERENCE VOLTAGE:	4.4V	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.4V	+ 20 (Ref)	1,732,600,127	0	0.0000000
100 %		- 30	1,732,599,999	-128	-0.0000074
100 %		- 20	1,732,599,945	-182	-0.0000105
100 %		- 10	1,732,600,384	257	0.0000148
100 %		0	1,732,600,125	-2	-0.0000001
100 %		+ 10	1,732,600,215	88	0.0000051
100 %		+ 20	1,732,600,084	-43	-0.0000025
100 %		+ 30	1,732,600,003	-124	-0.0000072
100 %		+ 40	1,732,600,136	9	0.0000005
100 %		+ 50	1,732,600,318	191	0.0000110
85 %		+ 20	1,732,599,980	-147	-0.0000085
BATT. ENDPOINT	2.5V	+ 20	1,732,600,208	81	0.0000047

Table 7-9. WCDMA AWS Frequency Stability Data

Note:
Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

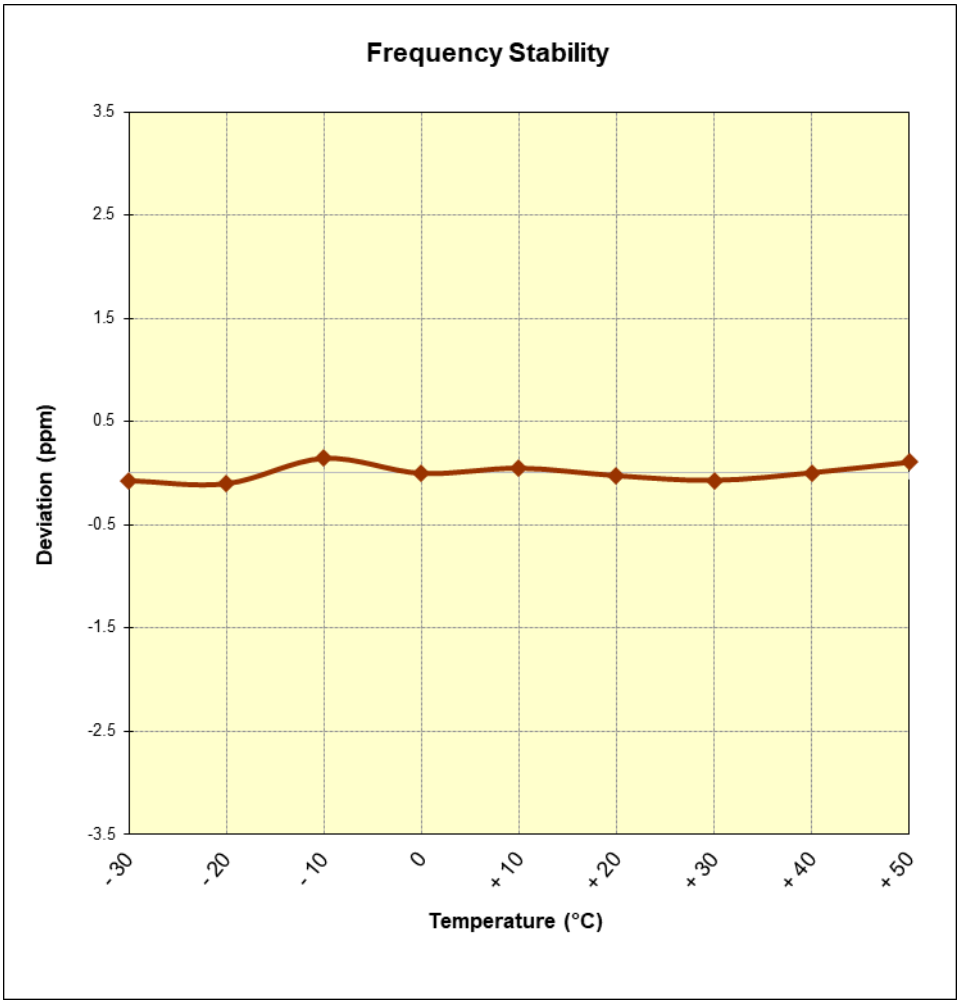


Table 7-9. WCDMA AWS Frequency Stability Chart

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFK330PM** complies with all the requirements of Part 27 of the FCC rules.