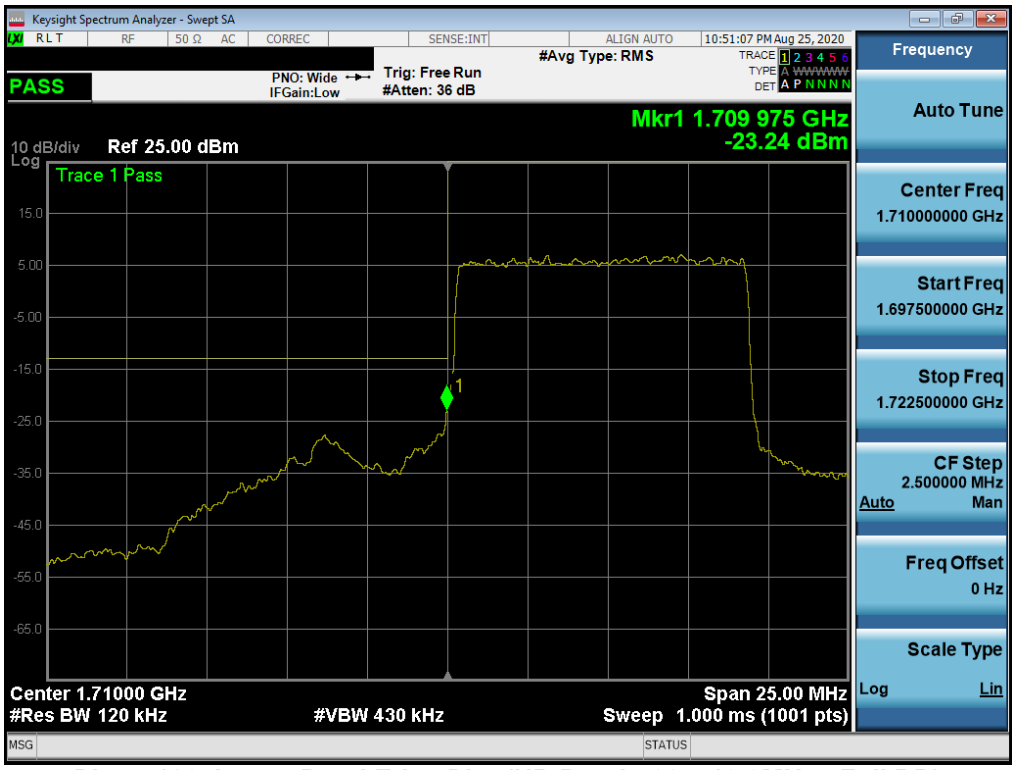
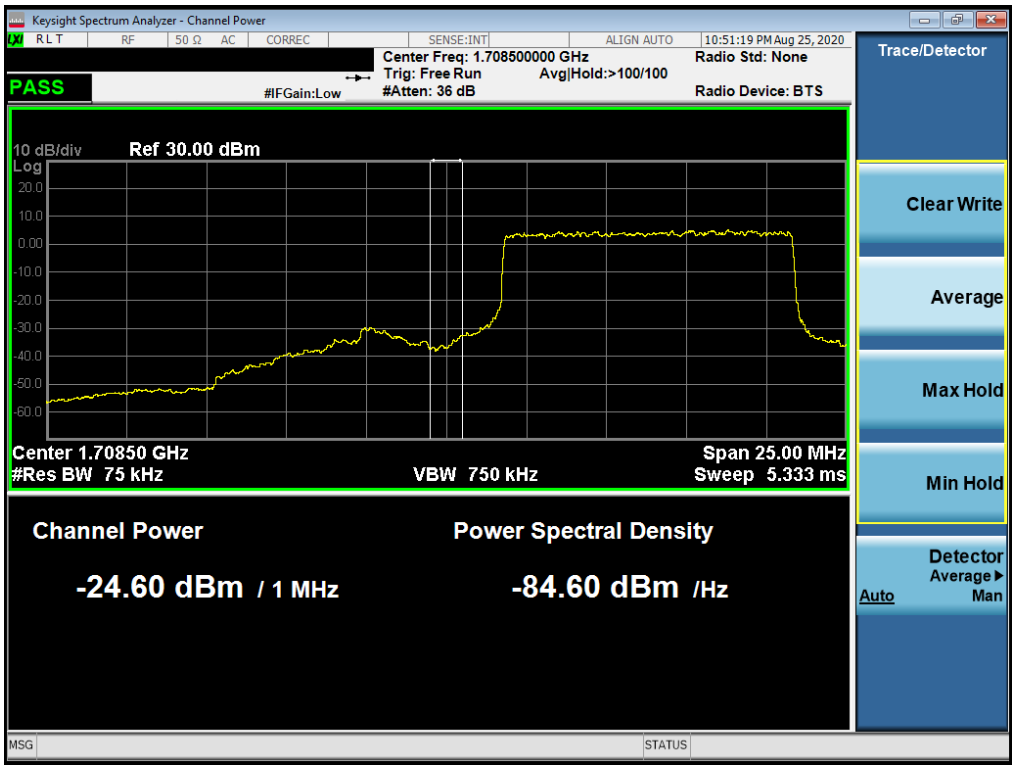
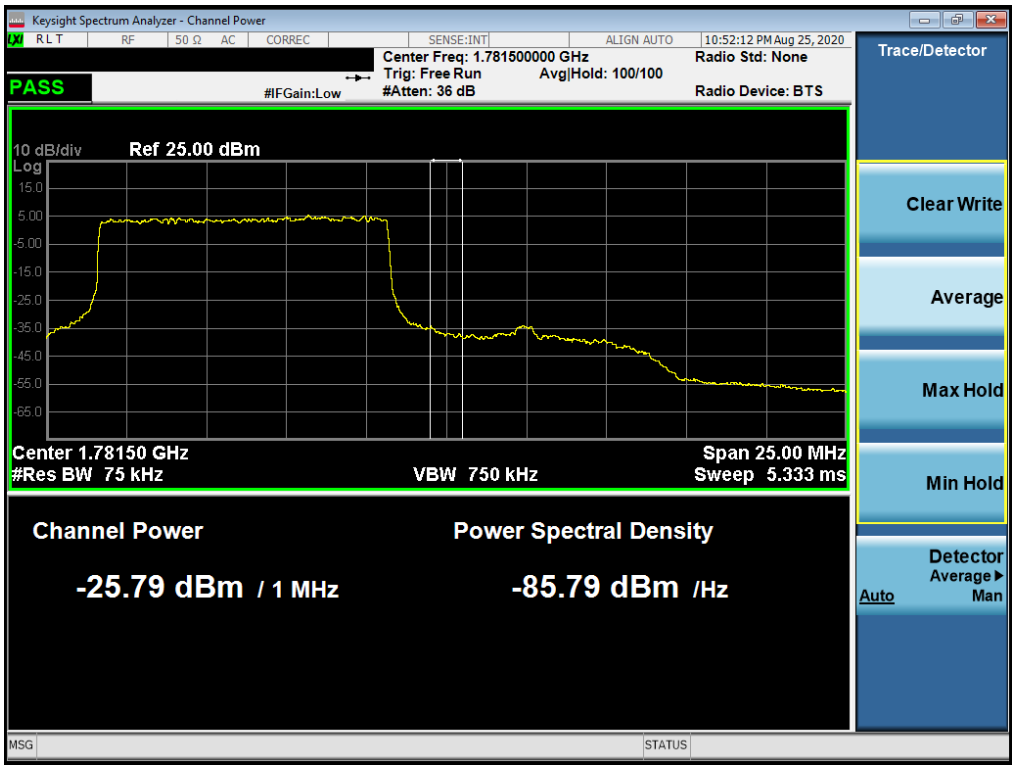


Plot 7-120. Lower Band Edge Plot (NR Band n66 – 10.0MHz - Full RB)

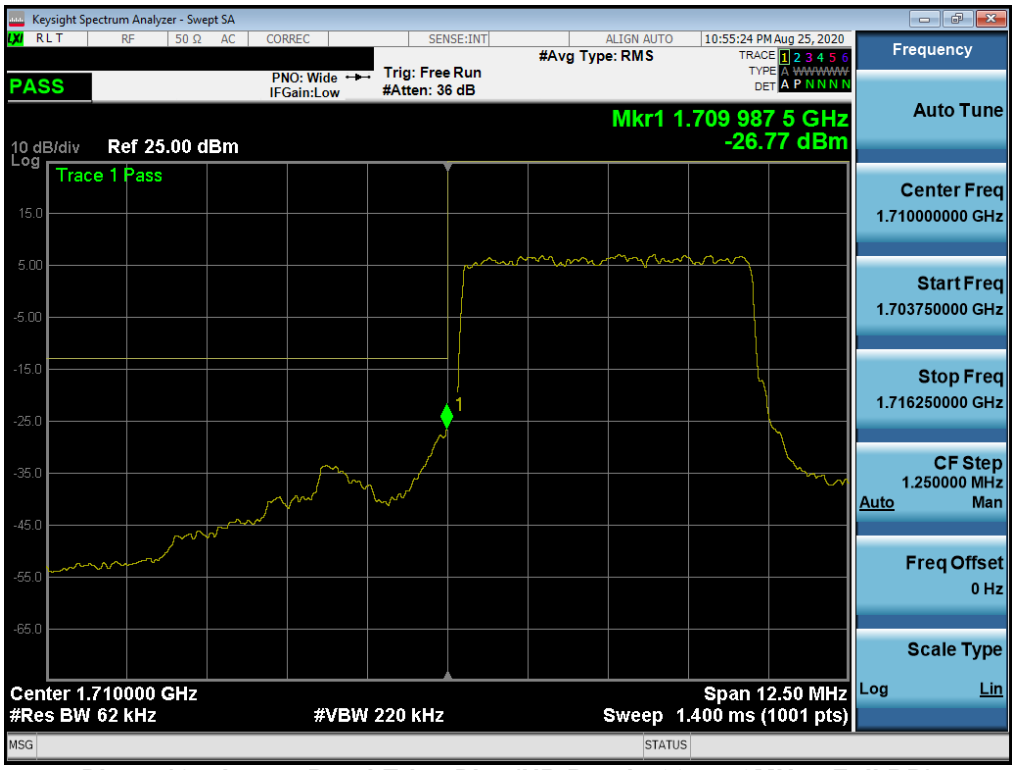


Plot 7-121. Lower Extended Band Edge Plot (NR Band n66 – 10.0MHz - Full RB)

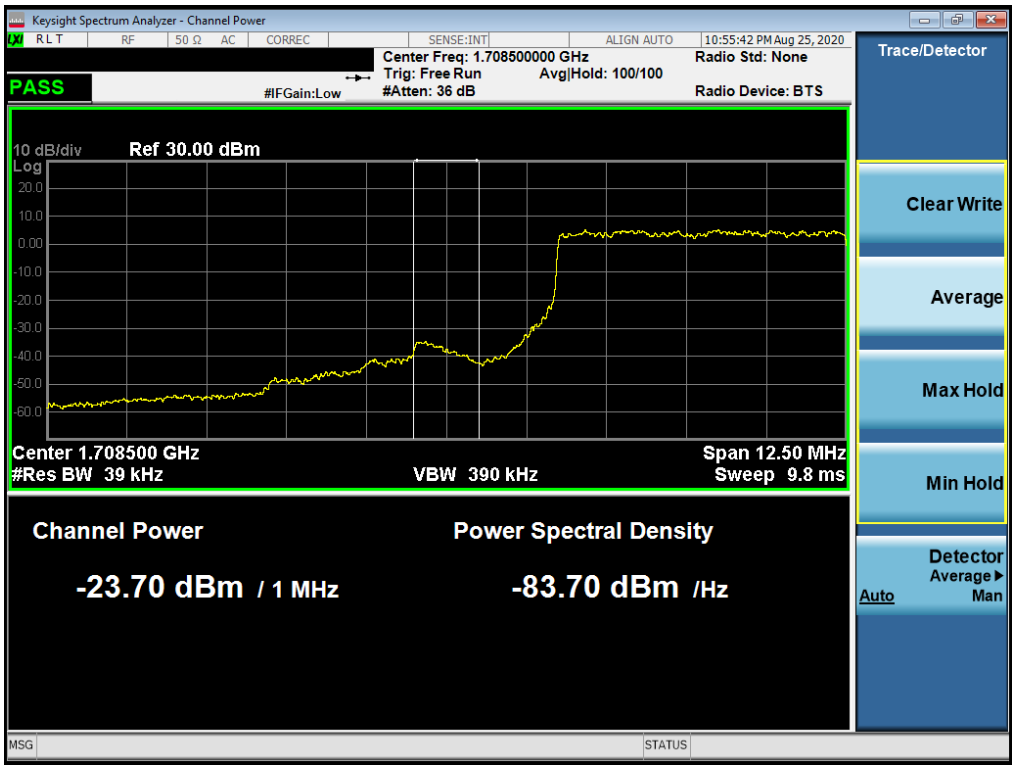
Plot 7-122. Upper Band Edge Plot (NR Band n66 – 10.0MHz - Full RB)



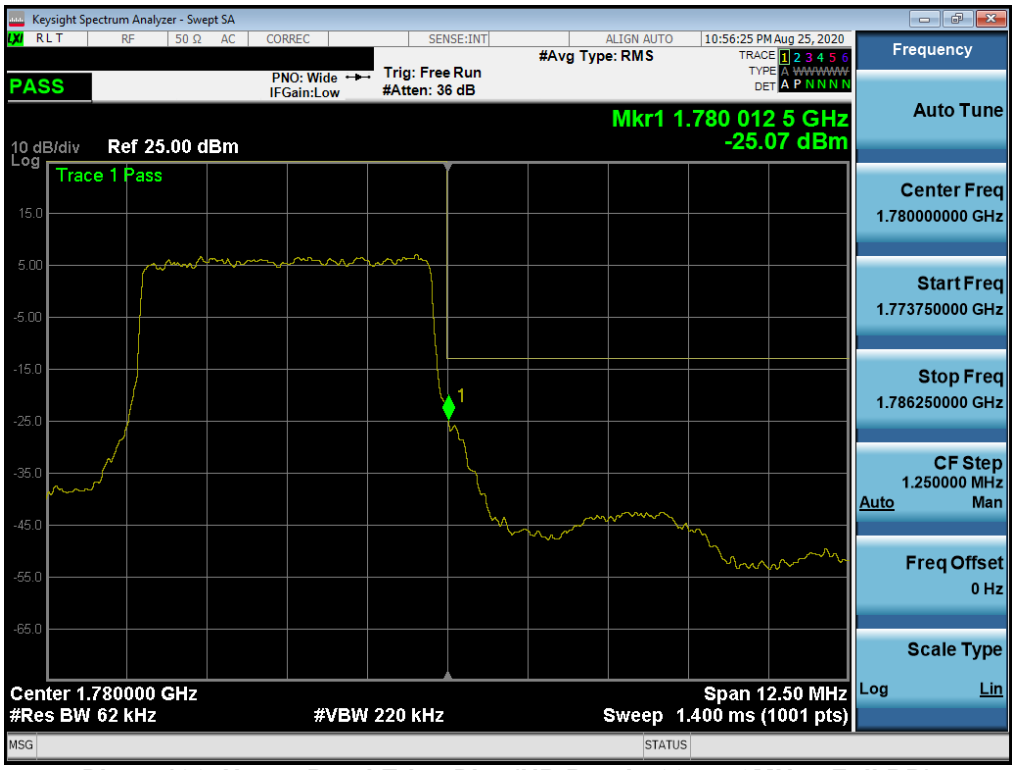
Plot 7-123. Upper Extended Band Edge Plot (NR Band n66 – 10.0MHz - Full RB)



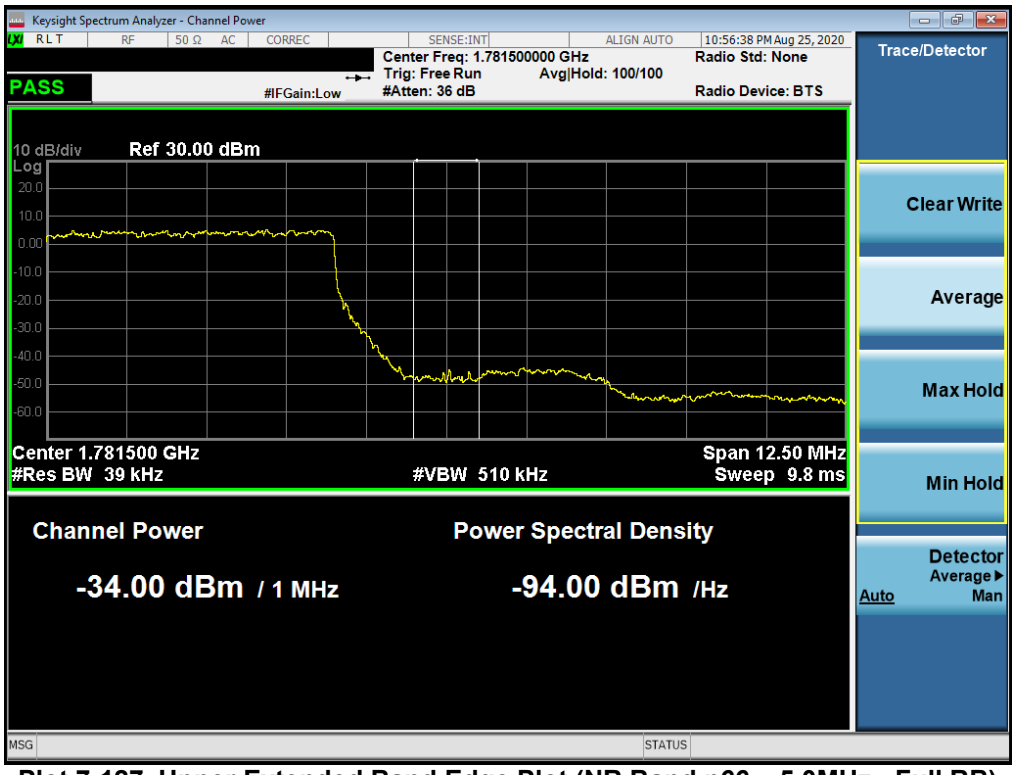
Plot 7-124. Lower Band Edge Plot (NR Band n66 – 5.0MHz - Full RB)



Plot 7-125. Lower Extended Band Edge Plot (NR Band n66 – 5.0MHz - Full RB)



Plot 7-126. Upper Band Edge Plot (NR Band n66 – 5.0MHz - Full RB)



Plot 7-127. Upper Extended Band Edge Plot (NR Band n66 – 5.0MHz - Full RB)

7.4 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is 43 + 10 $\log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 18GHz (separated into at least two plots per channel)
2. RBW ≥ 100kHz
3. VBW ≥ 3 x RBW
4. Detector = RMS
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

Test Setup

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

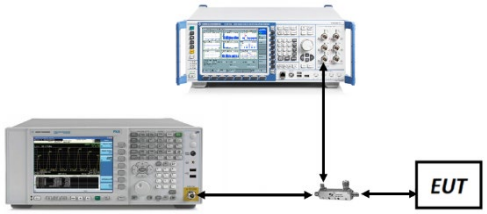
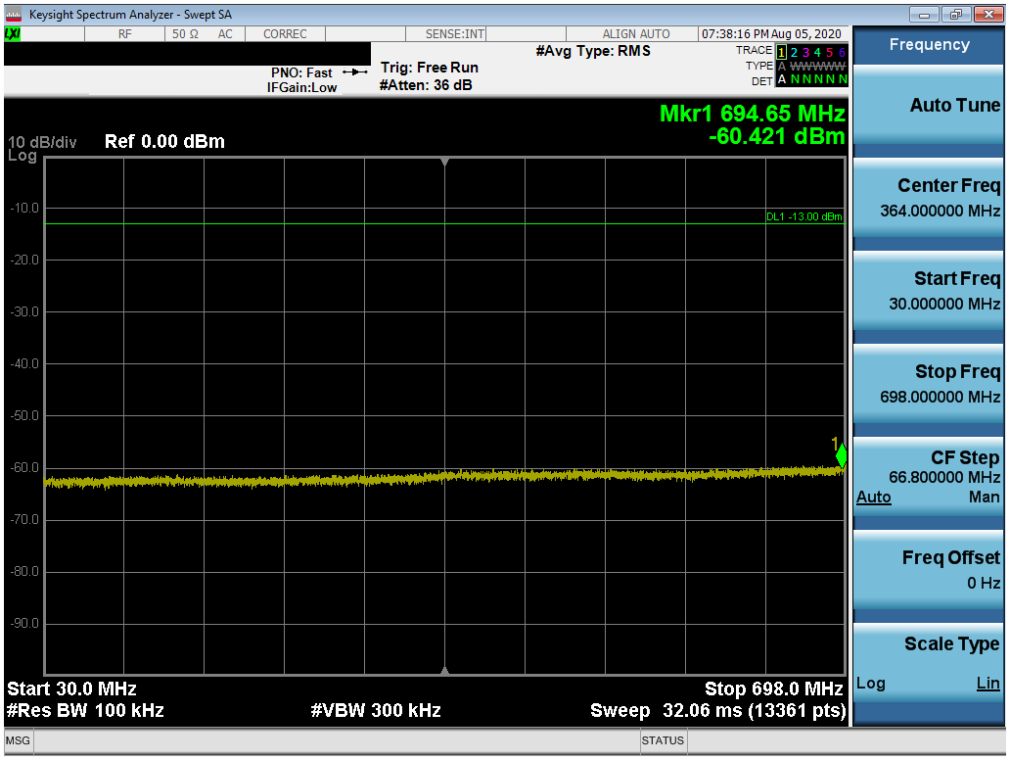


Figure 7-4. Test Instrument & Measurement Setup

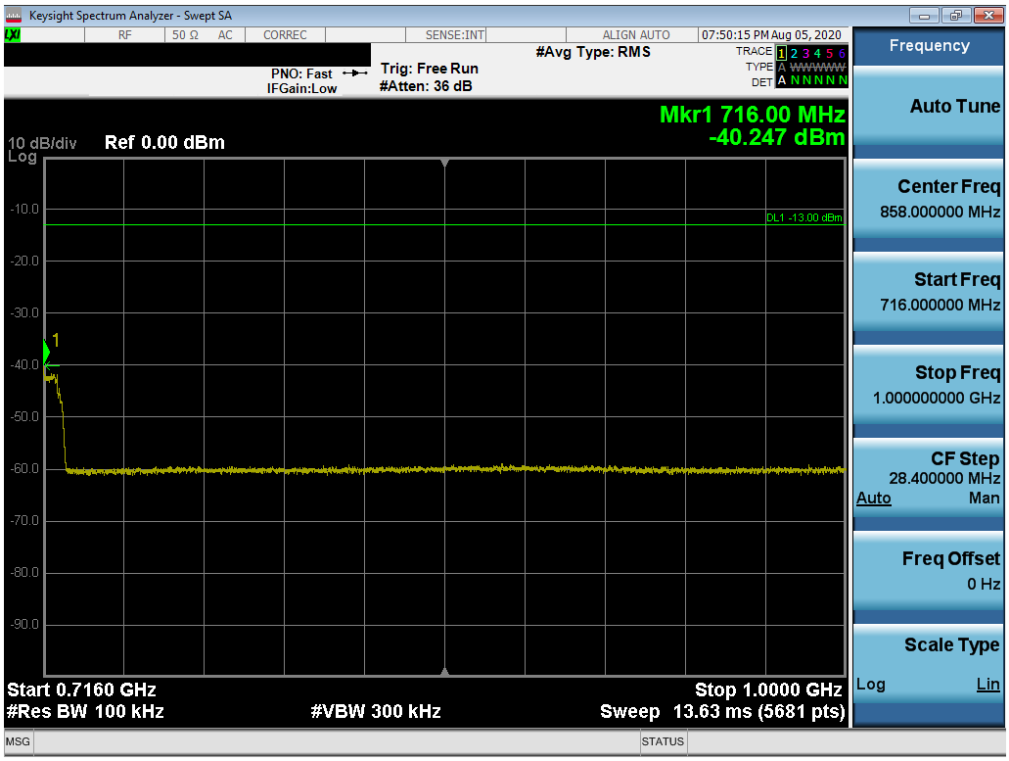
Test Notes

1. Per Part 27 and RSS-139, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

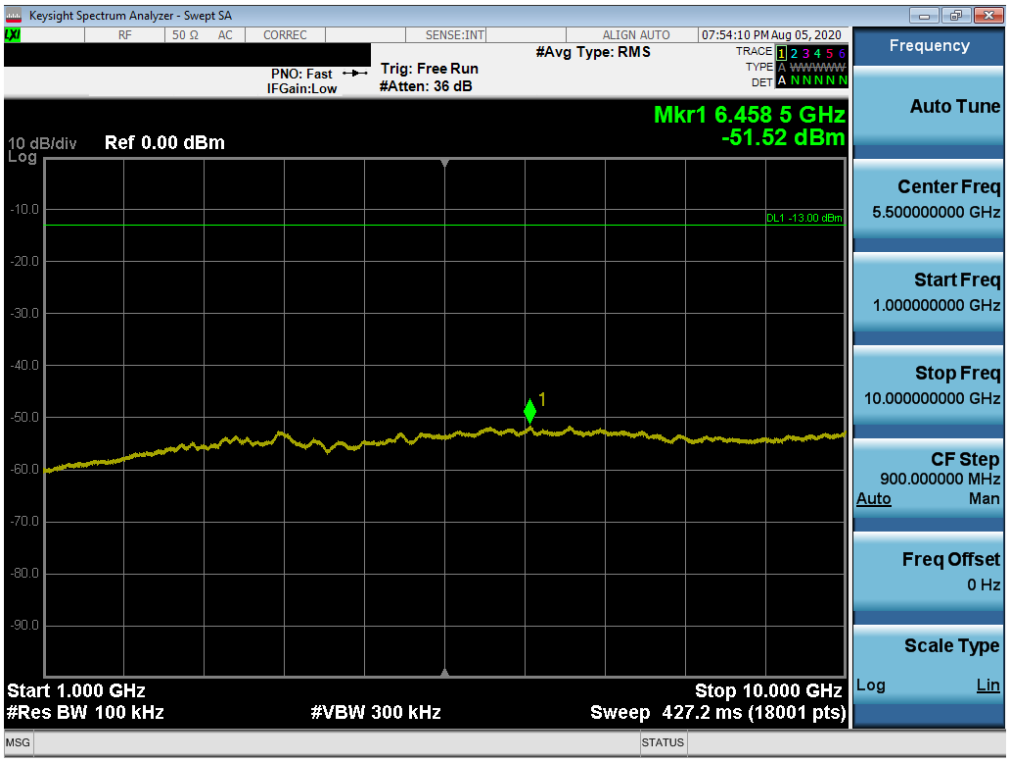
2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.



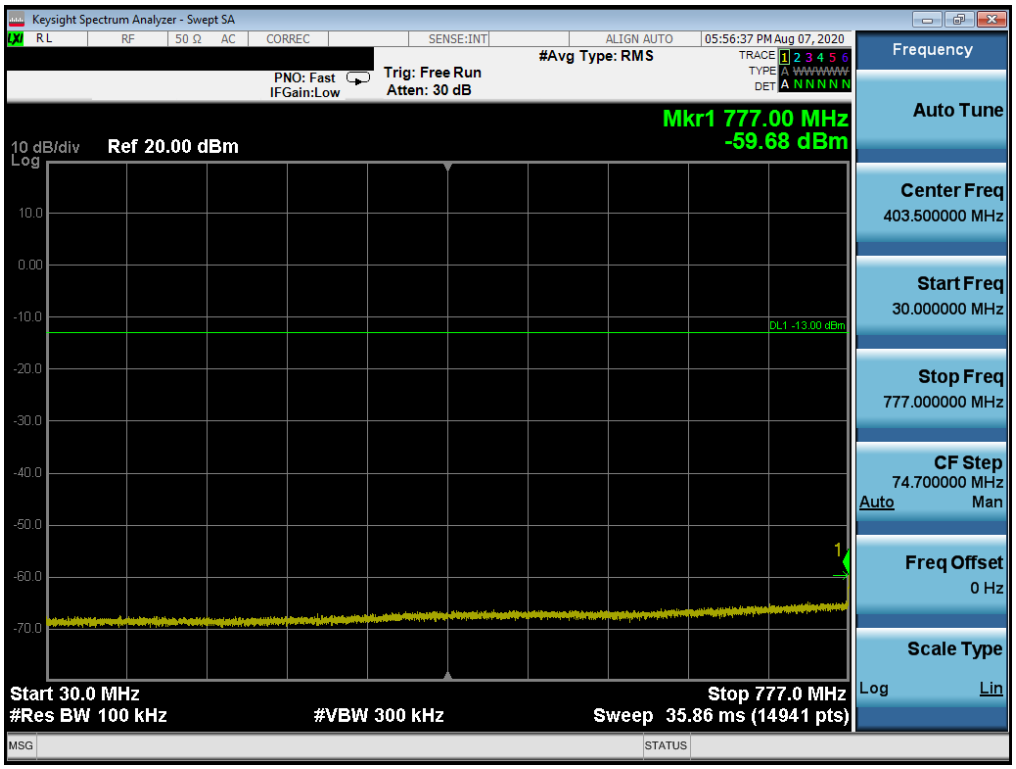
Plot 7-128. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



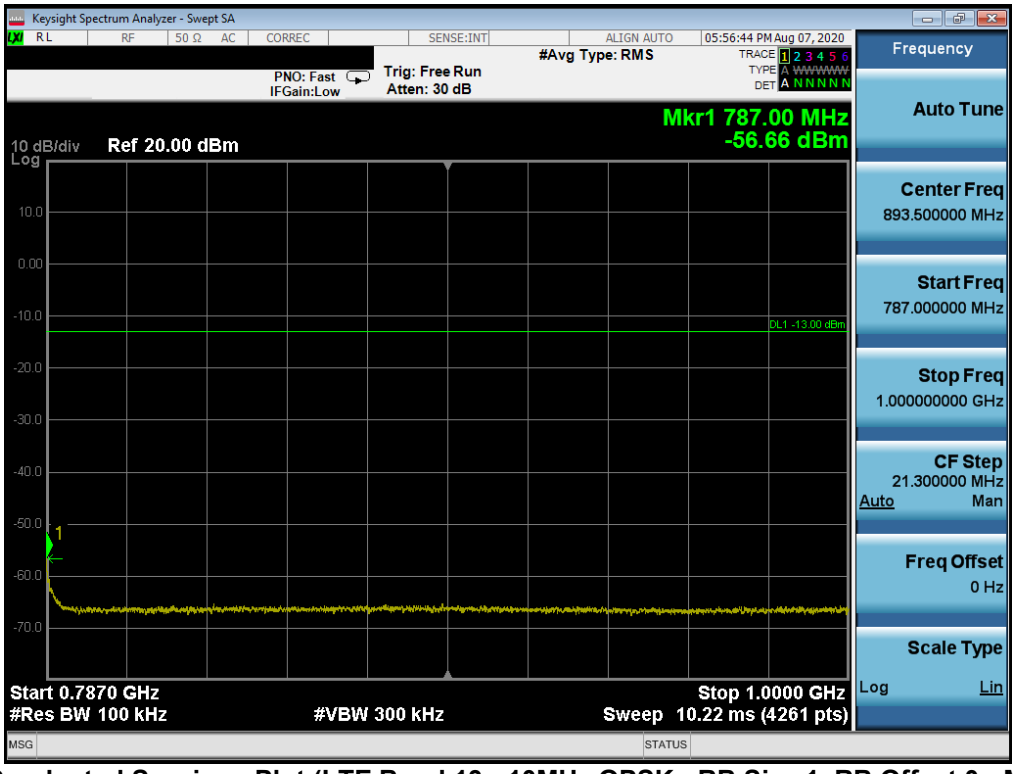
Plot 7-129. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



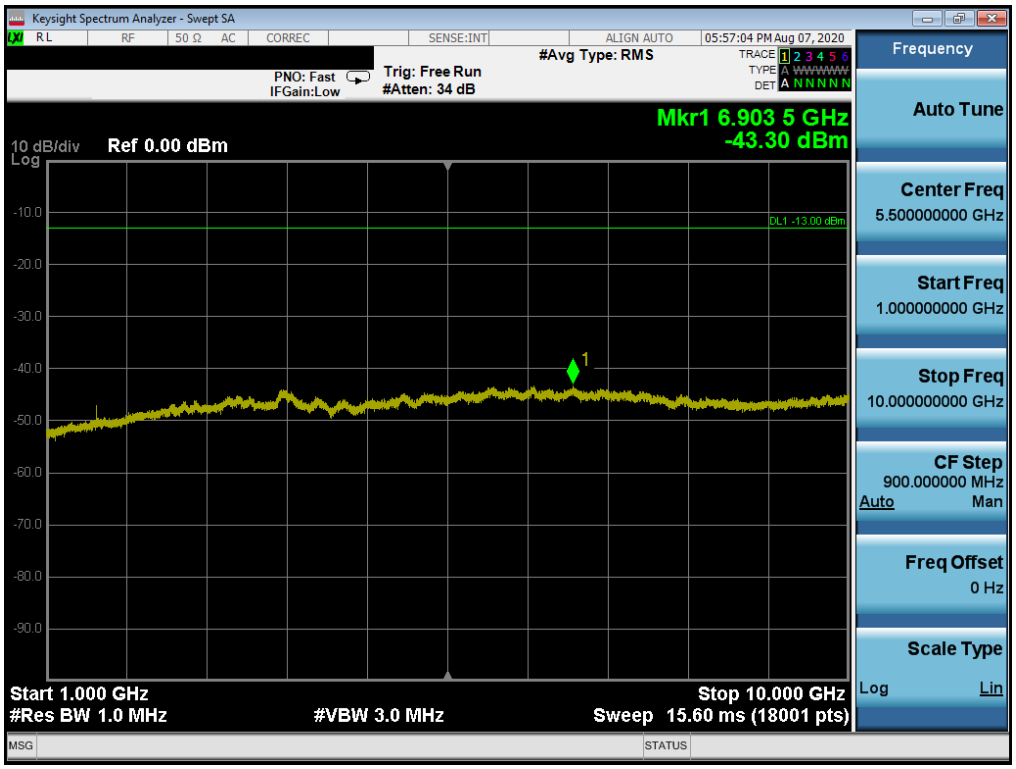
Plot 7-130. Conducted Spurious Plot (LTE Band 12/17 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-131. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

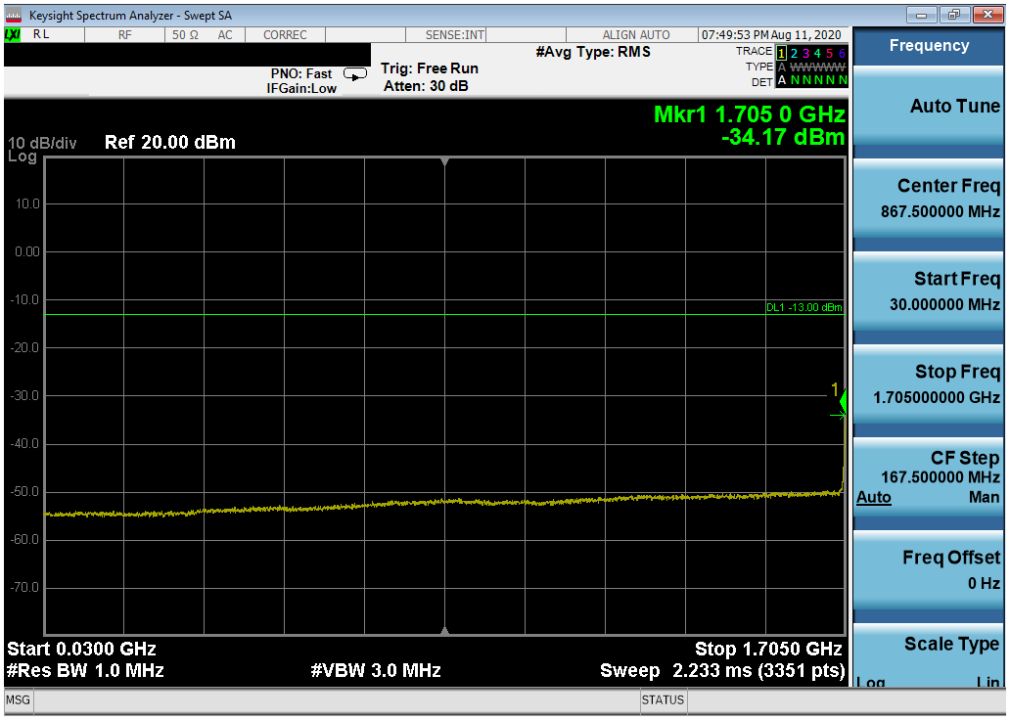


Plot 7-132. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

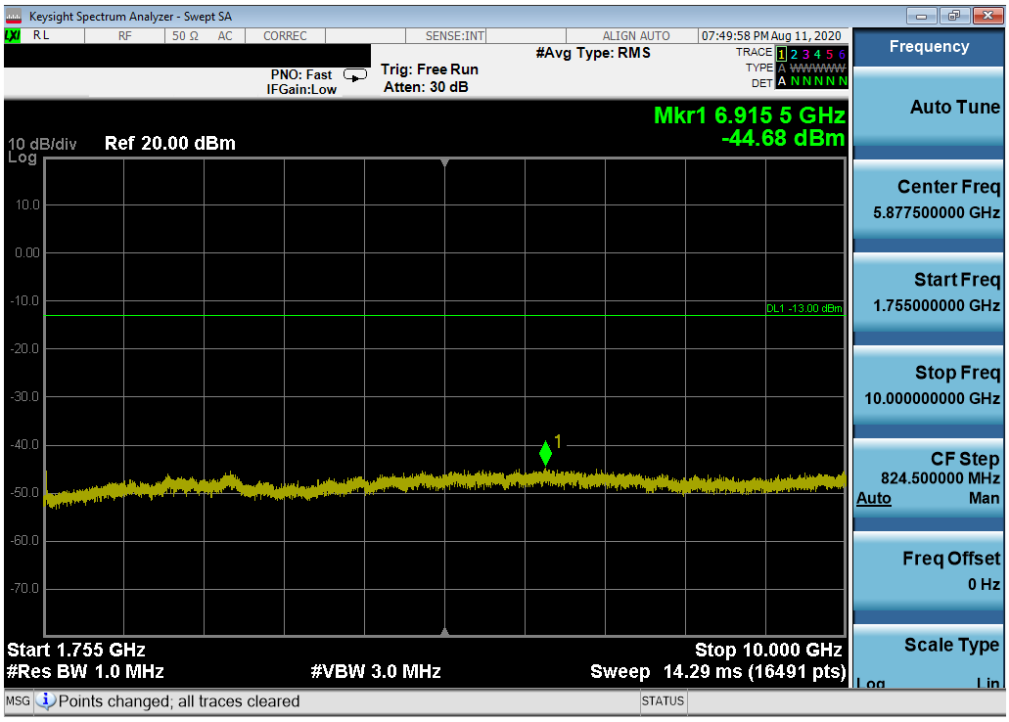


Plot 7-133. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

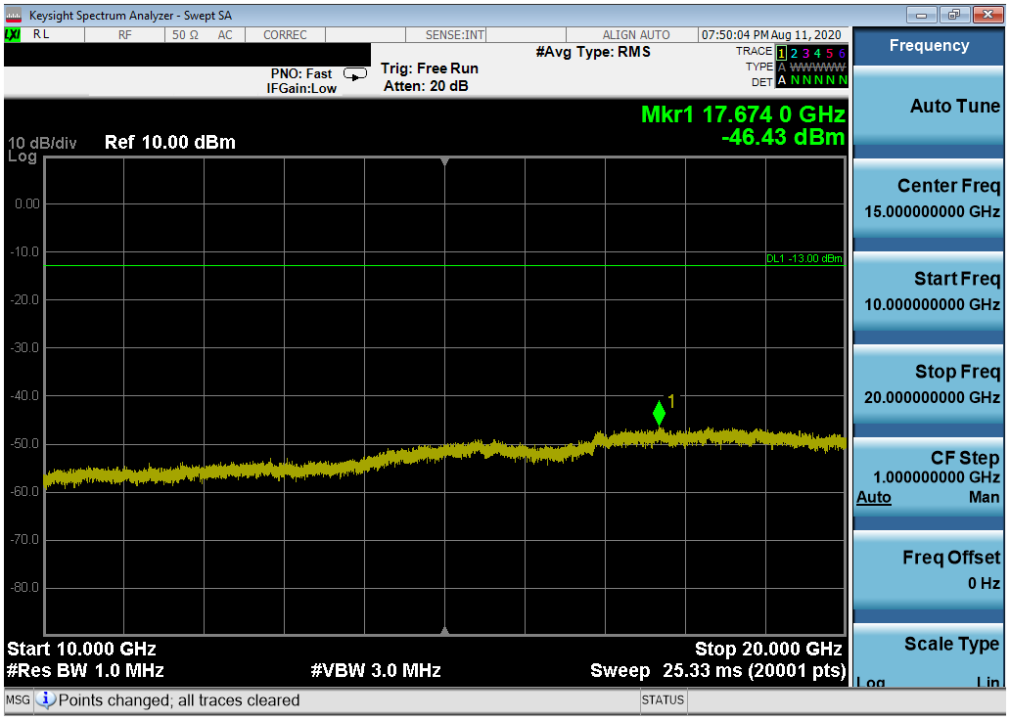
WCDMA AWS



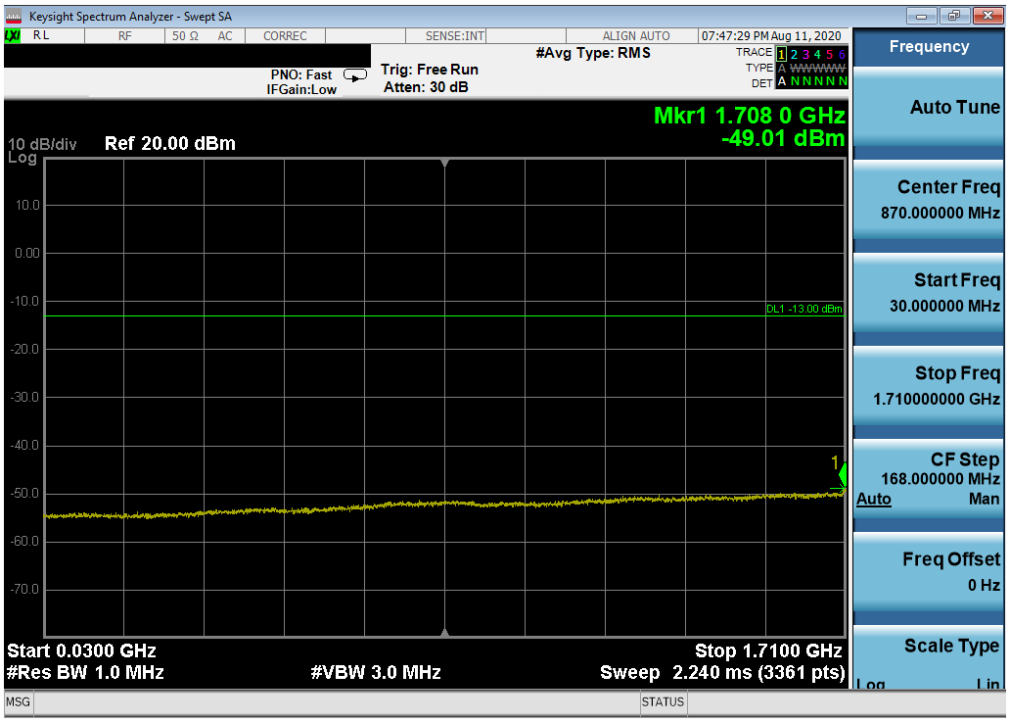
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)



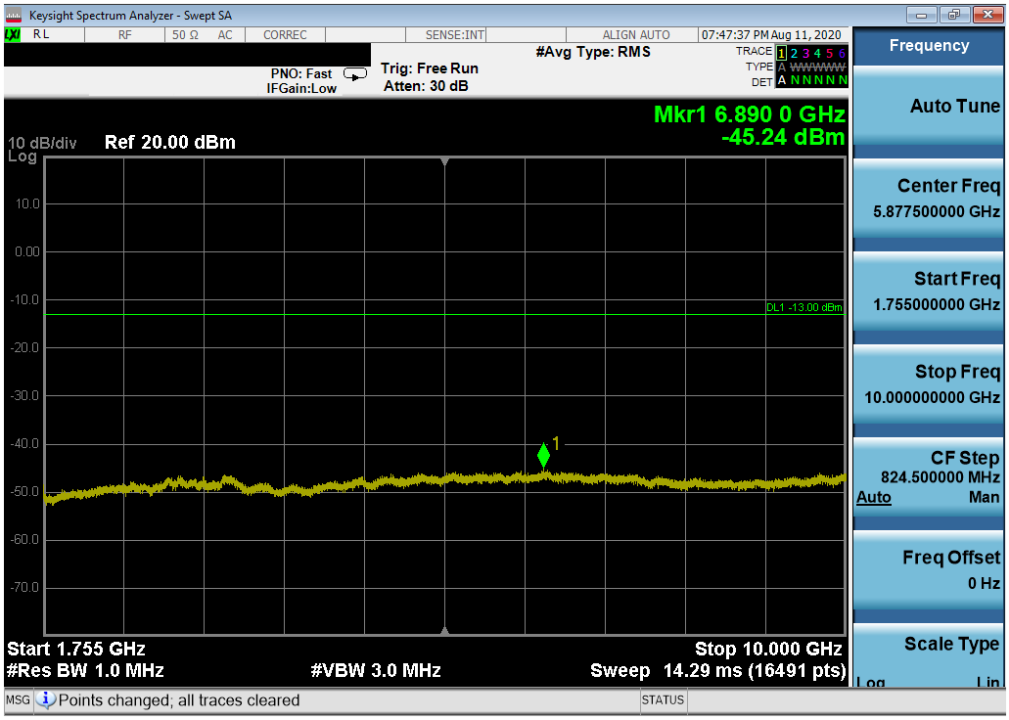
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)



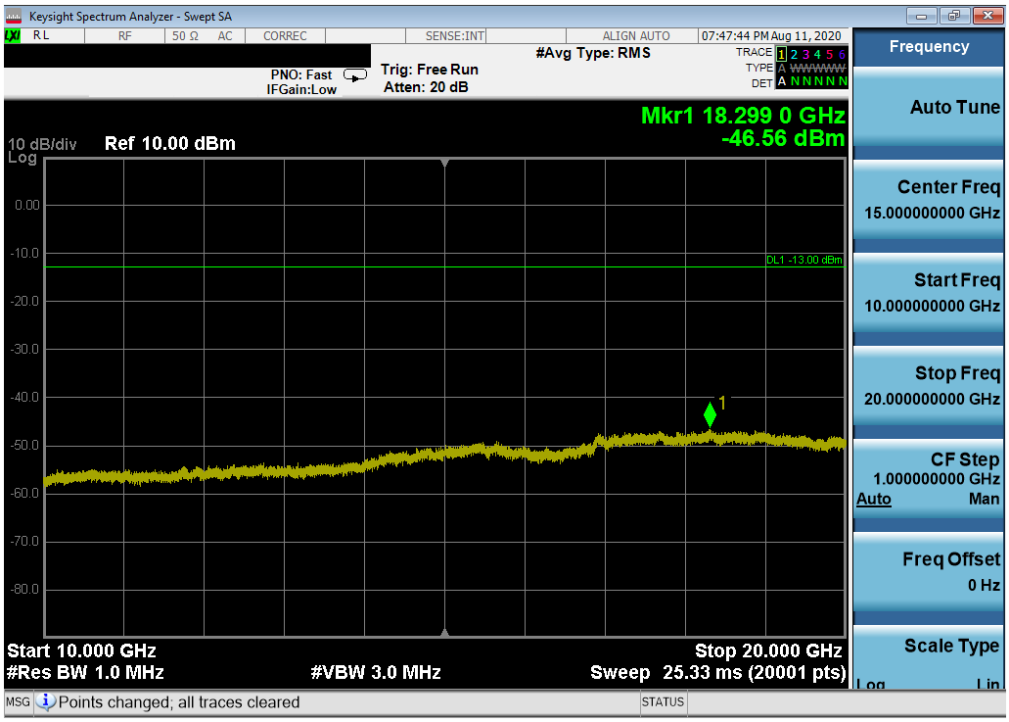
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)



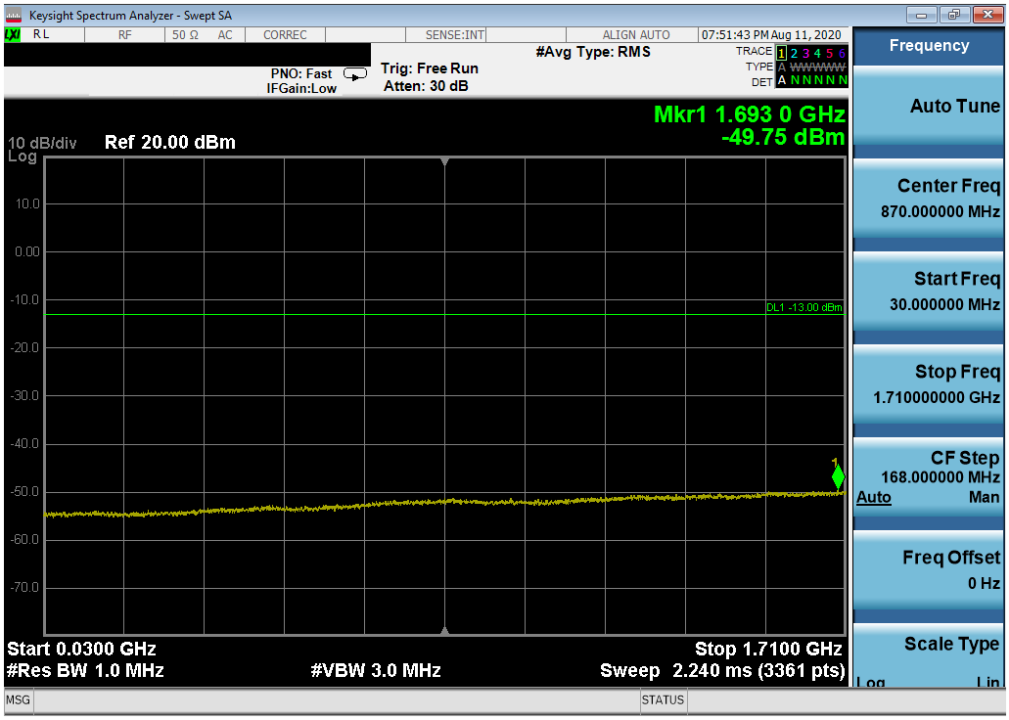
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)



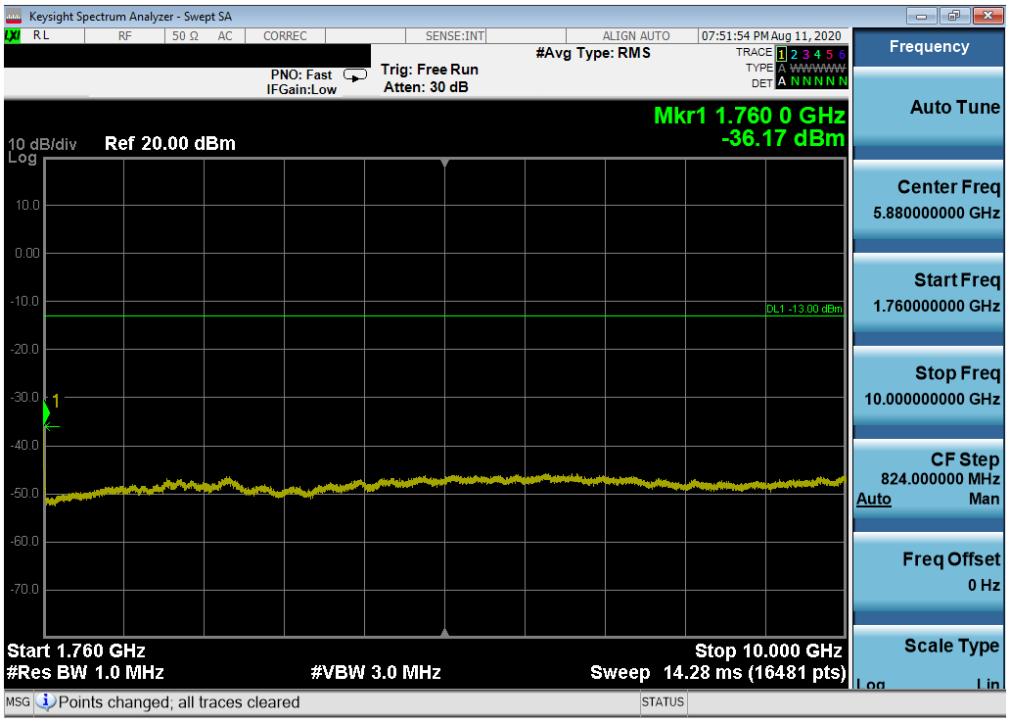
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)



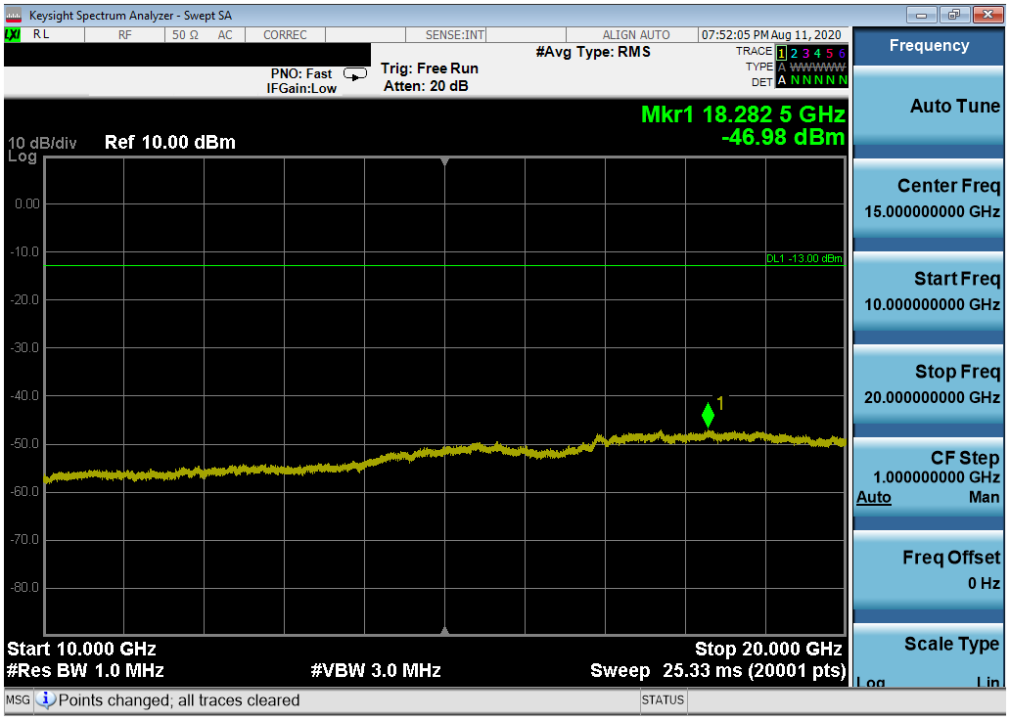
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)



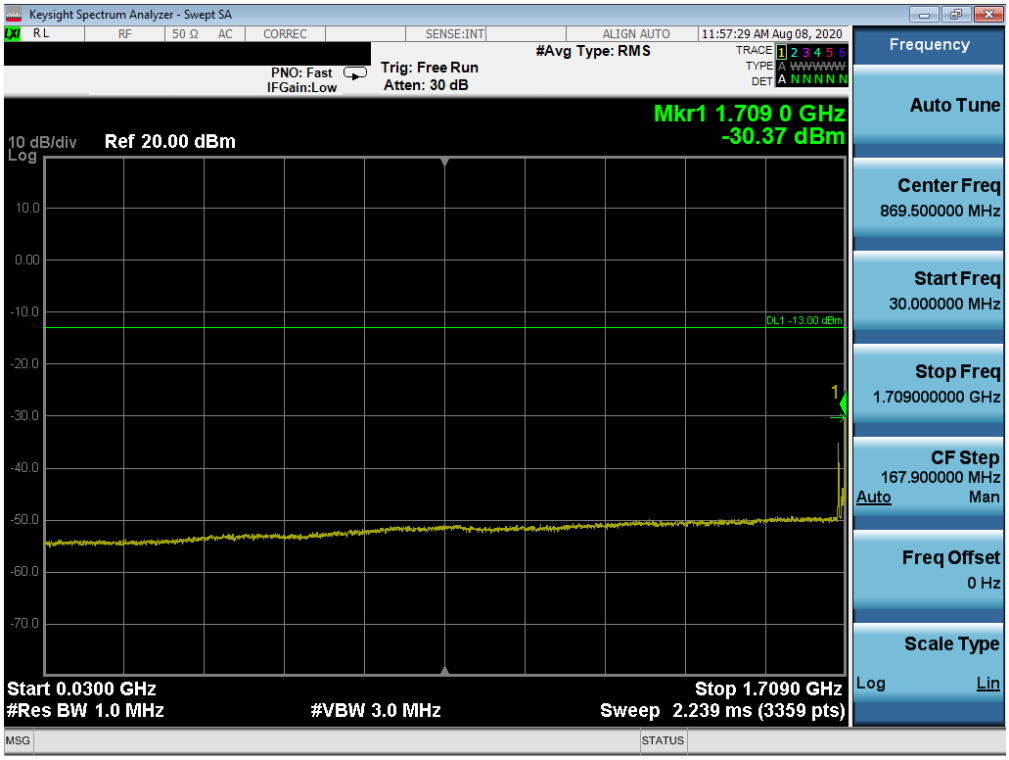
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)



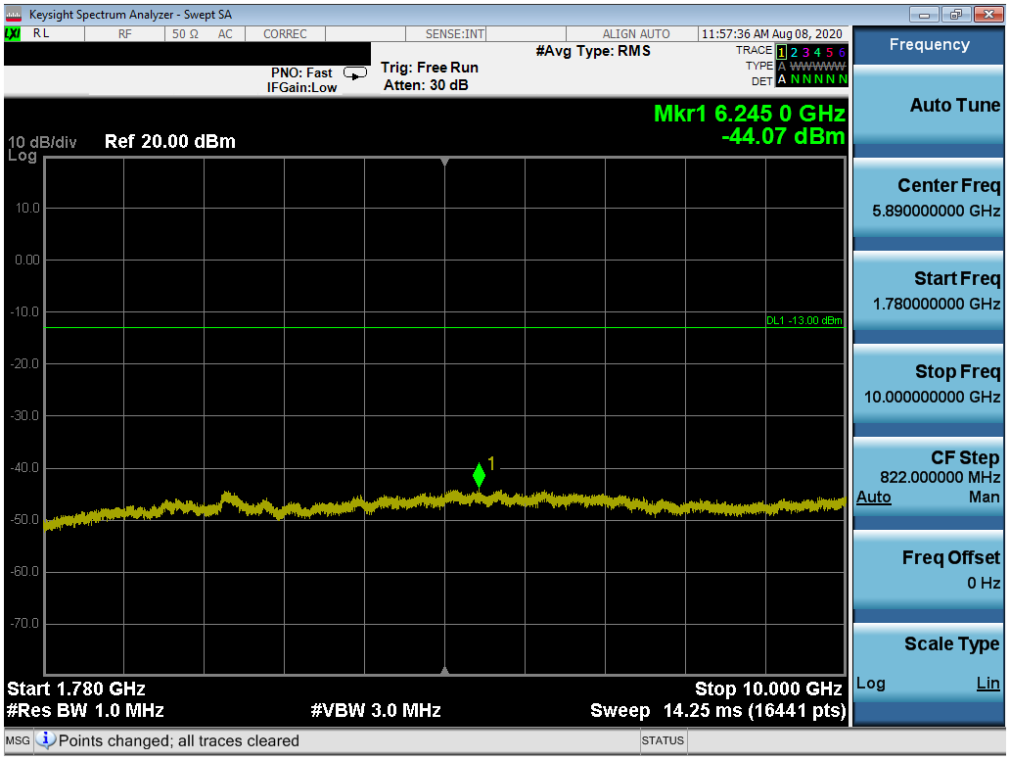
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)



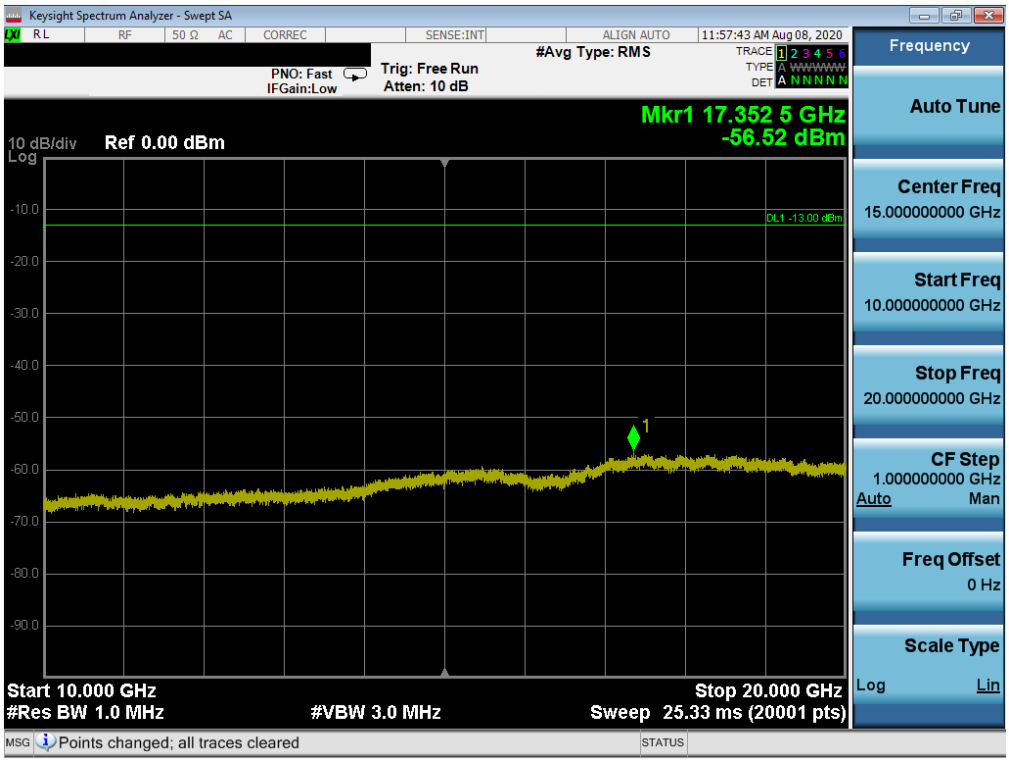
Plot 7-31. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)



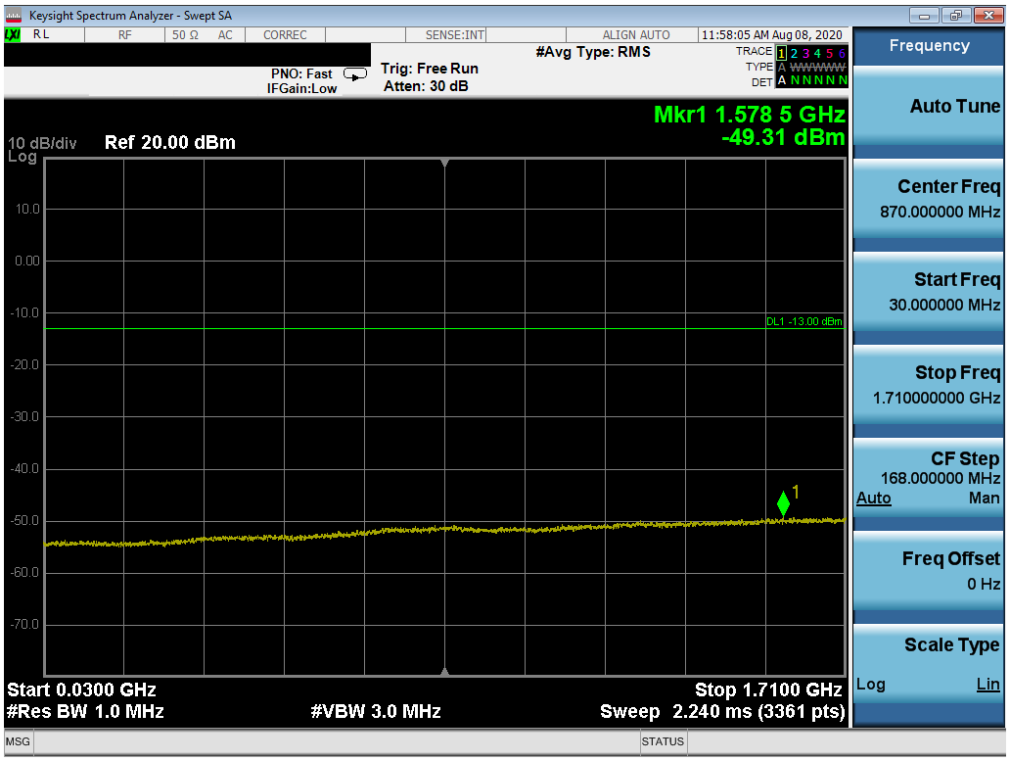
Plot 7-134. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



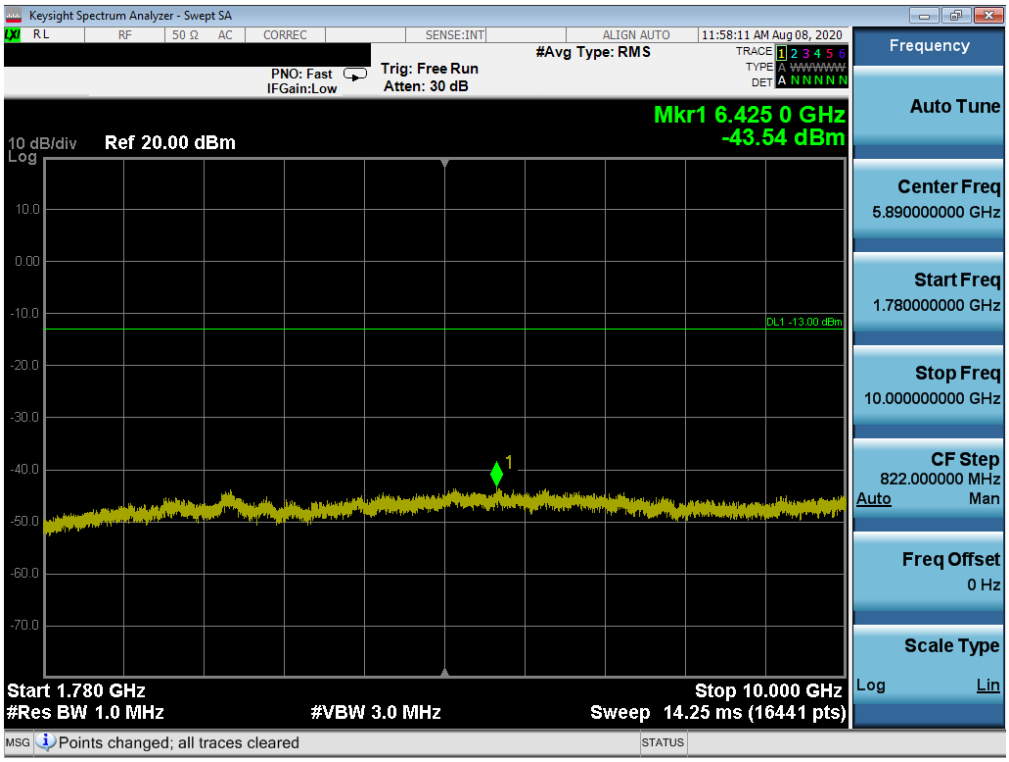
Plot 7-135. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



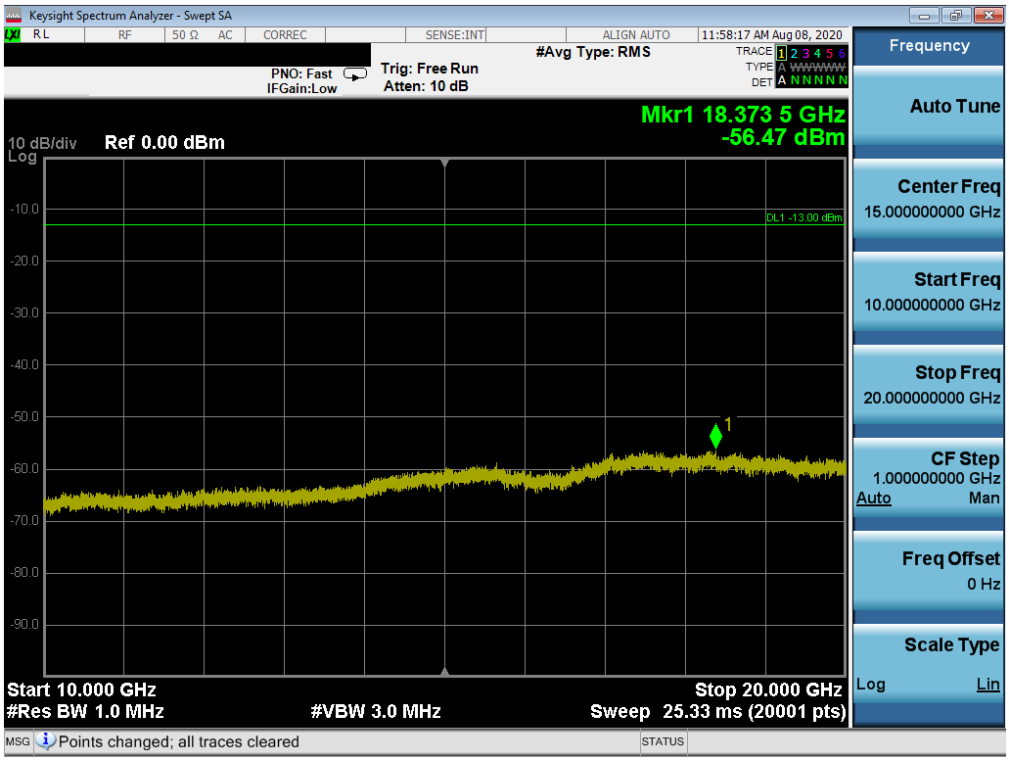
Plot 7-136. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



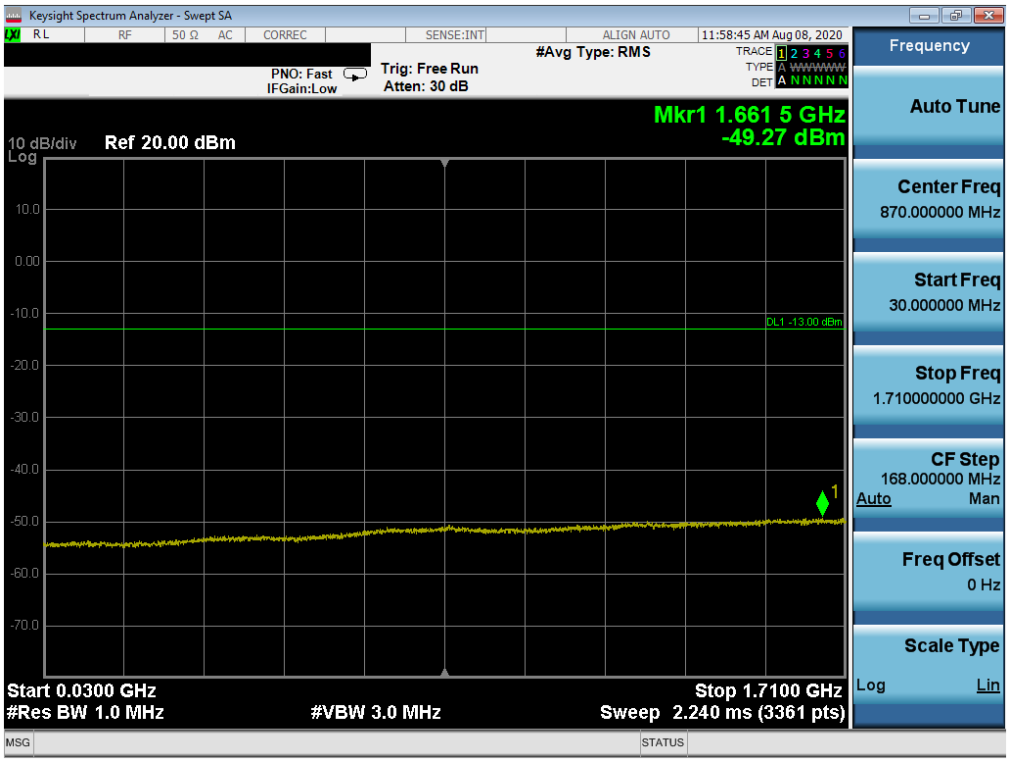
Plot 7-137. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



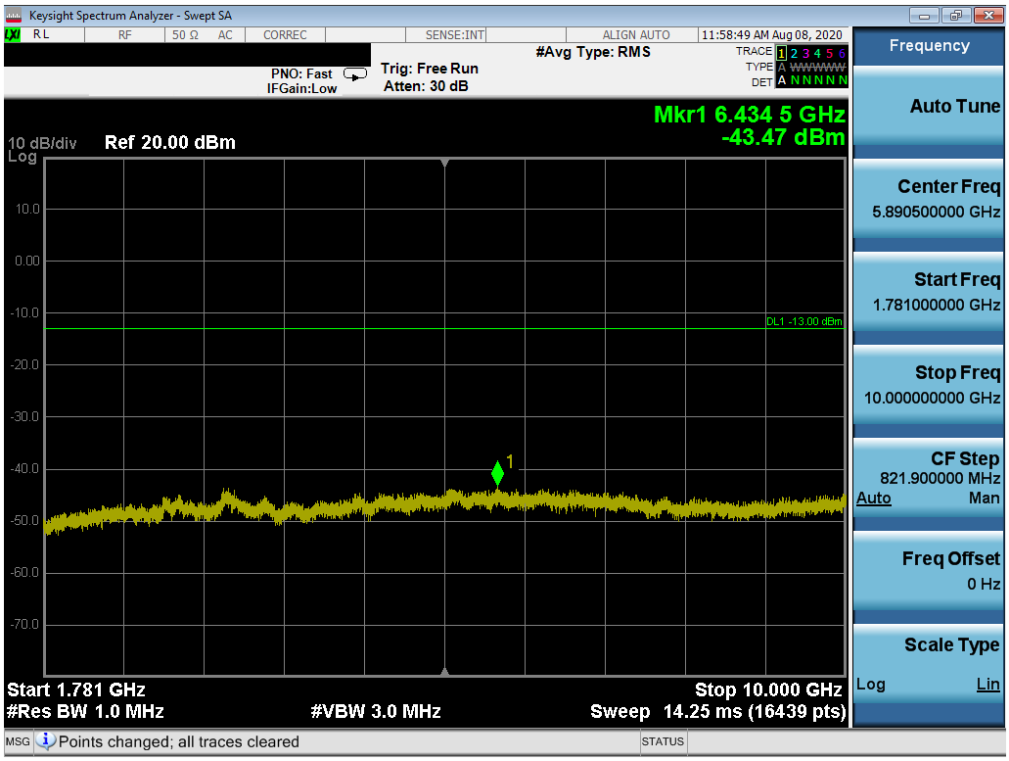
Plot 7-138. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



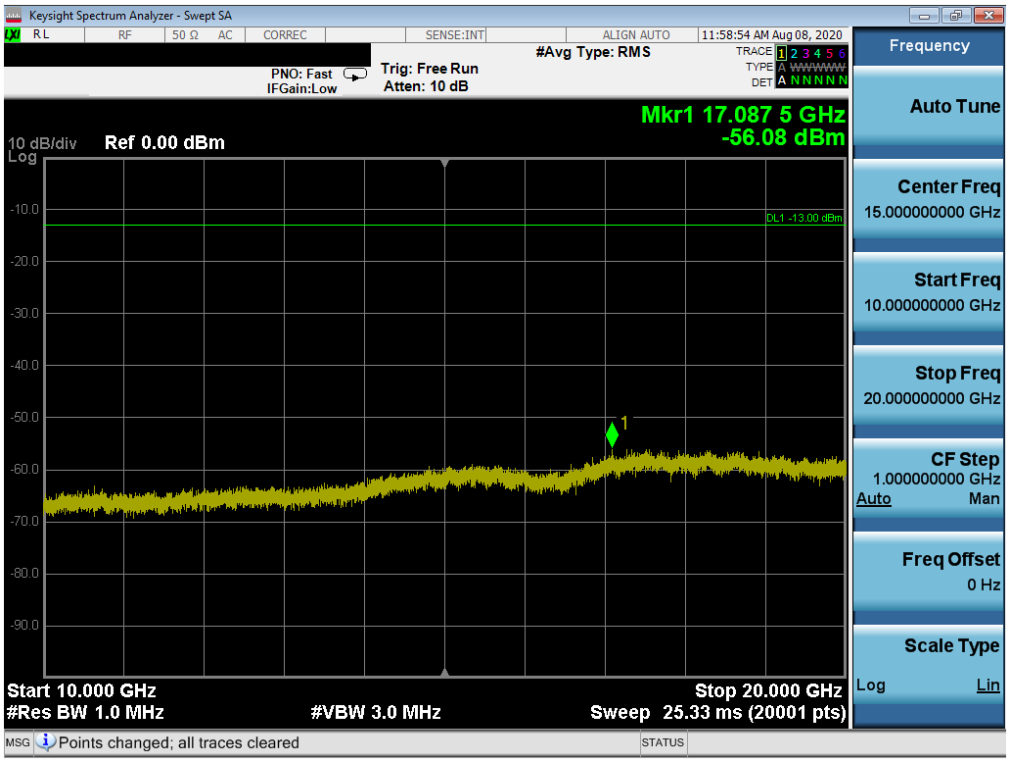
Plot 7-139. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



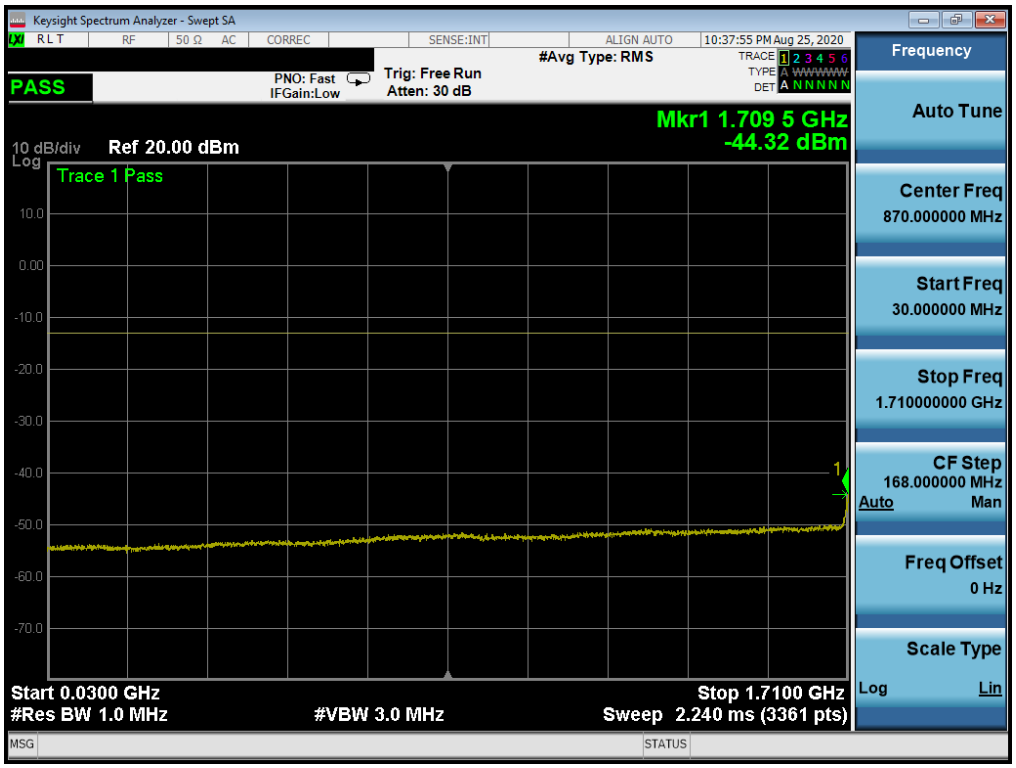
Plot 7-140. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



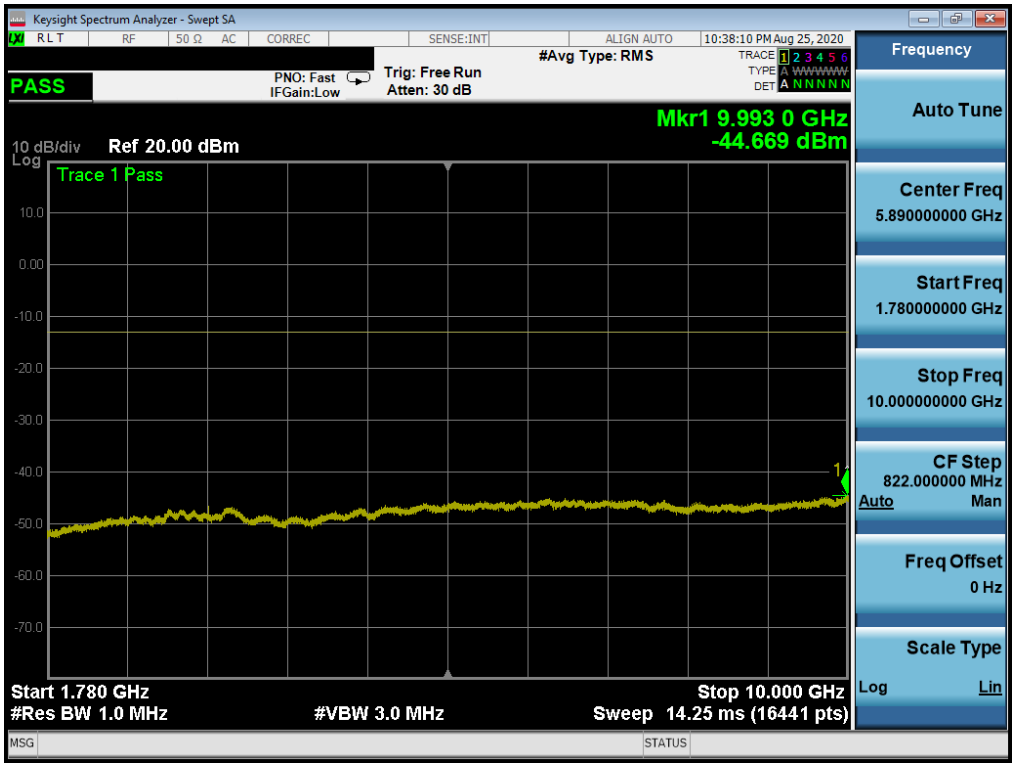
Plot 7-141. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-142. Conducted Spurious Plot (LTE Band 66/4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

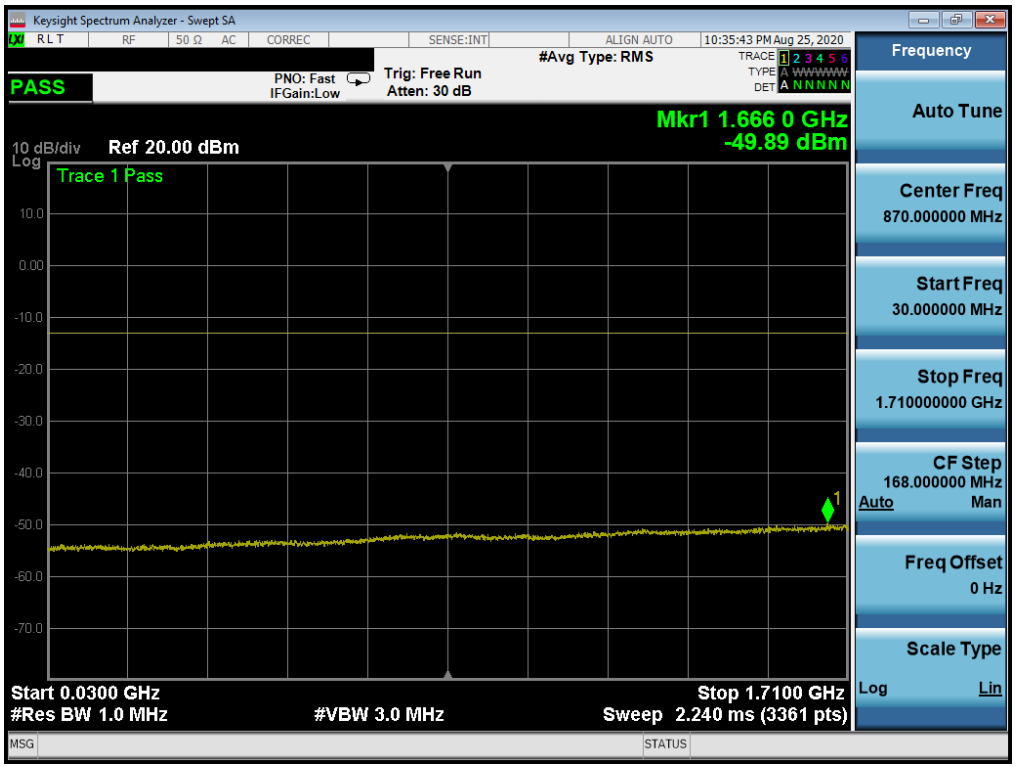


Plot 7-143. Conducted Spurious Plot (NR Band n66 -20.0MHz - RB Size 1, RB Offset 0 - Low Channel)

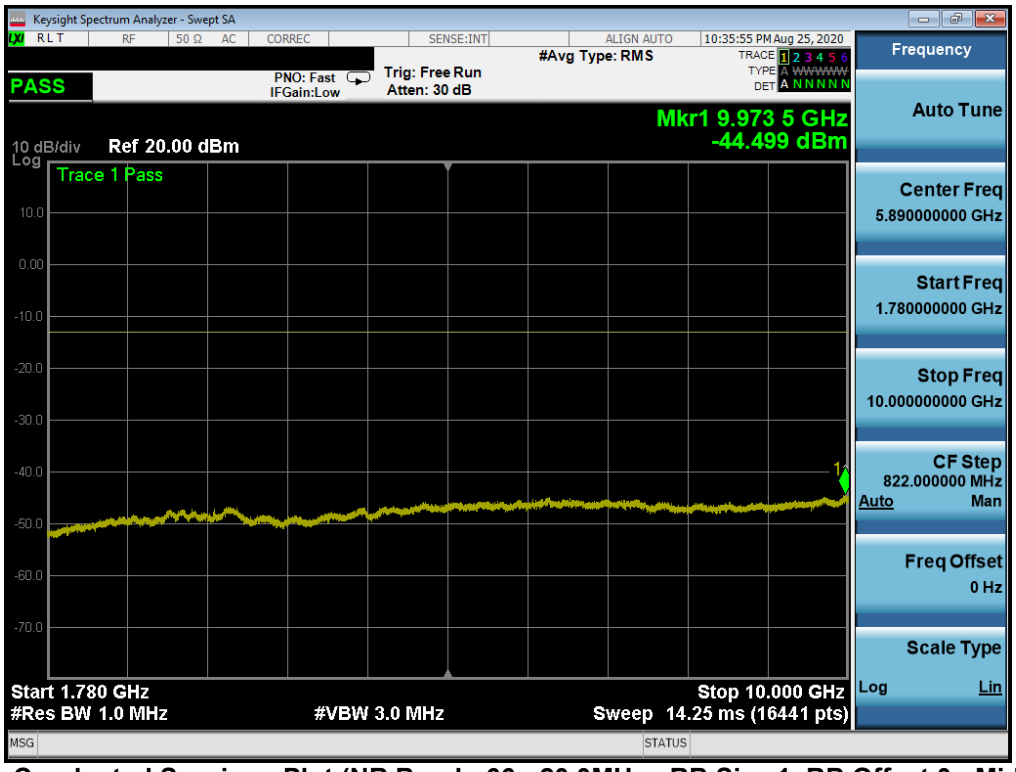


Plot 7-144. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Low Channel)

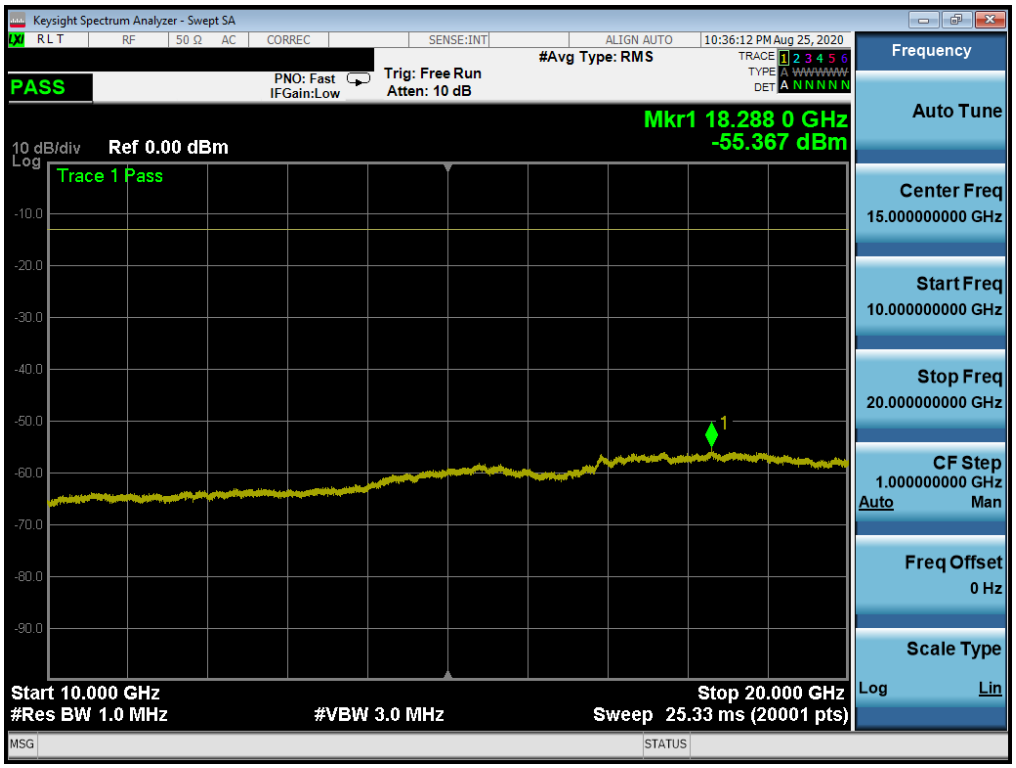
Plot 7-145. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Low Channel)



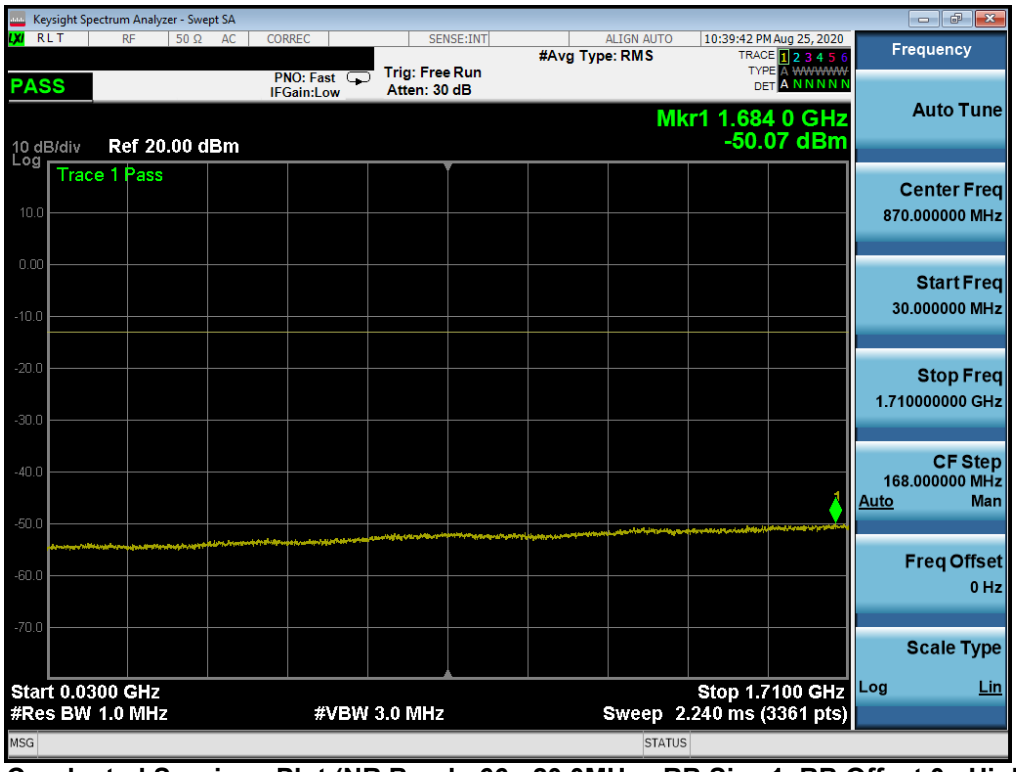
Plot 7-146. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Mid Channel)



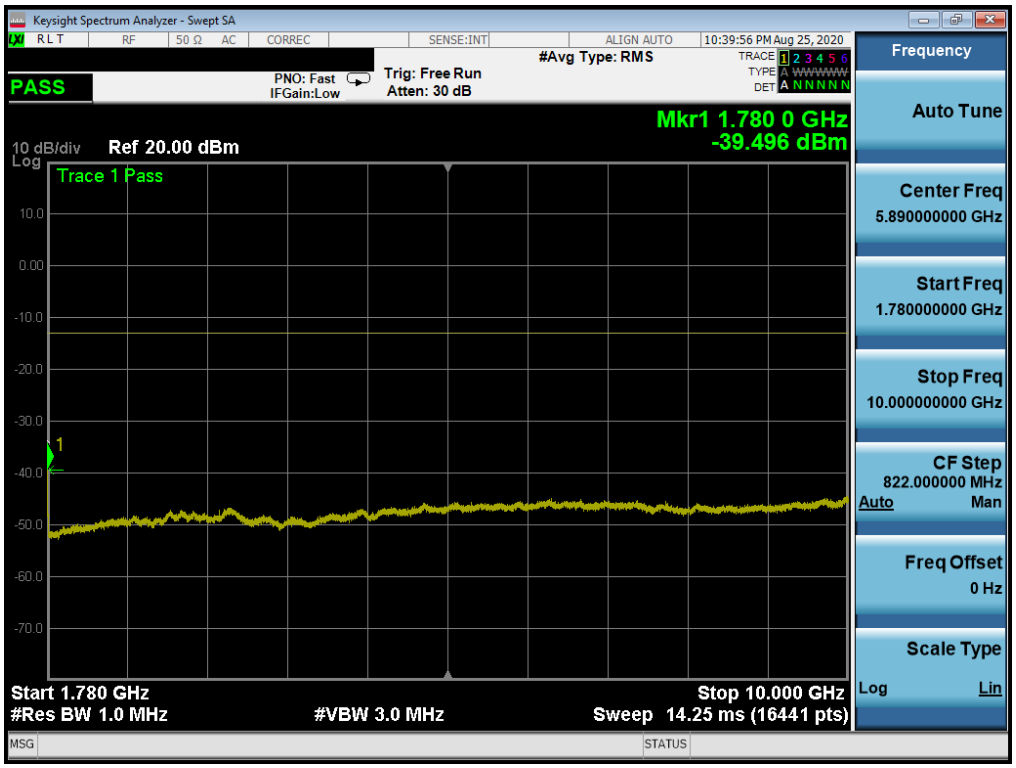
Plot 7-147. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Mid Channel)



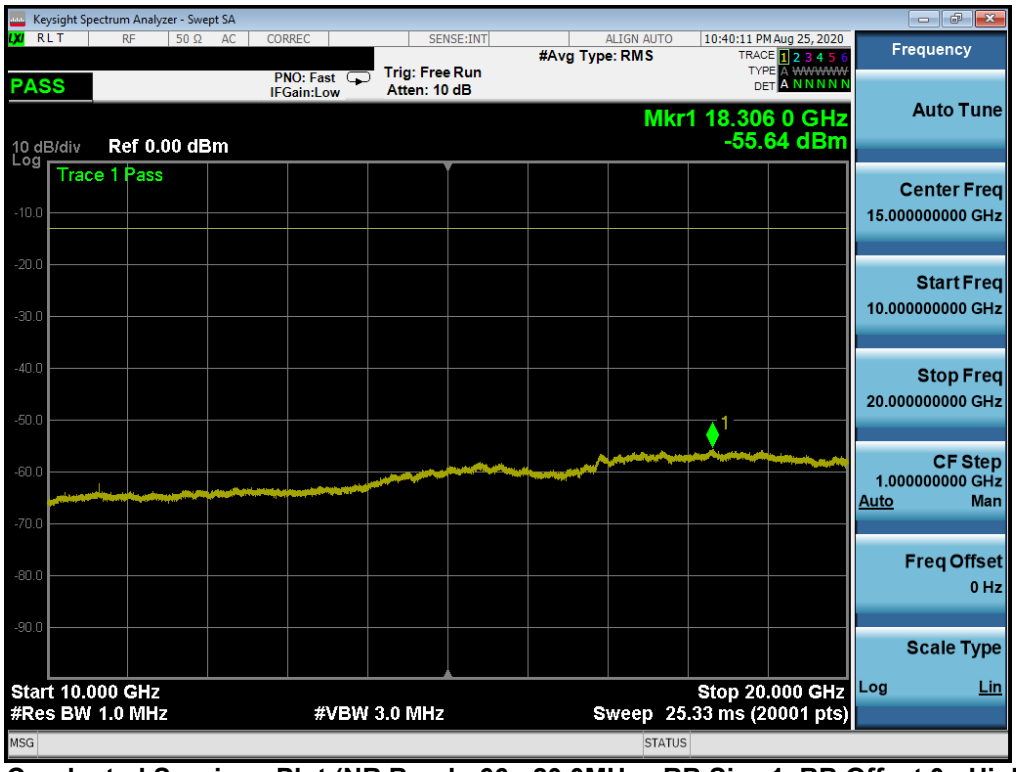
Plot 7-148. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - Mid Channel)



Plot 7-149. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - High Channel)



Plot 7-150. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - High Channel)



Plot 7-151. Conducted Spurious Plot (NR Band n66 - 20.0MHz - RB Size 1, RB Offset 0 - High Channel)

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.

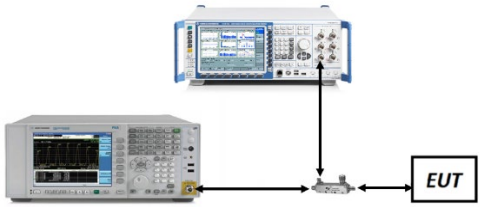
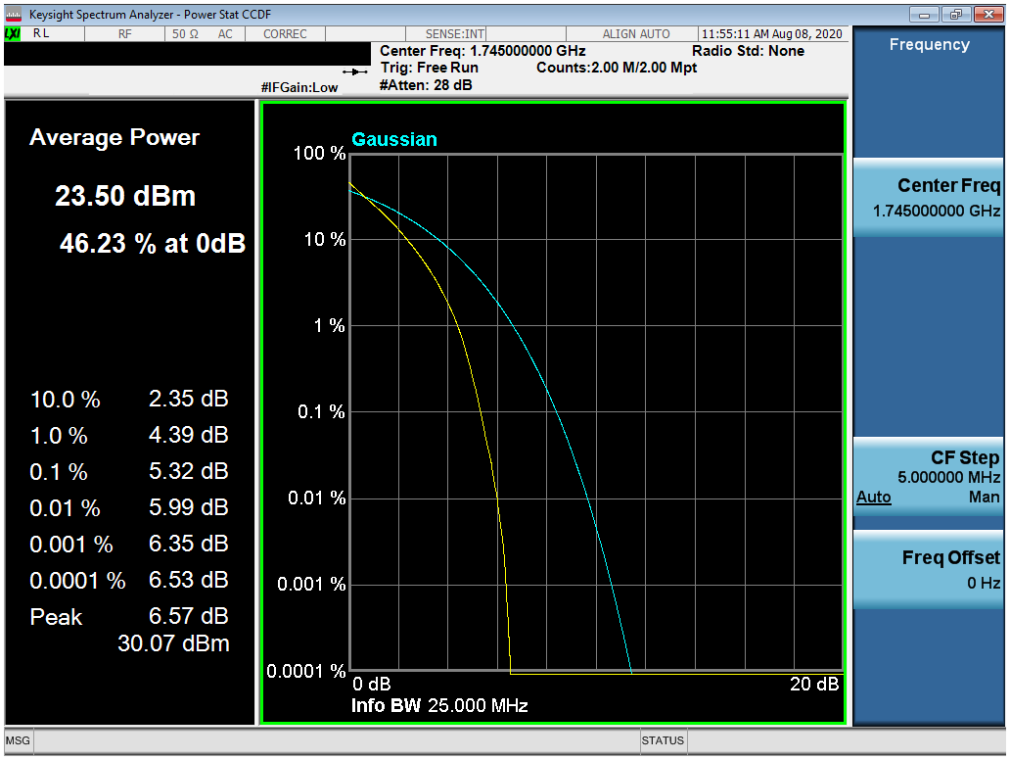


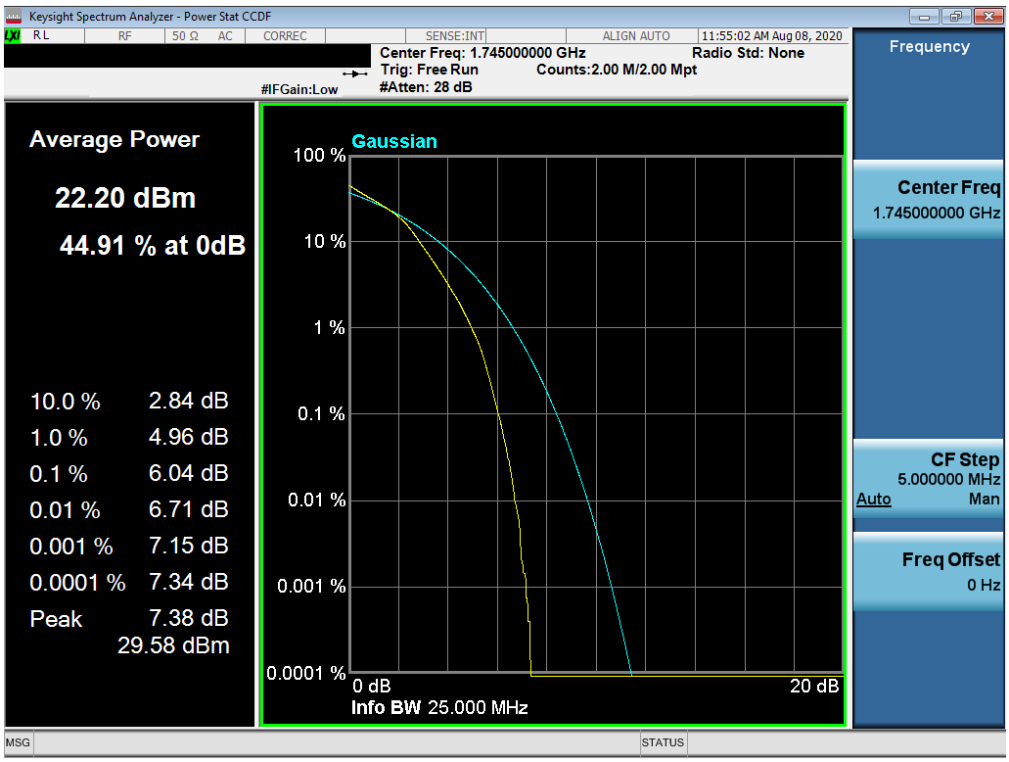
Figure 7-5. Test Instrument & Measurement Setup

Test Notes

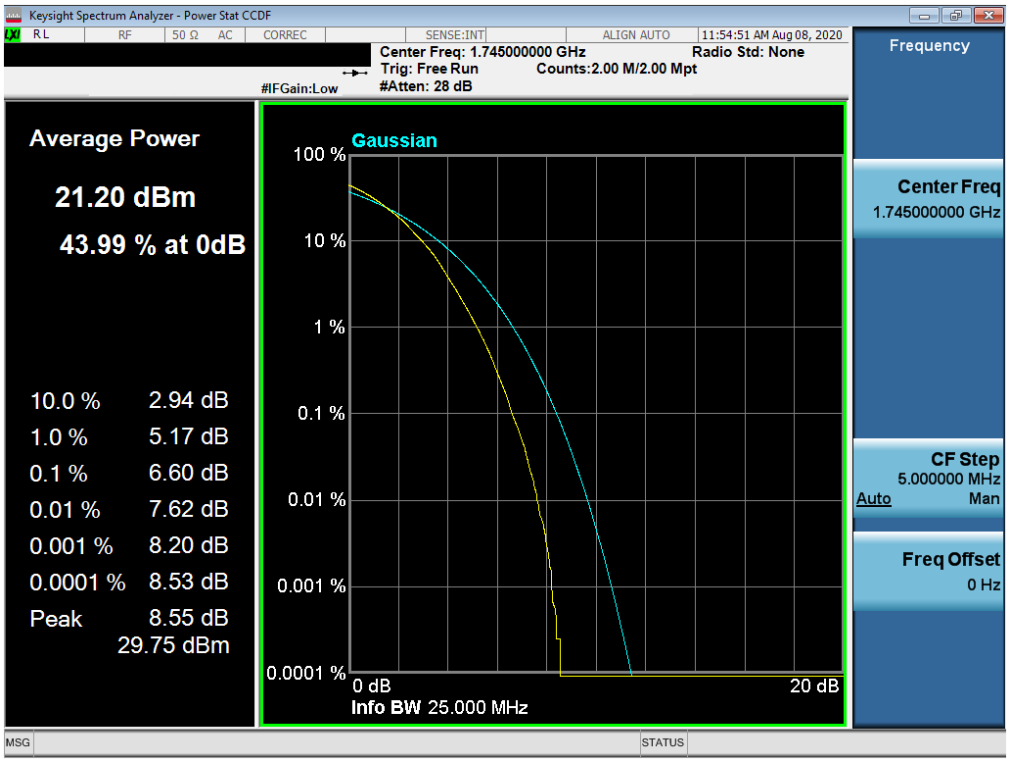
None.



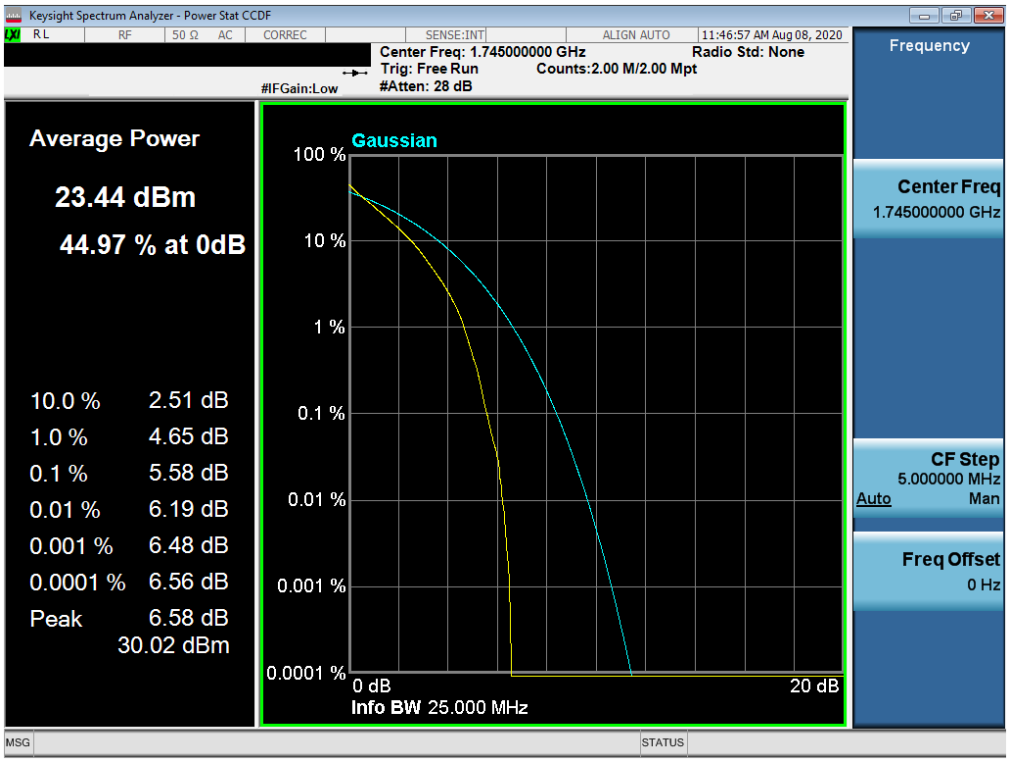
Plot 7-152. PAR Plot (LTE Band 66/4 - 20MHz QPSK - Full RB Configuration)



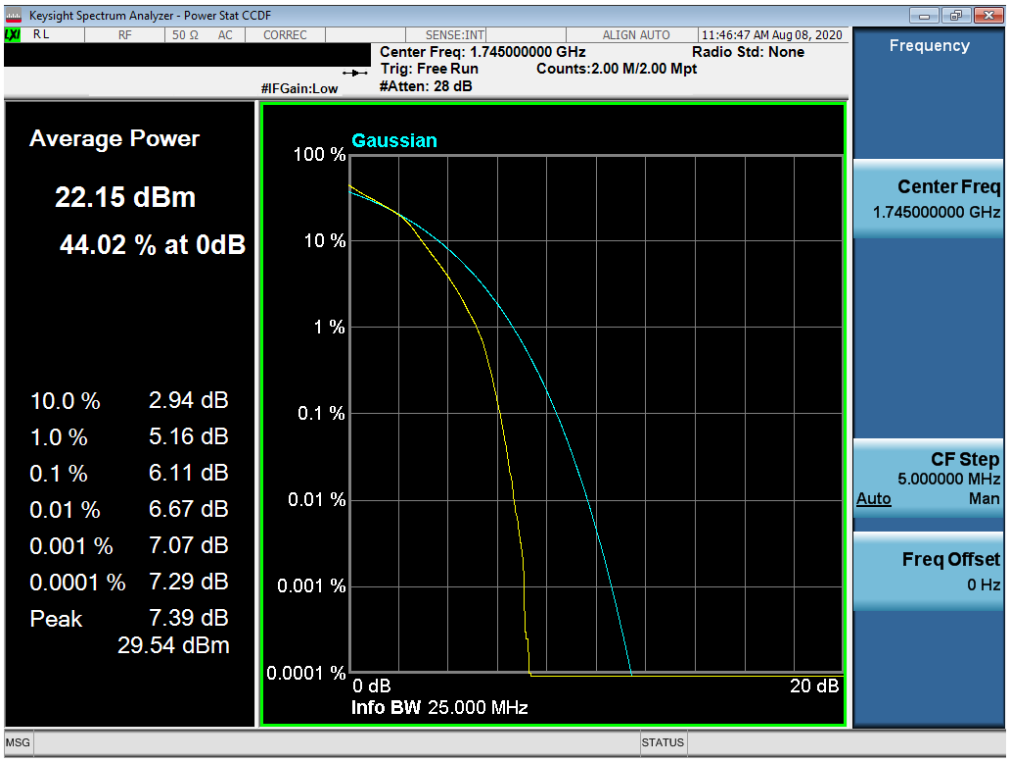
Plot 7-153. PAR Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB Configuration)



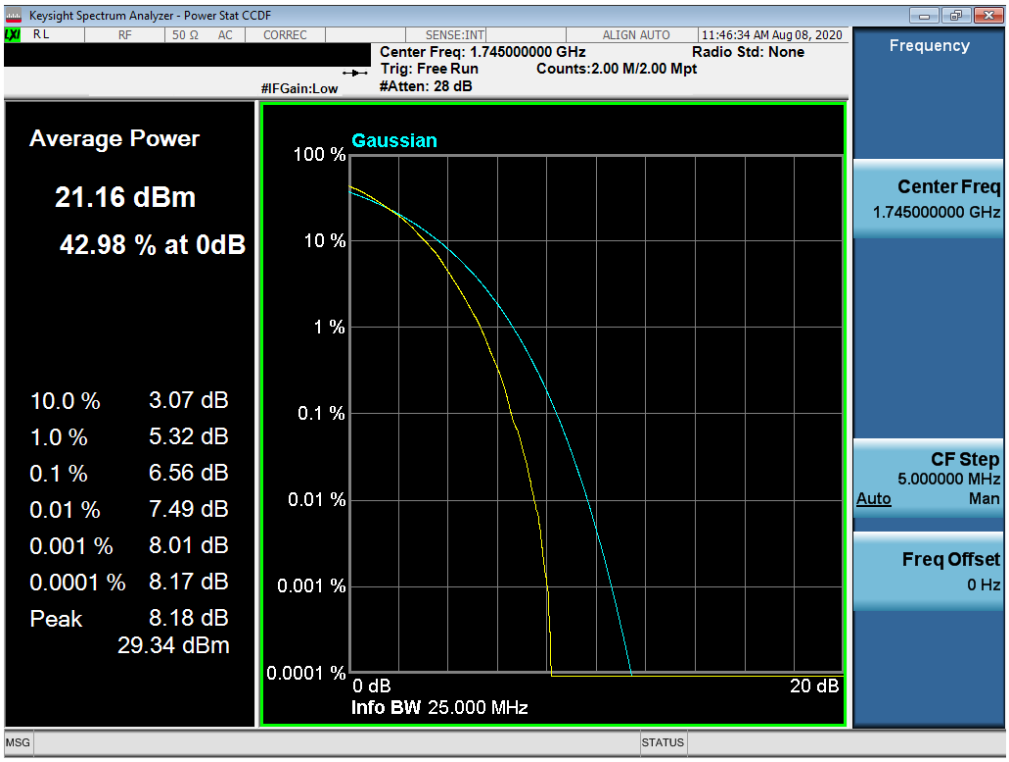
Plot 7-154. PAR Plot (LTE Band 66/4 - 20MHz 64-QAM - Full RB Configuration)



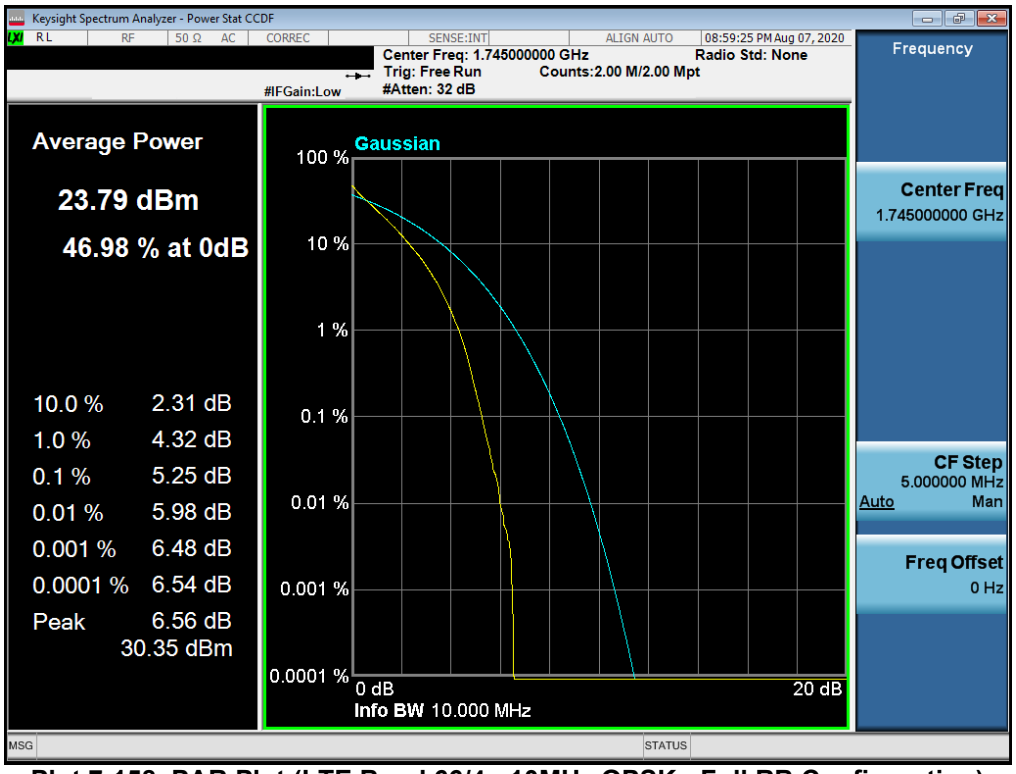
Plot 7-155. PAR Plot (LTE Band 66/4 - 15MHz QPSK - Full RB Configuration)



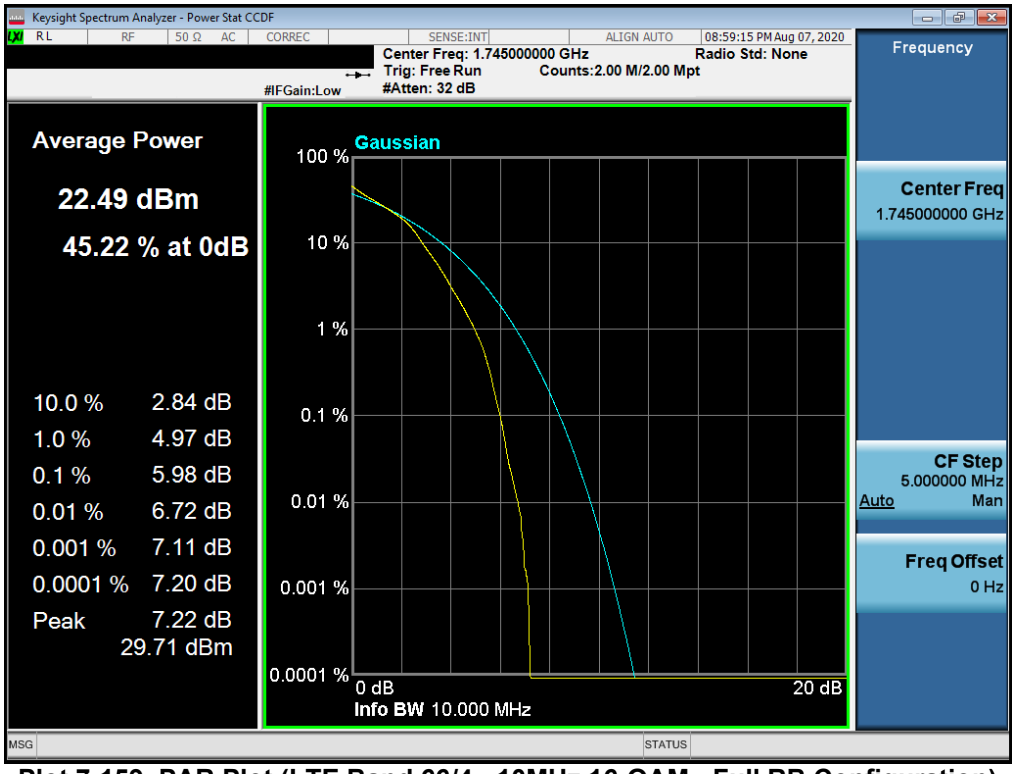
Plot 7-156. PAR Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB Configuration)



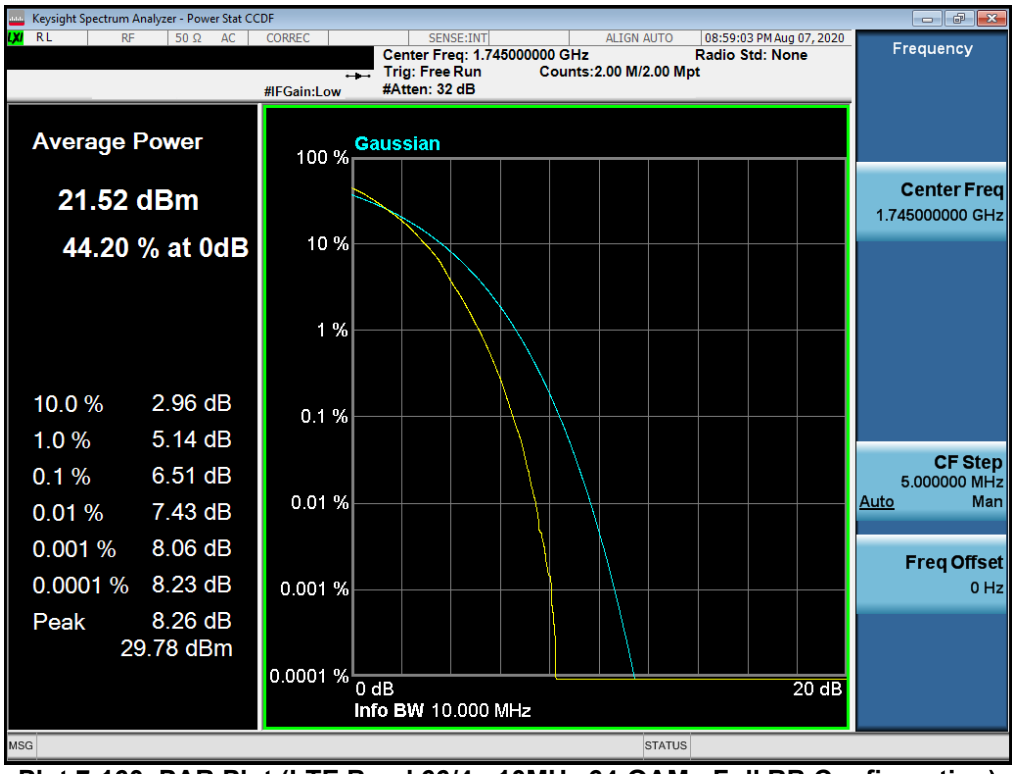
Plot 7-157. PAR Plot (LTE Band 66/4 - 15MHz 64-QAM - Full RB Configuration)



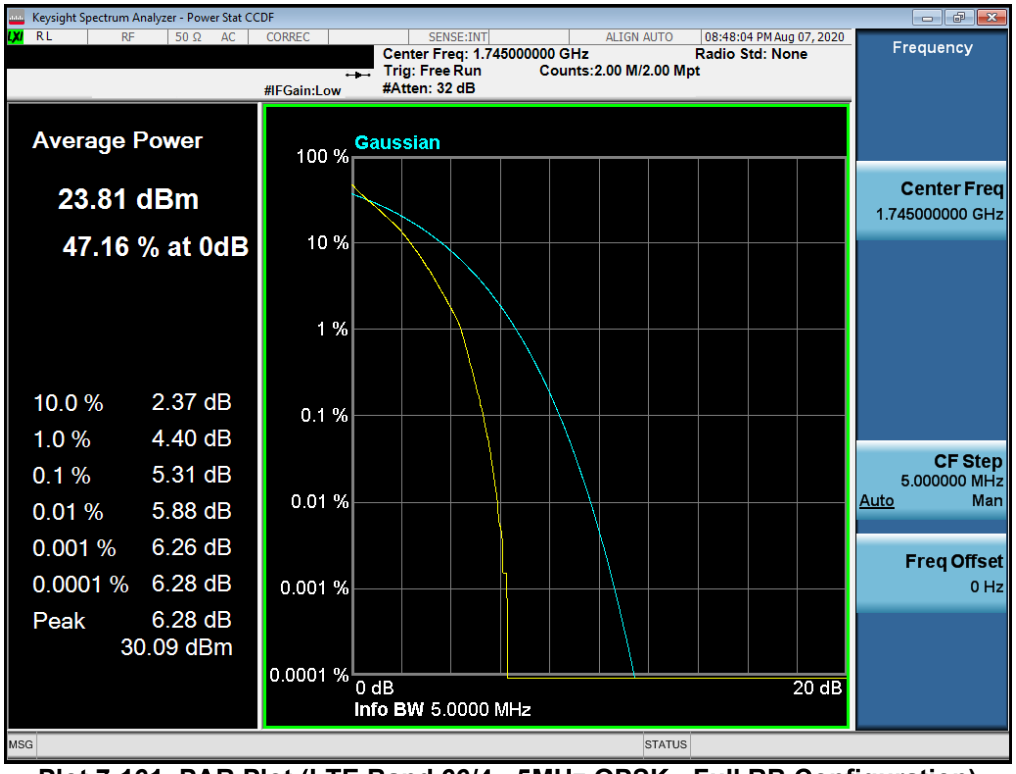
Plot 7-158. PAR Plot (LTE Band 66/4 - 10MHz QPSK - Full RB Configuration)



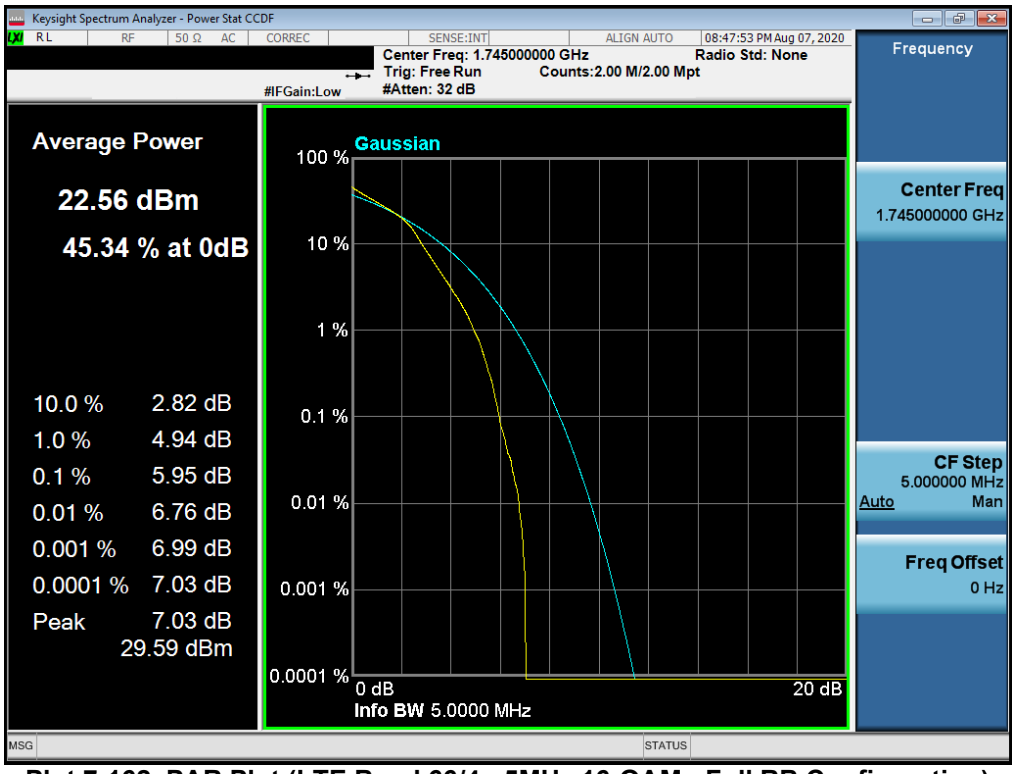
Plot 7-159. PAR Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB Configuration)



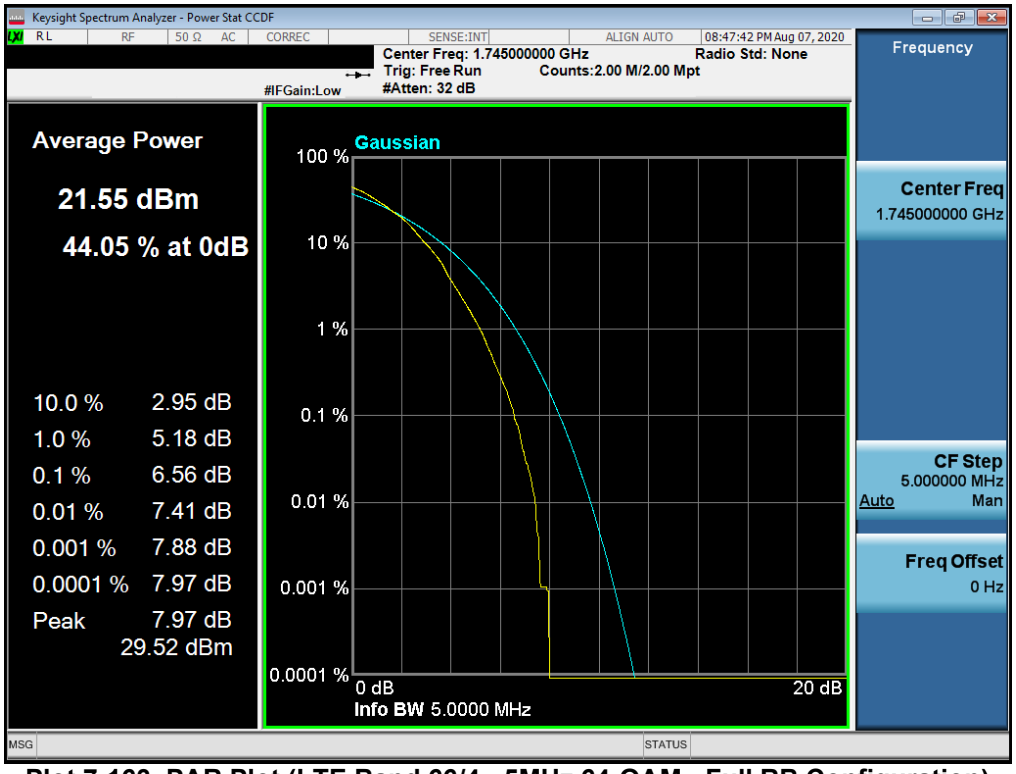
Plot 7-160. PAR Plot (LTE Band 66/4 - 10MHz 64-QAM - Full RB Configuration)



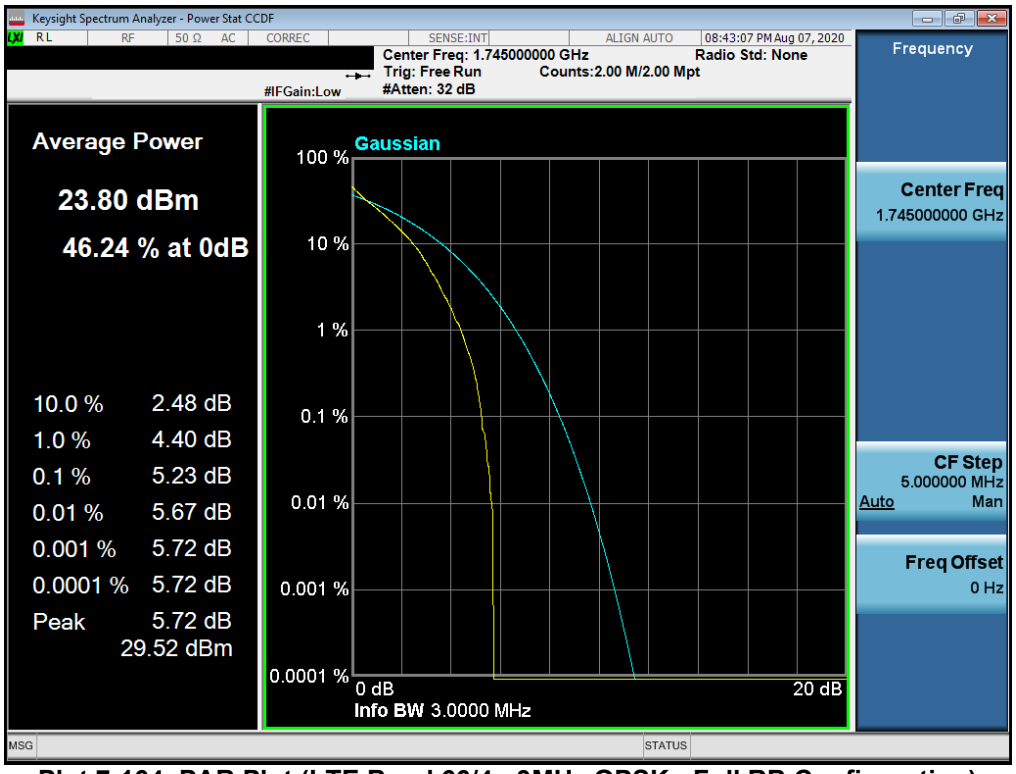
Plot 7-161. PAR Plot (LTE Band 66/4 - 5MHz QPSK - Full RB Configuration)



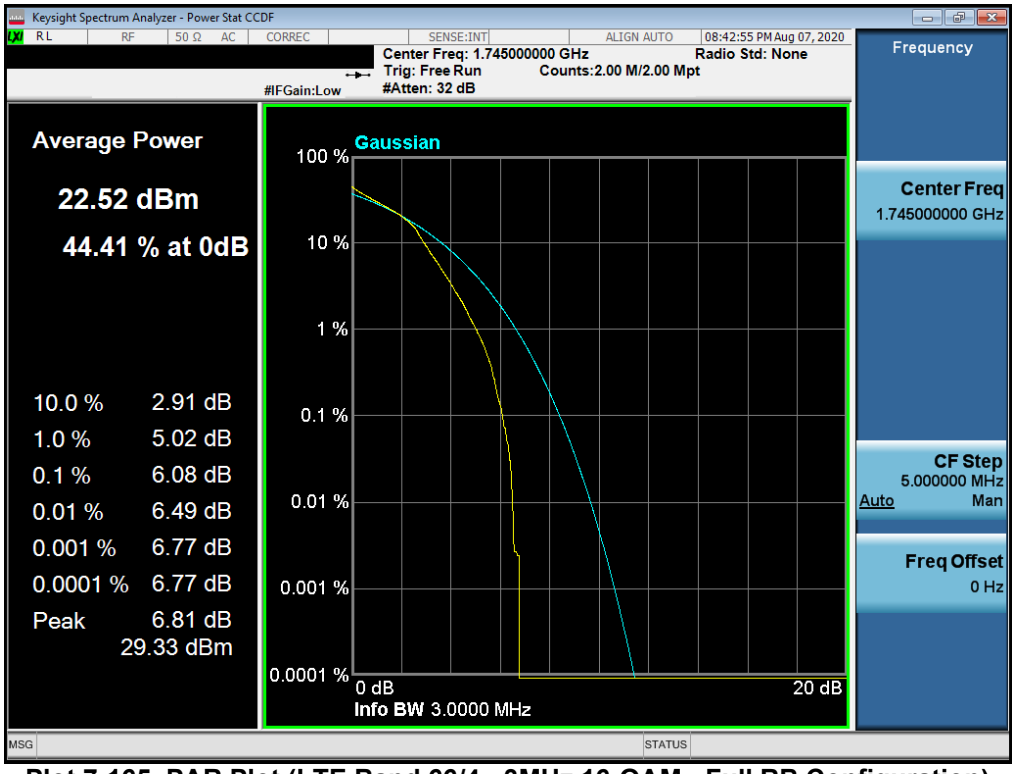
Plot 7-162. PAR Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB Configuration)



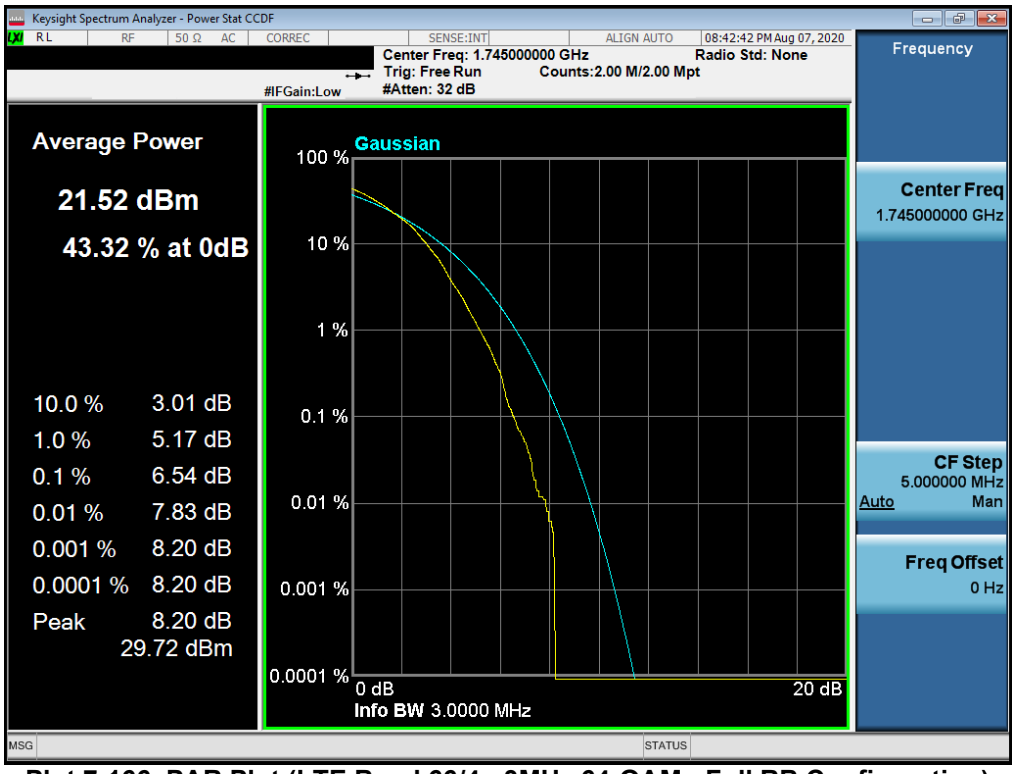
Plot 7-163. PAR Plot (LTE Band 66/4 - 5MHz 64-QAM - Full RB Configuration)



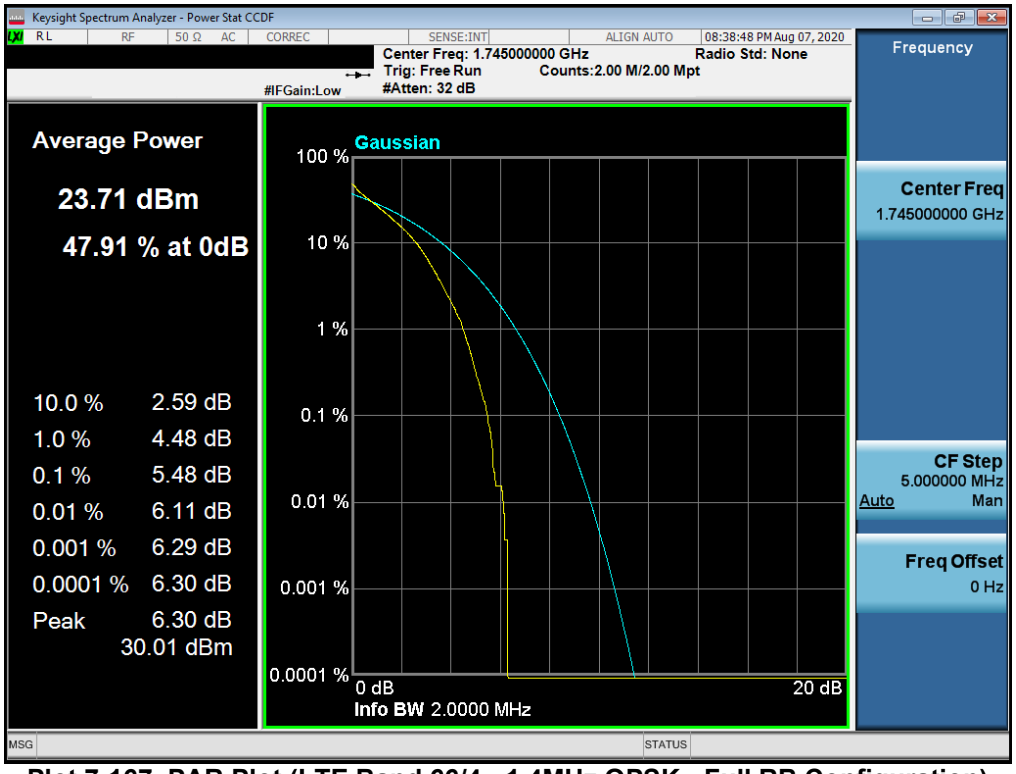
Plot 7-164. PAR Plot (LTE Band 66/4 - 3MHz QPSK - Full RB Configuration)



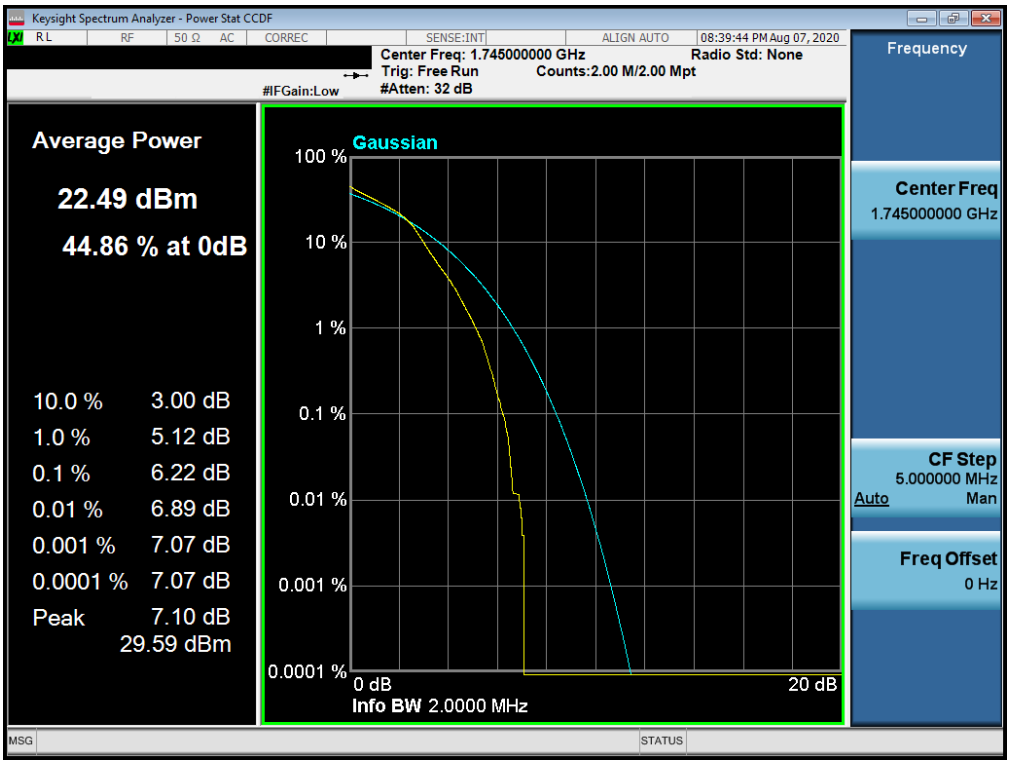
Plot 7-165. PAR Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB Configuration)



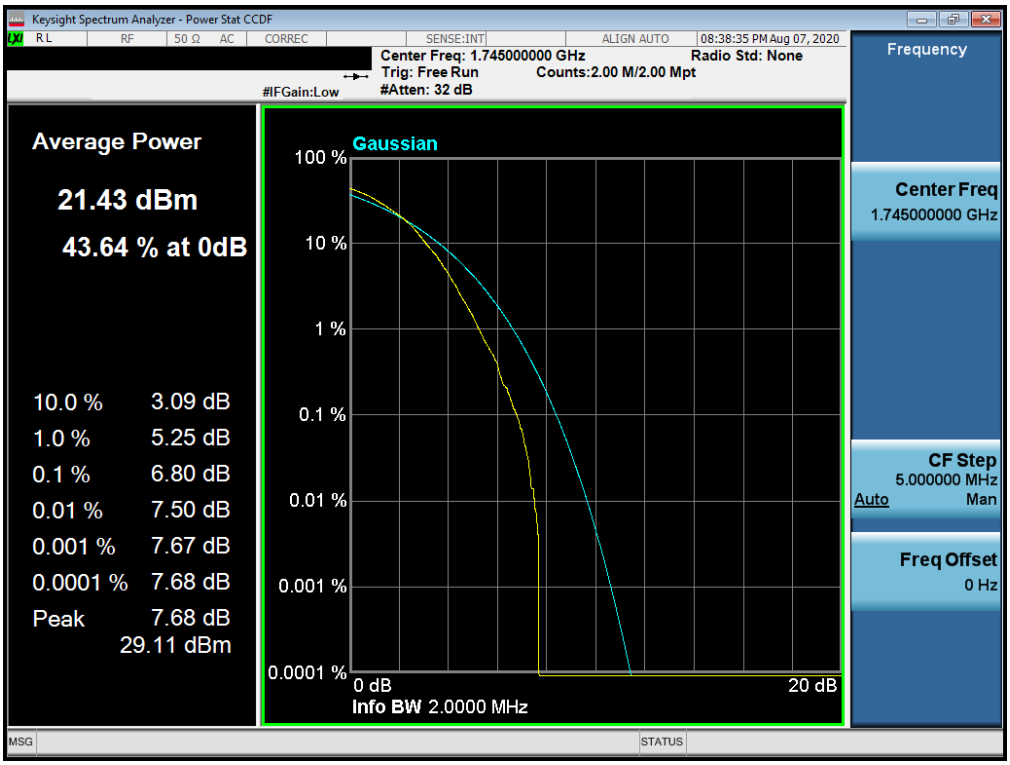
Plot 7-166. PAR Plot (LTE Band 66/4 - 3MHz 64-QAM - Full RB Configuration)



Plot 7-167. PAR Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

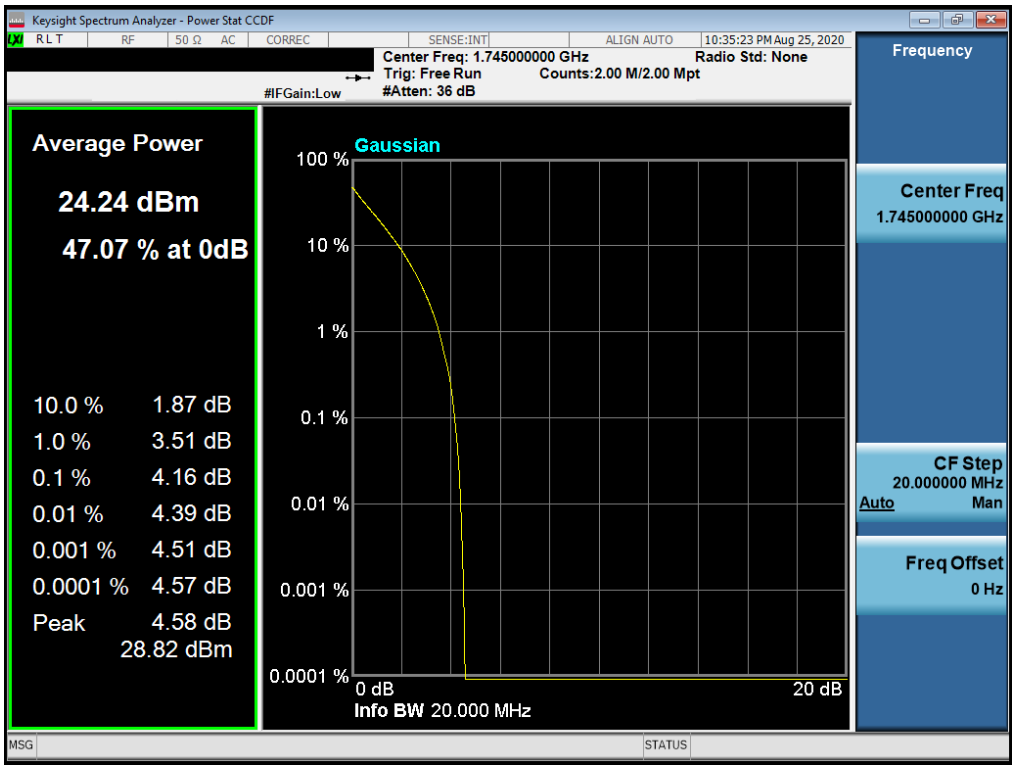


Plot 7-168. PAR Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

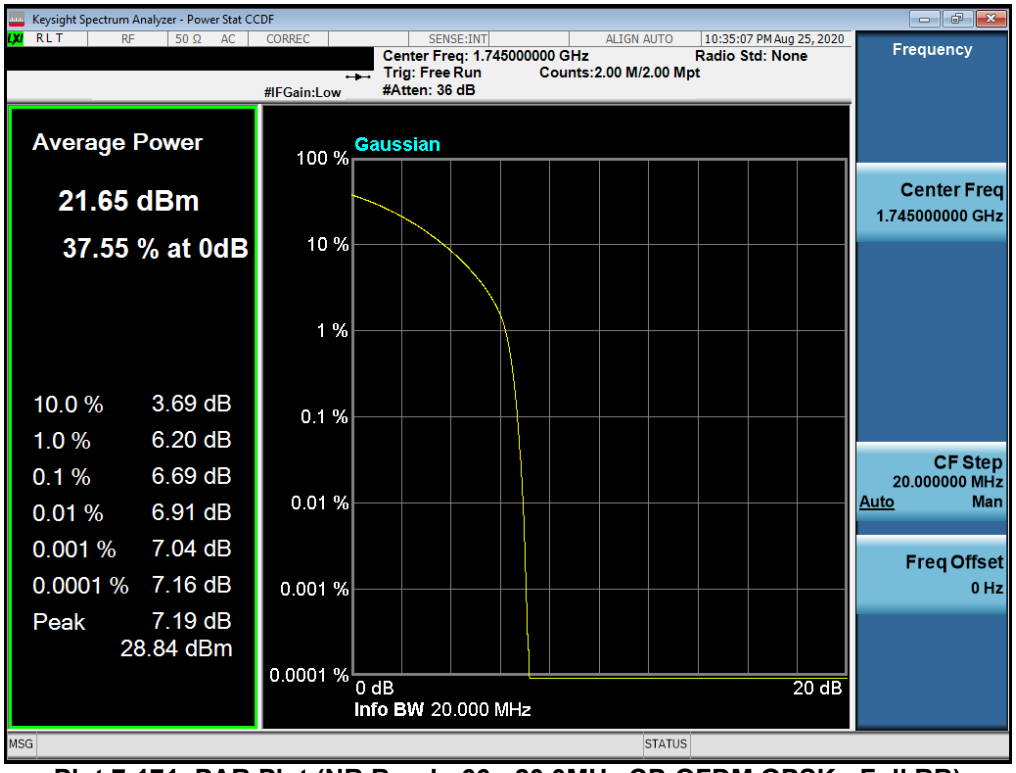


Plot 7-169. PAR Plot (LTE Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

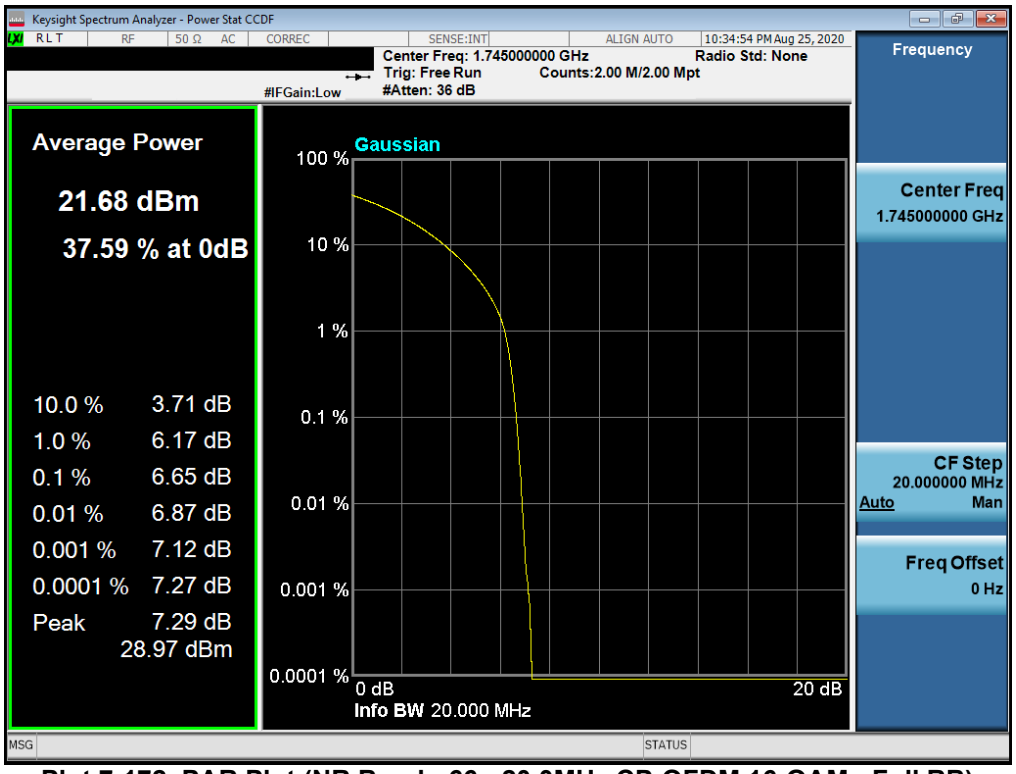
NR Band n66



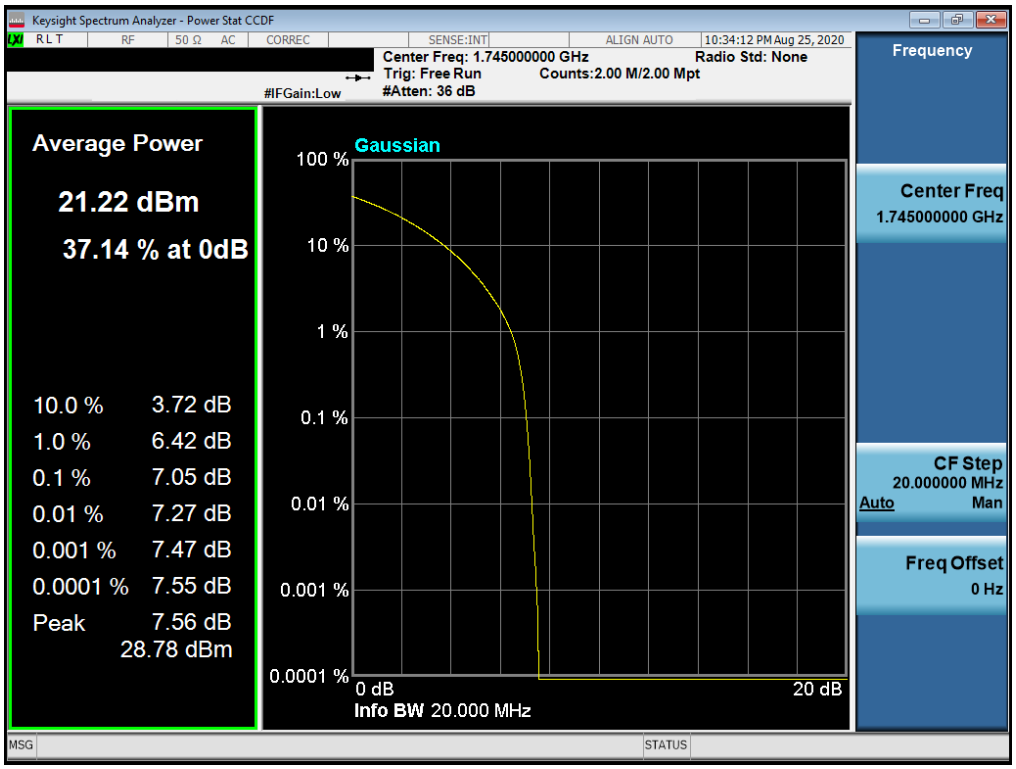
Plot 7-170. PAR Plot (NR Band n66 - 20.0MHz DFT-s-OFDM BPSK - Full RB)



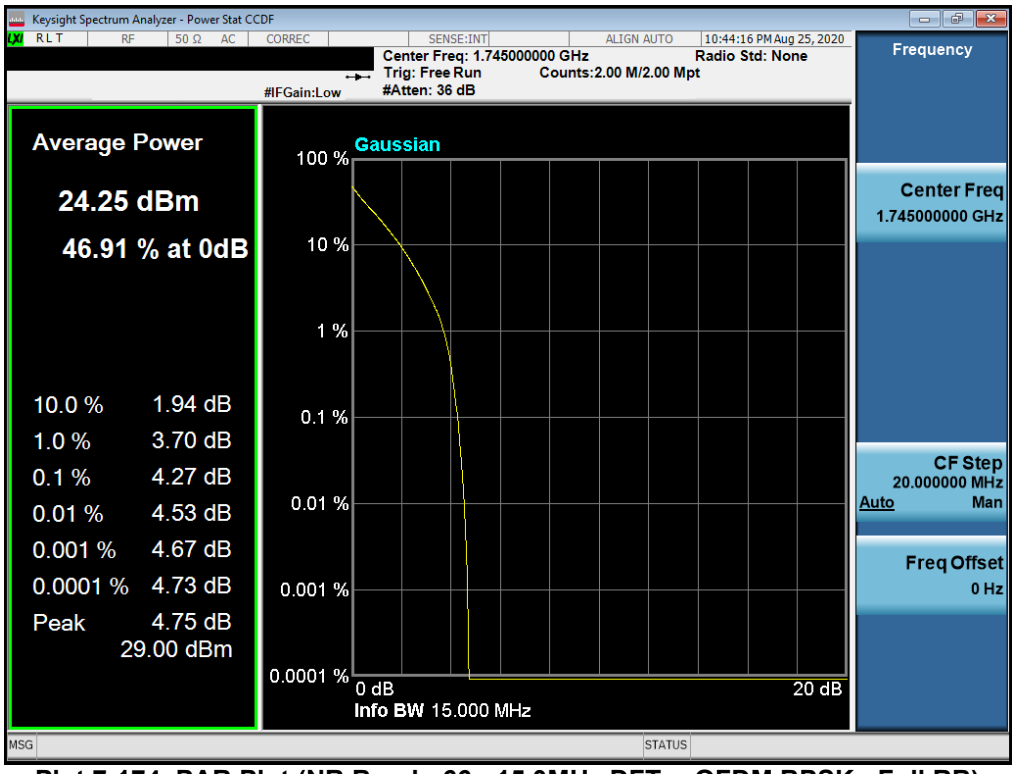
Plot 7-171. PAR Plot (NR Band n66 - 20.0MHz CP-OFDM QPSK - Full RB)



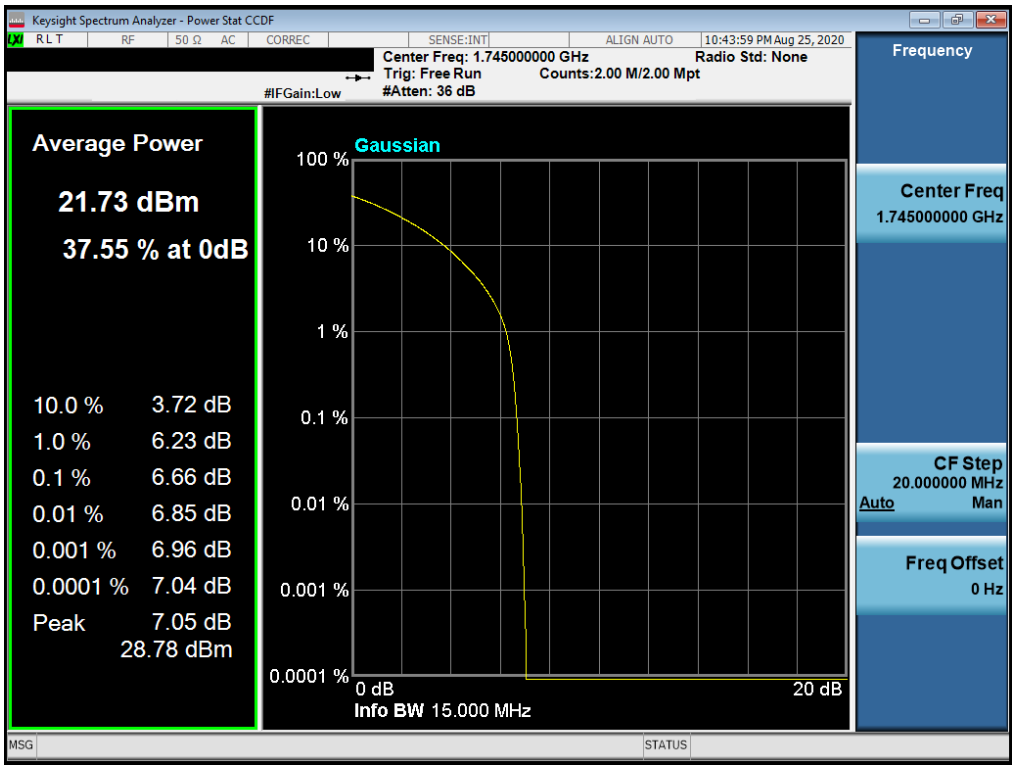
Plot 7-172. PAR Plot (NR Band n66 - 20.0MHz CP-OFDM 16-QAM - Full RB)



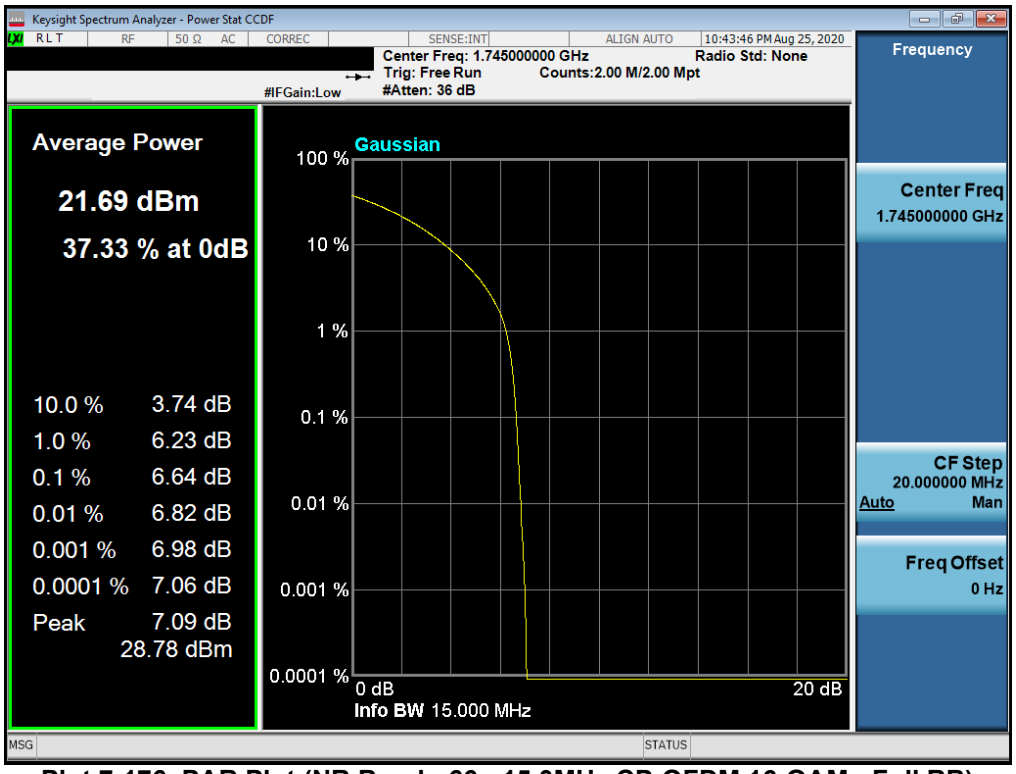
Plot 7-173. PAR Plot (NR Band n66 - 20.0MHz CP-OFDM 64-QAM - Full RB)



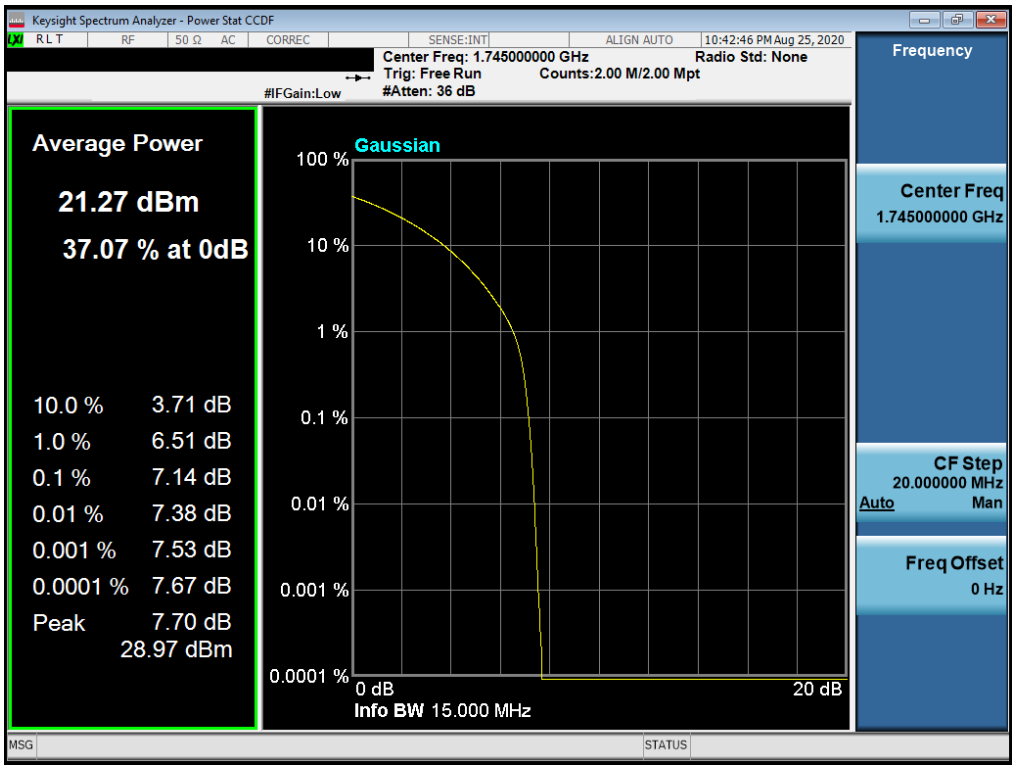
Plot 7-174. PAR Plot (NR Band n66 - 15.0MHz DFT-s-OFDM BPSK - Full RB)



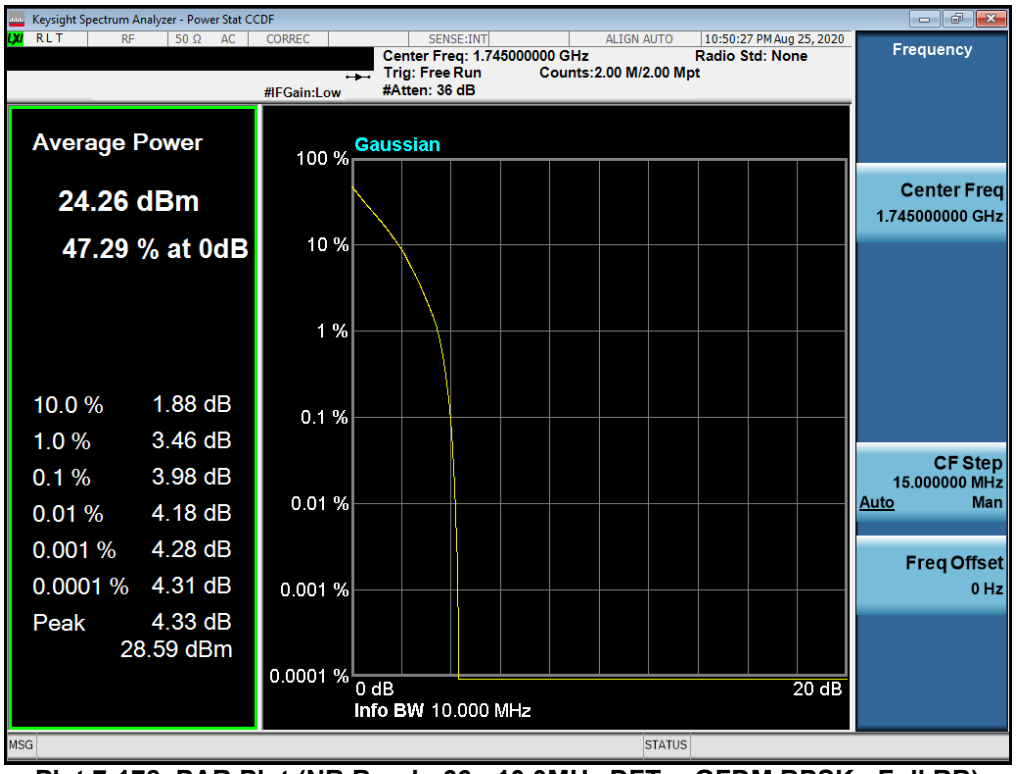
Plot 7-175. PAR Plot (NR Band n66 - 15.0MHz CP-OFDM QPSK - Full RB)



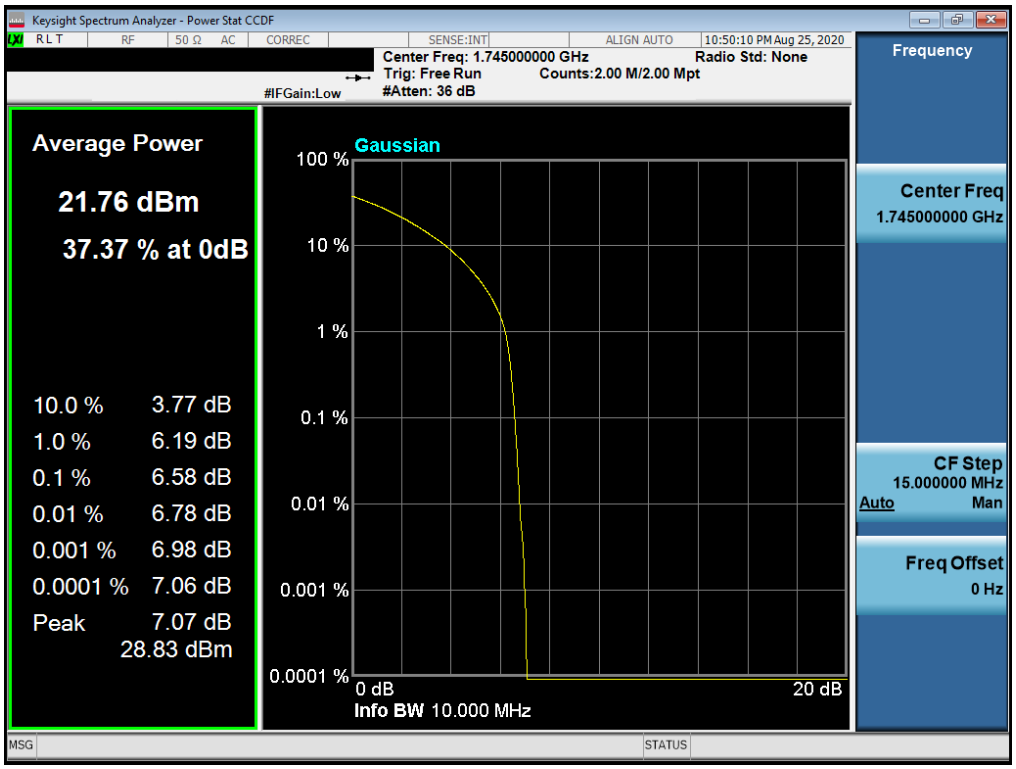
Plot 7-176. PAR Plot (NR Band n66 - 15.0MHz CP-OFDM 16-QAM - Full RB)



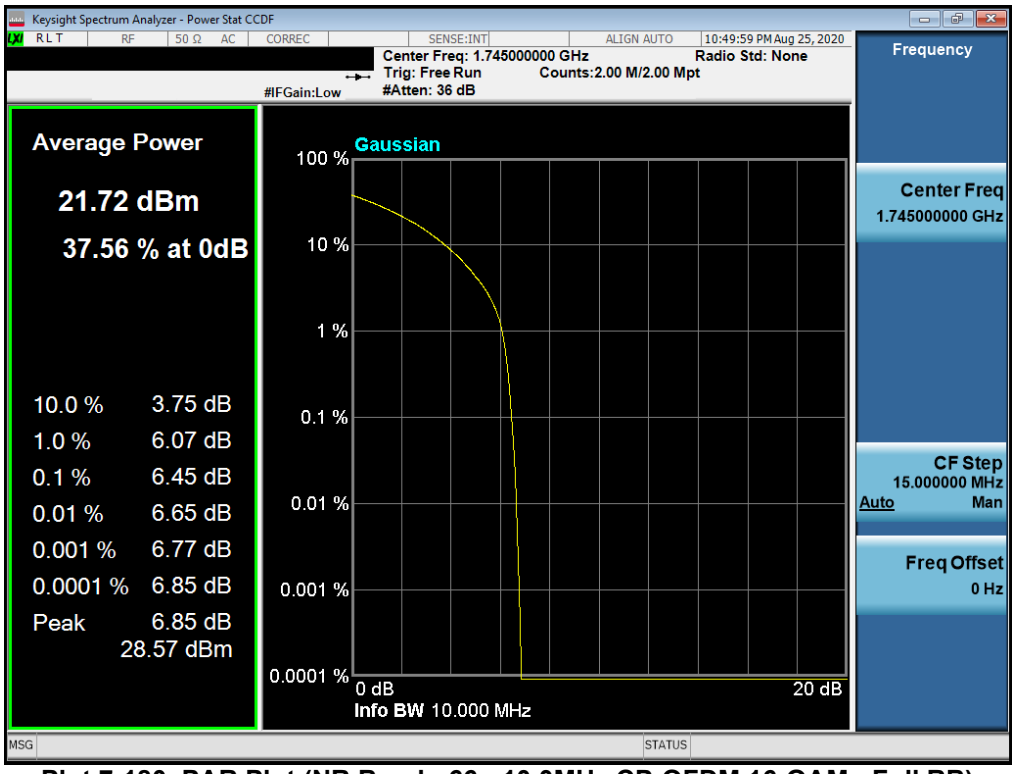
Plot 7-177. PAR Plot (NR Band n66 - 15.0MHz CP-OFDM 64-QAM - Full RB)



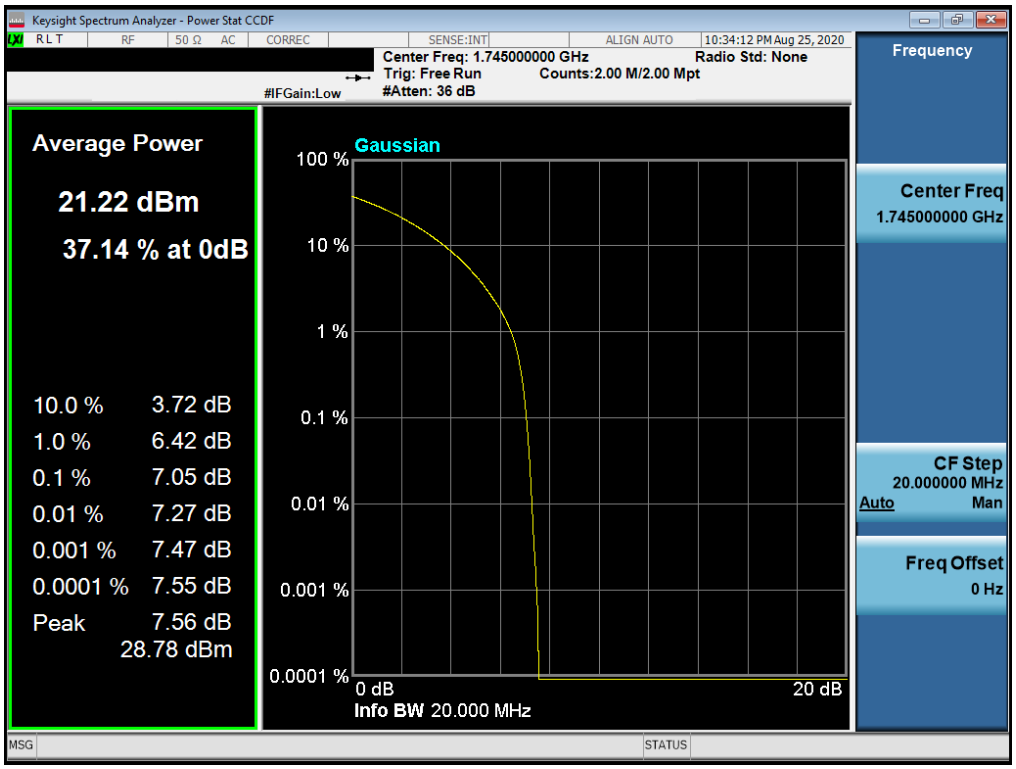
Plot 7-178. PAR Plot (NR Band n66 - 10.0MHz DFT-s-OFDM BPSK - Full RB)



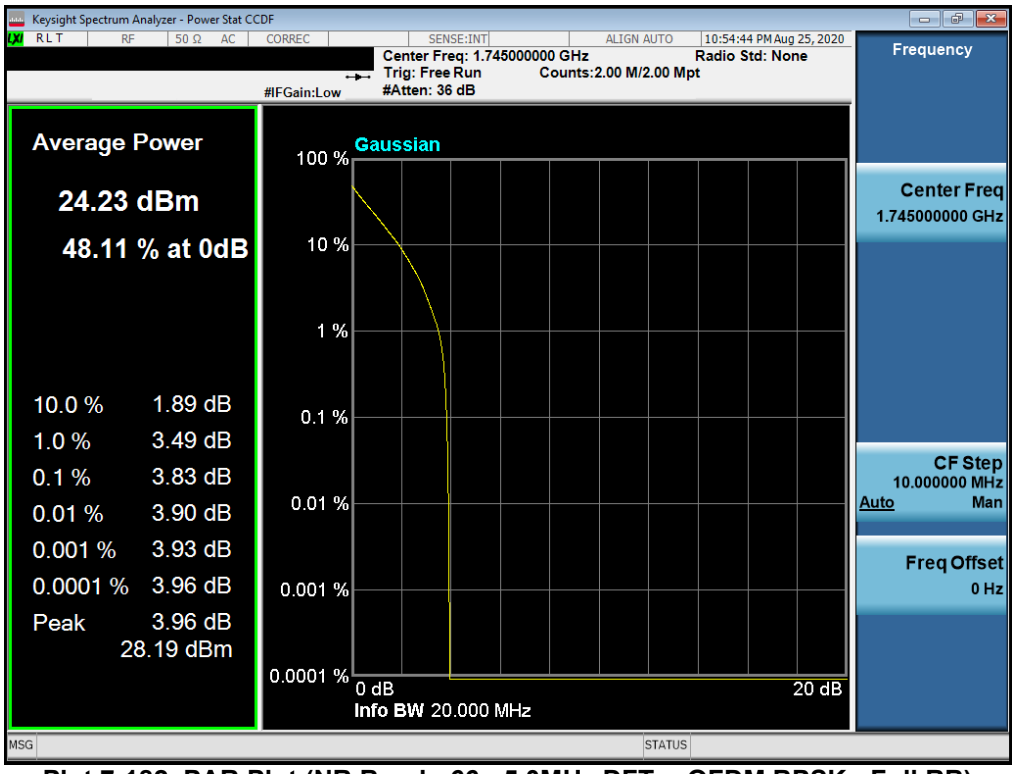
Plot 7-179. PAR Plot (NR Band n66 - 10.0MHz CP-OFDM QPSK - Full RB)



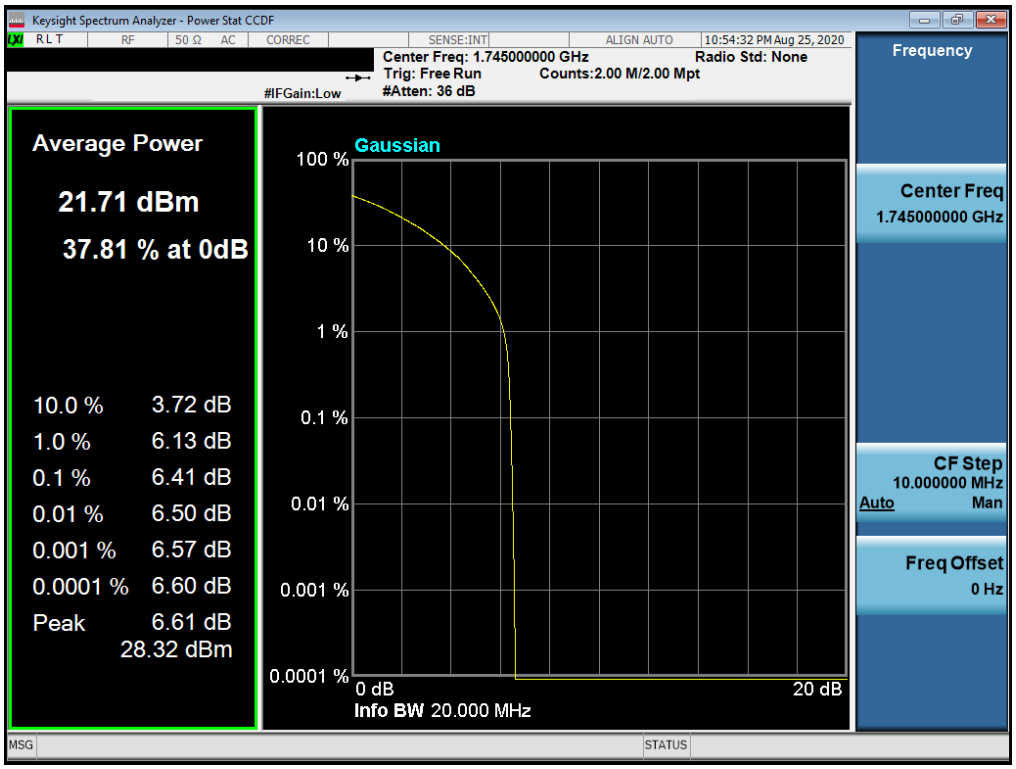
Plot 7-180. PAR Plot (NR Band n66 - 10.0MHz CP-OFDM 16-QAM - Full RB)



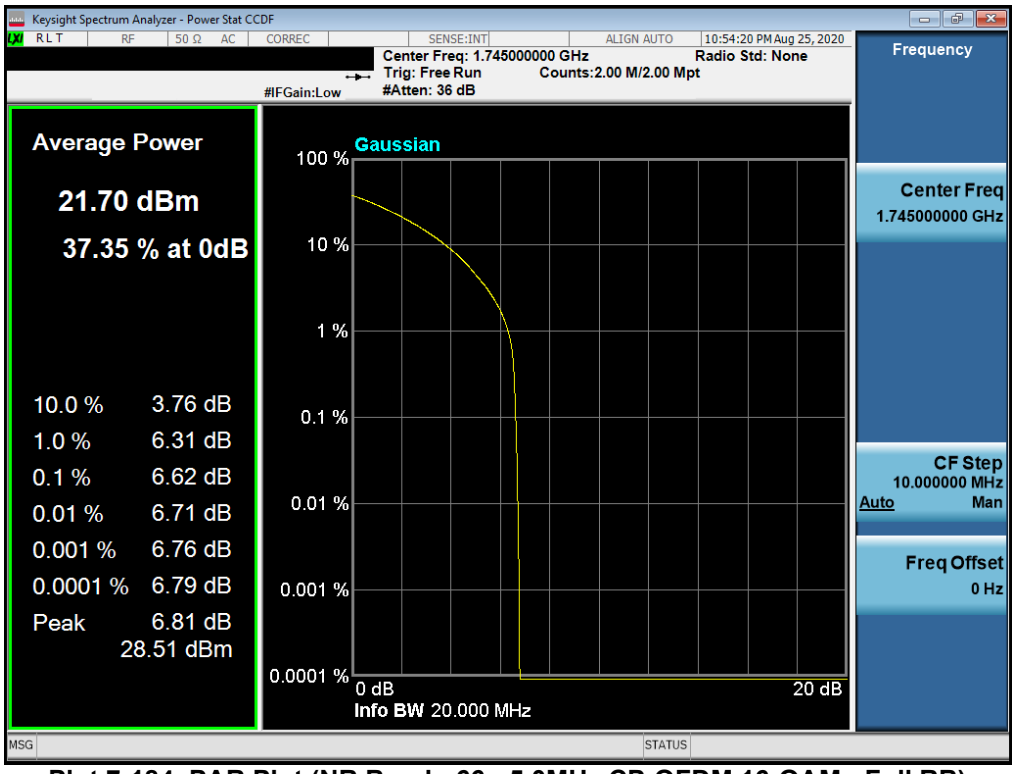
Plot 7-181. PAR Plot (NR Band n66 - 10.0MHz CP-OFDM 64-QAM - Full RB)



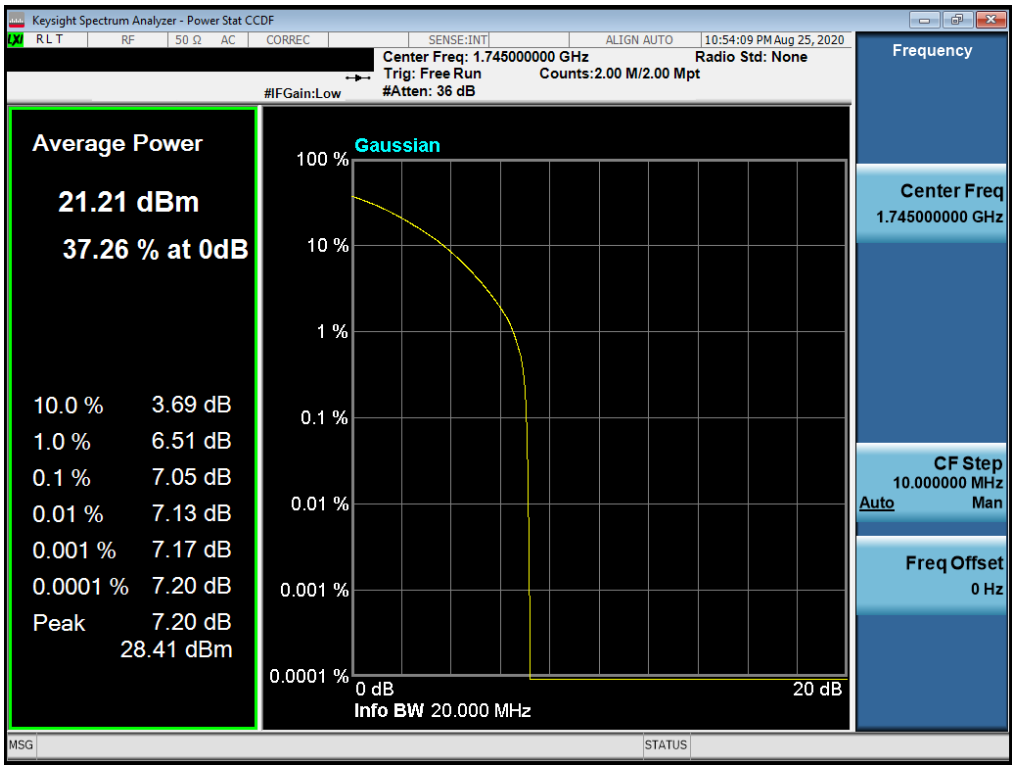
Plot 7-182. PAR Plot (NR Band n66 - 5.0MHz DFT-s-OFDM BPSK - Full RB)



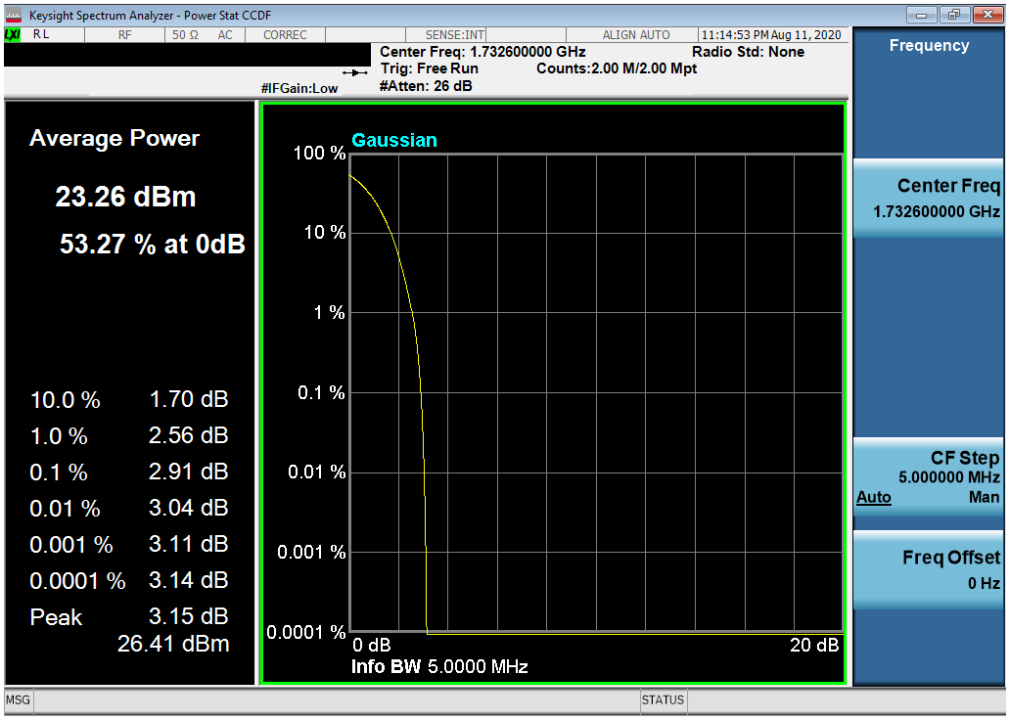
Plot 7-183. PAR Plot (NR Band n66 - 5.0MHz CP-OFDM QPSK - Full RB)



Plot 7-184. PAR Plot (NR Band n66 - 5.0MHz CP-OFDM 16-QAM - Full RB)



Plot 7-185. PAR Plot (NR Band n66 - 5.0MHz CP-OFDM 64-QAM - Full RB)



Plot 7-186. PAR Plot (WCDMA, Ch. 1413)

7.6 Radiated Power (EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) 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.

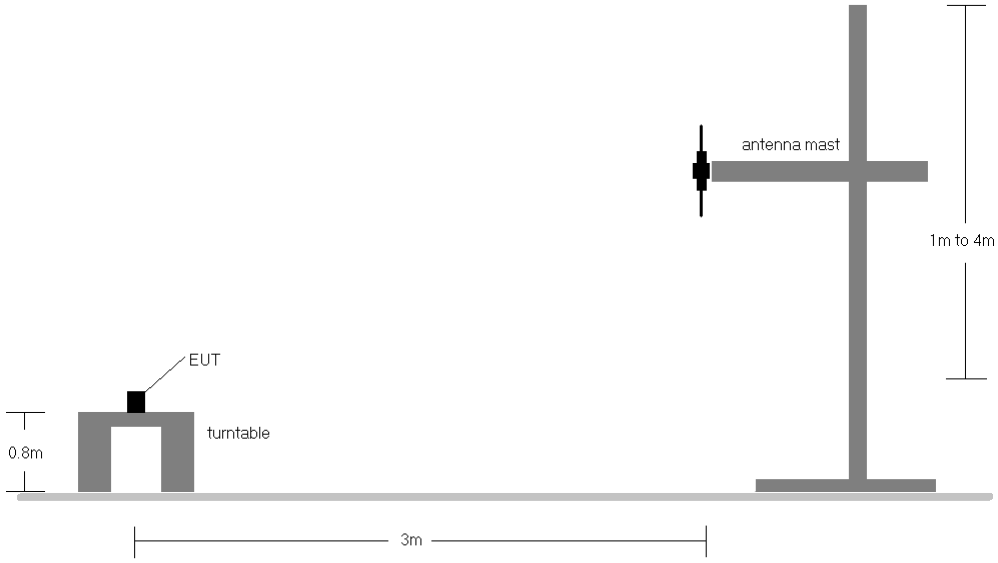


Figure 7-6. Radiated Test Setup <1GHz

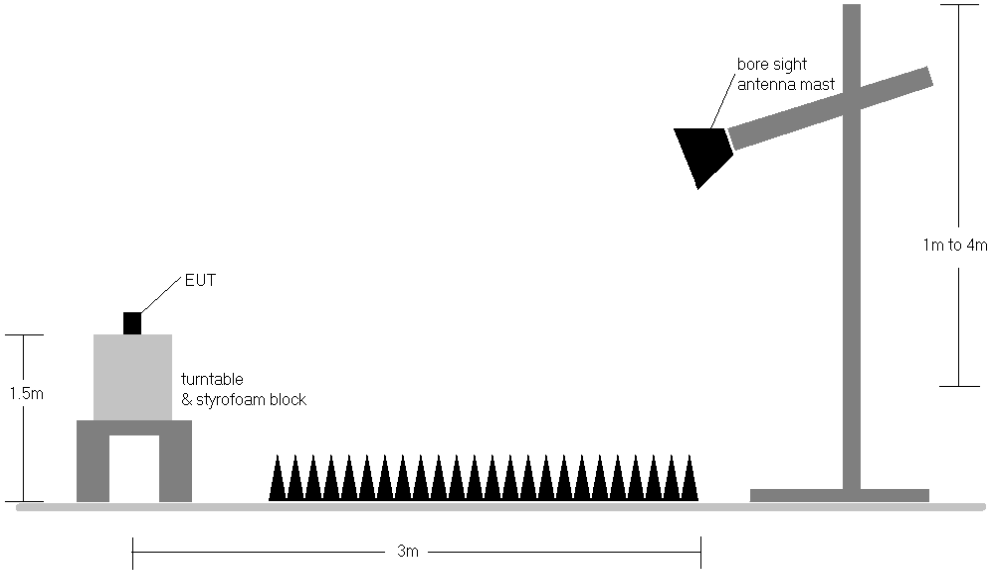


Figure 7-7. Radiated Test Setup >1GHz

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.

4) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

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	101.0	228.0	4.58	1 / 49	15.22	19.80	0.096	36.99	-17.19	17.65	0.058	34.77	-17.12
		707.5	V	101.0	230.0	4.62	1 / 25	15.52	**20.14**	0.103	36.99	-16.85	**17.99**	0.063	34.77	-16.78
		711.0	V	101.0	219.0	4.67	1 / 0	15.42	20.09	0.102	36.99	-16.90	17.94	0.062	34.77	-16.83
	16-QAM	707.5	V	101.0	230.0	4.62	1 / 25	14.65	**19.27**	0.085	36.99	-17.72	**17.12**	0.052	34.77	-17.65
	64-QAM	707.5	V	101.0	230.0	4.62	1 / 25	13.82	**18.44**	0.070	36.99	-18.55	**16.29**	0.043	34.77	-18.48
5 MHz	QPSK	701.5	V	101.0	228.0	4.60	1 / 0	15.42	20.02	0.100	36.99	-16.97	17.87	0.061	34.77	-16.90
		707.5	V	101.0	230.0	4.62	1 / 0	15.56	**20.18**	0.104	36.99	-16.81	**18.03**	0.064	34.77	-16.74
		713.5	V	101.0	219.0	4.70	1 / 0	15.25	19.95	0.099	36.99	-17.04	17.80	0.060	34.77	-16.97
	16-QAM	707.5	V	101.0	230.0	4.62	1 / 0	15.20	**19.82**	0.096	36.99	-17.17	**17.67**	0.059	34.77	-17.10
	64-QAM	707.5	V	101.0	230.0	4.62	1 / 0	14.18	**18.80**	0.076	36.99	-18.19	**16.65**	0.046	34.77	-18.12
3 MHz	QPSK	700.5	V	101.0	228.0	4.59	1 / 0	15.31	19.90	0.098	36.99	-17.09	17.75	0.060	34.77	-17.02
		707.5	V	101.0	230.0	4.62	1 / 0	15.46	**20.08**	0.102	36.99	-16.91	**17.93**	0.062	34.77	-16.84
		714.5	V	101.0	219.0	4.71	1 / 0	15.25	19.96	0.099	36.99	-17.03	17.81	0.060	34.77	-16.96
	16-QAM	707.5	V	101.0	230.0	4.62	1 / 0	14.67	**19.29**	0.085	36.99	-17.70	**17.14**	0.052	34.77	-17.63
	64-QAM	707.5	V	101.0	230.0	4.62	1 / 0	13.81	**18.43**	0.070	36.99	-18.56	**16.28**	0.042	34.77	-18.49
1.4 MHz	QPSK	699.7	V	101.0	228.0	4.56	1 / 2	15.22	19.78	0.095	36.99	-17.21	17.63	0.058	34.77	-17.14
		707.5	V	101.0	230.0	4.62	1 / 2	15.42	20.04	0.101	36.99	-16.95	17.89	0.062	34.77	-16.88
		715.3	V	101.0	219.0	4.72	1 / 2	15.34	**20.06**	0.101	36.99	-16.93	**17.91**	0.062	34.77	-16.86
	16-QAM	707.5	V	101.0	230.0	4.62	1 / 2	14.66	**19.28**	0.085	36.99	-17.71	**17.13**	0.052	34.77	-17.64
	64-QAM	707.5	V	101.0	230.0	4.62	1 / 2	13.83	**18.45**	0.070	36.99	-18.54	**16.30**	0.043	34.77	-18.47
	Opposite Pol.	707.5	H	101.0	230.0	4.62	1 / 25	14.49	19.11	0.082	36.99	-17.88	16.96	0.050	34.77	-17.81

Table 7-187. ERP Data (LTE Band 12/17)

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	154.0	10.0	5.89	1 / 49	12.15	**18.04**	0.064	36.99	-18.95	**15.89**	0.039	34.77	-18.88
	16-QAM	782.0	H	154.0	10.0	5.89	1 / 49	11.46	**17.35**	0.054	36.99	-19.64	**15.20**	0.033	34.77	-19.57
	64-QAM	782.0	H	154.0	10.0	5.89	1 / 49	10.44	**16.33**	0.043	36.99	-20.66	**14.18**	0.026	34.77	-20.59
5 MHz	QPSK	779.5	H	154.0	10.0	5.82	1 / 24	12.03	17.85	0.061	36.99	-19.14	15.70	0.037	34.77	-19.08
		782.0	H	154.0	10.0	5.89	1 / 24	12.44	**18.33**	0.068	36.99	-18.66	**16.18**	0.042	34.77	-18.59
		784.5	H	154.0	10.0	5.92	1 / 12	12.33	18.25	0.067	36.99	-18.74	16.10	0.041	34.77	-18.67
	16-QAM	782.0	H	154.0	10.0	5.89	1 / 24	11.72	**17.61**	0.058	36.99	-19.38	**15.46**	0.035	34.77	-19.31
	64-QAM	782.0	H	154.0	10.0	5.89	1 / 24	10.59	**16.48**	0.044	36.99	-20.51	**14.33**	0.027	34.77	-20.44
	Opposite Pol.	782.0	V	154.0	228.0	5.89	1 / 24	12.23	18.12	0.065	36.99	-18.87	15.97	0.040	34.77	-18.80

Table 7-188. ERP Data (LTE Band 13)

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	H	110	8	12.14	9.46	21.60	0.145	30.00	-8.40
1732.60	WCDMA1700	H	119	6	12.37	9.34	**21.71**	**0.148**	30.00	-8.29
1752.60	WCDMA1700	H	100	357	11.09	9.24	20.33	0.108	30.00	-9.67
1732.60	WCDMA1700	V	112	69	10.75	9.34	20.09	0.102	30.00	-9.91

Table 7-189. EIRP Data (WCDMA AWS)

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	115.0	16.0	9.41	1 / 50	13.83	**23.24**	0.211	30.00	-6.76
		1745.0	H	137.0	183.0	9.26	1 / 50	13.59	22.85	0.193	30.00	-7.15
		1770.0	H	138.0	18.0	9.27	1 / 0	13.54	22.81	0.191	30.00	-7.19
	16-QAM	1720.0	H	115.0	16.0	9.41	1 / 50	12.96	**22.37**	0.173	30.00	-7.63
	64-QAM	1720.0	H	115.0	16.0	9.41	1 / 50	12.09	**21.50**	0.141	30.00	-8.50
15 MHz	QPSK	1717.5	H	115.0	16.0	9.43	1 / 0	14.03	**23.46**	0.222	30.00	-6.54
		1745.0	H	137.0	183.0	9.26	1 / 36	13.68	22.94	0.197	30.00	-7.06
		1772.5	H	138.0	18.0	9.27	1 / 36	13.95	23.22	0.210	30.00	-6.78
	16-QAM	1717.5	H	115.0	16.0	9.43	1 / 0	12.94	**22.37**	0.173	30.00	-7.63
	64-QAM	1717.5	H	115.0	16.0	9.43	1 / 0	12.11	**21.54**	0.143	30.00	-8.46
10 MHz	QPSK	1715.0	H	115.0	16.0	9.44	1 / 0	13.86	**23.30**	0.214	30.00	-6.70
		1745.0	H	137.0	183.0	9.26	1 / 49	13.62	22.88	0.194	30.00	-7.12
		1775.0	H	138.0	18.0	9.28	1 / 0	13.93	23.21	0.209	30.00	-6.79
	16-QAM	1715.0	H	115.0	16.0	9.44	1 / 0	12.92	**22.36**	0.172	30.00	-7.64
	64-QAM	1715.0	H	115.0	16.0	9.44	1 / 0	12.11	**21.55**	0.143	30.00	-8.45
5 MHz	QPSK	1712.5	H	115.0	16.0	9.46	1 / 0	13.89	**23.35**	0.216	30.00	-6.65
		1745.0	H	137.0	183.0	9.26	1 / 12	13.75	23.01	0.200	30.00	-6.99
		1777.5	H	138.0	18.0	9.28	1 / 0	13.88	23.16	0.207	30.00	-6.84
	16-QAM	1745.0	H	137.0	183.0	9.26	1 / 12	13.15	**22.41**	0.174	30.00	-7.59
	64-QAM	1712.5	H	115.0	16.0	9.46	1 / 0	12.00	**21.46**	0.140	30.00	-8.54
3 MHz	QPSK	1711.5	H	115.0	16.0	9.47	1 / 0	13.86	**23.32**	0.215	30.00	-6.68
		1745.0	H	137.0	183.0	9.26	1 / 14	13.61	22.87	0.194	30.00	-7.13
		1778.5	H	138.0	18.0	9.28	1 / 0	13.86	23.15	0.206	30.00	-6.85
	16-QAM	1711.5	H	115.0	16.0	9.47	1 / 0	12.93	**22.39**	0.174	30.00	-7.61
	64-QAM	1711.5	H	115.0	16.0	9.47	1 / 0	12.07	**21.53**	0.142	30.00	-8.47
1.4 MHz	QPSK	1710.7	H	115.0	16.0	9.47	1 / 0	13.75	23.22	0.210	30.00	-6.78
		1745.0	H	137.0	183.0	9.26	1 / 2	13.55	22.81	0.191	30.00	-7.19
		1779.3	H	138.0	18.0	9.29	1 / 2	14.05	**23.34**	0.216	30.00	-6.66
	16-QAM	1710.7	H	115.0	16.0	9.47	1 / 0	12.88	**22.35**	0.172	30.00	-7.65
	64-QAM	1710.7	H	115.0	16.0	9.47	1 / 0	12.05	**21.52**	0.142	30.00	-8.48
	Opposite Pol.	1720.0	V	391.0	150.0	9.31	1 / 2	10.98	20.29	0.107	30.00	-9.71

Table 7-190. 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]
20 MHz	π/2 BPSK	1720.0	H	101.0	36.0	9.47	1 / 0	7.12	**16.59**	0.046	30.00	-13.41
		1745.0	H	133.0	26.0	9.26	1 / 0	5.35	14.61	0.029	30.00	-15.39
		1770.0	H	126.0	39.0	9.29	1 / 0	6.44	15.73	0.037	30.00	-14.27
	QPSK	1720.0	H	101.0	36.0	9.47	1 / 0	7.15	**16.62**	0.046	30.00	-13.38
		1745.0	H	133.0	26.0	9.26	1 / 0	5.91	15.17	0.033	30.00	-14.83
		1770.0	H	126.0	39.0	9.29	1 / 99	5.23	14.52	0.028	30.00	-15.48
	16-QAM	1720.0	H	101.0	36.0	9.47	1 / 0	6.07	**15.54**	0.036	30.00	-14.46
	64-QAM	1720.0	H	101.0	36.0	9.47	1 / 0	5.03	**14.50**	0.028	30.00	-15.50
15 MHz	π/2 BPSK	1717.5	H	101.0	36.0	9.47	1 / 1	7.50	**16.97**	0.050	30.00	-13.03
		1745.0	H	133.0	26.0	9.26	1 / 37	5.72	14.98	0.031	30.00	-15.02
		1772.5	H	126.0	39.0	9.29	1 / 1	6.97	16.26	0.042	30.00	-13.74
	QPSK	1717.5	H	101.0	36.0	9.47	1 / 1	7.24	**16.71**	0.047	30.00	-13.29
		1745.0	H	133.0	26.0	9.26	1 / 37	6.01	15.27	0.034	30.00	-14.73
		1772.5	H	126.0	39.0	9.29	1 / 1	5.43	14.72	0.030	30.00	-15.28
	16-QAM	1717.5	H	101.0	36.0	9.47	1 / 1	6.57	**16.04**	0.040	30.00	-13.96
	64-QAM	1717.5	H	101.0	36.0	9.47	1 / 1	5.77	**15.24**	0.033	30.00	-14.76
10 MHz	π/2 BPSK	1715.0	H	101.0	36.0	9.47	1 / 1	7.02	**16.49**	0.045	30.00	-13.51
		1745.0	H	133.0	26.0	9.26	1 / 26	5.34	14.60	0.029	30.00	-15.40
		1775.0	H	126.0	39.0	9.29	1 / 1	6.42	15.71	0.037	30.00	-14.29
	QPSK	1715.0	H	101.0	36.0	9.47	1 / 1	7.01	**16.48**	0.044	30.00	-13.52
		1745.0	H	133.0	26.0	9.26	1 / 26	5.89	15.15	0.033	30.00	-14.85
		1775.0	H	126.0	39.0	9.29	1 / 1	5.20	14.49	0.028	30.00	-15.51
	16-QAM	1715.0	H	101.0	36.0	9.47	1 / 1	5.98	**15.45**	0.035	30.00	-14.55
	64-QAM	1715.0	H	101.0	36.0	9.47	1 / 1	5.05	**14.52**	0.028	30.00	-15.48
5 MHz	π/2 BPSK	1712.5	H	101.0	36.0	9.47	1 / 23	6.93	**16.40**	0.044	30.00	-13.60
		1745.0	H	133.0	26.0	9.26	1 / 1	5.21	14.47	0.028	30.00	-15.53
		1777.5	H	126.0	39.0	9.29	1 / 13	6.36	15.65	0.037	30.00	-14.35
	QPSK	1712.5	H	101.0	36.0	9.47	1 / 23	6.97	**16.44**	0.044	30.00	-13.56
		1745.0	H	133.0	26.0	9.26	1 / 1	5.75	15.01	0.032	30.00	-14.99
		1777.5	H	126.0	39.0	9.29	1 / 13	5.13	14.42	0.028	30.00	-15.58
	16-QAM	1712.5	H	101.0	36.0	9.47	1 / 23	5.97	**15.44**	0.035	30.00	-14.56
	64-QAM	1712.5	H	101.0	36.0	9.47	1 / 23	5.08	**14.55**	0.029	30.00	-15.45
	QPSK (CP-OFDM)	1720.0	H	101.0	36.0	9.47	1 / 0	2.77	12.24	0.017	30.00	-17.76
	QPSK (Opposite Pol.)	1720.0	V	107.0	92.0	9.47	1 / 0	4.02	13.49	0.022	30.00	-16.51

Table 7-191. EIRP Data (NR Band n66)

7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions 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 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.

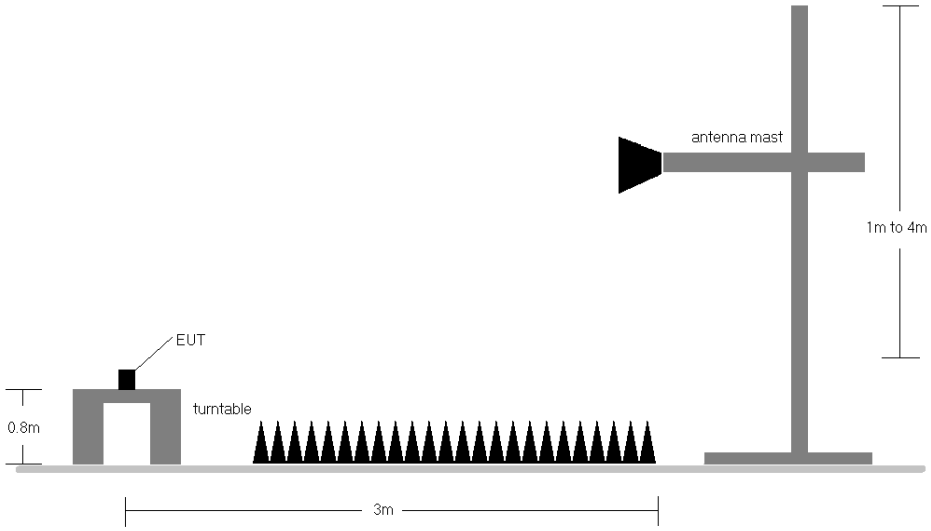


Figure 7-8. Test Instrument & Measurement Setup

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.

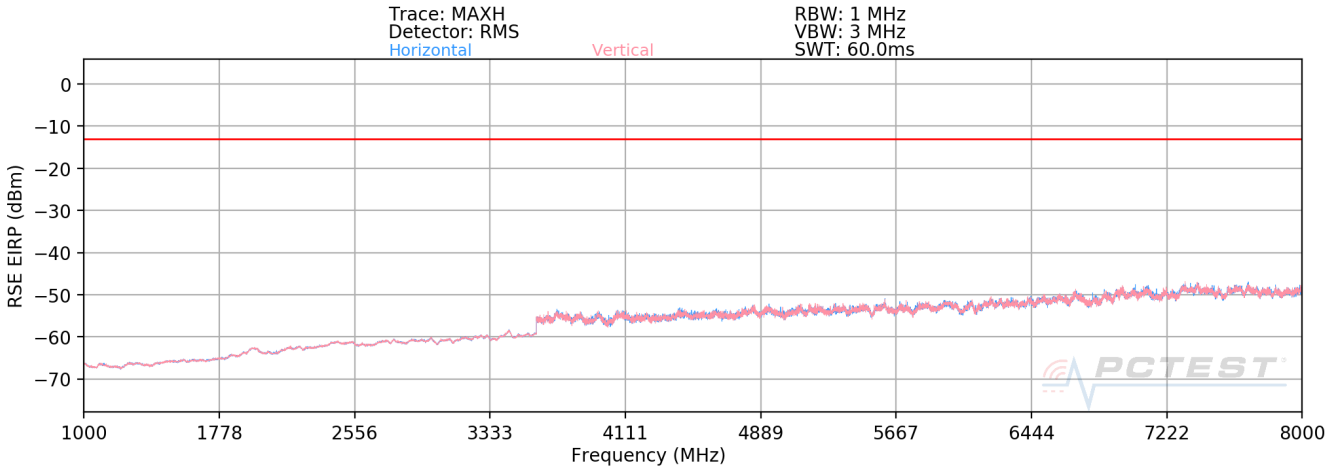
6) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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

8) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

9) Spurious emissions shown in this section are measured while operating in EN-DC mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor). Spurious emissions from the NR carrier device, is subject to the rules under which the NR carrier operates. Spurious emission caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates.

LTE Band 12/17



Plot 7-192. Radiated Spurious Plot (LTE Band 12/17)

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	-	-	-73.21	-1.96	31.83	-63.43	-13.00	-50.43
2112.0	V	-	-	-73.69	1.08	34.39	-60.87	-13.00	-47.87
2816.0	V	-	-	-75.01	3.53	35.52	-59.74	-13.00	-46.74

Table 7-18. Radiated Spurious Data (LTE Band 12/17 – 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	-	-	-72.91	-1.90	32.19	-63.07	-13.00	-50.07
2122.5	V	-	-	-73.59	1.27	34.68	-60.58	-13.00	-47.58
2830.0	V	-	-	-74.29	3.49	36.20	-59.06	-13.00	-46.06

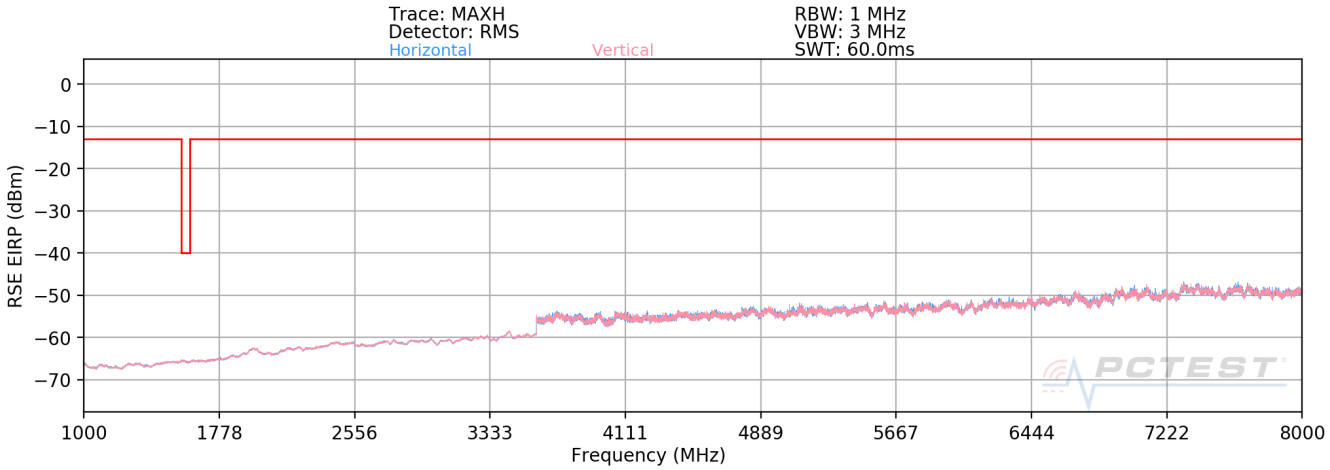
Table 7-19. Radiated Spurious Data (LTE Band 12/17 – Mid Channel)

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	117	276	-73.14	-2.05	31.81	-63.44	-13.00	-50.44
2133.0	V	-	-	-72.92	1.54	35.62	-59.64	-13.00	-46.64
2844.0	V	-	-	-73.98	3.34	36.36	-58.90	-13.00	-45.90

Table 7-20. Radiated Spurious Data (LTE Band 12/17 – High Channel)

LTE Band 13



Plot 7-193. Radiated Spurious Plot (LTE Band 13)

Bandwidth (MHz):	5
Frequency (MHz):	779.5
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]
1559.0	H	-	-	-74.24	-6.98	25.78	-69.48	-40.00	-29.48
2338.5	H	-	-	-74.39	-4.10	28.51	-66.75	-13.00	-53.75
3118.0	H	-	-	-74.86	0.23	32.37	-62.89	-13.00	-49.89

Table 7-21. Radiated Spurious Data (LTE Band 13 – Low Channel)

Bandwidth (MHz):	5
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	-	-	-75.69	-6.90	24.41	-70.85	-40.00	-30.85
2346.0	H	-	-	-75.65	-4.06	27.29	-67.97	-13.00	-54.97
3128.0	H	-	-	-76.11	0.40	31.29	-63.97	-13.00	-50.97

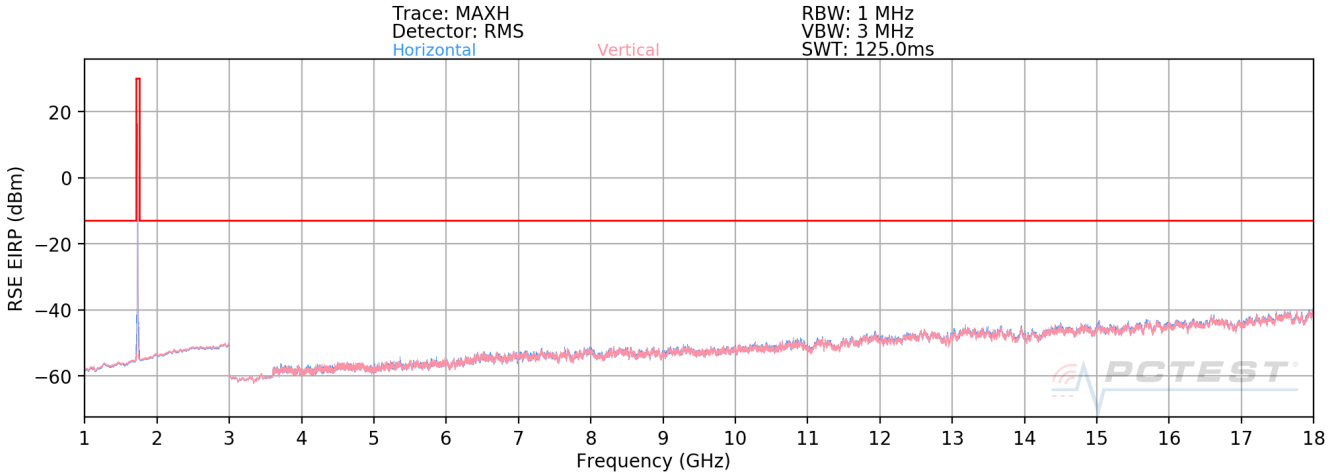
Table 7-22. Radiated Spurious Data (LTE Band 13 – Mid Channel)

Bandwidth (MHz):	5
Frequency (MHz):	784.5
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]
1569.0	H	-	-	-73.48	-6.90	26.62	-68.64	-40.00	-28.64
2353.5	H	-	-	-74.62	-4.06	28.32	-66.94	-13.00	-53.94
3138.0	H	-	-	-75.05	0.40	32.35	-62.91	-13.00	-49.91

Table 7-23. Radiated Spurious Data (LTE Band 13 – High Channel)

WCDMA AWS



Plot 7-194. 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	-	-	-69.21	7.10	44.89	-50.37	-13.00	-37.37
5137.2	H	-	-	-70.99	9.84	45.85	-49.41	-13.00	-36.41
6849.6	H	-	-	-73.01	13.11	47.10	-48.16	-13.00	-35.16

7-24. 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	-	-	-69.37	7.15	44.78	-50.48	-13.00	-37.48
5197.8	H	-	-	-70.53	9.70	46.17	-49.09	-13.00	-36.09
6930.4	H	-	-	-72.85	12.87	47.02	-48.23	-13.00	-35.23

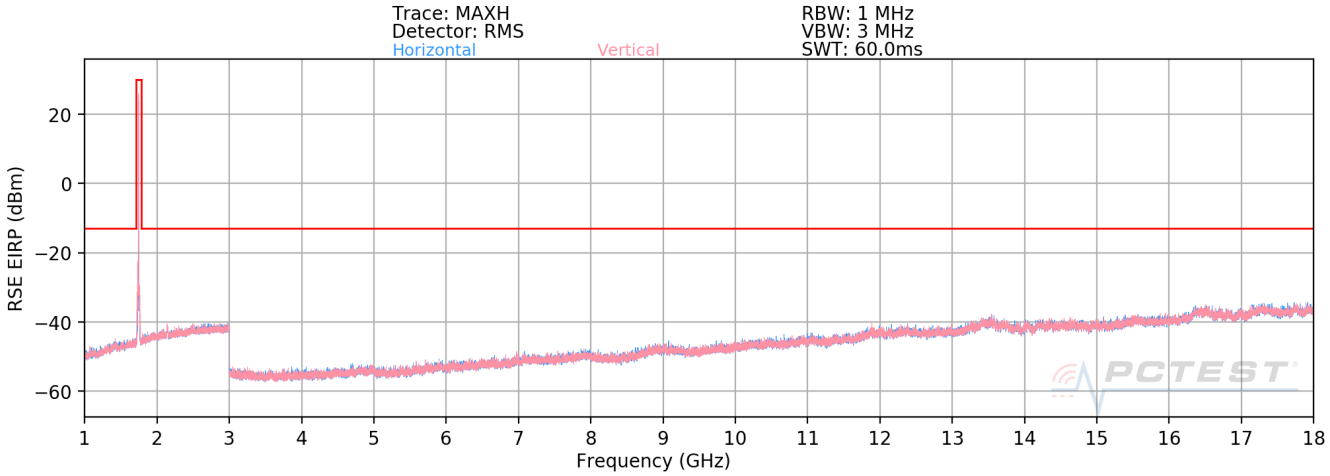
Table 7-25. Radiated Spurious Data (WCDMA AWS – Mid Channel)

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	-	-	-69.45	7.19	44.74	-50.52	-13.00	-37.52
5257.8	H	-	-	-70.21	9.83	46.62	-48.63	-13.00	-35.63
7010.4	H	-	-	-71.24	13.42	49.18	-46.08	-13.00	-33.08

Table 7-26. Radiated Spurious Data (WCDMA AWS – High Channel)

LTE Band 66/4



Plot 7-195. 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	H	-	-	-68.42	7.34	45.92	-49.33	-13.00	-36.33
5160.0	H	-	-	-69.94	9.77	46.83	-48.43	-13.00	-35.43
6880.0	H	-	-	-69.30	12.97	50.67	-44.59	-13.00	-31.59

Table 7-27. 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	H	-	-	-69.02	7.19	45.17	-50.09	-13.00	-37.09
5235.0	H	-	-	-70.37	9.60	46.23	-49.03	-13.00	-36.03
6980.0	H	-	-	-69.46	13.50	51.04	-44.21	-13.00	-31.21

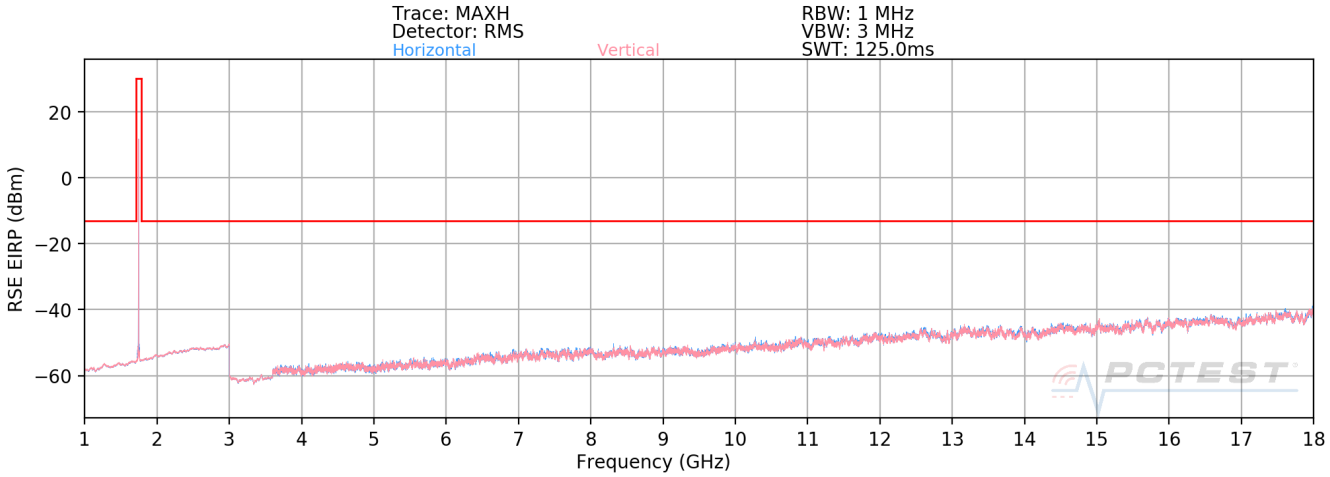
Table 7-28. Radiated Spurious Data (LTE Band 66/4 – Mid Channel)

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

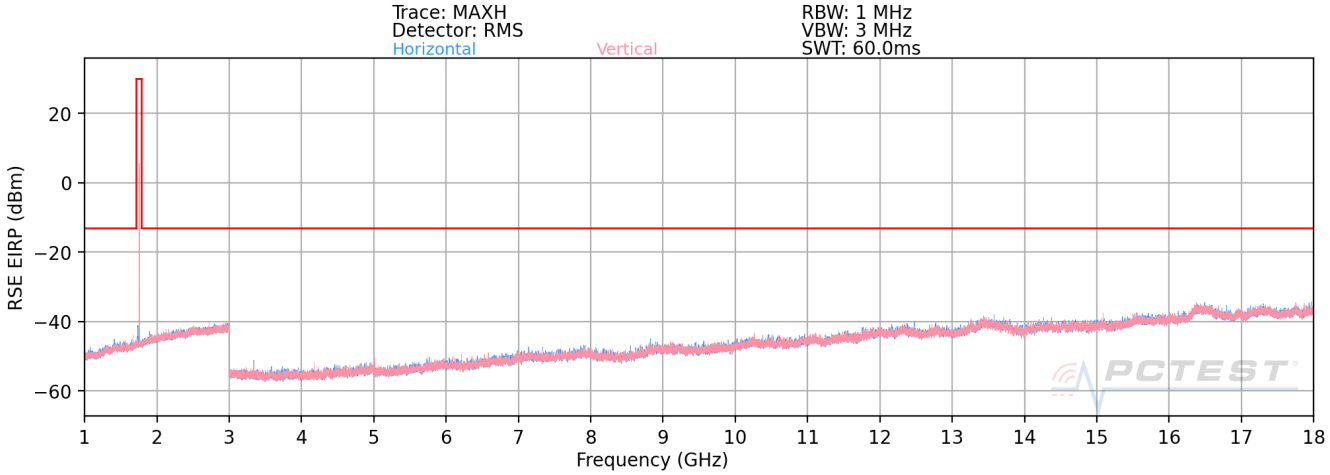
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3540.00	H	-	-	-69.16	7.66	45.50	-49.76	-13.00	-36.76
5310.00	H	-	-	-70.11	10.09	46.98	-48.28	-13.00	-35.28
7080.00	H	-	-	-69.82	14.13	51.31	-43.95	-13.00	-30.95

Table 7-29. Radiated Spurious Data (LTE Band 66/4 – High Channel)

NR Band n66



Plot 7-196. Radiated Spurious Plot (NR Band n66)



Plot 7-197. Radiated Spurious Plot (NR Band n66 + B13)

Bandwidth (MHz):	20
Frequency (MHz):	1720.0
RB / Offset:	1 / 50
Mode:	Standalone
Anchor Band:	-

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	H	-	-	-79.63	5.87	33.24	-62.02	-13.00	-49.02
5160.0	H	-	-	-79.82	7.92	35.10	-60.16	-13.00	-47.16

Table 7-30. Radiated Spurious Data (NR Band n66 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1745.0
RB / Offset:	1 / 50
Mode:	Standalone
Anchor Band:	-

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	H	-	-	-79.69	6.04	33.35	-61.90	-13.00	-48.90
5235.0	H	-	-	-79.64	8.14	35.50	-59.76	-13.00	-46.76

Table 7-31. Radiated Spurious Data (NR Band n66 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1770.0
RB / Offset:	1 / 50
Mode:	Standalone
Anchor Band:	-

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]
3540.0	H	-	-	-79.85	5.59	32.74	-62.51	-13.00	-49.51
5310.0	H	-	-	-79.64	8.25	35.61	-59.65	-13.00	-46.65

Table 7-32. Radiated Spurious Data (NR Band n66 – High Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1745.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 13

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]
1144.0	H	-	-	-79.85	-3.09	24.06	-71.20	-13.00	-58.20
2107.0	H	-	-	-78.69	0.87	29.18	-66.07	-13.00	-53.07
2708.0	H	-	-	-79.01	3.46	31.45	-63.80	-13.00	-50.80

Table 7-33. Radiated Spurious Data (NR Band n66 + B13 – Mid 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 12/17

Operating Frequency (Hz):	707,500,000
Ref. Voltage (VDC):	4.18
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	- 30	707,500,065	128	0.0000181
		- 20	707,499,884	-53	-0.0000075
		- 10	707,499,703	-234	-0.0000331
		0	707,500,168	231	0.0000327
		+ 10	707,499,748	-189	-0.0000267
		+ 20 (Ref)	707,499,937	0	0.0000000
		+ 30	707,500,000	63	0.0000089
		+ 40	707,500,242	305	0.0000431
		+ 50	707,499,874	-63	-0.0000089
Battery Endpoint	3.21	+ 20	707,499,940	3	0.0000004

Table 7-9. LTE Band 12/17 Frequency Stability Data

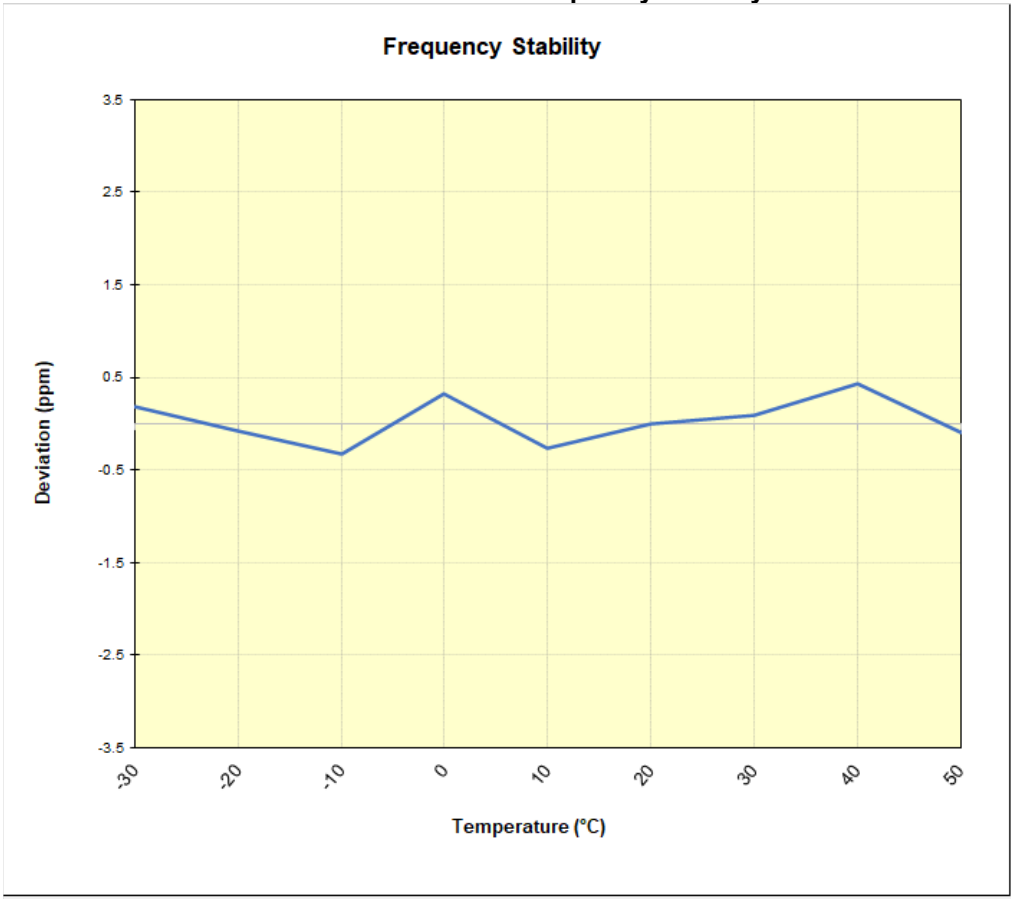


Table 7-9. LTE Band 12/17 Frequency Stability Chart

Frequency Stability / Temperature Variation

LTE Band 13

Operating Frequency (Hz):	782,000,000
Ref. Voltage (VDC):	4.18
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	- 30	781,999,925	-55	-0.0000070
		- 20	781,999,753	-227	-0.0000290
		- 10	782,000,328	348	0.0000445
		0	782,000,371	391	0.0000500
		+ 10	781,999,840	-140	-0.0000179
		+ 20 (Ref)	781,999,980	0	0.0000000
		+ 30	782,000,107	127	0.0000162
		+ 40	782,000,044	64	0.0000082
		+ 50	781,999,871	-109	-0.0000139
Battery Endpoint	3.21	+ 20	782,000,024	44	0.0000056

Table 7-9. LTE Band 13 Frequency Stability Data

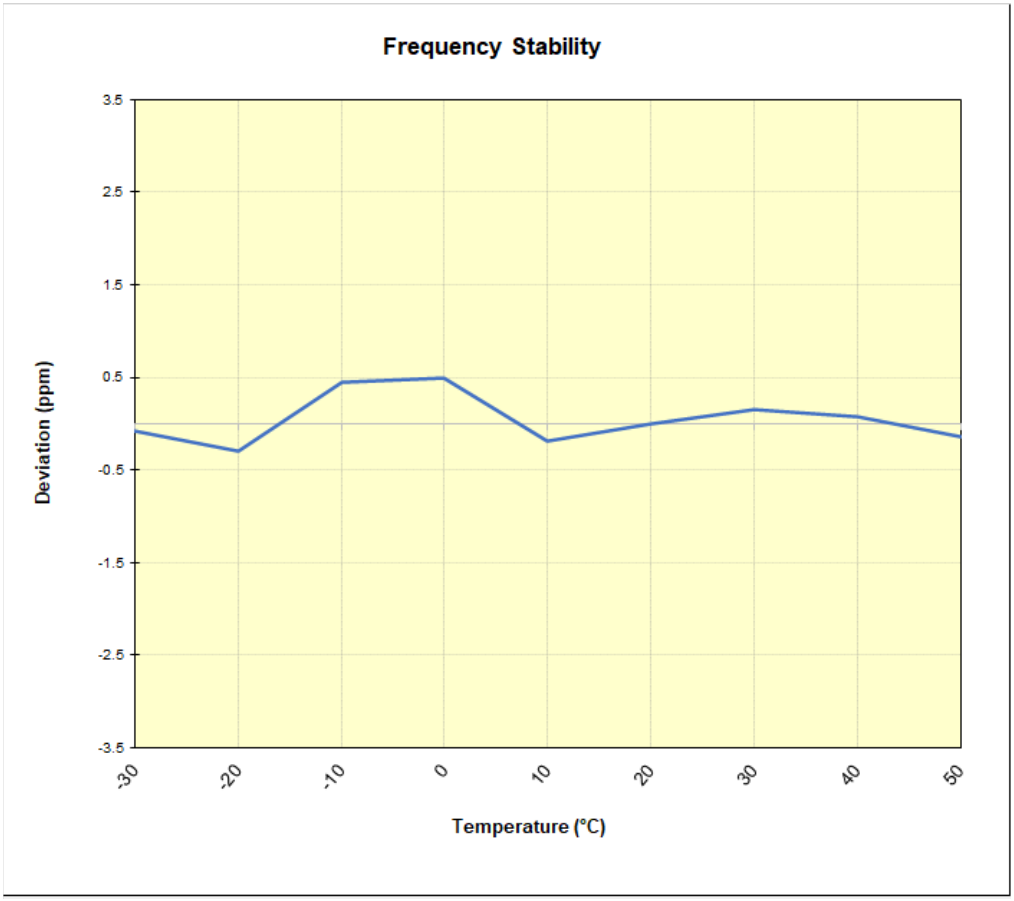


Table 7-9. LTE Band 13 Frequency Stability Chart

Frequency Stability / Temperature Variation

WCDMA AWS

Operating Frequency (Hz):	1,732,600,000
Ref. Voltage (VDC):	4.18
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	- 30	1,732,599,715	-31	-0.0000018
		- 20	1,732,600,271	525	0.0000303
		- 10	1,732,600,113	367	0.0000212
		0	1,732,599,546	-200	-0.0000115
		+ 10	1,732,600,155	409	0.0000236
		+ 20 (Ref)	1,732,599,746	0	0.0000000
		+ 30	1,732,600,135	389	0.0000225
		+ 40	1,732,599,520	-226	-0.0000130
		+ 50	1,732,600,011	265	0.0000153
Battery Endpoint	3.21	+ 20	1,732,600,156	410	0.0000237

Table 7-9. WCDMA AWS Frequency Stability Data

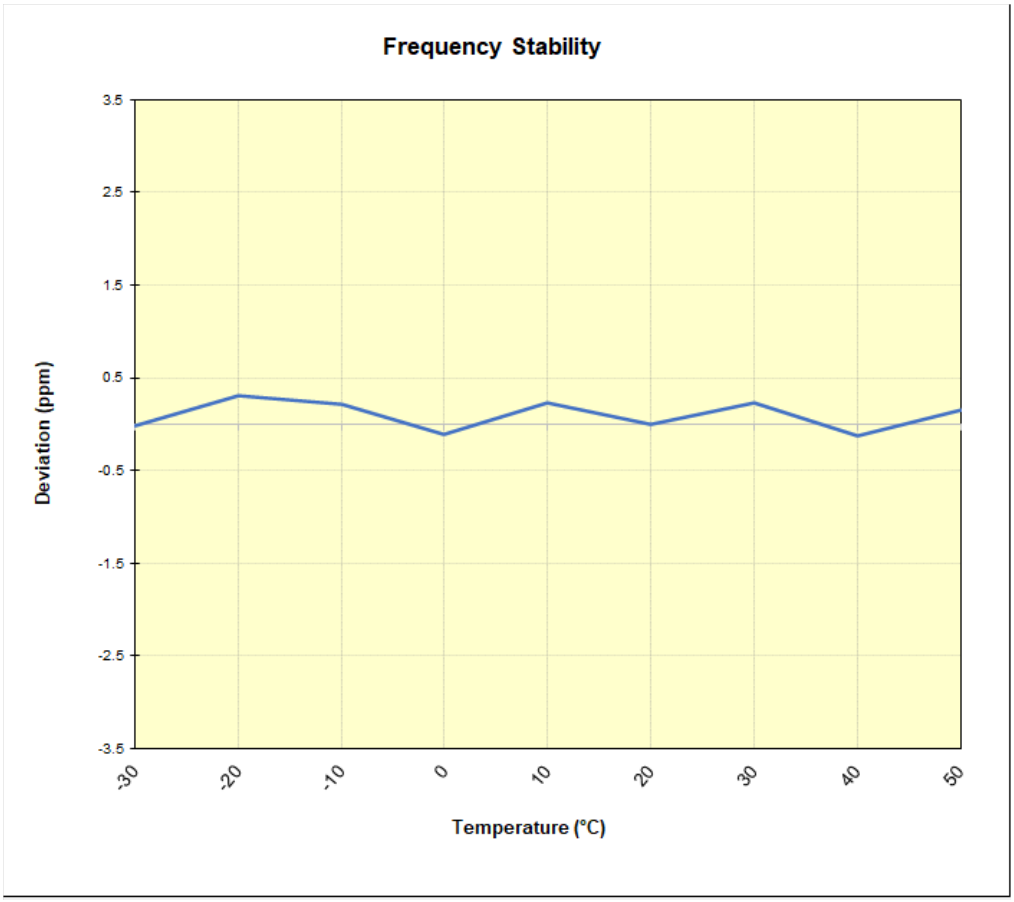


Table 7-9. WCDMA AWS Frequency Stability Chart

Frequency Stability / Temperature Variation

LTE Band 66/4

Operating Frequency (Hz):	1,745,000,000
Ref. Voltage (VDC):	4.18
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	- 30	1,744,999,888	-554	-0.0000317
		- 20	1,744,999,892	-550	-0.0000315
		- 10	1,745,000,275	-167	-0.0000096
		0	1,745,000,303	-139	-0.0000080
		+ 10	1,745,000,008	-434	-0.0000249
		+ 20 (Ref)	1,745,000,442	0	0.0000000
		+ 30	1,744,999,963	-479	-0.0000274
		+ 40	1,744,999,717	-725	-0.0000415
		+ 50	1,745,000,032	-410	-0.0000235
Battery Endpoint	3.21	+ 20	1,744,999,763	-679	-0.0000389

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

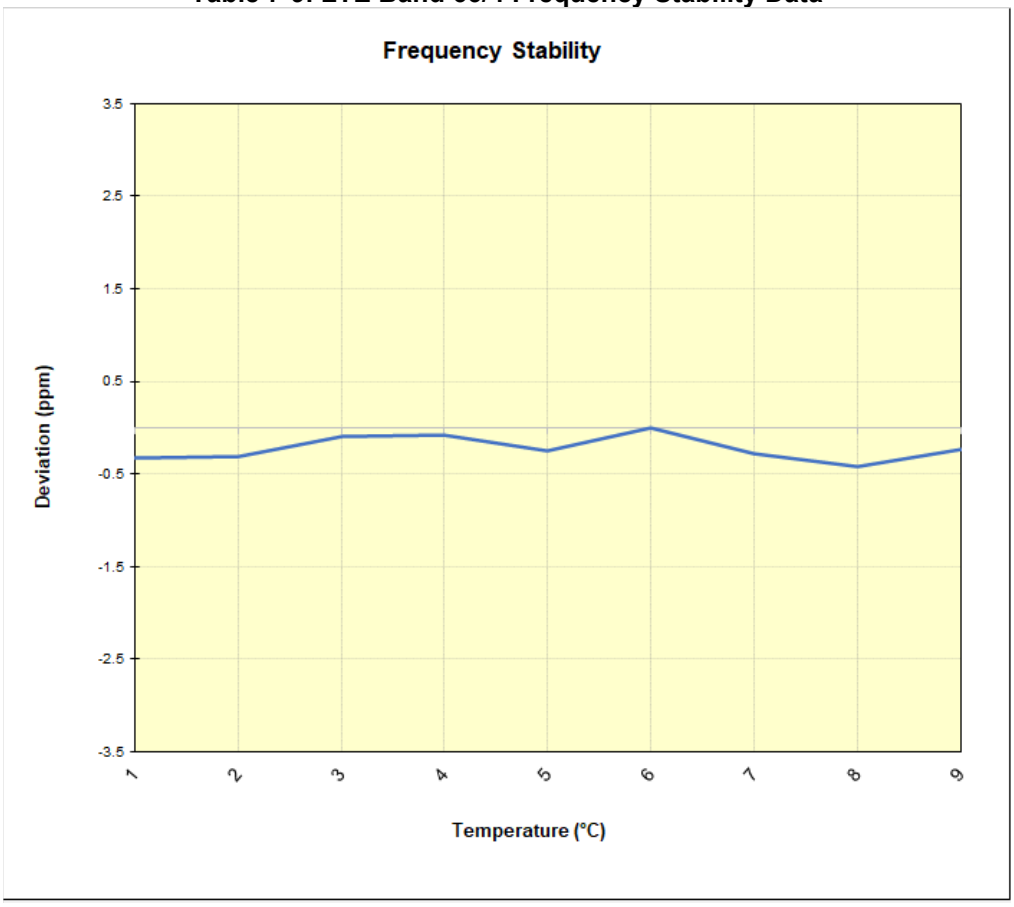


Table 7-9. LTE Band 66/4 Frequency Stability Chart

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the SONY **Portable Handset FCC ID: PY7-57441Y** complies with all the requirements of Part 27 of the FCC rules.