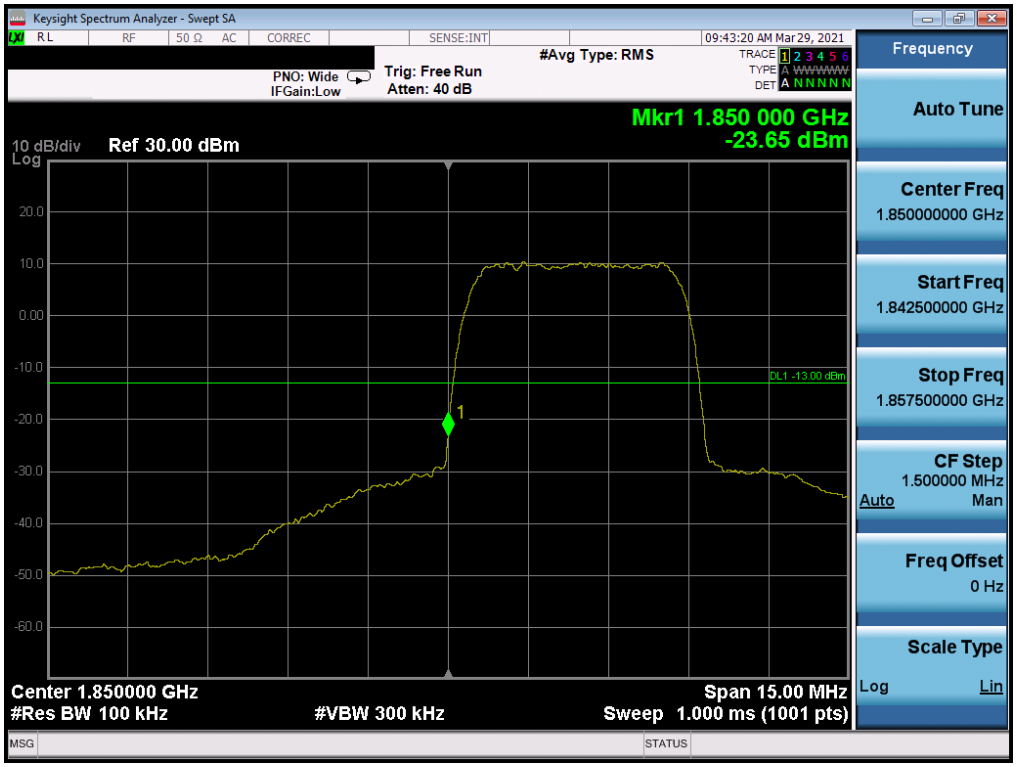
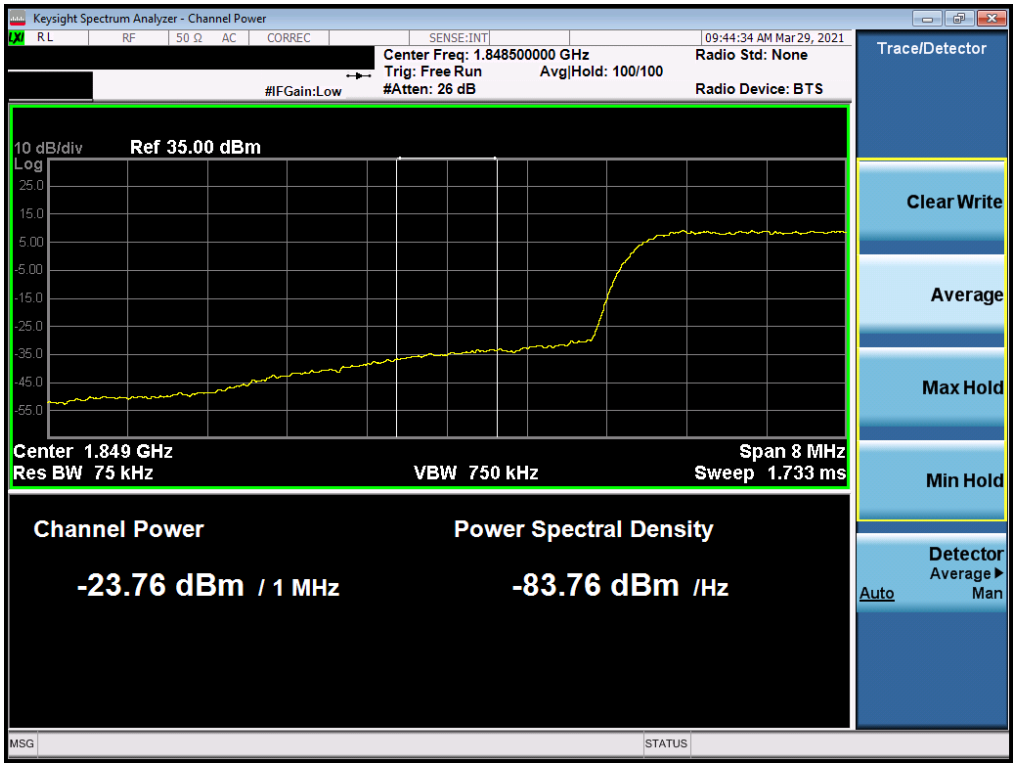
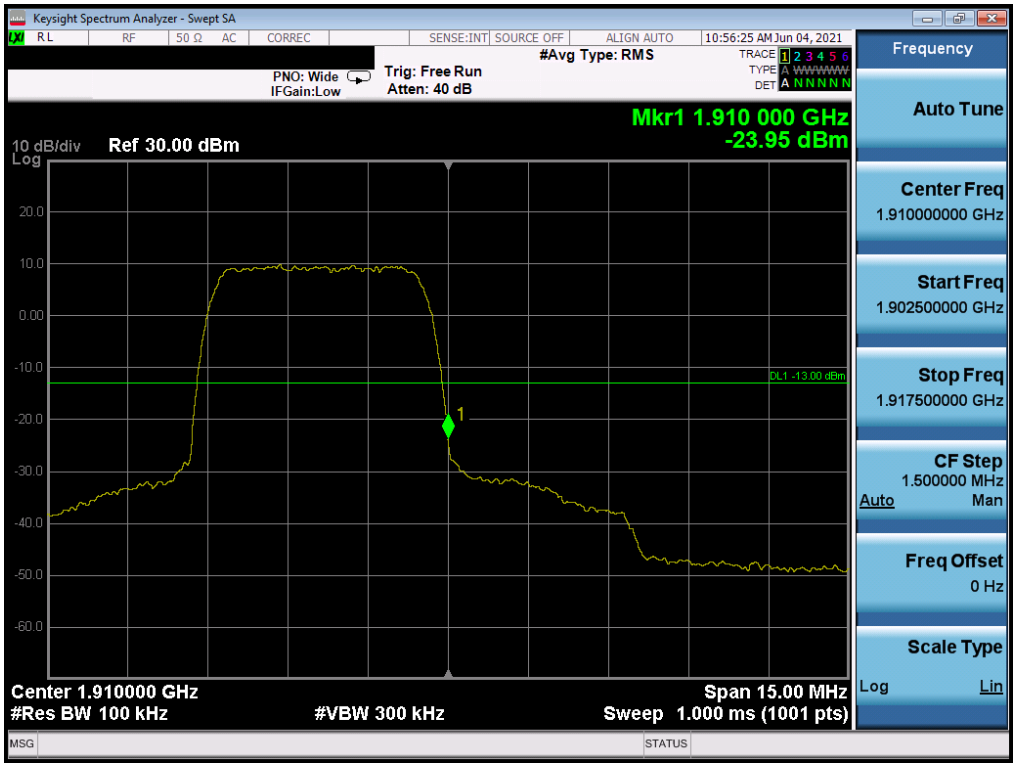
WCDMA PCS



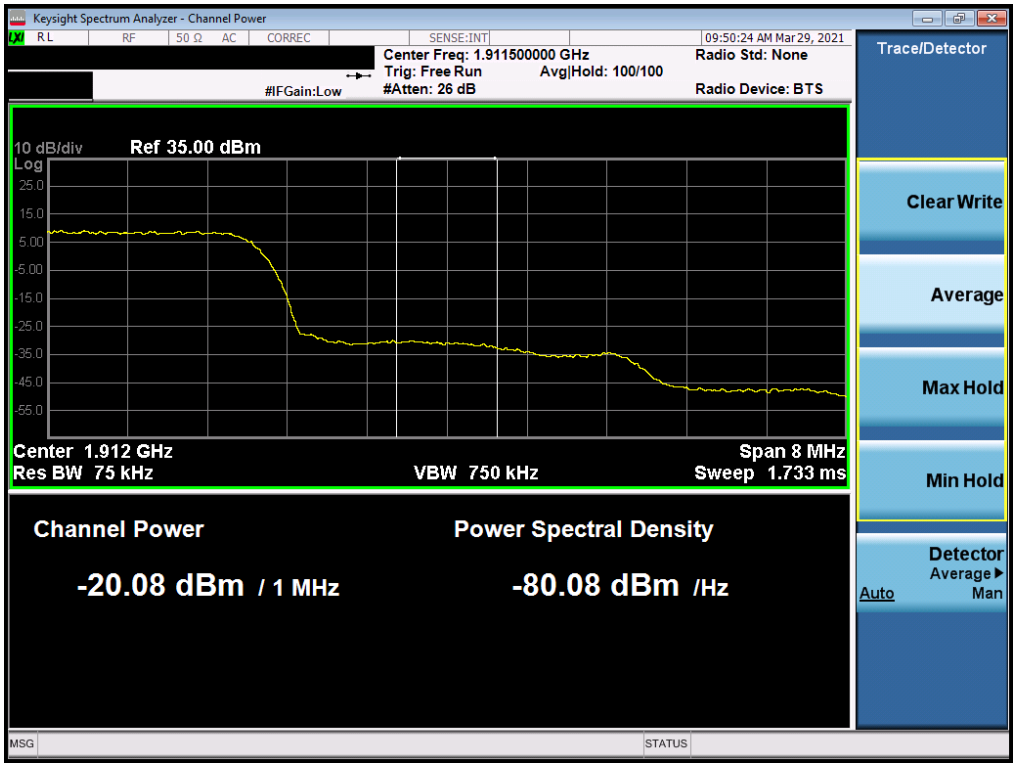
Plot 7-86. Lower Band Edge Plot (WCDMA PCS – Ch. 9262)



Plot 7-87. Extended Lower Band Edge Plot (WCDMA PCS – Ch. 9262)



Plot 7-88. Upper Band Edge Plot (WCDMA PCS – Ch. 9538)



Plot 7-89. Extended Upper Band Edge Plot (WCDMA PCS – Ch. 9538)

7.5 Peak-Average Ratio

§24.232(d)

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. All ports were tested and only the worst case data were reported.

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.

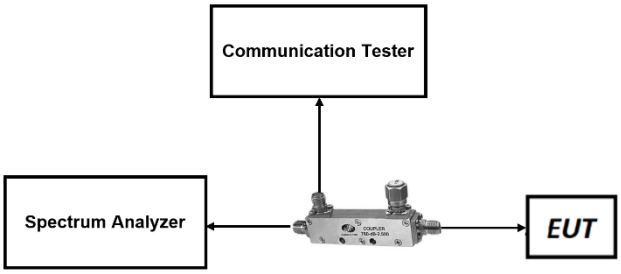
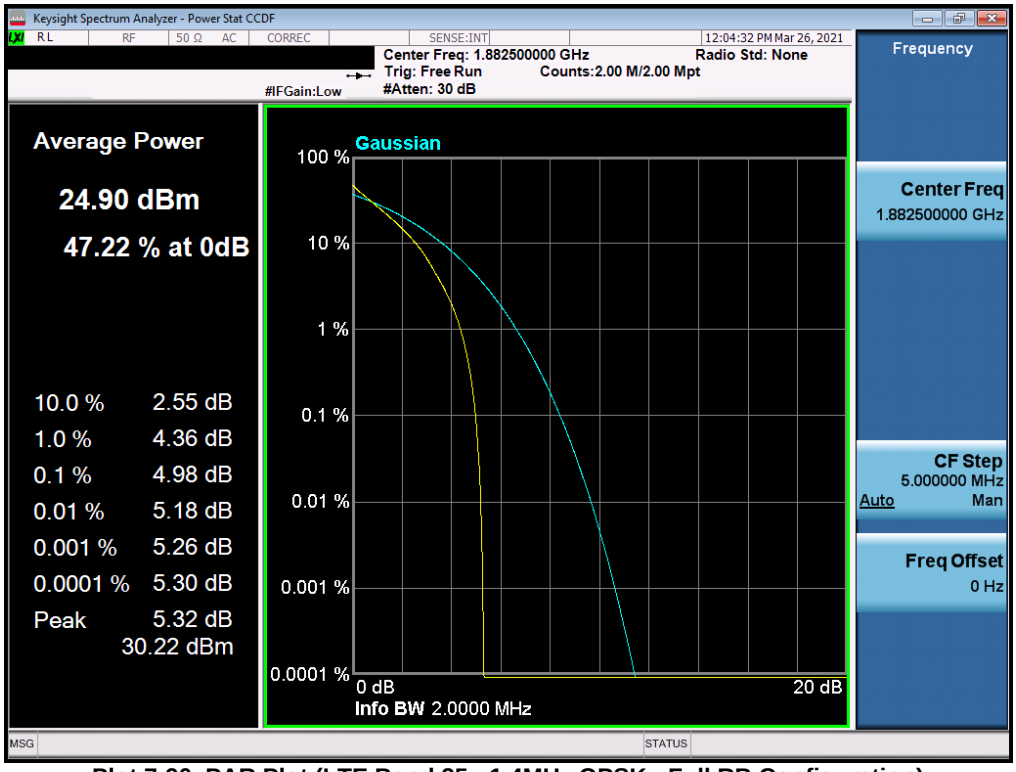


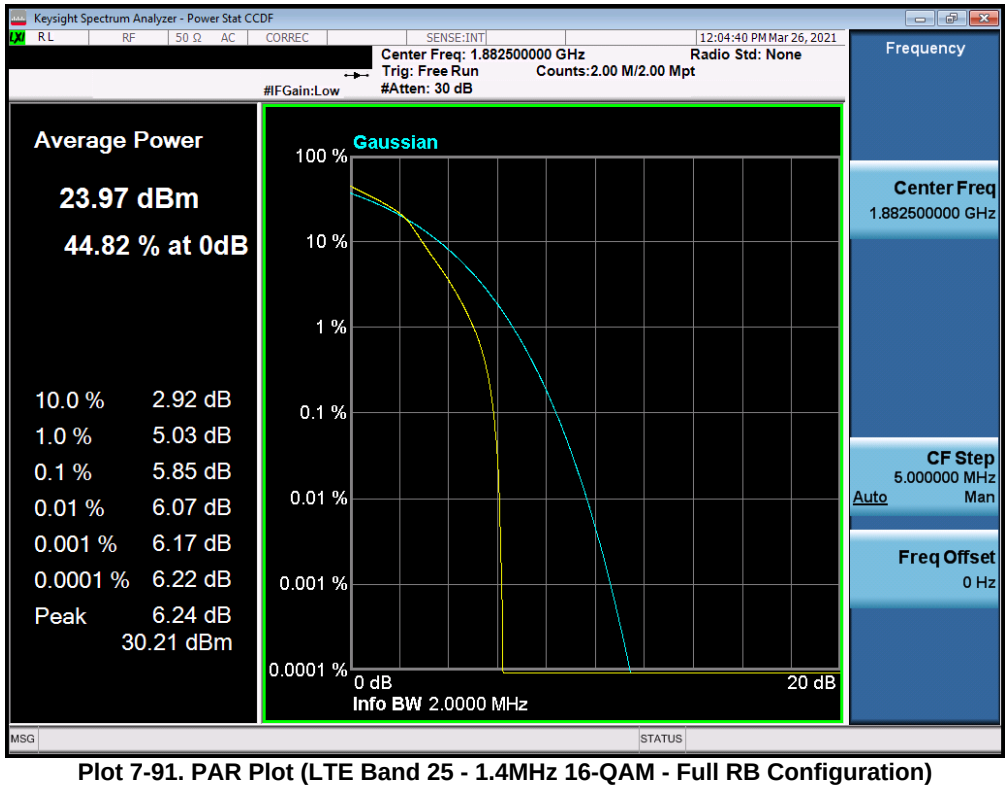
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

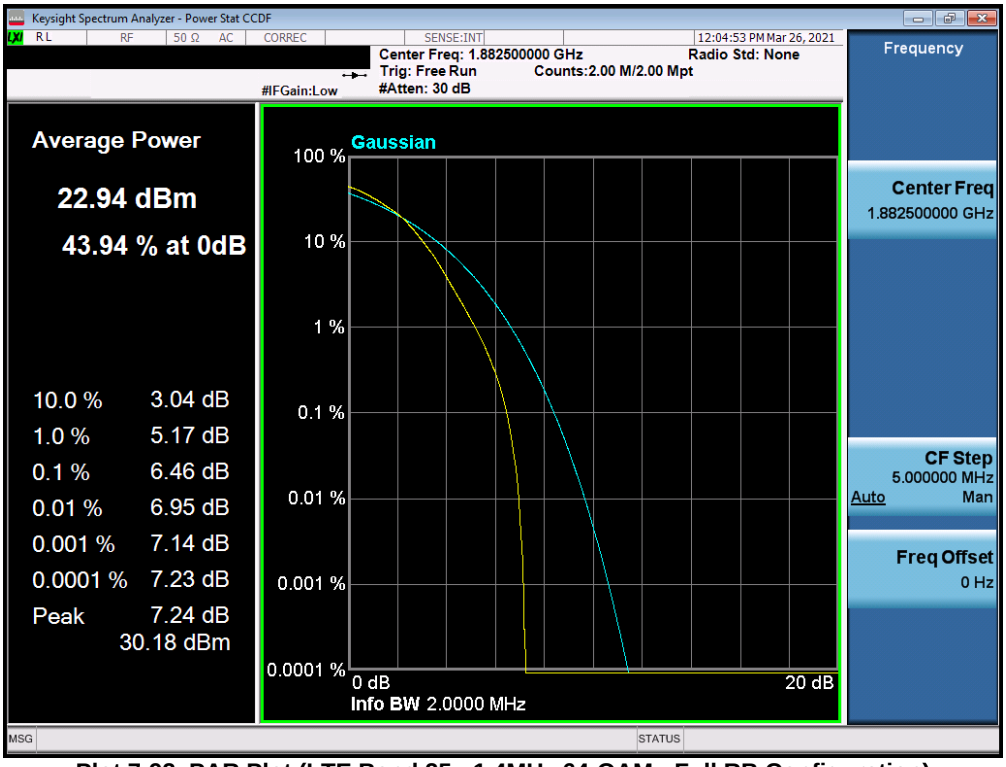
None.



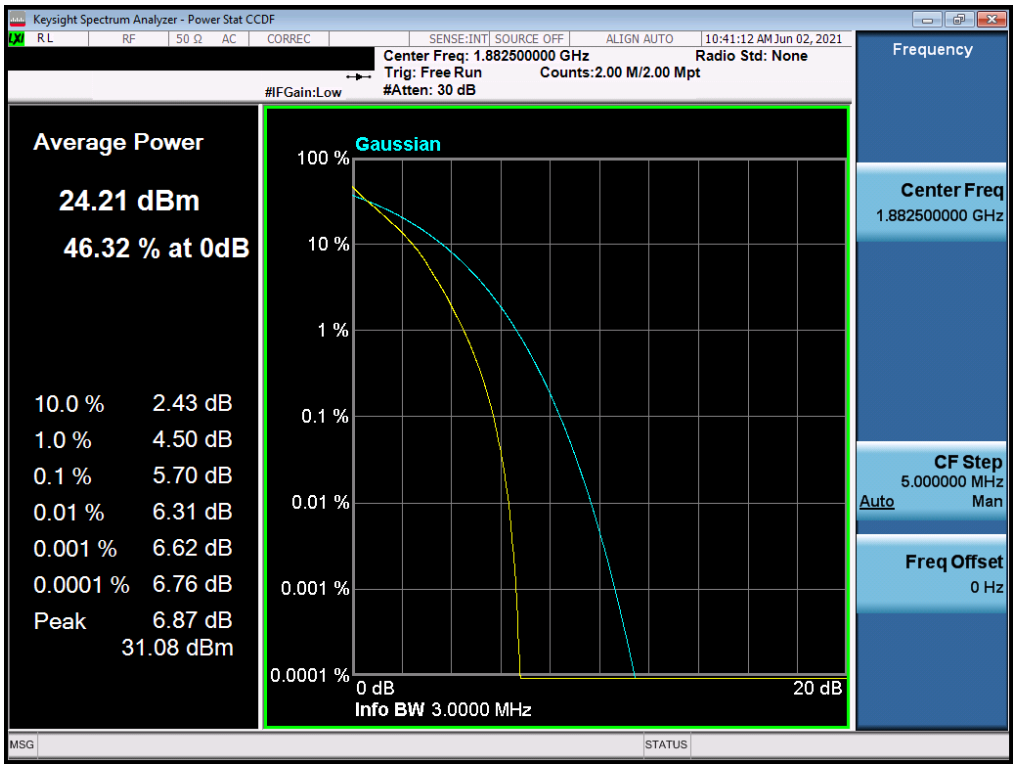
Plot 7-90. PAR Plot (LTE Band 25 - 1.4MHz QPSK - Full RB Configuration)



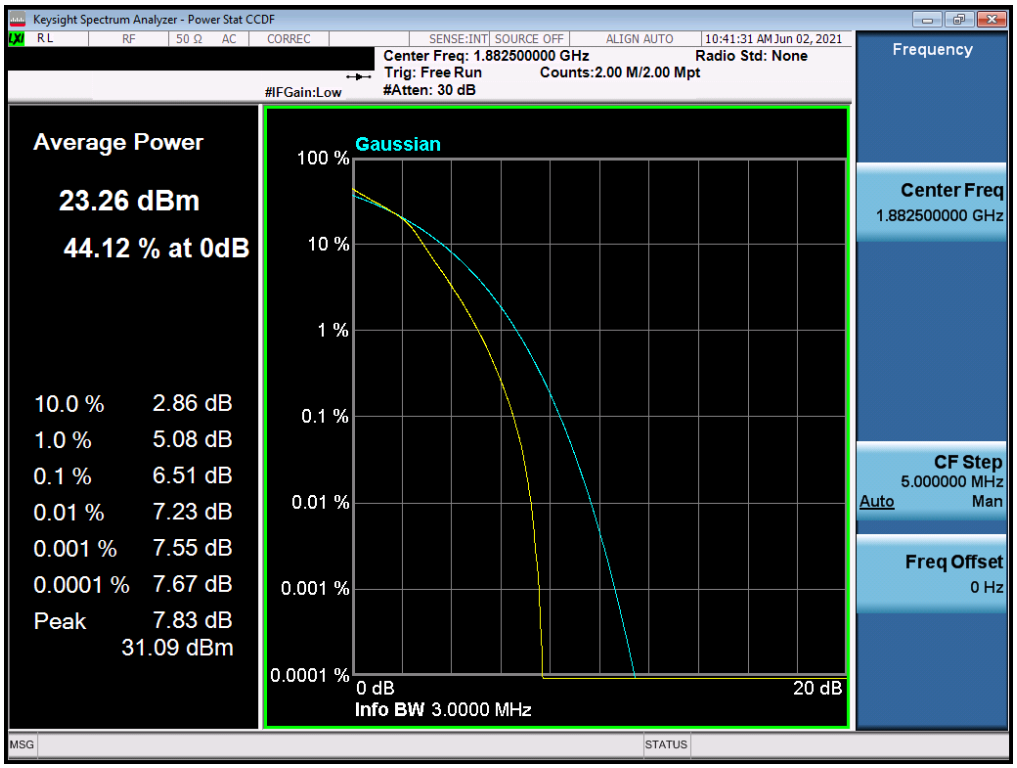
Plot 7-91. PAR Plot (LTE Band 25 - 1.4MHz 16-QAM - Full RB Configuration)



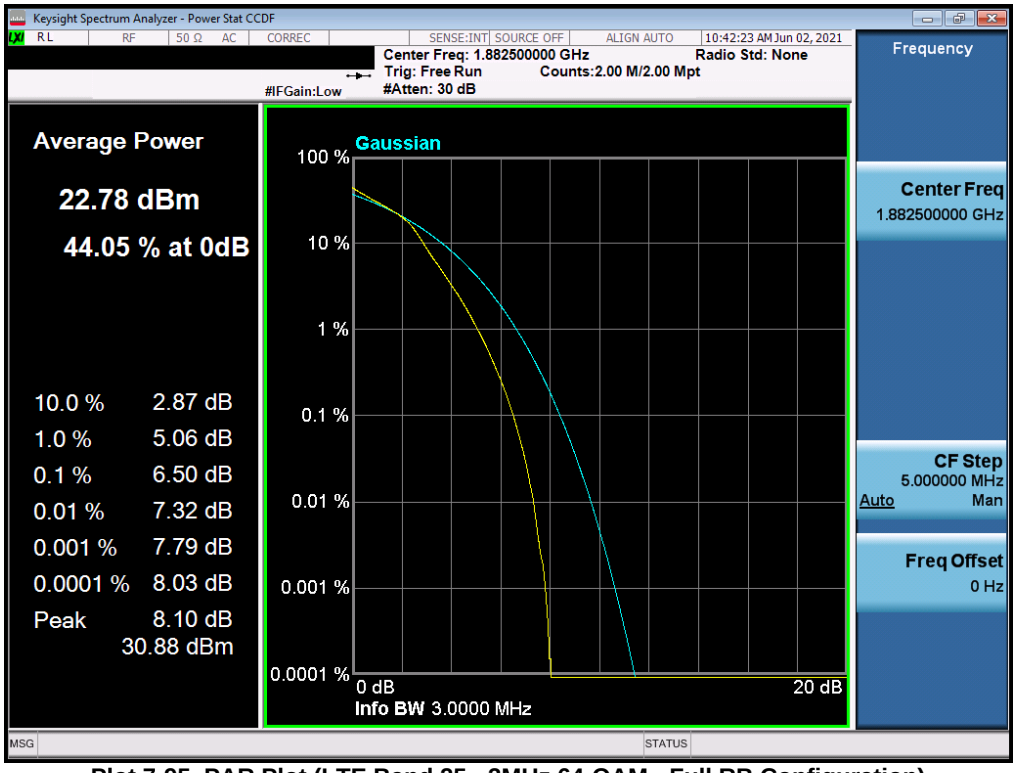
Plot 7-92. PAR Plot (LTE Band 25 - 1.4MHz 64-QAM - Full RB Configuration)



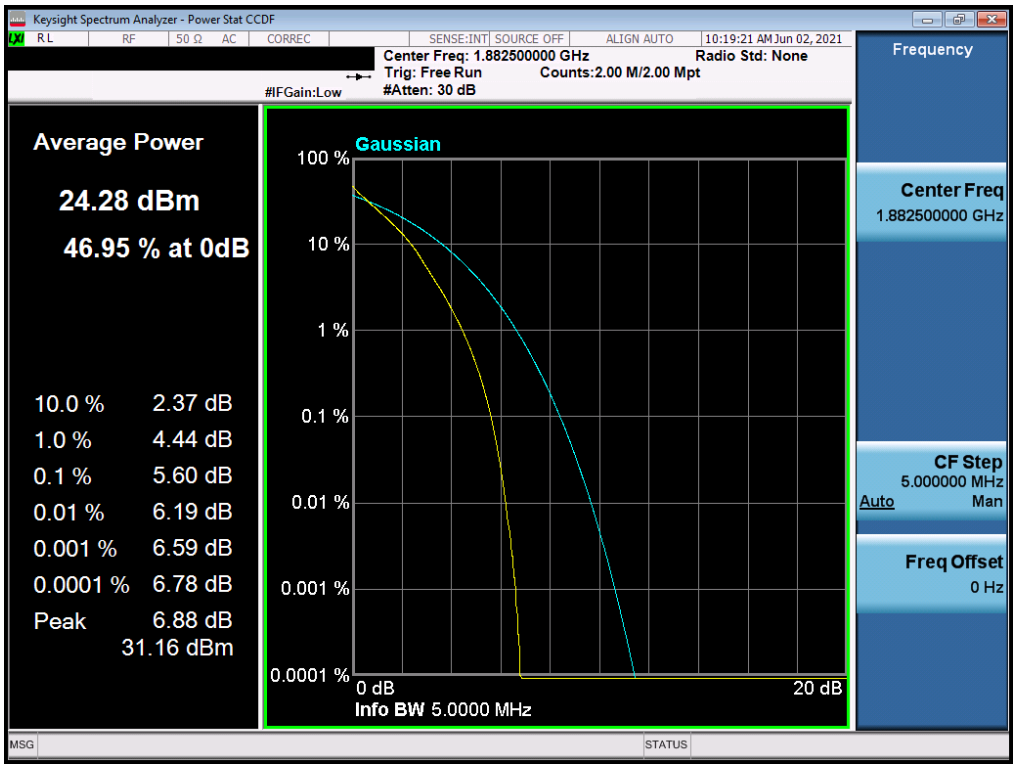
Plot 7-93. PAR Plot (LTE Band 25 - 3MHz QPSK - Full RB Configuration)



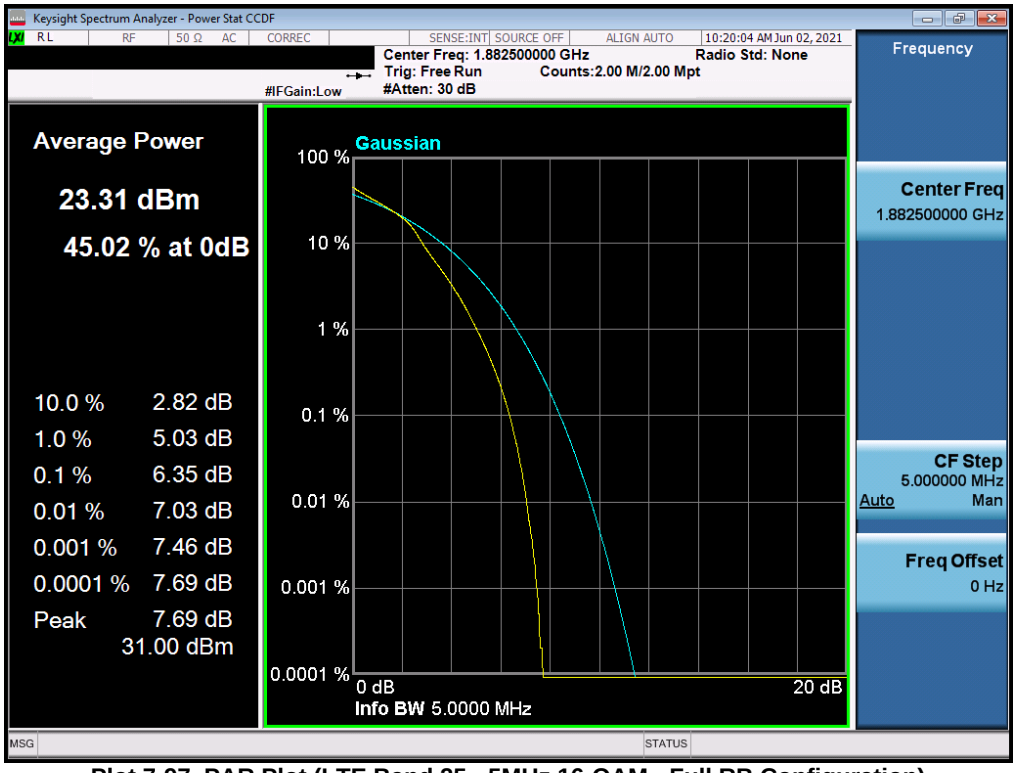
Plot 7-94. PAR Plot (LTE Band 25 - 3MHz 16-QAM - Full RB Configuration)



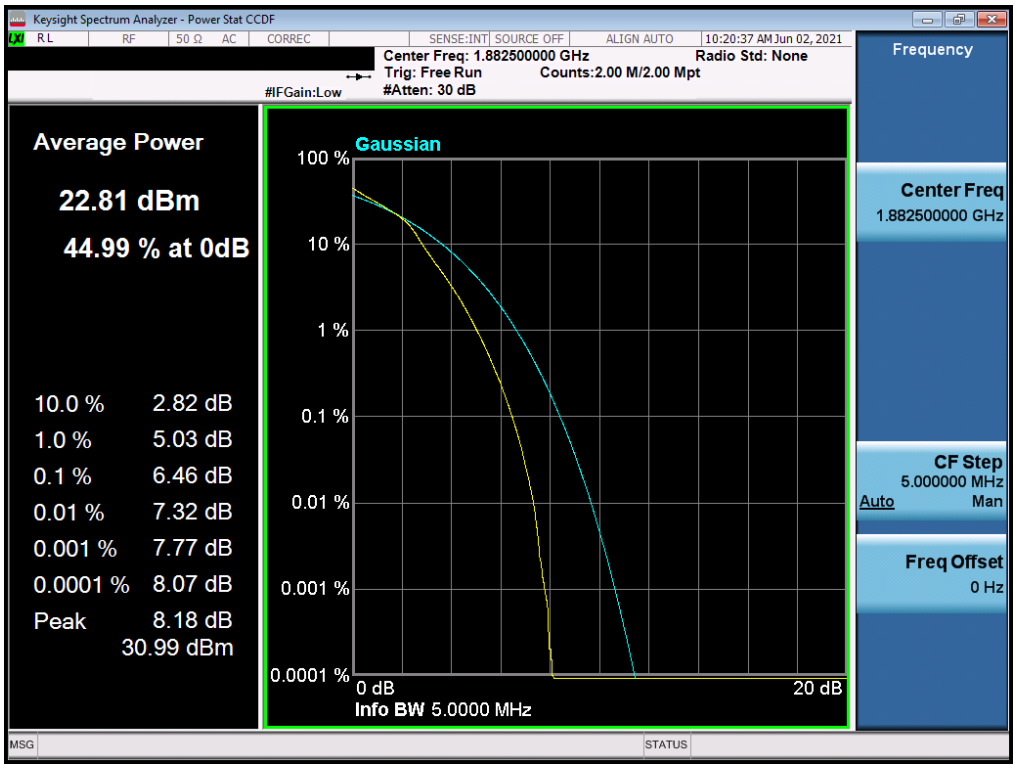
Plot 7-95. PAR Plot (LTE Band 25 - 3MHz 64-QAM - Full RB Configuration)



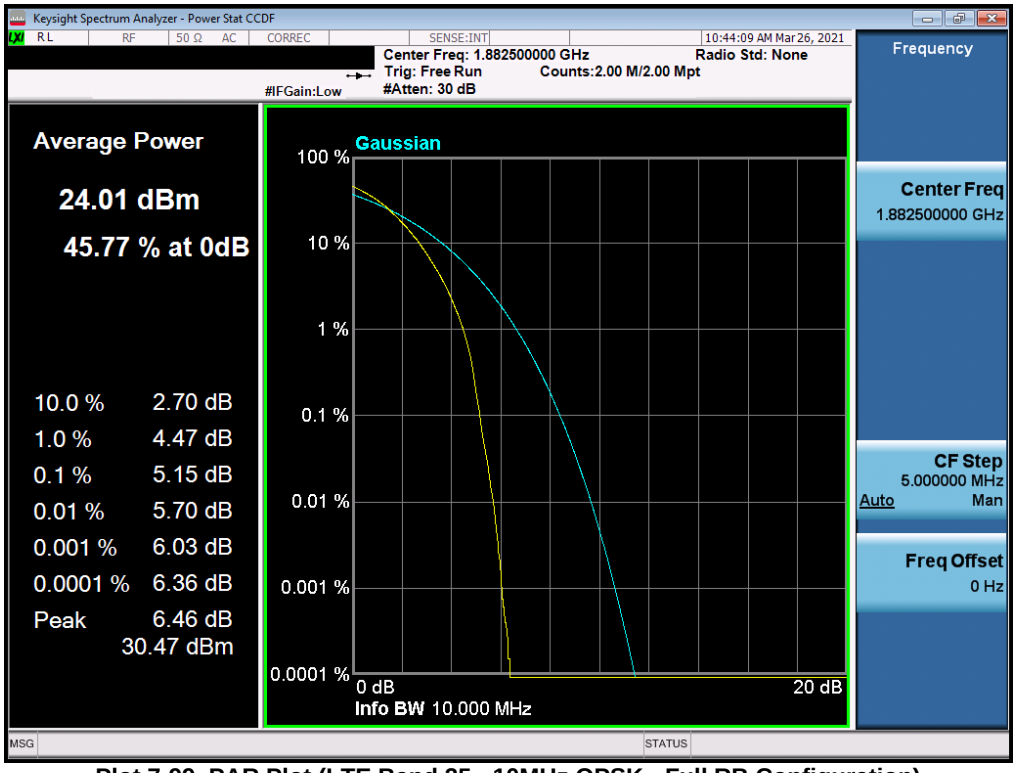
Plot 7-96. PAR Plot (LTE Band 25 - 5MHz QPSK - Full RB Configuration)



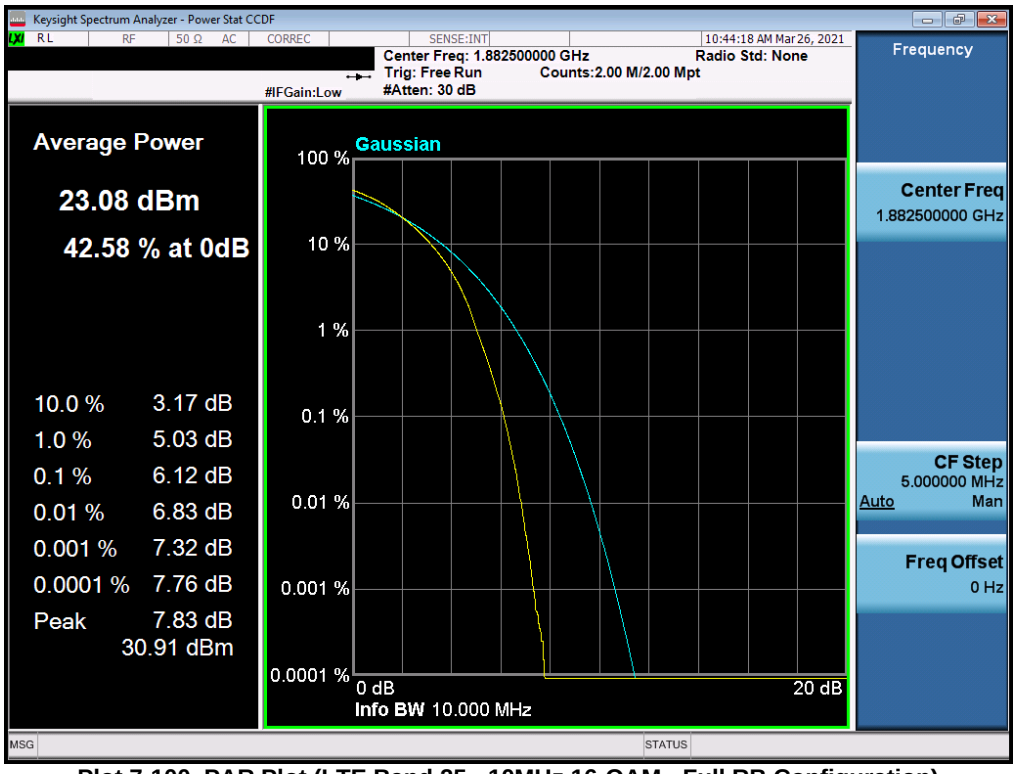
Plot 7-97. PAR Plot (LTE Band 25 - 5MHz 16-QAM - Full RB Configuration)



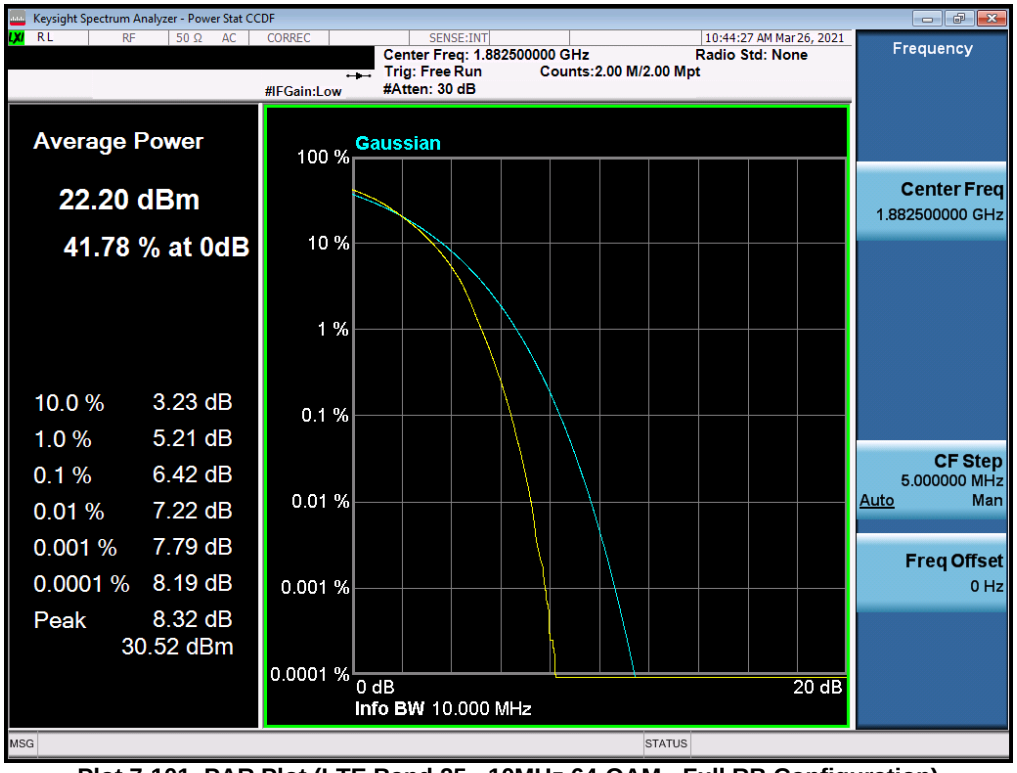
Plot 7-98. PAR Plot (LTE Band 25 - 5MHz 64-QAM - Full RB Configuration)



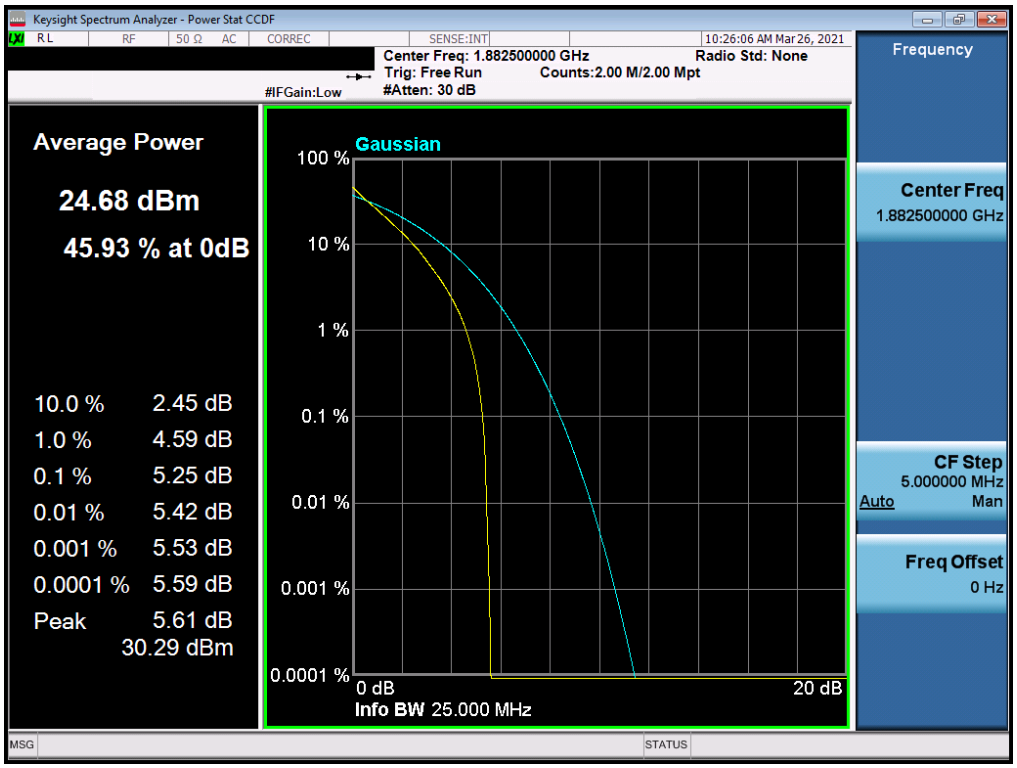
Plot 7-99. PAR Plot (LTE Band 25 - 10MHz QPSK - Full RB Configuration)



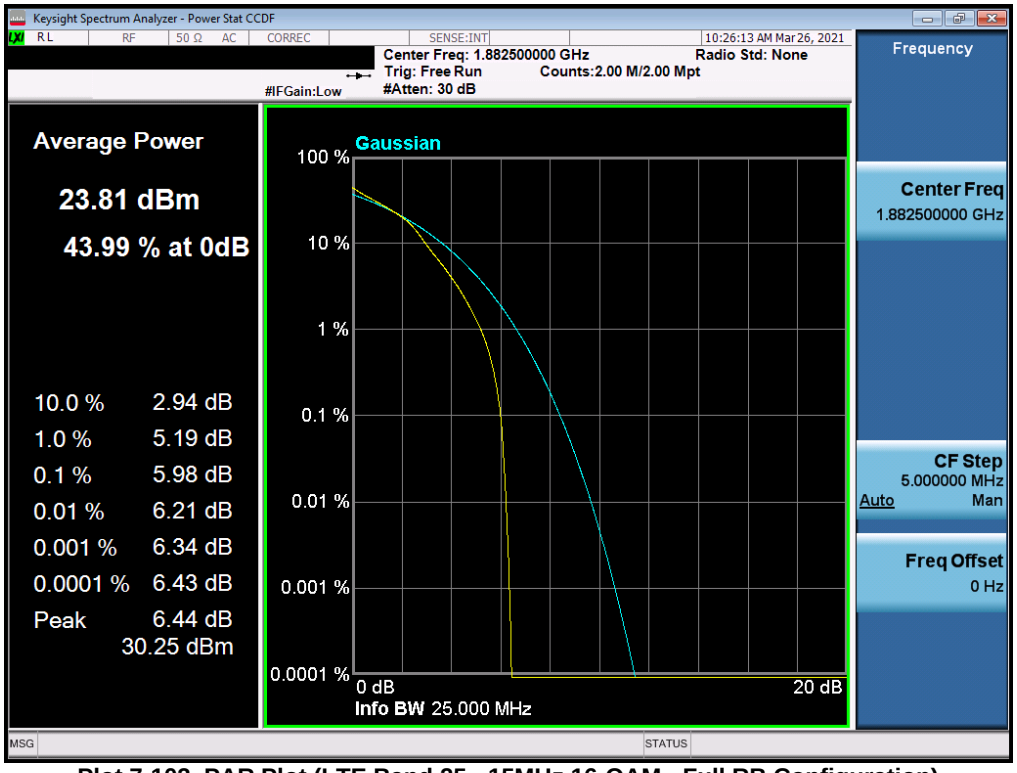
Plot 7-100. PAR Plot (LTE Band 25 - 10MHz 16-QAM - Full RB Configuration)



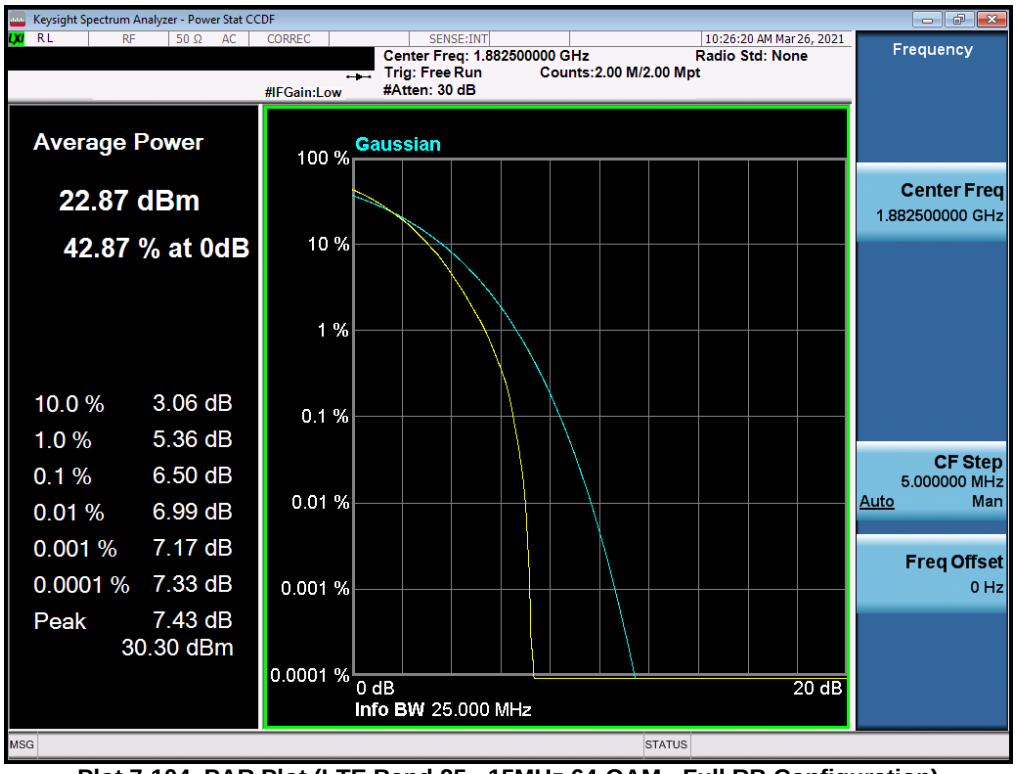
Plot 7-101. PAR Plot (LTE Band 25 - 10MHz 64-QAM - Full RB Configuration)



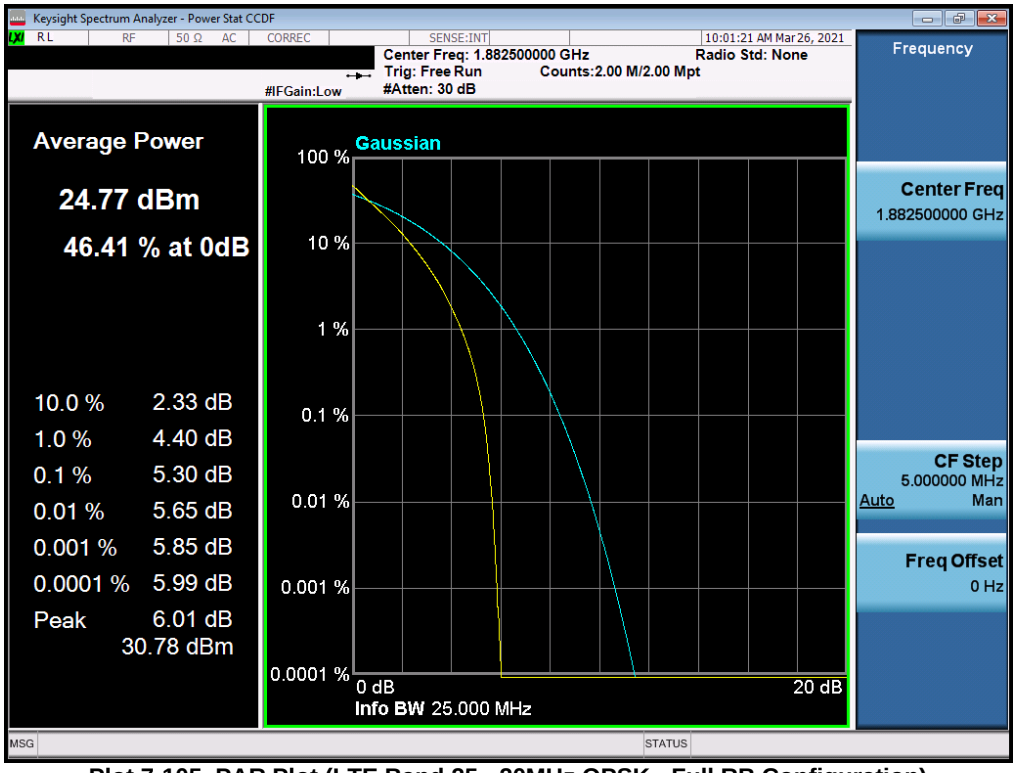
Plot 7-102. PAR Plot (LTE Band 25 - 15MHz QPSK - Full RB Configuration)



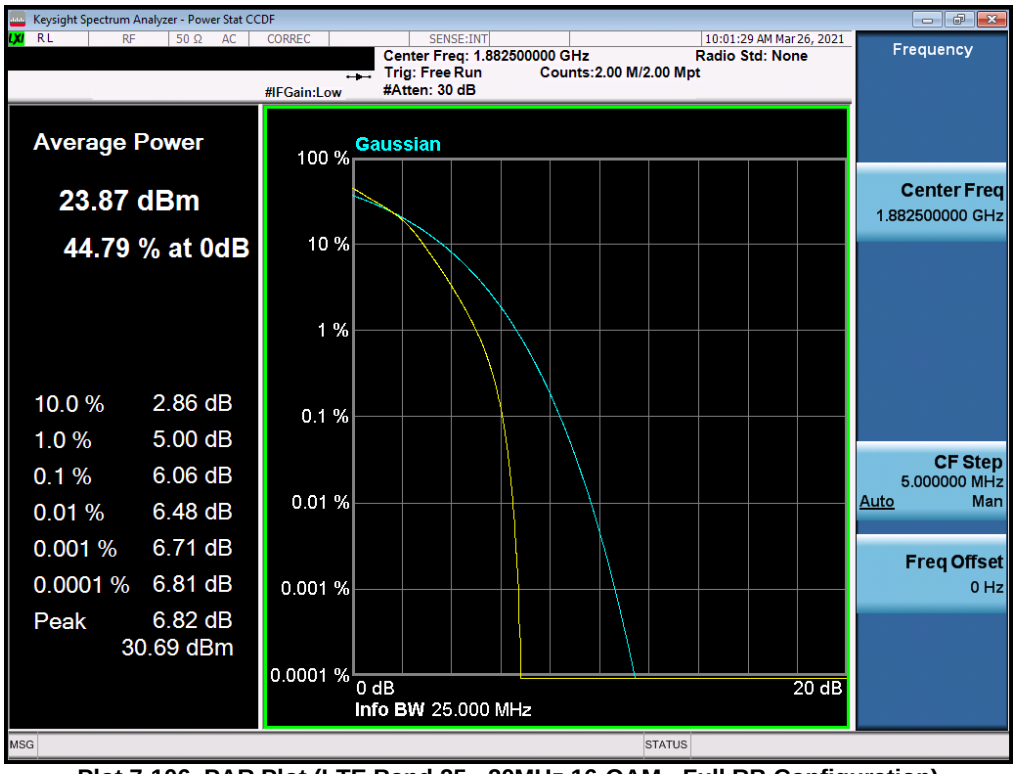
Plot 7-103. PAR Plot (LTE Band 25 - 15MHz 16-QAM - Full RB Configuration)



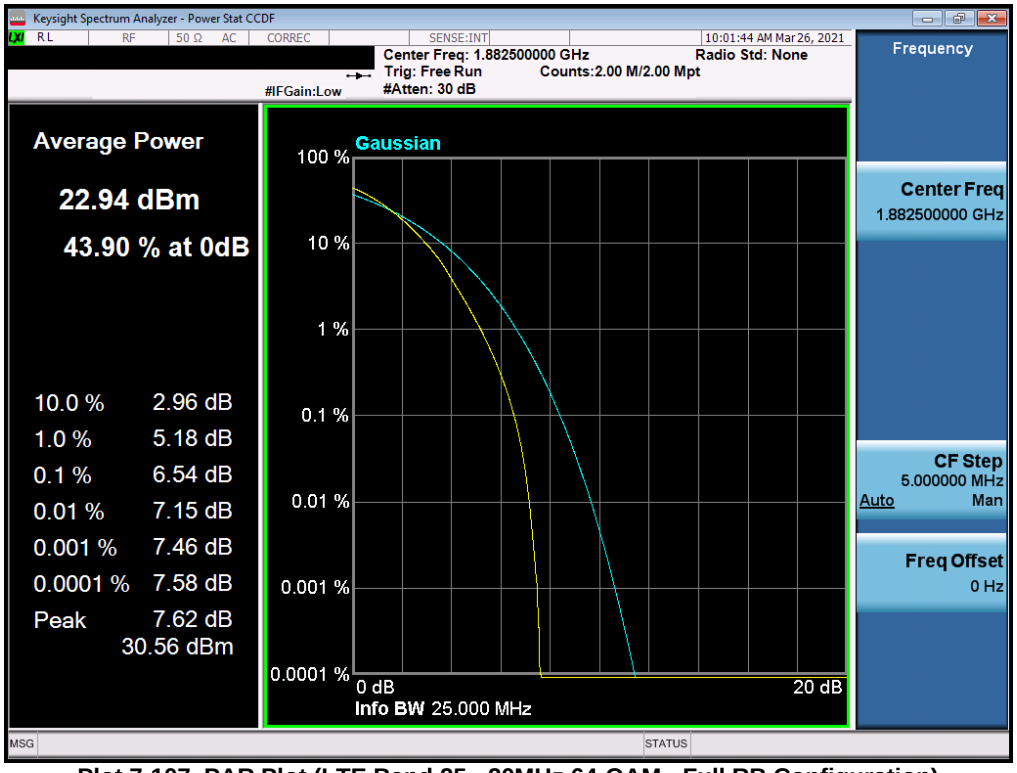
Plot 7-104. PAR Plot (LTE Band 25 - 15MHz 64-QAM - Full RB Configuration)



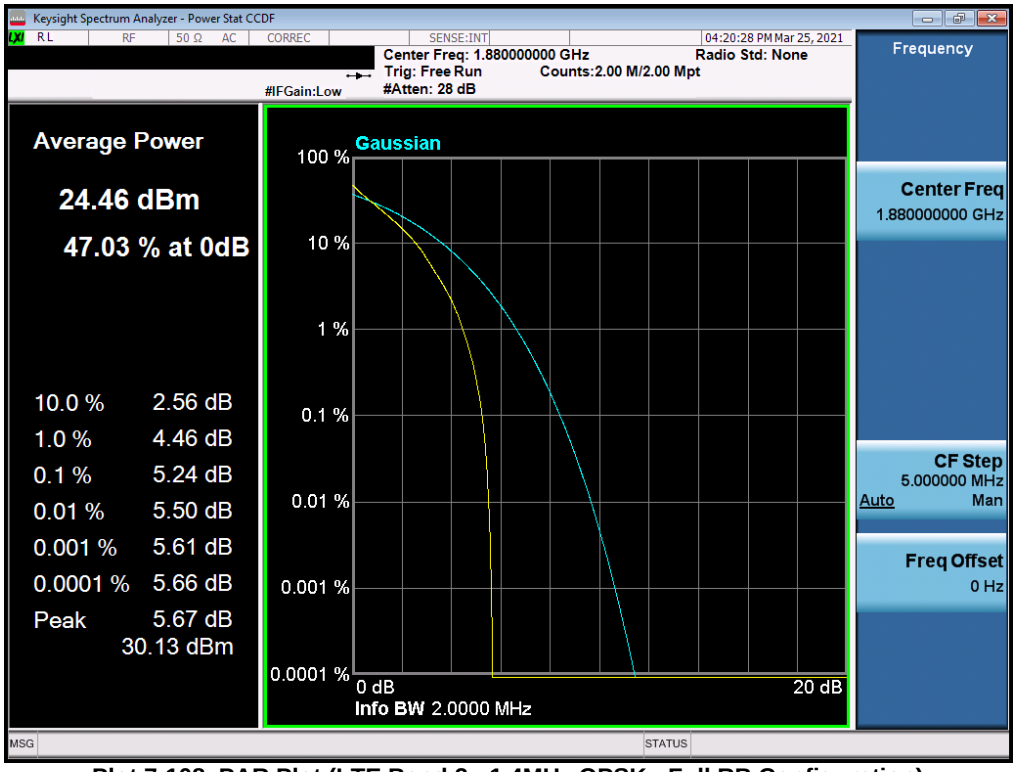
Plot 7-105. PAR Plot (LTE Band 25 - 20MHz QPSK - Full RB Configuration)



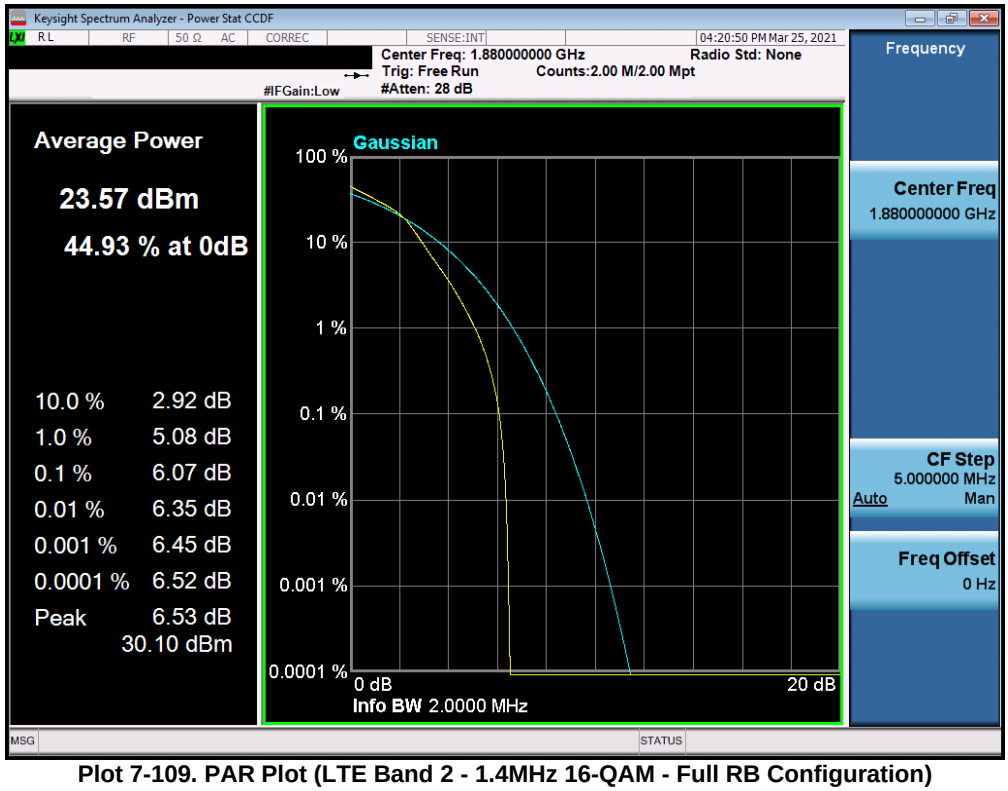
Plot 7-106. PAR Plot (LTE Band 25 - 20MHz 16-QAM - Full RB Configuration)



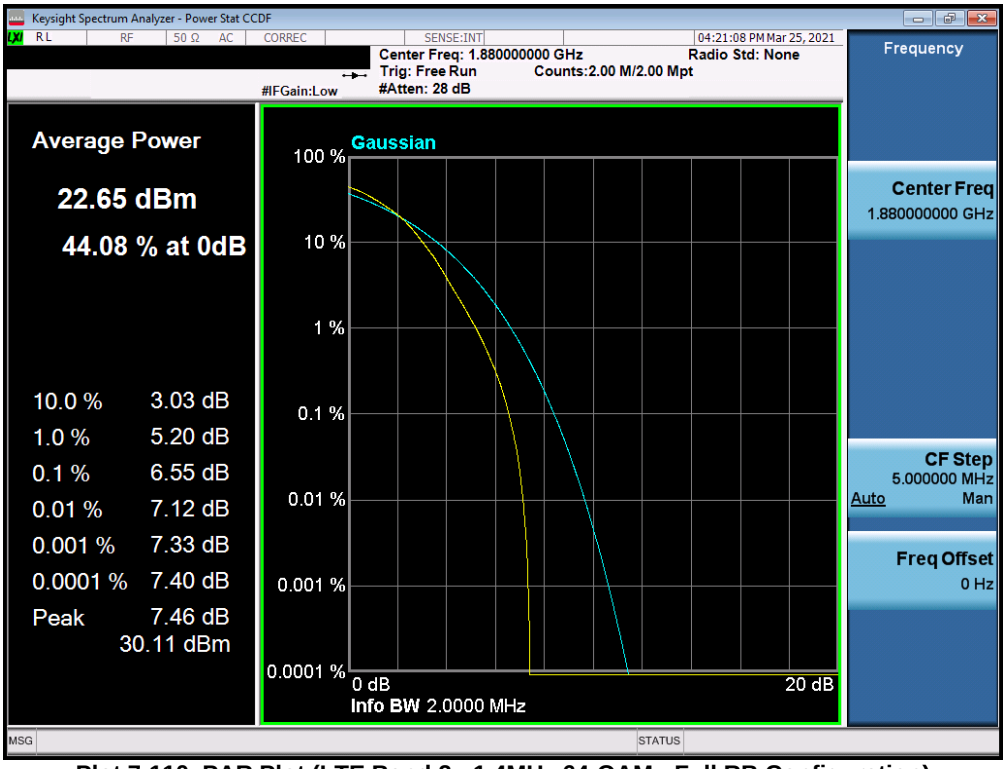
Plot 7-107. PAR Plot (LTE Band 25 - 20MHz 64-QAM - Full RB Configuration)



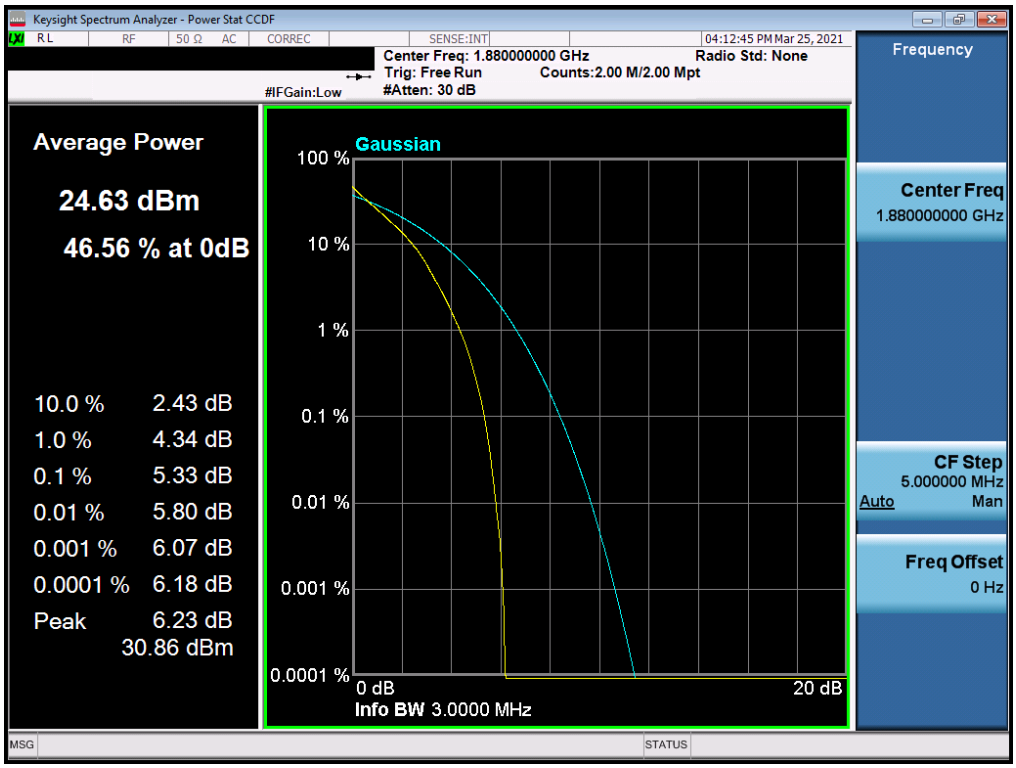
Plot 7-108. PAR Plot (LTE Band 2 - 1.4MHz QPSK - Full RB Configuration)



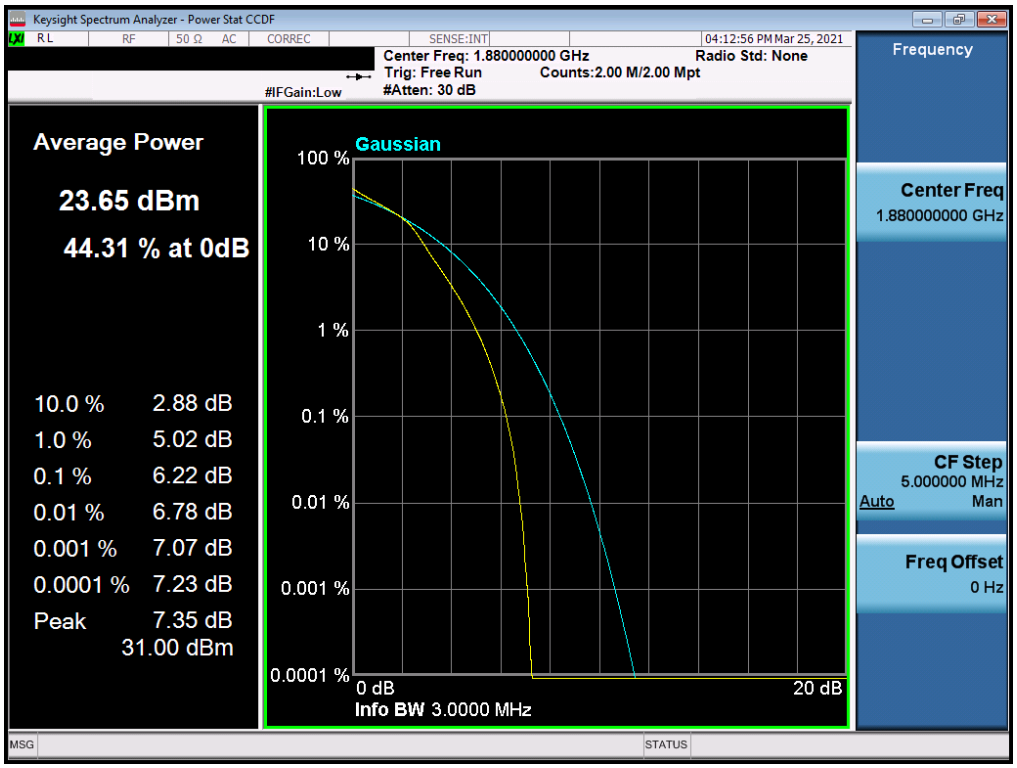
Plot 7-109. PAR Plot (LTE Band 2 - 1.4MHz 16-QAM - Full RB Configuration)



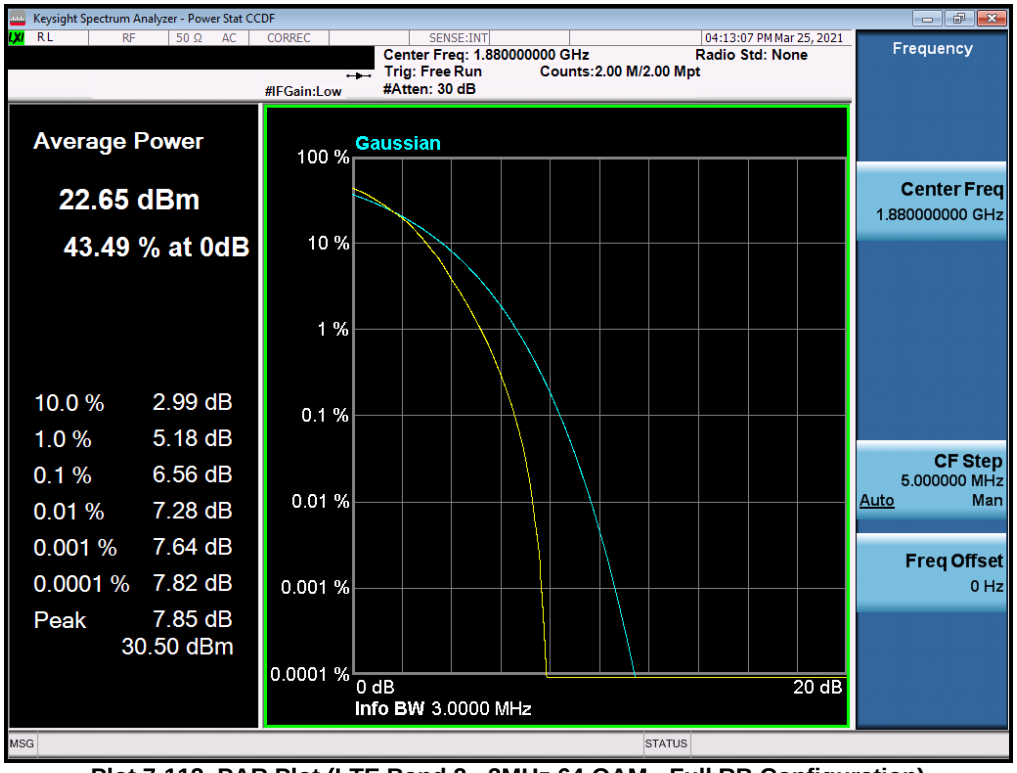
Plot 7-110. PAR Plot (LTE Band 2 - 1.4MHz 64-QAM - Full RB Configuration)



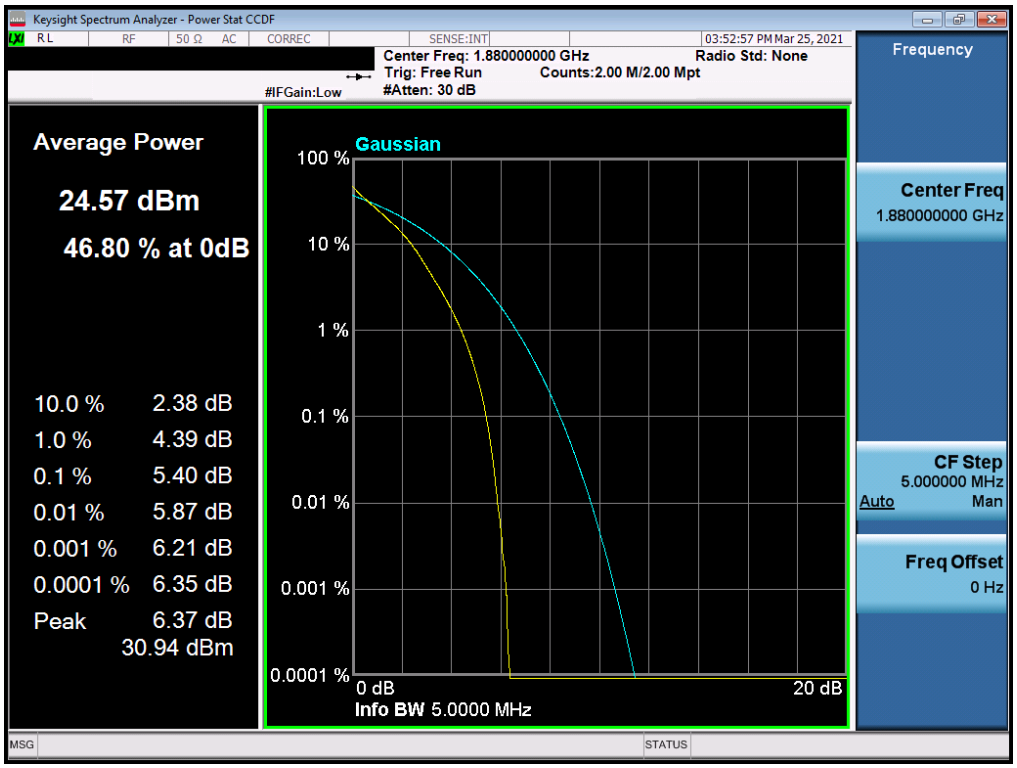
Plot 7-111. PAR Plot (LTE Band 2 - 3MHz QPSK - Full RB Configuration)



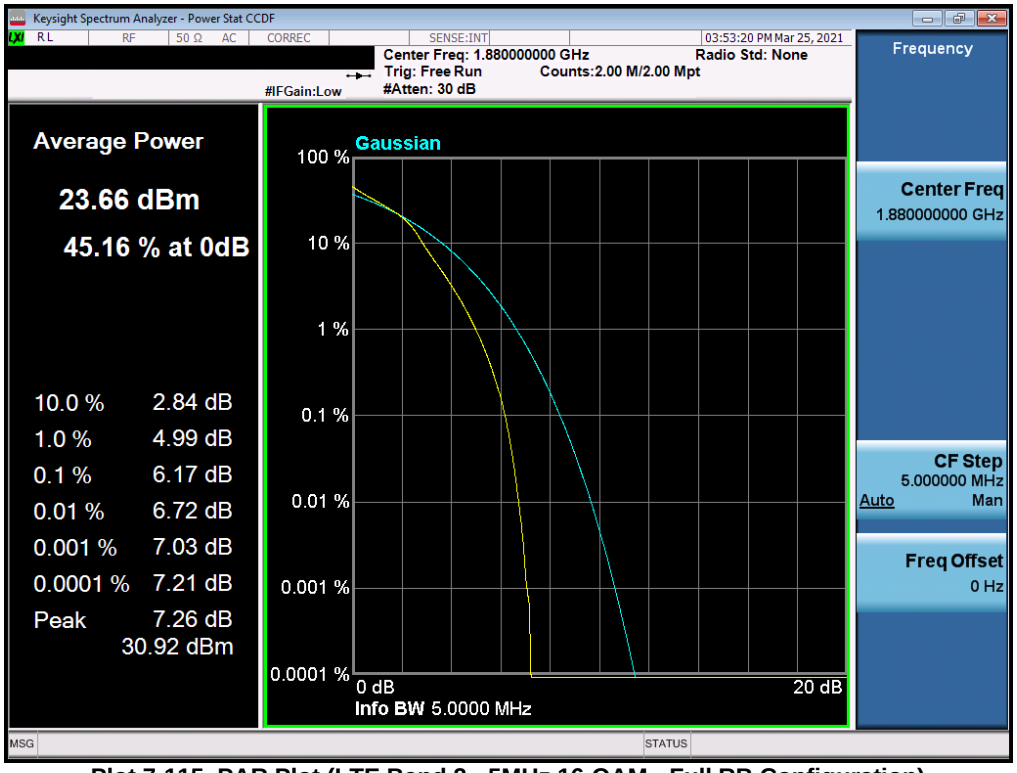
Plot 7-112. PAR Plot (LTE Band 2 - 3MHz 16-QAM - Full RB Configuration)



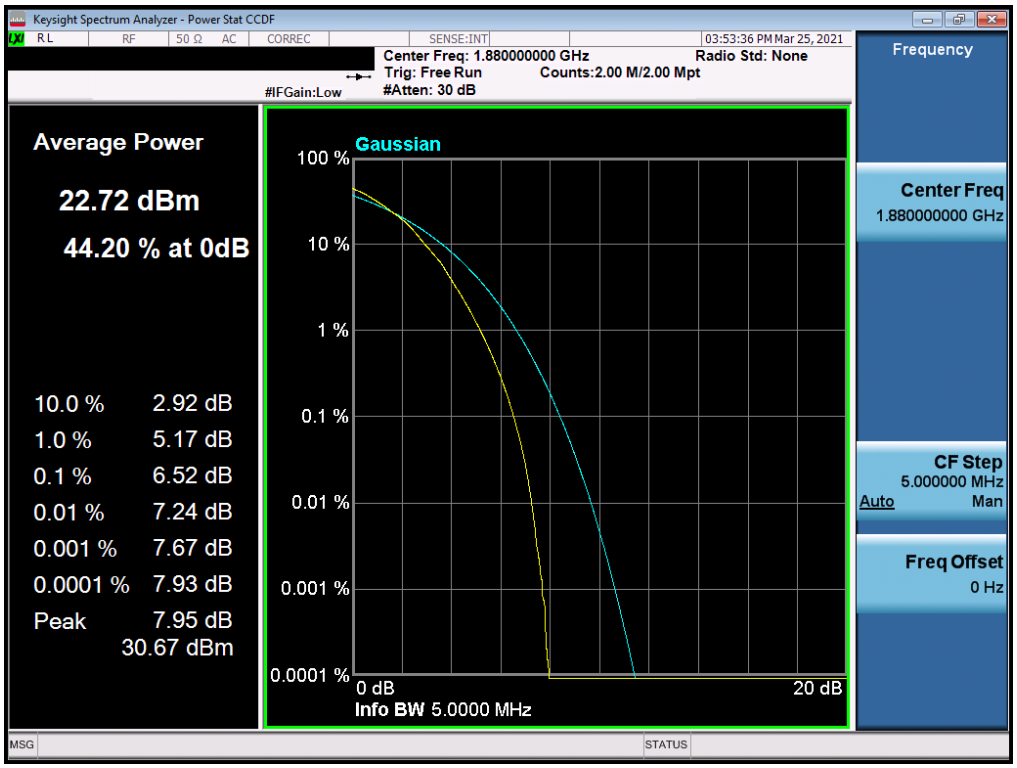
Plot 7-113. PAR Plot (LTE Band 2 - 3MHz 64-QAM - Full RB Configuration)



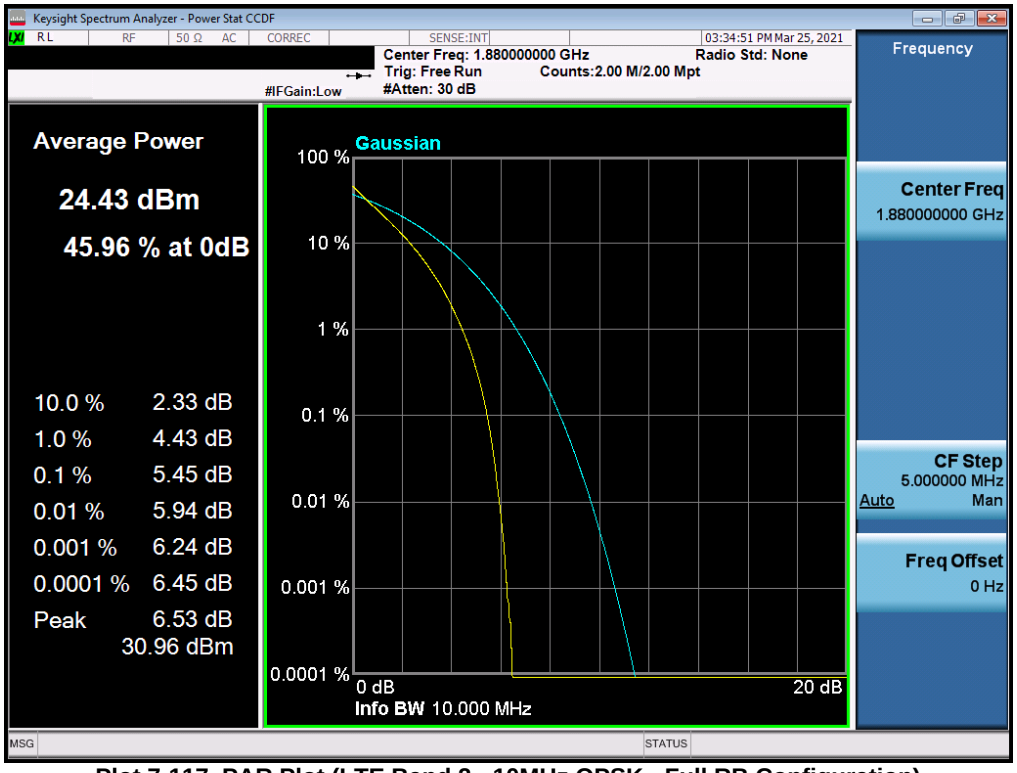
Plot 7-114. PAR Plot (LTE Band 2 - 5MHz QPSK - Full RB Configuration)



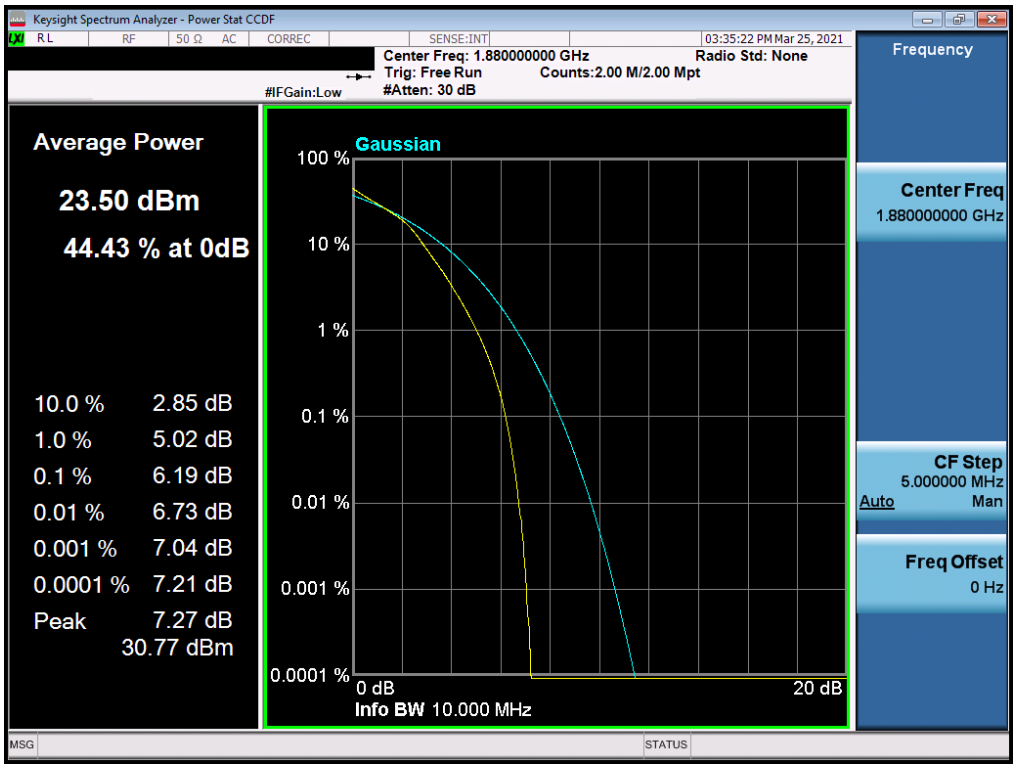
Plot 7-115. PAR Plot (LTE Band 2 - 5MHz 16-QAM - Full RB Configuration)



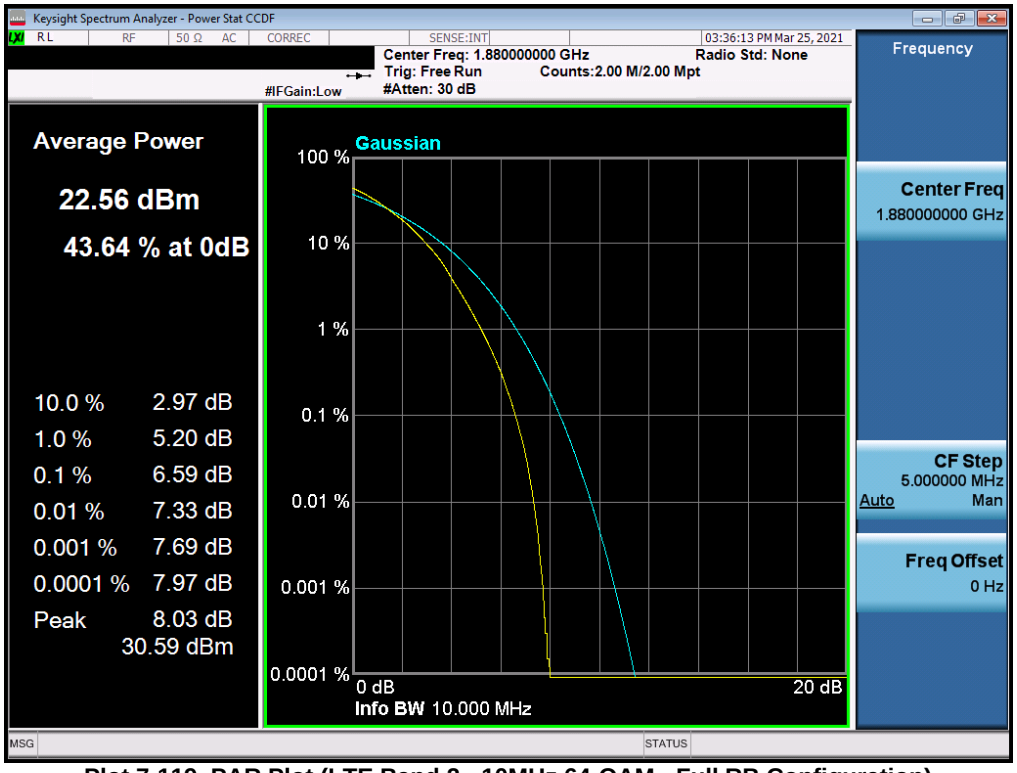
Plot 7-116. PAR Plot (LTE Band 2 - 5MHz 64-QAM - Full RB Configuration)



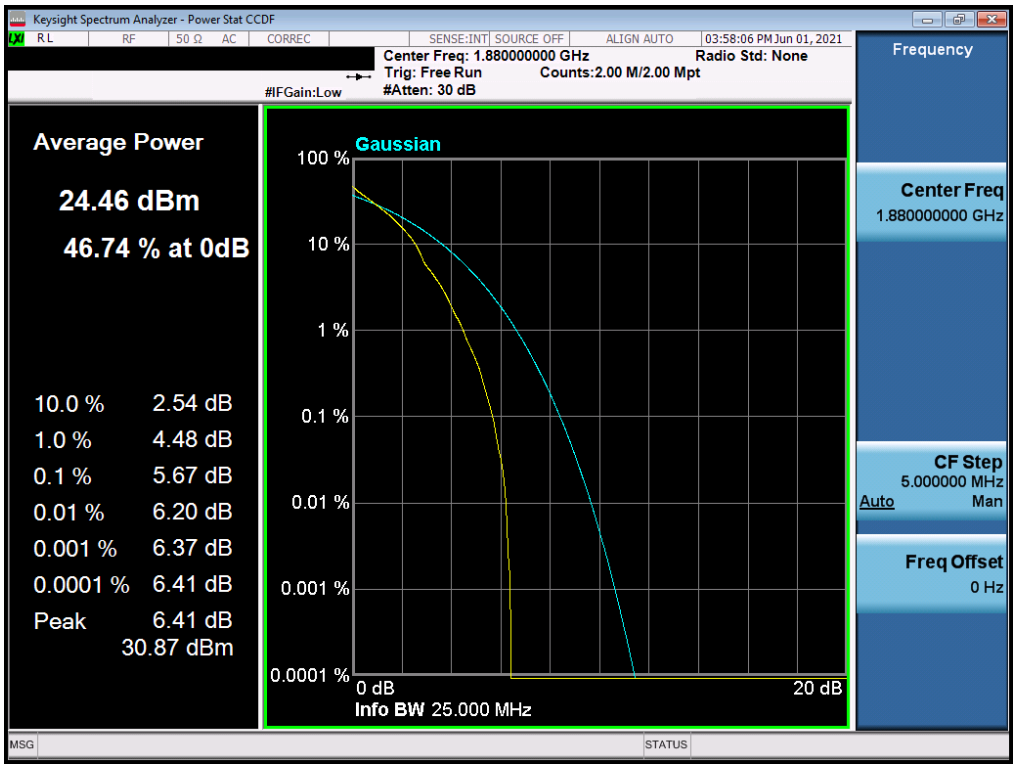
Plot 7-117. PAR Plot (LTE Band 2 - 10MHz QPSK - Full RB Configuration)



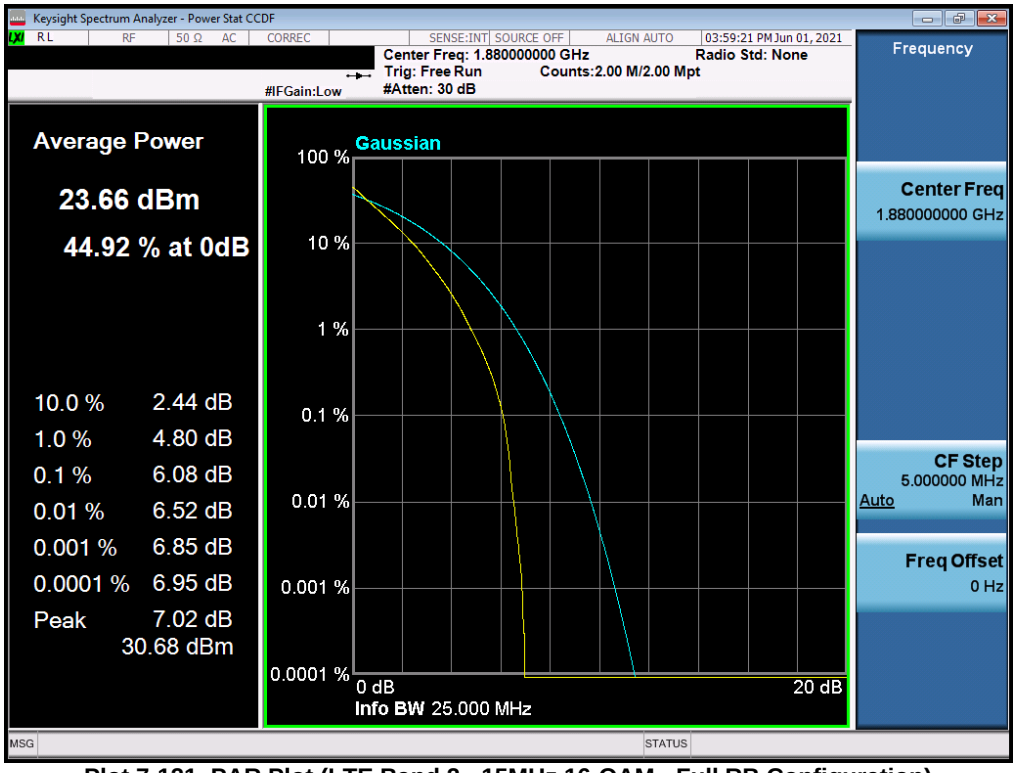
Plot 7-118. PAR Plot (LTE Band 2 - 10MHz 16-QAM - Full RB Configuration)



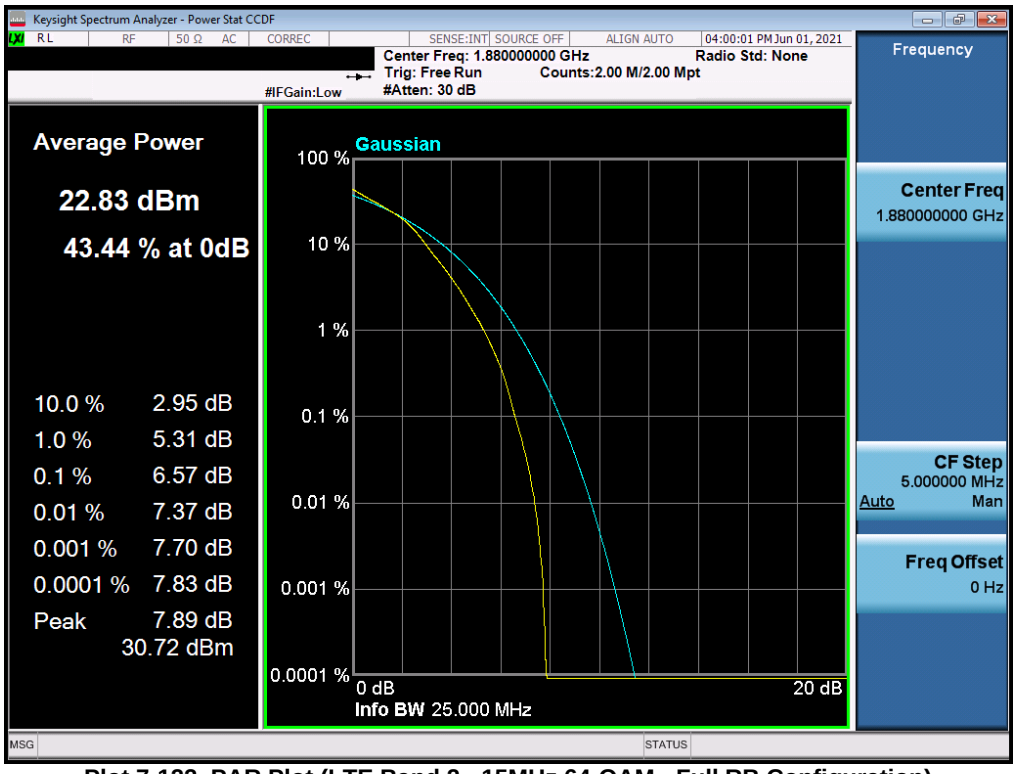
Plot 7-119. PAR Plot (LTE Band 2 - 10MHz 64-QAM - Full RB Configuration)



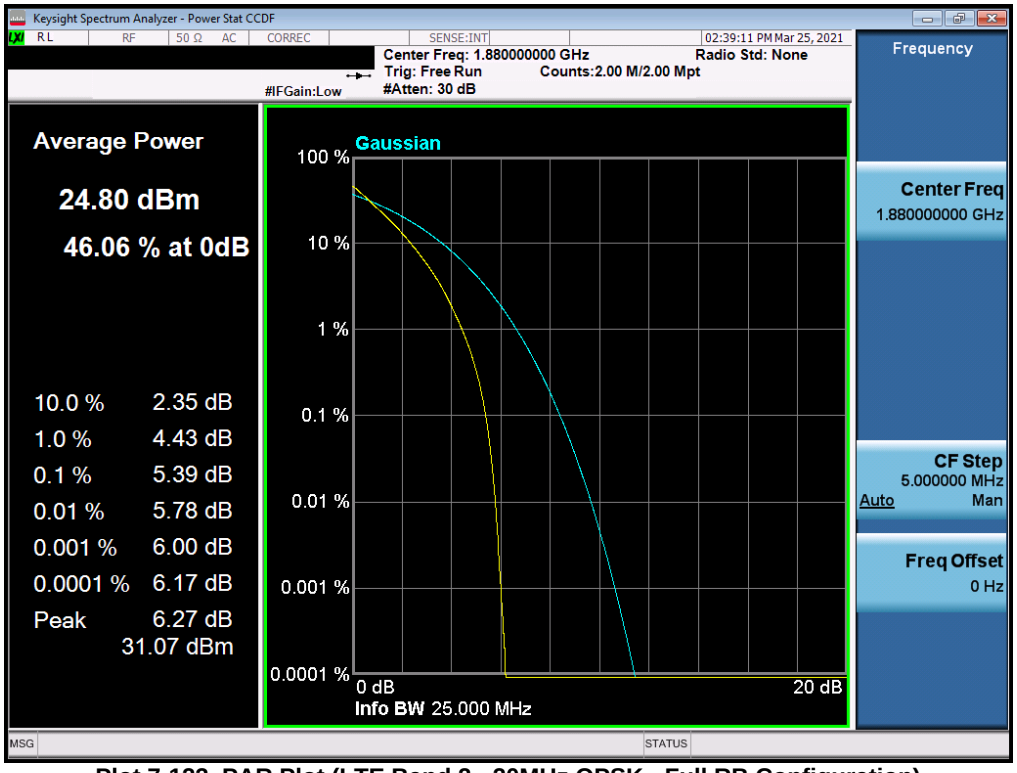
Plot 7-120. PAR Plot (LTE Band 2 - 15MHz QPSK - Full RB Configuration)



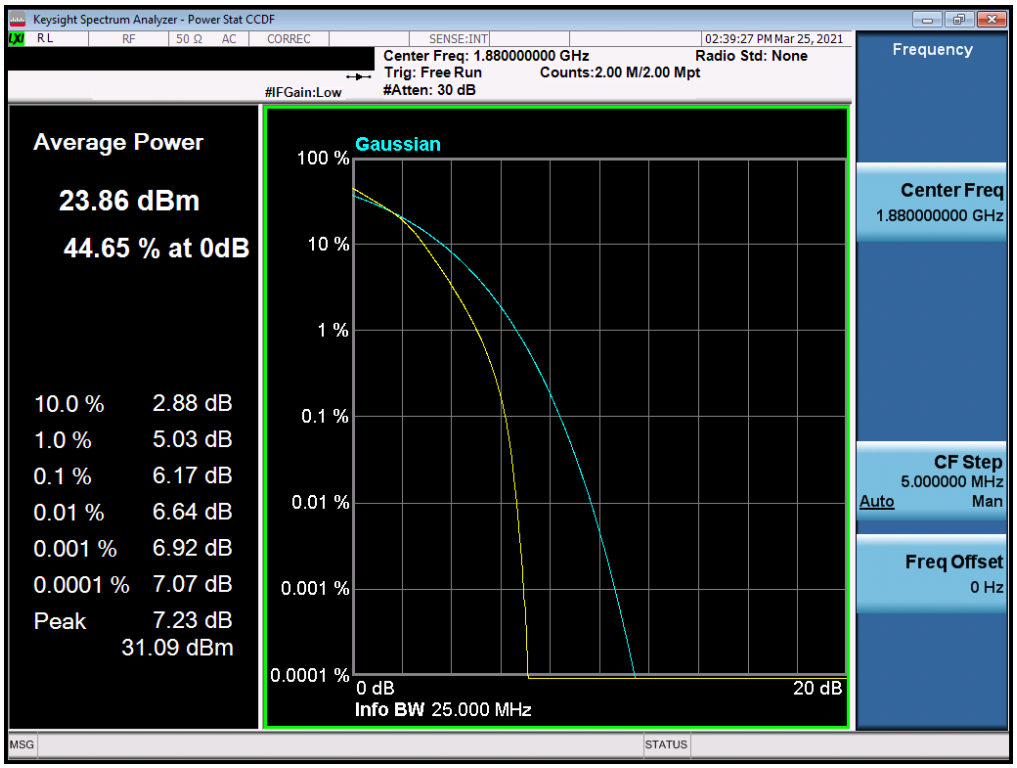
Plot 7-121. PAR Plot (LTE Band 2 - 15MHz 16-QAM - Full RB Configuration)



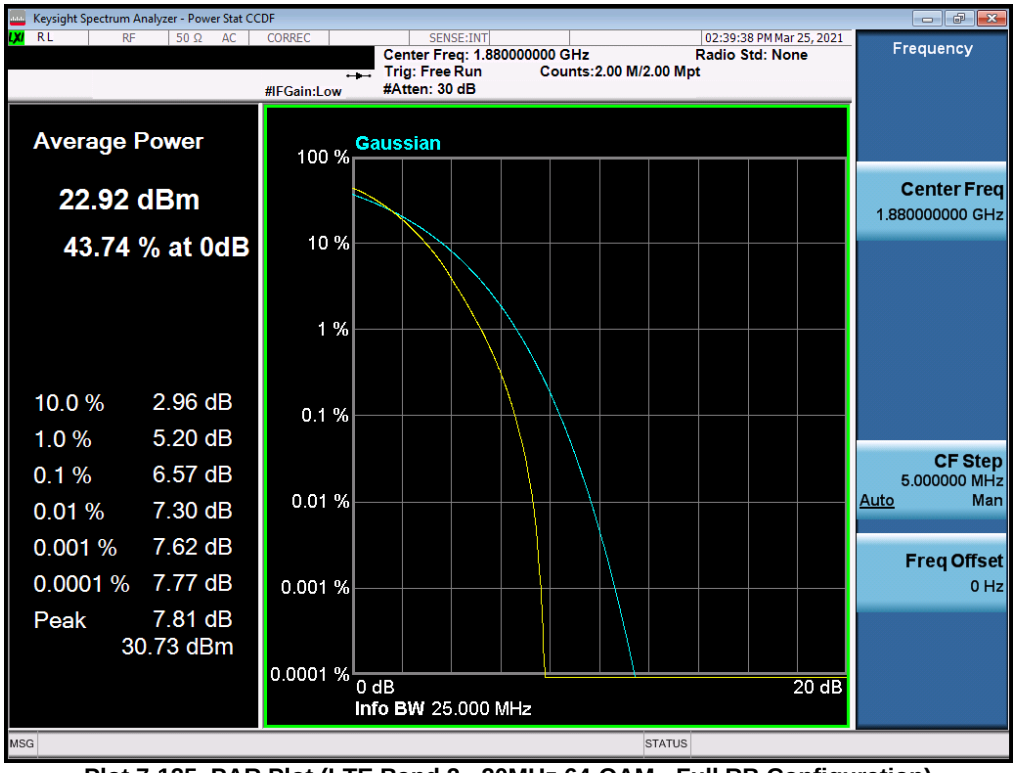
Plot 7-122. PAR Plot (LTE Band 2 - 15MHz 64-QAM - Full RB Configuration)



Plot 7-123. PAR Plot (LTE Band 2 - 20MHz QPSK - Full RB Configuration)

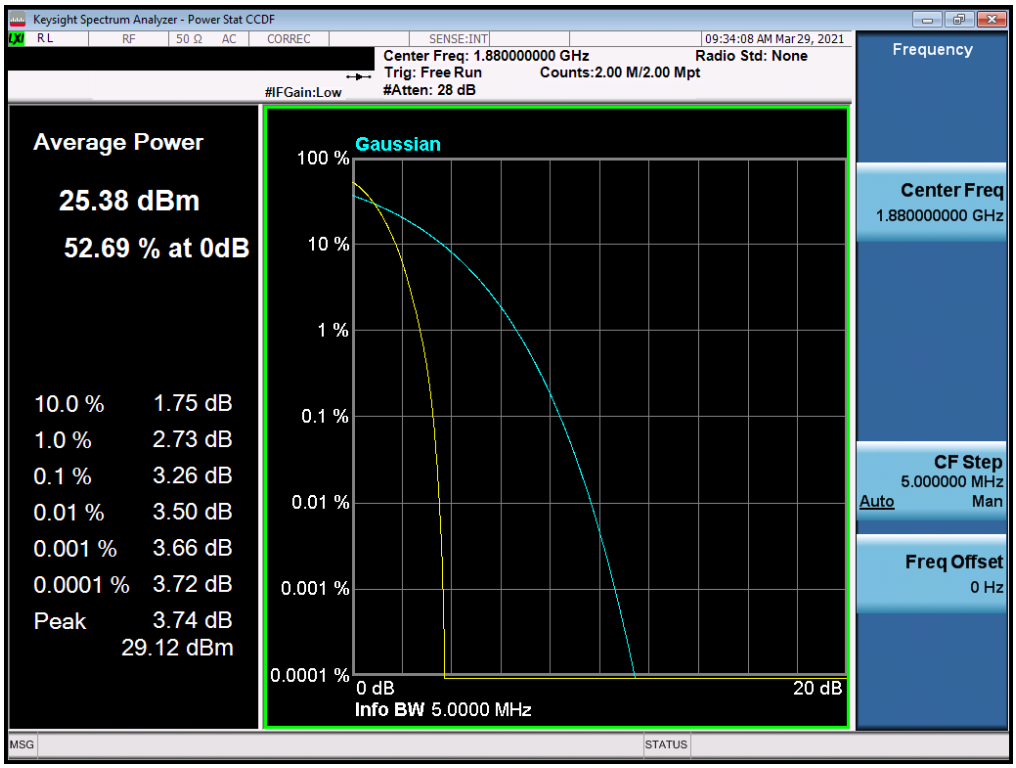


Plot 7-124. PAR Plot (LTE Band 2 - 20MHz 16-QAM - Full RB Configuration)



Plot 7-125. PAR Plot (LTE Band 2 - 20MHz 64-QAM - Full RB Configuration)

WCDMA PCS



Plot 7-126. PAR Plot (WCDMA, Ch. 9400)

7.6 Radiated Power (EIRP)

§24.232(c)

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are calculated by adding highest antenna gain to maximum measured conducted output power. 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 C63.26-2015 – Section 5.2.5.5

Test Settings

The relevant equation for determining the EIRP from the conducted RF output power measured is:

EIRP = PMeas – LC + GT

Where:

EIRP = Equivalent Isotropic Radiated Power (expressed in the same units as PMeas, typically dBW or dBm)

PMeas = measured transmitter output power or PSD, in dBW or dBm

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB

GT = gain of the transmitting antenna, in dBi (EIRP)

Test Setup

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

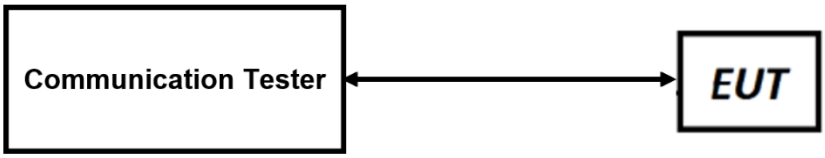


Figure 7-5. EIRP Measurement Setup

Test Notes

1. The EUT was tested in all possible test configurations. The worst case emissions are reported with the EUT 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 Level (dBm) readings in the table were taken with a correction table loaded into the base station simulator. The correction table was used to account for the signal attenuation in the connecting cable between the transmitter and antenna.

4. The Ant. Gains (GT) are listed in dBi.

7.6.1 Antenna C – EIRP

LTE Band 25

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1.4 MHz	QPSK	1850.7	2.30	1 / 5	25.42	27.72	0.592	33.01	-5.29
		1882.5	2.30	1 / 3	25.38	27.68	0.586	33.01	-5.33
		1914.3	2.30	1 / 3	25.50	**27.80**	0.603	33.01	-5.21
	16-QAM	1882.5	2.30	1 / 0	24.89	27.19	0.524	33.01	-5.82
	64-QAM	1914.3	2.30	1 / 5	23.93	26.23	0.420	33.01	-6.78
3 MHz	QPSK	1851.5	2.30	1 / 0	25.50	**27.80**	0.603	33.01	-5.21
		1882.5	2.30	1 / 0	25.37	27.67	0.585	33.01	-5.34
		1913.5	2.30	1 / 0	25.33	27.63	0.579	33.01	-5.38
	16-QAM	1851.5	2.30	1 / 14	24.94	27.24	0.530	33.01	-5.77
	64-QAM	1913.5	2.30	1 / 0	23.97	26.27	0.424	33.01	-6.74
5 MHz	QPSK	1852.5	2.30	1 / 12	25.50	**27.80**	0.603	33.01	-5.21
		1882.5	2.30	1 / 12	25.50	**27.80**	0.603	33.01	-5.21
		1912.5	2.30	1 / 24	25.40	27.70	0.589	33.01	-5.31
	16-QAM	1882.5	2.30	1 / 0	24.96	27.26	0.532	33.01	-5.75
	64-QAM	1912.5	2.30	1 / 12	24.05	26.35	0.432	33.01	-6.66
10 MHz	QPSK	1855.0	2.30	1 / 0	25.50	**27.80**	0.603	33.01	-5.21
		1882.5	2.30	1 / 49	25.50	**27.80**	0.603	33.01	-5.21
		1910.0	2.30	1 / 49	25.39	27.69	0.587	33.01	-5.32
	16-QAM	1882.5	2.30	1 / 49	24.85	27.15	0.519	33.01	-5.86
	64-QAM	1910.0	2.30	1 / 49	23.91	26.21	0.418	33.01	-6.80
15 MHz	QPSK	1857.5	2.30	1 / 37	25.50	**27.80**	0.603	33.01	-5.21
		1882.5	2.30	1 / 0	25.35	27.65	0.582	33.01	-5.36
		1907.5	2.30	1 / 37	25.43	27.73	0.593	33.01	-5.28
	16-QAM	1907.5	2.30	1 / 74	24.93	27.23	0.528	33.01	-5.78
	64-QAM	1907.5	2.30	1 / 74	23.84	26.14	0.411	33.01	-6.87
20 MHz	QPSK	1860.0	2.30	1 / 99	25.50	**27.80**	0.603	33.01	-5.21
		1882.5	2.30	1 / 50	25.33	27.63	0.579	33.01	-5.38
		1905.0	2.30	1 / 50	25.45	27.75	0.596	33.01	-5.26
	16-QAM	1882.5	2.30	1 / 99	24.77	27.07	0.509	33.01	-5.94
	64-QAM	1882.5	2.30	1 / 0	23.88	26.18	0.415	33.01	-6.83

Table 7-2. Antenna C EIRP Data (LTE Band 2)

LTE Band 2

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1.4 MHz	QPSK	1850.7	2.30	1 / 3	25.30	**27.60**	0.575	33.01	-5.41
		1880.0	2.30	1 / 5	25.05	27.35	0.543	33.01	-5.66
		1909.3	2.30	1 / 5	25.25	27.55	0.569	33.01	-5.46
	16-QAM	1850.7	2.30	1 / 5	24.74	27.04	0.506	33.01	-5.97
	64-QAM	1909.3	2.30	1 / 0	23.76	26.06	0.404	33.01	-6.95
3 MHz	QPSK	1851.5	2.30	1 / 0	25.28	**27.58**	0.573	33.01	-5.43
		1880.0	2.30	1 / 0	25.04	27.34	0.542	33.01	-5.67
		1908.5	2.30	1 / 0	24.98	27.28	0.535	33.01	-5.73
	16-QAM	1851.5	2.30	1 / 0	24.75	27.05	0.507	33.01	-5.96
	64-QAM	1851.5	2.30	1 / 7	23.67	25.97	0.395	33.01	-7.04
5 MHz	QPSK	1852.5	2.30	1 / 12	25.37	**27.67**	0.585	33.01	-5.34
		1880.0	2.30	1 / 24	25.21	27.51	0.564	33.01	-5.50
		1907.5	2.30	1 / 24	25.09	27.39	0.548	33.01	-5.62
	16-QAM	1852.5	2.30	1 / 12	24.96	27.26	0.532	33.01	-5.75
	64-QAM	1852.5	2.30	1 / 12	23.87	26.17	0.414	33.01	-6.84
10 MHz	QPSK	1855.0	2.30	1 / 25	25.28	**27.58**	0.573	33.01	-5.43
		1880.0	2.30	1 / 49	25.14	27.44	0.555	33.01	-5.57
		1905.0	2.30	1 / 25	25.18	27.48	0.560	33.01	-5.53
	16-QAM	1905.0	2.30	1 / 0	24.72	27.02	0.504	33.01	-5.99
	64-QAM	1905.0	2.30	1 / 25	23.81	26.11	0.408	33.01	-6.90
15 MHz	QPSK	1857.5	2.30	1 / 37	25.48	**27.78**	0.600	33.01	-5.23
		1880.0	2.30	1 / 74	25.19	27.49	0.561	33.01	-5.52
		1902.5	2.30	1 / 37	25.29	27.59	0.574	33.01	-5.42
	16-QAM	1902.5	2.30	1 / 74	24.83	27.13	0.516	33.01	-5.88
	64-QAM	1857.5	2.30	1 / 37	23.89	26.19	0.416	33.01	-6.82
20 MHz	QPSK	1860.0	2.30	1 / 99	25.31	27.61	0.577	33.01	-5.40
		1880.0	2.30	1 / 50	25.44	**27.74**	0.594	33.01	-5.27
		1900.0	2.30	1 / 50	25.35	27.65	0.582	33.01	-5.36
	16-QAM	1880.0	2.30	1 / 99	24.93	27.23	0.528	33.01	-5.78
	64-QAM	1860.0	2.30	1 / 99	24.06	26.36	0.433	33.01	-6.65

Table 7-3. Antenna C EIRP Data (LTE Band 2)

WCDMA PCS

Frequency [MHz]	Mode	Conducted Power [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	25.50	2.30	**27.80**	**0.603**	33.01	-5.21
1880.00	WCDMA1900	25.50	2.30	**27.80**	**0.603**	33.01	-5.21
1907.60	WCDMA1900	25.50	2.30	**27.80**	**0.603**	33.01	-5.21

Table 7-4. Antenna C EIRP Data (WCDMA PCS)

7.6.2 Antenna D – EIRP

LTE Band 25

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1.4 MHz	QPSK	1850.7	2.60	1 / 3	23.50	**26.10**	0.407	33.01	-6.91
		1882.5	2.60	1 / 3	23.34	25.94	0.393	33.01	-7.07
		1914.3	2.60	1 / 5	23.38	25.98	0.396	33.01	-7.03
	16-QAM	1850.7	2.60	1 / 3	22.92	25.52	0.356	33.01	-7.49
	64-QAM	1914.3	2.60	1 / 0	21.75	24.35	0.272	33.01	-8.66
3 MHz	QPSK	1851.5	2.60	1 / 0	23.50	**26.10**	0.407	33.01	-6.91
		1882.5	2.60	1 / 0	23.34	25.94	0.393	33.01	-7.07
		1913.5	2.60	1 / 7	23.46	26.06	0.404	33.01	-6.95
	16-QAM	1851.5	2.60	1 / 7	22.93	25.53	0.357	33.01	-7.48
	64-QAM	1851.5	2.60	1 / 14	21.74	24.34	0.272	33.01	-8.67
5 MHz	QPSK	1852.5	2.60	1 / 12	23.50	**26.10**	0.407	33.01	-6.91
		1882.5	2.60	1 / 24	23.36	25.96	0.394	33.01	-7.05
		1912.5	2.60	1 / 0	23.49	26.09	0.406	33.01	-6.92
	16-QAM	1852.5	2.60	1 / 12	22.93	25.53	0.357	33.01	-7.48
	64-QAM	1912.5	2.60	1 / 24	21.87	24.47	0.280	33.01	-8.54
10 MHz	QPSK	1855.0	2.60	1 / 25	23.50	**26.10**	0.407	33.01	-6.91
		1882.5	2.60	1 / 49	23.41	26.01	0.399	33.01	-7.00
		1910.0	2.60	1 / 25	23.47	26.07	0.405	33.01	-6.94
	16-QAM	1855.0	2.60	1 / 25	22.99	25.59	0.362	33.01	-7.42
	64-QAM	1882.5	2.60	1 / 49	21.71	24.31	0.270	33.01	-8.70
15 MHz	QPSK	1857.5	2.60	1 / 37	23.50	**26.10**	0.407	33.01	-6.91
		1882.5	2.60	1 / 74	23.47	26.07	0.405	33.01	-6.94
		1907.5	2.60	1 / 0	23.50	**26.10**	0.407	33.01	-6.91
	16-QAM	1857.5	2.60	1 / 74	22.89	25.49	0.354	33.01	-7.52
	64-QAM	1857.5	2.60	1 / 37	21.98	24.58	0.287	33.01	-8.43
20 MHz	QPSK	1860.0	2.60	1 / 50	23.50	**26.10**	0.407	33.01	-6.91
		1882.5	2.60	1 / 50	23.49	26.09	0.406	33.01	-6.92
		1905.0	2.60	1 / 50	23.43	26.03	0.401	33.01	-6.98
	16-QAM	1905.0	2.60	1 / 0	22.97	25.57	0.361	33.01	-7.44
	64-QAM	1882.5	2.60	1 / 50	21.88	24.48	0.281	33.01	-8.53

Table 7-5. Antenna D EIRP Data (LTE Band 2)

LTE Band 2

Bandwidth	Mod.	Frequency [MHz]	Ant. Gain [dBi]	RB Size/Offset	Conducted Power [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1.4 MHz	QPSK	1850.7	2.60	1 / 3	23.34	25.94	0.393	33.01	-7.07
		1880.0	2.60	1 / 5	23.09	25.69	0.371	33.01	-7.32
		1909.3	2.60	1 / 5	23.35	**25.95**	0.394	33.01	-7.06
	16-QAM	1850.7	2.60	1 / 3	22.77	25.37	0.344	33.01	-7.64
	64-QAM	1850.7	2.60	1 / 5	21.78	24.38	0.274	33.01	-8.63
3 MHz	QPSK	1851.5	2.60	1 / 0	23.34	**25.94**	0.393	33.01	-7.07
		1880.0	2.60	1 / 0	23.07	25.67	0.369	33.01	-7.34
		1908.5	2.60	1 / 0	23.10	25.70	0.372	33.01	-7.31
	16-QAM	1908.5	2.60	1 / 14	22.73	25.33	0.341	33.01	-7.68
	64-QAM	1851.5	2.60	1 / 0	21.64	24.24	0.265	33.01	-8.77
5 MHz	QPSK	1852.5	2.60	1 / 12	23.43	**26.03**	0.401	33.01	-6.98
		1880.0	2.60	1 / 24	23.23	25.83	0.383	33.01	-7.18
		1907.5	2.60	1 / 24	23.20	25.80	0.380	33.01	-7.21
	16-QAM	1852.5	2.60	1 / 24	22.80	25.40	0.347	33.01	-7.61
	64-QAM	1907.5	2.60	1 / 0	21.82	24.42	0.277	33.01	-8.59
10 MHz	QPSK	1855.0	2.60	1 / 25	23.38	**25.98**	0.396	33.01	-7.03
		1880.0	2.60	1 / 49	23.13	25.73	0.374	33.01	-7.28
		1905.0	2.60	1 / 25	23.31	25.91	0.390	33.01	-7.10
	16-QAM	1855.0	2.60	1 / 0	22.82	25.42	0.348	33.01	-7.59
	64-QAM	1855.0	2.60	1 / 25	21.83	24.43	0.277	33.01	-8.58
15 MHz	QPSK	1857.5	2.60	1 / 37	23.50	**26.10**	0.407	33.01	-6.91
		1880.0	2.60	1 / 74	23.18	25.78	0.378	33.01	-7.23
		1902.5	2.60	1 / 37	23.36	25.96	0.394	33.01	-7.05
	16-QAM	1902.5	2.60	1 / 37	22.92	25.52	0.356	33.01	-7.49
	64-QAM	1857.5	2.60	1 / 74	21.80	24.40	0.275	33.01	-8.61
20 MHz	QPSK	1860.0	2.60	1 / 50	23.38	25.98	0.396	33.01	-7.03
		1880.0	2.60	1 / 50	23.24	25.84	0.384	33.01	-7.17
		1900.0	2.60	1 / 0	23.46	**26.06**	0.404	33.01	-6.95
	16-QAM	1900.0	2.60	1 / 0	22.83	25.43	0.349	33.01	-7.58
	64-QAM	1900.0	2.60	1 / 0	21.77	24.37	0.274	33.01	-8.64

Table 7-6. Antenna D EIRP Data (LTE Band 2)

WCDMA PCS

Frequency [MHz]	Mode	Conducted Power [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	24.98	2.60	27.58	0.573	33.01	-5.43
1880.00	WCDMA1900	25.00	2.60	**27.60**	**0.575**	33.01	-5.41
1907.60	WCDMA1900	24.90	2.60	27.50	0.562	33.01	-5.51

Table 7-7. Antenna D EIRP Data (WCDMA PCS)

7.7 Radiated Spurious Emissions

§2.1053, 24.238(a)

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion 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

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.

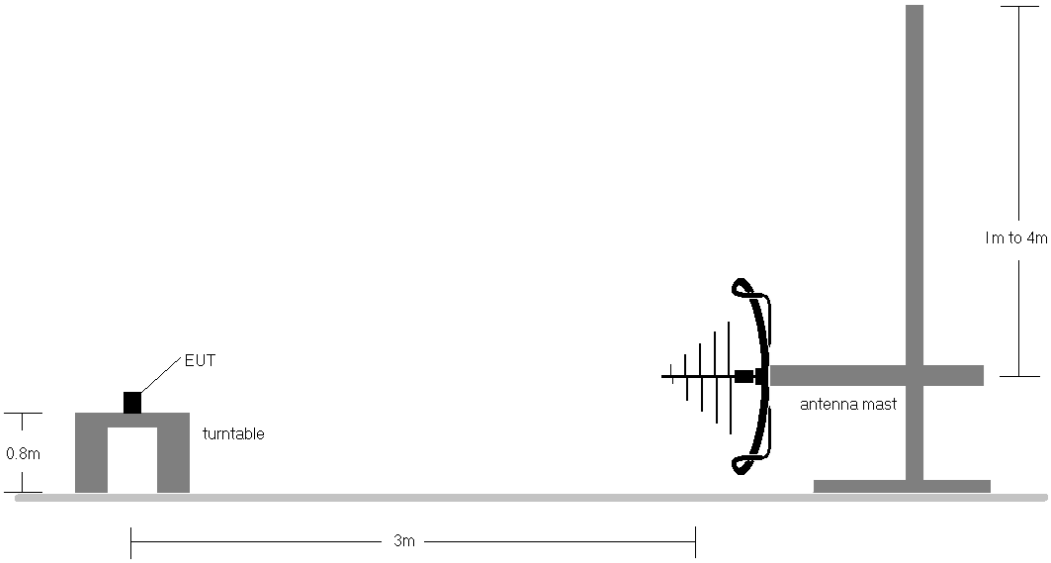


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

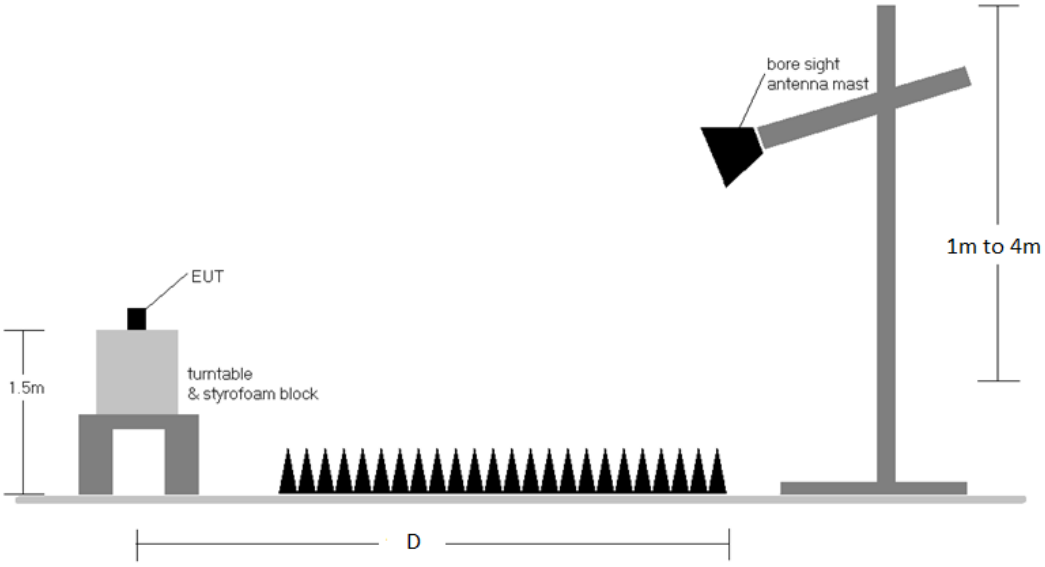


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

Test Notes

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

2. This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to “1”.

3. 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.

4. This unit was tested with its standard battery.

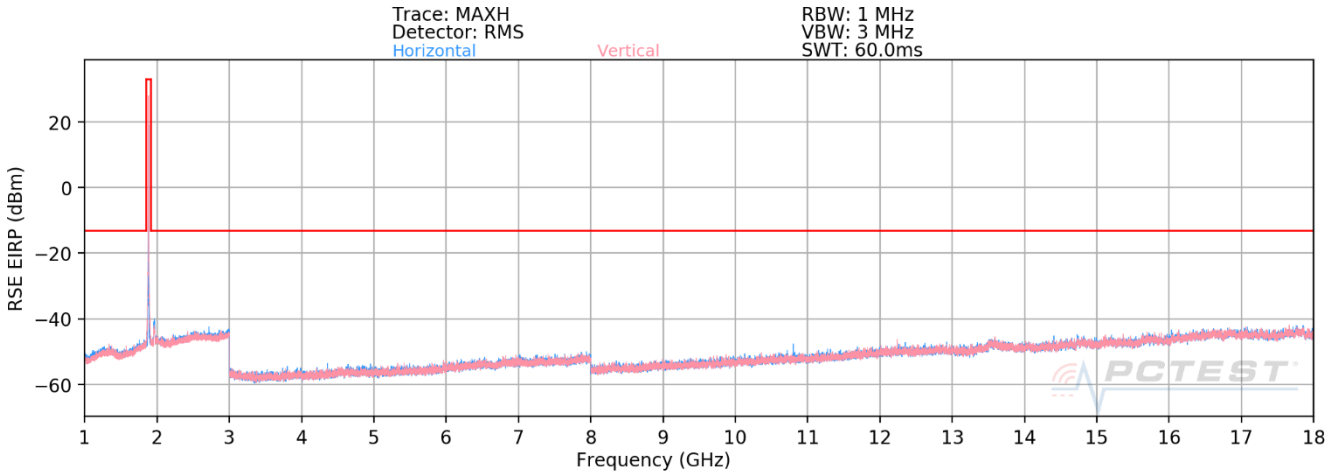
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

6. D is the measurement test distance and emissions 1-18GHz were measured at a 3 meters test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

7. No significant emissions were found for below 1GHz and Above 18GHz measurement.

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

7.7.1 Antenna C – Radiated Spurious Emission Measurement
LTE Band 25/2



Plot 7-127. Radiated Spurious Plot (LTE Band 25/2)

Bandwidth (MHz):	20
Frequency (MHz):	1860.0
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]
3720.0	V	-	-	-80.18	5.14	31.96	-63.30	-13.00	-50.30
5580.0	V	-	-	-81.08	7.56	33.48	-61.78	-13.00	-48.78
7440.0	V	-	-	-81.93	10.42	35.49	-59.77	-13.00	-46.77

Table 7-8. Antenna C Radiated Spurious Data (LTE Band 25/2 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1882.5
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]
3765.0	V	-	-	-80.26	5.11	31.85	-63.41	-13.00	-50.41
5647.5	V	-	-	-81.30	7.70	33.40	-61.86	-13.00	-48.86
7530.0	V	-	-	-82.05	10.81	35.76	-59.50	-13.00	-46.50

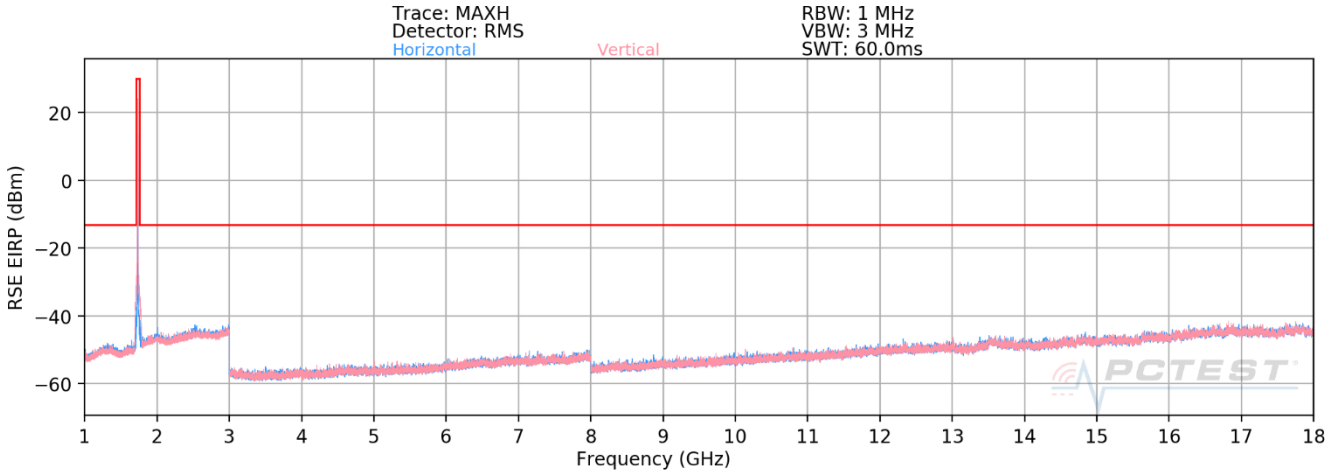
Table 7-9. Antenna C Radiated Spurious Data (LTE Band 25/2 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1905.0
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]
3810.00	V	-	-	-80.69	6.17	32.48	-62.78	-13.00	-49.78
5715.00	V	-	-	-81.19	7.90	33.71	-61.55	-13.00	-48.55
7620.00	V	-	-	-82.16	10.74	35.58	-59.68	-13.00	-46.68

Table 7-10. Antenna C Radiated Spurious Data (LTE Band 25/2 – High Channel)

WCDMA PCS



Plot 7-128. Radiated Spurious Plot (WCDMA PCS)

Mode:	WCDMA RMC
Channel:	9262
Frequency (MHz):	1852.4

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]
3704.8	V	-	-	-80.09	5.06	31.97	-63.29	-13.00	-50.29
5557.2	V	-	-	-81.24	7.77	33.53	-61.73	-13.00	-48.73
7409.6	V	-	-	-81.92	10.21	35.29	-59.96	-13.00	-46.96

Table 7-11. Antenna C Radiated Spurious Data (WCDMA PCS – Low Channel)

Mode:	WCDMA RMC
Channel:	9400
Frequency (MHz):	1880

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]
3760.0	V	-	-	-80.22	5.09	31.87	-63.39	-13.00	-50.39
5640.0	V	-	-	-81.02	7.77	33.75	-61.50	-13.00	-48.50
7520.0	V	-	-	-82.19	10.74	35.55	-59.71	-13.00	-46.71

Table 7-12. Antenna C Radiated Spurious Data (WCDMA PCS – Mid Channel)

Mode:	WCDMA RMC
Channel:	9538
Frequency (MHz):	1907.6

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]
3815.2	V	-	-	-80.25	5.91	32.66	-62.60	-13.00	-49.60
5722.8	V	-	-	-81.17	7.83	33.66	-61.60	-13.00	-48.60
7630.4	V	-	-	-81.96	11.10	36.14	-59.12	-13.00	-46.12

Table 7-13. Antenna C Radiated Spurious Data (WCDMA PCS – High Channel)

7.7.2 Antenna D – Radiated Spurious Emission Measurement
LTE Band 25/2

Bandwidth (MHz):	20
Frequency (MHz):	1860.0
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]
3720.0	H	-	-	-80.13	5.14	32.01	-63.25	-13.00	-50.25
5580.0	H	-	-	-81.17	7.56	33.39	-61.87	-13.00	-48.87
7440.0	H	-	-	-81.88	10.42	35.54	-59.72	-13.00	-46.72

Table 7-14. Antenna D Radiated Spurious Data (LTE Band 25/2 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1882.5
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]
3765.0	H	-	-	-80.44	5.11	31.67	-63.59	-13.00	-50.59
5647.5	H	-	-	-81.04	7.70	33.66	-61.60	-13.00	-48.60
7530.0	H	-	-	-82.10	10.81	35.71	-59.55	-13.00	-46.55

Table 7-15. Antenna D Radiated Spurious Data (LTE Band 25/2 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1905.0
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]
3810.00	H	-	-	-80.48	6.17	32.69	-62.57	-13.00	-49.57
5715.00	H	-	-	-81.25	7.90	33.65	-61.61	-13.00	-48.61
7620.00	H	-	-	-82.14	10.74	35.60	-59.66	-13.00	-46.66

Table 7-16. Antenna D Radiated Spurious Data (LTE Band 25/2 – High Channel)

WCDMA PCS

Mode:	WCDMA RMC
Channel:	9262
Frequency (MHz):	1852.4

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]
3704.8	H	-	-	-80.18	5.06	31.88	-63.38	-13.00	-50.38
5557.2	H	-	-	-81.19	7.77	33.58	-61.68	-13.00	-48.68
7409.6	H	-	-	-81.82	10.21	35.39	-59.86	-13.00	-46.86

Table 7-17. Antenna D Radiated Spurious Data (WCDMA PCS – Low Channel)

Mode:	WCDMA RMC
Channel:	9400
Frequency (MHz):	1880

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]
3760.0	H	-	-	-80.25	5.09	31.84	-63.42	-13.00	-50.42
5640.0	H	-	-	-81.12	7.77	33.65	-61.60	-13.00	-48.60
7520.0	H	-	-	-82.13	10.74	35.61	-59.65	-13.00	-46.65

Table 7-18. Antenna D Radiated Spurious Data (WCDMA PCS – Mid Channel)

Mode:	WCDMA RMC
Channel:	9538
Frequency (MHz):	1907.6

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]
3815.2	H	-	-	-80.15	5.91	32.76	-62.50	-13.00	-49.50
5722.8	H	-	-	-81.19	7.83	33.64	-61.62	-13.00	-48.62
7630.4	H	-	-	-81.96	11.10	36.14	-59.12	-13.00	-46.12

Table 7-19. Antenna D Radiated Spurious Data (WCDMA PCS – High Channel)

7.8 Frequency Stability / Temperature Variation

§2.1055, §24.235

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015 and 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 24 the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI C63.26-2015

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

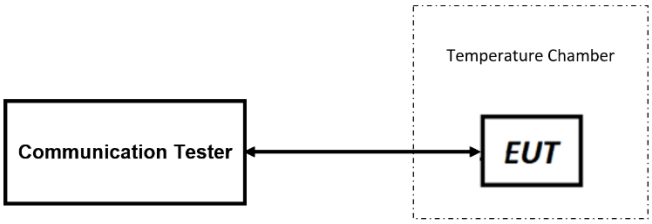


Figure 7-8. Test Instrument & Measurement Setup

Test Notes

1. All ports were tested and only the worst case data were reported.

Frequency Stability / Temperature Variation

LTE Band 25/2

Low Channel Frequency (Hz):	1,852,400,000
High Channel Frequency (Hz):	1,907,600,000
Ref. Voltage (VDC):	3.80

Voltage (%)	Power (VDC)	Temp (°C)	Low Freq. (Hz)	High Freq. (Hz)	Low Freq. Dev. (Hz)	High Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	1,852,400,004	1,907,600,003	2	1	0.000000127
		- 20	1,852,400,004	1,907,600,004	2	2	0.000000127
		- 10	1,852,400,005	1,907,600,004	3	2	0.000000165
		0	1,852,400,000	1,907,600,004	-2	2	-0.000000107
		+ 10	1,852,400,003	1,907,600,003	2	1	0.000000095
		+ 20 (Ref)	1,852,400,002	1,907,600,002	0	0	0.000000000
		+ 30	1,852,400,005	1,907,600,003	4	1	0.000000204
		+ 40	1,852,400,005	1,907,600,004	3	2	0.000000179
		+ 50	1,852,400,004	1,907,600,003	3	1	0.000000153
Battery Endpoint	3.23	+ 20	1,852,400,004	1,907,600,004	2	2	0.000000105

Table 7-20. LTE Band 25/2 Frequency Stability Data

Note: The lowest and highest channel of this band have been tested and is determined to remain operating in-band over the temperature and voltage range as tested

Frequency Stability / Temperature Variation

WCDMA PCS

Low Channel Frequency (Hz):	1,852,400,000
High Channel Frequency (Hz):	1,907,600,000
Ref. Voltage (VDC):	3.80

Voltage (%)	Power (VDC)	Temp (°C)	Low Freq. (Hz)	High Freq. (Hz)	Low Freq. Dev. (Hz)	High Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	- 30	1,852,399,999	1,907,600,001	-1	1	0.000000041
		- 20	1,852,400,000	1,907,600,000	1	-1	0.000000027
		- 10	1,852,400,000	1,907,600,001	1	1	0.000000044
		0	1,852,400,000	1,907,599,999	1	-1	-0.000000049
		+ 10	1,852,400,000	1,907,600,000	0	0	0.000000009
		+ 20 (Ref)	1,852,399,999	1,907,600,000	0	0	0.000000000
		+ 30	1,852,399,999	1,907,600,001	-1	0	-0.000000034
		+ 40	1,852,399,999	1,907,600,001	0	0	0.000000019
		+ 50	1,852,399,999	1,907,600,001	-1	0	-0.000000034
Battery Endpoint	3.23	+ 20	1,852,400,000	1,907,600,001	1	1	0.000000049

Table 7-21. WCDMA PCS Frequency Stability Data

Note: The lowest and highest channel of this band have been tested and is determined to remain operating in-band over the temperature and voltage range as tested

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the Apple **Tablet Device FCC ID: BCGA2603** complies with all the requirements of Part 24 of the FCC rules.