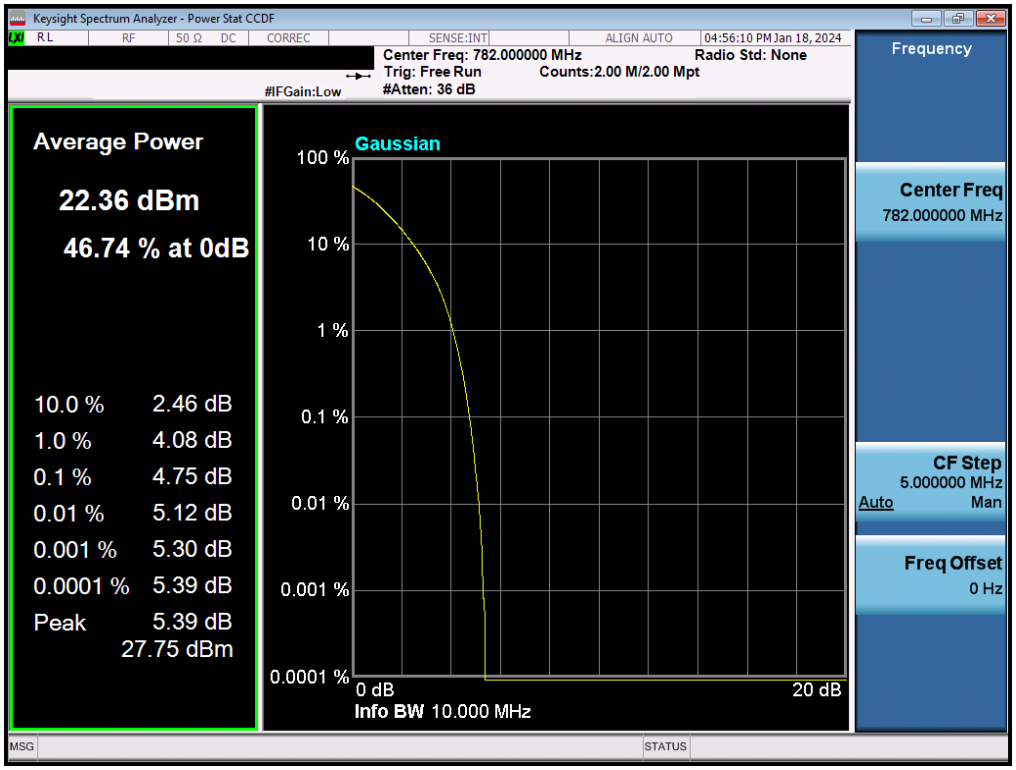
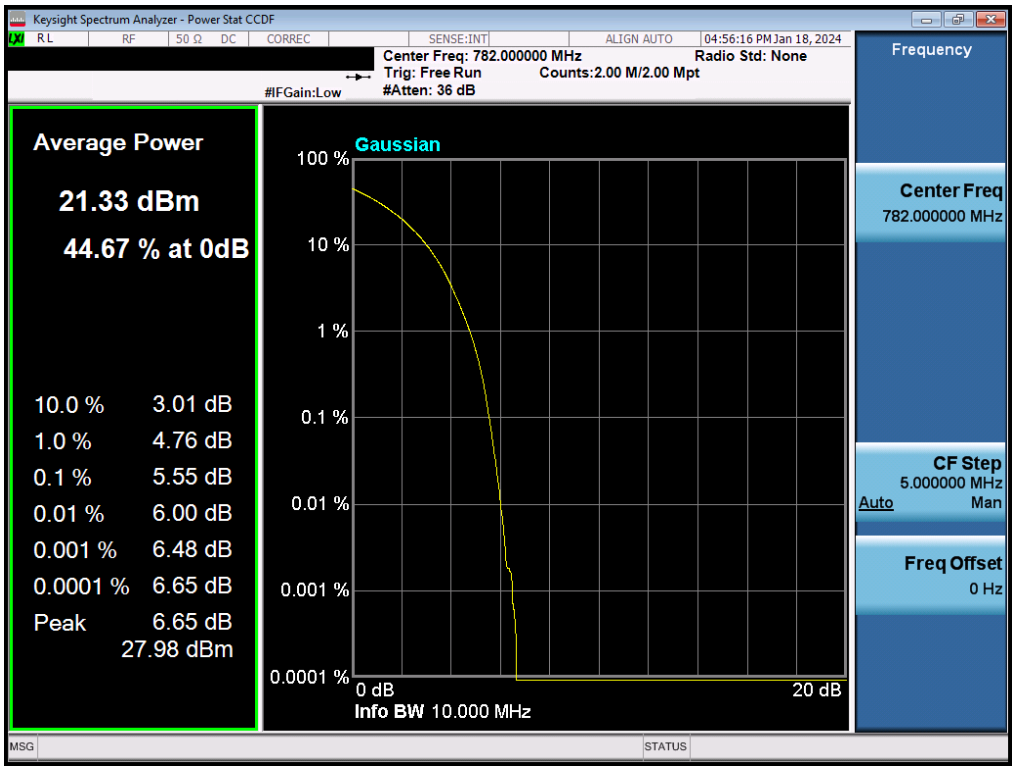
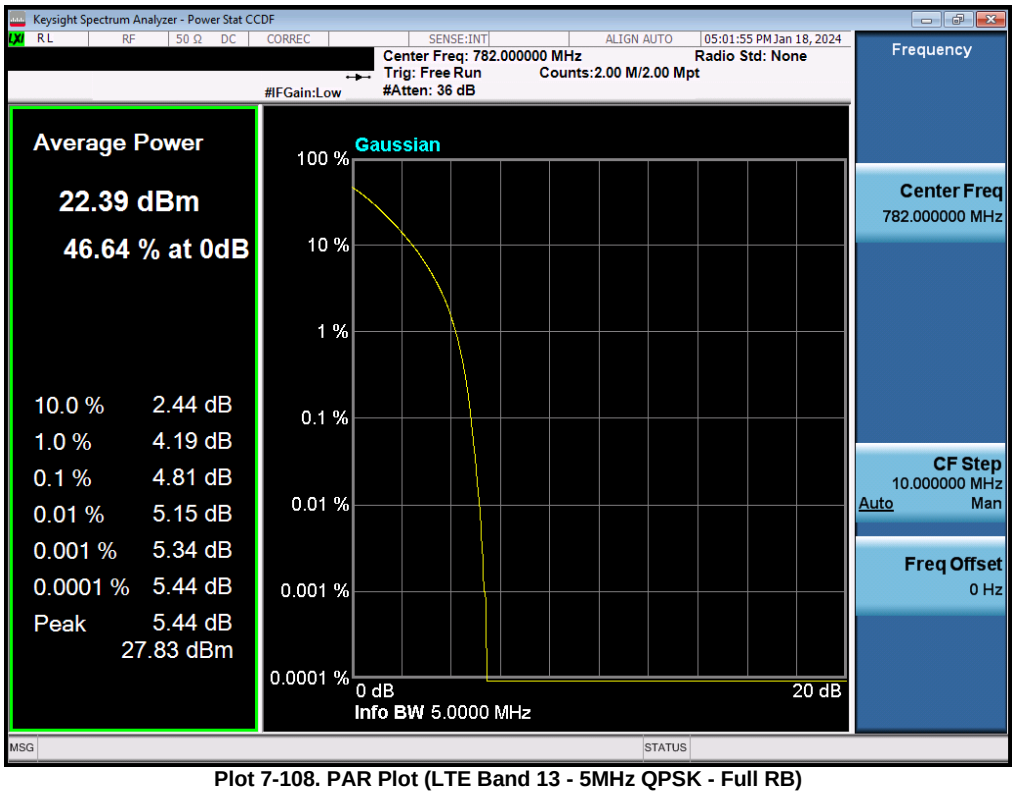
LTE Band 13



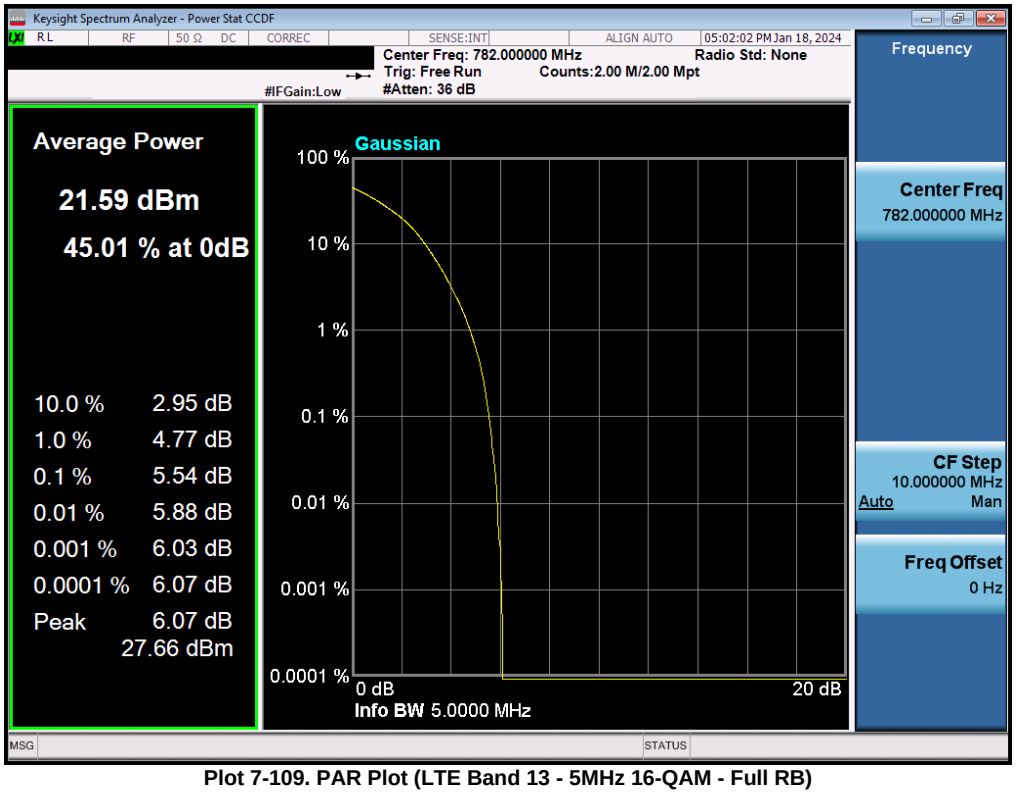
Plot 7-106. PAR Plot (LTE Band 13 - 10MHz QPSK - Full RB)



Plot 7-107. PAR Plot (LTE Band 13 - 10MHz 16-QAM - Full RB)

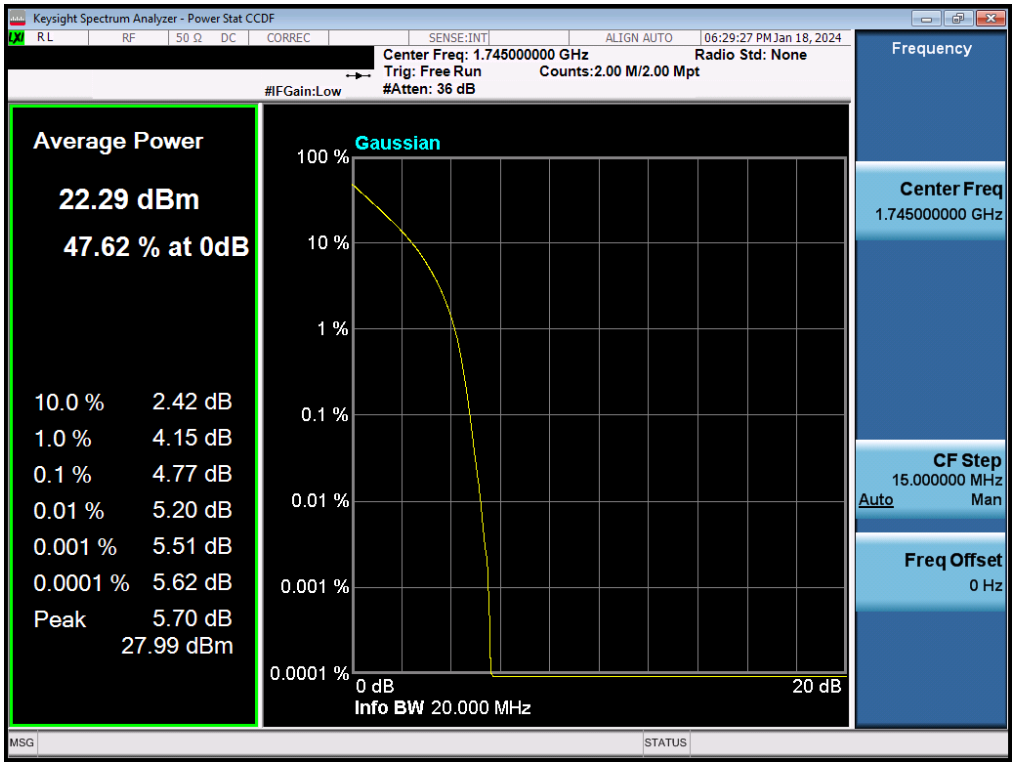


Plot 7-108. PAR Plot (LTE Band 13 - 5MHz QPSK - Full RB)

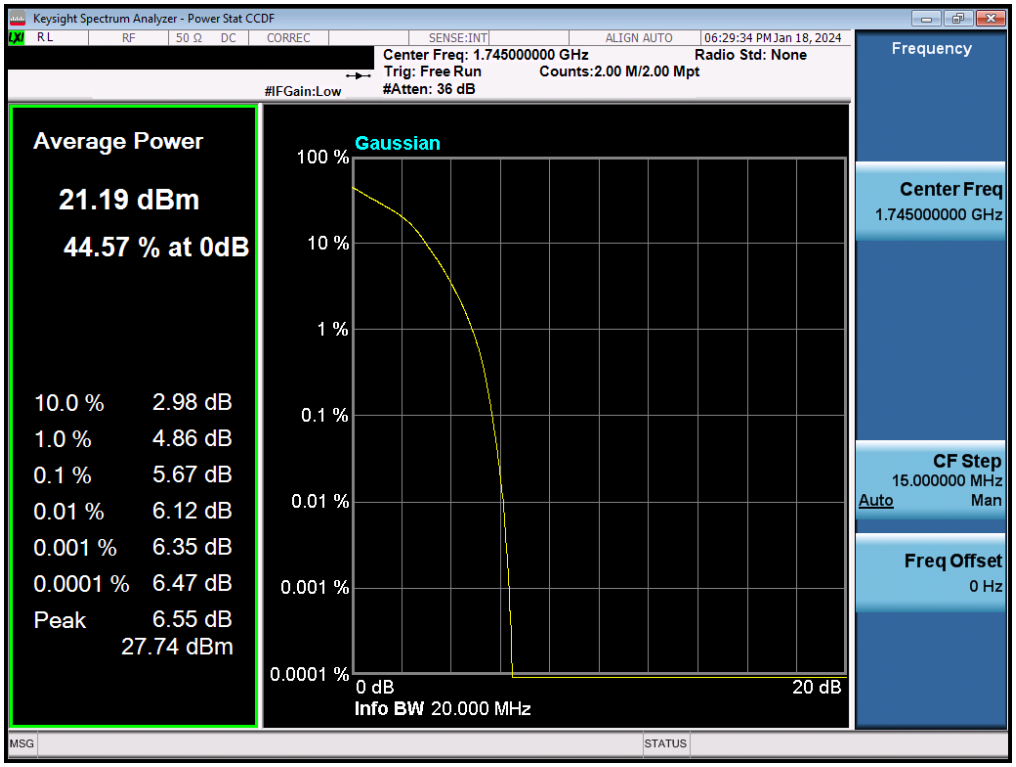


Plot 7-109. PAR Plot (LTE Band 13 - 5MHz 16-QAM - Full RB)

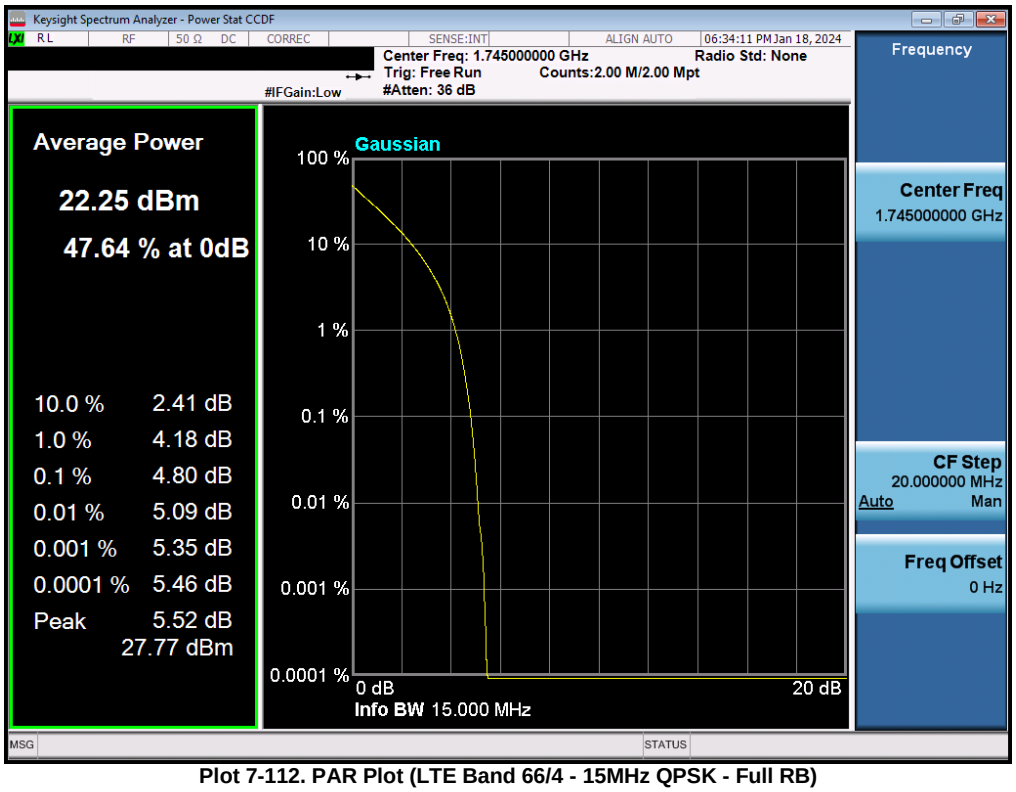
LTE Band 66/4



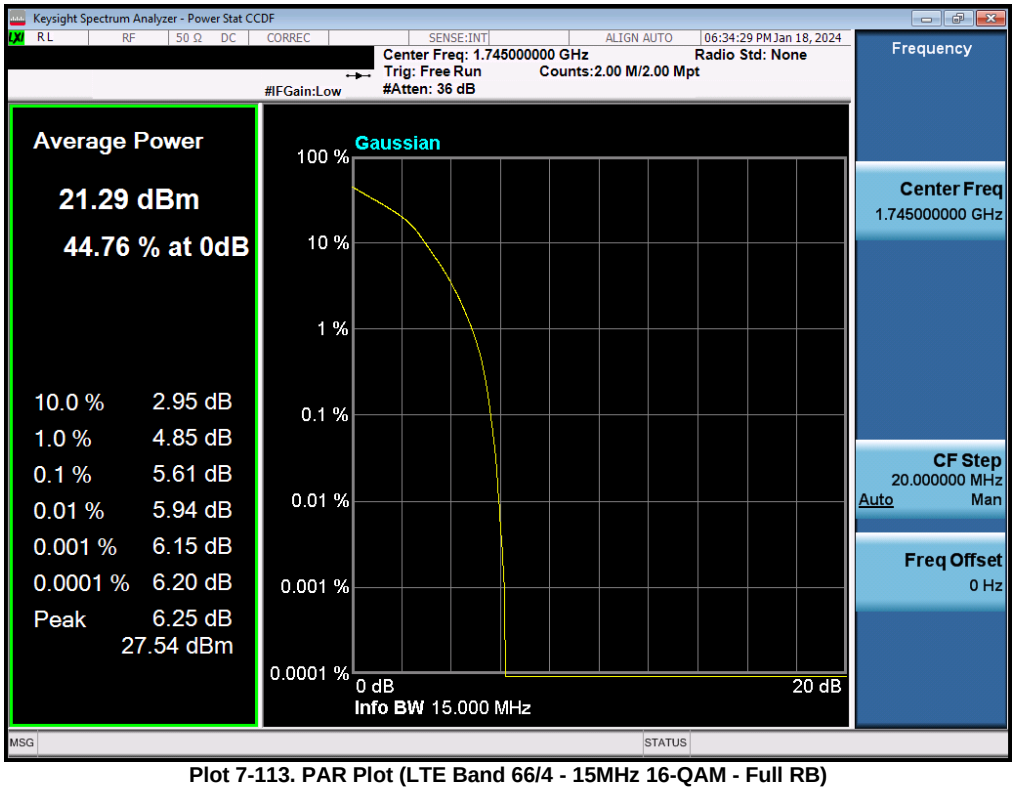
Plot 7-110. PAR Plot (LTE Band 66/4 - 20MHz QPSK - Full RB)



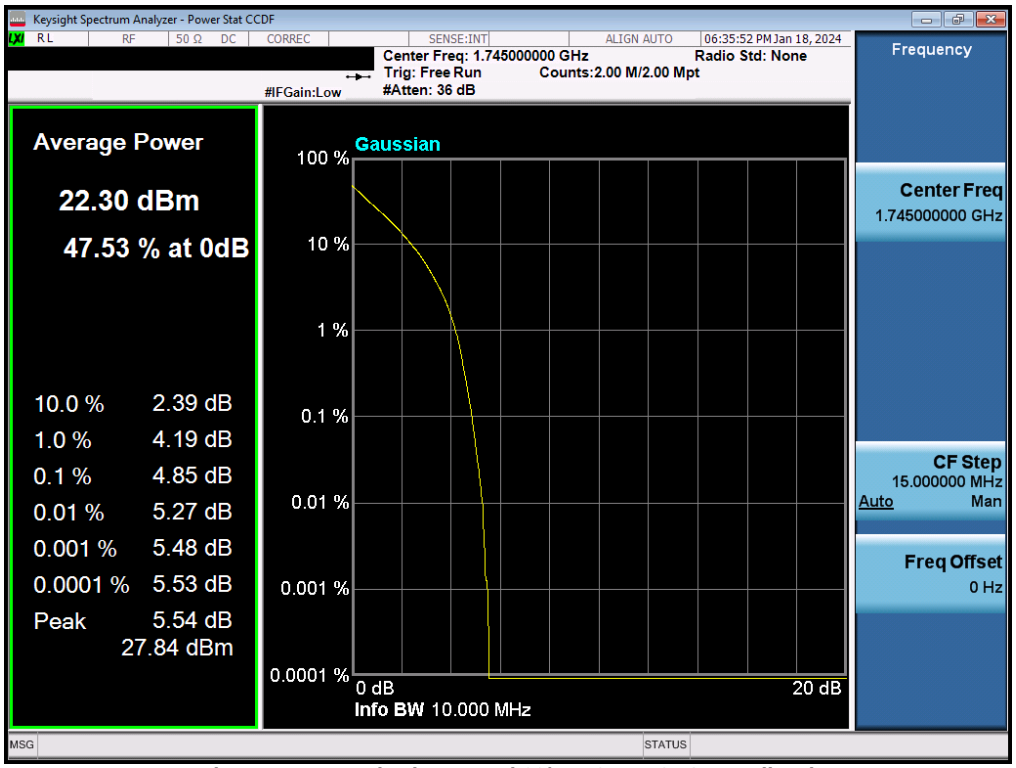
Plot 7-111. PAR Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB)



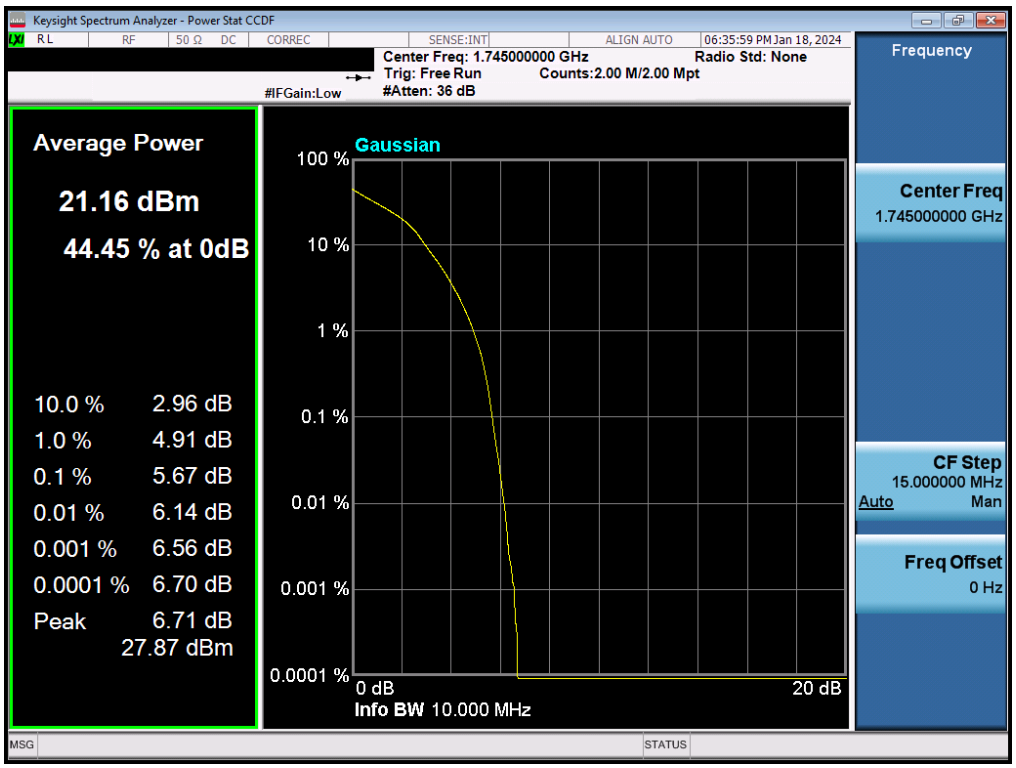
Plot 7-112. PAR Plot (LTE Band 66/4 - 15MHz QPSK - Full RB)



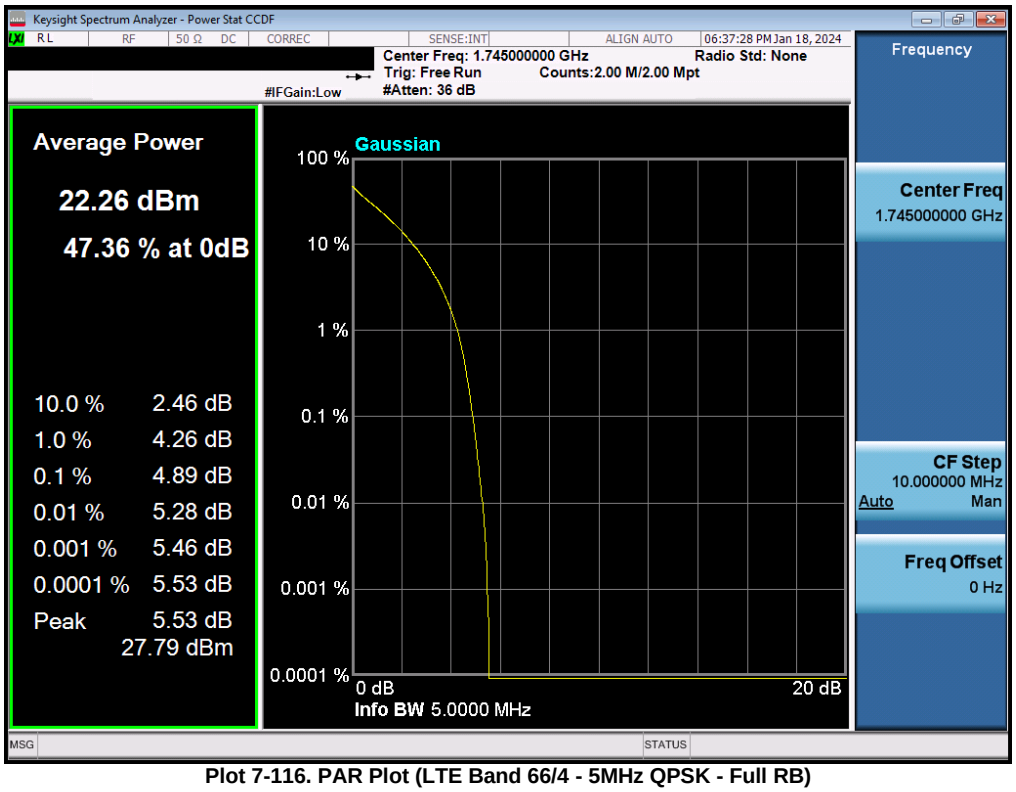
Plot 7-113. PAR Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB)



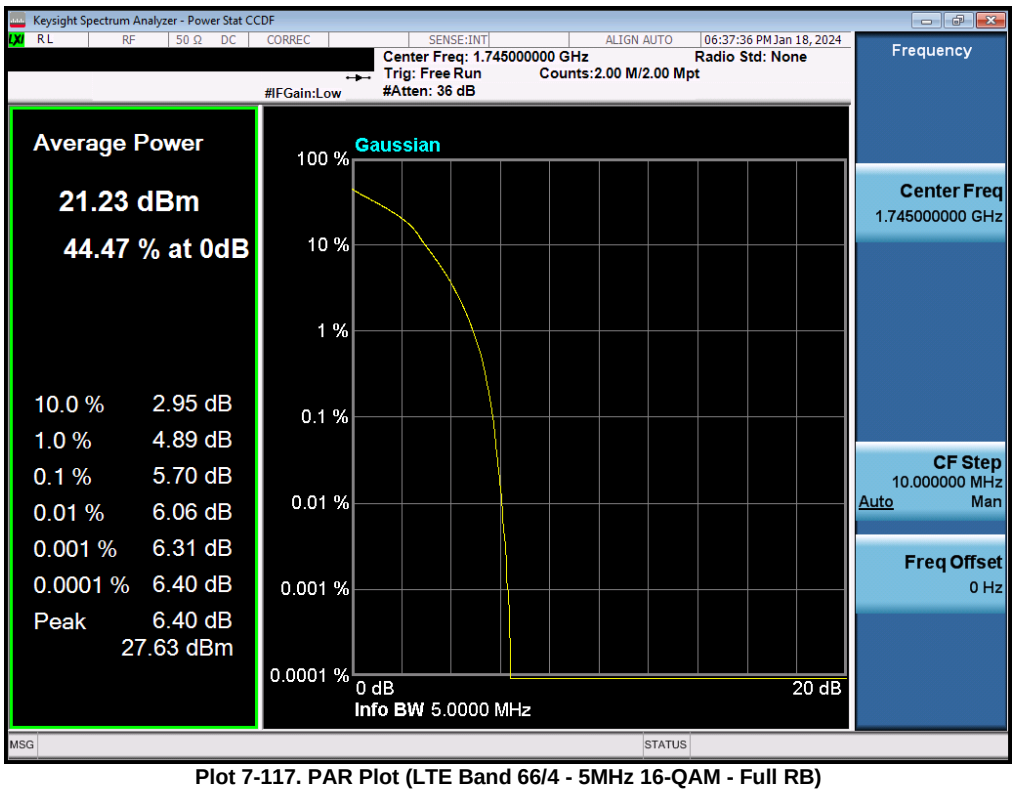
Plot 7-114. PAR Plot (LTE Band 66/4 - 10MHz QPSK - Full RB)



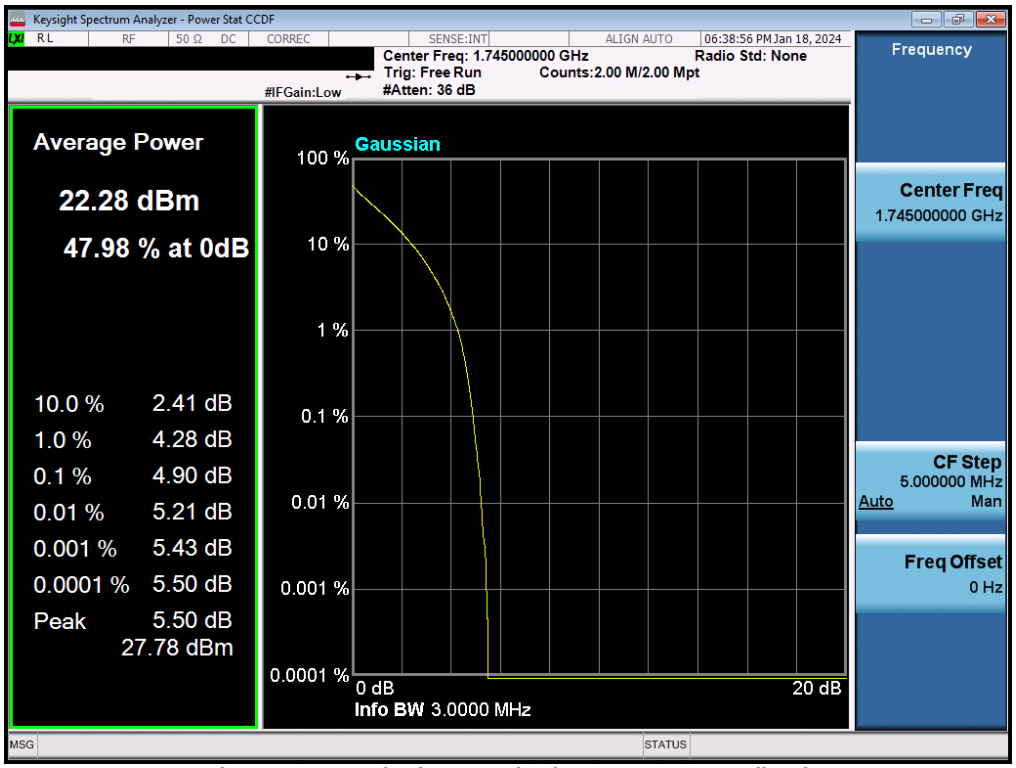
Plot 7-115. PAR Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB)



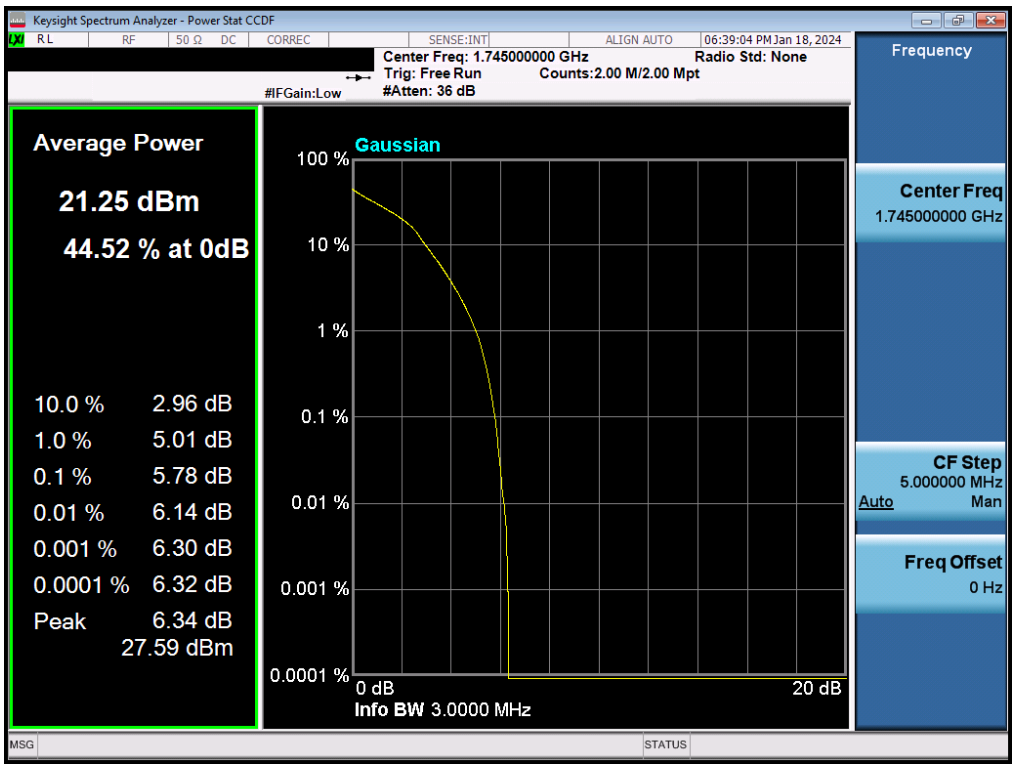
Plot 7-116. PAR Plot (LTE Band 66/4 - 5MHz QPSK - Full RB)



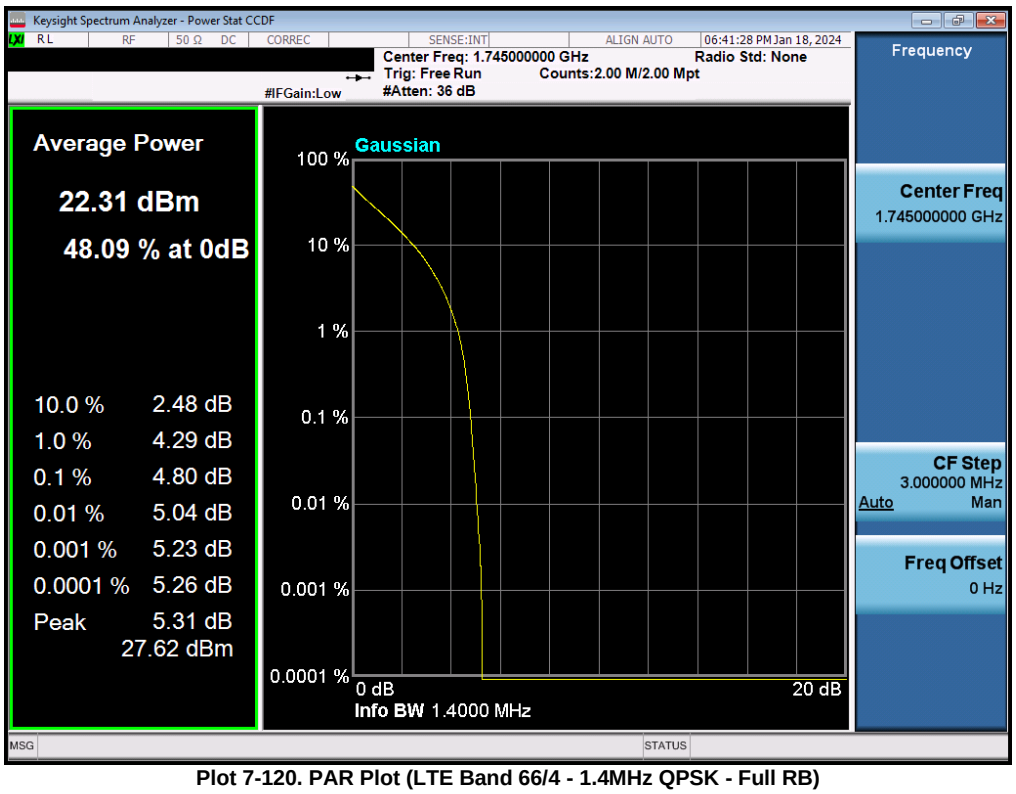
Plot 7-117. PAR Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB)



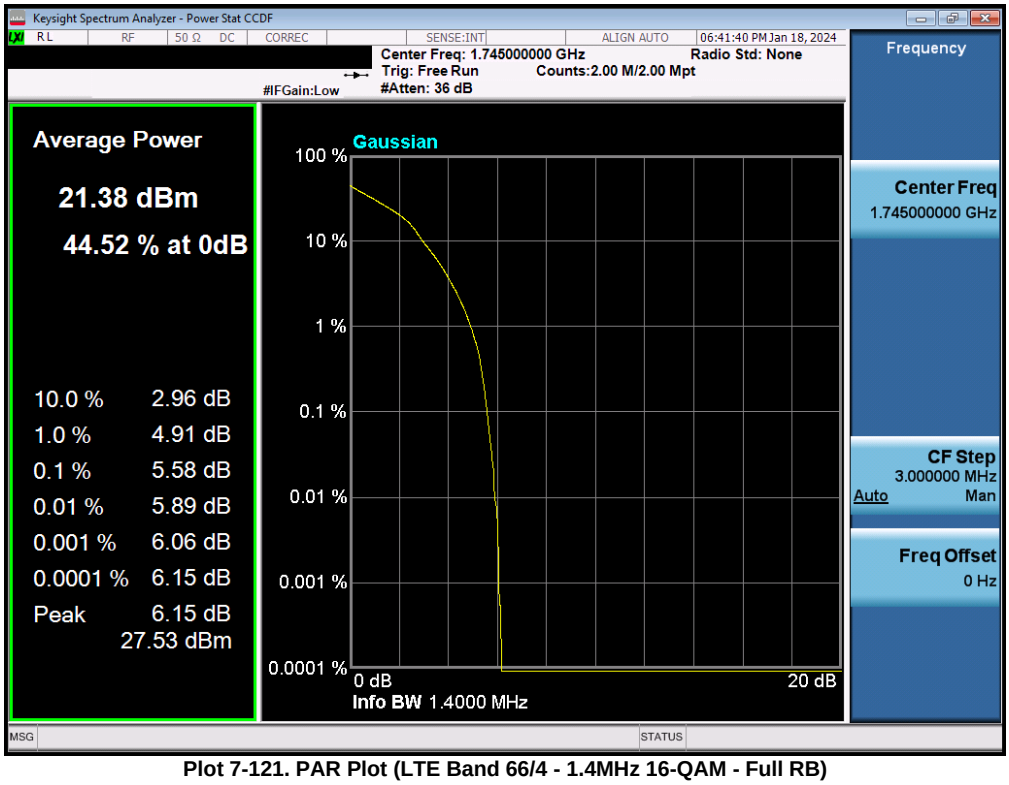
Plot 7-118. PAR Plot (LTE Band 66/4 - 3MHz QPSK - Full RB)



Plot 7-119. PAR Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB)



Plot 7-120. PAR Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB)



Plot 7-121. PAR Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB)

7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in ANSI C63.26-2015 with the EUT transmitting while all its antenna ports are terminated with 50 ohms. Measurements on signals operating below 1GHz are performed using hybrid (biconical/log) antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

ANSI C63.26-2015 – Section 5.5.4

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.

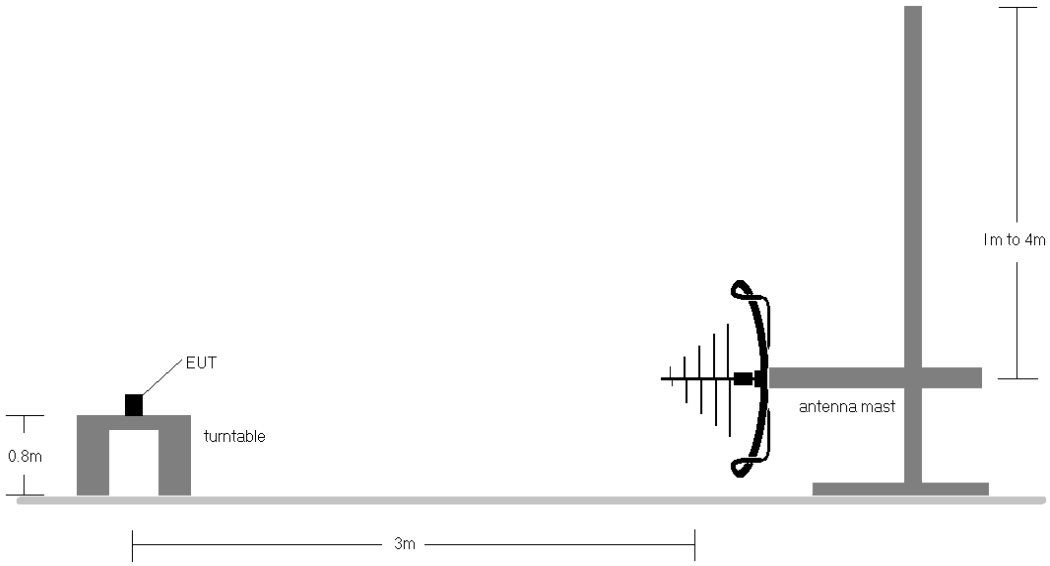


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

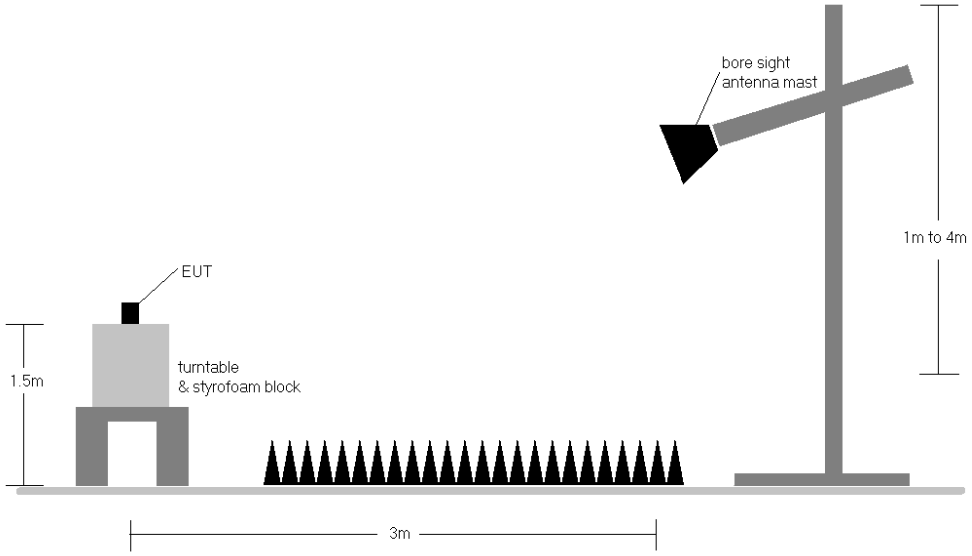


Figure 7-7. Test Instrument & Measurement Setup > 1GHz

Test Notes

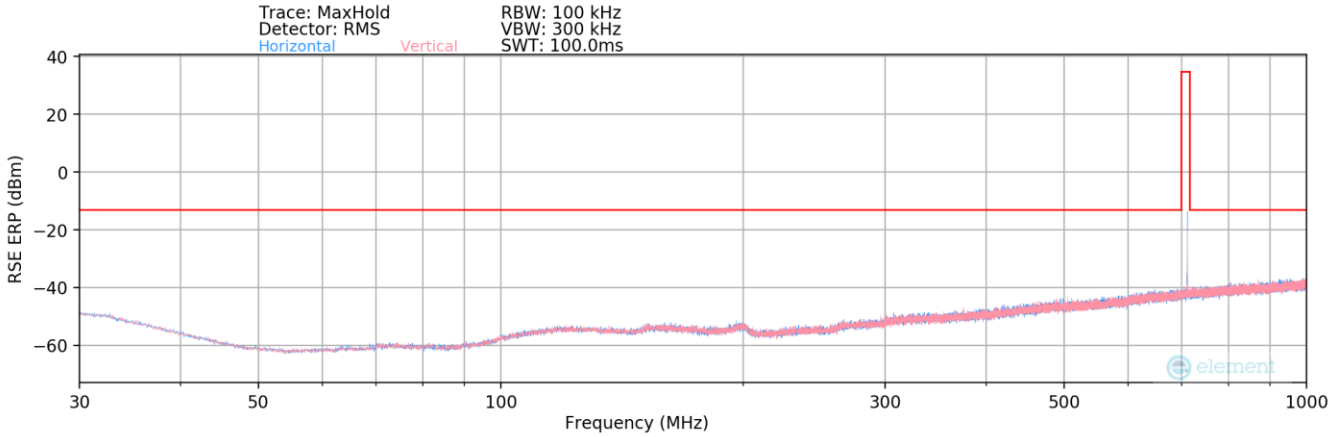
1) Field strengths are calculated using the Measurement quantity conversions in ANSI C63.26-2015 Section 5.2.7:
   a) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
   b) EIRP (dBm) = E(dBµV/m) + 20logD – 104.8; where D is the measurement distance in meters.

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

3) 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.

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

LTE Band 12

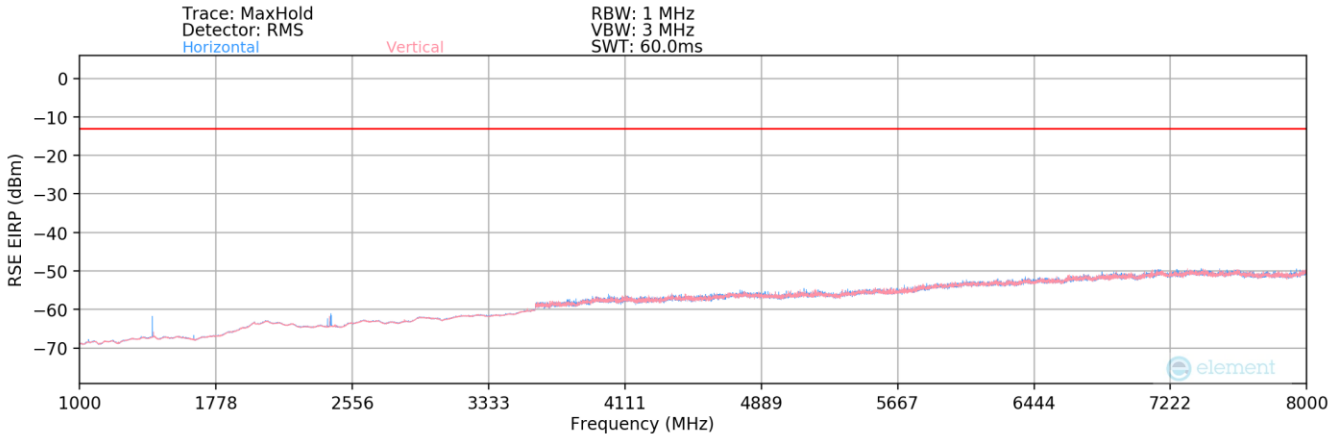


Plot 7-122. Radiated Spurious Plot (LTE Band 12)

Bandwidth (MHz):	10
Channel:	707.5
Frequency (MHz):	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
102.83	H	-	-	-84.07	18.21	41.14	-56.27	-13.00	-43.27
193.36	H	-	-	-83.91	19.07	42.16	-55.25	-13.00	-42.25
486.92	H	-	-	-83.78	25.74	48.96	-48.45	-13.00	-35.45

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



Plot 7-123. Radiated Spurious Plot (LTE Band 12)

Bandwidth (MHz):	10
Frequency (MHz):	704
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]
1408.00	H	134	135	-62.10	-6.66	38.24	-57.01	-13.00	-44.01
2112.00	H	211	131	-73.90	-2.64	30.46	-64.80	-13.00	-51.80
2816.00	H	387	247	-73.82	-2.76	30.42	-64.83	-13.00	-51.83
3520.00	H	312	225	-72.11	-0.27	34.62	-60.63	-13.00	-47.63
4224.00	H	260	162	-74.97	1.59	33.62	-61.64	-13.00	-48.64
4928.00	H	235	160	-71.58	2.60	38.02	-57.24	-13.00	-44.24
5632.00	H	235	135	-75.48	4.33	35.85	-59.41	-13.00	-46.41
6336.00	H	213	142	-74.75	6.57	38.82	-56.44	-13.00	-43.44

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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1415.00	H	159	242	-66.05	-6.69	34.26	-61.00	-13.00	-48.00
2122.50	H	156	229	-70.79	-2.75	33.46	-61.79	-13.00	-48.79
2830.00	H	373	260	-75.80	-2.62	28.58	-66.67	-13.00	-53.67
3537.50	H	110	144	-72.82	-0.14	34.04	-61.22	-13.00	-48.22
4245.00	H	333	116	-76.04	1.69	32.65	-62.60	-13.00	-49.60
4952.50	H	324	165	-73.97	2.84	35.87	-59.39	-13.00	-46.39
5660.00	H	-	-	-77.53	4.49	33.96	-61.30	-13.00	-48.30
6367.50	H	205	184	-77.32	6.57	36.25	-59.00	-13.00	-46.00

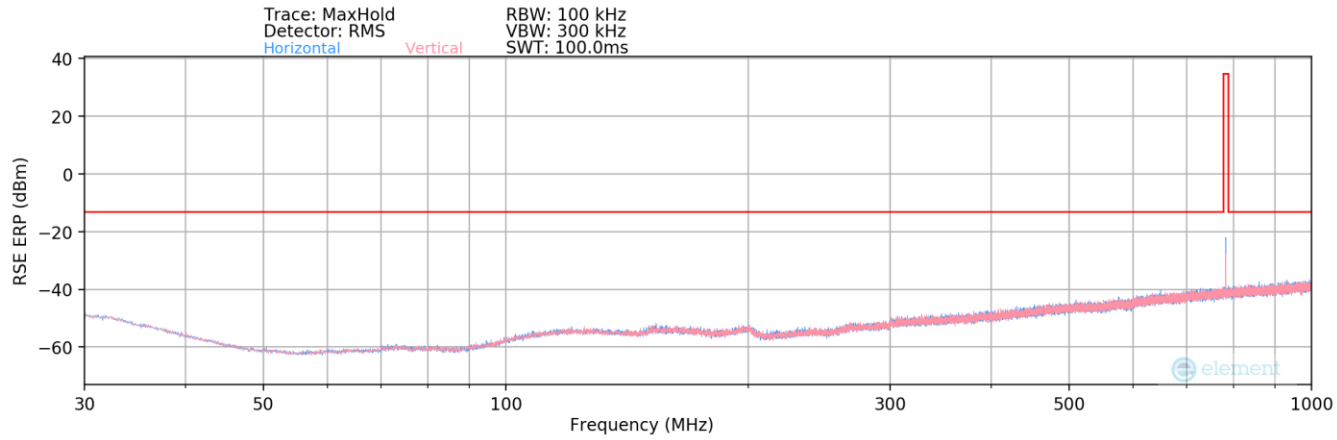
Table 7-7. Radiated Spurious Data (LTE Band 12 – Mid Channel)

Bandwidth (MHz):	10
Frequency (MHz):	711
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]
1422.00	H	131	139	-68.15	-6.73	32.12	-63.13	-13.00	-50.13
2133.00	H	211	62	-71.56	-2.86	32.58	-62.68	-13.00	-49.68
2844.00	H	299	194	-74.50	-2.56	29.94	-65.31	-13.00	-52.31
3555.00	H	313	148	-73.29	0.12	33.83	-61.43	-13.00	-48.43
4266.00	H	304	213	-75.63	1.82	33.19	-62.06	-13.00	-49.06
4977.00	H	252	167	-73.57	2.81	36.24	-59.02	-13.00	-46.02
5688.00	H	251	135	-75.46	4.45	35.99	-59.26	-13.00	-46.26
6399.00	H	-	-	-77.79	6.81	36.02	-59.24	-13.00	-46.24

Table 7-8. Radiated Spurious Data (LTE Band 12 – High Channel)

LTE Band 13

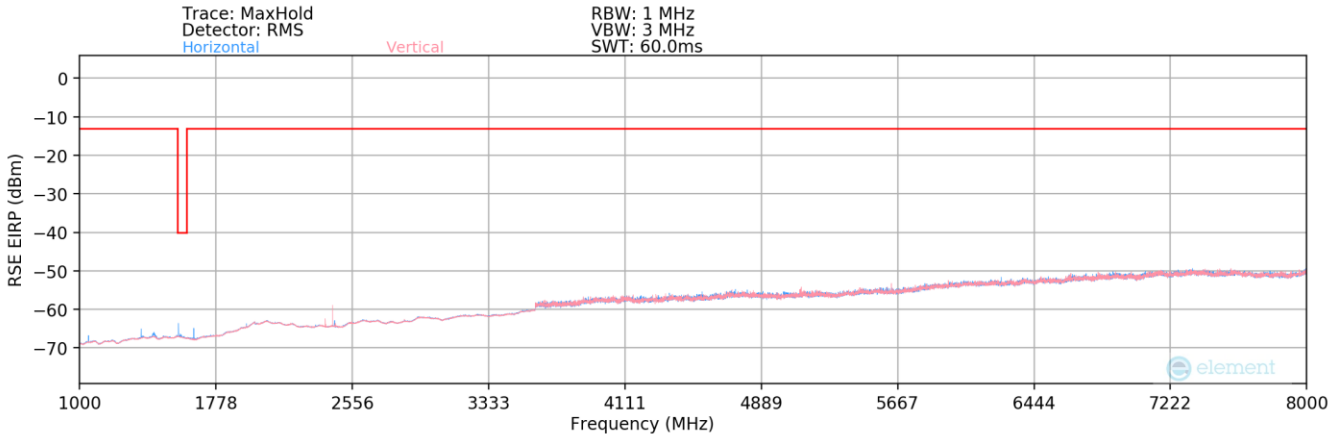


Plot 7-124. Radiated Spurious Plot (LTE Band 13)

Bandwidth (MHz):	10
Channel:	782
Frequency (MHz):	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
95.00	H	-	-	-83.98	15.98	39.00	-58.41	-13.00	-45.41
188.36	H	-	-	-83.89	18.69	41.80	-55.61	-13.00	-42.61
494.47	H	-	-	-83.87	25.80	48.93	-48.48	-13.00	-35.48

Table 7-9. Radiated Spurious Data (LTE Band 13 – Mid Channel)



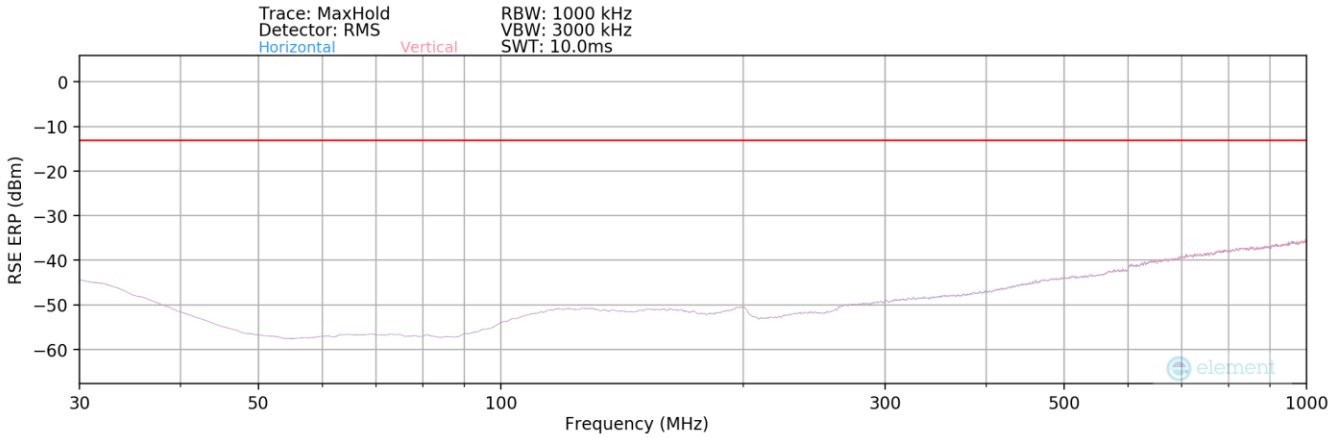
Plot 7-125. Radiated Spurious Plot (LTE Band 13)

Bandwidth (MHz):	10
Frequency (MHz):	782
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]
1564.00	H	143	162	-68.47	-6.58	31.95	-63.30	-40.00	-23.30
2346.00	H	185	182	-74.19	-3.73	29.08	-66.17	-13.00	-53.17
3128.00	H	-	-	-76.52	-1.69	28.79	-66.47	-13.00	-53.47
3910.00	H	-	-	-77.94	1.53	30.59	-64.66	-13.00	-51.66
4692.00	H	-	-	-77.91	2.96	32.05	-63.21	-13.00	-50.21

Table 7-10. Radiated Spurious Data (LTE Band 13 – Mid Channel)

LTE Band 66/4

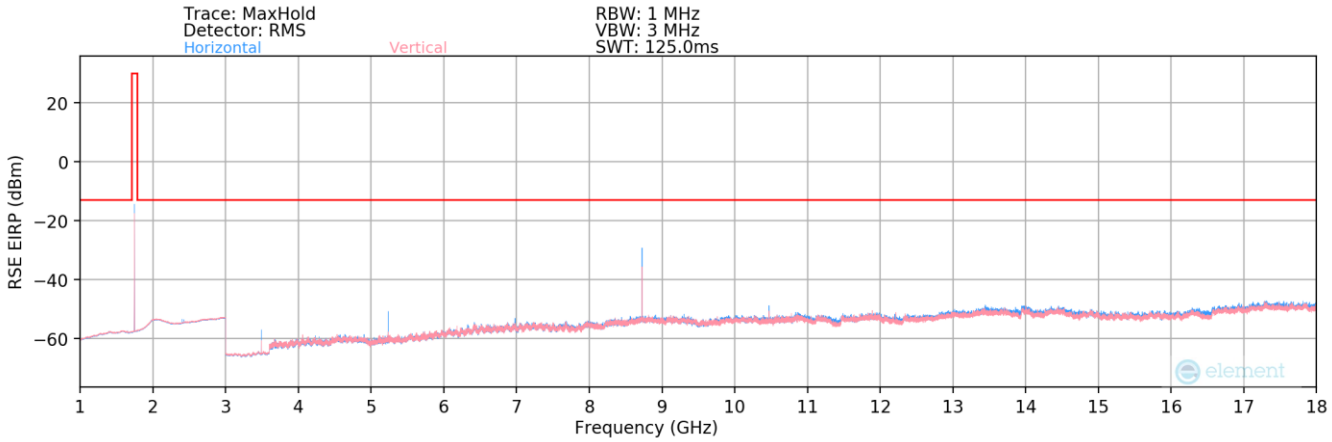


Plot 7-126. Radiated Spurious Plot (LTE Band 66/4)

Bandwidth (MHz):	20
Channel:	1745
Frequency (MHz):	1 / 50

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	ERP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
95.90	H	-	-	-83.90	15.97	39.07	-58.34	-13.00	-45.34
197.03	H	-	-	-83.80	19.89	43.09	-54.31	-13.00	-41.31
496.87	H	-	-	-83.75	25.63	48.88	-48.53	-13.00	-35.53

Table 7-11. Radiated Spurious Data (LTE Band 66/4 – Mid Channel)



Plot 7-127. Radiated Spurious Plot (LTE Band 66/4)

Bandwidth (MHz):	20
Frequency (MHz):	1720
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]
3440.00	H	366	99	-67.93	0.48	39.55	-55.71	-13.00	-42.71
5160.00	H	319	93	-71.24	3.42	39.18	-56.07	-13.00	-43.07
6880.00	H	366	343	-69.76	8.80	46.04	-49.22	-13.00	-36.22
8600.00	H	376	112	-54.85	11.12	63.27	-31.99	-13.00	-18.99
10320.00	H	290	128	-72.53	11.81	46.28	-48.98	-13.00	-35.98
12040.00	H	259	125	-70.29	13.51	50.22	-45.04	-13.00	-32.04
13760.00	H	232	56	-78.77	16.42	44.65	-50.61	-13.00	-37.61
15480.00	H	219	76	-78.25	13.84	42.59	-52.67	-13.00	-39.67

Table 7-12. Radiated Spurious Data (LTE Band 66/4 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1745
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]
3490.00	H	400	18	-69.11	0.12	38.01	-57.25	-13.00	-44.25
5235.00	H	291	99	-72.34	3.65	38.31	-56.95	-13.00	-43.95
6980.00	H	378	296	-72.79	7.94	42.15	-53.11	-13.00	-40.11
8725.00	H	367	109	-53.04	11.02	64.98	-30.28	-13.00	-17.28
10470.00	H	370	126	-71.08	12.72	48.64	-46.62	-13.00	-33.62
12215.00	H	355	120	-74.07	12.88	45.81	-49.44	-13.00	-36.44
13960.00	H	353	49	-78.07	15.84	44.77	-50.49	-13.00	-37.49
15705.00	H	351	83	-79.57	14.96	42.39	-52.87	-13.00	-39.87

Table 7-13. Radiated Spurious Data (LTE Band 66/4 – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1770
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	219	103	-71.12	-0.17	35.71	-59.54	-13.00	-46.54
5310.00	H	394	95	-68.64	3.36	41.72	-53.53	-13.00	-40.53
7080.00	H	305	329	-71.70	8.42	43.72	-51.54	-13.00	-38.54
8850.00	H	369	113	-50.23	11.06	67.83	-27.43	-13.00	-14.43
10620.00	H	309	127	-65.56	13.10	54.54	-40.72	-13.00	-27.72
12390.00	H	240	122	-77.11	12.90	42.79	-52.47	-13.00	-39.47
14160.00	H	348	44	-75.87	15.84	46.97	-48.29	-13.00	-35.29
15930.00	H	357	74	-77.73	14.29	43.56	-51.70	-13.00	-38.70

Table 7-14. Radiated Spurious Data (LTE Band 66/4 – High Channel)

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. 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 C63.26-2015 – Section 5.6

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

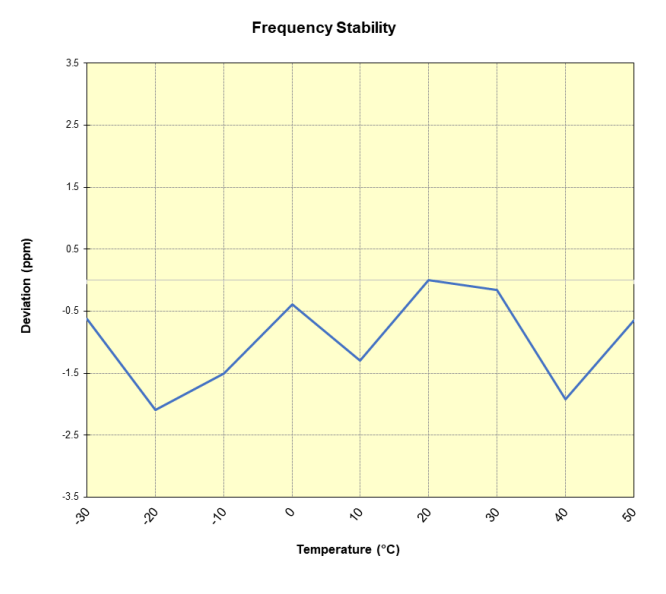
None

Frequency Stability / Temperature Variation

LTE Band 12	
Operating Frequency (Hz):	707,500,000
Ref. Voltage (VDC):	3.4

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.4	- 30	707,500,158	-441	-0.0000623
		- 20	707,499,119	-1,480	-0.0002092
		- 10	707,499,532	-1,067	-0.0001508
		0	707,500,320	-279	-0.0000394
		+ 10	707,499,681	-918	-0.0001298
		+ 20 (Ref)	707,500,599	0	0.0000000
		+ 30	707,500,489	-110	-0.0000155
		+ 40	707,499,240	-1,359	-0.0001921
		+ 50	707,500,142	-457	-0.0000646
85 %	2.89	+ 20	707,499,152	-1,447	-0.0002045
115 %	3.91	+ 20	707,500,516	-83	-0.0000118

Table 7-15. LTE Band 12 Frequency Stability Data



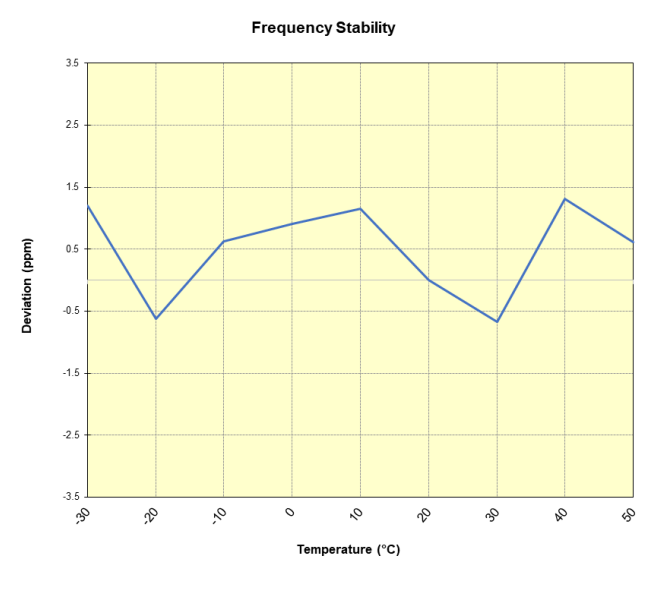
Plot 7-128. LTE Band 12 Frequency Stability Chart

LTE Band 13

Operating Frequency (Hz):	782,000,000
Ref. Voltage (VDC):	3.4

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.4	- 30	782,000,019	943	0.0001206
		- 20	781,998,593	-483	-0.0000617
		- 10	781,999,564	489	0.0000625
		0	781,999,785	709	0.0000907
		+ 10	781,999,980	904	0.0001157
		+ 20 (Ref)	781,999,075	0	0.0000000
		+ 30	781,998,554	-521	-0.0000667
		+ 40	782,000,100	1,025	0.0001310
		+ 50	781,999,554	479	0.0000613
85 %	2.89	+ 20	781,999,148	73	0.0000094
115 %	3.91	+ 20	782,000,287	1,212	0.0001550

Table 7-16. LTE Band 13 Frequency Stability Data



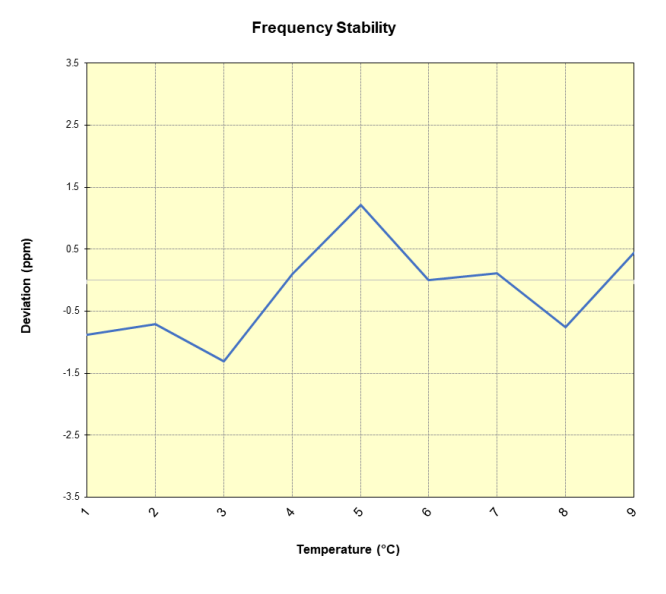
Plot 7-129. LTE Band 13 Frequency Stability Chart

LTE Band 66/4

Operating Frequency (Hz):	1,745,000,000
Ref. Voltage (VDC):	3.4

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.4	- 30	1,744,997,797	-1,538	-0.0000881
		- 20	1,744,998,103	-1,232	-0.0000706
		- 10	1,744,997,054	-2,281	-0.0001307
		0	1,744,999,513	178	0.0000102
		+ 10	1,745,001,458	2,124	0.0001217
		+ 20 (Ref)	1,744,999,335	0	0.0000000
		+ 30	1,744,999,537	203	0.0000116
		+ 40	1,744,998,011	-1,324	-0.0000759
		+ 50	1,745,000,111	776	0.0000445
85 %	2.89	+ 20	1,744,999,851	516	0.0000296
115 %	3.91	+ 20	1,744,999,347	12	0.0000007

Table 7-17. LTE Band 66/4 Frequency Stability Data



Plot 7-130. LTE Band 66/4 Frequency Stability Chart

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Telit Module FCC ID: RI7LE910C1SNX / IC: 5131A-LE910C1SNX** complies with all the requirements of Part 27 of the FCC rules and RSS-130, RSS-139 of the ISED rules.