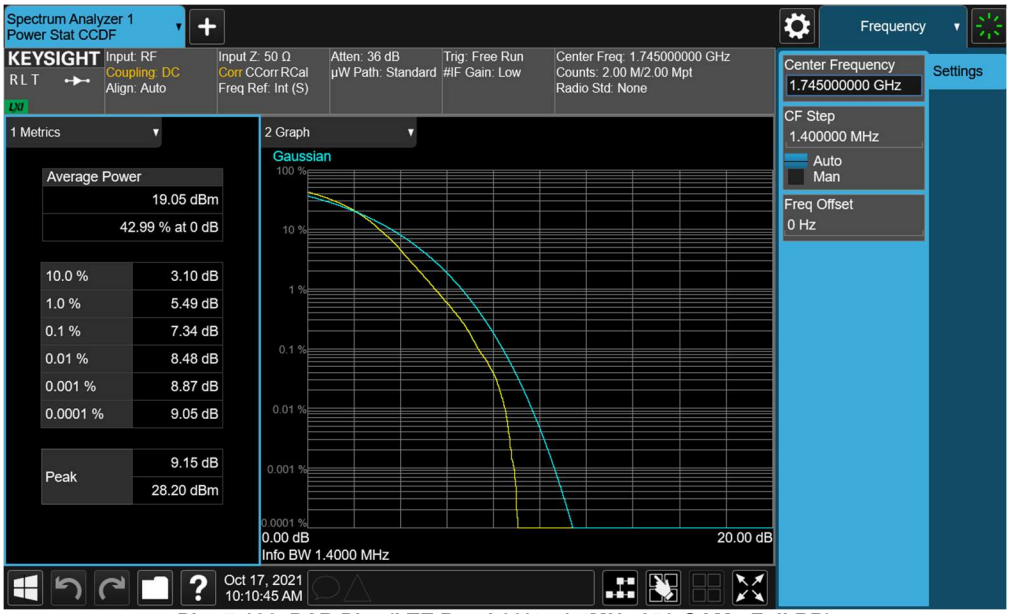
Plot 7-123. PAR Plot (LTE Band 66/4 - 3MHz QPSK - Full RB)

Plot 7-124. PAR Plot (LTE Band 66/4 - 3MHz 256-QAM - Full RB)

Plot 7-125. PAR Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB)



Plot 7-126. PAR Plot (LTE Band 66/4 - 1.4MHz 256-QAM - Full RB)

7.6 Radiated Power (ERP/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. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

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

Test Setup

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

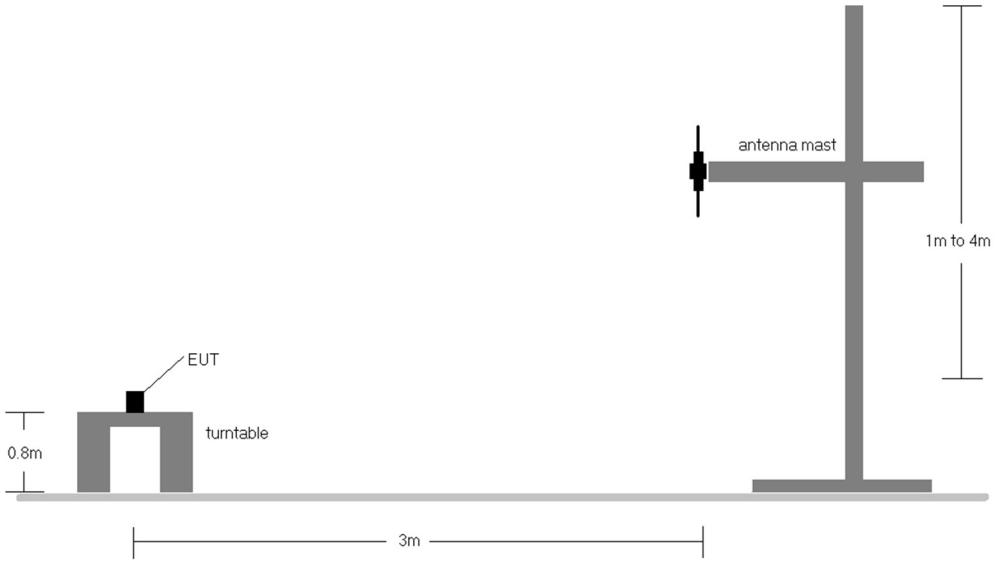


Figure 7-5. Radiated Test Setup <1GHz

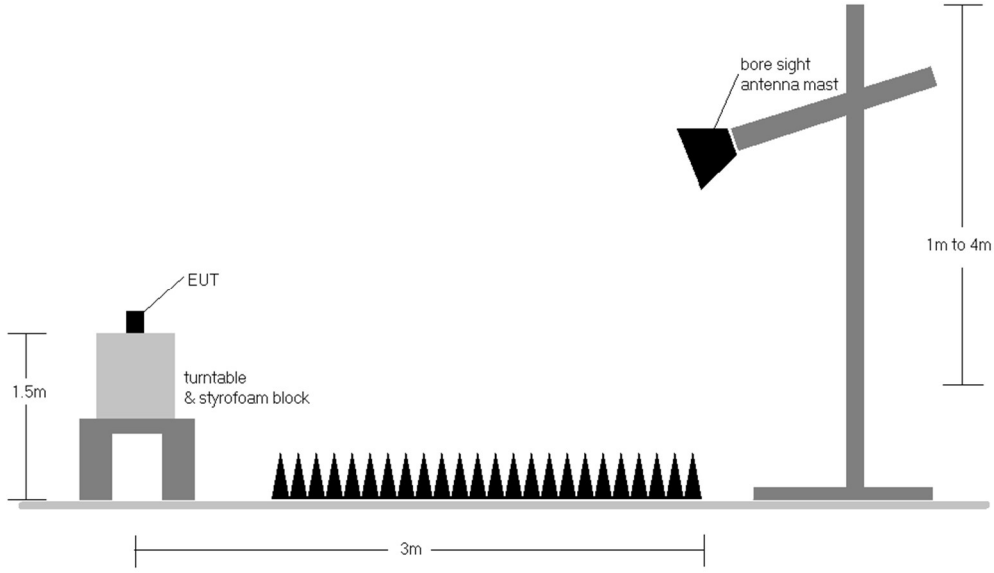


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

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

2) This unit was tested with its standard battery.

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	H	106	83	1.34	1 / 0	16.03	17.37	0.055	36.99	-19.62	15.22	0.033	34.77	-19.55
	QPSK	707.5	H	120	89	1.33	1 / 0	15.87	17.20	0.053	36.99	-19.79	15.05	0.032	34.77	-19.72
	QPSK	711.0	H	100	81	1.33	1 / 0	16.27	**17.60**	0.057	36.99	-19.39	**15.45**	0.035	34.77	-19.33
	16-QAM	711.0	H	100	81	1.33	1 / 0	14.74	16.07	0.040	36.99	-20.92	13.92	0.025	34.77	-20.86
5 MHz	QPSK	701.5	H	106	83	1.35	1 / 12	15.80	**17.15**	0.052	36.99	-19.84	**15.00**	0.032	34.77	-19.77
	QPSK	707.5	H	120	89	1.33	1 / 0	15.79	17.12	0.052	36.99	-19.87	14.97	0.031	34.77	-19.80
	QPSK	713.5	H	100	81	1.32	1 / 0	15.70	17.02	0.050	36.99	-19.97	14.87	0.031	34.77	-19.90
	16-QAM	701.5	H	106	83	1.35	1 / 12	14.75	16.10	0.041	36.99	-20.89	13.95	0.025	34.77	-20.82
3 MHz	QPSK	700.5	H	106	83	1.35	1 / 7	15.03	**16.38**	0.043	36.99	-20.61	**14.23**	0.026	34.77	-20.54
	QPSK	707.5	H	120	89	1.33	1 / 0	14.94	16.27	0.042	36.99	-20.72	14.12	0.026	34.77	-20.65
	QPSK	714.5	H	100	81	1.32	1 / 0	14.83	16.15	0.041	36.99	-20.84	14.00	0.025	34.77	-20.77
	16-QAM	700.5	H	106	83	1.35	1 / 7	14.09	15.44	0.035	36.99	-21.55	13.29	0.021	34.77	-21.48
1.4 MHz	QPSK	699.7	H	106	83	1.35	1 / 5	14.97	**16.32**	0.043	36.99	-20.67	**14.17**	0.026	34.77	-20.60
	QPSK	707.5	H	120	89	1.33	1 / 0	14.65	15.98	0.040	36.99	-21.01	13.83	0.024	34.77	-20.94
	QPSK	715.3	H	100	81	1.32	1 / 3	14.55	15.87	0.039	36.99	-21.12	13.72	0.024	34.77	-21.06
	16-QAM	699.7	H	106	83	1.35	1 / 5	13.86	15.21	0.033	36.99	-21.78	13.06	0.020	34.77	-21.71
10 MHz	Opposite Pol.	711.0	V	153	90	1.33	1 / 49	15.43	16.76	0.047	36.99	-20.23	14.61	0.029	34.77	-20.17
	WCP	711.0	H	147	77	1.33	1 / 25	14.15	15.48	0.035	36.99	-21.51	13.33	0.022	34.77	-21.45

Table 7-2. ERP Data (LTE Band 12/17)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	EUT Pol.	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	V	Z	154	96	1.17	1 / 49	19.19	**20.36**	0.109	36.99	-16.63	**18.21**	0.066	34.77	-16.56
	16-QAM	782.0	V	Z	154	96	1.17	1 / 49	18.03	19.20	0.083	36.99	-17.79	17.05	0.051	34.77	-17.72
5 MHz	QPSK	779.5	V	Z	161	101	1.17	1 / 0	18.88	**20.05**	0.101	36.99	-16.94	**17.90**	0.062	34.77	-16.87
	QPSK	782.0	V	Z	154	96	1.17	1 / 0	18.55	19.72	0.094	36.99	-17.27	17.57	0.057	34.77	-17.20
	QPSK	784.5	V	Z	157	96	1.16	1 / 24	18.54	19.70	0.093	36.99	-17.29	17.55	0.057	34.77	-17.22
	16-QAM	779.5	V	Z	161	101	1.17	1 / 0	17.65	18.82	0.076	36.99	-18.17	16.67	0.046	34.77	-18.10
10 MHz	Opposite Pol.	782.0	H	X	253	68	1.17	1 / 25	17.02	18.19	0.066	36.99	-18.80	16.04	0.040	34.77	-18.73
	WCP	782.0	V	Z	154	101	1.17	1 / 0	14.70	15.87	0.039	36.99	-21.12	13.72	0.024	34.77	-21.05

Table 7-3. 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	V	138	337	14.17	8.70	**22.87**	**0.193**	30.00	-7.13
1732.60	WCDMA1700	V	127	338	13.19	8.70	21.89	0.155	30.00	-8.11
1752.60	WCDMA1700	V	119	335	12.49	8.70	21.19	0.132	30.00	-8.81
1712.40	WCDMA1700	H	121	357	12.12	8.70	20.82	0.121	30.00	-9.18
1712.40	WCDMA1700 (WCP)	V	111	320	8.12	8.70	16.82	0.048	30.00	-13.18

Table 7-4. 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	V	130	325	8.70	1 / 50	13.76	22.46	0.176	30.00	-7.54
	QPSK	1745.0	V	125	342	8.70	1 / 0	13.10	21.80	0.151	30.00	-8.20
	QPSK	1770.0	V	140	336	8.71	1 / 99	13.78	**22.49**	0.177	30.00	-7.51
	16-QAM	1720.0	V	130	325	8.70	1 / 50	12.53	21.23	0.133	30.00	-8.77
15 MHz	QPSK	1717.5	V	130	325	8.70	1 / 37	13.84	22.54	0.179	30.00	-7.46
	QPSK	1745.0	V	125	342	8.70	1 / 37	12.80	21.50	0.141	30.00	-8.50
	QPSK	1772.5	V	140	336	8.71	1 / 37	13.86	**22.57**	0.181	30.00	-7.43
	16-QAM	1772.5	V	140	336	8.71	1 / 37	12.50	21.21	0.132	30.00	-8.79
10 MHz	QPSK	1715.0	V	130	325	8.70	1 / 25	14.14	**22.84**	0.192	30.00	-7.16
	QPSK	1745.0	V	125	342	8.70	1 / 25	12.76	21.46	0.140	30.00	-8.54
	QPSK	1775.0	V	140	336	8.71	1 / 25	14.04	22.75	0.188	30.00	-7.25
	16-QAM	1715.0	V	130	325	8.70	1 / 25	12.73	21.43	0.139	30.00	-8.57
5 MHz	QPSK	1712.5	V	130	325	8.70	1 / 12	13.56	22.26	0.168	30.00	-7.74
	QPSK	1745.0	V	125	342	8.70	1 / 12	12.31	21.01	0.126	30.00	-8.99
	QPSK	1777.5	V	140	336	8.71	1 / 0	13.55	**22.26**	0.168	30.00	-7.74
	16-QAM	1712.5	V	130	325	8.70	1 / 12	12.55	21.25	0.133	30.00	-8.75
3 MHz	QPSK	1711.5	V	130	325	8.70	1 / 7	13.06	**21.76**	0.150	30.00	-8.24
	QPSK	1745.0	V	125	342	8.70	1 / 7	11.63	20.33	0.108	30.00	-9.67
	QPSK	1778.5	V	140	336	8.71	1 / 0	12.87	21.58	0.144	30.00	-8.42
	16-QAM	1711.5	V	130	325	8.70	1 / 7	12.08	20.78	0.120	30.00	-9.22
1.4 MHz	QPSK	1710.7	V	130	325	8.70	1 / 3	12.90	**21.60**	0.144	30.00	-8.40
	QPSK	1745.0	V	125	342	8.70	1 / 3	11.64	20.34	0.108	30.00	-9.66
	QPSK	1779.3	V	140	336	8.71	1 / 0	12.64	21.35	0.136	30.00	-8.65
	16-QAM	1710.7	V	130	325	8.70	1 / 3	11.90	20.60	0.115	30.00	-9.40
10 MHz	Opposite Pol.	1715.0	H	142	161	8.70	1 / 3	13.23	21.93	0.156	30.00	-8.07
	WCP	1715.0	V	137	253	8.70	1 / 3	11.95	20.65	0.116	30.00	-9.35

Table 7-5. EIRP Data (LTE Band 66/4)

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 RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

Test Setup

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

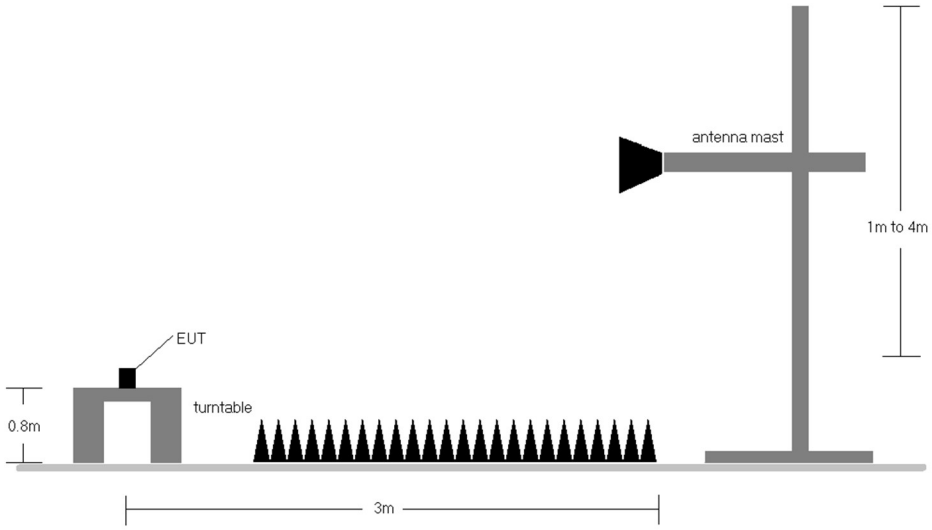


Figure 7-7. Test Instrument & Measurement Setup

Test Notes

1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
   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 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.

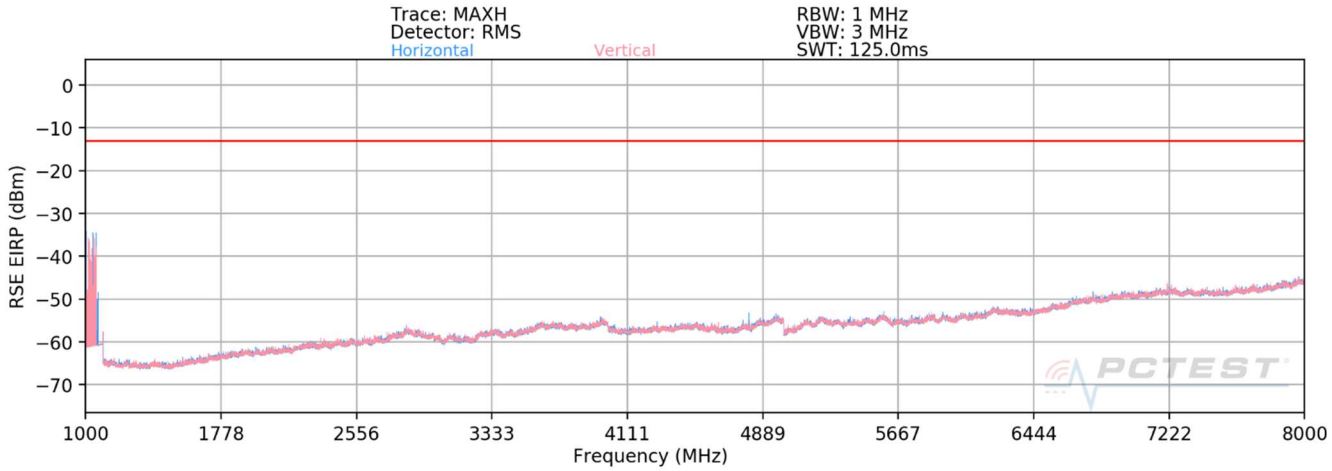
3) This unit was tested with its standard battery.

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

5) 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.

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

LTE Band 12/17



Plot 7-127. Radiated Spurious Plot (LTE Band 12/17)

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	-	-	-75.15	-8.56	23.29	-71.97	-13.00	-58.97
2112.00	H	-	-	-75.62	-5.67	25.71	-69.54	-13.00	-56.54
2816.00	H	-	-	-75.81	-3.53	27.66	-67.60	-13.00	-54.60
3520.00	H	-	-	-76.19	-1.00	29.81	-65.45	-13.00	-52.45

Table 7-6. 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]
1021.30	H	100	77	-34.25	-1.62	71.13	-24.13	-13.00	-11.13
1415.00	H	-	-	-75.45	-8.55	23.00	-72.26	-13.00	-59.26
2122.50	H	-	-	-75.81	-5.65	25.54	-69.72	-13.00	-56.72
2830.00	H	-	-	-75.65	-3.32	28.03	-67.22	-13.00	-54.22
3537.50	H	-	-	-76.54	-0.81	29.65	-65.61	-13.00	-52.61

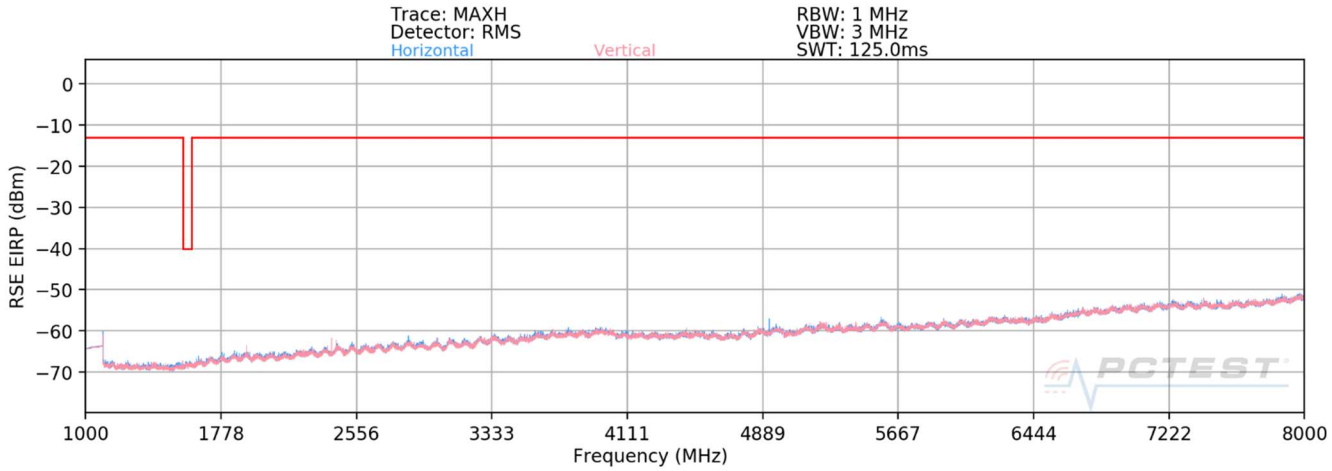
Table 7-7. Radiated Spurious Data (LTE Band 12/17 – Mid Channel)

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	-	-	-75.23	-8.54	23.23	-72.03	-13.00	-59.03
2133.00	H	-	-	-75.29	-5.67	26.04	-69.22	-13.00	-56.22
2844.00	H	-	-	-75.34	-3.05	28.61	-66.64	-13.00	-53.64
3555.00	H	-	-	-76.63	-0.62	29.75	-65.50	-13.00	-52.50

Table 7-8. Radiated Spurious Data (LTE Band 12/17 – High Channel)

LTE Band 13



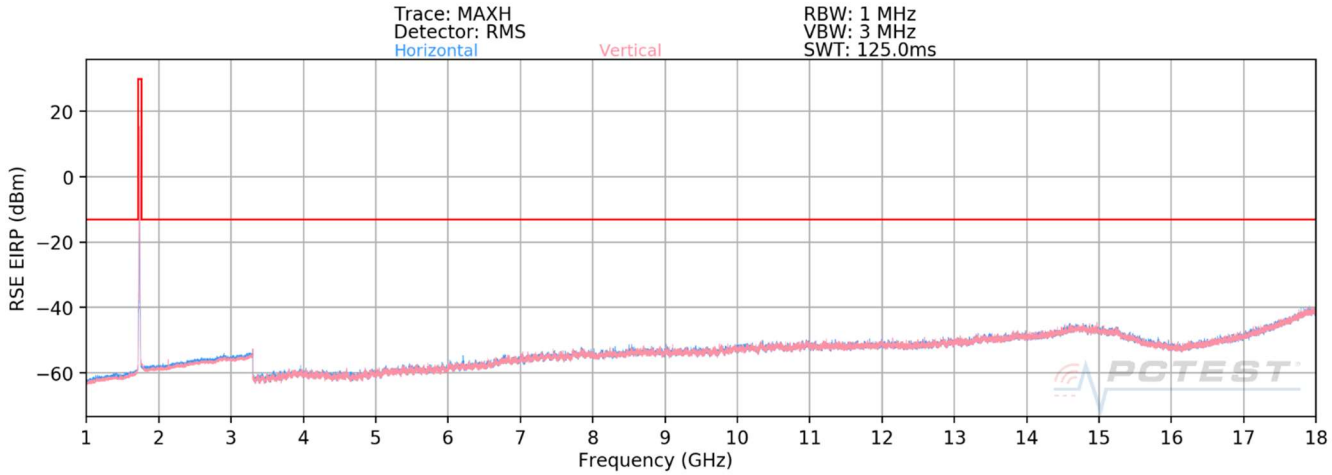
Plot 7-128. Radiated Spurious Plot (LTE Band 13)

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	-	-	-75.65	-8.09	23.26	-72.00	-40.00	-32.00
2346.00	H	141	299	-75.34	-4.64	27.02	-68.23	-13.00	-55.23
3128.00	H	-	-	-76.62	-1.60	28.78	-66.48	-13.00	-53.48
3910.00	H	-	-	-76.49	1.01	31.52	-63.74	-13.00	-50.74
4692.00	H	-	-	-77.10	0.61	30.51	-64.74	-13.00	-51.74

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

WCDMA AWS



Plot 7-129. 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]
3424.80	H	-	-	-76.33	-0.87	29.80	-65.46	-13.00	-52.46
5137.20	H	-	-	-77.06	2.36	32.30	-62.96	-13.00	-49.96
6849.60	H	-	-	-78.77	7.15	35.38	-59.88	-13.00	-46.88
8562.00	H	-	-	-79.46	10.38	37.92	-57.34	-13.00	-44.34

7-10. 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]
3465.20	H	-	-	-76.80	-1.23	28.97	-66.29	-13.00	-53.29
5197.80	H	-	-	-76.93	2.15	32.22	-63.04	-13.00	-50.04
6930.40	H	-	-	-78.76	7.34	35.58	-59.68	-13.00	-46.68
8663.00	H	-	-	-79.70	11.39	38.69	-56.57	-13.00	-43.57

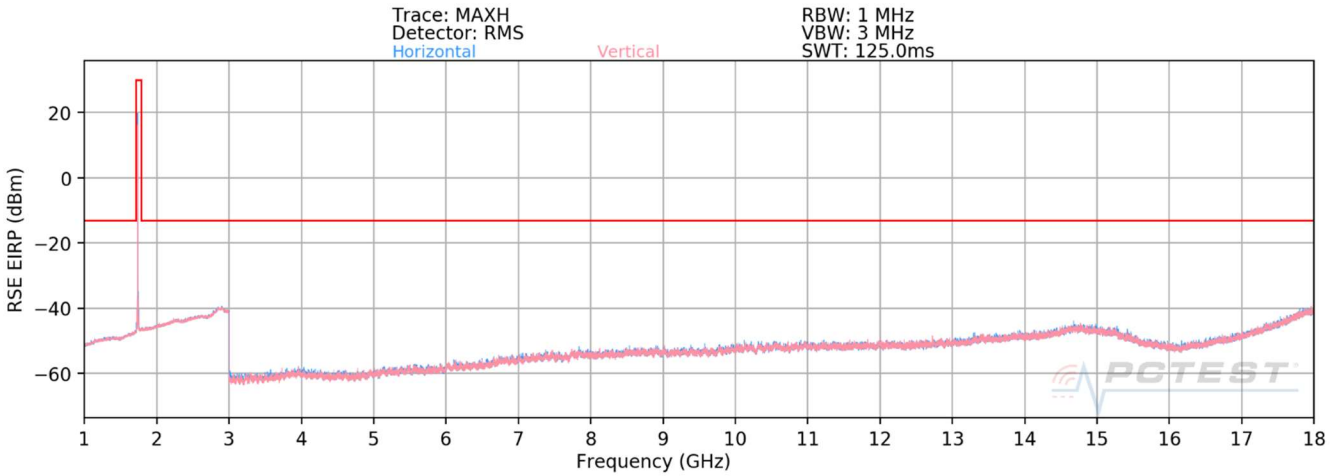
Table 7-11. Radiated Spurious Data (WCDMA AWS – Mid Channel)

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]
3505.20	H	-	-	-76.22	-0.60	30.18	-65.08	-13.00	-52.08
5257.80	H	-	-	-77.71	3.02	32.31	-62.95	-13.00	-49.95
7010.40	H	-	-	-78.13	7.42	36.29	-58.97	-13.00	-45.97
8763.00	H	-	-	-79.73	11.75	39.02	-56.24	-13.00	-43.24

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

LTE Band 66/4



Plot 7-130. Radiated Spurious Plot (LTE Band 66/4)

Bandwidth (MHz):	10
Frequency (MHz):	1715
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]
3430.00	H	-	-	-76.32	-0.84	29.84	-65.42	-13.00	-52.42
5145.00	H	-	-	-77.20	2.38	32.18	-63.08	-13.00	-50.08
6860.00	H	-	-	-78.74	7.20	35.46	-59.80	-13.00	-46.80
8575.00	H	-	-	-79.32	10.65	38.33	-56.93	-13.00	-43.93

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

Bandwidth (MHz):	10
Frequency (MHz):	1745
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]
3490.00	H	-	-	-76.61	-0.86	29.53	-65.73	-13.00	-52.73
5235.00	H	-	-	-77.95	2.33	31.38	-63.88	-13.00	-50.88
6980.00	H	-	-	-78.15	7.58	36.43	-58.83	-13.00	-45.83
8725.00	H	-	-	-79.45	11.08	38.63	-56.63	-13.00	-43.63

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

Bandwidth (MHz):	10
Frequency (MHz):	1775
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]
3550.00	H	-	-	-76.62	-0.35	30.03	-65.22	-13.00	-52.22
5325.00	H	-	-	-78.39	3.09	31.70	-63.56	-13.00	-50.56
7100.00	H	-	-	-78.17	7.58	36.41	-58.85	-13.00	-45.85
8875.00	H	-	-	-79.90	11.04	38.14	-57.12	-13.00	-44.12

Table 7-15. 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/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.

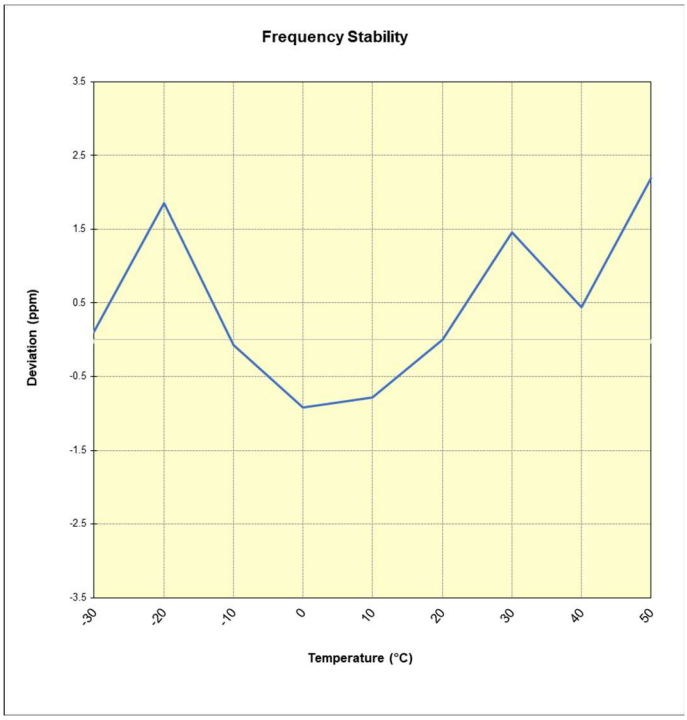
Test Notes

None

LTE Band 12/17	
Operating Frequency (Hz):	707,500,000
Ref. Voltage (VDC):	4.39
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	707,497,314	75	0.0000106
		- 20	707,498,551	1,312	0.0001854
		- 10	707,497,191	-48	-0.0000068
		0	707,496,588	-651	-0.0000920
		+ 10	707,496,683	-556	-0.0000786
		+ 20 (Ref)	707,497,239	0	0.0000000
		+ 30	707,498,271	1,032	0.0001459
		+ 40	707,497,551	312	0.0000441
		+ 50	707,498,788	1,549	0.0002189
Battery Endpoint	3.80	+ 20	707,497,956	717	0.0001013

Table 7-16. LTE Band 12/17 Frequency Stability Data

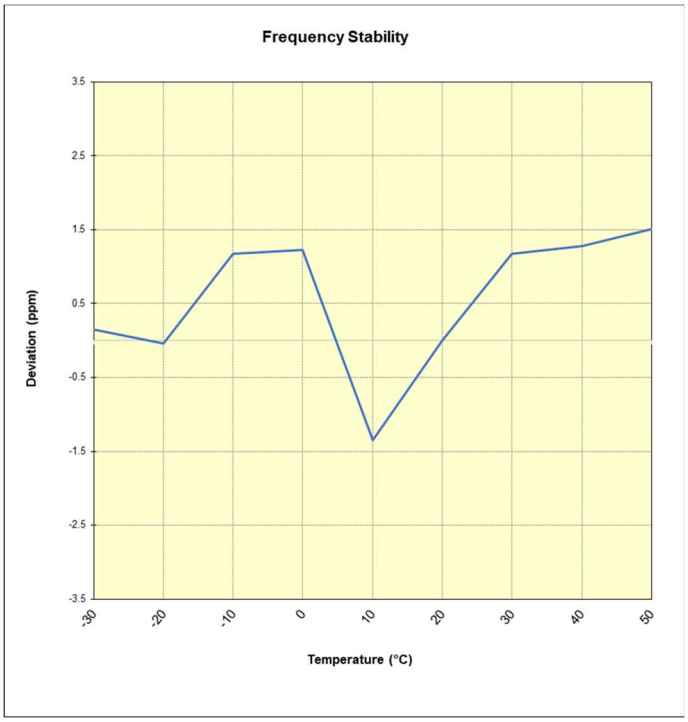


Plot 7-131. LTE Band 12/17 Frequency Stability Chart

LTE Band 13	
Operating Frequency (Hz):	782,000,000
Ref. Voltage (VDC):	4.39
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	782,000,199	118	0.0000151
		- 20	782,000,050	-32	-0.0000040
		- 10	782,000,998	917	0.0001173
		0	782,001,044	963	0.0001231
		+ 10	781,999,028	-1,054	-0.0001347
		+ 20 (Ref)	782,000,081	0	0.0000000
		+ 30	782,000,997	916	0.0001171
		+ 40	782,001,079	998	0.0001276
		+ 50	782,001,262	1,181	0.0001510
Battery Endpoint	3.80	+ 20	782,000,533	452	0.0000578

Table 7-17. LTE Band 13 Frequency Stability Data



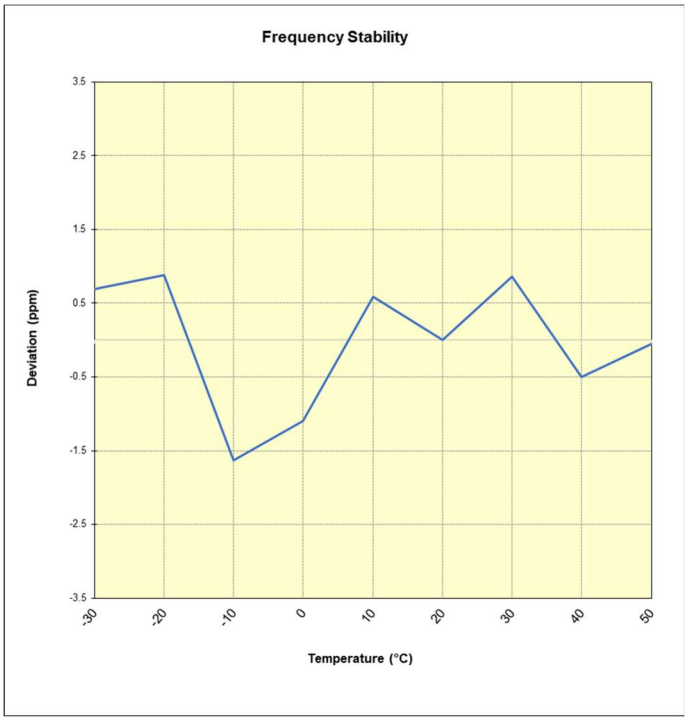
Plot 7-132. LTE Band 13 Frequency Stability Chart

WCDMA AWS

WCDMA AWS	
Operating Frequency (Hz):	1,732,600,000
Ref. Voltage (VDC):	4.39
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	1,880,001,359	1,301	0.0000692
		- 20	1,880,001,720	1,661	0.0000884
		- 10	1,879,996,986	-3,073	-0.0001634
		0	1,879,998,005	-2,054	-0.0001093
		+ 10	1,880,001,158	1,100	0.0000585
		+ 20 (Ref)	1,880,000,059	0	0.0000000
		+ 30	1,880,001,667	1,609	0.0000856
		+ 40	1,879,999,123	-936	-0.0000498
		+ 50	1,879,999,959	-100	-0.0000053
Battery Endpoint	3.80	+ 20	1,880,000,331	273	0.0000145

Table 7-18. WCDMA AWS Frequency Stability Data

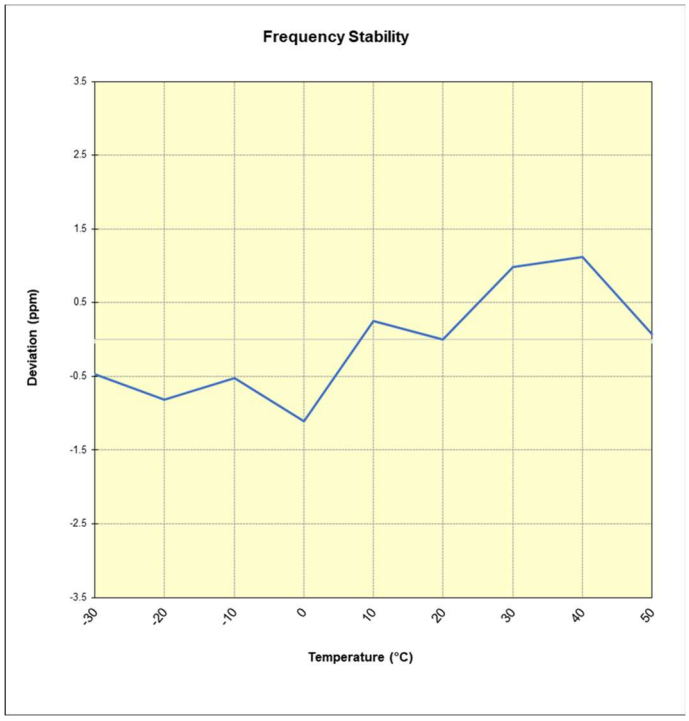


Plot 7-133. WCDMA AWS Frequency Stability Chart

LTE Band 66/4	
Operating Frequency (Hz):	1,745,000,000
Ref. Voltage (VDC):	4.39
Deviation Limit:	± 0.00025% or 2.5 ppm

Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	1,744,998,257	-817	-0.0000468
		- 20	1,744,997,642	-1,432	-0.0000821
		- 10	1,744,998,156	-918	-0.0000526
		0	1,744,997,145	-1,929	-0.0001105
		+ 10	1,744,999,510	436	0.0000250
		+ 20 (Ref)	1,744,999,074	0	0.0000000
		+ 30	1,745,000,789	1,716	0.0000983
		+ 40	1,745,001,024	1,951	0.0001118
		+ 50	1,744,999,206	132	0.0000076
Battery Endpoint	3.80	+ 20	1,745,000,868	1,795	0.0001028

Table 7-19. LTE Band 66/4 Frequency Stability Data



Plot 7-134. LTE Band 66/4 Frequency Stability Chart

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMS908E** complies with all the requirements of Part 27 of the FCC rules.