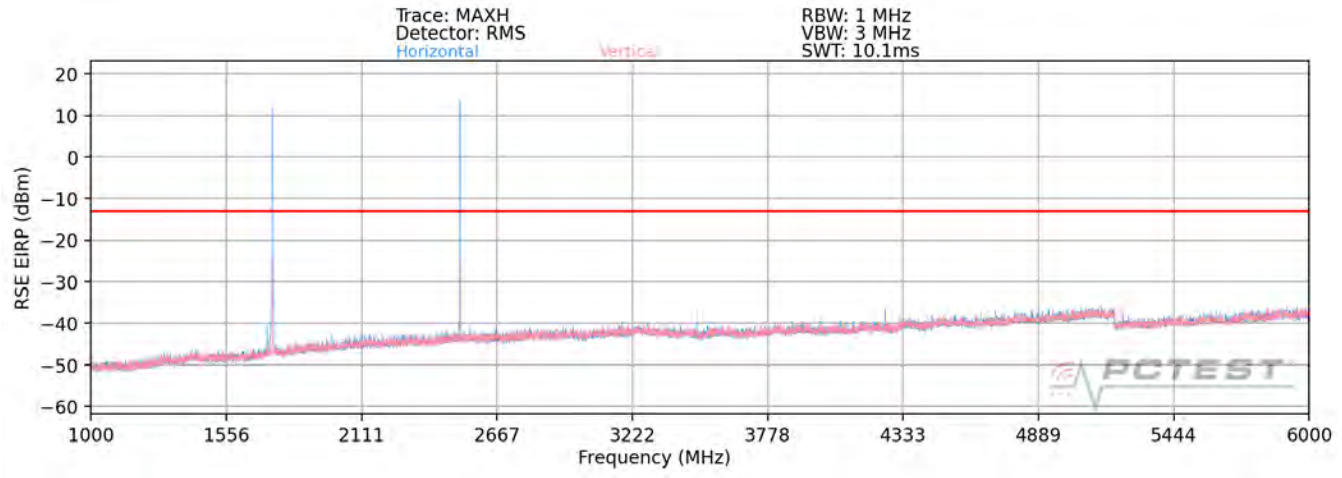
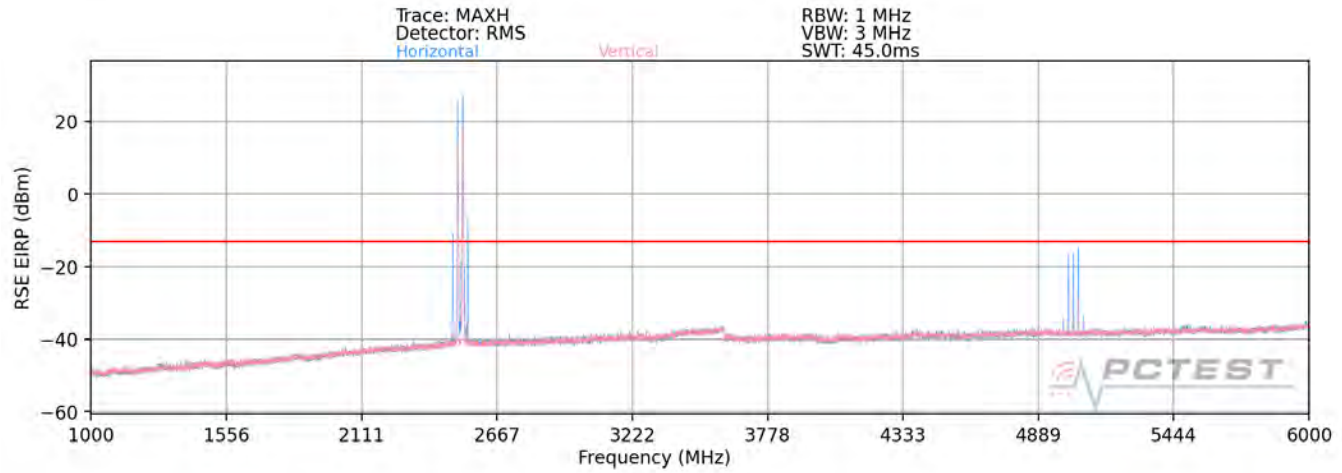


Plot 7-324. Radiated Spurious Plot (NR Band n41 – B66)

Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1 / 136
Mode:	EN-DC
Anchor Band:	LTE Band 66

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	Limit [dBm]	Margin [dB]
1647.0	V	-	-	-66.25	3.81	44.56	-60.24	-25.00	-35.24
3441.0	V	-	-	-78.98	9.95	37.97	-66.83	-25.00	-41.83
4289.0	V	-	-	-79.36	11.52	39.16	-65.64	-25.00	-40.64
5137.0	V	-	-	-80.22	13.63	40.41	-64.39	-25.00	-39.39

Table 7-26. Radiated Spurious Data (NR Band n41 – B66)



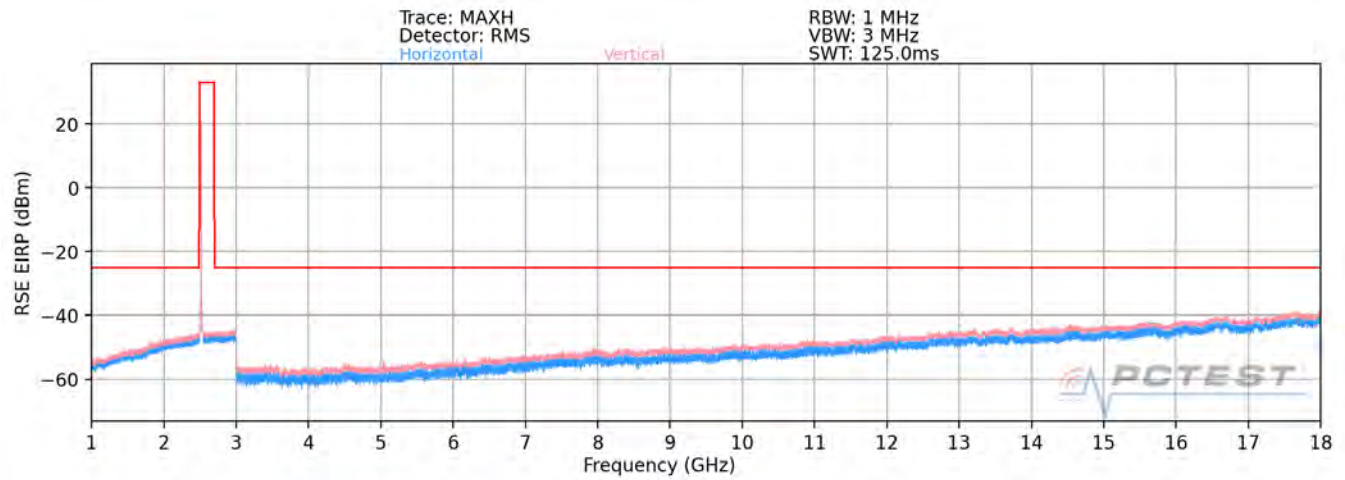
Plot 7-325. Radiated Spurious Plot (NR Band n41 – B41)

Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1 / 136
Mode:	EN-DC
Anchor Band:	LTE Band 41

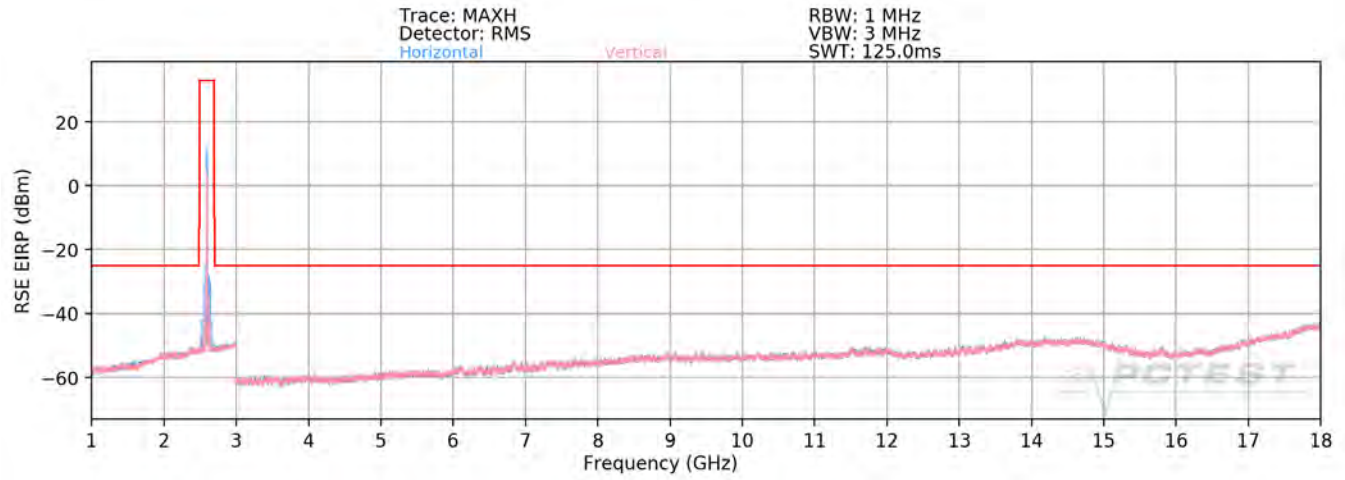
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBuV/m]	EIRP Spurious Emission	Limit [dBm]	Margin [dB]
5186.0	V	126	211	-71.26	4.45	40.19	-64.61	-25.00	-39.61
7779.0	V	136	220	-73.32	8.94	42.62	-62.18	-25.00	-37.18
10372.0	V	-	-	-78.70	11.88	40.18	-64.62	-25.00	-39.62
12965.0	V	-	-	-79.21	15.05	42.84	-61.96	-25.00	-36.96

Table 7-27. Radiated Spurious Data (NR Band n41 – B41)

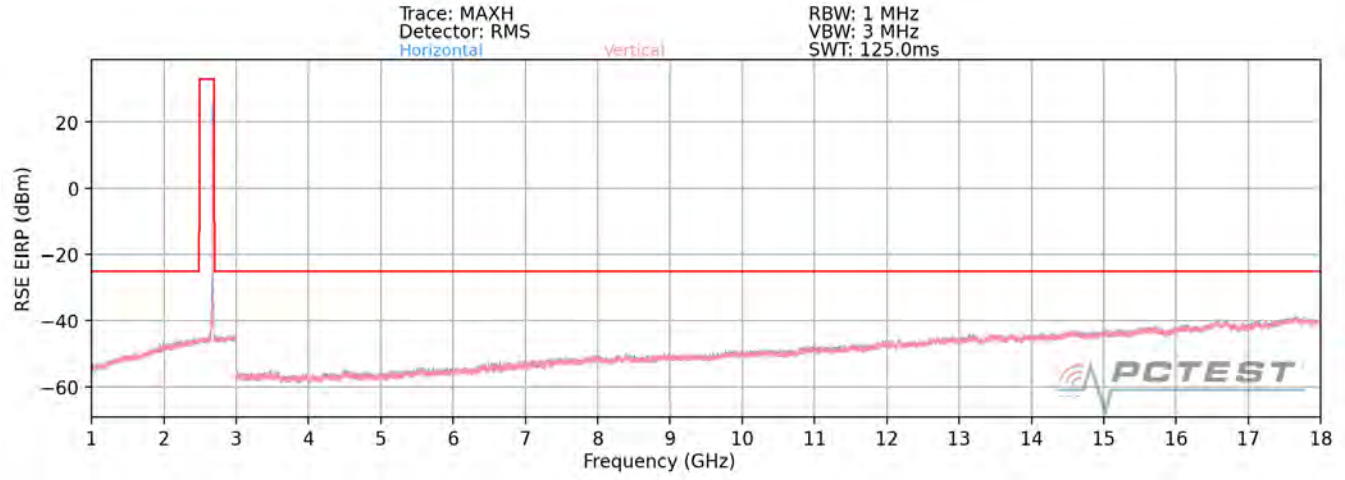
ULCA – LTE B41(PC2)



Plot 7-326. Radiated Spurious Plot (ULCA LTE B41(PC2) – Low)



Plot 7-327. Radiated Spurious Plot (ULCA LTE B41(PC2) – Mid)



Plot 7-328. Radiated Spurious Plot (ULCA LTE B41(PC2) – High)

OPERATING FREQUENCY (PCC):	2506.00	MHz
OPERATING FREQUENCY (SCC):	2525.80	MHz
CHANNEL (PCC):	39750	
CHANNEL (SCC):	39948	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5012.00	V	-	-	-65.06	11.39	-53.68	-28.7
7518.00	V	-	-	-59.42	11.08	-48.34	-23.3
10024.00	V	-	-	-57.93	12.31	-45.62	-20.6

Table 7-28. Radiated Spurious Data (ULCA LTE B41(PC2) – Low Channel)

OPERATING FREQUENCY (PCC):	2593.00	MHz
OPERATING FREQUENCY (SCC):	2612.80	MHz
CHANNEL (PCC):	40620	
CHANNEL (SCC):	40818	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	V	-	-	-62.50	11.02	-51.48	-26.5
7779.00	V	-	-	-60.09	11.49	-48.61	-23.6
10372.00	V	-	-	-58.49	12.66	-45.83	-20.8

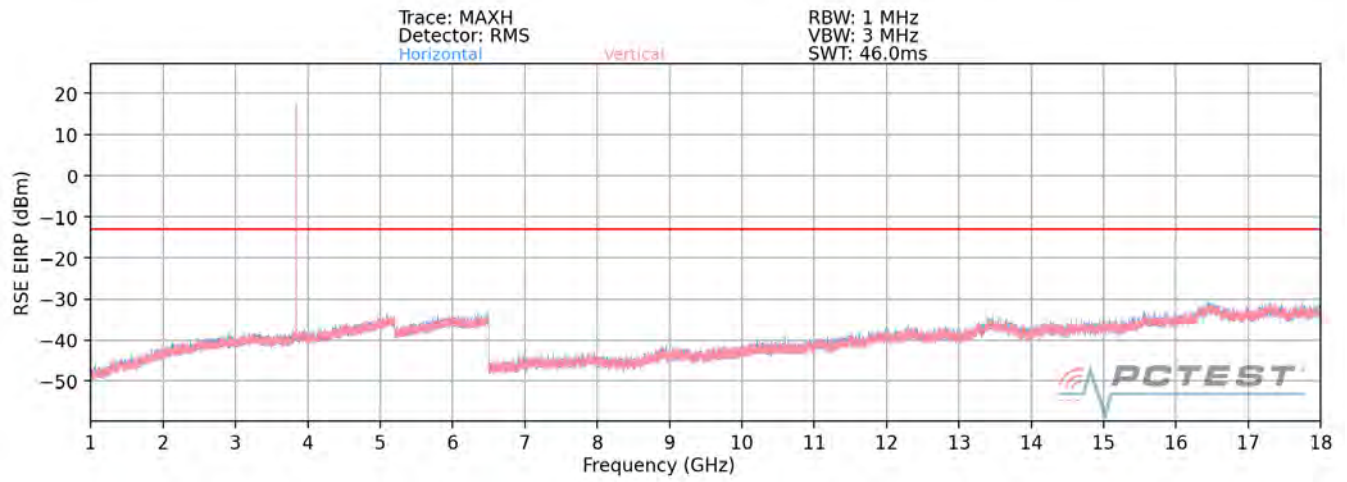
Table 7-29. Radiated Spurious Data (ULCA LTE B41(PC2) – Mid Channel)

OPERATING FREQUENCY (PCC):	2680.00	MHz
OPERATING FREQUENCY (SCC):	2660.20	MHz
CHANNEL (PCC):	41490	
CHANNEL (SCC):	41292	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

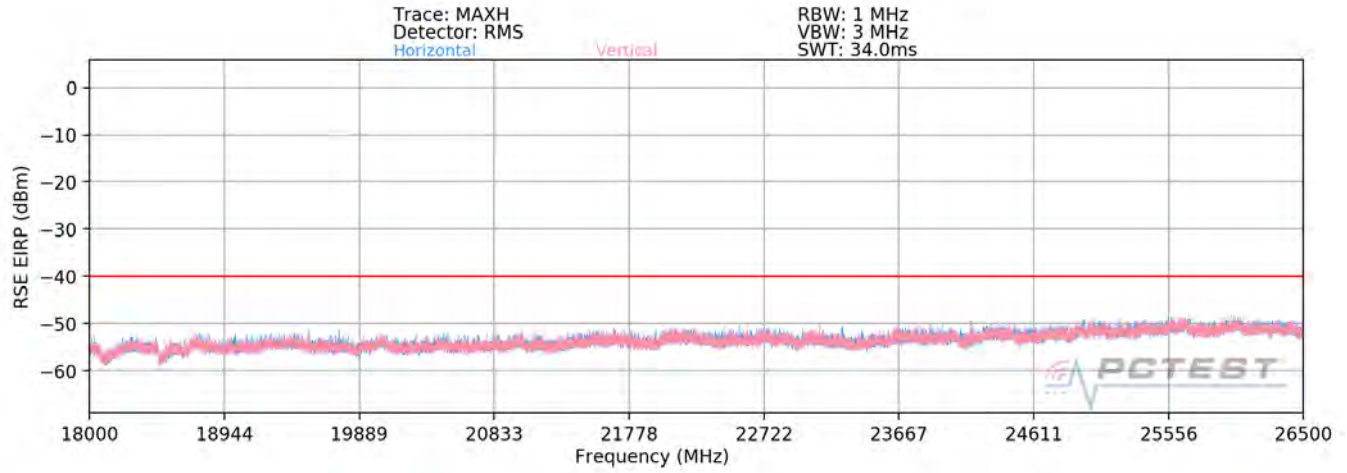
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5360.00	V	-	-	-64.30	11.15	-53.14	-28.1
8040.00	V	-	-	-59.57	11.42	-48.16	-23.2
10720.00	V	-	-	-58.11	12.92	-45.19	-20.2

Table 7-30. Radiated Spurious Data (ULCA LTE B41(PC2) – High Channel)

NR Band n77



Plot 7-329. Radiated Spurious Plot (NR Band n77)



Plot 7-330. Radiated Spurious Plot (NR Band n77)

Case:	n77
Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1 / 136

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]
7500.0	H	112	24	-72.33	15.46	50.13	-54.67	-13.00	-41.67
11250.0	H	-	-	-77.21	20.78	50.57	-54.23	-13.00	-41.23
15000.0	H	-	-	-77.92	26.44	55.52	-49.28	-13.00	-36.28

Table 7-31. Radiated Spurious Data (NR Band n77 – Low Channel)

Case:	n77
Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1 /136

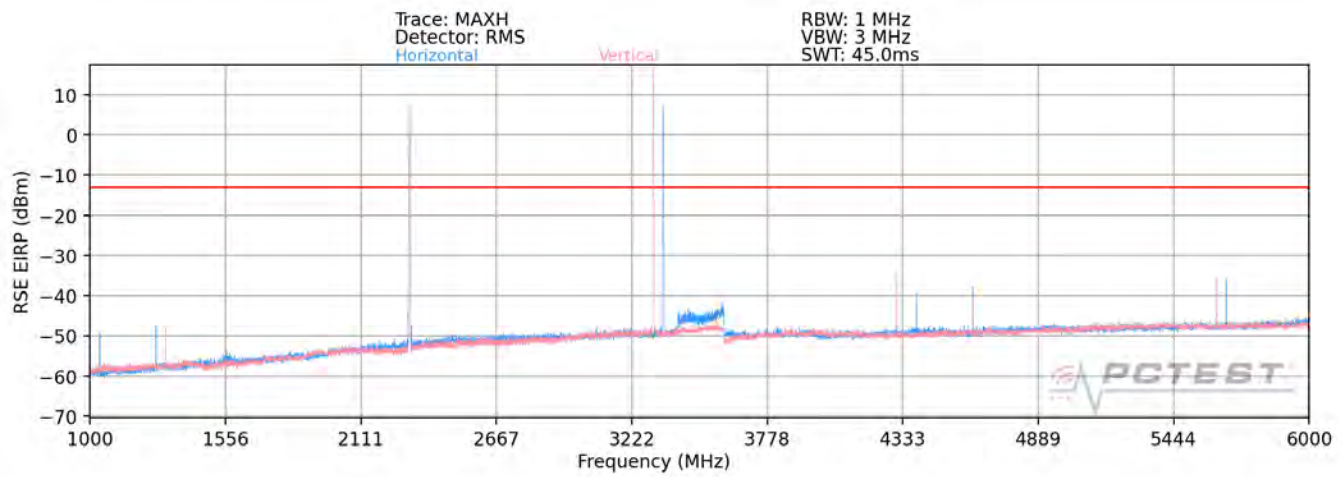
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7680.0	H	108	1	-71.86	15.74	50.88	-53.92	-13.00	-40.92
11520.0	H	-	-	-76.82	21.95	52.13	-52.67	-13.00	-39.67
15360.0	H	-	-	-77.88	27.21	56.33	-48.47	-13.00	-35.47

Table 7-32. Radiated Spurious Data (NR Band n77 – Mid Channel)

Case:	n77
Bandwidth (MHz):	100
Frequency (MHz):	3930.0
RB / Offset:	1 / 136

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]
7860.0	H	116	357	-70.24	15.93	52.69	-52.11	-13.00	-39.11
11790.0	H	-	-	-76.38	21.45	52.07	-52.73	-13.00	-39.73
15720.0	H	-	-	-71.28	27.75	63.47	-41.33	-13.00	-28.33

Table 7-33. Radiated Spurious Data (NR Band n77 – High Channel)

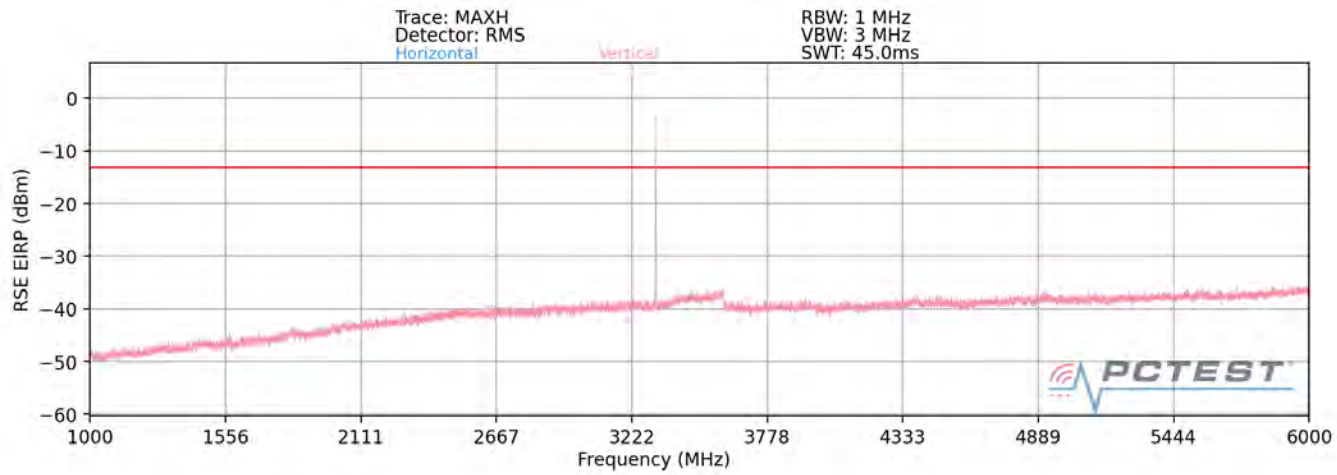


Plot 7-331. Radiated Spurious Plot (NR Band n77 + B30)

Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1 / 136
Mode:	EN-DC

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]
2010.0	H	-	-	-75.41	3.30	34.89	-60.36	-13.00	-47.36
3450.0	H	-	-	-76.21	7.50	38.29	-56.97	-13.00	-43.97
5190.0	H	-	-	-76.45	10.49	41.04	-54.22	-13.00	-41.22

Table 7-34. Radiated Spurious Data (NR Band n77 – B30)



Plot 7-332. Radiated Spurious Plot (NR Band n77 + B12)

Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1 / 136
Mode:	EN-DC

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]
2335.0	H	-	-	-72.14	4.43	39.29	-55.97	-13.00	-42.97
5377.0	H	-	-	-75.99	10.85	41.86	-53.39	-13.00	-40.39
6792.0	H	-	-	-72.33	21.67	56.34	-38.92	-13.00	-25.92

Table 7-35. Radiated Spurious Data (NR Band n77 – B12)

7.9 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.

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 30

OPERATING FREQUENCY:	2,310,000,000	Hz
CHANNEL:	27710	
REFERENCE VOLTAGE:	4.18	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	+ 20 (Ref)	2,310,000,078	78	0.0000034
100 %		- 30	2,310,000,173	173	0.0000075
100 %		- 20	2,309,999,731	-269	-0.0000116
100 %		- 10	2,310,000,076	76	0.0000033
100 %		0	2,310,000,067	67	0.0000029
100 %		+ 10	2,309,999,922	-78	-0.0000034
100 %		+ 20	2,309,999,793	-207	-0.0000090
100 %		+ 30	2,309,999,913	-87	-0.0000038
100 %		+ 40	2,309,999,796	-204	-0.0000088
100 %		+ 50	2,310,000,293	293	0.0000127
BATT. ENDPOINT	2.98	+ 20	2,310,000,196	196	0.0000085

Table 7-9. LTE Band 30 Frequency Stability Data

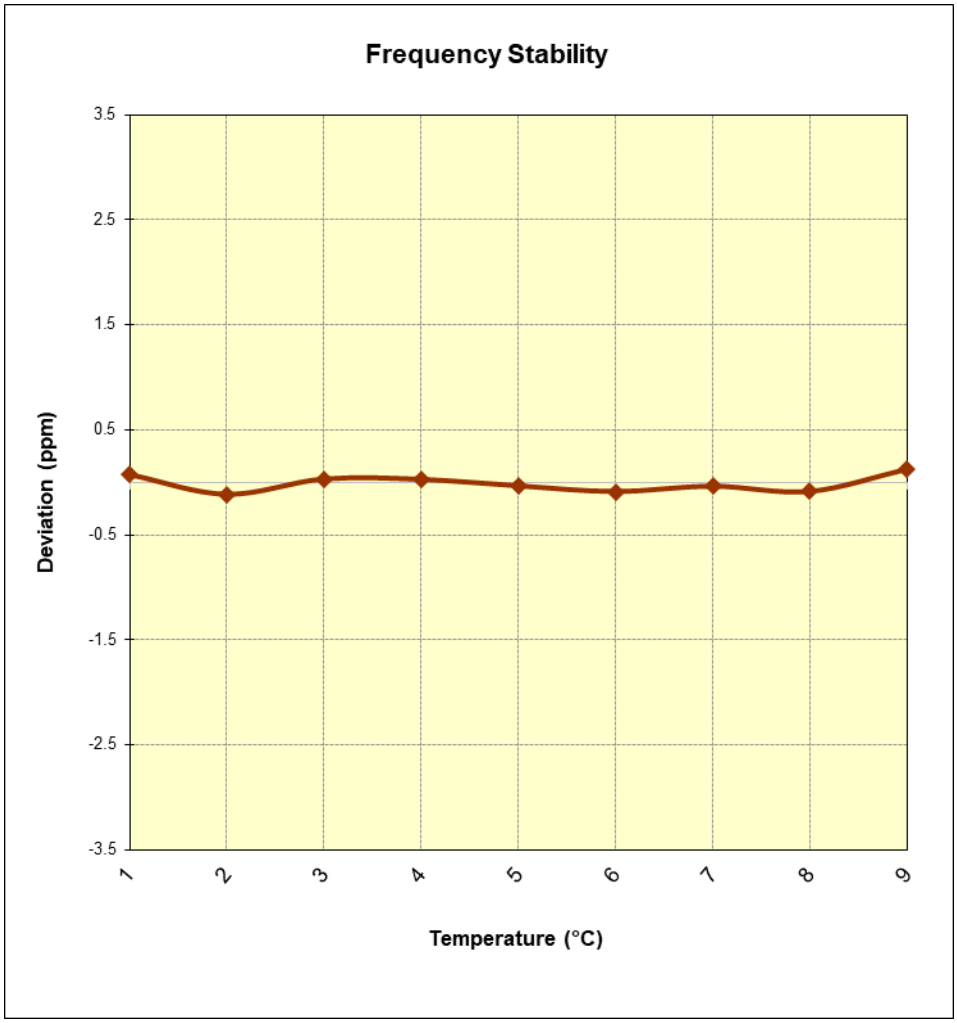


Table 7-9. LTE Band 30 Frequency Stability Chart

LTE Band 7

OPERATING FREQUENCY:	2,535,000,000	Hz
CHANNEL:	21100	
REFERENCE VOLTAGE:	4.18	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	+ 20 (Ref)	2,535,000,007	7	0.0000003
100 %		- 30	2,535,000,029	29	0.0000011
100 %		- 20	2,534,999,997	-3	-0.0000001
100 %		- 10	2,535,000,117	117	0.0000046
100 %		0	2,534,999,900	-100	-0.0000039
100 %		+ 10	2,535,000,127	127	0.0000050
100 %		+ 20	2,535,000,040	40	0.0000016
100 %		+ 30	2,535,000,018	18	0.0000007
100 %		+ 40	2,534,999,856	-144	-0.0000057
100 %		+ 50	2,534,999,869	-131	-0.0000052
BATT. ENDPOINT	2.98	+ 20	2,534,999,850	-150	-0.0000059

Table 7-9. LTE Band 7 Frequency Stability Data

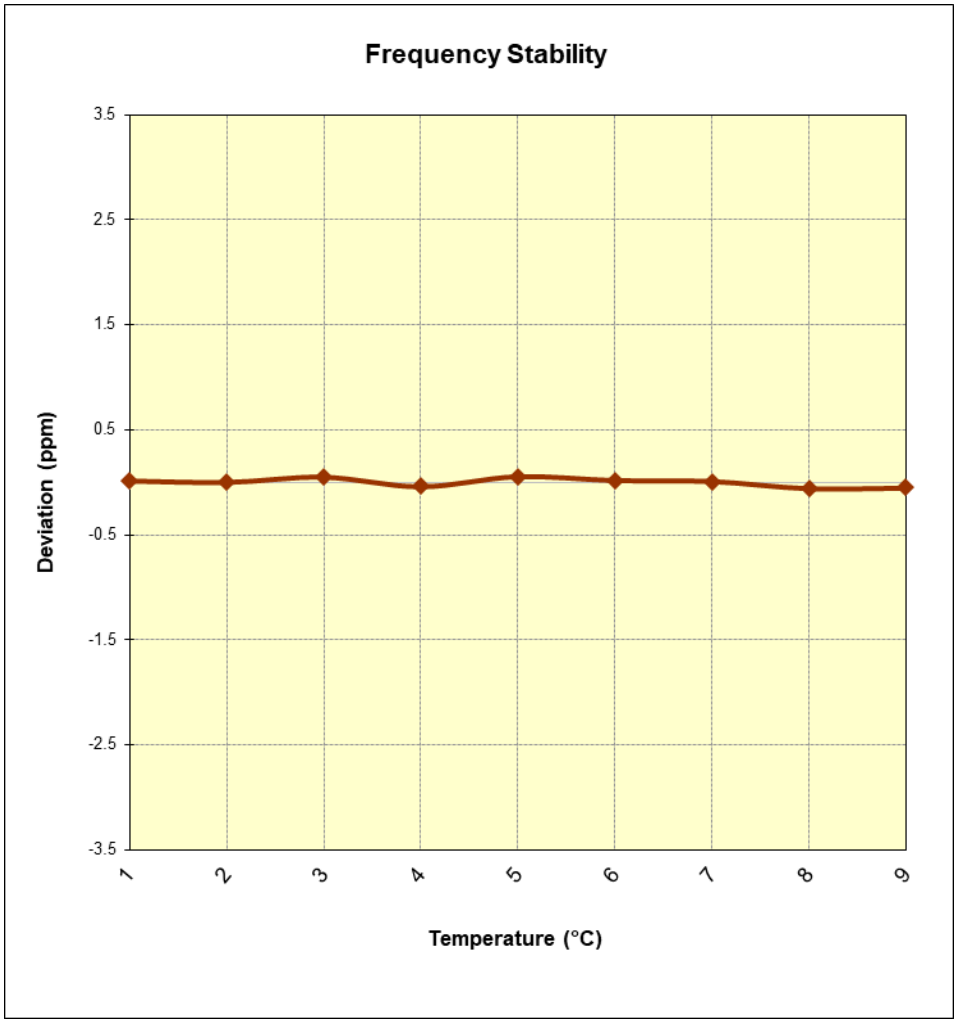


Table 7-9. LTE Band 7 Frequency Stability Chart

LTE Band 41

OPERATING FREQUENCY:	2,593,000,000	Hz
CHANNEL:	40620	
REFERENCE VOLTAGE:	4.18	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	+ 20 (Ref)	2,593,000,246	246	0.0000095
100 %		- 30	2,592,999,877	-123	-0.0000047
100 %		- 20	2,593,000,009	9	0.0000003
100 %		- 10	2,592,999,849	-151	-0.0000058
100 %		0	2,593,000,049	49	0.0000019
100 %		+ 10	2,593,000,021	21	0.0000008
100 %		+ 20	2,592,999,791	-209	-0.0000081
100 %		+ 30	2,593,000,021	21	0.0000008
100 %		+ 40	2,592,999,889	-111	-0.0000043
100 %		+ 50	2,592,999,918	-82	-0.0000032
BATT. ENDPOINT	2.98	+ 20	2,593,000,214	214	0.0000083

Table 7-9. LTE Band 41(PC2) Frequency Stability Data

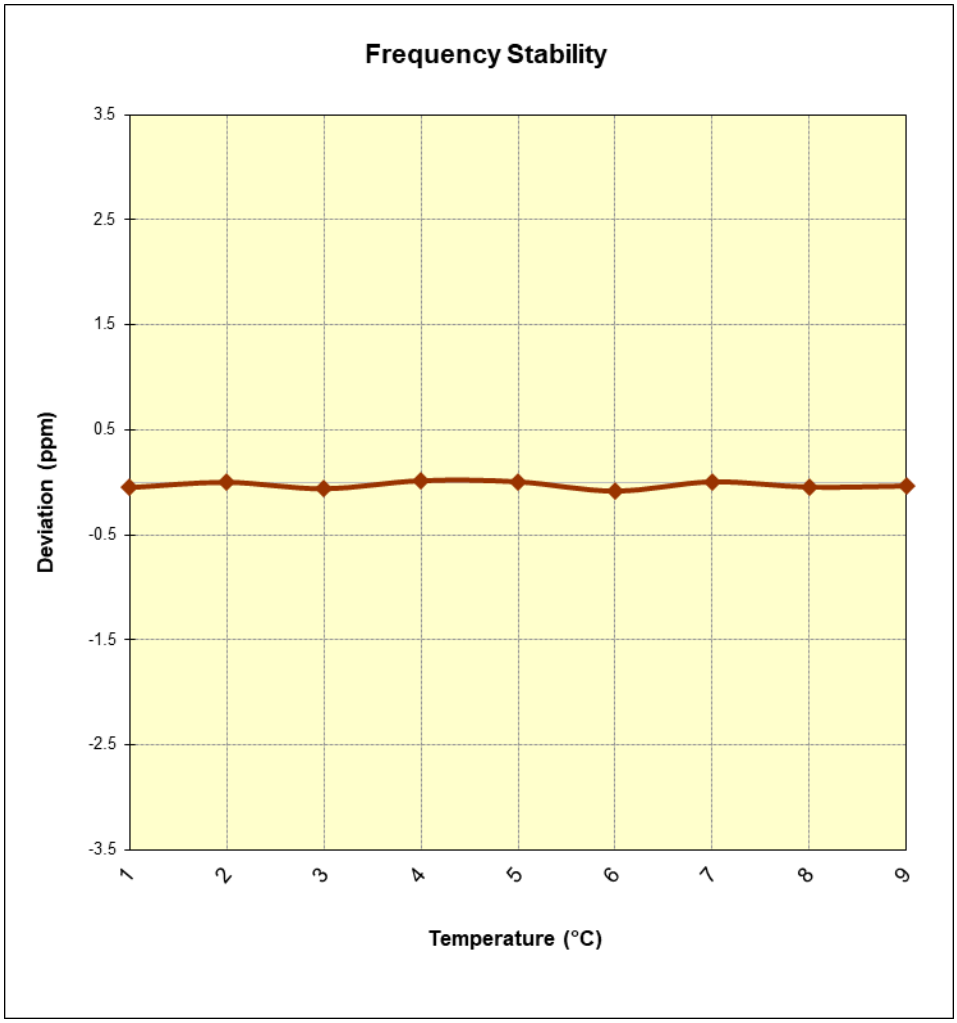


Table 7-9. LTE Band 41(PC2) Frequency Stability Chart

NR Band n41

OPERATING FREQUENCY:	2,593,000,000	Hz
CHANNEL:	40620	
REFERENCE VOLTAGE:	4.18	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	+ 20 (Ref)	2,592,999,733	-267	-0.0000103
100 %		- 30	2,593,000,367	367	0.0000142
100 %		- 20	2,593,000,028	28	0.0000011
100 %		- 10	2,592,999,741	-259	-0.0000100
100 %		0	2,592,999,708	-292	-0.0000113
100 %		+ 10	2,592,999,841	-159	-0.0000061
100 %		+ 20	2,593,000,025	25	0.0000010
100 %		+ 30	2,593,000,074	74	0.0000029
100 %		+ 40	2,593,000,153	153	0.0000059
100 %		+ 50	2,593,000,145	145	0.0000056
BATT. ENDPOINT	2.98	+ 20	2,593,000,435	435	0.0000168

Table 7-9. NR Band n41 Frequency Stability Data

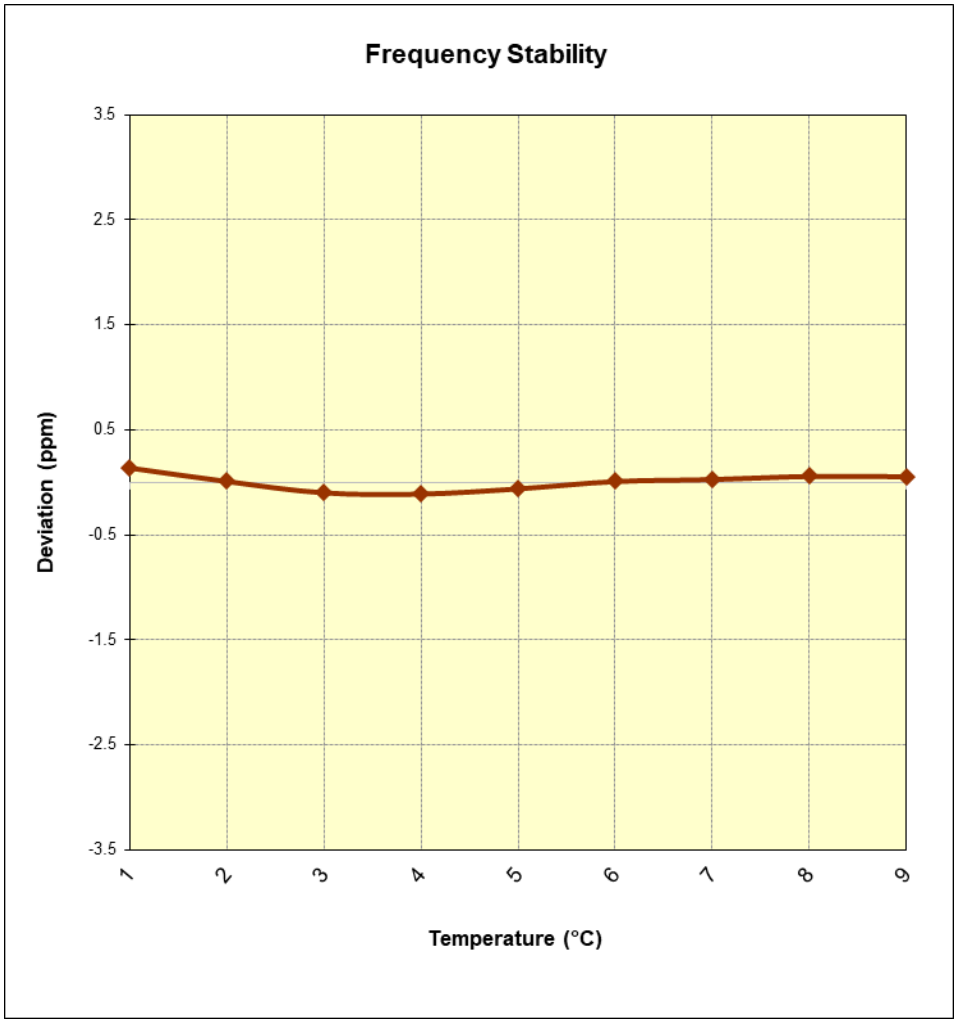


Table 7-9. NR Band n41 Frequency Stability Chart

NR Band n77

OPERATING FREQUENCY:	3,840,000,000	Hz
CHANNEL:	650000	
REFERENCE VOLTAGE:	4.18	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.18	+ 20 (Ref)	3,839,999,918	-82	-0.0000021
100 %		- 30	3,840,000,438	438	0.0000114
100 %		- 20	3,840,000,188	188	0.0000049
100 %		- 10	3,840,000,195	195	0.0000051
100 %		0	3,840,000,239	239	0.0000062
100 %		+ 10	3,839,999,801	-199	-0.0000052
100 %		+ 20	3,840,000,170	170	0.0000044
100 %		+ 30	3,839,999,792	-208	-0.0000054
100 %		+ 40	3,840,000,172	172	0.0000045
100 %		+ 50	3,840,000,144	144	0.0000038
BATT. ENDPOINT	2.98	+ 20	3,840,000,081	81	0.0000021

Table 7-9. NR Band n77 Frequency Stability Data

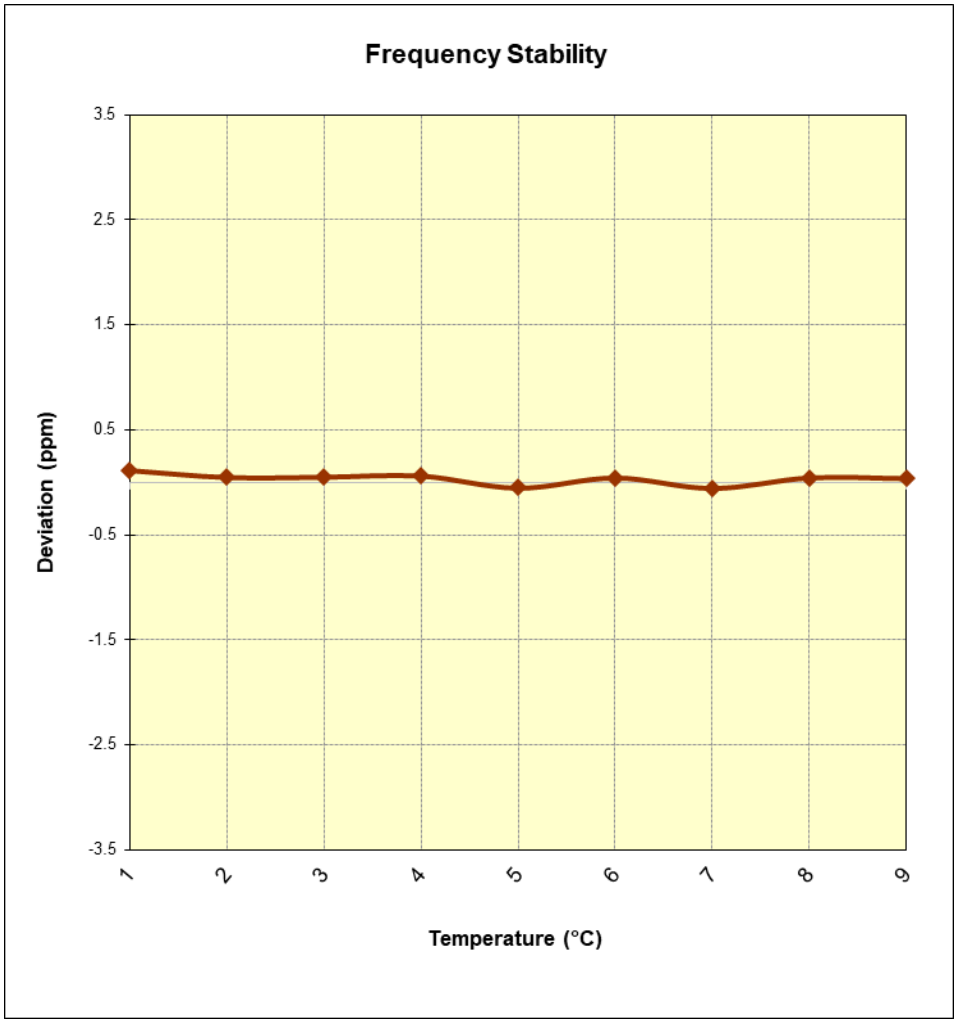


Table 7-9. NR Band n77 Frequency Stability Chart

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the Samsung **Portable Handset FCC ID: A3LSMG998U** complies with all the requirements of Part 27 of the FCC rules.