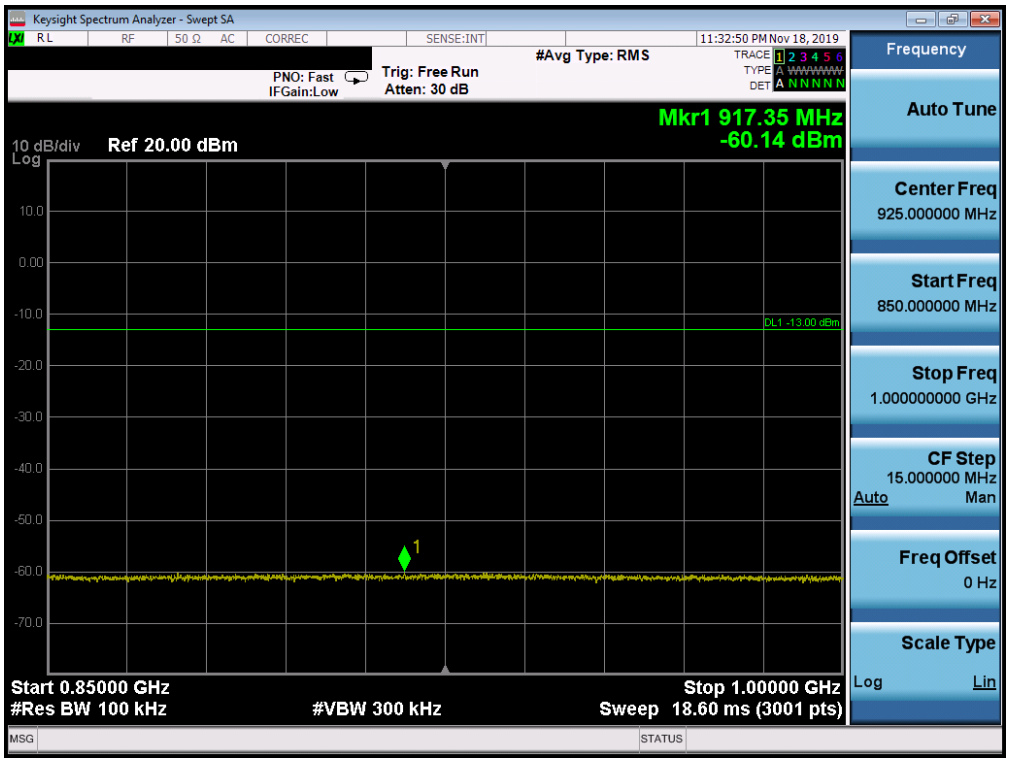
Plot 7-508. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/0 SCC 1/49 – High Channel)



Plot 7-509. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/0 SCC 1/49 – High Channel)

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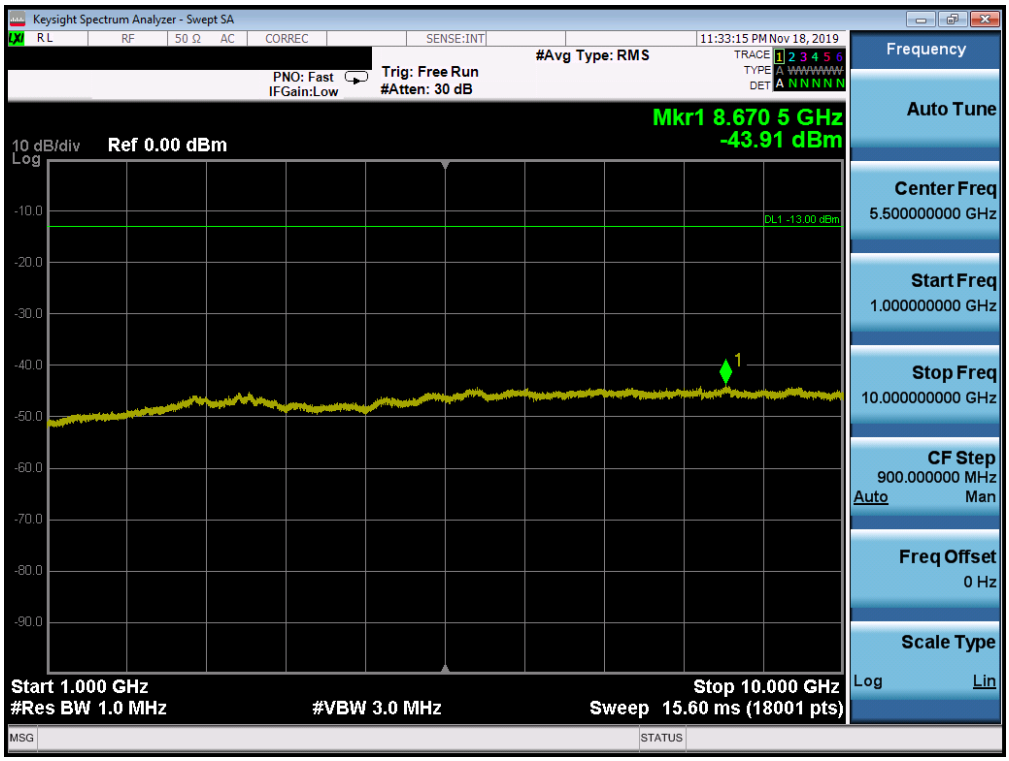

Plot 7-510. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/0 SCC 1/49 – High Channel)

Plot 7-511. Lower Band Edge Plot (Band 5 QPSK – PCC:10 MHz SCC:10 MHz – Full RB)

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Plot 7-512. Upper Band Edge Plot (Band 5 QPSK – PCC:10 MHz SCC:10 MHz – Full RB)

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Uplink CA Configuration 66B/C

Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B66	20	132072	1720	QPSK	1	99	LTE B66	20	132270	1739.8	QPSK	1	0	23.96
Max	LTE B66	20	132322	1745	QPSK	1	99	LTE B66	20	132520	1764.8	QPSK	1	0	24.06
Max	LTE B66	20	132572	1770	QPSK	1	0	LTE B66	20	132374	1750.2	QPSK	1	99	24.11

Table 7-5. Conducted Powers (B66 – 20MHz + 20MHz Channel Bandwidth – PCC/SCC: RB Size 1)

Power State	PCC							SCC							Power
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B66	20	132572	1770	QPSK	100	0	LTE B66	20	132770	1789.8	QPSK	100	0	22.14
Max	LTE B66	20	132572	1770	16-QAM	100	0	LTE B66	20	132770	1789.8	16-QAM	100	0	21.15
Max	LTE B66	20	132572	1770	64-QAM	100	0	LTE B66	20	132770	1789.8	64-QAM	100	0	20.86
Max	LTE B66	20	132572	1770	256-QAM	100	0	LTE B66	20	132770	1789.8	256-QAM	100	0	18.42

Table 7-6. Conducted Powers (B66 with Various Combinations for 20MHz + 20MHz Channel Bandwidth)

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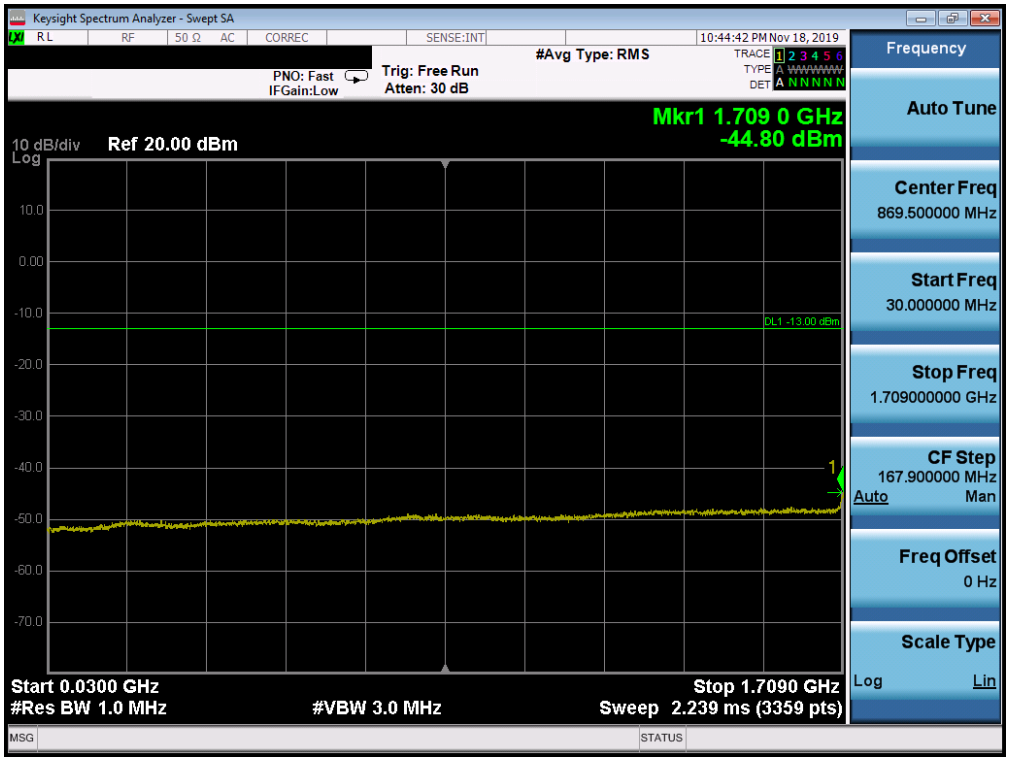
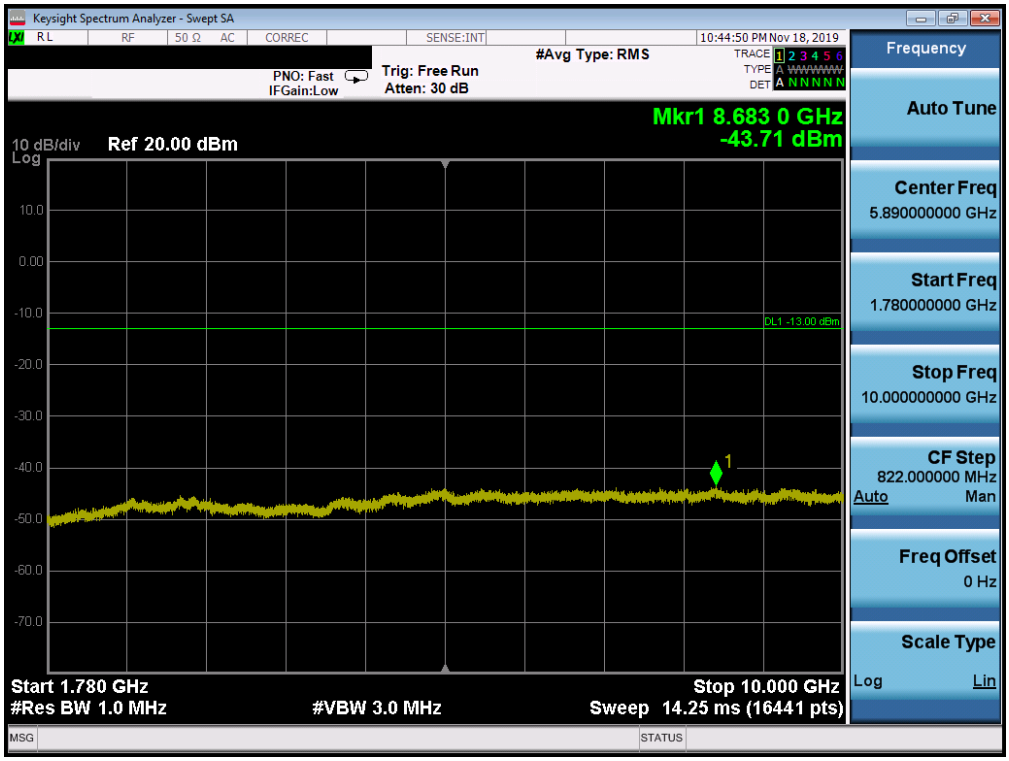


Plot 7-513. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Low Channel)



Plot 7-514. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Low Channel)

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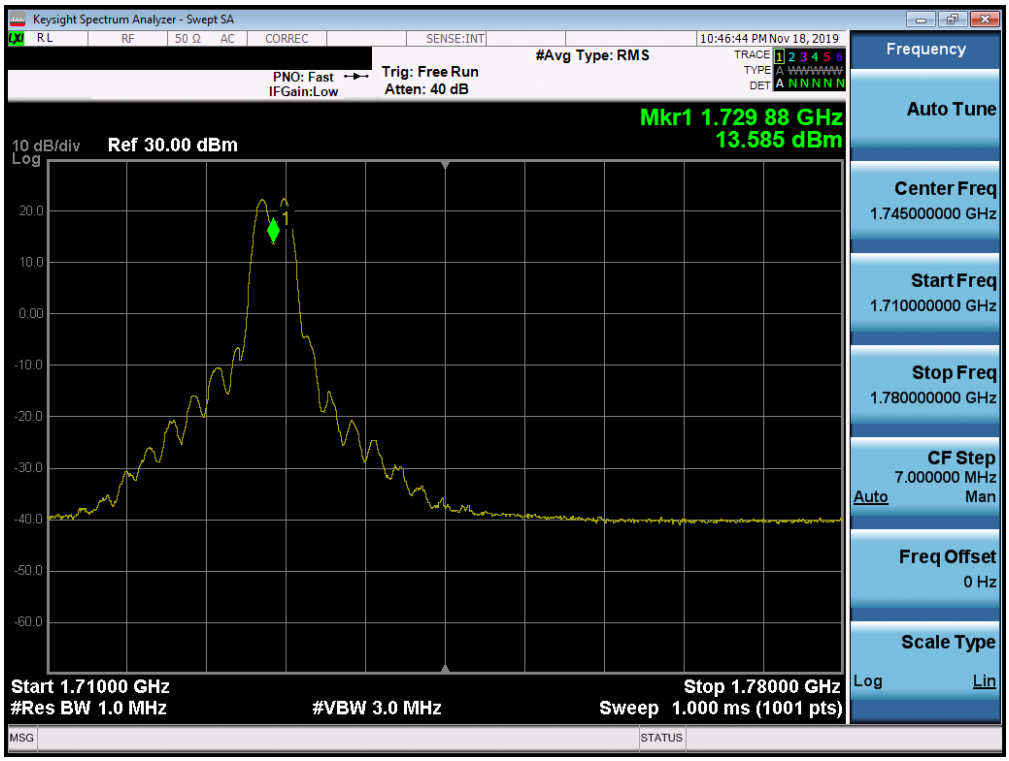

Plot 7-515. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Low Channel)

Plot 7-516. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Low Channel)

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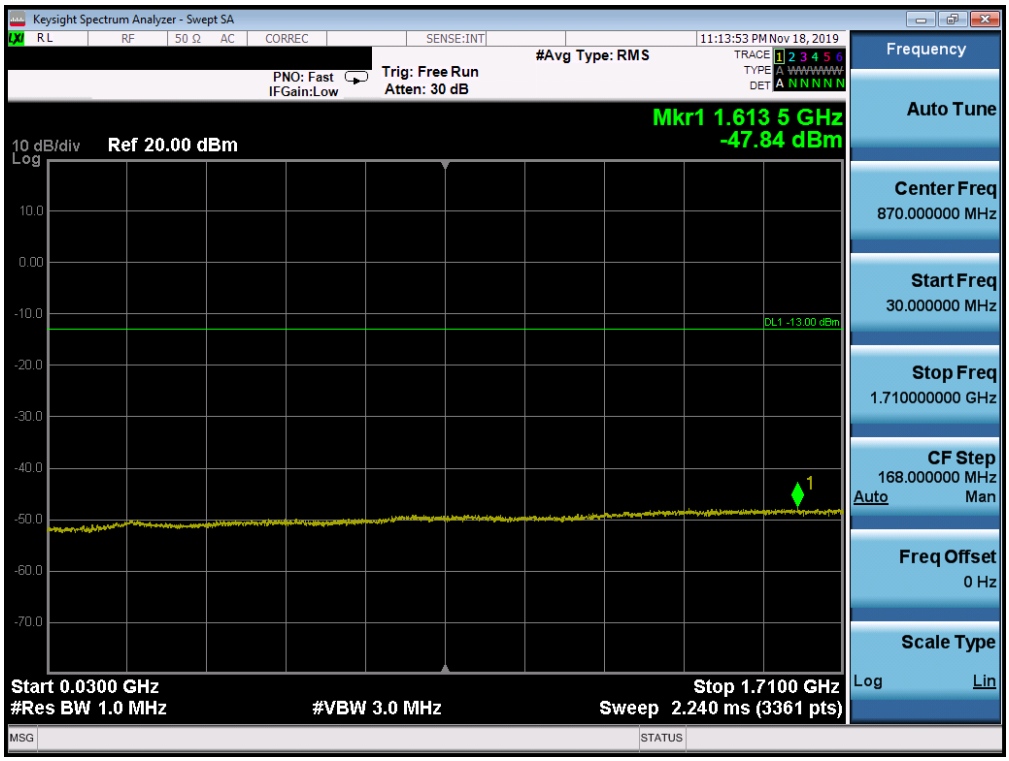
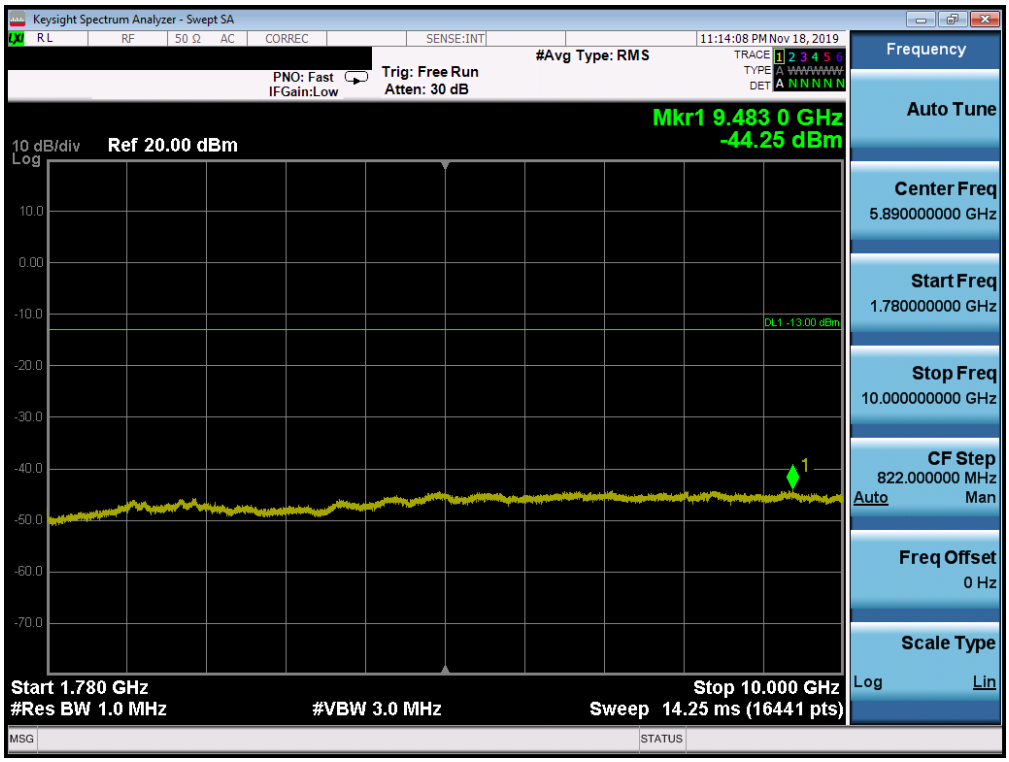


Plot 7-517. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)



Plot 7-518. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

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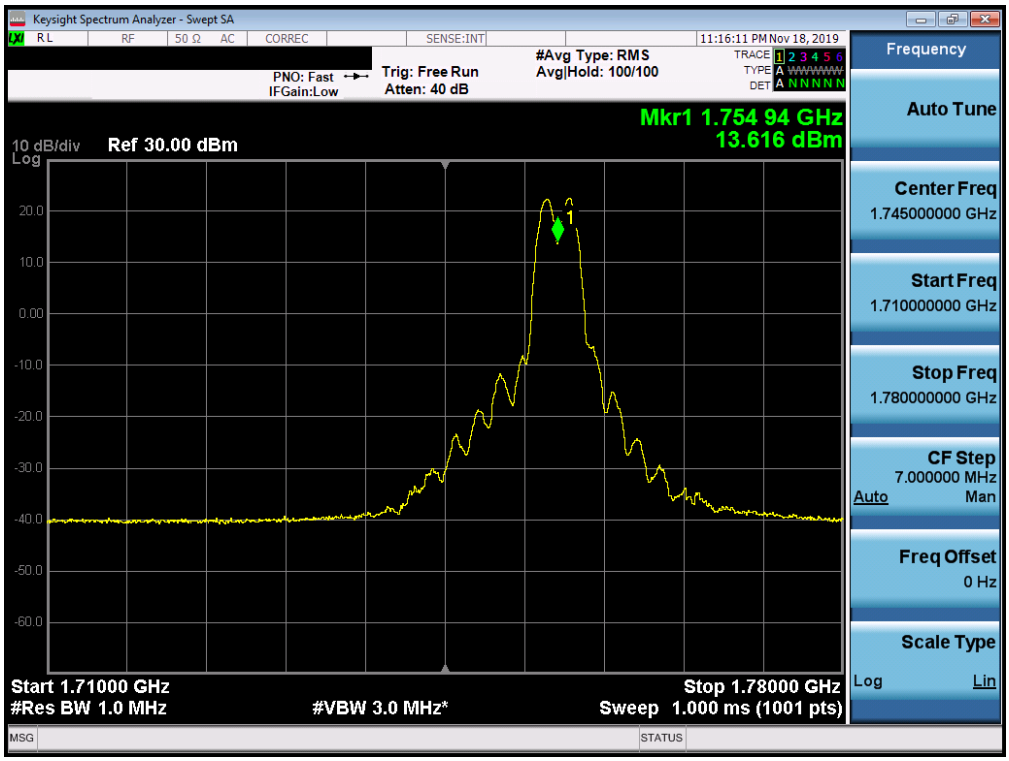

Plot 7-519. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

Plot 7-520. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

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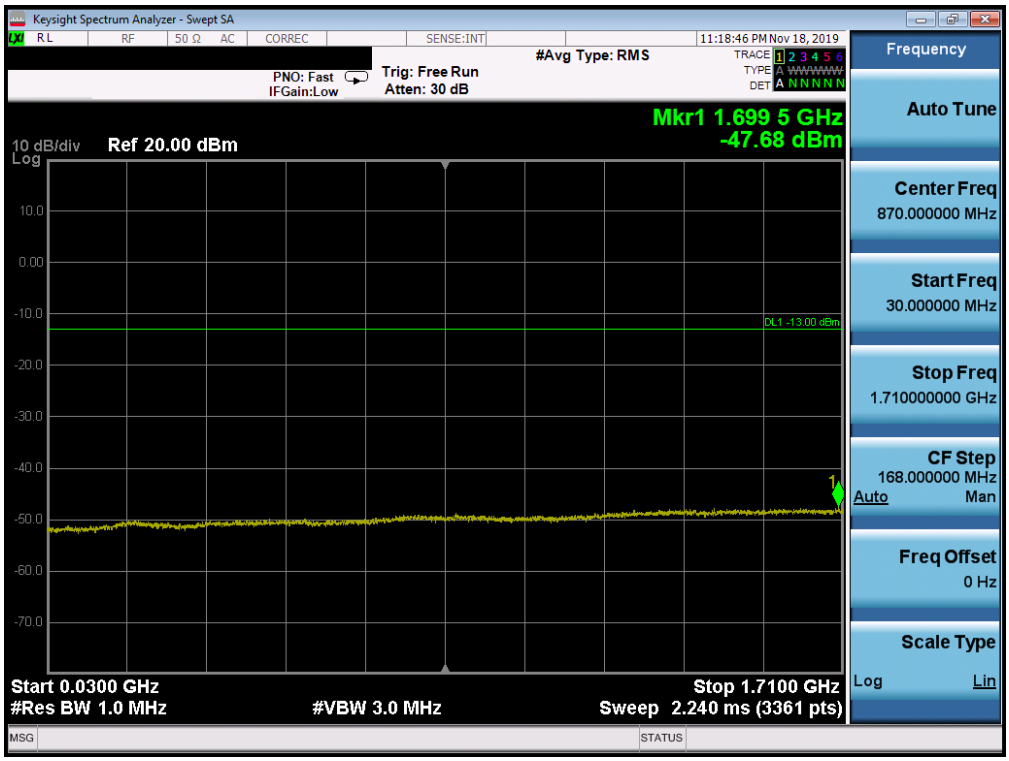
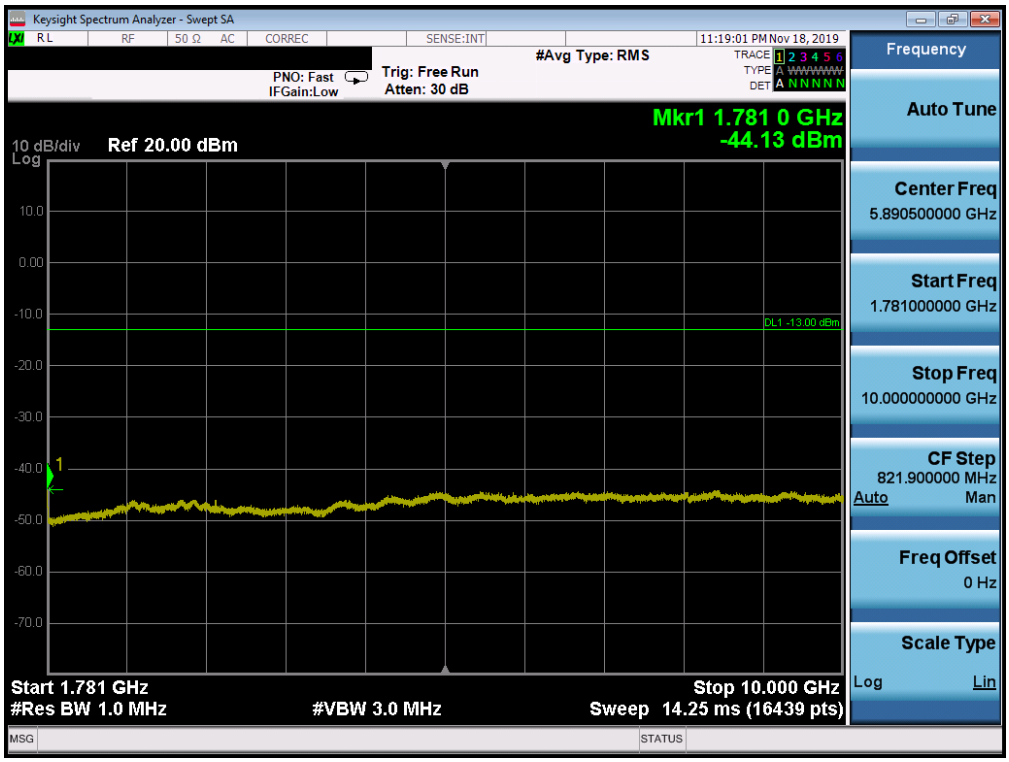


Plot 7-521. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)



Plot 7-522. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)

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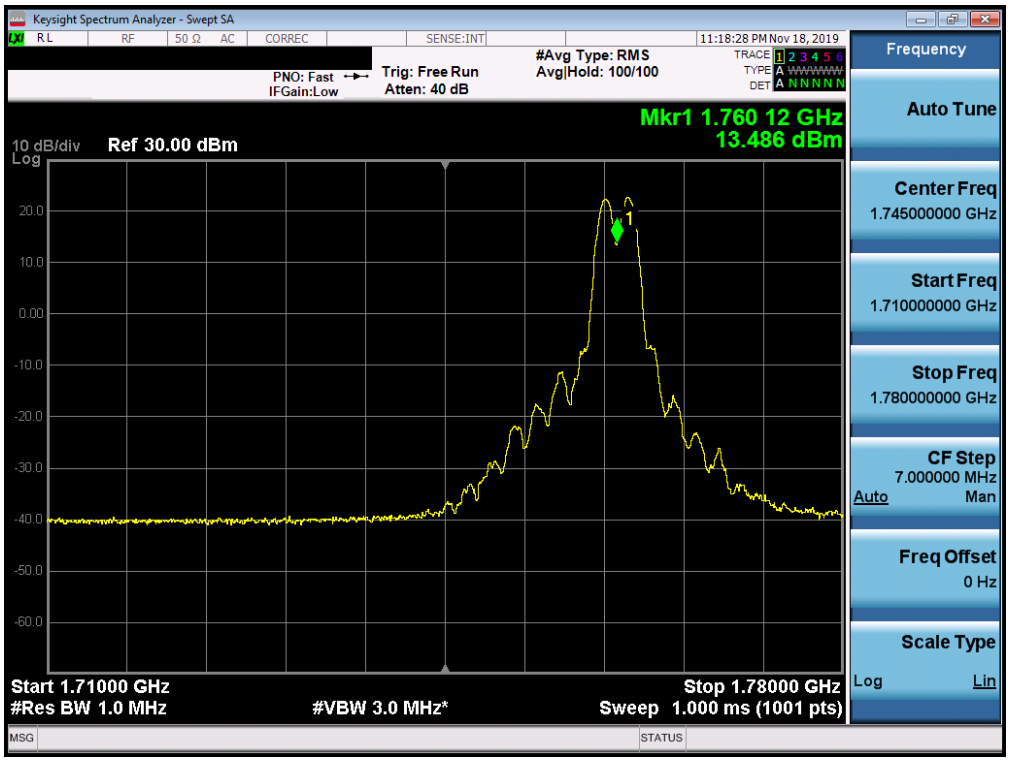

Plot 7-523. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)

Plot 7-524. Conducted Spurious Plot (Band 66 – 20.0MHz QPSK – PCC 1/0 SCC 1/99 – High Channel)

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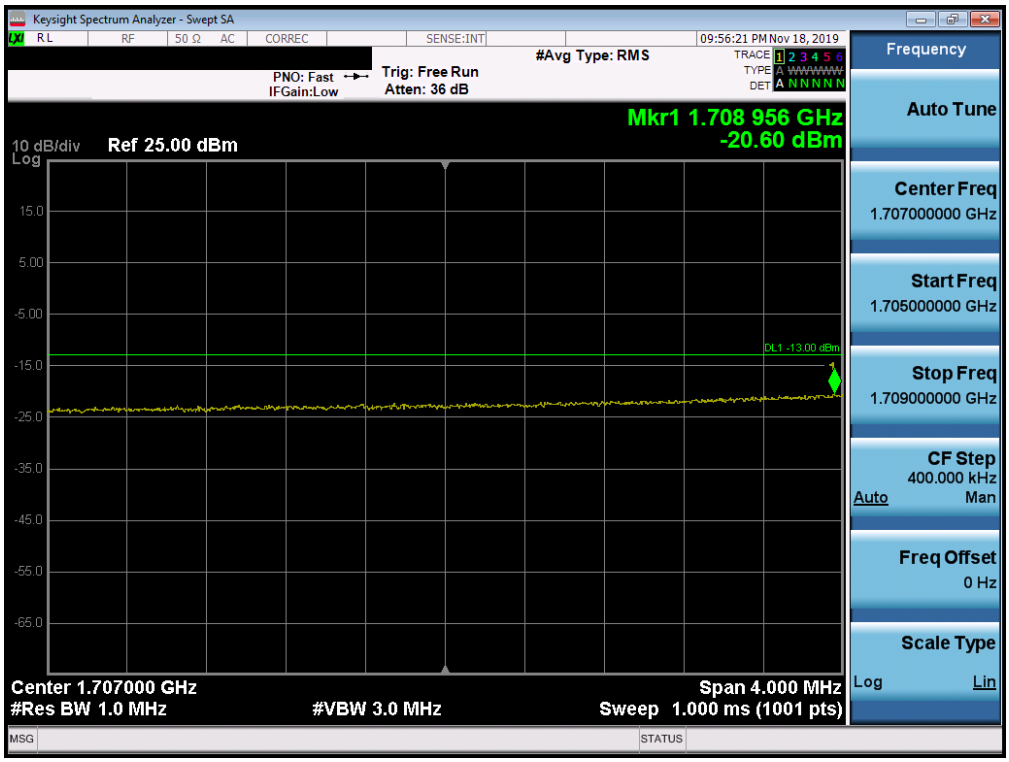
Plot 7-525. Lower Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)



Plot 7-526. Extended Lower Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

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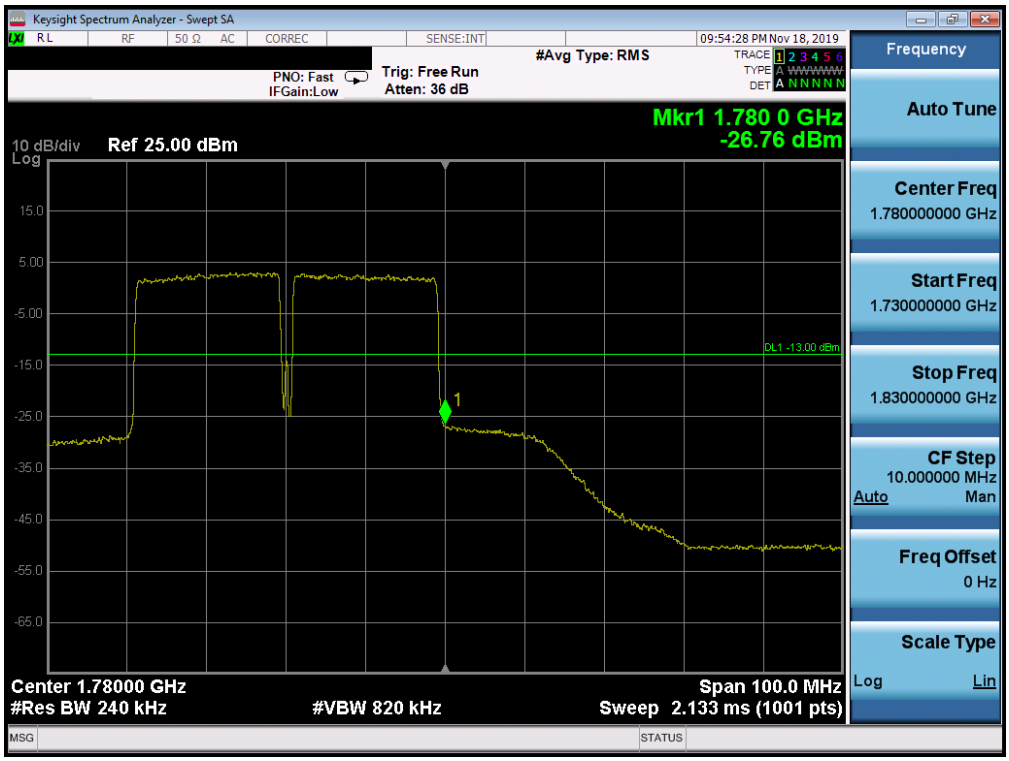
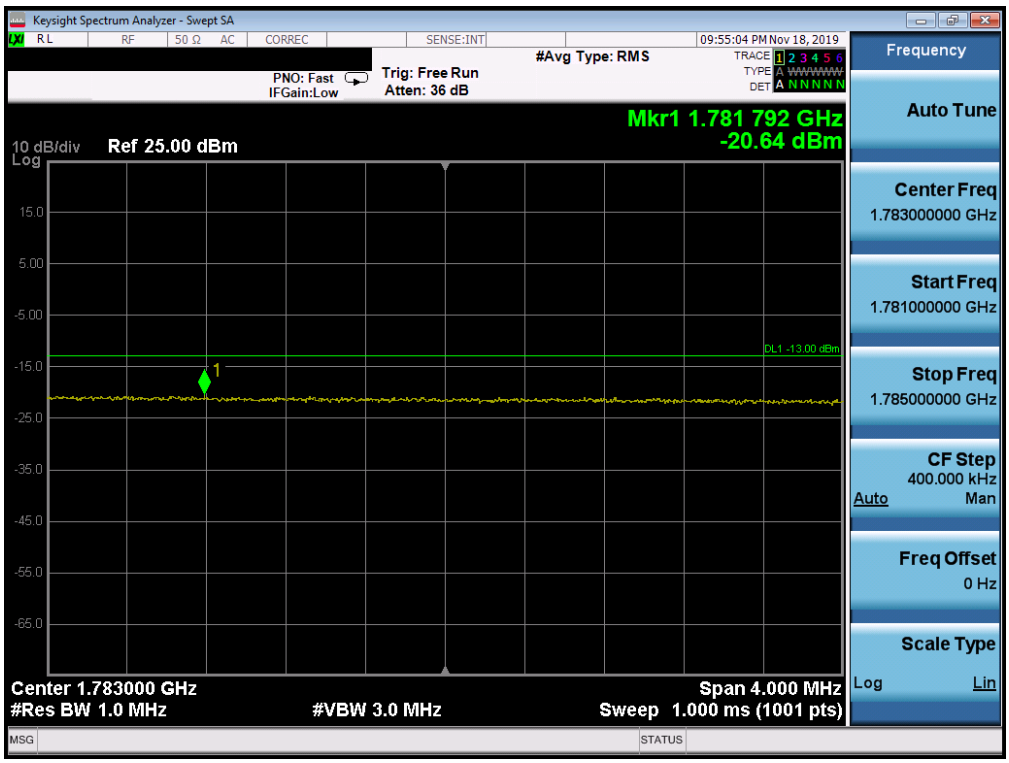


Plot 7-527. Upper Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)



Plot 7-528. Extended Upper Band Edge Plot (Band 66 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

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7.7 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 its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

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

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Test Setup

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

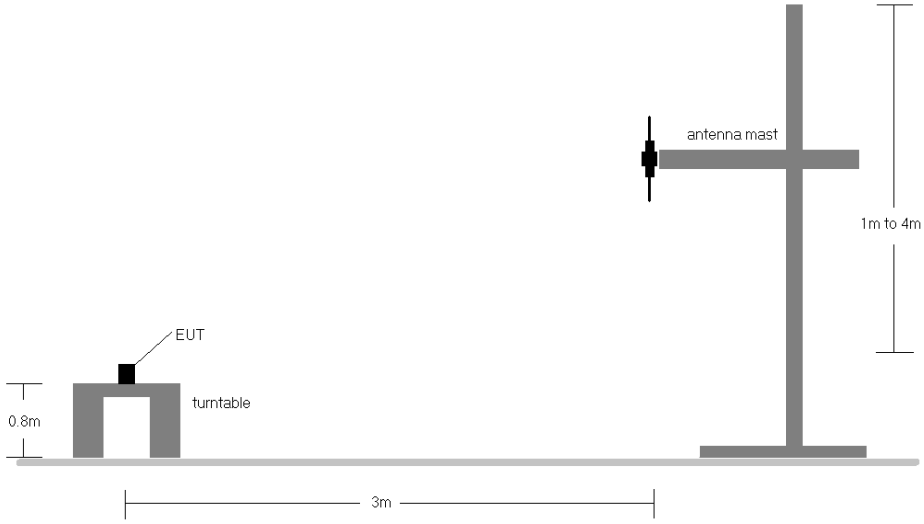

Figure 7-6. Radiated Test Setup <1GHz

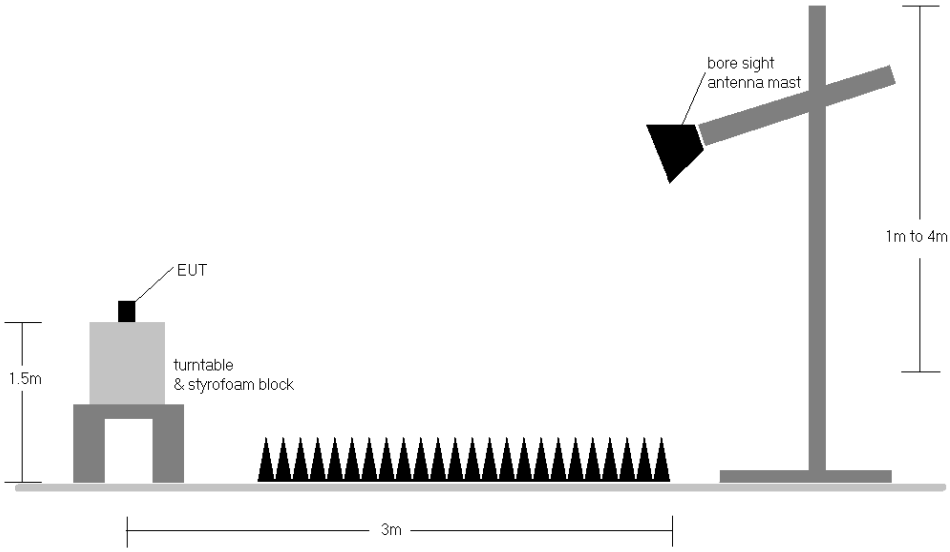

Figure 7-7. Radiated Test Setup >1GHz

Test Notes

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

2) This unit was tested with its standard battery.

3) All SCS's and Waveforms (CP-OFDM vs DFT-s OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section. Additional Data added representing other configurations (eg. CP-OFDM).

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	171	228	1 / 2	14.86	4.56	17.27	0.053	34.77	-17.50
707.50	1.4	QPSK	V	167	230	1 / 2	15.56	4.62	18.03	0.064	34.77	-16.74
715.30	1.4	QPSK	V	169	232	1 / 2	15.85	4.72	**18.42**	**0.069**	34.77	-16.35
715.30	1.4	16-QAM	V	169	232	1 / 2	15.00	4.72	**17.57**	0.057	34.77	-17.20
715.30	1.4	64-QAM	V	169	232	1 / 2	13.96	4.72	**16.53**	0.045	34.77	-18.24
715.30	1.4	256-QAM	V	169	232	1 / 2	11.30	4.72	**13.87**	**0.024**	34.77	-20.90
700.50	3	QPSK	V	171	228	1 / 7	14.84	4.59	17.28	0.053	34.77	-17.49
707.50	3	QPSK	V	167	230	1 / 7	15.55	4.62	18.02	0.063	34.77	-16.75
714.50	3	QPSK	V	169	232	1 / 0	15.70	4.71	**18.26**	0.067	34.77	-16.51
714.50	3	16-QAM	V	169	232	1 / 0	14.88	4.71	**17.44**	0.055	34.77	-17.33
714.50	3	64-QAM	V	169	232	1 / 0	13.90	4.71	**16.46**	0.044	34.77	-18.31
714.50	3	256-QAM	V	169	232	1 / 0	11.63	4.71	**14.19**	**0.026**	34.77	-20.58
701.50	5	QPSK	V	169	210	1 / 24	14.24	4.60	16.69	0.047	34.77	-18.08
707.50	5	QPSK	V	167	211	1 / 24	14.66	4.62	17.13	0.052	34.77	-17.64
713.50	5	QPSK	V	169	230	1 / 24	15.61	4.70	**18.16**	0.065	34.77	-16.61
713.50	5	16-QAM	V	169	230	1 / 24	14.76	4.70	**17.31**	0.054	34.77	-17.46
713.50	5	64-QAM	V	169	230	1 / 24	13.54	4.70	**16.09**	0.041	34.77	-18.68
713.50	5	256-QAM	V	169	230	1 / 24	11.38	4.70	**13.93**	**0.025**	34.77	-20.84
704.00	10	QPSK	V	171	228	1 / 49	14.43	4.58	16.86	0.049	34.77	-17.91
707.50	10	QPSK	V	167	230	1 / 49	15.44	4.62	17.91	0.062	34.77	-16.86
711.00	10	QPSK	V	169	232	1 / 49	15.61	4.67	**18.13**	0.065	34.77	-16.64
711.00	10	16-QAM	V	169	232	1 / 49	14.71	4.67	**17.23**	0.053	34.77	-17.54
711.00	10	64-QAM	V	169	232	1 / 49	13.77	4.67	**16.29**	0.043	34.77	-18.48
711.00	10	256-QAM	V	169	232	1 / 49	10.78	4.67	**13.30**	**0.021**	34.77	-21.47
715.30	1.4	QPSK	H	144	174	1 / 2	14.00	3.70	15.55	0.036	34.77	-19.22
715.30	1.4 (WCP)	QPSK	V	153	29	1 / 2	8.52	4.62	10.99	0.013	34.77	-23.78

Table 7-7. ERP Data (Band 12)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	V	158	253	1 / 0	16.32	5.77	**19.94**	0.099	34.77	-14.84
782.00	5	QPSK	V	155	250	1 / 0	16.20	5.79	19.84	0.096	34.77	-14.93
784.50	5	QPSK	V	158	255	1 / 0	16.08	5.82	19.75	0.094	34.77	-15.02
779.50	5	16-QAM	V	158	253	1 / 0	15.58	5.77	**19.20**	0.083	34.77	-15.58
779.50	5	64-QAM	V	158	253	1 / 0	14.60	5.77	**18.22**	0.066	34.77	-16.56
779.50	5	256-QAM	V	158	253	1 / 0	12.40	5.77	**16.02**	**0.040**	34.77	-18.76
782.00	10	QPSK	V	155	249	1 / 0	16.58	5.79	**20.22**	**0.105**	34.77	-14.55
782.00	10	16-QAM	V	155	249	1 / 0	15.71	5.79	**19.35**	0.086	34.77	-15.42
782.00	10	64-QAM	V	155	249	1 / 0	14.89	5.79	**18.53**	0.071	34.77	-16.24
782.00	10	256-QAM	V	155	249	1 / 0	12.56	5.79	**16.20**	**0.042**	34.77	-18.57
782.00	10	QPSK	H	251	280	1 / 0	14.75	5.89	18.49	0.071	34.77	-16.28
782.00	10 (WCP)	QPSK	V	153	300	1 / 0	11.39	5.79	15.03	0.032	34.77	-19.74

Table 7-8. ERP Data (Band 13)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	147	256	1 / 2	15.37	6.36	19.57	0.091	38.45	-18.88
836.50	1.4	QPSK	V	139	260	1 / 2	15.49	6.38	**19.72**	**0.094**	38.45	-18.73
848.30	1.4	QPSK	V	141	260	1 / 2	15.27	6.50	19.62	0.092	38.45	-18.83
836.50	1.4	16-QAM	V	139	260	1 / 2	14.60	6.38	**18.83**	0.076	38.45	-19.62
836.50	1.4	64-QAM	V	139	260	1 / 2	13.57	6.38	**17.80**	0.060	38.45	-20.65
836.50	1.4	256-QAM	V	139	260	1 / 2	11.20	6.38	**15.43**	**0.035**	38.45	-23.02
825.50	3	QPSK	V	147	256	1 / 14	15.35	6.36	19.56	0.090	38.45	-18.89
836.50	3	QPSK	V	139	260	1 / 14	15.42	6.38	**19.65**	0.092	38.45	-18.80
847.50	3	QPSK	V	141	260	1 / 7	15.09	6.49	19.44	0.088	38.45	-19.01
836.50	3	16-QAM	V	139	260	1 / 14	14.26	6.38	**18.49**	0.071	38.45	-19.96
836.50	3	64-QAM	V	139	260	1 / 14	13.64	6.38	**17.87**	0.061	38.45	-20.58
836.50	3	256-QAM	V	139	260	1 / 14	11.20	6.38	**15.43**	**0.035**	38.45	-23.02
826.50	5	QPSK	V	147	256	1 / 24	15.40	6.37	19.62	0.092	38.45	-18.83
836.50	5	QPSK	V	139	260	1 / 24	15.47	6.38	**19.70**	0.093	38.45	-18.75
846.50	5	QPSK	V	141	260	1 / 24	15.11	6.48	19.45	0.088	38.45	-19.00
836.50	5	16-QAM	V	139	260	1 / 24	14.54	6.38	**18.77**	0.075	38.45	-19.68
836.50	5	64-QAM	V	139	260	1 / 24	13.55	6.38	**17.78**	0.060	38.45	-20.67
836.50	5	256-QAM	V	139	260	1 / 24	11.26	6.38	**15.49**	**0.035**	38.45	-22.96
829.00	10	QPSK	V	141	236	1 / 49	15.20	6.40	19.45	0.088	38.45	-19.00
836.50	10	QPSK	V	138	236	1 / 25	15.28	6.38	**19.51**	0.089	38.45	-18.94
844.00	10	QPSK	V	141	250	1 / 0	15.16	6.46	19.47	0.088	38.45	-18.98
836.50	10	16-QAM	V	138	236	1 / 25	14.47	6.38	**18.70**	0.074	38.45	-19.75
836.50	10	64-QAM	V	138	236	1 / 25	13.60	6.38	**17.83**	0.061	38.45	-20.62
836.50	10	256-QAM	V	138	236	1 / 0	11.16	6.38	**15.39**	**0.035**	38.45	-23.06
836.50	1.4 (WCP)	QPSK	V	142	291	1 / 2	9.41	6.38	13.64	0.023	38.45	-24.81

Table 7-9. ERP Data (Band 26/5)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
831.50	15	QPSK	V	147	256	1 / 74	14.94	6.43	19.22	0.083	38.45	-19.23
836.50	15	QPSK	V	139	260	1 / 36	15.21	6.38	**19.44**	0.088	38.45	-19.01
841.50	15	QPSK	V	141	260	1 / 36	15.14	6.43	19.42	0.088	38.45	-19.03
836.50	15	16-QAM	V	139	260	1 / 36	14.37	6.38	**18.60**	0.072	38.45	-19.85
836.50	15	64-QAM	V	139	260	1 / 36	13.58	6.38	**17.81**	0.060	38.45	-20.64
836.50	15	256-QAM	V	139	260	1 / 36	10.87	6.38	**15.10**	**0.032**	38.45	-23.35

Table 7-10. ERP Data (Band 26)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
826.50	5	QPSK	V	232	232	1 / 1	11.04	7.18	16.07	0.040	38.45	-22.38
836.50	5	QPSK	V	216	213	1 / 1	10.58	7.37	15.80	0.038	38.45	-22.65
846.50	5	QPSK	V	222	241	1 / 1	11.41	7.55	**16.81**	0.048	38.45	-21.64
846.50	5	16-QAM	V	222	241	1 / 1	10.55	7.55	**15.95**	0.039	38.45	-22.50
846.50	5	64-QAM	V	222	241	1 / 1	8.63	7.55	**14.03**	0.025	38.45	-24.42
846.50	5	256-QAM	V	222	241	1 / 1	7.30	7.37	**12.51**	0.018	38.45	-25.94
846.50	5	BPSK	V	222	241	1 / 1	11.20	7.55	**16.60**	**0.046**	38.45	-21.85
829.00	10	QPSK	V	232	232	1 / 1	11.14	7.23	16.22	0.042	38.45	-22.23
836.50	10	QPSK	V	216	213	1 / 1	10.62	7.37	15.84	0.038	38.45	-22.61
844.00	10	QPSK	V	222	241	1 / 1	11.39	7.50	**16.74**	0.047	38.45	-21.71
844.00	10	16-QAM	V	222	241	1 / 1	10.49	7.50	**15.84**	0.038	38.45	-22.61
844.00	10	64-QAM	V	222	241	1 / 1	8.57	7.50	**13.92**	0.025	38.45	-24.53
844.00	10	256-QAM	V	222	241	1 / 1	7.29	7.37	**12.50**	0.018	38.45	-25.95
844.00	10	BPSK	V	222	241	1 / 1	11.05	7.50	**16.40**	**0.044**	38.45	-22.05
831.50	15	QPSK	V	232	232	1 / 1	11.58	7.18	16.61	0.046	38.45	-21.84
836.50	15	QPSK	V	216	213	1 / 1	11.01	7.37	16.23	0.042	38.45	-22.22
841.50	15	QPSK	V	222	241	1 / 1	11.73	7.55	**17.13**	0.052	38.45	-21.32
841.50	15	16-QAM	V	222	241	1 / 1	10.78	7.55	**16.18**	0.042	38.45	-22.27
841.50	15	64-QAM	V	222	241	1 / 1	8.86	7.55	**14.26**	0.027	38.45	-24.19
841.50	15	256-QAM	V	222	241	1 / 1	7.63	7.37	**12.84**	0.019	38.45	-25.61
841.50	15	BPSK	V	222	241	1 / 1	11.58	7.55	**16.98**	**0.050**	38.45	-21.47
834.00	20	QPSK	V	232	232	1 / 53	11.56	7.23	16.64	0.046	38.45	-21.81
836.50	20	QPSK	V	216	213	1 / 53	11.04	7.37	16.26	0.042	38.45	-22.19
839.00	20	QPSK	V	222	241	1 / 53	11.81	7.50	**17.16**	**0.052**	38.45	-21.29
839.00	20	16-QAM	V	222	241	1 / 53	11.00	7.50	**16.35**	0.043	38.45	-22.10
839.00	20	64-QAM	V	222	241	1 / 53	8.98	7.50	**14.33**	0.027	38.45	-24.12
839.00	20	256-QAM	V	222	241	1 / 53	7.56	7.50	**12.91**	**0.020**	38.45	-25.54
839.00	20	BPSK	V	222	241	1 / 53	11.74	7.50	**17.09**	**0.051**	38.45	-21.36
839.00	20	QPSK	H	147	93	1 / 53	8.71	7.37	13.93	0.025	38.45	-24.52
839.00	20 (WCP)	QPSK	V	241	301	1 / 53	10.21	7.50	15.56	0.036	38.45	-22.89
839.00	20 (CP)	QPSK	V	222	241	1 / 53	9.44	7.50	14.79	**0.030**	38.45	-23.66

Table 7-11. ERP Data (Band n5)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	V	180	327	1 / 2	14.27	9.38	23.65	0.232	30.00	-6.35
1745.00	1.4	QPSK	V	201	328	1 / 2	14.80	9.14	**23.94**	0.248	30.00	-6.06
1779.30	1.4	QPSK	V	160	218	1 / 2	14.23	9.20	23.43	0.220	30.00	-6.57
1745.00	1.4	16-QAM	V	201	328	1 / 2	13.88	9.14	**23.02**	0.200	30.00	-6.98
1745.00	1.4	64-QAM	V	201	328	1 / 2	12.62	9.14	**21.76**	0.150	30.00	-8.24
1745.00	1.4	256-QAM	V	201	328	1 / 2	9.97	9.14	**19.11**	**0.081**	30.00	-10.89
1711.50	3	QPSK	V	180	327	1 / 0	14.17	9.37	23.54	0.226	30.00	-6.46
1745.00	3	QPSK	V	201	328	1 / 0	14.78	9.14	**23.92**	0.246	30.00	-6.08
1778.50	3	QPSK	V	160	218	1 / 7	14.31	9.20	23.51	0.224	30.00	-6.49
1745.00	3	16-QAM	V	201	328	1 / 0	13.97	9.14	**23.11**	0.205	30.00	-6.89
1745.00	3	64-QAM	V	201	328	1 / 0	12.92	9.14	**22.06**	0.161	30.00	-7.94
1745.00	3	256-QAM	V	201	328	1 / 0	9.97	9.14	**19.11**	**0.081**	30.00	-10.89
1712.50	5	QPSK	V	180	327	1 / 12	14.27	9.37	23.63	0.231	30.00	-6.37
1745.00	5	QPSK	V	201	328	1 / 12	14.83	9.14	**23.97**	**0.249**	30.00	-6.03
1777.50	5	QPSK	V	160	218	1 / 12	14.31	9.19	23.50	0.224	30.00	-6.50
1745.00	5	16-QAM	V	201	328	1 / 12	13.95	9.14	**23.09**	0.204	30.00	-6.91
1745.00	5	64-QAM	V	201	328	1 / 12	12.94	9.14	**22.08**	0.161	30.00	-7.92
1745.00	5	256-QAM	V	201	328	1 / 12	9.94	9.14	**19.08**	**0.081**	30.00	-10.92
1715.00	10	QPSK	V	180	327	1 / 25	14.25	9.35	23.60	0.229	30.00	-6.40
1745.00	10	QPSK	V	201	328	1 / 25	14.64	9.14	**23.78**	0.239	30.00	-6.22
1775.00	10	QPSK	V	160	218	1 / 25	14.32	9.18	23.51	0.224	30.00	-6.49
1745.00	10	16-QAM	V	201	328	1 / 25	13.65	9.14	**22.79**	0.190	30.00	-7.21
1745.00	10	64-QAM	V	201	328	1 / 25	12.61	9.14	**21.75**	0.150	30.00	-8.25
1745.00	10	256-QAM	V	201	328	1 / 25	9.85	9.14	**18.99**	**0.079**	30.00	-11.01
1717.50	15	QPSK	V	180	327	1 / 36	14.24	9.33	23.57	0.228	30.00	-6.43
1745.00	15	QPSK	V	201	328	1 / 0	14.75	9.14	**23.89**	0.245	30.00	-6.11
1772.50	15	QPSK	V	160	218	1 / 36	14.40	9.18	23.58	0.228	30.00	-6.42
1745.00	15	16-QAM	V	201	328	1 / 0	13.77	9.14	**22.91**	0.195	30.00	-7.09
1745.00	15	64-QAM	V	201	328	1 / 0	12.82	9.14	**21.96**	0.157	30.00	-8.04
1745.00	15	256-QAM	V	201	328	1 / 0	9.91	9.14	**19.05**	**0.080**	30.00	-10.95
1720.00	20	QPSK	V	180	327	1 / 50	14.19	9.31	23.50	0.224	30.00	-6.50
1745.00	20	QPSK	V	201	328	1 / 50	14.52	9.14	**23.66**	0.232	30.00	-6.34
1770.00	20	QPSK	V	160	218	1 / 50	14.28	9.17	23.45	0.221	30.00	-6.55
1745.00	20	16-QAM	V	201	328	1 / 50	13.86	9.14	**23.00**	0.199	30.00	-7.00
1745.00	20	64-QAM	V	201	328	1 / 50	12.69	9.14	**21.83**	0.152	30.00	-8.17
1745.00	20	256-QAM	V	201	328	1 / 50	9.64	9.14	**18.78**	**0.075**	30.00	-11.22
1745.00	5	QPSK	H	128	156	1 / 12	13.81	9.26	23.07	0.203	30.00	-6.93
1745.00	5 (WCP)	QPSK	V	112	61	1 / 12	9.70	9.14	18.84	0.077	30.00	-11.16

Table 7-12. EIRP Data (Band 66/4)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1712.50	5	QPSK	V	109	312	1 / 13	13.66	9.37	23.02	0.201	30.00	-6.98
1745.00	5	QPSK	V	102	319	1 / 13	14.41	9.14	**23.55**	0.226	30.00	-6.45
1777.50	5	QPSK	V	101	324	1 / 1	13.82	9.19	23.01	0.200	30.00	-6.99
1745.00	5	16-QAM	V	102	319	1 / 13	13.46	9.14	**22.60**	0.182	30.00	-7.40
1745.00	5	64-QAM	V	102	319	1 / 13	12.21	9.14	**21.35**	0.136	30.00	-8.65
1745.00	5	256-QAM	V	102	319	1 / 13	9.91	9.14	**19.05**	0.080	30.00	-10.95
1745.00	5	BPSK	V	102	319	1 / 13	14.26	9.19	**23.46**	**0.222**	30.00	-6.54
1715.00	10	QPSK	V	109	312	1 / 26	13.66	9.35	23.01	0.200	30.00	-6.99
1745.00	10	QPSK	V	102	319	1 / 26	14.37	9.14	**23.51**	0.224	30.00	-6.49
1775.00	10	QPSK	V	101	324	1 / 26	13.87	9.18	23.06	0.202	30.00	-6.94
1745.00	10	16-QAM	V	102	319	1 / 26	13.00	9.14	**22.14**	0.164	30.00	-7.86
1745.00	10	64-QAM	V	102	319	1 / 26	11.97	9.14	**21.11**	0.129	30.00	-8.89
1745.00	10	256-QAM	V	102	319	1 / 26	9.67	9.14	**18.81**	0.076	30.00	-11.19
1745.00	10	BPSK	V	102	319	1 / 26	14.27	9.18	**23.46**	**0.222**	30.00	-6.54
1717.50	15	QPSK	V	109	312	1 / 40	13.82	9.33	23.15	0.207	30.00	-6.85
1745.00	15	QPSK	V	102	319	1 / 77	14.33	9.14	**23.47**	0.222	30.00	-6.53
1772.50	15	QPSK	V	101	324	1 / 40	13.99	9.18	23.17	0.207	30.00	-6.83
1745.00	15	16-QAM	V	102	319	1 / 77	13.38	9.14	**22.52**	0.179	30.00	-7.48
1745.00	15	64-QAM	V	102	319	1 / 77	12.13	9.14	**21.27**	0.134	30.00	-8.73
1745.00	15	256-QAM	V	102	319	1 / 77	9.83	9.14	**18.97**	0.079	30.00	-11.03
1745.00	15	BPSK	V	102	319	1 / 77	14.27	9.18	**23.45**	**0.221**	30.00	-6.55
1720.00	20	QPSK	V	109	312	1 / 53	14.22	9.31	23.53	0.226	30.00	-6.47
1745.00	20	QPSK	V	102	319	1 / 53	14.46	9.14	**23.60**	**0.229**	30.00	-6.40
1770.00	20	QPSK	V	101	324	1 / 53	14.25	9.17	23.42	0.220	30.00	-6.58
1745.00	20	16-QAM	V	102	319	1 / 53	13.29	9.14	**22.43**	0.175	30.00	-7.57
1745.00	20	64-QAM	V	102	319	1 / 53	12.04	9.14	**21.18**	0.131	30.00	-8.82
1745.00	20	256-QAM	V	102	319	1 / 53	9.74	9.14	**18.88**	**0.077**	30.00	-11.12
1745.00	20	BPSK	V	102	319	1 / 53	14.40	9.14	**23.54**	**0.226**	30.00	-6.46
1745.00	20	QPSK	H	111	279	1 / 53	13.46	9.14	22.60	0.182	30.00	-7.40
1745.00	20 (WCP)	QPSK	V	102	319	1 / 53	12.34	9.14	21.48	0.141	30.00	-8.52
1745.00	20 (CP)	QPSK	V	102	319	1 / 53	12.44	9.14	21.58	**0.144**	30.00	-8.42

Table 7-13. EIRP Data (Band n66)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	123	2	1 / 5	13.81	9.51	**23.32**	0.215	33.01	-9.69
1880.00	1.4	QPSK	H	115	1	1 / 5	12.23	9.93	22.16	0.164	33.01	-10.85
1909.30	1.4	QPSK	H	209	344	1 / 5	11.20	10.28	21.47	0.140	33.01	-11.54
1850.70	1.4	16-QAM	H	123	2	1 / 5	12.90	9.51	**22.41**	0.174	33.01	-10.60
1850.70	1.4	64-QAM	H	123	2	1 / 5	11.80	9.51	**21.31**	0.135	33.01	-11.70
1850.70	1.4	256-QAM	H	123	2	1 / 5	8.55	9.51	**18.06**	**0.064**	33.01	-14.95
1851.50	3	QPSK	H	123	2	1 / 0	13.94	9.52	**23.46**	0.222	33.01	-9.55
1880.00	3	QPSK	H	115	1	1 / 0	12.33	9.93	22.26	0.168	33.01	-10.75
1908.50	3	QPSK	H	209	344	1 / 0	11.16	10.27	21.43	0.139	33.01	-11.58
1851.50	3	16-QAM	H	123	2	1 / 0	13.03	9.52	**22.56**	0.180	33.01	-10.46
1851.50	3	64-QAM	H	123	2	1 / 0	11.55	9.52	**21.08**	0.128	33.01	-11.94
1851.50	3	256-QAM	H	123	2	1 / 0	8.60	9.52	**18.13**	**0.065**	33.01	-14.89
1852.50	5	QPSK	H	123	2	1 / 12	13.98	9.54	**23.51**	**0.225**	33.01	-9.50
1880.00	5	QPSK	H	115	1	1 / 12	12.38	9.93	22.31	0.170	33.01	-10.70
1907.50	5	QPSK	H	209	344	1 / 24	11.10	10.26	21.36	0.137	33.01	-11.65
1852.50	5	16-QAM	H	123	2	1 / 24	13.22	9.54	**22.75**	0.189	33.01	-10.26
1852.50	5	64-QAM	H	123	2	1 / 24	11.96	9.54	**21.49**	0.141	33.01	-11.52
1852.50	5	256-QAM	H	123	2	1 / 24	8.82	9.54	**18.35**	**0.068**	33.01	-14.66
1855.00	10	QPSK	H	123	2	1 / 25	13.73	9.57	**23.30**	0.214	33.01	-9.71
1880.00	10	QPSK	H	115	1	1 / 0	12.39	9.93	22.32	0.170	33.01	-10.69
1905.00	10	QPSK	H	209	344	1 / 49	11.29	10.24	21.53	0.142	33.01	-11.48
1855.00	10	16-QAM	H	123	2	1 / 25	12.78	9.57	**22.35**	0.172	33.01	-10.66
1855.00	10	64-QAM	H	123	2	1 / 25	11.51	9.57	**21.08**	0.128	33.01	-11.93
1855.00	10	256-QAM	H	123	2	1 / 25	8.94	9.57	**18.51**	**0.071**	33.01	-14.50
1857.50	15	QPSK	H	123	2	1 / 36	13.71	9.61	**23.31**	0.215	33.01	-9.70
1880.00	15	QPSK	H	115	1	1 / 36	12.45	9.93	22.38	0.173	33.01	-10.63
1902.50	15	QPSK	H	209	344	1 / 36	11.14	10.22	21.36	0.137	33.01	-11.65
1857.50	15	16-QAM	H	123	2	1 / 36	12.89	9.61	**22.49**	0.178	33.01	-10.52
1857.50	15	64-QAM	H	123	2	1 / 36	11.37	9.61	**20.97**	0.125	33.01	-12.04
1857.50	15	256-QAM	H	123	2	1 / 36	8.79	9.61	**18.39**	**0.069**	33.01	-14.62
1860.00	20	QPSK	H	123	2	1 / 0	13.49	9.64	**23.13**	0.206	33.01	-9.88
1880.00	20	QPSK	H	115	1	1 / 50	12.36	9.93	22.29	0.169	33.01	-10.72
1900.00	20	QPSK	H	209	344	1 / 0	11.27	10.20	21.47	0.140	33.01	-11.54
1860.00	20	16-QAM	H	123	2	1 / 0	12.76	9.64	**22.40**	0.174	33.01	-10.61
1860.00	20	64-QAM	H	123	2	1 / 0	11.68	9.64	**21.32**	0.136	33.01	-11.69
1860.00	20	256-QAM	H	123	2	1 / 0	8.31	9.64	**17.95**	**0.062**	33.01	-15.06
1852.50	5	QPSK	V	118	330	1 / 12	12.98	9.98	22.96	0.198	33.01	-10.05
1852.50	5 (WCP)	QPSK	H	193	159	1 / 12	11.65	10.13	21.78	0.151	33.01	-11.23

Table 7-14. EIRP Data (Band 2)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.50	5	QPSK	V	143	136	1 / 23	12.39	9.92	22.31	0.170	33.01	-10.70
1880.00	5	QPSK	V	145	142	1 / 1	13.14	10.13	**23.27**	0.212	33.01	-9.74
1907.50	5	QPSK	V	151	140	1 / 13	12.57	10.33	22.90	0.195	33.01	-10.11
1880.00	5	16-QAM	V	145	142	1 / 1	12.28	10.13	**22.41**	0.174	33.01	-10.60
1880.00	5	64-QAM	V	145	142	1 / 1	10.96	10.13	**21.09**	0.129	33.01	-11.92
1880.00	5	256-QAM	V	145	142	1 / 1	8.87	10.13	**19.00**	0.079	33.01	-14.01
1880.00	5	BPSK	V	145	142	1 / 1	13.30	10.33	**23.62**	**0.230**	33.01	-9.39
1855.00	10	QPSK	V	143	136	1 / 50	12.34	9.94	22.28	0.169	33.01	-10.73
1880.00	10	QPSK	V	145	142	1 / 26	13.36	10.13	**23.49**	0.224	33.01	-9.52
1905.00	10	QPSK	V	151	140	1 / 26	12.87	10.31	23.19	0.208	33.01	-9.82
1880.00	10	16-QAM	V	145	142	1 / 26	12.30	10.13	**22.43**	0.175	33.01	-10.58
1880.00	10	64-QAM	V	145	142	1 / 26	10.98	10.13	**21.11**	0.129	33.01	-11.90
1880.00	10	256-QAM	V	145	142	1 / 26	8.89	10.13	**19.02**	0.080	33.01	-13.99
1880.00	10	BPSK	V	145	142	1 / 26	13.03	10.31	**23.34**	**0.216**	33.01	-9.67
1857.50	15	QPSK	V	143	136	1 / 40	13.11	9.96	23.07	0.203	33.01	-9.94
1880.00	15	QPSK	V	145	142	1 / 1	13.50	10.13	**23.63**	0.231	33.01	-9.38
1902.50	15	QPSK	V	151	140	1 / 77	13.06	10.30	23.36	0.217	33.01	-9.65
1880.00	15	16-QAM	V	145	142	1 / 1	12.61	10.13	**22.74**	0.188	33.01	-10.27
1880.00	15	64-QAM	V	145	142	1 / 1	11.29	10.13	**21.42**	0.139	33.01	-11.59
1880.00	15	256-QAM	V	145	142	1 / 1	9.20	10.13	**19.33**	0.086	33.01	-13.68
1880.00	15	BPSK	V	145	142	1 / 1	13.36	10.30	**23.66**	**0.232**	33.01	-9.35
1860.00	20	QPSK	V	143	136	1 / 53	13.26	9.98	23.24	0.211	33.01	-9.77
1880.00	20	QPSK	V	145	142	1 / 53	13.71	10.13	23.84	0.242	33.01	-9.17
1900.00	20	QPSK	V	151	140	1 / 53	13.58	10.29	**23.87**	**0.244**	33.01	-9.14
1880.00	20	16-QAM	V	145	142	1 / 53	12.54	10.13	**22.67**	0.185	33.01	-10.34
1880.00	20	64-QAM	V	145	142	1 / 53	11.22	10.13	**21.35**	0.137	33.01	-11.66
1880.00	20	256-QAM	V	145	142	1 / 53	9.13	10.13	**19.26**	**0.084**	33.01	-13.75
1860.00	20	BPSK	V	143	136	1 / 53	12.08	9.98	22.06	0.161	33.01	-10.95
1900.00	20	QPSK	H	102	150	1 / 53	11.45	10.13	21.58	0.144	33.01	-11.43
1900.00	20 (WCP)	QPSK	V	221	159	1 / 53	13.33	10.29	23.62	0.230	33.01	-9.39
1900.00	20 (CP)	QPSK	V	145	142	1 / 53	11.65	10.29	21.94	**0.156**	33.01	-11.07

Table 7-15. EIRP Data (Band n2)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	155	184	1 / 24	13.17	9.46	**22.63**	0.183	33.01	-10.38
2593.00	5	QPSK	H	137	210	1 / 24	11.36	9.58	20.94	0.124	33.01	-12.07
2687.50	5	QPSK	H	100	199	1 / 24	8.48	9.85	18.32	0.068	33.01	-14.69
2498.50	5	16-QAM	H	155	184	1 / 24	12.34	9.46	**21.80**	0.151	33.01	-11.21
2498.50	5	64-QAM	H	155	184	1 / 24	11.35	9.46	**20.81**	0.121	33.01	-12.20
2498.50	5	256-QAM	H	155	184	1 / 24	7.81	9.46	**17.27**	**0.053**	33.01	-15.74
2501.00	10	QPSK	H	155	184	1 / 0	13.07	9.46	**22.52**	0.179	33.01	-10.49
2593.00	10	QPSK	H	137	210	1 / 0	11.38	9.58	20.96	0.125	33.01	-12.05
2685.00	10	QPSK	H	100	199	1 / 25	8.44	9.85	18.29	0.068	33.01	-14.72
2501.00	10	16-QAM	H	155	184	1 / 0	12.01	9.46	**21.46**	0.140	33.01	-11.55
2501.00	10	64-QAM	H	155	184	1 / 0	10.97	9.46	**20.42**	0.110	33.01	-12.59
2501.00	10	256-QAM	H	155	184	1 / 0	7.96	9.46	**17.41**	**0.055**	33.01	-15.60
2503.50	15	QPSK	H	155	184	1 / 0	13.07	9.45	**22.52**	0.179	33.01	-10.49
2593.00	15	QPSK	H	137	210	1 / 0	11.41	9.58	20.99	0.126	33.01	-12.02
2682.50	15	QPSK	H	100	199	1 / 74	8.62	9.86	18.47	0.070	33.01	-14.54
2503.50	15	16-QAM	H	155	184	1 / 0	12.28	9.45	**21.73**	0.149	33.01	-11.28
2503.50	15	64-QAM	H	155	184	1 / 0	11.17	9.45	**20.62**	0.115	33.01	-12.39
2503.50	15	256-QAM	H	155	184	1 / 0	7.89	9.45	**17.34**	**0.054**	33.01	-15.67
2506.00	20	QPSK	H	155	184	1 / 0	13.19	9.45	**22.64**	**0.184**	33.01	-10.37
2593.00	20	QPSK	H	137	210	1 / 50	11.46	9.58	21.04	0.127	33.01	-11.97
2680.00	20	QPSK	H	100	199	1 / 99	8.49	9.86	18.35	0.068	33.01	-14.66
2506.00	20	16-QAM	H	155	184	1 / 0	12.32	9.45	**21.77**	0.150	33.01	-11.24
2506.00	20	64-QAM	H	155	184	1 / 0	11.35	9.45	**20.80**	0.120	33.01	-12.21
2593.00	20	64-QAM	H	137	210	1 / 50	9.57	9.58	19.15	0.082	33.01	-13.86
2680.00	20	64-QAM	H	100	199	1 / 99	6.70	9.86	16.56	0.045	33.01	-16.45
2506.00	20	256-QAM	H	155	184	100 / 0	7.64	9.45	**17.09**	**0.051**	33.01	-15.92
2593.00	20	256-QAM	H	137	210	100 / 0	6.52	9.58	16.10	0.041	33.01	-16.91
2680.00	20	256-QAM	H	100	199	1 / 99	3.48	9.86	13.34	0.022	33.01	-19.67
2506.00	20	QPSK	V	141	82	1 / 0	11.13	9.42	20.55	0.114	33.01	-12.46
2506.00	20(WCP)	QPSK	H	352	99	1 / 0	10.86	9.45	20.31	0.107	33.01	-12.70

Table 7-16. EIRP Data (Band 41/38)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	H	153	7	1 / 24	12.59	9.46	22.05	0.160	33.01	-10.96
2535.00	5	QPSK	H	149	11	1 / 24	13.03	9.42	**22.45**	0.176	33.01	-10.56
2567.50	5	QPSK	H	178	29	1 / 0	12.40	9.48	21.88	0.154	33.01	-11.13
2535.00	5	16-QAM	H	149	11	1 / 24	11.98	9.42	**21.40**	0.138	33.01	-11.61
2535.00	5	64-QAM	H	149	11	1 / 24	11.12	9.42	**20.54**	0.113	33.01	-12.47
2535.00	5	256-QAM	H	149	11	1 / 24	7.87	9.42	**17.29**	**0.054**	33.01	-15.72
2505.00	10	QPSK	H	153	7	1 / 0	12.49	9.45	21.94	0.156	33.01	-11.07
2535.00	10	QPSK	H	149	11	1 / 49	13.02	9.42	**22.44**	0.176	33.01	-10.57
2565.00	10	QPSK	H	178	29	1 / 49	12.49	9.47	21.96	0.157	33.01	-11.05
2535.00	10	16-QAM	H	149	11	1 / 49	12.13	9.42	**21.55**	0.143	33.01	-11.46
2535.00	10	64-QAM	H	149	11	1 / 49	11.31	9.42	**20.73**	0.118	33.01	-12.28
2535.00	10	256-QAM	H	149	11	1 / 49	8.01	9.42	**17.43**	**0.055**	33.01	-15.58
2507.50	15	QPSK	H	153	7	1 / 0	12.49	9.45	21.94	0.156	33.01	-11.07
2535.00	15	QPSK	H	149	11	1 / 74	13.00	9.42	**22.42**	0.175	33.01	-10.59
2562.50	15	QPSK	H	178	29	1 / 74	12.56	9.46	22.02	0.159	33.01	-10.99
2535.00	15	16-QAM	H	149	11	1 / 74	11.74	9.42	**21.16**	0.131	33.01	-11.85
2535.00	15	64-QAM	H	149	11	1 / 74	11.17	9.42	**20.59**	0.115	33.01	-12.42
2535.00	15	256-QAM	H	149	11	1 / 74	8.02	9.42	**17.44**	**0.056**	33.01	-15.57
2510.00	20	QPSK	H	153	7	1 / 0	12.29	9.45	21.74	0.149	33.01	-11.27
2535.00	20	QPSK	H	149	11	1 / 0	13.04	9.42	**22.46**	**0.176**	33.01	-10.55
2560.00	20	QPSK	H	178	29	1 / 0	12.39	9.45	21.84	0.153	33.01	-11.17
2535.00	20	16-QAM	H	149	11	1 / 0	12.35	9.42	**21.77**	0.150	33.01	-11.24
2535.00	20	64-QAM	H	149	11	1 / 0	11.20	9.42	**20.62**	0.115	33.01	-12.39
2535.00	20	256-QAM	H	149	11	1 / 0	7.87	9.42	**17.29**	**0.054**	33.01	-15.72
2535.00	20	QPSK	V	147	54	1 / 0	12.21	9.41	21.62	0.145	33.01	-11.39
2535.00	20 (WCP)	QPSK	H	115	12	1 / 0	9.87	9.42	19.29	0.085	33.01	-13.72

Table 7-17. EIRP Data (Band 7)

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7.8 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 vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

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

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Test Setup

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

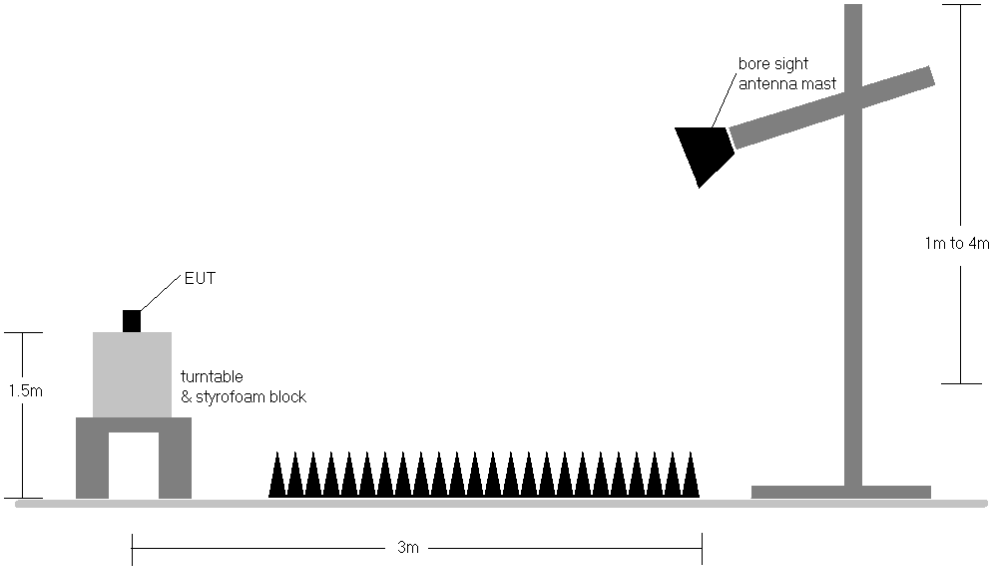

Figure 7-8. Test Instrument & Measurement Setup

Test Notes

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

2) This unit was tested with its standard battery.

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

4) 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.

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

6) All SCS's and Waveforms (CP-OFDM vs DFT-s OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

7) Per FCC Guidance, KDB 328880, Radiated Spurious Measurements were made based of the worst case modulation and RB\ configuraton as determined by EIRP measurement, and grouping the available combinations by Low Band, Mid Band, and High Band.

8) Spurious emissions shown in this section are measured while operating in EN-DC mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor). Per KDB 968740, spurious emissions from the NR carrier device, is subject to the rules under which the NR carrier operates. Spurious emission caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates. If the spurious emission is caused by the simultaneous operation of both devices, the limit is the highest level allowed by either rule part.

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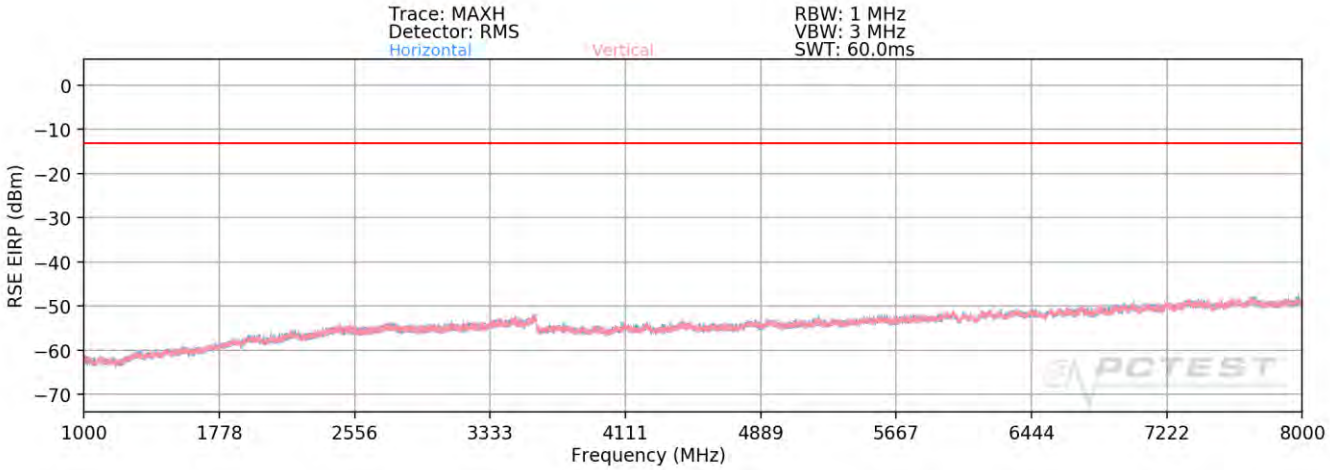
Band 12



Plot 7-529. Radiated Spurious Plot above 1GHz (Band 12)

OPERATING FREQUENCY:	699.70	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
1399.40	H	153	120	-61.08	2.65	-58.42	-45.4
2099.10	H	118	125	-63.61	3.56	-60.05	-47.1
2798.80	H	-	-	-65.07	4.94	-60.13	-47.1
3498.50	H	-	-	-65.41	6.34	-59.07	-46.1
4198.20	H	-	-	-66.87	7.72	-59.14	-46.1

Table 7-18. Radiated Spurious Data (Band 12 – Low Channel)

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OPERATING FREQUENCY: 707.50 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 1.4 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
1415.00	H	155	146	-63.66	2.80	-60.86	-47.9
2122.50	H	107	65	-64.72	3.57	-61.14	-48.1
2830.00	H	-	-	-65.09	5.02	-60.07	-47.1
3537.50	H	-	-	-65.47	6.31	-59.16	-46.2
4245.00	H	-	-	-66.62	7.80	-58.82	-45.8

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

OPERATING FREQUENCY: 715.30 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 1.4 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
1430.60	H	100	122	-62.67	2.94	-59.72	-46.7
2145.90	H	138	138	-64.02	3.59	-60.43	-47.4
2861.20	H	-	-	-64.67	5.10	-59.57	-46.6
3576.50	H	-	-	-64.97	6.35	-58.63	-45.6
4291.80	H	-	-	-67.37	7.88	-59.50	-46.5

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

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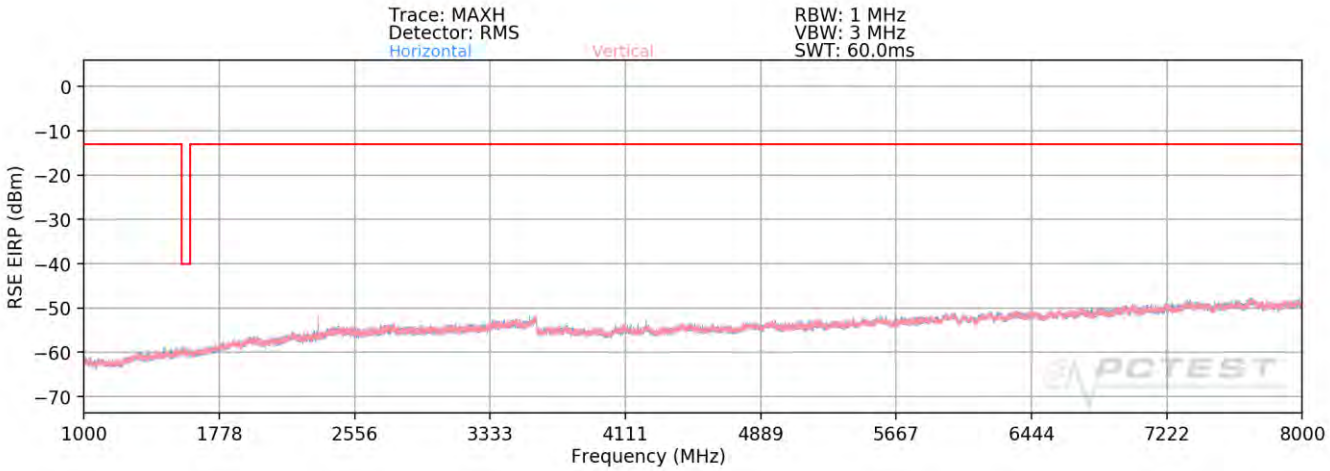
Band 13



Plot 7-530. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY:	782.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
2346.00	V	107	135	-57.25	4.00	-53.25	-40.3
3128.00	V	-	-	-65.06	5.38	-59.68	-46.7
3910.00	V	-	-	-66.86	7.09	-59.77	-46.8
4692.00	V	-	-	-67.30	8.37	-58.94	-45.9

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

MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.00	MHz
DISTANCE:	3	meters
NARROWBAND EMISSION LIMIT:	-50	dBm
WIDEBAND EMISSION LIMIT:	-40	dBm/MHz

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]
1564.00	V	138	130	-66.39	3.53	-62.86	-22.9

Table 7-22. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

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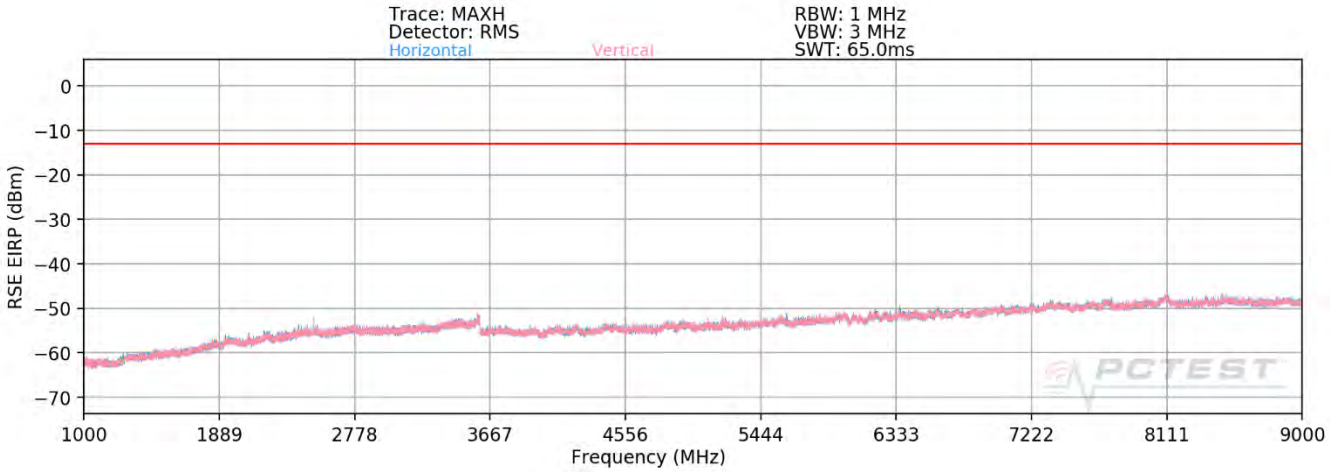
Band 26/5



Plot 7-531. Radiated Spurious Plot above 1GHz (Band 26)

OPERATING FREQUENCY:	824.70	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
1649.40	V	-	-	-67.60	3.61	-63.99	-51.0
2474.10	V	121	115	-58.81	4.25	-54.56	-41.6
3298.80	V	-	-	-65.60	5.83	-59.77	-46.8
4123.50	V	-	-	-66.94	7.66	-59.27	-46.3

Table 7-23. Radiated Spurious Data (Band 26 – Low Channel)

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OPERATING FREQUENCY: 836.50 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 1.4 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
1673.00	V	-	-	-67.70	3.62	-64.08	-51.1
2509.50	V	107	133	-59.48	4.33	-55.14	-42.1
3346.00	V	-	-	-65.03	5.92	-59.11	-46.1
4182.50	V	-	-	-67.07	7.69	-59.37	-46.4

Table 7-24. Radiated Spurious Data (Band 26 – Mid Channel)

OPERATING FREQUENCY: 848.30 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 1.4 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
1696.60	V	-	-	-67.51	3.63	-63.88	-50.9
2544.90	V	128	128	-58.42	4.47	-53.95	-40.9
3393.20	V	-	-	-64.94	6.05	-58.89	-45.9
4241.50	V	-	-	-66.78	7.75	-59.03	-46.0

Table 7-25. Radiated Spurious Data (Band 26 – High Channel)

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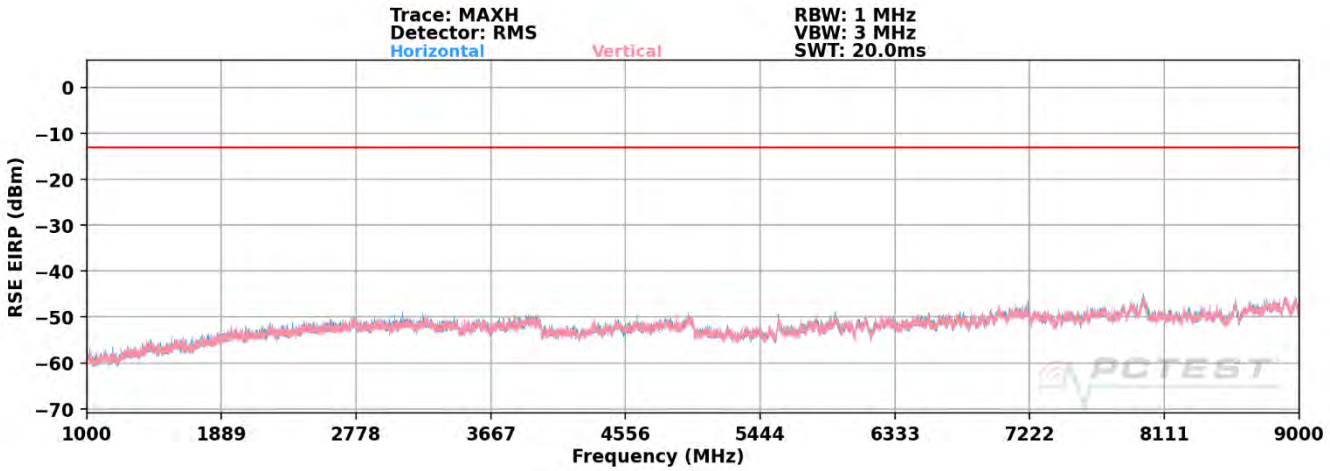
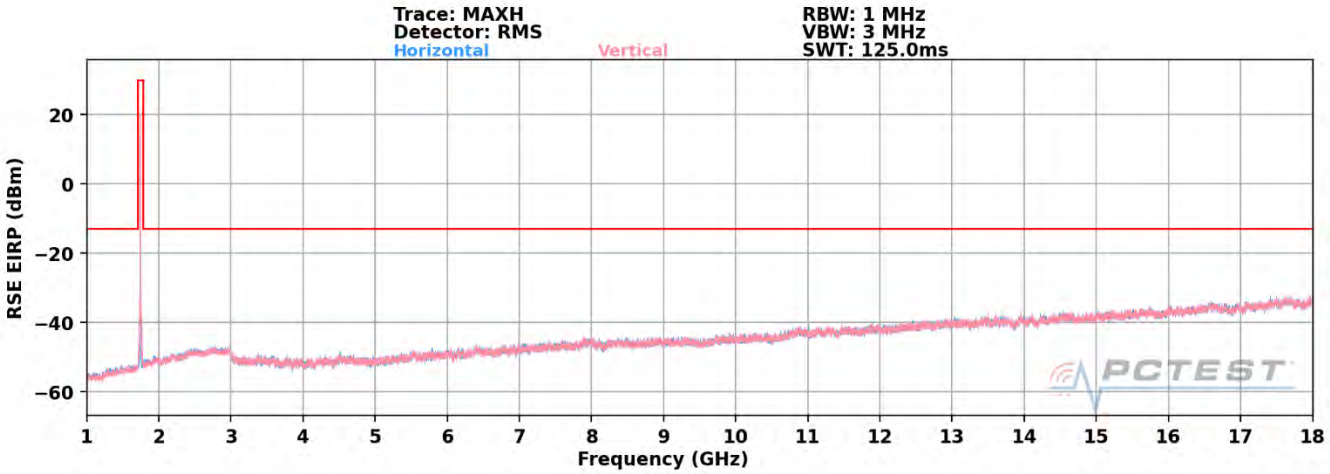
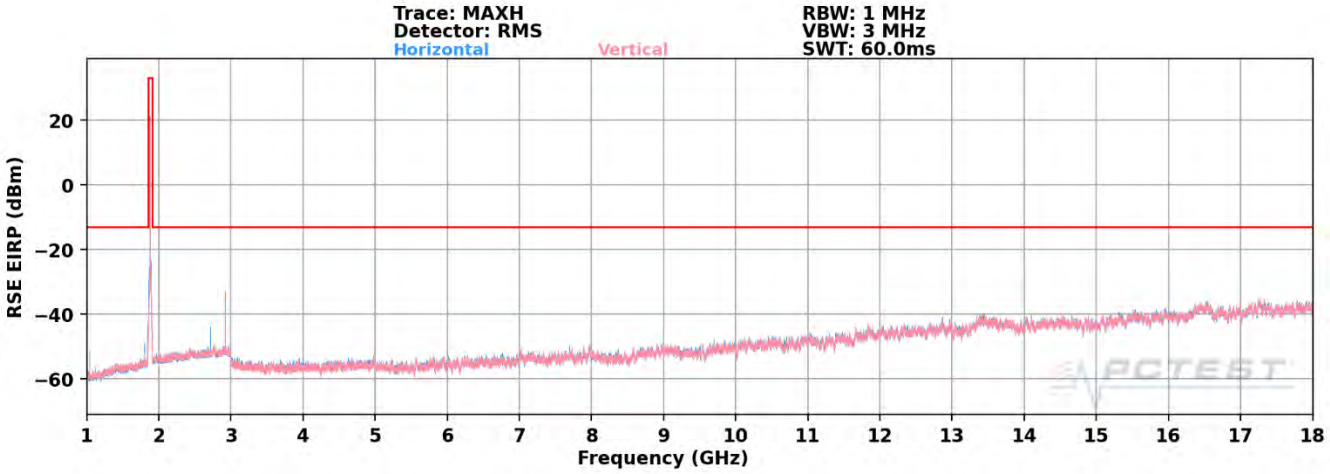
NR Band n5



Plot 7-532. Radiated Spurious Plot above 1GHz (n5 Standalone)



Plot 7-533. Radiated Spurious Plot above 1GHz (n5 + Anchor B66 EN-DC)



Plot 7-534. Radiated Spurious Plot above 1GHz (n5 + Anchor B2 EN-DC)

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OPERATING FREQUENCY: 824.00 MHz
MODULATION SIGNAL: QPSK (DFT-s-OFDM)
BANDWIDTH: 20.0 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
1648.00	H	-	-	-81.41	8.97	-72.44	-59.4
2482.00	H	400	105	-78.21	9.71	-68.49	-55.5
2936.00	H	400	358	-76.50	9.80	-66.70	-53.7
3316.00	H	400	118	-75.51	9.62	-65.89	-52.9
3992.00	H	-	-	-74.32	9.64	-64.68	-51.7
4150.00	H	-	-	-77.16	10.25	-66.90	-53.9
4984.00	H	-	-	-76.55	10.96	-65.59	-52.6

Table 7-26. Radiated Spurious Data (n5 + Anchor B2 EN-DC – Low Channel)

OPERATING FREQUENCY: 836.50 MHz
MODULATION SIGNAL: QPSK (DFT-s-OFDM)
BANDWIDTH: 20.0 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
1673.00	H	-	-	-81.52	8.98	-72.54	-59.5
2509.50	H	400	105	-77.76	9.78	-67.97	-55.0
2923.50	H	400	136	-76.54	9.87	-66.67	-53.7
3346.00	H	400	329	-75.25	9.63	-65.62	-52.6
3967.00	H	400	96	-71.37	9.55	-61.82	-48.8
4182.50	H	-	-	-75.17	10.37	-64.79	-51.8
5019.00	H	-	-	-74.96	10.91	-64.05	-51.0

Table 7-27. Radiated Spurious Data (n5 + Anchor B2 EN-DC – Mid Channel)

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OPERATING FREQUENCY:	839.00	MHz
MODULATION SIGNAL:	QPSK (DFT-s-OFDM)	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
1678.00	H	-	-	-83.39	8.98	-74.41	-61.4
2517.00	H	400	151	-77.61	9.78	-67.83	-54.8
2921.00	H	400	139	-76.19	9.88	-66.31	-53.3
3356.00	H	399	329	-75.40	9.66	-65.74	-52.7
3962.00	H	398	36	-72.95	9.53	-63.42	-50.4
4195.00	H	-	-	-75.09	10.42	-64.67	-51.7
5034.00	H	-	-	-74.26	10.87	-63.39	-50.4

Table 7-28. Radiated Spurious Data (n5 + Anchor B2 EN-DC – High Channel)

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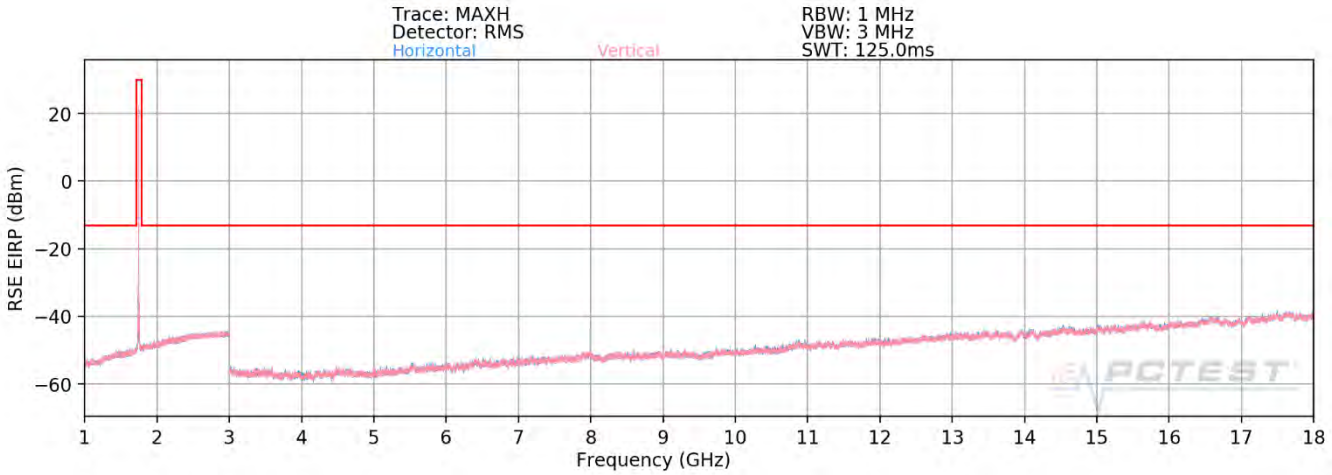
Band 66/4



Plot 7-535. Radiated Spurious Plot above 1GHz (Band 66/4)

OPERATING FREQUENCY:	1712.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
3425.00	H	186	315	-64.27	6.22	-58.05	-45.1
5137.50	H	-	-	-66.32	8.68	-57.64	-44.6
6850.00	H	-	-	-63.37	8.76	-54.62	-41.6

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

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OPERATING FREQUENCY: 1745.00 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
3490.00	H	308	322	-64.30	6.32	-57.98	-45.0
5235.00	H	-	-	-66.73	8.71	-58.02	-45.0
6980.00	H	-	-	-63.43	8.74	-54.69	-41.7

Table 7-30. Radiated Spurious Data (Band 66/4 – Mid Channel)

OPERATING FREQUENCY: 1777.50 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
3555.00	H	366	59	-64.52	6.31	-58.21	-45.2
5332.50	H	-	-	-66.80	8.74	-58.06	-45.1
7110.00	H	-	-	-63.28	8.66	-54.62	-41.6

Table 7-31. Radiated Spurious Data (Band 66/4 – High Channel)

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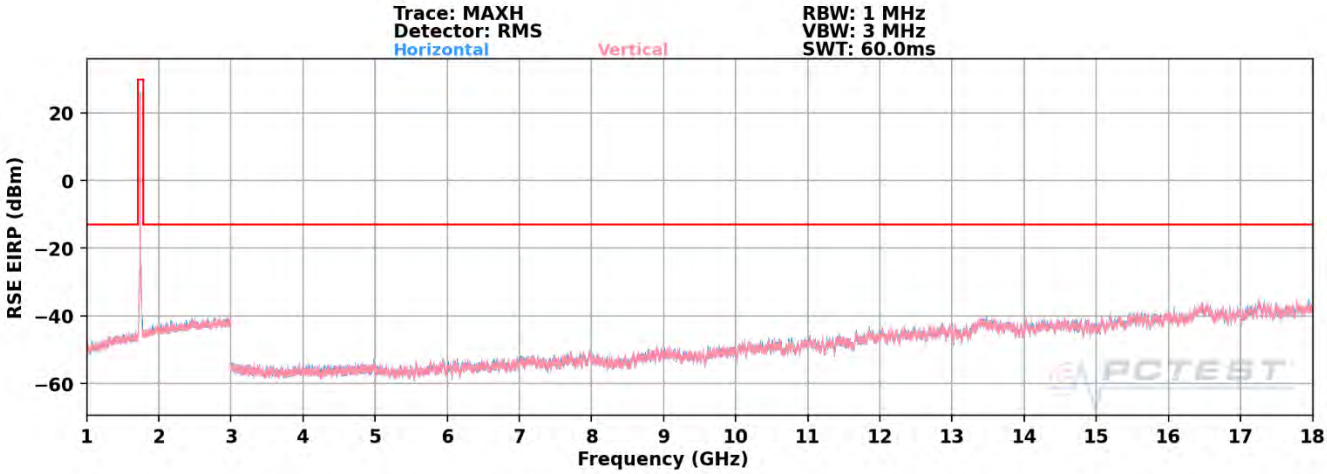
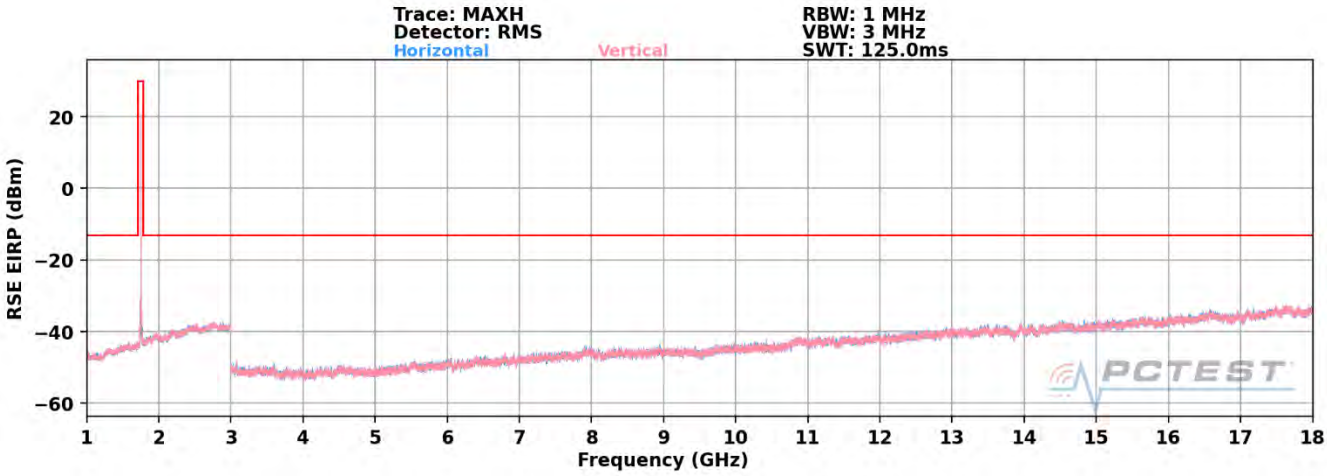
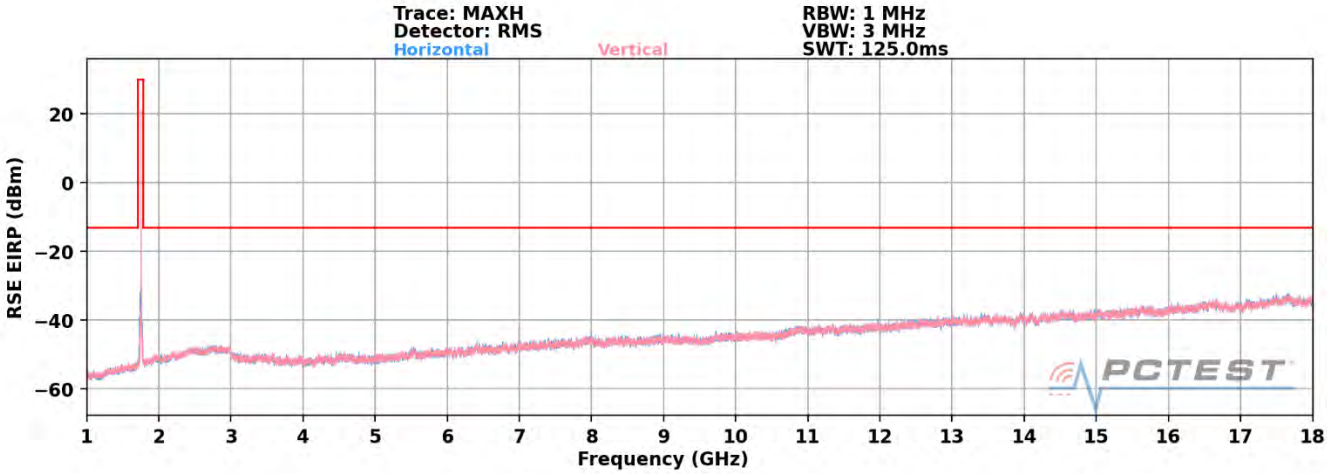
NR Band n66



Plot 7-536. Radiated Spurious Plot above 1GHz (n66 Standalone)



Plot 7-537. Radiated Spurious Plot above 1GHz (n66+ Anchor B5 EN-DC)



Plot 7-538. Radiated Spurious Plot above 1GHz (n66+ Anchor B13 EN-DC)

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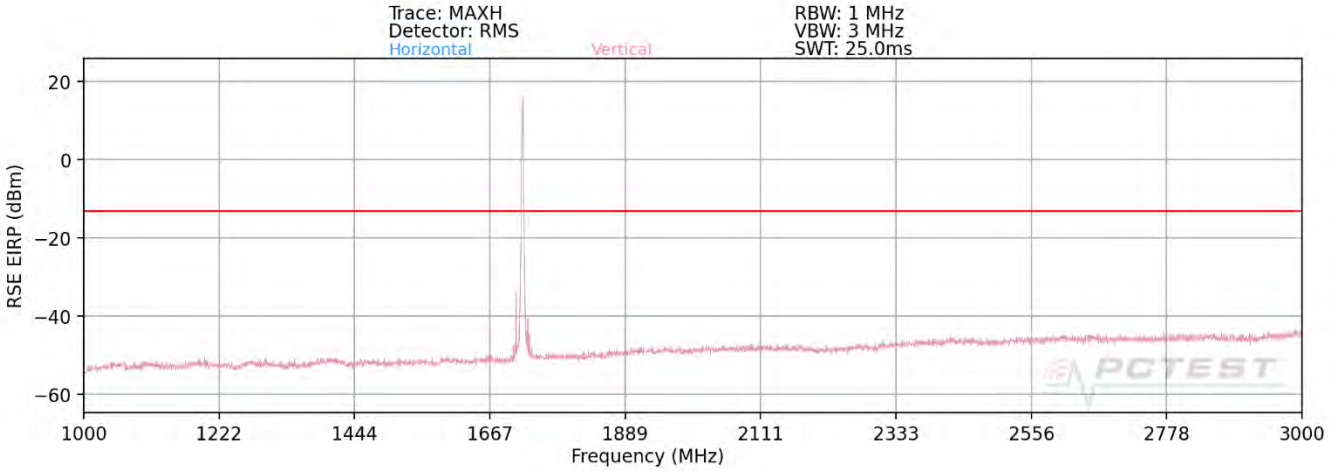
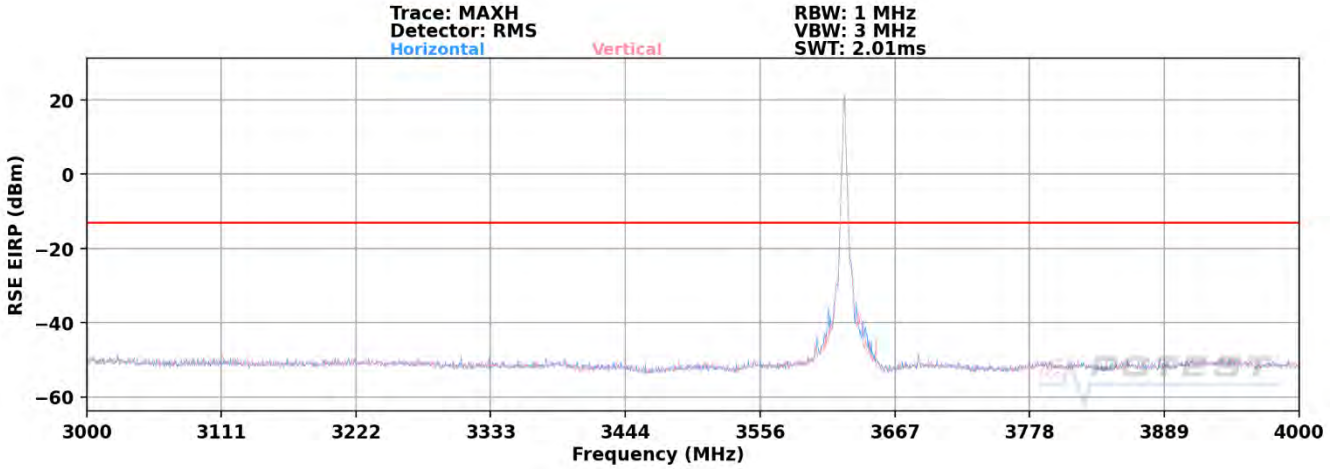
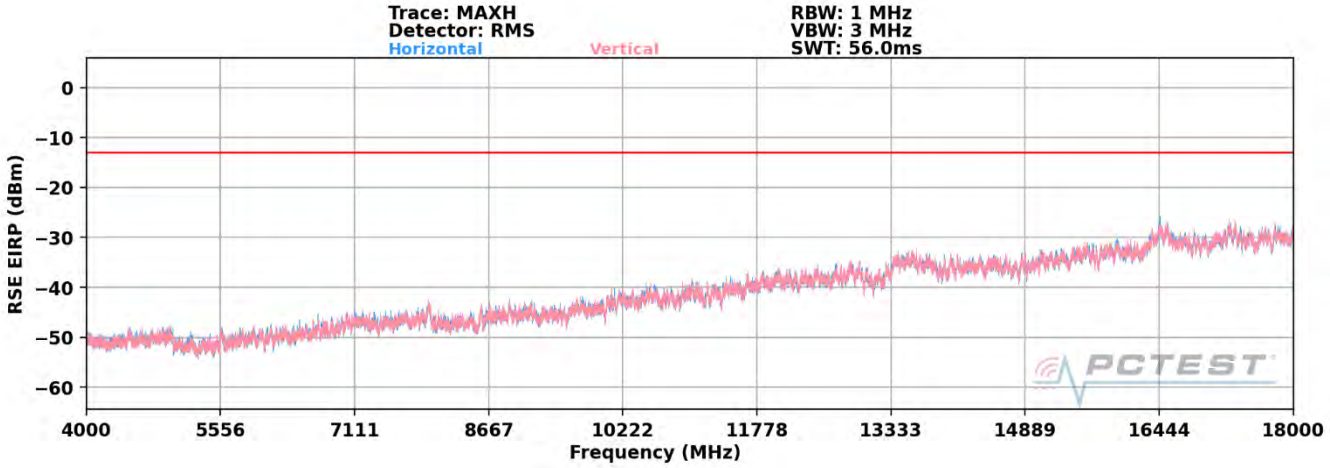


Plot 7-539. Radiated Spurious Plot above 1GHz (n66+ Anchor B48 EN-DC 1GHz – 3GHz)



Plot 7-540. Radiated Spurious Plot above 1GHz (n66+ Anchor B48 EN-DC 3GHz – 4 GHz)



Plot 7-541. Radiated Spurious Plot above 1GHz (n66+ Anchor B48 EN-DC 4GHz – 18GHz)

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OPERATING FREQUENCY: 1720.00 MHz
MODULATION SIGNAL: QPSK (DFT-s-OFDM)
BANDWIDTH: 20.0 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
3440.00	H	-	-	-59.08	6.22	-52.86	-39.9
5160.00	H	-	-	-60.96	8.68	-52.29	-39.3
6880.00	H	-	-	-59.76	8.76	-51.00	-38.0

Table 7-32. Radiated Spurious Data (n66 – Low Channel)

OPERATING FREQUENCY: 1745.00 MHz
MODULATION SIGNAL: QPSK (DFT-s-OFDM)
BANDWIDTH: 20.0 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
3490.00	H	-	-	-58.64	6.32	-52.31	-39.3
5235.00	H	-	-	-60.99	8.71	-52.27	-39.3
6980.00	H	-	-	-60.43	8.74	-51.70	-38.7

Table 7-33. Radiated Spurious Data (n66 – Mid Channel)

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OPERATING FREQUENCY:	1770.00	MHz
MODULATION SIGNAL:	QPSK (DFT-s-OFDM)	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
3540.00	H	-	-	-58.61	6.31	-52.30	-39.3
5310.00	H	-	-	-61.23	8.74	-52.49	-39.5
7080.00	H	-	-	-60.27	8.66	-51.61	-38.6

Table 7-34. Radiated Spurious Data (n66 – High Channel)

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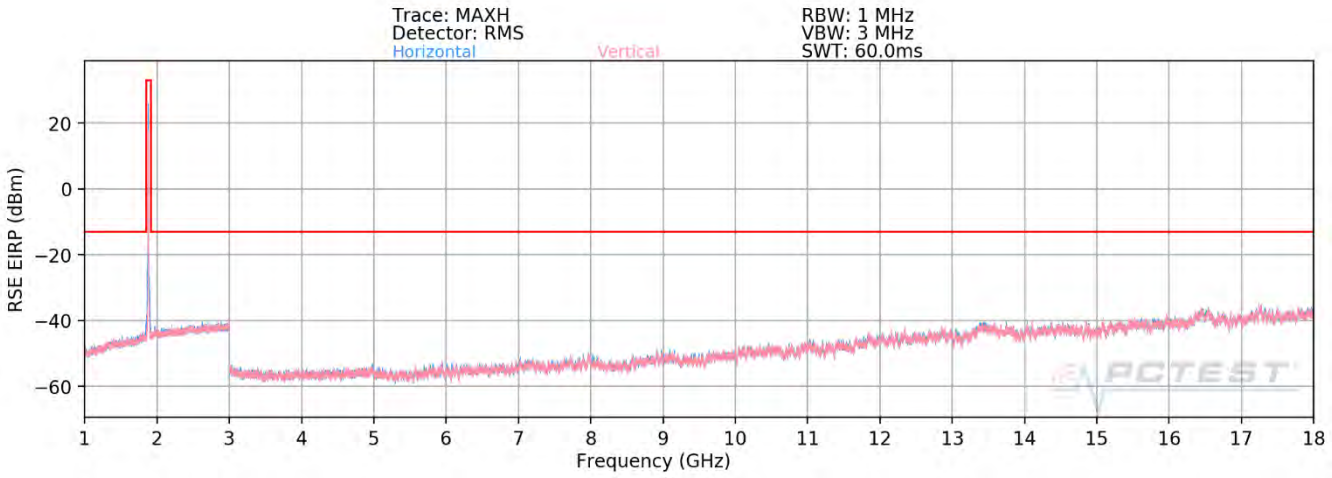
Band 2



Plot 7-542. Radiated Spurious Plot above 1GHz (Band 2)

OPERATING FREQUENCY:	1852.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
3705.00	H	113	49	-66.82	6.58	-60.24	-47.2
5557.50	H	-	-	-69.37	8.74	-60.63	-47.6
7410.00	H	-	-	-68.39	8.41	-59.97	-47.0
9262.50	H	-	-	-66.67	9.33	-57.34	-44.3

Table 7-35. Radiated Spurious Data (Band 2 – Low Channel)

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OPERATING FREQUENCY:	1880.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
3760.00	H	121	48	-66.42	6.67	-59.75	-46.7
5640.00	H	-	-	-70.49	8.81	-61.68	-48.7
7520.00	H	-	-	-68.52	8.48	-60.04	-47.0
9400.00	H	-	-	-67.26	9.32	-57.94	-44.9

Table 7-36. Radiated Spurious Data (Band 2 – Mid Channel)

OPERATING FREQUENCY:	1907.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
3815.00	H	139	51	-64.21	6.87	-57.34	-44.3
5722.50	H	-	-	-70.63	8.76	-61.86	-48.9
7630.00	H	-	-	-67.64	8.47	-59.17	-46.2
9537.50	H	-	-	-66.45	9.37	-57.08	-44.1

Table 7-37. Radiated Spurious Data (Band 2 – High Channel)

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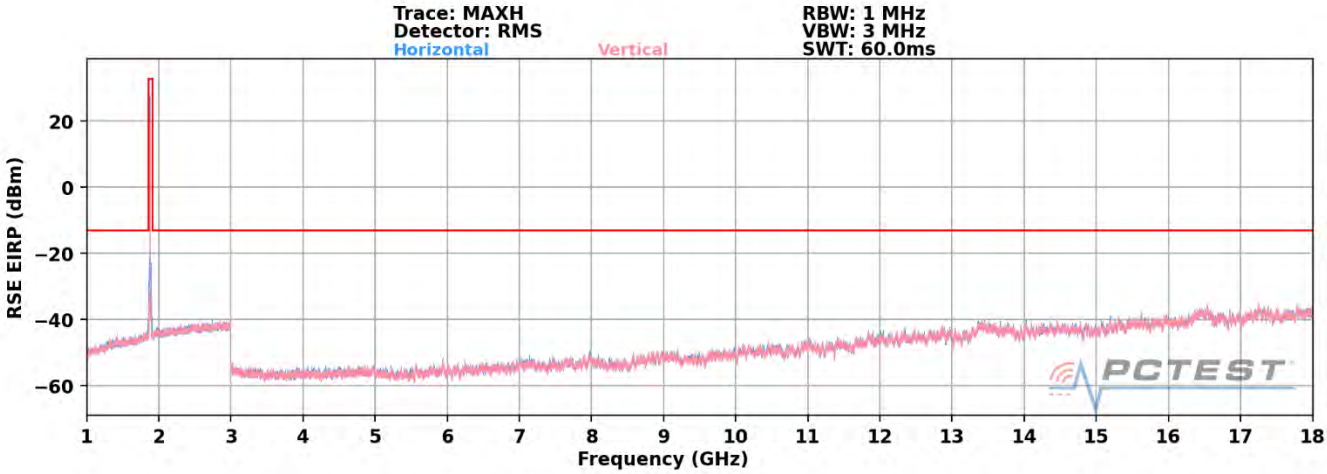
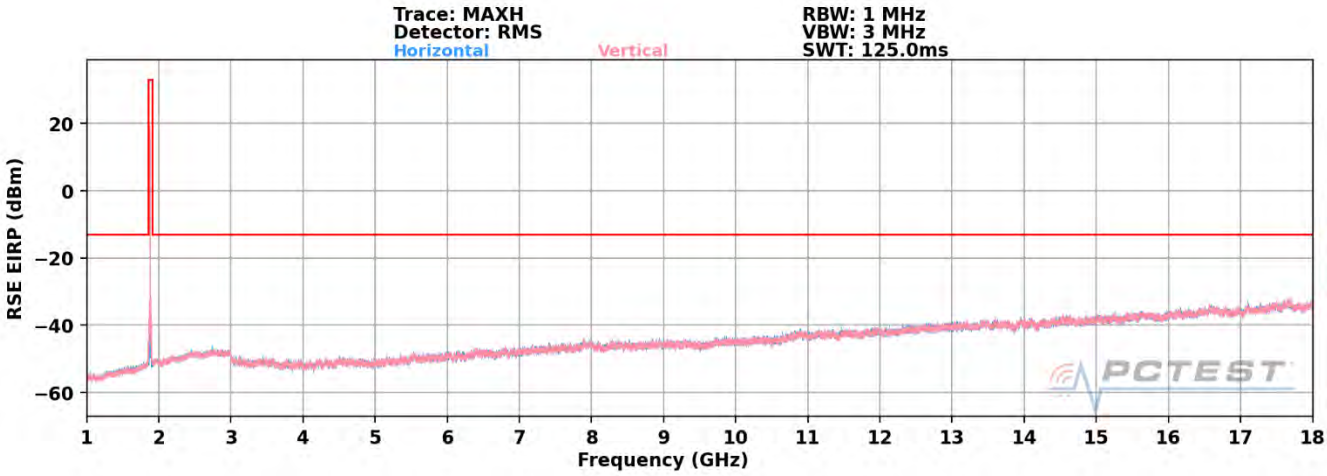
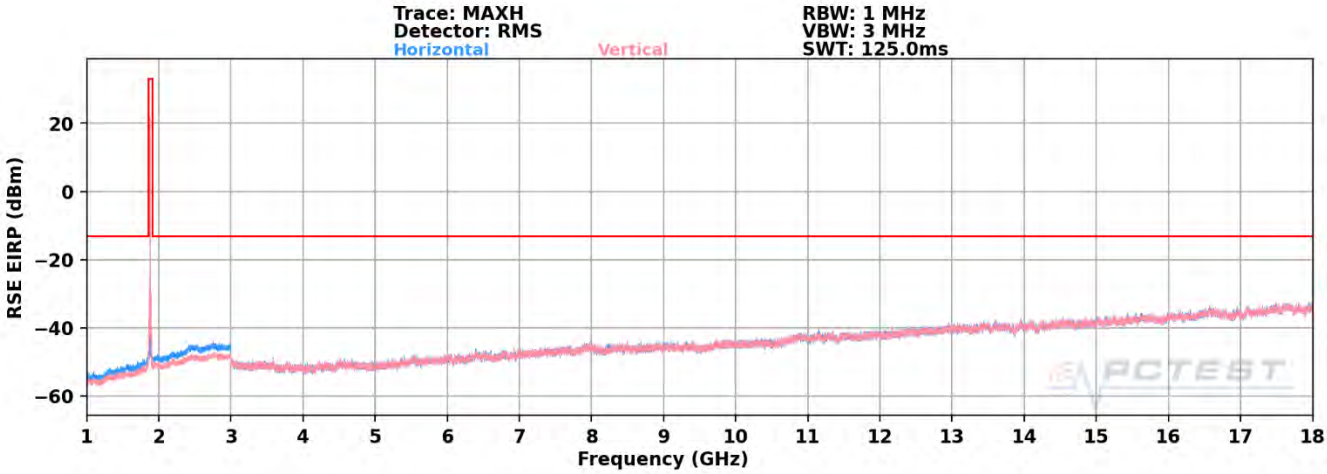
NR Band n2



Plot 7-543. Radiated Spurious Plot above 1GHz (n2 Standalone)



Plot 7-544. Radiated Spurious Plot above 1GHz (n2+ Anchor B13 EN-DC)



Plot 7-545. Radiated Spurious Plot above 1GHz (n2+ Anchor B5 EN-DC)

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OPERATING FREQUENCY: 1860.00 MHz
MODULATION SIGNAL: QPSK (DFT-s-OFDM)
BANDWIDTH: 20.0 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
3720.00	H	277	253	-57.03	6.58	-50.45	-37.4
5580.00	H	-	-	-57.66	8.74	-48.92	-35.9
7440.00	H	-	-	-55.99	8.41	-47.57	-34.6
9300.00	H	-	-	-54.44	9.33	-45.11	-32.1

Table 7-38. Radiated Spurious Data (n2 – Low Channel)

OPERATING FREQUENCY: 1880.00 MHz
MODULATION SIGNAL: QPSK (DFT-s-OFDM)
BANDWIDTH: 20.0 MHz
DISTANCE: 3 meters
LIMIT: -13 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]
3760.00	H	157	53	-57.28	6.67	-50.61	-37.6
5640.00	H	-	-	-59.13	8.81	-50.32	-37.3
7520.00	H	-	-	-56.08	8.48	-47.60	-34.6
9400.00	H	-	-	-55.21	9.32	-45.89	-32.9

Table 7-39. Radiated Spurious Data (n2 – Mid Channel)

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OPERATING FREQUENCY:	1900.00	MHz
MODULATION SIGNAL:	QPSK (DFT-s-OFDM)	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
3800.00	H	162	44	-56.75	6.87	-49.88	-36.9
5700.00	H	-	-	-59.31	8.76	-50.54	-37.5
7600.00	H	-	-	-55.13	8.47	-46.66	-33.7
9500.00	H	-	-	-54.32	9.37	-44.95	-31.9

Table 7-40. Radiated Spurious Data (n2 – High Channel)

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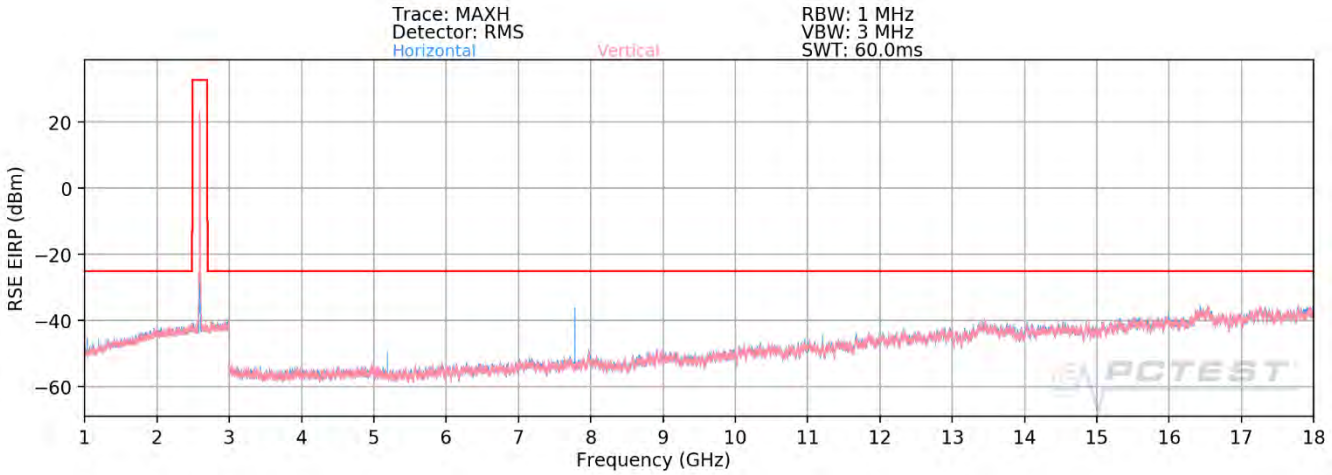
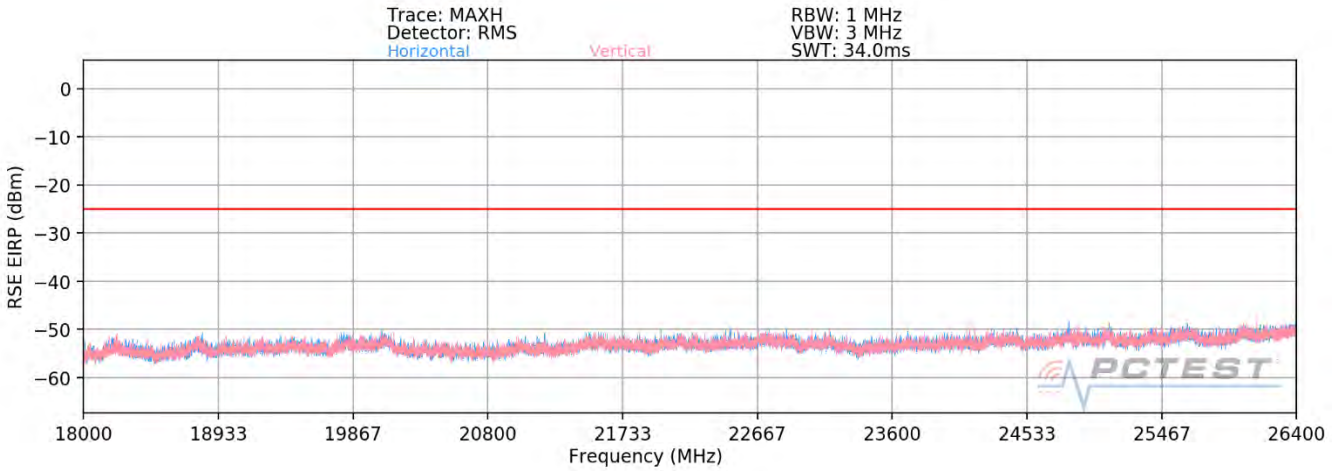
Band 41/38



Plot 7-546. Radiated Spurious Plot above 1GHz (Band 41/38)



Plot 7-547. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41/38)

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OPERATING FREQUENCY: 2506.00 MHz
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	H	107	251	-51.38	8.78	-42.59	-17.6
7518.00	H	100	187	-38.06	9.31	-28.75	-3.7
10024.00	H	226	194	-49.07	9.79	-39.28	-14.3
12530.00	H	241	260	-50.70	8.84	-41.86	-16.9
15036.00	H	-	-	-49.76	8.86	-40.90	-15.9

Table 7-41. Radiated Spurious Data (Band 41/38 – Low Channel)

OPERATING FREQUENCY: 2593.00 MHz
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	H	119	202	-52.12	9.03	-43.10	-18.1
7779.00	H	104	191	-42.85	9.29	-33.56	-8.6
10372.00	H	258	174	-48.55	9.50	-39.05	-14.0
12965.00	H	100	84	-46.13	8.75	-37.37	-12.4
15558.00	H	-	-	-47.94	8.47	-39.47	-14.5

Table 7-42. Radiated Spurious Data (Band 41/38 – Mid Channel)

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OPERATING FREQUENCY:	2680.00	MHz
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	H	115	48	-51.98	8.99	-42.99	-18.0
8040.00	H	118	335	-42.73	9.35	-33.37	-8.4
10720.00	H	213	356	-51.11	9.39	-41.72	-16.7
13400.00	H	211	34	-48.26	8.67	-39.59	-14.6
16080.00	H	-	-	-46.19	8.46	-37.73	-12.7

Table 7-43. Radiated Spurious Data (Band 41/38 – High Channel)

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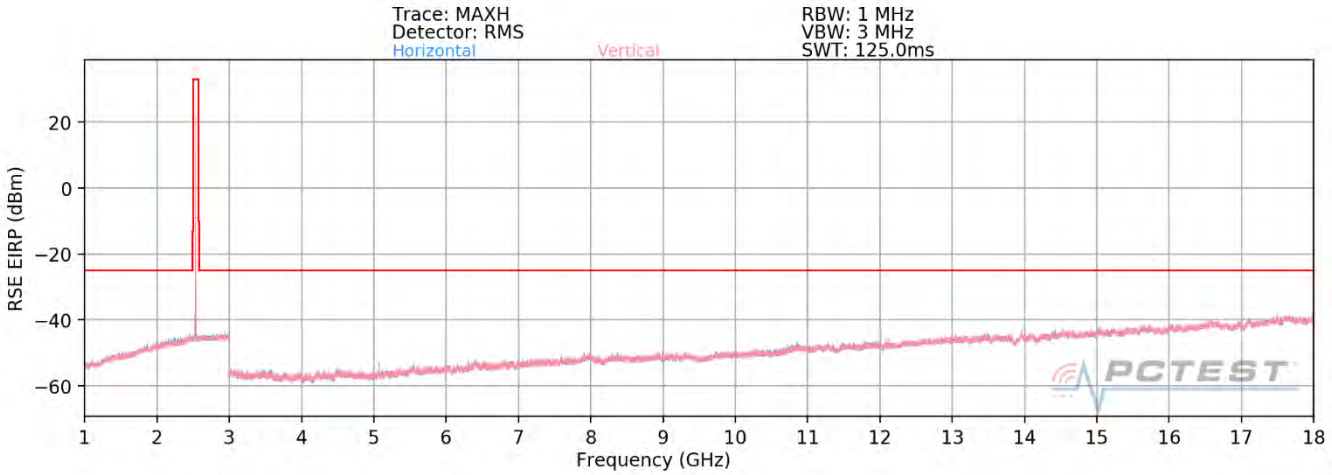
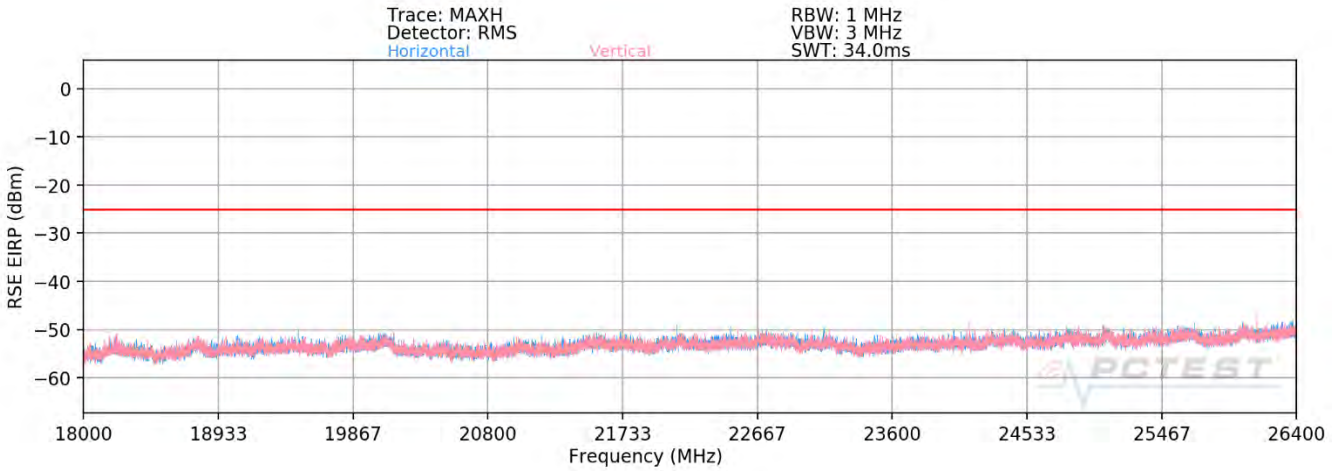
Band 7



Plot 7-548. Radiated Spurious Plot above 1GHz (Band 7)



Plot 7-549. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7)

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OPERATING FREQUENCY: 2510.00 MHz
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]
5020.00	H	102	57	-62.92	8.56	-54.36	-29.4
7530.00	H	-	-	-67.75	8.46	-59.29	-34.3
10040.00	H	-	-	-64.69	9.85	-54.84	-29.8

Table 7-44. Radiated Spurious Data (Band 7 – Low Channel)

OPERATING FREQUENCY: 2535.00 MHz
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]
5070.00	H	115	57	-64.12	8.60	-55.52	-30.5
7605.00	H	-	-	-67.58	8.48	-59.10	-34.1
10140.00	H	-	-	-65.86	9.78	-56.08	-31.1

Table 7-45. Radiated Spurious Data (Band 7 – Mid Channel)

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OPERATING FREQUENCY:	2560.00	MHz
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]
5120.00	H	102	64	-64.77	8.66	-56.11	-31.1
7680.00	H	-	-	-66.93	8.58	-58.35	-33.3
10240.00	H	-	-	-64.71	9.65	-55.06	-30.1

Table 7-46. Radiated Spurious Data (Band 7 – High Channel)

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7.9 Uplink Carrier Aggregation Radiated Measurements
§2.1053, §27.53(m)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 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 peak 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 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – 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. No. of sweep points ≥ 2 x span / RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. The trace was allowed to stabilize

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Test Setup

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

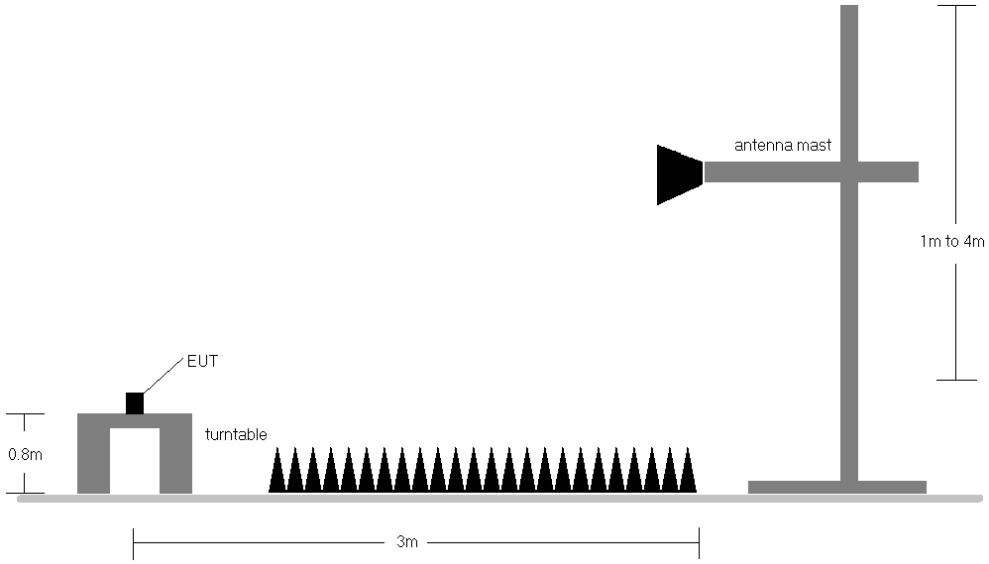

Figure 7-9. Test Instrument & Measurement Setup

Test Notes

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

2) This unit was tested with its standard battery.

3) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.

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) No significant emissions were found as a result of two uplink carriers operating contiguously.

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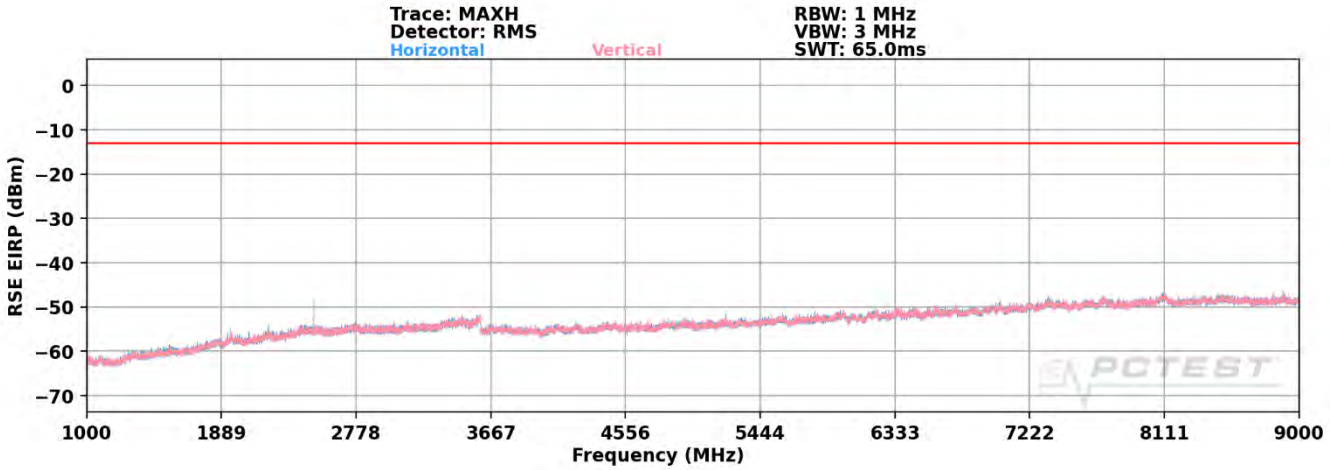
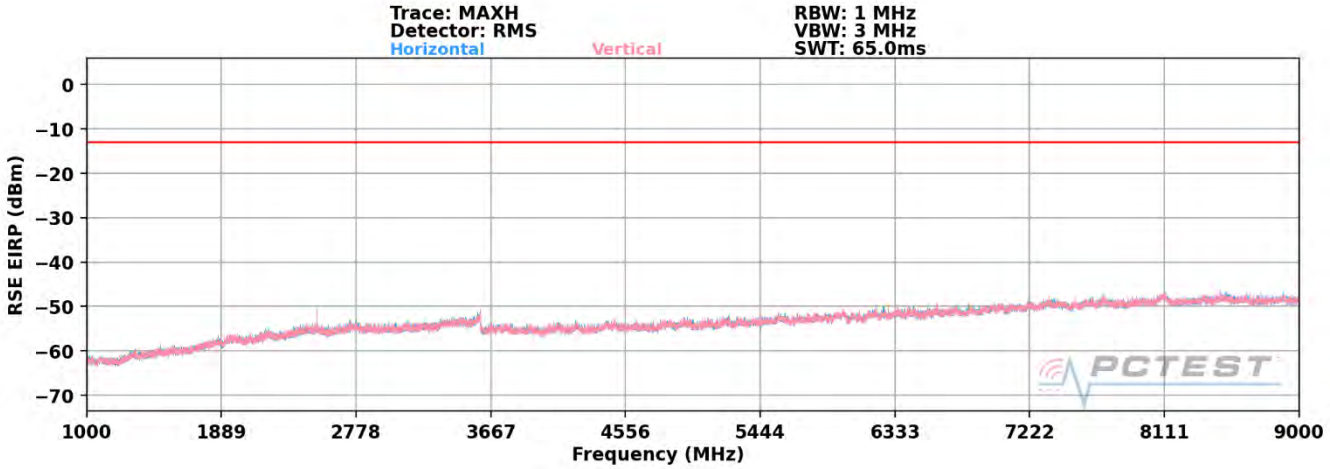
ULCA Band 5



Plot 7-550. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 5 Low Channel – PCC/SCC: 1RB)



Plot 7-551. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 5 High Channel – PCC/SCC: 1RB)

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OPERATING FREQUENCY (PCC):	829.00	MHz
OPERATING FREQUENCY (SCC):	838.90	MHz
CHANNEL (PCC):	20450	
CHANNEL (SCC):	20549	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
1658.00	H	-	-	-62.47	3.61	-58.86	-45.9
2487.00	H	400	361	-53.33	4.25	-49.08	-36.1
3316.00	H	-	-	-60.06	5.83	-54.23	-41.2
4145.00	H	-	-	-59.12	7.66	-51.45	-38.5
4974.00	H	-	-	-65.84	8.56	-57.27	-44.3

Plot 7-47. Radiated Spurious Data (ULCA B5 PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Low Channel)

OPERATING FREQUENCY (PCC):	844.00	MHz
OPERATING FREQUENCY (SCC):	834.10	MHz
CHANNEL (PCC):	20600	
CHANNEL (SCC):	20501	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
1688.00	H	-	-	-62.88	3.63	-59.25	-46.3
2532.00	H	304	356	-51.18	4.47	-46.71	-33.7
3376.00	H	-	-	-59.27	6.05	-53.22	-40.2
4220.00	H	-	-	-65.78	7.75	-58.03	-45.0
5064.00	H	-	-	-65.87	8.59	-57.28	-44.3

Plot 7-48. Radiated Spurious Data (ULCA B5 PCC: RB 1 Offset 0, SCC: RB 1 Offset 49 – High Channel)

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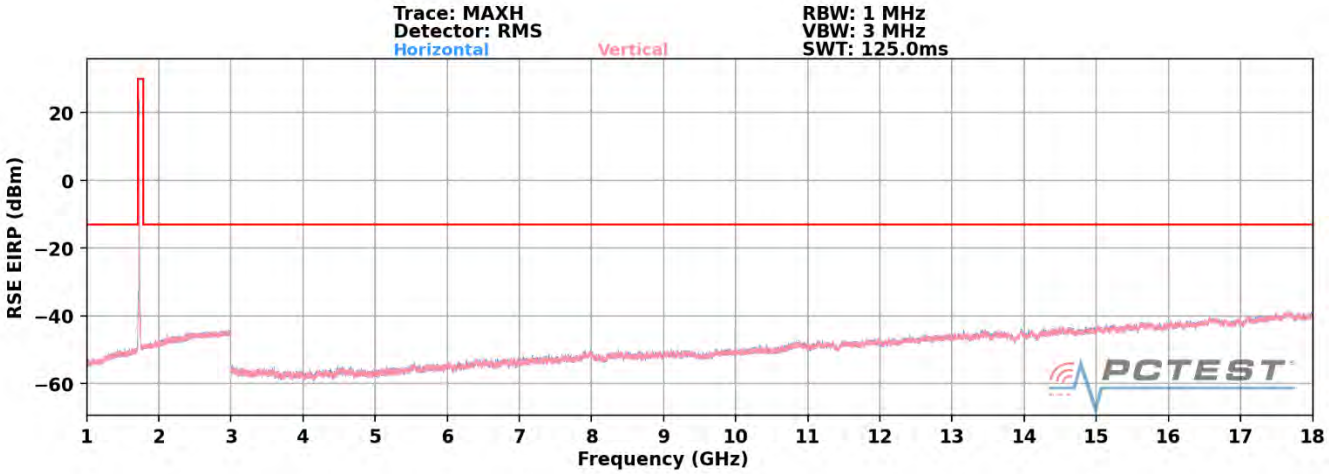
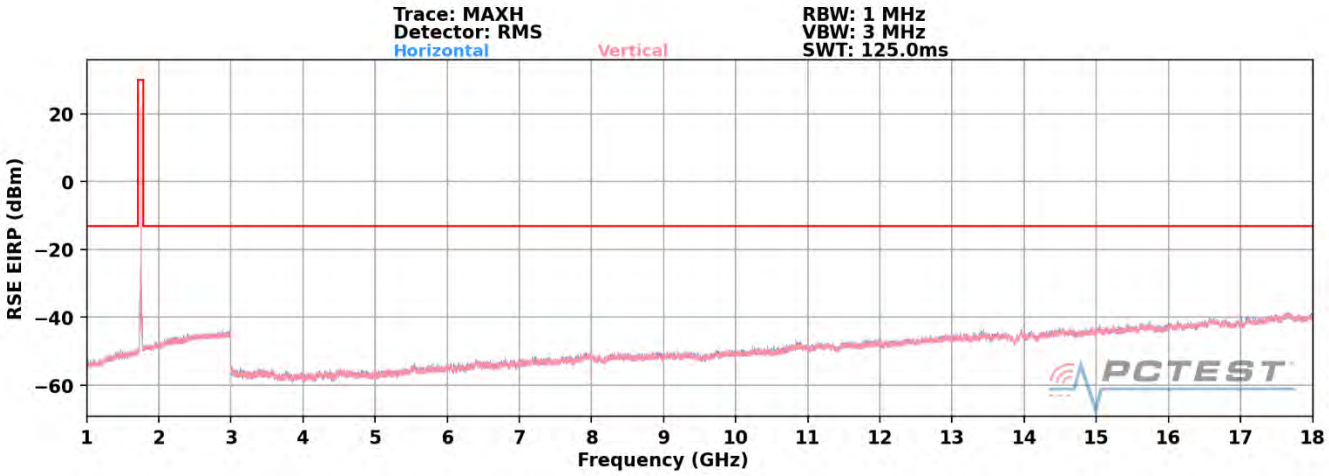
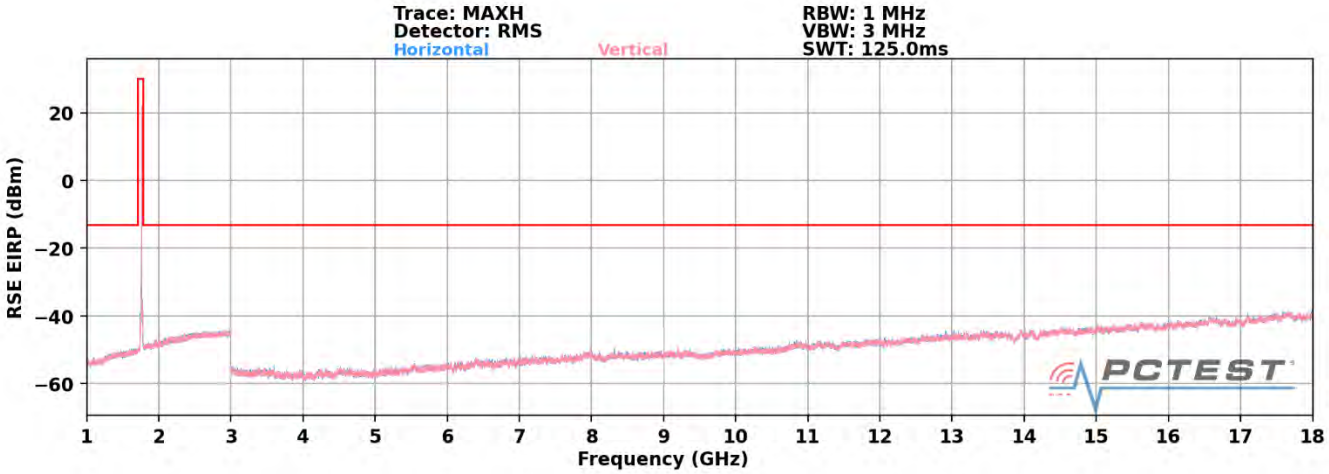
ULCA Band 66



Plot 7-552. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 66 Low Channel – PCC/SCC: 1RB)



Plot 7-553. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 66 Mid Channel – PCC/SCC: 1RB)



Plot 7-554. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 66 High Channel – PCC/SCC: 1RB)

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OPERATING FREQUENCY (PCC):	1720.00	MHz
OPERATING FREQUENCY (SCC):	1739.80	MHz
CHANNEL (PCC):	132072	
CHANNEL (SCC):	132270	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
3440.00	V	-	-	-59.26	6.22	-53.04	-40.0
5160.00	V	-	-	-64.90	8.68	-56.22	-43.2
6880.00	V	-	-	-62.17	8.76	-53.42	-40.4
8600.00	V	-	-	-61.45	9.17	-52.28	-39.3

Plot 7-49. Radiated Spurious Data (ULCA B66 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Low Channel)

OPERATING FREQUENCY (PCC):	1745.00	MHz
OPERATING FREQUENCY (SCC):	1764.80	MHz
CHANNEL (PCC):	132322	
CHANNEL (SCC):	132520	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
3490.00	V	219	308	-59.33	6.32	-53.01	-40.0
5235.00	V	-	-	-64.77	8.71	-56.06	-43.1
6980.00	V	-	-	-62.50	8.74	-53.76	-40.8
8725.00	V	-	-	-61.94	9.42	-52.52	-39.5

Plot 7-50. Radiated Spurious Data (ULCA B66 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Mid Channel)

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OPERATING FREQUENCY (PCC):	1770.00	MHz
OPERATING FREQUENCY (SCC):	1750.20	MHz
CHANNEL (PCC):	132572	
CHANNEL (SCC):	132374	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	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]
3540.00	V	117	63	-58.69	6.31	-52.38	-39.4
5310.00	V	-	-	-65.53	8.74	-56.79	-43.8
7080.00	V	-	-	-62.21	8.66	-53.55	-40.5
8850.00	V	-	-	-61.50	9.53	-51.97	-39.0

Plot 7-51. Radiated Spurious Data (ULCA B66 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 – High Channel)

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7.10 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 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency.

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

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Band 12 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz

CHANNEL: 23790

REFERENCE VOLTAGE: 4.16 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.16	- 30	707,500,098	98	0.0000139
100 %		- 20	707,500,127	127	0.0000180
100 %		- 10	707,499,925	-75	-0.0000106
100 %		0	707,499,978	-22	-0.0000031
100 %		+ 10	707,499,721	-279	-0.0000394
100 %		+ 20	707,500,043	43	0.0000061
100 %		+ 30	707,499,964	-36	-0.0000051
100 %		+ 40	707,499,792	-208	-0.0000294
100 %		+ 50	707,500,029	29	0.0000041
BATT. ENDPOINT	3.21	+ 20	707,499,986	-14	-0.0000020

Table 7-52. Frequency Stability Data (Band 12)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Band 12 Frequency Stability Measurements

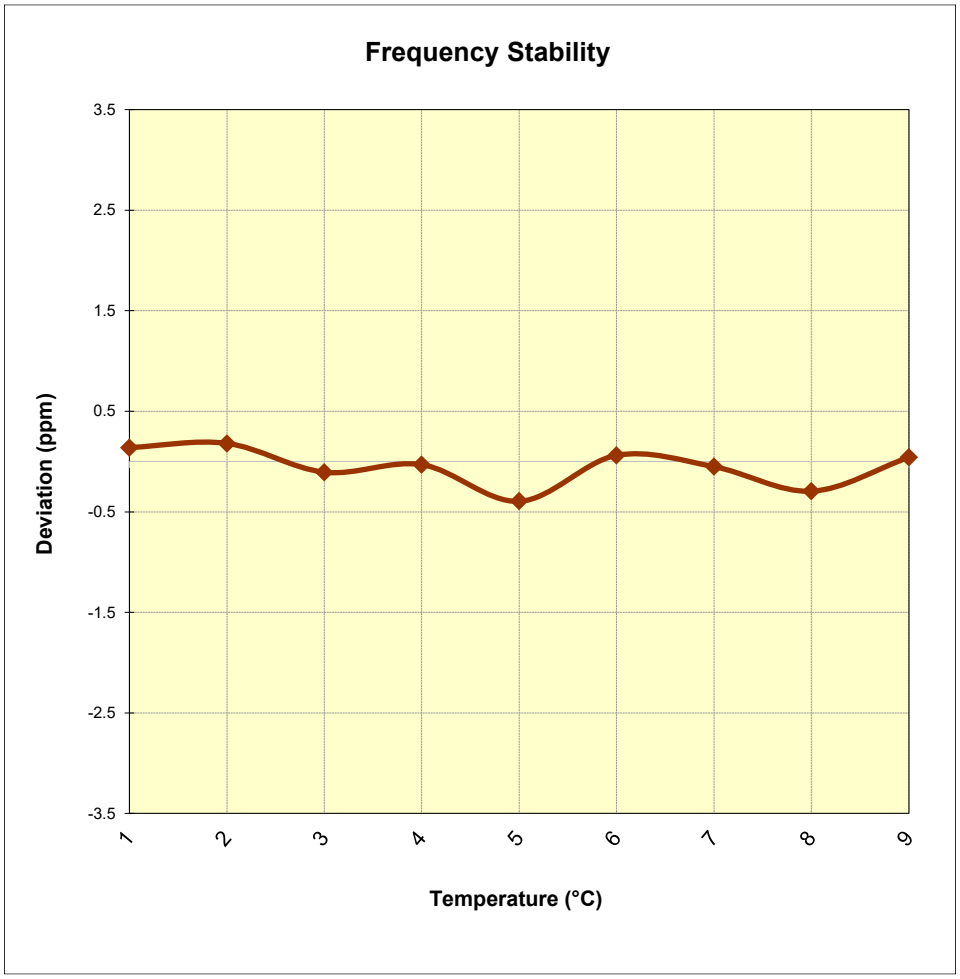

Figure 7-10. Frequency Stability Graph (Band 12)

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Band 13 Frequency Stability Measurements

OPERATING FREQUENCY: 782,000,000 Hz

CHANNEL: 23230

REFERENCE VOLTAGE: 4.16 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.16	- 30	781,999,900	-100	-0.0000128
100 %		- 20	782,000,012	12	0.0000015
100 %		- 10	782,000,134	134	0.0000171
100 %		0	782,000,309	309	0.0000395
100 %		+ 10	781,999,984	-16	-0.0000020
100 %		+ 20	781,999,701	-299	-0.0000382
100 %		+ 30	782,000,068	68	0.0000087
100 %		+ 40	782,000,327	327	0.0000418
100 %		+ 50	781,999,641	-359	-0.0000459
BATT. ENDPOINT	3.21	+ 20	781,999,938	-62	-0.0000079

Table 7-53. Frequency Stability Data (Band 13)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Band 13 Frequency Stability Measurements

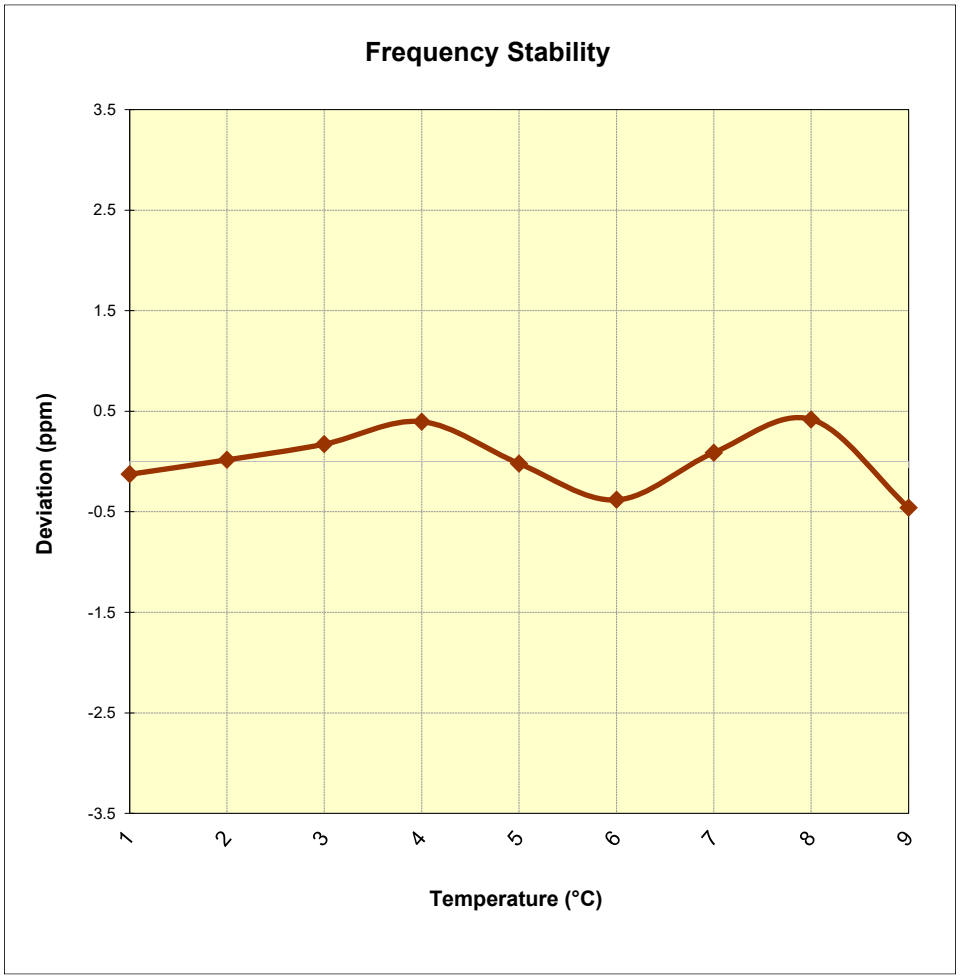

Figure 7-11. Frequency Stability Graph (Band 13)

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Band 26/5 Frequency Stability Measurements

OPERATING FREQUENCY:	831,500,000	Hz
CHANNEL:	26865	
REFERENCE VOLTAGE:	4.16	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.16	- 30	831,499,882	-118	-0.0000142
100 %		- 20	831,500,301	301	0.0000362
100 %		- 10	831,499,880	-120	-0.0000144
100 %		0	831,500,148	148	0.0000178
100 %		+ 10	831,499,968	-32	-0.0000038
100 %		+ 20	831,499,662	-338	-0.0000406
100 %		+ 30	831,500,040	40	0.0000048
100 %		+ 40	831,499,911	-89	-0.0000107
100 %		+ 50	831,500,075	75	0.0000090
BATT. ENDPOINT	3.21	+ 20	831,499,894	-106	-0.0000127

Table 7-54. Frequency Stability Data (Band 26)

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Band 26/5 Frequency Stability Measurements

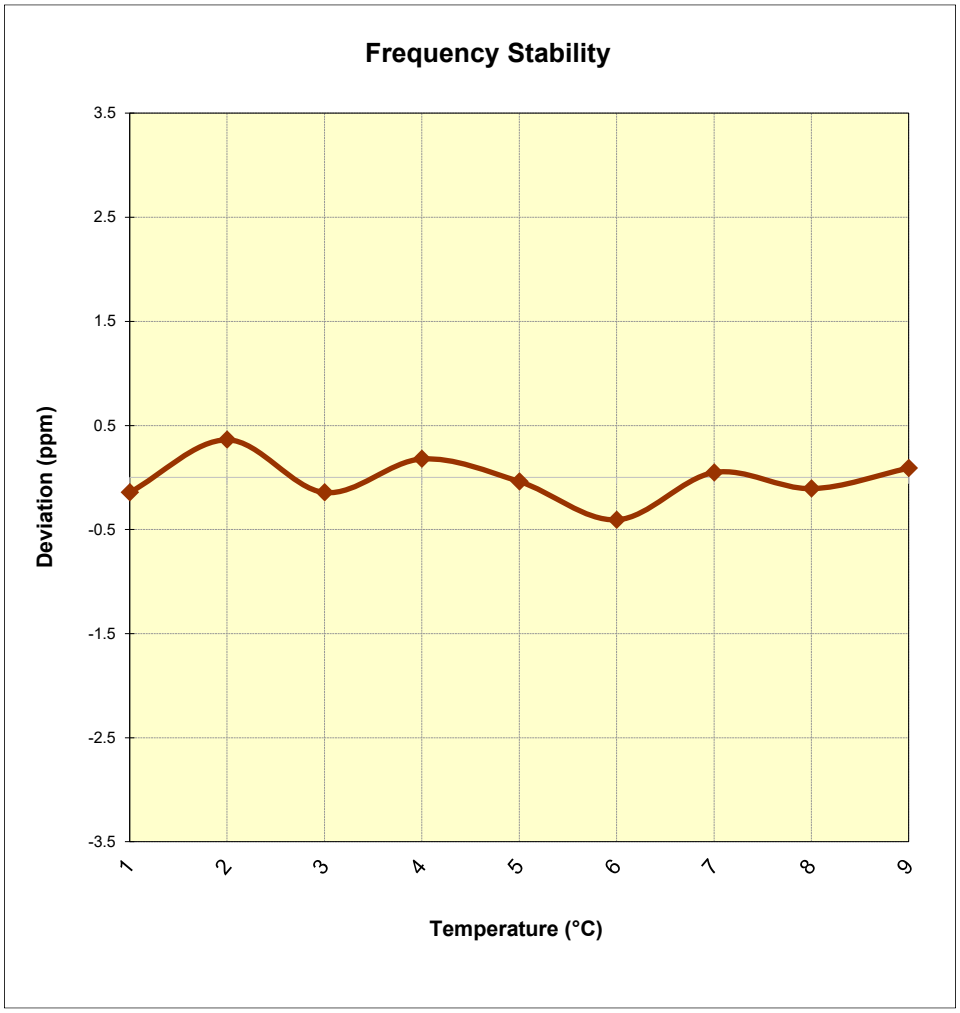

Figure 7-12. Frequency Stability Graph (Band 26)

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Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz

CHANNEL: 132322

REFERENCE VOLTAGE: 4.16 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.16	- 30	1,744,999,943	-57	-0.0000033
100 %		- 20	1,744,999,732	-268	-0.0000154
100 %		- 10	1,744,999,749	-251	-0.0000144
100 %		0	1,745,000,103	103	0.0000059
100 %		+ 10	1,744,999,978	-22	-0.0000013
100 %		+ 20	1,744,999,995	-5	-0.0000003
100 %		+ 30	1,745,000,351	351	0.0000201
100 %		+ 40	1,745,000,166	166	0.0000095
100 %		+ 50	1,745,000,124	124	0.0000071
BATT. ENDPOINT	3.21	+ 20	1,744,999,994	-6	-0.0000003

Table 7-55. Frequency Stability Data (Band 66/4)

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Band 66/4 Frequency Stability Measurements

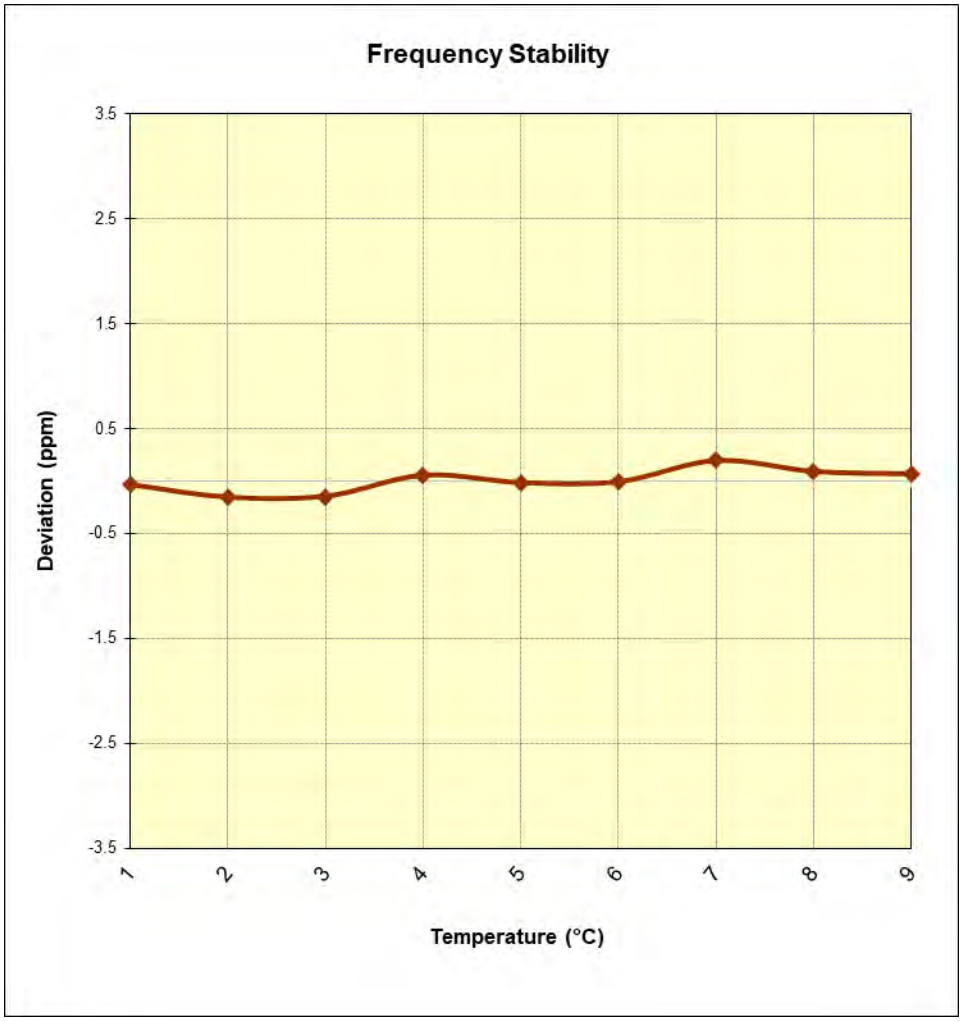

Figure 7-13. Frequency Stability Graph (Band 66/4)

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Band 2 Frequency Stability Measurements

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	18900	
REFERENCE VOLTAGE:	4.16	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.16	- 30	1,880,000,095	95	0.0000051
100 %		- 20	1,879,999,888	-112	-0.0000060
100 %		- 10	1,880,000,078	78	0.0000041
100 %		0	1,880,000,062	62	0.0000033
100 %		+ 10	1,880,000,001	1	0.0000001
100 %		+ 20	1,880,000,234	234	0.0000124
100 %		+ 30	1,879,999,704	-296	-0.0000157
100 %		+ 40	1,880,000,156	156	0.0000083
100 %		+ 50	1,879,999,887	-113	-0.0000060
BATT. ENDPOINT	3.21	+ 20	1,879,999,886	-114	-0.0000061

Table 7-56. Frequency Stability Data (Band 2)

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Band 2 Frequency Stability Measurements

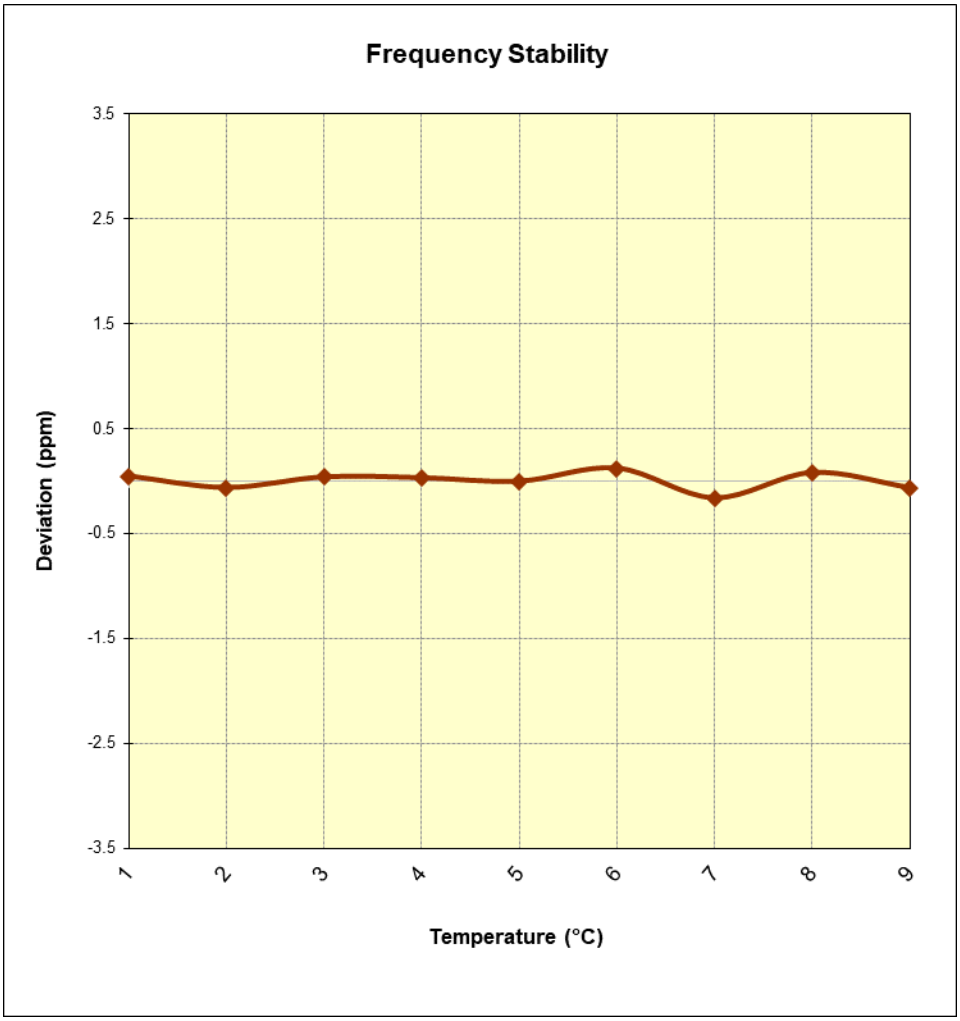

Figure 7-14. Frequency Stability Graph (Band 2)

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Band 41/38 Frequency Stability Measurements

OPERATING FREQUENCY: 2,593,000,000 Hz

CHANNEL: 40620

REFERENCE VOLTAGE: 4.16 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.16	- 30	2,593,000,029	29	0.0000011
100 %		- 20	2,592,999,885	-115	-0.0000044
100 %		- 10	2,593,000,231	231	0.0000089
100 %		0	2,592,999,838	-162	-0.0000062
100 %		+ 10	2,592,999,753	-247	-0.0000095
100 %		+ 20	2,592,999,994	-6	-0.0000002
100 %		+ 30	2,593,000,059	59	0.0000023
100 %		+ 40	2,592,999,716	-284	-0.0000110
100 %		+ 50	2,593,000,072	72	0.0000028
BATT. ENDPOINT	3.21	+ 20	2,593,000,088	88	0.0000034

Table 7-57. Frequency Stability Data (Band 41/38)

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Band 41/38 Frequency Stability Measurements

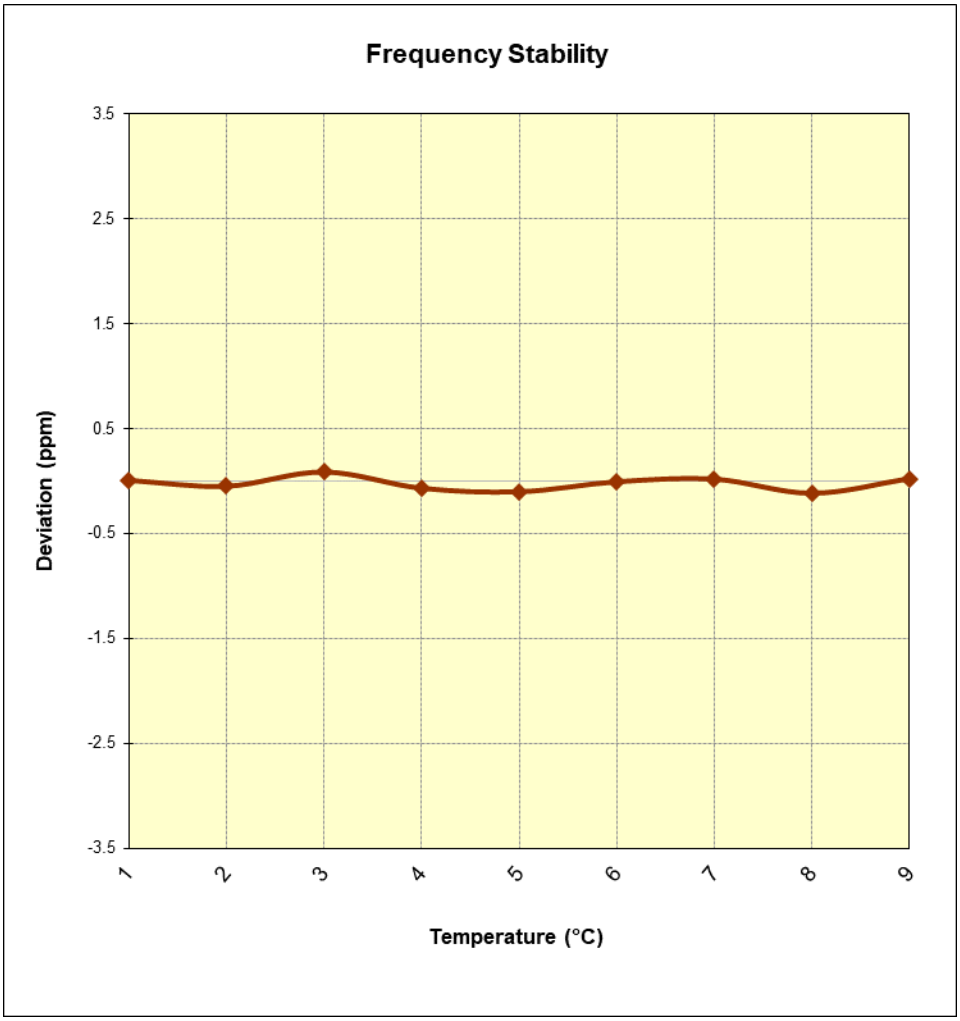

Figure 7-15. Frequency Stability Graph (Band 41/38)

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Band 7 Frequency Stability Measurements

OPERATING FREQUENCY: 2,535,000,000 Hz

CHANNEL: 21100

REFERENCE VOLTAGE: 4.16 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.16	- 30	2,535,000,103	103	0.0000041
100 %		- 20	2,534,999,852	-148	-0.0000058
100 %		- 10	2,534,999,857	-143	-0.0000056
100 %		0	2,535,000,272	272	0.0000107
100 %		+ 10	2,535,000,212	212	0.0000084
100 %		+ 20	2,534,999,862	-138	-0.0000054
100 %		+ 30	2,535,000,235	235	0.0000093
100 %		+ 40	2,534,999,826	-174	-0.0000069
100 %		+ 50	2,534,999,953	-47	-0.0000019
BATT. ENDPOINT	3.21	+ 20	2,534,999,825	-175	-0.0000069

Table 7-58. Frequency Stability Data (Band 7)

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Band 7 Frequency Stability Measurements

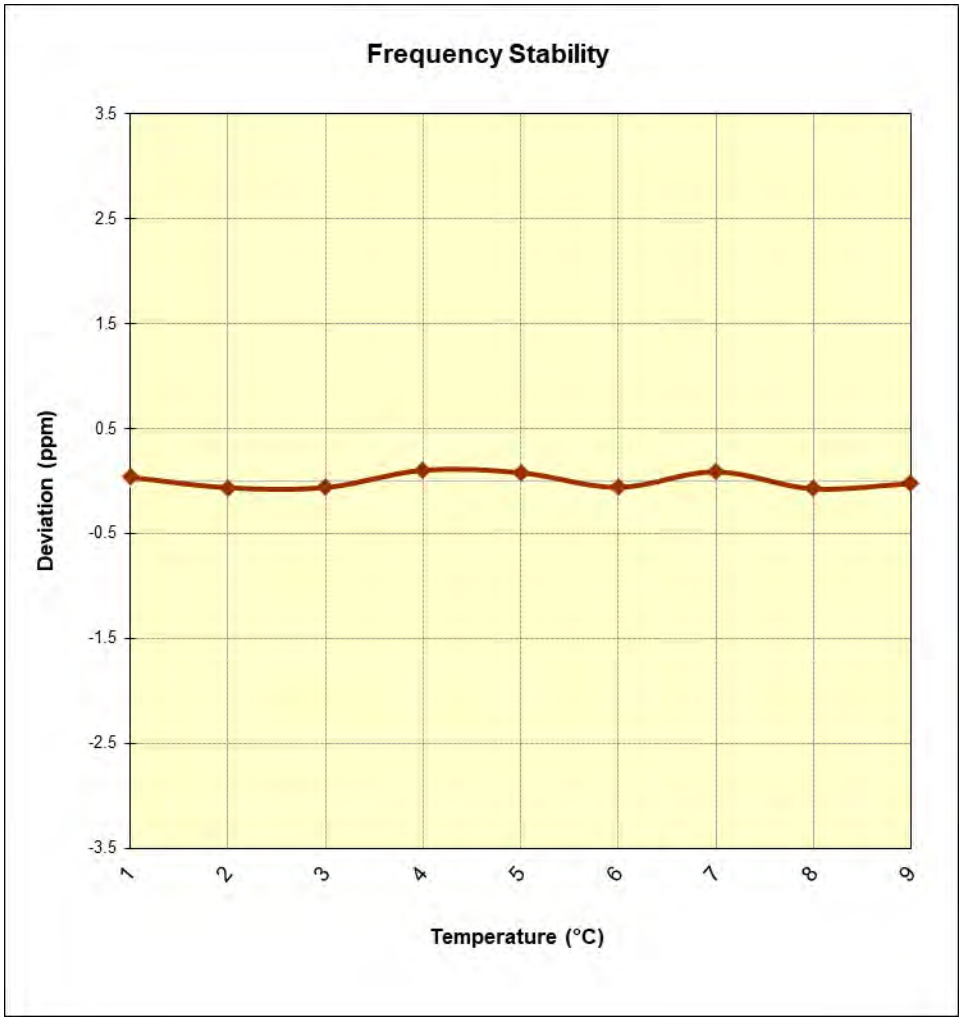

Figure 7-16. Frequency Stability Graph (Band 7)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG981V** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE and Sub6 GHz NR operation only.

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