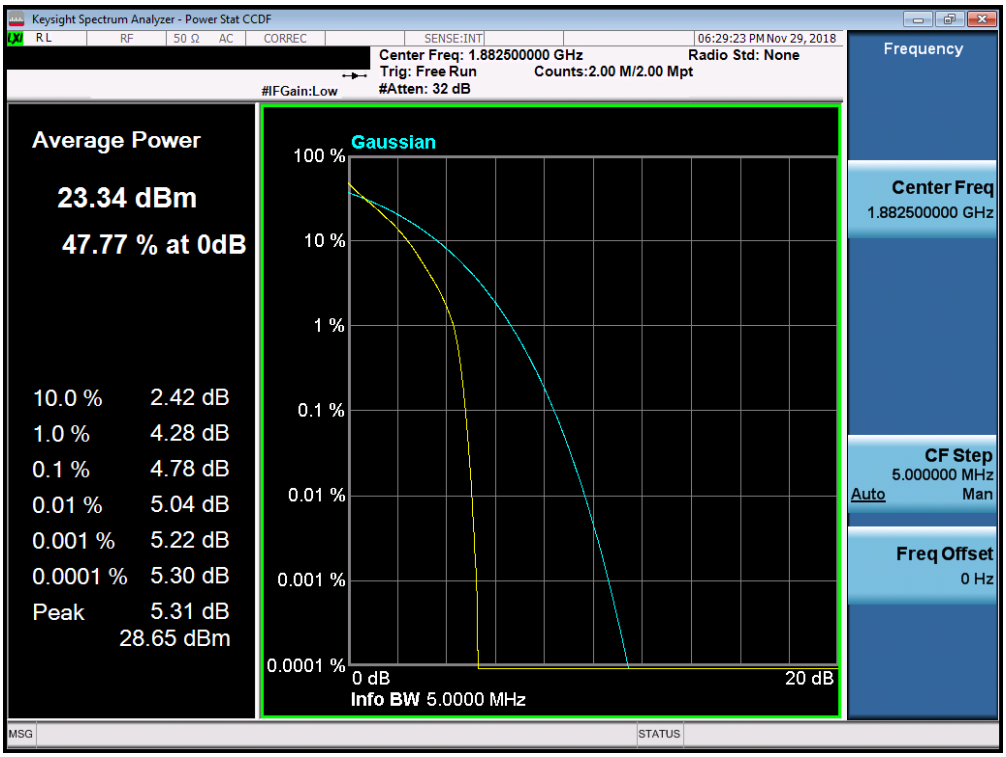
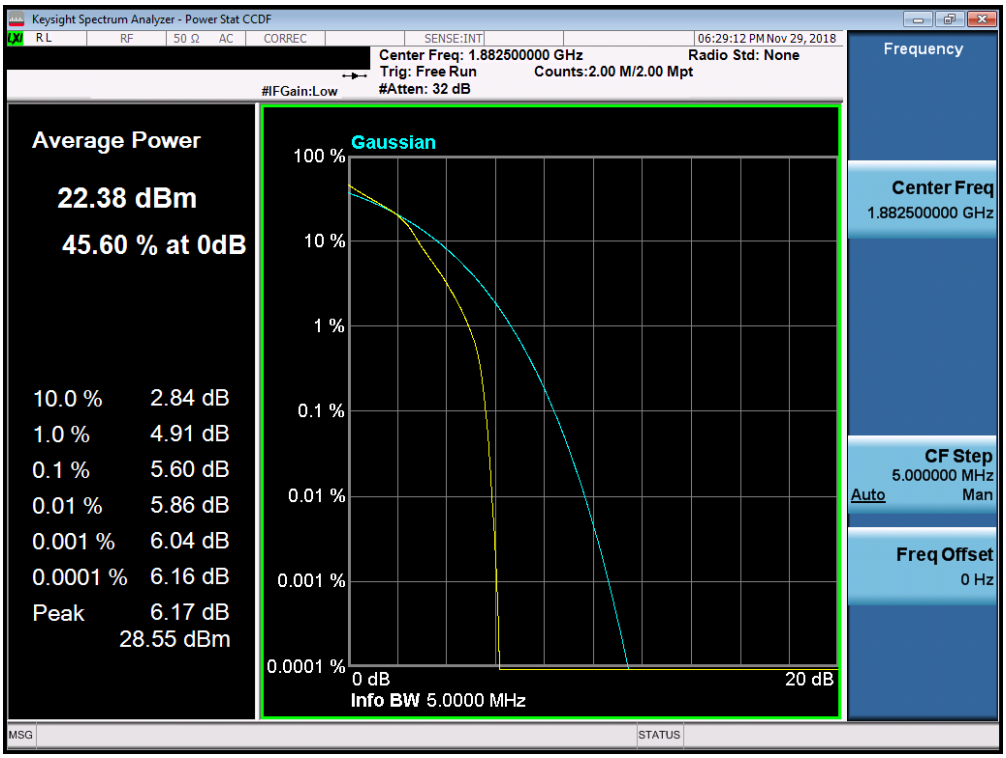


Plot 7-270. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-271. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

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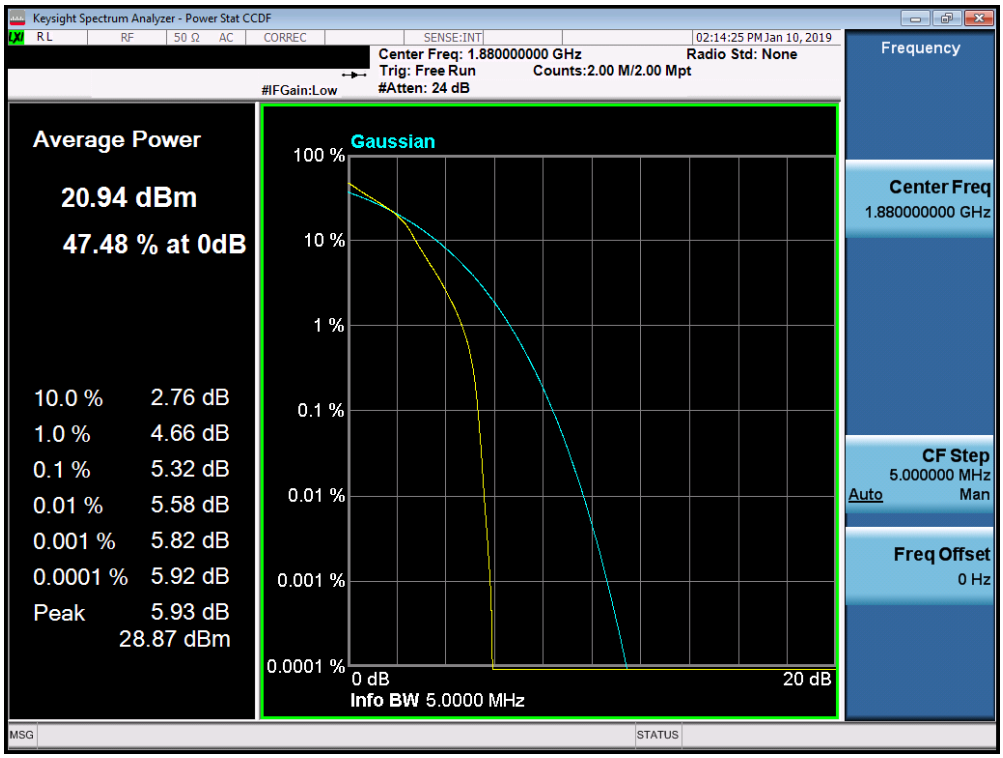
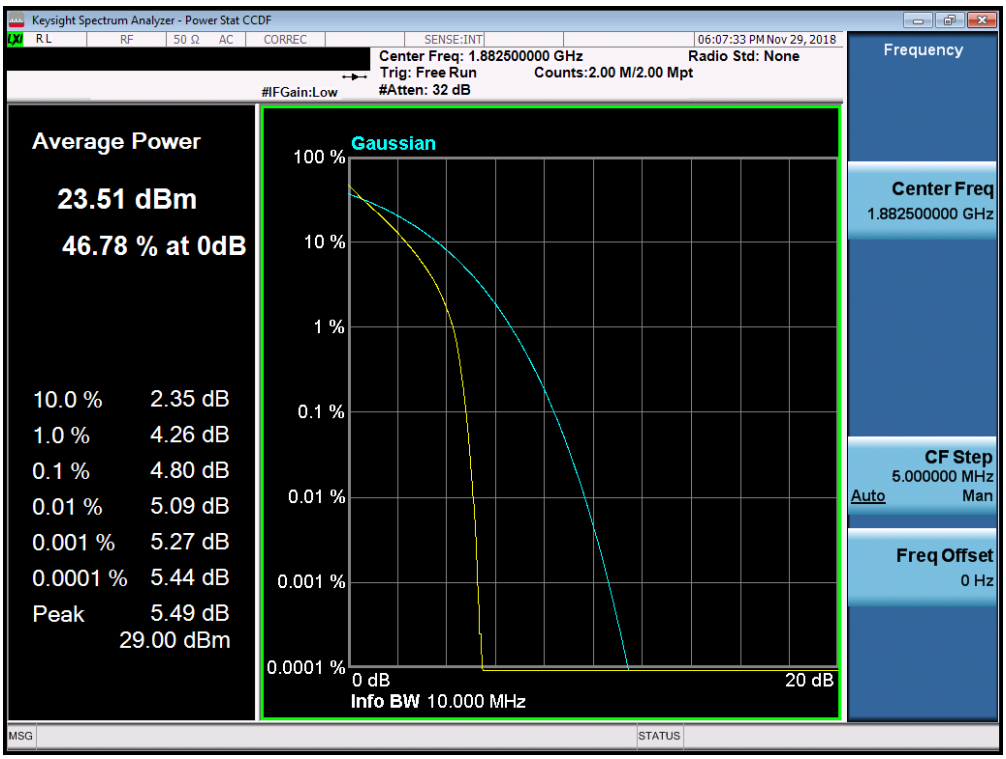


Plot 7-272. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-273. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

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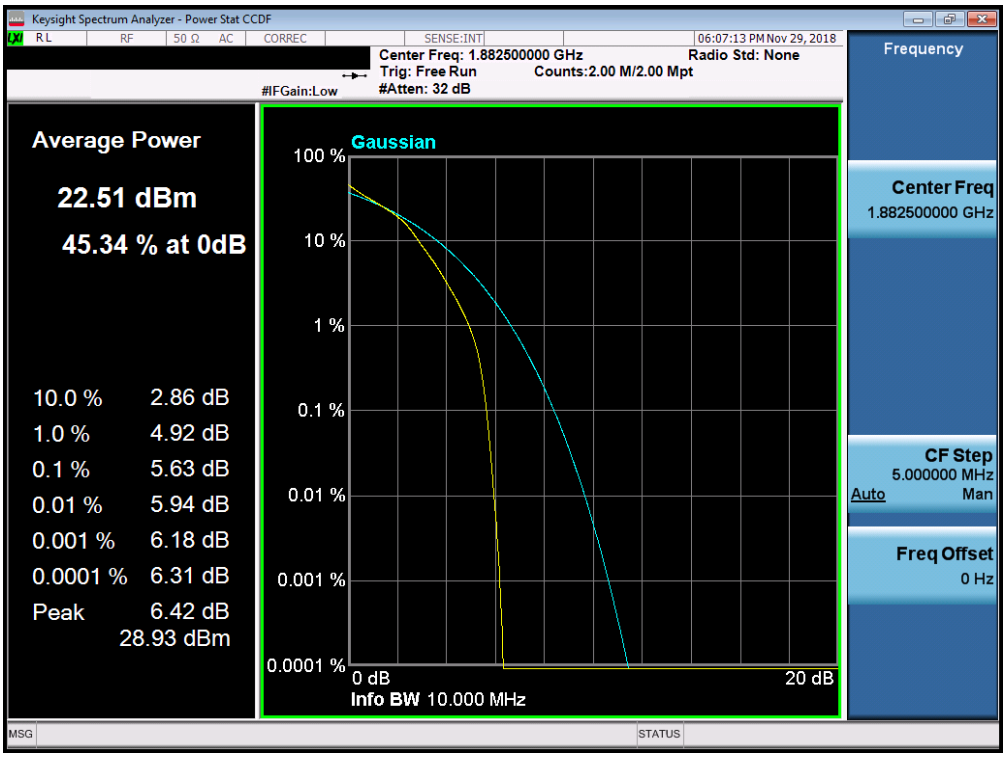
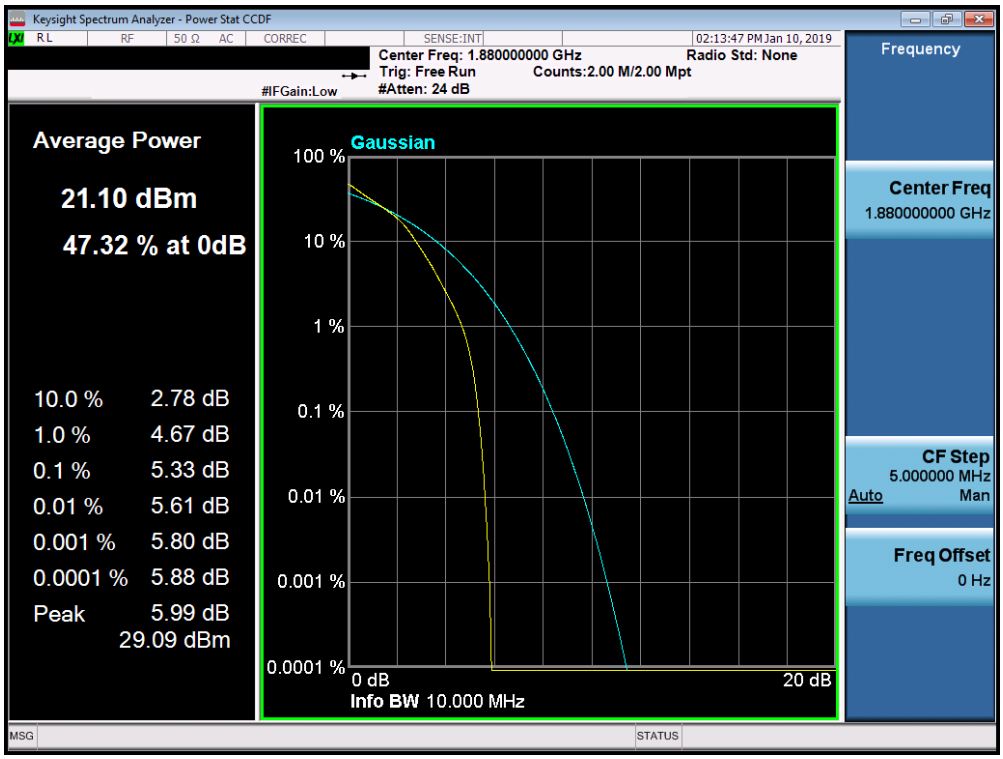


Plot 7-274. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-275. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)

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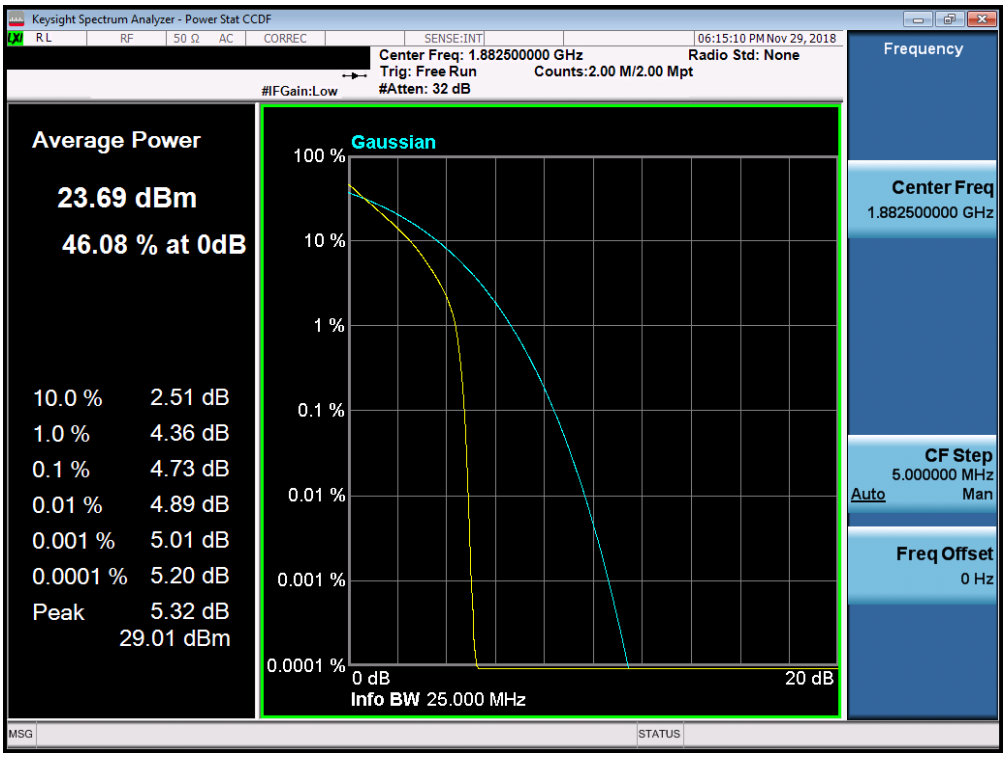
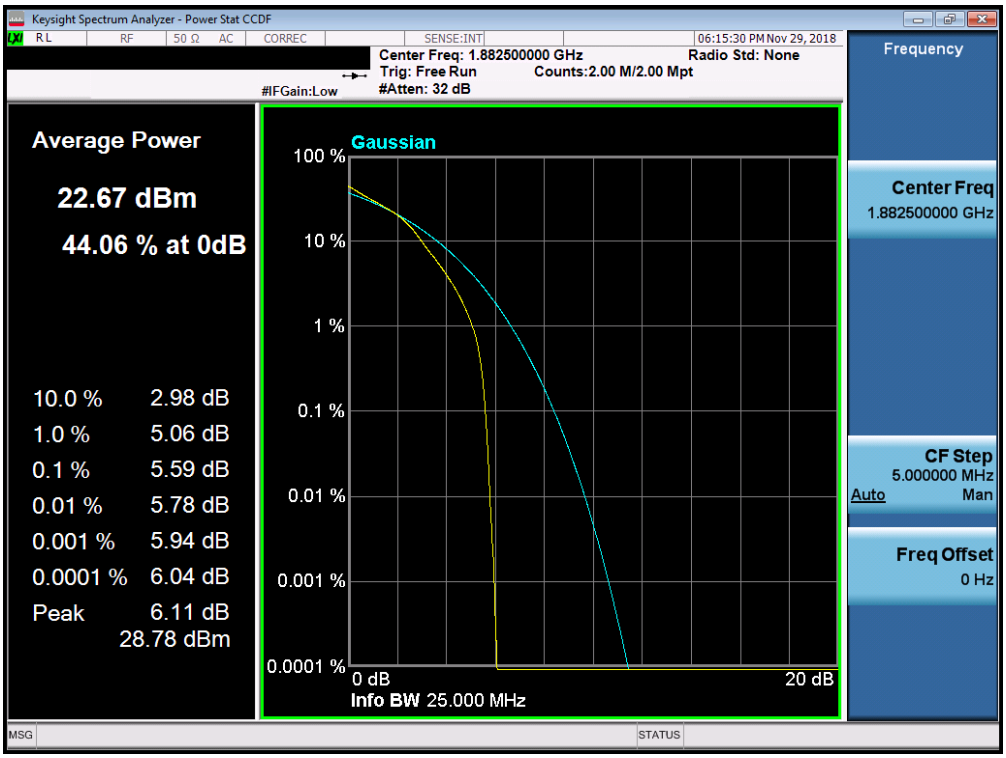


Plot 7-276. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-277. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

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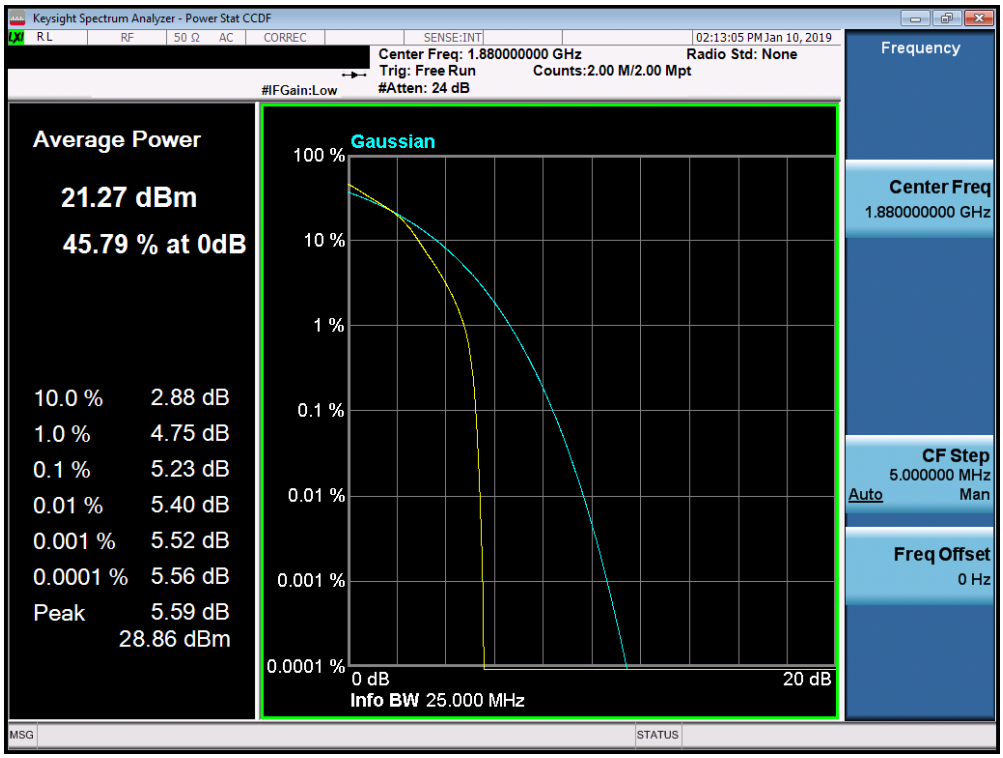
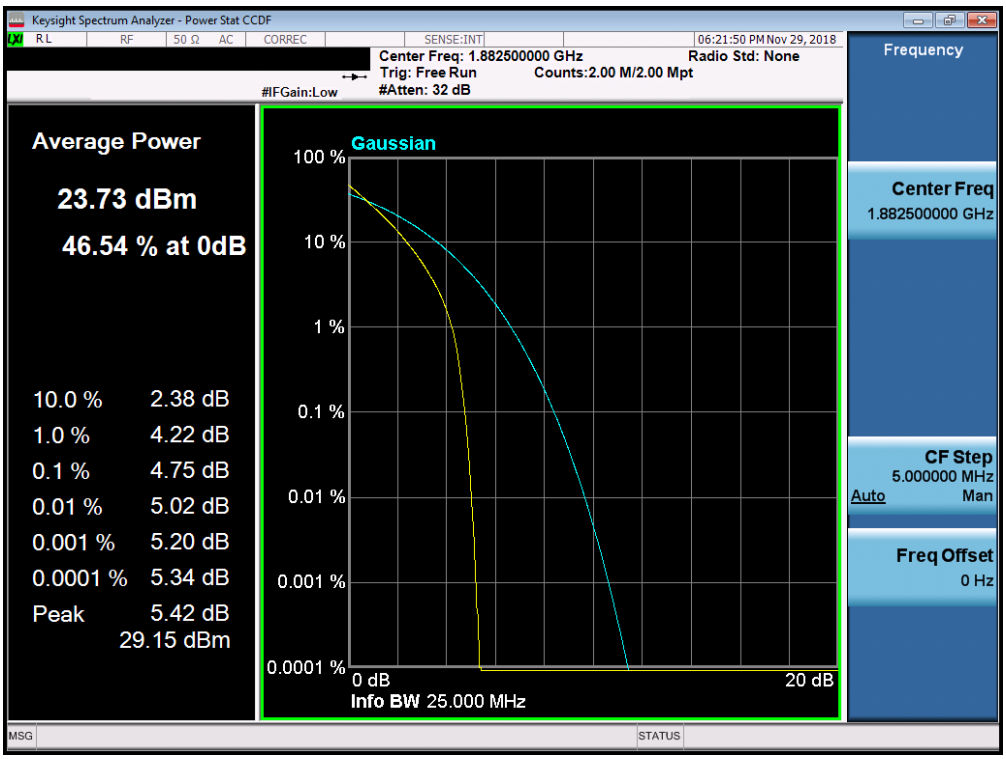


Plot 7-278. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-279. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

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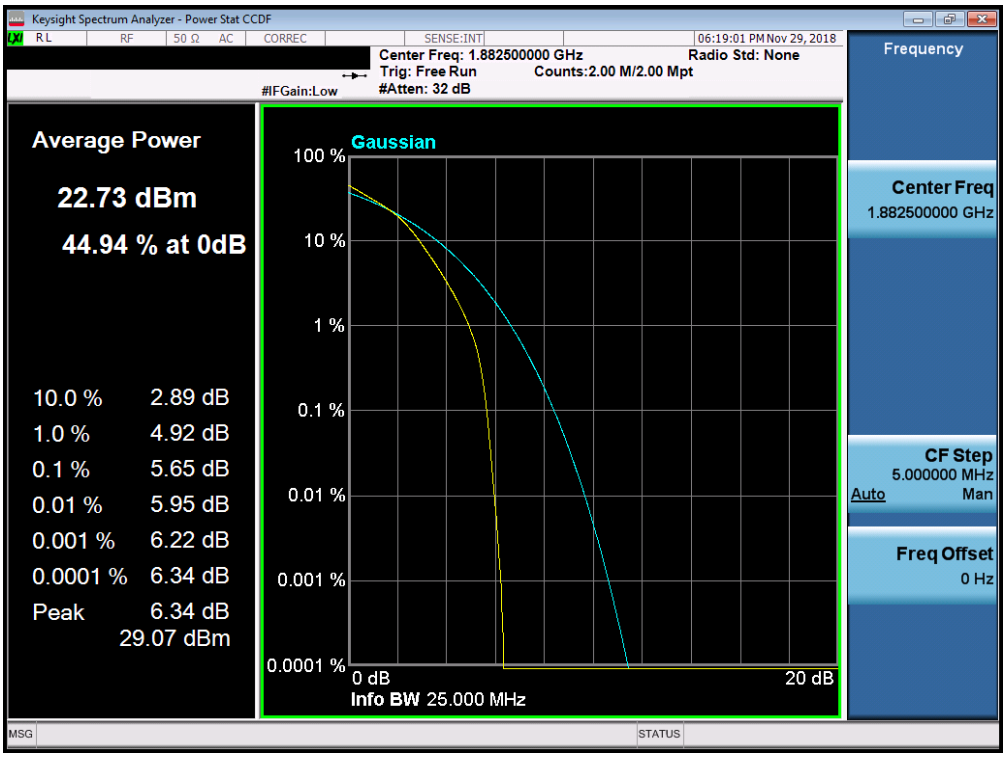
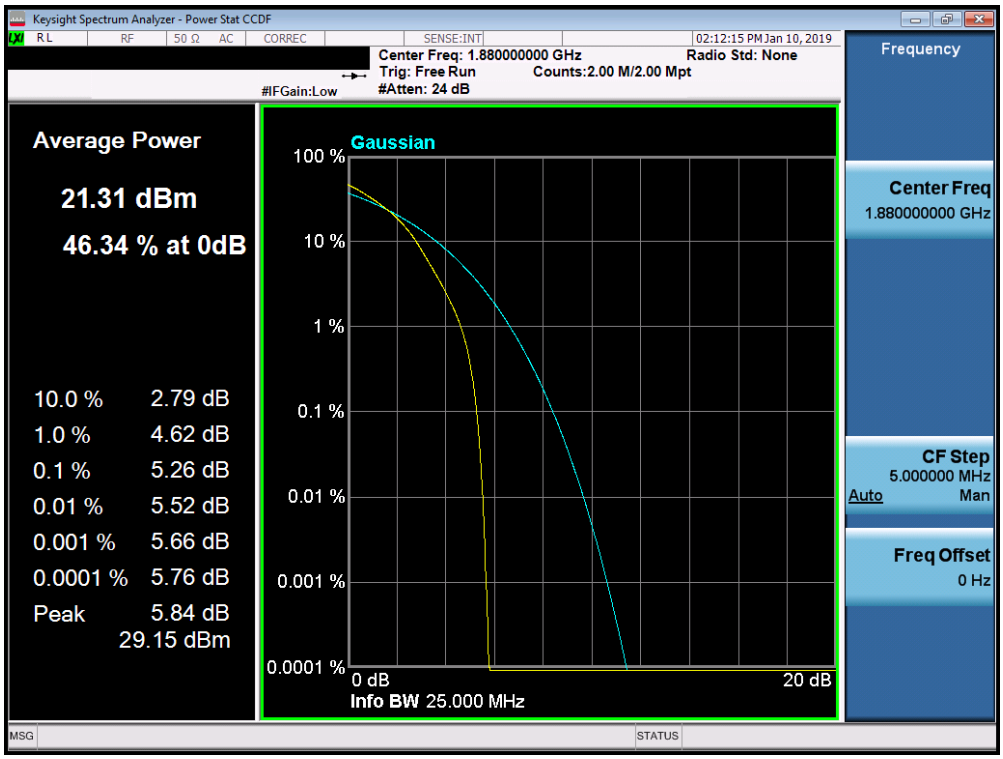


Plot 7-280. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-281. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

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7.6 Additional Maximum Power Reduction (A-MPR)
§2.1046

Test Overview

A-MPR is implemented in this device when operating at Power Class 2 in LTE Band 41 per the A-MPR specification in 3GPP TS 36.101. The conducted powers are shown herein to cover the different A-MPR levels specified in the standard. Measurement equipment was set up with triggering/gating on the spectrum analyzer such that powers were measured only during the on-time of the signal.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.2.2

Test Settings

1. Span = 2 x OBW to 3 x OBW
2. RBW = 1% to 5% of the OBW
3. Number of measurement points in sweep ≥ 2 x span / RBW
4. Sweep = auto-couple (less than transmission burst duration)
5. Detector = RMS (power)
6. Trigger was set to enable power measurements only on full power bursts
7. Trace was allowed to stabilize
8. Spectrum analyzer's "Channel Power" function was used to compute the power by integrating the spectrum across the OBW of the signal

Test Setup

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

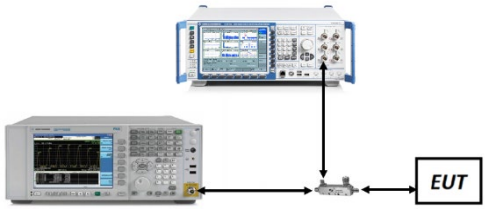

Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None.

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Test Case	NS	MCC	MNC	Channel BW [MHz]	Channel Number	Channel Frequency [MHz]	Modulation	RB Size	RB Offset	MPR [dB]	A-MPR [dB]	Measured Power [dBm]
1	01	310	120	5	39675	2498.5	QPSK	1	0	0	≤ 3	23.79
							16-QAM			≤ 1		23.03
							64-QAM			≤ 2		21.69
2				5	39675	2498.5	QPSK	1	9	0	0	26.80
							16-QAM			≤ 1		26.09
							64-QAM			≤ 2		24.76
3				10	39700	2501	QPSK	1	0	0	≤ 5	26.68
							16-QAM	1	0	≤ 1		26.00
							64-QAM	1	0	≤ 2		25.30
4				10	39700	2501	QPSK	20	0	0	≤ 2	24.06
							16-QAM	20	0	≤ 1		23.12
							64-QAM	20	0	≤ 2		22.02
5				10	39700	2501	QPSK	50	0	0	≤ 3	23.00
							16-QAM	50	0	≤ 1		22.05
							64-QAM	50	0	≤ 2		20.92
6				10	39700	2501	QPSK	25	20	0	≤ 1	24.88
							16-QAM	25	20	≤ 1		23.90
							64-QAM	25	20	≤ 2		22.86
7				10	39700	2501	QPSK	1	36	0	0	26.64
							16-QAM	1	36	≤ 1		26.04
							64-QAM	1	36	≤ 2		25.24
8				15	39725	2503.5	QPSK	1	0	0	≤ 5	26.73
							16-QAM	1	0	≤ 1		26.16
							64-QAM	1	0	≤ 2		25.38
9				15	39725	2503.5	QPSK	20	0	0	≤ 2	24.05
							16-QAM	20	0	≤ 1		23.00
							64-QAM	20	0	≤ 2		21.99
10				15	39725	2503.5	QPSK	75	0	0	≤ 4	22.23
							16-QAM	75	0	≤ 1		21.02
							64-QAM	75	0	≤ 2		20.08
11				15	39725	2503.5	QPSK	50	15	0	≤ 3	22.76
							16-QAM	50	15	≤ 1		21.90
							64-QAM	50	15	≤ 2		20.98
12				15	39725	2503.5	QPSK	1	60	0	0	26.88
							16-QAM	1	60	≤ 1		26.30
							64-QAM	1	60	≤ 2		25.42
13				20	39750	2506	QPSK	1	0	0	≤ 5	26.65
							16-QAM	1	0	≤ 1		26.21
							64-QAM	1	0	≤ 2		24.68
14				20	39750	2506	QPSK	20	0	0	≤ 2	24.29
							16-QAM	20	0	≤ 1		23.40
							64-QAM	20	0	≤ 2		22.45
15				20	39750	2506	QPSK	100	0	0	≤ 4	22.16
							16-QAM	100	0	≤ 1		21.11
							64-QAM	100	0	≤ 2		20.10
16				20	39750	2506	QPSK	75	24	0	≤ 3	23.15
							16-QAM	75	24	≤ 1		22.02
							64-QAM	75	24	≤ 2		20.88
17				20	39750	2506	QPSK	1	77	0	0	26.88
							16-QAM	1	77	≤ 1		26.22
							64-QAM	1	77	≤ 2		24.75
18	01	312	530	5	39675	2498.5	QPSK	1	0	0	≤ 3	23.81
							16-QAM			≤ 1		23.1
							64-QAM			≤ 2		22.02
19	01	001	01	5	39675	2498.5	QPSK	1	0	0	0	26.65
							16-QAM			≤ 1		25.94
							64-QAM			≤ 2		24.7

Table 7-3. A-MPR Conducted Power Measurements

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7.7 Uplink Carrier Aggregation

§27.53(m)

Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates 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.

For Band 38/41, the minimum permissible attenuation level of any spurious emission is 55 + $\log_{10}(P_{[Watts]})$.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

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

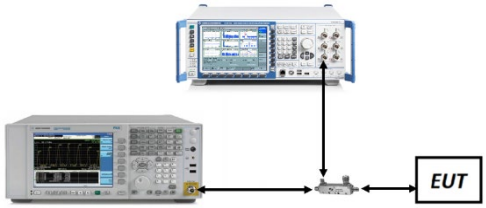

Figure 7-6. Test Instrument & Measurement Setup

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Test Notes

1. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.

2. Conducted power and spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in Table 7-503 and 7-504 below, with both carriers set to transmit using 1RB.

3. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

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	SCC UL# RB	SCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	0	18.00
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	99	14.17
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	99	10.66
Max	LTE B41	20	39750	2506	QPSK	1	50	LTE B41	20	39948	2525.8	QPSK	1	50	19.59
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	24.42
Max	LTE B41	20	39750	2506	QPSK	100	0	LTE B41	20	39948	2525.8	QPSK	100	0	21.26
Max	LTE B41	20	39750	2506	16-QAM	100	0	LTE B41	20	39948	2525.8	16-QAM	100	0	20.11
Max	LTE B41	20	39750	2506	64-QAM	100	0	LTE B41	20	39948	2525.8	64-QAM	100	0	19.02

Table 7-4. Conducted Powers (B41 with Various Combinations for 20MHz Channel Bandwidth)

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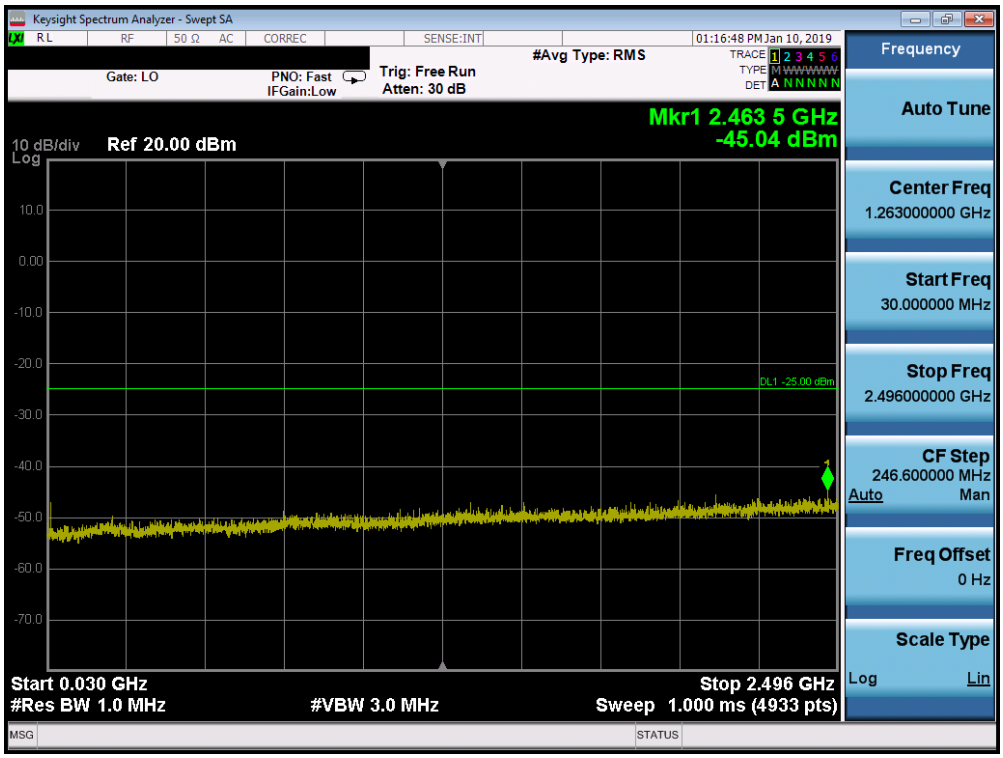

Table 7-282. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

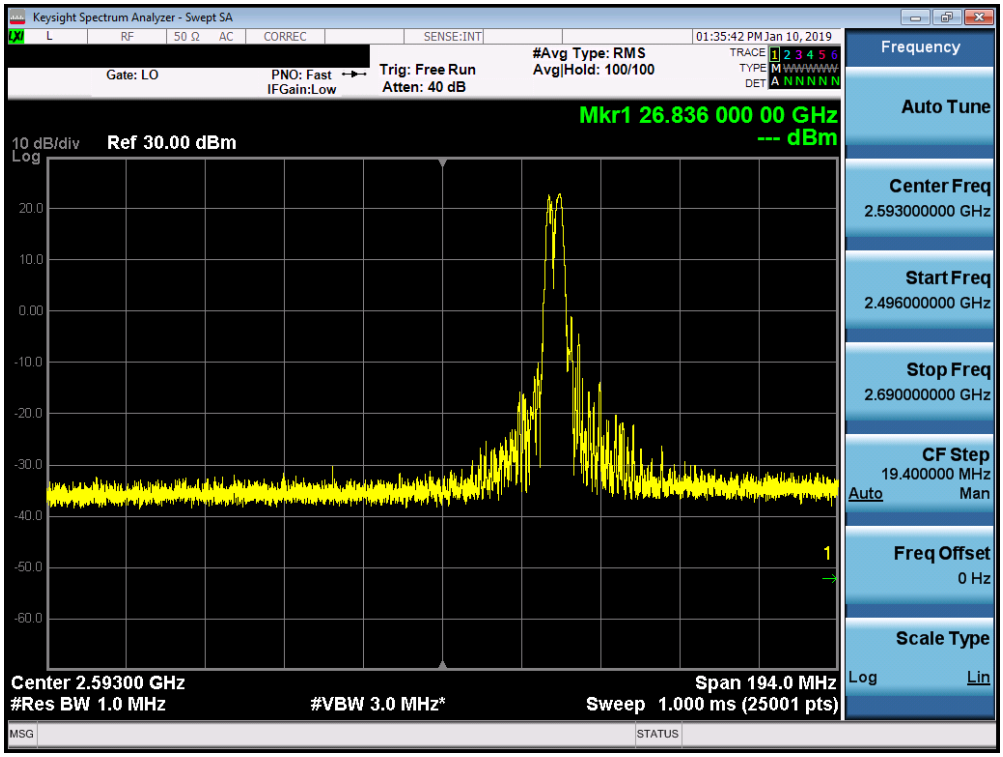

Table 7-283. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

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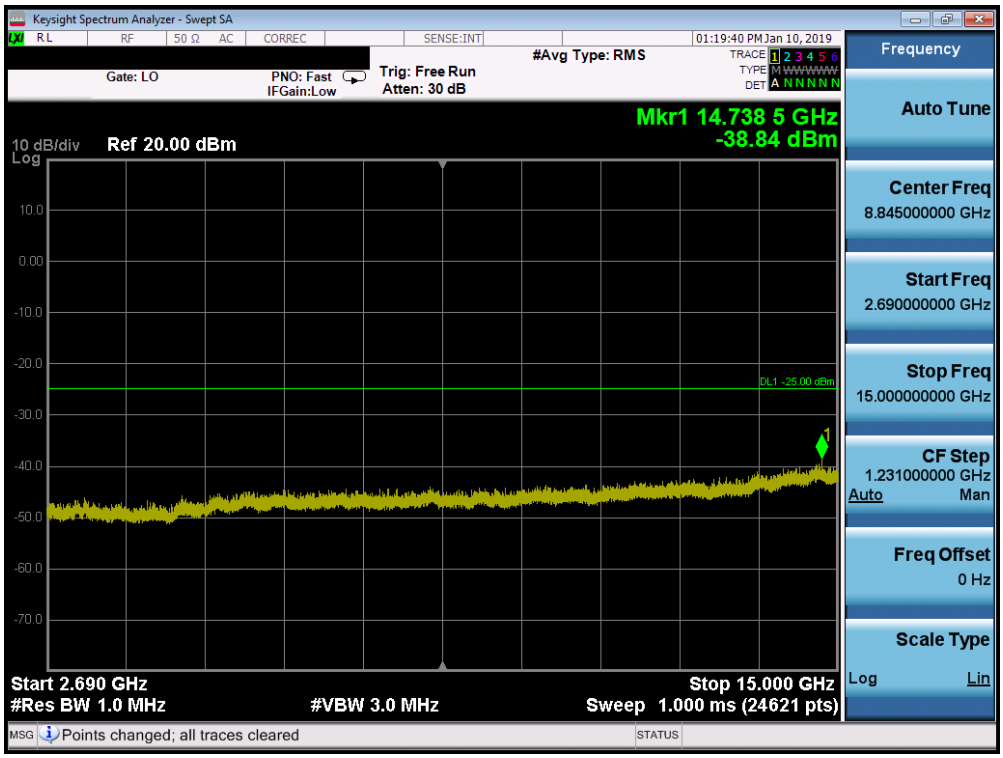

Table 7-284. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

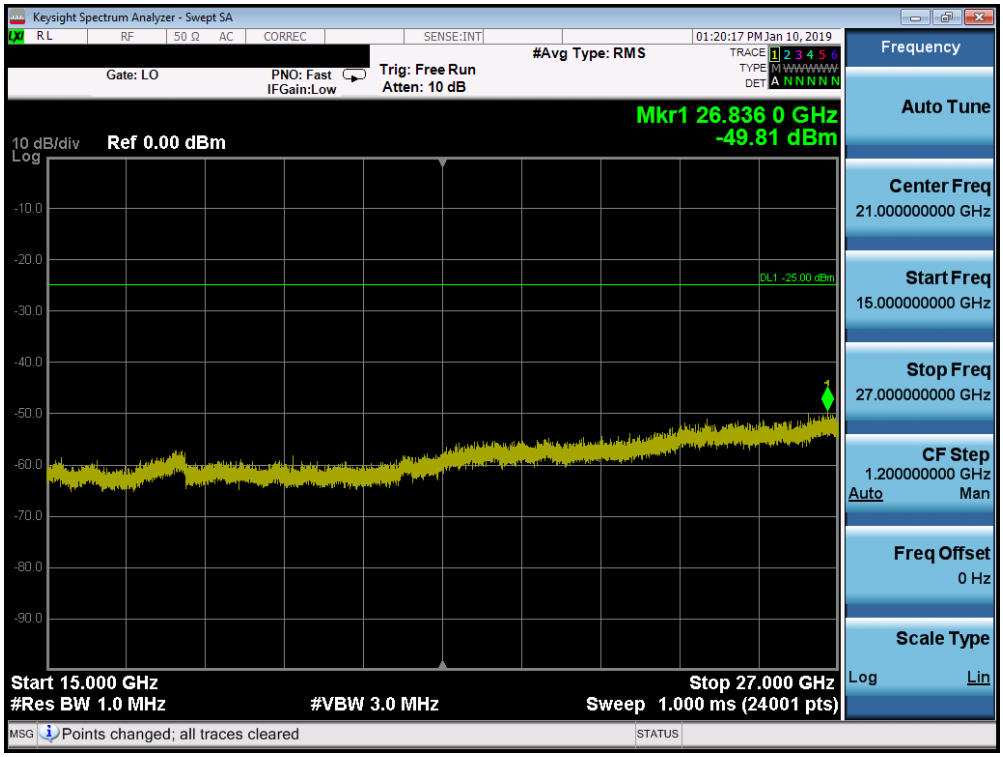

Table 7-285. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

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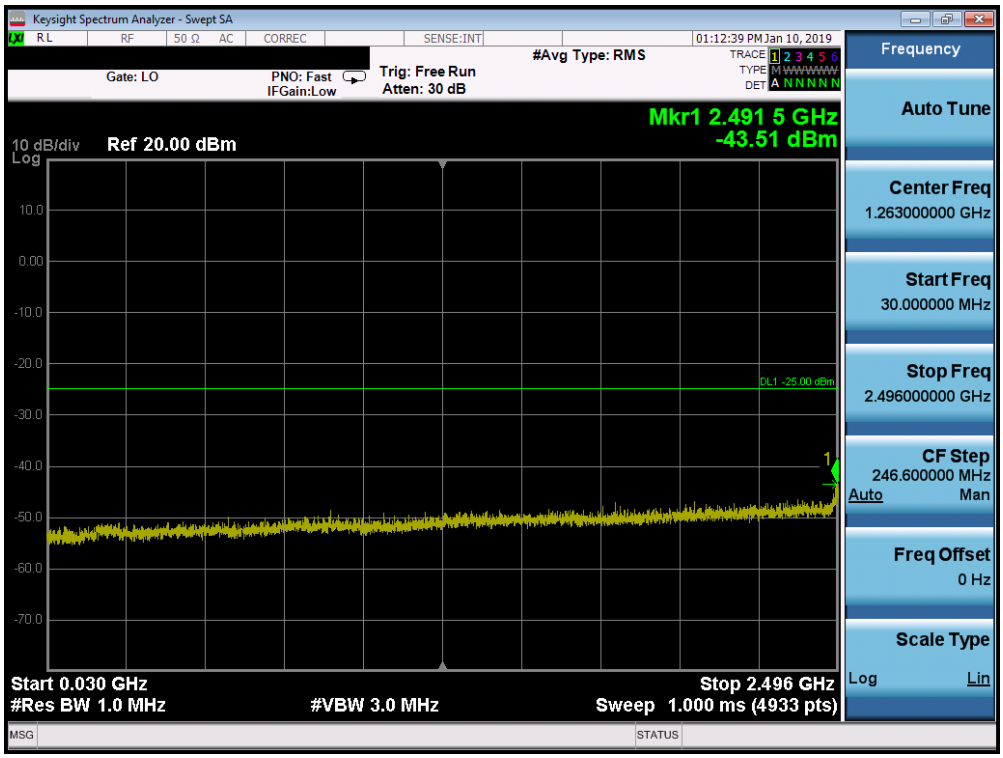

Table 7-286. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

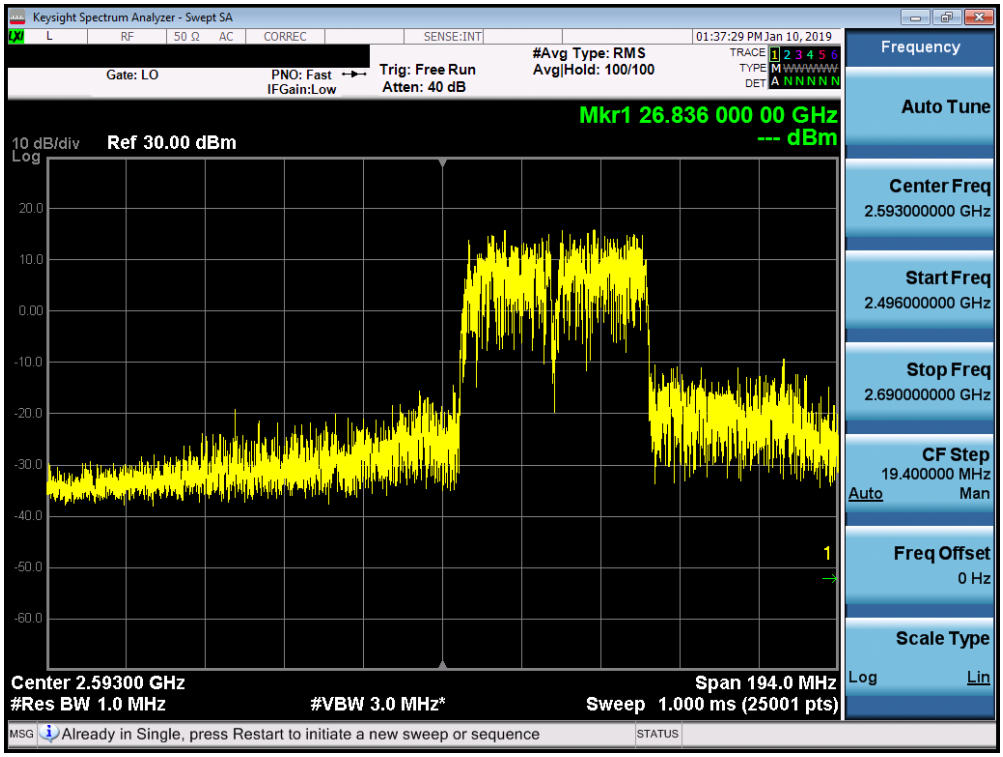

Table 7-287. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

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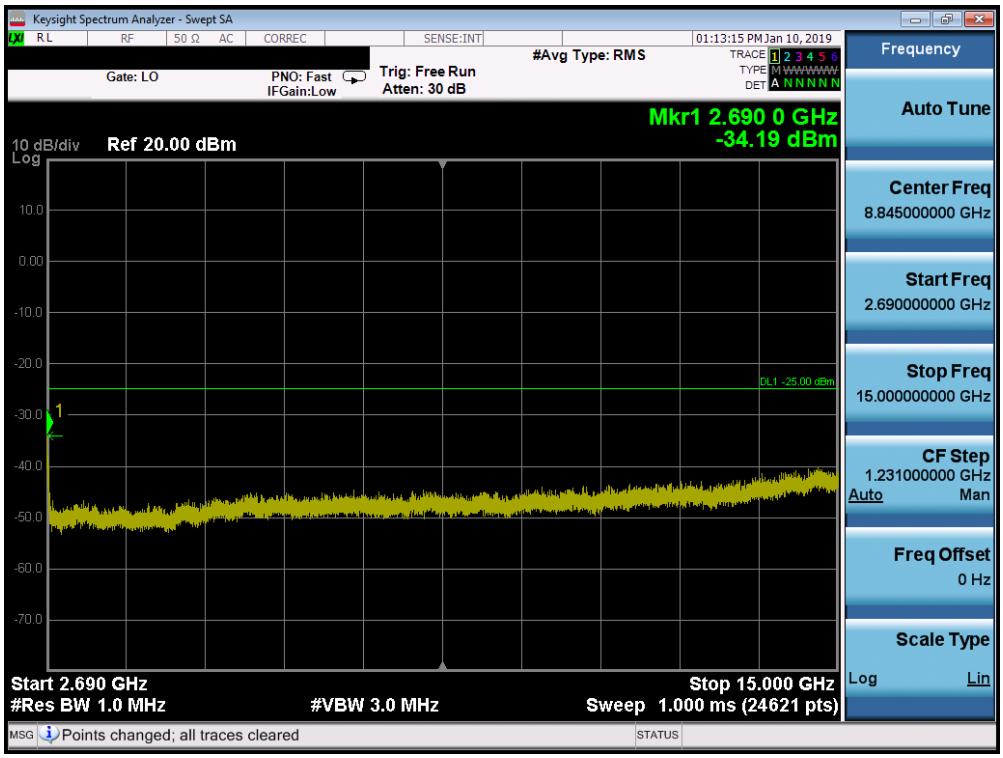

Table 7-288. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

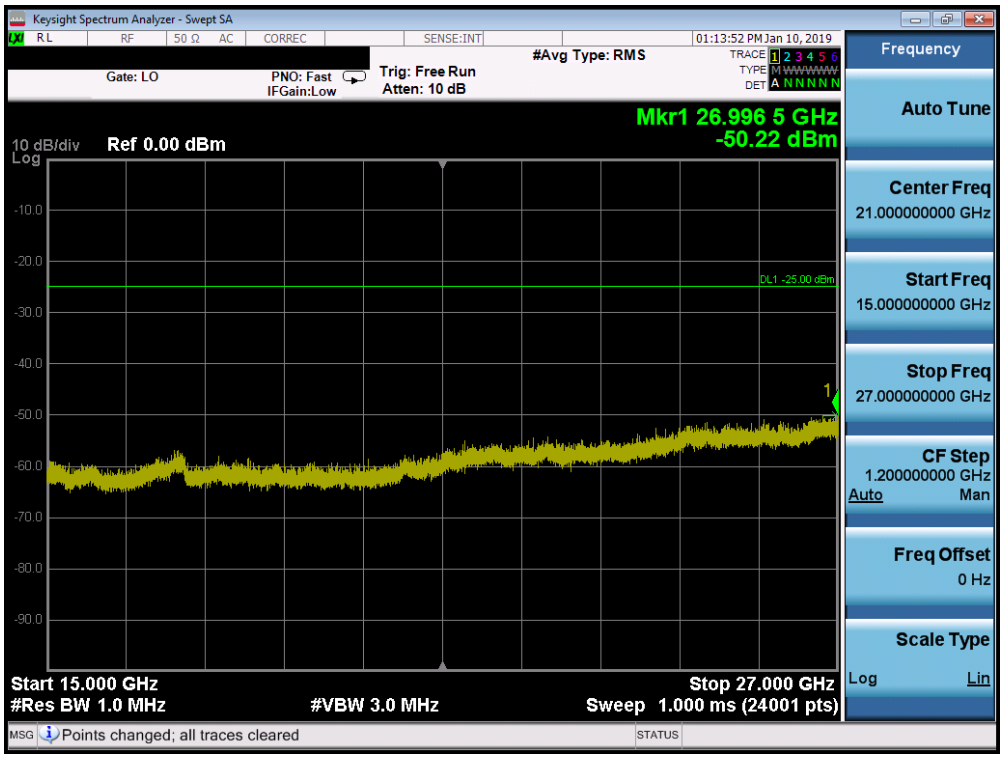

Table 7-289. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

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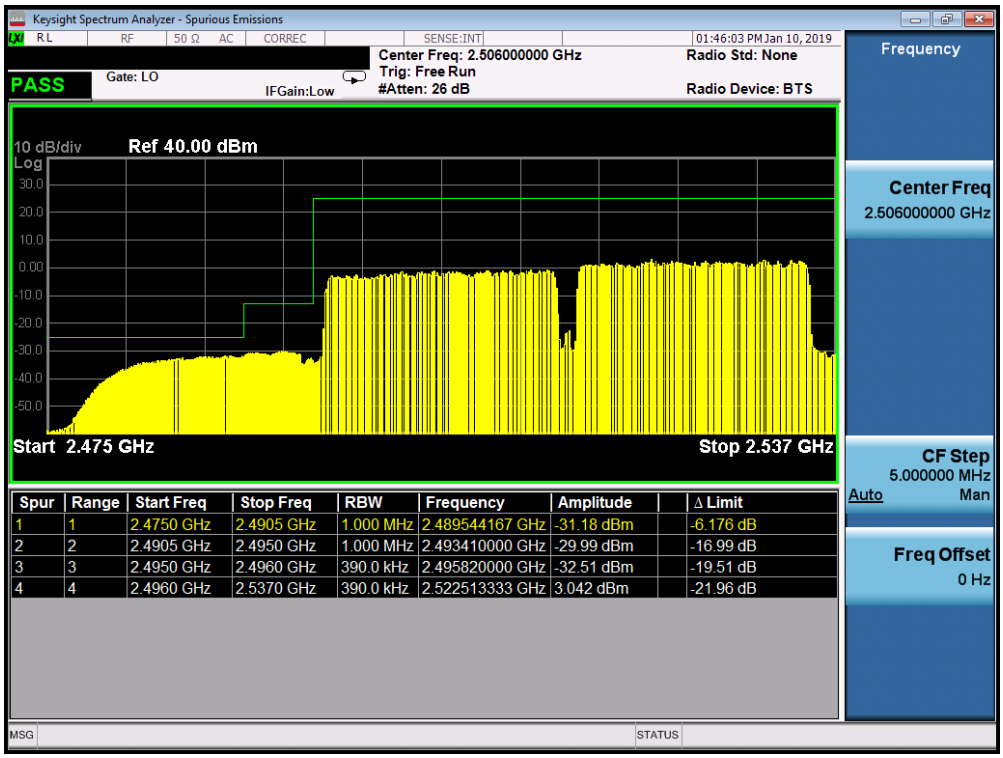
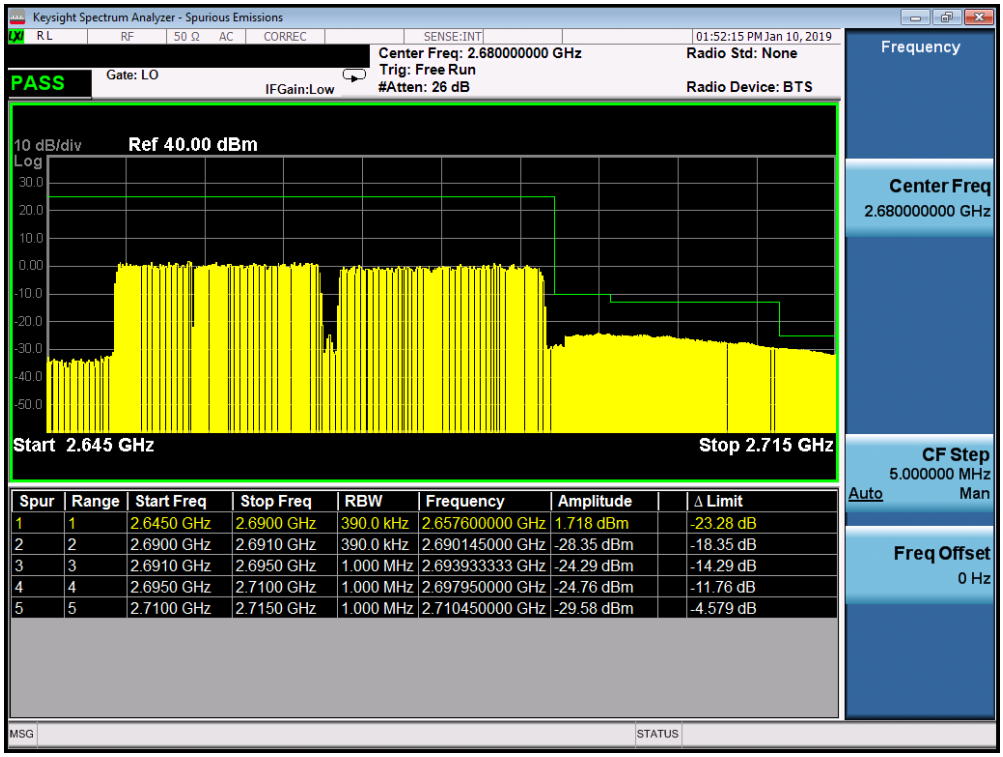


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489544167 GHz	-31.18 dBm	-6.176 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.493410000 GHz	-29.99 dBm	-16.99 dB
3	3	2.4950 GHz	2.4960 GHz	390.0 kHz	2.495820000 GHz	-32.51 dBm	-19.51 dB
4	4	2.4960 GHz	2.5370 GHz	390.0 kHz	2.522513333 GHz	3.042 dBm	-21.96 dB

Table 7-290. Lower ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6450 GHz	2.6900 GHz	390.0 kHz	2.657600000 GHz	1.718 dBm	-23.28 dB
2	2	2.6900 GHz	2.6910 GHz	390.0 kHz	2.690145000 GHz	-28.35 dBm	-18.35 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.693933333 GHz	-24.29 dBm	-14.29 dB
4	4	2.6950 GHz	2.7100 GHz	1.000 MHz	2.697950000 GHz	-24.76 dBm	-11.76 dB
5	5	2.7100 GHz	2.7150 GHz	1.000 MHz	2.710450000 GHz	-29.58 dBm	-4.579 dB

Table 7-291. Upper ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

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7.8 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. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
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". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
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.

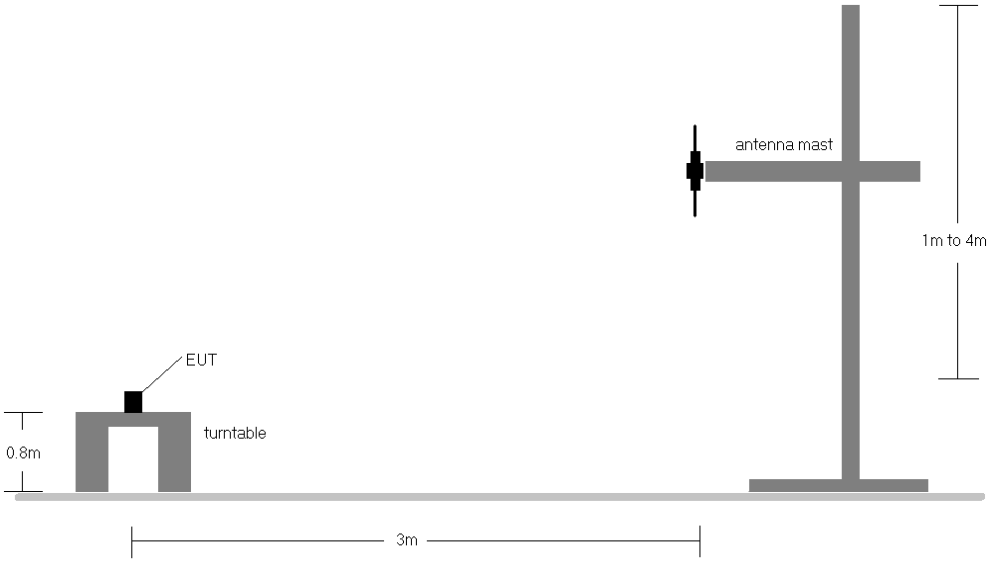

Figure 7-7. Radiated Test Setup <1GHz

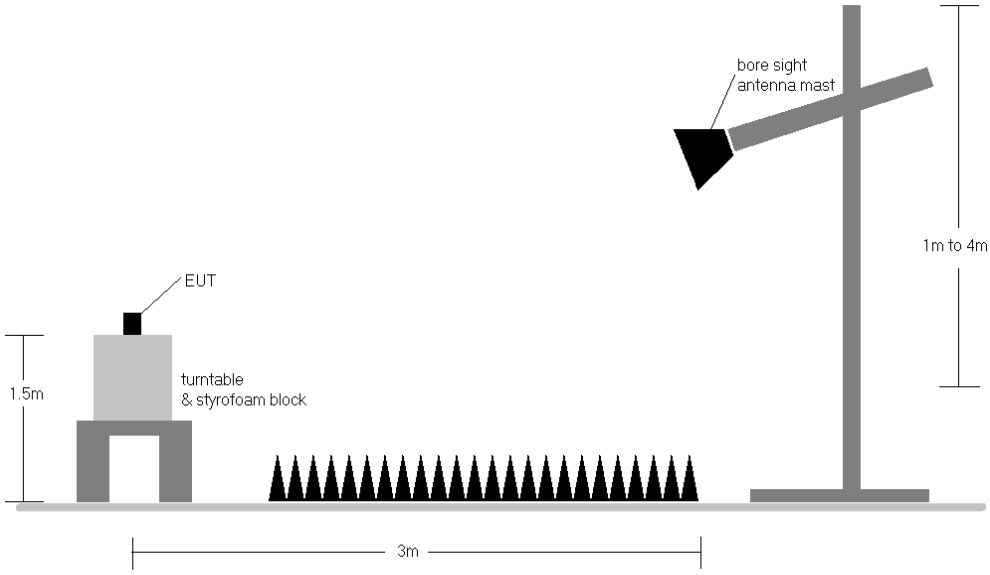

Figure 7-8. Radiated Test Setup >1GHz

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.

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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]
665.50	5	QPSK	H	166	170	1 / 24	15.04	3.84	16.73	0.047	34.77	-18.05
680.50	5	QPSK	H	155	0	1 / 24	14.65	3.91	16.41	0.044	34.77	-18.36
695.50	5	QPSK	H	168	162	1 / 24	14.94	3.98	**16.77**	0.048	34.77	-18.00
695.50	5	16-QAM	H	168	162	1 / 24	14.24	3.98	**16.07**	0.040	34.77	-18.70
695.50	5	64-QAM	H	168	162	1 / 24	13.32	3.98	**15.15**	0.033	34.77	-19.62
668.00	10	QPSK	H	167	177	1 / 49	15.38	3.85	17.08	0.051	34.77	-17.69
680.50	10	QPSK	H	169	168	1 / 49	15.62	3.91	**17.38**	0.055	34.77	-17.39
693.00	10	QPSK	H	173	168	1 / 49	15.51	3.97	17.33	0.054	34.77	-17.44
680.50	10	16-QAM	H	169	168	1 / 49	14.92	3.91	**16.68**	0.047	34.77	-18.09
680.50	10	64-QAM	H	169	168	1 / 49	14.22	3.91	**15.98**	0.040	34.77	-18.79
670.50	15	QPSK	H	166	174	1 / 74	15.35	3.86	17.06	0.051	34.77	-17.71
680.50	15	QPSK	H	174	165	1 / 74	15.02	3.91	16.78	0.048	34.77	-17.99
690.50	15	QPSK	H	170	166	1 / 0	15.33	3.96	**17.14**	0.052	34.77	-17.64
690.50	15	16-QAM	H	170	166	1 / 0	14.53	3.96	**16.34**	0.043	34.77	-18.44
690.50	15	64-QAM	H	170	166	1 / 0	13.64	3.96	**15.45**	0.035	34.77	-19.33
673.00	20	QPSK	H	163	170	1 / 99	15.47	3.87	17.19	0.052	34.77	-17.58
680.50	20	QPSK	H	173	165	1 / 0	15.43	3.91	17.19	0.052	34.77	-17.58
688.00	20	QPSK	H	175	166	1 / 0	15.73	3.94	**17.52**	**0.057**	34.77	-17.25
688.00	20	16-QAM	H	175	166	1 / 0	14.97	3.94	**16.76**	0.047	34.77	-18.01
688.00	20	64-QAM	H	175	166	1 / 0	14.08	3.94	**15.87**	0.039	34.77	-18.90
688.00	20	QPSK	V	218	355	1 / 0	13.99	3.94	15.78	0.038	34.77	-18.99
688.00	20 (WCP)	QPSK	H	204	193	1 / 0	15.12	3.94	16.91	0.049	34.77	-17.86

Table 7-5. ERP Data (Band 71)

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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	H	160	159	3 / 2	15.27	4.00	17.12	0.052	34.77	-17.65
707.50	1.4	QPSK	H	163	169	3 / 2	15.32	4.22	17.39	0.055	34.77	-17.39
715.30	1.4	QPSK	H	152	170	1 / 5	15.69	4.44	**17.98**	0.063	34.77	-16.79
715.30	1.4	16-QAM	H	152	170	1 / 5	14.85	4.44	**17.14**	0.052	34.77	-17.63
715.30	1.4	64-QAM	H	152	170	1 / 5	14.04	4.44	**16.33**	0.043	34.77	-18.44
700.50	3	QPSK	H	168	166	8 / 4	15.52	4.01	17.38	0.055	34.77	-17.39
707.50	3	QPSK	H	167	166	8 / 4	15.32	4.22	17.39	0.055	34.77	-17.39
714.50	3	QPSK	H	153	173	1 / 14	15.55	4.41	**17.81**	0.060	34.77	-16.96
714.50	3	16-QAM	H	153	173	1 / 14	14.72	4.41	**16.98**	0.050	34.77	-17.79
714.50	3	64-QAM	H	153	173	1 / 14	13.71	4.41	**15.97**	0.040	34.77	-18.80
701.50	5	QPSK	H	169	161	1 / 0	15.48	4.04	17.37	0.055	34.77	-17.40
707.50	5	QPSK	H	165	167	1 / 0	15.47	4.22	17.54	0.057	34.77	-17.24
713.50	5	QPSK	H	158	172	1 / 24	15.70	4.39	**17.94**	0.062	34.77	-16.83
713.50	5	16-QAM	H	158	172	1 / 24	14.99	4.39	**17.23**	0.053	34.77	-17.54
713.50	5	64-QAM	H	158	172	1 / 24	13.88	4.39	**16.12**	0.041	34.77	-18.65
704.00	10	QPSK	H	170	162	1 / 0	15.57	4.12	17.54	0.057	34.77	-17.24
707.50	10	QPSK	H	168	168	1 / 0	15.52	4.22	17.59	0.057	34.77	-17.19
711.00	10	QPSK	H	162	170	1 / 49	15.84	4.32	**18.01**	**0.063**	34.77	-16.77
711.00	10	16-QAM	H	162	170	1 / 49	15.06	4.32	**17.23**	0.053	34.77	-17.55
711.00	10	64-QAM	H	162	170	1 / 49	13.98	4.32	**16.15**	0.041	34.77	-18.63
711.00	10	QPSK	V	220	358	1 / 49	14.41	4.32	16.58	0.045	34.77	-18.20
711.00	10 (WCP)	QPSK	H	171	120	1 / 49	14.70	4.32	16.87	0.049	34.77	-17.91

Table 7-6. ERP Data (Band 12/17)

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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	H	130	357	1 / 24	15.72	6.18	19.75	0.094	34.77	-15.03
782.00	5	QPSK	H	136	356	1 / 24	15.92	6.24	**20.01**	**0.100**	34.77	-14.76
784.50	5	QPSK	H	138	351	12 / 6	15.79	6.30	19.94	0.099	34.77	-14.83
784.50	5	16-QAM	H	138	351	12 / 6	15.18	6.30	**19.33**	0.086	34.77	-15.44
784.50	5	64-QAM	H	138	351	12 / 6	14.29	6.30	**18.44**	0.070	34.77	-16.33
782.00	10	QPSK	H	122	354	25 / 12	15.09	6.24	**19.18**	0.083	34.77	-15.59
782.00	10	16-QAM	H	122	354	25 / 12	14.18	6.24	**18.27**	0.067	34.77	-16.50
782.00	10	64-QAM	H	122	354	25 / 12	13.43	6.24	**17.52**	0.056	34.77	-17.25
782.00	5	QPSK	V	212	350	1 / 24	13.24	6.24	17.33	0.054	34.77	-17.44
782.00	5 (WCP)	QPSK	H	110	17	1 / 24	15.27	6.24	19.36	0.086	34.77	-15.41

Table 7-7. 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	H	150	90	1 / 0	20.77	1.50	20.12	0.103	38.45	-18.33
836.50	1.4	QPSK	H	150	348	1 / 0	21.71	1.50	**21.06**	0.128	38.45	-17.39
848.30	1.4	QPSK	H	150	342	1 / 0	21.10	1.50	20.45	0.111	38.45	-18.00
836.50	1.4	16-QAM	H	150	348	1 / 0	20.89	1.50	**20.24**	0.106	38.45	-18.21
836.50	1.4	64-QAM	H	150	348	1 / 0	20.21	1.50	**19.56**	0.090	38.45	-18.89
825.50	3	QPSK	H	150	343	1 / 0	20.71	1.50	20.06	0.101	38.45	-18.39
836.50	3	QPSK	H	150	345	1 / 0	21.77	1.50	21.12	0.129	38.45	-17.33
847.50	3	QPSK	H	150	343	1 / 0	21.79	1.50	**21.14**	0.130	38.45	-17.31
836.50	3	16-QAM	H	150	345	1 / 0	21.01	1.50	**20.36**	0.109	38.45	-18.09
836.50	3	64-QAM	H	150	345	1 / 0	20.18	1.50	**19.53**	0.090	38.45	-18.92
826.50	5	QPSK	H	150	340	1 / 0	20.40	1.50	19.75	0.094	38.45	-18.70
836.50	5	QPSK	H	150	350	1 / 0	21.88	1.50	**21.23**	0.133	38.45	-17.22
846.50	5	QPSK	H	150	345	1 / 0	21.58	1.50	20.93	0.124	38.45	-17.52
836.50	5	16-QAM	H	150	350	1 / 0	21.03	1.50	**20.38**	0.109	38.45	-18.07
836.50	5	64-QAM	H	150	350	1 / 0	20.41	1.50	**19.76**	0.095	38.45	-18.69
829.00	10	QPSK	H	150	349	1 / 0	20.51	1.50	19.86	0.097	38.45	-18.59
836.50	10	QPSK	H	150	342	1 / 0	21.99	1.50	**21.34**	**0.136**	38.45	-17.11
844.00	10	QPSK	H	150	344	1 / 0	21.24	1.50	20.59	0.115	38.45	-17.86
836.50	10	16-QAM	H	150	342	1 / 0	21.15	1.50	**20.50**	0.112	38.45	-17.95
836.50	10	64-QAM	H	150	342	1 / 0	20.48	1.50	**19.83**	0.096	38.45	-18.62
831.50	15	QPSK	H	150	342	1 / 0	20.55	1.50	19.90	0.098	38.45	-18.55
836.50	15	QPSK	H	150	344	1 / 0	21.79	1.50	21.14	0.130	38.45	-17.31
841.50	15	QPSK	H	150	337	1 / 0	21.87	1.50	**21.22**	0.132	38.45	-17.23
841.50	15	16-QAM	H	150	337	1 / 0	20.97	1.50	**20.32**	0.108	38.45	-18.13
841.50	15	64-QAM	H	150	337	1 / 0	20.07	1.50	**19.42**	0.087	38.45	-19.03
836.50	10	QPSK	V	150	291	1 / 0	20.22	1.50	19.57	0.091	38.45	-18.88
836.50	10 (WCP)	QPSK	H	150	351	1 / 0	21.57	1.50	20.92	0.124	38.45	-17.53

Table 7-8. 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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	100	234	1 / 0	11.09	8.16	19.25	0.084	30.00	-10.75
1732.50	1.4	QPSK	H	222	241	1 / 5	11.16	8.18	19.34	0.086	30.00	-10.66
1754.30	1.4	QPSK	H	116	227	3 / 2	11.59	8.21	**19.80**	0.095	30.00	-10.20
1754.30	1.4	16-QAM	H	116	227	3 / 2	10.70	8.21	**18.91**	0.078	30.00	-11.09
1732.50	1.4	64-QAM	H	222	241	1 / 5	9.87	8.18	**18.05**	0.064	30.00	-11.95
1711.50	3	QPSK	H	100	232	8 / 4	11.83	8.16	**19.99**	0.100	30.00	-10.01
1732.50	3	QPSK	H	102	235	1 / 0	11.48	8.18	19.66	0.092	30.00	-10.34
1753.50	3	QPSK	H	170	234	8 / 4	11.78	8.21	19.99	0.100	30.00	-10.01
1753.50	3	16-QAM	H	170	234	8 / 4	11.02	8.21	**19.23**	0.084	30.00	-10.77
1753.50	3	64-QAM	H	170	234	8 / 4	10.38	8.21	**18.59**	0.072	30.00	-11.41
1712.50	5	QPSK	H	109	233	12 / 6	11.76	8.16	**19.92**	0.098	30.00	-10.08
1732.50	5	QPSK	H	106	241	12 / 6	11.22	8.18	19.40	0.087	30.00	-10.60
1752.50	5	QPSK	H	175	233	12 / 6	11.69	8.20	19.89	0.098	30.00	-10.11
1712.50	5	16-QAM	H	109	233	12 / 6	10.84	8.16	**19.00**	0.079	30.00	-11.00
1752.50	5	64-QAM	H	175	233	12 / 6	9.76	8.20	**17.96**	0.063	30.00	-12.04
1715.00	10	QPSK	H	110	238	25 / 12	12.14	8.16	20.30	0.107	30.00	-9.70
1732.50	10	QPSK	H	100	240	25 / 12	11.48	8.18	19.66	0.092	30.00	-10.34
1750.00	10	QPSK	H	119	235	25 / 12	12.17	8.20	**20.37**	**0.109**	30.00	-9.63
1750.00	10	16-QAM	H	119	235	25 / 12	11.36	8.20	**19.56**	0.090	30.00	-10.44
1750.00	10	64-QAM	H	119	235	25 / 12	10.24	8.20	**18.44**	0.070	30.00	-11.56
1717.50	15	QPSK	H	107	237	36 / 18	12.07	8.16	20.23	0.106	30.00	-9.77
1732.50	15	QPSK	H	106	242	1 / 0	11.54	8.18	19.72	0.094	30.00	-10.28
1747.50	15	QPSK	H	115	233	36 / 18	12.16	8.20	**20.36**	0.109	30.00	-9.64
1747.50	15	16-QAM	H	115	233	36 / 18	11.25	8.20	**19.45**	0.088	30.00	-10.55
1747.50	15	64-QAM	H	115	233	36 / 18	10.13	8.20	**18.33**	0.068	30.00	-11.67
1720.00	20	QPSK	H	100	246	1 / 0	11.86	8.17	**20.03**	0.101	30.00	-9.97
1732.50	20	QPSK	H	103	236	1 / 99	11.36	8.18	19.54	0.090	30.00	-10.46
1745.00	20	QPSK	H	112	235	1 / 0	11.80	8.19	19.99	0.100	30.00	-10.01
1720.00	20	16-QAM	H	100	246	1 / 0	10.87	8.17	**19.04**	0.080	30.00	-10.96
1745.00	20	64-QAM	H	112	235	1 / 0	10.01	8.19	**18.20**	0.066	30.00	-11.80
1750.00	10	QPSK	V	359	144	25 / 12	11.82	8.20	20.02	0.100	30.00	-9.98
1750.00	10 (WCP)	QPSK	H	110	249	25 / 12	12.10	8.20	20.30	0.107	30.00	-9.70

Table 7-9. 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]
1850.70	1.4	QPSK	H	213	59	1 / 0	10.94	8.37	19.31	0.085	33.01	-13.70
1880.00	1.4	QPSK	H	144	66	1 / 0	12.13	8.41	20.54	0.113	33.01	-12.47
1909.30	1.4	QPSK	H	151	84	1 / 5	12.10	8.46	**20.56**	0.114	33.01	-12.45
1880.00	1.4	16-QAM	H	144	66	1 / 0	11.32	8.41	**19.73**	0.094	33.01	-13.28
1880.00	1.4	64-QAM	H	144	66	1 / 0	10.18	8.41	**18.59**	0.072	33.01	-14.42
1851.50	3	QPSK	H	201	38	1 / 0	11.16	8.37	19.53	0.090	33.01	-13.48
1880.00	3	QPSK	H	157	65	1 / 0	12.37	8.41	**20.78**	0.120	33.01	-12.23
1908.50	3	QPSK	H	140	70	1 / 14	12.05	8.46	20.51	0.112	33.01	-12.50
1880.00	3	16-QAM	H	157	65	1 / 0	11.29	8.41	**19.70**	0.093	33.01	-13.31
1908.50	3	64-QAM	H	140	70	1 / 14	10.27	8.46	**18.73**	0.075	33.01	-14.28
1852.50	5	QPSK	H	196	33	1 / 24	11.24	8.37	19.61	0.091	33.01	-13.40
1880.00	5	QPSK	H	157	59	1 / 0	12.34	8.41	**20.75**	0.119	33.01	-12.26
1907.50	5	QPSK	H	148	64	1 / 24	12.12	8.46	20.58	0.114	33.01	-12.43
1880.00	5	16-QAM	H	157	59	1 / 0	11.53	8.41	**19.94**	0.099	33.01	-13.07
1880.00	5	64-QAM	H	157	59	1 / 0	10.50	8.41	**18.91**	0.078	33.01	-14.10
1855.00	10	QPSK	H	199	14	1 / 49	12.16	8.37	20.53	0.113	33.01	-12.48
1880.00	10	QPSK	H	153	57	1 / 0	13.58	8.41	**21.99**	**0.158**	33.01	-11.02
1905.00	10	QPSK	H	101	61	1 / 0	11.59	8.45	20.04	0.101	33.01	-12.97
1880.00	10	16-QAM	H	153	57	1 / 0	12.66	8.41	**21.07**	0.128	33.01	-11.94
1880.00	10	64-QAM	H	153	57	1 / 0	11.52	8.41	**19.93**	0.099	33.01	-13.08
1857.50	15	QPSK	H	142	20	1 / 74	12.11	8.38	20.49	0.112	33.01	-12.52
1880.00	15	QPSK	H	151	53	1 / 0	12.70	8.41	**21.11**	0.129	33.01	-11.90
1902.50	15	QPSK	H	142	64	1 / 0	12.35	8.45	20.80	0.120	33.01	-12.21
1880.00	15	16-QAM	H	151	53	1 / 0	11.75	8.41	**20.16**	0.104	33.01	-12.85
1880.00	15	64-QAM	H	151	53	1 / 0	10.71	8.41	**19.12**	0.082	33.01	-13.89
1860.00	20	QPSK	H	149	42	1 / 99	12.45	8.38	20.83	0.121	33.01	-12.18
1880.00	20	QPSK	H	153	56	1 / 0	12.76	8.41	**21.17**	0.131	33.01	-11.84
1900.00	20	QPSK	H	106	65	1 / 0	12.16	8.45	20.61	0.115	33.01	-12.40
1860.00	20	16-QAM	H	149	42	1 / 99	11.77	8.38	**20.15**	0.104	33.01	-12.86
1880.00	20	64-QAM	H	153	56	1 / 0	10.86	8.41	**19.27**	0.085	33.01	-13.74
1880.00	10	QPSK	V	357	161	1 / 0	12.62	8.41	21.03	0.127	33.01	-11.98
1880.00	10 (WCP)	QPSK	H	166	70	1 / 0	13.54	8.41	21.95	0.157	33.01	-11.06

Table 7-10. EIRP Data (Band 25/2)

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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]
2498.50	5	QPSK	H	111	70	1 / 24	16.77	7.90	24.67	0.293	33.01	-8.34
2593.00	5	QPSK	H	106	47	1 / 24	17.27	7.71	**24.98**	0.315	33.01	-8.03
2687.50	5	QPSK	H	106	50	1 / 24	16.65	7.52	24.17	0.261	33.01	-8.84
2593.00	5	16-QAM	H	106	47	1 / 24	16.35	7.71	**24.06**	0.255	33.01	-8.95
2498.50	5	64-QAM	H	111	70	1 / 24	15.50	7.90	**23.40**	0.219	33.01	-9.61
2501.00	10	QPSK	H	116	68	1 / 49	16.89	7.90	24.79	0.301	33.01	-8.22
2593.00	10	QPSK	H	108	61	1 / 49	17.36	7.71	**25.07**	**0.321**	33.01	-7.94
2685.00	10	QPSK	H	102	131	1 / 0	16.76	7.53	24.29	0.268	33.01	-8.72
2501.00	10	16-QAM	H	116	68	1 / 49	16.18	7.90	**24.08**	0.256	33.01	-8.93
2501.00	10	64-QAM	H	116	68	1 / 49	15.63	7.90	**23.53**	0.225	33.01	-9.48
2503.50	15	QPSK	H	111	47	1 / 74	16.68	7.89	24.57	0.287	33.01	-8.44
2593.00	15	QPSK	H	108	65	1 / 74	17.03	7.71	**24.74**	0.298	33.01	-8.27
2682.50	15	QPSK	H	100	125	1 / 0	15.75	7.53	23.28	0.213	33.01	-9.73
2593.00	15	16-QAM	H	108	65	1 / 74	16.29	7.71	**24.00**	0.251	33.01	-9.01
2593.00	15	64-QAM	H	108	65	1 / 74	15.58	7.71	**23.29**	0.213	33.01	-9.72
2506.00	20	QPSK	H	101	125	1 / 99	16.28	7.89	24.17	0.261	33.01	-8.84
2593.00	20	QPSK	H	108	48	1 / 99	17.03	7.71	**24.74**	0.298	33.01	-8.27
2680.00	20	QPSK	H	115	130	1 / 0	16.81	7.54	24.35	0.272	33.01	-8.67
2593.00	20	16-QAM	H	108	48	1 / 99	16.61	7.71	**24.32**	0.270	33.01	-8.69
2593.00	20	64-QAM	H	108	48	1 / 99	15.76	7.71	**23.47**	0.222	33.01	-9.54
2593.00	10	QPSK	V	221	340	1 / 49	15.64	7.71	23.35	0.216	33.01	-9.66
2593.00	10 (WCP)	QPSK	H	112	139	1 / 49	16.89	7.71	24.60	0.288	33.01	-8.41
2593.00	10 (PC3)	QPSK	H	114	127	1 / 49	14.71	7.71	22.42	**0.175**	33.01	-10.59

Table 7-11. EIRP Data (Band 41)

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7.9 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.

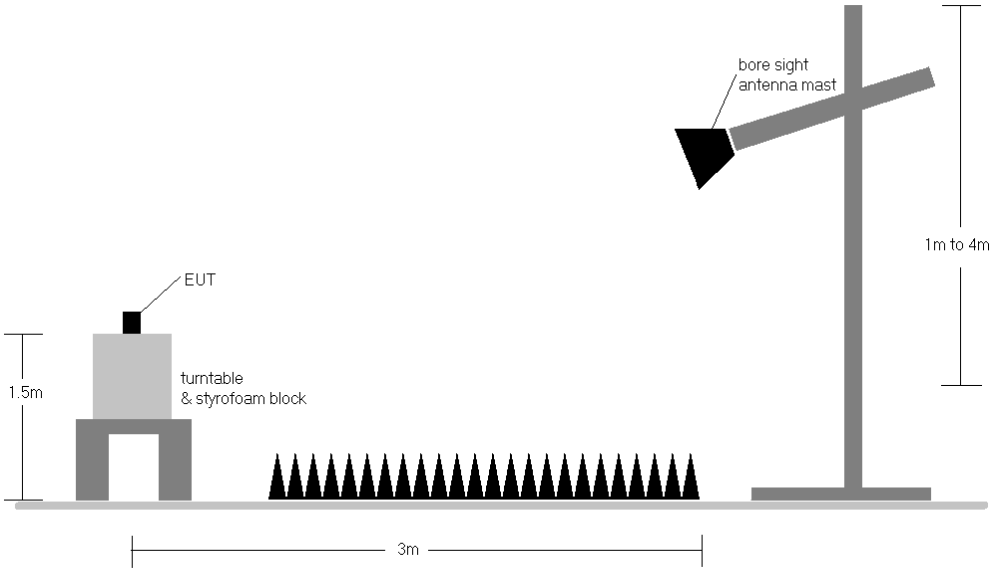

Figure 7-9. Test Instrument & Measurement Setup

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) 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.

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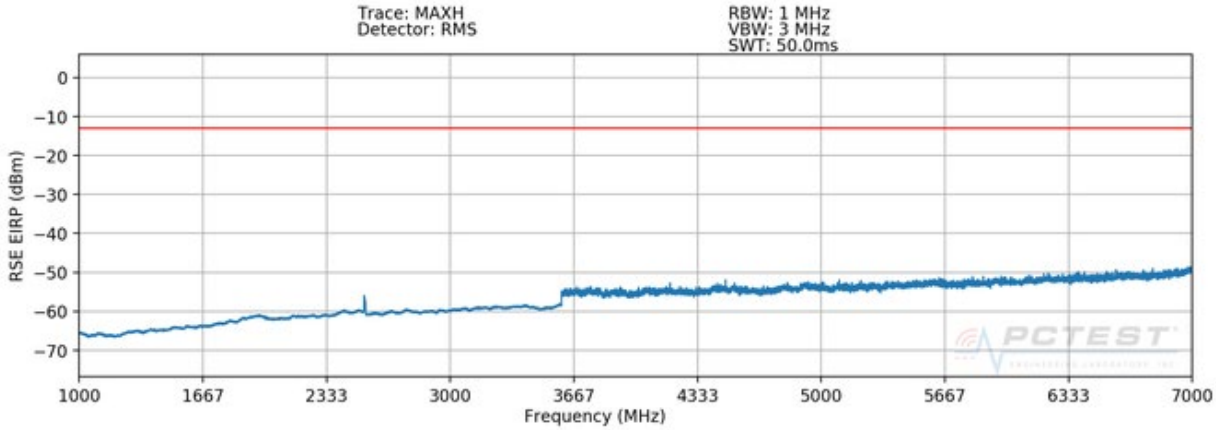
Band 71



Plot 7-292. Radiated Spurious Plot above 1GHz (Band 71)

OPERATING FREQUENCY:	673.00	MHz
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]
1346.00	H	288	355	-73.83	8.20	-65.63	-52.6
2019.00	H	226	12	-63.54	8.54	-55.00	-42.0
2692.00	H	-	-	-75.78	7.51	-68.27	-55.3

Table 7-12. Radiated Spurious Data (Band 71 – Low Channel)

OPERATING FREQUENCY:	680.50	MHz
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]
1361.00	H	180	271	-75.25	8.17	-67.08	-54.1
2041.50	H	205	339	-64.62	8.48	-56.14	-43.1
2722.00	H	-	-	-76.35	7.45	-68.90	-55.9

Table 7-13. Radiated Spurious Data (Band 71 – Mid Channel)

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OPERATING FREQUENCY:	680.50	MHz
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]
1361.00	H	180	271	-75.25	8.17	-67.08	-54.1
2041.50	H	205	339	-64.62	8.48	-56.14	-43.1
2722.00	H	-	-	-76.35	7.45	-68.90	-55.9

Table 7-14. Radiated Spurious Data (Band 71 – High Channel)

OPERATING FREQUENCY:	688.00	MHz
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]
1376.00	H	176	348	-74.17	8.14	-66.04	-53.0
2064.00	H	225	250	-63.63	8.41	-55.22	-42.2
2752.00	H	-	-	-75.50	7.40	-68.10	-55.1

Table 7-15. Radiated Spurious Data with WCP (Band 71 – High Channel)

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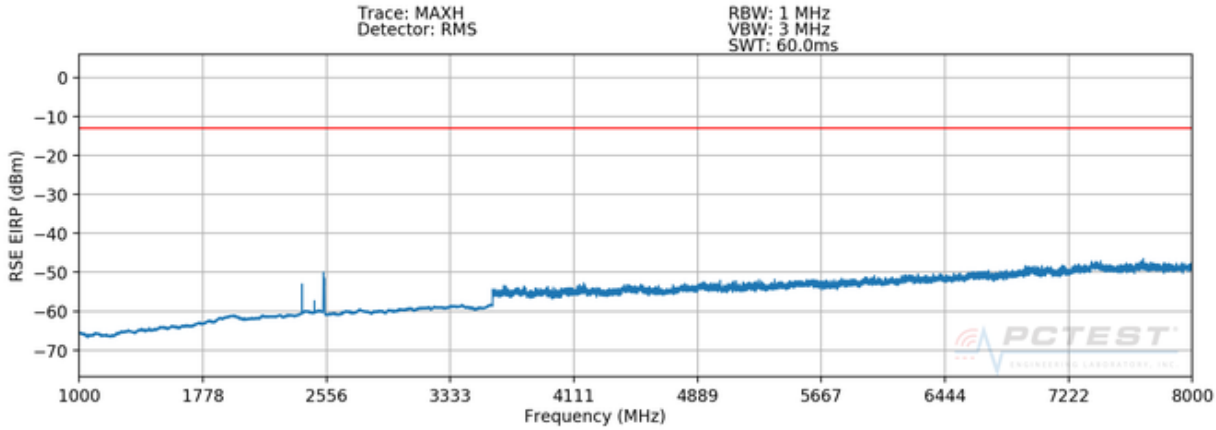
Band 12/17



Plot 7-293. Radiated Spurious Plot above 1GHz (Band 12/17)

OPERATING FREQUENCY:	704.00	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]
1408.00	H	270	341	-71.52	8.07	-63.44	-50.4
2112.00	H	263	322	-56.72	8.28	-48.45	-35.4
2816.00	H	-	-	-76.72	7.29	-69.43	-56.4

Table 7-16. Radiated Spurious Data (Band 12/17 – Low Channel)

OPERATING FREQUENCY:	707.50	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]
1415.00	H	293	230	-70.14	8.06	-62.08	-49.1
2122.50	H	166	253	-55.83	8.25	-47.58	-34.6
2830.00	H	-	-	-76.18	7.27	-68.91	-55.9

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

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OPERATING FREQUENCY:	711.00	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]
1422.00	H	176	345	-71.51	8.05	-63.46	-50.5
2133.00	H	380	318	-54.08	8.22	-45.87	-32.9
2844.00	H	-	-	-75.96	7.25	-68.71	-55.7

Table 7-18. Radiated Spurious Data (Band 12/17 – High Channel)

OPERATING FREQUENCY:	711.00	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]
1422.00	H	158	352	-73.99	8.05	-65.94	-52.9
2133.00	H	217	356	-63.34	8.22	-55.13	-42.1
2844.00	H	-	-	-74.76	7.25	-67.51	-54.5

Table 7-19. Radiated Spurious Data with WCP (Band 12/17 – High Channel)

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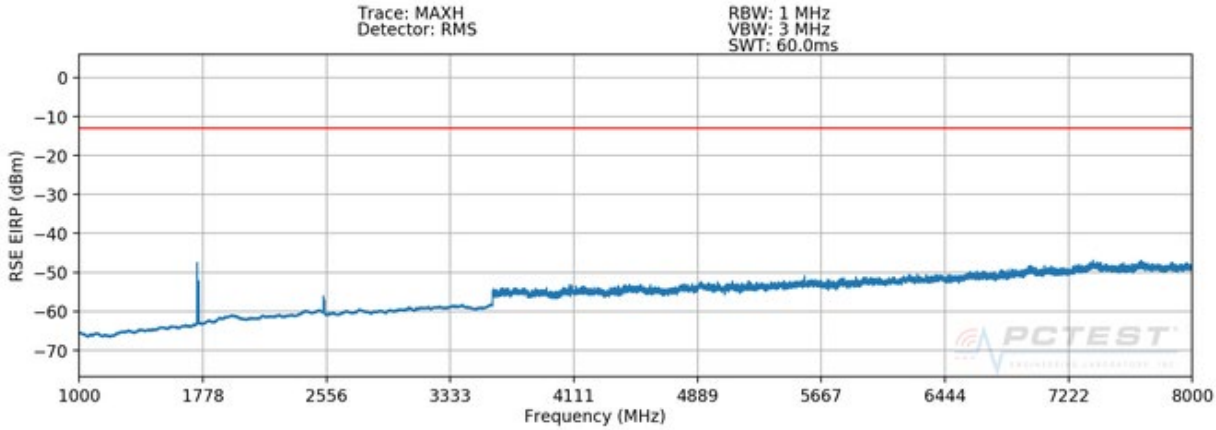
Band 13



Plot 7-294. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY:	779.50	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]
2338.50	H	140	273	-48.98	7.90	-41.08	-28.1
3118.00	H	-	-	-74.31	7.00	-67.31	-54.3

Table 7-20. Radiated Spurious Data (Band 13 – Low Channel)

OPERATING FREQUENCY:	782.00	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]
2346.00	H	210	149	-47.76	7.90	-39.86	-26.9
3128.00	H	-	-	-74.37	7.00	-67.37	-54.4

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

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OPERATING FREQUENCY:	784.50	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]
2353.50	H	118	275	-47.31	7.90	-39.41	-26.4
3138.00	H	-	-	-73.53	7.00	-66.53	-53.5

Table 7-22. Radiated Spurious Data (Band 13 – High Channel)

MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.00	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]
1559.00	H	229	29	-69.05	7.98	-61.08	-21.1
1564.00	H	153	319	-68.79	7.98	-60.81	-20.8
1569.00	H	225	33	-67.20	7.99	-59.22	-19.2

Table 7-23. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

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OPERATING FREQUENCY:	782.00	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]
2346.00	H	216	110	-54.66	7.90	-46.76	-33.8
3128.00	H	-	-	-72.26	7.00	-65.26	-52.3

Table 7-24. Radiated Spurious Data with WCP (Band 13 – Mid Channel)

MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.00	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	H	124	337	-71.21	7.98	-63.23	-23.2

Table 7-25. Radiated Spurious Data with WCP (Band 13 – 1559-1610MHz Band)

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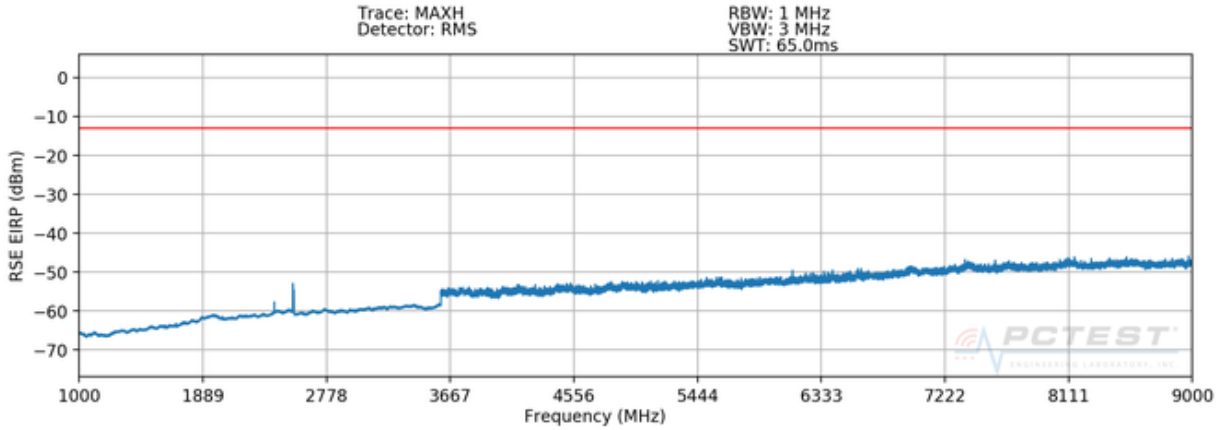
Band 26/5



Plot 7-295. Radiated Spurious Plot above 1GHz (Band 26/5)

OPERATING FREQUENCY:	829.00	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]
1658.00	H	-	-	-78.61	8.09	-70.52	-57.5
2487.00	H	201	337	-68.23	7.90	-60.33	-47.3
3316.00	H	-	-	-69.40	7.00	-62.40	-49.4

Table 7-26. Radiated Spurious Data (Band 26/5 – Low Channel)

OPERATING FREQUENCY:	836.50	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]
1673.00	H	-	-	-78.43	8.11	-70.31	-57.3
2509.50	H	120	339	-64.44	7.88	-56.56	-43.6
3346.00	H	-	-	-70.97	7.00	-63.97	-51.0

Table 7-27. Radiated Spurious Data (Band 26/5 – Mid Channel)

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OPERATING FREQUENCY:	844.00	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]
1688.00	H	-	-	-78.17	8.13	-70.04	-57.0
2532.00	H	145	330	-66.52	7.83	-58.69	-45.7
3376.00	H	-	-	-71.23	7.00	-64.23	-51.2

Table 7-28. Radiated Spurious Data (Band 26/5 – High Channel)

OPERATING FREQUENCY:	836.50	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]
1673.00	H	-	-	-78.69	8.11	-70.57	-57.6
2509.50	H	112	355	-68.11	7.88	-60.23	-47.2
3346.00	H	-	-	-71.83	7.00	-64.83	-51.8

Table 7-29. Radiated Spurious Data with WCP (Band 26/5 – Mid Channel)

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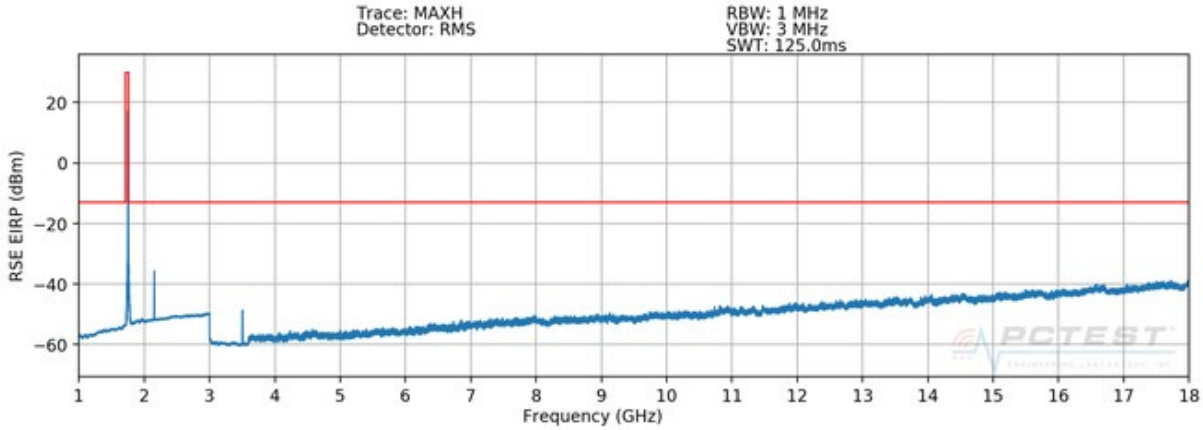
Band 66/4



Plot 7-296. Radiated Spurious Plot above 1GHz (Band 66/4)

OPERATING FREQUENCY:	1715.00	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]
3430.00	H	117	319	-55.00	7.00	-48.00	-35.0
5145.00	H	128	195	-66.70	8.65	-58.05	-45.1
6860.00	H	-	-	-71.81	9.84	-61.97	-49.0

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

OPERATING FREQUENCY:	1732.50	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]
3465.00	H	113	318	-59.34	7.00	-52.34	-39.3
5197.50	H	118	209	-70.00	8.52	-61.48	-48.5
6930.00	H	-	-	-71.93	9.87	-62.05	-49.1

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

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OPERATING FREQUENCY:	1750.00	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]
3500.00	H	187	315	-60.32	7.00	-53.32	-40.3
5250.00	H	118	50	-70.03	8.40	-61.63	-48.6
7000.00	H	-	-	-72.07	9.90	-62.17	-49.2

Table 7-32. Radiated Spurious Data (Band 66/4 – High Channel)

OPERATING FREQUENCY:	1750.00	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]
3500.00	H	202	347	-64.44	7.00	-57.44	-44.4
5250.00	H	112	23	-67.98	8.40	-59.58	-46.6
7000.00	H	-	-	-71.27	9.90	-61.37	-48.4

Table 7-33. Radiated Spurious Data with WCP (Band 66/4 – High Channel)

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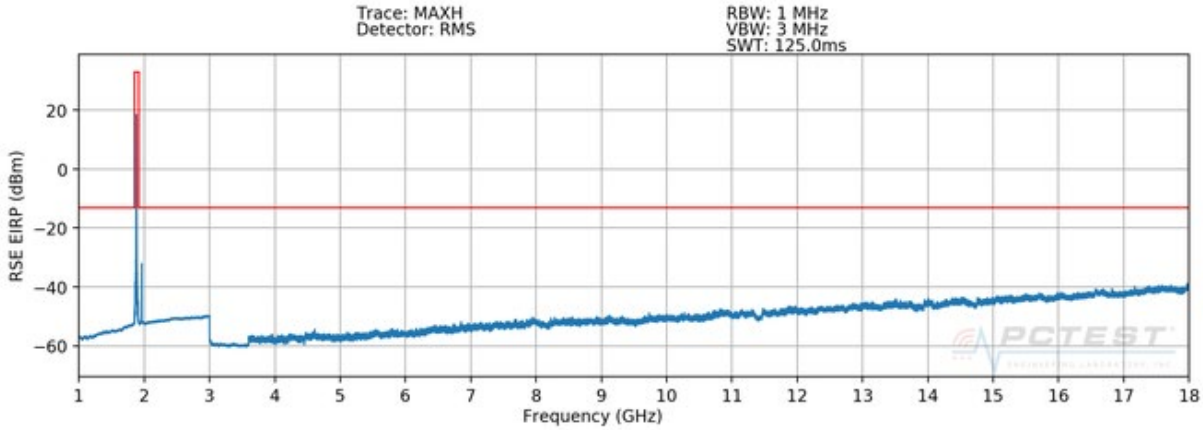
Band 25/2



Plot 7-297. Radiated Spurious Plot above 1GHz (Band 25/2)

OPERATING FREQUENCY:	1855.00	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]
3710.00	H	174	231	-67.73	5.40	-62.34	-49.3
5565.00	H	120	237	-71.83	9.49	-62.34	-49.3
7420.00	H	-	-	-70.30	9.77	-60.53	-47.5

Table 7-34. Radiated Spurious Data (Band 25/2 – Low Channel)

OPERATING FREQUENCY:	1880.00	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]
3760.00	H	133	277	-63.65	5.10	-58.54	-45.5
5640.00	H	170	228	-66.19	9.70	-56.49	-43.5
7520.00	H	-	-	-70.48	9.79	-60.69	-47.7

Table 7-35. Radiated Spurious Data (Band 25/2 – Mid Channel)

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OPERATING FREQUENCY:	1905.00	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]
3810.00	H	132	171	-68.94	5.12	-63.82	-50.8
5715.00	H	113	228	-70.52	9.90	-60.62	-47.6
7620.00	H	-	-	-70.64	9.75	-60.89	-47.9

Table 7-36. Radiated Spurious Data (Band 25/2 – High Channel)

OPERATING FREQUENCY:	1880.00	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]
3760.00	H	110	249	-63.07	5.10	-57.96	-45.0
5640.00	H	227	231	-69.25	9.70	-59.55	-46.6
7520.00	H	-	-	-69.19	9.79	-59.40	-46.4

Table 7-37. Radiated Spurious Data with WCP (Band 25/2 – Mid Channel)

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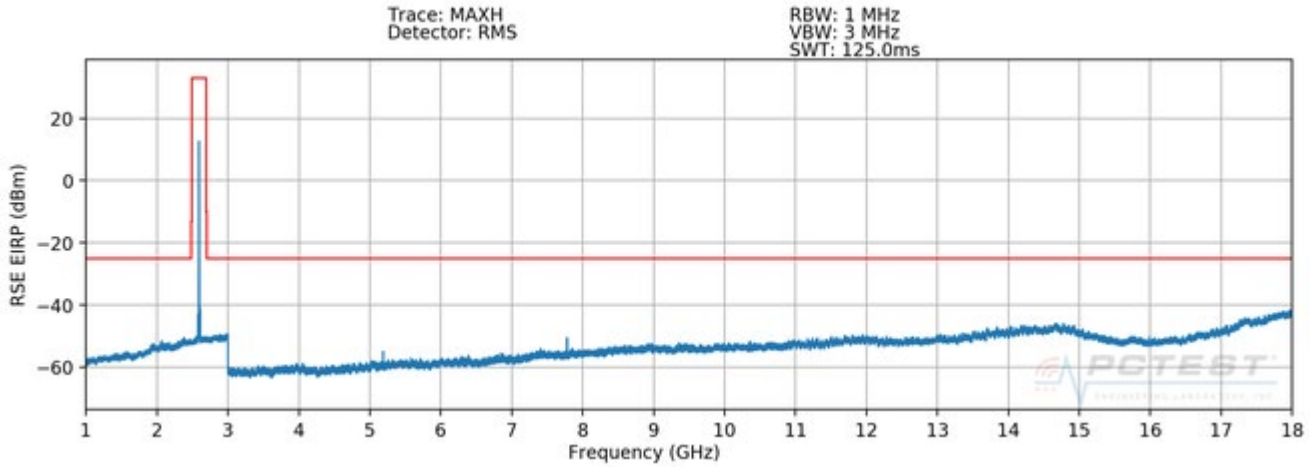
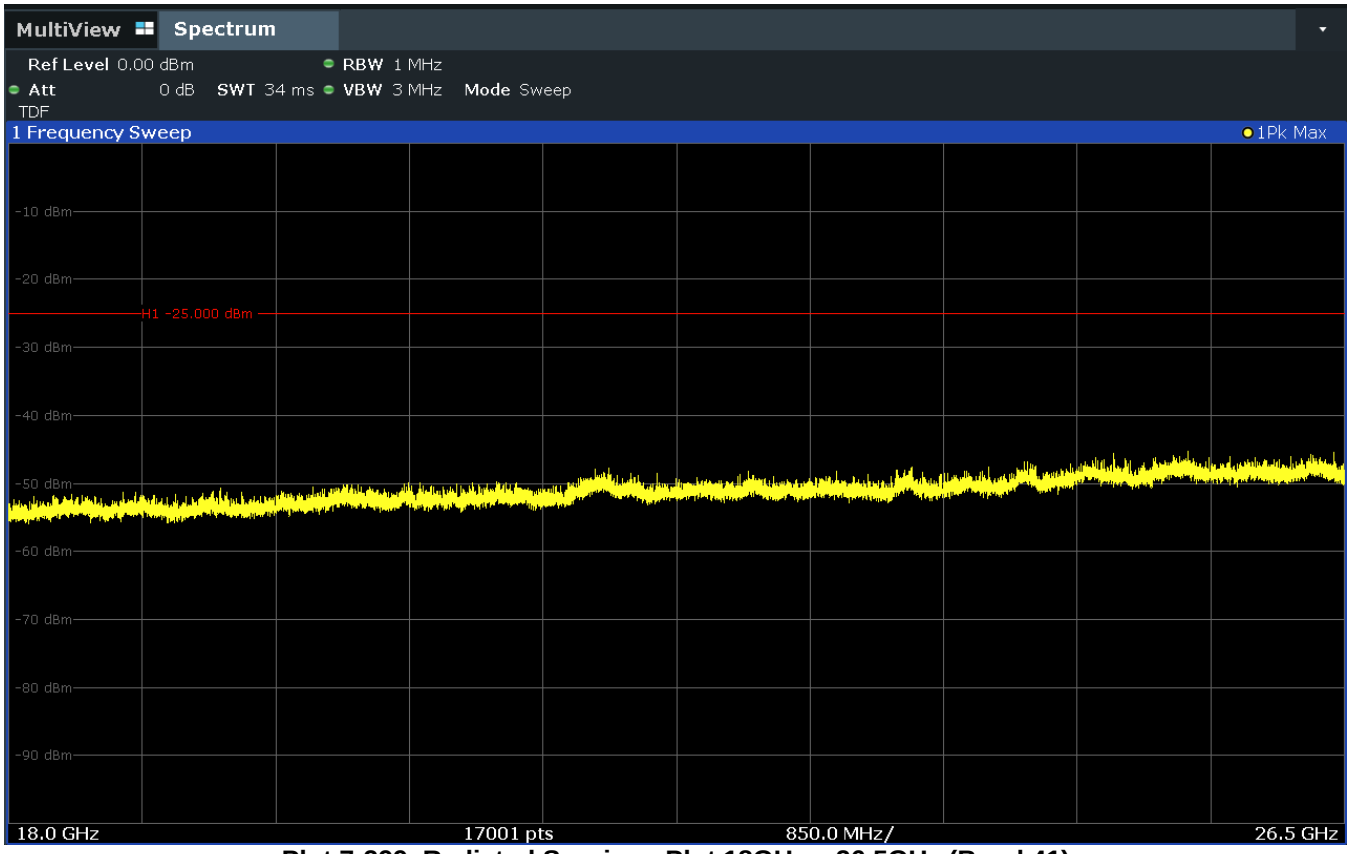
Band 41



Plot 7-298. Radiated Spurious Plot 1GHz - 18GHz (Band 41)



Plot 7-299. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41)

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OPERATING FREQUENCY:	2501.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	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]
5002.00	H	-	-	-73.54	10.93	-62.61	-37.6
7503.00	H	-	-	-69.94	11.08	-58.87	-33.9

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

OPERATING FREQUENCY:	2593.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	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	400	40	-68.17	10.74	-57.43	-32.4
7779.00	H	112	332	-59.95	11.44	-48.51	-23.5
10372.00	H	148	348	-67.62	12.42	-55.19	-30.2
12965.00	H	-	-	-66.40	13.29	-53.10	-28.1

Table 7-39. Radiated Spurious Data (Band 41 – Mid Channel)

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OPERATING FREQUENCY: 2685.00 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 10.0 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]
5370.00	H	313	4	-63.67	10.69	-52.98	-28.0
8055.00	H	115	324	-58.52	11.17	-47.35	-22.4
10740.00	H	399	41	-68.09	12.61	-55.49	-30.5
13425.00	H	-	-	-65.02	12.59	-52.43	-27.4

Table 7-40. Radiated Spurious Data (Band 41 – High Channel)

OPERATING FREQUENCY: 2593.00 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 10.0 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	205	347	-66.84	10.74	-56.10	-31.1
7779.00	H	123	354	-66.31	11.44	-54.87	-29.9
10372.00	H	-	-	-66.87	12.42	-54.45	-29.4

Table 7-41. Radiated Spurious Data with WCP (Band 41 – Mid Channel)

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7.10 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.

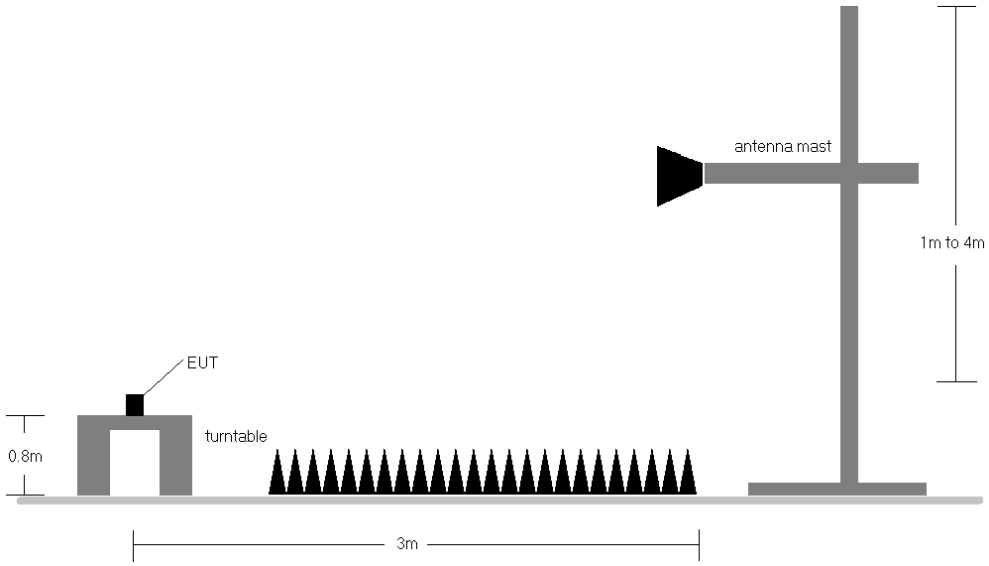

Figure 7-10. Test Instrument & Measurement Setup

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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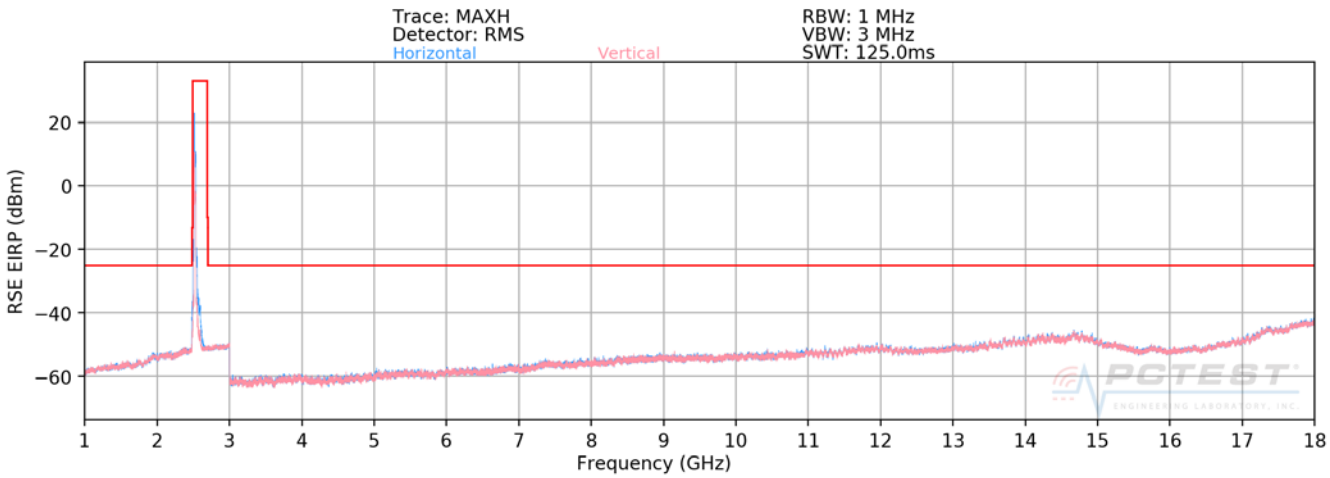
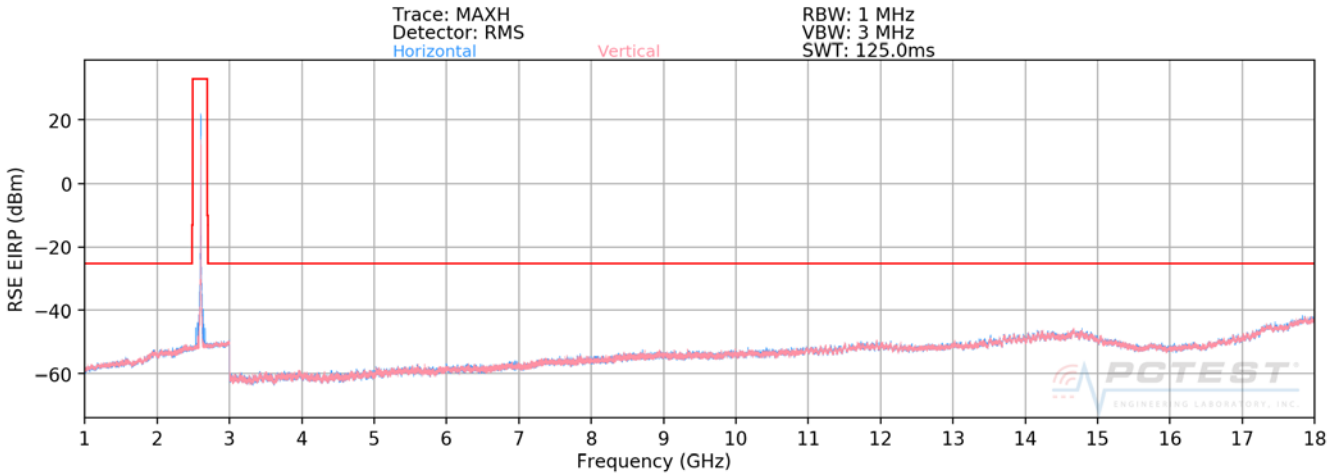
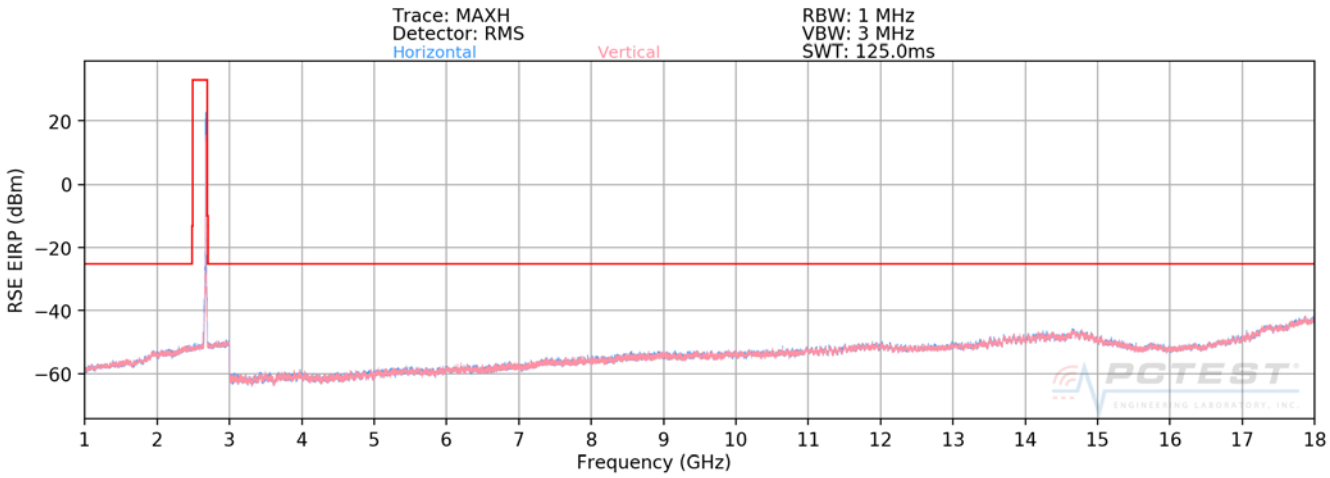


Plot 7-42. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0-Low Channel)



Plot 7-43. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0-Mid Channel)



Plot 7-44. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99-High Channel)

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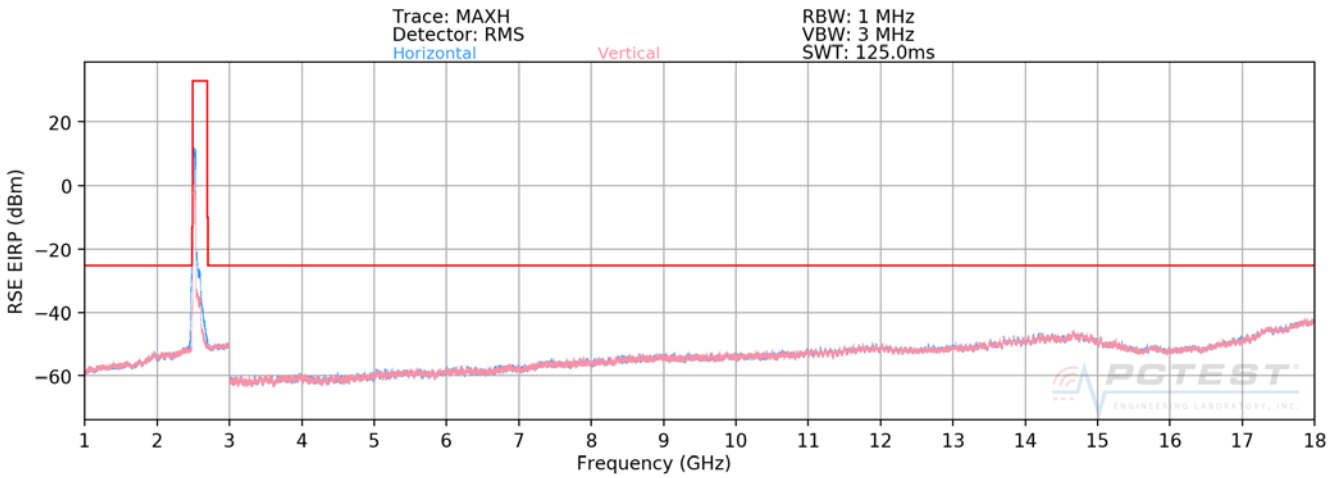
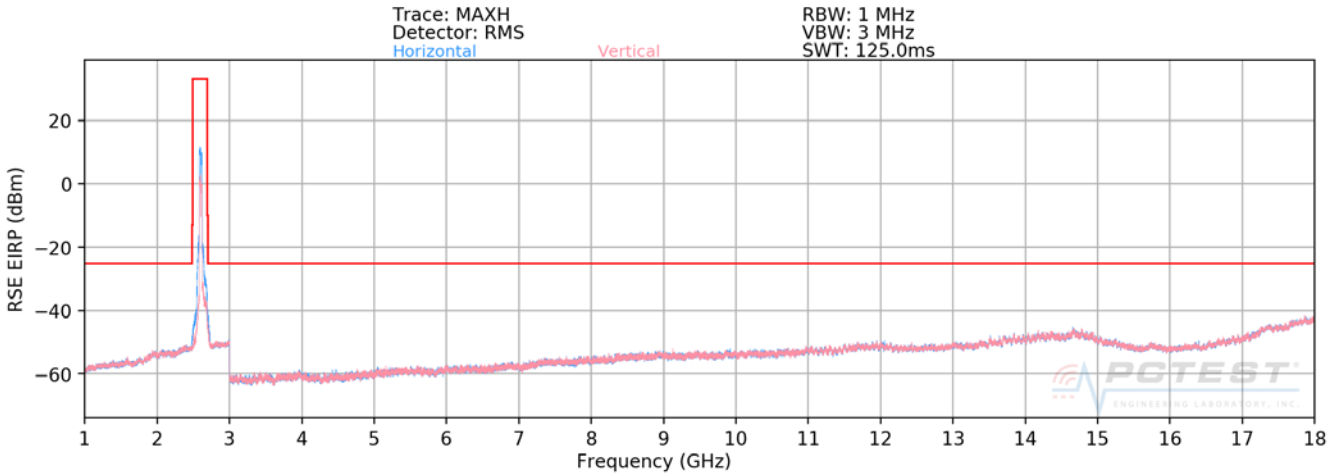
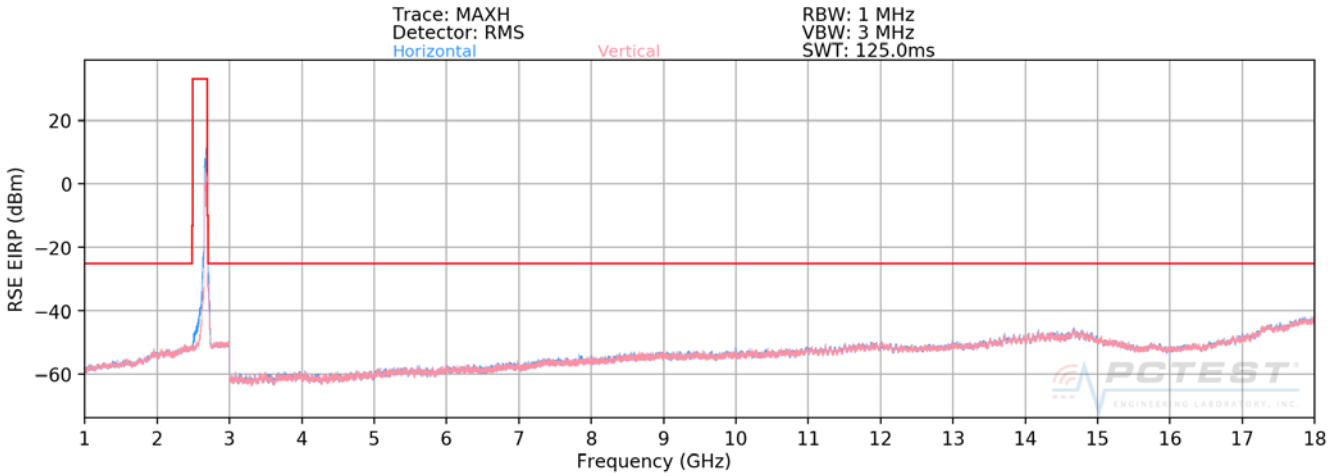


Plot 7-45. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0-Low Channel)



Plot 7-46. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0-Mid Channel)



Plot 7-47. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0-High Channel)

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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	H	-	-	-73.79	10.93	-62.86	-37.9
7513.00	H	-	-	-69.80	11.08	-58.72	-33.7

Table 7-48. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0-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	H	-	-	-72.94	10.74	-62.20	-37.2
7779.00	H	-	-	-70.30	11.44	-58.86	-33.9

Table 7-49. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0-Mid Channel)

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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	H	362	364	-63.17	10.69	-52.48	-27.5
8045.00	H	113	325	-56.19	11.17	-45.02	-20.0
10730.00	H	399	63	-68.00	12.61	-55.39	-30.4
13415.00	H	-	-	-65.10	12.59	-52.51	-27.5

Table 7-50. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99-High 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	H	350	348	-67.37	10.69	-56.68	-31.7
7953.00	H	125	312	-64.06	11.17	-52.90	-27.9
10546.00	H	-	-	-67.92	12.61	-55.32	-30.3
13139.00	H	-	-	-66.84	12.59	-54.25	-29.3

Table 7-51. Radiated Spurious Data with WCP (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99-High Channel)

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7.11 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. For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

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Band 71 Frequency Stability Measurements

OPERATING FREQUENCY: 680,500,000 Hz

REFERENCE VOLTAGE: 3.87 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.87	- 30	680,500,287	287	0.0000422
100 %		- 20	680,499,876	-124	-0.0000182
100 %		- 10	680,500,089	89	0.0000131
100 %		0	680,500,246	246	0.0000361
100 %		+ 10	680,500,279	279	0.0000410
100 %		+ 20	680,499,790	-210	-0.0000309
100 %		+ 30	680,499,855	-145	-0.0000213
100 %		+ 40	680,499,969	-31	-0.0000046
100 %		+ 50	680,500,153	153	0.0000225
BATT. ENDPOINT	3.19	+ 20	680,500,374	374	0.0000550

Table 7-52. Frequency Stability Data (Band 71)

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 71 Frequency Stability Measurements

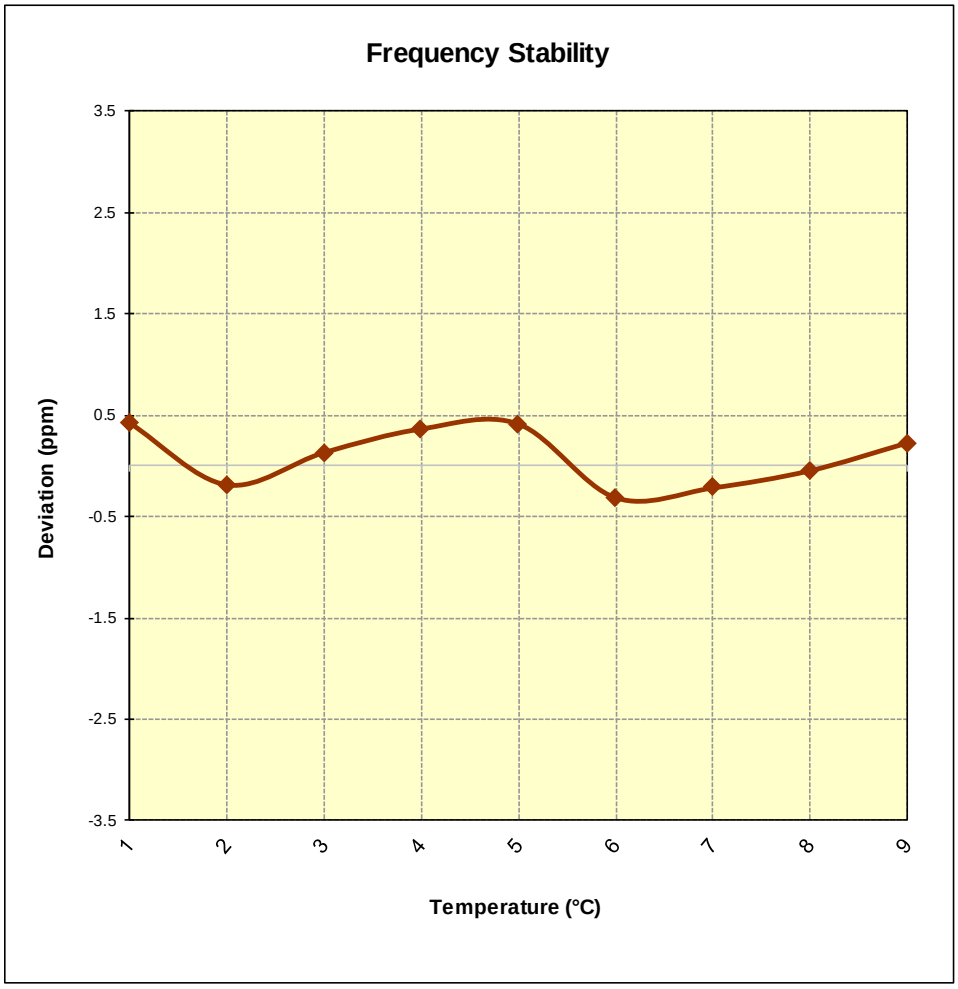

Figure 7-11. Frequency Stability Graph (Band 71)

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Band 12/17 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz

REFERENCE VOLTAGE: 3.87 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.87	- 30	707,499,781	-219	-0.0000310
100 %		- 20	707,500,421	421	0.0000595
100 %		- 10	707,499,721	-279	-0.0000394
100 %		0	707,500,300	300	0.0000424
100 %		+ 10	707,500,135	135	0.0000191
100 %		+ 20	707,499,987	-13	-0.0000018
100 %		+ 30	707,499,749	-251	-0.0000355
100 %		+ 40	707,499,917	-83	-0.0000117
100 %		+ 50	707,499,997	-3	-0.0000004
BATT. ENDPOINT	3.19	+ 20	707,499,625	-375	-0.0000530

Table 7-53. Frequency Stability Data (Band 12/17)

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 12/17 Frequency Stability Measurements

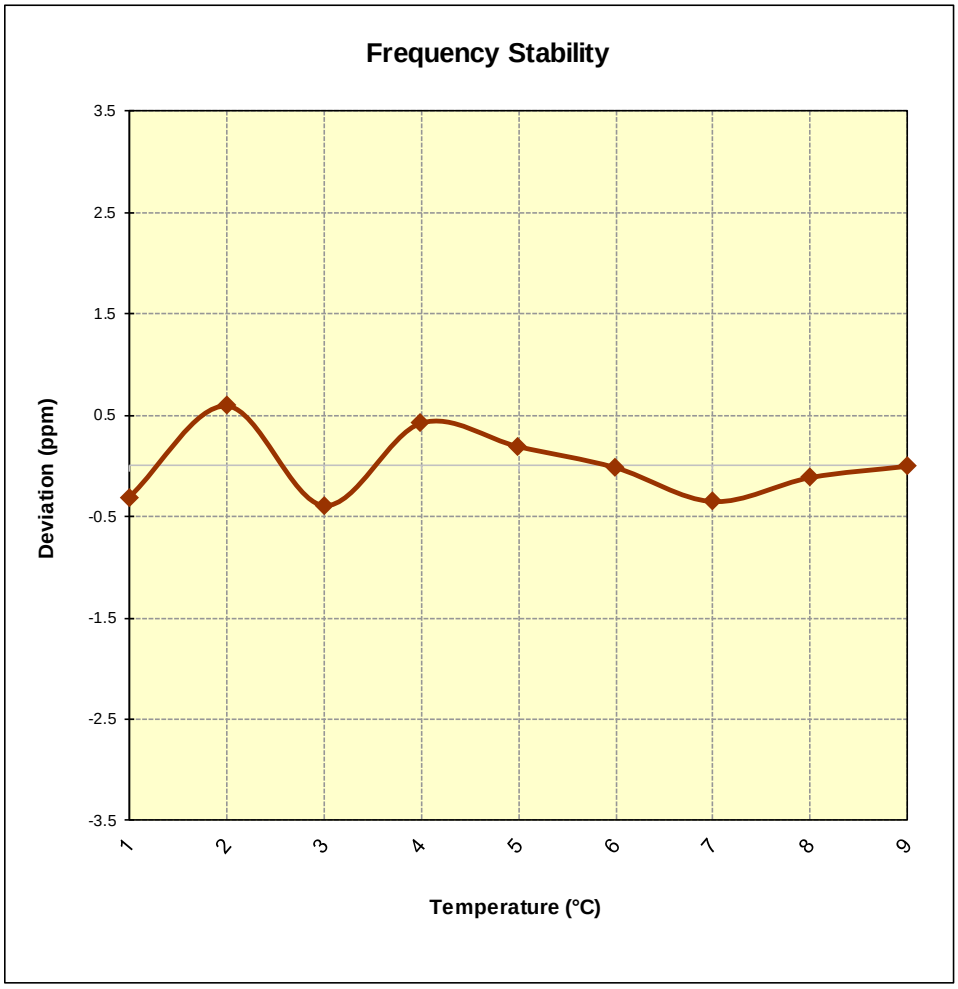

Figure 7-12. Frequency Stability Graph (Band 12/17)

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Band 13 Frequency Stability Measurements

OPERATING FREQUENCY: 782,000,000 Hz

REFERENCE VOLTAGE: 3.87 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.87	- 30	782,000,040	40	0.0000051
100 %		- 20	781,999,937	-63	-0.0000081
100 %		- 10	782,000,393	393	0.0000503
100 %		0	781,999,816	-184	-0.0000235
100 %		+ 10	781,999,731	-269	-0.0000344
100 %		+ 20	781,999,888	-112	-0.0000143
100 %		+ 30	782,000,221	221	0.0000283
100 %		+ 40	782,000,238	238	0.0000304
100 %		+ 50	781,999,928	-72	-0.0000092
BATT. ENDPOINT	3.19	+ 20	781,999,880	-120	-0.0000153

Table 7-54. 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

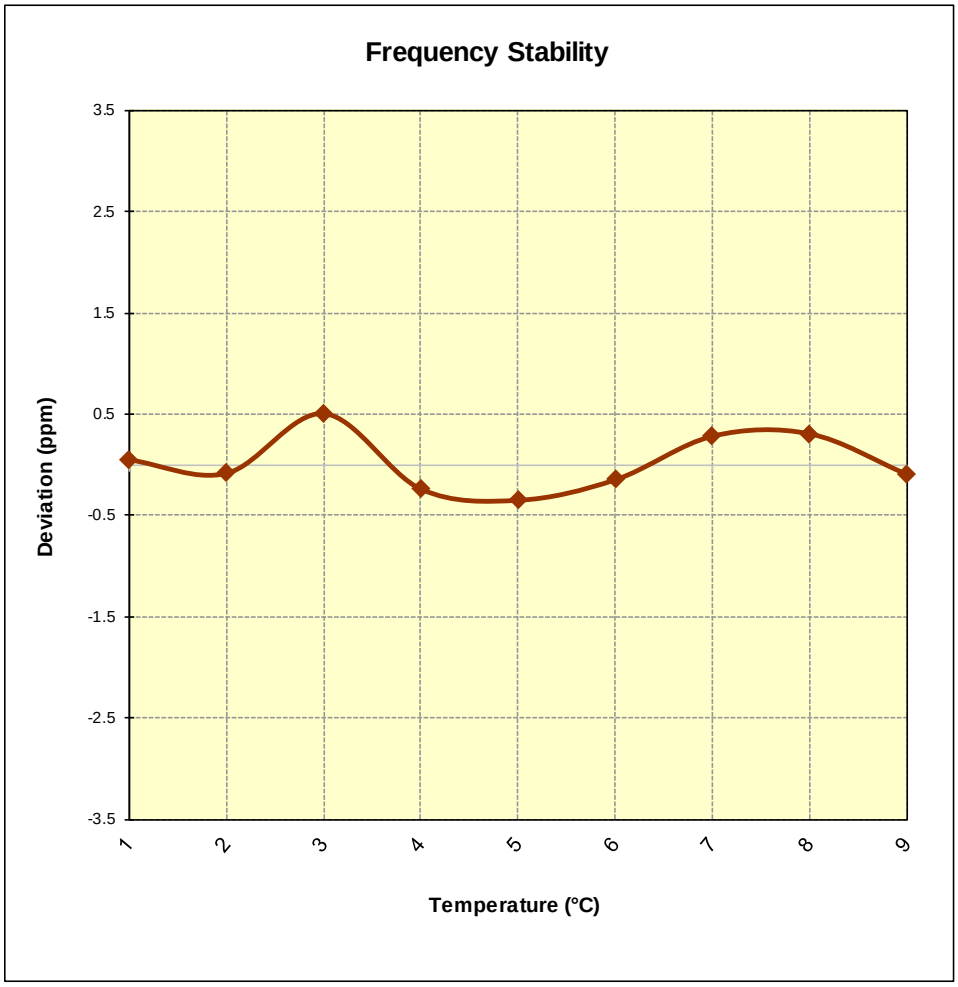

Figure 7-13. Frequency Stability Graph (Band 13)

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Band 26/5 Frequency Stability Measurements

OPERATING FREQUENCY: 836,500,000 Hz

REFERENCE VOLTAGE: 3.87 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.87	- 30	836,500,020	20	0.0000024
100 %		- 20	836,499,775	-225	-0.0000269
100 %		- 10	836,500,073	73	0.0000087
100 %		0	836,499,714	-286	-0.0000342
100 %		+ 10	836,499,909	-91	-0.0000109
100 %		+ 20	836,499,810	-190	-0.0000227
100 %		+ 30	836,500,057	57	0.0000068
100 %		+ 40	836,499,688	-312	-0.0000373
100 %		+ 50	836,500,148	148	0.0000177
BATT. ENDPOINT	3.19	+ 20	836,499,978	-22	-0.0000026

Table 7-55. Frequency Stability Data (Band 26/5)

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Band 26/5 Frequency Stability Measurements

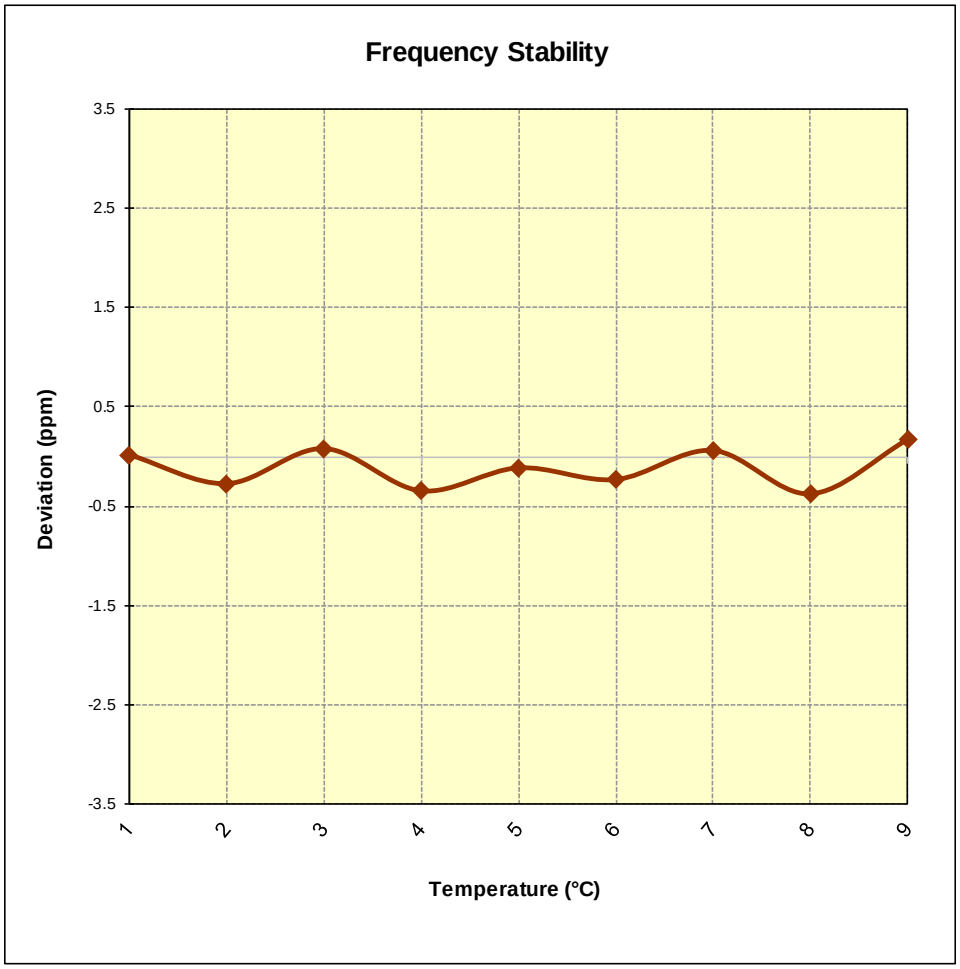

Figure 7-14. Frequency Stability Graph (Band 26/5)

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Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz

REFERENCE VOLTAGE: 3.87 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.87	- 30	1,744,999,614	-386	-0.0000221
100 %		- 20	1,745,000,295	295	0.0000169
100 %		- 10	1,745,000,061	61	0.0000035
100 %		0	1,745,000,323	323	0.0000185
100 %		+ 10	1,744,999,993	-7	-0.0000004
100 %		+ 20	1,745,000,048	48	0.0000028
100 %		+ 30	1,744,999,853	-147	-0.0000084
100 %		+ 40	1,744,999,937	-63	-0.0000036
100 %		+ 50	1,744,999,911	-89	-0.0000051
BATT. ENDPOINT	3.19	+ 20	1,745,000,081	81	0.0000046

Table 7-56. Frequency Stability Data (Band 66/4)

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 66/4 Frequency Stability Measurements

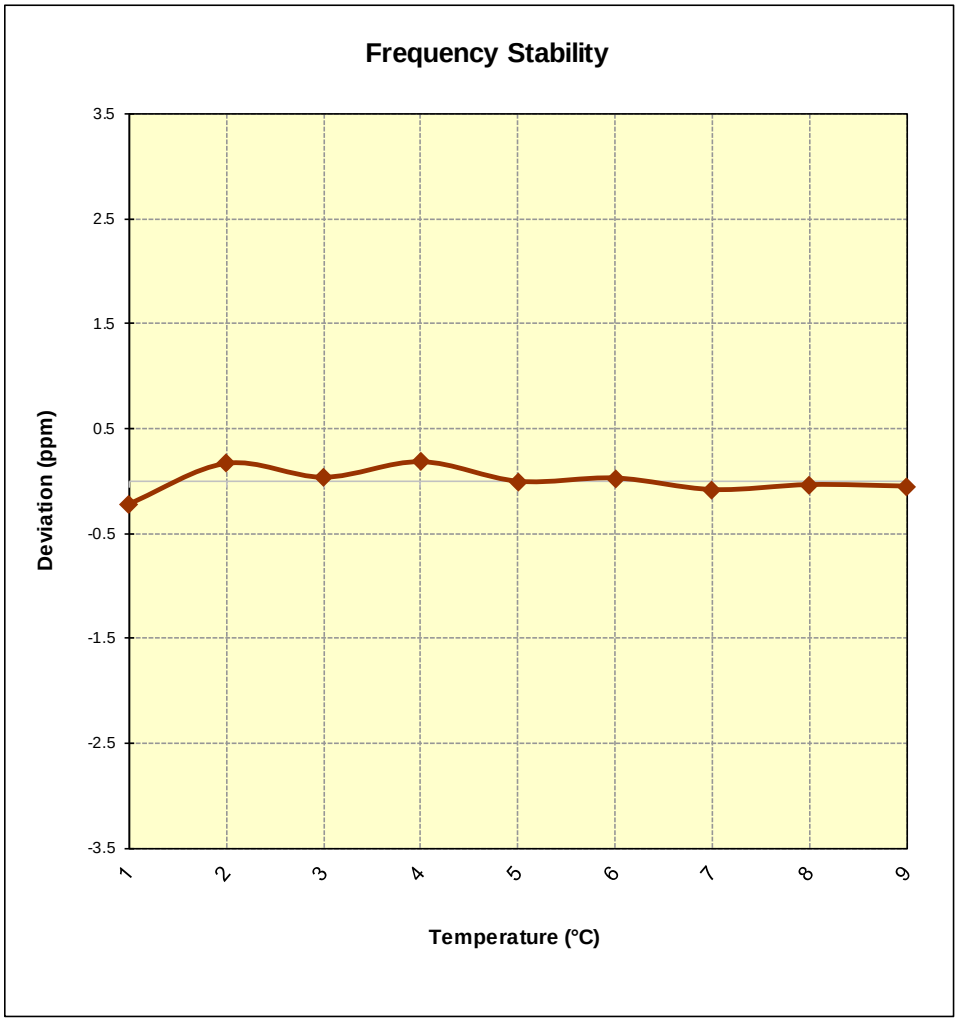

Figure 7-15. Frequency Stability Graph (Band 66/4)

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Band 25/2 Frequency Stability Measurements

OPERATING FREQUENCY: 1,882,500,000 Hz

REFERENCE VOLTAGE: 3.87 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.87	- 30	1,882,500,425	425	0.0000226
100 %		- 20	1,882,499,905	-95	-0.0000050
100 %		- 10	1,882,499,924	-76	-0.0000040
100 %		0	1,882,500,215	215	0.0000114
100 %		+ 10	1,882,499,939	-61	-0.0000032
100 %		+ 20	1,882,499,988	-12	-0.0000006
100 %		+ 30	1,882,499,992	-8	-0.0000004
100 %		+ 40	1,882,500,199	199	0.0000106
100 %		+ 50	1,882,500,049	49	0.0000026
BATT. ENDPOINT	3.19	+ 20	1,882,499,826	-174	-0.0000092

Table 7-57. Frequency Stability Data (Band 25/2)

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 25/2 Frequency Stability Measurements

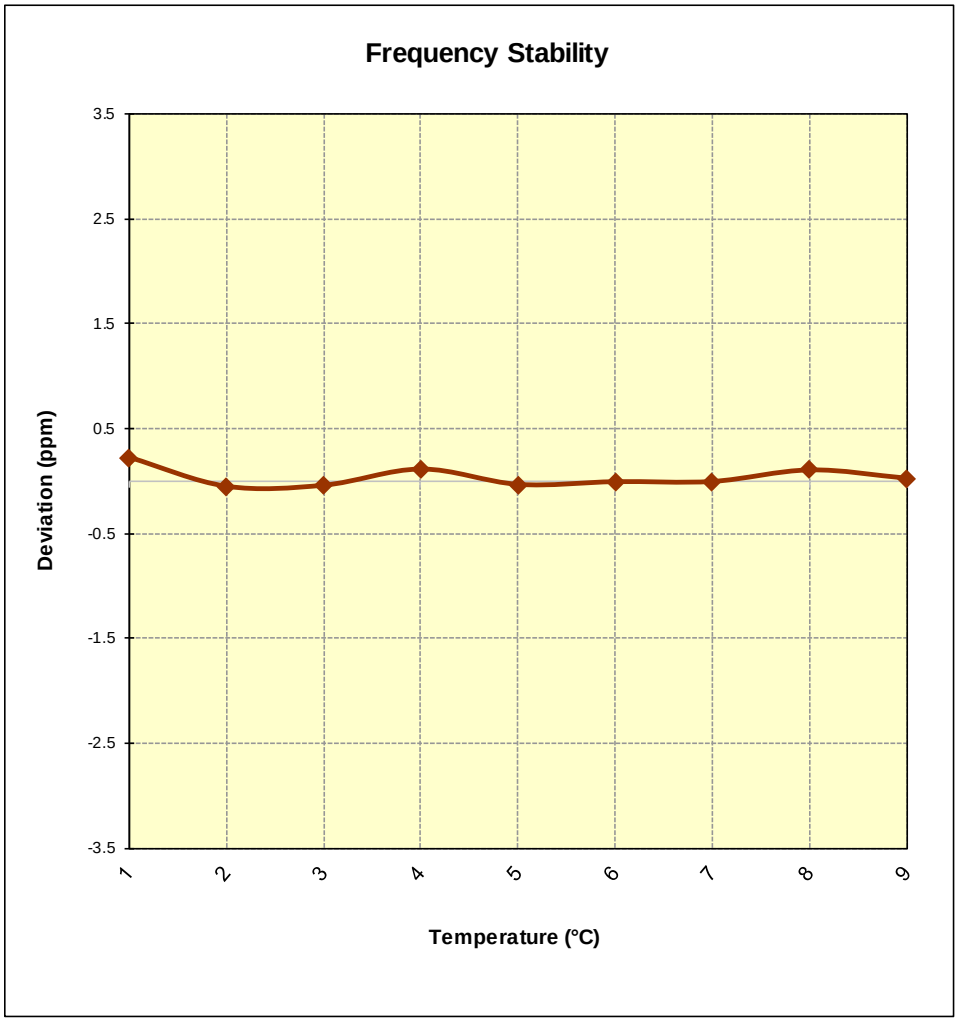

Figure 7-16. Frequency Stability Graph (Band 25/2)

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Band 41 Frequency Stability Measurements

OPERATING FREQUENCY: 2,593,000,000 Hz

REFERENCE VOLTAGE: 3.87 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.87	- 30	2,592,999,966	-34	-0.0000013
100 %		- 20	2,592,999,840	-160	-0.0000062
100 %		- 10	2,593,000,047	47	0.0000018
100 %		0	2,592,999,805	-195	-0.0000075
100 %		+ 10	2,592,999,828	-172	-0.0000066
100 %		+ 20	2,592,999,726	-274	-0.0000106
100 %		+ 30	2,593,000,034	34	0.0000013
100 %		+ 40	2,592,999,896	-104	-0.0000040
100 %		+ 50	2,593,000,289	289	0.0000111
BATT. ENDPOINT	3.19	+ 20	2,592,999,963	-37	-0.0000014

Table 7-58. Frequency Stability Data (Band 41)

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 41 Frequency Stability Measurements

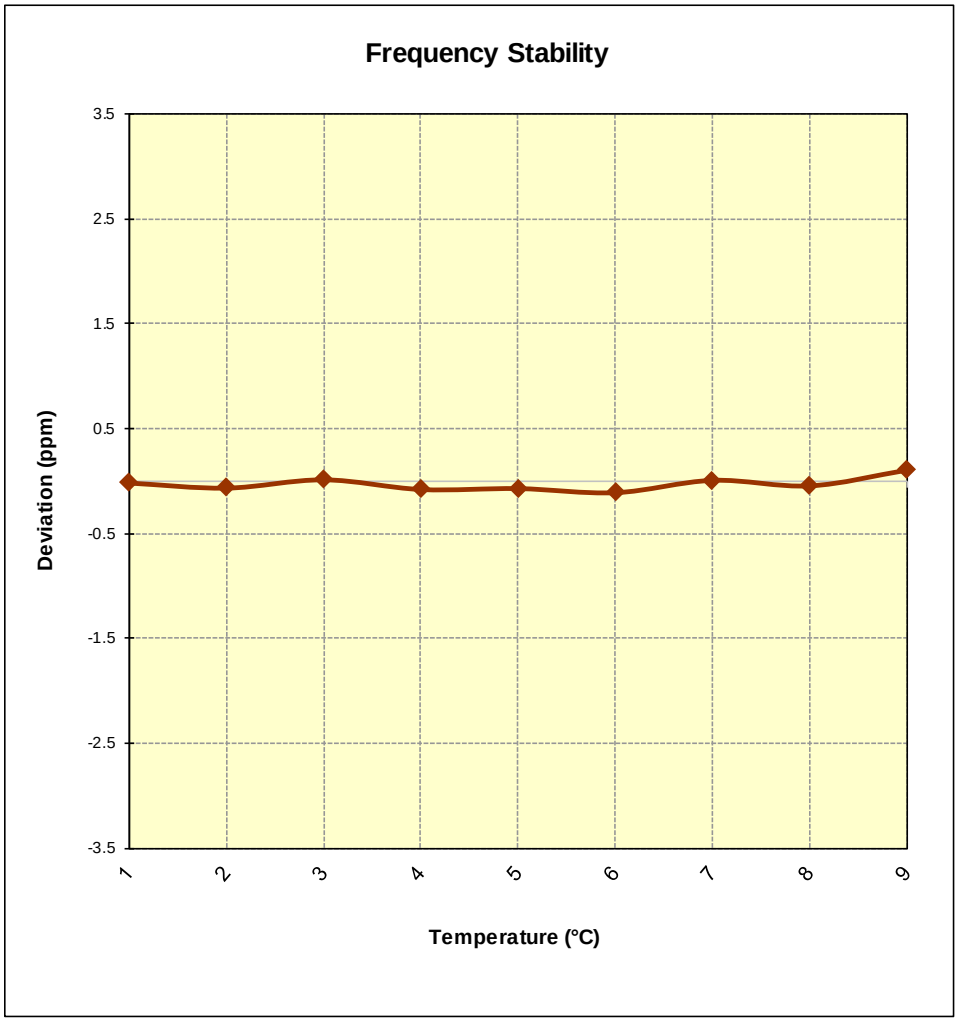

Figure 7-17. Frequency Stability Graph (Band 41)

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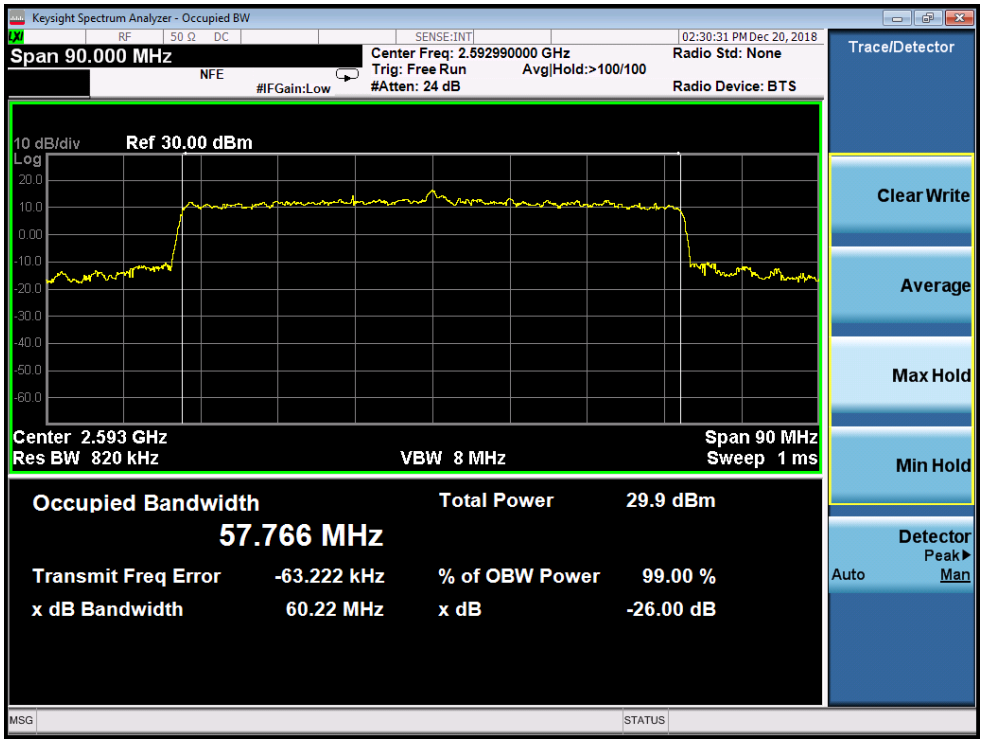
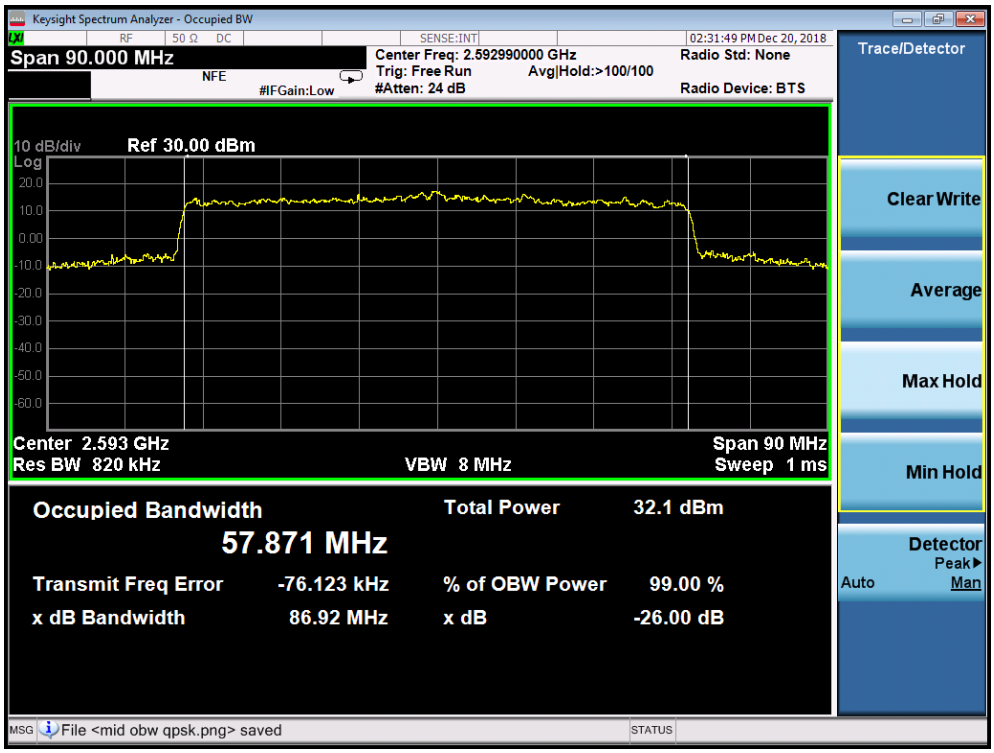
7.12 n41 (ENDC) Test Results



Plot 300. Occupied Bandwidth Plot (n41 60MHz CP-QPSK - Full RB Configuration)



Plot 301. Occupied Bandwidth Plot (n41 60MHz CP-16QAM - Full RB Configuration)

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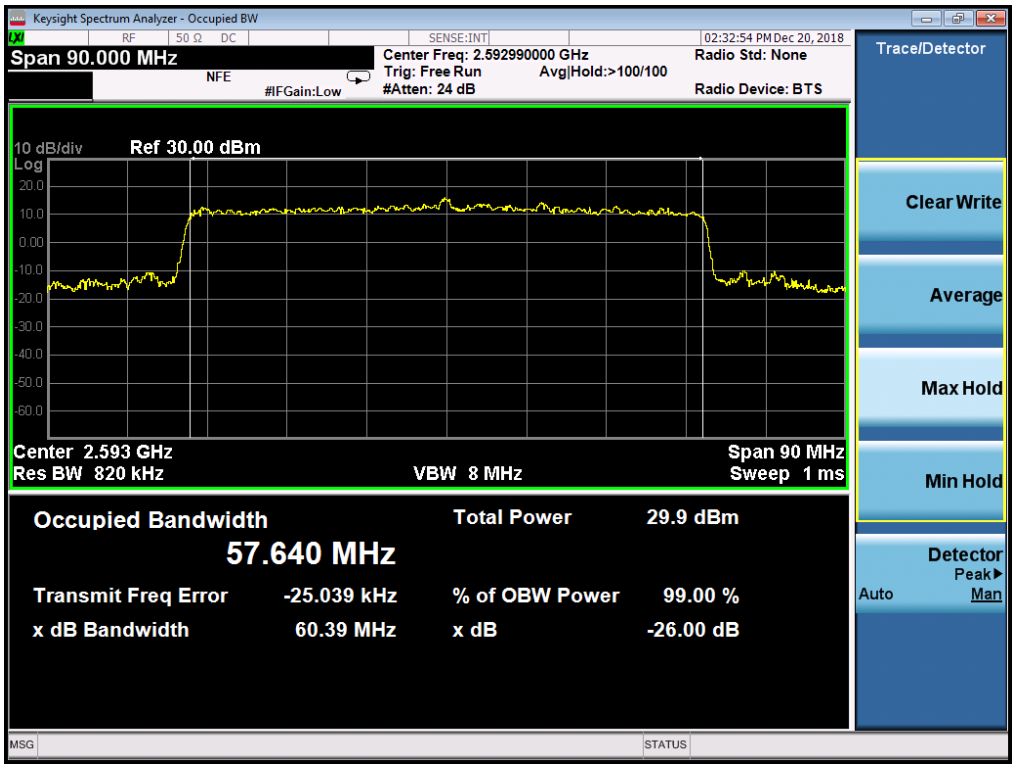
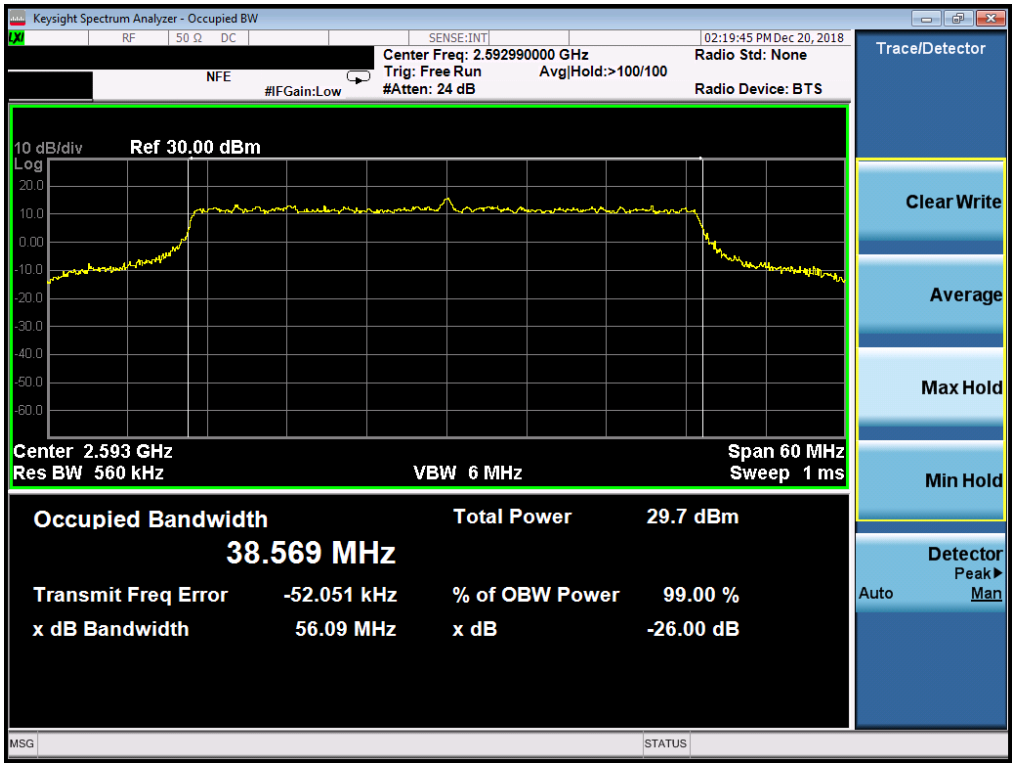


Plot 302. Occupied Bandwidth Plot (n41 60MHz CP-64QAM - Full RB Configuration)



Plot 303. Occupied Bandwidth Plot (n41 40MHz CP-QPSK - Full RB Configuration)

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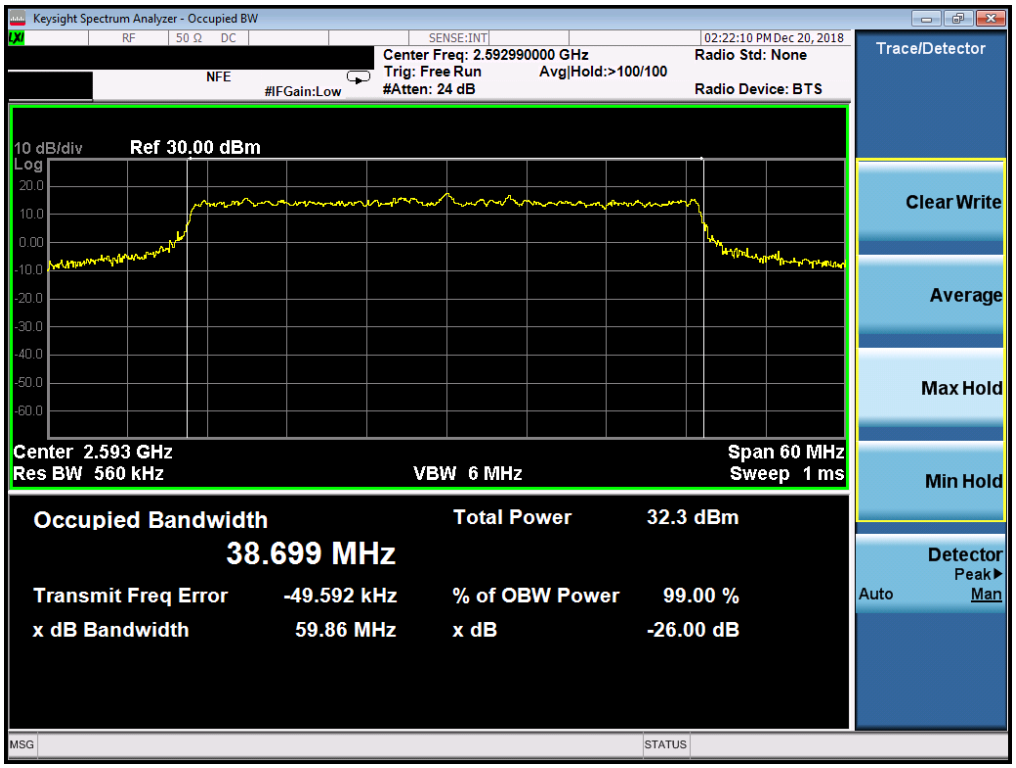
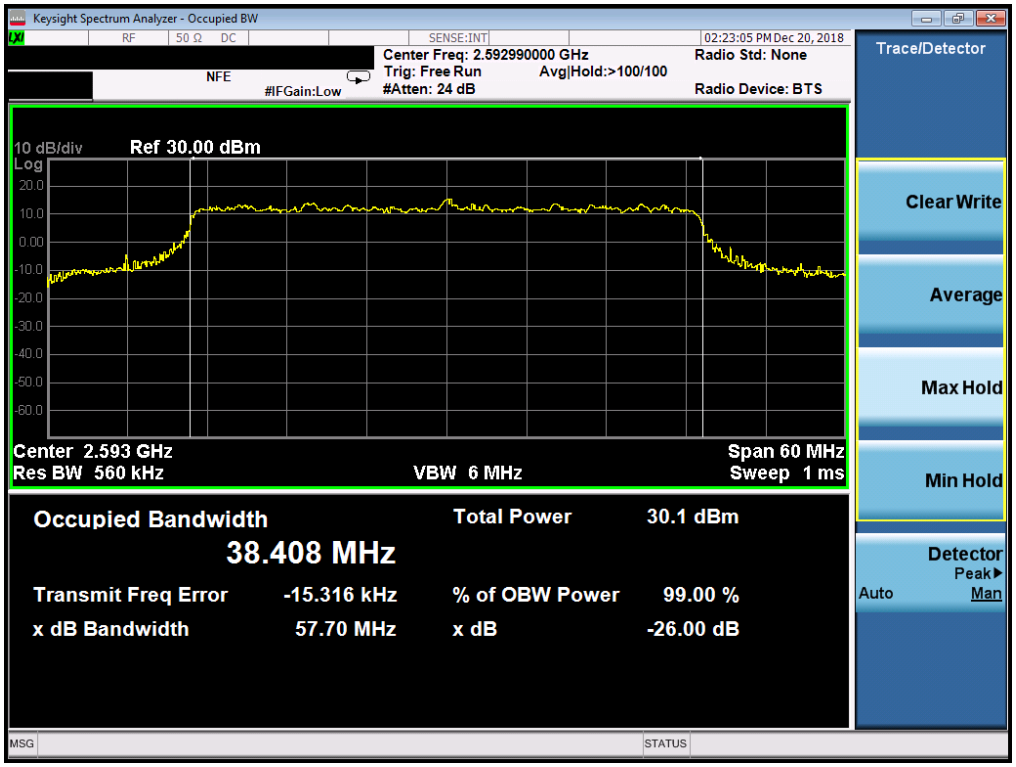


Plot 304. Occupied Bandwidth Plot (n41 40MHz CP-16QAM - Full RB Configuration)



Plot 305. Occupied Bandwidth Plot (n41 40MHz CP-64QAM- Full RB Configuration)

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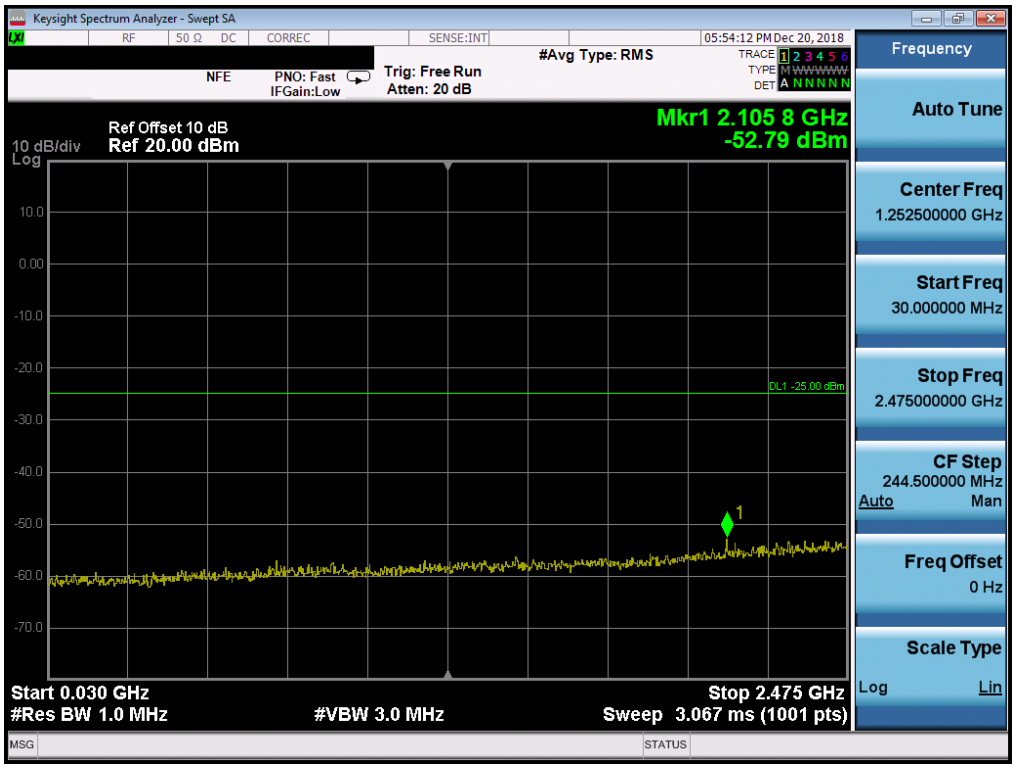
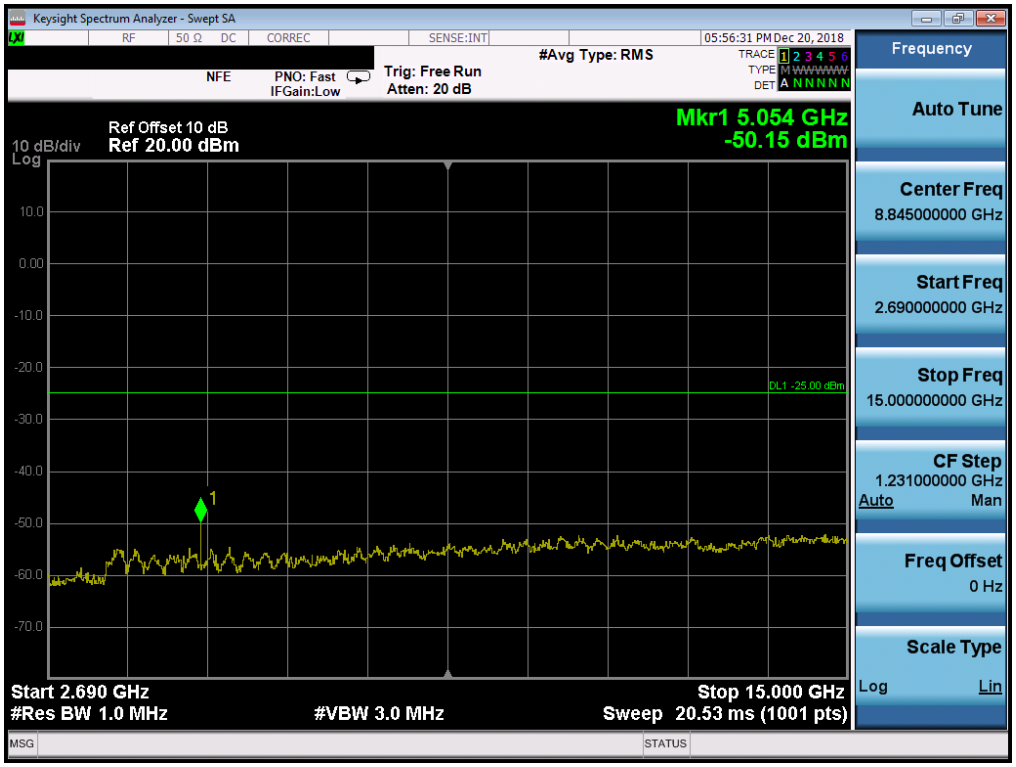


Plot 306. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - Low Channel)



Plot 307. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 – Low Channel)

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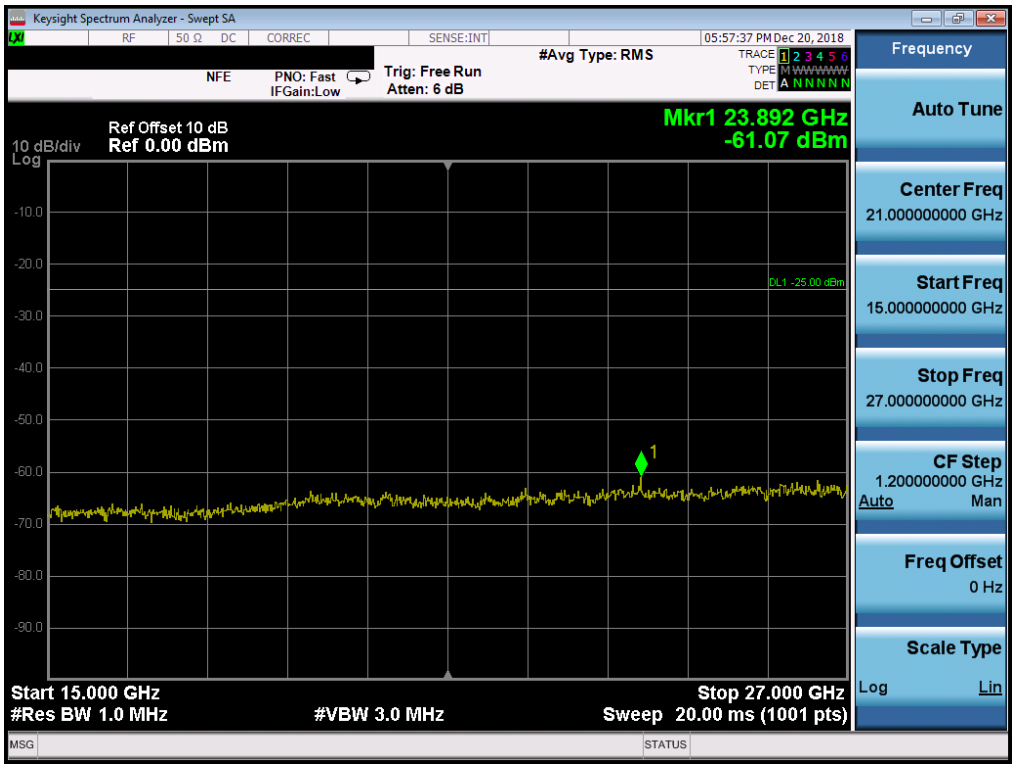
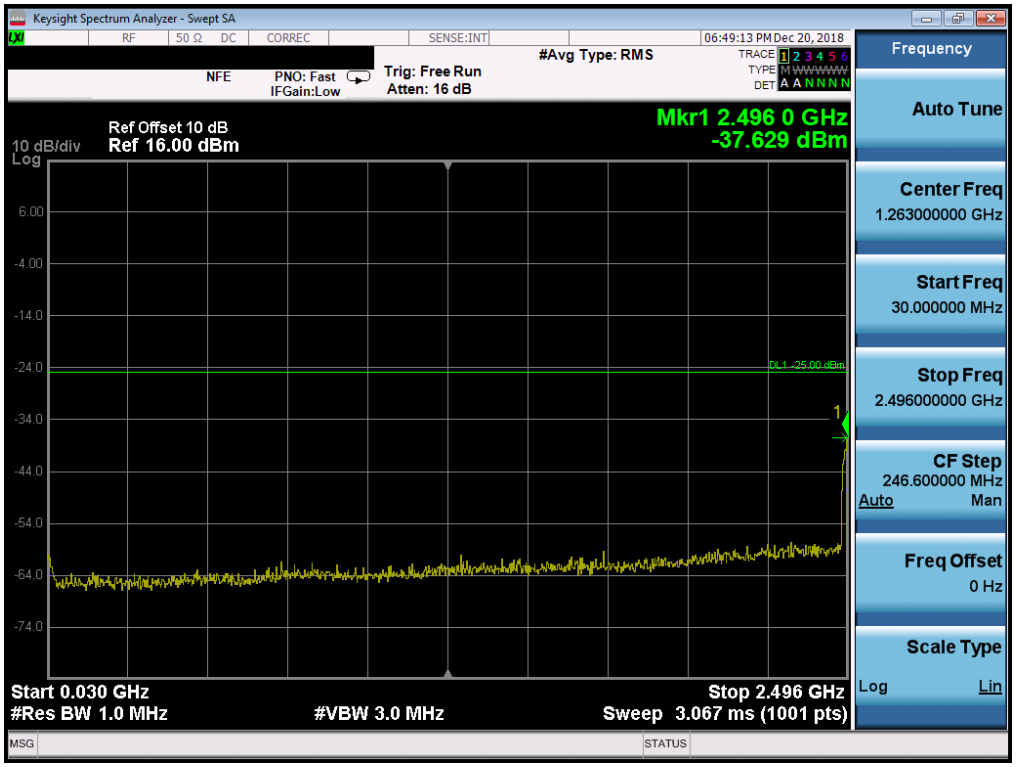


Plot 308. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 – Low Channel)



Plot 309. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - Mid Channel)

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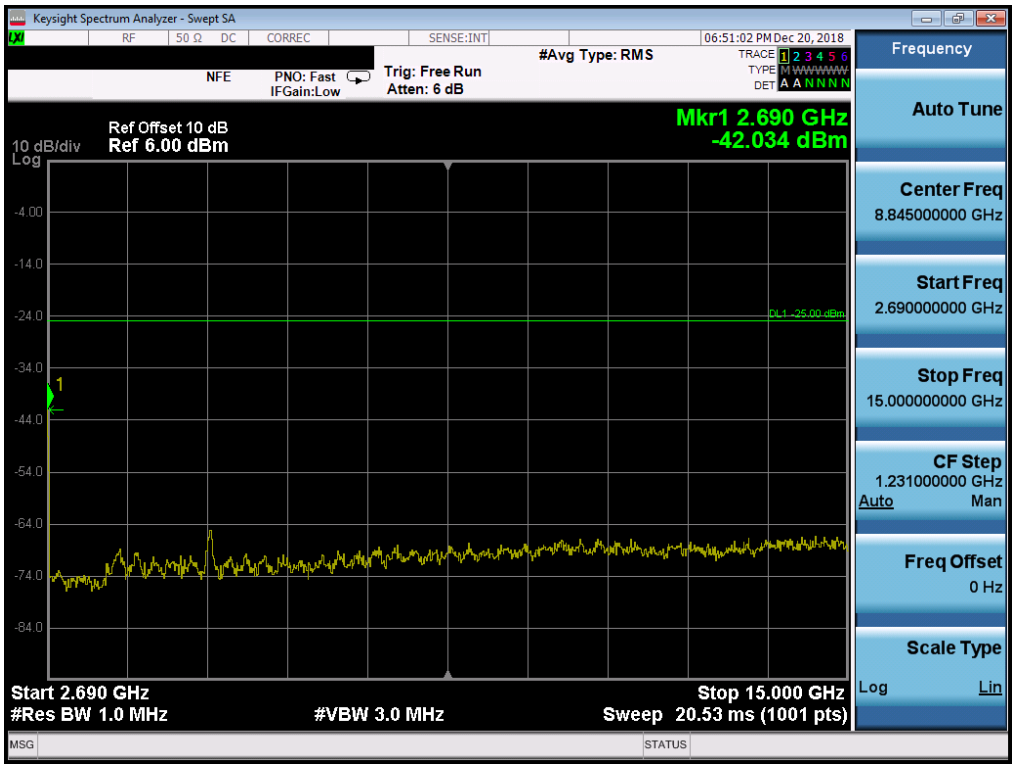
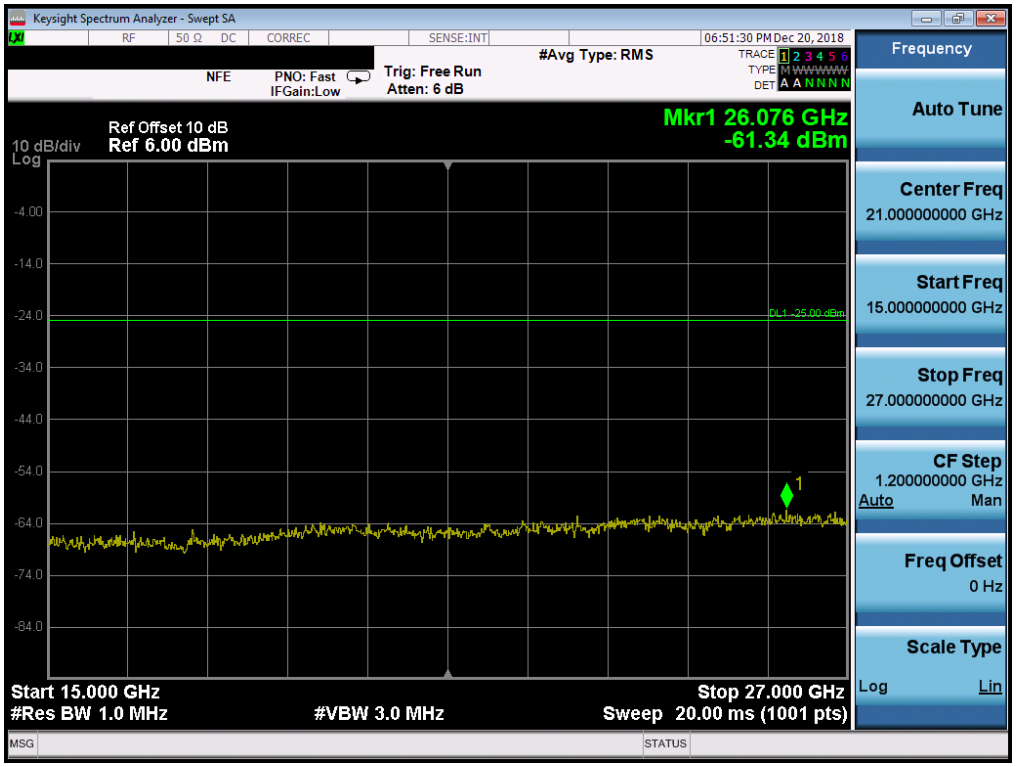


Plot 310. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 – Mid Channel)



Plot 311. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 – Mid Channel)

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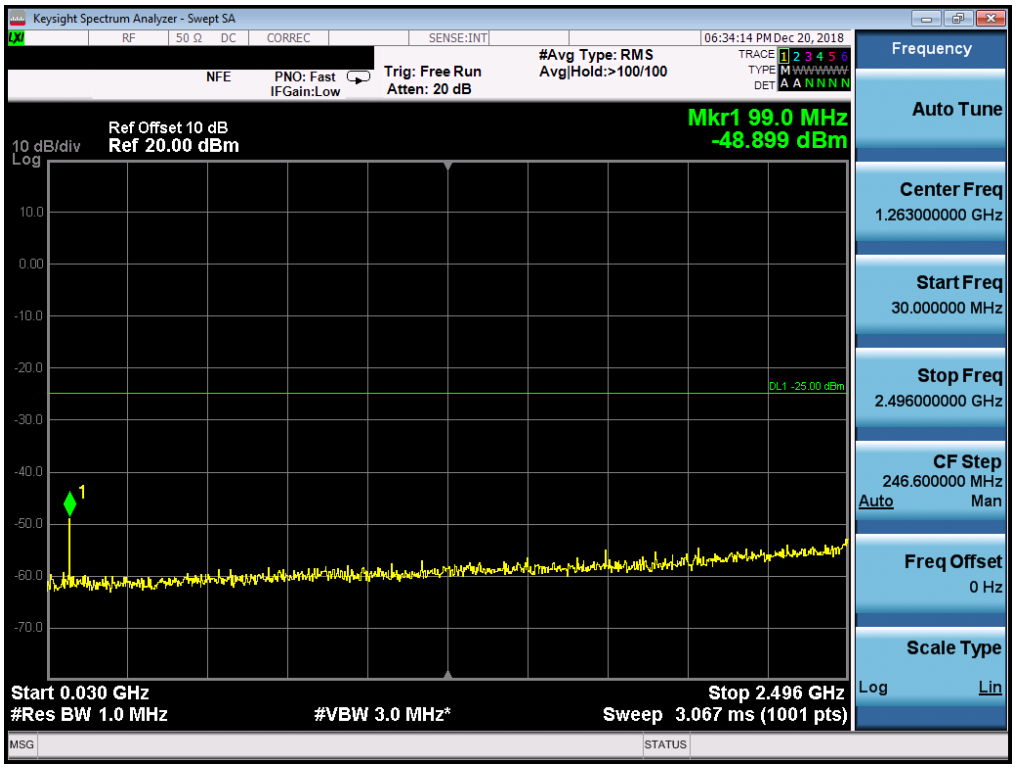
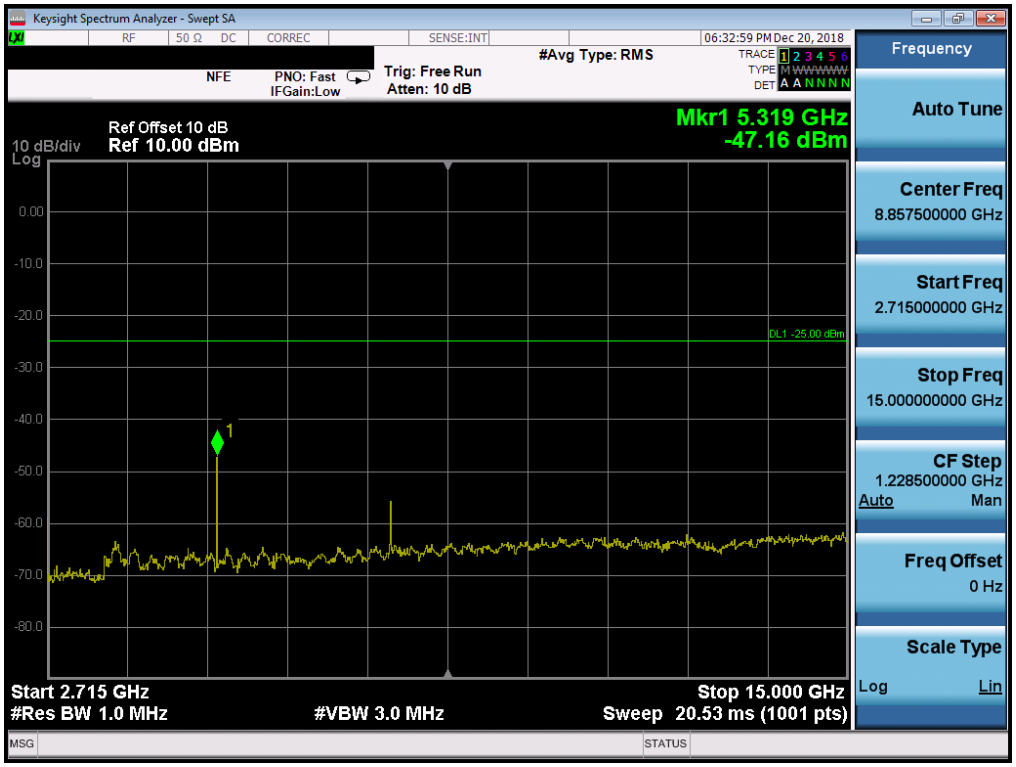


Plot 312. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 - High Channel)



Plot 313. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 – High Channel)

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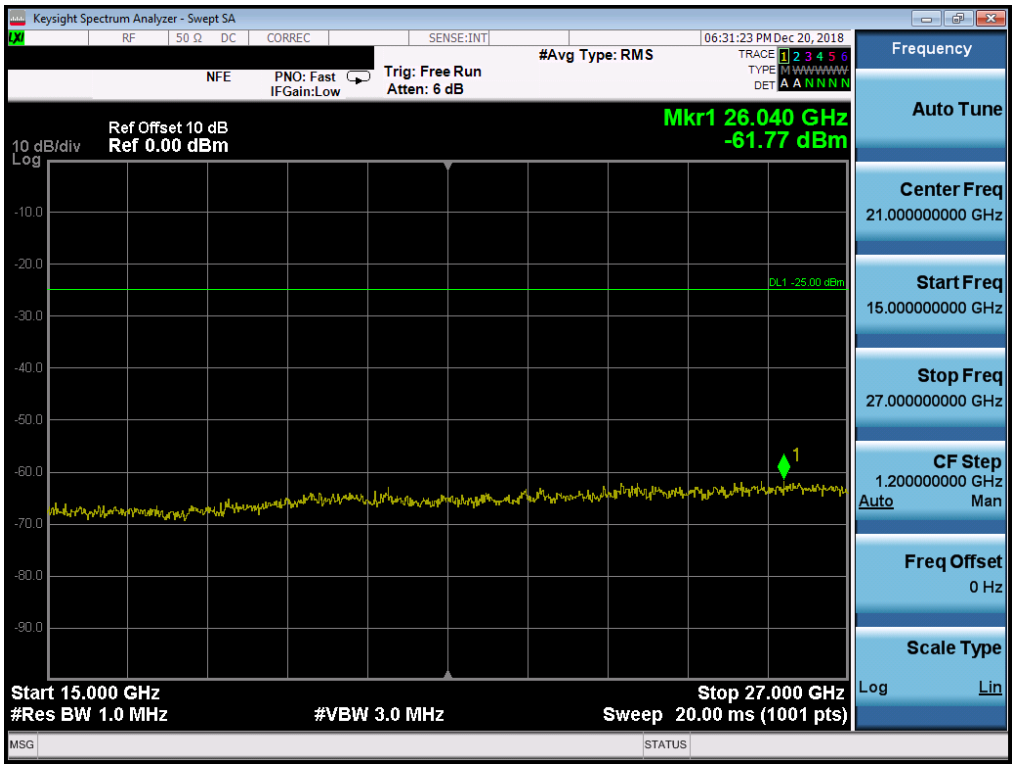
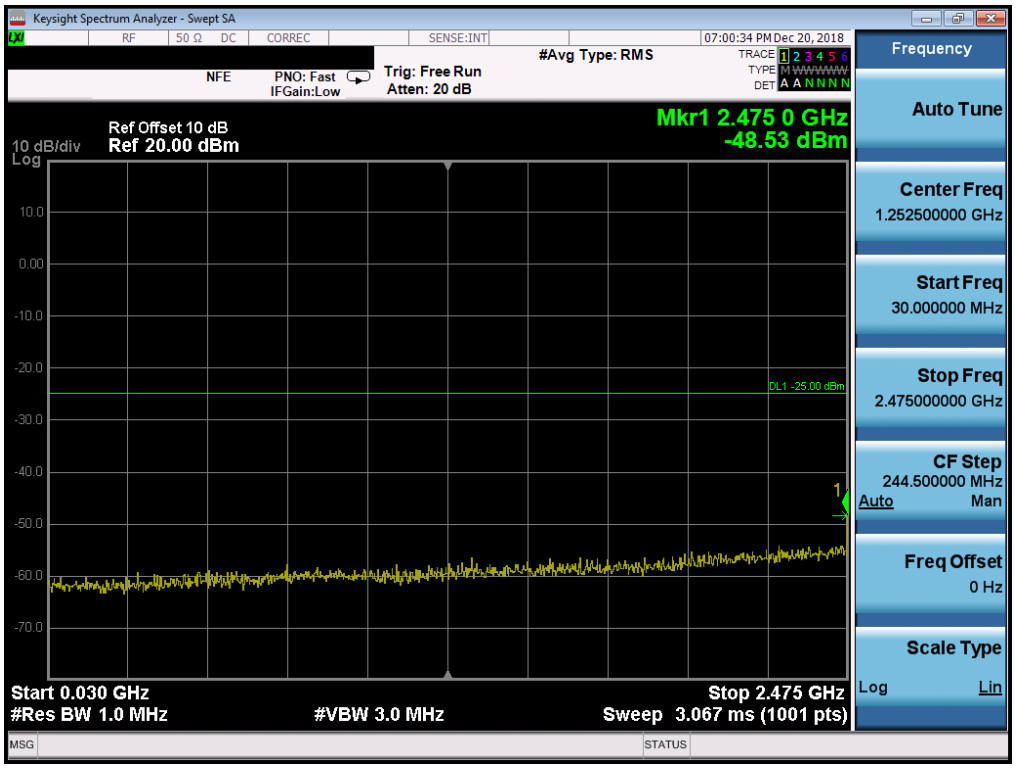


Plot 314. Conducted Spurious Plot (n41 - 60MHz CP-QPSK - RB Size 1, RB Offset 81 – High Channel)



Plot 315. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Low Channel)

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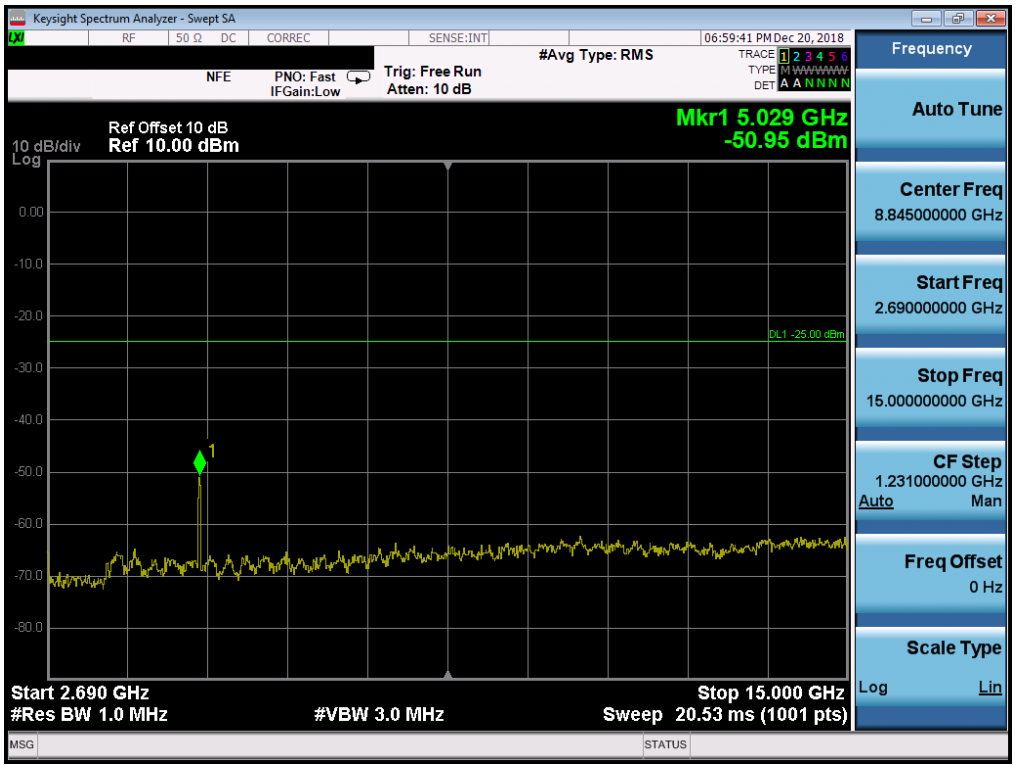
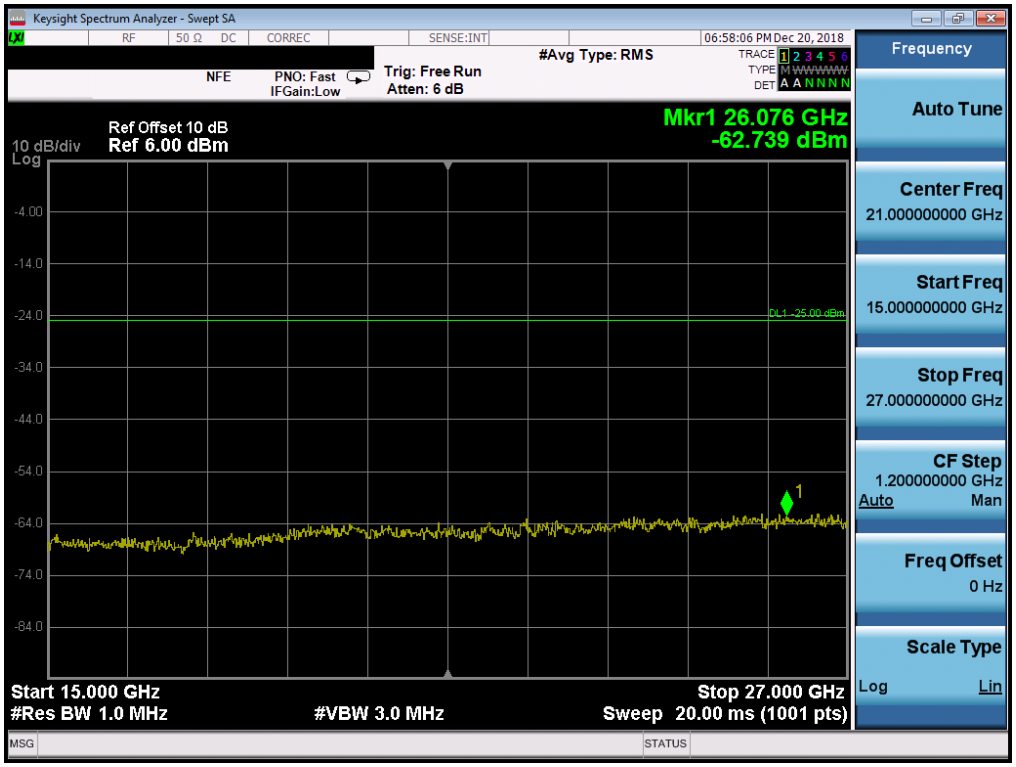


Plot 316. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Low Channel)



Plot 317. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Low Channel)

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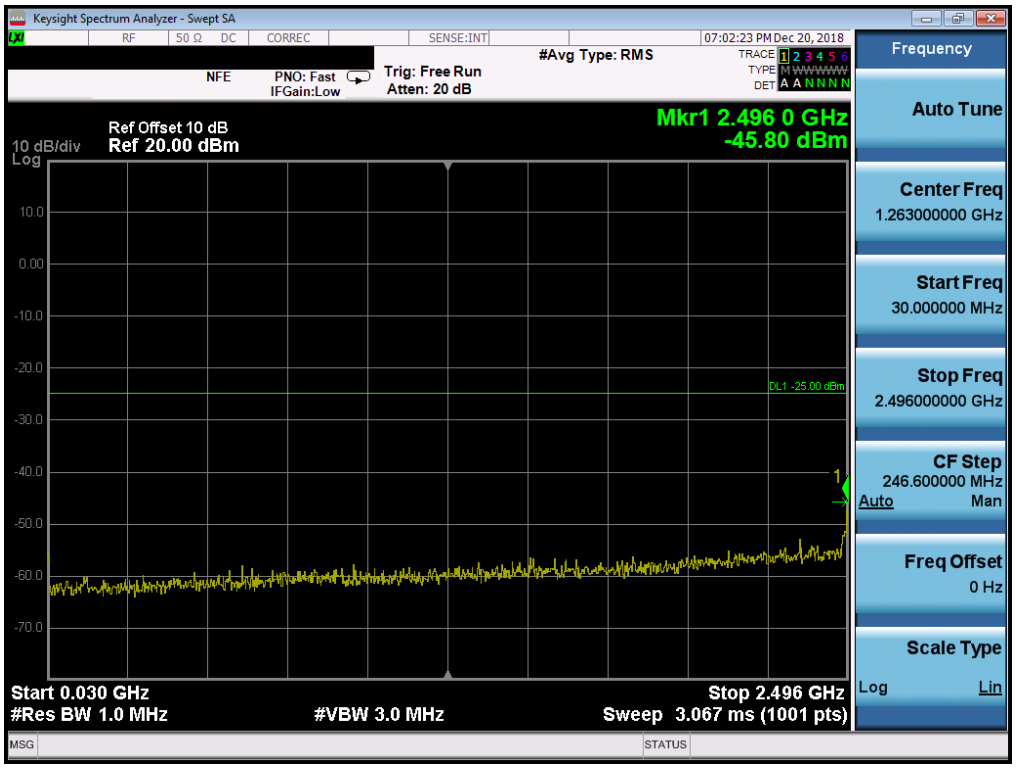
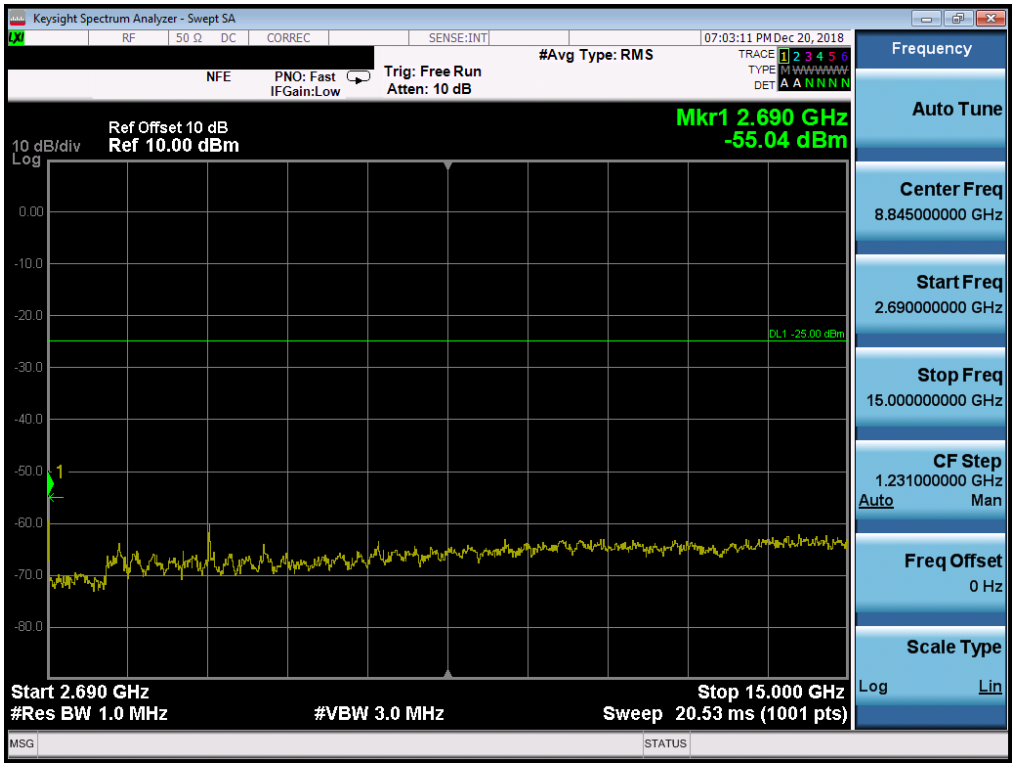


Plot 318. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Mid Channel)



Plot 319. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Mid Channel)

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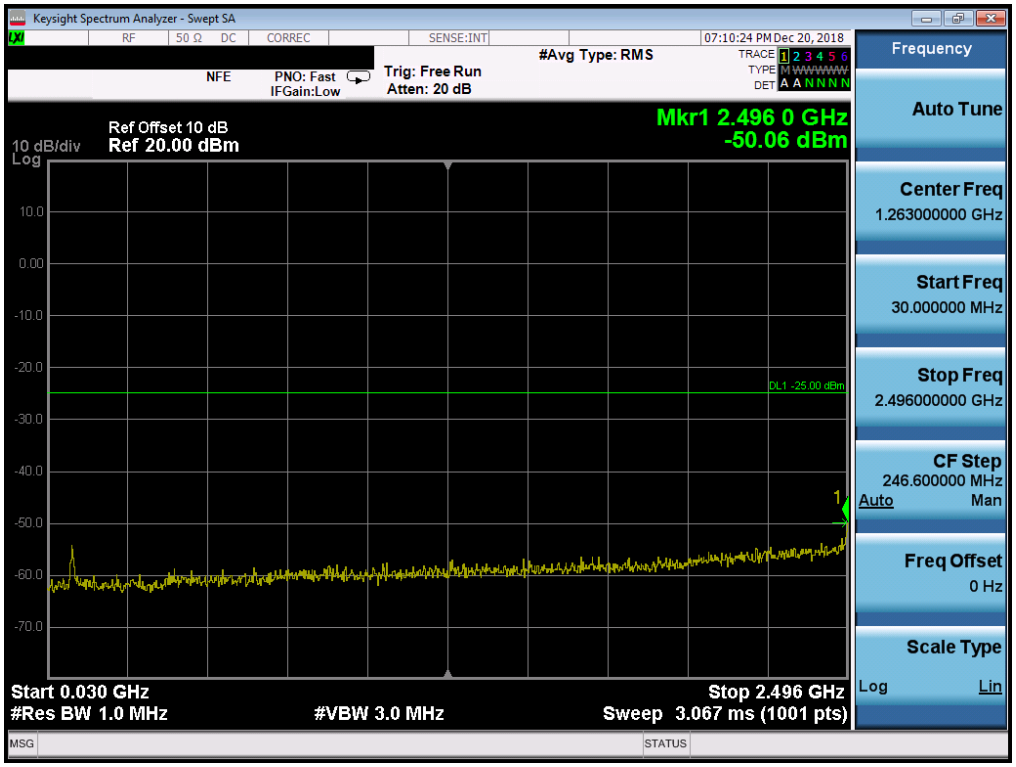
Plot 320. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - Mid Channel)



Plot 321. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 - High Channel)

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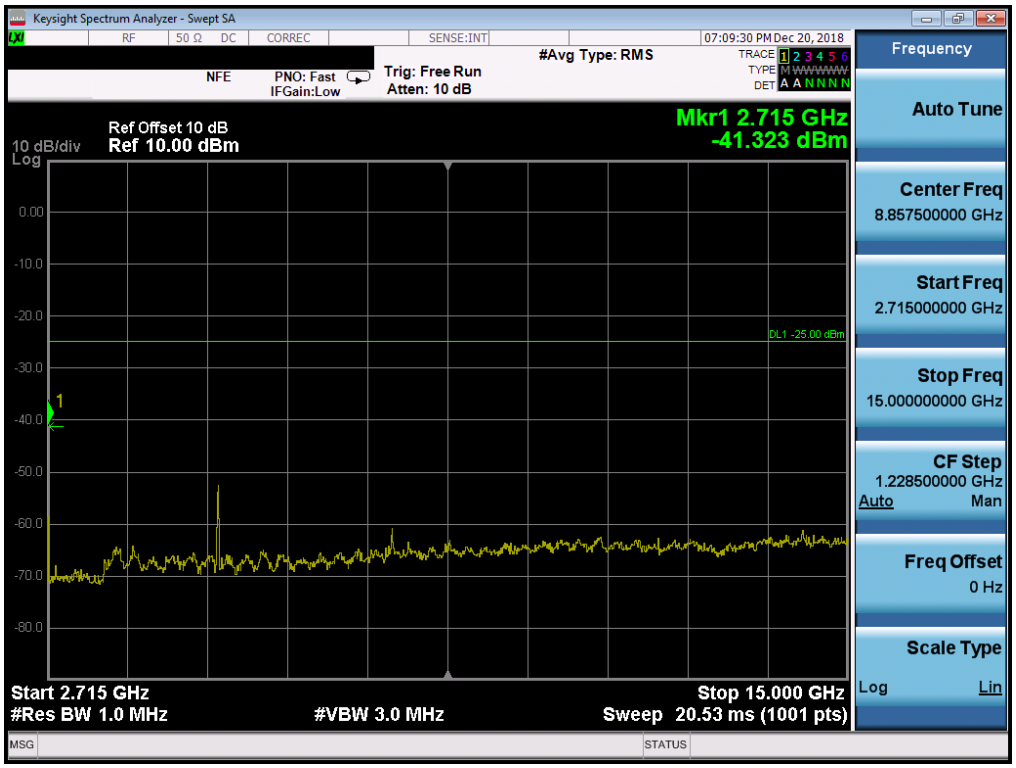
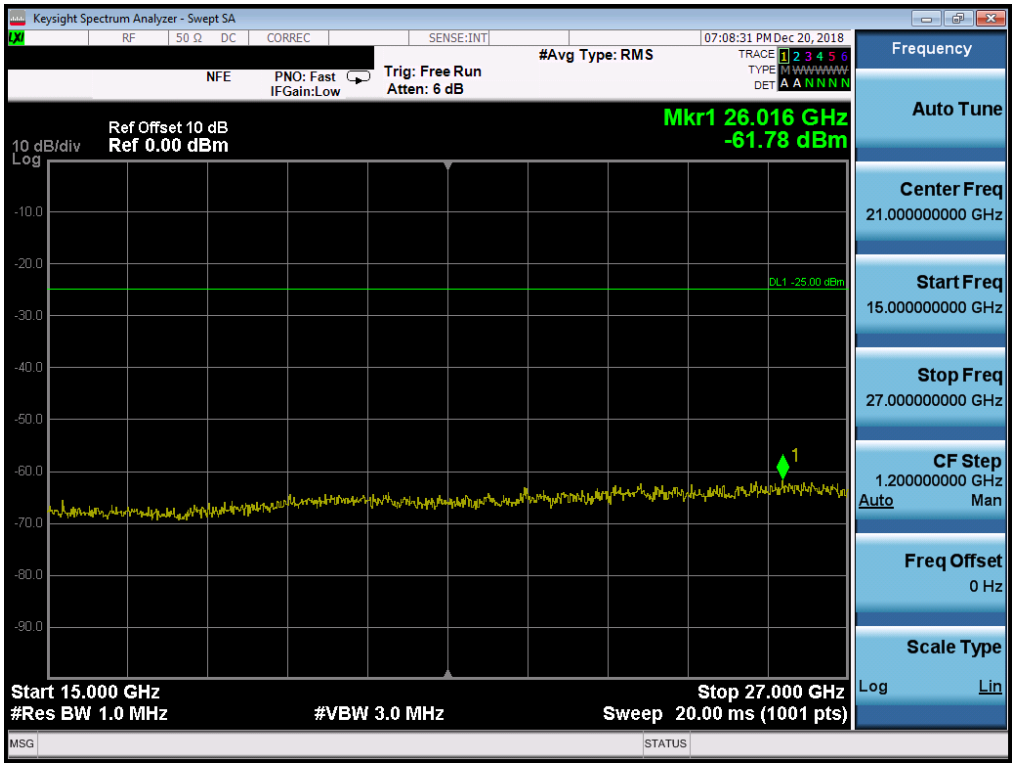


Plot 322. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 – High Channel)



Plot 323. Conducted Spurious Plot (n41 - 40MHz CP-QPSK - RB Size 53, RB Offset 26 – High Channel)

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Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490500000 GHz	-36.03 dBm	-11.03 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494122500 GHz	-34.38 dBm	-21.38 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.496000000 GHz	-27.87 dBm	-14.87 dB
4	4	2.4960 GHz	2.5170 GHz	1.000 MHz	2.516720000 GHz	-1.506 dBm	-26.51 dB

Plot 324. Lower Band Edge Plot (n41 - 60MHz CP-QPSK - Full RB Configuration)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	1.000 MHz	2.667291667 GHz	1.921 dBm	-23.08 dB
2	2	2.6900 GHz	2.6910 GHz	1.000 MHz	2.690000000 GHz	-27.07 dBm	-17.07 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691360000 GHz	-28.72 dBm	-18.72 dB
4	4	2.6950 GHz	2.7502 GHz	1.000 MHz	2.695368133 GHz	-29.83 dBm	-16.83 dB
5	5	2.7500 GHz	2.7600 GHz	1.000 MHz	2.750850000 GHz	-60.09 dBm	-35.09 dB

Plot 325. Upper Band Edge Plot (n41 - 60MHz CP-QPSK - Full RB Configuration)

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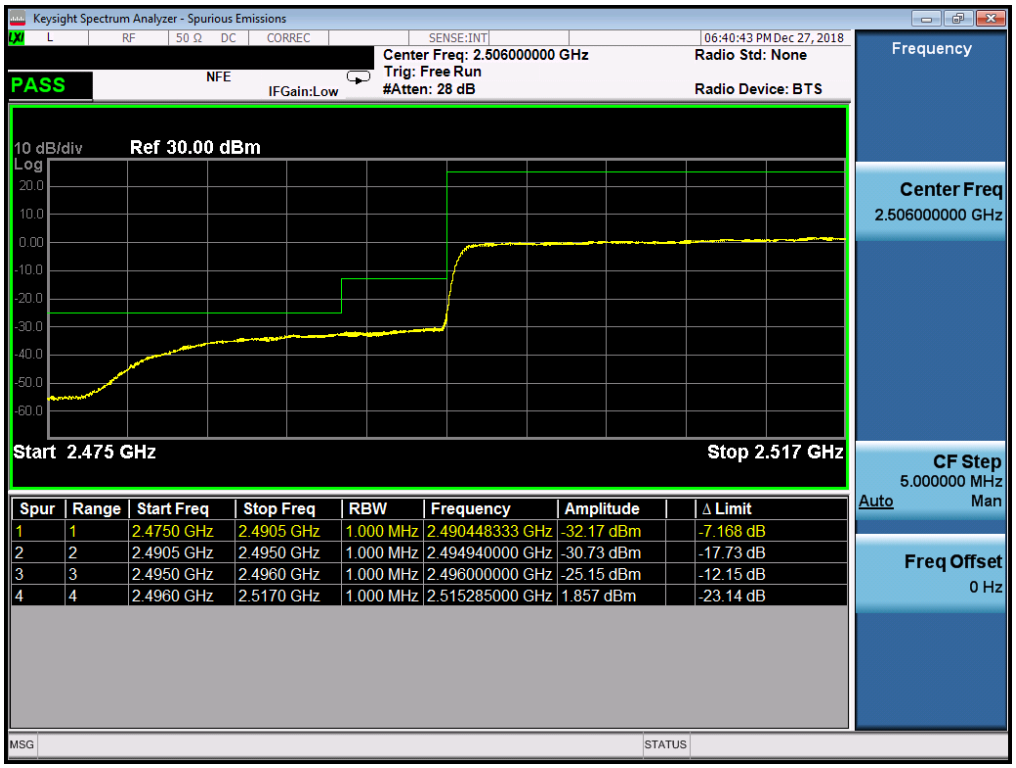

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490448333 GHz	-32.17 dBm	-7.168 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494940000 GHz	-30.73 dBm	-17.73 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.496000000 GHz	-25.15 dBm	-12.15 dB
4	4	2.4960 GHz	2.5170 GHz	1.000 MHz	2.515285000 GHz	1.857 dBm	-23.14 dB

Plot 326. Lower Band Edge Plot (n41 - 60MHz CP-16QAM - Full RB Configuration)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	1.000 MHz	2.665375000 GHz	2.505 dBm	-22.49 dB
2	2	2.6900 GHz	2.6910 GHz	1.000 MHz	2.690001667 GHz	-26.40 dBm	-16.40 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692120000 GHz	-27.76 dBm	-17.76 dB
4	4	2.6950 GHz	2.7502 GHz	1.000 MHz	2.695736267 GHz	-29.12 dBm	-16.12 dB
5	5	2.7500 GHz	2.7600 GHz	1.000 MHz	2.751000000 GHz	-59.89 dBm	-34.89 dB

Plot 327. Upper Band Edge Plot (n41 - 60MHz CP-16QAM - Full RB Configuration)

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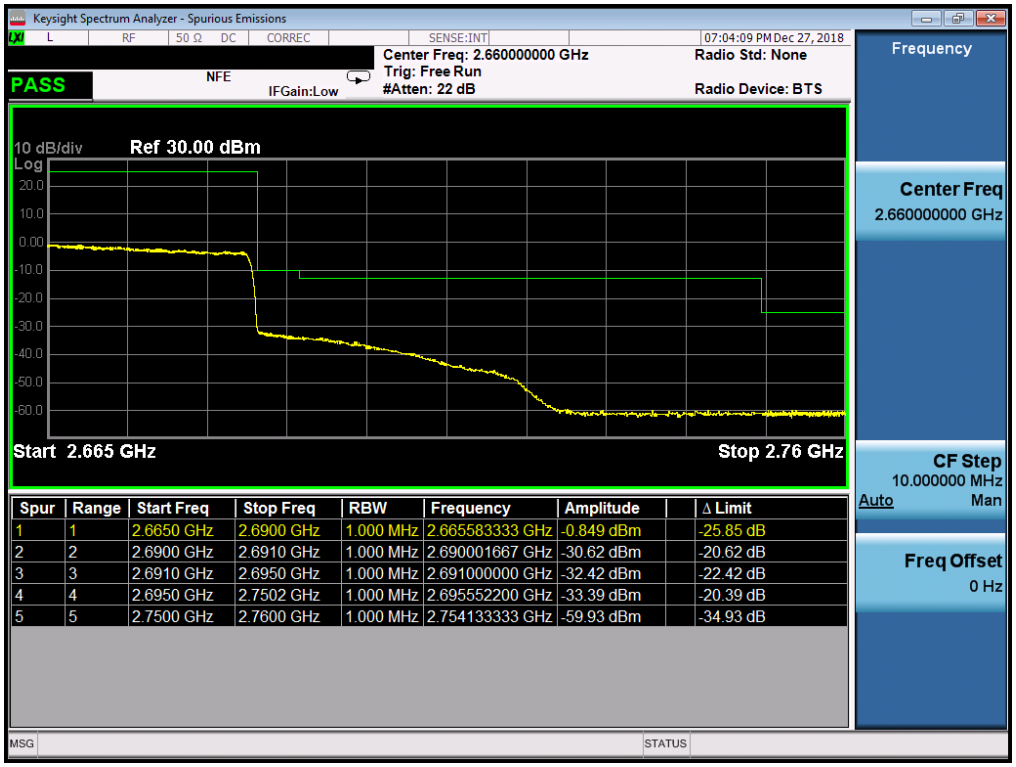
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490448333 GHz	-33.64 dBm	-8.637 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494992500 GHz	-32.61 dBm	-19.61 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.495996667 GHz	-26.45 dBm	-13.45 dB
4	4	2.4960 GHz	2.5170 GHz	1.000 MHz	2.513010000 GHz	0.763 dBm	-24.24 dB

Plot 328. Lower Band Edge Plot (n41 - 60MHz CP-64QAM - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	1.000 MHz	2.665583333 GHz	-0.849 dBm	-25.85 dB
2	2	2.6900 GHz	2.6910 GHz	1.000 MHz	2.690001667 GHz	-30.62 dBm	-20.62 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691000000 GHz	-32.42 dBm	-22.42 dB
4	4	2.6950 GHz	2.7502 GHz	1.000 MHz	2.695552200 GHz	-33.39 dBm	-20.39 dB
5	5	2.7500 GHz	2.7600 GHz	1.000 MHz	2.754133333 GHz	-59.93 dBm	-34.93 dB

Plot 329. Upper Band Edge Plot (n41 - 60MHz CP-64QAM - Full RB Configuration)

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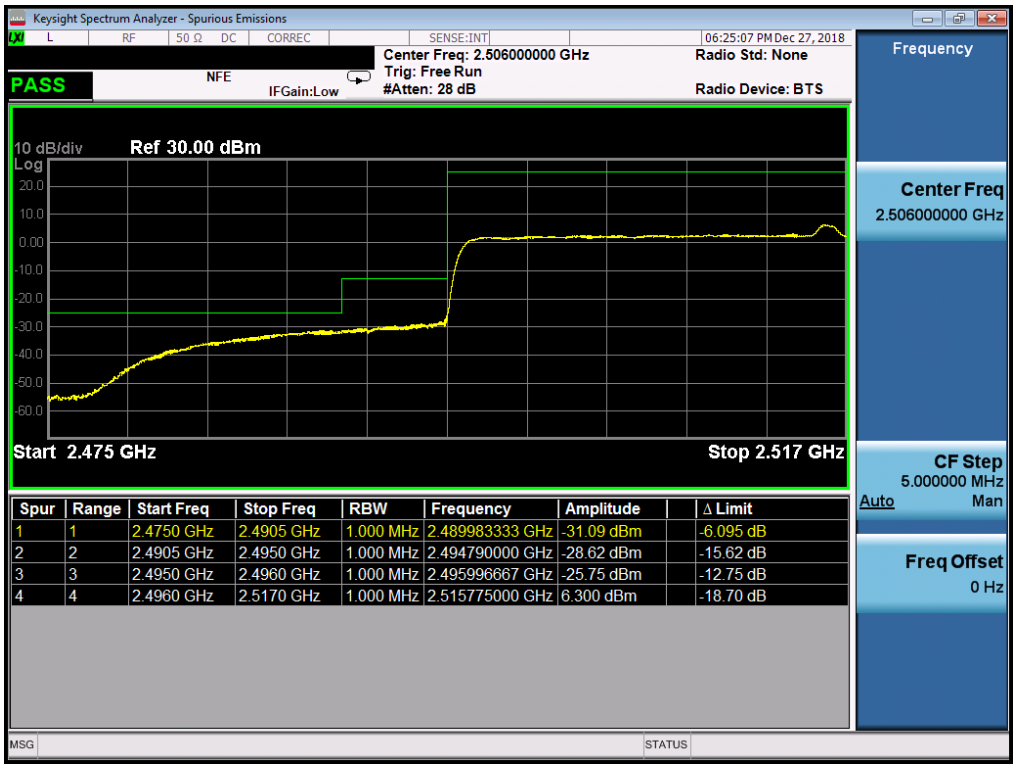
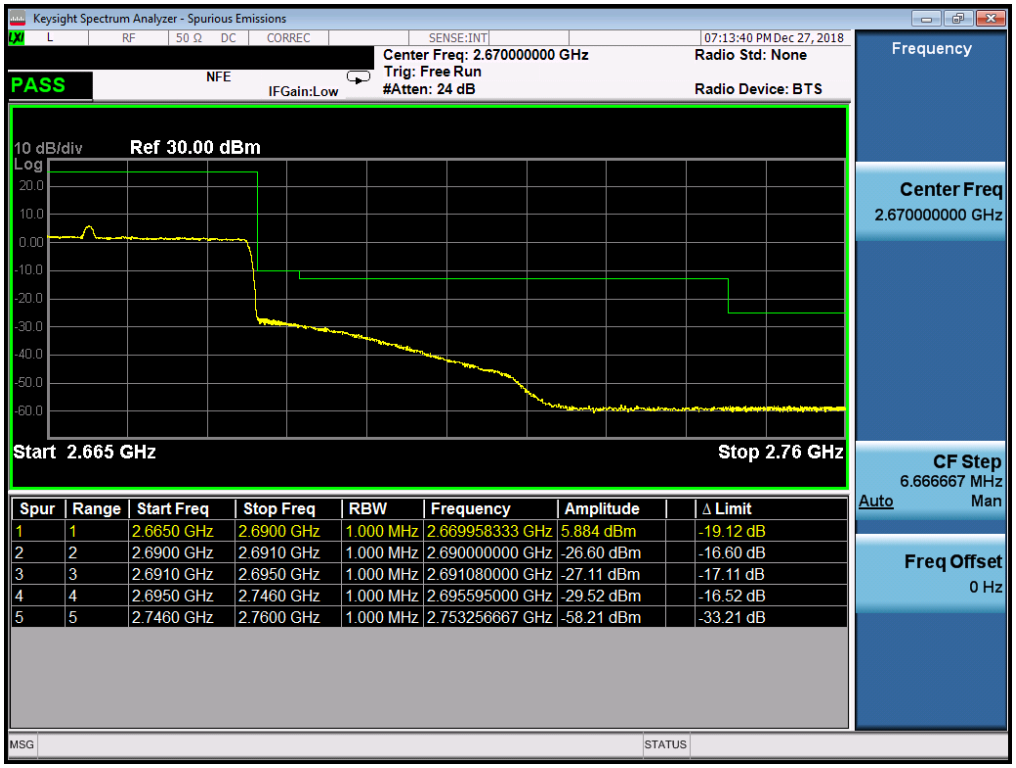


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489983333 GHz	-31.09 dBm	-6.095 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494790000 GHz	-28.62 dBm	-15.62 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.495996667 GHz	-25.75 dBm	-12.75 dB
4	4	2.4960 GHz	2.5170 GHz	1.000 MHz	2.515775000 GHz	6.300 dBm	-18.70 dB

Plot 330. Lower Band Edge Plot (n41 - 40MHz CP-QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	1.000 MHz	2.669958333 GHz	5.884 dBm	-19.12 dB
2	2	2.6900 GHz	2.6910 GHz	1.000 MHz	2.690000000 GHz	-26.60 dBm	-16.60 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691080000 GHz	-27.11 dBm	-17.11 dB
4	4	2.6950 GHz	2.7460 GHz	1.000 MHz	2.695595000 GHz	-29.52 dBm	-16.52 dB
5	5	2.7460 GHz	2.7600 GHz	1.000 MHz	2.753256667 GHz	-58.21 dBm	-33.21 dB

Plot 331. Upper Band Edge Plot (n41 - 40MHz CP-QPSK - Full RB Configuration)

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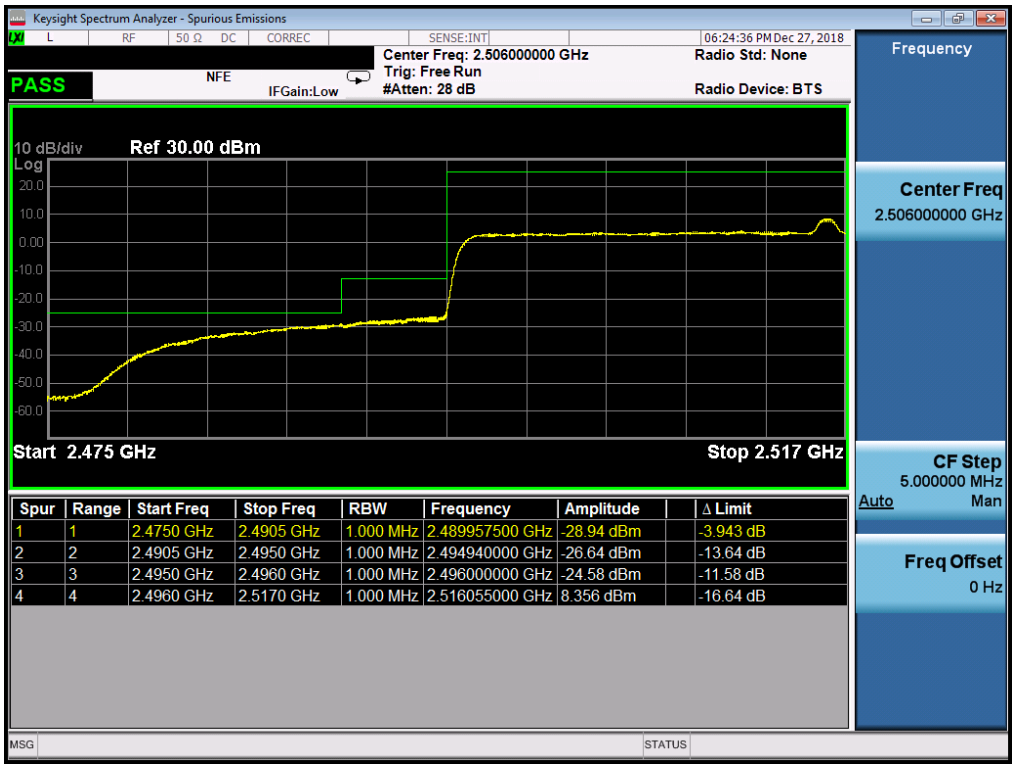
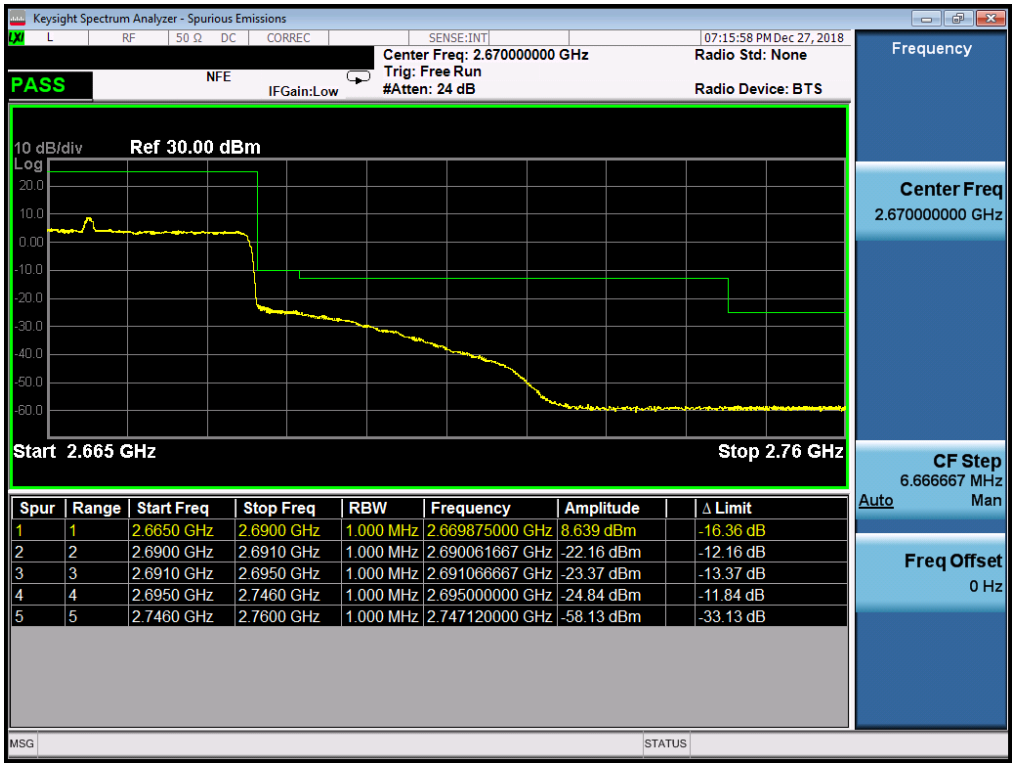


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489957500 GHz	-28.94 dBm	-3.943 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494940000 GHz	-26.64 dBm	-13.64 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.496000000 GHz	-24.58 dBm	-11.58 dB
4	4	2.4960 GHz	2.5170 GHz	1.000 MHz	2.516055000 GHz	8.356 dBm	-16.64 dB

Plot 332. Lower Band Edge Plot (n41 - 40MHz CP-16QAM - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	1.000 MHz	2.669875000 GHz	8.639 dBm	-16.36 dB
2	2	2.6900 GHz	2.6910 GHz	1.000 MHz	2.690061667 GHz	-22.16 dBm	-12.16 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691066667 GHz	-23.37 dBm	-13.37 dB
4	4	2.6950 GHz	2.7460 GHz	1.000 MHz	2.695000000 GHz	-24.84 dBm	-11.84 dB
5	5	2.7460 GHz	2.7600 GHz	1.000 MHz	2.747120000 GHz	-58.13 dBm	-33.13 dB

Plot 333. Upper Band Edge Plot (n41 - 40MHz CP-16QAM - Full RB Configuration)

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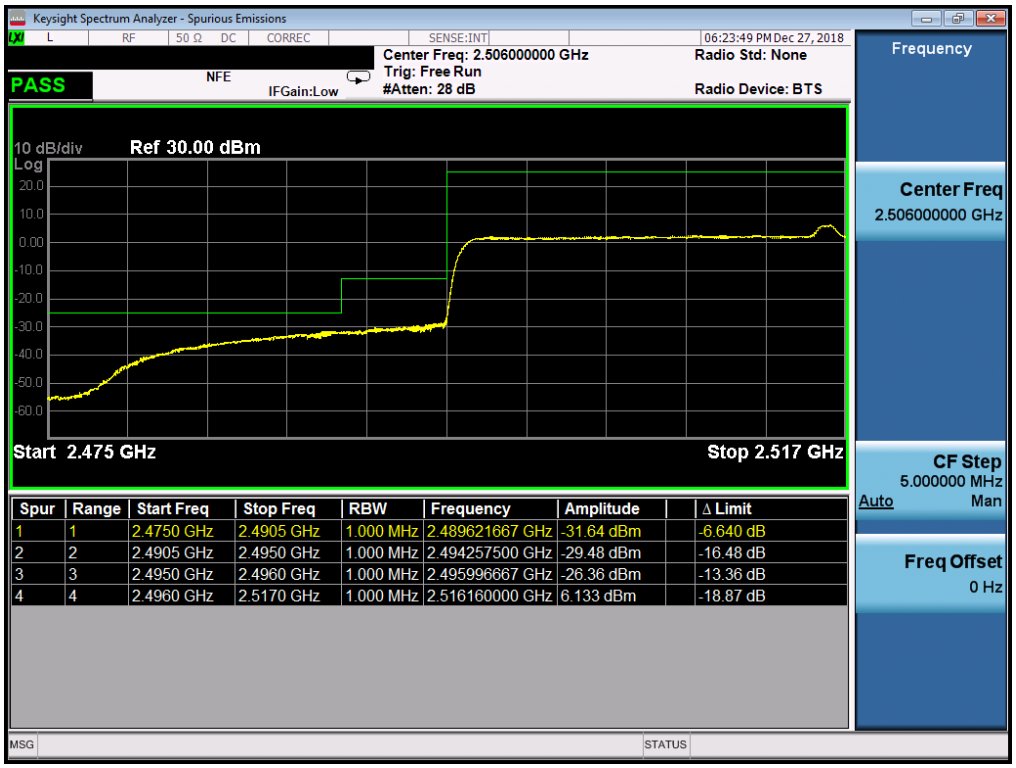
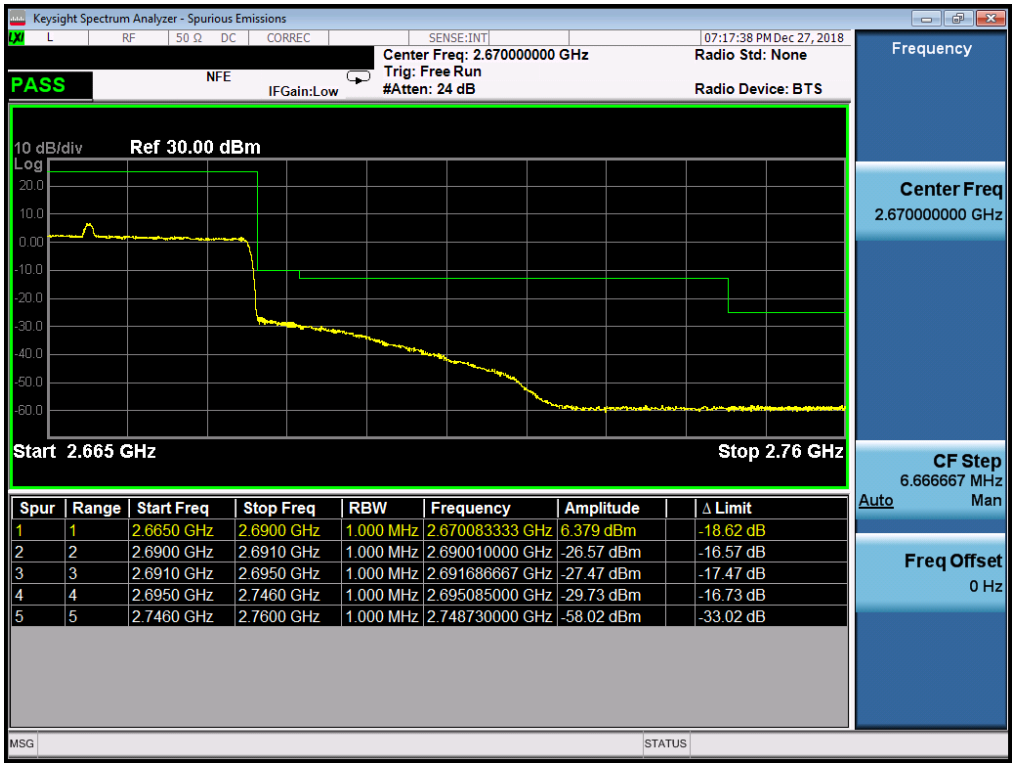


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489621667 GHz	-31.64 dBm	-6.640 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494257500 GHz	-29.48 dBm	-16.48 dB
3	3	2.4950 GHz	2.4960 GHz	1.000 MHz	2.495996667 GHz	-26.36 dBm	-13.36 dB
4	4	2.4960 GHz	2.5170 GHz	1.000 MHz	2.516160000 GHz	6.133 dBm	-18.87 dB

Plot 334. Lower Band Edge Plot (n41 - 40MHz CP-64QAM - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	1.000 MHz	2.670083333 GHz	6.379 dBm	-18.62 dB
2	2	2.6900 GHz	2.6910 GHz	1.000 MHz	2.690010000 GHz	-26.57 dBm	-16.57 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691686667 GHz	-27.47 dBm	-17.47 dB
4	4	2.6950 GHz	2.7460 GHz	1.000 MHz	2.695085000 GHz	-29.73 dBm	-16.73 dB
5	5	2.7460 GHz	2.7600 GHz	1.000 MHz	2.748730000 GHz	-58.02 dBm	-33.02 dB

Plot 335. Upper Band Edge Plot (n41 - 40MHz CP-64QAM - Full RB Configuration)

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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]
2526.00	60	QPSK	H	110	259	81/40	13.46	7.85	21.31	0.135	33.01	-11.70
2592.99	60	QPSK	H	182	176	81/40	14.30	7.71	**22.01**	**0.159**	33.01	-11.00
2659.98	60	QPSK	H	103	132	81/40	9.89	7.57	17.46	0.056	33.01	-15.55
2592.99	60	16-QAM	H	139	99	1/0	13.84	7.85	21.69	0.147	33.01	-11.32
2592.99	60	64-QAM	H	115	190	81/0	9.77	7.71	17.48	0.056	33.01	-15.53
2516.00	40	QPSK	H	139	87	53/26	12.72	7.87	20.59	0.114	33.01	-12.42
2593.00	40	QPSK	H	141	270	53/26	13.56	7.71	21.27	0.134	33.01	-11.74
2670.00	40	QPSK	H	119	86	53/26	12.22	7.55	19.77	0.095	33.01	-13.24
2593.00	40	16-QAM	H	124	88	1/52	13.06	7.71	20.77	0.119	33.01	-12.24
2593.00	40	64-QAM	H	110	97	106/0	10.29	7.71	18.00	0.063	33.01	-15.01

Table 59. EIRP Data (n41)

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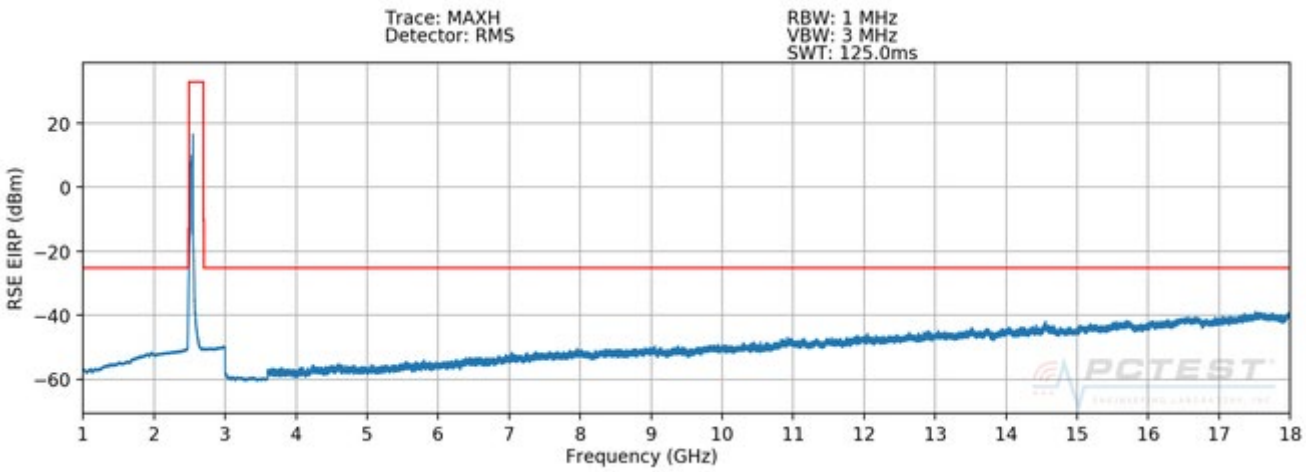

Plot 336. Radiated Spurious Plot above 1GHz (n41 – Low Channel)

n41 OPERATING FREQUENCY:	2526.00	MHz
n41 CHANNEL:	505200	
n41 MODULATION SIGNAL:	QPSK	
n41 BANDWIDTH:	60.0	MHz
n41 RB OFFSET:	81/40	
LTE OPERATING FREQUENCY:	2566.00	MHz
LTE CHANNEL:	40250	
LTE MODULATION SIGNAL:	QPSK	
LTE BANDWIDTH:	20.0	MHz
LTE RB OFFSET:	1/0	
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]
5052.00	H	-	-	-60.40	8.57	-51.83	-26.8
7578.00	H	-	-	-55.78	8.44	-47.34	-22.3
10104.00	H	-	-	-55.14	9.81	-45.33	-20.3

Table 60. Radiated Spurious Data (n41 – Low Channel)

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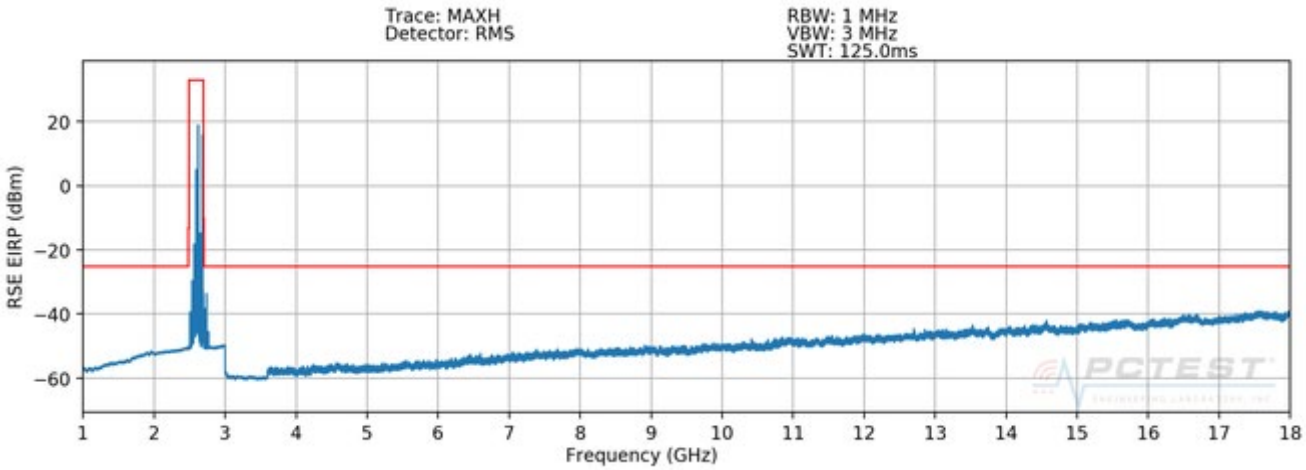

Plot 337. Radiated Spurious Plot above 1GHz (n41 – Mid Channel)

n41 OPERATING FREQUENCY:	2592.99	MHz
n41 CHANNEL:	518598	
n41 MODULATION SIGNAL:	QPSK	
n41 BANDWIDTH:	60.0	MHz
n41 RB OFFSET:	81/40	
LTE OPERATING FREQUENCY:	2680.00	MHz
LTE CHANNEL:	41490	
LTE MODULATION SIGNAL:	QPSK	
LTE BANDWIDTH:	20.0	MHz
LTE RB OFFSET:	1/50	
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]
5185.98	H	-	-	-61.15	8.70	-52.45	-27.4
7778.97	H	-	-	-56.15	8.69	-47.47	-22.5
10371.96	H	-	-	-54.21	9.62	-44.59	-19.6

Table 61. Radiated Spurious Data (n41 – Mid Channel)

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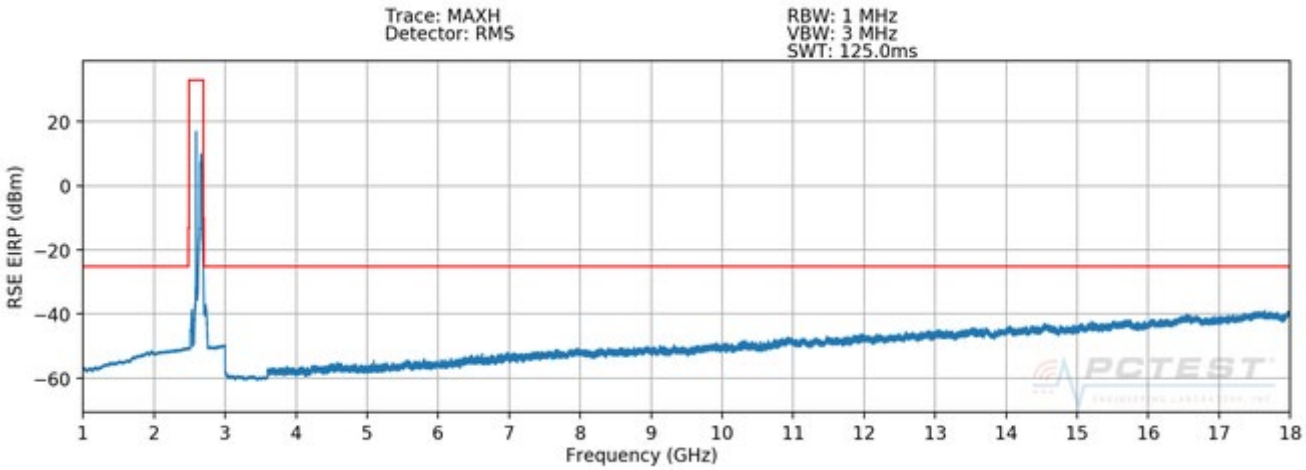

Plot 338. Radiated Spurious Plot above 1GHz (n41 – High Channel)

n41 OPERATING FREQUENCY:	2659.98	MHz
n41 CHANNEL:	531996	
n41 MODULATION SIGNAL:	QPSK	
n41 BANDWIDTH:	60.0	MHz
n41 RB OFFSET:	81/40	
LTE OPERATING FREQUENCY:	2593.00	MHz
LTE CHANNEL:	40620	
LTE MODULATION SIGNAL:	QPSK	
LTE BANDWIDTH:	20.0	MHz
LTE RB OFFSET:	1/50	
DISTANCE:	-25	dBm
LIMIT:		

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]
5319.96	H	-	-	-61.35	8.73	-52.62	-27.6
7979.94	H	-	-	-55.55	8.85	-46.69	-21.7
10639.92	H	-	-	-53.29	9.50	-43.79	-18.8

Table 62. Radiated Spurious Data (n41 – High Channel)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFV450PM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE and n41 (ENDC) operation only.

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