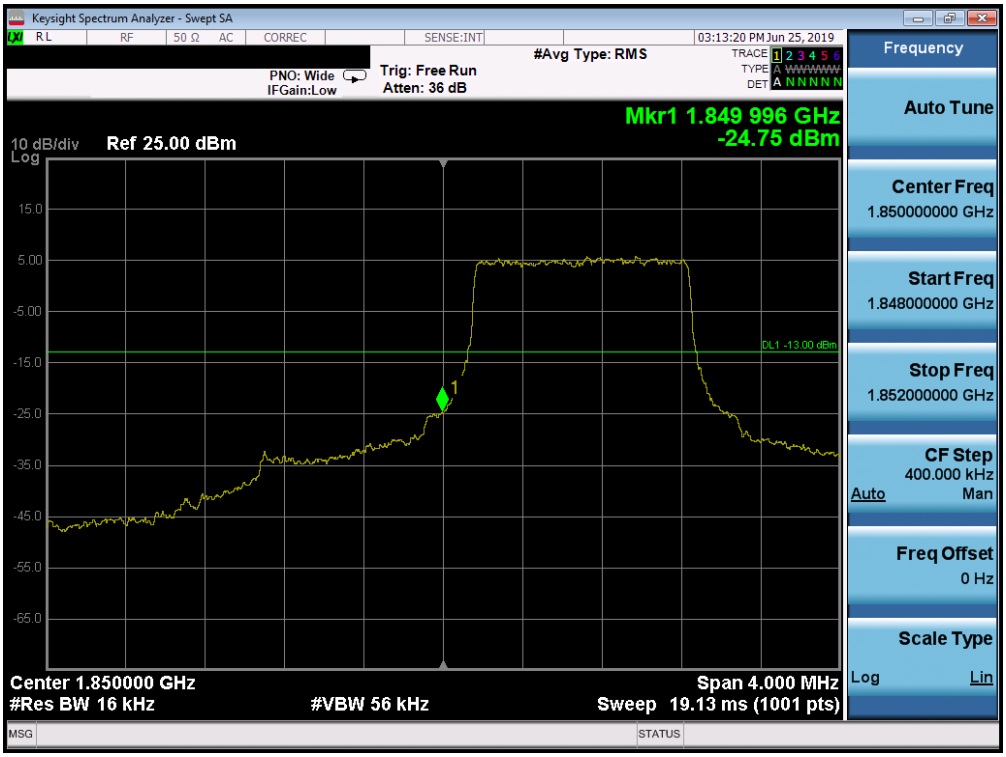
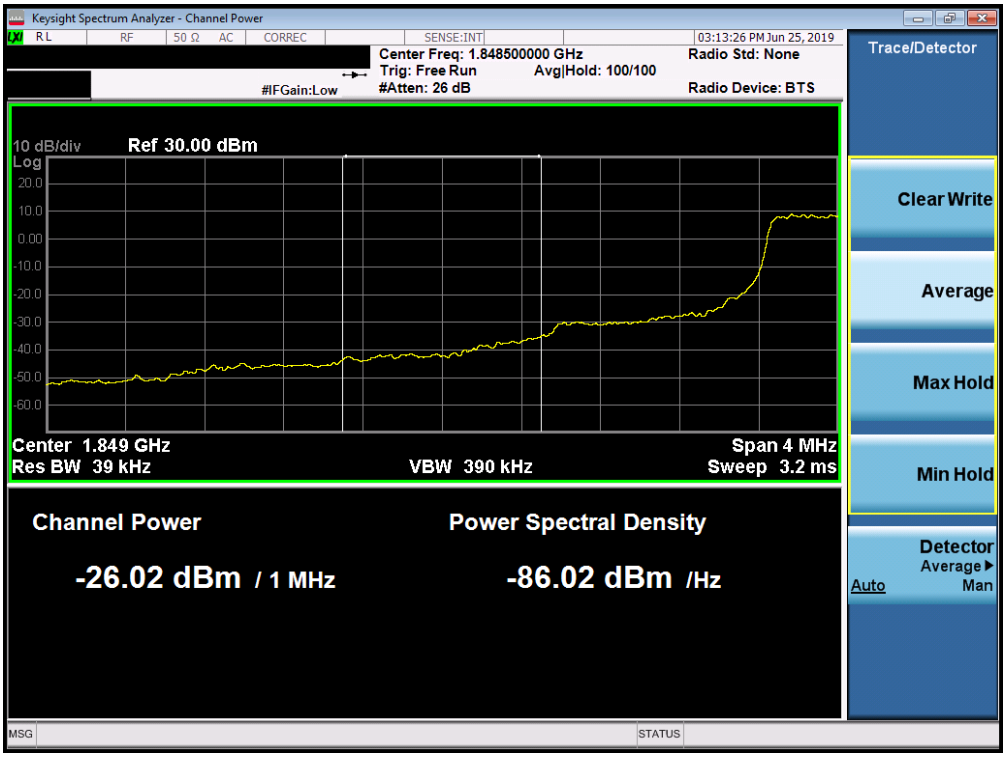
Band 25/2

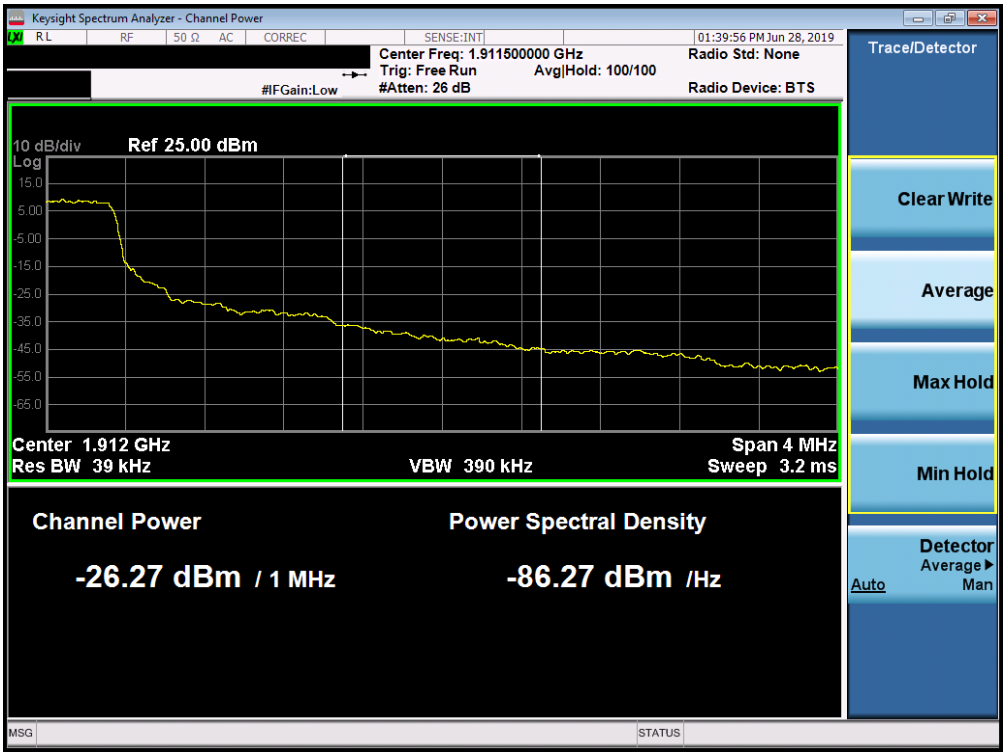


Plot 7-235. Lower Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



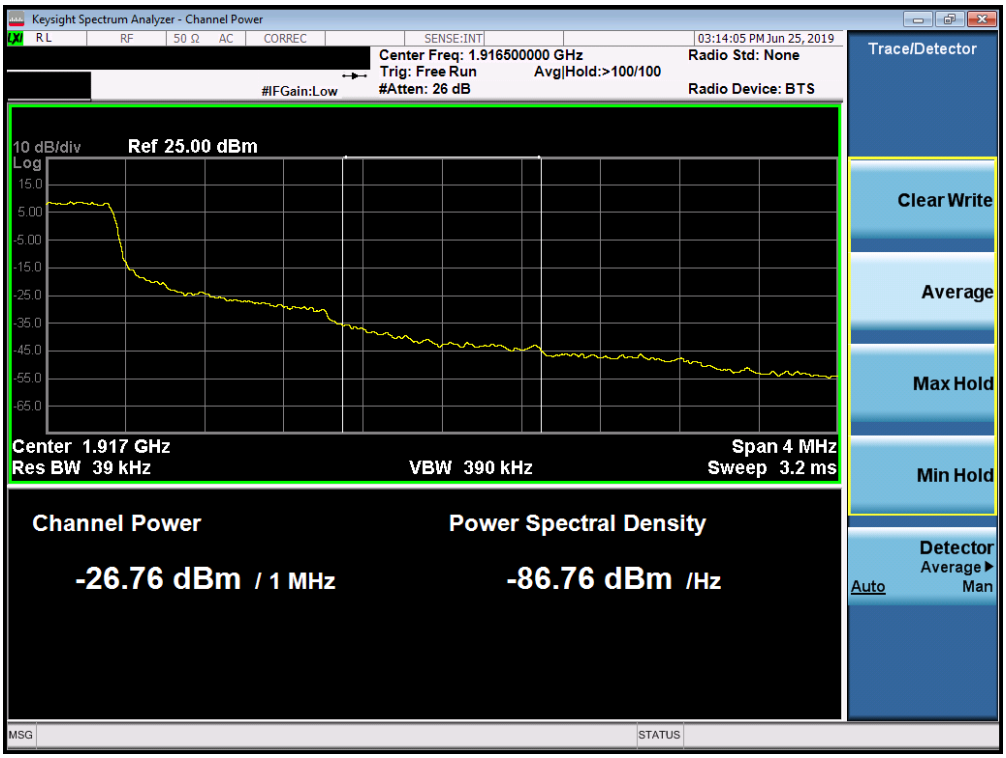
Plot 7-236. Lower Extended Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

Plot 7-237. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

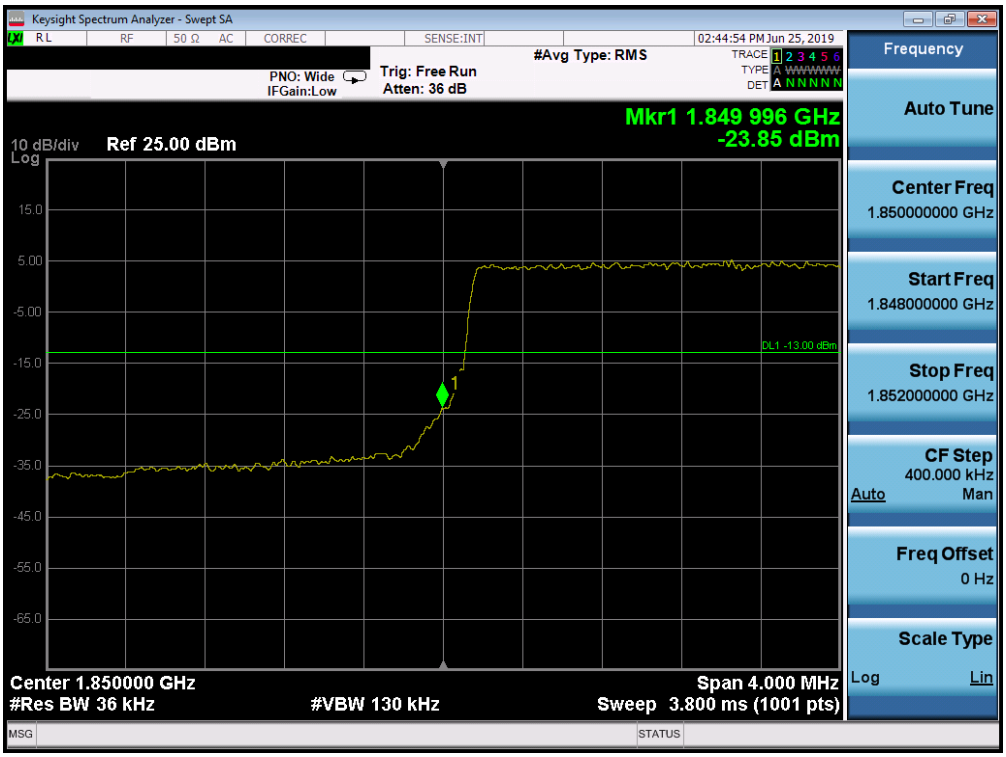


Plot 7-238. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

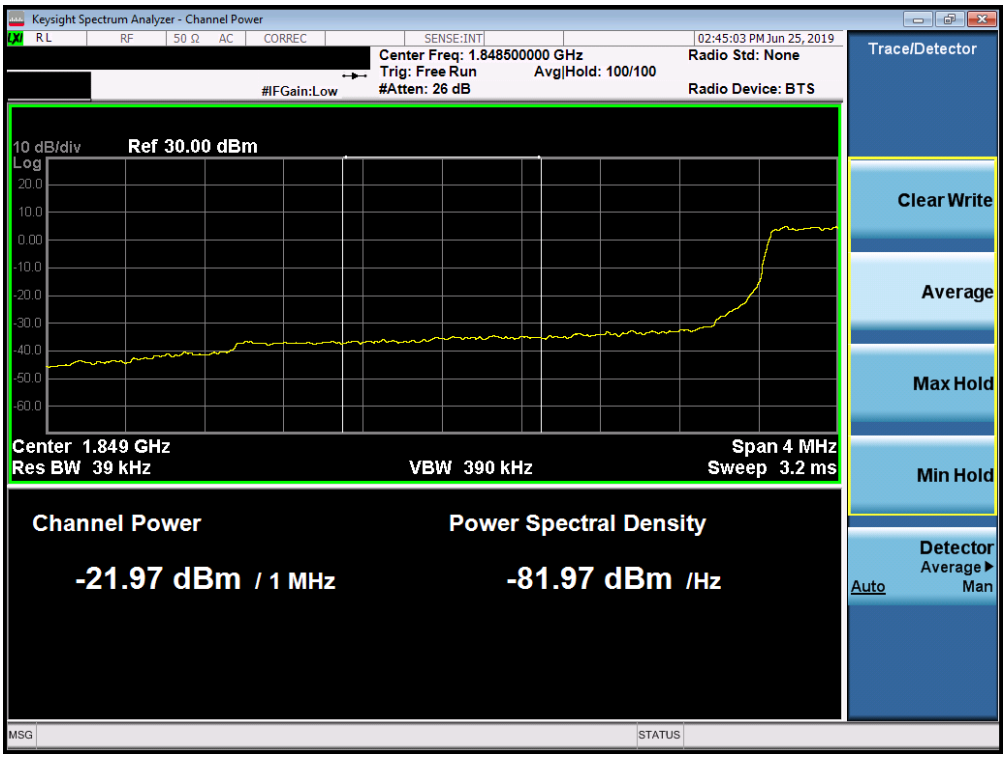
Plot 7-239. Upper Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)



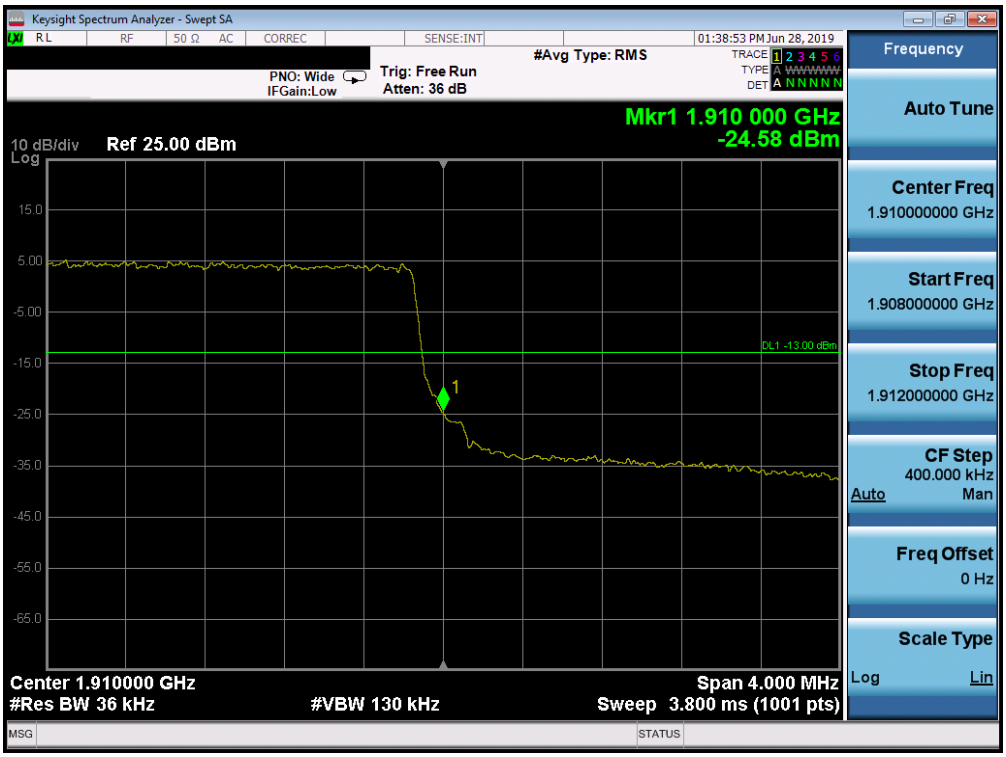
Plot 7-240. Upper Extended Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)



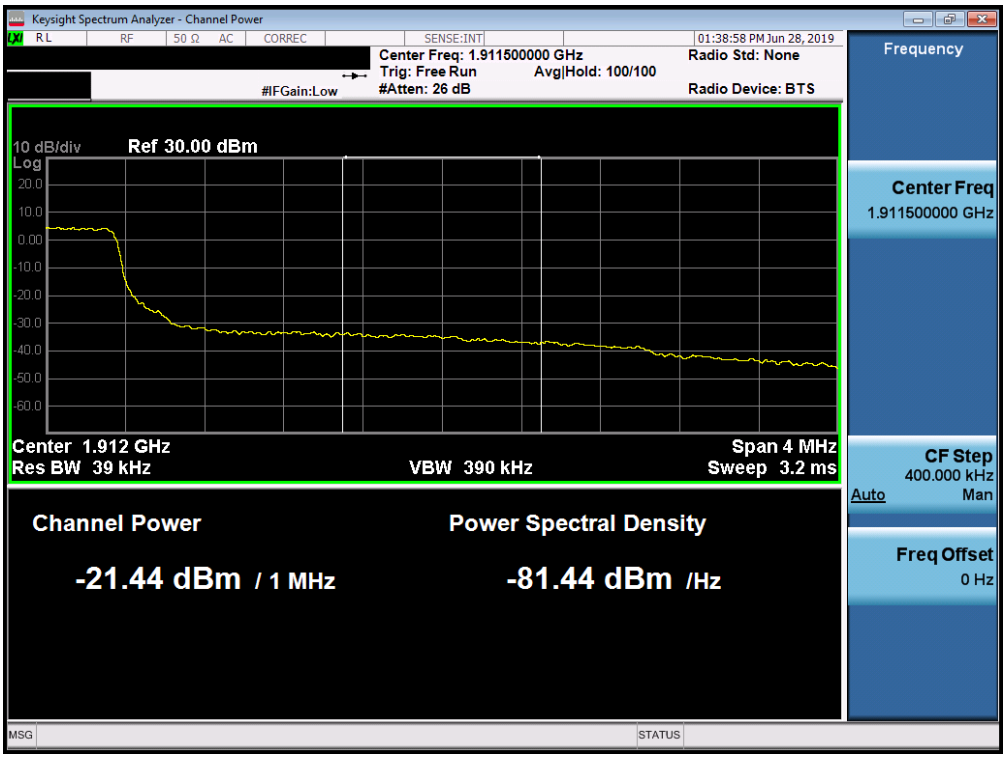
Plot 7-241. Lower Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-242. Lower Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

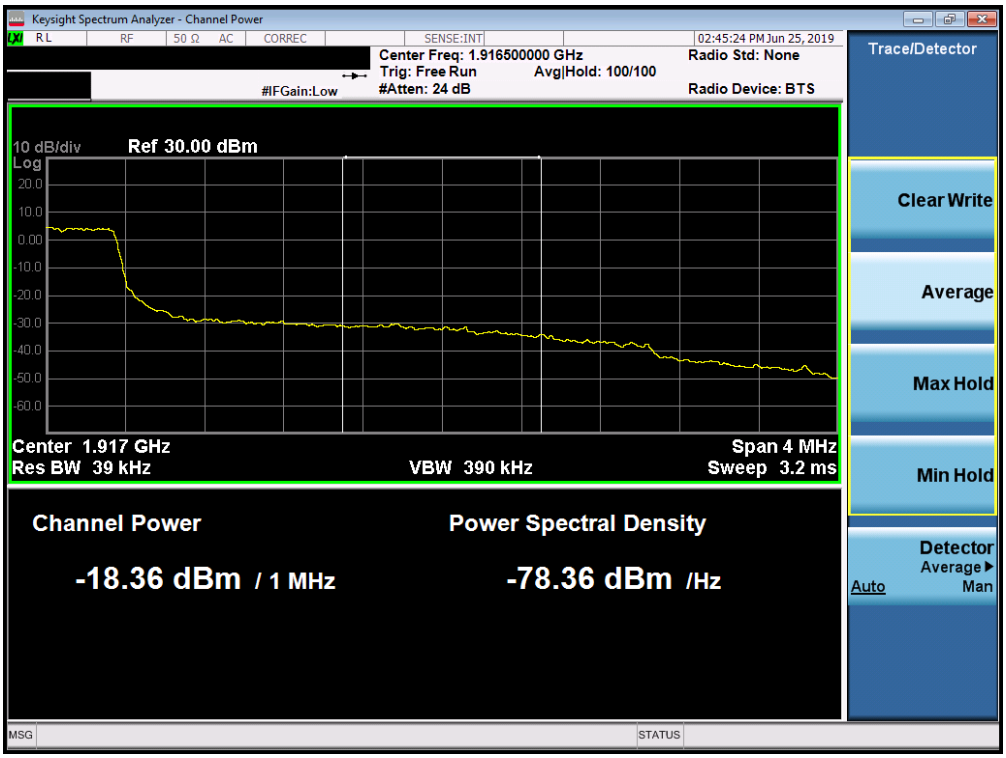


Plot 7-243. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

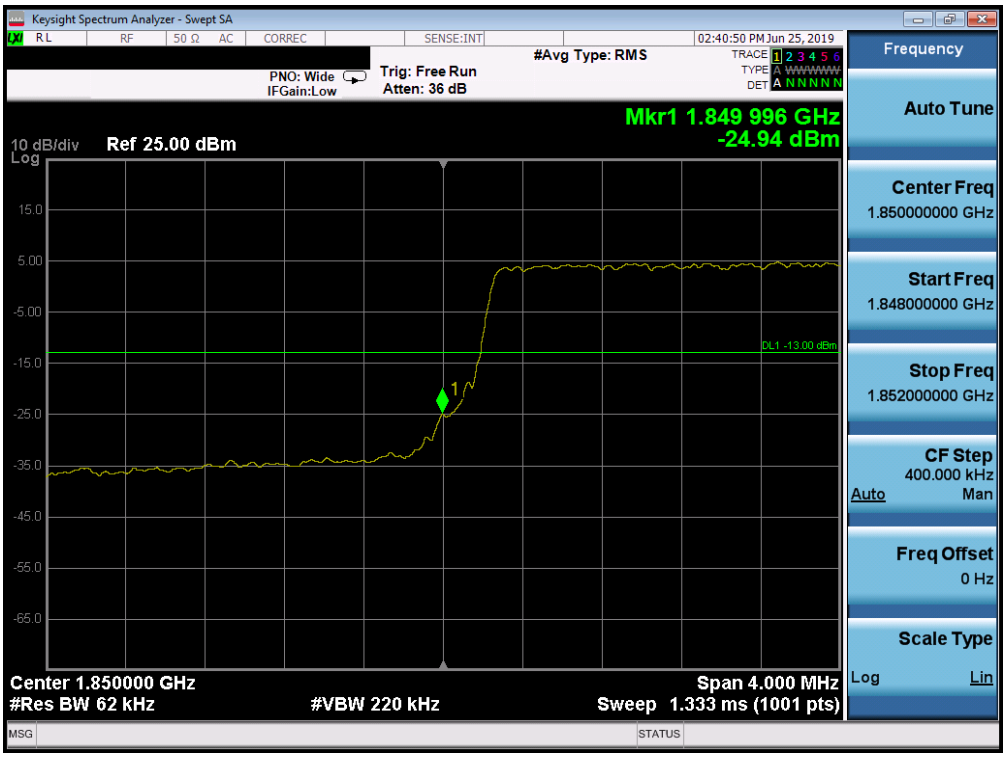


Plot 7-244. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

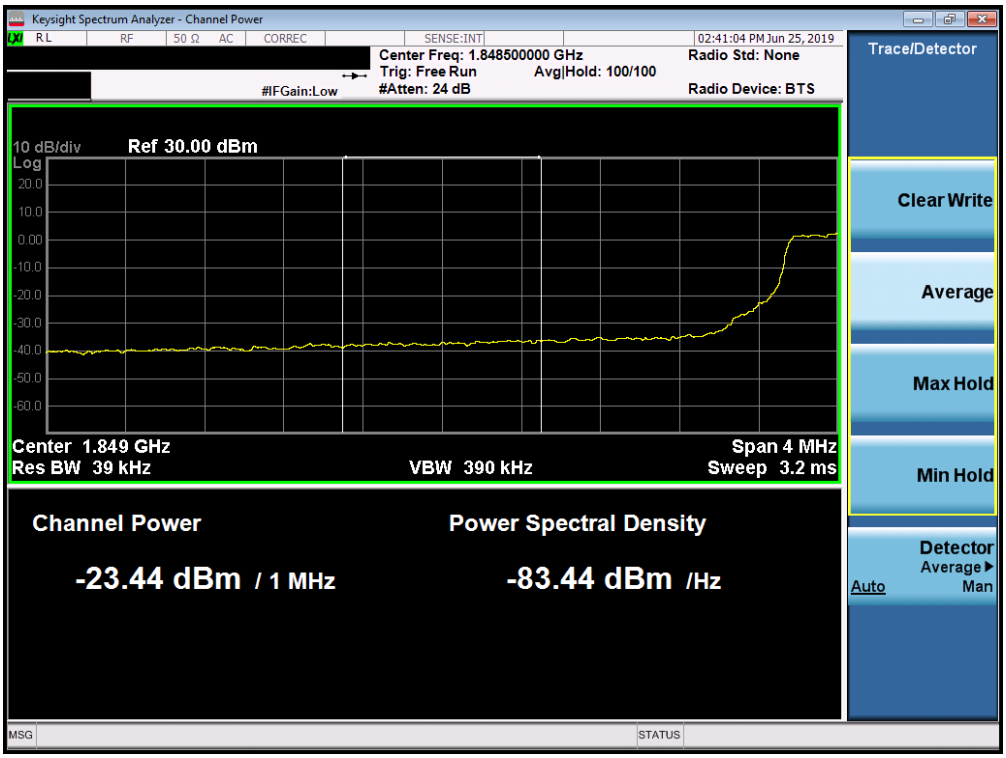
Plot 7-245. Upper Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-246. Upper Extended Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)

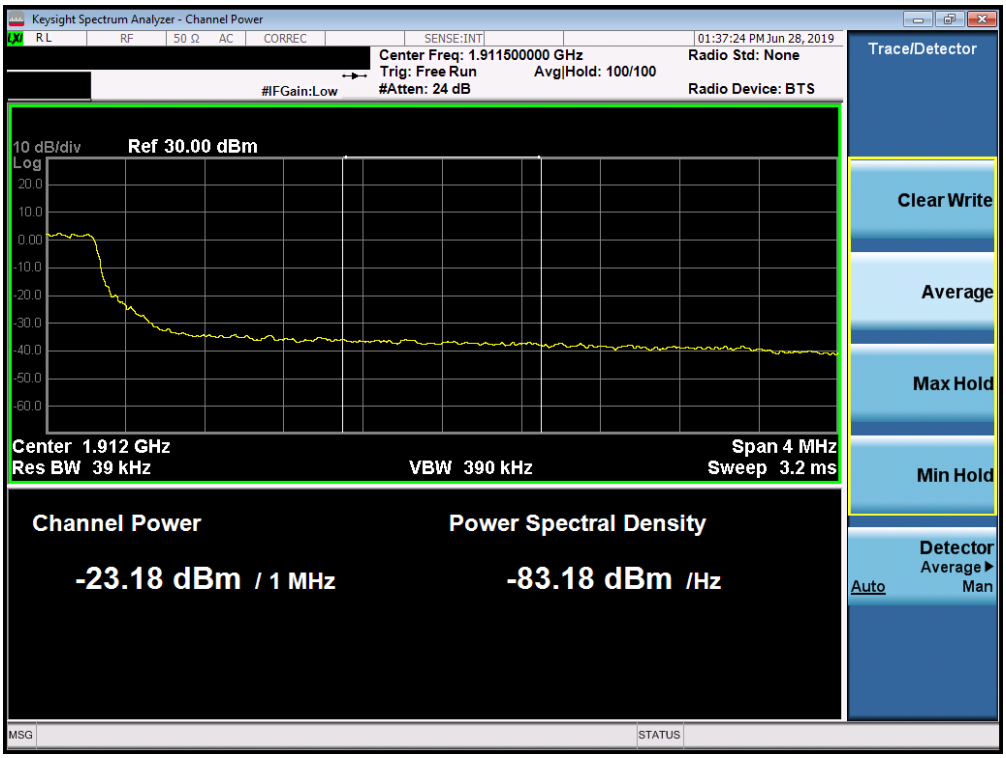


Plot 7-247. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



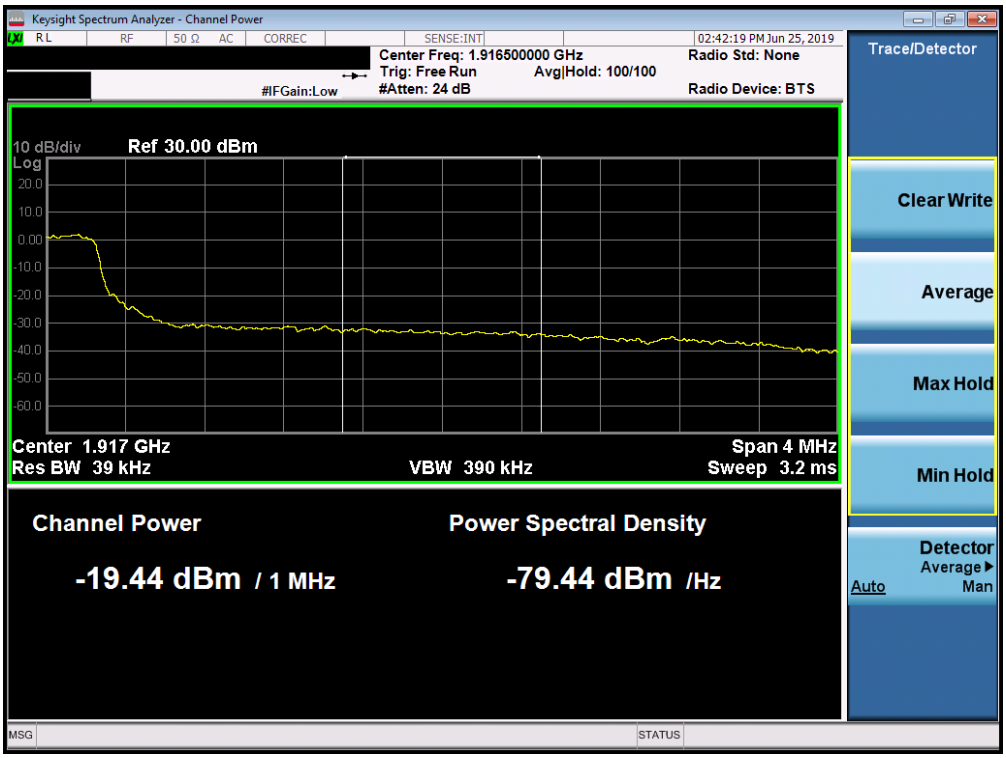
Plot 7-248. Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-249. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

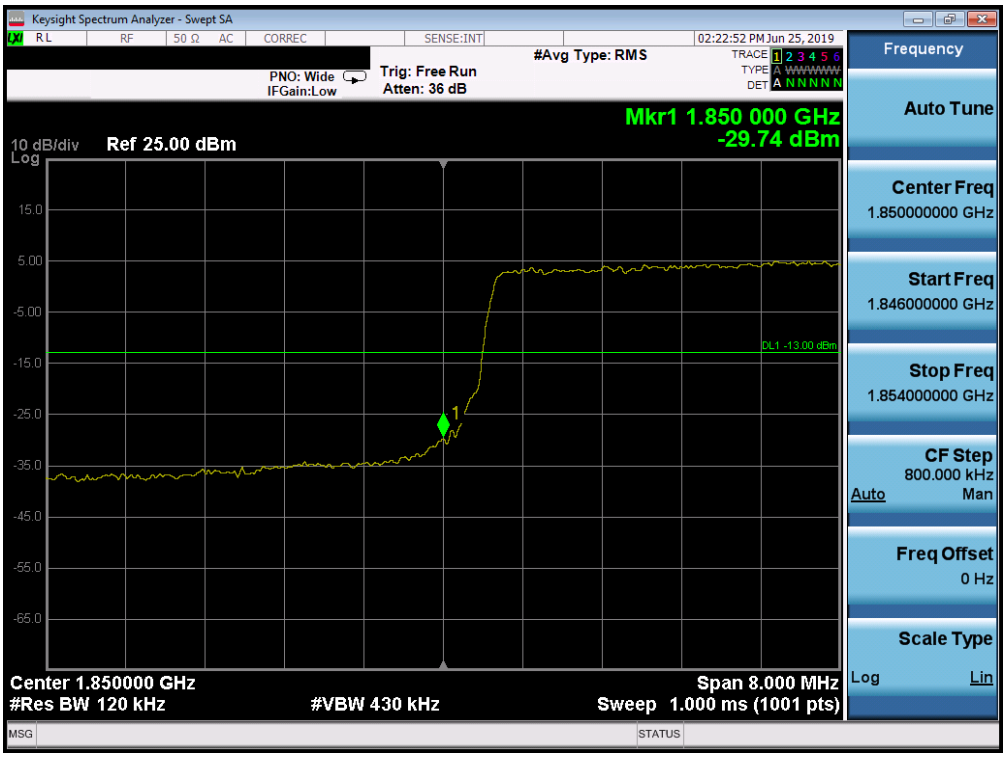


Plot 7-250. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

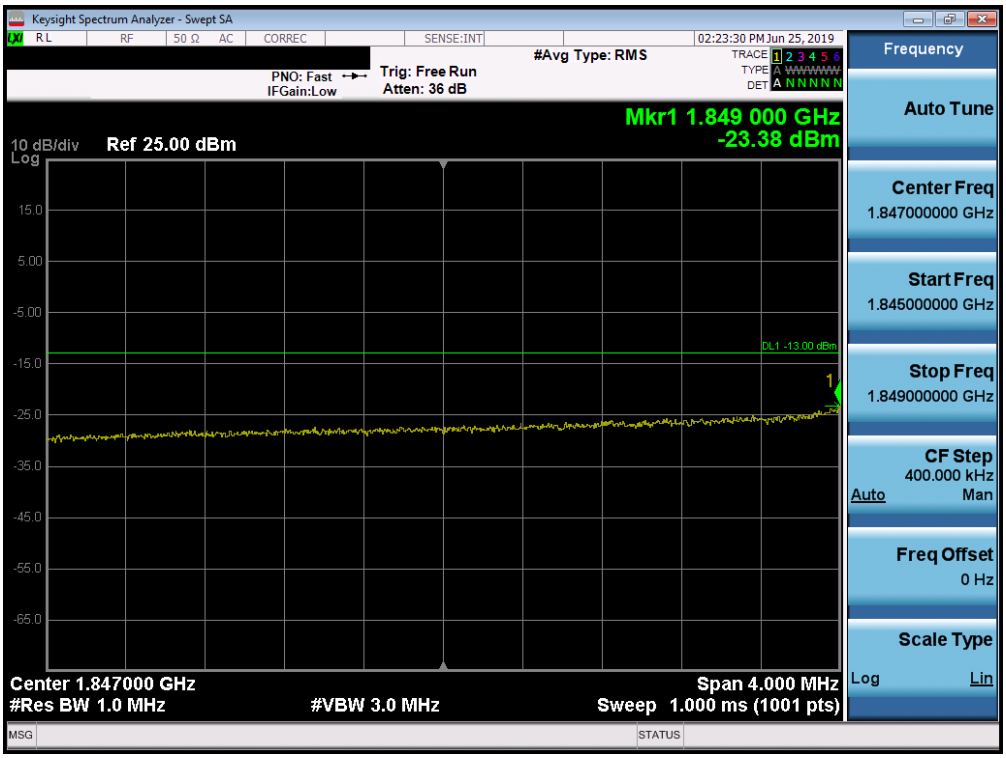
Plot 7-251. Upper Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-252. Upper Extended Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-253. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

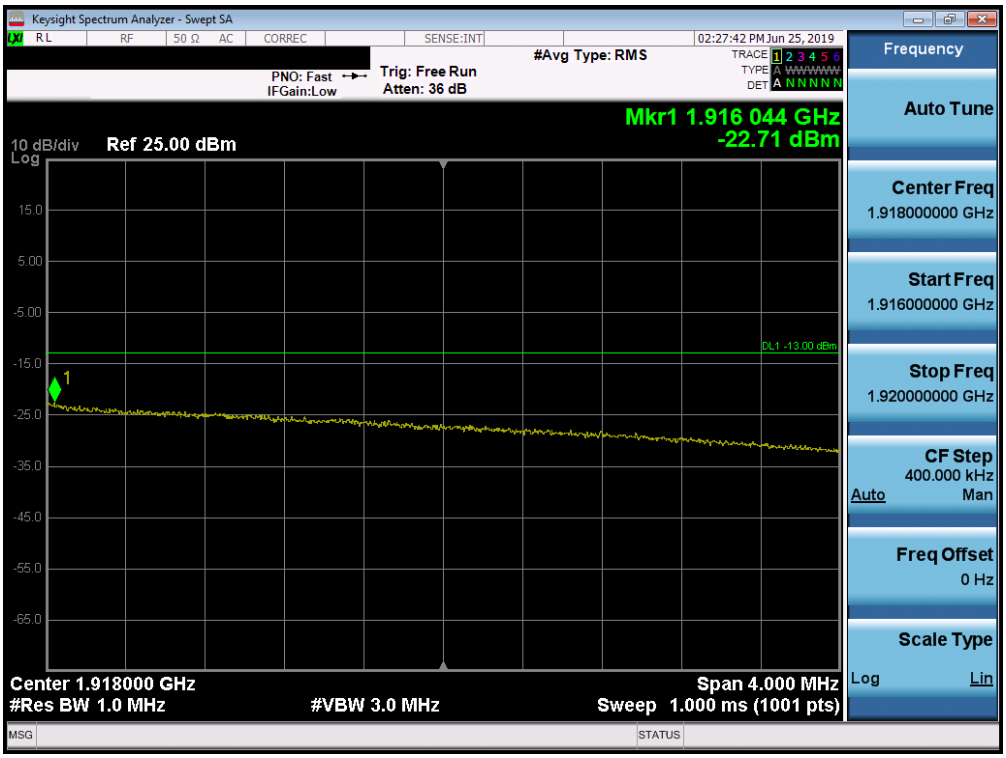


Plot 7-254. Lower Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

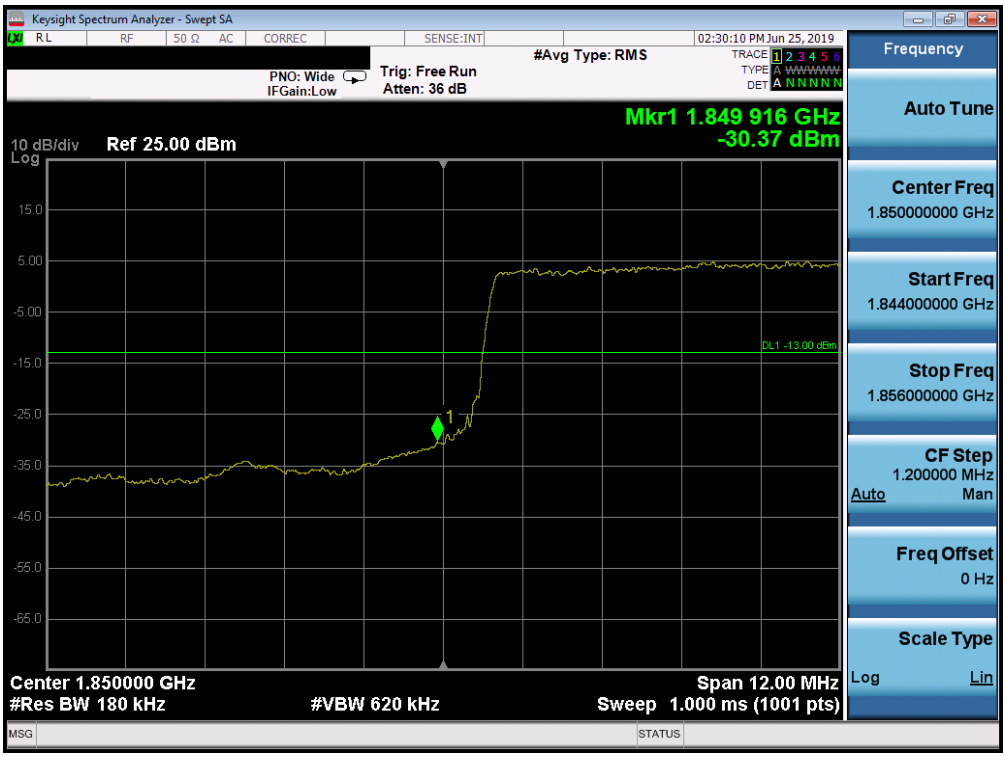
Plot 7-255. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

Plot 7-256. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

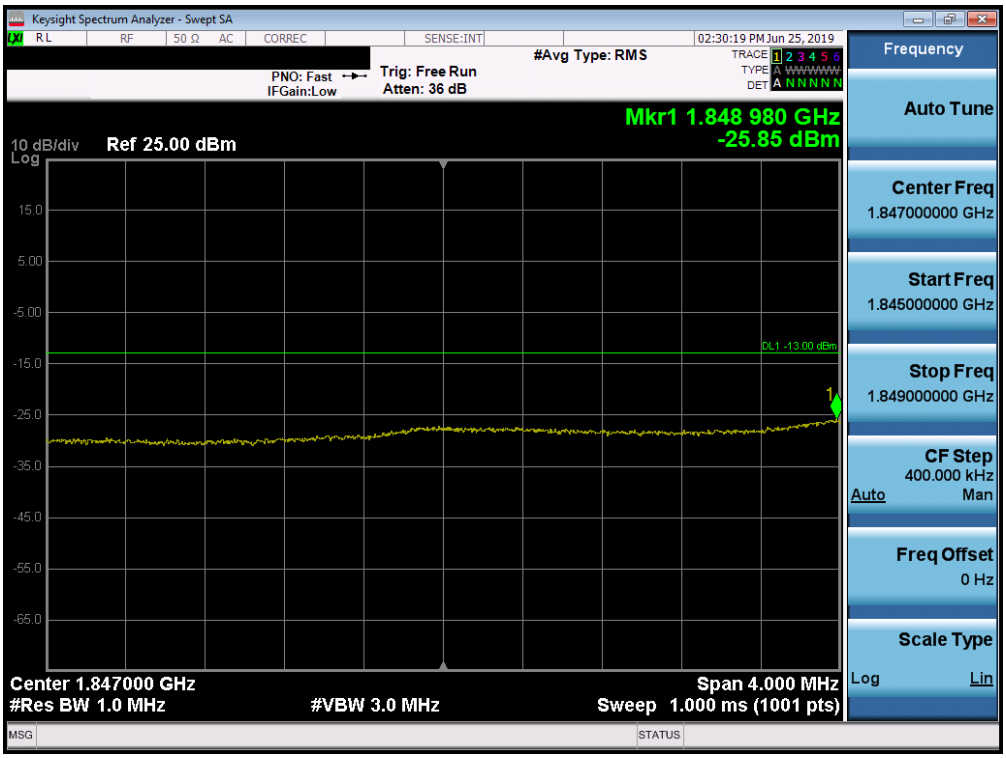
Plot 7-257. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-258. Upper Extended Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)

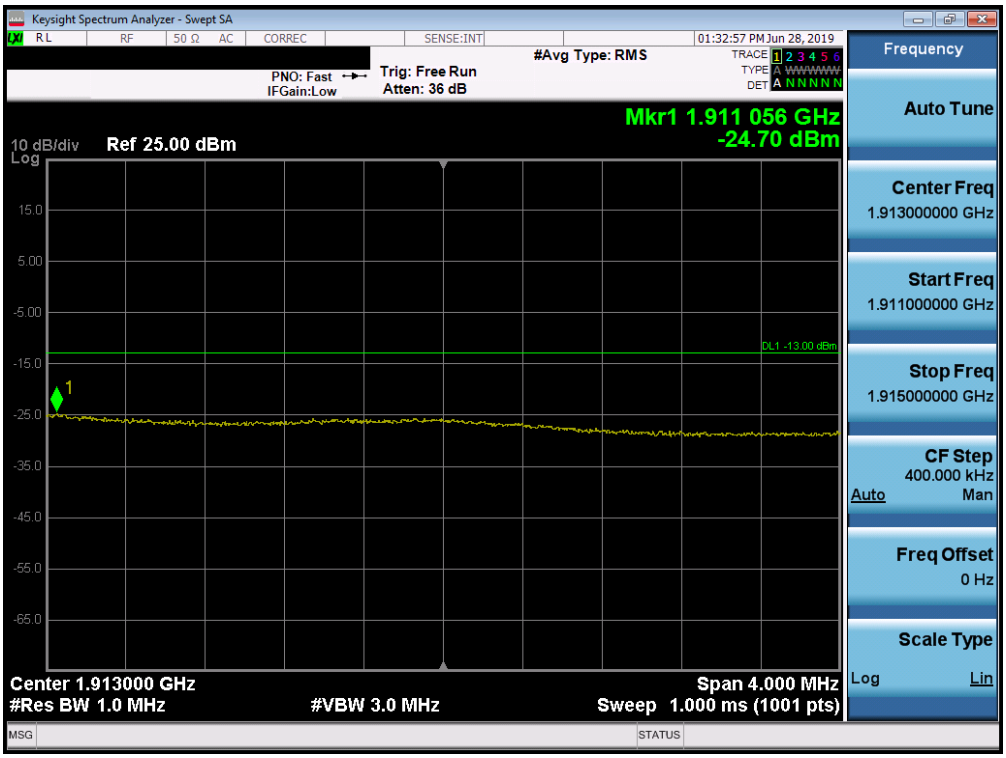


Plot 7-259. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



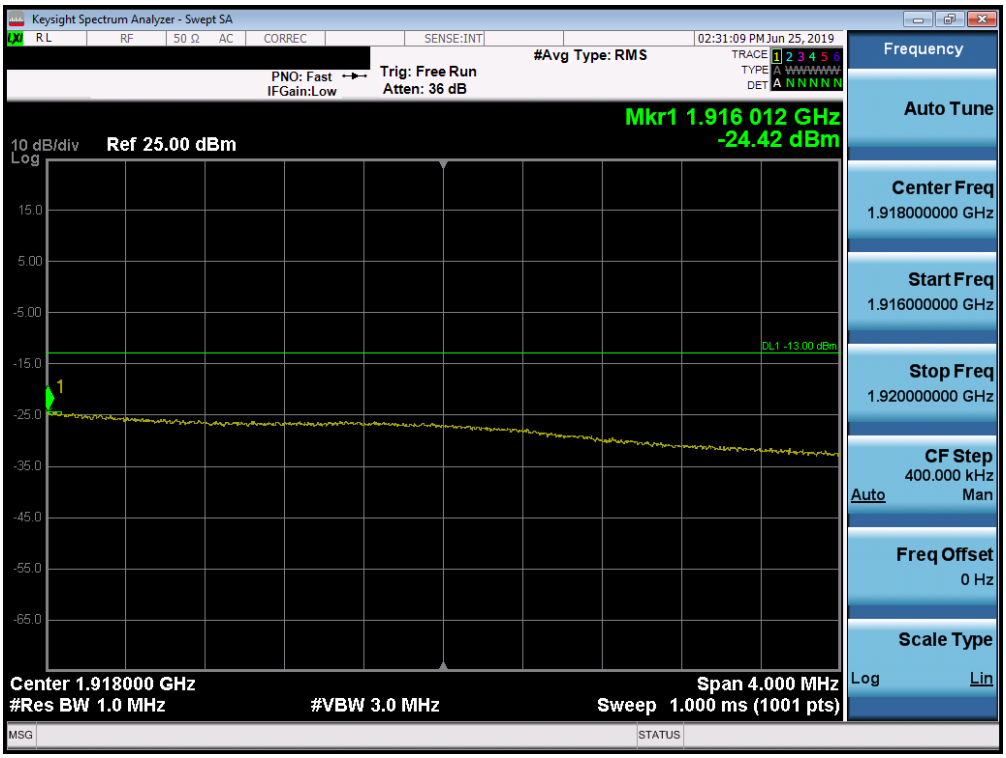
Plot 7-260. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

Plot 7-261. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

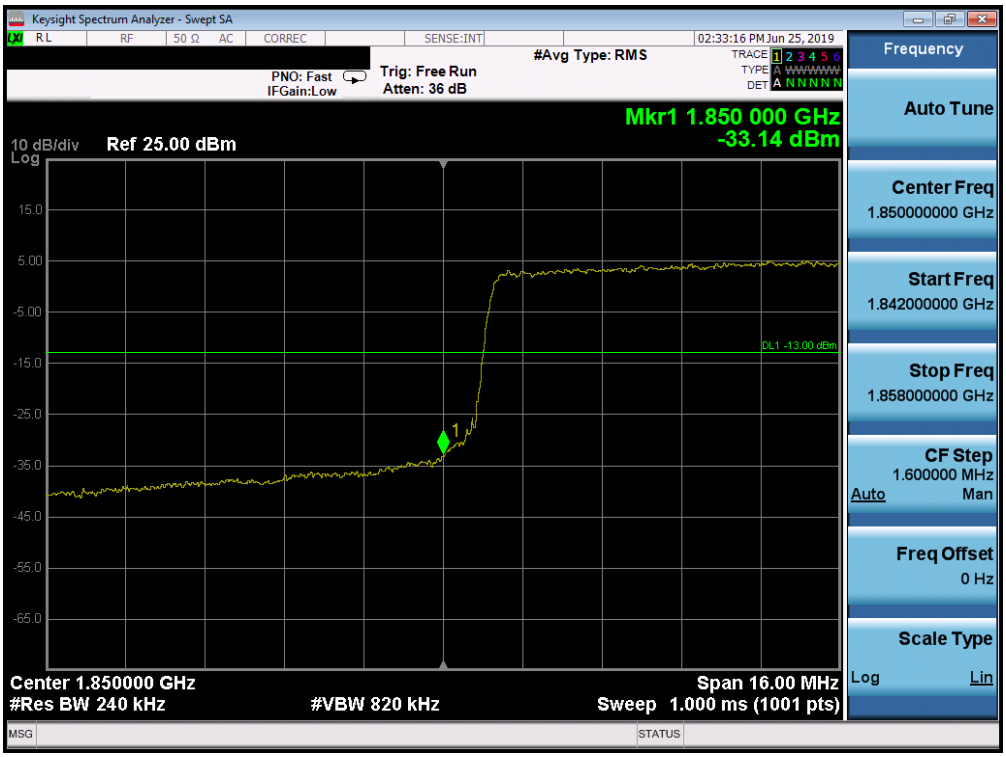


Plot 7-262. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

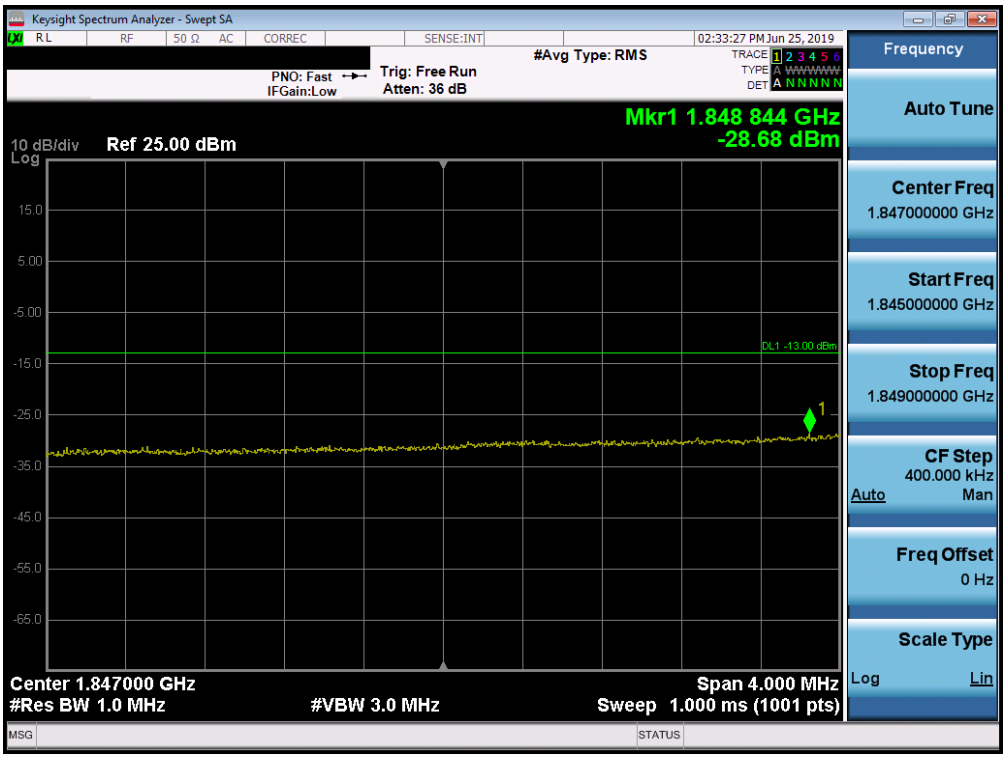
Plot 7-263. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



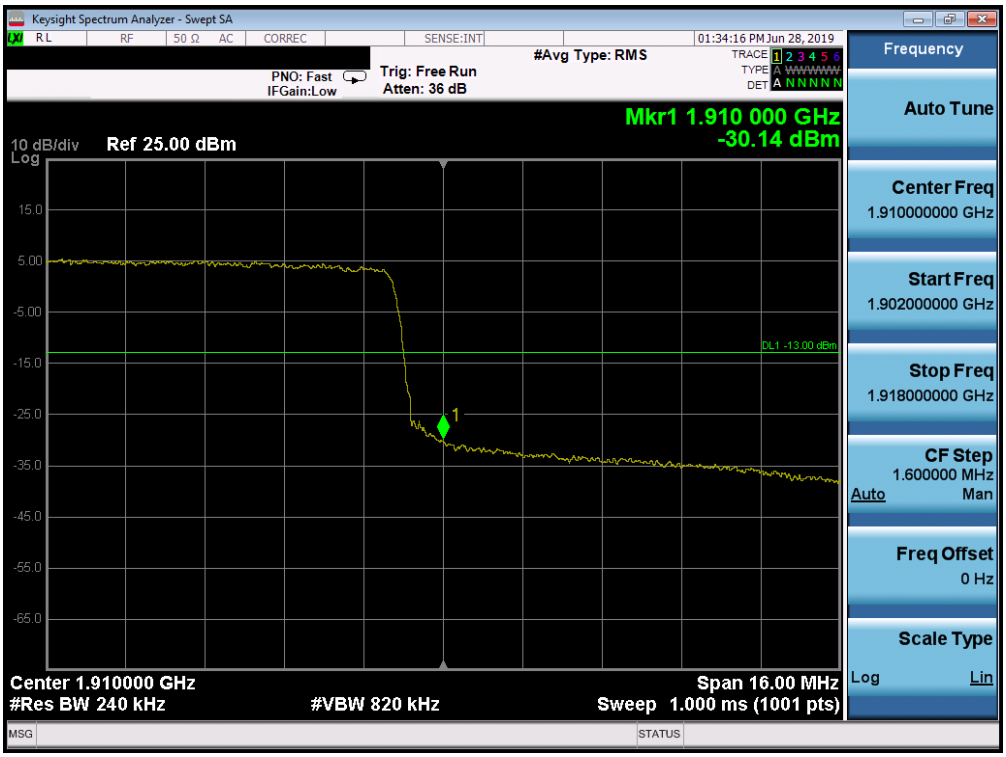
Plot 7-264. Upper Extended Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



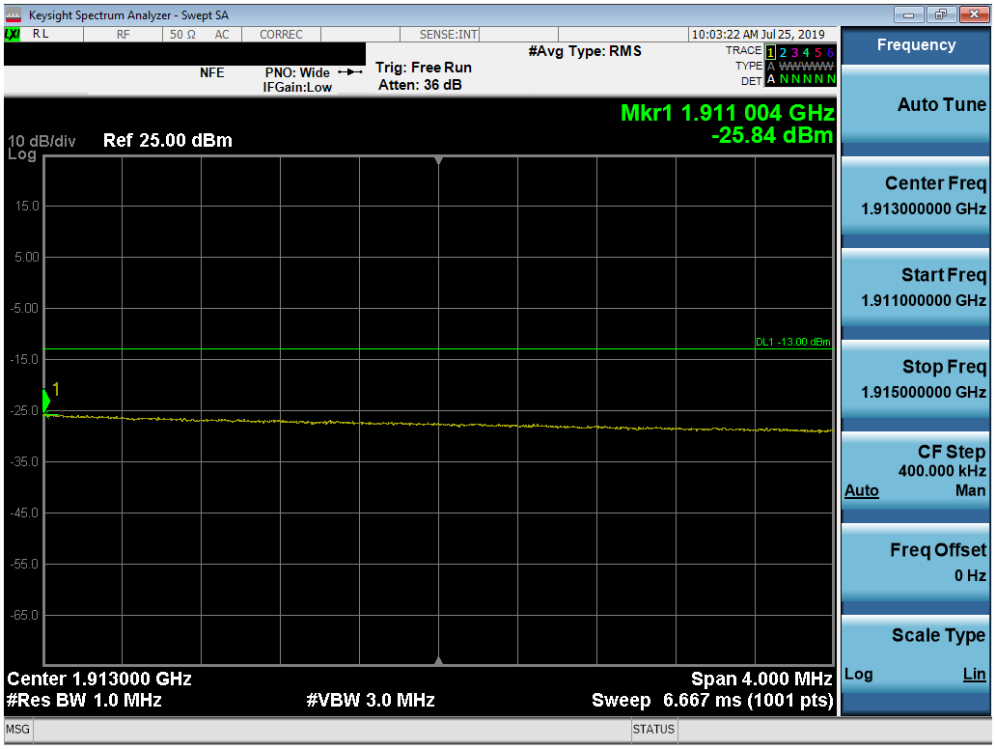
Plot 7-265. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-266. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

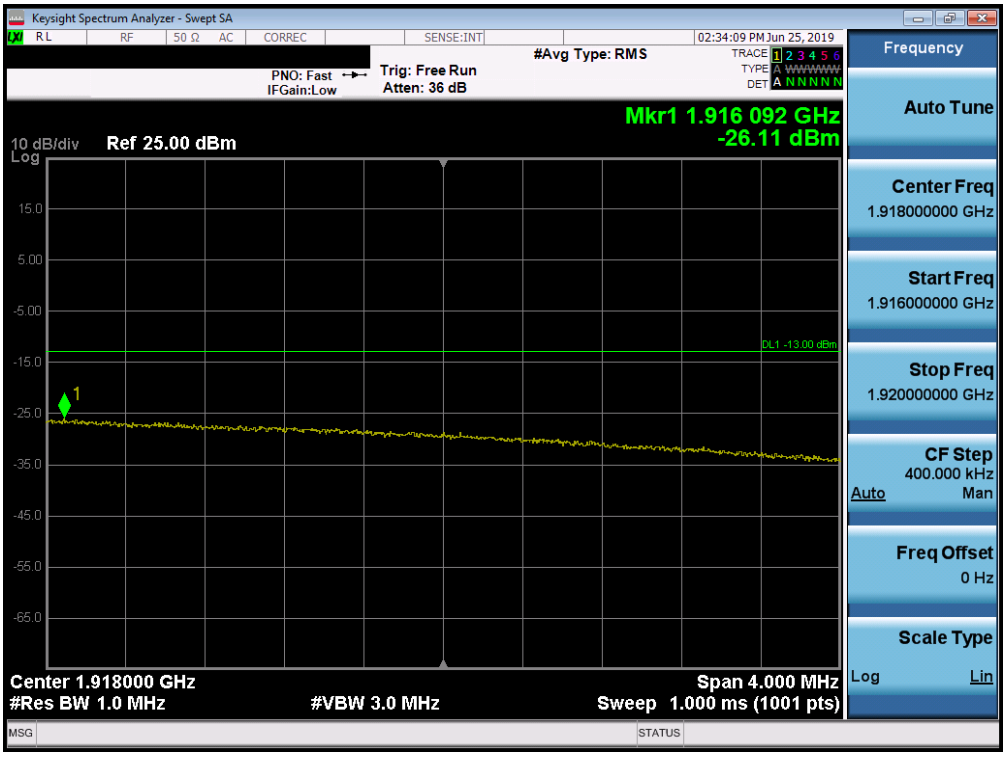


Plot 7-267. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



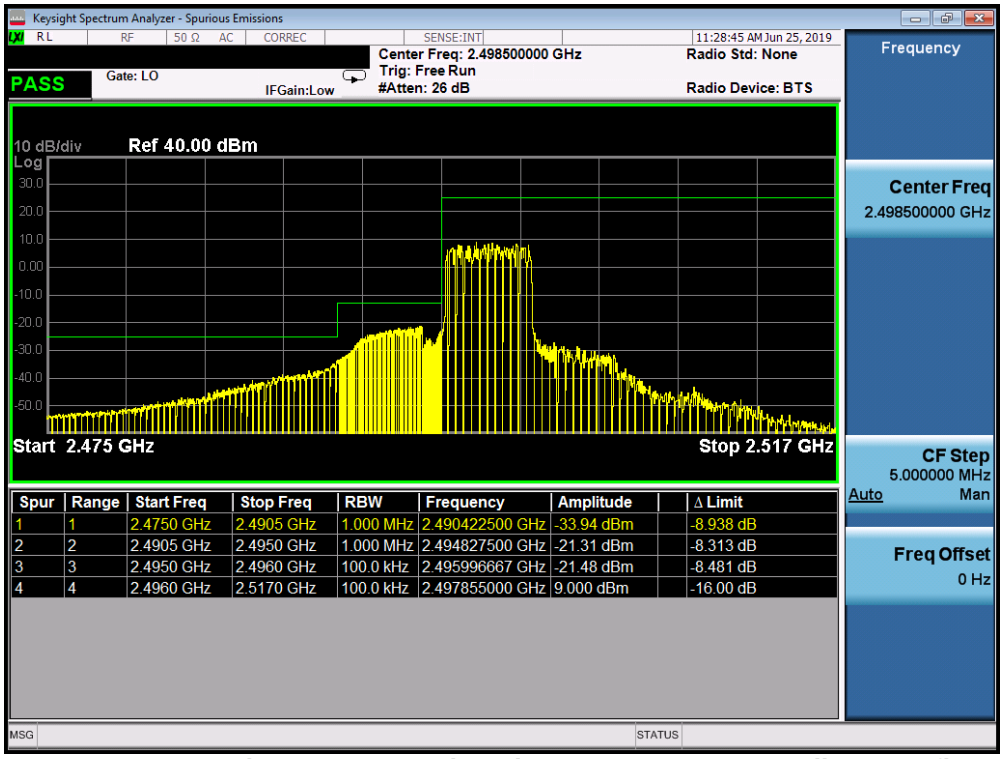
Plot 7-268. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

Plot 7-269. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



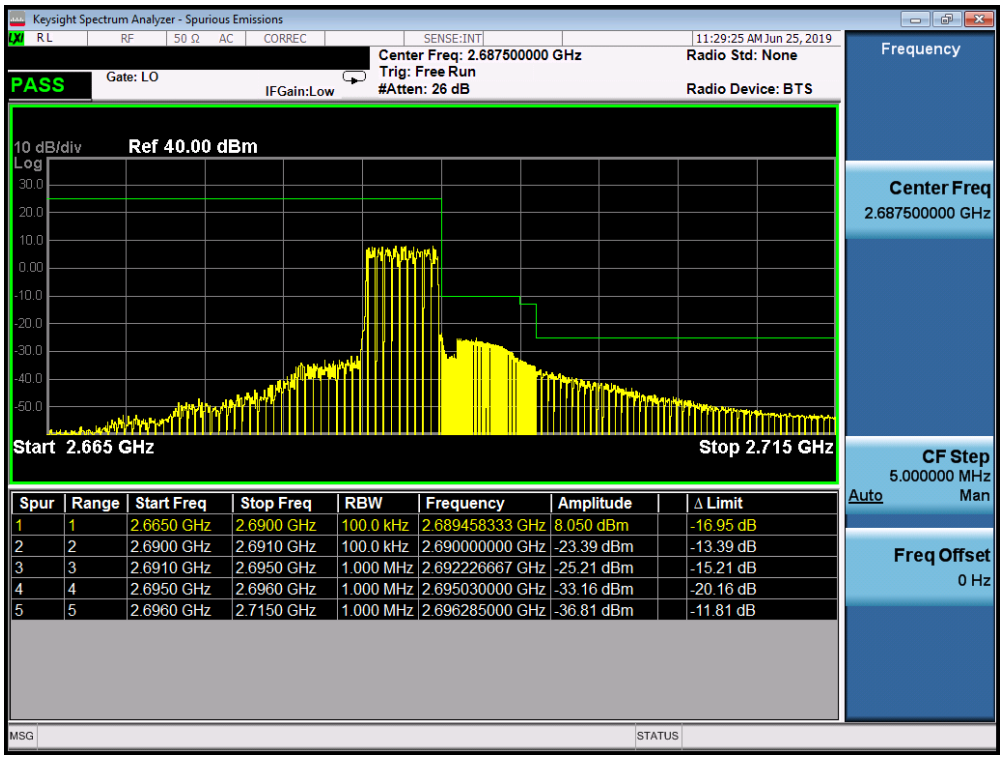
Plot 7-270. Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

Band 41 (PC2)



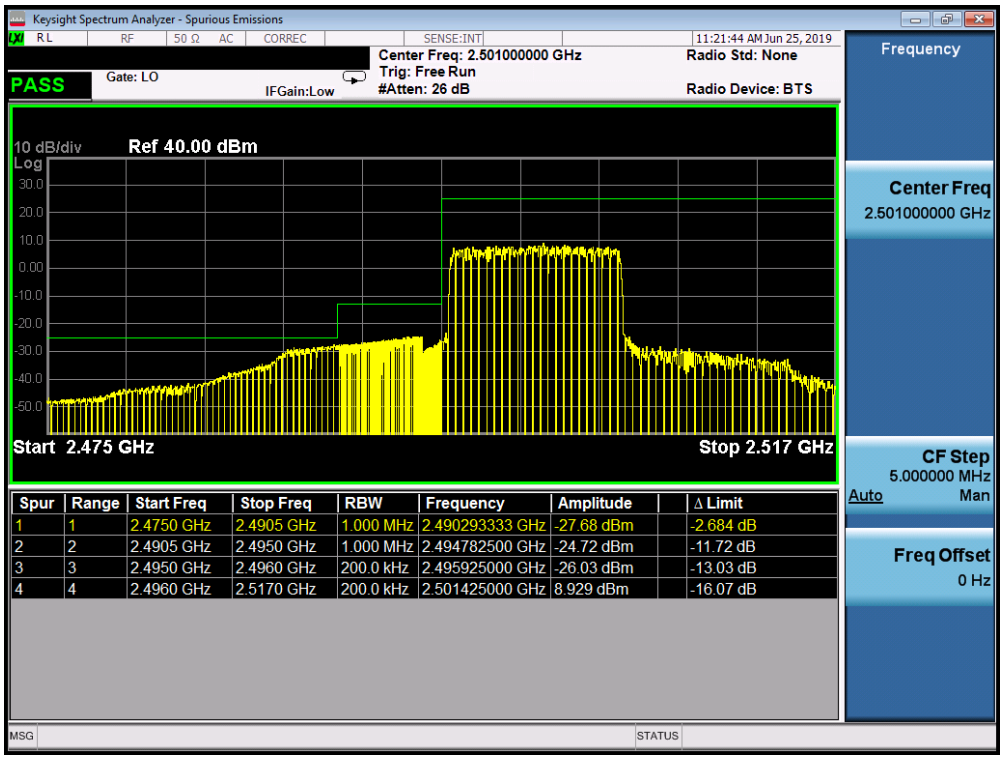
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490422500 GHz	-33.94 dBm	-8.938 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494827500 GHz	-21.31 dBm	-8.313 dB
3	3	2.4950 GHz	2.4960 GHz	100.0 kHz	2.495996667 GHz	-21.48 dBm	-8.481 dB
4	4	2.4960 GHz	2.5170 GHz	100.0 kHz	2.497855000 GHz	9.000 dBm	-16.00 dB

Plot 7-271. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - Full RB Configuration)



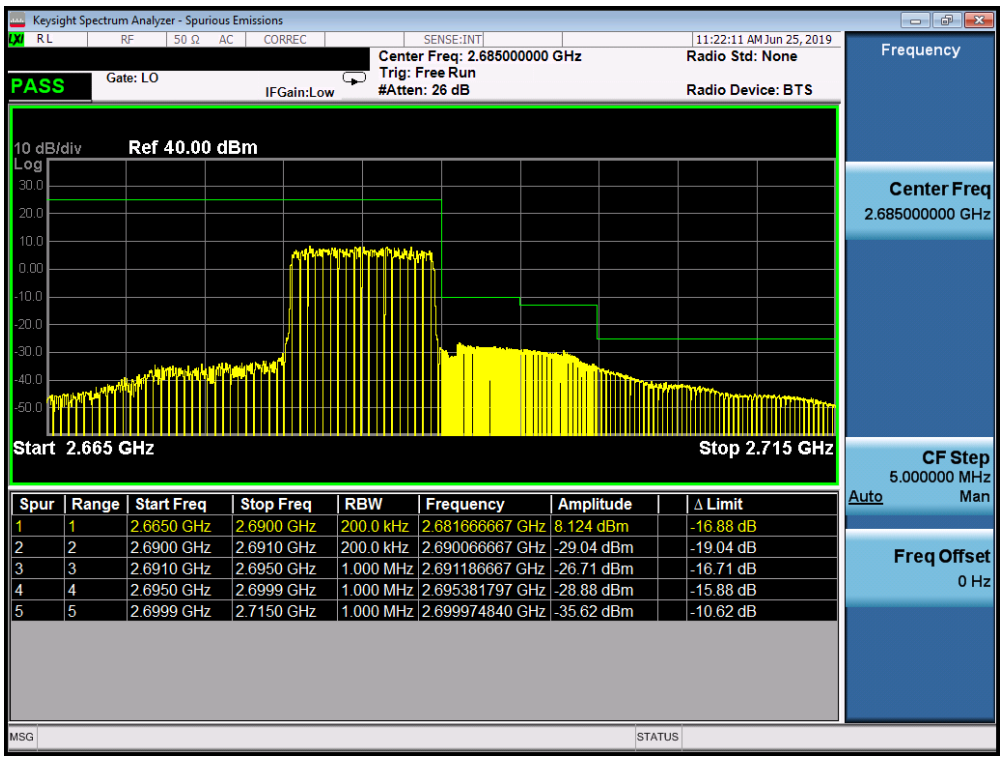
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	100.0 kHz	2.689458333 GHz	8.050 dBm	-16.95 dB
2	2	2.6900 GHz	2.6910 GHz	100.0 kHz	2.690000000 GHz	-23.39 dBm	-13.39 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692226667 GHz	-25.21 dBm	-15.21 dB
4	4	2.6950 GHz	2.6960 GHz	1.000 MHz	2.695030000 GHz	-33.16 dBm	-20.16 dB
5	5	2.6960 GHz	2.7150 GHz	1.000 MHz	2.696285000 GHz	-36.81 dBm	-11.81 dB

Plot 7-272. Upper ACP Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)



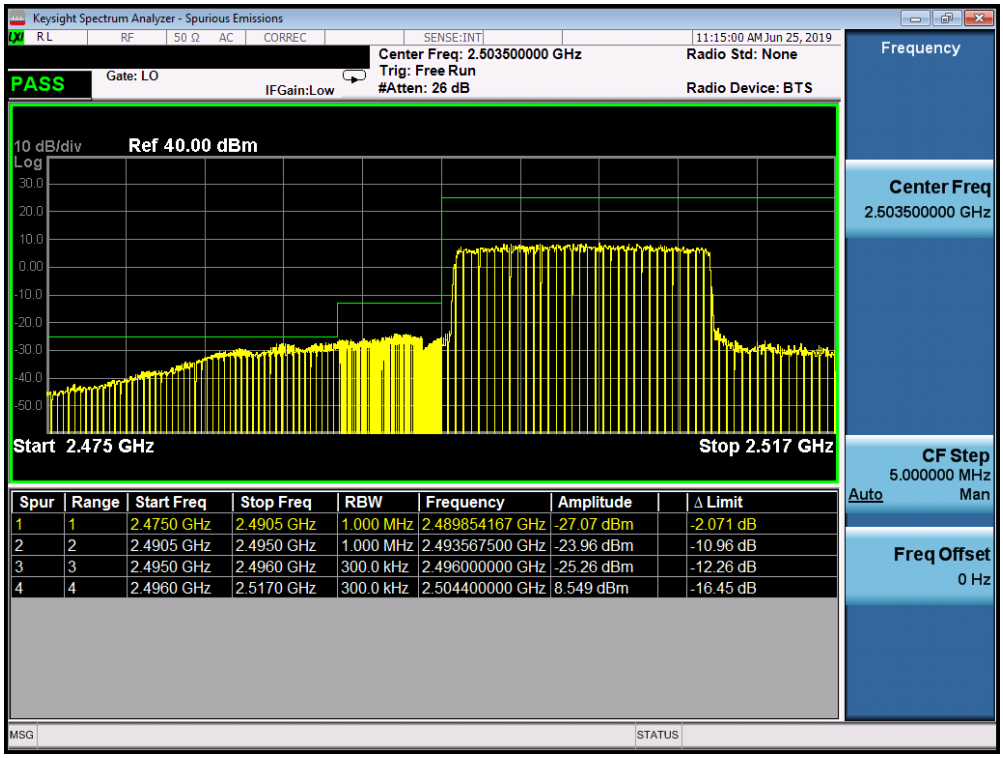
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490293333 GHz	-27.68 dBm	-2.684 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494782500 GHz	-24.72 dBm	-11.72 dB
3	3	2.4950 GHz	2.4960 GHz	200.0 kHz	2.495925000 GHz	-26.03 dBm	-13.03 dB
4	4	2.4960 GHz	2.5170 GHz	200.0 kHz	2.501425000 GHz	8.929 dBm	-16.07 dB

Plot 7-273. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - Full RB Configuration)



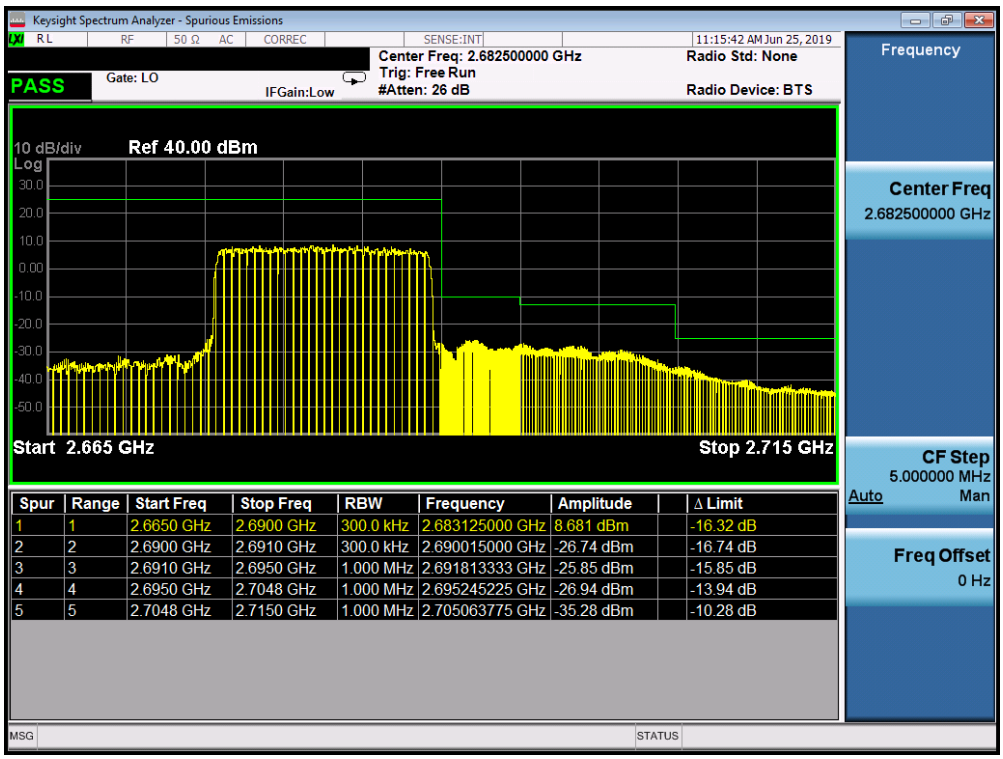
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	200.0 kHz	2.681666667 GHz	8.124 dBm	-16.88 dB
2	2	2.6900 GHz	2.6910 GHz	200.0 kHz	2.690066667 GHz	-29.04 dBm	-19.04 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691186667 GHz	-26.71 dBm	-16.71 dB
4	4	2.6950 GHz	2.6999 GHz	1.000 MHz	2.695381797 GHz	-28.88 dBm	-15.88 dB
5	5	2.6999 GHz	2.7150 GHz	1.000 MHz	2.699974840 GHz	-35.62 dBm	-10.62 dB

Plot 7-274. Upper ACP Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)



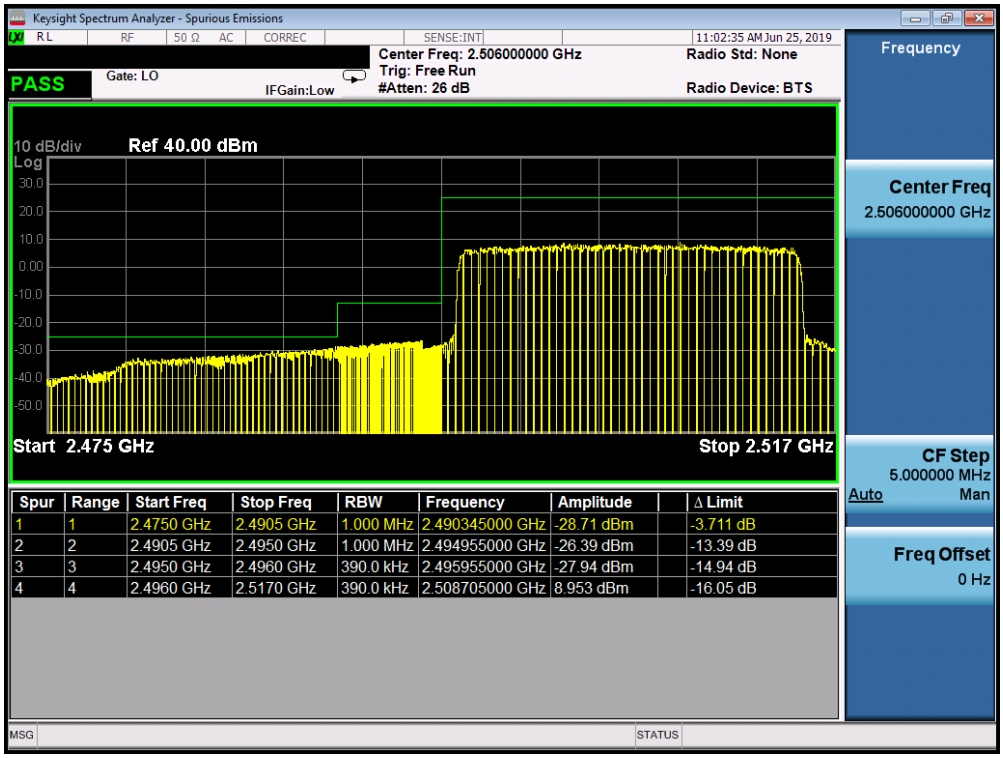
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489854167 GHz	-27.07 dBm	-2.071 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.493567500 GHz	-23.96 dBm	-10.96 dB
3	3	2.4950 GHz	2.4960 GHz	300.0 kHz	2.496000000 GHz	-25.26 dBm	-12.26 dB
4	4	2.4960 GHz	2.5170 GHz	300.0 kHz	2.504400000 GHz	8.549 dBm	-16.45 dB

Plot 7-275. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - Full RB Configuration)

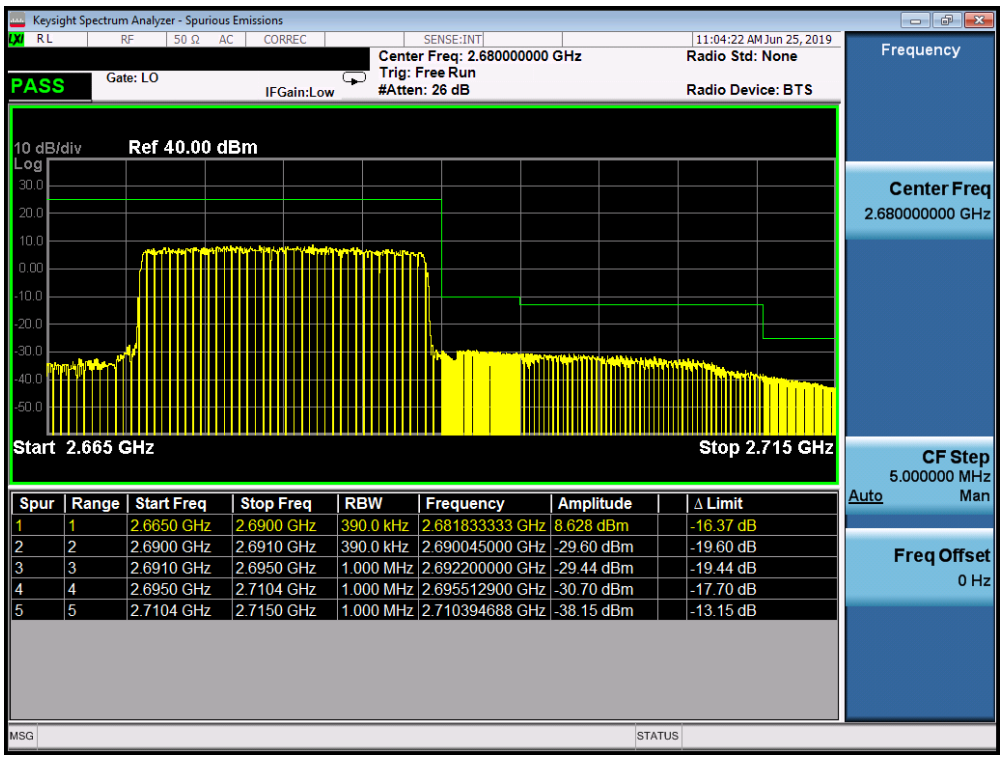


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	300.0 kHz	2.683125000 GHz	8.681 dBm	-16.32 dB
2	2	2.6900 GHz	2.6910 GHz	300.0 kHz	2.690015000 GHz	-26.74 dBm	-16.74 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691813333 GHz	-25.85 dBm	-15.85 dB
4	4	2.6950 GHz	2.7048 GHz	1.000 MHz	2.695245225 GHz	-26.94 dBm	-13.94 dB
5	5	2.7048 GHz	2.7150 GHz	1.000 MHz	2.705063775 GHz	-35.28 dBm	-10.28 dB

Plot 7-276. Upper ACP Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)

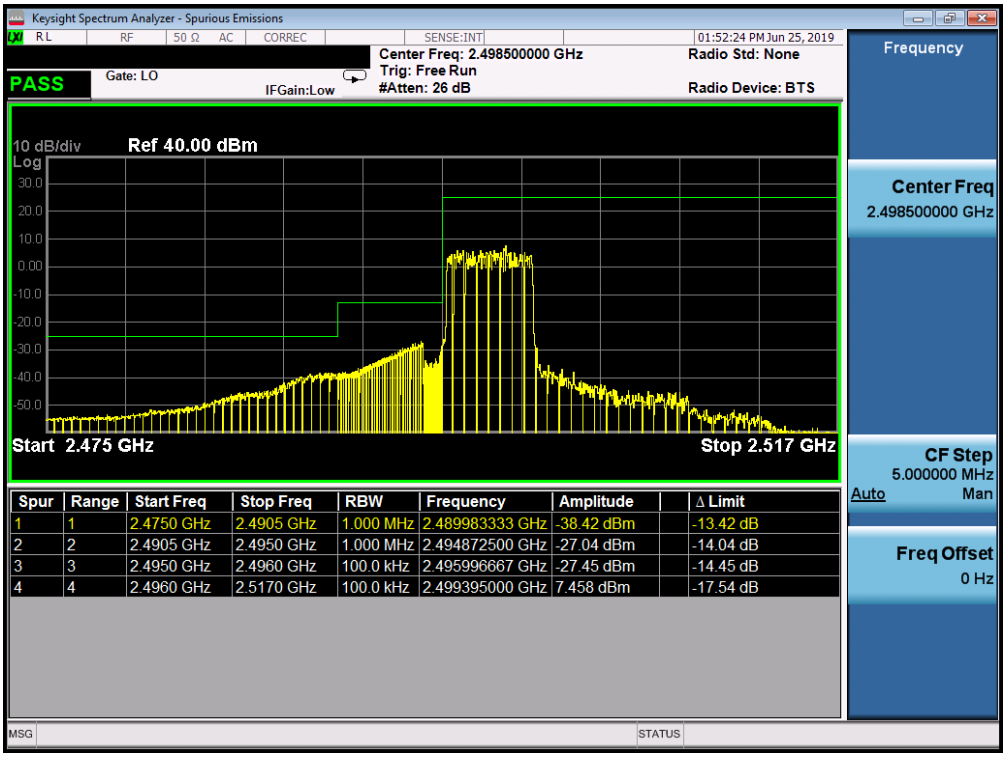


Plot 7-277. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - Full RB Configuration)



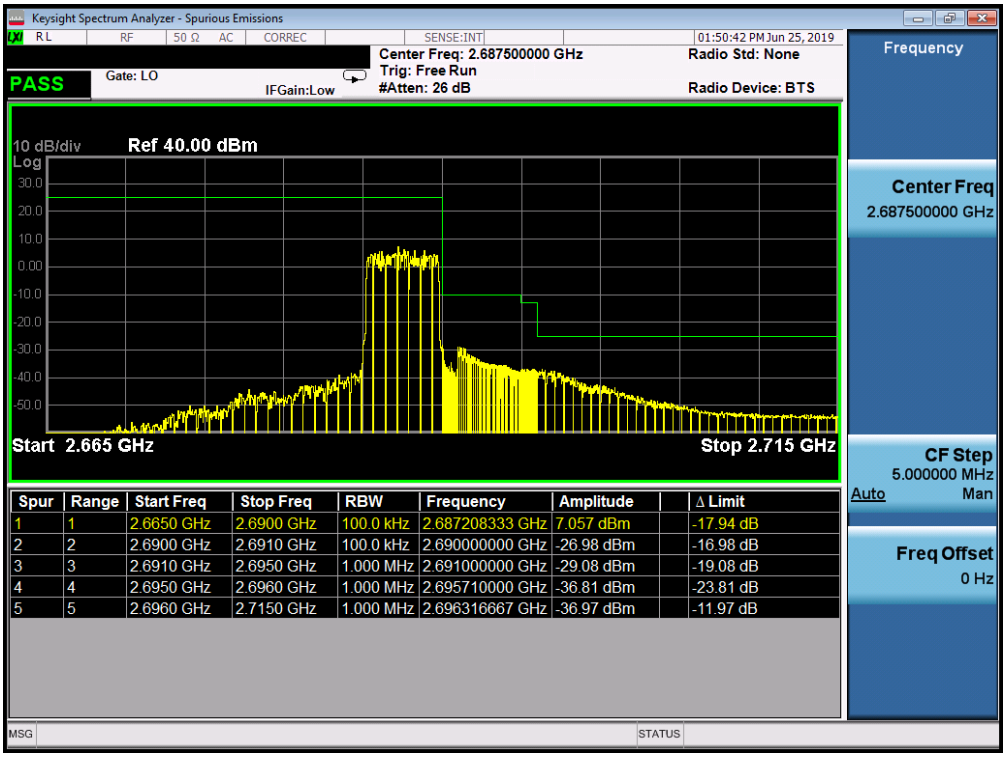
Plot 7-278. Upper ACP Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)

Band 41(PC3)



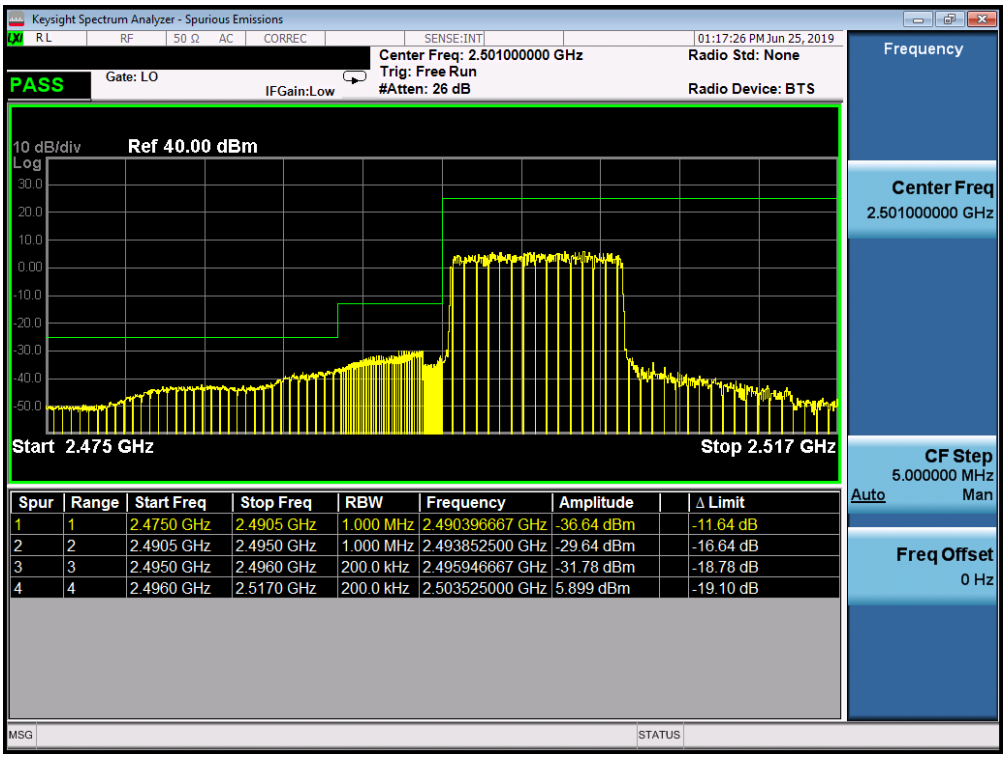
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489983333 GHz	-38.42 dBm	-13.42 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494872500 GHz	-27.04 dBm	-14.04 dB
3	3	2.4950 GHz	2.4960 GHz	100.0 kHz	2.495996667 GHz	-27.45 dBm	-14.45 dB
4	4	2.4960 GHz	2.5170 GHz	100.0 kHz	2.499395000 GHz	7.458 dBm	-17.54 dB

Plot 7-279. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - Full RB Configuration)



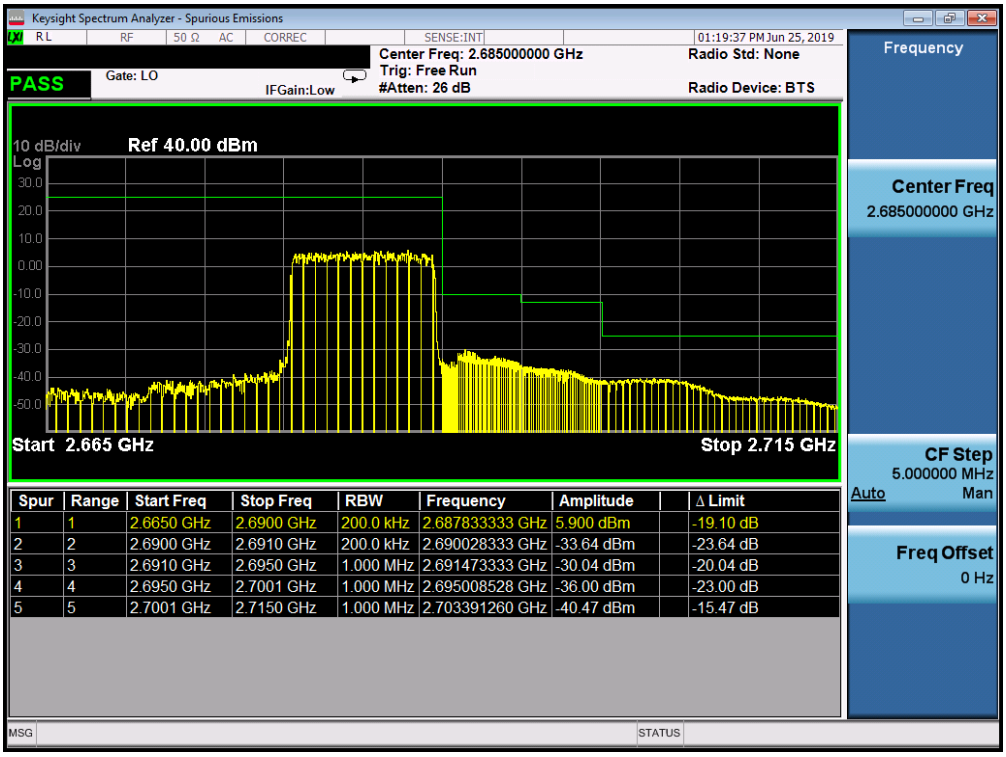
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	100.0 kHz	2.687208333 GHz	7.057 dBm	-17.94 dB
2	2	2.6900 GHz	2.6910 GHz	100.0 kHz	2.690000000 GHz	-26.98 dBm	-16.98 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691000000 GHz	-29.08 dBm	-19.08 dB
4	4	2.6950 GHz	2.6960 GHz	1.000 MHz	2.695710000 GHz	-36.81 dBm	-23.81 dB
5	5	2.6960 GHz	2.7150 GHz	1.000 MHz	2.696316667 GHz	-36.97 dBm	-11.97 dB

Plot 7-280. Upper ACP Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)



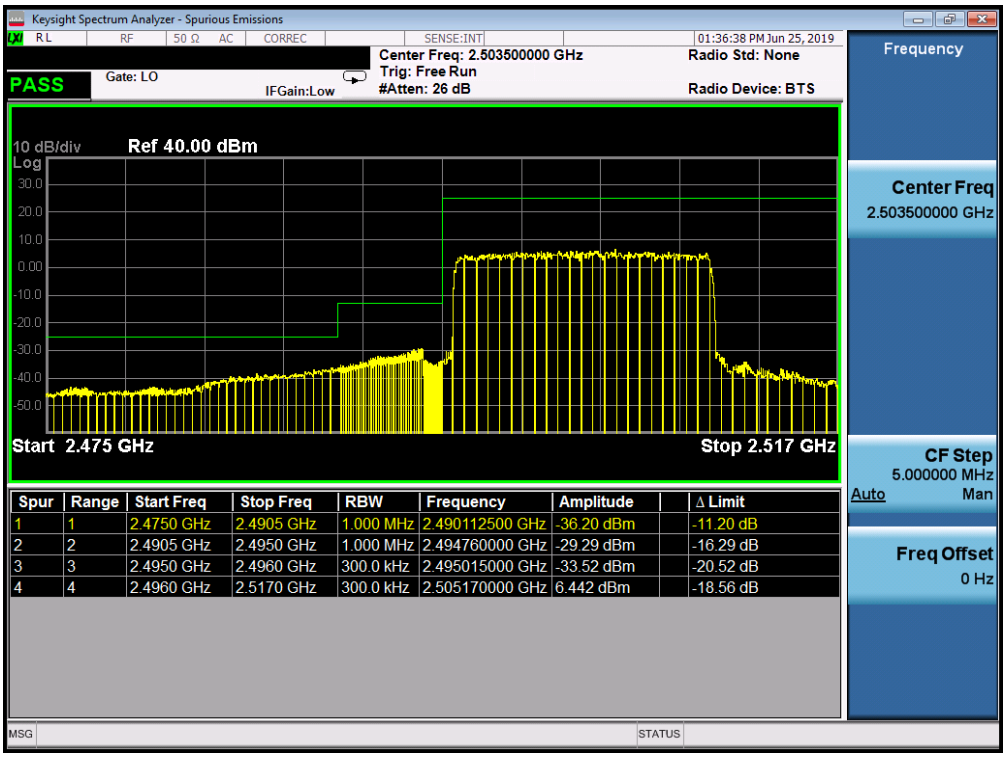
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490396667 GHz	-36.64 dBm	-11.64 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.493852500 GHz	-29.64 dBm	-16.64 dB
3	3	2.4950 GHz	2.4960 GHz	200.0 kHz	2.495946667 GHz	-31.78 dBm	-18.78 dB
4	4	2.4960 GHz	2.5170 GHz	200.0 kHz	2.503525000 GHz	5.899 dBm	-19.10 dB

Plot 7-281. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - Full RB Configuration)

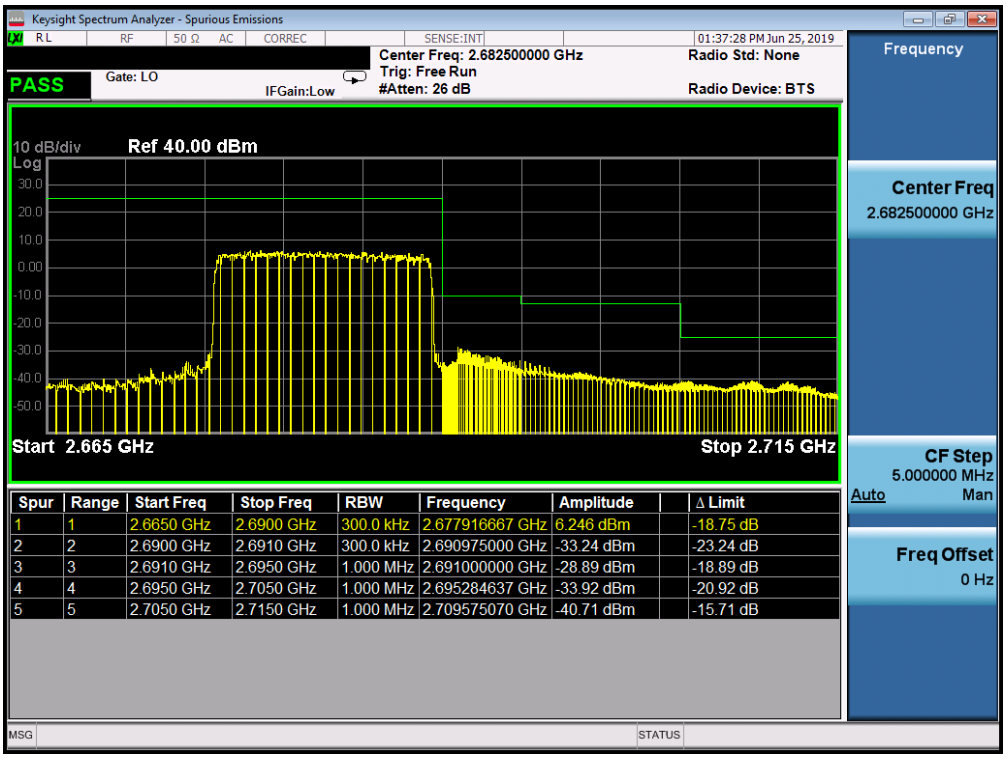


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	200.0 kHz	2.687833333 GHz	5.900 dBm	-19.10 dB
2	2	2.6900 GHz	2.6910 GHz	200.0 kHz	2.690028333 GHz	-33.64 dBm	-23.64 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691473333 GHz	-30.04 dBm	-20.04 dB
4	4	2.6950 GHz	2.7001 GHz	1.000 MHz	2.695008528 GHz	-36.00 dBm	-23.00 dB
5	5	2.7001 GHz	2.7150 GHz	1.000 MHz	2.703391260 GHz	-40.47 dBm	-15.47 dB

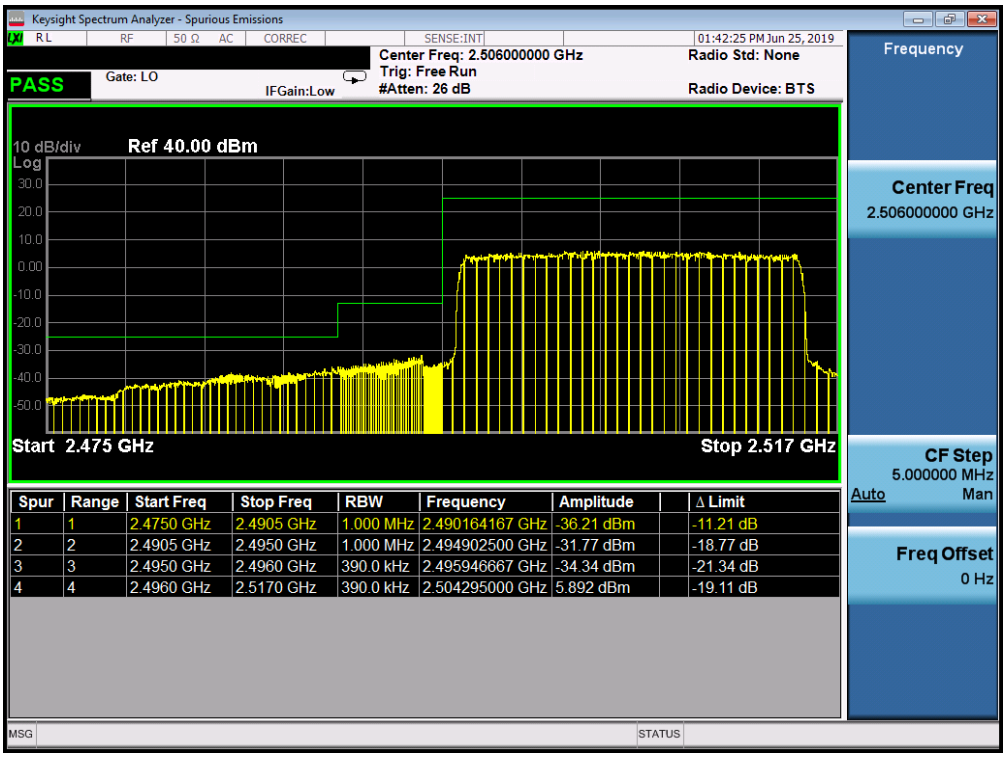
Plot 7-282. Upper ACP Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)



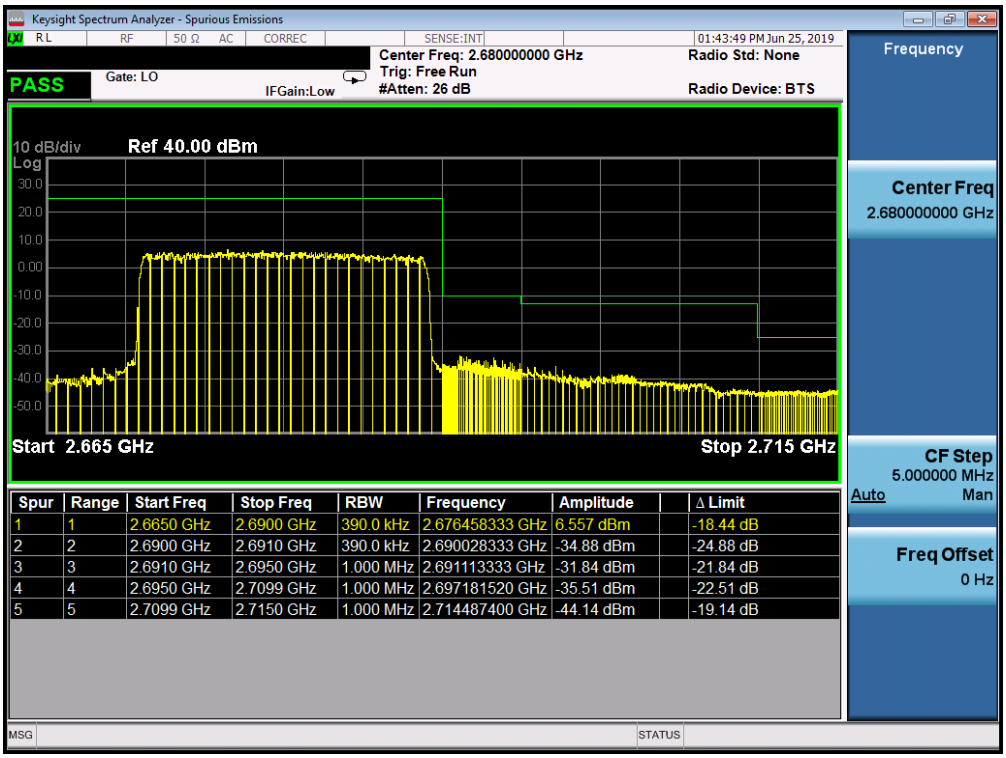
Plot 7-283. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-284. Upper ACP Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-285. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-286. Upper ACP Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)

7.5 Peak-Average Ratio

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW ≥ OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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

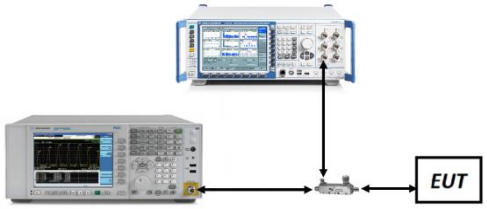
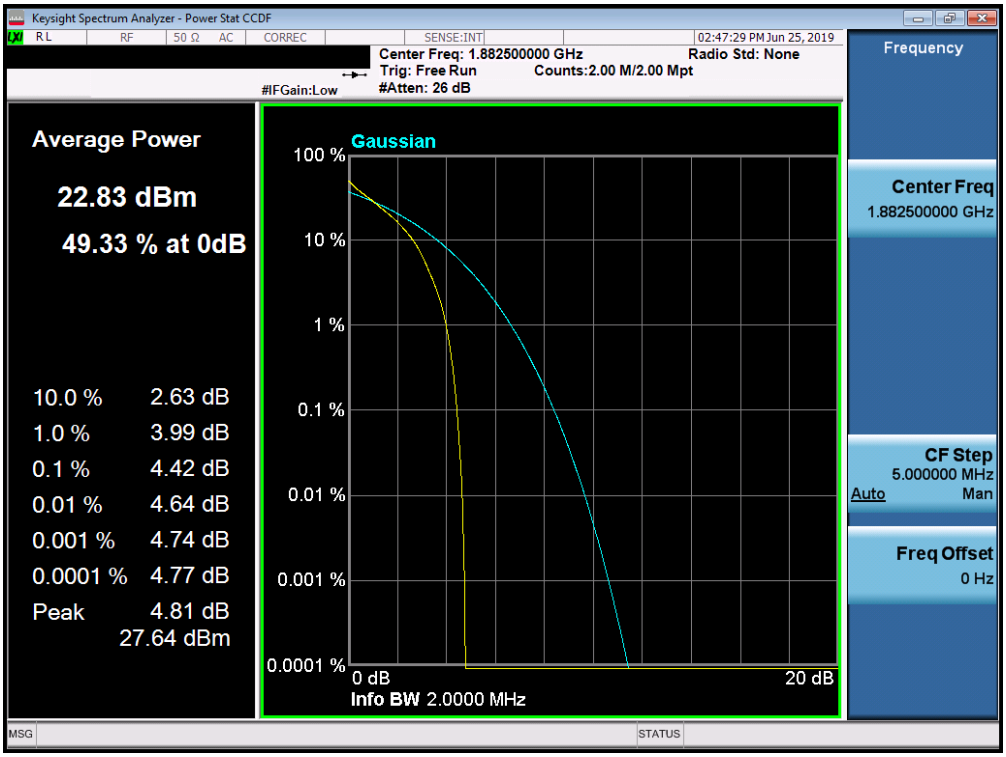


Figure 7-4. Test Instrument & Measurement Setup

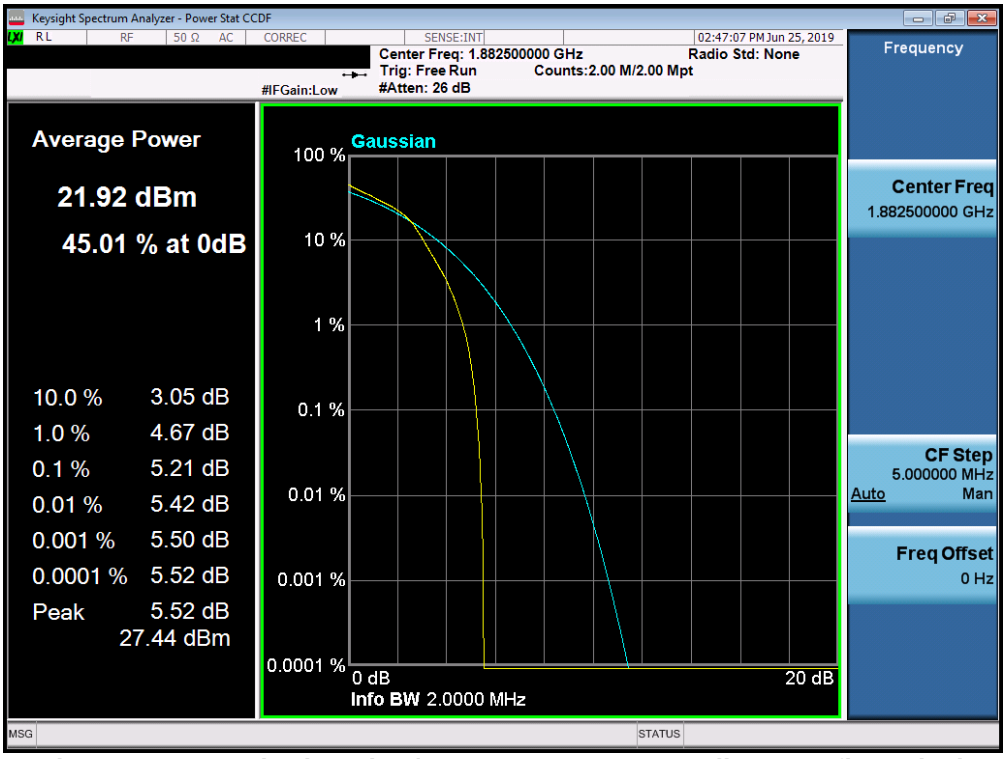
Test Notes

None.

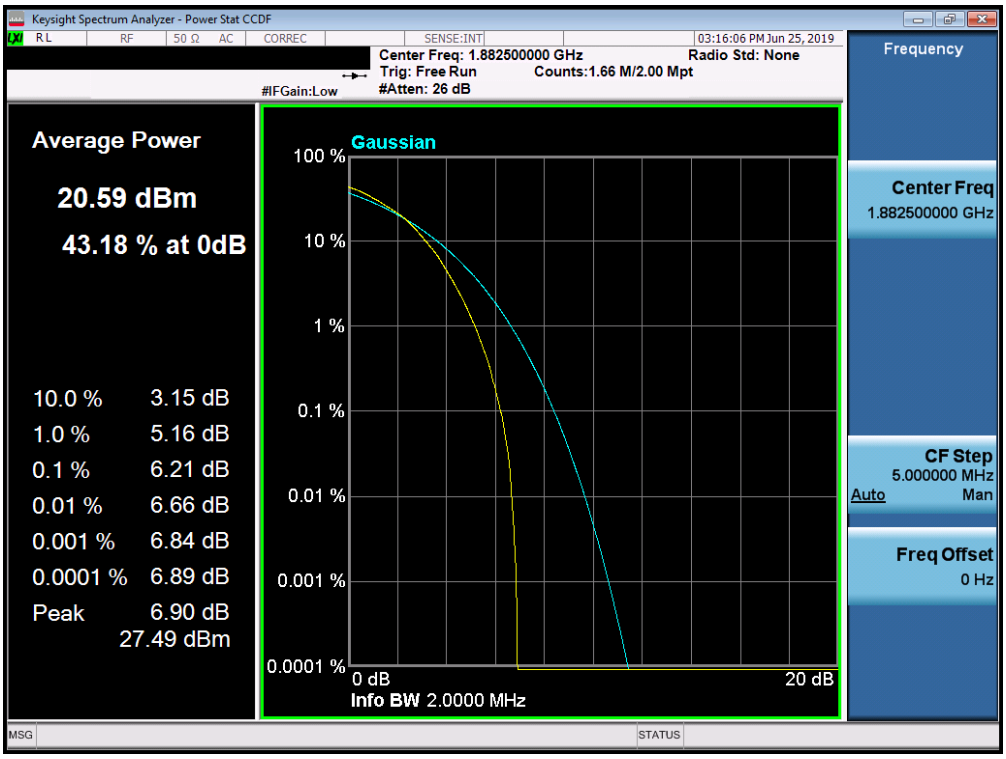
Band 25/2



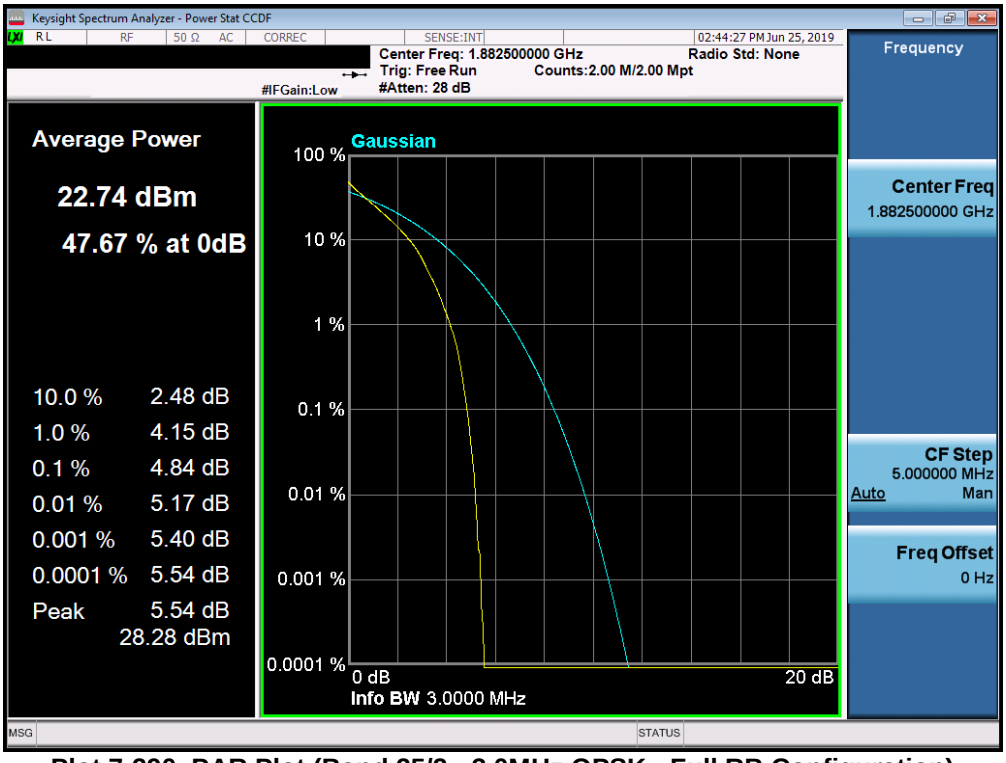
Plot 7-287. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



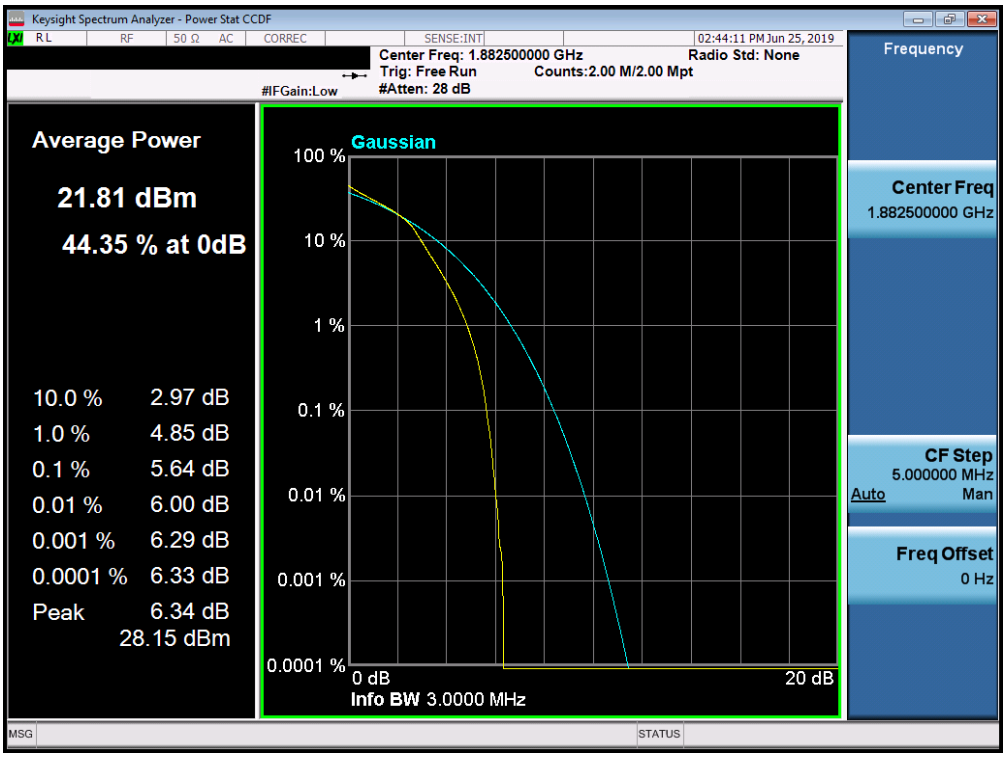
Plot 7-288. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)



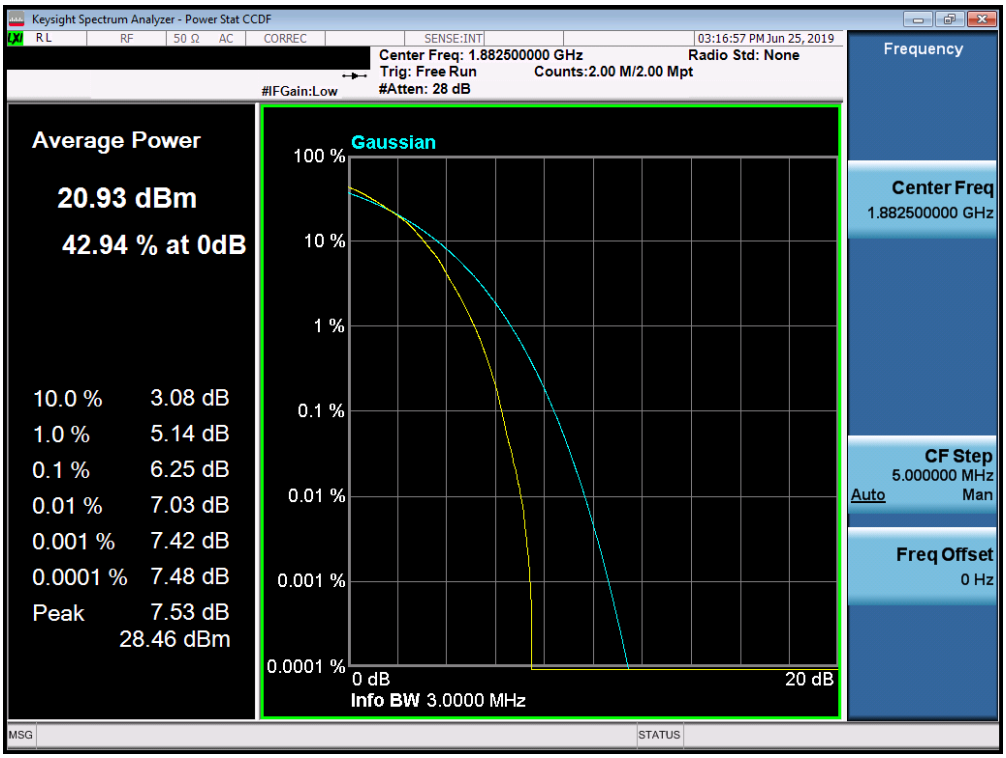
Plot 7-289. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)



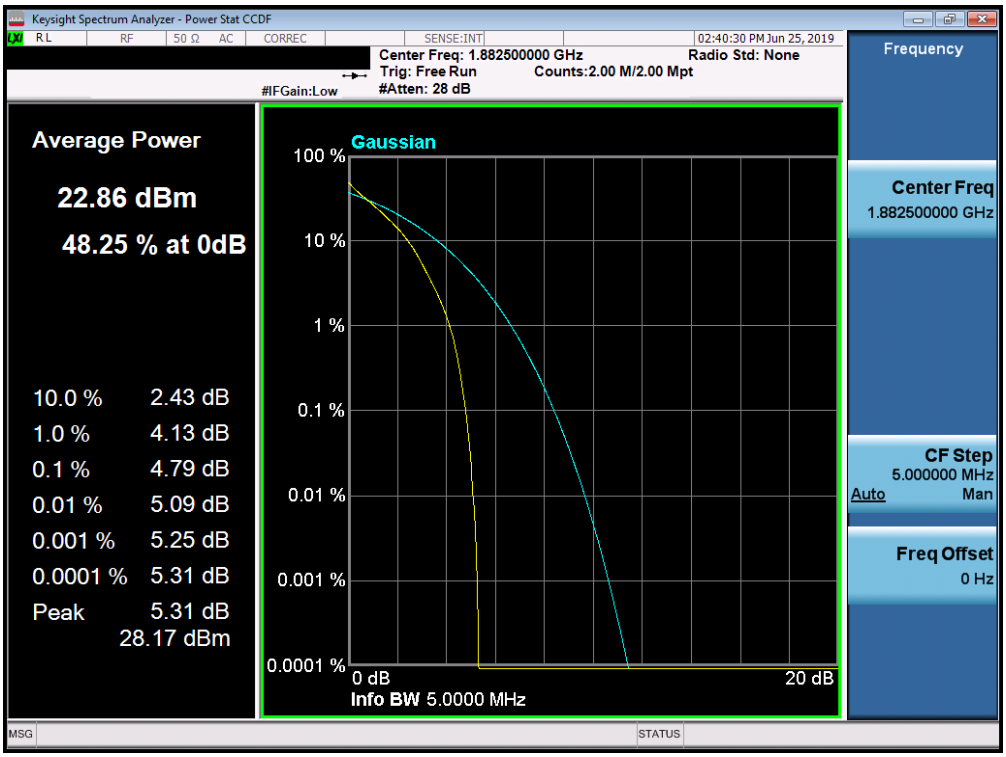
Plot 7-290. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



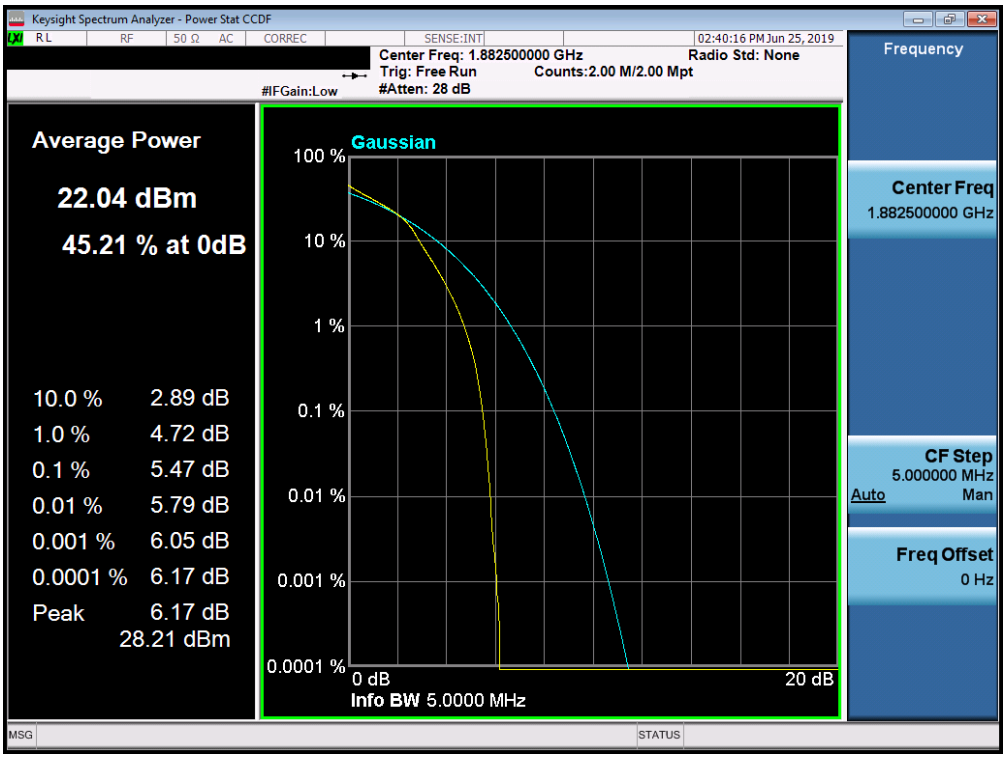
Plot 7-291. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



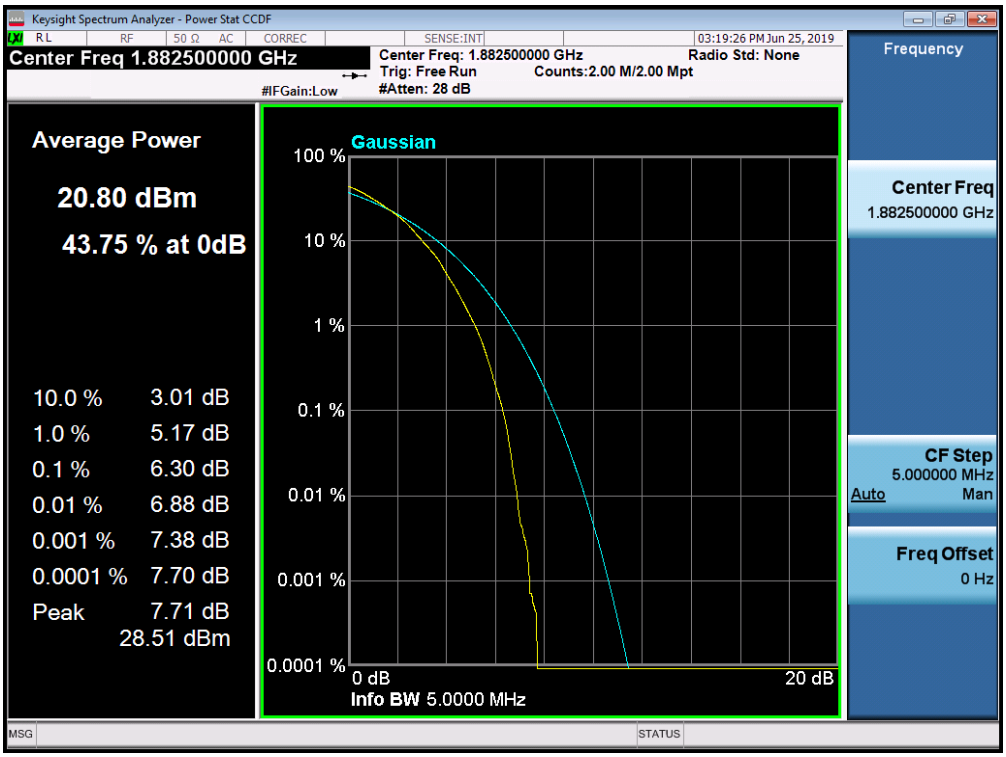
Plot 7-292. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)



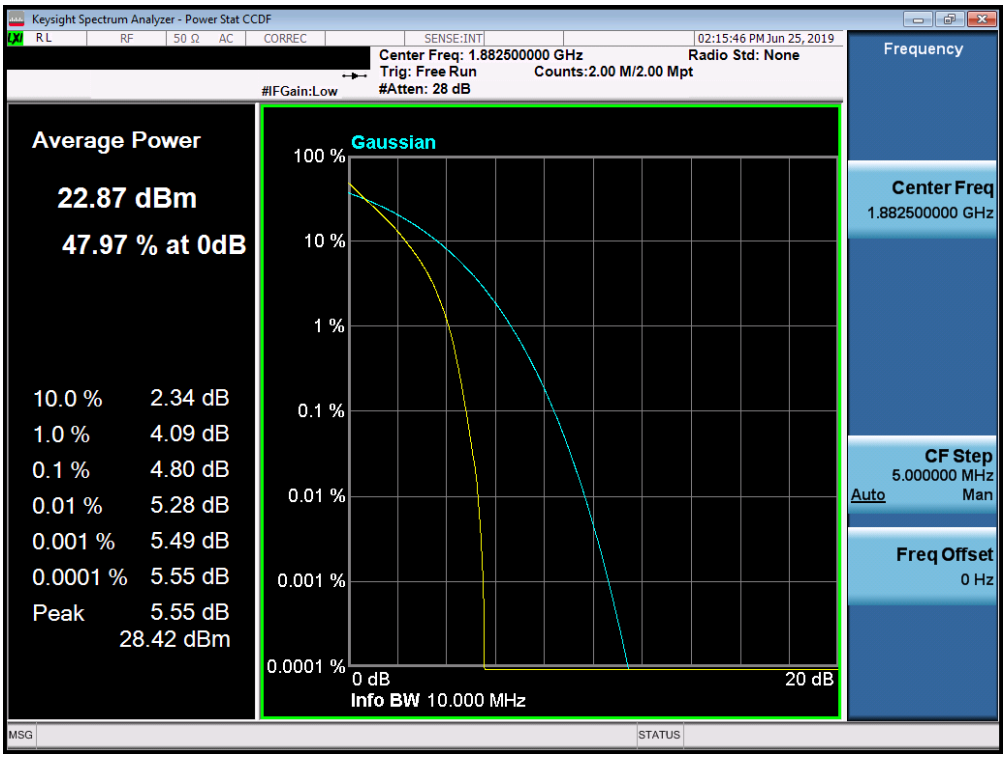
Plot 7-293. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



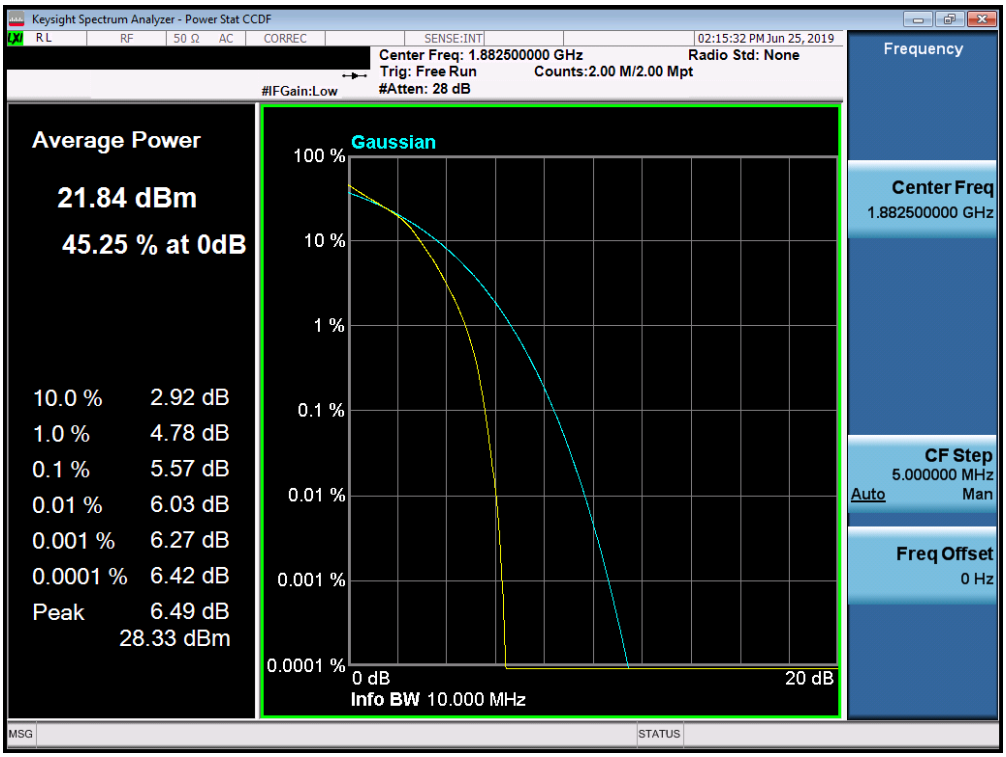
Plot 7-294. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)



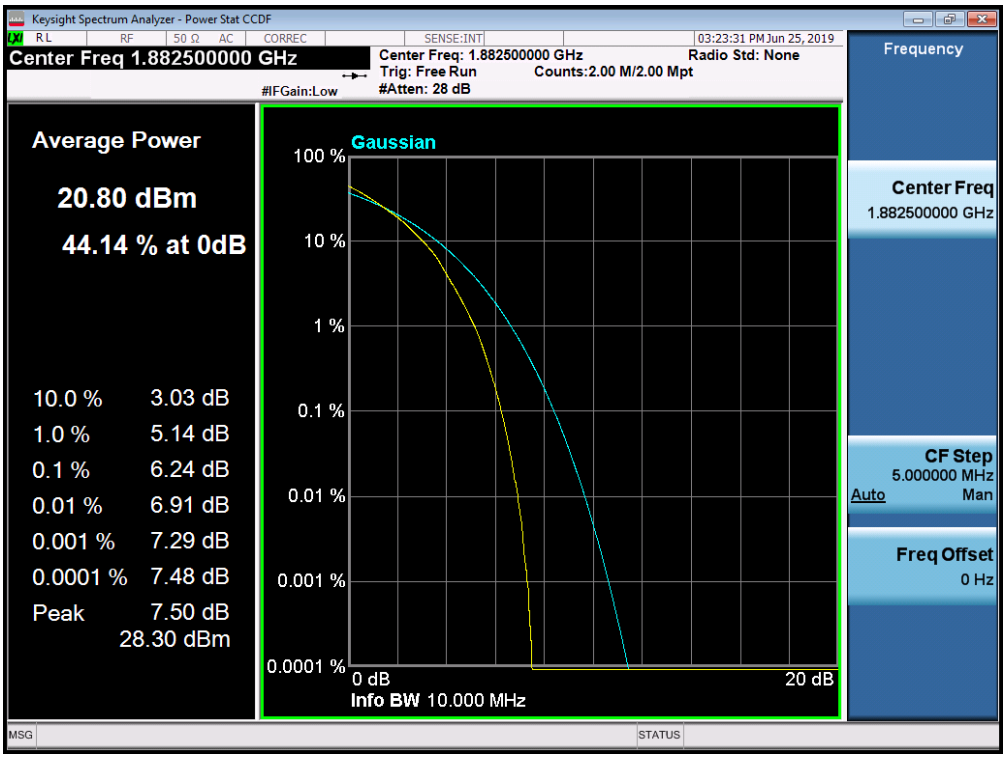
Plot 7-295. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)



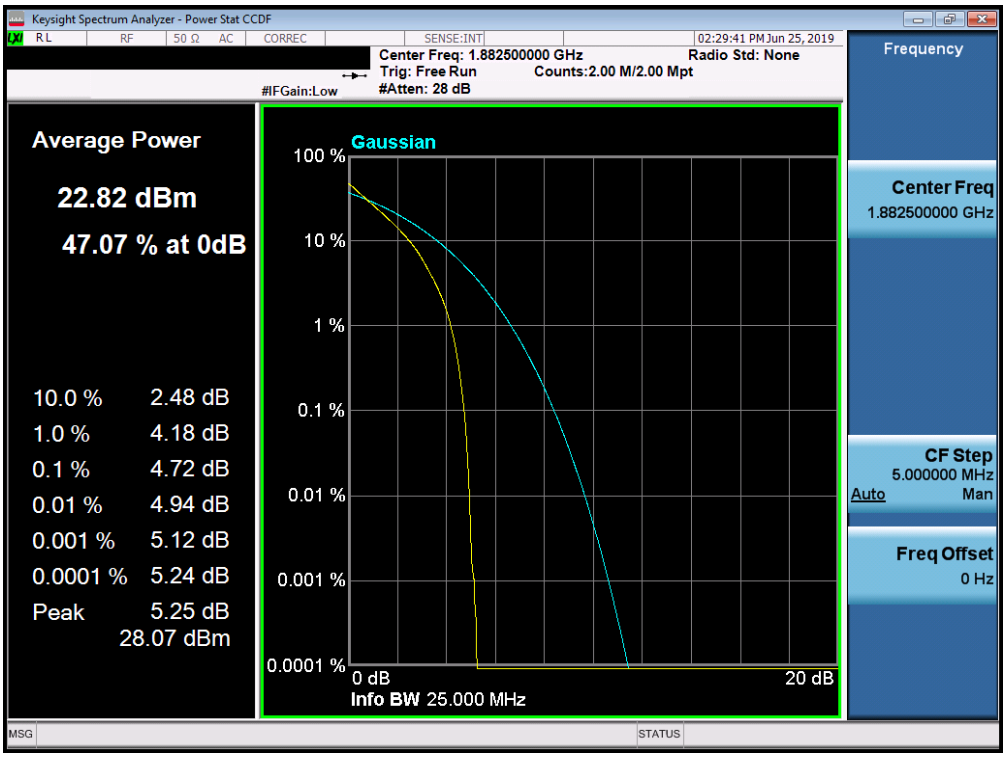
Plot 7-296. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



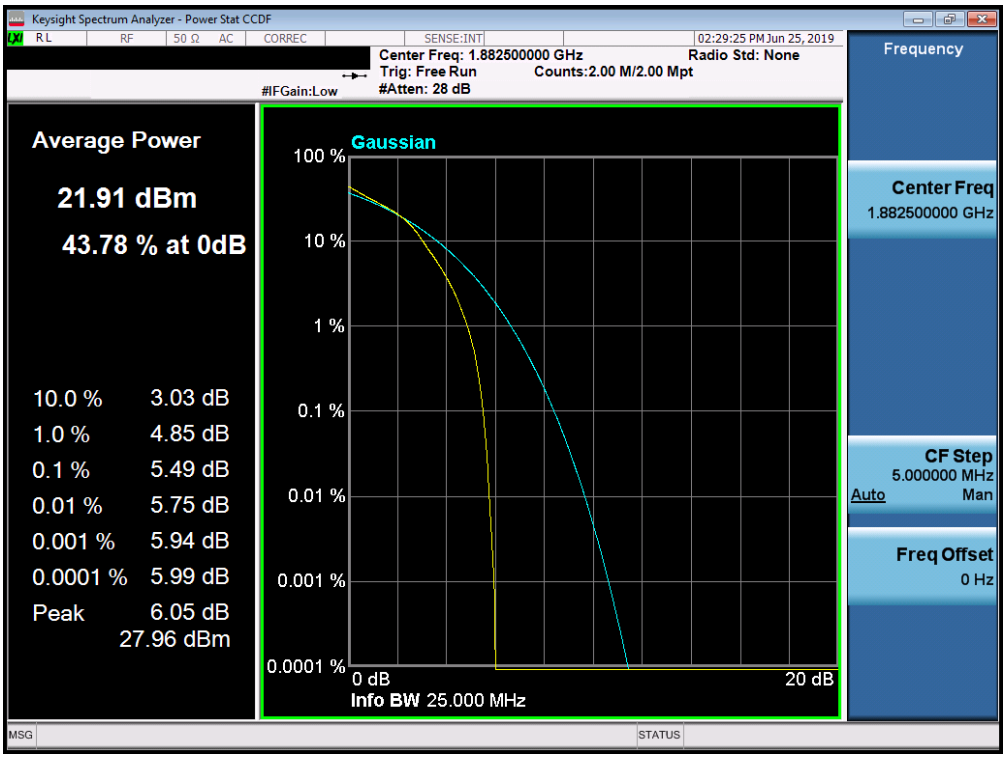
Plot 7-297. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



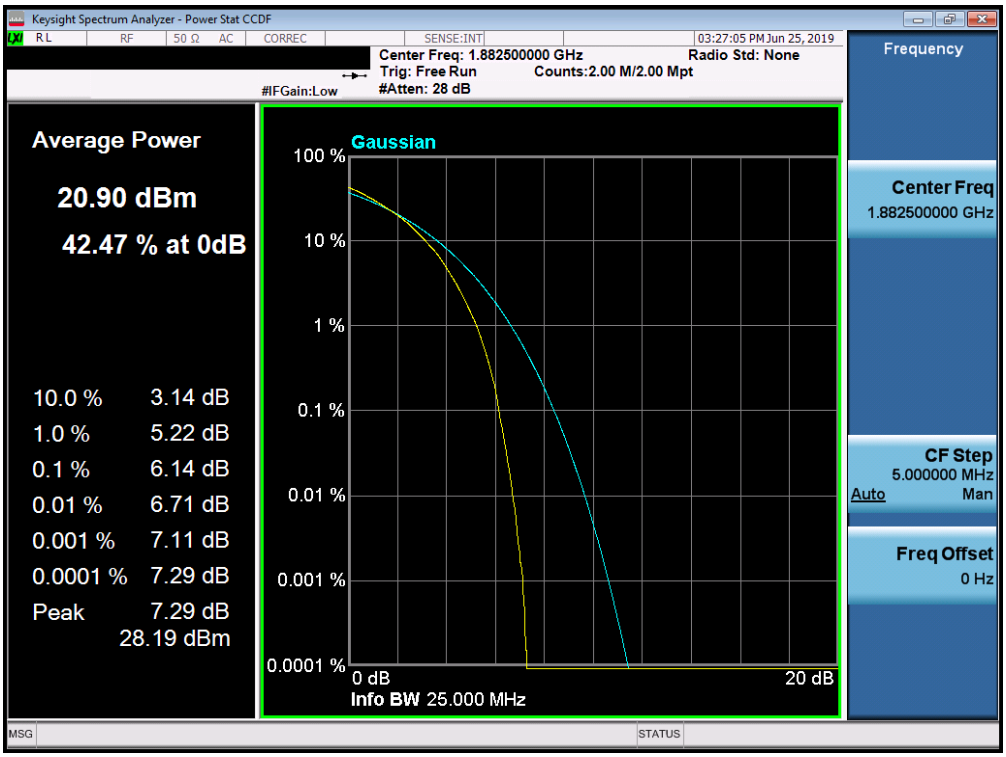
Plot 7-298. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)



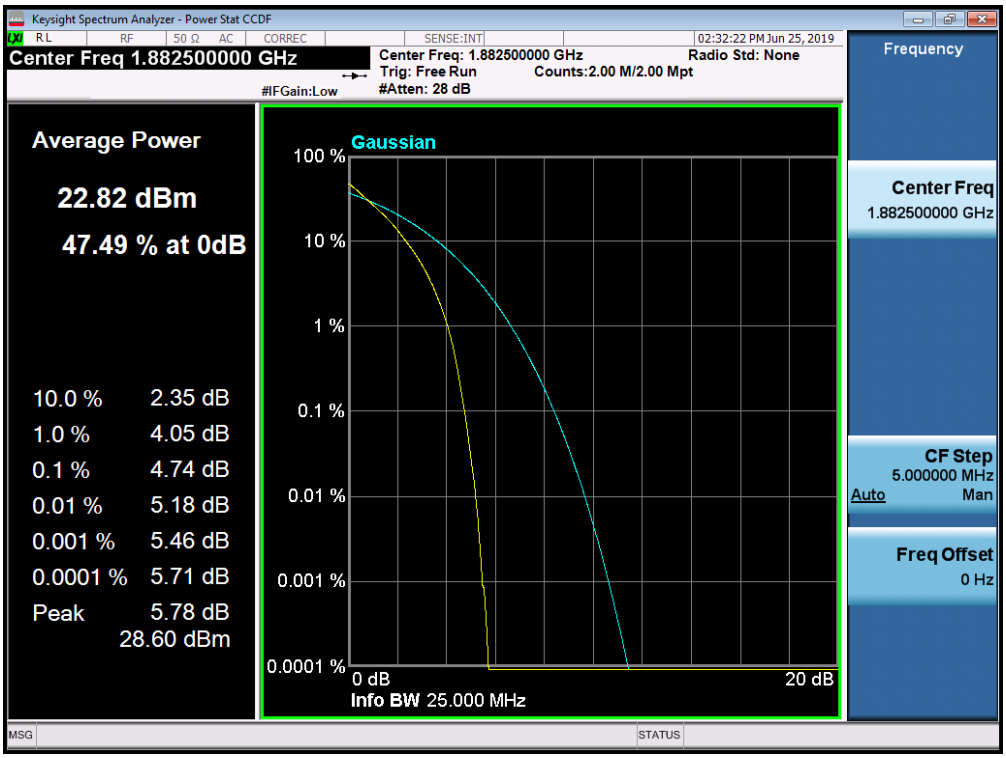
Plot 7-299. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



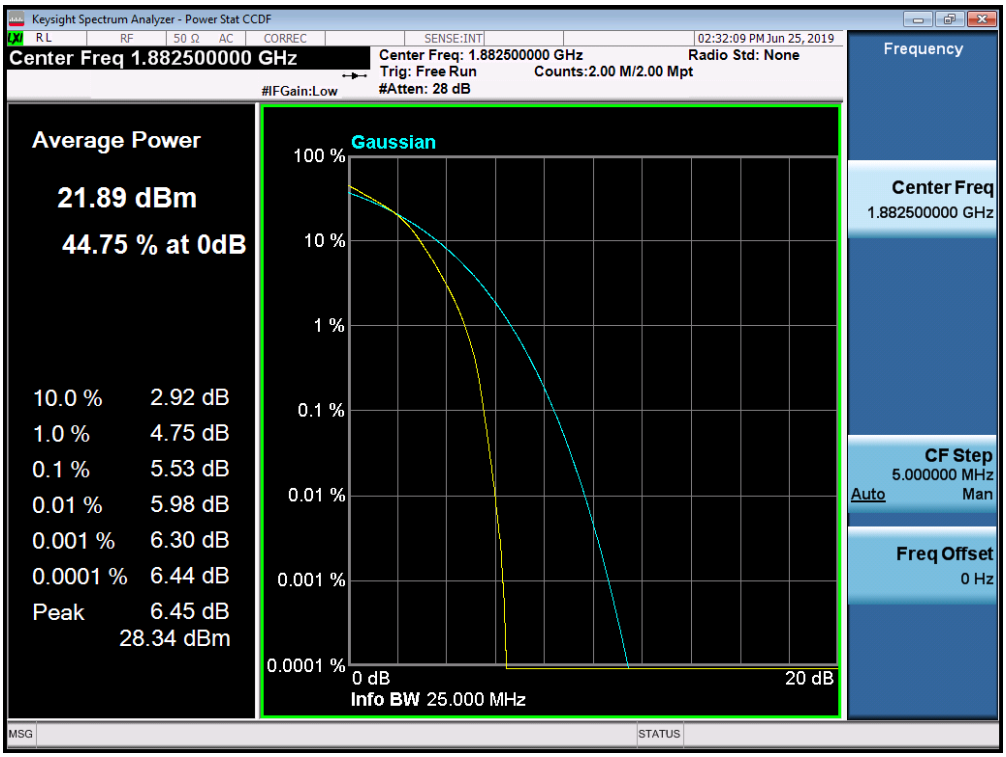
Plot 7-300. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)



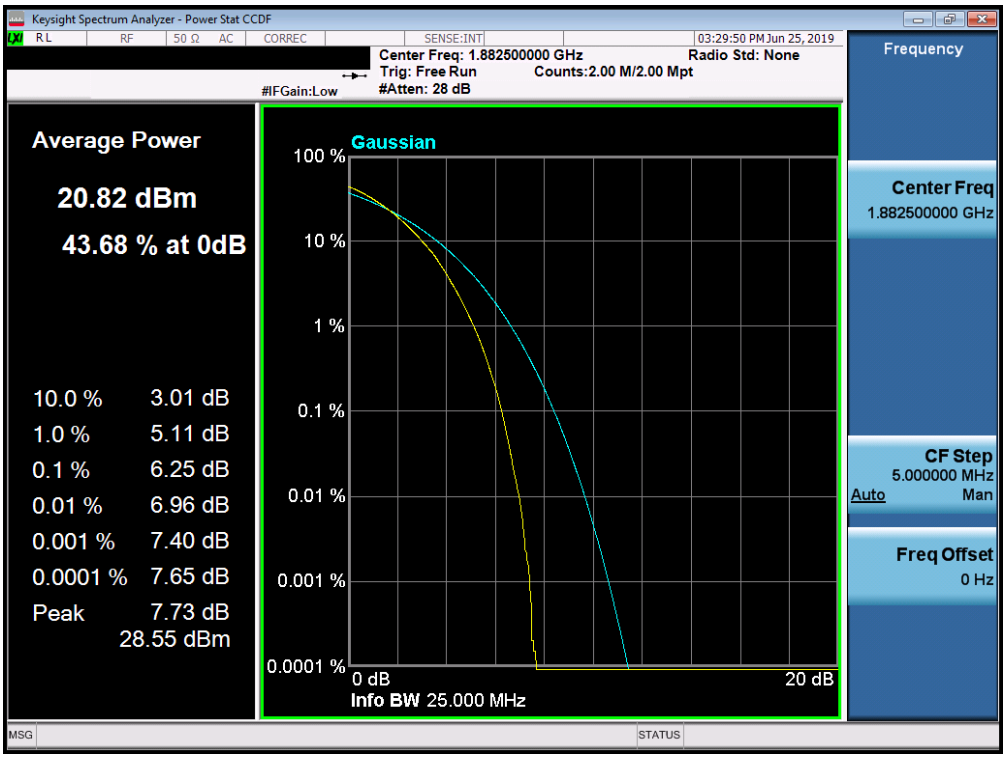
Plot 7-301. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-302. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

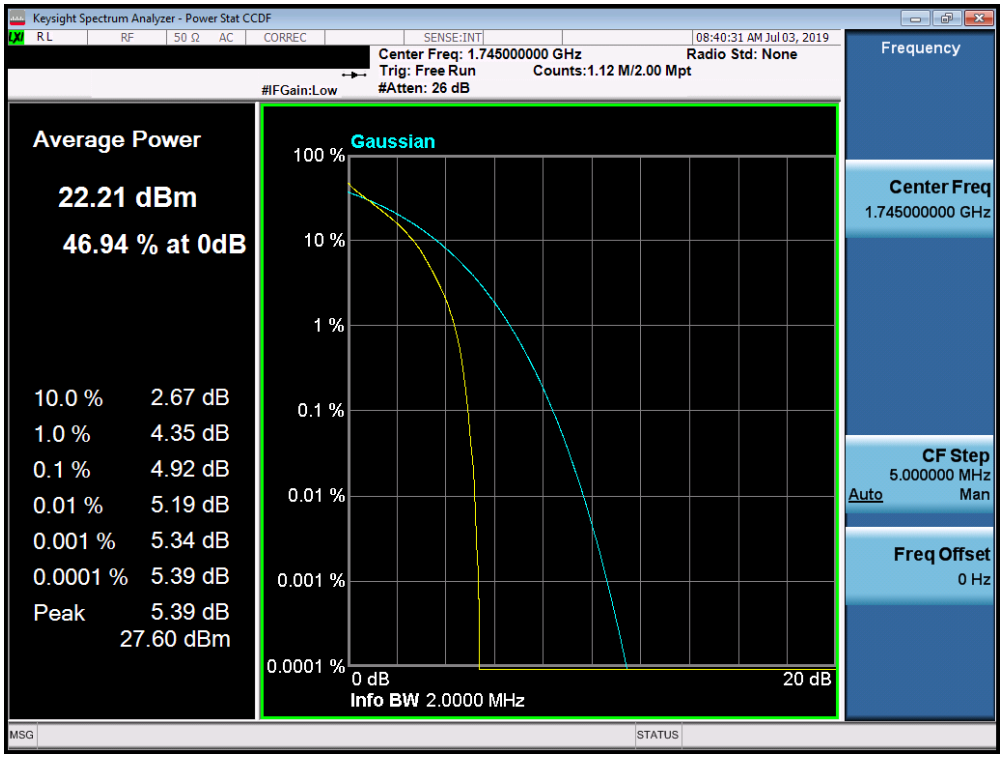


Plot 7-303. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)

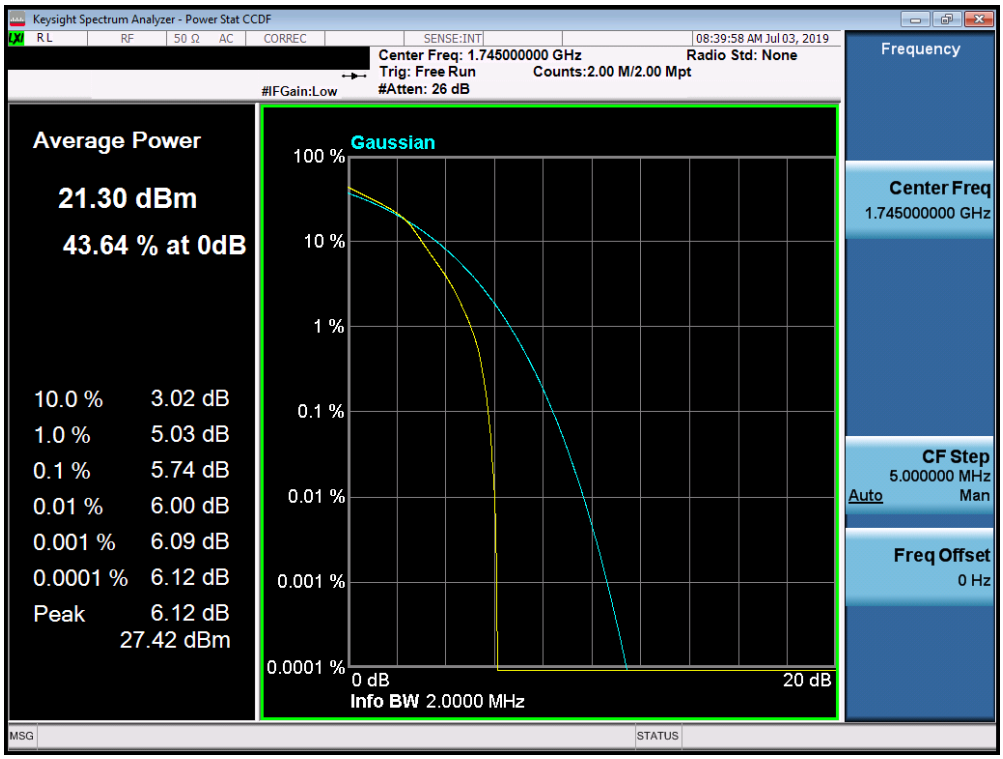


Plot 7-304. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

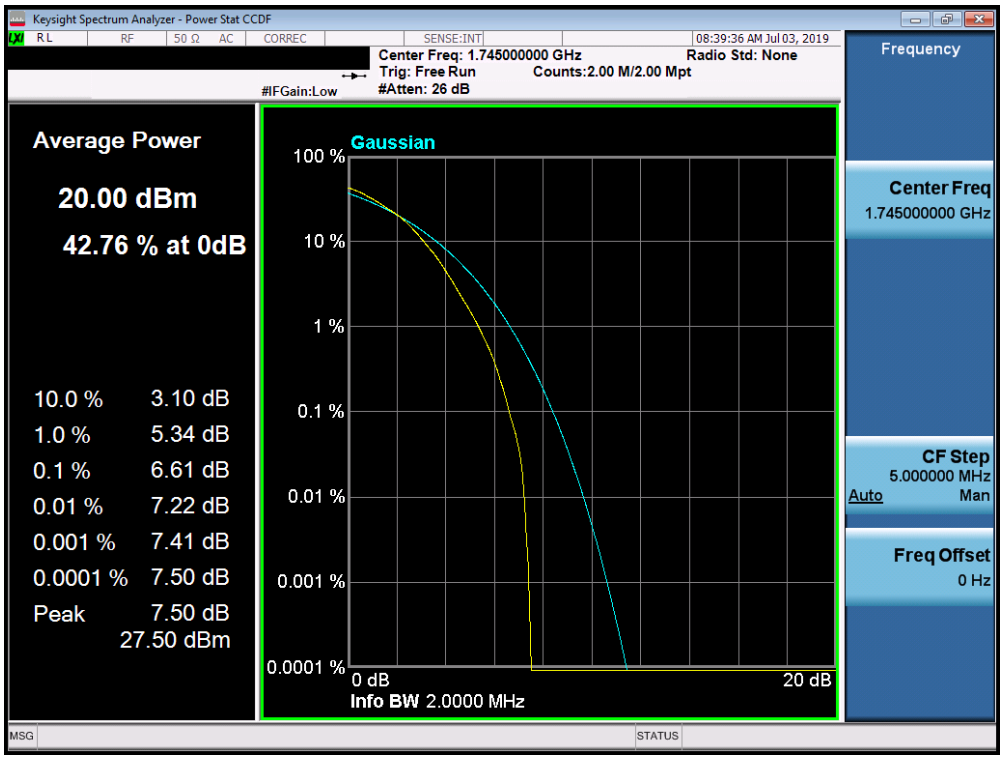
Band 66/4



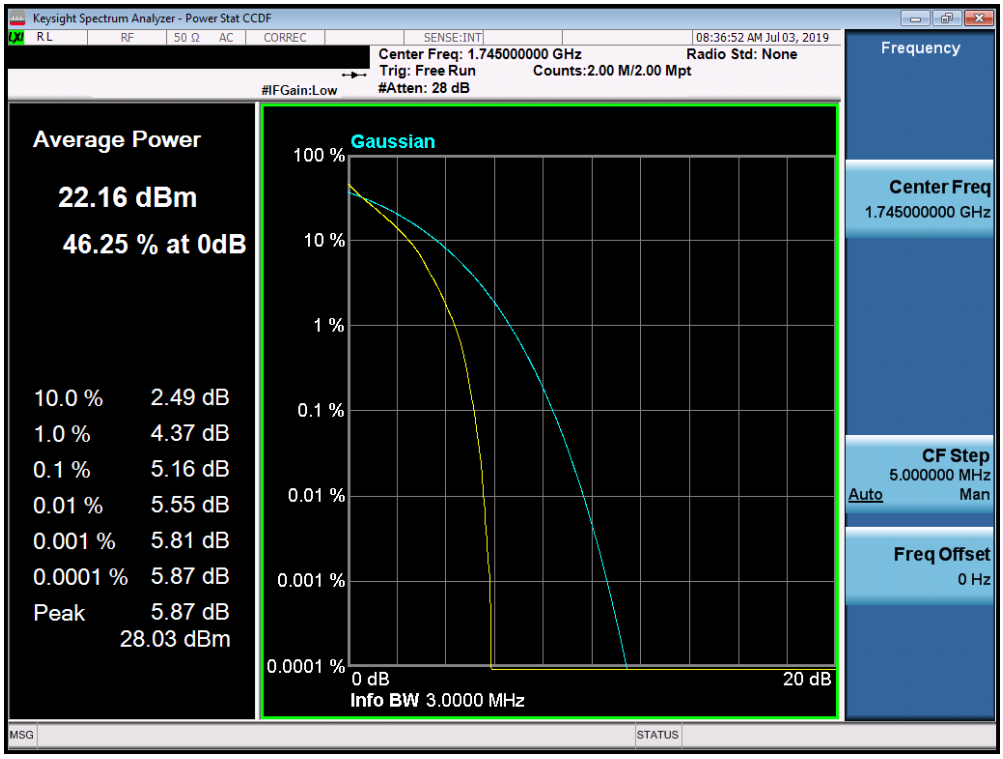
Plot 7-305. PAR Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



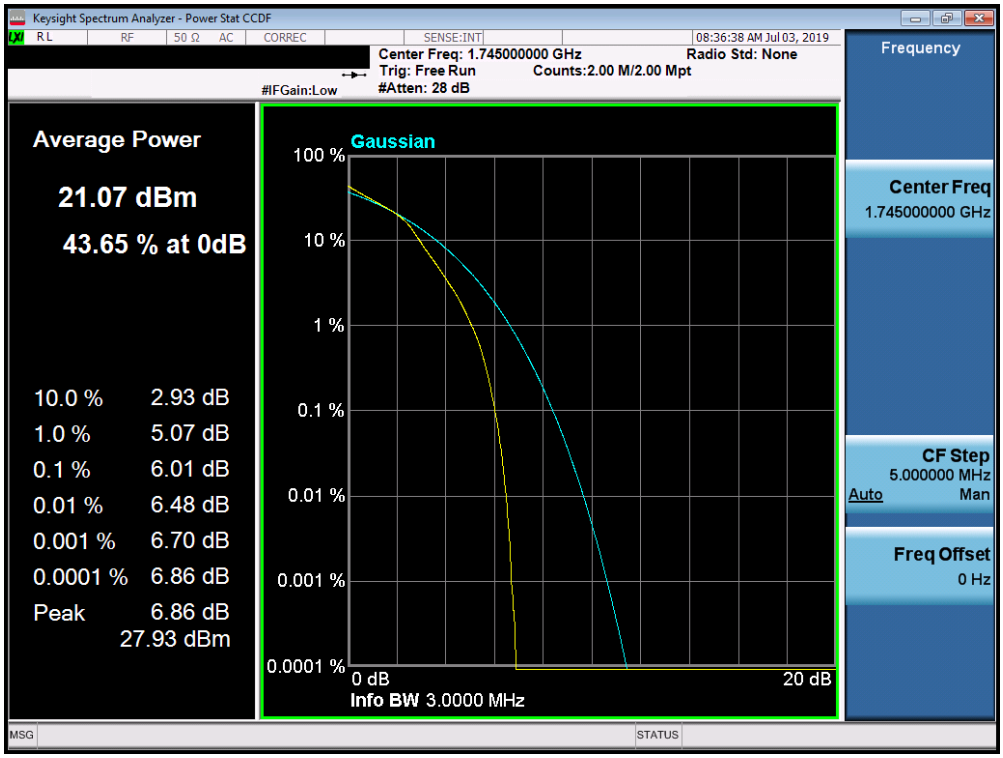
Plot 7-306. PAR Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)



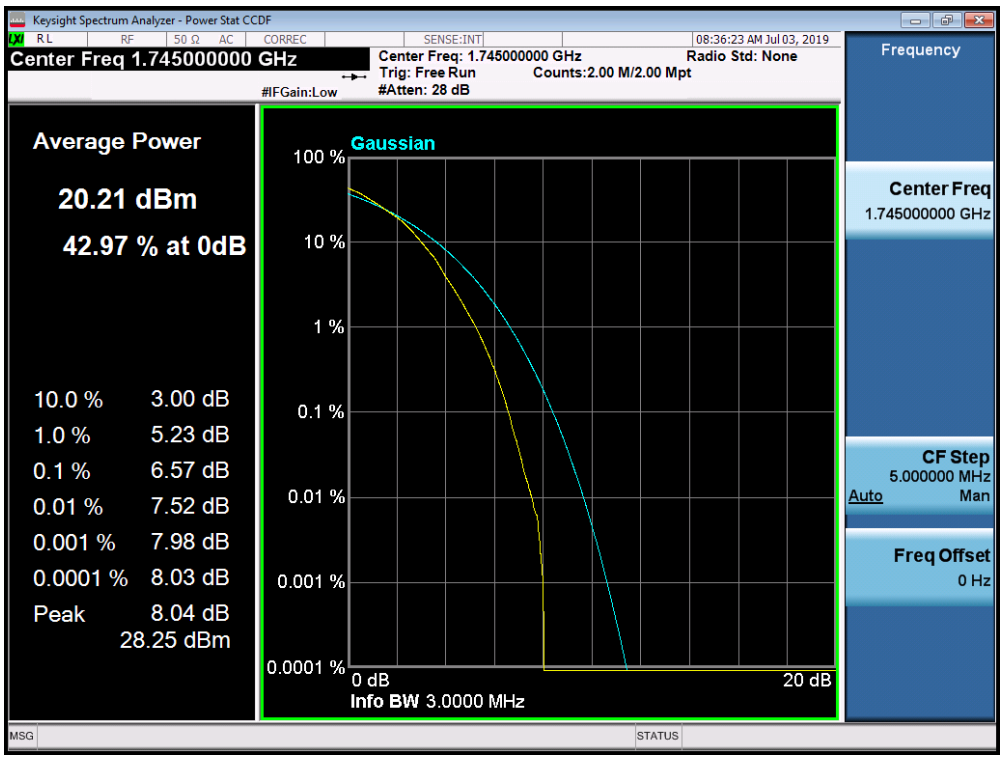
Plot 7-307. PAR Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)



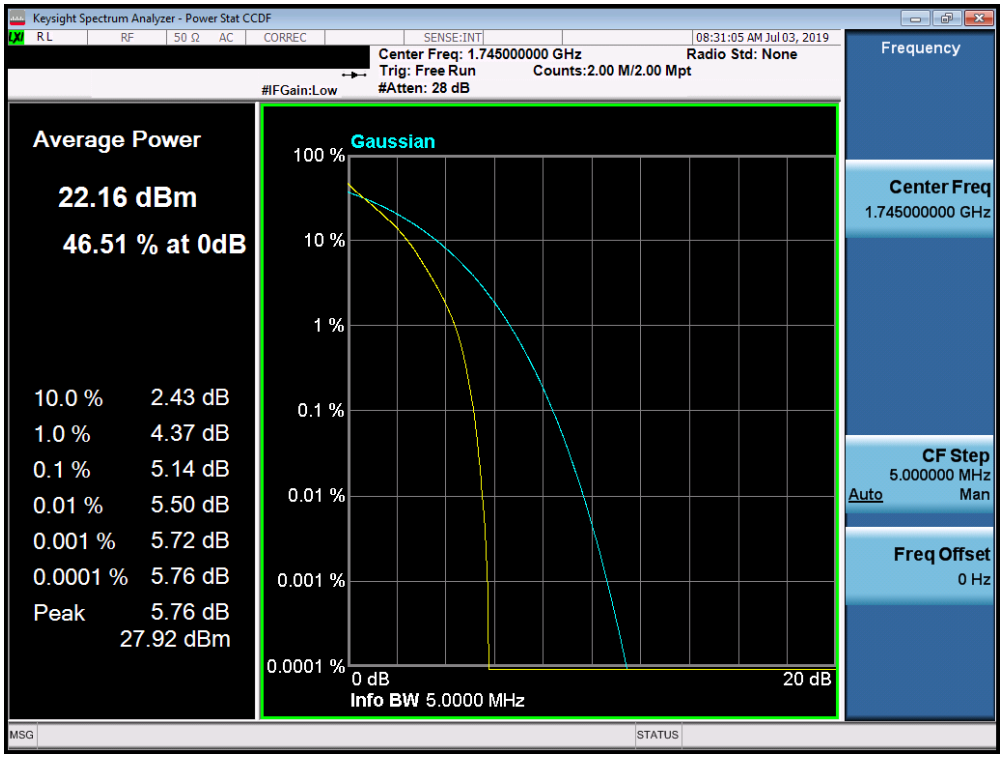
Plot 7-308. PAR Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)



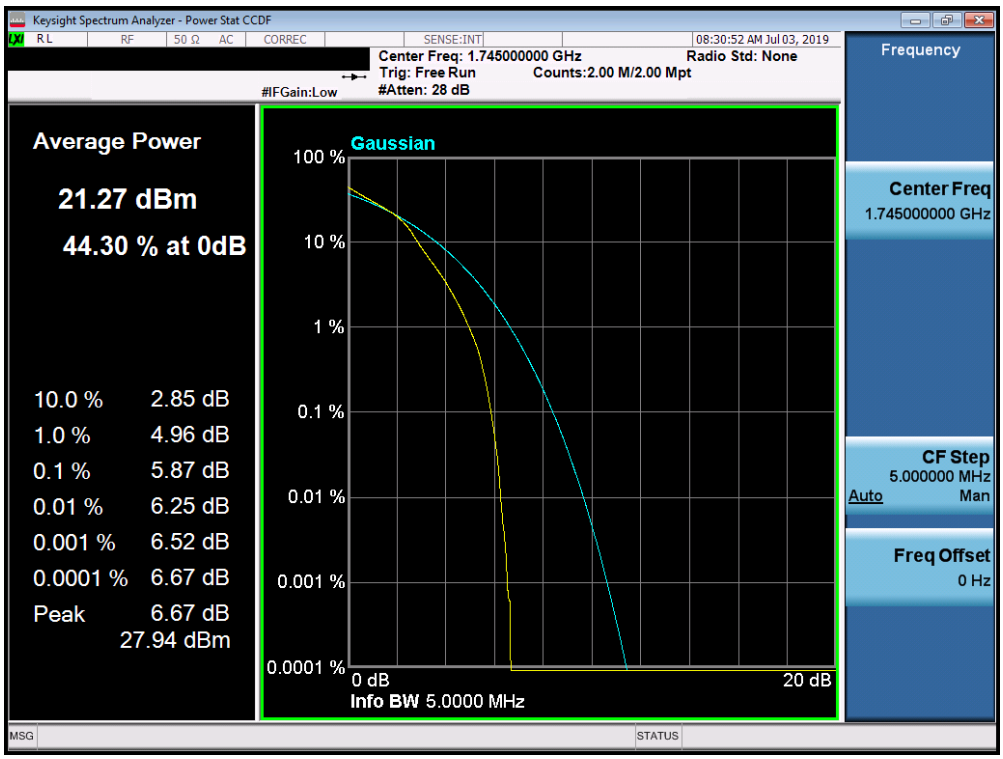
Plot 7-309. PAR Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)



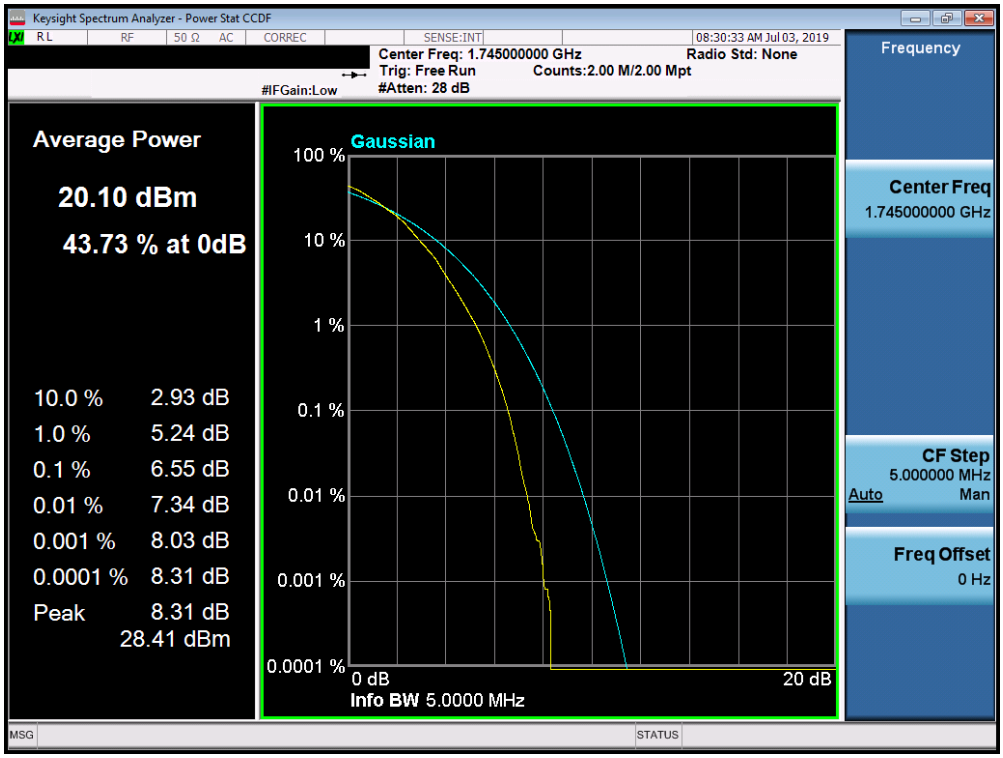
Plot 7-310. PAR Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)



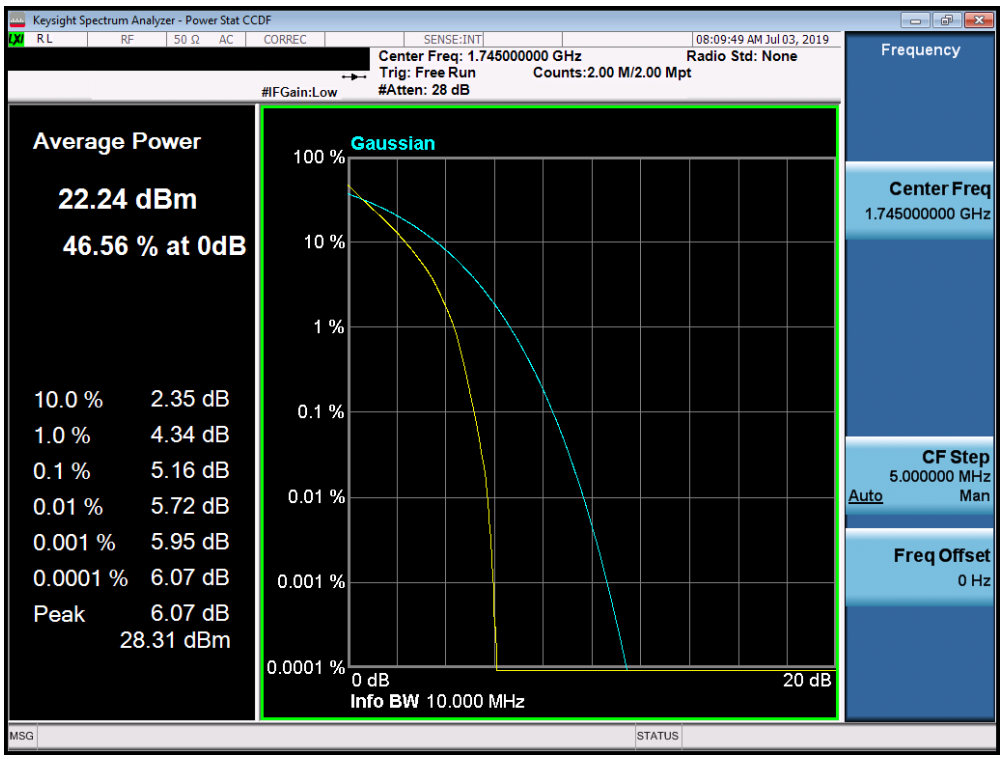
Plot 7-311. PAR Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



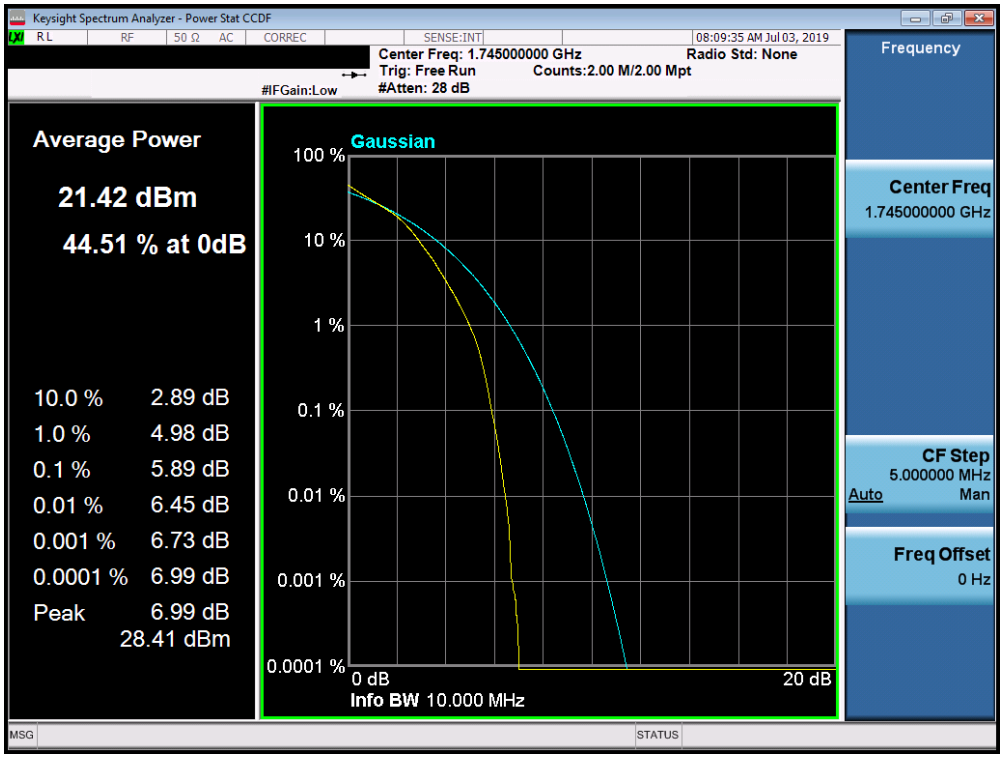
Plot 7-312. PAR Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)



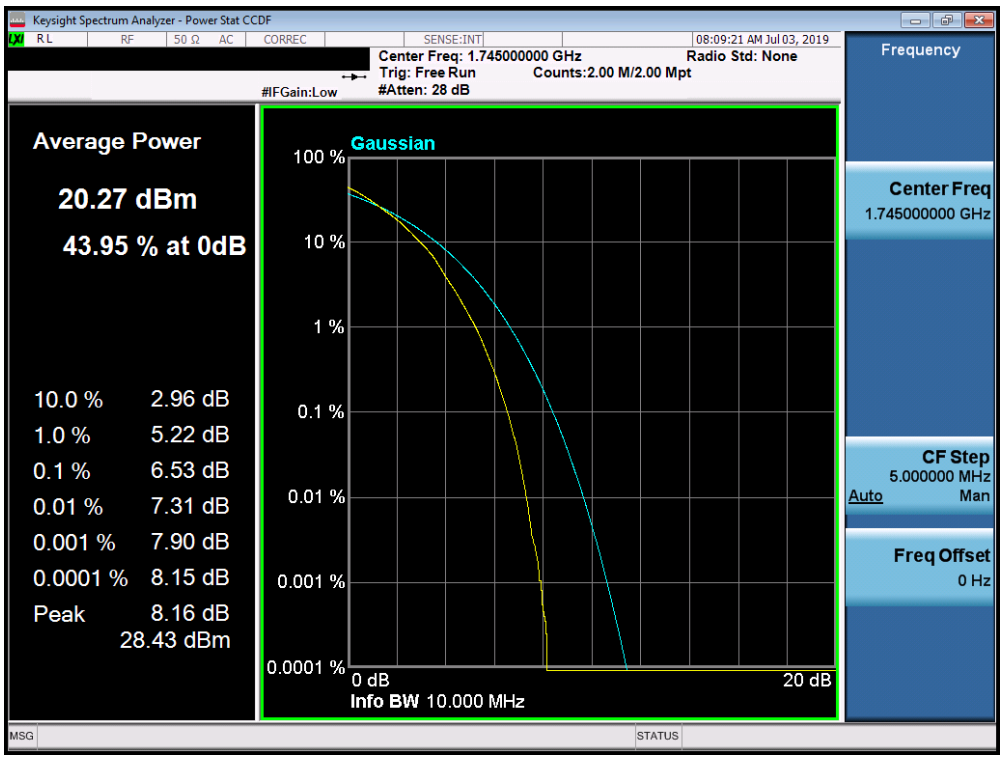
Plot 7-313. PAR Plot (Band 66/4 - 5.0MHz 64-QAM - Full RB Configuration)



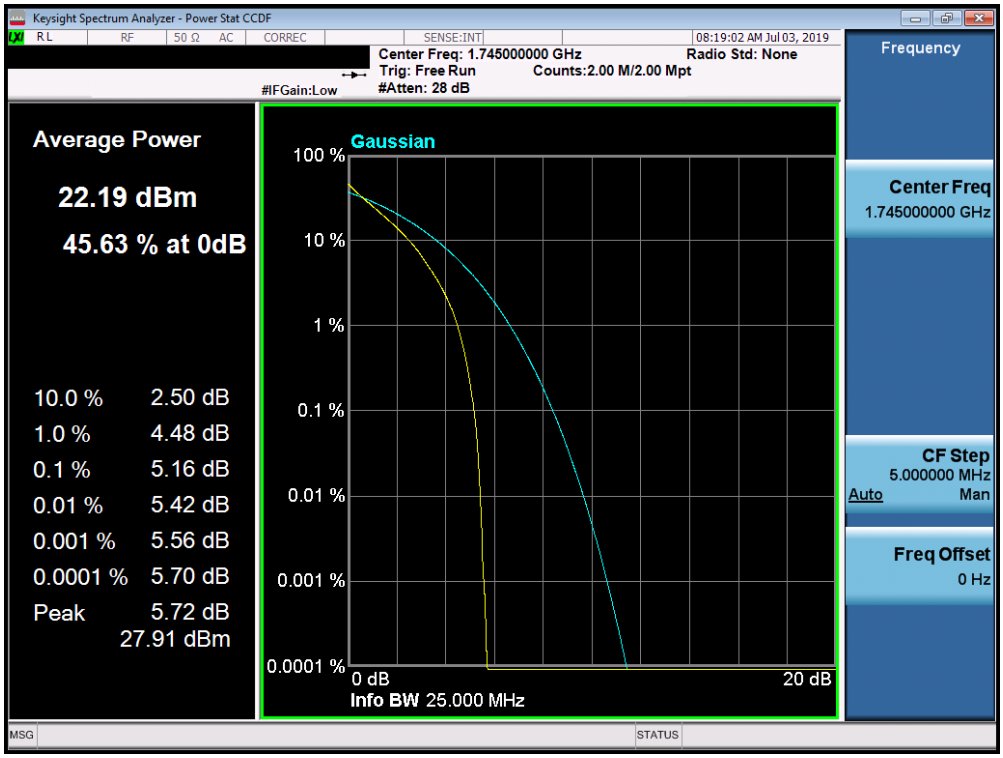
Plot 7-314. PAR Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)



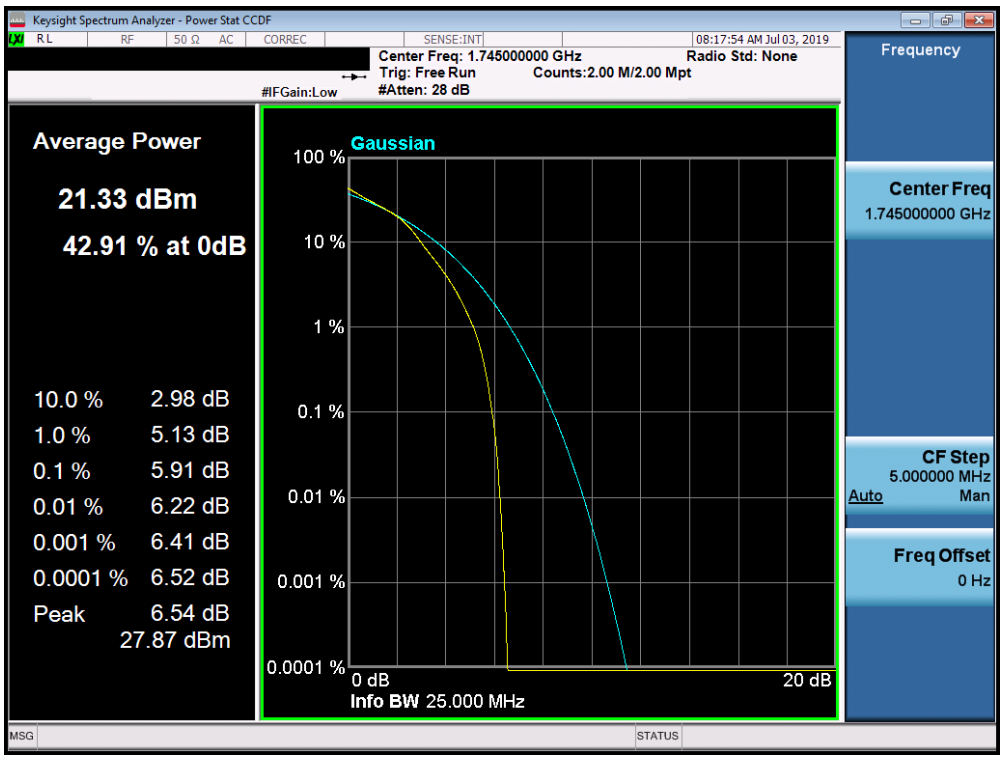
Plot 7-315. PAR Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)



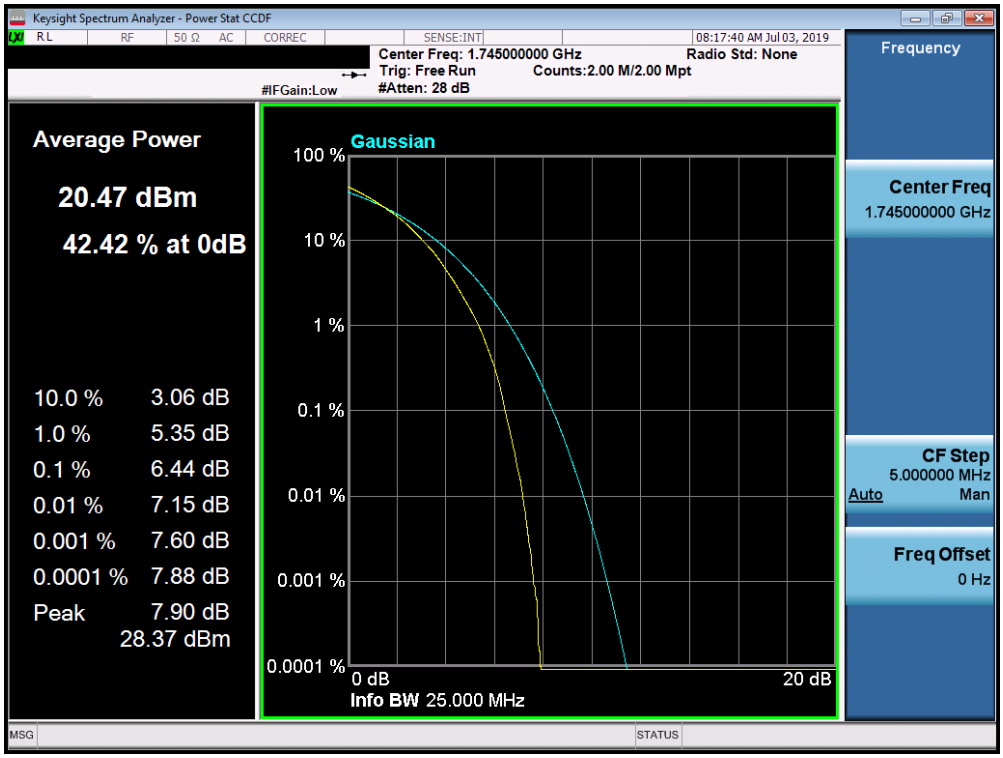
Plot 7-316. PAR Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)



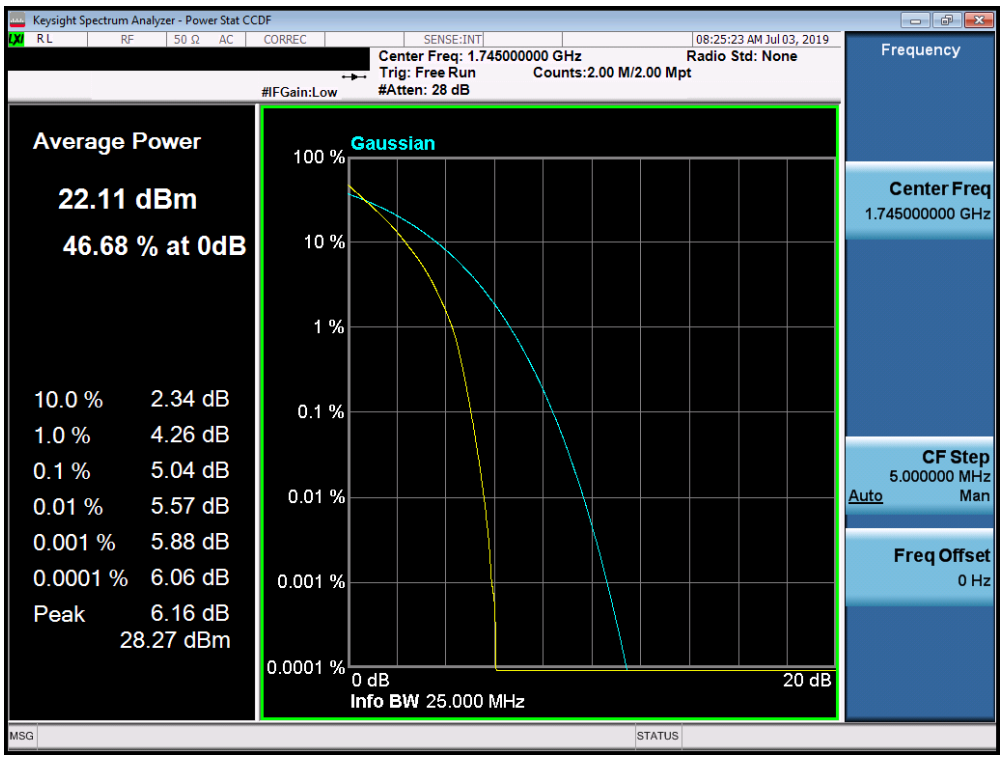
Plot 7-317. PAR Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)



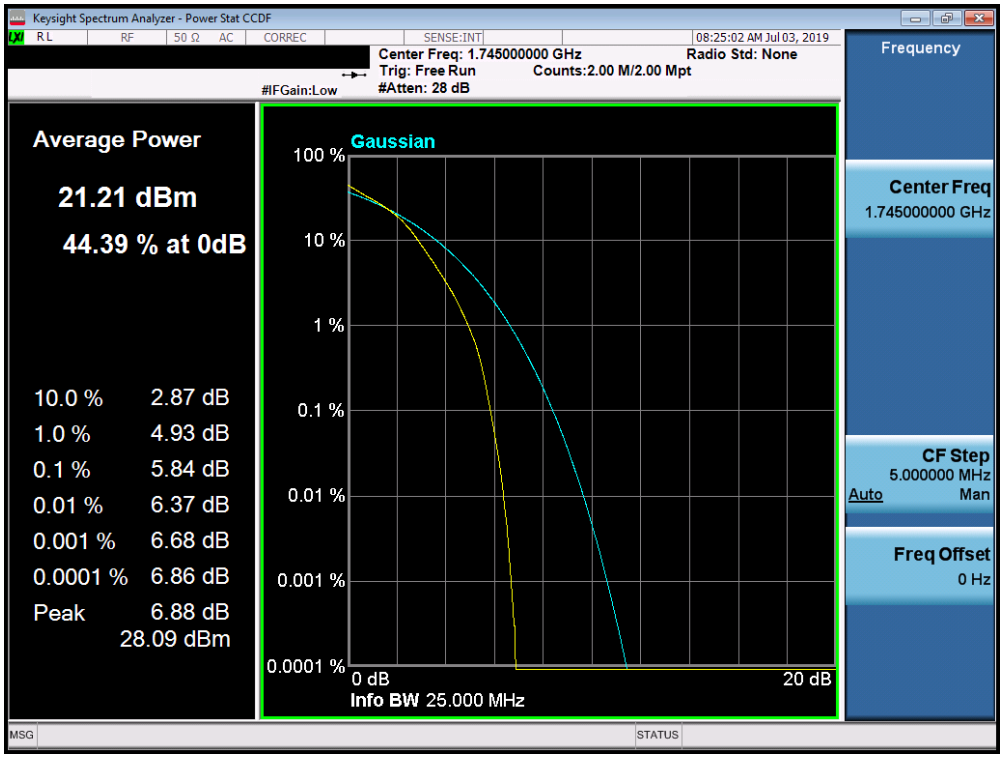
Plot 7-318. PAR Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)



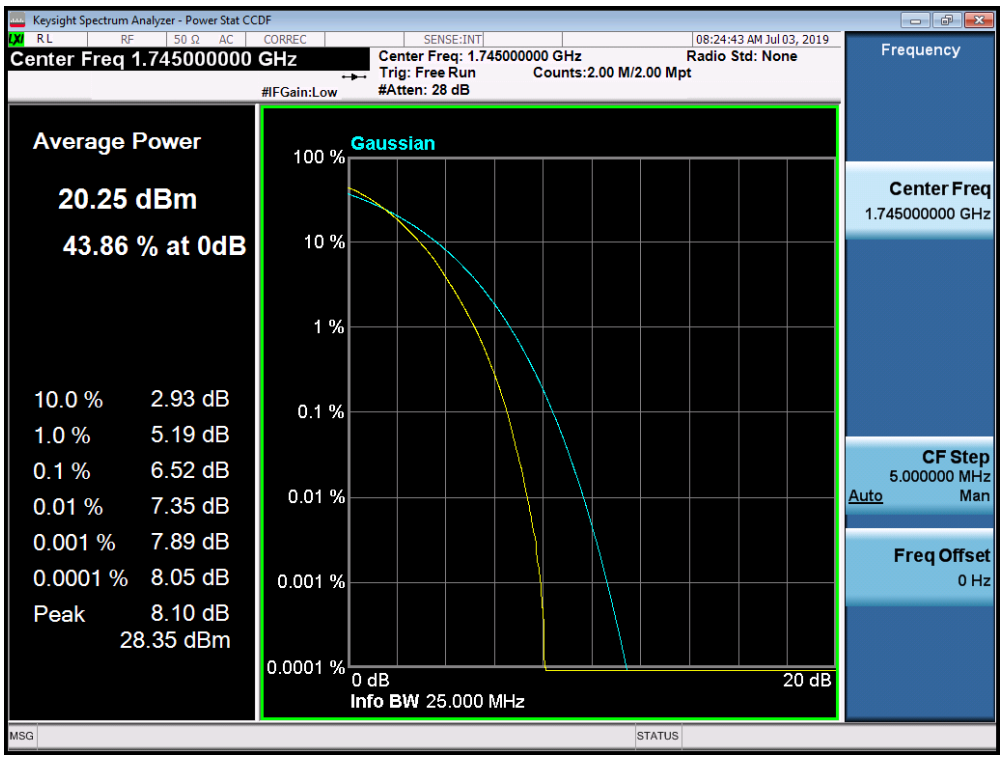
Plot 7-319. PAR Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-320. PAR Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-321. PAR Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-322. PAR Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

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.

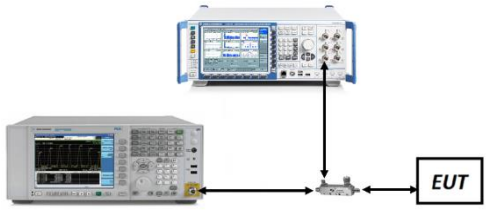


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None.

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	26.46
							16-QAM			≤ 1		24.44
							64-QAM			≤ 2		23.87
2				5	39675	2498.5	QPSK	1	9	0	0	26.47
							16-QAM			≤ 1		24.73
							64-QAM			≤ 2		23.98
3				10	39700	2501	QPSK	1	0	0	≤ 5	26.55
							16-QAM	1	0	≤ 1		25.17
							64-QAM	1	0	≤ 2		24.27
4				10	39700	2501	QPSK	20	0	0	≤ 2	25.33
							16-QAM	20	0	≤ 1		24.38
							64-QAM	20	0	≤ 2		23.49
5				10	39700	2501	QPSK	50	0	0	≤ 3	25.45
							16-QAM	50	0	≤ 1		24.59
							64-QAM	50	0	≤ 2		23.43
6				10	39700	2501	QPSK	25	20	0	≤ 1	25.47
							16-QAM	25	20	≤ 1		24.33
							64-QAM	25	20	≤ 2		23.40
7				10	39700	2501	QPSK	1	36	0	0	26.57
							16-QAM	1	36	≤ 1		24.77
							64-QAM	1	36	≤ 2		24.46
8				15	39725	2503.5	QPSK	1	0	0	≤ 5	26.36
							16-QAM	1	0	≤ 1		24.84
							64-QAM	1	0	≤ 2		24.31
9				15	39725	2503.5	QPSK	20	0	0	≤ 2	25.21
							16-QAM	20	0	≤ 1		24.27
							64-QAM	20	0	≤ 2		23.30
10				15	39725	2503.5	QPSK	75	0	0	≤ 4	25.36
							16-QAM	75	0	≤ 1		24.42
							64-QAM	75	0	≤ 2		23.46
11				15	39725	2503.5	QPSK	50	15	0	≤ 3	25.40
							16-QAM	50	15	≤ 1		24.38
							64-QAM	50	15	≤ 2		23.34
12				15	39725	2503.5	QPSK	1	60	0	0	26.43
							16-QAM	1	60	≤ 1		24.86
							64-QAM	1	60	≤ 2		24.39
13				20	39750	2506	QPSK	1	0	0	≤ 5	26.46
							16-QAM	1	0	≤ 1		24.70
							64-QAM	1	0	≤ 2		24.29
14				20	39750	2506	QPSK	20	0	0	≤ 2	25.36
							16-QAM	20	0	≤ 1		24.45
							64-QAM	20	0	≤ 2		23.43
15				20	39750	2506	QPSK	100	0	0	≤ 4	25.42
							16-QAM	100	0	≤ 1		24.33
							64-QAM	100	0	≤ 2		23.43
16				20	39750	2506	QPSK	75	24	0	≤ 3	25.35
							16-QAM	75	24	≤ 1		24.42
							64-QAM	75	24	≤ 2		23.39
17				20	39750	2506	QPSK	1	77	0	0	26.61
							16-QAM	1	77	≤ 1		24.76
							64-QAM	1	77	≤ 2		24.67

Table 7-3. A-MPR Conducted Power Measurements

7.7 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. 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

Test Setup

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

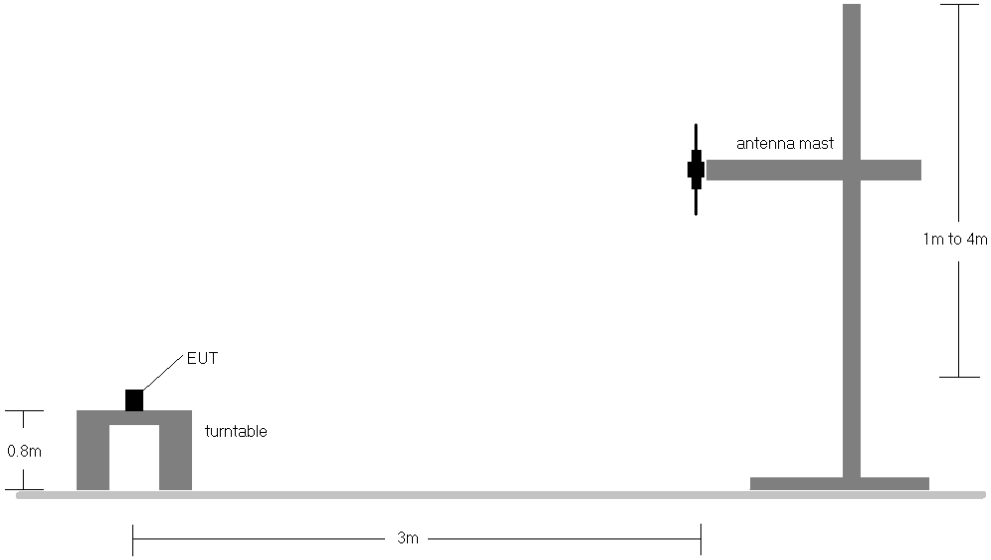


Figure 7-6. Radiated Test Setup <1GHz

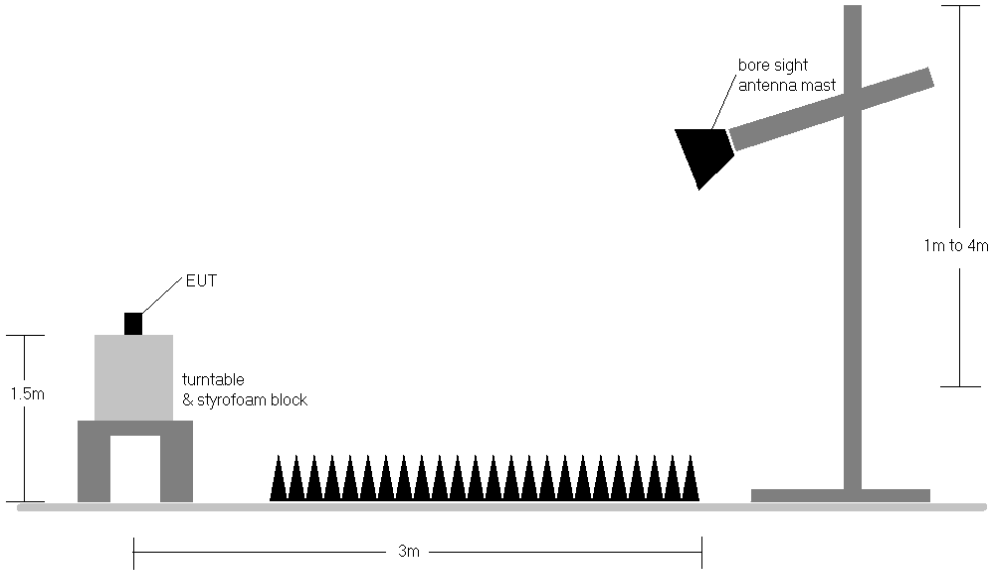


Figure 7-7. Radiated Test Setup >1GHz

Test Notes

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

2) This unit was tested with its standard battery.

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	V	175	335	1 / 0	14.04	2.90	14.79	0.030	34.77	-19.98
680.50	5	QPSK	V	188	331	1 / 0	14.14	3.20	15.19	0.033	34.77	-19.58
695.50	5	QPSK	V	189	332	1 / 0	14.24	3.30	**15.39**	0.035	34.77	-19.38
695.50	5	16-QAM	V	189	332	1 / 0	11.74	3.30	**12.89**	0.019	34.77	-21.88
695.50	5	64-QAM	V	189	332	1 / 0	11.34	3.30	**12.49**	0.018	34.77	-22.28
668.00	10	QPSK	V	175	335	1 / 0	14.64	2.90	15.39	0.035	34.77	-19.38
680.50	10	QPSK	V	188	331	1 / 0	14.74	3.20	**15.79**	0.038	34.77	-18.98
693.00	10	QPSK	V	189	332	1 / 0	14.54	3.30	15.69	0.037	34.77	-19.08
680.50	10	16-QAM	V	188	331	1 / 0	12.24	3.20	**13.29**	0.021	34.77	-21.48
680.50	10	64-QAM	V	188	331	1 / 0	11.94	3.20	**12.99**	0.020	34.77	-21.78
670.50	15	QPSK	V	175	335	1 / 0	14.04	3.00	14.89	0.031	34.77	-19.88
680.50	15	QPSK	V	188	331	1 / 0	14.14	3.20	15.19	0.033	34.77	-19.58
690.50	15	QPSK	V	189	332	1 / 0	14.34	3.30	**15.49**	0.035	34.77	-19.28
690.50	15	16-QAM	V	189	332	1 / 0	11.64	3.30	**12.79**	0.019	34.77	-21.98
690.50	15	64-QAM	V	189	332	1 / 0	11.34	3.30	**12.49**	0.018	34.77	-22.28
673.00	20	QPSK	V	175	335	1 / 0	14.90	3.10	15.85	0.038	34.77	-18.92
680.50	20	QPSK	V	188	331	1 / 0	14.94	3.20	15.99	0.040	34.77	-18.78
688.00	20	QPSK	V	189	332	1 / 0	14.85	3.30	**16.00**	**0.040**	34.77	-18.77
688.00	20	16-QAM	V	189	332	1 / 0	12.27	3.30	**13.42**	0.022	34.77	-21.35
688.00	20	64-QAM	V	189	332	1 / 0	12.02	3.30	**13.17**	0.021	34.77	-21.60
688.00	20	QPSK	H	128	74	1 / 0	14.23	3.30	15.38	0.035	34.77	-19.39

Table 7-4. ERP Data (Band 71)

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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	162	351	1 / 5	14.59	3.40	15.84	0.038	34.77	-18.93	17.99	0.063	36.99	-19.00
707.50	1.4	QPSK	V	169	351	1 / 5	14.69	3.65	**16.19**	0.042	34.77	-18.58	**18.34**	0.068	36.99	-18.65
715.30	1.4	QPSK	V	177	4	1 / 5	14.29	3.70	15.84	0.038	34.77	-18.93	17.99	0.063	36.99	-19.00
707.50	1.4	16-QAM	V	169	351	1 / 5	12.69	3.65	**14.19**	0.026	34.77	-20.58	**16.34**	0.043	36.99	-20.65
707.50	1.4	64-QAM	V	169	351	1 / 5	11.69	3.65	**13.19**	0.021	34.77	-21.58	**15.34**	0.034	36.99	-21.65
700.50	3	QPSK	V	162	351	1 / 14	14.94	3.40	16.19	0.042	34.77	-18.58	18.34	0.068	36.99	-18.65
707.50	3	QPSK	V	169	351	1 / 14	14.99	3.65	**16.49**	0.045	34.77	-18.28	**18.64**	0.073	36.99	-18.35
714.50	3	QPSK	V	177	4	1 / 14	14.69	3.70	16.24	0.042	34.77	-18.53	18.39	0.069	36.99	-18.60
707.50	3	16-QAM	V	169	351	1 / 14	13.09	3.65	**14.59**	0.029	34.77	-20.18	**16.74**	0.047	36.99	-20.25
707.50	3	64-QAM	V	169	351	1 / 14	11.99	3.65	**13.49**	0.022	34.77	-21.28	**15.64**	0.037	36.99	-21.35
701.50	5	QPSK	V	162	351	1 / 24	14.69	3.40	15.94	0.039	34.77	-18.83	18.09	0.064	36.99	-18.90
707.50	5	QPSK	V	169	351	1 / 24	14.74	3.65	**16.24**	0.042	34.77	-18.53	**18.39**	0.069	36.99	-18.60
713.50	5	QPSK	V	177	4	1 / 24	14.39	3.70	15.94	0.039	34.77	-18.83	18.09	0.064	36.99	-18.90
707.50	5	16-QAM	V	169	351	1 / 24	12.79	3.65	**14.29**	0.027	34.77	-20.48	**16.44**	0.044	36.99	-20.55
707.50	5	64-QAM	V	169	351	1 / 24	11.69	3.65	**13.19**	0.021	34.77	-21.58	**15.34**	0.034	36.99	-21.65
704.00	10	QPSK	V	162	351	1 / 49	15.06	3.50	16.41	0.044	34.77	-18.36	18.56	0.072	36.99	-18.43
707.50	10	QPSK	V	169	351	1 / 49	15.09	3.65	**16.59**	**0.046**	34.77	-18.18	**18.74**	**0.075**	36.99	-18.25
711.00	10	QPSK	V	177	4	1 / 49	14.75	3.70	16.30	0.043	34.77	-18.47	18.45	0.070	36.99	-18.54
707.50	10	16-QAM	V	169	351	1 / 49	13.19	3.65	**14.69**	0.029	34.77	-20.08	**16.84**	0.048	36.99	-20.15
707.50	10	64-QAM	V	169	351	1 / 49	12.09	3.65	**13.59**	0.023	34.77	-21.18	**15.74**	0.037	36.99	-21.25
707.50	10	QPSK	H	277	272	1 / 49	14.66	3.65	16.16	0.041	34.77	-18.61	18.31	0.068	36.99	-18.68

Table 7-5. ERP Data (Band 12)

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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
779.50	5	QPSK	V	150	312	1 / 0	12.98	5.80	16.63	0.046	34.77	-18.14	18.78	0.076	36.99	-18.21
782.00	5	QPSK	V	155	310	1 / 0	13.03	5.80	**16.68**	**0.047**	34.77	-18.09	**18.83**	**0.076**	36.99	-18.16
784.50	5	QPSK	V	165	300	1 / 0	12.73	5.90	16.48	0.044	34.77	-18.29	18.63	0.073	36.99	-18.36
782.00	5	16-QAM	V	155	310	1 / 0	11.11	5.80	**14.76**	0.030	34.77	-20.01	**16.91**	0.049	36.99	-20.08
782.00	5	64-QAM	V	155	310	1 / 0	9.63	5.80	**13.28**	0.021	34.77	-21.49	**15.43**	0.035	36.99	-21.56
782.00	10	QPSK	V	152	315	1 / 0	12.93	5.80	**16.58**	0.045	34.77	-18.19	**18.73**	0.075	36.99	-18.26
782.00	10	16-QAM	V	152	315	1 / 0	10.95	5.80	**14.60**	0.029	34.77	-20.17	**16.75**	0.047	36.99	-20.24
782.00	10	64-QAM	V	152	315	1 / 0	9.48	5.80	**13.13**	0.021	34.77	-21.64	**15.28**	0.034	36.99	-21.71
782.00	10	QPSK	H	240	280	1 / 0	12.79	5.80	16.44	0.044	34.77	-18.33	18.59	0.072	36.99	-18.40

Table 7-6. ERP Data (Band 13)

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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	129	128	1 / 5	13.20	6.70	17.75	0.060	38.45	-20.70	19.90	0.098	40.61	-20.71
836.50	1.4	QPSK	V	142	223	1 / 5	14.25	6.70	**18.80**	0.076	38.45	-19.65	**20.95**	0.124	40.61	-19.66
848.30	1.4	QPSK	V	141	224	1 / 5	13.55	6.70	18.10	0.065	38.45	-20.35	20.25	0.106	40.61	-20.36
836.50	1.4	16-QAM	V	142	223	1 / 5	12.65	6.70	**17.20**	0.052	38.45	-21.25	**19.35**	0.086	40.61	-21.26
836.50	1.4	64-QAM	V	142	223	1 / 5	11.35	6.70	**15.90**	0.039	38.45	-22.55	**18.05**	0.064	40.61	-22.56
825.50	3	QPSK	V	129	128	1 / 14	13.15	6.70	17.70	0.059	38.45	-20.75	19.85	0.097	40.61	-20.76
836.50	3	QPSK	V	142	223	1 / 14	14.30	6.70	**18.85**	0.077	38.45	-19.60	**21.00**	0.126	40.61	-19.61
847.50	3	QPSK	V	141	224	1 / 14	13.43	6.65	17.93	0.062	38.45	-20.52	20.08	0.102	40.61	-20.53
836.50	3	16-QAM	V	142	223	1 / 14	12.45	6.70	**17.00**	0.050	38.45	-21.45	**19.15**	0.082	40.61	-21.46
836.50	3	64-QAM	V	142	223	1 / 14	11.25	6.70	**15.80**	0.038	38.45	-22.65	**17.95**	0.062	40.61	-22.66
826.50	5	QPSK	V	129	128	1 / 24	13.30	6.70	17.85	0.061	38.45	-20.60	20.00	0.100	40.61	-20.61
836.50	5	QPSK	V	142	223	1 / 24	14.40	6.70	**18.95**	0.079	38.45	-19.50	**21.10**	0.129	40.61	-19.51
846.50	5	QPSK	V	141	224	1 / 24	13.70	6.60	18.15	0.065	38.45	-20.30	20.30	0.107	40.61	-20.31
836.50	5	16-QAM	V	142	223	1 / 24	12.75	6.70	**17.30**	0.054	38.45	-21.15	**19.45**	0.088	40.61	-21.16
836.50	5	64-QAM	V	142	223	1 / 24	11.55	6.70	**16.10**	0.041	38.45	-22.35	**18.25**	0.067	40.61	-22.36
829.00	10	QPSK	V	129	128	1 / 49	13.35	6.70	17.90	0.062	38.45	-20.55	20.05	0.101	40.61	-20.56
836.50	10	QPSK	V	142	223	1 / 49	14.40	6.70	**18.95**	0.079	38.45	-19.50	**21.10**	0.129	40.61	-19.51
844.00	10	QPSK	V	141	224	1 / 49	13.65	6.60	18.10	0.065	38.45	-20.35	20.25	0.106	40.61	-20.36
836.50	10	16-QAM	V	142	223	1 / 49	12.75	6.70	**17.30**	0.054	38.45	-21.15	**19.45**	0.088	40.61	-21.16
836.50	10	64-QAM	V	142	223	1 / 49	11.55	6.70	**16.10**	0.041	38.45	-22.35	**18.25**	0.067	40.61	-22.36

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

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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
831.50	15	QPSK	V	129	128	1 / 74	13.55	6.70	18.10	0.065	38.45	-20.35	20.25	0.106	40.61	-20.36
836.50	15	QPSK	V	142	223	1 / 74	14.60	6.70	**19.15**	**0.082**	38.45	-19.30	**21.30**	**0.135**	40.61	-19.31
841.50	15	QPSK	V	141	224	1 / 74	13.93	6.60	18.38	0.069	38.45	-20.07	20.53	0.113	40.61	-20.08
836.50	15	16-QAM	V	142	223	1 / 74	12.95	6.70	**17.50**	0.056	38.45	-20.95	**19.65**	0.092	40.61	-20.96
836.50	15	64-QAM	V	142	223	1 / 74	11.76	6.70	**16.31**	0.043	38.45	-22.14	**18.46**	0.070	40.61	-22.15
836.50	15	QPSK	H	226	287	1 / 74	13.79	6.70	18.34	0.068	38.45	-20.11	20.49	0.112	40.61	-20.12

Table 7-8. ERP Data (Band 26)

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	102	20	1 / 0	14.27	9.44	**23.71**	0.235	30.00	-6.29
1745.00	1.4	QPSK	H	100	18	1 / 0	14.07	9.23	23.30	0.214	30.00	-6.70
1779.30	1.4	QPSK	H	100	16	1 / 0	11.67	9.26	20.93	0.124	30.00	-9.07
1710.70	1.4	16-QAM	H	102	20	1 / 0	11.77	9.44	**21.21**	0.132	30.00	-8.79
1710.70	1.4	64-QAM	H	102	20	1 / 0	10.95	9.44	**20.39**	0.109	30.00	-9.61
1711.50	3	QPSK	H	102	20	1 / 0	14.27	9.44	**23.71**	0.235	30.00	-6.29
1745.00	3	QPSK	H	100	18	1 / 0	13.97	9.23	23.20	0.209	30.00	-6.80
1778.50	3	QPSK	H	100	16	1 / 0	12.67	9.26	21.93	0.156	30.00	-8.07
1711.50	3	16-QAM	H	102	20	1 / 0	11.77	9.44	**21.21**	0.132	30.00	-8.79
1711.50	3	64-QAM	H	102	20	1 / 0	10.87	9.44	**20.31**	0.107	30.00	-9.69
1712.50	5	QPSK	H	102	20	1 / 0	14.07	9.43	**23.50**	0.224	30.00	-6.50
1745.00	5	QPSK	H	100	18	1 / 0	13.82	9.23	23.05	0.202	30.00	-6.95
1777.50	5	QPSK	H	100	16	1 / 0	12.47	9.26	21.73	0.149	30.00	-8.27
1712.50	5	16-QAM	H	102	20	1 / 0	11.59	9.43	**21.02**	0.127	30.00	-8.98
1712.50	5	64-QAM	H	102	20	1 / 0	10.87	9.43	**20.30**	0.107	30.00	-9.70
1715.00	10	QPSK	H	102	20	1 / 0	14.27	9.42	**23.69**	0.234	30.00	-6.31
1745.00	10	QPSK	H	100	18	1 / 0	13.97	9.23	23.20	0.209	30.00	-6.80
1775.00	10	QPSK	H	100	16	1 / 0	12.67	9.25	21.92	0.156	30.00	-8.08
1715.00	10	16-QAM	H	102	20	1 / 0	11.81	9.42	**21.23**	0.133	30.00	-8.77
1715.00	10	64-QAM	H	102	20	1 / 0	10.97	9.42	**20.39**	0.109	30.00	-9.61
1717.50	15	QPSK	H	102	20	1 / 0	14.37	9.40	**23.77**	**0.238**	30.00	-6.23
1745.00	15	QPSK	H	100	18	1 / 0	14.17	9.23	23.40	0.219	30.00	-6.60
1772.50	15	QPSK	H	100	16	1 / 0	12.82	9.25	22.07	0.161	30.00	-7.93
1717.50	15	16-QAM	H	102	20	1 / 0	11.89	9.40	**21.29**	0.135	30.00	-8.71
1717.50	15	64-QAM	H	102	20	1 / 0	11.09	9.40	**20.49**	0.112	30.00	-9.51
1720.00	20	QPSK	H	102	20	1 / 0	14.36	9.38	**23.74**	0.237	30.00	-6.26
1745.00	20	QPSK	H	100	18	1 / 0	14.09	9.23	23.32	0.215	30.00	-6.68
1770.00	20	QPSK	H	100	16	1 / 0	12.73	9.24	21.97	0.157	30.00	-8.03
1720.00	20	16-QAM	H	102	20	1 / 0	11.87	9.38	**21.25**	0.134	30.00	-8.75
1720.00	20	64-QAM	H	102	20	1 / 0	11.07	9.38	**20.45**	0.111	30.00	-9.55
1720.00	20	QPSK	V	100	97	1 / 0	13.42	9.40	22.82	0.191	30.00	-7.18

Table 7-9. EIRP Data (Band 66/4)

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	V	100	54	1 / 5	13.26	9.48	22.74	0.188	33.01	-10.27
1882.50	1.4	QPSK	V	100	115	1 / 5	12.96	9.94	**22.90**	0.195	33.01	-10.12
1914.30	1.4	QPSK	V	100	79	1 / 5	12.56	10.29	22.85	0.193	33.01	-10.16
1882.50	1.4	16-QAM	V	100	115	1 / 5	10.46	9.94	**20.40**	0.110	33.01	-12.62
1882.50	1.4	64-QAM	V	100	115	1 / 5	9.36	9.94	**19.30**	0.085	33.01	-13.72
1851.50	3	QPSK	V	100	54	1 / 14	13.45	9.50	22.95	0.197	33.01	-10.06
1882.50	3	QPSK	V	100	115	1 / 14	13.16	9.94	**23.10**	0.204	33.01	-9.92
1913.50	3	QPSK	V	100	79	1 / 14	11.86	10.29	22.15	0.164	33.01	-10.87
1882.50	3	16-QAM	V	100	115	1 / 14	10.61	9.94	**20.55**	0.113	33.01	-12.47
1882.50	3	64-QAM	V	100	115	1 / 14	9.56	9.94	**19.50**	0.089	33.01	-13.52
1852.50	5	QPSK	V	100	54	1 / 24	13.56	9.51	23.07	0.203	33.01	-9.94
1882.50	5	QPSK	V	100	115	1 / 24	13.26	9.94	**23.20**	0.209	33.01	-9.82
1912.50	5	QPSK	V	100	79	1 / 24	11.96	10.28	22.24	0.167	33.01	-10.77
1882.50	5	16-QAM	V	100	115	1 / 24	10.66	9.94	**20.60**	0.115	33.01	-12.42
1882.50	5	64-QAM	V	100	115	1 / 24	9.64	9.94	**19.58**	0.091	33.01	-13.44
1855.00	10	QPSK	V	100	54	1 / 49	13.76	9.55	23.31	0.214	33.01	-9.70
1882.50	10	QPSK	V	100	115	1 / 49	13.49	9.94	**23.43**	0.220	33.01	-9.59
1910.00	10	QPSK	V	100	79	1 / 49	12.21	10.26	22.47	0.177	33.01	-10.54
1882.50	10	16-QAM	V	100	115	1 / 49	10.86	9.94	**20.80**	0.120	33.01	-12.22
1882.50	10	64-QAM	V	100	115	1 / 49	9.96	9.94	**19.90**	0.098	33.01	-13.12
1857.50	15	QPSK	V	100	54	1 / 74	13.56	9.58	23.14	0.206	33.01	-9.87
1882.50	15	QPSK	V	100	115	1 / 74	13.26	9.94	**23.20**	0.209	33.01	-9.82
1907.50	15	QPSK	V	100	79	1 / 74	12.06	10.24	22.30	0.170	33.01	-10.71
1882.50	15	16-QAM	V	100	115	1 / 74	10.66	9.94	**20.60**	0.115	33.01	-12.42
1882.50	15	64-QAM	V	100	115	1 / 74	9.56	9.94	**19.50**	0.089	33.01	-13.52
1860.00	20	QPSK	V	100	54	1 / 99	13.85	9.62	23.47	0.222	33.01	-9.54
1882.50	20	QPSK	V	100	115	1 / 99	13.55	9.94	**23.49**	**0.223**	33.01	-9.53
1905.00	20	QPSK	V	100	79	1 / 99	12.31	10.22	22.53	0.179	33.01	-10.48
1882.50	20	16-QAM	V	100	115	1 / 99	10.95	9.94	**20.89**	0.123	33.01	-12.13
1860.00	20	64-QAM	V	100	54	1 / 99	11.30	9.62	**20.92**	0.124	33.01	-12.09
1882.50	20	QPSK	H	112	263	1 / 99	12.07	9.94	22.01	0.159	33.01	-11.01

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

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	100	39	1 / 24	17.21	9.43	**26.64**	0.462	33.01	-6.37
2593.00	5	QPSK	H	100	37	1 / 24	15.47	9.55	25.02	0.318	33.01	-7.99
2687.50	5	QPSK	H	100	36	1 / 24	15.07	9.82	24.89	0.308	33.01	-8.12
2498.50	5	16-QAM	H	100	39	1 / 24	16.08	9.43	**25.51**	0.356	33.01	-7.50
2498.50	5	64-QAM	H	100	39	1 / 24	14.92	9.43	**24.35**	0.272	33.01	-8.66
2501.00	10	QPSK	H	100	39	1 / 49	17.72	9.43	**27.15**	**0.519**	33.01	-5.86
2593.00	10	QPSK	H	100	37	1 / 49	15.42	9.55	24.97	0.314	33.01	-8.04
2685.00	10	QPSK	H	100	36	1 / 49	15.02	9.82	24.84	0.305	33.01	-8.17
2501.00	10	16-QAM	H	100	39	1 / 49	16.02	9.43	**25.45**	0.351	33.01	-7.56
2501.00	10	64-QAM	H	100	39	1 / 49	14.87	9.43	**24.30**	0.269	33.01	-8.71
2503.50	15	QPSK	H	100	39	1 / 74	17.32	9.43	**26.75**	0.473	33.01	-6.26
2593.00	15	QPSK	H	100	37	1 / 74	15.52	9.55	25.07	0.322	33.01	-7.94
2682.50	15	QPSK	H	100	36	1 / 74	15.12	9.83	24.95	0.313	33.01	-8.06
2503.50	15	16-QAM	H	100	39	1 / 74	16.12	9.43	**25.55**	0.359	33.01	-7.46
2503.50	15	64-QAM	H	100	39	1 / 74	14.92	9.43	**24.35**	0.272	33.01	-8.66
2506.00	20	QPSK	H	100	39	1 / 99	17.03	9.42	**26.45**	0.442	33.01	-6.56
2593.00	20	QPSK	H	100	37	1 / 99	15.27	9.55	24.82	0.304	33.01	-8.19
2680.00	20	QPSK	H	100	36	1 / 99	14.84	9.83	24.67	0.293	33.01	-8.34
2506.00	20	16-QAM	H	100	39	1 / 99	15.88	9.42	**25.30**	0.339	33.01	-7.71
2506.00	20	64-QAM	H	100	39	1 / 99	14.72	9.42	**24.14**	0.260	33.01	-8.87
2506.00	20	QPSK	V	100	264	1 / 49	11.65	9.43	21.08	0.128	33.01	-11.93

Table 7-11. EIRP Data (Band 41 – PC2)

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	100	38	1 / 24	13.97	9.43	**23.40**	0.219	33.01	-9.61
2593.00	5	QPSK	H	100	329	1 / 24	12.17	9.55	21.72	0.149	33.01	-11.29
2687.50	5	QPSK	H	100	36	1 / 24	13.32	9.82	23.14	0.206	33.01	-9.87
2498.50	5	16-QAM	H	100	38	1 / 24	12.22	9.43	**21.65**	0.146	33.01	-11.36
2498.50	5	64-QAM	H	100	38	1 / 24	11.17	9.43	**20.60**	0.115	33.01	-12.41
2501.00	10	QPSK	H	100	38	1 / 49	14.02	9.43	**23.45**	**0.221**	33.01	-9.56
2593.00	10	QPSK	H	100	329	1 / 49	11.12	9.55	20.67	0.117	33.01	-12.34
2685.00	10	QPSK	H	100	36	1 / 49	13.42	9.82	23.24	0.211	33.01	-9.77
2501.00	10	16-QAM	H	100	38	1 / 49	12.22	9.43	**21.65**	0.146	33.01	-11.36
2501.00	10	64-QAM	H	100	38	1 / 49	11.22	9.43	**20.65**	0.116	33.01	-12.36
2503.50	15	QPSK	H	100	38	1 / 74	13.82	9.43	**23.25**	0.211	33.01	-9.76
2593.00	15	QPSK	H	100	329	1 / 74	12.02	9.55	21.57	0.144	33.01	-11.44
2682.50	15	QPSK	H	100	36	1 / 74	13.22	9.83	23.05	0.202	33.01	-9.96
2503.50	15	16-QAM	H	100	38	1 / 74	12.12	9.43	**21.55**	0.143	33.01	-11.46
2503.50	15	64-QAM	H	100	38	1 / 74	10.52	9.43	**19.95**	0.099	33.01	-13.06
2506.00	20	QPSK	H	100	38	1 / 99	13.52	9.42	**22.94**	0.197	33.01	-10.07
2593.00	20	QPSK	H	100	329	1 / 99	11.68	9.55	21.23	0.133	33.01	-11.78
2680.00	20	QPSK	H	100	36	1 / 99	13.02	9.83	22.85	0.193	33.01	-10.16
2506.00	20	16-QAM	H	100	38	1 / 99	11.79	9.42	**21.21**	0.132	33.01	-11.80
2506.00	20	64-QAM	H	100	38	1 / 99	10.72	9.42	**20.14**	0.103	33.01	-12.87
2506.00	20	QPSK	V	310	258	1 / 49	9.93	9.43	19.36	0.086	33.01	-13.65

Table 7-12. EIRP Data (Band 41 – PC3)

7.8 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

Test Setup

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

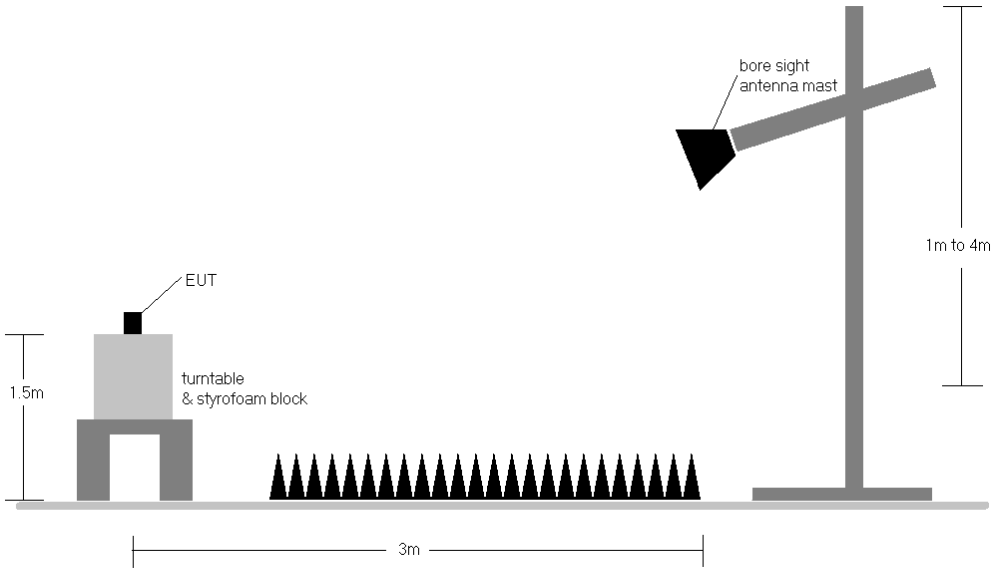


Figure 7-8. Test Instrument & Measurement Setup

Test Notes

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

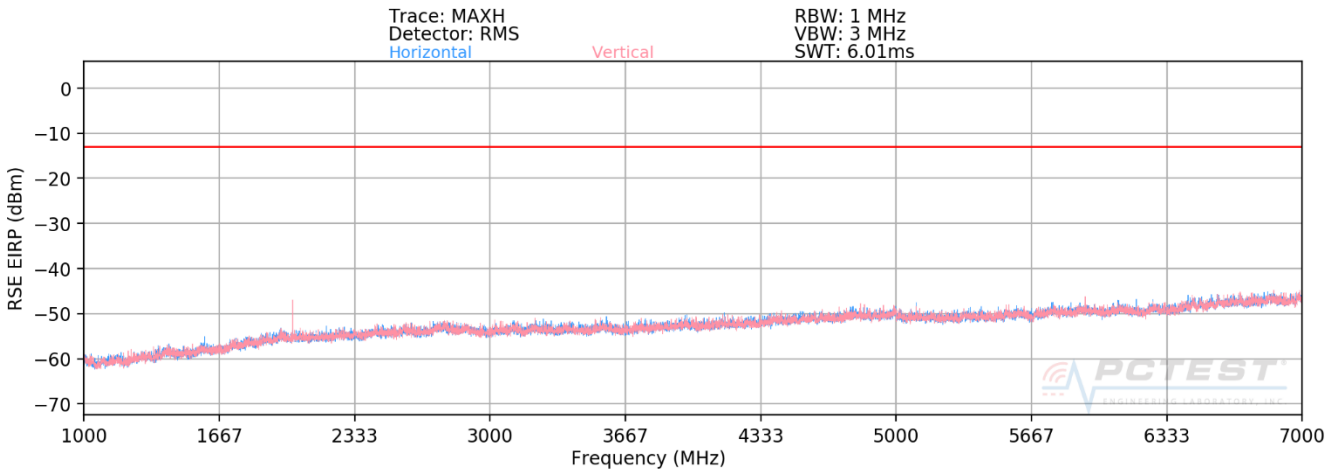
2) This unit was tested with its standard battery.

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

4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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

Band 71



Plot 7-323. Radiated Spurious Plot above 1GHz (Band 71)

OPERATING FREQUENCY:	668.00	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]
1336.00	V	325	88	-72.74	7.41	-65.33	-52.3
2004.00	V	250	172	-76.82	8.63	-68.19	-55.2
2672.00	V	275	155	-74.36	9.93	-64.43	-51.4
3340.00	V	-	-	-73.56	9.60	-63.96	-51.0

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

OPERATING FREQUENCY:	680.50	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]
1361.00	V	400	67	-76.64	7.48	-69.15	-56.2
2041.50	V	300	116	-77.03	8.76	-68.27	-55.3
2722.00	V	275	155	-72.37	10.08	-62.29	-49.3
3402.50	V	-	-	-75.29	9.80	-65.49	-52.5

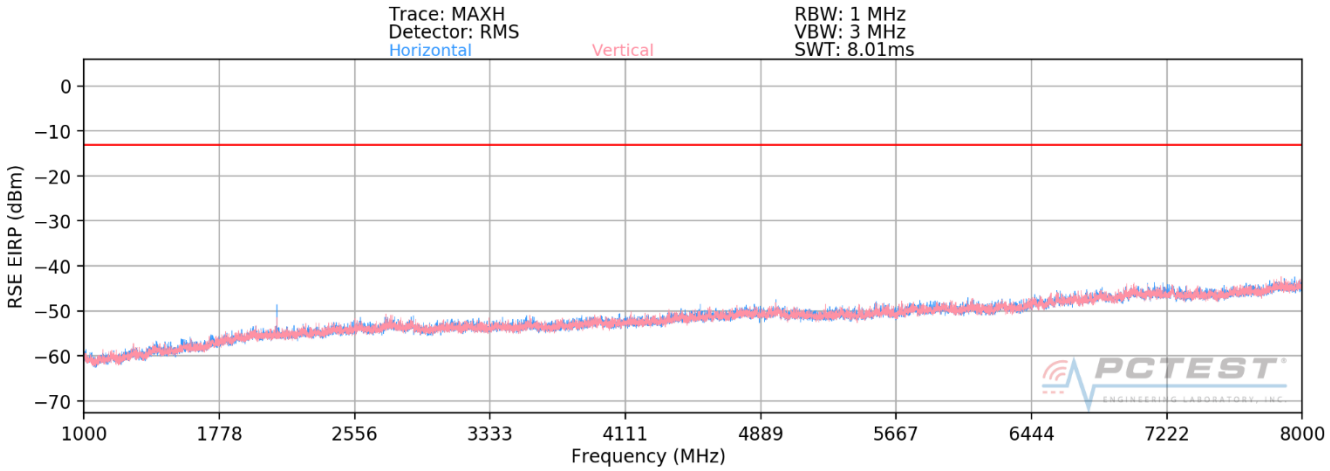
Table 7-14. Radiated Spurious Data (Band 71 – Mid Channel)

OPERATING FREQUENCY:	693.00	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]
1386.00	V	-	-	-78.09	7.45	-70.64	-57.6
2079.00	V	156	217	-76.77	8.82	-67.95	-55.0
2772.00	V	200	350	-75.64	10.16	-65.48	-52.5
3465.00	V	-	-	-74.15	9.88	-64.27	-51.3

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

Band 12



Plot 7-324. Radiated Spurious Plot above 1GHz (Band 12)

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	V	400	343	-73.06	7.54	-65.52	-52.5
2112.00	V	155	243	-67.51	8.85	-58.66	-45.7
2816.00	V	-	-	-71.73	10.12	-61.61	-48.6

Table 7-16. Radiated Spurious Data (Band 12 – 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	V	354	286	-73.60	7.63	-65.97	-53.0
2122.50	V	112	256	-70.87	8.86	-62.01	-49.0
2830.00	V	209	300	-72.03	10.10	-61.93	-48.9
3537.50	V	-	-	-69.87	9.90	-59.97	-47.0

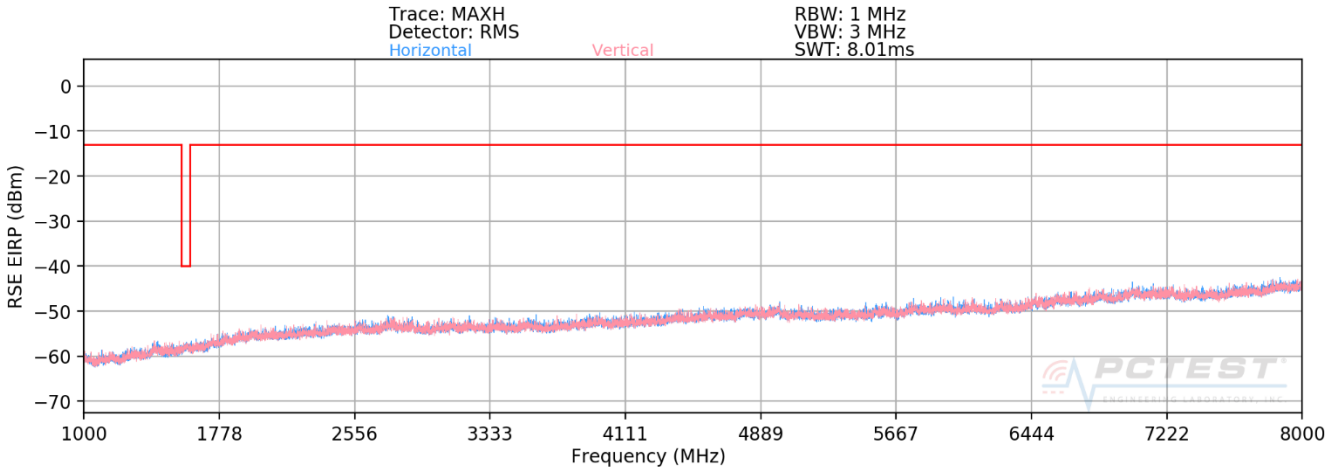
Table 7-17. Radiated Spurious Data (Band 12 – Mid Channel)

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	V	145	226	-74.42	7.72	-66.69	-53.7
2133.00	V	200	310	-72.12	8.87	-63.25	-50.2
2844.00	V	-	-	-71.97	10.07	-61.90	-48.9

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

Band 13



Plot 7-325. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY:	782.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	V	-	-	-74.88	8.53	-66.35	-53.4
2346.00	V	400	6	-71.02	9.43	-61.59	-48.6
3128.00	V	125	206	-70.44	9.34	-61.09	-48.1
3910.00	V	-	-	-69.88	9.37	-60.51	-47.5

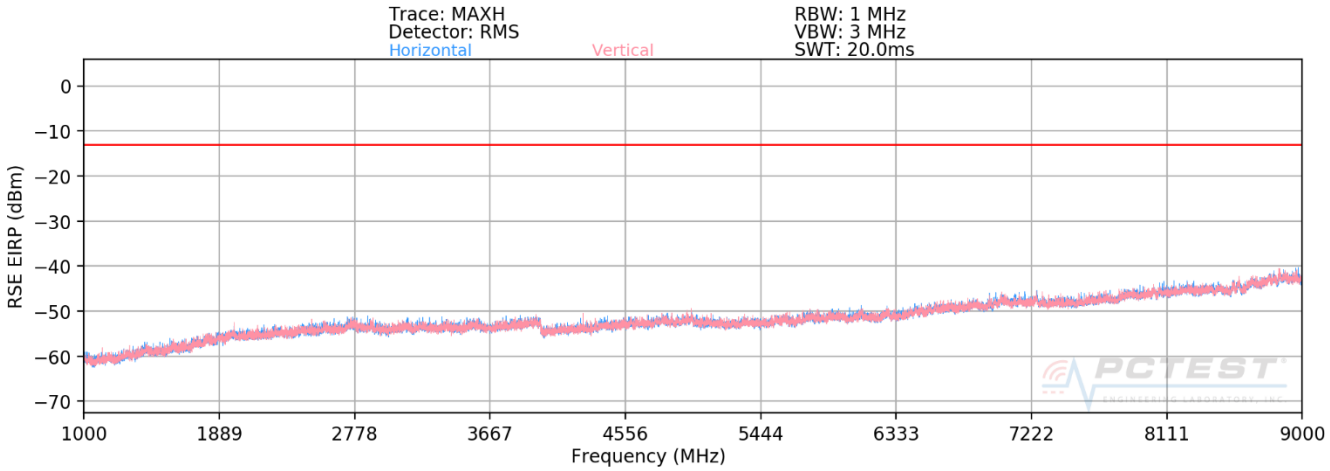
Table 7-19. Radiated Spurious Data (Band 13 – Mid Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	V	-	-	-74.88	8.53	-66.35	-26.4

Table 7-20. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

Band 26



Plot 7-326. Radiated Spurious Plot above 1GHz (Band 26)

OPERATING FREQUENCY:	831.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
1663.00	V	-	-	-75.41	8.95	-66.46	-53.5
2494.50	V	-	-	-72.34	9.73	-62.60	-49.6

Table 7-21. Radiated Spurious Data (Band 26 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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	V	-	-	-75.36	8.95	-66.41	-53.4
2509.50	V	112	275	-72.28	9.75	-62.52	-49.5
3346.00	V	-	-	-70.55	9.60	-60.95	-47.9

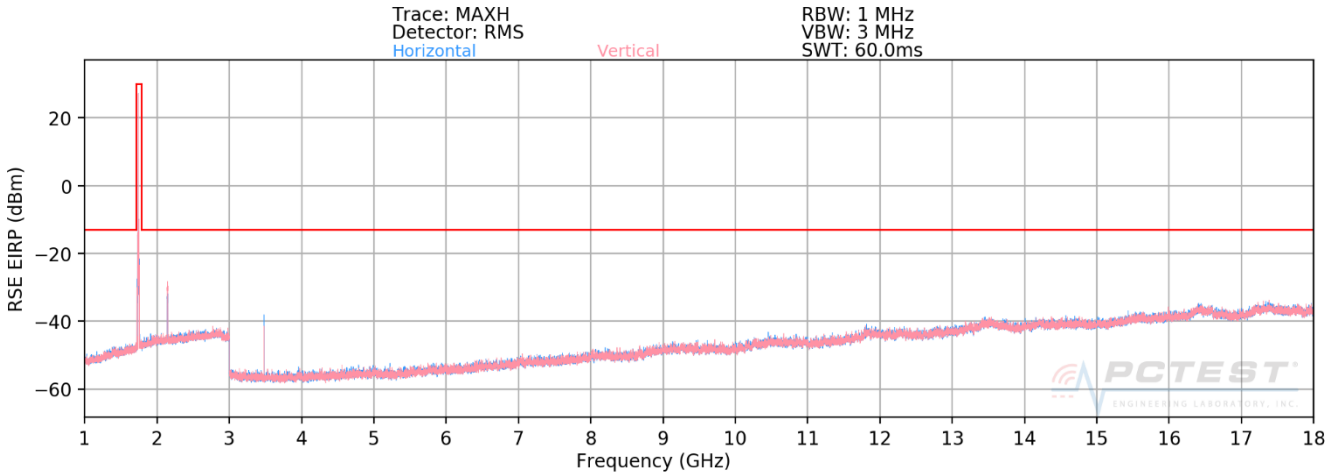
Table 7-22. Radiated Spurious Data (Band 26 – Mid Channel)

OPERATING FREQUENCY:	841.50	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
1683.00	V	113	263	-74.39	8.95	-65.44	-52.4
2524.50	V	155	213	-67.22	9.75	-57.47	-44.5
3366.00	V	-	-	-70.99	9.67	-61.32	-48.3

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

Band 66/4



Plot 7-327. Radiated Spurious Plot above 1GHz (Band 66/4)

OPERATING FREQUENCY:	1720.00	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]
3440.00	H	134	15	-50.33	9.84	-40.48	-27.5
5160.00	H	116	39	-64.75	10.71	-54.04	-41.0
6880.00	H	-	-	-68.26	11.68	-56.58	-43.6

Table 7-24. Radiated Spurious Data (Band 66/4 – Low Channel)

OPERATING FREQUENCY:	1745.00	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]
3490.00	H	118	125	-55.44	9.91	-45.53	-32.5
5235.00	H	125	235	-71.00	10.73	-60.27	-47.3
6980.00	H	-	-	-71.32	11.82	-59.49	-46.5

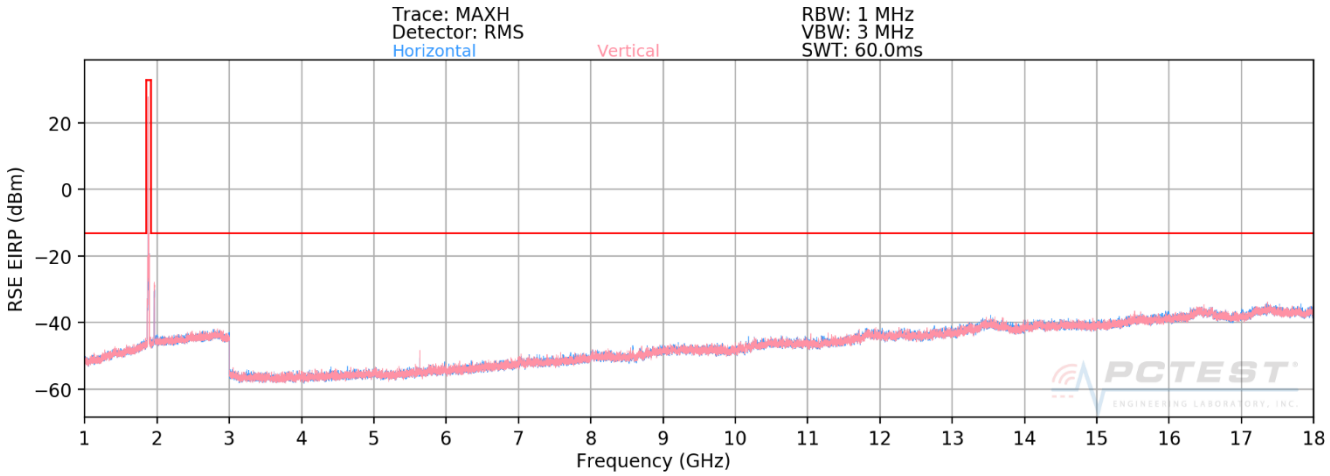
Table 7-25. Radiated Spurious Data (Band 66/4 – Mid Channel)

OPERATING FREQUENCY:	1770.00	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]
3540.00	H	400	141	-56.84	9.89	-46.95	-33.9
5310.00	H	-	-	-69.21	10.69	-58.53	-45.5
7080.00	H	-	-	-68.00	11.79	-56.21	-43.2

Table 7-26. Radiated Spurious Data (Band 66/4 – High Channel)

Band 25/2



Plot 7-328. Radiated Spurious Plot above 1GHz (Band 25/2)

OPERATING FREQUENCY:	1860.00	MHz
CHANNEL:	26140	
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]
3720.00	H	111	152	-65.60	9.51	-56.10	-43.1
5580.00	H	-	-	-68.98	10.99	-58.00	-45.0
7440.00	H	-	-	-65.22	10.99	-54.24	-41.2

Table 7-27. Radiated Spurious Data (Band 25/2 – Low Channel)

OPERATING FREQUENCY:	1882.50	MHz
CHANNEL:	26365	
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]
3765.00	H	350	160	-68.44	9.36	-59.08	-46.1
5647.50	H	114	358	-67.06	11.19	-55.87	-42.9
7530.00	H	-	-	-65.25	11.13	-54.12	-41.1

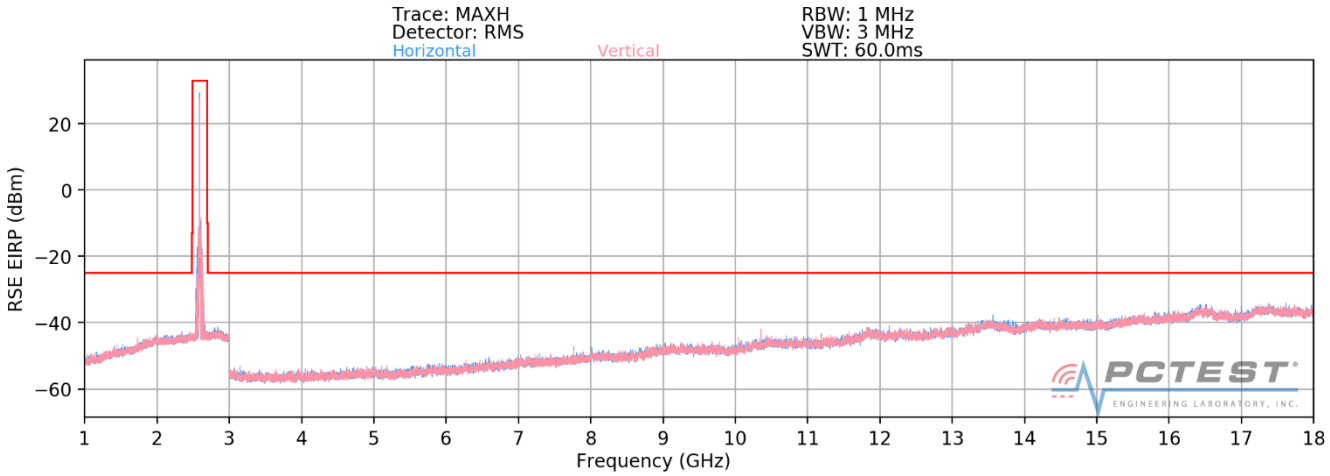
Table 7-28. Radiated Spurious Data (Band 25/2 – Mid Channel)

OPERATING FREQUENCY:	1905.00	MHz
CHANNEL:	26590	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

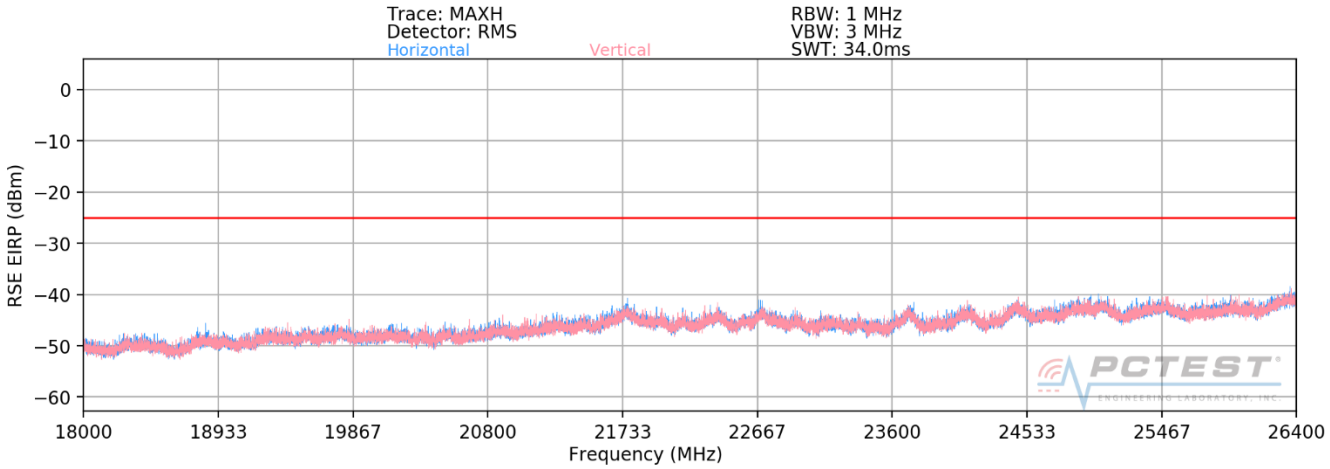
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3810.00	H	116	174	-66.87	9.29	-57.57	-44.6
5715.00	H	-	-	-69.23	11.35	-57.89	-44.9
7620.00	H	-	-	-65.89	11.29	-54.60	-41.6

Table 7-29. Radiated Spurious Data (Band 25/2 – High Channel)

Band 41 (PC2)



Plot 7-329. Radiated Spurious Plot 1GHz - 18GHz (Band 41)



Plot 7-330. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41)

OPERATING FREQUENCY:	2510.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	111	143	-66.98	10.91	-56.07	-31.1
7530.00	H	120	115	-58.40	11.10	-47.30	-22.3
10040.00	H	114	227	-62.69	11.99	-50.70	-25.7
12550.00	H	217	135	-60.36	13.56	-46.80	-21.8
15060.00	H	-	-	-58.78	13.49	-45.29	-20.3

Table 7-30. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY:	2593.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	H	129	2	-64.85	10.74	-54.11	-29.1
7779.00	H	145	120	-60.96	11.44	-49.51	-24.5
10372.00	H	165	127	-62.09	12.42	-49.67	-24.7
12965.00	H	172	295	-55.49	13.29	-42.20	-17.2
15558.00	H	-	-	-60.96	16.33	-44.64	-19.6

Table 7-31. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY:	2680.00	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5360.00	H	334	287	-63.11	10.69	-52.42	-27.4
8040.00	H	240	317	-57.99	11.17	-46.83	-21.8
10720.00	H	200	132	-62.26	12.61	-49.65	-24.7
13400.00	H	-	-	-59.42	12.59	-46.83	-21.8

Table 7-32. Radiated Spurious Data (Band 41 – High Channel)

7.9 Frequency Stability / Temperature Variation

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

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

Band 71 Frequency Stability Measurements

OPERATING FREQUENCY:	680,500,000	Hz
CHANNEL:	133297	
REFERENCE VOLTAGE:	4.29	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	680,500,075	75	0.0000110
100 %		- 20	680,500,166	166	0.0000244
100 %		- 10	680,500,121	121	0.0000178
100 %		0	680,500,299	299	0.0000439
100 %		+ 10	680,500,367	367	0.0000539
100 %		+ 20	680,500,170	170	0.0000250
100 %		+ 30	680,499,823	-177	-0.0000260
100 %		+ 40	680,499,886	-114	-0.0000168
100 %		+ 50	680,499,901	-99	-0.0000145
BATT. ENDPOINT	3.80	+ 20	680,499,864	-136	-0.0000200

Table 7-33. 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.

Band 71 Frequency Stability Measurements

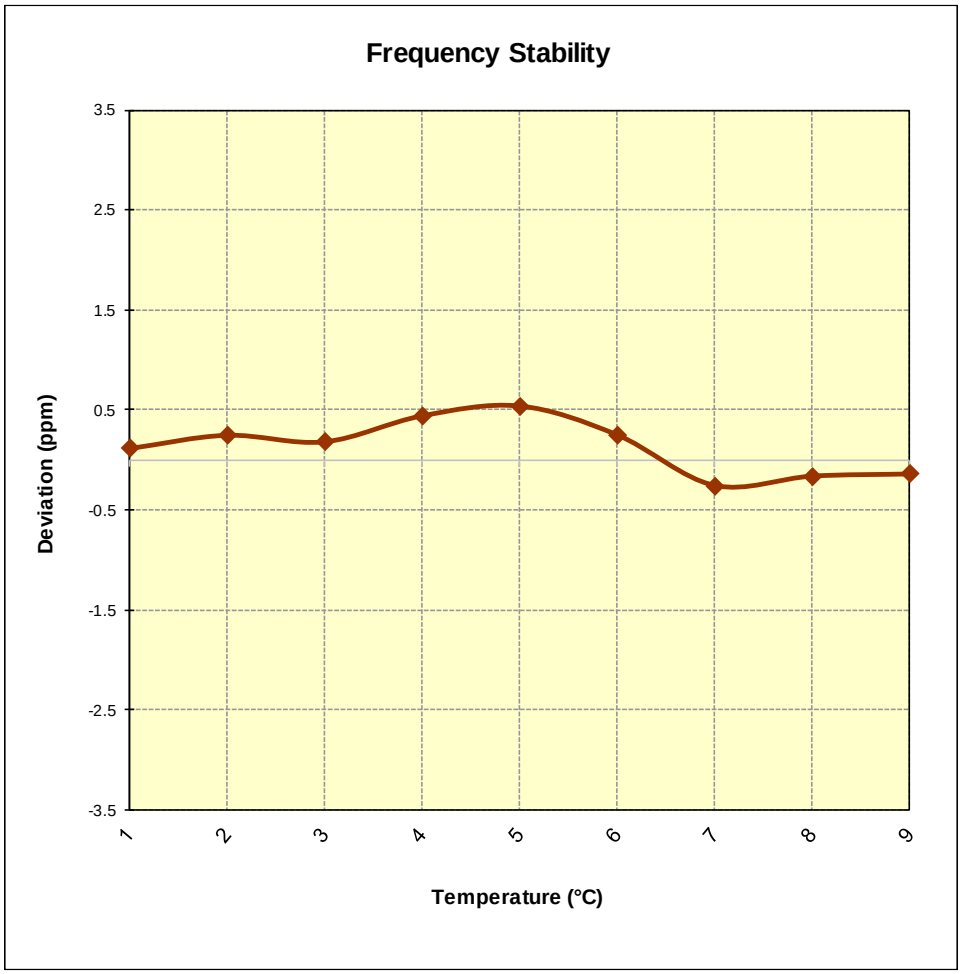


Figure 7-9. Frequency Stability Graph (Band 71)

Band 12 Frequency Stability Measurements

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	
REFERENCE VOLTAGE:	4.29	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	707,500,097	97	0.0000137
100 %		- 20	707,499,843	-157	-0.0000222
100 %		- 10	707,500,128	128	0.0000181
100 %		0	707,500,168	168	0.0000237
100 %		+ 10	707,500,035	35	0.0000049
100 %		+ 20	707,500,107	107	0.0000151
100 %		+ 30	707,500,164	164	0.0000232
100 %		+ 40	707,499,939	-61	-0.0000086
100 %		+ 50	707,499,816	-184	-0.0000260
BATT. ENDPOINT	3.80	+ 20	707,500,277	277	0.0000392

Table 7-34. Frequency Stability Data (Band 12)

Note:

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

Band 12 Frequency Stability Measurements

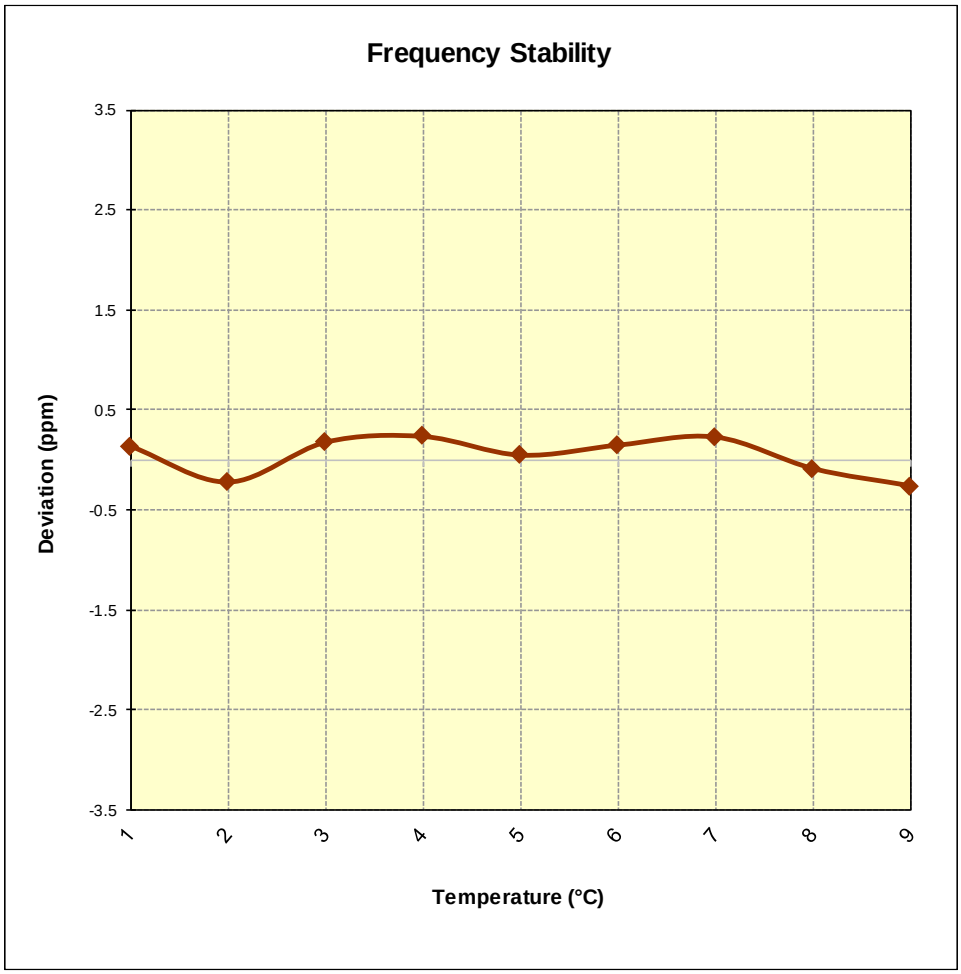


Figure 7-10. Frequency Stability Graph (Band 12)

Band 13 Frequency Stability Measurements

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	
REFERENCE VOLTAGE:	4.29	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	781,999,981	-19	-0.0000024
100 %		- 20	782,000,115	115	0.0000147
100 %		- 10	781,999,866	-134	-0.0000171
100 %		0	782,000,038	38	0.0000049
100 %		+ 10	782,000,021	21	0.0000027
100 %		+ 20	782,000,074	74	0.0000095
100 %		+ 30	781,999,938	-62	-0.0000079
100 %		+ 40	781,999,968	-32	-0.0000041
100 %		+ 50	781,999,920	-80	-0.0000102
BATT. ENDPOINT	3.80	+ 20	781,999,780	-220	-0.0000281

Table 7-35. 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.

Band 13 Frequency Stability Measurements

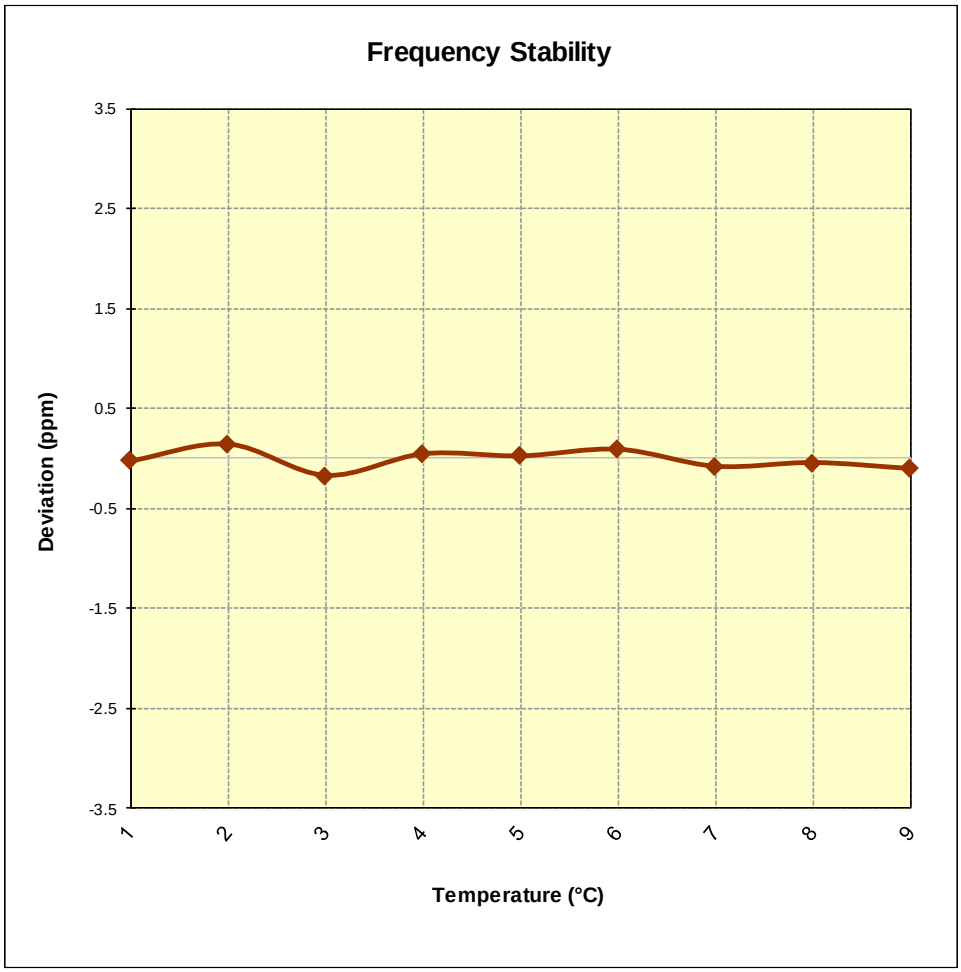


Figure 7-11. Frequency Stability Graph (Band 13)

Band 26/5 Frequency Stability Measurements

OPERATING FREQUENCY:	836,500,000	Hz
CHANNEL:	20525	
REFERENCE VOLTAGE:	4.29	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	836,499,901	-99	-0.0000118
100 %		- 20	836,500,064	64	0.0000077
100 %		- 10	836,500,008	8	0.0000010
100 %		0	836,499,678	-322	-0.0000385
100 %		+ 10	836,500,187	187	0.0000224
100 %		+ 20	836,499,993	-7	-0.0000008
100 %		+ 30	836,500,014	14	0.0000017
100 %		+ 40	836,499,752	-248	-0.0000296
100 %		+ 50	836,500,150	150	0.0000179
BATT. ENDPOINT	3.80	+ 20	836,499,729	-271	-0.0000324

Table 7-36. Frequency Stability Data (Band 26/5)

Band 26/5 Frequency Stability Measurements

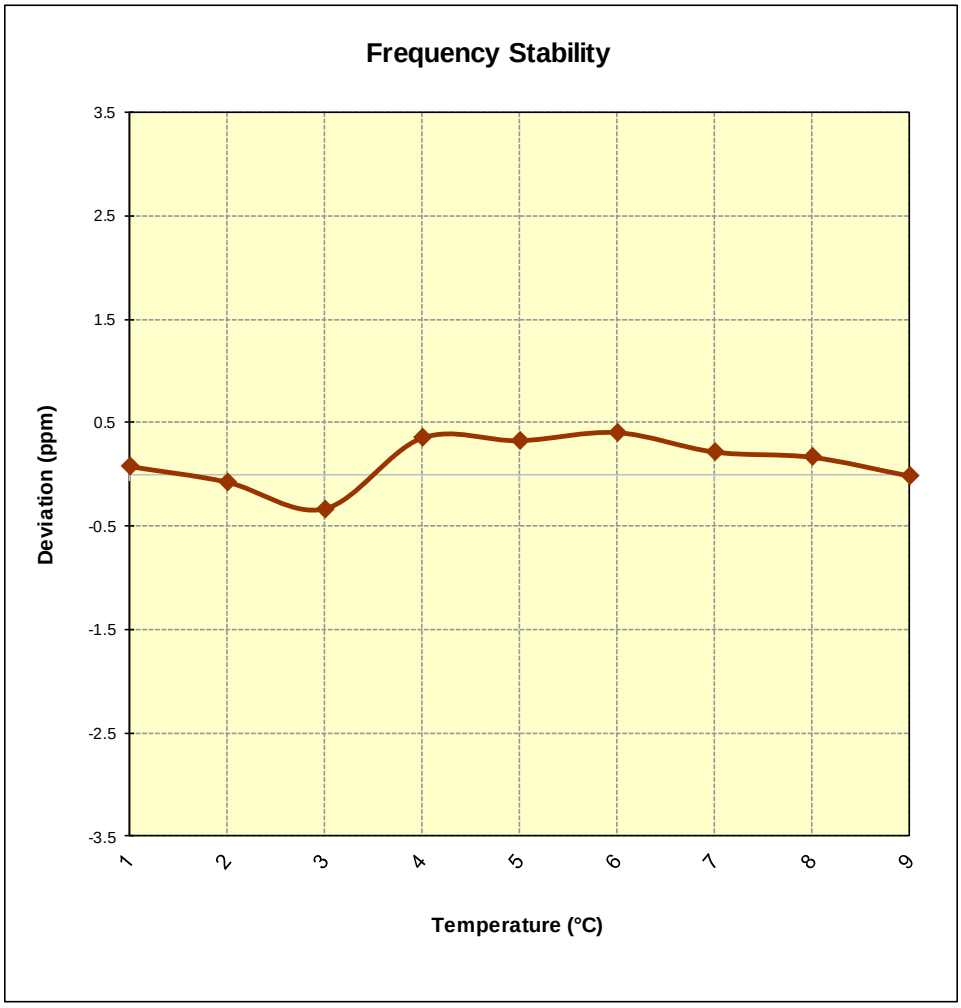


Figure 7-12. Frequency Stability Graph (Band 26/5)

Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY:	1,745,000,000	Hz
CHANNEL:	132322	
REFERENCE VOLTAGE:	4.29	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	1,745,000,079	79	0.0000045
100 %		- 20	1,744,999,729	-271	-0.0000155
100 %		- 10	1,744,999,864	-136	-0.0000078
100 %		0	1,745,000,005	5	0.0000003
100 %		+ 10	1,744,999,849	-151	-0.0000087
100 %		+ 20	1,744,999,676	-324	-0.0000186
100 %		+ 30	1,744,999,981	-19	-0.0000011
100 %		+ 40	1,745,000,269	269	0.0000154
100 %		+ 50	1,744,999,866	-134	-0.0000077
BATT. ENDPOINT	3.80	+ 20	1,745,000,173	173	0.0000099

Table 7-37. 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.

Band 66/4 Frequency Stability Measurements

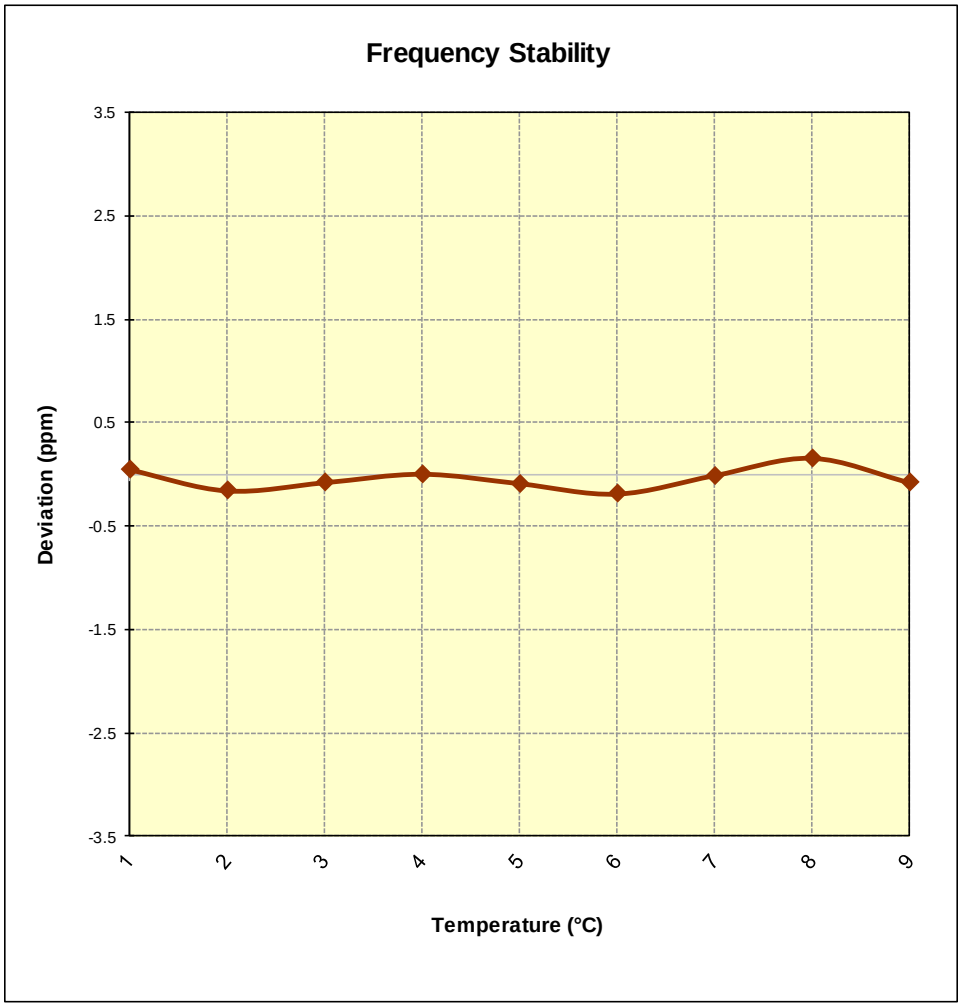


Figure 7-13. Frequency Stability Graph (Band 66/4)

Band 25/2 Frequency Stability Measurements

OPERATING FREQUENCY:	1,882,500,000	Hz
CHANNEL:	26365	
REFERENCE VOLTAGE:	4.29	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	1,882,500,043	43	0.0000023
100 %		- 20	1,882,499,594	-406	-0.0000216
100 %		- 10	1,882,500,046	46	0.0000024
100 %		0	1,882,500,187	187	0.0000099
100 %		+ 10	1,882,499,825	-175	-0.0000093
100 %		+ 20	1,882,499,887	-113	-0.0000060
100 %		+ 30	1,882,499,725	-275	-0.0000146
100 %		+ 40	1,882,500,387	387	0.0000206
100 %		+ 50	1,882,499,732	-268	-0.0000142
BATT. ENDPOINT	3.80	+ 20	1,882,500,174	174	0.0000092

Table 7-38. Frequency Stability Data (Band 25/2)

Band 25/2 Frequency Stability Measurements

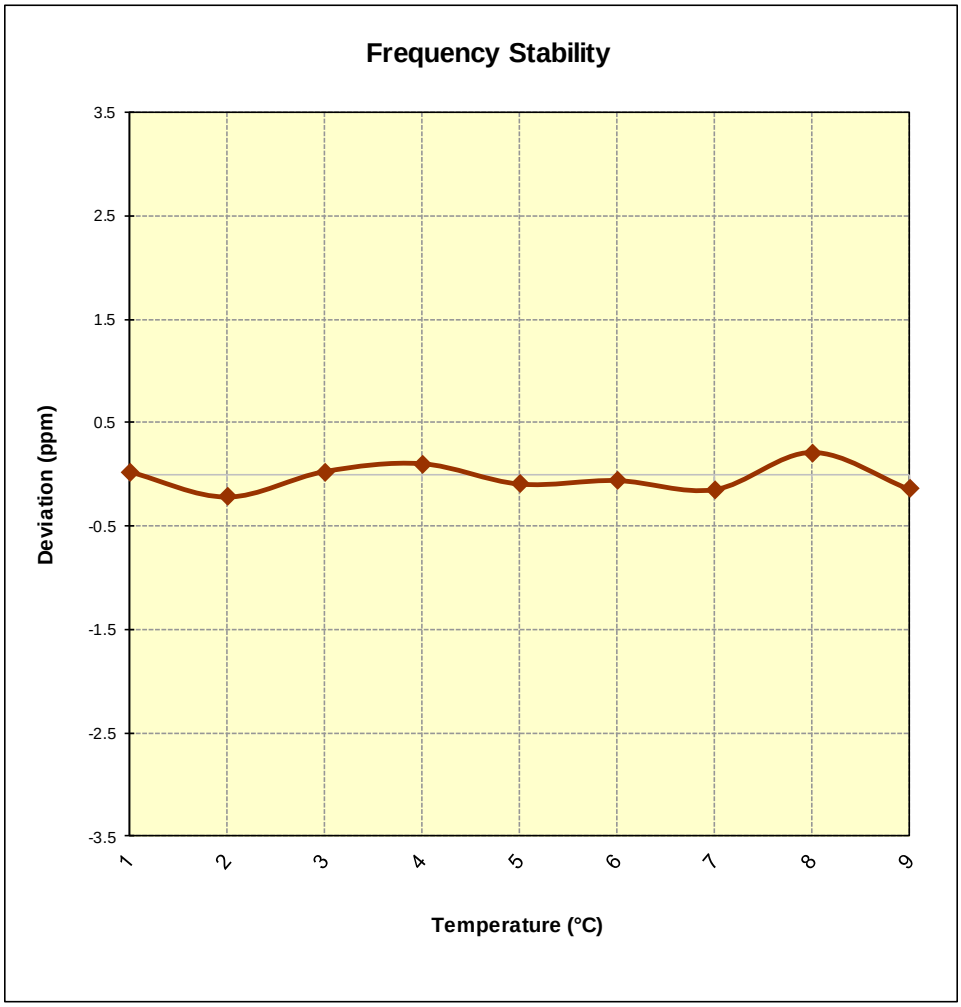


Figure 7-14. Frequency Stability Graph (Band 25/2)

Band 41 Frequency Stability Measurements

OPERATING FREQUENCY:	2,593,000,000	Hz
CHANNEL:	40620	
REFERENCE VOLTAGE:	4.29	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	2,593,000,046	46	0.0000018
100 %		- 20	2,592,999,712	-288	-0.0000111
100 %		- 10	2,592,999,828	-172	-0.0000066
100 %		0	2,593,000,180	180	0.0000069
100 %		+ 10	2,592,999,854	-146	-0.0000056
100 %		+ 20	2,593,000,112	112	0.0000043
100 %		+ 30	2,593,000,006	6	0.0000002
100 %		+ 40	2,593,000,072	72	0.0000028
100 %		+ 50	2,593,000,091	91	0.0000035
BATT. ENDPOINT	3.80	+ 20	2,592,999,987	-13	-0.0000005

Table 7-39. 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.

Band 41 Frequency Stability Measurements

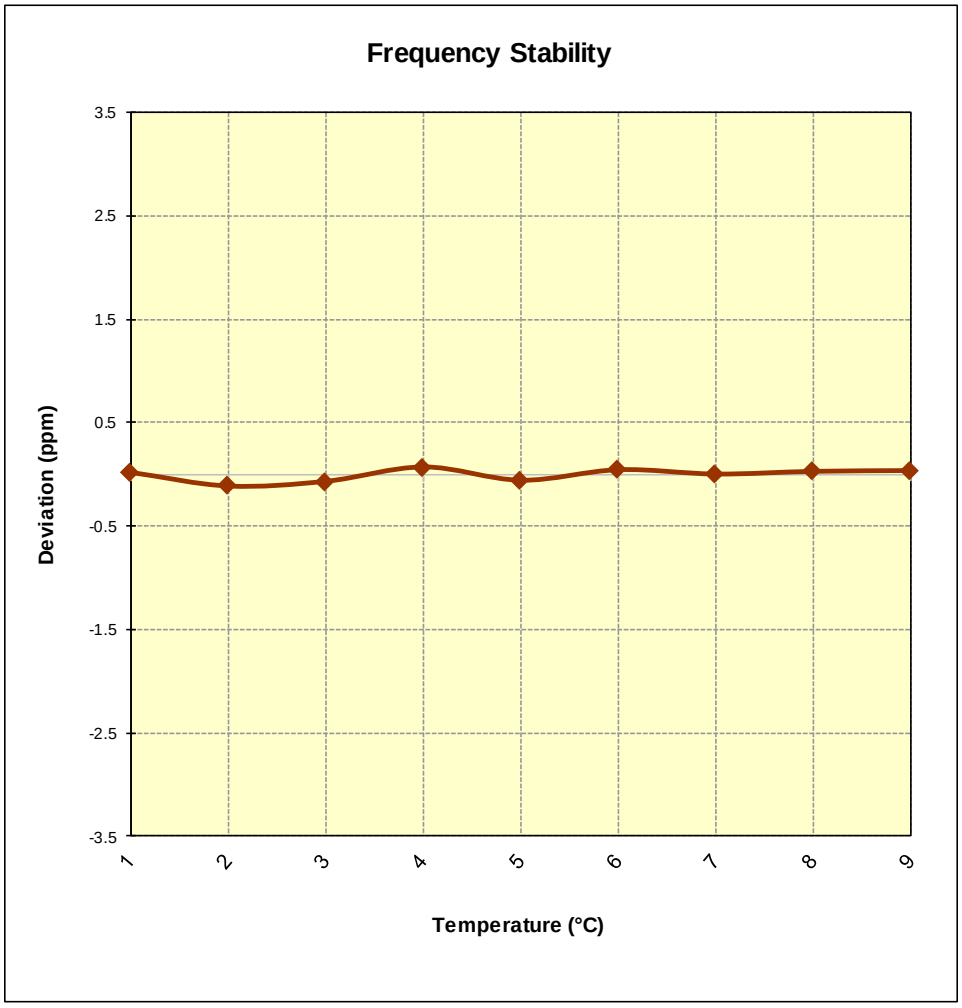


Figure 7-15. Frequency Stability Graph (Band 41)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFX320TA** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.