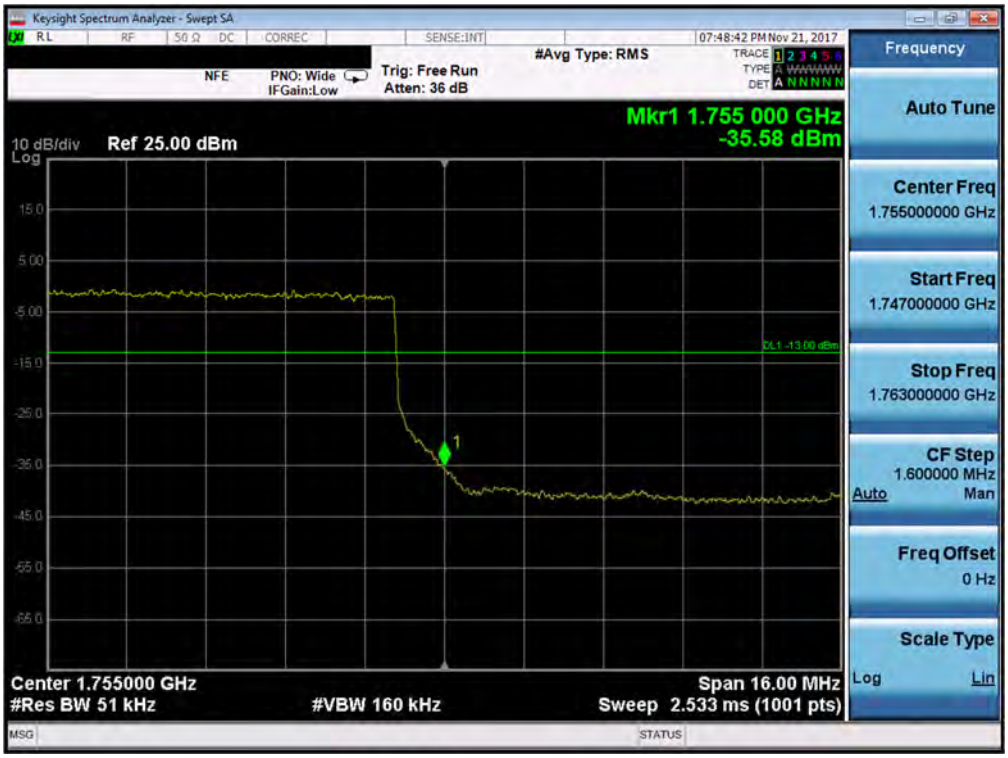
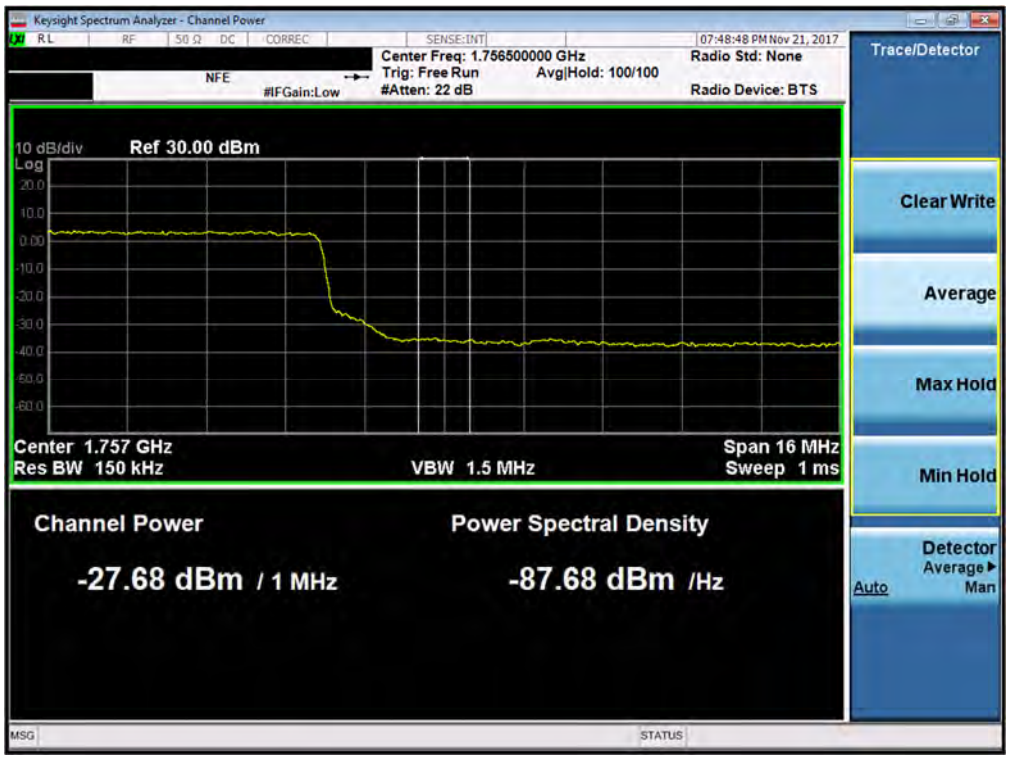
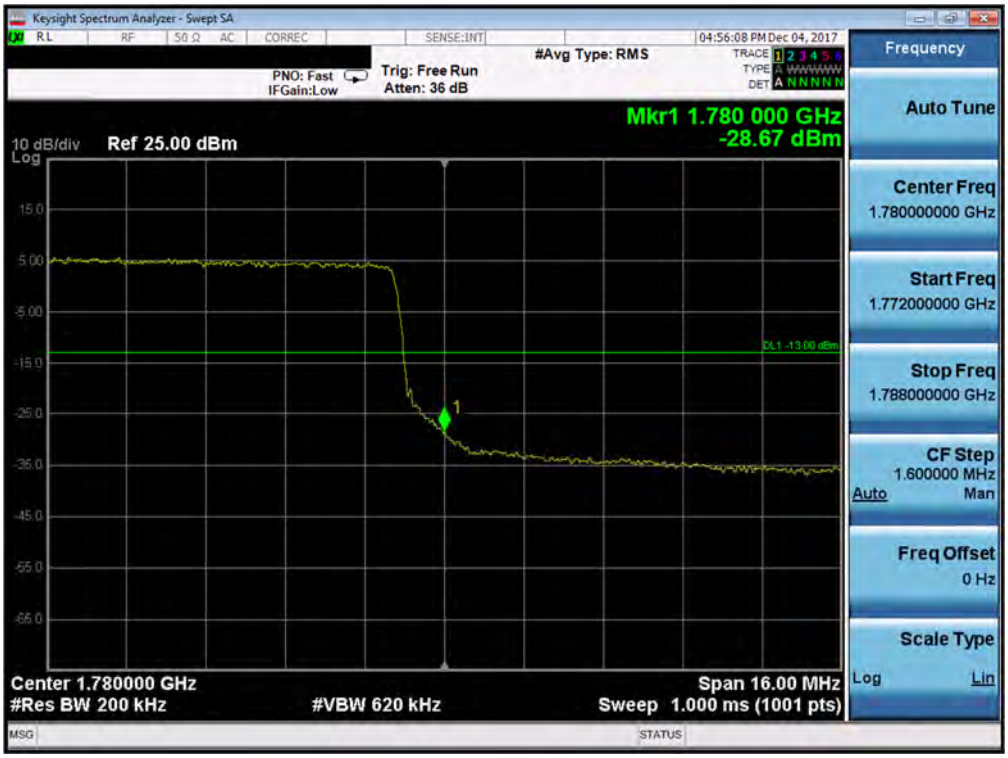


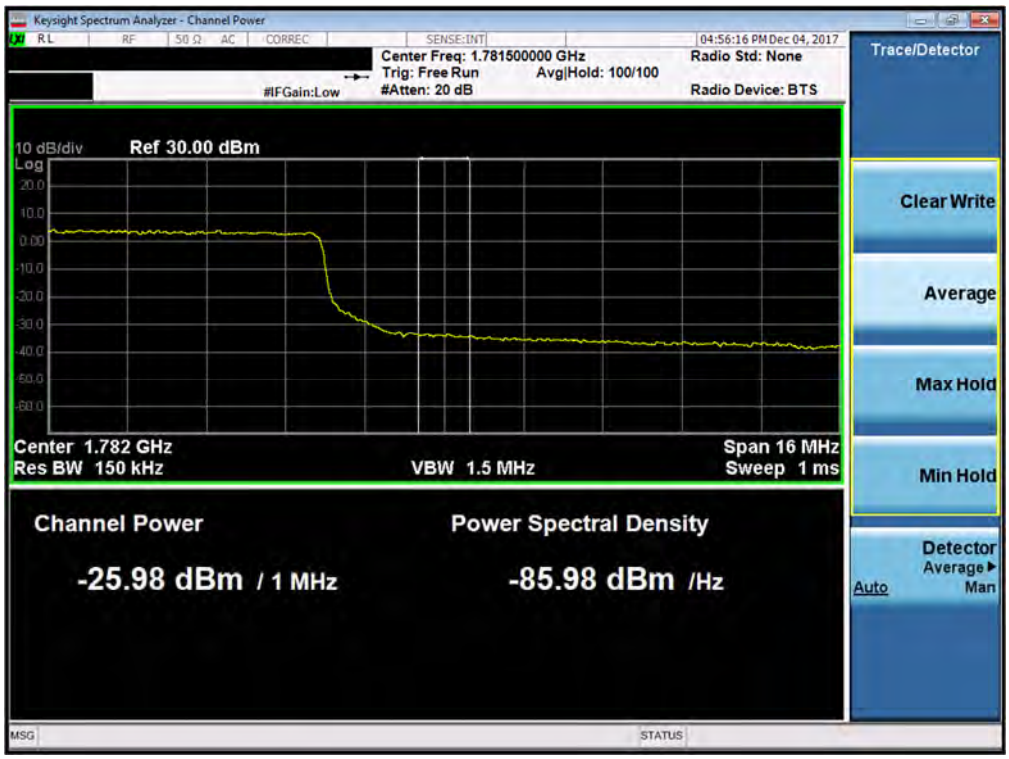
Plot 7-285. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-286. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

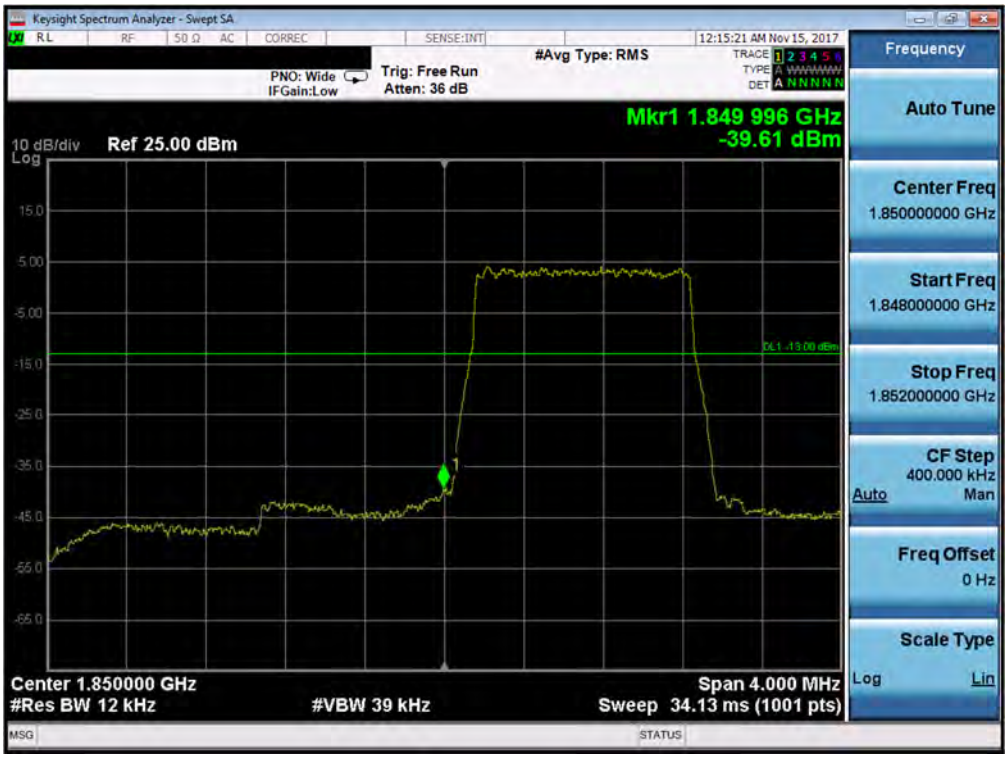


Plot 7-287. Upper Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

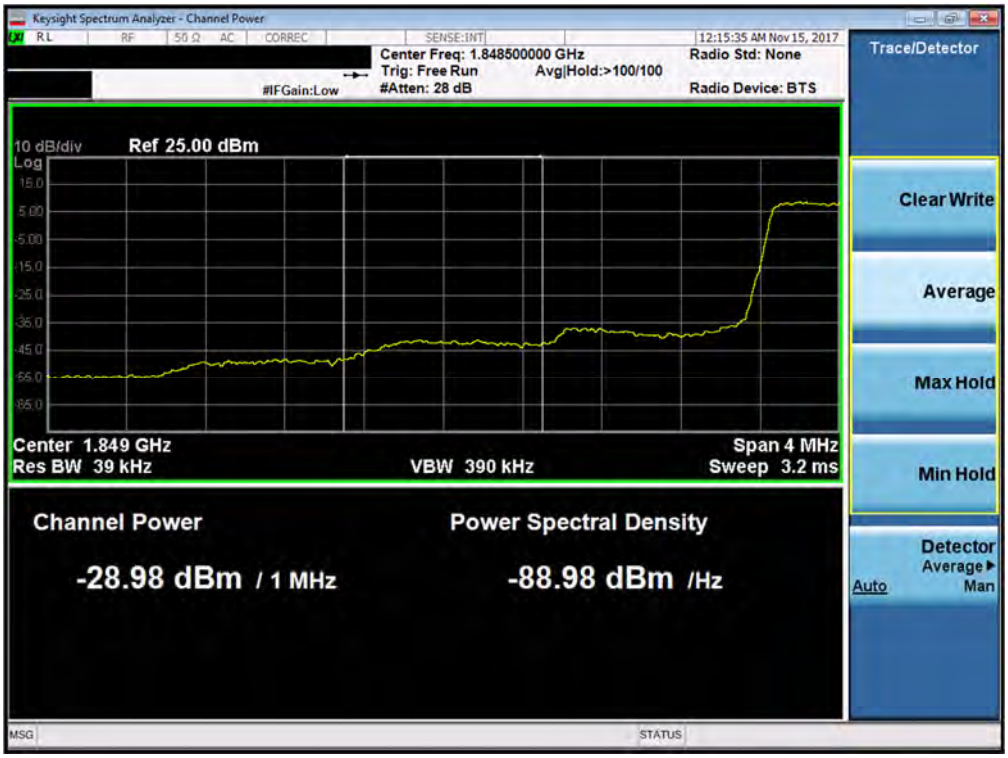


Plot 7-288. Upper Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

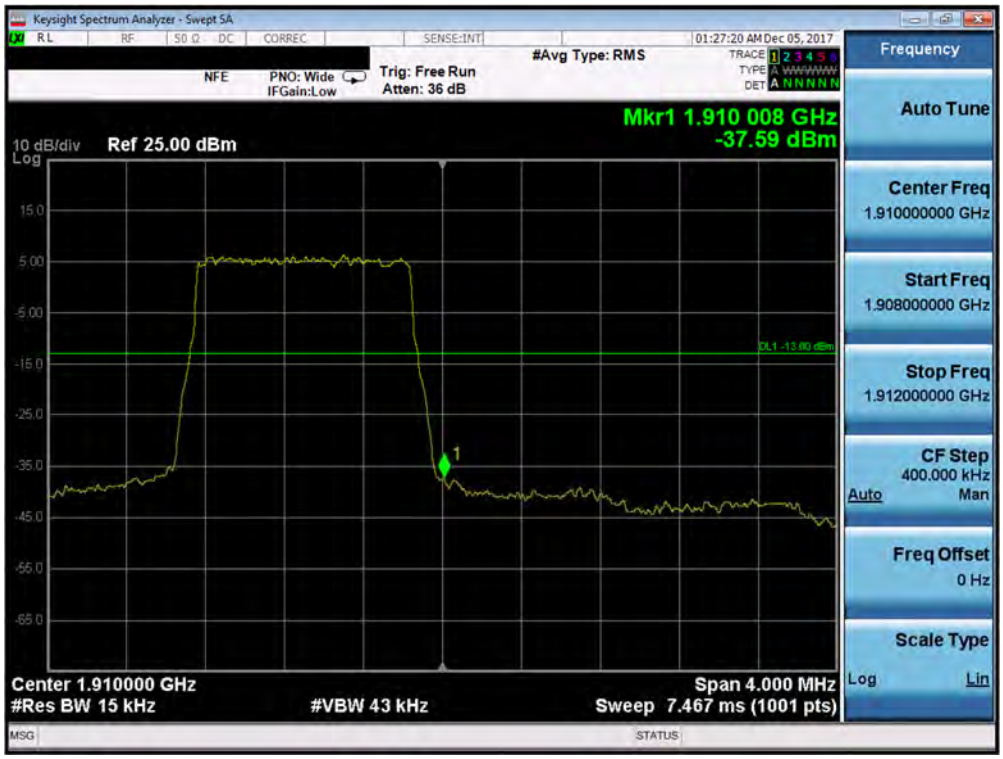
Band 25/2



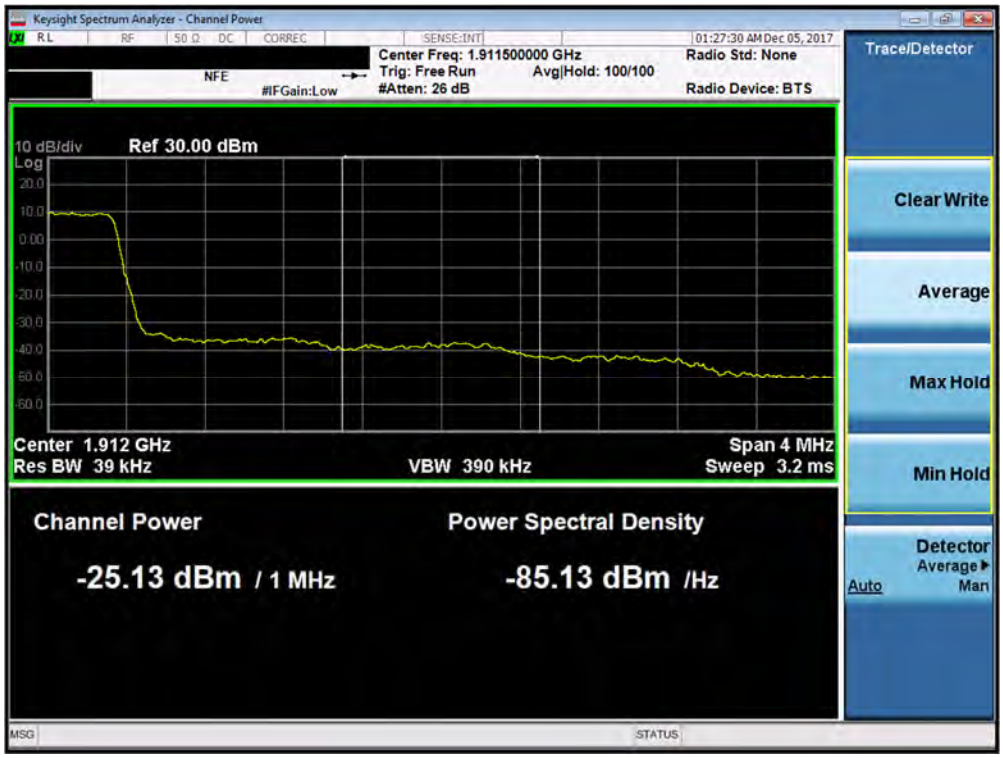
Plot 7-289. Lower Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



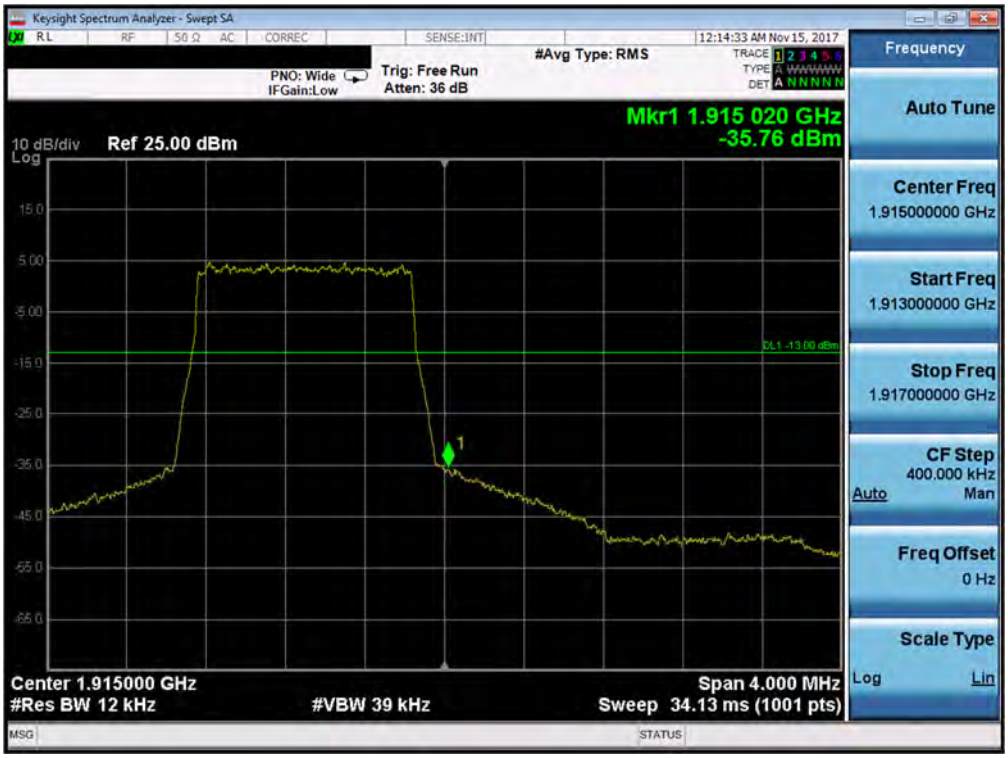
Plot 7-290. Lower Extended Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



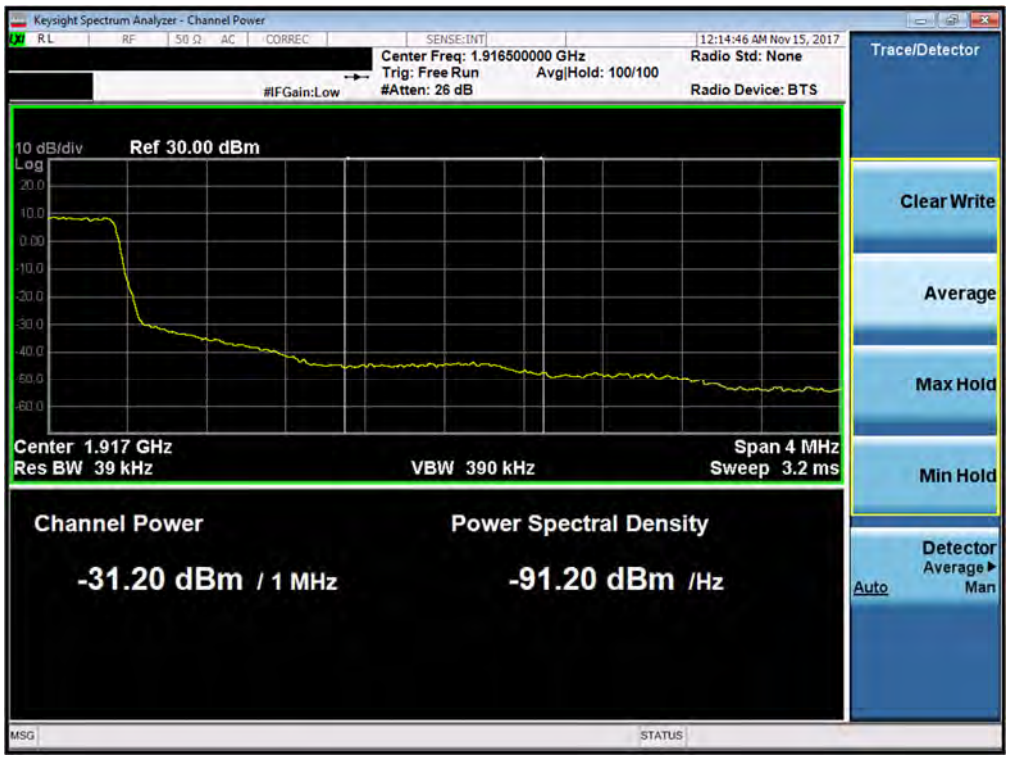
Plot 7-291. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



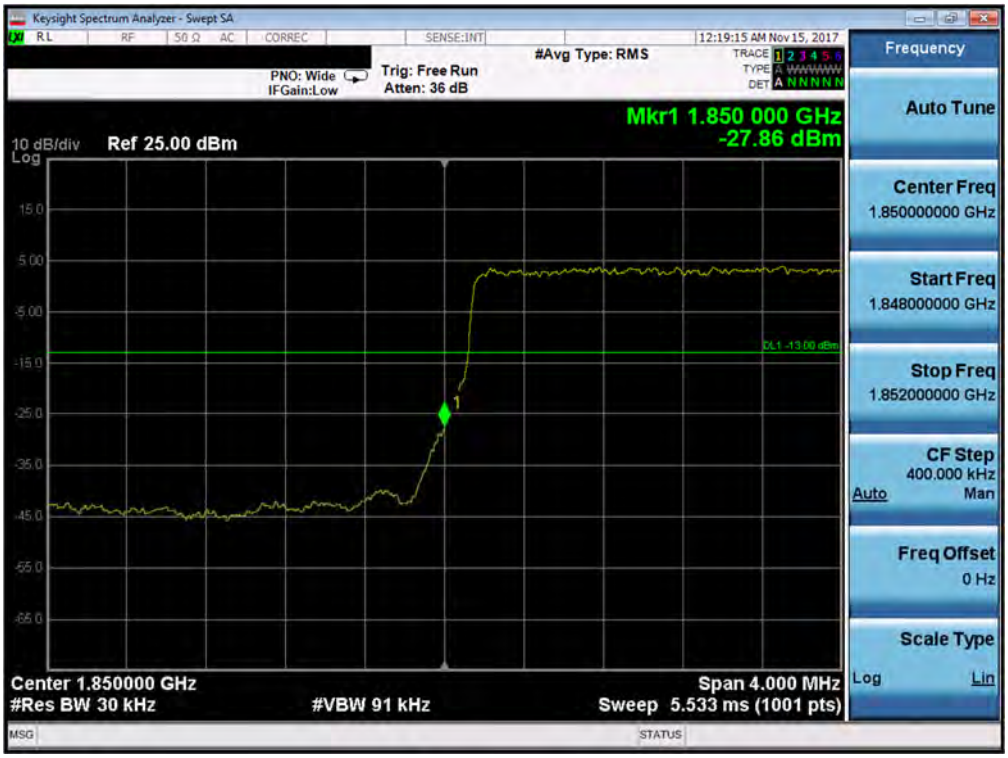
Plot 7-292. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



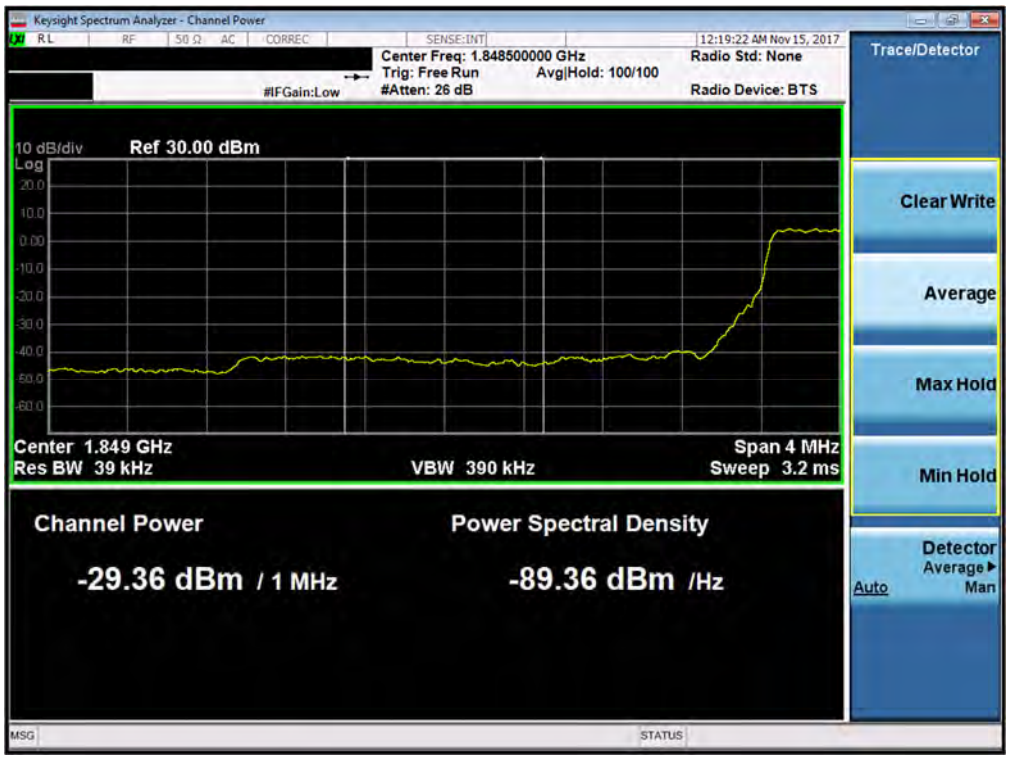
Plot 7-293. Upper Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-294. Upper Extended Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)

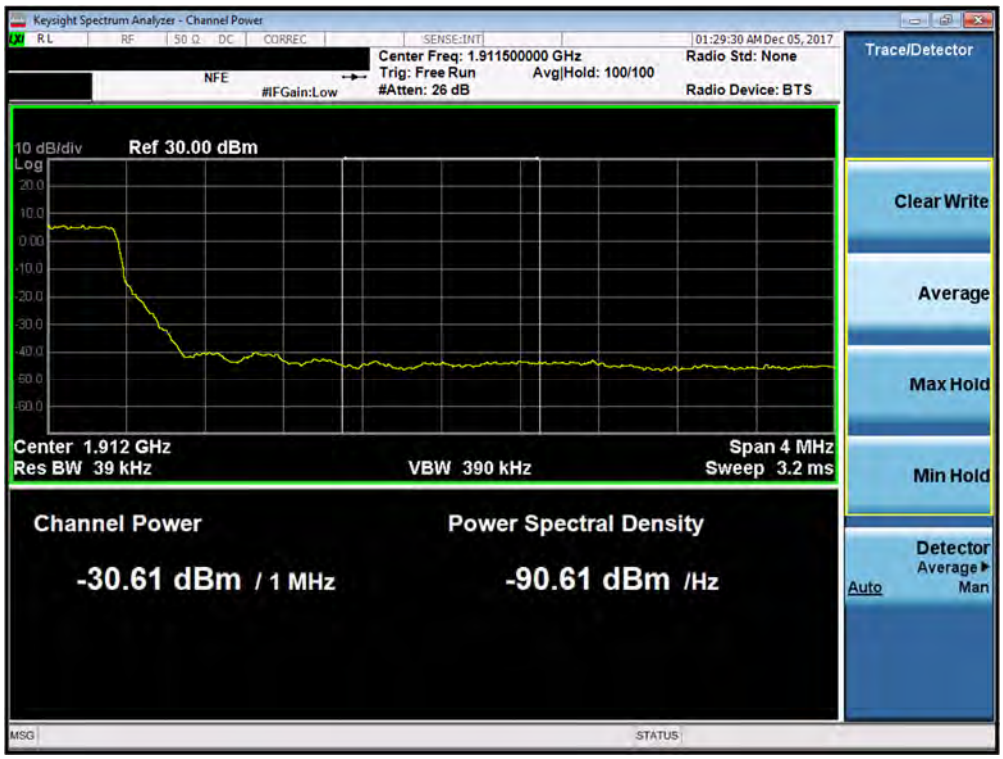


Plot 7-295. Lower Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

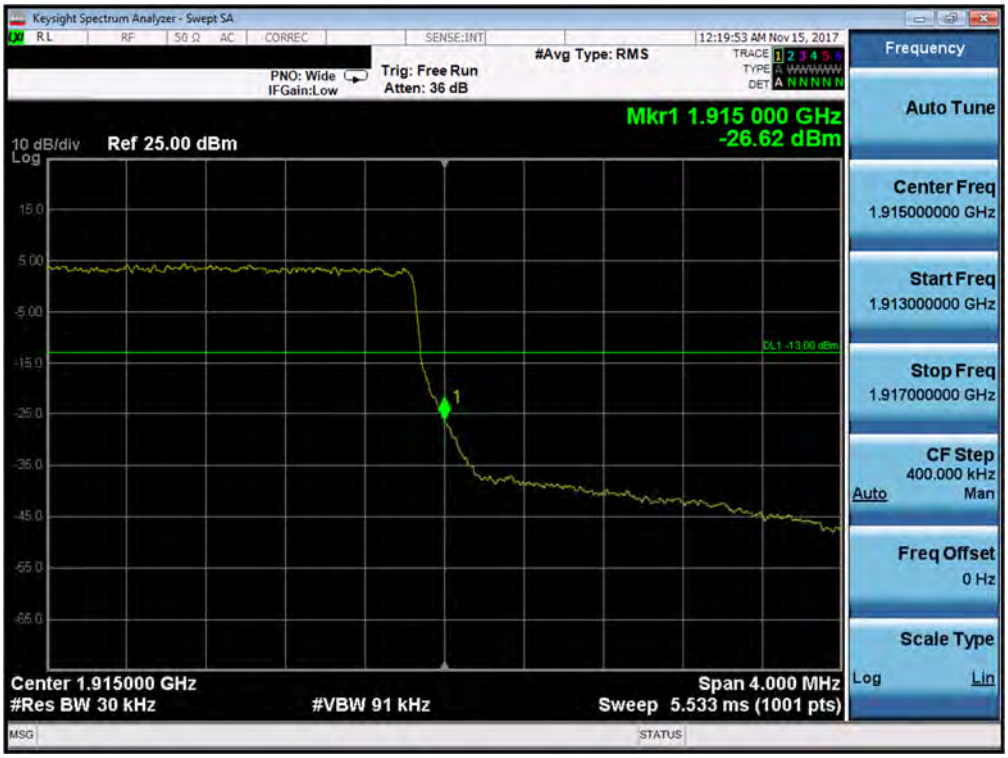


Plot 7-296. Lower Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

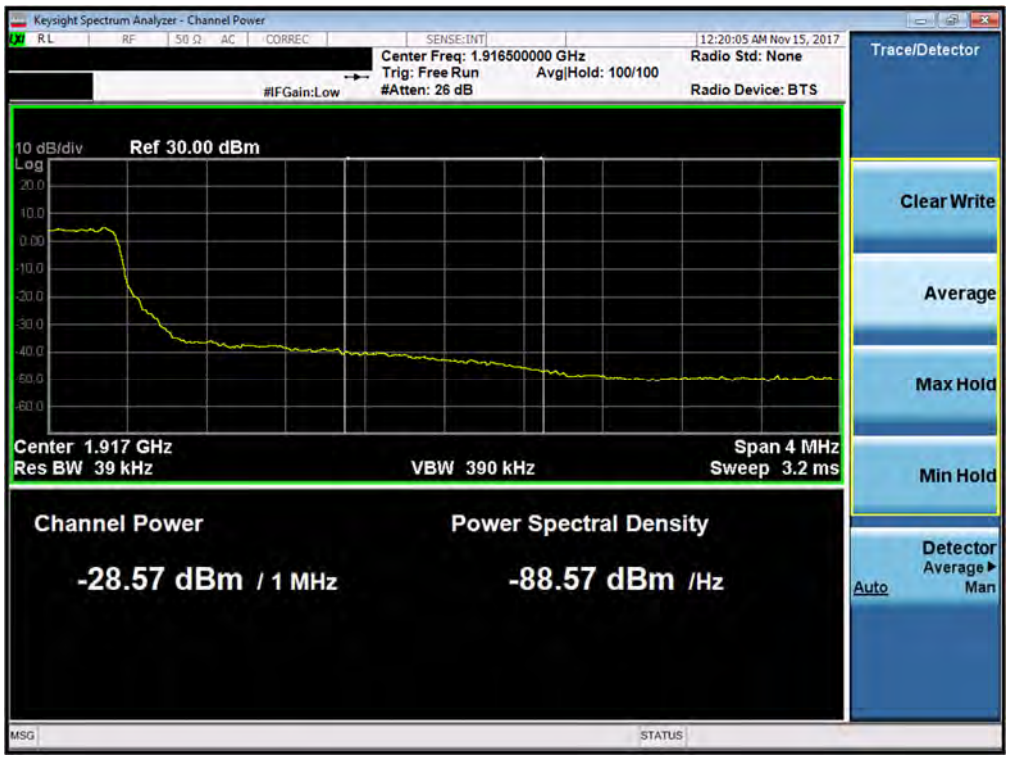
Plot 7-297. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



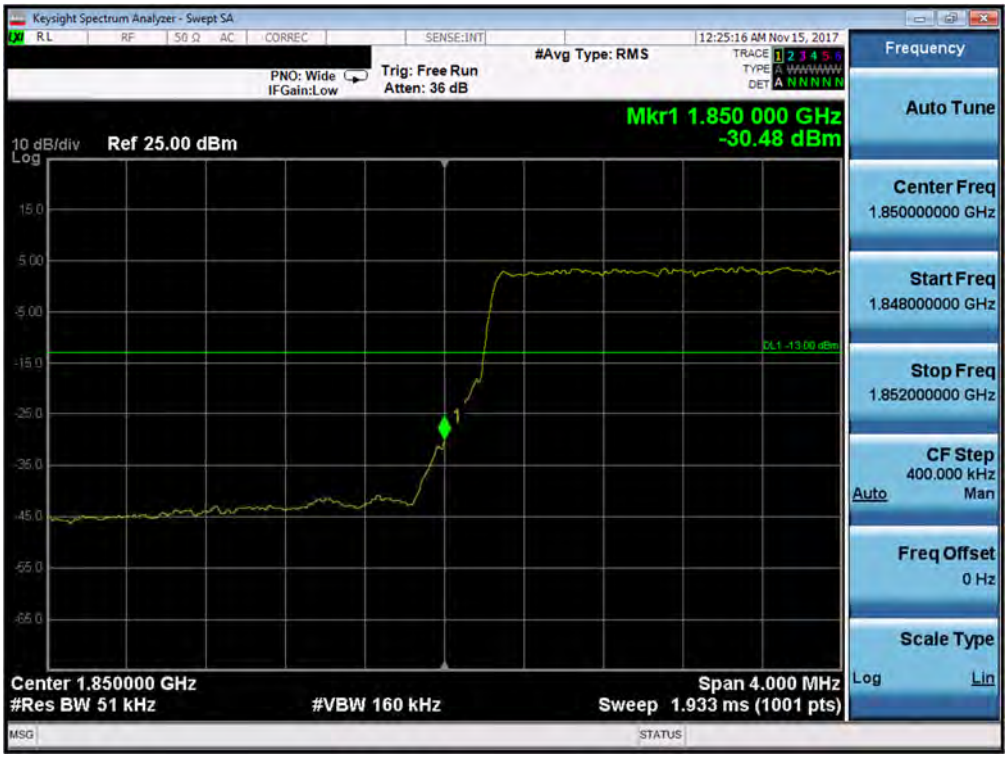
Plot 7-298. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



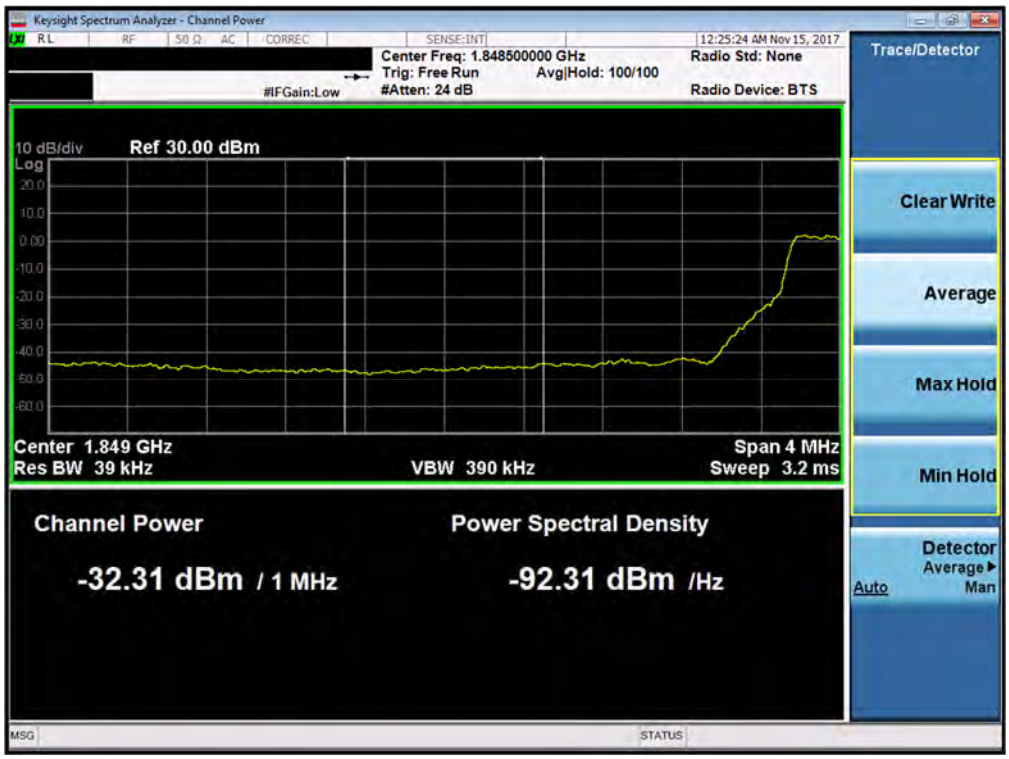
Plot 7-299. Upper Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)



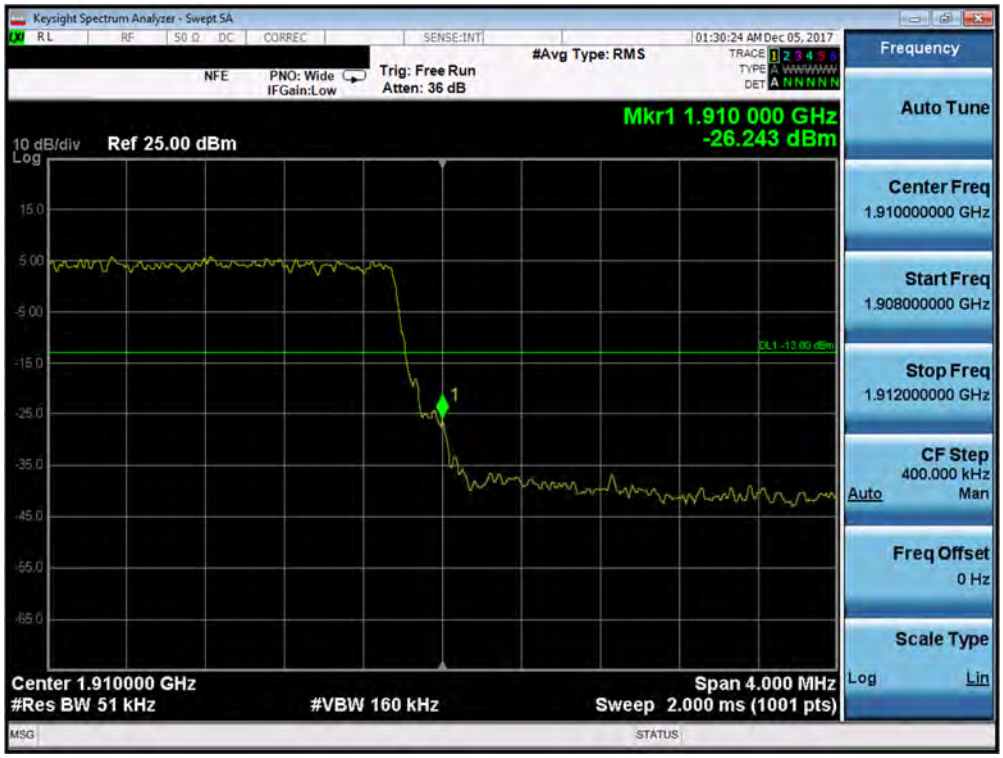
Plot 7-300. Upper Extended Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)



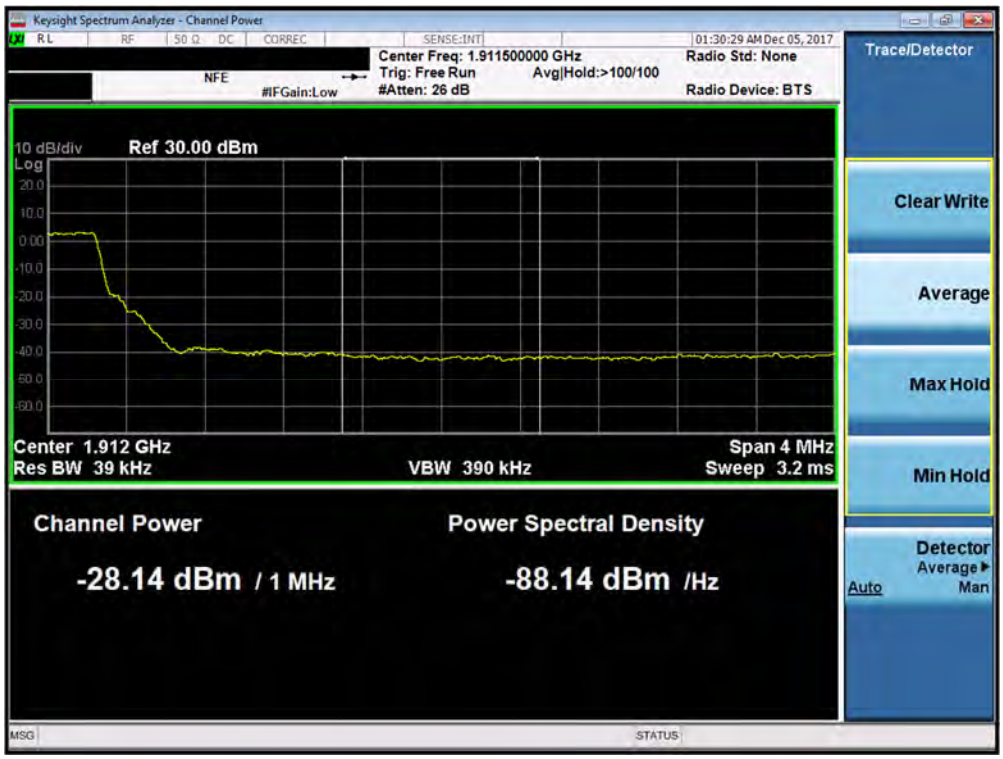
Plot 7-301. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-302. Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

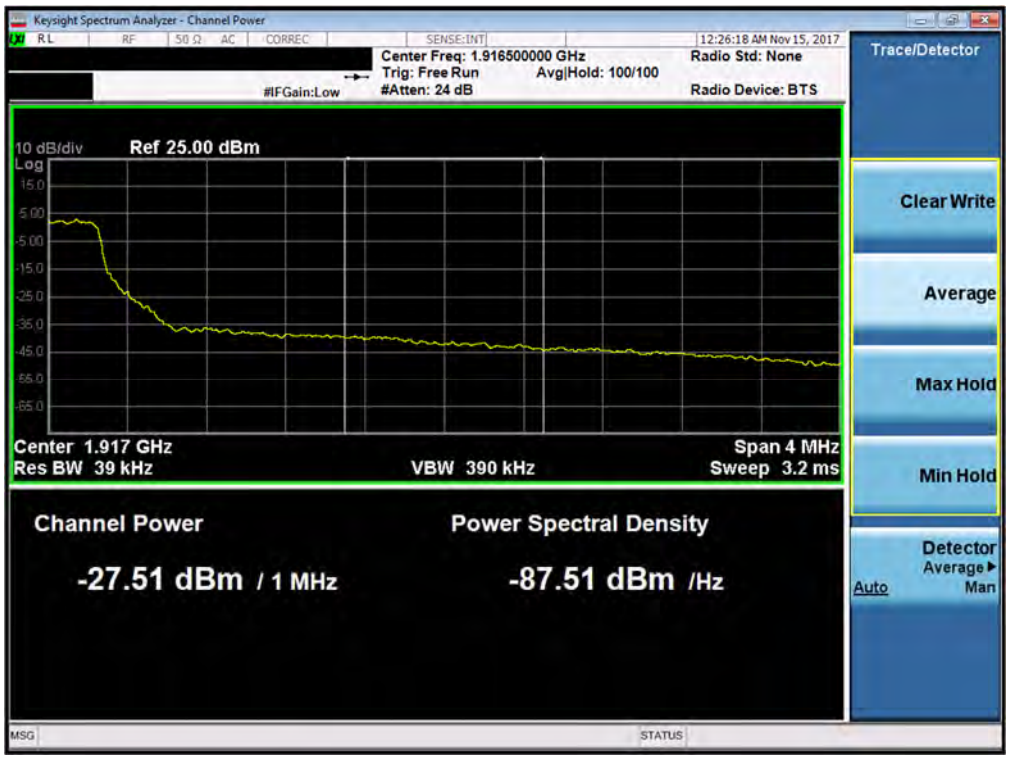


Plot 7-303. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

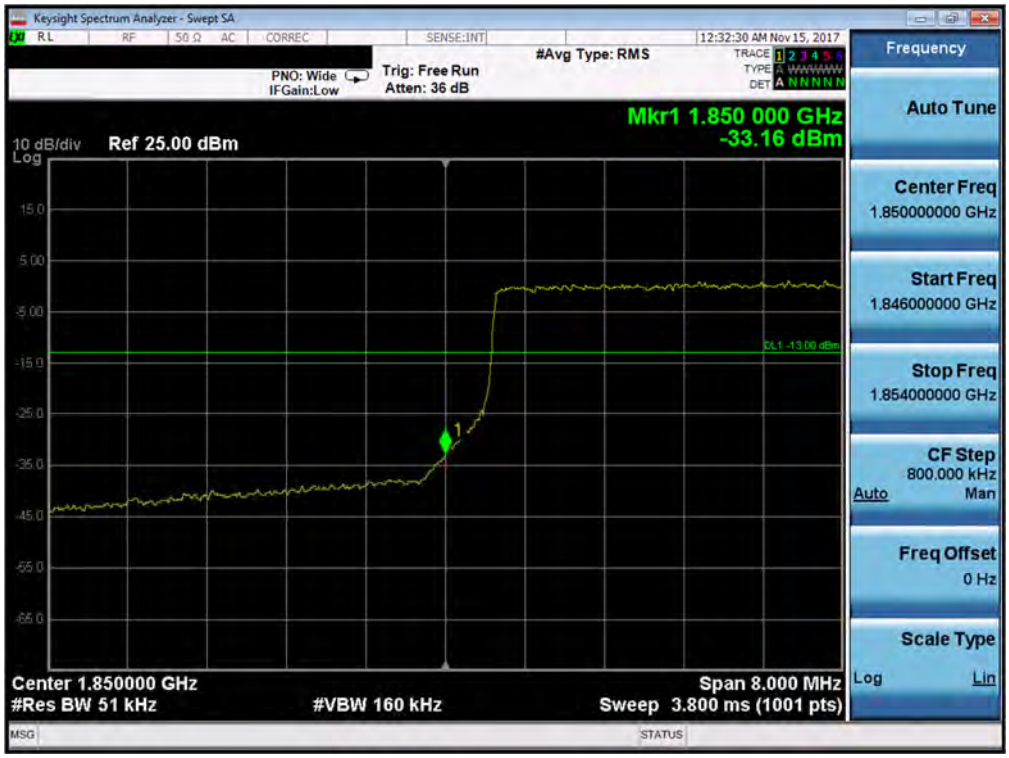


Plot 7-304. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

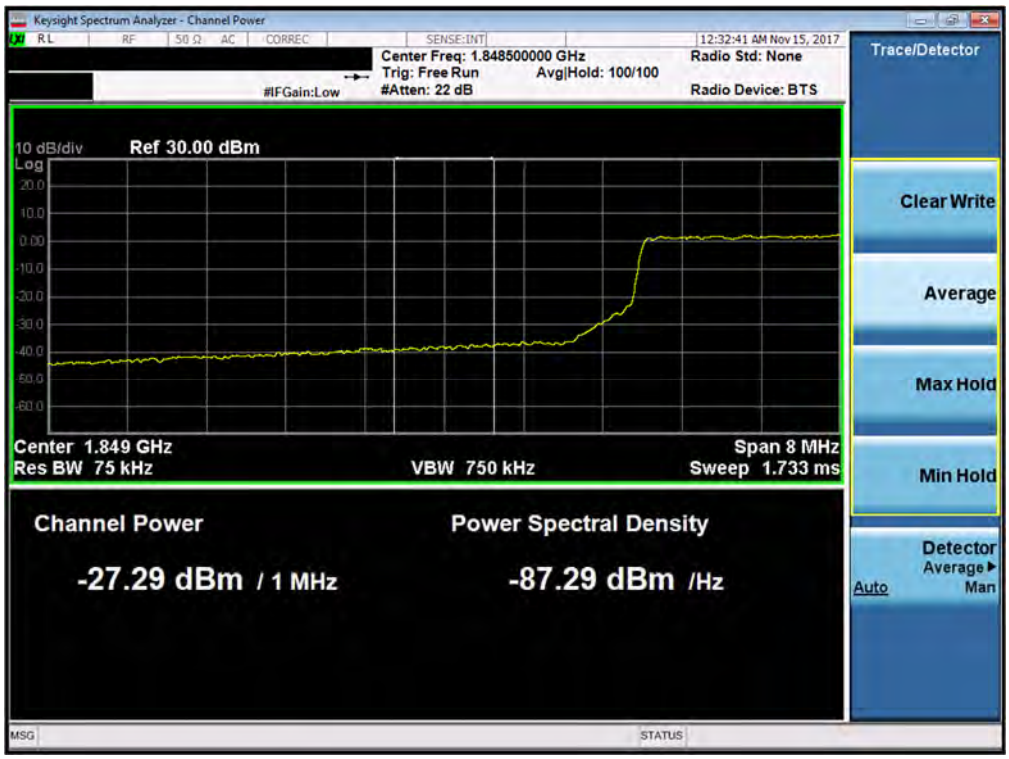
Plot 7-305. Upper Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)



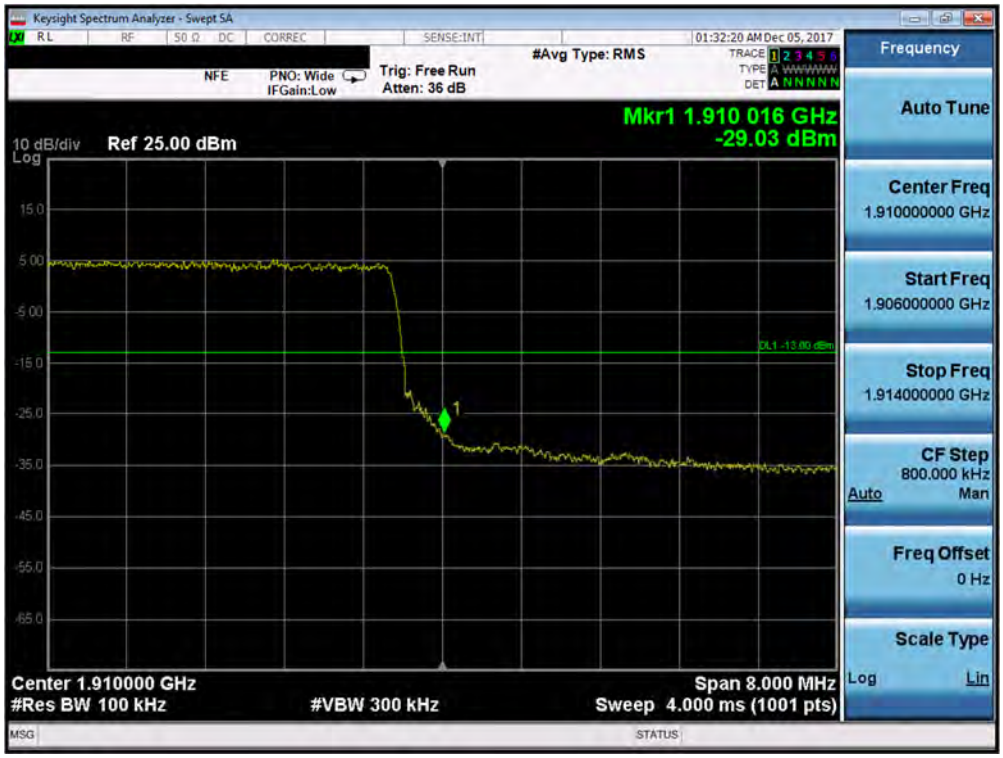
Plot 7-306. Upper Extended Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)



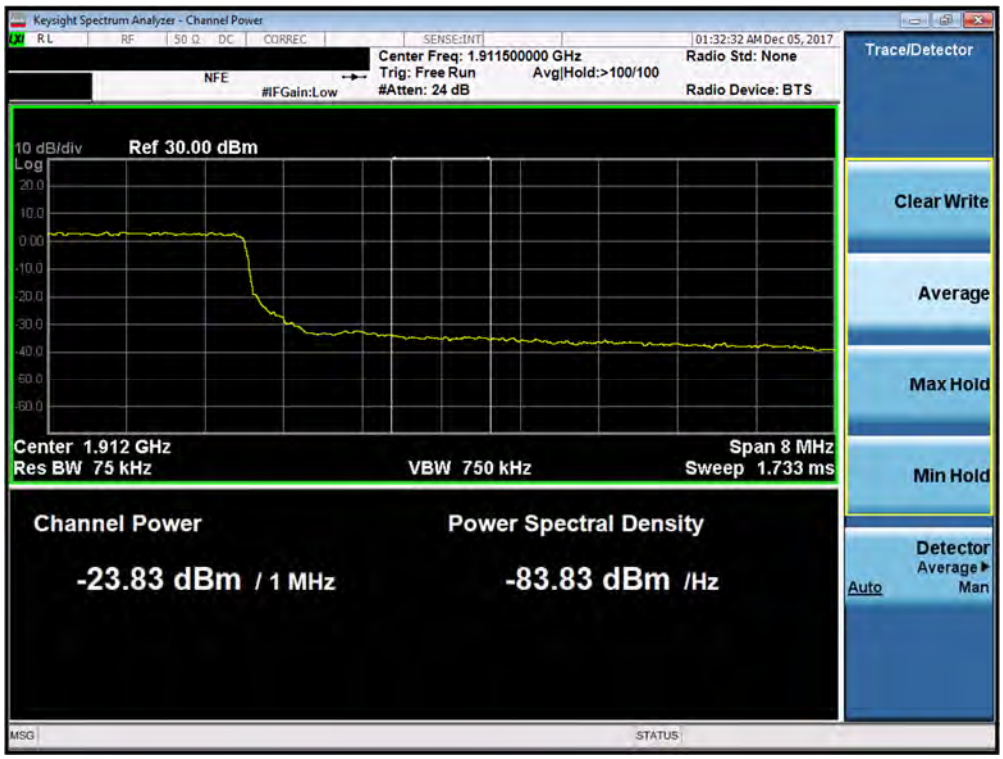
Plot 7-307. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-308. Lower Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

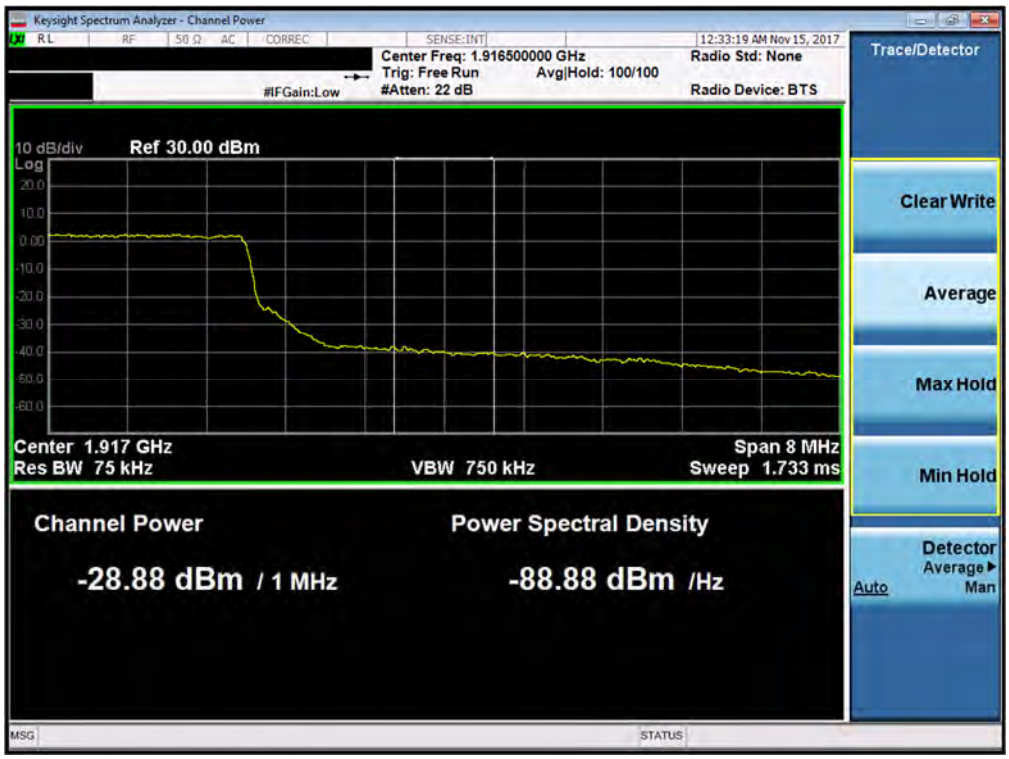


Plot 7-309. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

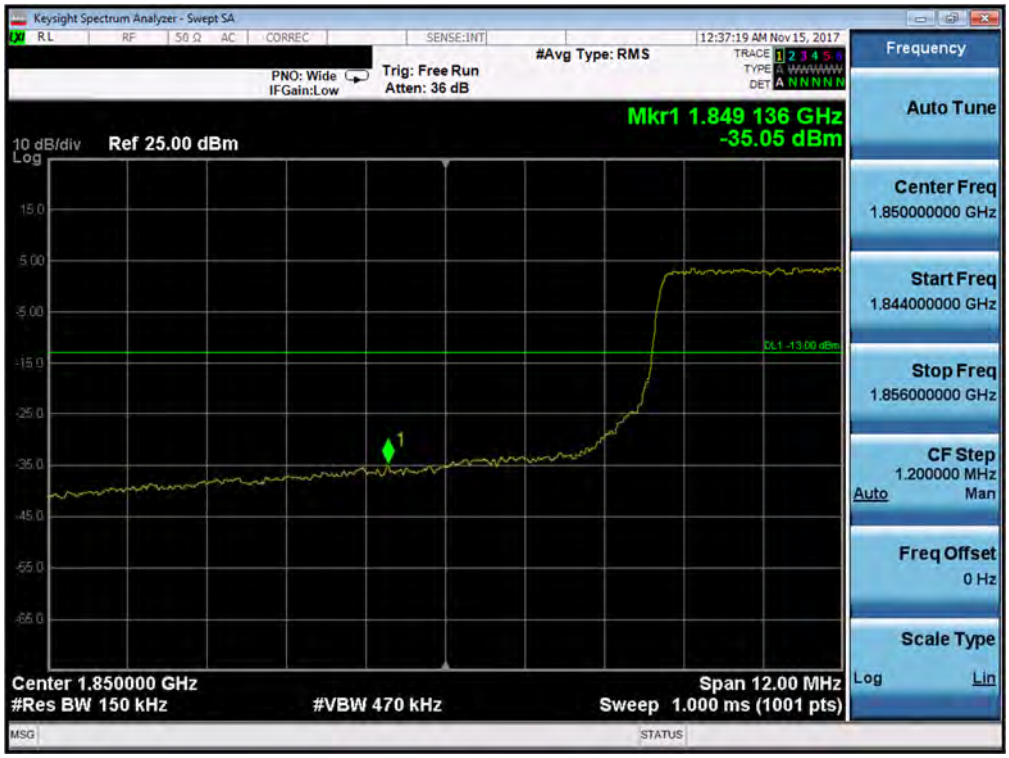


Plot 7-310. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

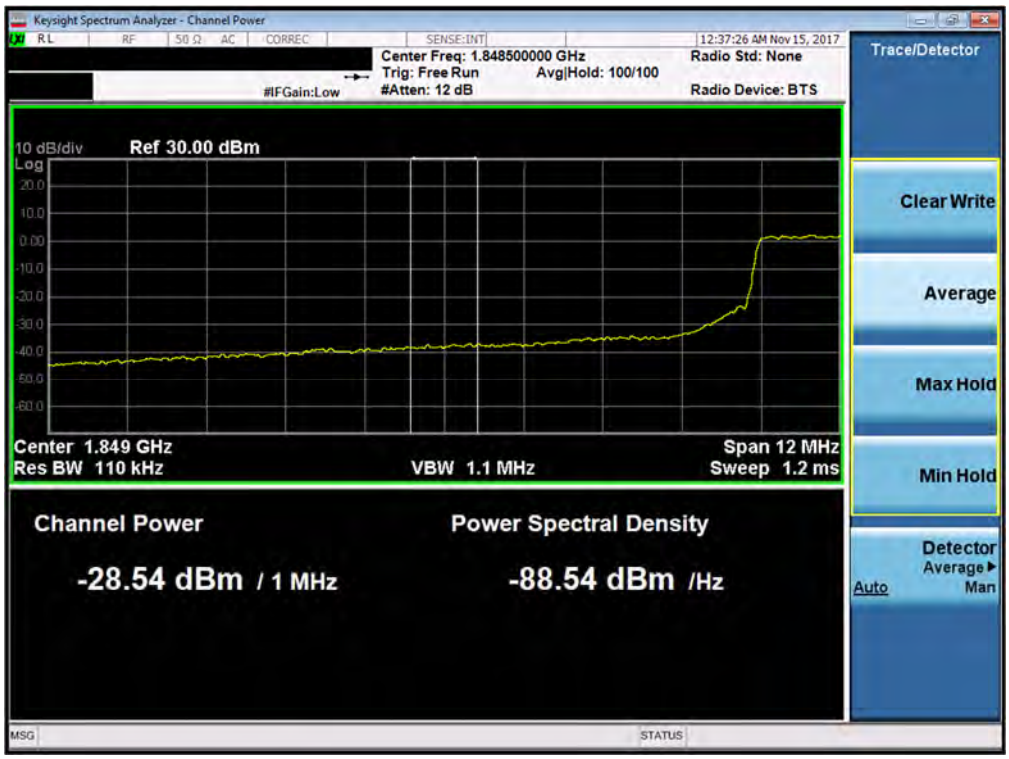
Plot 7-311. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



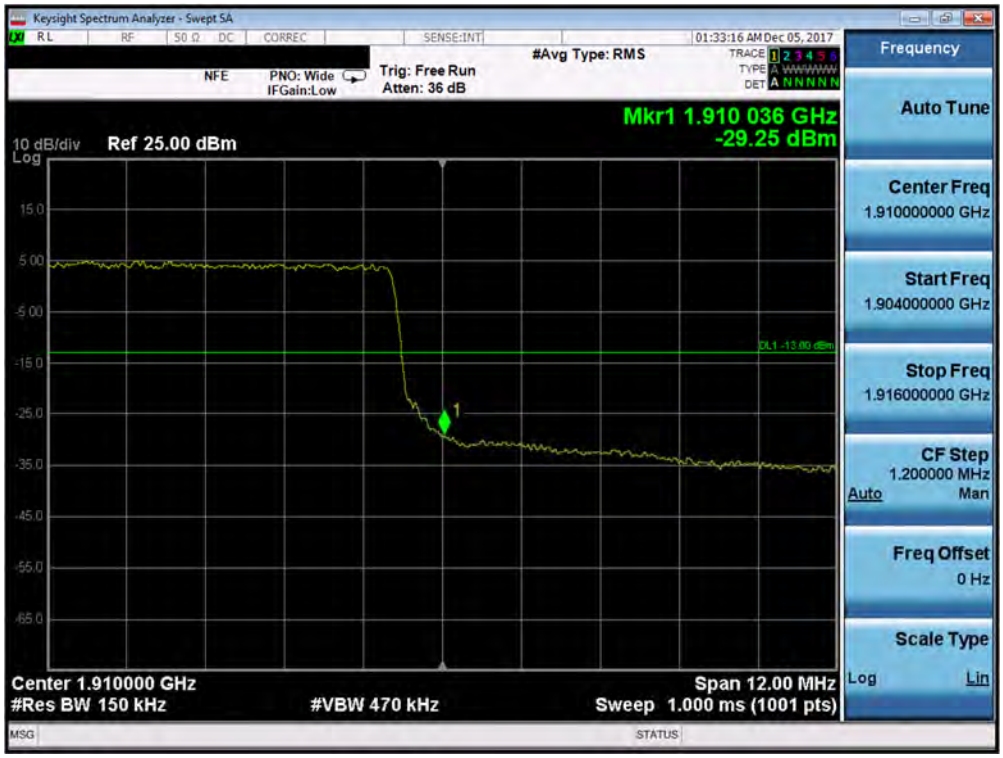
Plot 7-312. Upper Extended Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



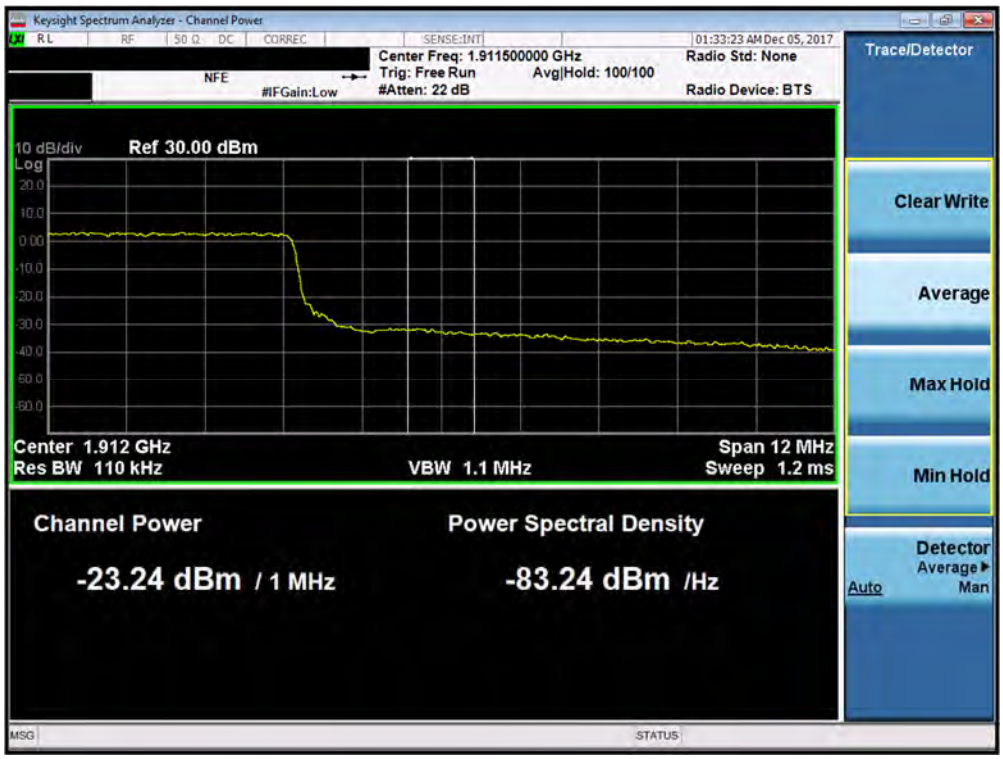
Plot 7-313. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



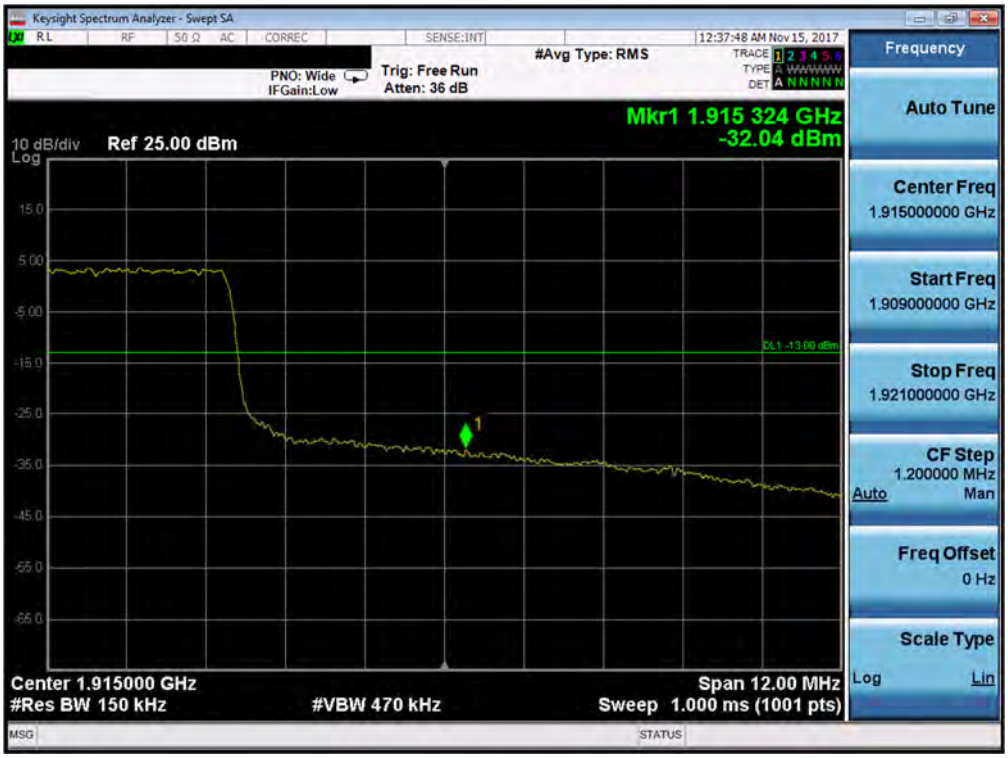
Plot 7-314. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



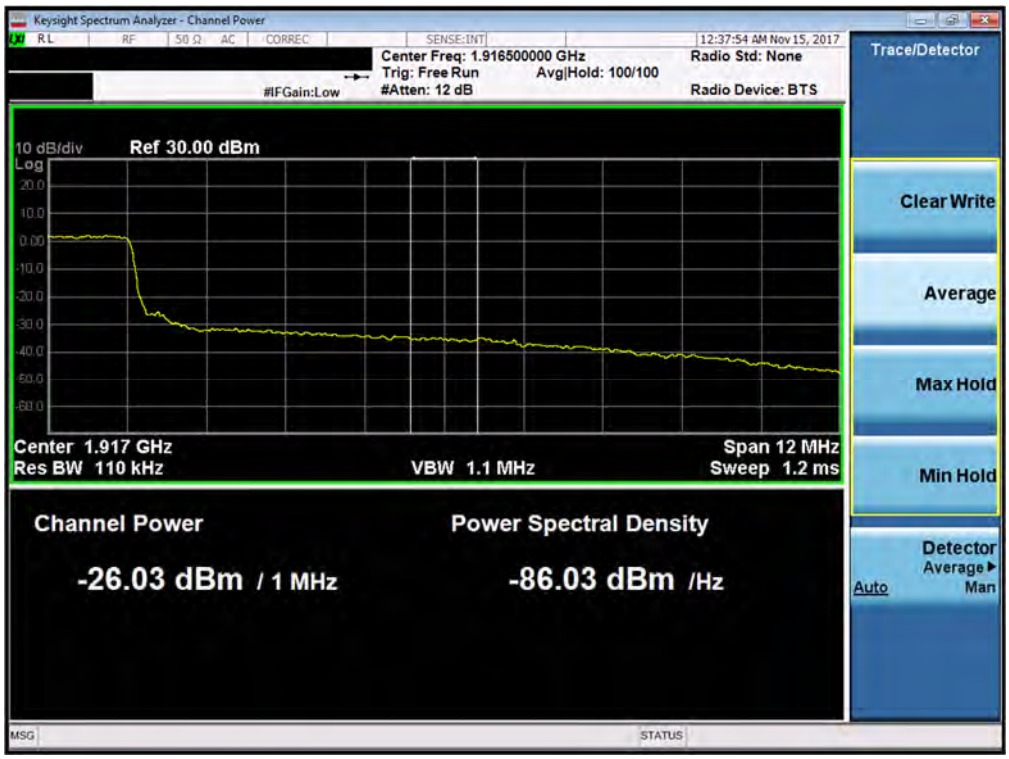
Plot 7-315. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



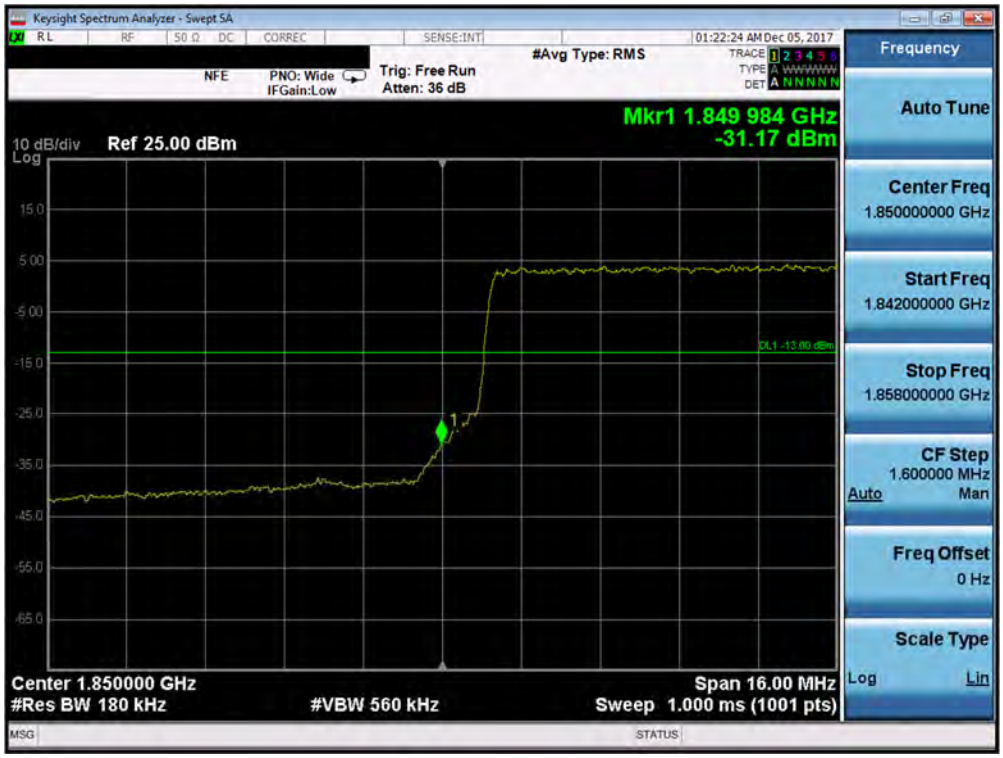
Plot 7-316. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



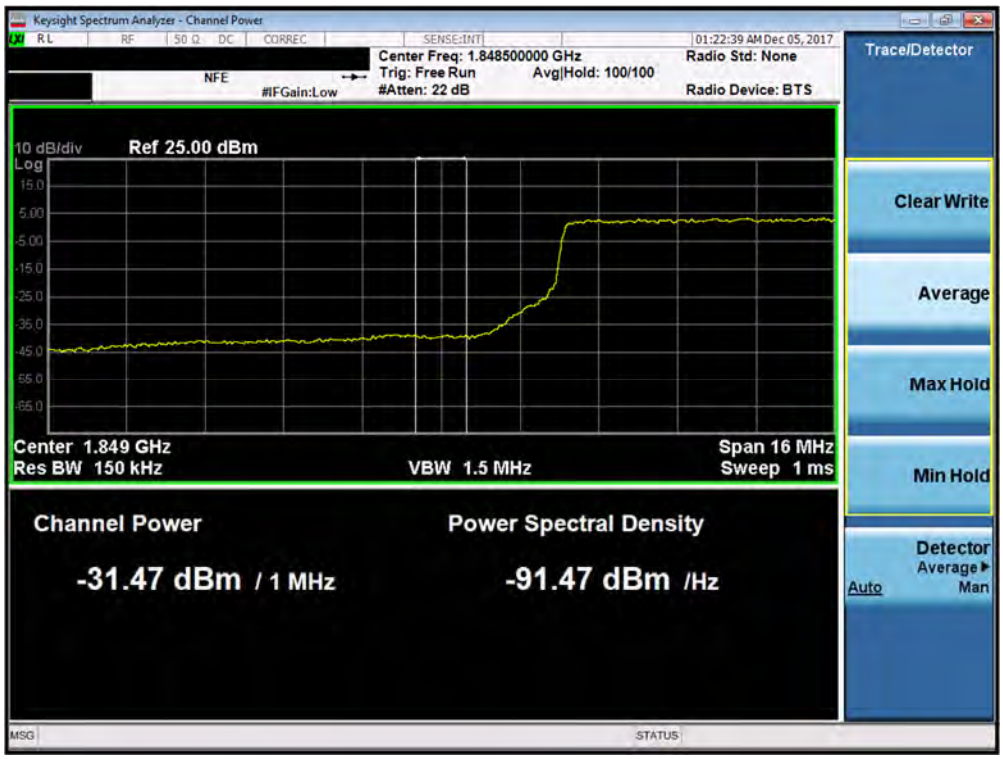
Plot 7-317. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



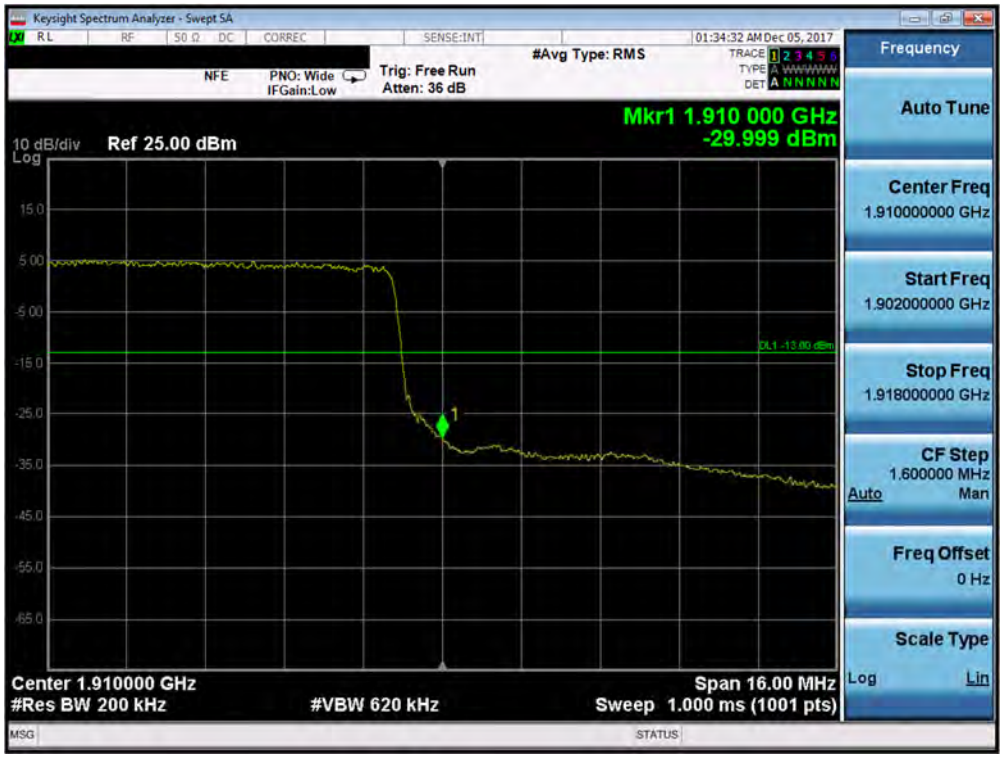
Plot 7-318. Upper Extended Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



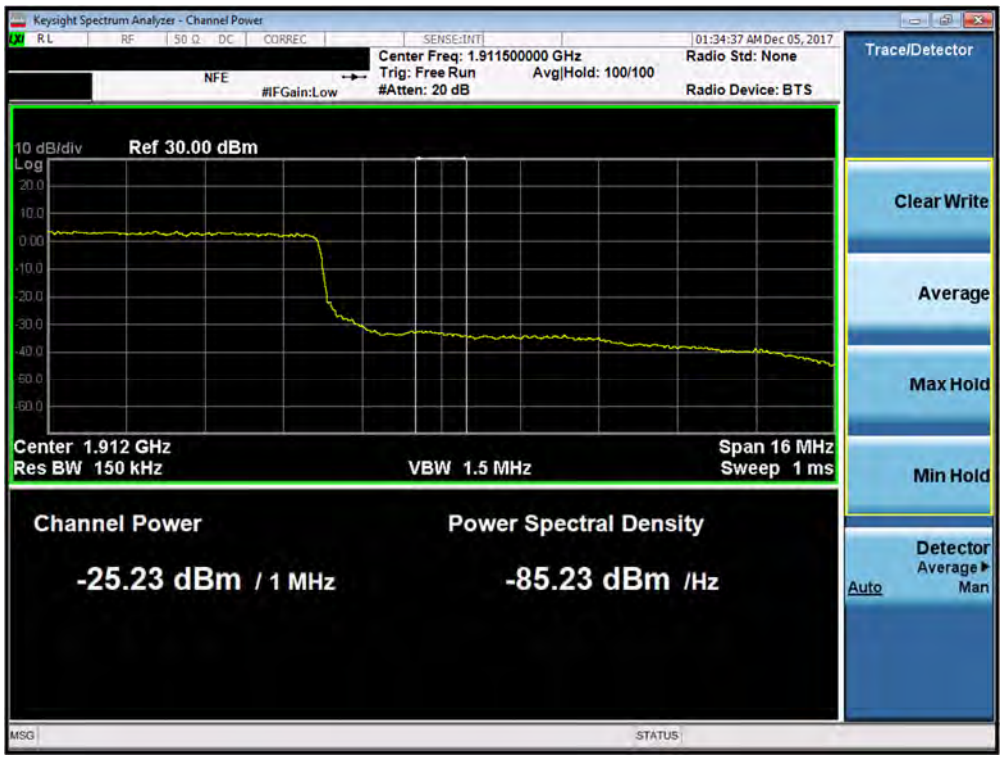
Plot 7-319. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



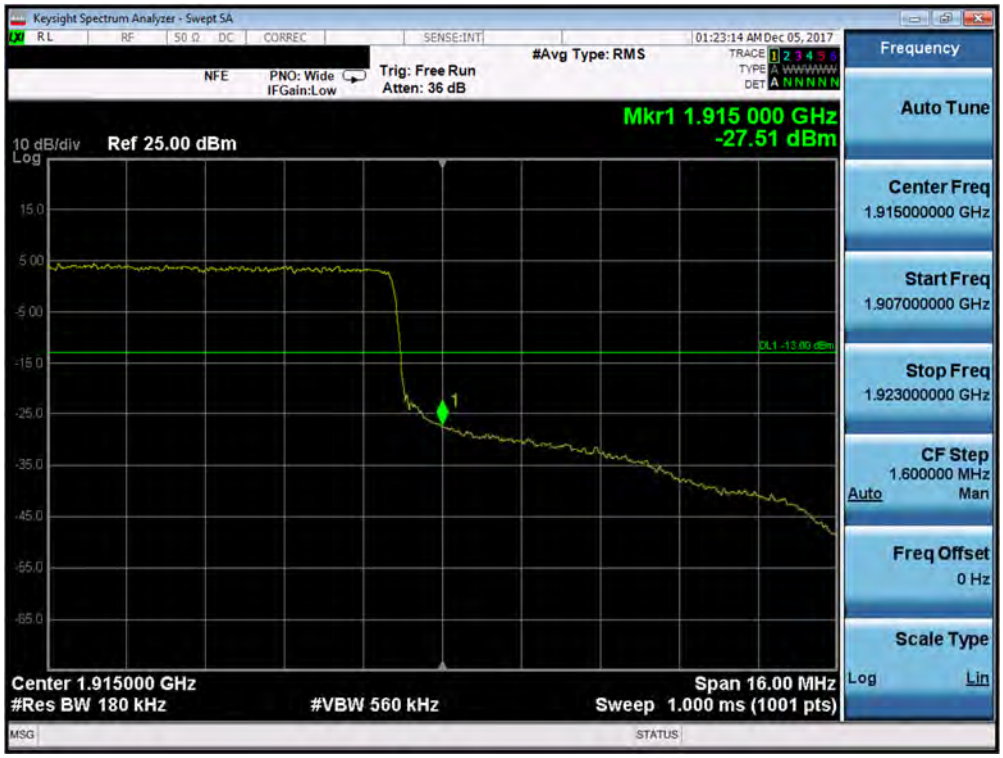
Plot 7-320. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



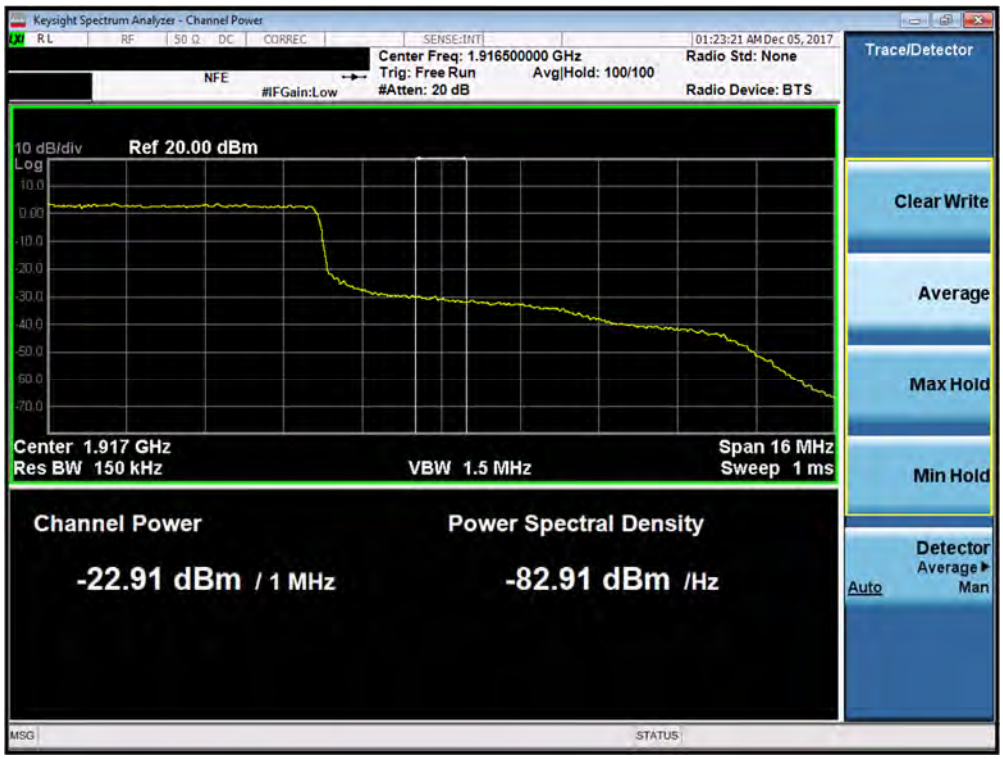
Plot 7-321. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-322. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

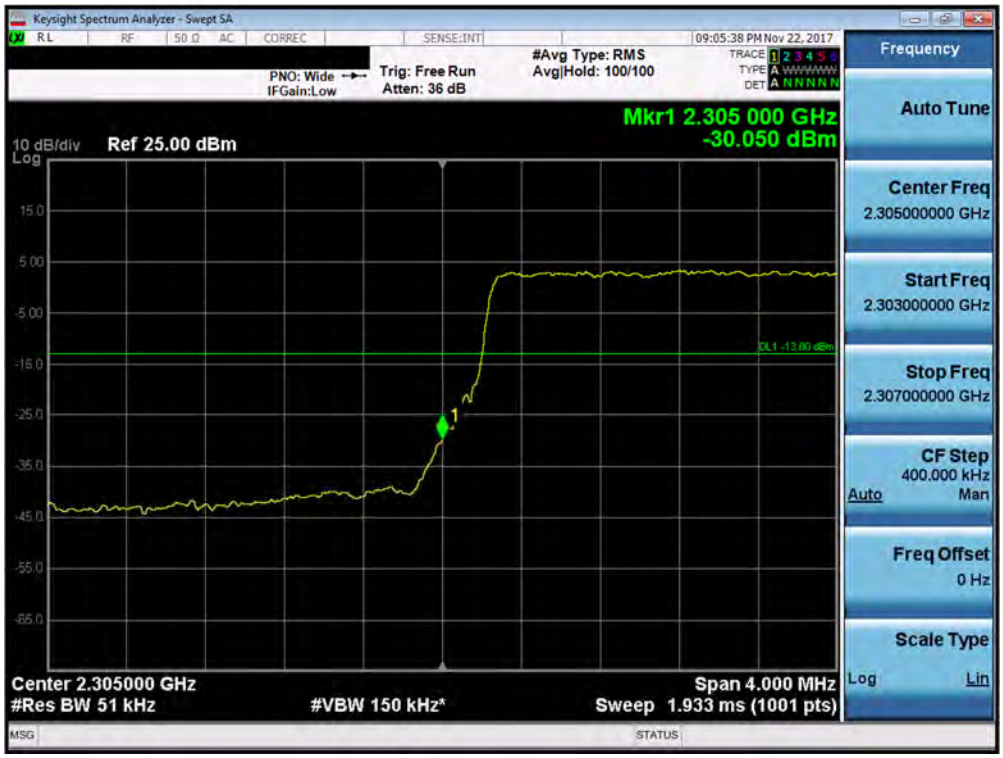


Plot 7-323. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



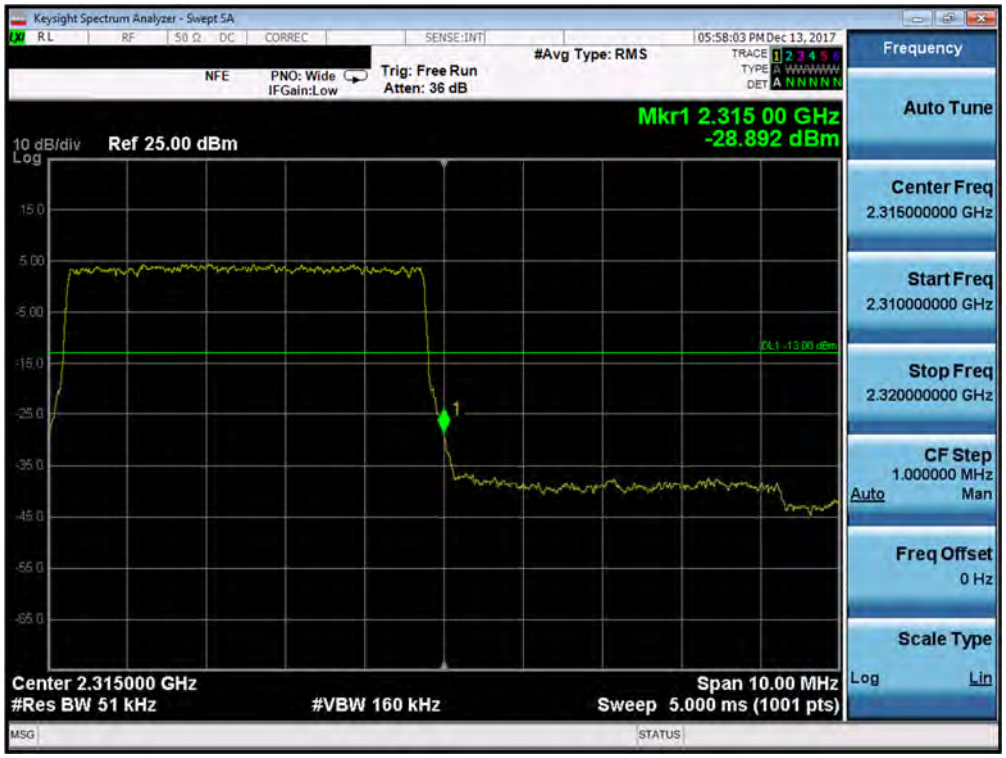
Plot 7-324. Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

Band 30 – Antenna A



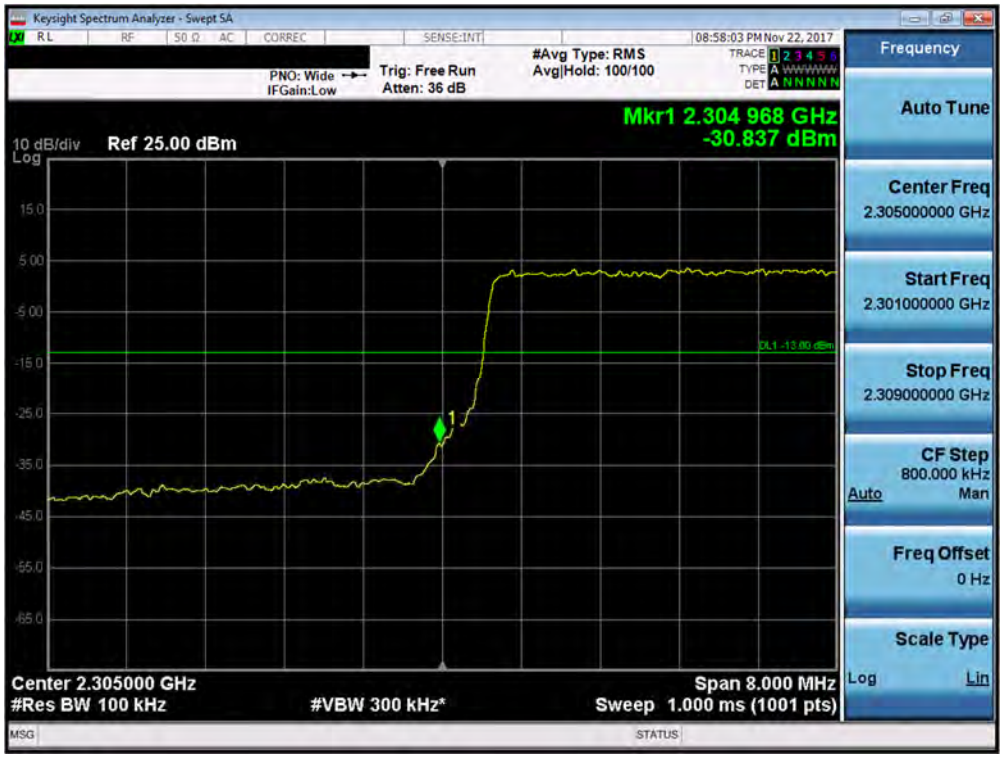
Plot 7-325. Lower Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration – Antenna A)

Plot 7-326. Lower Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration – Antenna A)



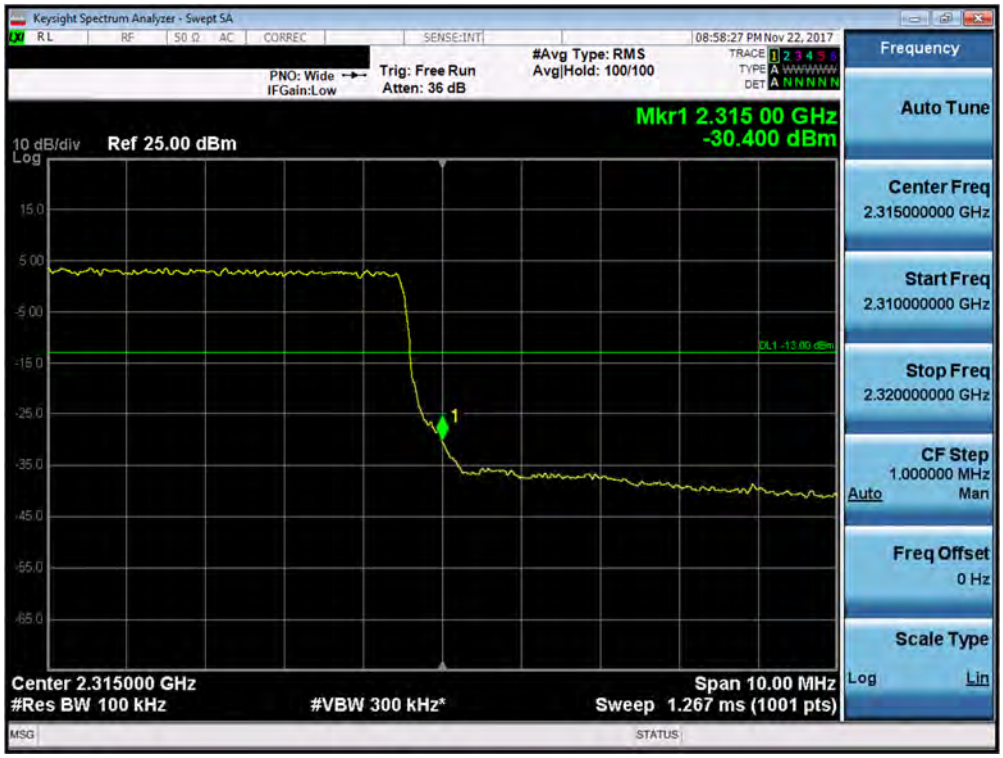
Plot 7-327. Upper Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration – Antenna A)

Plot 7-328. Upper Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration – Antenna A)



Plot 7-329. Lower Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration – Antenna A)

Plot 7-330. Lower Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration–Antenna A)



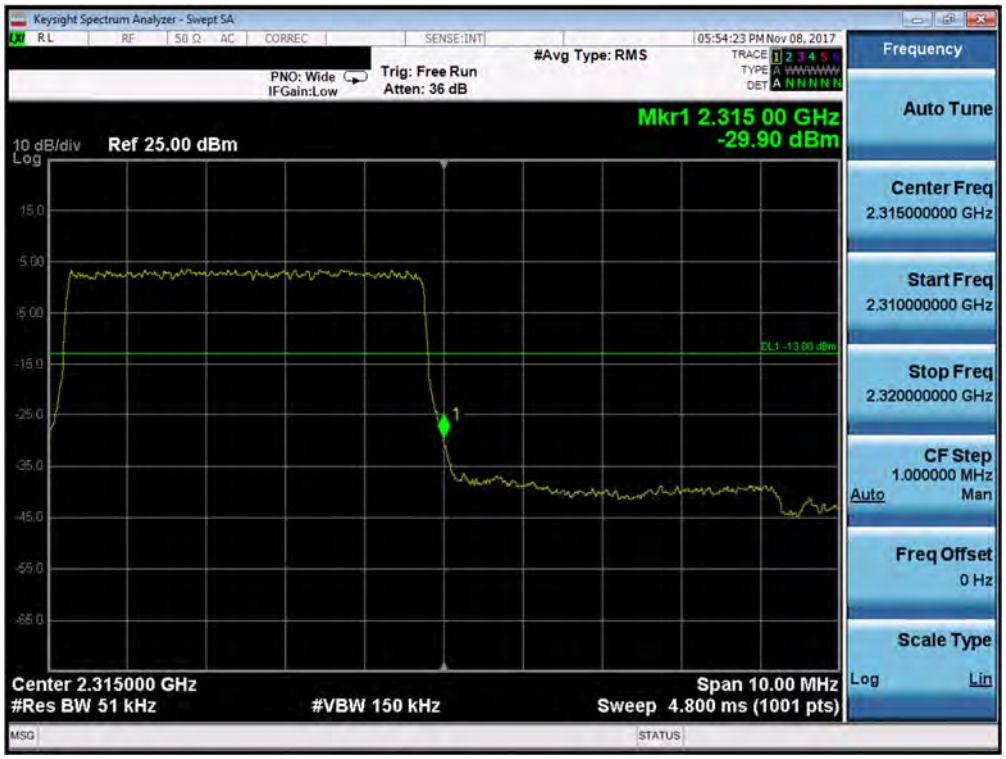
Plot 7-331. Upper Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration – Antenna A)

Plot 7-332. Upper Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration–Antenna A)

Band 30 – Antenna B

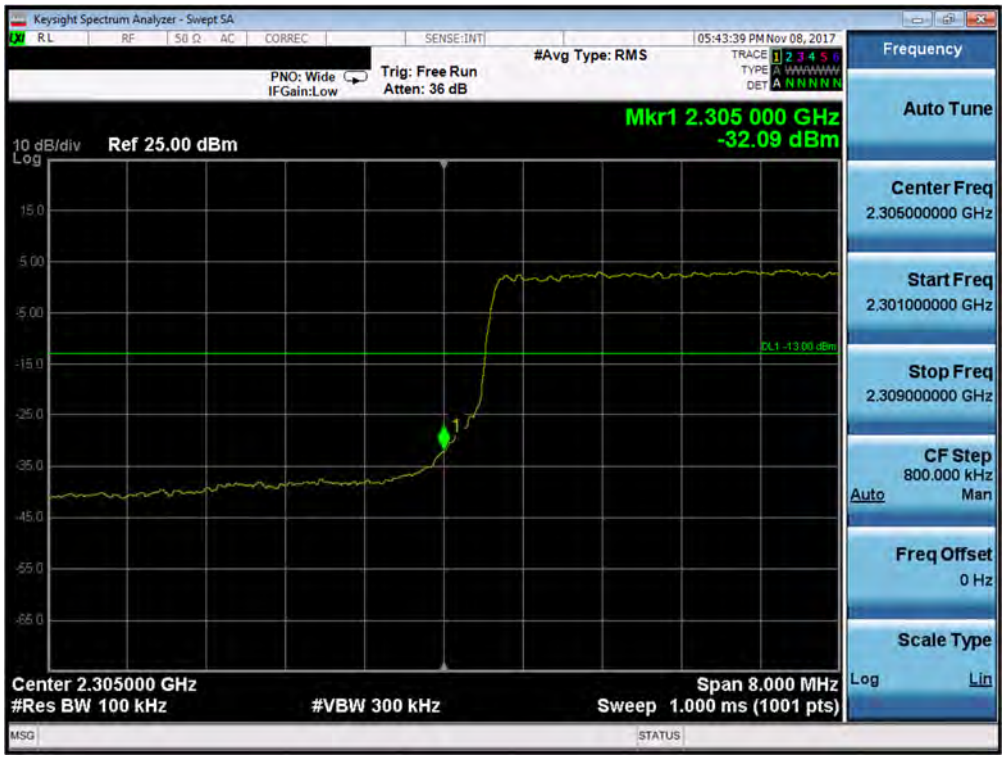
Plot 7-333. Lower Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration – Antenna B)

Plot 7-334. Lower Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration – Antenna B)



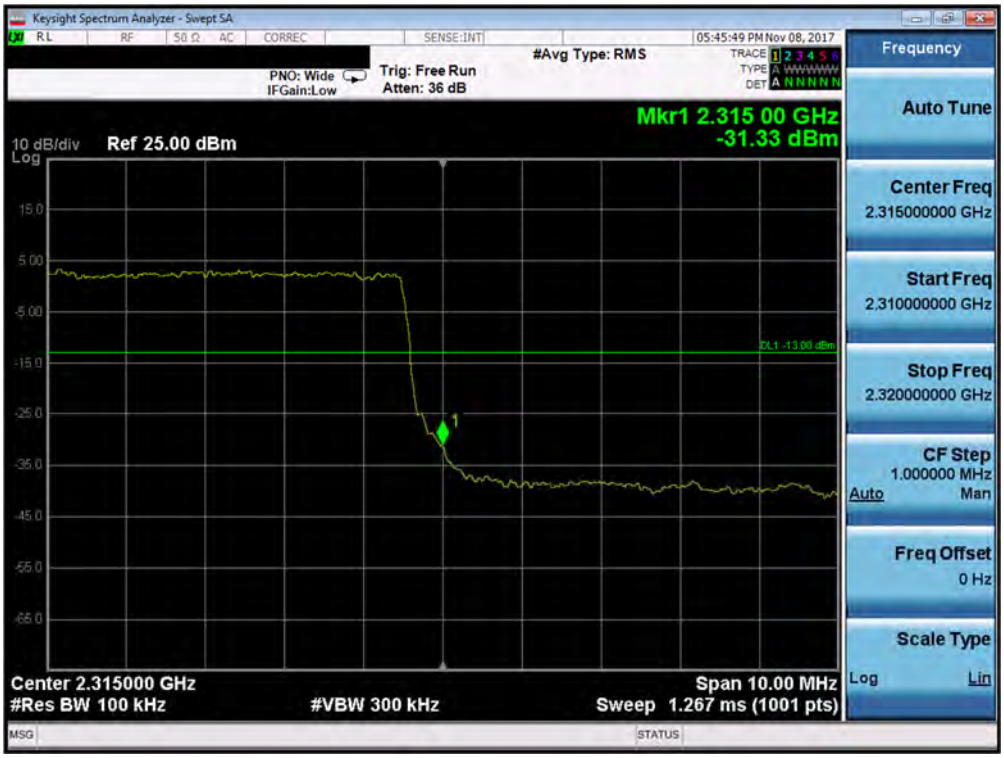
Plot 7-335. Upper Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration – Antenna B)

Plot 7-336. Upper Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration – Antenna B)



Plot 7-337. Lower Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration – Antenna B)

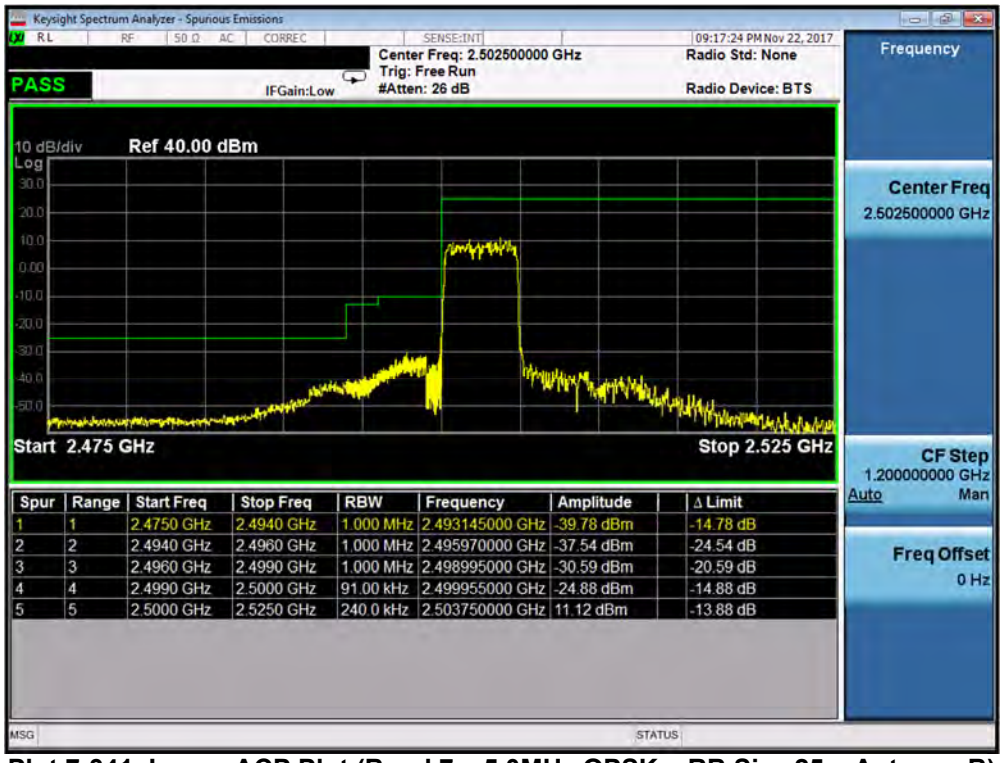
Plot 7-338. Lower Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration–Antenna B)



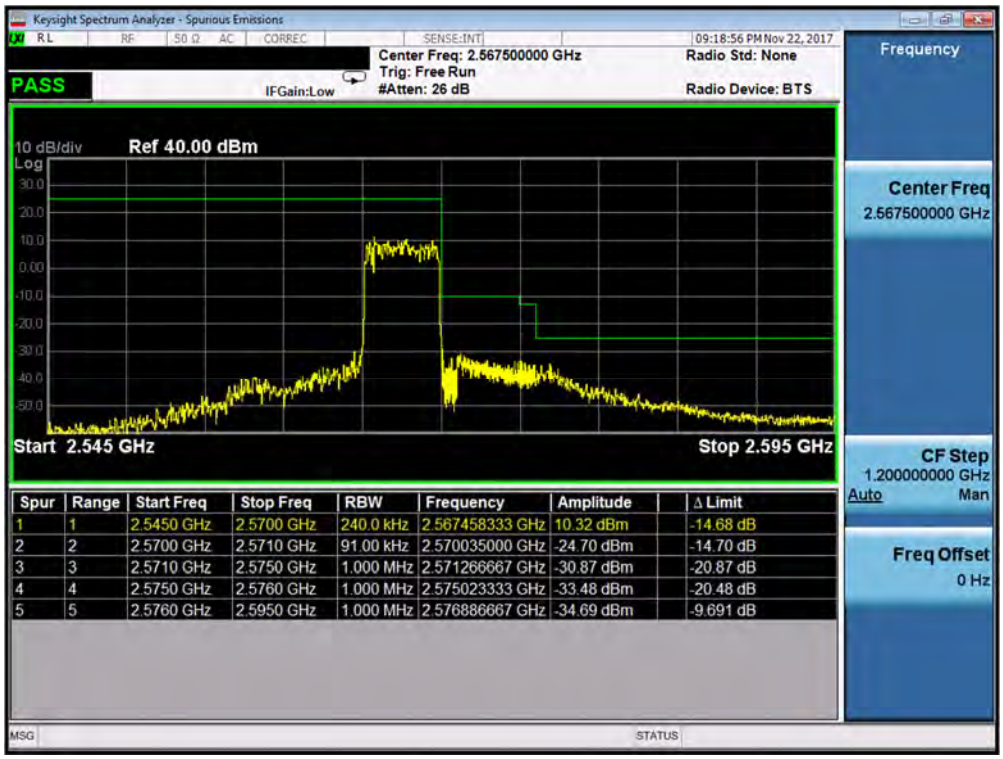
Plot 7-339. Upper Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration – Antenna B)

Plot 7-340. Upper Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration–Antenna B)

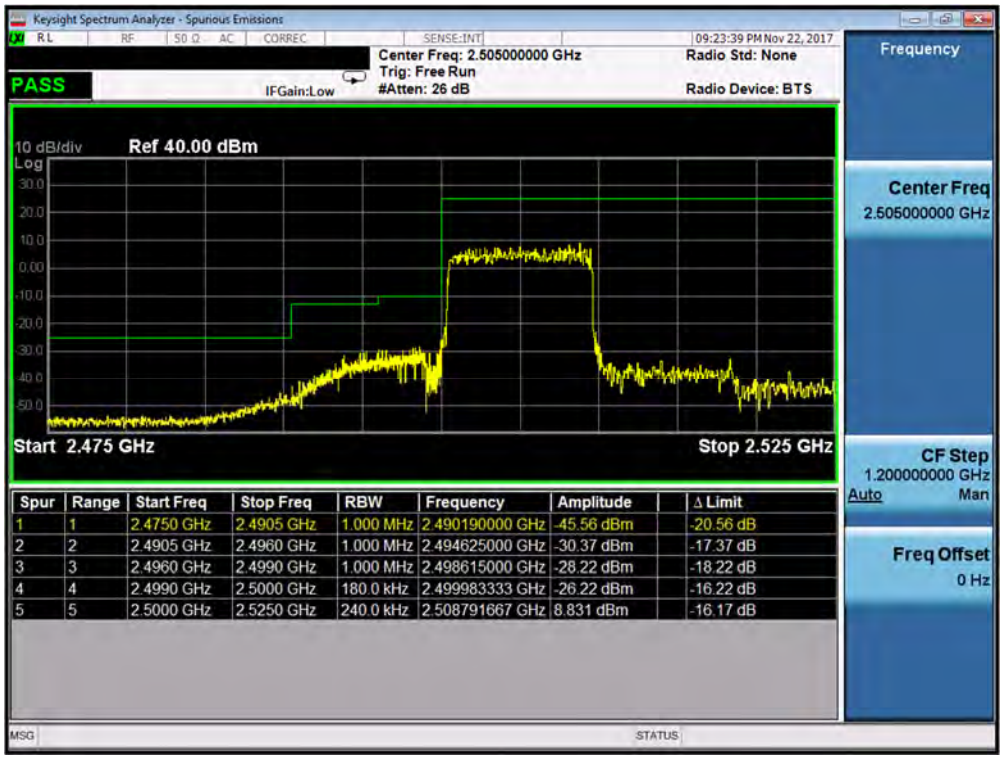
Band 7 – Antenna A



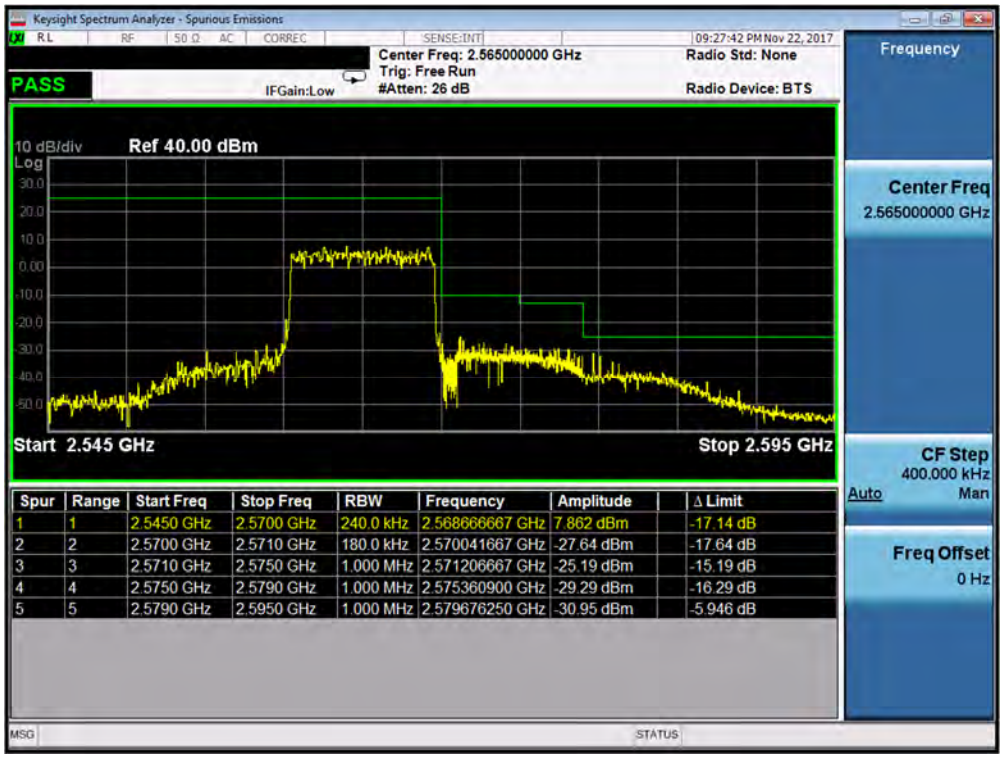
Plot 7-341. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25 – Antenna B)



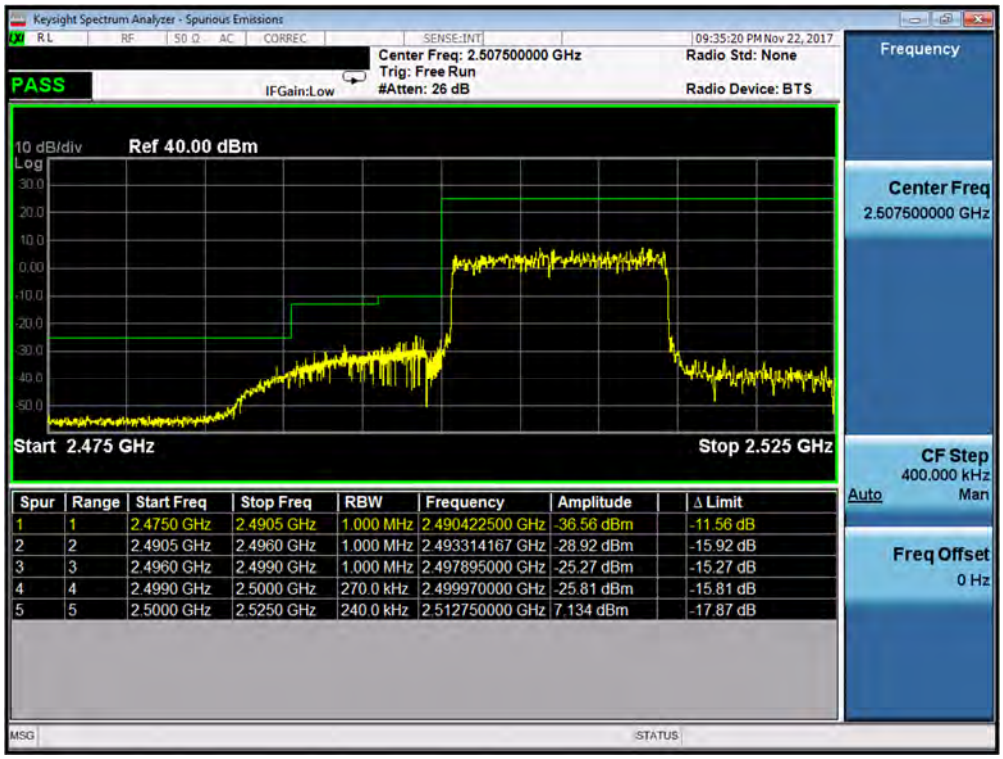
Plot 7-342. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25 – Antenna A)



Plot 7-343. Lower ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50 – Antenna A)

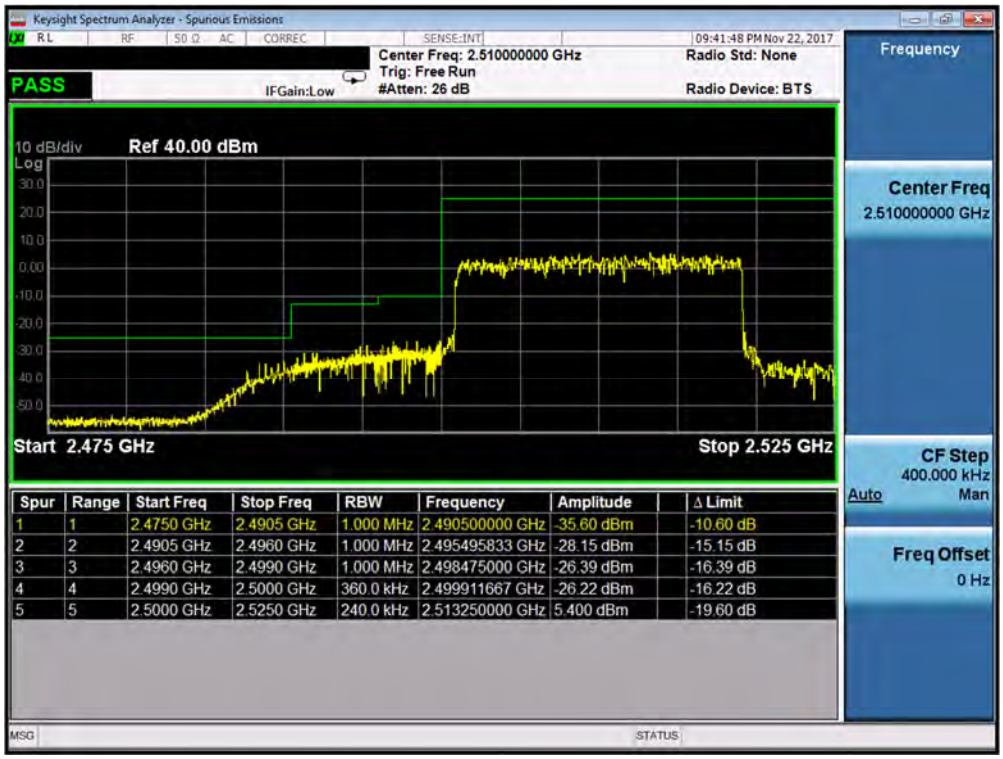


Plot 7-344. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50 – Antenna A)



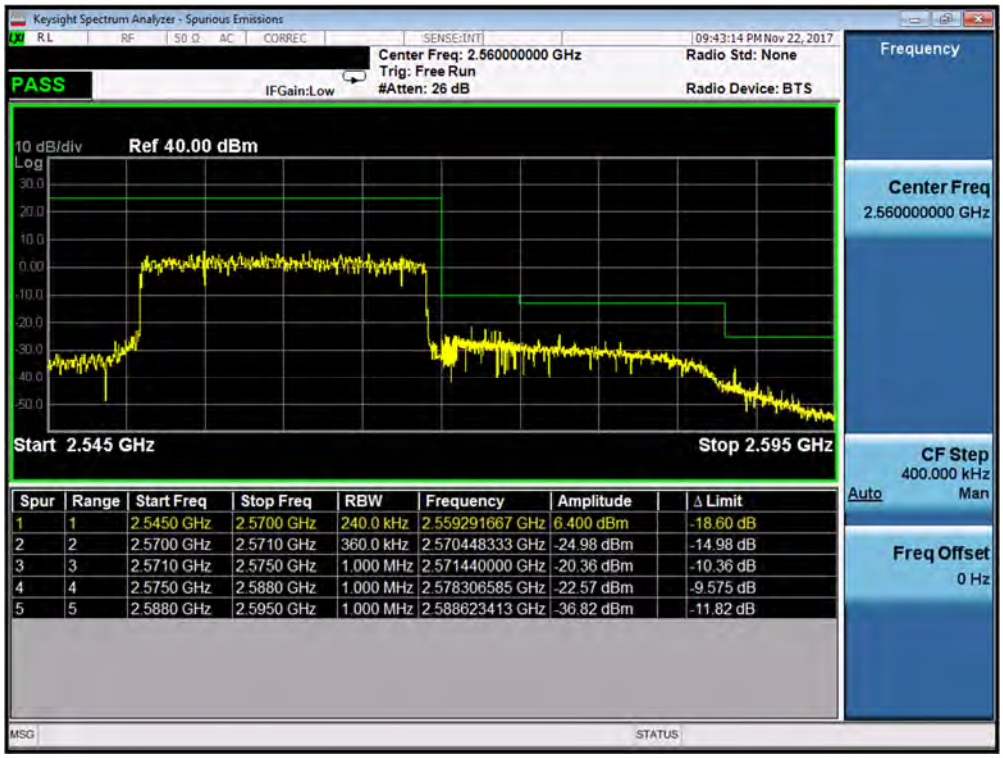
Plot 7-345. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75 – Antenna A)

Plot 7-346. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75 – Antenna A)



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	-35.60 dBm	-10.60 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495495833 GHz	-28.15 dBm	-15.15 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498475000 GHz	-26.39 dBm	-16.39 dB
4	4	2.4990 GHz	2.5000 GHz	360.0 kHz	2.499911667 GHz	-26.22 dBm	-16.22 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.513250000 GHz	5.400 dBm	-19.60 dB

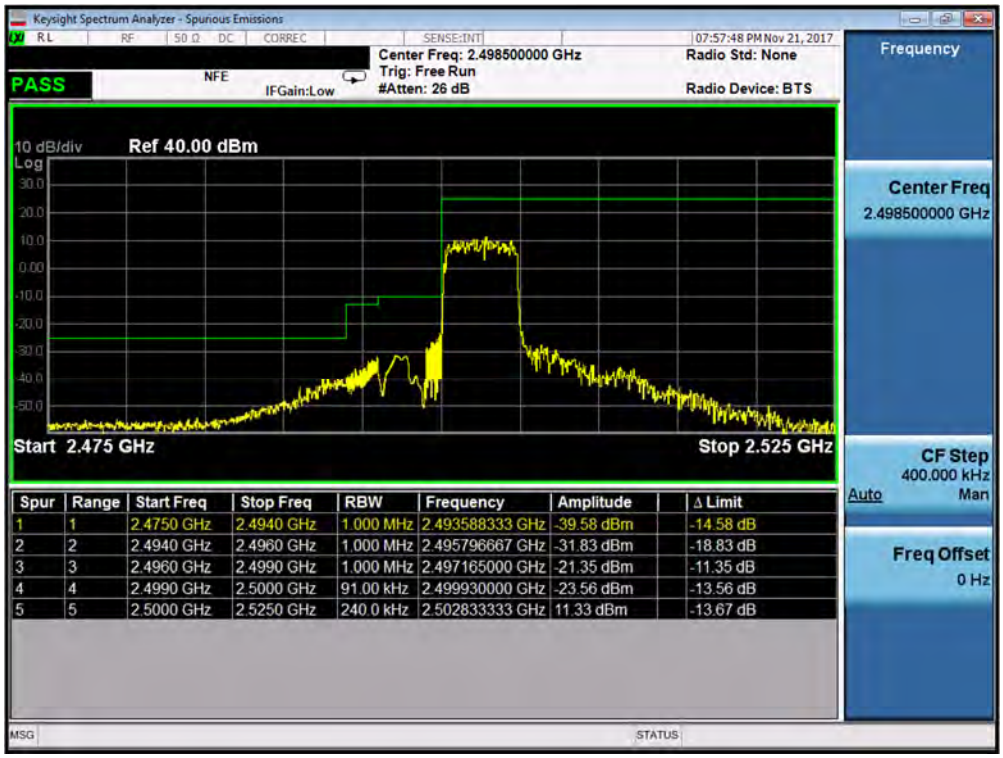
Plot 7-347. Lower ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100 – Antenna A)



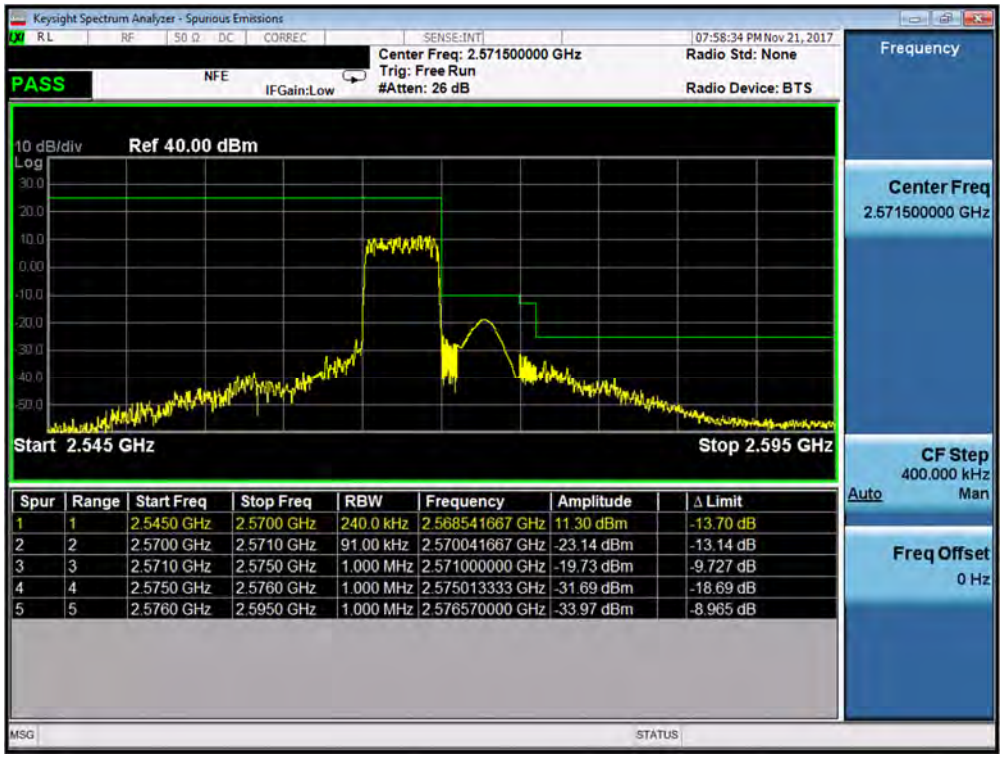
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.559291667 GHz	6.400 dBm	-18.60 dB
2	2	2.5700 GHz	2.5710 GHz	360.0 kHz	2.570448333 GHz	-24.98 dBm	-14.98 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571440000 GHz	-20.36 dBm	-10.36 dB
4	4	2.5750 GHz	2.5880 GHz	1.000 MHz	2.578306585 GHz	-22.57 dBm	-9.575 dB
5	5	2.5880 GHz	2.5950 GHz	1.000 MHz	2.588623413 GHz	-36.82 dBm	-11.82 dB

Plot 7-348. Upper ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100 – Antenna A)

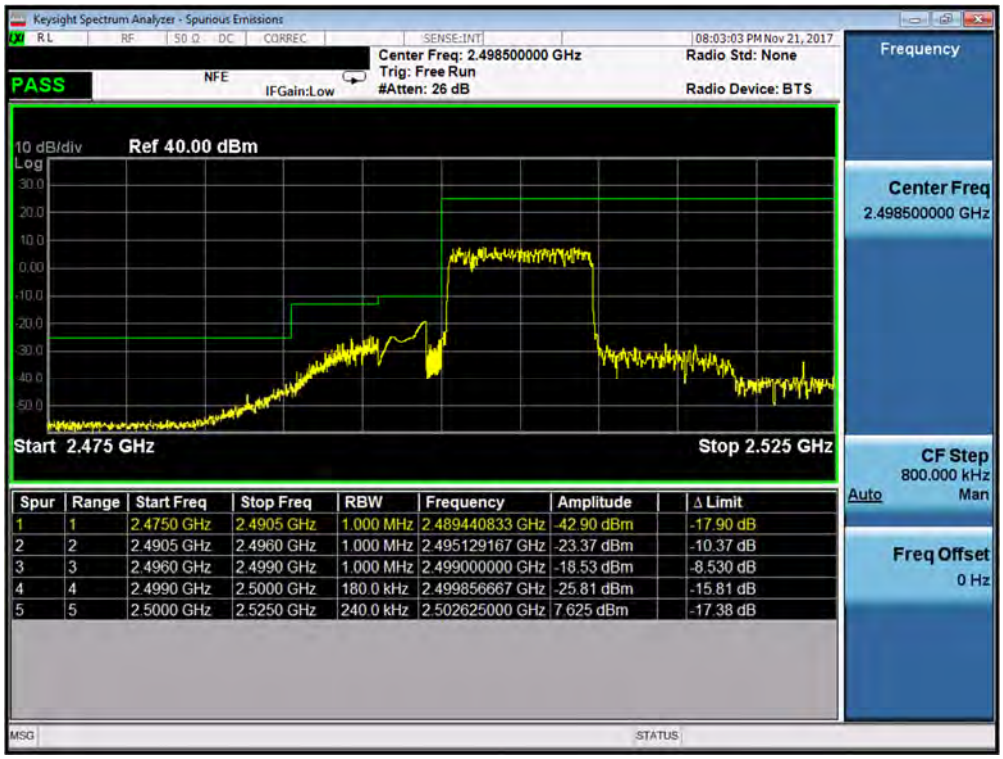
Band 7 – Antenna B



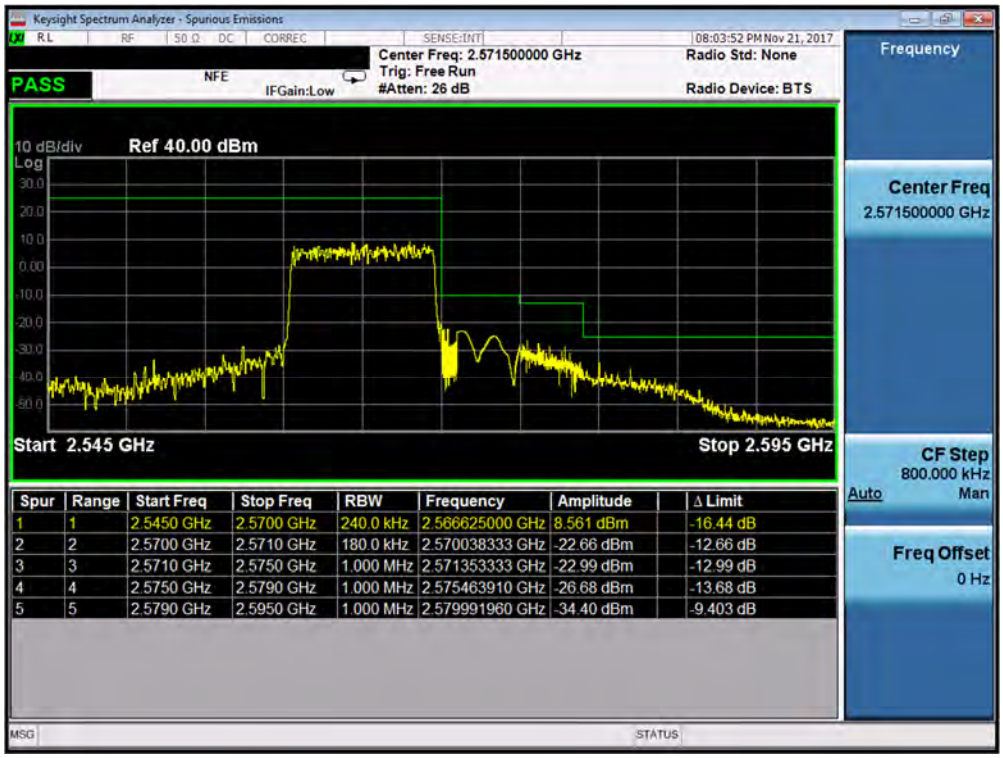
Plot 7-349. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25 – Antenna B)



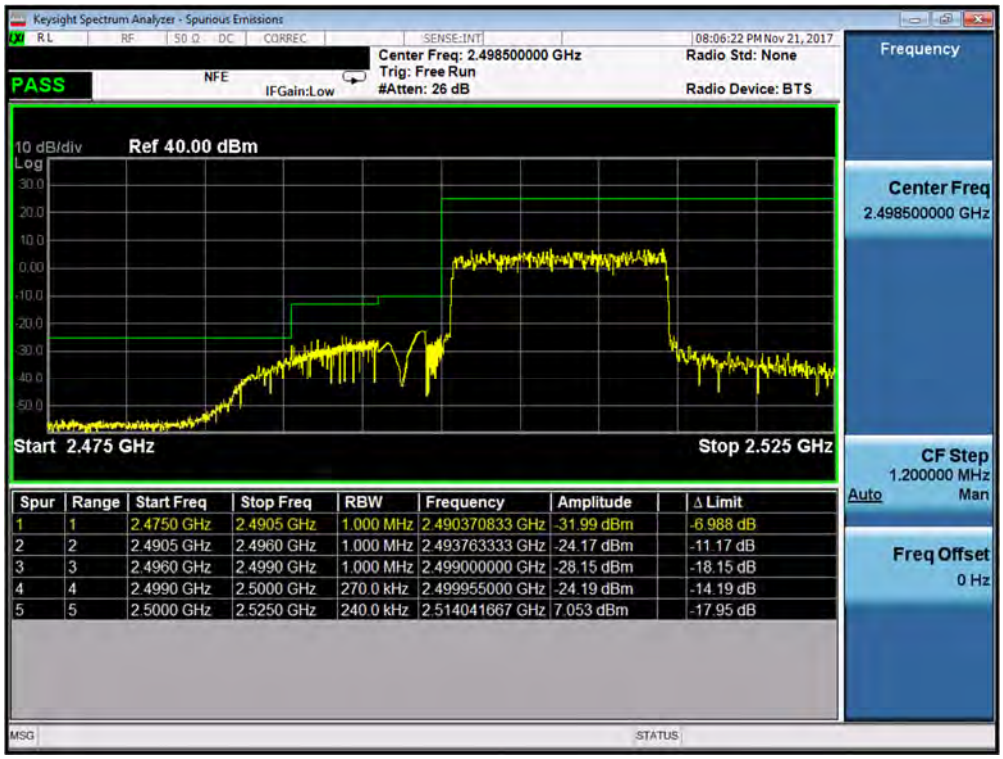
Plot 7-350. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25 – Antenna B)



Plot 7-351. Lower ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50 – Antenna B)

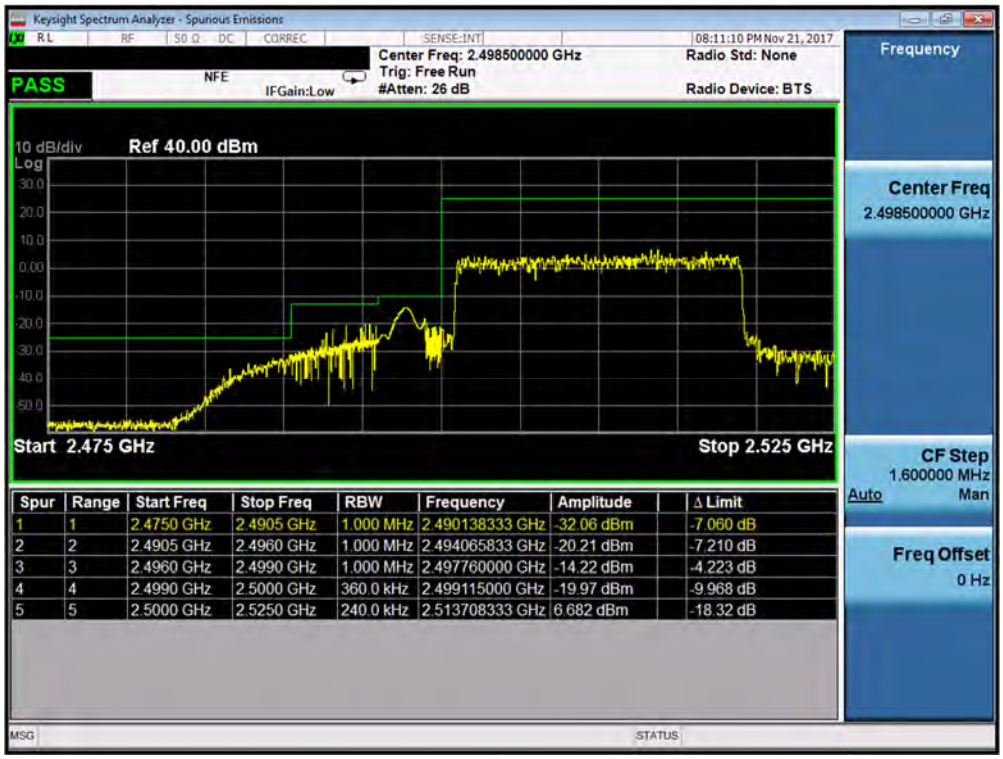


Plot 7-352. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50 – Antenna B)

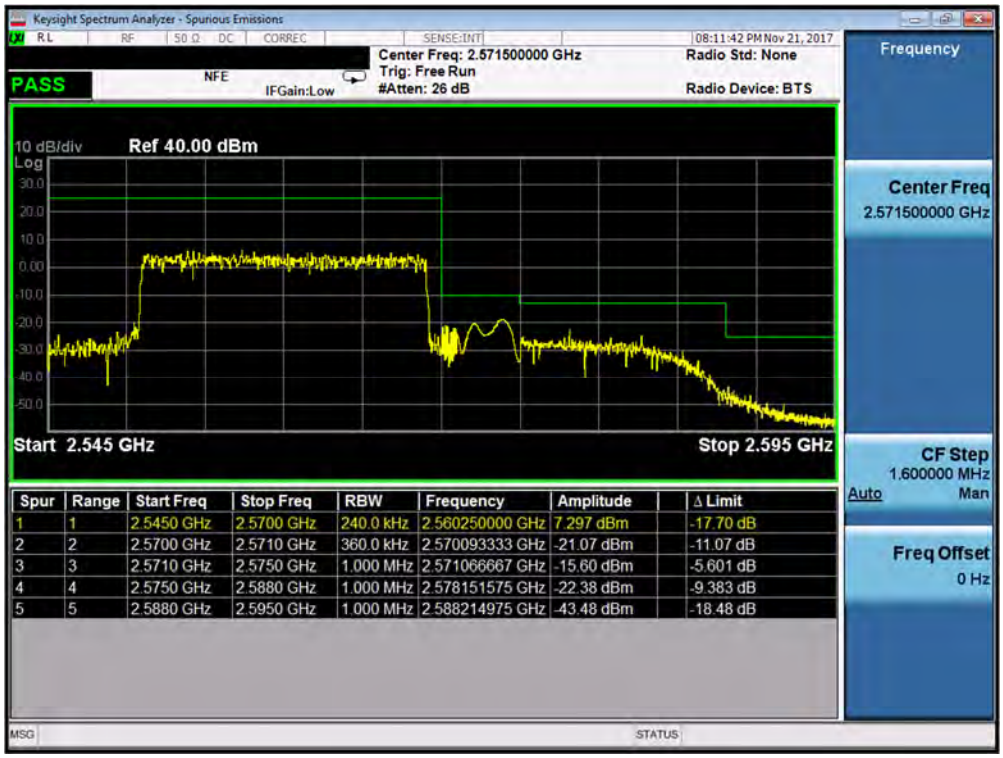


Plot 7-353. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75 – Antenna B)

Plot 7-354. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75 – Antenna B)

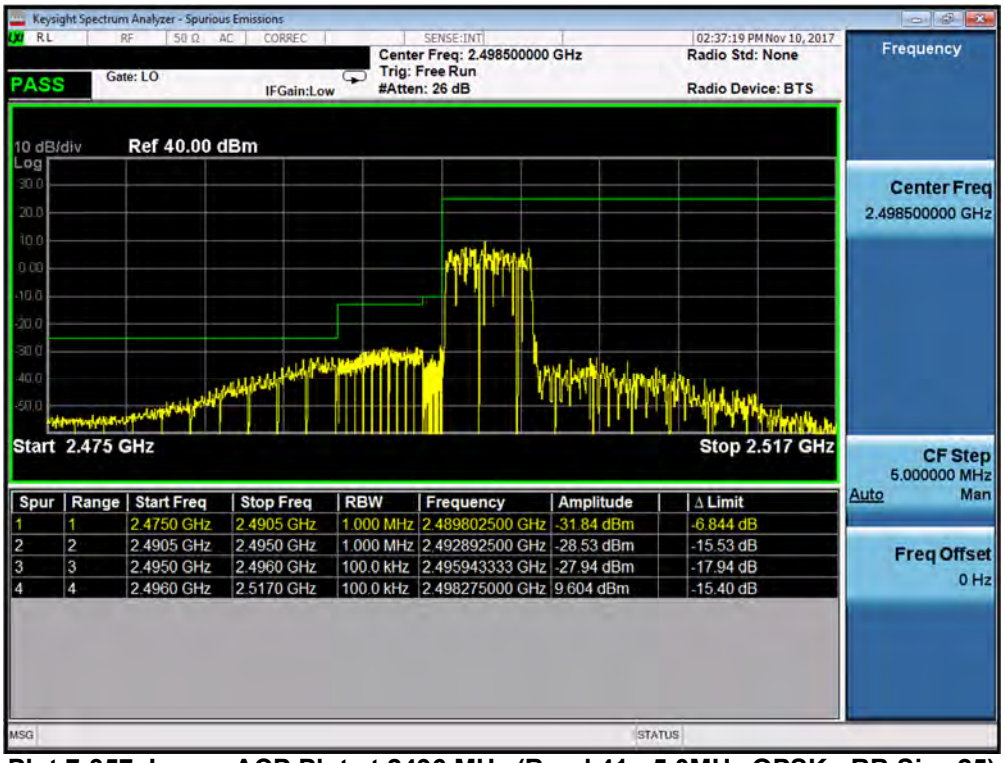


Plot 7-355. Lower ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100 – Antenna B)



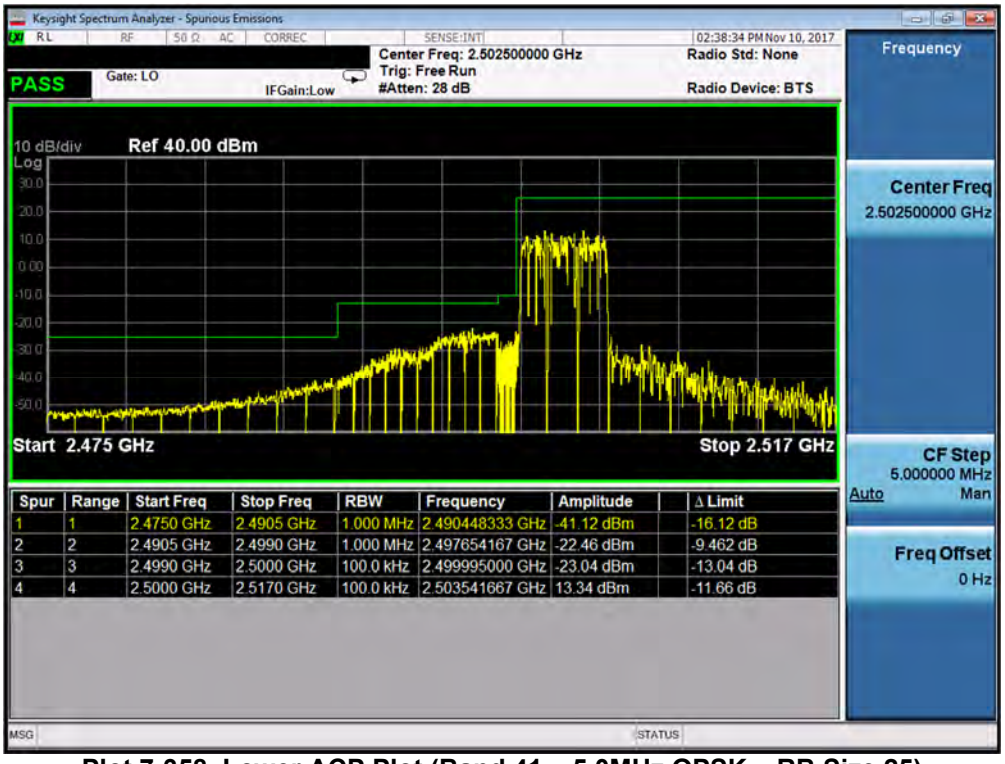
Plot 7-356. Upper ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100 – Antenna B)

Band 41



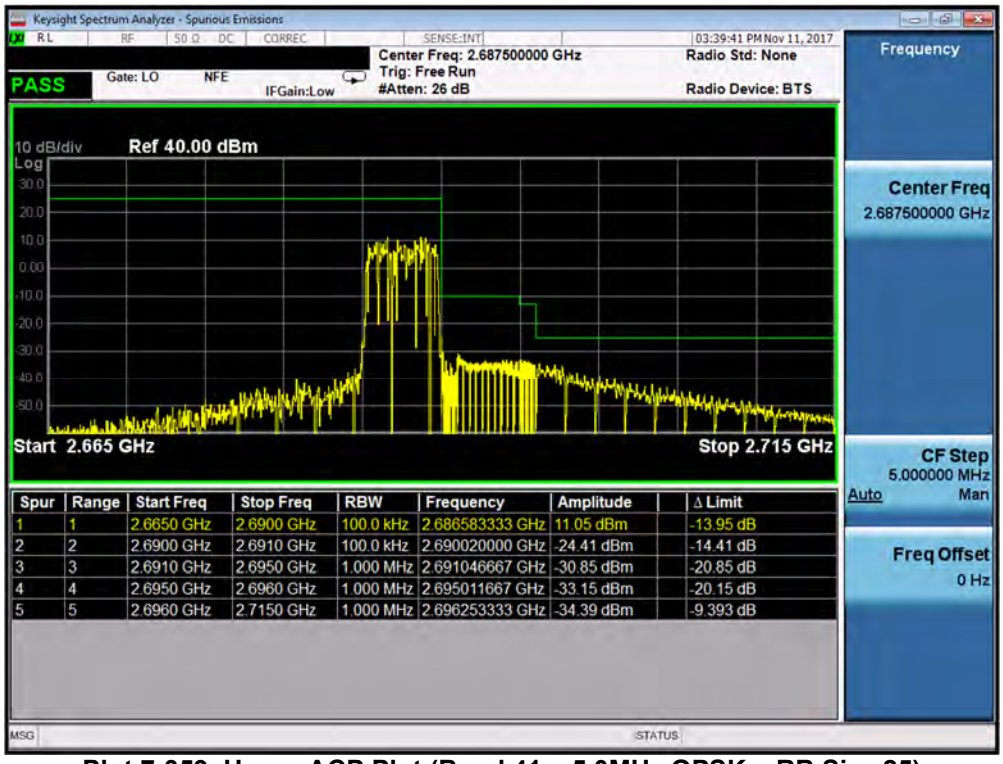
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489802500 GHz	-31.84 dBm	-6.844 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.492892500 GHz	-28.53 dBm	-15.53 dB
3	3	2.4950 GHz	2.4960 GHz	100.0 kHz	2.495943333 GHz	-27.94 dBm	-17.94 dB
4	4	2.4960 GHz	2.5170 GHz	100.0 kHz	2.498275000 GHz	9.604 dBm	-15.40 dB

Plot 7-357. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - RB Size 25)

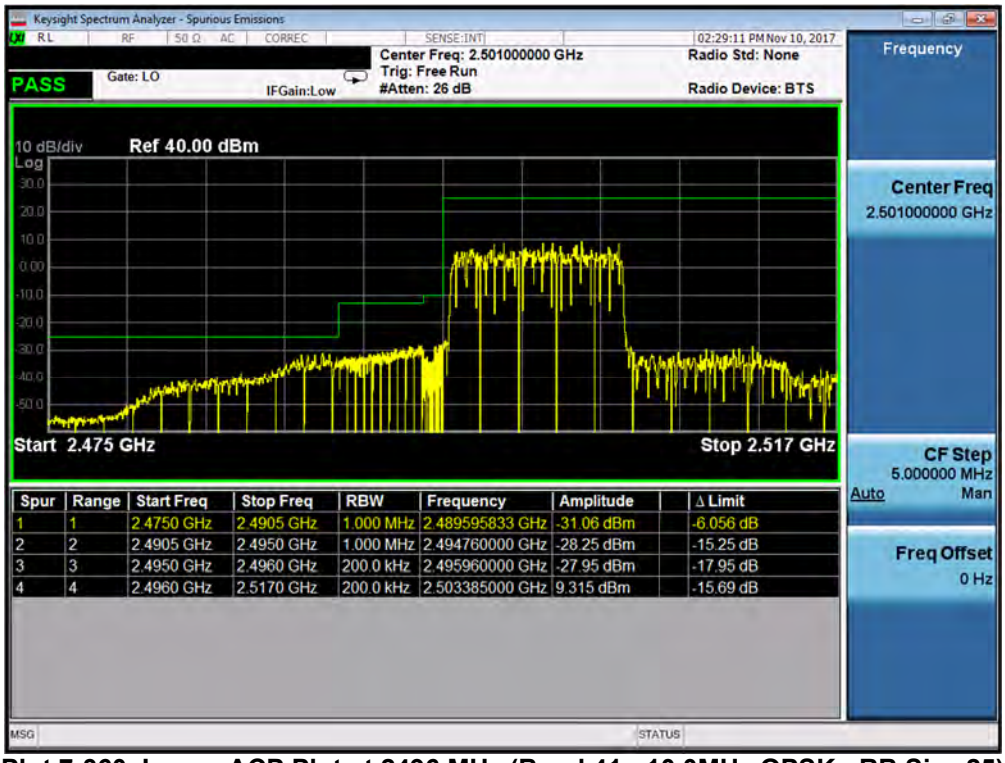


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490448333 GHz	-41.12 dBm	-16.12 dB
2	2	2.4905 GHz	2.4990 GHz	1.000 MHz	2.497654167 GHz	-22.46 dBm	-9.462 dB
3	3	2.4990 GHz	2.5000 GHz	100.0 kHz	2.499995000 GHz	-23.04 dBm	-13.04 dB
4	4	2.5000 GHz	2.5170 GHz	100.0 kHz	2.503541667 GHz	13.34 dBm	-11.66 dB

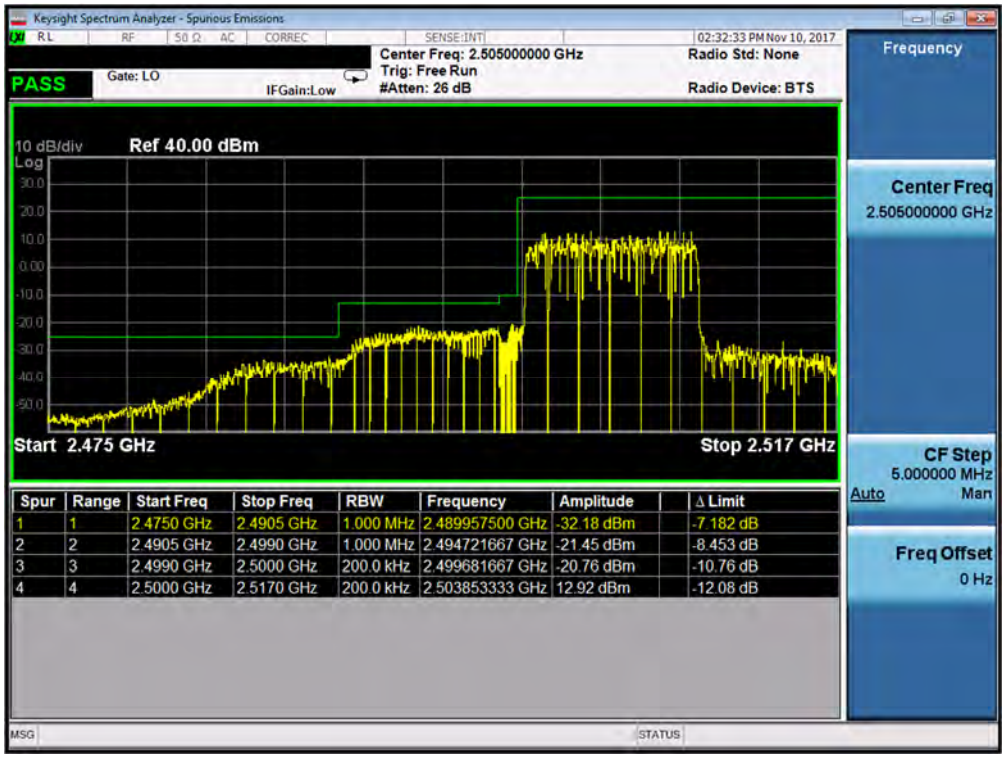
Plot 7-358. Lower ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)



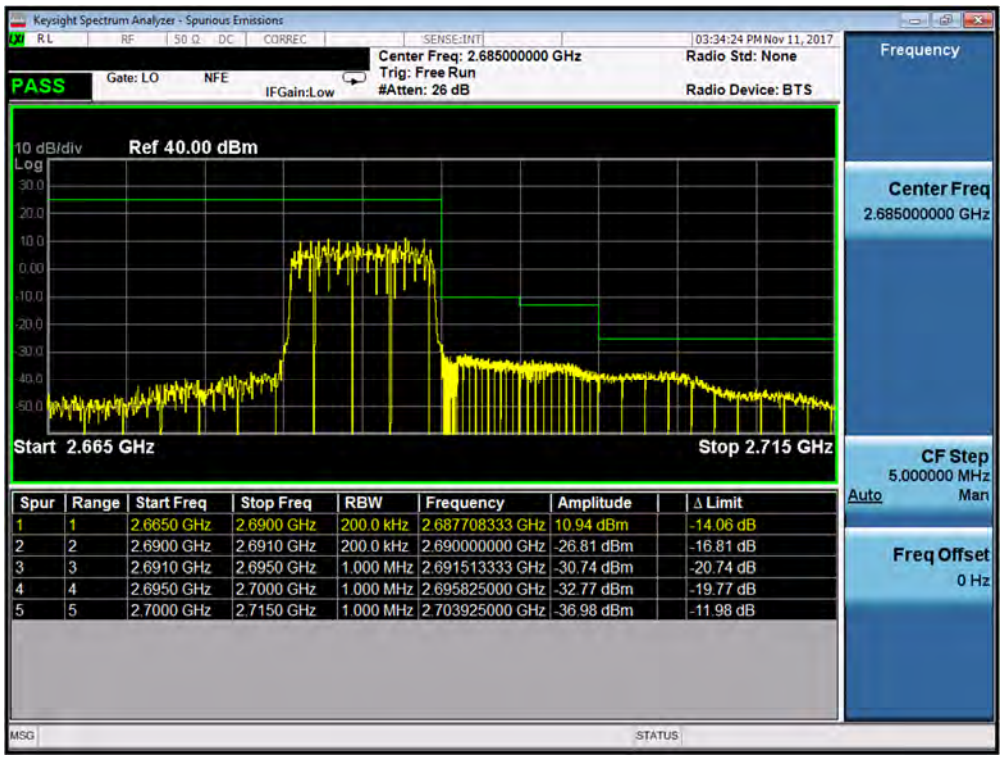
Plot 7-359. Upper ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)



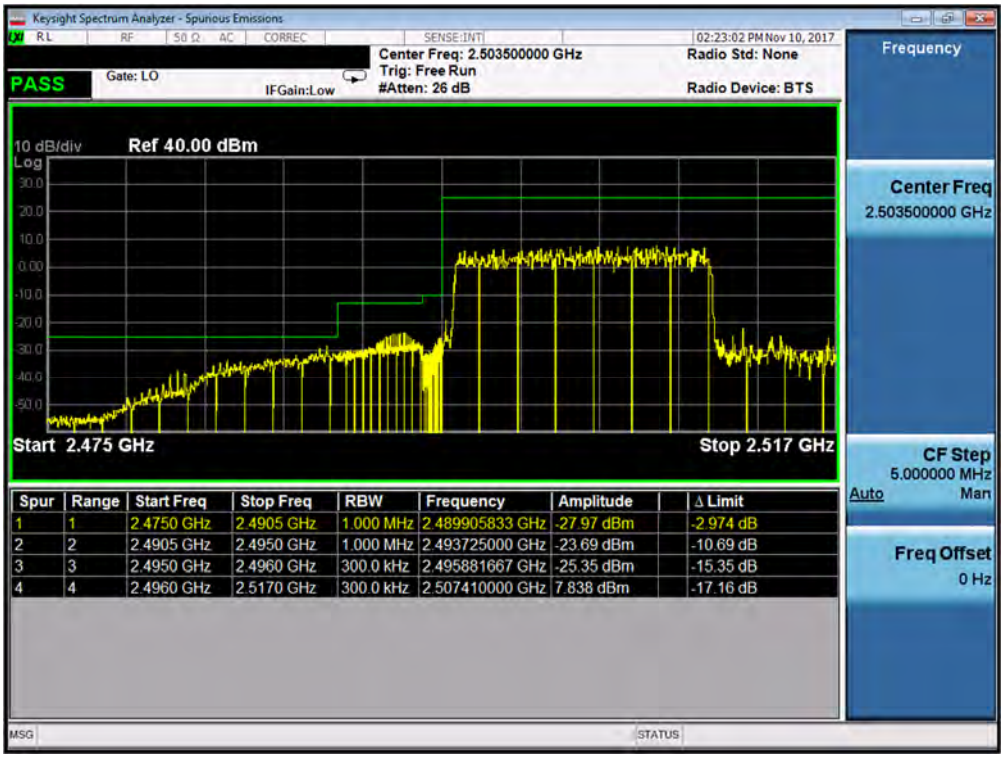
Plot 7-360. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - RB Size 25)



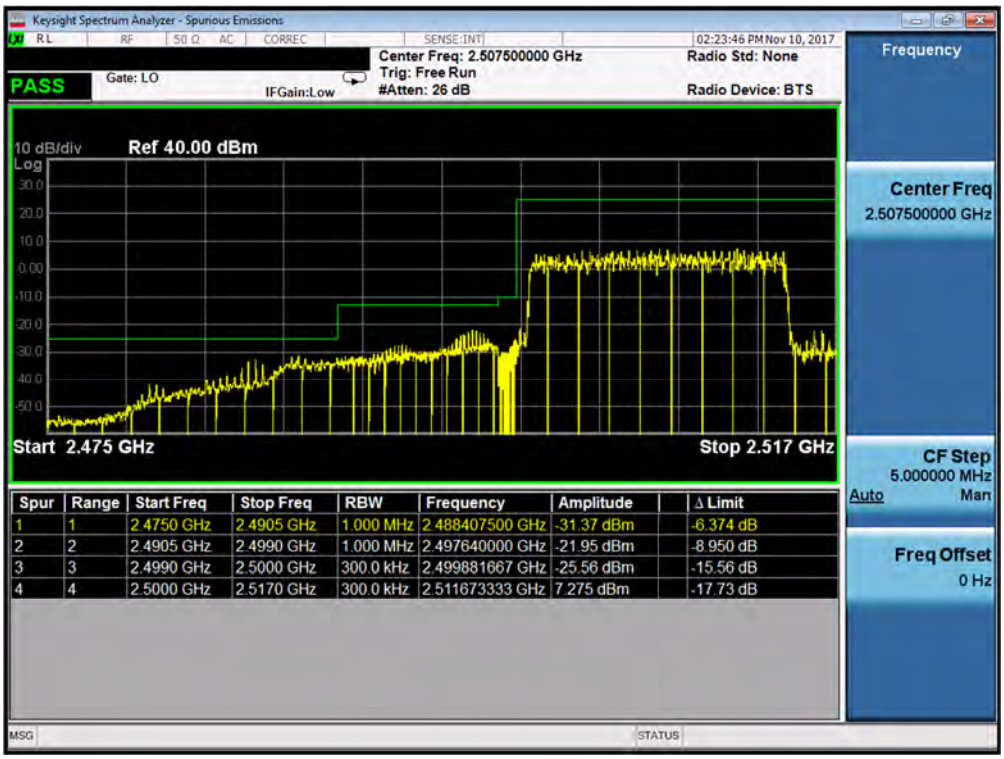
Plot 7-361. Lower ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)



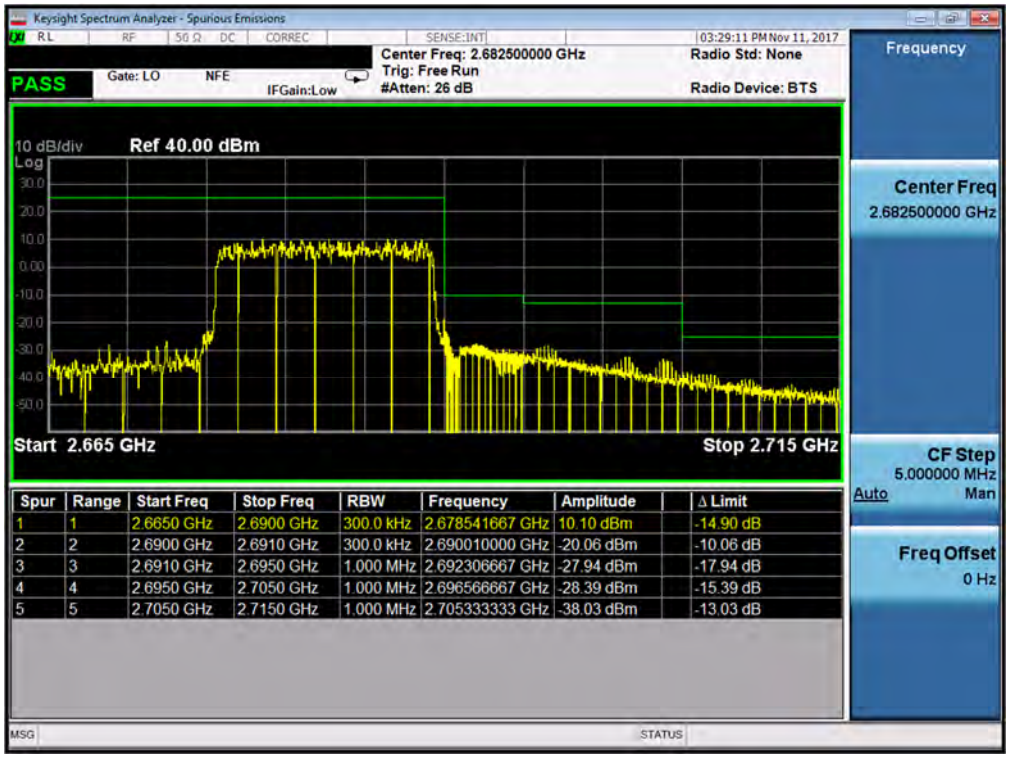
Plot 7-362. Upper ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)



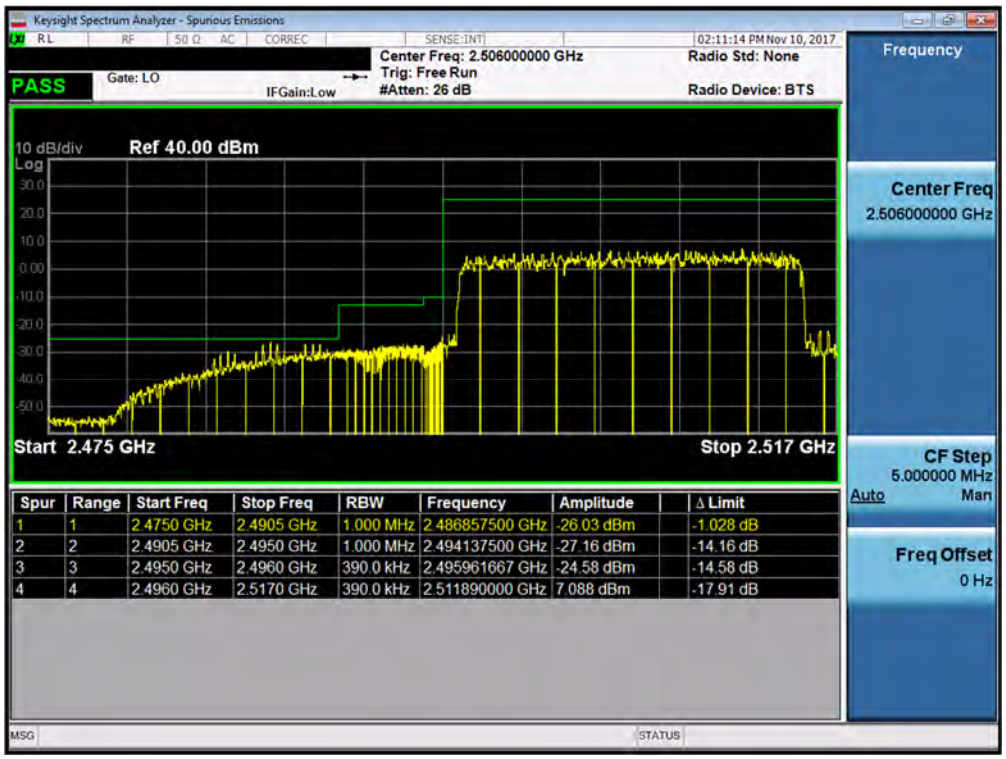
Plot 7-363. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - RB Size 25)



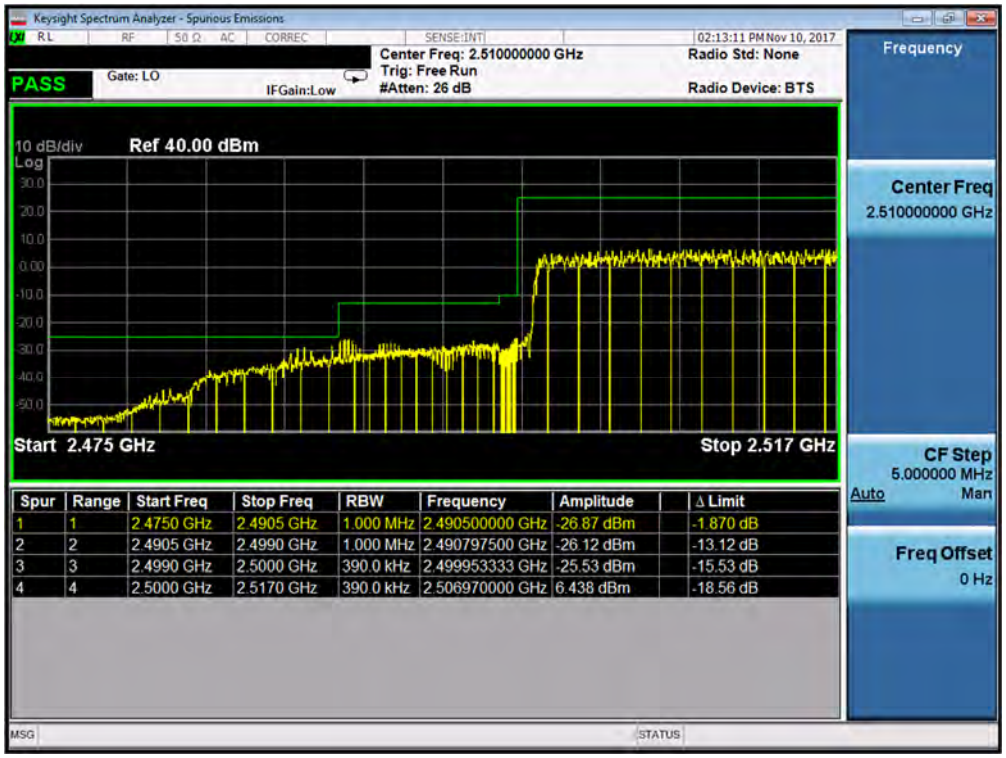
Plot 7-364. Lower ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)



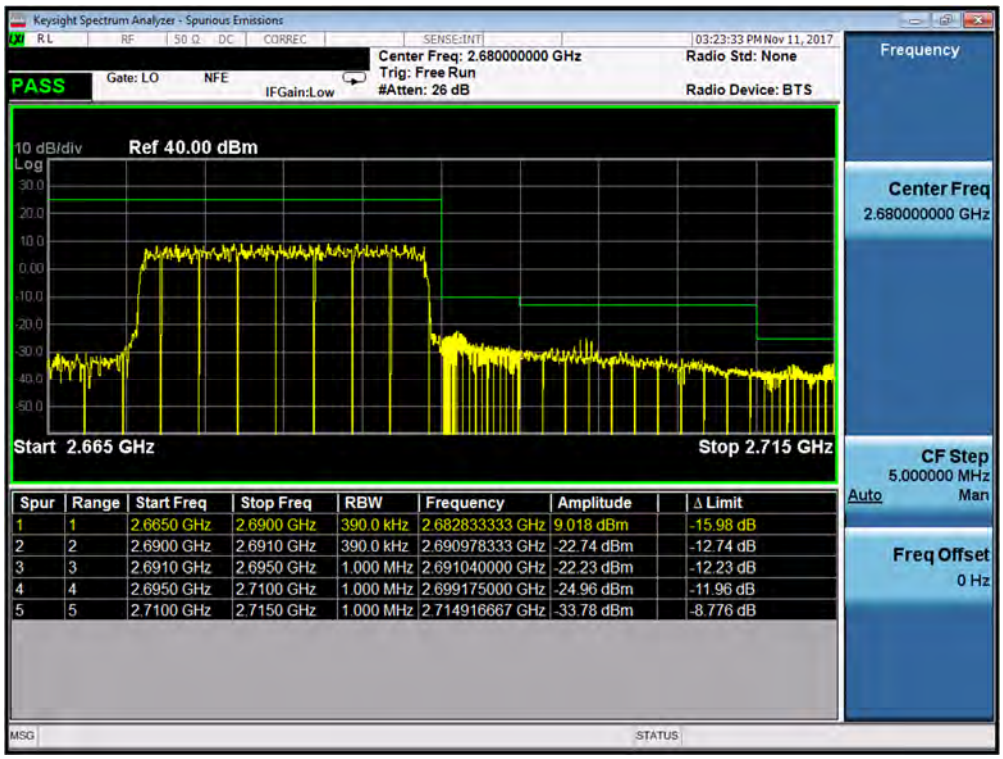
Plot 7-365. Upper ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)



Plot 7-366. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - RB Size 25)

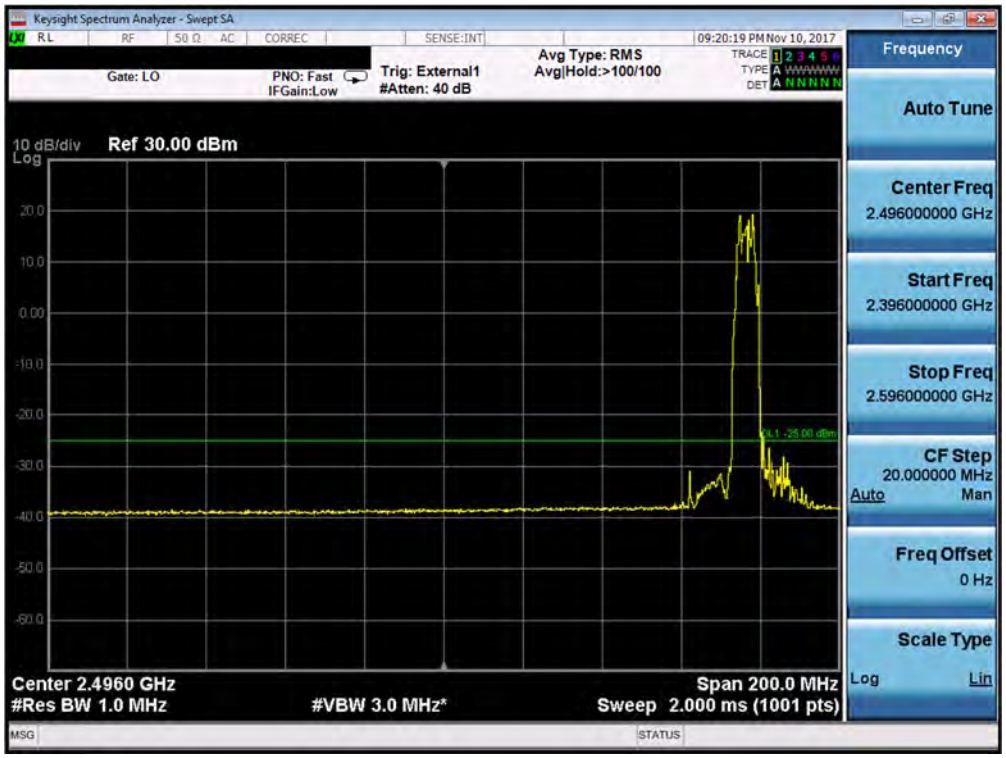


Plot 7-367. Lower ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)

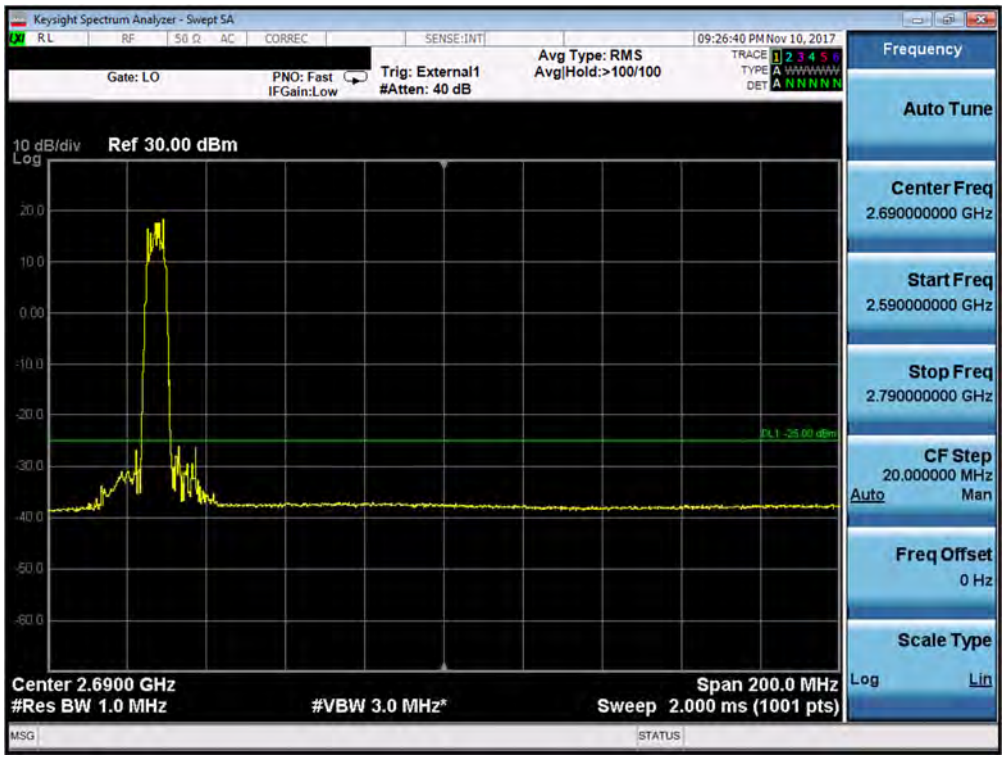


Plot 7-368. Upper ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)

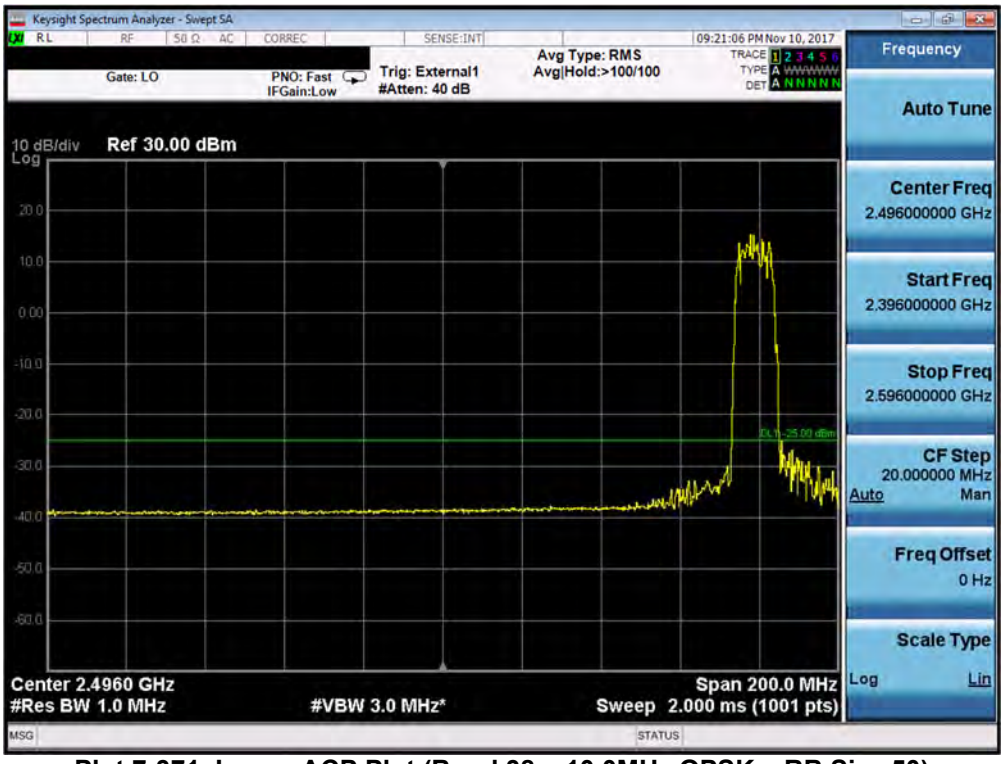
Band 41



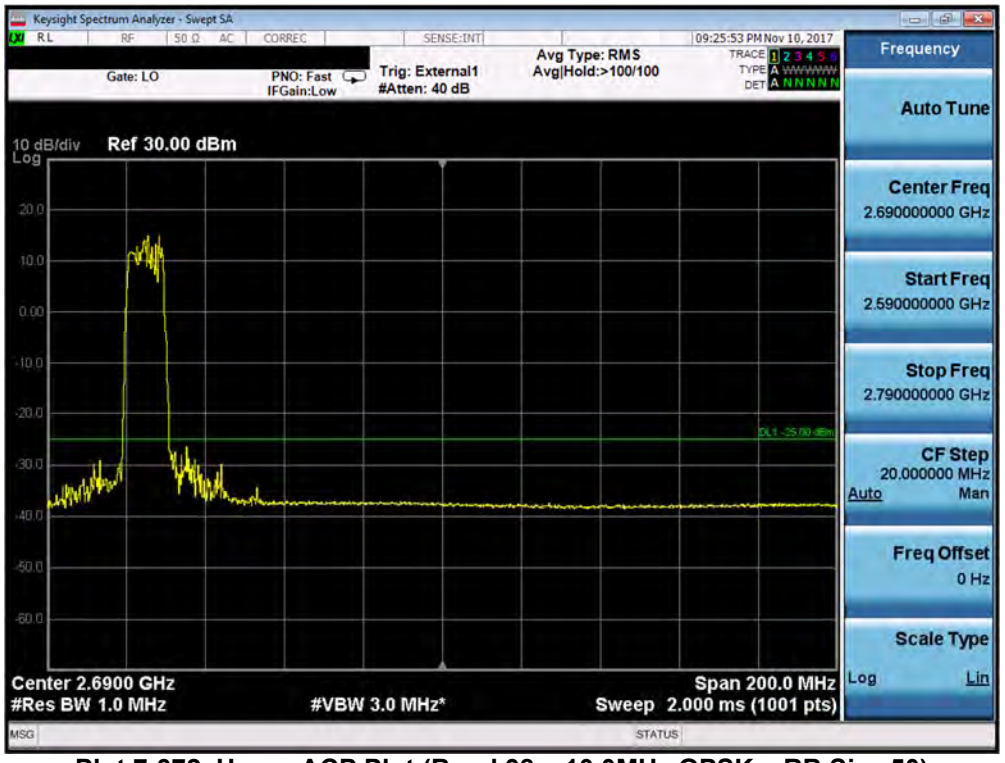
Plot 7-369. Lower ACP Plot (Band 38 – 5.0MHz QPSK – RB Size 25)



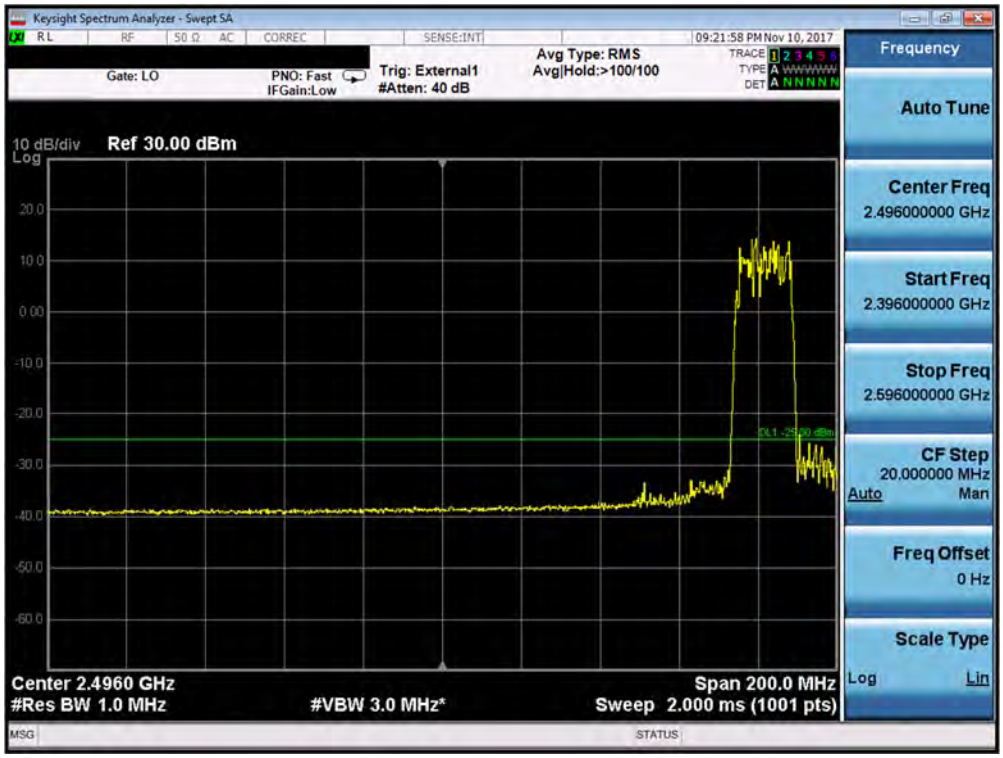
Plot 7-370. Upper ACP Plot (Band 38 – 5.0MHz QPSK – RB Size 25)



Plot 7-371. Lower ACP Plot (Band 38 – 10.0MHz QPSK – RB Size 50)

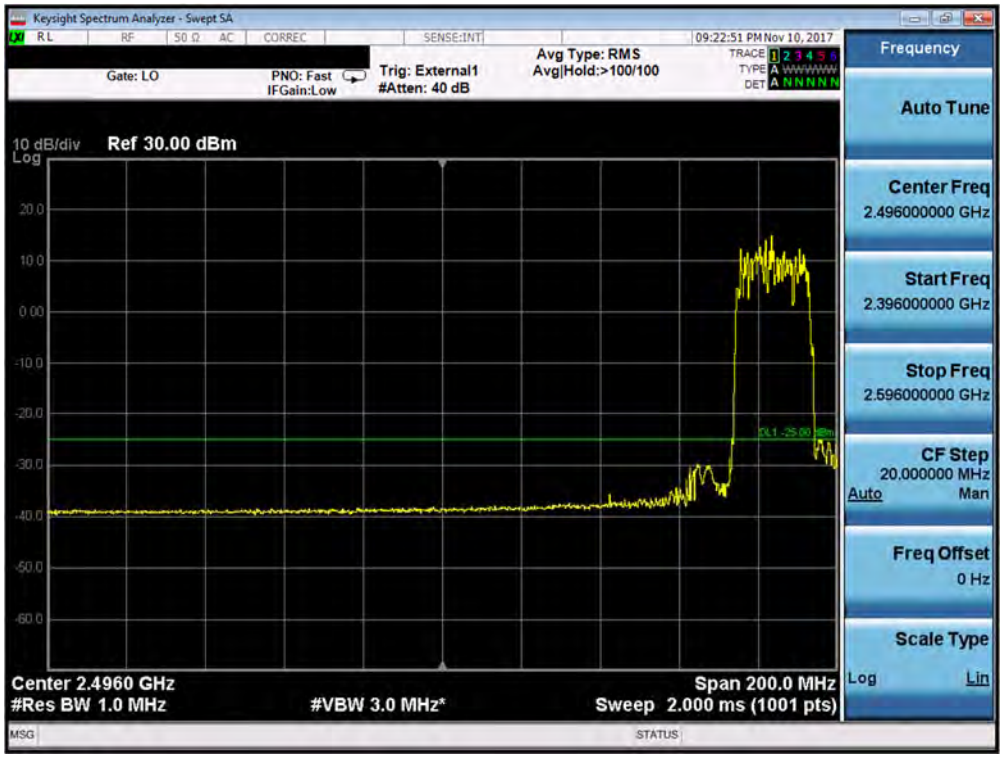


Plot 7-372. Upper ACP Plot (Band 38 – 10.0MHz QPSK – RB Size 50)

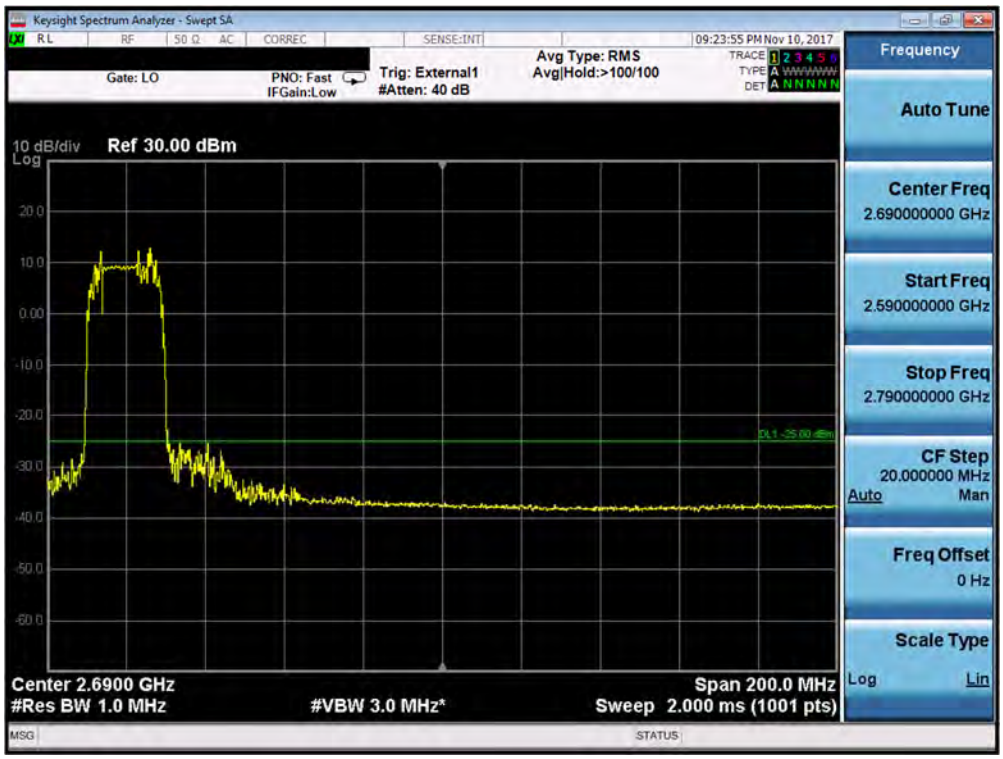


Plot 7-373. Lower ACP Plot (Band 38 – 15.0MHz QPSK – RB Size 75)

Plot 7-374. Upper ACP Plot (Band 38 – 15.0MHz QPSK – RB Size 75)



Plot 7-375. Lower ACP Plot (Band 38 – 20.0MHz QPSK – RB Size 100)



Plot 7-376. Upper ACP Plot (Band 38 – 20.0MHz QPSK – RB Size 100)

7.5 Peak-Average Ratio

§24.232(d)

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 v03 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
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.

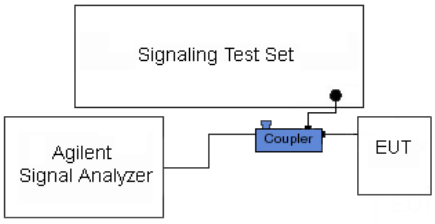
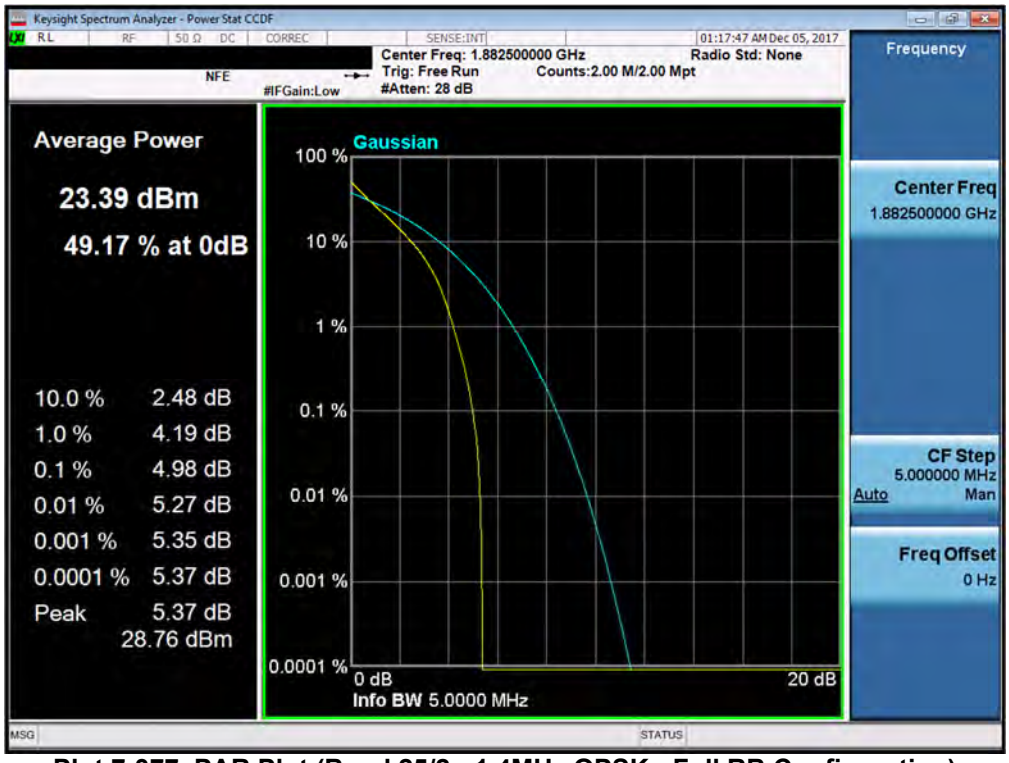


Figure 7-4. Test Instrument & Measurement Setup

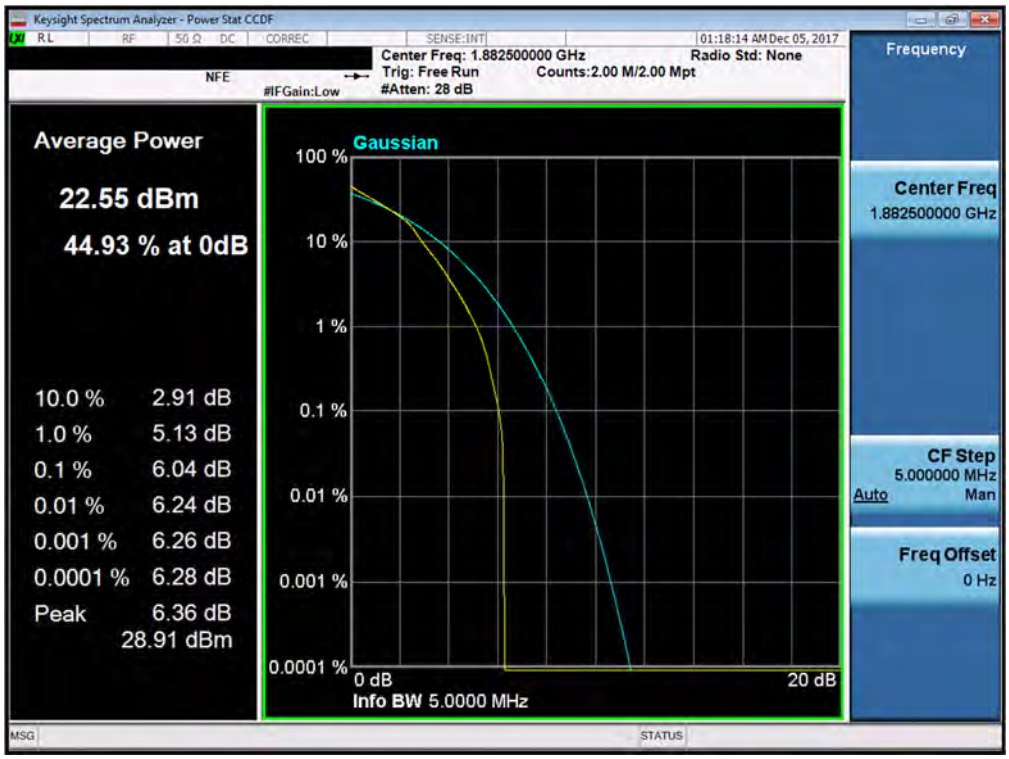
Test Notes

None.

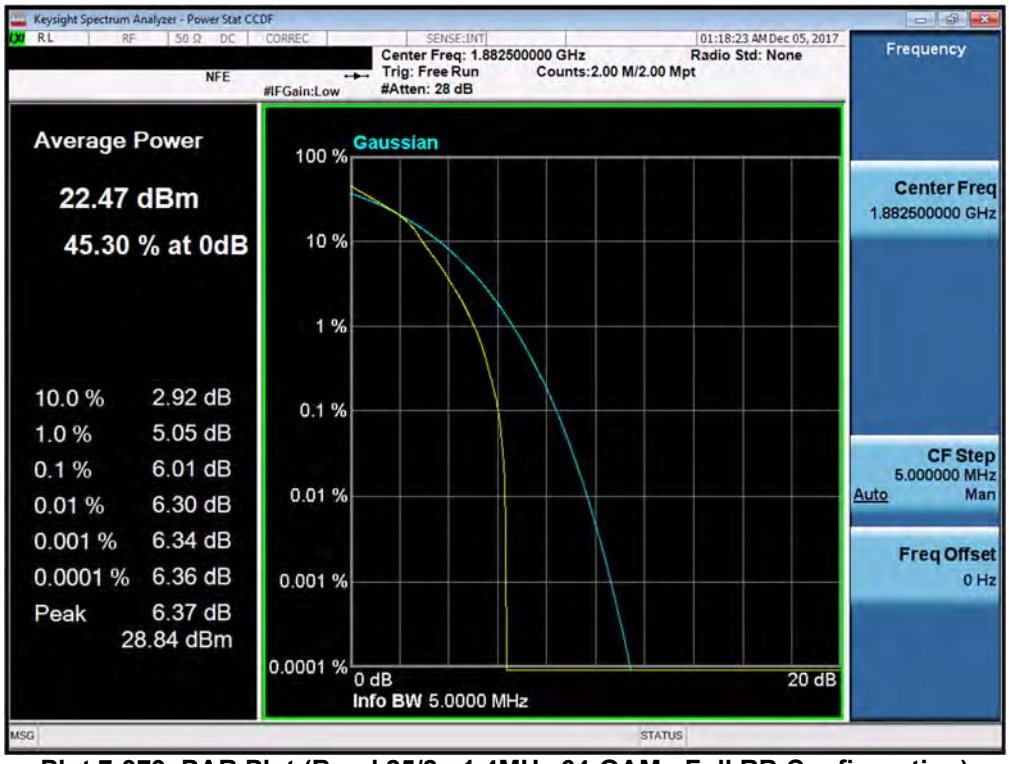
Band 25/2



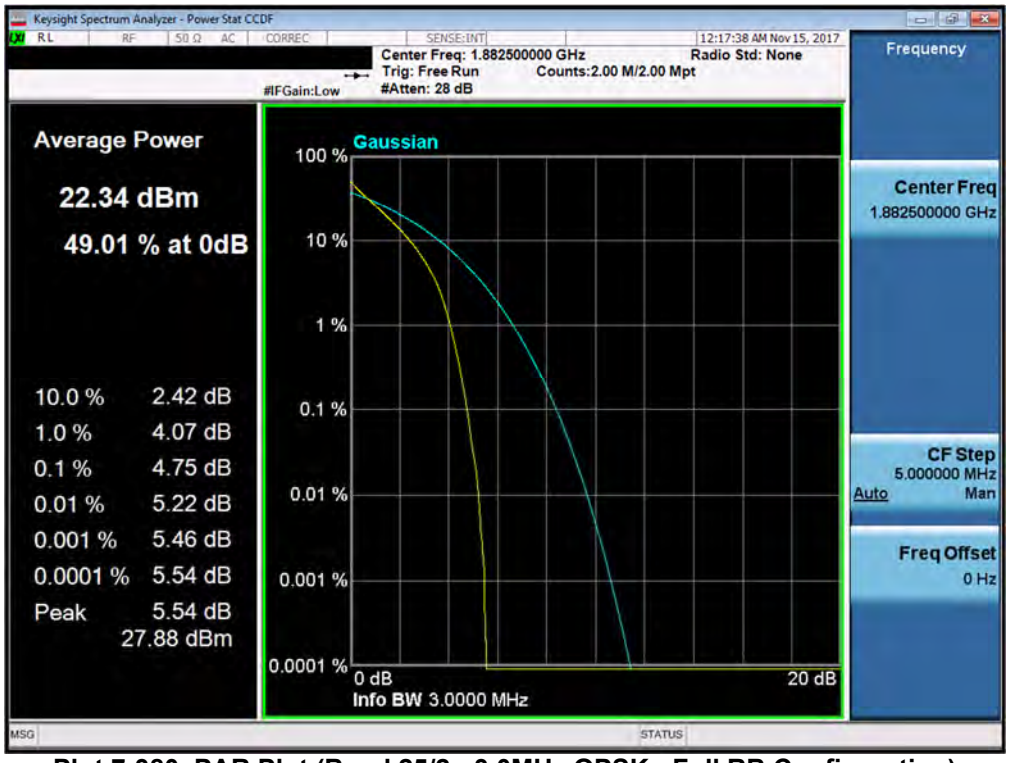
Plot 7-377. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



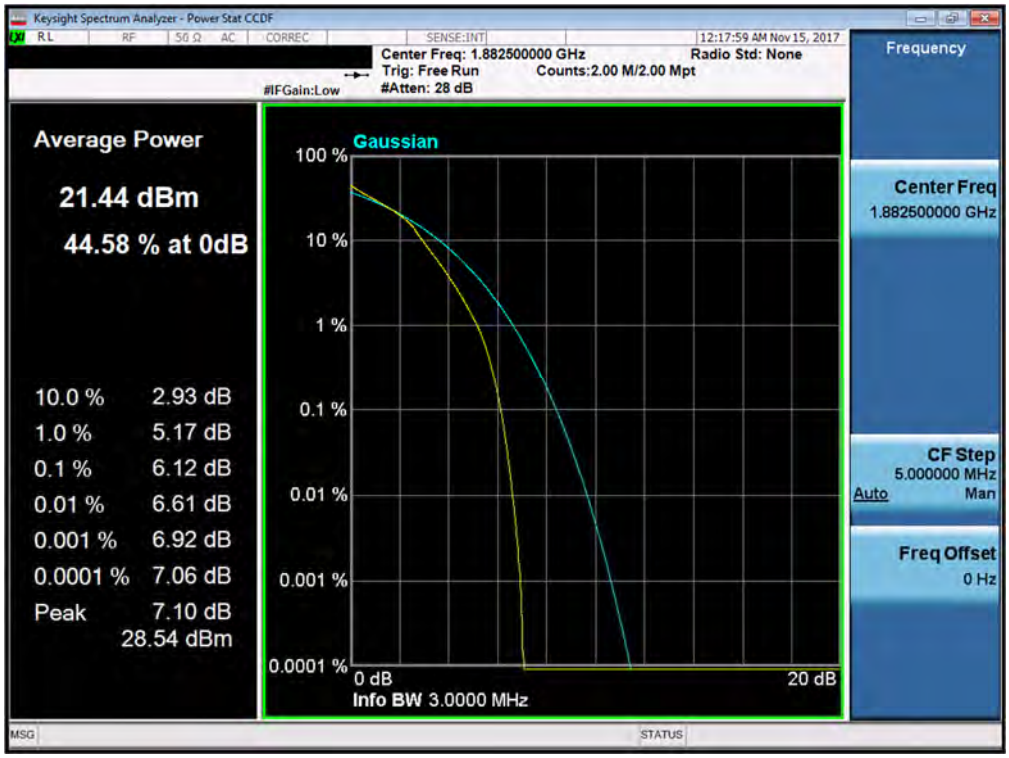
Plot 7-378. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)



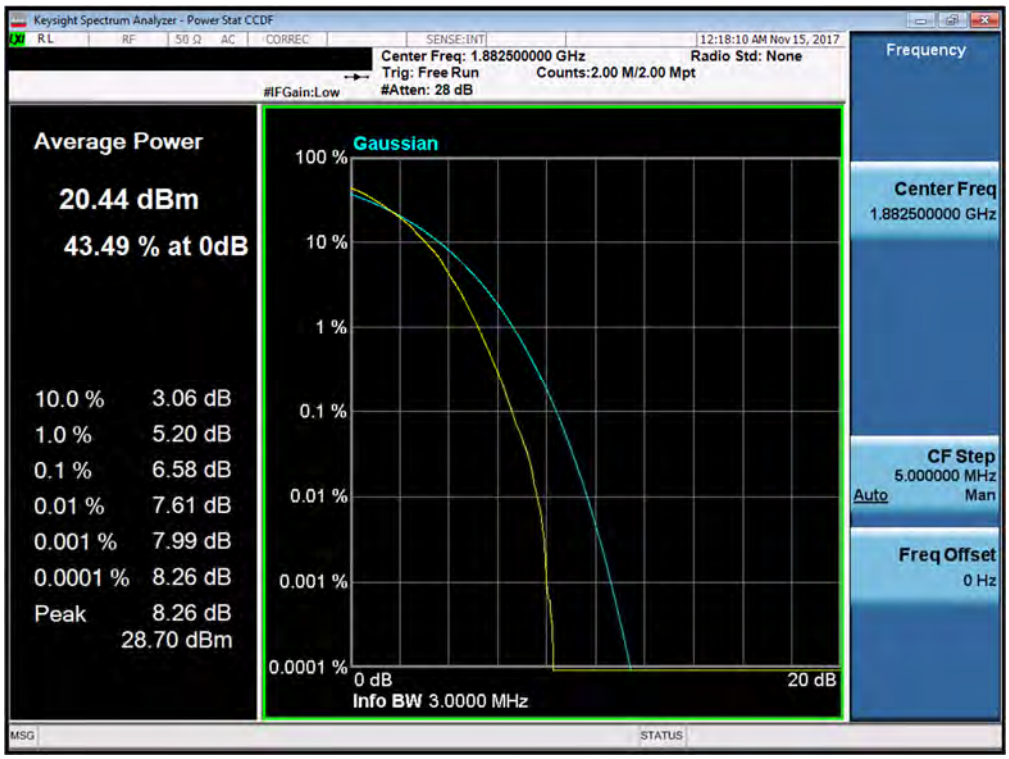
Plot 7-379. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)



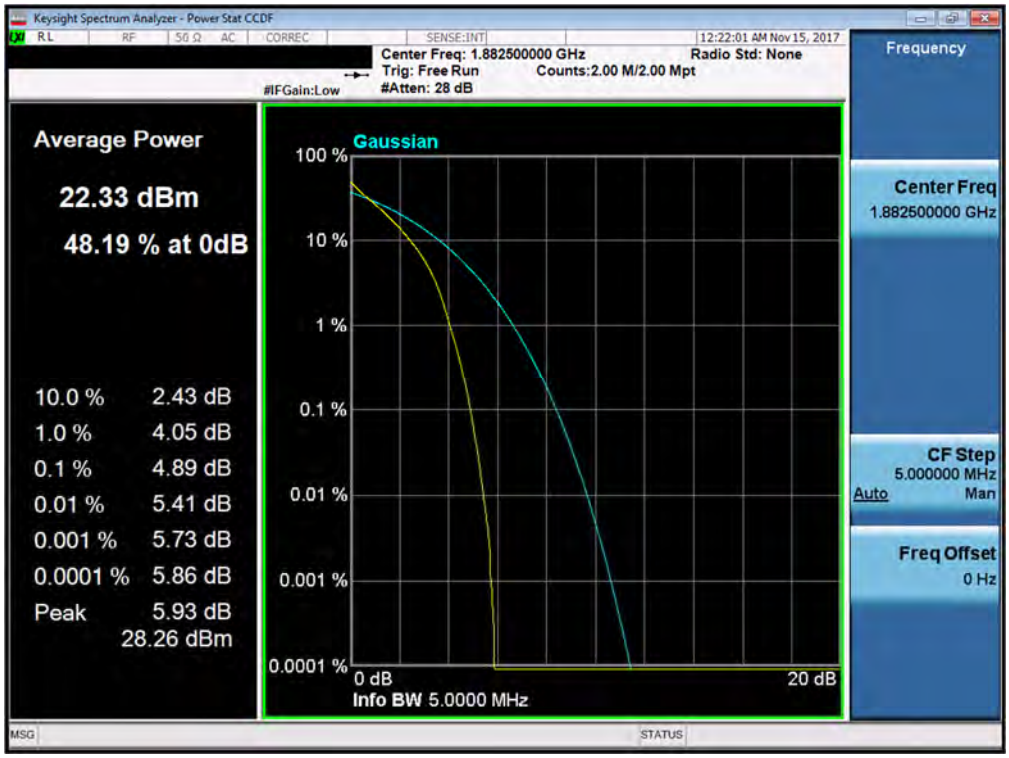
Plot 7-380. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



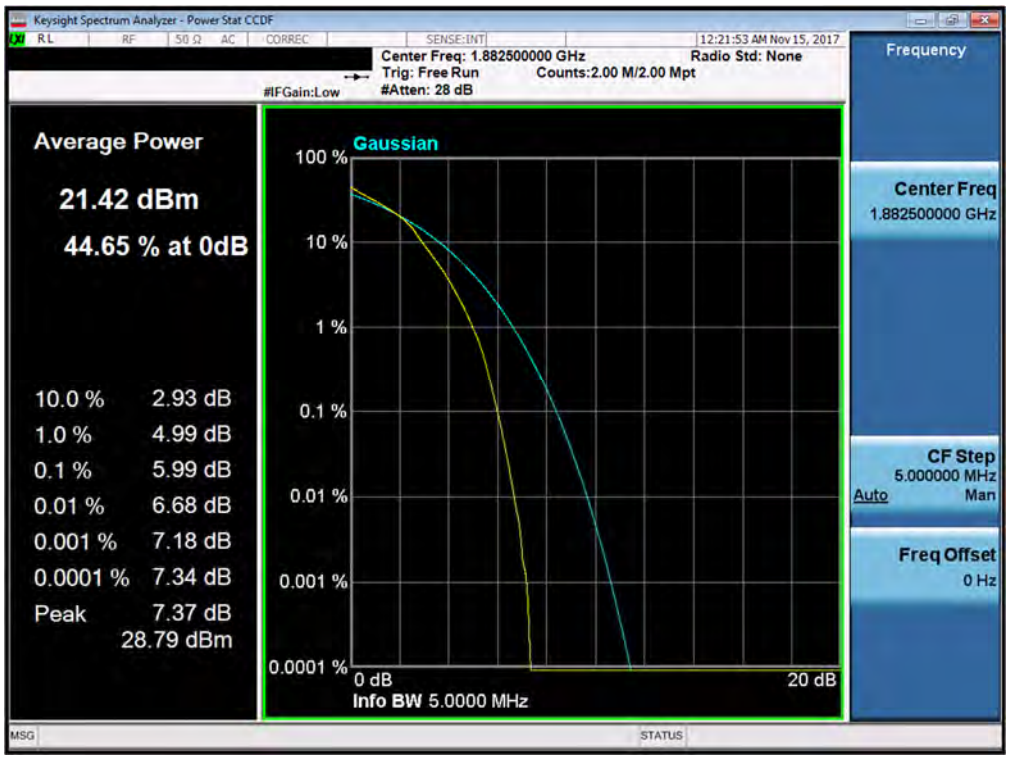
Plot 7-381. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



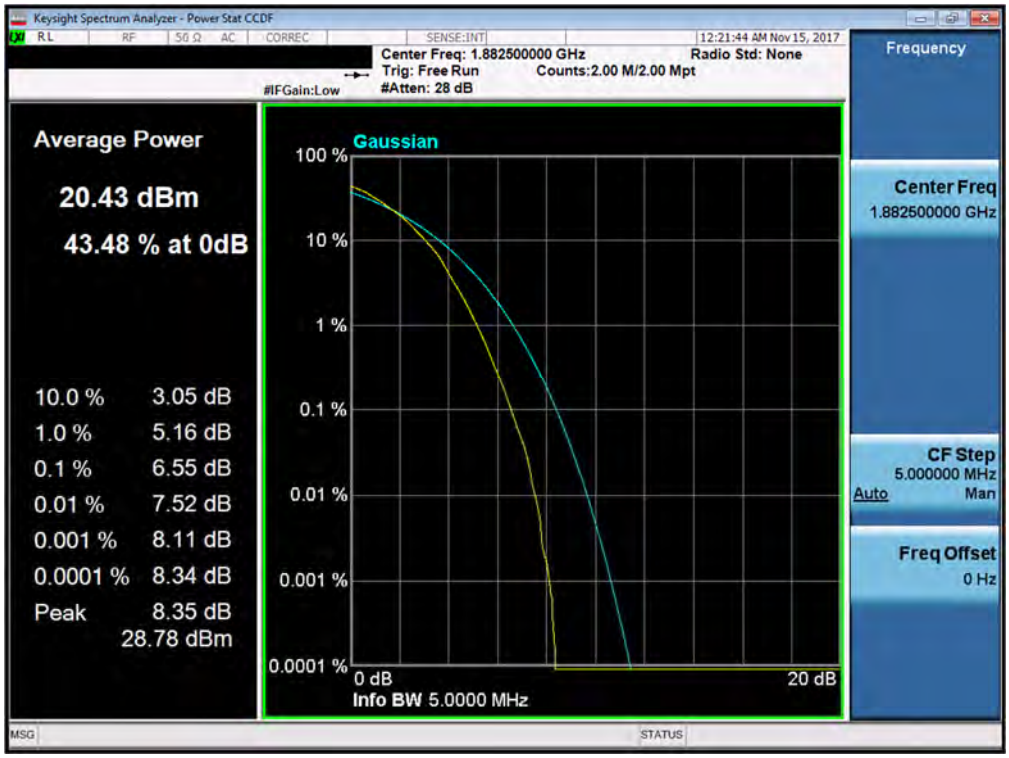
Plot 7-382. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)



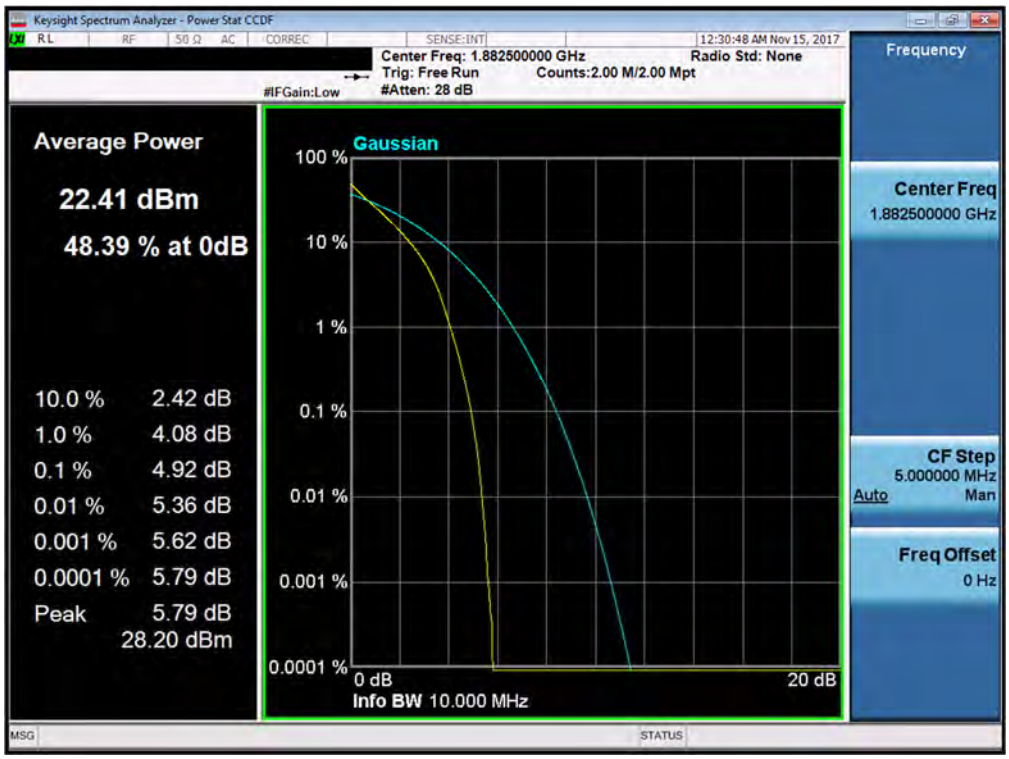
Plot 7-383. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



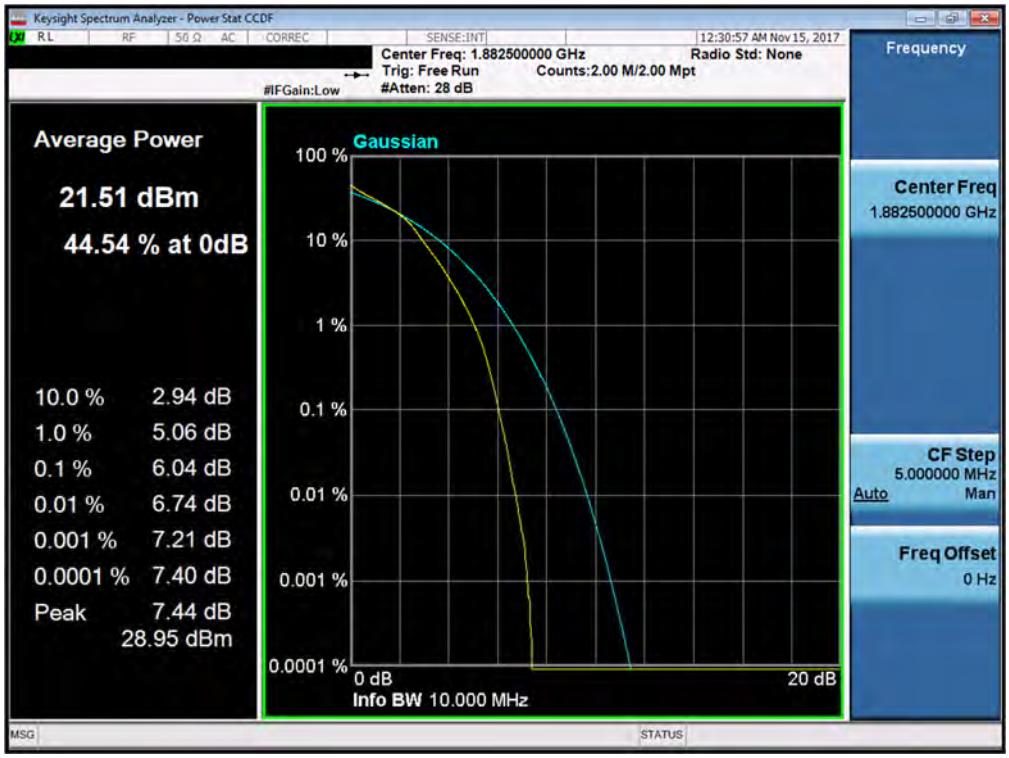
Plot 7-384. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)



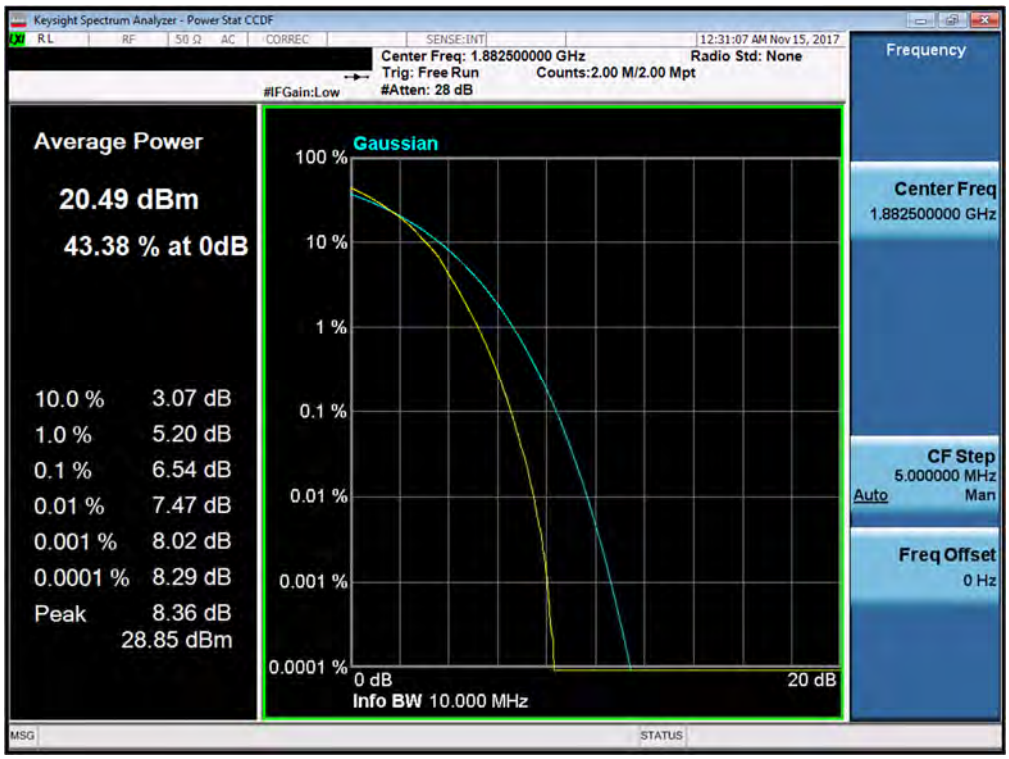
Plot 7-385. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)



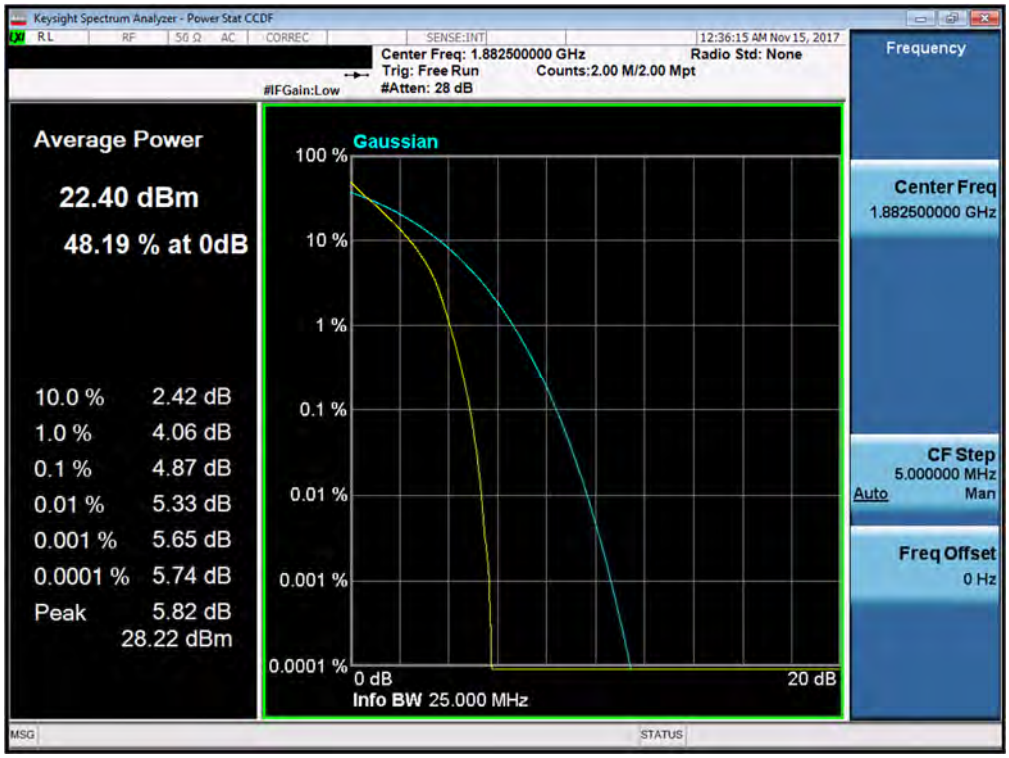
Plot 7-386. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



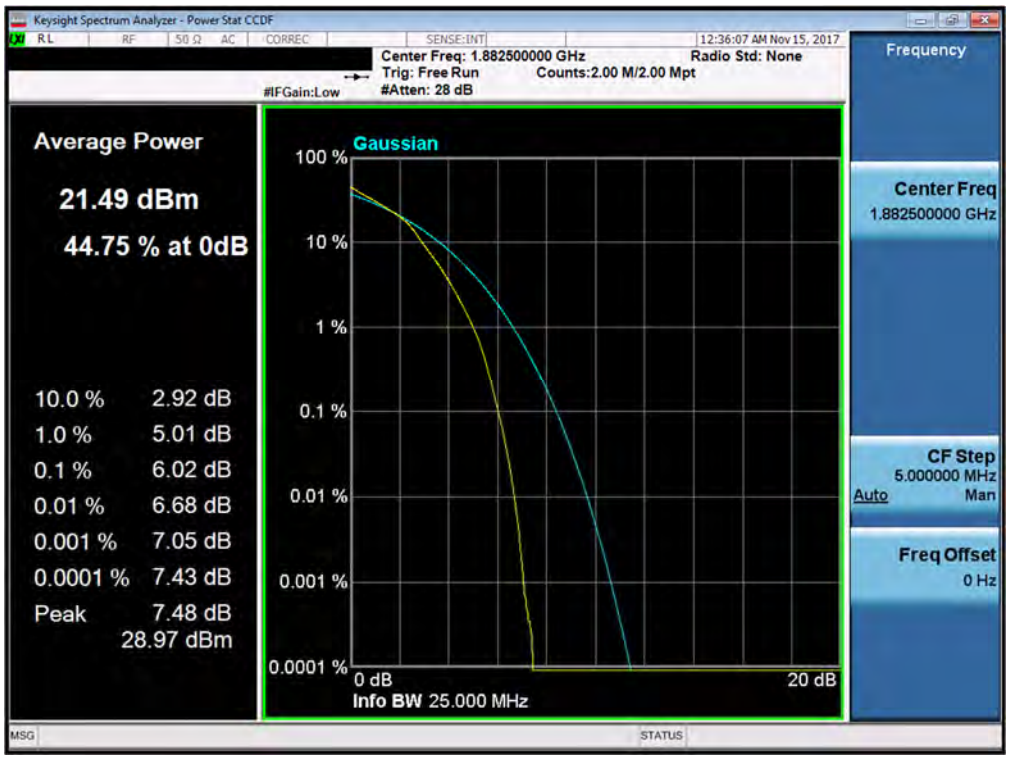
Plot 7-387. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



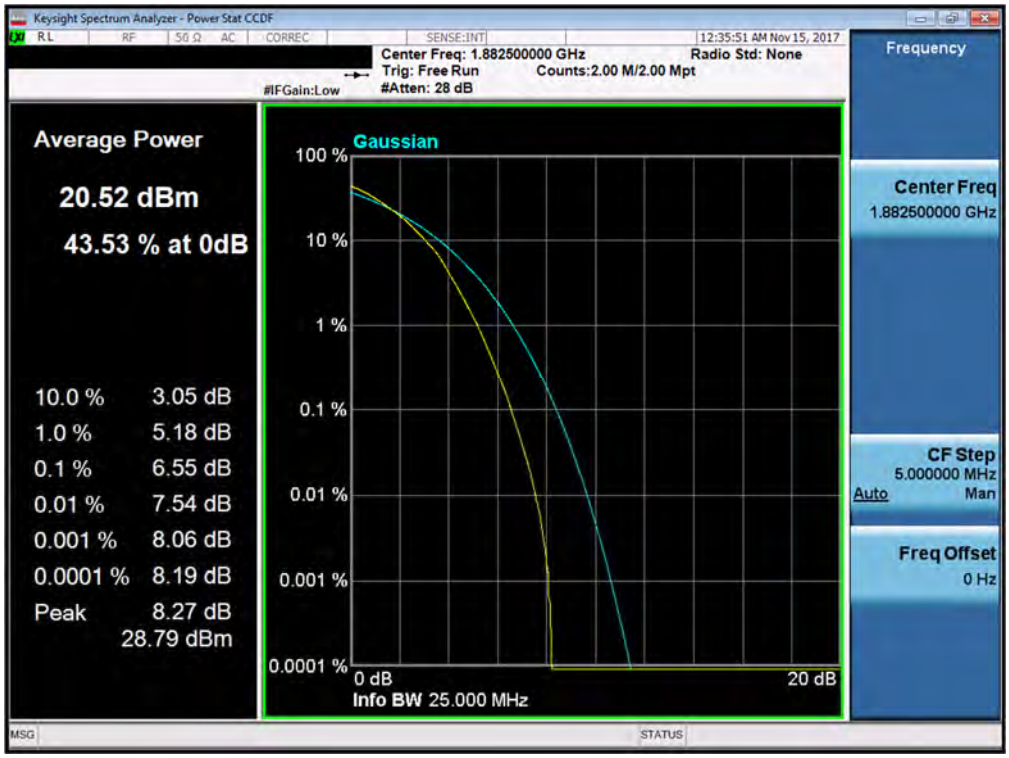
Plot 7-388. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)



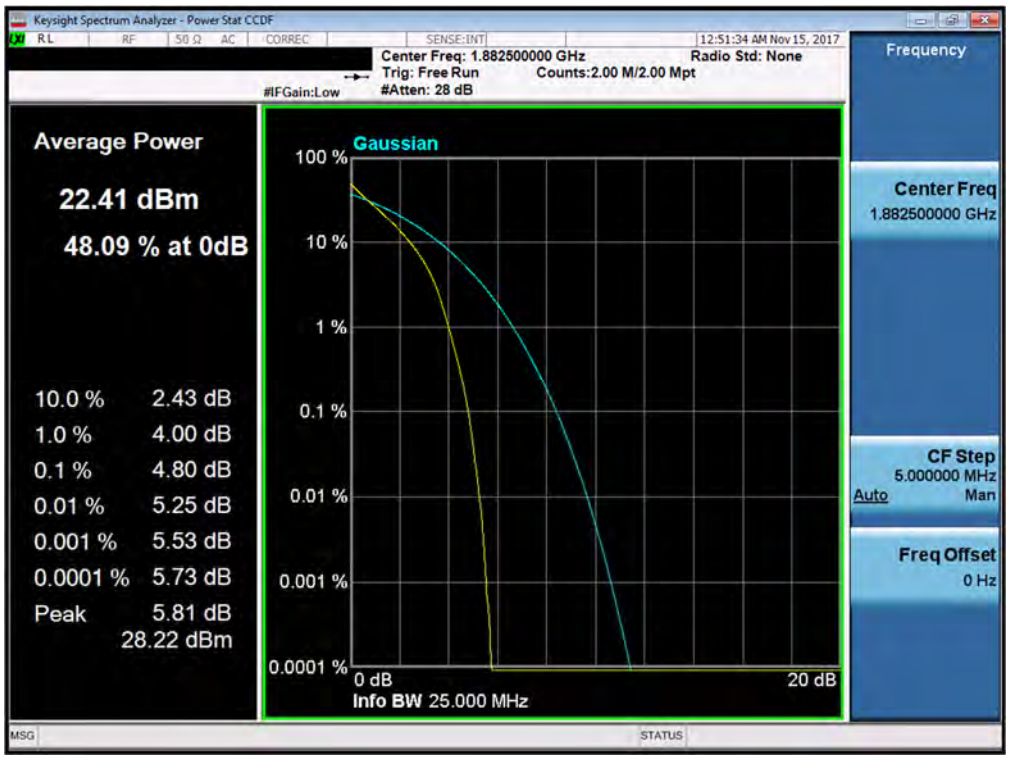
Plot 7-389. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



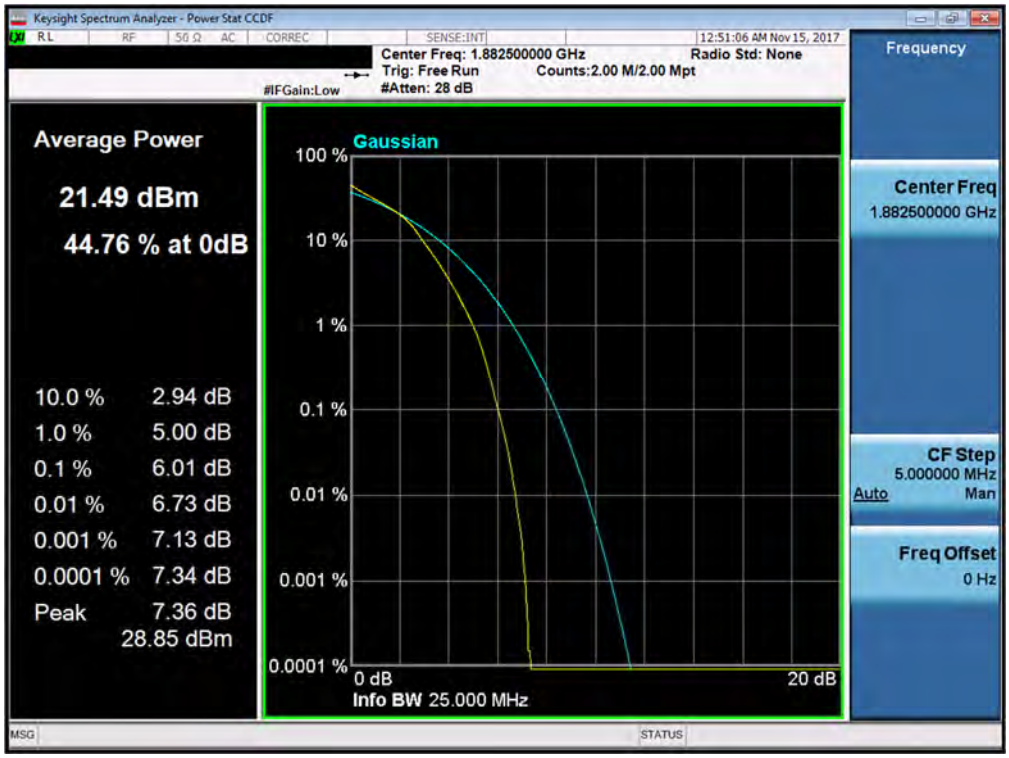
Plot 7-390. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)



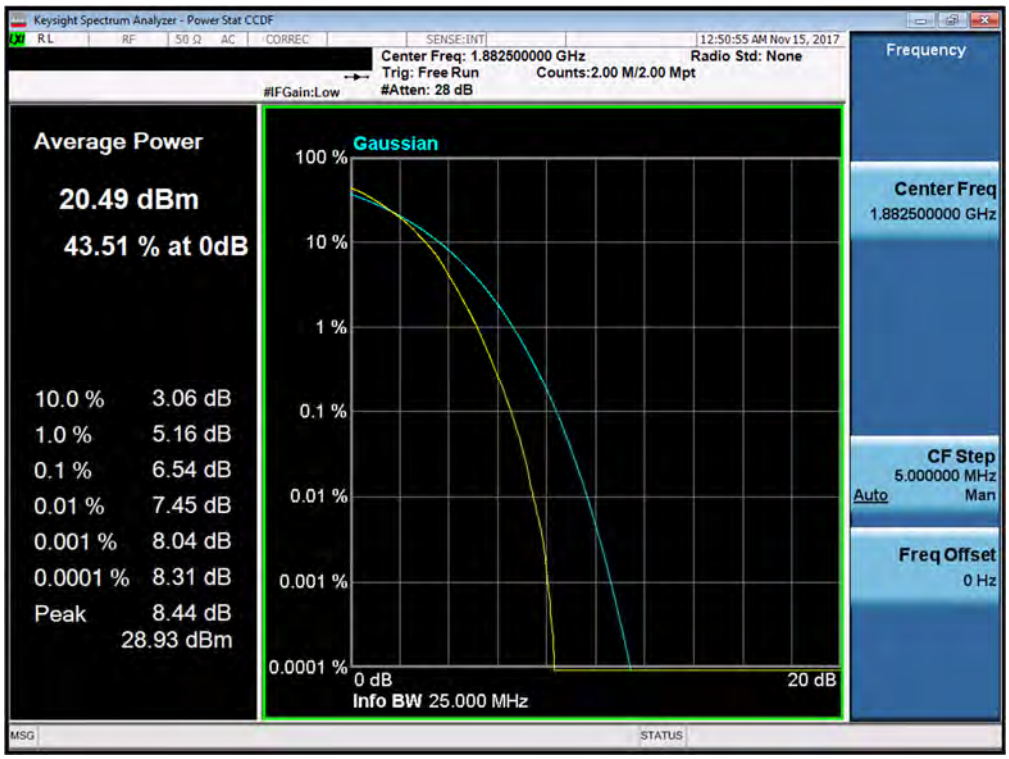
Plot 7-391. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-392. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-393. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-394. PAR Plot (Band 25/2 - 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 v03 – Section 5.2.2

Test Settings

6. Span = 2 x OBW to 3 x OBW
7. RBW = 1% to 5% of the OBW
8. Number of measurement points in sweep ≥ 2 x span / RBW
9. Sweep = auto-couple (less than transmission burst duration)
10. Detector = RMS (power)
11. Trigger was set to enable power measurements only on full power bursts
12. Trace was allowed to stabilize
13. 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.

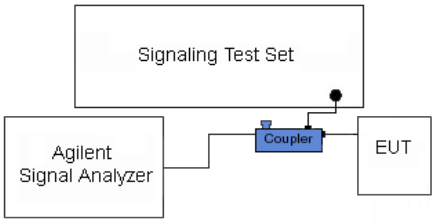


Figure 7-5. Test Instrument & Measurement Setup

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	312	530	5	39675	2498.5	QPSK	1	0	0	≤ 3	23.94
							16-QAM			≤ 1		23.25
							64-QAM			≤ 2		21.95
2				5	39675	2498.5	QPSK	1	9	0	0	26.97
							16-QAM			≤ 1		26.11
							64-QAM			≤ 2		25.38
3				10	39700	2501	QPSK	1	0	0	≤ 5	21.96
							16-QAM	1	0	≤ 1		21.29
							64-QAM	1	0	≤ 2		20.00
4				10	39700	2501	QPSK	20	0	0	≤ 2	23.84
							16-QAM	20	0	≤ 1		22.91
							64-QAM	20	0	≤ 2		21.53
5				10	39700	2501	QPSK	50	0	0	≤ 3	23.05
							16-QAM	50	0	≤ 1		22.11
							64-QAM	50	0	≤ 2		21.38
6				10	39700	2501	QPSK	25	20	0	≤ 1	24.77
							16-QAM	25	20	≤ 1		24.07
							64-QAM	25	20	≤ 2		23.23
7				10	39700	2501	QPSK	1	36	0	0	26.78
							16-QAM	1	36	≤ 1		26.13
							64-QAM	1	36	≤ 2		24.96
8				15	39725	2503.5	QPSK	1	0	0	≤ 5	22.02
							16-QAM	1	0	≤ 1		21.32
							64-QAM	1	0	≤ 2		20.17
9				15	39725	2503.5	QPSK	20	0	0	≤ 2	23.73
							16-QAM	20	0	≤ 1		22.81
							64-QAM	20	0	≤ 2		21.91
10				15	39725	2503.5	QPSK	75	0	0	≤ 4	22.03
							16-QAM	75	0	≤ 1		21.10
							64-QAM	75	0	≤ 2		20.49
11				15	39725	2503.5	QPSK	50	15	0	≤ 3	23.03
							16-QAM	50	15	≤ 1		22.10
							64-QAM	50	15	≤ 2		20.67
12				15	39725	2503.5	QPSK	1	60	0	0	26.87
							16-QAM	1	60	≤ 1		26.13
							64-QAM	1	60	≤ 2		24.92
13				20	39750	2506	QPSK	1	0	0	≤ 5	22.04
							16-QAM	1	0	≤ 1		21.39
							64-QAM	1	0	≤ 2		20.39
14				20	39750	2506	QPSK	20	0	0	≤ 2	24.07
							16-QAM	20	0	≤ 1		23.42
							64-QAM	20	0	≤ 2		22.00
15				20	39750	2506	QPSK	100	0	0	≤ 4	21.98
							16-QAM	100	0	≤ 1		20.99
							64-QAM	100	0	≤ 2		19.59
16				20	39750	2506	QPSK	75	24	0	≤ 3	22.95
							16-QAM	75	24	≤ 1		22.03
							64-QAM	75	24	≤ 2		20.62
17				20	39750	2506	QPSK	1	77	0	0	27.31
							16-QAM	1	77	≤ 1		26.46
							64-QAM	1	77	≤ 2		24.71
18	01	311	490	5	39675	2498.5	QPSK	1	0	0	≤ 3	24.00
							16-QAM			≤ 1		23.21
							64-QAM			≤ 2		22.48
19	01	001	01	5	39675	2498.5	QPSK	1	0	0	0	26.93
							16-QAM			≤ 1		26.29
							64-QAM			≤ 2		24.93

Table 7-3. A-MPR Conducted Power Measurements

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

Test Procedure Used

KDB 971168 D01 v02r02 – 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.

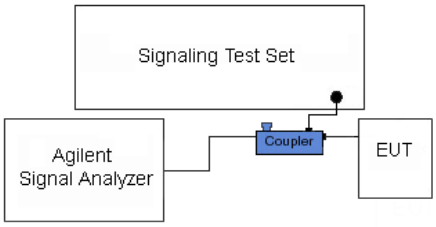


Figure 7-6. Test Instrument & Measurement Setup

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 7-3 below, with both carriers set to transmit using 1RB.

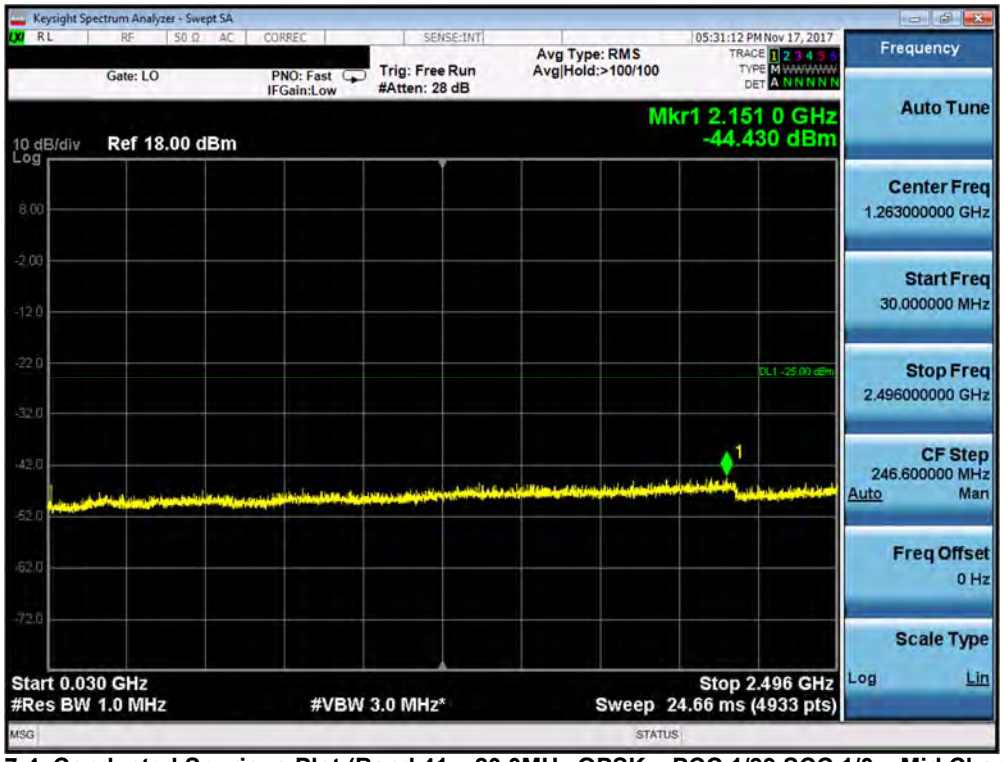
3. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the 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	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B41	10	40620	2593	QPSK	1	49	LTE B41	20	40764	2607.4	QPSK	1	0	24.28
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	15	40770	2608	QPSK	1	0	24.35
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	20	40791	2610.1	QPSK	1	0	23.71
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	10	40764	2607.4	QPSK	1	0	24.52
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	15	40791	2610.1	QPSK	1	0	24.38
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	23.94

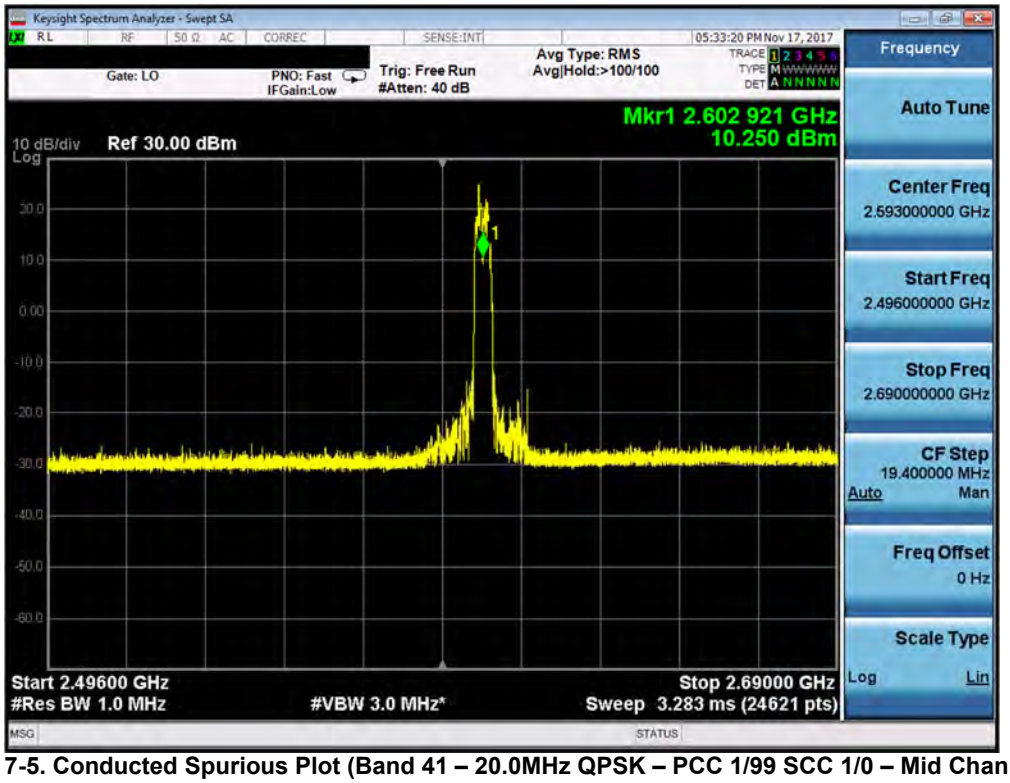
Table 7-395. Conducted Powers (B41 – PCC: RB Size 1 Offset Max SCC: RB Size 1 Offset 0)

Power State	PCC							SCC							Power	
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)	LTE Rel. 8 PCC Tx.Power (dBm)
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	0	20.27	24.17
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	99	20.15	23.96
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	99	15.59	24.17
Max	LTE B41	20	39750	2506	QPSK	1	50	LTE B41	20	39948	2525.8	QPSK	1	50	20.18	23.98
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	24.60	23.96
Max	LTE B41	20	39750	2506	QPSK	100	0	LTE B41	20	39948	2525.8	QPSK	100	0	22.64	23.01
Max	LTE B41	20	39750	2506	16-QAM	100	0	LTE B41	20	39948	2525.8	16-QAM	100	0	21.63	22.10
Max	LTE B41	20	39750	2506	64-QAM	100	0	LTE B41	20	39948	2525.8	64-QAM	100	0	21.29	21.11

Table 7-396. Conducted Powers (B41 with Various Combinations for 20MHz Channel Bandwidth)



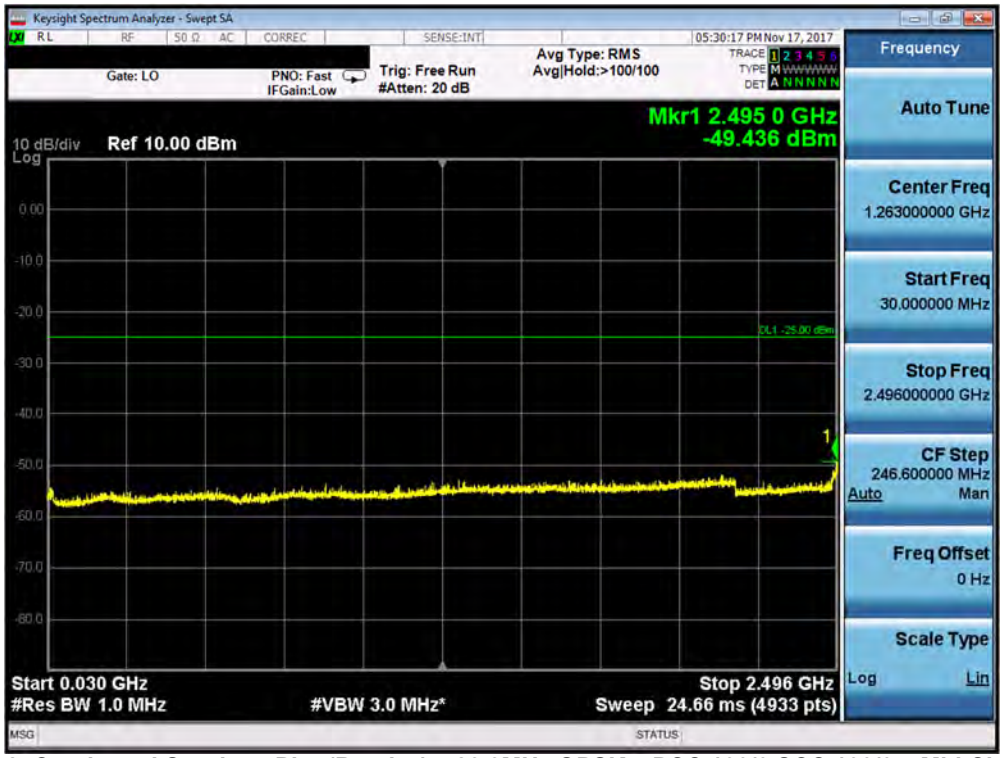
Plot 7-4. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)



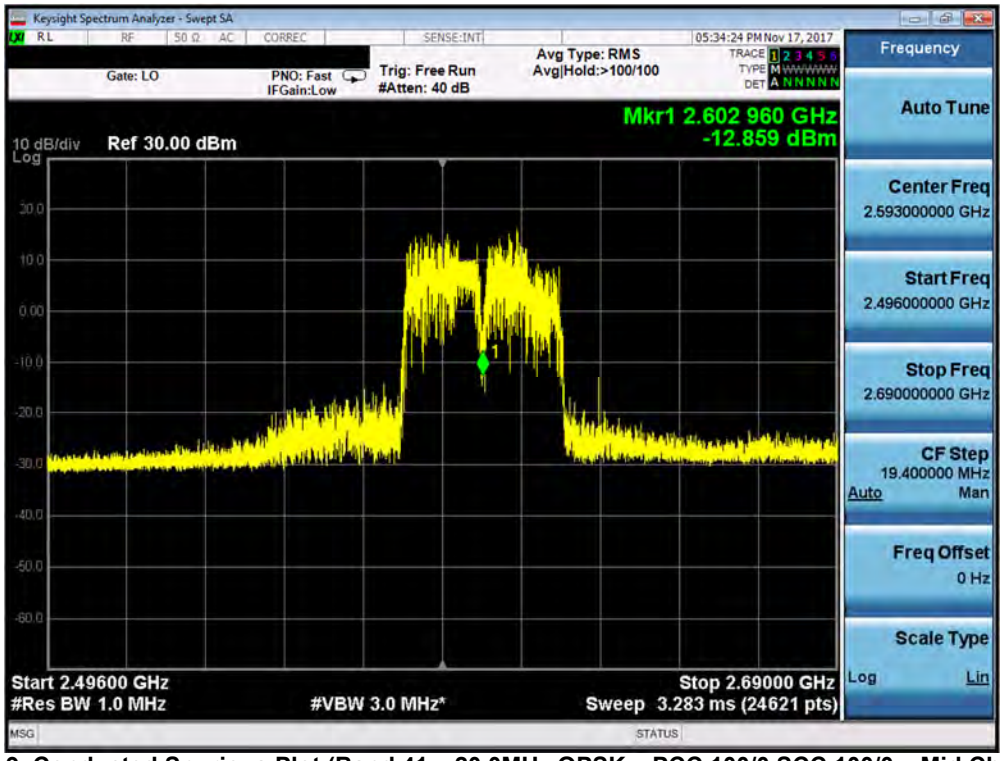
Plot 7-5. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

Plot 7-6. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

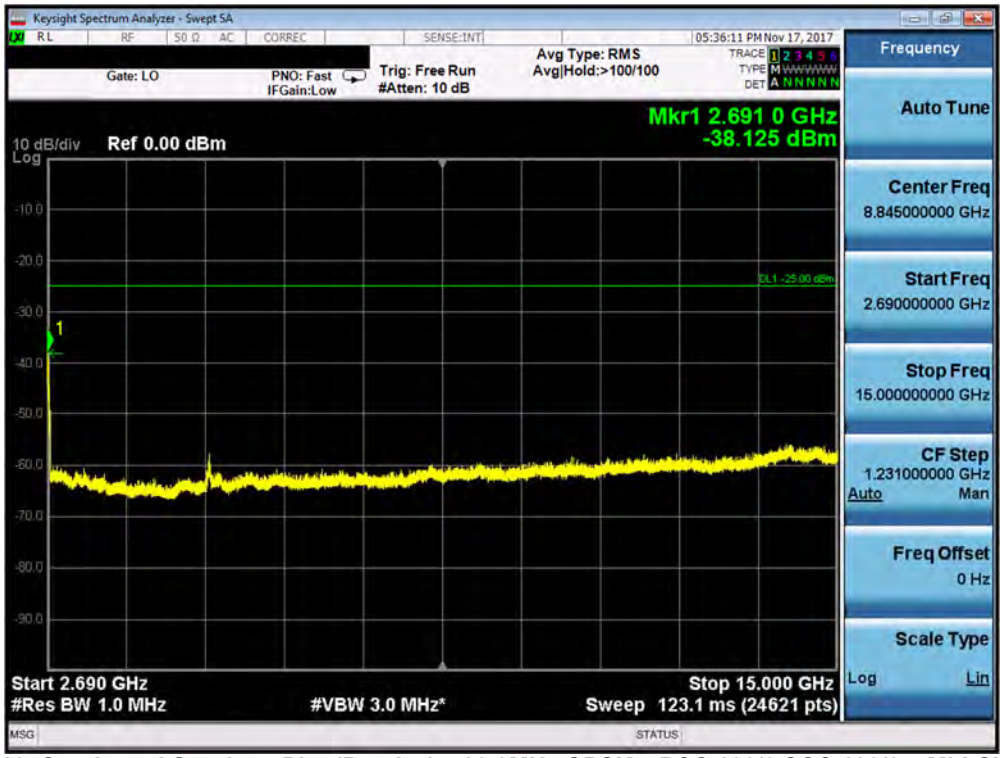
Plot 7-7. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)



Plot 7-8. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

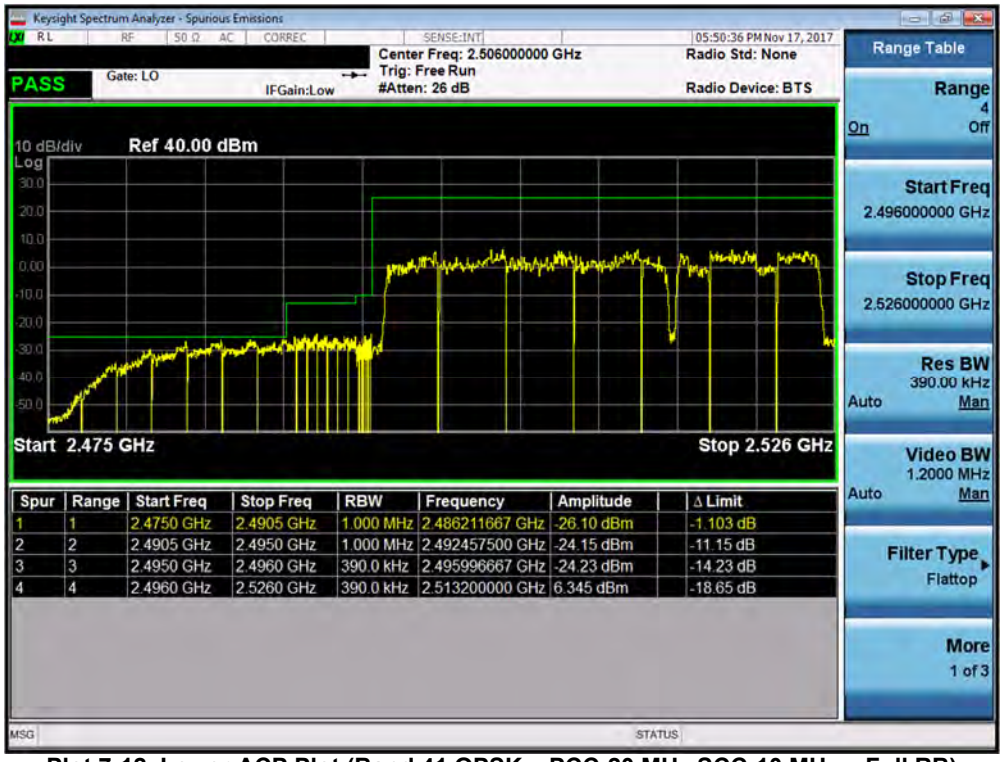


Plot 7-9. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

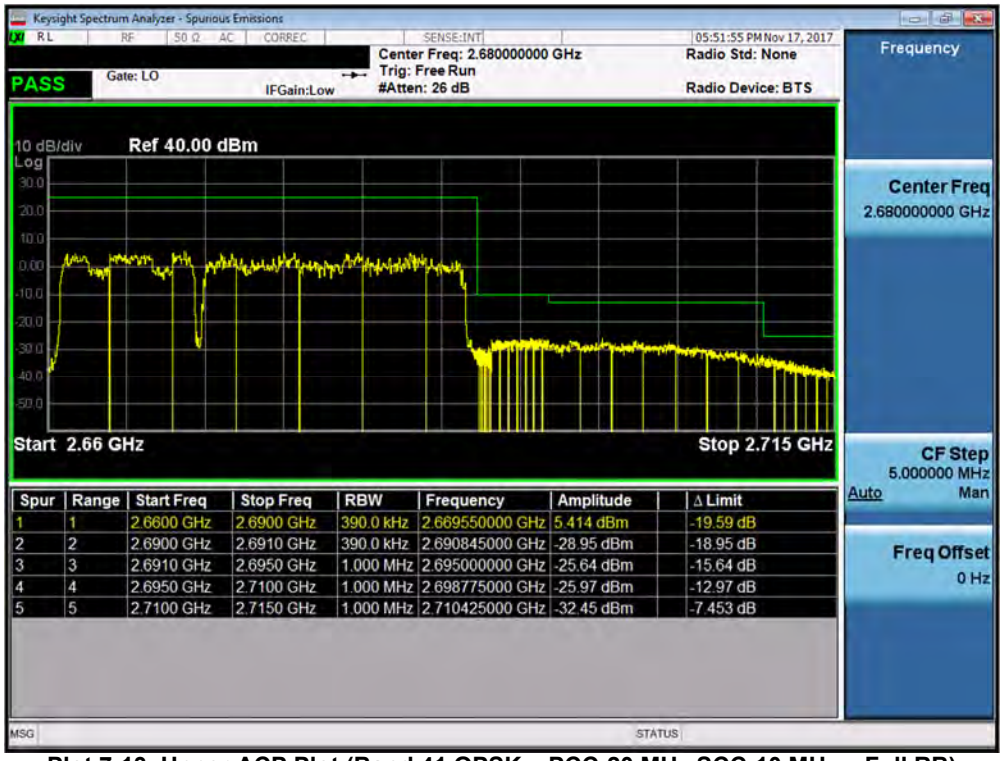


Plot 7-10. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

Plot 7-11. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

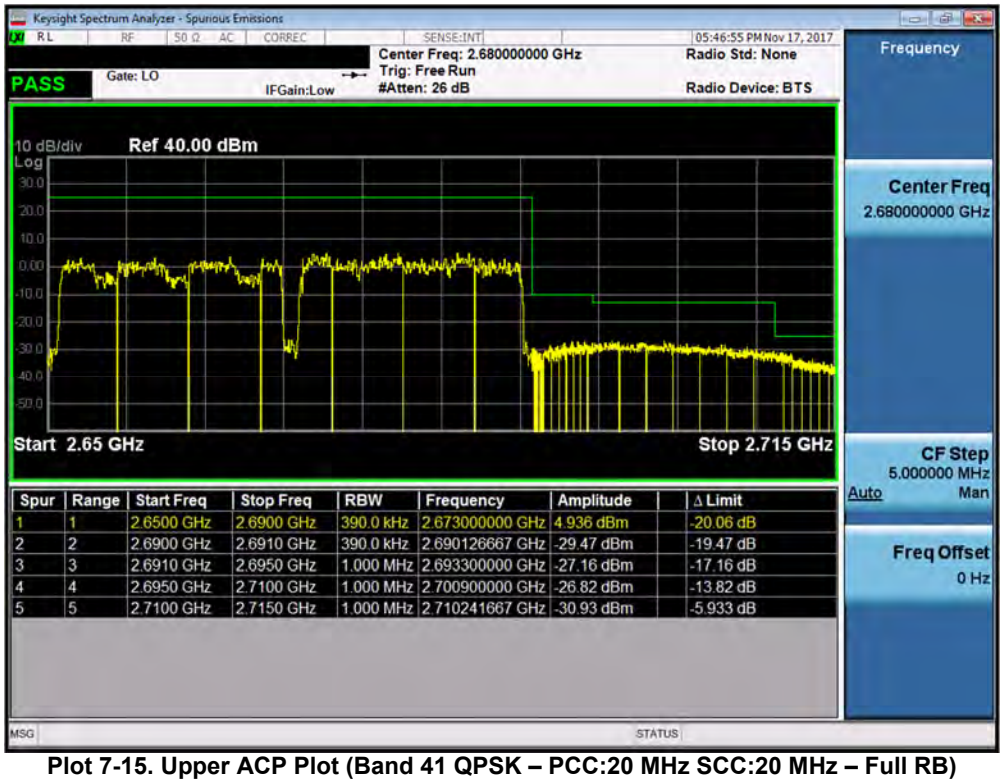


Plot 7-12. Lower ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:10 MHz – Full RB)



Plot 7-13. Upper ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:10 MHz – Full RB)

Plot 7-14. Lower ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)



Plot 7-15. Upper ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

7.8 Radiated Power (ERP/EIRP)

§22.913(a)(2) §24.232(c.2) §27.50(h)(2) §27.50(b)(10) §27.50(c)(10) §27.50(d)(4) §27.50(a)(3)

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 v03 – 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.

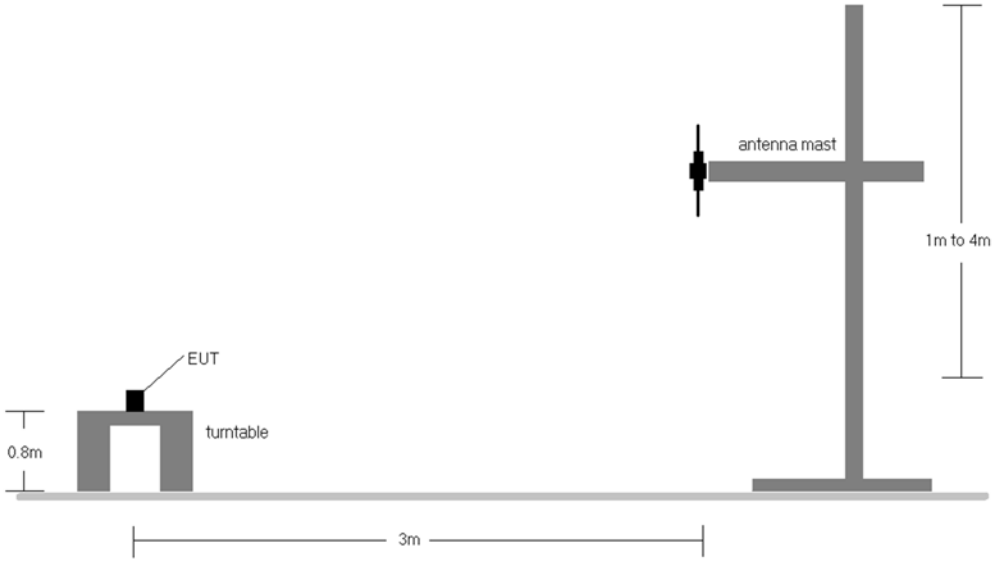


Figure 7-7. Radiated Test Setup <1GHz

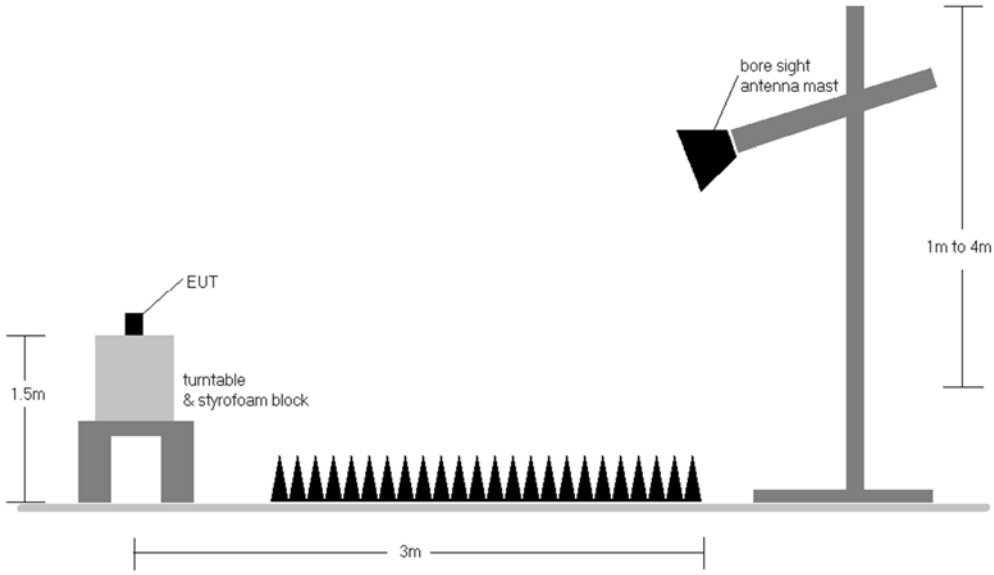


Figure 7-8. Radiated Test Setup >1GHz

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.

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]
665.50	5	QPSK	H	100	151	1 / 24	15.89	3.84	17.58	0.057	34.77	-17.20	19.73	0.094	40.61	-20.88
680.50	5	QPSK	H	100	161	1 / 0	16.96	3.91	18.72	0.074	34.77	-16.05	20.87	0.122	40.61	-19.74
695.50	5	QPSK	H	100	164	1 / 0	13.52	3.98	15.35	0.034	34.77	-19.42	17.50	0.056	40.61	-23.11
680.50	5	16-QAM	H	100	161	1 / 0	16.06	3.91	17.82	0.061	34.77	-16.95	19.97	0.099	40.61	-20.64
680.50	5	64-QAM	H	100	161	1 / 0	15.05	3.91	16.81	0.048	34.77	-17.96	18.96	0.079	40.61	-21.65
668.00	10	QPSK	H	100	158	1 / 0	15.41	3.85	17.11	0.051	34.77	-17.66	19.26	0.084	40.61	-21.35
680.50	10	QPSK	H	100	162	1 / 0	16.90	3.91	18.66	0.073	34.77	-16.11	20.81	0.120	40.61	-19.80
693.00	10	QPSK	H	100	163	1 / 0	15.82	3.97	17.64	0.058	34.77	-17.13	19.79	0.095	40.61	-20.82
680.50	10	16-QAM	H	100	162	1 / 0	15.88	3.91	17.64	0.058	34.77	-17.13	19.79	0.095	40.61	-20.82
680.50	10	64-QAM	H	100	162	1 / 0	14.72	3.91	16.48	0.044	34.77	-18.29	18.63	0.073	40.61	-21.98
670.50	15	QPSK	H	100	158	1 / 74	17.26	3.86	18.97	0.079	34.77	-15.80	21.12	0.129	40.61	-19.49
680.50	15	QPSK	H	100	160	1 / 0	16.82	3.91	18.58	0.072	34.77	-16.19	20.73	0.118	40.61	-19.88
690.50	15	QPSK	H	100	162	1 / 0	17.14	3.96	18.95	0.078	34.77	-15.83	21.10	0.129	40.61	-19.51
670.50	15	16-QAM	H	100	158	1 / 74	16.22	3.86	17.93	0.062	34.77	-16.84	20.08	0.102	40.61	-20.53
670.50	15	64-QAM	H	100	158	1 / 74	15.26	3.86	16.97	0.050	34.77	-17.80	19.12	0.082	40.61	-21.49
673.00	20	QPSK	H	100	160	1 / 99	17.08	3.87	18.80	0.076	34.77	-15.97	20.95	0.125	40.61	-19.65
680.50	20	QPSK	H	100	161	1 / 0	16.50	3.91	18.26	0.067	34.77	-16.51	20.41	0.110	40.61	-20.20
688.00	20	QPSK	H	100	162	1 / 0	17.50	3.94	19.29	0.085	34.77	-15.48	21.44	0.139	40.61	-19.16
688.00	20	16-QAM	H	100	162	1 / 0	16.43	3.94	18.22	0.066	34.77	-16.55	20.37	0.109	40.61	-20.23
688.00	20	64-QAM	H	100	162	1 / 0	15.18	3.94	16.97	0.050	34.77	-17.80	19.12	0.082	40.61	-21.48
688.00	20	QPSK	V	231	94	1 / 0	14.94	3.64	16.43	0.044	34.77	-18.34	18.58	0.072	40.61	-22.02
688 (WCP)	20	QPSK	H	171	8	1 / 0	17.44	3.94	19.23	0.084	34.77	-15.54	21.38	0.138	40.61	-19.22

Table 7-16. ERP/EIRP 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]	Margin [dB]
699.70	1.4	QPSK	V	150	246	1 / 5	18.73	1.10	17.68	0.059	34.77	-17.09	19.83	0.096	-20.78
707.50	1.4	QPSK	V	150	258	1 / 0	19.76	1.13	18.74	0.075	34.77	-16.03	20.89	0.123	-19.72
715.30	1.4	QPSK	V	150	246	1 / 0	20.03	1.16	19.04	0.080	34.77	-15.73	21.19	0.132	-19.42
715.30	1.4	16-QAM	V	150	246	1 / 0	19.32	1.16	18.33	0.068	34.77	-16.44	20.48	0.112	-20.13
715.30	1.4	64-QAM	V	150	246	1 / 0	19.12	1.16	18.13	0.065	34.77	-16.64	20.28	0.107	-20.33
700.50	3	QPSK	V	150	353	1 / 14	18.81	1.10	17.76	0.060	34.77	-17.01	19.91	0.098	-20.69
707.50	3	QPSK	V	150	358	1 / 14	19.39	1.13	18.37	0.069	34.77	-16.40	20.52	0.113	-20.09
714.50	3	QPSK	V	150	3	1 / 0	19.44	1.16	18.45	0.070	34.77	-16.32	20.60	0.115	-20.01
714.50	3	16-QAM	V	150	3	1 / 0	18.82	1.16	17.83	0.061	34.77	-16.94	19.98	0.100	-20.63
714.50	3	64-QAM	V	150	3	1 / 0	18.60	1.16	17.61	0.058	34.77	-17.16	19.76	0.095	-20.85

Table 7-17. ERP/EIRP 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]	Margin [dB]
701.50	5	QPSK	V	150	252	1 / 24	19.22	1.11	18.18	0.066	34.77	-16.60	20.33	0.108	-20.28
707.50	5	QPSK	V	150	251	1 / 24	19.43	1.13	18.41	0.069	34.77	-16.36	20.56	0.114	-20.05
713.50	5	QPSK	V	150	262	1 / 0	19.87	1.15	18.87	0.077	34.77	-15.90	21.02	0.127	-19.58
713.50	5	16-QAM	V	150	262	1 / 24	19.29	1.15	18.29	0.068	34.77	-16.48	20.44	0.111	-20.16
713.50	5	64-QAM	V	150	262	1 / 24	19.16	1.15	18.16	0.066	34.77	-16.61	20.31	0.108	-20.29
704.00	10	QPSK	V	150	260	1 / 49	19.68	1.12	18.65	0.073	34.77	-16.12	20.80	0.120	-19.81
707.50	10	QPSK	V	150	257	1 / 49	19.81	1.13	18.79	0.076	34.77	-15.98	20.94	0.124	-19.67
711.00	10	QPSK	V	150	255	1 / 49	20.23	1.14	19.22	0.084	34.77	-15.55	21.37	0.137	-19.23
707.50	10	16-QAM	V	150	257	1 / 49	19.38	1.13	18.36	0.069	34.77	-16.41	20.51	0.112	-20.10
711.00	10	64-QAM	V	150	255	1 / 49	19.13	1.14	18.12	0.065	34.77	-16.65	20.27	0.107	-20.33
711.00	10	QPSK	H	150	301	1 / 74	17.58	1.14	16.57	0.045	34.77	-18.20	18.72	0.075	-21.88
711 (WCP)	10	QPSK	V	150	260	1 / 0	14.54	1.14	13.53	0.023	34.77	-21.24	15.68	0.037	-24.92

Table 7-18. ERP/EIRP Data (Band 12/17)

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]	Margin [dB]
779.50	5	QPSK	H	150	294	1 / 0	19.99	1.32	19.16	0.082	34.77	-15.61	21.31	0.135	-19.30
782.00	5	QPSK	H	150	288	1 / 0	19.74	1.33	18.92	0.078	34.77	-15.85	21.07	0.128	-19.54
784.50	5	QPSK	H	150	309	1 / 0	20.00	1.34	19.19	0.083	34.77	-15.58	21.34	0.136	-19.27
779.50	5	16-QAM	H	150	294	1 / 0	19.35	1.32	18.52	0.071	34.77	-16.25	20.67	0.117	-19.94
782.00	5	64-QAM	H	150	288	1 / 0	18.42	1.33	17.60	0.058	34.77	-17.17	19.75	0.094	-20.86
782.00	10	QPSK	H	150	301	1 / 0	20.26	1.33	19.44	0.088	34.77	-15.33	21.59	0.144	-19.02
782.00	10	16-QAM	H	150	301	1 / 0	19.64	1.33	18.82	0.076	34.77	-15.95	20.97	0.125	-19.64
782.00	10	64-QAM	H	150	301	1 / 0	18.61	1.33	17.79	0.060	34.77	-16.98	19.94	0.099	-20.67
782.00	10	QPSK	V	150	5	1 / 74	19.30	1.33	18.48	0.070	34.77	-16.29	20.63	0.116	-19.98
782 (WCP)	10	QPSK	H	150	251	1 / 0	12.49	1.33	11.67	0.015	34.77	-23.10	13.82	0.024	-26.79

Table 7-19. ERP/EIRP 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]	Margin [dB]
824.70	1.4	QPSK	H	150	363	1 / 5	18.16	1.50	17.51	0.056	38.45	-20.94	19.66	0.092	-17.33
836.50	1.4	QPSK	H	150	353	1 / 5	19.04	1.50	18.39	0.069	38.45	-20.06	20.54	0.113	-16.45
848.30	1.4	QPSK	H	150	0	1 / 0	19.57	1.50	18.92	0.078	38.45	-19.53	21.07	0.128	-15.92
848.30	1.4	16-QAM	H	150	0	1 / 0	18.85	1.50	18.20	0.066	38.45	-20.25	20.35	0.108	-16.64
848.30	1.4	64-QAM	H	150	0	1 / 0	17.75	1.50	17.10	0.051	38.45	-21.35	19.25	0.084	-17.74
825.50	3	QPSK	H	150	357	1 / 14	18.70	1.50	18.05	0.064	38.45	-20.40	20.20	0.105	-16.79
836.50	3	QPSK	H	150	355	1 / 14	19.48	1.50	18.83	0.076	38.45	-19.62	20.98	0.125	-16.01
847.50	3	QPSK	H	150	359	1 / 0	19.82	1.50	19.17	0.083	38.45	-19.28	21.32	0.136	-15.67
847.50	3	16-QAM	H	150	359	1 / 0	19.16	1.50	18.51	0.071	38.45	-19.94	20.66	0.116	-16.33
847.50	3	64-QAM	H	150	359	1 / 0	17.88	1.50	17.23	0.053	38.45	-21.22	19.38	0.087	-17.61
826.50	5	QPSK	H	150	353	1 / 24	18.47	1.50	17.82	0.061	38.45	-20.63	19.97	0.099	-17.02
836.50	5	QPSK	H	150	0	1 / 24	19.02	1.50	18.37	0.069	38.45	-20.08	20.52	0.113	-16.47
846.50	5	QPSK	H	150	0	1 / 0	19.59	1.50	18.94	0.078	38.45	-19.51	21.09	0.129	-15.90
846.50	5	16-QAM	H	150	0	1 / 0	18.67	1.50	18.02	0.063	38.45	-20.43	20.17	0.104	-16.82
846.50	5	64-QAM	H	150	0	1 / 0	17.67	1.50	17.02	0.050	38.45	-21.43	19.17	0.083	-17.82
829.00	10	QPSK	H	105	0	1 / 49	19.28	1.50	18.63	0.073	38.45	-19.82	20.78	0.120	-16.21
836.50	10	QPSK	H	150	0	1 / 49	19.55	1.50	18.90	0.078	38.45	-19.55	21.05	0.127	-15.94
844.00	10	QPSK	H	150	7	1 / 0	19.19	1.50	18.54	0.071	38.45	-19.91	20.69	0.117	-16.30
836.50	10	16-QAM	H	150	0	1 / 49	18.53	1.50	17.88	0.061	38.45	-20.57	20.03	0.101	-16.96
836.50	10	64-QAM	H	150	0	1 / 49	17.62	1.50	16.97	0.050	38.45	-21.48	19.12	0.082	-17.87
847.50	3	QPSK	V	150	274	1 / 0	19.24	1.50	18.59	0.072	38.45	-19.86	20.74	0.119	-16.25
847.5 (WCP)	3	QPSK	H	150	281	1 / 0	16.73	1.50	16.08	0.041	38.45	-22.37	18.23	0.067	-18.76

Table 7-20. ERP/EIRP Data (Band 5/26)

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]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
831.50	15	QPSK	H	150	0	1 / 74	19.18	1.50	18.53	0.071	38.45	-19.92	20.68	0.117	-16.31
836.50	15	QPSK	H	150	0	1 / 74	19.62	1.50	18.97	0.079	38.45	-19.48	21.12	0.129	-15.87
841.50	15	QPSK	H	150	8	1 / 74	19.32	1.50	18.67	0.074	38.45	-19.78	20.82	0.121	-16.17
836.50	15	16-QAM	H	150	0	1 / 74	19.11	1.50	18.46	0.070	38.45	-19.99	20.61	0.115	-16.38
831.50	15	64-QAM	H	150	0	1 / 74	18.00	1.50	17.35	0.054	38.45	-21.10	19.50	0.089	-17.49

Table 7-21. ERP/EIRP 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	150	20	3 / 2	17.85	5.56	23.41	0.219	30.00	-6.59
1745.00	1.4	QPSK	H	150	18	3 / 2	17.93	5.32	23.25	0.211	30.00	-6.75
1779.30	1.4	QPSK	H	150	15	3 / 2	18.83	5.09	23.92	0.247	30.00	-6.08
1779.30	1.4	16-QAM	H	150	15	1 / 5	18.06	5.09	23.15	0.207	30.00	-6.85
1779.30	1.4	64-QAM	H	150	15	3 / 2	17.04	5.09	22.13	0.163	30.00	-7.87
1711.50	3	QPSK	H	150	13	1 / 0	17.54	5.55	23.09	0.204	30.00	-6.91
1745.00	3	QPSK	H	150	11	1 / 0	18.10	5.32	23.42	0.220	30.00	-6.58
1778.50	3	QPSK	H	150	15	1 / 0	18.87	5.10	23.97	0.249	30.00	-6.03
1778.50	3	16-QAM	H	150	15	1 / 14	18.07	5.10	23.17	0.207	30.00	-6.83
1778.50	3	64-QAM	H	150	15	1 / 0	17.11	5.10	22.21	0.166	30.00	-7.79
1712.50	5	QPSK	H	150	20	1 / 0	18.02	5.55	23.57	0.227	30.00	-6.43
1745.00	5	QPSK	H	150	18	1 / 24	18.21	5.32	23.53	0.226	30.00	-6.47
1777.50	5	QPSK	H	150	22	1 / 24	18.49	5.10	23.59	0.229	30.00	-6.41
1745.00	5	16-QAM	H	150	18	1 / 24	17.56	5.32	22.88	0.194	30.00	-7.12
1712.50	5	64-QAM	H	150	20	1 / 0	16.45	5.55	22.00	0.158	30.00	-8.00
1715.00	10	QPSK	H	150	11	1 / 49	17.79	5.53	23.32	0.215	30.00	-6.68
1745.00	10	QPSK	H	150	9	1 / 49	18.53	5.32	23.85	0.243	30.00	-6.15
1775.00	10	QPSK	H	150	13	1 / 49	18.85	5.12	23.97	0.249	30.00	-6.03
1745.00	10	16-QAM	H	150	9	1 / 49	18.22	5.32	23.54	0.226	30.00	-6.46
1745.00	10	64-QAM	H	150	9	1 / 49	16.95	5.32	22.27	0.169	30.00	-7.73
1717.50	15	QPSK	H	150	20	1 / 74	18.45	5.51	23.96	0.249	30.00	-6.04
1745.00	15	QPSK	H	150	18	1 / 74	19.03	5.32	24.35	0.272	30.00	-5.65
1772.50	15	QPSK	H	150	15	1 / 0	19.03	5.14	24.17	0.261	30.00	-5.83
1745.00	15	16-QAM	H	150	18	1 / 74	18.35	5.32	23.67	0.233	30.00	-6.33
1772.50	15	64-QAM	H	150	15	1 / 0	17.42	5.14	22.56	0.180	30.00	-7.44
1720.00	20	QPSK	H	150	13	1 / 99	18.54	5.49	24.03	0.253	30.00	-5.97
1745.00	20	QPSK	H	150	11	1 / 99	19.10	5.32	24.42	0.277	30.00	-5.58
1770.00	20	QPSK	H	150	15	1 / 0	19.17	5.15	24.32	0.271	30.00	-5.68
1745.00	20	16-QAM	H	150	11	1 / 99	18.62	5.32	23.94	0.248	30.00	-6.06
1770.00	20	64-QAM	H	150	15	1 / 0	17.52	5.15	22.67	0.185	30.00	-7.33
1745.00	20	QPSK	V	150	307	1 / 0	17.18	5.27	22.45	0.176	30.00	-7.55
1745 (WCP)	20	QPSK	H	150	8	1 / 99	18.16	5.27	23.43	0.220	30.00	-6.57

Table 7-22. 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	150	318	1 / 0	18.54	4.79	23.33	0.215	33.01	-9.68
1882.50	1.4	QPSK	V	150	323	1 / 0	18.19	4.85	23.04	0.201	33.01	-9.97
1914.30	1.4	QPSK	V	150	333	1 / 5	17.71	4.85	22.56	0.180	33.01	-10.45
1850.70	1.4	16-QAM	V	150	318	1 / 0	17.70	4.79	22.49	0.177	33.01	-10.52
1850.70	1.4	64-QAM	V	150	318	1 / 0	16.66	4.79	21.45	0.140	33.01	-11.56
1851.50	3	QPSK	V	150	315	1 / 0	18.56	4.79	23.35	0.216	33.01	-9.66
1882.50	3	QPSK	V	150	314	1 / 0	17.53	4.85	22.38	0.173	33.01	-10.63
1913.50	3	QPSK	V	150	330	1 / 0	17.00	4.85	21.85	0.153	33.01	-11.16
1851.50	3	16-QAM	V	150	315	1 / 0	17.80	4.79	22.59	0.181	33.01	-10.42
1851.50	3	64-QAM	V	150	315	1 / 0	17.10	4.79	21.89	0.154	33.01	-11.12
1852.50	5	QPSK	V	150	318	1 / 24	18.67	4.79	23.46	0.222	33.01	-9.55
1882.50	5	QPSK	V	150	315	1 / 0	17.48	4.85	22.33	0.171	33.01	-10.68
1912.50	5	QPSK	V	150	328	1 / 0	17.10	4.85	21.95	0.157	33.01	-11.06
1852.50	5	16-QAM	V	150	318	1 / 24	18.11	4.79	22.90	0.195	33.01	-10.11
1852.50	5	64-QAM	V	150	318	1 / 24	16.75	4.79	21.54	0.143	33.01	-11.47
1855.00	10	QPSK	V	150	325	1 / 49	18.66	4.80	23.46	0.222	33.01	-9.55
1882.50	10	QPSK	V	150	315	1 / 0	18.25	4.85	23.10	0.204	33.01	-9.91
1910.00	10	QPSK	V	150	335	1 / 0	17.70	4.86	22.56	0.180	33.01	-10.45
1882.50	10	16-QAM	V	150	315	1 / 0	17.76	4.85	22.61	0.182	33.01	-10.40
1855.00	10	64-QAM	V	150	325	1 / 49	16.60	4.80	21.40	0.138	33.01	-11.61
1857.50	15	QPSK	V	150	316	1 / 0	18.48	4.80	23.28	0.213	33.01	-9.73
1882.50	15	QPSK	V	150	313	1 / 0	17.83	4.85	22.68	0.185	33.01	-10.33
1907.50	15	QPSK	V	150	331	1 / 0	17.65	4.87	22.52	0.178	33.01	-10.49
1857.50	15	16-QAM	V	150	316	1 / 0	17.58	4.80	22.38	0.173	33.01	-10.63
1857.50	15	64-QAM	V	150	316	1 / 0	16.44	4.80	21.24	0.133	33.01	-11.77
1860.00	20	QPSK	V	150	320	1 / 0	18.66	4.81	23.47	0.222	33.01	-9.55
1882.50	20	QPSK	V	150	310	1 / 0	17.80	4.85	22.65	0.184	33.01	-10.36
1905.00	20	QPSK	V	150	330	1 / 0	17.77	4.87	22.64	0.184	33.01	-10.37
1860.00	20	16-QAM	V	150	320	1 / 0	17.86	4.81	22.67	0.185	33.01	-10.35
1860.00	20	64-QAM	V	150	320	1 / 0	17.19	4.81	22.00	0.158	33.01	-11.02
1860.00	20	QPSK	H	150	14	1 / 0	18.30	4.81	23.11	0.204	33.01	-9.91
1860 (WCP)	20	QPSK	V	150	52	1 / 99	11.89	4.81	16.70	0.047	33.01	-16.32

Table 7-23. 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]
2307.50	5	QPSK	H	150	325	1 / 0	16.64	5.74	22.38	0.173	23.98	-1.60
2312.50	5	QPSK	H	150	319	1 / 24	15.84	5.74	21.58	0.144	23.98	-2.40
2307.50	5	16-QAM	H	150	325	1 / 0	15.96	5.74	21.70	0.148	23.98	-2.28
2307.50	5	64-QAM	H	150	325	1 / 0	14.98	5.74	20.72	0.118	23.98	-3.26
2310.00	10	QPSK	H	150	325	1 / 0	16.56	5.74	22.30	0.170	23.98	-1.68
2310.00	10	16-QAM	H	150	325	1 / 0	15.95	5.74	21.69	0.147	23.98	-2.29
2310.00	10	64-QAM	H	150	325	1 / 0	14.90	5.74	20.64	0.116	23.98	-3.34
2307.50	5	QPSK	V	150	257	1 / 0	15.85	5.56	21.41	0.138	23.98	-2.57
2307.5 (WCP)	5	QPSK	V	150	80	1 / 0	13.44	5.74	19.18	0.083	23.98	-4.80

Table 7-24. EIRP Data (Band 30 – Antenna A)

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]
2307.50	5	QPSK	V	150	100	1 / 0	15.44	5.56	21.00	0.126	23.98	-2.98
2312.50	5	QPSK	V	150	101	1 / 24	14.50	5.59	20.09	0.102	23.98	-3.89
2307.50	5	16-QAM	V	150	100	1 / 0	14.25	5.56	19.81	0.096	23.98	-4.17
2307.50	5	64-QAM	V	150	100	1 / 0	13.26	5.56	18.82	0.076	23.98	-5.16
2310.00	10	QPSK	V	150	99	1 / 0	15.35	5.57	20.92	0.124	23.98	-3.06
2310.00	10	16-QAM	V	150	99	1 / 0	14.95	5.57	20.52	0.113	23.98	-3.46
2310.00	10	64-QAM	V	150	99	1 / 0	14.88	5.57	20.45	0.111	23.98	-3.53
2307.50	5	QPSK	H	150	0	1 / 0	14.84	5.59	20.43	0.110	23.98	-3.55
2307.5 (WCP)	5	QPSK	V	150	195	1 / 0	13.99	5.59	19.58	0.091	23.98	-4.40

Table 7-25. EIRP Data (Band 30 – Antenna B)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	V	150	286	1 / 0	14.54	5.61	20.15	0.103	33.01	-12.86
2535.00	5	QPSK	V	150	285	1 / 0	15.40	5.85	21.25	0.133	33.01	-11.76
2567.50	5	QPSK	V	150	295	1 / 24	16.40	6.09	22.49	0.177	33.01	-10.52
2567.50	5	16-QAM	V	150	295	1 / 24	15.96	6.09	22.05	0.160	33.01	-10.96
2567.50	5	64-QAM	V	150	295	1 / 24	15.01	6.09	21.10	0.129	33.01	-11.91
2505.00	10	QPSK	V	150	280	1 / 0	14.20	5.63	19.83	0.096	33.01	-13.18
2535.00	10	QPSK	V	150	282	1 / 0	16.15	5.85	22.00	0.158	33.01	-11.01
2565.00	10	QPSK	V	150	288	1 / 49	16.58	6.07	22.65	0.184	33.01	-10.36
2565.00	10	16-QAM	V	150	288	1 / 49	16.04	6.07	22.11	0.163	33.01	-10.90
2565.00	10	64-QAM	V	150	288	1 / 49	14.95	6.07	21.02	0.126	33.01	-11.99
2507.50	15	QPSK	V	150	283	1 / 0	15.14	5.64	20.78	0.120	33.01	-12.23
2535.00	15	QPSK	V	150	280	1 / 0	16.93	5.85	22.78	0.190	33.01	-10.23
2562.50	15	QPSK	V	150	288	1 / 0	17.63	6.05	23.68	0.233	33.01	-9.33
2562.50	15	16-QAM	V	150	288	1 / 0	17.25	6.05	23.30	0.214	33.01	-9.71
2562.50	15	64-QAM	V	150	288	1 / 0	16.28	6.05	22.33	0.171	33.01	-10.68
2510.00	20	QPSK	V	150	284	1 / 99	16.23	5.66	21.89	0.155	33.01	-11.12
2535.00	20	QPSK	V	150	286	1 / 0	17.32	5.85	23.17	0.207	33.01	-9.84
2560.00	20	QPSK	V	150	290	1 / 0	17.97	6.03	24.00	0.251	33.01	-9.01
2560.00	20	16-QAM	V	150	290	1 / 0	17.47	6.03	23.50	0.224	33.01	-9.51
2560.00	20	64-QAM	V	150	290	1 / 0	16.36	6.03	22.39	0.174	33.01	-10.62
2560.00	20	QPSK	H	150	32	1 / 0	17.49	5.95	23.44	0.221	33.01	-9.57
2560 (WCP)	20	QPSK	V	150	15	1 / 0	14.46	6.03	20.49	0.112	33.01	-12.52

Table 7-26. EIRP Data (Band 7 – Antenna A)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	H	150	228	1 / 24	16.58	5.74	22.32	0.171	33.01	-10.69
2535.00	5	QPSK	H	150	225	1 / 24	15.78	5.86	21.64	0.146	33.01	-11.37
2567.50	5	QPSK	H	150	228	1 / 0	16.62	5.98	22.60	0.182	33.01	-10.41
2567.50	5	16-QAM	H	150	228	1 / 0	15.73	5.98	21.71	0.148	33.01	-11.30
2567.50	5	64-QAM	H	150	228	1 / 0	14.71	5.98	20.69	0.117	33.01	-12.32
2505.00	10	QPSK	H	150	230	1 / 0	16.78	5.75	22.53	0.179	33.01	-10.48
2535.00	10	QPSK	H	150	230	1 / 0	15.99	5.86	21.85	0.153	33.01	-11.16
2565.00	10	QPSK	H	150	233	1 / 0	16.83	5.97	22.80	0.191	33.01	-10.21
2565.00	10	16-QAM	H	150	233	1 / 0	16.01	5.97	21.98	0.158	33.01	-11.03
2565.00	10	64-QAM	H	150	233	1 / 0	14.74	5.97	20.71	0.118	33.01	-12.30
2507.50	15	QPSK	H	150	224	1 / 74	16.67	5.76	22.43	0.175	33.01	-10.58
2535.00	15	QPSK	H	150	229	1 / 74	16.47	5.86	22.33	0.171	33.01	-10.68
2562.50	15	QPSK	H	150	229	1 / 74	16.58	5.96	22.54	0.180	33.01	-10.47
2507.50	15	16-QAM	H	150	224	1 / 74	16.18	5.76	21.94	0.156	33.01	-11.07
2562.50	15	64-QAM	H	150	229	1 / 74	14.76	5.96	20.72	0.118	33.01	-12.29
2510.00	20	QPSK	H	150	232	1 / 0	16.99	5.77	22.76	0.189	33.01	-10.25
2535.00	20	QPSK	H	150	229	1 / 99	16.34	5.86	22.20	0.166	33.01	-10.81
2560.00	20	QPSK	H	150	235	1 / 99	16.45	5.95	22.40	0.174	33.01	-10.61
2560.00	20	16-QAM	H	150	235	1 / 99	15.83	5.95	21.78	0.151	33.01	-11.23
2510.00	20	64-QAM	H	150	232	1 / 0	14.82	5.77	20.59	0.114	33.01	-12.42
2565.00	10	QPSK	V	150	267	1 / 99	16.76	5.97	22.73	0.188	33.01	-10.28
2565 (WCP)	10	QPSK	H	150	219	1 / 99	15.80	5.97	21.77	0.150	33.01	-11.24

Table 7-27. EIRP Data (Band 7 – Antenna B)

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	V	150	267	1 / 24	18.58	5.59	24.17	0.261	33.01	-8.84
2502.50	5	QPSK	V	150	270	1 / 0	20.73	5.61	26.34	0.430	33.01	-6.67
2593.00	5	QPSK	V	150	293	1 / 24	20.91	6.27	27.18	0.523	33.01	-5.83
2687.50	5	QPSK	V	150	185	1 / 24	19.27	6.47	25.74	0.375	33.01	-7.27
2593.00	5	16-QAM	V	150	293	1 / 24	20.32	6.27	26.59	0.456	33.01	-6.42
2593.00	5	64-QAM	V	150	293	1 / 24	19.97	6.27	26.24	0.421	33.01	-6.77
2501.00	10	QPSK	V	150	201	1 / 0	18.62	5.60	24.22	0.264	33.01	-8.79
2505.00	10	QPSK	V	150	185	1 / 49	21.41	5.63	27.04	0.505	33.01	-5.97
2593.00	10	QPSK	V	150	88	1 / 0	20.59	6.27	26.86	0.486	33.01	-6.15
2685.00	10	QPSK	V	150	206	1 / 0	19.77	6.46	26.23	0.420	33.01	-6.78
2505.00	10	16-QAM	V	150	185	1 / 49	20.38	5.63	26.01	0.399	33.01	-7.00
2505.00	10	64-QAM	V	150	185	1 / 49	19.17	5.63	24.80	0.302	33.01	-8.21
2503.50	15	QPSK	V	150	266	1 / 74	20.36	5.61	25.97	0.396	33.01	-7.04
2507.50	15	QPSK	V	150	266	1 / 74	21.84	5.64	27.48	0.560	33.01	-5.53
2593.00	15	QPSK	V	150	293	1 / 74	21.15	6.27	27.42	0.553	33.01	-5.59
2682.50	15	QPSK	V	150	270	1 / 74	18.99	6.46	25.45	0.351	33.01	-7.56
2593.00	15	16-QAM	V	150	293	1 / 74	20.74	6.27	27.01	0.503	33.01	-6.00
2593.00	15	64-QAM	V	150	293	1 / 74	19.71	6.27	25.98	0.397	33.01	-7.03
2506.00	20	QPSK	V	150	292	1 / 0	19.48	5.63	25.11	0.325	33.01	-7.90
2510.00	20	QPSK	V	150	292	1 / 0	19.42	5.66	25.08	0.322	33.01	-7.93
2593.00	20	QPSK	V	150	293	1 / 0	21.72	6.27	27.99	0.630	33.01	-5.02
2680.00	20	QPSK	V	150	303	1 / 0	19.77	6.46	26.23	0.419	33.01	-6.78
2593.00	20	16-QAM	V	150	293	1 / 0	20.70	6.27	26.97	0.498	33.01	-6.04
2593.00	20	64-QAM	V	150	293	1 / 0	19.74	6.27	26.01	0.399	33.01	-7.00
2593.00	20	QPSK	H	150	206	1 / 0	21.18	6.27	27.45	0.556	33.01	-5.56
2593 (WCP)	20	QPSK	V	150	297	1 / 0	15.71	6.27	21.98	0.158	33.01	-11.03

Table 7-28. 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]
2502.50	5	QPSK	V	150	308	1 / 0	16.26	5.61	21.87	0.154	33.01	-11.14
2593.00	5	QPSK	V	150	286	1 / 0	18.89	6.27	25.16	0.328	33.01	-7.85
2687.50	5	QPSK	V	150	313	1 / 0	17.15	6.47	23.62	0.230	33.01	-9.39
2593.00	5	16-QAM	V	150	286	1 / 0	17.88	6.27	24.15	0.260	33.01	-8.86
2593.00	5	64-QAM	V	150	286	1 / 0	17.22	6.27	23.49	0.224	33.01	-9.52
2505.00	10	QPSK	V	150	271	1 / 0	16.88	5.63	22.51	0.178	33.01	-10.50
2593.00	10	QPSK	V	150	288	1 / 0	18.74	6.27	25.01	0.317	33.01	-8.00
2685.00	10	QPSK	V	150	283	1 / 0	17.40	6.46	23.86	0.243	33.01	-9.15
2593.00	10	16-QAM	V	150	288	1 / 0	18.44	6.27	24.71	0.296	33.01	-8.30
2593.00	10	64-QAM	V	150	288	1 / 0	17.31	6.27	23.58	0.228	33.01	-9.43
2507.50	15	QPSK	V	150	266	1 / 0	16.86	5.64	22.50	0.178	33.01	-10.51
2593.00	15	QPSK	V	150	293	1 / 0	19.35	6.27	25.62	0.365	33.01	-7.39
2682.50	15	QPSK	V	150	309	1 / 0	16.73	6.46	23.19	0.208	33.01	-9.82
2593.00	15	16-QAM	V	150	293	1 / 0	18.32	6.27	24.59	0.288	33.01	-8.42
2593.00	15	64-QAM	V	150	293	1 / 0	17.27	6.27	23.54	0.226	33.01	-9.47
2510.00	20	QPSK	V	150	287	1 / 0	16.83	5.66	22.49	0.178	33.01	-10.52
2593.00	20	QPSK	V	150	292	1 / 0	19.18	6.27	25.45	0.351	33.01	-7.56
2680.00	20	QPSK	V	150	305	1 / 0	17.29	6.46	23.75	0.237	33.01	-9.26
2593.00	20	16-QAM	V	150	292	1 / 0	18.38	6.27	24.65	0.292	33.01	-8.36
2593.00	20	64-QAM	V	150	292	1 / 0	17.42	6.27	23.69	0.234	33.01	-9.32
2593.00	15	QPSK	H	150	206	1 / 0	18.54	6.07	24.61	0.289	33.01	-8.40
2593 (WCP)	15	QPSK	V	150	69	1 / 0	16.23	6.27	22.50	0.178	33.01	-10.51

Table 7-29. EIRP Data (Band 38/41 – PC3)

7.9 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(c) §27.53(f) §27.53(g) §27.53(h) §27.53(m) §27.53(a)(4)

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 v03 – 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.

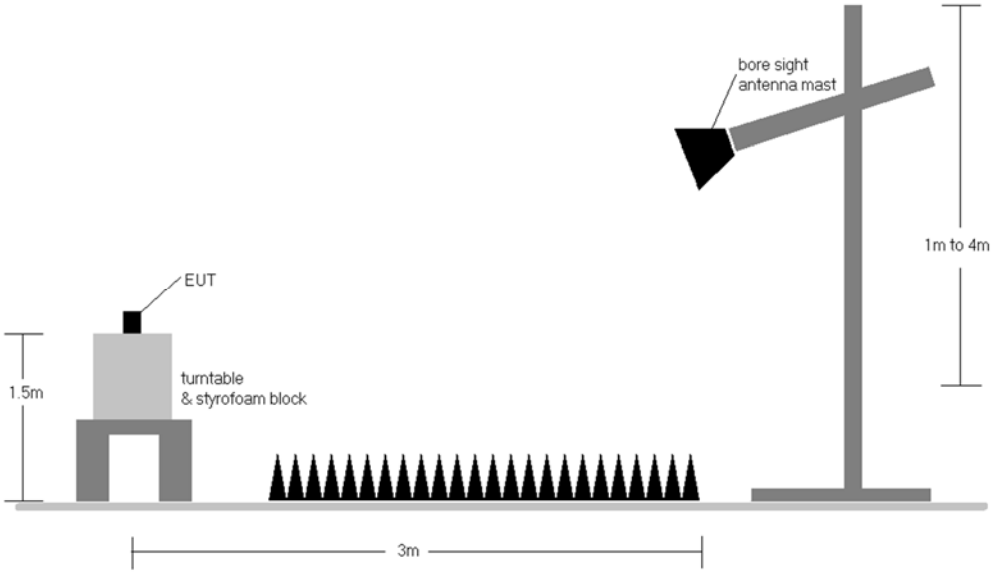


Figure 7-9. Test Instrument & Measurement Setup

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.

Band 71

OPERATING FREQUENCY:	673.00	MHz
CHANNEL:	133222	
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	V	139	306	-76.16	7.90	-68.26	-55.3
2019.00	V	369	310	-77.72	8.65	-69.07	-56.1
2692.00	V	-	-	-76.58	9.55	-67.03	-54.0

Table 7-30. Radiated Spurious Data (Band 71 – Low Channel)

OPERATING FREQUENCY:	680.50	MHz
CHANNEL:	133297	
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	V	147	259	-72.25	8.02	-64.23	-51.2
2041.50	V	128	340	-76.78	8.81	-67.97	-55.0
2722.00	V	-	-	-77.28	9.72	-67.56	-54.6

Table 7-31. Radiated Spurious Data (Band 71 – Mid Channel)

OPERATING FREQUENCY:	688.00	MHz
CHANNEL:	133372	
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	V	146	140	-79.39	8.14	-71.25	-58.2
2064.00	V	103	344	-75.69	8.90	-66.79	-53.8
2752.00	V	-	-	-76.68	9.93	-66.75	-53.7

Table 7-32. Radiated Spurious Data (Band 71 – High Channel)

OPERATING FREQUENCY:	688 (WCP)	MHz
CHANNEL:	133222	
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	V	400	28	-80.37	8.14	-72.23	-59.2
2064.00	V	127	300	-76.50	8.90	-67.60	-54.6
2752.00	V	-	-	-76.53	9.93	-66.60	-53.6

Table 7-33. Radiated Spurious Data with WCP (Band 71 – High Channel)

Band 12/17

OPERATING FREQUENCY:	704.00	MHz
CHANNEL:	23060	
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	255	96	-75.56	7.79	-67.77	-54.8
2112.00	H	369	180	-73.82	8.85	-64.97	-52.0
2816.00	H	155	182	-73.35	10.06	-63.29	-50.3
3520.00	H	-	-	-71.36	9.95	-61.41	-48.4

Table 7-34. Radiated Spurious Data (Band 12/17 – Low Channel)

OPERATING FREQUENCY:	707.50	MHz
CHANNEL:	23095	
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	324	170	-74.49	7.84	-66.65	-53.6
2122.50	H	253	181	-73.38	8.90	-64.48	-51.5
2830.00	H	-	-	-73.92	10.05	-63.88	-50.9

Table 7-35. Radiated Spurious Data (Band 12/17 – Mid Channel)

OPERATING FREQUENCY:	711.00	MHz
CHANNEL:	23130	
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	175	-74.63	7.90	-66.73	-53.7
2133.00	H	158	164	-73.37	8.94	-64.43	-51.4
2844.00	H	-	-	-73.86	10.03	-63.82	-50.8

Table 7-36. Radiated Spurious Data (Band 12/17 – High Channel)

OPERATING FREQUENCY:	711 (WCP)	MHz
CHANNEL:	23130	
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	128	335	-66.29	7.90	-58.39	-45.4
2133.00	H	-	-	-69.48	8.94	-60.54	-47.5
2844.00	H	-	-	-68.18	10.03	-58.14	-45.1

Table 7-37. Radiated Spurious Data with WCP (Band 12/17 – High Channel)

Band 13

OPERATING FREQUENCY:	782.00	MHz
CHANNEL:	23230	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	-	-	-74.59	9.48	-65.11	-52.1
3128.00	H	-	-	-71.61	9.35	-62.26	-49.3

Table 7-38. 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	H	-	-	-76.98	8.72	-68.26	-28.3

Table 7-39. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

OPERATING FREQUENCY:	782 (WCP)	MHz
CHANNEL:	23230	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	-	-	-69.33	9.48	-59.85	-46.9
3128.00	H	-	-	-66.68	9.35	-57.33	-44.3

Table 7-40. Radiated Spurious Data with WCP (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	H	-	-	-72.36	8.72	-63.64	-23.6

Table 7-41. Radiated Spurious Data with WCP (Band 13 – 1559-1610MHz Band)

Band 5/26

OPERATING FREQUENCY:	825.50	MHz
CHANNEL:	26805	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	3.0	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]
1651.00	H	-	-	-76.32	8.85	-67.47	-54.5
2476.50	H	-	-	-75.08	9.68	-65.40	-52.4

Table 7-42. Radiated Spurious Data (Band 5/26 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz
CHANNEL:	26915	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	3.0	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	-	-	-77.19	8.85	-68.34	-55.3
2509.50	H	-	-	-74.76	9.78	-64.99	-52.0

Table 7-43. Radiated Spurious Data (Band 5/26 – Mid Channel)

OPERATING FREQUENCY:	847.50	MHz
CHANNEL:	27025	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	3.0	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]
1695.00	H	-	-	-76.67	8.85	-67.82	-54.8
2542.50	H	-	-	-74.12	9.75	-64.37	-51.4

Table 7-44. Radiated Spurious Data (Band 5/26 – High Channel)

OPERATING FREQUENCY:	847.5 (WCP)	MHz
CHANNEL:	27025	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	3.0	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]
1695.00	H	-	-	-71.48	8.85	-62.63	-49.6
2542.50	H	-	-	-68.79	9.75	-59.04	-46.0

Table 7-45. Radiated Spurious Data with WCP (Band 5/26 – High Channel)

Band 66/4

OPERATING FREQUENCY:	1720.00	MHz
CHANNEL:	132072	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3440.00	V	-	-	-69.37	9.54	-59.83	-46.8
5160.00	V	-	-	-68.20	10.79	-57.40	-44.4

Table 7-46. Radiated Spurious Data (Band 66/4 – Low Channel)

OPERATING FREQUENCY:	1745.00	MHz
CHANNEL:	132322	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	V	121	10	-68.93	9.65	-59.28	-46.3
5235.00	V	-	-	-68.76	10.93	-57.83	-44.8

Table 7-47. Radiated Spurious Data (Band 66/4 – Mid Channel)

OPERATING FREQUENCY:	1770.00	MHz
CHANNEL:	132572	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3540.00	V	-	-	-69.04	9.69	-59.34	-46.3
5310.00	V	-	-	-68.77	10.97	-57.81	-44.8

Table 7-48. Radiated Spurious Data (Band 66/4 – High Channel)

OPERATING FREQUENCY:	1745 (WCP)	MHz
CHANNEL:	132322	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	V	-	-	-67.47	9.62	-57.86	-44.9
5235.00	V	-	-	-67.01	10.90	-56.11	-43.1

Table 7-49. Radiated Spurious Data with WCP (Band 66/4 – Mid Channel)

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	V	-	-	-69.27	9.77	-59.50	-46.5
5580.00	V	-	-	-67.90	11.01	-56.89	-43.9

Table 7-50. 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	V	-	-	-68.90	9.59	-59.31	-46.3
5647.50	V	-	-	-68.14	11.14	-57.00	-44.0

Table 7-51. 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	V	-	-	-67.55	9.28	-58.27	-45.3
5715.00	V	-	-	-68.19	11.28	-56.91	-43.9

Table 7-52. Radiated Spurious Data (Band 25/2 – High Channel)

OPERATING FREQUENCY:	1860 (WCP)	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]
3660.00	V	-	-	-67.30	9.77	-57.53	-44.5
5520.00	V	206	236	-64.54	11.01	-53.53	-40.5
7380.00	V	-	-	-61.01	10.82	-50.19	-37.2

Table 7-53. Radiated Spurious Data with WCP (Band 25/2 – Low Channel)

Band 30 – Antenna A

OPERATING FREQUENCY:	2307.50	MHz
CHANNEL:	27685	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-40	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]
4615.00	H	-	-	-71.74	11.22	-60.52	-20.5
6922.50	H	-	-	-65.39	10.89	-54.50	-14.5

Table 7-54. Radiated Spurious Data (Band 30 – Low Channel – Antenna A)

OPERATING FREQUENCY:	2312.50	MHz
CHANNEL:	27735	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-40	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]
4625.00	H	-	-	-71.81	11.23	-60.58	-20.6
6937.50	H	-	-	-65.29	10.91	-54.38	-14.4

Table 7-55. Radiated Spurious Data (Band 30 – High Channel – Antenna A)

OPERATING FREQUENCY:	2307.50	MHz
CHANNEL:	27685	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-40	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]
4615.00	H	-	-	-71.77	11.23	-60.54	-20.5
6927.50	H	-	-	-65.19	10.91	-54.28	-14.3

Table 7-56. Radiated Spurious Data with WCP (Band 30 – Low Channel – Antenna A)

Band 30 – Antenna B

OPERATING FREQUENCY:	2307.50	MHz
CHANNEL:	27685	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-40	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]
4615.00	H	124	64	-64.10	11.22	-52.88	-12.9
6922.50	H	196	356	-65.69	10.89	-54.80	-14.8
9230.00	H	-	-	-68.00	12.29	-55.71	-15.7

Table 7-57. Radiated Spurious Data (Band 30 – Low Channel – Antenna B)

OPERATING FREQUENCY:	2312.50	MHz
CHANNEL:	27735	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-40	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]
4625.00	H	316	75	-64.09	11.23	-52.86	-12.9
6937.50	H	182	6	-64.45	10.91	-53.54	-13.5
9250.00	H	-	-	-68.27	12.28	-55.98	-16.0

Table 7-58. Radiated Spurious Data (Band 30 – High Channel – Antenna B)

OPERATING FREQUENCY:	2312.50	MHz
CHANNEL:	27735	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-40	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]
4625.00	H	306	307	-65.48	11.23	-54.25	-14.3
6937.50	H	245	281	-65.82	10.91	-54.91	-14.9
9250.00	H	-	-	-68.28	12.28	-55.99	-16.0

Table 7-59. Radiated Spurious Data with WCP (Band 30 – High Channel – Antenna B)

Band 7 – Antenna A

OPERATING FREQUENCY:	2510.00	MHz
CHANNEL:	20850	
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	-	-	-69.05	10.90	-58.15	-33.2
7525.00	H	-	-	-64.49	11.11	-53.38	-28.4

Table 7-60. Radiated Spurious Data (Band 7 – Low Channel – Antenna A)

OPERATING FREQUENCY:	2535.00	MHz
CHANNEL:	21100	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5070.00	H	112	326	-67.47	10.81	-56.66	-31.7
7605.00	H	-	-	-64.77	11.30	-53.47	-28.5

Table 7-61. Radiated Spurious Data (Band 7 – Mid Channel – Antenna A)

OPERATING FREQUENCY:	2560.00	MHz
CHANNEL:	21350	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5120.00	H	-	-	-68.56	10.76	-57.81	-32.8
7685.00	H	-	-	-65.03	11.38	-53.65	-28.7

Table 7-62. Radiated Spurious Data (Band 7 – High Channel – Antenna A)

OPERATING FREQUENCY:	2560 (WCP)	MHz
CHANNEL:	21350	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5120.00	H	169	308	-67.95	10.76	-57.20	-32.2
7680.00	H	-	-	-64.92	11.38	-53.54	-28.5

Table 7-63. Radiated Spurious Data with WCP (Band 7 – High Channel – Antenna A)

Band 7 – Antenna B

OPERATING FREQUENCY:	2505.00	MHz
CHANNEL:	20800	
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]
5010.00	V	114	21	-58.92	11.12	-47.80	-22.8
7515.00	V	368	62	-63.08	10.99	-52.08	-27.1
10020.00	V	-	-	-62.36	12.15	-50.20	-25.2
12525.00	V	-	-	-61.40	12.75	-48.64	-23.6

Table 7-64. Radiated Spurious Data (Band 7 – Low Channel – Antenna B)

OPERATING FREQUENCY:	2535.00	MHz
CHANNEL:	21100	
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]
5070.00	V	104	9	-63.62	10.93	-52.68	-27.7
7605.00	V	114	0	-63.28	11.22	-52.06	-27.1
10140.00	V	-	-	-62.67	12.31	-50.36	-25.4
12675.00	V	-	-	-61.14	12.95	-48.19	-23.2

Table 7-65. Radiated Spurious Data (Band 7 – Mid Channel – Antenna B)

OPERATING FREQUENCY:	2565.00	MHz
CHANNEL:	21400	
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]
5130.00	V	104	284	-60.81	10.77	-50.05	-25.0
7695.00	V	370	10	-64.03	11.39	-52.65	-27.6
10260.00	V	-	-	-62.45	12.47	-49.98	-25.0
12825.00	V	-	-	-60.80	12.88	-47.92	-22.9

Table 7-66. Radiated Spurious Data (Band 7 – High Channel – Antenna B)

OPERATING FREQUENCY:	2565 (WCP)	MHz
CHANNEL:	21400	
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]
5130.00	V	103	235	-61.48	10.77	-50.72	-25.7
7695.00	V	-	-	-62.09	11.39	-50.71	-25.7
10260.00	V	-	-	-60.61	12.47	-48.14	-23.1

Table 7-67. Radiated Spurious Data with WCP (Band 7 – High Channel – Antenna B)

Band 41

OPERATING FREQUENCY:	2506.00	MHz
CHANNEL:	39750	
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	326	320	-45.63	8.35	-37.28	-12.3
7518.00	H	63	33	-53.04	8.45	-44.59	-19.6
10024.00	H	-	-	-53.30	9.84	-43.46	-18.5

Table 7-68. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY:	2593.00	MHz
CHANNEL:	40620	
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	324	321	-46.24	8.45	-37.79	-12.8
7779.00	H	-	-	-54.09	8.75	-45.35	-20.3
10372.00	H	-	-	-52.73	9.73	-43.01	-18.0

Table 7-69. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY:	2680.00	MHz
CHANNEL:	41490	
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	326	320	-47.00	8.40	-38.60	-13.6
8040.00	H	-	-	-55.23	9.19	-46.05	-21.0

Table 7-70. Radiated Spurious Data (Band 41 – High Channel)

OPERATING FREQUENCY:	2593 (WCP)	MHz
CHANNEL:	40620	
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	122	230	-60.52	10.75	-49.77	-24.8
7779.00	H	277	53	-61.90	11.40	-50.50	-25.5
10372.00	H	-	-	-60.65	12.59	-48.06	-23.1

Table 7-71. Radiated Spurious Data with WCP (Band 41 – Mid Channel)

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 = Max Hold
6. The trace was allowed to stabilize

Test Setup

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

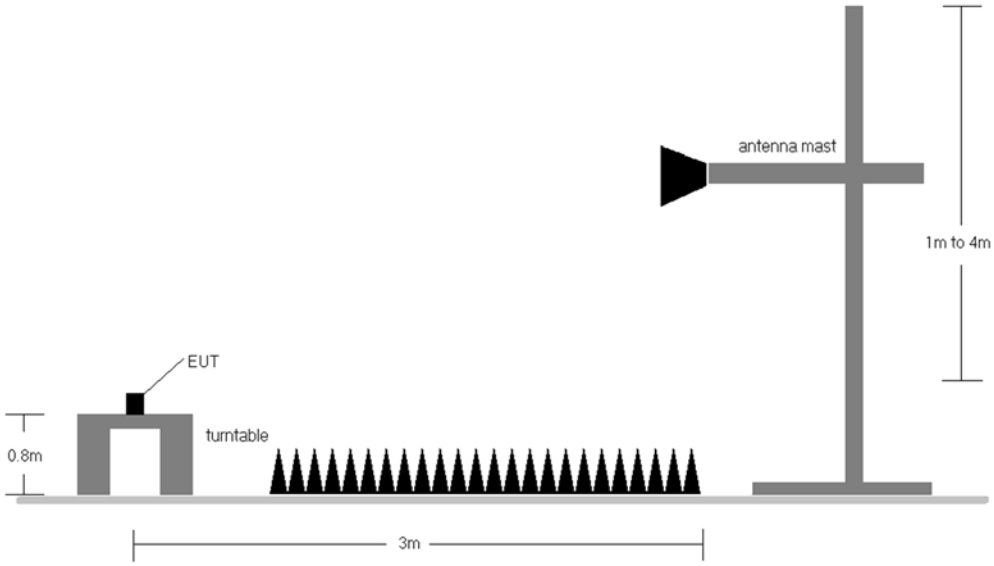


Figure 7-10. Test Instrument & Measurement Setup

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.

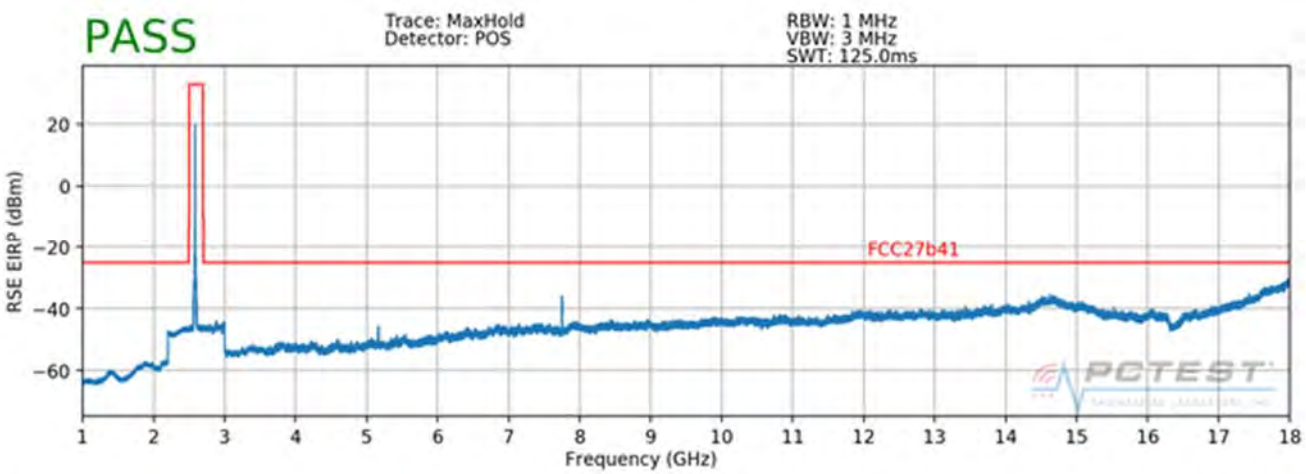
2) This unit was tested with its standard battery.

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.

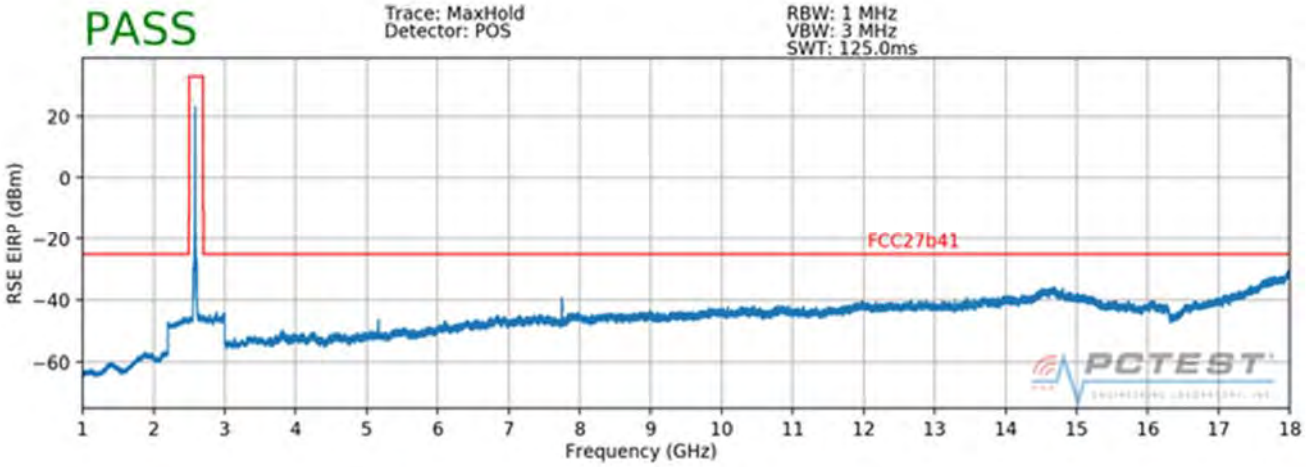
4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

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.

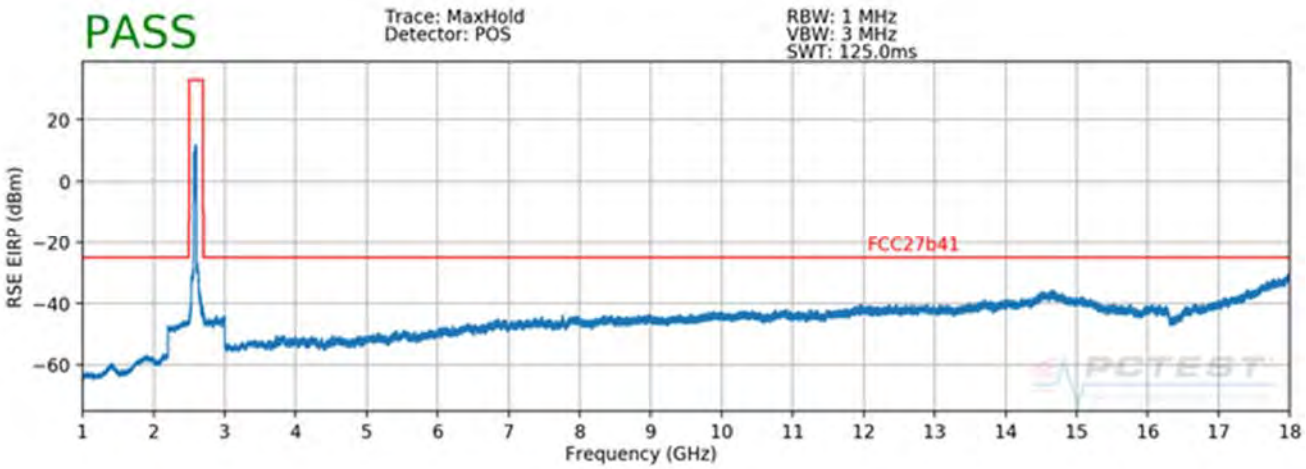
6) No significant emissions were found as a result of two uplink carriers operating contiguously.



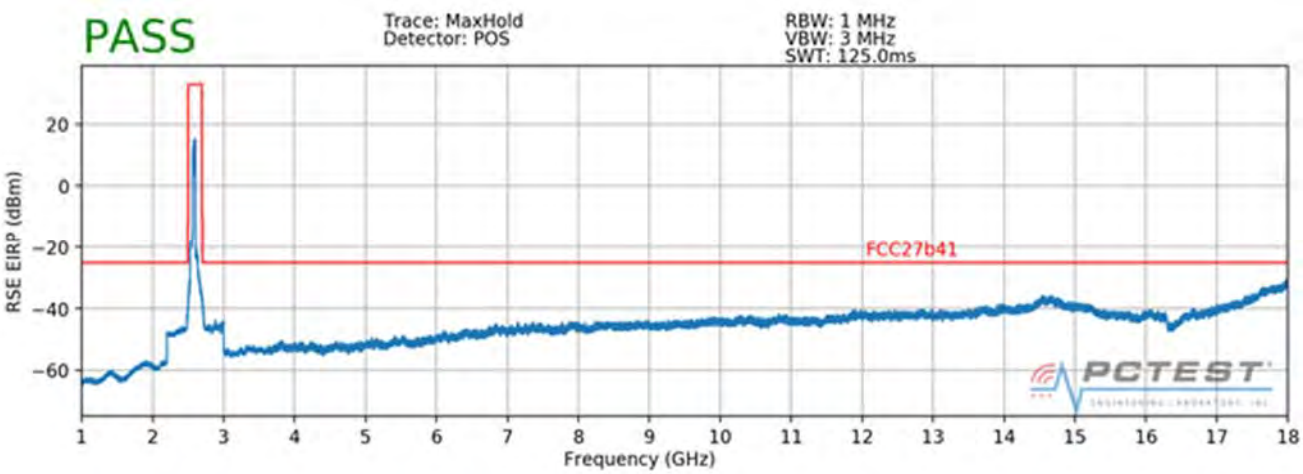
Plot 7-72. Radiated Spruious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0, Ant. Pol. H)



Plot 7-73. Radiated Spruious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0, Ant. Pol. V)



Plot 7-74. Radiated Spruious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0, Ant. Pol. H)



Plot 7-75. Radiated Spruious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0, Ant. Pol. V)

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	100	117	-58.47	10.82	-47.65	-22.6
7779.00	H	100	318	-47.98	11.45	-36.52	-11.5
10372.00	H	234	290	-61.39	12.53	-48.85	-23.9
12965.00	H	-	-	-60.02	12.70	-47.32	-22.3
15558.00	H	-	-	-62.45	15.04	-47.41	-22.4

Plot 7-76. Radiated Spruious Data (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99)

7.11 Frequency Stability / Temperature Variation

§2.1055 §22.355 §24.235 §27.54

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 and 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

§2.1055 §27.54

OPERATING FREQUENCY:	680,500,000	Hz
CHANNEL:	133297	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	680,500,072	72	0.0000106
100 %		- 30	680,500,015	15	0.0000022
100 %		- 20	680,500,020	20	0.0000029
100 %		- 10	680,499,803	-197	-0.0000289
100 %		0	680,500,095	95	0.0000140
100 %		+ 10	680,499,828	-172	-0.0000253
100 %		+ 20	680,500,273	273	0.0000401
100 %		+ 30	680,499,992	-8	-0.0000012
100 %		+ 40	680,500,358	358	0.0000526
100 %		+ 50	680,500,192	192	0.0000282
BATT. ENDPOINT	3.45	+ 20	680,499,915	-85	-0.0000125

Table 7-77. 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

§2.1055 §27.54

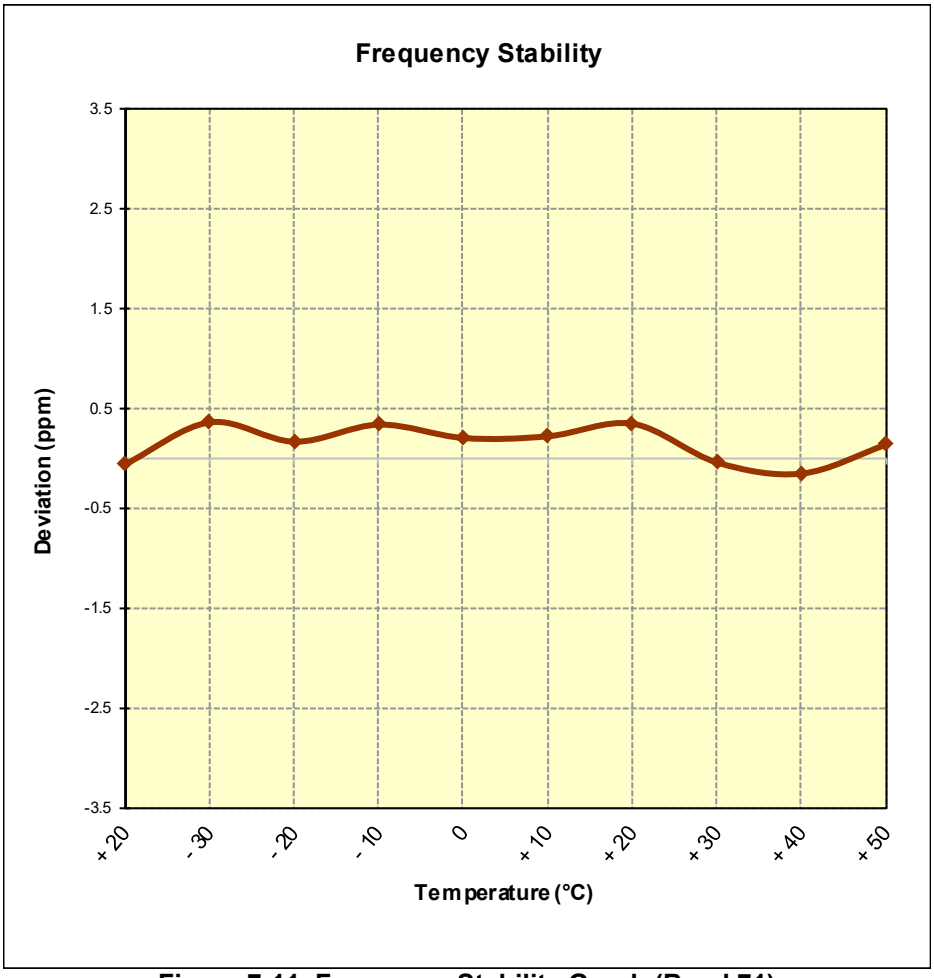


Figure 7-11. Frequency Stability Graph (Band 71)

Band 12/17 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	707,499,958	-42	-0.0000059
100 %		- 30	707,500,257	257	0.0000363
100 %		- 20	707,500,118	118	0.0000167
100 %		- 10	707,500,240	240	0.0000339
100 %		0	707,500,144	144	0.0000204
100 %		+ 10	707,500,157	157	0.0000222
100 %		+ 20	707,500,246	246	0.0000348
100 %		+ 30	707,499,969	-31	-0.0000044
100 %		+ 40	707,499,891	-109	-0.0000154
100 %		+ 50	707,500,098	98	0.0000139
BATT. ENDPOINT	3.45	+ 20	707,500,033	33	0.0000047

Table 7-78. 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.

Band 12/17 Frequency Stability Measurements

§2.1055 §27.54

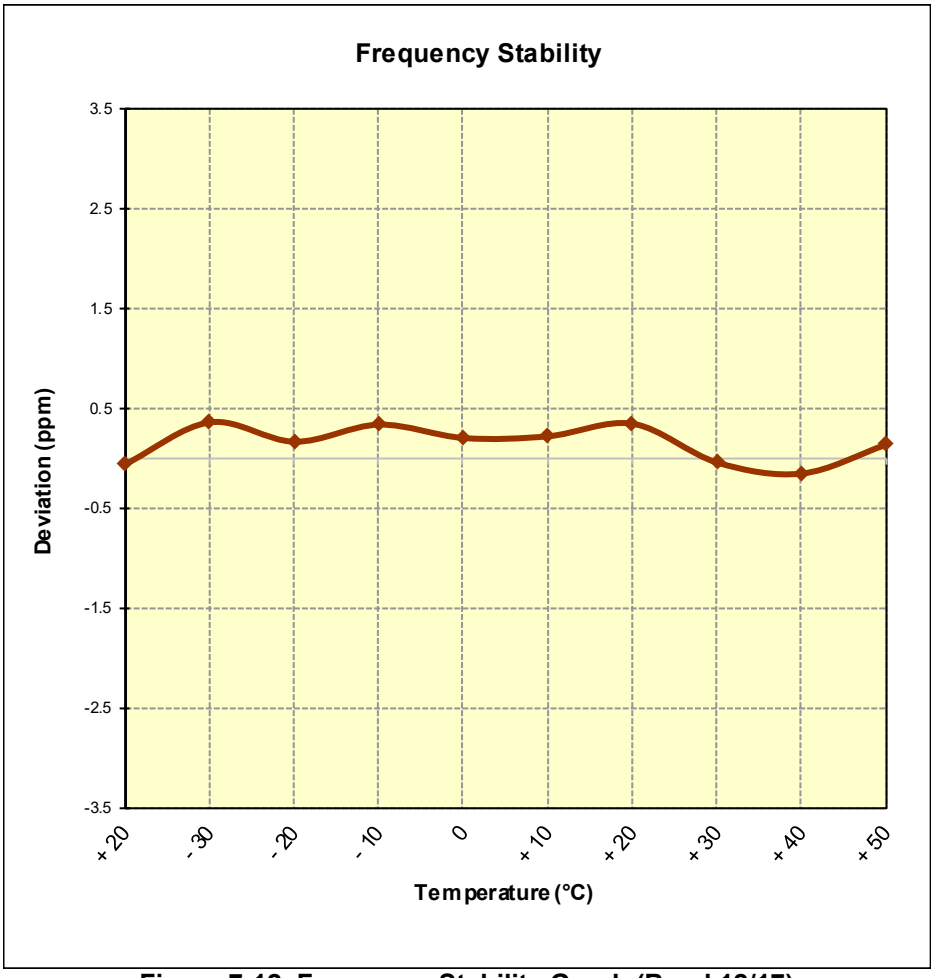


Figure 7-12. Frequency Stability Graph (Band 12/17)

Band 13 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	781,999,701	-299	-0.0000382
100 %		- 30	782,000,351	351	0.0000449
100 %		- 20	781,999,985	-15	-0.0000019
100 %		- 10	781,999,991	-9	-0.0000012
100 %		0	781,999,578	-422	-0.0000540
100 %		+ 10	782,000,023	23	0.0000029
100 %		+ 20	781,999,862	-138	-0.0000176
100 %		+ 30	782,000,307	307	0.0000393
100 %		+ 40	782,000,070	70	0.0000090
100 %		+ 50	782,000,034	34	0.0000043
BATT. ENDPOINT	3.45	+ 20	782,000,395	395	0.0000505

Table 7-79. 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

§2.1055 §27.54

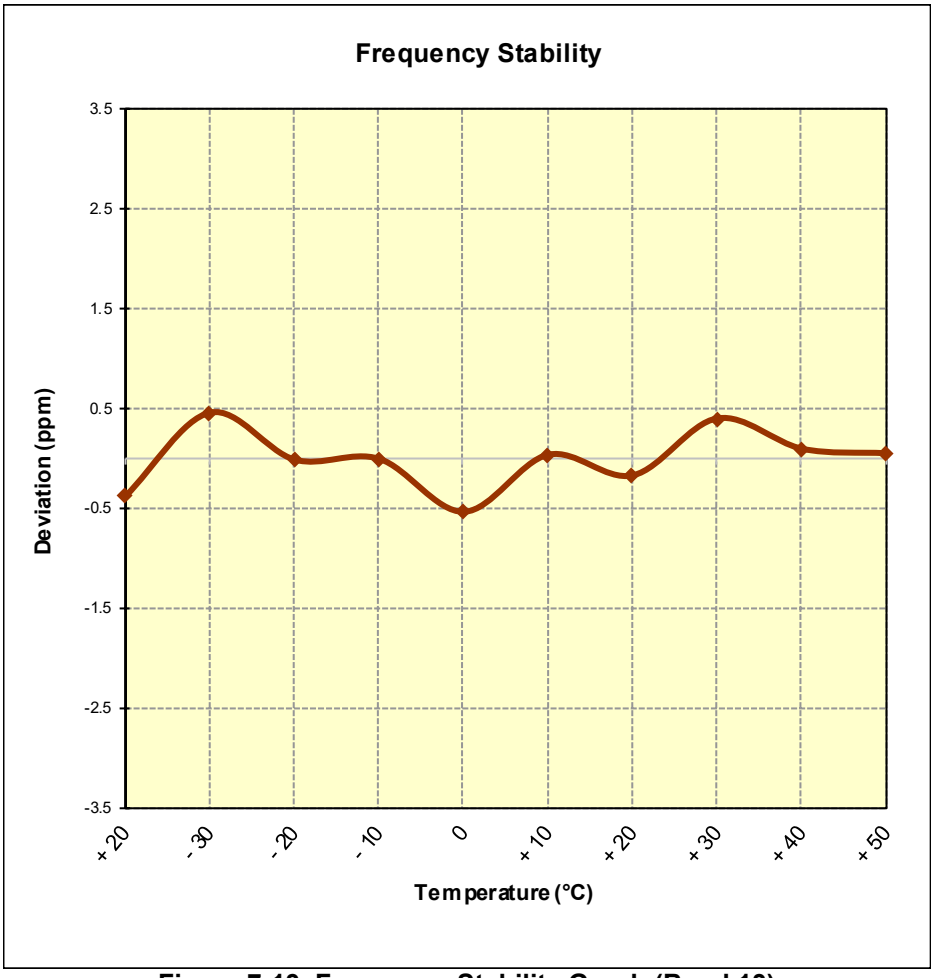


Figure 7-13. Frequency Stability Graph (Band 13)

Band 5/26 Frequency Stability Measurements

§2.1055 §22.355

OPERATING FREQUENCY:	831,500,000	Hz
CHANNEL:	26865	
REFERENCE VOLTAGE:	3.85	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	831,500,201	201	0.0000242
100 %		- 30	831,500,402	402	0.0000483
100 %		- 20	831,499,889	-111	-0.0000133
100 %		- 10	831,500,052	52	0.0000063
100 %		0	831,499,677	-323	-0.0000388
100 %		+ 10	831,500,201	201	0.0000242
100 %		+ 20	831,500,149	149	0.0000179
100 %		+ 30	831,500,019	19	0.0000023
100 %		+ 40	831,500,056	56	0.0000067
100 %		+ 50	831,499,782	-218	-0.0000262
BATT. ENDPOINT	3.45	+ 20	831,499,768	-232	-0.0000279

Table 7-80. Frequency Stability Data (Band 5/26)

Band 5/26 Frequency Stability Measurements

§2.1055 §22.355

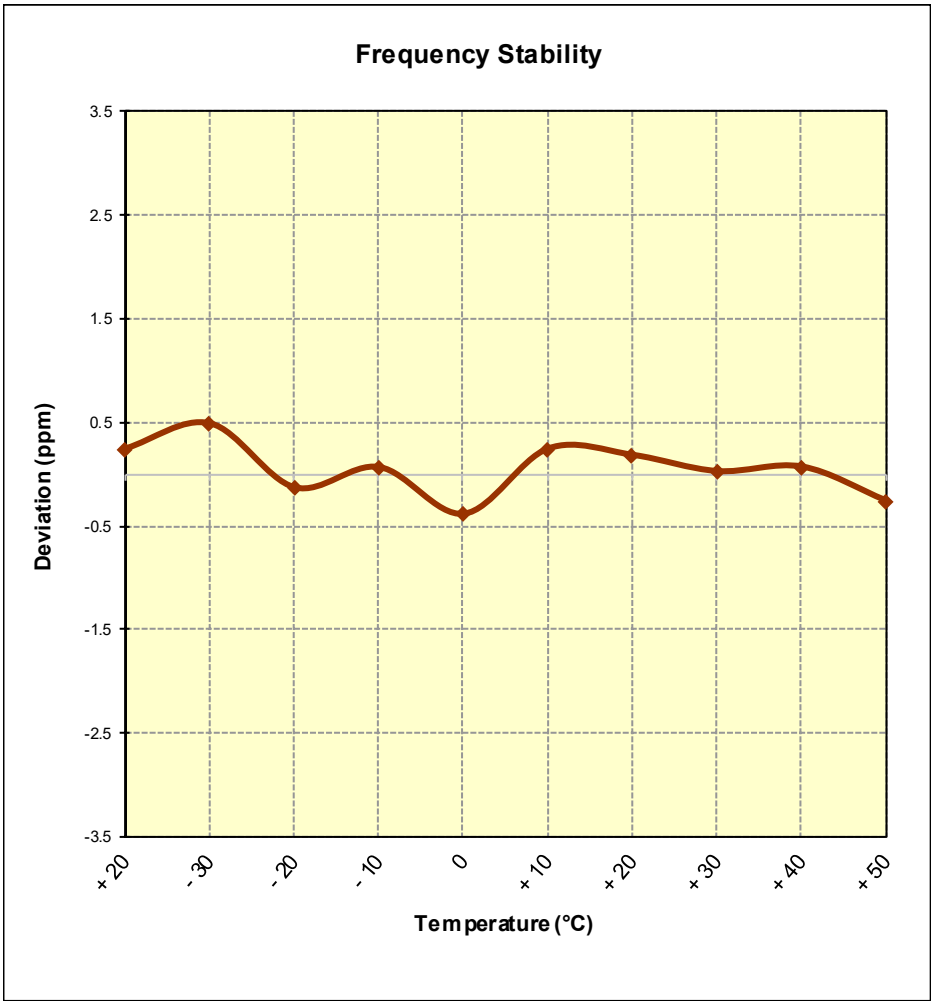


Figure 7-14. Frequency Stability Graph (Band 5/26)

Band 66/4 Frequency Stability Measurements

§2.1055 §§27.54

OPERATING FREQUENCY:	1,745,000,000	Hz
CHANNEL:	132322	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,744,999,993	-7	-0.0000004
100 %		- 30	1,744,999,823	-177	-0.0000101
100 %		- 20	1,744,999,901	-99	-0.0000057
100 %		- 10	1,744,999,804	-196	-0.0000112
100 %		0	1,745,000,013	13	0.0000007
100 %		+ 10	1,744,999,847	-153	-0.0000088
100 %		+ 20	1,745,000,119	119	0.0000068
100 %		+ 30	1,745,000,313	313	0.0000179
100 %		+ 40	1,745,000,039	39	0.0000022
100 %		+ 50	1,745,000,313	313	0.0000179
BATT. ENDPOINT	3.45	+ 20	1,745,000,014	14	0.0000008

Table 7-81. 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

§2.1055 §§27.54

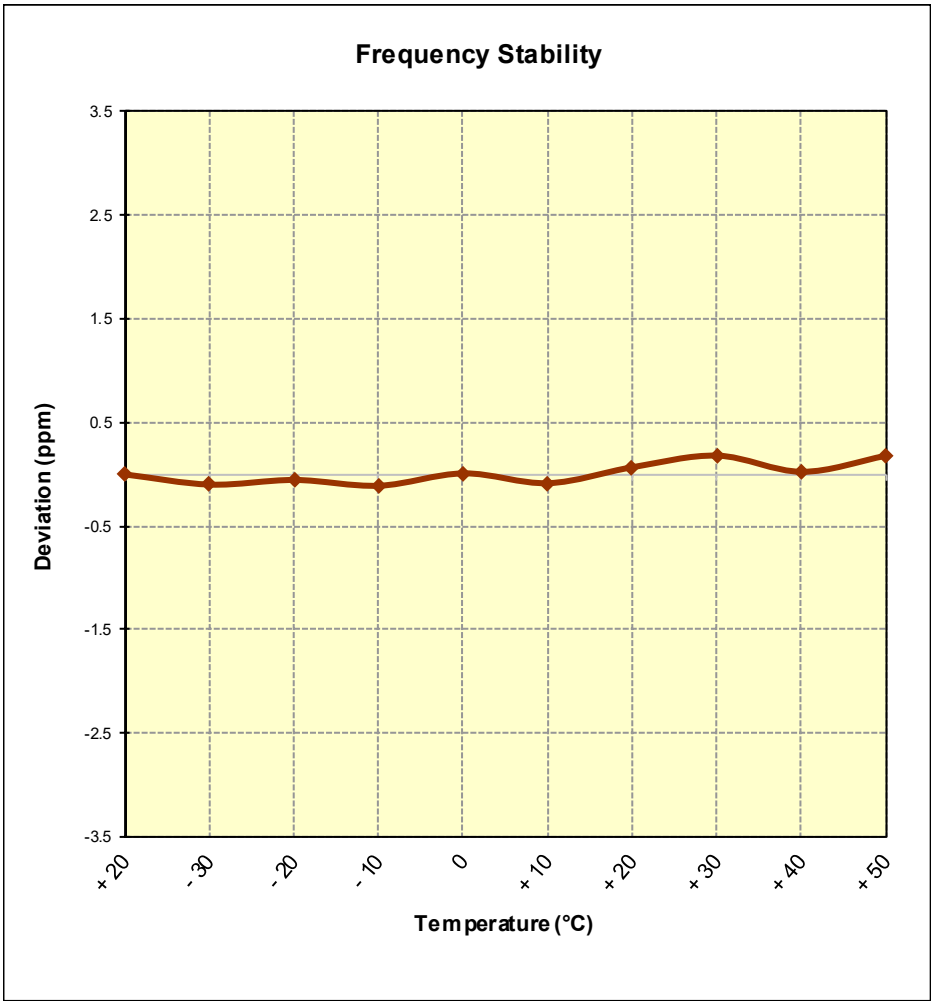


Figure 7-15. Frequency Stability Graph (Band 66/4)

Band 25/2 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY:	1,882,500,000	Hz
CHANNEL:	26365	
REFERENCE VOLTAGE:	3.85	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,882,500,158	158	0.0000084
100 %		- 30	1,882,499,657	-343	-0.0000182
100 %		- 20	1,882,500,126	126	0.0000067
100 %		- 10	1,882,500,242	242	0.0000129
100 %		0	1,882,500,214	214	0.0000114
100 %		+ 10	1,882,499,814	-186	-0.0000099
100 %		+ 20	1,882,499,796	-204	-0.0000108
100 %		+ 30	1,882,500,367	367	0.0000195
100 %		+ 40	1,882,499,880	-120	-0.0000064
100 %		+ 50	1,882,499,999	-1	-0.0000001
BATT. ENDPOINT	3.45	+ 20	1,882,500,077	77	0.0000041

Table 7-82. Frequency Stability Data (Band 25/2)

Band 25/2 Frequency Stability Measurements

§2.1055 §24.235

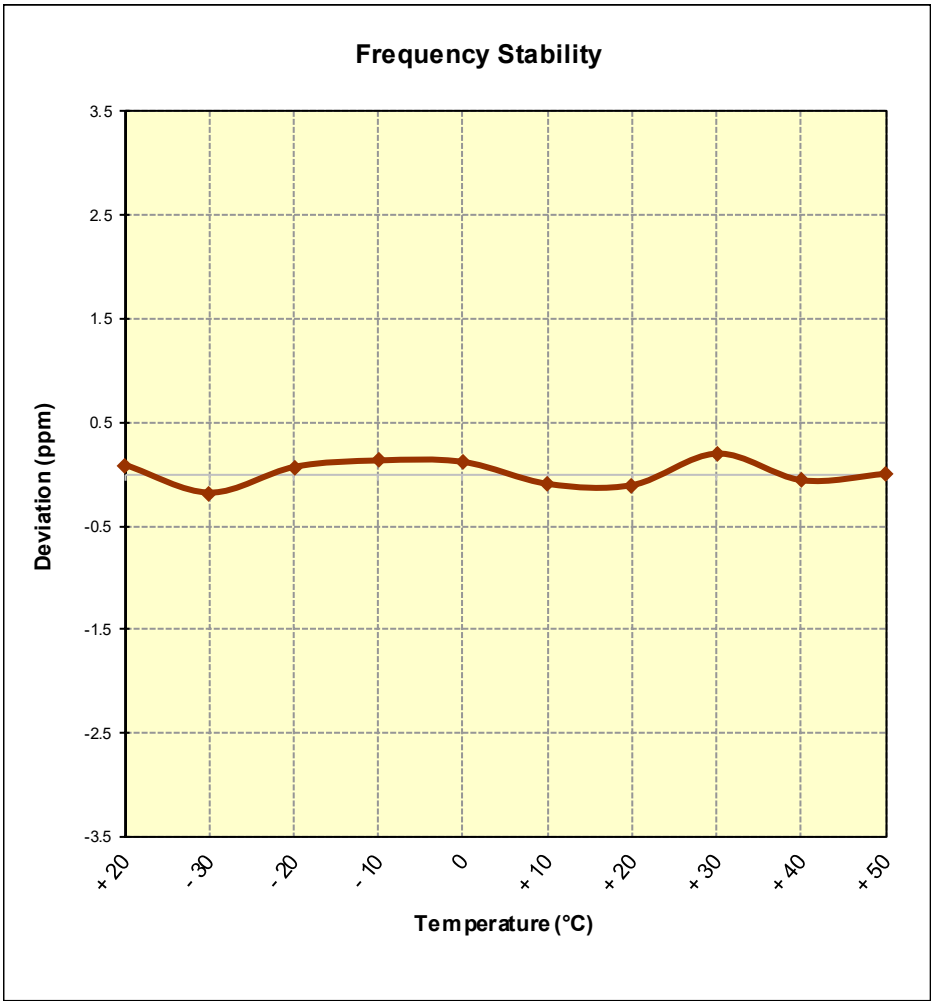


Figure 7-16. Frequency Stability Graph (Band 25/2)

Band 30 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY:	2,310,000,000	Hz
CHANNEL:	27710	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	2,309,999,847	-153	-0.0000066
100 %		- 30	2,309,999,980	-20	-0.0000009
100 %		- 20	2,309,999,572	-428	-0.0000185
100 %		- 10	2,310,000,157	157	0.0000068
100 %		0	2,310,000,379	379	0.0000164
100 %		+ 10	2,310,000,262	262	0.0000113
100 %		+ 20	2,310,000,341	341	0.0000148
100 %		+ 30	2,309,999,869	-131	-0.0000057
100 %		+ 40	2,309,999,869	-131	-0.0000057
100 %		+ 50	2,309,999,778	-222	-0.0000096
BATT. ENDPOINT	3.45	+ 20	2,310,000,150	150	0.0000065

Table 7-83. Frequency Stability Data (Band 30)

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 30 Frequency Stability Measurements

§2.1055 §24.235

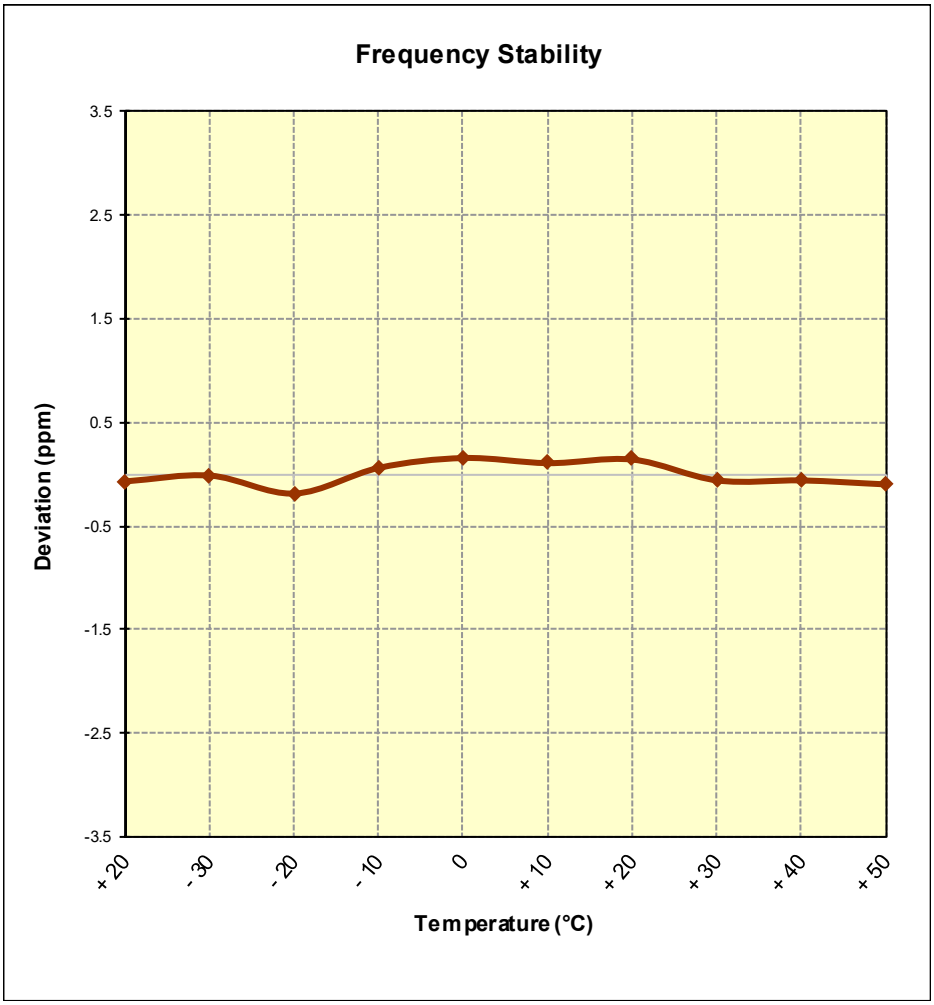


Figure 7-17. Frequency Stability Graph (Band 30)

Band 7 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY:	2,535,000,000	Hz
CHANNEL:	21100	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	2,535,000,097	97	0.0000038
100 %		- 30	2,534,999,865	-135	-0.0000053
100 %		- 20	2,535,000,034	34	0.0000013
100 %		- 10	2,534,999,917	-83	-0.0000033
100 %		0	2,534,999,885	-115	-0.0000045
100 %		+ 10	2,535,000,015	15	0.0000006
100 %		+ 20	2,534,999,952	-48	-0.0000019
100 %		+ 30	2,534,999,779	-221	-0.0000087
100 %		+ 40	2,535,000,050	50	0.0000020
100 %		+ 50	2,534,999,991	-9	-0.0000004
BATT. ENDPOINT	3.45	+ 20	2,535,000,061	61	0.0000024

Table 7-84. Frequency Stability Data (Band 7)

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 7 Frequency Stability Measurements

§2.1055 §27.54

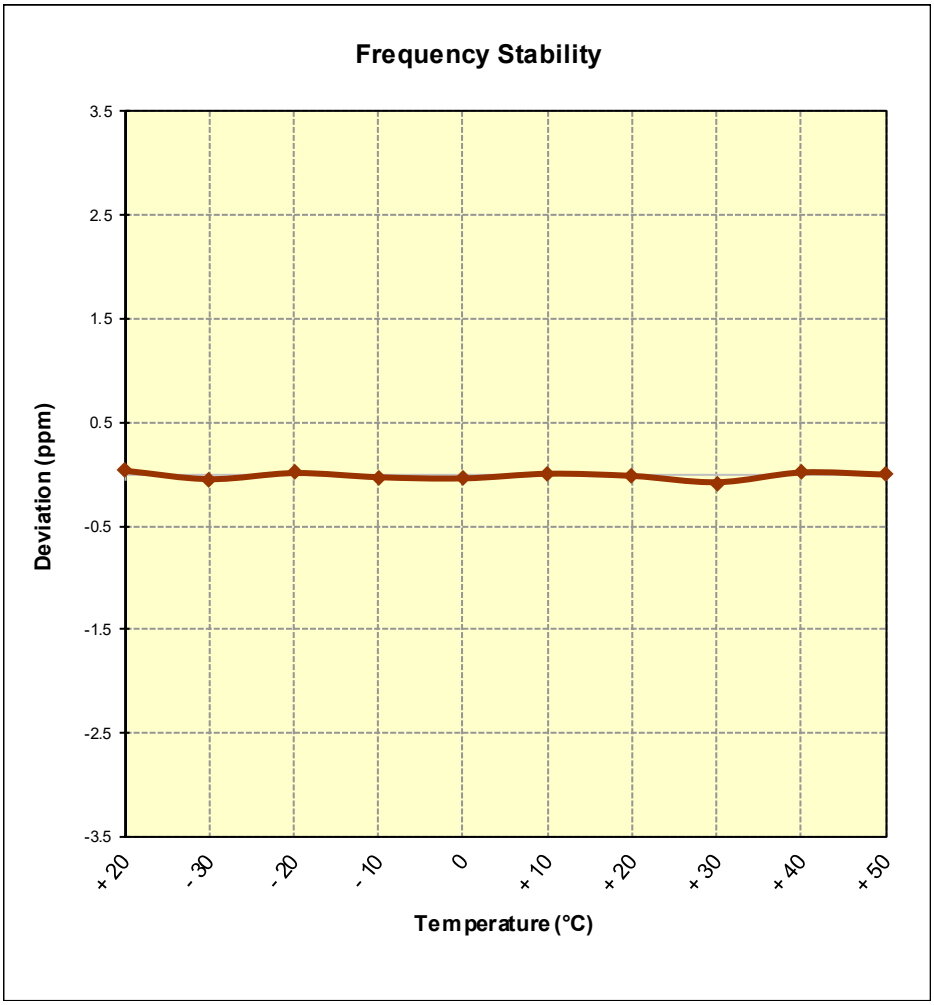


Figure 7-18. Frequency Stability Graph (Band 7)

Band 38/41 Frequency Stability Measurements

§2.1055 §27.54

OPERATING FREQUENCY:	2,593,000,000	Hz
CHANNEL:	40620	
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	2,592,999,745	-255	-0.0000098
100 %		- 30	2,592,999,674	-326	-0.0000126
100 %		- 20	2,592,999,871	-129	-0.0000050
100 %		- 10	2,593,000,199	199	0.0000077
100 %		0	2,593,000,357	357	0.0000138
100 %		+ 10	2,593,000,277	277	0.0000107
100 %		+ 20	2,593,000,016	16	0.0000006
100 %		+ 30	2,592,999,926	-74	-0.0000029
100 %		+ 40	2,593,000,115	115	0.0000044
100 %		+ 50	2,592,999,986	-14	-0.0000005
BATT. ENDPOINT	3.45	+ 20	2,592,999,866	-134	-0.0000052

Table 7-85. Frequency Stability Data (Band 38/41)

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 38/41 Frequency Stability Measurements

§2.1055 §27.54

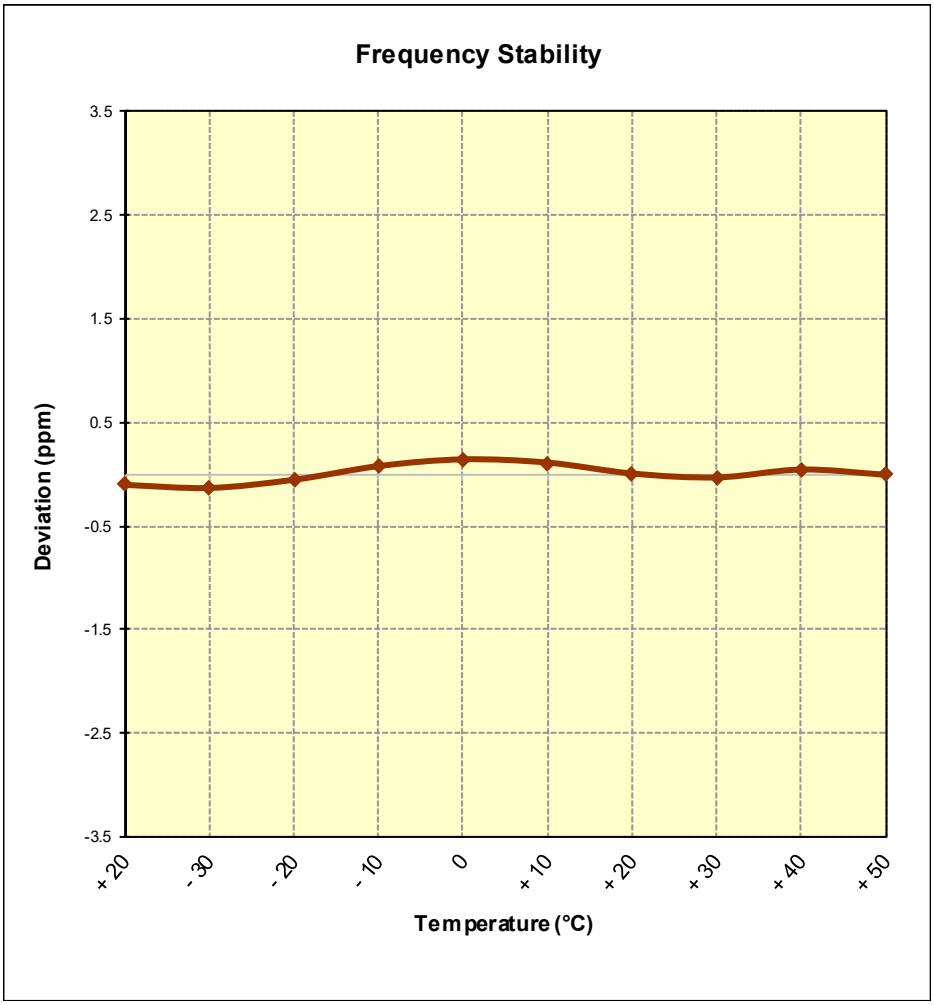


Figure 7-19. Frequency Stability Graph (Band 38/41)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG965U** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.