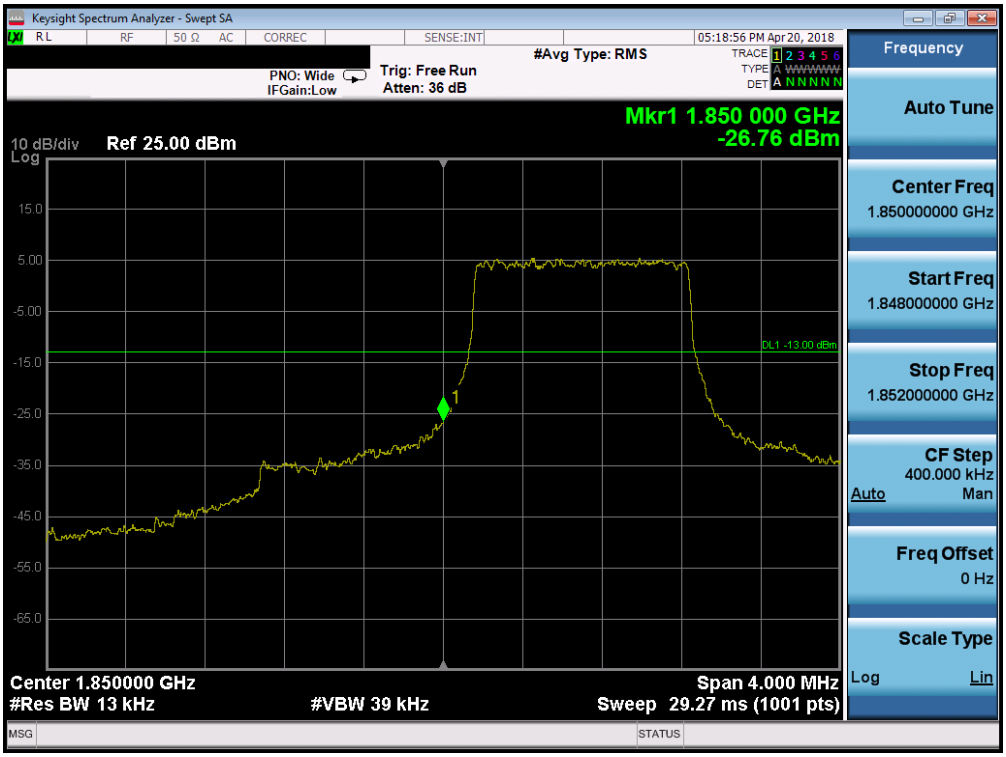
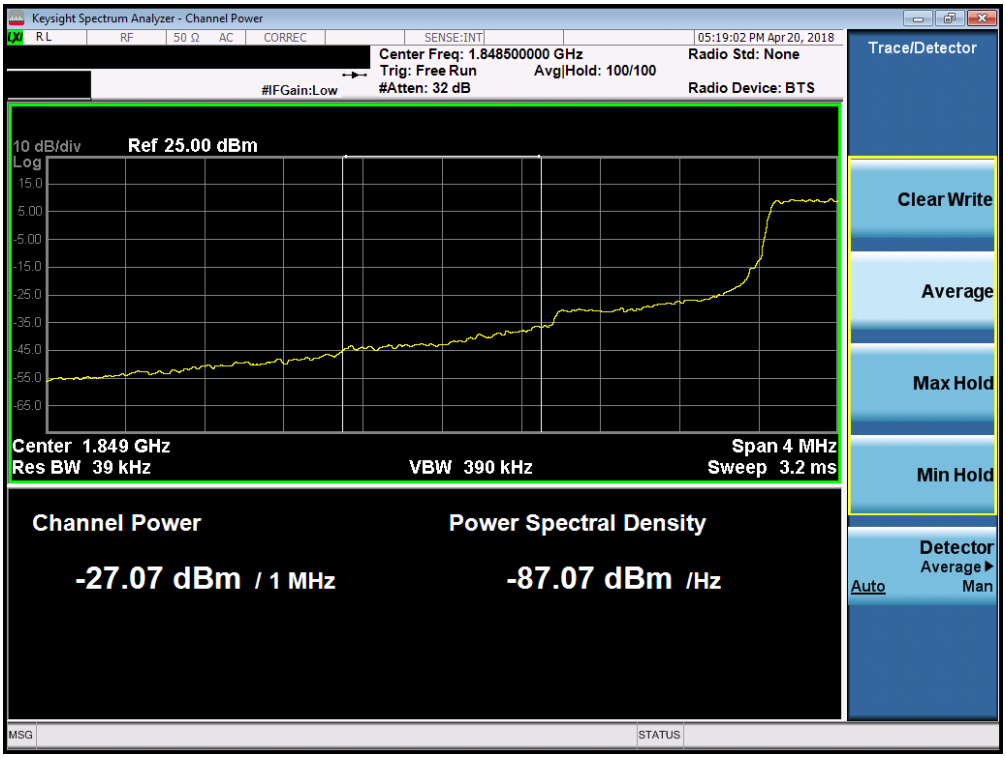
Band 25/2

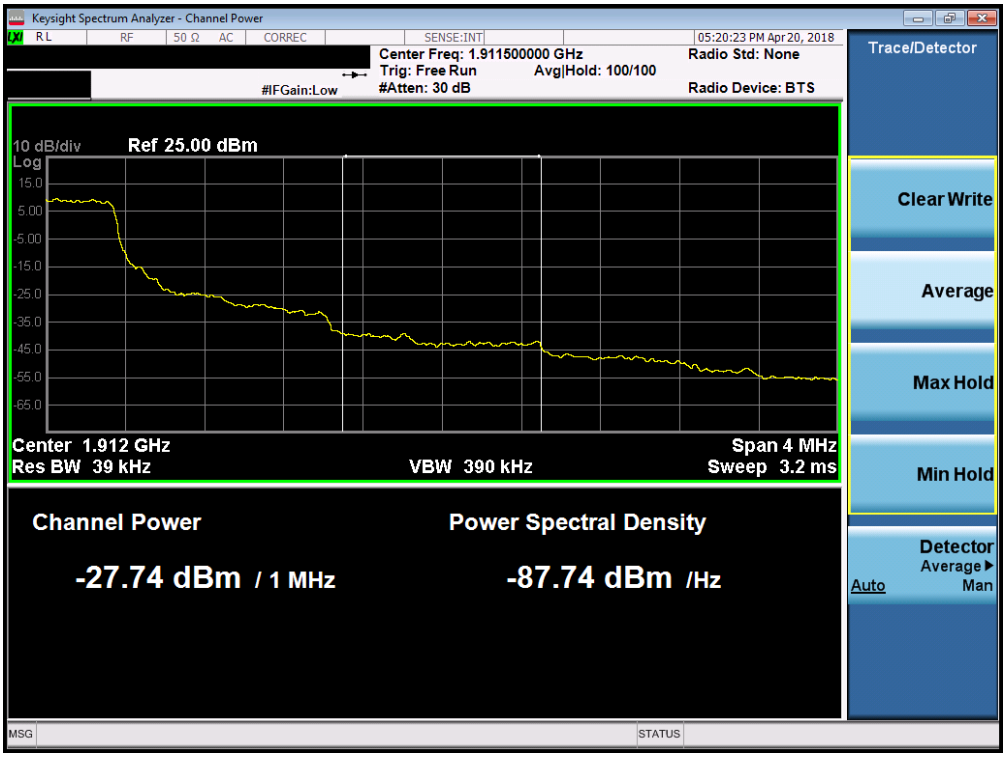


Plot 7-169. Lower Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



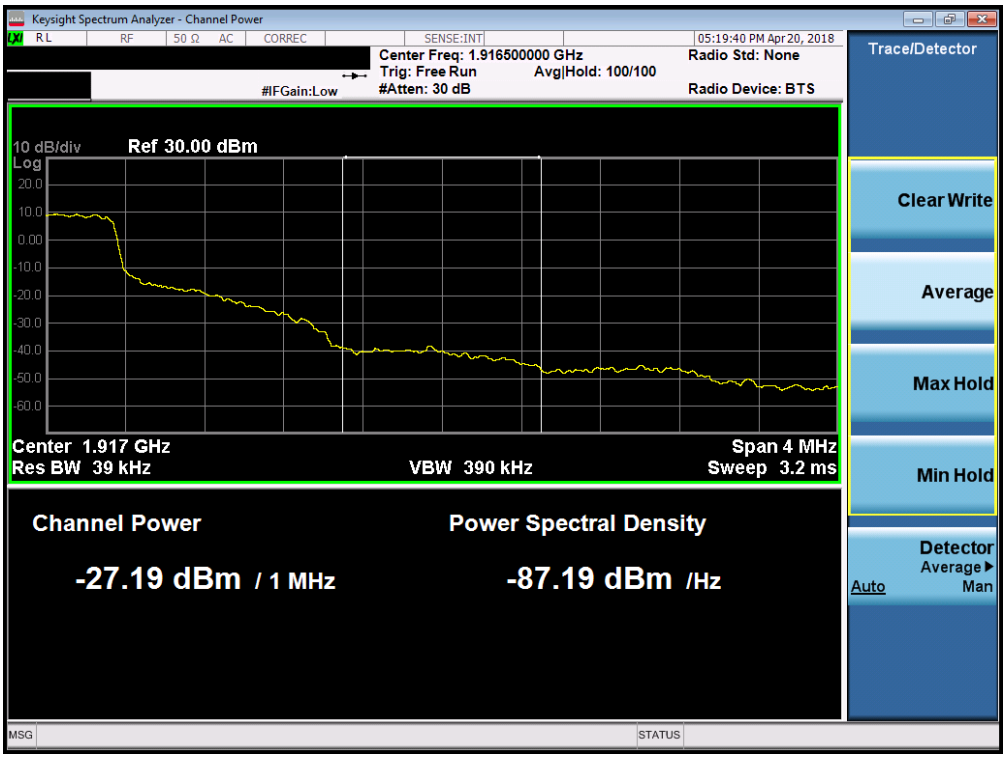
Plot 7-170. Lower Extended Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

Plot 7-171. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

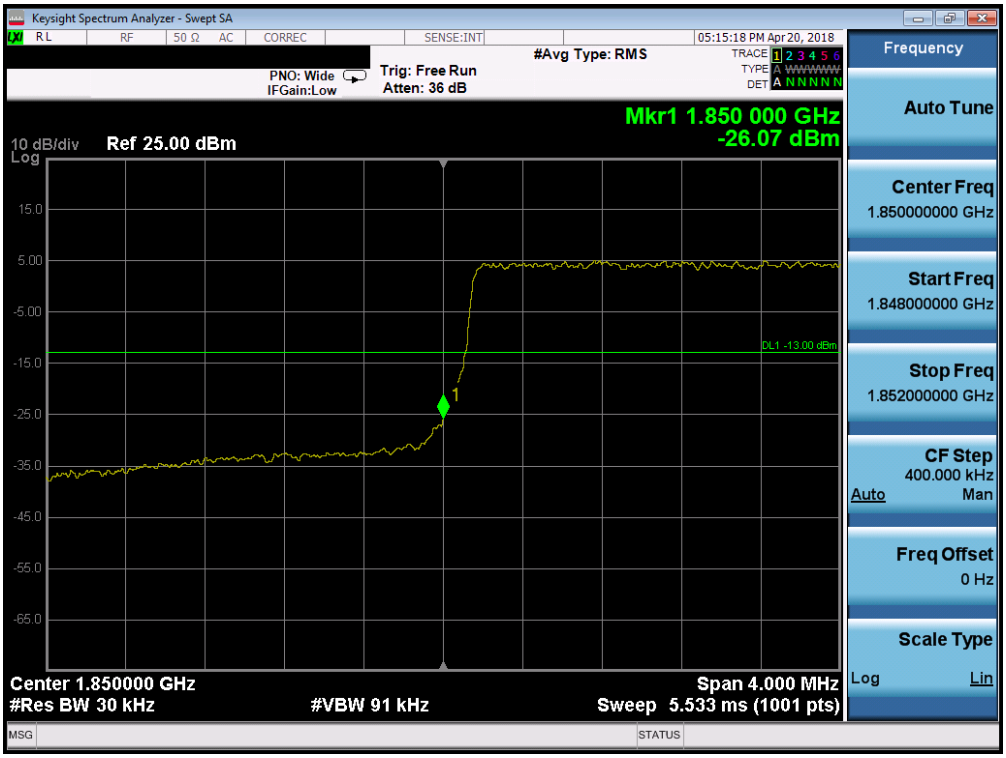


Plot 7-172. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

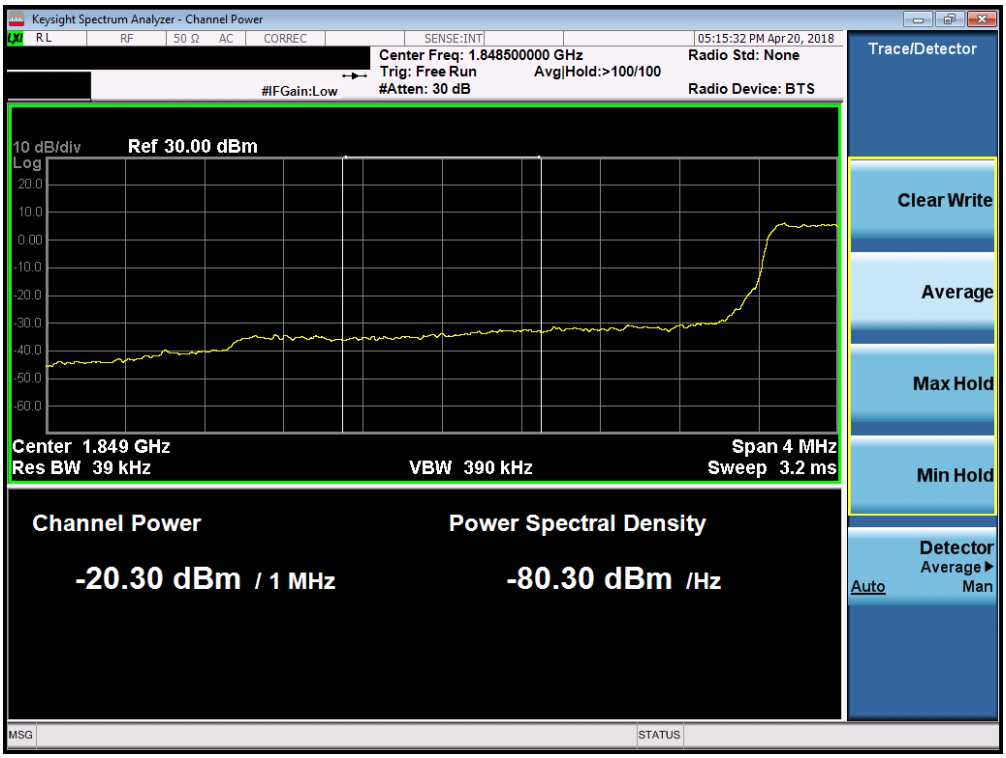
Plot 7-173. Upper Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)



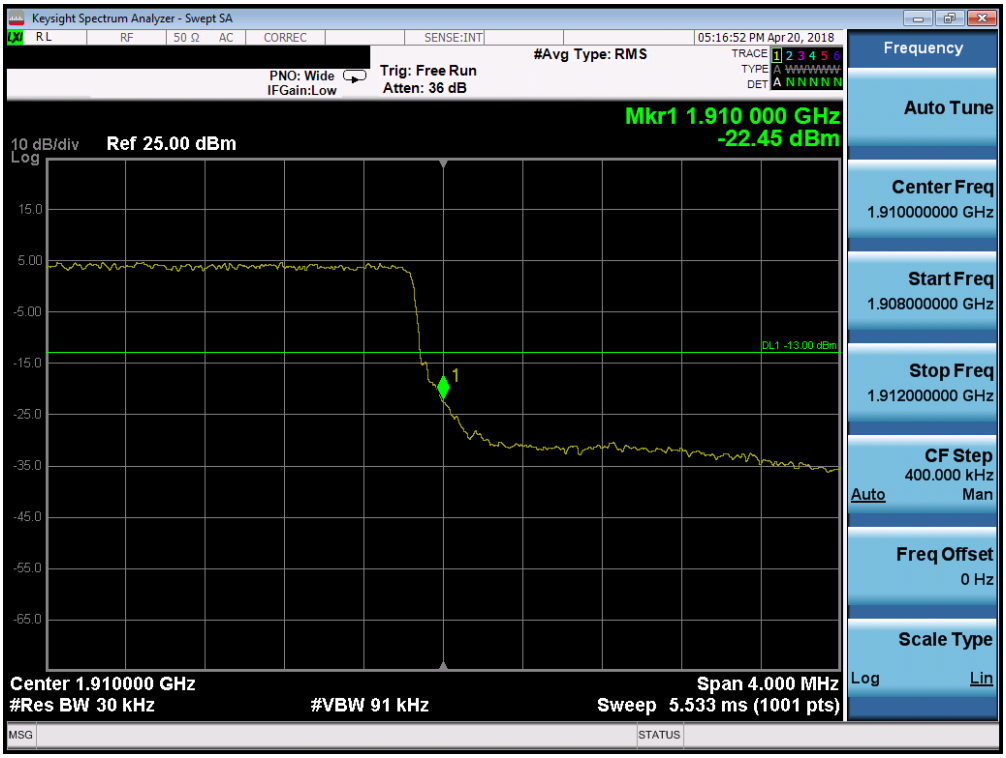
Plot 7-174. Upper Extended Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)



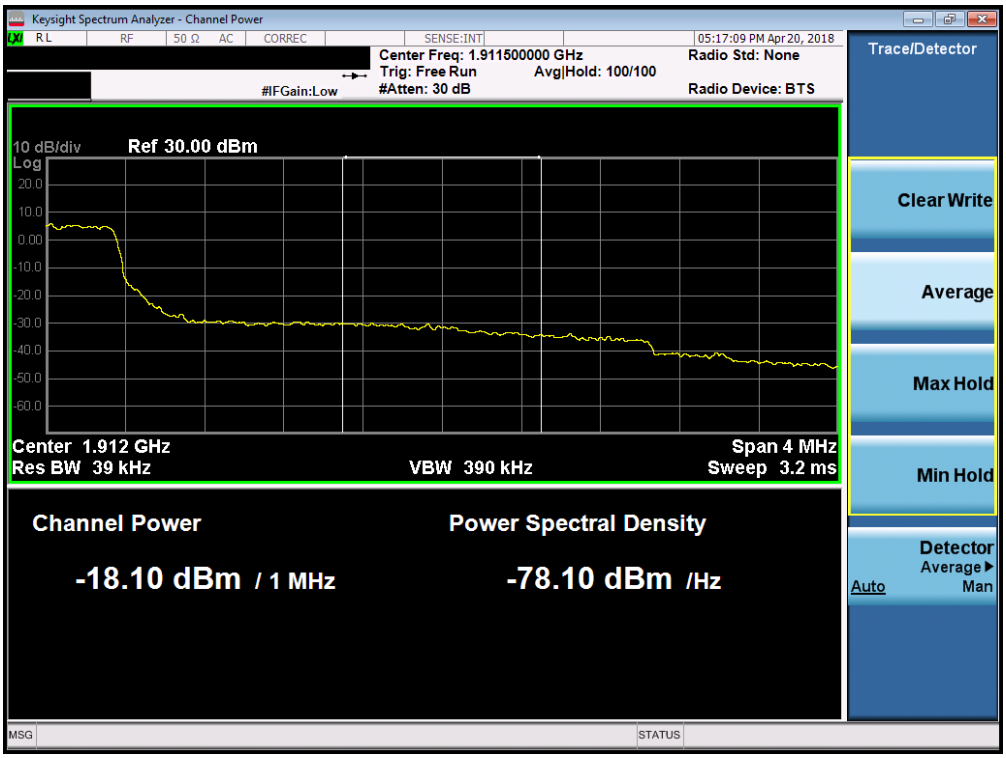
Plot 7-175. Lower Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-176. Lower Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

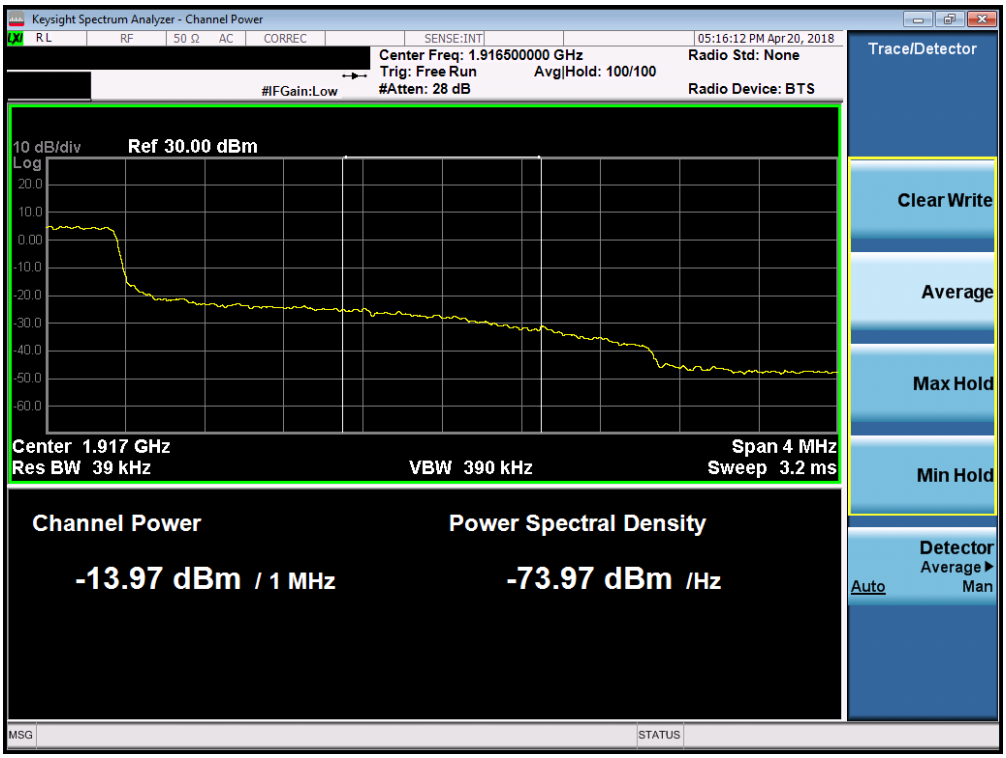


Plot 7-177. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

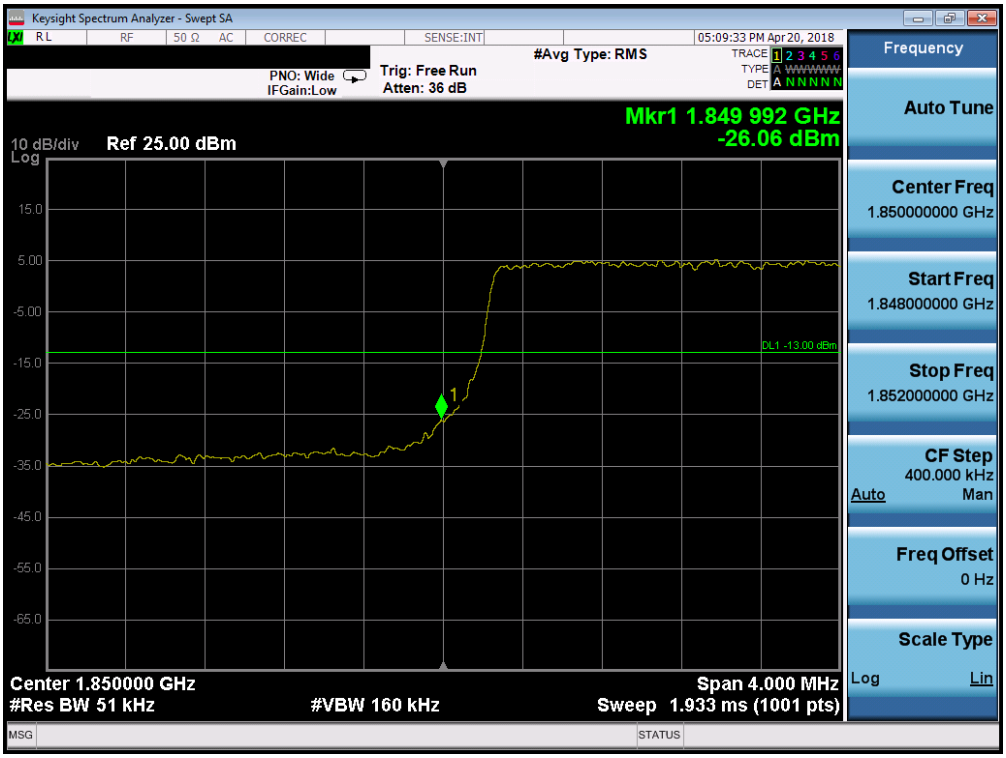


Plot 7-178. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

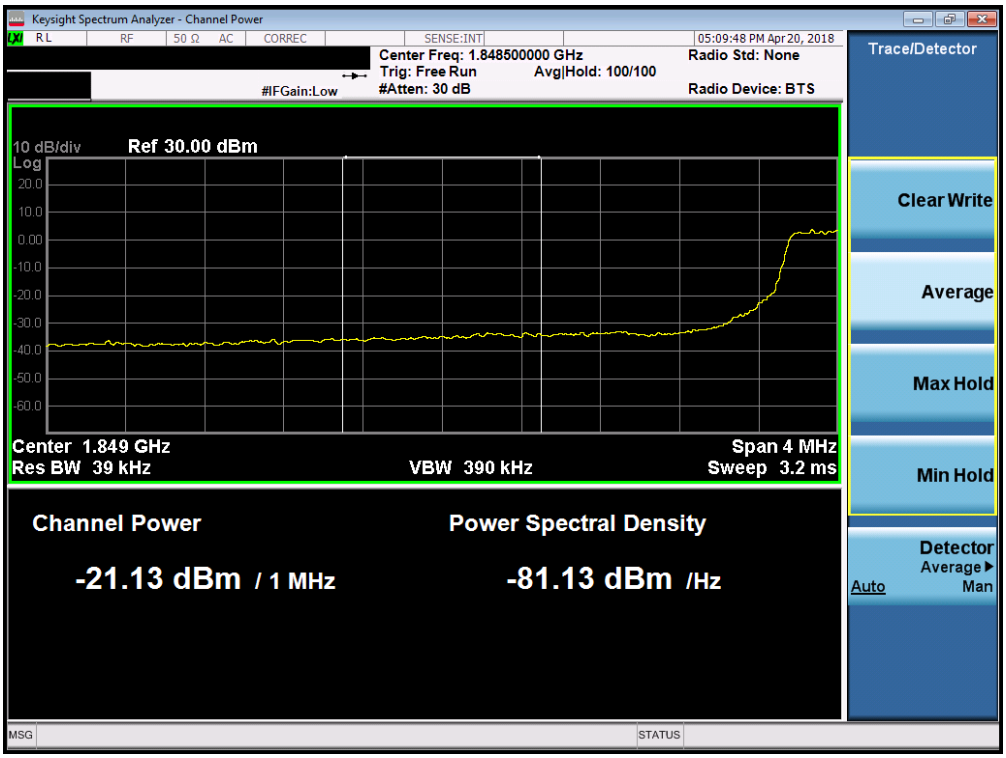
Plot 7-179. Upper Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)



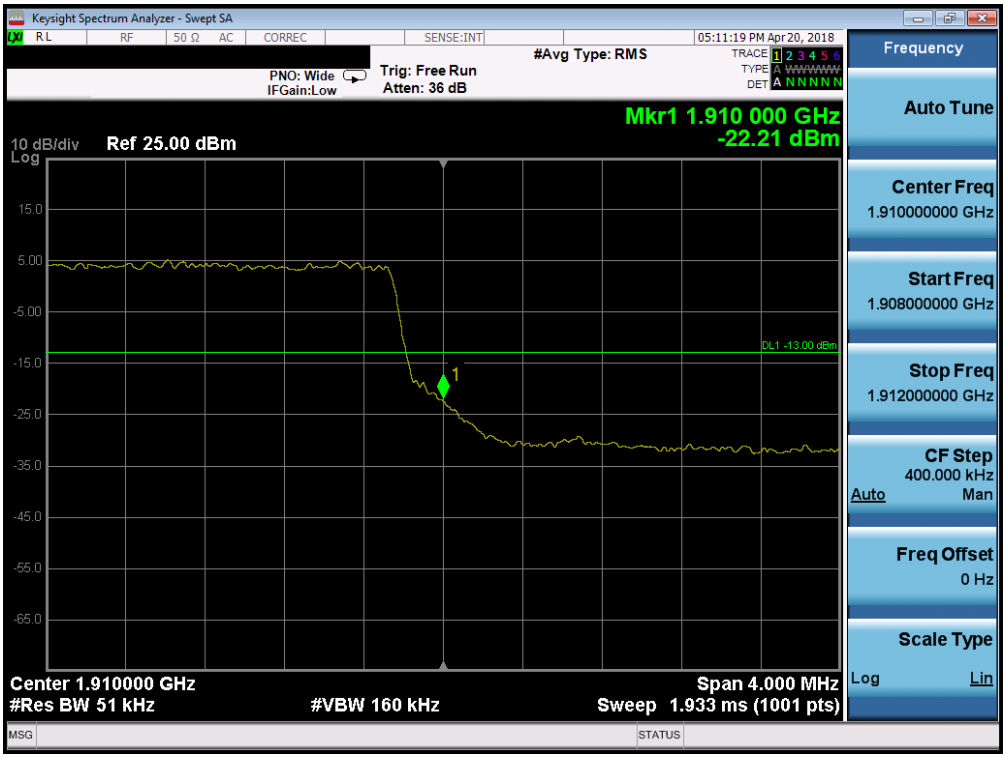
Plot 7-180. Upper Extended Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)



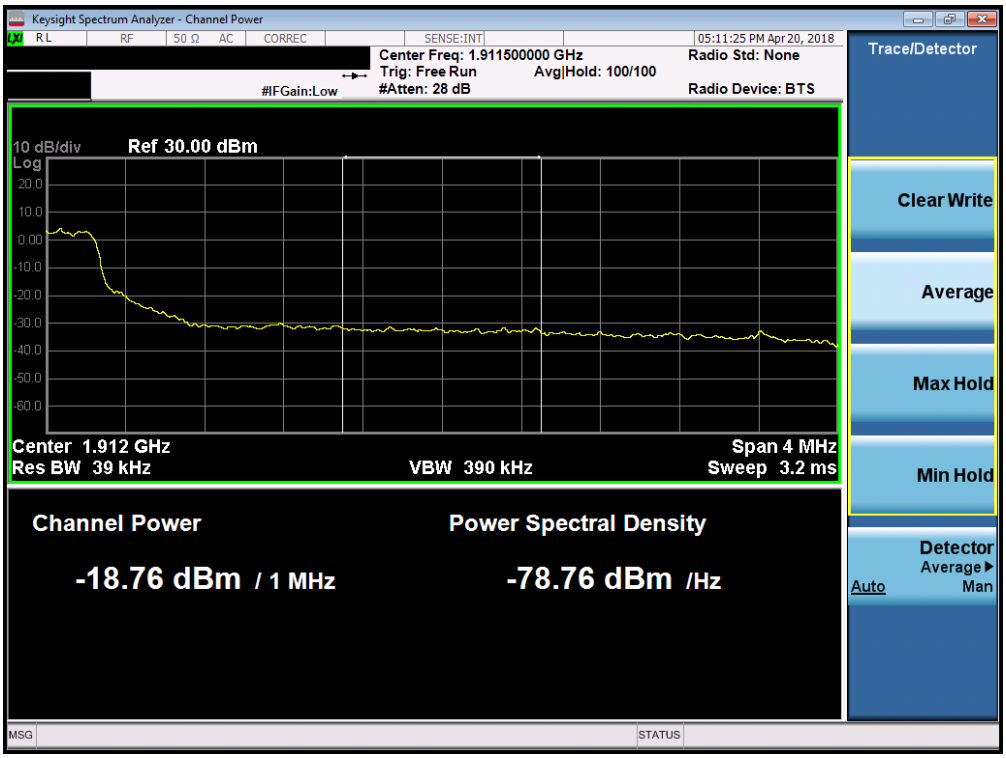
Plot 7-181. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-182. Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

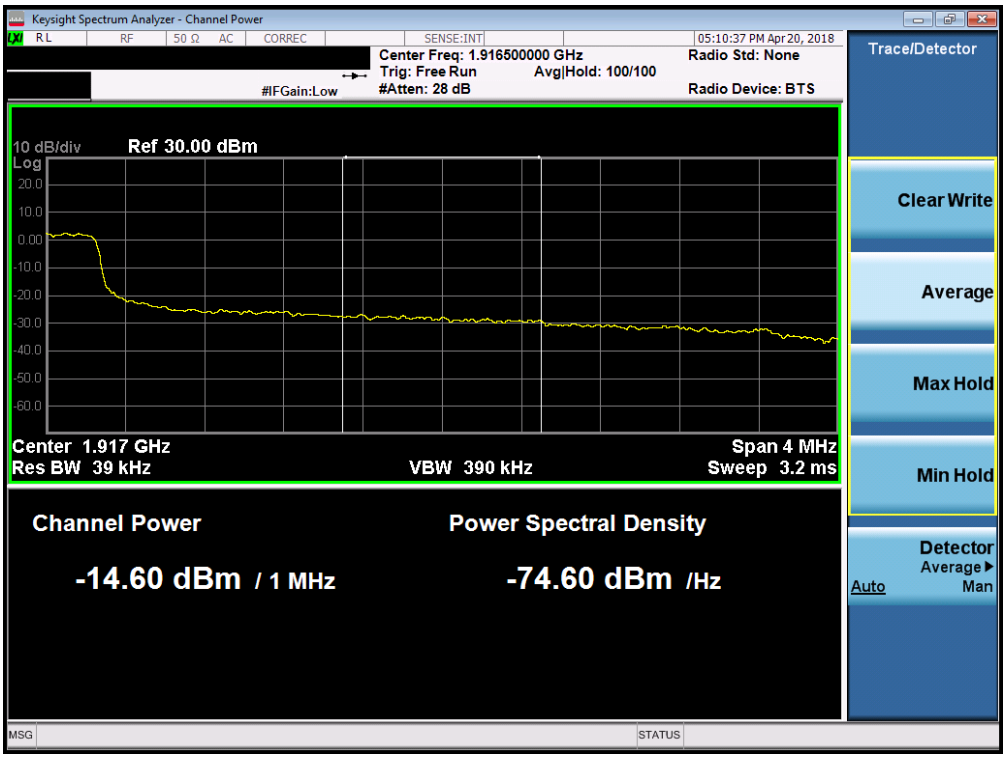


Plot 7-183. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

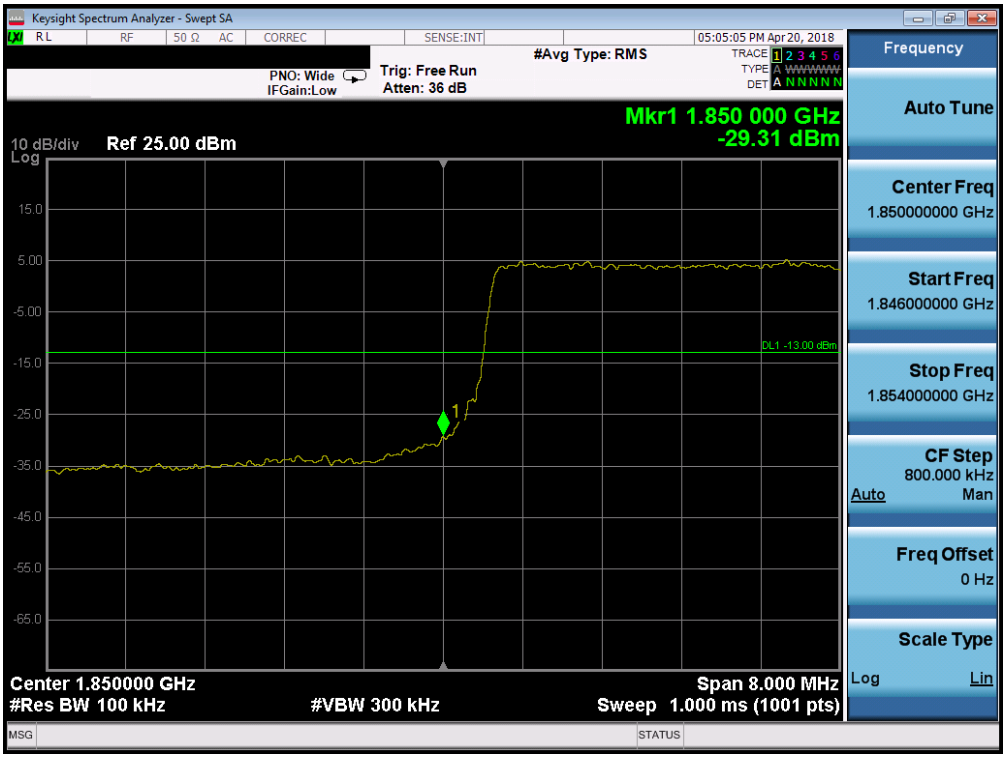


Plot 7-184. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-185. Upper Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

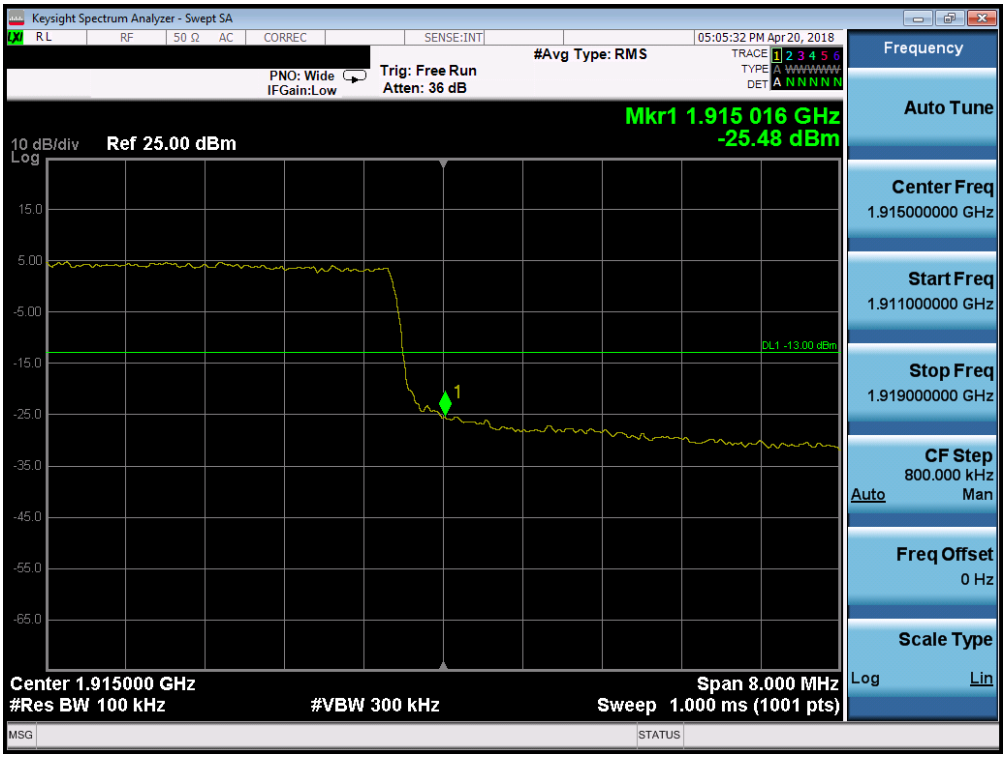


Plot 7-186. Upper Extended Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

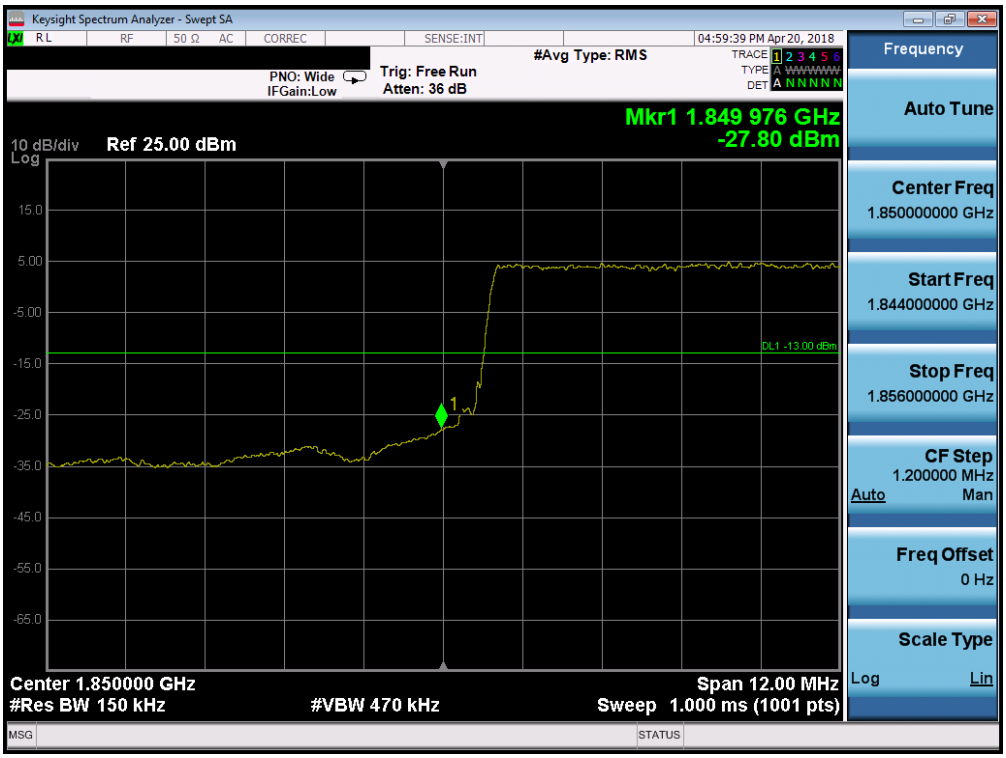


Plot 7-187. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

Plot 7-188. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



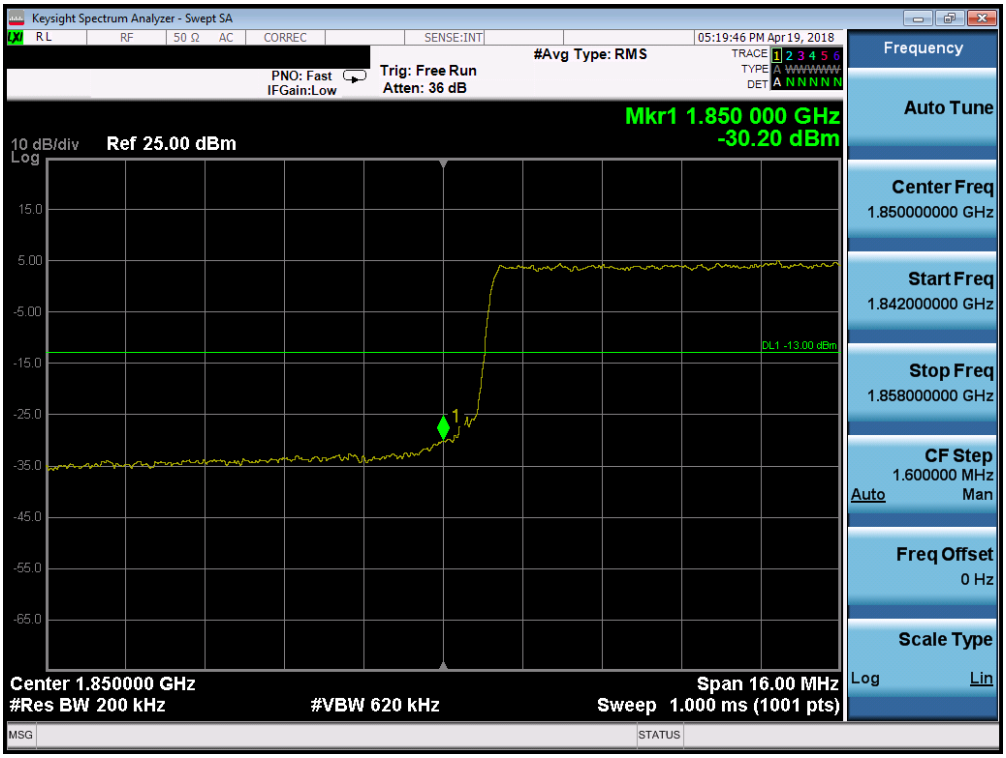
Plot 7-189. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



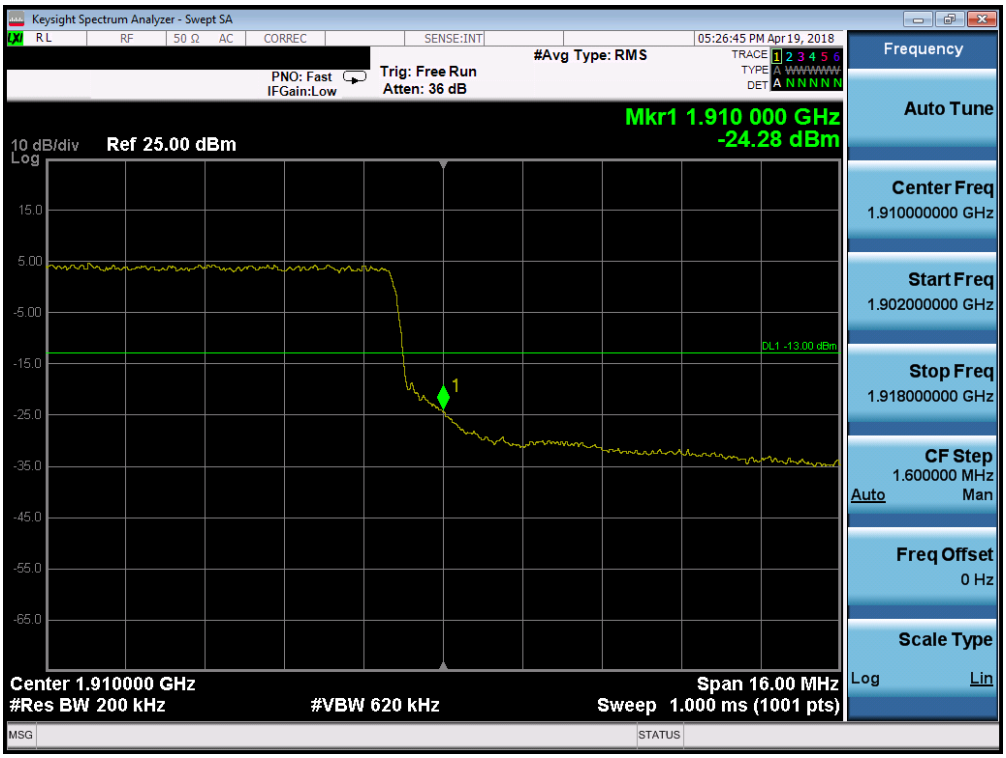
Plot 7-190. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

Plot 7-191. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

Plot 7-192. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-193. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



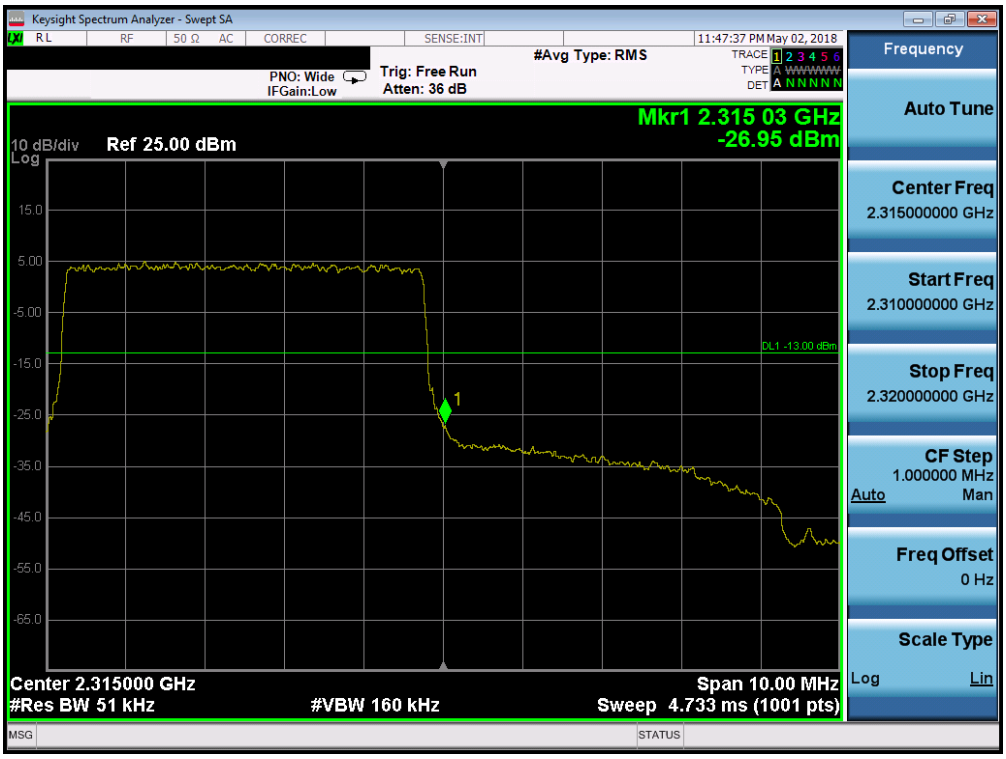
Plot 7-194. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

Plot 7-195. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

Band 30

Plot 7-196. Lower Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-197. Lower Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

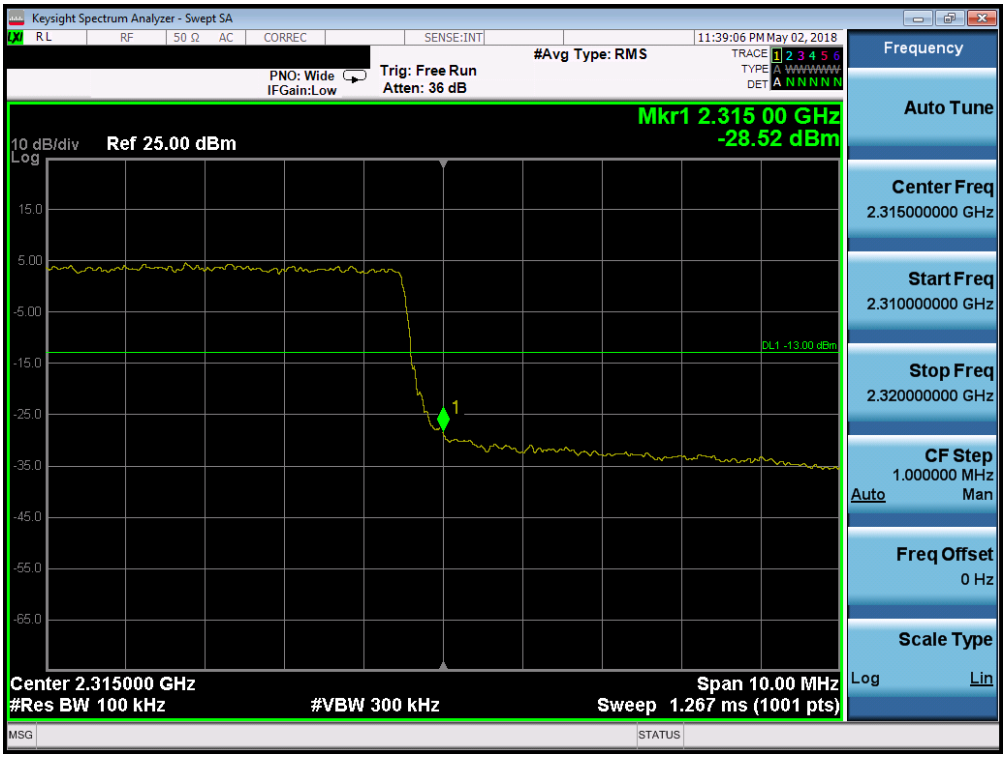


Plot 7-198. Upper Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-199. Upper Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-200. Lower Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

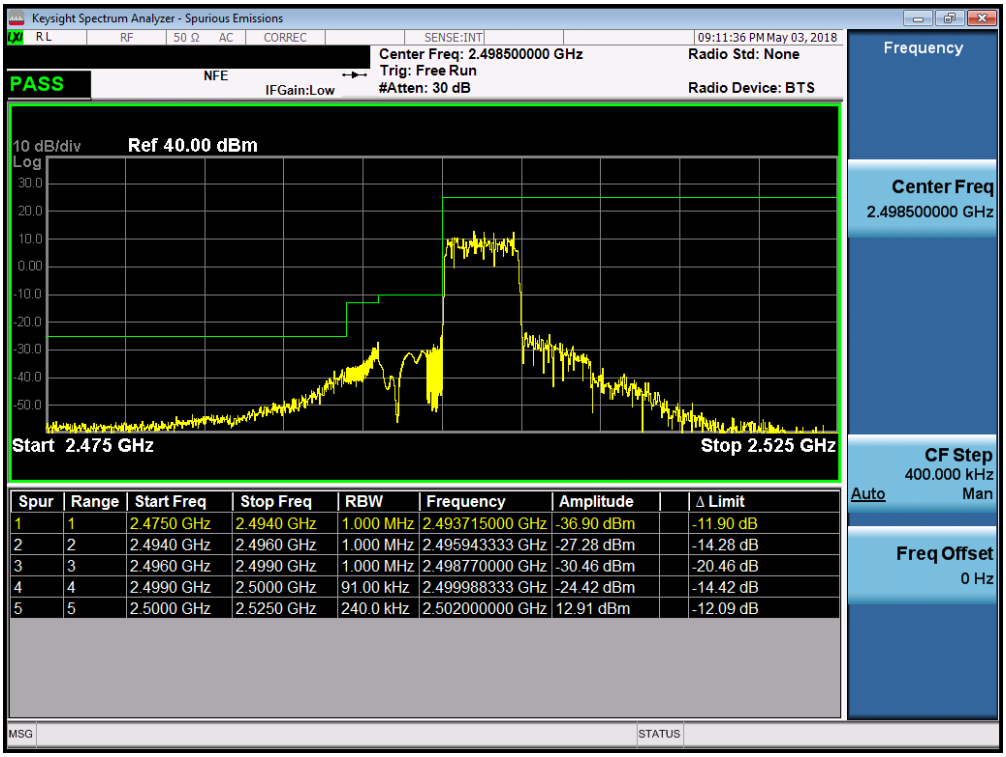
Plot 7-201. Lower Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-202. Upper Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

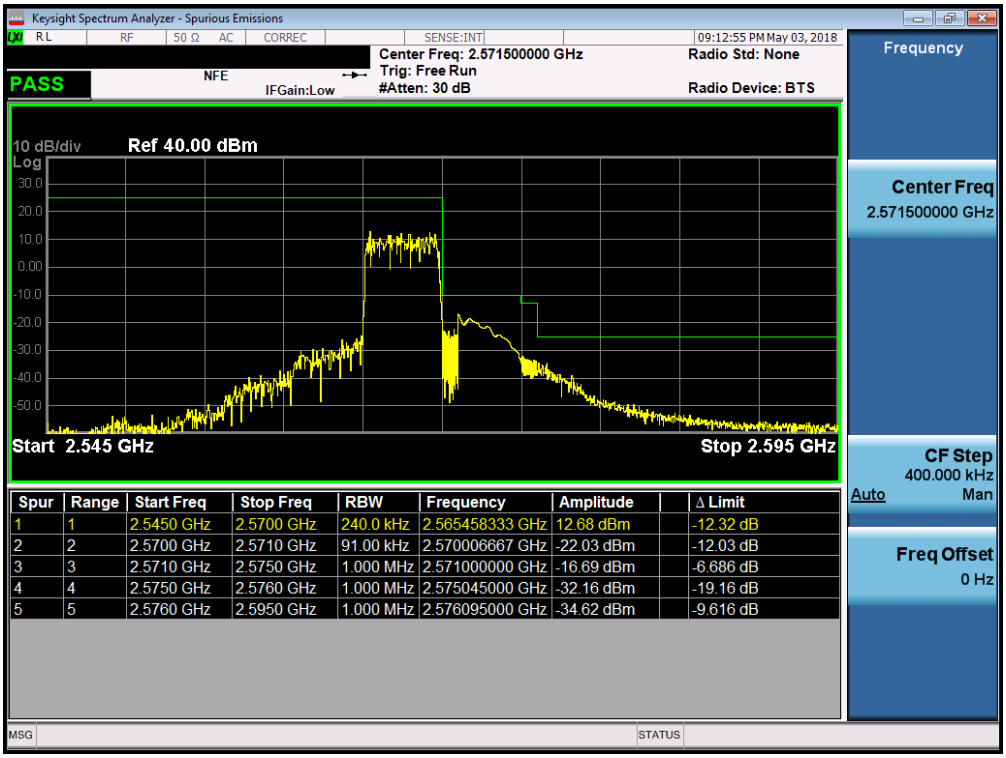
Plot 7-203. Upper Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

Band 7



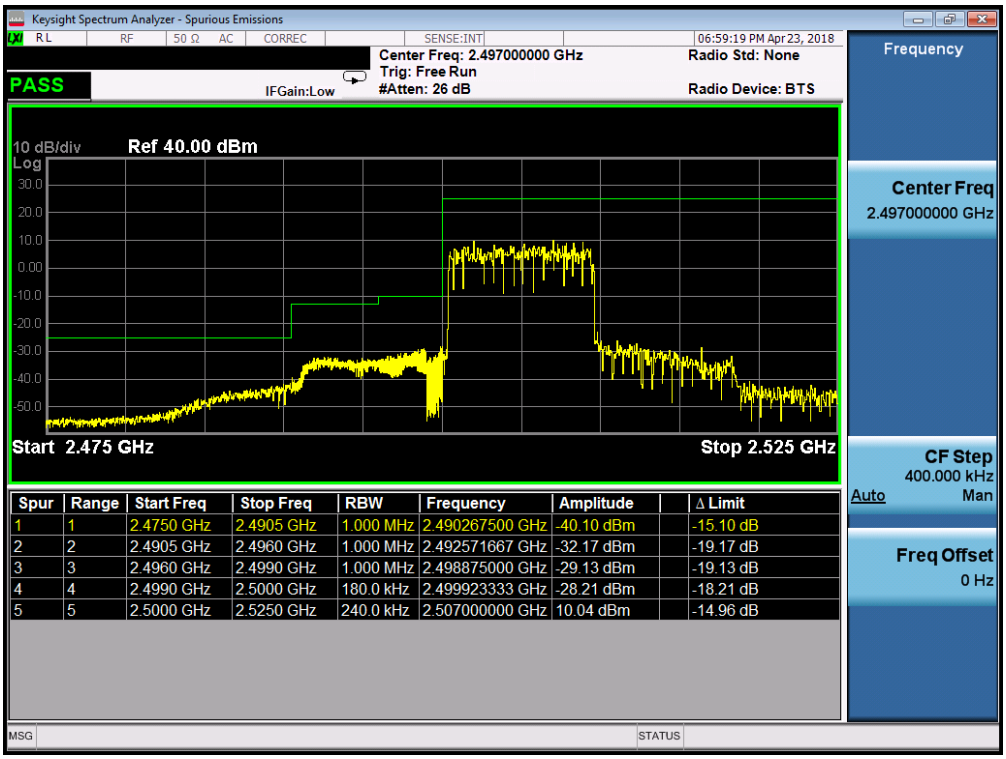
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4940 GHz	1.000 MHz	2.493715000 GHz	-36.90 dBm	-11.90 dB
2	2	2.4940 GHz	2.4960 GHz	1.000 MHz	2.495943333 GHz	-27.28 dBm	-14.28 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498770000 GHz	-30.46 dBm	-20.46 dB
4	4	2.4990 GHz	2.5000 GHz	91.00 kHz	2.499988333 GHz	-24.42 dBm	-14.42 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.502000000 GHz	12.91 dBm	-12.09 dB

Plot 7-204. Lower ACP Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)

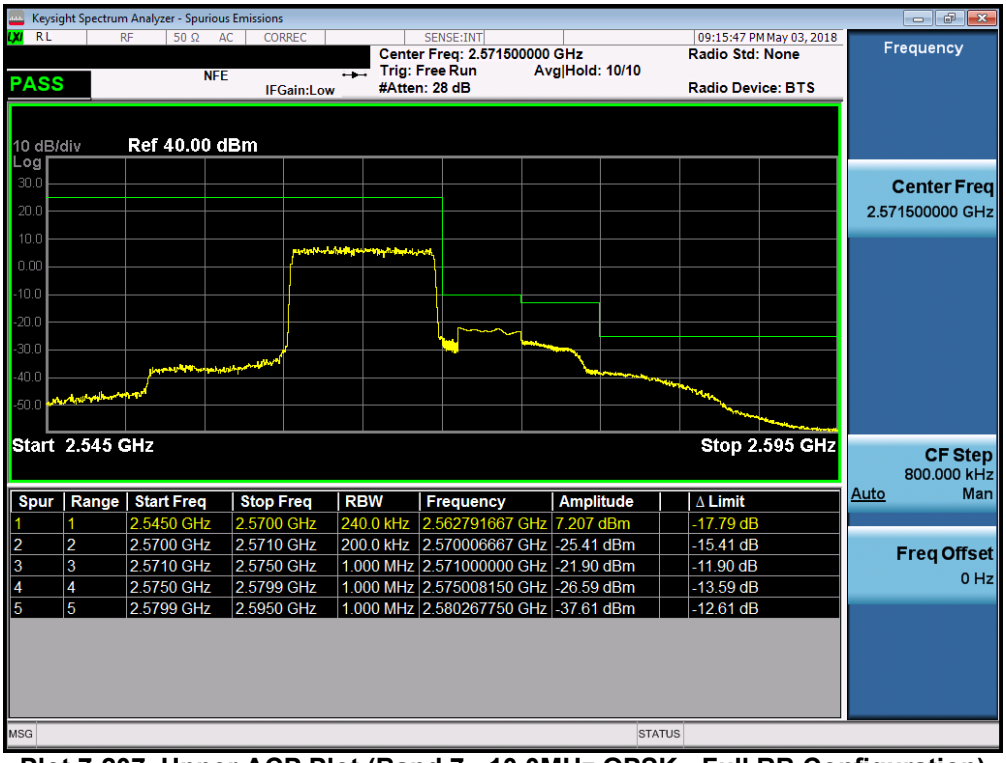


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.565458333 GHz	12.68 dBm	-12.32 dB
2	2	2.5700 GHz	2.5710 GHz	91.00 kHz	2.570006667 GHz	-22.03 dBm	-12.03 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571000000 GHz	-16.69 dBm	-6.686 dB
4	4	2.5750 GHz	2.5760 GHz	1.000 MHz	2.575045000 GHz	-32.16 dBm	-19.16 dB
5	5	2.5760 GHz	2.5950 GHz	1.000 MHz	2.576095000 GHz	-34.62 dBm	-9.616 dB

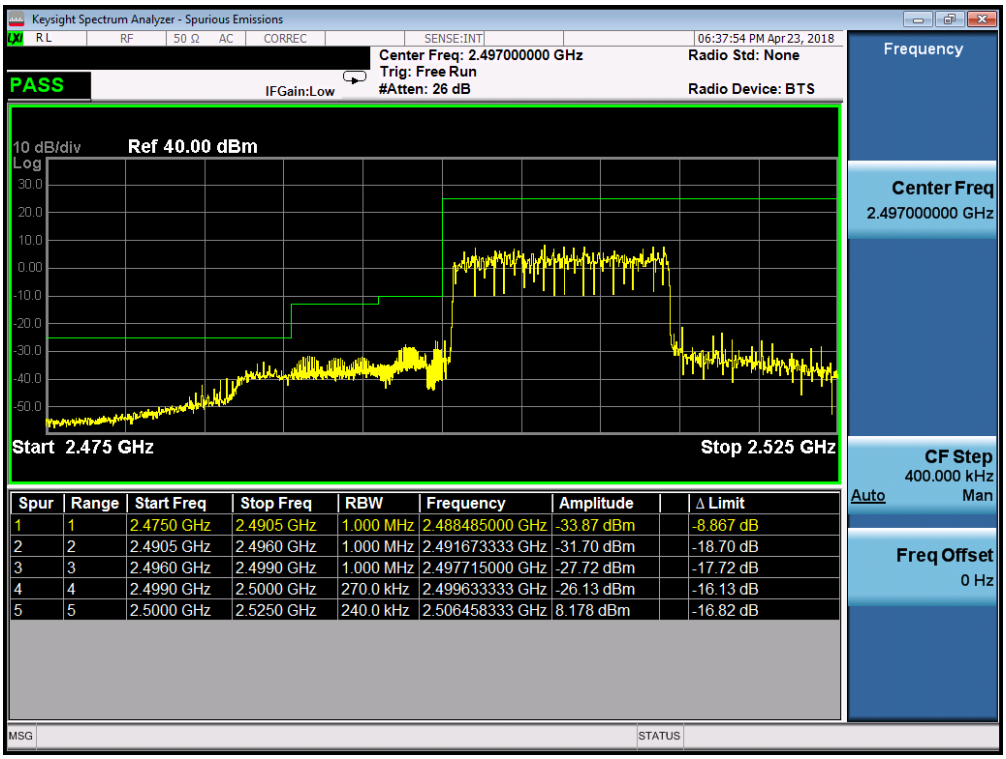
Plot 7-205. Upper ACP Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-206. Lower ACP Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

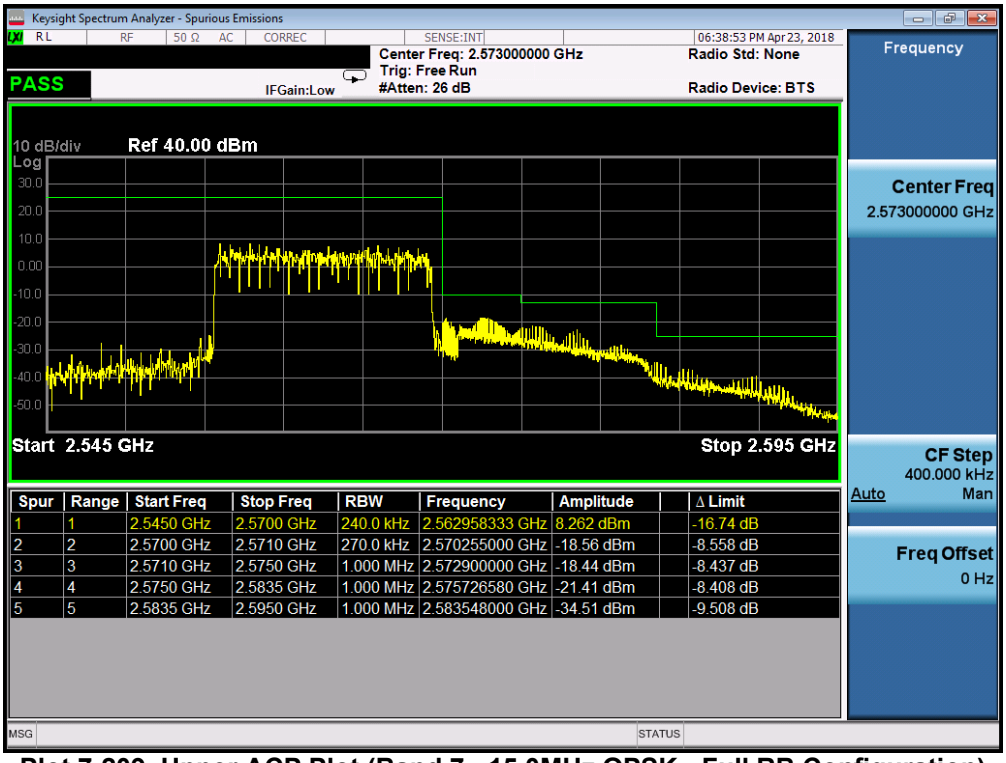


Plot 7-207. Upper ACP Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)



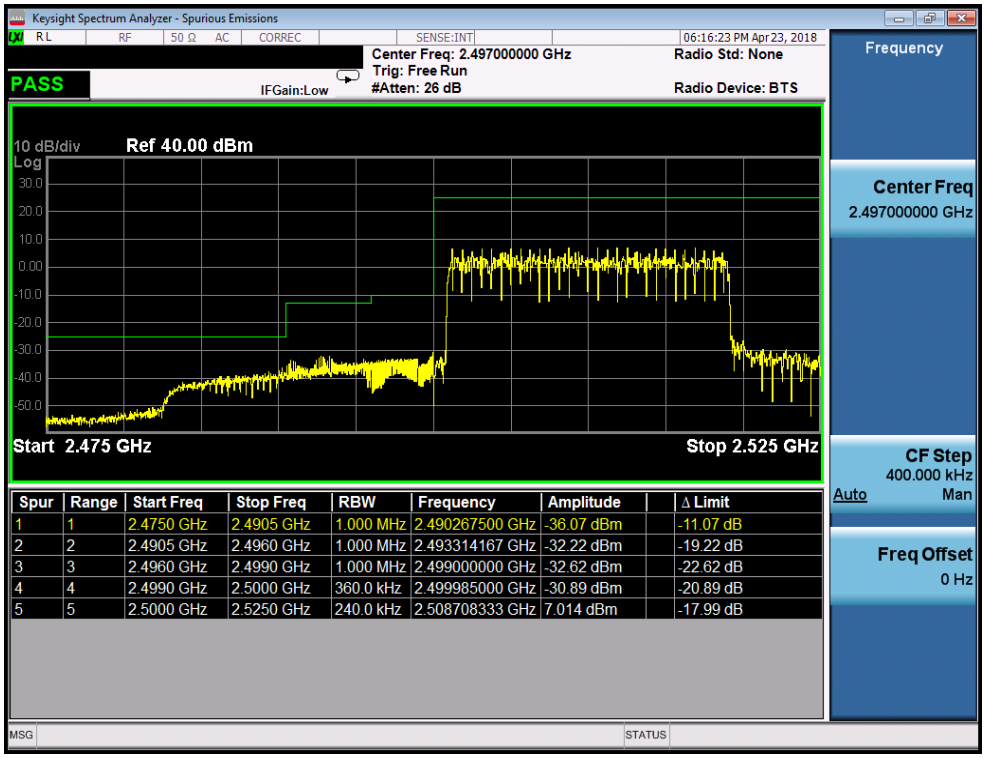
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.488485000 GHz	-33.87 dBm	-8.867 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.491673333 GHz	-31.70 dBm	-18.70 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.497715000 GHz	-27.72 dBm	-17.72 dB
4	4	2.4990 GHz	2.5000 GHz	270.0 kHz	2.499633333 GHz	-26.13 dBm	-16.13 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.506458333 GHz	8.178 dBm	-16.82 dB

Plot 7-208. Lower ACP Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)

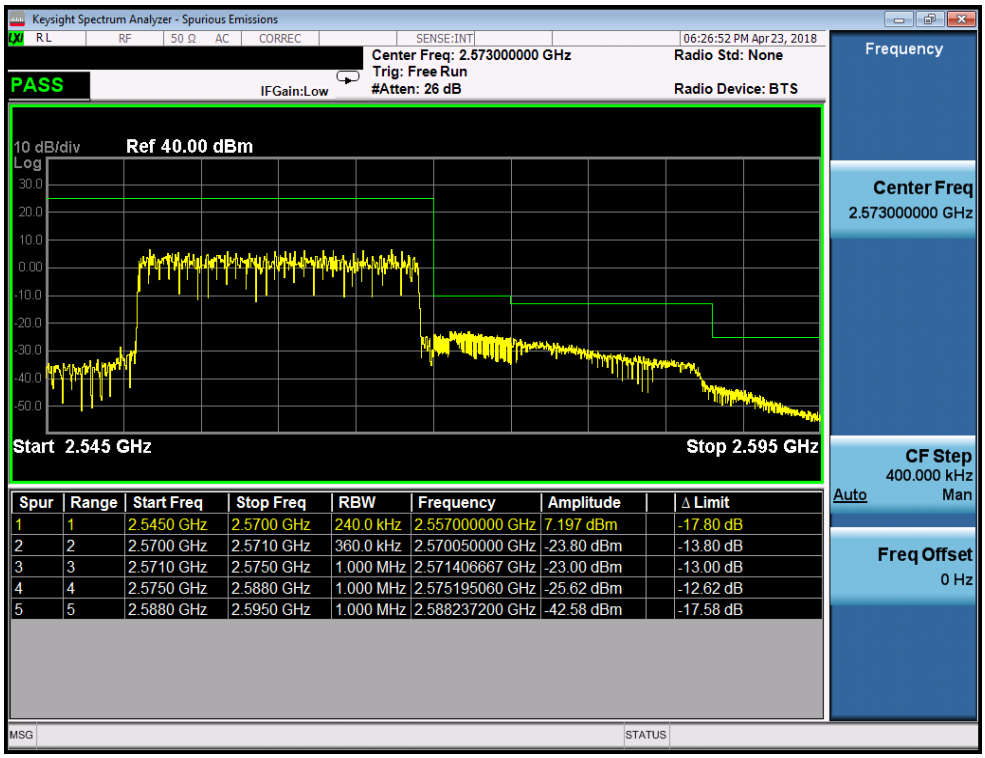


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.562958333 GHz	8.262 dBm	-16.74 dB
2	2	2.5700 GHz	2.5710 GHz	270.0 kHz	2.570255000 GHz	-18.56 dBm	-8.558 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.572900000 GHz	-18.44 dBm	-8.437 dB
4	4	2.5750 GHz	2.5835 GHz	1.000 MHz	2.575726580 GHz	-21.41 dBm	-8.408 dB
5	5	2.5835 GHz	2.5950 GHz	1.000 MHz	2.583548000 GHz	-34.51 dBm	-9.508 dB

Plot 7-209. Upper ACP Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-210. Lower ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-211. Upper ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)

7.5 Peak-Average Ratio

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

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

Test Setup

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

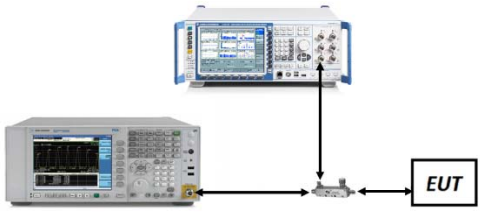
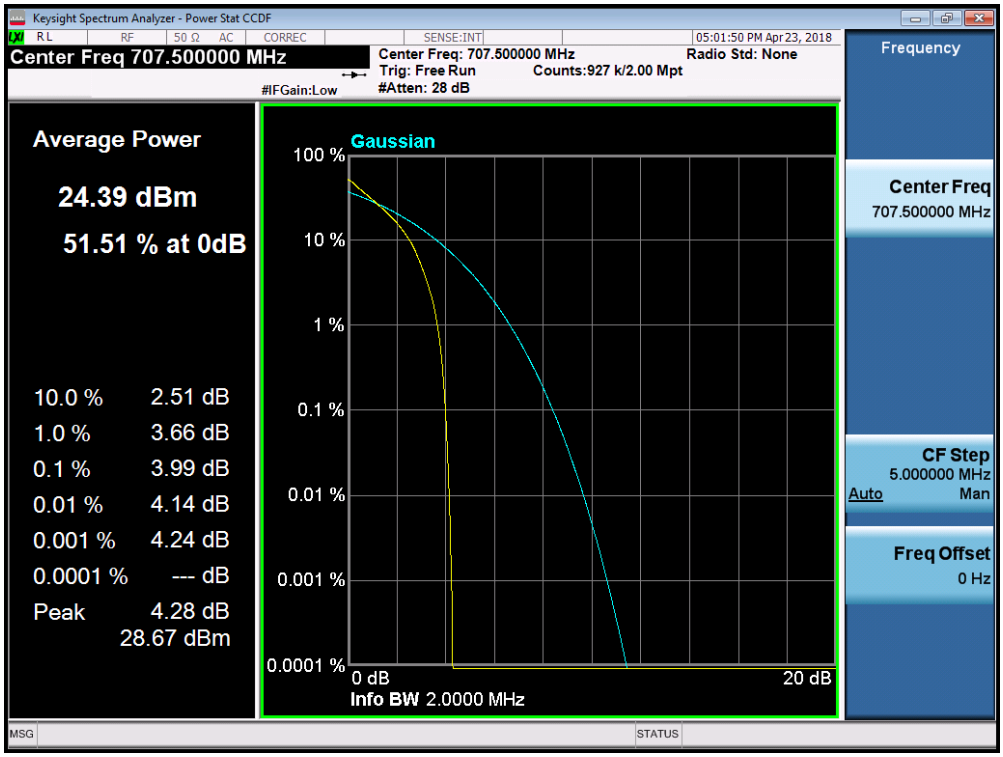


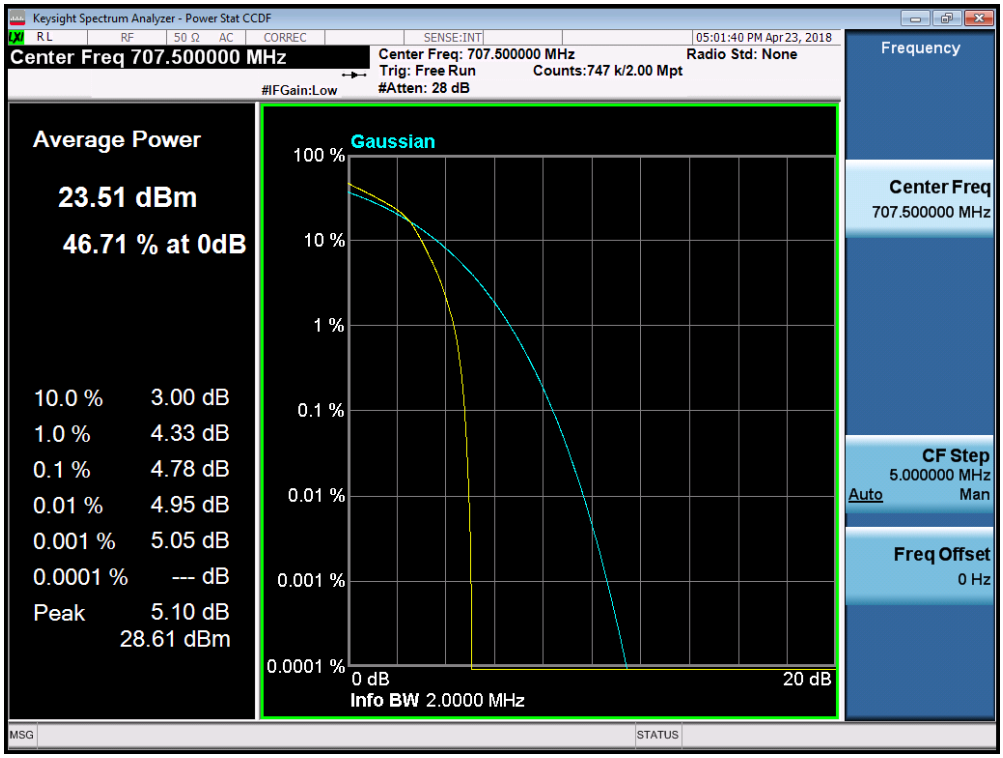
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

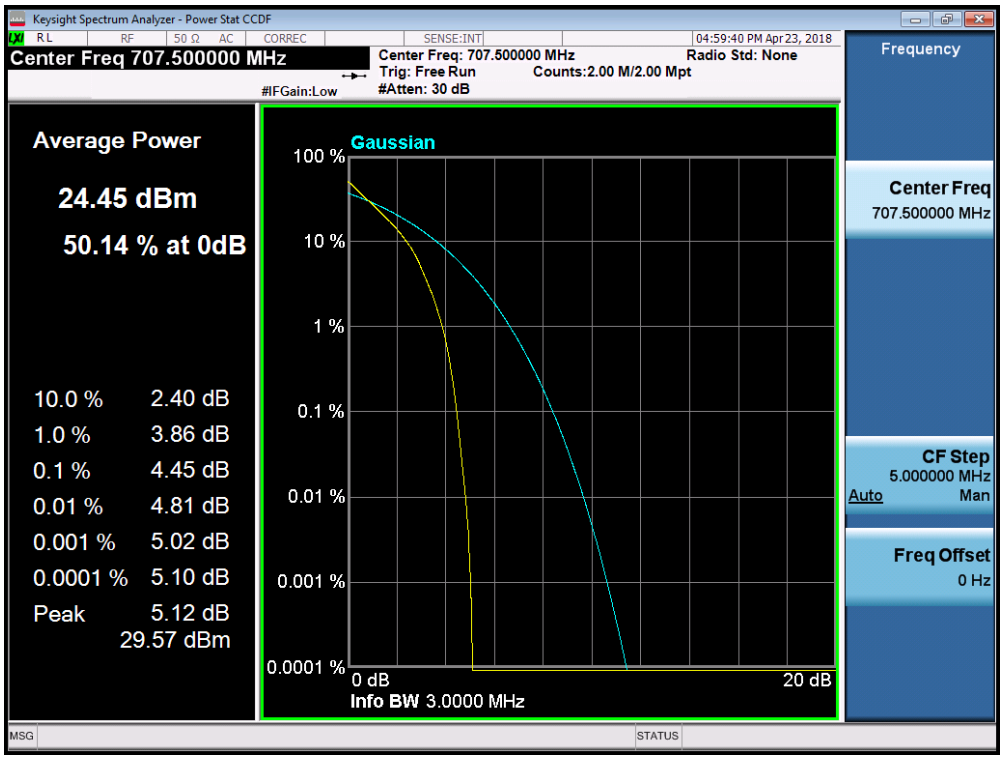
None.



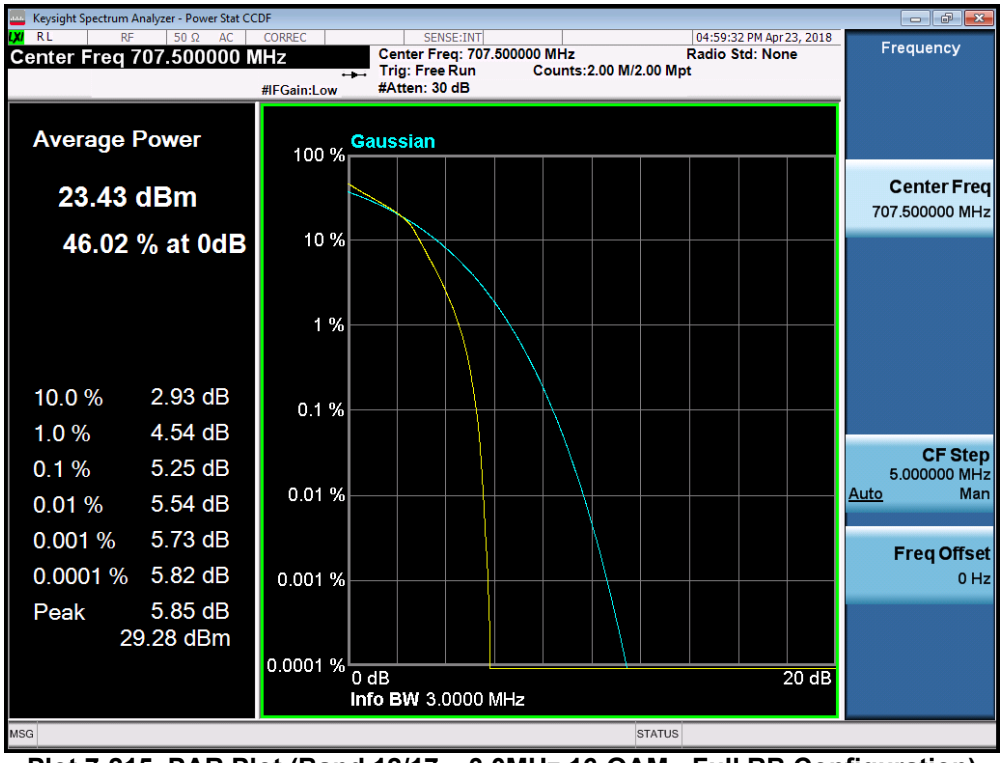
Plot 7-212. PAR Plot (Band 12/17 – 1.4MHz QPSK - Full RB Configuration)



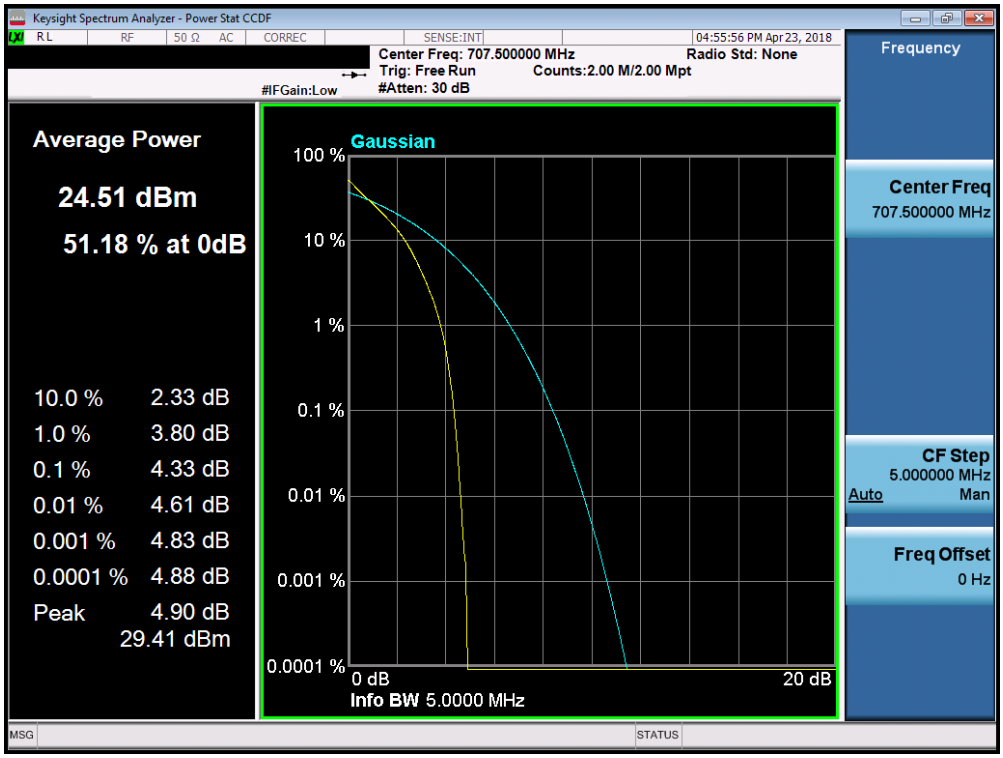
Plot 7-213. PAR Plot (Band 12/17 – 1.4MHz 16-QAM - Full RB Configuration)



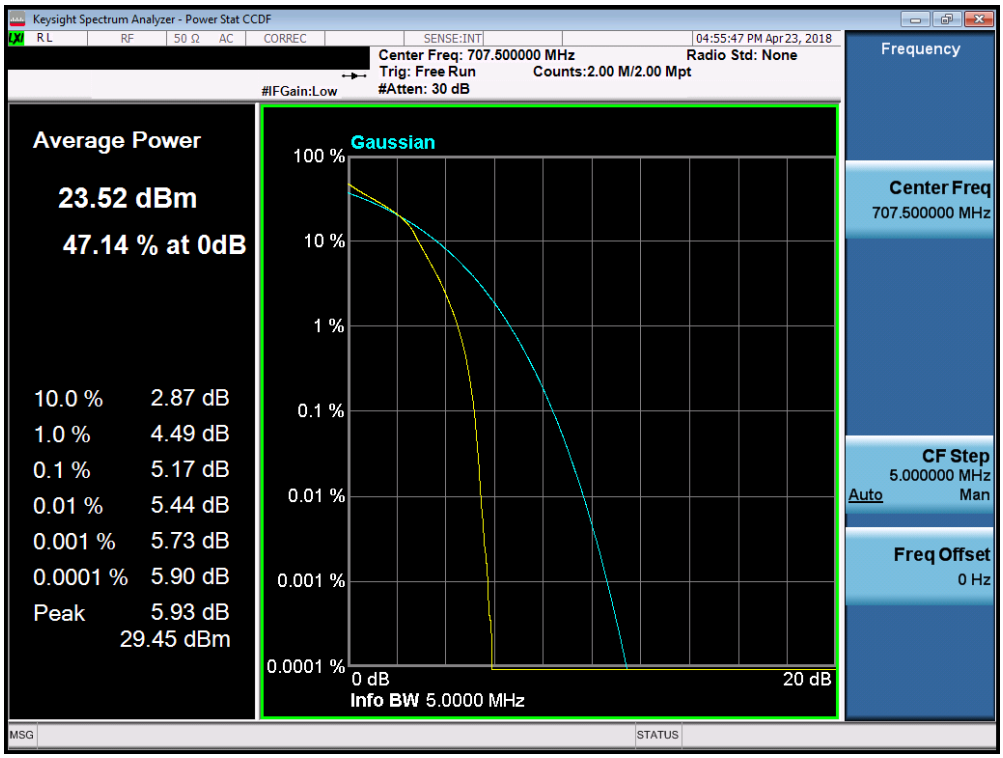
Plot 7-214. PAR Plot (Band 12/17 – 3.0MHz QPSK - Full RB Configuration)



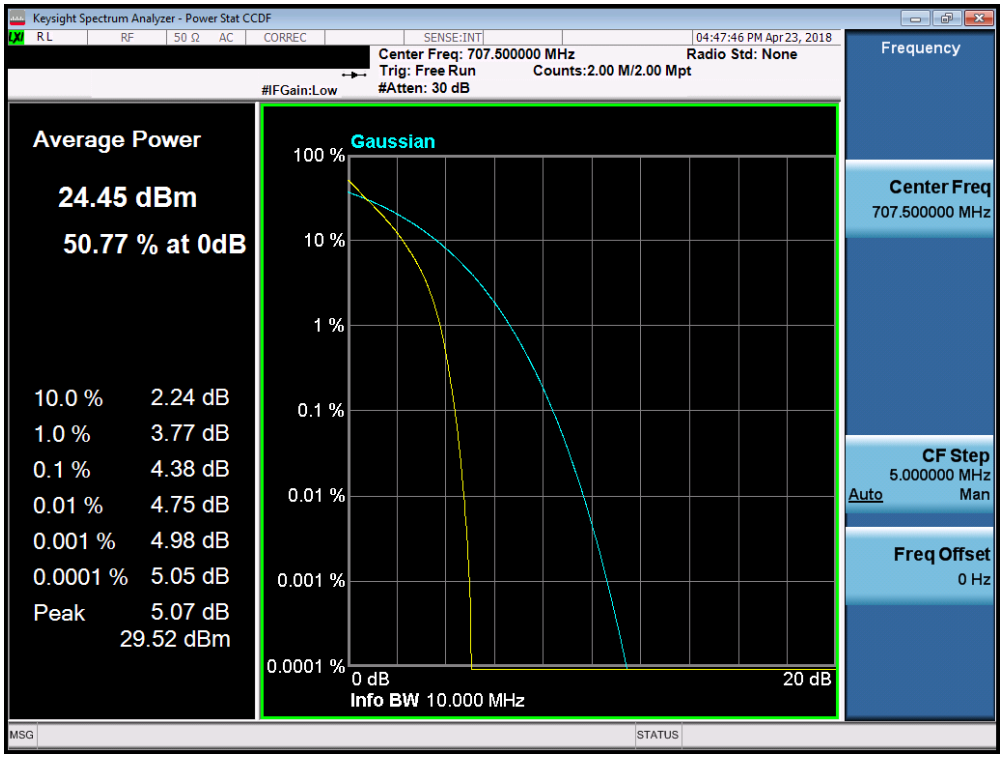
Plot 7-215. PAR Plot (Band 12/17 – 3.0MHz 16-QAM - Full RB Configuration)



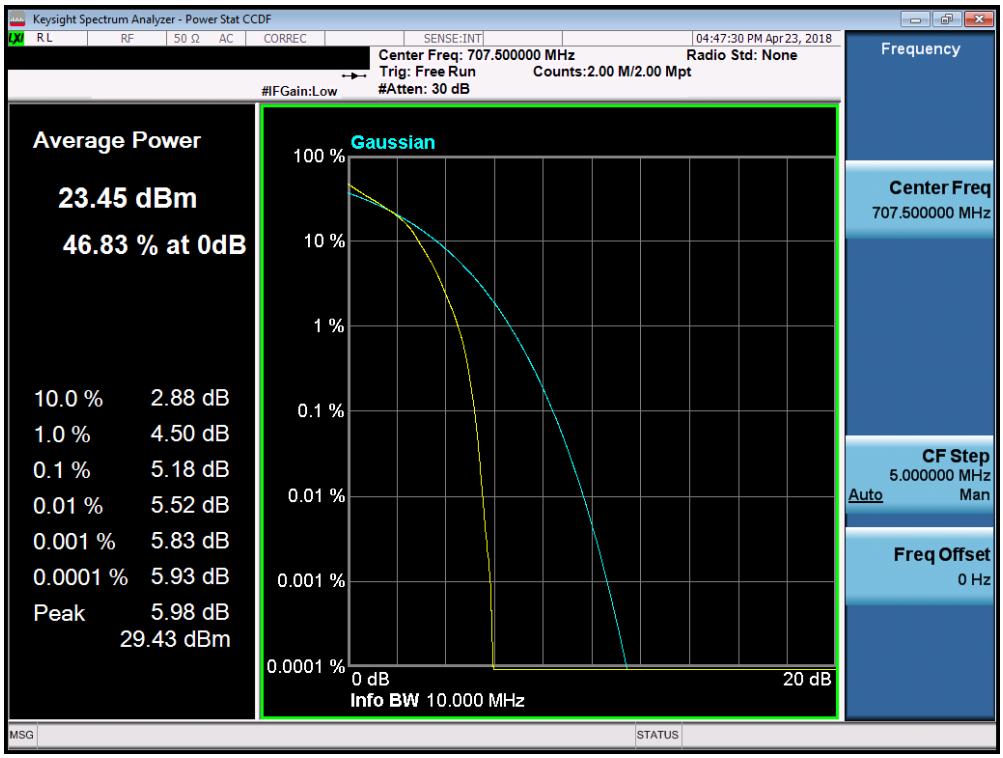
Plot 7-216. PAR Plot (Band 12/17 – 5.0MHz QPSK - Full RB Configuration)



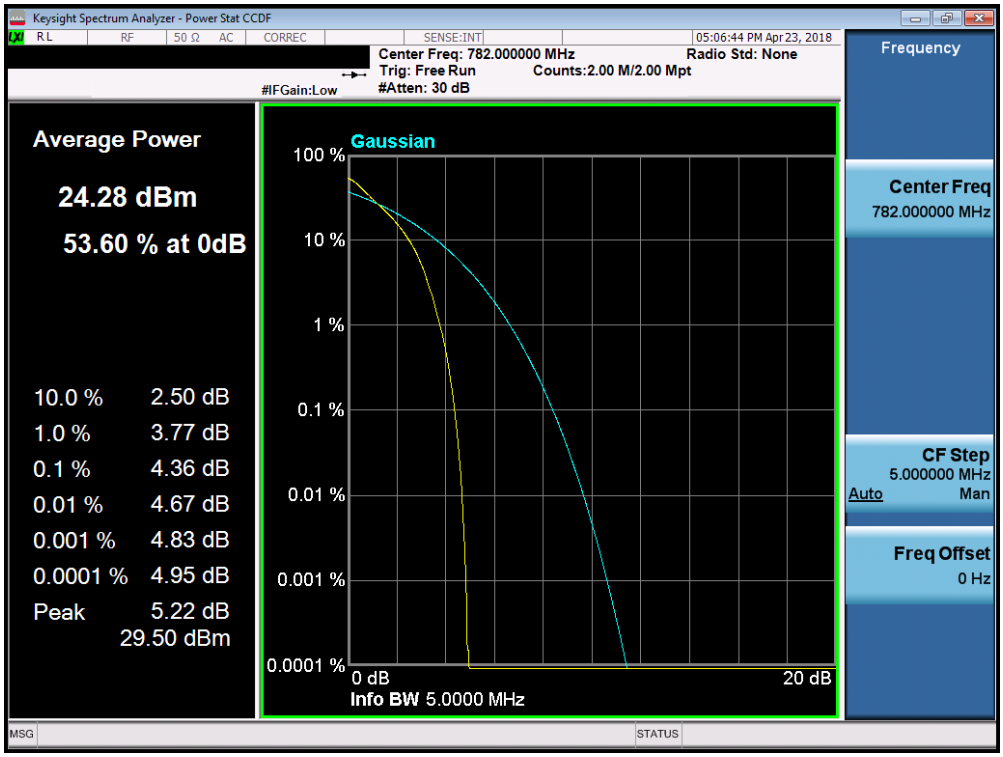
Plot 7-217. PAR Plot (Band 12/17 – 5.0MHz 16-QAM - Full RB Configuration)



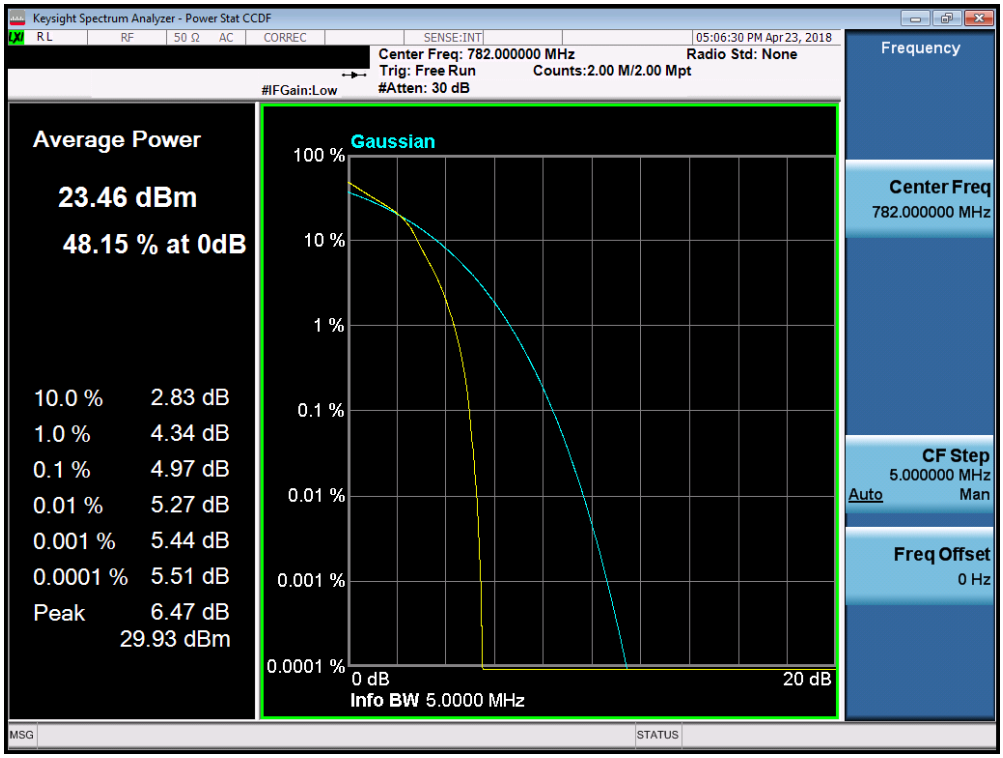
Plot 7-218. PAR Plot (Band 12/17 – 10.0MHz QPSK - Full RB Configuration)



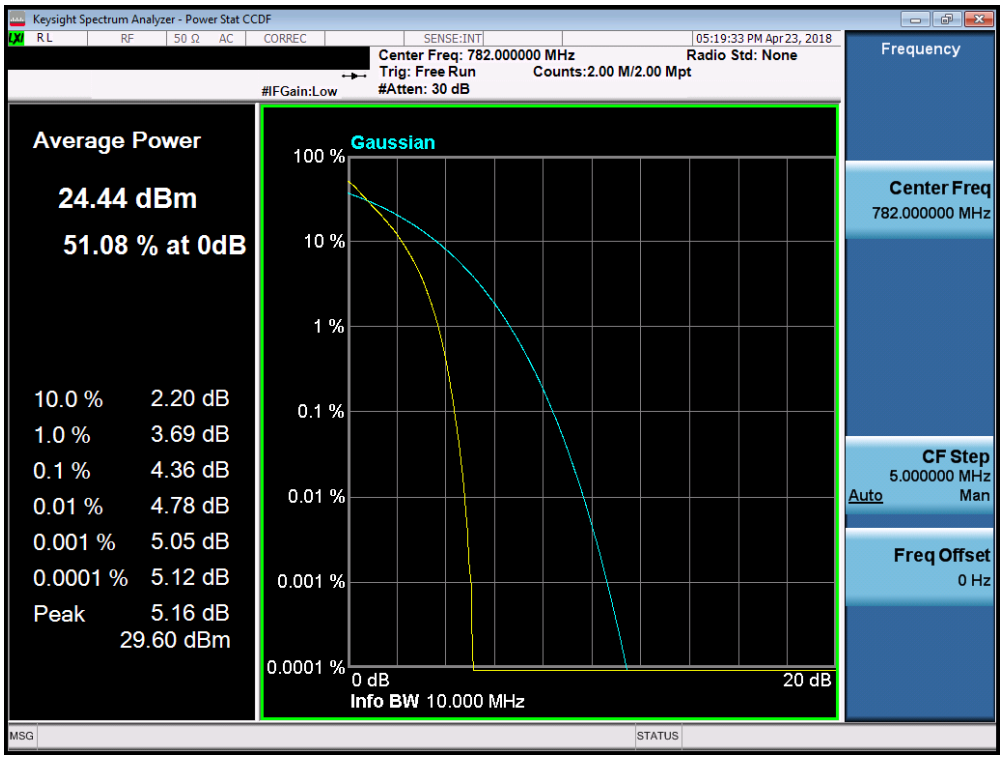
Plot 7-219. PAR Plot (Band 12/17 – 10.0MHz 16-QAM - Full RB Configuration)



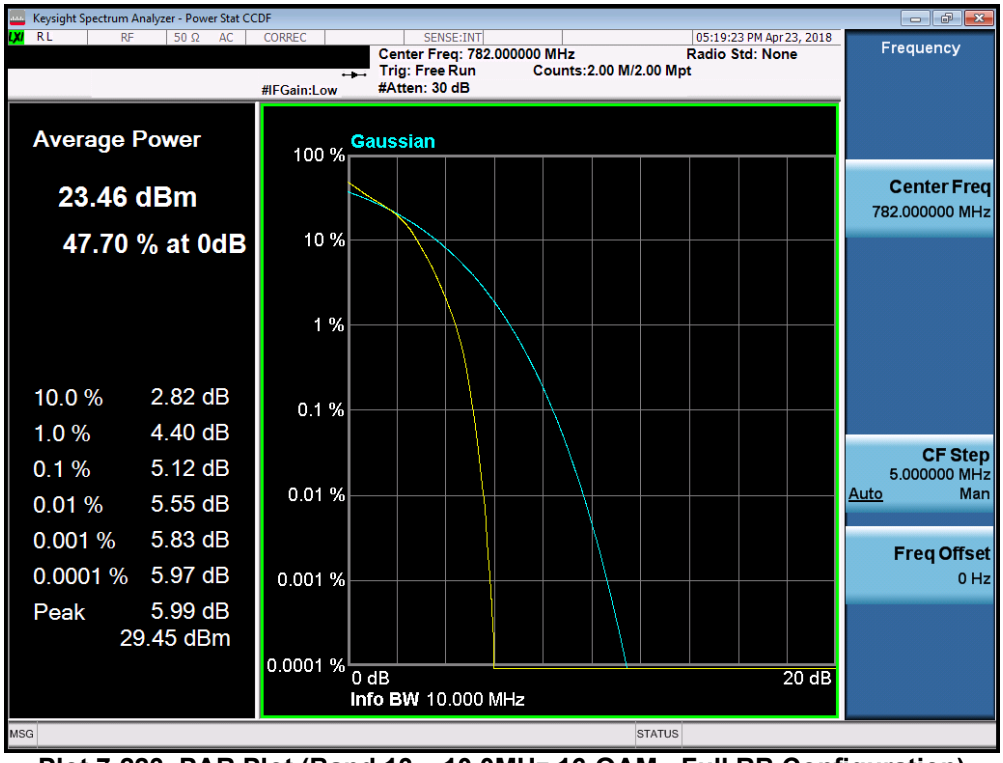
Plot 7-220. PAR Plot (Band 13 – 5.0MHz QPSK - Full RB Configuration)



Plot 7-221. PAR Plot (Band 13 – 5.0MHz 16-QAM - Full RB Configuration)

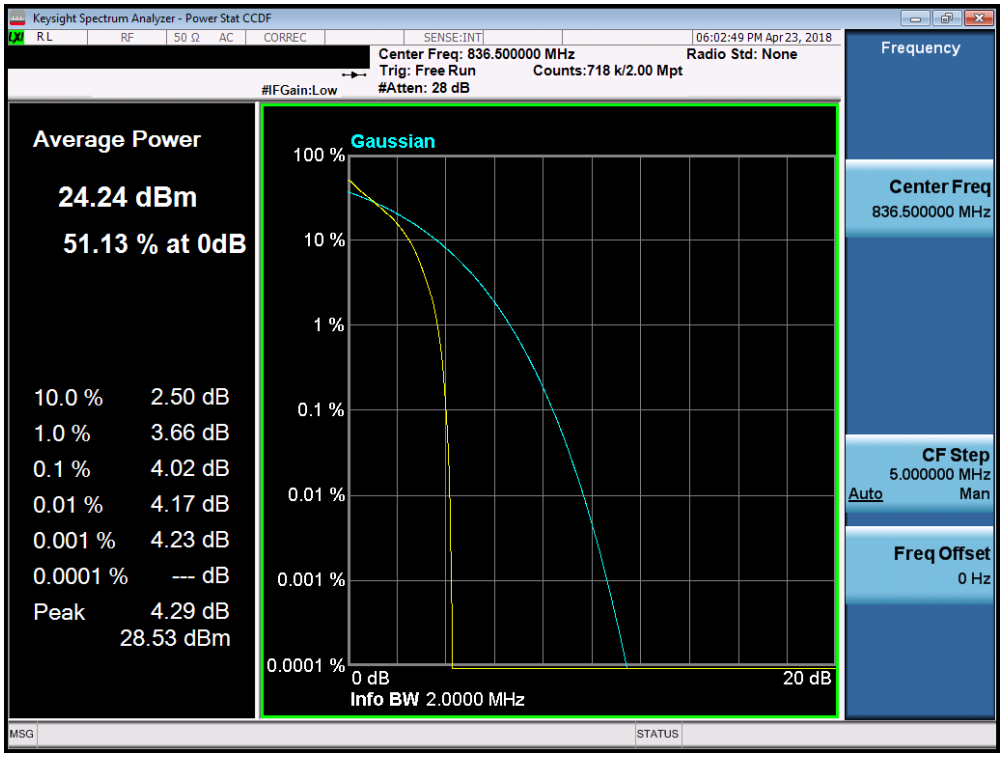


Plot 7-222. PAR Plot (Band 13 – 10.0MHz QPSK - Full RB Configuration)

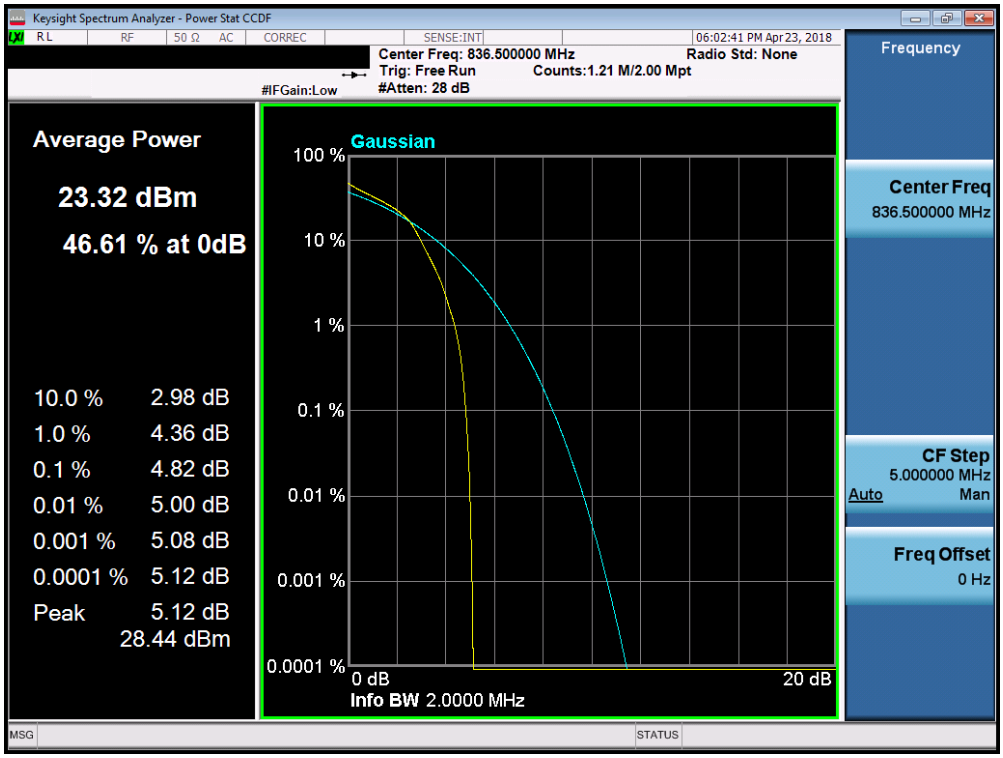


Plot 7-223. PAR Plot (Band 13 – 10.0MHz 16-QAM - Full RB Configuration)

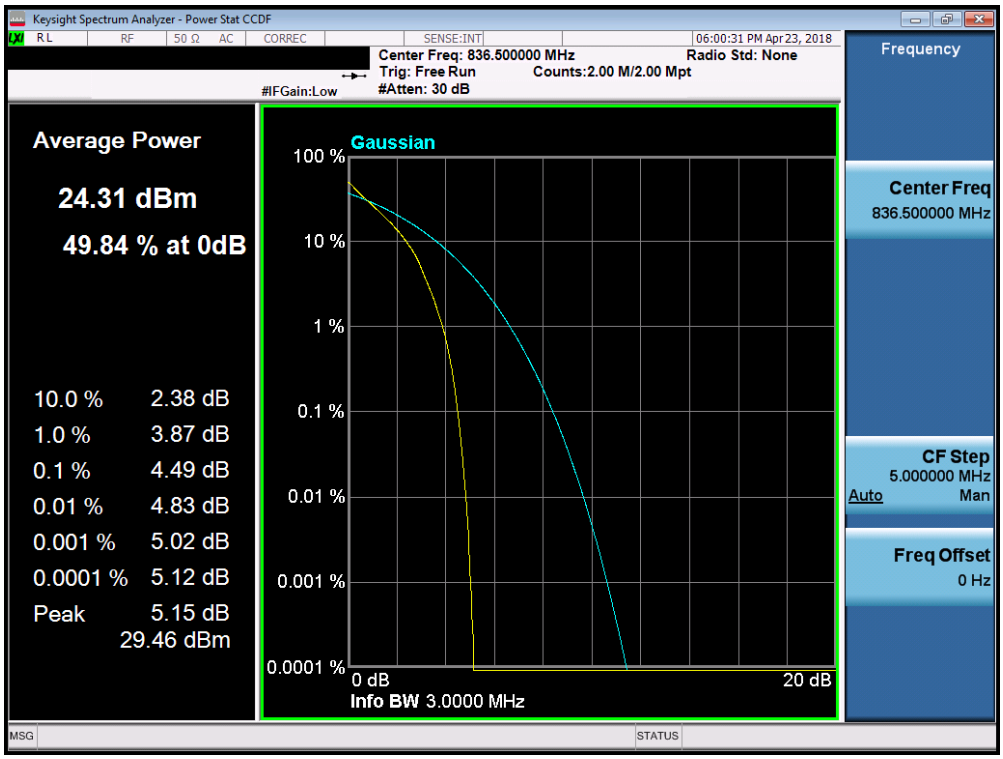
Band 5



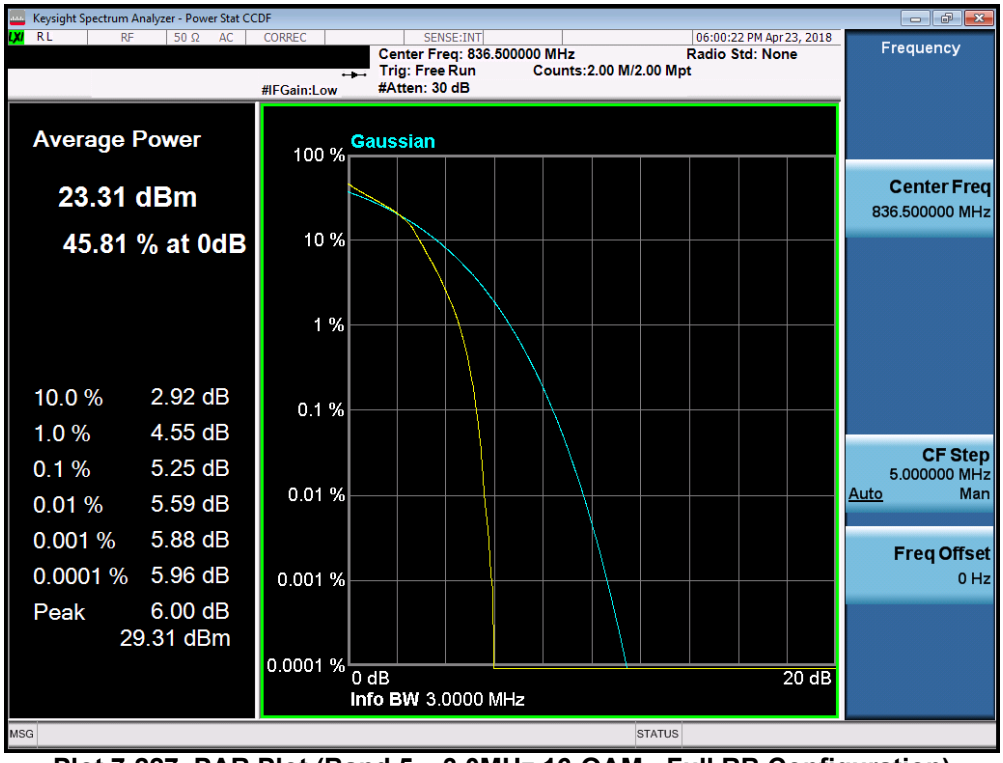
Plot 7-224. PAR Plot (Band 5 – 1.4MHz QPSK - Full RB Configuration)



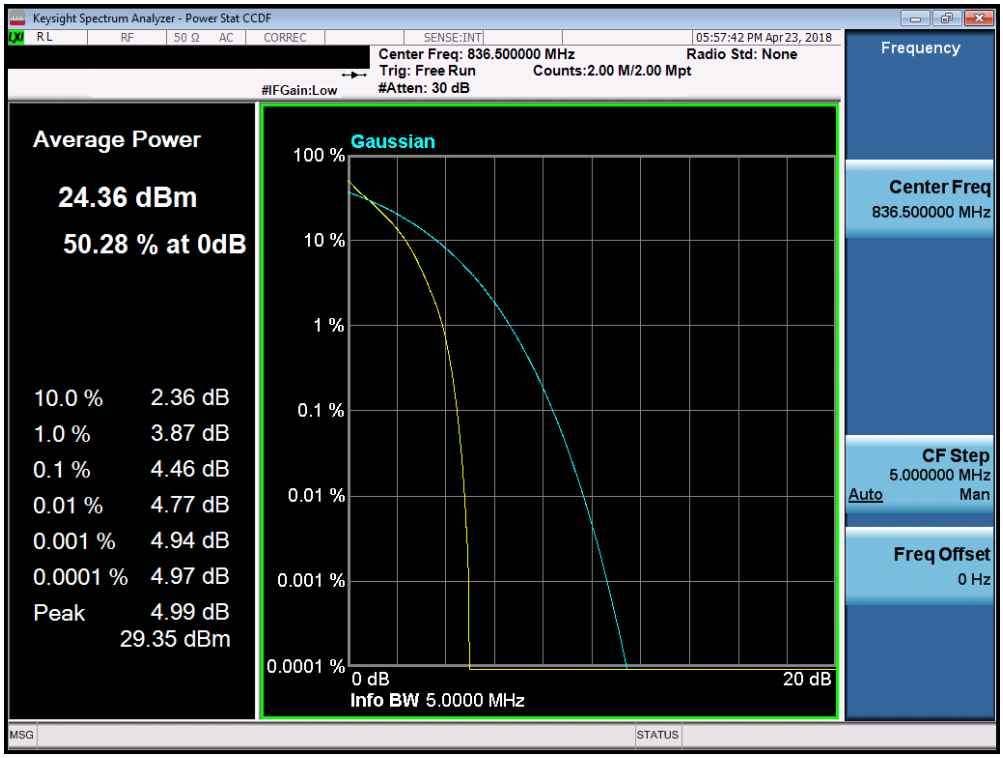
Plot 7-225. PAR Plot (Band 5 – 1.4MHz 16-QAM - Full RB Configuration)



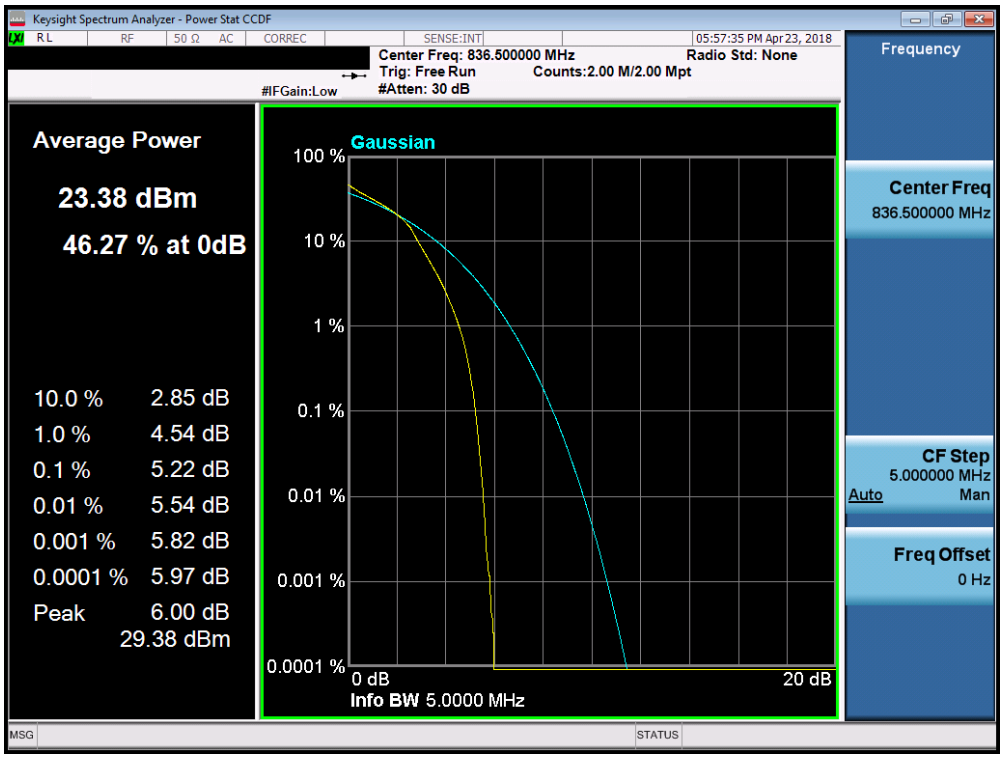
Plot 7-226. PAR Plot (Band 5 – 3.0MHz QPSK - Full RB Configuration)



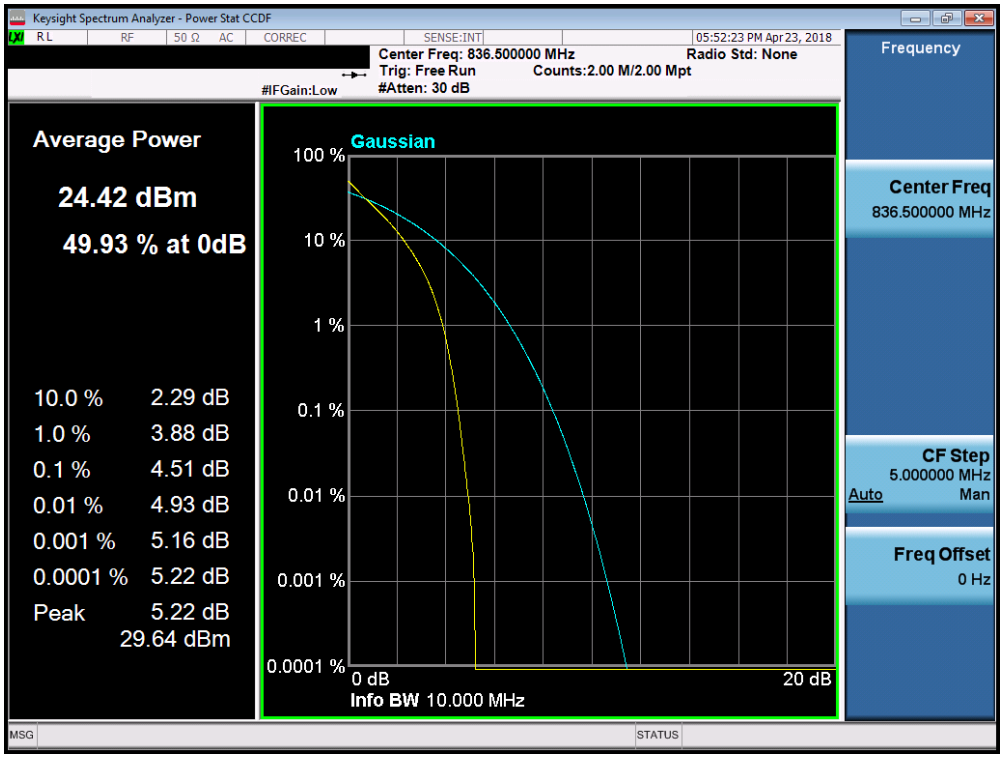
Plot 7-227. PAR Plot (Band 5 – 3.0MHz 16-QAM - Full RB Configuration)



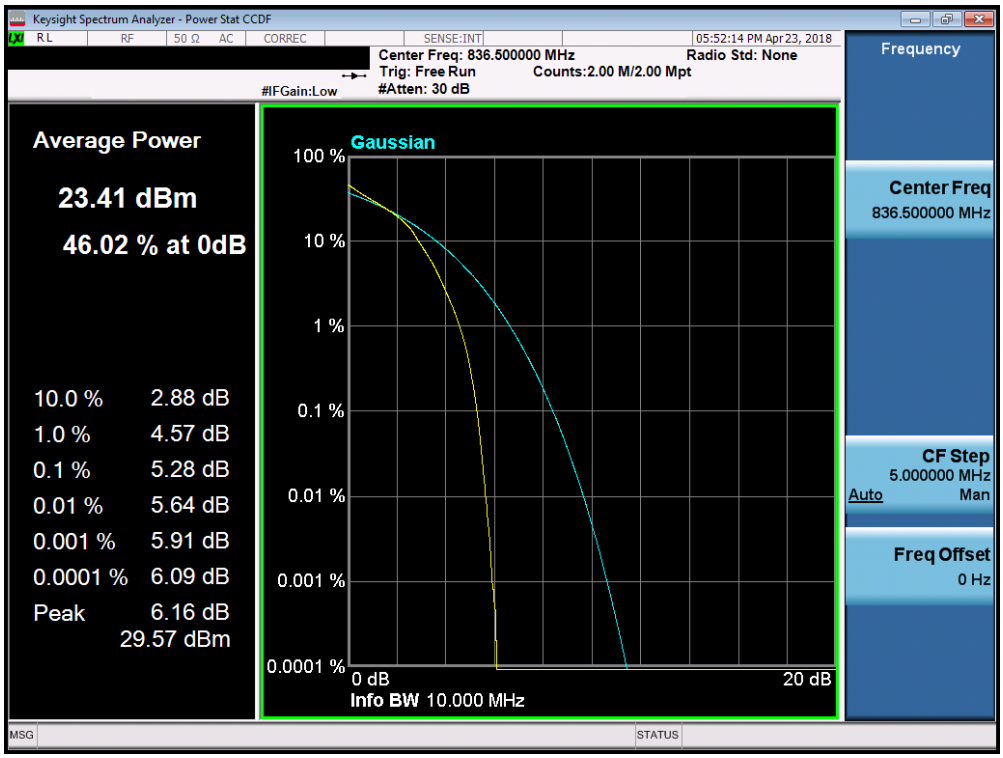
Plot 7-228. PAR Plot (Band 5 – 5.0MHz QPSK - Full RB Configuration)



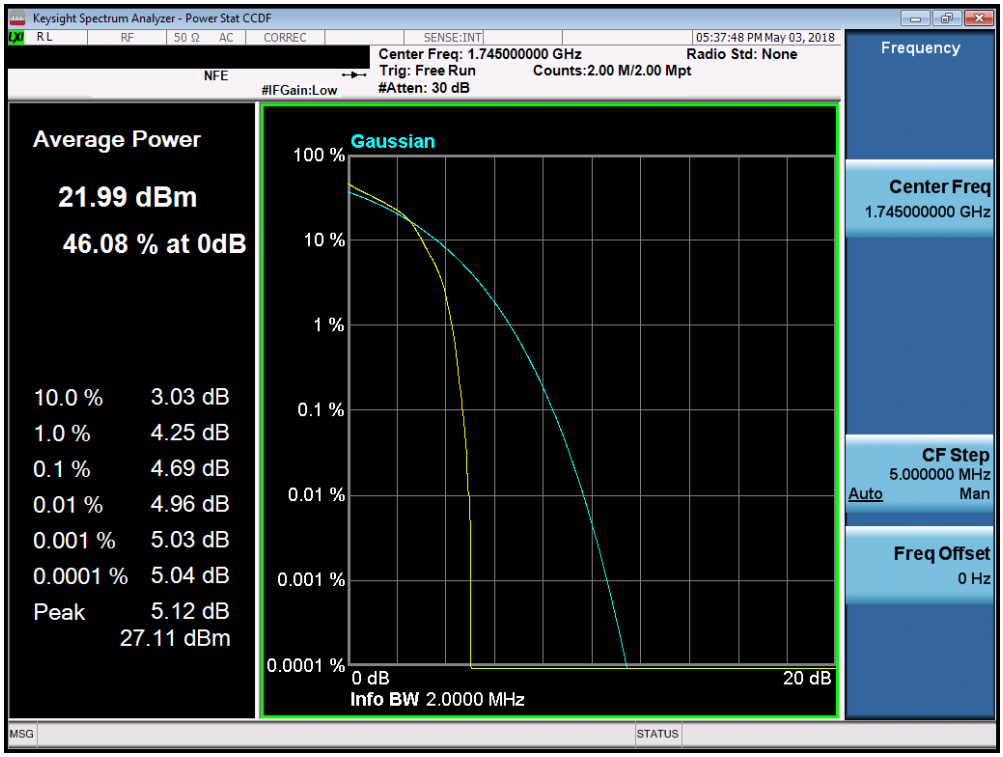
Plot 7-229. PAR Plot (Band 5 – 5.0MHz 16-QAM - Full RB Configuration)



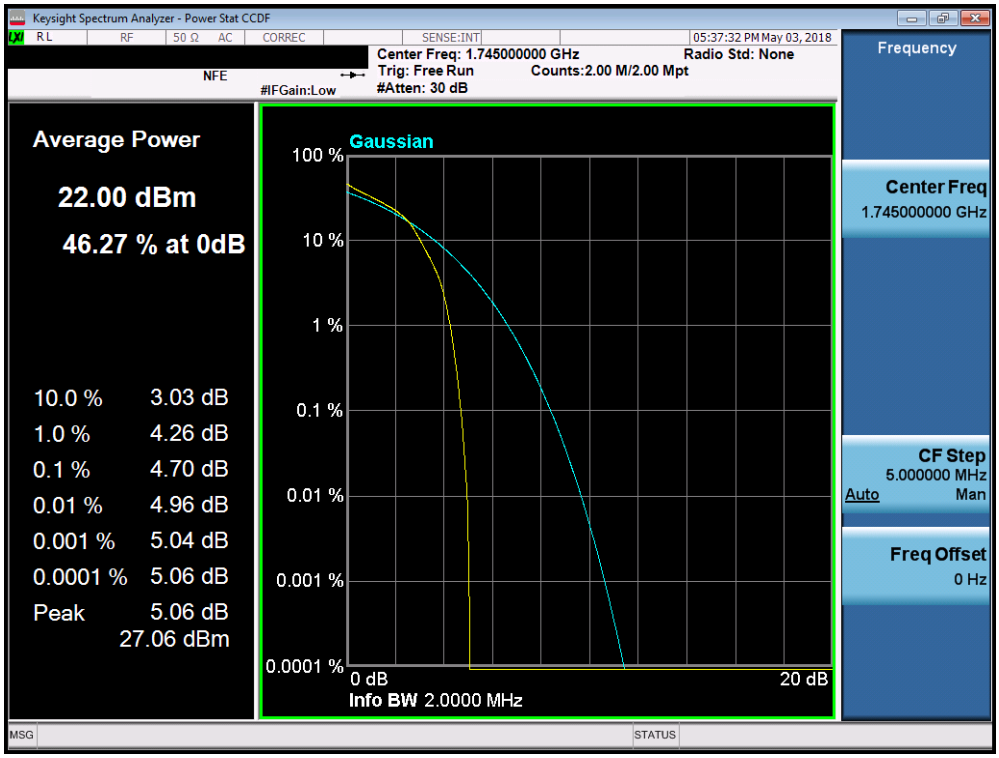
Plot 7-230. PAR Plot (Band 5 – 10.0MHz QPSK - Full RB Configuration)



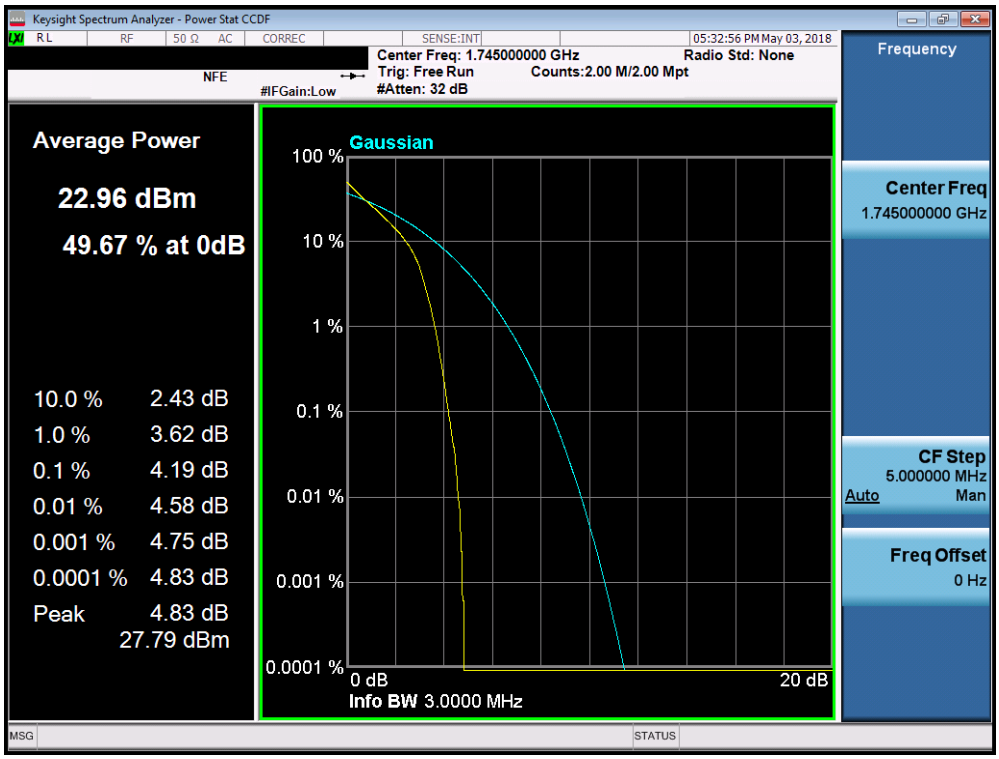
Plot 7-231. PAR Plot (Band 5 – 10.0MHz 16-QAM - Full RB Configuration)



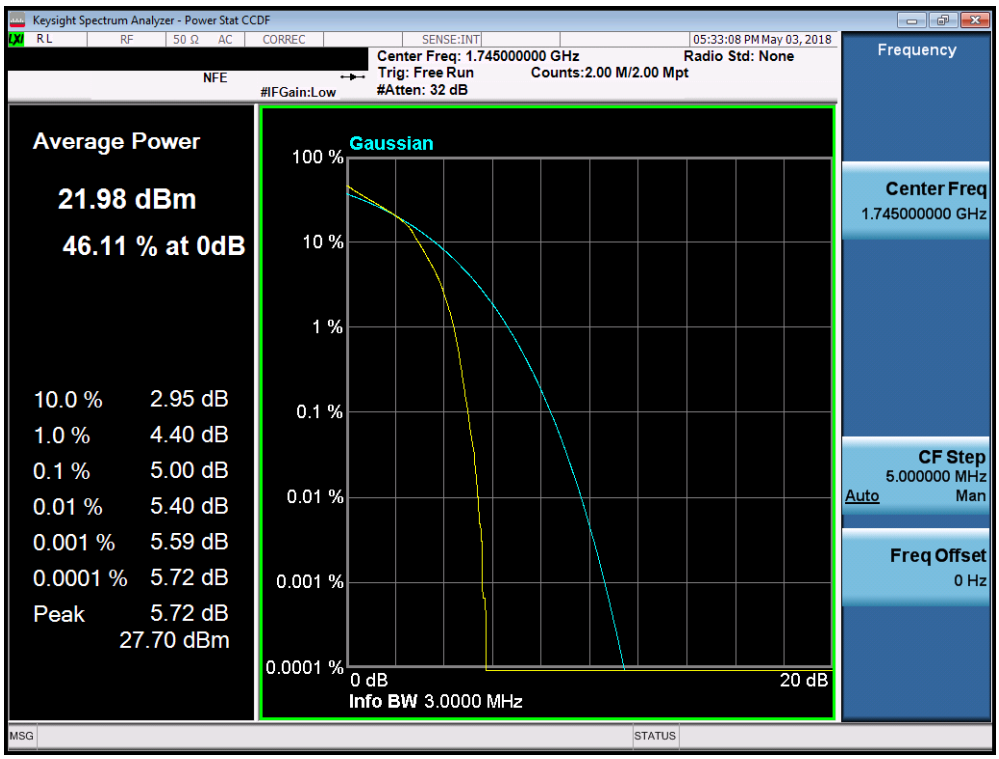
Plot 7-232. PAR Plot (Band 66/4 – 1.4MHz QPSK - Full RB Configuration)



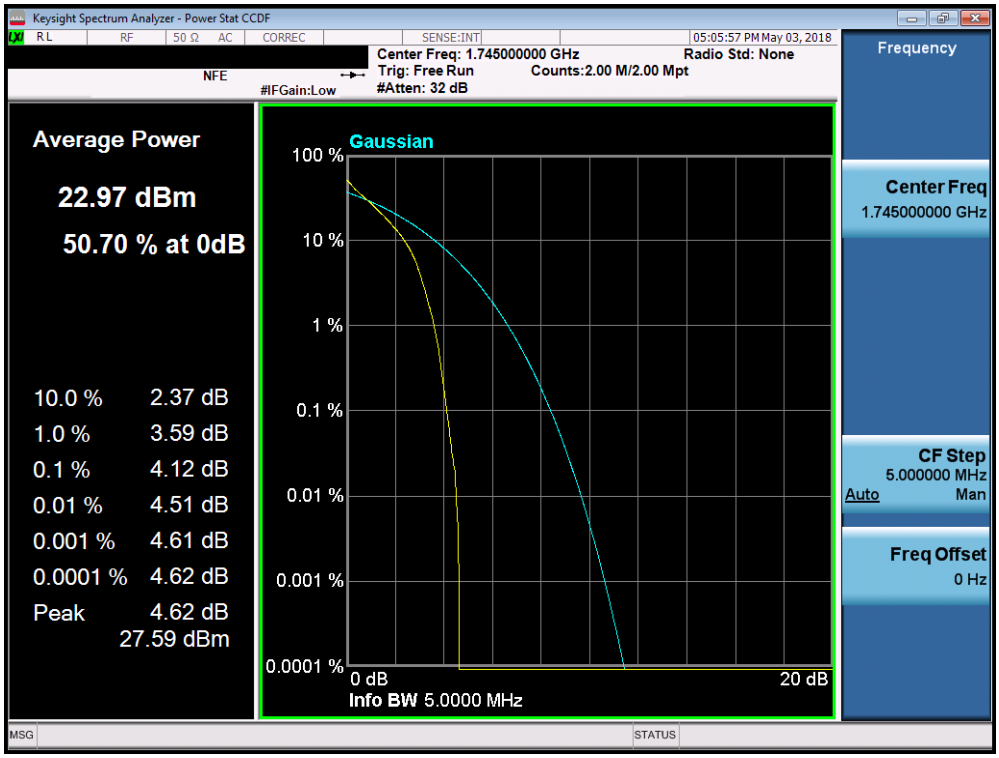
Plot 7-233. PAR Plot (Band 66/4 – 1.4MHz 16-QAM - Full RB Configuration)



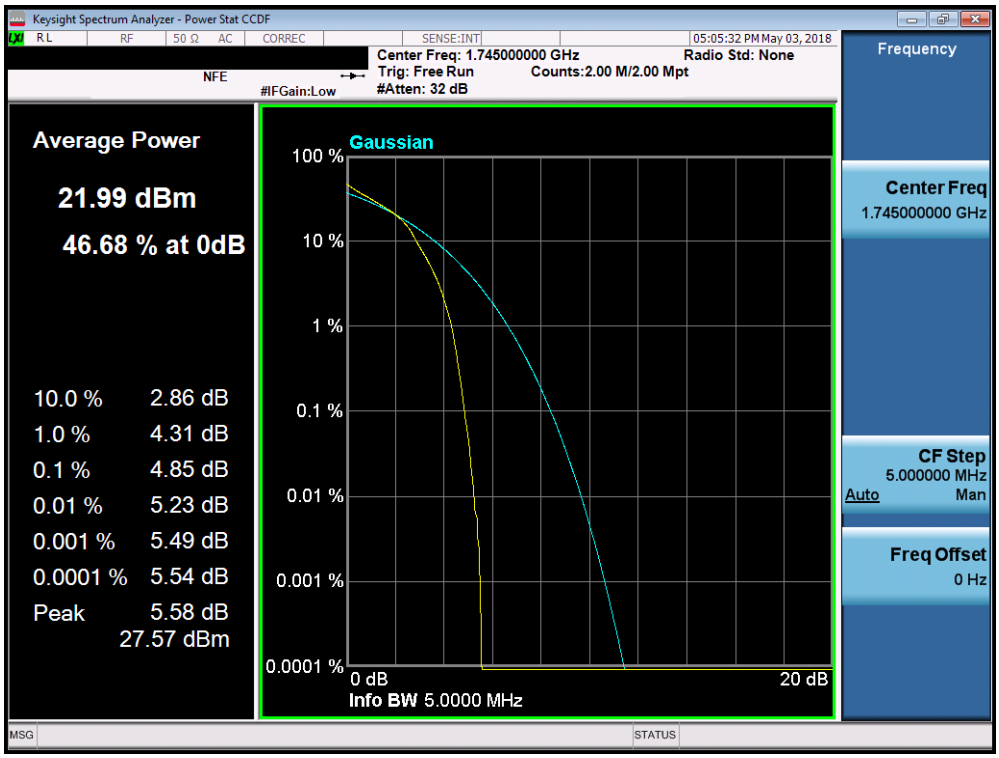
Plot 7-234. PAR Plot (Band 66/4 – 3.0MHz QPSK - Full RB Configuration)



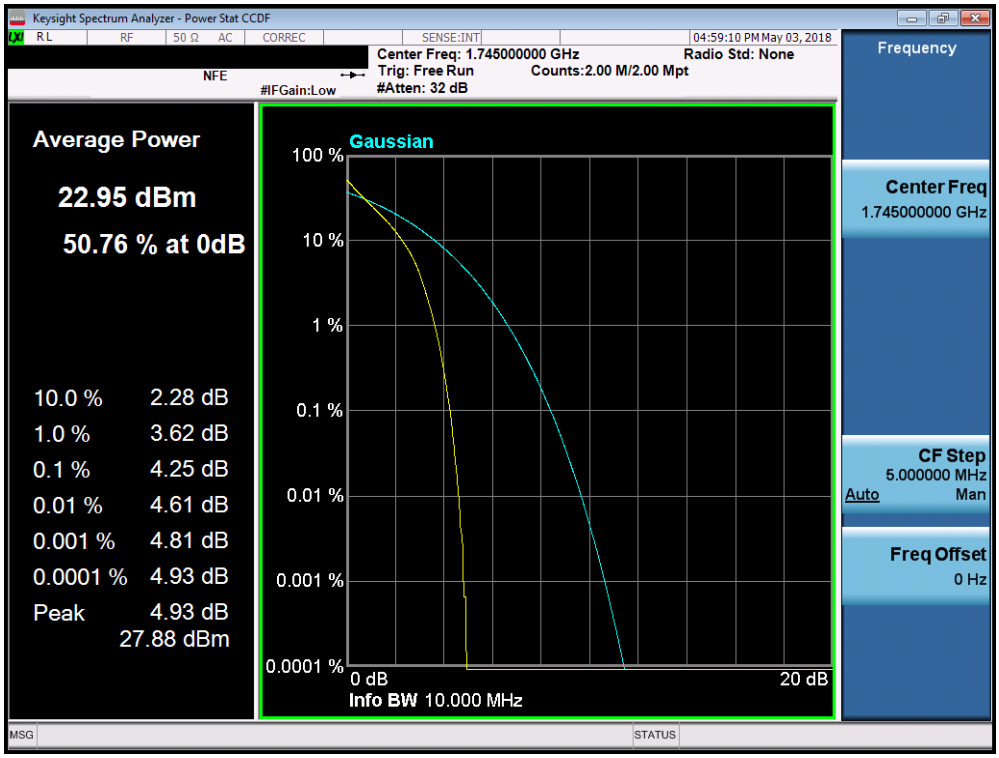
Plot 7-235. PAR Plot (Band 66/4 – 3.0MHz 16-QAM - Full RB Configuration)



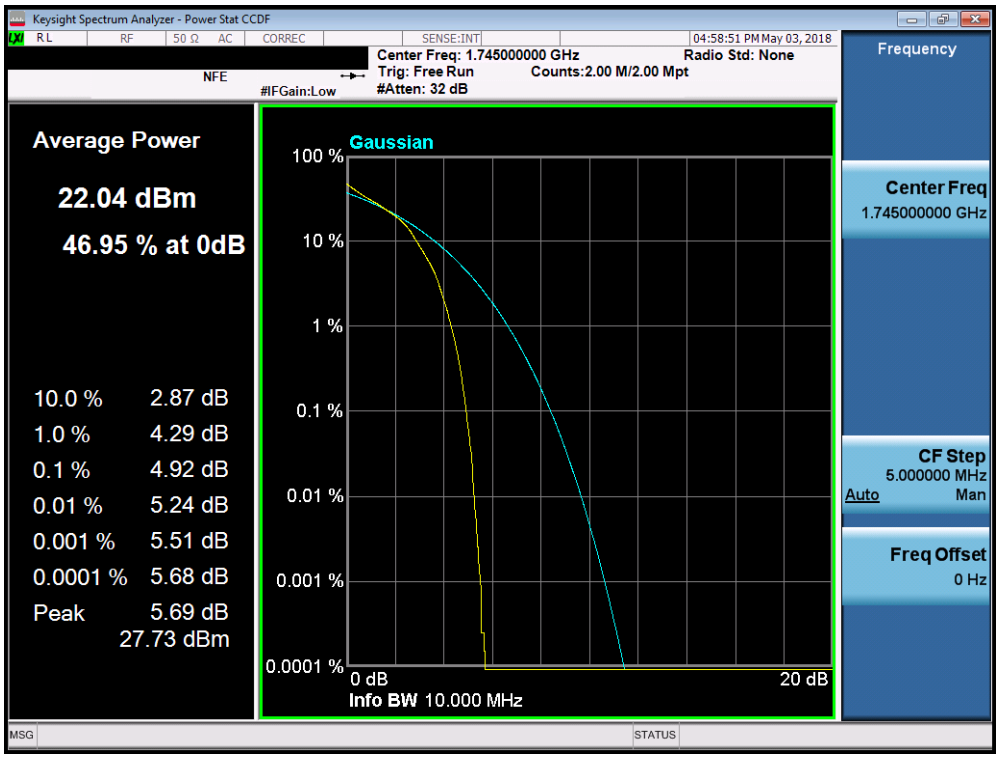
Plot 7-236. PAR Plot (Band 66/4 – 5.0MHz QPSK - Full RB Configuration)



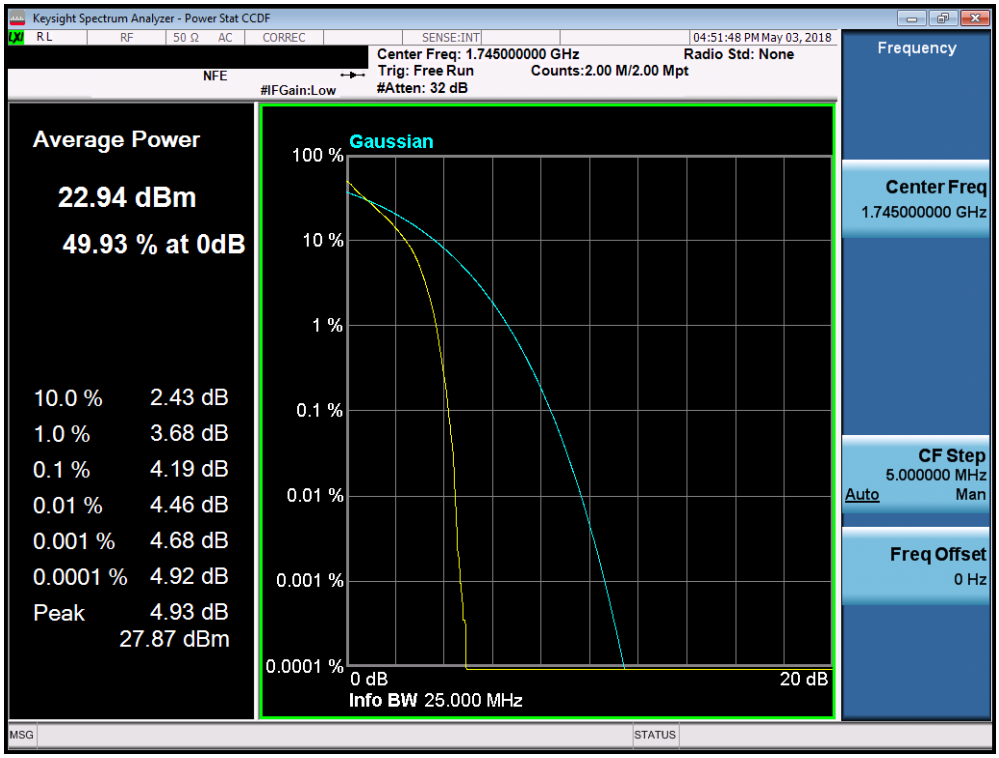
Plot 7-237. PAR Plot (Band 66/4 – 5.0MHz 16-QAM - Full RB Configuration)



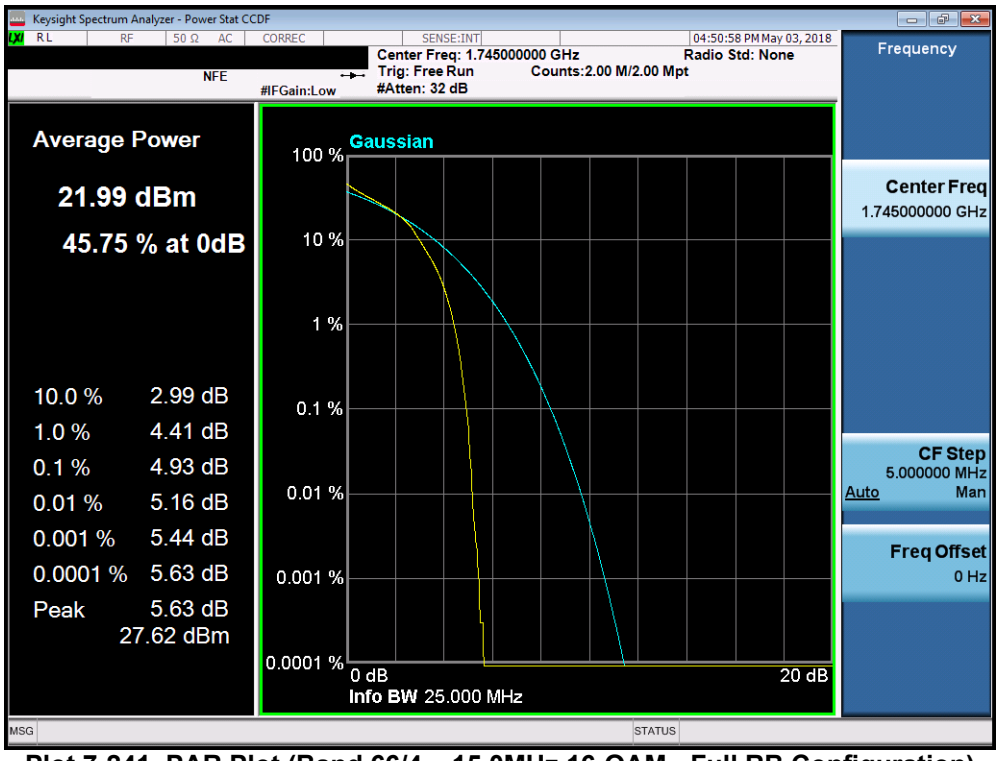
Plot 7-238. PAR Plot (Band 66/4 – 10.0MHz QPSK - Full RB Configuration)



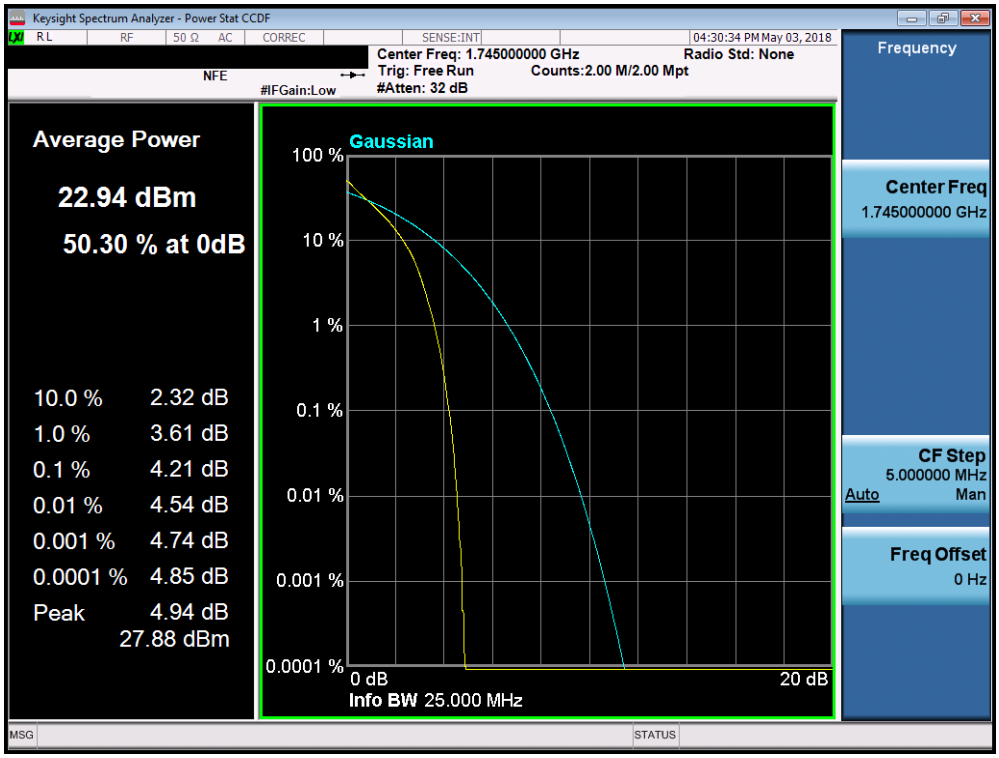
Plot 7-239. PAR Plot (Band 66/4 – 10.0MHz 16-QAM - Full RB Configuration)



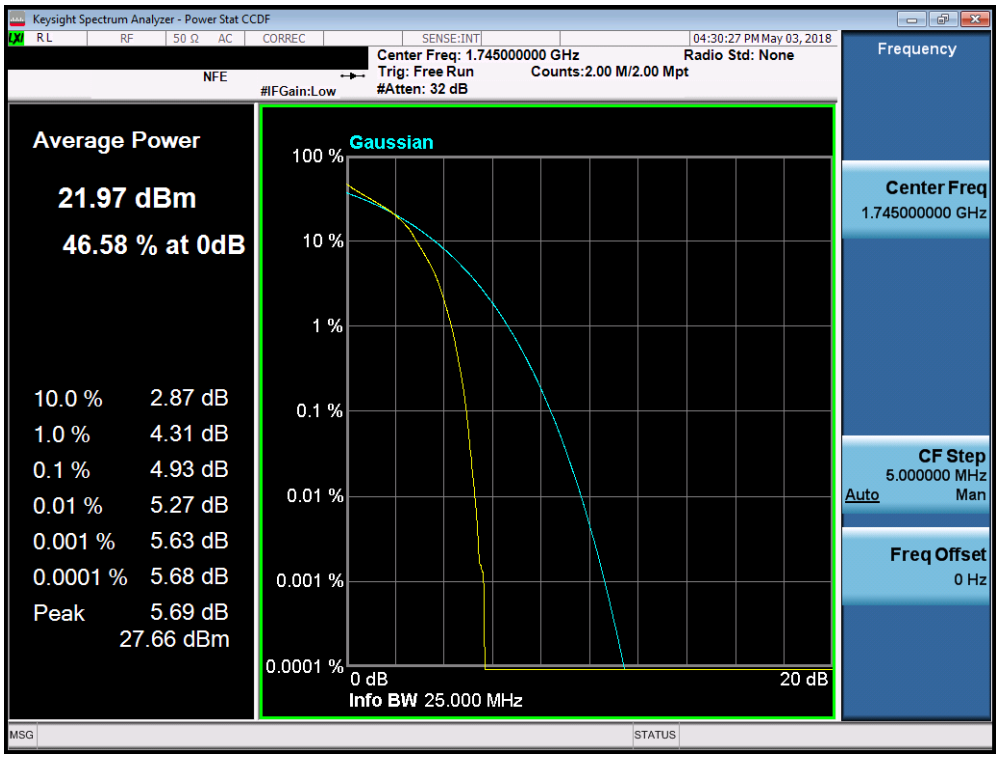
Plot 7-240. PAR Plot (Band 66/4 – 15.0MHz QPSK - Full RB Configuration)



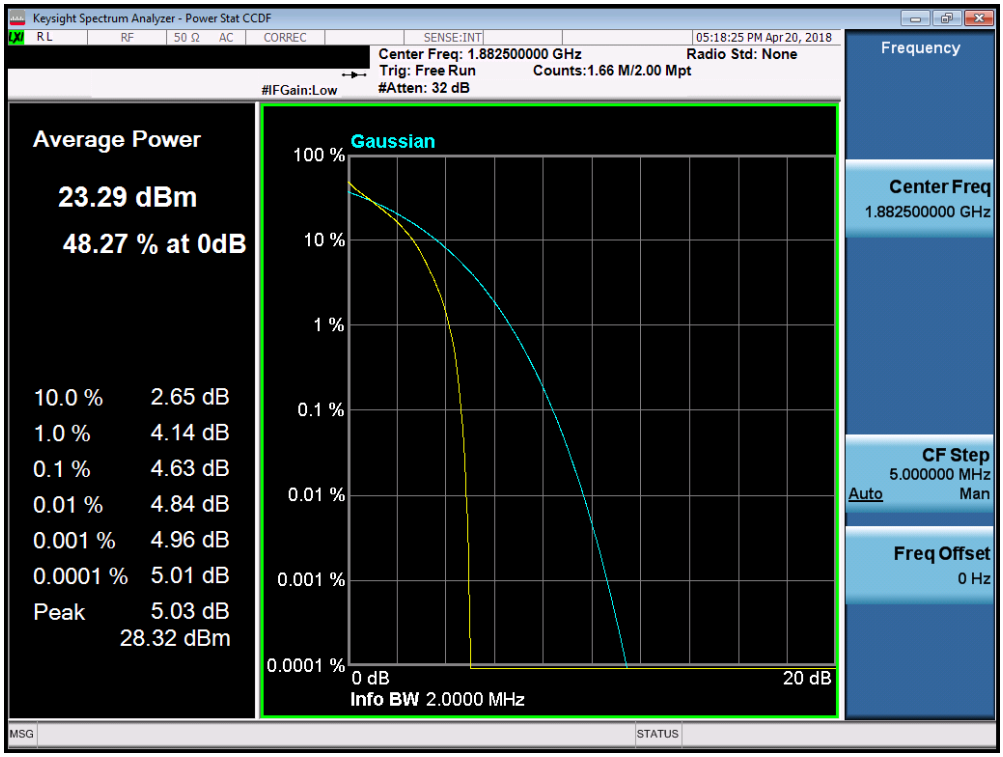
Plot 7-241. PAR Plot (Band 66/4 – 15.0MHz 16-QAM - Full RB Configuration)



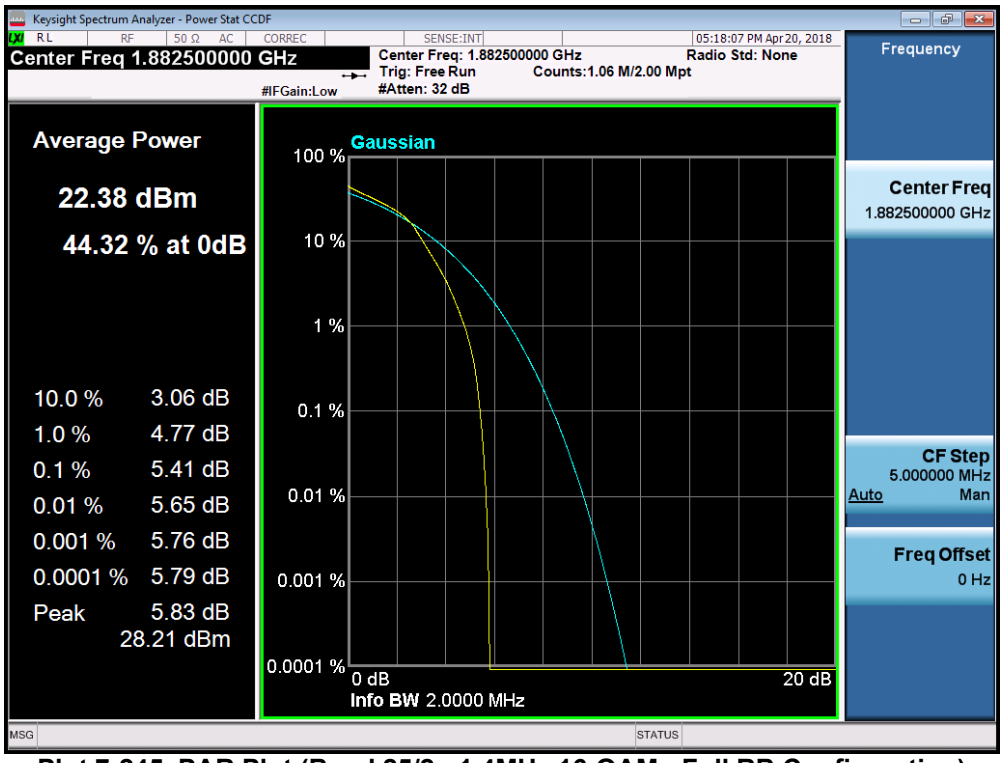
Plot 7-242. PAR Plot (Band 66/4 – 20.0MHz QPSK - Full RB Configuration)



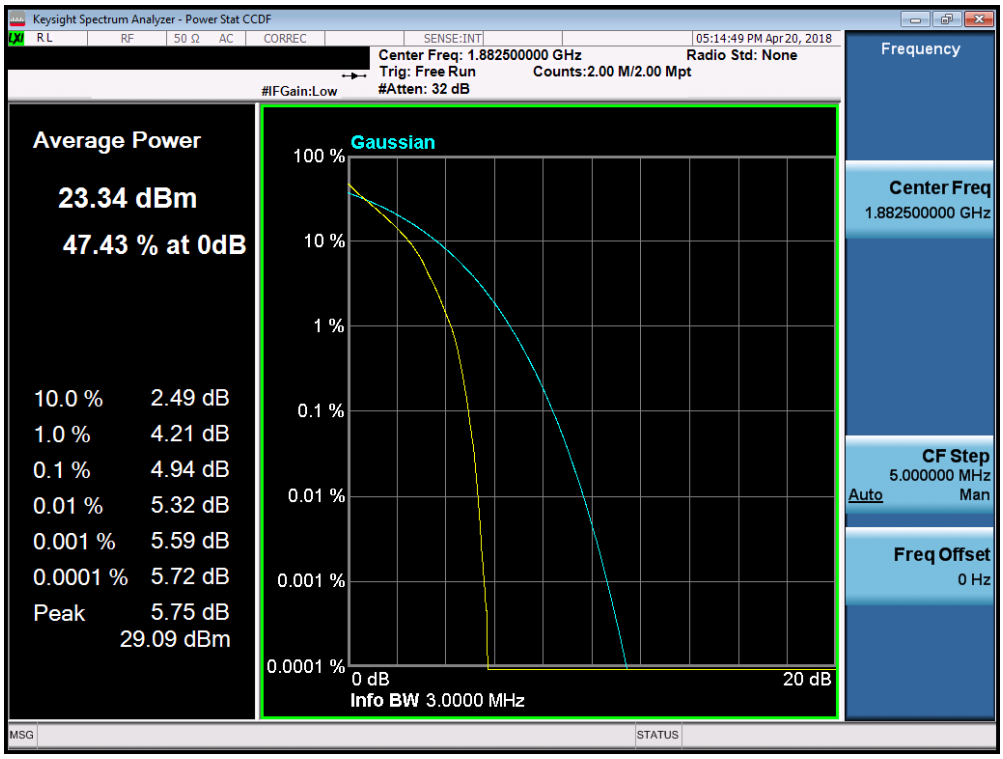
Plot 7-243. PAR Plot (Band 66/4 – 20.0MHz 16-QAM - Full RB Configuration)



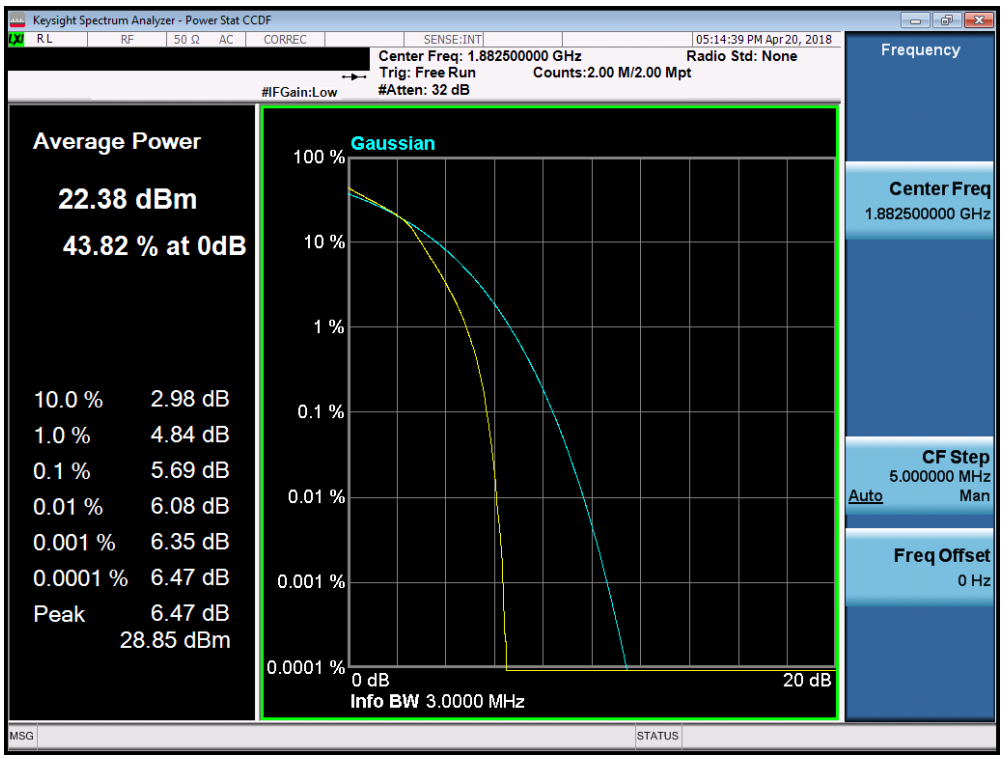
Plot 7-244. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



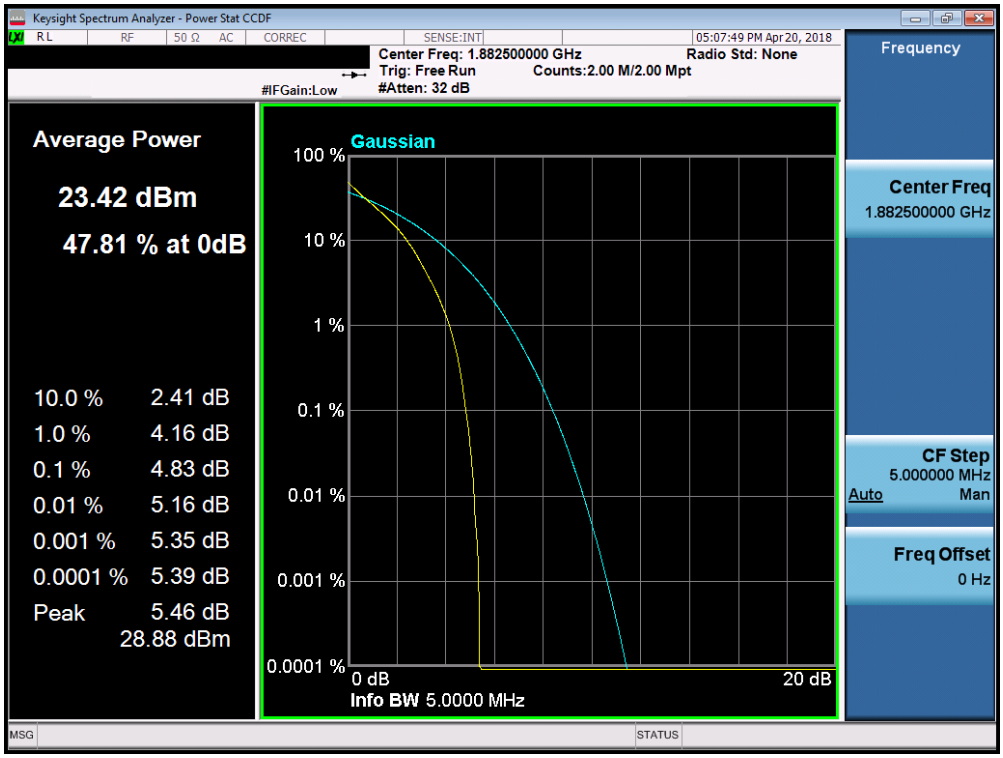
Plot 7-245. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)



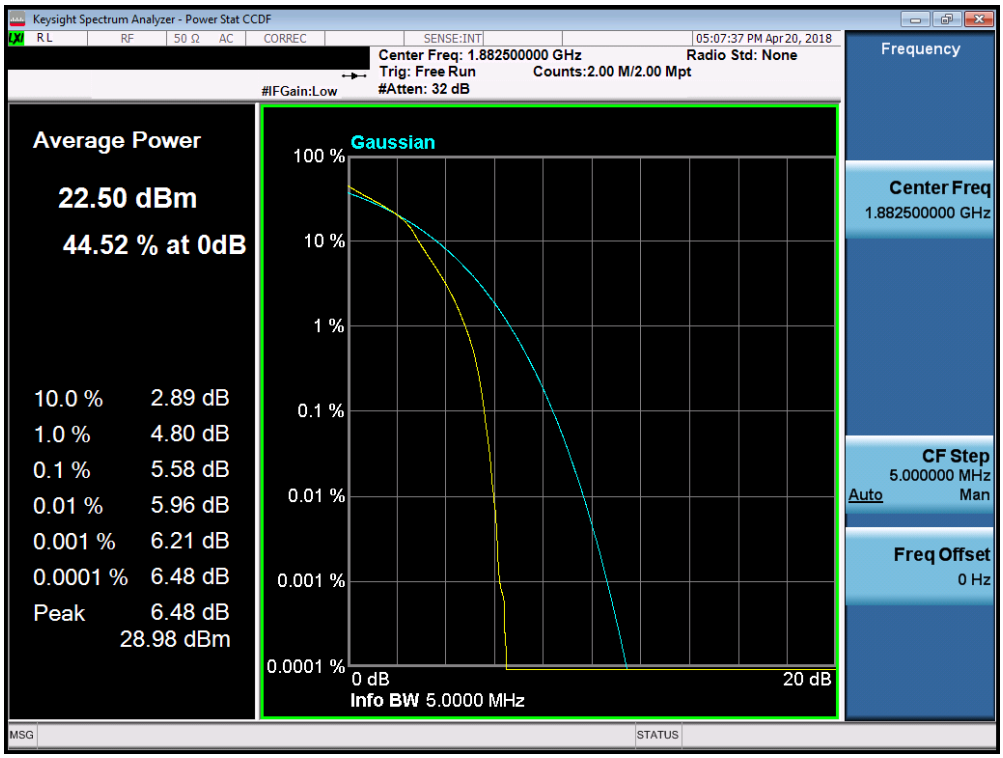
Plot 7-246. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



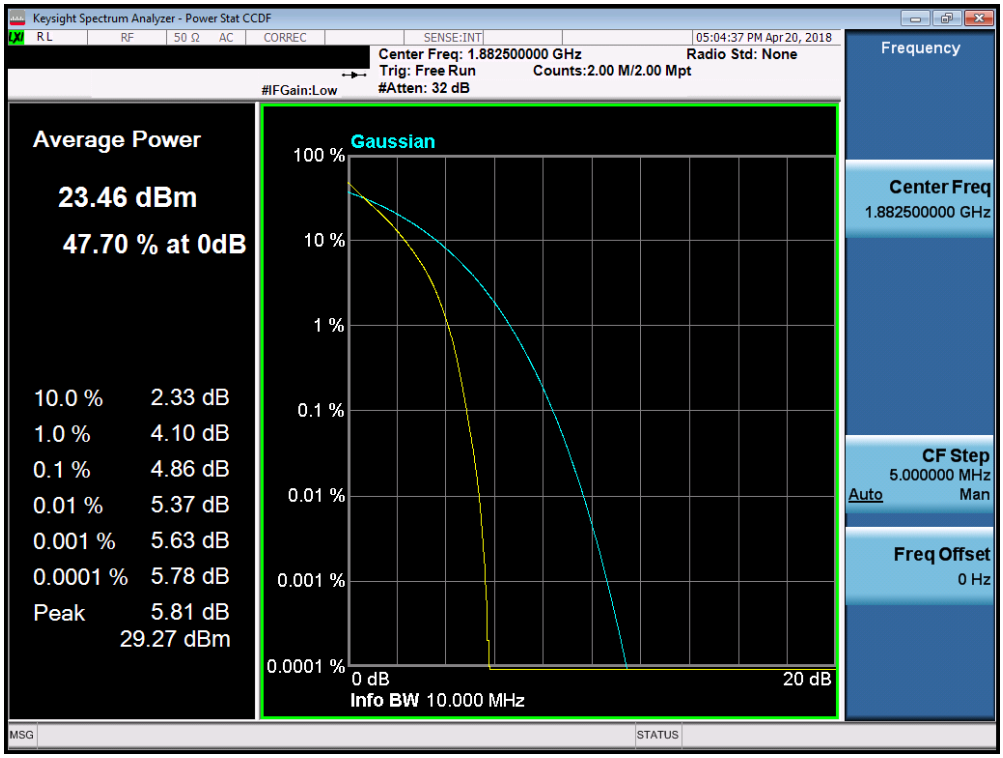
Plot 7-247. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



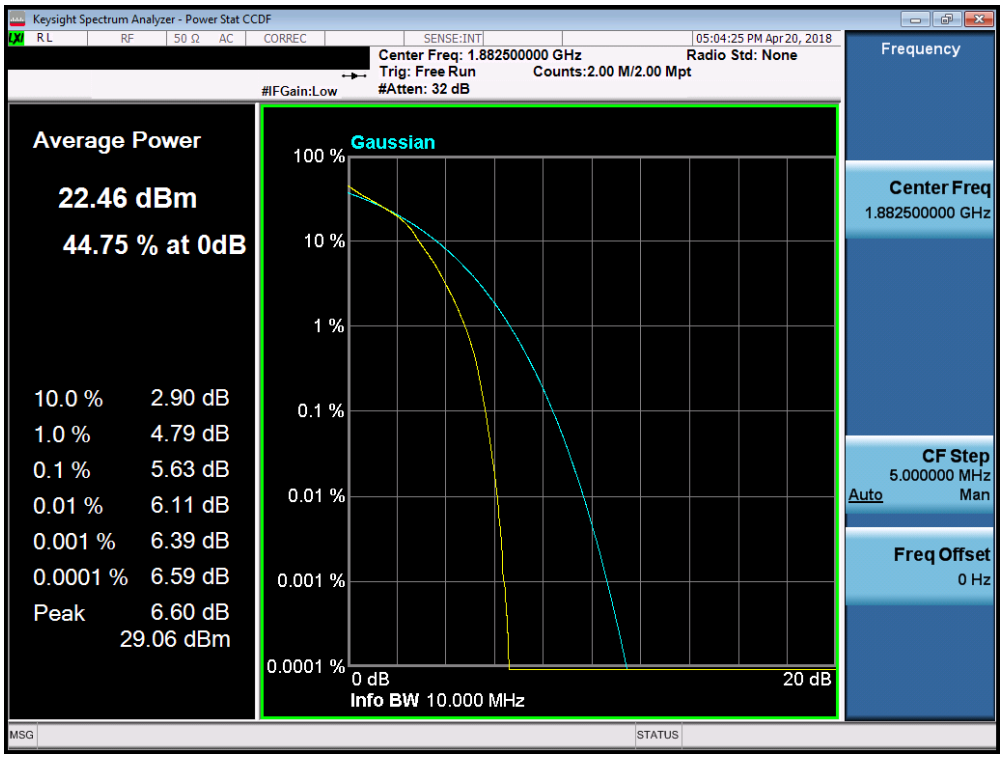
Plot 7-248. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



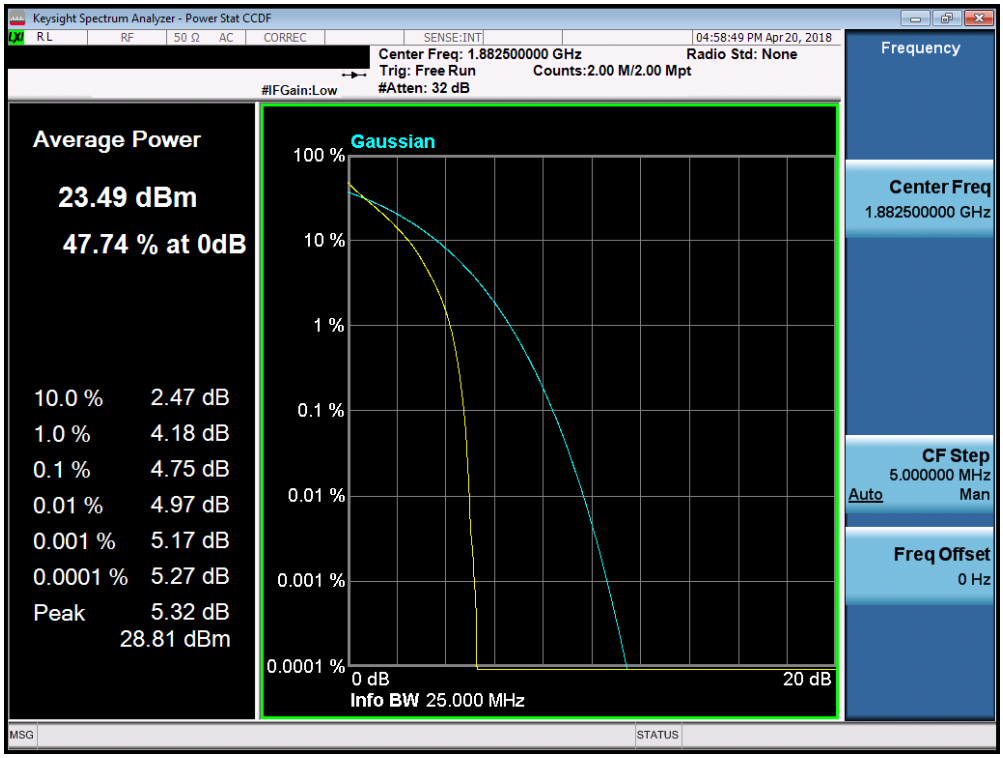
Plot 7-249. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)



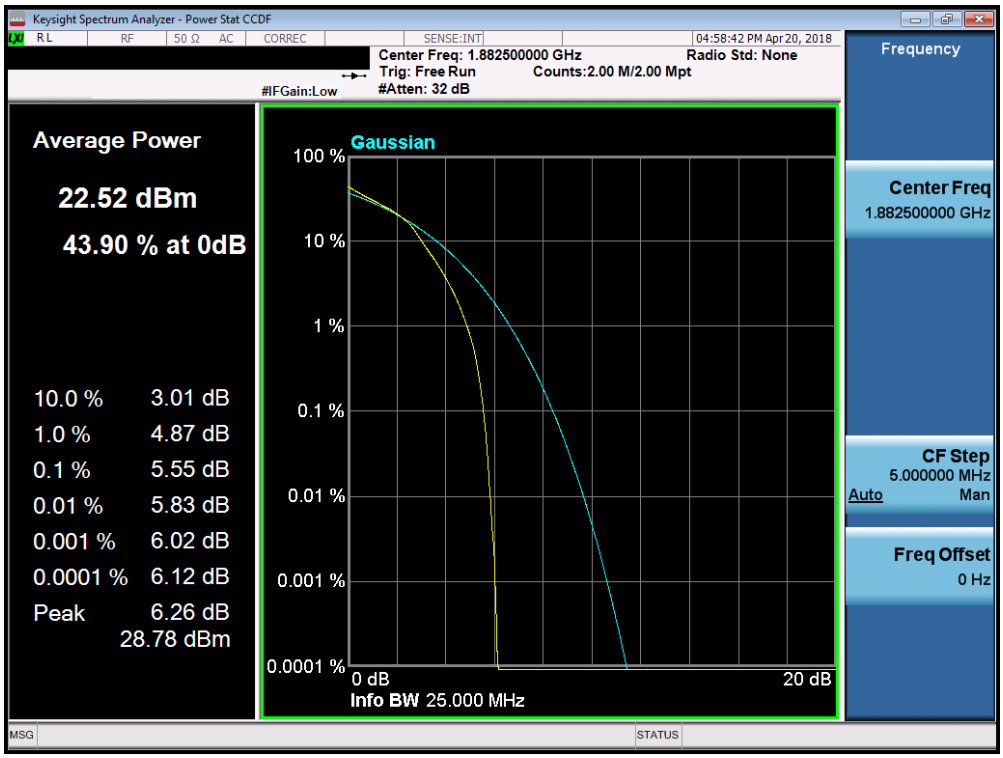
Plot 7-250. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



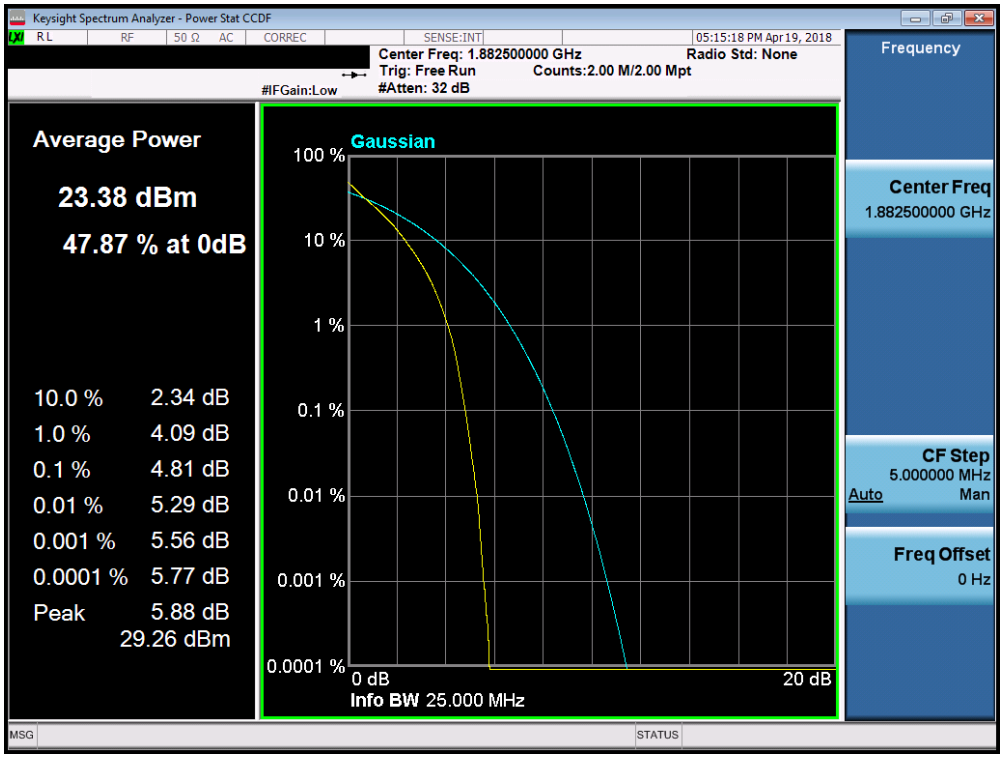
Plot 7-251. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



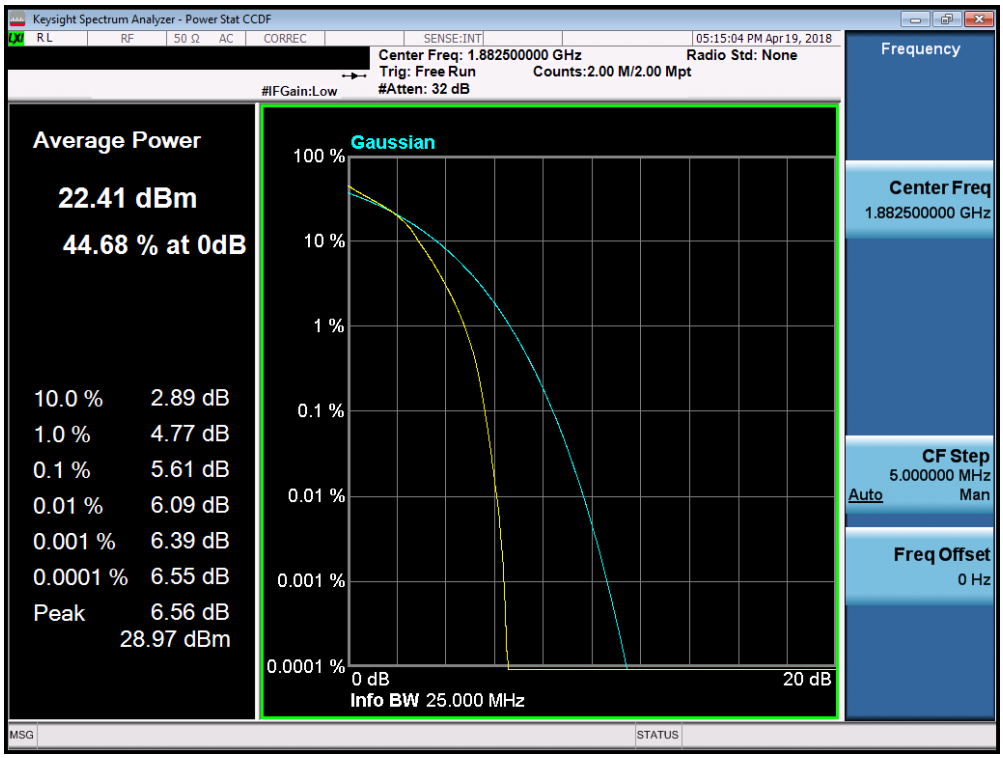
Plot 7-252. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



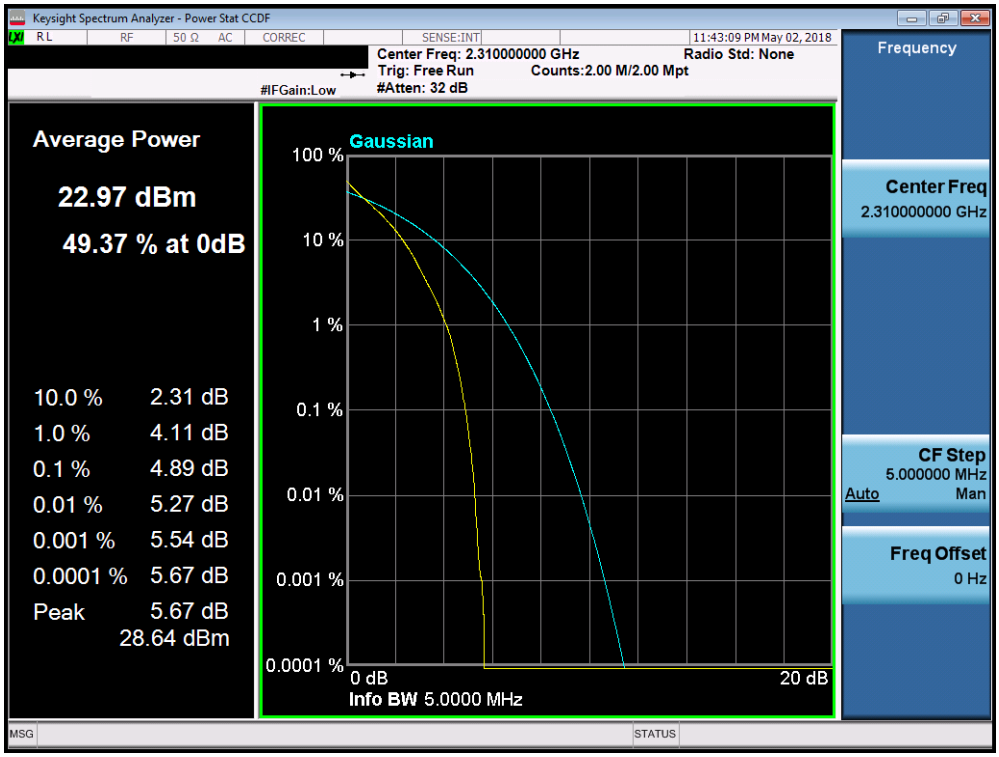
Plot 7-253. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)



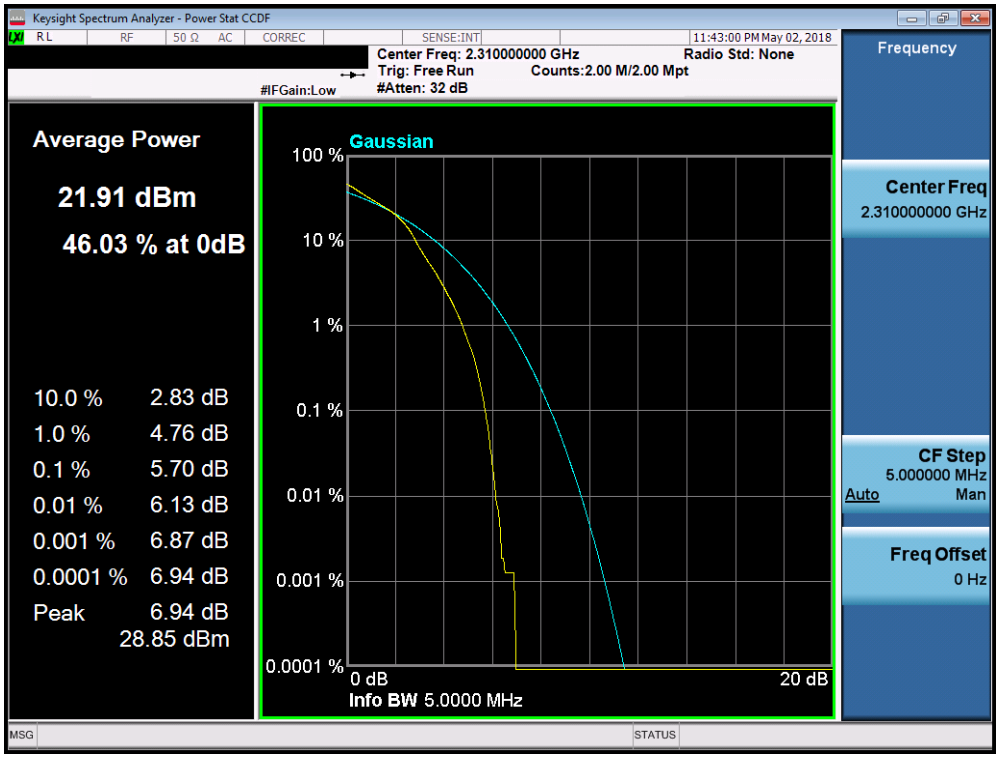
Plot 7-254. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



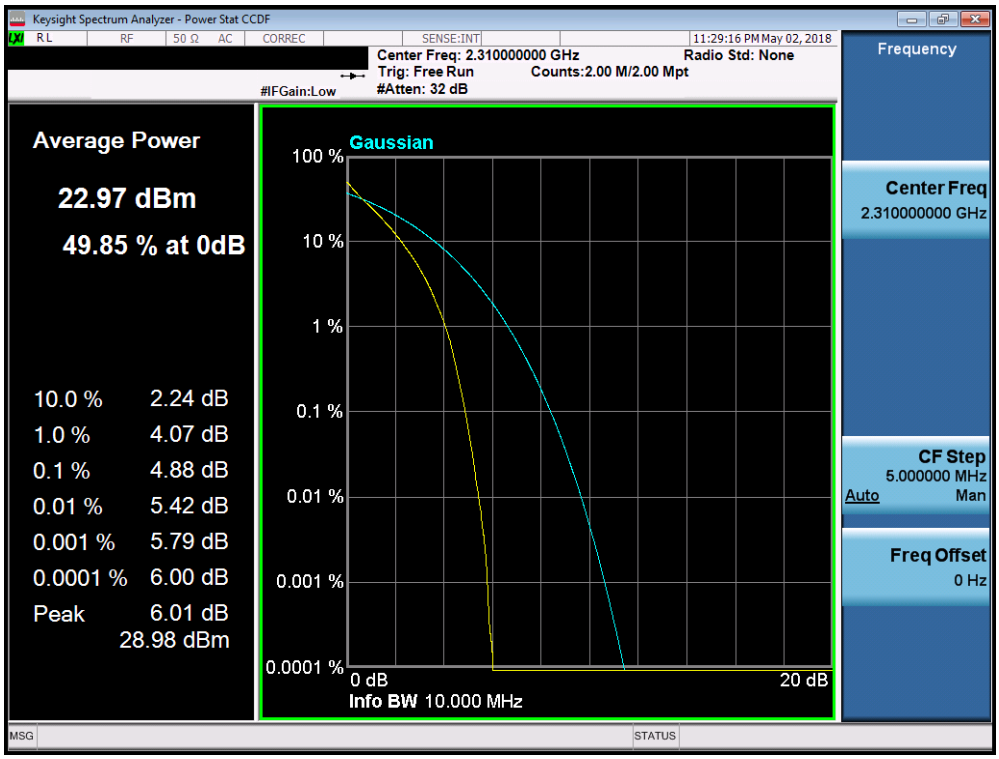
Plot 7-255. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



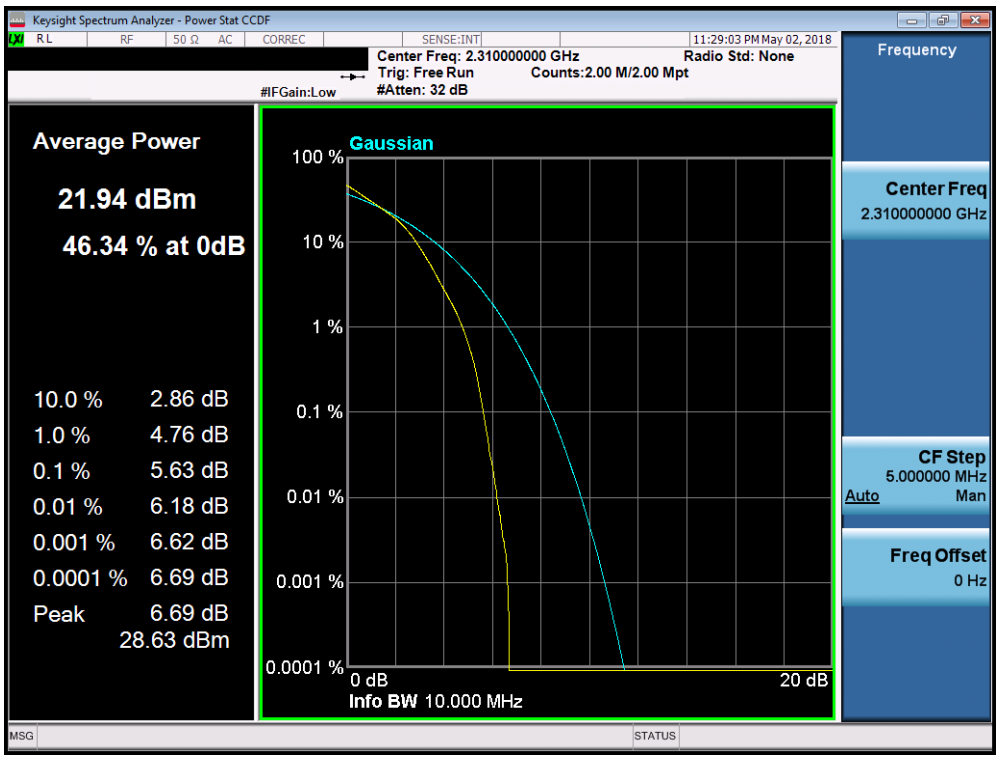
Plot 7-256. PAR Plot (Band 30 – 5.0MHz QPSK - Full RB Configuration)



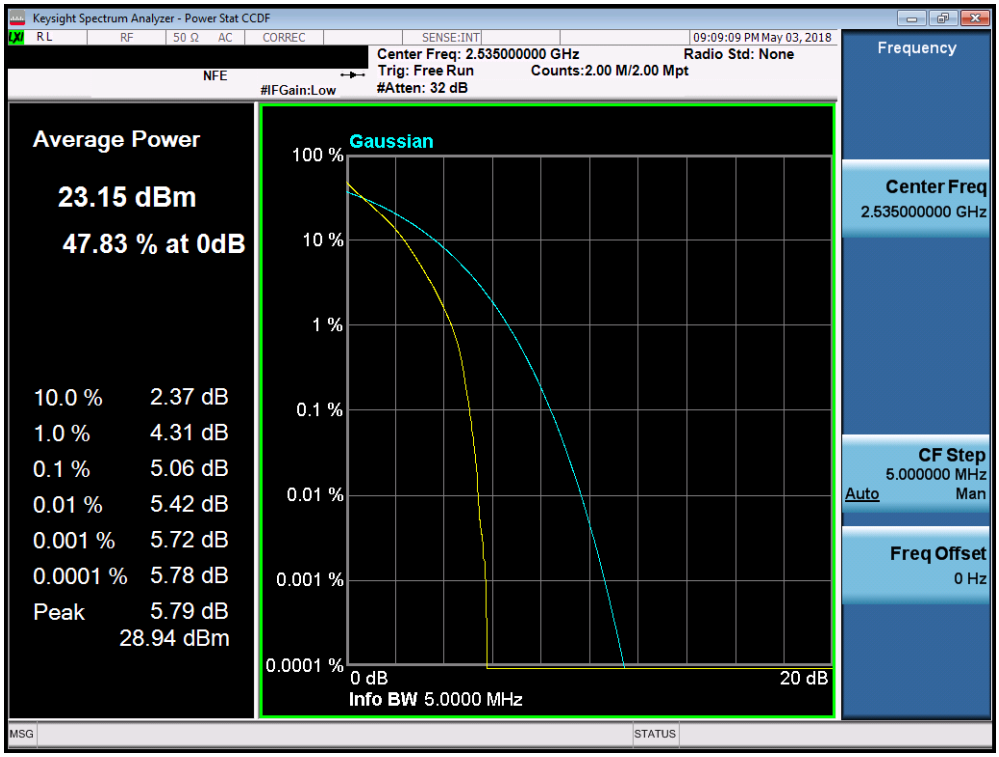
Plot 7-257. PAR Plot (Band 30 – 5.0MHz 16-QAM - Full RB Configuration)



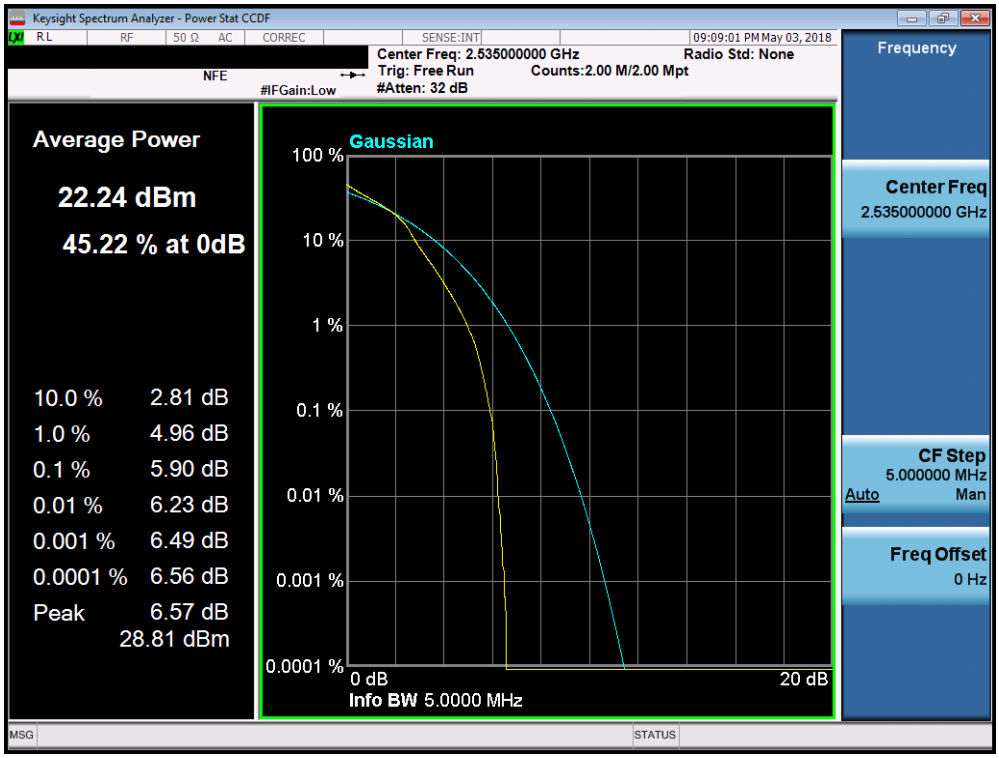
Plot 7-258. PAR Plot (Band 30 – 10.0MHz QPSK - Full RB Configuration)



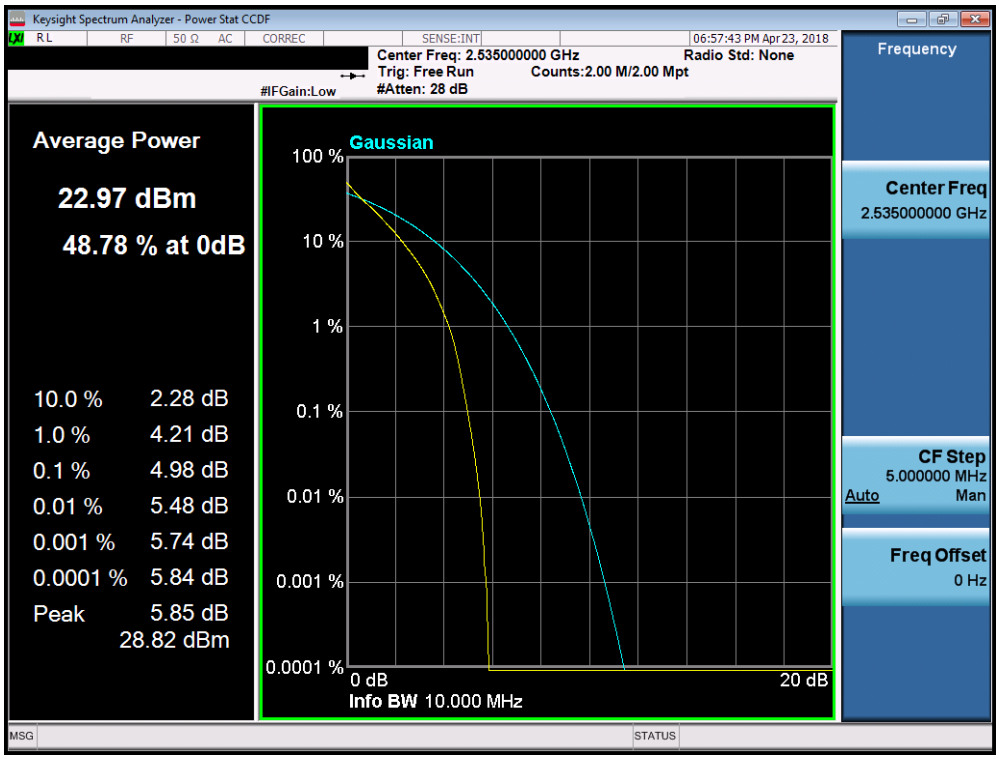
Plot 7-259. PAR Plot (Band 30 – 10.0MHz 16-QAM - Full RB Configuration)



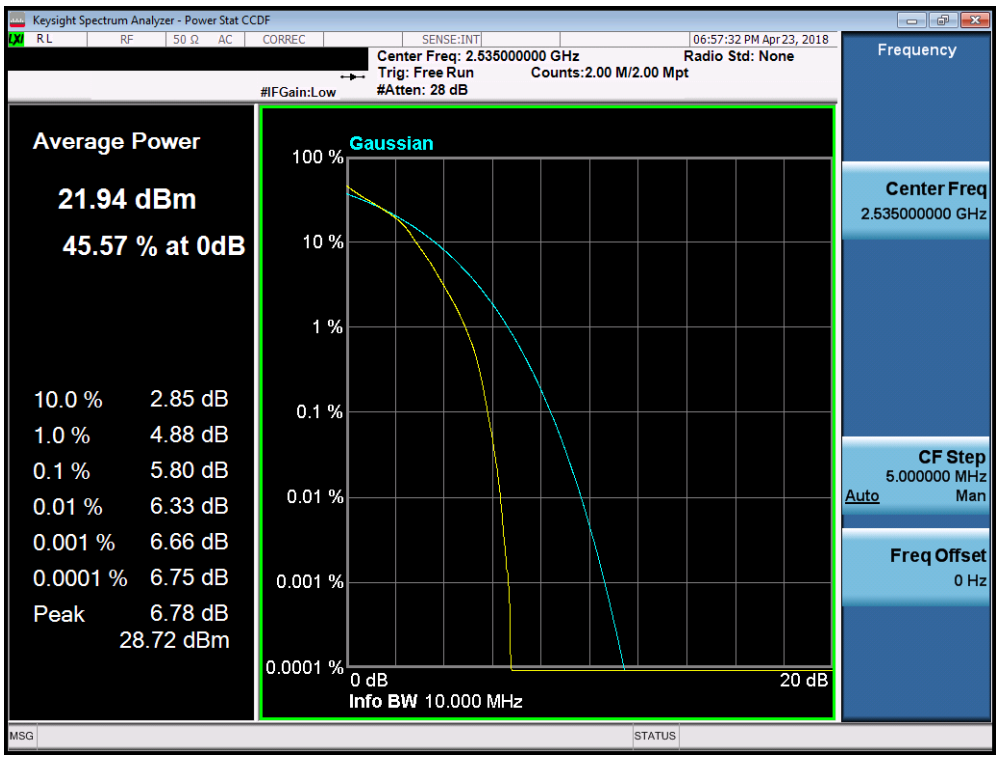
Plot 7-260. PAR Plot (Band 7 – 5.0MHz QPSK - Full RB Configuration)



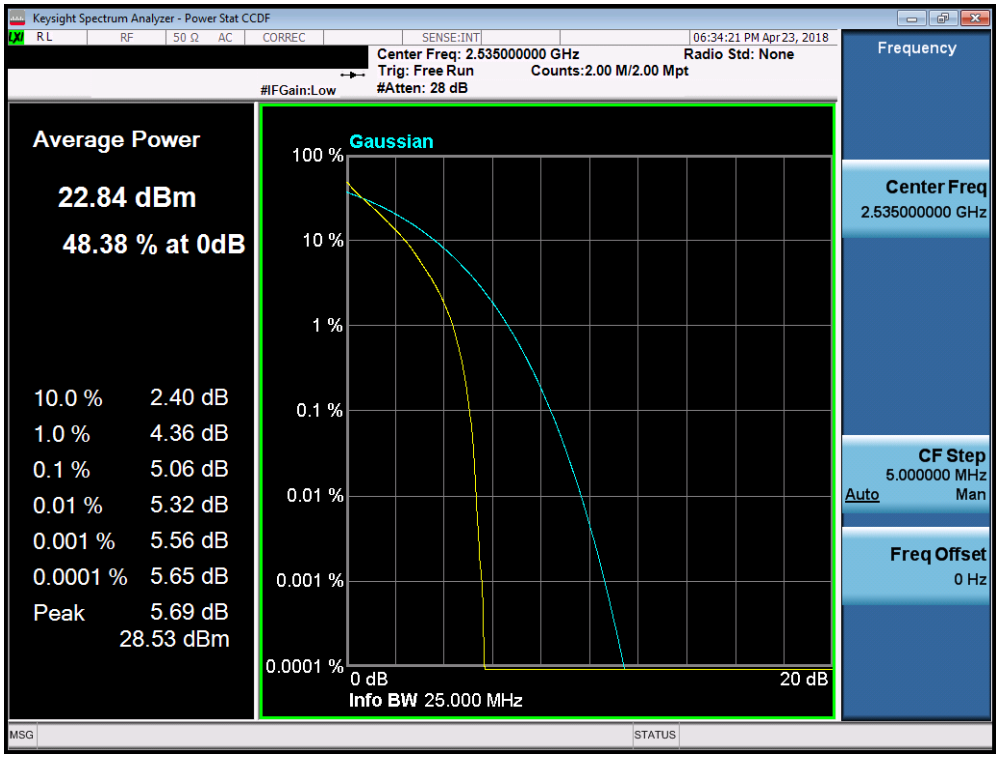
Plot 7-261. PAR Plot (Band 7 – 5.0MHz 16-QAM - Full RB Configuration)



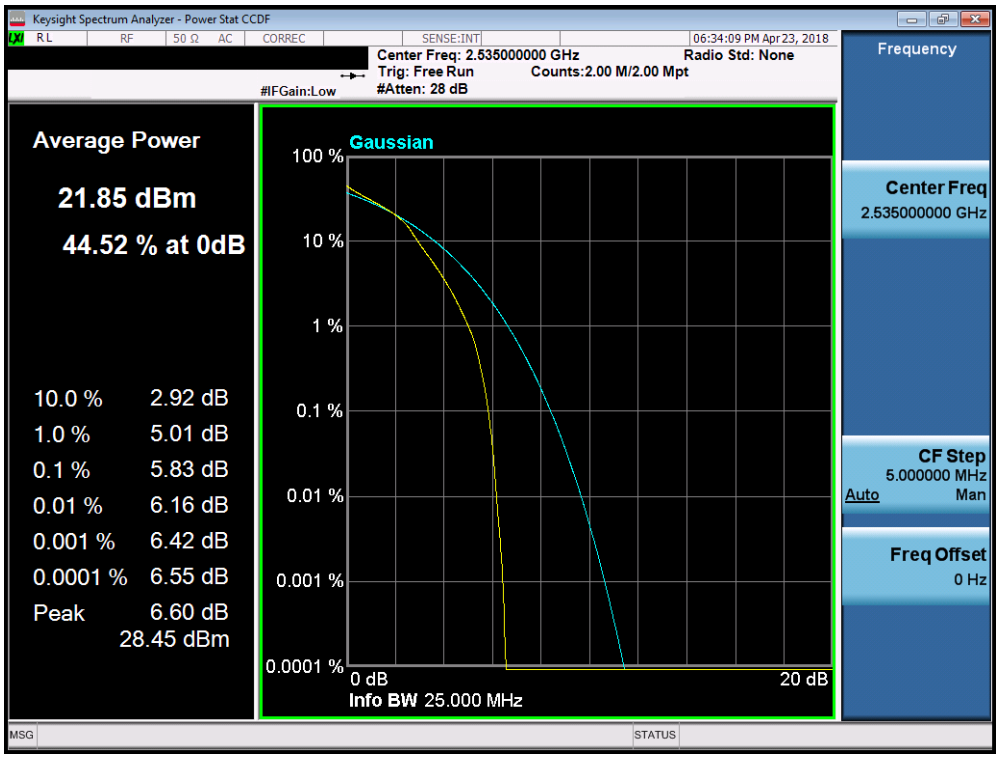
Plot 7-262. PAR Plot (Band 7 – 10.0MHz QPSK - Full RB Configuration)



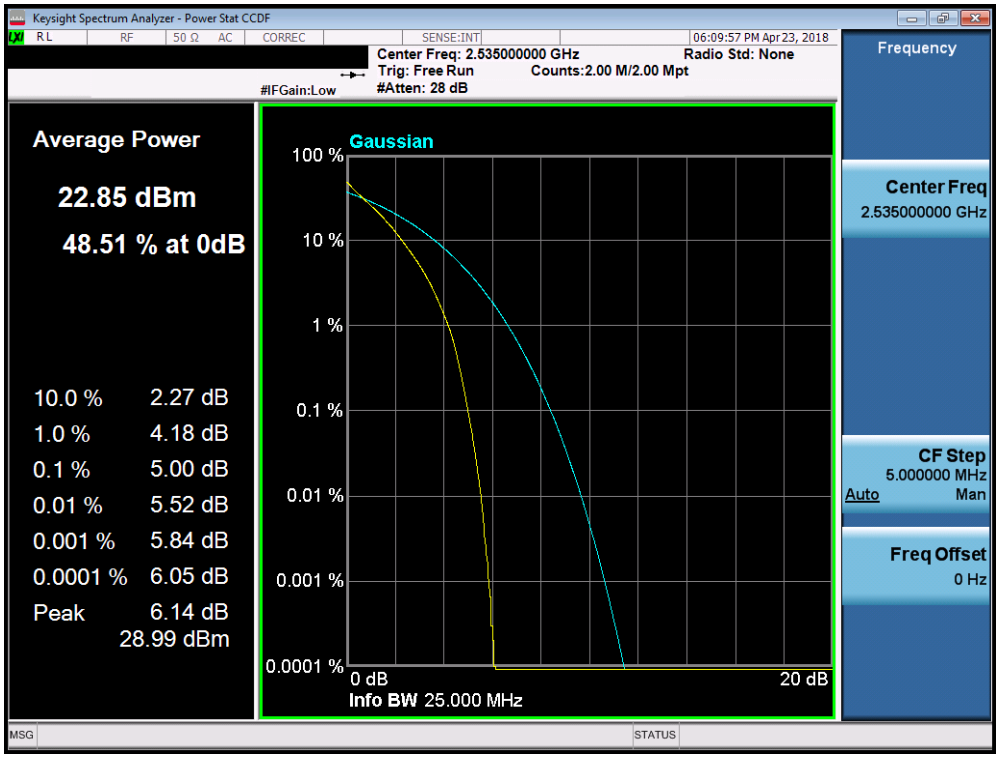
Plot 7-263. PAR Plot (Band 7 – 10.0MHz 16-QAM - Full RB Configuration)



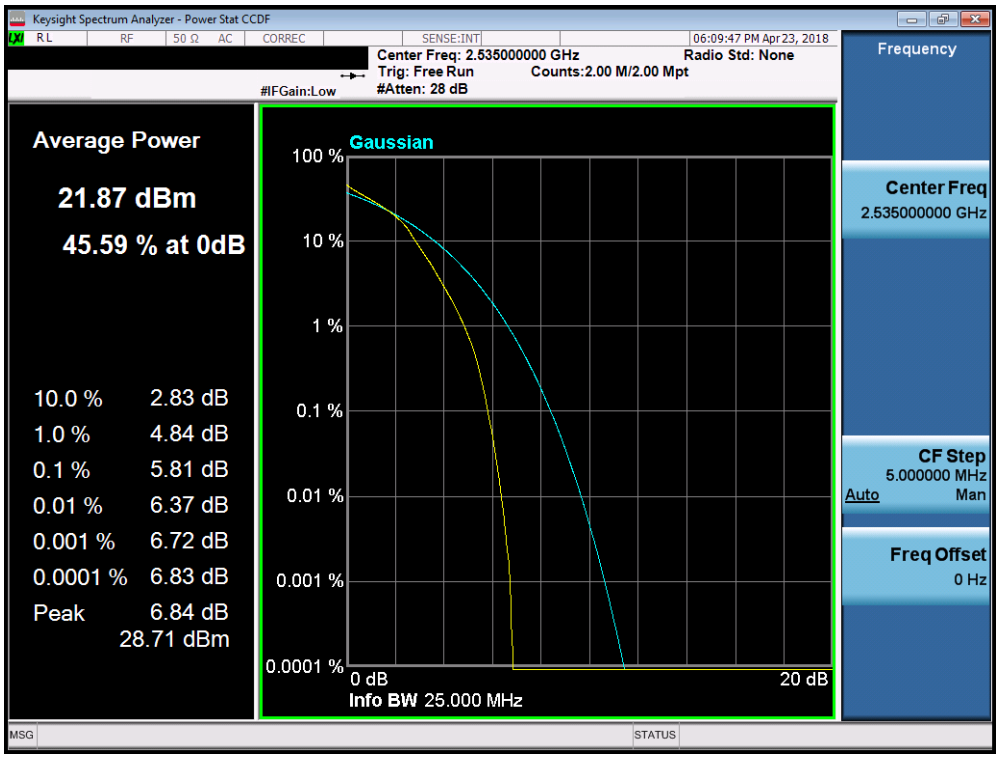
Plot 7-264. PAR Plot (Band 7 – 15.0MHz QPSK - Full RB Configuration)



Plot 7-265. PAR Plot (Band 7 – 15.0MHz 16-QAM - Full RB Configuration)



Plot 7-266. PAR Plot (Band 7 – 20.0MHz QPSK - Full RB Configuration)



Plot 7-267. PAR Plot (Band 7 – 20.0MHz 16-QAM - Full RB Configuration)

7.6 Radiated Power (ERP/EIRP)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

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

Test Setup

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

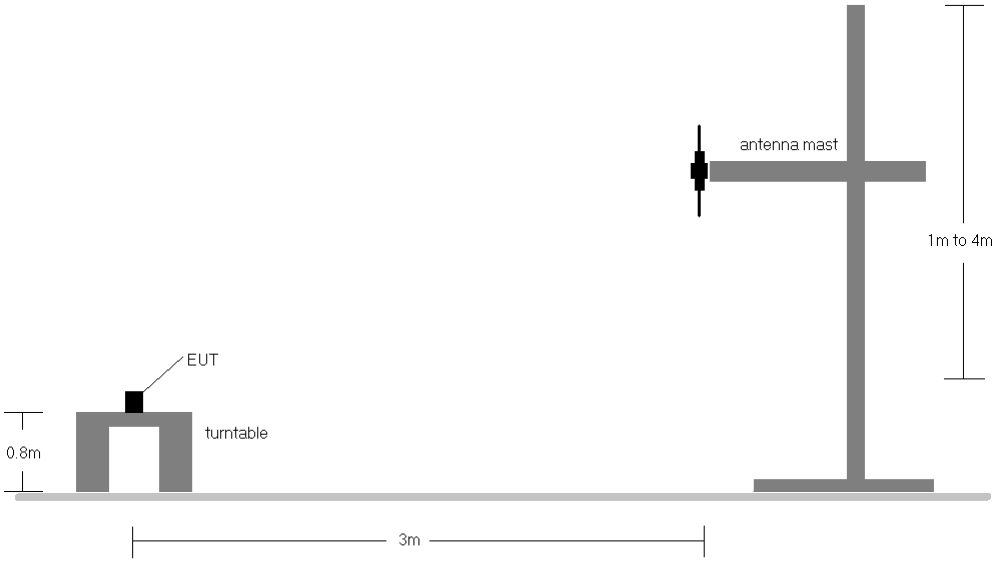


Figure 7-5. Radiated Test Setup <1GHz

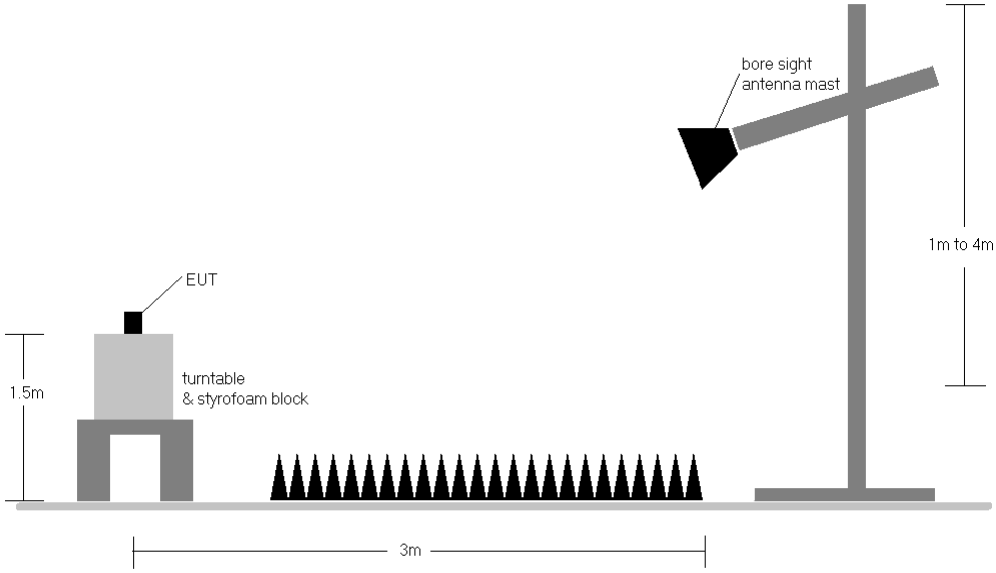


Figure 7-6. Radiated Test Setup >1GHz

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]
699.70	1.4	QPSK	V	150	98	1 / 5	20.53	1.10	19.48	0.089	34.77	-15.29	21.63	0.146	36.99	-15.36
707.50	1.4	QPSK	V	150	98	1 / 5	20.96	1.13	**19.94**	0.099	34.77	-14.83	**22.09**	0.162	36.99	-14.90
715.30	1.4	QPSK	V	150	98	1 / 5	20.35	1.16	19.36	0.086	34.77	-15.41	21.51	0.142	36.99	-15.48
707.50	1.4	16-QAM	V	150	98	1 / 5	20.08	1.13	**19.06**	0.081	34.77	-15.71	**21.21**	0.132	36.99	-15.78
700.50	3	QPSK	V	150	99	1 / 14	20.82	1.10	**19.77**	0.095	34.77	-15.00	**21.92**	0.156	36.99	-15.07
707.50	3	QPSK	V	150	99	1 / 14	20.59	1.13	19.57	0.091	34.77	-15.20	21.72	0.149	36.99	-15.27
714.50	3	QPSK	V	150	99	1 / 14	20.18	1.16	19.19	0.083	34.77	-15.58	21.34	0.136	36.99	-15.65
700.50	3	16-QAM	V	150	99	1 / 14	20.07	1.10	**19.02**	0.080	34.77	-15.75	**21.17**	0.131	36.99	-15.82

Table 7-3. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
701.50	5	QPSK	V	150	101	1 / 24	21.08	1.11	**20.04**	**0.101**	34.77	-14.74	**22.19**	**0.165**	36.99	-14.80
707.50	5	QPSK	V	150	101	1 / 24	20.93	1.13	19.91	0.098	34.77	-14.86	22.06	0.161	36.99	-14.93
713.50	5	QPSK	V	150	101	1 / 24	20.52	1.15	19.52	0.090	34.77	-15.25	21.67	0.147	36.99	-15.32
701.50	5	16-QAM	V	150	101	1 / 24	20.12	1.11	**19.08**	0.081	34.77	-15.70	**21.23**	0.133	36.99	-15.76
704.00	10	QPSK	V	150	116	1 / 49	20.97	1.12	**19.94**	0.099	34.77	-14.83	**22.09**	0.162	36.99	-14.90
707.50	10	QPSK	V	150	116	1 / 49	20.60	1.13	19.58	0.091	34.77	-15.19	21.73	0.149	36.99	-15.26
711.00	10	QPSK	V	150	116	1 / 49	20.45	1.14	19.44	0.088	34.77	-15.33	21.59	0.144	36.99	-15.40
704.00	10	16-QAM	V	150	116	1 / 49	20.16	1.12	**19.13**	0.082	34.77	-15.64	**21.28**	0.134	36.99	-15.71
701.50	5	QPSK	H	150	342	1 / 24	19.57	1.11	18.53	0.071	34.77	-16.25	20.68	0.117	36.99	-16.31

Table 7-4. ERP 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]
779.50	5	QPSK	V	150	125	1 / 0	18.45	1.32	**17.62**	0.058	34.77	-17.15
782.00	5	QPSK	V	150	125	1 / 0	18.34	1.33	17.52	0.056	34.77	-17.25
784.50	5	QPSK	V	150	125	1 / 0	18.41	1.34	17.60	0.058	34.77	-17.17
779.50	5	16-QAM	V	150	125	1 / 0	17.82	1.32	**16.99**	0.050	34.77	-17.78
782.00	10	QPSK	V	150	120	1 / 0	18.67	1.33	**17.85**	**0.061**	34.77	-16.92
782.00	10	16-QAM	V	150	120	1 / 0	17.61	1.33	**16.79**	0.048	34.77	-17.98
782.00	10	QPSK	H	150	326	1 / 0	17.41	1.33	16.59	0.046	34.77	-18.18

Table 7-5. ERP Data (Band 13)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	150	100	3 / 2	17.88	1.50	17.23	0.053	38.45	-21.22	19.38	0.087	40.61	-21.23
836.50	1.4	QPSK	H	150	100	3 / 2	17.80	1.50	17.15	0.052	38.45	-21.30	19.30	0.085	40.61	-21.31
848.30	1.4	QPSK	H	150	100	3 / 2	17.92	1.50	**17.27**	0.053	38.45	-21.18	**19.42**	0.087	40.61	-21.19
848.30	1.4	16-QAM	H	150	100	3 / 2	16.84	1.50	**16.19**	0.042	38.45	-22.26	**18.34**	0.068	40.61	-22.27
825.50	3	QPSK	H	150	95	1 / 14	17.50	1.50	16.85	0.048	38.45	-21.60	19.00	0.079	40.61	-21.61
836.50	3	QPSK	H	150	95	1 / 14	17.71	1.50	17.06	0.051	38.45	-21.39	19.21	0.083	40.61	-21.40
847.50	3	QPSK	H	150	95	1 / 14	18.26	1.50	**17.61**	0.058	38.45	-20.84	**19.76**	0.095	40.61	-20.85
847.50	3	16-QAM	H	150	95	1 / 14	16.97	1.50	**16.32**	0.043	38.45	-22.13	**18.47**	0.070	40.61	-22.14
826.50	5	QPSK	H	150	113	1 / 24	17.82	1.50	17.17	0.052	38.45	-21.28	19.32	0.086	40.61	-21.29
836.50	5	QPSK	H	150	113	1 / 24	17.93	1.50	17.28	0.053	38.45	-21.17	19.43	0.088	40.61	-21.18
846.50	5	QPSK	H	150	113	1 / 24	18.46	1.50	**17.81**	0.060	38.45	-20.64	**19.96**	0.099	40.61	-20.65
846.50	5	16-QAM	H	150	113	1 / 24	17.28	1.50	**16.63**	0.046	38.45	-21.82	**18.78**	0.076	40.61	-21.83
829.00	10	QPSK	H	150	110	1 / 49	18.28	1.50	17.63	0.058	38.45	-20.82	19.78	0.095	40.61	-20.83
836.50	10	QPSK	H	150	110	1 / 49	18.31	1.50	17.66	0.058	38.45	-20.79	19.81	0.096	40.61	-20.80
844.00	10	QPSK	H	150	110	1 / 49	18.80	1.50	**18.15**	**0.065**	38.45	-20.30	**20.30**	**0.107**	40.61	-20.31
844.00	10	16-QAM	H	150	110	1 / 49	17.49	1.50	**16.84**	0.048	38.45	-21.61	**18.99**	0.079	40.61	-21.62
844.00	10	QPSK	V	150	213	1 / 49	17.55	1.50	16.90	0.049	38.45	-21.55	19.05	0.080	40.61	-21.56

Table 7-6. ERP Data (Band 5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	150	335	3 / 2	19.59	5.56	**25.15**	0.327	30.00	-4.85
1745.00	1.4	QPSK	H	150	335	3 / 2	19.04	5.32	24.36	0.273	30.00	-5.64
1779.30	1.4	QPSK	H	150	335	3 / 2	19.16	5.09	24.25	0.266	30.00	-5.75
1710.70	1.4	16-QAM	H	150	335	3 / 2	19.00	5.56	**24.56**	0.286	30.00	-5.44
1711.50	3	QPSK	H	150	342	1 / 14	18.97	5.55	24.52	0.283	30.00	-5.48
1745.00	3	QPSK	H	150	342	1 / 14	19.90	5.32	**25.22**	0.333	30.00	-4.78
1778.50	3	QPSK	H	150	342	1 / 14	18.21	5.10	23.31	0.214	30.00	-6.69
1745.00	3	16-QAM	H	150	342	1 / 14	18.85	5.32	**24.17**	0.261	30.00	-5.83
1712.50	5	QPSK	H	150	344	1 / 24	20.27	5.55	**25.82**	0.382	30.00	-4.18
1745.00	5	QPSK	H	150	344	1 / 24	20.02	5.32	25.34	0.342	30.00	-4.66
1777.50	5	QPSK	H	150	344	1 / 24	20.45	5.10	25.55	0.359	30.00	-4.45
1777.50	5	16-QAM	H	150	344	1 / 24	19.57	5.10	**24.67**	0.293	30.00	-5.33
1715.00	10	QPSK	H	150	349	1 / 49	20.15	5.53	25.67	0.369	30.00	-4.33
1745.00	10	QPSK	H	150	349	1 / 49	20.50	5.32	25.82	0.382	30.00	-4.18
1775.00	10	QPSK	H	150	349	1 / 49	20.81	5.12	**25.93**	0.392	30.00	-4.07
1775.00	10	16-QAM	H	150	349	1 / 49	19.76	5.12	**24.88**	0.308	30.00	-5.12
1717.50	15	QPSK	H	150	344	1 / 74	20.13	5.51	25.64	0.366	30.00	-4.36
1745.00	15	QPSK	H	150	344	1 / 74	20.36	5.32	**25.68**	0.370	30.00	-4.32
1772.50	15	QPSK	H	150	344	1 / 74	19.55	5.14	24.69	0.294	30.00	-5.31
1745.00	15	16-QAM	H	150	344	1 / 74	19.80	5.32	**25.12**	0.325	30.00	-4.88
1720.00	20	QPSK	H	150	346	1 / 99	20.80	5.49	**26.29**	**0.426**	30.00	-3.71
1745.00	20	QPSK	H	150	346	1 / 99	20.32	5.32	25.64	0.367	30.00	-4.36
1770.00	20	QPSK	H	150	346	1 / 99	20.53	5.15	25.68	0.370	30.00	-4.32
1720.00	20	16-QAM	H	150	346	1 / 99	19.96	5.49	**25.45**	0.351	30.00	-4.55
1720.00	20	QPSK	V	150	256	1 / 99	16.88	5.49	22.37	0.173	30.00	-7.63

Table 7-7. 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	H	150	360	1 / 0	19.57	4.82	24.39	0.275	33.01	-8.62
1882.50	1.4	QPSK	H	150	360	1 / 0	19.70	4.73	**24.43**	0.278	33.01	-8.58
1914.30	1.4	QPSK	H	150	3630	1 / 0	18.36	4.68	23.04	0.201	33.01	-9.97
1882.50	1.4	16-QAM	H	150	360	1 / 0	19.04	4.73	**23.77**	0.238	33.01	-9.24
1851.50	3	QPSK	H	150	351	1 / 0	19.77	4.82	**24.59**	0.287	33.01	-8.42
1882.50	3	QPSK	H	150	351	1 / 0	19.85	4.73	24.58	0.287	33.01	-8.43
1913.50	3	QPSK	H	150	351	1 / 0	18.97	4.68	23.65	0.232	33.01	-9.36
1882.50	3	16-QAM	H	150	351	1 / 0	18.76	4.73	**23.49**	0.224	33.01	-9.52
1852.50	5	QPSK	H	150	355	1 / 0	19.25	4.81	24.06	0.255	33.01	-8.95
1882.50	5	QPSK	H	150	355	1 / 24	19.43	4.73	**24.16**	0.261	33.01	-8.85
1912.50	5	QPSK	H	150	355	1 / 0	18.13	4.68	22.81	0.191	33.01	-10.20
1882.50	5	16-QAM	H	150	355	1 / 0	18.83	4.73	**23.56**	0.227	33.01	-9.45
1855.00	10	QPSK	H	150	357	1 / 0	19.91	4.81	24.72	0.296	33.01	-8.29
1882.50	10	QPSK	H	150	357	1 / 0	20.03	4.73	**24.76**	0.299	33.01	-8.25
1910.00	10	QPSK	H	150	357	1 / 0	18.50	4.68	23.18	0.208	33.01	-9.83
1882.50	10	16-QAM	H	150	357	1 / 0	19.45	4.73	**24.18**	0.262	33.01	-8.83
1857.50	15	QPSK	H	150	359	1 / 0	19.77	4.80	**24.57**	0.286	33.01	-8.44
1882.50	15	QPSK	H	150	359	1 / 0	19.83	4.73	24.56	0.286	33.01	-8.45
1907.50	15	QPSK	H	150	359	1 / 0	18.26	4.68	22.94	0.197	33.01	-10.07
1882.50	15	16-QAM	H	150	359	1 / 0	18.22	4.73	**22.95**	0.197	33.01	-10.06
1860.00	20	QPSK	H	150	355	1 / 0	20.16	4.79	**24.95**	**0.313**	33.01	-8.06
1882.50	20	QPSK	H	150	359	1 / 0	20.21	4.73	24.94	0.312	33.01	-8.07
1905.00	20	QPSK	H	150	358	1 / 0	18.60	4.68	23.28	0.213	33.01	-9.73
1882.50	20	16-QAM	H	150	359	1 / 0	18.52	4.73	**23.25**	0.212	33.01	-9.76
1860.00	20	QPSK	V	150	288	1 / 0	17.14	4.79	21.93	0.156	33.01	-11.08

Table 7-8. 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	V	150	270	1 / 0	12.95	5.74	**18.69**	**0.074**	23.98	-5.29
2312.50	5	QPSK	V	150	353	1 / 0	12.62	5.74	18.36	0.068	23.98	-5.62
2307.50	5	16-QAM	V	150	270	1 / 0	11.99	5.74	**17.73**	0.059	23.98	-6.25
2310.00	10	QPSK	V	150	355	1 / 0	12.14	5.74	**17.88**	0.061	23.98	-6.10
2310.00	10	16-QAM	V	150	355	1 / 0	11.19	5.74	16.93	0.049	23.98	-7.05
2307.50	5	QPSK	H	150	353	1 / 0	12.66	5.74	18.40	0.069	23.98	-5.58

Table 7-9. EIRP Data (Band 30)

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	220	1 / 24	11.61	5.74	17.35	0.054	33.01	-15.66
2535.00	5	QPSK	V	150	220	1 / 24	12.41	5.86	**18.27**	**0.067**	33.01	-14.74
2567.50	5	QPSK	V	150	220	1 / 24	11.66	5.98	17.64	0.058	33.01	-15.37
2535.00	5	16-QAM	V	150	220	1 / 24	11.27	5.86	**17.13**	0.052	33.01	-15.88
2505.00	10	QPSK	V	150	220	1 / 49	11.53	5.75	17.28	0.053	33.01	-15.73
2535.00	10	QPSK	V	150	220	1 / 49	12.37	5.86	**18.23**	0.067	33.01	-14.78
2565.00	10	QPSK	V	150	220	1 / 49	11.62	5.97	17.59	0.057	33.01	-15.42
2535.00	10	16-QAM	V	150	220	1 / 49	11.25	5.86	**17.11**	0.051	33.01	-15.90
2507.50	15	QPSK	V	150	224	1 / 74	11.40	5.76	17.16	0.052	33.01	-15.85
2535.00	15	QPSK	V	150	224	1 / 74	12.02	5.86	**17.88**	0.061	33.01	-15.13
2562.50	15	QPSK	V	150	224	1 / 74	11.45	5.96	17.41	0.055	33.01	-15.60
2535.00	15	16-QAM	V	150	224	1 / 74	11.24	5.86	**17.10**	0.051	33.01	-15.91
2510.00	20	QPSK	V	150	221	1 / 99	11.28	5.77	17.05	0.051	33.01	-15.96
2535.00	20	QPSK	V	150	221	1 / 99	12.18	5.86	**18.04**	0.064	33.01	-14.97
2560.00	20	QPSK	V	150	221	1 / 99	11.33	5.95	17.28	0.053	33.01	-15.73
2535.00	20	16-QAM	V	150	221	1 / 99	11.17	5.86	**17.03**	0.050	33.01	-15.98
2535.00	5	QPSK	H	150	219	1 / 24	10.86	5.86	16.72	0.047	33.01	-16.29

Table 7-10. EIRP Data (Band 7)

7.7 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

Test Setup

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

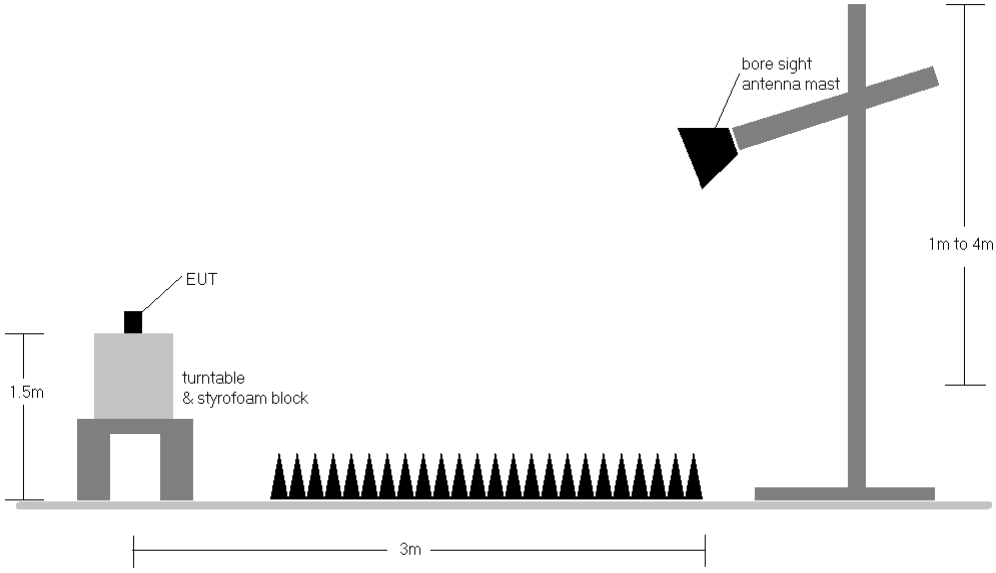


Figure 7-7. Test Instrument & Measurement Setup

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.

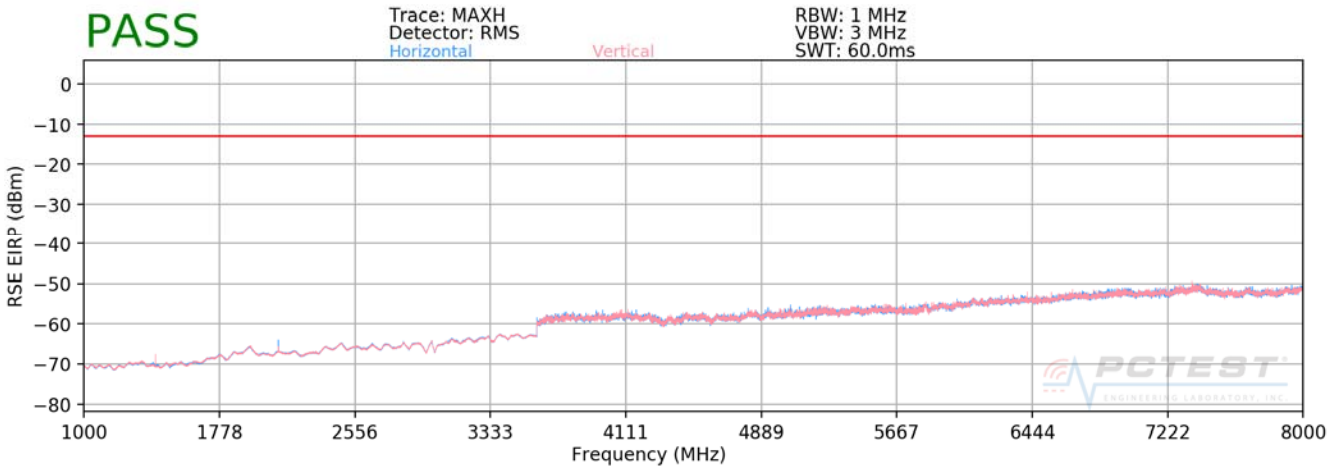
2) This unit was tested with its standard battery.

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 12/17



Plot 7-268. Radiated Spurious Plot above 1GHz (Band 12/17)

OPERATING FREQUENCY:	701.50	MHz
CHANNEL:	23035	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1403.00	H	145	249	-77.10	7.94	-69.16	-56.2
2104.50	H	205	200	-74.96	8.90	-66.06	-53.1
2806.00	H	-	-	-77.40	10.07	-67.33	-54.3
3507.50	H	-	-	-75.28	9.67	-65.61	-52.6

Table 7-11. Radiated Spurious Data (Band 12/17 – Low Channel)

OPERATING FREQUENCY:	707.50	MHz
CHANNEL:	23095	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	153	234	-77.97	8.09	-69.88	-56.9
2122.50	H	218	206	-73.91	8.88	-65.03	-52.0
2830.00	H	-	-	-76.69	10.13	-66.56	-53.6
3537.50	H	-	-	-74.92	9.69	-65.22	-52.2

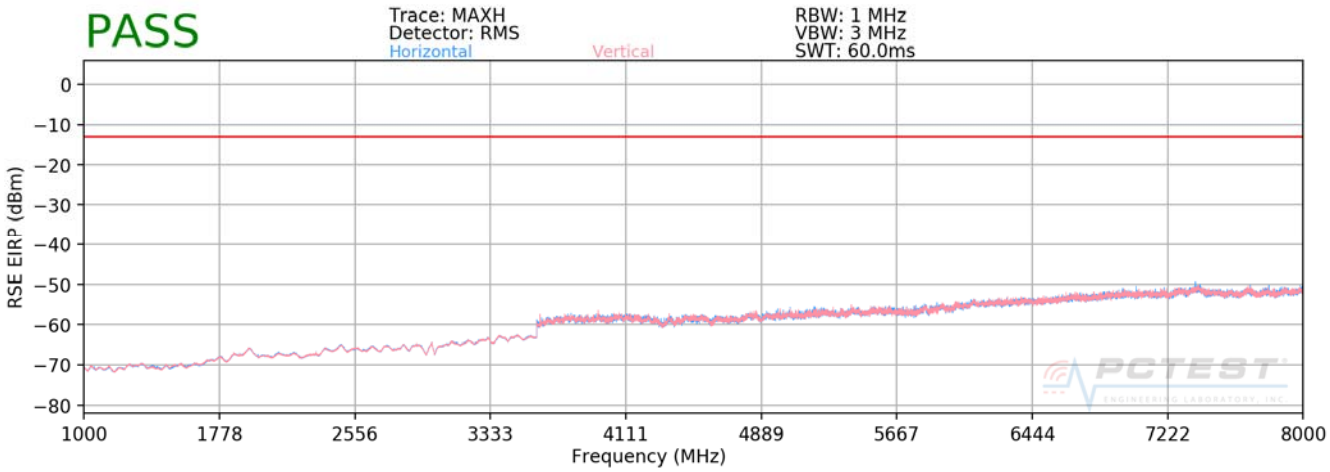
Table 7-12. Radiated Spurious Data (Band 12/17 – Mid Channel)

OPERATING FREQUENCY:	713.50	MHz
CHANNEL:	23155	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1427.00	H	148	229	-78.63	8.23	-70.40	-57.4
2140.50	H	209	200	-76.09	8.86	-67.23	-54.2
2854.00	H	-	-	-77.83	10.18	-67.65	-54.7
3567.50	H	-	-	-74.57	9.75	-64.83	-51.8

Table 7-13. Radiated Spurious Data (Band 12/17 – High Channel)

Band 13



Plot 7-269. Radiated Spurious Plot above 1GHz (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	131	154	-74.81	9.49	-65.32	-52.3
3128.00	H	-	-	-75.82	9.53	-66.29	-53.3
3910.00	H	-	-	-72.62	9.09	-63.53	-50.5

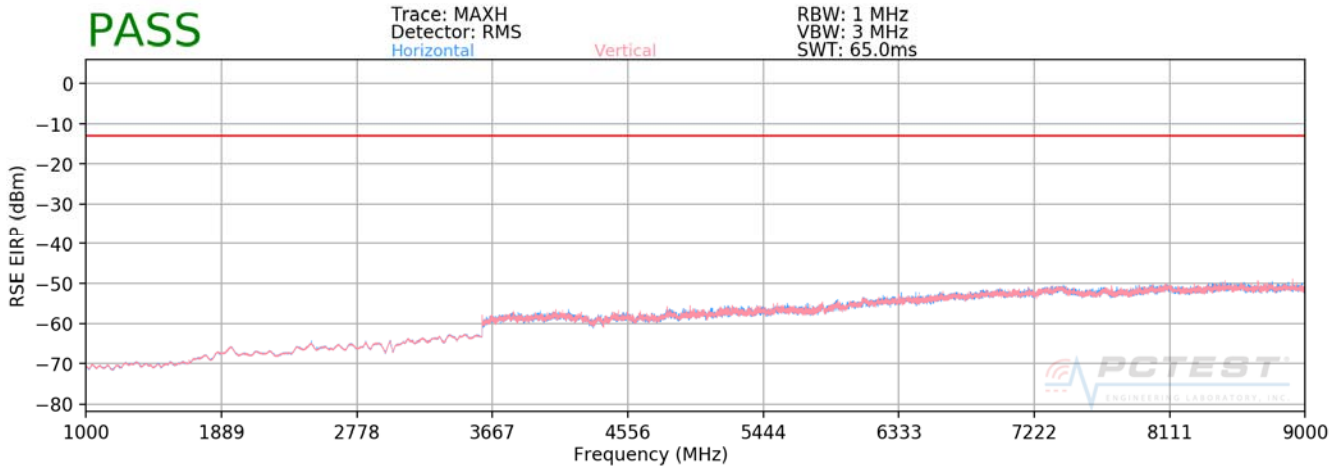
Table 7-14. Radiated Spurious Data (Band 13)

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	-	-	-80.93	8.73	-72.20	-32.2

Table 7-15. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

Band 5



Plot 7-270. Radiated Spurious Plot above 1GHz (Band 5)

OPERATING FREQUENCY:	829.00	MHz
CHANNEL:	20450	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	H	115	185	-79.29	8.96	-70.33	-57.3
2487.00	H	106	250	-74.32	9.13	-65.19	-52.2
3316.00	H	-	-	-74.25	9.36	-64.88	-51.9
4145.00	H	-	-	-73.70	9.95	-63.75	-50.8

Table 7-16. Radiated Spurious Data (Band 5 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz
CHANNEL:	20525	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	119	9	-78.36	8.85	-69.51	-56.5
2509.50	H	125	190	-76.10	9.17	-66.93	-53.9
3346.00	H	-	-	-75.74	9.36	-66.38	-53.4
4182.50	H	-	-	-72.86	10.19	-62.67	-49.7

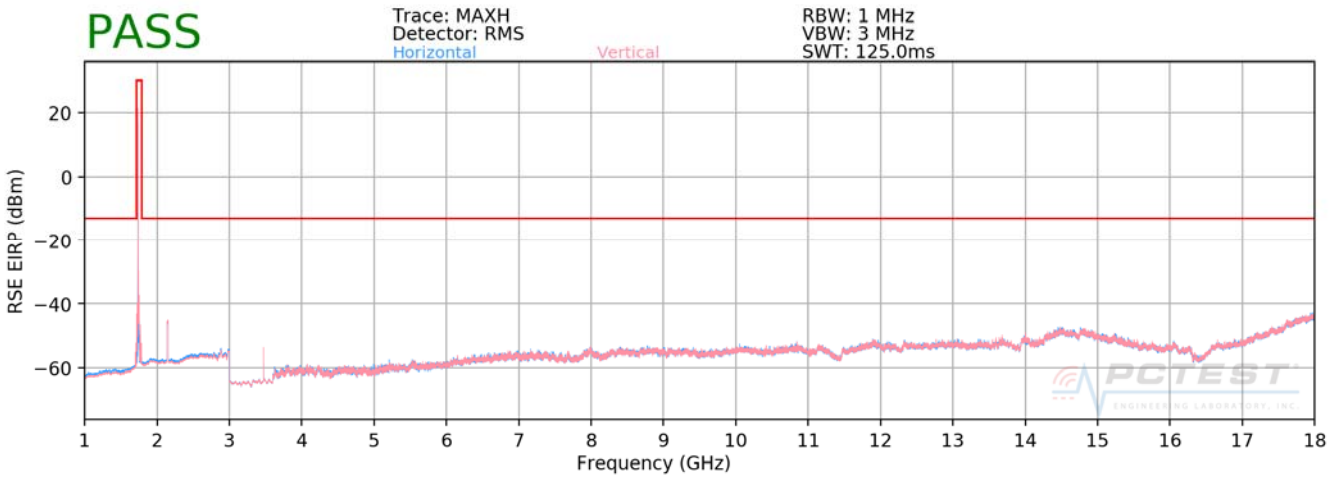
Table 7-17. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY:	844.00	MHz
CHANNEL:	20600	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	H	100	358	-77.99	8.74	-69.25	-56.2
2532.00	H	-	-	-77.28	9.24	-68.05	-55.0
3376.00	H	-	-	-75.29	9.42	-65.87	-52.9

Table 7-18. Radiated Spurious Data (Band 5 – High Channel)

Band 66/4



Plot 7-271. Radiated Spurious Plot above 1GHz (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	H	130	319	-57.09	9.54	-47.55	-34.5
5160.00	H	110	290	-69.31	10.79	-58.51	-45.5
6880.00	H	109	6	-68.43	10.86	-57.58	-44.6
8600.00	H	-	-	-69.35	11.69	-57.66	-44.7
10320.00	H	-	-	-68.28	12.49	-55.78	-42.8

Table 7-19. 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	H	123	328	-59.91	9.65	-50.26	-37.3
5235.00	H	115	222	-68.70	10.93	-57.77	-44.8
6980.00	H	120	6	-68.64	10.96	-57.68	-44.7
8725.00	H	-	-	-69.33	11.83	-57.50	-44.5
10470.00	H	-	-	-69.39	12.56	-56.83	-43.8

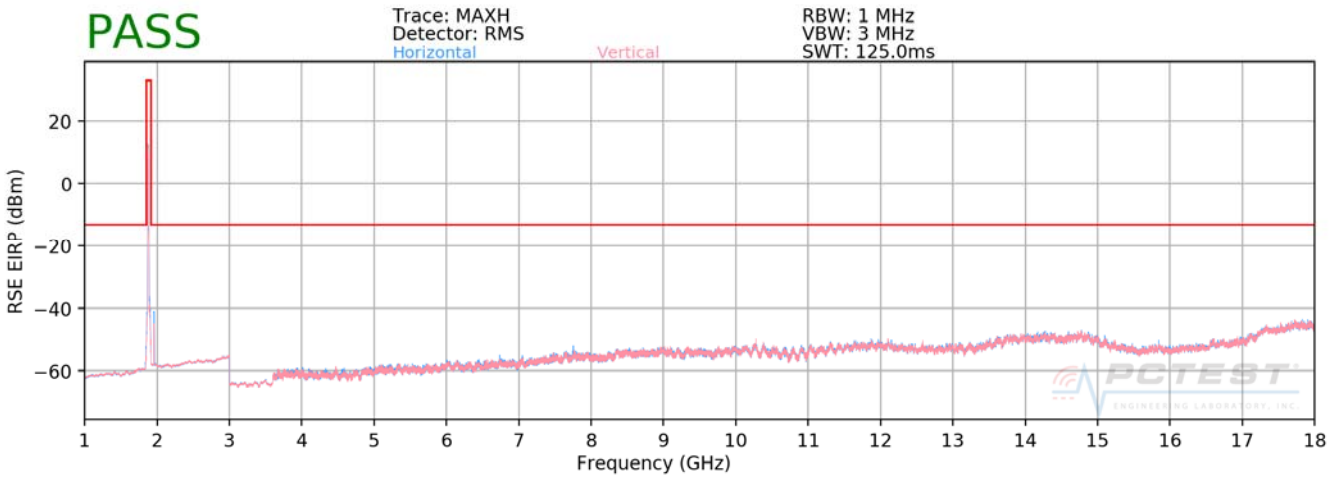
Table 7-20. Radiated Spurious Data (Band 66/4 – Mid Channel)

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	H	115	327	-63.90	9.69	-54.20	-41.2
5310.00	H	111	231	-69.31	10.97	-58.35	-45.3
7080.00	H	119	10	-68.42	11.01	-57.41	-44.4
8850.00	H	-	-	-69.39	11.95	-57.44	-44.4
10620.00	H	-	-	-69.51	12.66	-56.85	-43.8

Table 7-21. Radiated Spurious Data (Band 66/4 – High Channel)

Band 25/2



Plot 7-272. Radiated Spurious Plot above 1GHz (Band 25/2)

OPERATING FREQUENCY:	1860.00	MHz
CHANNEL:	26140	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3720.00	V	150	5	-71.00	9.51	-61.50	-48.5
5580.00	V	-	-	-72.72	10.99	-61.73	-48.7
7440.00	V	136	0	-68.69	10.99	-57.70	-44.7
9300.00	V	-	-	-67.40	11.61	-55.80	-42.8
11160.00	V	-	-	-67.90	12.73	-55.17	-42.2

Table 7-22. 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	127	10	-71.16	9.36	-61.80	-48.8
5647.50	V	125	0	-72.74	11.19	-61.55	-48.5
7530.00	V	106	10	-68.36	11.13	-57.23	-44.2
9412.50	V	-	-	-67.99	11.57	-56.42	-43.4
11295.00	V	-	-	-67.27	12.71	-54.56	-41.6

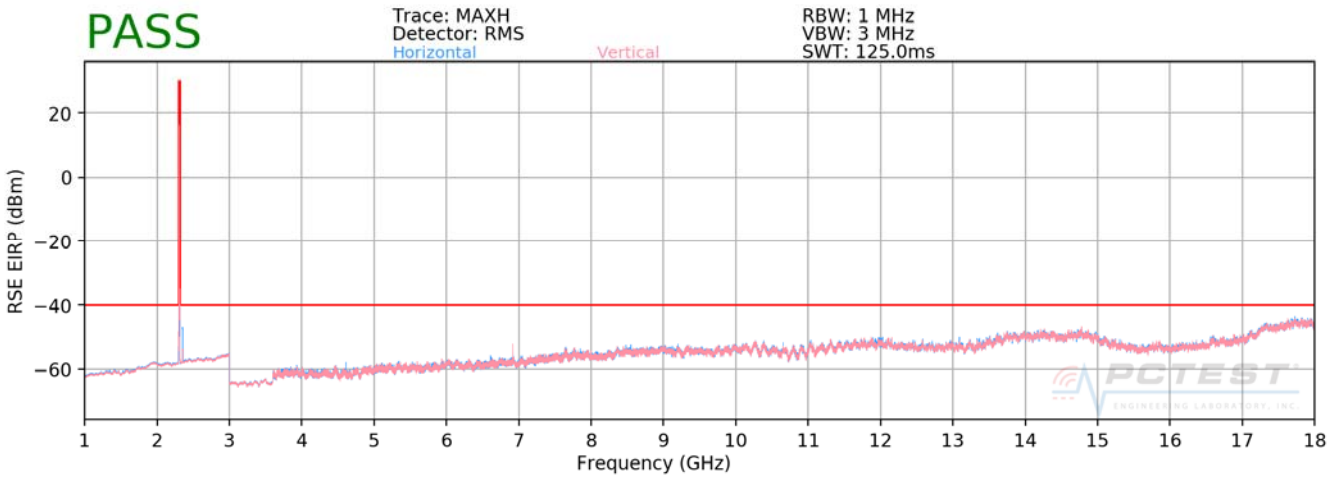
Table 7-23. Radiated Spurious Data (Band 25/2 – Mid Channel)

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

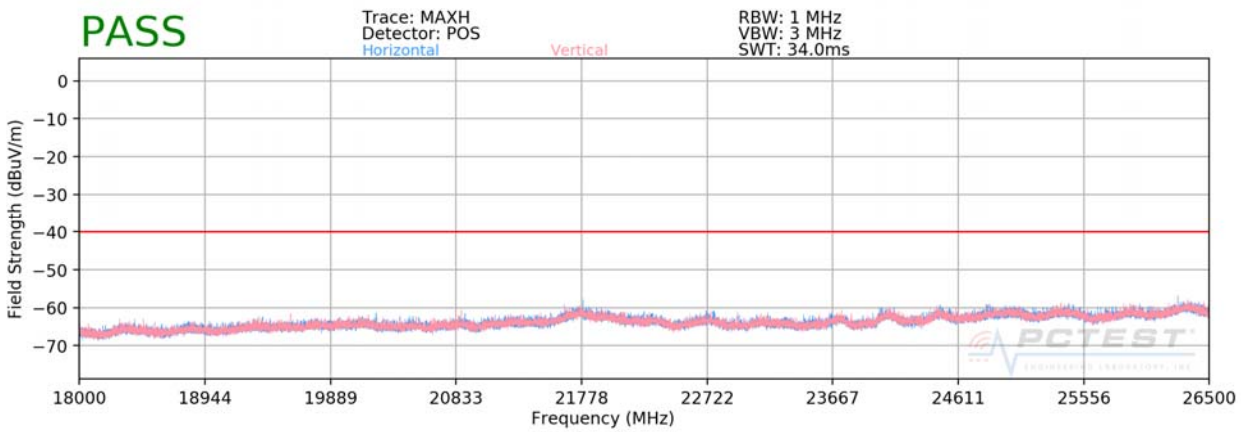
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3810.00	V	114	360	-71.05	9.29	-61.76	-48.8
5715.00	V	-	-	-73.20	11.35	-61.86	-48.9
7620.00	V	120	358	-68.36	11.29	-57.07	-44.1
9525.00	V	-	-	-67.88	11.73	-56.15	-43.1
11430.00	V	-	-	-67.16	12.83	-54.33	-41.3

Table 7-24. Radiated Spurious Data (Band 25/2 – High Channel)

Band 30



Plot 7-273. Radiated Spurious Plot 1GHz - 18GHz (Band 30)



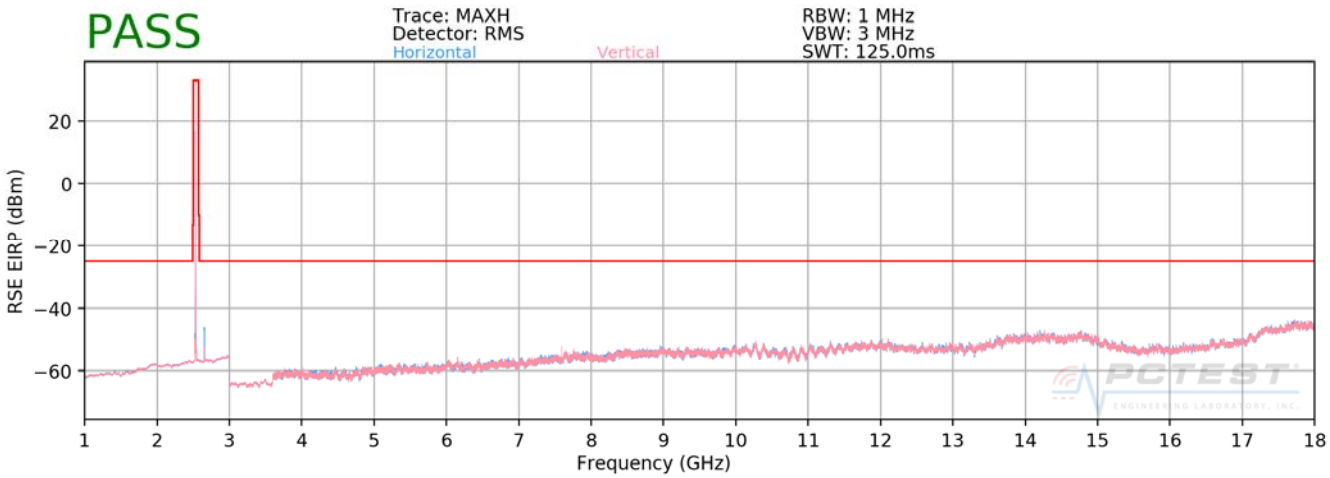
Plot 7-274. Radiated Spurious Plot 18GHz – 26.5GHz (Band 30)

OPERATING FREQUENCY:	2310.00	MHz
CHANNEL:	27710	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-40	dBm

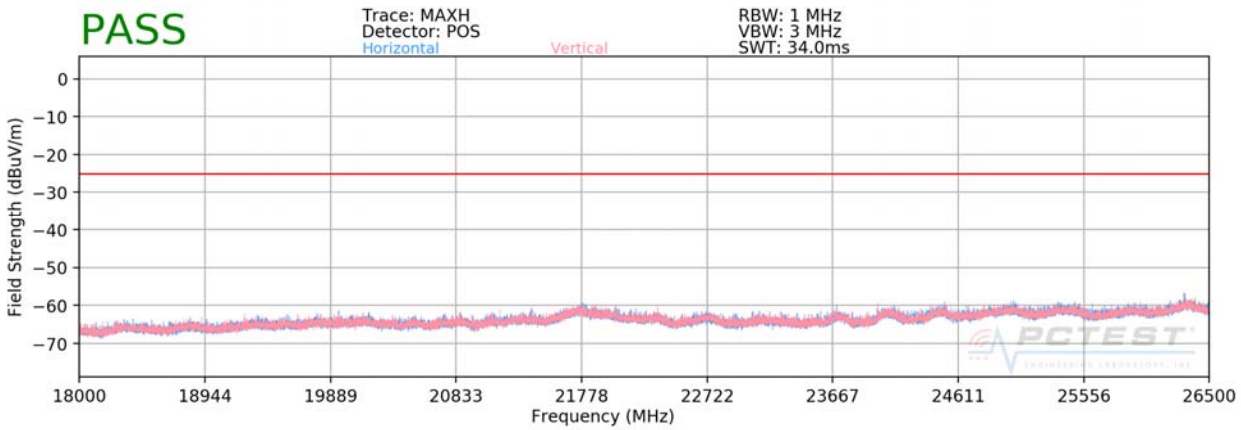
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
4620.00	V	324	241	-68.76	10.92	-57.85	-17.8
6930.00	V	234	314	-64.34	11.74	-52.60	-12.6
9240.00	V	-	-	-68.97	11.62	-57.35	-17.3
11550.00	V	-	-	-67.79	12.72	-55.07	-15.1

Table 7-25. Radiated Spurious Data (Band 30)

Band 7



Plot 7-275. Radiated Spurious Plot 1GHz - 18GHz (Band 7)



Plot 7-276. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7)

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	379	0	-71.45	10.91	-60.54	-35.5
7515.00	V	400	330	-61.37	11.10	-50.27	-25.3
10020.00	V	-	-	-68.49	11.99	-56.49	-31.5
12525.00	V	-	-	-70.30	13.56	-56.74	-31.7

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

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	341	16	-70.96	10.75	-60.22	-35.2
7605.00	V	116	356	-64.15	11.25	-52.91	-27.9
10140.00	V	-	-	-67.55	12.07	-55.48	-30.5
12675.00	V	-	-	-69.64	13.66	-55.97	-31.0

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

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	338	0	-69.83	10.69	-59.15	-34.1
7695.00	V	106	325	-59.74	11.41	-48.33	-23.3
10260.00	V	-	-	-66.74	12.20	-54.54	-29.5
12825.00	V	-	-	-69.42	13.48	-55.93	-30.9

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

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

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

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

None

Band 12 Frequency Stability Measurements

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)	707,500,088	88	0.0000124
100 %		- 30	707,500,163	163	0.0000230
100 %		- 20	707,500,350	350	0.0000495
100 %		- 10	707,499,866	-134	-0.0000189
100 %		0	707,500,072	72	0.0000102
100 %		+ 10	707,499,750	-250	-0.0000353
100 %		+ 20	707,500,145	145	0.0000205
100 %		+ 30	707,500,056	56	0.0000079
100 %		+ 40	707,500,044	44	0.0000062
100 %		+ 50	707,499,991	-9	-0.0000013
BATT. ENDPOINT	3.45	+ 20	707,500,110	110	0.0000155

Table 7-29. Frequency Stability Data (Band 12)

Note:

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

Band 12 Frequency Stability Measurements

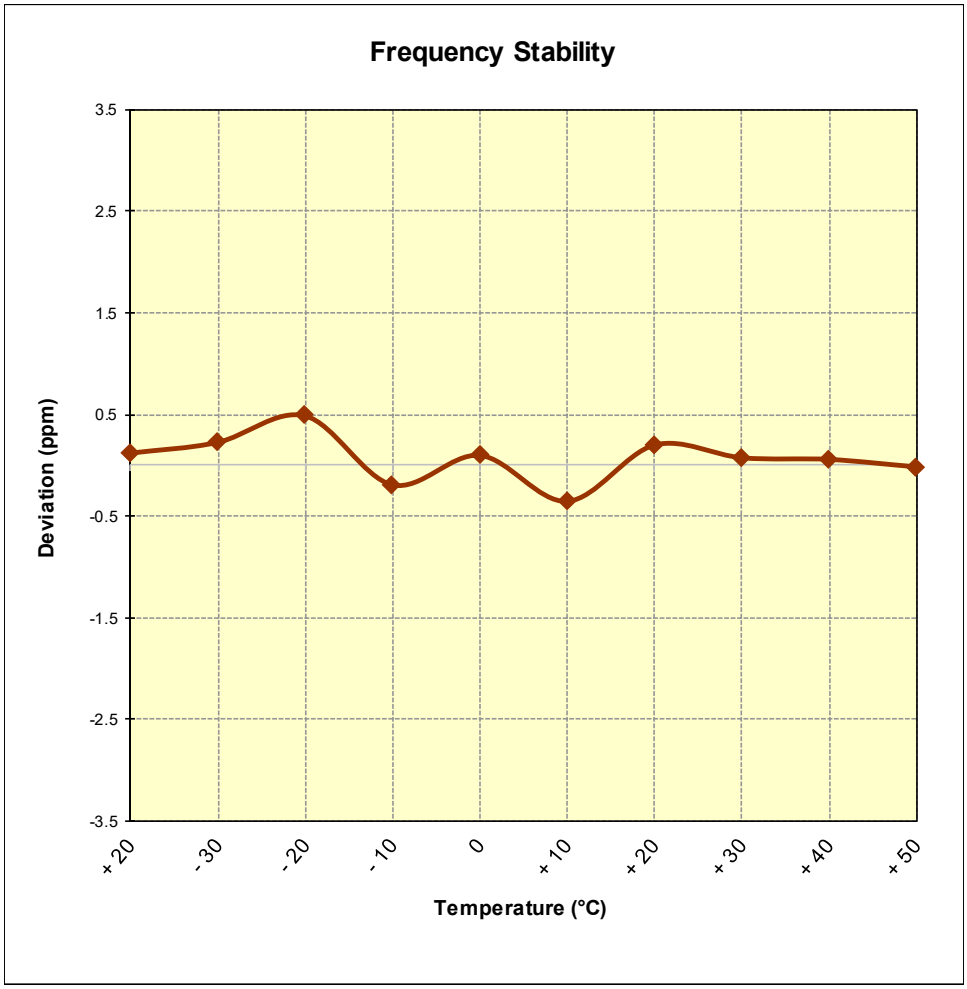


Figure 7-8. Frequency Stability Graph (Band 12)

Band 13 Frequency Stability Measurements

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)	782,000,186	186	0.0000238
100 %		- 30	782,000,125	125	0.0000160
100 %		- 20	782,000,249	249	0.0000318
100 %		- 10	782,000,056	56	0.0000072
100 %		0	781,999,895	-105	-0.0000134
100 %		+ 10	781,999,787	-213	-0.0000272
100 %		+ 20	781,999,786	-214	-0.0000274
100 %		+ 30	781,999,953	-47	-0.0000060
100 %		+ 40	781,999,956	-44	-0.0000056
100 %		+ 50	782,000,090	90	0.0000115
BATT. ENDPOINT	3.45	+ 20	782,000,289	289	0.0000370

Table 7-30. Frequency Stability Data (Band 13)

Note:

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

Band 13 Frequency Stability Measurements

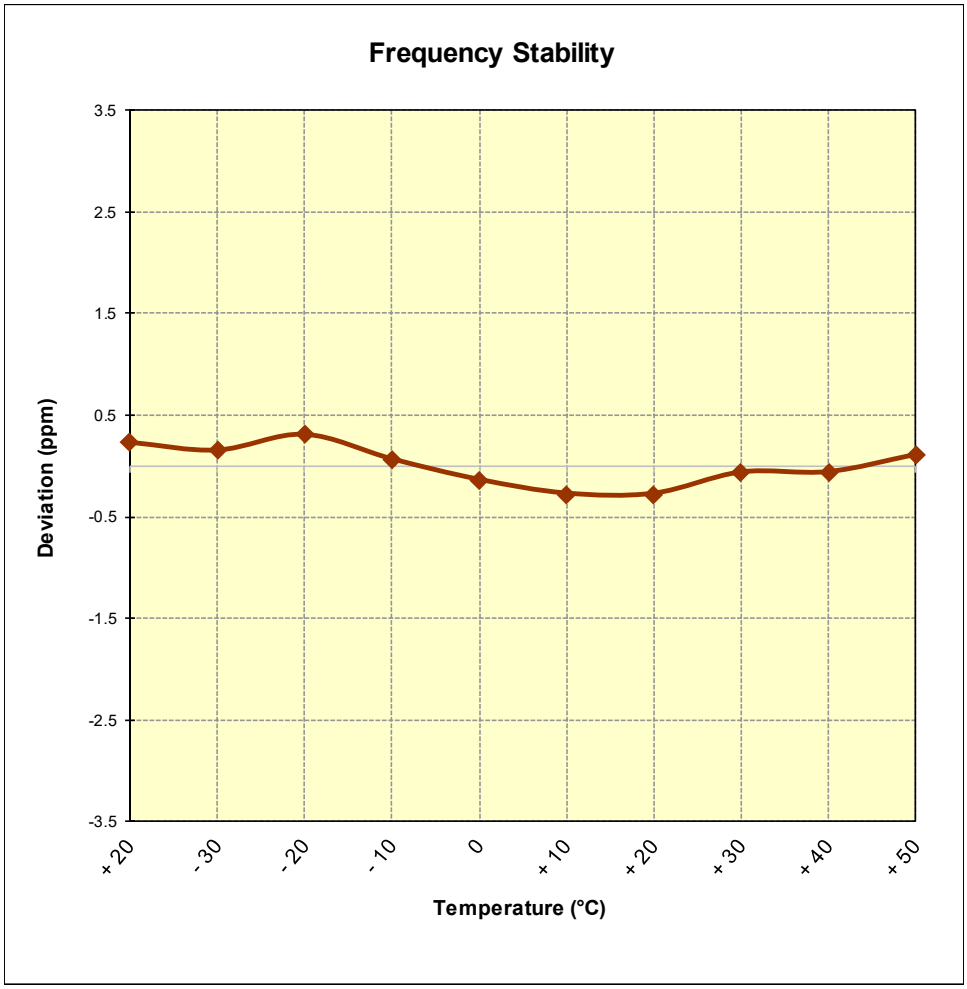


Figure 7-9. Frequency Stability Graph (Band 13)

Band 5 Frequency Stability Measurements

OPERATING FREQUENCY:	836,500,000	Hz
CHANNEL:	20525	
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)	836,499,631	-369	-0.0000441
100 %		- 30	836,499,602	-398	-0.0000476
100 %		- 20	836,500,018	18	0.0000022
100 %		- 10	836,500,140	140	0.0000167
100 %		0	836,499,627	-373	-0.0000446
100 %		+ 10	836,499,967	-33	-0.0000039
100 %		+ 20	836,500,212	212	0.0000253
100 %		+ 30	836,499,900	-100	-0.0000120
100 %		+ 40	836,499,780	-220	-0.0000263
100 %		+ 50	836,499,984	-16	-0.0000019
85 %	3.27	+ 20	836,500,084	84	0.0000100
BATT. ENDPOINT	3.45	+ 20	836,500,271	271	0.0000324

Table 7-31. Frequency Stability Data (Band 5)

Band 5 Frequency Stability Measurements

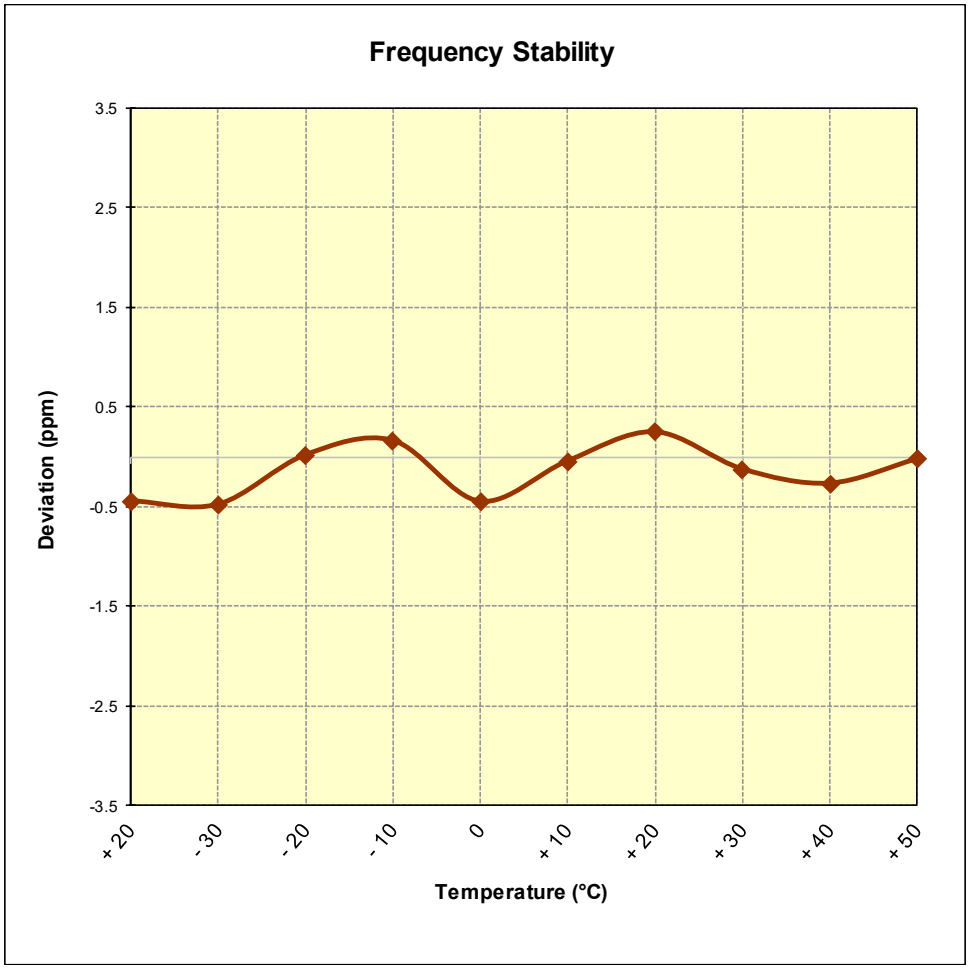


Figure 7-10. Frequency Stability Graph (Band 5)

Band 66/4 Frequency Stability Measurements

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)	1,744,999,791	-209	-0.0000120
100 %		- 30	1,745,000,014	14	0.0000008
100 %		- 20	1,744,999,984	-16	-0.0000009
100 %		- 10	1,745,000,139	139	0.0000080
100 %		0	1,744,999,917	-83	-0.0000048
100 %		+ 10	1,745,000,075	75	0.0000043
100 %		+ 20	1,744,999,732	-268	-0.0000154
100 %		+ 30	1,745,000,321	321	0.0000184
100 %		+ 40	1,744,999,943	-57	-0.0000033
100 %		+ 50	1,744,999,687	-313	-0.0000179
BATT. ENDPOINT	3.45	+ 20	1,744,999,704	-296	-0.0000170

Table 7-32. Frequency Stability Data (Band 66)

Note:

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

Band 66/4 Frequency Stability Measurements

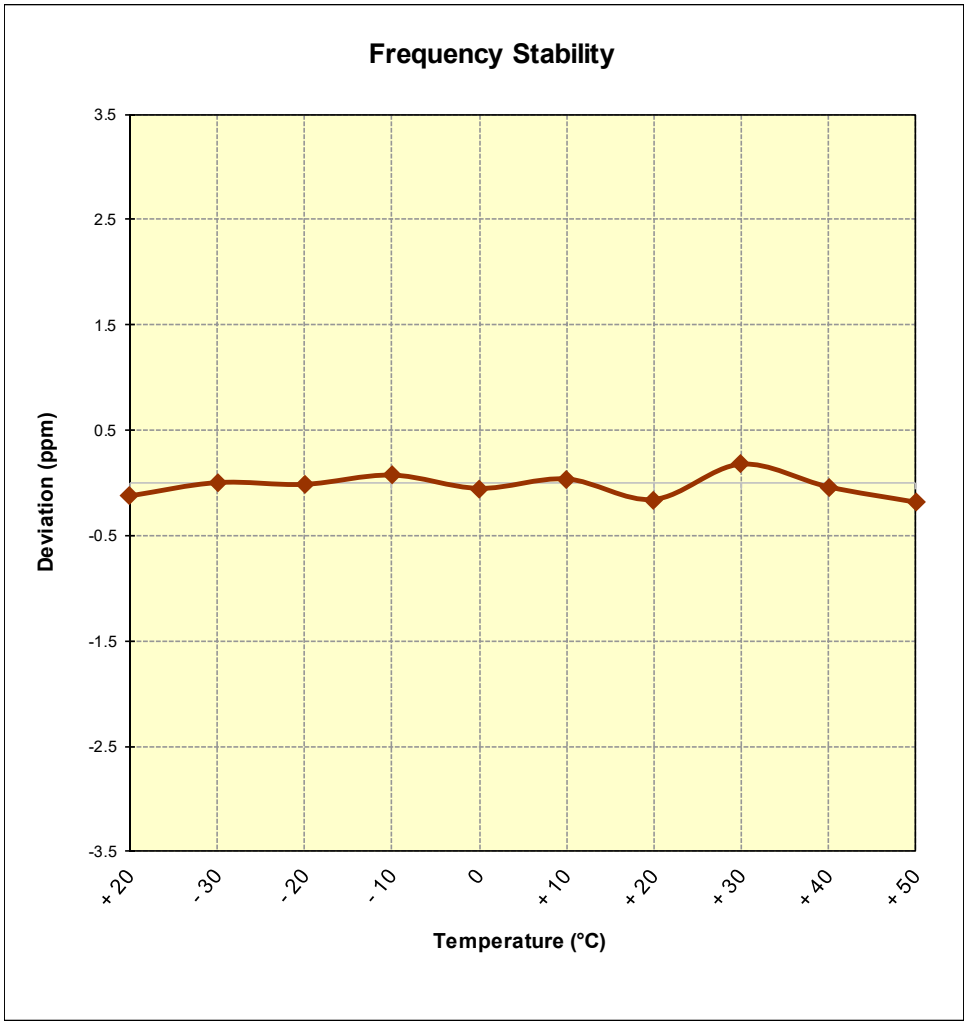


Figure 7-11. Frequency Stability Graph (Band 66/4)

Band 25/2 Frequency Stability Measurements

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)	1,882,500,095	95	0.0000050
100 %		- 30	1,882,500,335	335	0.0000178
100 %		- 20	1,882,500,068	68	0.0000036
100 %		- 10	1,882,499,731	-269	-0.0000143
100 %		0	1,882,499,868	-132	-0.0000070
100 %		+ 10	1,882,499,902	-98	-0.0000052
100 %		+ 20	1,882,499,934	-66	-0.0000035
100 %		+ 30	1,882,500,039	39	0.0000021
100 %		+ 40	1,882,500,004	4	0.0000002
100 %		+ 50	1,882,500,135	135	0.0000072
BATT. ENDPOINT	3.45	+ 20	1,882,500,009	9	0.0000005

Table 7-33. Frequency Stability Data (Band 25/2)

Note:

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

Band 25/2 Frequency Stability Measurements

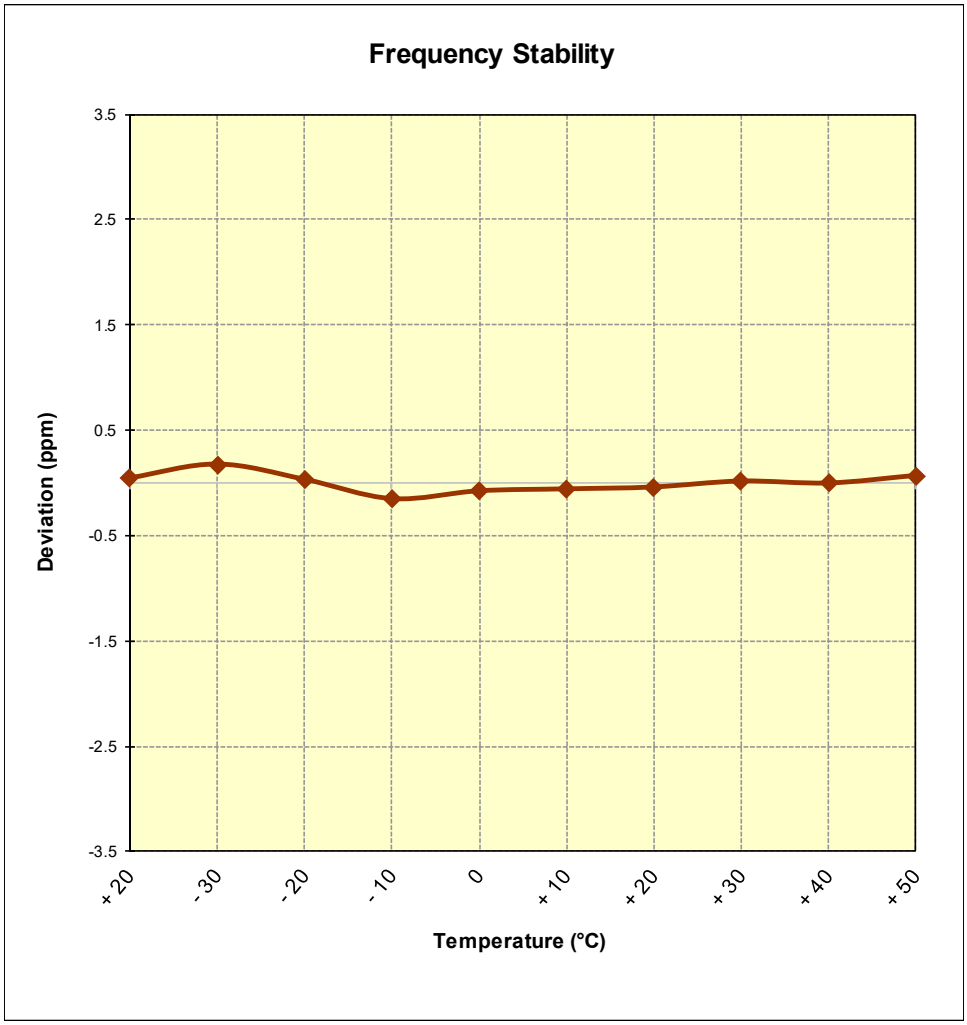


Figure 7-12. Frequency Stability Graph (Band 25/2)

Band 30 Frequency Stability Measurements

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)	2,309,999,814	-186	-0.0000081
100 %		- 30	2,310,000,051	51	0.0000022
100 %		- 20	2,309,999,978	-22	-0.0000010
100 %		- 10	2,309,999,834	-166	-0.0000072
100 %		0	2,309,999,957	-43	-0.0000019
100 %		+ 10	2,309,999,752	-248	-0.0000107
100 %		+ 20	2,310,000,042	42	0.0000018
100 %		+ 30	2,309,999,953	-47	-0.0000020
100 %		+ 40	2,310,000,104	104	0.0000045
100 %		+ 50	2,309,999,769	-231	-0.0000100
BATT. ENDPOINT	3.45	+ 20	2,309,999,906	-94	-0.0000041

Table 7-34. 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

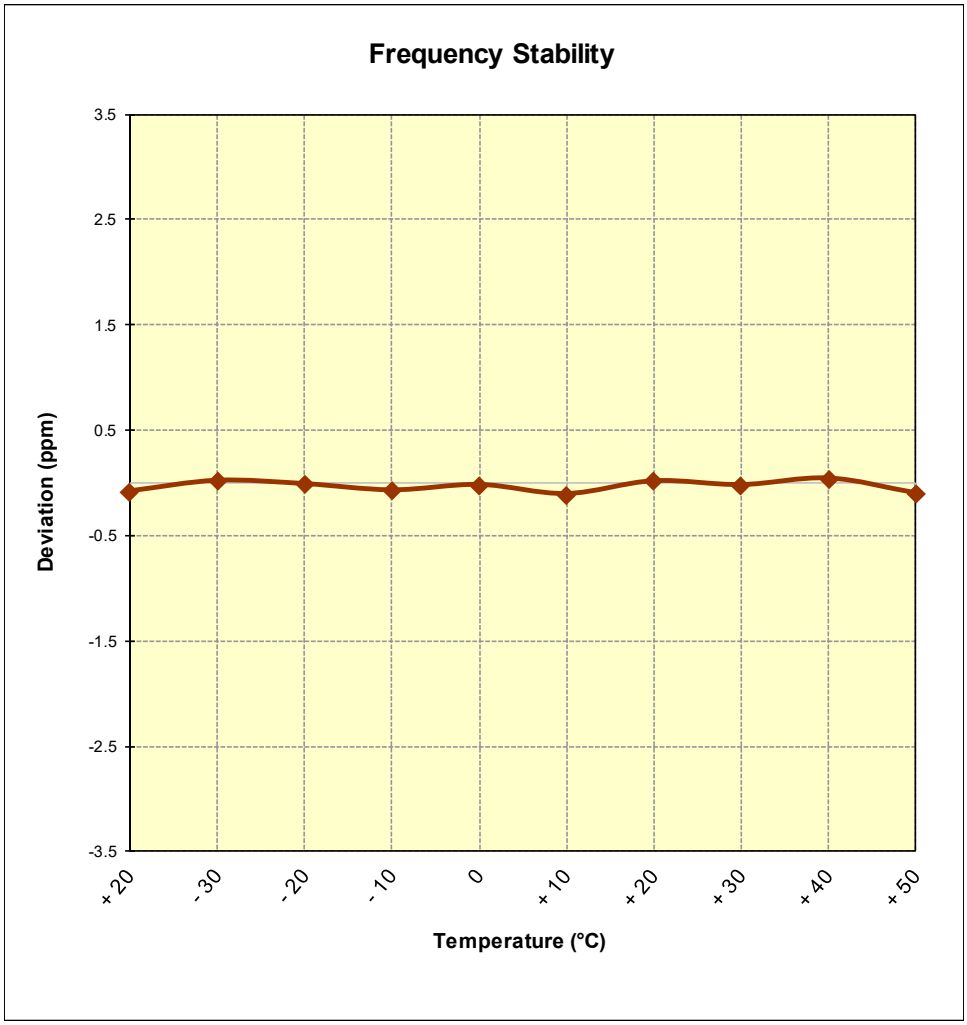


Figure 7-13. Frequency Stability Graph (Band 30)

Band 7 Frequency Stability Measurements

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)	2,534,999,992	-8	-0.0000003
100 %		- 30	2,535,000,277	277	0.0000109
100 %		- 20	2,534,999,955	-45	-0.0000018
100 %		- 10	2,535,000,309	309	0.0000122
100 %		0	2,534,999,820	-180	-0.0000071
100 %		+ 10	2,534,999,970	-30	-0.0000012
100 %		+ 20	2,535,000,029	29	0.0000011
100 %		+ 30	2,535,000,161	161	0.0000064
100 %		+ 40	2,534,999,620	-380	-0.0000150
100 %		+ 50	2,534,999,902	-98	-0.0000039
BATT. ENDPOINT	3.45	+ 20	2,534,999,787	-213	-0.0000084

Table 7-35. 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

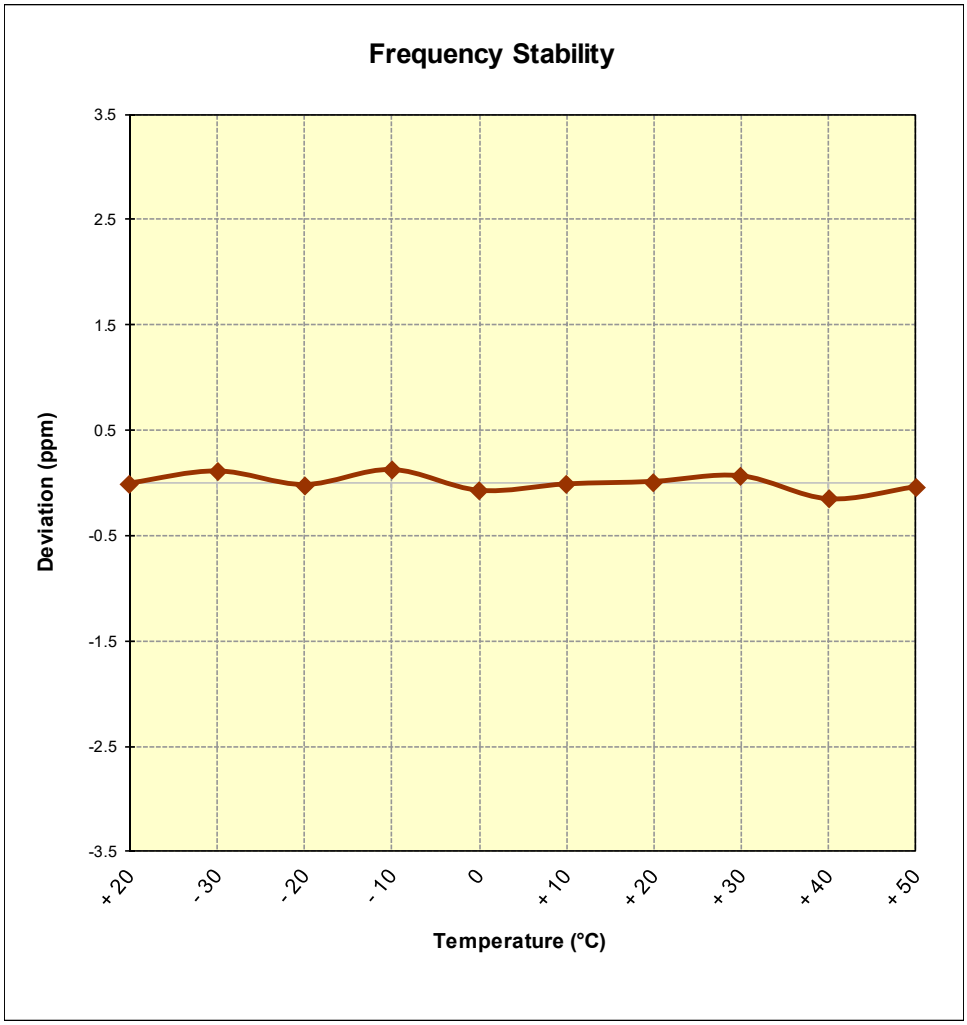


Figure 7-14. Frequency Stability Graph (Band 7)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFQ710WA** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules and RSS-130, RSS-132, RSS-133, RSS-139, RSS-195, RSS-199 of the Innovation, Science and Economic Development Canada Rules for LTE operation.