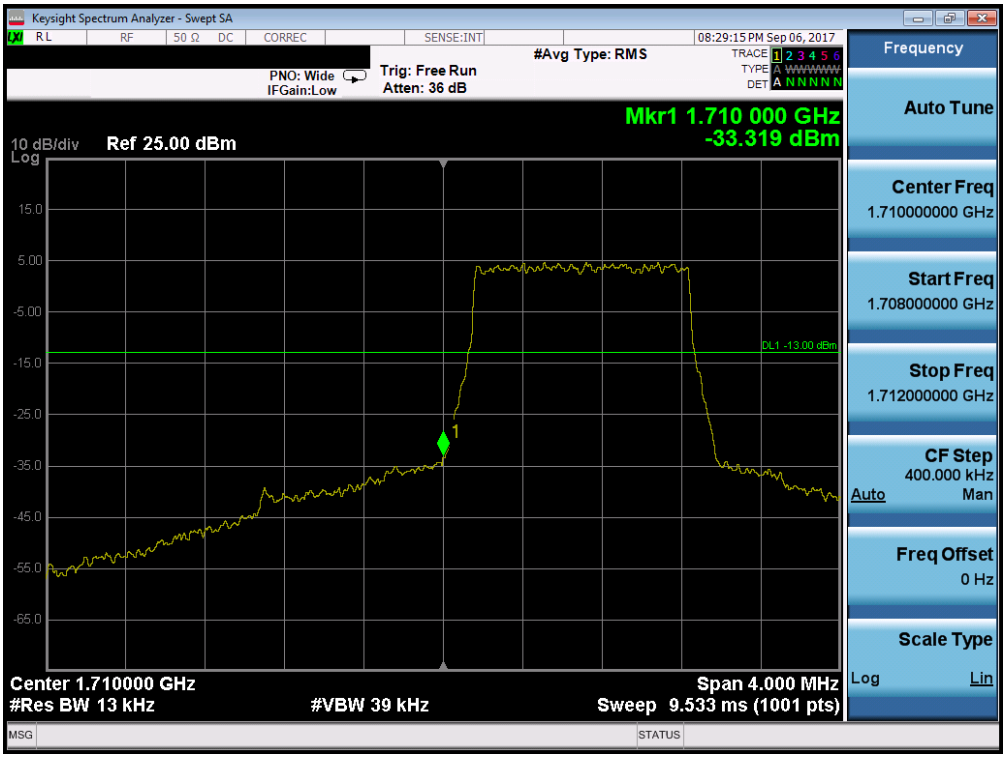
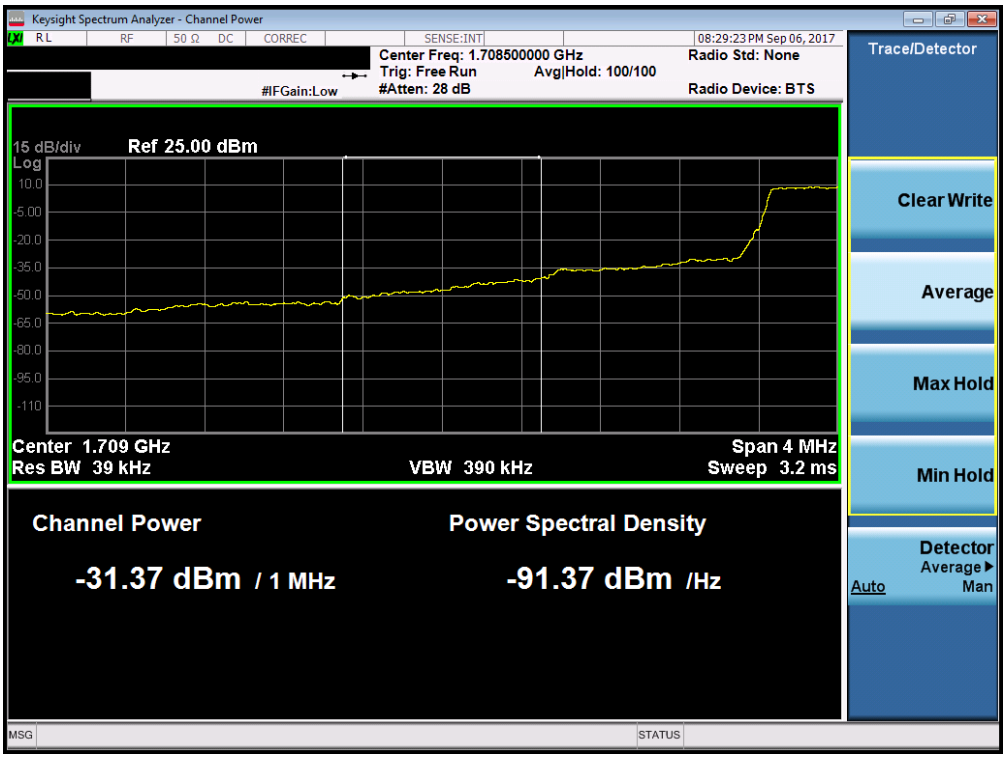
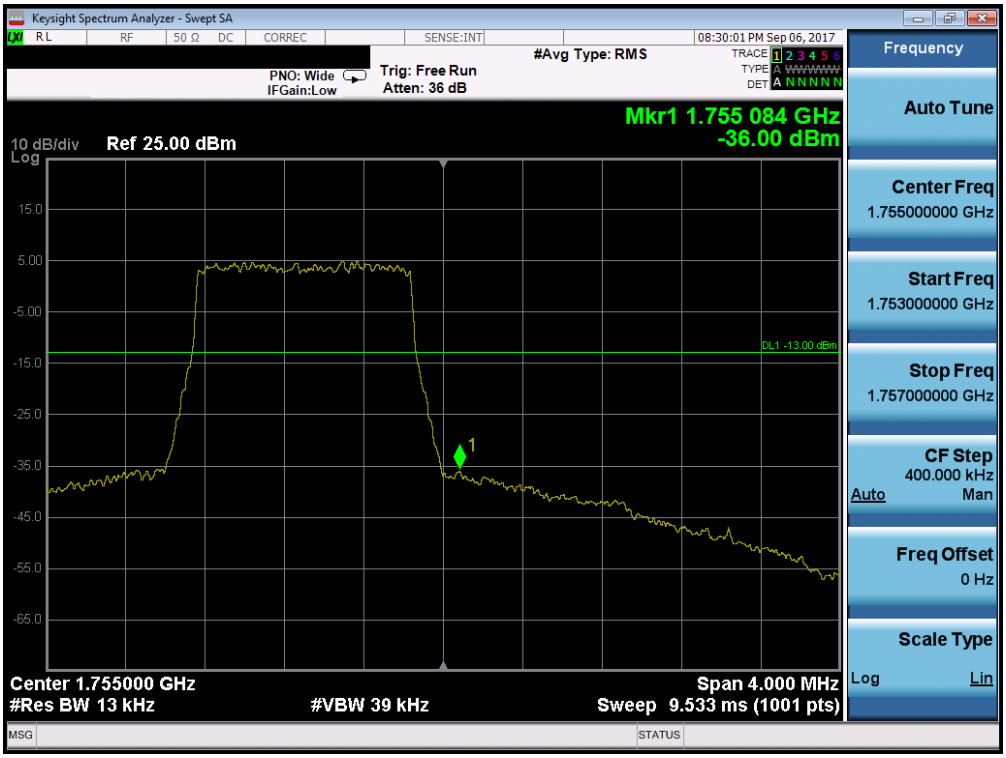


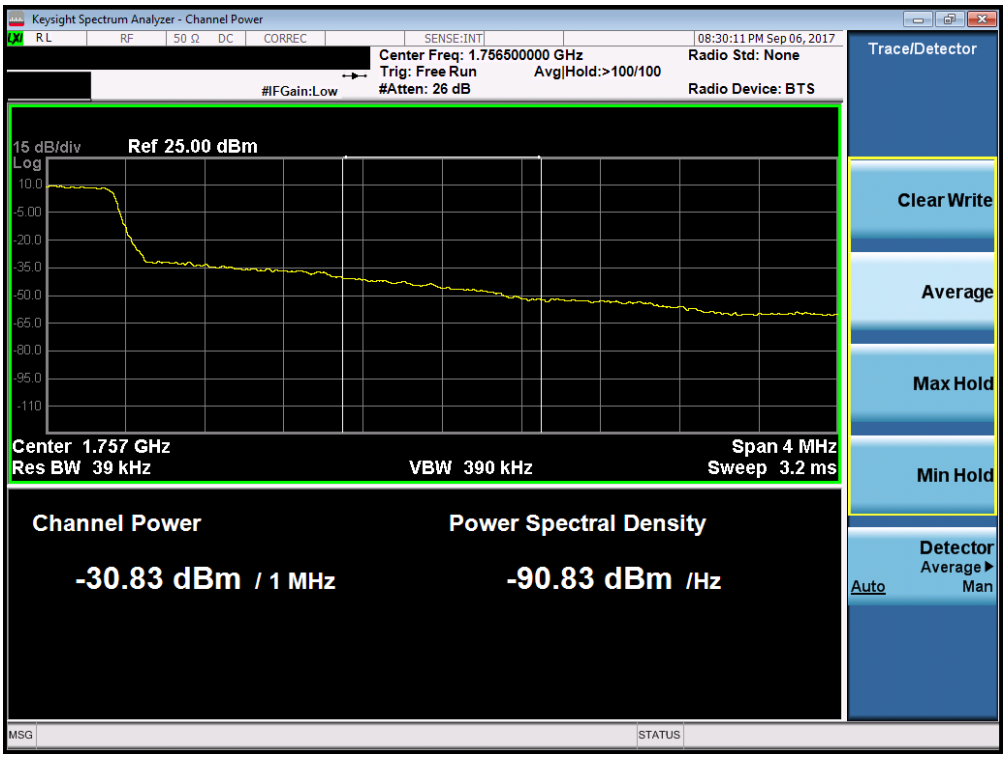
Plot 7-126. Lower Band Edge Plot (Band 4 – 1.4MHz QPSK - Full RB Configuration)



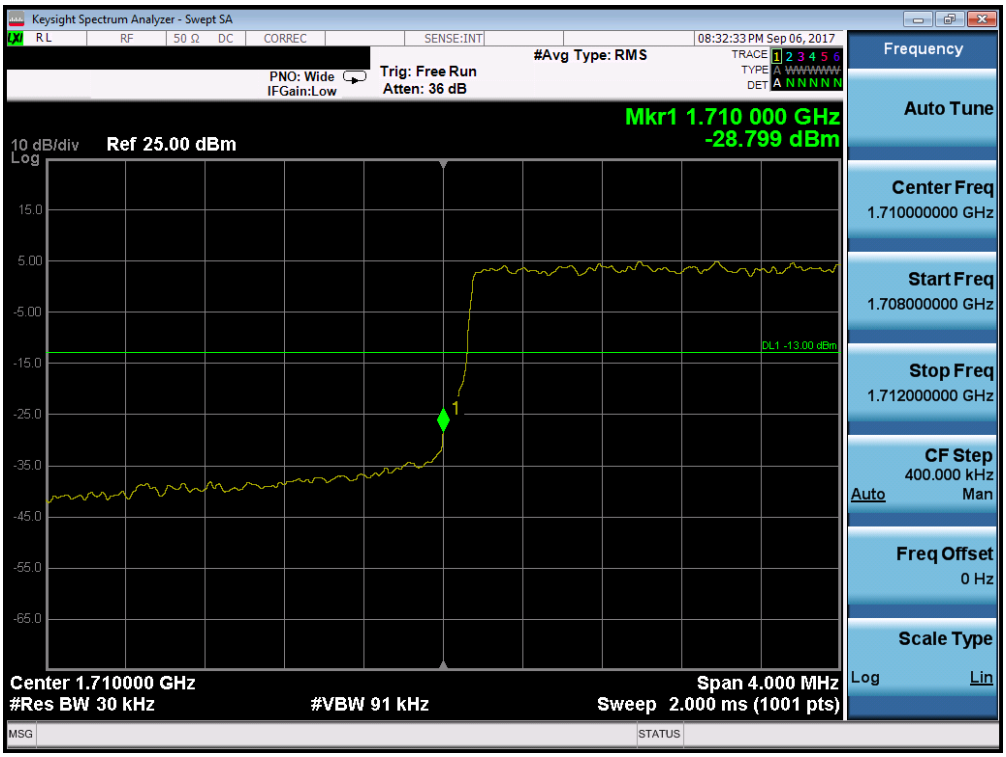
Plot 7-127. . Lower Extended Band Edge Plot (Band 4 – 1.4MHz QPSK - Full RB Configuration)



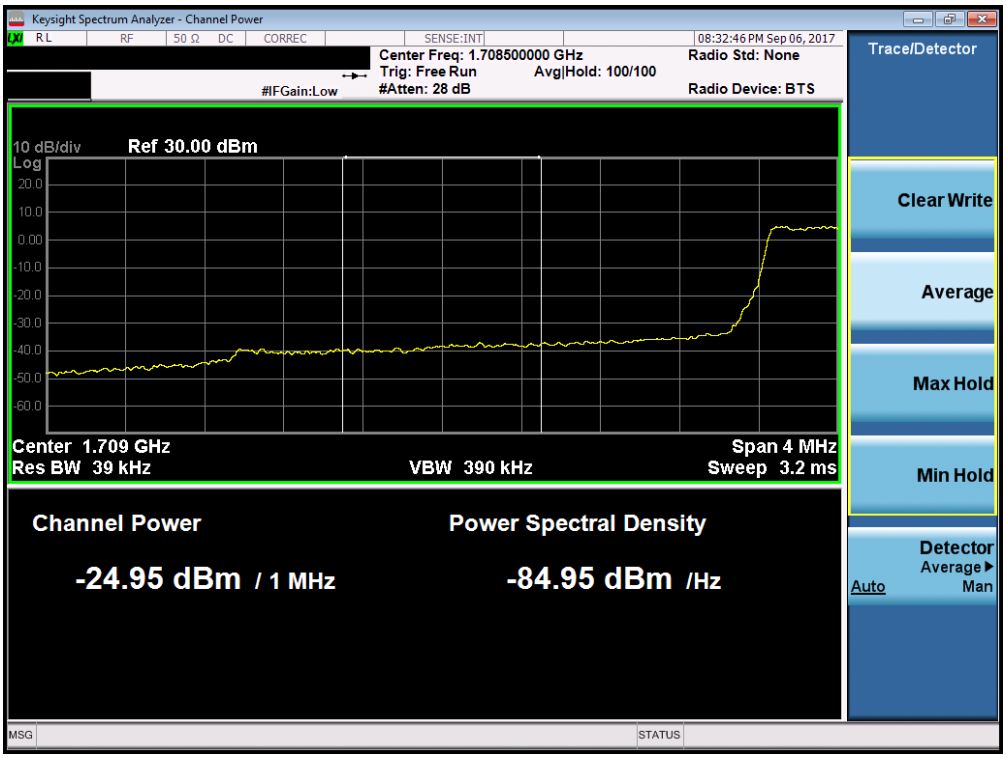
Plot 7-128. Upper Band Edge Plot (Band 4 – 1.4MHz QPSK - Full RB Configuration)



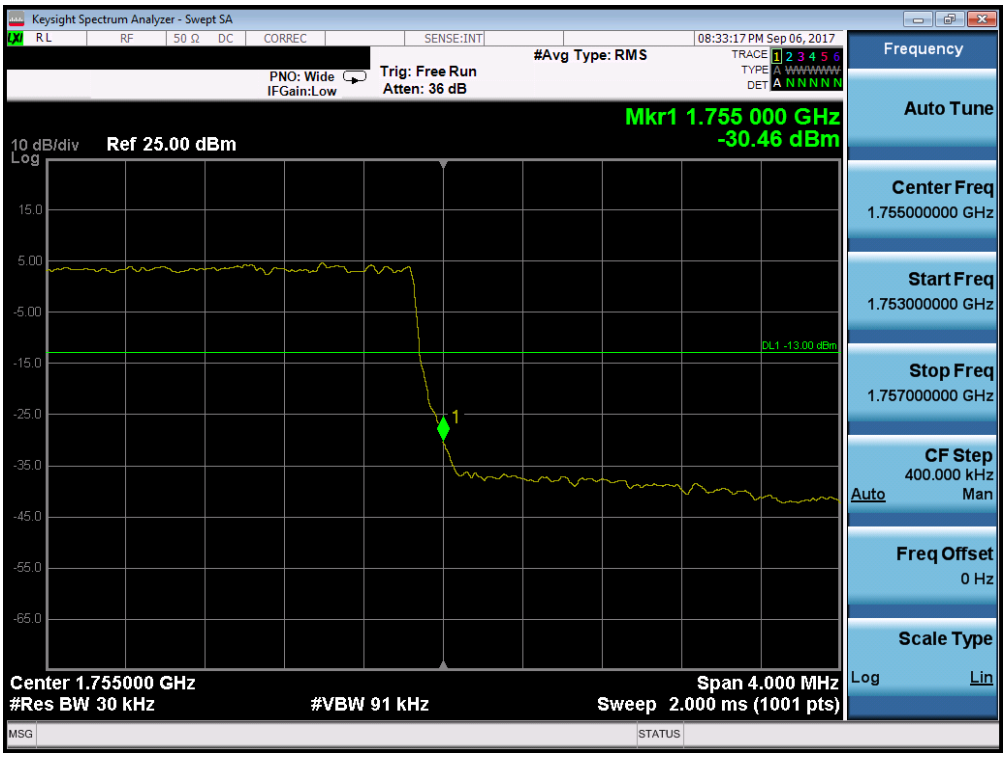
Plot 7-129. . Upper Extended Band Edge Plot (Band 4 – 1.4MHz QPSK - Full RB Configuration)



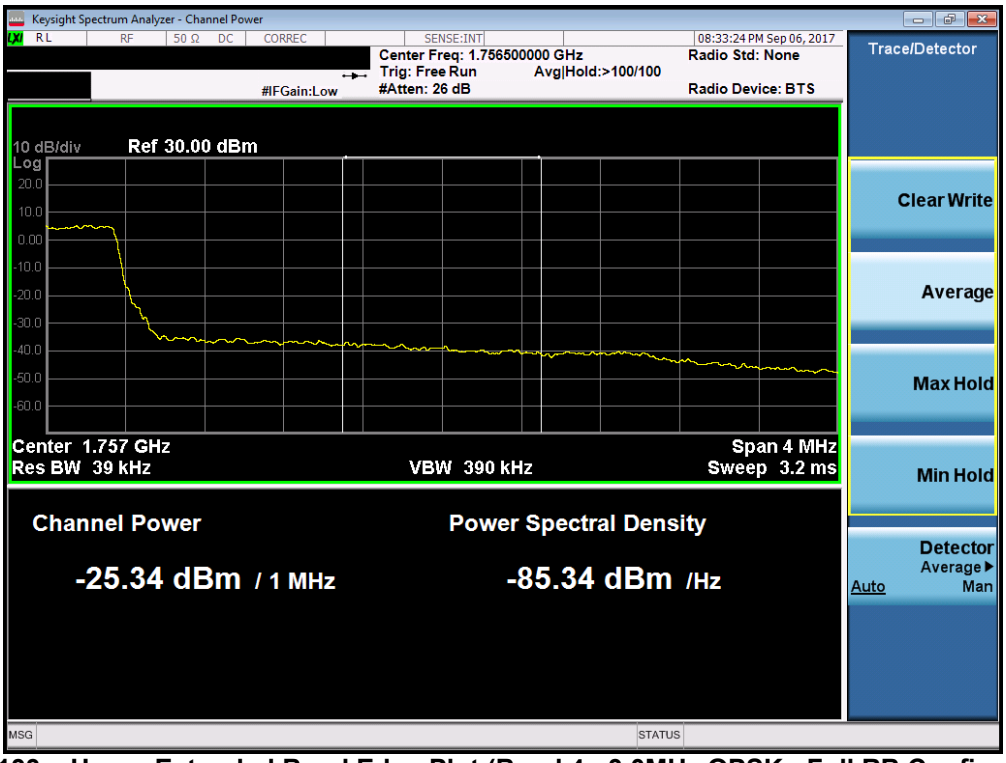
Plot 7-130. Lower Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



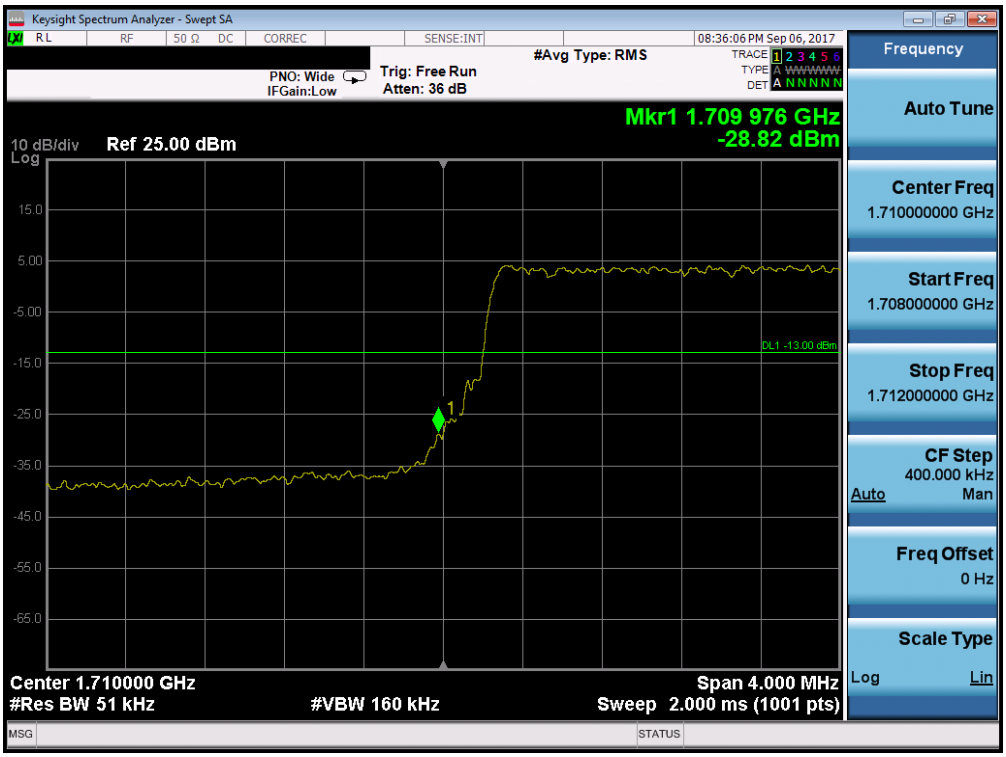
Plot 7-131. . Lower Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



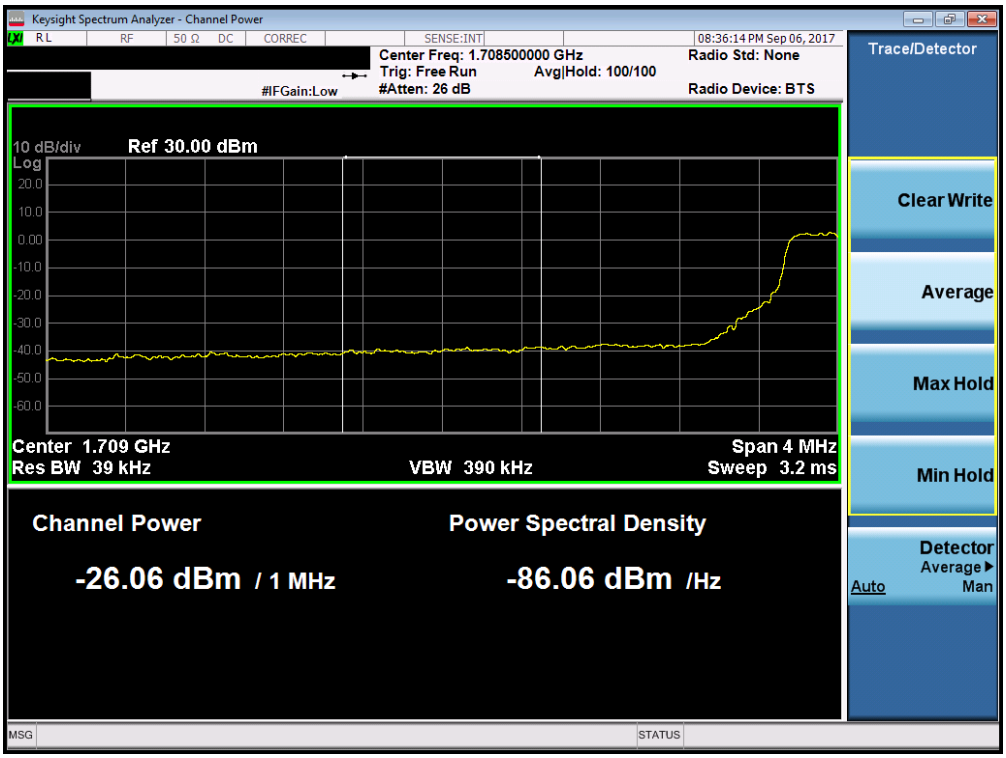
Plot 7-132. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-133. . Upper Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

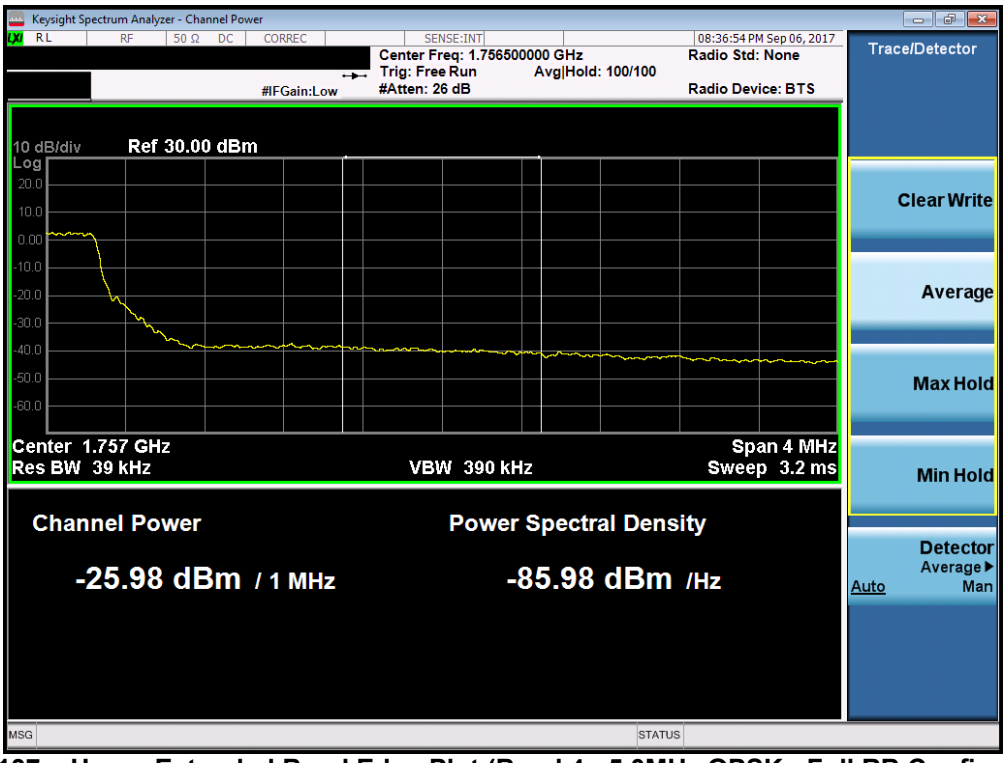


Plot 7-134. Lower Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

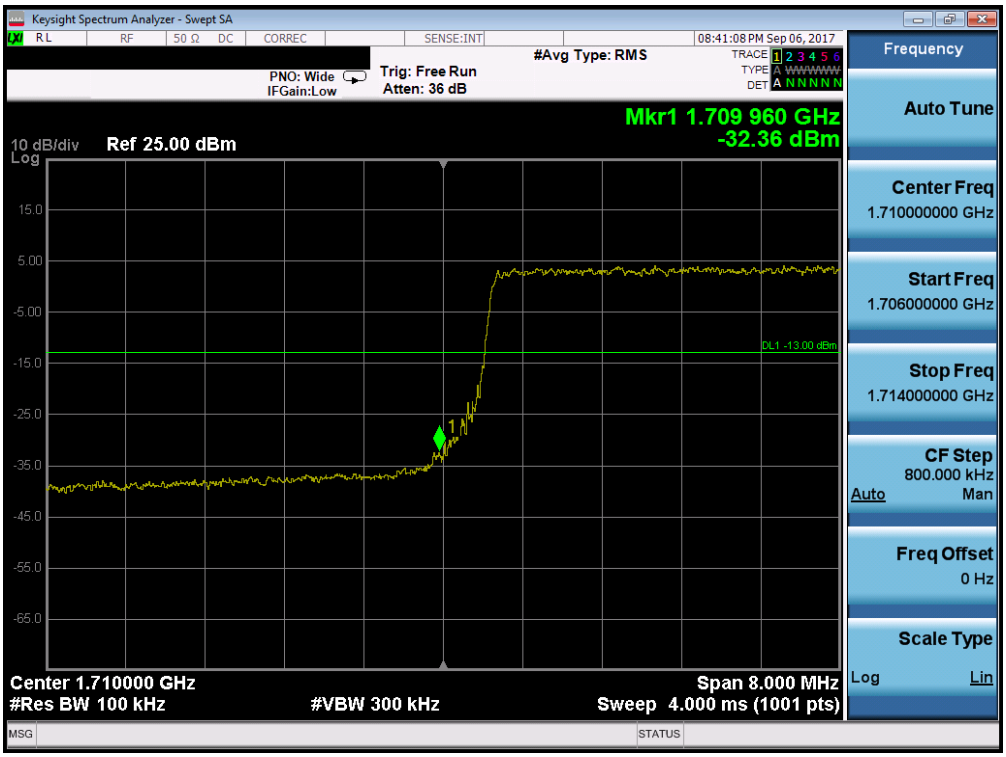


Plot 7-135. . Lower Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

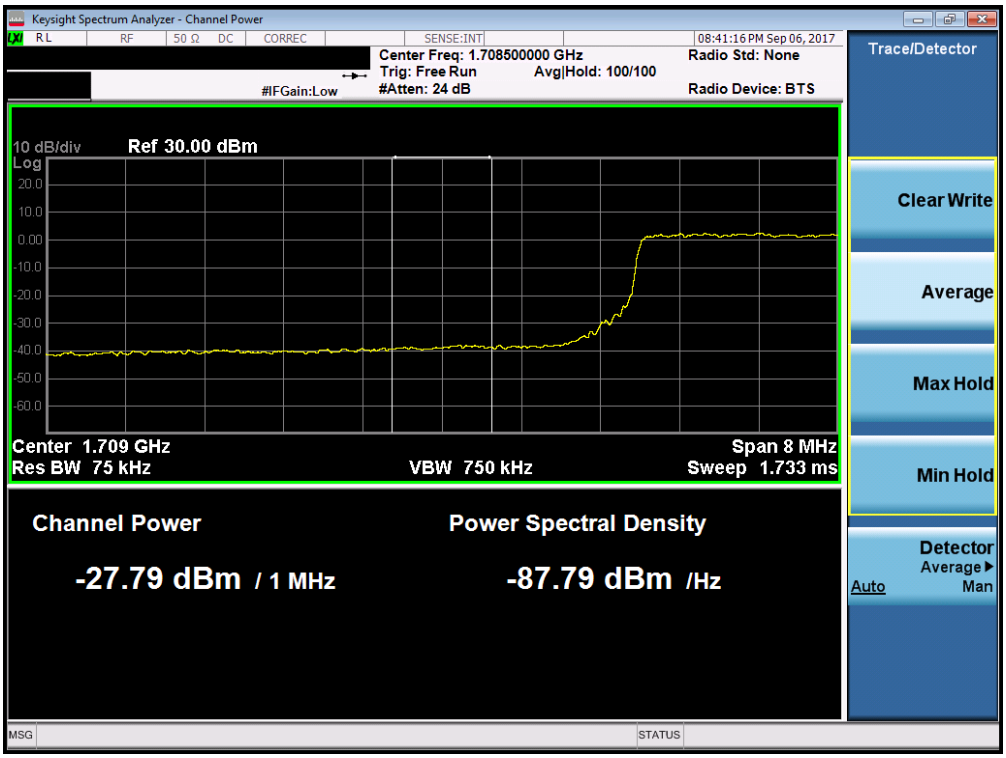
Plot 7-136. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



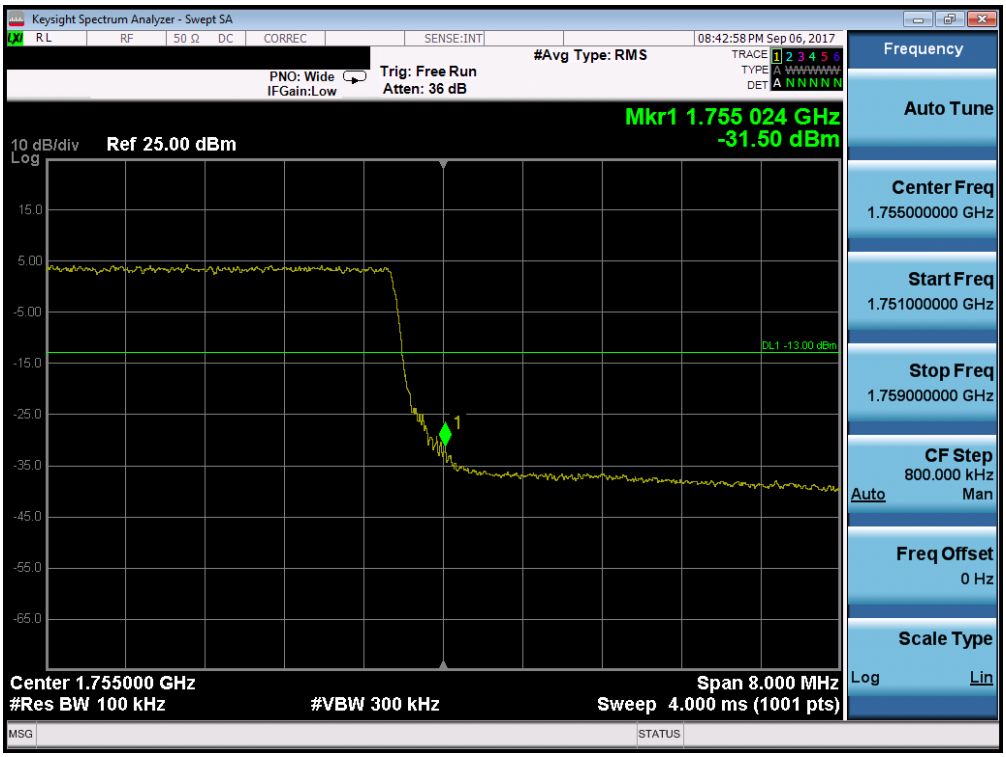
Plot 7-137. . Upper Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



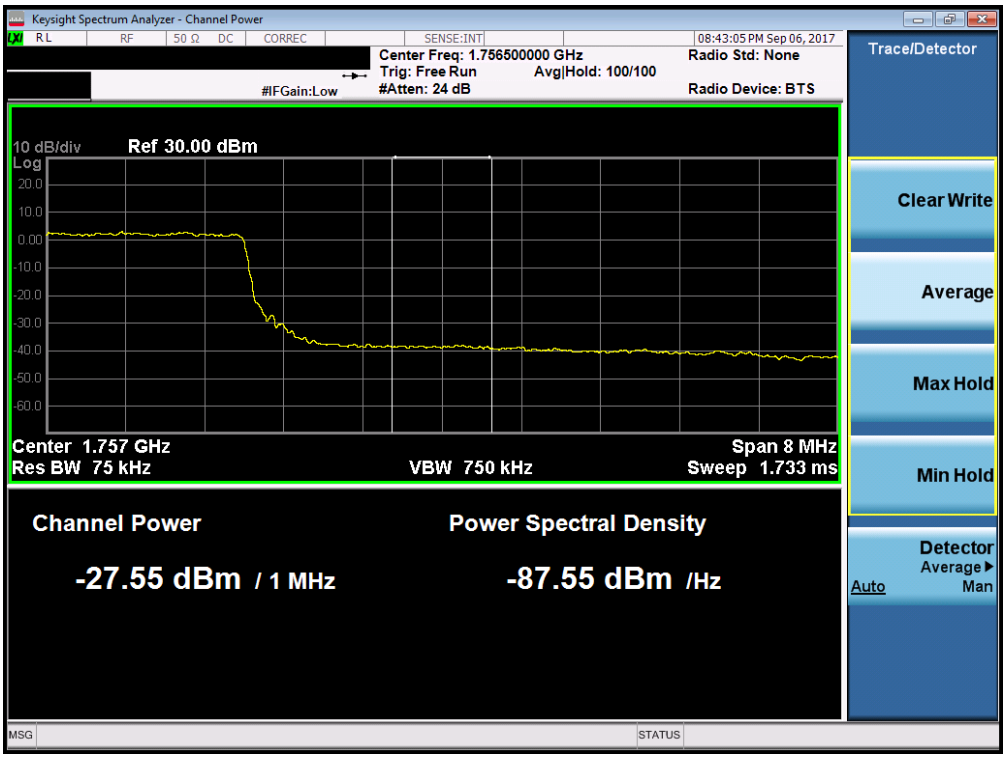
Plot 7-138. Lower Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



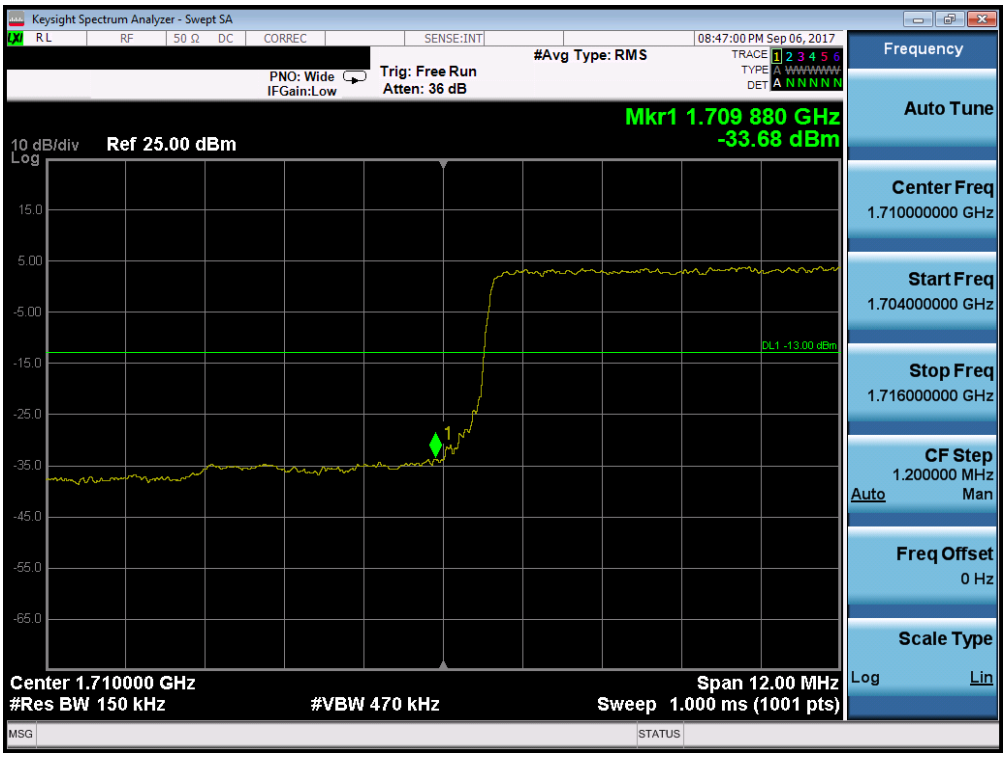
Plot 7-139. . Lower Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



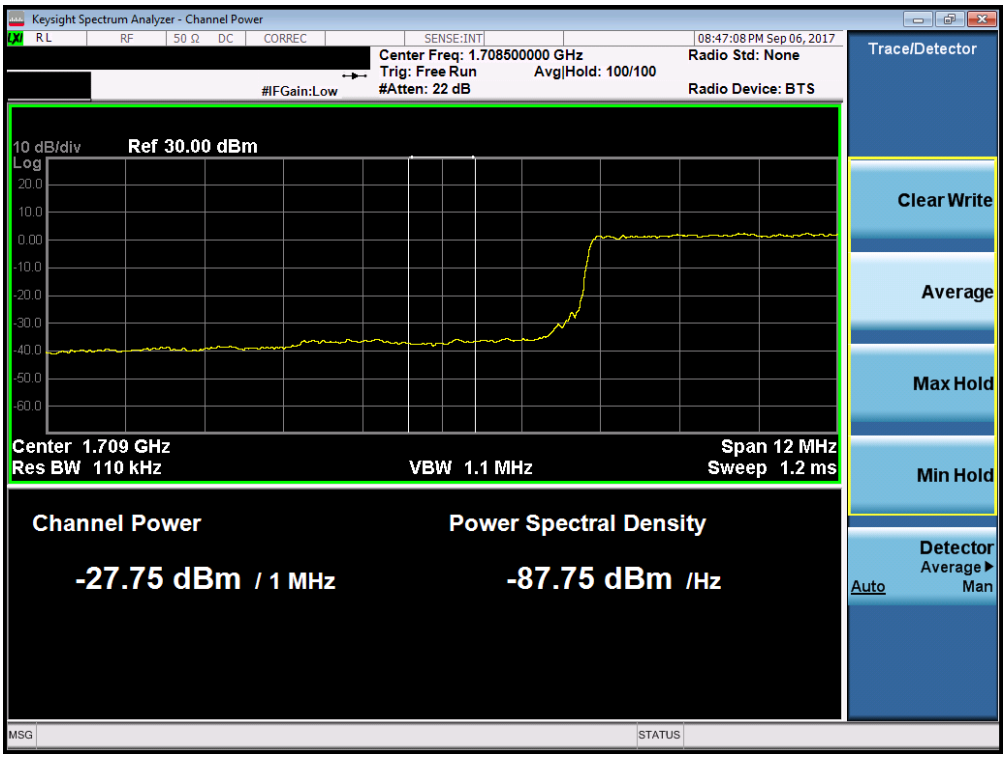
Plot 7-140. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-141. . Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

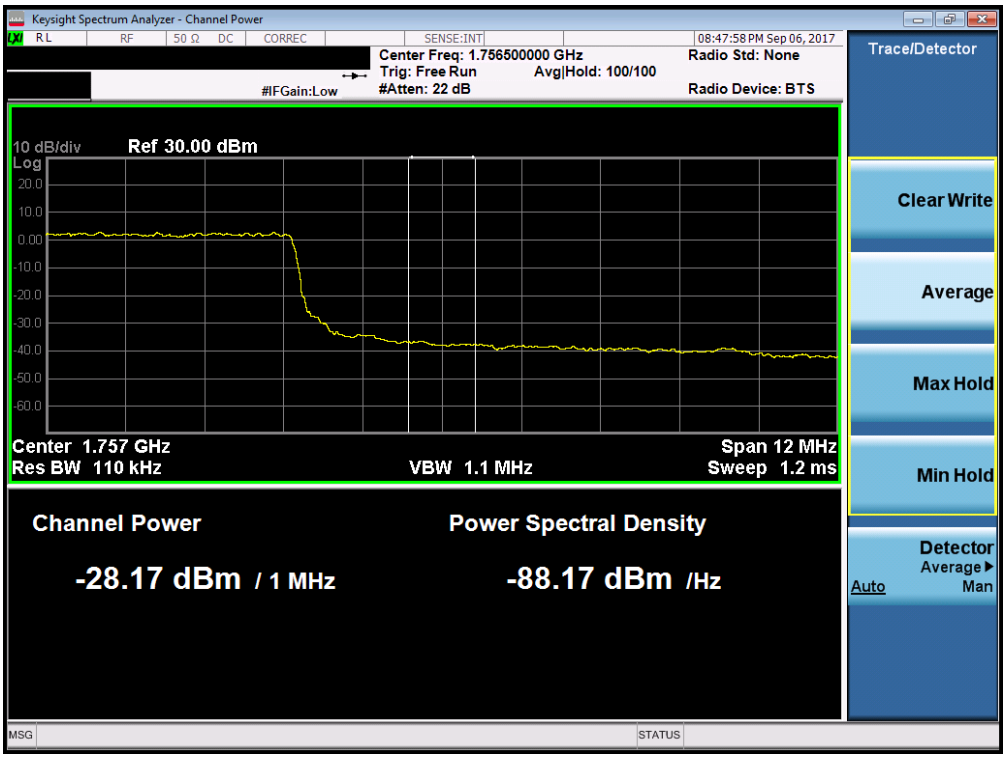


Plot 7-142. Lower Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

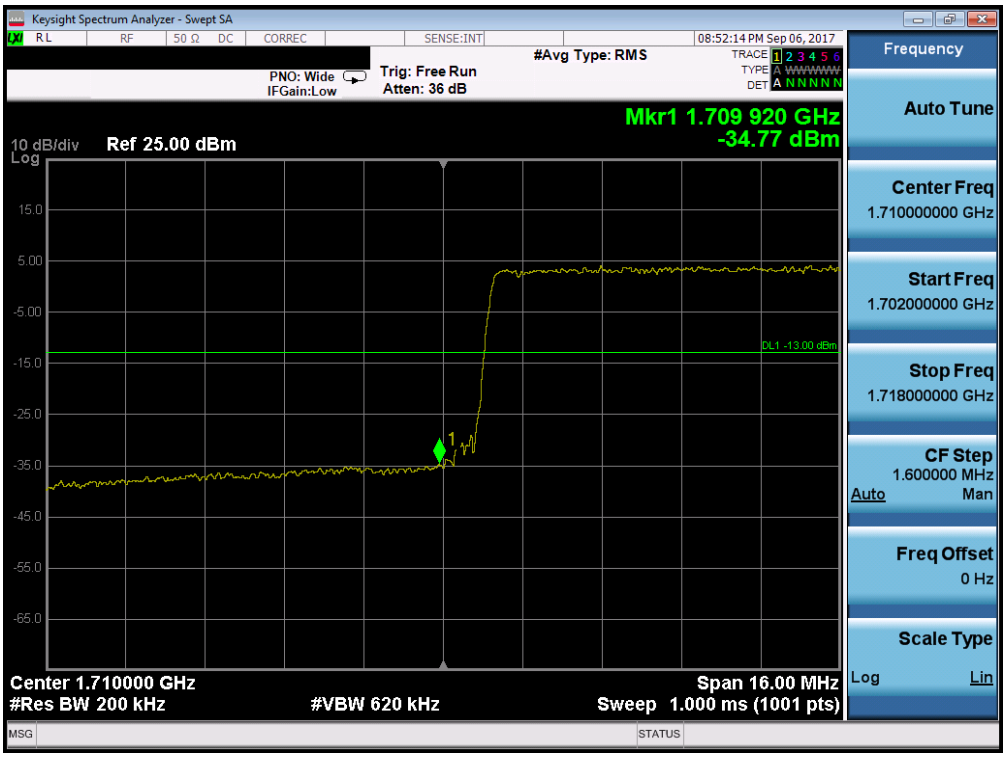


Plot 7-143. . Lower Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

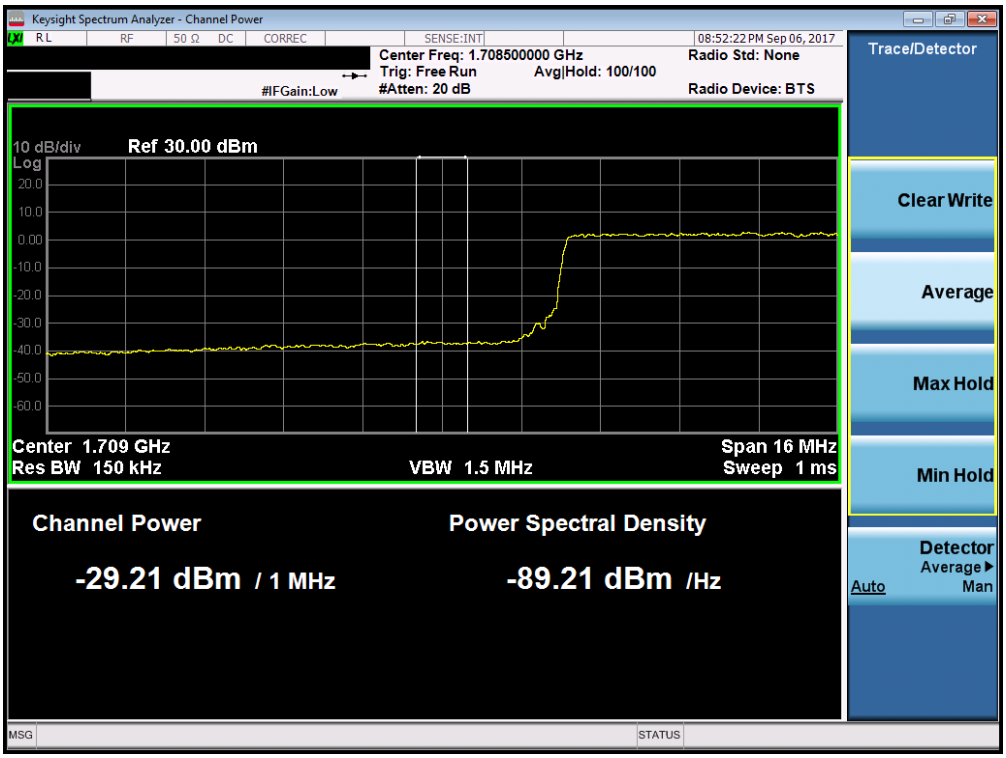
Plot 7-144. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



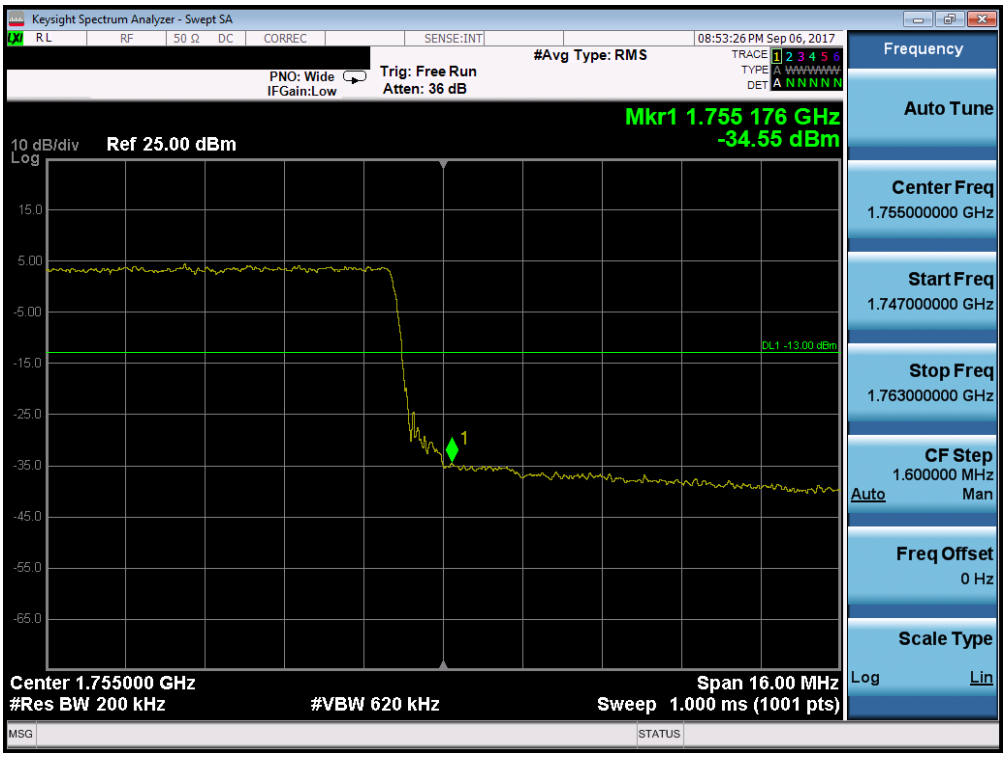
Plot 7-145. . Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



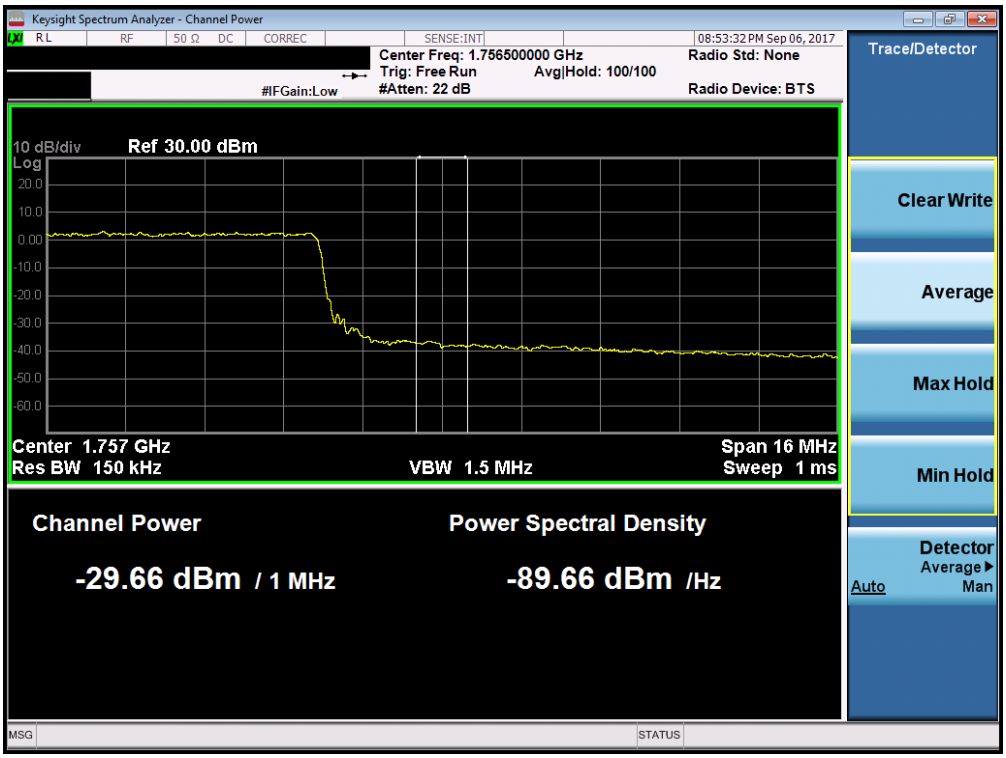
Plot 7-146. Lower Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



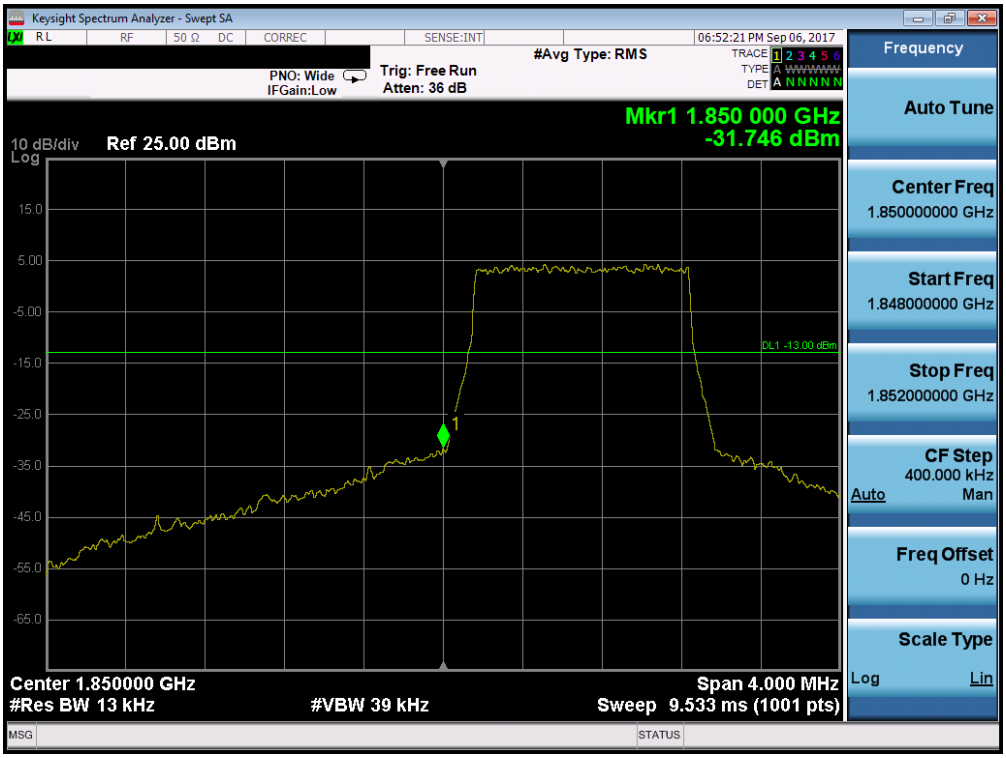
Plot 7-147. . Lower Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



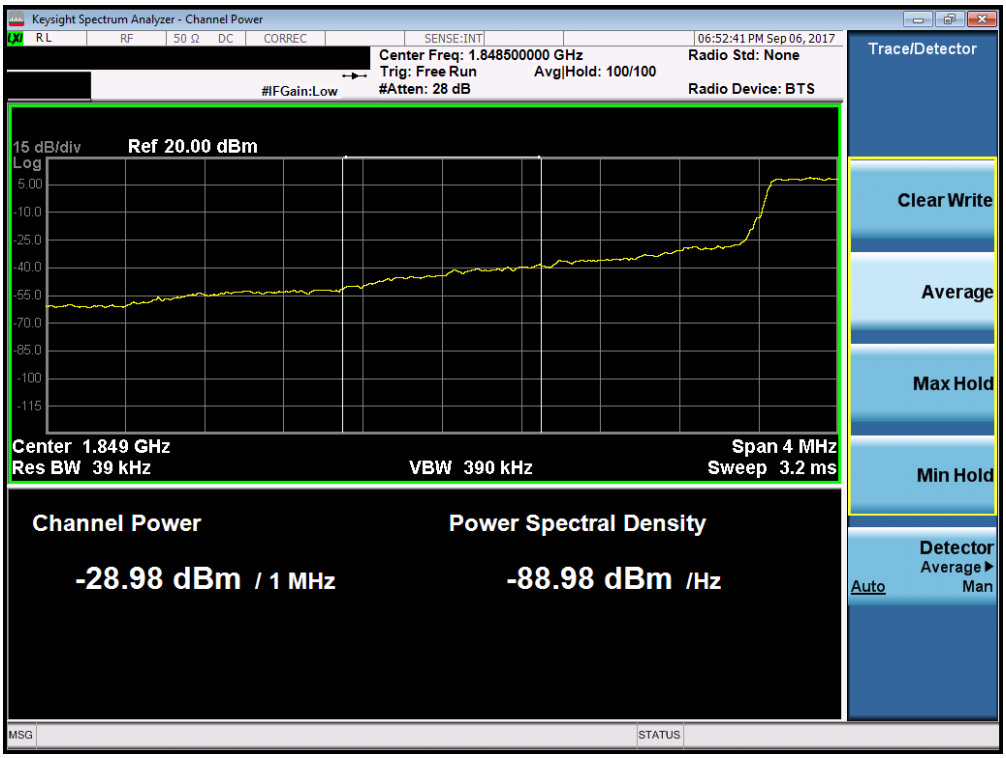
Plot 7-148. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



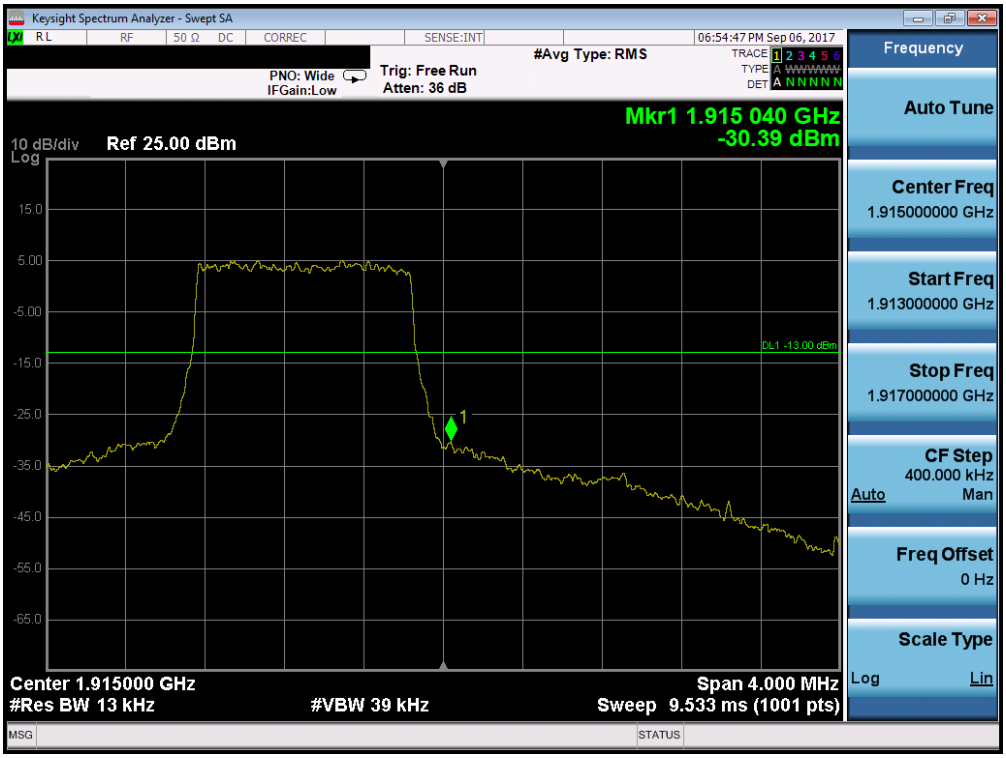
Plot 7-149. . Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



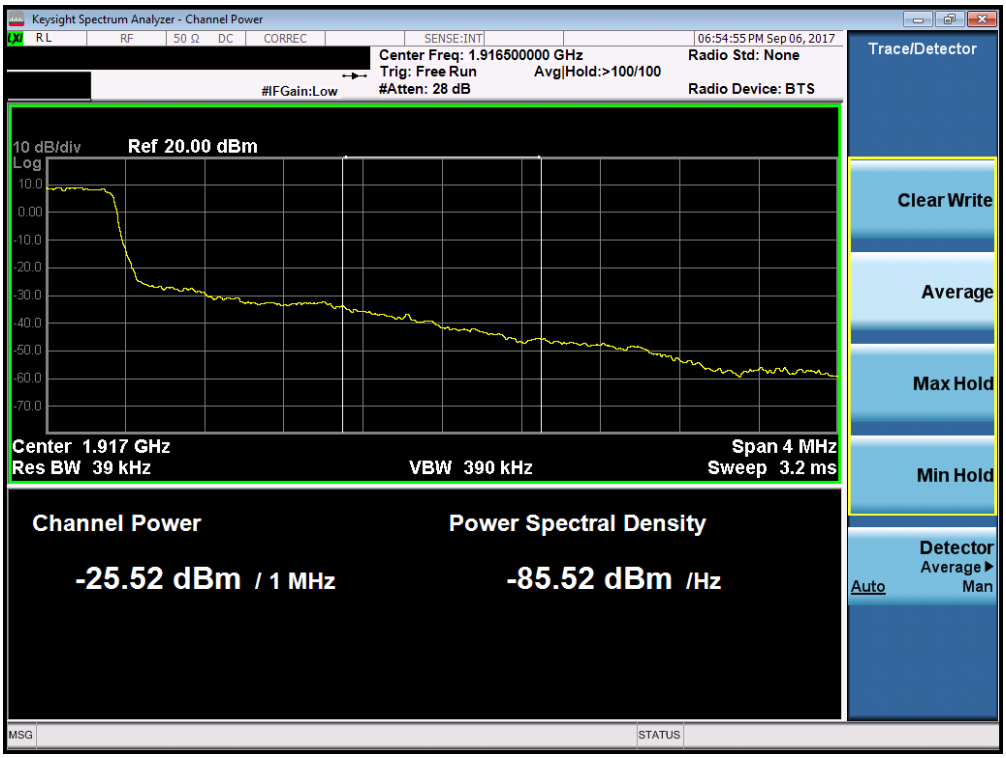
Plot 7-150. Lower Band Edge Plot (Band 25/2 – 1.4MHz QPSK - Full RB Configuration)



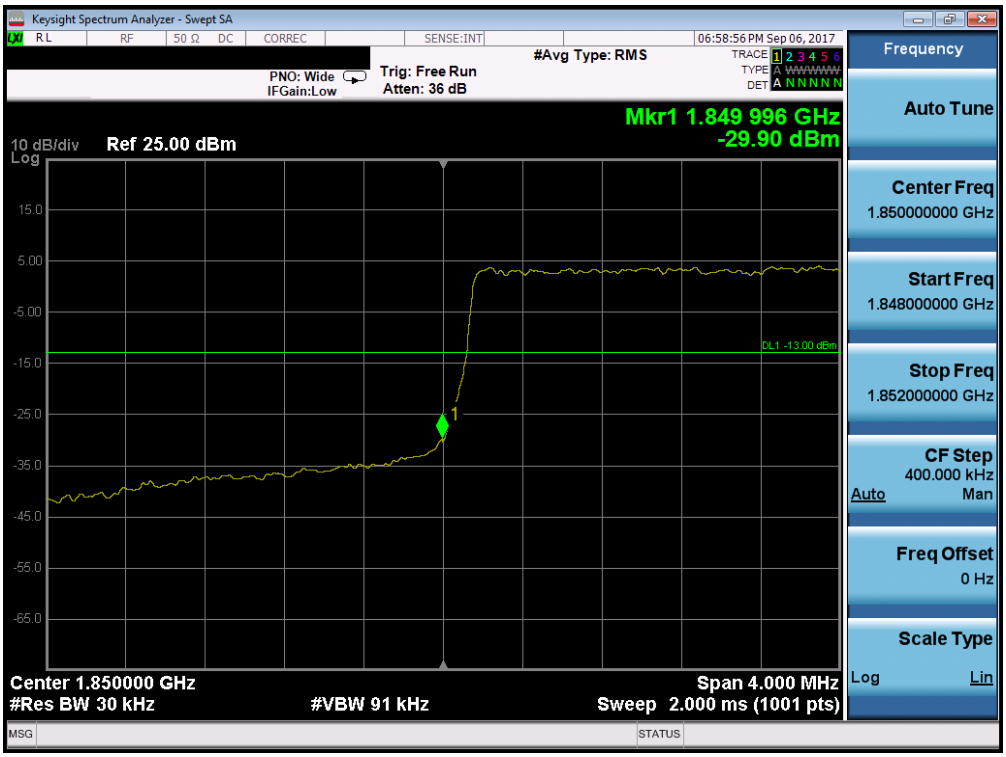
Plot 7-151. . Lower Extended Band Edge Plot (Band 25/2 – 1.4MHz QPSK - Full RB Configuration)



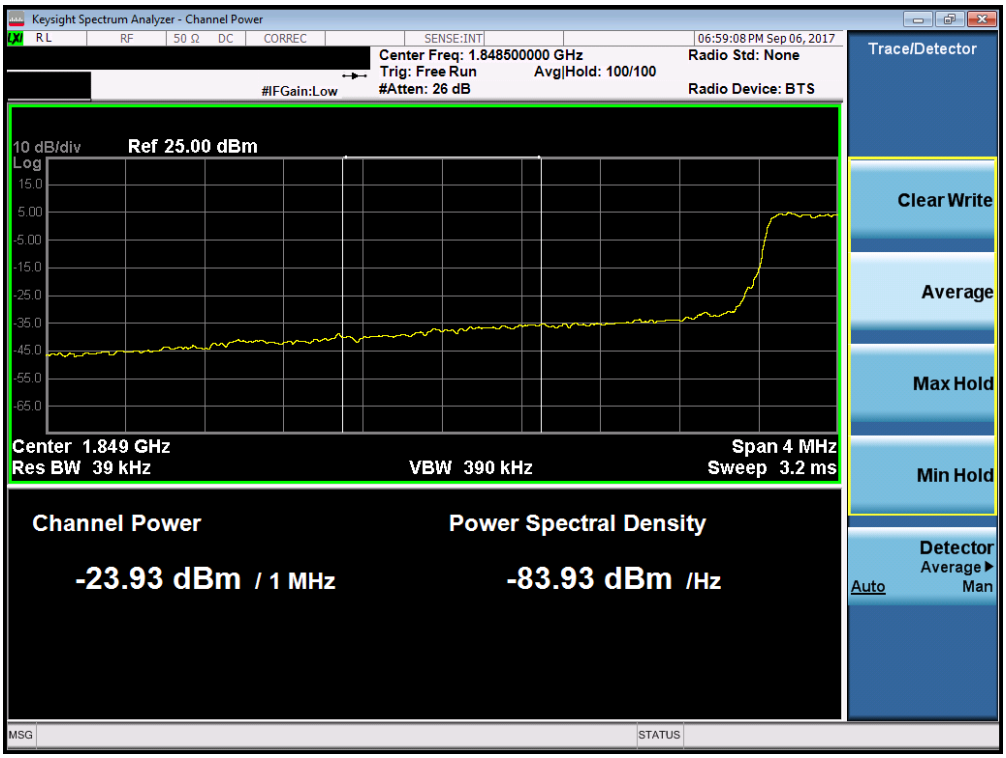
Plot 7-152. Upper Band Edge Plot (Band 25 – 1.4MHz QPSK - Full RB Configuration)



Plot 7-153. . Upper Extended Band Edge Plot (Band 25 – 1.4MHz QPSK - Full RB Configuration)

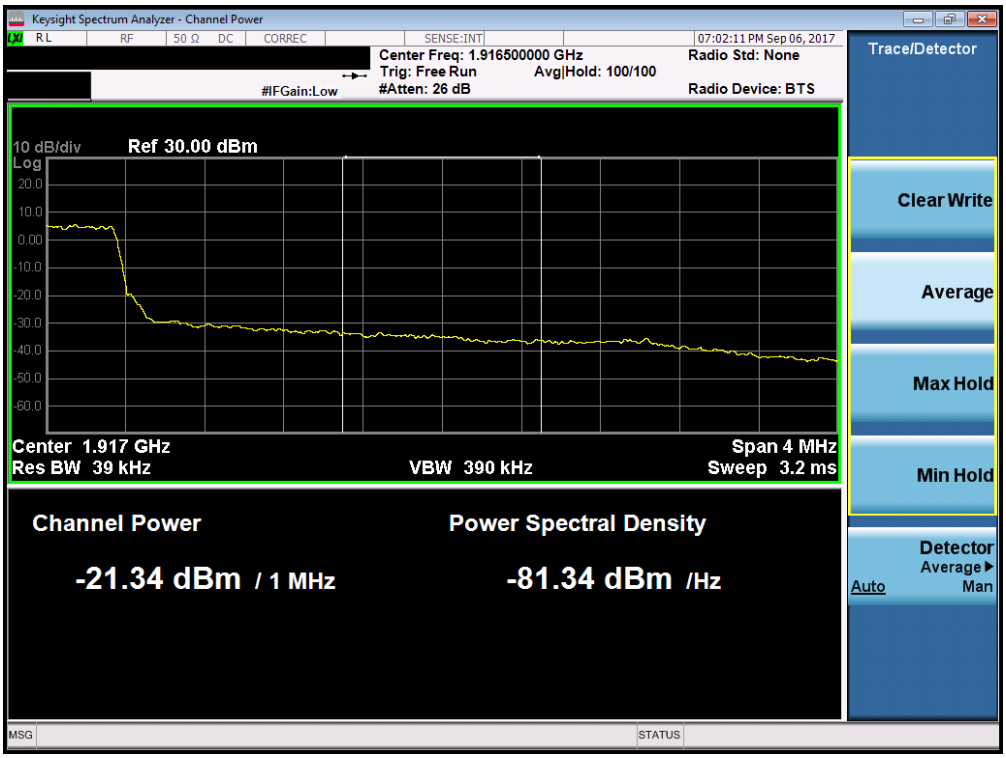


Plot 7-154. Lower Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

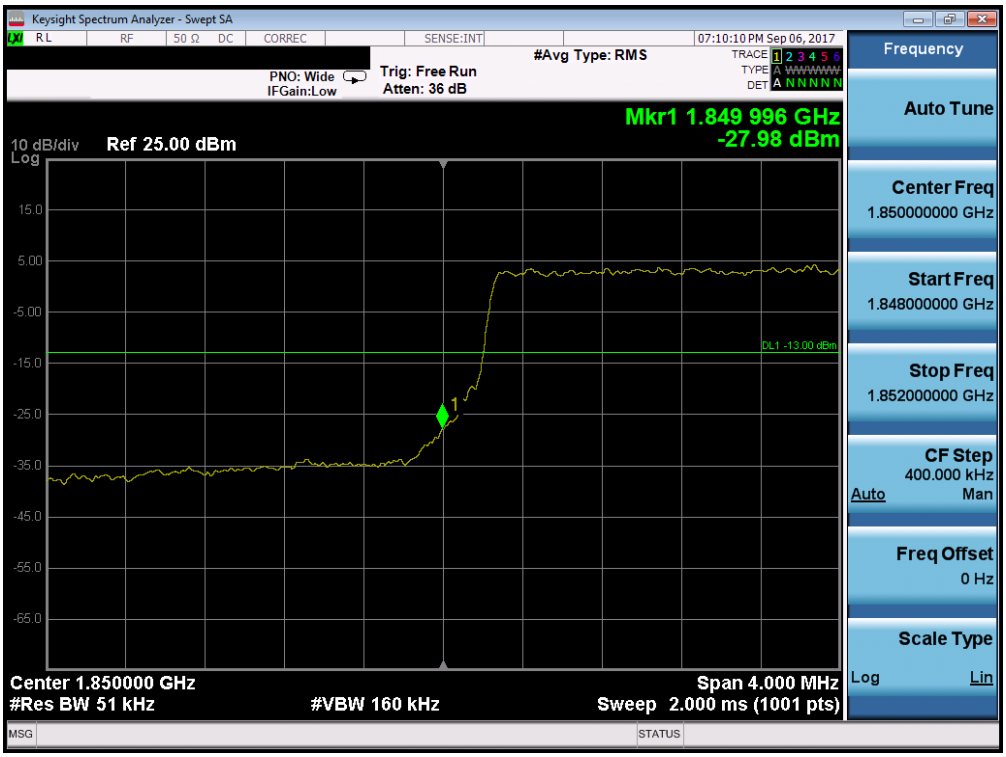


Plot 7-155. . Lower Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

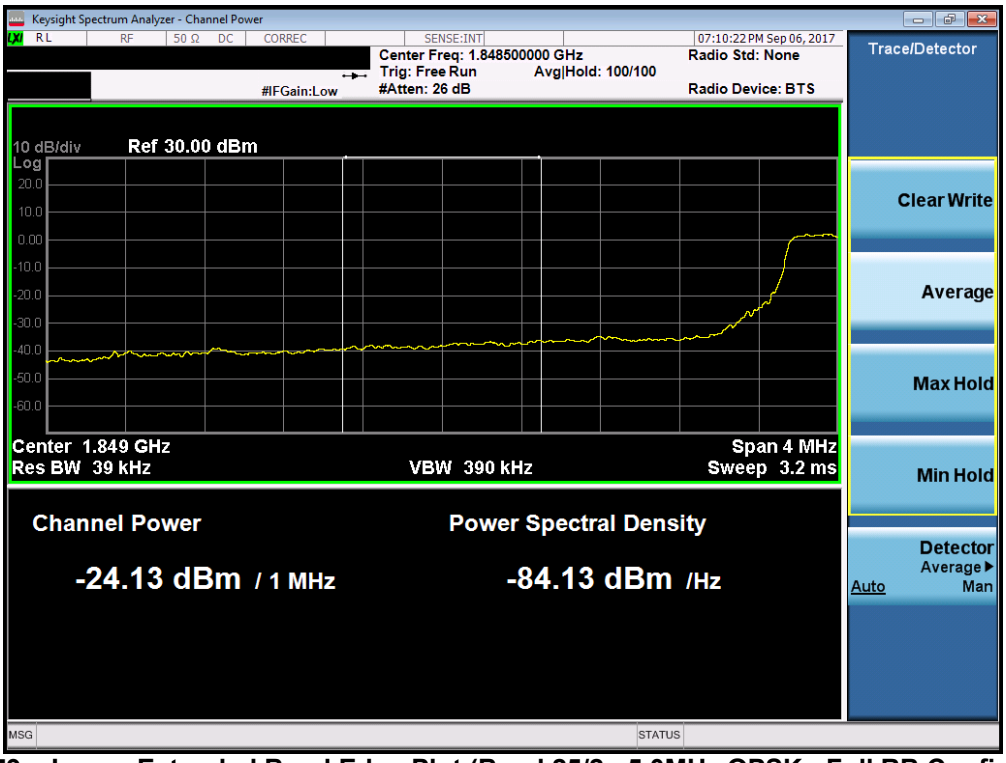
Plot 7-156. Upper Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-157. . Upper Extended Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)

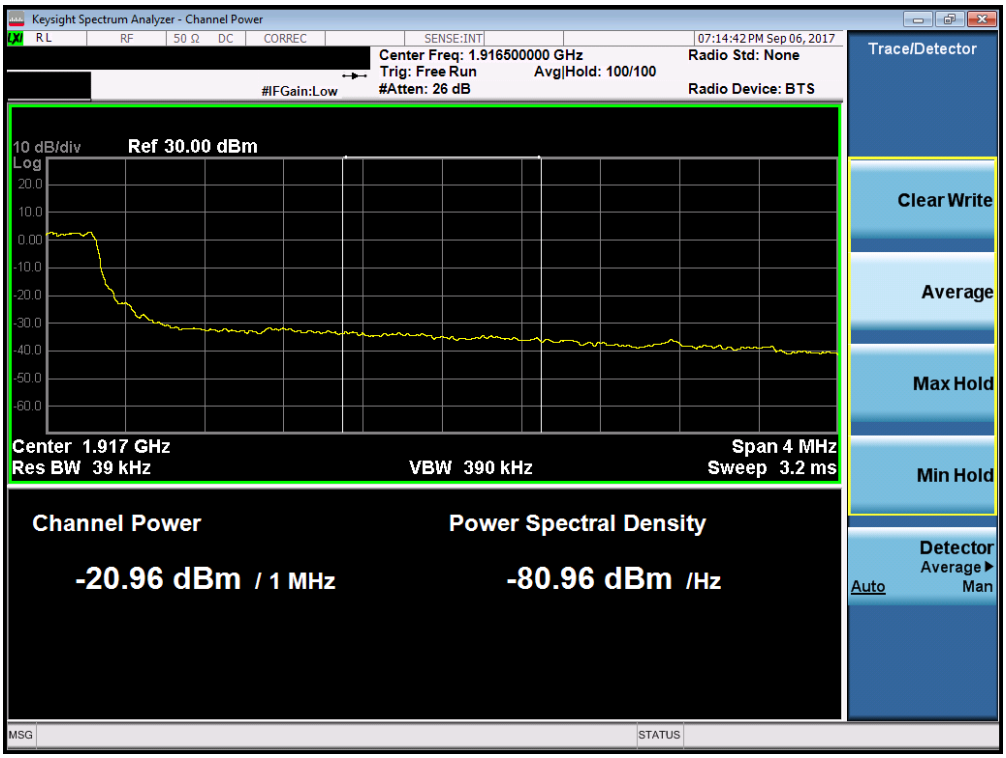


Plot 7-158. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

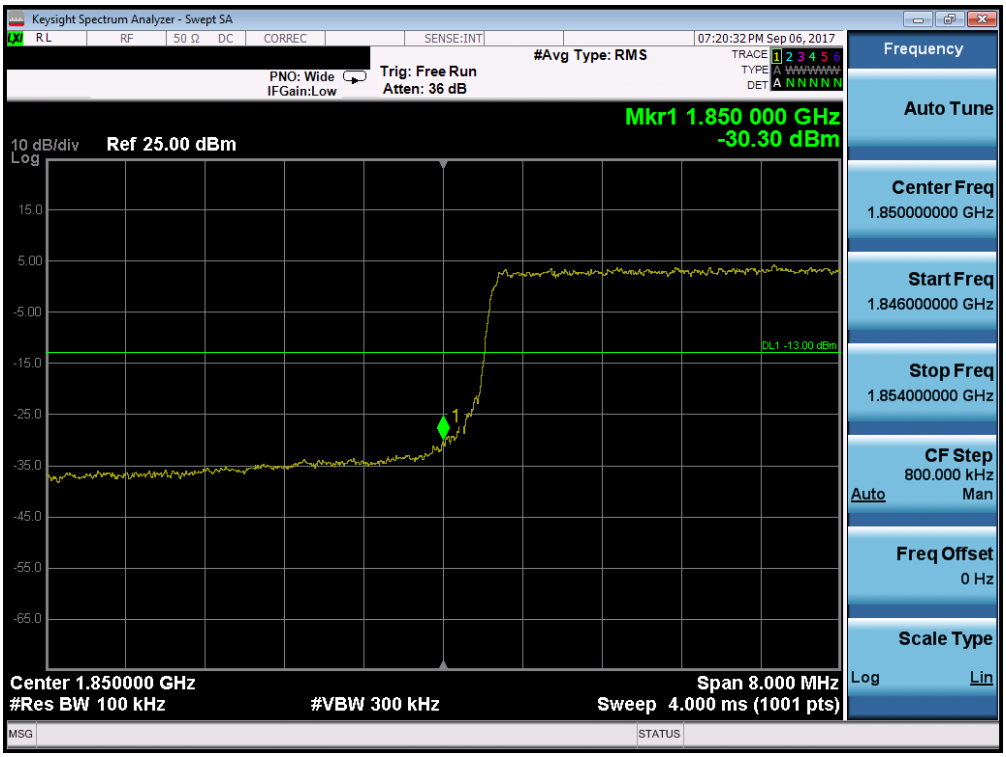


Plot 7-159. . Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

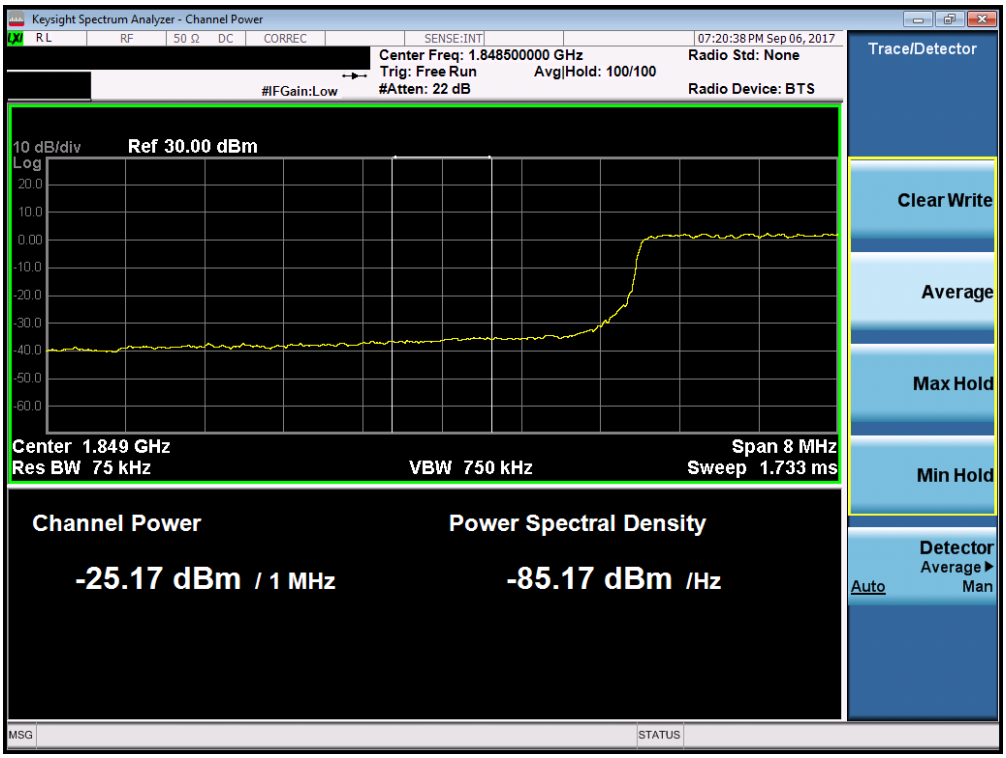
Plot 7-160. Upper Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)



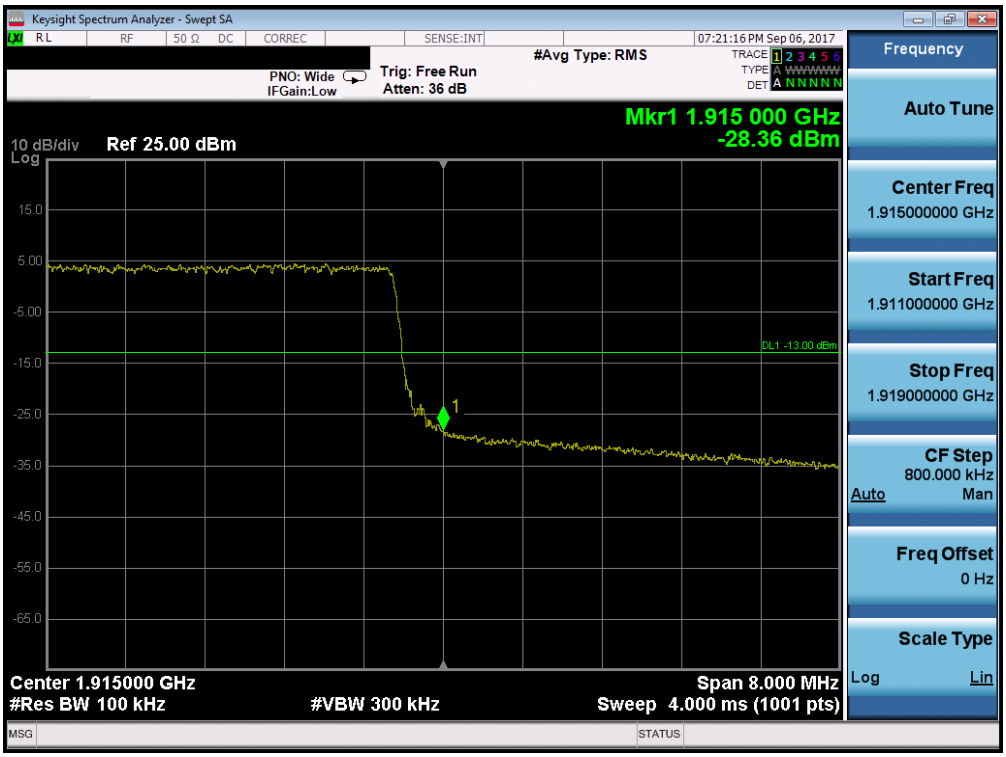
Plot 7-161. . Upper Extended Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)



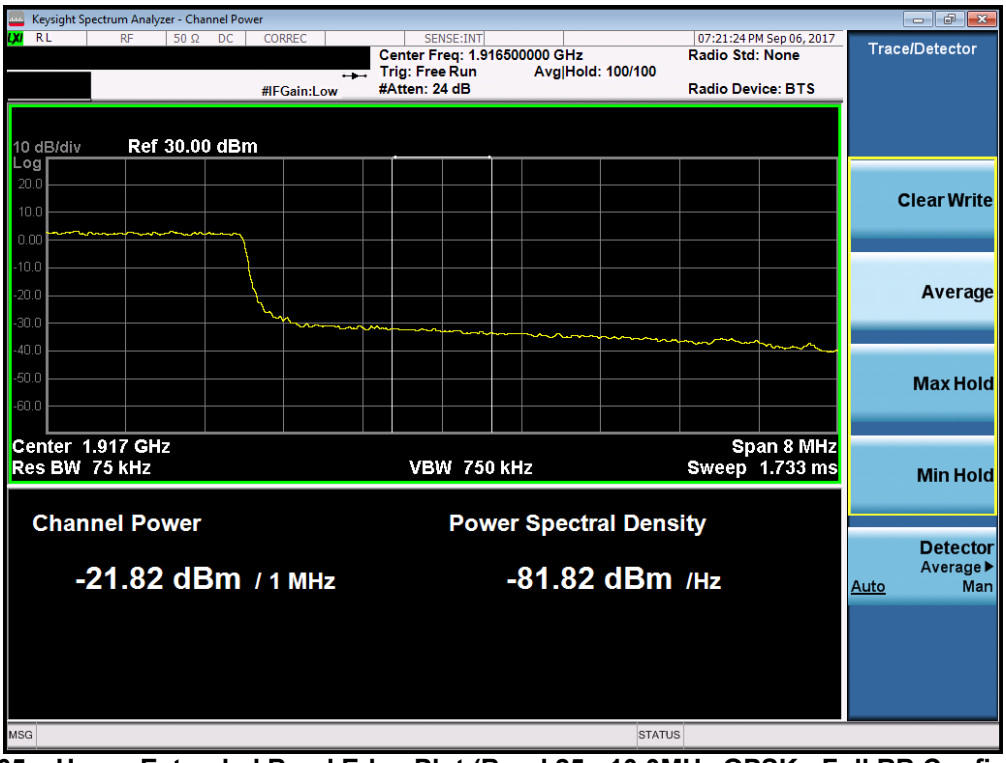
Plot 7-162. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



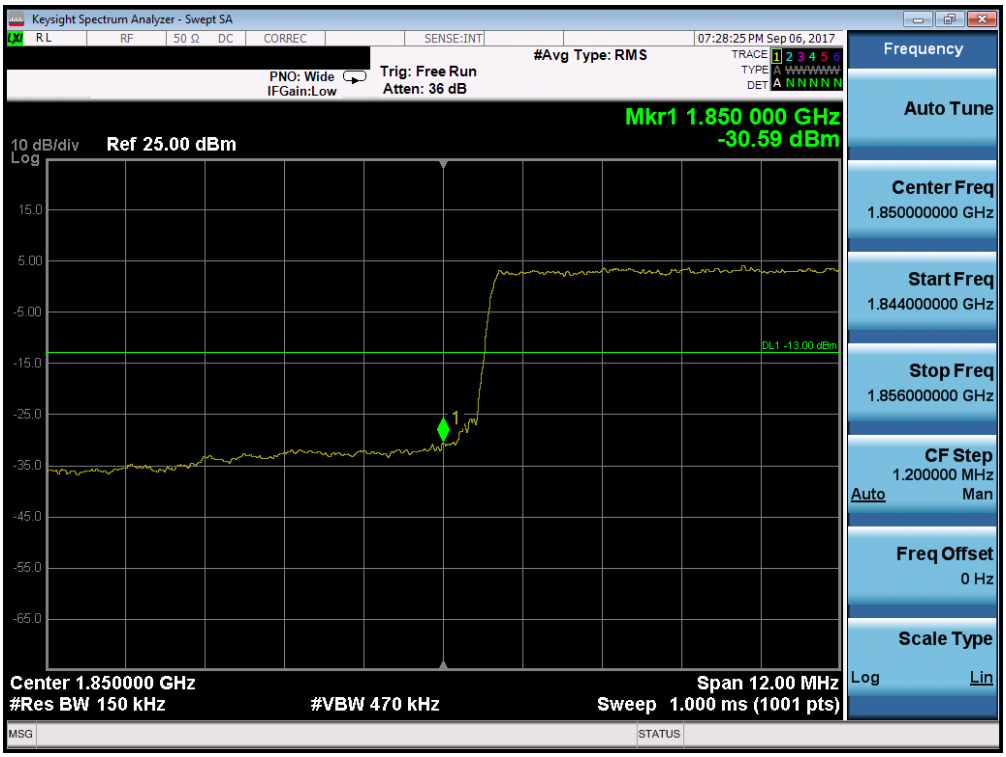
Plot 7-163. . Lower Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



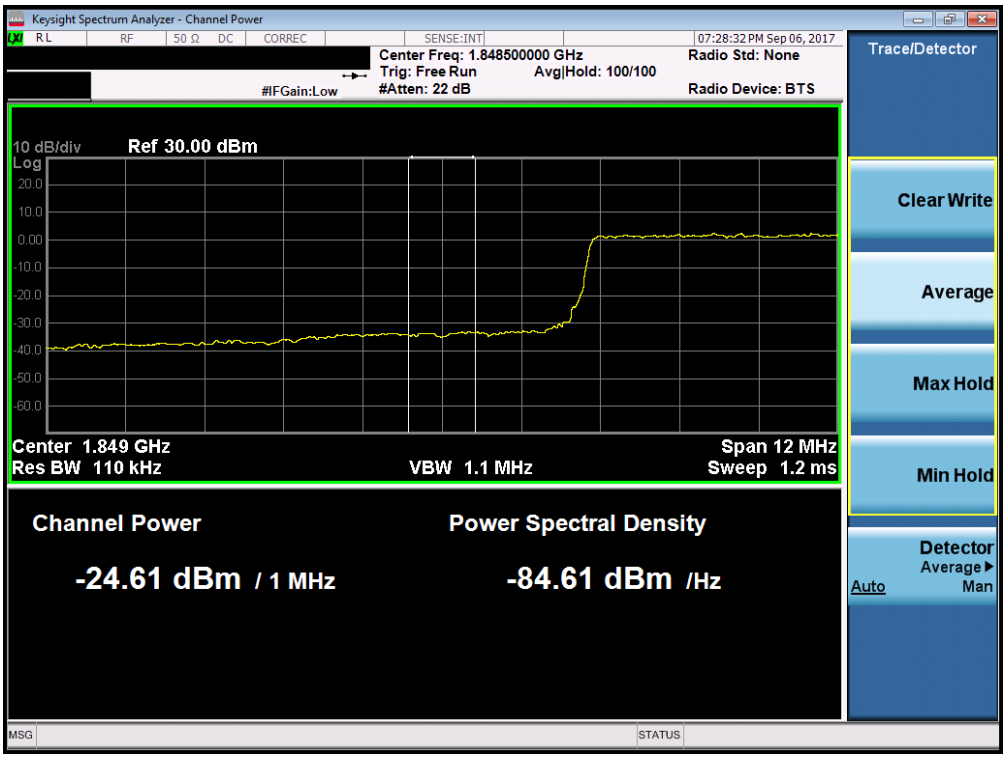
Plot 7-164. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-165. . Upper Extended Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)

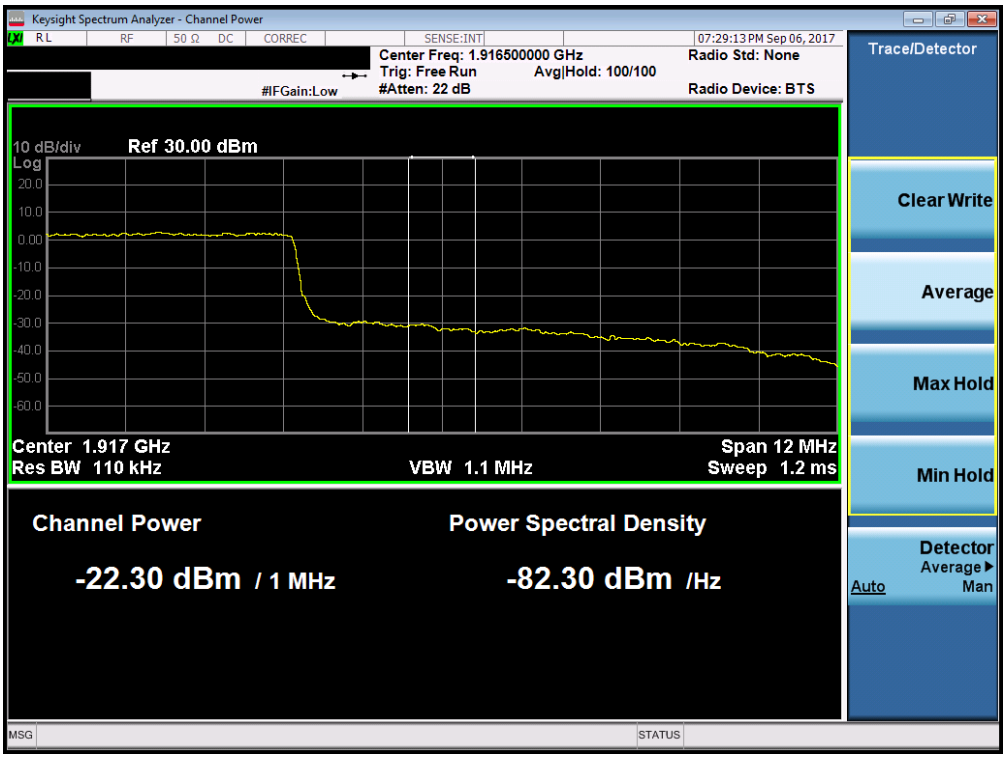


Plot 7-166. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

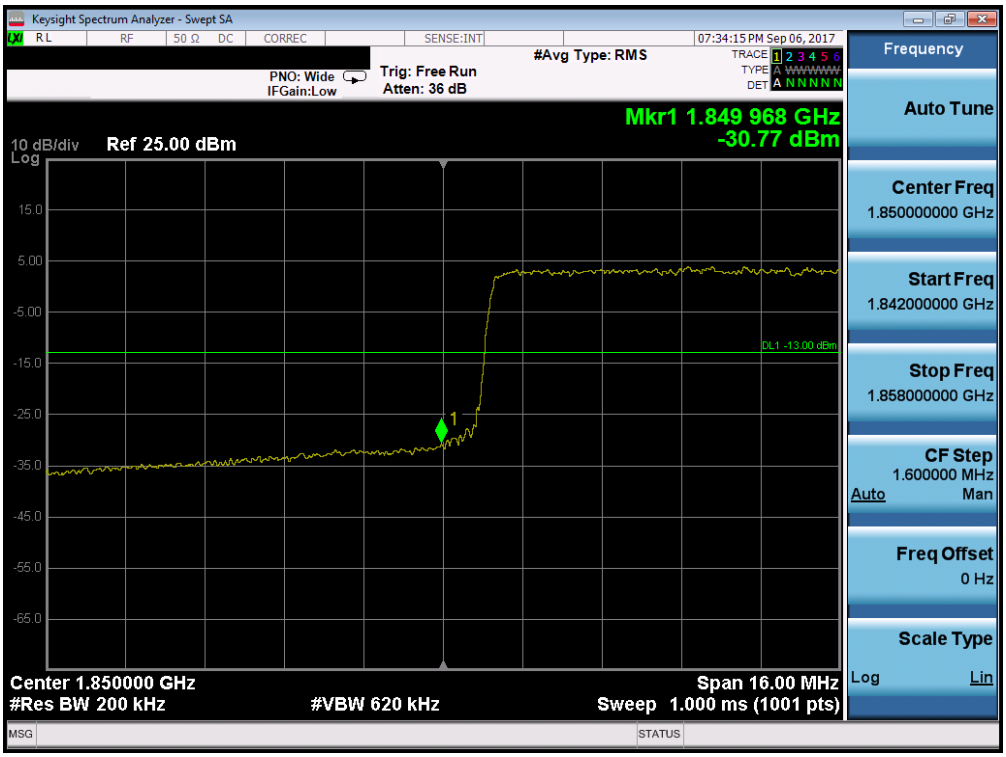


Plot 7-167. . Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

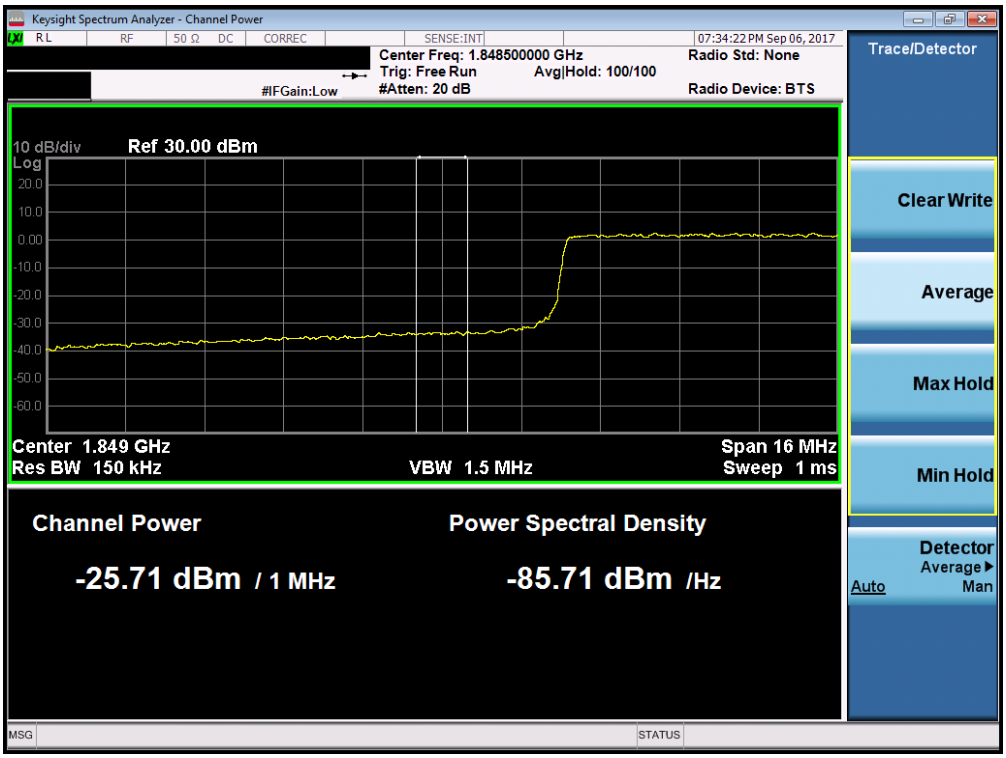
Plot 7-168. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-169. . Upper Extended Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

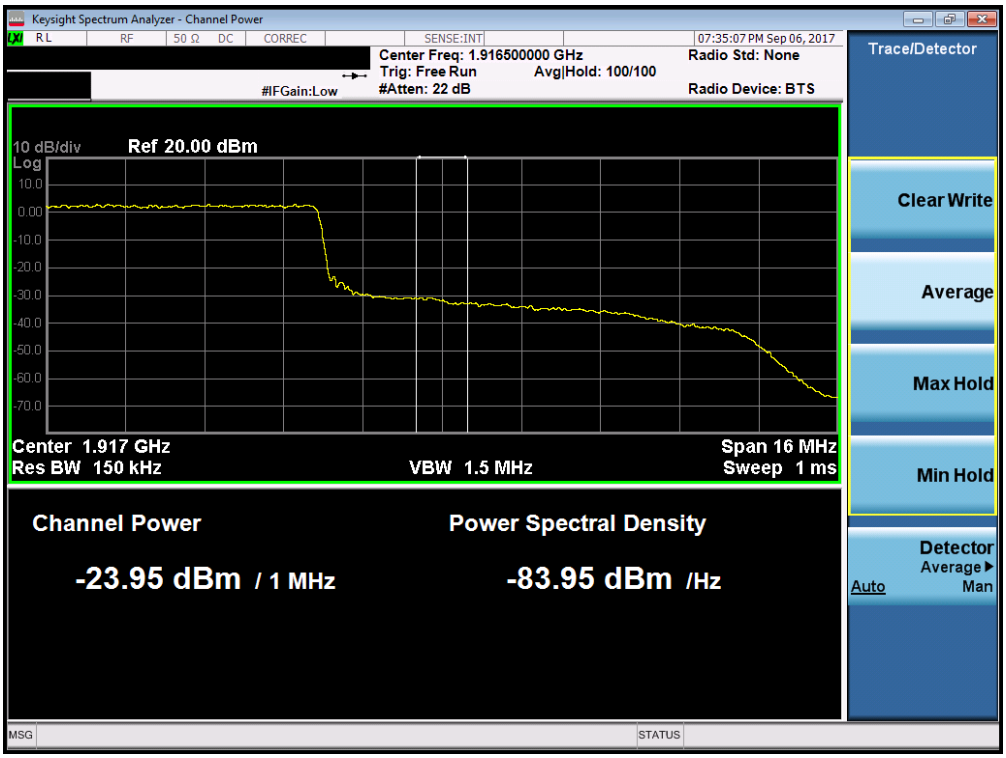


Plot 7-170. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

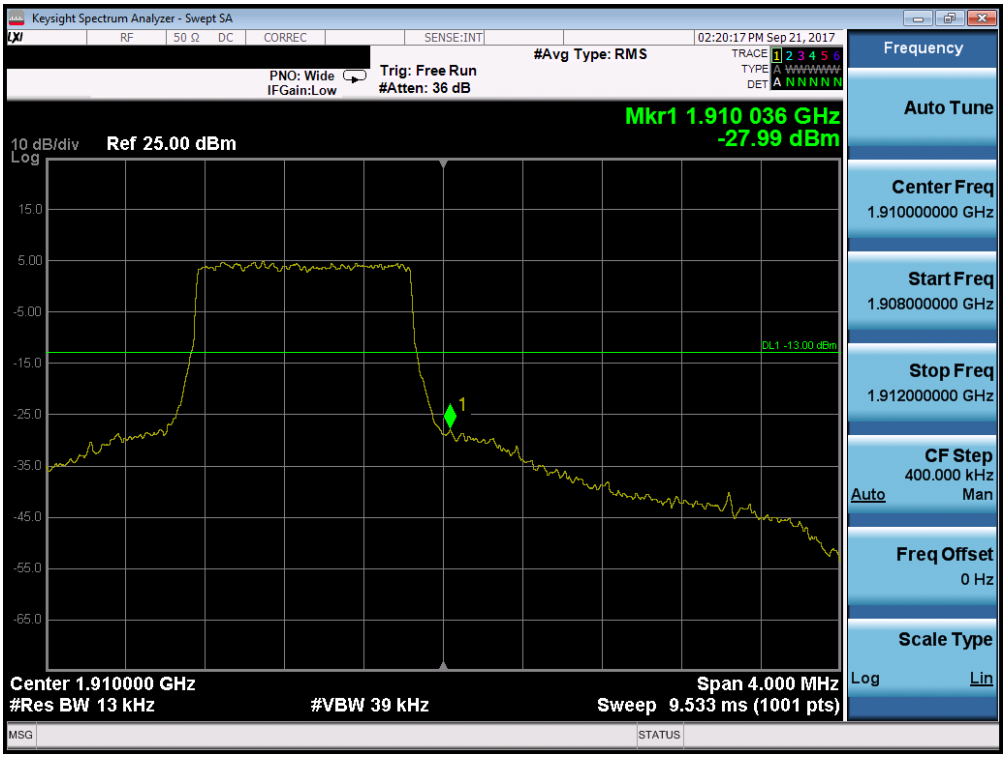


Plot 7-171. . Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

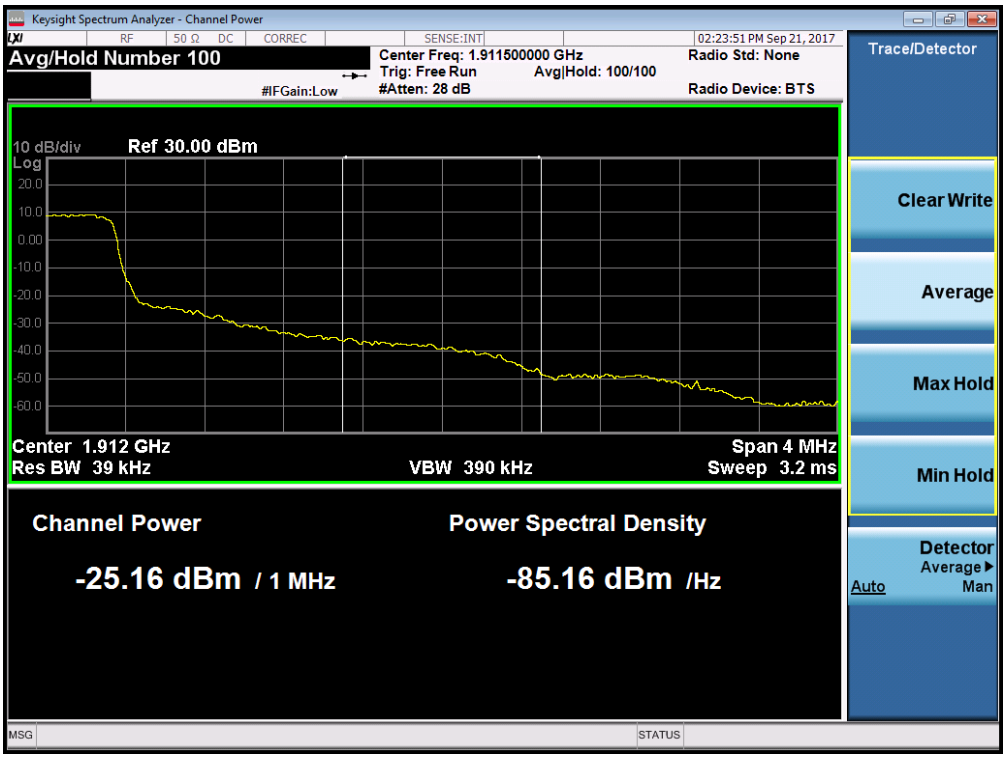
Plot 7-172. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



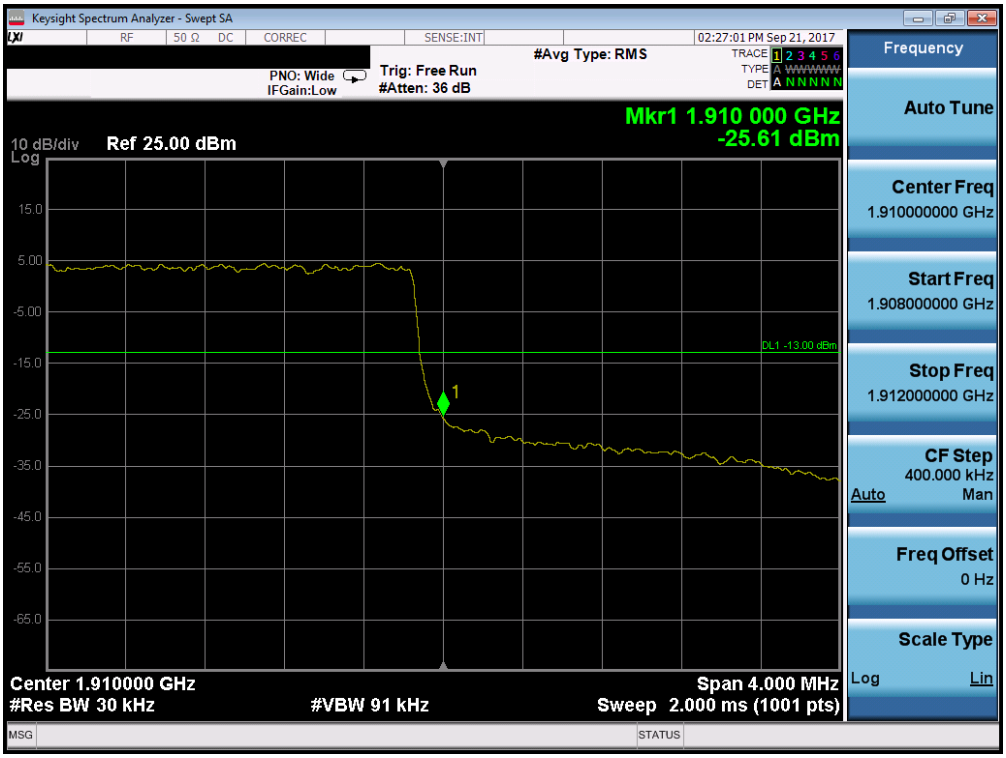
Plot 7-173. . Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



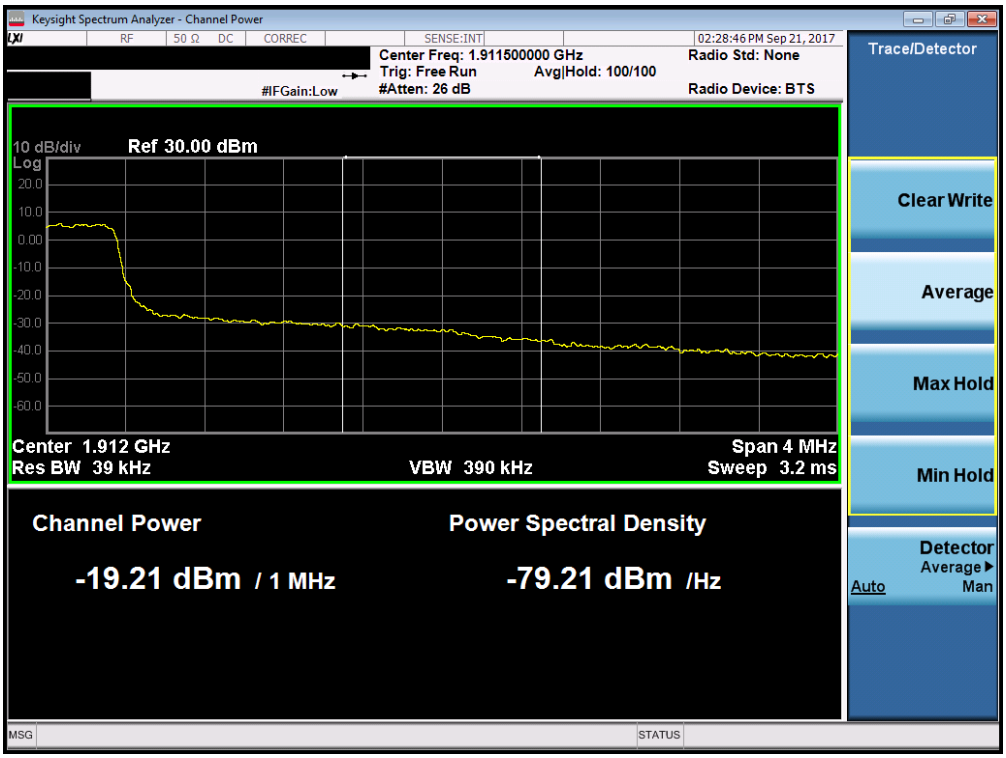
Plot 7-174. Upper Band Edge Plot (Band 2 – 1.4MHz QPSK - Full RB Configuration)



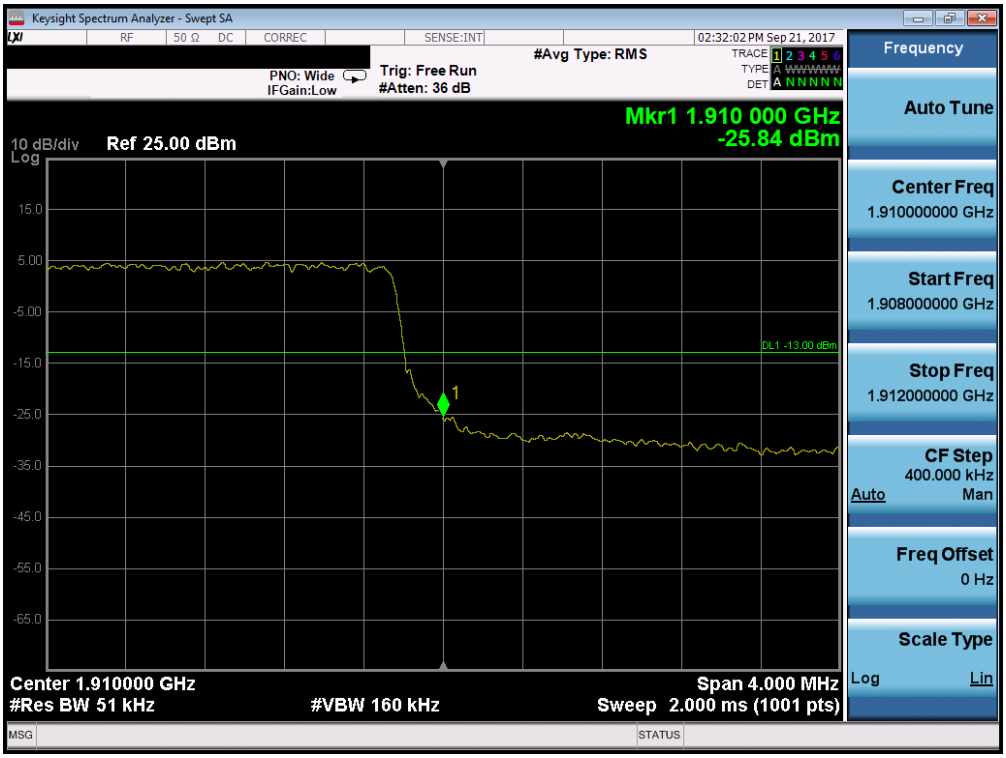
Plot 7-175. . Upper Extended Band Edge Plot (Band 2 – 1.4MHz QPSK - Full RB Configuration)



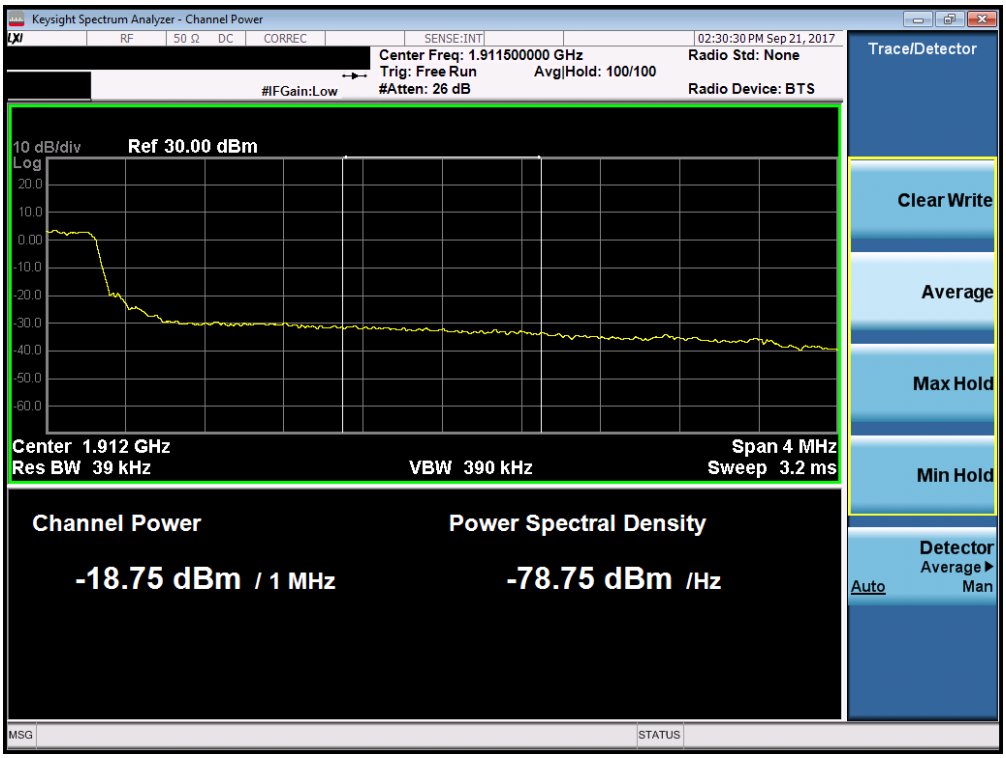
Plot 7-176. Upper Band Edge Plot (Band 2 – 3.0MHz QPSK - Full RB Configuration)



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

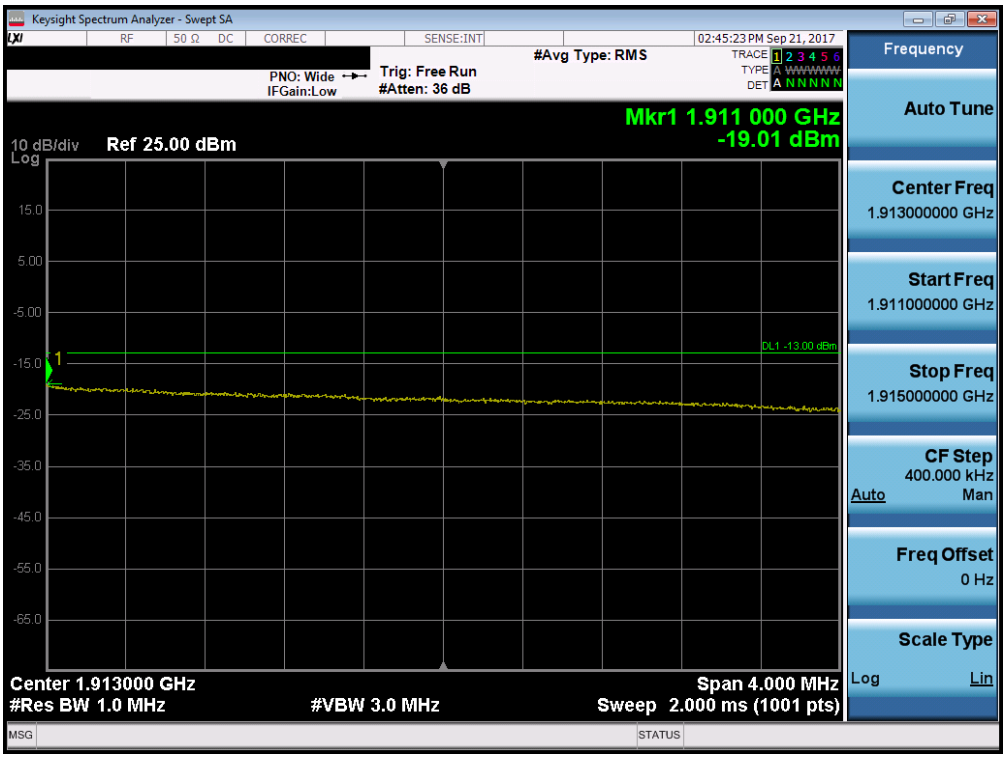


Plot 7-178. Upper Band Edge Plot (Band 2 – 5.0MHz QPSK - Full RB Configuration)



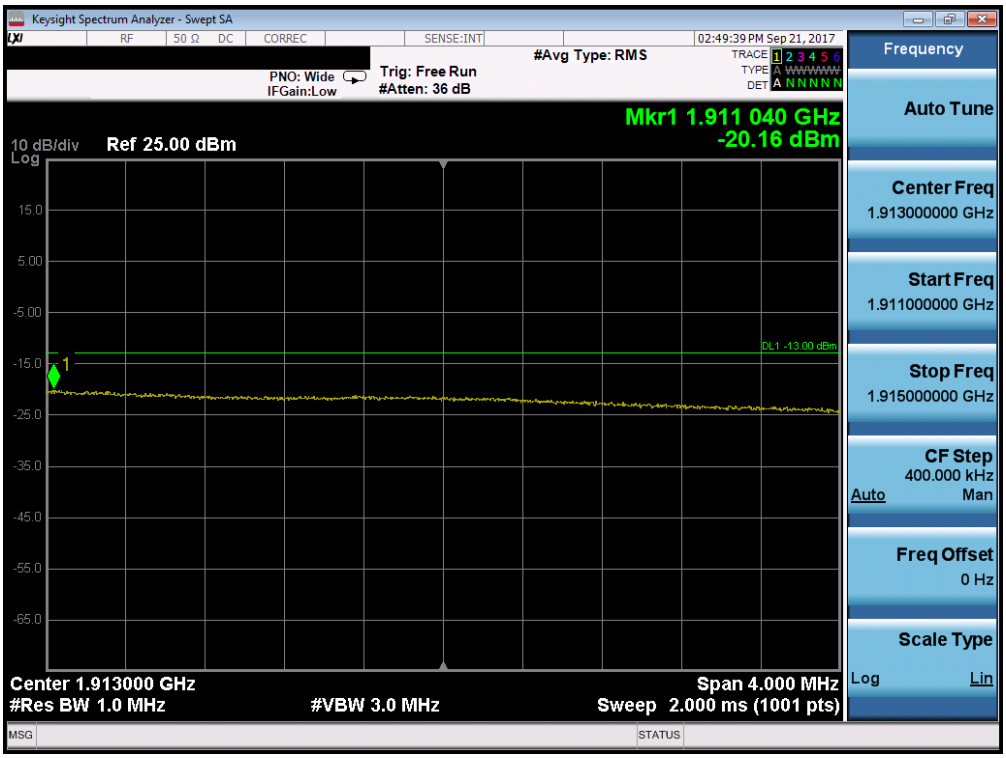
Plot 7-179. . Upper Extended Band Edge Plot (Band 2 – 5.0MHz QPSK - Full RB Configuration)

Plot 7-180. Upper Band Edge Plot (Band 2 – 10.0MHz QPSK - Full RB Configuration)



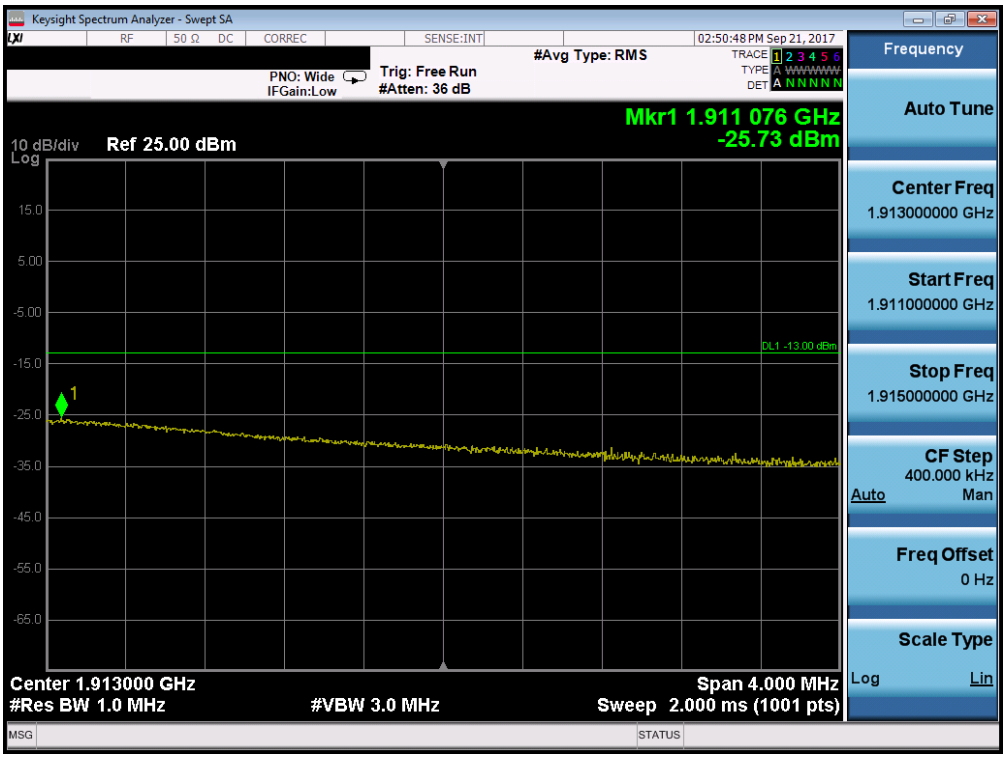
Plot 7-181. . Upper Extended Band Edge Plot (Band 2 – 10.0MHz QPSK - Full RB Configuration)

Plot 7-182. Upper Band Edge Plot (Band 2 – 15.0MHz QPSK - Full RB Configuration)

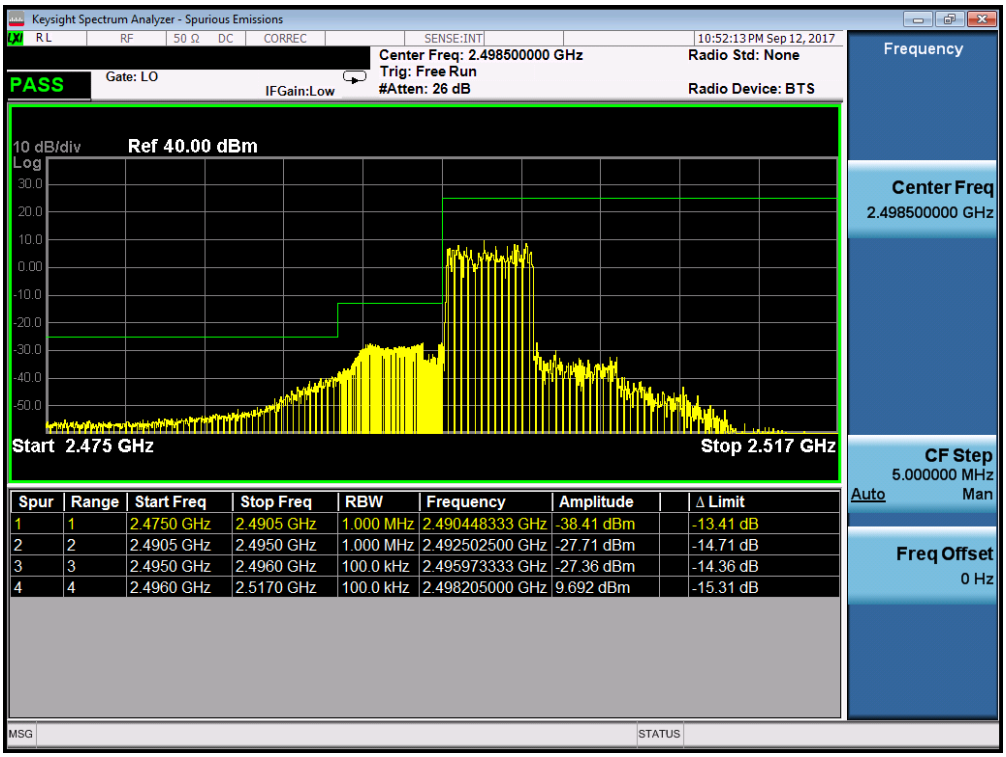


Plot 7-183. . Upper Extended Band Edge Plot (Band 2 – 15.0MHz QPSK - Full RB Configuration)

Plot 7-184. Upper Band Edge Plot (Band 2 – 20.0MHz QPSK - Full RB Configuration)

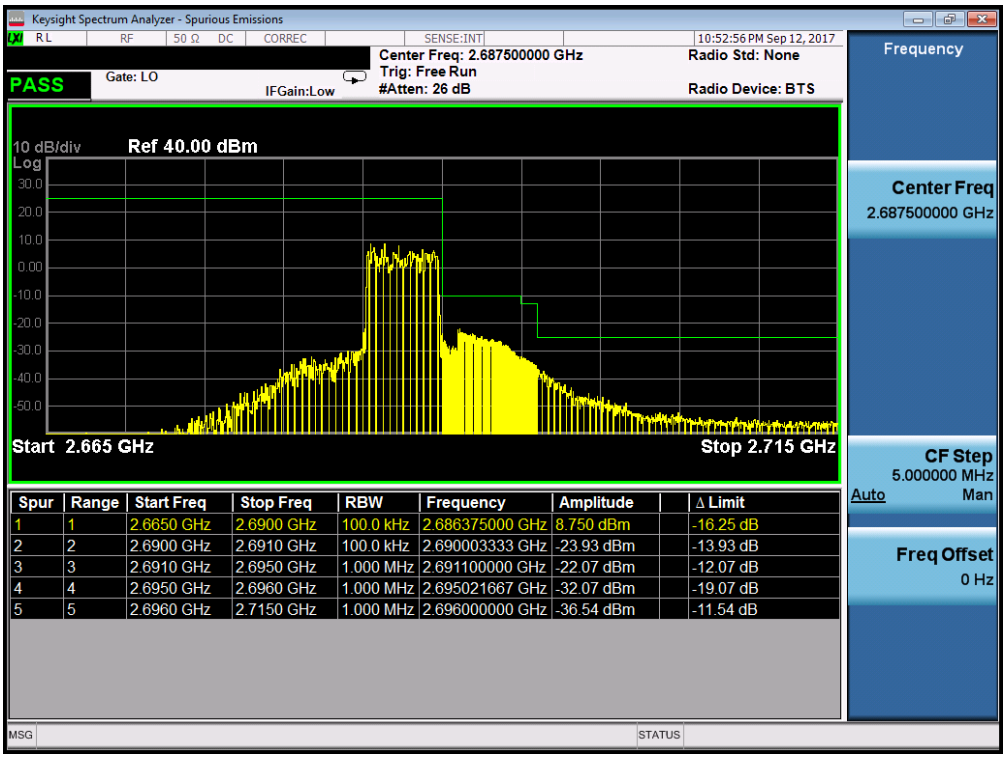


Plot 7-185. . Upper Extended Band Edge Plot (Band 2 – 20.0MHz QPSK - Full RB Configuration)



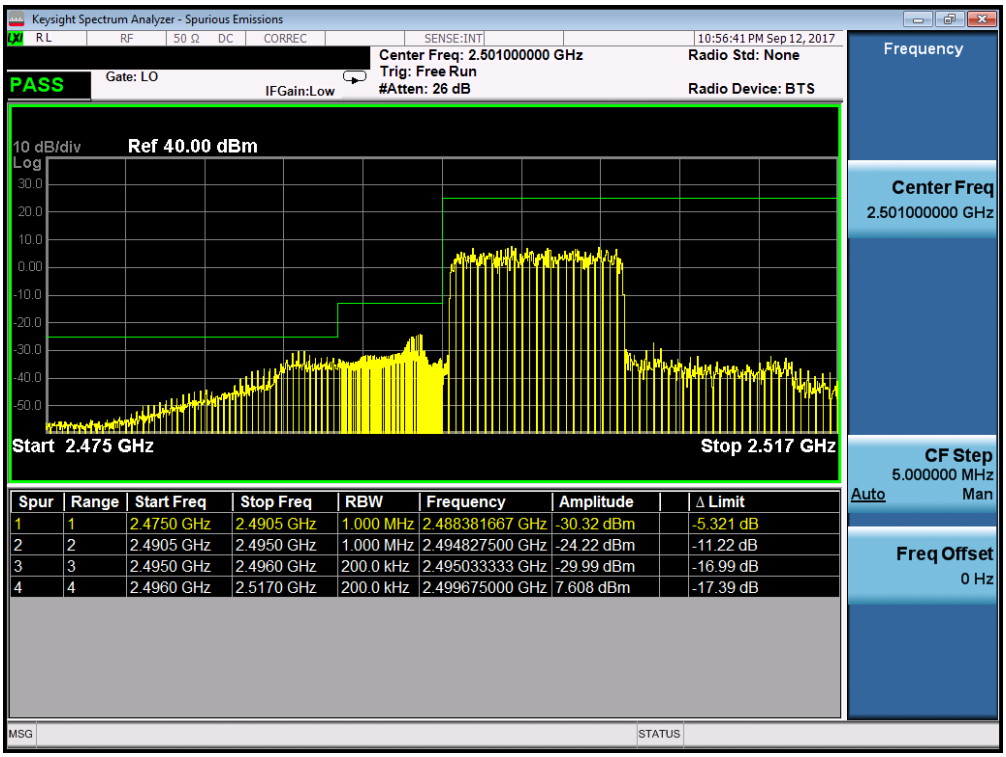
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490448333 GHz	-38.41 dBm	-13.41 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.492502500 GHz	-27.71 dBm	-14.71 dB
3	3	2.4950 GHz	2.4960 GHz	100.0 kHz	2.495973333 GHz	-27.36 dBm	-14.36 dB
4	4	2.4960 GHz	2.5170 GHz	100.0 kHz	2.498205000 GHz	9.692 dBm	-15.31 dB

Plot 7-186. Lower ACP Plot (Band 41 - 5.0MHz QPSK - RB Size 25)



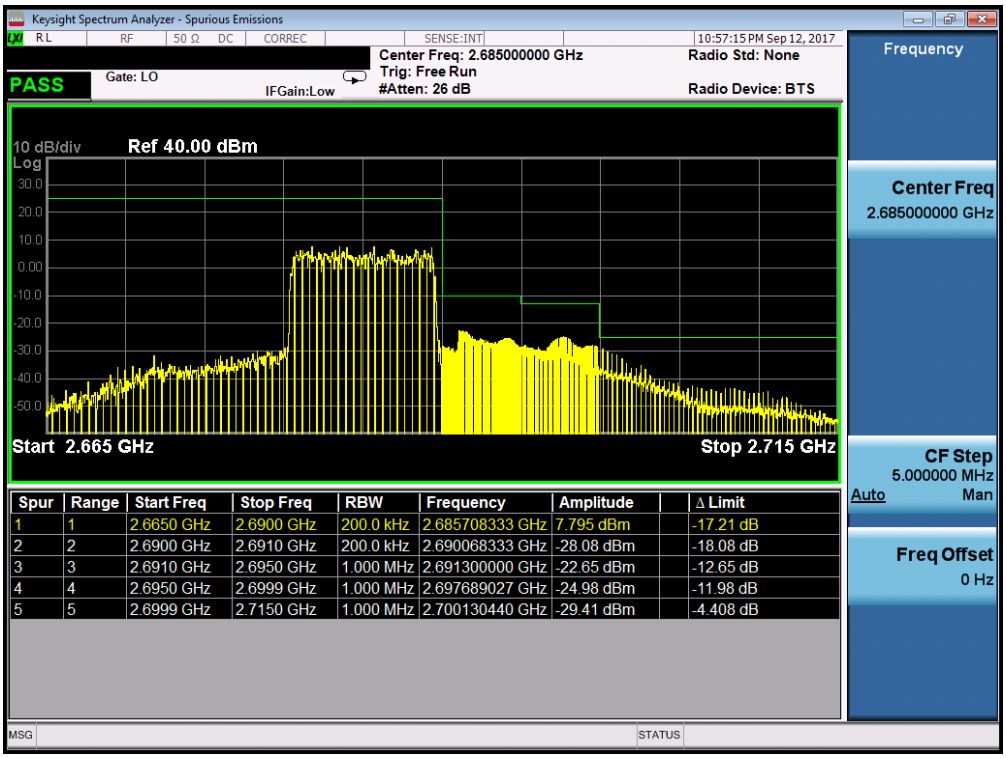
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	100.0 kHz	2.686375000 GHz	8.750 dBm	-16.25 dB
2	2	2.6900 GHz	2.6910 GHz	100.0 kHz	2.690003333 GHz	-23.93 dBm	-13.93 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691100000 GHz	-22.07 dBm	-12.07 dB
4	4	2.6950 GHz	2.6960 GHz	1.000 MHz	2.695021667 GHz	-32.07 dBm	-19.07 dB
5	5	2.6960 GHz	2.7150 GHz	1.000 MHz	2.696000000 GHz	-36.54 dBm	-11.54 dB

Plot 7-187. Upper ACP Plot (Band 41 - 5.0MHz QPSK - RB Size 25)



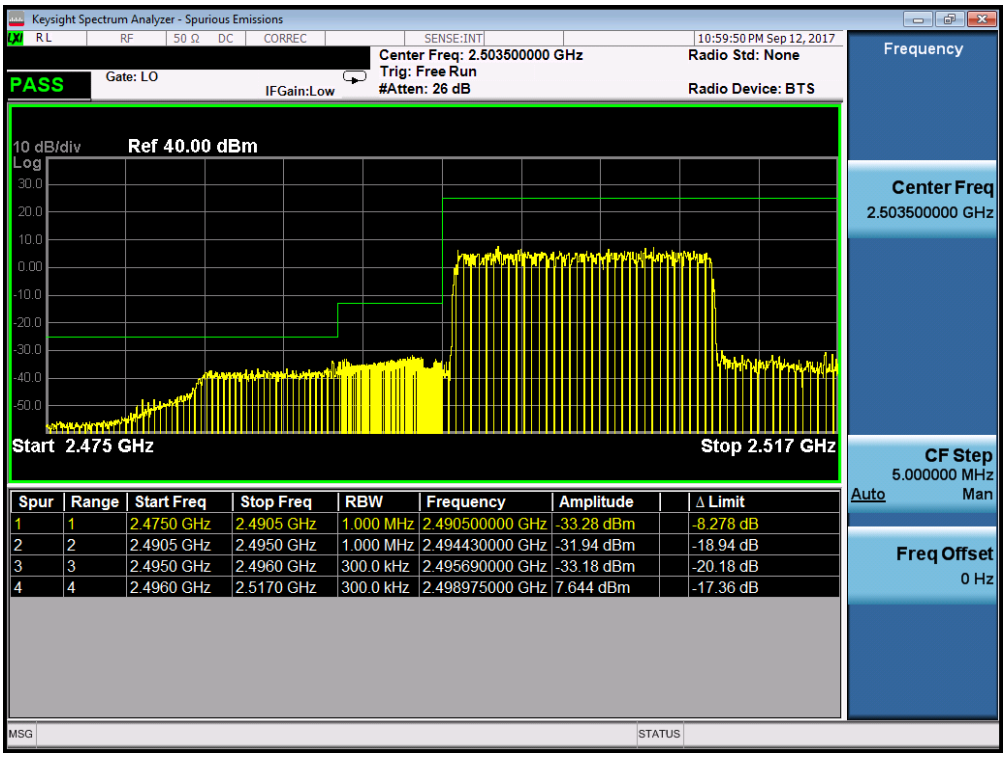
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.488381667 GHz	-30.32 dBm	-5.321 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494827500 GHz	-24.22 dBm	-11.22 dB
3	3	2.4950 GHz	2.4960 GHz	200.0 kHz	2.495033333 GHz	-29.99 dBm	-16.99 dB
4	4	2.4960 GHz	2.5170 GHz	200.0 kHz	2.499675000 GHz	7.608 dBm	-17.39 dB

Plot 7-188. Lower ACP Plot (Band 41 - 10.0MHz QPSK - RB Size 25)

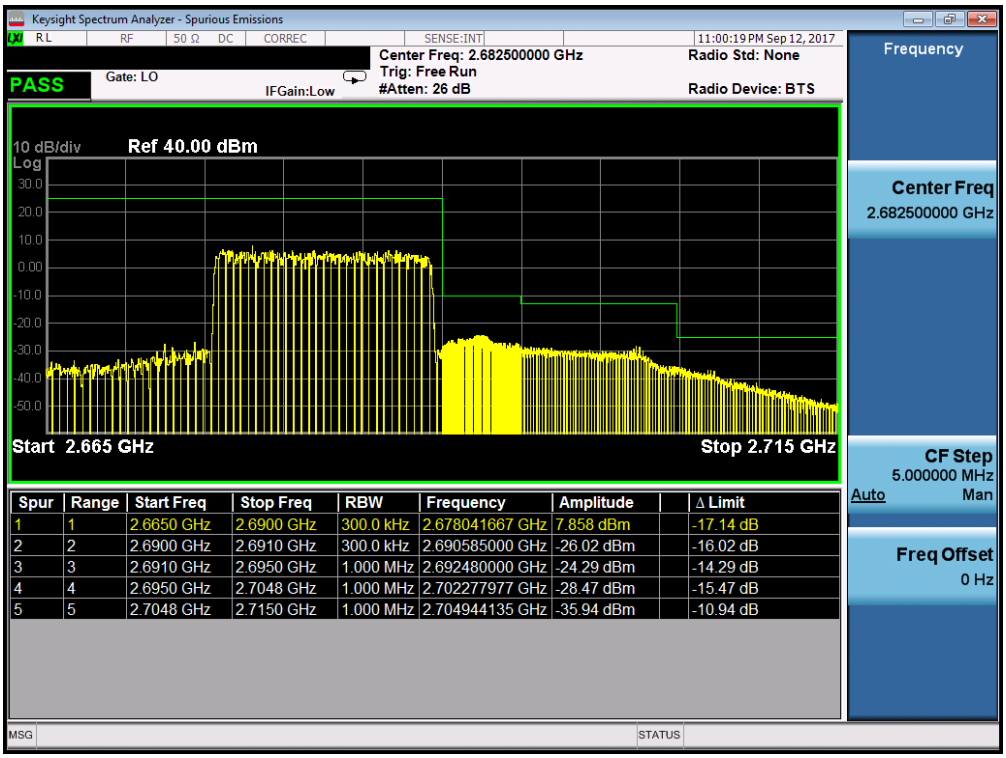


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	200.0 kHz	2.685708333 GHz	7.795 dBm	-17.21 dB
2	2	2.6900 GHz	2.6910 GHz	200.0 kHz	2.690068333 GHz	-28.08 dBm	-18.08 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691300000 GHz	-22.65 dBm	-12.65 dB
4	4	2.6950 GHz	2.6999 GHz	1.000 MHz	2.697689027 GHz	-24.98 dBm	-11.98 dB
5	5	2.6999 GHz	2.7150 GHz	1.000 MHz	2.700130440 GHz	-29.41 dBm	-4.408 dB

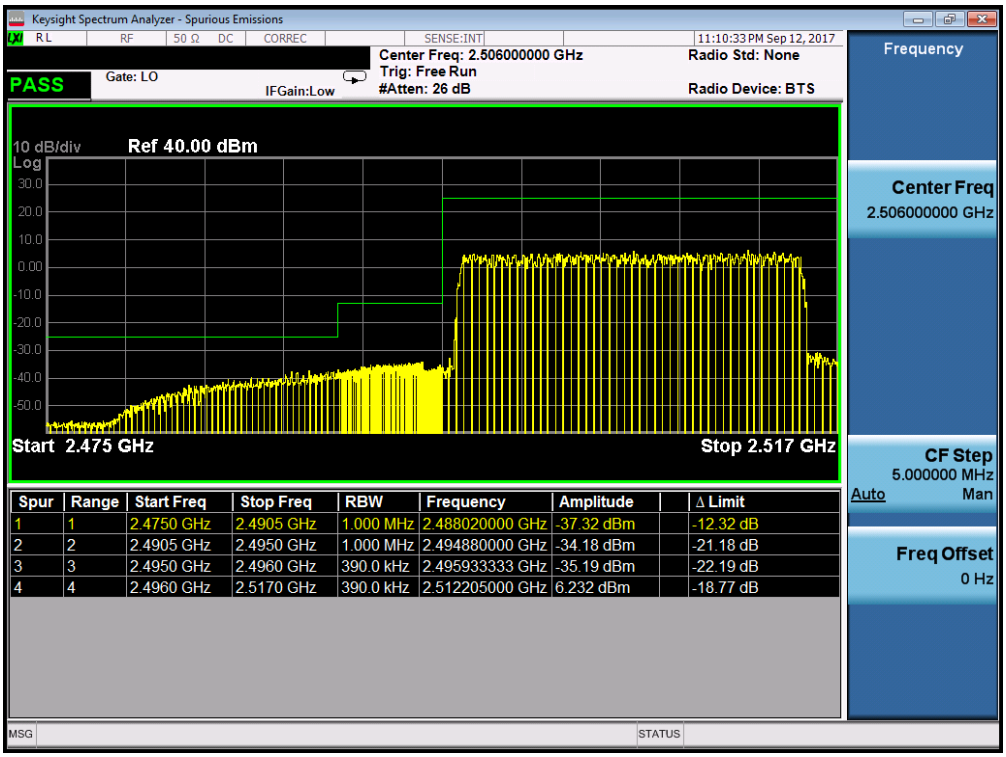
Plot 7-189. Upper ACP Plot (Band 41 - 10.0MHz QPSK - RB Size 25)



Plot 7-190. Lower ACP Plot (Band 41 - 15.0MHz QPSK - RB Size 25)

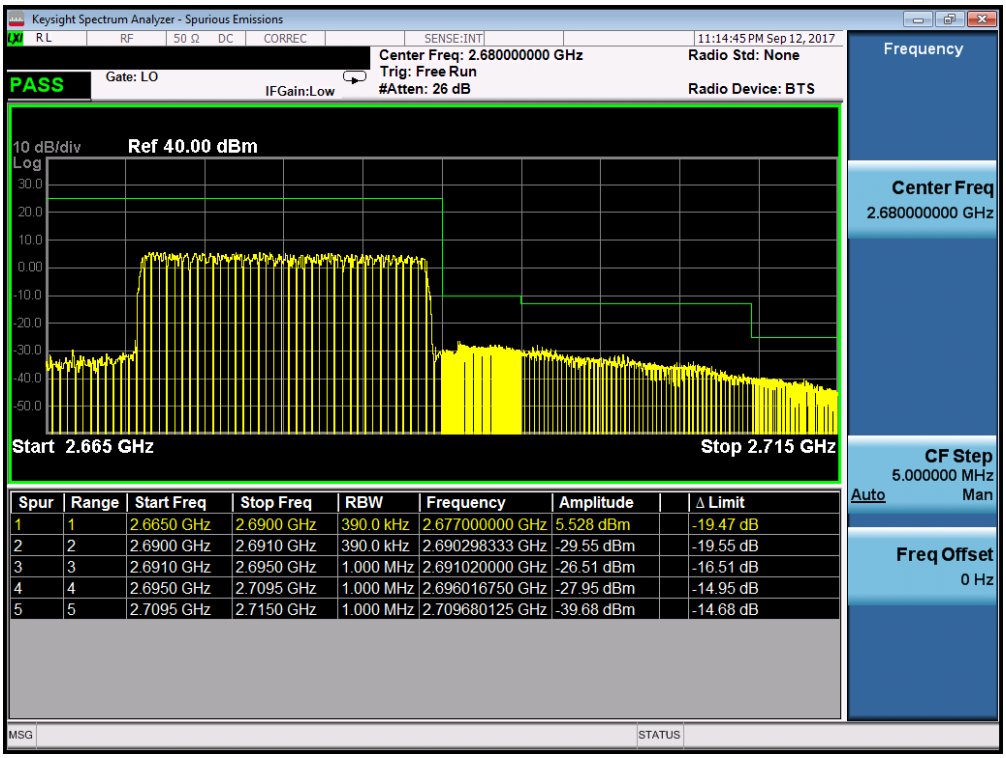


Plot 7-191. Upper ACP Plot (Band 41 - 15.0MHz QPSK - RB Size 25)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.488020000 GHz	-37.32 dBm	-12.32 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494880000 GHz	-34.18 dBm	-21.18 dB
3	3	2.4950 GHz	2.4960 GHz	390.0 kHz	2.495933333 GHz	-35.19 dBm	-22.19 dB
4	4	2.4960 GHz	2.5170 GHz	390.0 kHz	2.512205000 GHz	6.232 dBm	-18.77 dB

Plot 7-192. Lower ACP Plot (Band 41 - 20.0MHz QPSK - RB Size 25)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	390.0 kHz	2.677000000 GHz	5.528 dBm	-19.47 dB
2	2	2.6900 GHz	2.6910 GHz	390.0 kHz	2.690298333 GHz	-29.55 dBm	-19.55 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691020000 GHz	-26.51 dBm	-16.51 dB
4	4	2.6950 GHz	2.7095 GHz	1.000 MHz	2.696016750 GHz	-27.95 dBm	-14.95 dB
5	5	2.7095 GHz	2.7150 GHz	1.000 MHz	2.709680125 GHz	-39.68 dBm	-14.68 dB

Plot 7-193. Upper ACP Plot (Band 41 - 20.0MHz QPSK - RB Size 25)

7.5 Peak-Average Ratio

§24.232(d) RSS-130(4.4) RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)

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 v02r02 – 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.

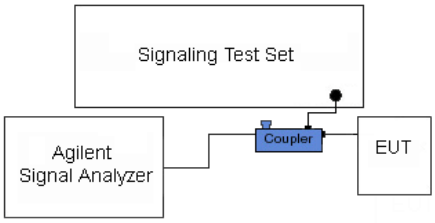
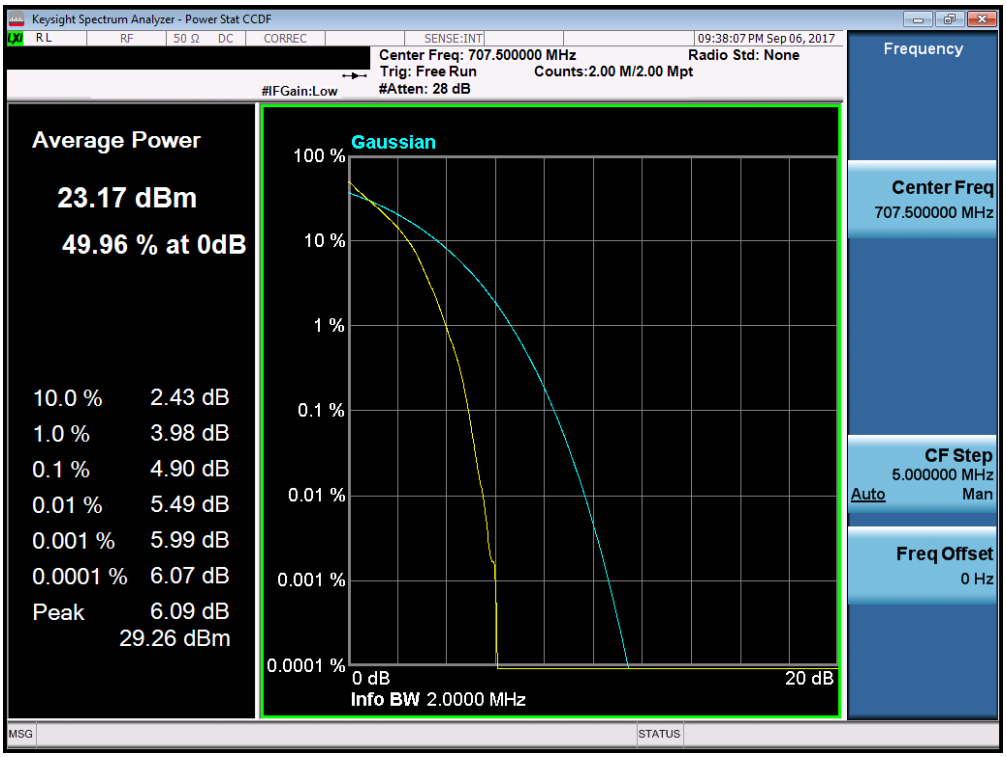


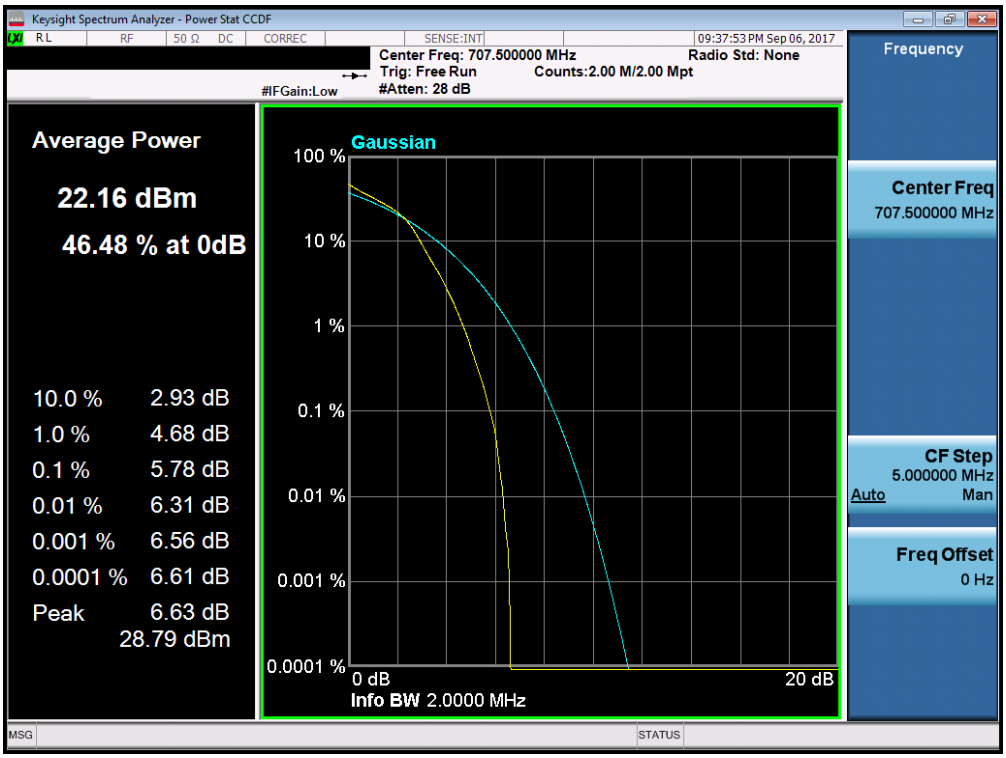
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

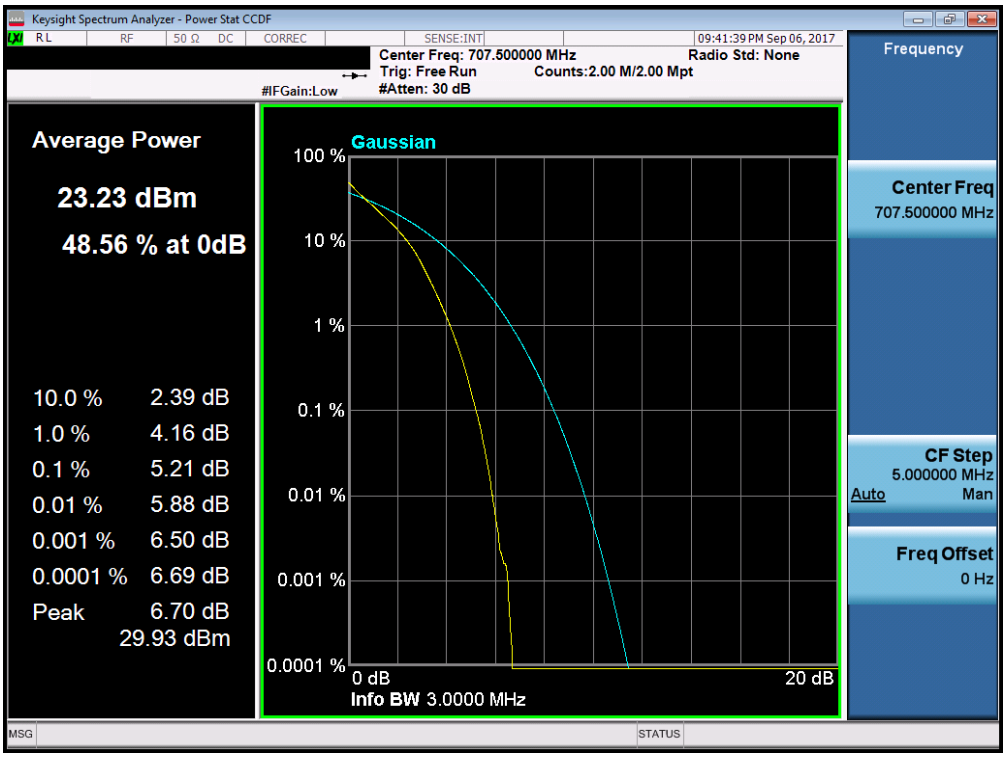
None.



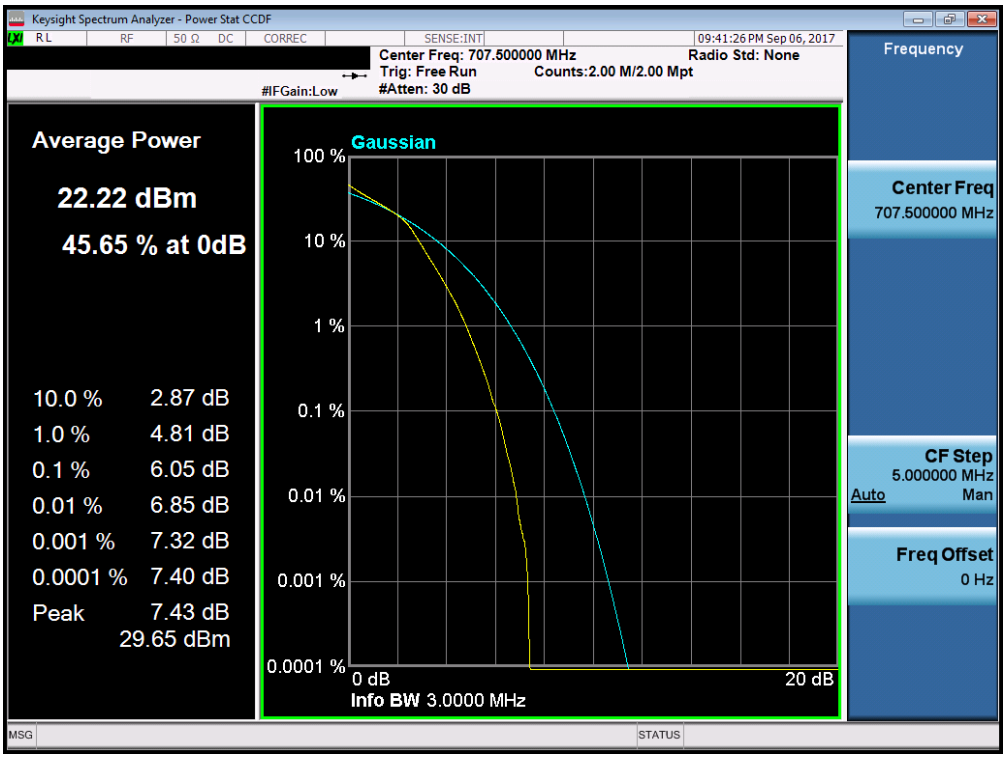
Plot 7-194. PAR Plot (Band 12 - 1.4.0MHz QPSK - Full RB Configuration)



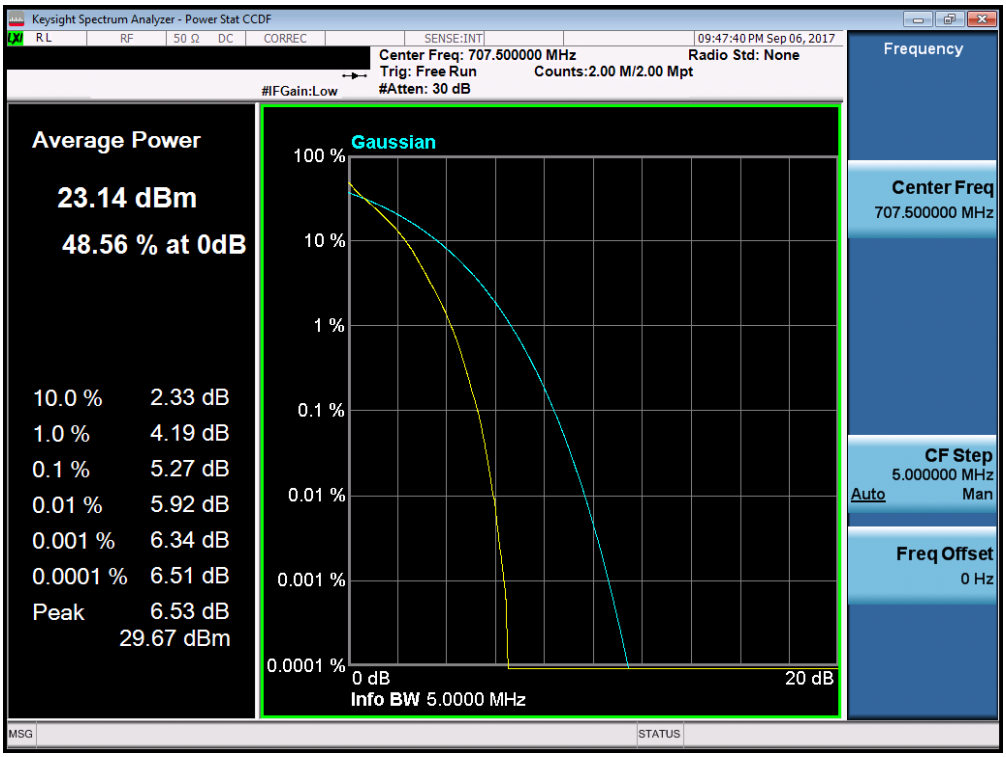
Plot 7-195. PAR Plot (Band 12 - 1.4.0MHz 16-QAM - Full RB Configuration)



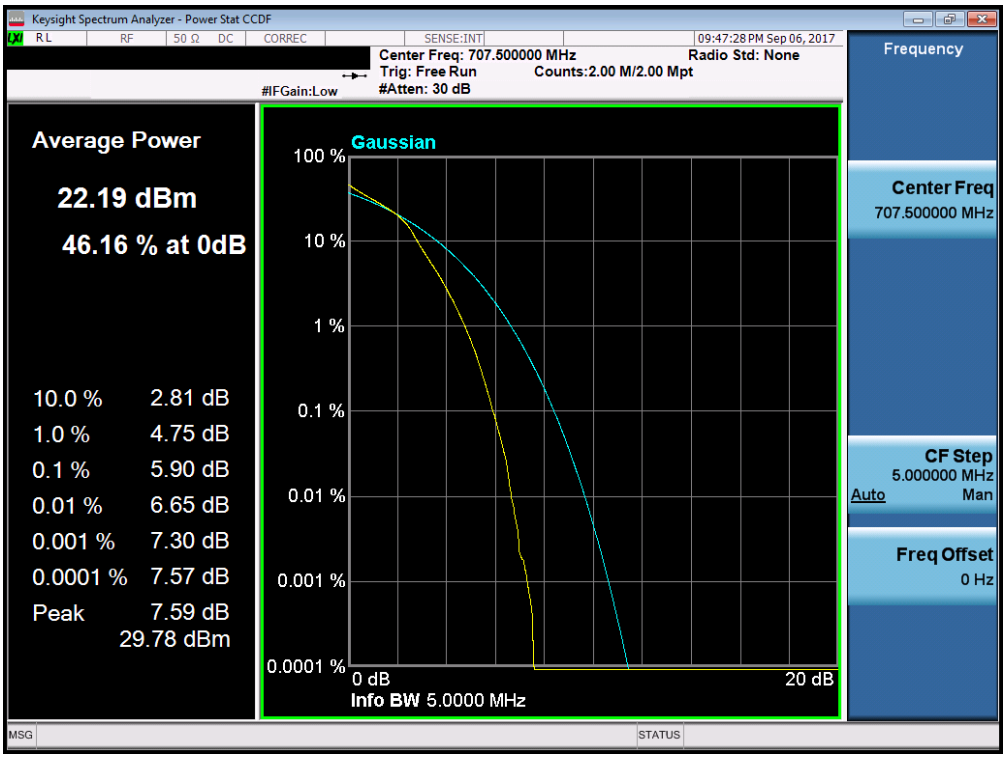
Plot 7-196. PAR Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)



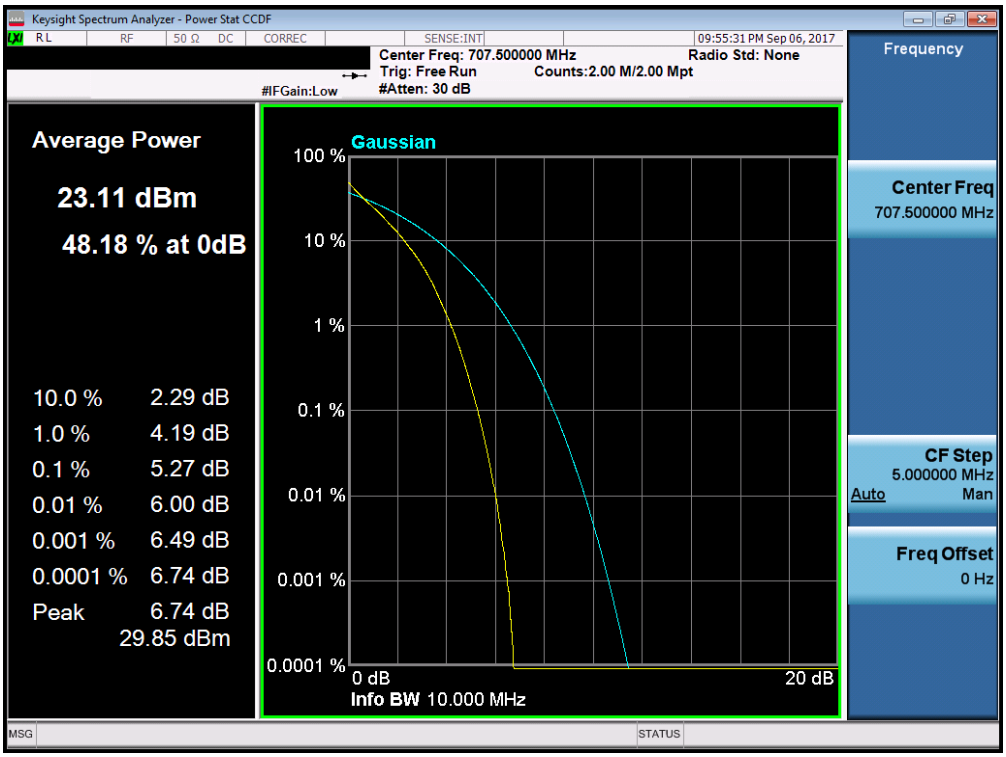
Plot 7-197. PAR Plot (Band 12 - 3.0MHz 16-QAM - Full RB Configuration)



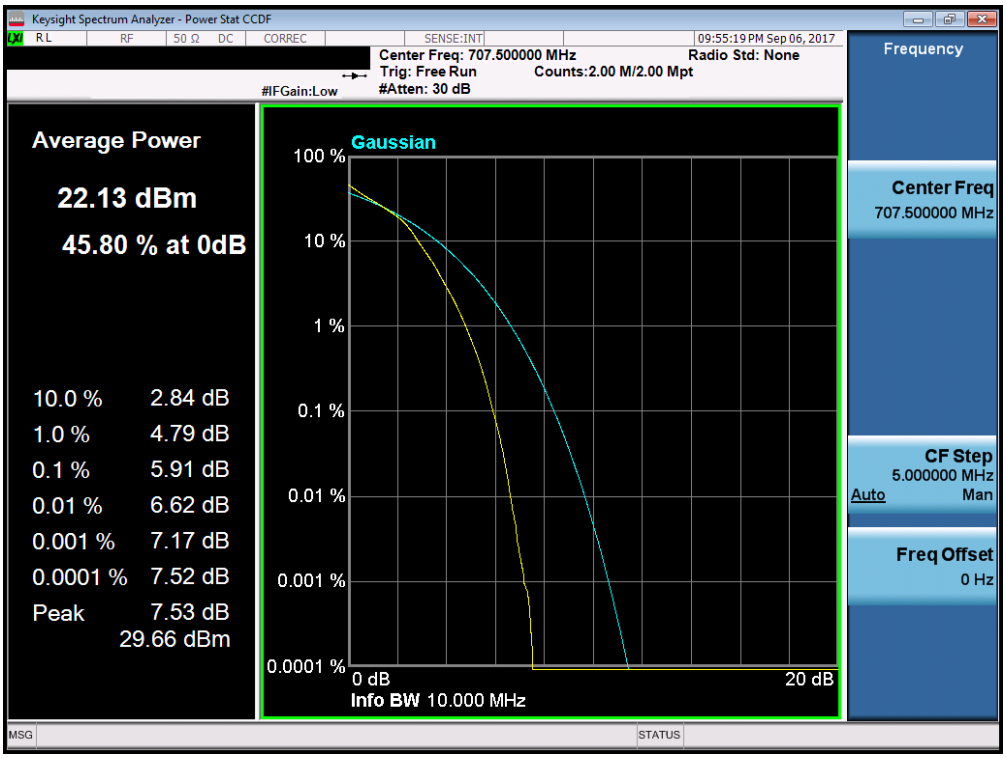
Plot 7-198. PAR Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)



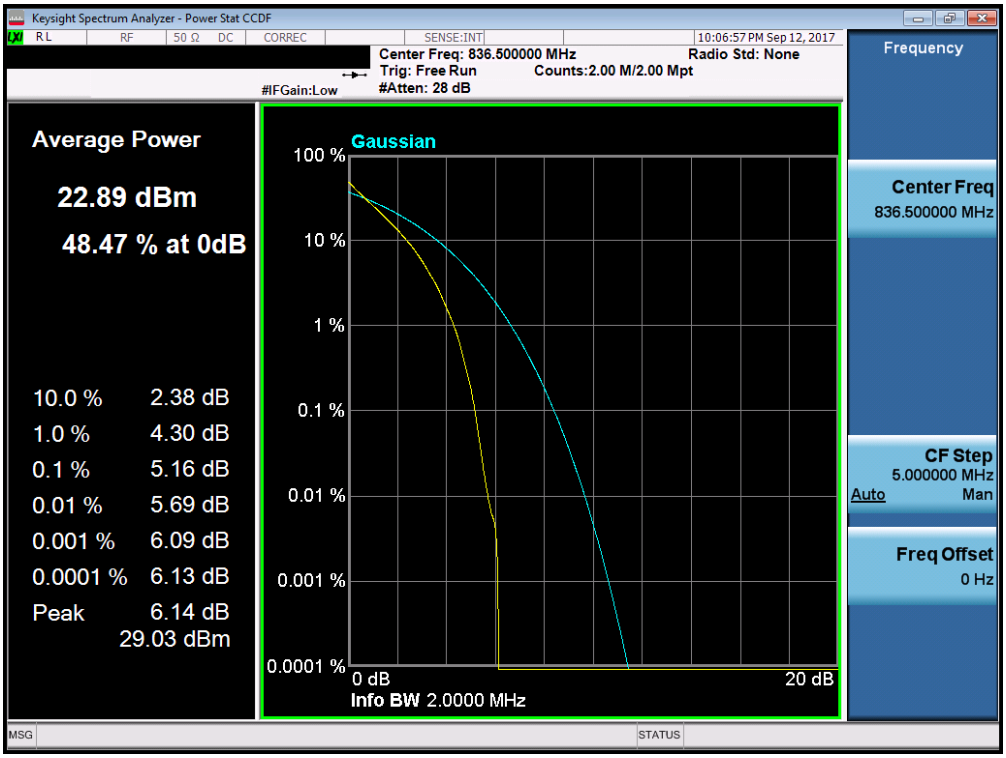
Plot 7-199. PAR Plot (Band 12 - 5.0MHz 16-QAM - Full RB Configuration)



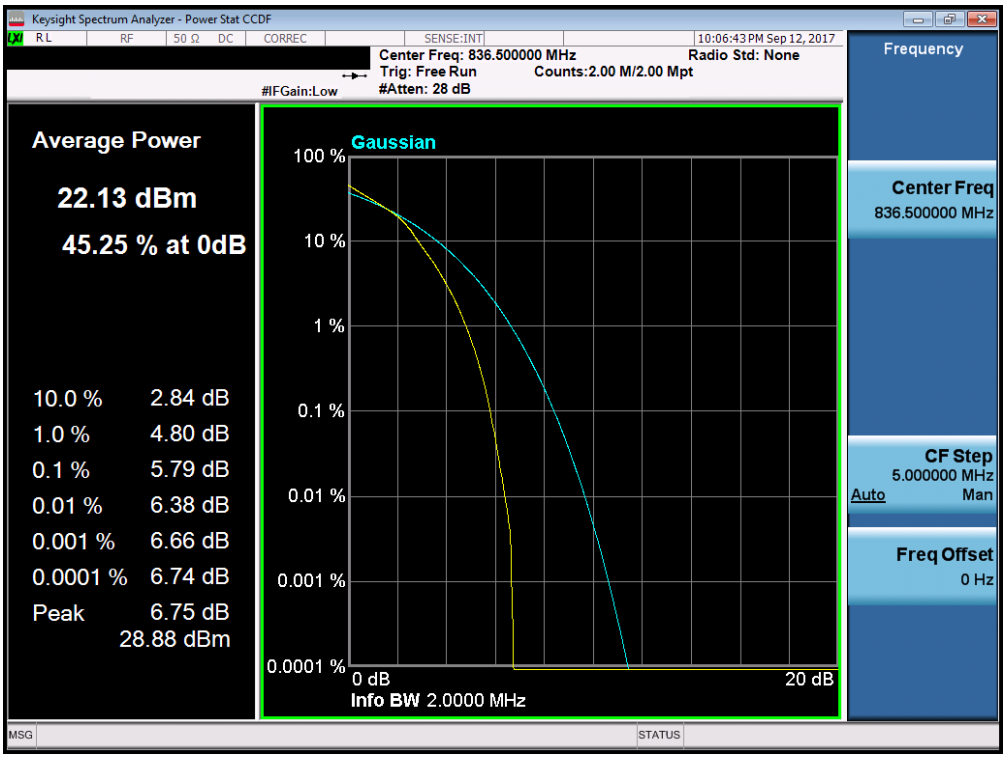
Plot 7-200. PAR Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)



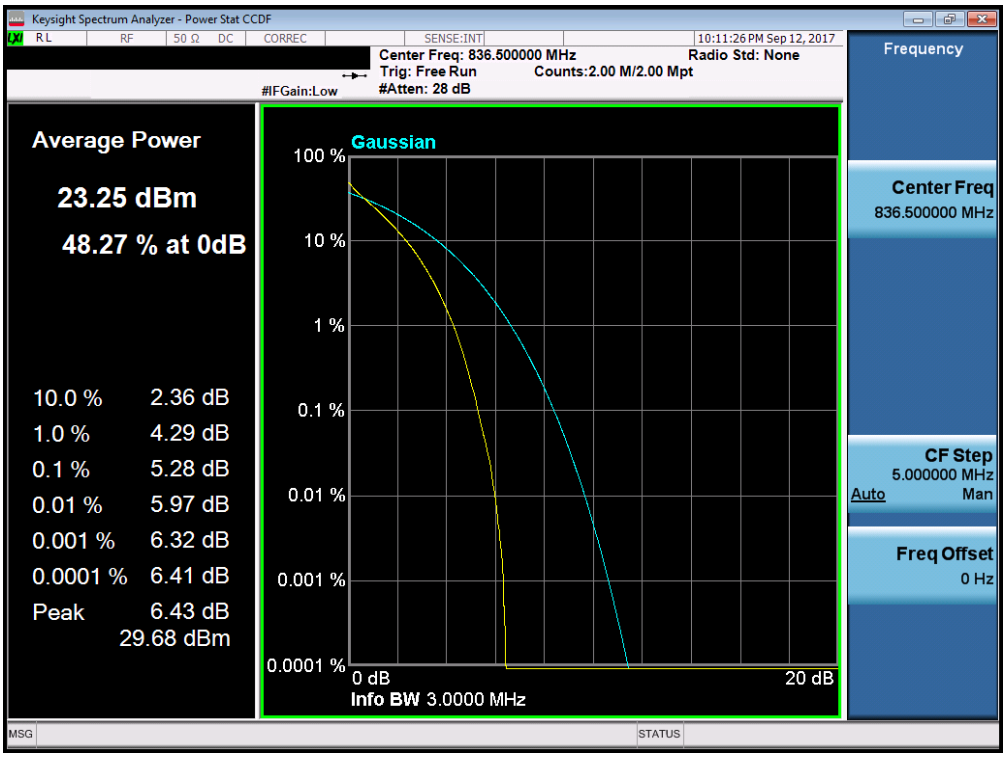
Plot 7-201. PAR Plot (Band 12 - 10.0MHz 16-QAM - Full RB Configuration)



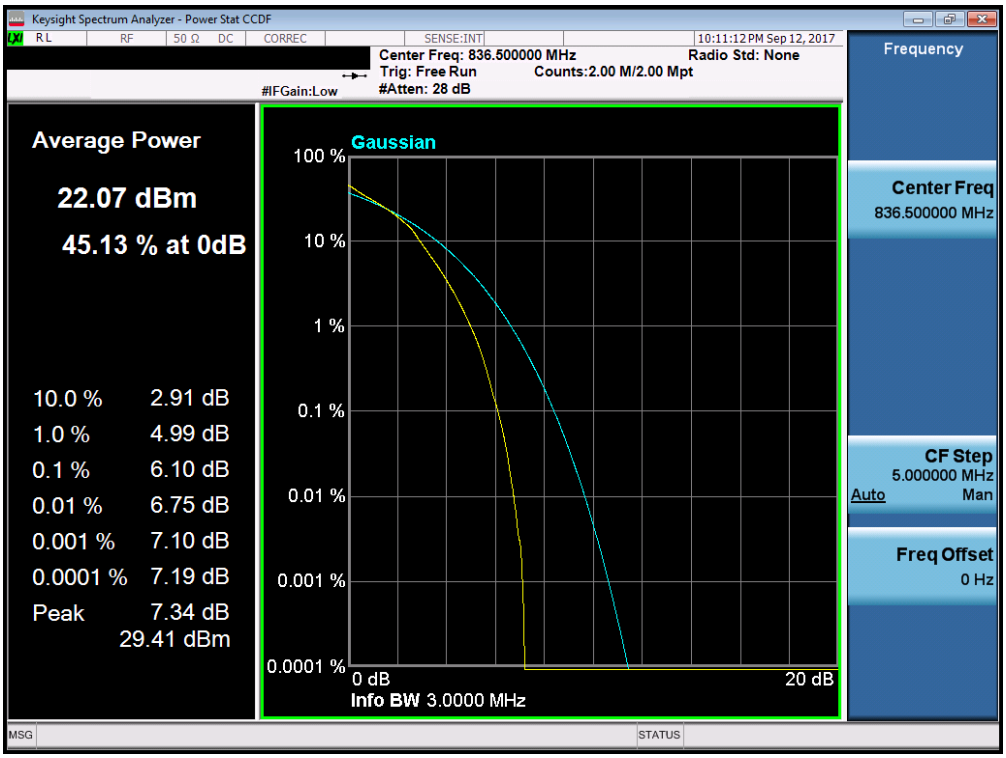
Plot 7-202. PAR Plot (Band 26/5 – 1.4MHz QPSK - Full RB Configuration)



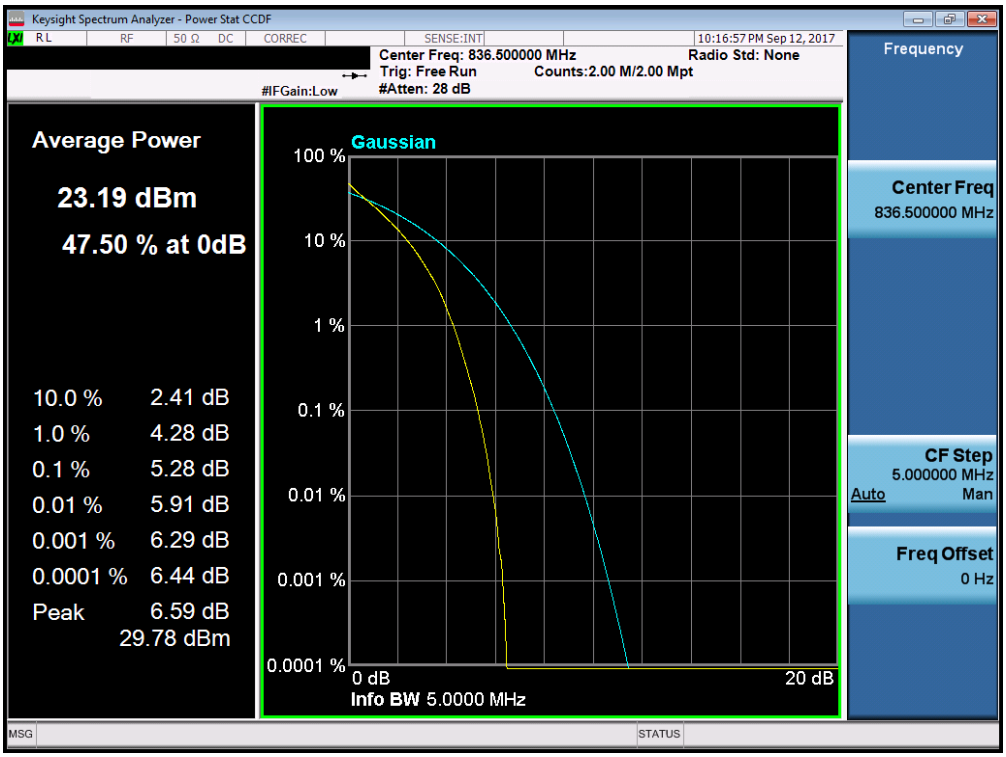
Plot 7-203. PAR Plot (Band 26/5 – 1.4MHz 16-QAM - Full RB Configuration)



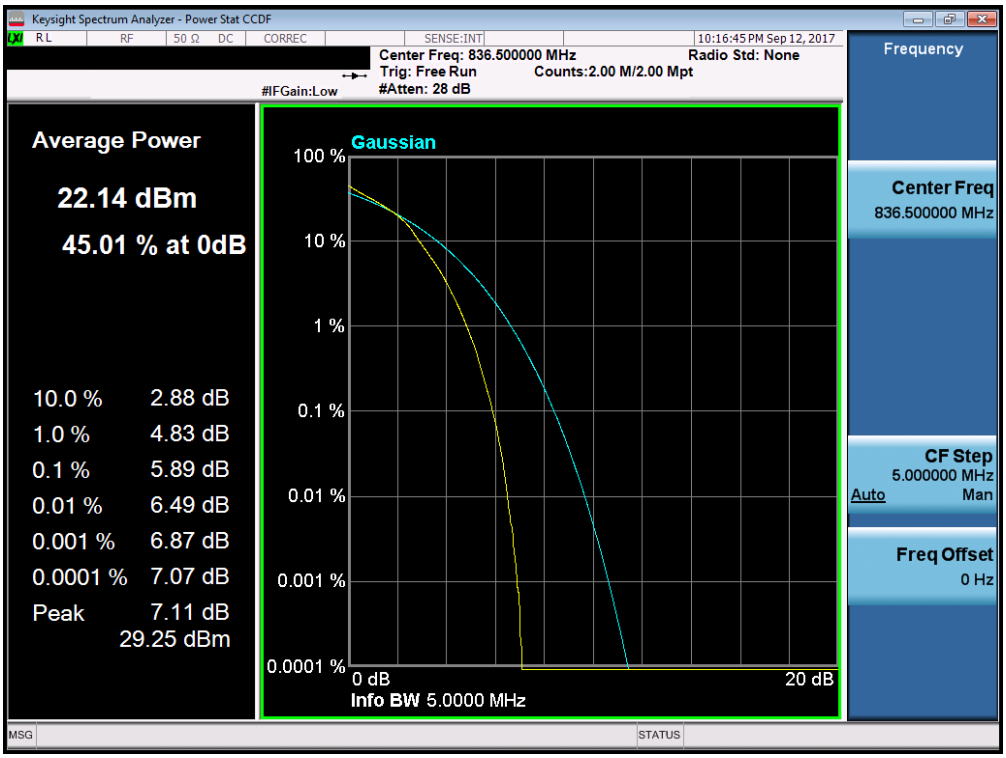
Plot 7-204. PAR Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)



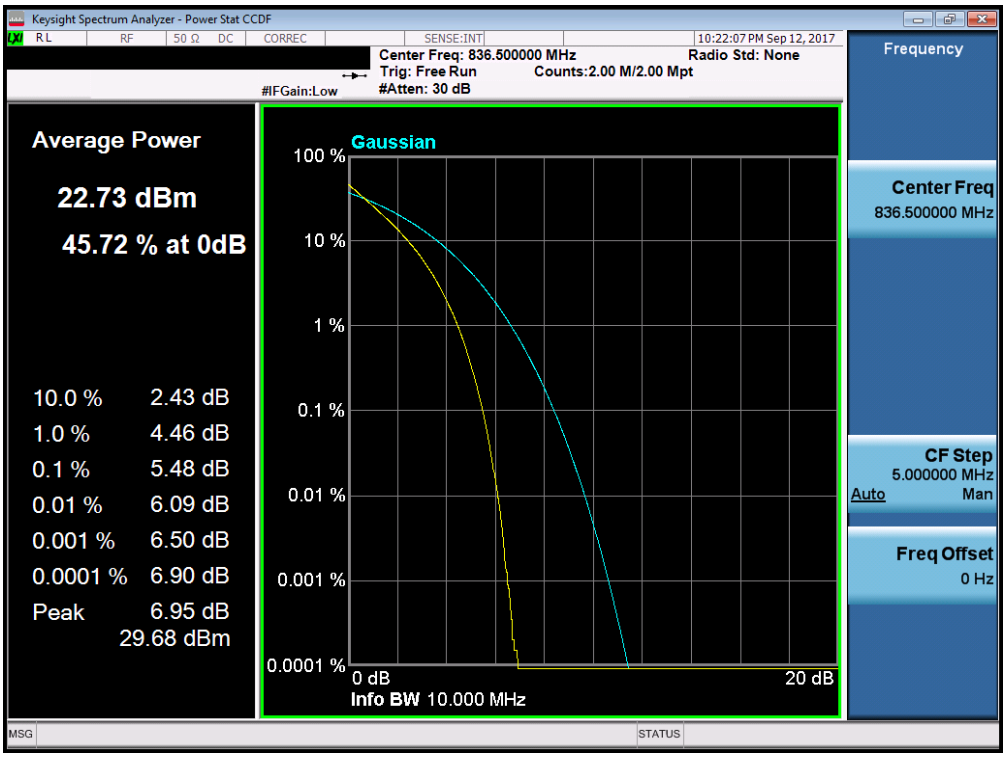
Plot 7-205. PAR Plot (Band 26/5 - 3.0MHz 16-QAM - Full RB Configuration)



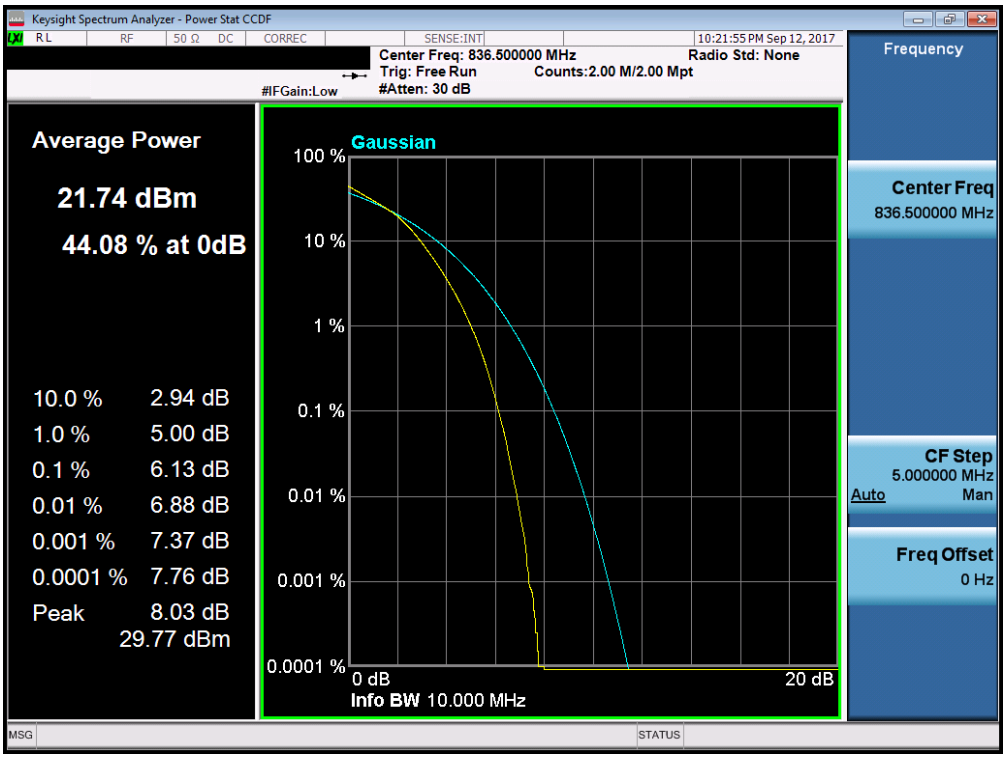
Plot 7-206. PAR Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)



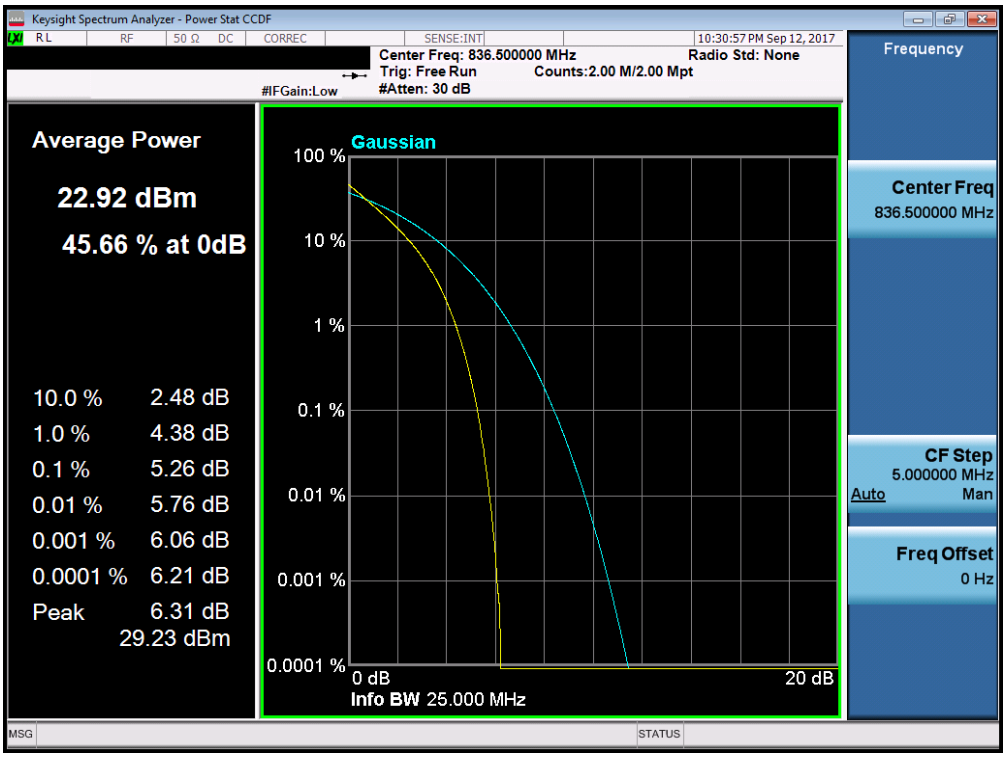
Plot 7-207. PAR Plot (Band 26/5 - 5.0MHz 16-QAM - Full RB Configuration)



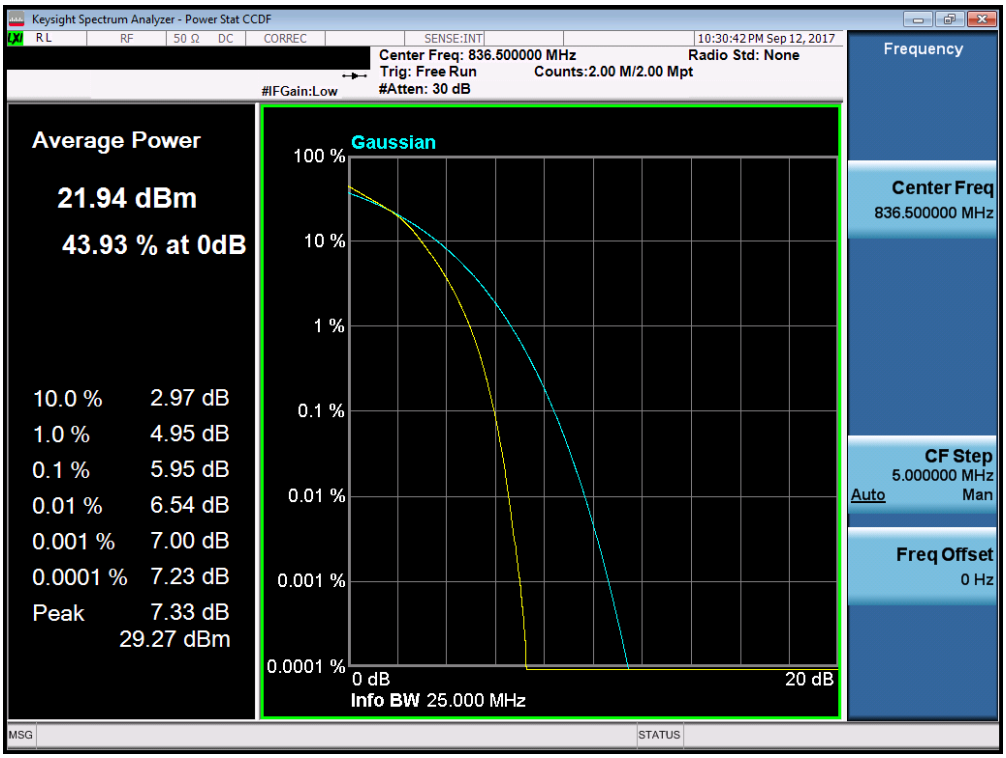
Plot 7-208. PAR Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)



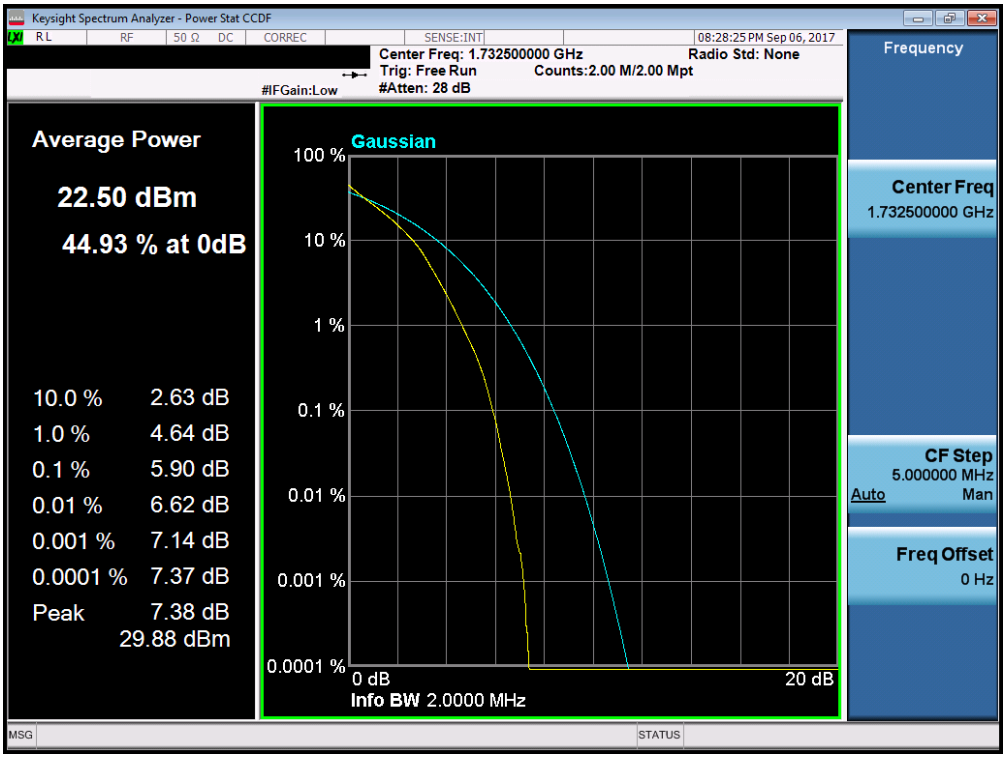
Plot 7-209. PAR Plot (Band 26/5 - 10.0MHz 16-QAM - Full RB Configuration)



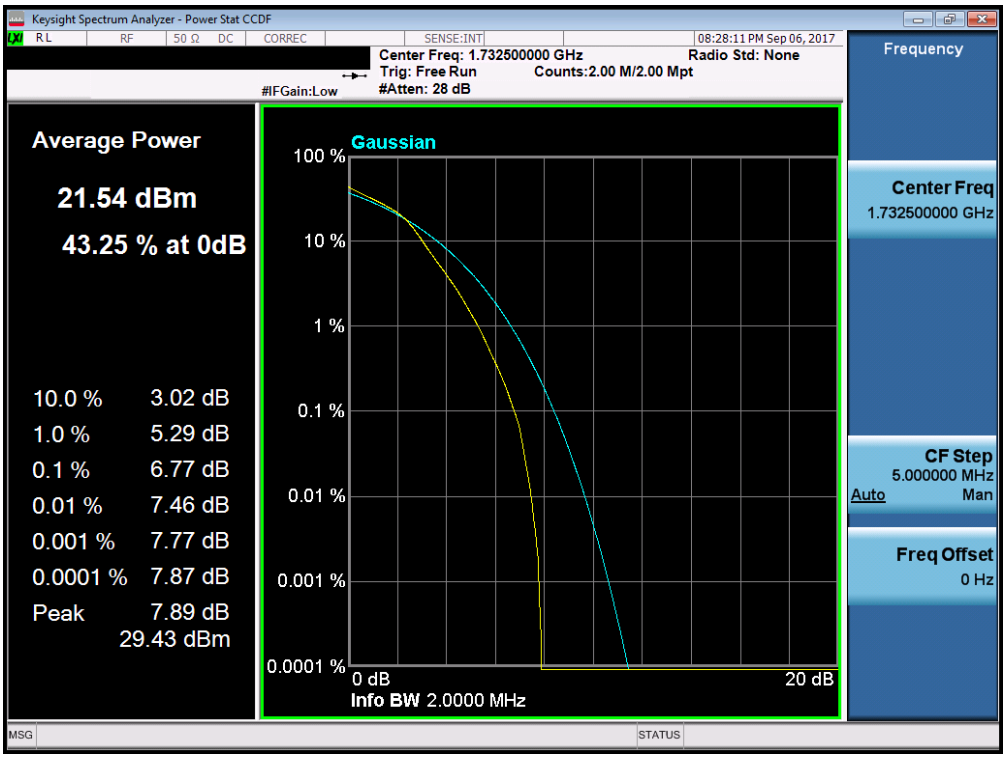
Plot 7-210. PAR Plot (Band 26 - 15.0MHz QPSK - Full RB Configuration)



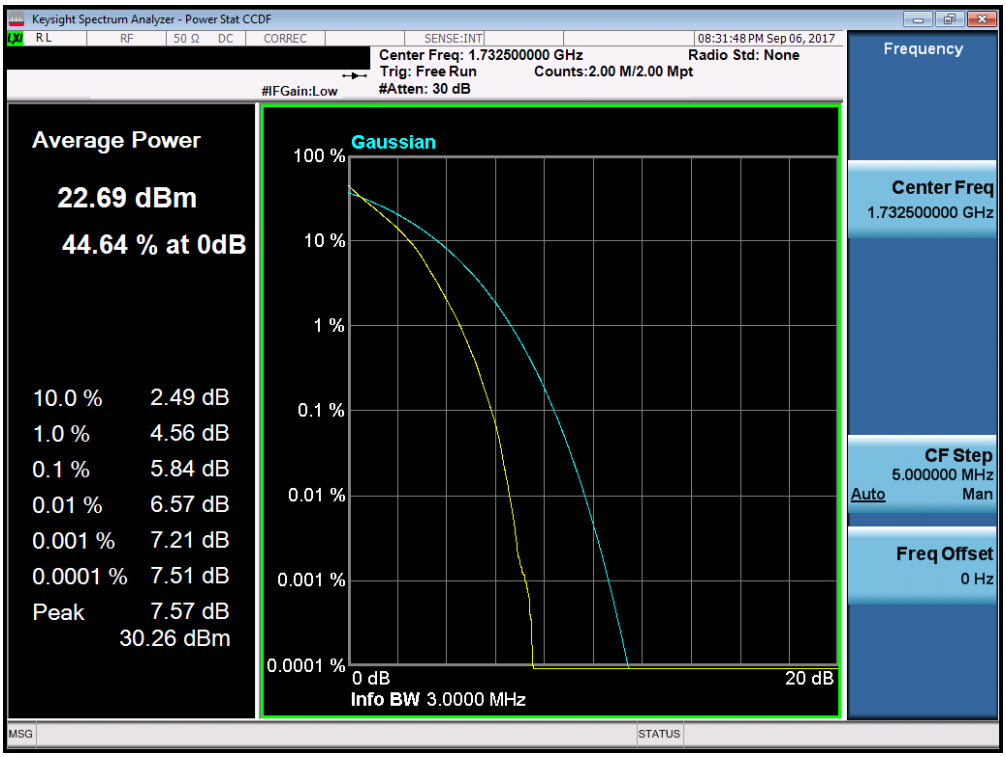
Plot 7-211. PAR Plot (Band 26 - 15.0MHz 16-QAM - Full RB Configuration)



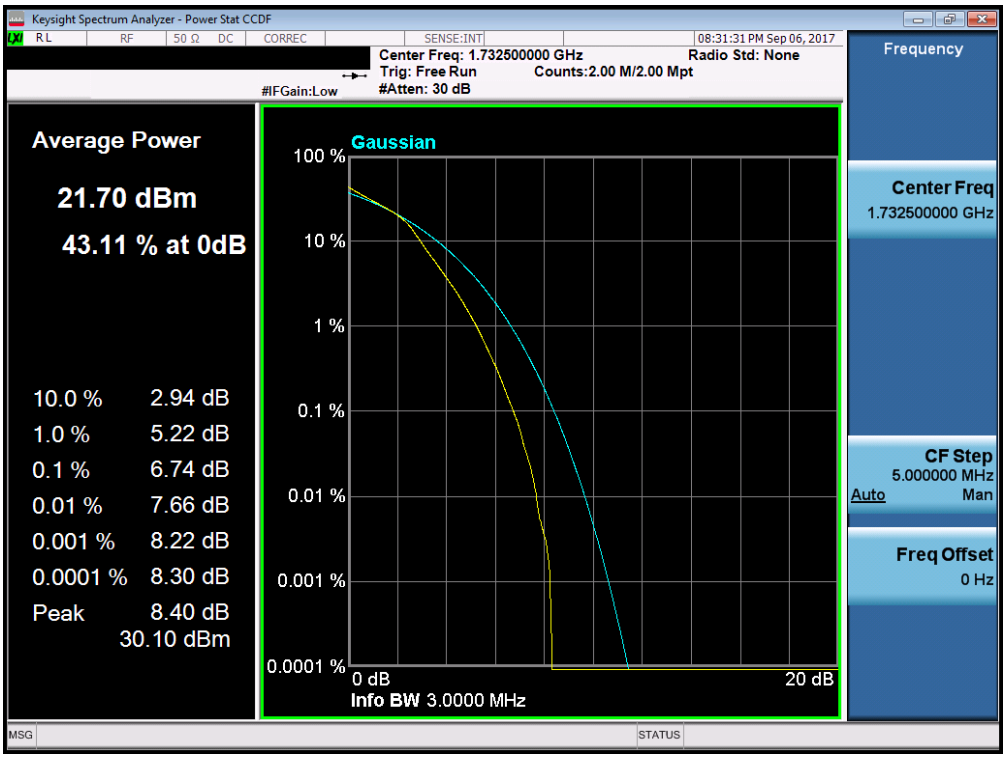
Plot 7-212. PAR Plot (Band 4 – 1.4MHz QPSK - Full RB Configuration)



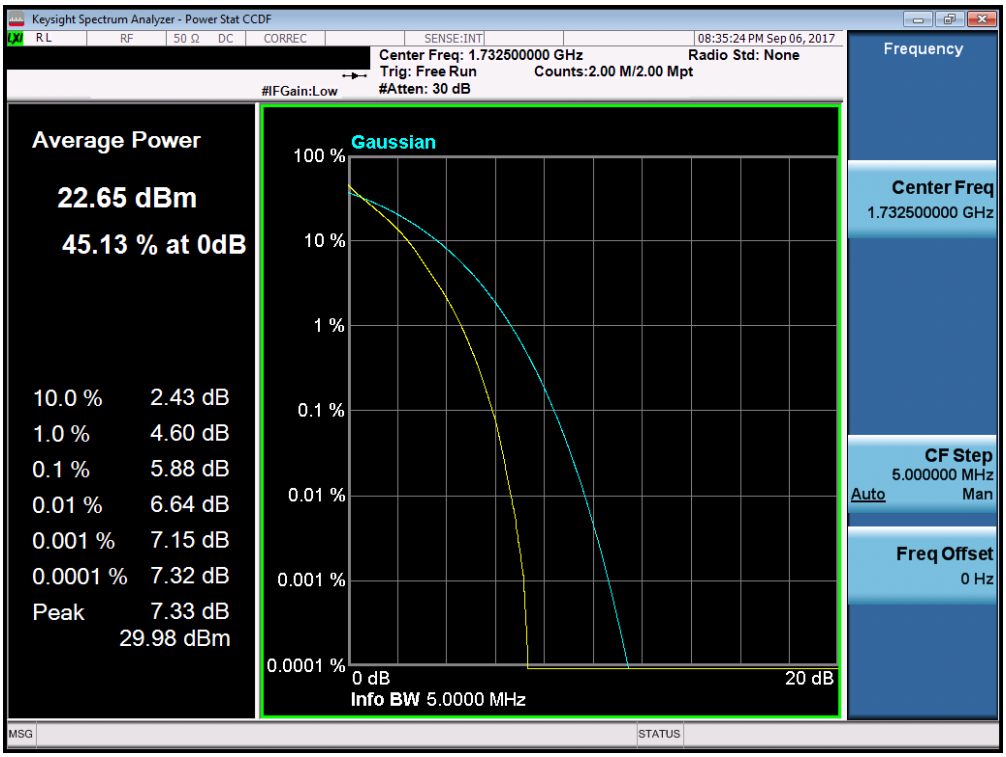
Plot 7-213. PAR Plot (Band 4 – 1.4MHz 16-QAM - Full RB Configuration)



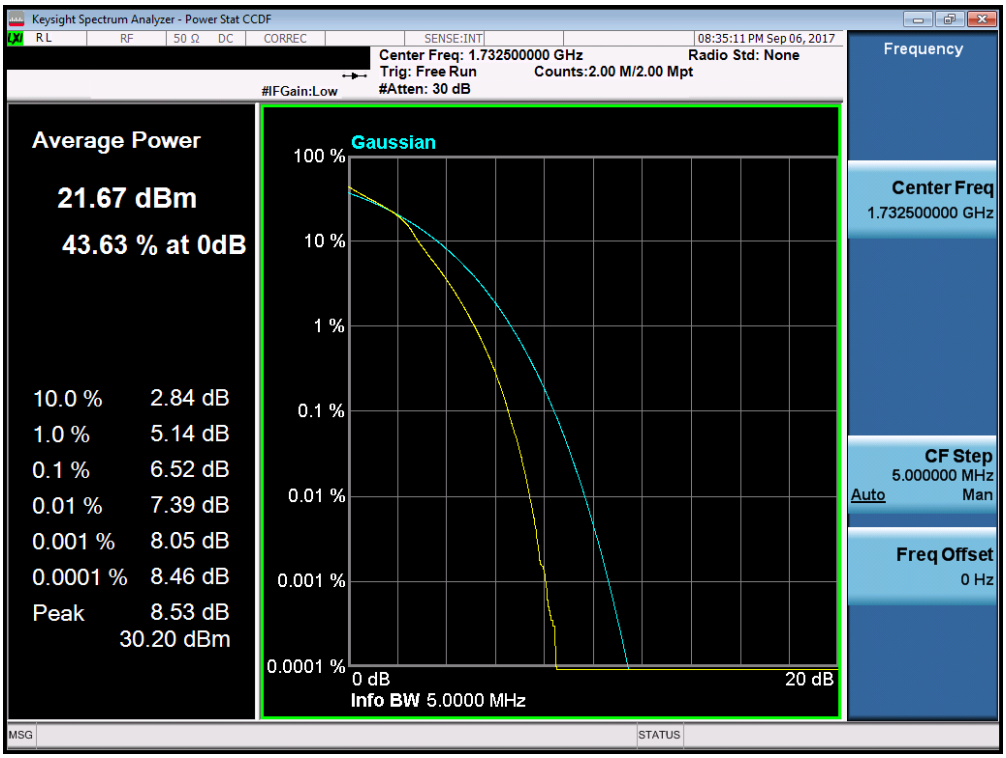
Plot 7-214. PAR Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



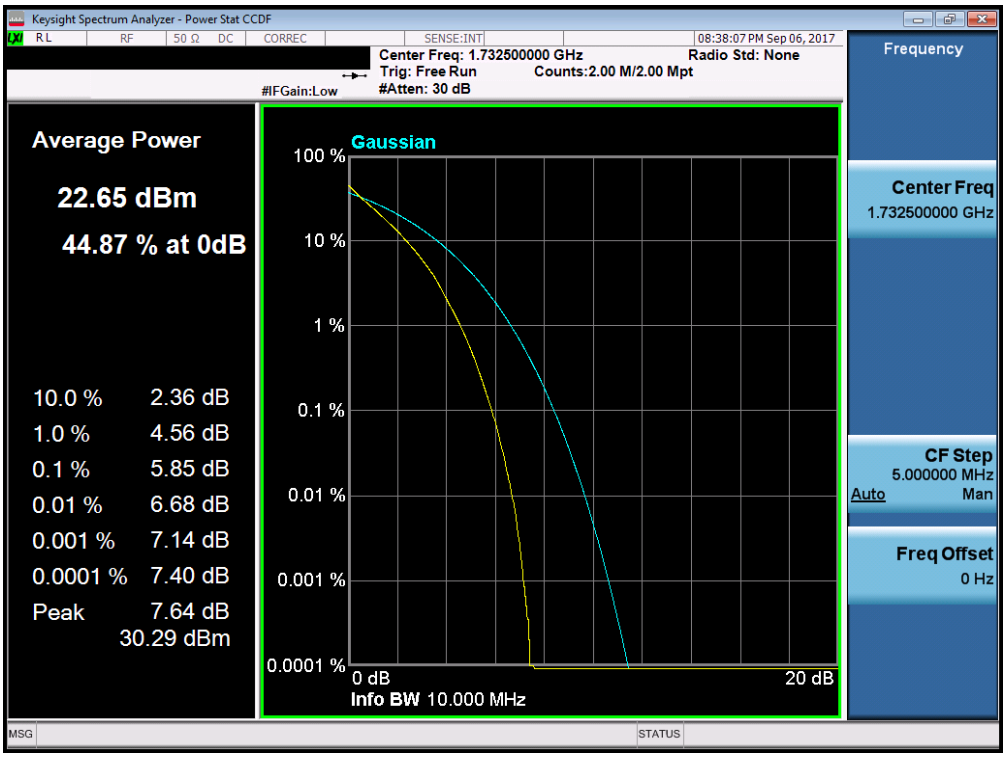
Plot 7-215. PAR Plot (Band 4 - 3.0MHz 16-QAM - Full RB Configuration)



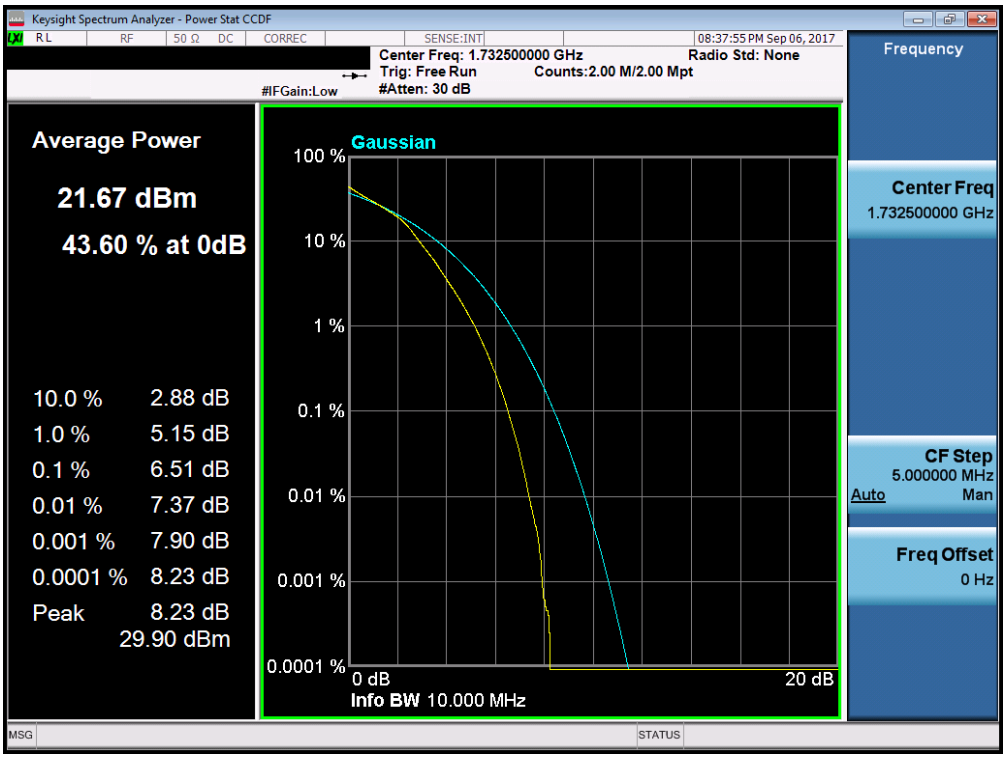
Plot 7-216. PAR Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



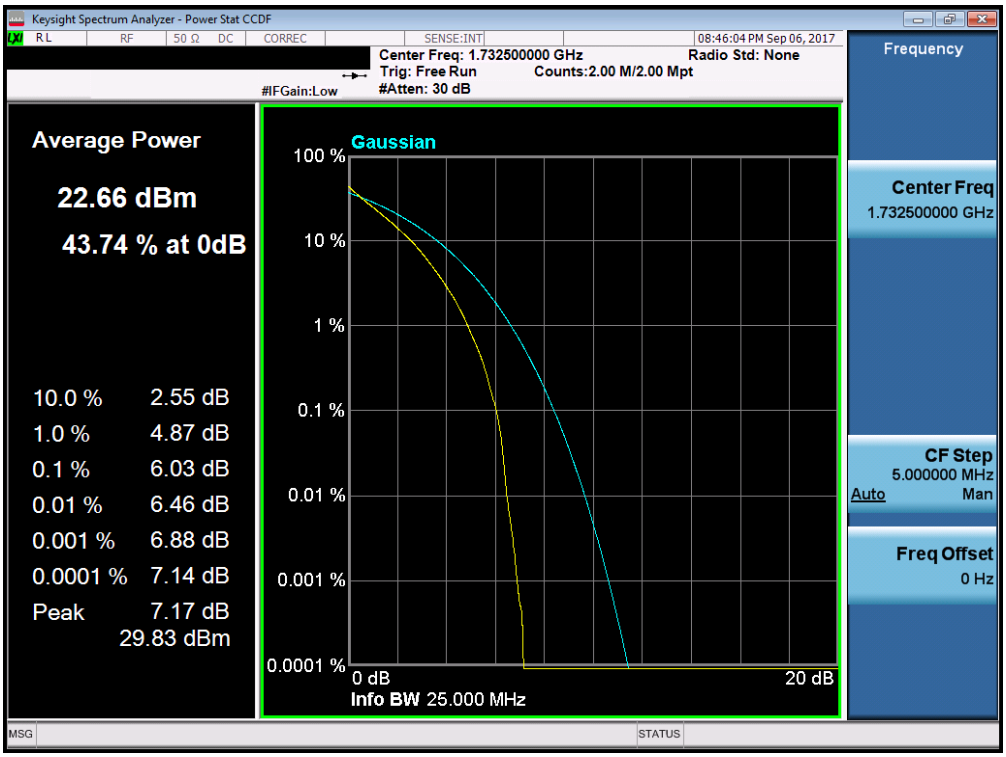
Plot 7-217. PAR Plot (Band 4 - 5.0MHz 16-QAM - Full RB Configuration)



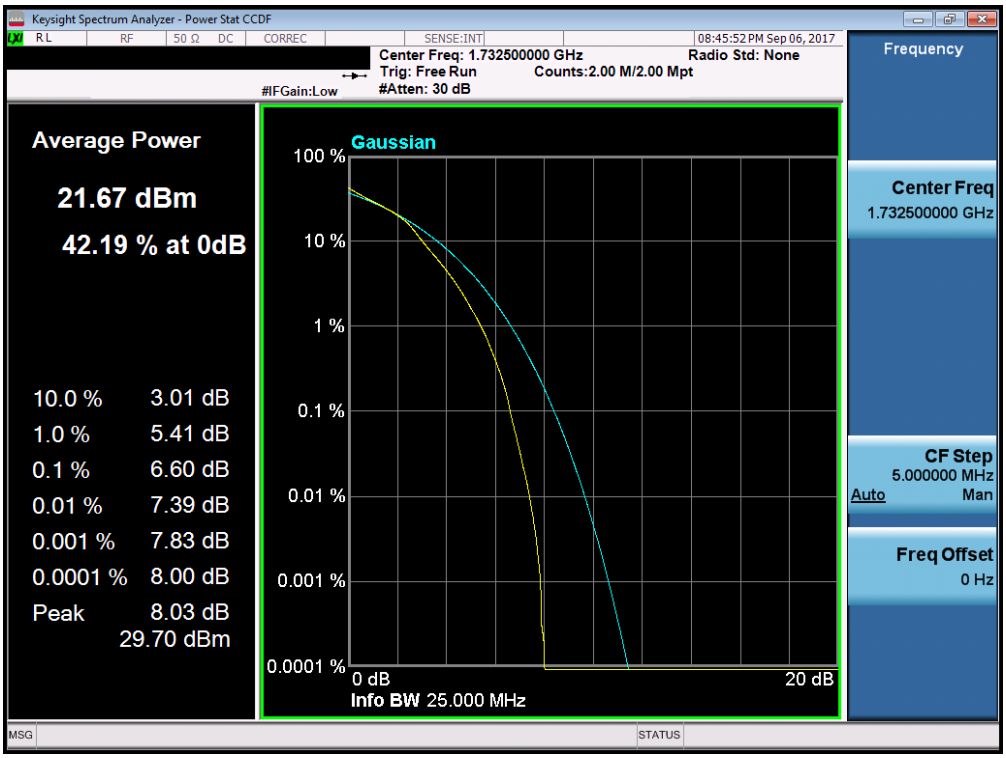
Plot 7-218. PAR Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



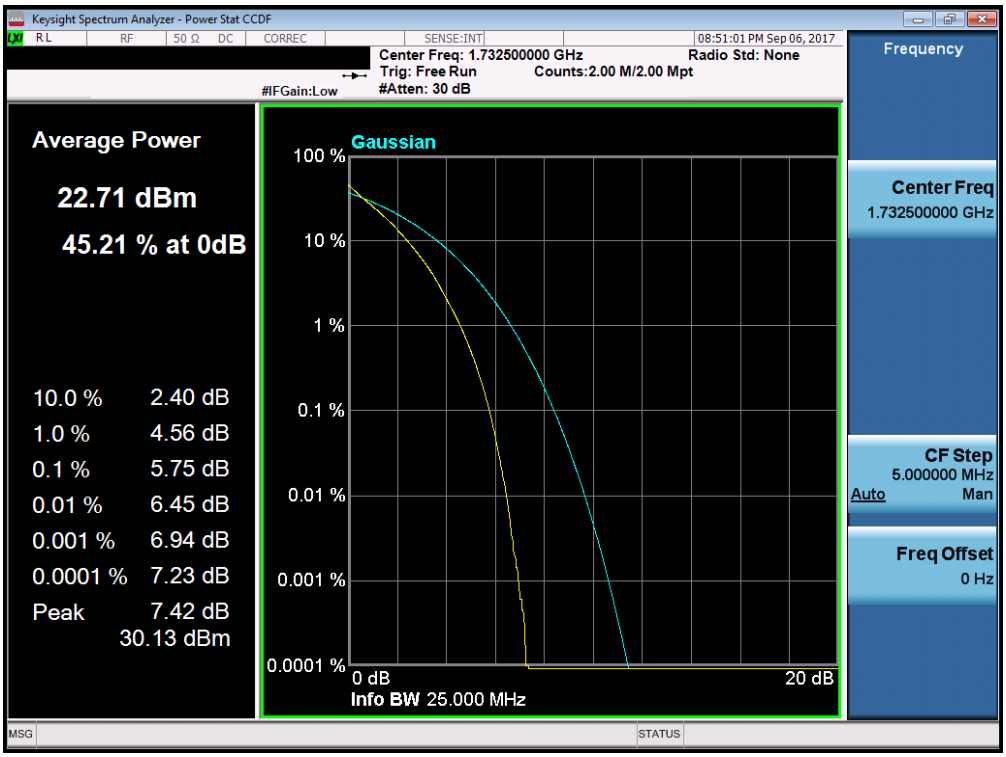
Plot 7-219. PAR Plot (Band 4 - 10.0MHz 16-QAM - Full RB Configuration)



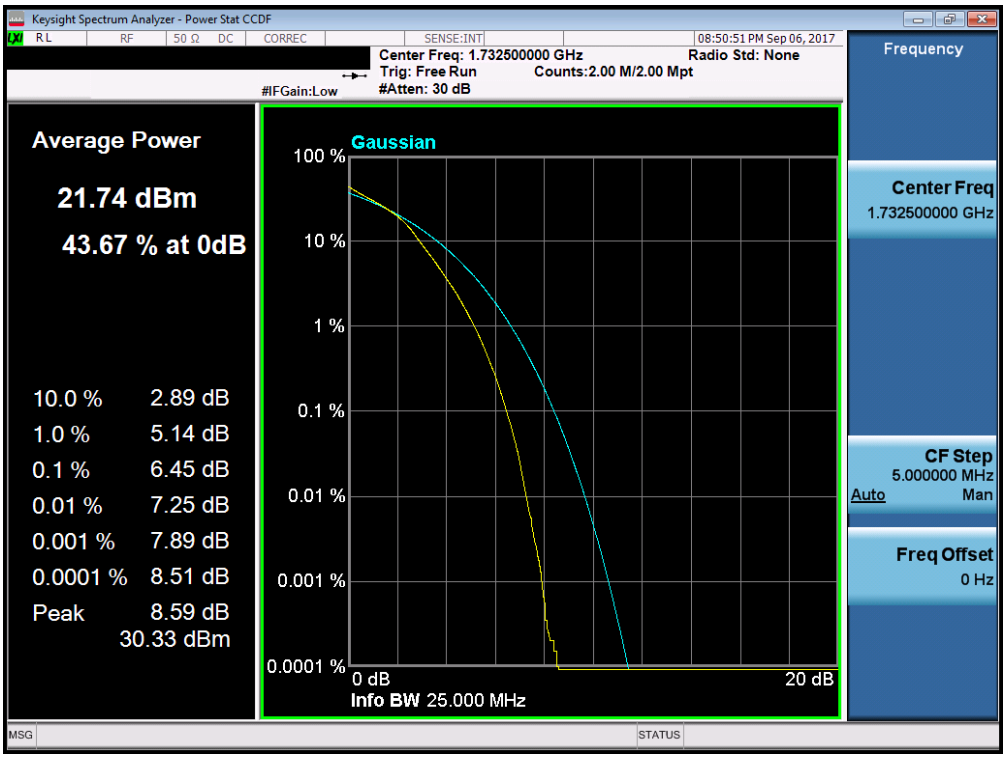
Plot 7-220. PAR Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



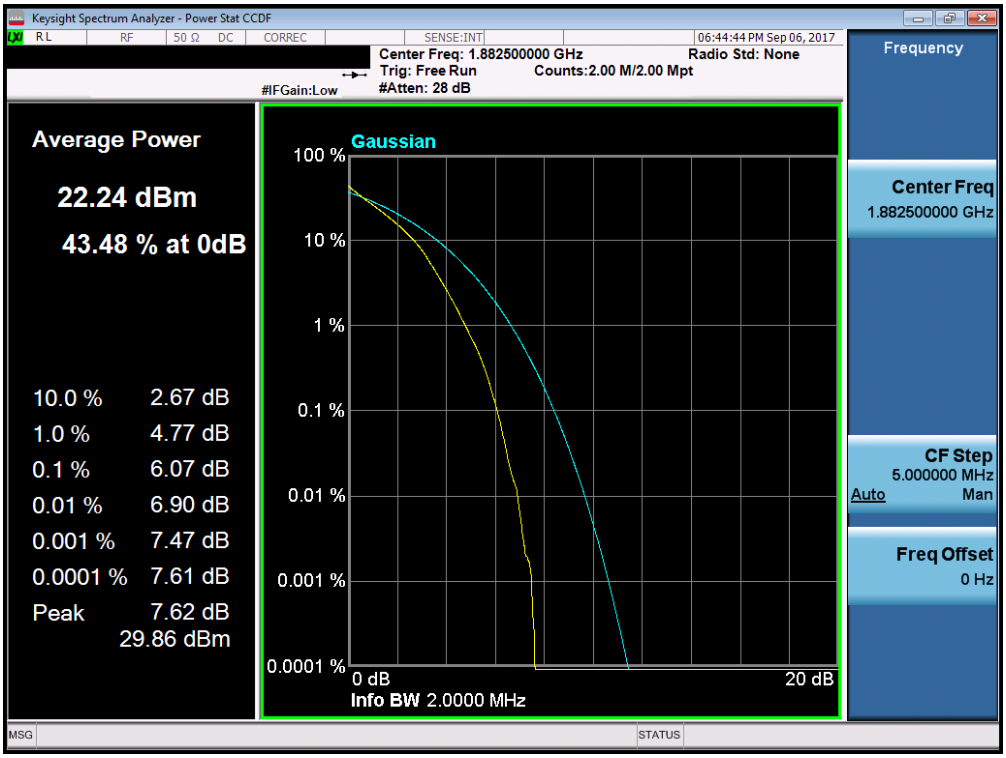
Plot 7-221. PAR Plot (Band 4 - 15.0MHz 16-QAM - Full RB Configuration)



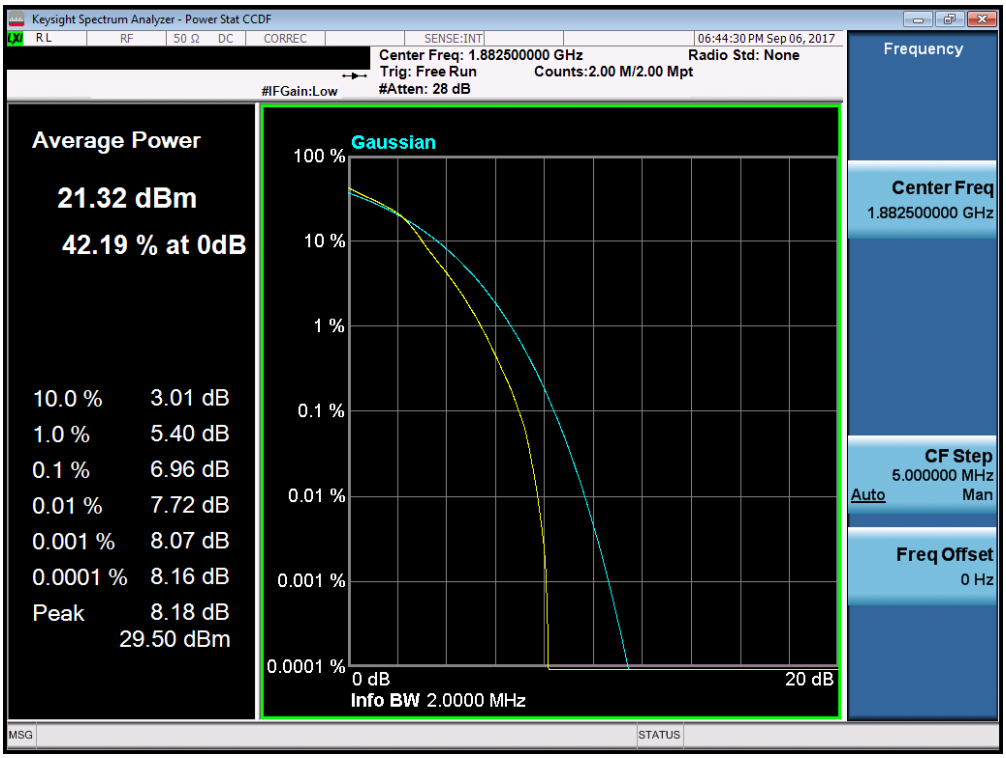
Plot 7-222. PAR Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



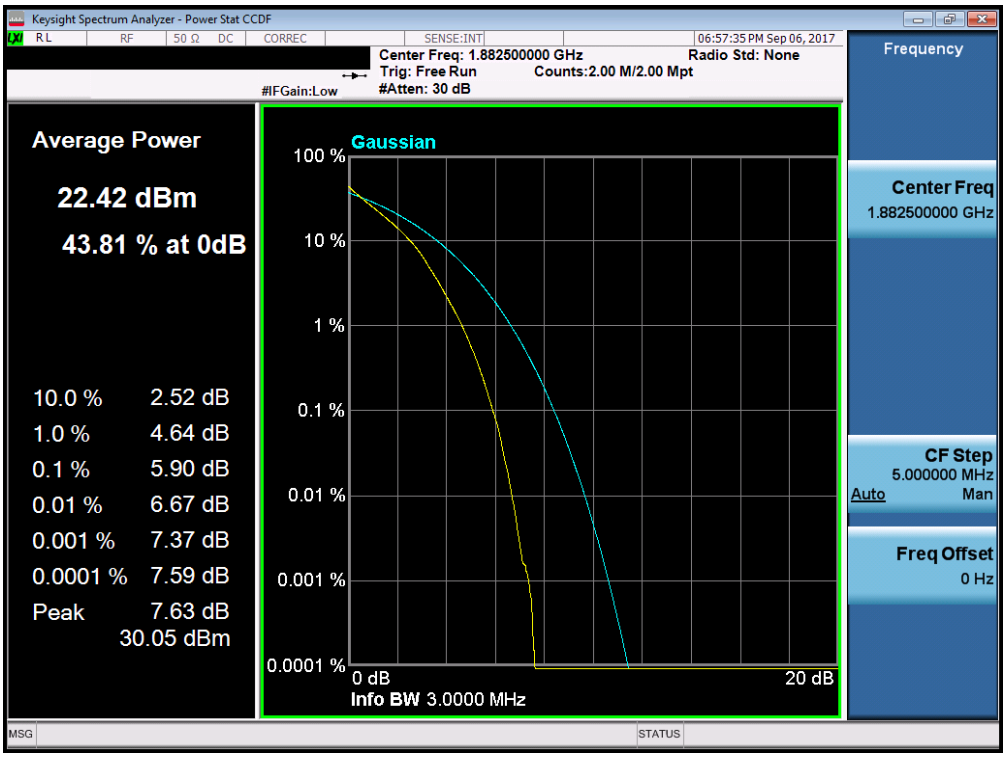
Plot 7-223. PAR Plot (Band 4 - 20.0MHz 16-QAM - Full RB Configuration)



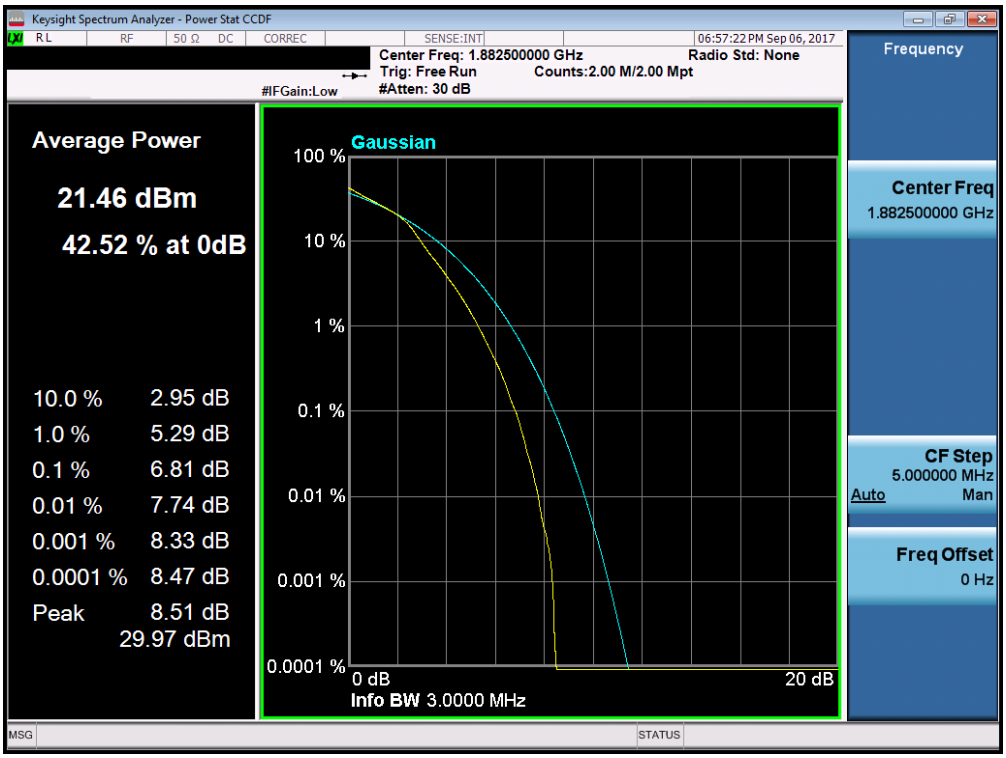
Plot 7-224. PAR Plot (Band 25/2 – 1.4MHz QPSK - Full RB Configuration)



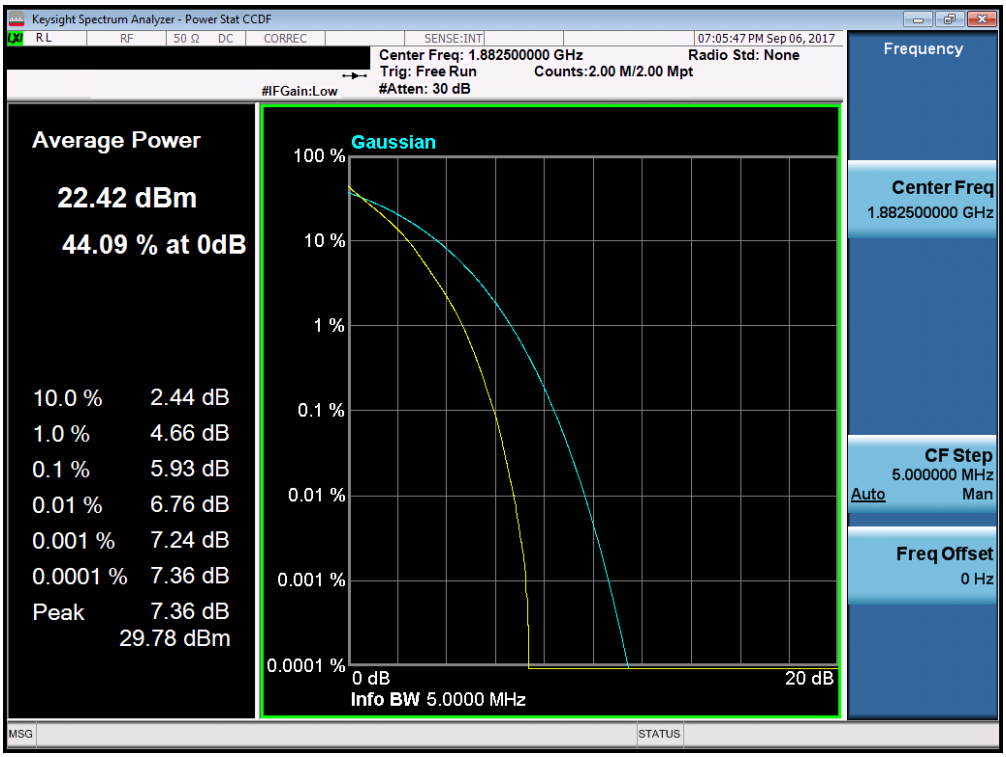
Plot 7-225. PAR Plot (Band 25/2 – 1.4MHz 16-QAM - Full RB Configuration)



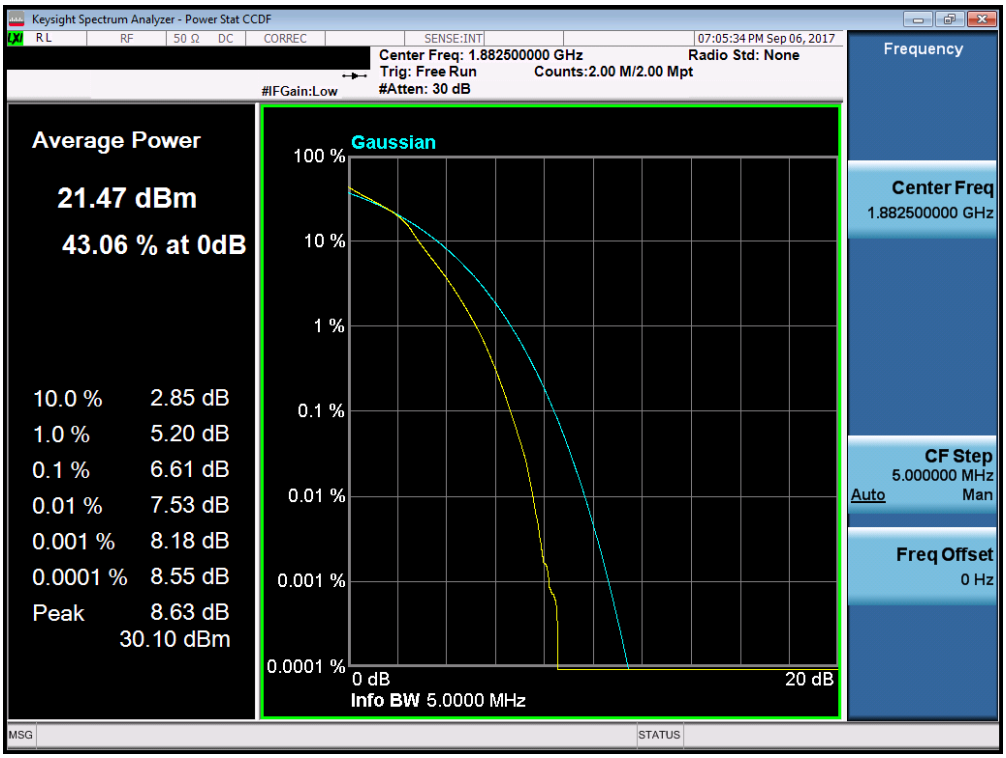
Plot 7-226. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



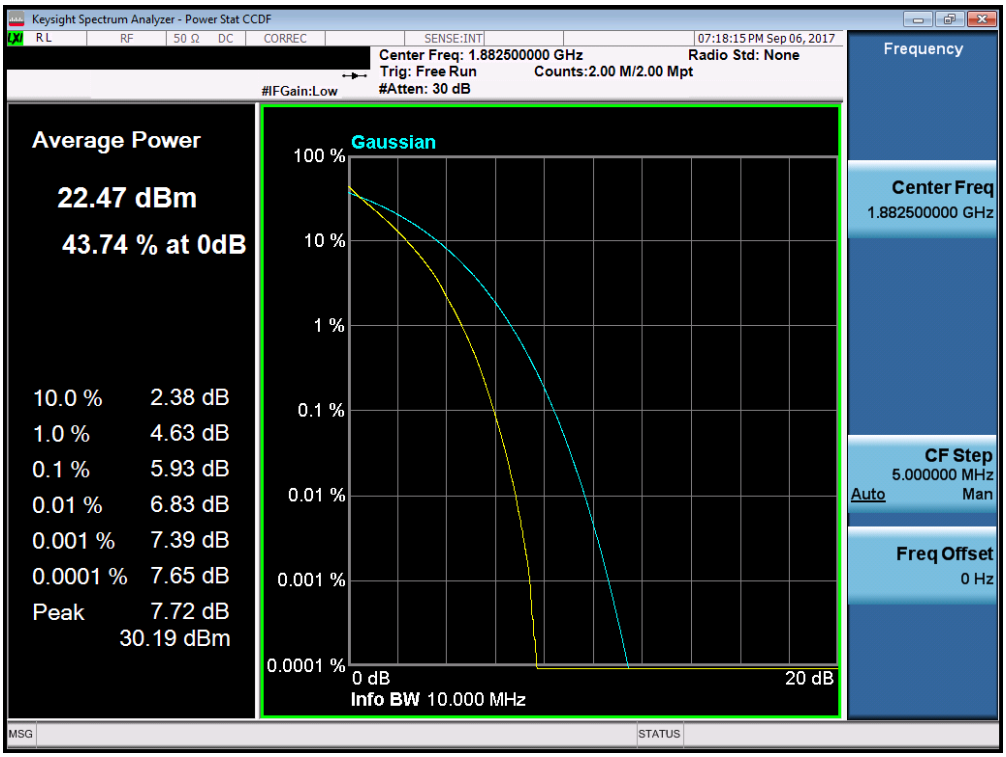
Plot 7-227. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



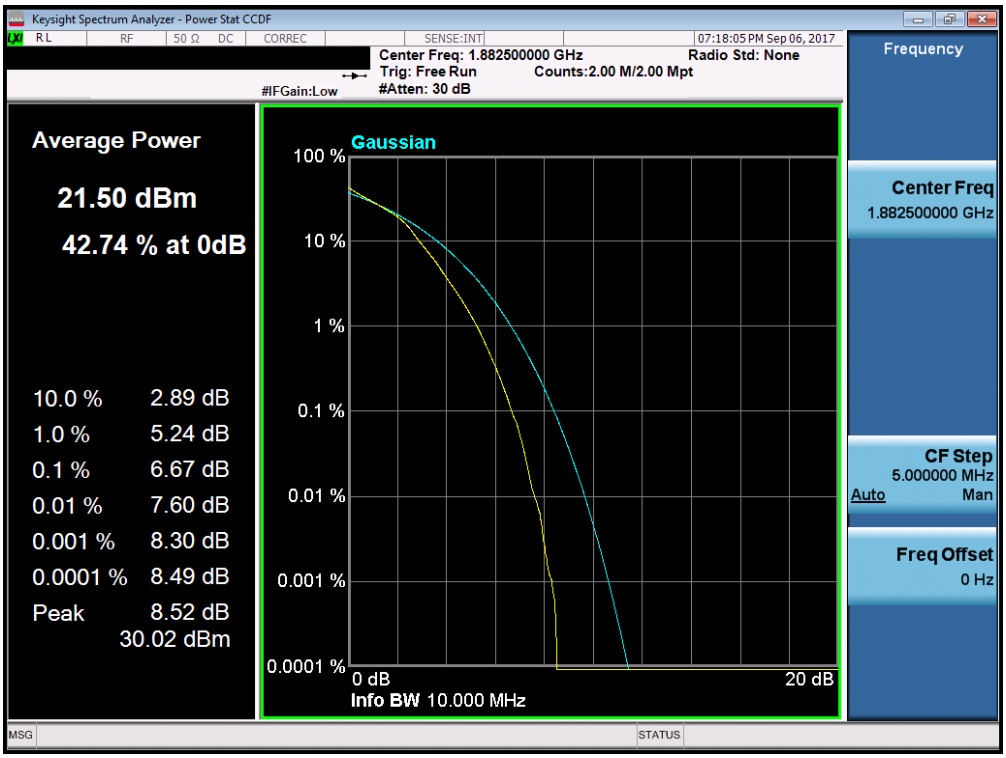
Plot 7-228. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



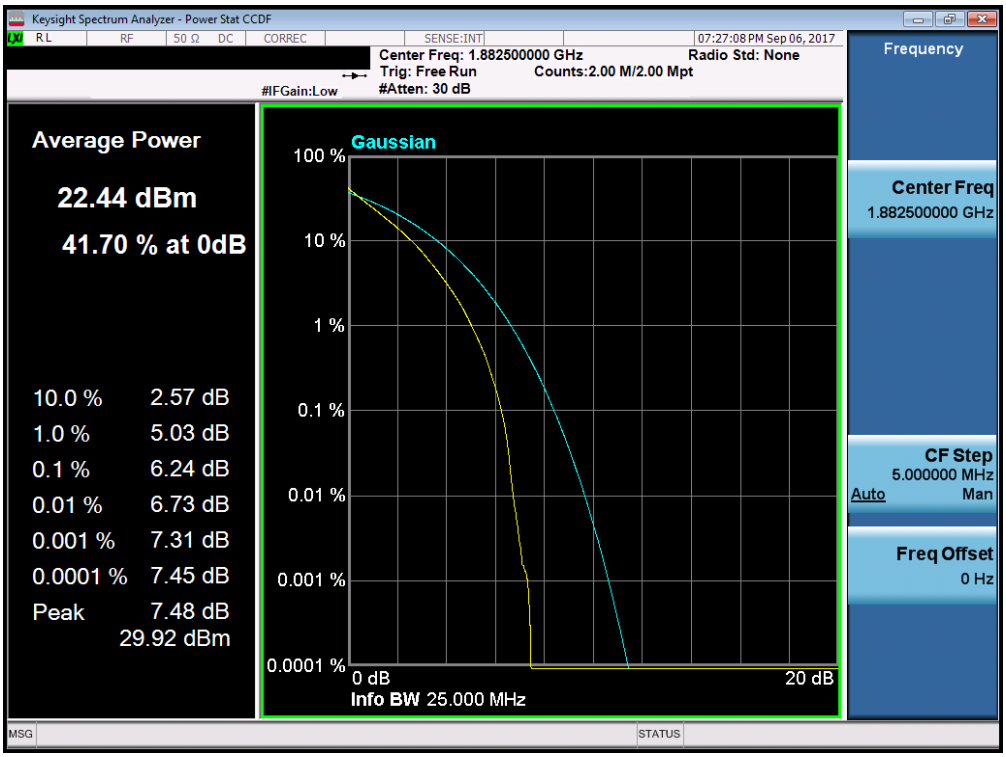
Plot 7-229. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)



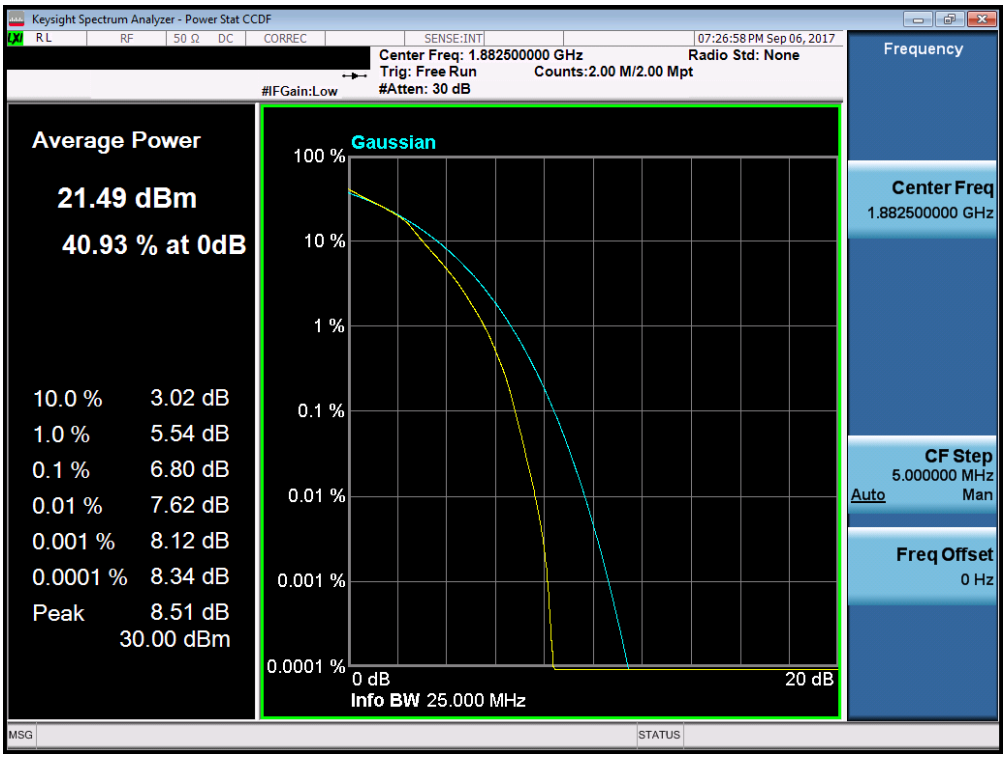
Plot 7-230. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



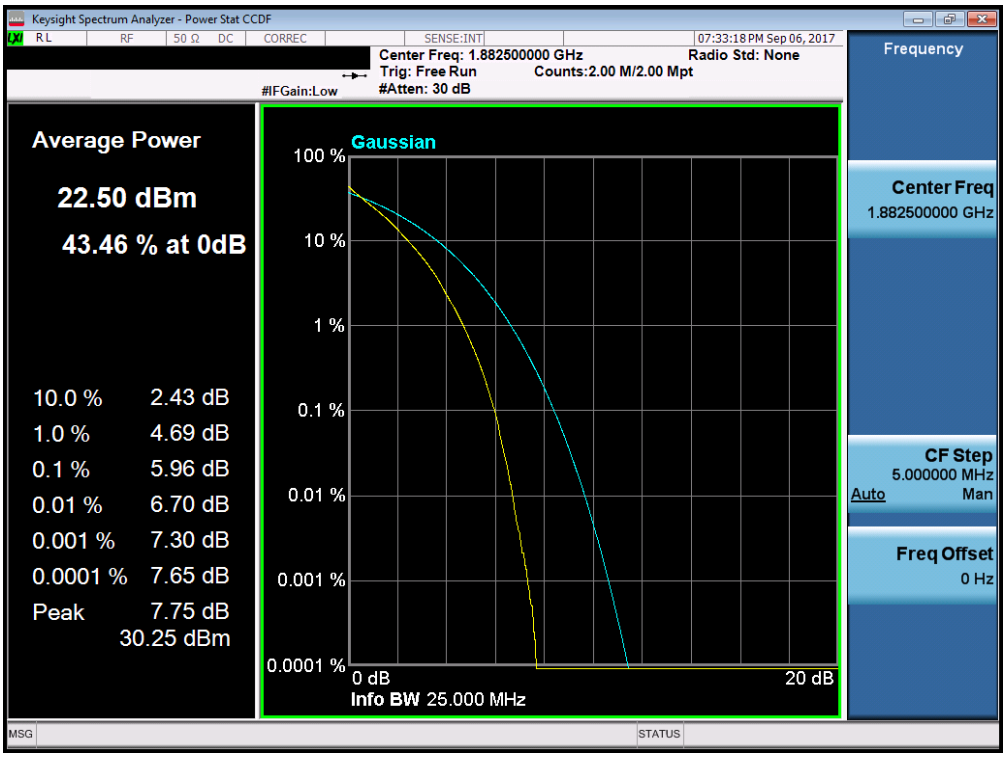
Plot 7-231. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



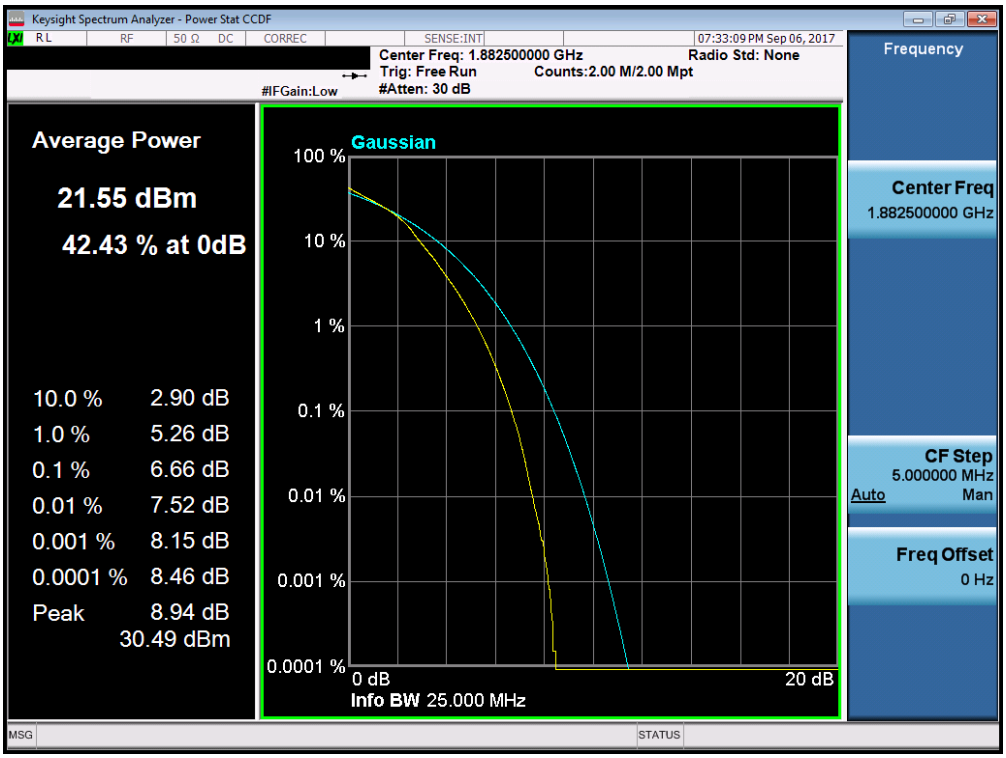
Plot 7-232. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-233. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)



Plot 7-234. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-235. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)

7.6 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) RSS-130(4.4) RSS-132(5.4) RSS-133(6.4) RSS-139(6.5) RSS-199(4.4)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) 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 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 v02r02 – Section 5.2.1

ANSI/TIA-603-D-2010 – 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.

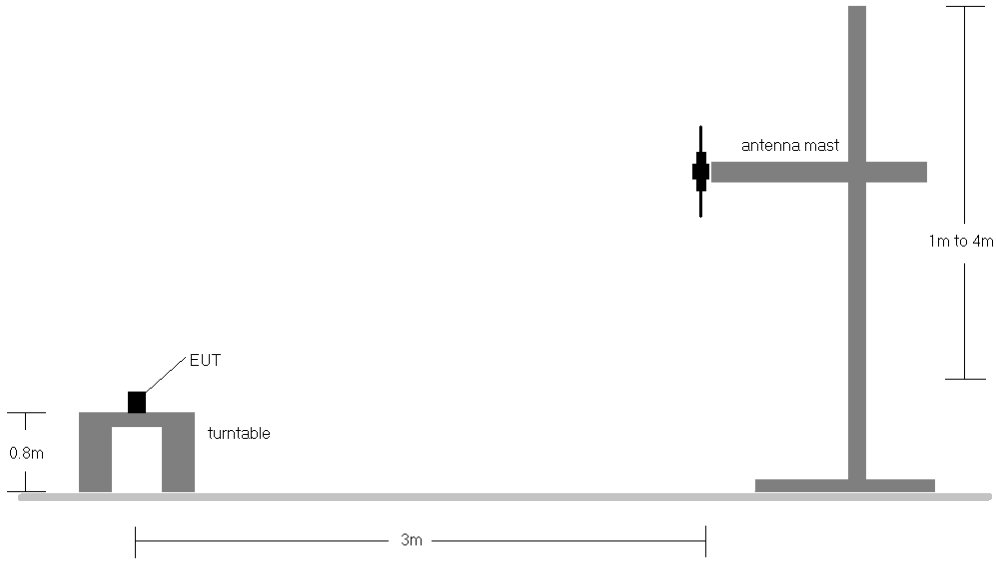


Figure 7-5. Radiated Test Setup <1GHz

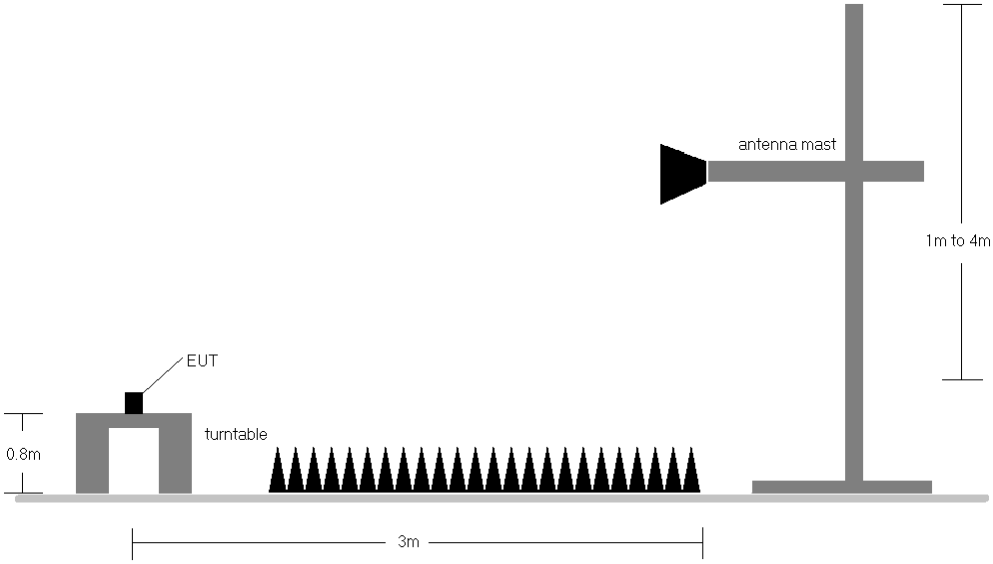


Figure 7-6. Radiated Test Setup >1GHz

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]	Margin [dB]
699.70	1.4	QPSK	V	150	340	1 / 5	21.84	1.00	20.69	0.117	34.77	-14.08	22.84	0.192	-17.76
707.50	1.4	QPSK	V	150	340	1 / 5	22.04	0.97	20.86	0.122	34.77	-13.91	23.01	0.200	-17.60
715.30	1.4	QPSK	V	150	350	1 / 0	22.32	0.94	21.11	0.129	34.77	-13.66	23.26	0.212	-17.35
715.30	1.4	16-QAM	V	150	350	1 / 0	21.32	0.94	20.11	0.103	34.77	-14.66	22.26	0.168	-18.35
700.50	3	QPSK	V	150	342	1 / 14	21.89	1.00	20.74	0.119	34.77	-14.03	22.89	0.194	-17.72
707.50	3	QPSK	V	150	340	1 / 14	21.92	0.97	20.74	0.119	34.77	-14.03	22.89	0.195	-17.72
714.50	3	QPSK	V	150	348	1 / 14	22.36	0.94	21.15	0.130	34.77	-13.62	23.30	0.214	-17.31
714.50	3	16-QAM	V	150	348	1 / 14	21.39	0.94	20.18	0.104	34.77	-14.59	22.33	0.171	-18.28
701.50	5	QPSK	V	150	353	1 / 0	22.03	0.99	20.87	0.122	34.77	-13.90	23.02	0.201	-17.58
707.50	5	QPSK	V	150	336	1 / 24	22.13	0.97	20.95	0.124	34.77	-13.82	23.10	0.204	-17.51
713.50	5	QPSK	V	150	344	1 / 24	22.58	0.95	21.38	0.137	34.77	-13.40	23.53	0.225	-17.08
713.50	5	16-QAM	V	150	344	1 / 24	21.62	0.95	20.42	0.110	34.77	-14.36	22.57	0.181	-18.04
704.00	10	QPSK	V	150	350	1 / 0	21.96	0.98	20.79	0.120	34.77	-13.98	22.94	0.197	-17.66
707.50	10	QPSK	V	150	346	1 / 49	22.16	0.97	20.98	0.125	34.77	-13.79	23.13	0.206	-17.48
711.00	10	QPSK	V	150	345	1 / 49	22.52	0.96	21.33	0.136	34.77	-13.45	23.48	0.223	-17.13
711.00	10	16-QAM	V	150	345	1 / 49	21.61	0.96	20.42	0.110	34.77	-14.36	22.57	0.181	-18.04
713.50	5	QPSK	H	150	211	1 / 24	22.37	0.95	21.17	0.131	34.77	-13.61	23.32	0.215	-17.29

Table 7-236. 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]
779.50	5	QPSK	V	150	353	1 / 12	21.64	0.78	20.27	0.106	34.77	-14.50	22.42	0.175	-18.19
782.00	5	QPSK	V	150	348	1 / 24	21.97	0.77	20.59	0.115	34.77	-14.18	22.74	0.188	-17.87
784.50	5	QPSK	V	150	347	1 / 0	21.75	0.76	20.36	0.109	34.77	-14.41	22.51	0.178	-18.10
782.00	5	16-QAM	V	150	348	1 / 24	21.06	0.77	19.68	0.093	34.77	-15.09	21.83	0.152	-18.78
782.00	10	QPSK	V	150	8	1 / 0	20.90	0.77	19.52	0.090	34.77	-15.25	21.67	0.147	-18.94
782.00	10	16-QAM	V	150	8	1 / 0	19.77	0.77	18.39	0.069	34.77	-16.38	20.54	0.113	-20.07
782.00	5	QPSK	H	150	224	1 / 24	21.67	0.77	20.29	0.107	34.77	-14.48	22.44	0.175	-18.17

Table 7-237. 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	V	150	351	1 / 0	23.78	1.40	23.03	0.201	38.45	-15.42	25.18	0.330	-11.81
836.50	1.4	QPSK	V	150	3	1 / 5	23.77	1.31	22.93	0.196	38.45	-15.52	25.08	0.322	-11.91
848.30	1.4	QPSK	V	150	347	1 / 5	23.42	1.21	22.48	0.177	38.45	-15.97	24.63	0.291	-12.36
824.70	1.4	16-QAM	V	150	351	1 / 0	23.01	1.40	22.26	0.168	38.45	-16.19	24.41	0.276	-12.58
825.50	3	QPSK	V	150	353	1 / 14	23.95	1.40	23.20	0.209	38.45	-15.26	25.35	0.342	-11.64
836.50	3	QPSK	V	150	355	1 / 14	23.87	1.31	23.03	0.201	38.45	-15.42	25.18	0.329	-11.81
847.50	3	QPSK	V	150	344	1 / 0	23.46	1.22	22.53	0.179	38.45	-15.92	24.68	0.294	-12.31
825.50	3	16-QAM	V	150	353	1 / 14	22.77	1.40	22.02	0.159	38.45	-16.44	24.17	0.261	-12.82
826.50	5	QPSK	V	150	360	1 / 24	23.85	1.39	23.09	0.204	38.45	-15.36	25.24	0.334	-11.75
836.50	5	QPSK	V	150	347	1 / 0	23.84	1.31	23.00	0.199	38.45	-15.45	25.15	0.327	-11.84
846.50	5	QPSK	V	150	340	1 / 0	23.31	1.23	22.39	0.173	38.45	-16.06	24.54	0.284	-12.45
826.50	5	16-QAM	V	150	360	1 / 24	22.90	1.39	22.14	0.164	38.45	-16.31	24.29	0.268	-12.70
829.00	10	QPSK	V	150	357	1 / 25	23.87	1.37	23.09	0.204	38.45	-15.36	25.24	0.334	-11.75
836.50	10	QPSK	V	150	350	1 / 25	23.71	1.31	22.87	0.194	38.45	-15.58	25.02	0.317	-11.97
844.00	10	QPSK	V	150	357	1 / 0	23.52	1.25	22.62	0.183	38.45	-15.83	24.77	0.300	-12.22
829.00	10	16-QAM	V	150	357	1 / 25	22.81	1.37	22.03	0.159	38.45	-16.42	24.18	0.262	-12.81
831.50	15	QPSK	V	150	344	1 / 74	23.73	1.35	22.93	0.196	38.45	-15.52	25.08	0.322	-11.91
836.50	15	QPSK	V	150	359	1 / 37	23.66	1.31	22.82	0.191	38.45	-15.63	24.97	0.314	-12.02
841.50	15	QPSK	V	150	353	1 / 0	23.58	1.27	22.70	0.186	38.45	-15.75	24.85	0.305	-12.14
831.50	15	16-QAM	V	150	344	1 / 74	22.84	1.35	22.04	0.160	38.45	-16.41	24.19	0.262	-12.80
825.50	3	QPSK	H	150	203	1 / 14	21.86	1.40	21.11	0.129	38.45	-17.35	23.26	0.212	-13.73

Table 7-238. ERP/EIRP Data (Band 26/5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	150	353	1 / 0	19.72	5.56	25.28	0.337	30.00	-4.72
1732.50	1.4	QPSK	H	150	355	1 / 0	19.66	5.41	25.07	0.321	30.00	-4.93
1754.30	1.4	QPSK	H	150	356	1 / 0	19.11	5.26	24.37	0.274	30.00	-5.63
1710.70	1.4	16-QAM	H	150	353	1 / 0	18.99	5.56	24.55	0.285	30.00	-5.45
1711.50	3	QPSK	H	150	349	1 / 7	20.14	5.55	25.69	0.371	30.00	-4.31
1732.50	3	QPSK	H	150	344	1 / 14	19.88	5.41	25.29	0.338	30.00	-4.71
1753.50	3	QPSK	H	150	351	1 / 14	19.77	5.26	25.03	0.319	30.00	-4.97
1711.50	3	16-QAM	H	150	349	1 / 7	19.22	5.55	24.77	0.300	30.00	-5.23
1712.50	5	QPSK	H	150	357	1 / 12	19.89	5.55	25.44	0.350	30.00	-4.56
1732.50	5	QPSK	H	150	355	1 / 0	19.64	5.41	25.05	0.320	30.00	-4.95
1752.50	5	QPSK	H	150	353	1 / 0	19.96	5.27	25.23	0.334	30.00	-4.77
1712.50	5	16-QAM	H	150	357	1 / 12	18.99	5.55	24.54	0.284	30.00	-5.46
1715.00	10	QPSK	H	150	359	1 / 25	19.58	5.53	25.11	0.324	30.00	-4.89
1732.50	10	QPSK	H	150	344	1 / 25	18.85	5.41	24.26	0.267	30.00	-5.74
1750.00	10	QPSK	H	150	354	1 / 0	19.69	5.29	24.98	0.315	30.00	-5.02
1715.00	10	16-QAM	H	150	359	1 / 25	18.99	5.53	24.52	0.283	30.00	-5.48
1717.50	15	QPSK	H	150	356	1 / 0	19.97	5.51	25.48	0.353	30.00	-4.52
1732.50	15	QPSK	H	150	348	1 / 0	19.46	5.41	24.87	0.307	30.00	-5.13
1747.50	15	QPSK	H	150	356	1 / 0	19.82	5.31	25.13	0.326	30.00	-4.87
1717.50	15	16-QAM	H	150	356	1 / 0	19.16	5.51	24.67	0.293	30.00	-5.33
1720.00	20	QPSK	H	150	356	1 / 0	20.02	5.49	25.51	0.356	30.00	-4.49
1732.50	20	QPSK	H	150	356	1 / 0	19.74	5.41	25.15	0.327	30.00	-4.85
1745.00	20	QPSK	H	150	356	1 / 0	19.82	5.32	25.14	0.327	30.00	-4.86
1720.00	20	16-QAM	H	150	356	1 / 0	19.31	5.49	24.80	0.302	30.00	-5.20
1711.50	3	QPSK	V	150	223	1 / 7	17.54	5.55	23.09	0.204	30.00	-6.91

Table 7-239. EIRP Data (Band 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	258	1 / 0	19.90	4.79	24.69	0.294	33.01	-8.32
1880.00	1.4	QPSK	V	150	231	1 / 0	20.71	4.84	25.55	0.359	33.01	-7.46
1909.30	1.4	QPSK	V	150	231	1 / 5	21.02	4.86	25.88	0.387	33.01	-7.13
1909.30	1.4	16-QAM	V	150	231	1 / 5	20.02	4.86	24.88	0.308	33.01	-8.13
1851.50	3	QPSK	V	150	232	1 / 0	20.76	4.79	25.55	0.359	33.01	-7.46
1880.00	3	QPSK	V	150	232	1 / 7	21.32	4.84	26.16	0.414	33.01	-6.85
1908.50	3	QPSK	V	150	237	1 / 0	21.28	4.86	26.14	0.411	33.01	-6.87
1880.00	3	16-QAM	V	150	232	1 / 7	20.21	4.84	25.05	0.320	33.01	-7.96
1852.50	5	QPSK	V	150	228	1 / 24	20.30	4.79	25.09	0.323	33.01	-7.92
1880.00	5	QPSK	V	150	227	1 / 24	20.92	4.84	25.76	0.377	33.01	-7.25
1907.50	5	QPSK	V	150	230	1 / 12	21.09	4.87	25.96	0.394	33.01	-7.05
1907.50	5	16-QAM	V	150	230	1 / 12	20.15	4.87	25.02	0.317	33.01	-7.99
1855.00	10	QPSK	V	150	227	1 / 49	20.13	4.80	24.93	0.311	33.01	-8.08
1880.00	10	QPSK	V	150	229	1 / 49	21.00	4.84	25.84	0.384	33.01	-7.17
1905.00	10	QPSK	V	150	239	1 / 49	20.98	4.87	25.85	0.385	33.01	-7.16
1905.00	10	16-QAM	V	150	239	1 / 49	20.08	4.87	24.95	0.313	33.01	-8.06
1857.50	15	QPSK	V	150	235	1 / 74	20.53	4.80	25.33	0.341	33.01	-7.68
1880.00	15	QPSK	V	150	230	1 / 74	20.94	4.84	25.78	0.379	33.01	-7.23
1902.50	15	QPSK	V	150	233	1 / 0	21.47	4.88	26.35	0.431	33.01	-6.66
1902.50	15	16-QAM	V	150	233	1 / 0	20.47	4.88	25.35	0.343	33.01	-7.66
1860.00	20	QPSK	V	150	235	1 / 99	20.50	4.81	25.31	0.339	33.01	-7.71
1880.00	20	QPSK	V	150	231	1 / 99	20.89	4.84	25.73	0.375	33.01	-7.28
1900.00	20	QPSK	V	150	231	1 / 0	21.45	4.88	26.33	0.430	33.01	-6.68
1900.00	20	16-QAM	V	150	231	1 / 0	20.44	4.88	25.32	0.341	33.01	-7.69
1902.50	15	QPSK	H	150	350	1 / 0	20.87	4.86	25.73	0.374	33.01	-7.28

Table 7-240. EIRP Data (Band 25/2)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	150	343	1 / 12	19.88	5.73	25.61	0.364	33.01	-7.40
2593.00	5	QPSK	H	150	292	1 / 12	19.86	6.07	25.93	0.392	33.01	-7.08
2687.50	5	QPSK	H	150	340	1 / 12	20.16	6.48	26.64	0.462	33.01	-6.37
2687.50	5	16-QAM	H	150	340	1 / 12	18.94	6.48	25.42	0.349	33.01	-7.59
2501.00	10	QPSK	H	150	350	1 / 25	19.60	5.73	25.33	0.341	33.01	-7.68
2593.00	10	QPSK	H	150	346	1 / 25	19.88	6.07	25.95	0.394	33.01	-7.06
2685.00	10	QPSK	H	150	1	1 / 25	19.48	6.47	25.95	0.394	33.01	-7.06
2685.00	10	16-QAM	H	150	1	1 / 25	18.27	6.47	24.74	0.298	33.01	-8.27
2503.50	15	QPSK	H	150	355	1 / 37	19.55	5.74	25.29	0.338	33.01	-7.72
2593.00	15	QPSK	H	150	349	1 / 37	19.81	6.07	25.88	0.387	33.01	-7.13
2682.50	15	QPSK	H	150	349	1 / 37	19.52	6.46	25.98	0.397	33.01	-7.03
2682.50	15	16-QAM	H	150	349	1 / 37	18.62	6.46	25.08	0.322	33.01	-7.93
2506.00	20	QPSK	H	150	340	1 / 50	19.51	5.75	25.26	0.336	33.01	-7.75
2593.00	20	QPSK	H	150	346	1 / 50	19.73	6.07	25.80	0.380	33.01	-7.21
2680.00	20	QPSK	H	150	356	1 / 50	19.66	6.45	26.11	0.409	33.01	-6.90
2680.00	20	16-QAM	H	150	356	1 / 50	18.72	6.45	25.17	0.329	33.01	-7.84
2687.50	5	QPSK	V	150	341	1 / 12	17.93	6.48	24.41	0.276	33.01	-8.60

Table 7-241. EIRP Data (Band 41)

7.7 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) RSS-130(4.6) RSS-132(5.5) RSS-133(6.5) RSS-139(6.6) RSS-199(4.5)

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.

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. 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.

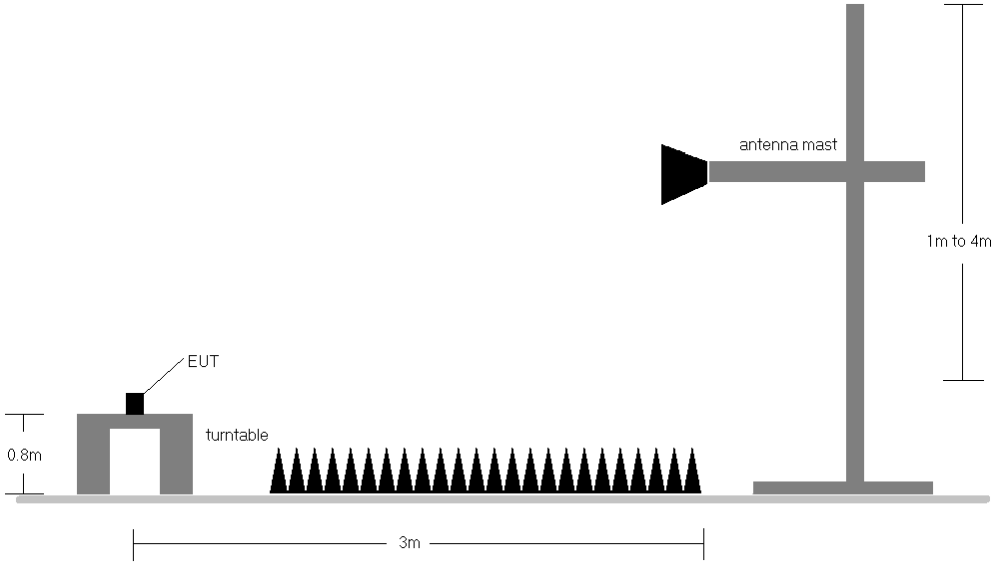


Figure 7-7. Test Instrument & Measurement Setup

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.

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	V	100	281	-71.92	7.90	-64.02	-51.0
2104.50	V	100	276	-74.24	8.76	-65.48	-52.5
2806.00	V	-	-	-73.08	10.05	-63.03	-50.0

Table 7-242. Radiated Spurious Data (Band 12 – 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	V	199	321	-71.42	7.95	-63.47	-50.5
2122.50	V	193	290	-72.72	8.86	-63.86	-50.9
2830.00	V	-	-	-73.07	10.03	-63.04	-50.0

Table 7-243. Radiated Spurious Data (Band 12 – 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	V	100	280	-76.35	8.01	-68.34	-55.3
2140.50	V	100	271	-73.58	8.96	-64.63	-51.6
2854.00	V	-	-	-72.51	10.01	-62.50	-49.5

Table 7-244. Radiated Spurious Data (Band 12 – High Channel)

OPERATING FREQUENCY:	779.50	MHz
CHANNEL:	23205	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2338.50	V	100	316	-67.65	9.46	-58.19	-45.2
3118.00	V	-	-	-69.88	9.35	-60.53	-47.5

Table 7-245. Radiated Spurious Data (Band 13 – Low Channel)

OPERATING FREQUENCY:	782.00	MHz
CHANNEL:	23230	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	V	100	308	-66.72	9.43	-57.29	-44.3
3128.00	V	-	-	-68.72	9.34	-59.38	-46.4

Table 7-246. Radiated Spurious Data (Band 13 – Mid Channel)

OPERATING FREQUENCY:	784.50	MHz
CHANNEL:	23255	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2353.50	V	377	302	-66.15	9.40	-56.76	-43.8
3138.00	V	-	-	-68.38	9.34	-59.05	-46.0

Table 7-247. Radiated Spurious Data (Band 13 – High Channel)

MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.00	MHz
DISTANCE:	3	meters
NARROWBAND EMISSION LIMIT:	-50	dBm
WIDEBAND EMISSION LIMIT:	-40	dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1559.00	V	100	309	-72.73	8.63	-64.11	-24.1
1564.00	V	100	311	-67.43	8.65	-58.78	-18.8
1569.00	V	100	311	-69.65	8.67	-60.98	-21.0

Table 7-248. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

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	V	100	299	-61.89	8.89	-53.00	-40.0
2476.50	V	195	297	-70.35	9.67	-60.68	-47.7
3302.00	V	-	-	-69.56	9.65	-59.90	-46.9

Table 7-249. Radiated Spurious Data (Band 26/5 – 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	V	100	291	-67.16	8.92	-58.24	-45.2
2509.50	V	100	290	-71.72	9.80	-61.91	-48.9
3346.00	V	-	-	-68.53	9.68	-58.85	-45.8

Table 7-250. Radiated Spurious Data (Band 26/5 – 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	V	100	295	-66.09	8.95	-57.14	-44.1
2542.50	V	191	292	-72.08	9.77	-62.32	-49.3
3390.00	V	-	-	-68.77	9.71	-59.06	-46.1

Table 7-251. Radiated Spurious Data (Band 26/5 – High Channel)

OPERATING FREQUENCY:	1711.50	MHz
CHANNEL:	19965	
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]
3423.00	V	100	0	-66.86	9.76	-57.10	-44.1
5134.50	V	186	357	-64.96	10.73	-54.24	-41.2
6846.00	V	-	-	-65.46	11.66	-53.80	-40.8

Table 7-252. Radiated Spurious Data (Band 4 – Low Channel)

OPERATING FREQUENCY:	1732.50	MHz
CHANNEL:	20175	
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]
3465.00	V	100	0	-66.06	9.85	-56.21	-43.2
5197.50	V	147	354	-63.74	10.59	-53.14	-40.1
6930.00	V	-	-	-64.56	11.76	-52.80	-39.8

Table 7-253. Radiated Spurious Data (Band 4 – Mid Channel)

OPERATING FREQUENCY:	1753.50	MHz
CHANNEL:	20385	
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]
3507.00	V	100	0	-66.78	9.92	-56.86	-43.9
5260.50	V	100	350	-66.07	10.66	-55.41	-42.4
7014.00	V	-	-	-65.11	11.78	-53.33	-40.3

Table 7-254. Radiated Spurious Data (Band 4 – High Channel)

OPERATING FREQUENCY:	1857.50	MHz
CHANNEL:	18675	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3715.00	V	252	182	-63.03	9.49	-53.54	-40.5
5572.50	V	199	322	-62.30	10.98	-51.32	-38.3
7430.00	V	-	-	-63.20	10.97	-52.24	-39.2

Table 7-255. Radiated Spurious Data (Band 25/2 – Low Channel)

OPERATING FREQUENCY:	1880.00	MHz
CHANNEL:	18900	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	V	153	214	-61.79	9.38	-52.41	-39.4
5640.00	V	195	336	-60.92	11.15	-49.77	-36.8
7520.00	V	-	-	-62.13	11.11	-51.02	-38.0

Table 7-256. Radiated Spurious Data (Band 25/2 – Mid Channel)

OPERATING FREQUENCY:	1902.50	MHz
CHANNEL:	19125	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3805.00	V	150	350	-66.27	9.28	-56.99	-44.0
5707.50	V	140	9	-58.13	11.34	-46.79	-33.8
7610.00	V	-	-	-63.18	11.30	-51.88	-38.9

Table 7-257. Radiated Spurious Data (Band 25/2 – High Channel)

OPERATING FREQUENCY:	2498.50	MHz
CHANNEL:	39675	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	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]
4997.00	V	156	263	-59.69	10.88	-48.80	-23.8
7495.50	V	143	123	-58.97	11.06	-47.91	-22.9
9994.00	V	-	-	-59.48	12.05	-47.43	-22.4

Table 7-258. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY:	2593.00	MHz
CHANNEL:	40620	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	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	V	157	3	-56.32	10.62	-45.71	-20.7
7779.00	V	100	34	-60.46	11.40	-49.06	-24.1
10372.00	V	-	-	-59.91	12.54	-47.37	-22.4

Table 7-259. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY:	2687.50	MHz
CHANNEL:	41565	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	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]
5375.00	V	145	318	-47.16	10.73	-36.44	-11.4
8062.50	V	134	319	-59.94	11.14	-48.81	-23.8
10750.00	V	-	-	-61.71	12.73	-48.99	-24.0

Table 7-260. Radiated Spurious Data (Band 41 – High Channel)

7.8 Frequency Stability / Temperature Variation

§2.1055 §22.355 §24.235 §27.54 RSS-130(4.3) RSS-132(5.3) RSS-133(6.3) RSS-139(6.3) RSS-199(4.3)

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-D-2010. 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, RSS-132 and RSS-133, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24, Part 27, RSS-130, RSS-139 and RSS-199, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-D-2010

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

§2.1055 §27.54 RSS-130(4.3)

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	707,500,098	98	0.0000139
100 %		- 30	707,499,759	-241	-0.0000341
100 %		- 20	707,499,820	-180	-0.0000254
100 %		- 10	707,500,118	118	0.0000167
100 %		0	707,500,267	267	0.0000377
100 %		+ 10	707,500,213	213	0.0000301
100 %		+ 20	707,500,124	124	0.0000175
100 %		+ 30	707,500,040	40	0.0000057
100 %		+ 40	707,499,614	-386	-0.0000546
100 %		+ 50	707,500,097	97	0.0000137
BATT. ENDPOINT	3.40	+ 20	707,499,943	-57	-0.0000081

Table 7-261. 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

§2.1055 §27.54 RSS-130(4.3)

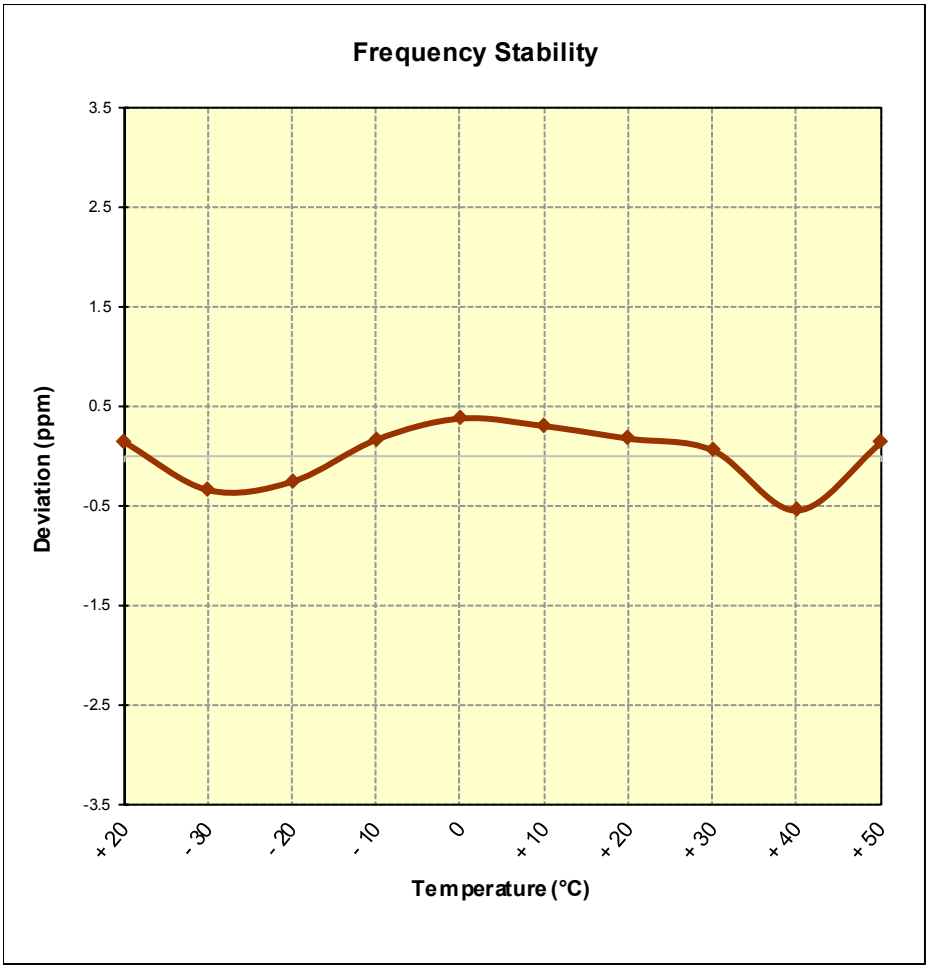


Figure 7-8. Frequency Stability Graph (Band 12)

Band 13 Frequency Stability Measurements

§2.1055 §27.54 RSS-130(4.3)

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	781,999,722	-278	-0.0000355
100 %		- 30	782,000,005	5	0.0000006
100 %		- 20	782,000,040	40	0.0000051
100 %		- 10	782,000,132	132	0.0000169
100 %		0	781,999,937	-63	-0.0000081
100 %		+ 10	782,000,026	26	0.0000033
100 %		+ 20	781,999,981	-19	-0.0000024
100 %		+ 30	782,000,322	322	0.0000412
100 %		+ 40	781,999,708	-292	-0.0000373
100 %		+ 50	782,000,395	395	0.0000505
BATT. ENDPOINT	3.40	+ 20	782,000,262	262	0.0000335

Table 7-262. 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 RSS-130(4.3)

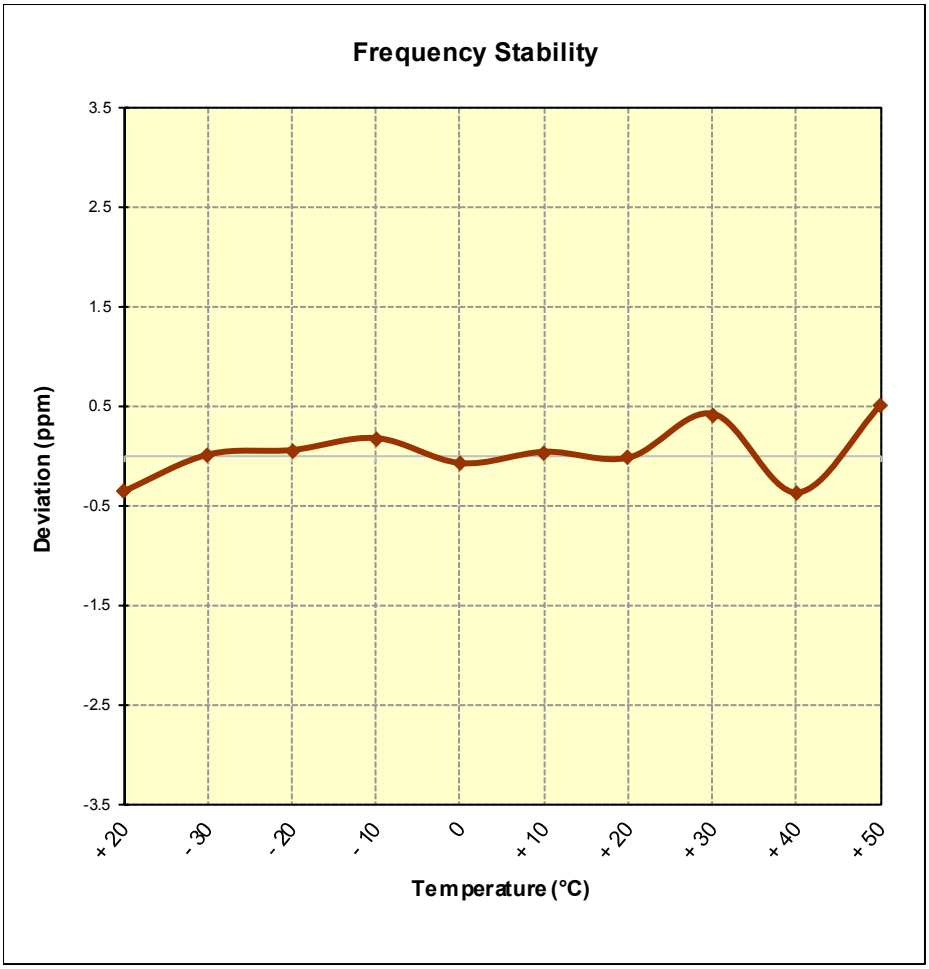


Figure 7-9. Frequency Stability Graph (Band 13)

Band 26/5 Frequency Stability Measurements

§2.1055 §22.355 RSS-132(5.3)

OPERATING FREQUENCY:	831,500,000	Hz
CHANNEL:	26865	
REFERENCE VOLTAGE:	3.80	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	831,499,798	-202	-0.0000243
100 %		- 30	831,500,205	205	0.0000247
100 %		- 20	831,500,192	192	0.0000231
100 %		- 10	831,500,142	142	0.0000171
100 %		0	831,499,951	-49	-0.0000059
100 %		+ 10	831,499,958	-42	-0.0000051
100 %		+ 20	831,499,971	-29	-0.0000035
100 %		+ 30	831,499,856	-144	-0.0000173
100 %		+ 40	831,499,976	-24	-0.0000029
100 %		+ 50	831,500,049	49	0.0000059
BATT. ENDPOINT	3.40	+ 20	831,499,985	-15	-0.0000018

Table 7-263. Frequency Stability Data (Band 26/5)

Band 26/5 Frequency Stability Measurements

§2.1055 §22.355 RSS-132(5.3)

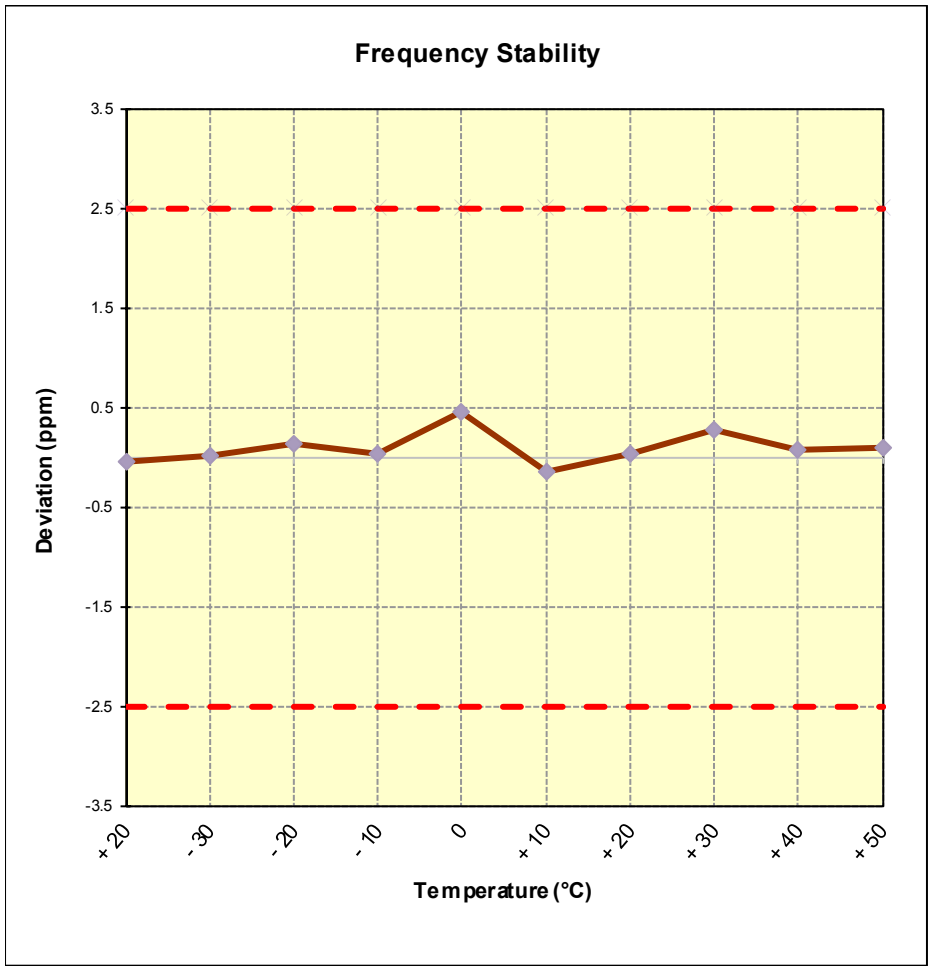


Figure 7-10. Frequency Stability Graph (Band 26/5)

Band 4 Frequency Stability Measurements

§2.1055 §§27.54 RSS-139(6.4)

OPERATING FREQUENCY:	1,732,500,000	Hz
CHANNEL:	20175	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,732,499,893	-107	-0.0000062
100 %		- 30	1,732,499,660	-340	-0.0000196
100 %		- 20	1,732,499,934	-66	-0.0000038
100 %		- 10	1,732,499,806	-194	-0.0000112
100 %		0	1,732,499,883	-117	-0.0000068
100 %		+ 10	1,732,499,892	-108	-0.0000062
100 %		+ 20	1,732,500,127	127	0.0000073
100 %		+ 30	1,732,499,842	-158	-0.0000091
100 %		+ 40	1,732,499,677	-323	-0.0000186
100 %		+ 50	1,732,500,049	49	0.0000028
BATT. ENDPOINT	3.40	+ 20	1,732,499,848	-152	-0.0000088

Table 7-264. Frequency Stability Data (Band 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 4 Frequency Stability Measurements

§2.1055 §§27.54 RSS-139(6.4)

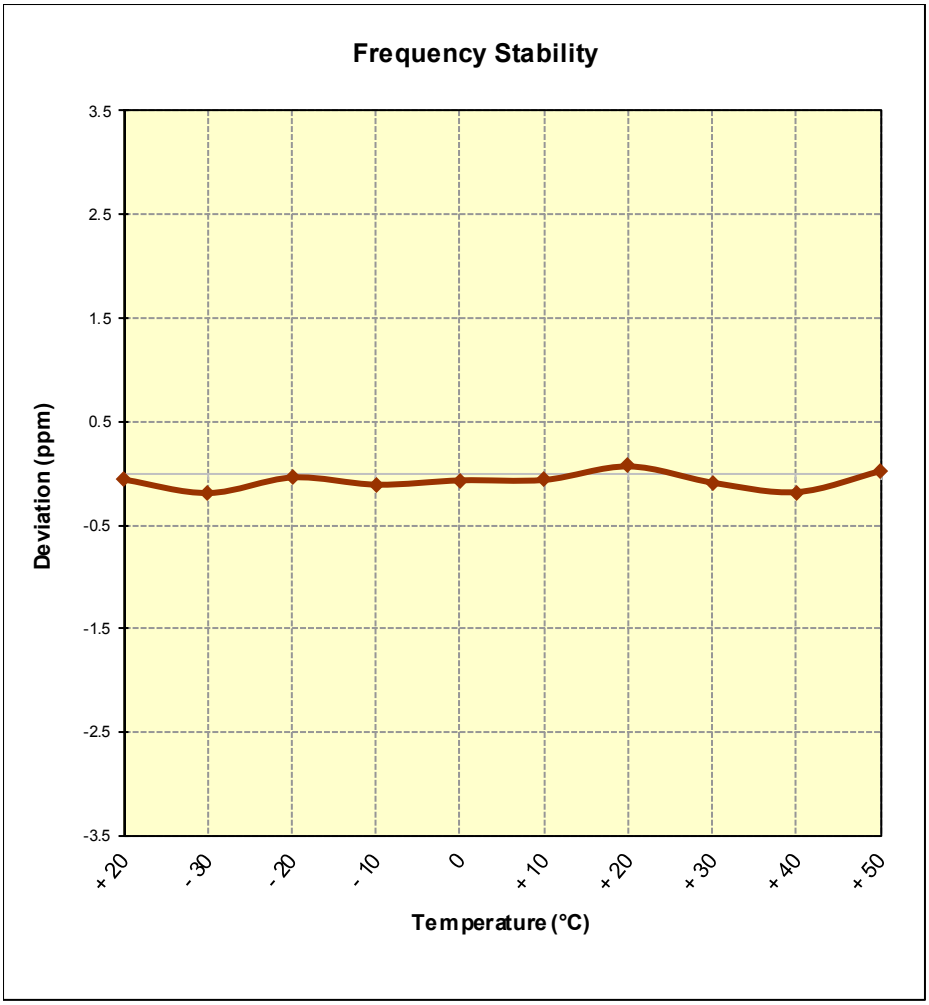


Figure 7-11. Frequency Stability Graph (Band 4)

Band 25/2 Frequency Stability Measurements

§2.1055 §24.235 RSS-133(6.3)

OPERATING FREQUENCY:	1,882,500,000	Hz
CHANNEL:	26365	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,882,500,044	44	0.0000023
100 %		- 30	1,882,500,156	156	0.0000083
100 %		- 20	1,882,500,027	27	0.0000014
100 %		- 10	1,882,500,379	379	0.0000201
100 %		0	1,882,499,909	-91	-0.0000048
100 %		+ 10	1,882,500,144	144	0.0000076
100 %		+ 20	1,882,499,785	-215	-0.0000114
100 %		+ 30	1,882,499,839	-161	-0.0000086
100 %		+ 40	1,882,500,134	134	0.0000071
100 %		+ 50	1,882,500,391	391	0.0000208
BATT. ENDPOINT	3.40	+ 20	1,882,499,612	-388	-0.0000206

Table 7-265. Frequency Stability Data (Band 25/2)

Band 25/2 Frequency Stability Measurements

§2.1055 §24.235 RSS-133(6.3)

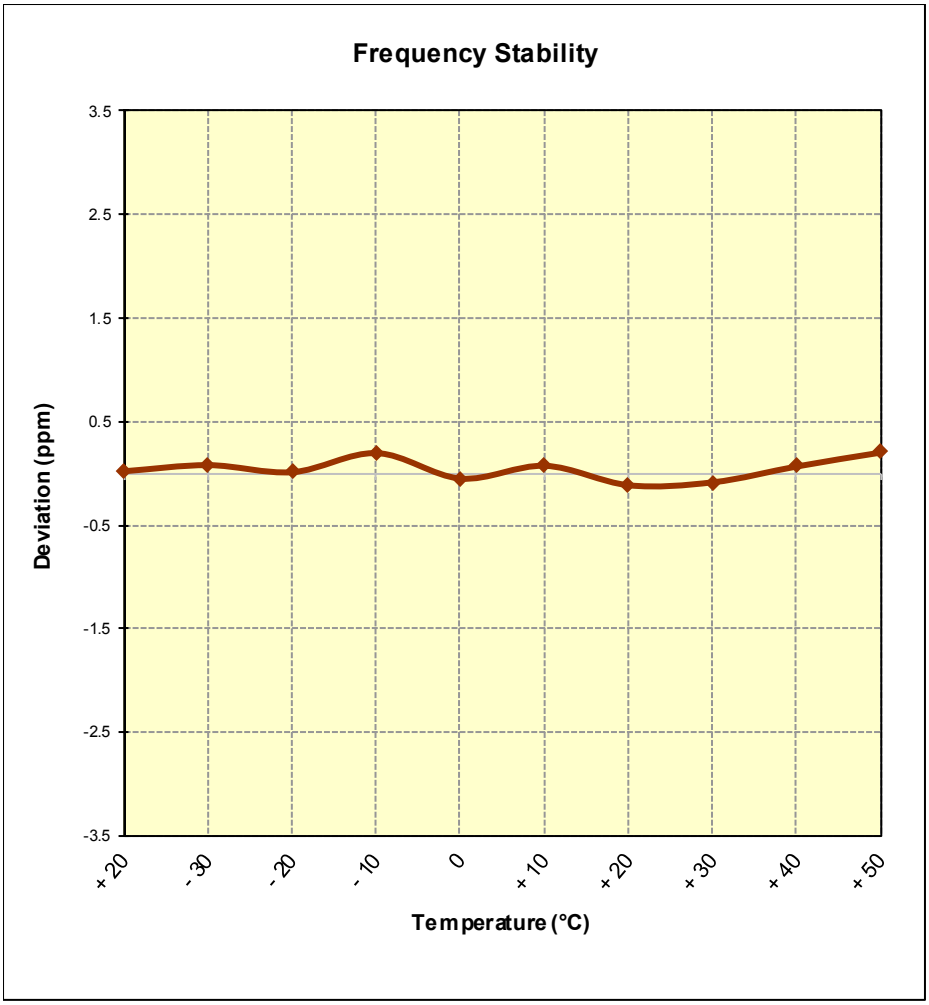


Figure 7-12. Frequency Stability Graph (Band 25/2)

Band 41 Frequency Stability Measurements

§2.1055 §27.54 RSS-199(4.3)

OPERATING FREQUENCY:	2,593,000,000	Hz
CHANNEL:	40620	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	2,592,999,930	-70	-0.0000027
100 %		- 30	2,592,999,952	-48	-0.0000019
100 %		- 20	2,592,999,908	-92	-0.0000035
100 %		- 10	2,592,999,538	-462	-0.0000178
100 %		0	2,592,999,791	-209	-0.0000081
100 %		+ 10	2,592,999,829	-171	-0.0000066
100 %		+ 20	2,592,999,822	-178	-0.0000069
100 %		+ 30	2,592,999,897	-103	-0.0000040
100 %		+ 40	2,593,000,007	7	0.0000003
100 %		+ 50	2,592,999,775	-225	-0.0000087
BATT. ENDPOINT	3.40	+ 20	2,593,000,070	70	0.0000027

Table 7-266. Frequency Stability Data (Band 41)

Note:

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

Band 41 Frequency Stability Measurements

§2.1055 §27.54 RSS-199(4.3)

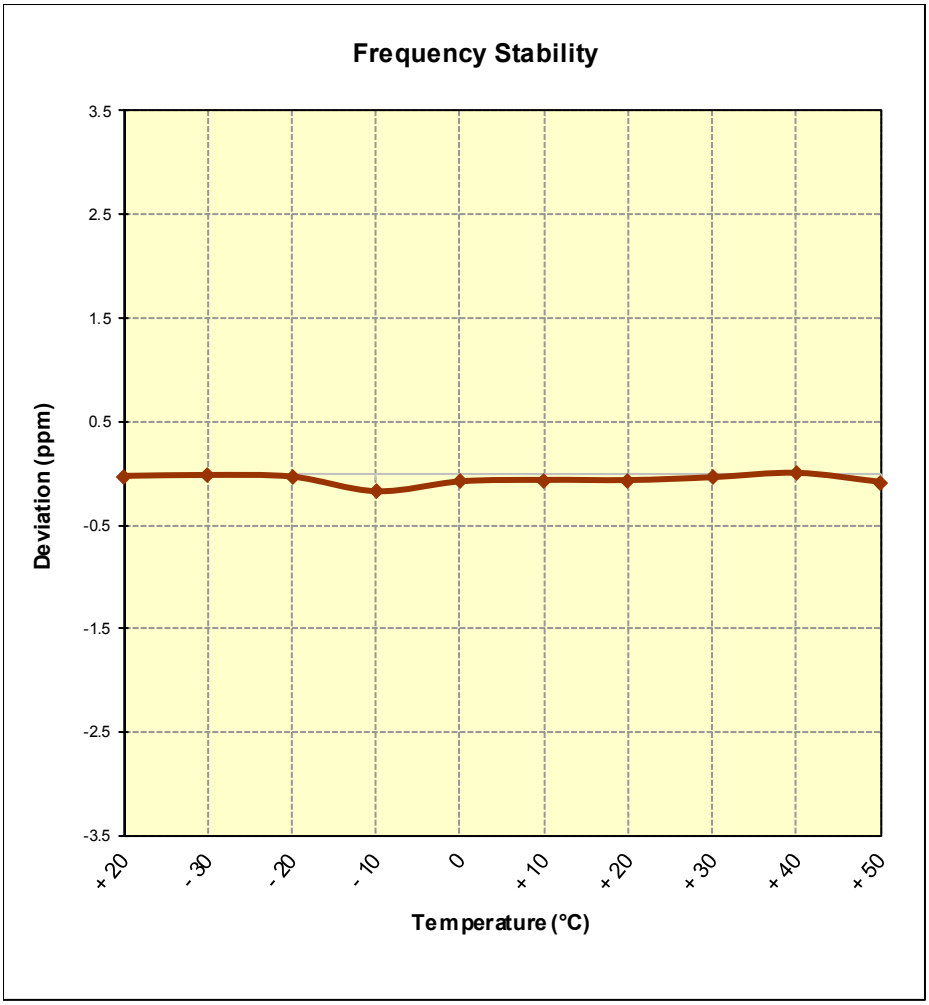


Figure 7-13. Frequency Stability Graph (Band 41)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFSP200** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.