Plot 7-131. Lower Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-132. Upper Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

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Plot 7-133. Lower Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

Plot 7-134. Upper Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

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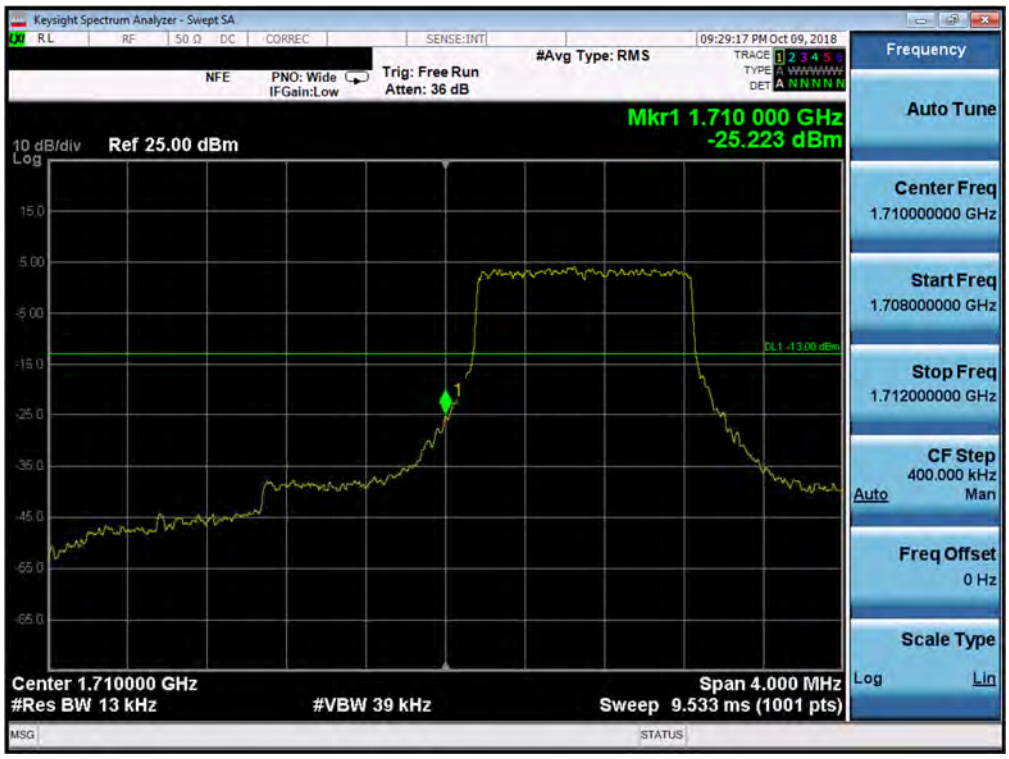
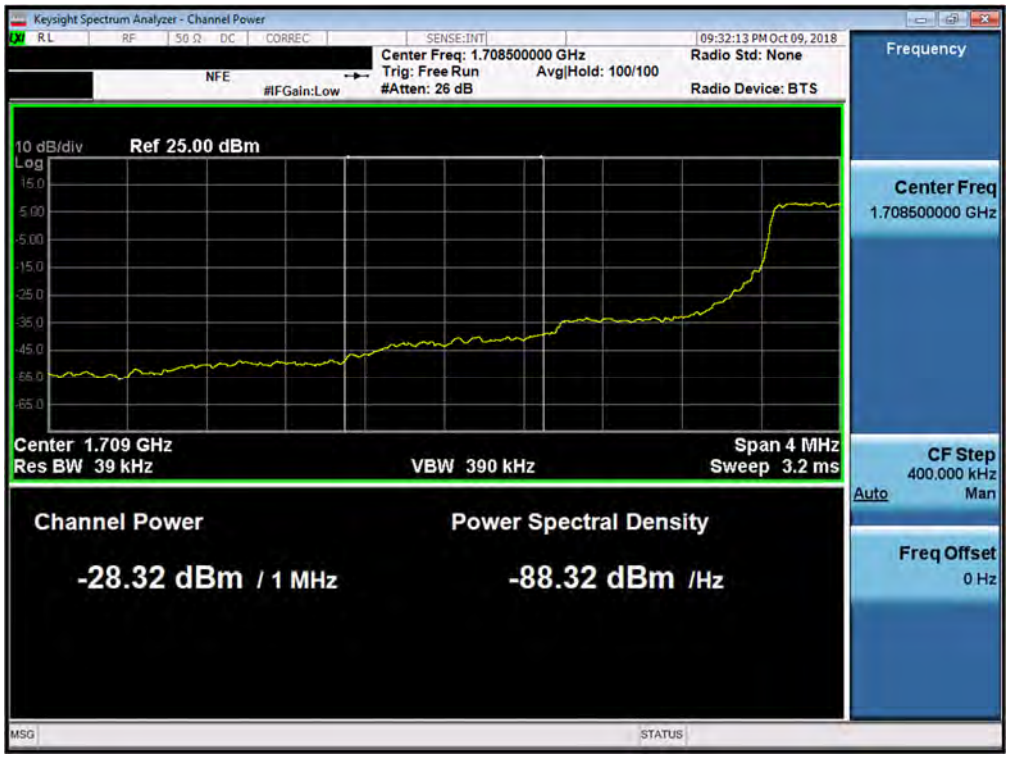
Band 66/4



Plot 7-135. Lower Band Edge Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



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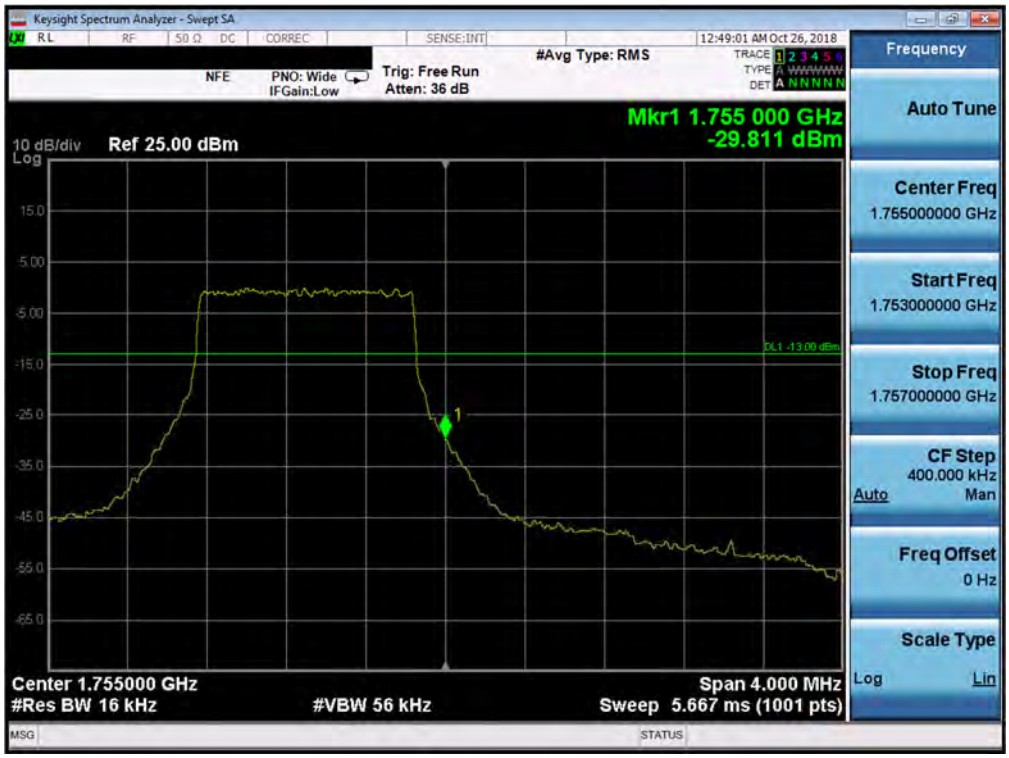
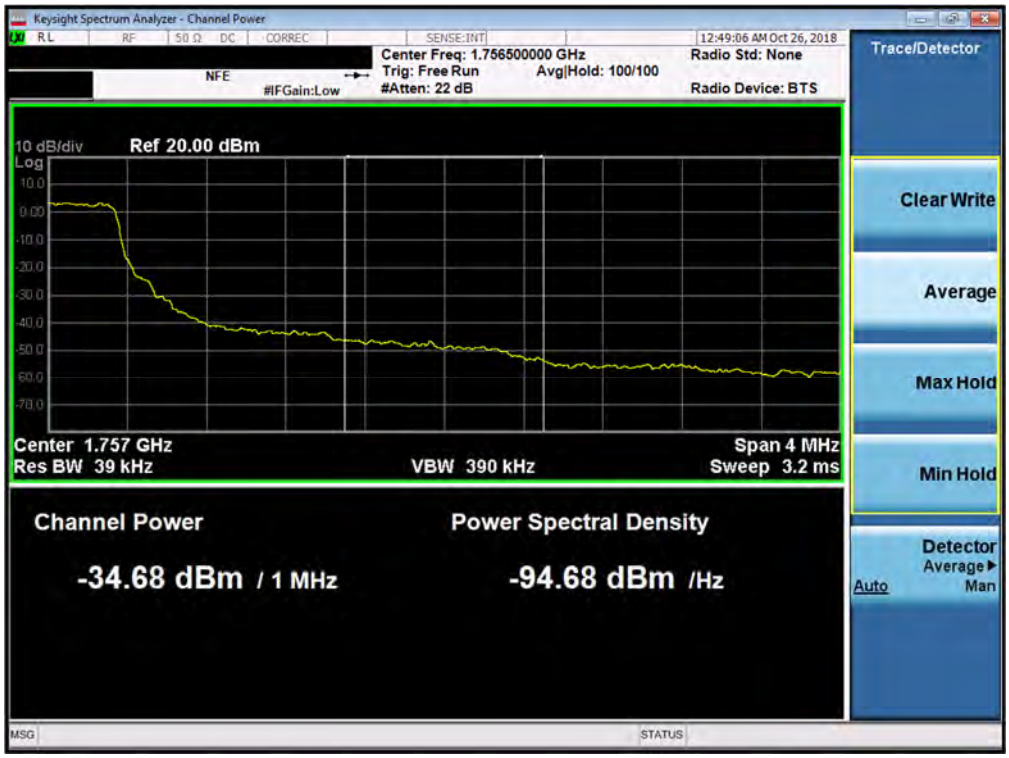
Plot 7-136. Lower Extended Band Edge Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-137. Upper Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-138. Upper Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

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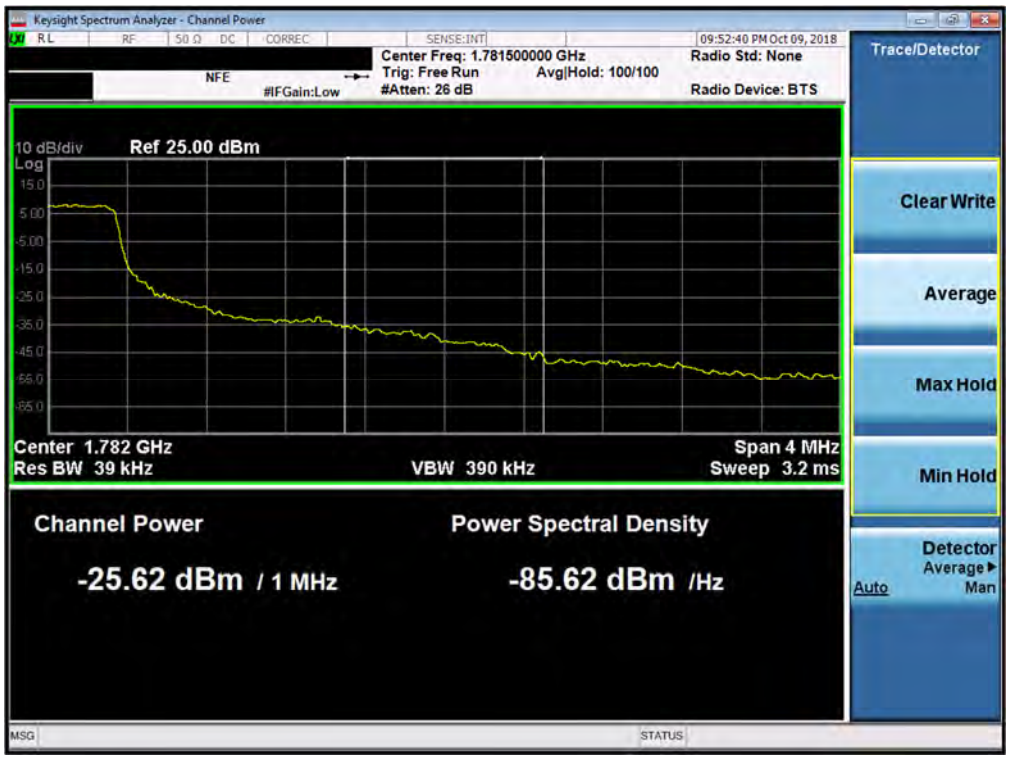
Plot 7-139. Upper Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-140. Upper Extended Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)

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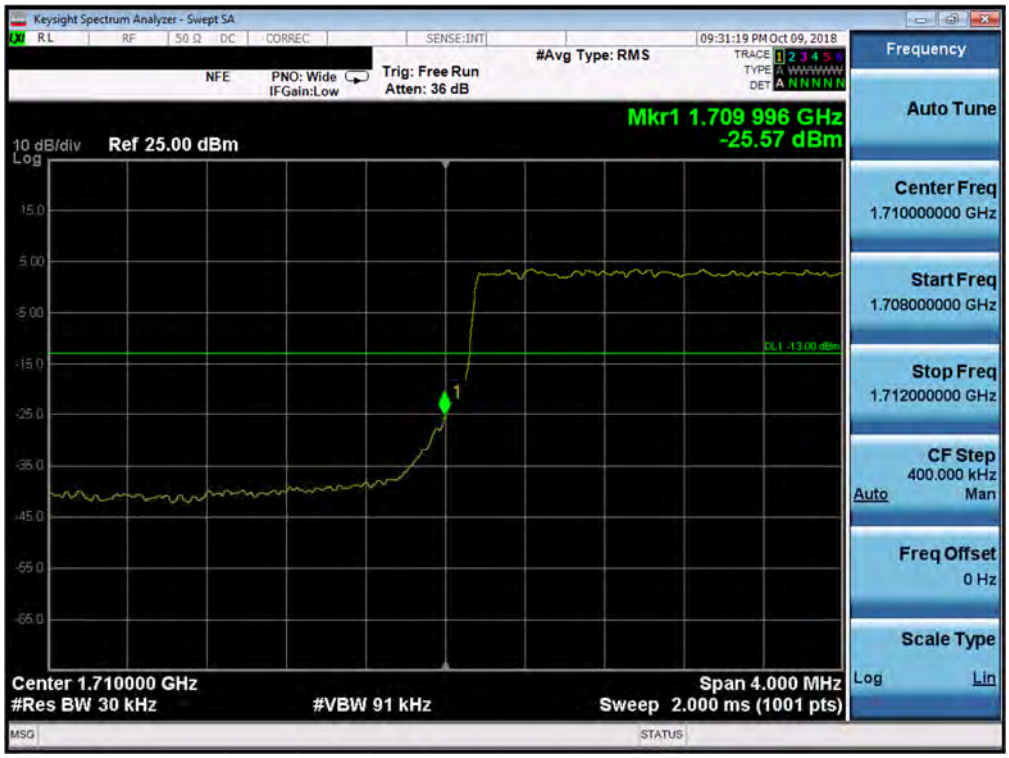
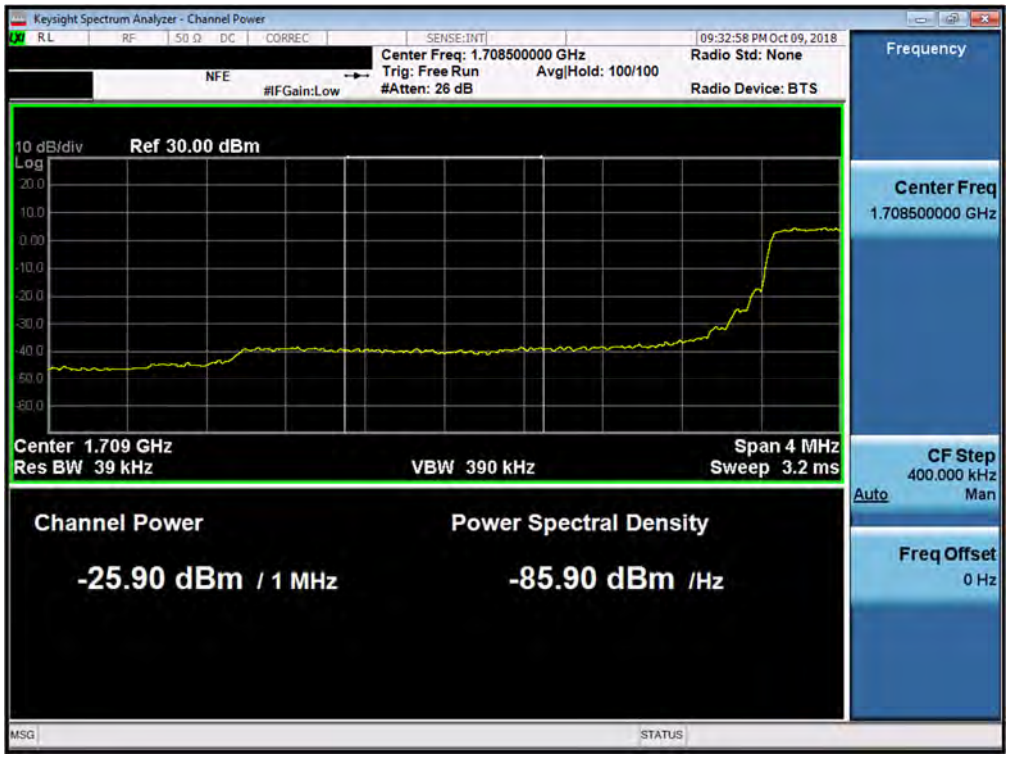


Plot 7-141. Lower Band Edge Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-142. Lower Extended Band Edge Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

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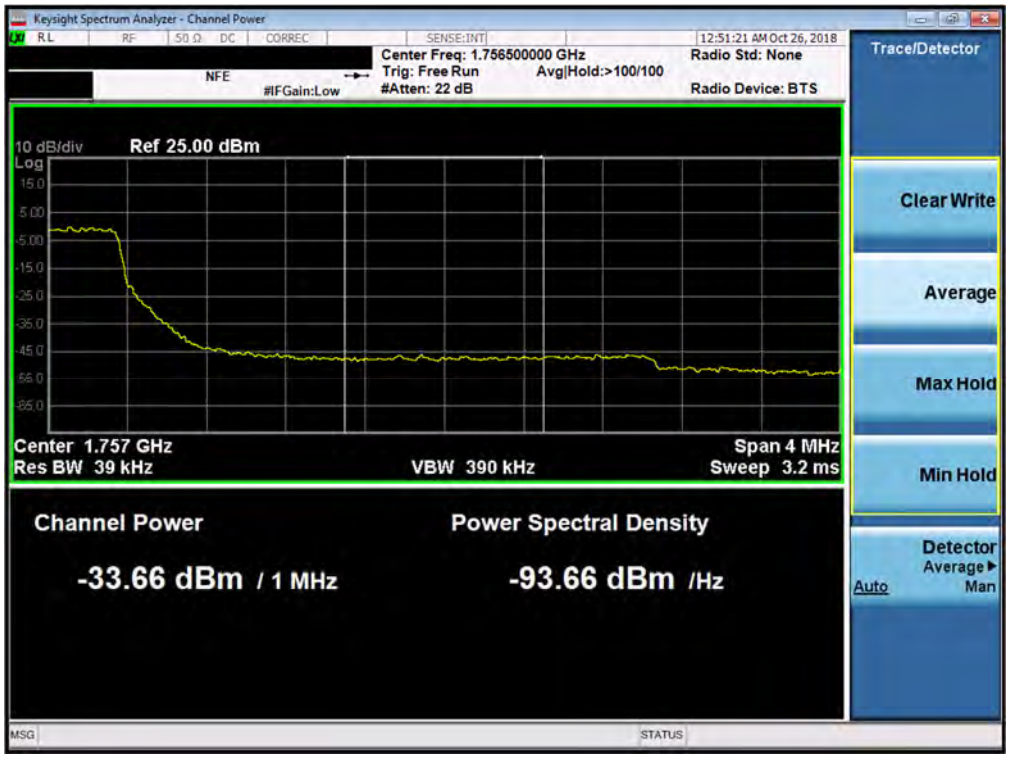
Plot 7-143. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-144. Upper Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

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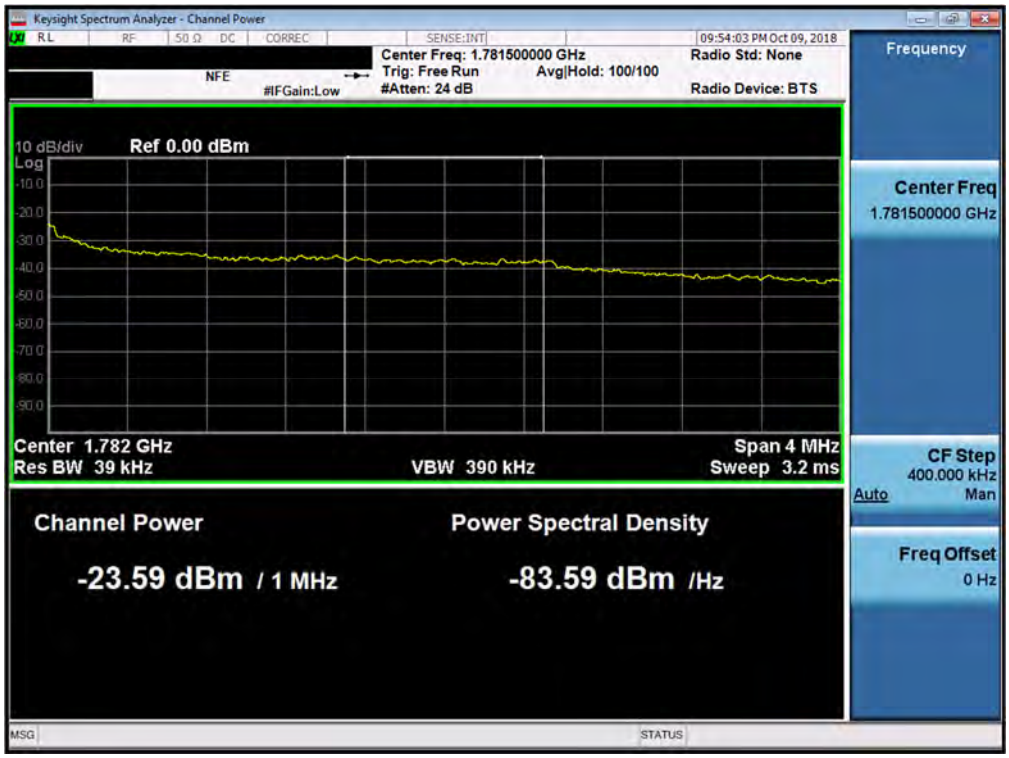
Plot 7-145. Upper Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-146. Upper Extended Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

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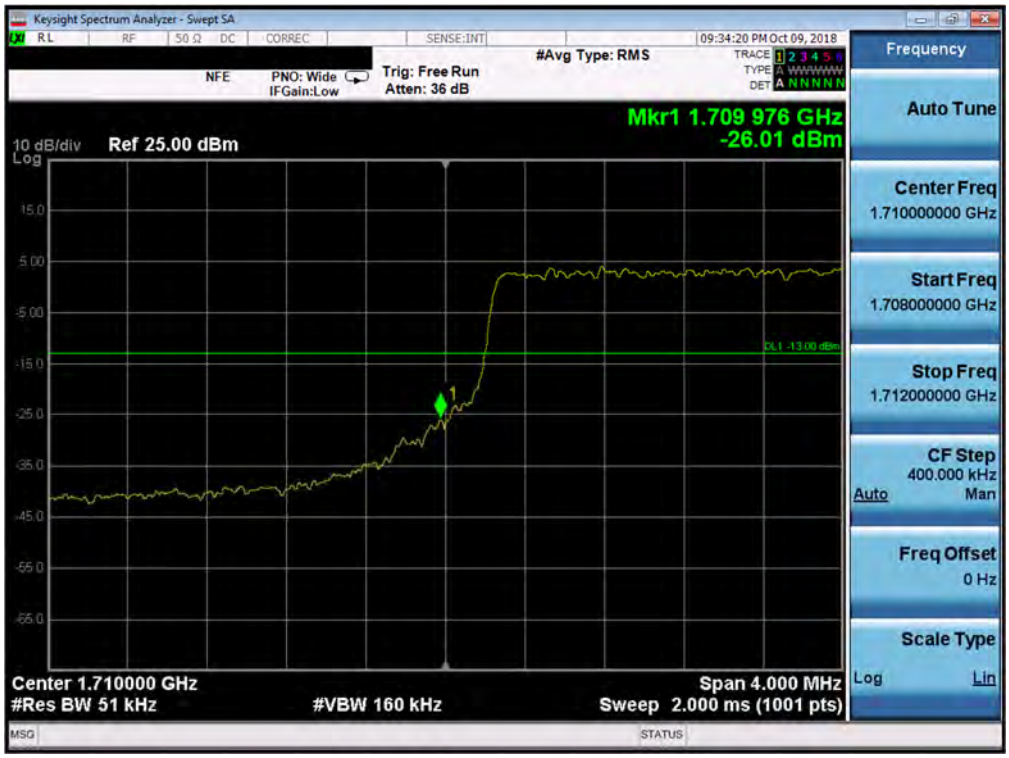
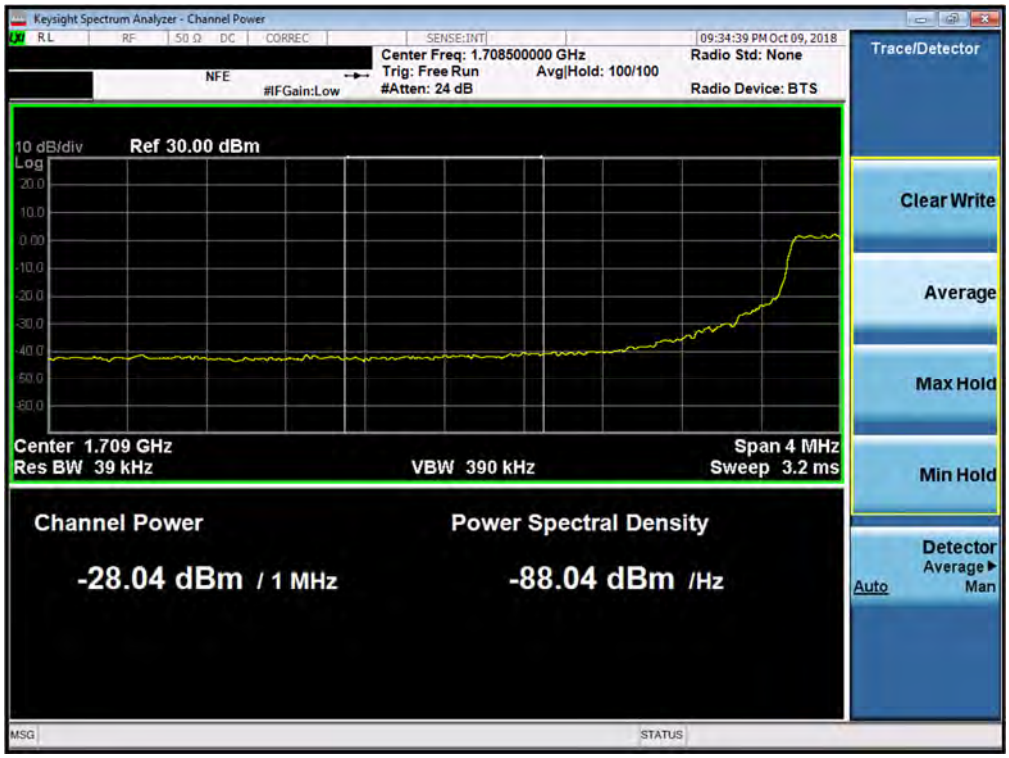


Plot 7-147. Lower Band Edge Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-148. Lower Extended Band Edge Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)

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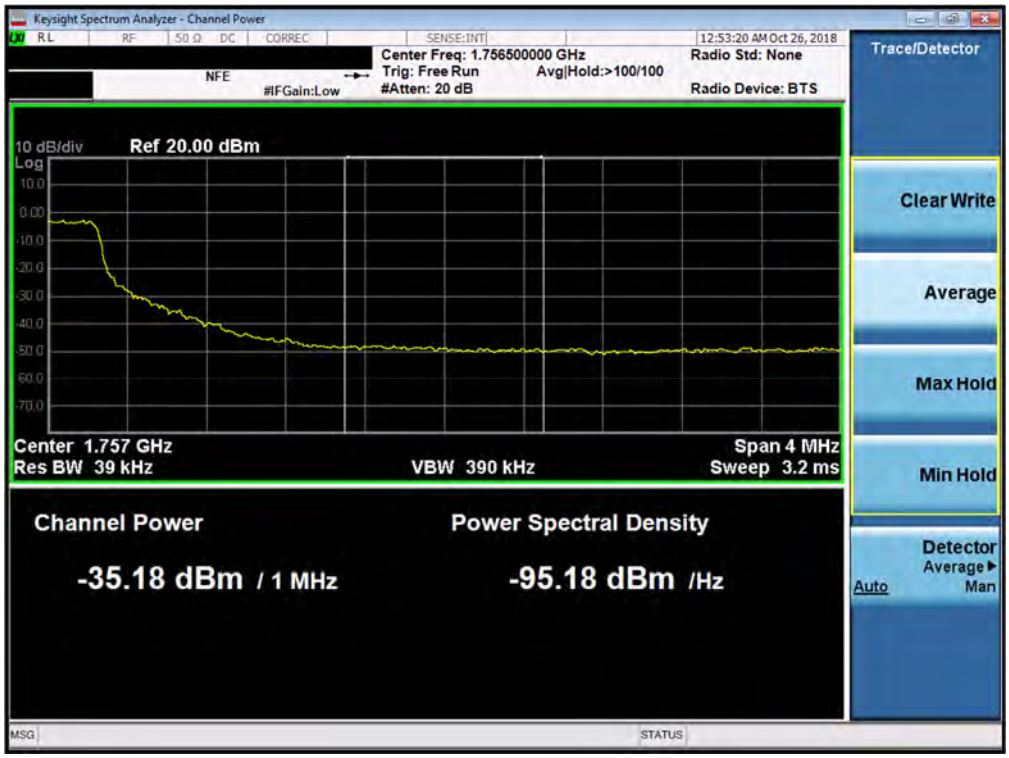
Plot 7-149. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-150. Upper Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

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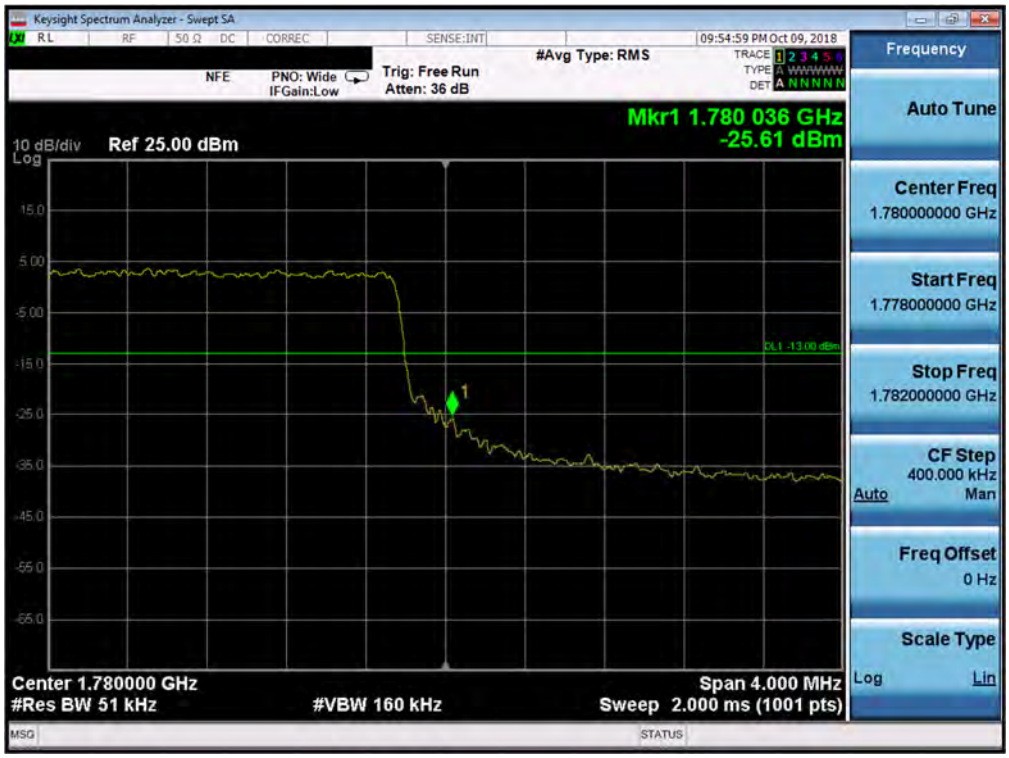
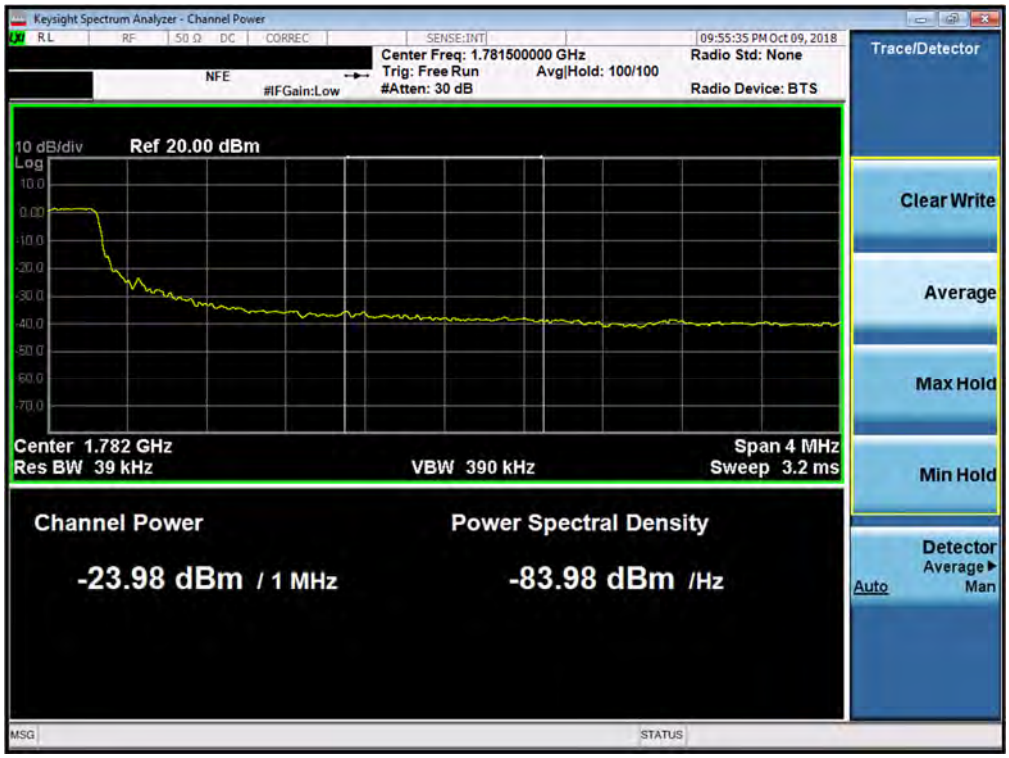


Plot 7-151. Upper Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-152. Upper Extended Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

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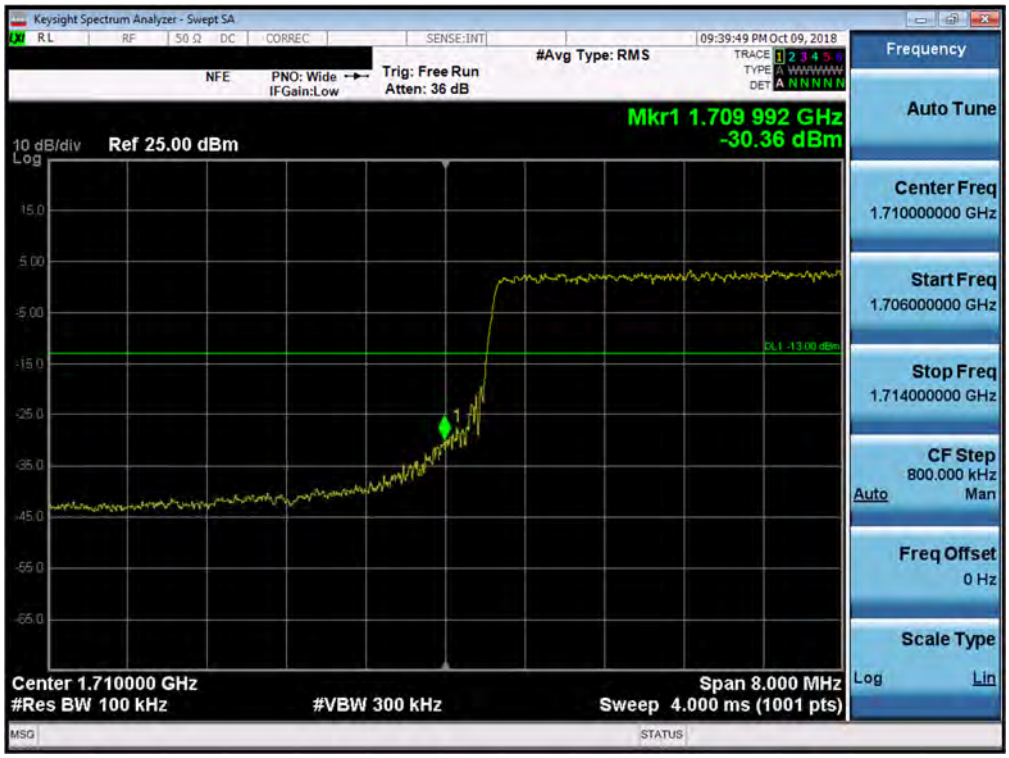
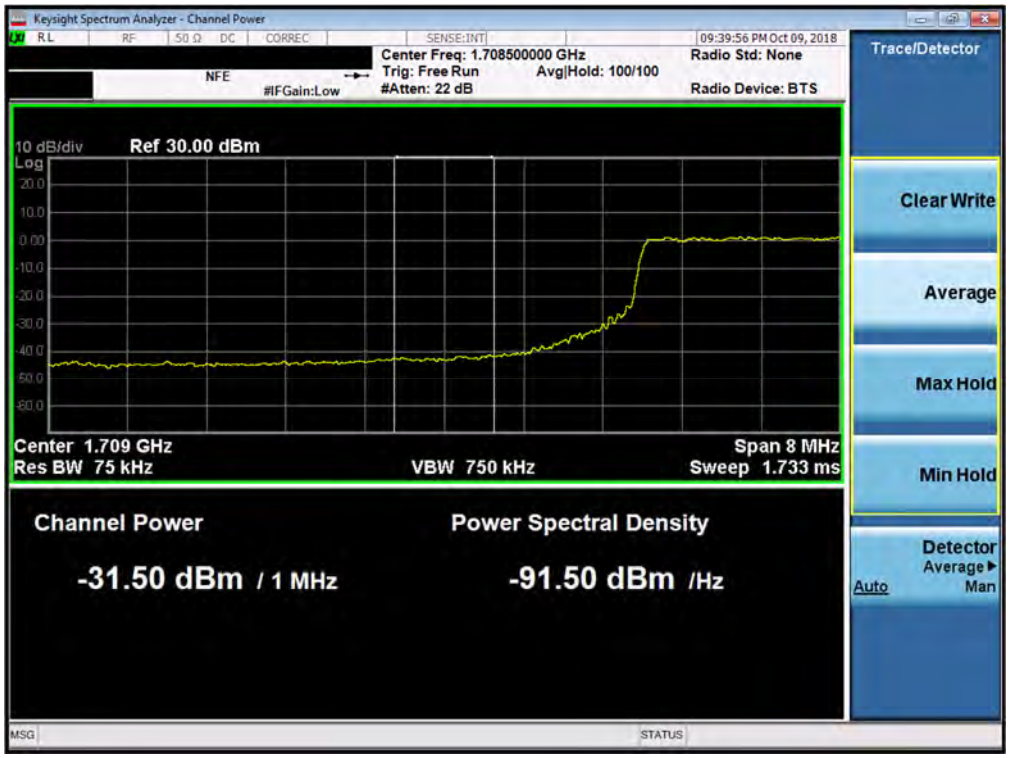


Plot 7-153. Lower Band Edge Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-154. Lower Extended Band Edge Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

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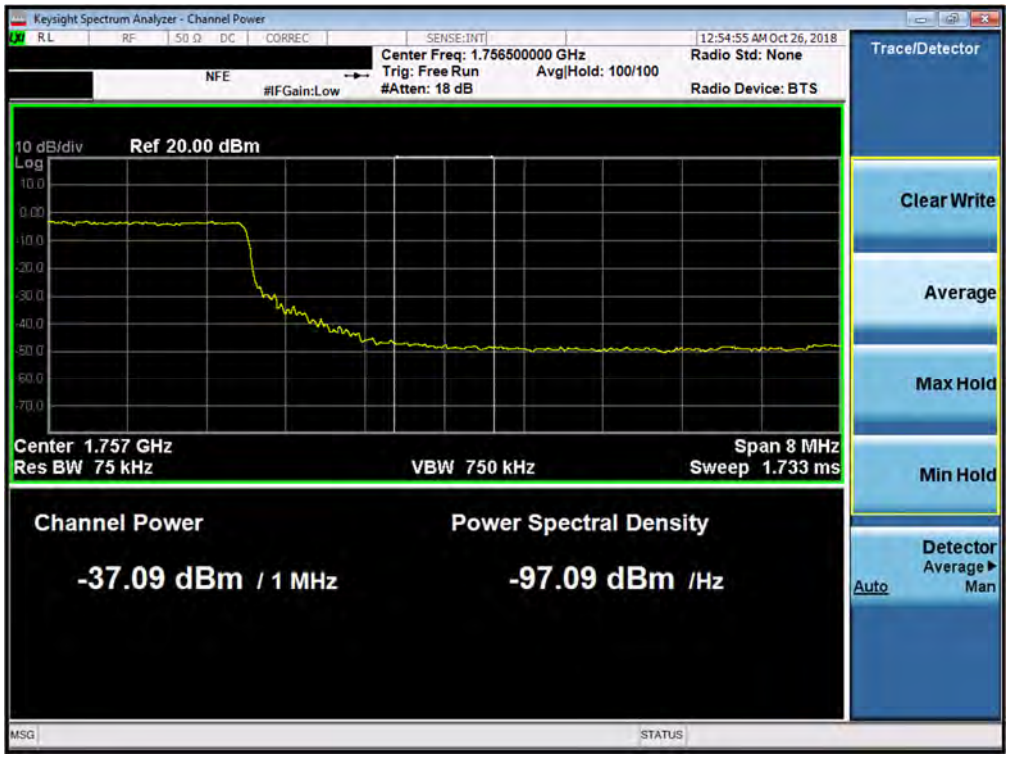
Plot 7-155. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-156. Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

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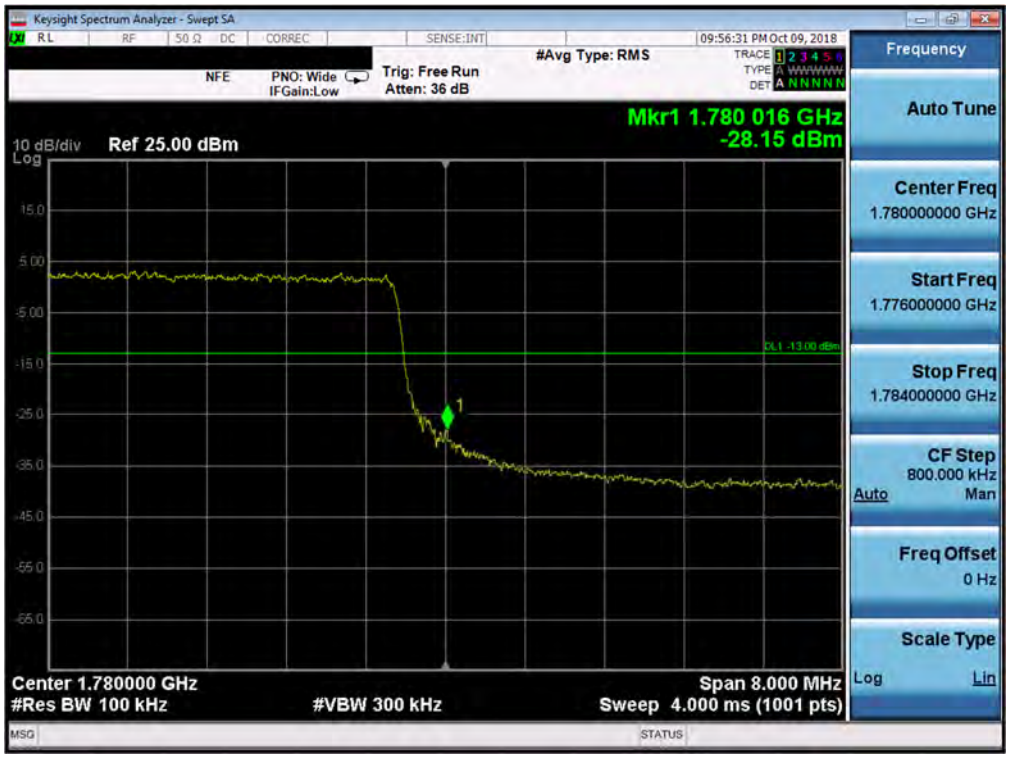
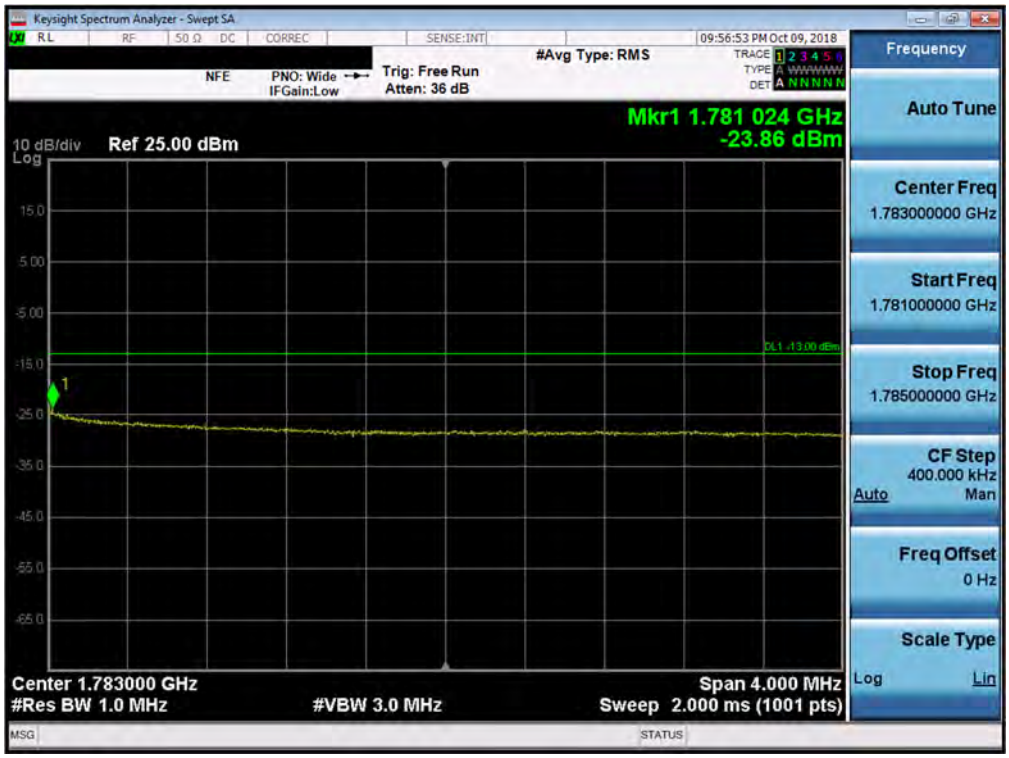


Plot 7-157. Upper Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-158. Upper Extended Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

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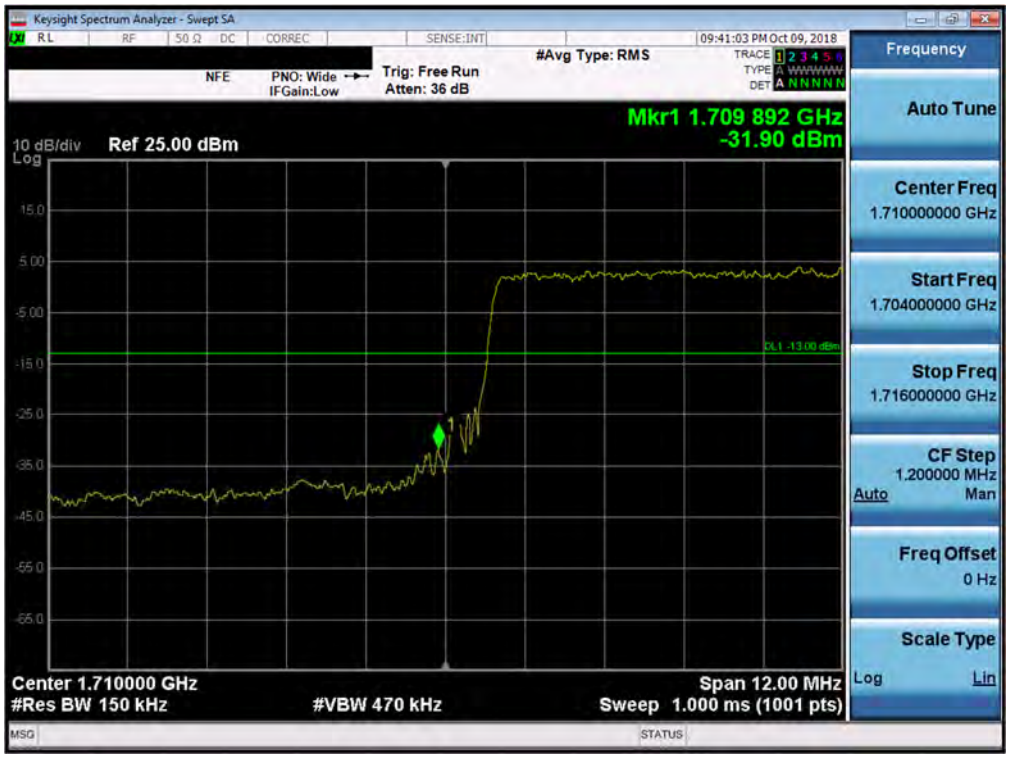
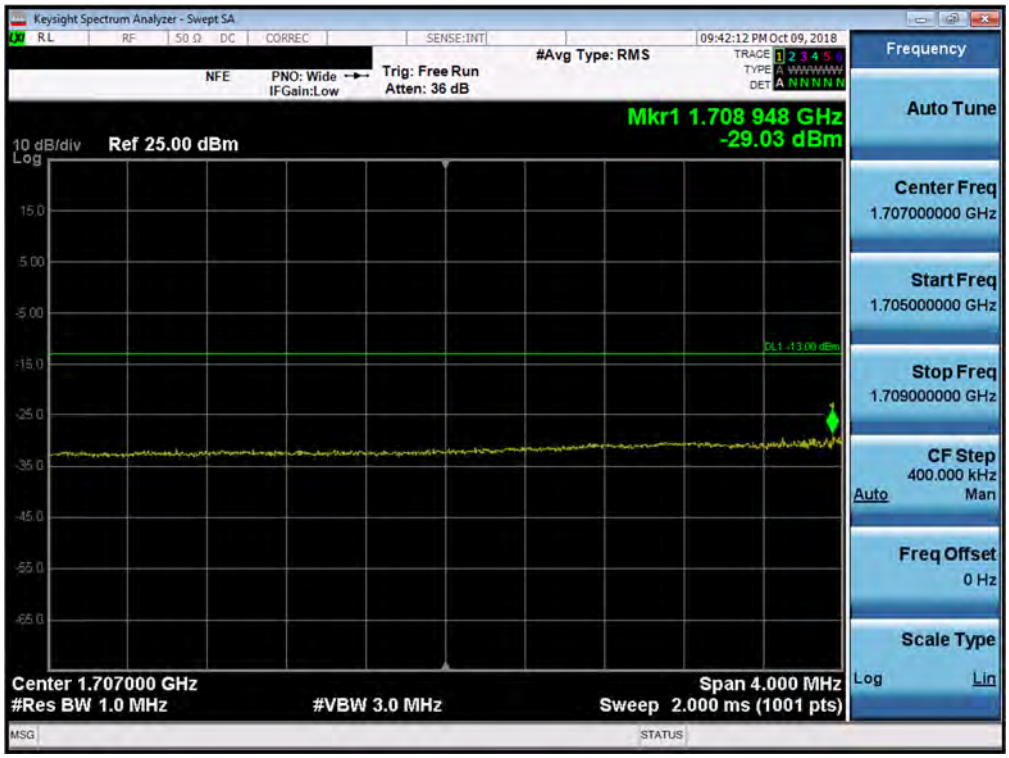


Plot 7-159. Lower Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-160. Lower Extended Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

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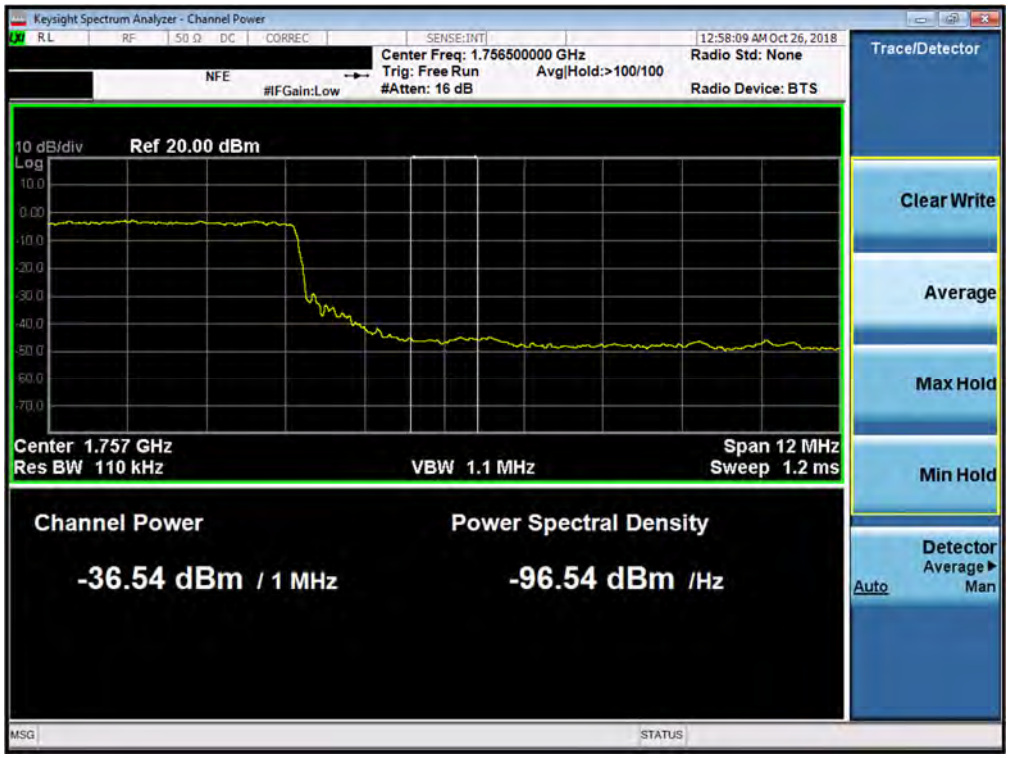
Plot 7-161. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-162. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

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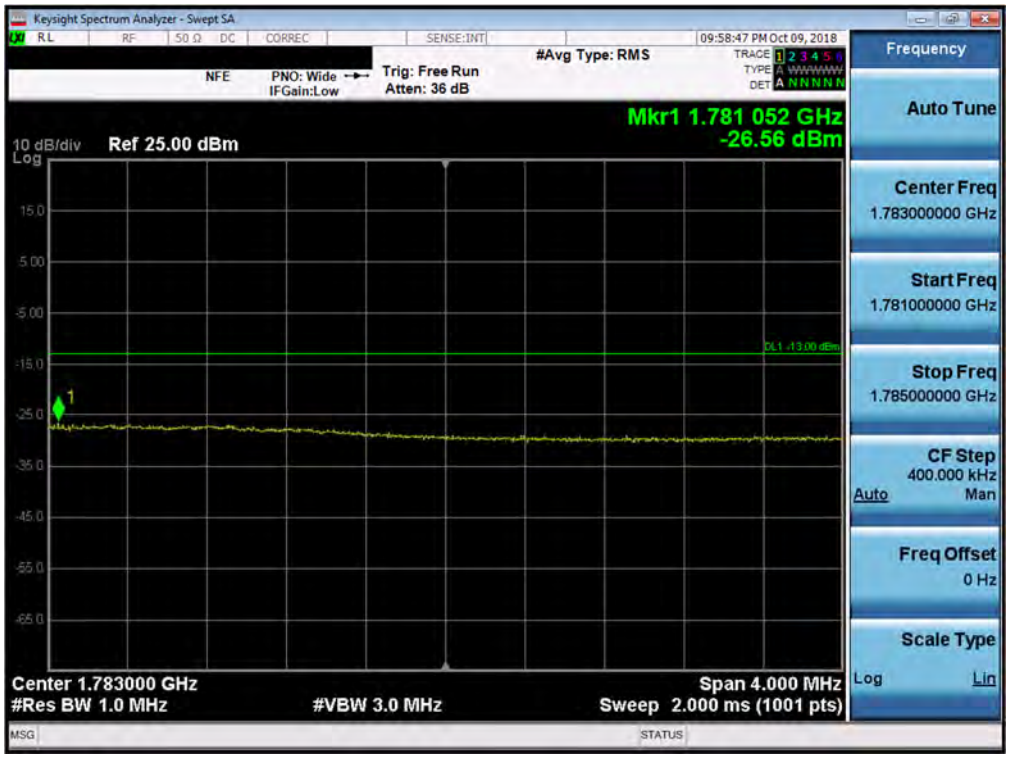
Plot 7-163. Upper Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-164. Upper Extended Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

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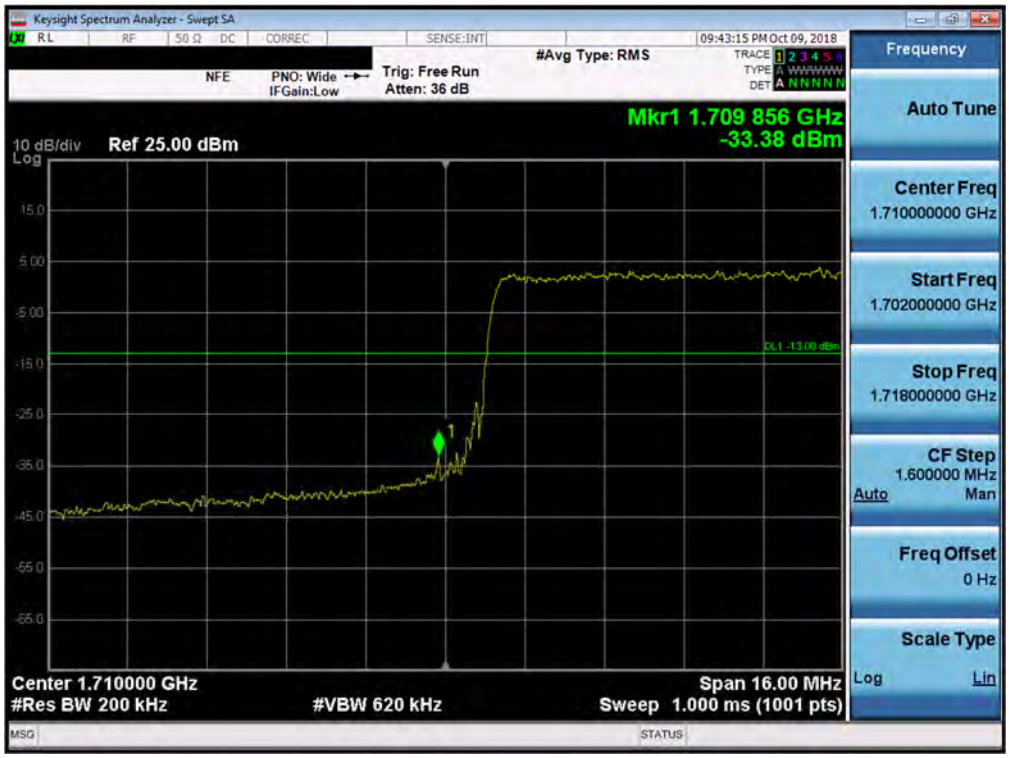
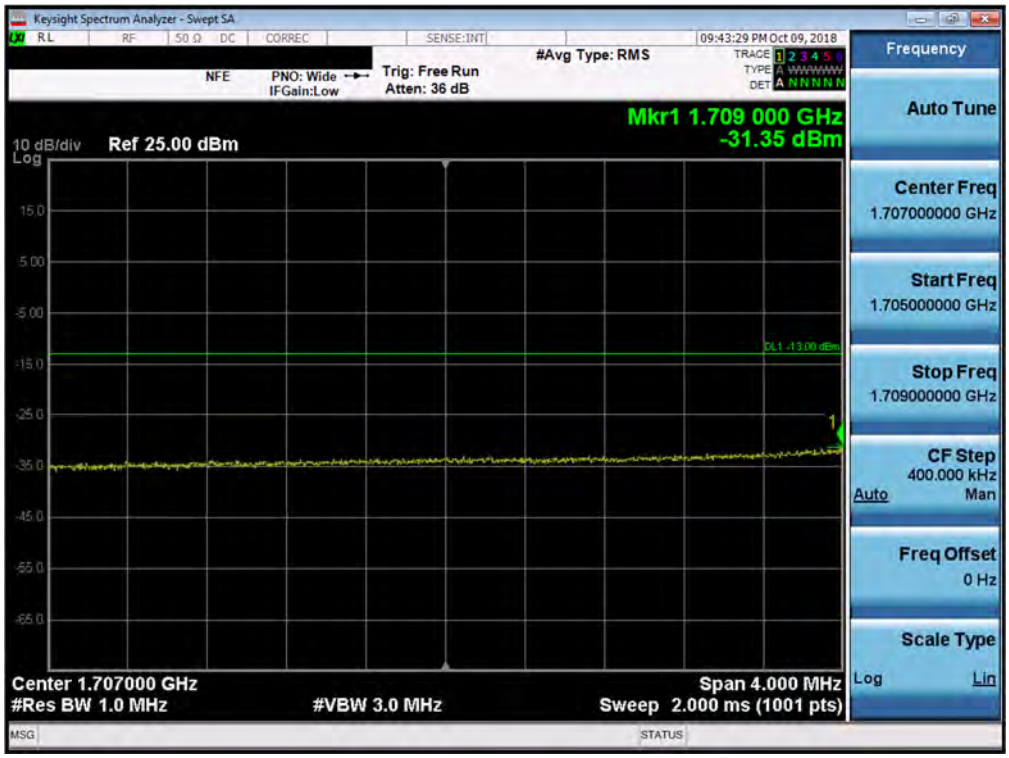


Plot 7-165. Lower Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-166. Lower Extended Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

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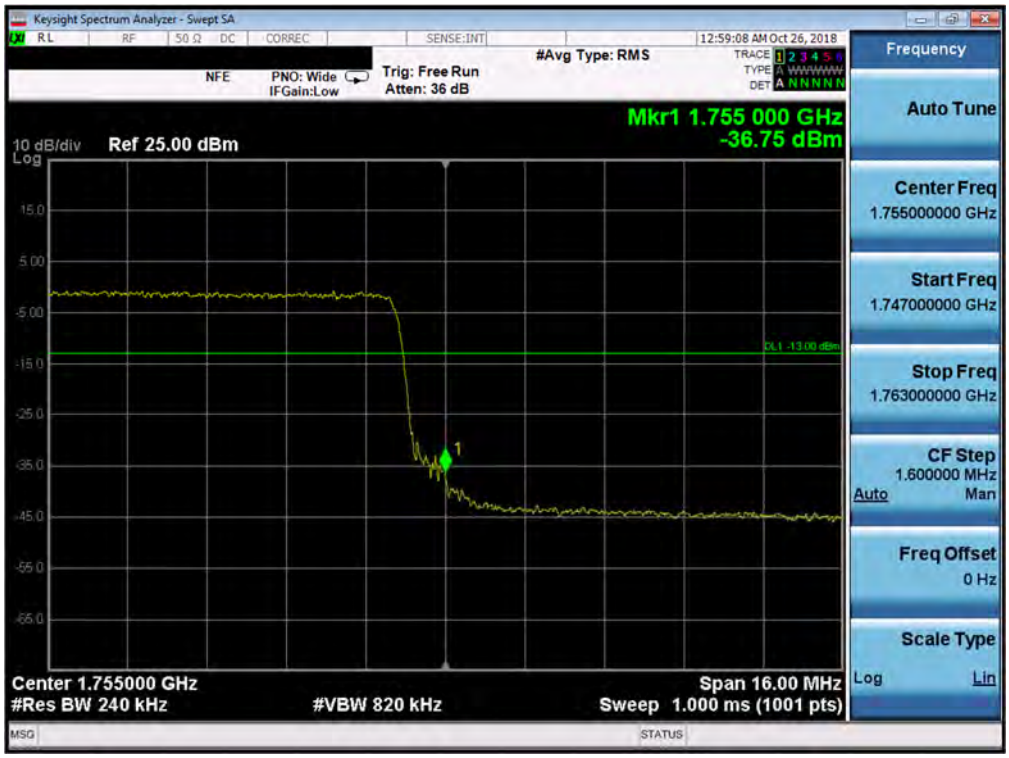
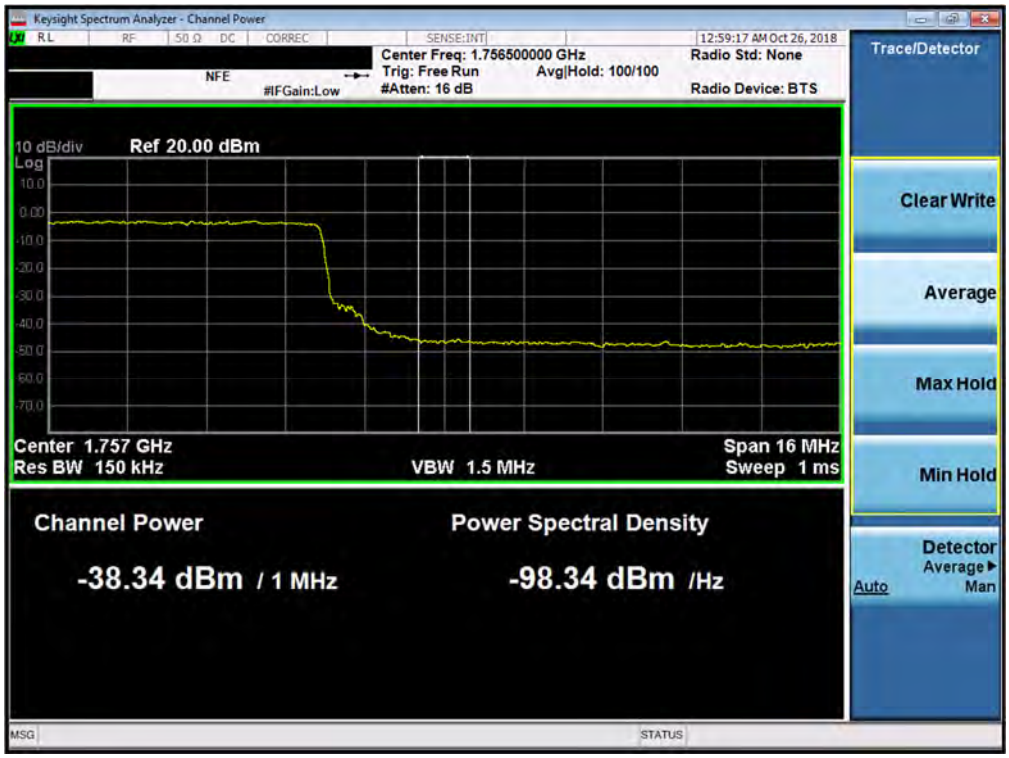


Plot 7-167. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-168. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

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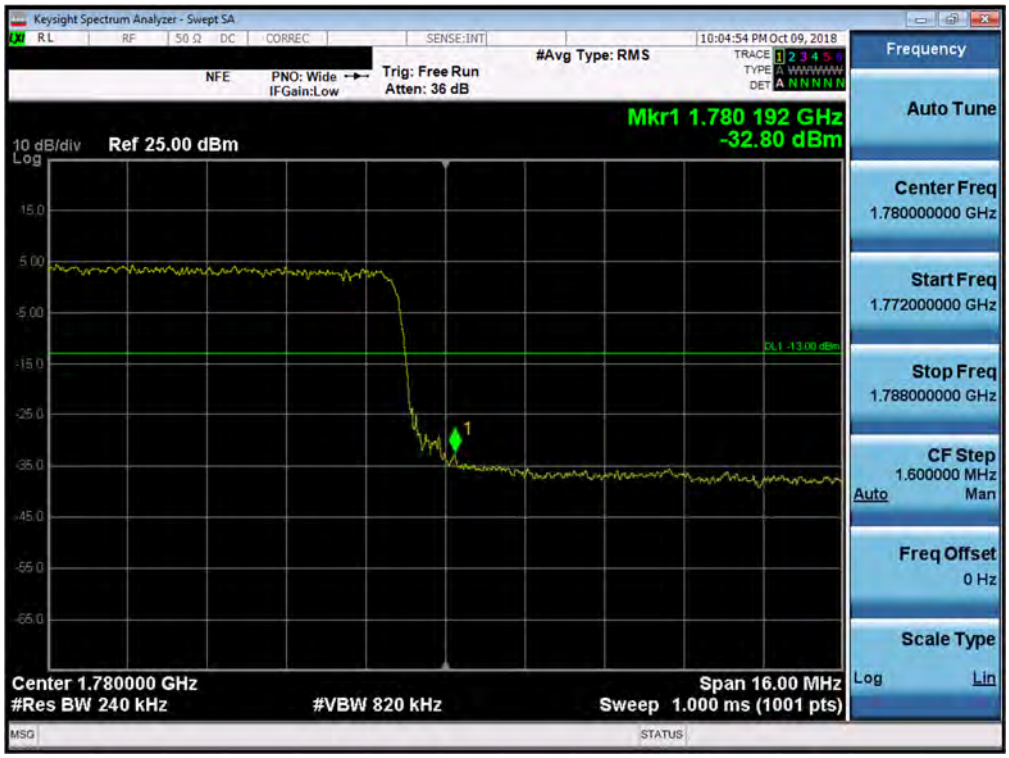
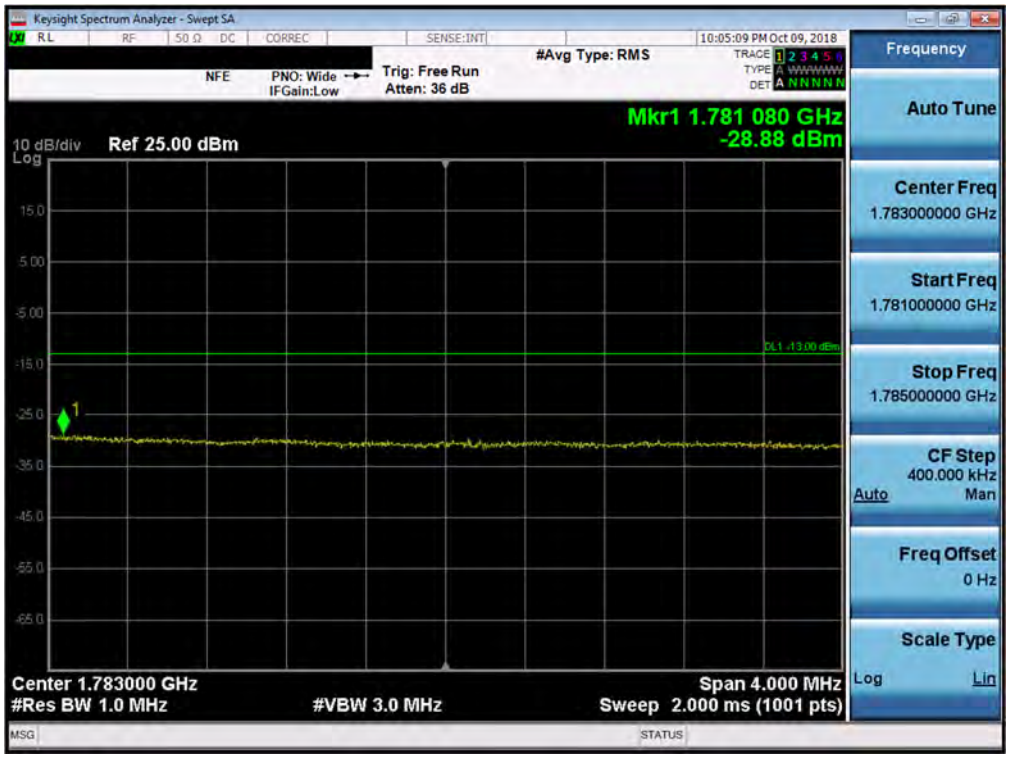


Plot 7-169. Upper Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-170. Upper Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

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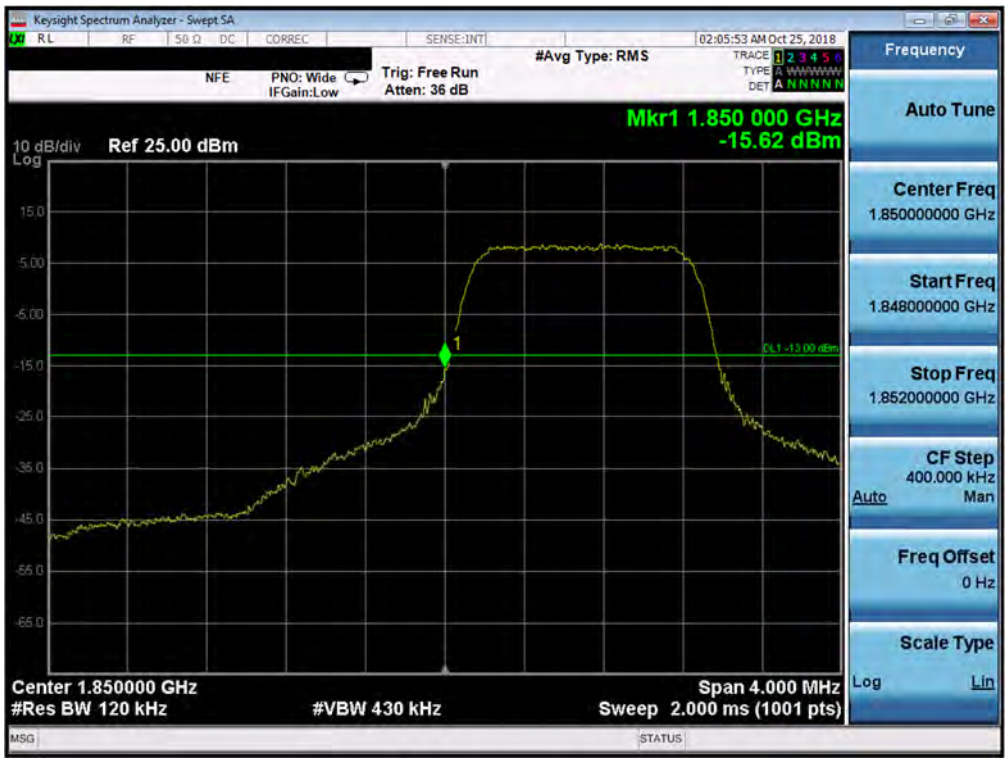
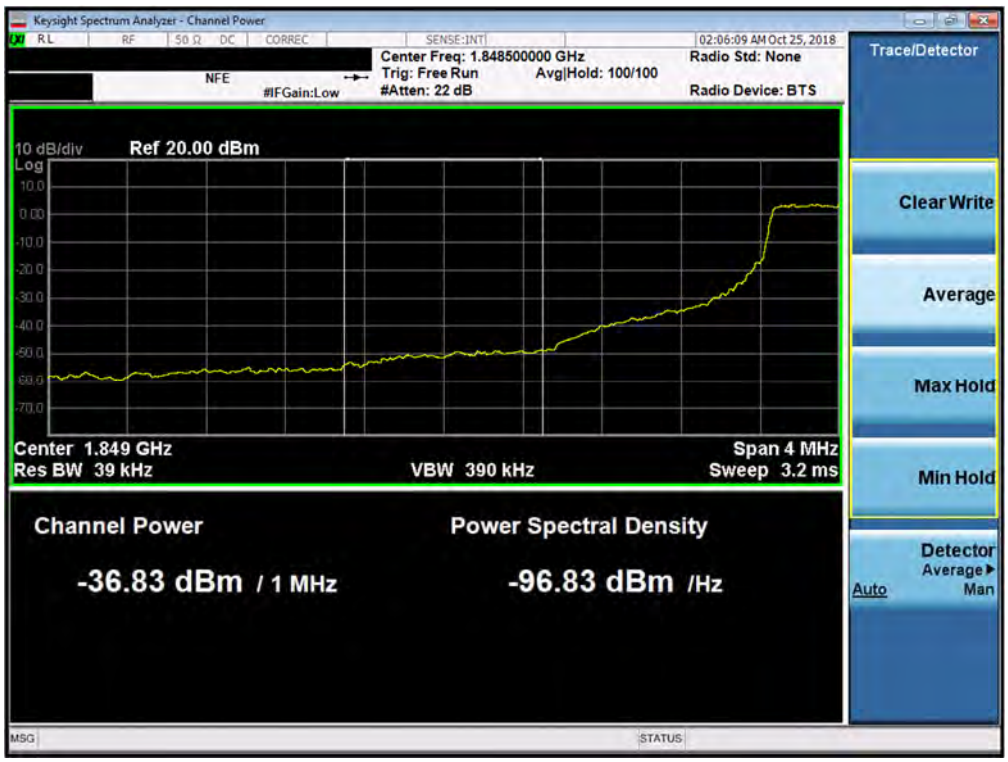
Band 2



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



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

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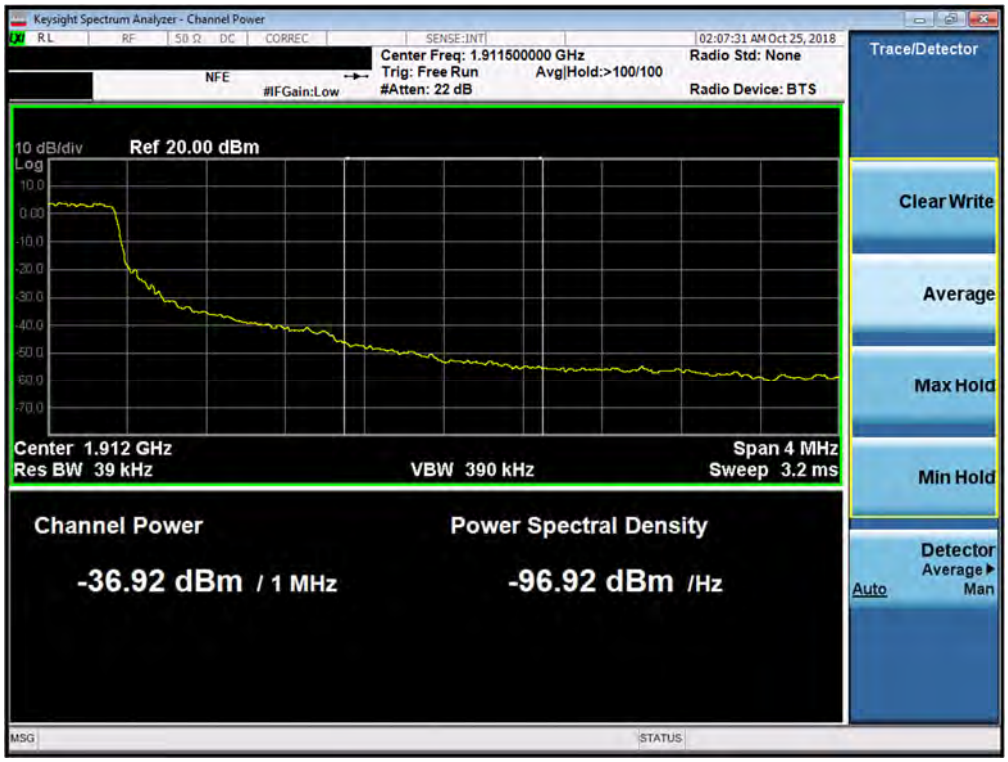
Plot 7-173. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



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

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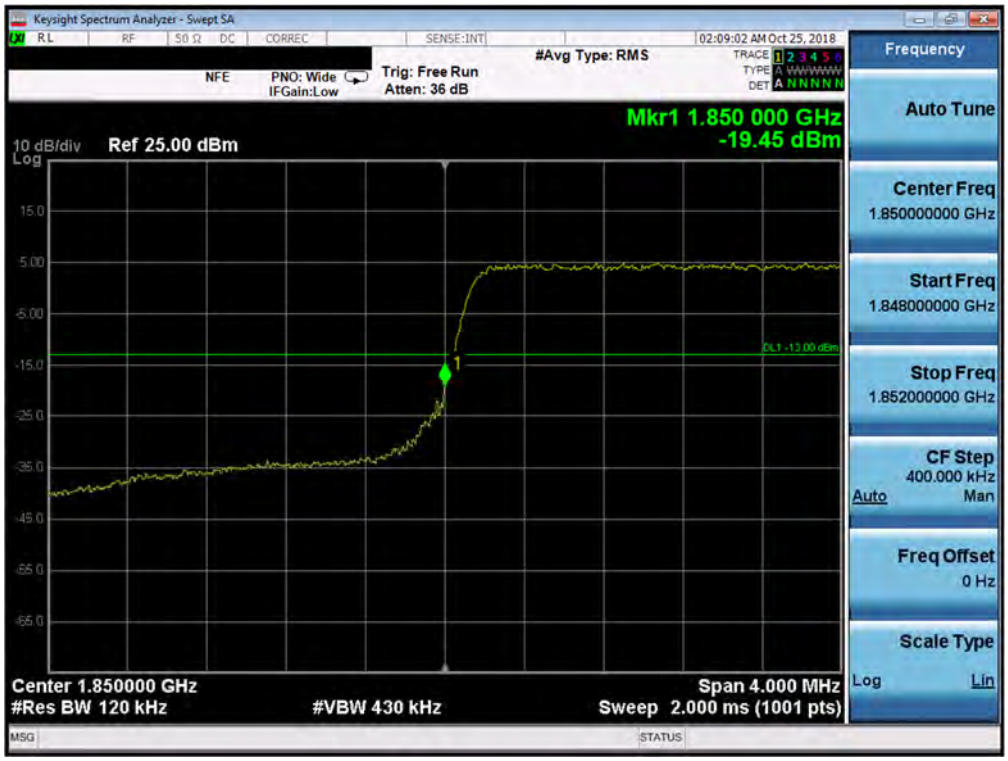
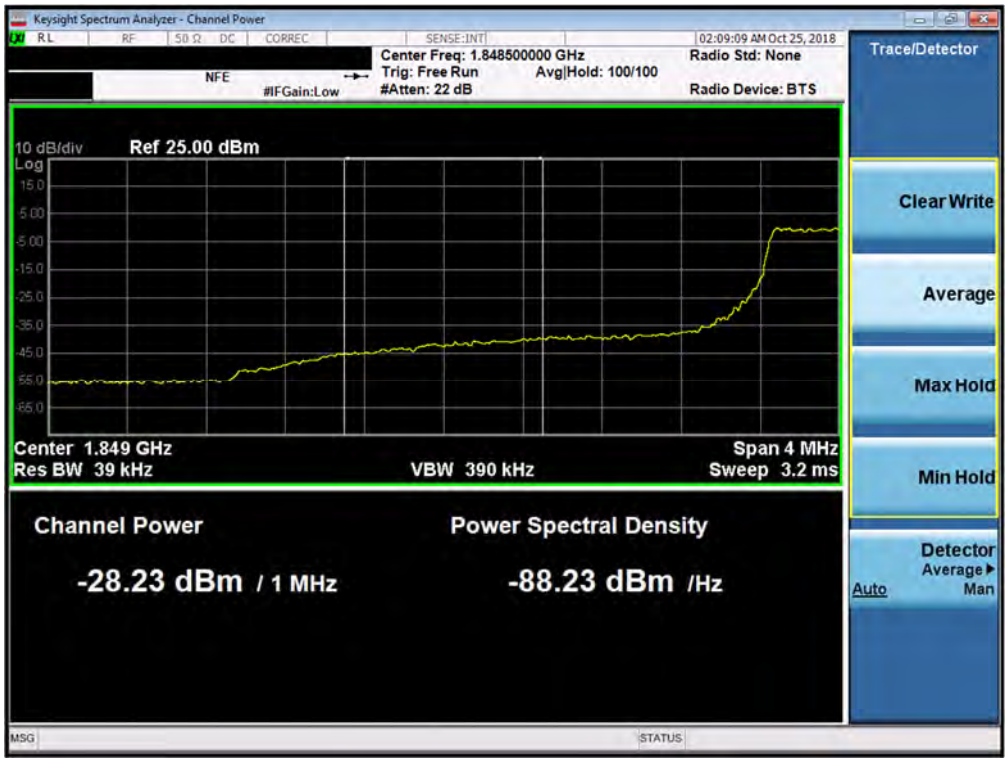


Plot 7-175. Lower Band Edge Plot (Band 2 –3.0MHz QPSK - Full RB Configuration)



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

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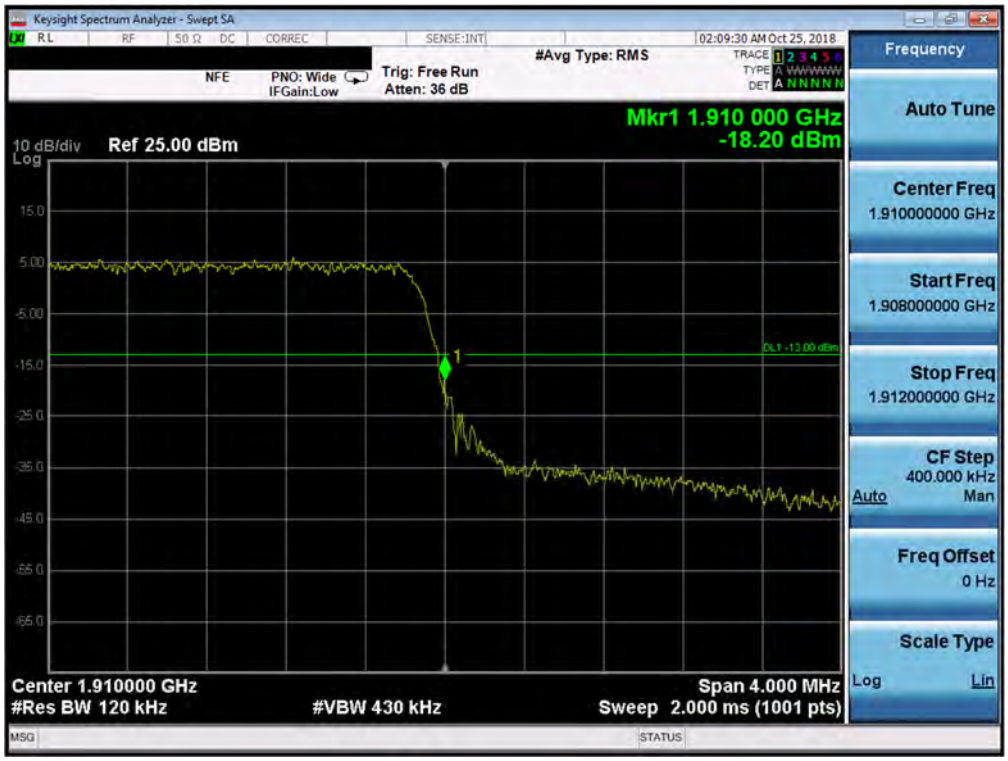
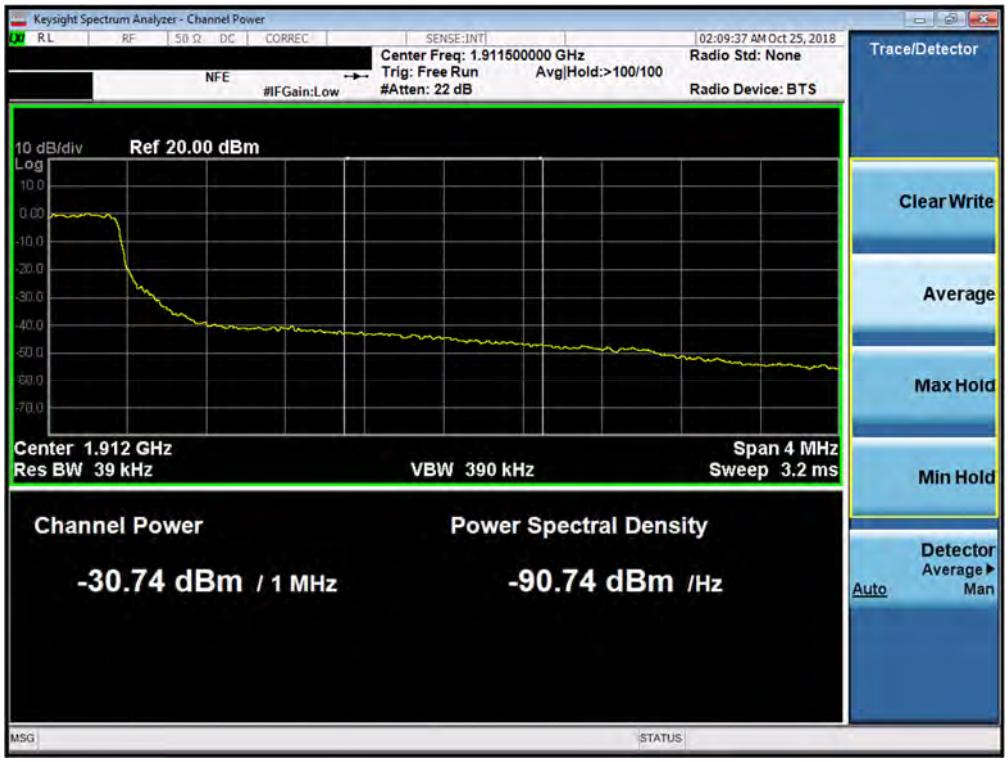


Plot 7-177. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



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

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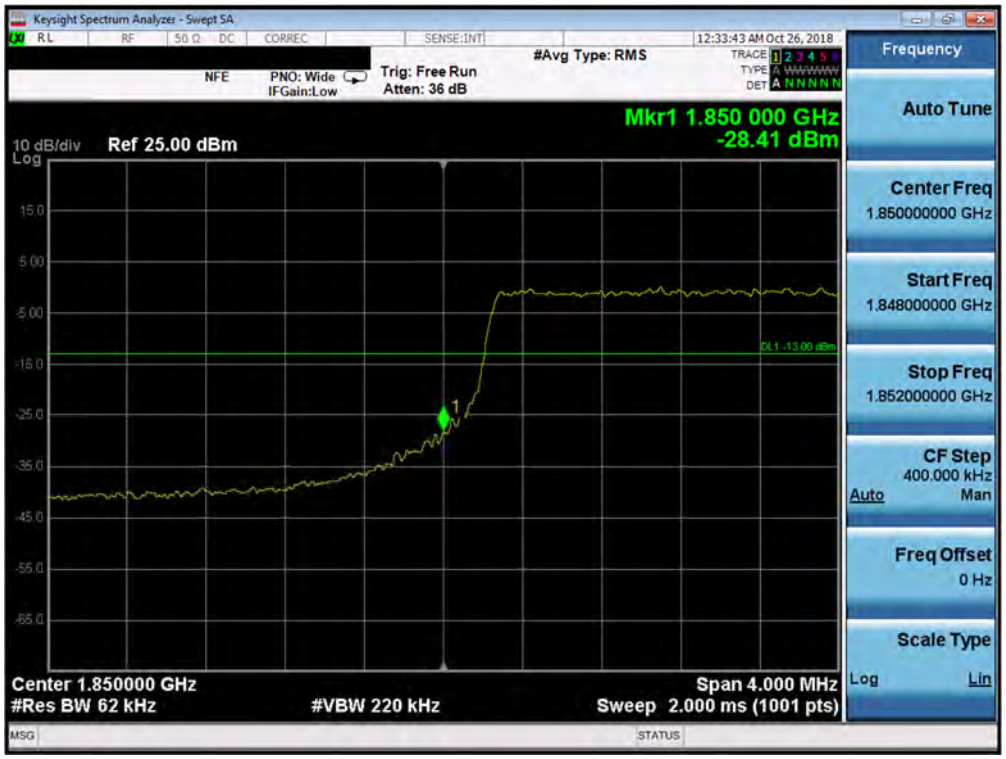
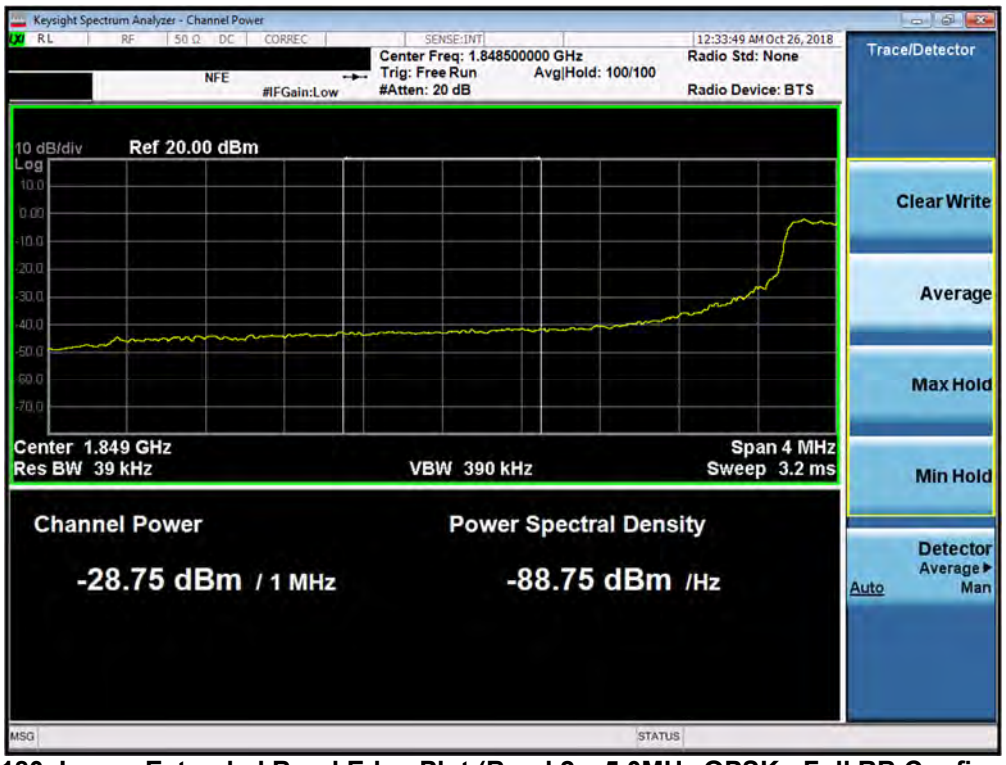


Plot 7-179. Lower Band Edge Plot (Band 2 – 5.0MHz QPSK - Full RB Configuration)



Plot 7-180. Lower Extended Band Edge Plot (Band 2 – 5.0MHz QPSK - Full RB Configuration)

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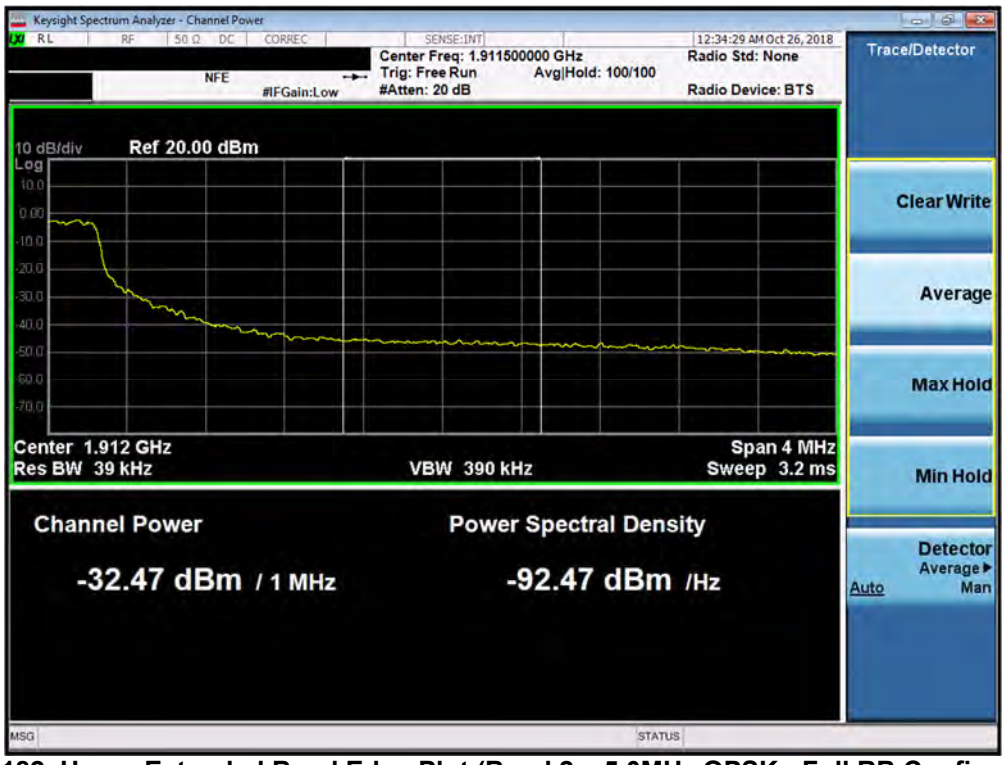
Plot 7-181. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-182. Upper Extended Band Edge Plot (Band 2 – 5.0MHz QPSK - Full RB Configuration)

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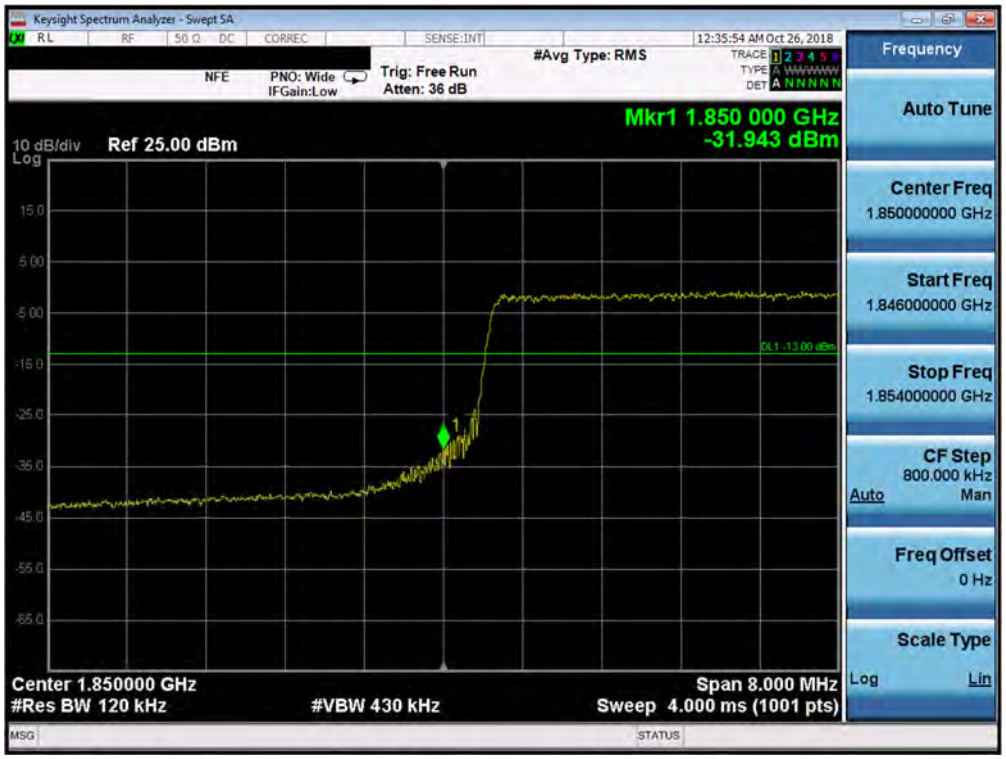
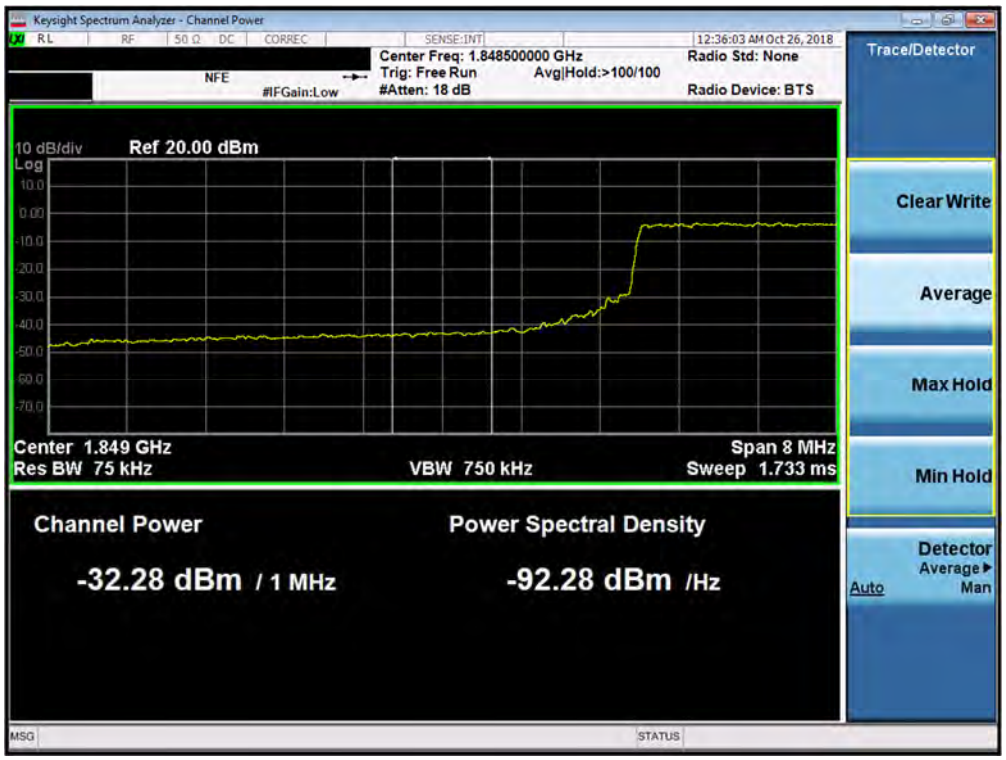


Plot 7-183. Lower Band Edge Plot (Band 2 –10.0MHz QPSK - Full RB Configuration)



Plot 7-184. Lower Extended Band Edge Plot (Band 2 – 10.0MHz QPSK - Full RB Configuration)

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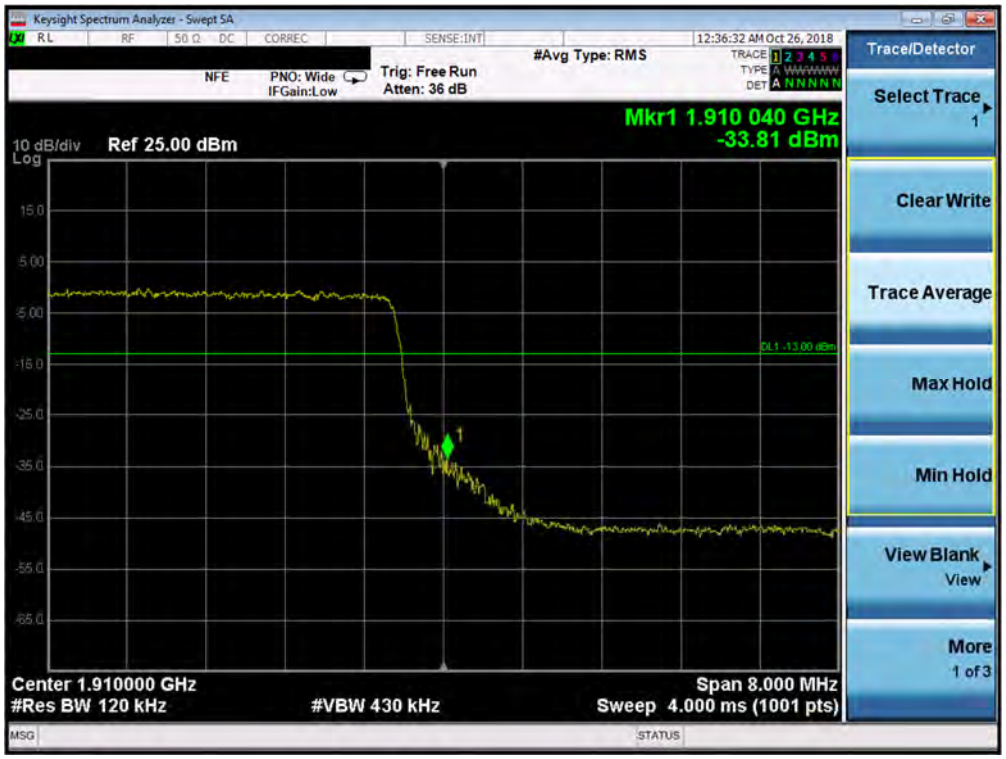
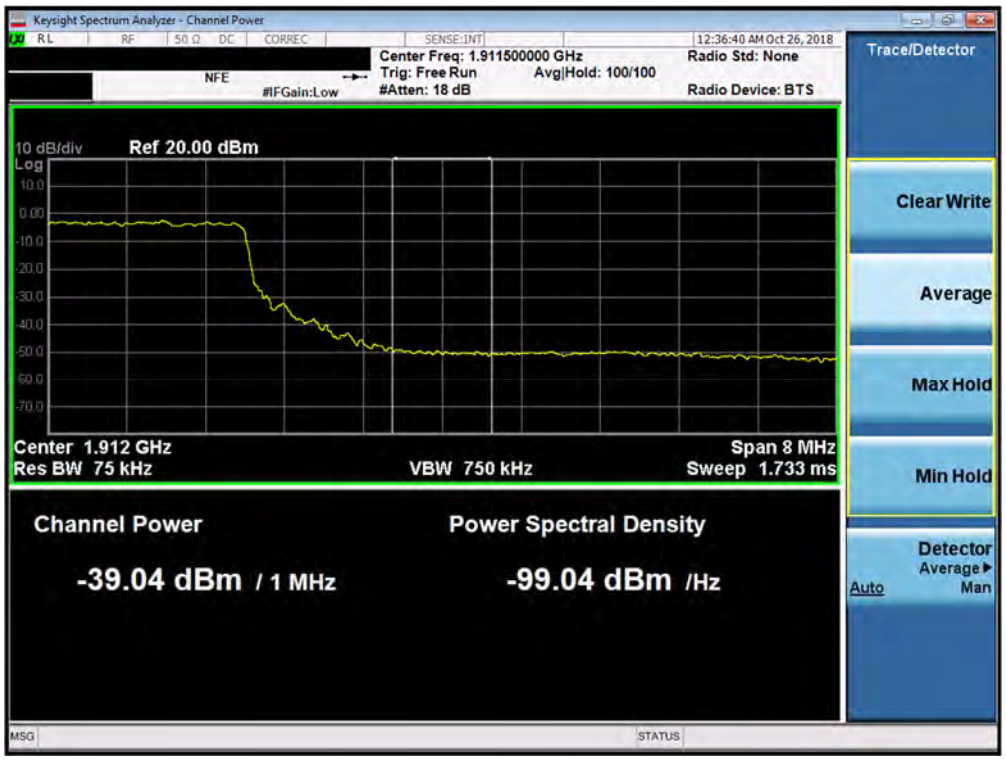


Plot 7-185. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-186. Upper Extended Band Edge Plot (Band 2 – 10.0MHz QPSK - Full RB Configuration)

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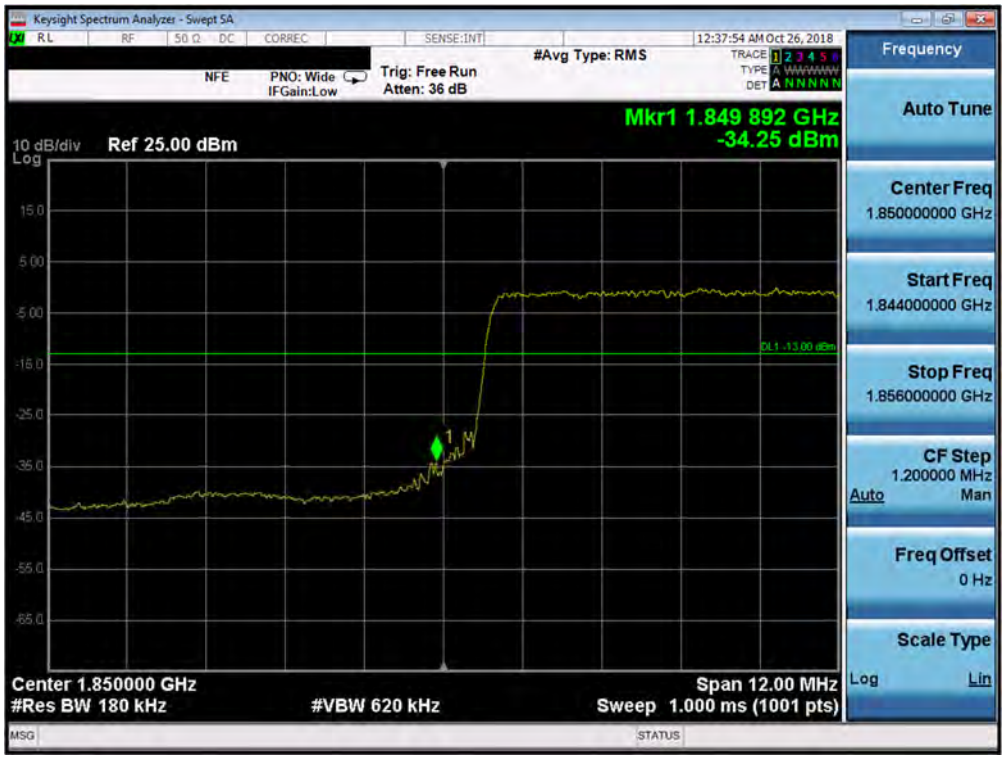
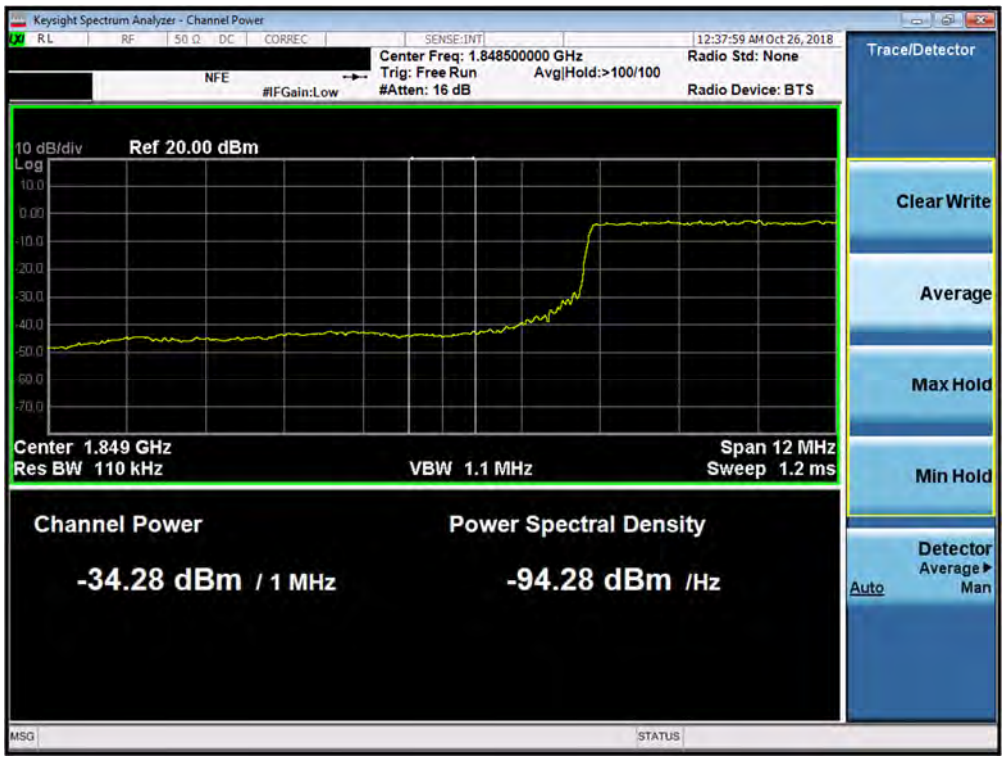


Plot 7-187. Lower Band Edge Plot (Band 2 –15.0MHz QPSK - Full RB Configuration)



Plot 7-188. Lower Extended Band Edge Plot (Band 2 – 15.0MHz QPSK - Full RB Configuration)

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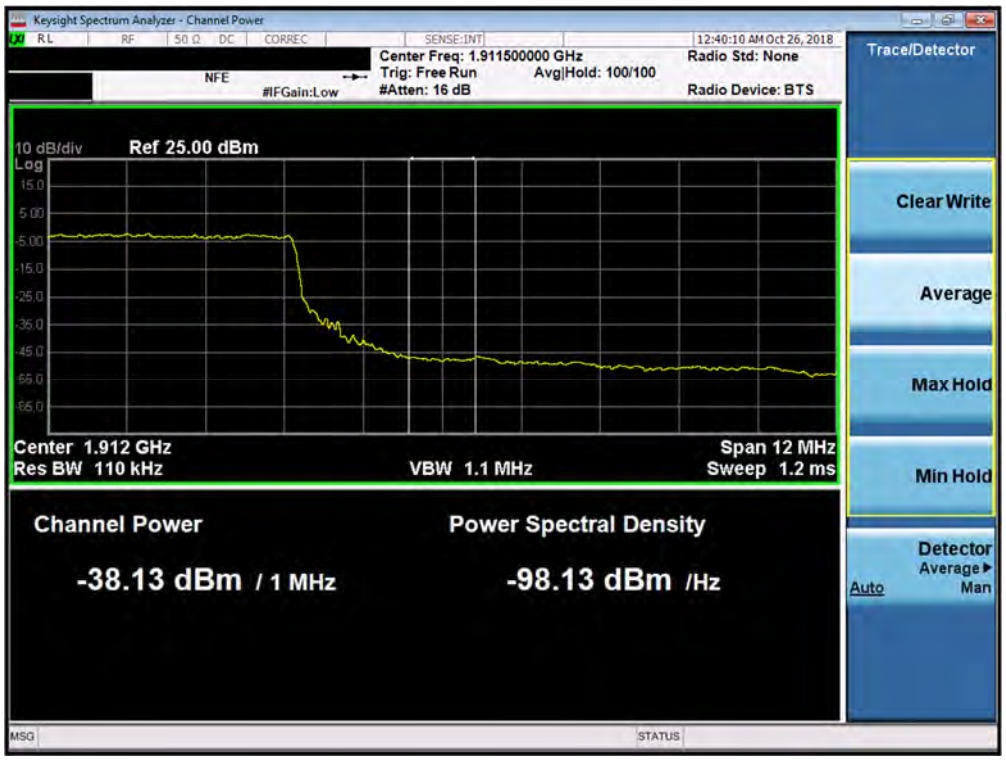
Plot 7-189. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-190. Upper Extended Band Edge Plot (Band 2 – 15.0MHz QPSK - Full RB Configuration)

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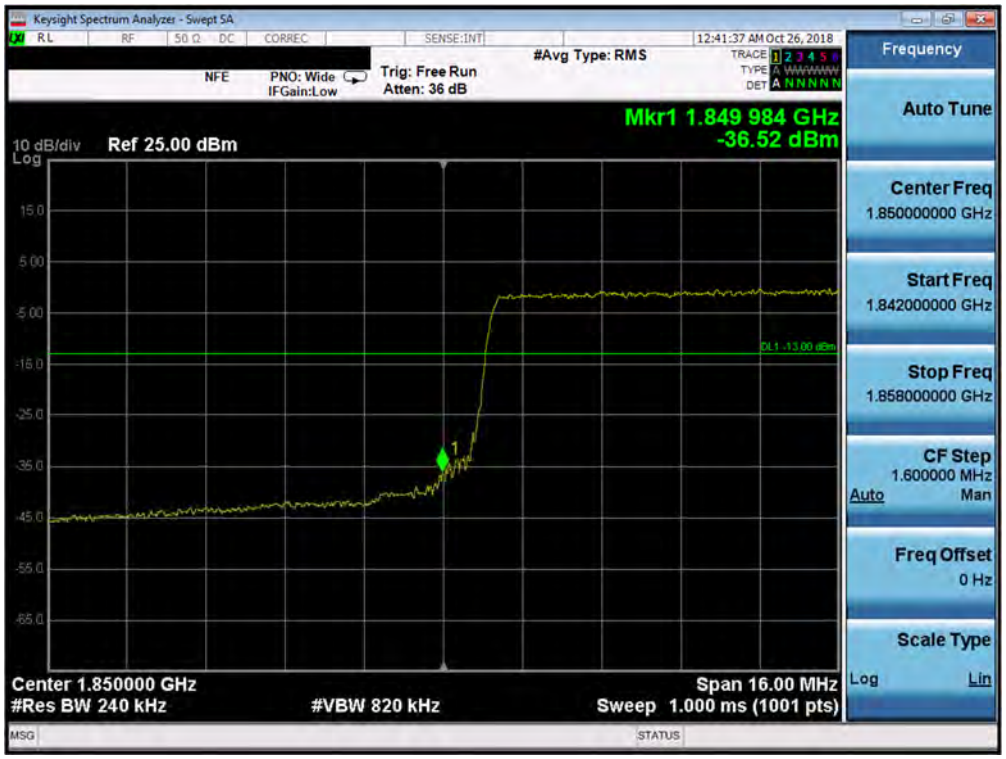
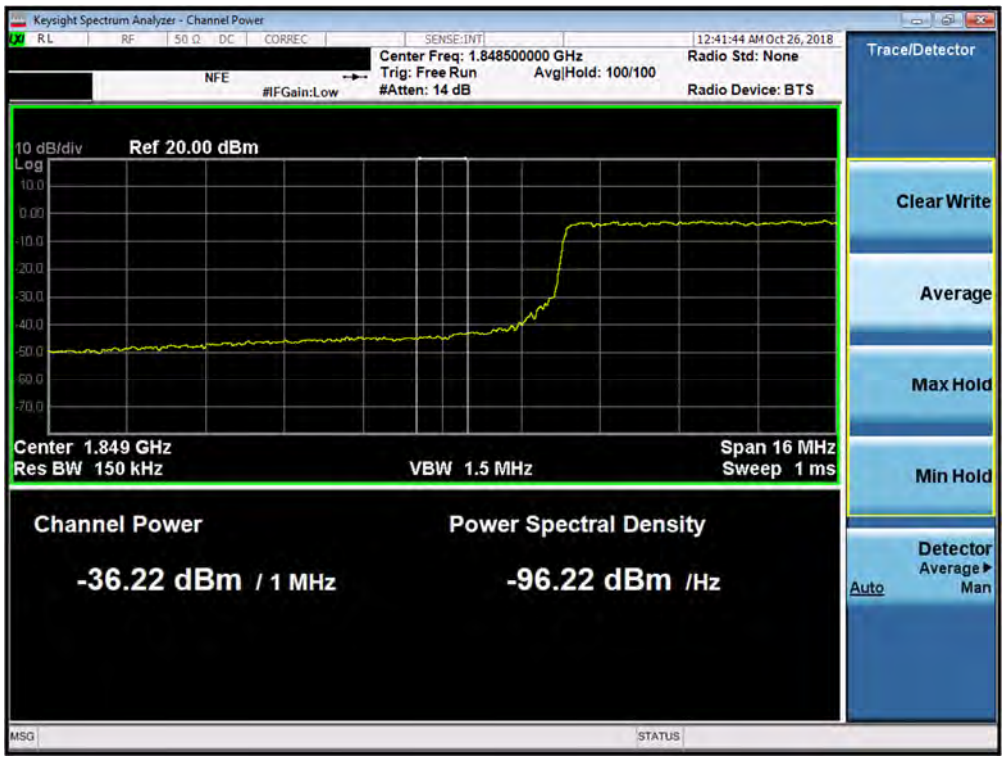


Plot 7-191. Lower Band Edge Plot (Band 2 – 20.0MHz QPSK - Full RB Configuration)



Plot 7-192. Lower Extended Band Edge Plot (Band 2 – 20.0MHz QPSK - Full RB Configuration)

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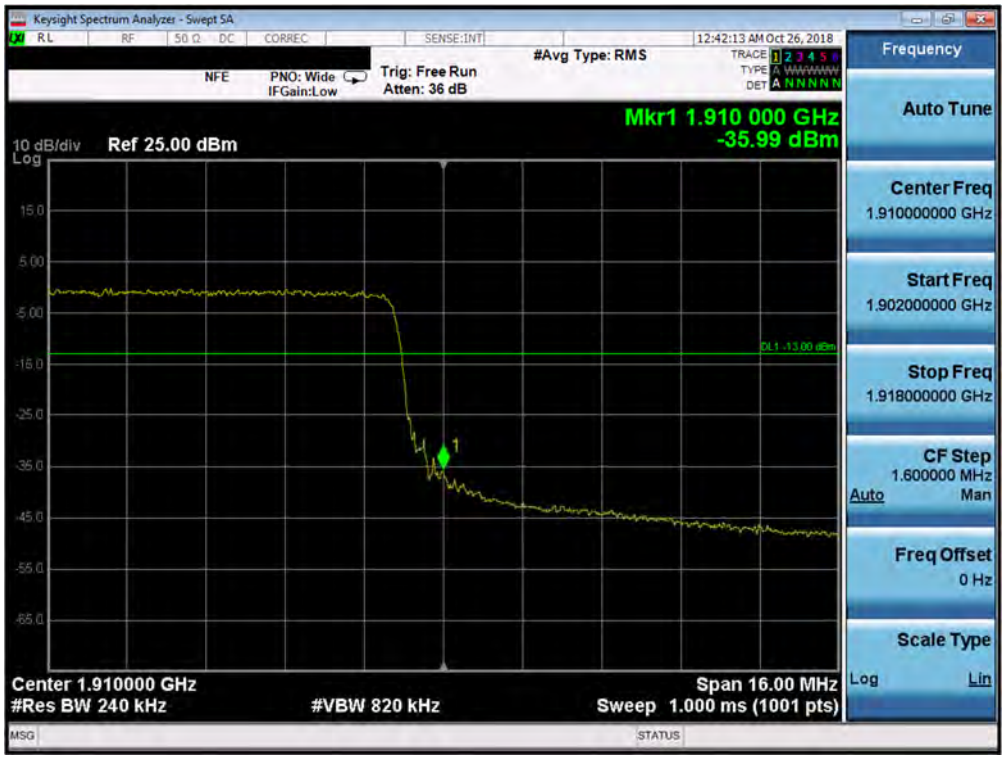
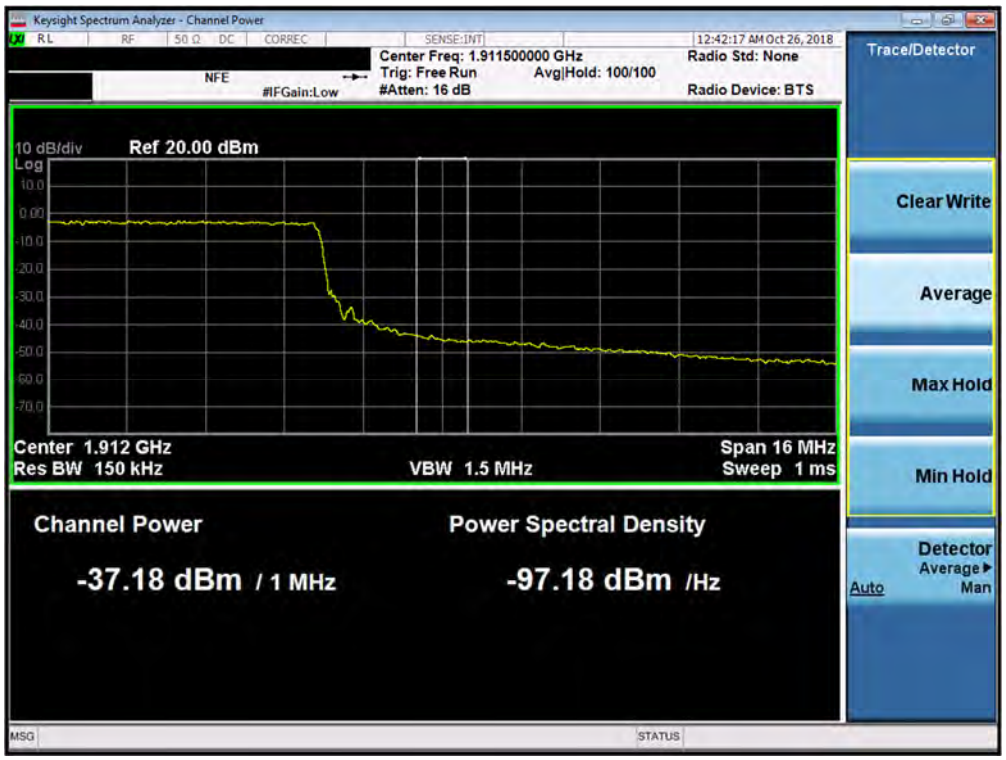


Plot 7-193. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



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

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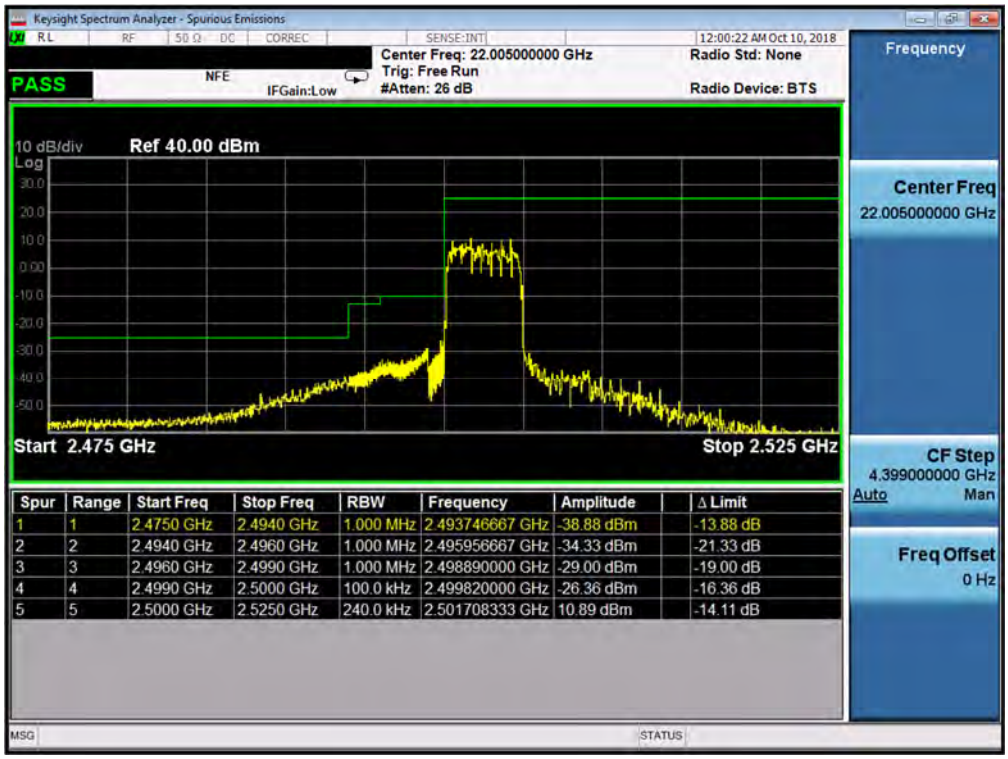
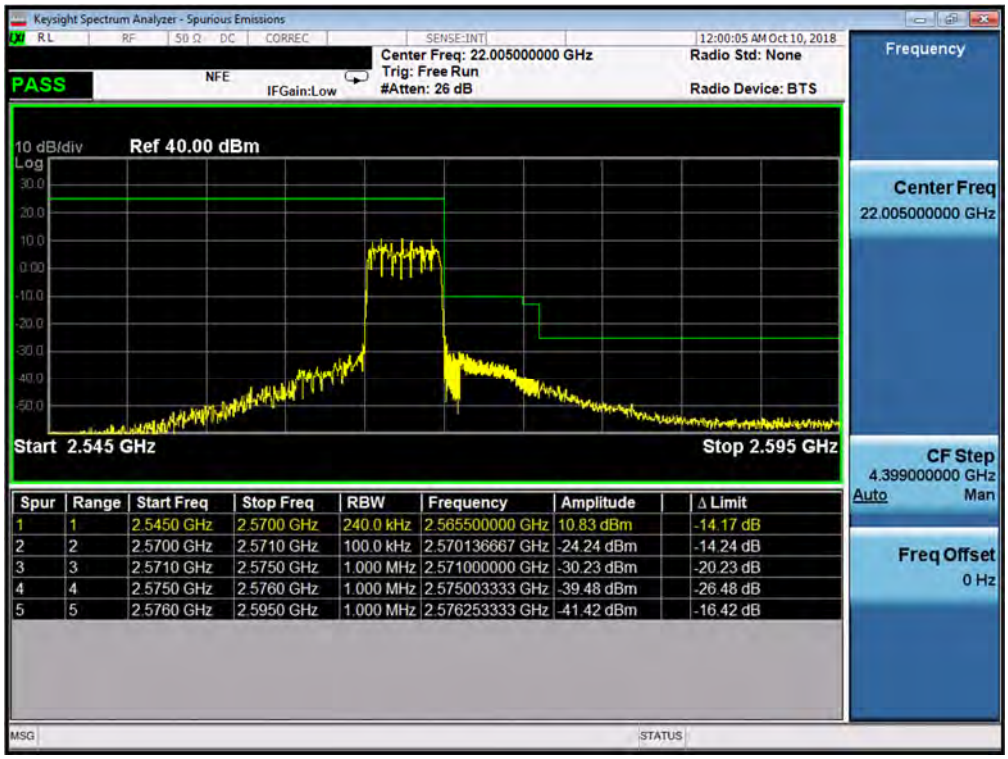
Band 7



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4940 GHz	1.000 MHz	2.493746667 GHz	-38.88 dBm	-13.88 dB
2	2	2.4940 GHz	2.4960 GHz	1.000 MHz	2.495956667 GHz	-34.33 dBm	-21.33 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498890000 GHz	-29.00 dBm	-19.00 dB
4	4	2.4990 GHz	2.5000 GHz	100.0 kHz	2.499820000 GHz	-26.36 dBm	-16.36 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.501708333 GHz	10.89 dBm	-14.11 dB

Plot 7-195. Lower ACP Plot (Band 7 - 5.0MHz QPSK - RB Size 25)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.565500000 GHz	10.83 dBm	-14.17 dB
2	2	2.5700 GHz	2.5710 GHz	100.0 kHz	2.570136667 GHz	-24.24 dBm	-14.24 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571000000 GHz	-30.23 dBm	-20.23 dB
4	4	2.5750 GHz	2.5760 GHz	1.000 MHz	2.575003333 GHz	-39.48 dBm	-26.48 dB
5	5	2.5760 GHz	2.5950 GHz	1.000 MHz	2.576253333 GHz	-41.42 dBm	-16.42 dB

Plot 7-196. Upper ACP Plot (Band 7 - 5.0MHz QPSK - RB Size 25)

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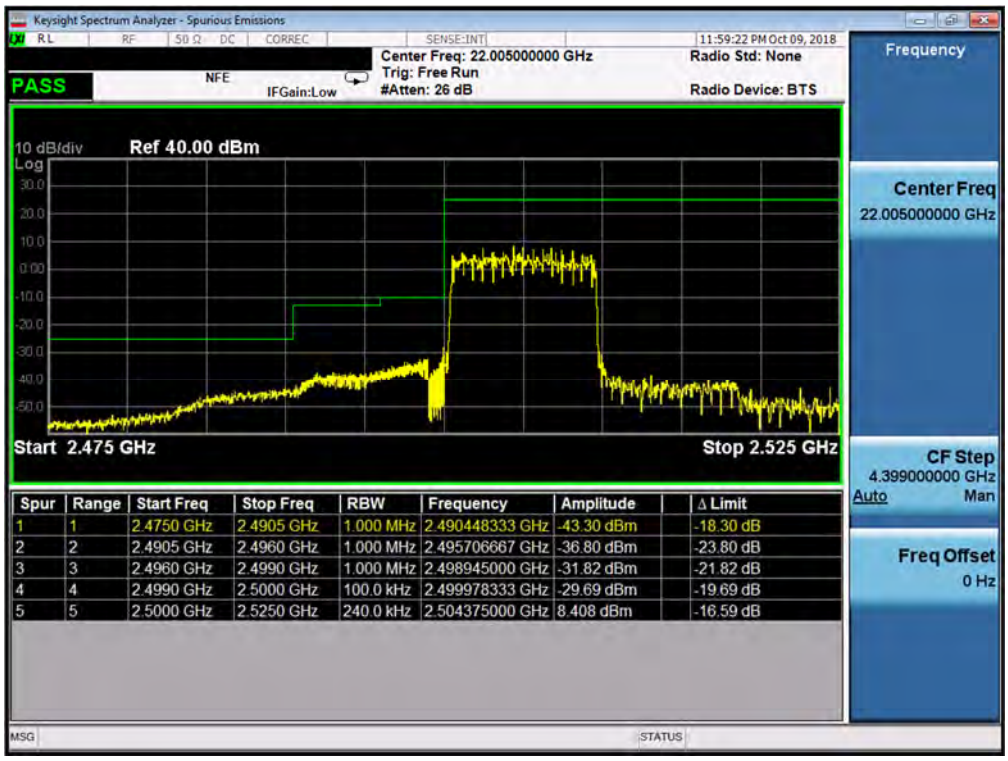
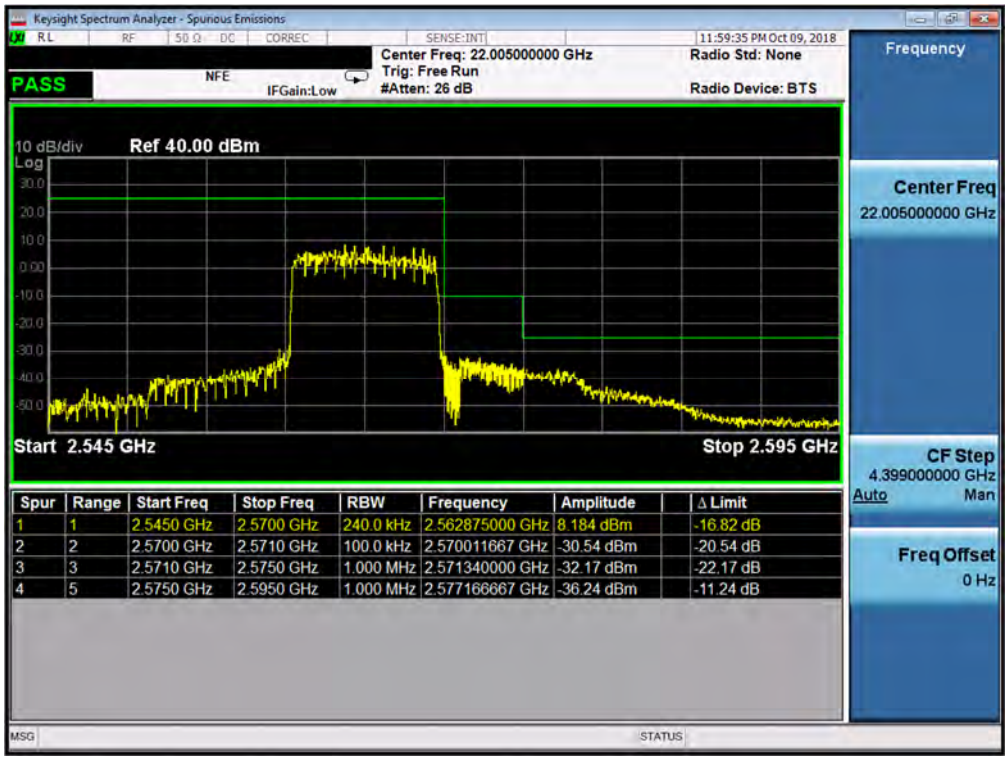


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490448333 GHz	-43.30 dBm	-18.30 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495706667 GHz	-36.80 dBm	-23.80 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498945000 GHz	-31.82 dBm	-21.82 dB
4	4	2.4990 GHz	2.5000 GHz	100.0 kHz	2.499978333 GHz	-29.69 dBm	-19.69 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.504375000 GHz	8.408 dBm	-16.59 dB

Plot 7-197. Lower ACP Plot (Band 7 - 10.0MHz QPSK - RB Size 50)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.562875000 GHz	8.184 dBm	-16.82 dB
2	2	2.5700 GHz	2.5710 GHz	100.0 kHz	2.570011667 GHz	-30.54 dBm	-20.54 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571340000 GHz	-32.17 dBm	-22.17 dB
4	5	2.5750 GHz	2.5950 GHz	1.000 MHz	2.577166667 GHz	-36.24 dBm	-11.24 dB

Plot 7-198. Upper ACP Plot (Band 7 - 10.0MHz QPSK - RB Size 50)

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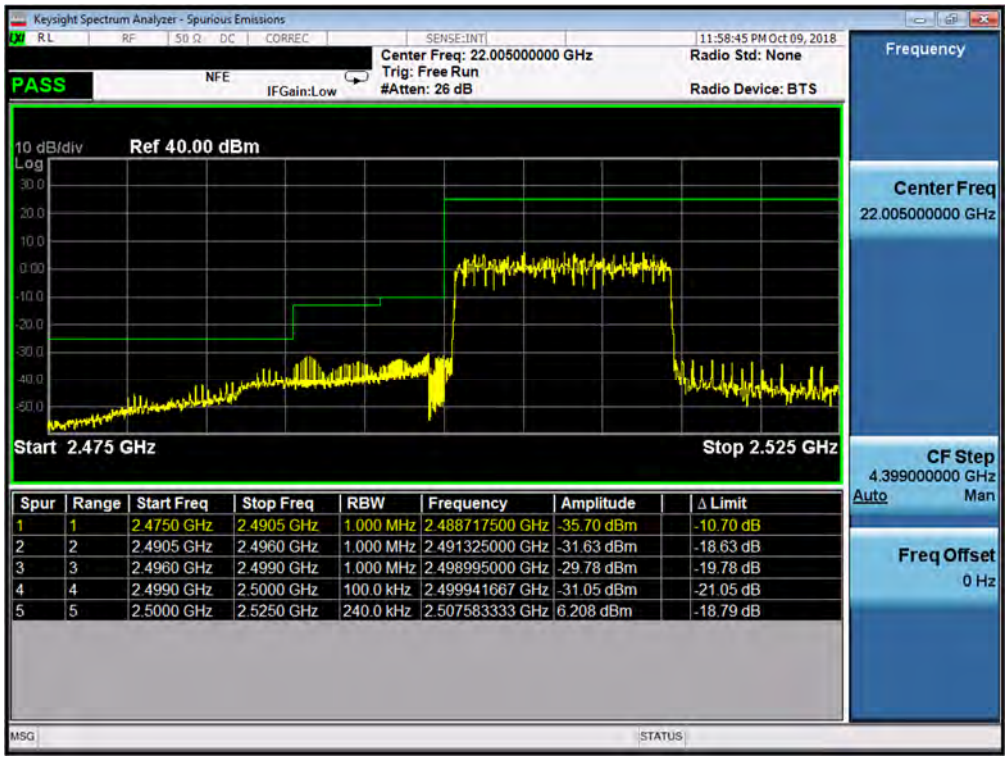
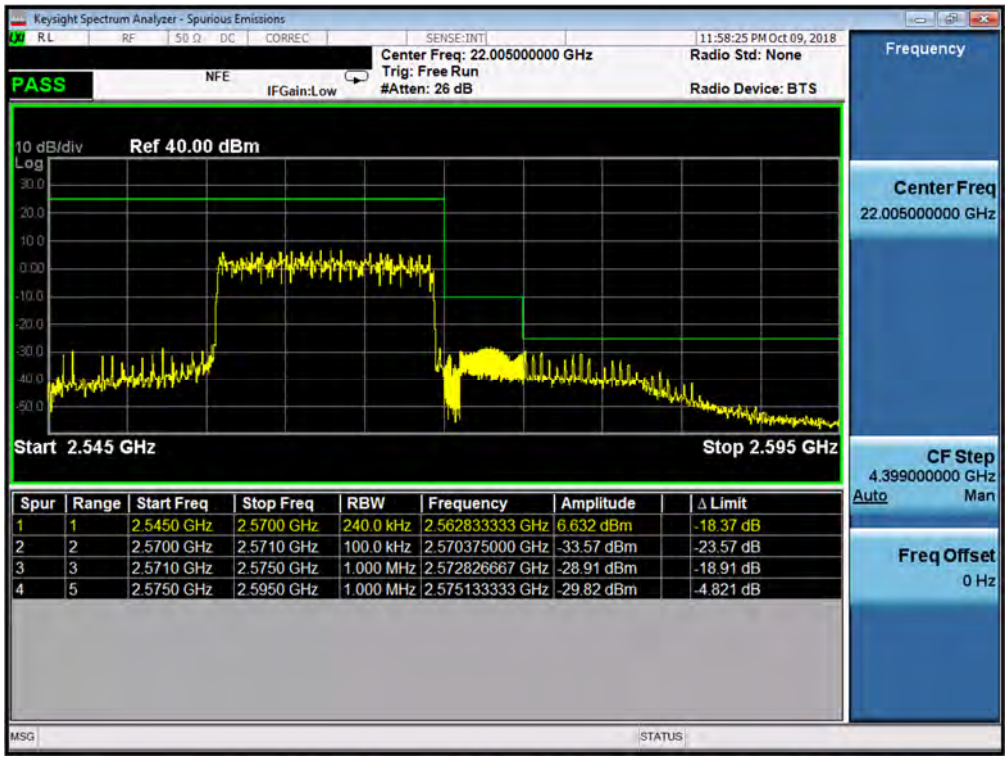


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.488717500 GHz	-35.70 dBm	-10.70 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.491325000 GHz	-31.63 dBm	-18.63 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498995000 GHz	-29.78 dBm	-19.78 dB
4	4	2.4990 GHz	2.5000 GHz	100.0 kHz	2.499941667 GHz	-31.05 dBm	-21.05 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.507583333 GHz	6.208 dBm	-18.79 dB

Plot 7-199. Lower ACP Plot (Band 7 - 15.0MHz QPSK - RB Size 75)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.562833333 GHz	6.632 dBm	-18.37 dB
2	2	2.5700 GHz	2.5710 GHz	100.0 kHz	2.570375000 GHz	-33.57 dBm	-23.57 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.572826667 GHz	-28.91 dBm	-18.91 dB
4	5	2.5750 GHz	2.5950 GHz	1.000 MHz	2.575133333 GHz	-29.82 dBm	-4.821 dB

Plot 7-200. Upper ACP Plot (Band 7 - 15.0MHz QPSK - RB Size 75)

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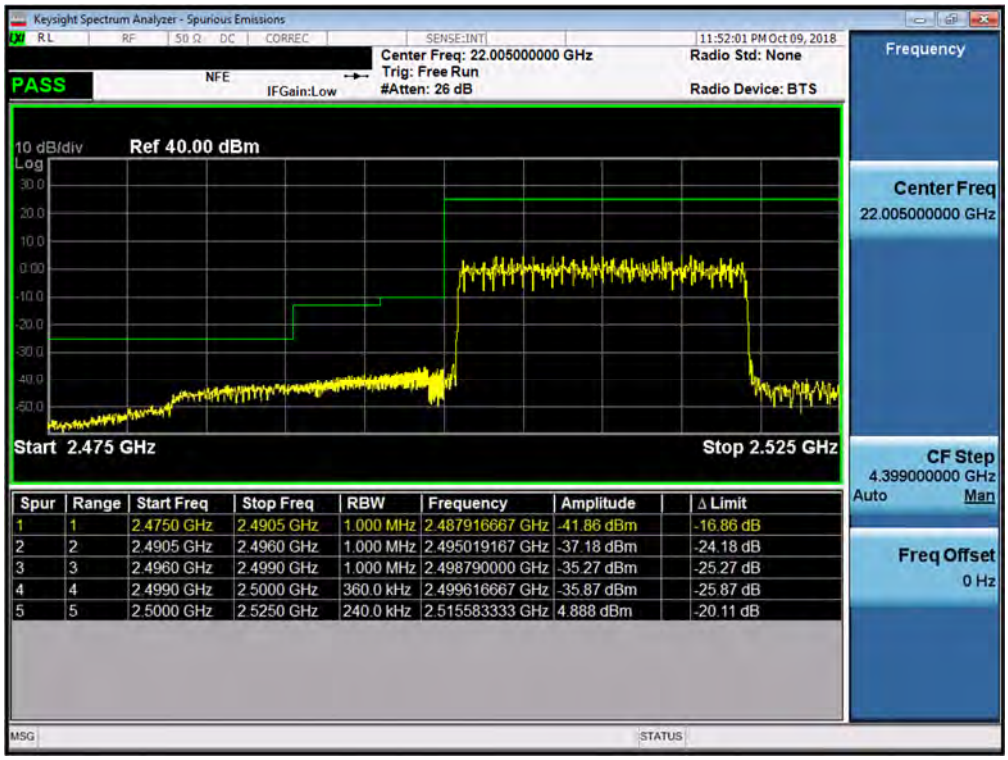
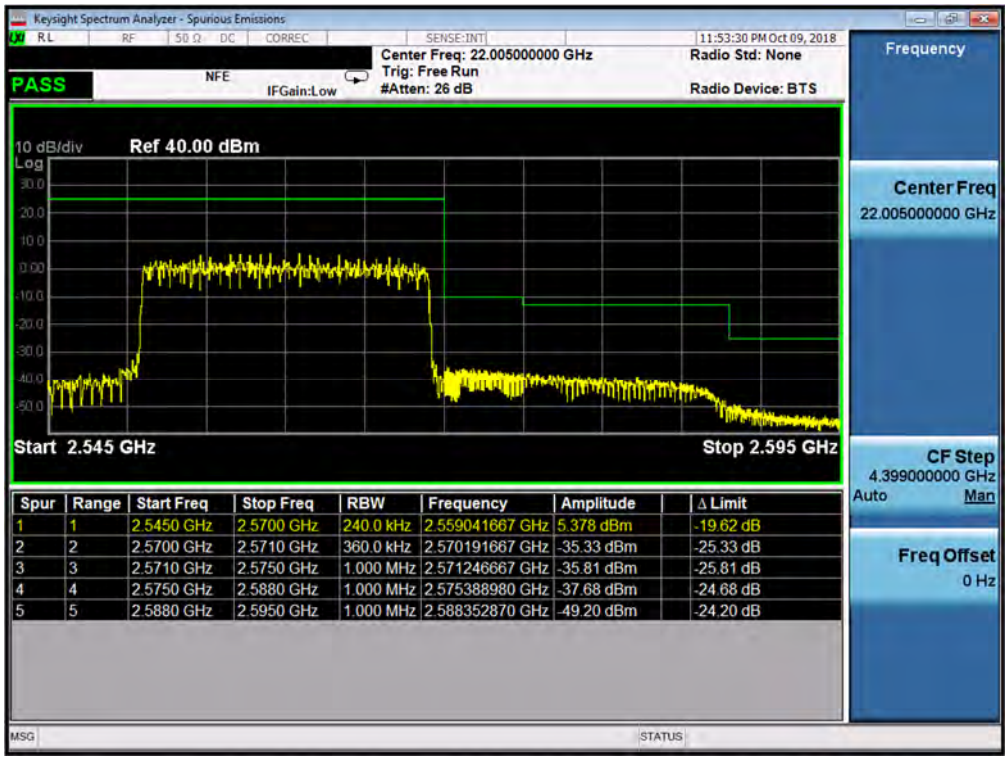


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.487916667 GHz	-41.86 dBm	-16.86 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495019167 GHz	-37.18 dBm	-24.18 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498790000 GHz	-35.27 dBm	-25.27 dB
4	4	2.4990 GHz	2.5000 GHz	360.0 kHz	2.499616667 GHz	-35.87 dBm	-25.87 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.515583333 GHz	4.888 dBm	-20.11 dB

Plot 7-201. Lower ACP Plot (Band 7 - 20.0MHz QPSK - RB Size 100)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.559041667 GHz	5.378 dBm	-19.62 dB
2	2	2.5700 GHz	2.5710 GHz	360.0 kHz	2.570191667 GHz	-35.33 dBm	-25.33 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571246667 GHz	-35.81 dBm	-25.81 dB
4	4	2.5750 GHz	2.5880 GHz	1.000 MHz	2.575388980 GHz	-37.68 dBm	-24.68 dB
5	5	2.5880 GHz	2.5950 GHz	1.000 MHz	2.588352870 GHz	-49.20 dBm	-24.20 dB

Plot 7-202. Upper ACP Plot (Band 7 - 20.0MHz QPSK - RB Size 100)

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7.5 Peak-Average Ratio

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW ≥ OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.

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.

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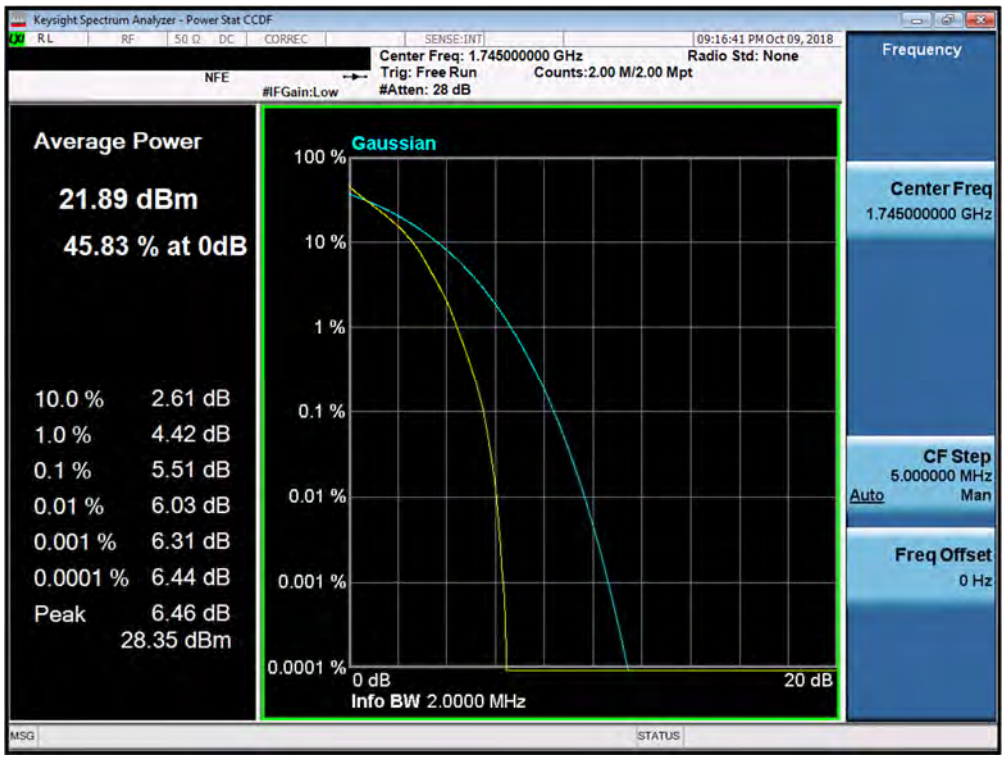
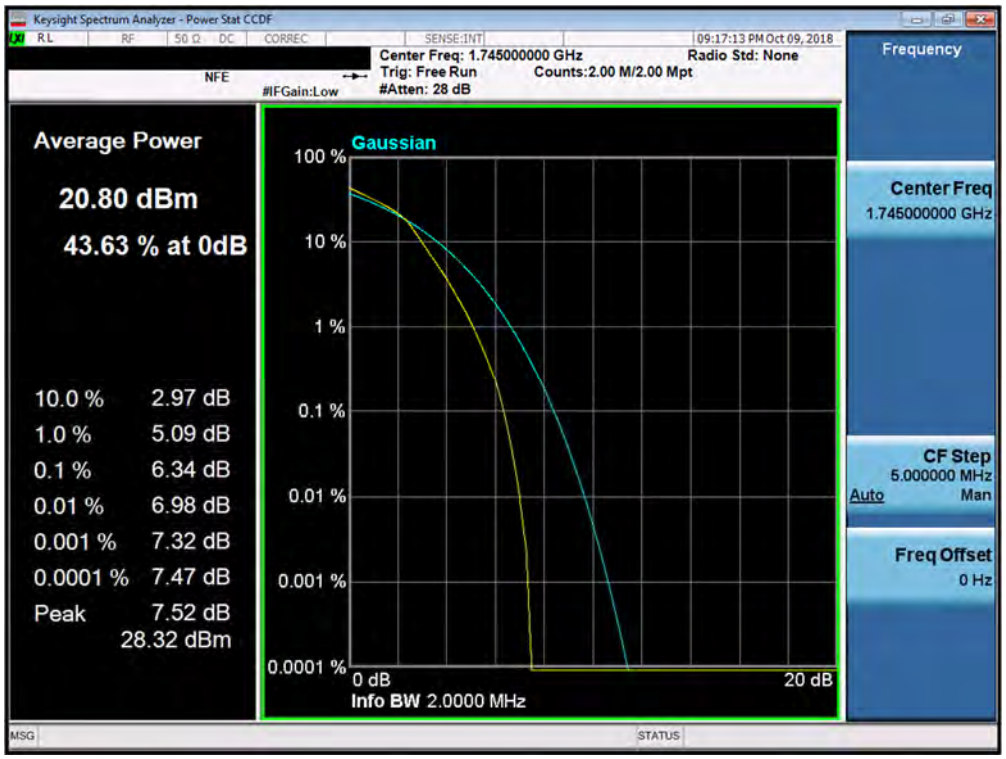
Band 66/4



Plot 7-203. PAR Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-204. PAR Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

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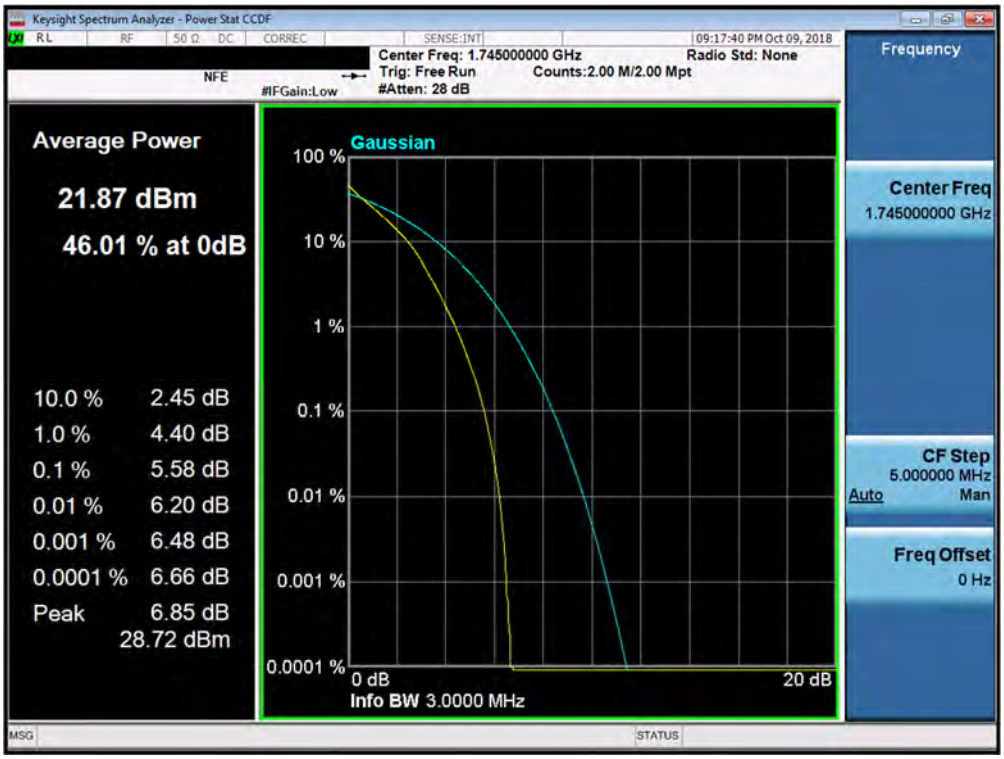
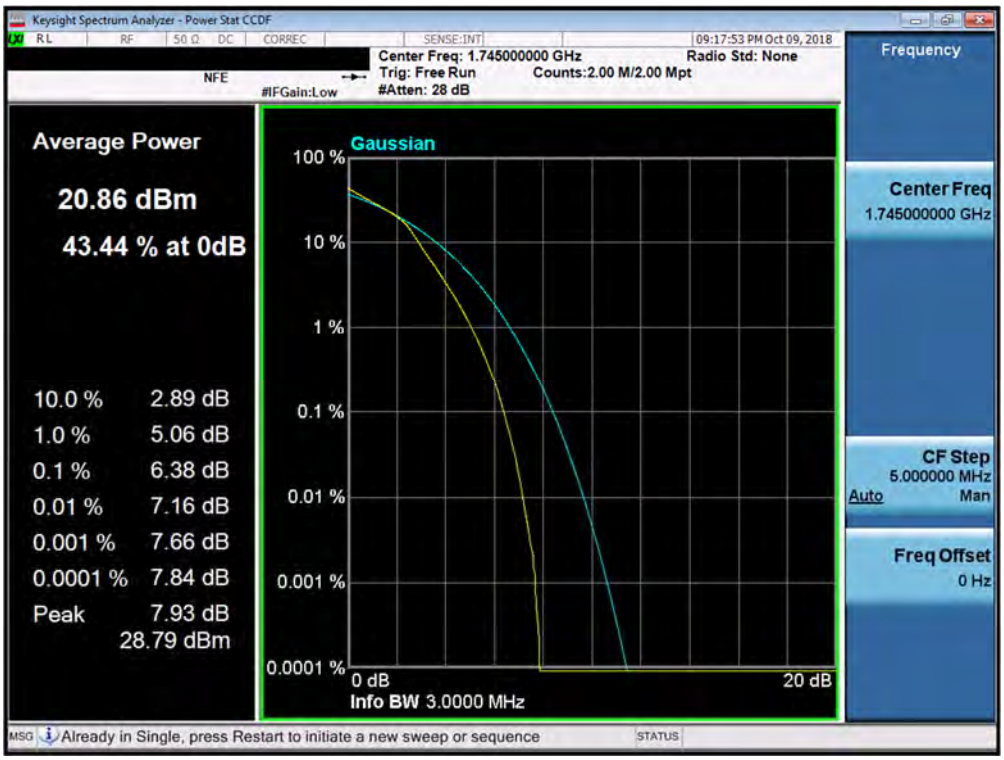


Plot 7-205. PAR Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-206. PAR Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)

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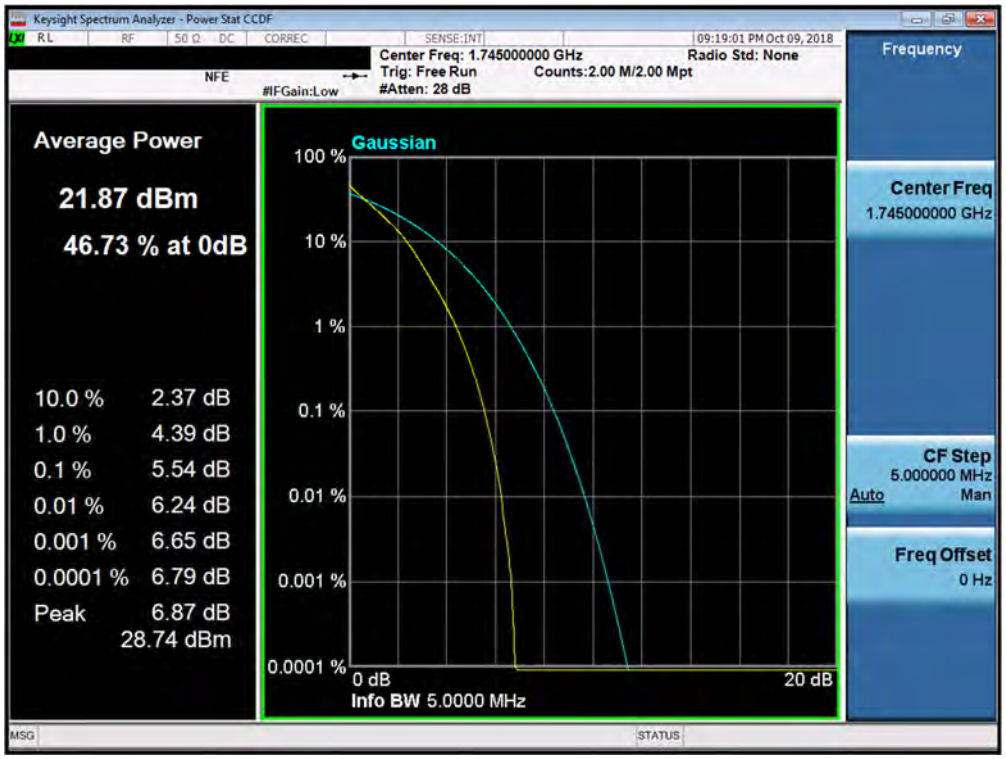
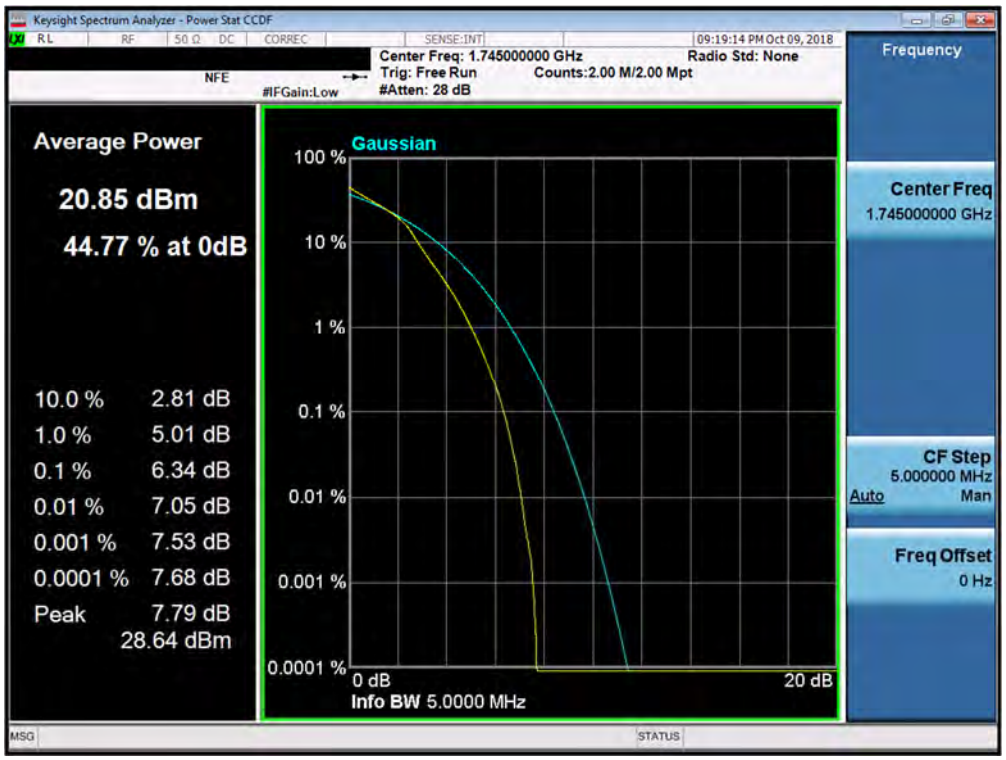


Plot 7-207. PAR Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-208. PAR Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)

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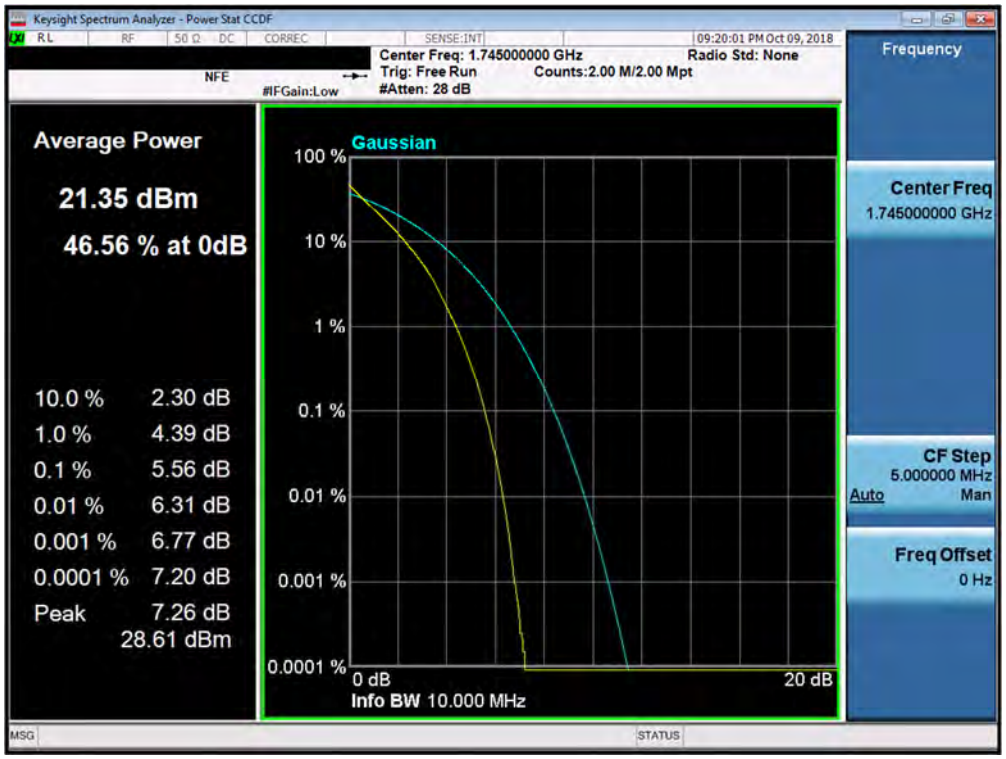
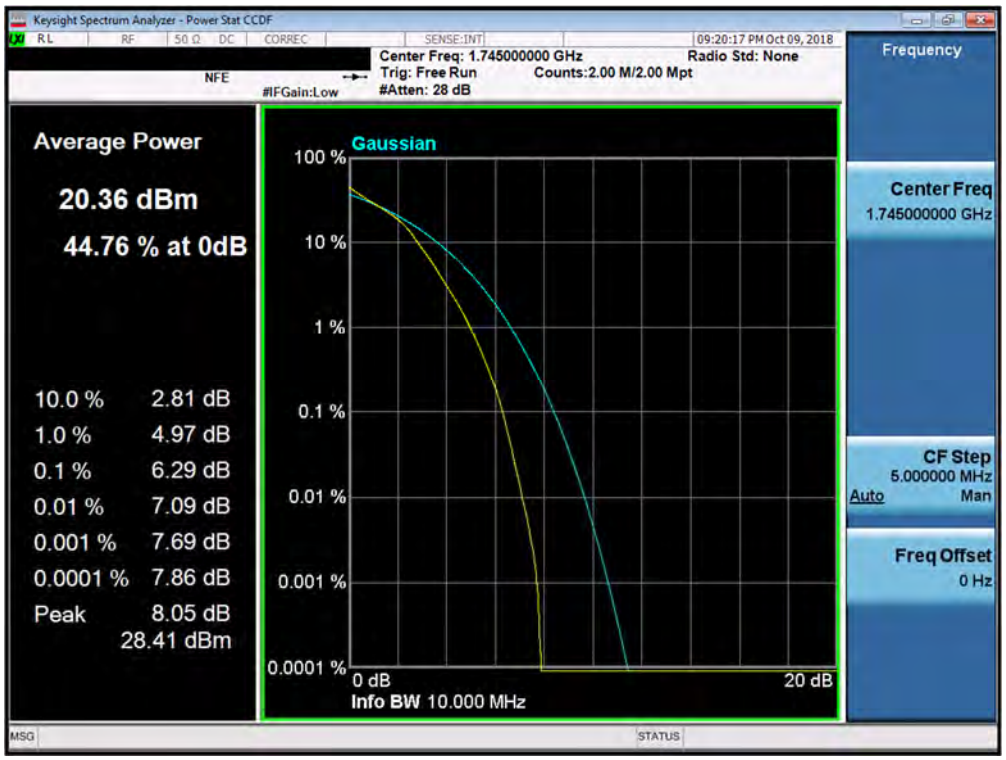


Plot 7-209. PAR Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-210. PAR Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)

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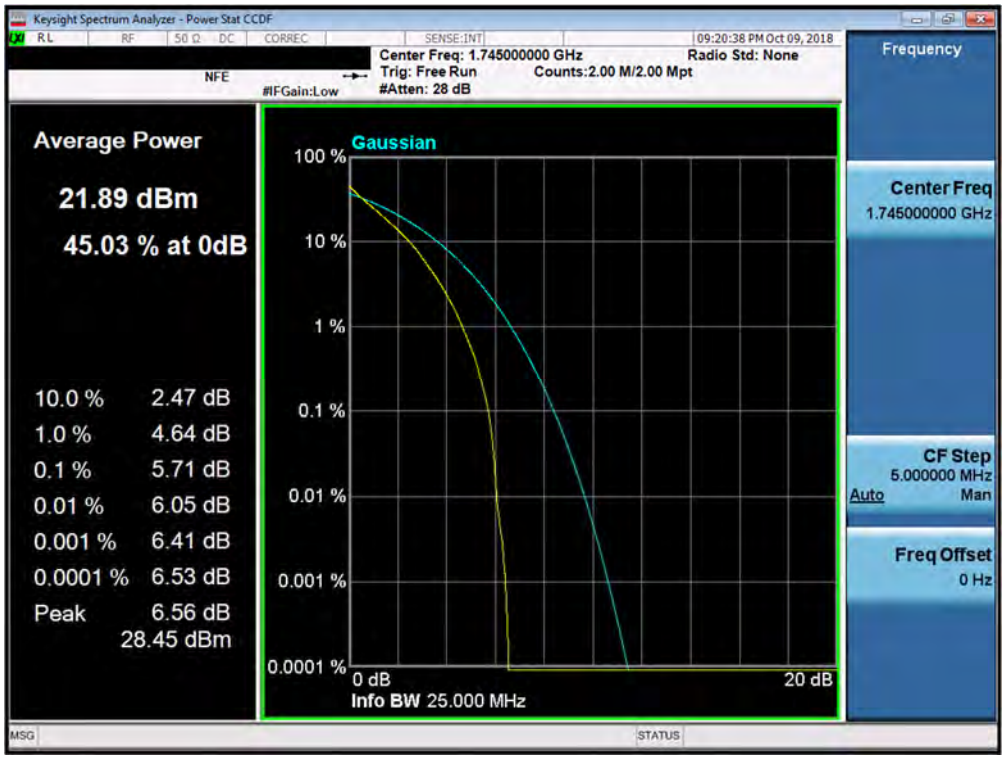
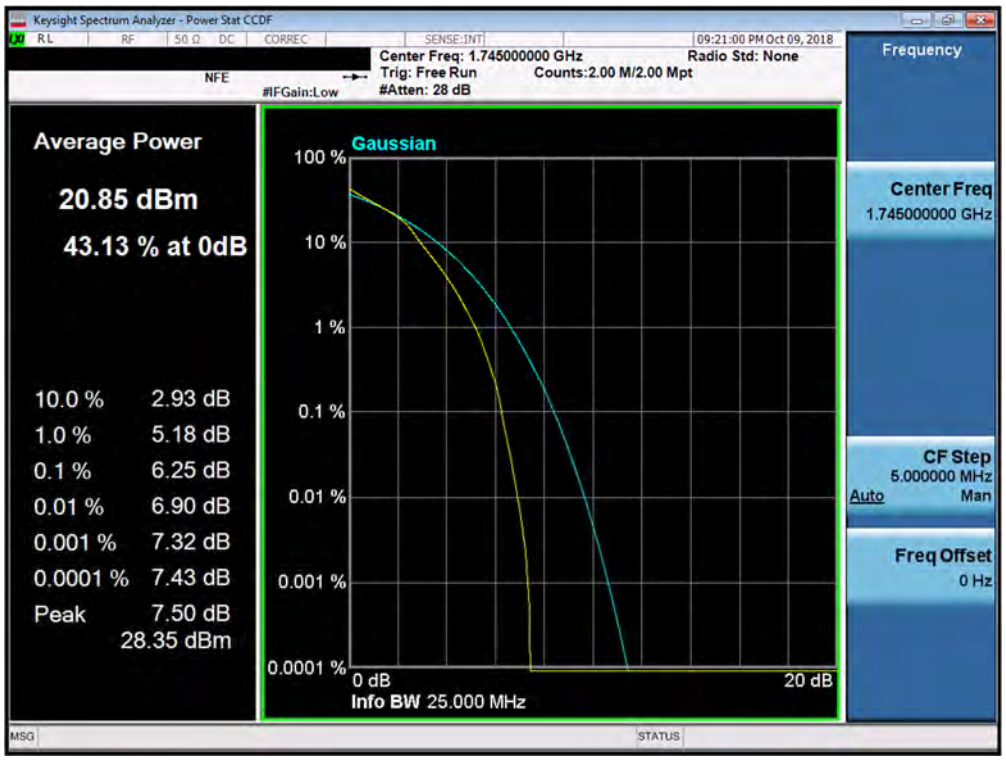


Plot 7-211. PAR Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-212. PAR Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)

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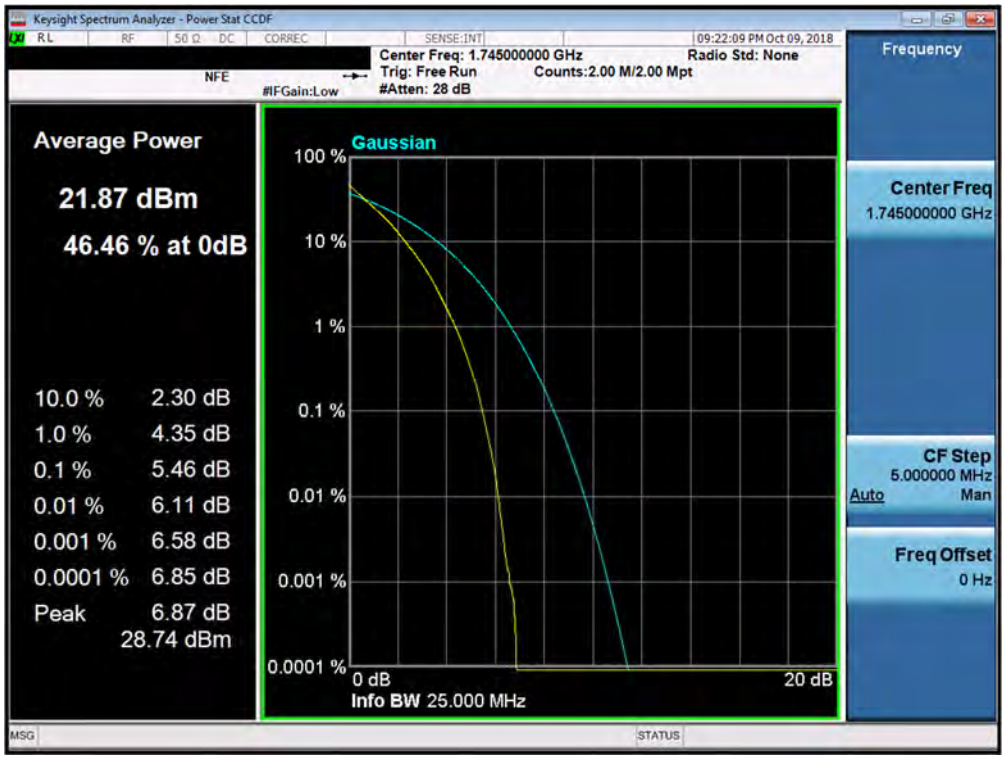
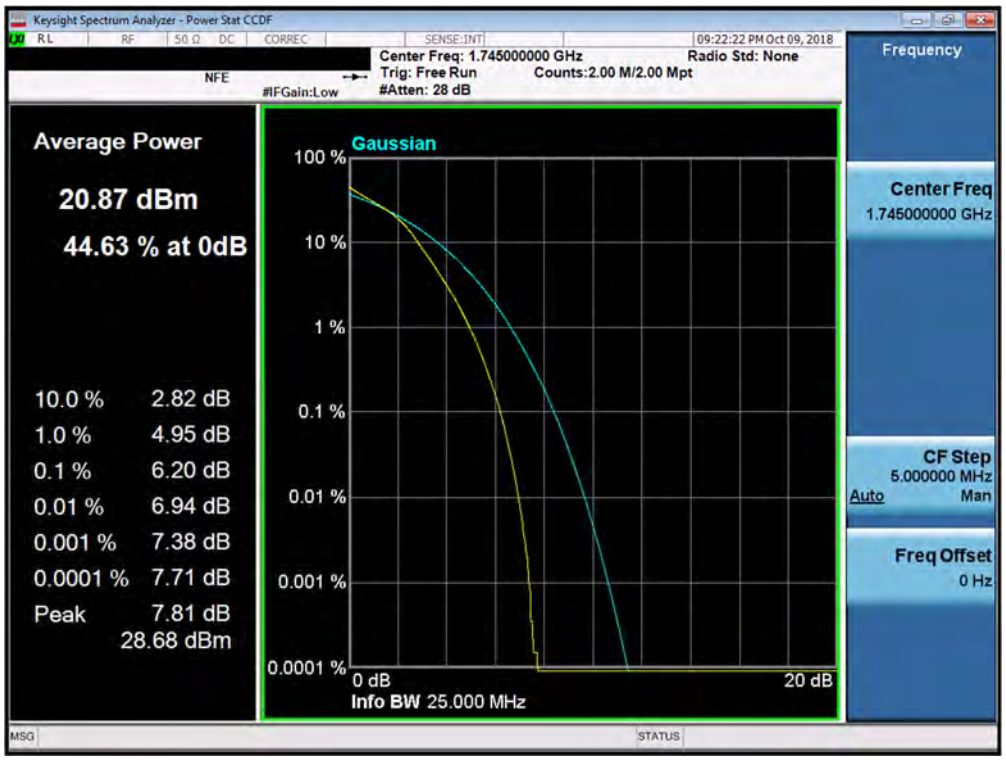


Plot 7-213. PAR Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-214. PAR Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)

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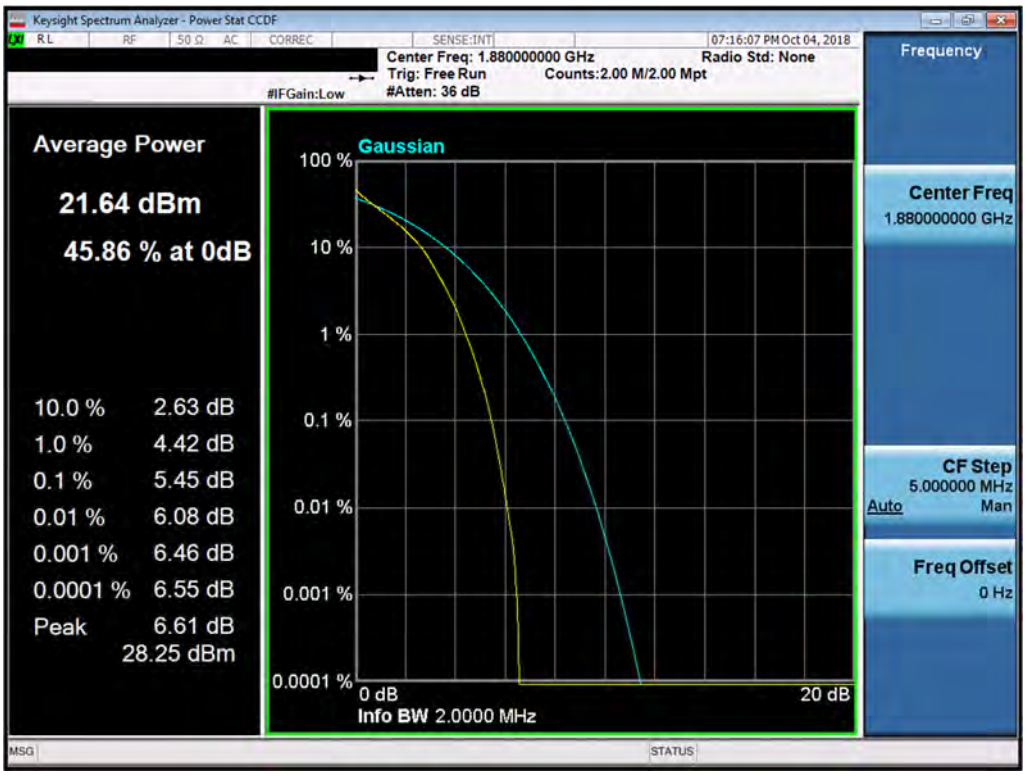
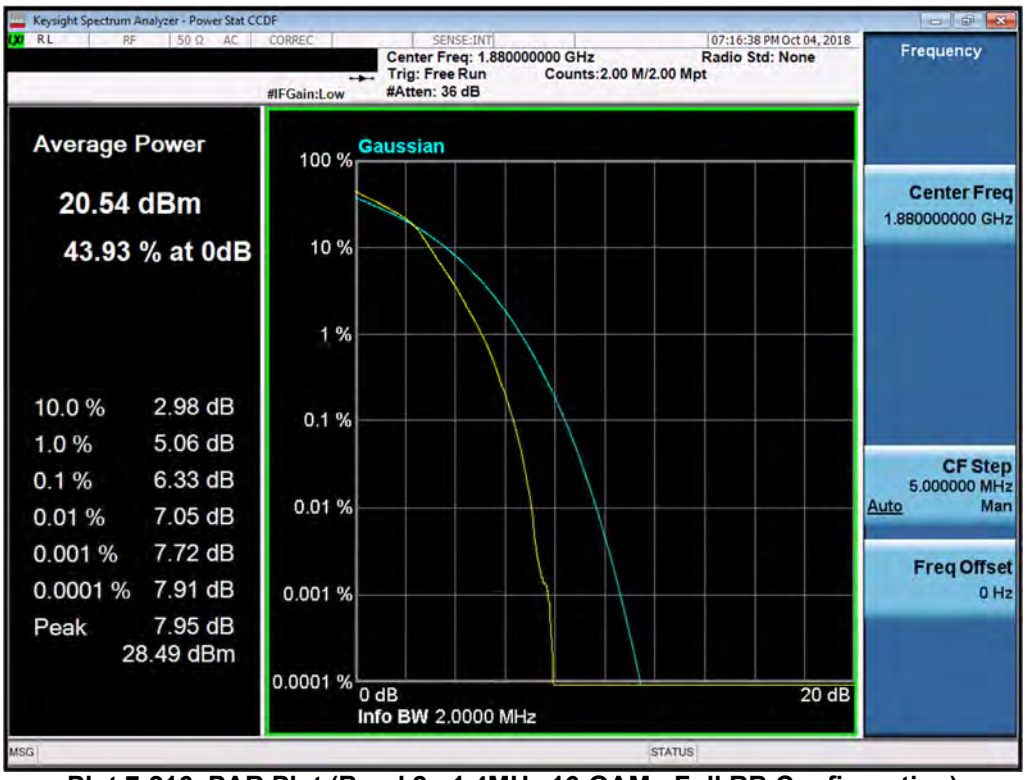
Band 2



Plot 7-215. PAR Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-216. PAR Plot (Band 2 - 1.4MHz 16-QAM - Full RB Configuration)

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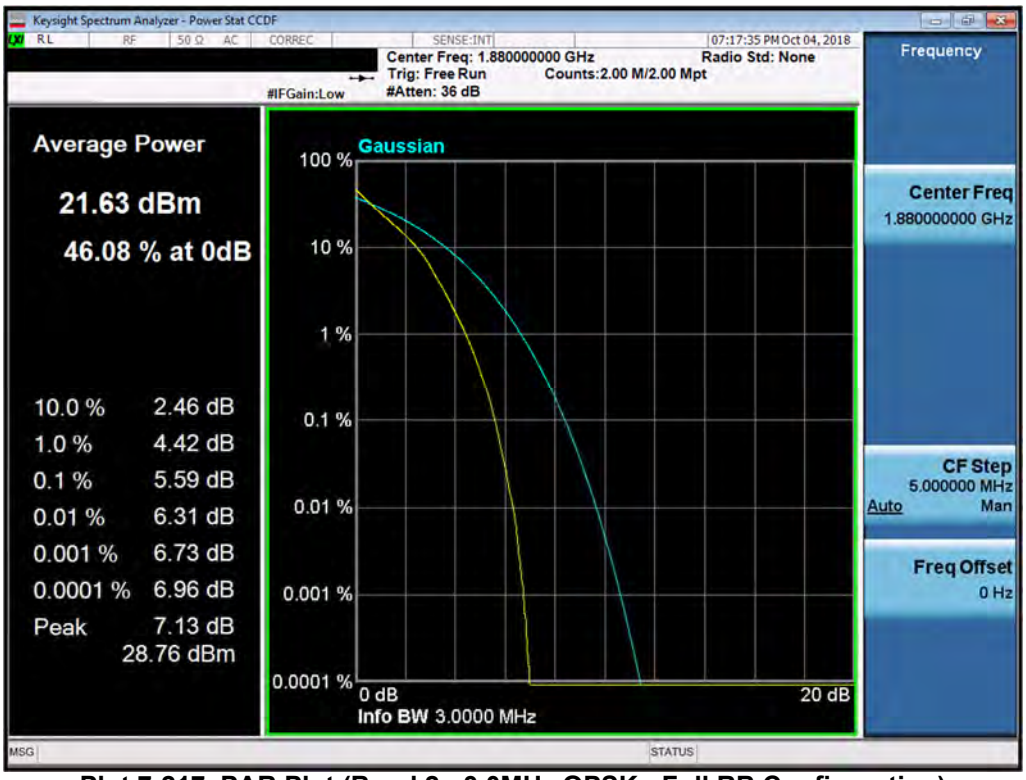
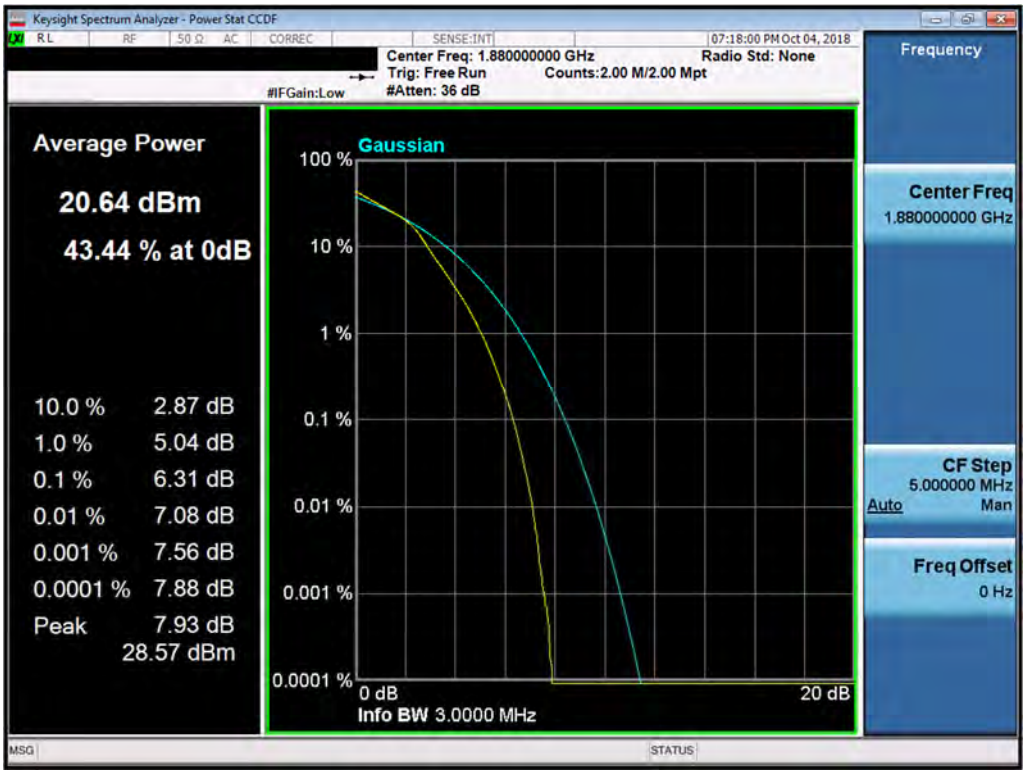


Plot 7-217. PAR Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-218. PAR Plot (Band 2 - 3.0MHz 16-QAM - Full RB Configuration)

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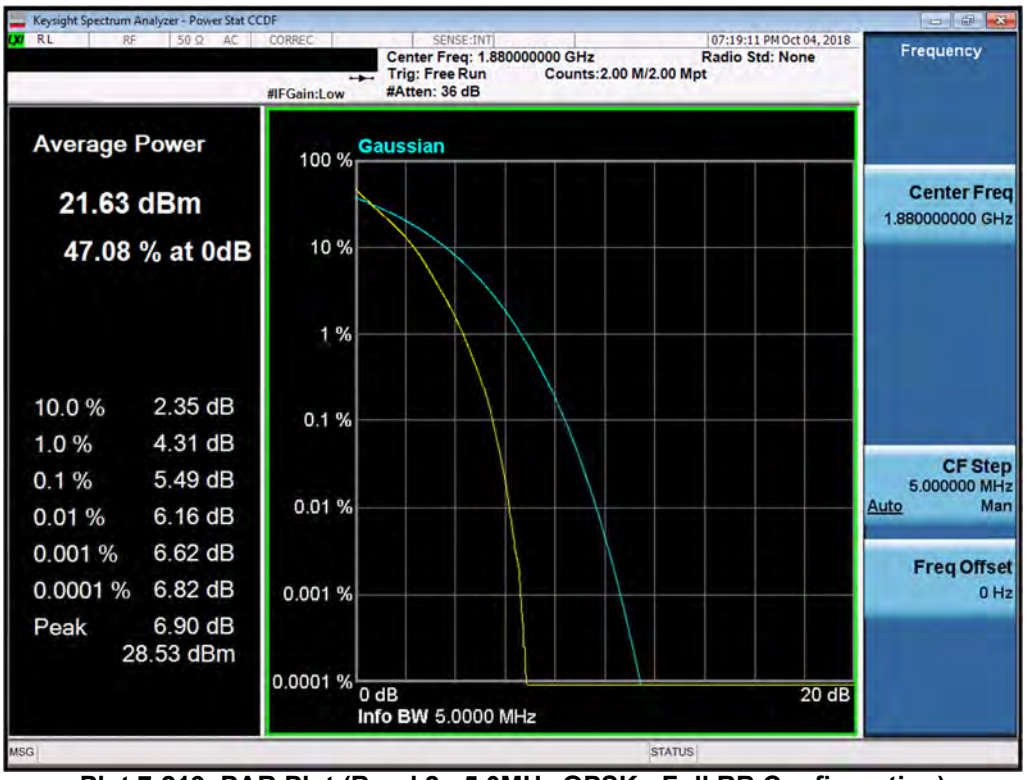
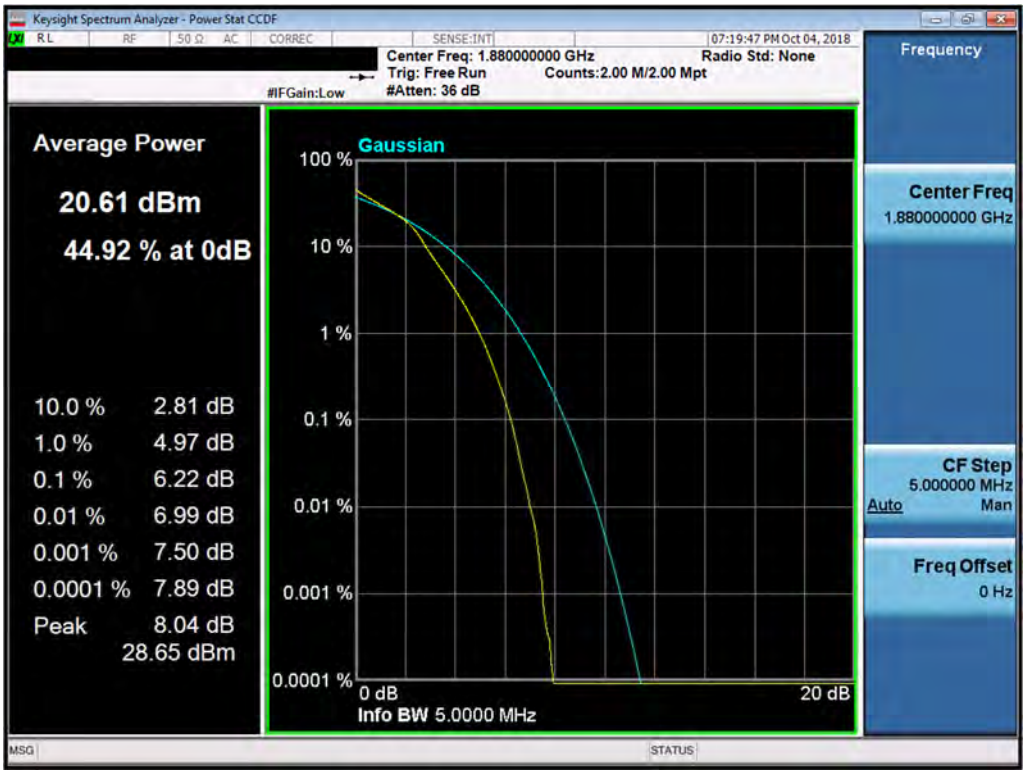


Plot 7-219. PAR Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-220. PAR Plot (Band 2 - 5.0MHz 16-QAM - Full RB Configuration)

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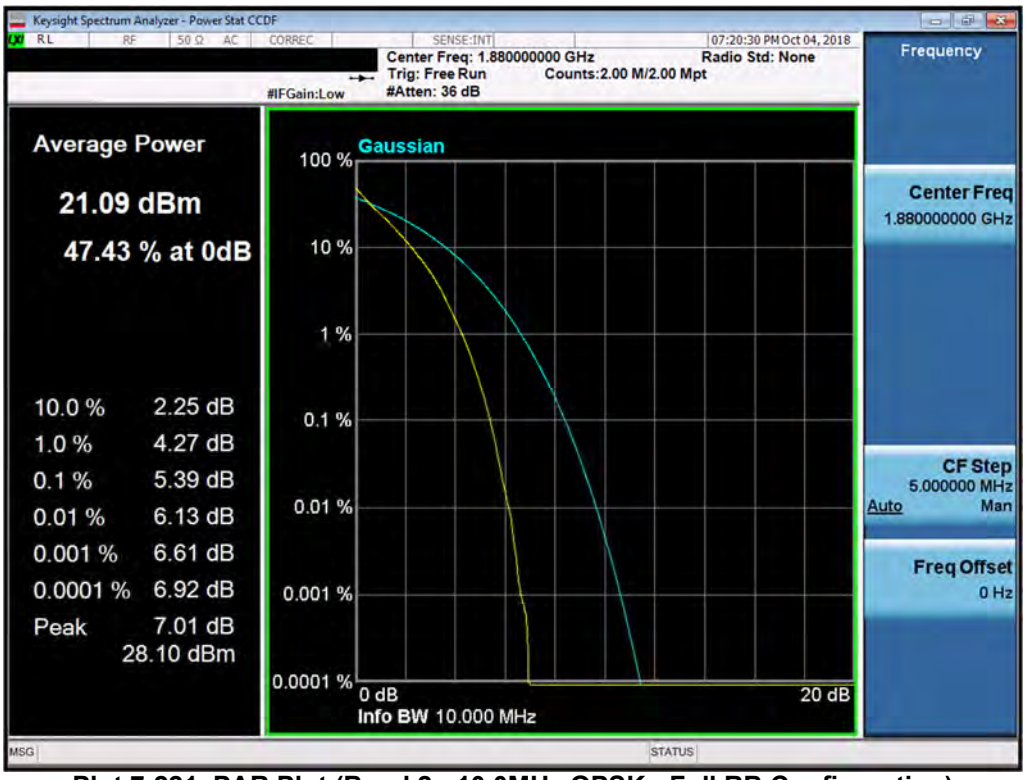
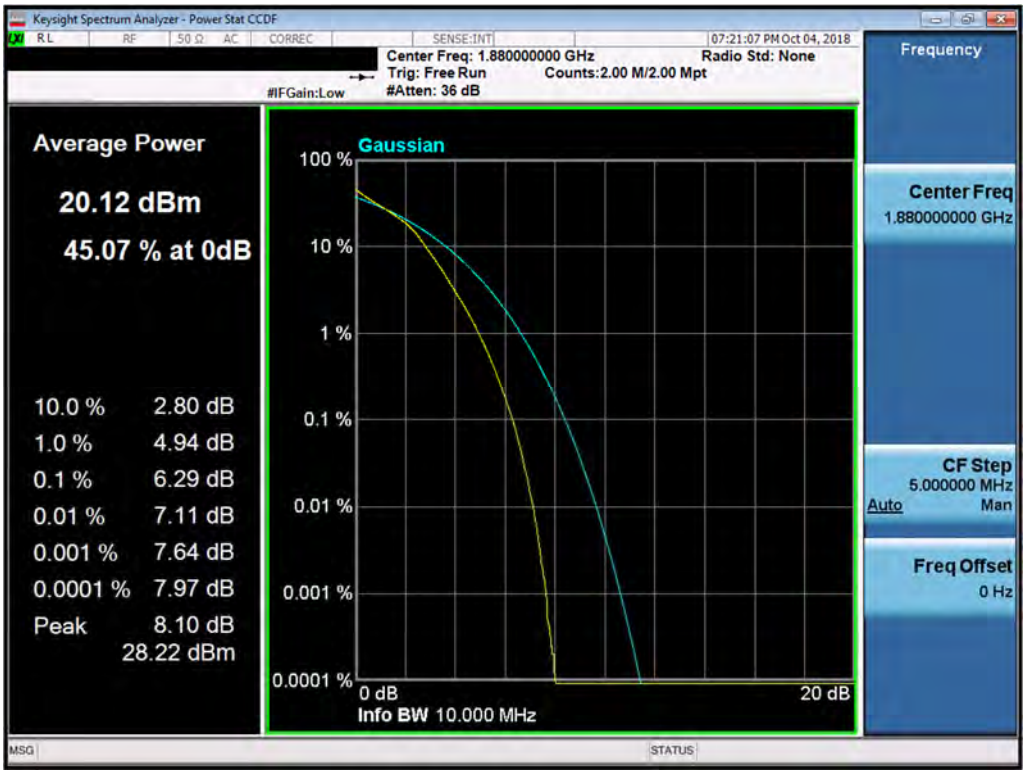


Plot 7-221. PAR Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-222. PAR Plot (Band 2 - 10.0MHz 16-QAM - Full RB Configuration)

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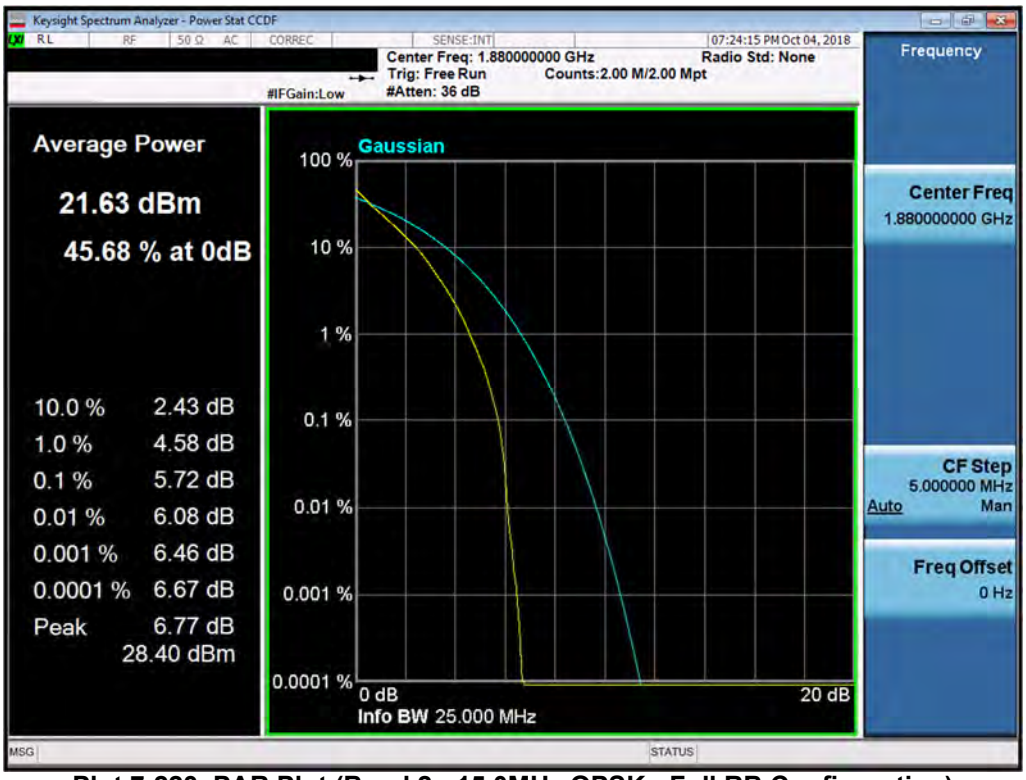
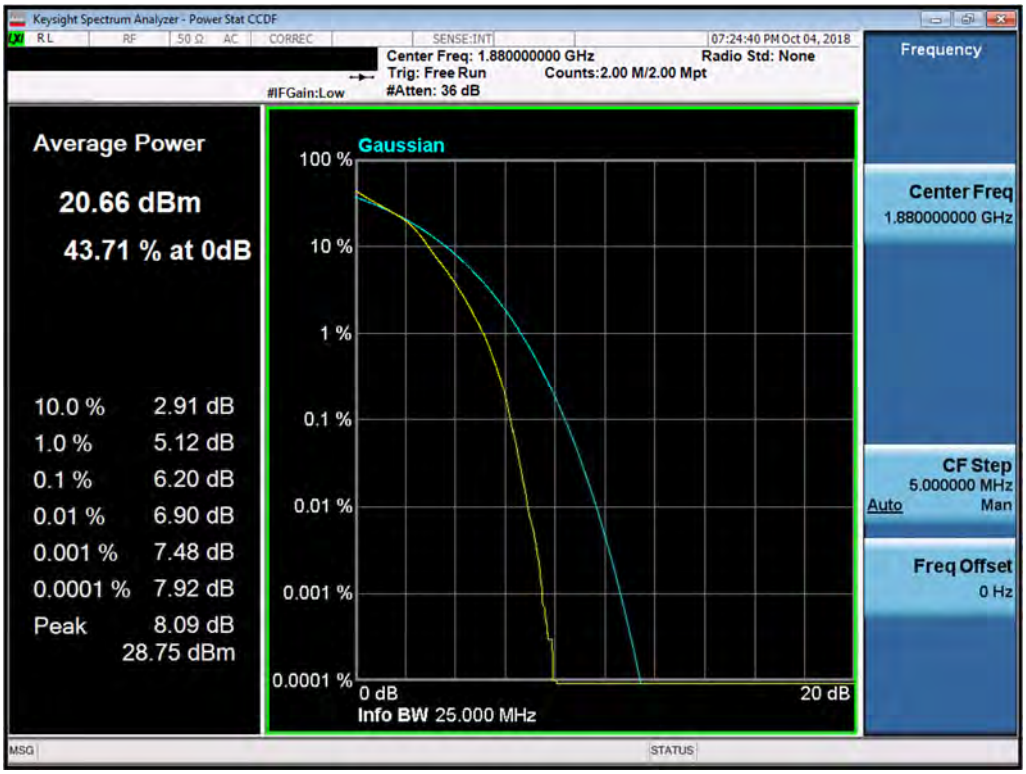


Plot 7-223. PAR Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-224. PAR Plot (Band 2 - 15.0MHz 16-QAM - Full RB Configuration)

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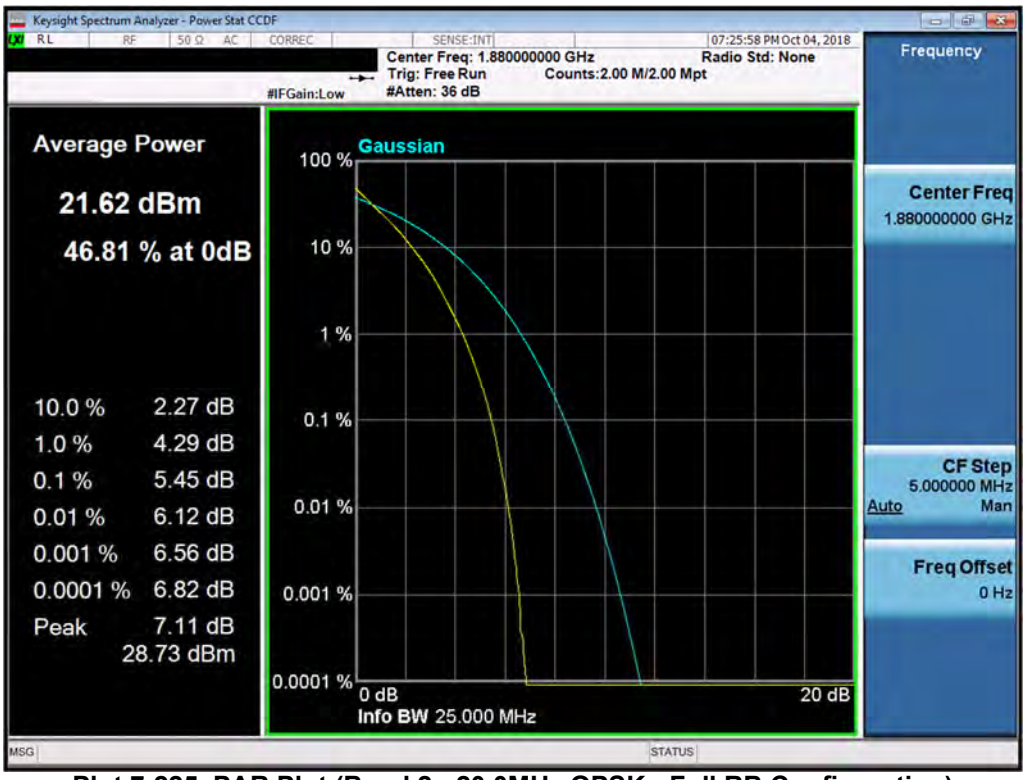
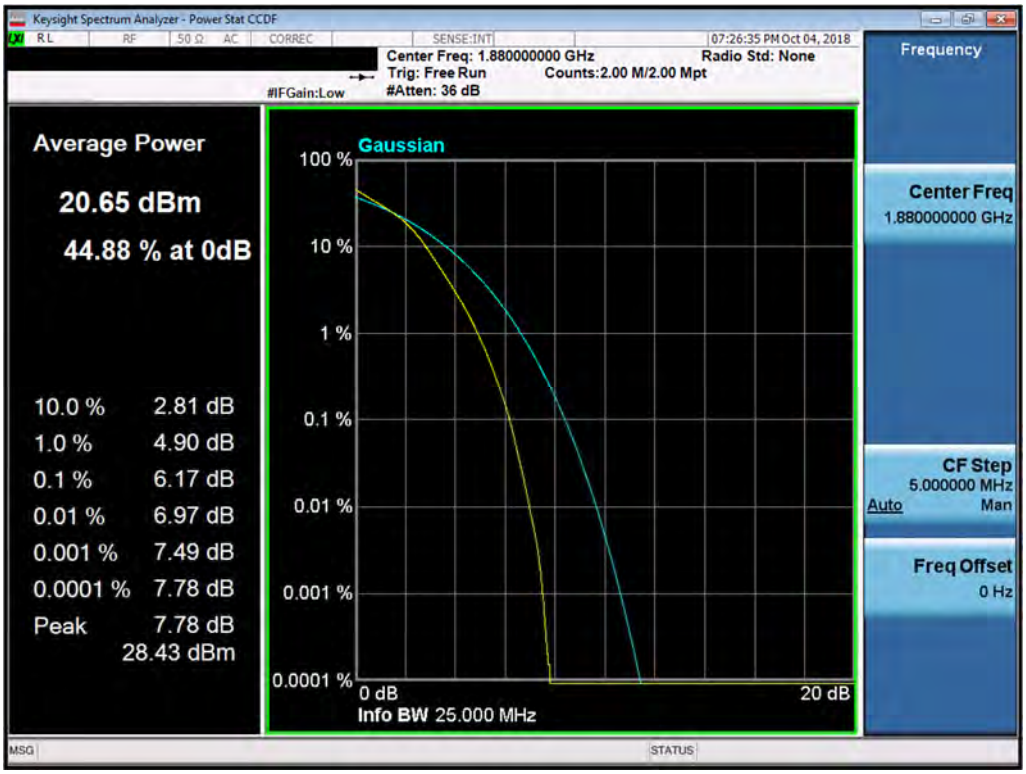


Plot 7-225. PAR Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-226. PAR Plot (Band 2 - 20.0MHz 16-QAM - Full RB Configuration)

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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

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

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Test Setup

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

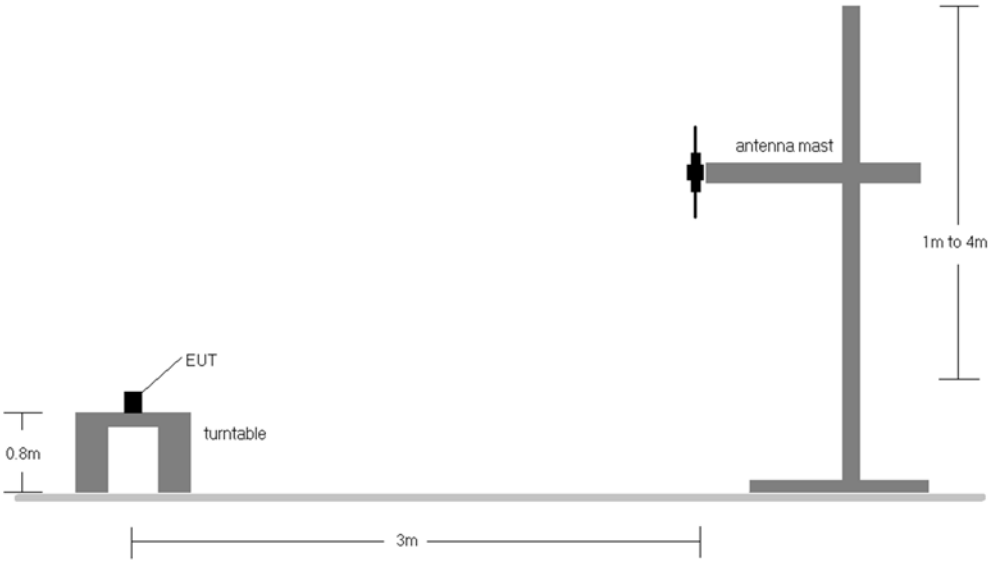

Figure 7-5. Radiated Test Setup <1GHz

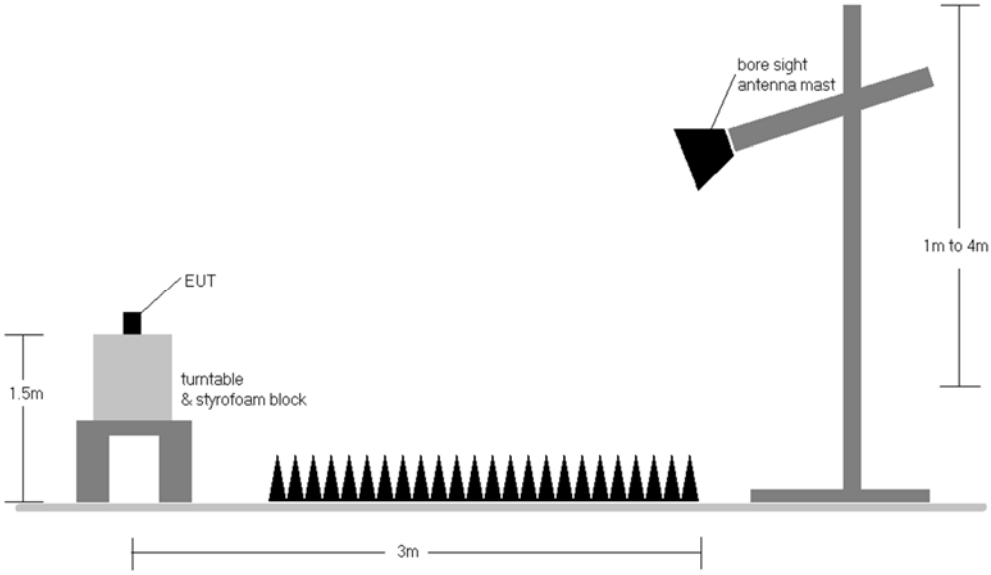

Figure 7-6. Radiated Test Setup >1GHz

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7.6.1 Radiated Power (ERP/EIRP)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
665.50	5	QPSK	H	327	328	1 / 0	16.37	3.84	**18.06**	**0.064**	34.77	-16.72
680.50	5	QPSK	H	310	289	1 / 0	16.19	3.91	17.95	0.062	34.77	-16.82
695.50	5	QPSK	H	339	305	1 / 0	15.92	3.98	17.75	0.060	34.77	-17.02
665.50	5	16-QAM	H	327	328	1 / 0	15.20	3.84	**16.89**	0.049	34.77	-17.89
668.00	10	QPSK	H	335	276	1 / 0	15.96	3.85	17.66	0.058	34.77	-17.11
680.50	10	QPSK	H	315	301	1 / 0	16.22	3.91	**17.98**	0.063	34.77	-16.79
693.00	10	QPSK	H	328	310	1 / 0	16.12	3.97	17.94	0.062	34.77	-16.83
680.50	10	16-QAM	H	315	301	1 / 0	15.11	3.91	**16.87**	0.049	34.77	-17.90
670.50	15	QPSK	H	334	257	1 / 0	16.20	3.86	17.91	0.062	34.77	-16.86
680.50	15	QPSK	H	312	309	1 / 0	15.99	3.91	17.75	0.060	34.77	-17.02
690.50	15	QPSK	H	315	319	1 / 0	16.12	3.96	**17.93**	0.062	34.77	-16.85
680.50	15	16-QAM	H	312	309	1 / 0	14.89	3.91	**16.65**	0.046	34.77	-18.12
673.00	20	QPSK	H	342	315	1 / 0	16.23	3.87	17.95	0.062	34.77	-16.82
683.00	20	QPSK	H	309	329	1 / 0	16.26	3.92	**18.03**	0.064	34.77	-16.74
688.00	20	QPSK	H	312	328	1 / 0	16.21	3.94	18.00	0.063	34.77	-16.77
683.00	20	16-QAM	H	309	329	1 / 0	15.20	3.92	**16.97**	0.050	34.77	-17.80
665.50	5	QPSK	V	278	281	1 / 0	18.06	1.10	17.01	0.050	34.77	-17.76

Table 7-3. ERP Data (Band 71)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	150	3	1 / 0	18.74	1.10	**17.69**	0.059	34.77	-17.08	**19.84**	0.096	36.99	-17.15
707.50	1.4	QPSK	H	150	12	1 / 0	17.81	1.13	16.79	0.048	34.77	-17.98	18.94	0.078	36.99	-18.05
715.30	1.4	QPSK	H	150	356	1 / 5	18.36	1.16	17.37	0.055	34.77	-17.40	19.52	0.090	36.99	-17.47
699.70	1.4	16-QAM	H	150	3	1 / 0	16.62	1.10	**15.57**	0.036	34.77	-19.20	**17.72**	0.059	36.99	-19.27
700.50	3	QPSK	H	150	350	1 / 0	18.75	1.10	**17.70**	0.059	34.77	-17.07	**19.85**	0.097	36.99	-17.14
707.50	3	QPSK	H	150	6	1 / 0	17.94	1.13	16.92	0.049	34.77	-17.85	19.07	0.081	36.99	-17.92
714.50	3	QPSK	H	150	350	1 / 0	18.46	1.16	17.47	0.056	34.77	-17.30	19.62	0.092	36.99	-17.37
700.50	3	16-QAM	H	150	350	1 / 0	16.73	1.10	**15.68**	0.037	34.77	-19.09	**17.83**	0.061	36.99	-19.16
701.50	5	QPSK	H	150	356	1 / 0	19.05	1.11	**18.01**	**0.063**	34.77	-16.77	**20.16**	**0.104**	36.99	-16.83
707.50	5	QPSK	H	150	23	1 / 0	17.81	1.13	16.79	0.048	34.77	-17.98	18.94	0.078	36.99	-18.05
713.50	5	QPSK	H	150	356	1 / 0	18.79	1.15	17.79	0.060	34.77	-16.98	19.94	0.099	36.99	-17.05
701.50	5	16-QAM	H	150	356	1 / 0	16.68	1.11	**15.64**	0.037	34.77	-19.14	**17.79**	0.060	36.99	-19.20
704.00	10	QPSK	H	150	357	1 / 0	18.71	1.12	**17.68**	0.059	34.77	-17.09	**19.83**	0.096	36.99	-17.16
707.50	10	QPSK	H	150	5	1 / 0	18.27	1.13	17.25	0.053	34.77	-17.52	19.40	0.087	36.99	-17.59
711.00	10	QPSK	H	150	358	1 / 0	18.65	1.14	17.64	0.058	34.77	-17.13	19.79	0.095	36.99	-17.20
704.00	10	16-QAM	H	150	357	1 / 0	16.63	1.12	**15.60**	0.036	34.77	-19.17	**17.75**	0.060	36.99	-19.24
701.50	5	QPSK	V	150	351	1 / 0	18.42	1.13	17.40	0.055	34.77	-17.37	19.55	0.090	36.99	-17.44

Table 7-4. 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]
824.70	1.4	QPSK	V	150	356	1 / 5	22.57	1.50	**21.92**	0.156	38.45	-16.53	**24.07**	0.255	40.61	-16.54
836.50	1.4	QPSK	V	150	2	1 / 5	22.40	1.50	21.75	0.150	38.45	-16.70	23.90	0.246	40.61	-16.71
848.30	1.4	QPSK	V	150	3	1 / 0	22.06	1.50	21.41	0.138	38.45	-17.04	23.56	0.227	40.61	-17.05
824.70	1.4	16-QAM	V	150	356	1 / 5	20.50	1.50	**19.85**	0.097	38.45	-18.60	**22.00**	0.158	40.61	-18.61
825.50	3	QPSK	V	150	350	1 / 14	14.92	1.50	14.27	0.027	38.45	-24.18	16.42	0.044	40.61	-24.19
836.50	3	QPSK	V	150	356	1 / 14	22.44	1.50	**21.79**	0.151	38.45	-16.66	**23.94**	0.248	40.61	-16.67
847.50	3	QPSK	V	150	358	1 / 0	21.66	1.50	21.01	0.126	38.45	-17.44	23.16	0.207	40.61	-17.45
825.50	3	16-QAM	V	150	350	1 / 14	20.55	1.50	**19.90**	0.098	38.45	-18.55	**22.05**	0.160	40.61	-18.56
826.50	5	QPSK	V	150	355	1 / 24	22.76	1.50	**22.11**	**0.163**	38.45	-16.34	**24.26**	**0.267**	40.61	-16.35
836.50	5	QPSK	V	150	354	1 / 24	22.60	1.50	21.95	0.157	38.45	-16.50	24.10	0.257	40.61	-16.51
846.50	5	QPSK	V	150	354	1 / 24	22.57	1.50	21.92	0.156	38.45	-16.53	24.07	0.255	40.61	-16.54
826.50	5	16-QAM	V	150	355	1 / 24	20.83	1.50	**20.18**	0.104	38.45	-18.27	**22.33**	0.171	40.61	-18.28
829.00	10	QPSK	V	150	347	1 / 49	22.74	1.50	**22.09**	0.162	38.45	-16.36	**24.24**	0.266	40.61	-16.37
836.50	10	QPSK	V	150	359	1 / 0	22.60	1.50	21.95	0.157	38.45	-16.50	24.10	0.257	40.61	-16.51
844.00	10	QPSK	V	150	356	1 / 0	22.72	1.50	22.07	0.161	38.45	-16.38	24.22	0.264	40.61	-16.39
829.00	10	16-QAM	V	150	347	1 / 49	20.83	1.50	**20.18**	0.104	38.45	-18.27	**22.33**	0.171	40.61	-18.28
826.50	5	QPSK	H	150	79	1 / 24	18.77	1.50	18.12	0.065	38.45	-20.33	20.27	0.106	40.61	-20.34

Table 7-5. ERP Data (Band 5)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	115	239	1 / 5	14.66	8.16	22.82	0.191	30.00	-7.18
1745.00	1.4	QPSK	H	103	352	1 / 5	15.47	8.19	**23.66**	0.233	30.00	-6.34
1779.30	1.4	QPSK	H	235	345	1 / 0	13.46	8.25	21.71	0.148	30.00	-8.29
1745.00	1.4	16-QAM	H	103	352	1 / 0	11.98	8.19	**20.17**	0.104	30.00	-9.83
1711.50	3	QPSK	H	113	178	1 / 0	14.68	8.16	22.84	0.192	30.00	-7.16
1745.00	3	QPSK	H	103	354	1 / 0	15.22	8.19	**23.41**	0.220	30.00	-6.59
1778.50	3	QPSK	H	235	348	1 / 0	13.92	8.25	22.17	0.165	30.00	-7.83
1745.00	3	16-QAM	H	103	354	1 / 0	13.54	8.19	**21.73**	0.149	30.00	-8.27
1712.50	5	QPSK	H	147	179	1 / 0	15.92	8.16	24.08	0.256	30.00	-5.92
1745.00	5	QPSK	H	101	347	1 / 0	15.91	8.19	**24.10**	0.257	30.00	-5.90
1777.50	5	QPSK	H	146	351	1 / 0	14.89	8.25	23.14	0.206	30.00	-6.86
1777.50	5	16-QAM	H	146	351	1 / 0	14.06	8.25	**22.31**	0.170	30.00	-7.69
1715.00	10	QPSK	H	149	783	1 / 0	15.31	8.16	23.47	0.222	30.00	-6.53
1745.00	10	QPSK	H	118	359	1 / 0	15.66	8.19	**23.85**	0.243	30.00	-6.15
1775.00	10	QPSK	H	153	346	1 / 0	15.01	8.24	23.25	0.211	30.00	-6.75
1745.00	10	16-QAM	H	118	359	1 / 0	14.53	8.19	**22.72**	0.187	30.00	-7.28
1717.50	15	QPSK	H	102	302	1 / 0	15.87	8.16	24.03	0.253	30.00	-5.97
1745.00	15	QPSK	H	152	351	1 / 0	16.24	8.19	**24.43**	0.278	30.00	-5.57
1772.50	15	QPSK	H	112	346	1 / 0	15.53	8.24	23.77	0.238	30.00	-6.23
1745.00	15	16-QAM	H	152	351	1 / 0	15.20	8.19	**23.39**	0.218	30.00	-6.61
1720.00	20	QPSK	H	103	352	1 / 0	15.86	8.17	24.03	0.253	30.00	-5.97
1745.00	20	QPSK	H	103	354	1 / 99	15.87	8.19	**24.06**	0.255	30.00	-5.94
1770.00	20	QPSK	H	106	348	1 / 0	15.72	8.23	23.95	0.249	30.00	-6.05
1745.00	20	16-QAM	H	103	354	1 / 99	14.76	8.19	**22.95**	0.197	30.00	-7.05
1745.00	15	QPSK	V	275	356	1 / 0	16.20	8.19	24.39	0.275	30.00	-5.61

Table 7-6. EIRP Data (Band 66/4)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	V	150	358	1 / 0	18.11	4.82	**22.93**	0.196	33.01	-10.08
1880.00	1.4	QPSK	V	150	353	1 / 0	15.58	4.74	20.32	0.108	33.01	-12.69
1909.30	1.4	QPSK	V	150	359	1 / 0	14.72	4.68	19.40	0.087	33.01	-13.61
1850.70	1.4	16-QAM	V	150	358	1 / 0	16.82	4.82	**21.64**	0.146	33.01	-11.37
1851.50	3	QPSK	V	150	9	1 / 0	18.45	4.82	**23.27**	**0.212**	33.01	-9.74
1880.00	3	QPSK	V	150	350	1 / 0	15.69	4.74	20.43	0.110	33.01	-12.58
1908.50	3	QPSK	V	150	355	1 / 0	14.86	4.68	19.54	0.090	33.01	-13.47
1851.50	3	16-QAM	V	150	9	1 / 0	16.87	4.82	**21.69**	0.147	33.01	-11.32
1852.50	5	QPSK	V	150	4	1 / 0	18.24	4.81	**23.05**	0.202	33.01	-9.96
1880.00	5	QPSK	V	150	356	1 / 0	15.91	4.74	20.65	0.116	33.01	-12.36
1907.50	5	QPSK	V	150	358	1 / 0	14.84	4.68	19.52	0.090	33.01	-13.49
1852.50	5	16-QAM	V	150	4	1 / 0	16.58	4.81	**21.39**	0.138	33.01	-11.62
1855.00	10	QPSK	V	150	10	1 / 0	18.13	4.81	**22.94**	0.197	33.01	-10.07
1880.00	10	QPSK	V	150	358	1 / 0	16.24	4.74	20.98	0.125	33.01	-12.03
1905.00	10	QPSK	V	150	0	1 / 0	14.96	4.68	19.64	0.092	33.01	-13.37
1855.00	10	16-QAM	V	150	10	1 / 0	16.54	4.81	**21.35**	0.136	33.01	-11.66
1857.50	15	QPSK	V	150	5	1 / 0	18.25	4.80	**23.05**	0.202	33.01	-9.96
1880.00	15	QPSK	V	150	356	1 / 0	16.59	4.74	21.33	0.136	33.01	-11.68
1902.50	15	QPSK	V	150	3	1 / 0	15.54	4.69	20.23	0.105	33.01	-12.78
1857.50	15	16-QAM	V	150	5	1 / 0	16.05	4.80	**20.85**	0.122	33.01	-12.16
1860.00	20	QPSK	V	150	8	1 / 0	17.99	4.79	**22.78**	0.190	33.01	-10.23
1880.00	20	QPSK	V	150	350	1 / 0	16.63	4.74	21.37	0.137	33.01	-11.64
1900.00	20	QPSK	V	150	352	1 / 0	15.44	4.69	20.13	0.103	33.01	-12.88
1860.00	20	16-QAM	V	150	8	1 / 0	16.36	4.79	**21.15**	0.130	33.01	-11.86
1851.50	3	QPSK	H	150	357	1 / 0	17.54	4.82	22.36	0.172	33.01	-10.65

Table 7-7. EIRP Data (Band 2)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	H	150	129	1 / 24	17.41	5.74	23.15	0.207	33.01	-9.86
2535.00	5	QPSK	H	150	126	1 / 24	18.03	5.86	23.89	0.245	33.01	-9.12
2567.50	5	QPSK	H	150	113	1 / 0	18.00	5.98	**23.98**	0.250	33.01	-9.03
2535.00	5	16-QAM	H	150	126	1 / 24	16.96	5.86	**22.82**	0.191	33.01	-10.19
2505.00	10	QPSK	H	150	352	1 / 49	17.48	5.75	23.23	0.210	33.01	-9.78
2535.00	10	QPSK	H	150	120	1 / 0	17.78	5.86	23.64	0.231	33.01	-9.37
2565.00	10	QPSK	H	150	115	1 / 0	17.89	5.97	**23.86**	0.243	33.01	-9.15
2565.00	10	16-QAM	H	150	115	1 / 0	16.91	5.97	**22.88**	0.194	33.01	-10.13
2507.50	15	QPSK	H	150	139	1 / 74	17.93	5.76	23.69	0.234	33.01	-9.32
2535.00	15	QPSK	H	150	123	1 / 74	18.14	5.86	**24.00**	0.251	33.01	-9.01
2562.50	15	QPSK	H	150	120	1 / 0	17.74	5.96	23.70	0.235	33.01	-9.31
2535.00	15	16-QAM	H	150	123	1 / 74	17.03	5.86	**22.89**	0.195	33.01	-10.12
2510.00	20	QPSK	H	150	129	1 / 99	17.59	5.77	23.36	0.217	33.01	-9.65
2535.00	20	QPSK	H	150	115	1 / 99	18.16	5.86	**24.02**	**0.252**	33.01	-8.99
2560.00	20	QPSK	H	150	239	1 / 0	17.83	5.95	23.78	0.239	33.01	-9.23
2535.00	20	16-QAM	H	150	115	1 / 99	16.91	5.86	**22.77**	0.189	33.01	-10.24
2535.00	20	QPSK	V	150	38	1 / 99	11.26	5.86	17.12	0.052	33.01	-15.89

Table 7-8. EIRP Data (Band 7)

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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

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Test Setup

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

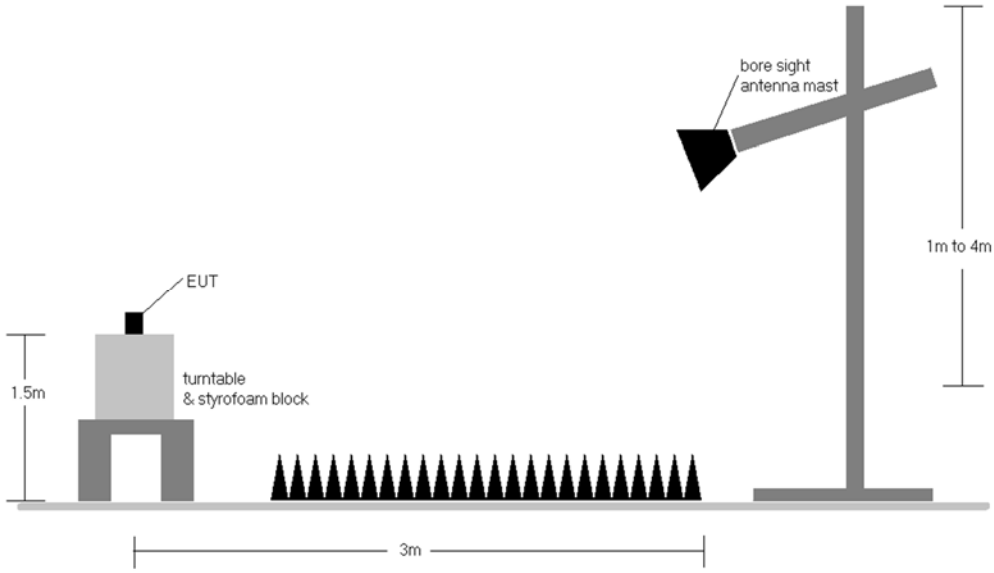

Figure 7-7. Test Instrument & Measurement Setup

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.

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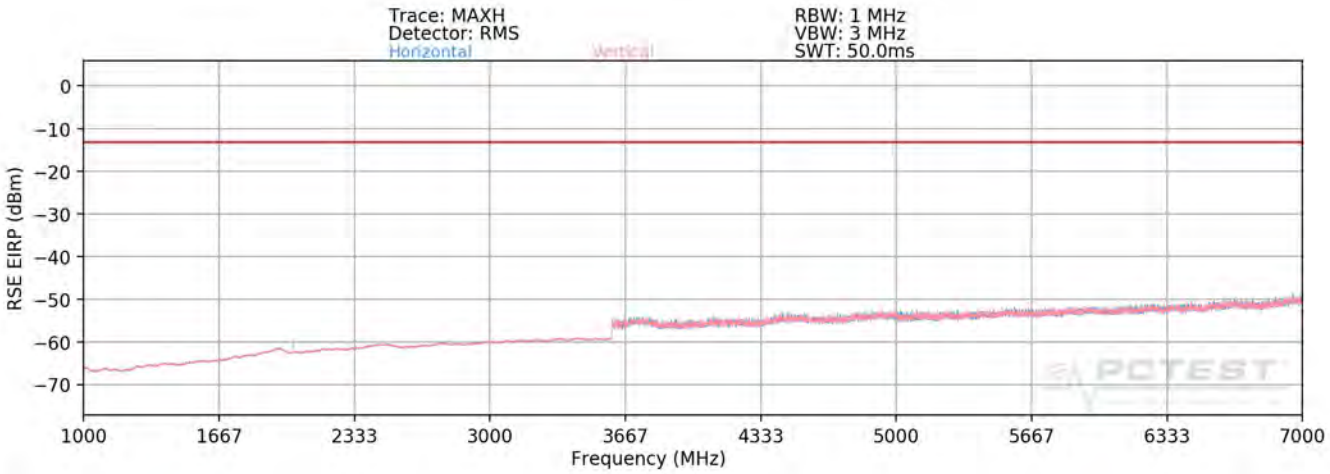
Band 71



Plot 7-227. Radiated Spurious Plot above 1GHz (Band 71)

OPERATING FREQUENCY:	665.50	MHz
CHANNEL:	133147	
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]
1331.00	H	204	167	-66.64	3.90	-62.74	-49.7
1996.50	H	126	52	-59.60	3.40	-56.20	-43.2
2662.00	H	-	-	-66.65	4.82	-61.83	-48.8

Table 7-9. Radiated Spurious Data (Band 71 – Low Channel)

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OPERATING FREQUENCY:	680.50	MHz
CHANNEL:	133297	
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]
1361.00	H	101	182	-68.86	3.88	-64.99	-52.0
2041.50	H	117	120	-61.13	3.37	-57.76	-44.8
2722.00	H	-	-	-66.66	4.95	-61.71	-48.7

Table 7-10. Radiated Spurious Data (Band 71 – Mid Channel)

OPERATING FREQUENCY:	695.50	MHz
CHANNEL:	133447	
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]
1391.00	H	122	187	-65.13	3.76	-61.37	-48.4
2086.50	H	159	70	-59.35	3.42	-55.93	-42.9
2782.00	H	-	-	-67.39	5.16	-62.23	-49.2

Table 7-11. Radiated Spurious Data (Band 71 – High Channel)

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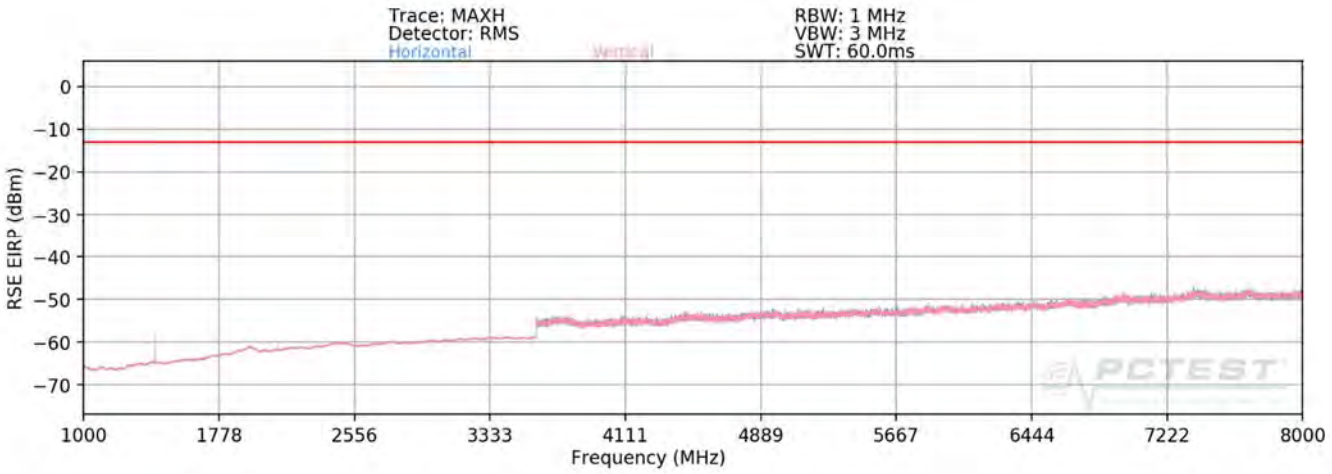
Band 12



Plot 7-228. Radiated Spurious Plot above 1GHz (Band 12)

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	224	149	-71.95	4.39	-67.55	-54.6
2104.50	H	109	169	-66.95	5.27	-61.69	-48.7
2806.00	H	-	-	-74.99	6.98	-68.01	-55.0

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

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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	112	208	-72.64	4.56	-68.08	-55.1
2122.50	H	110	128	-64.74	5.31	-59.43	-46.4
2830.00	H	392	169	-74.25	7.02	-67.24	-54.2
3537.50	H	-	-	-73.31	8.52	-64.79	-51.8

Table 7-13. 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	H	394	132	-73.89	4.72	-69.17	-56.2
2140.50	H	248	120	-63.83	5.35	-58.48	-45.5
2854.00	H	-	-	-74.21	7.05	-67.16	-54.2

Table 7-14. Radiated Spurious Data (Band 12 – High Channel)

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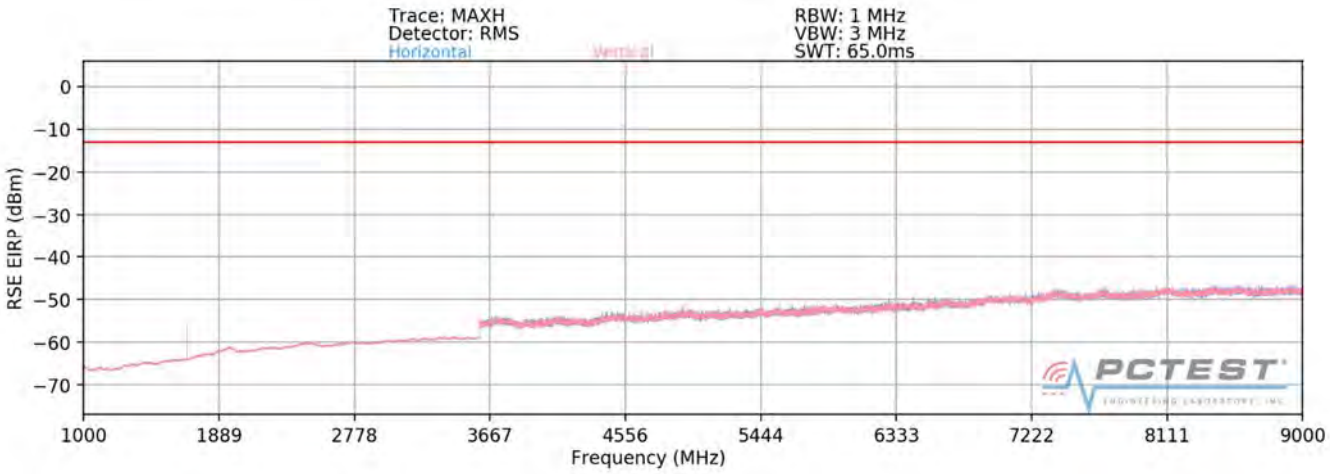
Band 5



Plot 7-229. Radiated Spurious Plot above 1GHz (Band 5)

OPERATING FREQUENCY:	826.50	MHz
CHANNEL:	20425	
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]
1653.00	H	264	166	-64.10	3.61	-60.50	-47.5
2479.50	H	359	350	-65.30	4.23	-61.07	-48.1
3306.00	H	-	-	-67.28	5.80	-61.48	-48.5

Table 7-15. Radiated Spurious Data (Band 5 – Low Channel)

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OPERATING FREQUENCY:	836.50	MHz
CHANNEL:	20525	
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]
1673.00	H	136	346	-61.87	3.62	-58.25	-45.3
2509.50	H	109	140	-66.16	4.33	-61.83	-48.8
3346.00	H	-	-	-66.82	5.92	-60.90	-47.9

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

OPERATING FREQUENCY:	846.50	MHz
CHANNEL:	20625	
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]
1693.00	H	101	21	-57.38	3.63	-53.75	-40.7
2539.50	H	196	326	-66.31	4.52	-61.79	-48.8

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

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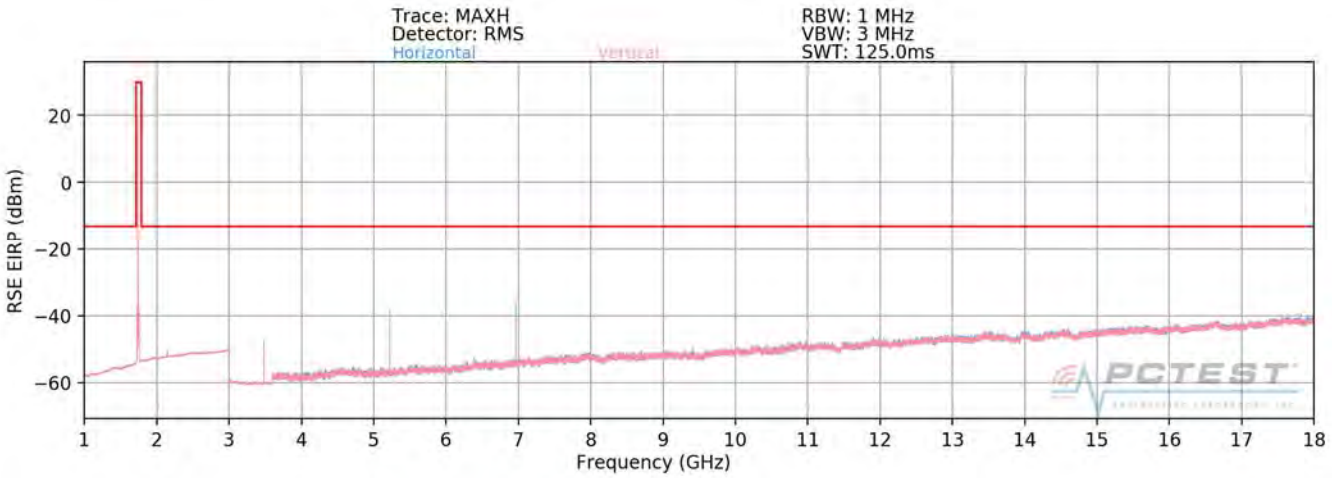
Band 66/4



Plot 7-230. Radiated Spurious Plot above 1GHz (Band 66/4)

OPERATING FREQUENCY:	1717.50	MHz
CHANNEL:	132047	
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]
3435.00	V	219	345	-48.22	6.79	-41.43	-28.4
5152.50	V	209	21	-47.32	8.98	-38.34	-25.3
6870.00	V	218	29	-43.84	9.60	-34.24	-21.2
8587.50	V	121	0	-64.20	9.83	-54.37	-41.4
10305.00	V	130	0	-60.23	9.55	-50.69	-37.7
12022.50	V	-	-	-59.40	9.30	-50.10	-37.1

Table 7-18. Radiated Spurious Data (Band 66/4 – Low Channel)

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OPERATING FREQUENCY: 1745.00 MHz
CHANNEL: 132322
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]
3490.00	V	228	344	-53.62	6.92	-46.71	-33.7
5235.00	V	176	16	-45.69	9.04	-36.65	-23.6
6980.00	V	235	16	-47.83	9.54	-38.29	-25.3
8725.00	V	-	-	-64.54	9.84	-54.70	-41.7

Table 7-19. Radiated Spurious Data (Band 66/4 – Mid Channel)

OPERATING FREQUENCY: 1772.50 MHz
CHANNEL: 132597
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]
3545.00	V	221	330	-55.23	6.97	-48.26	-35.3
5317.50	V	101	15	-51.26	9.03	-42.22	-29.2
7090.00	V	101	28	-54.97	9.49	-45.48	-32.5
8862.50	V	-	-	-64.51	9.86	-54.65	-41.6

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

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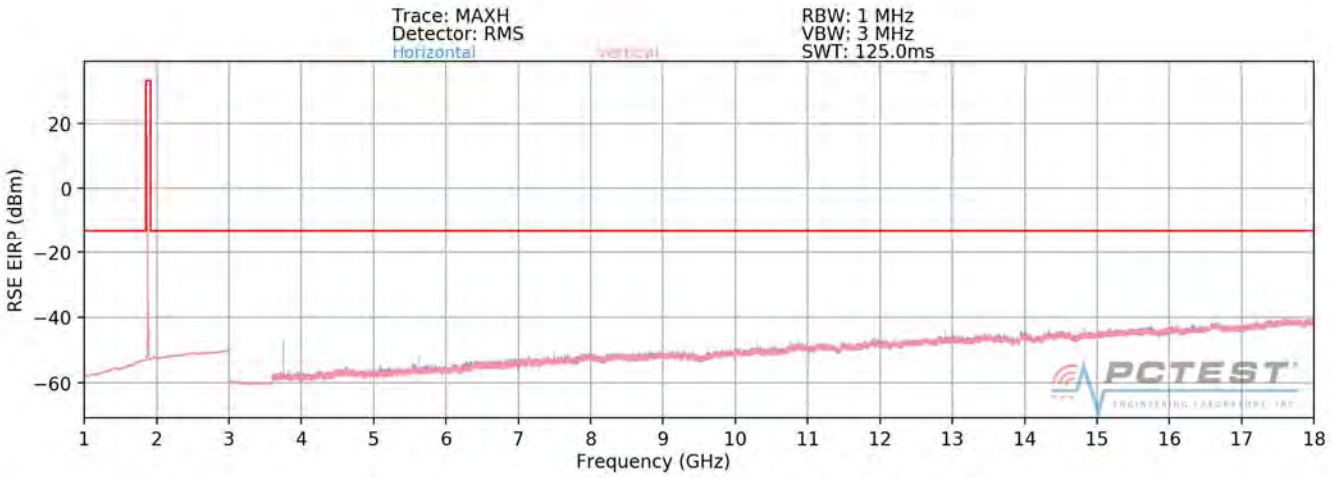
Band 2



Plot 7-231. Radiated Spurious Plot above 1GHz (Band 2)

OPERATING FREQUENCY:	1851.50	MHz
CHANNEL:	18615	
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]
3703.00	V	124	129	-56.27	6.56	-49.70	-36.7
5554.50	V	118	345	-54.62	8.72	-45.90	-32.9
7406.00	V	342	18	-61.82	8.41	-53.41	-40.4
9257.50	V	-	-	-67.77	9.45	-58.32	-45.3
11109.00	V	-	-	-65.60	9.31	-56.29	-43.3

Table 7-21. Radiated Spurious Data (Band 2 – Low Channel)

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OPERATING FREQUENCY:	1880.00	MHz
CHANNEL:	18900	
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]
3760.00	V	122	131	-56.34	6.67	-49.67	-36.7
5640.00	V	123	347	-60.43	8.81	-51.62	-38.6
7520.00	V	336	14	-64.14	8.48	-55.66	-42.7
9400.00	V	-	-	-66.52	9.32	-57.20	-44.2
11280.00	V	-	-	-64.98	9.24	-55.74	-42.7

Table 7-22. Radiated Spurious Data (Band 2 – Mid Channel)

OPERATING FREQUENCY:	1908.50	MHz
CHANNEL:	19185	
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]
3817.00	V	143	128	-56.56	6.98	-49.58	-36.6
5725.50	V	350	350	-56.38	8.77	-47.61	-34.6
7634.00	V	330	272	-65.99	8.53	-57.46	-44.5
9542.50	V	135	84	-65.54	9.42	-56.12	-43.1
11451.00	V	-	-	-64.30	9.17	-55.13	-42.1
13359.50	V	-	-	-63.04	8.87	-54.17	-41.2

Table 7-23. Radiated Spurious Data (Band 2 – High Channel)

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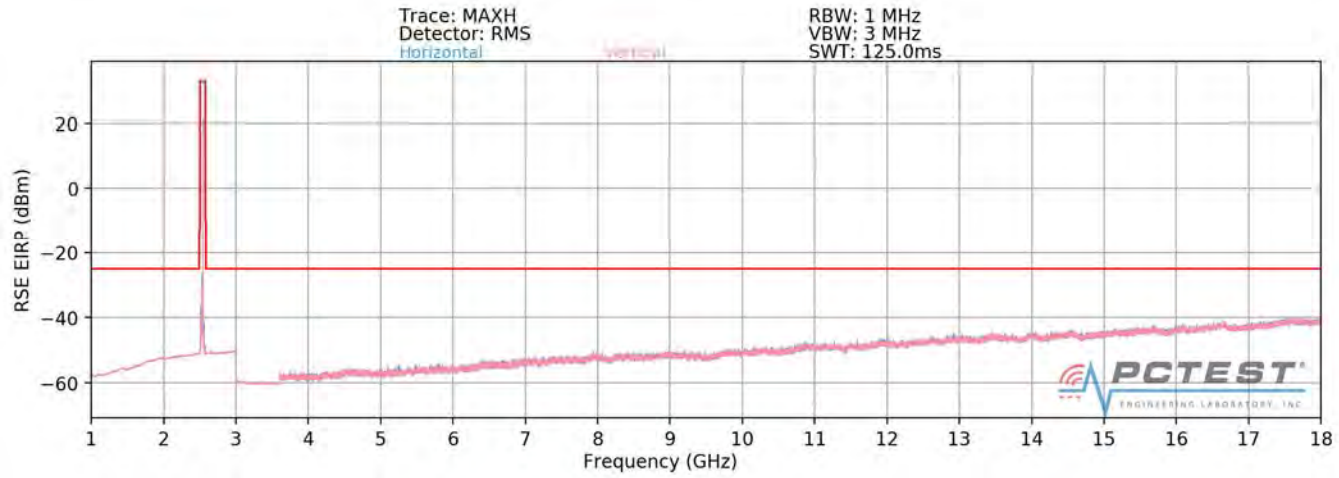
Band 7



Plot 7-232. Radiated Spurious Plot above 1GHz (Band 7)

OPERATING FREQUENCY:	2510.00	MHz
CHANNEL:	20850	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	108	344	-57.86	8.56	-49.30	-24.3
7530.00	H	277	18	-58.35	8.46	-49.89	-24.9
10040.00	H	277	359	-56.24	9.85	-46.39	-21.4
12550.00	H	-	-	-59.48	9.06	-50.43	-25.4

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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5070.00	H	115	42	-58.56	8.60	-49.96	-25.0
7605.00	H	222	19	-60.65	8.48	-52.16	-27.2
10140.00	H	245	350	-56.32	9.78	-46.54	-21.5
12675.00	H	-	-	-59.02	9.08	-49.94	-24.9
25350.00	V	-	-	-66.98	12.03	-54.95	-29.9

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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5120.00	H	106	151	-58.45	8.66	-49.79	-24.8
7680.00	H	263	329	-59.13	8.58	-50.55	-25.6
10240.00	H	223	342	-54.09	9.65	-44.43	-19.4
12800.00	H	-	-	-58.54	9.07	-49.47	-24.5

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

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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

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Band 71 Frequency Stability Measurements

OPERATING FREQUENCY: 680,500,000 Hz

CHANNEL: 133297

REFERENCE VOLTAGE: 4.21 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	680,499,973	-27	-0.0000040
100 %		- 30	680,499,944	-56	-0.0000082
100 %		- 20	680,499,984	-16	-0.0000024
100 %		- 10	680,500,094	94	0.0000138
100 %		0	680,499,679	-321	-0.0000472
100 %		+ 10	680,499,958	-42	-0.0000062
100 %		+ 20	680,500,028	28	0.0000041
100 %		+ 30	680,500,118	118	0.0000173
100 %		+ 40	680,500,099	99	0.0000145
100 %		+ 50	680,499,770	-230	-0.0000338
BATT. ENDPOINT	3.62	+ 20	680,499,969	-31	-0.0000046

Table 7-27. Frequency Stability Data (Band 71)

Note:

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

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Band 71 Frequency Stability Measurements

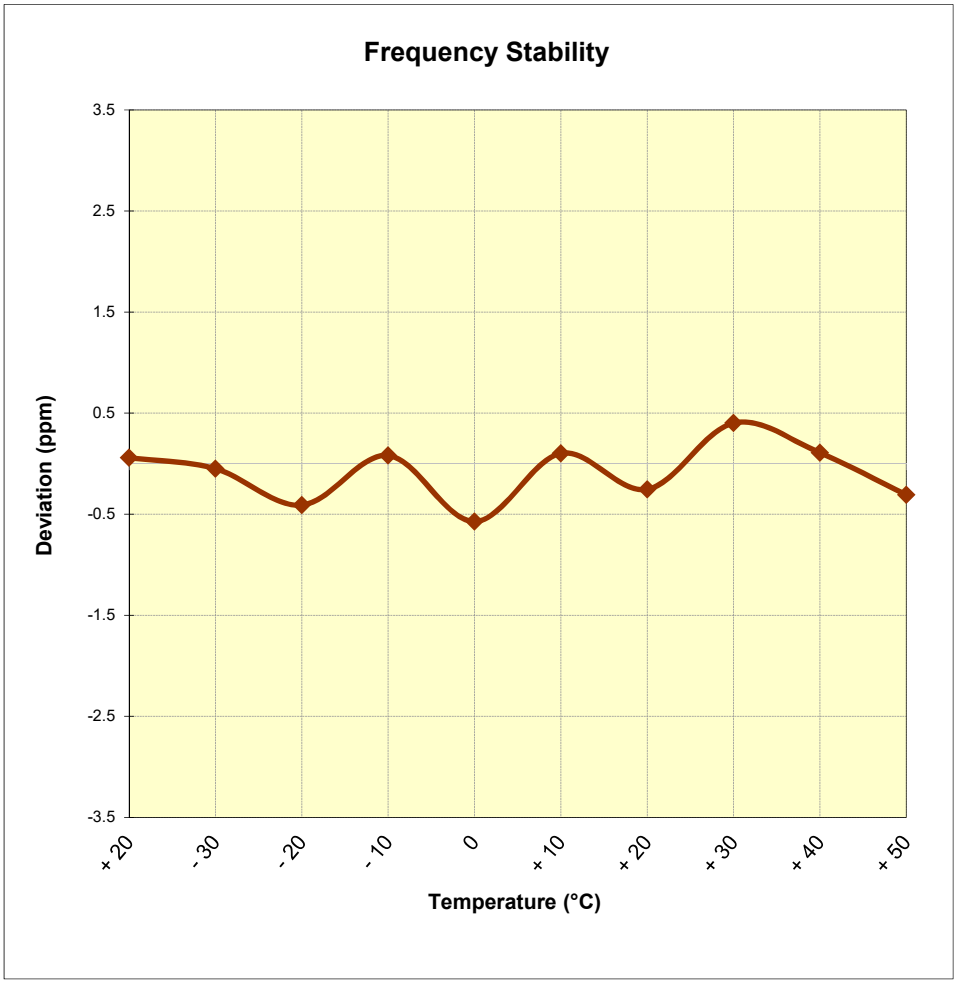

Figure 7-8. Frequency Stability Graph (Band 71)

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Band 12 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz

CHANNEL: 23790

REFERENCE VOLTAGE: 4.21 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	707,499,938	-62	-0.0000088
100 %		- 30	707,500,339	339	0.0000479
100 %		- 20	707,500,042	42	0.0000059
100 %		- 10	707,500,058	58	0.0000082
100 %		0	707,500,117	117	0.0000165
100 %		+ 10	707,499,568	-432	-0.0000611
100 %		+ 20	707,499,984	-16	-0.0000023
100 %		+ 30	707,500,329	329	0.0000465
100 %		+ 40	707,499,892	-108	-0.0000153
100 %		+ 50	707,499,895	-105	-0.0000148
BATT. ENDPOINT	3.62	+ 20	707,499,901	-99	-0.0000140

Table 7-28. 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.

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Band 12 Frequency Stability Measurements

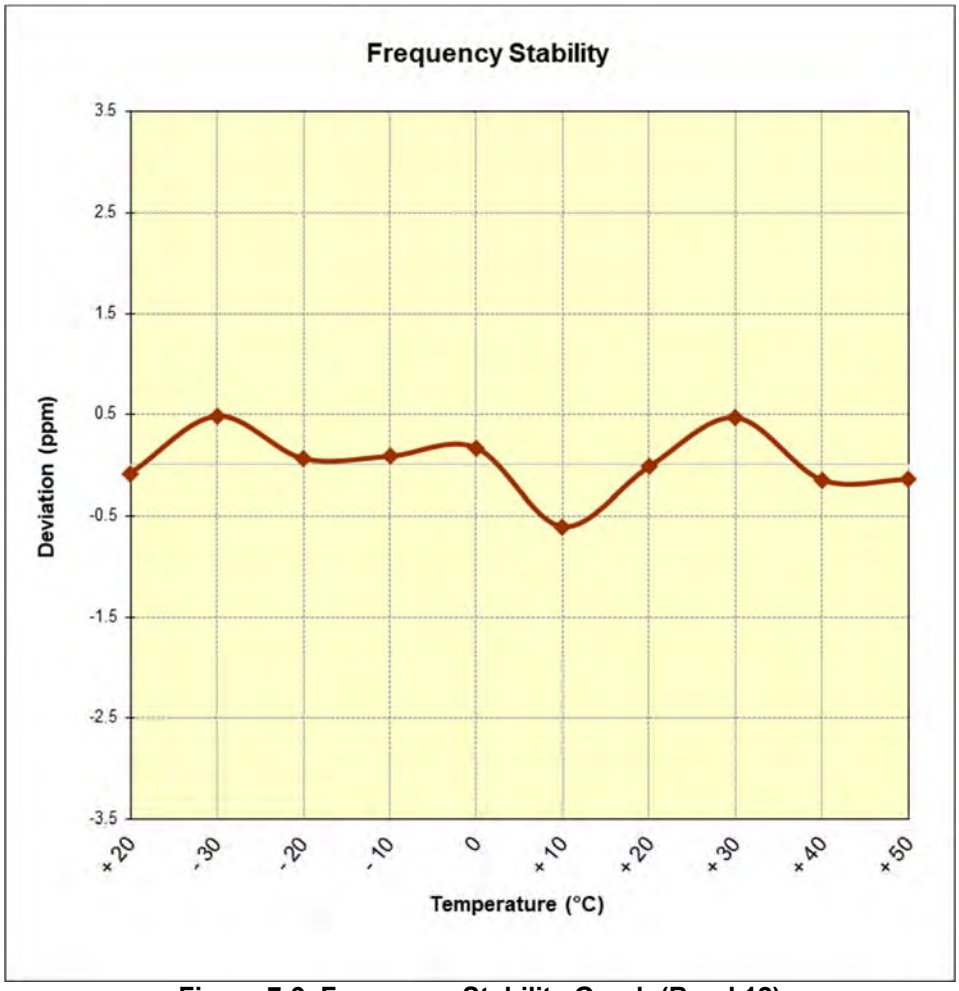

Figure 7-9. Frequency Stability Graph (Band 12)

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Band 5 Frequency Stability Measurements

OPERATING FREQUENCY: 836,500,000 Hz

CHANNEL: 20525

REFERENCE VOLTAGE: 4.21 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	836,499,761	-239	-0.0000286
100 %		- 30	836,500,399	399	0.0000477
100 %		- 20	836,500,094	94	0.0000112
100 %		- 10	836,500,256	256	0.0000306
100 %		0	836,500,022	22	0.0000026
100 %		+ 10	836,499,933	-67	-0.0000080
100 %		+ 20	836,500,060	60	0.0000072
100 %		+ 30	836,500,277	277	0.0000331
100 %		+ 40	836,499,839	-161	-0.0000192
100 %		+ 50	836,499,762	-238	-0.0000285
BATT. ENDPOINT	3.62	+ 20	836,500,005	5	0.0000006

Table 7-29. Frequency Stability Data (Band 5)

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Band 5 Frequency Stability Measurements

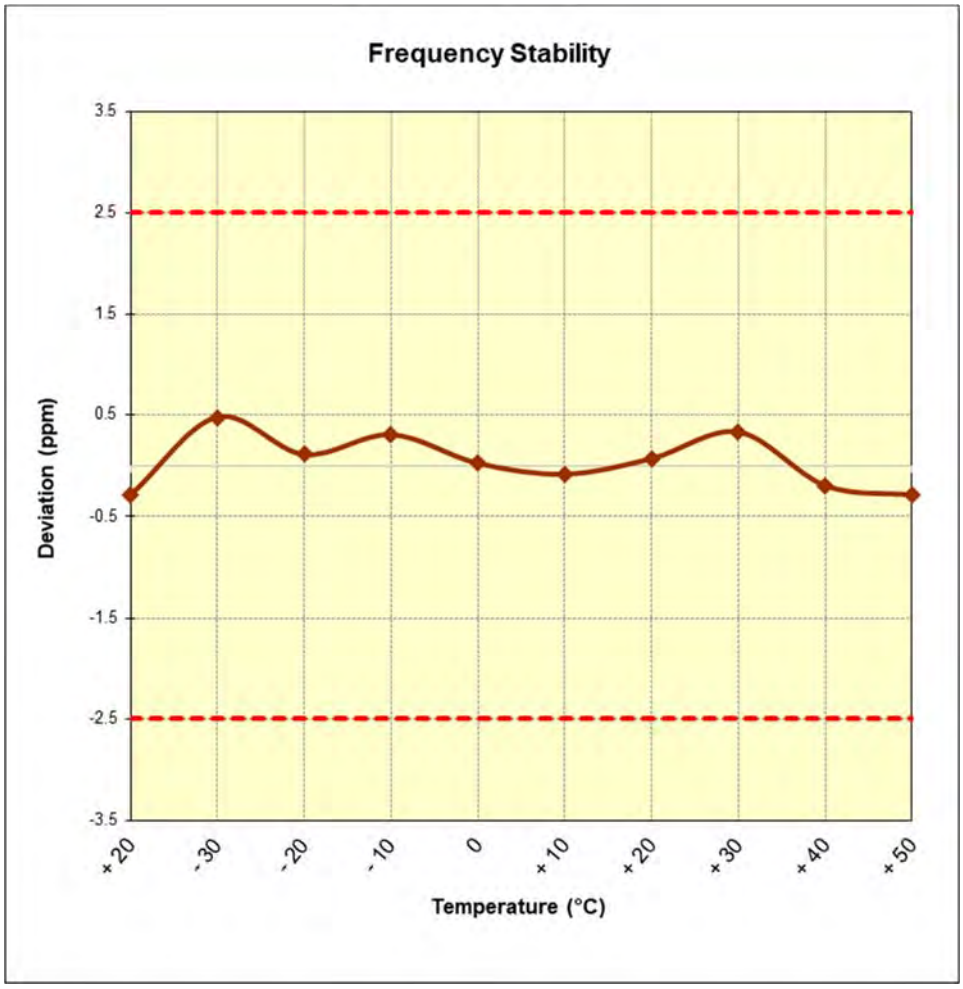

Figure 7-10. Frequency Stability Graph (Band 5)

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Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz

CHANNEL: 132322

REFERENCE VOLTAGE: 4.21 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	1,744,999,636	-364	-0.0000209
100 %		- 30	1,744,999,828	-172	-0.0000099
100 %		- 20	1,744,999,984	-16	-0.0000009
100 %		- 10	1,745,000,009	9	0.0000005
100 %		0	1,745,000,160	160	0.0000092
100 %		+ 10	1,744,999,994	-6	-0.0000003
100 %		+ 20	1,744,999,809	-191	-0.0000109
100 %		+ 30	1,744,999,945	-55	-0.0000032
100 %		+ 40	1,745,000,005	5	0.0000003
100 %		+ 50	1,745,000,076	76	0.0000044
85 %	3.57	+ 20	1,744,999,954	-46	-0.0000026
BATT. ENDPOINT	3.62	+ 20	1,745,000,150	150	0.0000086

Table 7-30. Frequency Stability Data (Band 66/4)

Note:

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

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Band 66/4 Frequency Stability Measurements

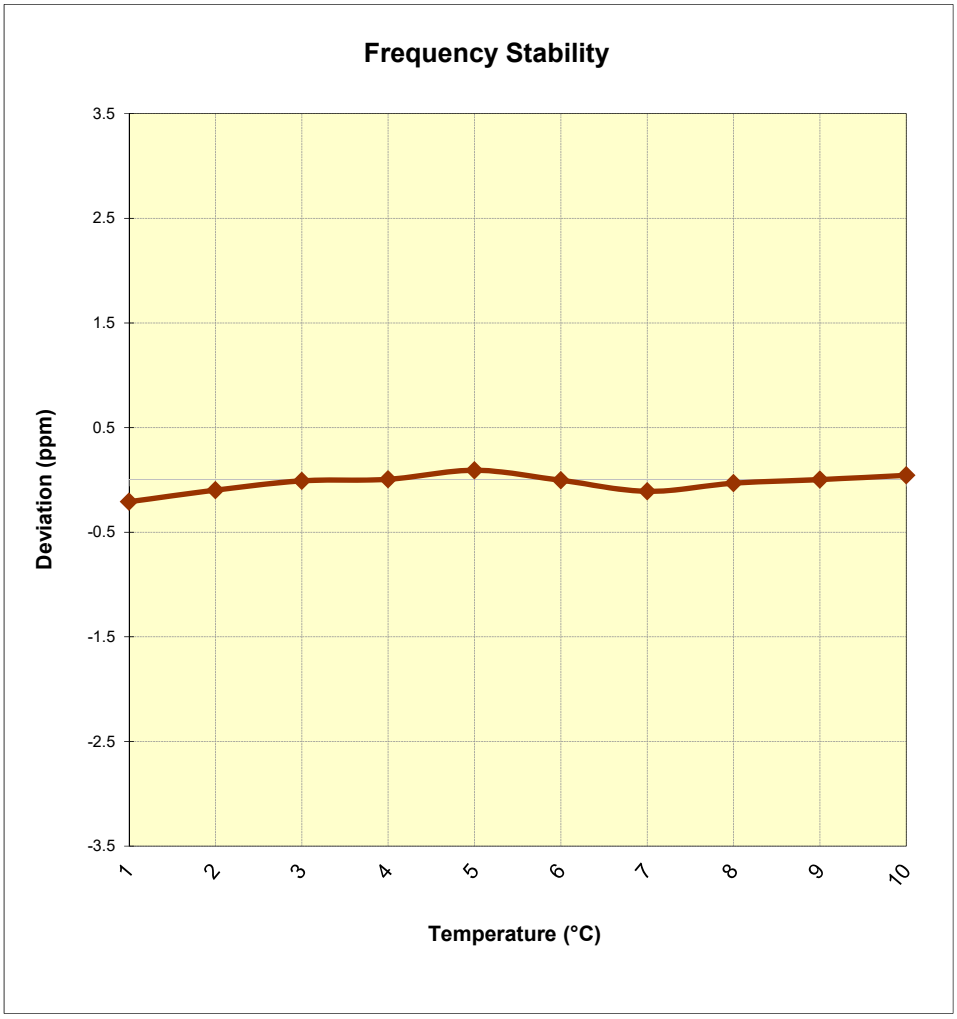

Figure 7-11. Frequency Stability Graph (Band 66/4)

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Band 2 Frequency Stability Measurements

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 18900

REFERENCE VOLTAGE: 4.21 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	1,879,999,621	-379	-0.0000202
100 %		- 30	1,880,000,018	18	0.0000010
100 %		- 20	1,879,999,857	-143	-0.0000076
100 %		- 10	1,879,999,961	-39	-0.0000021
100 %		0	1,879,999,873	-127	-0.0000068
100 %		+ 10	1,879,999,944	-56	-0.0000030
100 %		+ 20	1,880,000,206	206	0.0000110
100 %		+ 30	1,879,999,887	-113	-0.0000060
100 %		+ 40	1,879,999,811	-189	-0.0000101
100 %		+ 50	1,879,999,888	-112	-0.0000060
BATT. ENDPOINT	3.62	+ 20	1,880,000,014	14	0.0000007

Table 7-31. Frequency Stability Data (Band 2)

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Band 2 Frequency Stability Measurements

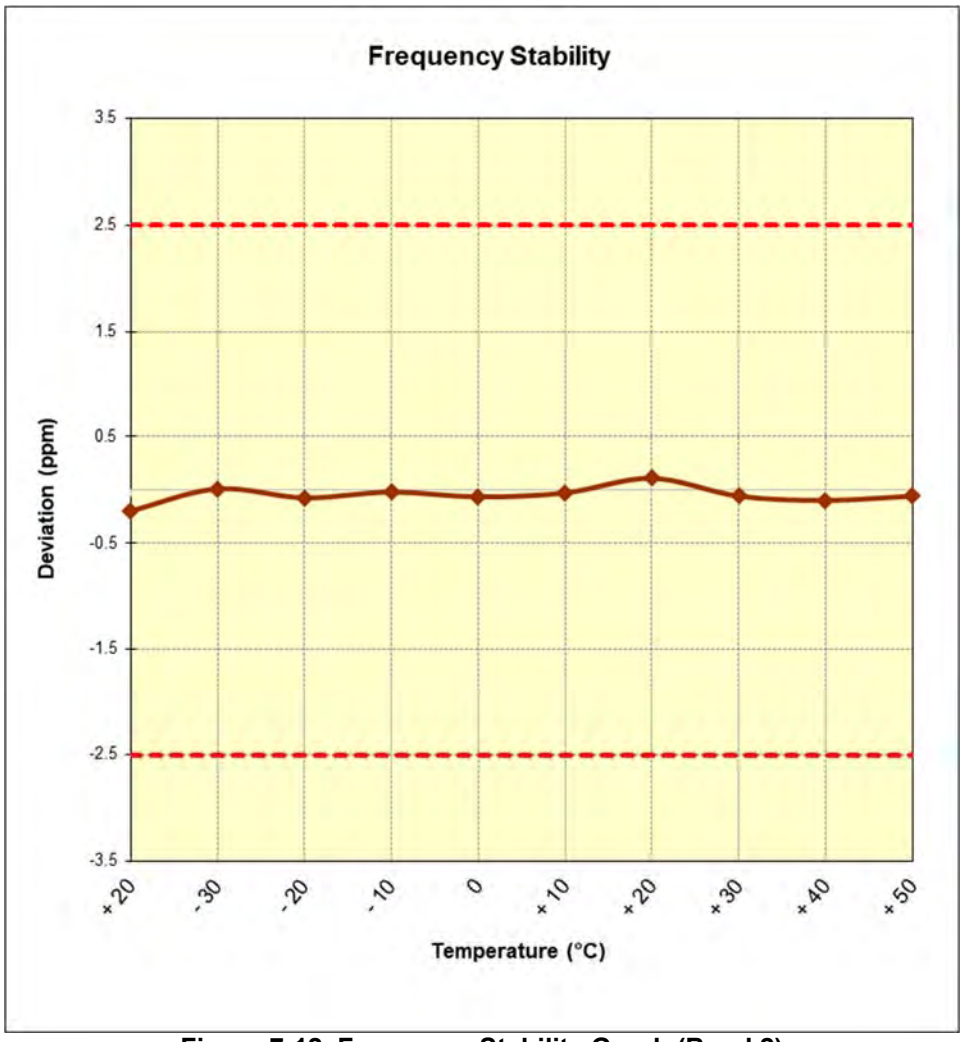

Figure 7-12. Frequency Stability Graph (Band 2)

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Band 7 Frequency Stability Measurements

OPERATING FREQUENCY: 2,535,000,000 Hz

CHANNEL: 21100

REFERENCE VOLTAGE: 4.21 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	2,534,999,697	-303	-0.0000120
100 %		- 30	2,534,999,806	-194	-0.0000077
100 %		- 20	2,535,000,164	164	0.0000065
100 %		- 10	2,535,000,208	208	0.0000082
100 %		0	2,534,999,857	-143	-0.0000056
100 %		+ 10	2,535,000,307	307	0.0000121
100 %		+ 20	2,535,000,008	8	0.0000003
100 %		+ 30	2,534,999,990	-10	-0.0000004
100 %		+ 40	2,535,000,286	286	0.0000113
100 %		+ 50	2,534,999,849	-151	-0.0000060
BATT. ENDPOINT	3.62	+ 20	2,534,999,675	-325	-0.0000128

Table 7-32. 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.

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Band 7 Frequency Stability Measurements

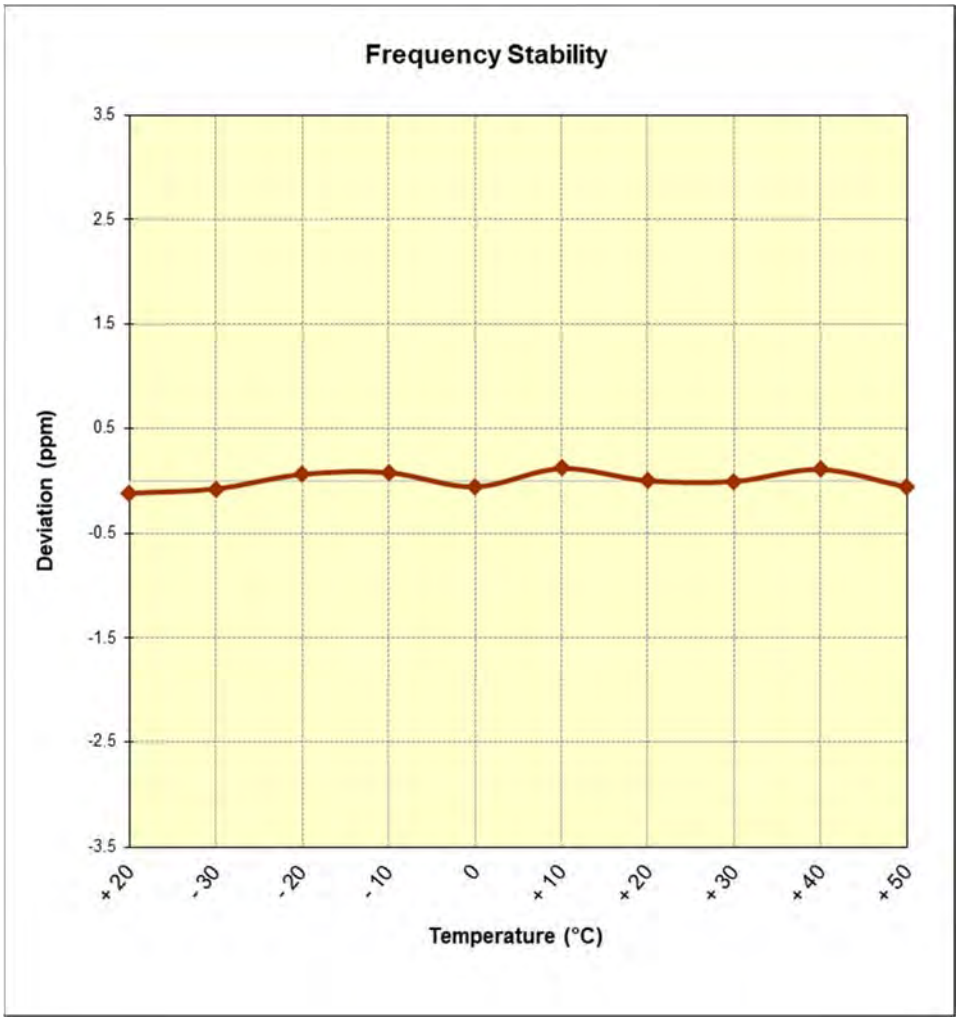

Figure 7-13. Frequency Stability Graph (Band 7)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMJ260T1** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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