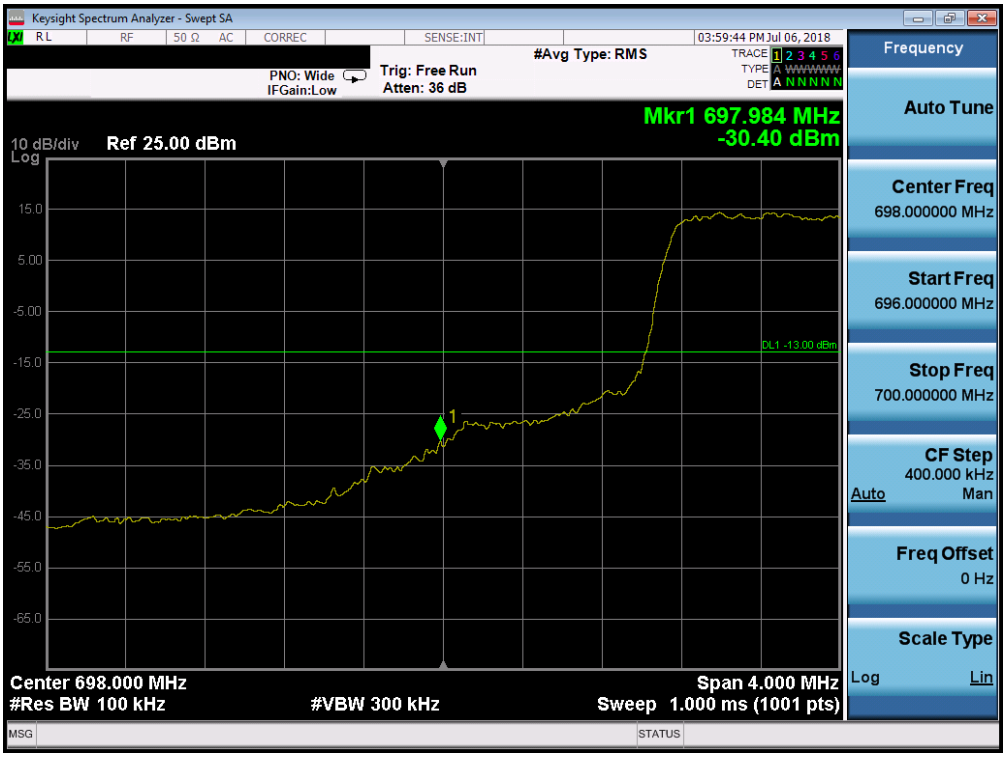
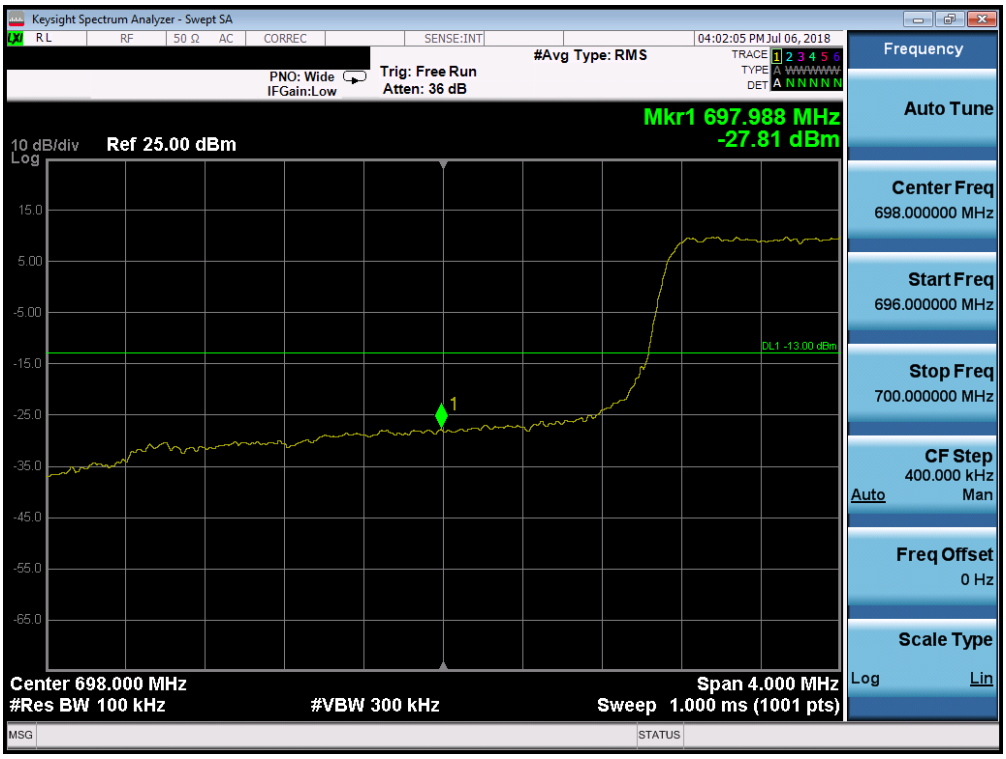
Band 12



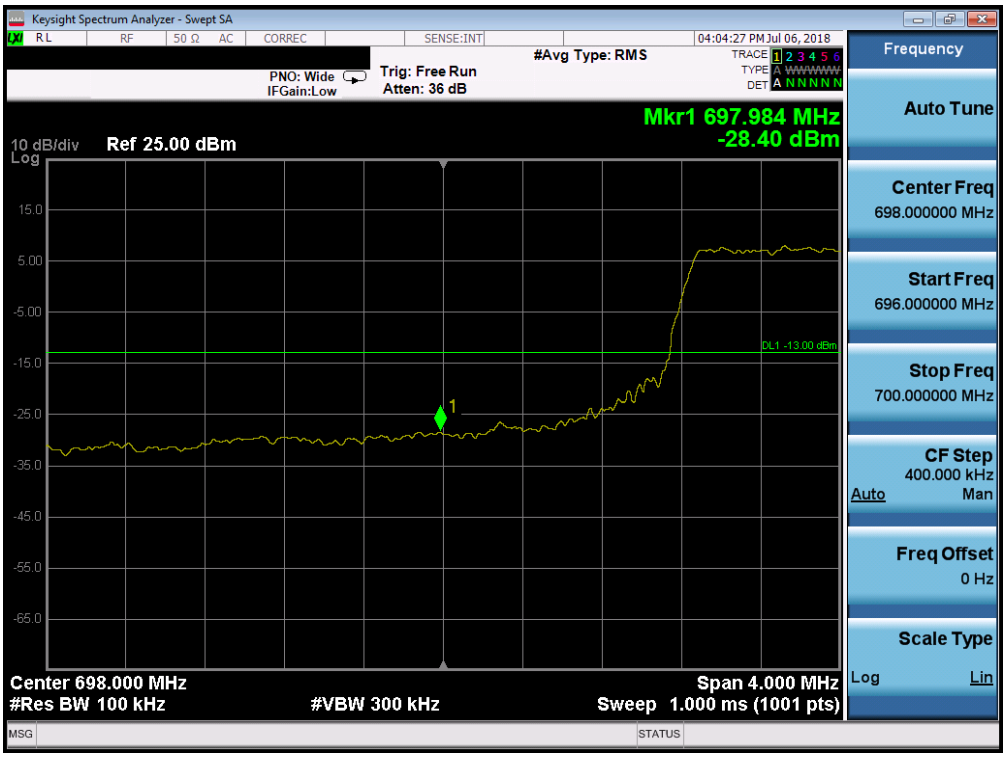
Plot 7-116. Lower Band Edge Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)

Plot 7-117. Upper Band Edge Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)



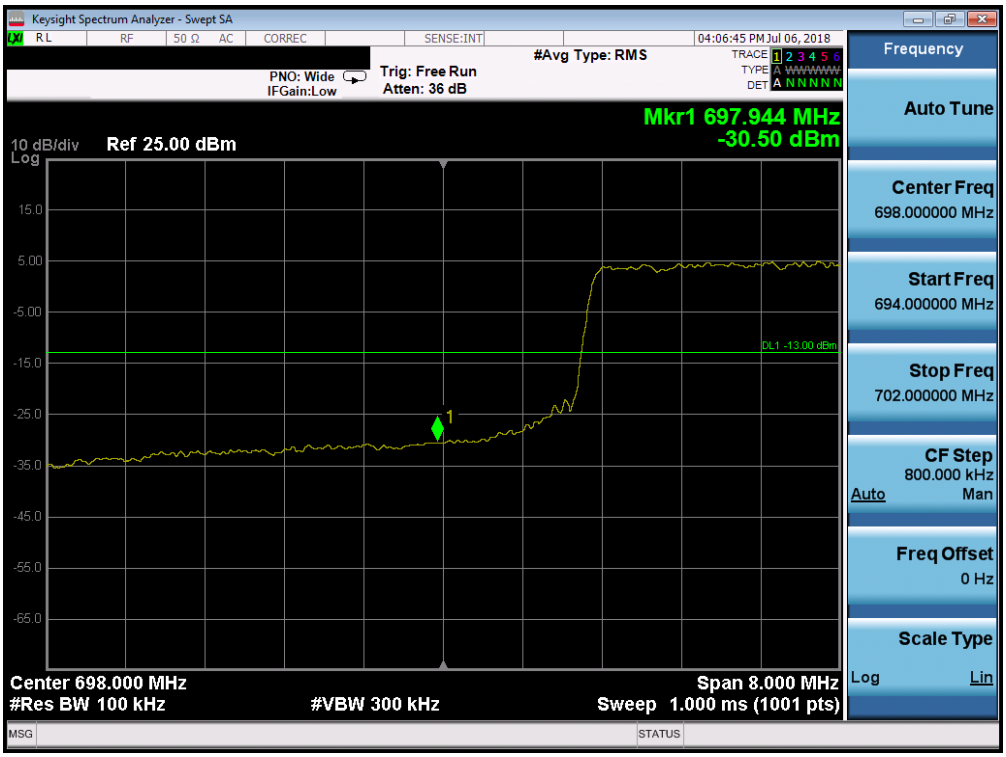
Plot 7-118. Lower Band Edge Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

Plot 7-119. Upper Band Edge Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)

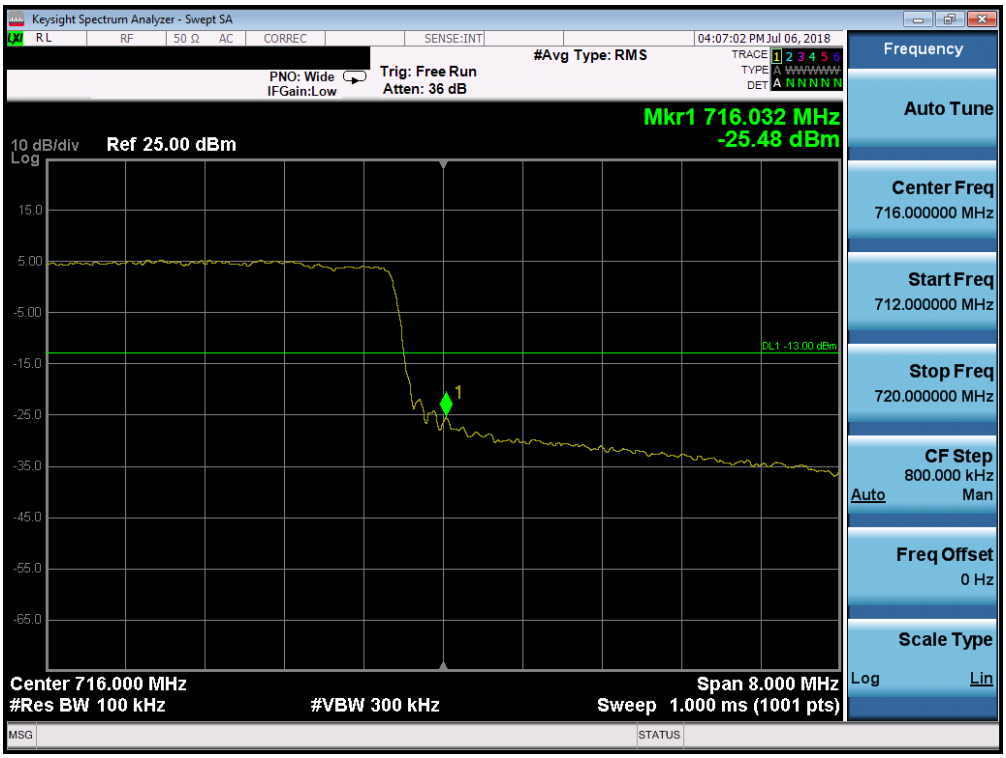


Plot 7-120. Lower Band Edge Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-121. Upper Band Edge Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)

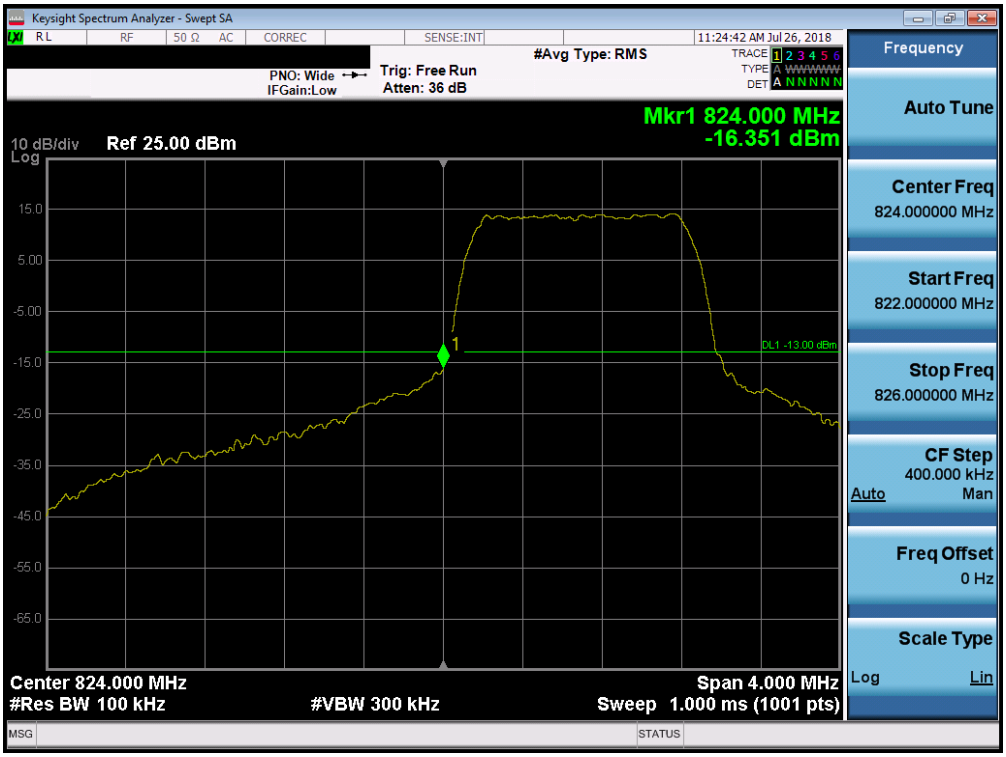


Plot 7-122. Lower Band Edge Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)



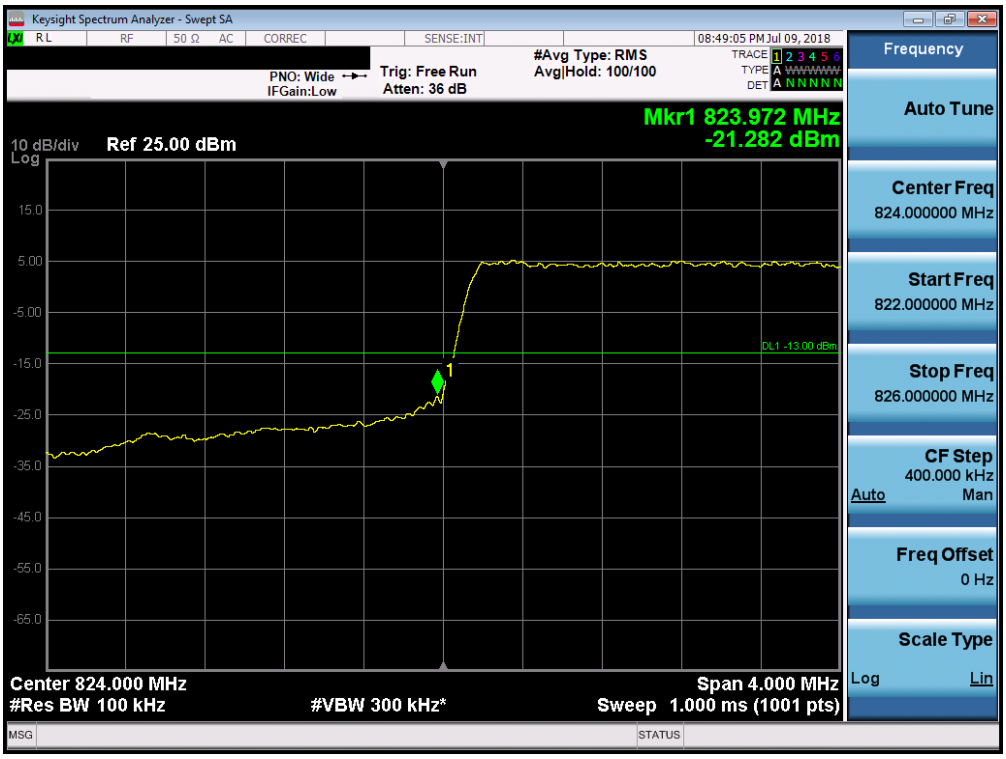
Plot 7-123. Upper Band Edge Plot (Band 12 - 10.0MHz QPSK - Full RB Configuration)

Band 5



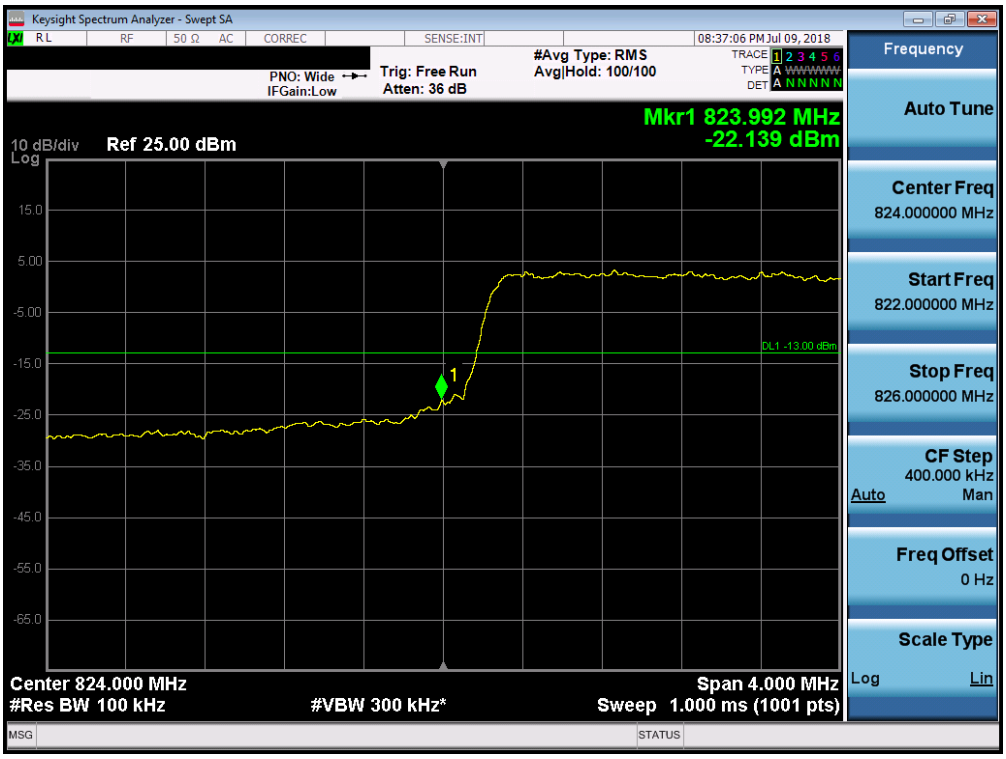
Plot 7-124. Lower Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

Plot 7-125. Upper Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)



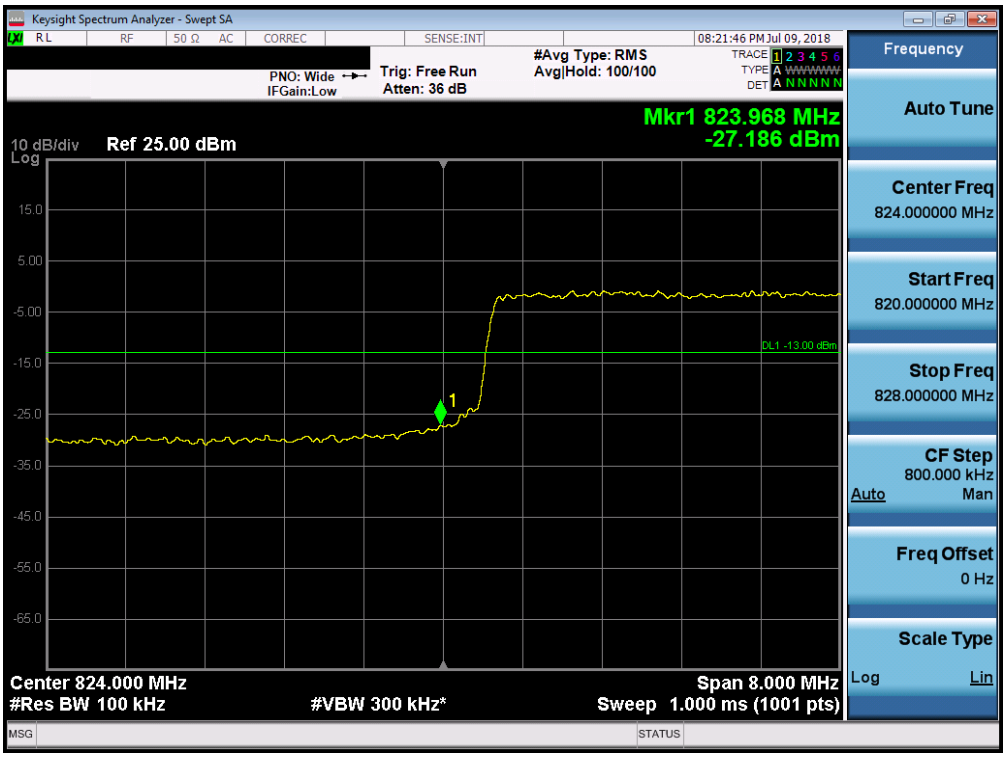
Plot 7-126. Lower Band Edge Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

Plot 7-127. Upper Band Edge Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-128. Lower Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

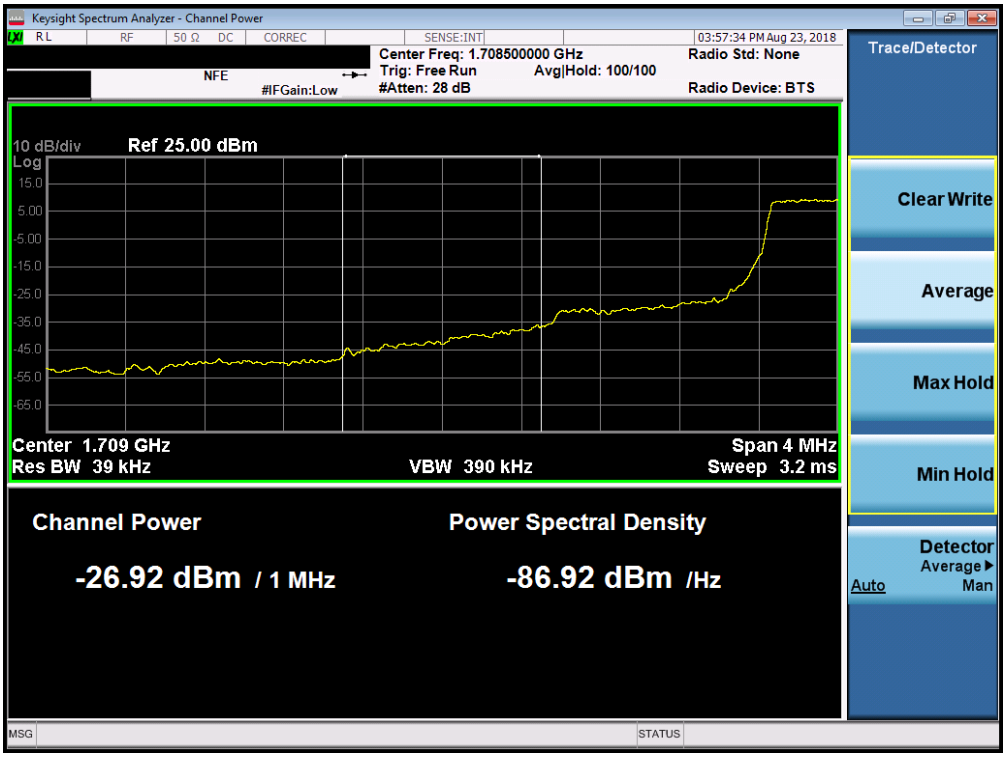
Plot 7-129. Upper Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)



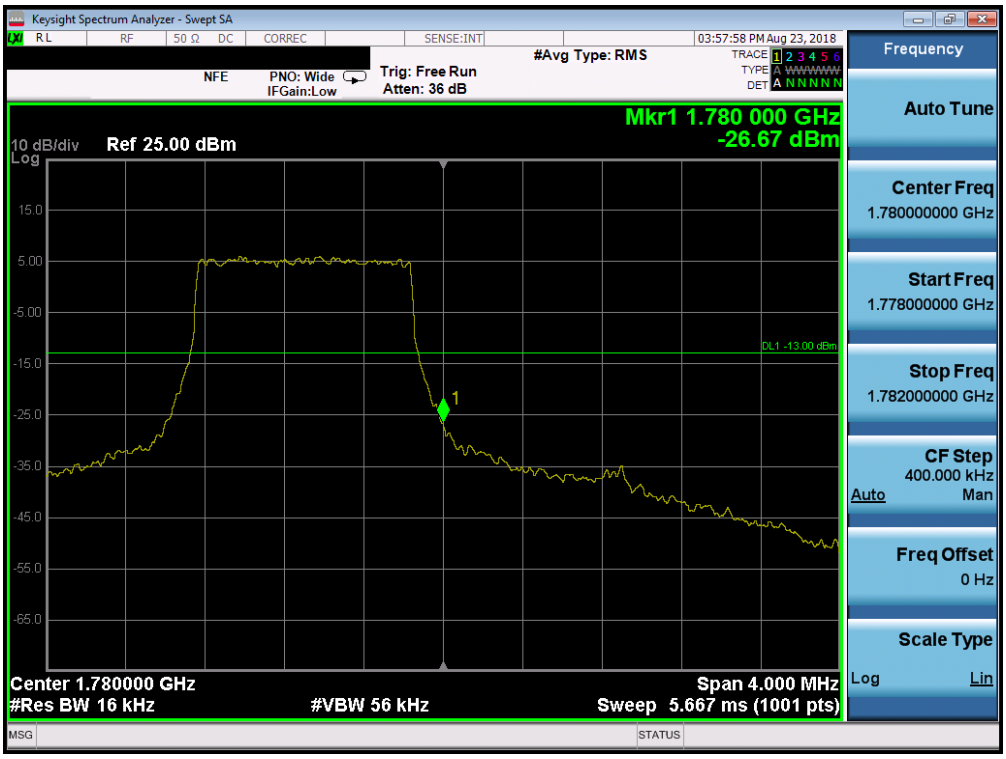
Plot 7-130. Lower Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

Plot 7-131. Upper Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

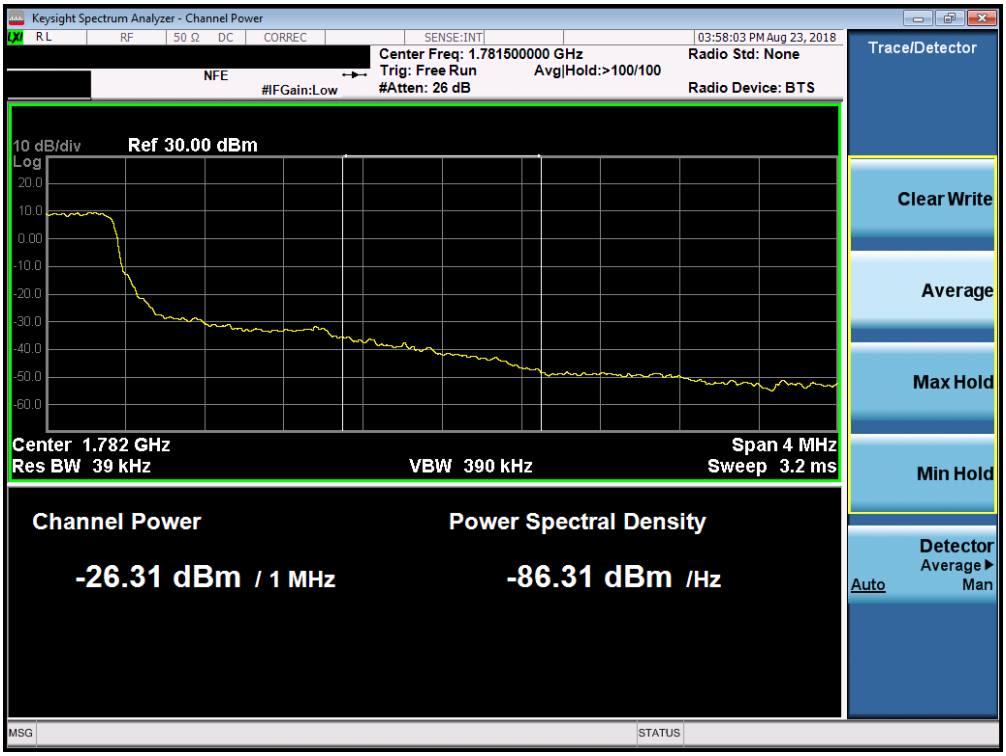
Plot 7-132. Lower Band Edge Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-133. Lower Extended Band Edge Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

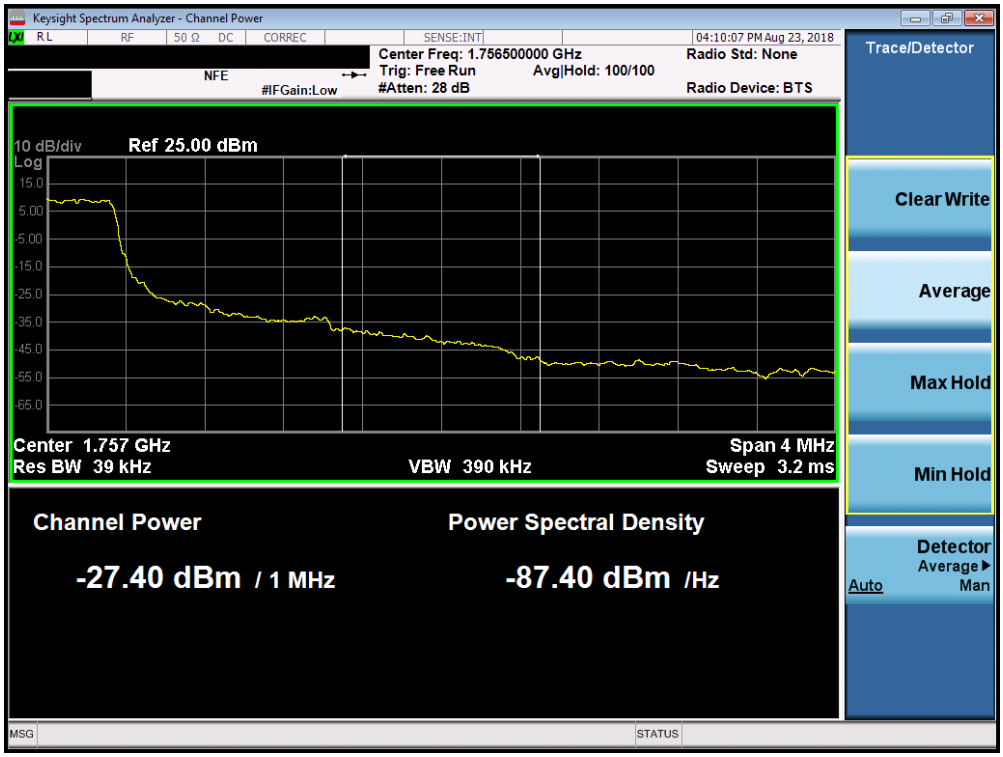


Plot 7-134. Upper Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)



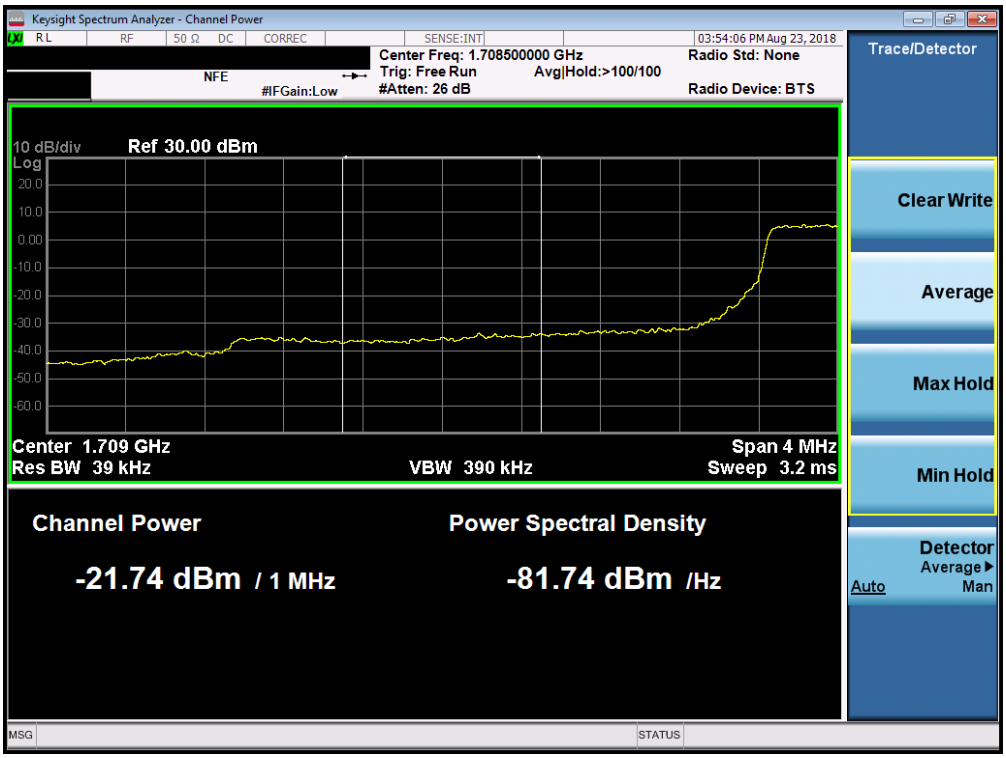
Plot 7-135. Upper Extended Band Edge Plot (Band 66 - 1.4MHz QPSK - Full RB Configuration)

Plot 7-136. Upper Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

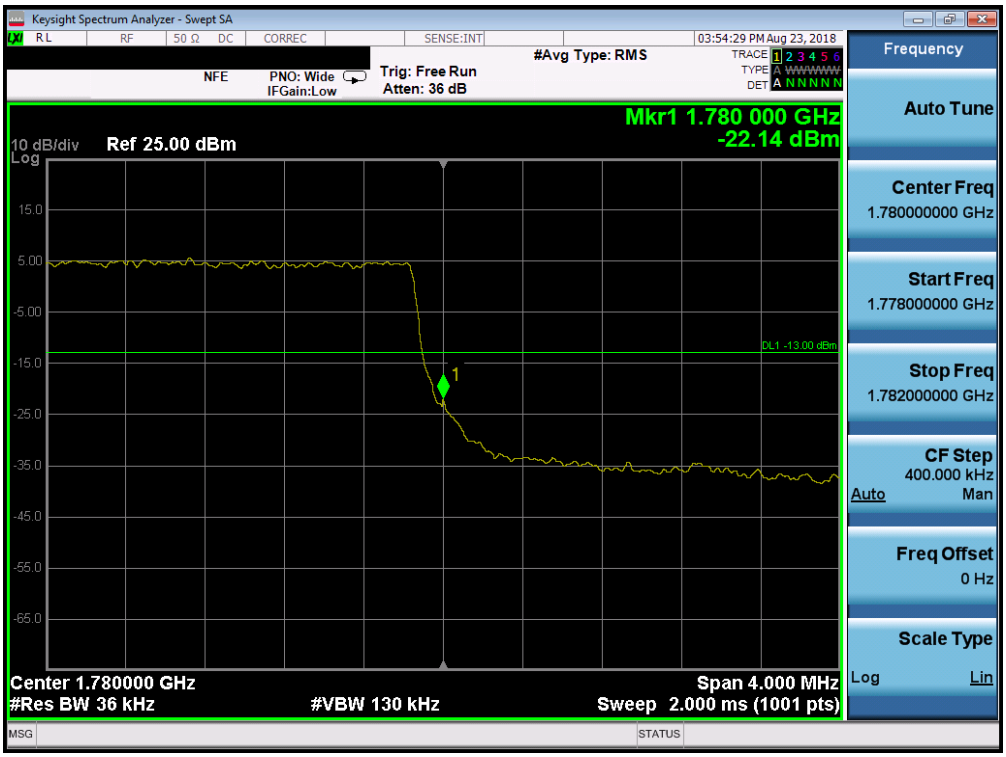


Plot 7-137. Upper Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

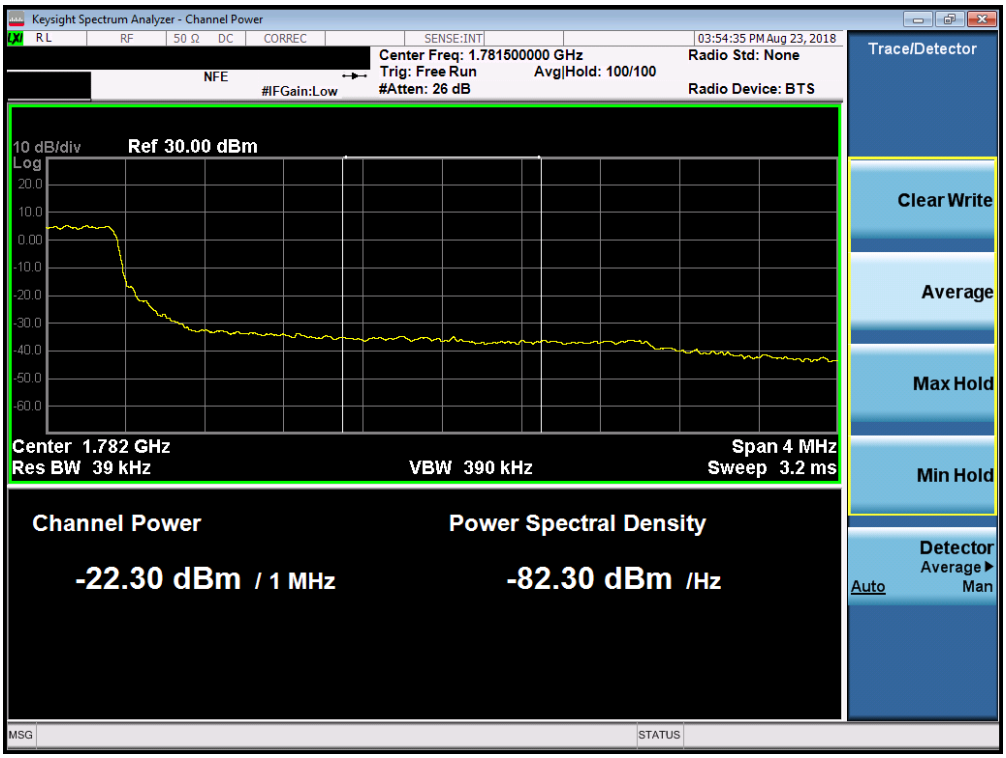
Plot 7-138. Lower Band Edge Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-139. Lower Extended Band Edge Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

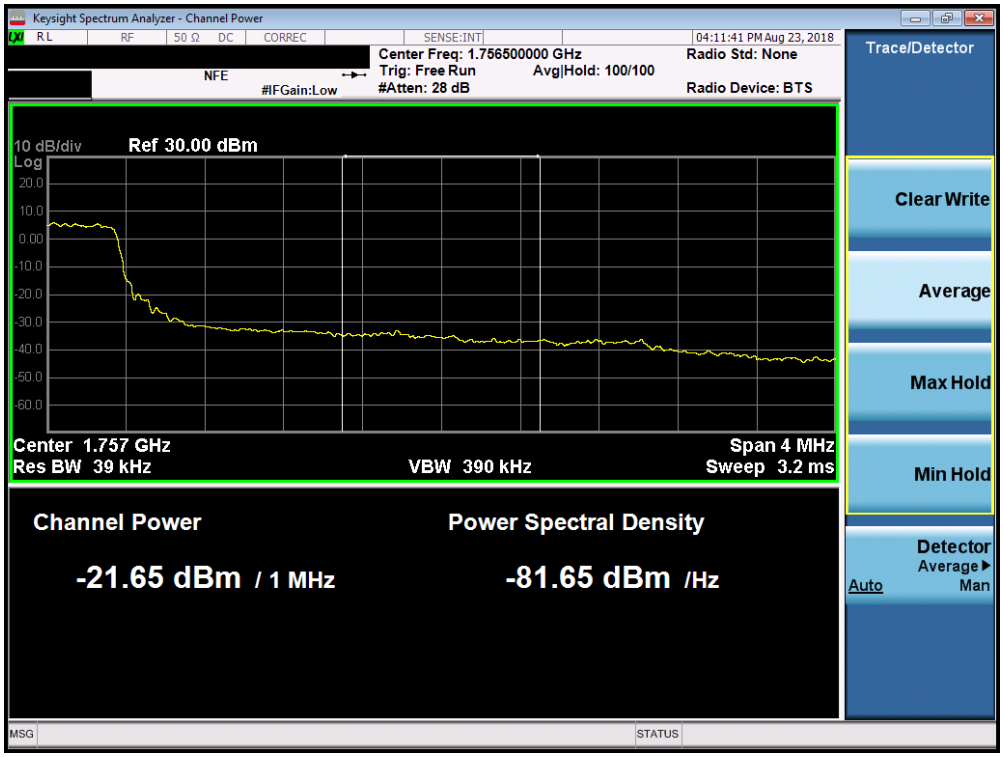


Plot 7-140. Upper Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

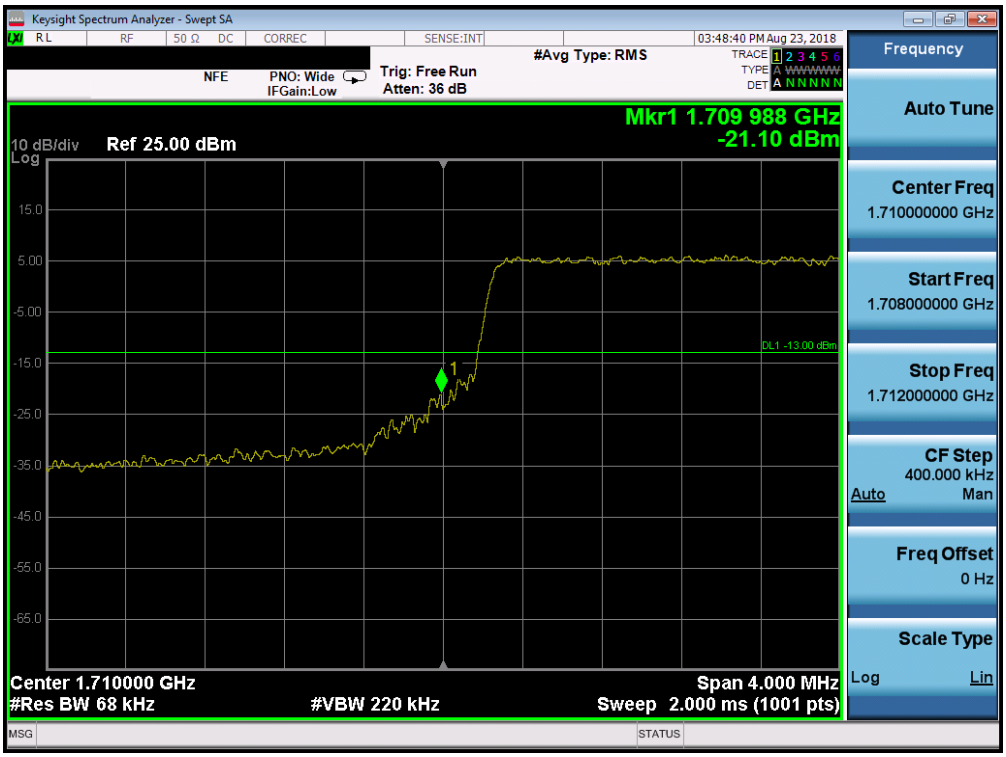


Plot 7-141. Upper Extended Band Edge Plot (Band 66 - 3.0MHz QPSK - Full RB Configuration)

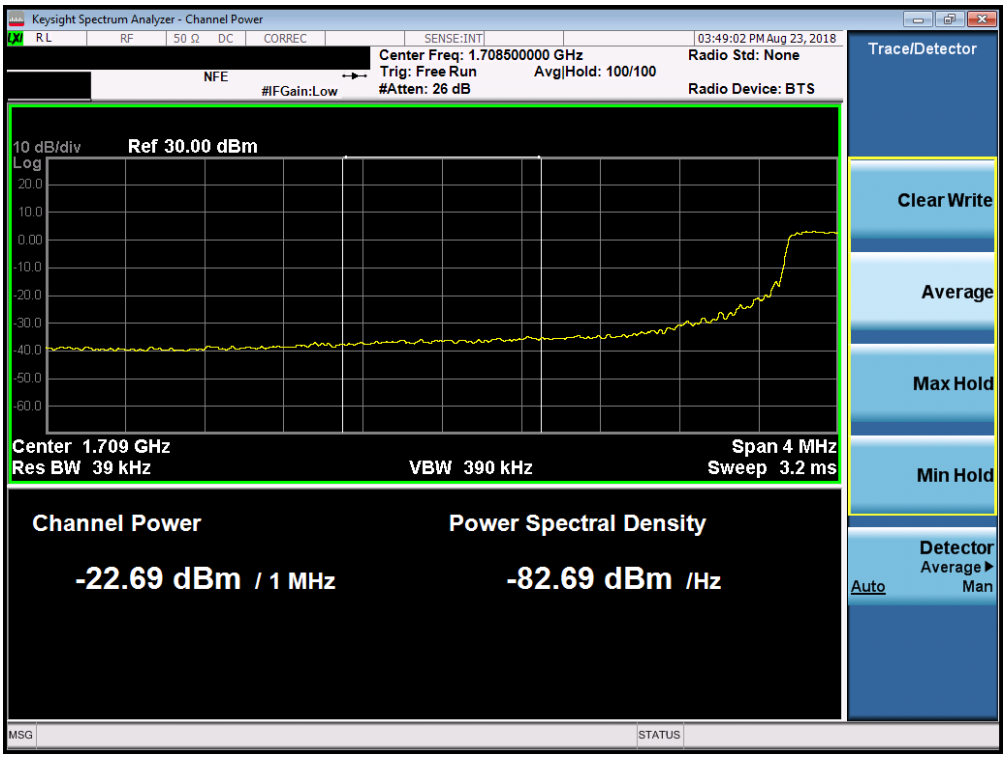
Plot 7-142. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



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

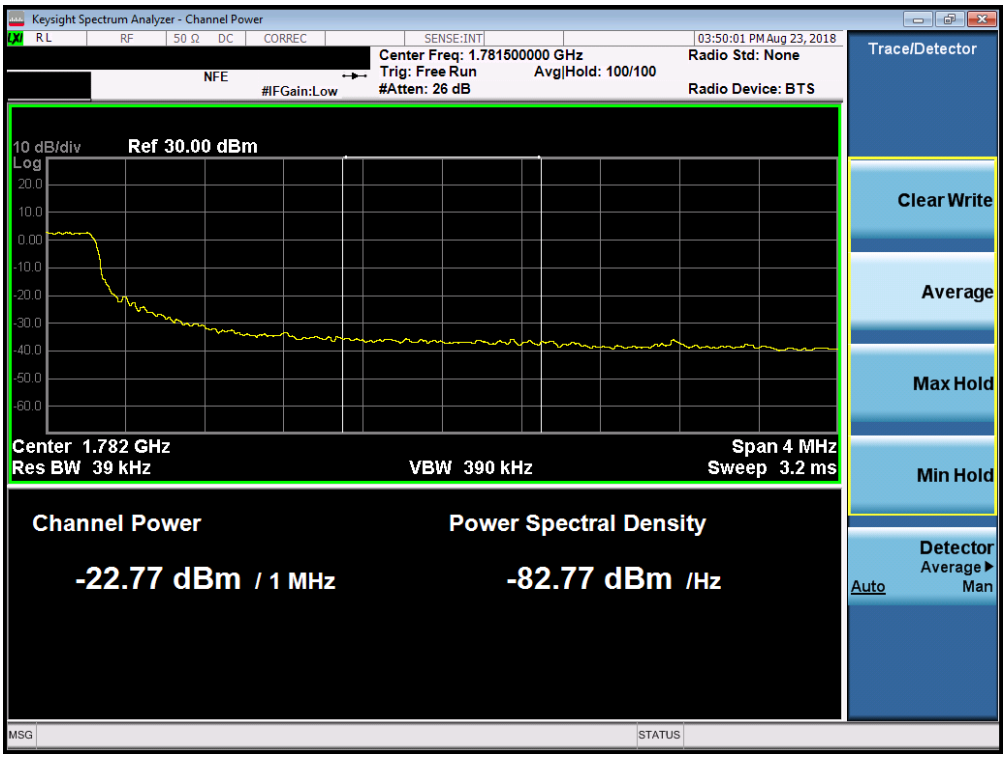


Plot 7-144. Lower Band Edge Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



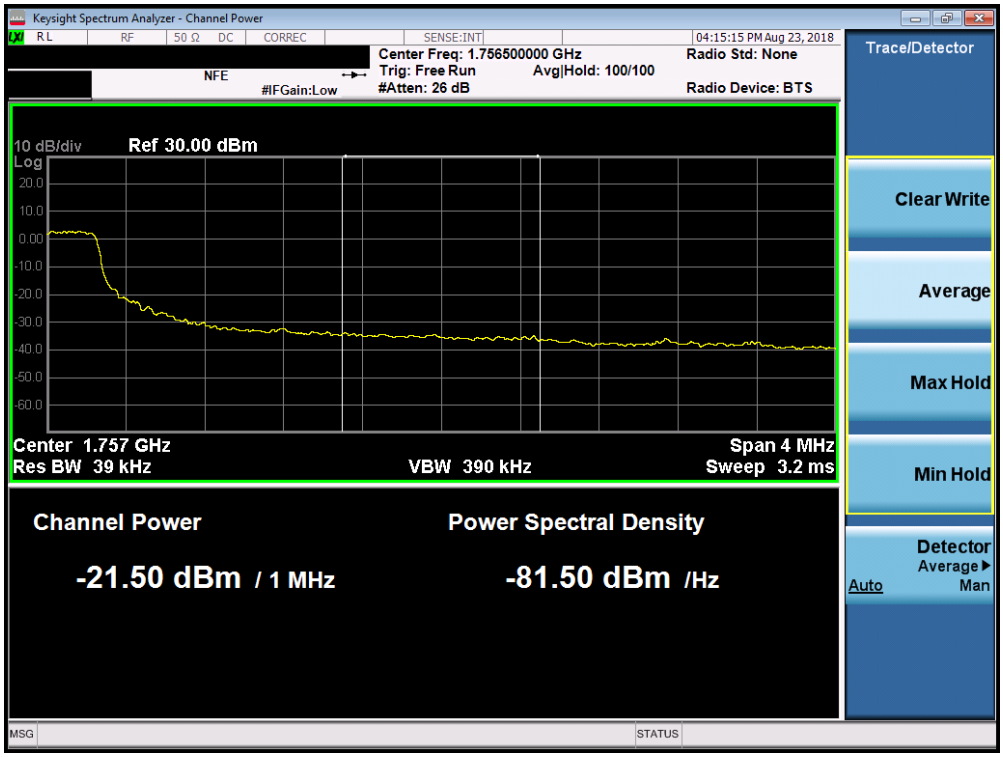
Plot 7-145. Lower Extended Band Edge Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-146. Upper Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

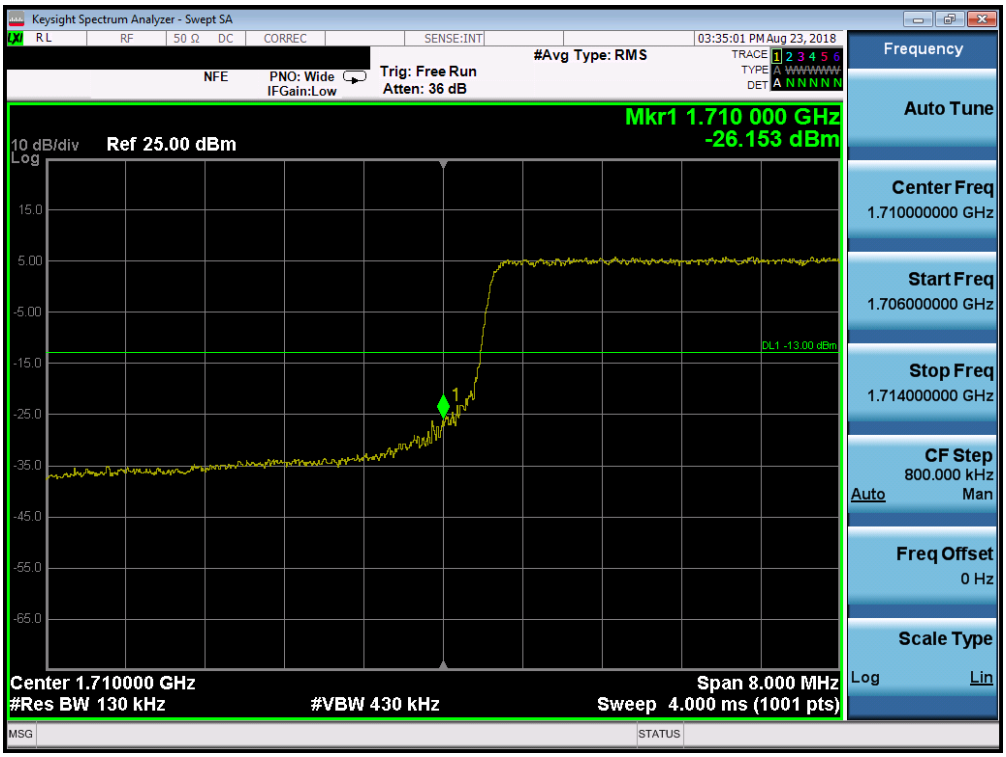


Plot 7-147. Upper Extended Band Edge Plot (Band 66 - 5.0MHz QPSK - Full RB Configuration)

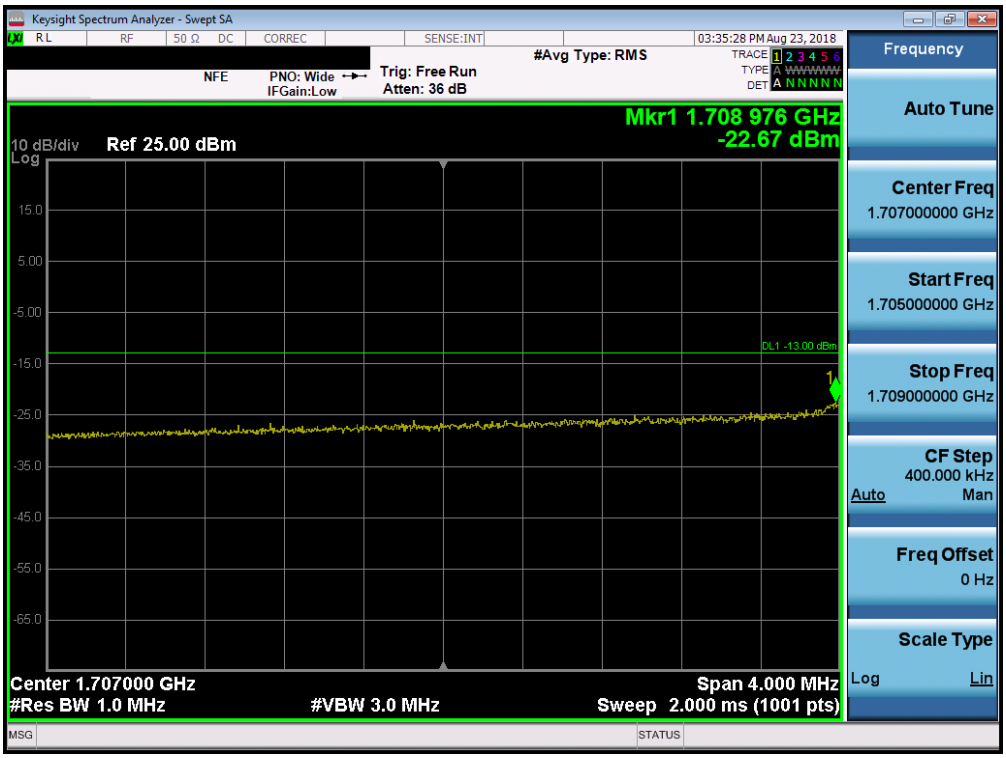
Plot 7-148. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



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

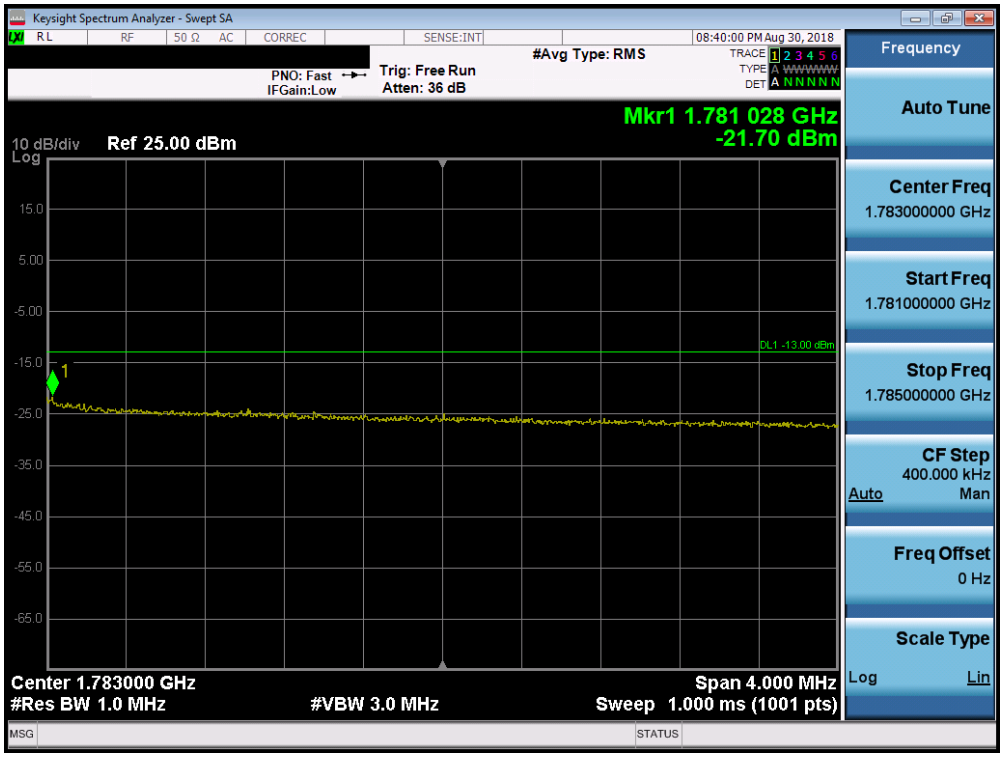


Plot 7-150. Lower Band Edge Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)



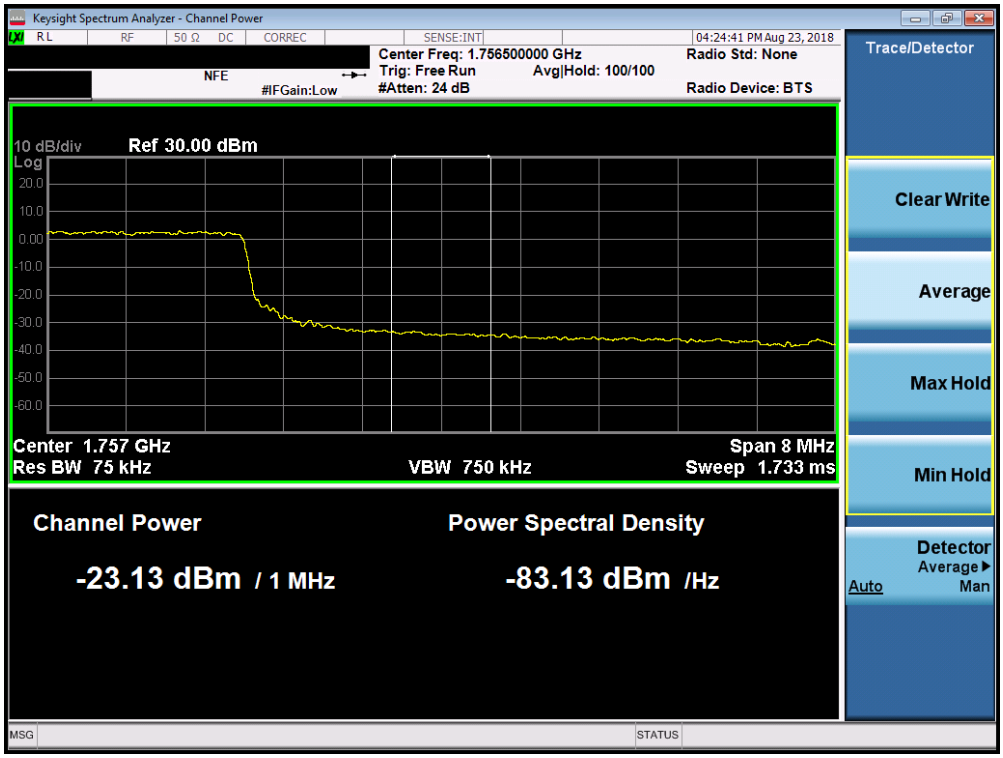
Plot 7-151. Lower Extended Band Edge Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

Plot 7-152. Upper Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

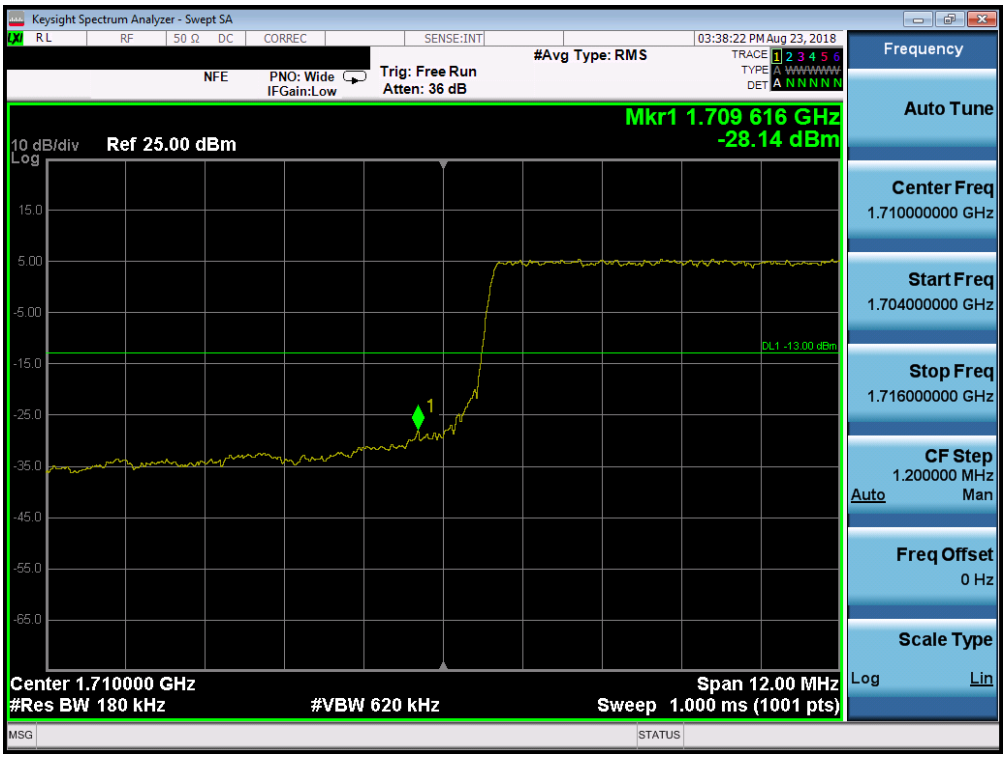


Plot 7-153. Upper Extended Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

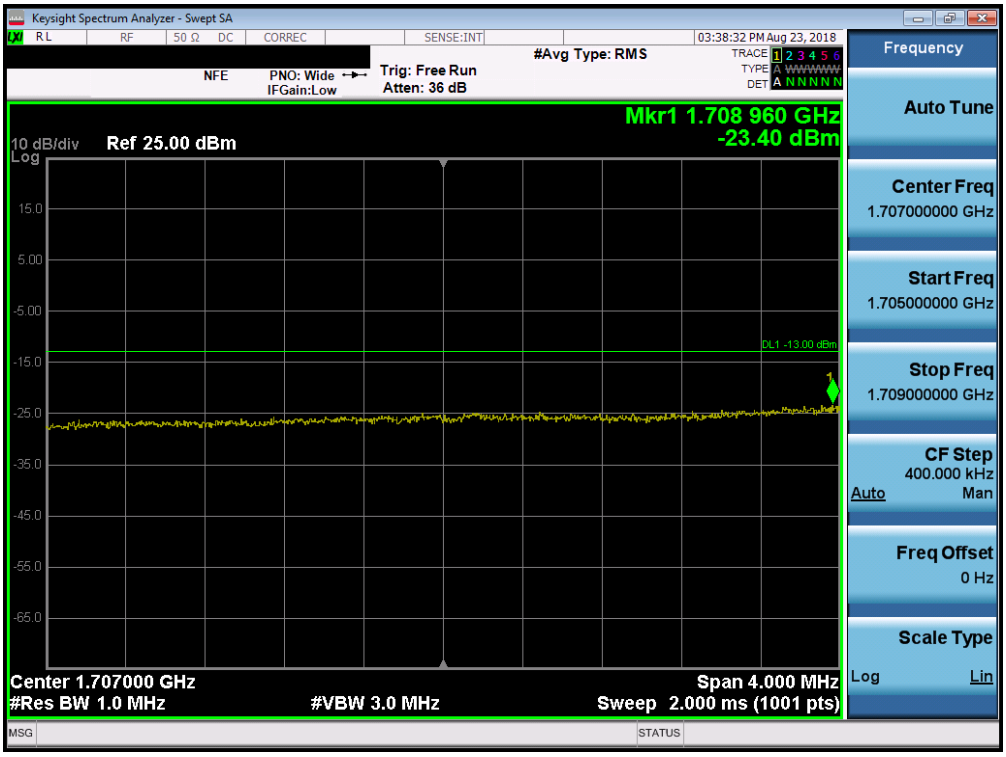
Plot 7-154. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



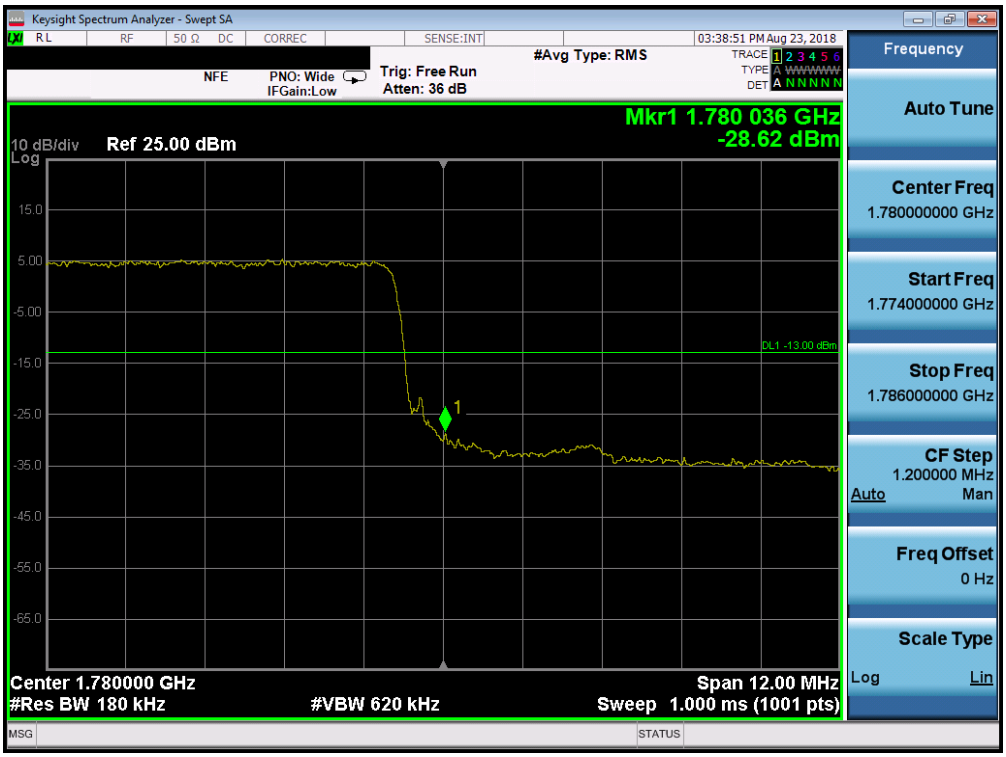
Plot 7-155. Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-156. Lower Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

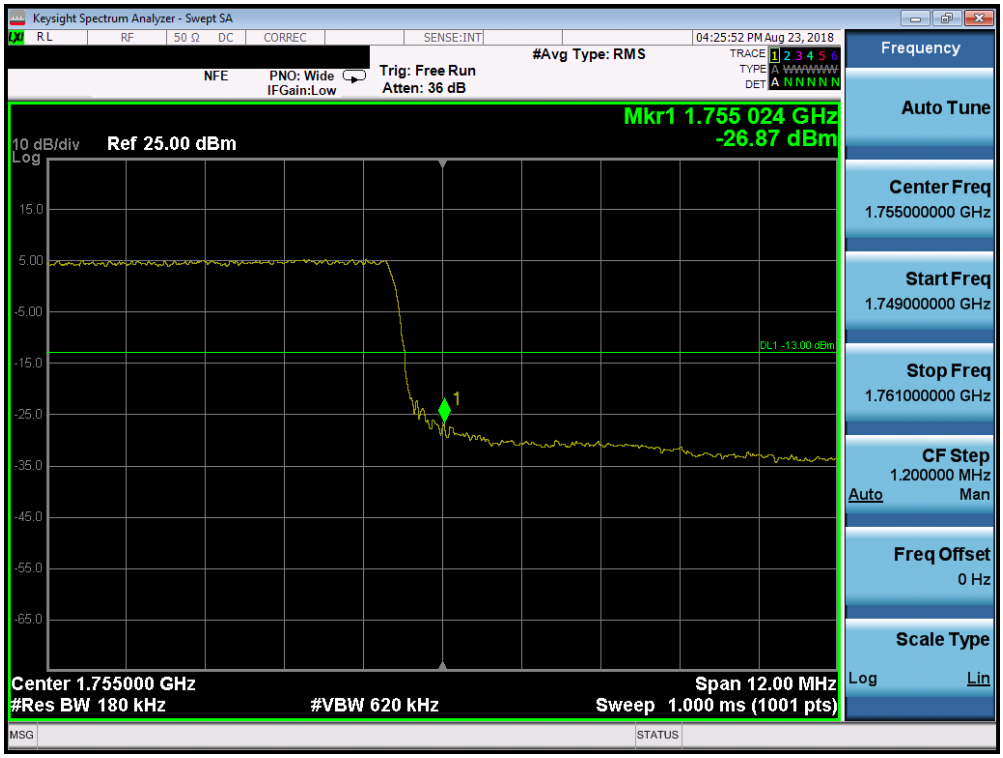


Plot 7-157. Lower Extended Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

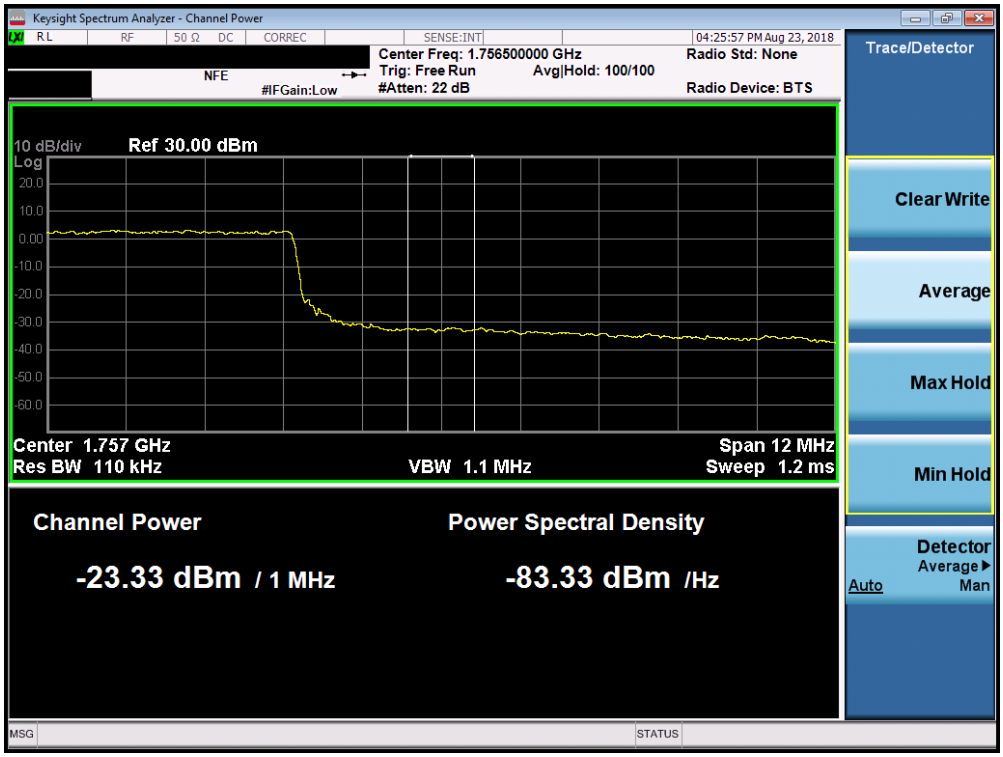


Plot 7-158. Upper Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

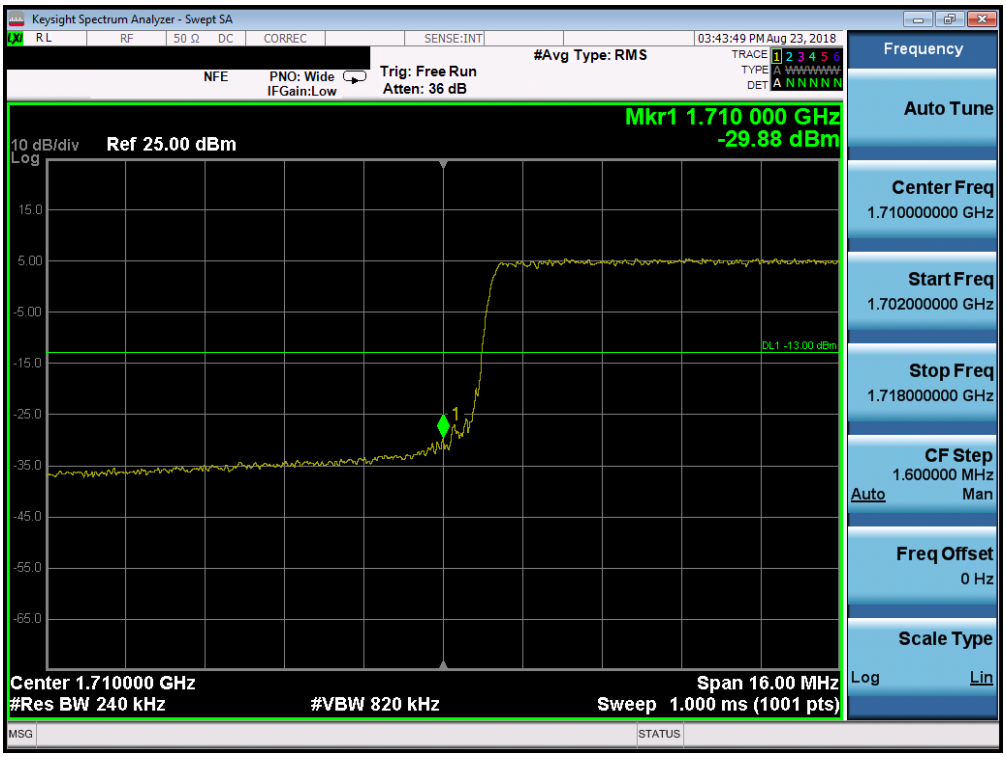
Plot 7-159. Upper Extended Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-160. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



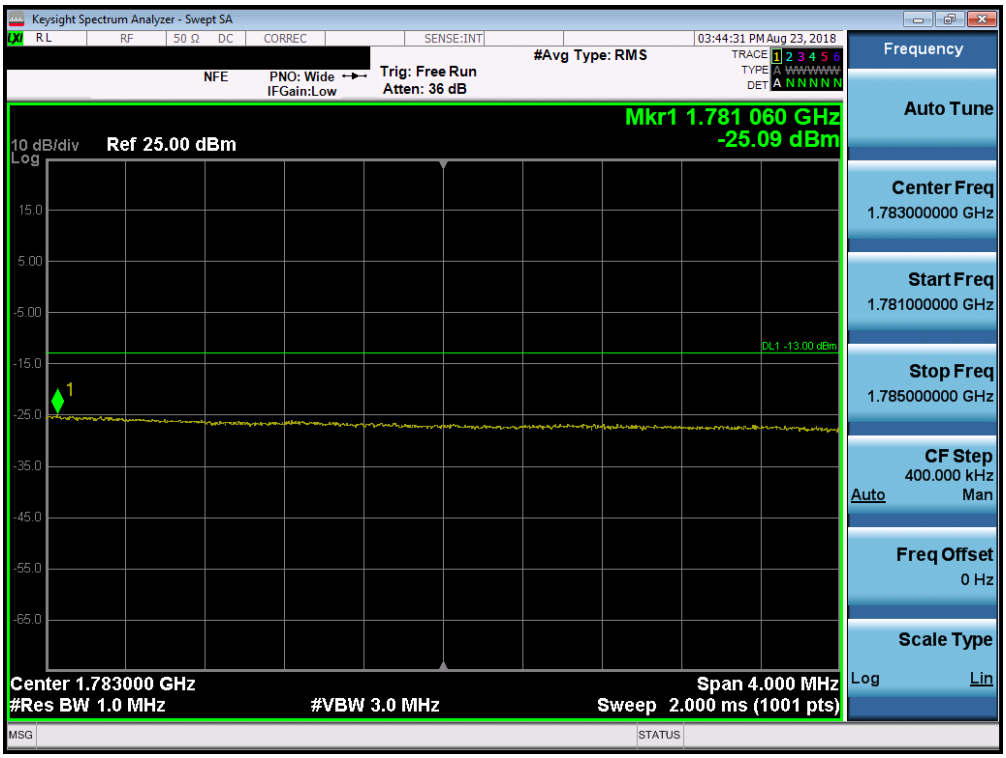
Plot 7-161. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-162. Lower Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

Plot 7-163. Lower Extended Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

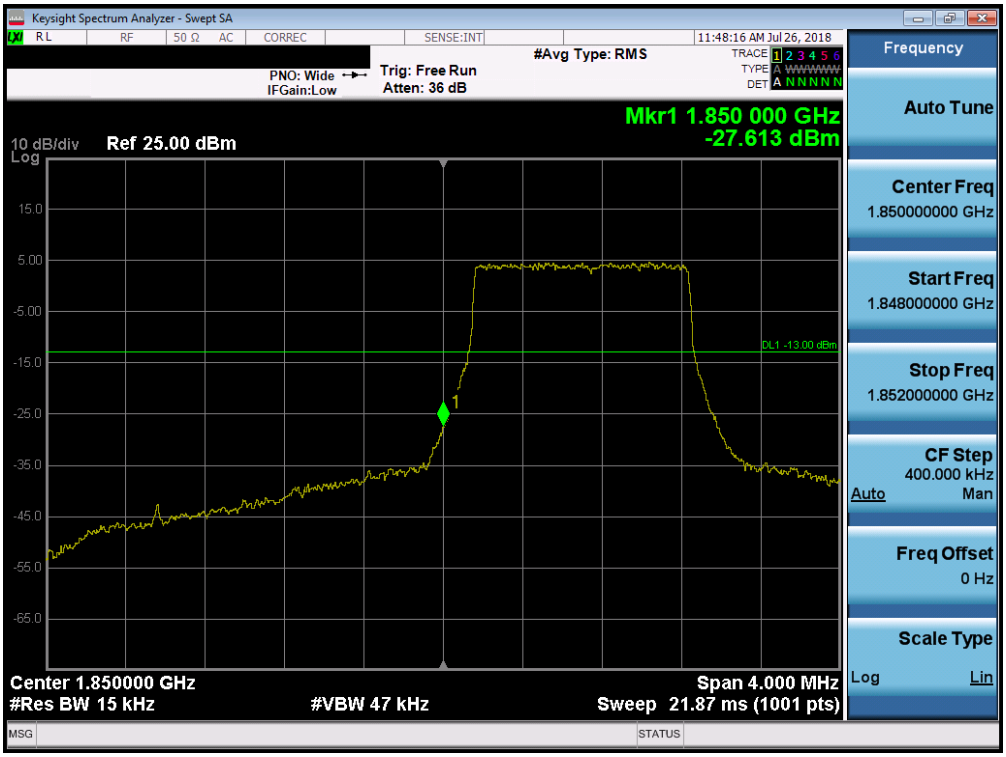
Plot 7-164. Upper Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)



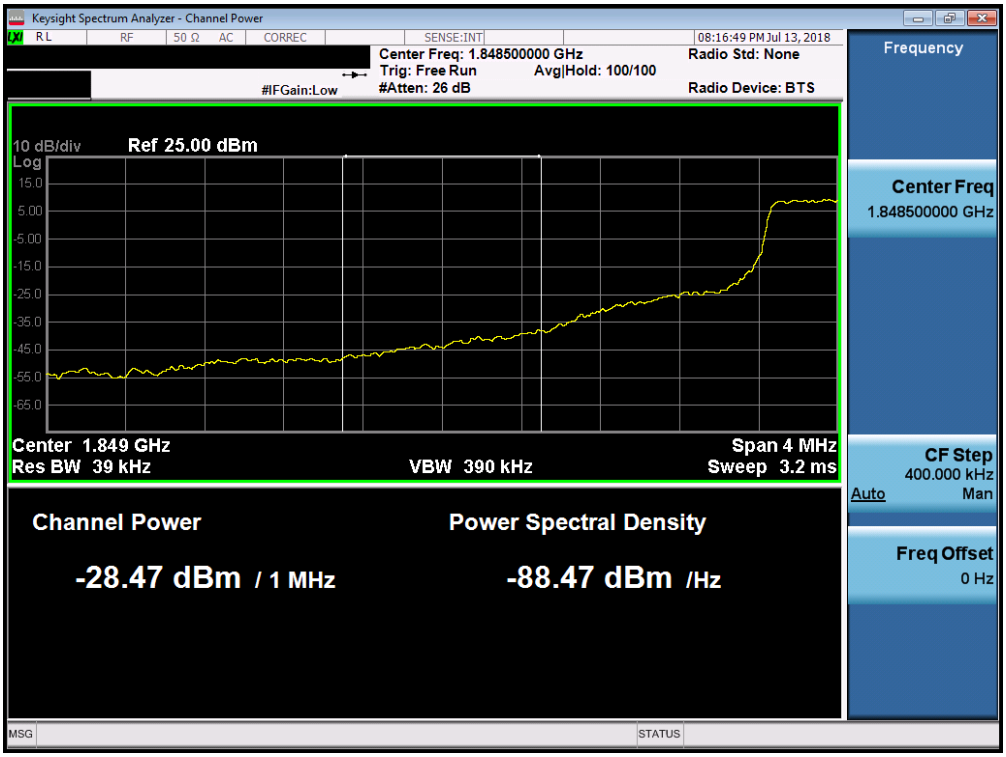
Plot 7-165. Upper Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

Plot 7-166. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

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

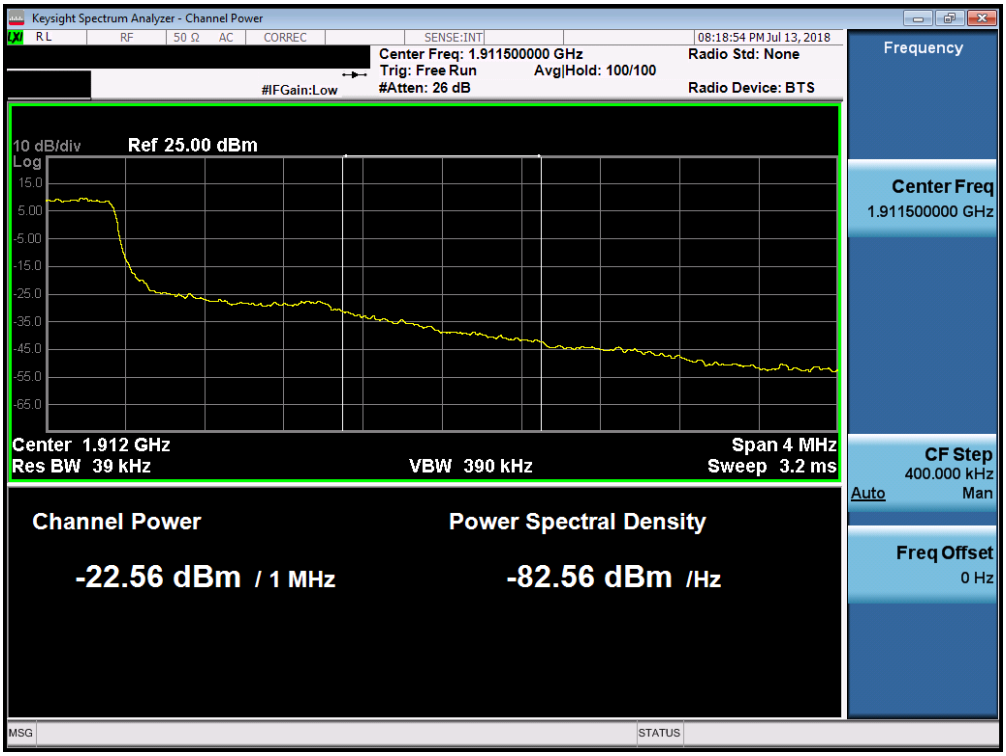


Plot 7-168. Lower Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

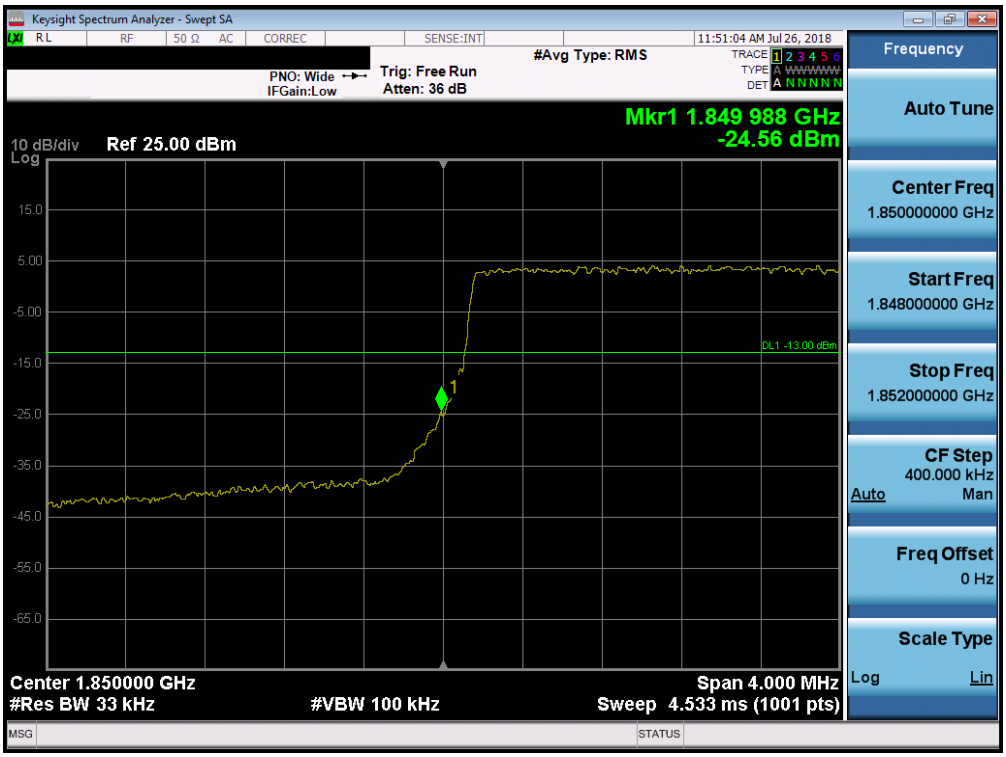


Plot 7-169. Lower Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

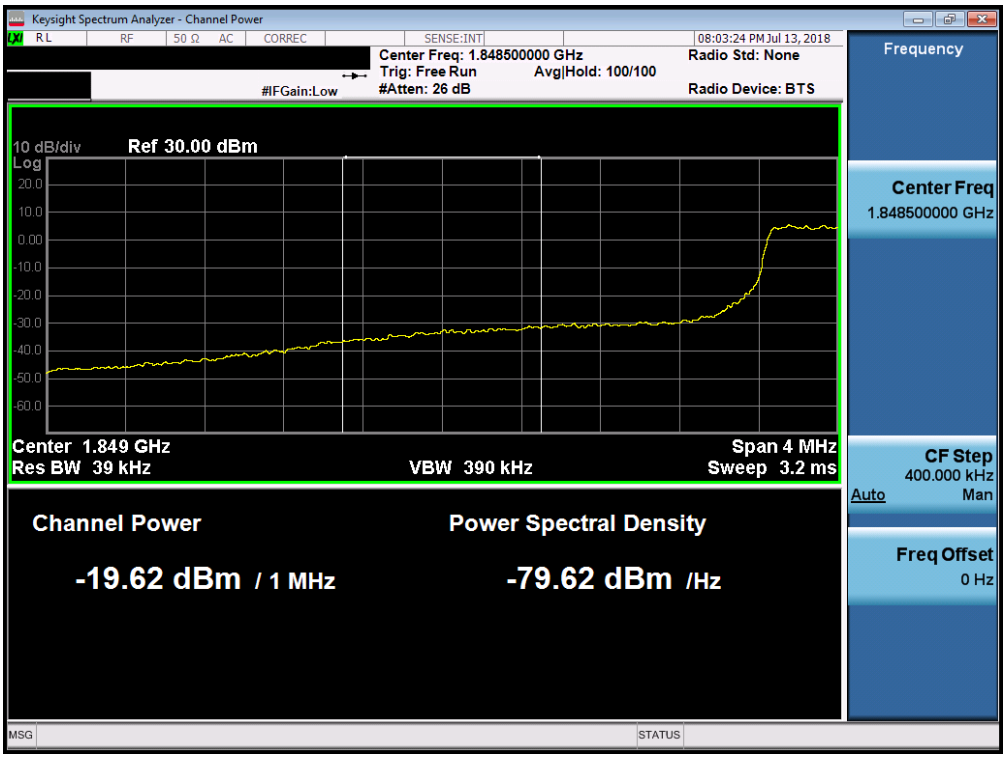
Plot 7-170. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



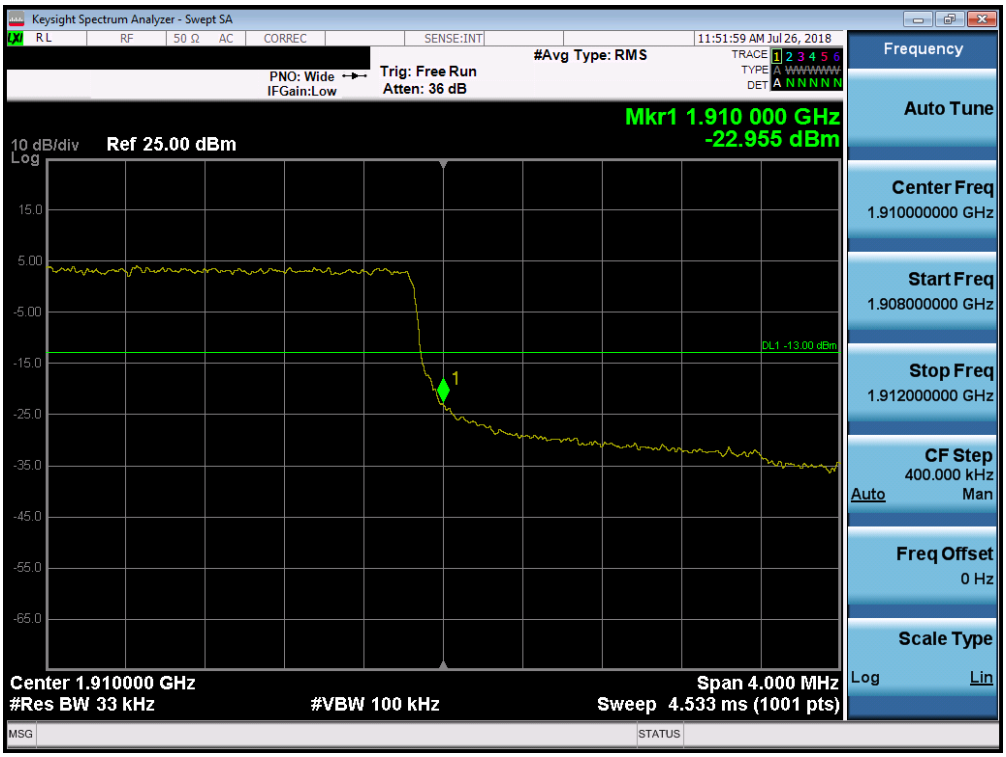
Plot 7-171. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



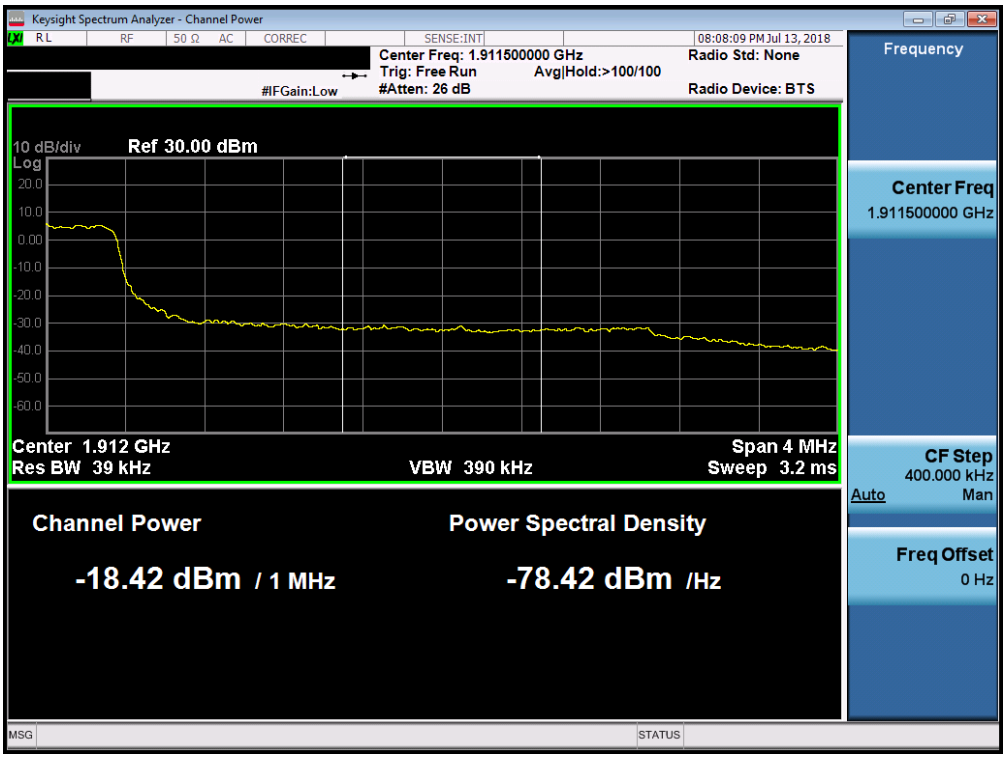
Plot 7-172. Lower Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



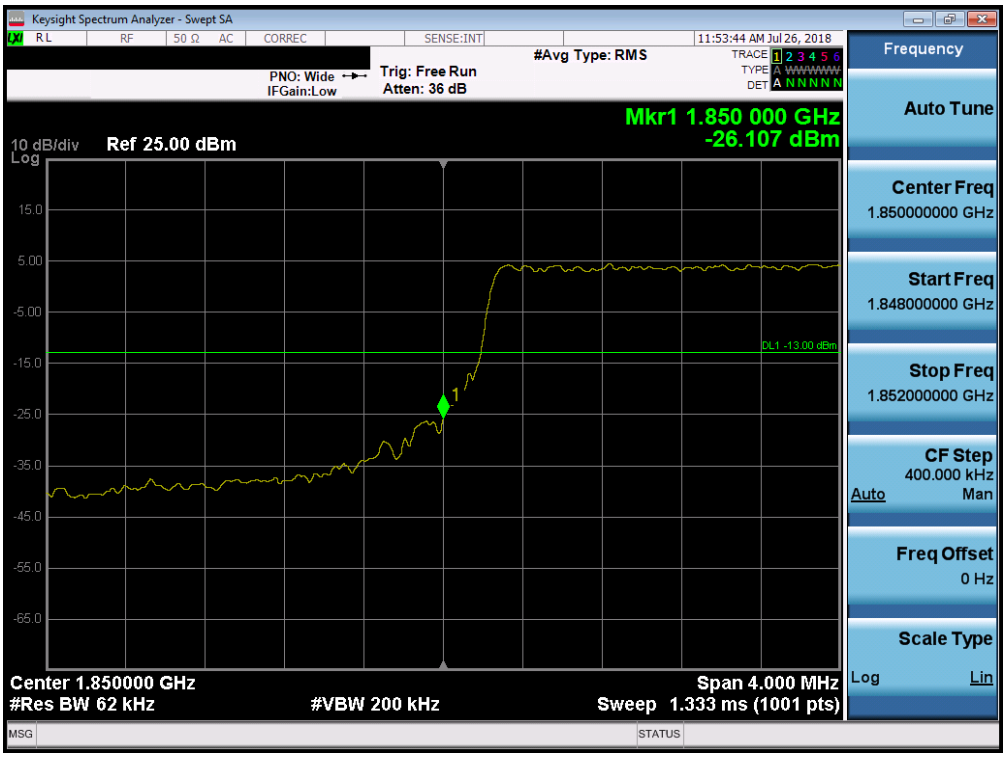
Plot 7-173. Lower Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



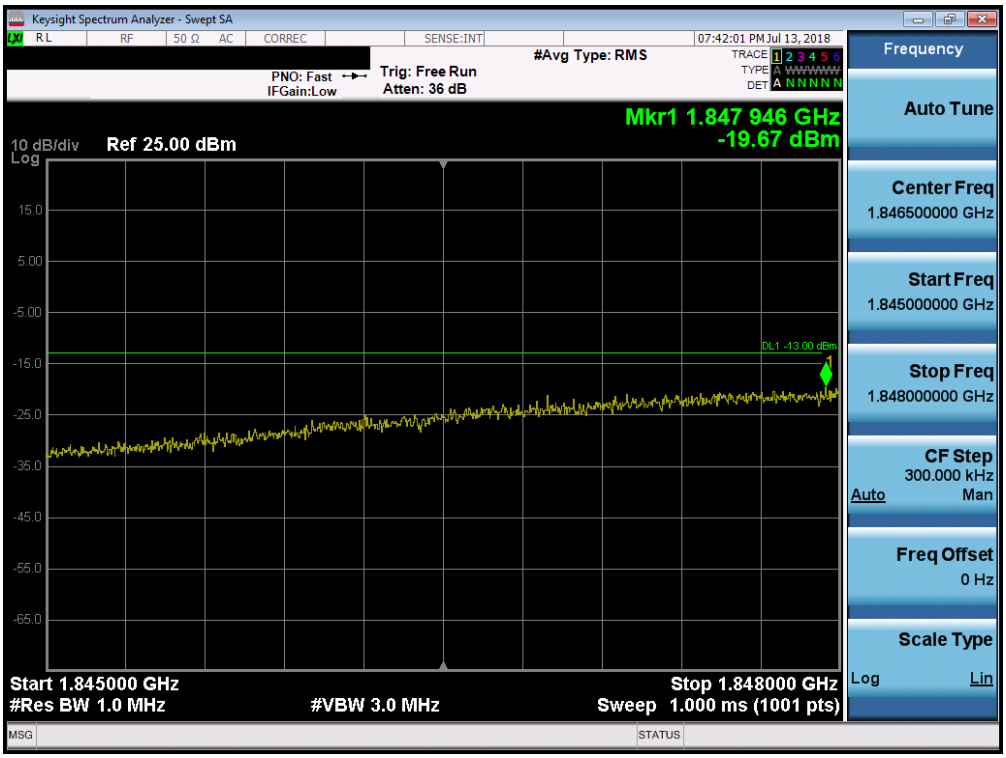
Plot 7-174. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



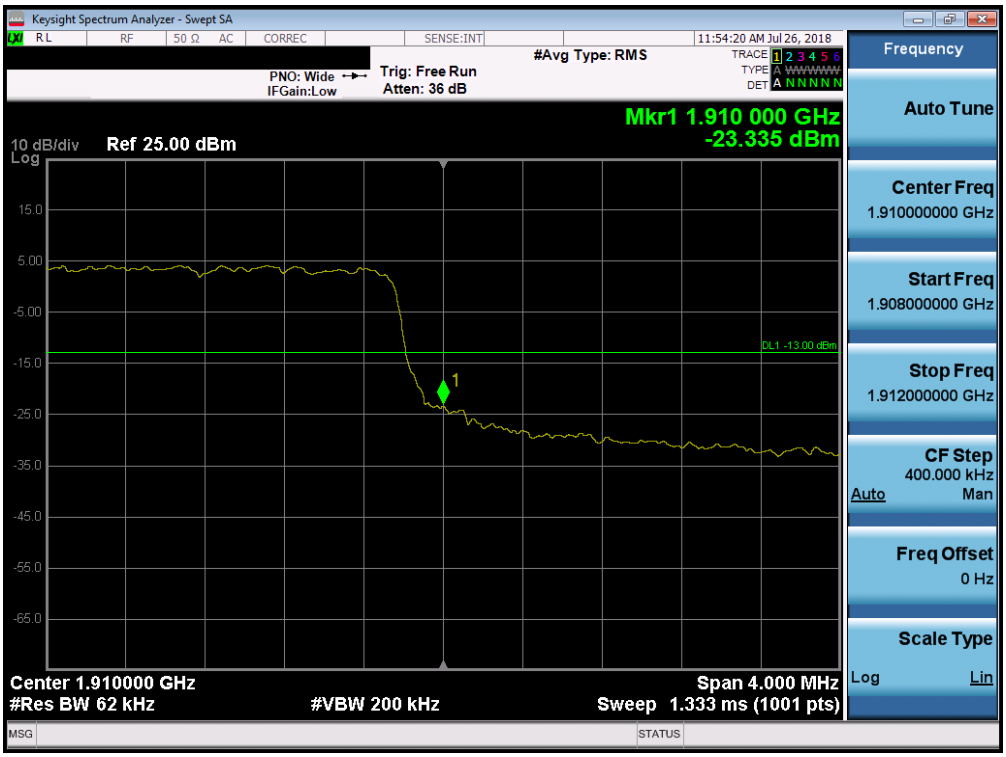
Plot 7-175. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



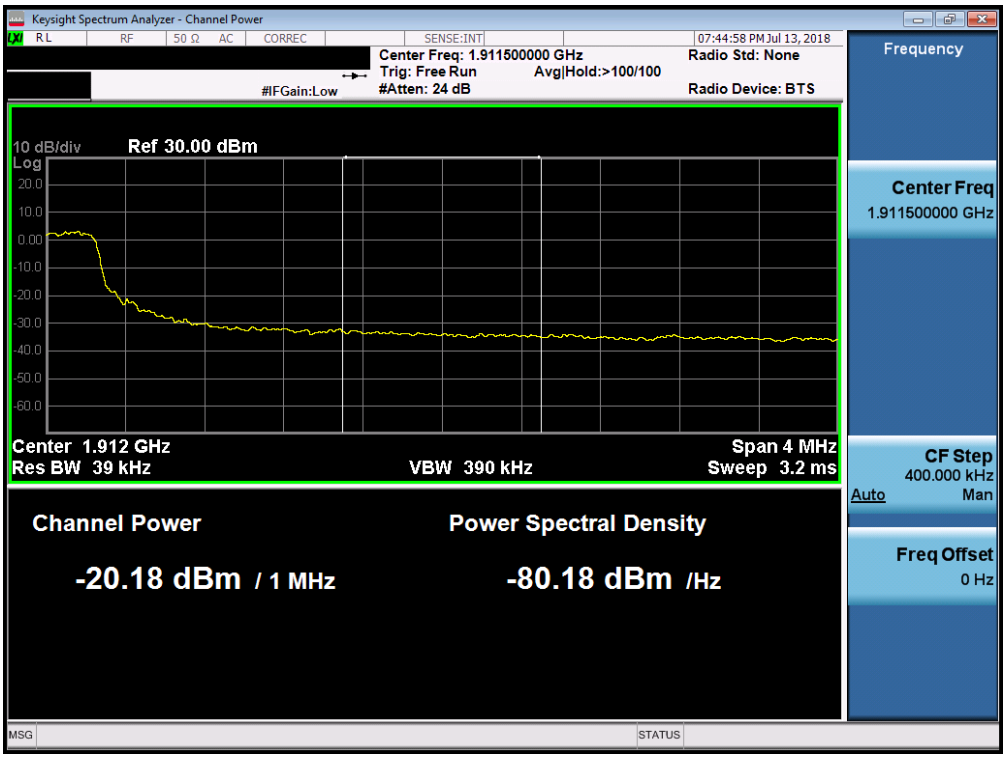
Plot 7-176. Lower Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



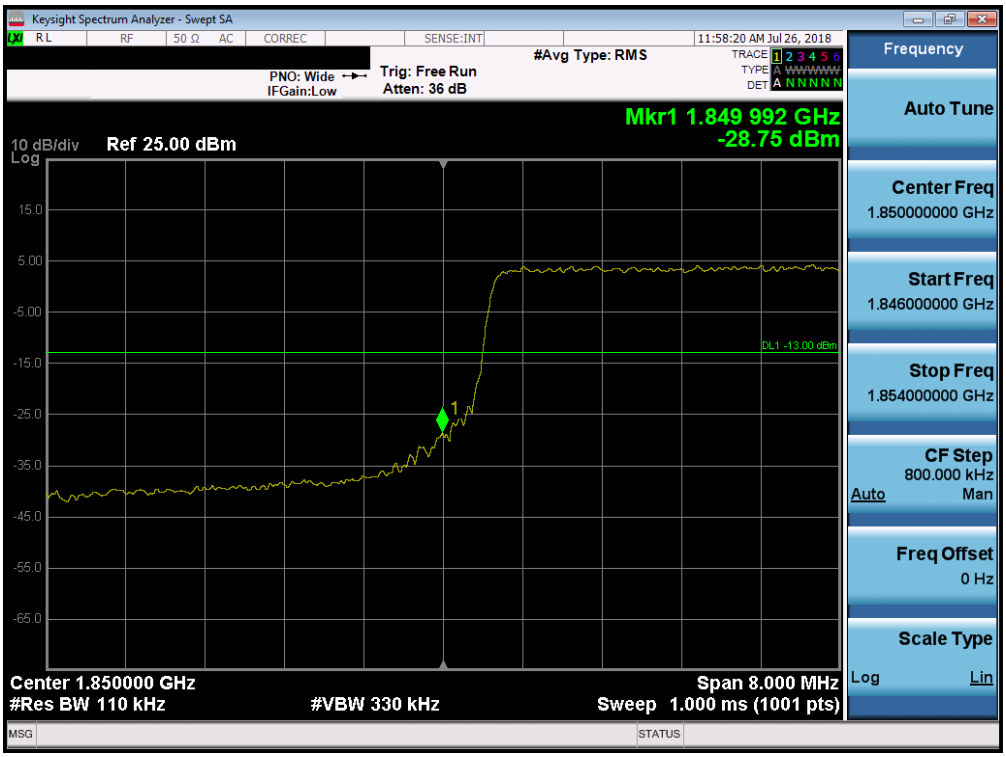
Plot 7-177. Lower Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



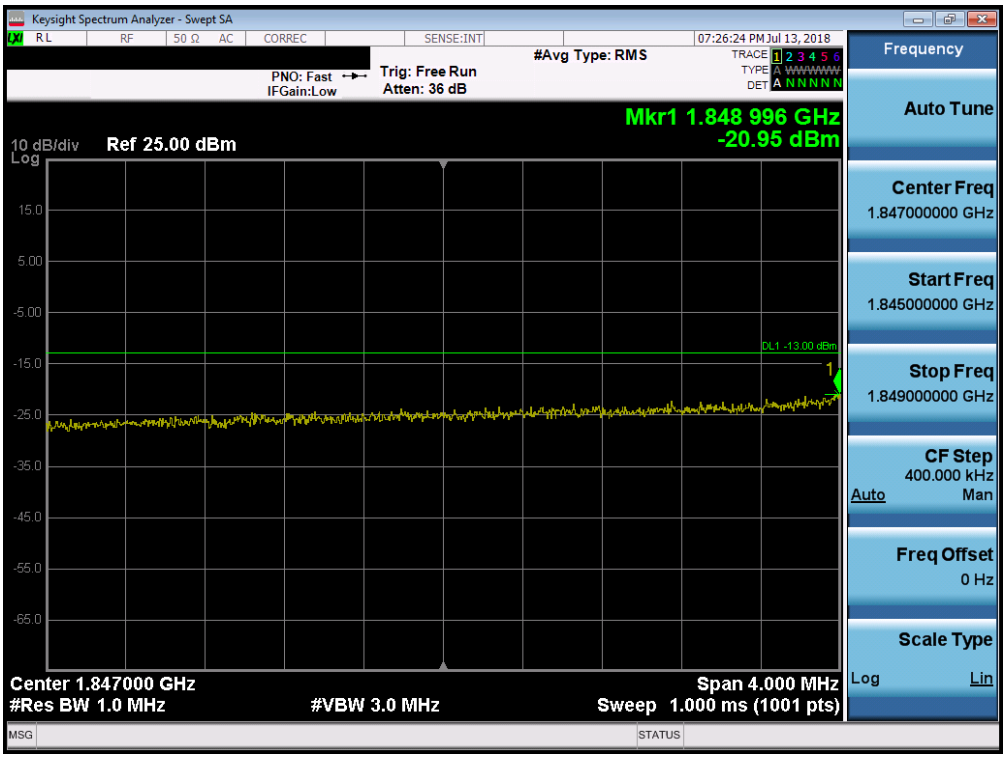
Plot 7-178. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



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

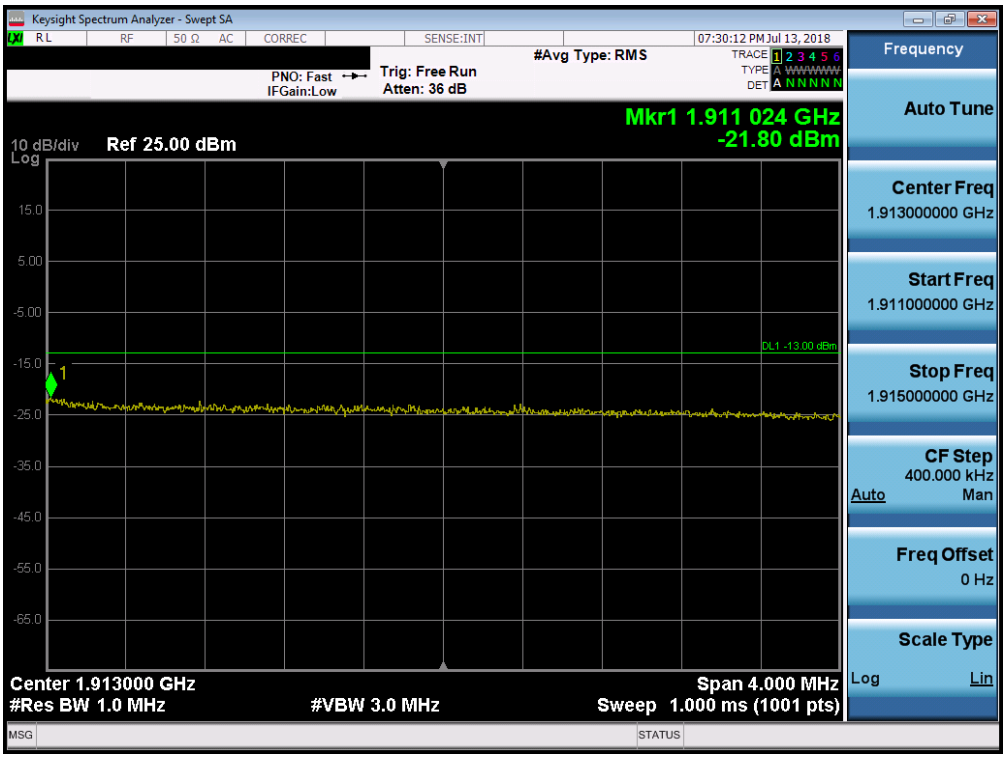


Plot 7-180. Lower Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

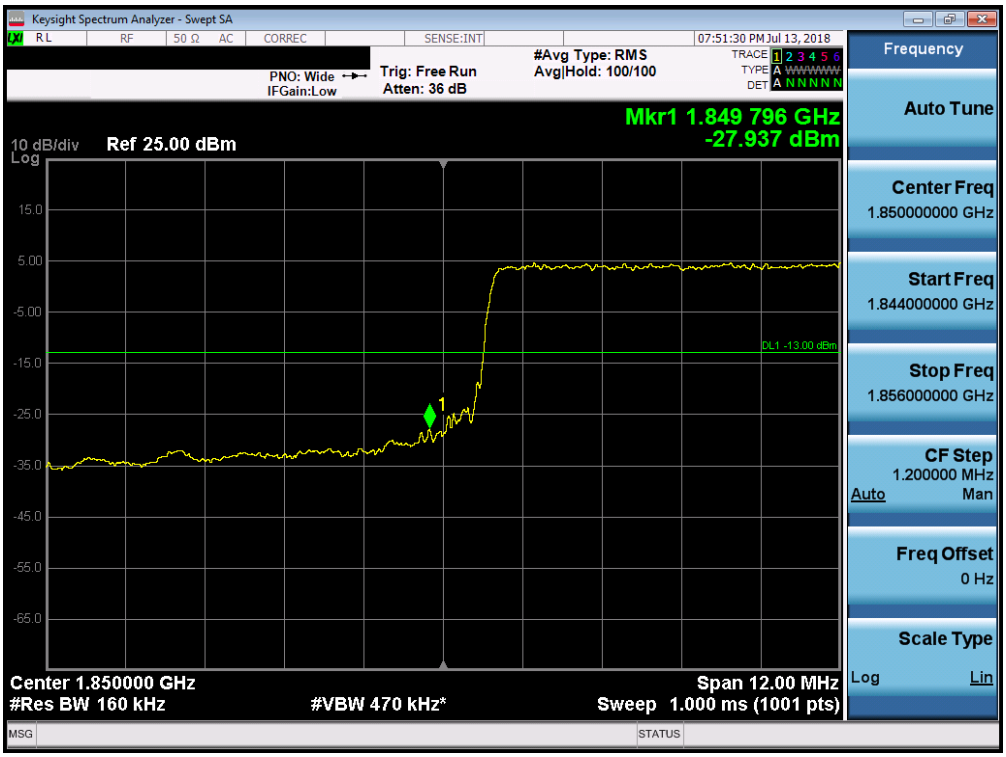


Plot 7-181. Lower Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

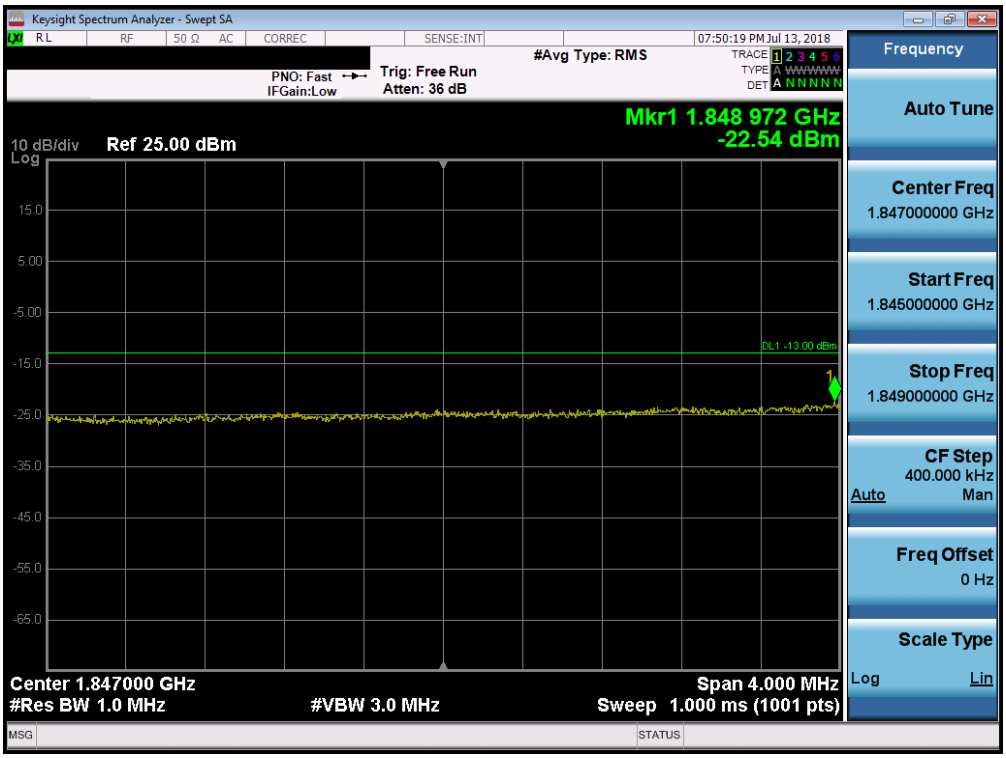
Plot 7-182. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



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

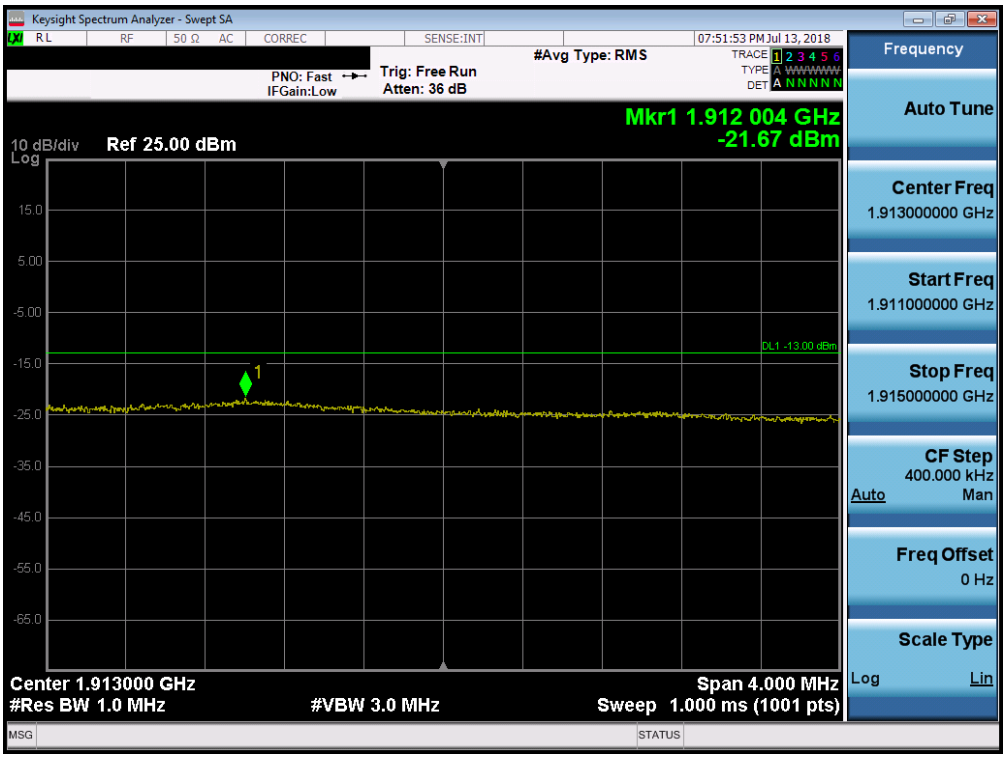


Plot 7-184. Lower Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

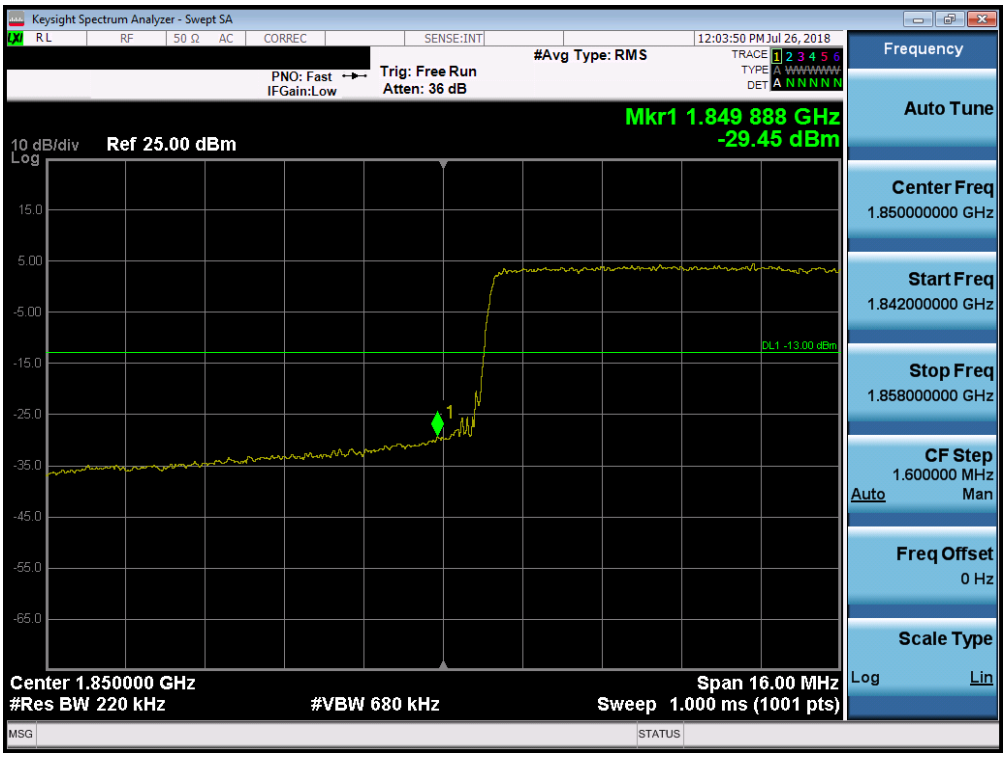


Plot 7-185. Lower Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

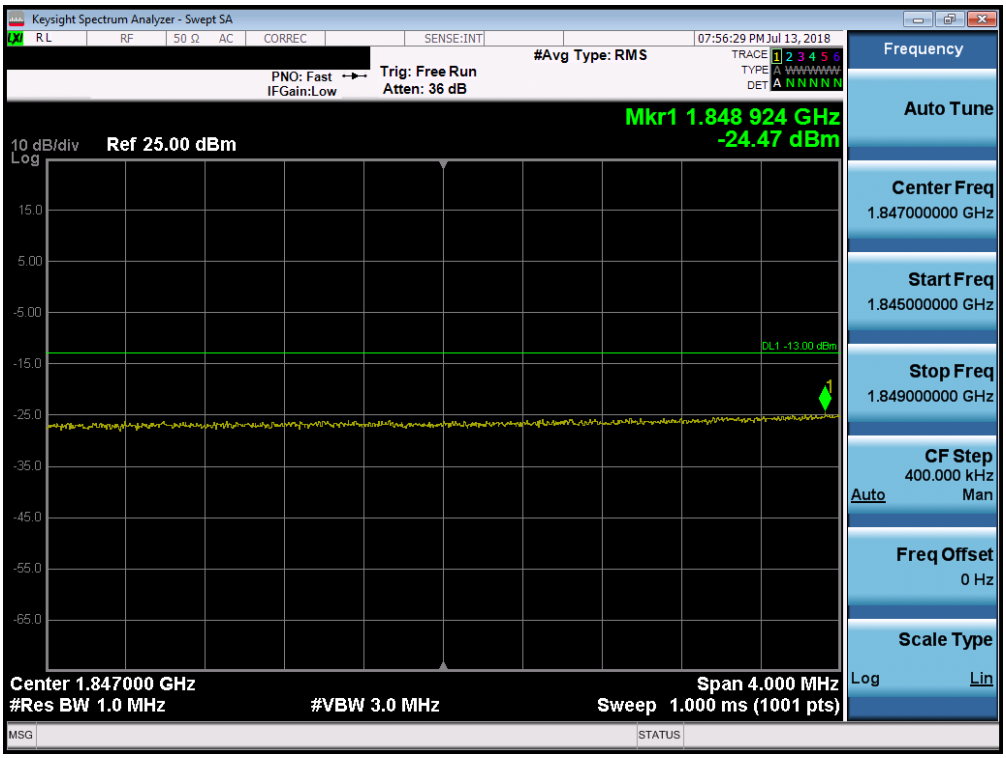
Plot 7-186. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



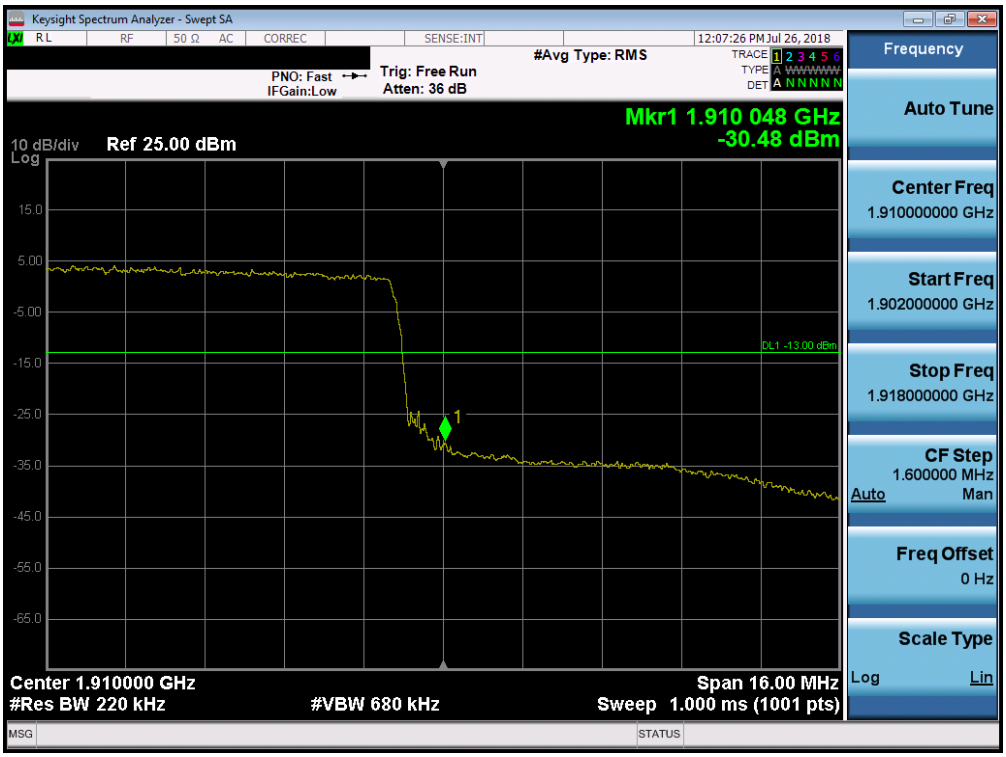
Plot 7-187. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



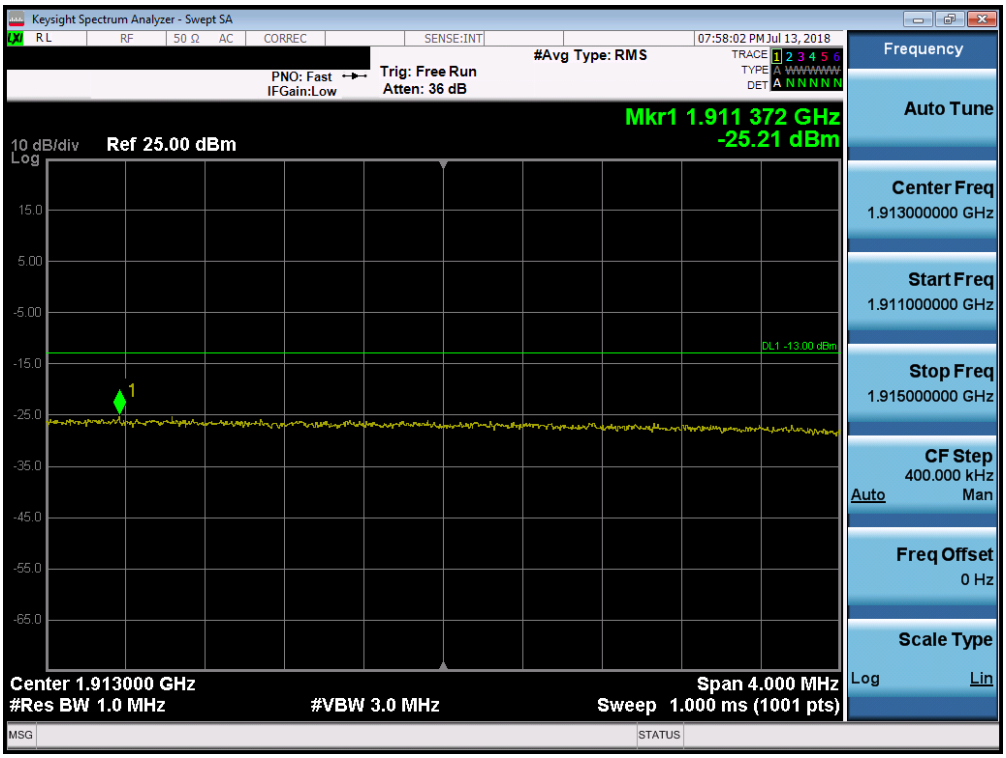
Plot 7-188. Lower Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-189. Lower Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

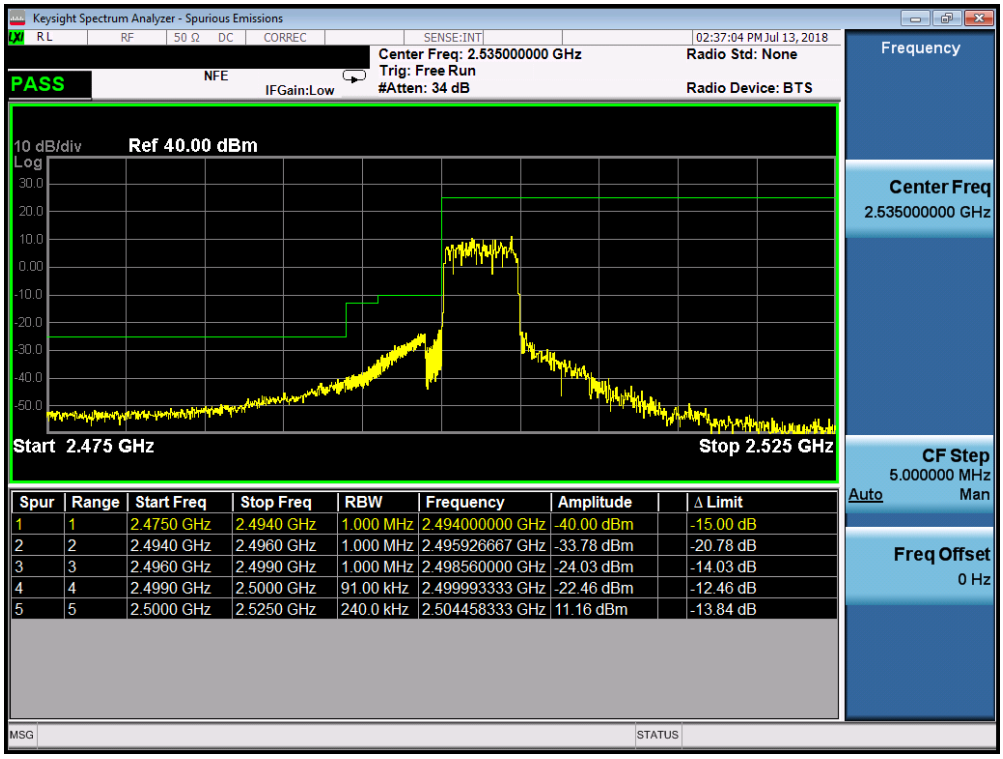


Plot 7-190. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



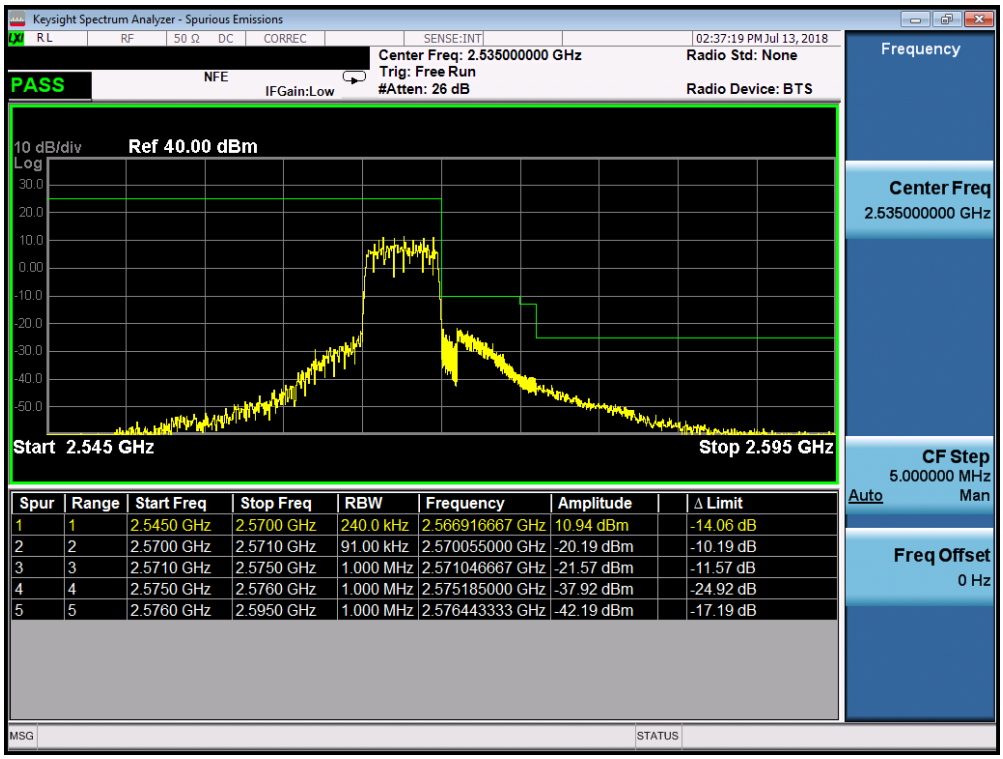
Plot 7-191. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

Band 7



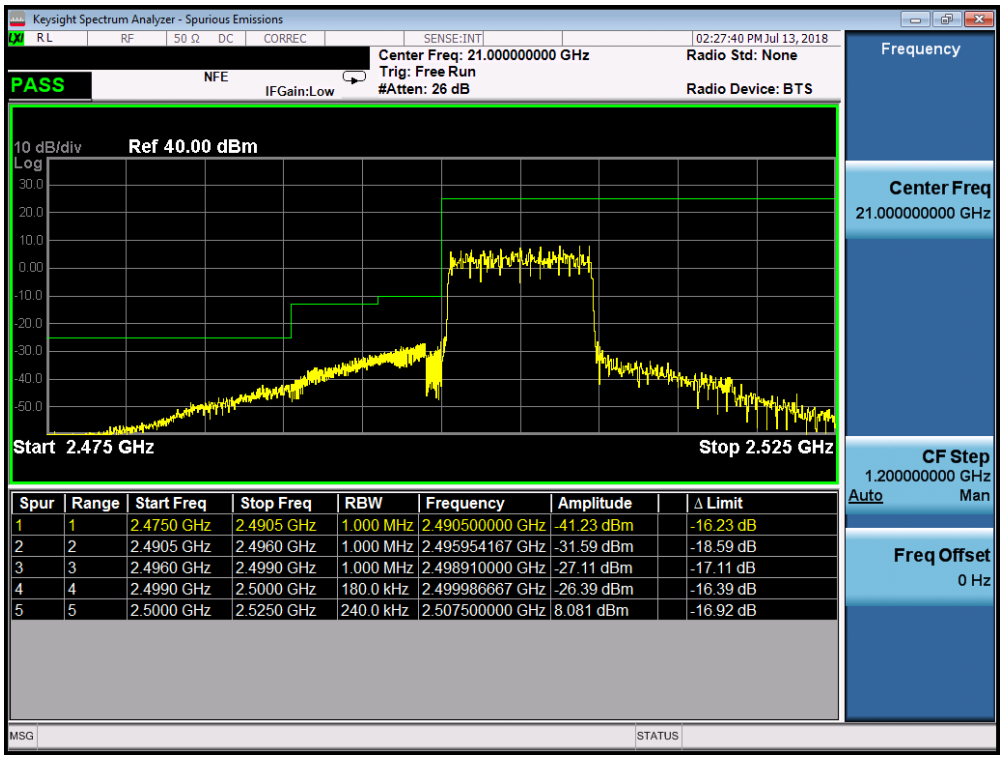
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4940 GHz	1.000 MHz	2.494000000 GHz	-40.00 dBm	-15.00 dB
2	2	2.4940 GHz	2.4960 GHz	1.000 MHz	2.495926667 GHz	-33.78 dBm	-20.78 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498560000 GHz	-24.03 dBm	-14.03 dB
4	4	2.4990 GHz	2.5000 GHz	91.00 kHz	2.499993333 GHz	-22.46 dBm	-12.46 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.504458333 GHz	11.16 dBm	-13.84 dB

Plot 7-192. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)



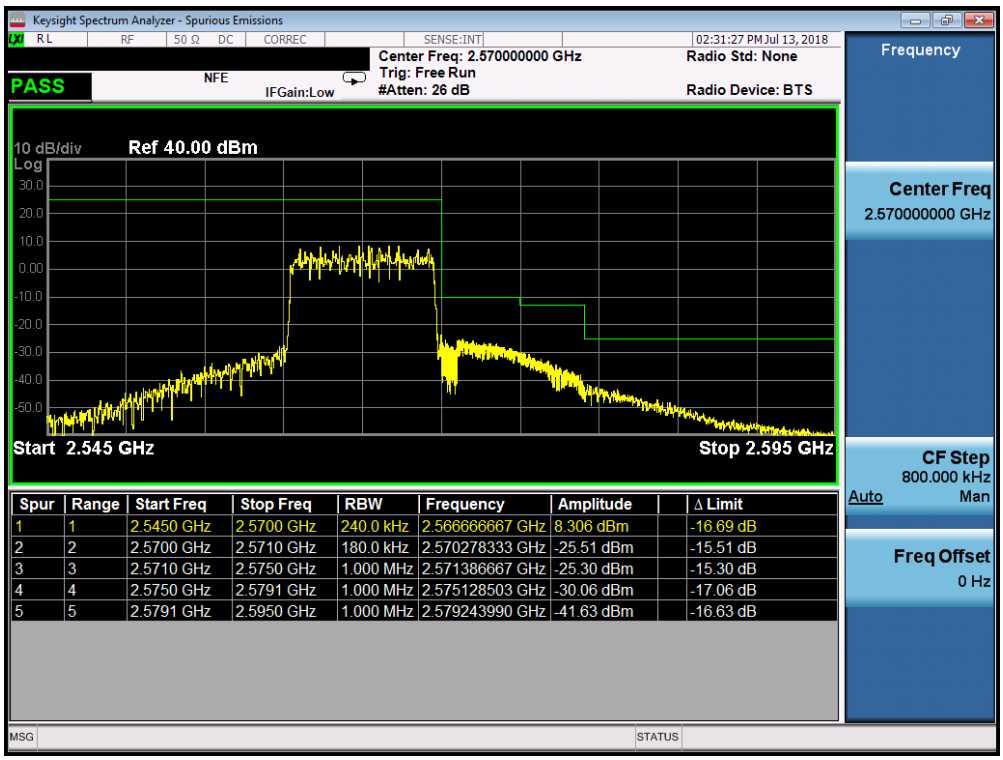
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.566916667 GHz	10.94 dBm	-14.06 dB
2	2	2.5700 GHz	2.5710 GHz	91.00 kHz	2.570055000 GHz	-20.19 dBm	-10.19 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571046667 GHz	-21.57 dBm	-11.57 dB
4	4	2.5750 GHz	2.5760 GHz	1.000 MHz	2.575185000 GHz	-37.92 dBm	-24.92 dB
5	5	2.5760 GHz	2.5950 GHz	1.000 MHz	2.576443333 GHz	-42.19 dBm	-17.19 dB

Plot 7-193. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)



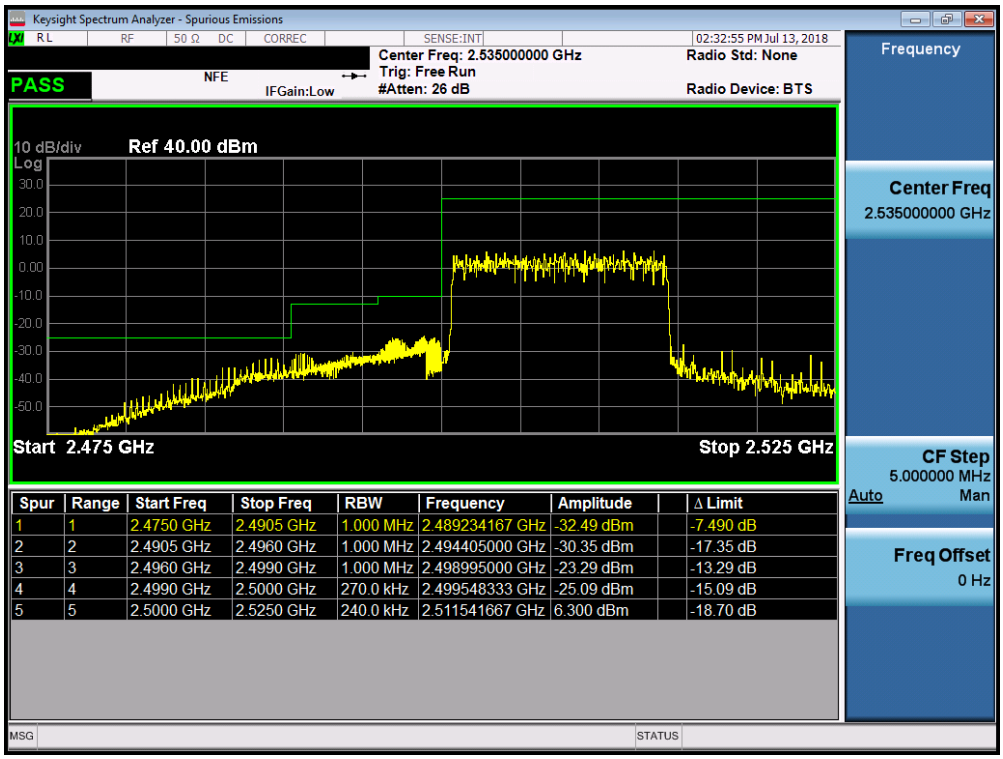
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490500000 GHz	-41.23 dBm	-16.23 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495954167 GHz	-31.59 dBm	-18.59 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498910000 GHz	-27.11 dBm	-17.11 dB
4	4	2.4990 GHz	2.5000 GHz	180.0 kHz	2.499986667 GHz	-26.39 dBm	-16.39 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.507500000 GHz	8.081 dBm	-16.92 dB

Plot 7-194. Lower ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)



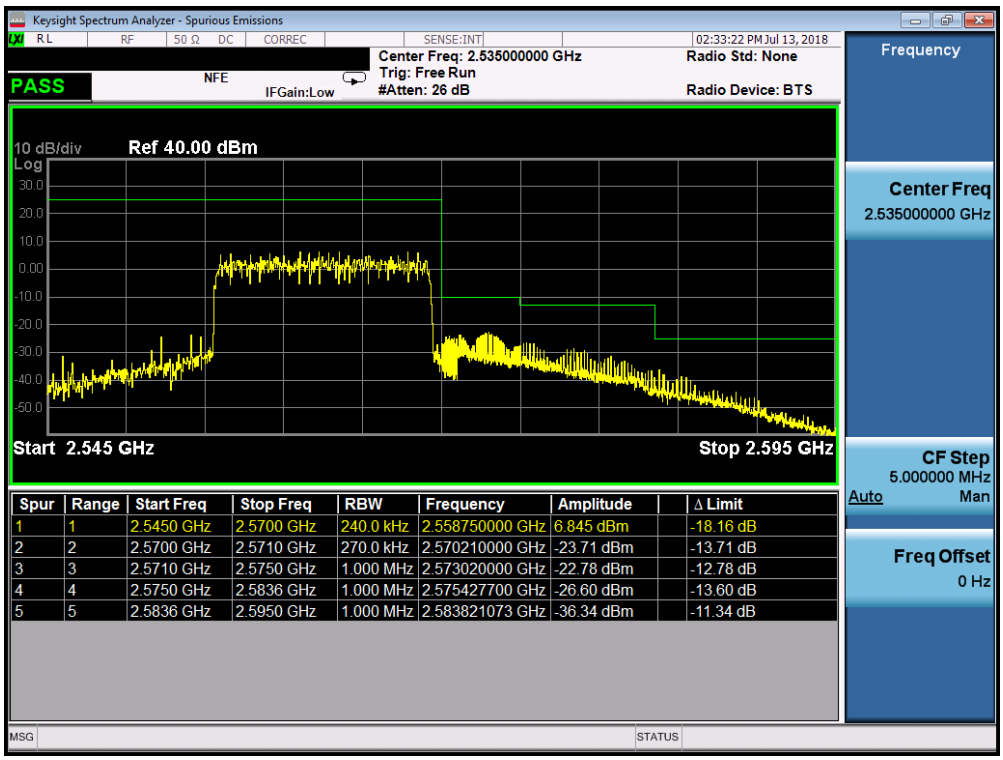
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.566666667 GHz	8.306 dBm	-16.69 dB
2	2	2.5700 GHz	2.5710 GHz	180.0 kHz	2.570278333 GHz	-25.51 dBm	-15.51 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571386667 GHz	-25.30 dBm	-15.30 dB
4	4	2.5750 GHz	2.5791 GHz	1.000 MHz	2.575128503 GHz	-30.06 dBm	-17.06 dB
5	5	2.5791 GHz	2.5950 GHz	1.000 MHz	2.579243990 GHz	-41.63 dBm	-16.63 dB

Plot 7-195. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)



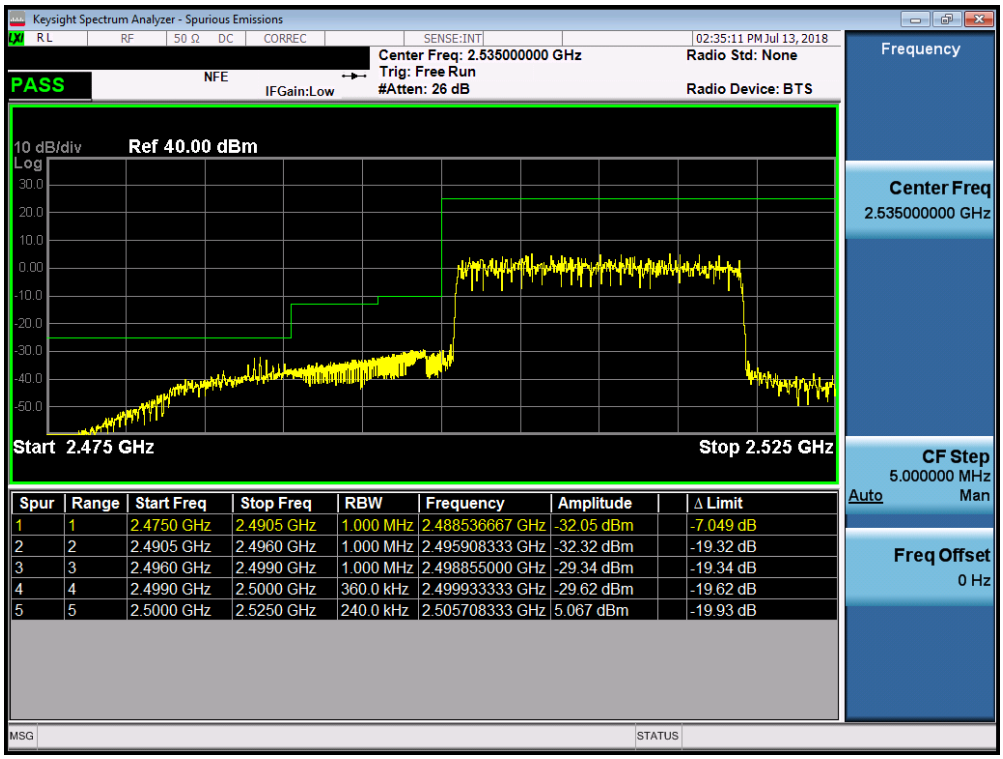
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489234167 GHz	-32.49 dBm	-7.490 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.494405000 GHz	-30.35 dBm	-17.35 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498995000 GHz	-23.29 dBm	-13.29 dB
4	4	2.4990 GHz	2.5000 GHz	270.0 kHz	2.499548333 GHz	-25.09 dBm	-15.09 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.511541667 GHz	6.300 dBm	-18.70 dB

Plot 7-196. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)



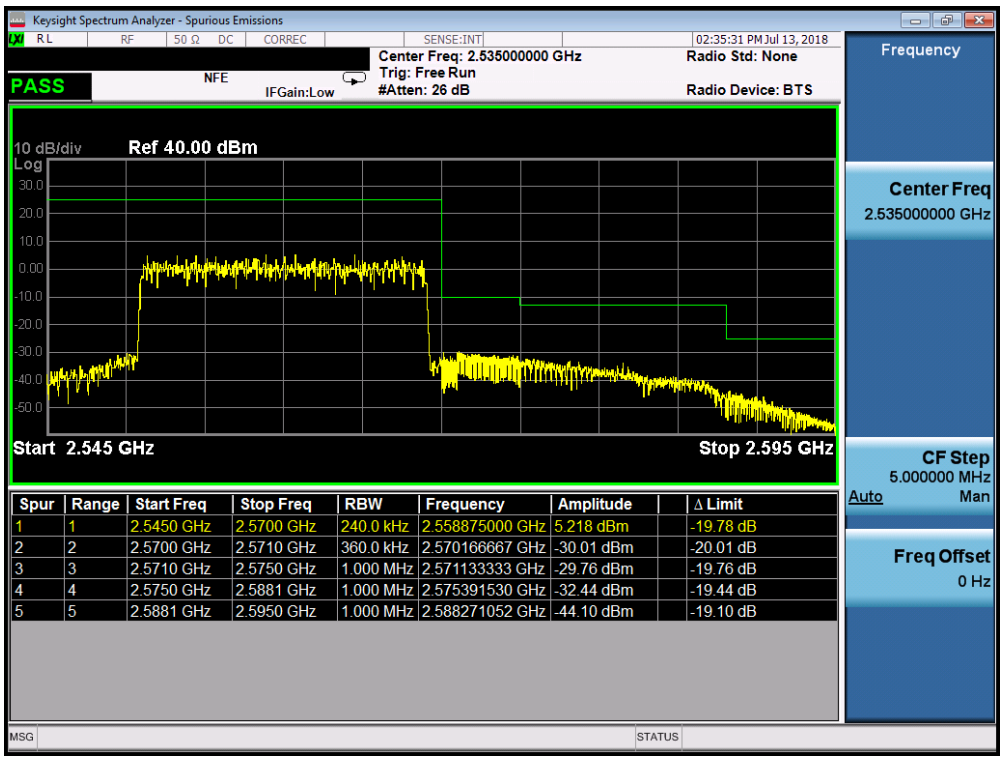
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.558750000 GHz	6.845 dBm	-18.16 dB
2	2	2.5700 GHz	2.5710 GHz	270.0 kHz	2.570210000 GHz	-23.71 dBm	-13.71 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.573020000 GHz	-22.78 dBm	-12.78 dB
4	4	2.5750 GHz	2.5836 GHz	1.000 MHz	2.575427700 GHz	-26.60 dBm	-13.60 dB
5	5	2.5836 GHz	2.5950 GHz	1.000 MHz	2.583821073 GHz	-36.34 dBm	-11.34 dB

Plot 7-197. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.488536667 GHz	-32.05 dBm	-7.049 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495908333 GHz	-32.32 dBm	-19.32 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498855000 GHz	-29.34 dBm	-19.34 dB
4	4	2.4990 GHz	2.5000 GHz	360.0 kHz	2.499933333 GHz	-29.62 dBm	-19.62 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.505708333 GHz	5.067 dBm	-19.93 dB

Plot 7-198. 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	2.558875000 GHz	5.218 dBm	-19.78 dB
2	2	2.5700 GHz	2.5710 GHz	360.0 kHz	2.570166667 GHz	-30.01 dBm	-20.01 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571133333 GHz	-29.76 dBm	-19.76 dB
4	4	2.5750 GHz	2.5881 GHz	1.000 MHz	2.575391530 GHz	-32.44 dBm	-19.44 dB
5	5	2.5881 GHz	2.5950 GHz	1.000 MHz	2.588271052 GHz	-44.10 dBm	-19.10 dB

Plot 7-199. Upper ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

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.

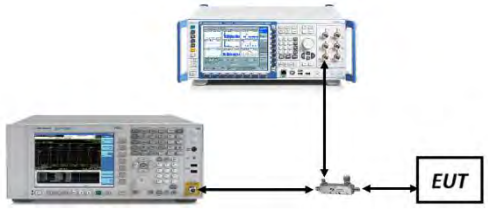
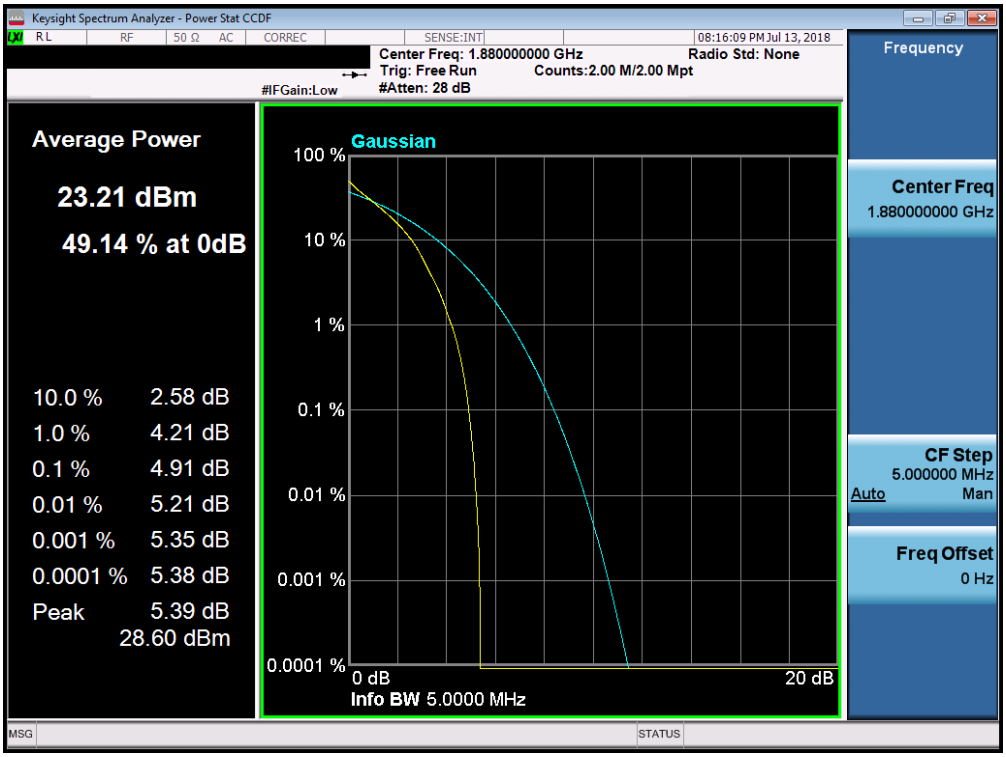


Figure 7-4. Test Instrument & Measurement Setup

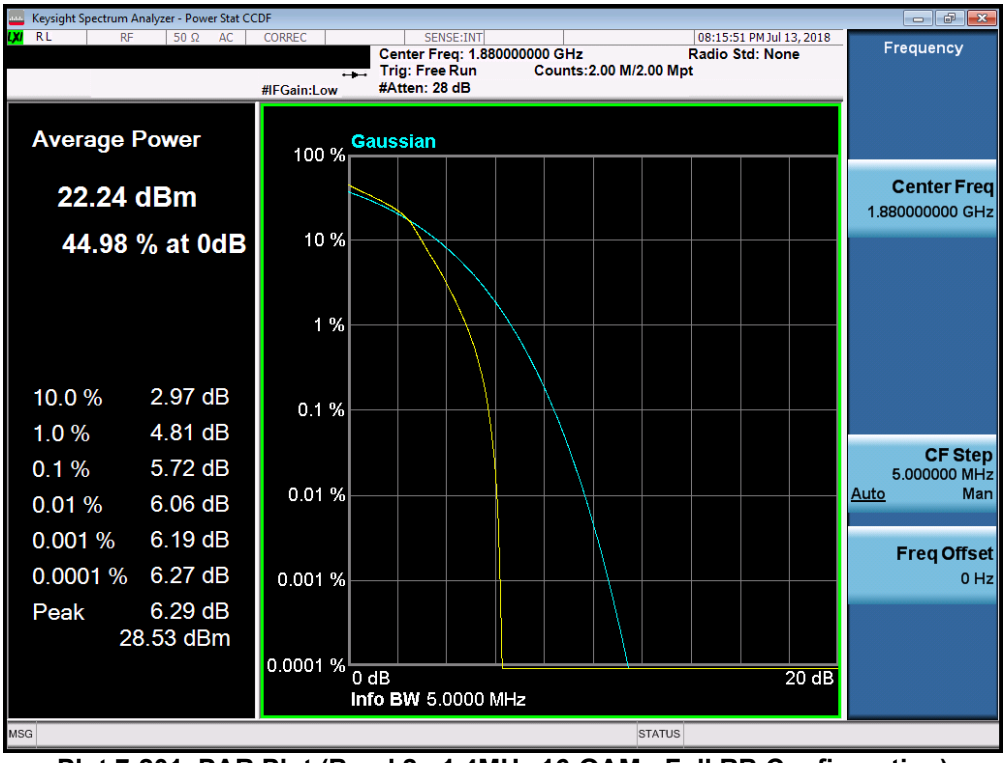
Test Notes

None.

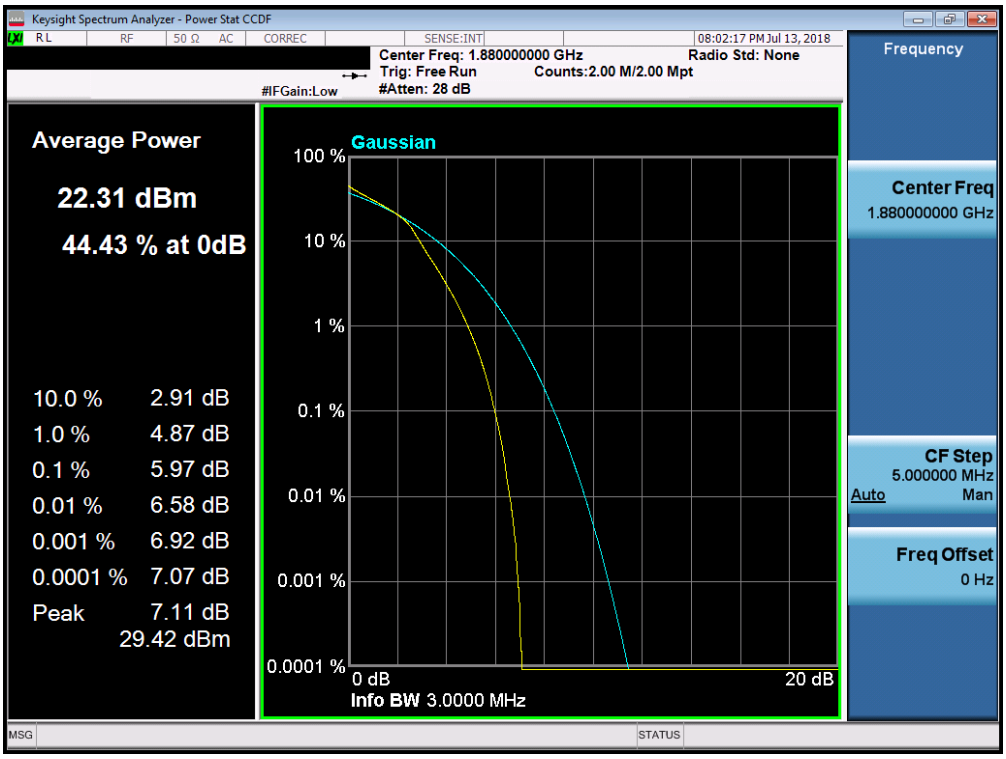
Band 2



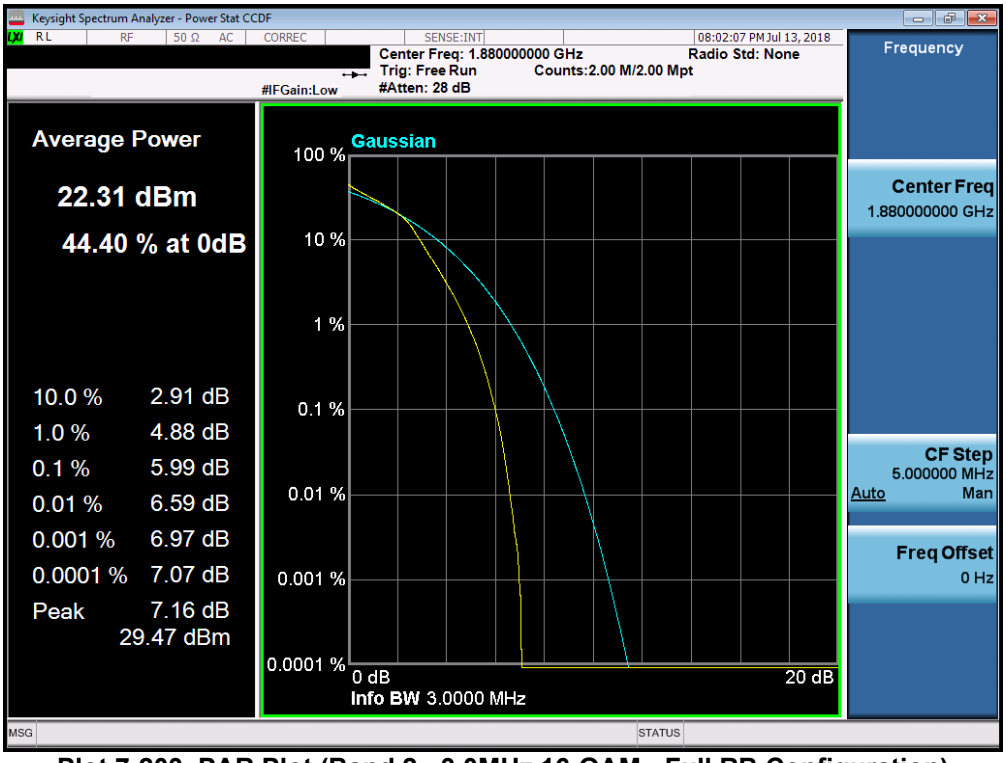
Plot 7-200. PAR Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



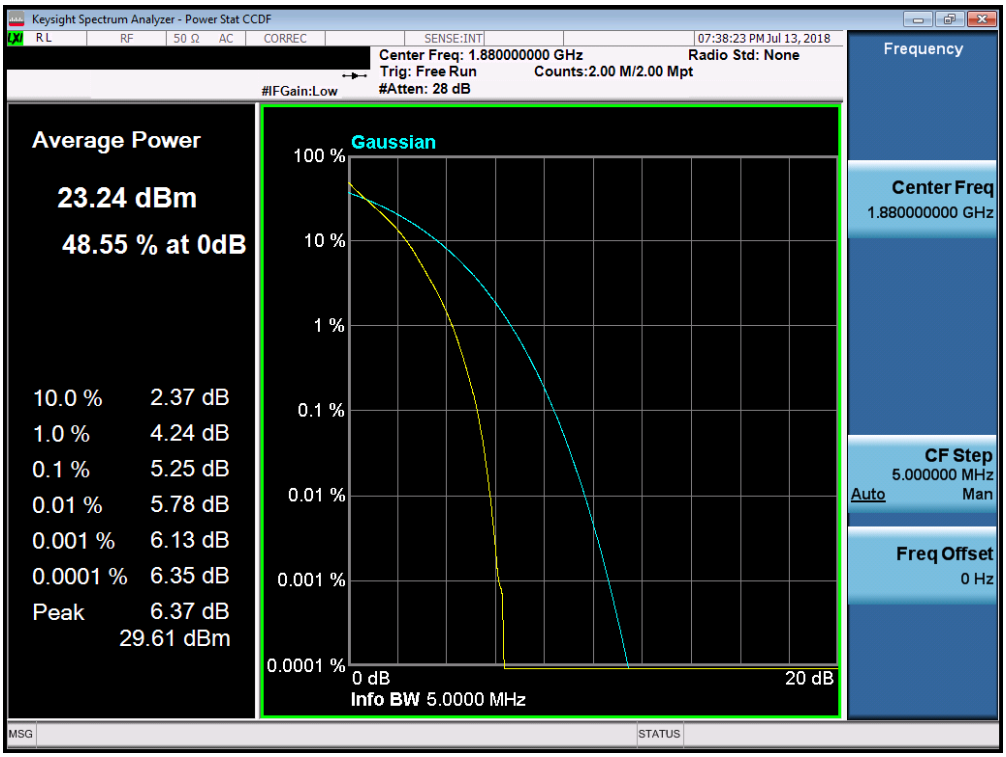
Plot 7-201. PAR Plot (Band 2 - 1.4MHz 16-QAM - Full RB Configuration)



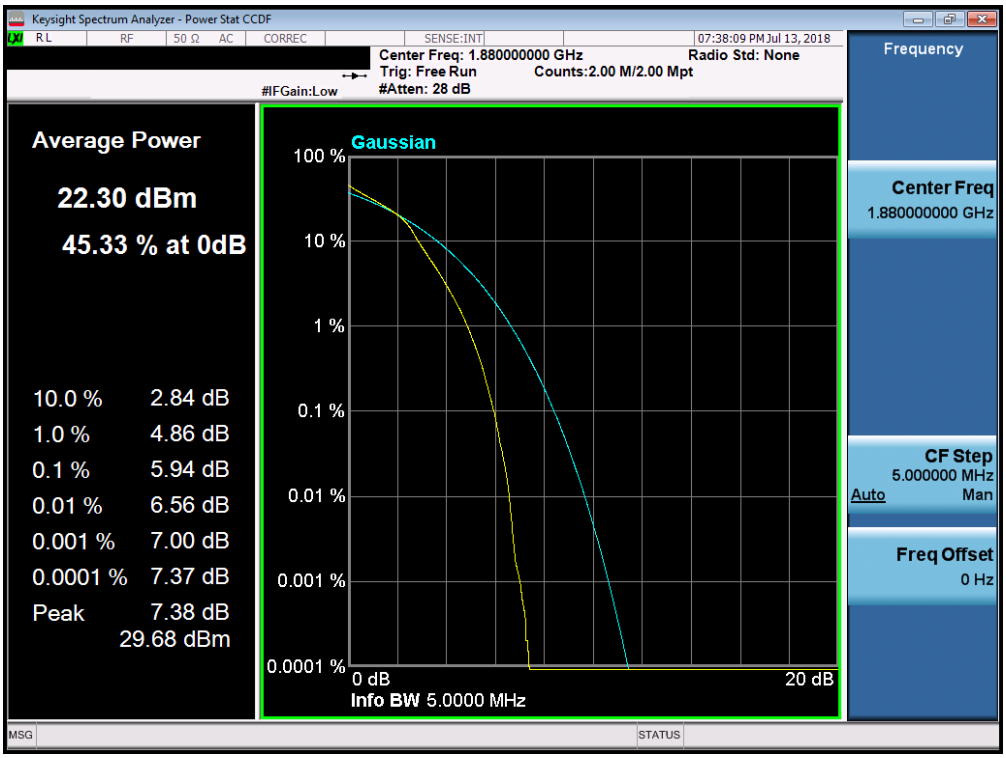
Plot 7-202. PAR Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



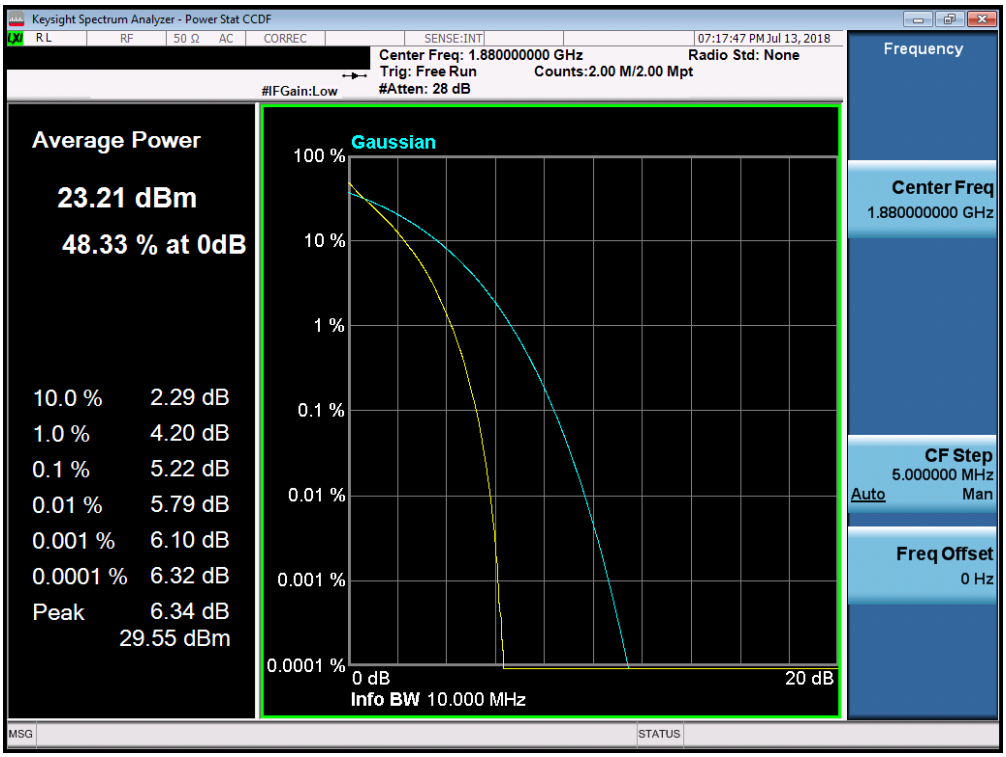
Plot 7-203. PAR Plot (Band 2 - 3.0MHz 16-QAM - Full RB Configuration)



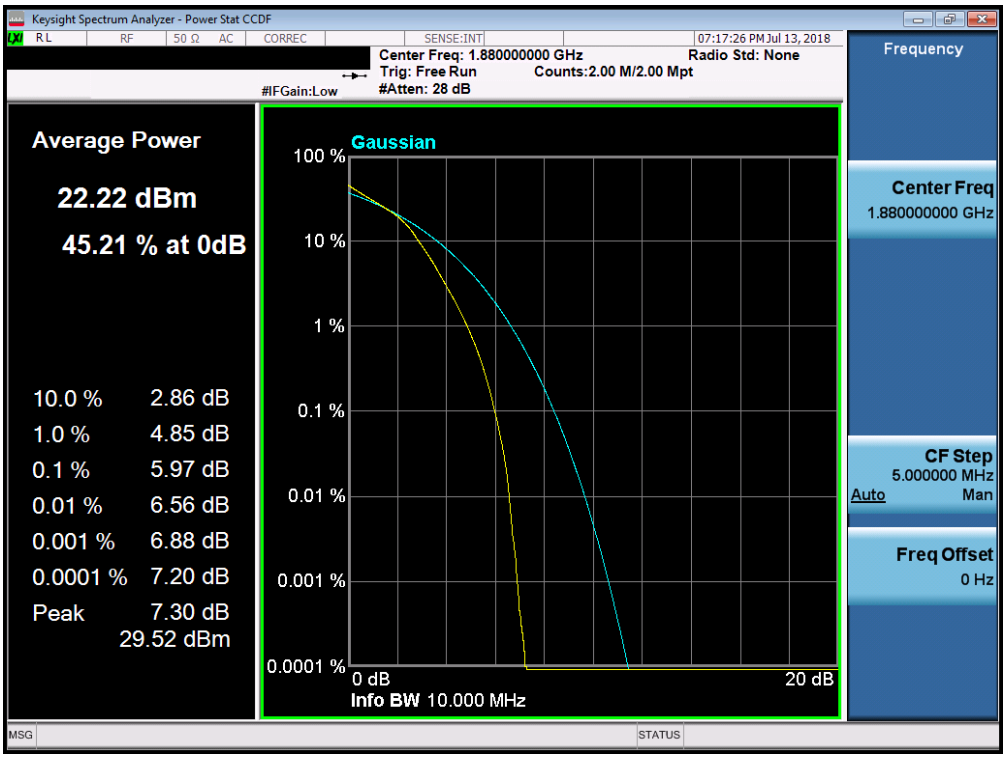
Plot 7-204. PAR Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



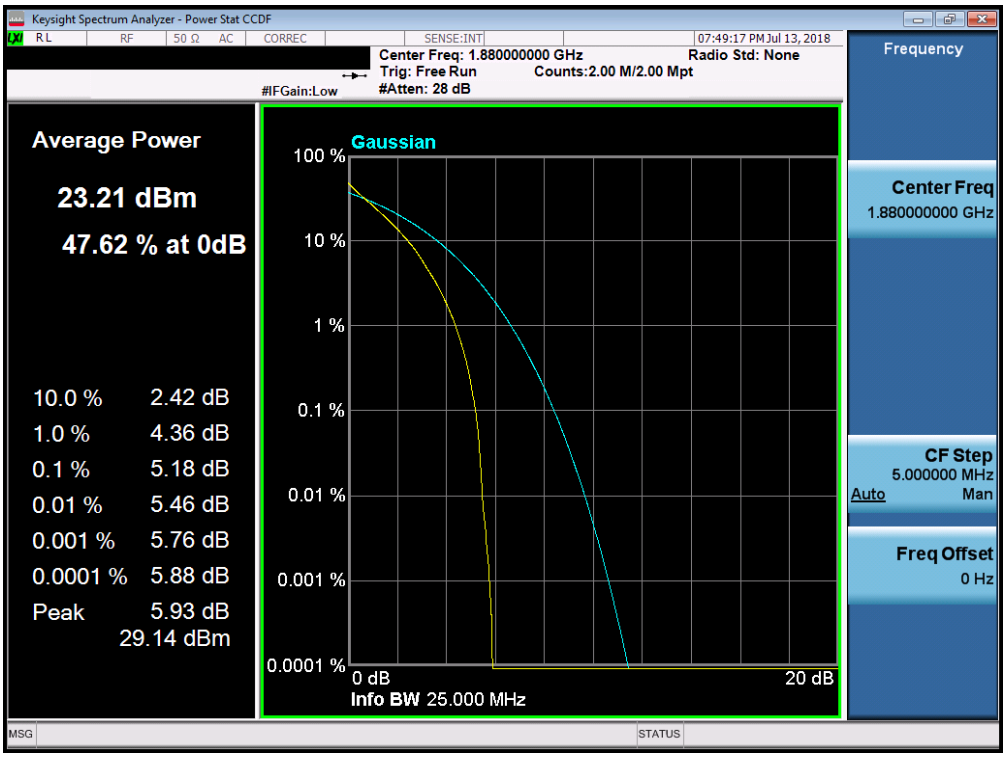
Plot 7-205. PAR Plot (Band 2 - 5.0MHz 16-QAM - Full RB Configuration)



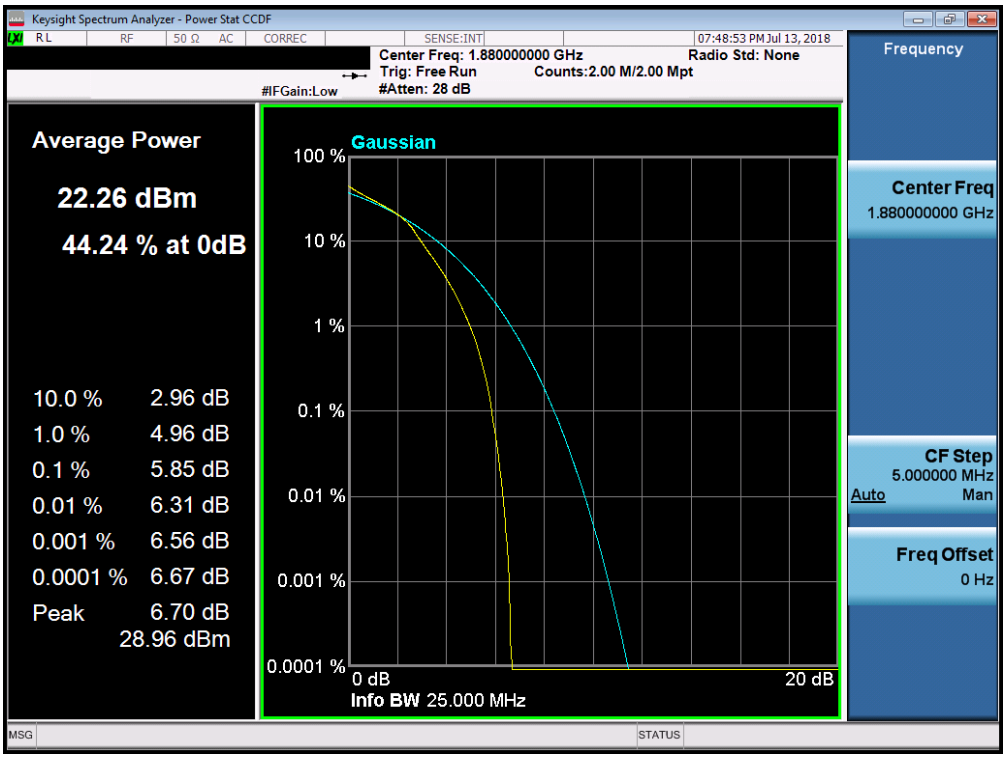
Plot 7-206. PAR Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



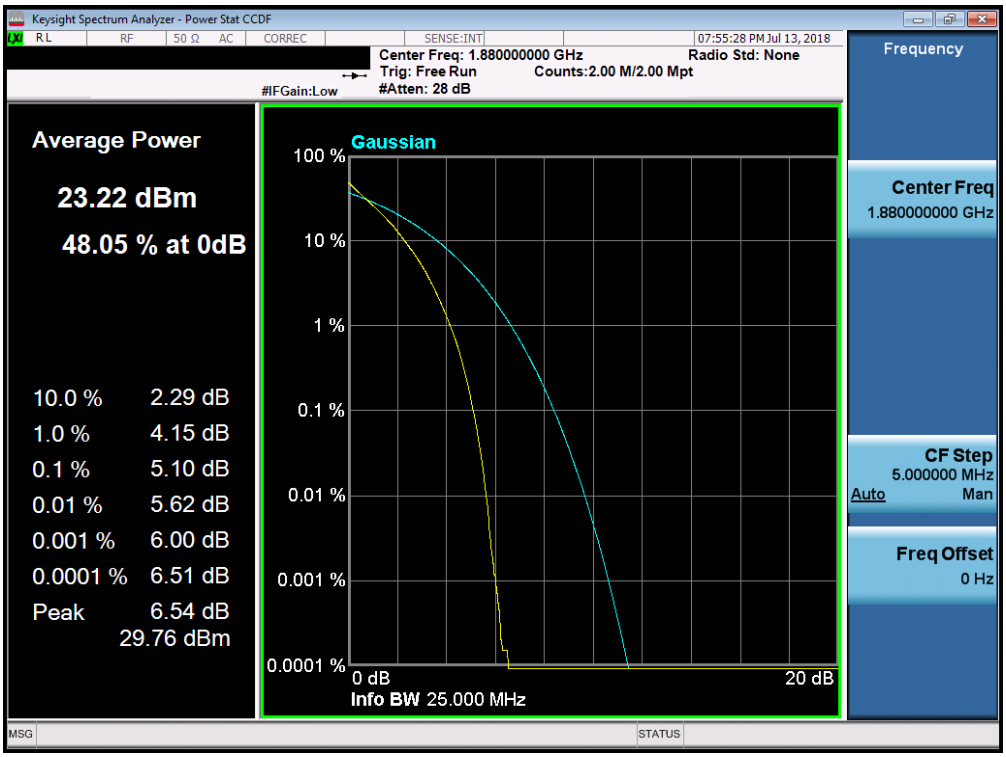
Plot 7-207. PAR Plot (Band 2 - 10.0MHz 16-QAM - Full RB Configuration)



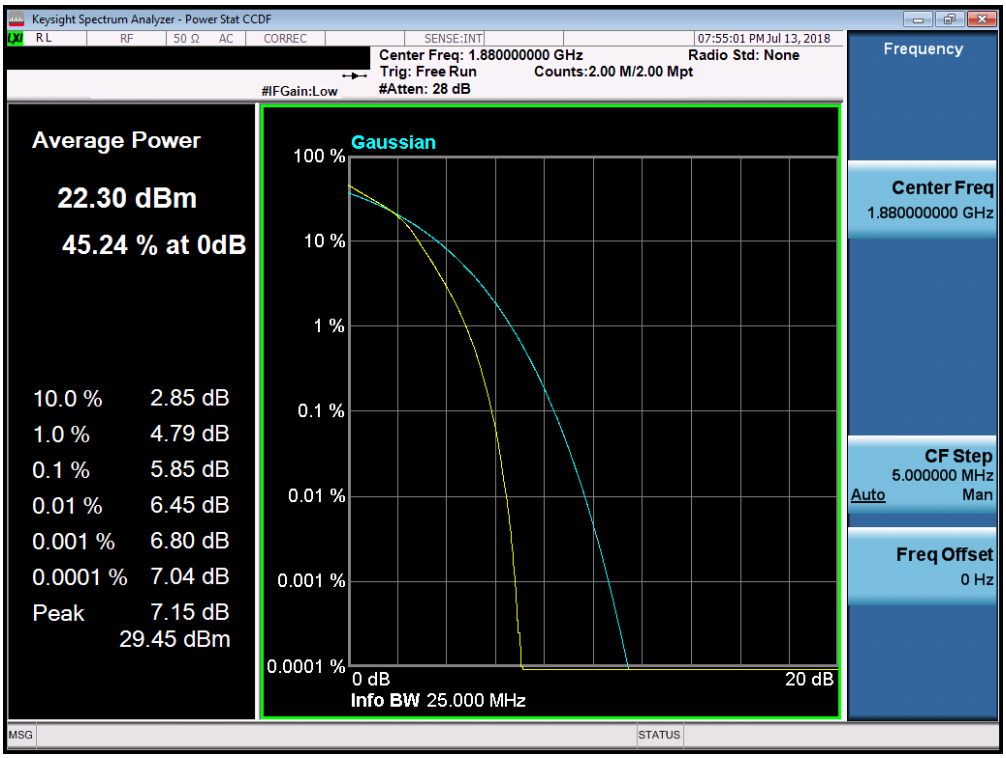
Plot 7-208. PAR Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-209. PAR Plot (Band 2 - 15.0MHz 16-QAM - Full RB Configuration)



Plot 7-210. PAR Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-211. PAR Plot (Band 2 - 20.0MHz 16-QAM - Full RB Configuration)

7.6 Radiated Power (ERP/EIRP)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

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

Test Setup

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

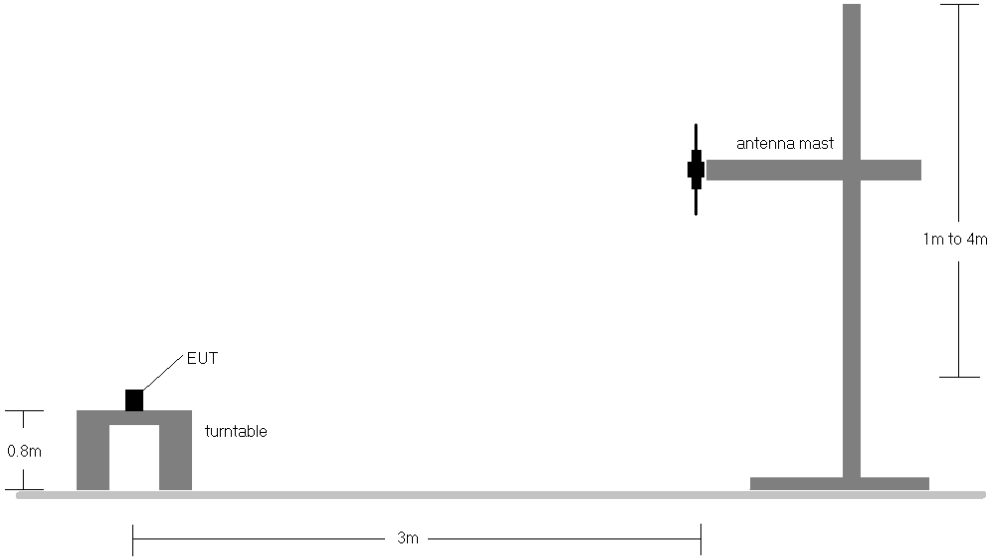


Figure 7-5. Radiated Test Setup <1GHz

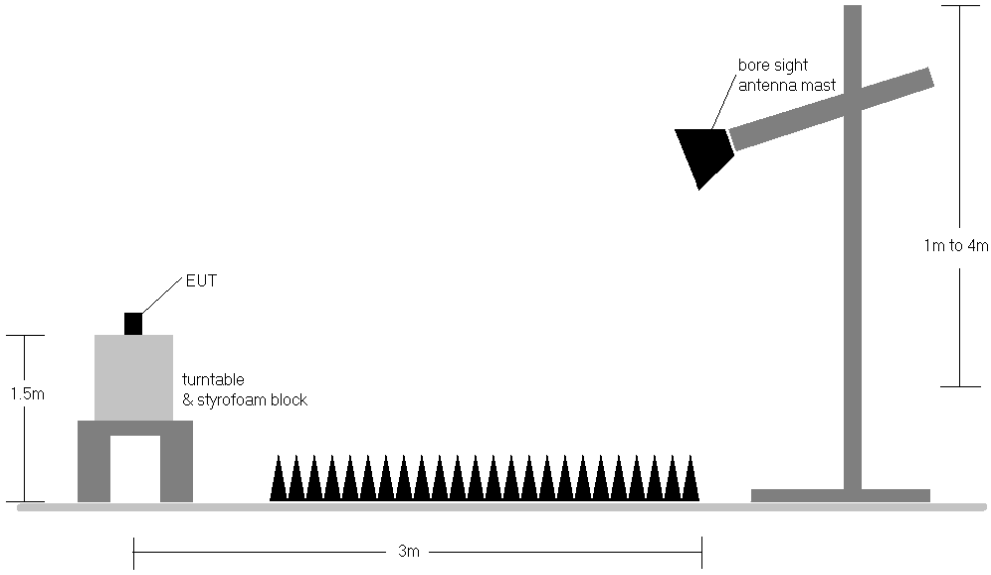


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

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

2) This unit was tested with its standard battery.

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
665.50	5	QPSK	H	150	2	1 / 24	16.68	1.10	15.63	0.037	34.77	-19.14
680.50	5	QPSK	H	150	358	1 / 24	17.56	1.10	16.51	0.045	34.77	-18.26
695.50	5	QPSK	H	150	355	1 / 24	17.69	1.10	**16.64**	0.046	34.77	-18.13
695.50	5	16-QAM	H	150	355	1 / 24	16.35	1.10	**15.30**	0.034	34.77	-19.47
668.00	10	QPSK	H	150	0	1 / 0	17.08	1.10	16.03	0.040	34.77	-18.74
680.50	10	QPSK	H	150	353	1 / 0	17.56	1.10	16.51	0.045	34.77	-18.26
693.00	10	QPSK	H	150	356	1 / 0	17.80	1.10	**16.75**	0.047	34.77	-18.02
693.00	10	16-QAM	H	150	356	1 / 0	16.73	1.10	**15.68**	0.037	34.77	-19.09
670.50	15	QPSK	H	150	351	1 / 74	16.97	1.10	15.92	0.039	34.77	-18.85
680.50	15	QPSK	H	150	1	1 / 74	17.89	1.10	16.84	0.048	34.77	-17.93
690.50	15	QPSK	H	150	1	1 / 74	18.15	1.10	**17.10**	**0.051**	34.77	-17.67
690.50	15	16-QAM	H	150	1	1 / 74	17.15	1.10	**16.10**	0.041	34.77	-18.67
673.00	20	QPSK	H	150	1	1 / 99	17.72	1.10	16.67	0.046	34.77	-18.10
680.50	20	QPSK	H	150	2	1 / 99	18.01	1.10	**16.96**	0.050	34.77	-17.81
688.00	20	QPSK	H	150	358	1 / 99	17.90	1.10	16.85	0.048	34.77	-17.92
673.00	20	16-QAM	H	150	1	1 / 99	16.69	1.10	**15.64**	0.037	34.77	-19.13
690.50	15	QPSK	V	150	82	1 / 74	16.88	1.10	15.83	0.038	34.77	-18.94

Table 7-3. ERP Data (Band 71)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	150	253	1 / 5	18.98	1.10	17.93	0.062	34.77	-16.84	20.08	0.102	36.99	-16.91
707.50	1.4	QPSK	H	150	253	1 / 5	19.23	1.13	18.21	0.066	34.77	-16.56	20.36	0.109	36.99	-16.63
715.30	1.4	QPSK	H	150	258	1 / 5	19.69	1.16	**18.70**	0.074	34.77	-16.07	**20.85**	0.122	36.99	-16.14
715.30	1.4	16-QAM	H	150	258	1 / 5	18.52	1.16	**17.53**	0.057	34.77	-17.24	**19.68**	0.093	36.99	-17.31
700.50	3	QPSK	H	150	252	1 / 14	18.70	1.10	17.65	0.058	34.77	-17.12	19.80	0.096	36.99	-17.19
707.50	3	QPSK	H	150	256	1 / 14	19.29	1.13	18.27	0.067	34.77	-16.50	20.42	0.110	36.99	-16.57
714.50	3	QPSK	H	150	255	1 / 14	19.96	1.16	**18.97**	0.079	34.77	-15.80	**21.12**	0.129	36.99	-15.87
714.50	3	16-QAM	H	150	255	1 / 14	18.96	1.16	**17.97**	0.063	34.77	-16.80	**20.12**	0.103	36.99	-16.87
701.50	5	QPSK	H	150	257	1 / 24	19.04	1.11	18.00	0.063	34.77	-16.78	20.15	0.103	36.99	-16.84
707.50	5	QPSK	H	150	253	1 / 24	19.44	1.13	18.42	0.070	34.77	-16.35	20.57	0.114	36.99	-16.42
713.50	5	QPSK	H	150	253	1 / 24	19.98	1.15	**18.98**	**0.079**	34.77	-15.79	**21.13**	**0.130**	36.99	-15.86
713.50	5	16-QAM	H	150	253	1 / 24	19.05	1.15	**18.05**	0.064	34.77	-16.72	**20.20**	0.105	36.99	-16.79
704.00	10	QPSK	H	150	254	1 / 49	19.29	1.12	18.26	0.067	34.77	-16.51	20.41	0.110	36.99	-16.58
707.50	10	QPSK	H	150	258	1 / 49	19.98	1.13	**18.96**	0.079	34.77	-15.81	**21.11**	0.129	36.99	-15.88
711.00	10	QPSK	H	150	264	1 / 49	19.73	1.14	18.72	0.075	34.77	-16.05	20.87	0.122	36.99	-16.12
707.50	10	16-QAM	H	150	258	1 / 49	18.63	1.13	**17.61**	0.058	34.77	-17.16	**19.76**	0.095	36.99	-17.23
713.50	5	QPSK	V	150	342	1 / 24	15.53	1.15	14.53	0.028	34.77	-20.24	16.68	0.047	36.99	-20.31

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]
824.70	1.4	QPSK	H	150	1	1 / 5	20.54	1.50	19.89	0.097	38.45	-18.56
836.50	1.4	QPSK	H	150	5	1 / 5	20.79	1.50	**20.14**	0.103	38.45	-18.31
848.30	1.4	QPSK	H	150	1	1 / 5	20.21	1.50	19.56	0.090	38.45	-18.89
836.50	1.4	16-QAM	H	150	5	1 / 5	19.66	1.50	**19.01**	0.080	38.45	-19.44
825.50	3	QPSK	H	150	4	1 / 14	20.81	1.50	**20.16**	0.104	38.45	-18.29
836.50	3	QPSK	H	150	8	1 / 14	20.71	1.50	20.06	0.101	38.45	-18.39
847.50	3	QPSK	H	150	5	1 / 0	20.53	1.50	19.88	0.097	38.45	-18.57
825.50	3	16-QAM	H	150	4	1 / 14	19.70	1.50	**19.05**	0.080	38.45	-19.40
826.50	5	QPSK	H	150	1	1 / 0	20.60	1.50	19.95	0.099	38.45	-18.50
836.50	5	QPSK	H	150	3	1 / 0	20.75	1.50	**20.10**	0.102	38.45	-18.35
846.50	5	QPSK	H	150	5	1 / 0	20.49	1.50	19.84	0.096	38.45	-18.61
836.50	5	16-QAM	H	150	3	1 / 0	19.78	1.50	**19.13**	0.082	38.45	-19.32
829.00	10	QPSK	H	150	5	1 / 0	20.75	1.50	20.10	0.102	38.45	-18.35
836.50	10	QPSK	H	150	5	1 / 0	20.89	1.50	**20.24**	**0.106**	38.45	-18.21
844.00	10	QPSK	H	150	1	1 / 0	20.67	1.50	20.02	0.100	38.45	-18.43
836.50	10	16-QAM	H	150	5	1 / 0	19.74	1.50	**19.09**	0.081	38.45	-19.36
836.50	10	QPSK	V	150	100	1 / 0	18.25	1.50	17.60	0.058	38.45	-20.85

Table 7-5. ERP Data (Band 5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	V	150	286	1 / 5	15.86	5.56	21.42	0.139	30.00	-8.58
1745.00	1.4	QPSK	V	150	139	1 / 5	16.77	5.32	22.09	0.162	30.00	-7.91
1779.30	1.4	QPSK	V	150	129	1 / 5	18.01	5.09	**23.10**	0.204	30.00	-6.90
1779.30	1.4	16-QAM	V	150	129	1 / 5	16.91	5.09	**22.00**	0.159	30.00	-8.00
1711.50	3	QPSK	V	150	290	1 / 14	13.94	5.55	19.49	0.089	30.00	-10.51
1745.00	3	QPSK	V	150	131	1 / 14	17.94	5.32	**23.26**	0.212	30.00	-6.74
1778.50	3	QPSK	V	150	276	1 / 14	15.59	5.10	20.69	0.117	30.00	-9.31
1745.00	3	16-QAM	V	150	131	1 / 14	16.43	5.32	**21.75**	0.150	30.00	-8.25
1712.50	5	QPSK	V	150	290	1 / 24	14.96	5.55	20.51	0.112	30.00	-9.49
1745.00	5	QPSK	V	150	129	1 / 24	17.89	5.32	**23.21**	0.210	30.00	-6.79
1777.50	5	QPSK	V	150	226	1 / 24	17.78	5.10	22.88	0.194	30.00	-7.12
1745.00	5	16-QAM	V	150	129	1 / 24	16.56	5.32	**21.88**	0.154	30.00	-8.12
1715.00	10	QPSK	V	150	131	1 / 49	17.49	5.53	23.02	0.200	30.00	-6.98
1745.00	10	QPSK	V	150	131	1 / 49	17.96	5.32	**23.28**	0.213	30.00	-6.72
1775.00	10	QPSK	V	150	127	1 / 49	18.03	5.12	23.15	0.207	30.00	-6.85
1775.00	10	16-QAM	V	150	127	1 / 49	16.71	5.12	**21.83**	0.152	30.00	-8.17
1717.50	15	QPSK	V	150	137	1 / 74	17.78	5.51	23.29	0.213	30.00	-6.71
1745.00	15	QPSK	V	150	130	1 / 74	18.04	5.32	23.36	0.217	30.00	-6.64
1772.50	15	QPSK	V	150	127	1 / 74	18.33	5.14	**23.47**	**0.222**	30.00	-6.53
1772.50	15	16-QAM	V	150	127	1 / 74	16.88	5.14	**22.02**	0.159	30.00	-7.98
1720.00	20	QPSK	V	150	137	1 / 99	17.46	5.49	22.95	0.197	30.00	-7.05
1745.00	20	QPSK	V	150	130	1 / 99	17.86	5.32	**23.18**	0.208	30.00	-6.82
1770.00	20	QPSK	V	150	286	1 / 99	15.56	5.15	20.71	0.118	30.00	-9.29
1720.00	20	16-QAM	V	150	137	1 / 99	16.25	5.49	**21.74**	0.149	30.00	-8.26
1772.50	15	QPSK	H	150	186	1 / 74	18.27	5.14	23.41	0.219	30.00	-6.59

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

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	150	207	1 / 0	17.36	4.82	22.18	0.165	33.01	-10.83
1880.00	1.4	QPSK	H	150	204	1 / 0	17.49	4.74	**22.23**	0.167	33.01	-10.78
1909.30	1.4	QPSK	H	150	210	1 / 0	16.29	4.68	20.97	0.125	33.01	-12.04
1880.00	1.4	16-QAM	H	150	204	1 / 0	16.11	4.74	**20.85**	0.122	33.01	-12.16
1851.50	3	QPSK	H	150	203	1 / 0	17.48	4.82	22.30	0.170	33.01	-10.71
1880.00	3	QPSK	H	150	203	1 / 0	17.66	4.74	**22.40**	0.174	33.01	-10.61
1908.50	3	QPSK	H	150	210	1 / 0	16.44	4.68	21.12	0.129	33.01	-11.89
1851.50	3	16-QAM	H	150	203	1 / 0	16.12	4.82	**20.94**	0.124	33.01	-12.07
1852.50	5	QPSK	H	150	208	1 / 0	17.41	4.81	**22.22**	0.167	33.01	-10.79
1880.00	5	QPSK	H	150	201	1 / 0	17.30	4.74	22.04	0.160	33.01	-10.97
1907.50	5	QPSK	H	150	208	1 / 0	16.55	4.68	21.23	0.133	33.01	-11.78
1852.50	5	16-QAM	H	150	208	1 / 0	16.17	4.81	**20.98**	0.125	33.01	-12.03
1855.00	10	QPSK	H	150	210	1 / 0	17.61	4.81	22.42	0.174	33.01	-10.59
1880.00	10	QPSK	H	150	203	1 / 0	17.80	4.74	**22.54**	0.179	33.01	-10.47
1905.00	10	QPSK	H	150	206	1 / 0	16.38	4.68	21.06	0.128	33.01	-11.95
1880.00	10	16-QAM	H	150	203	1 / 0	16.35	4.74	**21.09**	0.129	33.01	-11.92
1857.50	15	QPSK	H	150	202	1 / 0	17.54	4.80	22.34	0.171	33.01	-10.67
1880.00	15	QPSK	H	150	206	1 / 0	18.02	4.74	**22.76**	**0.189**	33.01	-10.25
1902.50	15	QPSK	H	150	205	1 / 0	16.65	4.69	21.34	0.136	33.01	-11.67
1880.00	15	16-QAM	H	150	206	1 / 0	16.63	4.74	**21.37**	0.137	33.01	-11.64
1860.00	20	QPSK	H	150	215	1 / 0	17.35	4.79	22.14	0.164	33.01	-10.87
1880.00	20	QPSK	H	150	219	1 / 0	17.47	4.74	**22.21**	0.166	33.01	-10.80
1900.00	20	QPSK	H	150	229	1 / 0	16.74	4.69	21.43	0.139	33.01	-11.58
1880.00	20	16-QAM	H	150	219	1 / 0	16.33	4.74	**21.07**	0.128	33.01	-11.94
1880.00	15	QPSK	V	150	216	1 / 0	16.72	4.74	21.46	0.140	33.01	-11.55

Table 7-7. EIRP Data (Band 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]
2502.50	5	QPSK	H	150	189	1 / 24	11.88	5.74	17.62	0.058	33.01	-15.39
2535.00	5	QPSK	H	150	193	1 / 24	13.69	5.86	19.55	0.090	33.01	-13.46
2567.50	5	QPSK	H	150	192	1 / 24	14.18	5.98	**20.16**	0.104	33.01	-12.85
2567.50	5	16-QAM	H	150	192	1 / 24	12.95	5.98	**18.93**	0.078	33.01	-14.08
2505.00	10	QPSK	H	150	190	1 / 49	12.03	5.75	17.78	0.060	33.01	-15.23
2535.00	10	QPSK	H	150	190	1 / 49	13.82	5.86	19.68	0.093	33.01	-13.33
2565.00	10	QPSK	H	150	193	1 / 49	14.64	5.97	**20.61**	**0.115**	33.01	-12.40
2565.00	10	16-QAM	H	150	193	1 / 49	13.60	5.97	**19.57**	0.091	33.01	-13.44
2507.50	15	QPSK	H	150	192	1 / 74	12.45	5.76	18.21	0.066	33.01	-14.80
2535.00	15	QPSK	H	150	192	1 / 74	13.71	5.86	19.57	0.091	33.01	-13.44
2562.50	15	QPSK	H	150	194	1 / 74	14.24	5.96	**20.20**	0.105	33.01	-12.81
2535.00	15	16-QAM	H	150	192	1 / 74	12.94	5.86	**18.80**	0.076	33.01	-14.21
2510.00	20	QPSK	H	150	192	1 / 99	13.15	5.77	18.92	0.078	33.01	-14.09
2535.00	20	QPSK	H	150	192	1 / 99	14.09	5.86	19.95	0.099	33.01	-13.06
2560.00	20	QPSK	H	150	194	1 / 99	14.25	5.95	**20.20**	0.105	33.01	-12.81
2560.00	20	16-QAM	H	150	194	1 / 99	12.74	5.95	**18.69**	0.074	33.01	-14.32
2565.00	10	QPSK	V	150	278	1 / 49	11.55	5.97	17.52	0.057	33.01	-15.49

Table 7-8. EIRP Data (Band 7)

7.7 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

Test Setup

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

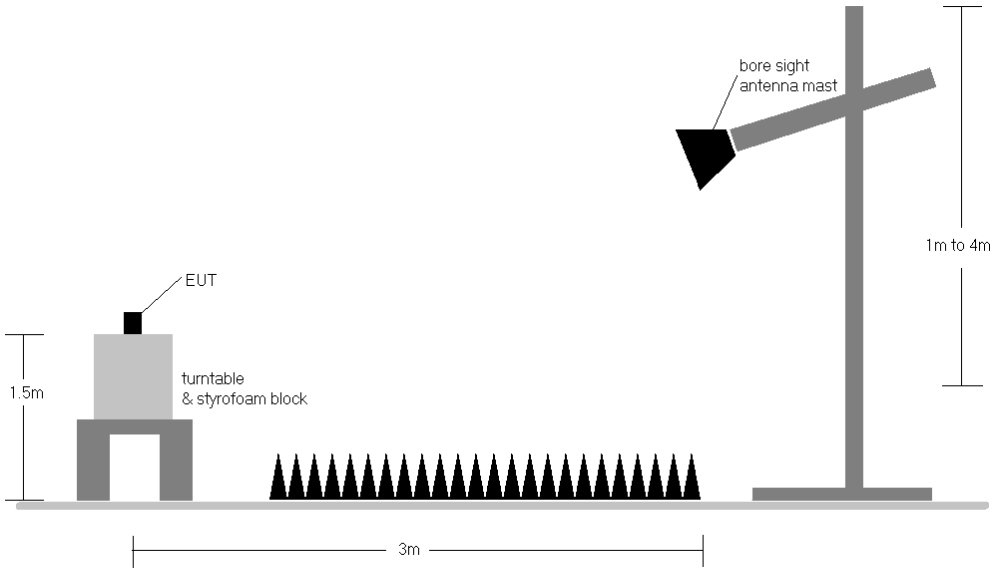


Figure 7-7. Test Instrument & Measurement Setup

Test Notes

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

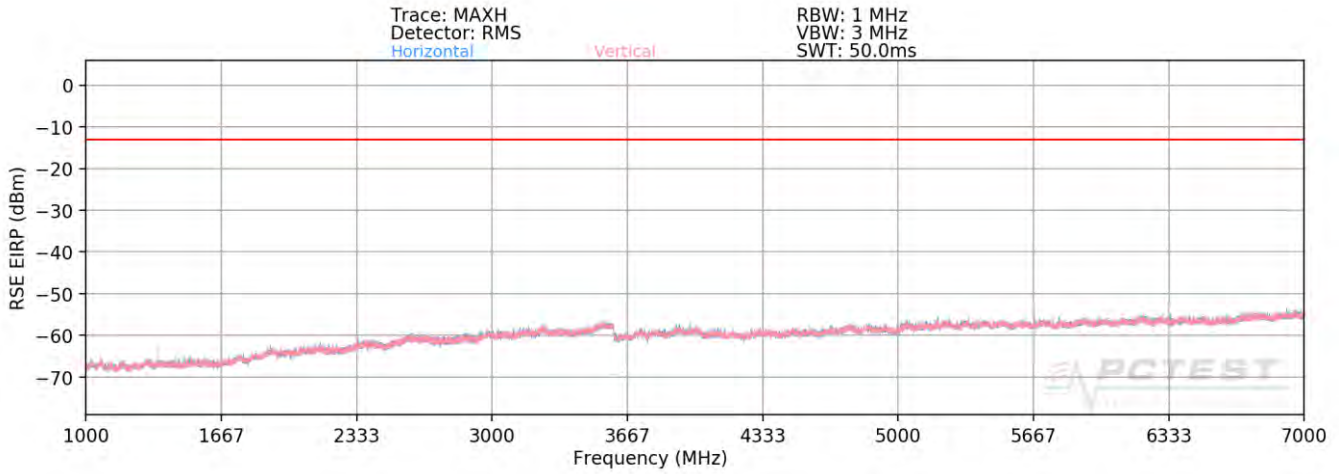
2) This unit was tested with its standard battery.

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

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

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

Band 71



Plot 7-212. Radiated Spurious Plot above 1GHz (Band 71)

OPERATING FREQUENCY:	670.50	MHz
CHANNEL:	133197	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15MHz	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]
1341.00	H	160	340	-69.64	3.90	-65.73	-52.7
2011.50	H	161	139	-67.20	4.75	-62.46	-49.5
2682.00	H	-	-	-69.24	5.35	-63.90	-50.9

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

OPERATING FREQUENCY:	680.50	MHz
CHANNEL:	133297	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15MHz	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	165	345	-72.14	3.90	-68.24	-55.2
2041.50	H	130	133	-66.01	4.78	-61.23	-48.2
2722.00	H	-	-	-68.97	5.49	-63.48	-50.5

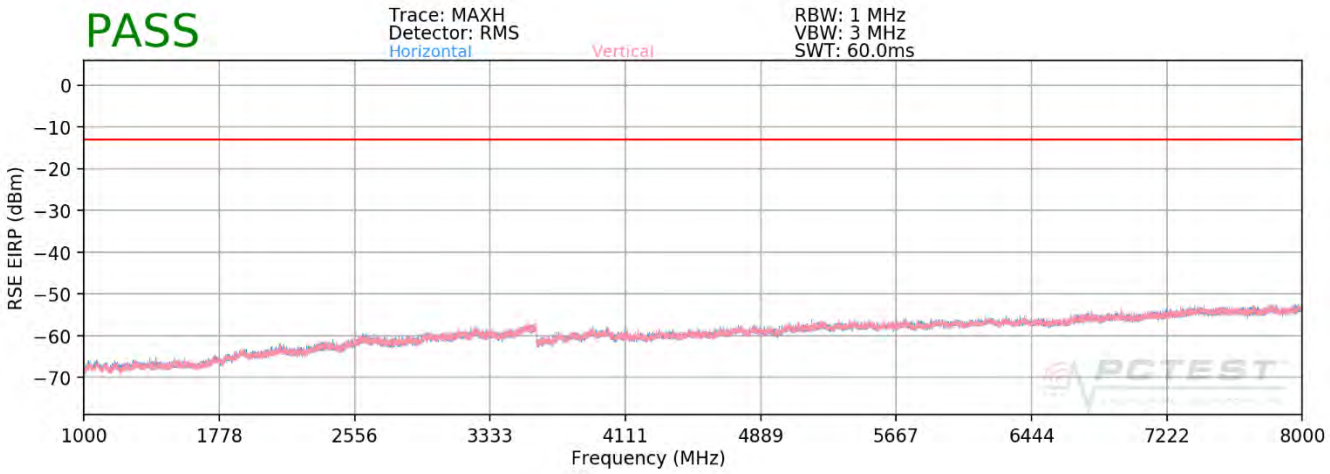
Table 7-10. Radiated Spurious Data (Band 71 – Mid Channel)

OPERATING FREQUENCY:	690.50	MHz
CHANNEL:	133397	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15MHz	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]
1381.00	H	174	146	-71.28	3.83	-67.44	-54.4
2071.50	H	118	148	-63.44	4.79	-58.65	-45.7
2762.00	H	-	-	-68.91	5.67	-63.23	-50.2

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

Band 12



Plot 7-213. 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	144	258	-57.37	7.94	-49.42	-36.4
2104.50	H	135	225	-57.02	8.90	-48.12	-35.1
2806.00	H	-	-	-68.40	10.07	-58.33	-45.3
3507.50	H	-	-	-64.47	9.67	-54.80	-41.8

Table 7-12. 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	H	140	250	-72.63	8.09	-64.54	-51.5
2122.50	H	144	230	-71.66	8.88	-62.78	-49.8
2830.00	H	-	-	-71.81	10.13	-61.68	-48.7

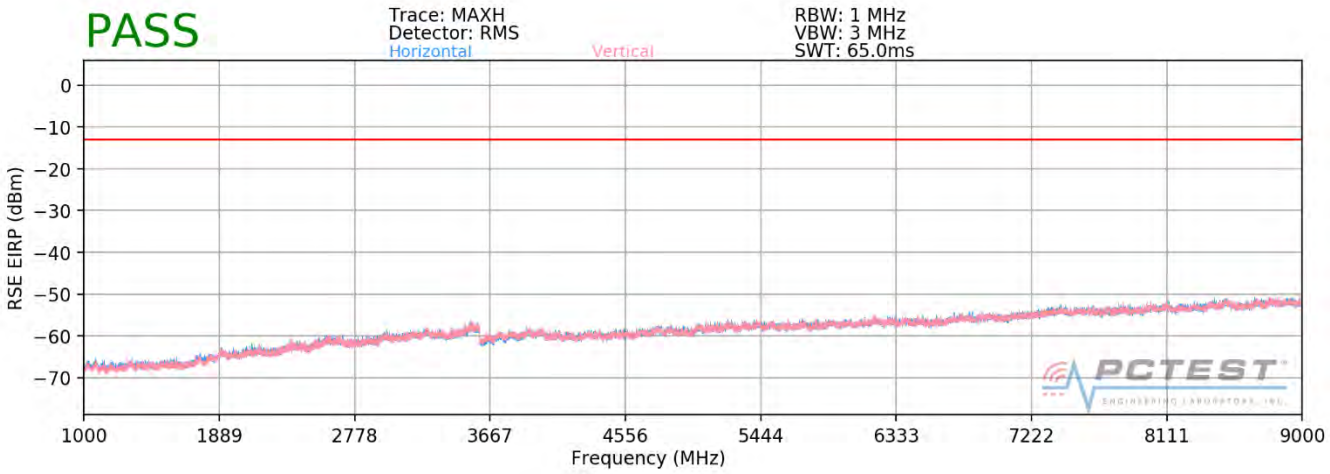
Table 7-13. Radiated Spurious Data (Band 12 – Mid Channel)

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	237	207	-54.38	8.23	-46.16	-33.2
2140.50	H	130	225	-56.01	8.86	-47.16	-34.2
2854.00	H	-	-	-69.35	10.18	-59.17	-46.2
3567.50	H	-	-	-64.97	9.75	-55.23	-42.2

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

Band 5



Plot 7-214. Radiated Spurious Plot above 1GHz (Band 5)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	H	-	-	-70.93	4.83	-66.10	-53.1
2487.00	H	-	-	-68.39	5.02	-63.37	-50.4

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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	-	-	-71.64	4.86	-66.78	-53.8
2509.50	H	-	-	-68.80	5.10	-63.70	-50.7

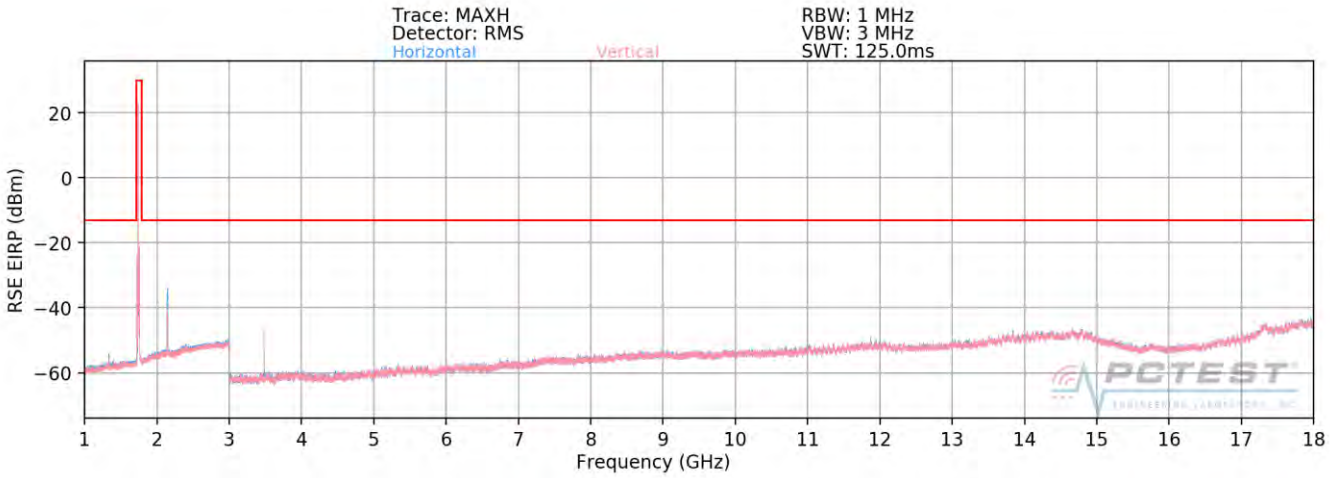
Table 7-16. Radiated Spurious Data (Band 5 – Mid Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	H	-	-	-70.85	4.89	-65.95	-53.0
2532.00	H	-	-	-68.09	5.21	-62.88	-49.9

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

Band 66/4



Plot 7-215. 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	H	150	181	-60.04	9.84	-50.20	-37.2
5152.50	H	116	169	-71.33	10.70	-60.63	-47.6
6870.00	H	-	-	-70.37	11.67	-58.70	-45.7

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

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	H	120	190	-66.19	9.91	-56.28	-43.3
5235.00	H	152	212	-71.23	10.73	-60.49	-47.5
6980.00	H	-	-	-71.34	11.82	-59.52	-46.5

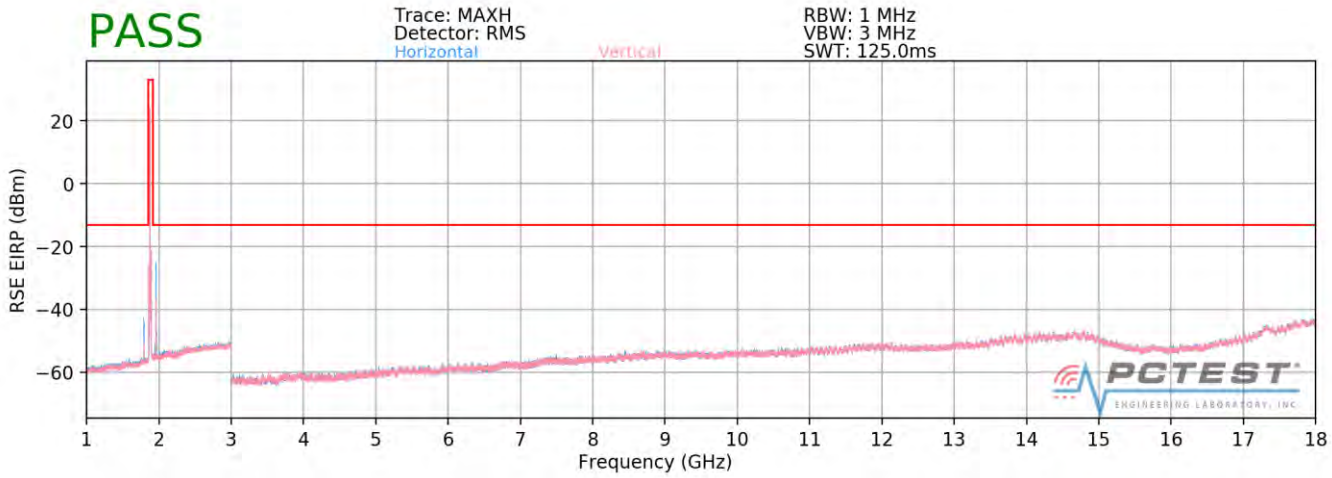
Table 7-19. Radiated Spurious Data (Band 66/4 – Mid Channel)

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	H	112	189	-60.96	9.89	-51.07	-38.1
5317.50	H	158	209	-70.52	10.69	-59.83	-46.8

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

Band 2



Plot 7-216. Radiated Spurious Plot above 1GHz (Band 2)

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	H	-	-	-55.66	6.78	-48.89	-35.9
5572.50	H	-	-	-53.29	8.44	-44.85	-31.8

Table 7-21. Radiated Spurious Data (Band 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	H	-	-	-54.49	6.84	-47.65	-34.7
5640.00	H	-	-	-54.19	8.52	-45.68	-32.7

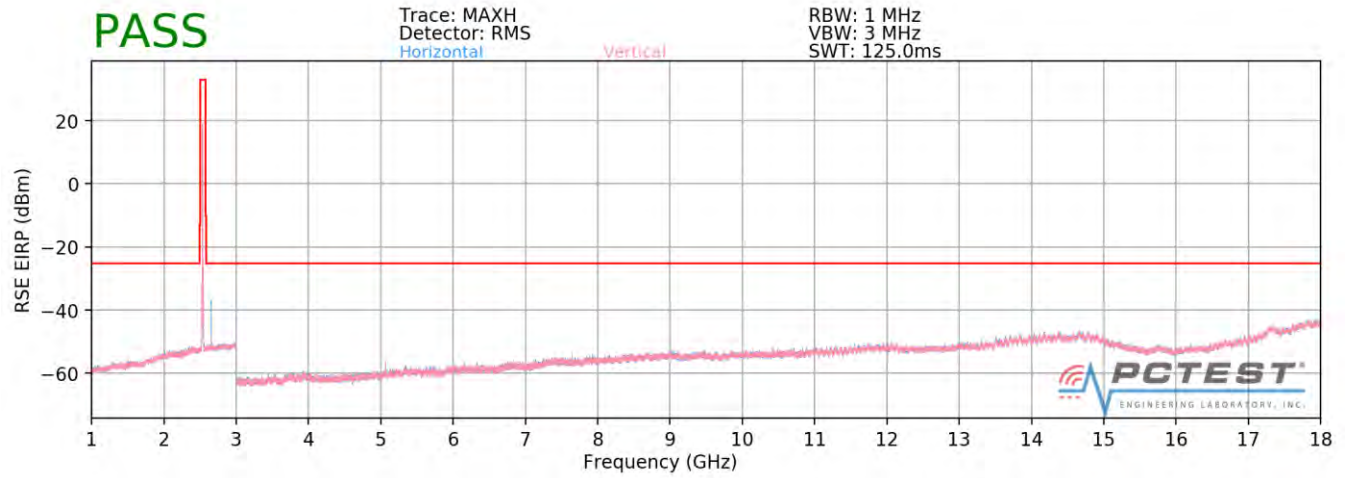
Table 7-22. Radiated Spurious Data (Band 2 – Mid Channel)

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

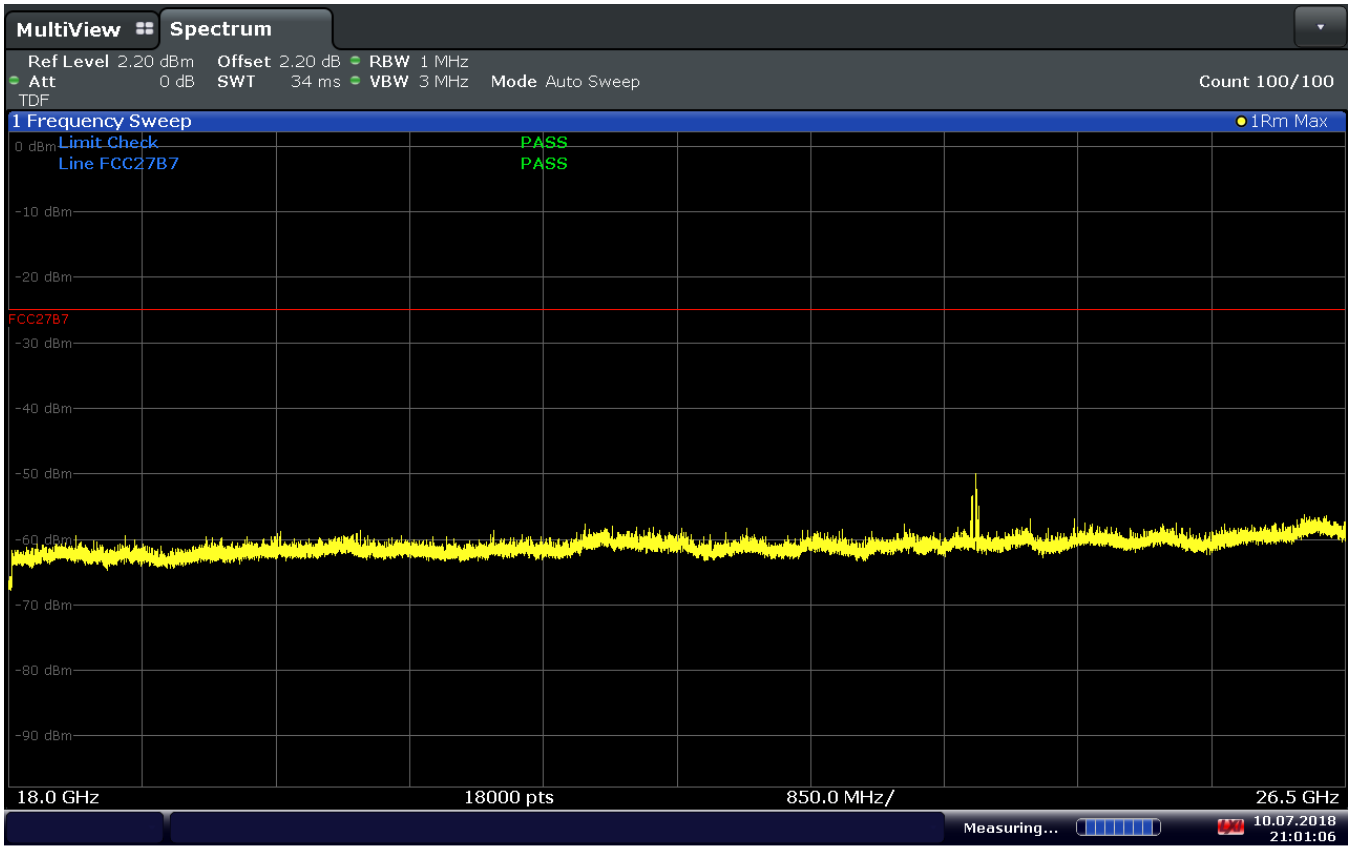
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3805.00	H	-	-	-54.04	6.95	-47.09	-34.1
5707.50	H	-	-	-52.95	8.57	-44.38	-31.4

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

Band 7

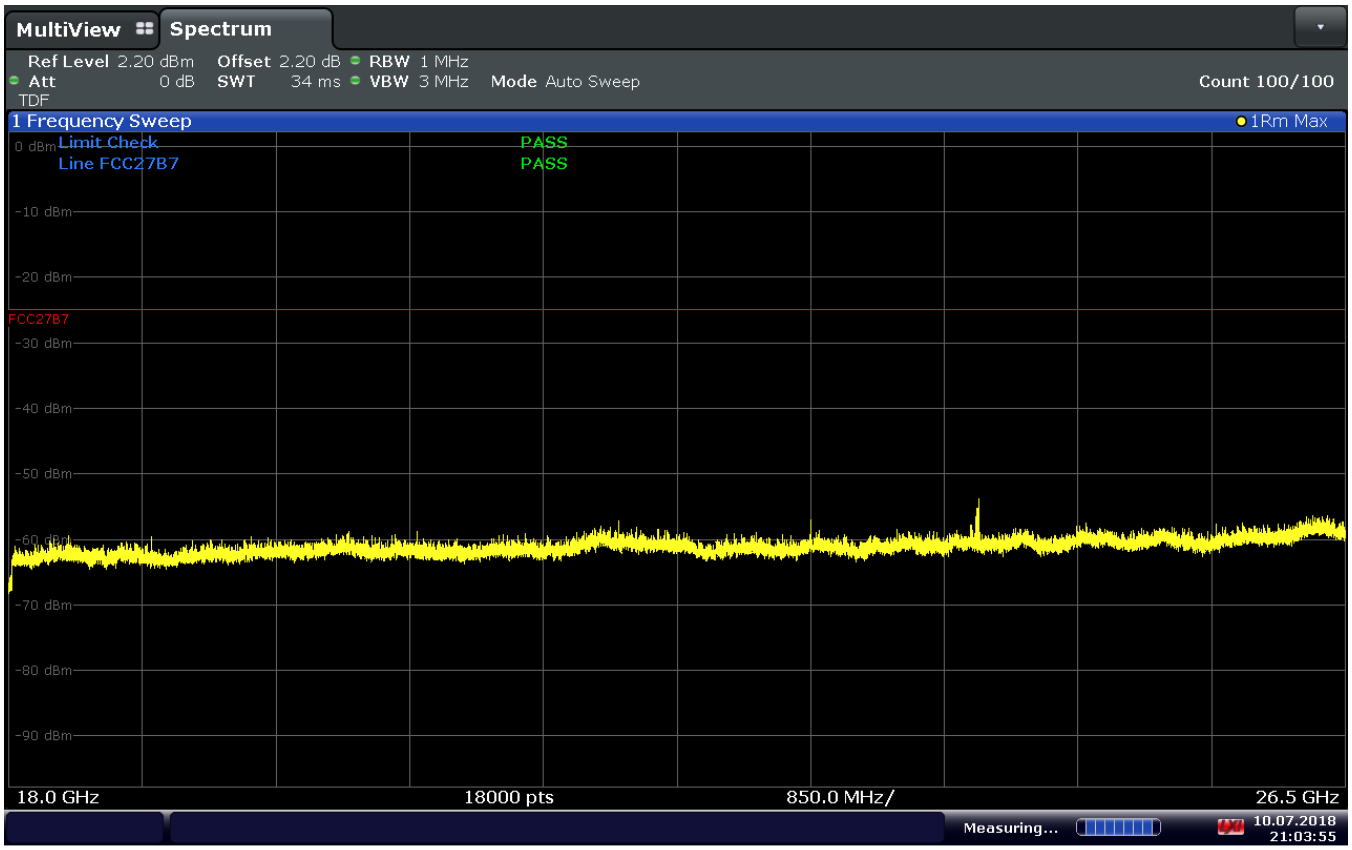


Plot 7-217. Radiated Spurious Plot 1GHz - 18GHz (Band 7)



21:01:07 10.07.2018

Plot 7-218. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7), H Pol.



21:03:56 10.07.2018

Plot 7-219. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7), V Pol.

OPERATING FREQUENCY:	2505.00	MHz
CHANNEL:	20800	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5010.00	H	111	291	-73.18	10.91	-62.28	-37.3
7515.00	H	369	281	-70.18	11.10	-59.08	-34.1
10020.00	H	388	193	-69.76	11.99	-57.77	-32.8
12525.00	H	-	-	-70.96	13.56	-57.40	-32.4

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

OPERATING FREQUENCY:	2535.00	MHz
CHANNEL:	21100	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5070.00	H	113	287	-73.45	10.75	-62.70	-37.7
7605.00	H	116	286	-69.52	11.25	-58.27	-33.3
10140.00	H	393	181	-69.85	12.07	-57.77	-32.8
12675.00	H	-	-	-70.41	13.66	-56.75	-31.7

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

OPERATING FREQUENCY:	2565.00	MHz
CHANNEL:	21400	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5130.00	H	-	-	-74.01	10.69	-63.32	-38.3
7695.00	H	116	249	-68.80	11.41	-57.39	-32.4
10260.00	H	-	-	-70.17	12.20	-57.97	-33.0

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

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

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

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

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

None

Band 71 Frequency Stability Measurements

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	680,499,809	-191	-0.0000281
100 %		- 30	680,499,843	-157	-0.0000231
100 %		- 20	680,499,899	-101	-0.0000148
100 %		- 10	680,499,831	-169	-0.0000248
100 %		0	680,499,862	-138	-0.0000203
100 %		+ 10	680,499,885	-115	-0.0000169
100 %		+ 20	680,499,804	-196	-0.0000288
100 %		+ 30	680,499,841	-159	-0.0000234
100 %		+ 40	680,499,825	-175	-0.0000257
100 %		+ 50	680,499,881	-119	-0.0000174
BATT. ENDPOINT	3.57	+ 20	680,499,912	-88	-0.0000130

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.

Band 71 Frequency Stability Measurements

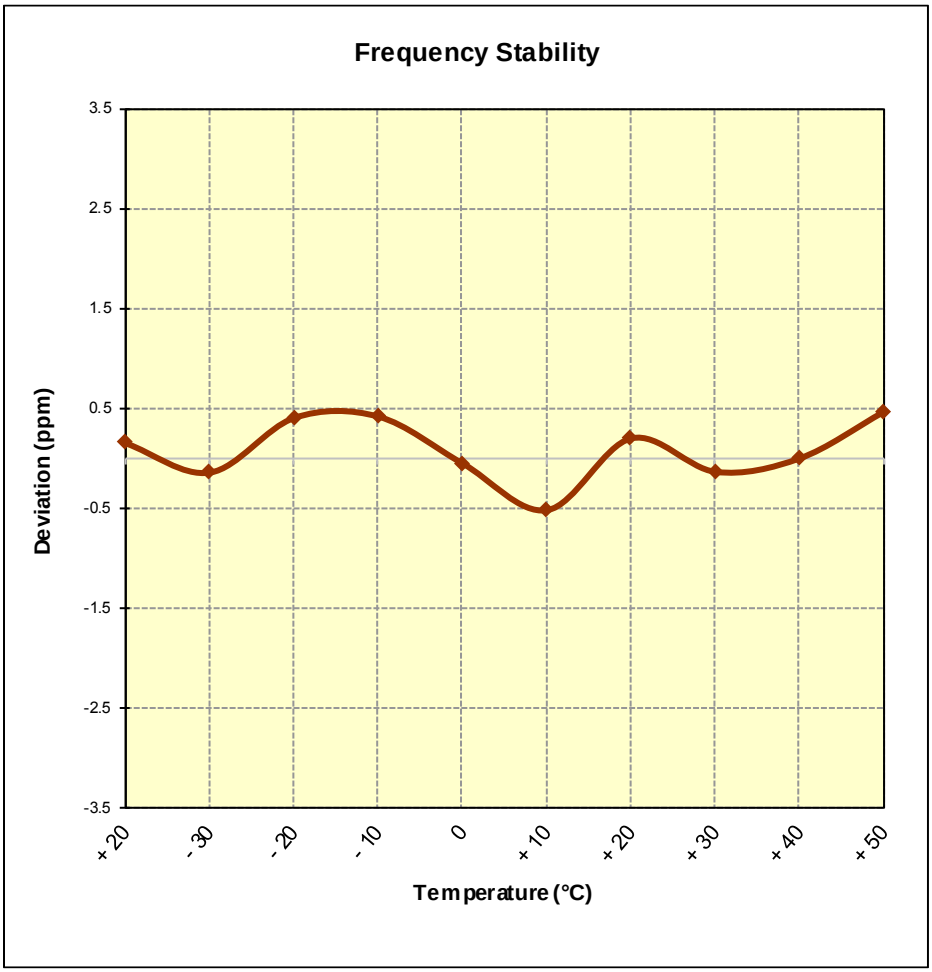


Figure 7-8. Frequency Stability Graph (Band 71)

Band 12 Frequency Stability Measurements

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	707,500,110	110	0.0000155
100 %		- 30	707,499,902	-98	-0.0000139
100 %		- 20	707,500,290	290	0.0000410
100 %		- 10	707,500,299	299	0.0000423
100 %		0	707,499,966	-34	-0.0000048
100 %		+ 10	707,499,635	-365	-0.0000516
100 %		+ 20	707,500,145	145	0.0000205
100 %		+ 30	707,499,907	-93	-0.0000131
100 %		+ 40	707,500,003	3	0.0000004
100 %		+ 50	707,500,334	334	0.0000472
BATT. ENDPOINT	3.57	+ 20	707,500,298	298	0.0000421

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.

Band 12 Frequency Stability Measurements

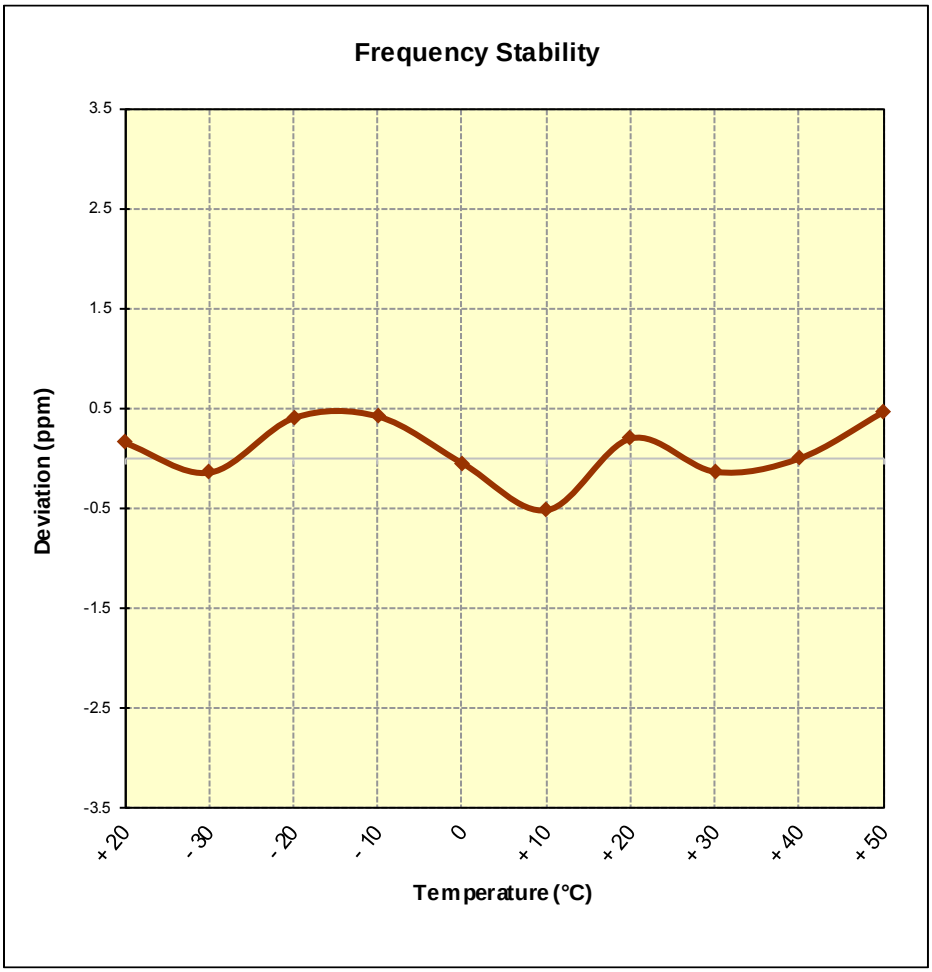


Figure 7-9. Frequency Stability Graph (Band 12)

Band 5 Frequency Stability Measurements

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	836,499,950	-50	-0.0000060
100 %		- 30	836,499,890	-110	-0.0000132
100 %		- 20	836,499,948	-52	-0.0000063
100 %		- 10	836,499,807	-193	-0.0000231
100 %		0	836,499,957	-43	-0.0000052
100 %		+ 10	836,499,817	-183	-0.0000219
100 %		+ 20	836,499,838	-162	-0.0000194
100 %		+ 30	836,499,940	-60	-0.0000071
100 %		+ 40	836,499,828	-172	-0.0000205
100 %		+ 50	836,499,978	-22	-0.0000026
BATT. ENDPOINT	3.57	+ 20	836,499,824	-176	-0.0000210

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

Band 5 Frequency Stability Measurements

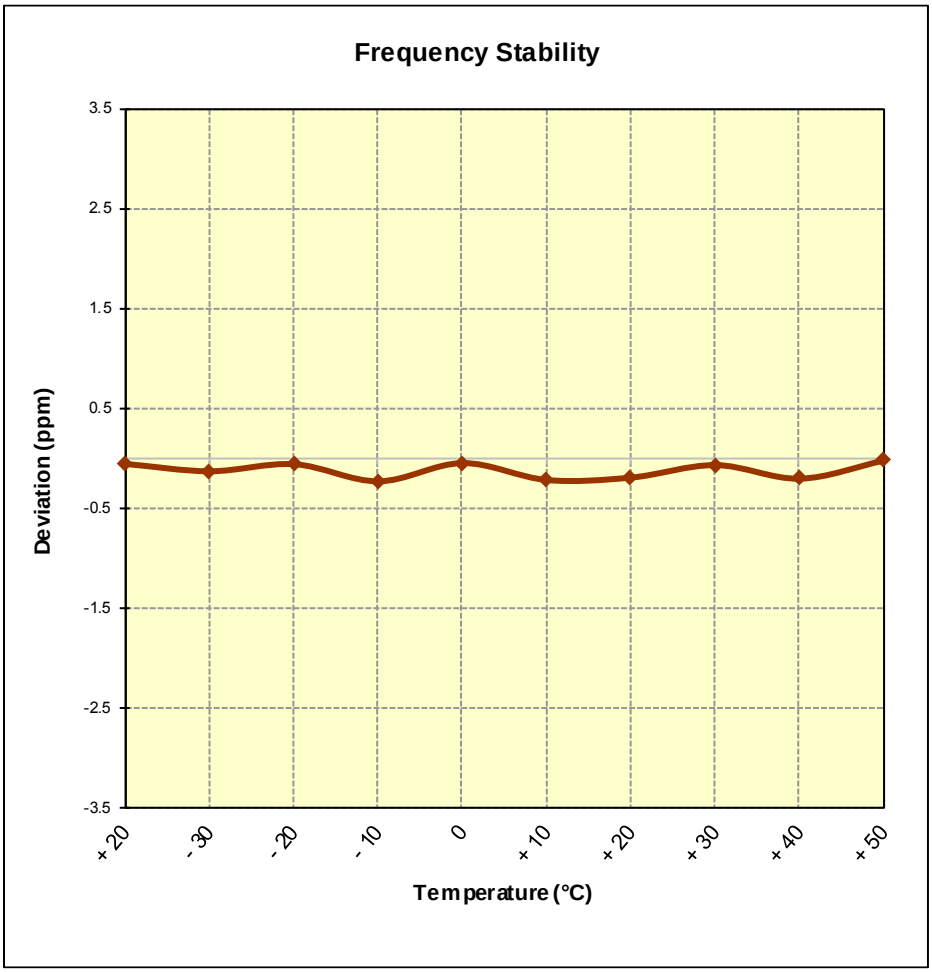


Figure 7-10. Frequency Stability Graph (Band 5)

Band 66/4 Frequency Stability Measurements

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	1,744,999,809	-191	-0.0000110
100 %		- 30	1,744,999,815	-185	-0.0000106
100 %		- 20	1,744,999,943	-57	-0.0000032
100 %		- 10	1,744,999,962	-38	-0.0000022
100 %		0	1,744,999,954	-46	-0.0000026
100 %		+ 10	1,744,999,984	-16	-0.0000009
100 %		+ 20	1,744,999,937	-63	-0.0000036
100 %		+ 30	1,744,999,858	-142	-0.0000081
100 %		+ 40	1,744,999,884	-116	-0.0000066
100 %		+ 50	1,744,999,861	-139	-0.0000079
BATT. ENDPOINT	3.57	+ 20	1,744,999,941	-59	-0.0000034

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.

Band 66/4 Frequency Stability Measurements

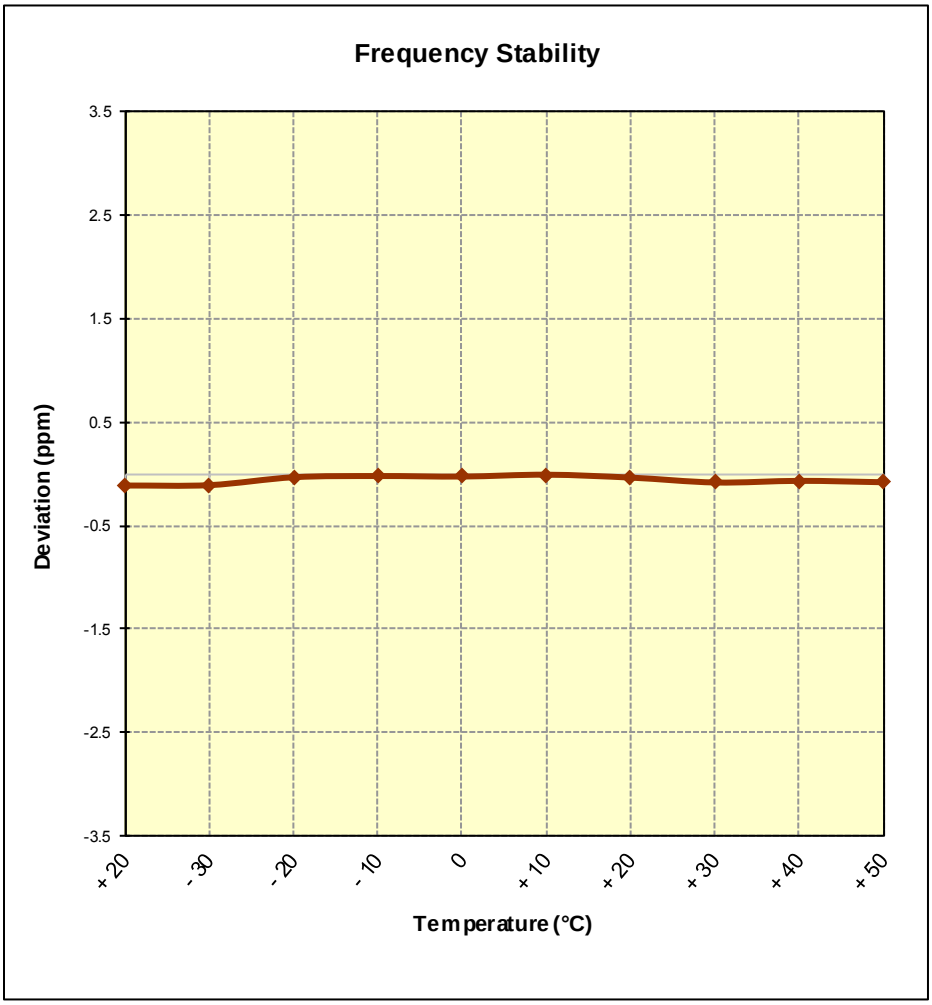


Figure 7-11. Frequency Stability Graph (Band 66/4)

Band 2 Frequency Stability Measurements

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	18900	
REFERENCE VOLTAGE:	4.29	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	1,879,999,880	-120	-0.0000064
100 %		- 30	1,879,999,890	-110	-0.0000059
100 %		- 20	1,879,999,948	-52	-0.0000028
100 %		- 10	1,879,999,971	-29	-0.0000015
100 %		0	1,879,999,977	-23	-0.0000012
100 %		+ 10	1,879,999,978	-22	-0.0000012
100 %		+ 20	1,879,999,817	-183	-0.0000097
100 %		+ 30	1,879,999,822	-178	-0.0000095
100 %		+ 40	1,879,999,885	-115	-0.0000061
100 %		+ 50	1,879,999,917	-83	-0.0000044
BATT. ENDPOINT	3.57	+ 20	1,879,999,979	-21	-0.0000011

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

Band 2 Frequency Stability Measurements

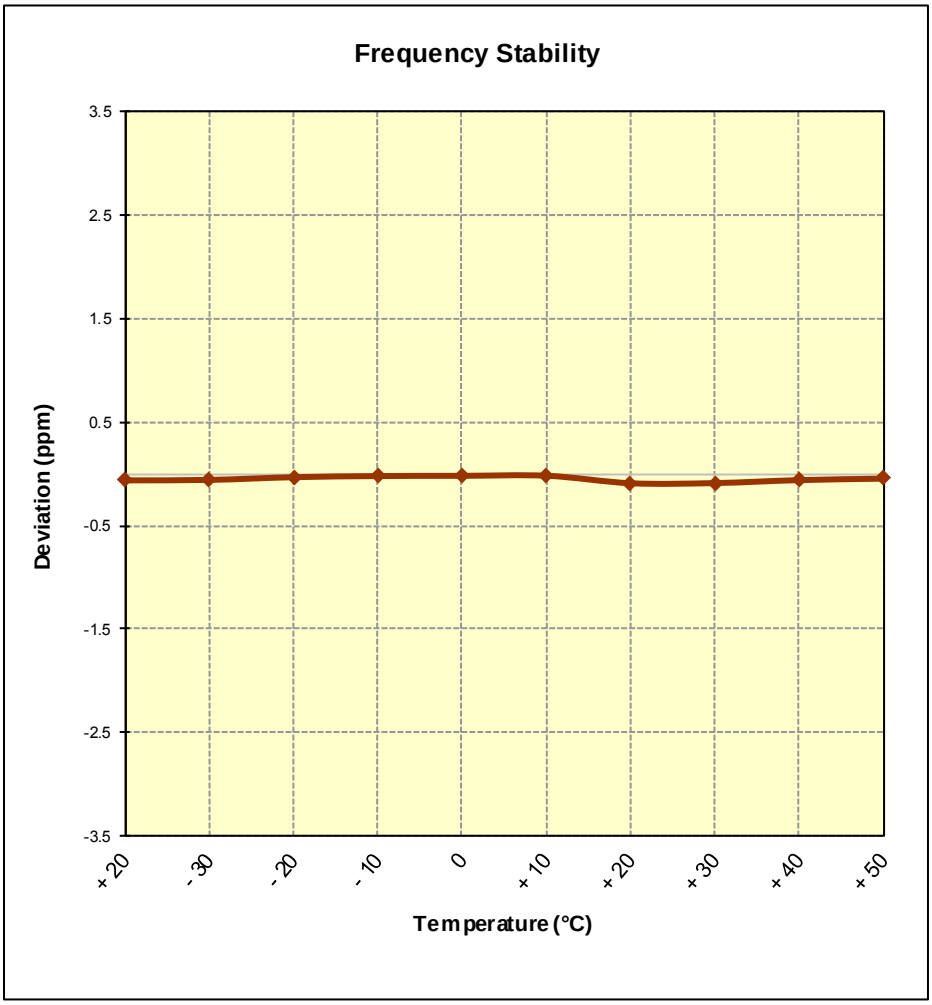


Figure 7-12. Frequency Stability Graph (Band 2)

Band 7 Frequency Stability Measurements

OPERATING FREQUENCY:	2,535,000,000	Hz
CHANNEL:	21100	
REFERENCE VOLTAGE:	4.29	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	+ 20 (Ref)	2,534,999,832	-168	-0.0000066
100 %		- 30	2,534,999,888	-112	-0.0000044
100 %		- 20	2,534,999,970	-30	-0.0000012
100 %		- 10	2,534,999,978	-22	-0.0000009
100 %		0	2,534,999,907	-93	-0.0000037
100 %		+ 10	2,534,999,954	-46	-0.0000018
100 %		+ 20	2,534,999,939	-61	-0.0000024
100 %		+ 30	2,534,999,939	-61	-0.0000024
100 %		+ 40	2,534,999,920	-80	-0.0000032
100 %		+ 50	2,534,999,854	-146	-0.0000058
BATT. ENDPOINT	3.57	+ 20	2,534,999,917	-83	-0.0000033

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.

Band 7 Frequency Stability Measurements

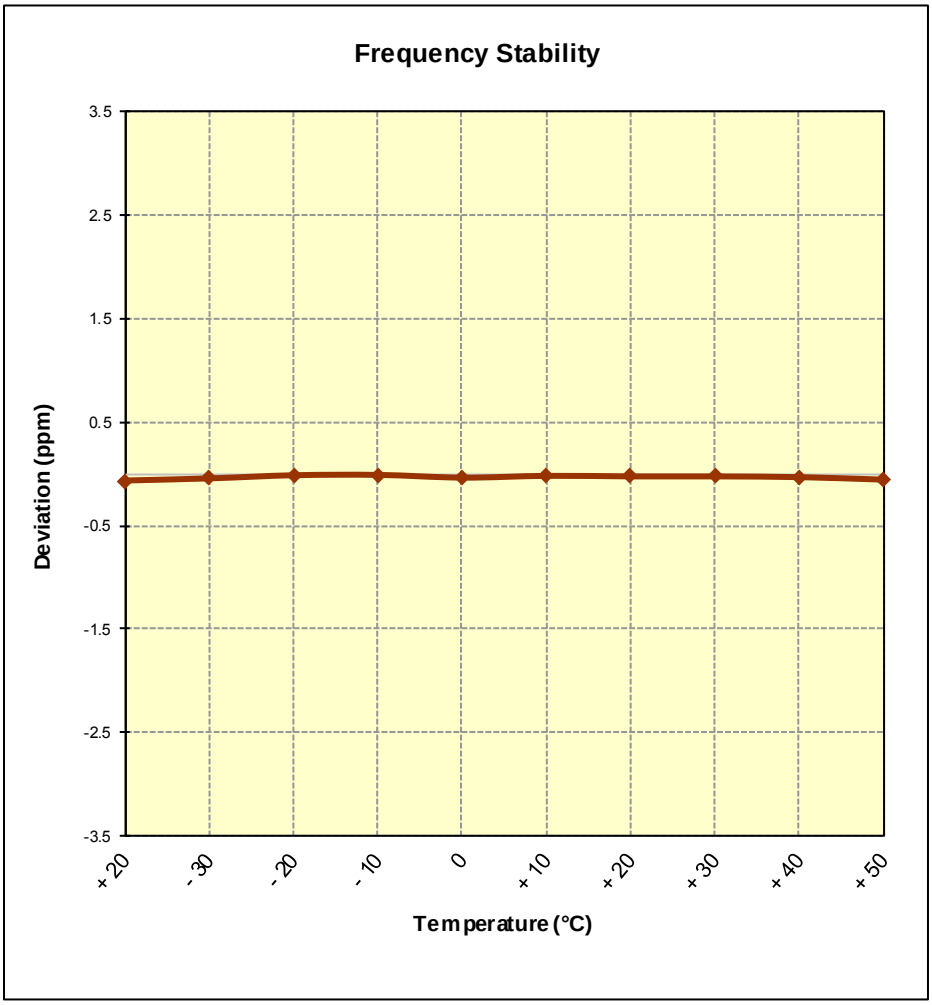


Figure 7-13. Frequency Stability Graph (Band 7)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMA600T** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.