7.4 Band Edge Emissions at Antenna Terminal

§2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h)

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is 43 + $log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v02r02 – Section 6.0

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW ≥ 1% of the emission bandwidth
4. VBW ≥ 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

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

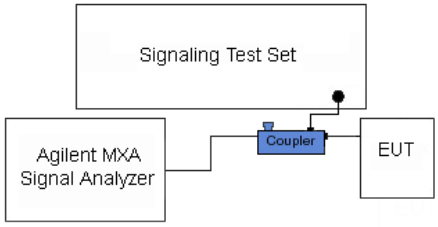


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

Per 22.917(b) 24.238(a) 27.53(h) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

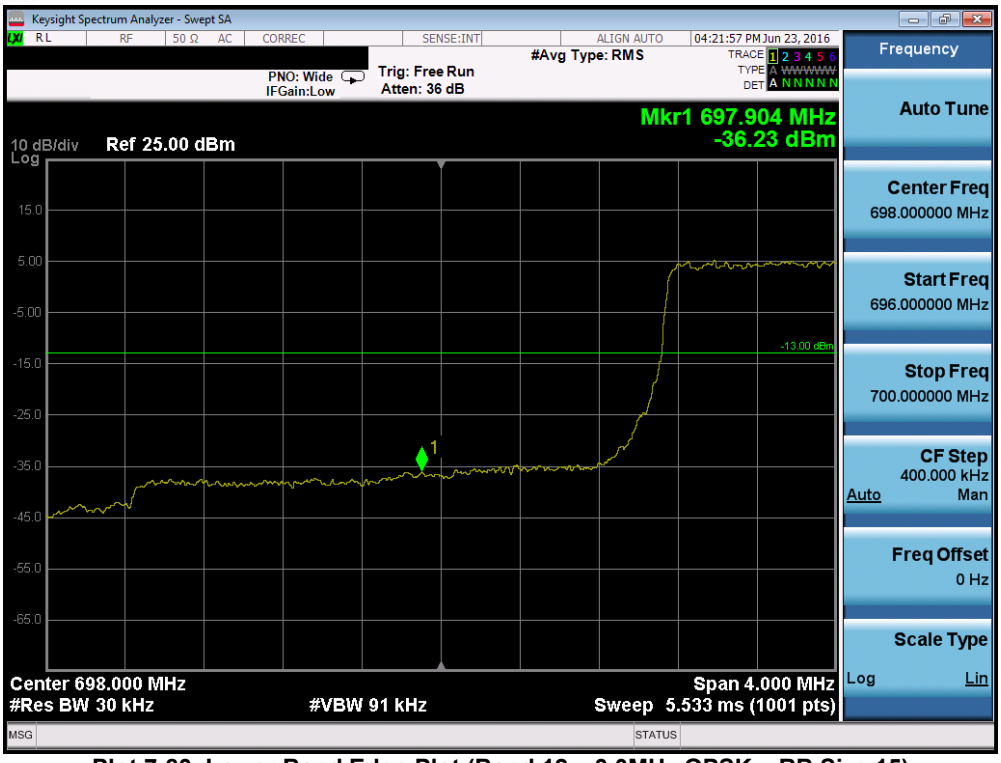
Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Plot 7-79. Lower Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

Plot 7-80. Lower Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

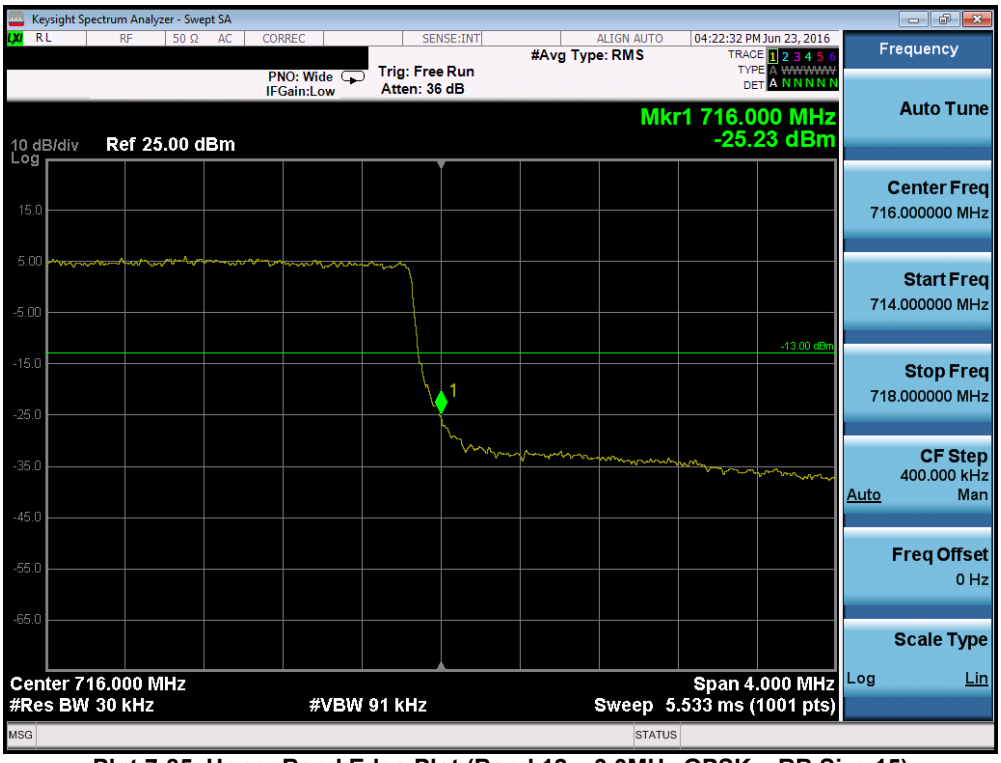
Plot 7-81. Upper Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

Plot 7-82. Upper Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)



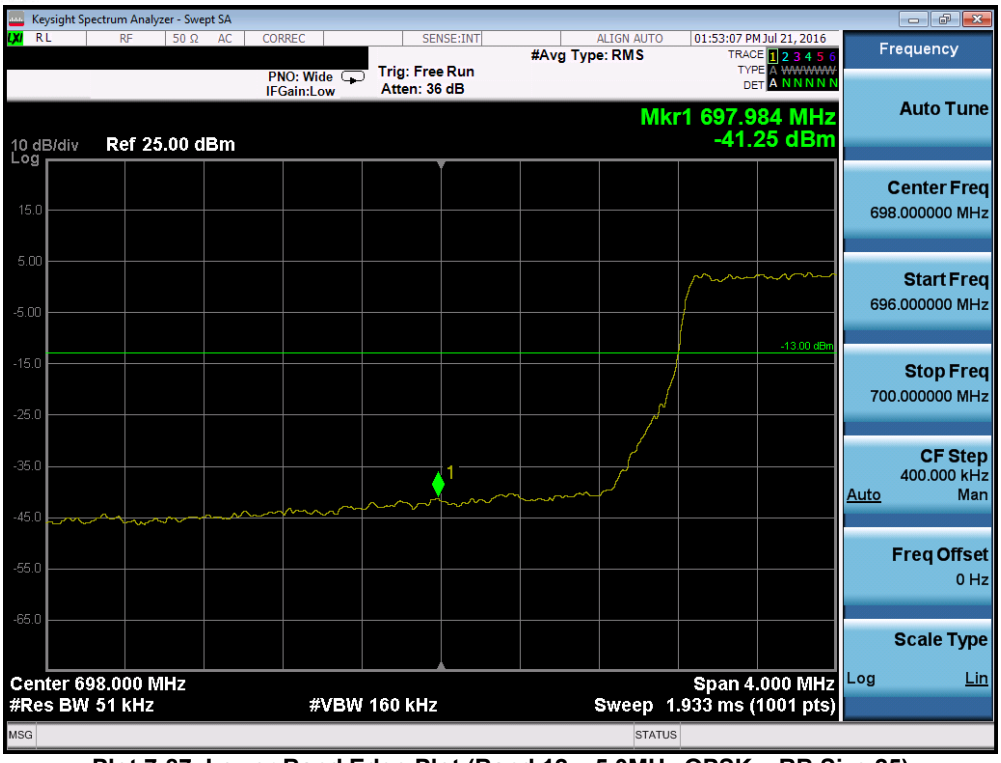
Plot 7-83. Lower Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

Plot 7-84. Lower Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

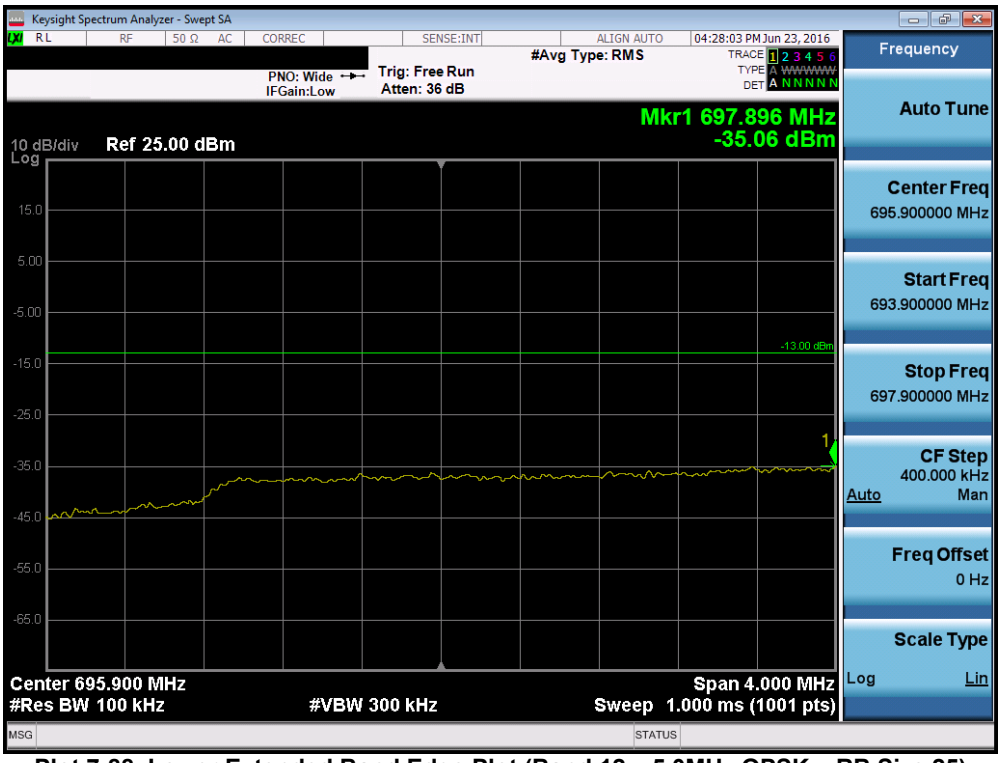


Plot 7-85. Upper Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

Plot 7-86. Upper Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

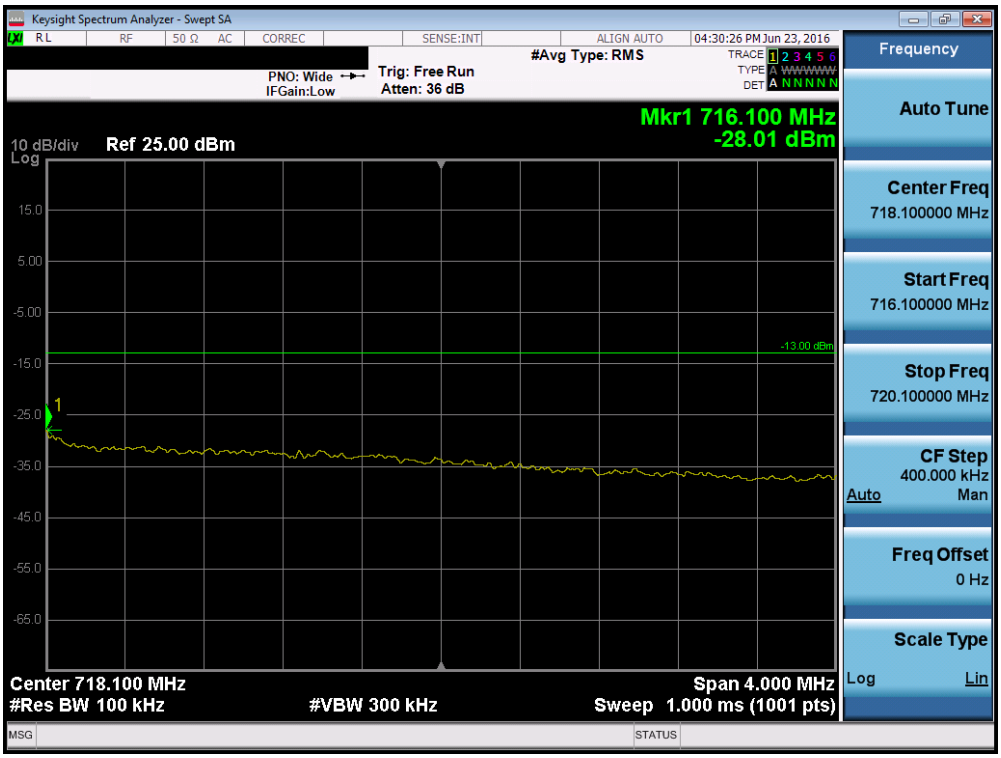


Plot 7-87. Lower Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

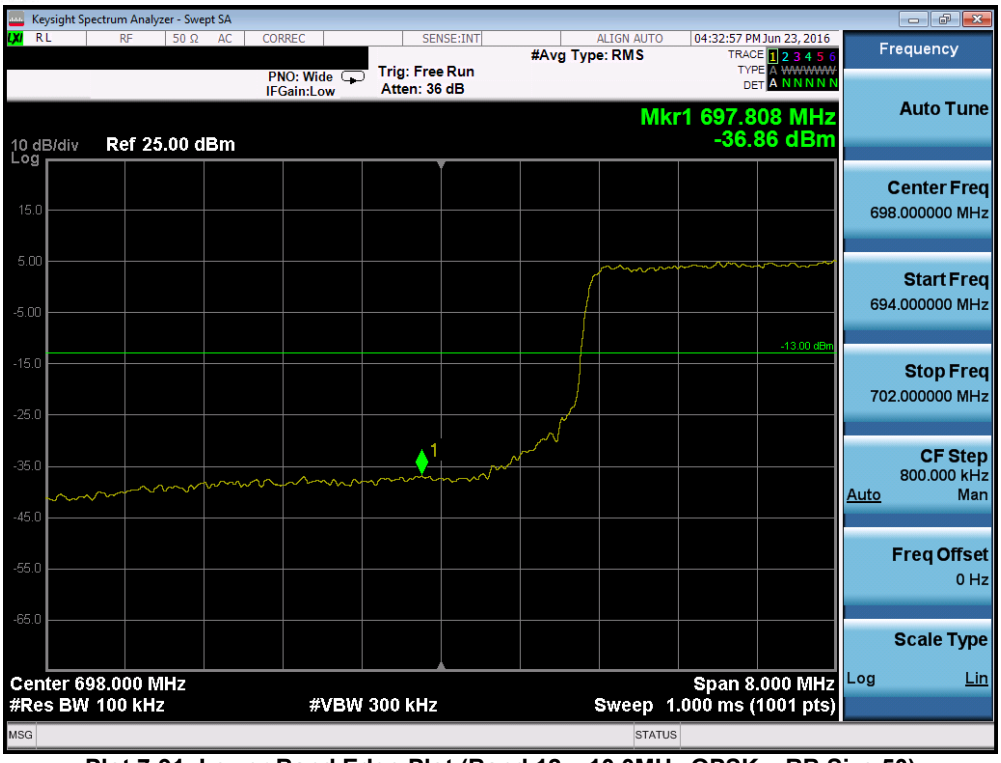


Plot 7-88. Lower Extended Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

Plot 7-89. Upper Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)



Plot 7-90. Upper Extended Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)



Plot 7-91. Lower Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

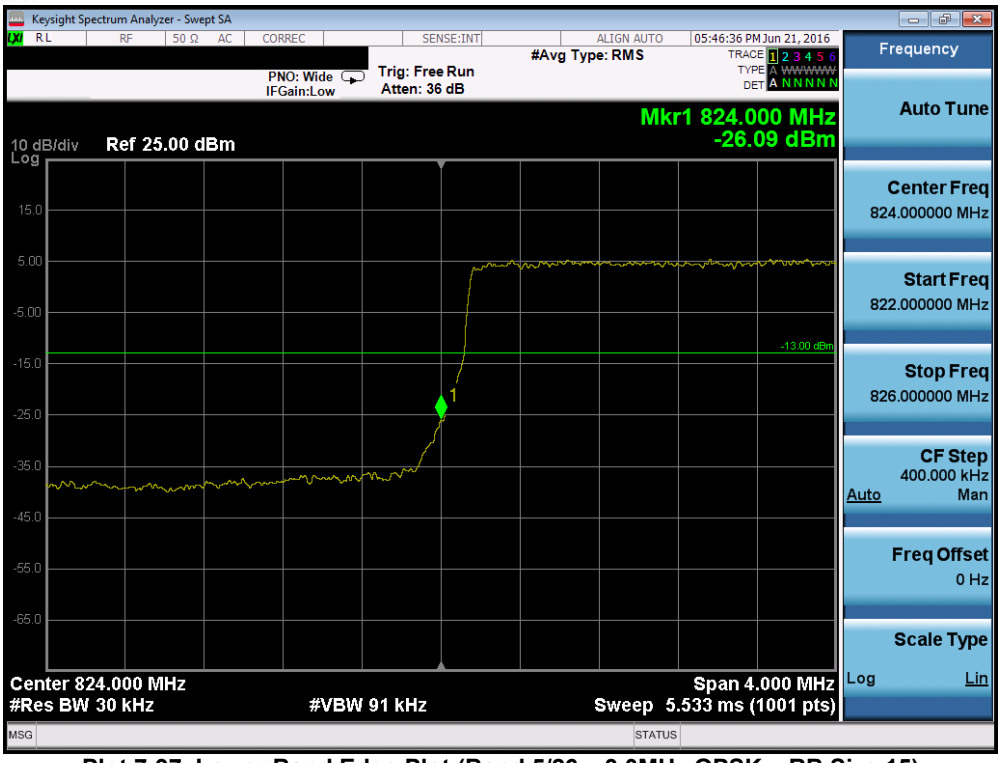
Plot 7-92. Upper Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

Plot 7-93. Lower Band Edge Plot (Band 5/26 – 1.4MHz QPSK – RB Size 6)

Plot 7-94. Lower Extended Band Edge Plot (Band 5/26 – 1.4MHz QPSK – RB Size 6)

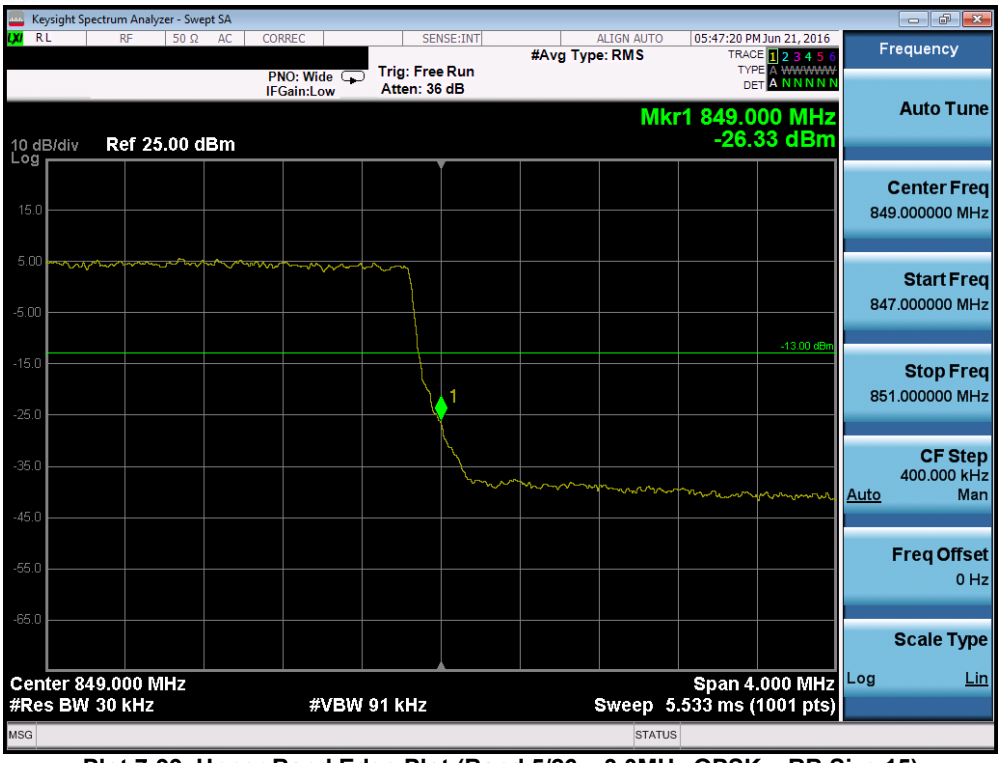
Plot 7-95. Upper Band Edge Plot (Band 5/26 – 1.4MHz QPSK – RB Size 6)

Plot 7-96. Upper Extended Band Edge Plot (Band 5/26 – 1.4MHz QPSK – RB Size 6)

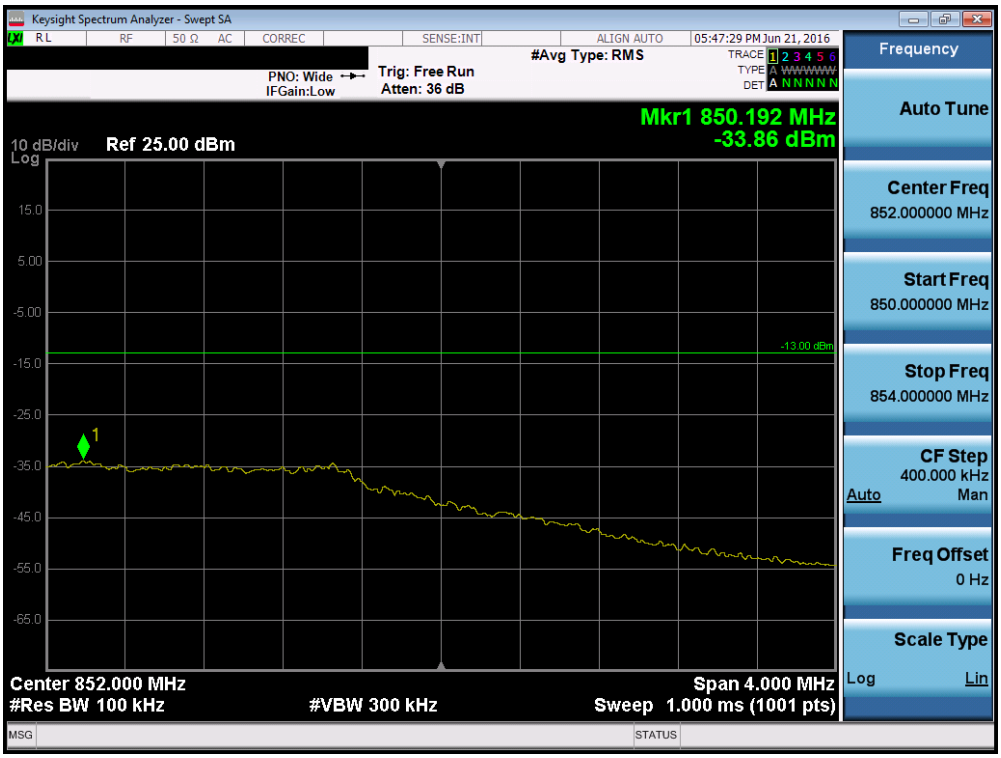


Plot 7-97. Lower Band Edge Plot (Band 5/26 – 3.0MHz QPSK – RB Size 15)

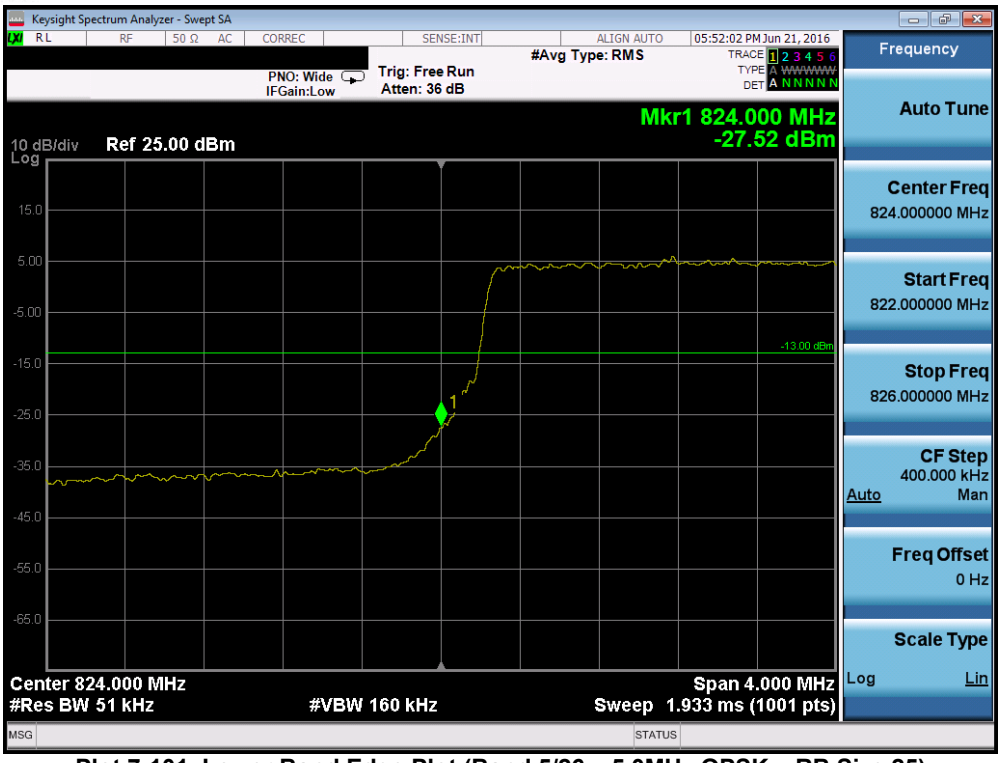
Plot 7-98. Lower Extended Band Edge Plot (Band 5/26 – 3.0MHz QPSK – RB Size 15)



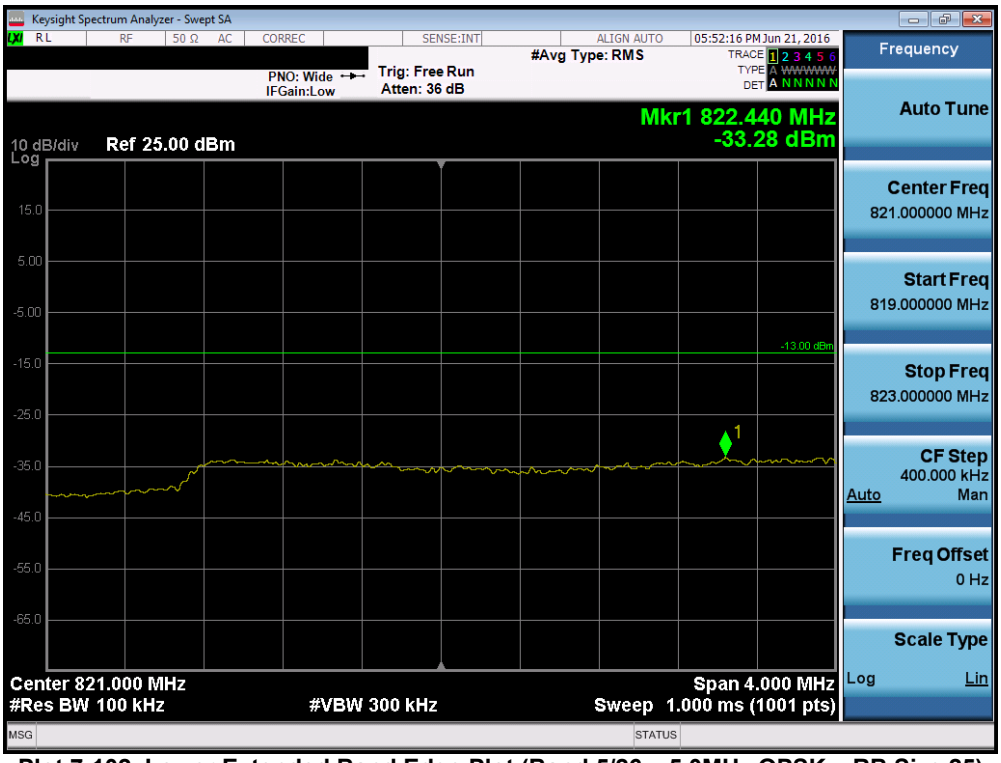
Plot 7-99. Upper Band Edge Plot (Band 5/26 – 3.0MHz QPSK – RB Size 15)



Plot 7-100. Upper Extended Band Edge Plot (Band 5/26 – Band 5 – 3.0MHz QPSK – RB Size 15)

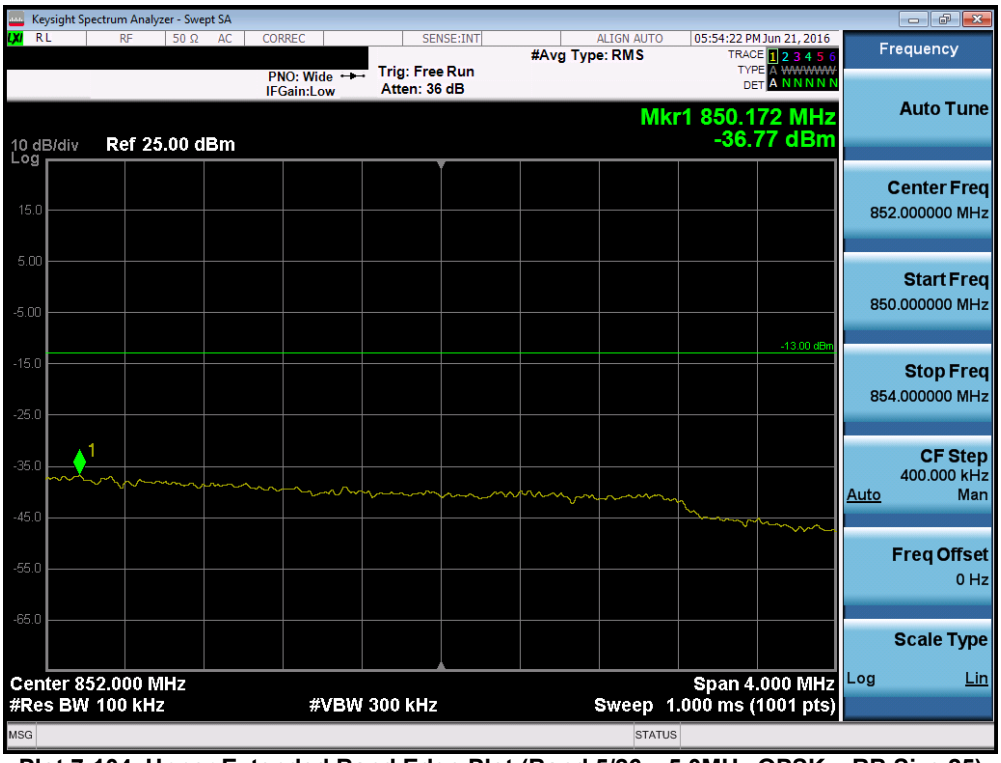


Plot 7-101. Lower Band Edge Plot (Band 5/26 – 5.0MHz QPSK – RB Size 25)

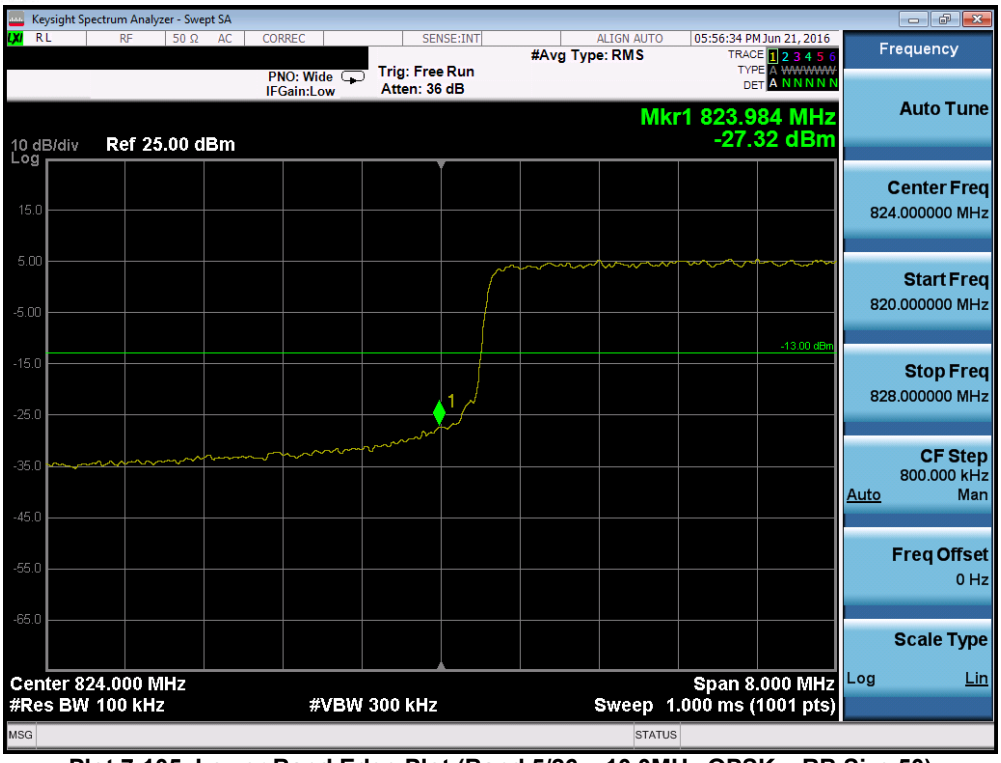


Plot 7-102. Lower Extended Band Edge Plot (Band 5/26 – 5.0MHz QPSK – RB Size 25)

Plot 7-103. Upper Band Edge Plot (Band 5/26 – 5.0MHz QPSK – RB Size 25)

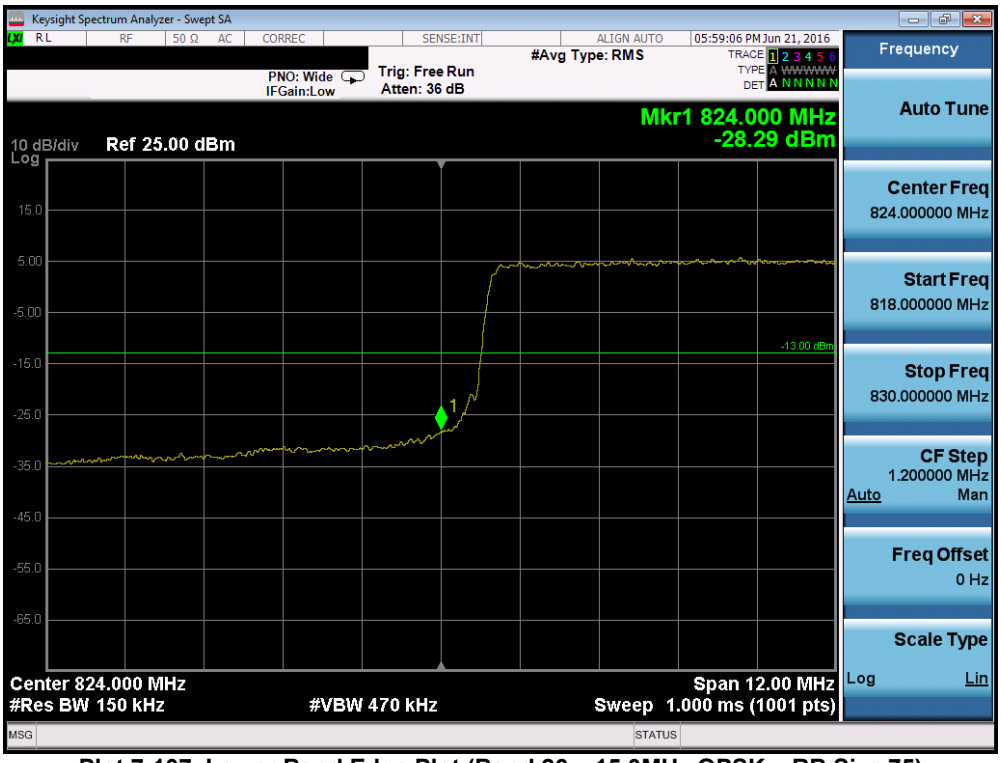


Plot 7-104. Upper Extended Band Edge Plot (Band 5/26 – 5.0MHz QPSK – RB Size 25)



Plot 7-105. Lower Band Edge Plot (Band 5/26 – 10.0MHz QPSK – RB Size 50)

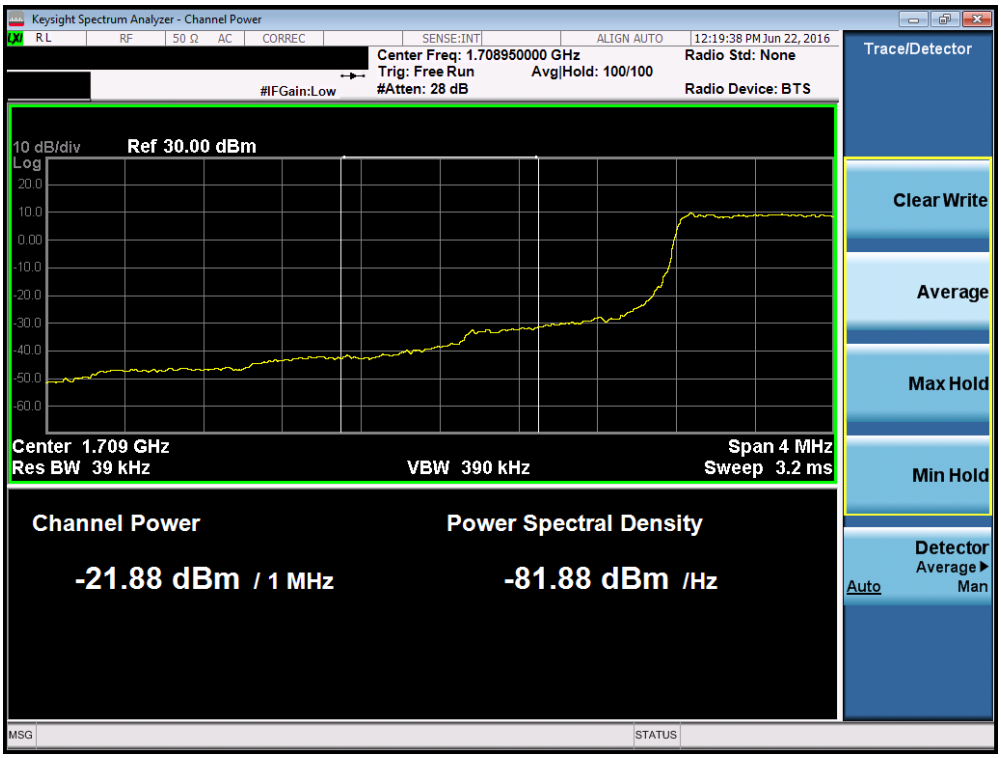
Plot 7-106. Upper Band Edge Plot (Band 5/26 – 10.0MHz QPSK – RB Size 50)



Plot 7-107. Lower Band Edge Plot (Band 26 – 15.0MHz QPSK – RB Size 75)

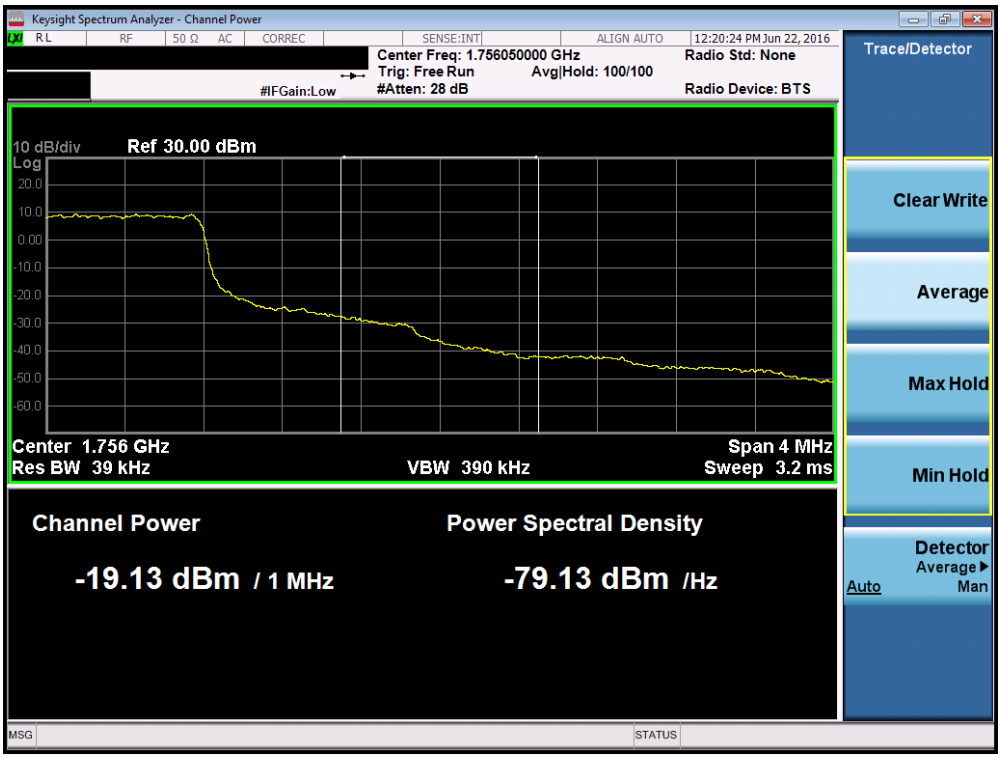
Plot 7-108. Upper Band Edge Plot (Band 26 – 15.0MHz QPSK – RB Size 75)

Plot 7-109. Lower Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

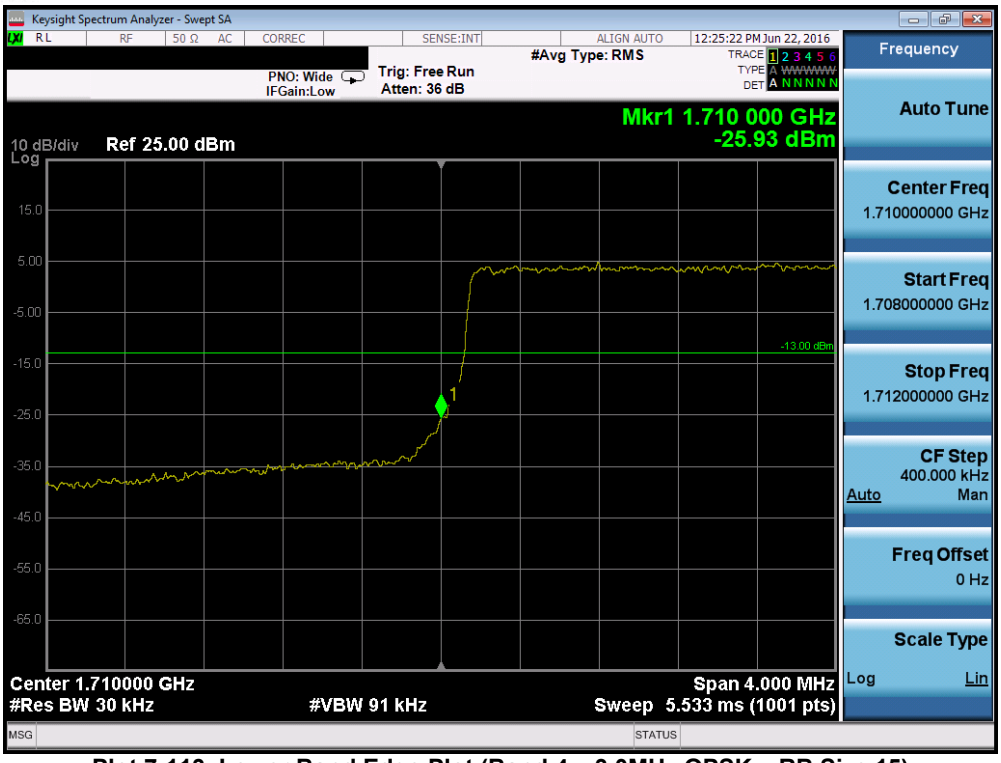


Plot 7-110. Lower Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

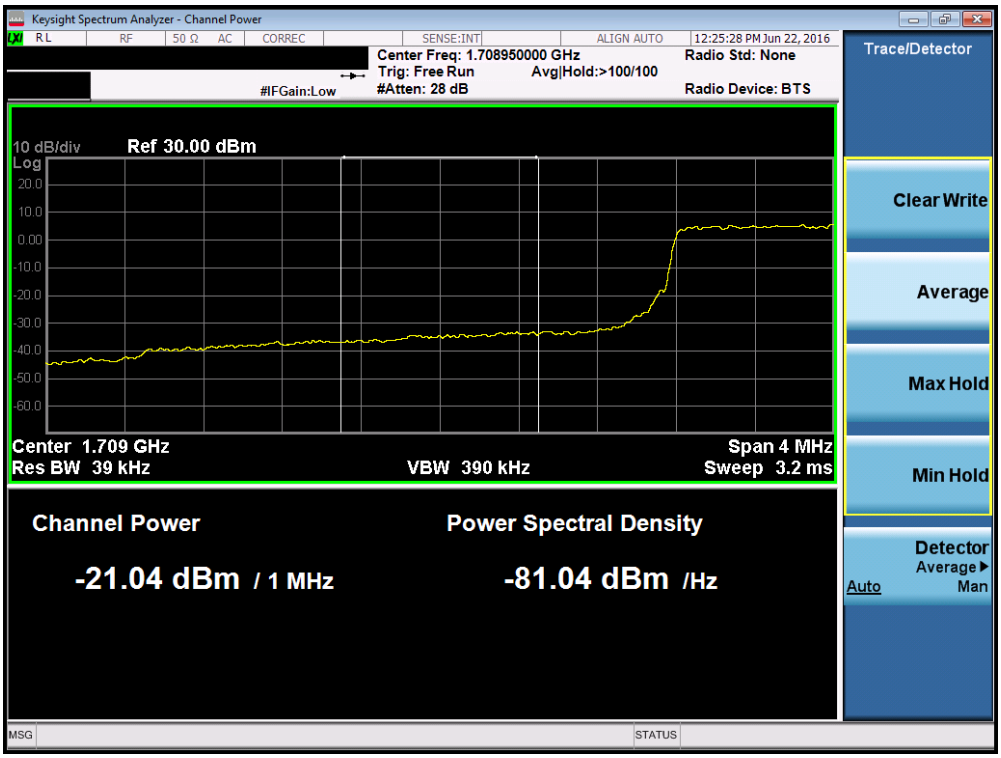
Plot 7-111. Upper Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



Plot 7-112. Upper Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

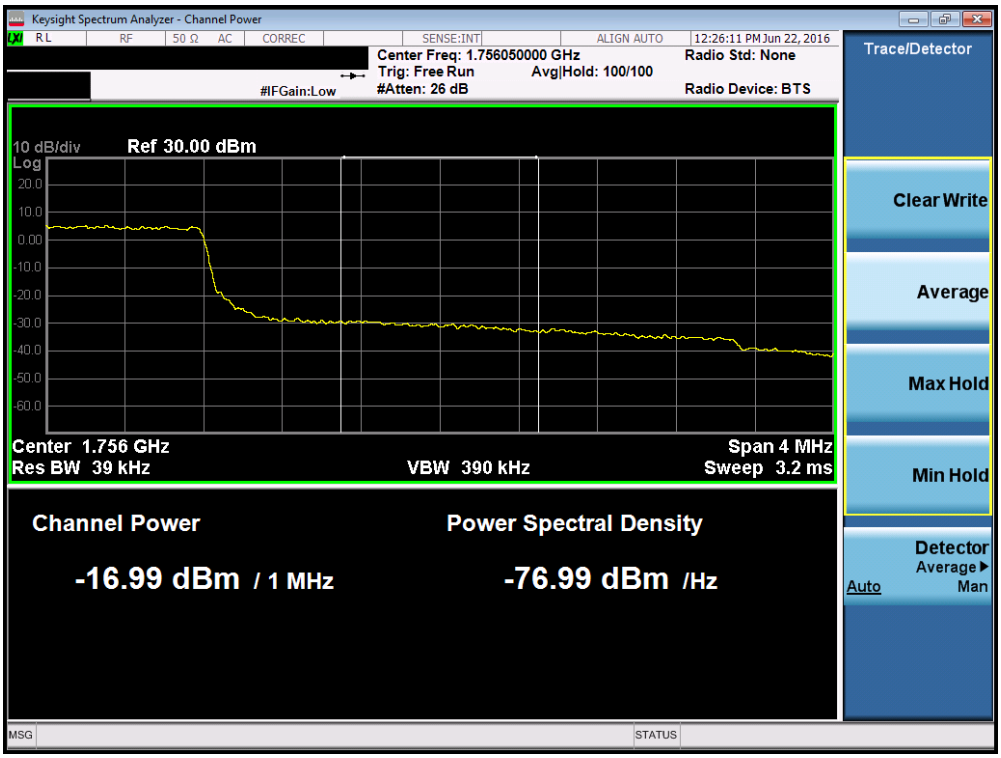


Plot 7-113. Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

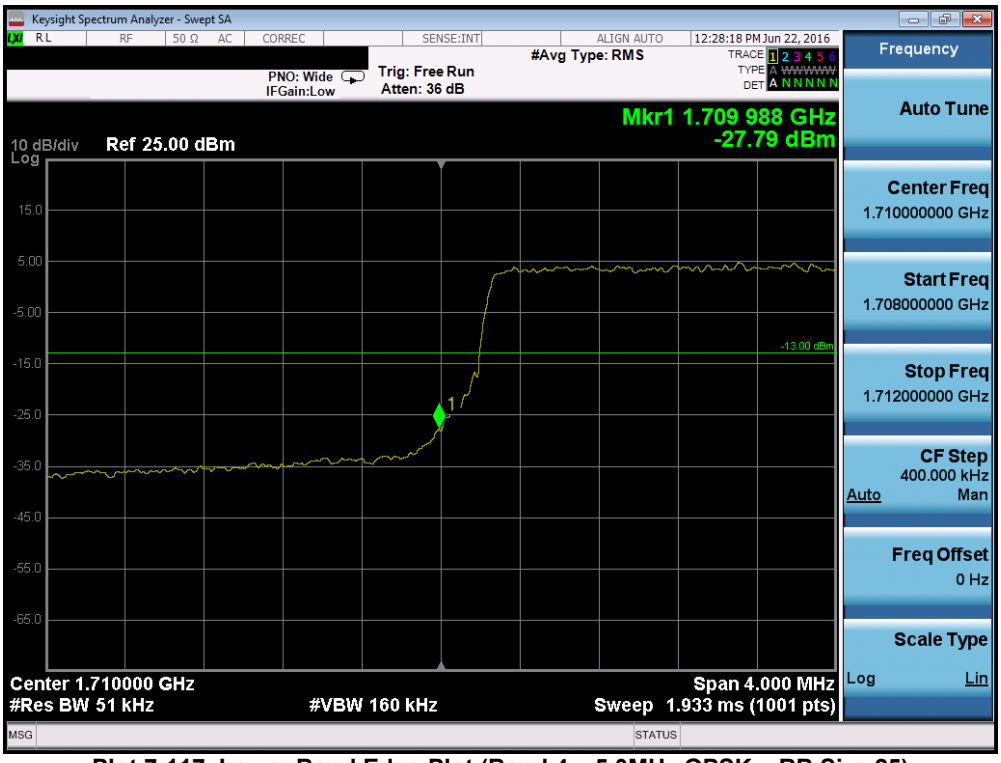


Plot 7-114. Lower Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

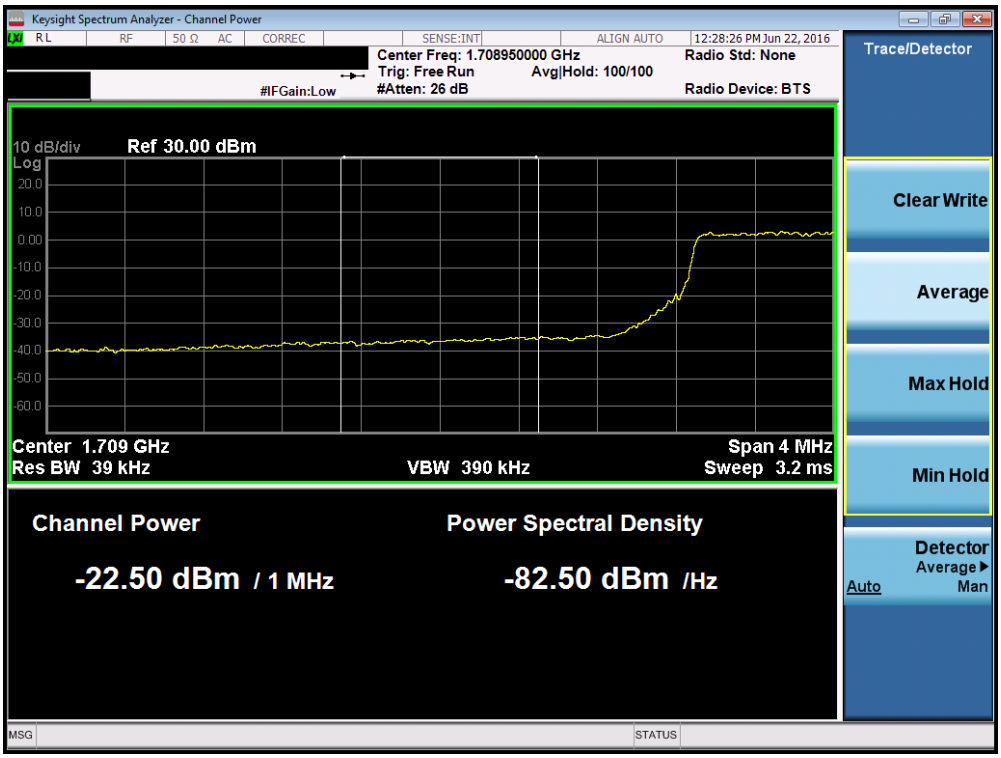
Plot 7-115. Upper Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



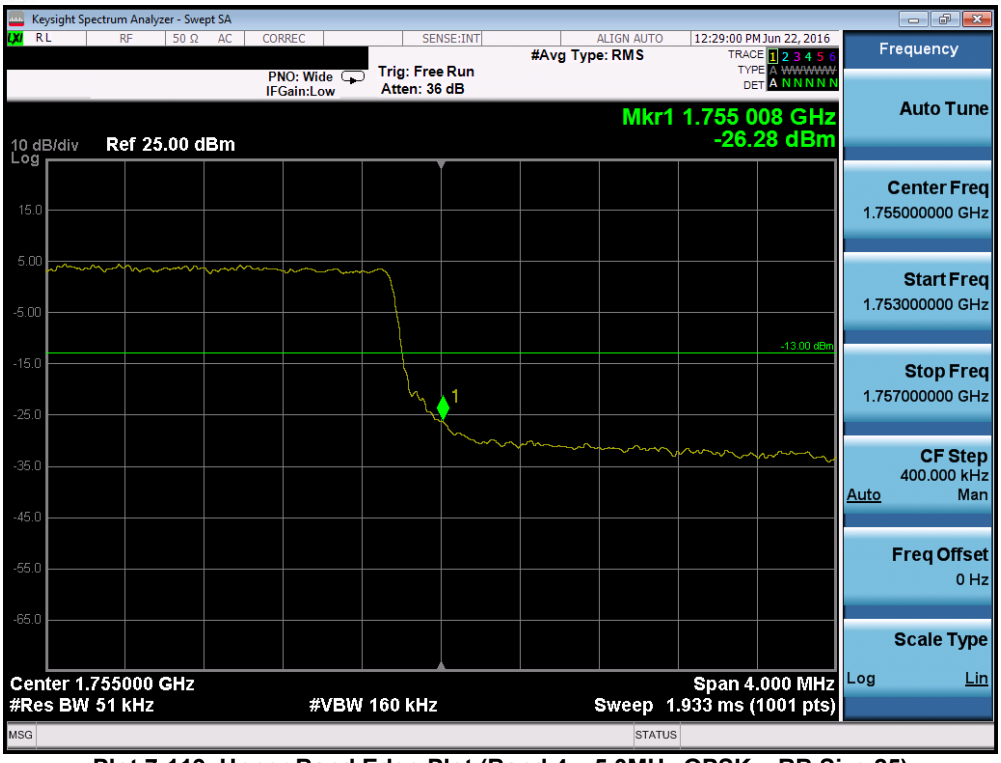
Plot 7-116. Upper Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



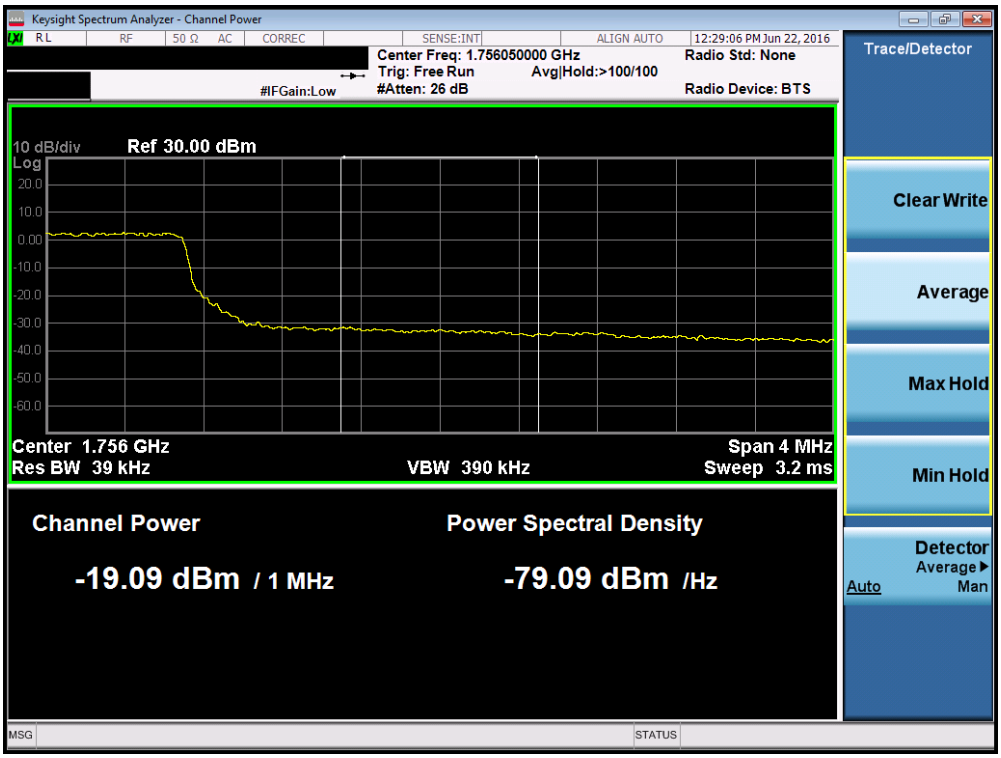
Plot 7-117. Lower Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



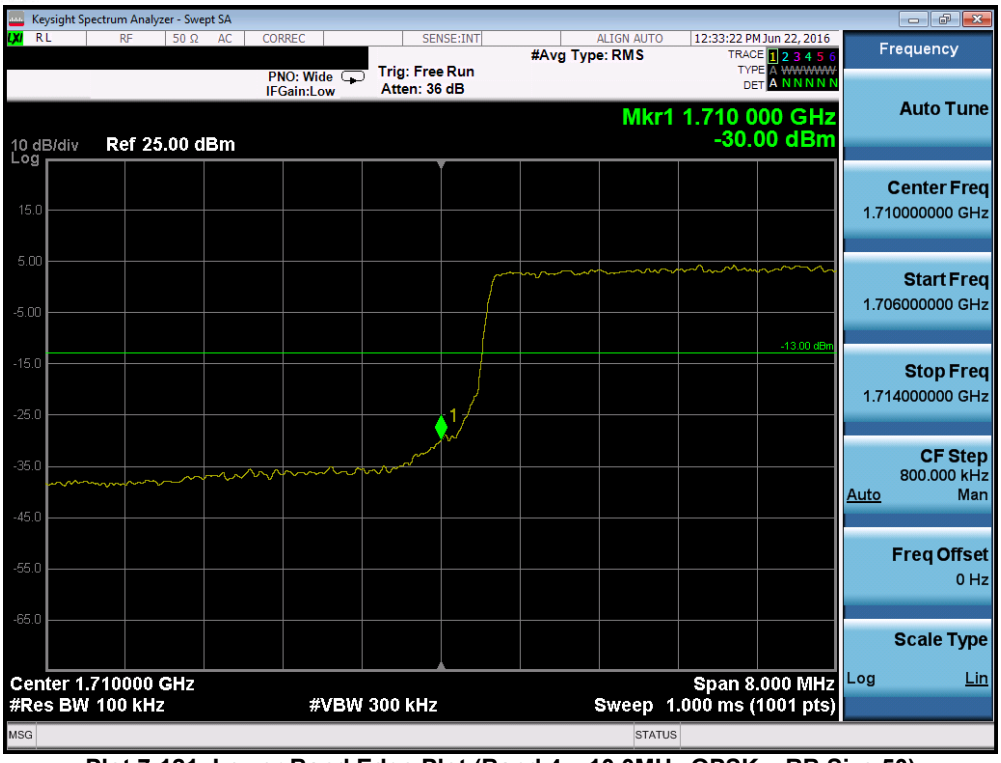
Plot 7-118. Lower Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



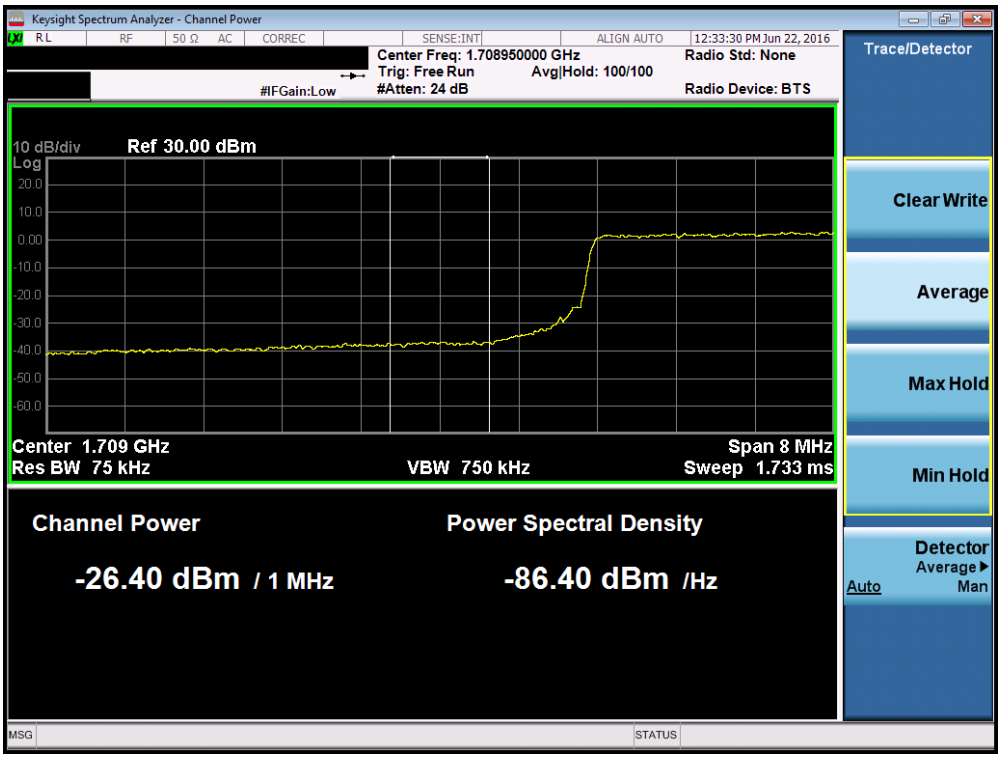
Plot 7-119. Upper Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



Plot 7-120. Upper Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

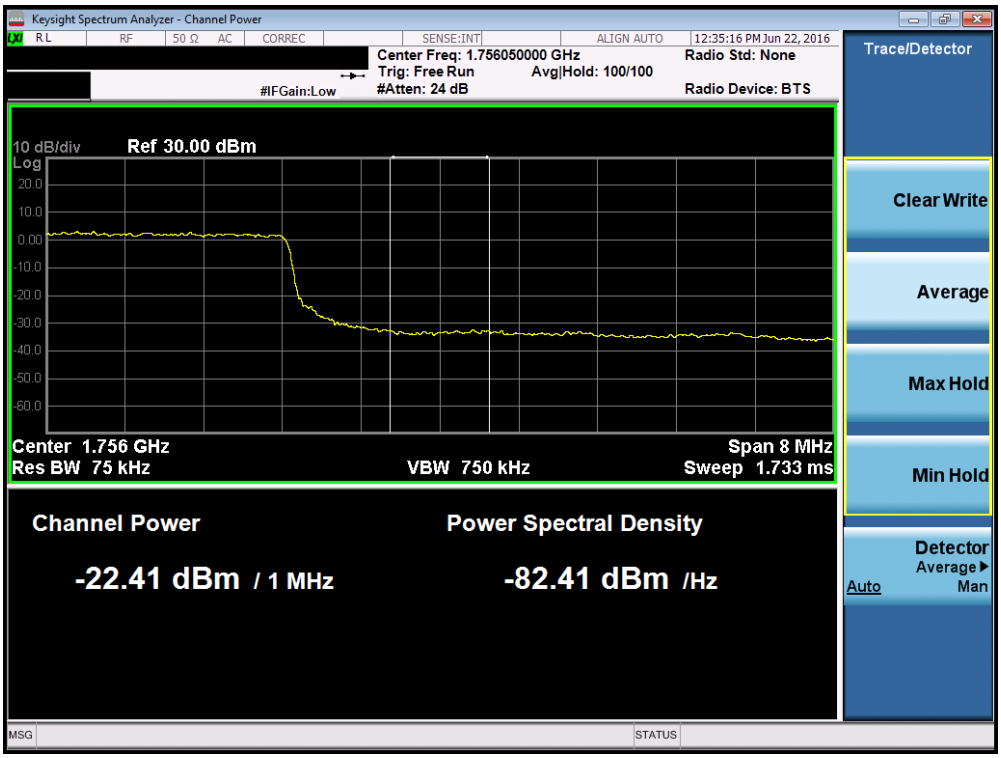


Plot 7-121. Lower Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

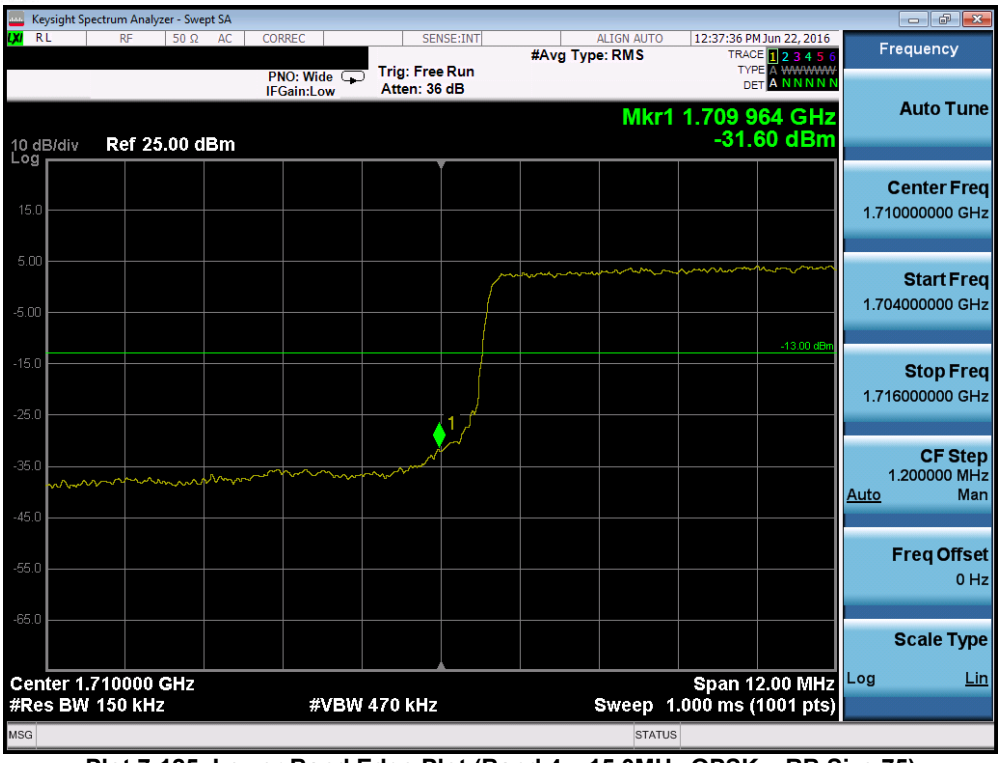


Plot 7-122. Lower Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

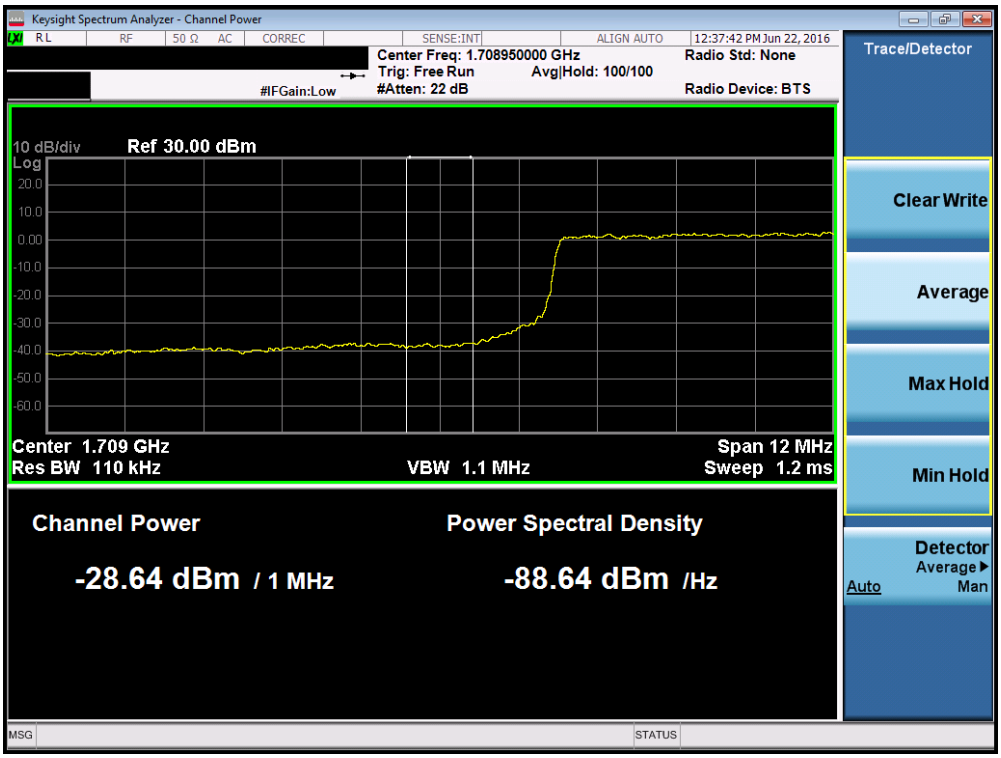
Plot 7-123. Upper Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)



Plot 7-124. Upper Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

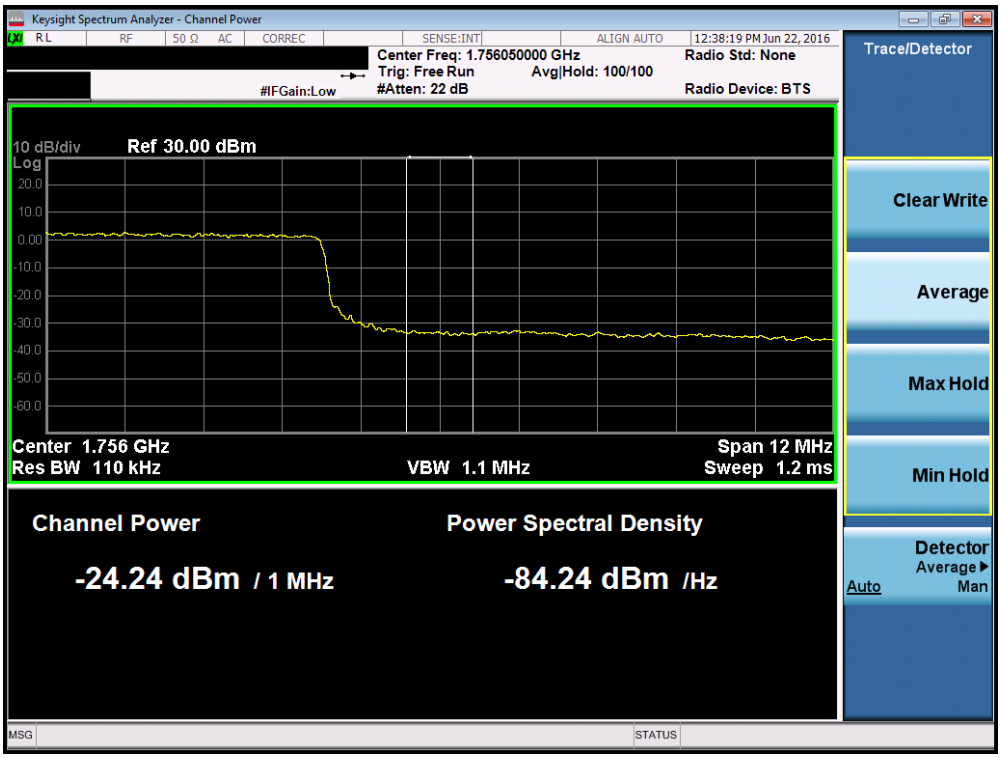


Plot 7-125. Lower Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

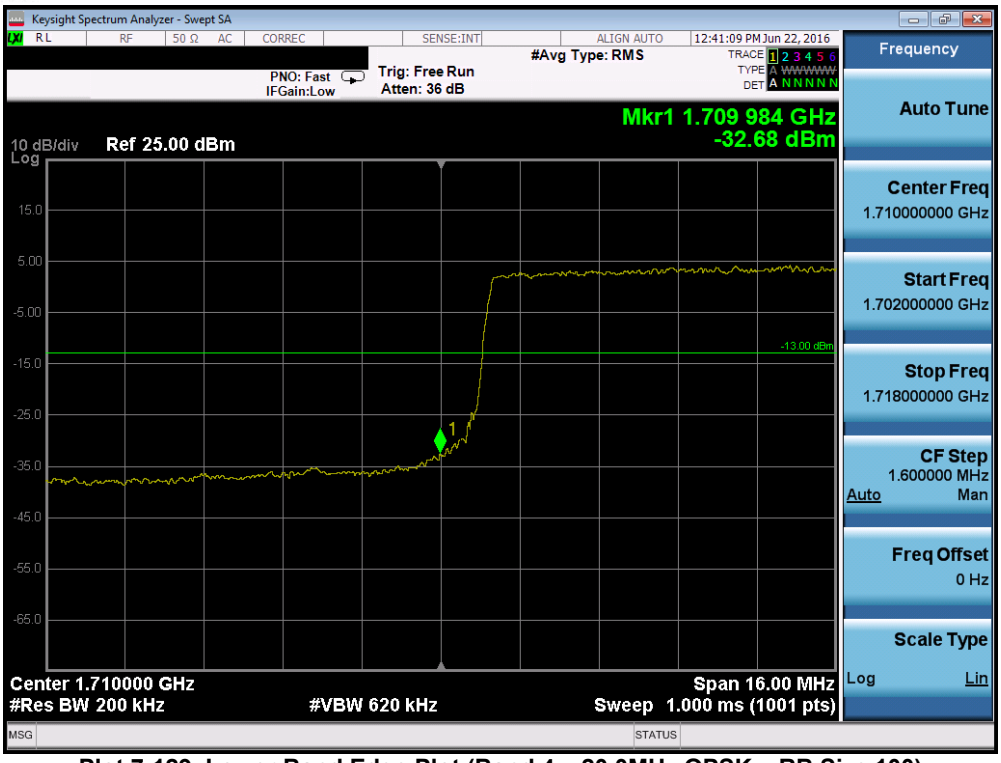


Plot 7-126. Lower Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

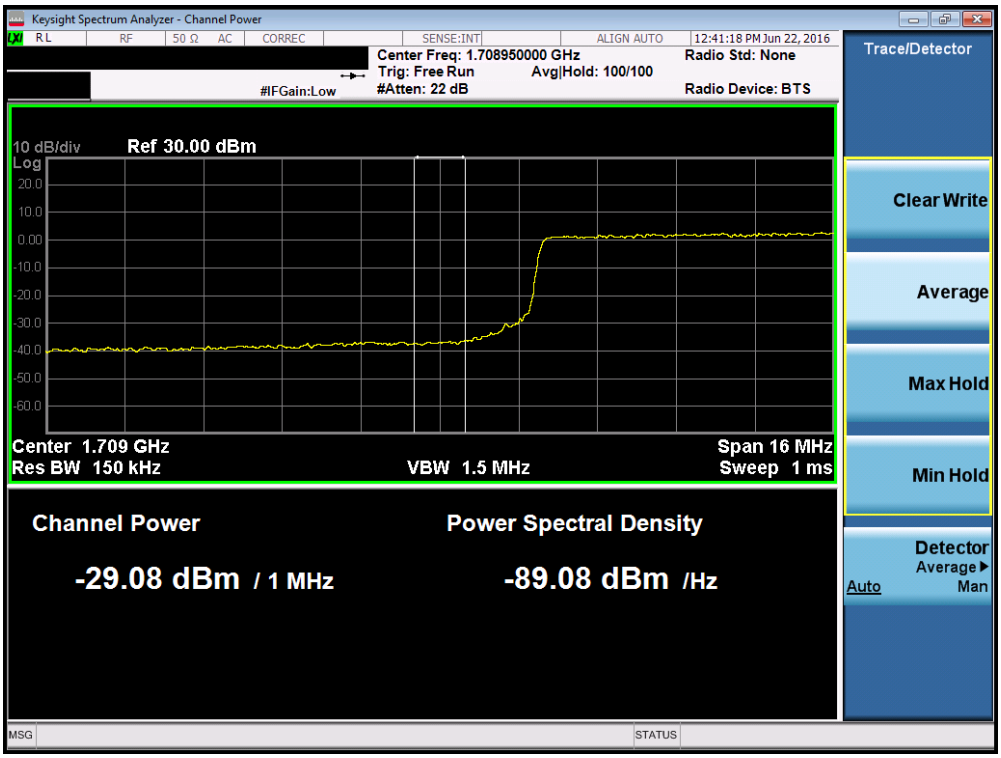
Plot 7-127. Upper Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)



Plot 7-128. Upper Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

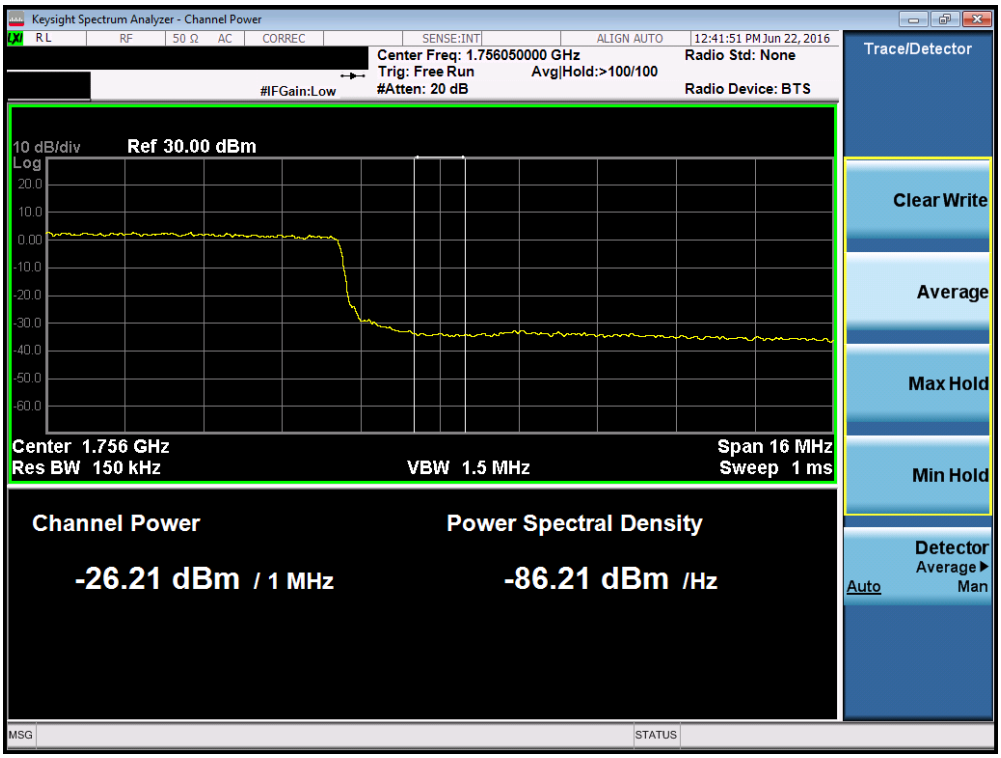


Plot 7-129. Lower Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)



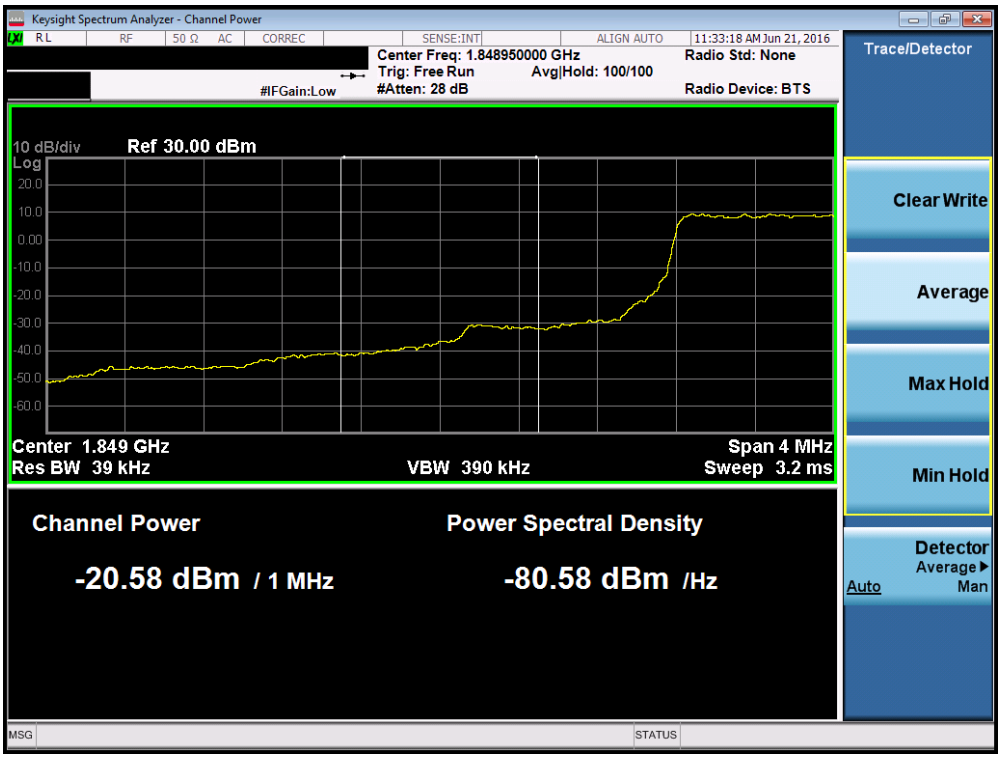
Plot 7-130. Lower Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

Plot 7-131. Upper Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)



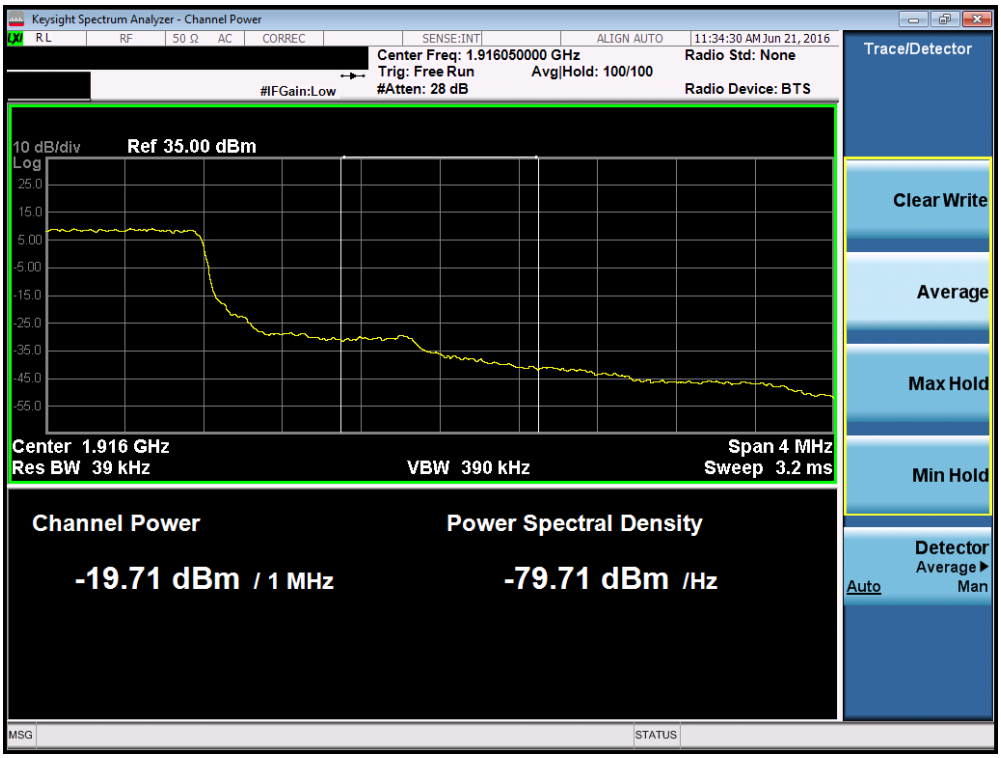
Plot 7-132. Upper Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

Plot 7-133. Lower Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)

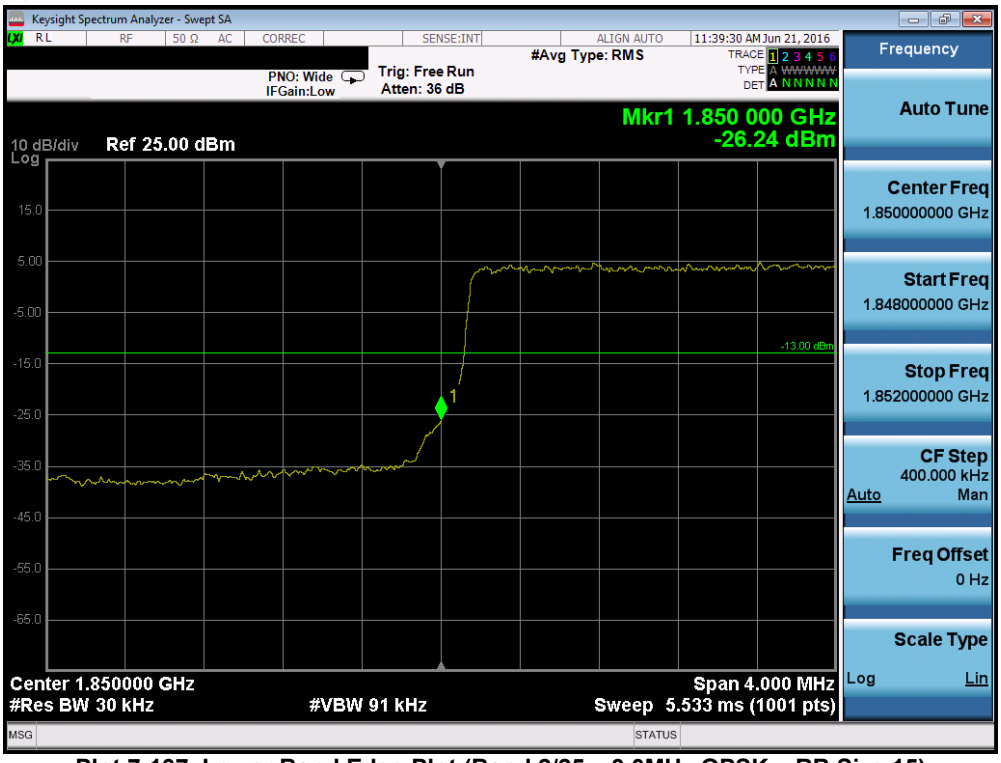


Plot 7-134. Lower Extended Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)

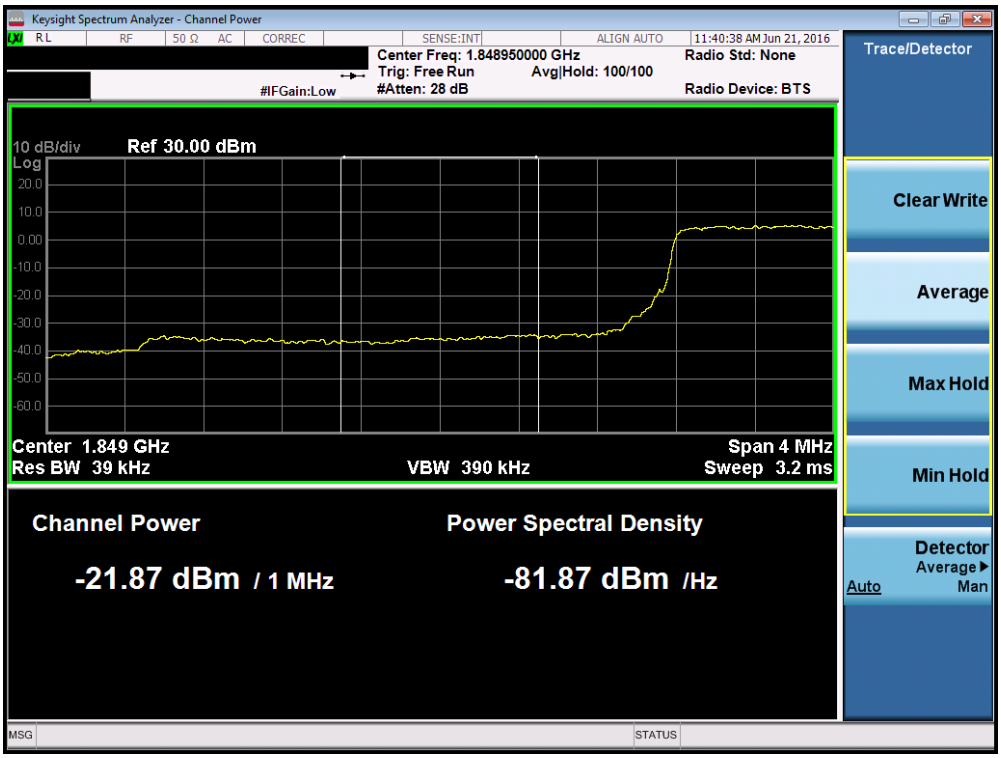
Plot 7-135. Upper Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)



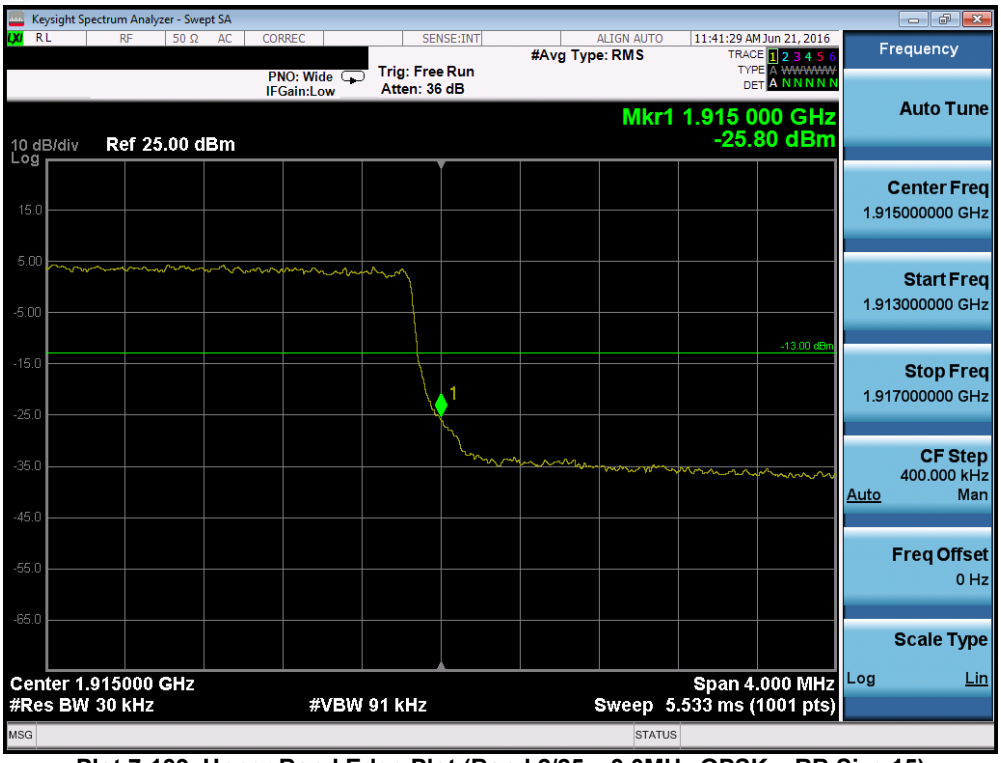
Plot 7-136. Upper Extended Band Edge Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)



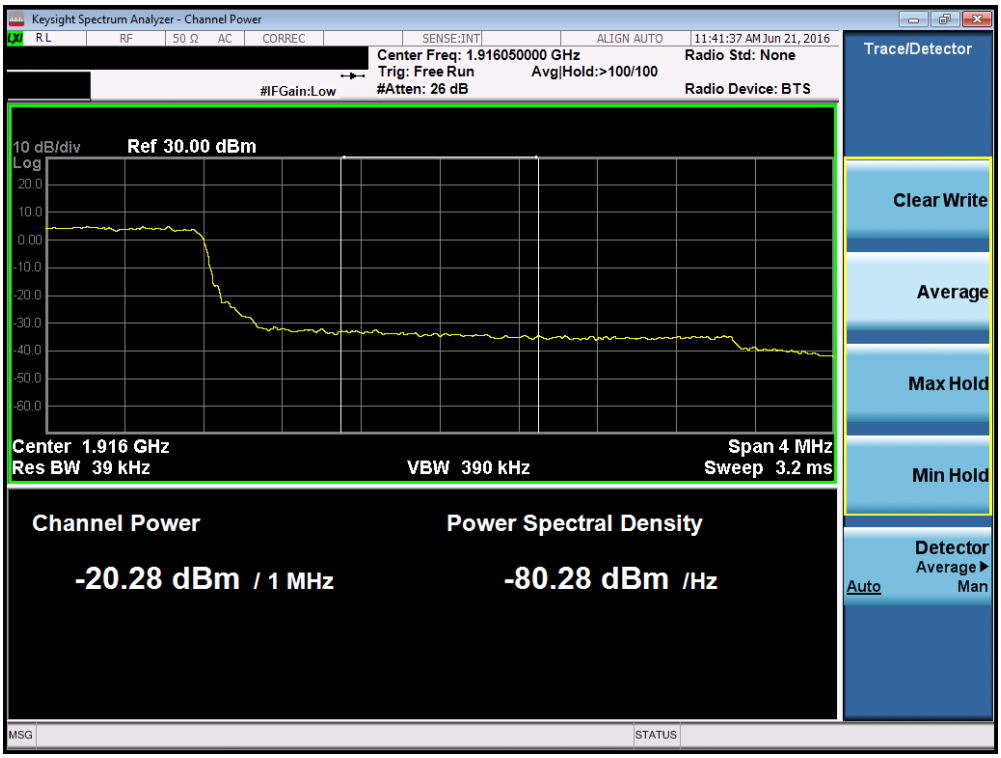
Plot 7-137. Lower Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)



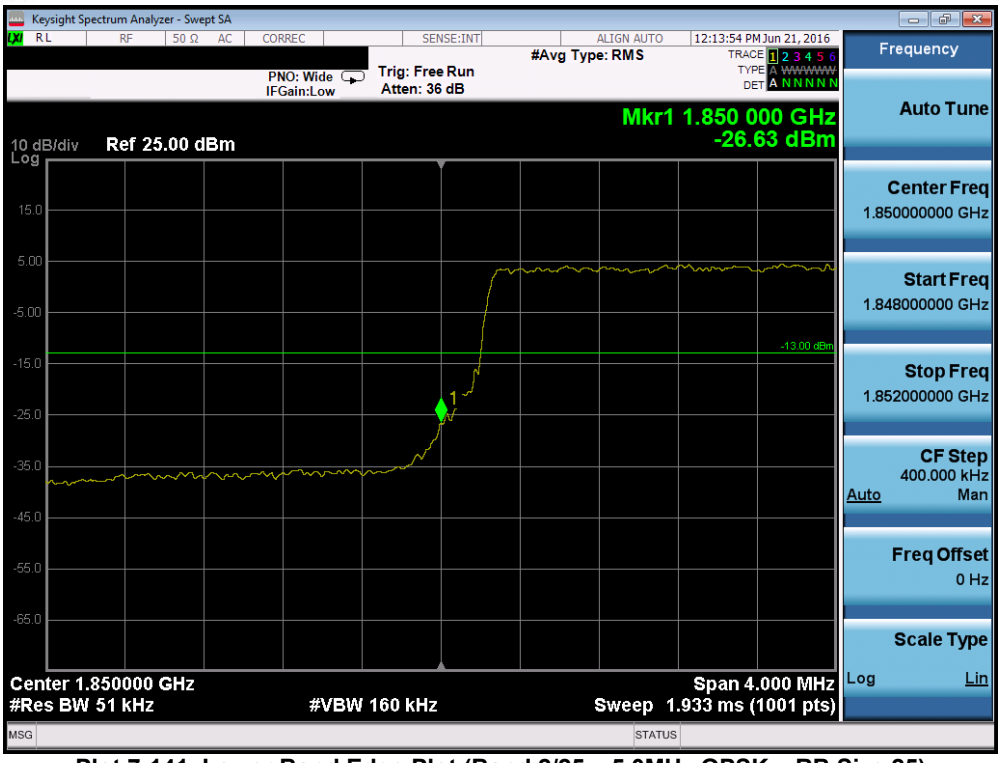
Plot 7-138. Lower Extended Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)



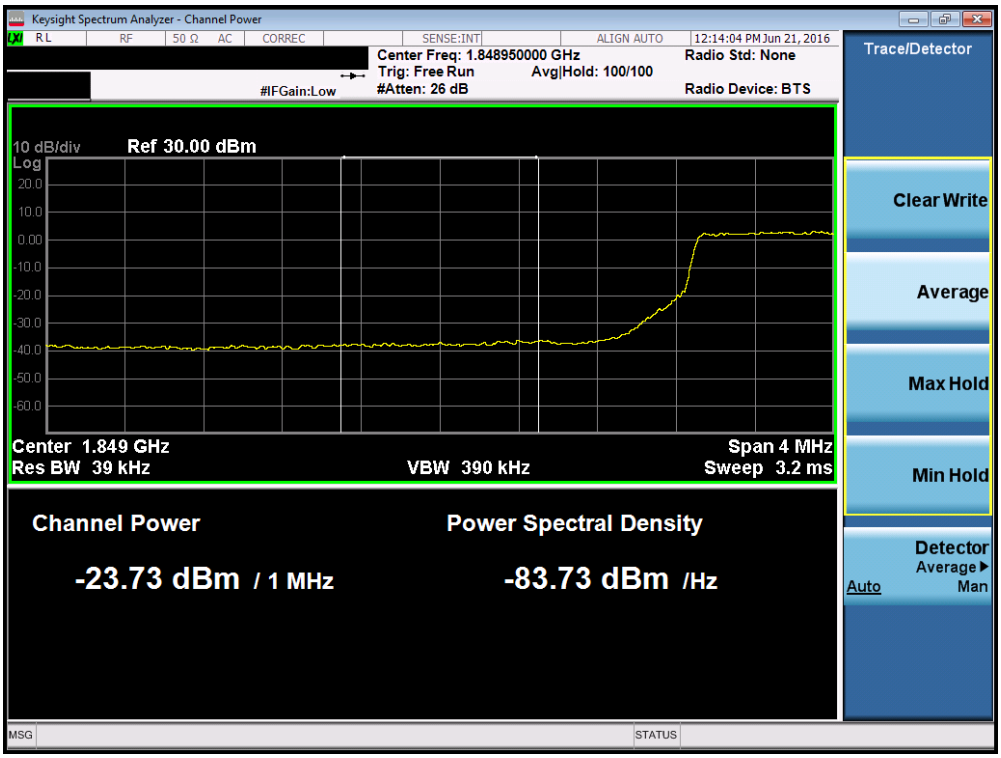
Plot 7-139. Upper Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)



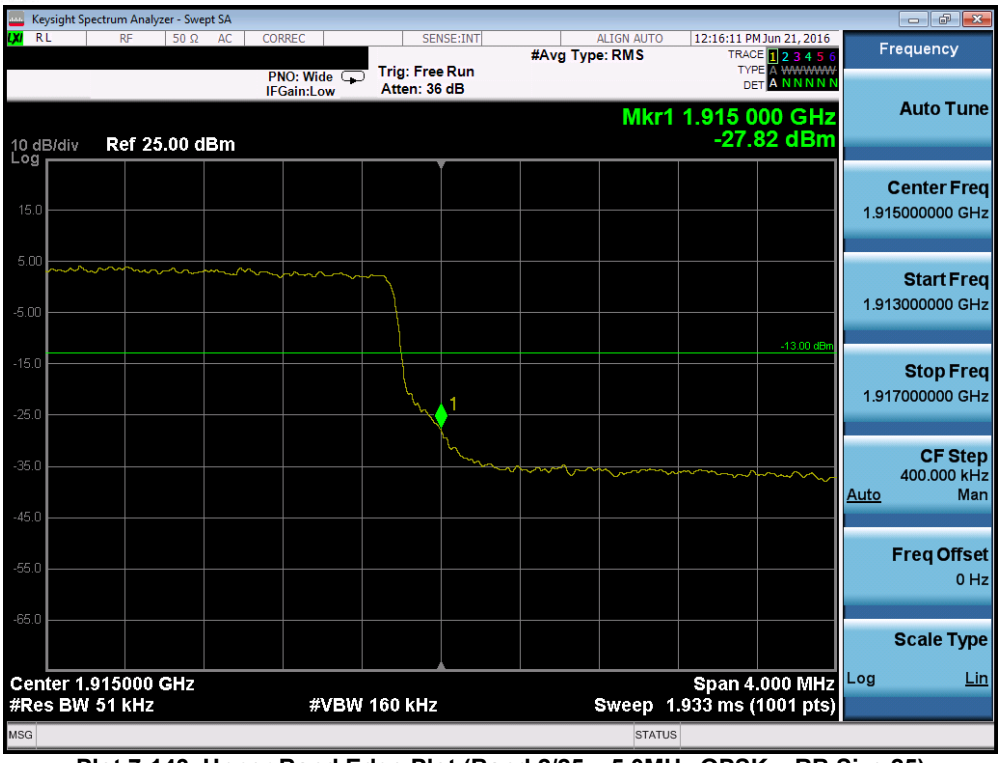
Plot 7-140. Upper Extended Band Edge Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)



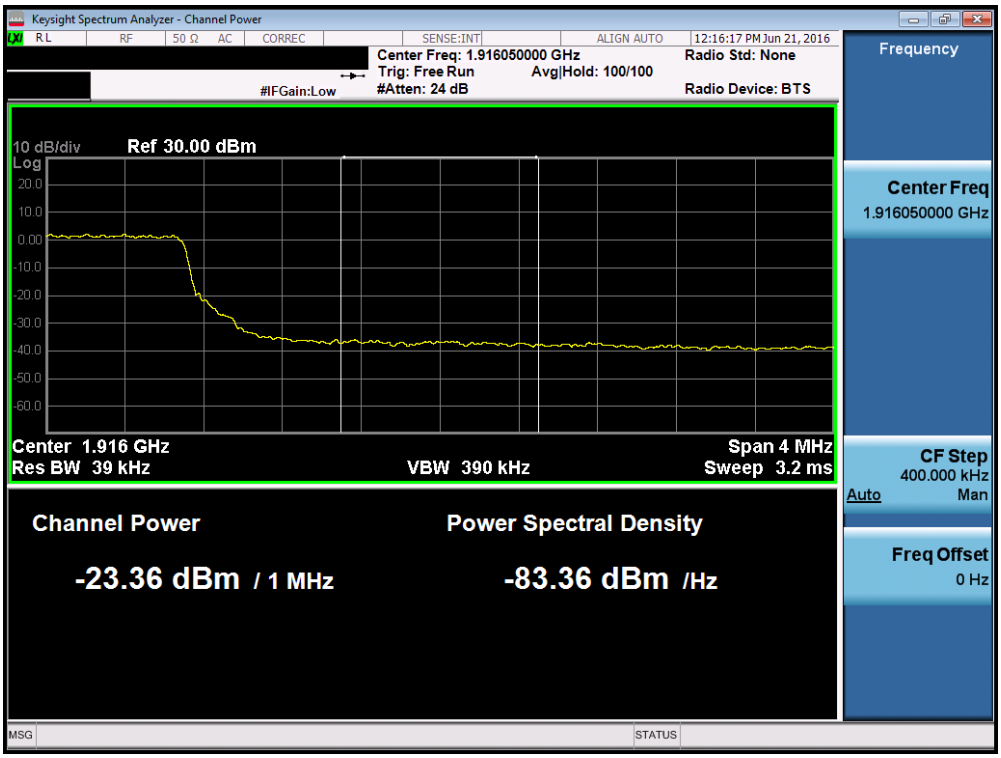
Plot 7-141. Lower Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)



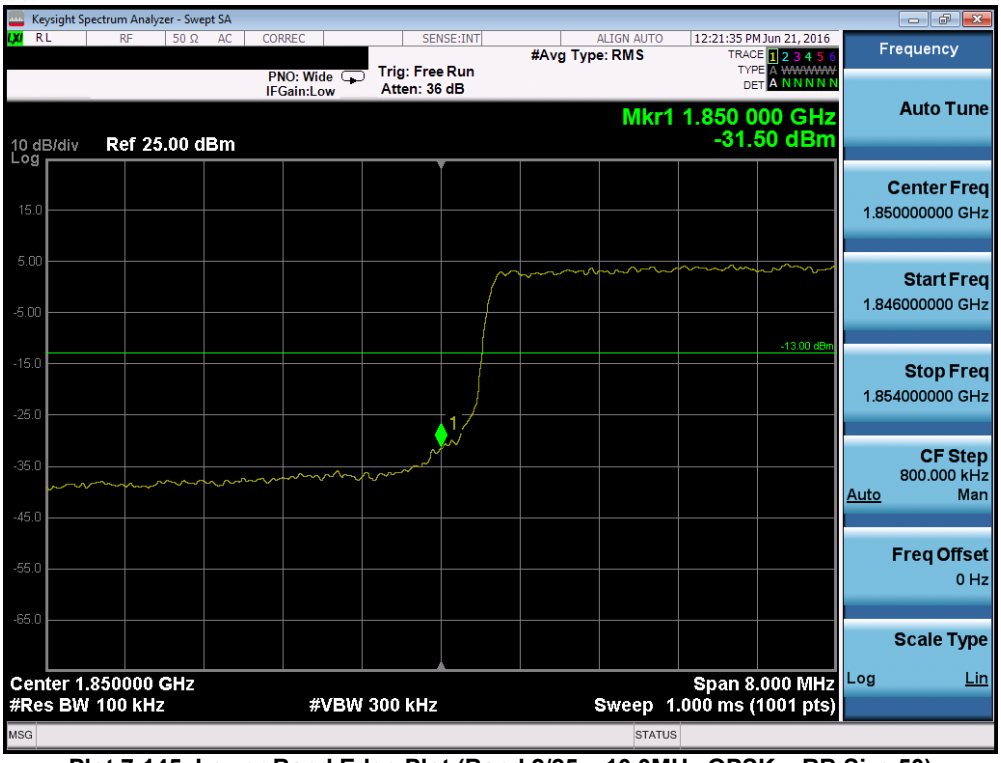
Plot 7-142. Lower Extended Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)



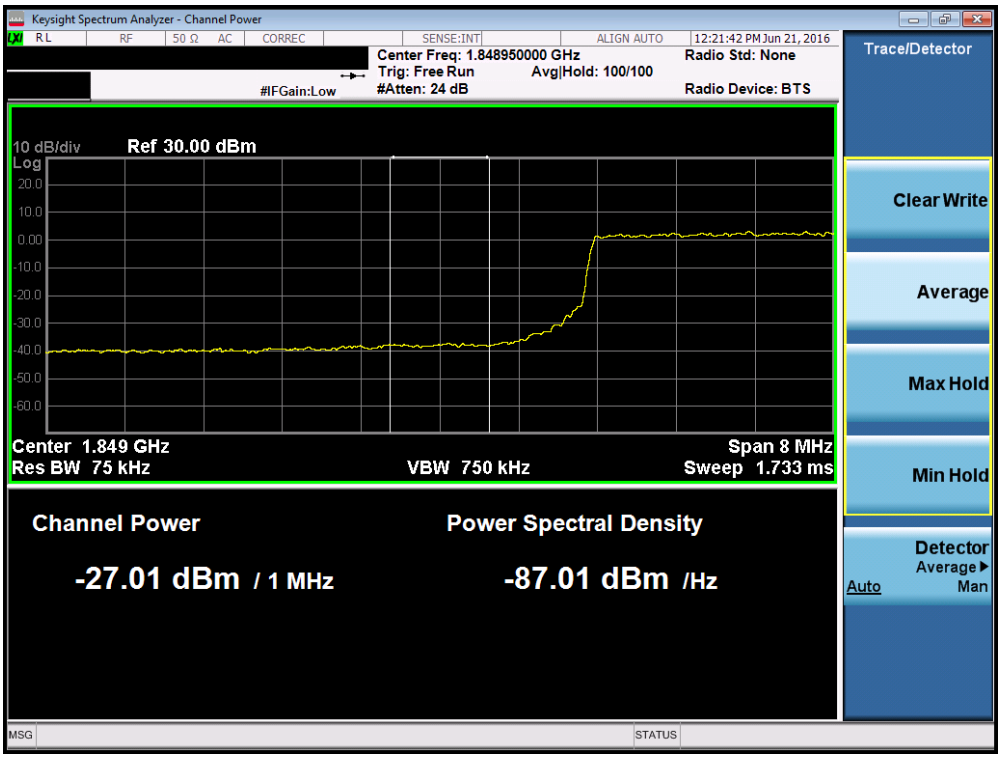
Plot 7-143. Upper Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)



Plot 7-144. Upper Extended Band Edge Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)

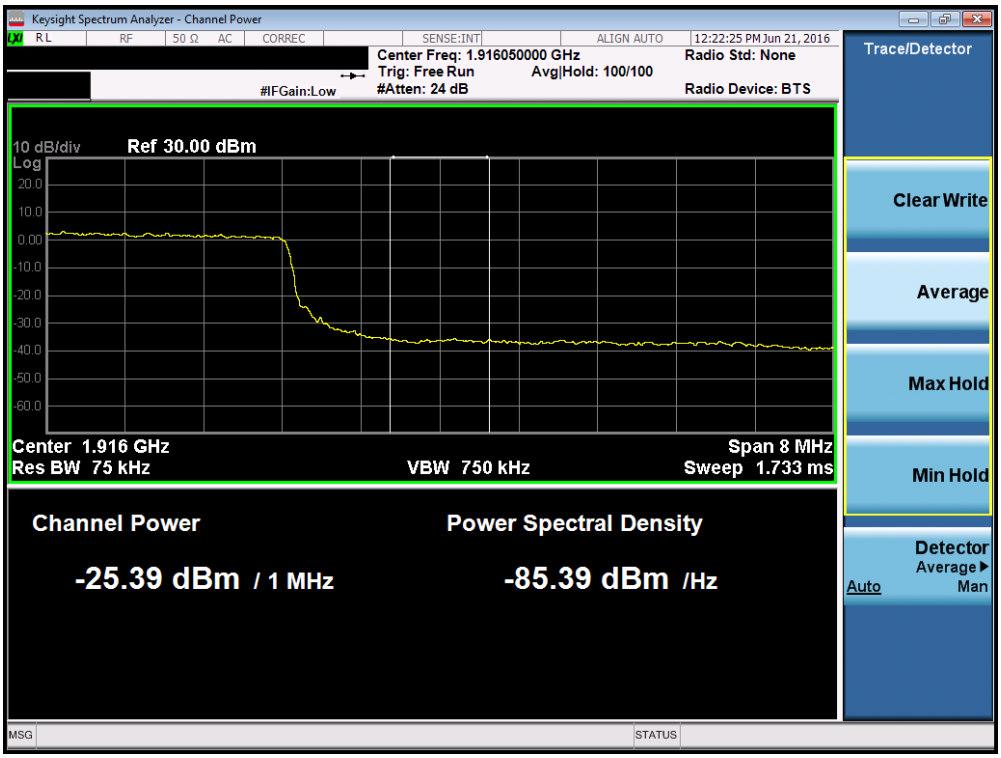


Plot 7-145. Lower Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

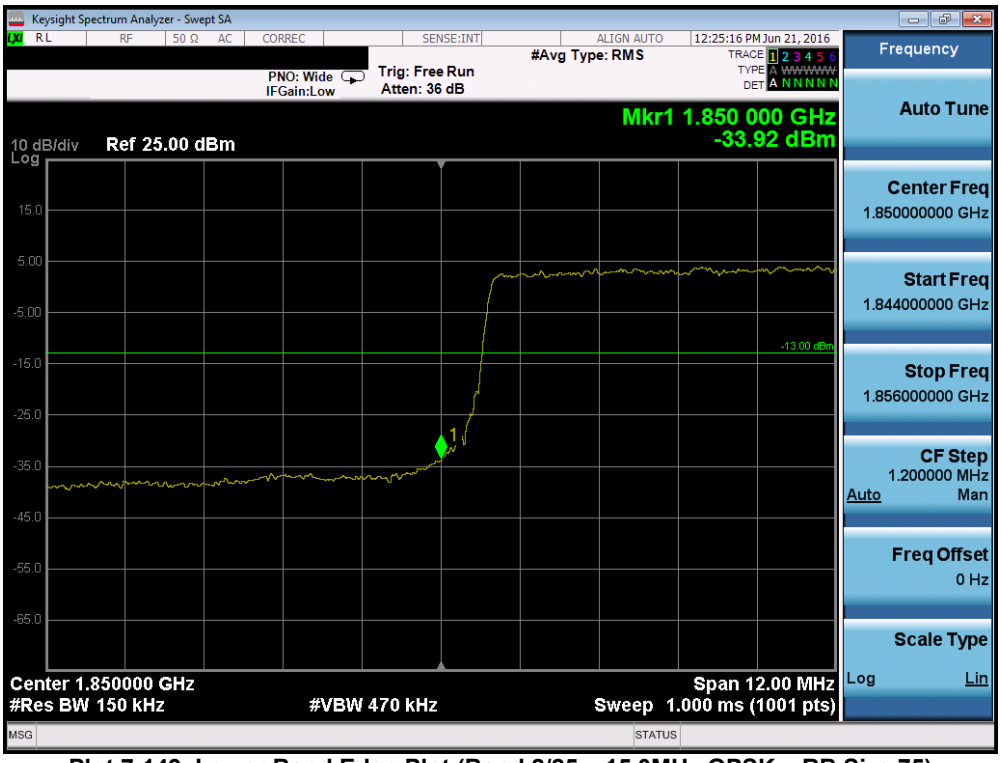


Plot 7-146. Lower Extended Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

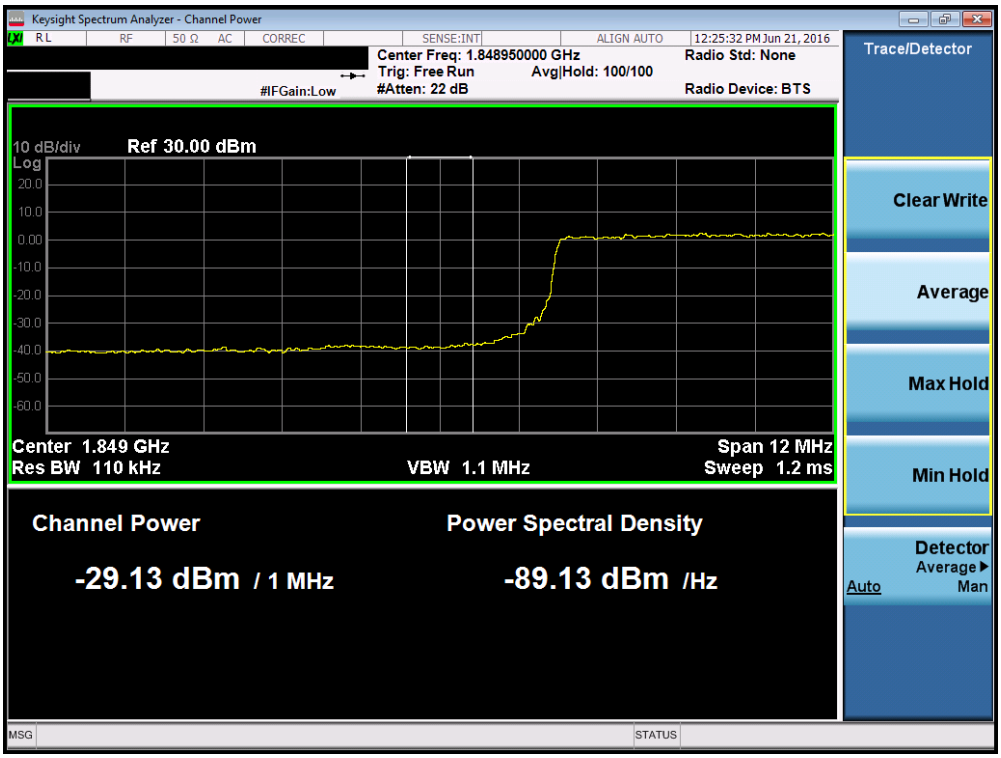
Plot 7-147. Upper Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)



Plot 7-148. Upper Extended Band Edge Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)

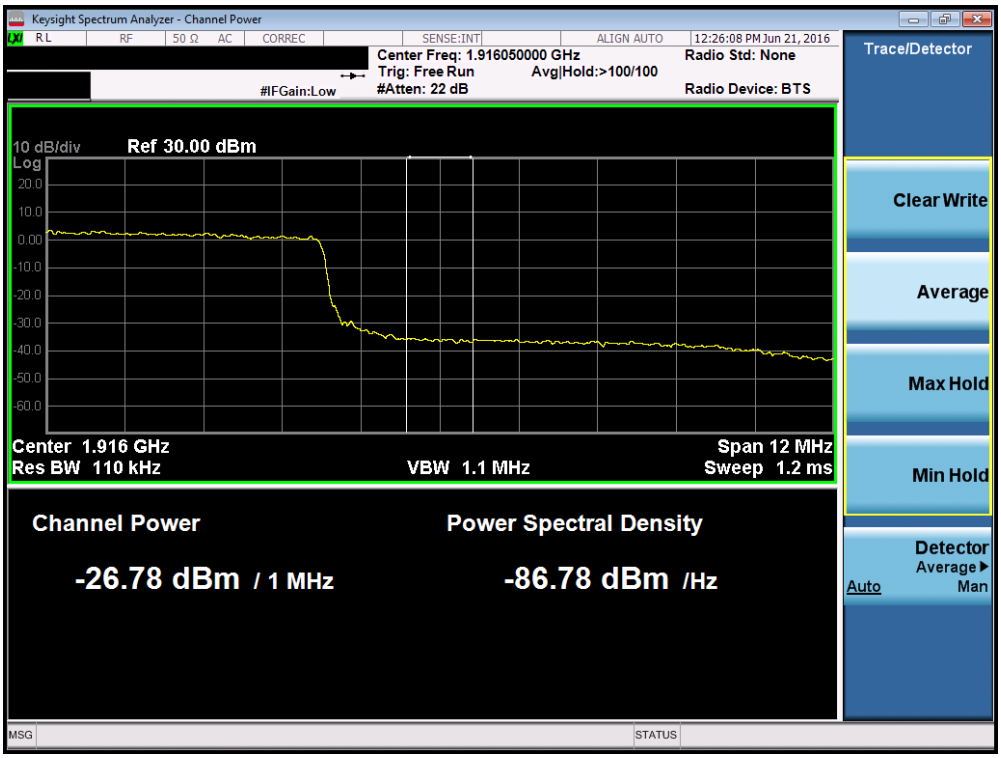


Plot 7-149. Lower Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

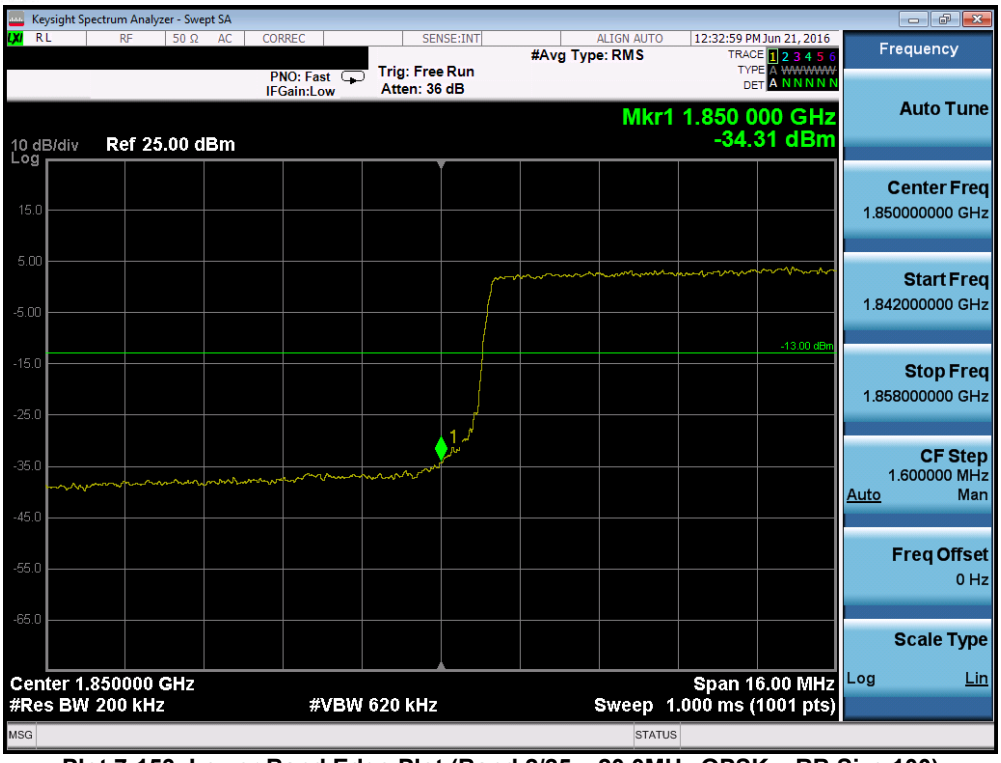


Plot 7-150. Lower Extended Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

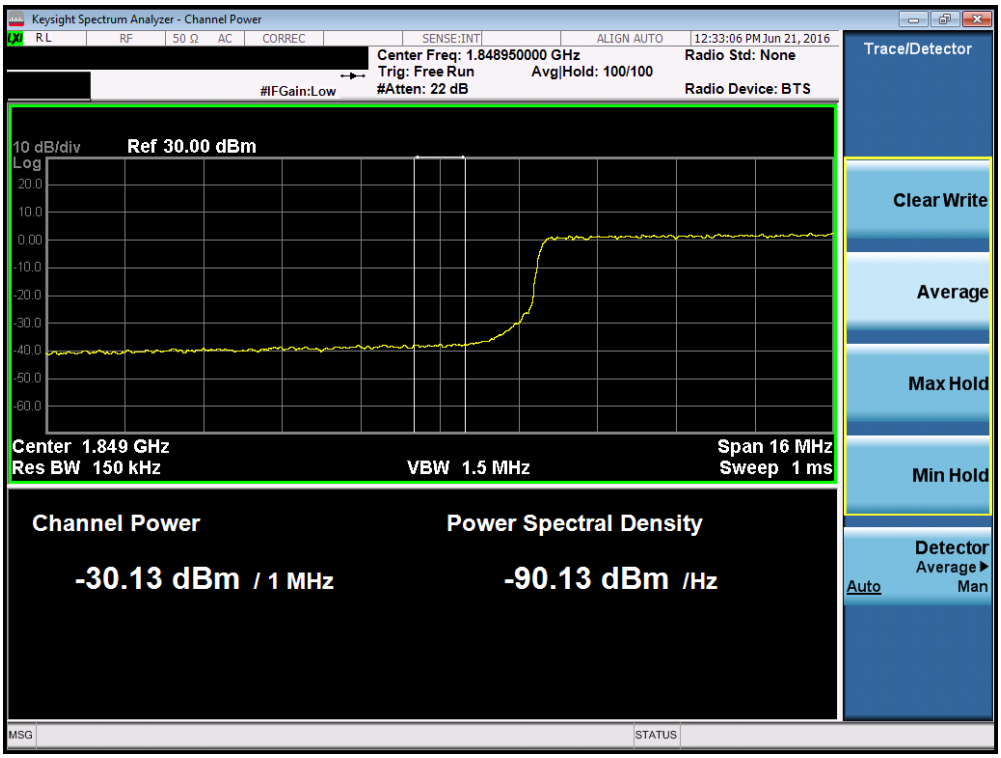
Plot 7-151. Upper Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)



Plot 7-152. Upper Extended Band Edge Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)

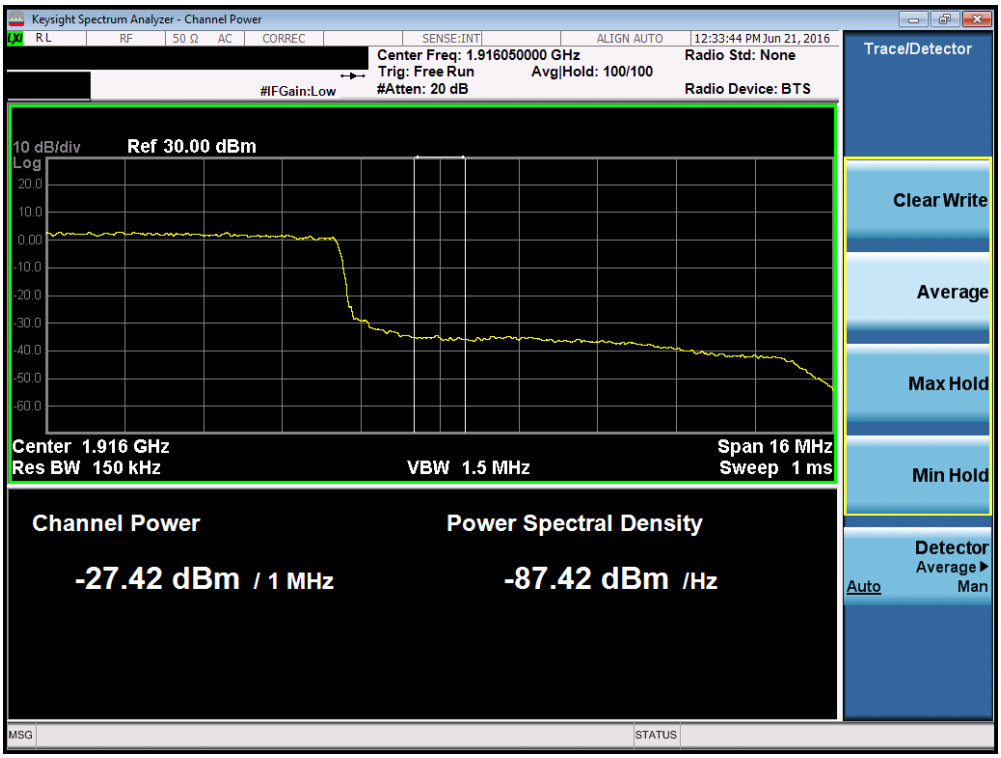


Plot 7-153. Lower Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)



Plot 7-154. Lower Extended Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)

Plot 7-155. Upper Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)



Plot 7-156. Upper Extended Band Edge Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)

7.5 Peak-Average Ratio

§24.232(d)

Test Overview

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

Test Procedure Used

KDB 971168 D01 v02r02 – Section 5.7.1

Test Settings

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

Test Setup

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

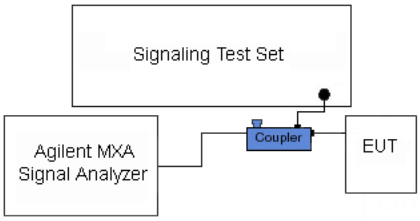
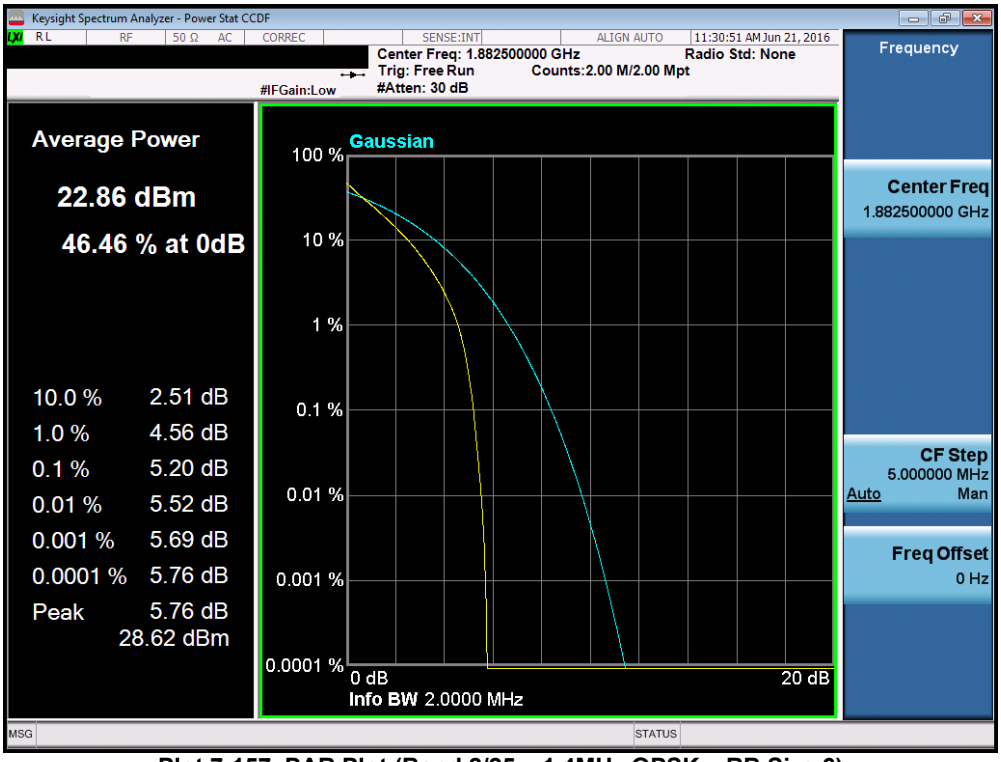


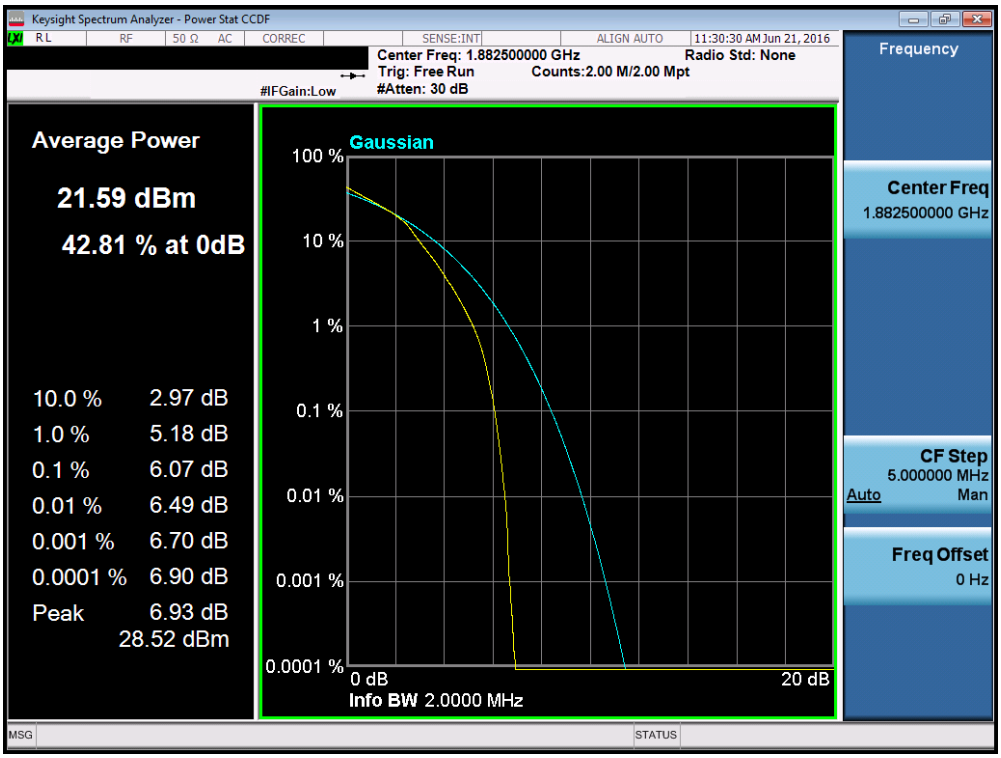
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

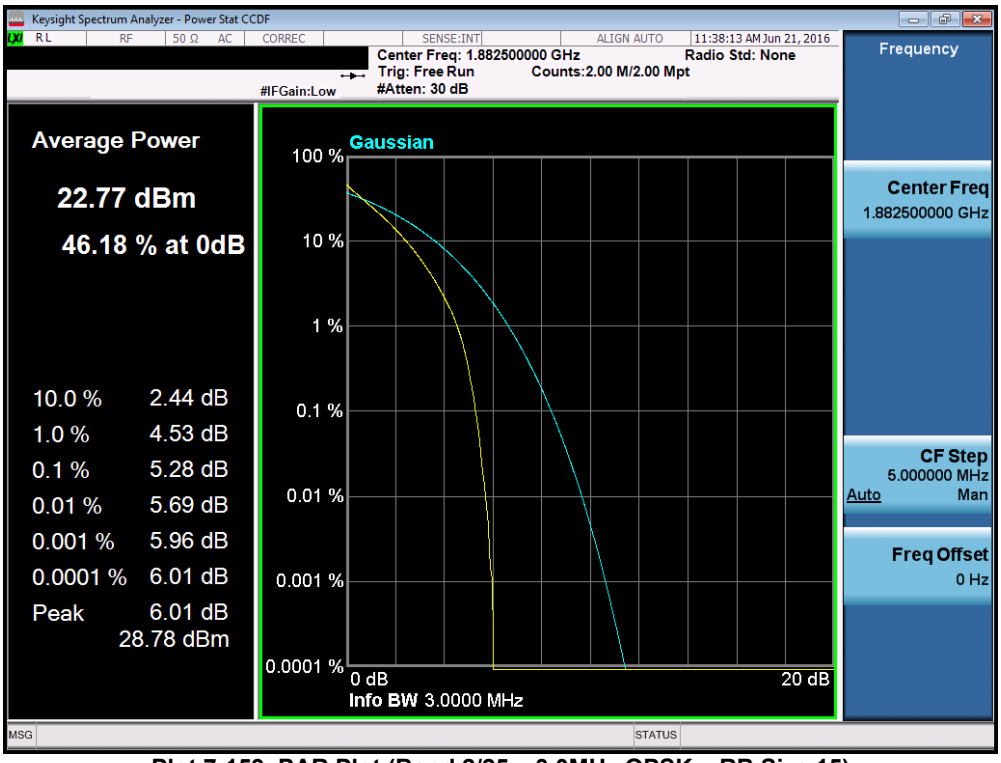
None.



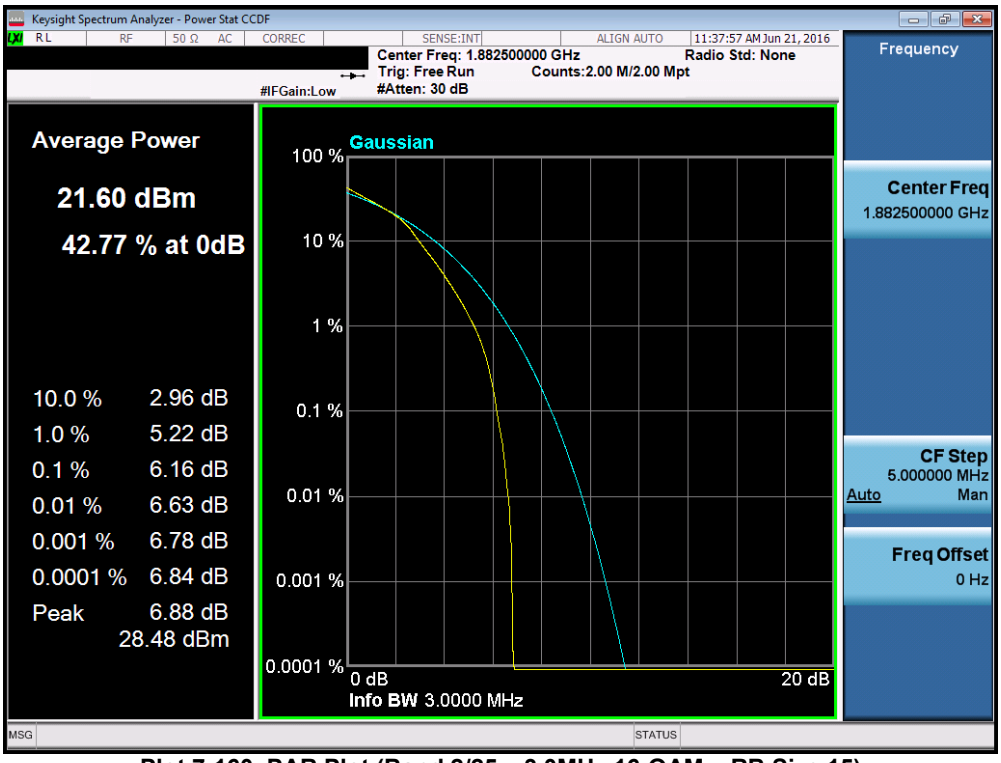
Plot 7-157. PAR Plot (Band 2/25 – 1.4MHz QPSK – RB Size 6)



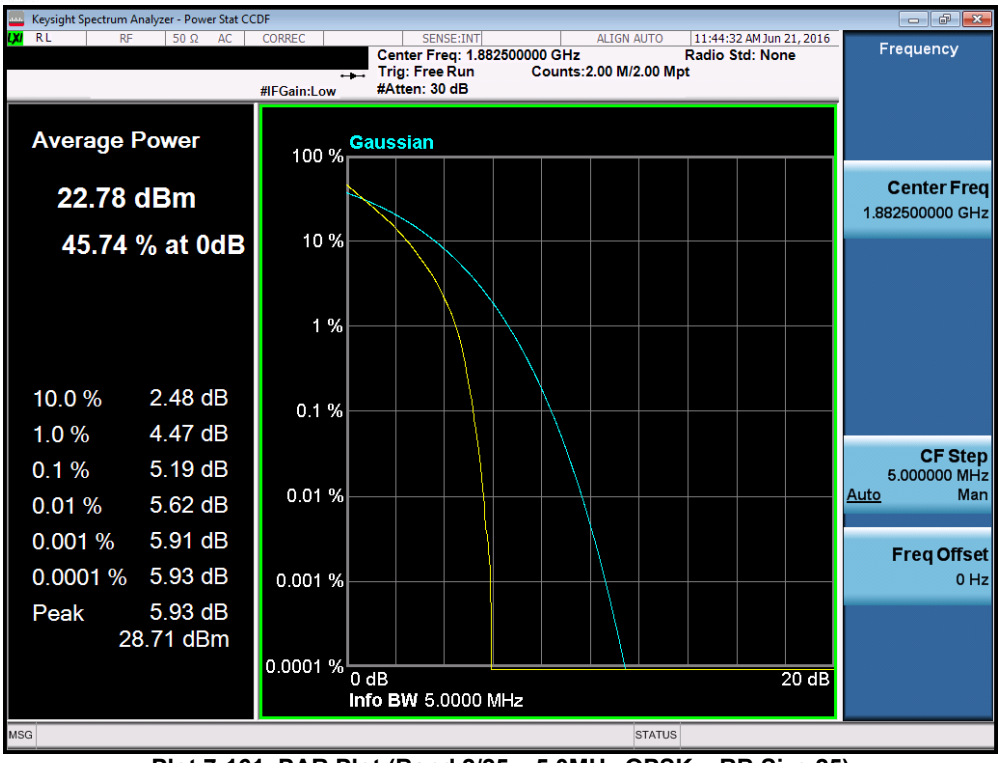
Plot 7-158. PAR Plot (Band 2/25 – 1.4MHz 16-QAM – RB Size 6)



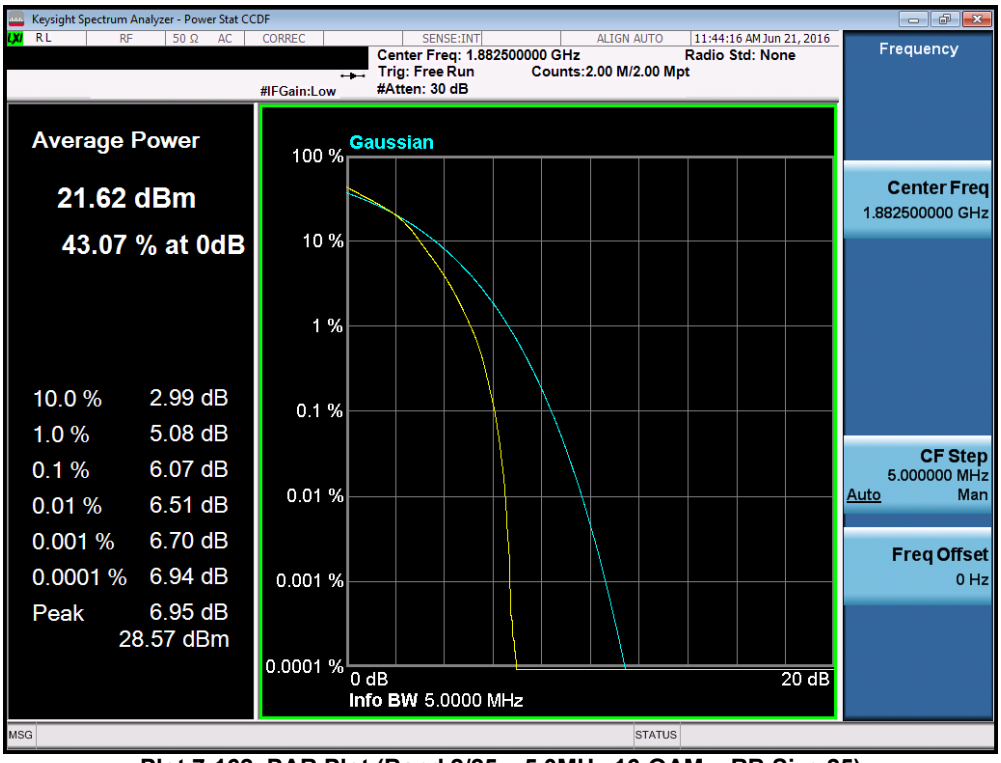
Plot 7-159. PAR Plot (Band 2/25 – 3.0MHz QPSK – RB Size 15)



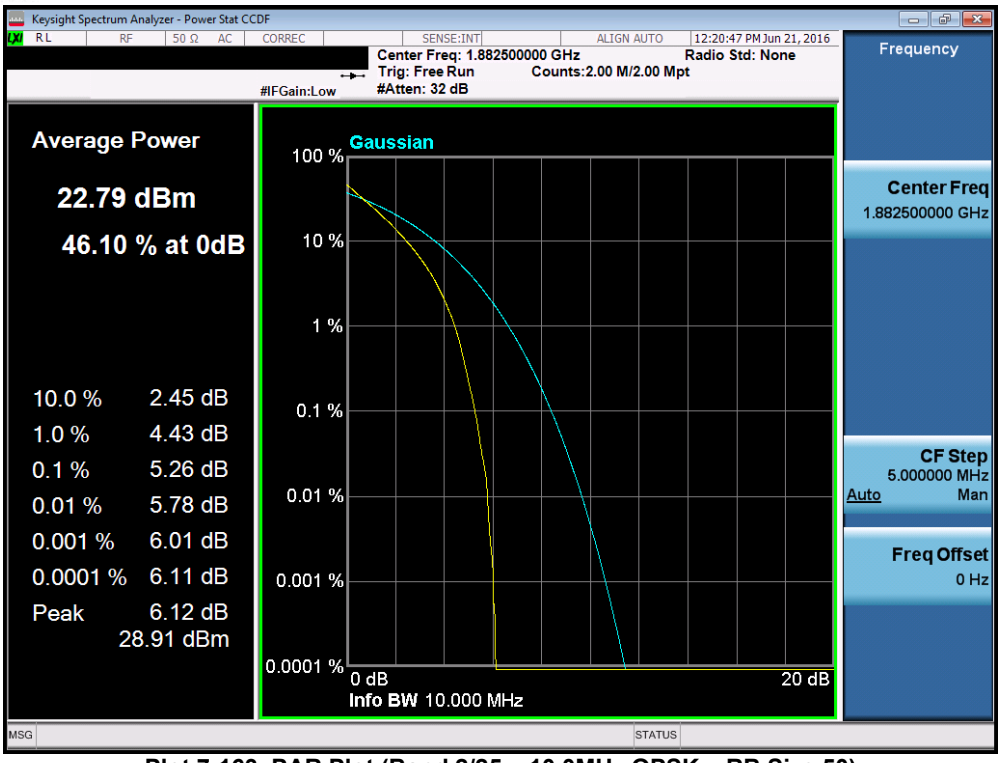
Plot 7-160. PAR Plot (Band 2/25 – 3.0MHz 16-QAM – RB Size 15)



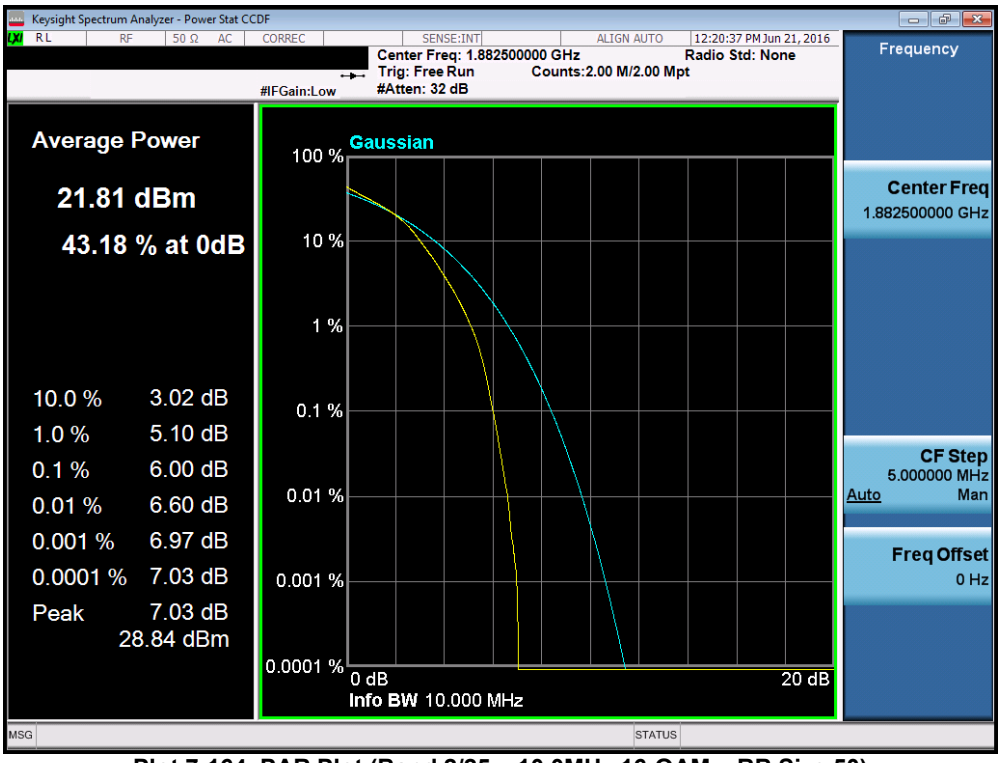
Plot 7-161. PAR Plot (Band 2/25 – 5.0MHz QPSK – RB Size 25)



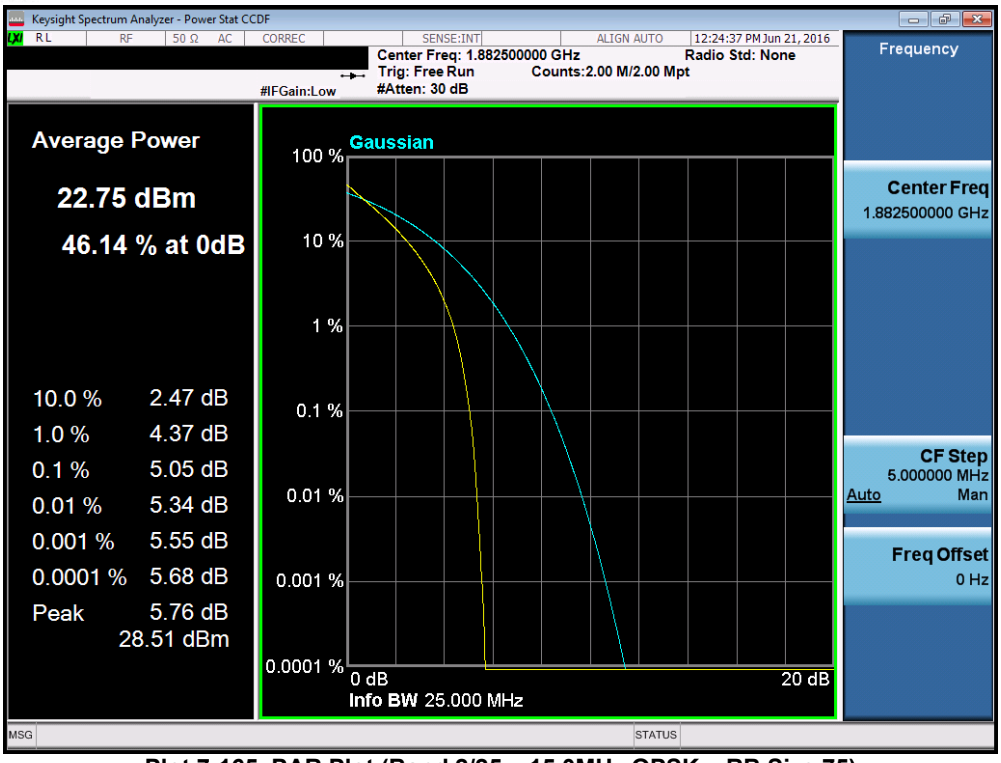
Plot 7-162. PAR Plot (Band 2/25 – 5.0MHz 16-QAM – RB Size 25)



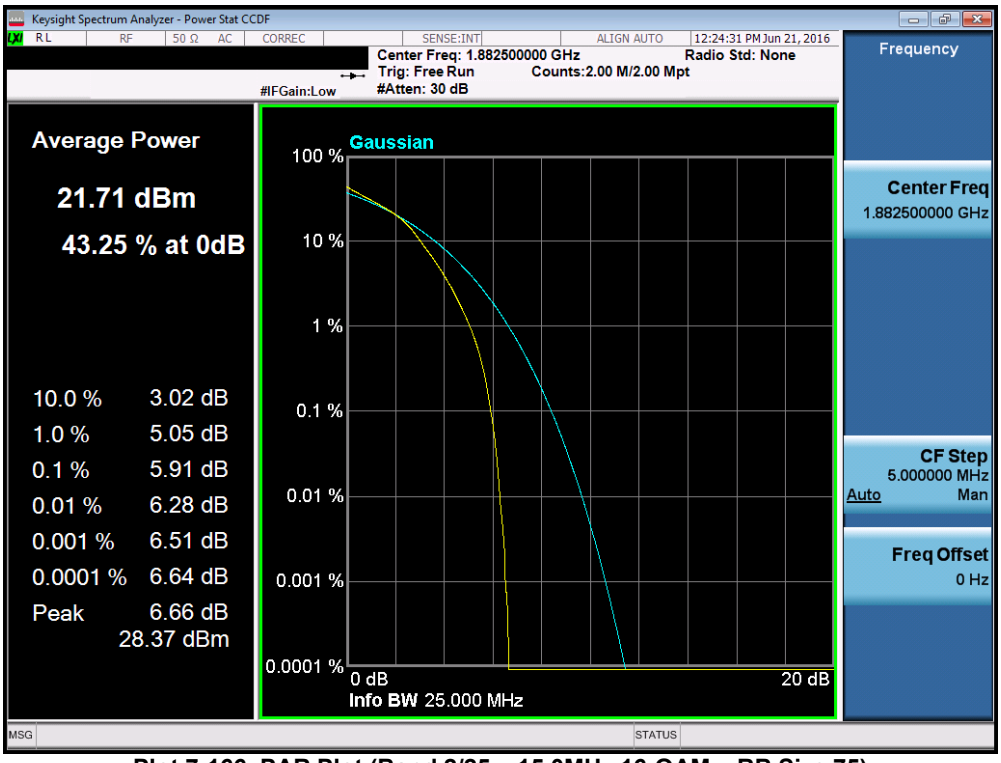
Plot 7-163. PAR Plot (Band 2/25 – 10.0MHz QPSK – RB Size 50)



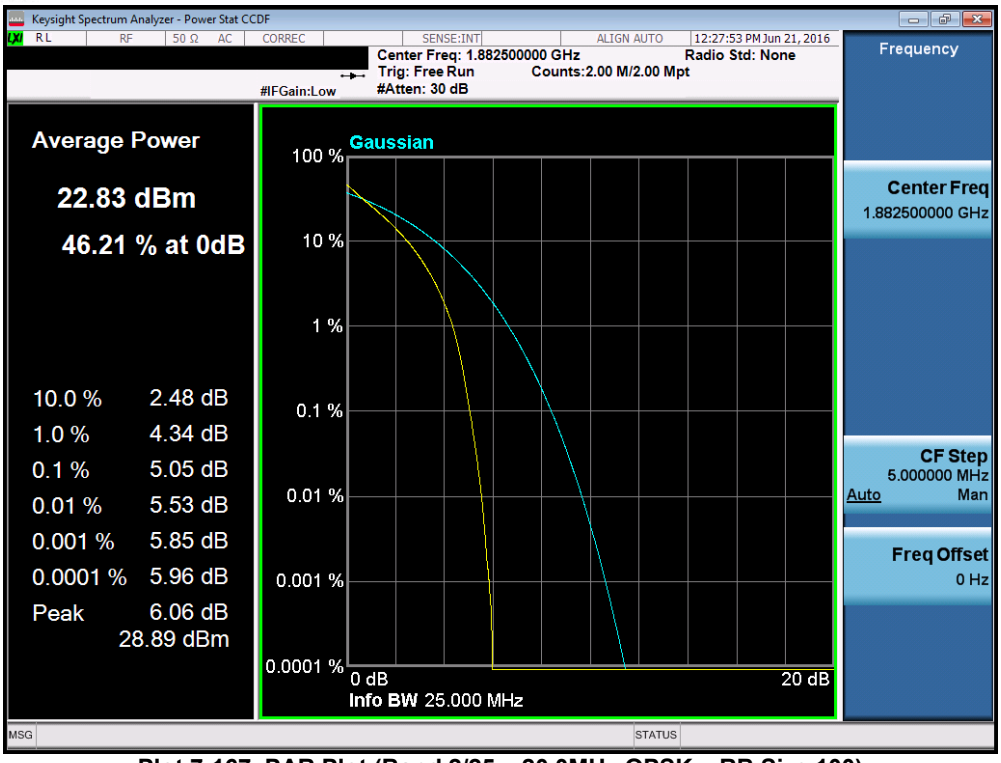
Plot 7-164. PAR Plot (Band 2/25 – 10.0MHz 16-QAM – RB Size 50)



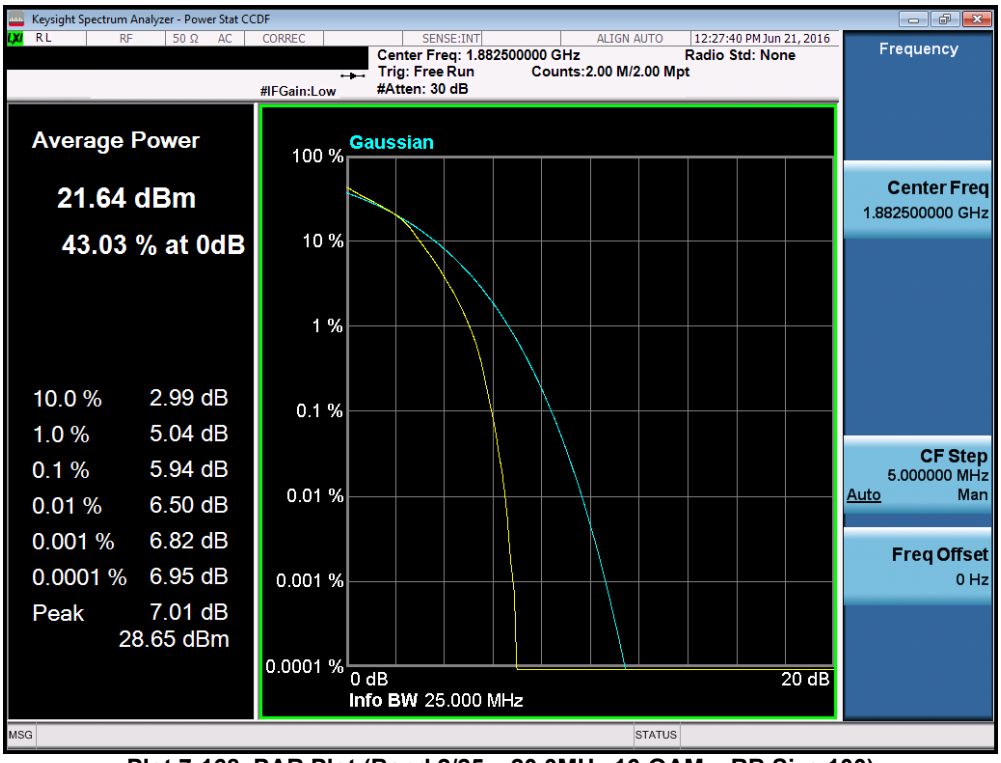
Plot 7-165. PAR Plot (Band 2/25 – 15.0MHz QPSK – RB Size 75)



Plot 7-166. PAR Plot (Band 2/25 – 15.0MHz 16-QAM – RB Size 75)



Plot 7-167. PAR Plot (Band 2/25 – 20.0MHz QPSK – RB Size 100)



Plot 7-168. PAR Plot (Band 2/25 – 20.0MHz 16-QAM – RB Size 100)

7.6 Radiated Power (ERP/EIRP)

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

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.2.1

ANSI/TIA-603-D-2010 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
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.

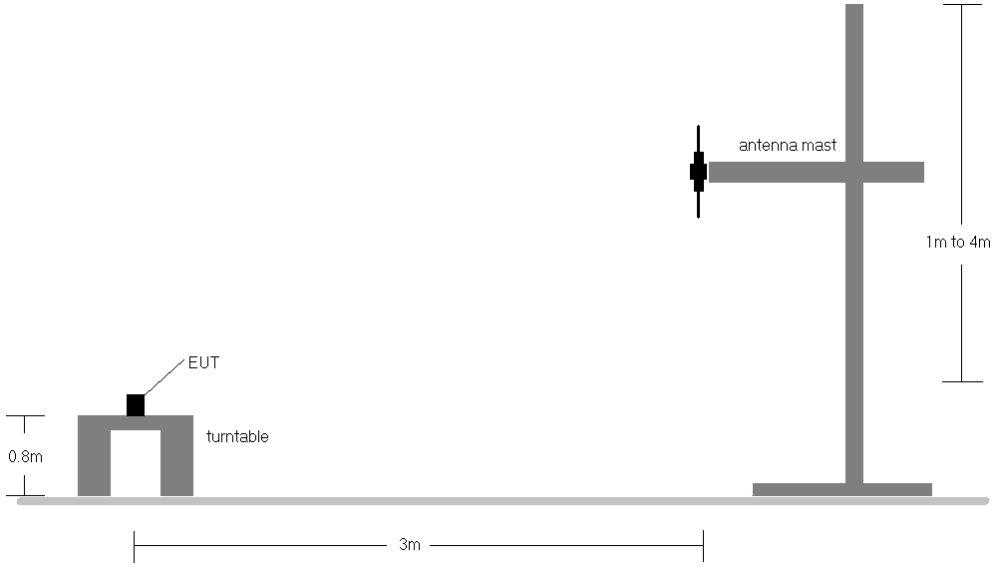


Figure 7-5. Radiated Test Setup <1GHz

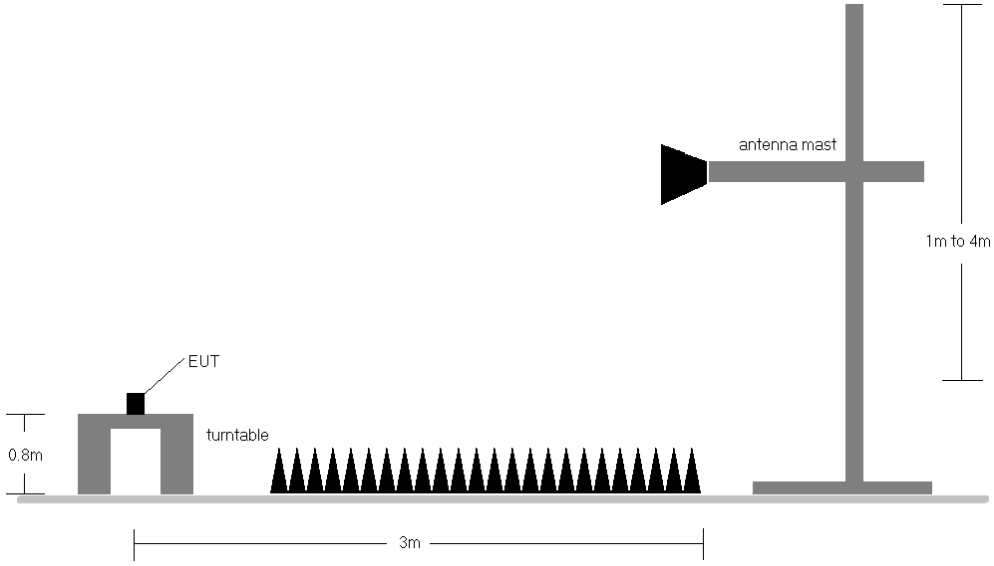


Figure 7-6. Radiated Test Setup >1GHz

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 [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	248	114	1 / 5	19.90	2.11	22.01	34.77	-12.77
707.50	1.4	QPSK	H	256	116	1 / 0	20.92	2.31	23.23	34.77	-11.54
715.30	1.4	QPSK	H	230	113	1 / 0	20.53	2.52	23.05	34.77	-11.72
699.70	1.4	16-QAM	H	248	114	1 / 5	18.40	2.11	20.51	34.77	-14.27
707.50	1.4	16-QAM	H	256	116	1 / 0	19.77	2.31	22.08	34.77	-12.69
715.30	1.4	16-QAM	H	230	113	1 / 0	19.41	2.52	21.93	34.77	-12.84
700.50	3	QPSK	H	250	119	1 / 7	20.17	2.12	22.29	34.77	-12.48
707.50	3	QPSK	H	255	119	1 / 7	21.17	2.31	23.48	34.77	-11.29
714.50	3	QPSK	H	231	111	1 / 7	20.68	2.50	23.18	34.77	-11.59
700.50	3	16-QAM	H	250	119	1 / 7	18.43	2.12	20.55	34.77	-14.22
707.50	3	16-QAM	H	255	119	1 / 7	19.82	2.31	22.13	34.77	-12.64
714.50	3	16-QAM	H	231	111	1 / 7	19.10	2.50	21.60	34.77	-13.17
701.50	5	QPSK	H	254	118	1 / 12	20.55	2.15	22.70	34.77	-12.07
707.50	5	QPSK	H	253	117	1 / 12	20.98	2.31	23.29	34.77	-11.48
713.50	5	QPSK	H	260	116	1 / 12	21.05	2.48	23.53	34.77	-11.25
701.50	5	16-QAM	H	254	118	1 / 12	18.51	2.15	20.66	34.77	-14.11
707.50	5	16-QAM	H	253	117	1 / 12	19.56	2.31	21.87	34.77	-12.90
713.50	5	16-QAM	H	260	116	1 / 12	19.12	2.48	21.60	34.77	-13.18
704.00	10	QPSK	H	252	118	1 / 0	20.44	2.22	22.66	34.77	-12.12
707.50	10	QPSK	H	255	117	1 / 0	20.83	2.31	23.14	34.77	-11.63
711.00	10	QPSK	H	256	109	1 / 0	20.99	2.41	23.40	34.77	-11.37
704.00	10	16-QAM	H	252	118	1 / 0	18.39	2.22	20.61	34.77	-14.17
707.50	10	16-QAM	H	255	117	1 / 0	19.42	2.31	21.73	34.77	-13.04
711.00	10	16-QAM	H	256	109	1 / 0	18.94	2.41	21.35	34.77	-13.42
713.50	5	QPSK	V	288	158	1 / 0	20.91	2.48	23.39	34.77	-11.39

Table 7-2. 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 [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	175	68	1 / 0	15.78	5.01	20.79	38.45	-17.66
836.50	1.4	QPSK	H	312	64	1 / 0	16.73	5.16	21.89	38.45	-16.56
848.30	1.4	QPSK	H	296	79	1 / 0	18.22	5.30	23.52	38.45	-14.93
824.70	1.4	16-QAM	H	175	68	1 / 0	14.57	5.01	19.58	38.45	-18.87
836.50	1.4	16-QAM	H	312	64	1 / 0	16.05	5.16	21.21	38.45	-17.24
848.30	1.4	16-QAM	H	296	79	1 / 0	16.94	5.30	22.24	38.45	-16.21
825.50	3	QPSK	H	174	77	1 / 0	16.29	5.02	21.31	38.45	-17.14
836.50	3	QPSK	H	312	88	1 / 0	17.22	5.16	22.38	38.45	-16.07
847.50	3	QPSK	H	296	88	1 / 0	18.22	5.29	23.51	38.45	-14.94
825.50	3	16-QAM	H	174	77	1 / 0	14.98	5.02	20.00	38.45	-18.45
836.50	3	16-QAM	H	312	88	1 / 0	15.98	5.16	21.14	38.45	-17.31
847.50	3	16-QAM	H	296	88	1 / 0	16.88	5.29	22.17	38.45	-16.28
826.50	5	QPSK	H	173	76	1 / 0	15.91	5.03	20.94	38.45	-17.51
836.50	5	QPSK	H	310	87	1 / 0	17.03	5.16	22.19	38.45	-16.26
846.50	5	QPSK	H	294	81	1 / 24	18.25	5.28	23.53	38.45	-14.92
826.50	5	16-QAM	H	173	76	1 / 0	14.41	5.03	19.44	38.45	-19.01
836.50	5	16-QAM	H	310	87	1 / 0	15.66	5.16	20.82	38.45	-17.63
846.50	5	16-QAM	H	294	81	1 / 24	16.80	5.28	22.08	38.45	-16.37
829.00	10	QPSK	H	329	45	1 / 49	16.49	5.06	21.55	38.45	-16.90
836.50	10	QPSK	H	313	51	1 / 0	16.75	5.16	21.91	38.45	-16.54
844.00	10	QPSK	H	295	84	1 / 49	17.68	5.25	22.93	38.45	-15.52
829.00	10	16-QAM	H	329	45	1 / 49	15.59	5.06	20.65	38.45	-17.80
836.50	10	16-QAM	H	313	51	1 / 0	15.25	5.16	20.41	38.45	-18.04
844.00	10	16-QAM	H	295	84	1 / 49	16.56	5.25	21.81	38.45	-16.64
831.50	15	QPSK	H	316	58	1 / 74	16.32	5.10	21.42	38.45	-17.04
836.50	15	QPSK	H	310	73	1 / 0	16.58	5.16	21.74	38.45	-16.71
841.50	15	QPSK	H	317	60	1 / 74	17.47	5.22	22.69	38.45	-15.76
831.50	15	16-QAM	H	316	58	1 / 74	15.42	5.10	20.52	38.45	-17.94
836.50	15	16-QAM	H	310	73	1 / 0	15.11	5.16	20.27	38.45	-18.18
841.50	15	16-QAM	H	317	60	1 / 74	16.34	5.22	21.56	38.45	-16.89
846.50	5	QPSK	V	170	259	1 / 0	16.88	5.28	22.16	38.45	-16.29

Table 7-3. ERP Data (Band 5/26)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	V	171	93	1 / 5	13.79	9.67	23.46	30.00	-6.54
1732.50	1.4	QPSK	V	175	91	1 / 0	15.07	9.53	24.60	30.00	-5.40
1754.30	1.4	QPSK	V	160	94	1 / 5	14.71	9.39	24.10	30.00	-5.90
1710.70	1.4	16-QAM	V	171	93	1 / 5	12.98	9.67	22.65	30.00	-7.35
1732.50	1.4	16-QAM	V	175	91	1 / 0	13.73	9.53	23.26	30.00	-6.74
1754.30	1.4	16-QAM	V	160	94	1 / 5	13.90	9.39	23.29	30.00	-6.71
1711.50	3	QPSK	V	172	94	1 / 0	13.53	9.67	23.20	30.00	-6.80
1732.50	3	QPSK	V	169	92	1 / 0	14.91	9.53	24.44	30.00	-5.56
1753.50	3	QPSK	V	163	95	1 / 14	14.37	9.40	23.77	30.00	-6.23
1711.50	3	16-QAM	V	172	94	1 / 0	12.24	9.67	21.91	30.00	-8.09
1732.50	3	16-QAM	V	169	92	1 / 0	13.80	9.53	23.33	30.00	-6.67
1753.50	3	16-QAM	V	163	95	1 / 14	13.64	9.40	23.04	30.00	-6.96
1712.50	5	QPSK	V	173	91	1 / 24	13.96	9.66	23.62	30.00	-6.38
1732.50	5	QPSK	V	173	92	1 / 0	15.26	9.53	24.79	30.00	-5.21
1752.50	5	QPSK	V	163	91	1 / 24	14.86	9.40	24.26	30.00	-5.74
1712.50	5	16-QAM	V	173	91	1 / 24	13.23	9.66	22.89	30.00	-7.11
1732.50	5	16-QAM	V	173	92	1 / 0	13.96	9.53	23.49	30.00	-6.51
1752.50	5	16-QAM	V	163	91	1 / 24	14.16	9.40	23.56	30.00	-6.44
1715.00	10	QPSK	V	173	92	1 / 25	13.75	9.64	23.39	30.00	-6.61
1732.50	10	QPSK	V	174	90	1 / 0	15.15	9.53	24.68	30.00	-5.32
1750.00	10	QPSK	V	166	91	1 / 49	14.60	9.42	24.02	30.00	-5.98
1715.00	10	16-QAM	V	173	92	1 / 25	12.41	9.64	22.05	30.00	-7.95
1732.50	10	16-QAM	V	174	90	1 / 0	13.98	9.53	23.51	30.00	-6.49
1750.00	10	16-QAM	V	166	91	1 / 49	13.84	9.42	23.26	30.00	-6.74
1717.50	15	QPSK	V	175	88	1 / 74	13.66	9.63	23.29	30.00	-6.71
1732.50	15	QPSK	V	177	91	1 / 0	15.01	9.53	24.54	30.00	-5.46
1747.50	15	QPSK	V	162	90	1 / 74	14.41	9.43	23.84	30.00	-6.16
1717.50	15	16-QAM	V	175	88	1 / 74	12.30	9.63	21.93	30.00	-8.07
1732.50	15	16-QAM	V	177	91	1 / 0	13.87	9.53	23.40	30.00	-6.60
1747.50	15	16-QAM	V	162	90	1 / 74	13.74	9.43	23.17	30.00	-6.83
1720.00	20	QPSK	V	177	94	1 / 0	13.57	9.61	23.18	30.00	-6.82
1732.50	20	QPSK	V	175	93	1 / 0	14.85	9.53	24.38	30.00	-5.62
1745.00	20	QPSK	V	163	96	1 / 99	14.32	9.45	23.77	30.00	-6.23
1720.00	20	16-QAM	V	177	94	1 / 0	12.19	9.61	21.80	30.00	-8.20
1732.50	20	16-QAM	V	175	93	1 / 0	13.78	9.53	23.31	30.00	-6.69
1745.00	20	16-QAM	V	163	96	1 / 99	13.60	9.45	23.05	30.00	-6.95
1732.50	5	QPSK	H	151	277	1 / 0	14.35	9.53	23.88	30.00	-6.12

Table 7-4. EIRP Data (Band 4)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	V	184	93	1 / 5	13.88	9.21	23.09	33.01	-9.92
1882.50	1.4	QPSK	V	148	108	1 / 5	12.33	9.27	21.60	33.01	-11.41
1914.30	1.4	QPSK	V	146	97	1 / 5	15.37	9.36	24.73	33.01	-8.28
1850.70	1.4	16-QAM	V	184	93	1 / 5	13.12	9.21	22.33	33.01	-10.68
1882.50	1.4	16-QAM	V	148	108	1 / 5	11.49	9.27	20.76	33.01	-12.25
1914.30	1.4	16-QAM	V	146	97	1 / 5	14.54	9.36	23.90	33.01	-9.11
1851.50	3	QPSK	V	184	93	1 / 14	13.84	9.21	23.05	33.01	-9.96
1882.50	3	QPSK	V	148	108	1 / 14	12.46	9.27	21.73	33.01	-11.28
1913.50	3	QPSK	V	146	97	1 / 14	15.28	9.36	24.64	33.01	-8.37
1851.50	3	16-QAM	V	184	93	1 / 14	13.09	9.21	22.30	33.01	-10.71
1882.50	3	16-QAM	V	148	108	1 / 14	11.35	9.27	20.62	33.01	-12.39
1913.50	3	16-QAM	V	146	97	1 / 14	14.57	9.36	23.93	33.01	-9.08
1852.50	5	QPSK	V	195	96	1 / 24	16.80	9.22	26.02	33.01	-6.99
1882.50	5	QPSK	V	146	91	1 / 24	16.07	9.27	25.34	33.01	-7.67
1912.50	5	QPSK	V	147	96	1 / 12	17.29	9.35	26.64	33.01	-6.37
1852.50	5	16-QAM	V	195	96	1 / 24	15.90	9.22	25.12	33.01	-7.89
1882.50	5	16-QAM	V	146	91	1 / 24	14.99	9.27	24.26	33.01	-8.75
1912.50	5	16-QAM	V	147	96	1 / 12	15.84	9.35	25.19	33.01	-7.82
1855.00	10	QPSK	V	147	91	1 / 25	15.61	9.22	24.83	33.01	-8.18
1882.50	10	QPSK	V	183	63	1 / 49	13.94	9.27	23.21	33.01	-9.80
1910.00	10	QPSK	V	145	96	1 / 25	17.33	9.34	26.67	33.01	-6.34
1855.00	10	16-QAM	V	147	91	1 / 25	14.17	9.22	23.39	33.01	-9.62
1882.50	10	16-QAM	V	183	63	1 / 49	12.65	9.27	21.92	33.01	-11.09
1910.00	10	16-QAM	V	145	96	1 / 25	16.01	9.34	25.35	33.01	-7.66
1857.50	15	QPSK	V	149	85	1 / 0	13.15	9.23	22.38	33.01	-10.63
1882.50	15	QPSK	V	157	73	1 / 74	14.39	9.27	23.66	33.01	-9.35
1907.50	15	QPSK	V	137	104	1 / 0	14.77	9.33	24.10	33.01	-8.91
1857.50	15	16-QAM	V	149	85	1 / 0	12.88	9.23	22.11	33.01	-10.90
1882.50	15	16-QAM	V	157	73	1 / 74	13.95	9.27	23.22	33.01	-9.79
1907.50	15	16-QAM	V	137	104	1 / 0	13.88	9.33	23.21	33.01	-9.80
1860.00	20	QPSK	V	152	73	1 / 0	13.83	9.23	23.06	33.01	-9.95
1882.50	20	QPSK	V	147	93	1 / 99	14.54	9.27	23.81	33.01	-9.20
1905.00	20	QPSK	V	137	90	1 / 50	14.88	9.31	24.19	33.01	-8.82
1860.00	20	16-QAM	V	152	73	1 / 0	12.86	9.23	22.09	33.01	-10.92
1882.50	20	16-QAM	V	147	93	1 / 99	14.06	9.27	23.33	33.01	-9.68
1905.00	20	16-QAM	V	137	90	1 / 50	14.00	9.31	23.31	33.01	-9.70
1910.00	10	QPSK	H	157	270	1 / 0	15.95	9.34	25.29	33.01	-7.72

Table 7-5. EIRP Data (Band 2/25)

7.7 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

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

Test Setup

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

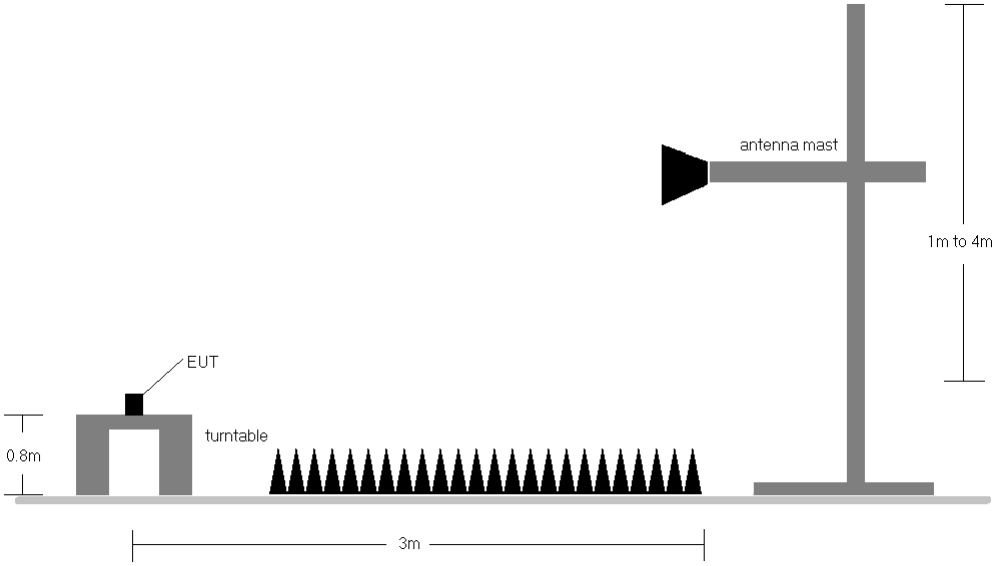


Figure 7-7. Test Instrument & Measurement Setup

Test Notes

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

2) This unit was tested with its standard battery.

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

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

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

OPERATING FREQUENCY:	701.50	MHz		
CHANNEL:	23035			
MEASURED OUTPUT POWER:	22.70	dBm	=	0.186 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.70	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1403.00	H	142	185	-53.10	2.39	-50.71	73.4
2104.50	H	140	247	-50.96	3.46	-47.50	70.2
2806.00	H	-	-	-57.47	4.76	-52.71	75.4

Table 7-6. Radiated Spurious Data (Band 12 – Low Channel)

OPERATING FREQUENCY:	707.50	MHz		
CHANNEL:	23095			
MEASURED OUTPUT POWER:	23.29	dBm	=	0.213 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.29	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	144	150	-53.26	2.54	-50.72	74.0
2122.50	H	140	243	-50.67	3.42	-47.25	70.5
2830.00	H	-	-	-57.12	4.85	-52.26	75.6

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

OPERATING FREQUENCY:	713.50	MHz		
CHANNEL:	23155			
MEASURED OUTPUT POWER:	23.53	dBm	=	0.225 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.53	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1427.00	H	138	193	-53.82	2.70	-51.12	74.6
2140.50	H	144	230	-51.88	3.38	-48.50	72.0
2854.00	H	-	-	-57.84	4.95	-52.90	76.4

Table 7-8. Radiated Spurious Data (Band 12 – High Channel)

OPERATING FREQUENCY:	826.50	MHz		
CHANNEL:	20425			
MEASURED OUTPUT POWER:	20.94	dBm	=	0.124 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	33.94	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1653.00	H	189	12	-57.26	3.62	-53.64	74.6
2479.50	H	-	-	-56.34	3.56	-52.78	73.7
3306.00	H	-	-	-57.58	5.83	-51.75	72.7

Table 7-9. Radiated Spurious Data (Band 5/26 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz		
CHANNEL:	20525			
MEASURED OUTPUT POWER:	22.19	dBm	=	0.165 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	35.19	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	H	261	357	-58.56	3.52	-55.04	77.2
2509.50	H	-	-	-55.94	3.59	-52.35	74.5
3346.00	H	-	-	-58.09	5.87	-52.22	74.4

Table 7-10. Radiated Spurious Data (Band 5/26 – Mid Channel)

OPERATING FREQUENCY:	846.50	MHz		
CHANNEL:	20625			
MEASURED OUTPUT POWER:	23.53	dBm	=	0.225 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.53	dBc	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1693.00	H	257	177	-56.38	3.42	-52.96	76.5
2539.50	H	-	-	-56.40	3.72	-52.68	76.2
3386.00	H	-	-	-57.57	5.91	-51.66	75.2

Table 7-11. Radiated Spurious Data (Band 5/26 – High Channel)

OPERATING FREQUENCY:	1712.50	MHz		
CHANNEL:	19975			
MEASURED OUTPUT POWER:	23.62	dBm	=	0.230 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.62	dBc	

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]	[dBc]
3425.00	H	149	164	-54.39	8.15	-46.25	69.9
5137.50	H	-	-	-56.71	10.37	-46.34	70.0
6850.00	H	-	-	-55.23	11.48	-43.76	67.4

Table 7-12. Radiated Spurious Data (Band 4 – Low Channel)

OPERATING FREQUENCY:	1732.50	MHz		
CHANNEL:	20175			
MEASURED OUTPUT POWER:	24.79	dBm	=	0.301 W
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W) =	37.79	dBc	

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]	[dBc]
3465.00	H	150	12	-53.61	8.26	-45.35	70.1
5197.50	H	-	-	-55.61	10.41	-45.19	70.0
6930.00	H	-	-	-53.79	11.53	-42.26	67.1

Table 7-13. Radiated Spurious Data (Band 4 – Mid Channel)

OPERATING FREQUENCY:	1752.50	MHz			
CHANNEL:	20375				
MEASURED OUTPUT POWER:	24.26	dBm	=	0.267	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	5.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	37.26	dBc		

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]	[dBc]
3505.00	H	143	177	-56.27	8.36	-47.91	72.2
5257.50	H	-	-	-55.99	10.35	-45.63	69.9
7010.00	H	-	-	-53.92	11.58	-42.33	66.6

Table 7-14. Radiated Spurious Data (Band 4 – High Channel)

OPERATING FREQUENCY:	1855.00	MHz			
CHANNEL:	18650				
MEASURED OUTPUT POWER:	24.83	dBm	=	0.304	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	10.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	37.83	dBc		

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]	[dBc]
3710.00	H	246	26	-52.55	8.44	-44.11	68.9
5565.00	H	-	-	-54.49	10.53	-43.96	68.8
7420.00	H	-	-	-54.83	12.01	-42.82	67.7

Table 7-15. Radiated Spurious Data (Band 2/25 – Low Channel)

OPERATING FREQUENCY:	1880.00	MHz			
CHANNEL:	18900				
MEASURED OUTPUT POWER:	23.21	dBm	=	0.209	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	10.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	36.21	dBc		

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]	[dBc]
3760.00	H	158	25	-51.05	8.64	-42.42	65.6
5640.00	H	-	-	-54.78	10.62	-44.16	67.4
7520.00	H	-	-	-54.57	12.04	-42.52	65.7

Table 7-16. Radiated Spurious Data (Band 2/25 – Mid Channel)

OPERATING FREQUENCY:	1905.00	MHz			
CHANNEL:	19150				
MEASURED OUTPUT POWER:	26.67	dBm	=	0.465	W
MODULATION SIGNAL:	QPSK				
BANDWIDTH:	10.0	MHz			
DISTANCE:	3	meters			
LIMIT:	43 + 10 $\log_{10}$ (W) =	39.67	dBc		

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]	[dBc]
3810.00	H	152	10	-50.63	8.78	-41.85	68.5
5715.00	H	-	-	-56.08	10.70	-45.39	72.1
7620.00	H	-	-	-55.00	12.16	-42.84	69.5

Table 7-17. Radiated Spurious Data (Band 2/25 – High Channel)

7.8 Frequency Stability / Temperature Variation

§2.1055 §22.355 §24.235 §27.54

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-D-2010. The frequency stability of the transmitter is measured by:

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

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

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

Test Procedure Used

ANSI/TIA-603-D-2010

Test Settings

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

Test Setup

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

Test Notes

None

Band 12 Frequency Stability Measurements

§2.1055 §27.54

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	707,499,982	-18	-0.0000025
100 %		- 30	707,499,630	-370	-0.0000523
100 %		- 20	707,500,018	18	0.0000025
100 %		- 10	707,500,310	310	0.0000438
100 %		0	707,500,011	11	0.0000016
100 %		+ 10	707,500,016	16	0.0000023
100 %		+ 20	707,500,269	269	0.0000380
100 %		+ 30	707,499,791	-209	-0.0000295
100 %		+ 40	707,500,345	345	0.0000488
100 %		+ 50	707,499,976	-24	-0.0000034
BATT. ENDPOINT	3.40	+ 20	707,499,974	-26	-0.0000037

Table 7-18. Frequency Stability Data (Band 12)

Band 12 Frequency Stability Measurements

§2.1055 §27.54

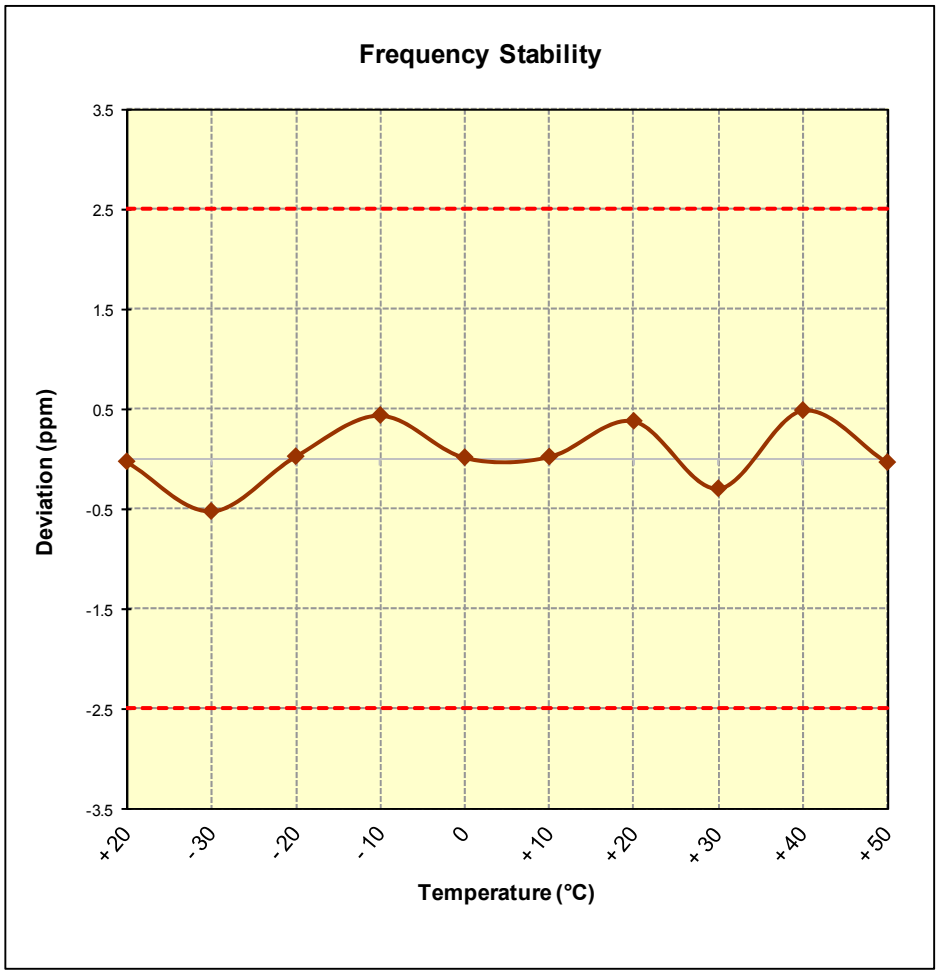


Figure 7-8. Frequency Stability Graph (Band 12)

Band 5/26 Frequency Stability Measurements

§2.1055 §22.355

OPERATING FREQUENCY:	836,500,000	Hz
CHANNEL:	20525	
REFERENCE VOLTAGE:	3.80	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,500,067	67	0.0000080
100 %		- 30	836,500,161	161	0.0000192
100 %		- 20	836,500,160	160	0.0000191
100 %		- 10	836,499,923	-77	-0.0000092
100 %		0	836,500,055	55	0.0000066
100 %		+ 10	836,500,035	35	0.0000042
100 %		+ 20	836,500,036	36	0.0000043
100 %		+ 30	836,499,830	-170	-0.0000203
100 %		+ 40	836,499,544	-456	-0.0000545
100 %		+ 50	836,499,741	-259	-0.0000310
BATT. ENDPOINT	3.40	+ 20	836,499,979	-21	-0.0000025

Table 7-19. Frequency Stability Data (Band 5/26)

Band 5/26 Frequency Stability Measurements

§2.1055 §22.355

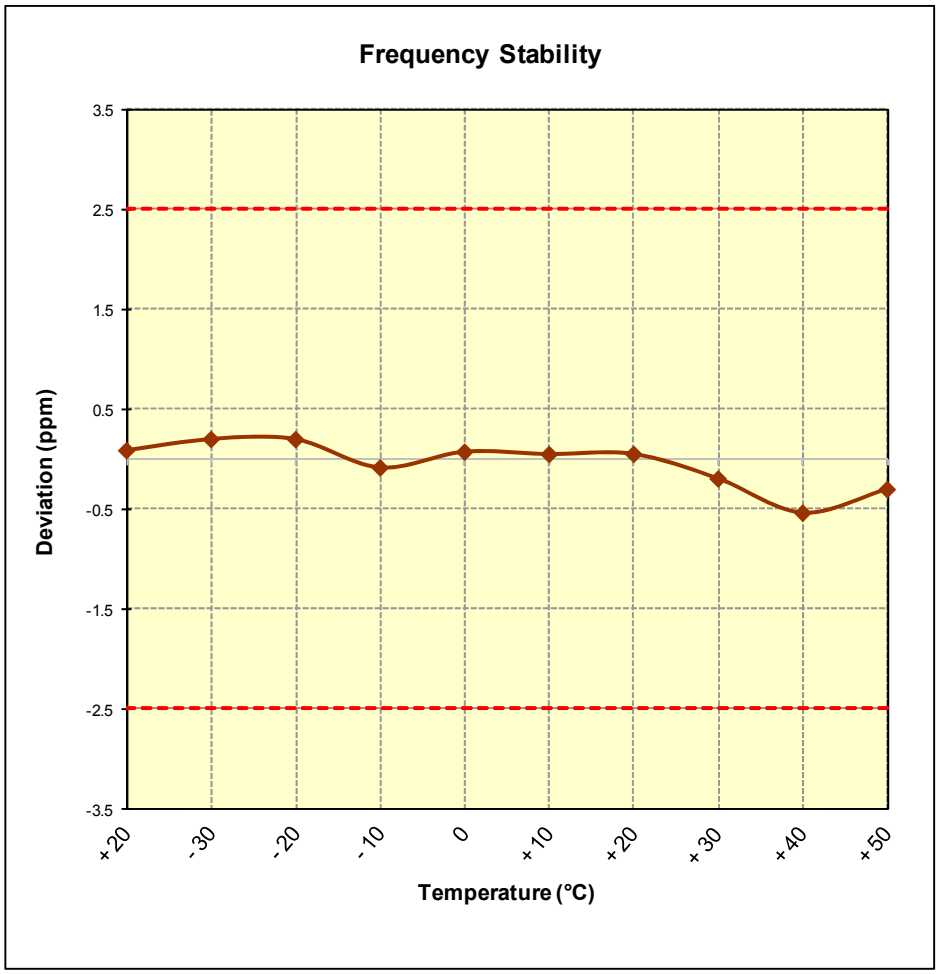


Figure 7-9. Frequency Stability Graph (Band 5/26)

Band 5/26 Frequency Stability Measurements

§2.1055 §22.355

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	831,499,612	-388	-0.0000467
100 %		- 30	831,499,615	-385	-0.0000463
100 %		- 20	831,500,092	92	0.0000111
100 %		- 10	831,500,115	115	0.0000138
100 %		0	831,499,744	-256	-0.0000308
100 %		+ 10	831,500,137	137	0.0000165
100 %		+ 20	831,499,682	-318	-0.0000382
100 %		+ 30	831,500,202	202	0.0000243
100 %		+ 40	831,499,982	-18	-0.0000022
100 %		+ 50	831,499,946	-54	-0.0000065
BATT. ENDPOINT	3.40	+ 20	831,500,139	139	0.0000167

Table 7-20. Frequency Stability Data (Band 5/26)

Band 5/26 Frequency Stability Measurements

§2.1055 §22.355

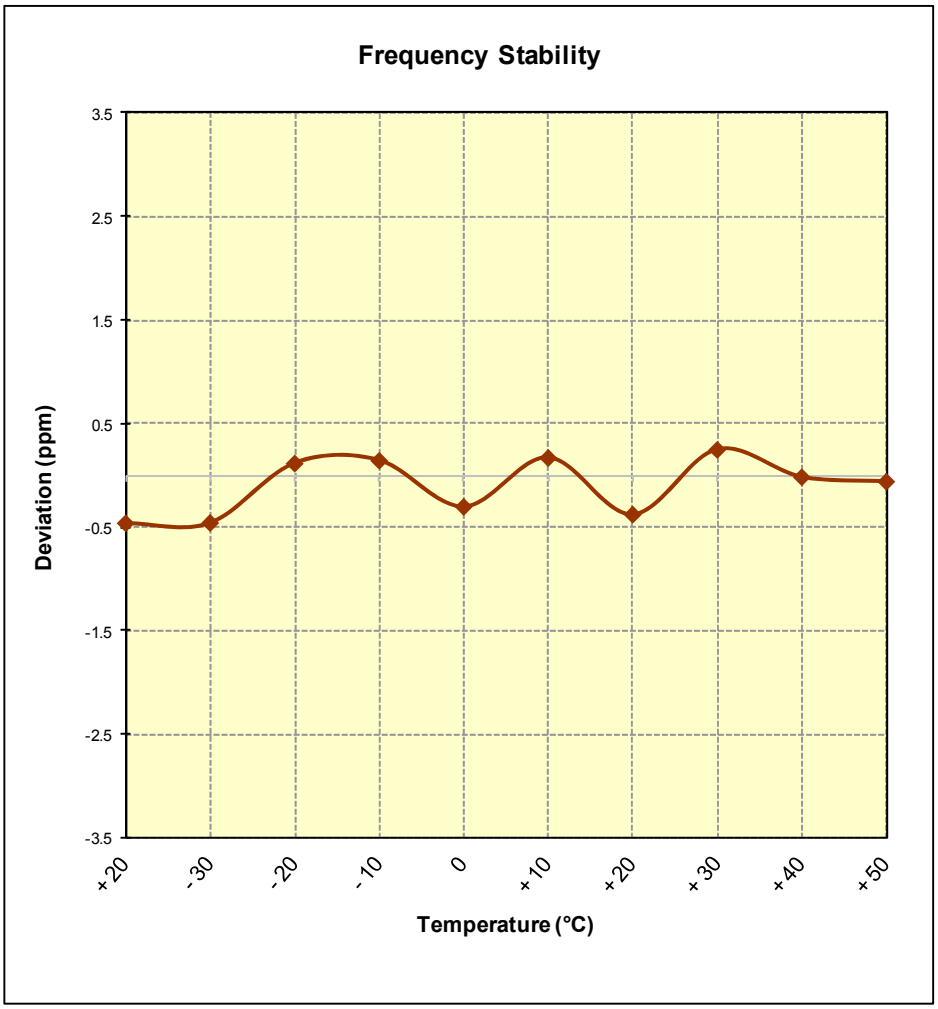


Figure 7-10. Frequency Stability Graph (Band 5/26)

Band 4 Frequency Stability Measurements

§2.1055 §§27.54

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,732,499,892	-108	-0.0000062
100 %		- 30	1,732,499,871	-129	-0.0000074
100 %		- 20	1,732,500,439	439	0.0000253
100 %		- 10	1,732,499,839	-161	-0.0000093
100 %		0	1,732,499,999	-1	-0.0000001
100 %		+ 10	1,732,500,247	247	0.0000143
100 %		+ 20	1,732,499,990	-10	-0.0000006
100 %		+ 30	1,732,500,205	205	0.0000118
100 %		+ 40	1,732,499,546	-454	-0.0000262
100 %		+ 50	1,732,499,899	-101	-0.0000058
BATT. ENDPOINT	3.40	+ 20	1,732,499,894	-106	-0.0000061

Table 7-21. Frequency Stability Data (Band 4)

Note:

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

Band 4 Frequency Stability Measurements

§2.1055 §§27.54

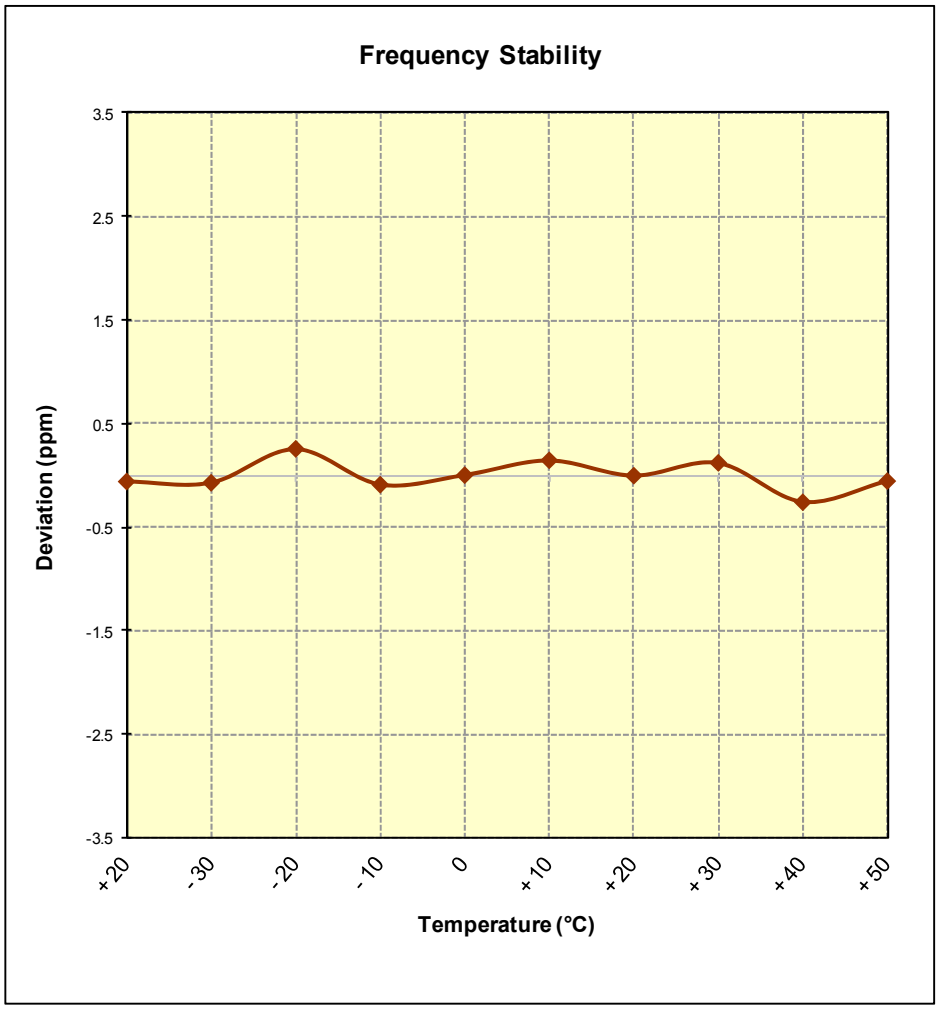


Figure 7-11. Frequency Stability Graph (Band 4)

Band 2/25 Frequency Stability Measurements

§2.1055 §24.235

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

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,882,499,985	-15	-0.0000008
100 %		- 30	1,882,499,952	-48	-0.0000025
100 %		- 20	1,882,499,834	-166	-0.0000088
100 %		- 10	1,882,500,171	171	0.0000091
100 %		0	1,882,499,960	-40	-0.0000021
100 %		+ 10	1,882,499,763	-237	-0.0000126
100 %		+ 20	1,882,500,108	108	0.0000057
100 %		+ 30	1,882,499,807	-193	-0.0000103
100 %		+ 40	1,882,499,966	-34	-0.0000018
100 %		+ 50	1,882,499,606	-394	-0.0000209
BATT. ENDPOINT	3.40	+ 20	1,882,500,049	49	0.0000026

Table 7-22. Frequency Stability Data (Band 2/25)

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 2/25 Frequency Stability Measurements

§2.1055 §24.235

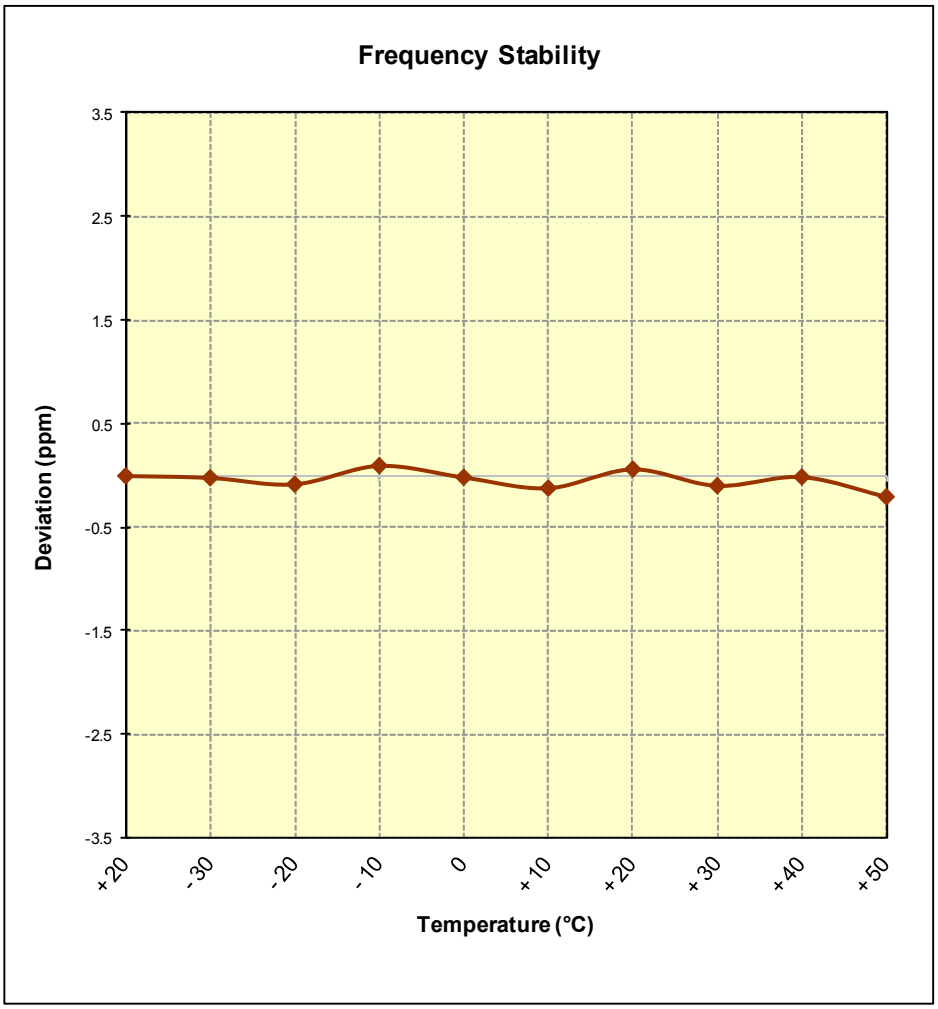


Figure 7-12. Frequency Stability Graph (Band 2/25)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Tablet FCC ID: ZNFUK750** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.