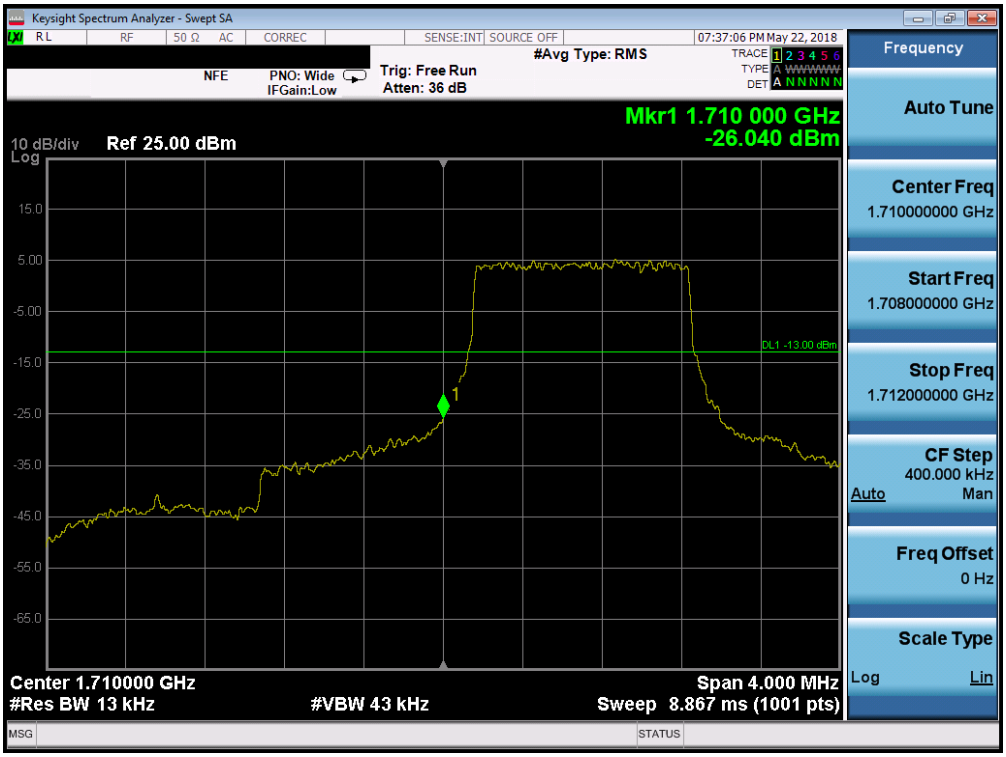
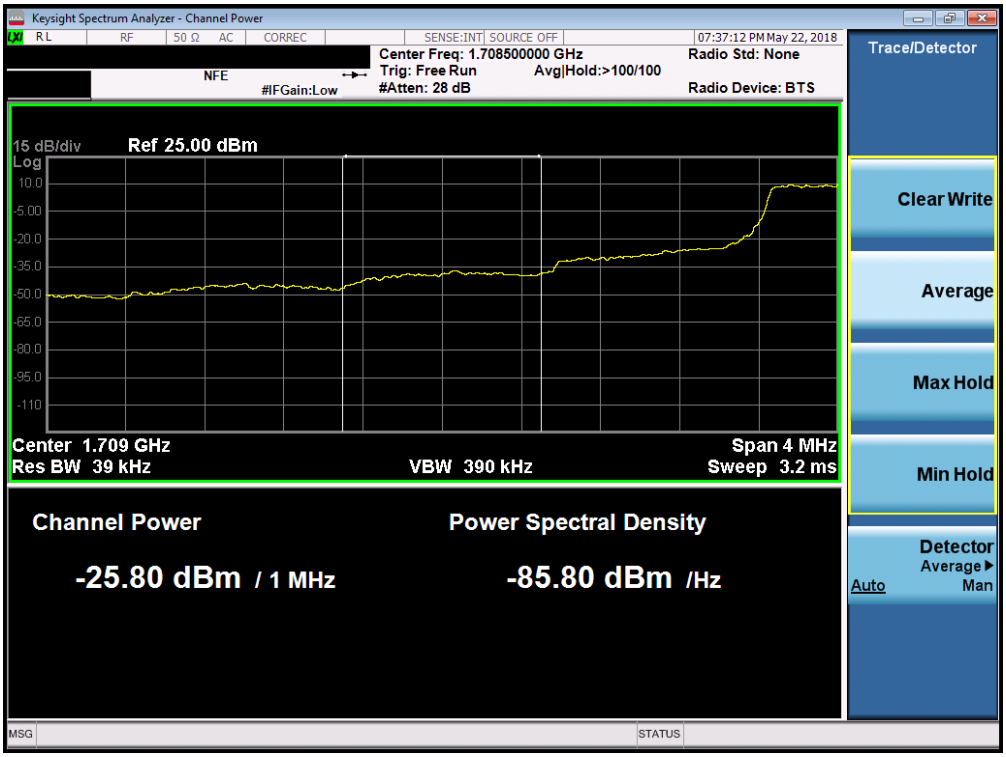
Band 4



Plot 7-94. Lower Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-95. Lower Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

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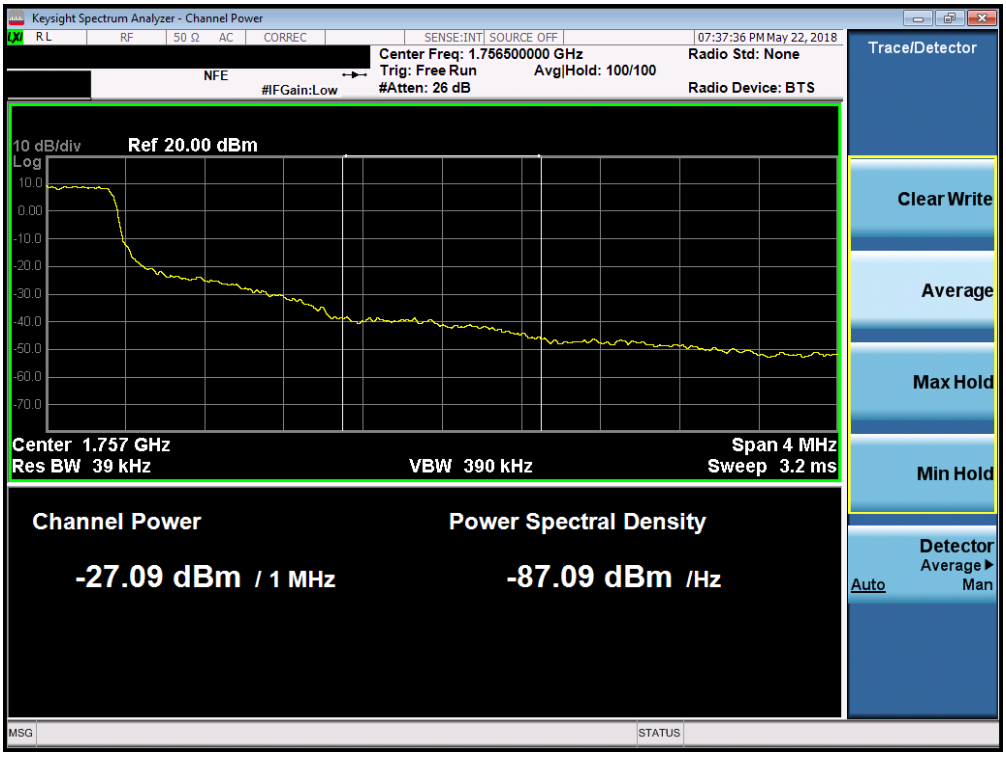
Plot 7-96. Upper Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-97. Upper Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

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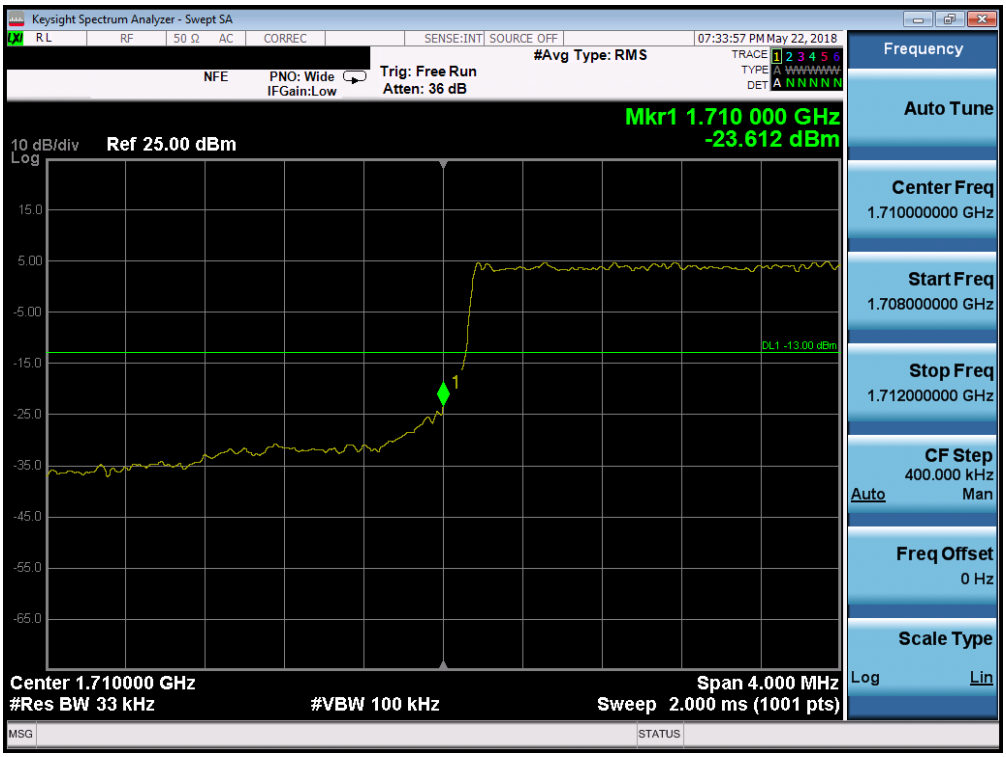
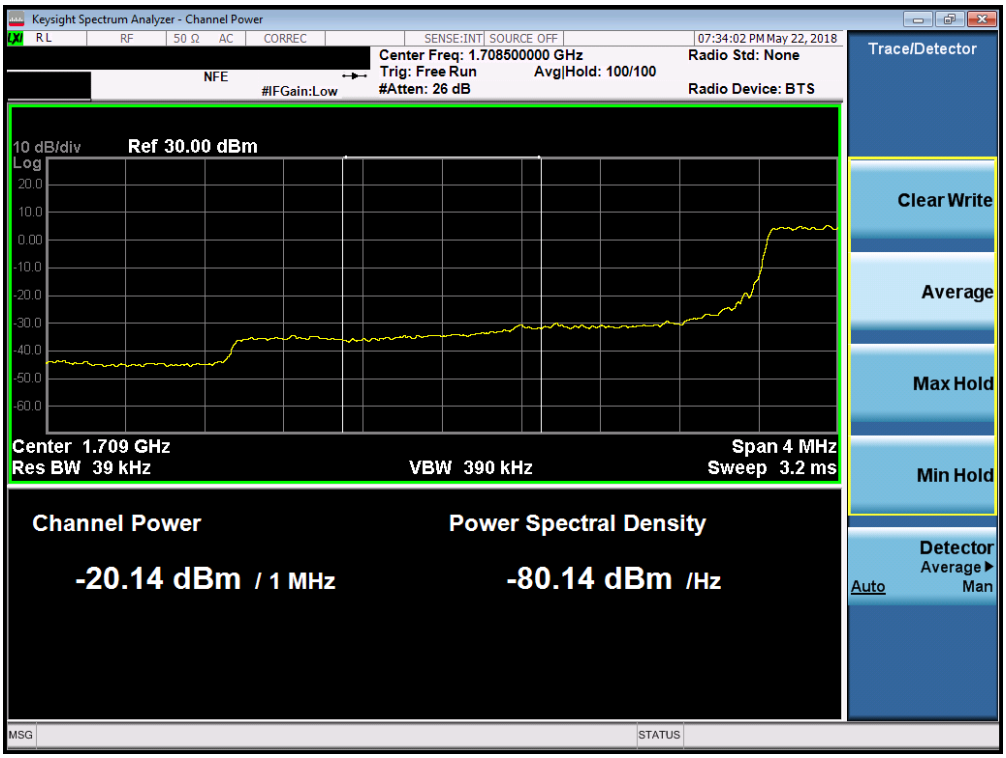


Plot 7-98. Lower Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-99. Lower Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

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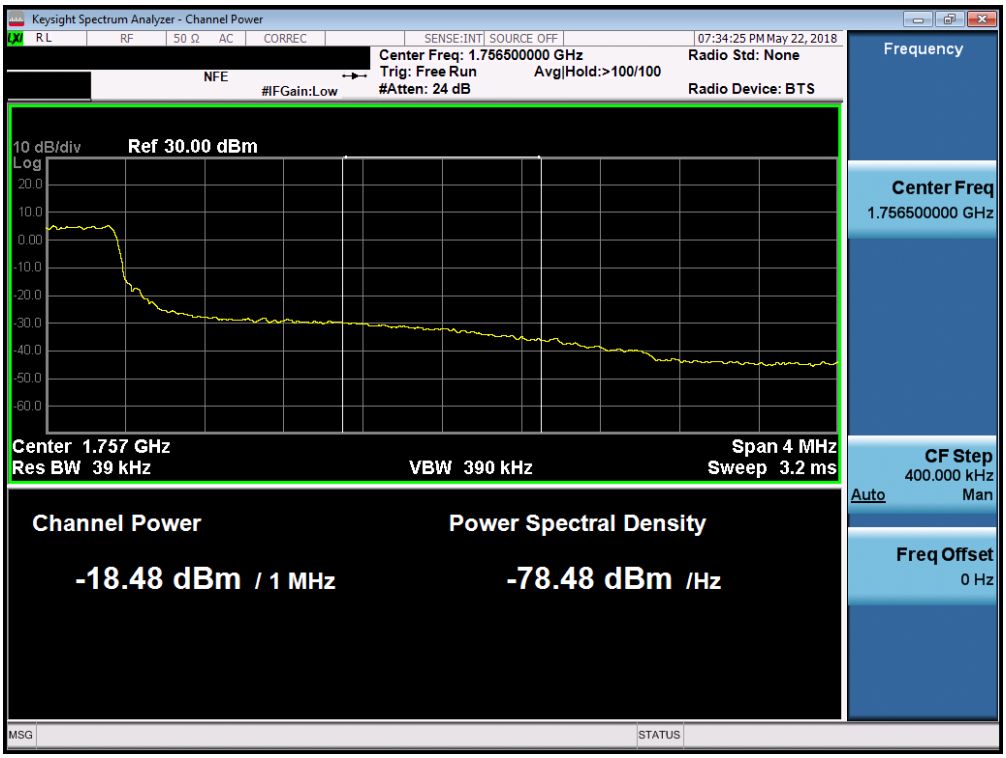
Plot 7-100. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-101. Upper Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

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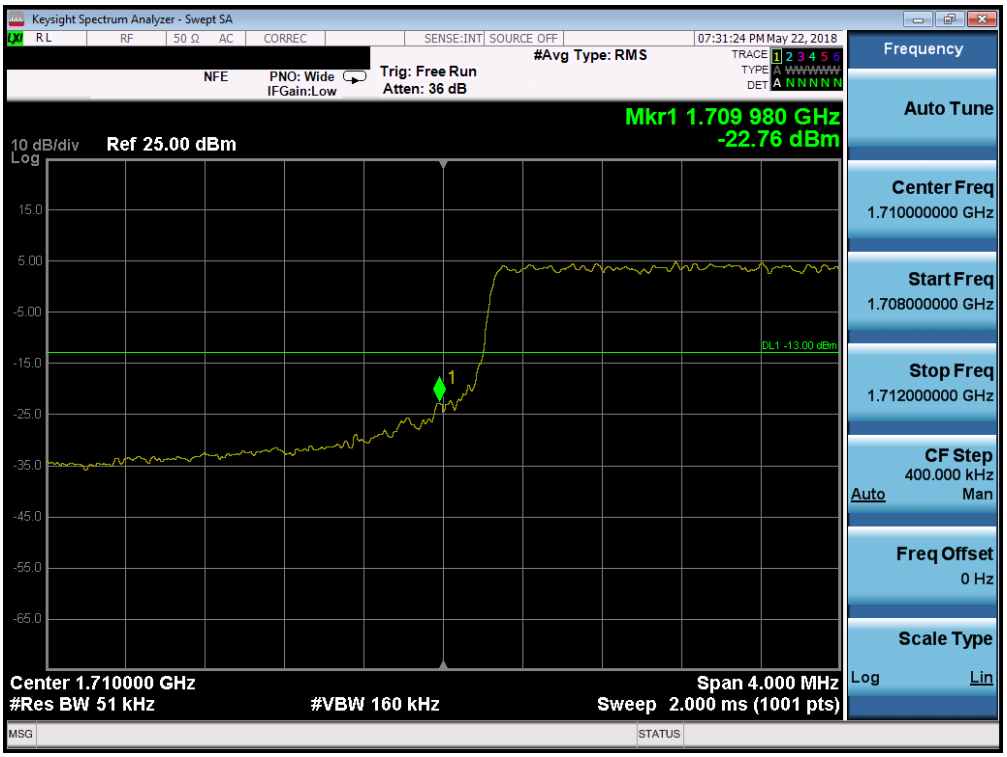
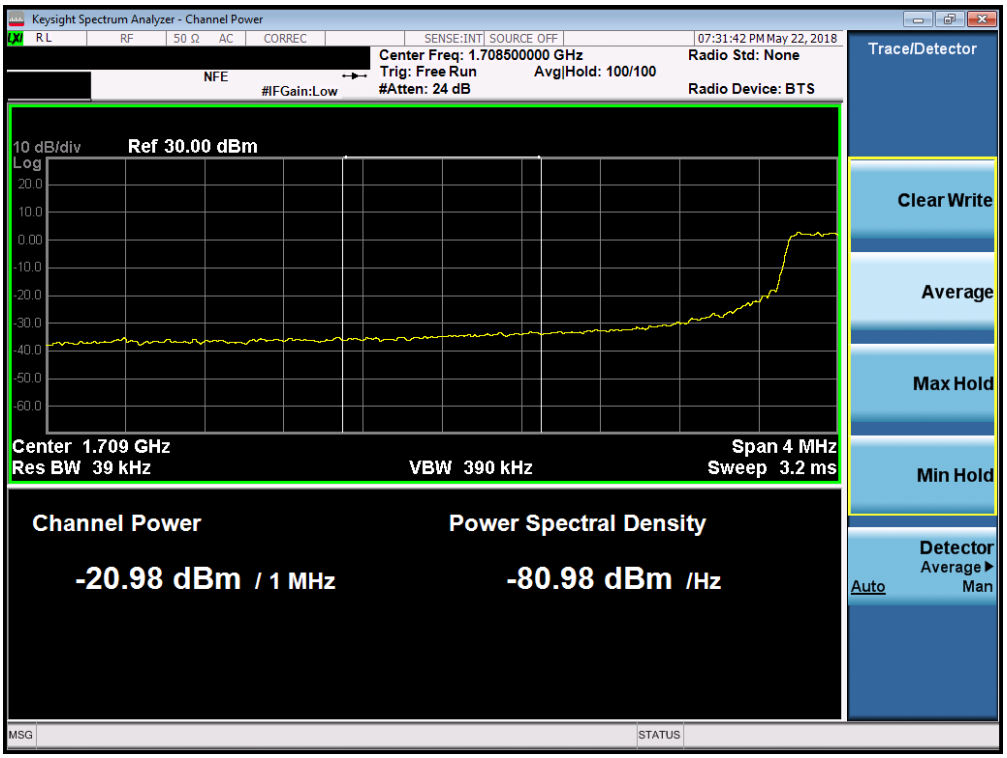


Plot 7-102. Lower Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-103. Lower Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

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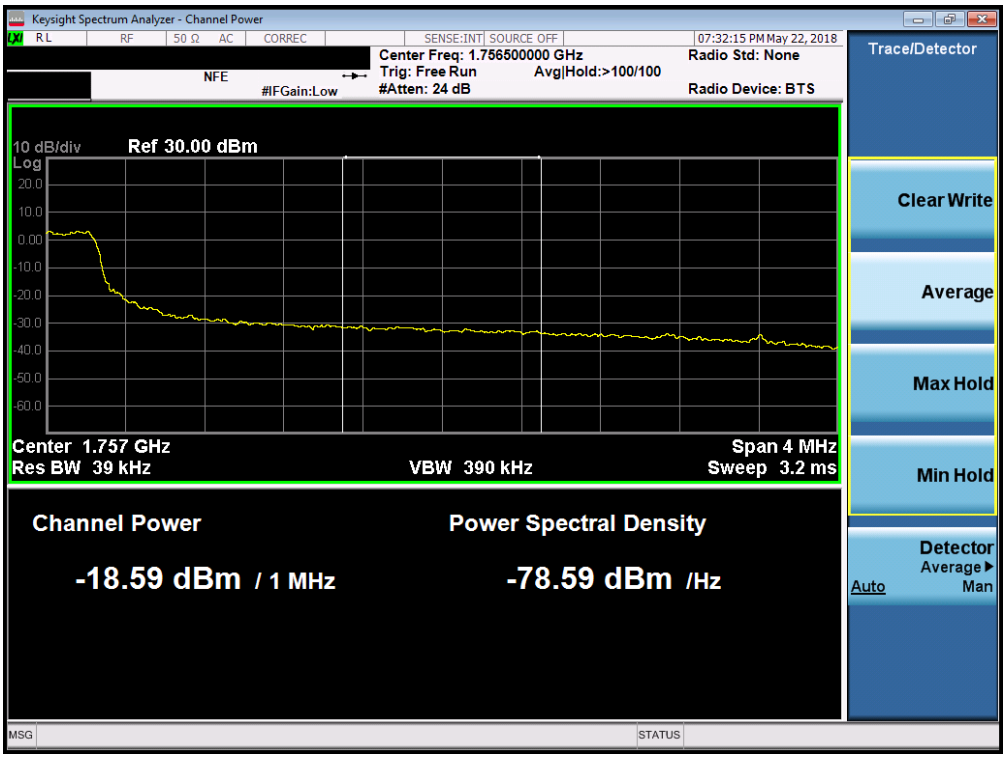
Plot 7-104. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-105. Upper Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

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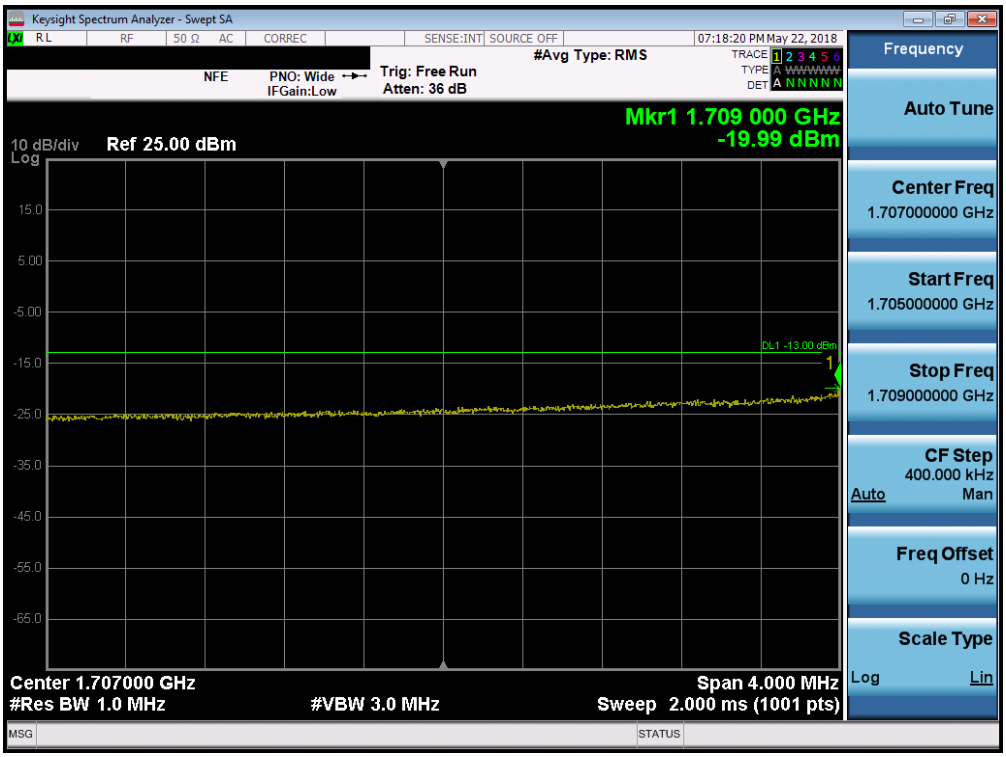

Plot 7-106. Lower Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

Plot 7-107. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

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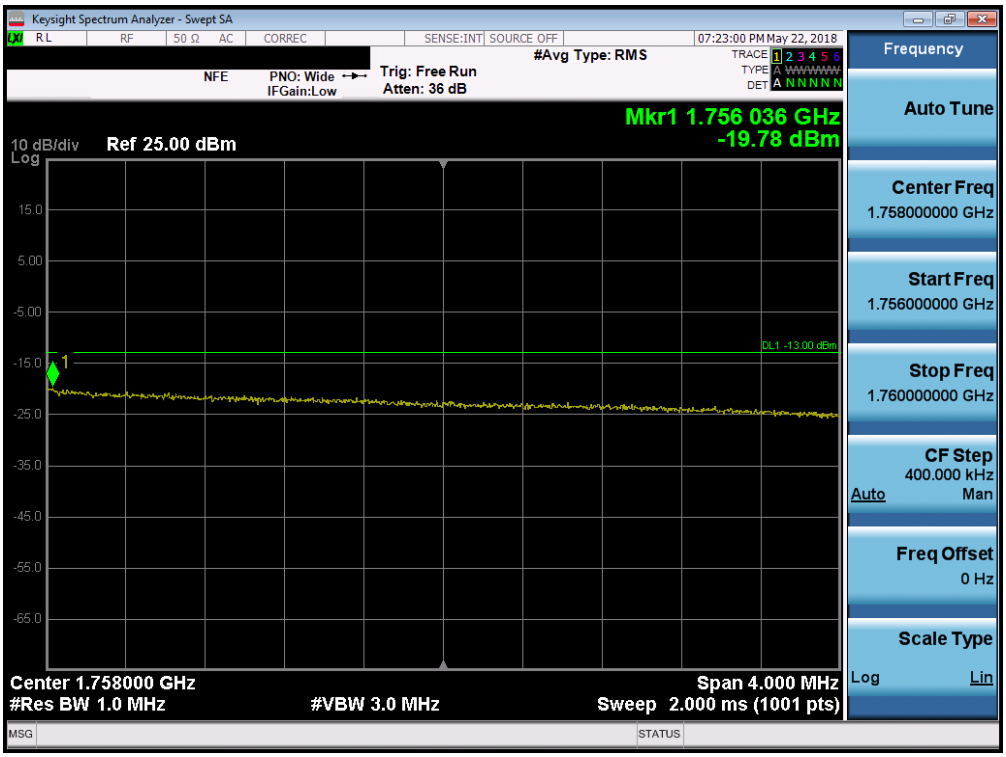
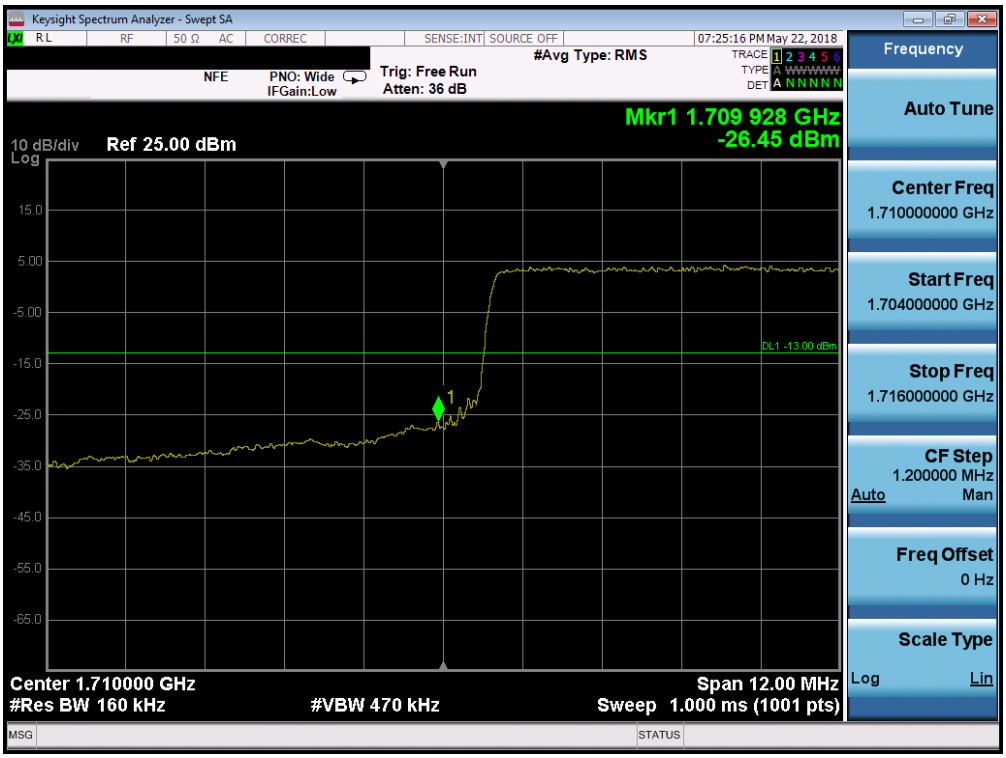


Plot 7-108. Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-109. Lower Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

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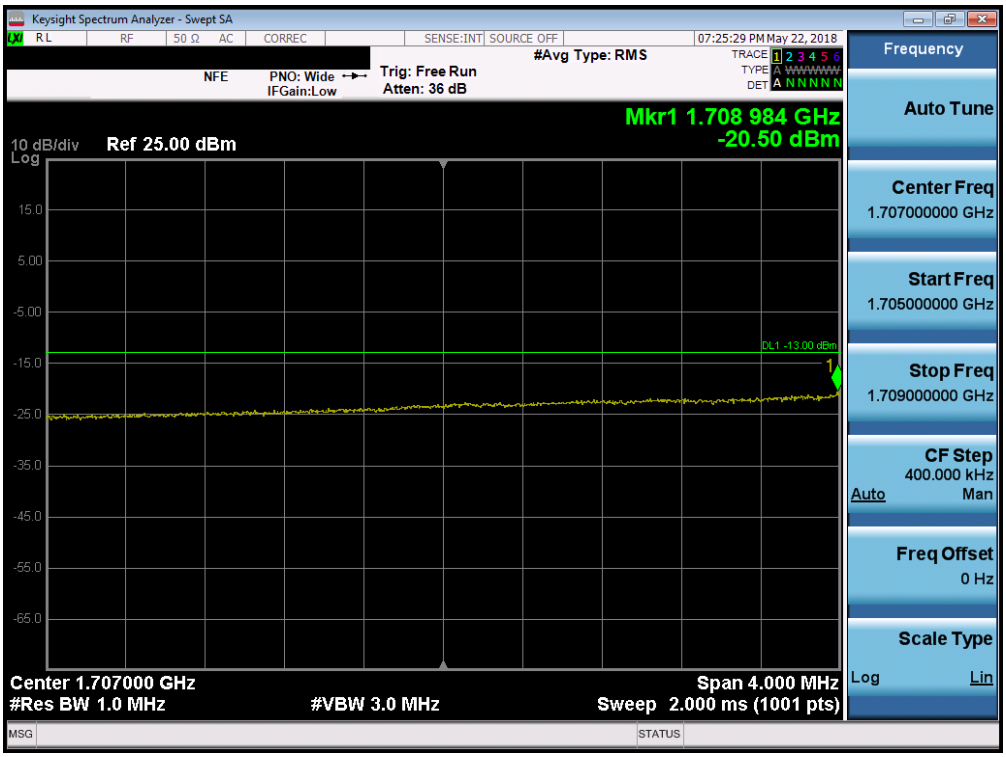

Plot 7-110. Lower Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

Plot 7-111. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

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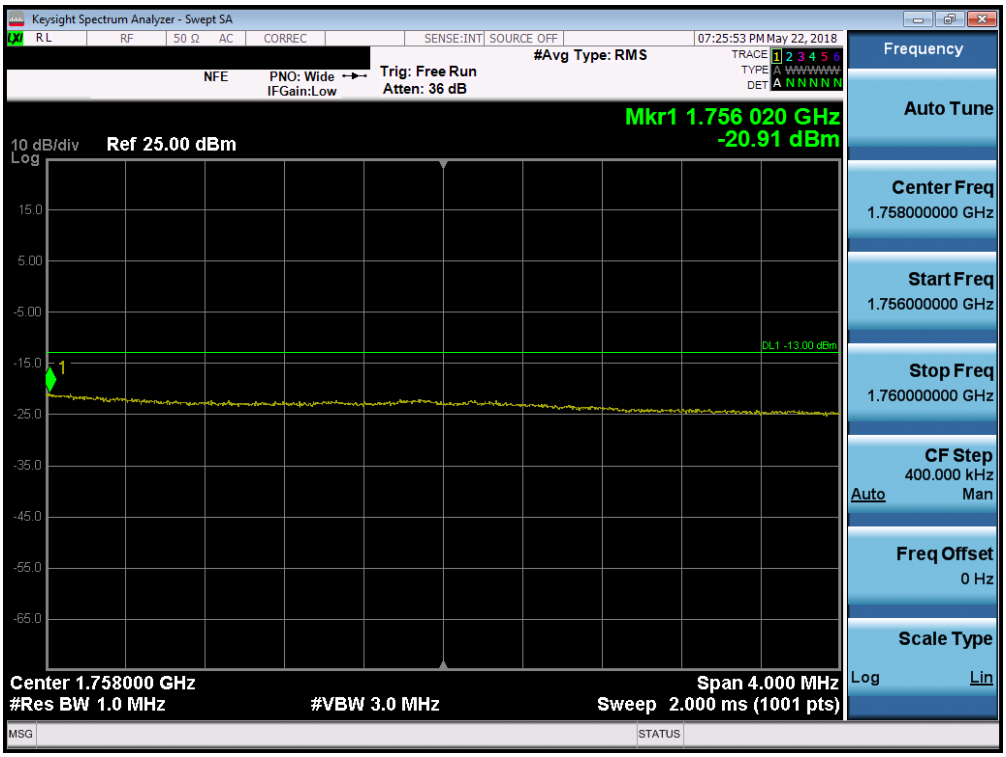
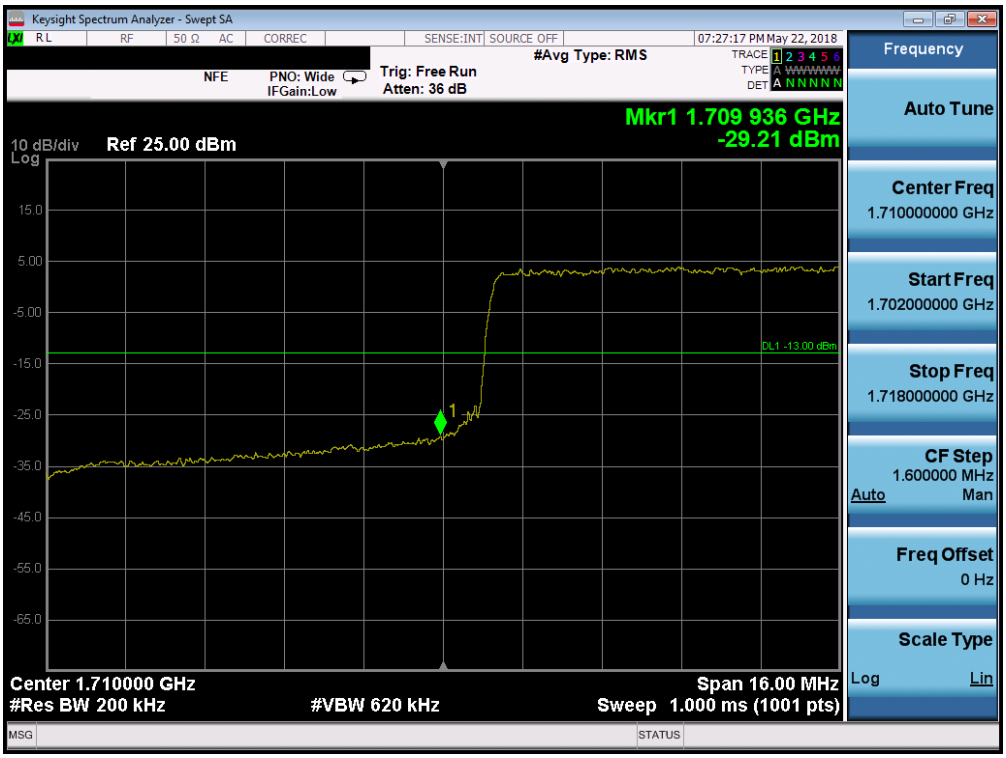


Plot 7-112. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-113. Lower Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

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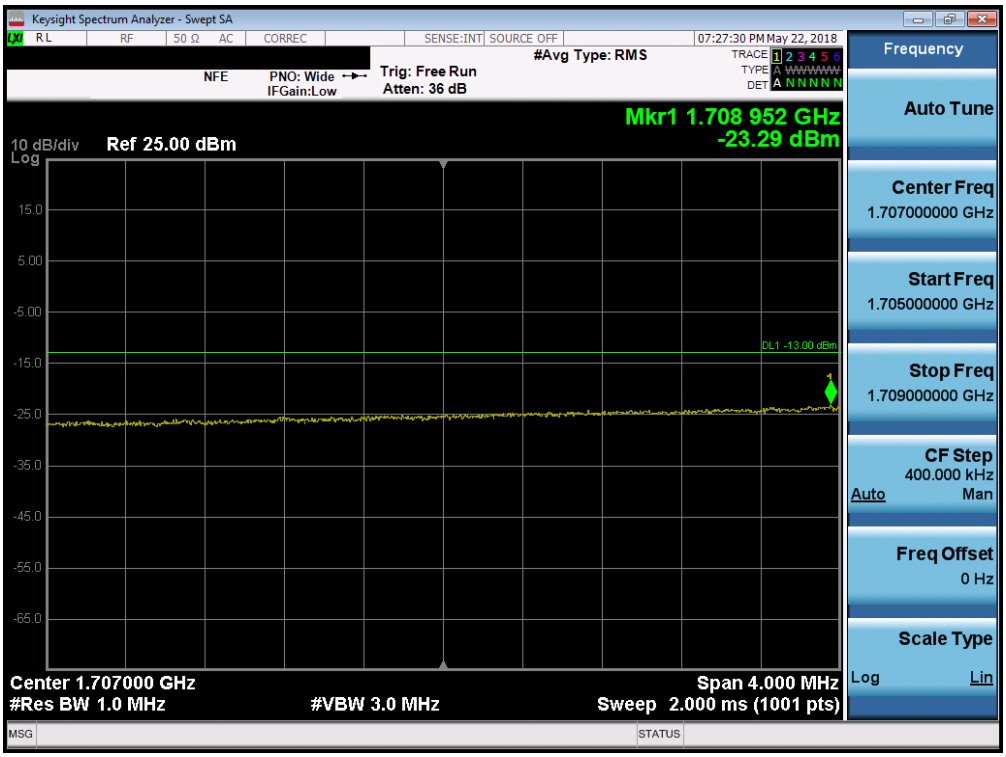
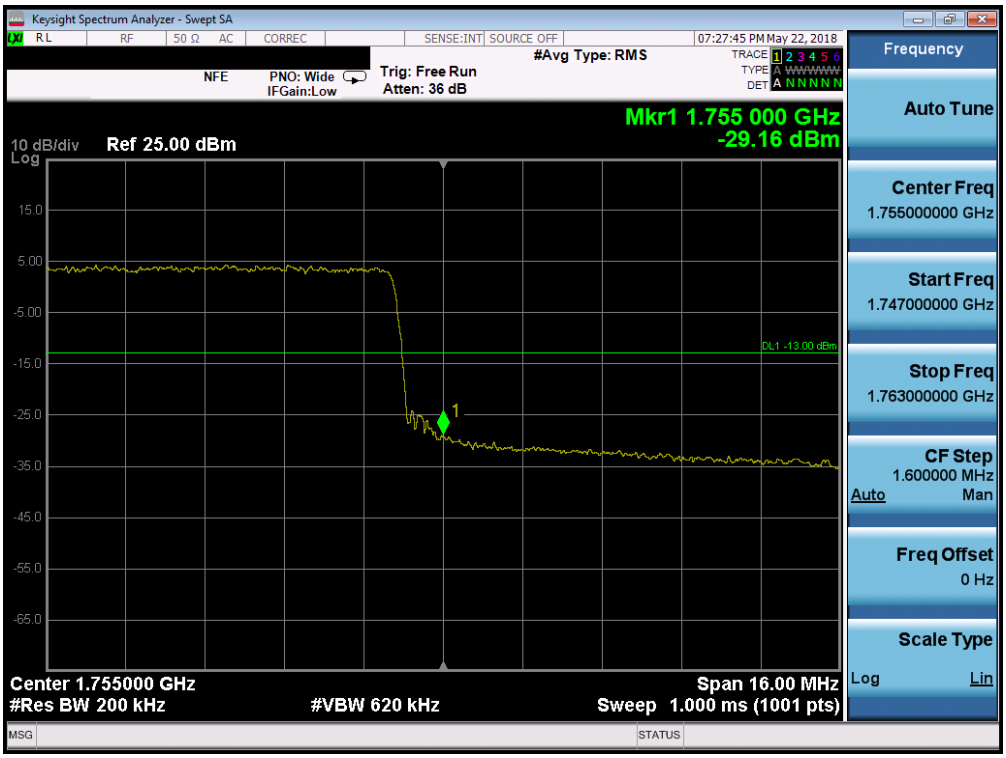


Plot 7-114. Lower Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-115. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

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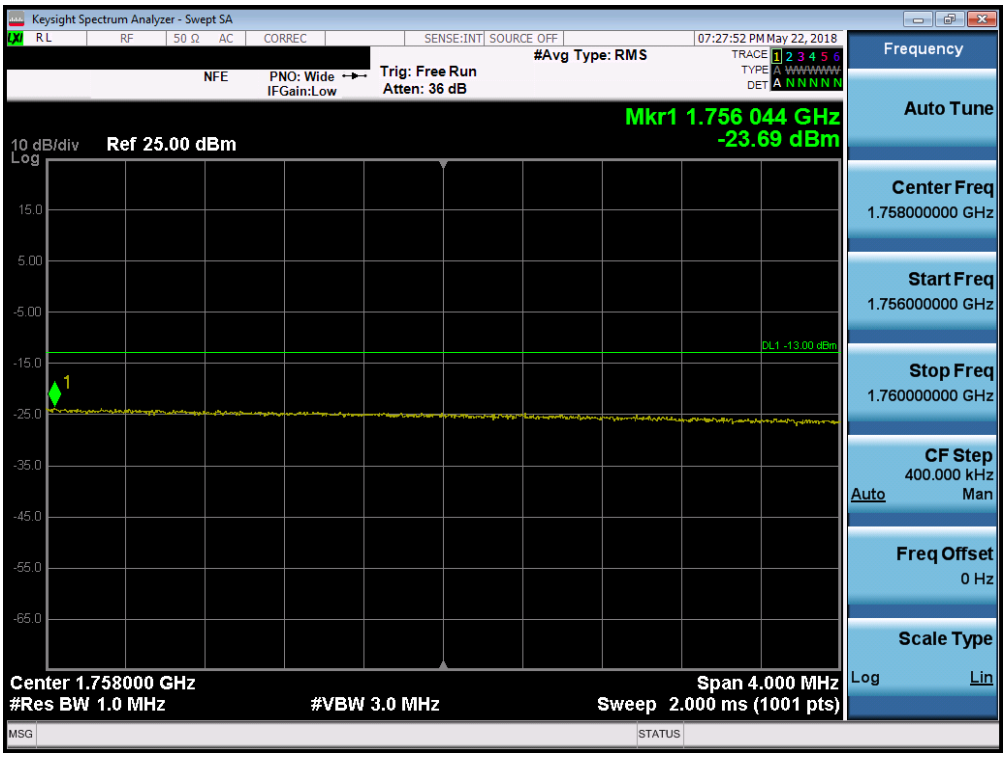

Plot 7-116. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

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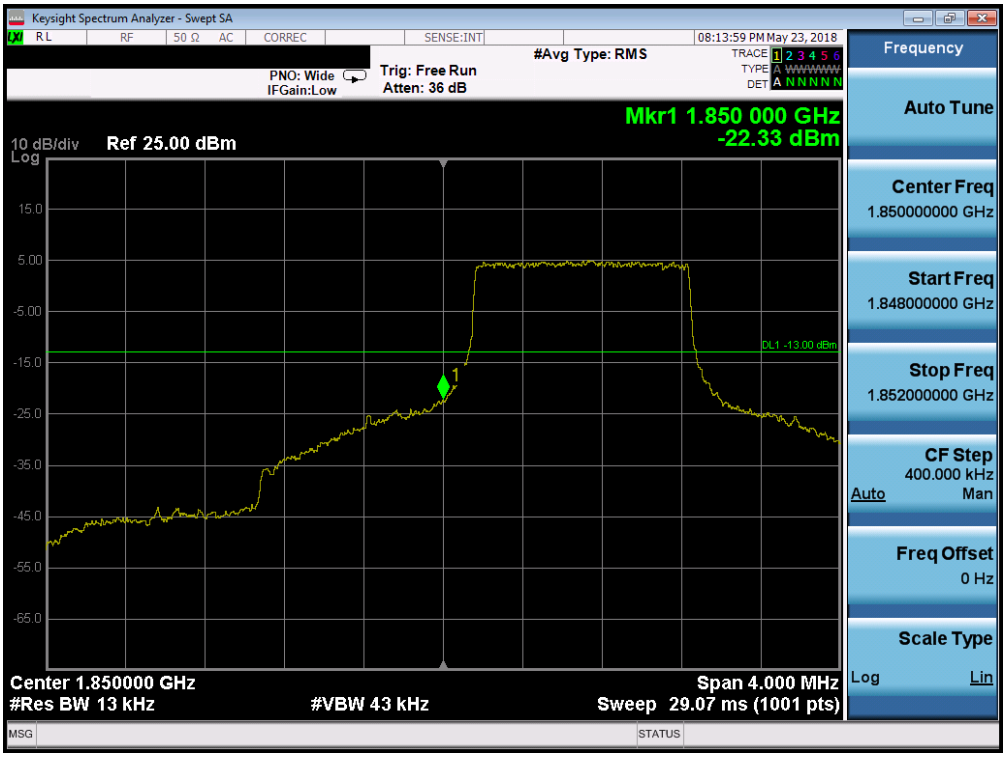
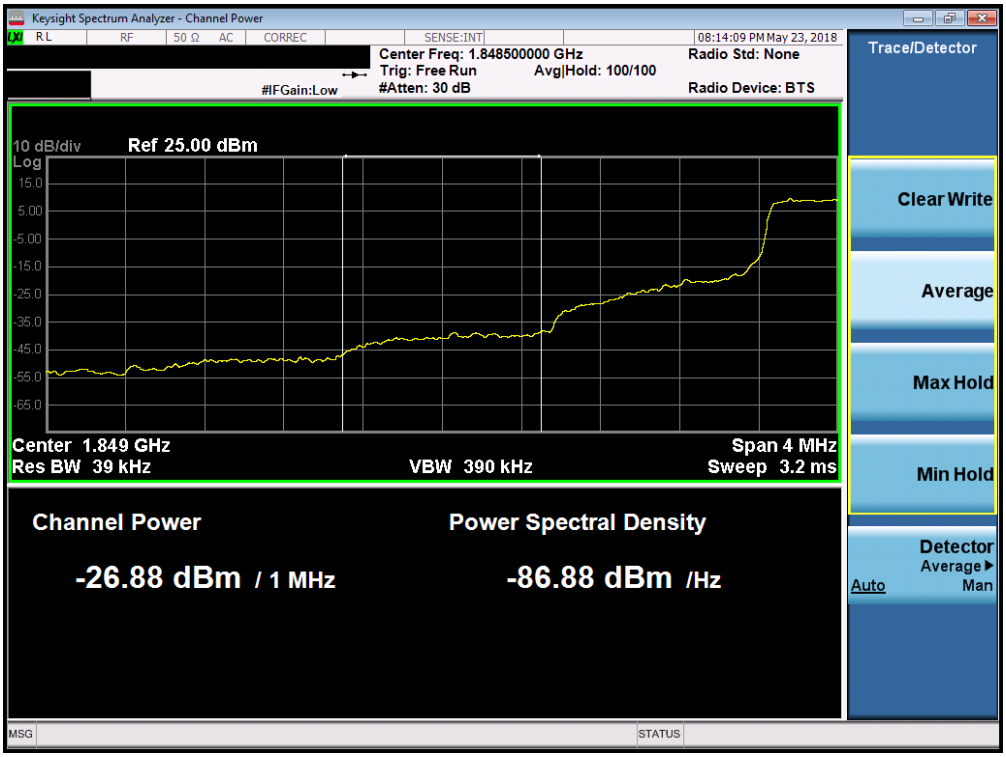
Band 25/2



Plot 7-117. Lower Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-118. Lower Extended Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

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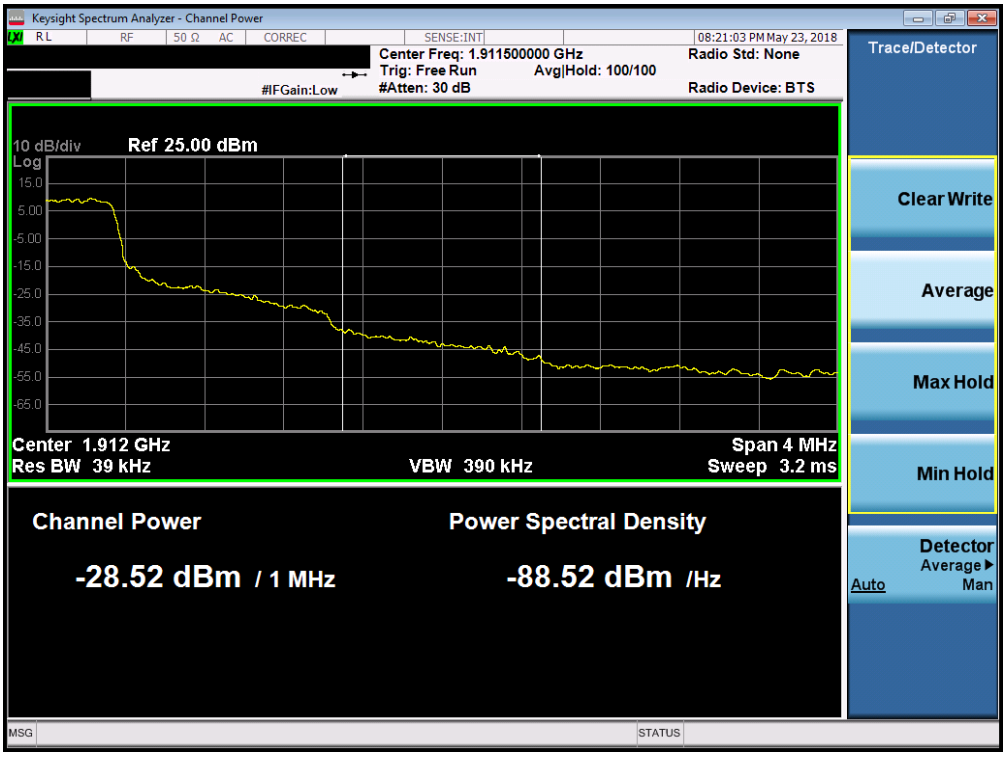
Plot 7-119. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-120. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

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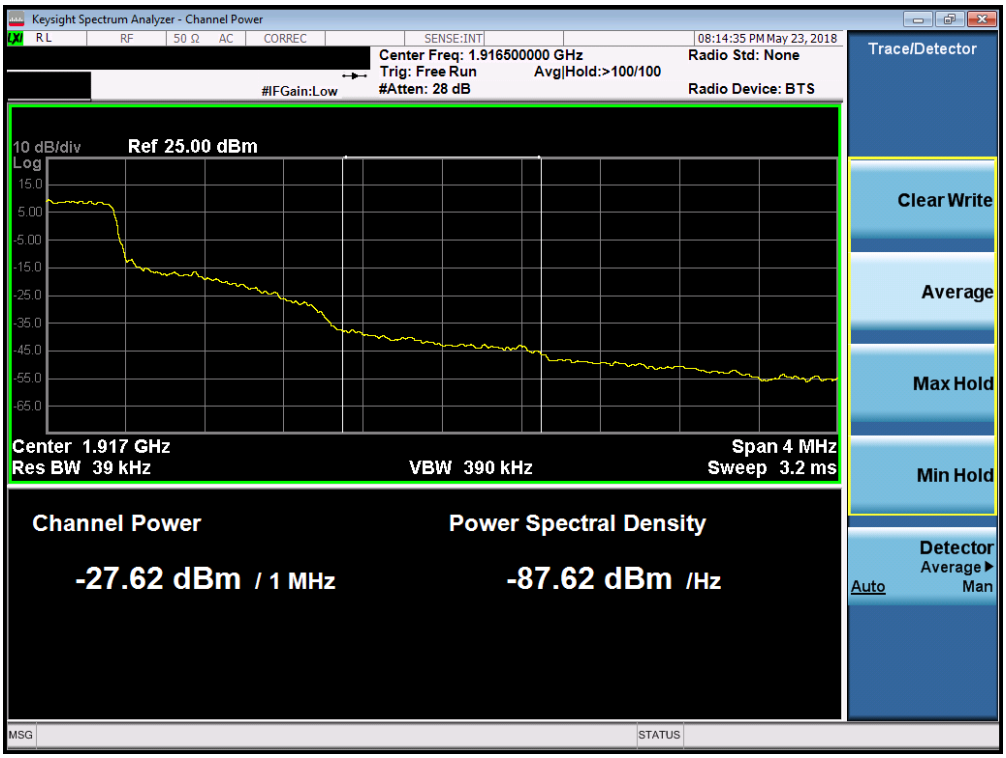
Plot 7-121. Upper Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-122. Upper Extended Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)

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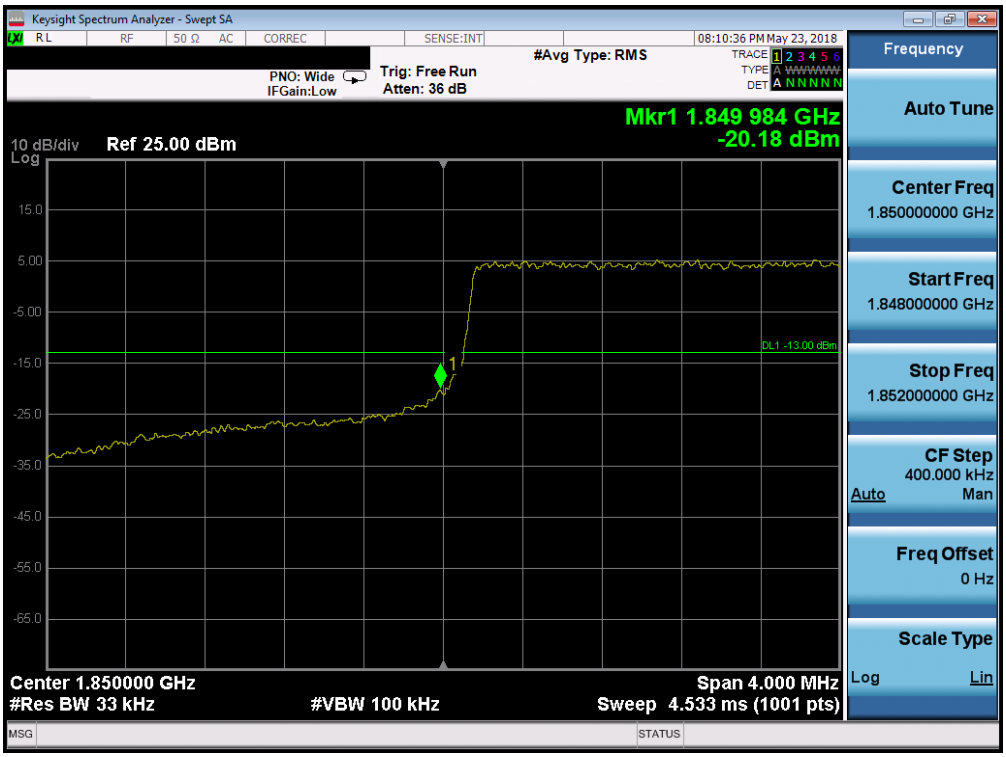
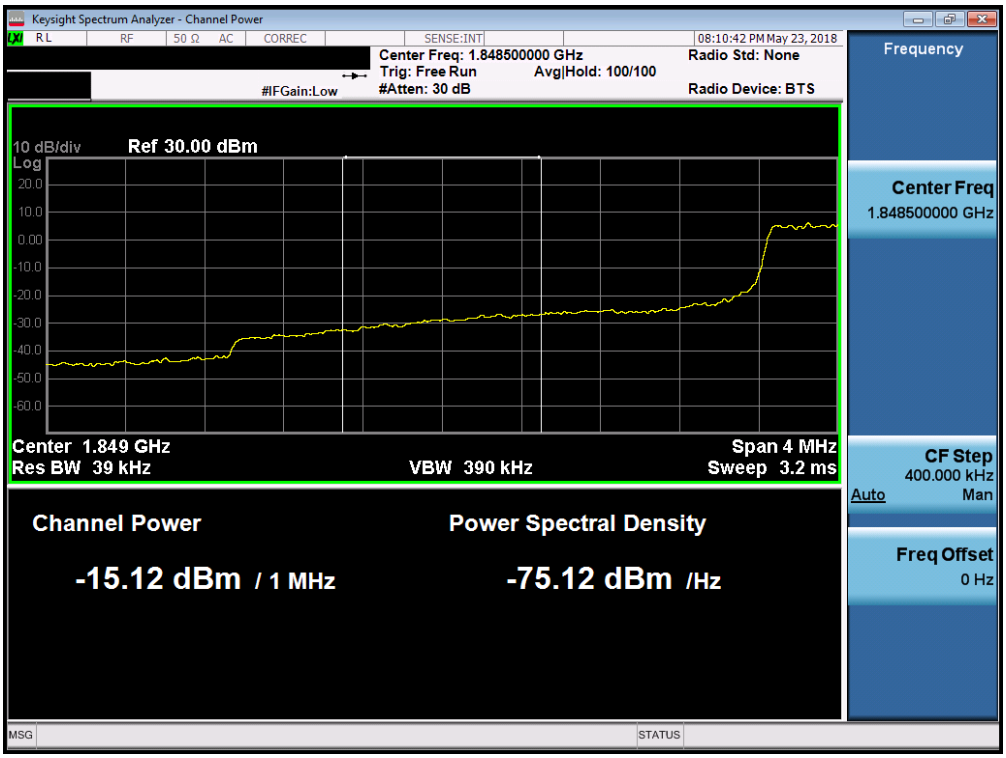


Plot 7-123. Lower Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-124. Lower Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

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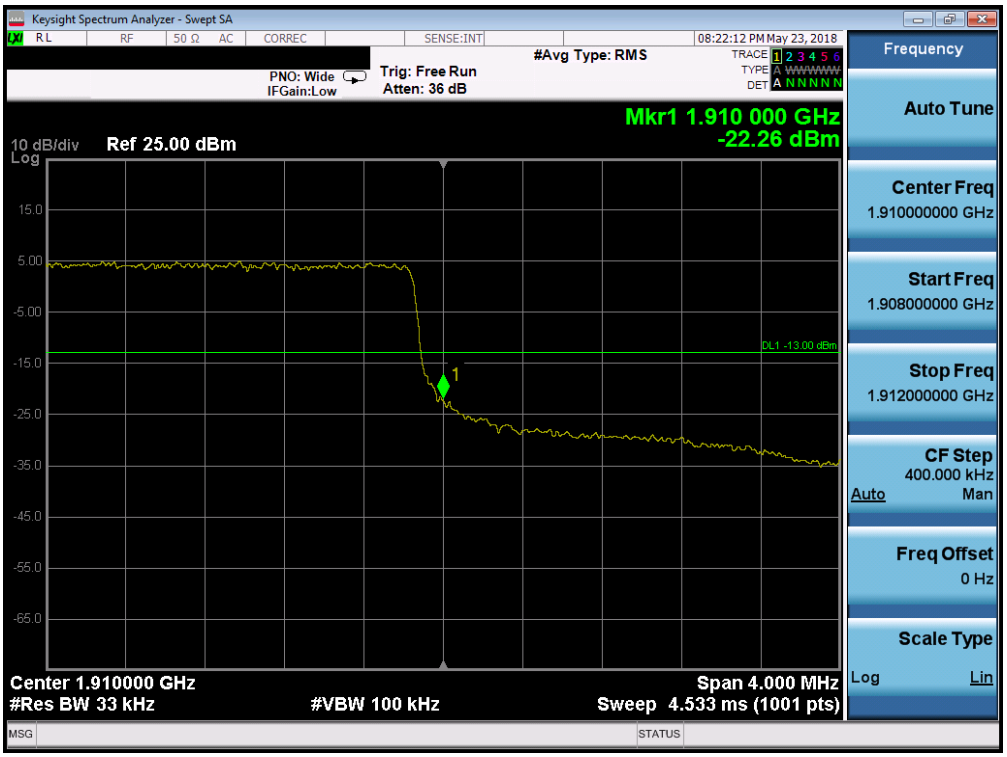
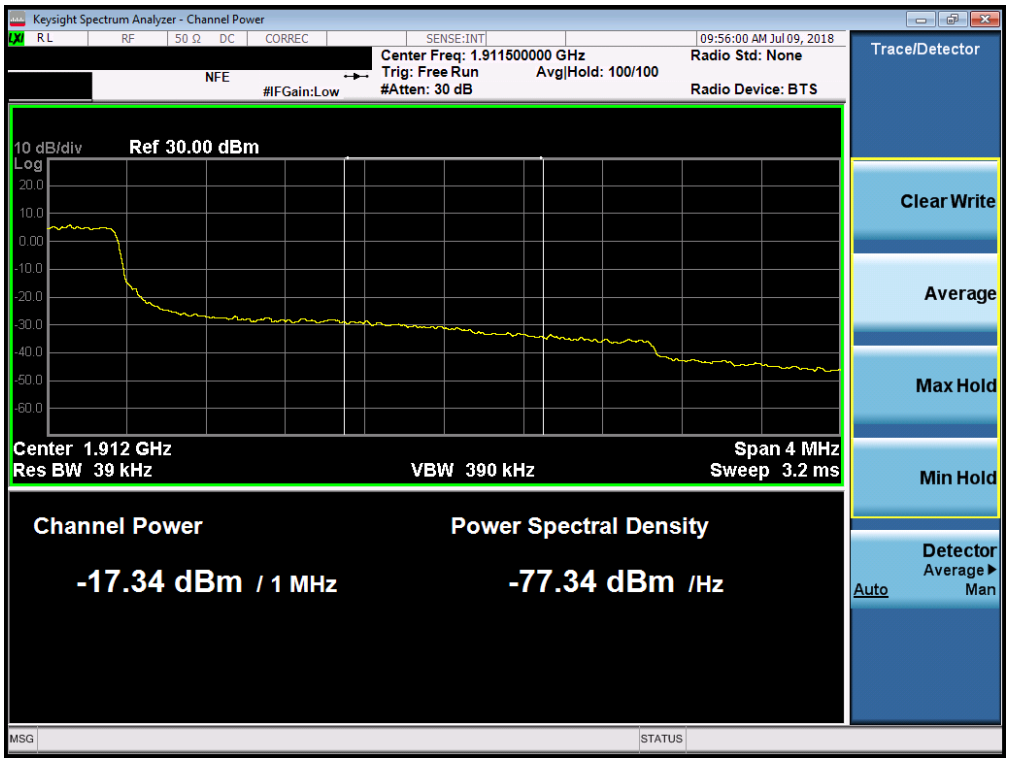


Plot 7-125. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-126. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

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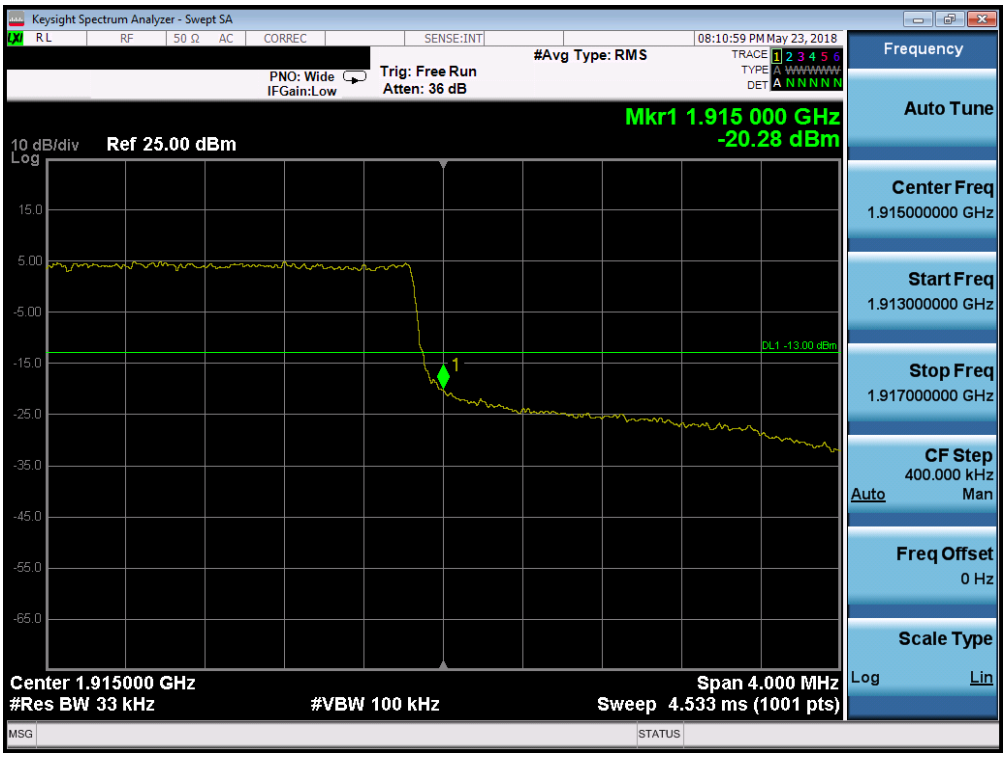
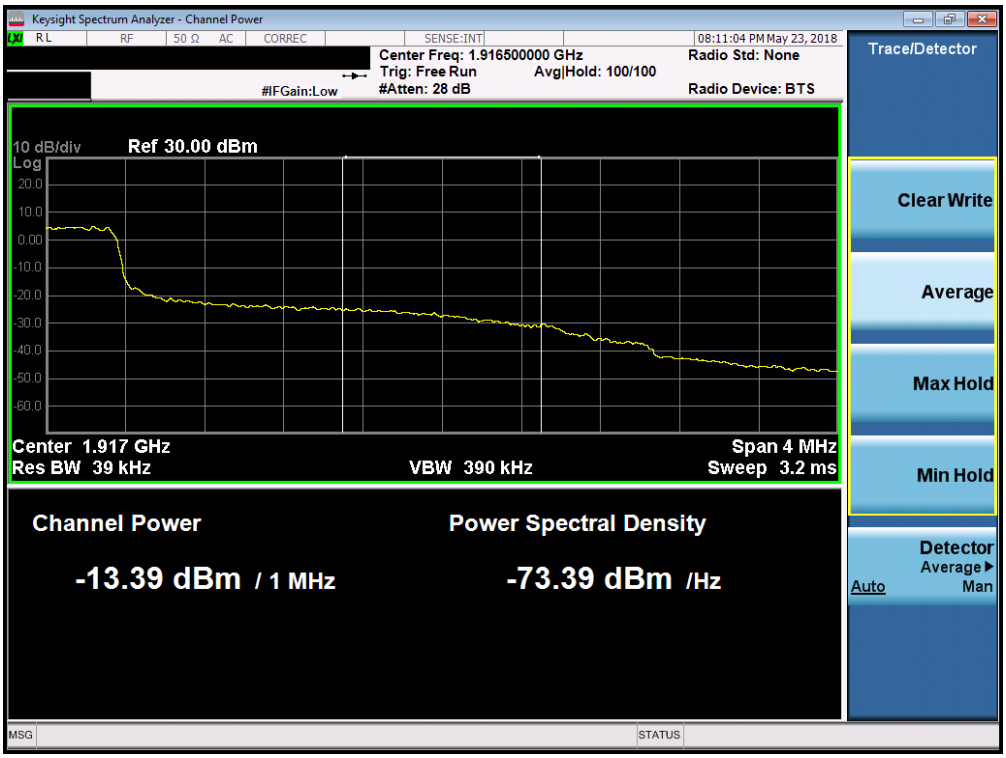


Plot 7-127. Upper Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-128. Upper Extended Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)

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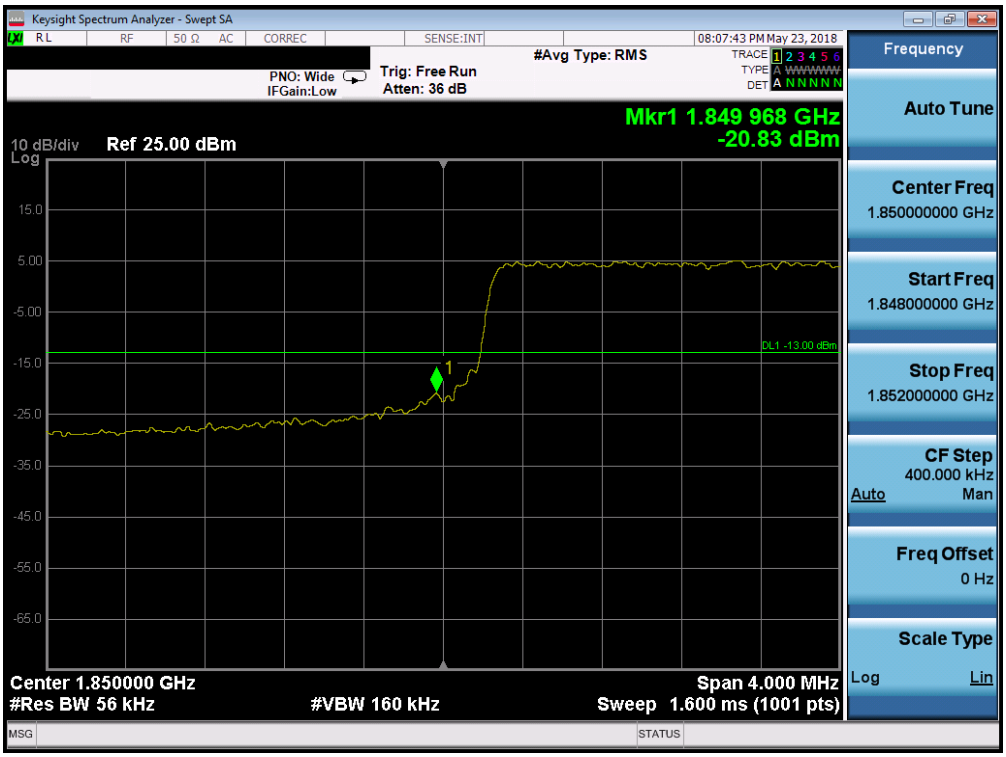
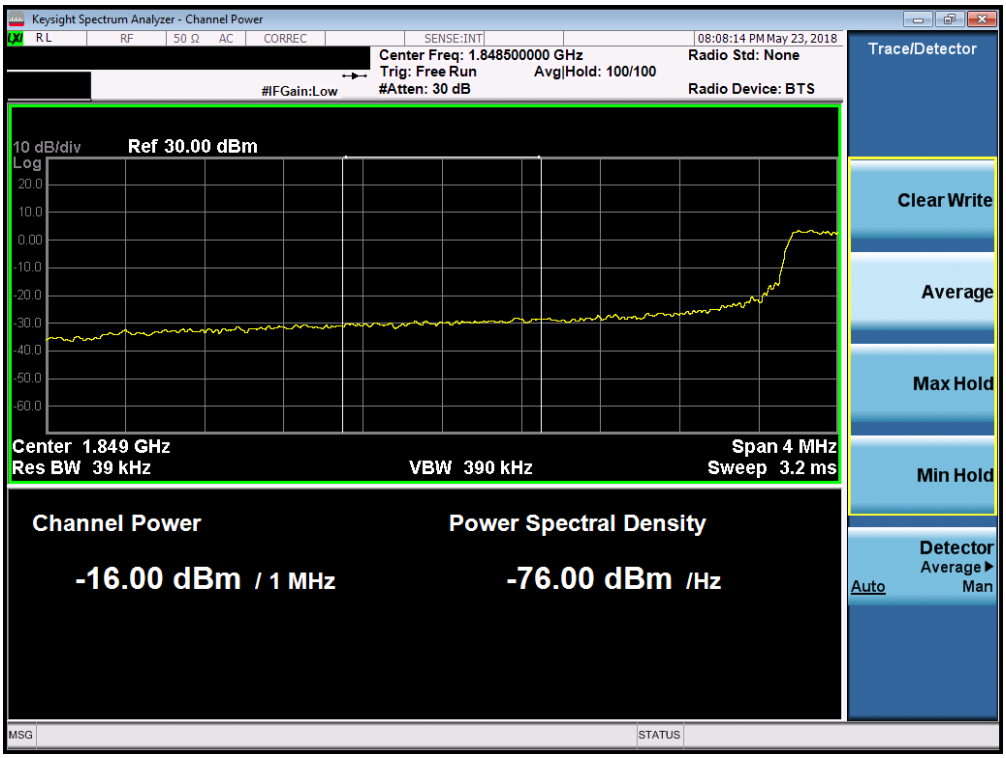


Plot 7-129. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-130. Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

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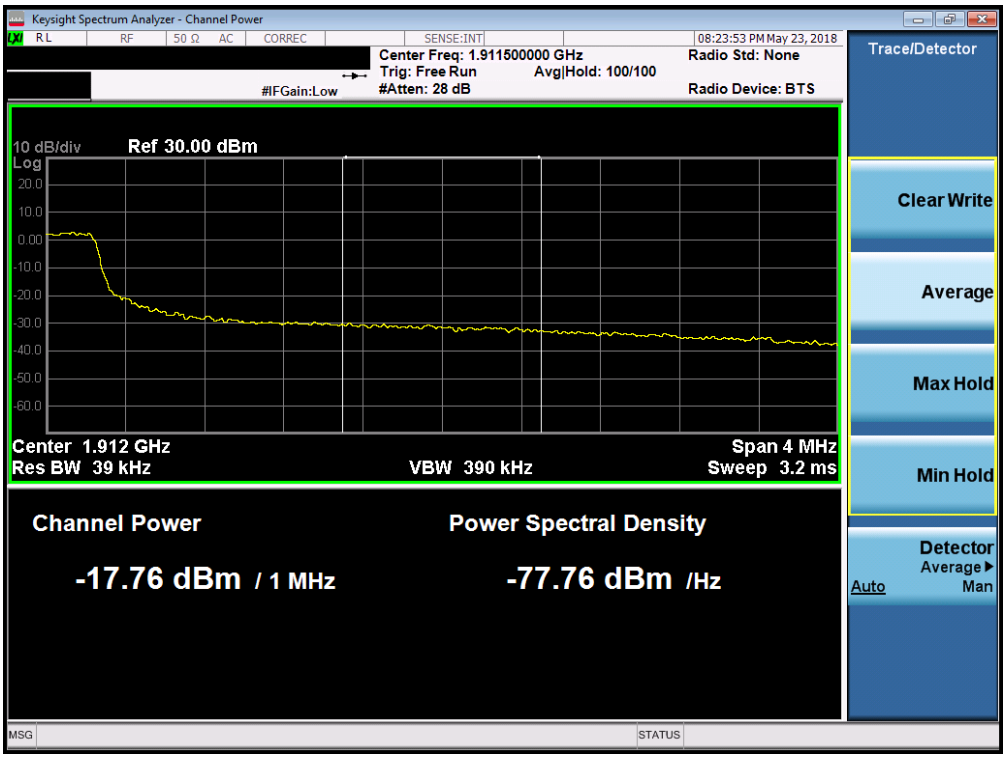
Plot 7-131. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-132. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

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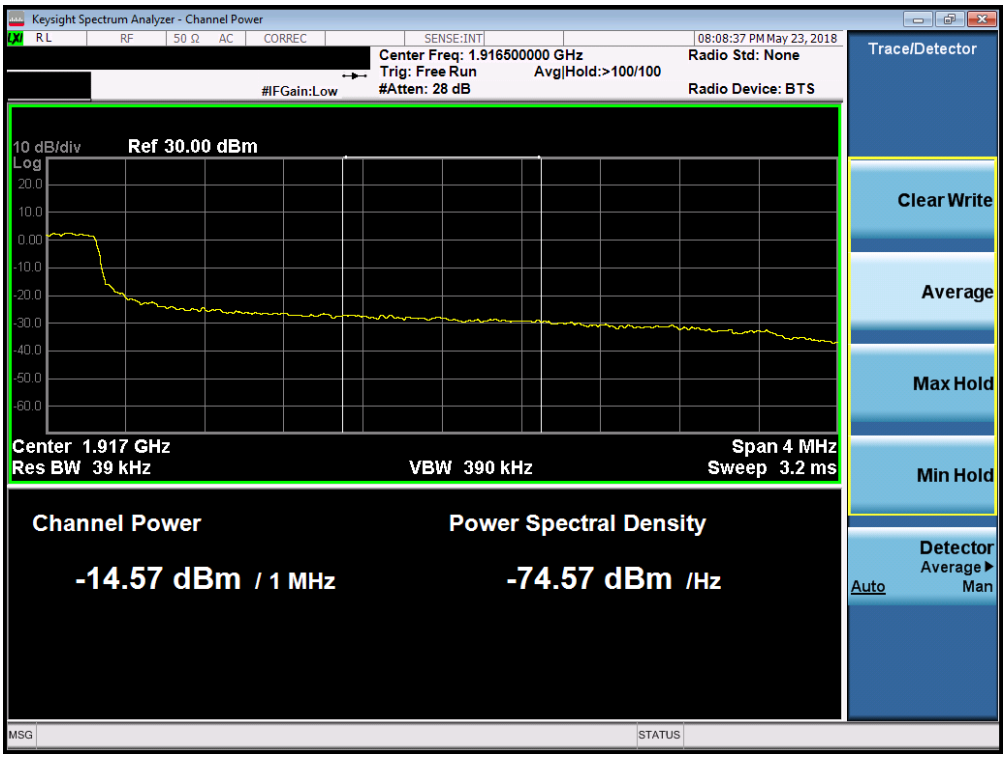
Plot 7-133. Upper Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-134. Upper Extended Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

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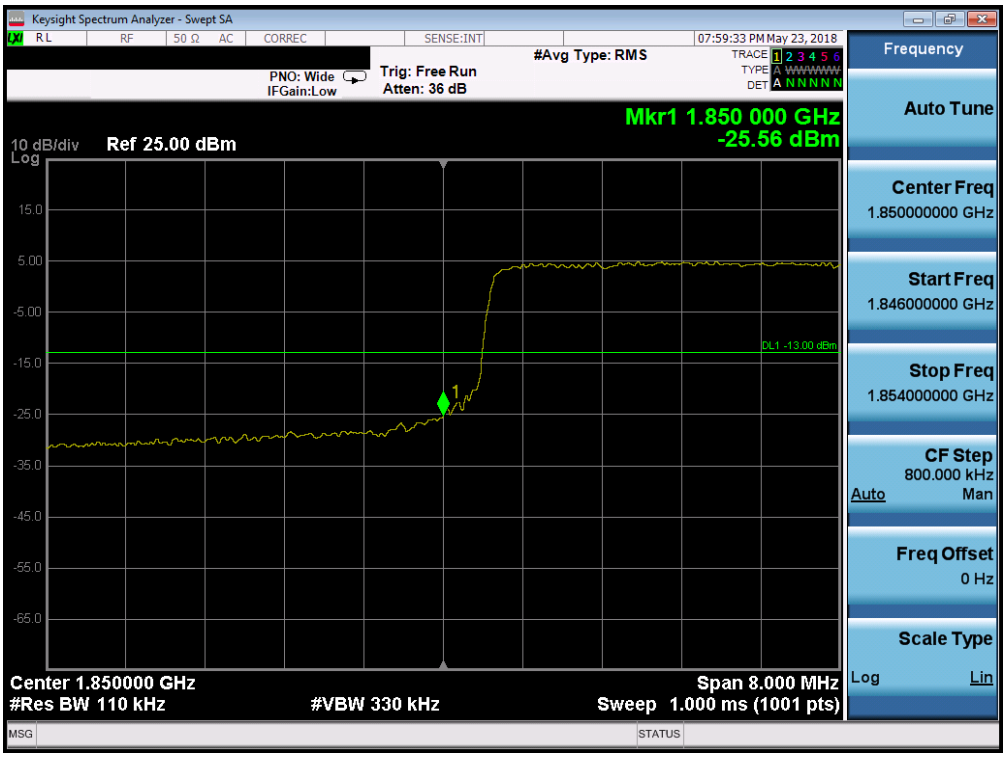
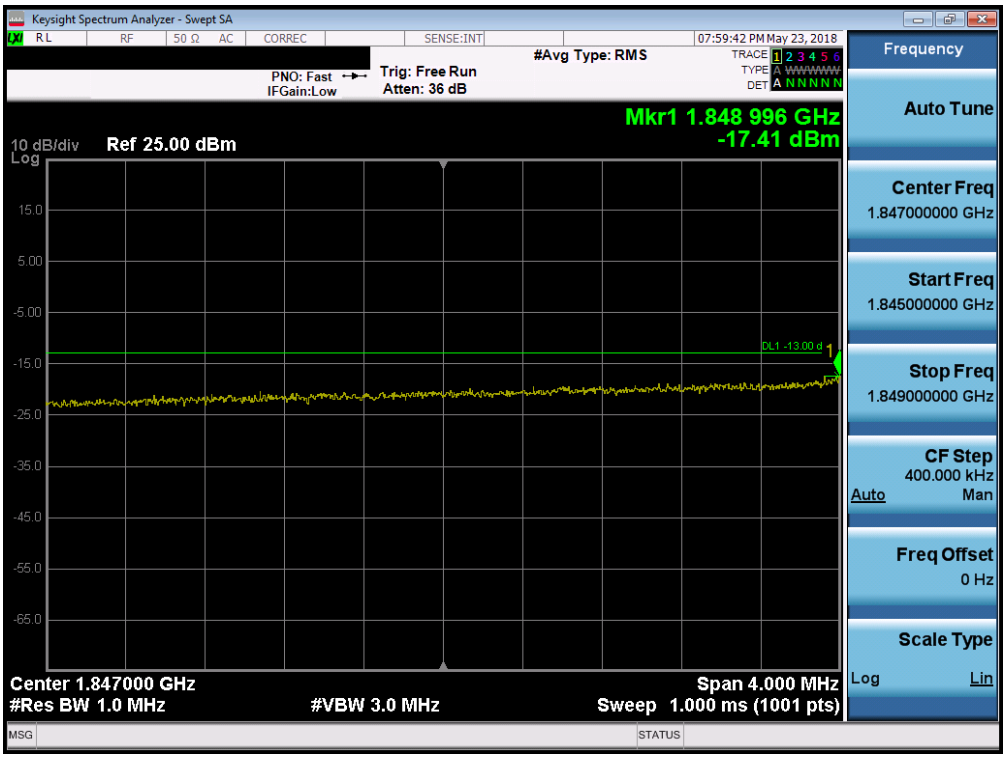


Plot 7-135. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-136. Lower Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

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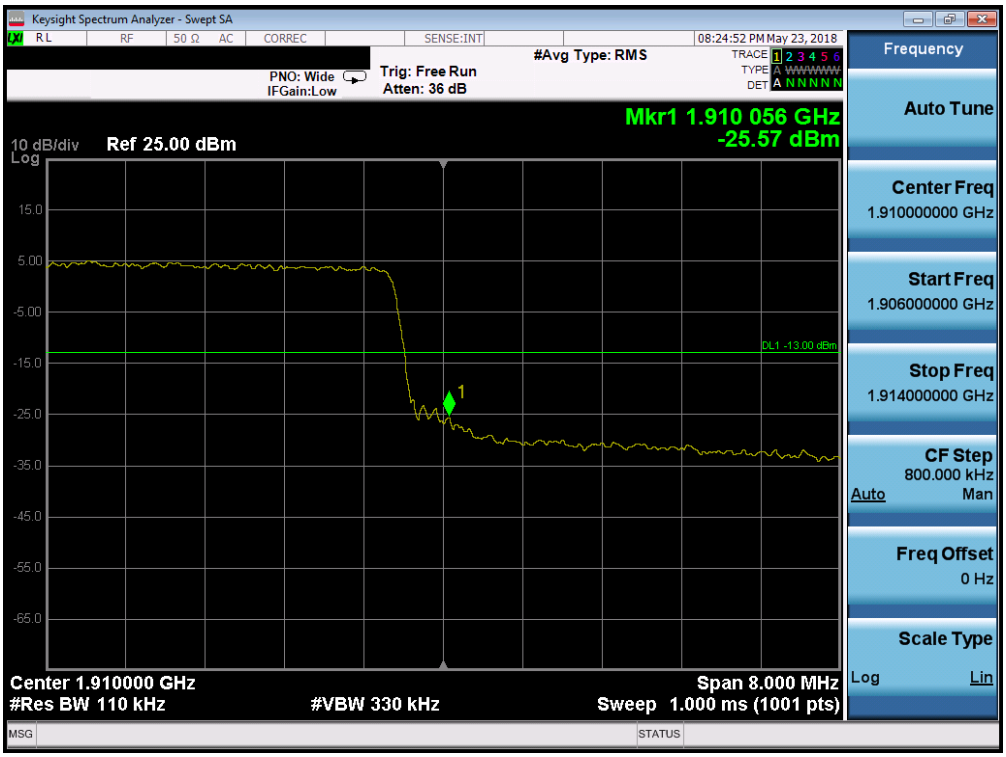
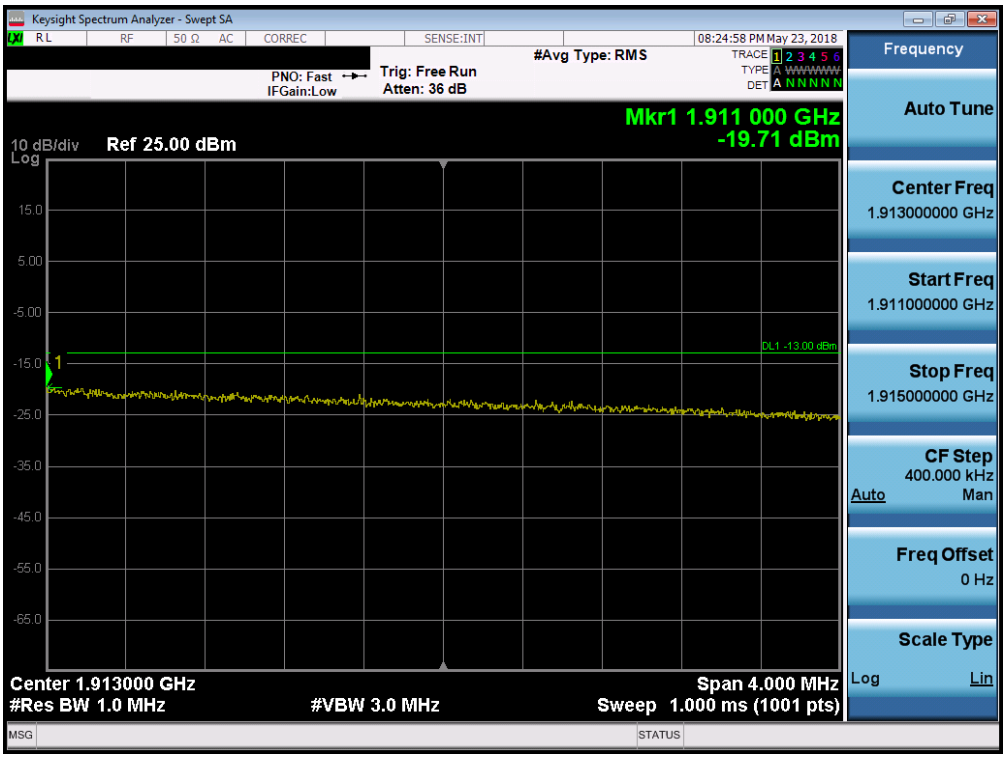


Plot 7-137. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-138. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

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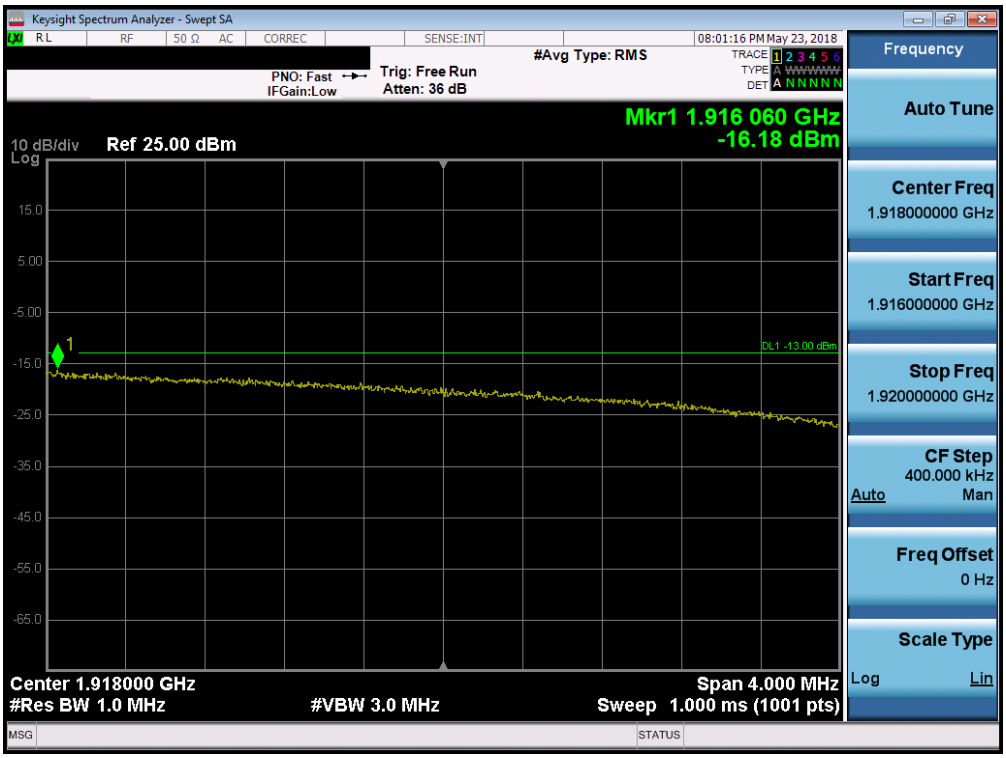
Plot 7-139. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-140. Upper Extended Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)

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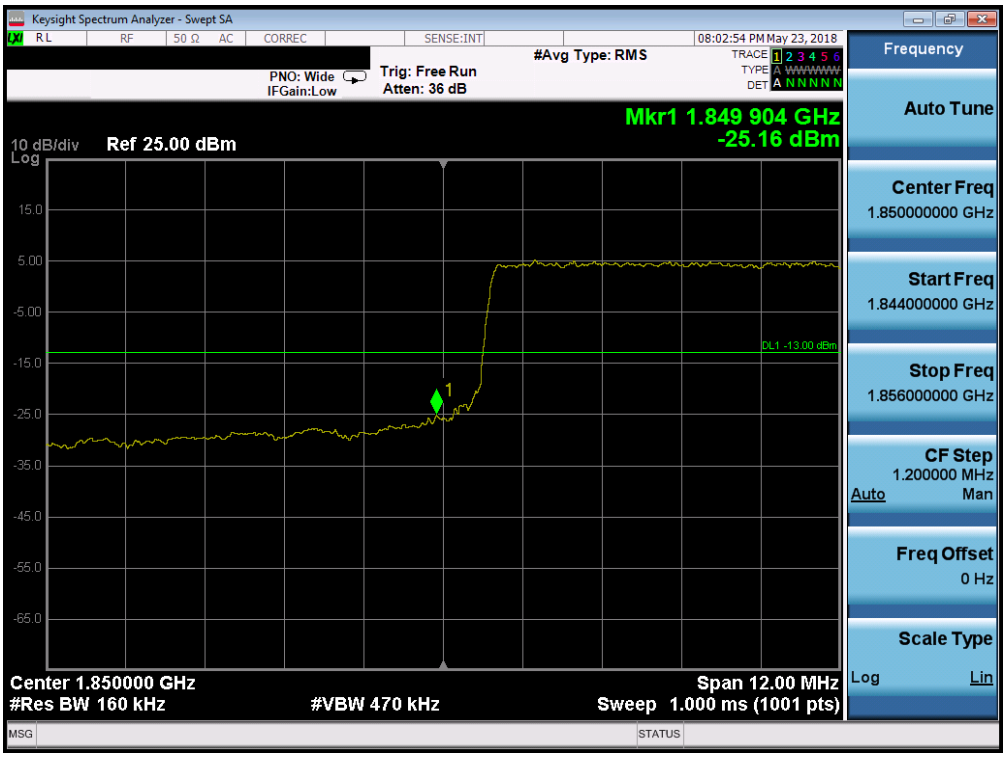
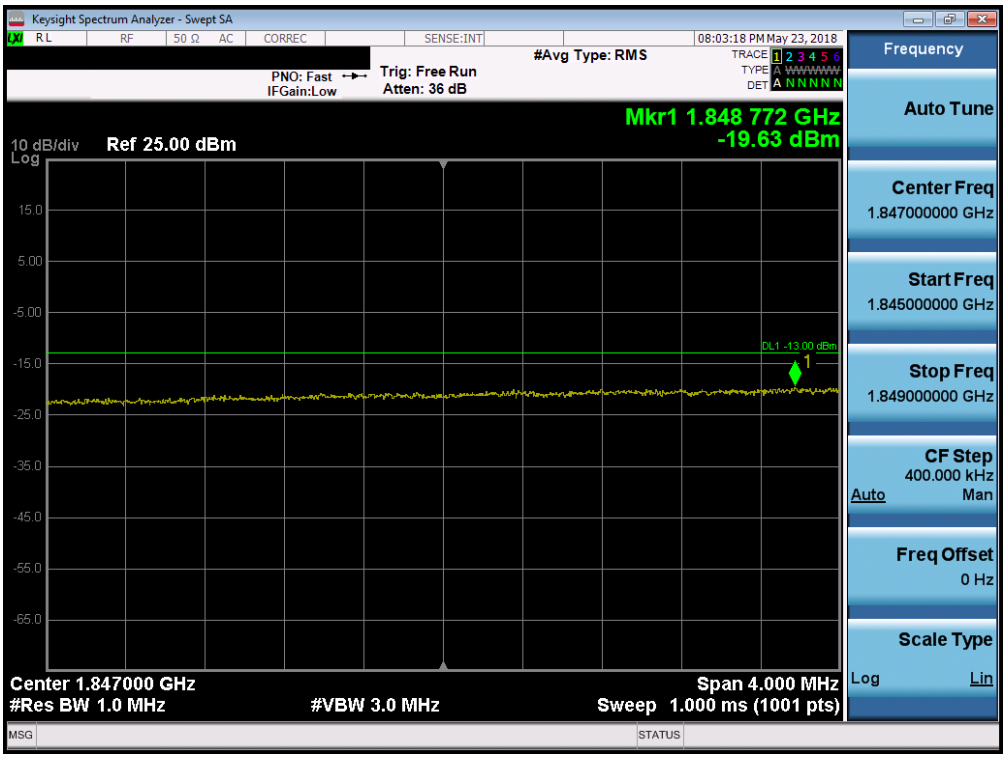


Plot 7-141. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-142. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

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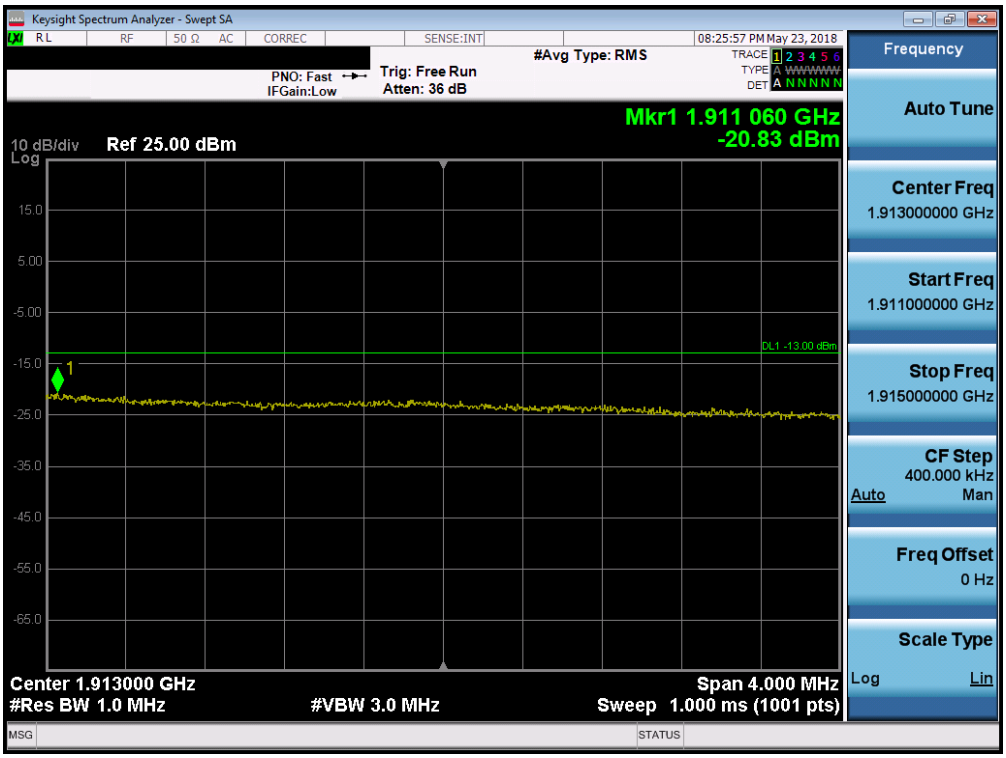
Plot 7-143. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-144. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

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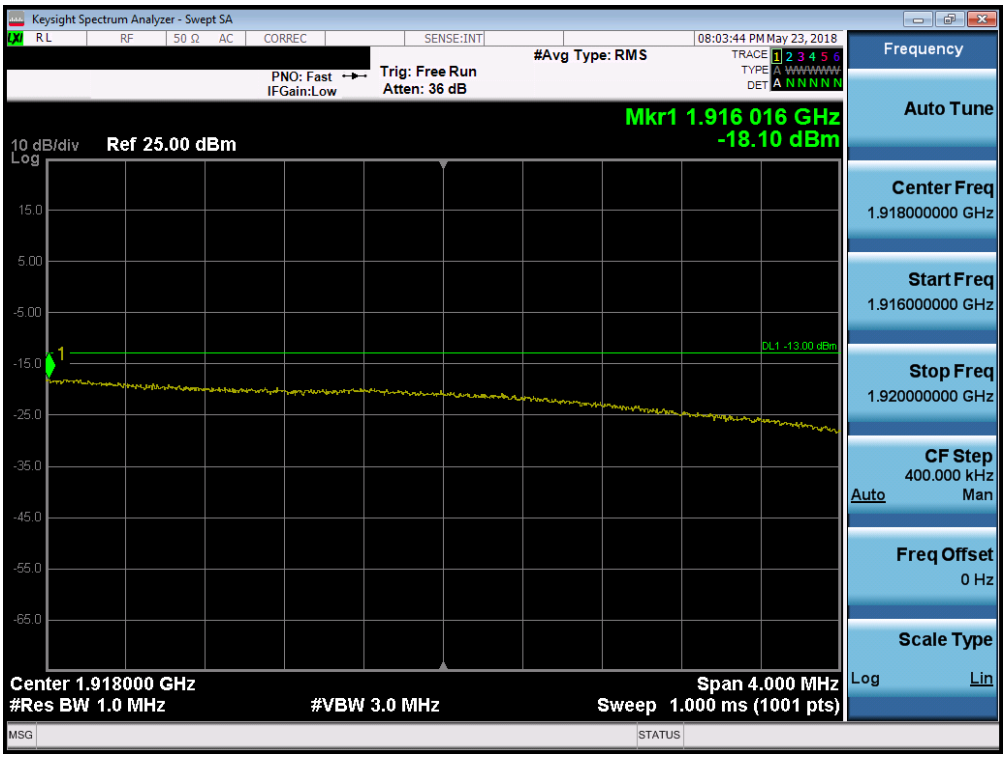
Plot 7-145. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-146. Upper Extended Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

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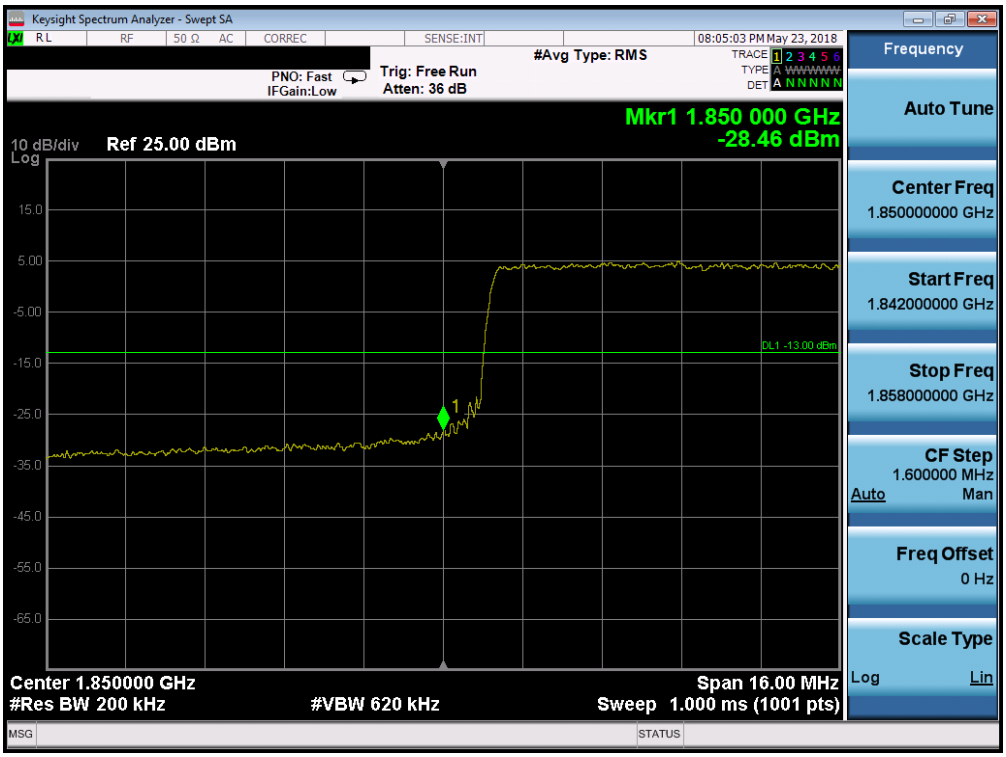
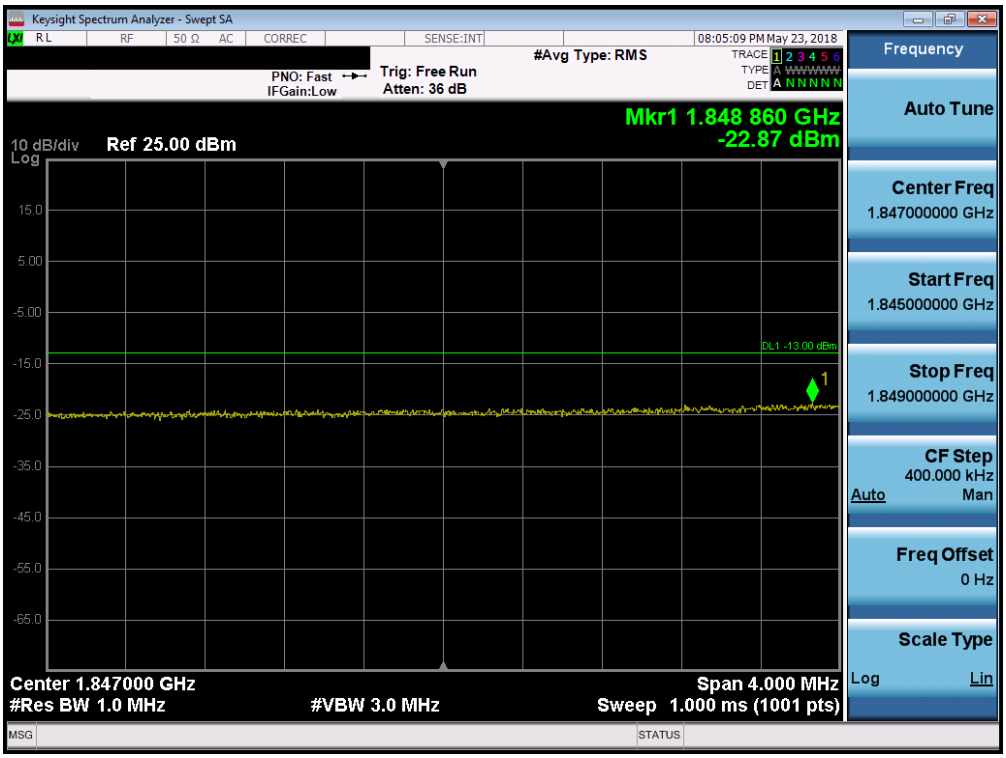


Plot 7-147. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-148. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

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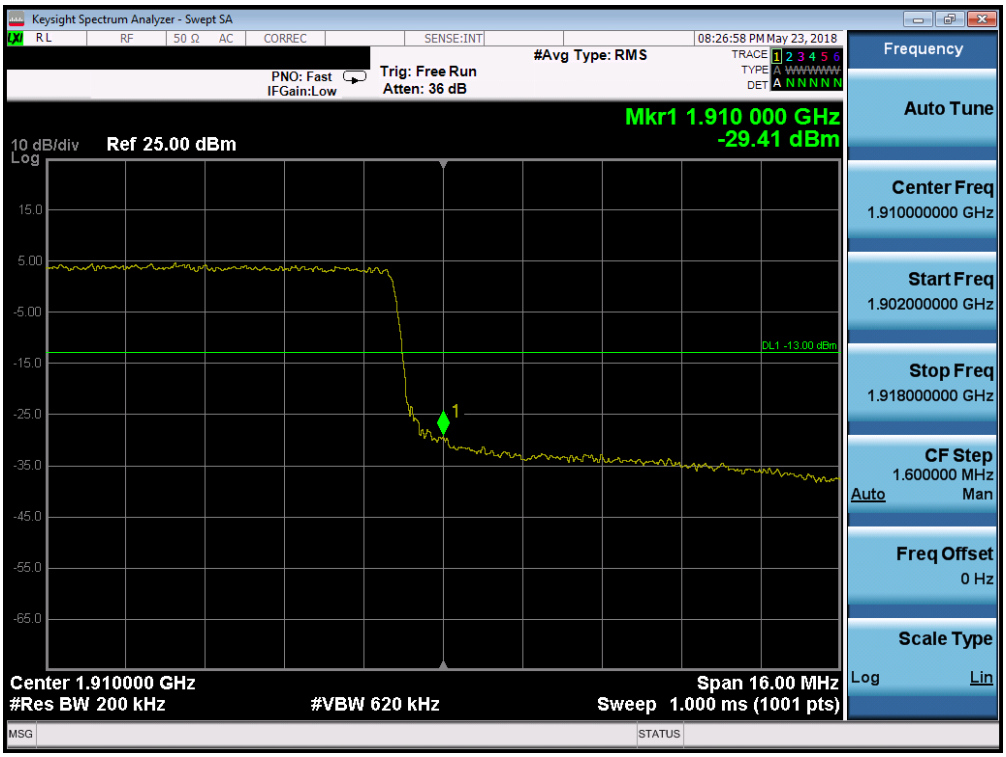
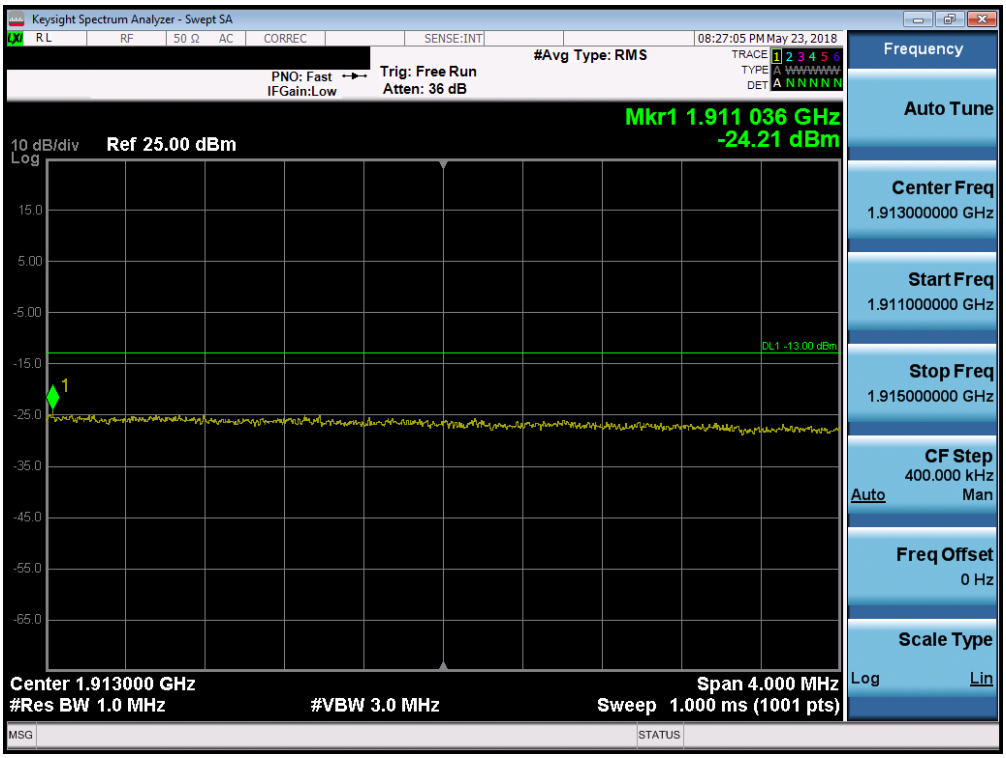


Plot 7-149. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-150. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

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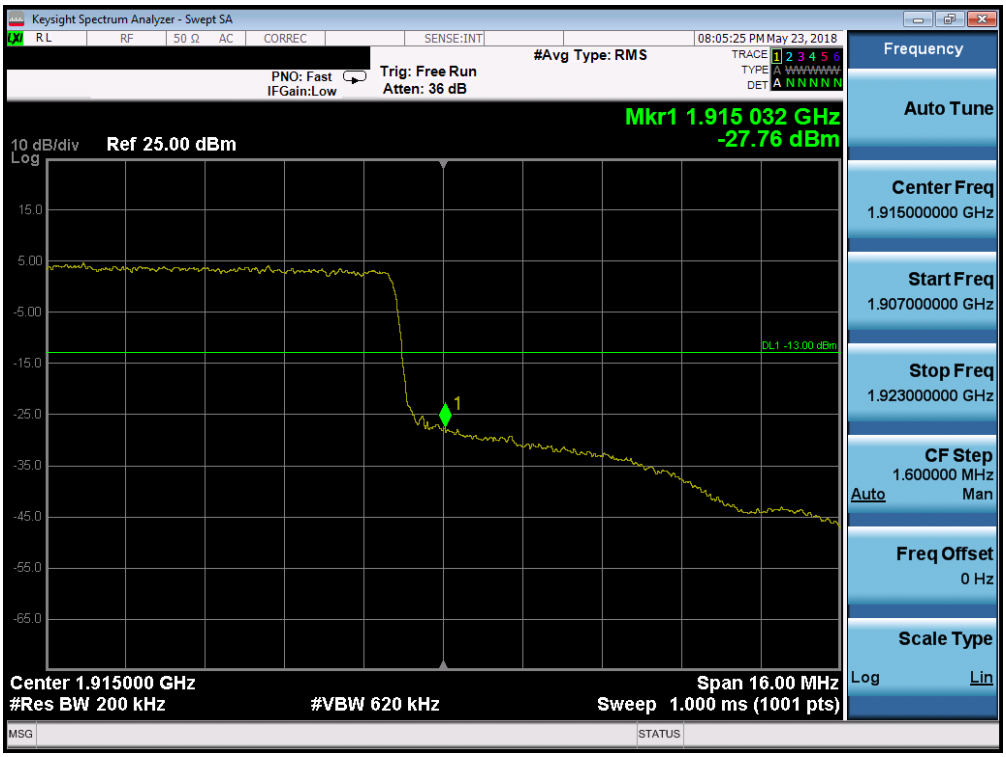
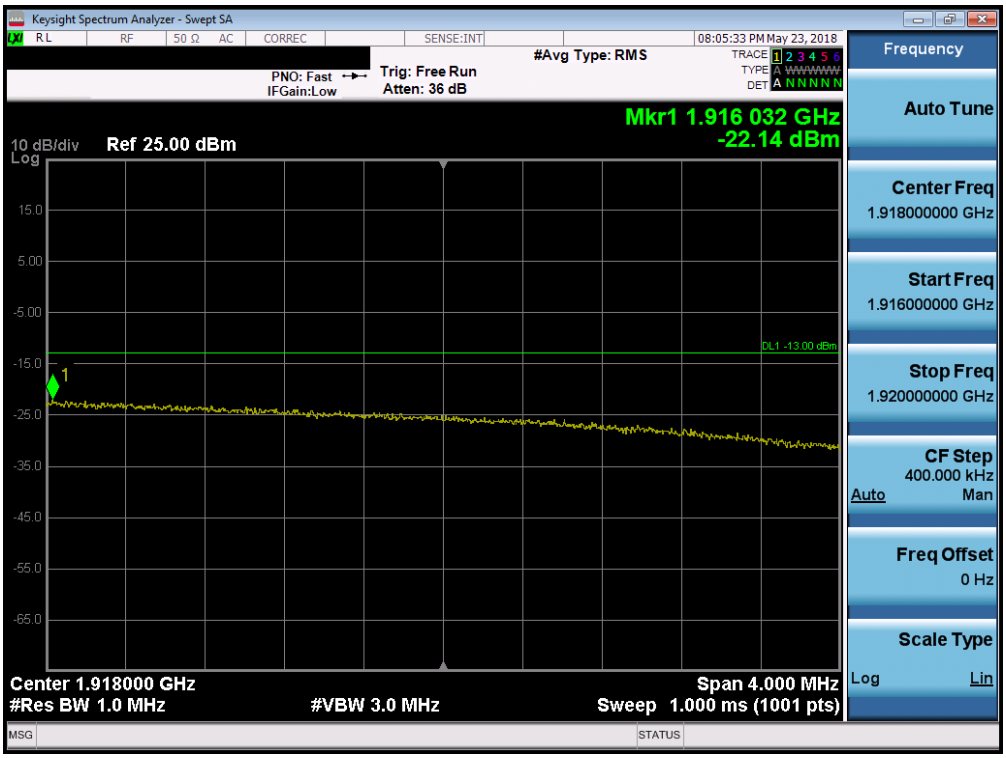


Plot 7-151. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-152. Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

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7.5 Peak-Average Ratio

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

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

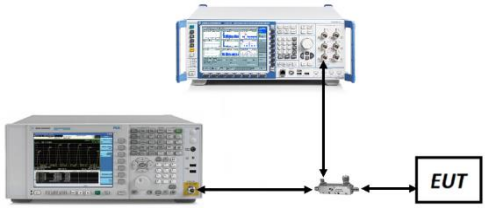

Figure 7-4. Test Instrument & Measurement Setup

Test Notes

None.

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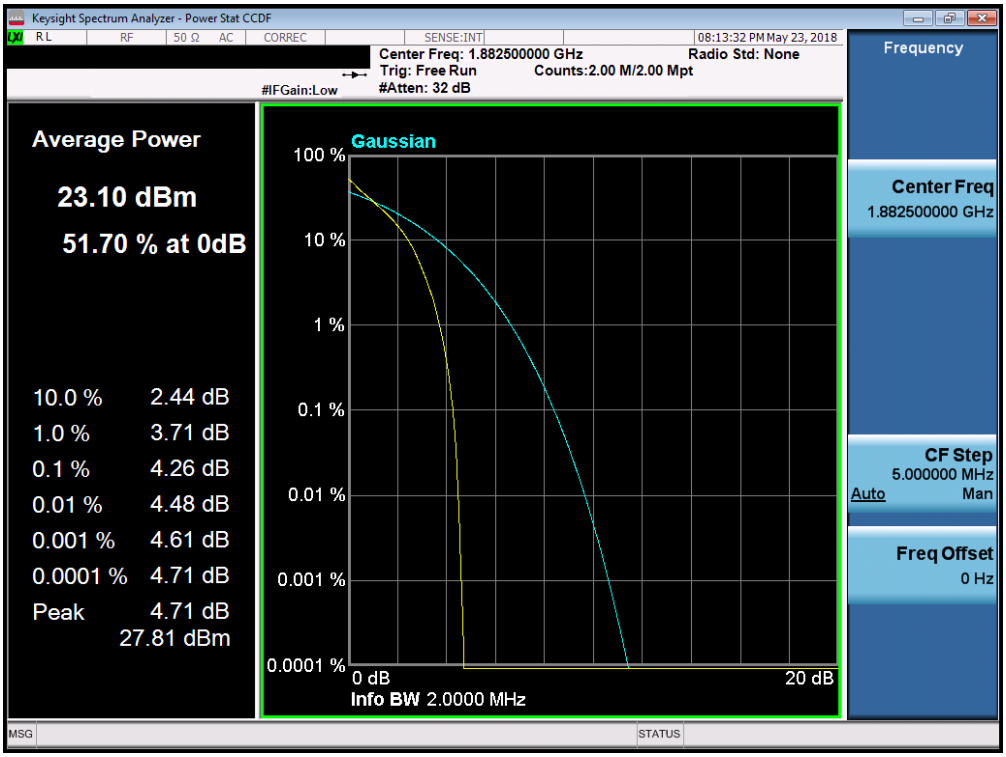
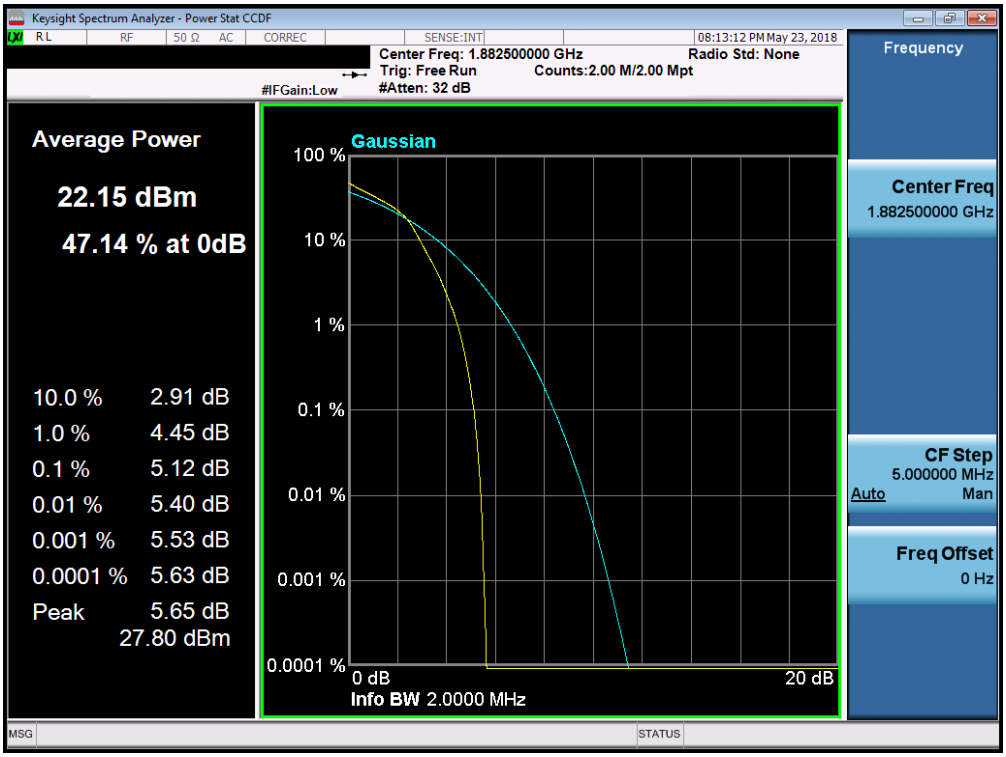
Band 25/2



Plot 7-153. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-154. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)

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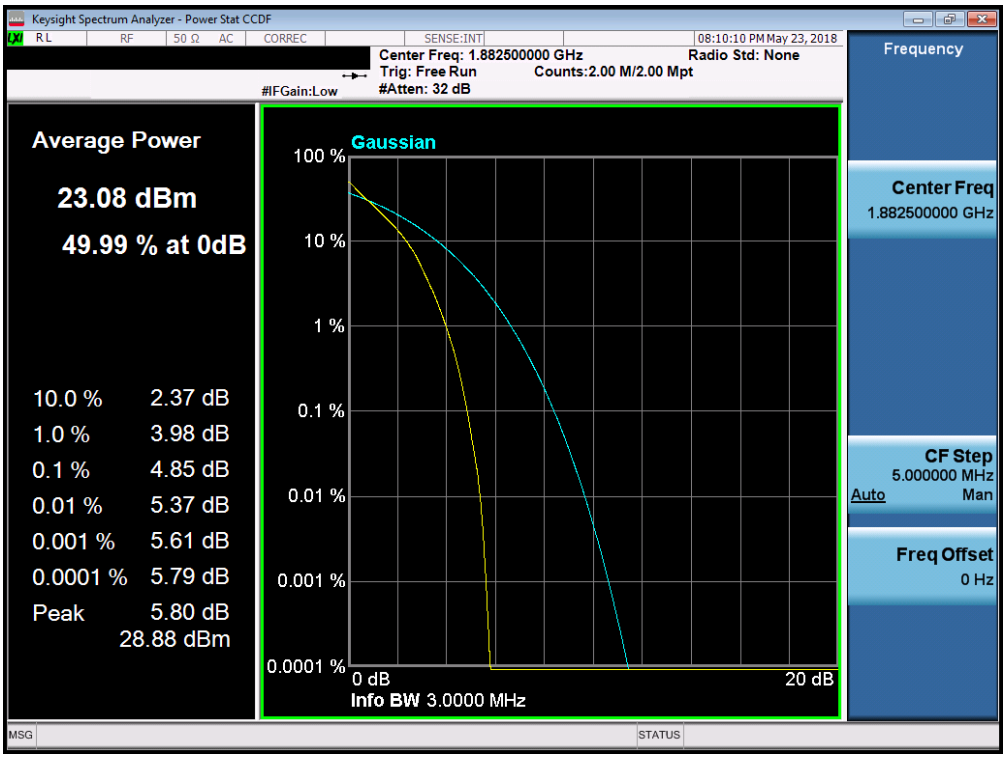
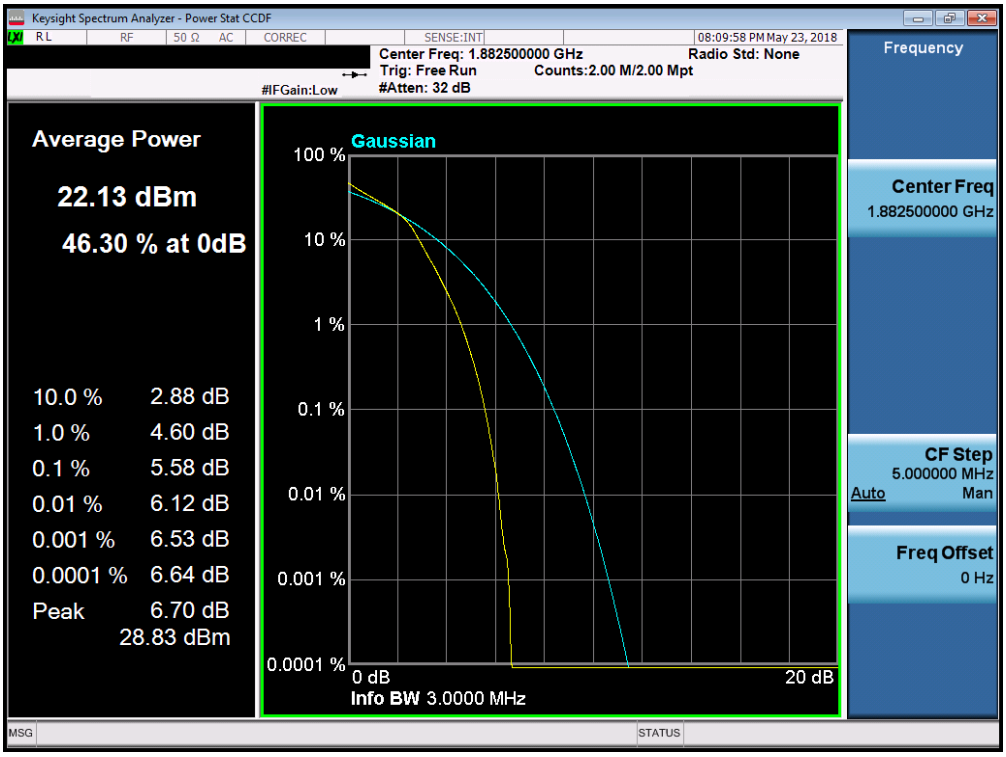


Plot 7-155. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-156. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)

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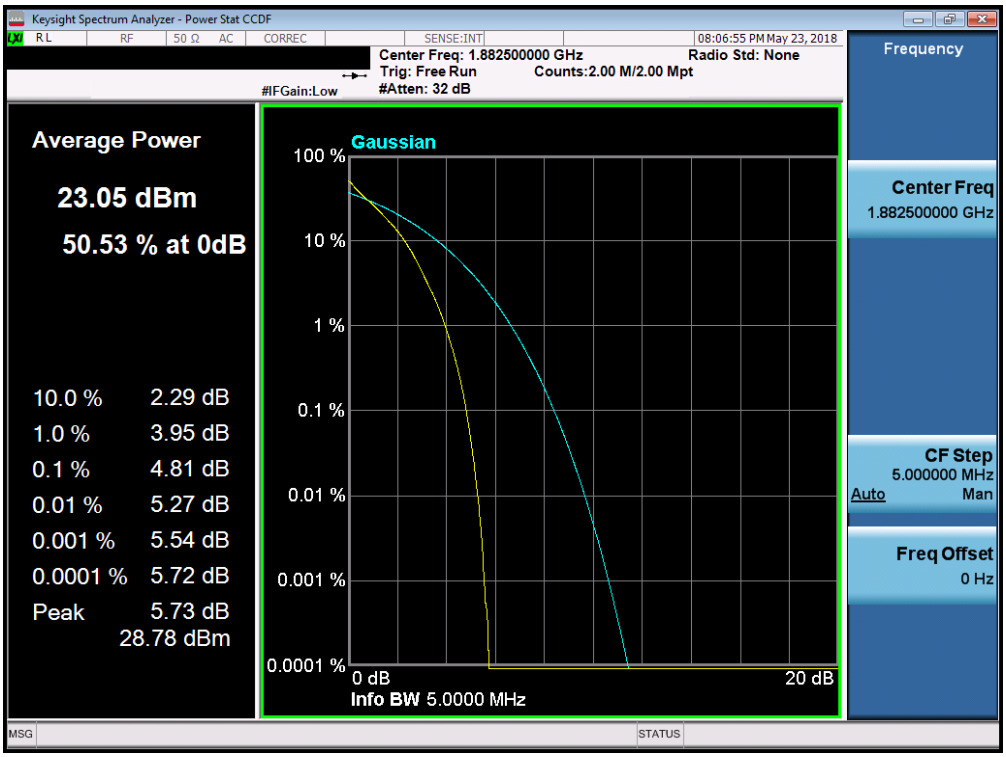
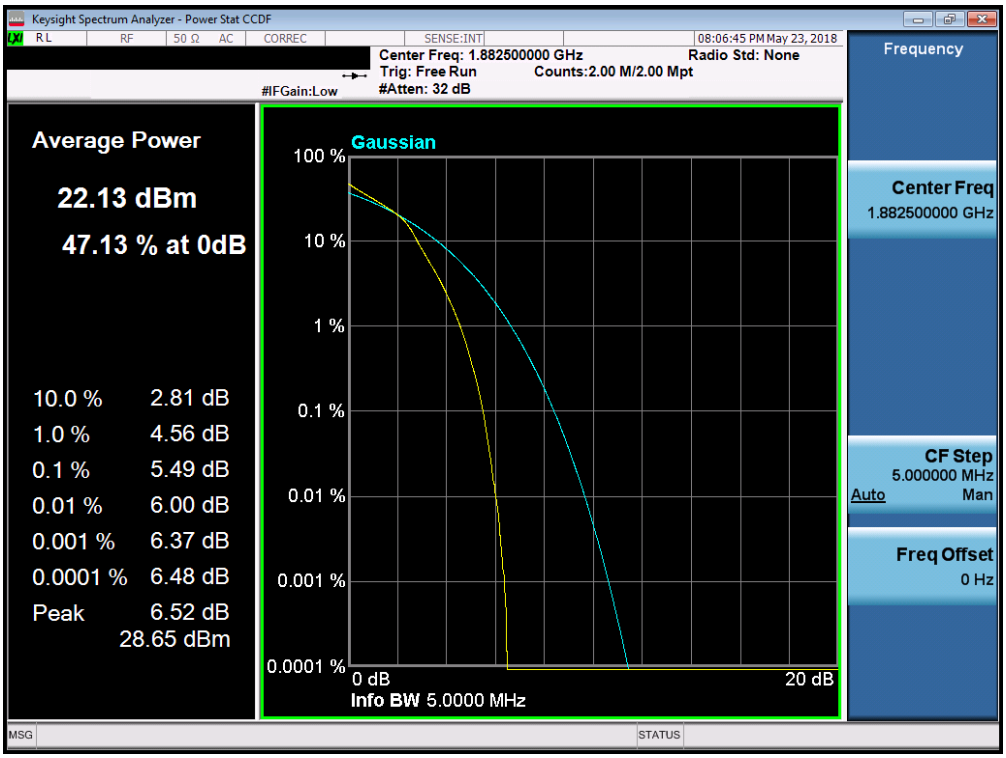


Plot 7-157. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-158. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

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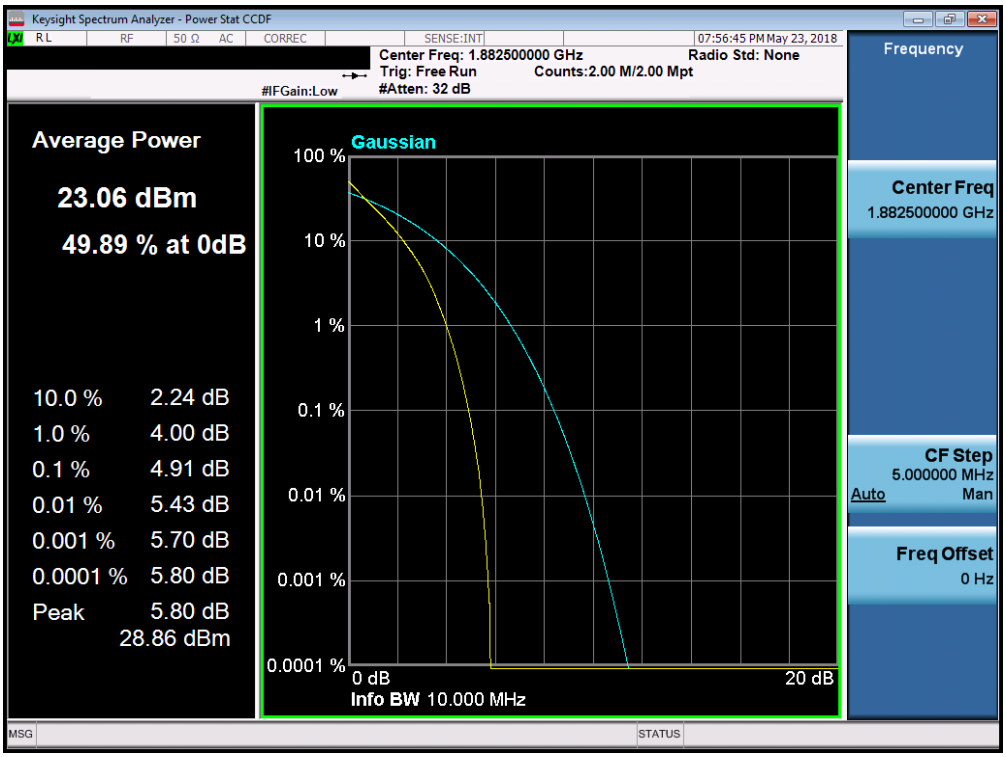
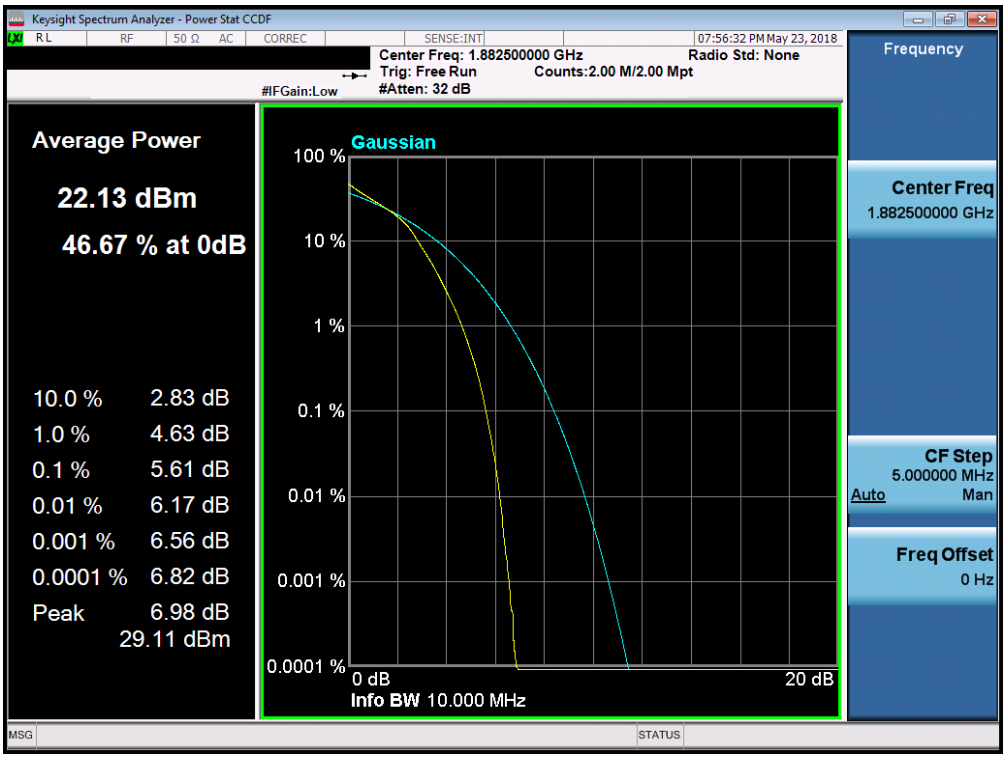


Plot 7-159. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-160. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)

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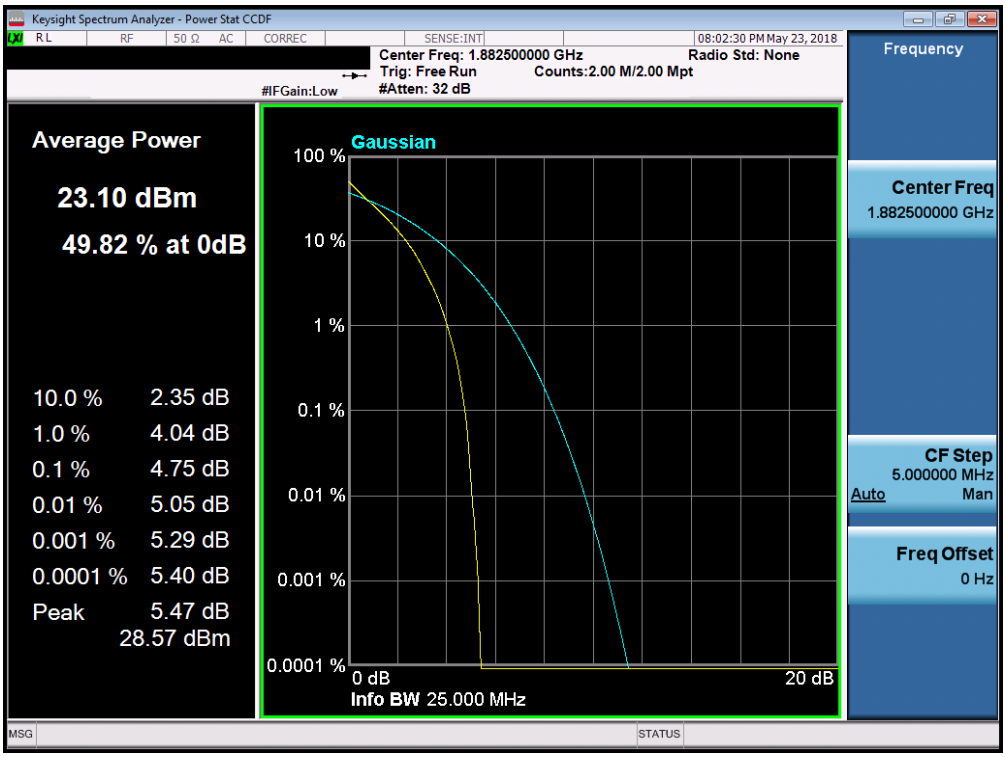
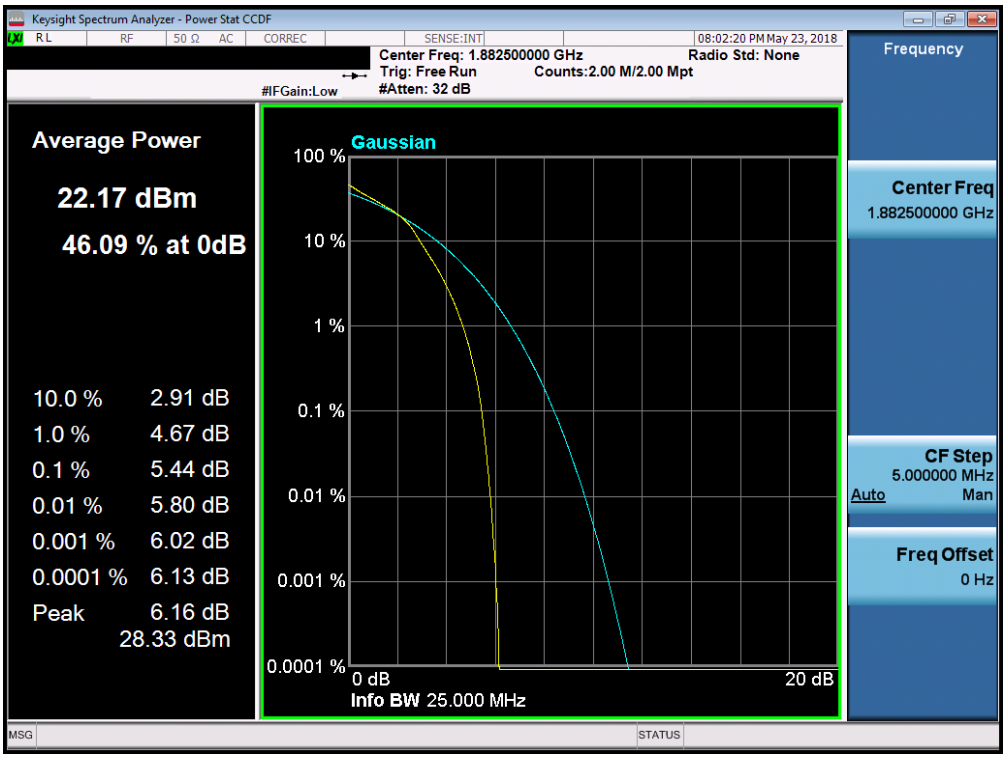


Plot 7-161. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-162. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

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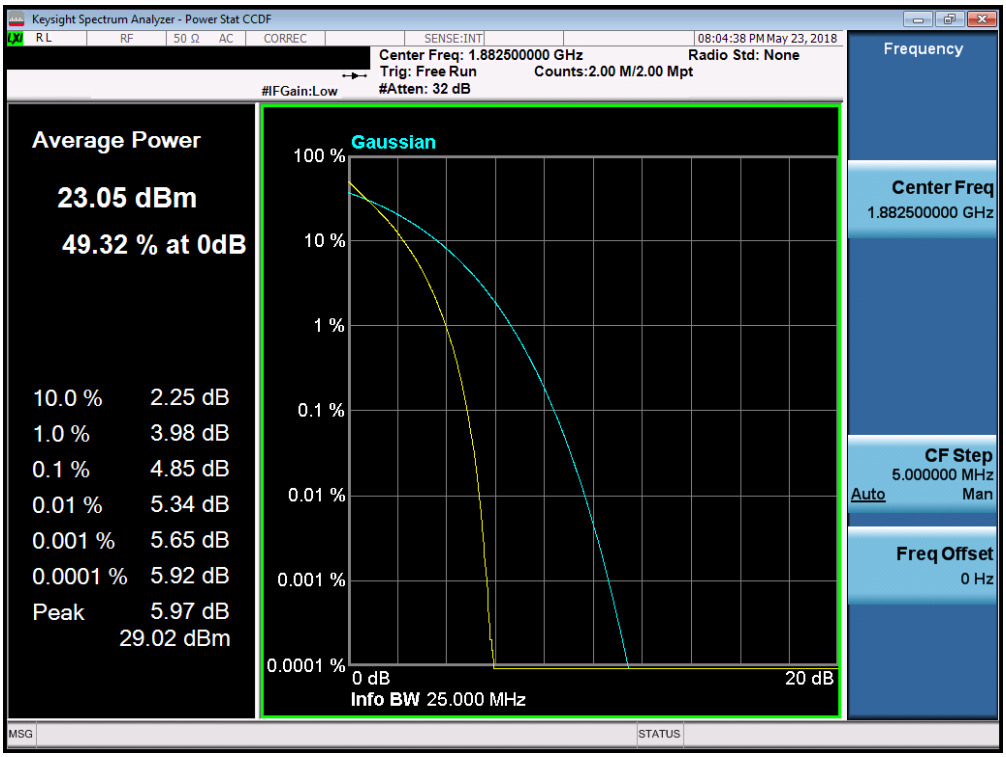
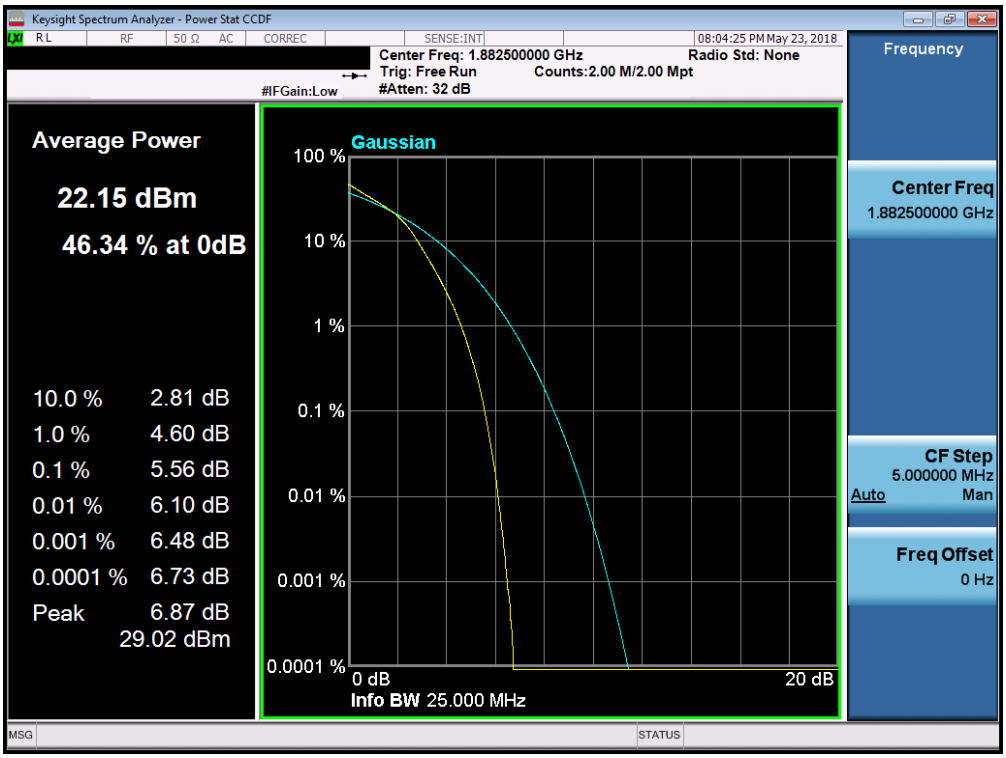


Plot 7-163. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-164. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)

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7.6 Radiated Power (ERP/EIRP)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

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

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Test Setup

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

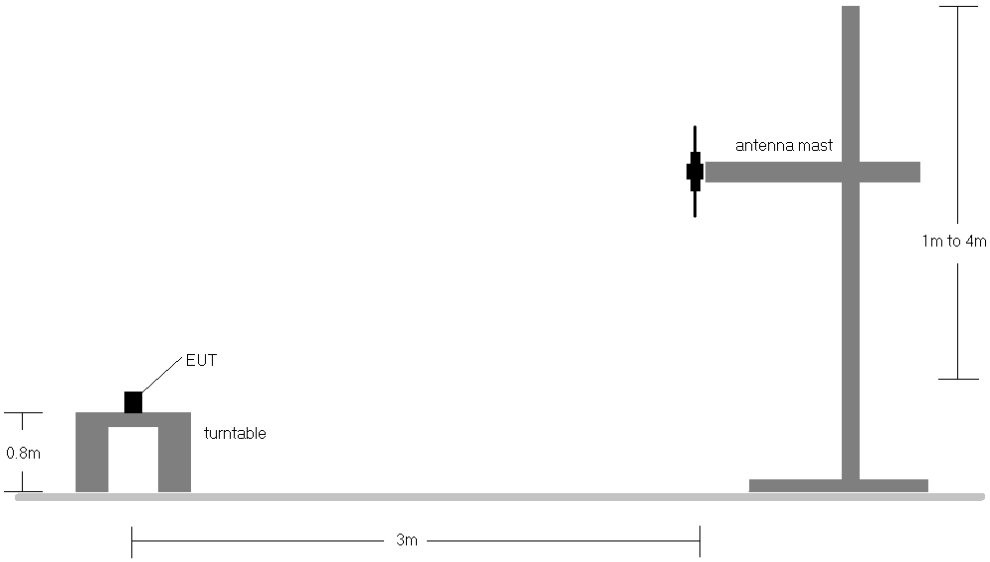

Figure 7-5. Radiated Test Setup <1GHz

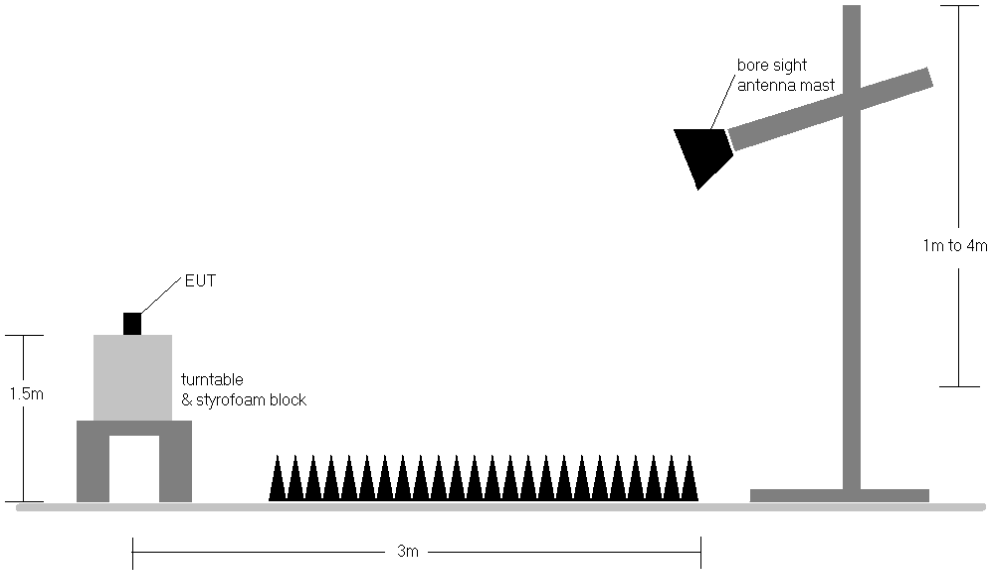

Figure 7-6. Radiated Test Setup >1GHz

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.

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	150	355	1 / 0	18.19	1.10	17.14	0.052	34.77	-17.63	19.29	0.085	36.99	-17.70
707.50	1.4	QPSK	V	150	355	1 / 5	17.70	1.13	16.68	0.047	34.77	-18.09	18.83	0.076	36.99	-18.16
715.30	1.4	QPSK	V	150	355	1 / 0	18.52	1.16	**17.53**	0.057	34.77	-17.24	**19.68**	0.093	36.99	-17.31
699.70	1.4	16-QAM	V	150	355	1 / 0	17.22	1.10	16.17	0.041	34.77	-18.60	18.32	0.068	36.99	-18.67
707.50	1.4	16-QAM	V	150	355	1 / 5	16.69	1.13	15.67	0.037	34.77	-19.10	17.82	0.061	36.99	-19.17
715.30	1.4	16-QAM	V	150	355	1 / 0	17.49	1.16	**16.50**	0.045	34.77	-18.27	**18.65**	0.073	36.99	-18.34
700.50	3	QPSK	V	150	12	1 / 0	17.94	1.10	16.89	0.049	34.77	-17.88	19.04	0.080	36.99	-17.95
707.50	3	QPSK	V	150	12	1 / 0	18.26	1.13	17.24	0.053	34.77	-17.53	19.39	0.087	36.99	-17.60
714.50	3	QPSK	V	150	12	1 / 0	18.38	1.16	**17.39**	0.055	34.77	-17.38	**19.54**	0.090	36.99	-17.45
700.50	3	16-QAM	V	150	12	1 / 0	16.88	1.10	15.83	0.038	34.77	-18.94	17.98	0.063	36.99	-19.01
707.50	3	16-QAM	V	150	12	1 / 0	17.22	1.13	16.20	0.042	34.77	-18.57	18.35	0.068	36.99	-18.64
714.50	3	16-QAM	V	150	12	1 / 0	17.28	1.16	**16.29**	0.043	34.77	-18.48	**18.44**	0.070	36.99	-18.55
701.50	5	QPSK	V	150	4	1 / 24	18.28	1.11	17.24	0.053	34.77	-17.54	19.39	0.087	36.99	-17.60
707.50	5	QPSK	V	150	4	1 / 24	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	4	1 / 24	18.36	1.15	17.36	0.055	34.77	-17.41	19.51	0.089	36.99	-17.48
701.50	5	16-QAM	V	150	4	1 / 0	17.67	1.11	**16.63**	0.046	34.77	-18.15	**18.78**	0.075	36.99	-18.21
707.50	5	16-QAM	V	150	4	1 / 24	17.58	1.13	16.56	0.045	34.77	-18.21	18.71	0.074	36.99	-18.28
713.50	5	16-QAM	V	150	4	1 / 24	17.38	1.15	16.38	0.043	34.77	-18.39	18.53	0.071	36.99	-18.46
704.00	10	QPSK	V	150	355	1 / 49	18.79	1.12	**17.76**	**0.060**	34.77	-17.01	**19.91**	**0.098**	36.99	-17.08
707.50	10	QPSK	V	150	355	1 / 49	18.52	1.13	17.50	0.056	34.77	-17.27	19.65	0.092	36.99	-17.34
711.00	10	QPSK	V	150	355	1 / 0	18.66	1.14	17.65	0.058	34.77	-17.12	19.80	0.096	36.99	-17.19
704.00	10	16-QAM	V	150	355	1 / 49	17.25	1.12	16.22	0.042	34.77	-18.55	18.37	0.069	36.99	-18.62
707.50	10	16-QAM	V	150	355	1 / 49	17.53	1.13	**16.51**	0.045	34.77	-18.26	**18.66**	0.073	36.99	-18.33
711.00	10	16-QAM	V	150	355	1 / 0	17.36	1.14	16.35	0.043	34.77	-18.42	18.50	0.071	36.99	-18.49
704.00	10	QPSK	H	150	227	1 / 49	18.08	1.12	17.05	0.051	34.77	-17.72	19.20	0.083	36.99	-17.79

Table 7-3. ERP Data (Band 12)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	150	279	1 / 5	20.13	1.50	19.48	0.089	38.45	-18.97	21.63	0.146	40.61	-18.98
836.50	1.4	QPSK	H	150	279	1 / 0	20.28	1.50	19.63	0.092	38.45	-18.82	21.78	0.151	40.61	-18.83
848.30	1.4	QPSK	H	150	279	1 / 5	21.10	1.50	**20.45**	**0.111**	38.45	-18.00	**22.60**	**0.182**	40.61	-18.01
824.70	1.4	16-QAM	H	150	279	1 / 5	18.91	1.50	18.26	0.067	38.45	-20.19	20.41	0.110	40.61	-20.20
836.50	1.4	16-QAM	H	150	279	1 / 0	19.16	1.50	18.51	0.071	38.45	-19.94	20.66	0.116	40.61	-19.95
848.30	1.4	16-QAM	H	150	279	1 / 5	19.84	1.50	**19.19**	0.083	38.45	-19.26	**21.34**	0.136	40.61	-19.27
825.50	3	QPSK	H	150	275	1 / 14	20.29	1.50	19.64	0.092	38.45	-18.81	21.79	0.151	40.61	-18.82
836.50	3	QPSK	H	150	275	1 / 0	20.40	1.50	19.75	0.094	38.45	-18.70	21.90	0.155	40.61	-18.71
847.50	3	QPSK	H	150	275	1 / 14	20.74	1.50	**20.09**	0.102	38.45	-18.36	**22.24**	0.167	40.61	-18.37
825.50	3	16-QAM	H	150	275	1 / 14	19.10	1.50	18.45	0.070	38.45	-20.00	20.60	0.115	40.61	-20.01
836.50	3	16-QAM	H	150	275	1 / 0	19.74	1.50	19.09	0.081	38.45	-19.36	21.24	0.133	40.61	-19.37
847.50	3	16-QAM	H	150	275	1 / 14	19.92	1.50	**19.27**	0.085	38.45	-19.18	**21.42**	0.139	40.61	-19.19
826.50	5	QPSK	H	150	267	1 / 0	20.52	1.50	19.87	0.097	38.45	-18.58	22.02	0.159	40.61	-18.59
836.50	5	QPSK	H	150	267	1 / 24	20.70	1.50	20.05	0.101	38.45	-18.40	22.20	0.166	40.61	-18.41
846.50	5	QPSK	H	150	267	1 / 0	20.80	1.50	**20.15**	0.104	38.45	-18.30	**22.30**	0.170	40.61	-18.31
826.50	5	16-QAM	H	150	267	1 / 0	18.79	1.50	18.14	0.065	38.45	-20.31	20.29	0.107	40.61	-20.32
836.50	5	16-QAM	H	150	267	1 / 24	19.28	1.50	18.63	0.073	38.45	-19.82	20.78	0.120	40.61	-19.83
846.50	5	16-QAM	H	150	267	1 / 0	20.16	1.50	**19.51**	0.089	38.45	-18.94	**21.66**	0.147	40.61	-18.95
829.00	10	QPSK	H	150	275	1 / 49	20.86	1.50	**20.21**	0.105	38.45	-18.24	**22.36**	0.172	40.61	-18.25
836.50	10	QPSK	H	150	275	1 / 0	20.42	1.50	19.77	0.095	38.45	-18.68	21.92	0.156	40.61	-18.69
844.00	10	QPSK	H	150	275	1 / 0	20.45	1.50	19.80	0.095	38.45	-18.65	21.95	0.157	40.61	-18.66
829.00	10	16-QAM	H	150	275	1 / 49	19.63	1.50	18.98	0.079	38.45	-19.47	21.13	0.130	40.61	-19.48
836.50	10	16-QAM	H	150	275	1 / 0	19.89	1.50	**19.24**	0.084	38.45	-19.21	**21.39**	0.138	40.61	-19.22
844.00	10	16-QAM	H	150	275	1 / 0	18.77	1.50	18.12	0.065	38.45	-20.33	20.27	0.106	40.61	-20.34
848.30	1.4	QPSK	V	150	355	1 / 5	19.66	1.50	19.01	0.080	38.45	-19.44	21.16	0.131	40.61	-19.45

Table 7-4. ERP Data (Band 5)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	V	150	101	1 / 0	15.72	5.56	**21.28**	0.134	30.00	-8.72
1732.50	1.4	QPSK	V	150	101	1 / 0	15.64	5.41	21.05	0.127	30.00	-8.95
1754.30	1.4	QPSK	V	150	101	1 / 5	15.53	5.26	20.79	0.120	30.00	-9.21
1710.70	1.4	16-QAM	V	150	101	1 / 0	15.21	5.56	**20.77**	0.119	30.00	-9.23
1732.50	1.4	16-QAM	V	150	101	1 / 0	13.97	5.41	19.38	0.087	30.00	-10.62
1754.30	1.4	16-QAM	V	150	101	1 / 5	14.71	5.26	19.97	0.099	30.00	-10.03
1711.50	3	QPSK	V	150	291	1 / 14	16.50	5.55	**22.05**	**0.160**	30.00	-7.95
1732.50	3	QPSK	V	150	291	1 / 0	16.37	5.41	21.78	0.151	30.00	-8.22
1753.50	3	QPSK	V	150	291	1 / 14	16.35	5.26	21.61	0.145	30.00	-8.39
1711.50	3	16-QAM	V	150	291	1 / 14	15.90	5.55	**21.45**	0.140	30.00	-8.55
1732.50	3	16-QAM	V	150	291	1 / 0	14.64	5.41	20.05	0.101	30.00	-9.95
1753.50	3	16-QAM	V	150	291	1 / 14	15.36	5.26	20.62	0.115	30.00	-9.38
1712.50	5	QPSK	V	150	93	1 / 0	15.54	5.55	**21.09**	0.128	30.00	-8.91
1732.50	5	QPSK	V	150	93	1 / 0	15.32	5.41	20.73	0.118	30.00	-9.27
1752.50	5	QPSK	V	150	93	1 / 0	15.36	5.27	20.63	0.116	30.00	-9.37
1712.50	5	16-QAM	V	150	93	1 / 0	14.75	5.55	**20.30**	0.107	30.00	-9.70
1732.50	5	16-QAM	V	150	93	1 / 0	13.64	5.41	19.05	0.080	30.00	-10.95
1752.50	5	16-QAM	V	150	93	1 / 0	14.08	5.27	19.35	0.086	30.00	-10.65
1715.00	10	QPSK	V	150	296	1 / 0	16.35	5.53	**21.88**	0.154	30.00	-8.12
1732.50	10	QPSK	V	150	296	1 / 0	16.28	5.41	21.69	0.147	30.00	-8.31
1750.00	10	QPSK	V	150	293	1 / 49	16.12	5.29	21.41	0.138	30.00	-8.59
1715.00	10	16-QAM	V	150	296	1 / 0	15.13	5.53	**20.66**	0.116	30.00	-9.34
1732.50	10	16-QAM	V	150	296	1 / 0	14.82	5.41	20.23	0.105	30.00	-9.77
1750.00	10	16-QAM	V	150	293	1 / 49	14.90	5.29	20.19	0.104	30.00	-9.81
1717.50	15	QPSK	V	150	88	1 / 0	15.31	5.51	**20.82**	0.121	30.00	-9.18
1732.50	15	QPSK	V	150	88	1 / 74	15.00	5.41	20.41	0.110	30.00	-9.59
1747.50	15	QPSK	V	150	88	1 / 74	15.27	5.31	20.58	0.114	30.00	-9.42
1717.50	15	16-QAM	V	150	88	1 / 0	14.22	5.51	**19.73**	0.094	30.00	-10.27
1732.50	15	16-QAM	V	150	88	1 / 74	13.91	5.41	19.32	0.085	30.00	-10.68
1747.50	15	16-QAM	V	150	88	1 / 74	14.28	5.31	19.59	0.091	30.00	-10.41
1720.00	20	QPSK	V	150	305	1 / 0	15.94	5.49	21.43	0.139	30.00	-8.57
1732.50	20	QPSK	V	150	305	1 / 0	16.10	5.41	**21.51**	0.142	30.00	-8.49
1745.00	20	QPSK	V	150	305	1 / 99	15.56	5.32	20.88	0.123	30.00	-9.12
1720.00	20	16-QAM	V	150	305	1 / 0	14.79	5.49	**20.28**	0.107	30.00	-9.72
1732.50	20	16-QAM	V	150	305	1 / 0	14.48	5.41	19.89	0.097	30.00	-10.11
1745.00	20	16-QAM	V	150	305	1 / 99	14.49	5.32	19.81	0.096	30.00	-10.19
1711.50	3	QPSK	H	150	92	1 / 14	15.99	5.55	21.54	0.143	30.00	-8.46

Table 7-5. EIRP Data (Band 4)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	V	150	283	1 / 0	20.65	4.82	25.47	0.352	33.01	-7.54
1880.00	1.4	QPSK	V	150	283	1 / 5	20.83	4.74	**25.57**	0.361	33.01	-7.44
1909.30	1.4	QPSK	V	150	283	1 / 0	20.80	4.68	25.48	0.353	33.01	-7.53
1850.70	1.4	16-QAM	V	150	283	1 / 0	19.36	4.82	24.18	0.262	33.01	-8.83
1880.00	1.4	16-QAM	V	150	283	1 / 5	19.72	4.74	24.46	0.279	33.01	-8.55
1909.30	1.4	16-QAM	V	150	283	1 / 0	19.86	4.68	**24.54**	0.285	33.01	-8.47
1851.50	3	QPSK	V	150	287	1 / 14	20.78	4.82	25.60	0.363	33.01	-7.41
1880.00	3	QPSK	V	150	287	1 / 0	20.87	4.74	**25.61**	0.364	33.01	-7.40
1908.50	3	QPSK	V	150	287	1 / 0	20.71	4.68	25.39	0.346	33.01	-7.62
1851.50	3	16-QAM	V	150	287	1 / 14	19.48	4.82	**24.30**	0.269	33.01	-8.71
1880.00	3	16-QAM	V	150	287	1 / 0	18.70	4.74	23.44	0.221	33.01	-9.57
1908.50	3	16-QAM	V	150	287	1 / 0	19.44	4.68	24.12	0.258	33.01	-8.89
1852.50	5	QPSK	V	150	92	1 / 0	19.65	4.81	24.46	0.279	33.01	-8.55
1880.00	5	QPSK	V	150	92	1 / 0	20.16	4.74	24.90	0.309	33.01	-8.11
1907.50	5	QPSK	V	150	92	1 / 0	20.72	4.68	**25.40**	0.347	33.01	-7.61
1852.50	5	16-QAM	V	150	92	1 / 0	18.84	4.81	23.65	0.232	33.01	-9.36
1880.00	5	16-QAM	V	150	92	1 / 0	18.62	4.74	23.36	0.217	33.01	-9.65
1907.50	5	16-QAM	V	150	92	1 / 0	19.47	4.68	**24.15**	0.260	33.01	-8.86
1855.00	10	QPSK	V	150	300	1 / 49	20.37	4.81	**25.18**	0.329	33.01	-7.83
1880.00	10	QPSK	V	150	300	1 / 0	20.09	4.74	24.83	0.304	33.01	-8.18
1905.00	10	QPSK	V	150	300	1 / 49	20.10	4.68	24.78	0.301	33.01	-8.23
1855.00	10	16-QAM	V	150	300	1 / 49	19.17	4.81	23.98	0.250	33.01	-9.03
1880.00	10	16-QAM	V	150	300	1 / 0	19.49	4.74	**24.23**	0.265	33.01	-8.78
1905.00	10	16-QAM	V	150	300	1 / 49	19.01	4.68	23.69	0.234	33.01	-9.32
1857.50	15	QPSK	V	150	101	1 / 74	20.11	4.80	24.91	0.310	33.01	-8.10
1880.00	15	QPSK	V	150	101	1 / 74	20.49	4.74	25.23	0.333	33.01	-7.78
1902.50	15	QPSK	V	150	101	1 / 74	21.14	4.69	**25.83**	**0.382**	33.01	-7.18
1857.50	15	16-QAM	V	150	101	1 / 74	18.76	4.80	23.56	0.227	33.01	-9.45
1880.00	15	16-QAM	V	150	101	1 / 74	18.73	4.74	23.47	0.222	33.01	-9.54
1902.50	15	16-QAM	V	150	101	1 / 74	19.92	4.69	**24.61**	0.289	33.01	-8.40
1860.00	20	QPSK	V	150	92	1 / 99	20.11	4.79	24.90	0.309	33.01	-8.11
1880.00	20	QPSK	V	150	92	1 / 0	20.31	4.74	25.05	0.320	33.01	-7.96
1900.00	20	QPSK	V	150	92	1 / 99	21.01	4.69	**25.70**	0.371	33.01	-7.31
1860.00	20	16-QAM	V	150	92	1 / 99	19.23	4.79	24.02	0.253	33.01	-8.99
1880.00	20	16-QAM	V	150	92	1 / 0	19.02	4.74	23.76	0.238	33.01	-9.25
1900.00	20	16-QAM	V	150	92	1 / 99	19.46	4.69	**24.15**	0.260	33.01	-8.86
1902.50	15	QPSK	H	150	196	1 / 74	20.32	4.69	25.01	0.317	33.01	-8.00

Table 7-6. EIRP Data (Band 25/2)

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7.7 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

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Test Setup

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

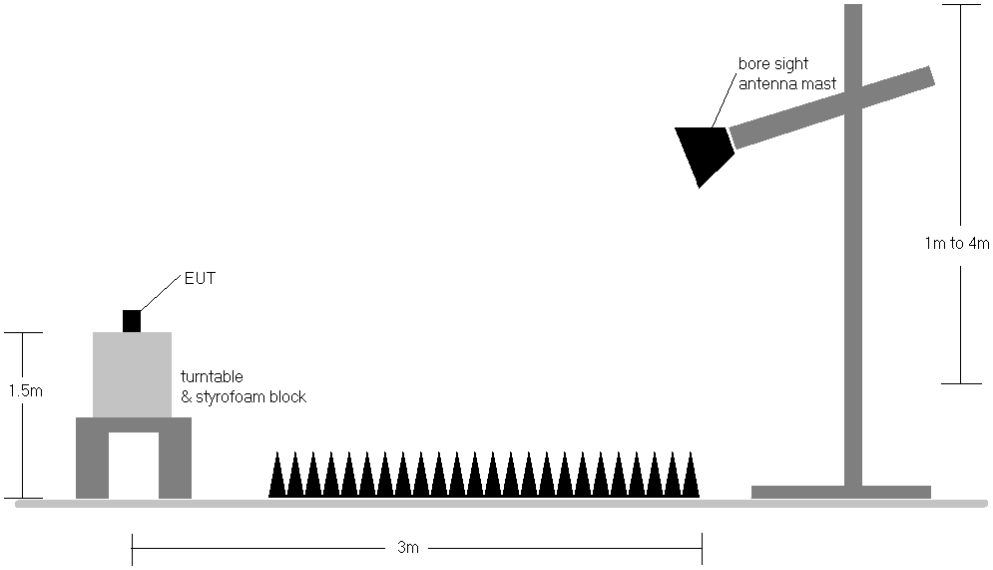

Figure 7-7. Test Instrument & Measurement Setup

Test Notes

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

2) This unit was tested with its standard battery.

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

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

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

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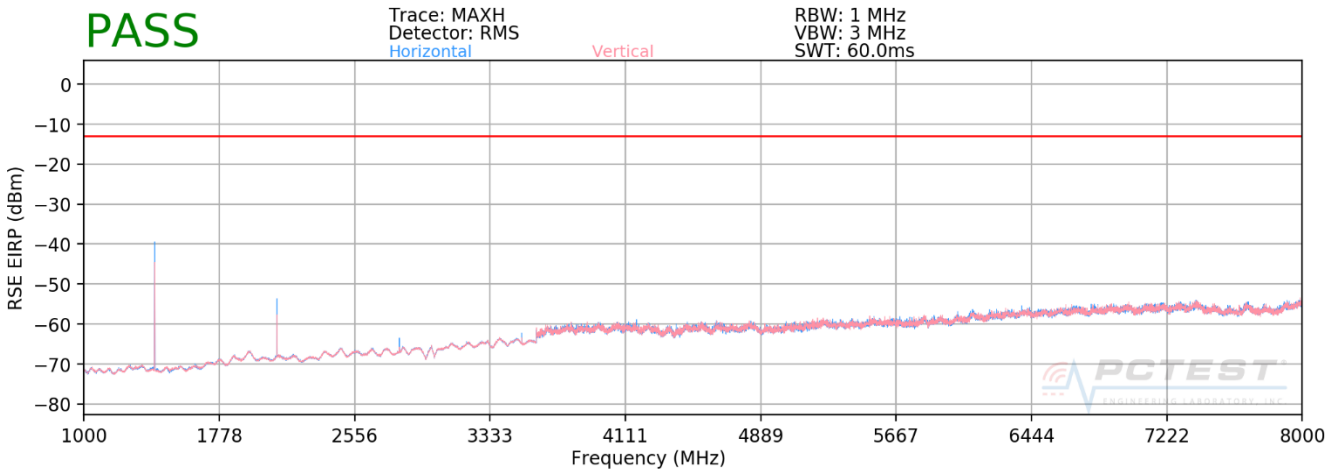
Band 12



Plot 7-165. Radiated Spurious Plot above 1GHz (Band 12)

OPERATING FREQUENCY:	704.00	MHz
CHANNEL:	23060	
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]
1408.00	V	150	122	-38.77	3.84	-34.92	-21.9
2112.00	V	150	96	-46.33	4.79	-41.54	-28.5
2816.00	V	150	367	-50.82	5.69	-45.14	-32.1
3520.00	V	150	283	-51.45	6.57	-44.88	-31.9
4224.00	V	-	-	-56.92	7.72	-49.20	-36.2

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

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OPERATING FREQUENCY:	707.50	MHz
CHANNEL:	23095	
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]
1415.00	V	150	114	-35.51	3.90	-31.61	-18.6
2122.50	V	150	93	-47.17	4.78	-42.39	-29.4
2830.00	V	150	350	-51.66	5.73	-45.93	-32.9
3537.50	V	150	216	-48.20	6.54	-41.66	-28.7

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

OPERATING FREQUENCY:	711.00	MHz
CHANNEL:	23130	
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]
1422.00	V	150	118	-35.71	3.97	-31.74	-18.7
2133.00	V	150	21	-48.91	4.78	-44.14	-31.1
2844.00	V	150	43	-50.02	5.77	-44.24	-31.2
3555.00	V	150	225	-53.15	6.54	-46.61	-33.6
4266.00	V	-	-	-57.62	7.78	-49.85	-36.8

Table 7-9. Radiated Spurious Data (Band 12 – High Channel)

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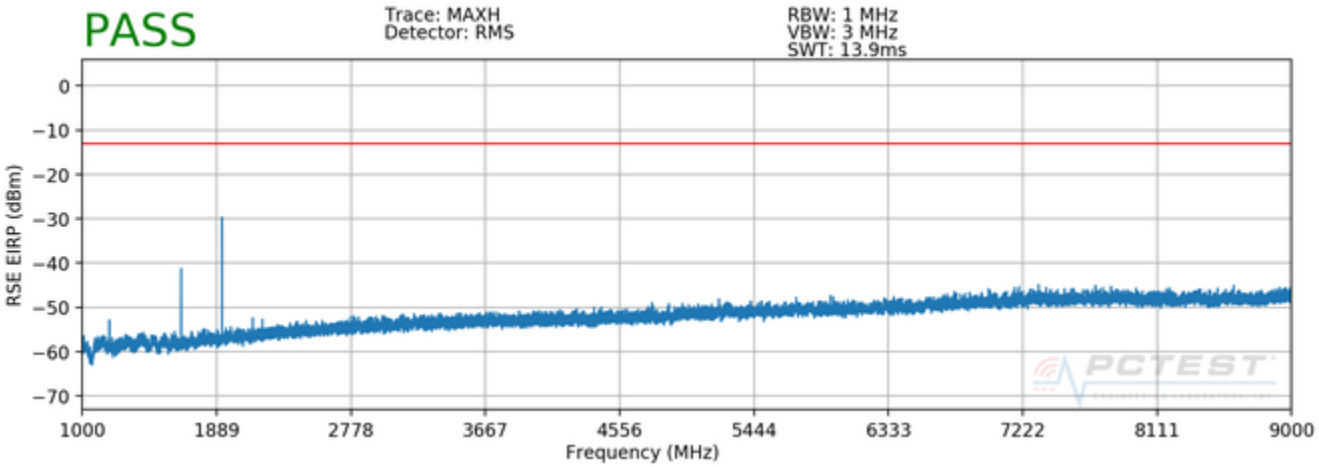
Band 5



Plot 7-166. Radiated Spurious Plot above 1GHz (Band 5)

OPERATING FREQUENCY:	824.70	MHz
CHANNEL:	20407	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	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]
1649.40	V	150	109	-42.34	4.81	-37.53	-24.5
2474.10	V	-	-	-52.32	4.99	-47.33	-34.3
3298.80	V	-	-	-51.00	6.25	-44.75	-31.8

Table 7-10. Radiated Spurious Data (Band 5 – Low Channel)

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OPERATING FREQUENCY:	836.50	MHz
CHANNEL:	20525	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	V	150	101	-47.81	4.86	-42.95	-29.9
2509.50	V	-	-	-55.43	5.10	-50.33	-37.3

Table 7-11. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY:	848.30	MHz
CHANNEL:	20643	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	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]
1696.60	V	150	101	-49.86	4.91	-44.95	-32.0
2544.90	V	150	288	-54.54	5.27	-49.26	-36.3
3393.20	V	-	-	-55.31	6.39	-48.92	-35.9

Table 7-12. Radiated Spurious Data (Band 5 – High Channel)

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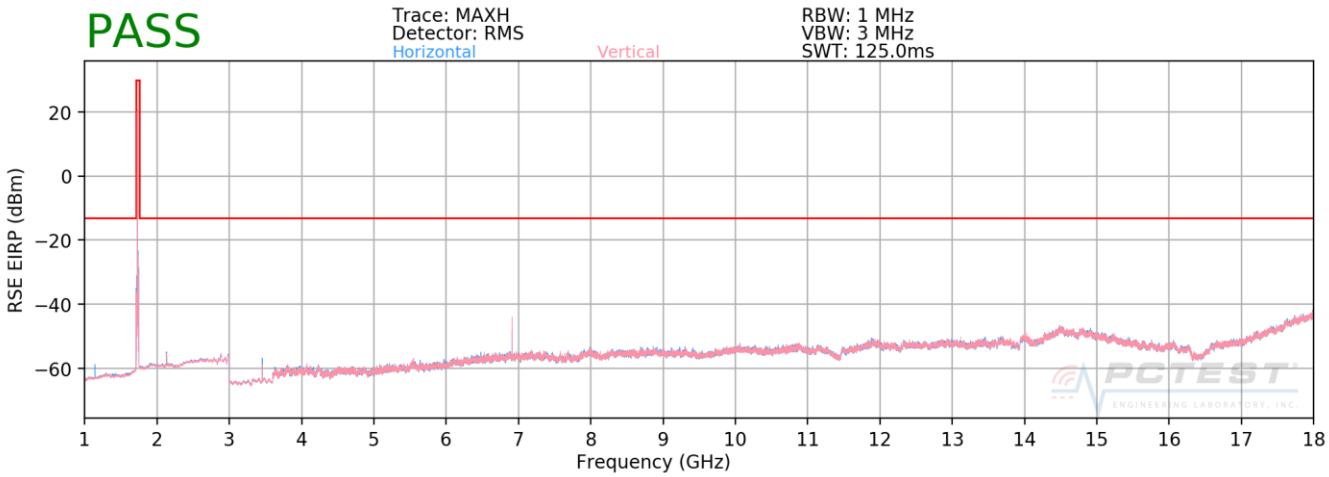
Band 4



Plot 7-167. Radiated Spurious Plot above 1GHz (Band 4)

OPERATING FREQUENCY:	1711.50	MHz
CHANNEL:	19965	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	3.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3423.00	H	150	259	-49.27	6.47	-42.80	-29.8
5134.50	H	150	80	-49.77	8.43	-41.34	-28.3
6846.00	H	150	271	-48.02	8.71	-39.31	-26.3
8557.50	H	-	-	-52.92	9.61	-43.31	-30.3

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

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OPERATING FREQUENCY:	1732.50	MHz
CHANNEL:	20175	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	3.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3465.00	H	150	271	-48.39	6.56	-41.83	-28.8
5197.50	H	150	26	-53.42	8.45	-44.97	-32.0
6930.00	H	150	251	-45.50	8.67	-36.83	-23.8
8662.50	H	-	-	-52.79	9.81	-42.98	-30.0

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

OPERATING FREQUENCY:	1753.50	MHz
CHANNEL:	20385	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	3.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3507.00	H	150	162	-41.96	6.59	-35.37	-22.4
5260.50	H	150	24	-45.14	8.41	-36.73	-23.7
7014.00	H	150	255	-36.28	8.57	-27.71	-14.7
8767.50	H	-	-	-43.43	9.95	-33.48	-20.5

Table 7-15. Radiated Spurious Data (Band 4 – High Channel)

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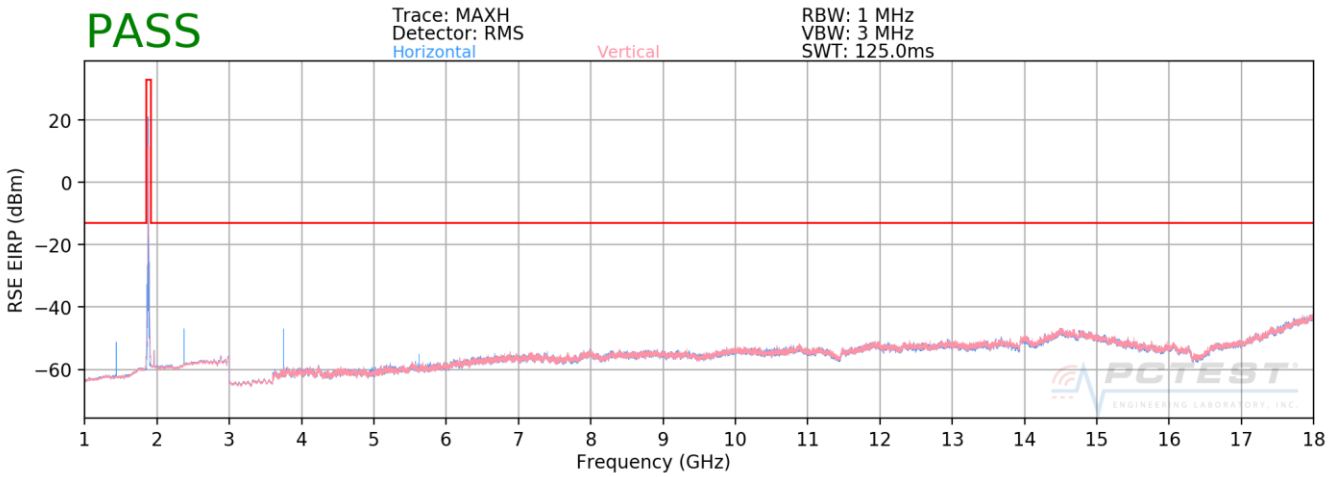
Band 25/2



Plot 7-168. Radiated Spurious Plot above 1GHz (Band 25/2)

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	150	324	-51.43	6.78	-44.66	-31.7
5572.50	H	150	24	-46.48	8.44	-38.04	-25.0
7430.00	H	-	-	-54.21	8.31	-45.89	-32.9

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

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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	150	342	-52.49	6.84	-45.65	-32.6
5640.00	H	150	271	-47.56	8.52	-39.05	-26.0
7520.00	H	-	-	-54.54	8.44	-46.10	-33.1

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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3805.00	H	150	241	-51.31	6.95	-44.36	-31.4
5707.50	H	150	358	-47.40	8.57	-38.82	-25.8
7610.00	H	-	-	-55.38	8.52	-46.86	-33.9

Table 7-18. Radiated Spurious Data (Band 25/2 – High Channel)

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7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

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

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

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

None

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Band 12 Frequency Stability Measurements

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)	707,499,913	-87	-0.0000123
100 %		- 30	707,499,931	-69	-0.0000098
100 %		- 20	707,499,851	-149	-0.0000211
100 %		- 10	707,500,102	102	0.0000144
100 %		0	707,500,010	10	0.0000014
100 %		+ 10	707,499,890	-110	-0.0000155
100 %		+ 20	707,499,925	-75	-0.0000106
100 %		+ 30	707,500,101	101	0.0000143
100 %		+ 40	707,499,996	-4	-0.0000006
100 %		+ 50	707,500,100	100	0.0000141
BATT. ENDPOINT	3.40	+ 20	707,499,958	-42	-0.0000059

Table 7-19. Frequency Stability Data (Band 12)

Note:

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

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Band 12 Frequency Stability Measurements

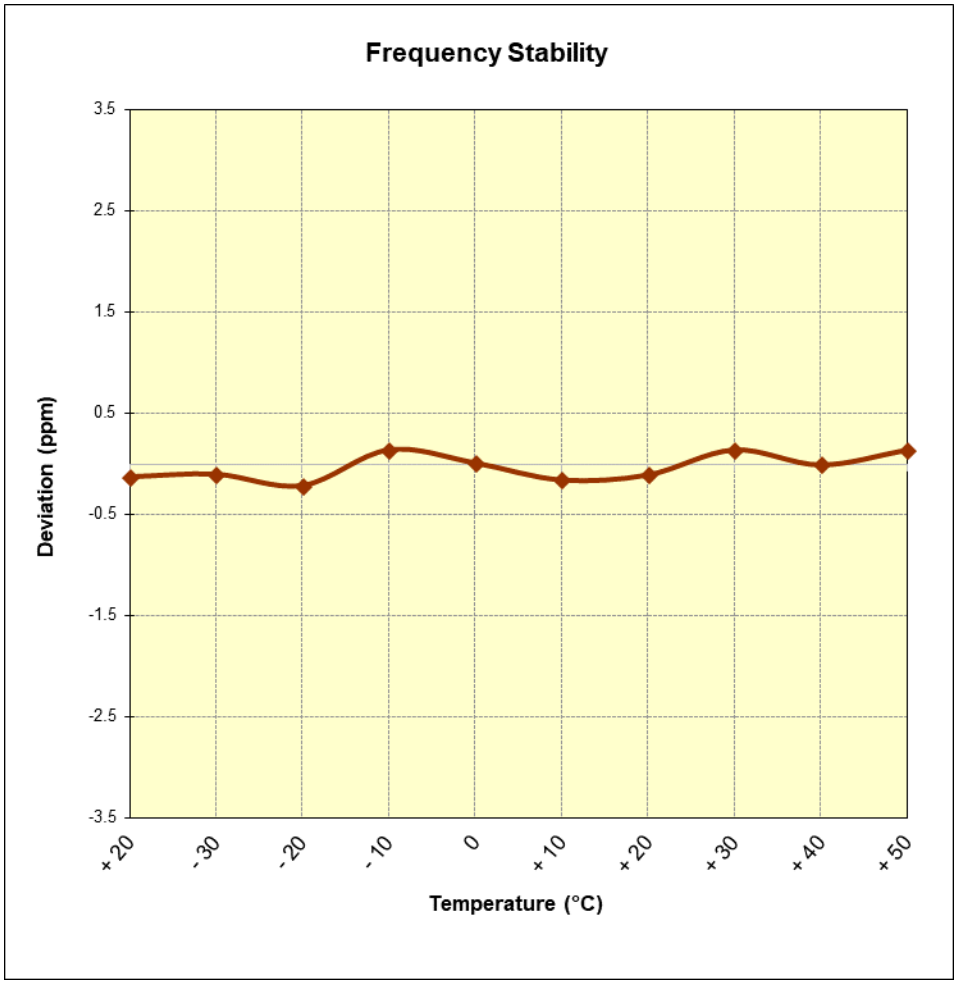

Figure 7-8. Frequency Stability Graph (Band 12)

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Band 5 Frequency Stability Measurements

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)	836,500,039	39	0.0000047
100 %		- 30	836,500,111	111	0.0000133
100 %		- 20	836,500,025	25	0.0000030
100 %		- 10	836,499,919	-81	-0.0000097
100 %		0	836,500,084	84	0.0000100
100 %		+ 10	836,500,092	92	0.0000110
100 %		+ 20	836,499,968	-32	-0.0000038
100 %		+ 30	836,500,067	67	0.0000080
100 %		+ 40	836,500,143	143	0.0000171
100 %		+ 50	836,500,103	103	0.0000123
BATT. ENDPOINT	3.40	+ 20	836,499,970	-30	-0.0000036

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

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Band 5 Frequency Stability Measurements

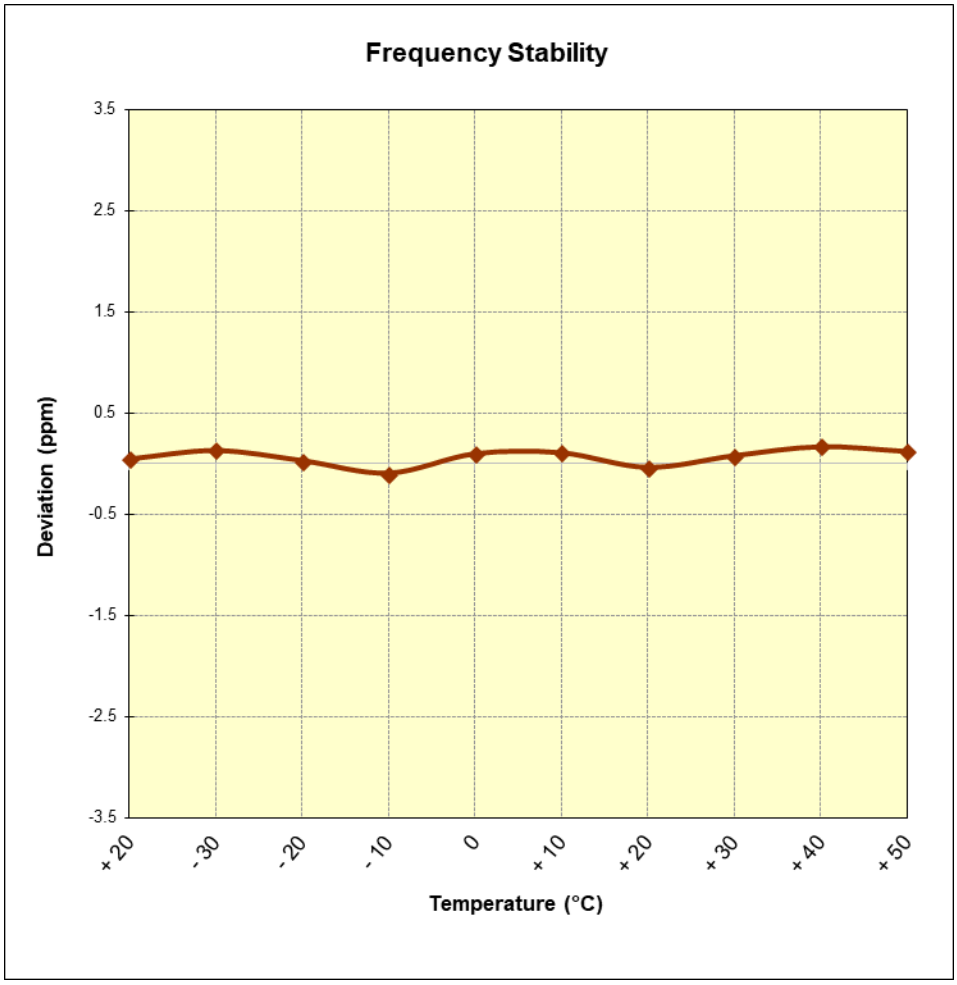

Figure 7-9. Frequency Stability Graph (Band 5)

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Band 4 Frequency Stability Measurements

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)	1,732,500,085	85	0.0000049
100 %		- 30	1,732,500,094	94	0.0000054
100 %		- 20	1,732,499,901	-99	-0.0000057
100 %		- 10	1,732,500,060	60	0.0000035
100 %		0	1,732,500,003	3	0.0000002
100 %		+ 10	1,732,500,112	112	0.0000065
100 %		+ 20	1,732,500,085	85	0.0000049
100 %		+ 30	1,732,499,909	-91	-0.0000053
100 %		+ 40	1,732,499,925	-75	-0.0000043
100 %		+ 50	1,732,500,031	31	0.0000018
BATT. ENDPOINT	3.40	+ 20	1,732,499,893	-107	-0.0000062

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.

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Band 4 Frequency Stability Measurements

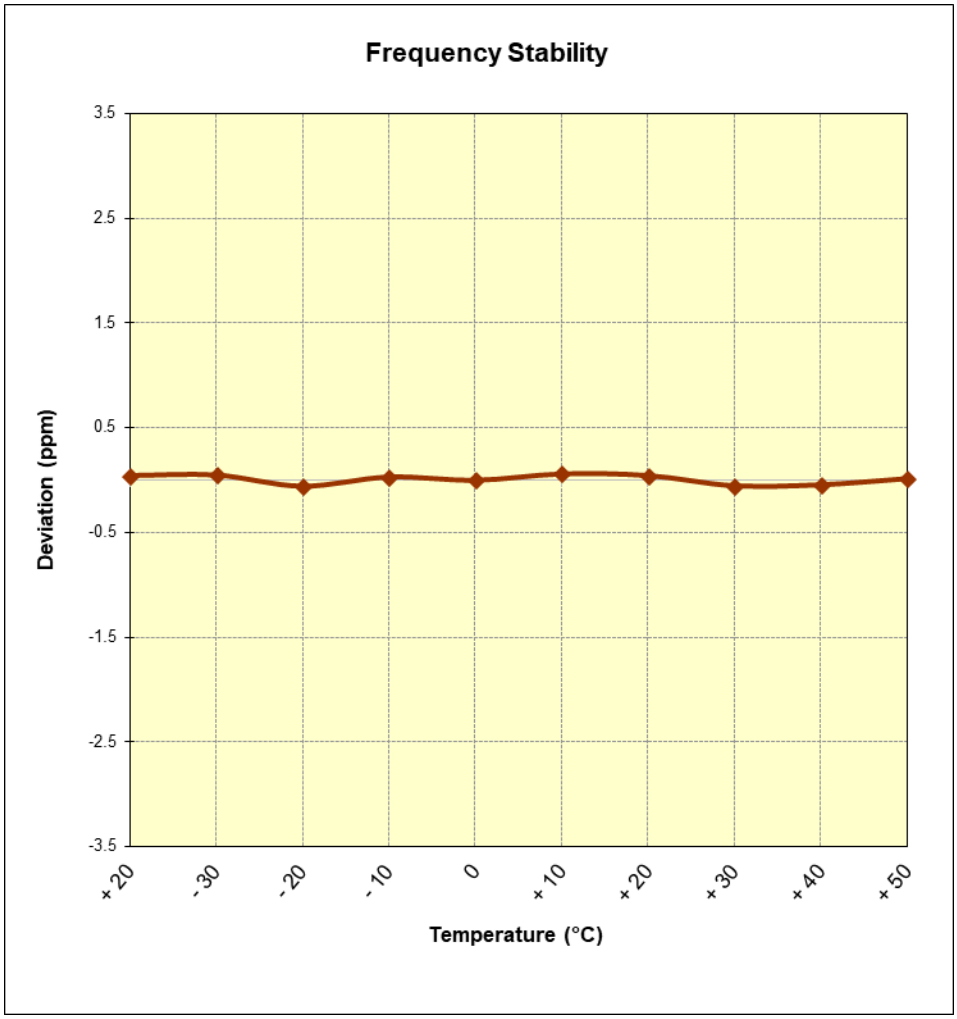

Figure 7-10. Frequency Stability Graph (Band 4)

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Band 25/2 Frequency Stability Measurements

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 18900

REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,879,999,917	-83	-0.0000044
100 %		- 30	1,880,000,131	131	0.0000070
100 %		- 20	1,879,999,918	-82	-0.0000044
100 %		- 10	1,880,000,136	136	0.0000072
100 %		0	1,879,999,878	-122	-0.0000065
100 %		+ 10	1,879,999,960	-40	-0.0000021
100 %		+ 20	1,879,999,961	-39	-0.0000021
100 %		+ 30	1,879,999,963	-37	-0.0000020
100 %		+ 40	1,880,000,124	124	0.0000066
100 %		+ 50	1,879,999,935	-65	-0.0000035
BATT. ENDPOINT	3.40	+ 20	1,880,000,062	62	0.0000033

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

Note:

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

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Band 25/2 Frequency Stability Measurements

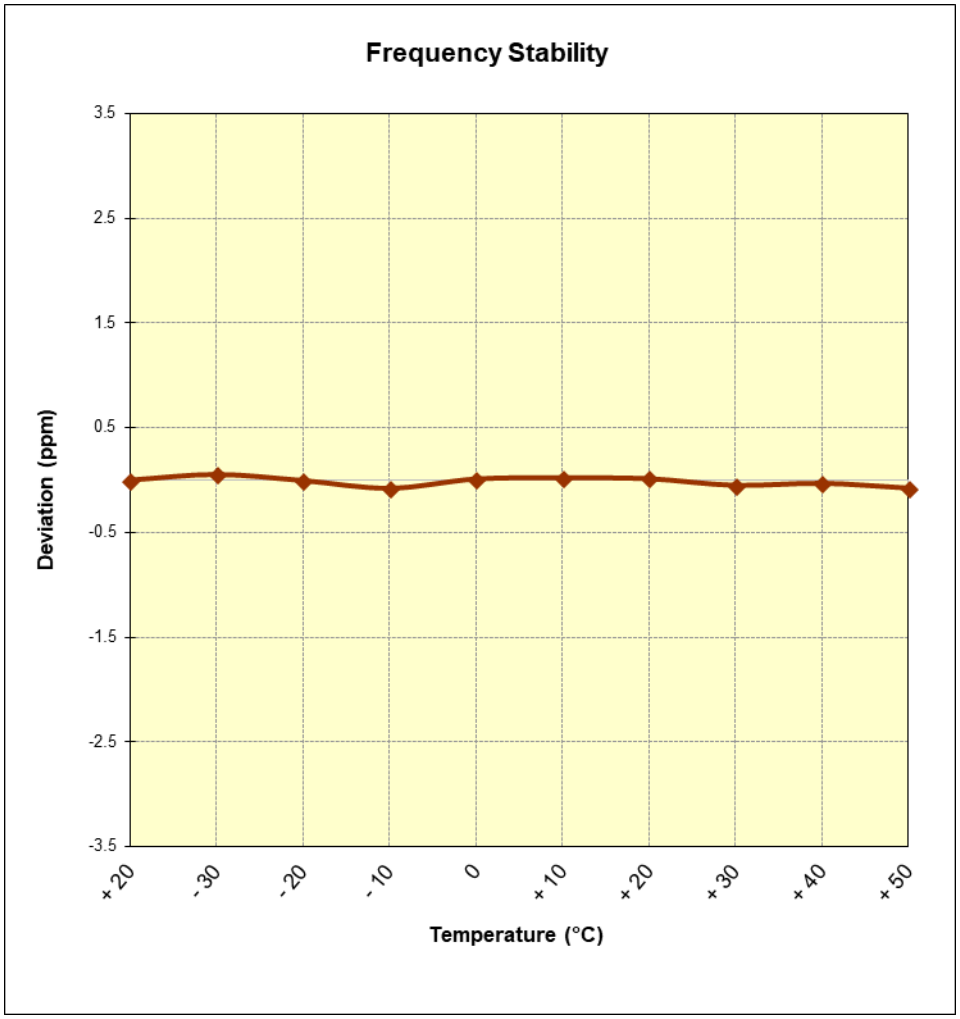

Figure 7-11. Frequency Stability Graph (Band 25/2)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMJ337R4** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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