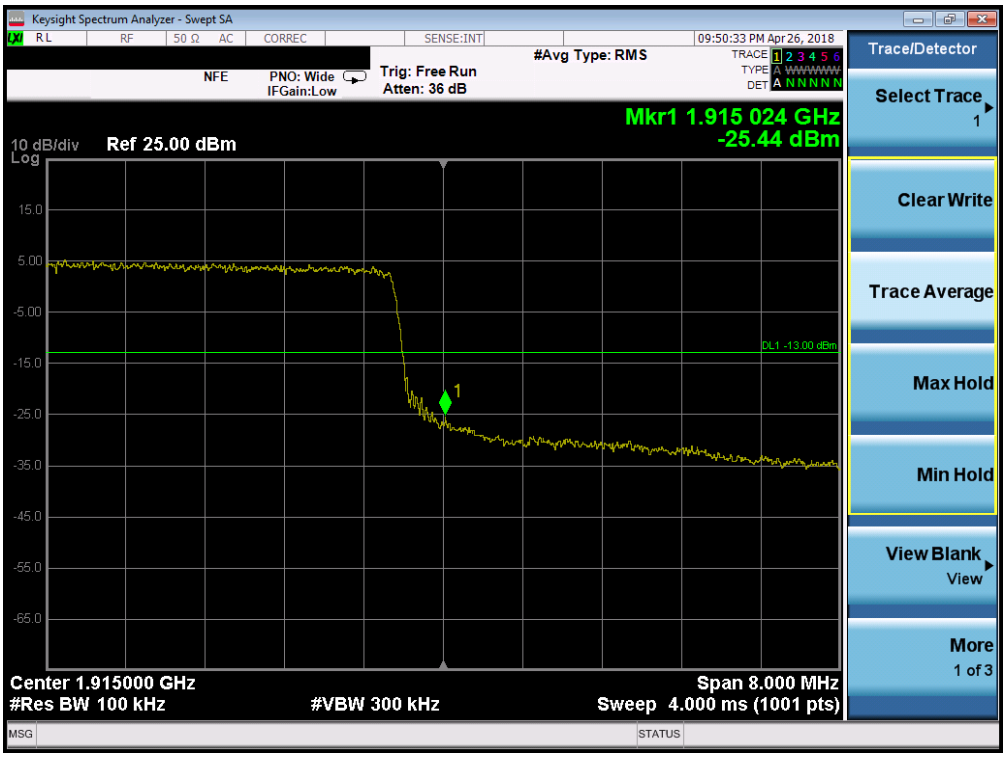
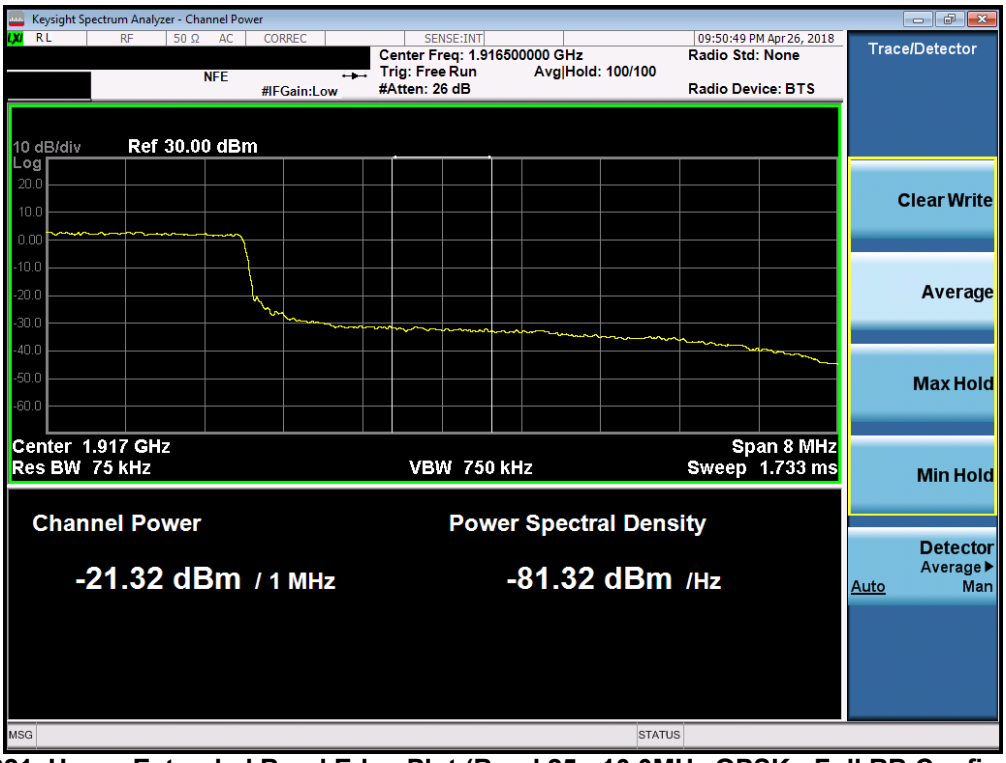
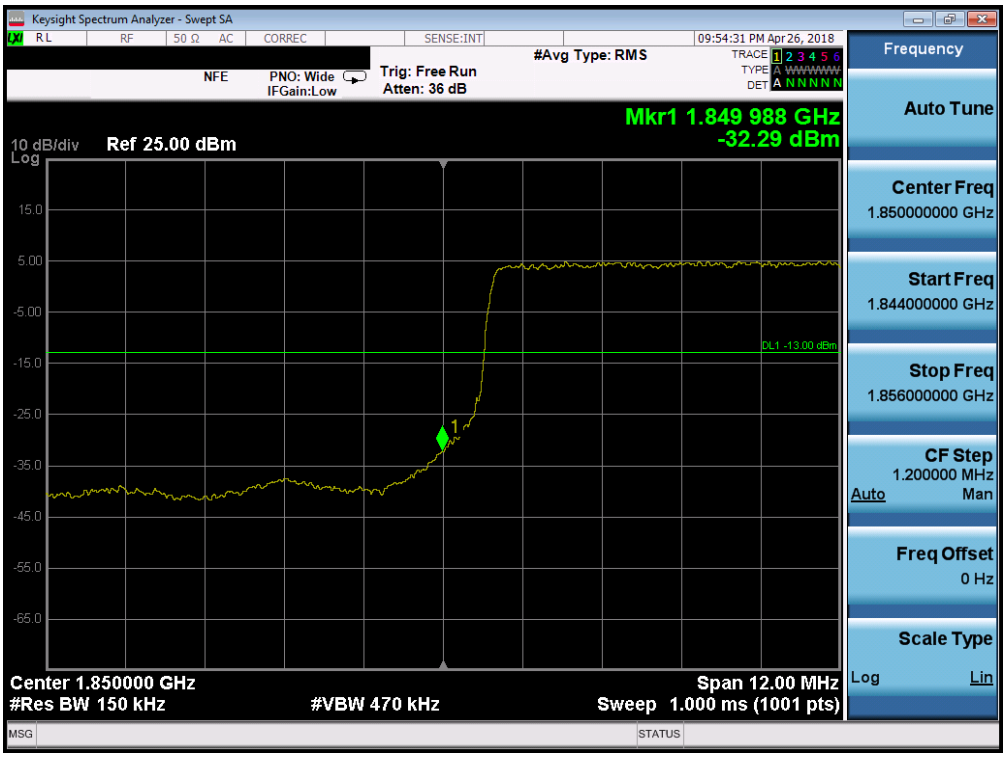


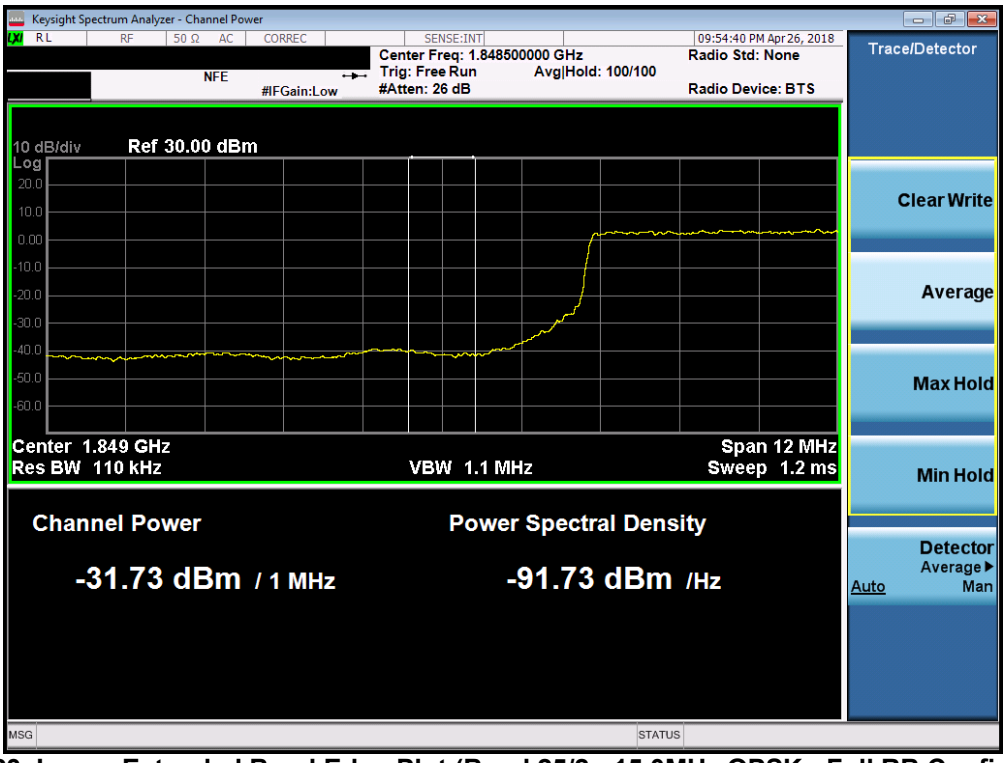
Plot 7-220. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



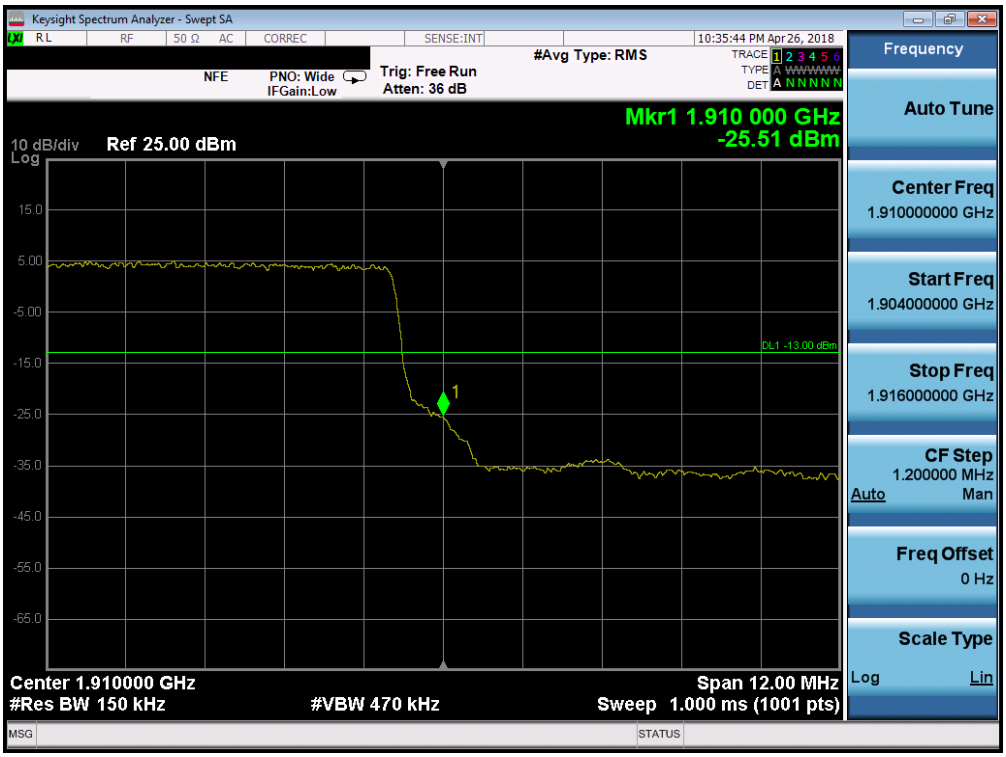
Plot 7-221. Upper Extended Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



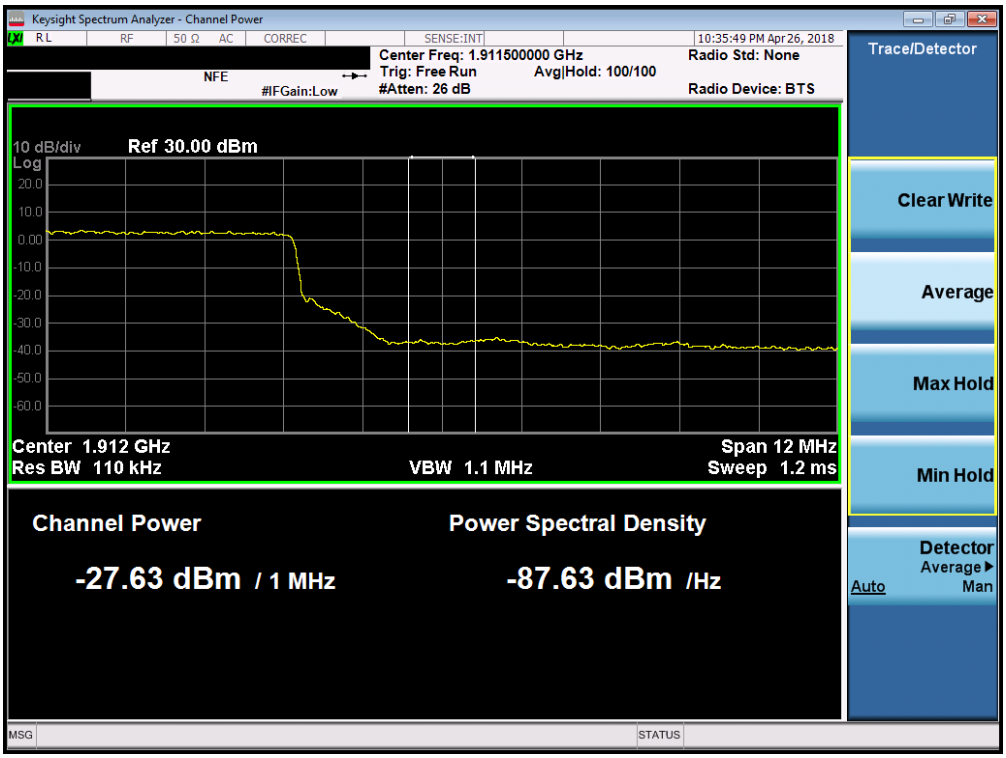
Plot 7-222. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-223. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

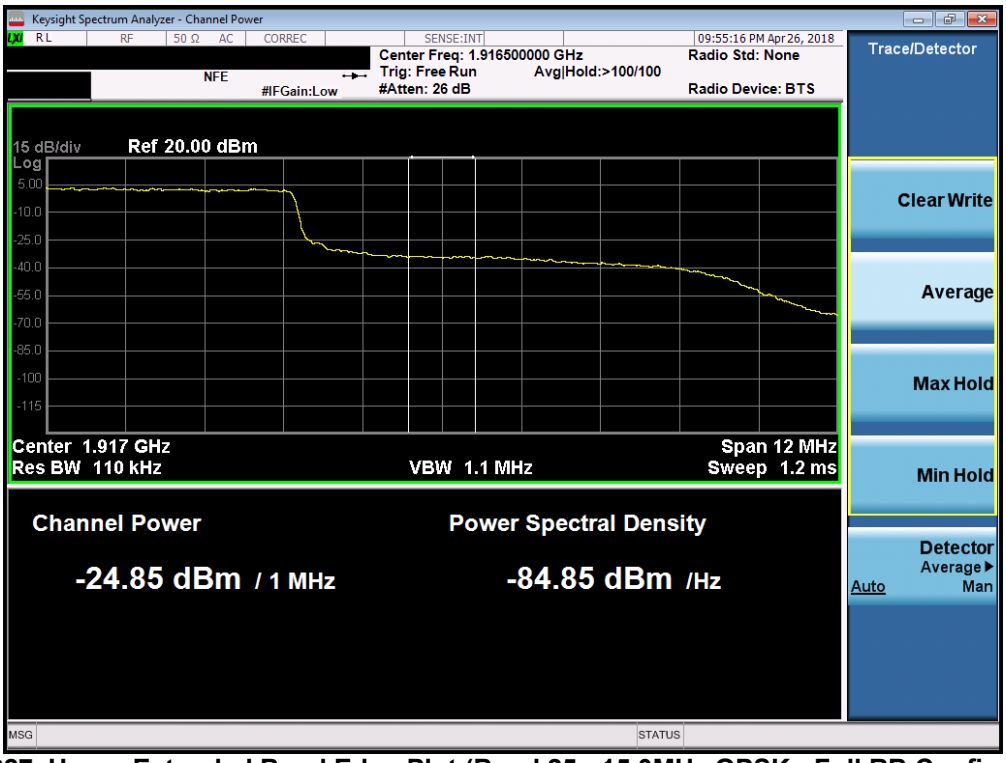


Plot 7-224. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

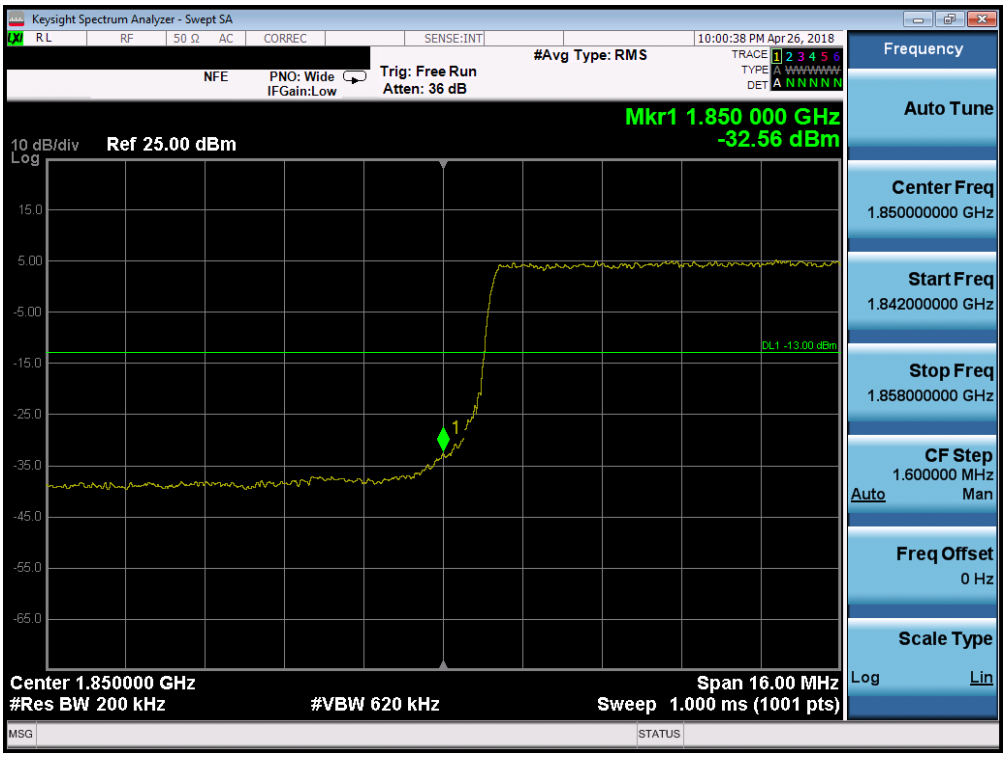


Plot 7-225. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

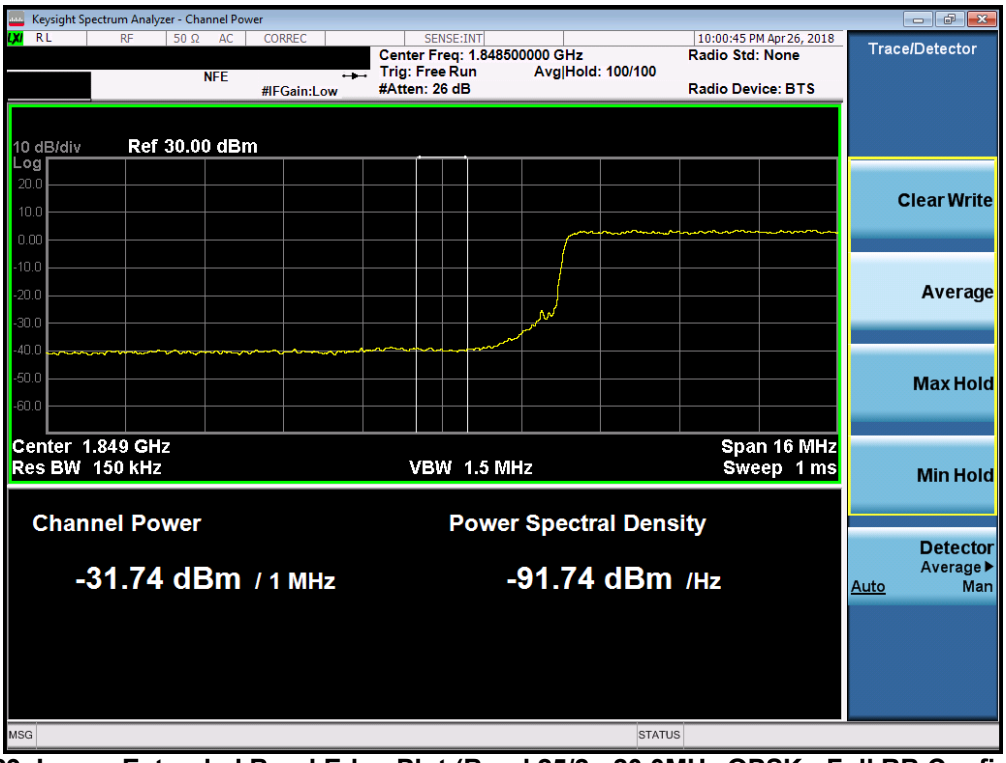
Plot 7-226. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



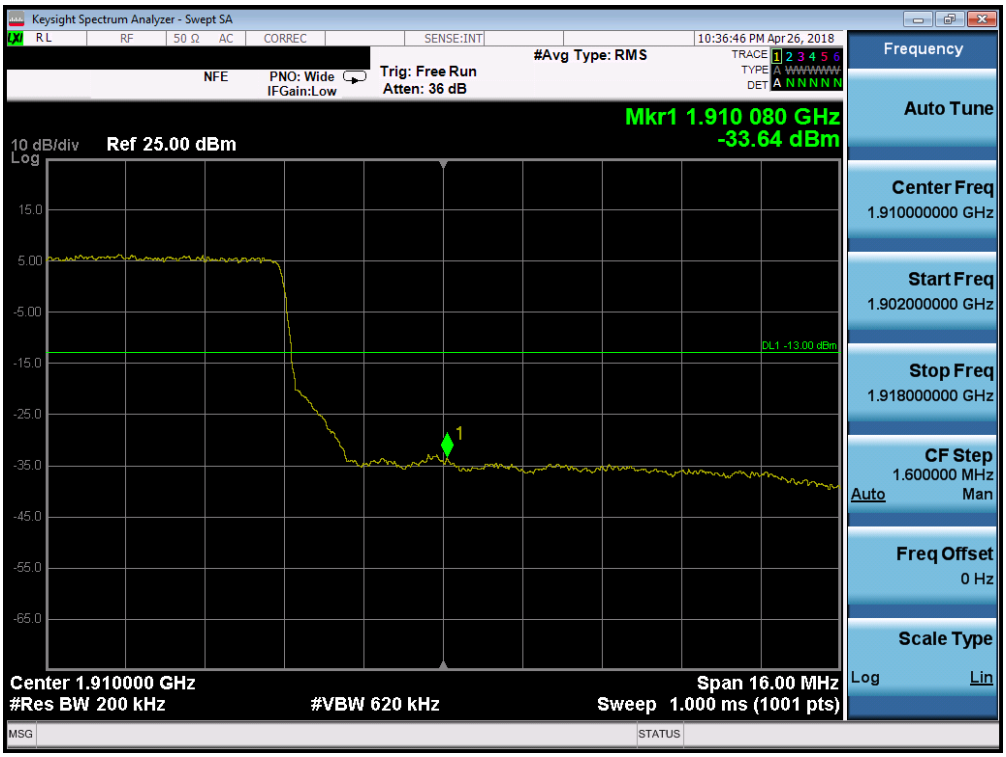
Plot 7-227. Upper Extended Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



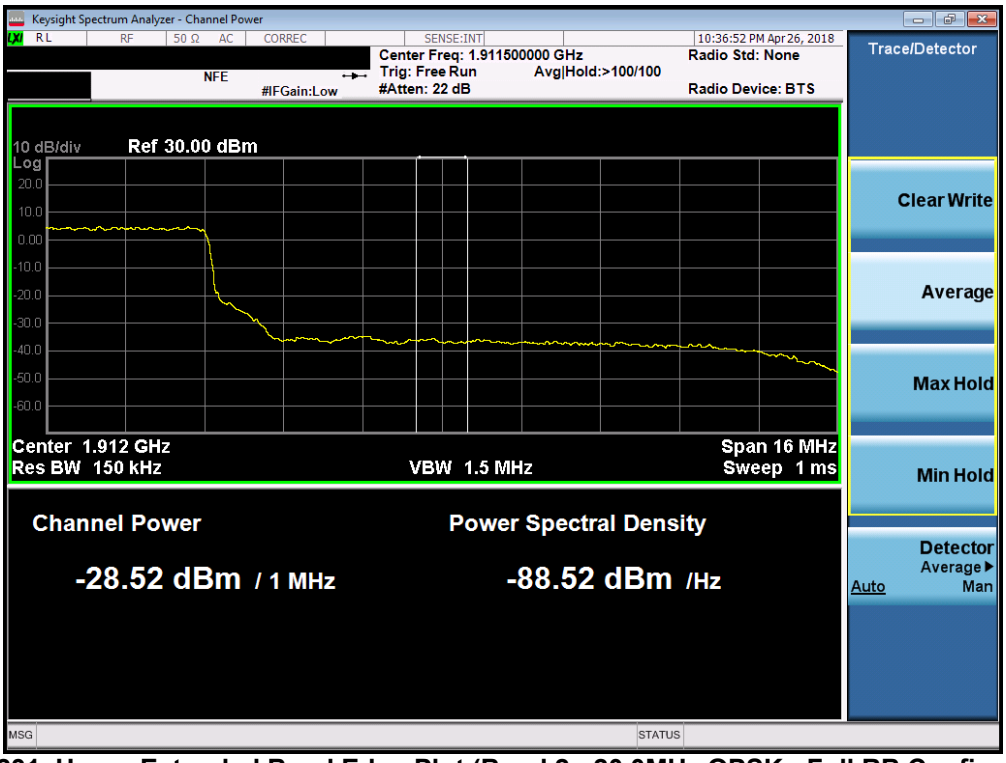
Plot 7-228. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-229. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

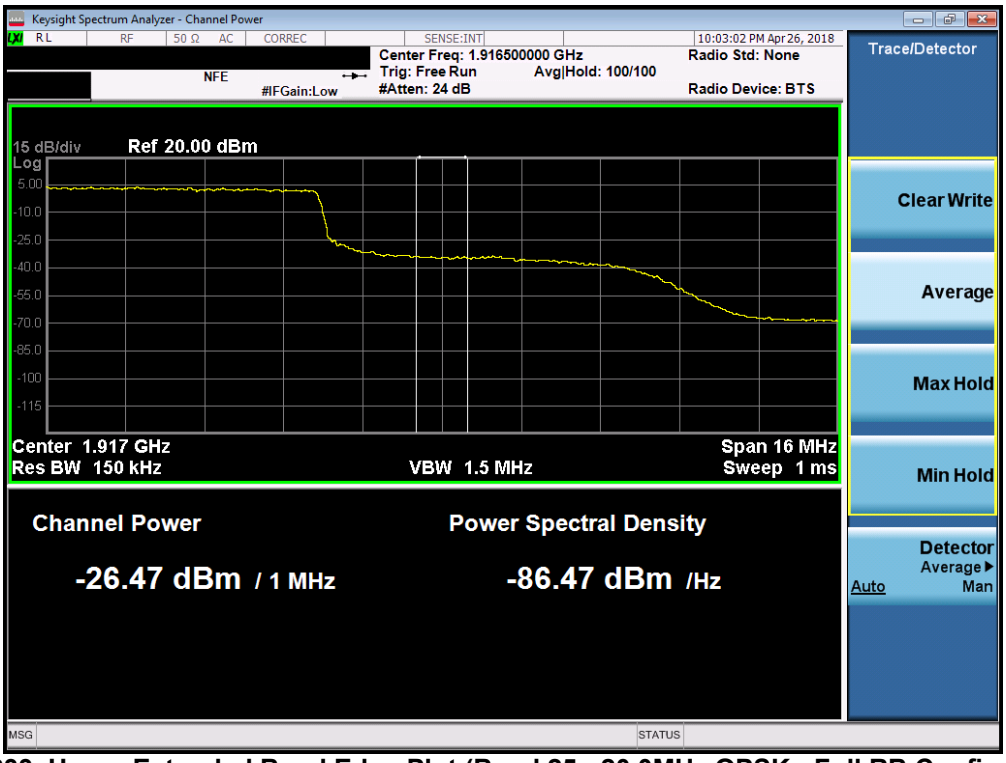


Plot 7-230. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



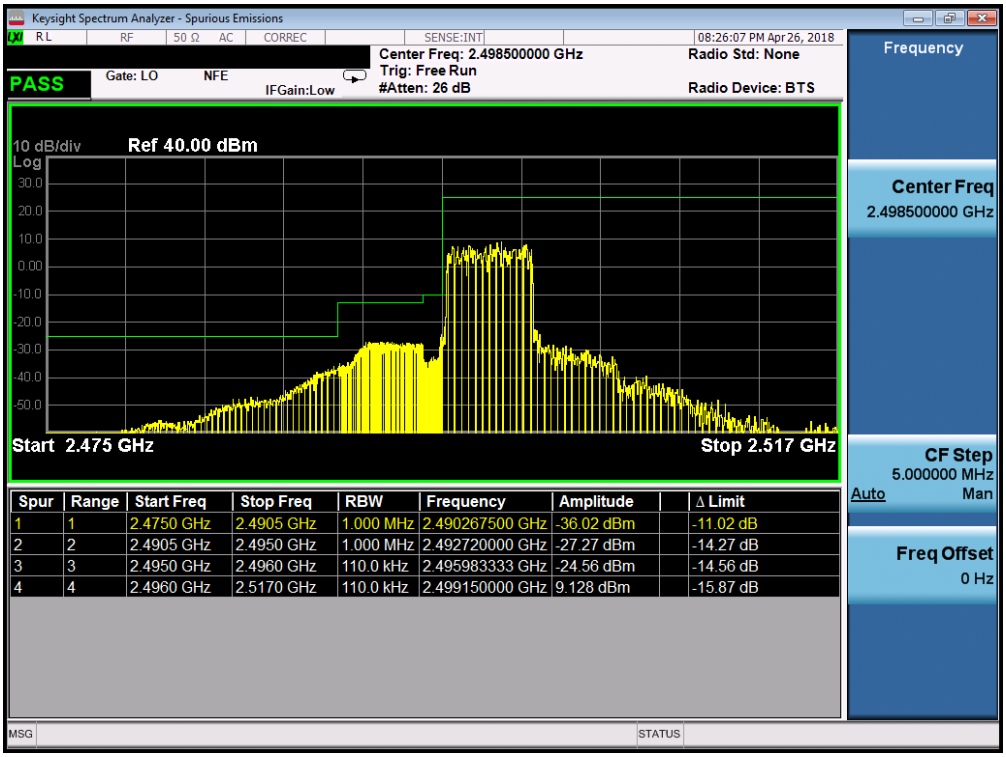
Plot 7-231. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

Plot 7-232. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



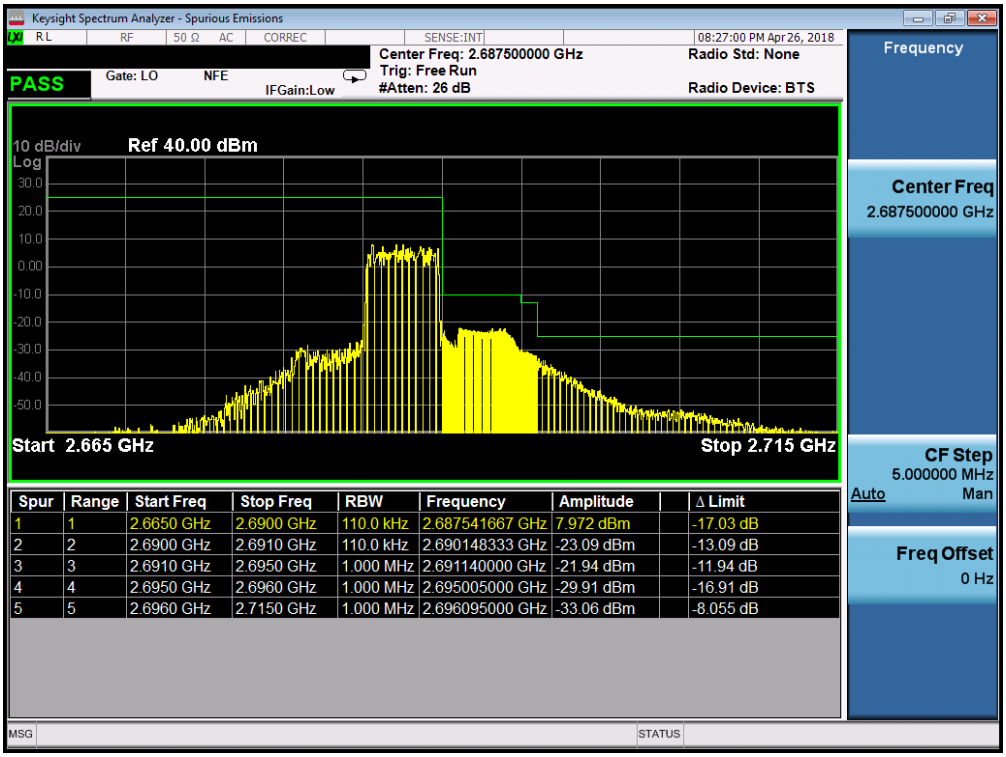
Plot 7-233. Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

Band 41



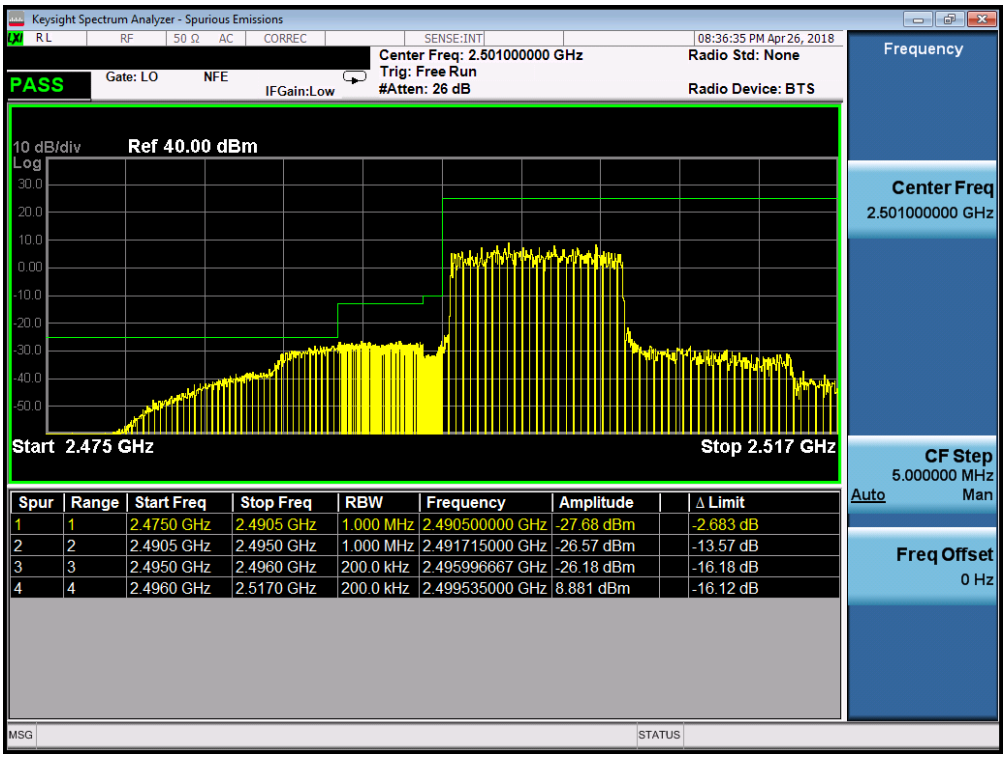
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490267500 GHz	-36.02 dBm	-11.02 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.492720000 GHz	-27.27 dBm	-14.27 dB
3	3	2.4950 GHz	2.4960 GHz	110.0 kHz	2.495983333 GHz	-24.56 dBm	-14.56 dB
4	4	2.4960 GHz	2.5170 GHz	110.0 kHz	2.499150000 GHz	9.128 dBm	-15.87 dB

Plot 7-234. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - RB Size 25)

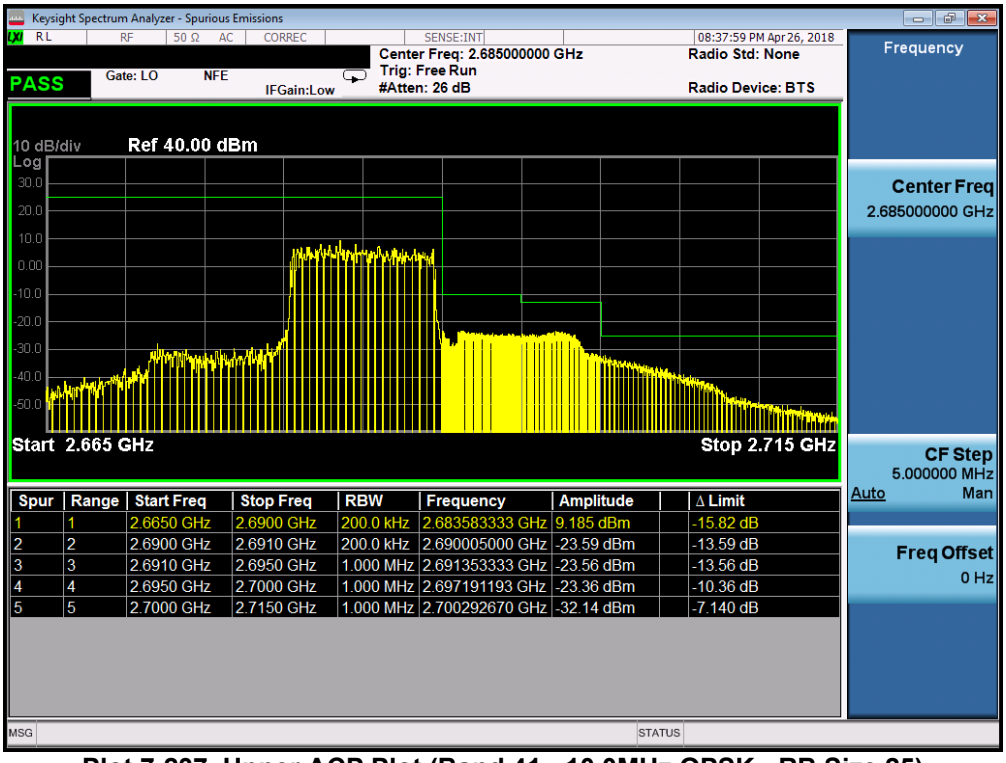


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	110.0 kHz	2.687541667 GHz	7.972 dBm	-17.03 dB
2	2	2.6900 GHz	2.6910 GHz	110.0 kHz	2.690148333 GHz	-23.09 dBm	-13.09 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691140000 GHz	-21.94 dBm	-11.94 dB
4	4	2.6950 GHz	2.6960 GHz	1.000 MHz	2.695005000 GHz	-29.91 dBm	-16.91 dB
5	5	2.6960 GHz	2.7150 GHz	1.000 MHz	2.696095000 GHz	-33.06 dBm	-8.055 dB

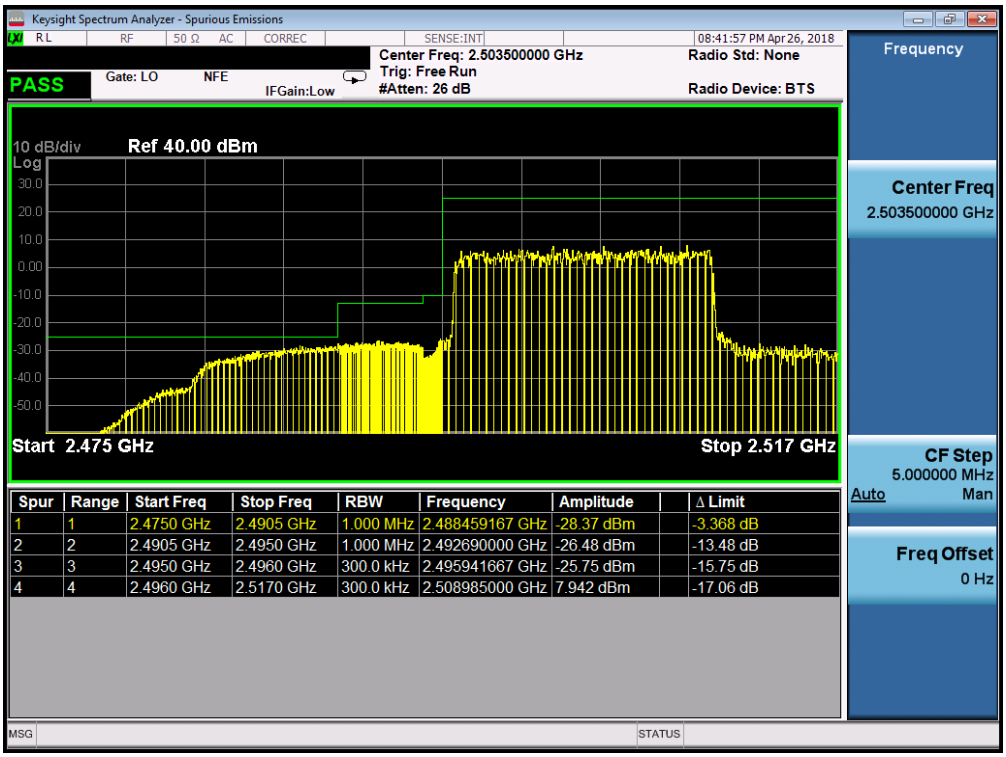
Plot 7-235. Upper ACP Plot (Band 41 - 5.0MHz QPSK - RB Size 25)



Plot 7-236. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - RB Size 25)

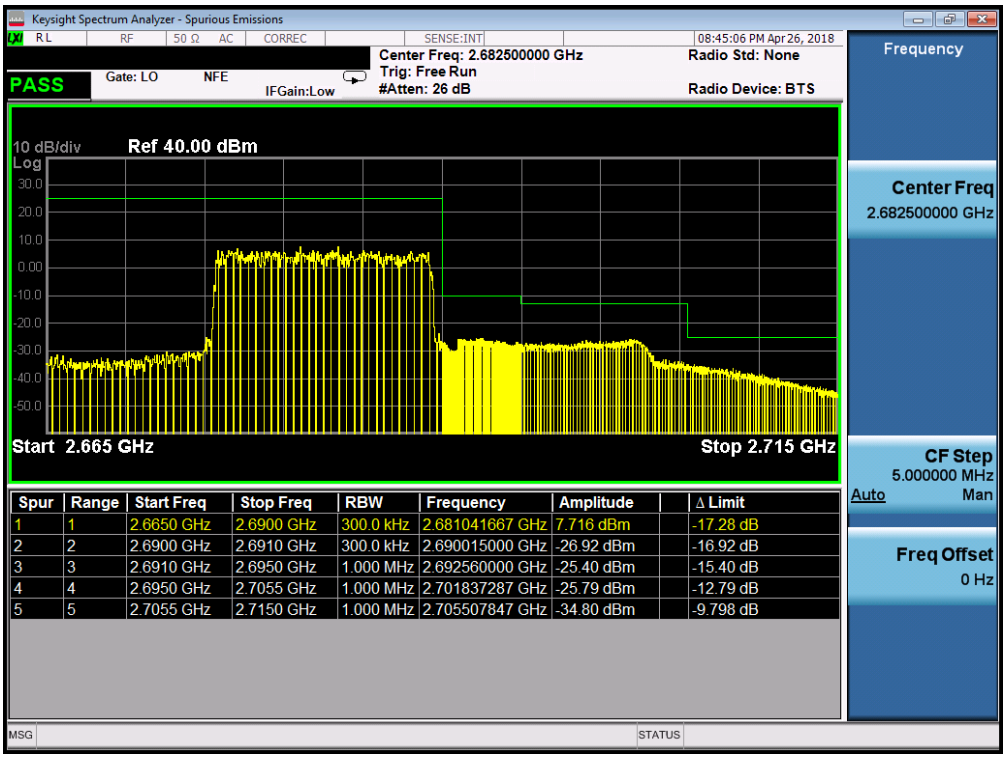


Plot 7-237. Upper ACP Plot (Band 41 - 10.0MHz QPSK - RB Size 25)



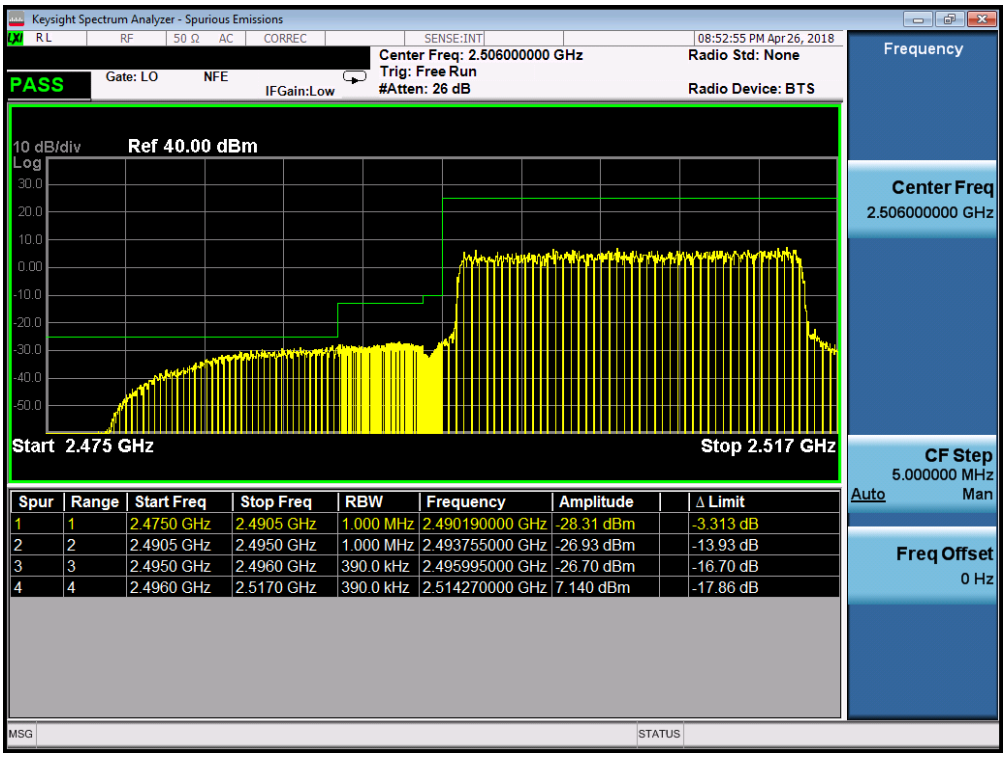
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.488459167 GHz	-28.37 dBm	-3.368 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.492690000 GHz	-26.48 dBm	-13.48 dB
3	3	2.4950 GHz	2.4960 GHz	300.0 kHz	2.495941667 GHz	-25.75 dBm	-15.75 dB
4	4	2.4960 GHz	2.5170 GHz	300.0 kHz	2.508985000 GHz	7.942 dBm	-17.06 dB

Plot 7-238. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - RB Size 25)



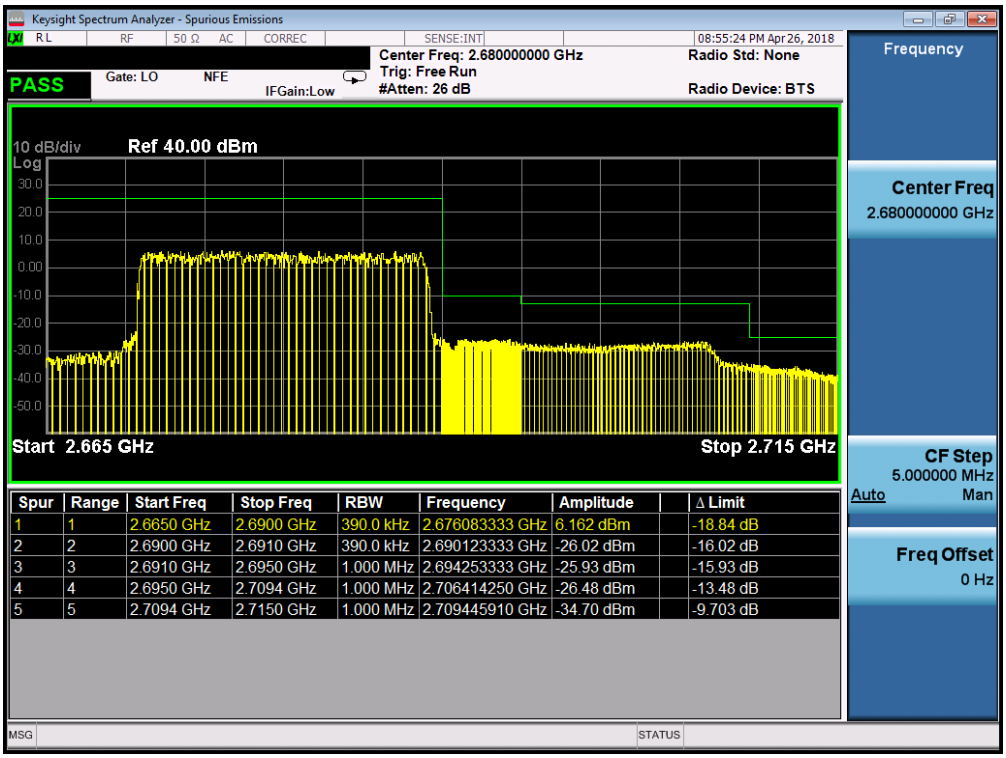
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	300.0 kHz	2.681041667 GHz	7.716 dBm	-17.28 dB
2	2	2.6900 GHz	2.6910 GHz	300.0 kHz	2.690015000 GHz	-26.92 dBm	-16.92 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692560000 GHz	-25.40 dBm	-15.40 dB
4	4	2.6950 GHz	2.7055 GHz	1.000 MHz	2.701837287 GHz	-25.79 dBm	-12.79 dB
5	5	2.7055 GHz	2.7150 GHz	1.000 MHz	2.705507847 GHz	-34.80 dBm	-9.798 dB

Plot 7-239. Upper ACP Plot (Band 41 - 15.0MHz QPSK - RB Size 25)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490190000 GHz	-28.31 dBm	-3.313 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.493755000 GHz	-26.93 dBm	-13.93 dB
3	3	2.4950 GHz	2.4960 GHz	390.0 kHz	2.495995000 GHz	-26.70 dBm	-16.70 dB
4	4	2.4960 GHz	2.5170 GHz	390.0 kHz	2.514270000 GHz	7.140 dBm	-17.86 dB

Plot 7-240. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - RB Size 25)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	390.0 kHz	2.676083333 GHz	6.162 dBm	-18.84 dB
2	2	2.6900 GHz	2.6910 GHz	390.0 kHz	2.690123333 GHz	-26.02 dBm	-16.02 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.694253333 GHz	-25.93 dBm	-15.93 dB
4	4	2.6950 GHz	2.7094 GHz	1.000 MHz	2.706414250 GHz	-26.48 dBm	-13.48 dB
5	5	2.7094 GHz	2.7150 GHz	1.000 MHz	2.709445910 GHz	-34.70 dBm	-9.703 dB

Plot 7-241. Upper ACP Plot (Band 41 - 20.0MHz QPSK - RB Size 25)

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. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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

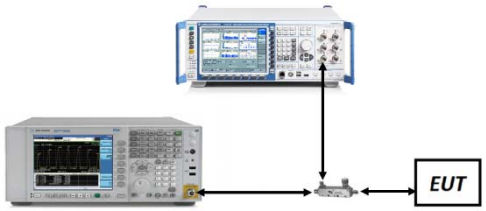
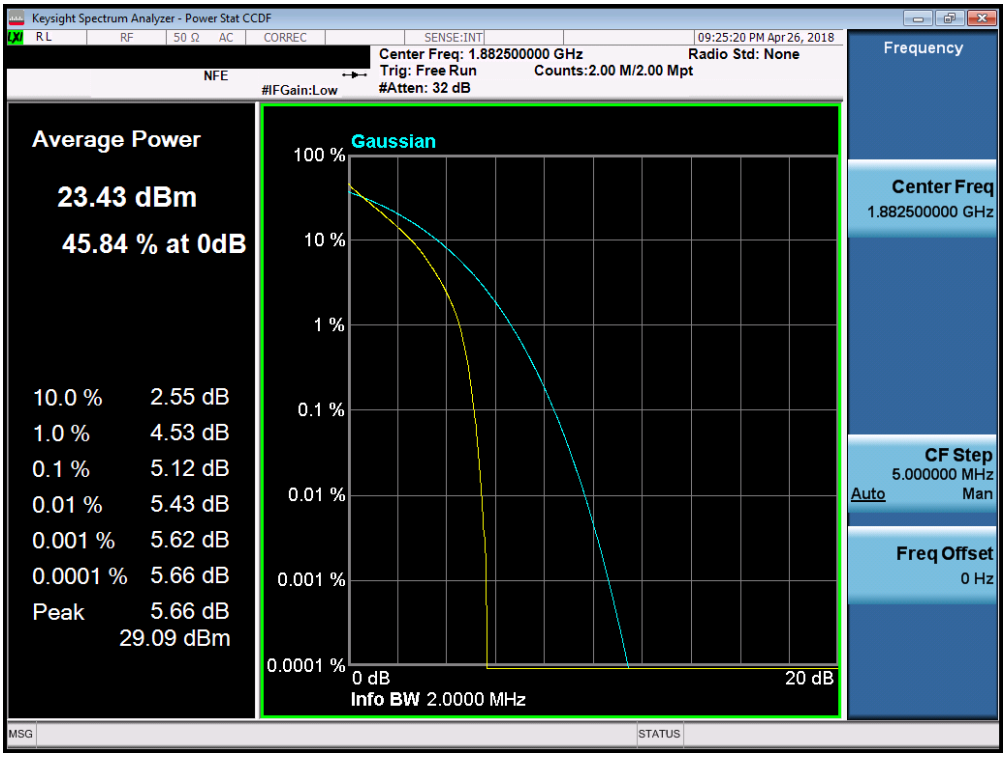


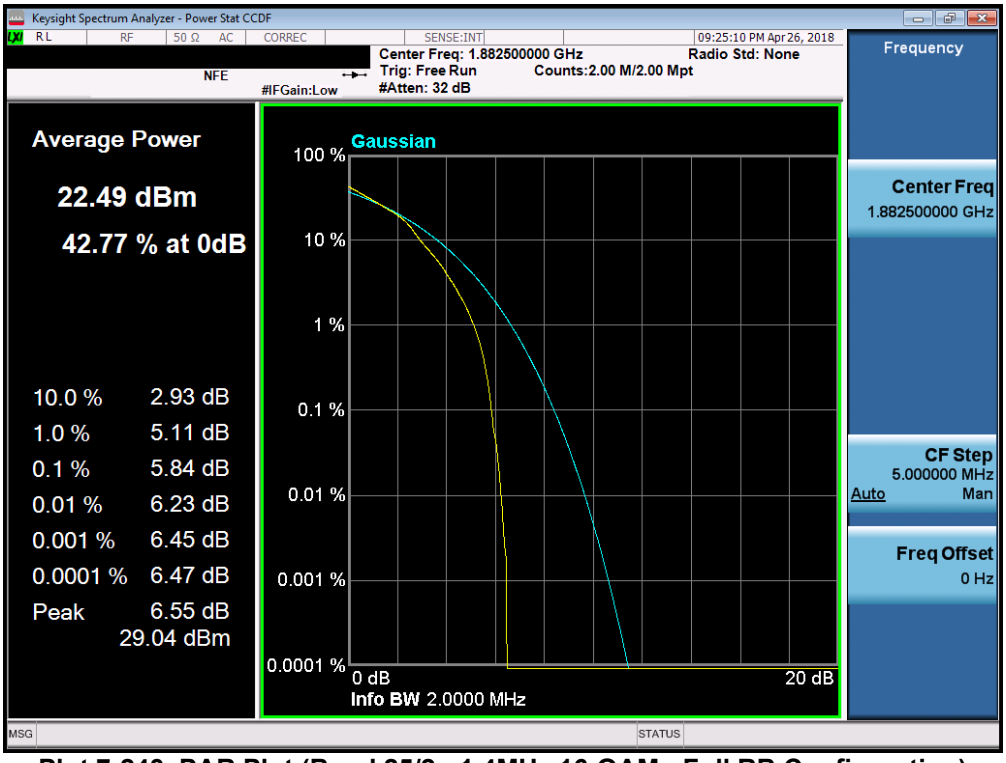
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

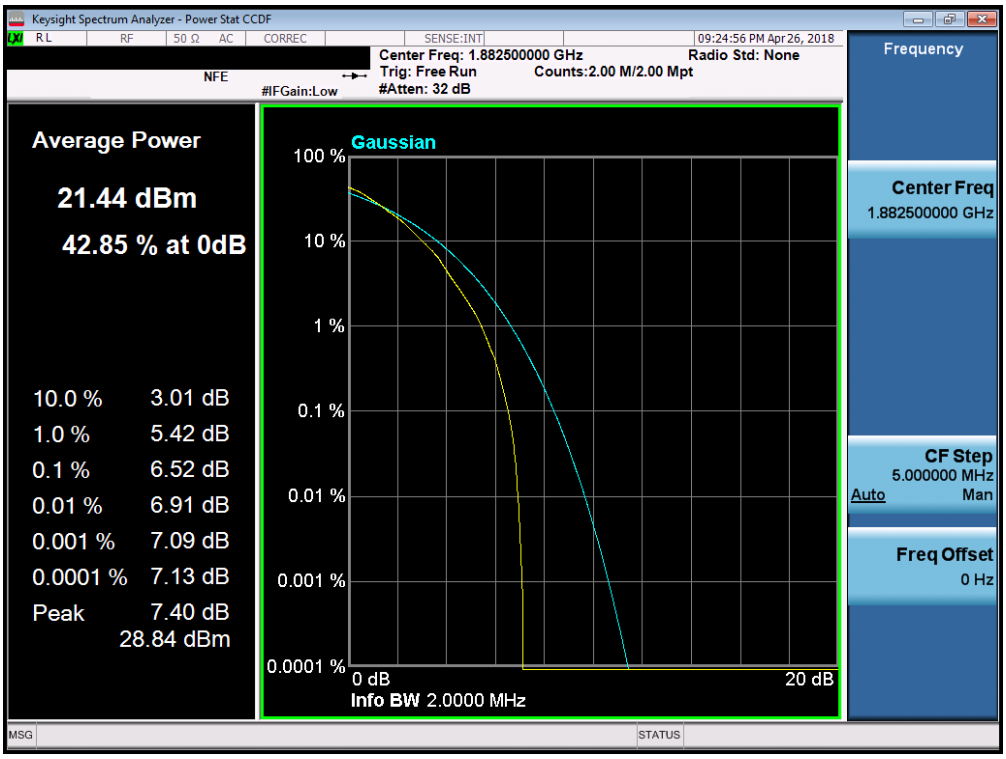
None.



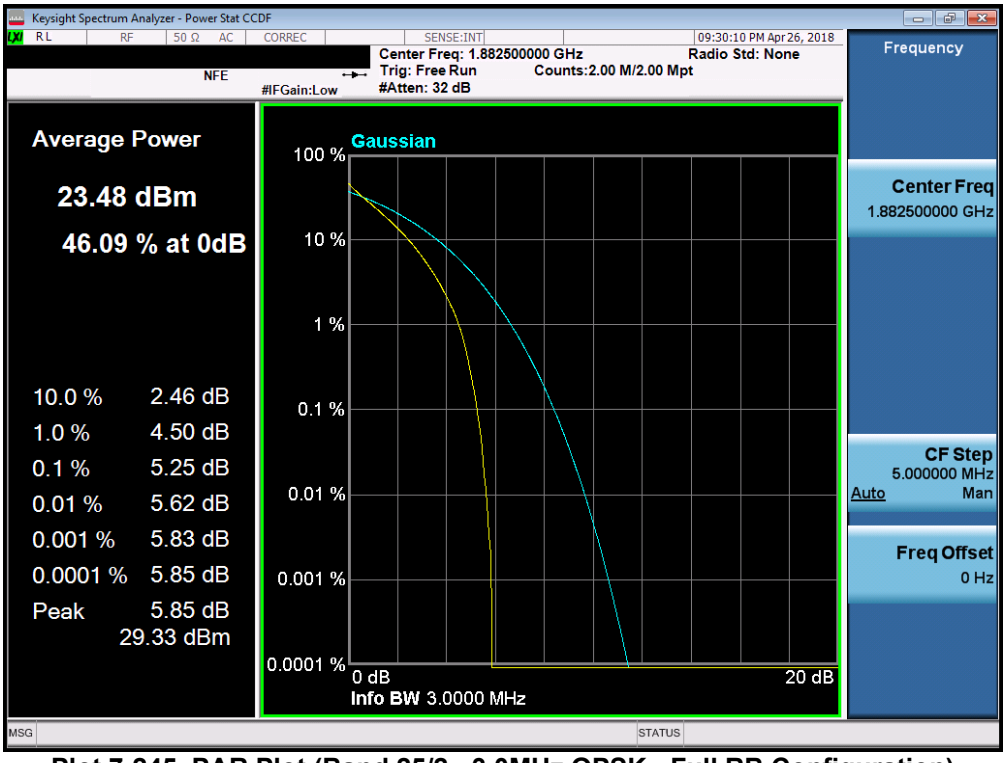
Plot 7-242. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



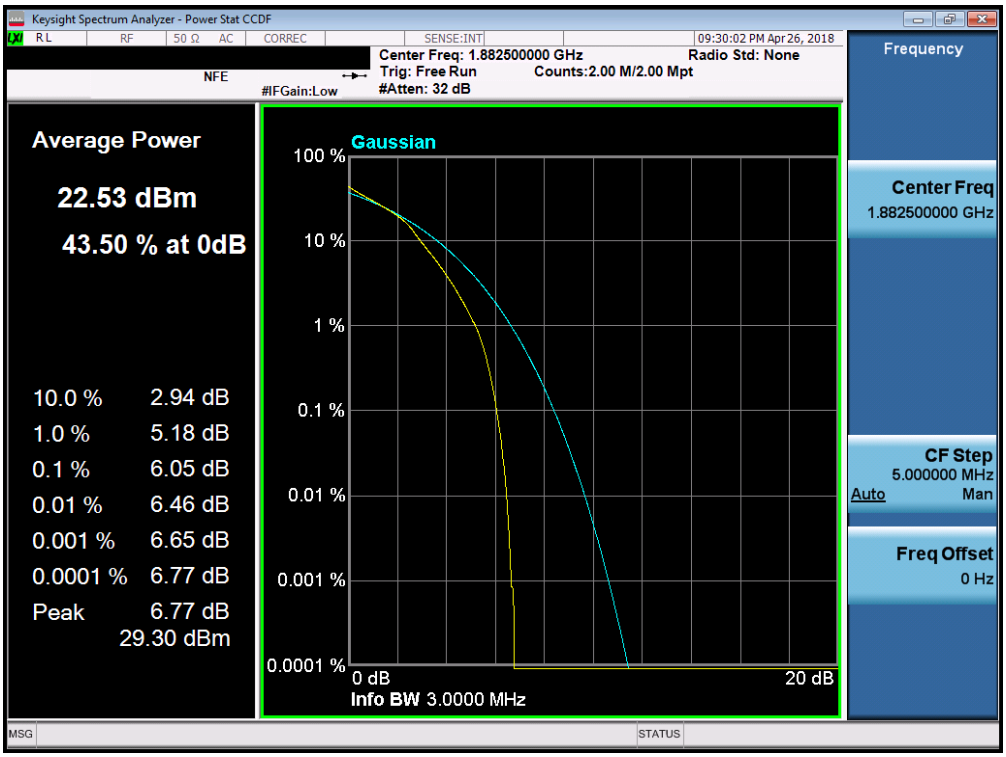
Plot 7-243. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)



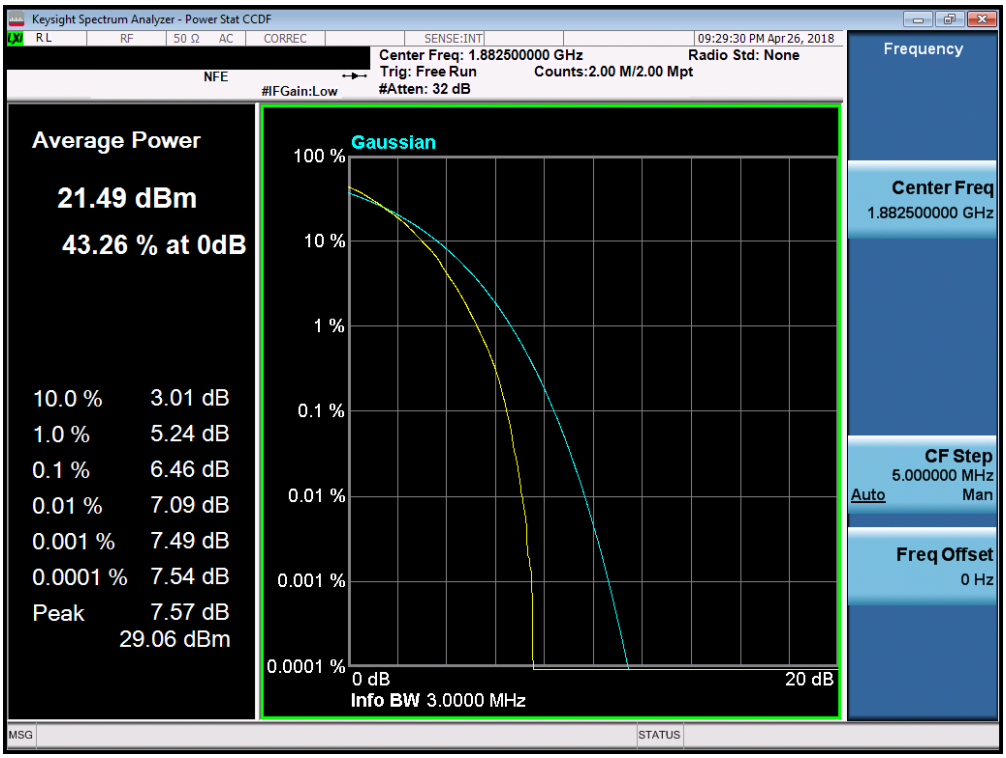
Plot 7-244. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)



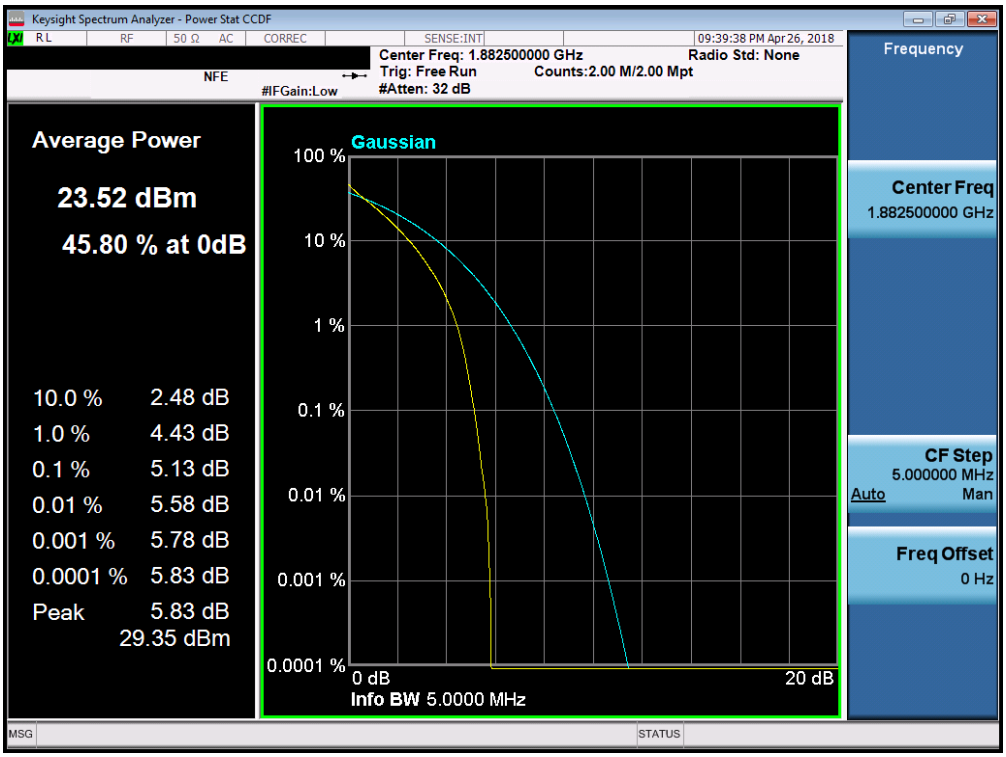
Plot 7-245. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



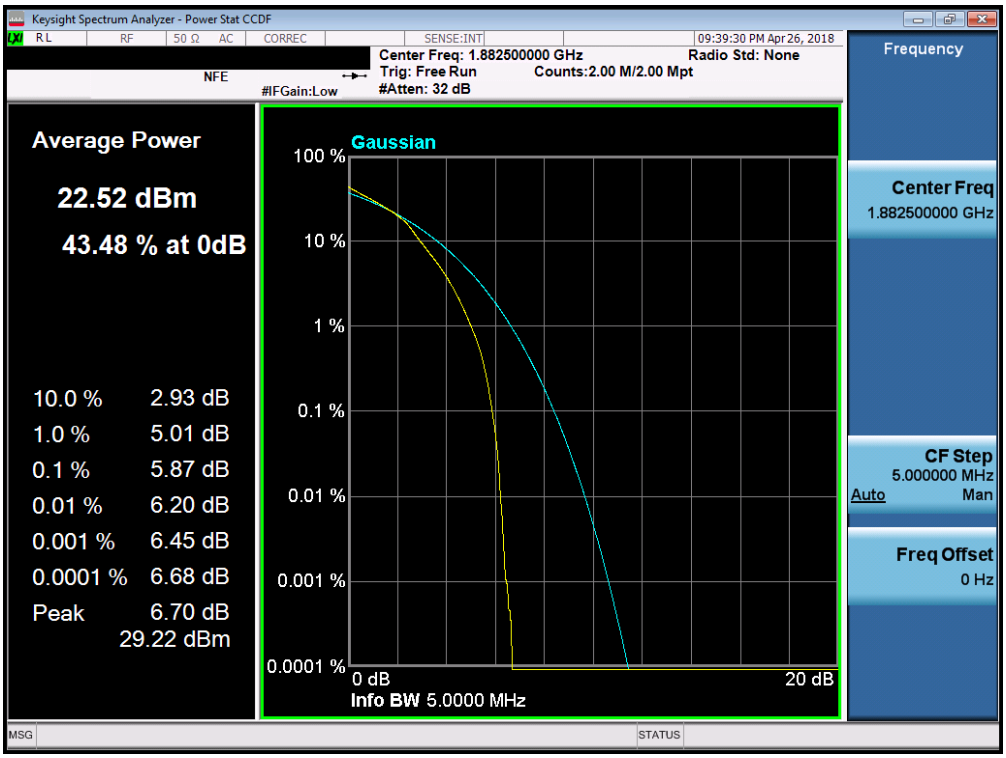
Plot 7-246. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



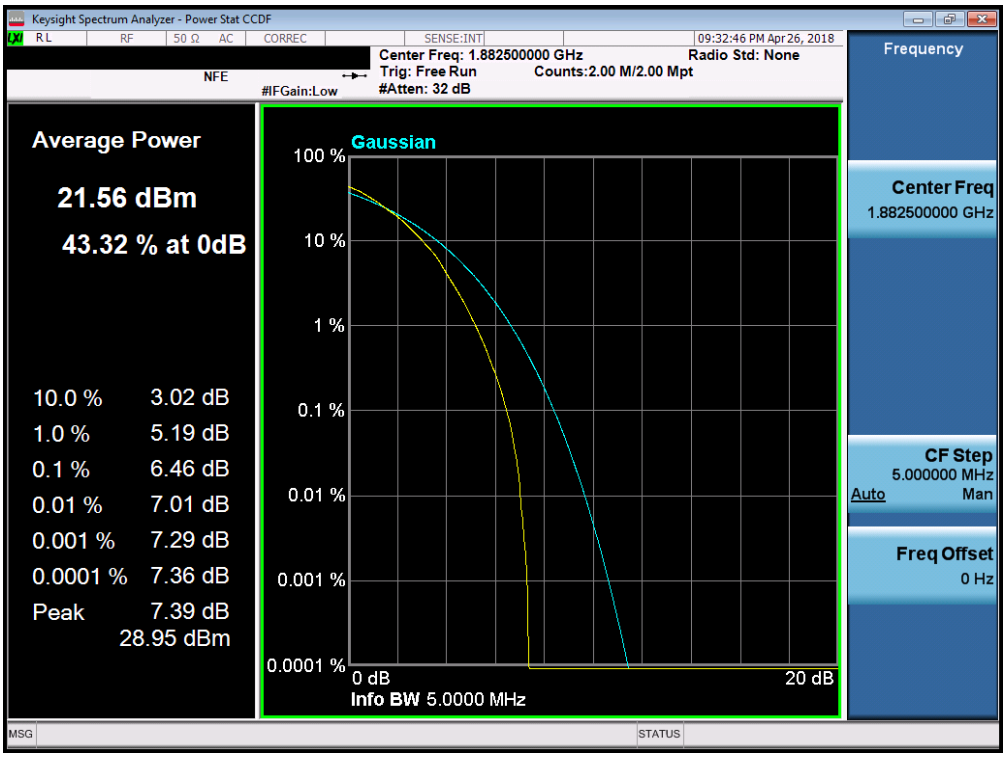
Plot 7-247. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)



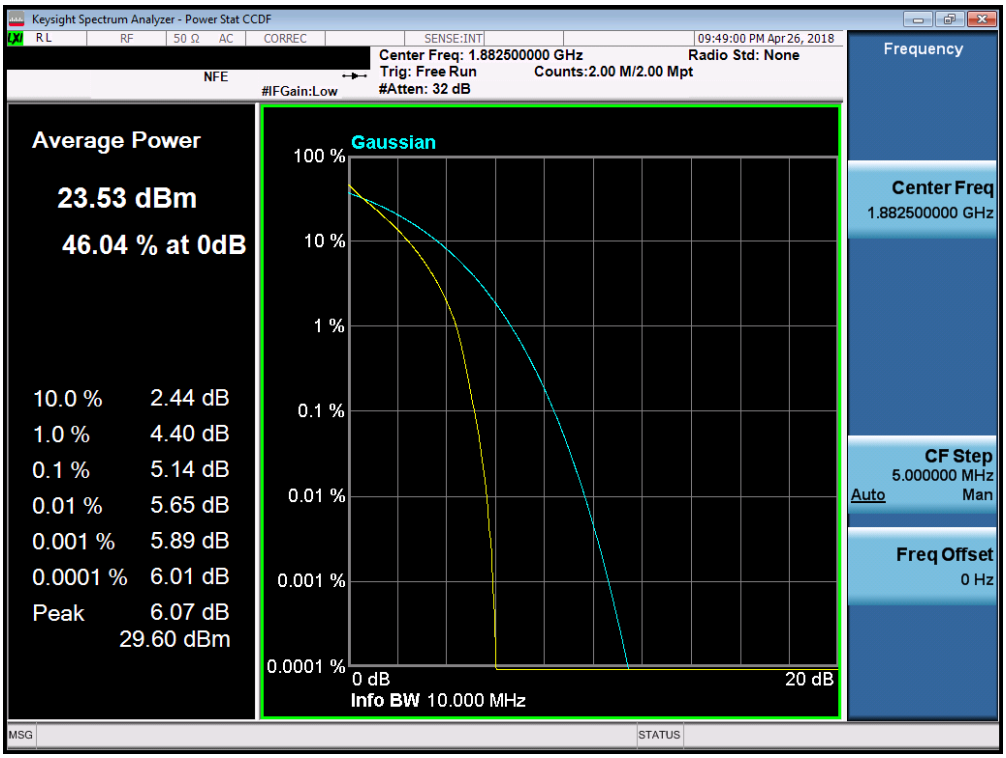
Plot 7-248. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



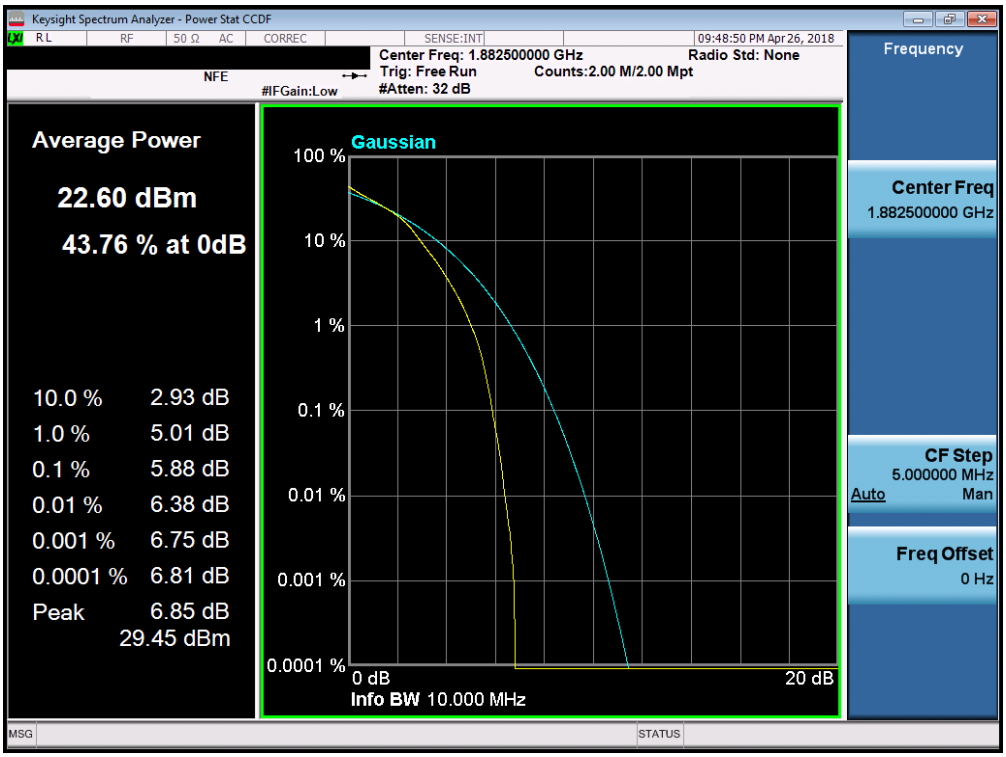
Plot 7-249. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)



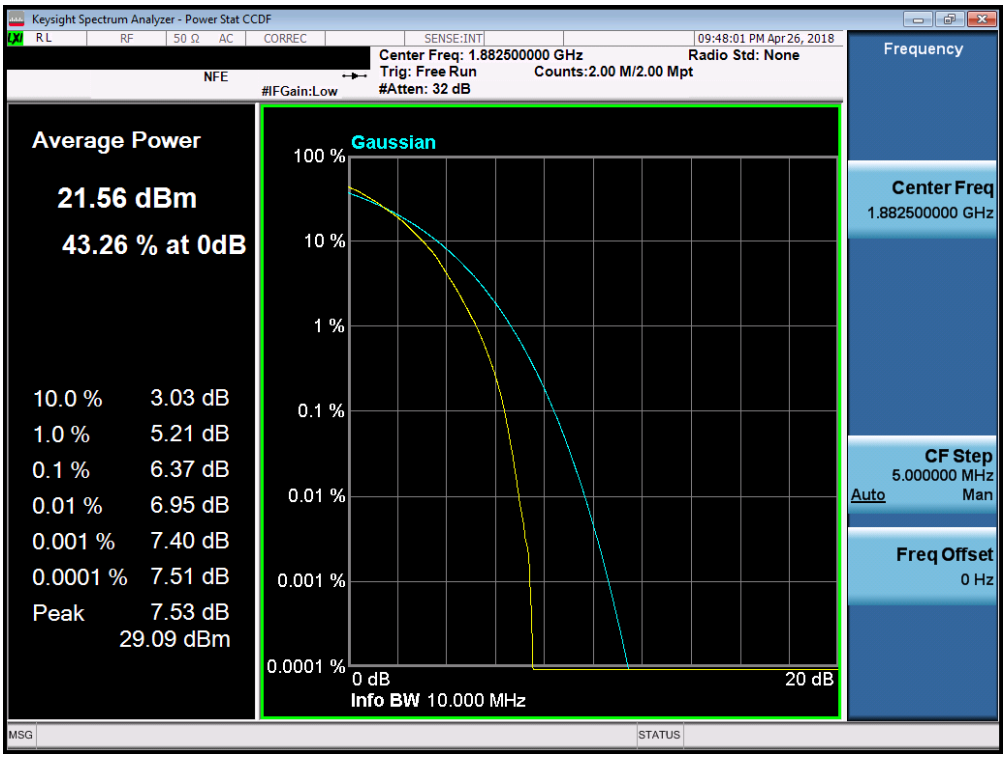
Plot 7-250. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)



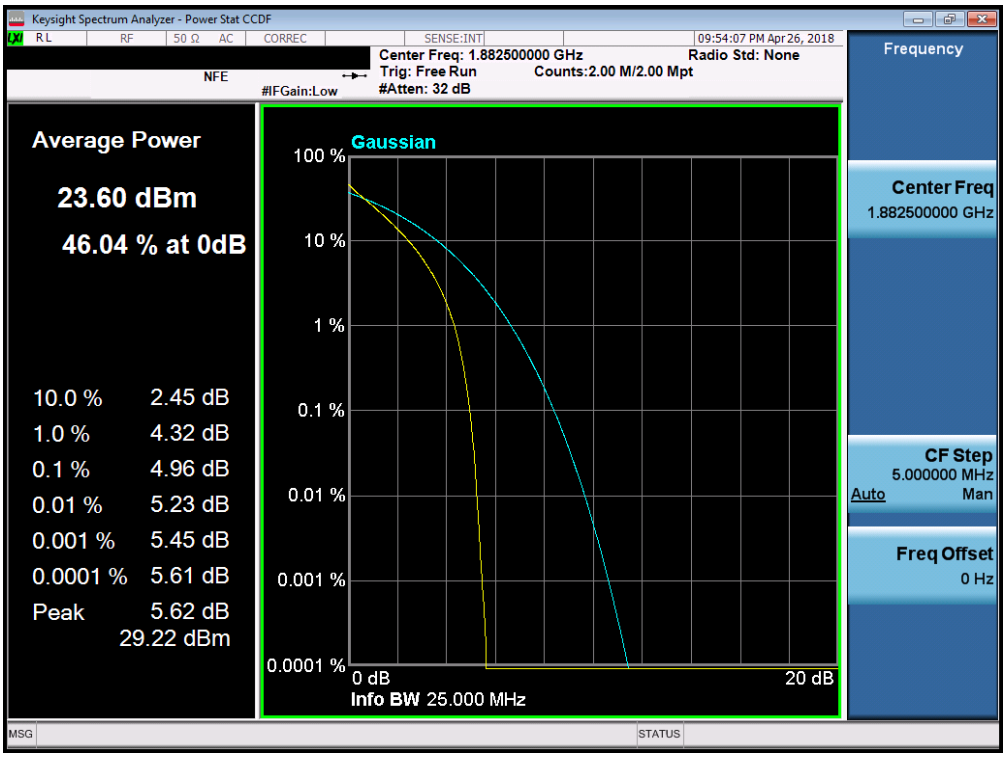
Plot 7-251. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



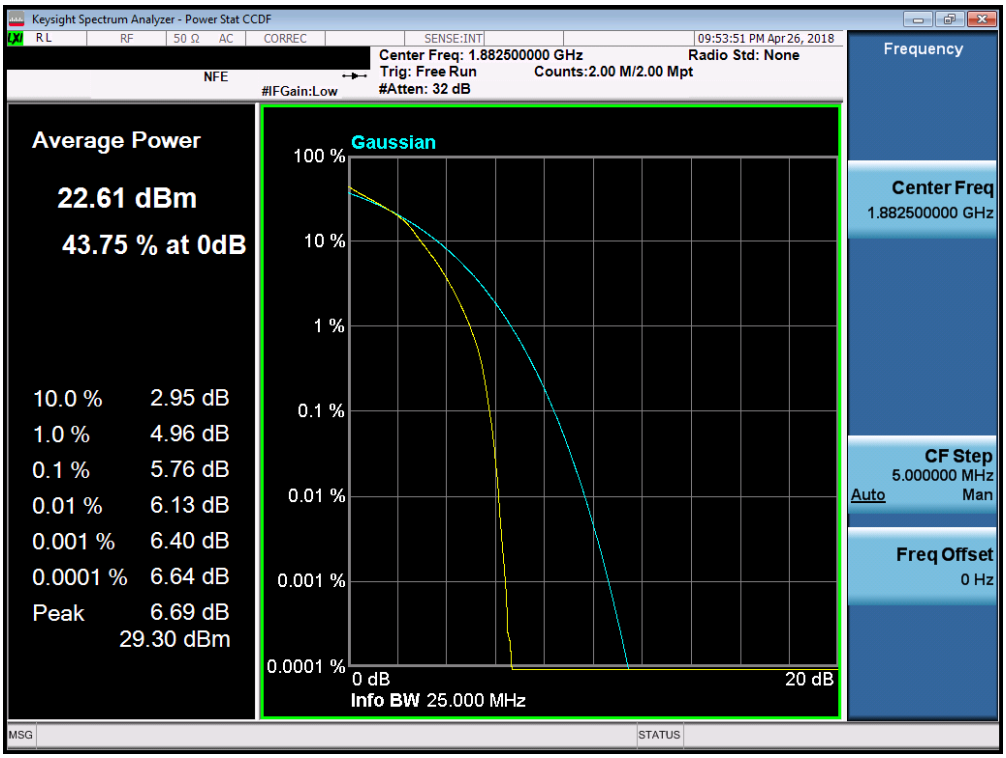
Plot 7-252. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



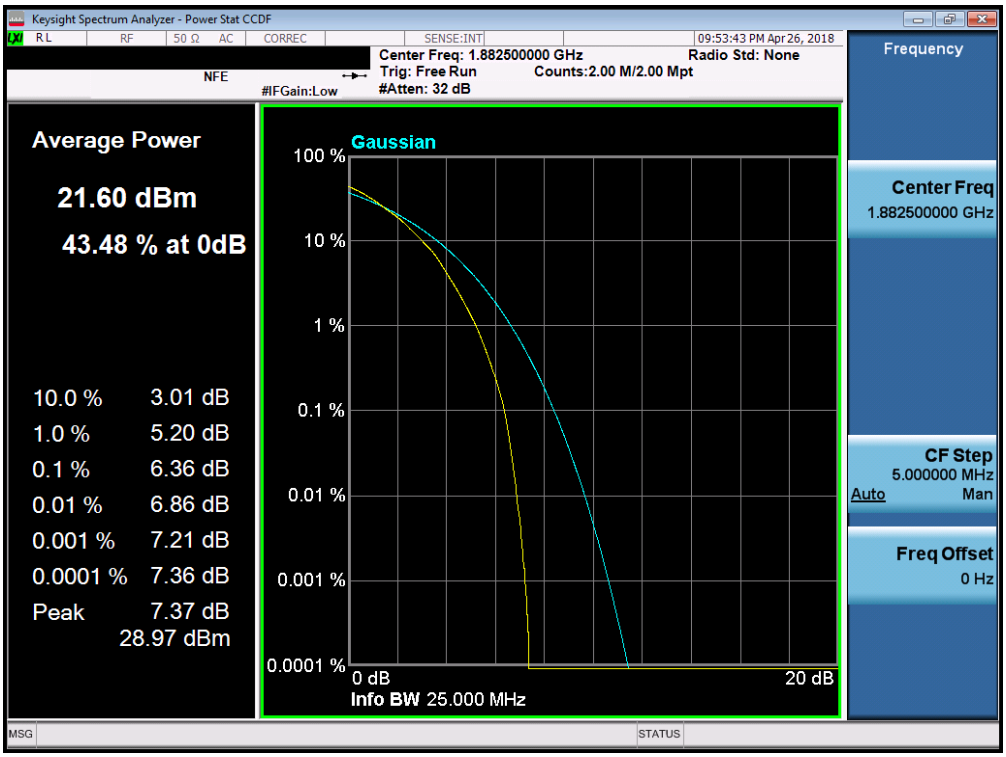
Plot 7-253. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)



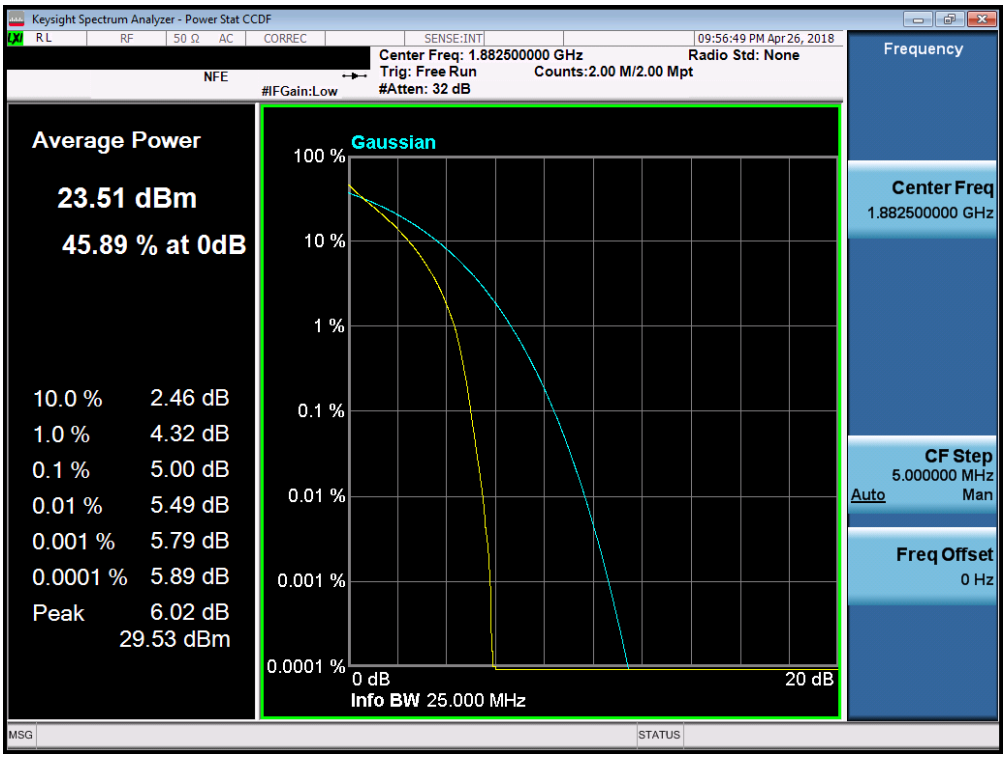
Plot 7-254. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



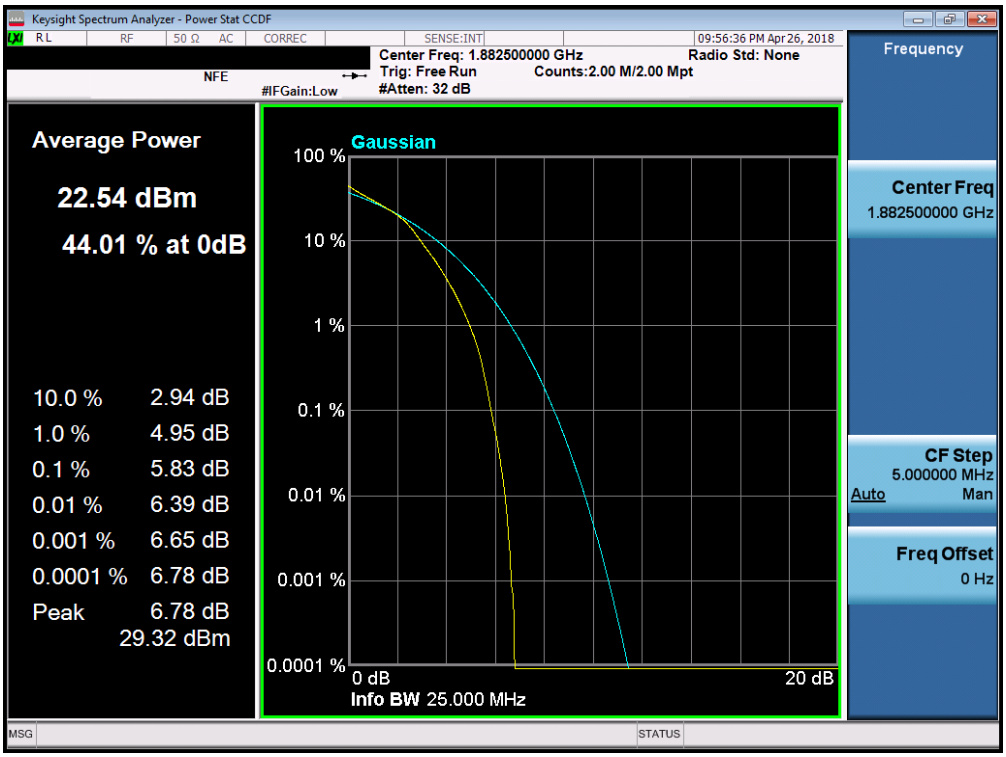
Plot 7-255. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)



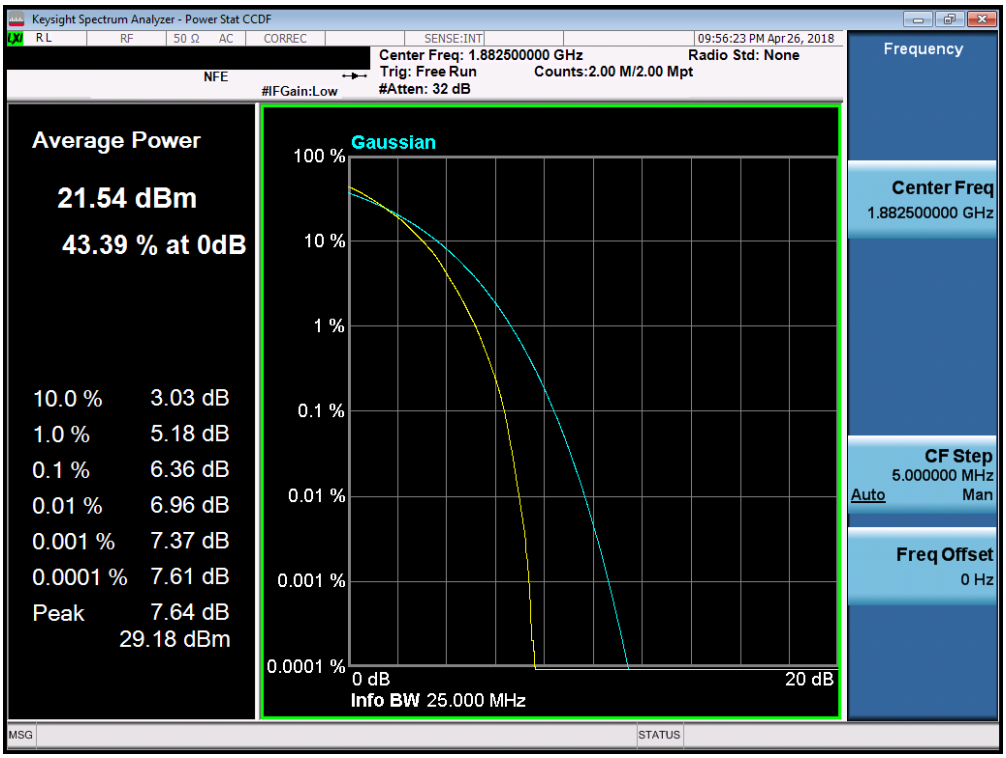
Plot 7-256. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-257. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-258. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-259. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

7.6 Radiated Power (ERP/EIRP)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

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

Test Setup

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

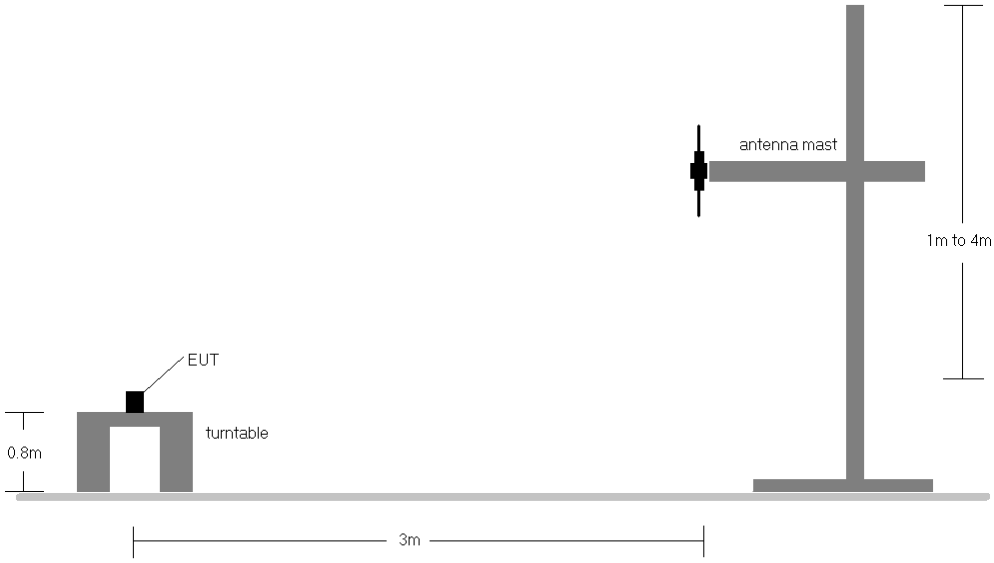


Figure 7-5. Radiated Test Setup <1GHz

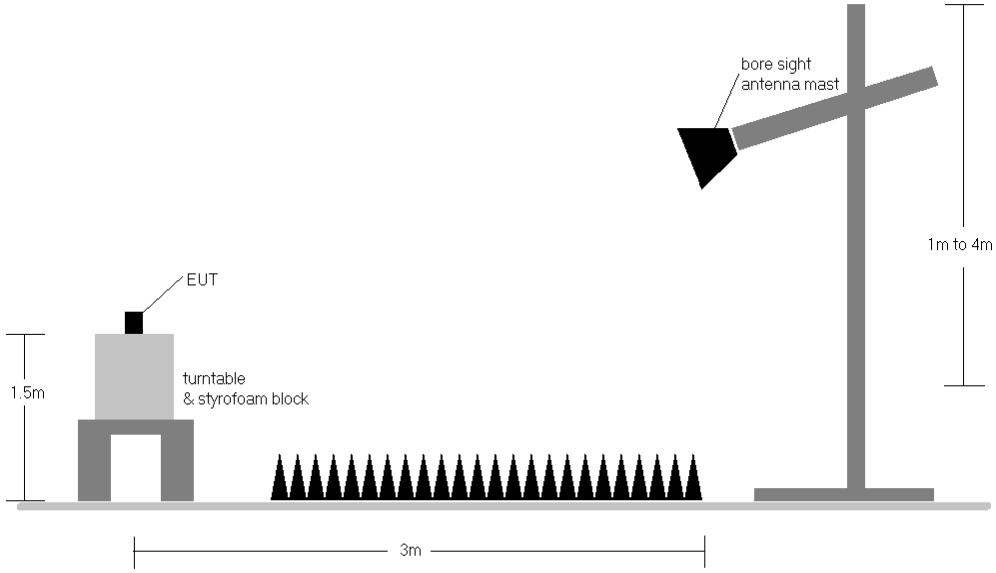


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

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

2) This unit was tested with its standard battery.

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	150	268	1 / 0	20.17	1.10	**19.12**	0.082	34.77	-15.65	**21.27**	0.134	36.99	-15.72
707.50	1.4	QPSK	V	150	260	1 / 5	20.02	1.13	19.00	0.079	34.77	-15.77	21.15	0.130	36.99	-15.84
715.30	1.4	QPSK	V	150	250	1 / 0	19.82	1.16	18.83	0.076	34.77	-15.94	20.98	0.125	36.99	-16.01
699.70	1.4	16-QAM	V	150	268	1 / 0	20.05	1.10	**19.00**	0.079	34.77	-15.77	**21.15**	0.130	36.99	-15.84
699.70	1.4	64-QAM	V	150	268	1 / 0	19.48	1.10	**18.43**	0.070	34.77	-16.34	**20.58**	0.114	36.99	-16.41
700.50	3	QPSK	V	150	263	1 / 0	20.21	1.10	**19.16**	0.082	34.77	-15.61	**21.31**	0.135	36.99	-15.68
707.50	3	QPSK	V	150	261	1 / 0	20.06	1.13	19.04	0.080	34.77	-15.73	21.19	0.132	36.99	-15.80
714.50	3	QPSK	V	150	278	1 / 0	19.79	1.16	18.80	0.076	34.77	-15.97	20.95	0.124	36.99	-16.04
700.50	3	16-QAM	V	150	263	1 / 0	20.03	1.10	**18.98**	0.079	34.77	-15.79	**21.13**	0.130	36.99	-15.86
700.50	3	64-QAM	V	150	263	1 / 0	19.50	1.10	**18.45**	0.070	34.77	-16.32	**20.60**	0.115	36.99	-16.39

Table 7-3. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
701.50	5	QPSK	V	150	257	1 / 24	19.80	1.11	18.76	0.075	34.77	-16.02	20.91	0.123	36.99	-16.08
707.50	5	QPSK	V	150	263	1 / 24	19.59	1.13	18.57	0.072	34.77	-16.20	20.72	0.118	36.99	-16.27
713.50	5	QPSK	V	150	272	1 / 24	19.92	1.15	**18.92**	0.078	34.77	-15.85	**21.07**	0.128	36.99	-15.92
701.50	5	16-QAM	V	150	257	1 / 24	19.04	1.11	18.00	0.063	34.77	-16.78	20.15	0.103	36.99	-16.84
707.50	5	16-QAM	V	150	263	1 / 24	19.38	1.13	18.36	0.069	34.77	-16.41	20.51	0.112	36.99	-16.48
713.50	5	16-QAM	V	150	272	1 / 24	19.50	1.15	**18.50**	0.071	34.77	-16.27	**20.65**	0.116	36.99	-16.34
713.50	5	64-QAM	V	150	272	1 / 0	19.76	1.15	**18.76**	0.075	34.77	-16.01	**20.91**	0.123	36.99	-16.08
704.00	10	QPSK	V	150	264	1 / 0	20.32	1.12	19.29	0.085	34.77	-15.48	21.44	0.139	36.99	-15.55
707.50	10	QPSK	V	150	261	1 / 0	20.57	1.13	**19.55**	**0.090**	34.77	-15.22	**21.70**	**0.148**	36.99	-15.29
711.00	10	QPSK	V	150	261	50 / 0	20.18	1.14	19.17	0.083	34.77	-15.60	21.32	0.136	36.99	-15.67
704.00	10	16-QAM	V	150	264	1 / 0	20.11	1.12	19.08	0.081	34.77	-15.69	21.23	0.133	36.99	-15.76
707.50	10	16-QAM	V	150	261	1 / 0	20.29	1.13	**19.27**	0.085	34.77	-15.50	**21.42**	0.139	36.99	-15.57
711.00	10	16-QAM	V	150	261	1 / 0	19.98	1.14	18.97	0.079	34.77	-15.80	21.12	0.130	36.99	-15.87
707.50	10	64-QAM	V	150	261	1 / 0	19.85	1.13	**18.83**	0.076	34.77	-15.94	**20.98**	0.125	36.99	-16.01
707.50	10	QPSK	H	150	74	1 / 74	20.37	1.13	19.35	0.086	34.77	-15.42	21.50	0.141	36.99	-15.49

Table 7-4. ERP Data (Band 12/17)

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]
779.50	5	QPSK	V	150	33	12 / 6	17.96	1.32	**17.13**	0.052	34.77	-17.64	**19.28**	0.085	36.99	-17.71
782.00	5	QPSK	V	150	35	1 / 0	17.85	1.33	17.03	0.050	34.77	-17.74	19.18	0.083	36.99	-17.81
784.50	5	QPSK	V	150	34	25 / 0	17.80	1.34	16.99	0.050	34.77	-17.78	19.14	0.082	36.99	-17.85
782.00	5	16-QAM	V	150	35	1 / 0	17.60	1.33	**16.78**	0.048	34.77	-17.99	**18.93**	0.078	36.99	-18.06
779.50	5	64-QAM	V	150	33	1 / 0	17.48	1.32	**16.65**	0.046	34.77	-18.12	**18.80**	0.076	36.99	-18.19
782.00	10	QPSK	V	150	38	1 / 0	18.10	1.33	**17.28**	**0.053**	34.77	-17.49	**19.43**	**0.088**	36.99	-17.56
782.00	10	16-QAM	V	150	38	1 / 0	17.80	1.33	**16.98**	0.050	34.77	-17.79	**19.13**	0.082	36.99	-17.86
782.00	10	64-QAM	V	150	38	1 / 0	17.13	1.33	**16.31**	0.043	34.77	-18.46	**18.46**	0.070	36.99	-18.53
782.00	10	QPSK	H	150	162	1 / 0	16.41	1.33	15.59	0.036	34.77	-19.18	17.74	0.059	36.99	-19.25

Table 7-5. ERP Data (Band 13)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	150	69	1 / 5	20.77	1.50	**20.12**	0.103	38.45	-18.33	**22.27**	0.169	40.61	-18.34
836.50	1.4	QPSK	H	150	67	1 / 0	20.36	1.50	19.71	0.094	38.45	-18.74	21.86	0.153	40.61	-18.75
848.30	1.4	QPSK	H	150	77	1 / 5	20.19	1.50	19.54	0.090	38.45	-18.91	21.69	0.148	40.61	-18.92
824.70	1.4	16-QAM	H	150	69	1 / 0	20.04	1.50	**19.39**	0.087	38.45	-19.06	**21.54**	0.143	40.61	-19.07
824.70	1.4	64-QAM	H	150	69	1 / 0	19.02	1.50	**18.37**	0.069	38.45	-20.08	**20.52**	0.113	40.61	-20.09
825.50	3	QPSK	H	150	66	1 / 0	21.00	1.50	**20.35**	0.108	38.45	-18.10	**22.50**	0.178	40.61	-18.11
836.50	3	QPSK	H	150	68	1 / 0	20.58	1.50	19.93	0.098	38.45	-18.52	22.08	0.161	40.61	-18.53
847.50	3	QPSK	H	150	71	1 / 0	20.01	1.50	19.36	0.086	38.45	-19.09	21.51	0.142	40.61	-19.10
825.50	3	16-QAM	H	150	66	1 / 0	19.77	1.50	**19.12**	0.082	38.45	-19.33	**21.27**	0.134	40.61	-19.34
825.50	3	64-QAM	H	150	66	1 / 0	18.77	1.50	**18.12**	0.065	38.45	-20.33	**20.27**	0.106	40.61	-20.34
826.50	5	QPSK	H	150	72	1 / 0	20.84	1.50	**20.19**	0.104	38.45	-18.26	**22.34**	0.171	40.61	-18.27
836.50	5	QPSK	H	150	81	1 / 24	20.21	1.50	19.56	0.090	38.45	-18.89	21.71	0.148	40.61	-18.90
846.50	5	QPSK	H	150	73	1 / 24	20.65	1.50	20.00	0.100	38.45	-18.45	22.15	0.164	40.61	-18.46
826.50	5	16-QAM	H	150	72	1 / 0	19.95	1.50	**19.30**	0.085	38.45	-19.15	**21.45**	0.140	40.61	-19.16
826.50	5	64-QAM	H	150	72	1 / 0	18.65	1.50	**18.00**	0.063	38.45	-20.45	**20.15**	0.104	40.61	-20.46
829.00	10	QPSK	H	150	69	1 / 0	20.95	1.50	**20.30**	0.107	38.45	-18.15	**22.45**	0.176	40.61	-18.16
836.50	10	QPSK	H	150	71	1 / 0	20.87	1.50	20.22	0.105	38.45	-18.23	22.37	0.173	40.61	-18.24
844.00	10	QPSK	H	150	77	1 / 0	20.20	1.50	19.55	0.090	38.45	-18.90	21.70	0.148	40.61	-18.91
836.50	10	16-QAM	H	150	71	1 / 0	20.31	1.50	**19.66**	0.092	38.45	-18.79	**21.81**	0.152	40.61	-18.80
836.50	10	64-QAM	H	150	71	1 / 0	19.02	1.50	**18.37**	0.069	38.45	-20.08	**20.52**	0.113	40.61	-20.09

Table 7-6. ERP Data (Band 26/5)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
831.50	15	QPSK	H	150	69	1 / 0	21.25	1.50	**20.60**	**0.115**	38.45	-17.85	**22.75**	**0.188**	40.61	-17.86
836.50	15	QPSK	H	150	75	1 / 0	20.59	1.50	19.94	0.099	38.45	-18.51	22.09	0.162	40.61	-18.52
841.50	15	QPSK	H	150	81	1 / 0	20.59	1.50	19.94	0.099	38.45	-18.51	22.09	0.162	40.61	-18.52
831.50	15	16-QAM	H	150	69	1 / 0	19.96	1.50	**19.31**	0.085	38.45	-19.14	**21.46**	0.140	40.61	-19.15
831.50	15	64-QAM	H	150	69	1 / 0	19.73	1.50	**19.08**	0.081	38.45	-19.37	**21.23**	0.133	40.61	-19.38
831.50	15	QPSK	V	349	107	1 / 0	17.82	1.50	17.17	0.052	38.45	-21.28	19.32	0.086	40.61	-21.29

Table 7-7. ERP Data (Band 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 [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	150	6	1 / 0	17.24	5.56	22.80	0.190	30.00	-7.20
1745.00	1.4	QPSK	H	150	358	3 / 2	17.91	5.32	**23.23**	0.211	30.00	-6.77
1779.30	1.4	QPSK	H	150	1	3 / 2	18.12	5.09	23.21	0.210	30.00	-6.79
1745.00	1.4	16-QAM	H	150	358	1 / 0	17.66	5.32	**22.98**	0.199	30.00	-7.02
1745.00	1.4	64-QAM	H	150	358	1 / 5	17.79	5.32	**23.11**	0.205	30.00	-6.89
1711.50	3	QPSK	H	150	349	1 / 14	18.13	5.55	23.68	0.233	30.00	-6.32
1745.00	3	QPSK	H	150	351	1 / 14	18.48	5.32	**23.80**	0.240	30.00	-6.20
1778.50	3	QPSK	H	150	354	1 / 0	18.17	5.10	23.27	0.212	30.00	-6.73
1745.00	3	16-QAM	H	150	351	1 / 14	18.23	5.32	**23.55**	0.227	30.00	-6.45
1745.00	3	64-QAM	H	150	351	1 / 0	17.80	5.32	**23.12**	0.205	30.00	-6.88
1712.50	5	QPSK	H	150	345	1 / 24	18.21	5.55	23.76	0.237	30.00	-6.24
1745.00	5	QPSK	H	150	351	1 / 0	19.00	5.32	**24.32**	0.271	30.00	-5.68
1777.50	5	QPSK	H	150	353	1 / 0	18.00	5.10	23.10	0.204	30.00	-6.90
1745.00	5	16-QAM	H	150	351	1 / 0	18.52	5.32	**23.84**	0.242	30.00	-6.16
1745.00	5	64-QAM	H	150	351	1 / 0	17.46	5.32	**22.78**	0.190	30.00	-7.22
1715.00	10	QPSK	H	150	356	1 / 49	17.70	5.53	23.23	0.210	30.00	-6.77
1745.00	10	QPSK	H	150	353	1 / 49	17.15	5.32	22.47	0.177	30.00	-7.53
1775.00	10	QPSK	H	150	356	1 / 49	18.53	5.12	**23.65**	0.232	30.00	-6.35
1775.00	10	16-QAM	H	150	356	1 / 49	18.58	5.12	**23.70**	0.234	30.00	-6.30
1775.00	10	64-QAM	H	150	356	1 / 49	16.96	5.12	**22.08**	0.161	30.00	-7.92
1717.50	15	QPSK	H	150	351	1 / 74	18.61	5.51	24.12	0.258	30.00	-5.88
1745.00	15	QPSK	H	150	351	1 / 0	19.21	5.32	**24.53**	0.284	30.00	-5.47
1772.50	15	QPSK	H	150	350	1 / 0	18.58	5.14	23.72	0.235	30.00	-6.28
1745.00	15	16-QAM	H	150	351	1 / 74	18.76	5.32	**24.08**	0.256	30.00	-5.92
1745.00	15	64-QAM	H	150	351	1 / 0	17.97	5.32	**23.29**	0.213	30.00	-6.71
1720.00	20	QPSK	H	150	351	1 / 99	19.09	5.49	24.58	0.287	30.00	-5.42
1745.00	20	QPSK	H	150	353	1 / 99	19.29	5.32	**24.61**	**0.289**	30.00	-5.39
1770.00	20	QPSK	H	150	349	1 / 0	18.44	5.15	23.59	0.229	30.00	-6.41
1720.00	20	16-QAM	H	150	351	1 / 99	18.80	5.49	**24.29**	0.269	30.00	-5.71
1720.00	20	64-QAM	H	150	351	1 / 0	19.03	5.49	**24.52**	0.283	30.00	-5.48
1745.00	20	QPSK	V	150	210	1 / 99	13.77	5.32	19.09	0.081	30.00	-10.91

Table 7-8. EIRP Data (Band 66/4)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	150	297	1 / 5	16.25	4.82	21.07	0.128	33.01	-11.94
1882.50	1.4	QPSK	H	150	299	1 / 0	16.39	4.73	**21.13**	0.130	33.01	-11.88
1914.30	1.4	QPSK	H	150	307	1 / 0	16.37	4.68	21.05	0.127	33.01	-11.96
1850.70	1.4	16-QAM	H	150	297	1 / 5	15.99	4.82	**20.81**	0.121	33.01	-12.20
1850.70	1.4	64-QAM	H	150	297	1 / 5	15.49	4.82	**20.31**	0.107	33.01	-12.70
1851.50	3	QPSK	H	150	286	1 / 0	15.68	4.82	20.50	0.112	33.01	-12.51
1882.50	3	QPSK	H	150	298	1 / 14	16.02	4.73	**20.76**	0.119	33.01	-12.25
1913.50	3	QPSK	H	150	286	1 / 0	16.04	4.68	20.72	0.118	33.01	-12.29
1882.50	3	16-QAM	H	150	298	1 / 0	15.88	4.73	**20.62**	0.115	33.01	-12.39
1851.50	3	64-QAM	H	150	286	1 / 0	15.07	4.82	**19.89**	0.098	33.01	-13.12
1852.50	5	QPSK	H	150	289	1 / 24	16.17	4.81	20.99	0.126	33.01	-12.02
1882.50	5	QPSK	H	150	298	1 / 0	16.46	4.73	**21.20**	**0.132**	33.01	-11.81
1912.50	5	QPSK	H	150	281	1 / 24	15.61	4.68	20.29	0.107	33.01	-12.72
1852.50	5	16-QAM	H	150	289	1 / 0	15.98	4.81	**20.80**	0.120	33.01	-12.21
1852.50	5	64-QAM	H	150	289	1 / 0	14.26	4.81	**19.08**	0.081	33.01	-13.93
1855.00	10	QPSK	H	150	256	1 / 49	13.66	4.81	18.47	0.070	33.01	-14.54
1882.50	10	QPSK	H	150	248	1 / 49	13.87	4.73	18.61	0.073	33.01	-14.40
1910.00	10	QPSK	H	150	272	1 / 0	14.93	4.68	**19.62**	0.092	33.01	-13.39
1910.00	10	16-QAM	H	150	272	1 / 0	14.80	4.68	**19.49**	0.089	33.01	-13.52
1910.00	10	64-QAM	H	150	272	1 / 0	15.95	4.68	**20.64**	0.116	33.01	-12.37
1857.50	15	QPSK	H	150	229	1 / 74	15.14	4.80	19.94	0.099	33.01	-13.07
1882.50	15	QPSK	H	150	234	1 / 74	15.21	4.73	19.95	0.099	33.01	-13.06
1907.50	15	QPSK	H	150	237	1 / 74	15.53	4.68	**20.22**	0.105	33.01	-12.79
1907.50	15	16-QAM	H	150	237	1 / 74	15.46	4.68	**20.15**	0.103	33.01	-12.86
1907.50	15	64-QAM	H	150	237	1 / 74	14.46	4.68	**19.15**	0.082	33.01	-13.86
1860.00	20	QPSK	H	150	158	1 / 99	15.62	4.79	20.42	0.110	33.01	-12.59
1882.50	20	QPSK	H	150	156	1 / 99	16.12	4.73	**20.86**	0.122	33.01	-12.15
1905.00	20	QPSK	H	150	156	1 / 0	16.05	4.68	20.74	0.119	33.01	-12.27
1882.50	20	16-QAM	H	150	156	1 / 99	15.46	4.73	**20.20**	0.105	33.01	-12.81
1882.50	20	64-QAM	H	150	156	1 / 99	14.40	4.73	**19.14**	0.082	33.01	-13.87
1882.50	5	QPSK	V	150	178	1 / 99	14.60	4.73	19.34	0.086	33.01	-13.67

Table 7-9. EIRP Data (Band 25/2)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	150	248	1 / 0	9.60	5.73	15.33	0.034	33.01	-17.68
2502.50	5	QPSK	H	150	255	1 / 0	9.96	5.74	15.70	0.037	33.01	-17.31
2593.00	5	QPSK	H	150	205	1 / 0	11.50	6.07	**17.57**	0.057	33.01	-15.44
2687.50	5	QPSK	H	150	233	1 / 0	10.05	6.48	16.53	0.045	33.01	-16.48
2593.00	5	16-QAM	H	150	205	1 / 0	11.21	6.07	**17.28**	0.053	33.01	-15.73
2593.00	5	64-QAM	H	150	205	1 / 24	10.28	6.07	**16.35**	0.043	33.01	-16.66
2501.00	10	QPSK	H	150	250	1 / 49	11.40	5.73	17.13	0.052	33.01	-15.88
2505.00	10	QPSK	H	150	251	1 / 49	10.14	5.75	15.89	0.039	33.01	-17.12
2593.00	10	QPSK	H	150	202	1 / 0	11.53	6.07	**17.60**	0.058	33.01	-15.41
2685.00	10	QPSK	H	150	246	1 / 0	9.33	6.47	15.80	0.038	33.01	-17.21
2593.00	10	16-QAM	H	150	202	1 / 0	11.40	6.07	**17.47**	0.056	33.01	-15.54
2593.00	10	64-QAM	H	150	202	1 / 49	10.11	6.07	**16.18**	0.042	33.01	-16.83
2503.50	15	QPSK	H	150	206	1 / 74	8.80	5.74	14.54	0.028	33.01	-18.47
2507.50	15	QPSK	H	150	221	1 / 74	10.21	5.76	15.97	0.040	33.01	-17.04
2593.00	15	QPSK	H	150	194	1 / 74	12.67	6.07	18.74	0.075	33.01	-14.27
2682.50	15	QPSK	H	150	226	1 / 74	12.56	6.46	**19.02**	0.080	33.01	-13.99
2593.00	15	16-QAM	H	150	194	1 / 74	12.22	6.07	**18.29**	0.067	33.01	-14.72
2682.50	15	64-QAM	H	150	226	1 / 74	11.25	6.46	**17.71**	0.059	33.01	-15.30
2506.00	20	QPSK	H	150	210	1 / 99	9.39	5.75	15.14	0.033	33.01	-17.87
2510.00	20	QPSK	H	150	220	1 / 99	11.07	5.77	16.84	0.048	33.01	-16.17
2593.00	20	QPSK	H	150	201	1 / 99	13.20	6.07	19.27	0.085	33.01	-13.74
2680.00	20	QPSK	H	150	214	1 / 99	13.44	6.45	**19.89**	**0.098**	33.01	-13.12
2680.00	20	16-QAM	H	150	214	1 / 0	12.41	6.45	**18.86**	0.077	33.01	-14.15
2680.00	20	64-QAM	H	150	214	1 / 99	11.38	6.45	**17.83**	0.061	33.01	-15.18
2680.00	20	QPSK	V	150	273	1 / 99	13.17	6.45	19.62	0.092	33.01	-13.39

Table 7-10. EIRP Data (Band 41)

7.7 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

Test Setup

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

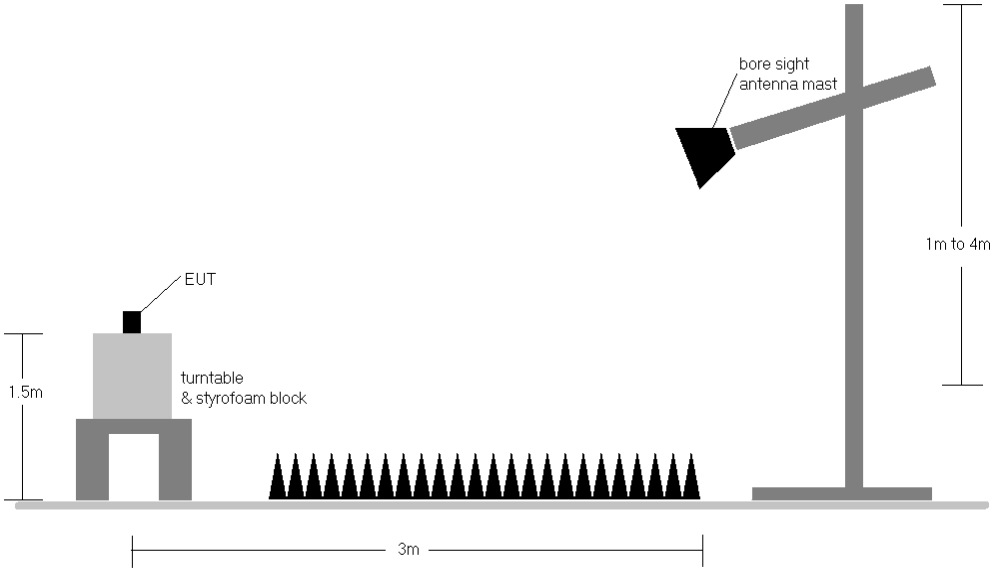


Figure 7-7. Test Instrument & Measurement Setup

Test Notes

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

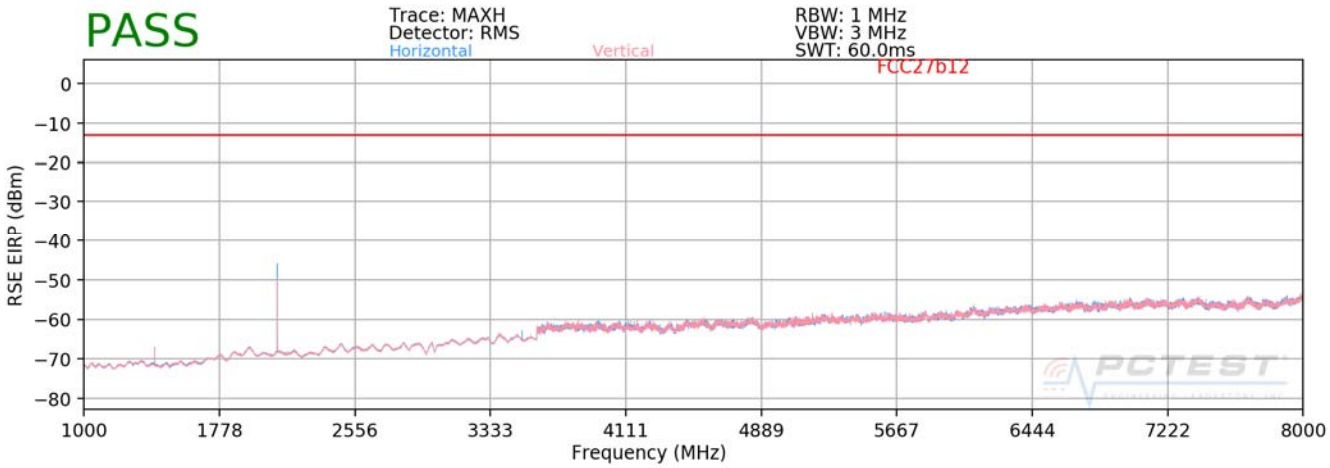
2) This unit was tested with its standard battery.

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

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

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

Band 12/17



Plot 7-260. 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	H	150	348	-62.60	3.84	-58.76	-45.8
2112.00	H	150	53	-56.63	4.79	-51.83	-38.8
2816.00	H	-	-	-66.51	5.69	-60.82	-47.8

Table 7-11. Radiated Spurious Data (Band 12/17 – Low Channel)

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	H	150	357	-63.92	3.90	-60.02	-47.0
2122.50	H	150	50	-54.38	4.78	-49.60	-36.6
2830.00	H	-	-	-66.74	5.73	-61.01	-48.0

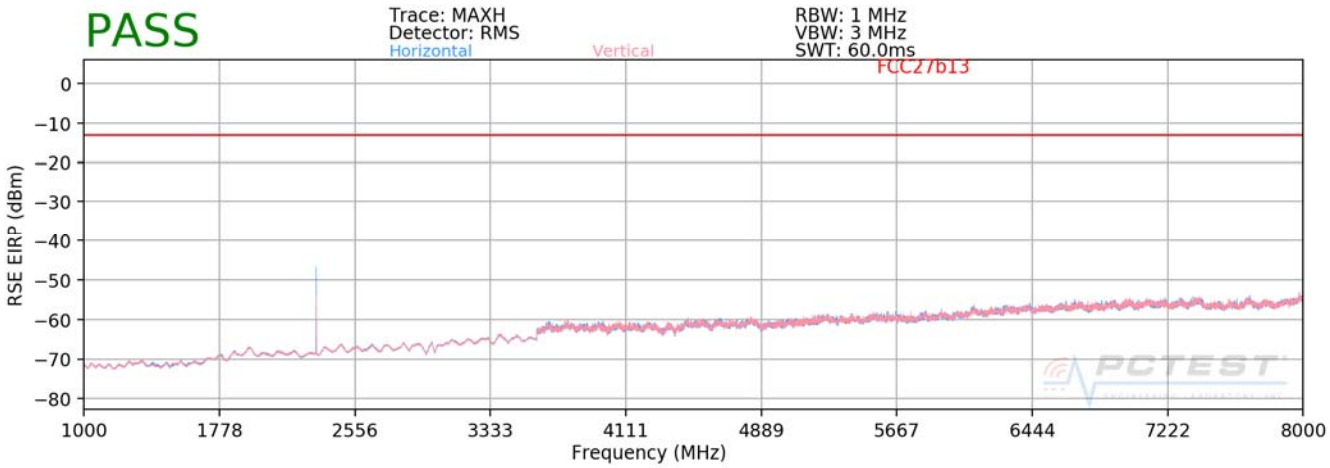
Table 7-12. Radiated Spurious Data (Band 12/17 – Mid Channel)

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	H	150	5	-65.51	3.97	-61.54	-48.5
2133.00	H	150	49	-63.79	4.78	-59.02	-46.0
2844.00	H	-	-	-66.42	5.77	-60.64	-47.6

Table 7-13. Radiated Spurious Data (Band 12/17 – High Channel)

Band 13



Plot 7-261. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY:	782.00	MHz
CHANNEL:	23230	
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]
2346.00	H	150	14	-58.40	4.88	-53.52	-40.5
3128.00	H	-	-	-66.01	6.02	-59.99	-47.0

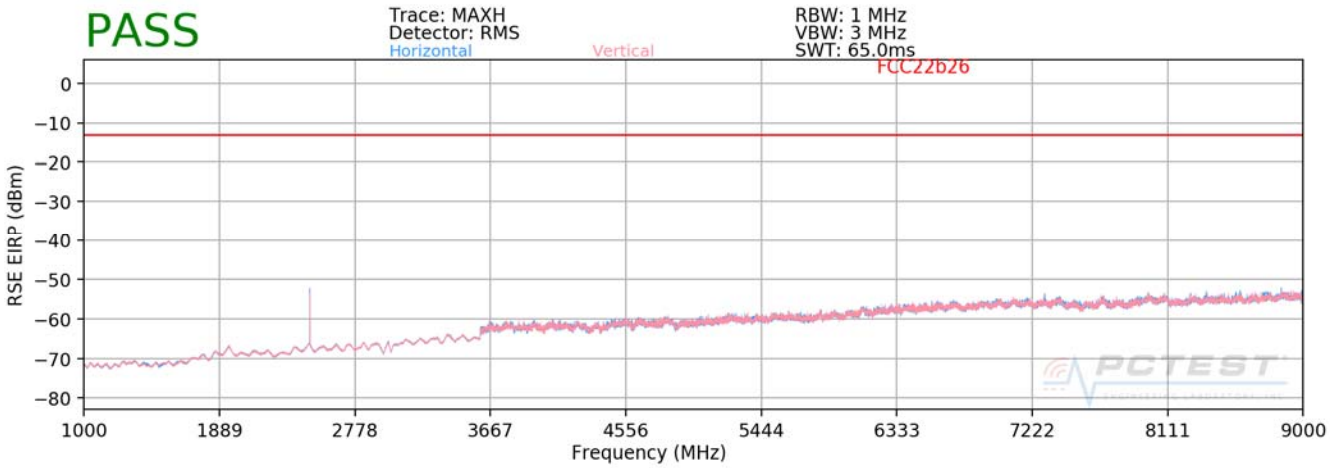
Table 7-14. Radiated Spurious Data (Band 13 – Mid Channel)

MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.00	MHz
DISTANCE:	3	meters
NARROWBAND EMISSION LIMIT:	-50	dBm
WIDEBAND EMISSION LIMIT:	-40	dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	-	-	-69.23	4.50	-64.74	-24.7

Table 7-15. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

Band 26/5



Plot 7-262. Radiated Spurious Plot above 1GHz (Band 26)

OPERATING FREQUENCY:	829.00	MHz
CHANNEL:	26840	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	H	-	-	-79.58	8.95	-70.63	-57.6
2487.00	H	203	202	-72.22	9.70	-62.52	-49.5
3316.00	H	-	-	-74.57	9.59	-64.98	-52.0

Table 7-16. Radiated Spurious Data (Band 26/5 – Low Channel)

OPERATING FREQUENCY:	836.50	MHz
CHANNEL:	26915	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	-	-	-79.62	8.95	-70.67	-57.7
2509.50	H	194	190	-75.64	9.75	-65.89	-52.9
3346.00	H	-	-	-73.49	9.60	-63.89	-50.9

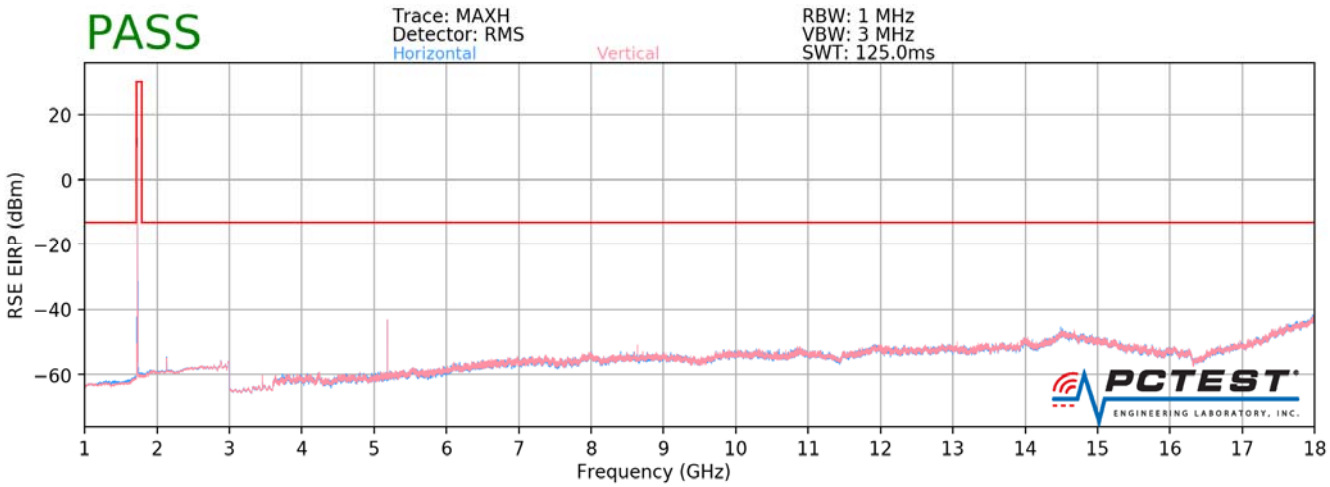
Table 7-17. Radiated Spurious Data (Band 26/5 – Mid Channel)

OPERATING FREQUENCY:	844.00	MHz
CHANNEL:	26990	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	H	-	-	-79.31	8.95	-70.36	-57.4
2532.00	H	200	209	-76.17	9.75	-66.42	-53.4
3376.00	H	-	-	-74.00	9.71	-64.29	-51.3

Table 7-18. Radiated Spurious Data (Band 26/5 – High Channel)

Band 66/4



Plot 7-263. Radiated Spurious Plot above 1GHz (Band 66)

OPERATING FREQUENCY:	1720.00	MHz
CHANNEL:	132072	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	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]
3440.00	V	379	357	-60.98	9.84	-51.13	-38.1
5160.00	V	111	99	-51.17	10.71	-40.46	-27.5
6880.00	V	-	-	-69.72	11.68	-58.04	-45.0
8600.00	V	118	348	-61.21	11.08	-50.13	-37.1
10320.00	V	-	-	-67.60	12.38	-55.22	-42.2
12040.00	V	-	-	-64.75	12.71	-52.04	-39.0

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

OPERATING FREQUENCY:	1745.00	MHz
CHANNEL:	132322	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	V	389	14	-57.81	9.91	-47.90	-34.9
5235.00	V	110	97	-52.02	10.73	-41.29	-28.3
6980.00	V	366	40	-68.49	11.82	-56.67	-43.7
8725.00	V	112	352	-61.58	11.00	-50.58	-37.6
10470.00	V	-	-	-67.54	12.58	-54.96	-42.0
12215.00	V	-	-	-65.18	13.11	-52.07	-39.1

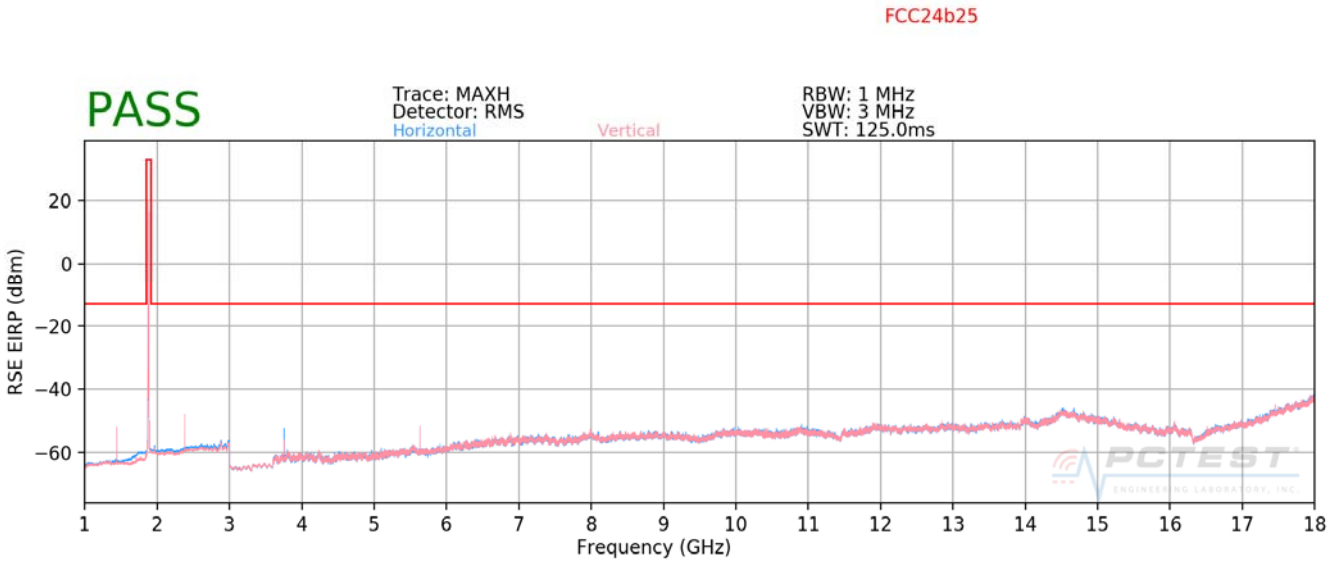
Table 7-20. Radiated Spurious Data (Band 66/4 – Mid Channel)

OPERATING FREQUENCY:	1770.00	MHz
CHANNEL:	132572	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	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]
3540.00	V	152	117	-61.76	9.89	-51.86	-38.9
5310.00	V	173	162	-54.97	10.69	-44.28	-31.3
7080.00	V	-	-	-70.41	11.79	-58.62	-45.6
8850.00	V	235	353	-61.79	11.00	-50.79	-37.8
10620.00	V	-	-	-67.48	12.58	-54.90	-41.9
12390.00	V	-	-	-65.06	13.33	-51.73	-38.7

Table 7-21. Radiated Spurious Data (Band 66/4 – High Channel)

Band 25/2



Plot 7-264. Radiated Spurious Plot above 1GHz (Band 25)

OPERATING FREQUENCY:	1860.00	MHz
CHANNEL:	26140	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	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]
3720.00	H	101	40	-48.97	9.49	-39.47	-26.5
5580.00	H	-	-	-54.19	11.02	-43.17	-30.2
7440.00	H	-	-	-49.48	10.75	-38.73	-25.7

Table 7-22. Radiated Spurious Data (Band 25/2 – Low Channel)

OPERATING FREQUENCY:	1882.50	MHz
CHANNEL:	26365	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	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]
3765.00	H	100	280	-49.28	9.25	-40.03	-27.0
5647.50	H	-	-	-54.64	11.15	-43.49	-30.5
7530.00	H	-	-	-50.01	10.90	-39.11	-26.1

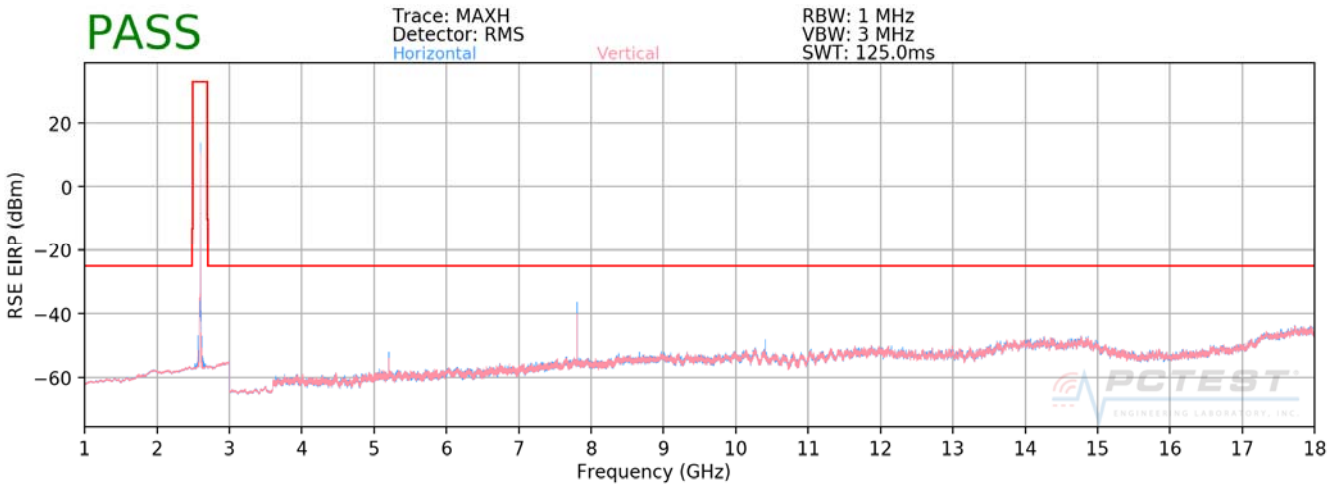
Table 7-23. Radiated Spurious Data (Band 25/2 – Mid Channel)

OPERATING FREQUENCY:	1905.00	MHz
CHANNEL:	26590	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

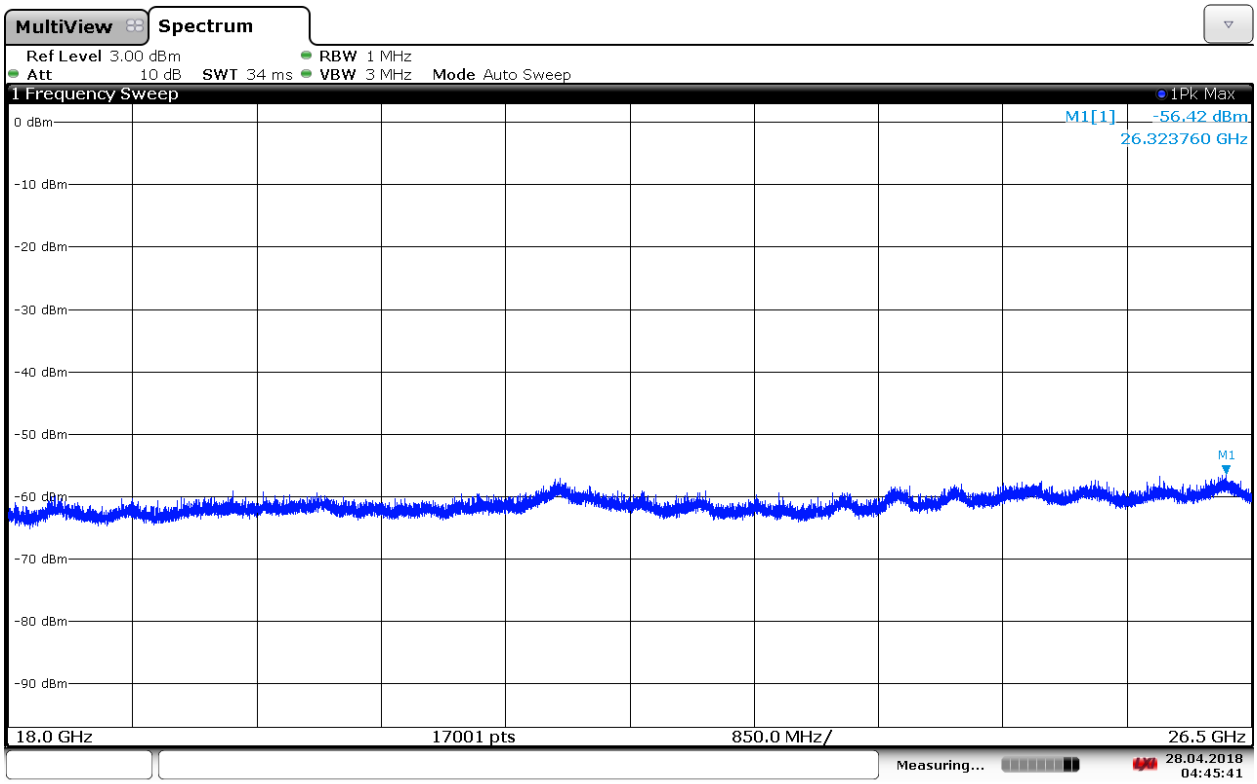
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3810.00	H	100	66	-52.97	9.08	-43.89	-30.9
5715.00	H	-	-	-54.89	11.28	-43.61	-30.6
7620.00	H	-	-	-50.17	11.05	-39.12	-26.1

Table 7-24. Radiated Spurious Data (Band 25/2 – High Channel)

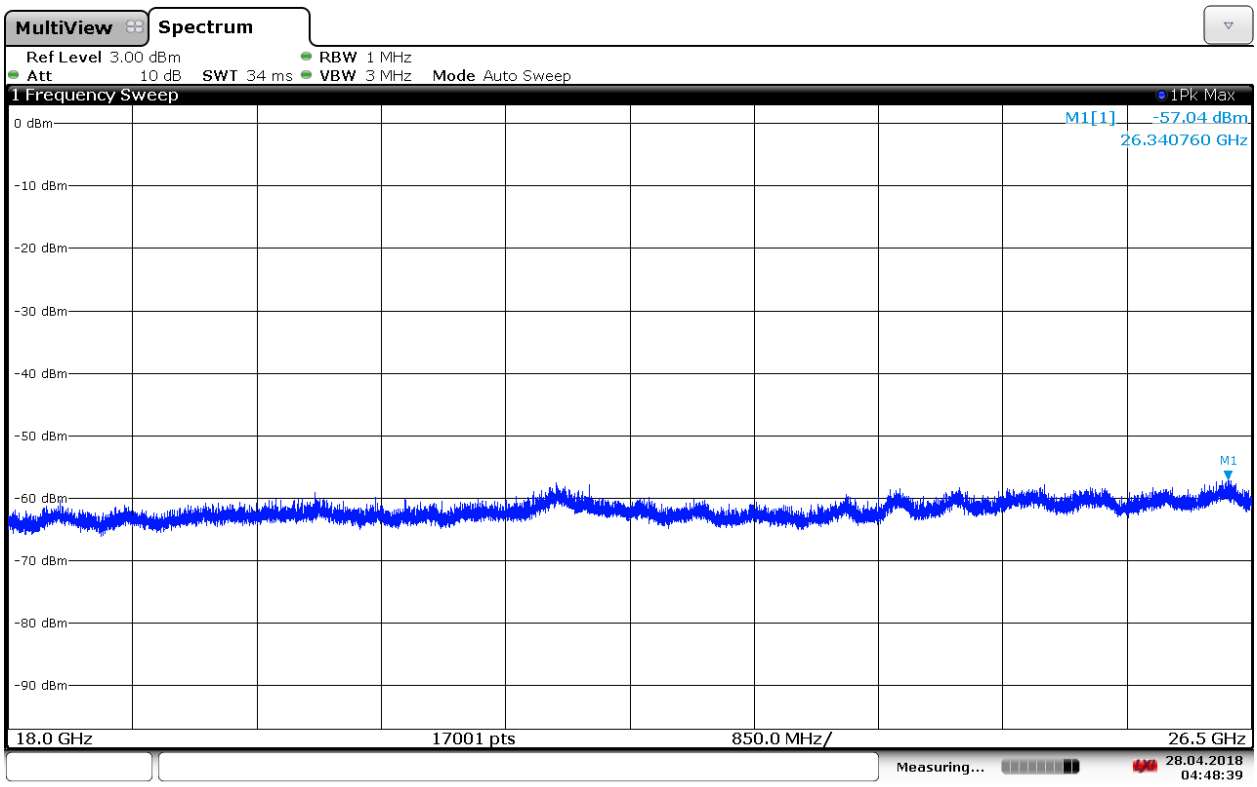
Band 41



Plot 7-265. Radiated Spurious Plot 1GHz - 18GHz (Band 41)



Plot 7-266. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41) - Horizontal



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Plot 7-267. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41) - Vertical

OPERATING FREQUENCY:	2510.00	MHz
CHANNEL:	39790	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	109	118	-57.21	10.88	-46.33	-21.3
7530.00	H	110	340	-62.46	11.13	-51.33	-26.3
10040.00	H	110	352	-57.33	11.99	-45.35	-20.3
12550.00	H	327	5	-62.54	13.56	-48.98	-24.0
15060.00	H	-	-	-62.01	13.58	-48.43	-23.4
17570.00	H	-	-	-55.06	11.59	-43.47	-18.5

Table 7-25. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY:	2593.00	MHz
CHANNEL:	40620	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	H	349	118	-59.76	10.74	-49.02	-24.0
7779.00	H	110	318	-58.59	11.44	-47.15	-22.1
10372.00	H	110	318	-60.93	12.42	-48.51	-23.5
12965.00	H	-	-	-62.59	13.29	-49.30	-24.3
15558.00	H	-	-	-67.32	16.33	-50.99	-26.0

Table 7-26. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY:	2680.00	MHz
CHANNEL:	41490	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5360.00	H	127	139	-51.11	10.70	-40.42	-15.4
8040.00	H	130	141	-49.83	11.16	-38.67	-13.7
10720.00	H	125	140	-61.45	12.59	-48.86	-23.9
13400.00	H	-	-	-62.88	12.59	-50.28	-25.3
16080.00	H	-	-	-66.70	16.68	-50.02	-25.0

Table 7-27. Radiated Spurious Data (Band 41 – High Channel)

7.8 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

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

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

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

None

Band 12/17 Frequency Stability Measurements

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	
REFERENCE VOLTAGE:	4.40	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.40	+ 20 (Ref)	707,500,252	252	0.0000356
100 %		- 30	707,500,032	32	0.0000045
100 %		- 20	707,500,162	162	0.0000229
100 %		- 10	707,499,974	-26	-0.0000037
100 %		0	707,499,714	-286	-0.0000404
100 %		+ 10	707,499,919	-81	-0.0000114
100 %		+ 20	707,500,131	131	0.0000185
100 %		+ 30	707,499,743	-257	-0.0000363
100 %		+ 40	707,500,238	238	0.0000336
100 %		+ 50	707,499,907	-93	-0.0000131
BATT. ENDPOINT	3.40	+ 20	707,500,122	122	0.0000172

Table 7-28. Frequency Stability Data (Band 12/17)

Note:

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

Band 12/17 Frequency Stability Measurements

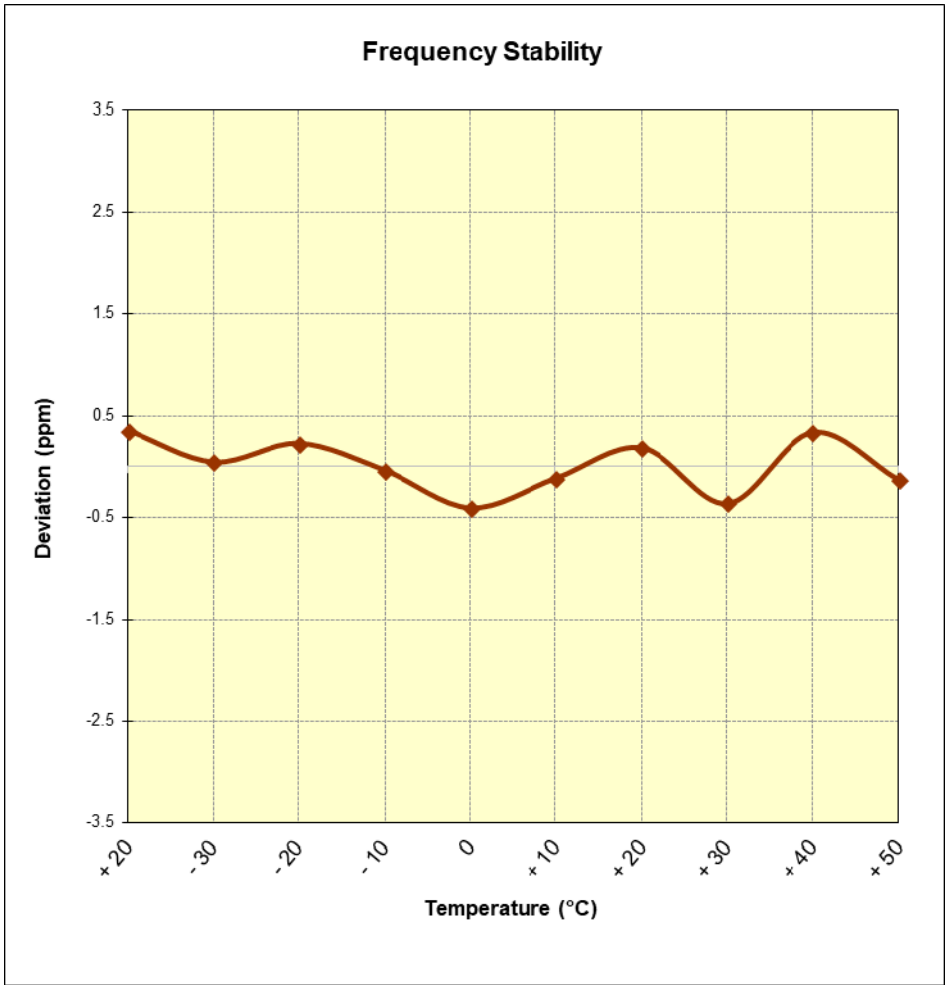

Figure 7-8. Frequency Stability Graph (Band 12/17)

Band 13 Frequency Stability Measurements

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	
REFERENCE VOLTAGE:	4.40	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.40	+ 20 (Ref)	781,999,847	-153	-0.0000196
100 %		- 30	782,000,061	61	0.0000078
100 %		- 20	781,999,998	-2	-0.0000003
100 %		- 10	781,999,947	-53	-0.0000068
100 %		0	782,000,070	70	0.0000090
100 %		+ 10	782,000,338	338	0.0000432
100 %		+ 20	781,999,594	-406	-0.0000519
100 %		+ 30	781,999,822	-178	-0.0000228
100 %		+ 40	781,999,820	-180	-0.0000230
100 %		+ 50	781,999,638	-362	-0.0000463
BATT. ENDPOINT	3.40	+ 20	781,999,946	-54	-0.0000069

Table 7-29. Frequency Stability Data (Band 13)

Note:

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

Band 13 Frequency Stability Measurements

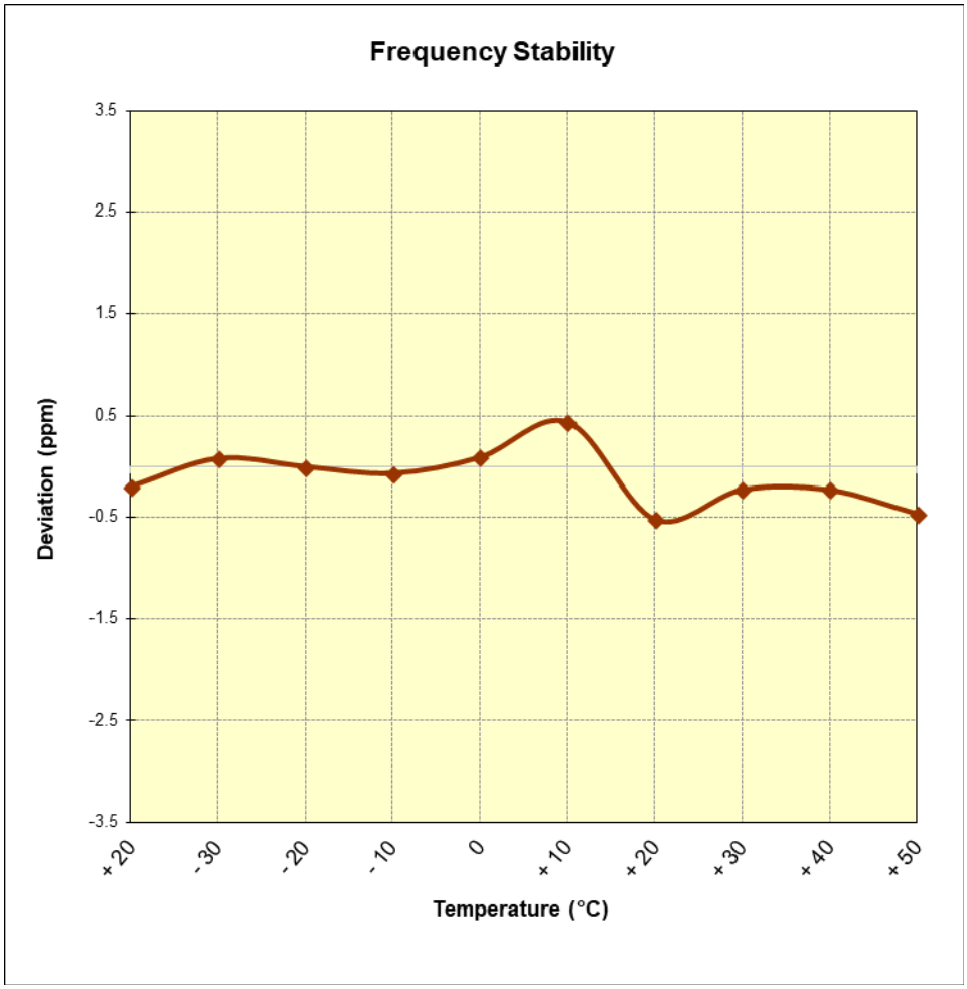

Figure 7-9. Frequency Stability Graph (Band 13)

Band 26/5 Frequency Stability Measurements

OPERATING FREQUENCY:	831,500,000	Hz
CHANNEL:	26865	
REFERENCE VOLTAGE:	4.40	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.40	+ 20 (Ref)	831,499,871	-129	-0.0000155
100 %		- 30	831,499,876	-124	-0.0000149
100 %		- 20	831,500,431	431	0.0000518
100 %		- 10	831,500,049	49	0.0000059
100 %		0	831,499,860	-140	-0.0000168
100 %		+ 10	831,499,806	-194	-0.0000233
100 %		+ 20	831,499,968	-32	-0.0000038
100 %		+ 30	831,499,863	-137	-0.0000165
100 %		+ 40	831,500,265	265	0.0000319
100 %		+ 50	831,499,944	-56	-0.0000067
BATT. ENDPOINT	3.40	+ 20	831,500,120	120	0.0000144

Table 7-30. Frequency Stability Data (Band 26/5)

Band 26/5 Frequency Stability Measurements

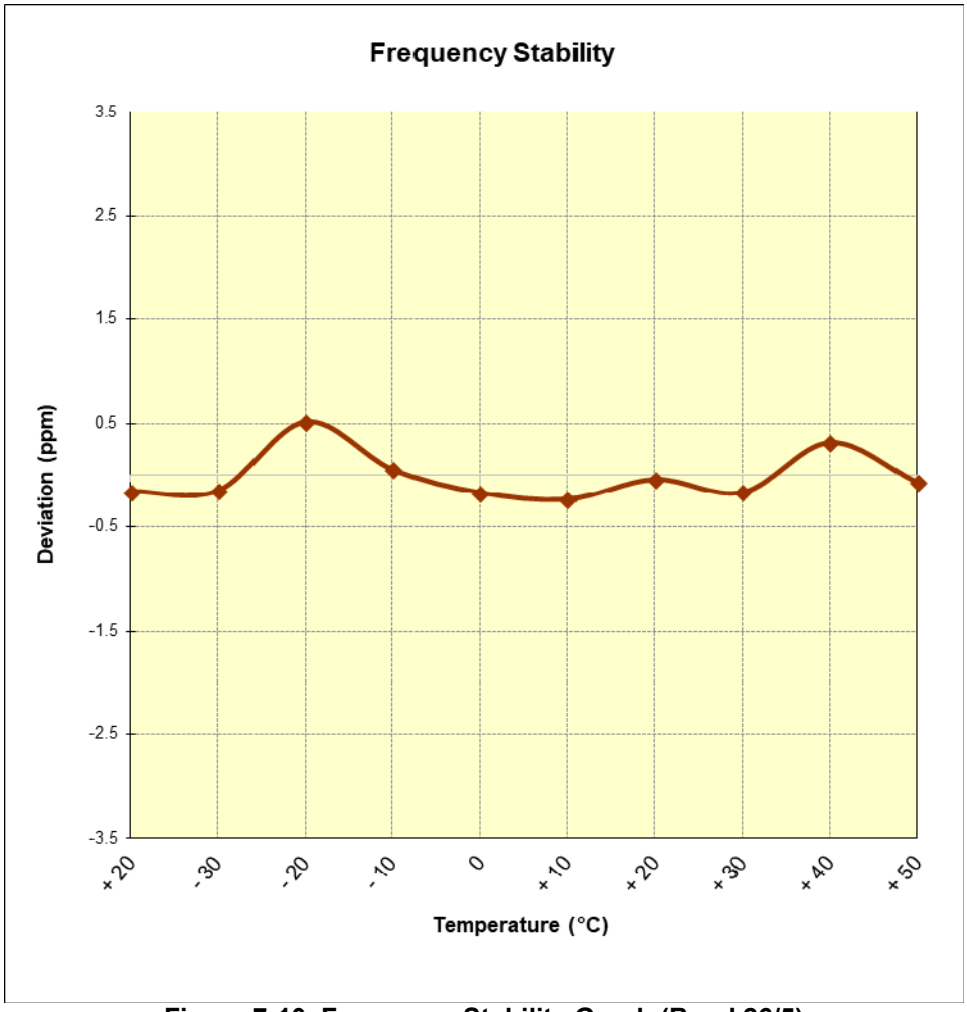

Figure 7-10. Frequency Stability Graph (Band 26/5)

Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY:	1,745,000,000	Hz
CHANNEL:	132322	
REFERENCE VOLTAGE:	4.40	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.40	+ 20 (Ref)	1,744,999,776	-224	-0.0000128
100 %		- 30	1,745,000,011	11	0.0000006
100 %		- 20	1,744,999,888	-112	-0.0000064
100 %		- 10	1,745,000,345	345	0.0000198
100 %		0	1,745,000,107	107	0.0000061
100 %		+ 10	1,745,000,129	129	0.0000074
100 %		+ 20	1,745,000,188	188	0.0000108
100 %		+ 30	1,745,000,094	94	0.0000054
100 %		+ 40	1,745,000,050	50	0.0000029
100 %		+ 50	1,745,000,047	47	0.0000027
BATT. ENDPOINT	3.40	+ 20	1,744,999,910	-90	-0.0000052

Table 7-31. Frequency Stability Data (Band 66/4)

Note:

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

Band 66/4 Frequency Stability Measurements

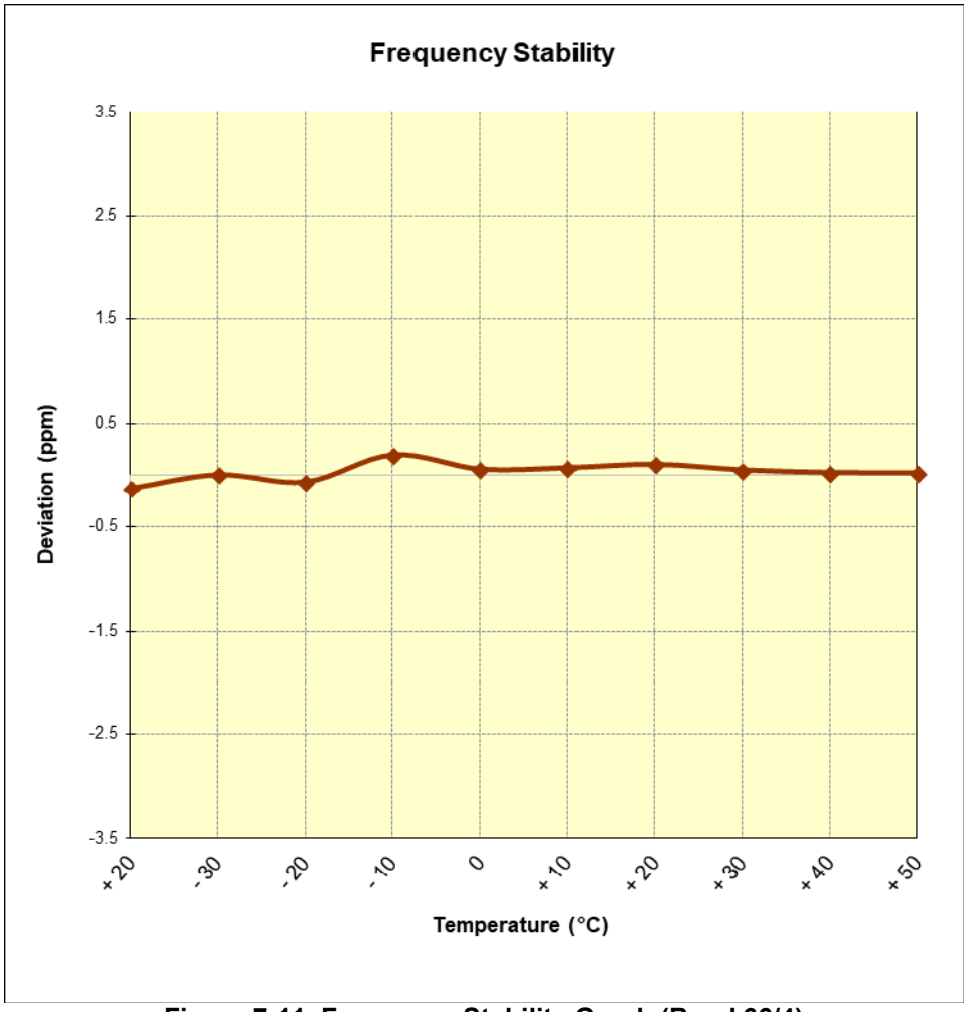

Figure 7-11. Frequency Stability Graph (Band 66/4)

Band 25/2 Frequency Stability Measurements

OPERATING FREQUENCY:	1,882,500,000	Hz
CHANNEL:	26365	
REFERENCE VOLTAGE:	4.40	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.40	+ 20 (Ref)	1,882,499,963	-37	-0.0000020
100 %		- 30	1,882,499,737	-263	-0.0000140
100 %		- 20	1,882,499,817	-183	-0.0000097
100 %		- 10	1,882,499,790	-210	-0.0000112
100 %		0	1,882,500,005	5	0.0000003
100 %		+ 10	1,882,500,277	277	0.0000147
100 %		+ 20	1,882,500,162	162	0.0000086
100 %		+ 30	1,882,499,699	-301	-0.0000160
100 %		+ 40	1,882,500,028	28	0.0000015
100 %		+ 50	1,882,499,933	-67	-0.0000036
BATT. ENDPOINT	3.40	+ 20	1,882,499,942	-58	-0.0000031

Table 7-32. Frequency Stability Data (Band 25/2)

Band 25/2 Frequency Stability Measurements

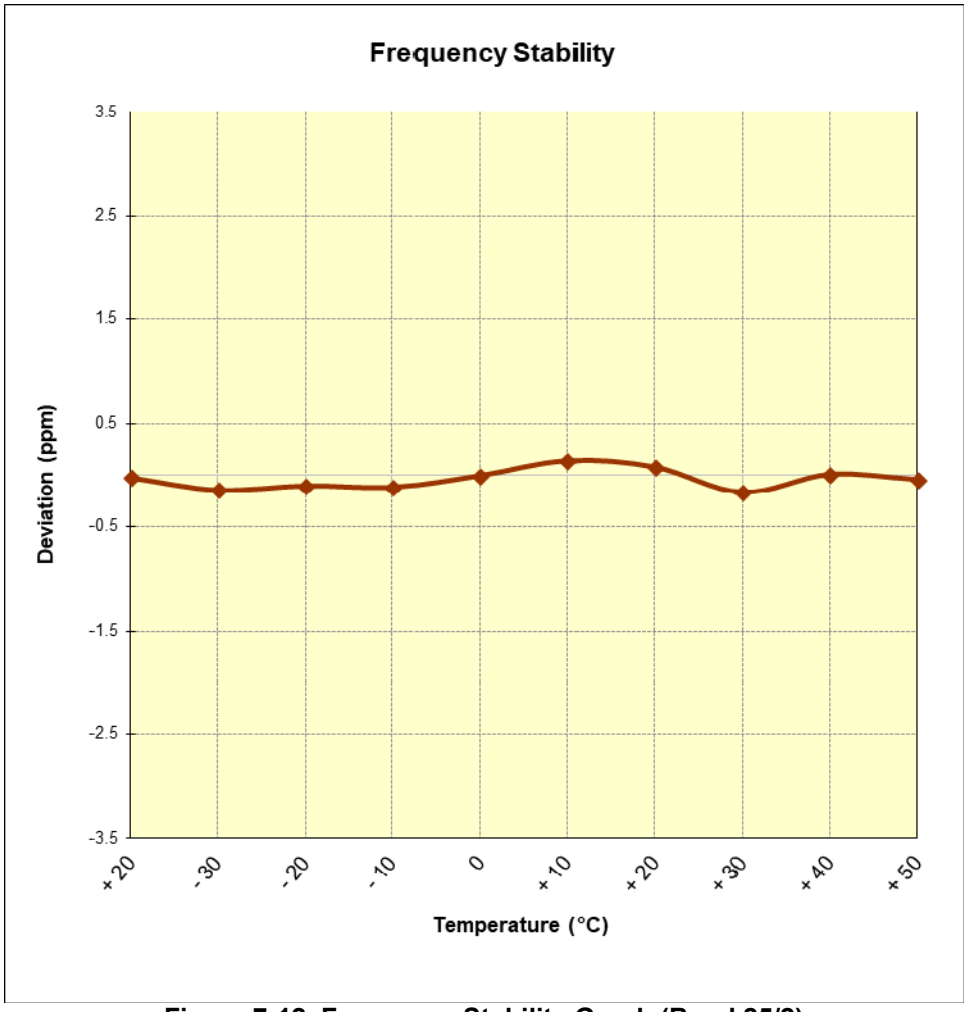

Figure 7-12. Frequency Stability Graph (Band 25/2)

Band 41 Frequency Stability Measurements

OPERATING FREQUENCY:	2,593,000,000	Hz
CHANNEL:	40620	
REFERENCE VOLTAGE:	4.40	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.40	+ 20 (Ref)	2,592,999,723	-277	-0.0000107
100 %		- 30	2,593,000,122	122	0.0000047
100 %		- 20	2,593,000,000	0	0.0000000
100 %		- 10	2,592,999,609	-391	-0.0000151
100 %		0	2,593,000,066	66	0.0000025
100 %		+ 10	2,593,000,023	23	0.0000009
100 %		+ 20	2,592,999,996	-4	-0.0000002
100 %		+ 30	2,593,000,081	81	0.0000031
100 %		+ 40	2,593,000,126	126	0.0000049
100 %		+ 50	2,593,000,102	102	0.0000039
BATT. ENDPOINT	3.40	+ 20	2,593,000,274	274	0.0000106

Table 7-33. Frequency Stability Data (Band 41)

Note:

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

Band 41 Frequency Stability Measurements

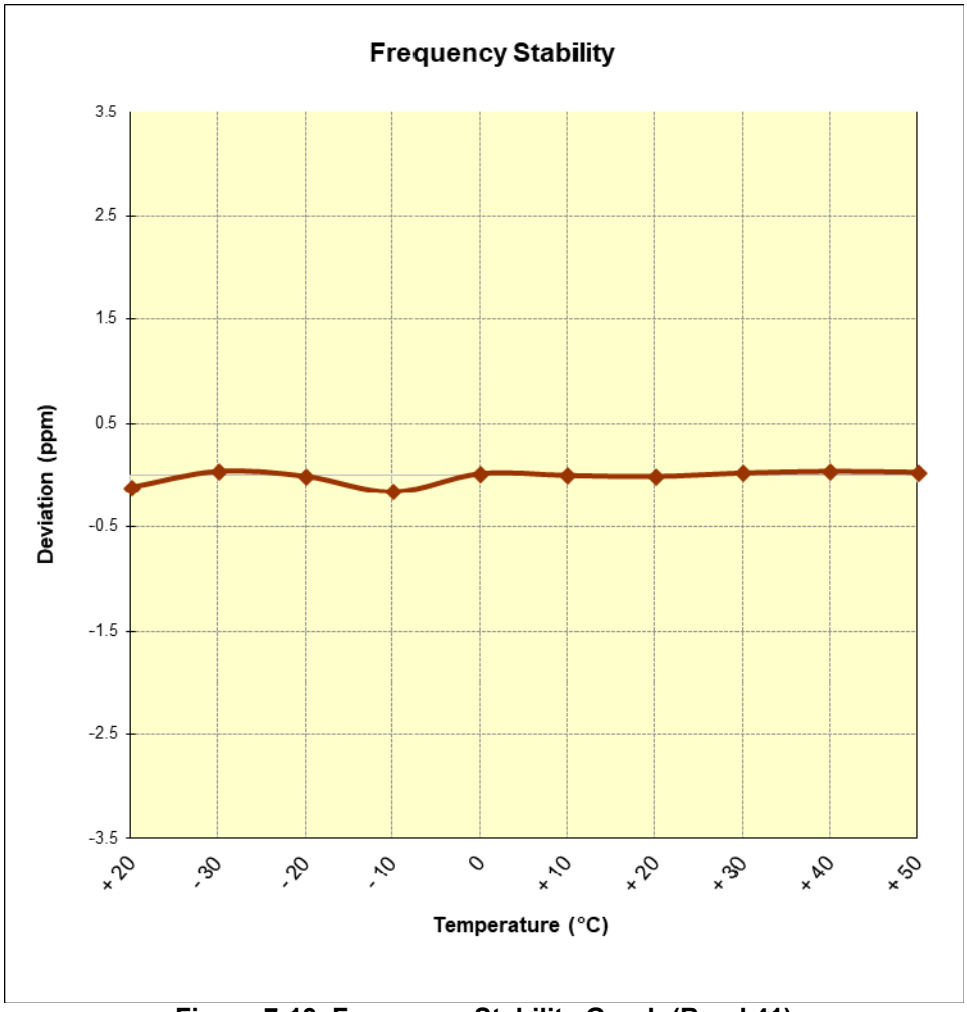

Figure 7-13. Frequency Stability Graph (Band 41)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFQ710US** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.