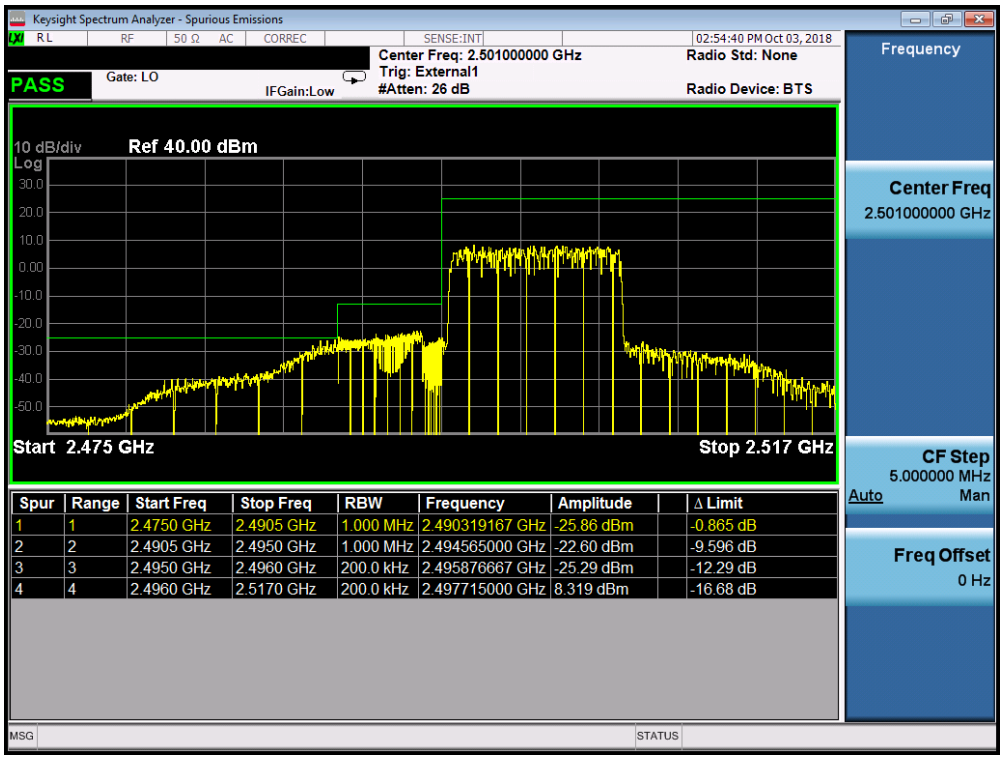
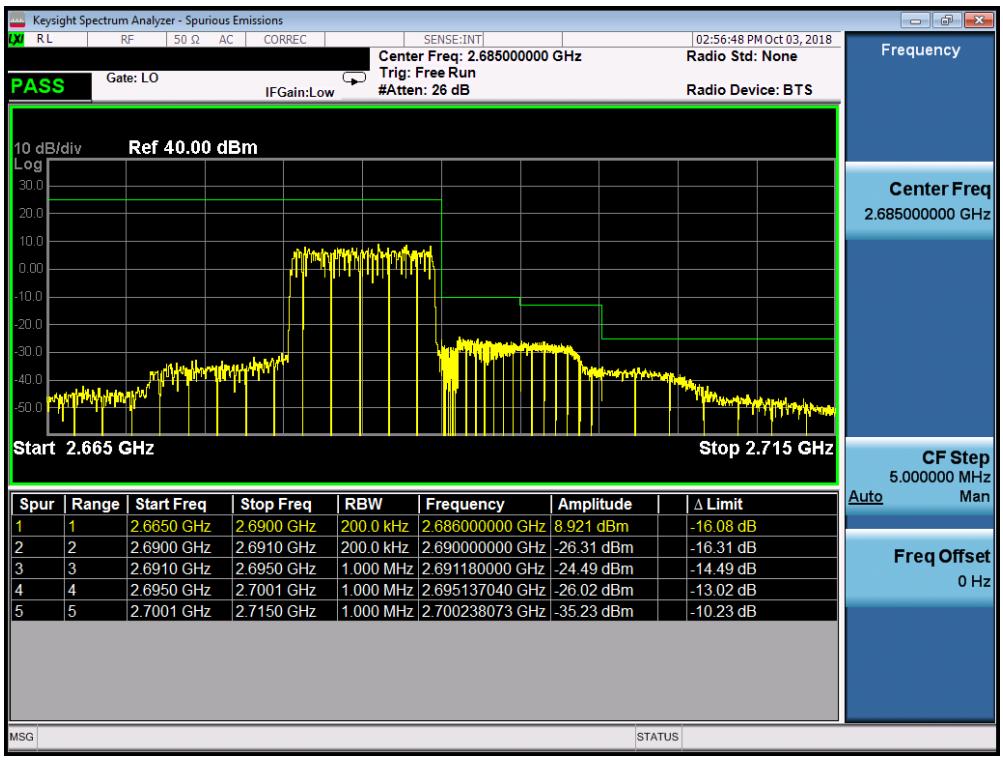


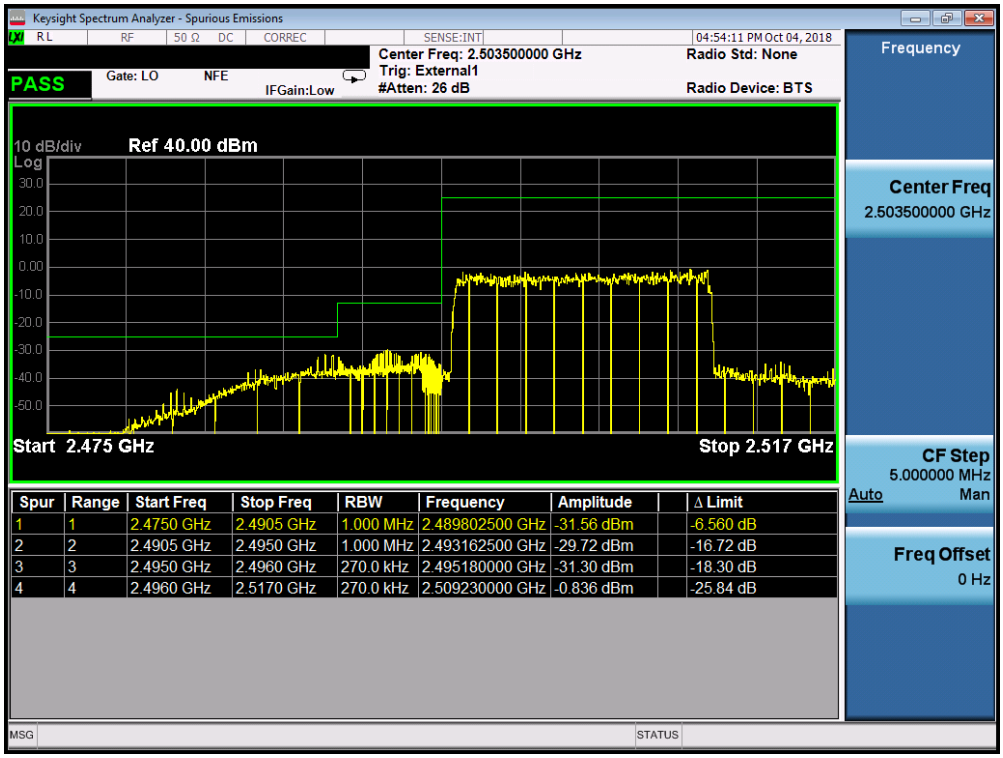
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490319167 GHz	-25.86 dBm	-0.865 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494565000 GHz	-22.60 dBm	-9.596 dB
3	3	2.4950 GHz	2.4960 GHz	200.0 kHz	2.495876667 GHz	-25.29 dBm	-12.29 dB
4	4	2.4960 GHz	2.5170 GHz	200.0 kHz	2.497715000 GHz	8.319 dBm	-16.68 dB

Plot 7-215. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - Full RB Configuration)



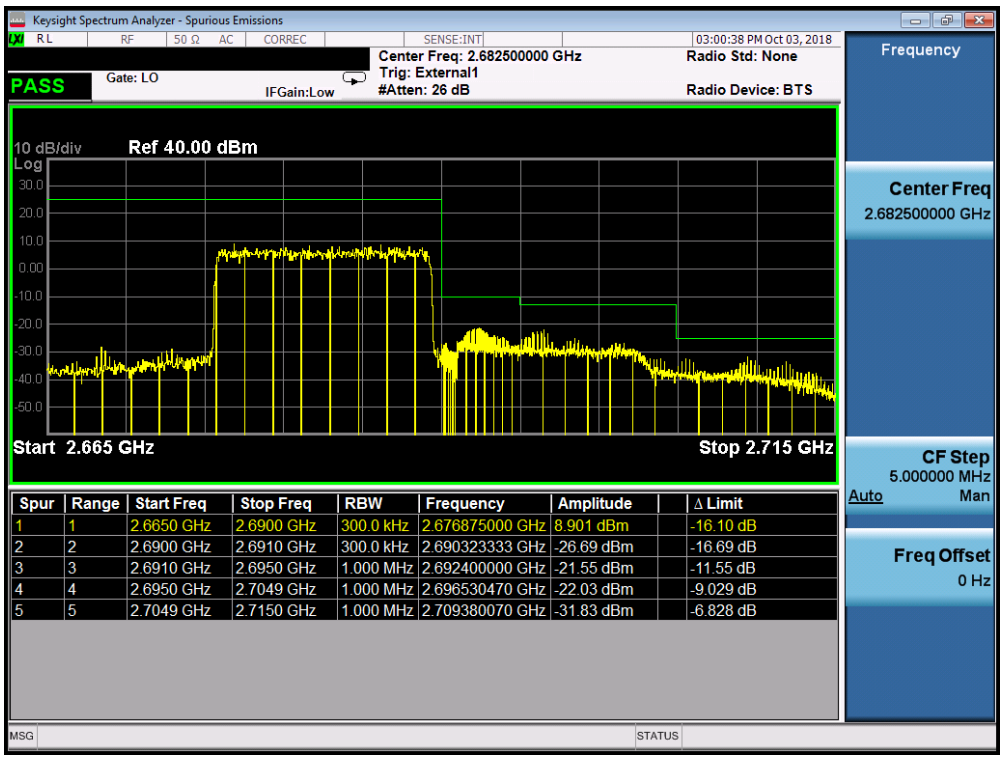
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	200.0 kHz	2.686000000 GHz	8.921 dBm	-16.08 dB
2	2	2.6900 GHz	2.6910 GHz	200.0 kHz	2.690000000 GHz	-26.31 dBm	-16.31 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691180000 GHz	-24.49 dBm	-14.49 dB
4	4	2.6950 GHz	2.7001 GHz	1.000 MHz	2.695137040 GHz	-26.02 dBm	-13.02 dB
5	5	2.7001 GHz	2.7150 GHz	1.000 MHz	2.700238073 GHz	-35.23 dBm	-10.23 dB

Plot 7-216. Upper ACP Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)



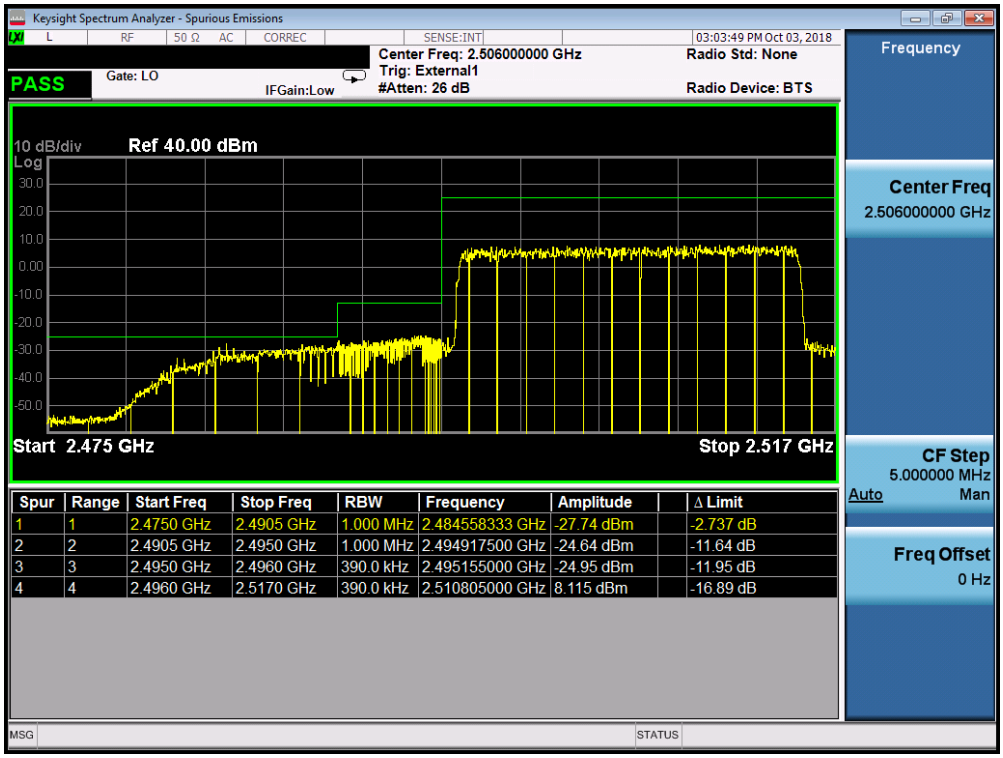
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489802500 GHz	-31.56 dBm	-6.560 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.493162500 GHz	-29.72 dBm	-16.72 dB
3	3	2.4950 GHz	2.4960 GHz	270.0 kHz	2.495180000 GHz	-31.30 dBm	-18.30 dB
4	4	2.4960 GHz	2.5170 GHz	270.0 kHz	2.509230000 GHz	-0.836 dBm	-25.84 dB

Plot 7-217. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - Full RB Configuration)



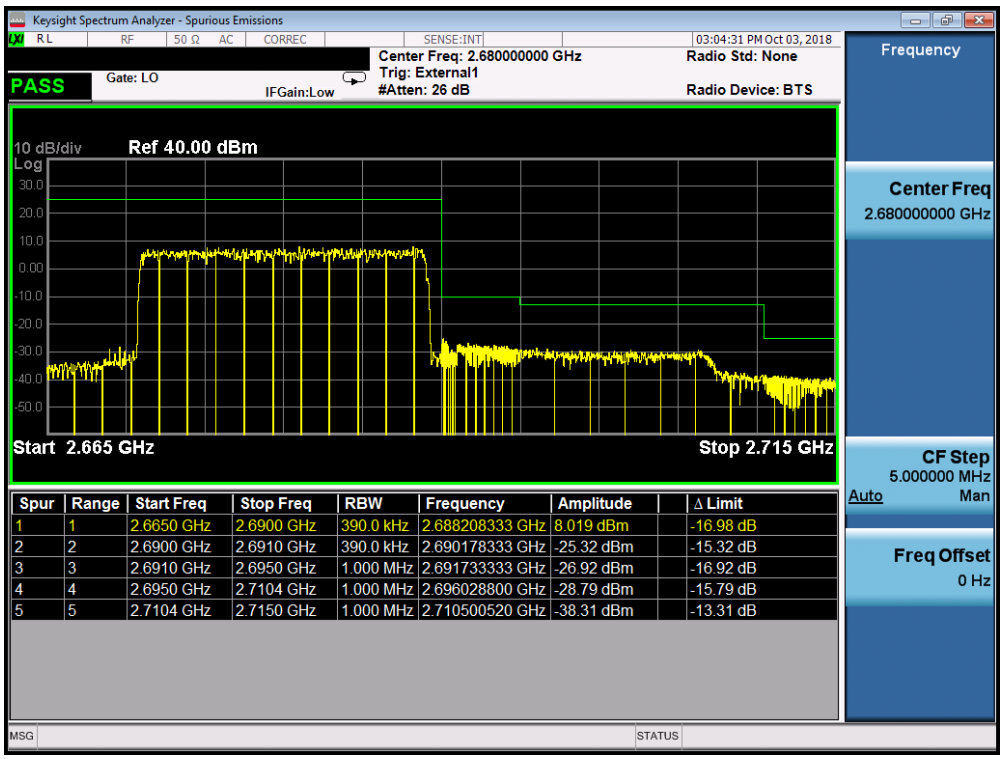
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	300.0 kHz	2.676875000 GHz	8.901 dBm	-16.10 dB
2	2	2.6900 GHz	2.6910 GHz	300.0 kHz	2.690323333 GHz	-26.69 dBm	-16.69 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692400000 GHz	-21.55 dBm	-11.55 dB
4	4	2.6950 GHz	2.7049 GHz	1.000 MHz	2.696530470 GHz	-22.03 dBm	-9.029 dB
5	5	2.7049 GHz	2.7150 GHz	1.000 MHz	2.709380070 GHz	-31.83 dBm	-6.828 dB

Plot 7-218. Upper ACP Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.484558333 GHz	-27.74 dBm	-2.737 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494917500 GHz	-24.64 dBm	-11.64 dB
3	3	2.4950 GHz	2.4960 GHz	390.0 kHz	2.495155000 GHz	-24.95 dBm	-11.95 dB
4	4	2.4960 GHz	2.5170 GHz	390.0 kHz	2.510805000 GHz	8.115 dBm	-16.89 dB

Plot 7-219. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	390.0 kHz	2.688208333 GHz	8.019 dBm	-16.98 dB
2	2	2.6900 GHz	2.6910 GHz	390.0 kHz	2.690178333 GHz	-25.32 dBm	-15.32 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691733333 GHz	-26.92 dBm	-16.92 dB
4	4	2.6950 GHz	2.7104 GHz	1.000 MHz	2.696028800 GHz	-28.79 dBm	-15.79 dB
5	5	2.7104 GHz	2.7150 GHz	1.000 MHz	2.710500520 GHz	-38.31 dBm	-13.31 dB

Plot 7-220. Upper ACP Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)

7.5 Peak-Average Ratio

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

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

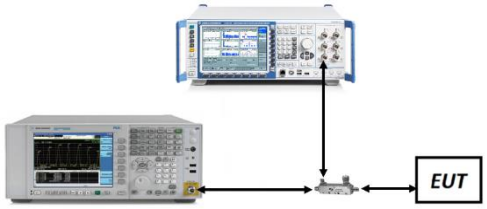
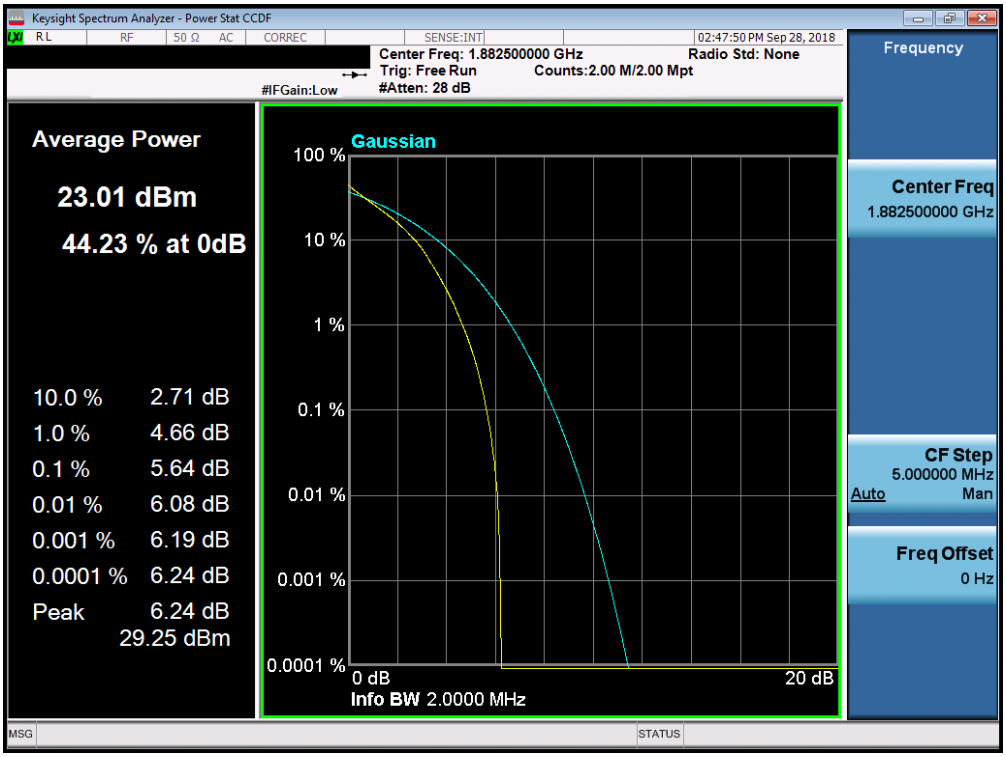


Figure 7-4. Test Instrument & Measurement Setup

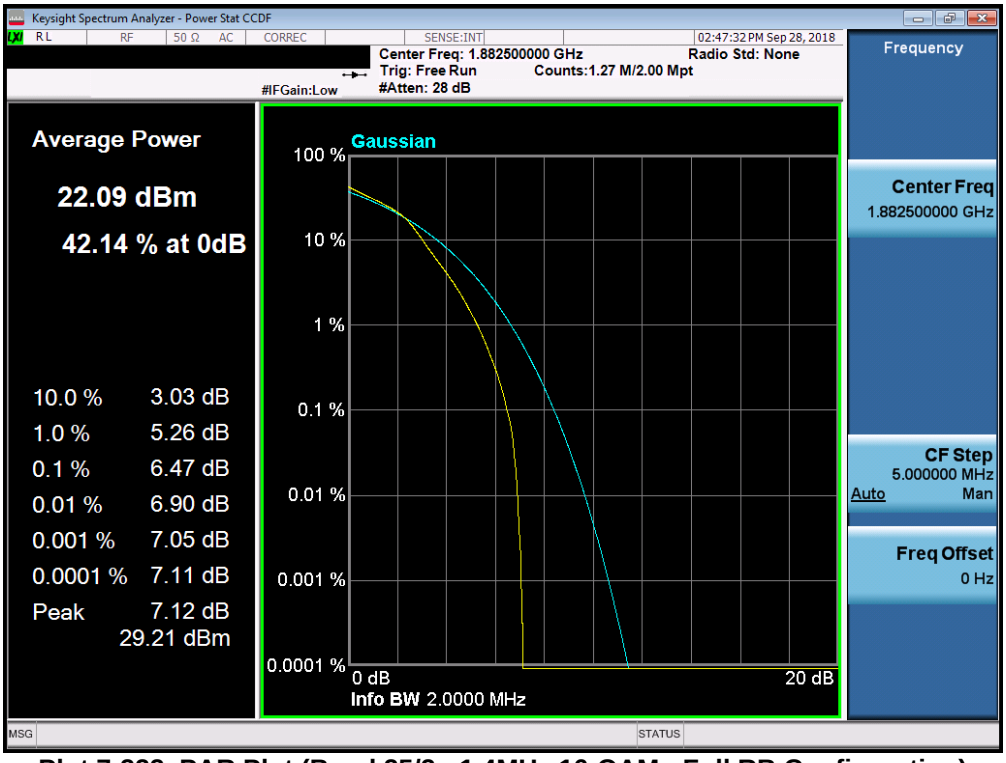
Test Notes

None.

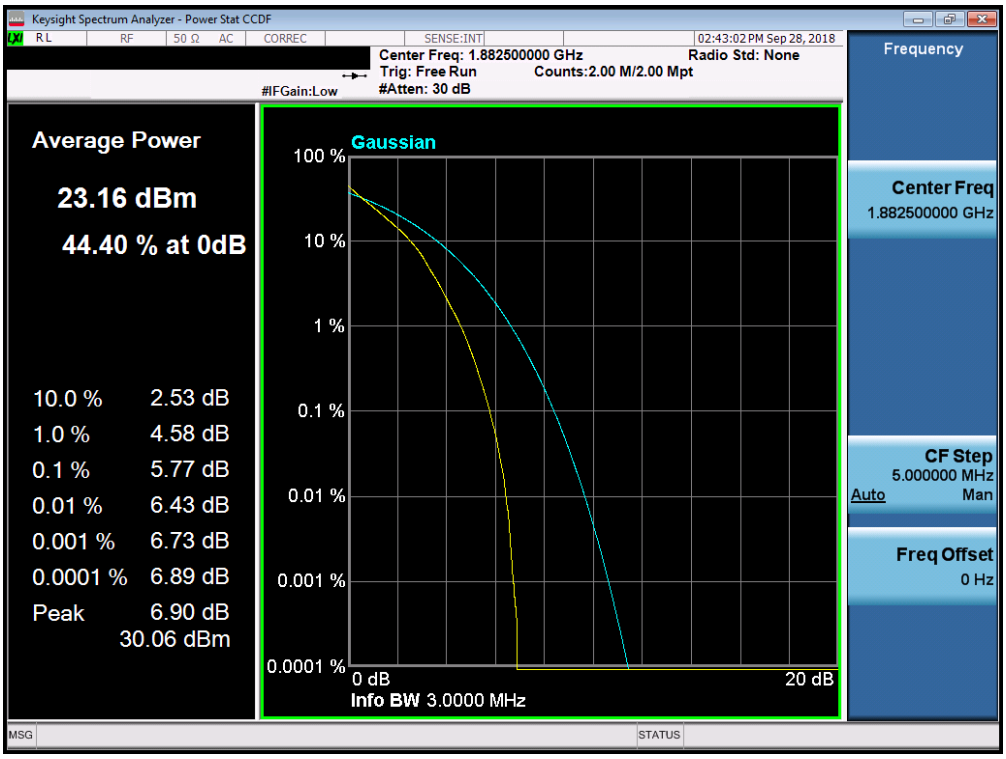
Band 25/2



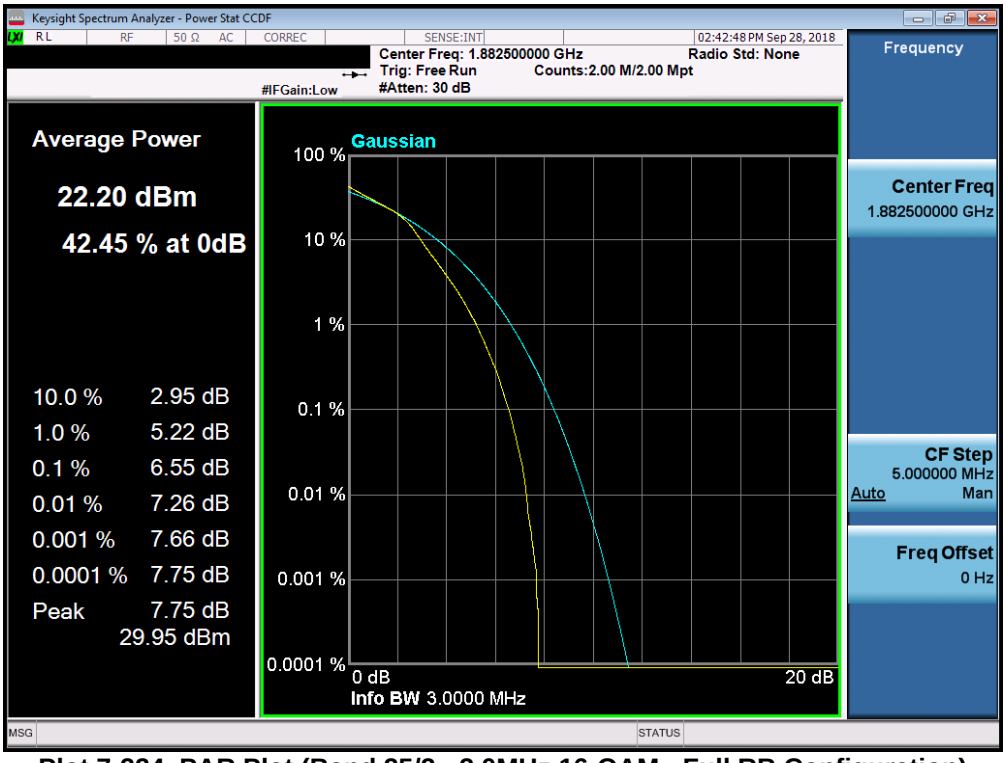
Plot 7-221. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



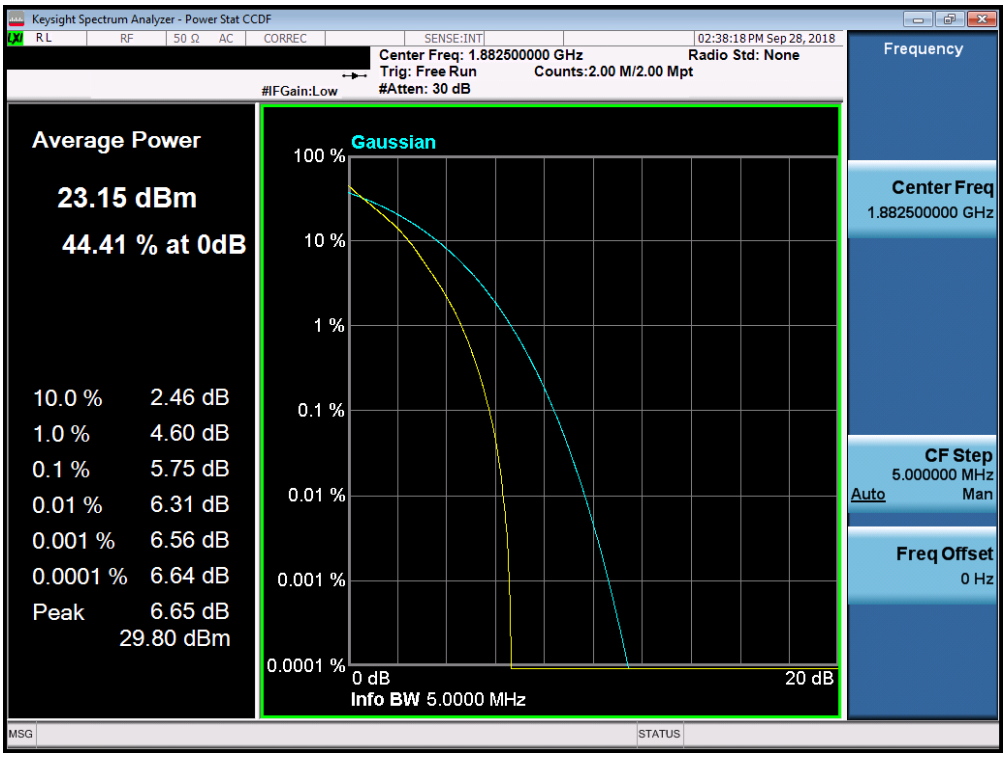
Plot 7-222. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)



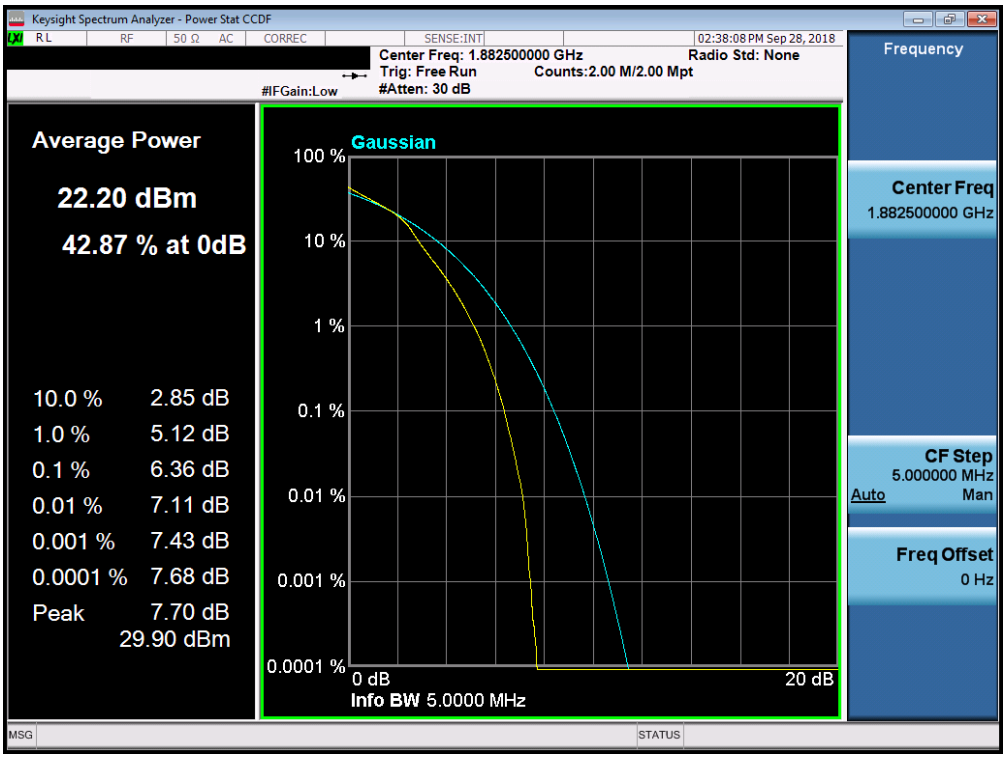
Plot 7-223. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



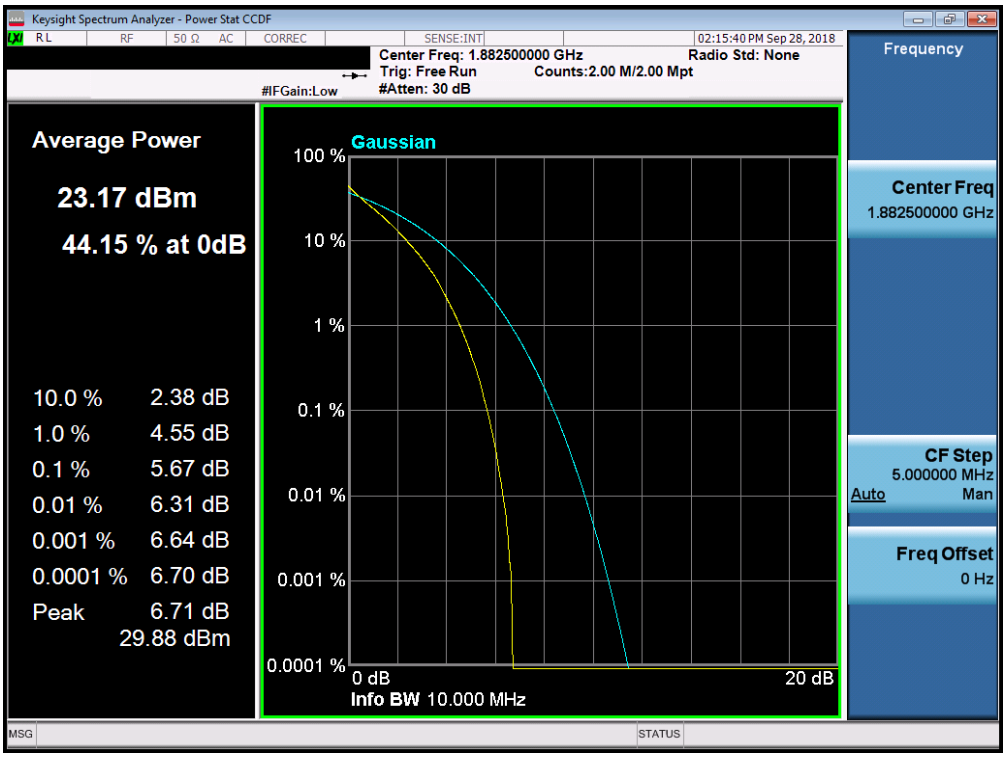
Plot 7-224. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



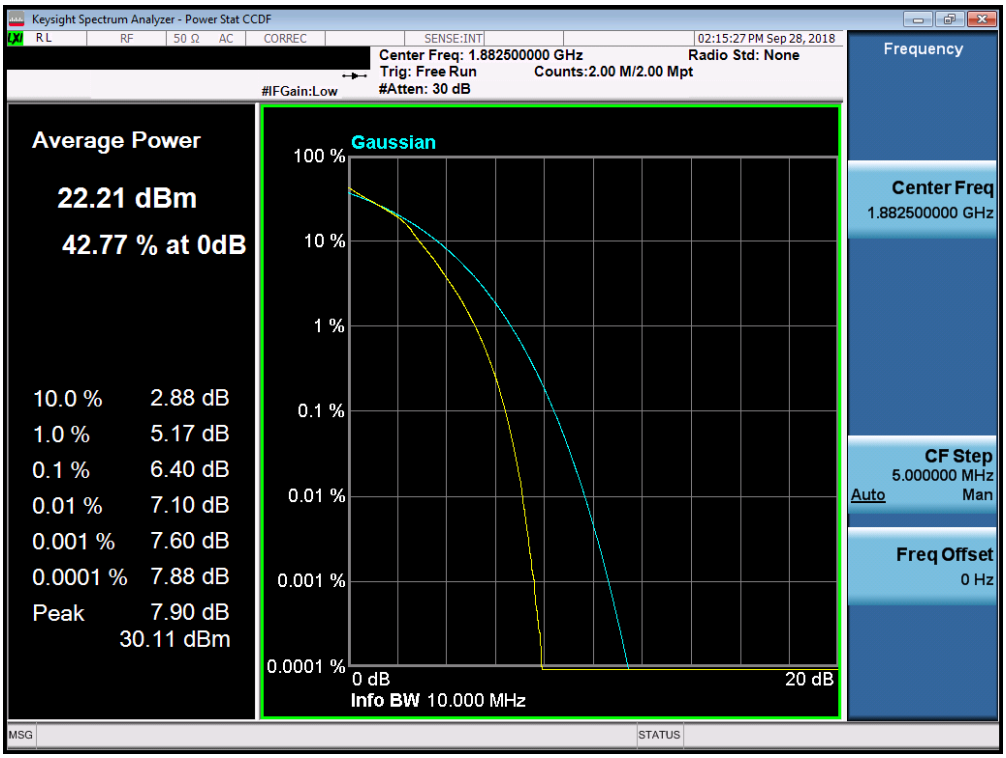
Plot 7-225. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



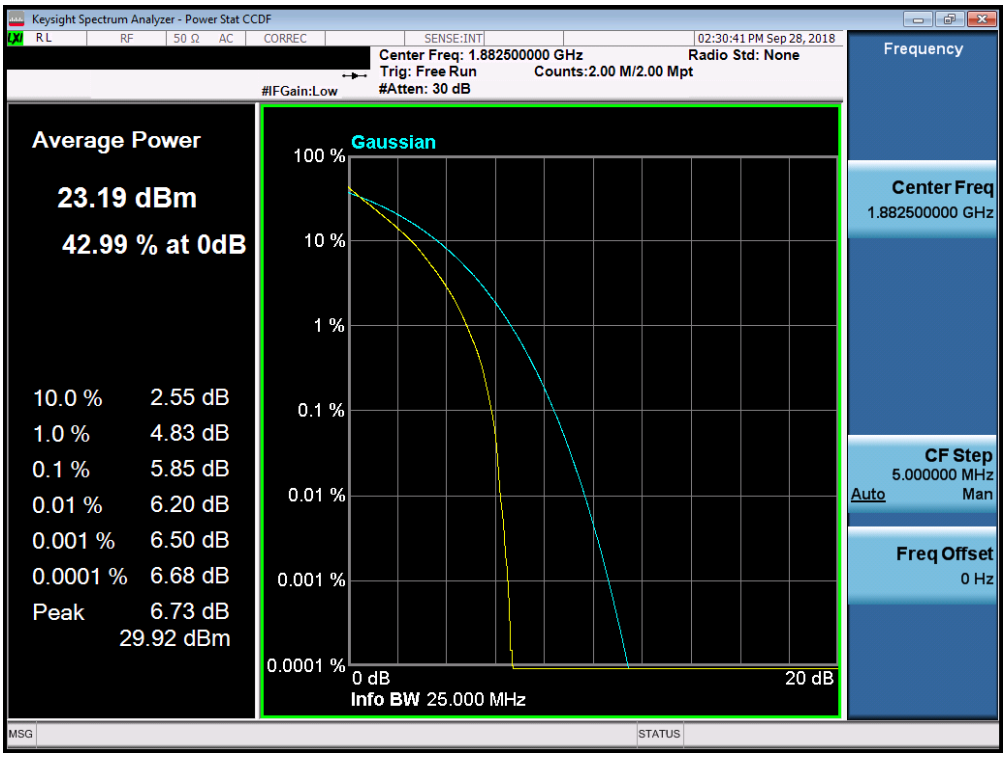
Plot 7-226. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)



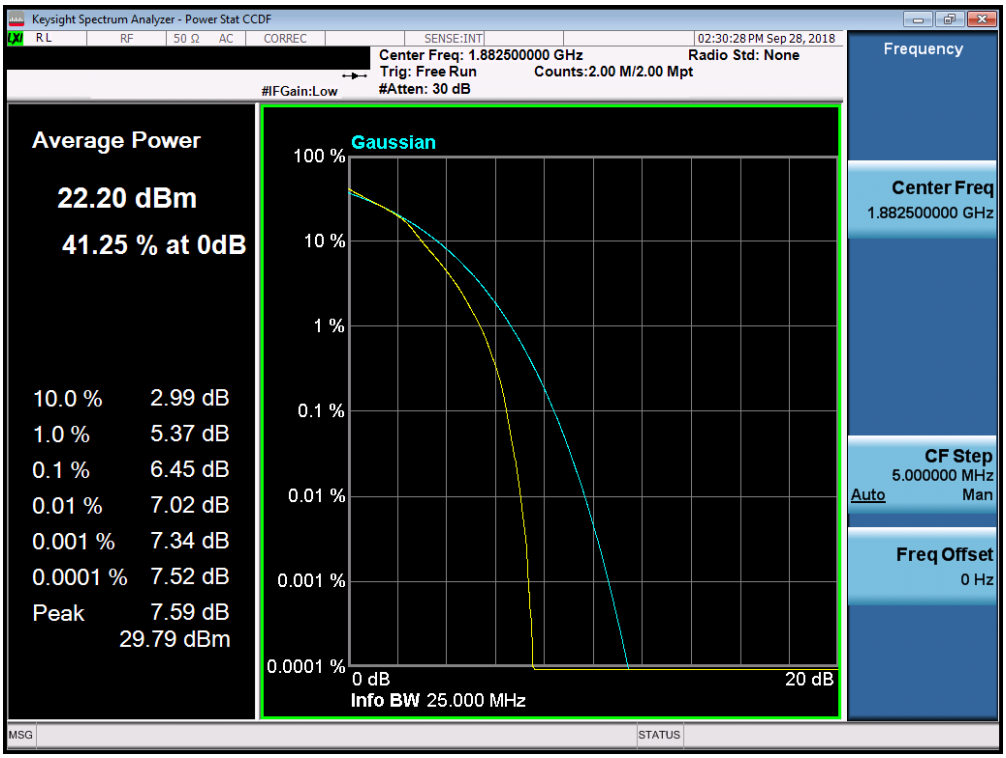
Plot 7-227. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



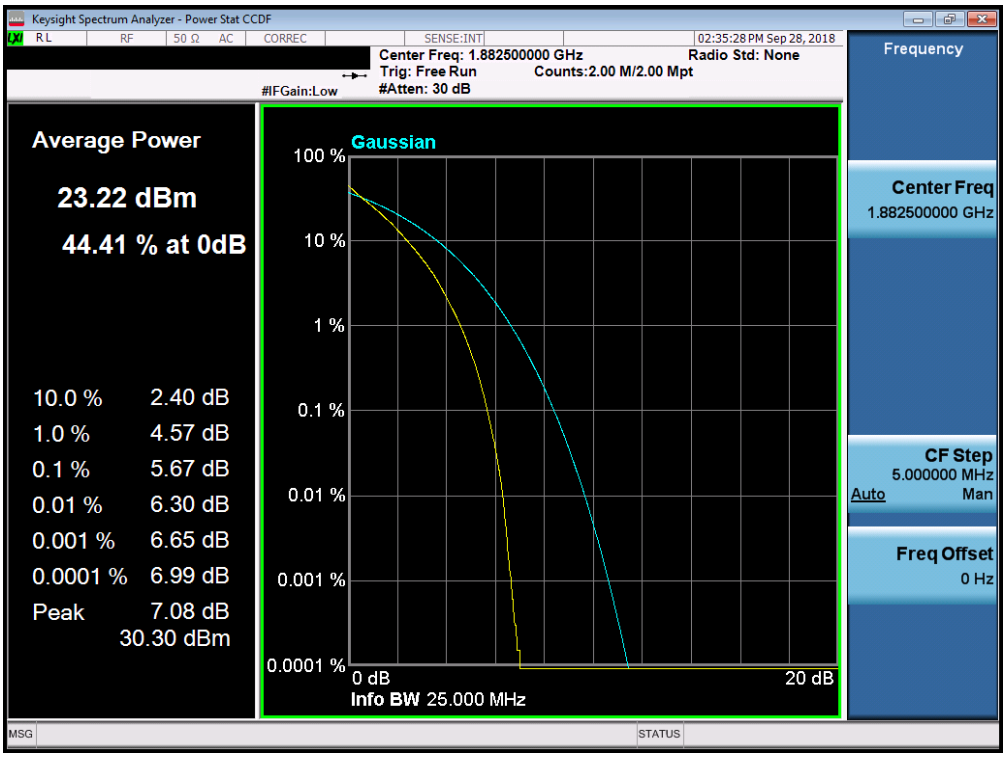
Plot 7-228. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



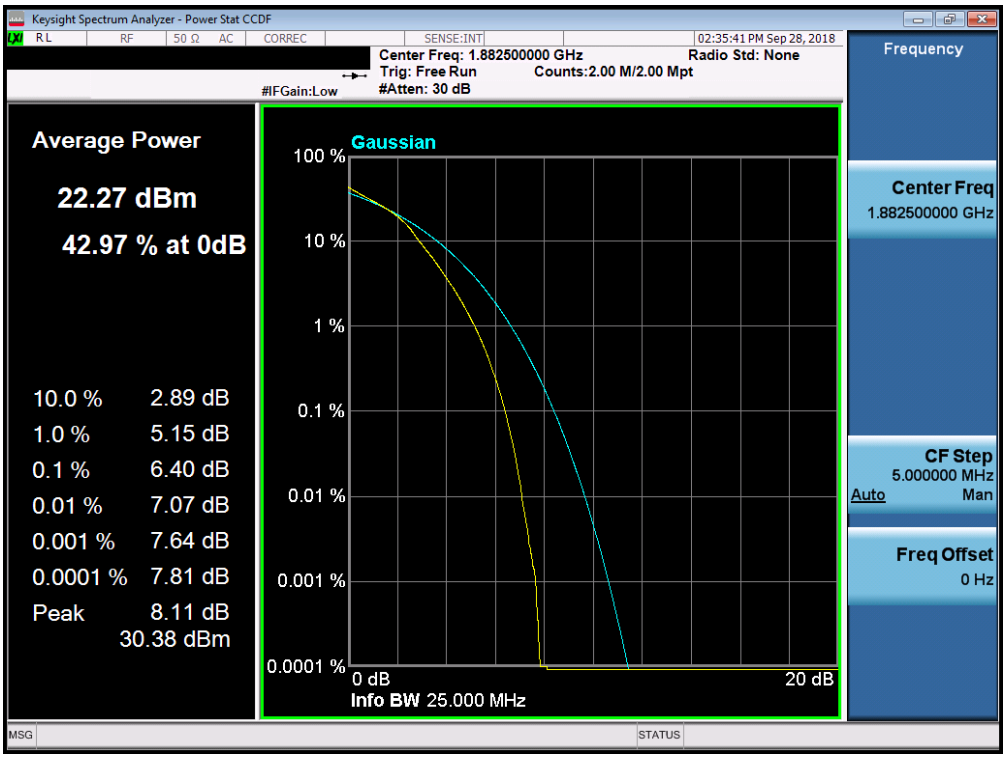
Plot 7-229. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-230. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

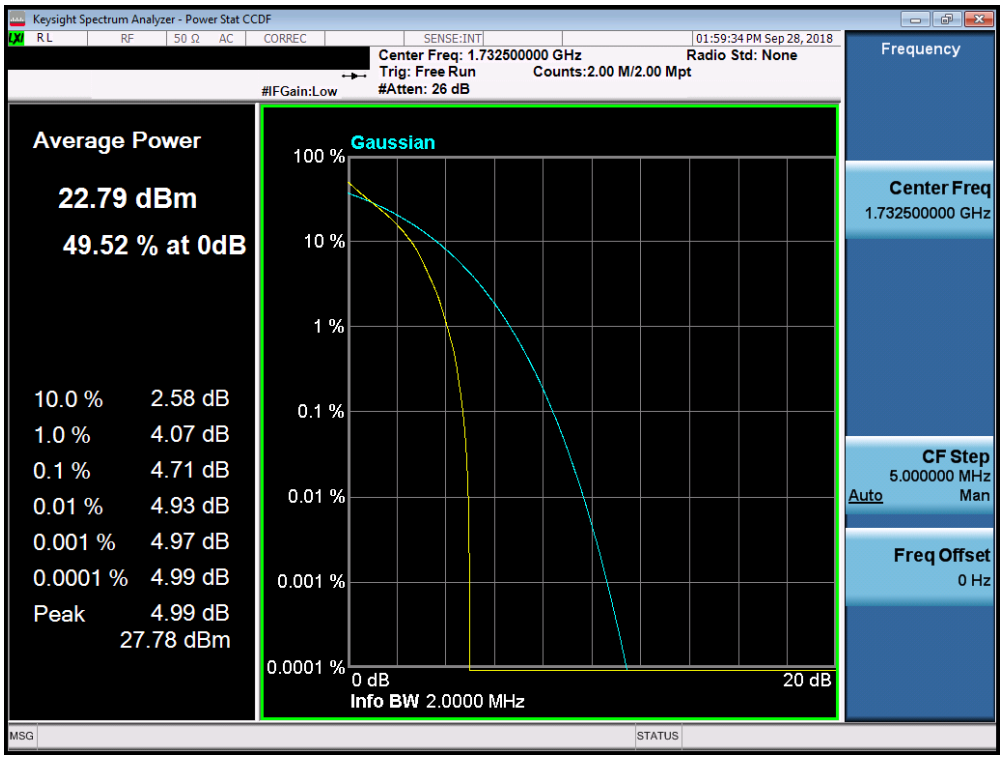


Plot 7-231. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

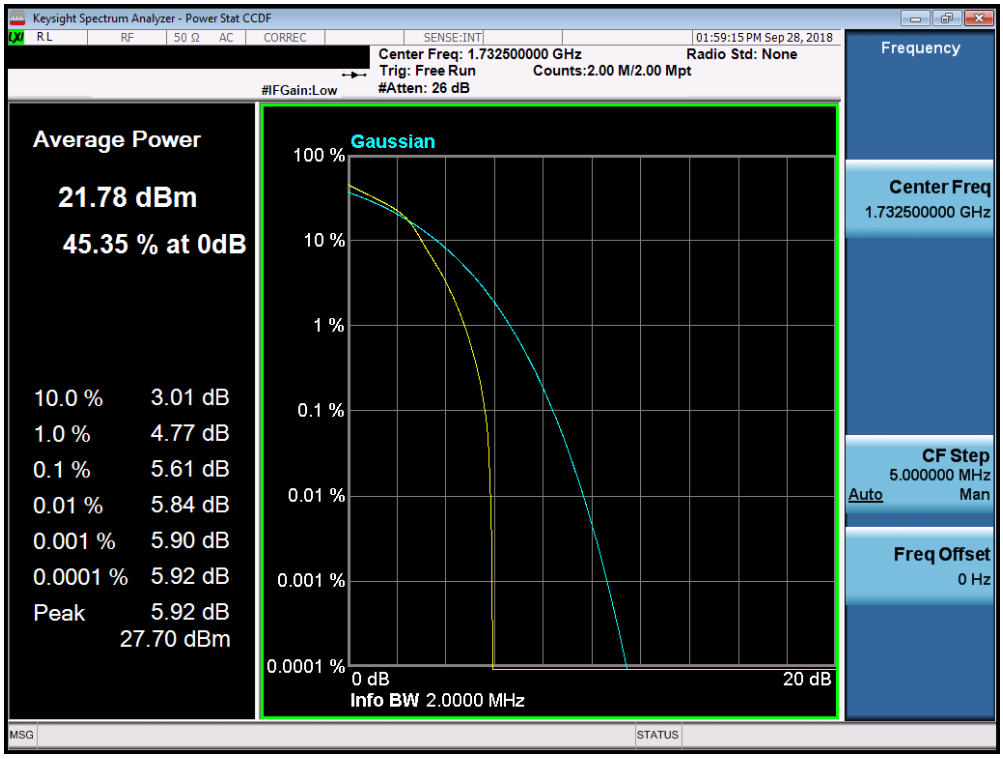


Plot 7-232. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)

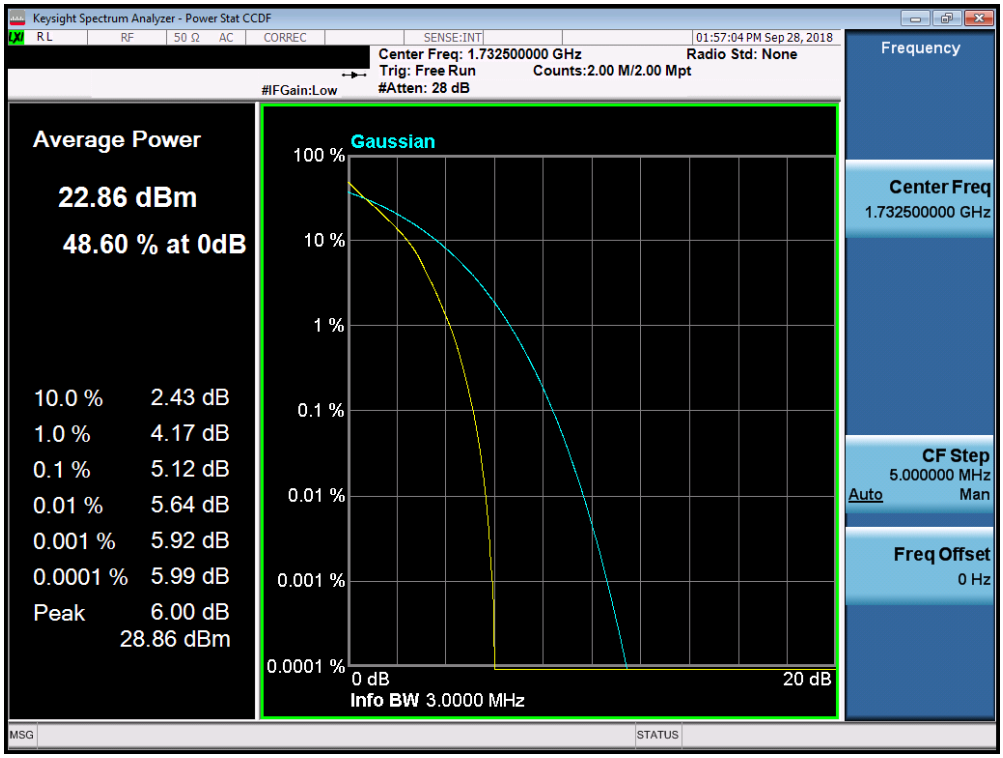
Band 4



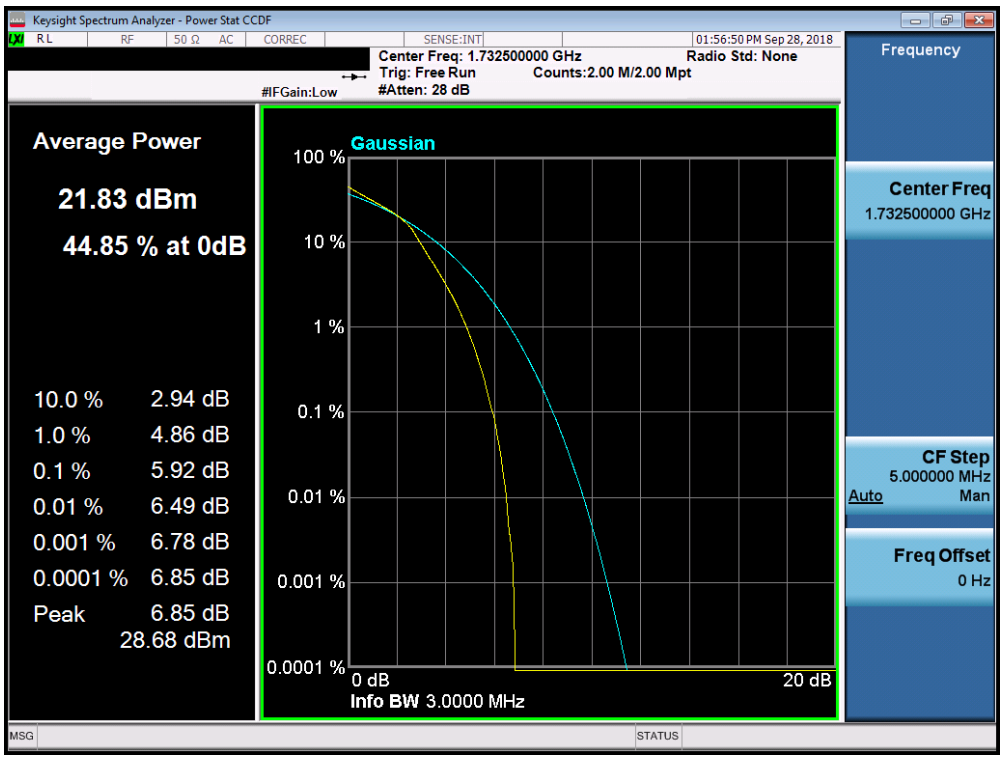
Plot 7-233. PAR Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



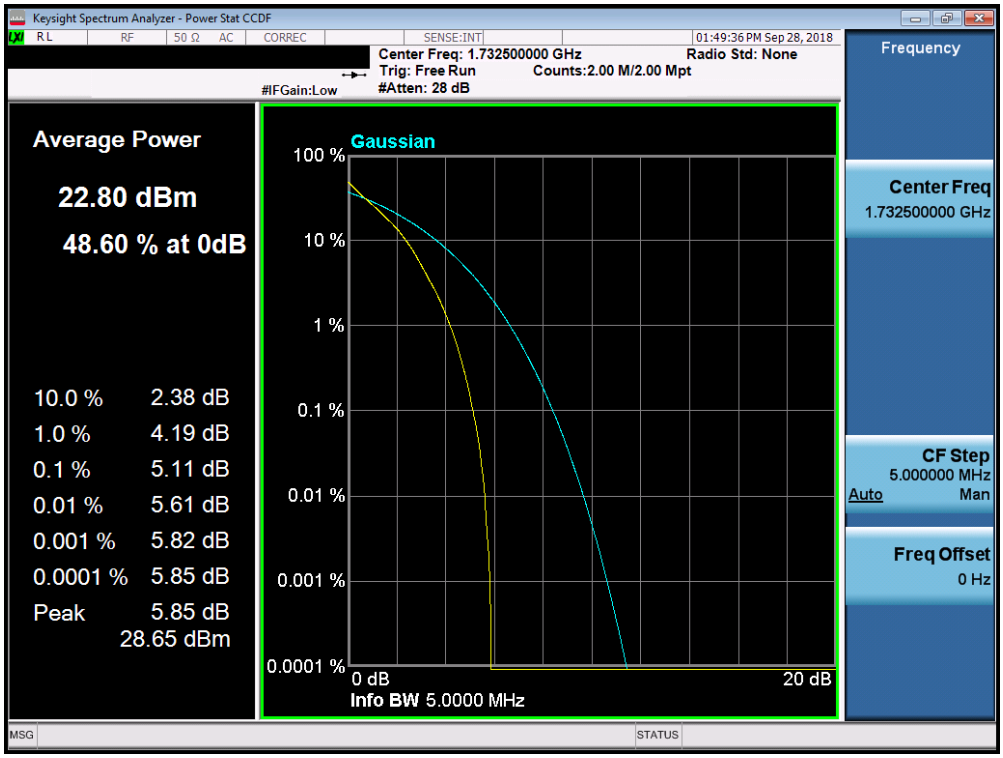
Plot 7-234. PAR Plot (Band 4 - 1.4MHz 16-QAM - Full RB Configuration)



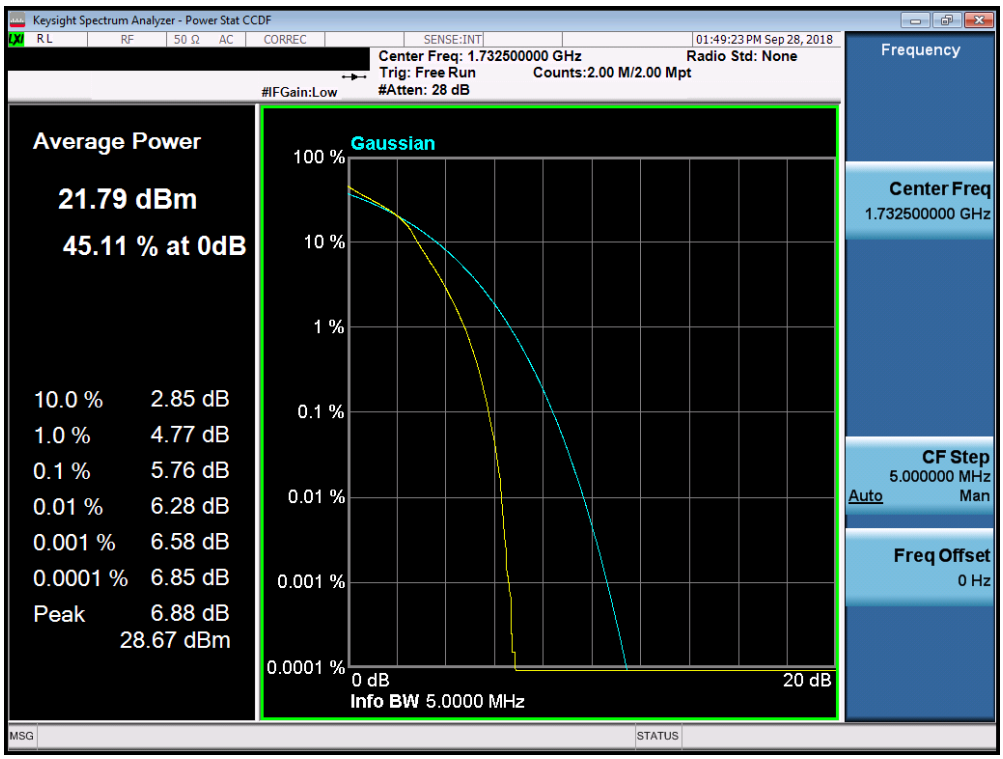
Plot 7-235. PAR Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



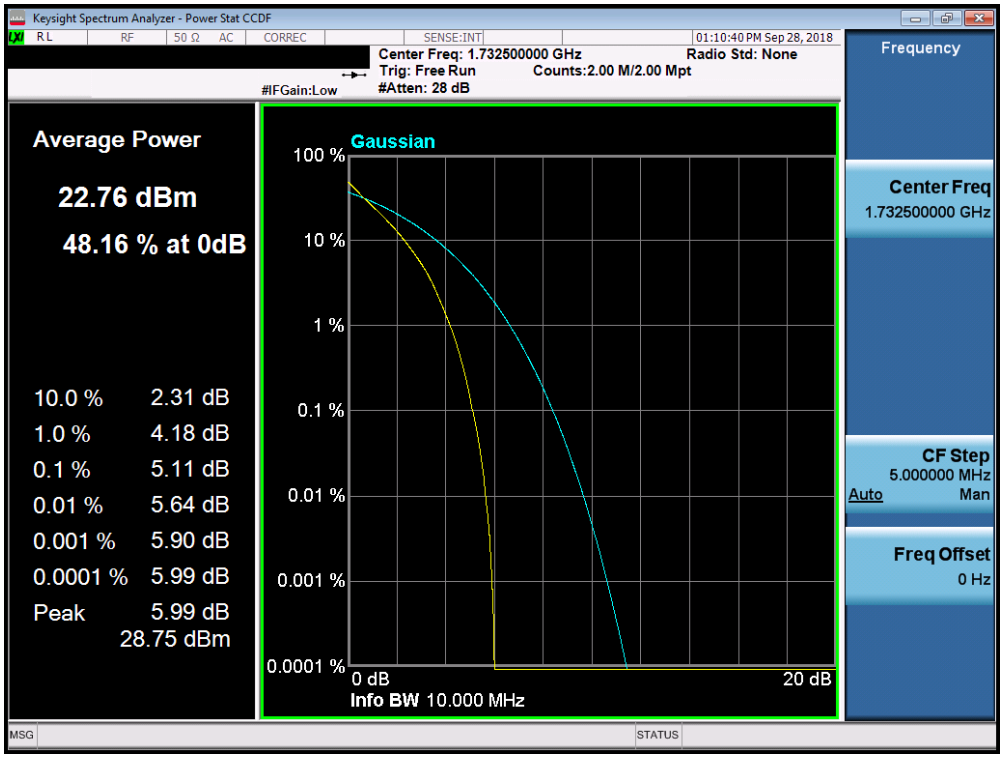
Plot 7-236. PAR Plot (Band 4 - 3.0MHz 16-QAM - Full RB Configuration)



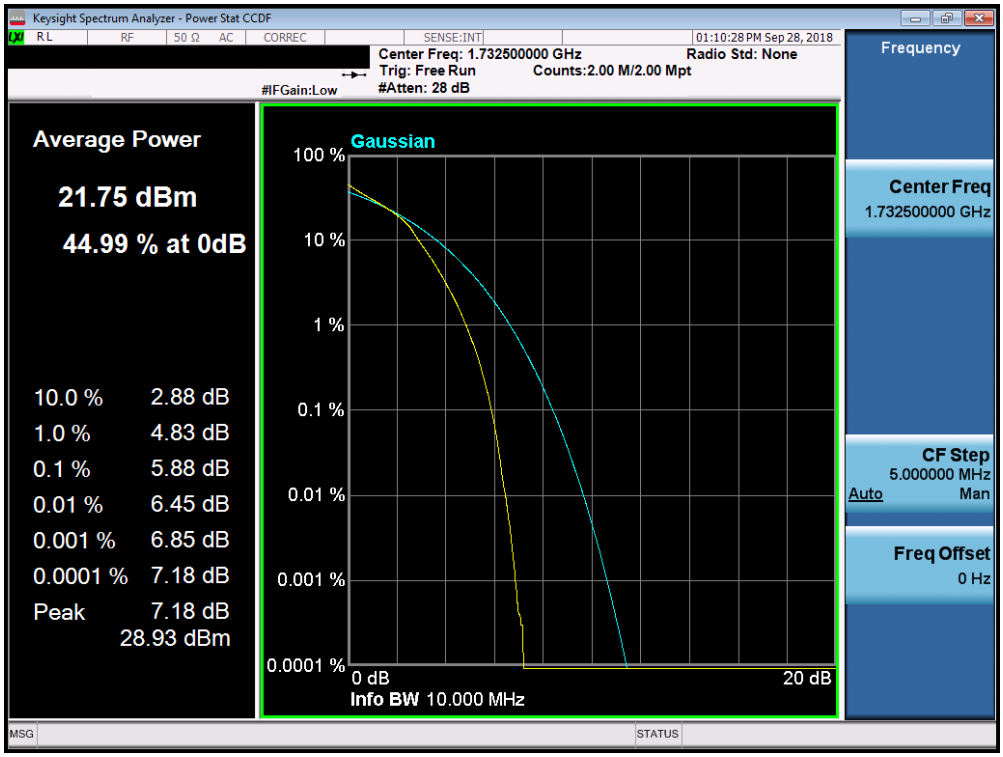
Plot 7-237. PAR Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



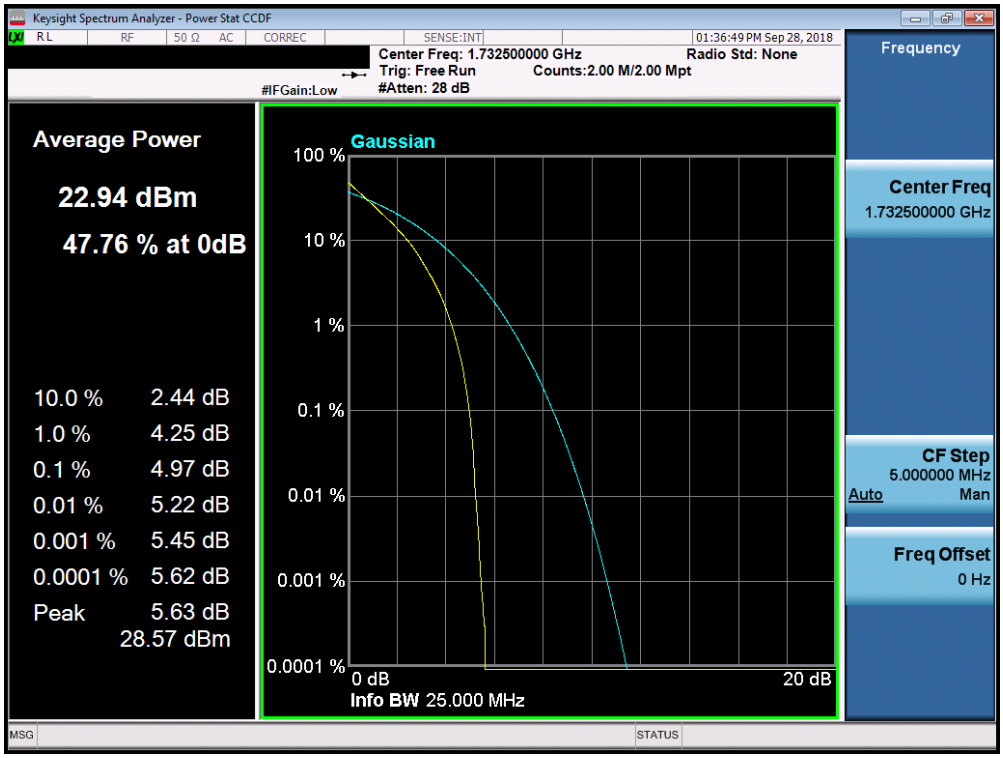
Plot 7-238. PAR Plot (Band 4 - 5.0MHz 16-QAM - Full RB Configuration)



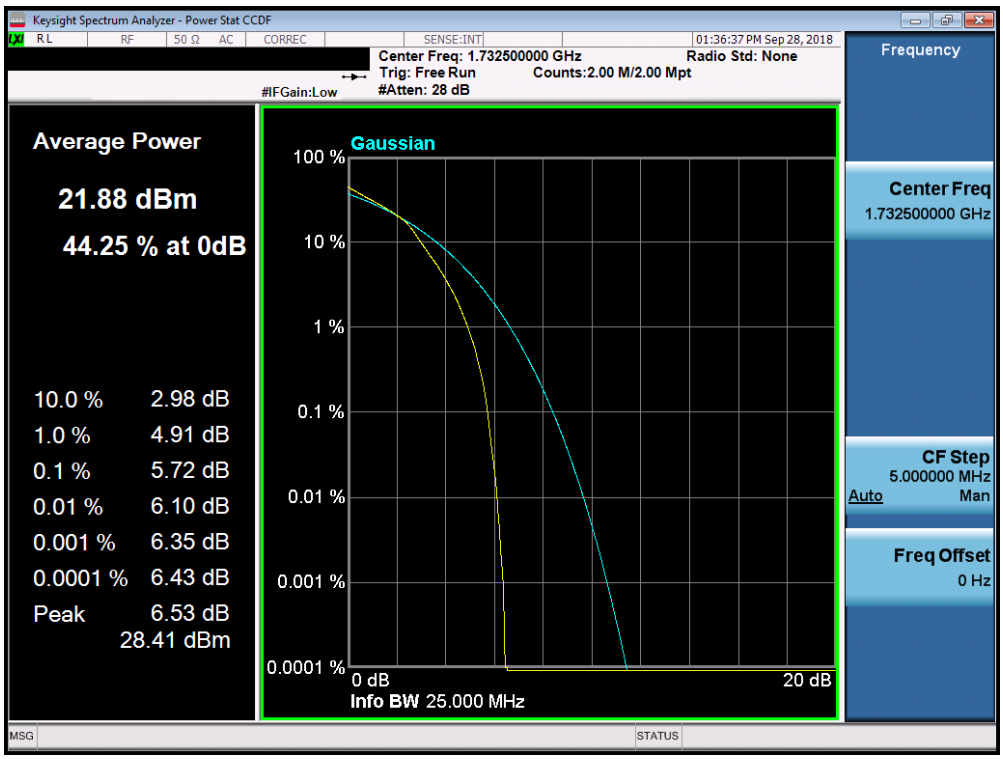
Plot 7-239. PAR Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



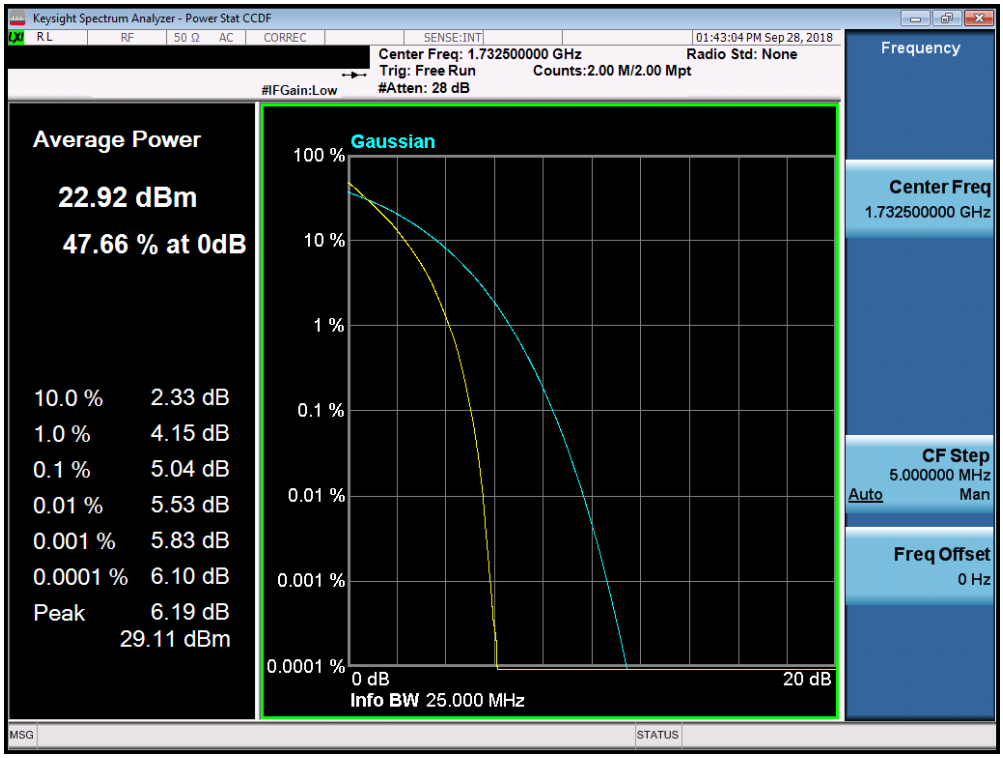
Plot 7-240. PAR Plot (Band 4 - 10.0MHz 16-QAM - Full RB Configuration)



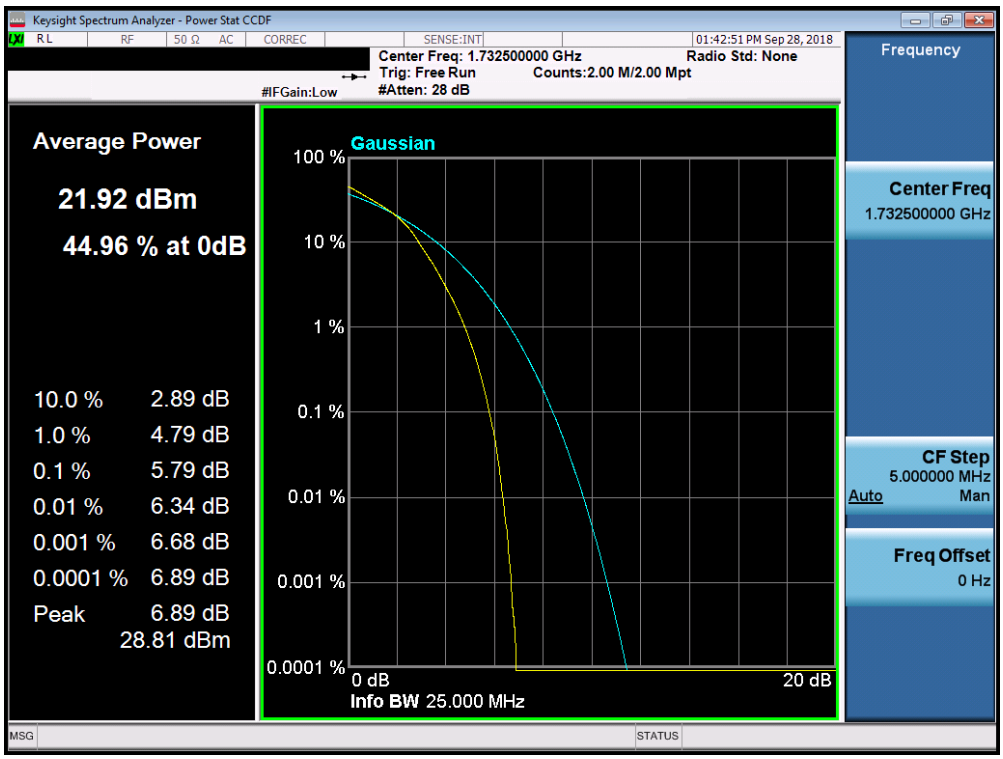
Plot 7-241. PAR Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-242. PAR Plot (Band 4 - 15.0MHz 16-QAM - Full RB Configuration)



Plot 7-243. PAR Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-244. PAR Plot (Band 4 - 20.0MHz 16-QAM - Full RB Configuration)

7.6 Additional Maximum Power Reduction (A-MPR)

§2.1046

Test Overview

A-MPR is implemented in this device when operating at Power Class 2 in LTE Band 41 per the A-MPR specification in 3GPP TS 36.101. The conducted powers are shown herein to cover the different A-MPR levels specified in the standard. Measurement equipment was set up with triggering/gating on the spectrum analyzer such that powers were measured only during the on-time of the signal.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.2.2

Test Settings

1. Span = 2 x OBW to 3 x OBW
2. RBW = 1% to 5% of the OBW
3. Number of measurement points in sweep ≥ 2 x span / RBW
4. Sweep = auto-couple (less than transmission burst duration)
5. Detector = RMS (power)
6. Trigger was set to enable power measurements only on full power bursts
7. Trace was allowed to stabilize
8. Spectrum analyzer's "Channel Power" function was used to compute the power by integrating the spectrum across the OBW of the signal

Test Setup

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

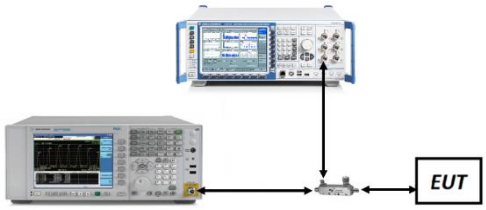


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None.

Test Case	NS	MCC	MNC	Channel BW [MHz]	Channel Number	Channel Frequency [MHz]	Modulation	RB Size	RB Offset	MPR [dB]	A-MPR [dB]	Measured Power [dBm]	Lowest Typical Power [dBm]	Delta [dB]
1	01	312	530	5	39675	2498.5	QPSK	1	0	0	≤ 3	24.36	23.7	**0.66**
							16-QAM			≤ 1		23.58	22.7	**0.88**
2				5	39675	2498.5	QPSK	1	9	0	0	27.36	26.7	**0.66**
							16-QAM			≤ 1		26.57	25.7	**0.87**
3				10	39700	2501	QPSK	1	0	0	≤ 5	22.47	21.7	**0.77**
							16-QAM	1	0	≤ 1		21.71	20.7	**1.01**
4				10	39700	2501	QPSK	20	0	0	≤ 2	24.45	23.7	**0.75**
							16-QAM	20	0	≤ 1		23.35	22.7	**0.65**
5				10	39700	2501	QPSK	50	0	0	≤ 3	23.53	22.7	**0.83**
							16-QAM	50	0	≤ 1		22.56	21.7	**0.86**
6				10	39700	2501	QPSK	25	20	0	≤ 1	25.52	24.7	**0.82**
							16-QAM	25	20	≤ 1		24.57	23.7	**0.87**
7				10	39700	2501	QPSK	1	36	0	0	27.43	26.7	**0.73**
							16-QAM	1	36	≤ 1		26.66	25.7	**0.96**
8				15	39725	2503.5	QPSK	1	0	0	≤ 5	22.53	21.7	**0.83**
							16-QAM	1	0	≤ 1		21.76	20.7	**1.06**
9				15	39725	2503.5	QPSK	20	0	0	≤ 2	24.53	23.7	**0.83**
							16-QAM	20	0	≤ 1		23.43	22.7	**0.73**
10				15	39725	2503.5	QPSK	75	0	0	≤ 4	22.57	21.7	**0.87**
							16-QAM	75	0	≤ 1		21.58	20.7	**0.88**
11				15	39725	2503.5	QPSK	50	15	0	≤ 3	23.59	22.7	**0.89**
							16-QAM	50	15	≤ 1		22.62	21.7	**0.92**
12				15	39725	2503.5	QPSK	1	60	0	0	27.46	26.7	**0.76**
							16-QAM	1	60	≤ 1		26.66	25.7	**0.96**
13				20	39750	2506	QPSK	1	0	0	≤ 5	22.65	21.7	**0.95**
							16-QAM	1	0	≤ 1		21.85	20.7	**1.15**
14				20	39750	2506	QPSK	20	0	0	≤ 2	24.58	23.7	**0.88**
							16-QAM	20	0	≤ 1		23.49	22.7	**0.79**
15				20	39750	2506	QPSK	100	0	0	≤ 4	22.63	21.7	**0.93**
							16-QAM	100	0	≤ 1		21.64	20.7	**0.94**
16				20	39750	2506	QPSK	75	24	0	≤ 3	23.75	22.7	**1.05**
							16-QAM	75	24	≤ 1		22.77	21.7	**1.07**
17				20	39750	2506	QPSK	1	77	0	0	27.47	26.7	**0.77**
							16-QAM	1	77	≤ 1		26.66	25.7	**0.96**
18	01	310	120	5	39675	2498.5	QPSK	1	0	0	≤ 3	24.37	23.7	**0.67**
							16-QAM			≤ 1		23.6	22.7	**0.90**
19	01	001	01	5	39675	2498.5	QPSK	1	0	0	0	27.28	26.7	**0.58**
							16-QAM			≤ 1		26.46	25.7	**0.76**

Table 7-3. A-MPR Conducted Power Measurements

7.7 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.

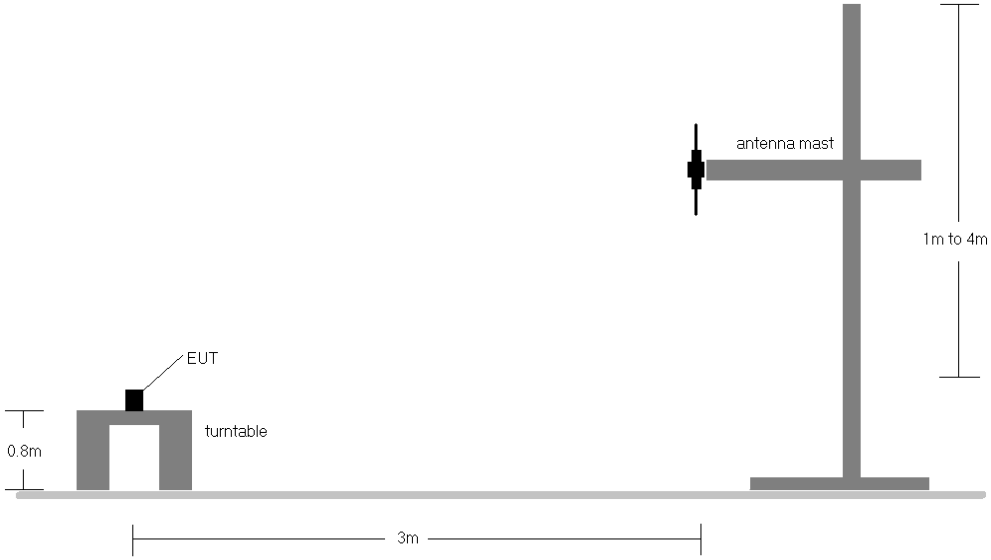


Figure 7-6. Radiated Test Setup <1GHz

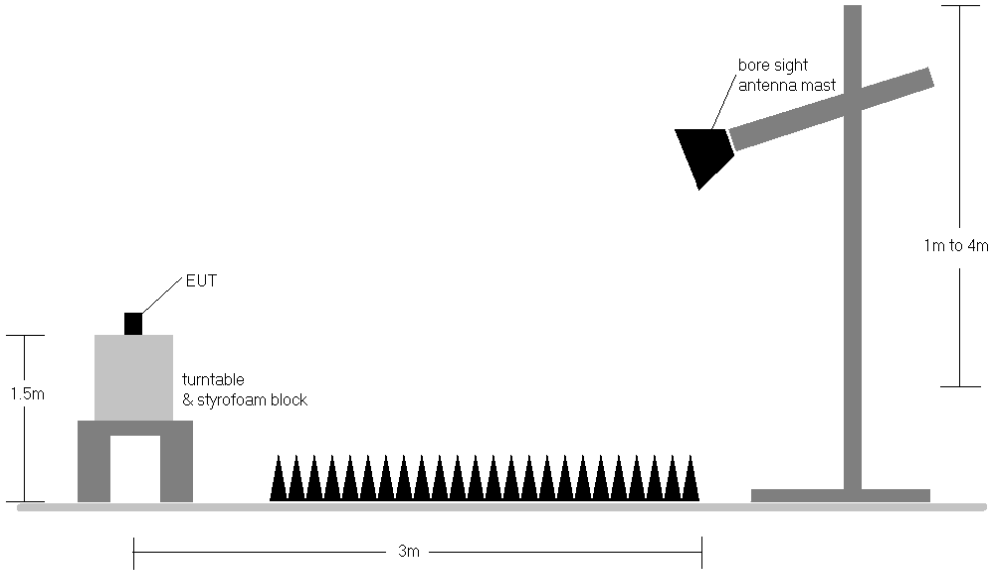


Figure 7-7. Radiated Test Setup >1GHz

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.

Radiated Power (ERP/EIRP)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	150	81	1 / 5	19.84	1.40	19.09	0.081	34.77	-15.68	21.24	0.133	36.99	-15.75
707.50	1.4	QPSK	V	150	80	3 / 2	20.40	1.43	19.68	0.093	34.77	-15.09	21.83	0.152	36.99	-15.16
715.30	1.4	QPSK	V	150	78	1 / 0	20.70	1.46	**20.01**	0.100	34.77	-14.76	**22.16**	0.165	36.99	-14.82
715.30	1.4	16-QAM	V	150	78	3 / 2	19.77	1.46	**19.08**	0.081	34.77	-15.69	**21.23**	0.133	36.99	-15.75
700.50	3	QPSK	V	150	88	1 / 14	19.93	1.40	19.18	0.083	34.77	-15.59	21.33	0.136	36.99	-15.66
707.50	3	QPSK	V	150	82	1 / 14	20.34	1.43	19.62	0.092	34.77	-15.15	21.77	0.150	36.99	-15.22
714.50	3	QPSK	V	150	80	1 / 14	20.84	1.46	**20.15**	**0.104**	34.77	-14.62	**22.30**	**0.170**	36.99	-14.69
714.50	3	16-QAM	V	150	80	1 / 14	19.60	1.46	**18.91**	0.078	34.77	-15.86	**21.06**	0.128	36.99	-15.93
701.50	5	QPSK	V	150	77	1 / 24	19.91	1.41	19.17	0.083	34.77	-15.60	21.32	0.135	36.99	-15.67
707.50	5	QPSK	V	150	80	1 / 0	20.04	1.43	19.32	0.086	34.77	-15.45	21.47	0.140	36.99	-15.52
713.50	5	QPSK	V	150	87	1 / 0	20.19	1.46	**19.50**	0.089	34.77	-15.27	**21.65**	0.146	36.99	-15.34
713.50	5	16-QAM	V	150	87	1 / 24	19.51	1.46	**18.82**	0.076	34.77	-15.95	**20.97**	0.125	36.99	-16.02
704.00	10	QPSK	V	150	86	1 / 49	20.27	1.42	19.54	0.090	34.77	-15.23	21.69	0.147	36.99	-15.30
707.50	10	QPSK	V	150	77	1 / 49	20.13	1.43	19.41	0.087	34.77	-15.36	21.56	0.143	36.99	-15.43
711.00	10	QPSK	V	150	72	1 / 49	20.52	1.45	**19.82**	0.096	34.77	-14.95	**21.97**	0.157	36.99	-15.02
704.00	10	16-QAM	V	150	86	1 / 49	19.57	1.42	**18.84**	0.077	34.77	-15.93	**20.99**	0.126	36.99	-16.00
714.50	3	QPSK	H	150	250	1 / 14	20.14	1.46	19.45	0.088	34.77	-15.32	21.60	0.145	36.99	-15.39

Table 7-4. ERP/EIRP 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]
779.50	5	QPSK	H	150	272	1 / 0	23.10	1.32	**22.27**	0.169	34.77	-12.50	**24.42**	0.277	36.99	-12.57
782.00	5	QPSK	H	150	276	1 / 24	22.67	1.33	21.85	0.153	34.77	-12.92	24.00	0.251	36.99	-12.99
784.50	5	QPSK	H	150	281	1 / 0	22.79	1.34	21.98	0.158	34.77	-12.79	24.13	0.259	36.99	-12.86
784.50	5	16-QAM	H	150	281	1 / 24	22.12	1.34	**21.31**	0.135	34.77	-13.46	**23.46**	0.222	36.99	-13.53
782.00	10	QPSK	H	150	284	1 / 0	23.13	1.33	**22.31**	**0.170**	34.77	-12.46	**24.46**	**0.279**	36.99	-12.53
782.00	10	16-QAM	H	150	284	1 / 49	22.14	1.33	**21.32**	0.135	34.77	-13.45	**23.47**	0.222	36.99	-13.52
782.00	10	QPSK	V	150	274	1 / 0	22.87	1.33	22.05	0.160	34.77	-12.72	24.20	0.263	36.99	-12.79

Table 7-5. ERP/EIRP 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	150	1 / 5	15.30	6.75	19.90	0.098	38.45	-18.55	22.05	0.160	40.61	-18.56
836.50	1.4	QPSK	H	150	150	1 / 0	15.33	6.78	19.96	0.099	38.45	-18.50	22.11	0.162	40.61	-18.50
848.30	1.4	QPSK	H	150	3	1 / 5	15.62	6.80	**20.27**	0.106	38.45	-18.18	**22.42**	0.175	40.61	-18.19
848.30	1.4	16-QAM	H	150	3	1 / 5	14.83	6.80	**19.48**	0.089	38.45	-18.97	**21.63**	0.146	40.61	-18.98
825.50	3	QPSK	H	150	3	1 / 14	15.41	6.75	**20.01**	0.100	38.45	-18.44	**22.16**	0.165	40.61	-18.44
836.50	3	QPSK	H	150	1	1 / 0	15.37	6.78	20.00	0.100	38.45	-18.46	22.15	0.164	40.61	-18.46
847.50	3	QPSK	H	150	3	1 / 14	13.27	6.80	17.92	0.062	38.45	-20.53	20.07	0.102	40.61	-20.54
847.50	3	16-QAM	H	150	3	1 / 14	14.81	6.80	**19.46**	0.088	38.45	-18.99	**21.61**	0.145	40.61	-19.00
826.50	5	QPSK	H	150	0	1 / 24	15.38	6.76	19.99	0.100	38.45	-18.47	22.14	0.164	40.61	-18.47
836.50	5	QPSK	H	150	357	1 / 0	15.23	6.78	19.86	0.097	38.45	-18.60	22.01	0.159	40.61	-18.60
846.50	5	QPSK	H	150	1	1 / 24	15.58	6.80	**20.23**	0.105	38.45	-18.23	**22.38**	0.173	40.61	-18.23
846.50	5	16-QAM	H	150	1	1 / 24	14.80	6.80	**19.45**	0.088	38.45	-19.01	**21.60**	0.144	40.61	-19.01
829.00	10	QPSK	H	150	2	1 / 49	14.38	6.76	18.99	0.079	38.45	-19.46	21.14	0.130	40.61	-19.47
836.50	10	QPSK	H	150	1	1 / 0	15.42	6.78	20.05	0.101	38.45	-18.41	22.20	0.166	40.61	-18.41
844.00	10	QPSK	H	150	359	1 / 49	15.74	6.79	**20.38**	**0.109**	38.45	-18.07	**22.53**	**0.179**	40.61	-18.08
844.00	10	16-QAM	H	150	359	1 / 49	14.88	6.79	**19.52**	0.090	38.45	-18.93	**21.67**	0.147	40.61	-18.94
844.00	10	QPSK	V	150	105	1 / 49	12.31	6.80	16.96	0.050	38.45	-21.49	19.11	0.081	40.61	-21.50

Table 7-6. ERP/EIRP 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	357	1 / 0	15.48	6.77	20.10	0.102	38.45	-18.36	22.25	0.168	40.61	-18.36
836.50	15	QPSK	H	150	2	1 / 0	15.59	6.78	20.22	0.105	38.45	-18.24	22.37	0.172	40.61	-18.24
841.50	15	QPSK	H	150	359	1 / 74	15.73	6.79	**20.37**	0.109	38.45	-18.09	**22.52**	0.178	40.61	-18.09
841.50	15	16-QAM	H	150	359	1 / 74	14.77	6.79	**19.41**	0.087	38.45	-19.05	**21.56**	0.143	40.61	-19.05

Table 7-7. ERP/EIRP 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	214	173	1 / 0	11.90	8.16	20.06	0.101	30.00	-9.94
1732.50	1.4	QPSK	H	132	209	1 / 0	11.90	8.18	**20.08**	0.102	30.00	-9.92
1754.30	1.4	QPSK	H	186	173	1 / 0	10.18	8.21	18.39	0.069	30.00	-11.61
1732.50	1.4	16-QAM	H	132	209	1 / 0	11.83	8.18	**20.01**	0.100	30.00	-9.99
1711.50	3	QPSK	H	210	173	1 / 14	12.39	8.16	**20.55**	0.113	30.00	-9.45
1732.50	3	QPSK	H	123	201	1 / 0	12.09	8.18	20.27	0.106	30.00	-9.73
1753.50	3	QPSK	H	153	177	1 / 0	11.81	8.21	20.02	0.100	30.00	-9.98
1732.50	3	16-QAM	H	123	201	1 / 0	11.97	8.18	**20.15**	0.104	30.00	-9.85
1712.50	5	QPSK	H	144	37	1 / 0	11.90	8.16	20.06	0.101	30.00	-9.94
1732.50	5	QPSK	H	113	196	1 / 0	12.37	8.18	20.55	0.114	30.00	-9.45
1752.50	5	QPSK	H	185	172	1 / 24	12.55	8.20	**20.75**	0.119	30.00	-9.25
1732.50	5	16-QAM	H	113	196	1 / 0	12.24	8.18	**20.42**	0.110	30.00	-9.58
1715.00	10	QPSK	H	111	197	1 / 49	13.62	8.16	**21.78**	0.151	30.00	-8.22
1732.50	10	QPSK	H	115	226	1 / 0	12.72	8.18	20.90	0.123	30.00	-9.10
1750.00	10	QPSK	H	101	202	1 / 49	12.82	8.20	21.02	0.126	30.00	-8.98
1715.00	10	16-QAM	H	111	197	1 / 49	12.58	8.16	**20.74**	0.119	30.00	-9.26
1717.50	15	QPSK	H	111	204	1 / 74	14.27	8.16	**22.43**	**0.175**	30.00	-7.57
1732.50	15	QPSK	H	113	209	1 / 0	12.91	8.18	21.09	0.129	30.00	-8.91
1747.50	15	QPSK	H	365	194	1 / 0	12.83	8.20	21.03	0.127	30.00	-8.97
1732.50	15	16-QAM	H	113	209	1 / 0	13.98	8.18	**22.16**	0.164	30.00	-7.84
1720.00	20	QPSK	H	106	200	1 / 99	13.63	8.17	**21.80**	0.151	30.00	-8.20
1732.50	20	QPSK	H	118	204	1 / 0	12.99	8.18	21.17	0.131	30.00	-8.83
1745.00	20	QPSK	H	155	201	1 / 0	13.44	8.19	21.63	0.146	30.00	-8.37
1732.50	20	16-QAM	H	118	204	1 / 0	13.04	8.18	**21.22**	0.132	30.00	-8.78
1717.50	15	QPSK	V	100	150	1 / 74	10.45	8.16	18.61	0.073	30.00	-11.39

Table 7-8. EIRP Data (Band 4)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	150	358	1 / 0	16.22	8.37	**24.59**	0.288	33.01	-8.42
1882.50	1.4	QPSK	H	150	359	1 / 0	15.18	8.42	23.60	0.229	33.01	-9.41
1914.30	1.4	QPSK	H	150	359	1 / 0	15.28	8.47	23.75	0.237	33.01	-9.26
1850.70	1.4	16-QAM	H	150	358	1 / 0	15.34	8.37	**23.71**	0.235	33.01	-9.30
1851.50	3	QPSK	H	150	358	1 / 0	15.97	8.37	**24.34**	0.272	33.01	-8.67
1882.50	3	QPSK	H	150	358	1 / 0	15.40	8.42	23.82	0.241	33.01	-9.19
1913.50	3	QPSK	H	150	358	1 / 0	15.37	8.47	23.84	0.242	33.01	-9.17
1851.50	3	16-QAM	H	150	358	1 / 0	15.14	8.37	**23.51**	0.224	33.01	-9.50
1852.50	5	QPSK	H	150	2	1 / 0	15.20	8.37	**23.57**	0.228	33.01	-9.44
1882.50	5	QPSK	H	150	2	1 / 0	13.99	8.42	22.41	0.174	33.01	-10.60
1912.50	5	QPSK	H	150	360	1 / 0	13.80	8.47	22.27	0.168	33.01	-10.74
1852.50	5	16-QAM	H	150	2	1 / 0	14.09	8.37	**22.46**	0.176	33.01	-10.55
1855.00	10	QPSK	H	150	359	1 / 0	15.40	8.37	**23.77**	0.238	33.01	-9.24
1882.50	10	QPSK	H	150	359	1 / 0	14.37	8.42	22.79	0.190	33.01	-10.22
1910.00	10	QPSK	H	150	359	1 / 0	13.62	8.46	22.08	0.162	33.01	-10.93
1855.00	10	16-QAM	H	150	359	1 / 0	14.08	8.37	**22.45**	0.176	33.01	-10.56
1857.50	15	QPSK	H	150	1	1 / 0	16.21	8.38	**24.59**	**0.288**	33.01	-8.42
1882.50	15	QPSK	H	150	360	1 / 0	14.20	8.42	22.62	0.183	33.01	-10.39
1907.50	15	QPSK	H	150	1	1 / 0	14.83	8.46	23.29	0.213	33.01	-9.72
1857.50	15	16-QAM	H	150	1	1 / 0	15.09	8.38	**23.47**	0.222	33.01	-9.54
1860.00	20	QPSK	H	150	356	1 / 0	15.19	8.38	23.57	0.228	33.01	-9.44
1882.50	20	QPSK	H	150	360	1 / 0	15.79	8.42	**24.21**	0.264	33.01	-8.80
1905.00	20	QPSK	H	150	358	1 / 0	15.05	8.45	23.50	0.224	33.01	-9.51
1860.00	20	16-QAM	H	150	356	1 / 0	15.13	8.38	**23.51**	0.225	33.01	-9.50
1857.50	15	QPSK	V	150	99	1 / 0	14.36	8.38	22.74	0.188	33.01	-10.27

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	14	1 / 24	18.57	5.73	**24.30**	0.269	33.01	-8.71
2593.00	5	QPSK	H	150	14	1 / 24	18.19	6.07	24.26	0.267	33.01	-8.75
2687.50	5	QPSK	H	150	12	1 / 0	17.39	6.48	23.87	0.244	33.01	-9.14
2687.50	5	16-QAM	H	150	12	1 / 24	16.95	6.48	**23.43**	0.221	33.01	-9.58
2501.00	10	QPSK	H	150	93	1 / 49	17.77	5.73	23.50	0.224	33.01	-9.51
2593.00	10	QPSK	H	150	78	1 / 49	17.52	6.07	**23.59**	0.229	33.01	-9.42
2685.00	10	QPSK	H	150	89	1 / 49	14.97	6.47	21.44	0.139	33.01	-11.57
2593.00	10	16-QAM	H	150	78	1 / 49	15.97	6.07	**22.04**	0.160	33.01	-10.97
2503.50	15	QPSK	H	150	94	1 / 0	19.08	5.74	**24.82**	**0.304**	33.01	-8.19
2593.00	15	QPSK	H	150	89	1 / 0	17.42	6.07	23.49	0.223	33.01	-9.52
2682.50	15	QPSK	H	150	80	1 / 0	16.08	6.46	22.54	0.180	33.01	-10.47
2593.00	15	16-QAM	H	150	89	1 / 0	17.78	6.07	**23.85**	0.243	33.01	-9.16
2506.00	20	QPSK	H	150	84	1 / 99	17.34	5.75	**23.09**	0.204	33.01	-9.92
2593.00	20	QPSK	H	150	77	1 / 99	16.54	6.07	22.61	0.183	33.01	-10.40
2680.00	20	QPSK	H	150	87	1 / 0	14.96	6.45	21.41	0.138	33.01	-11.60
2506.00	20	16-QAM	H	150	84	1 / 99	16.95	5.75	**22.70**	0.186	33.01	-10.31
2503.50	15	QPSK	V	150	29	1 / 0	18.55	5.74	24.29	0.269	33.01	-8.72

Table 7-10. EIRP Data (Band 41), PC2

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]
2503.50	15	QPSK	H	150	263	1 / 74	15.54	5.74	**21.28**	**0.134**	33.01	-11.73
2503.50	15	16-QAM	H	150	263	1 / 74	14.50	5.74	**20.24**	0.106	33.01	-12.77

Table 7-11. EIRP Data (Band 41), PC3

7.8 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.

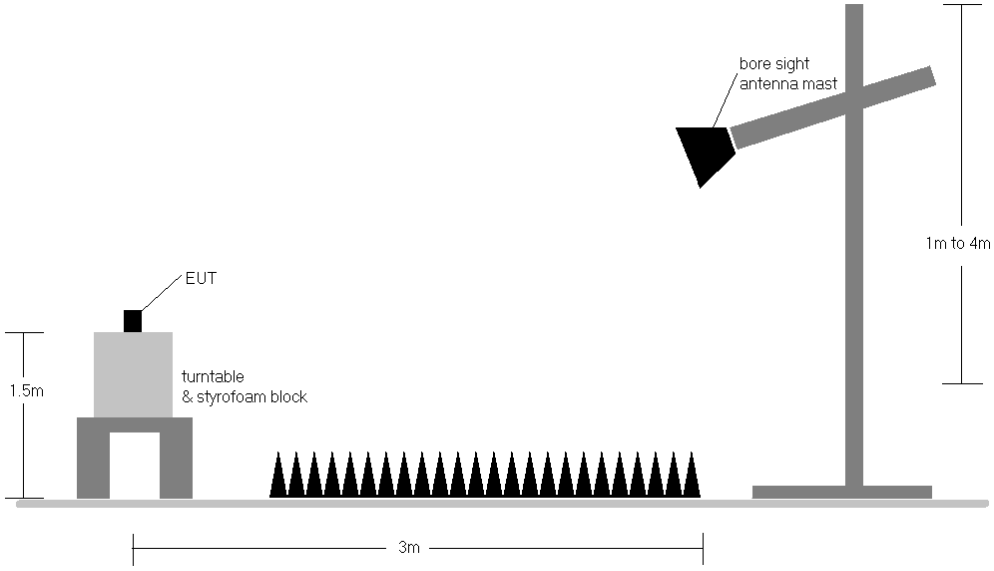


Figure 7-8. Test Instrument & Measurement Setup

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.

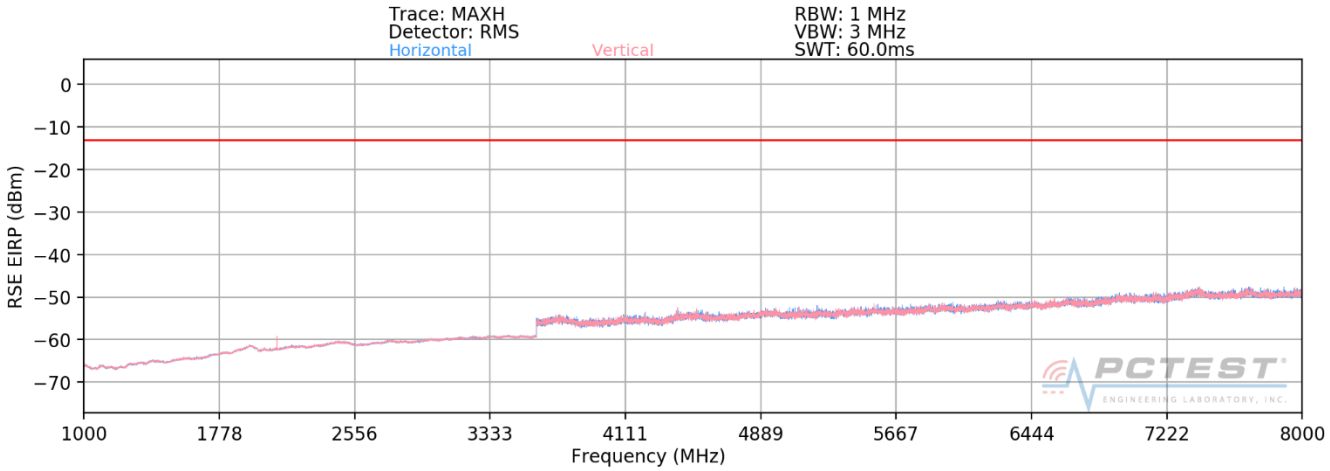
3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

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.

Radiated Spurious Emissions Measurements

Band 12



Plot 7-245. Radiated Spurious Plot above 1GHz (Band 12)

OPERATING FREQUENCY:	700.50	MHz
CHANNEL:	23025	
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]
1401.00	V	230	281	-68.57	2.63	-65.94	-52.9
2101.50	V	101	334	-62.97	3.56	-59.41	-46.4
2802.00	V	-	-	-67.39	4.93	-62.46	-49.5

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

OPERATING FREQUENCY:	707.50	MHz
CHANNEL:	23095	
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]
1415.00	V	231	237	-68.94	2.80	-66.14	-53.1
2122.50	V	140	324	-63.85	3.57	-60.27	-47.3
2830.00	V	-	-	-67.28	5.02	-62.25	-49.3

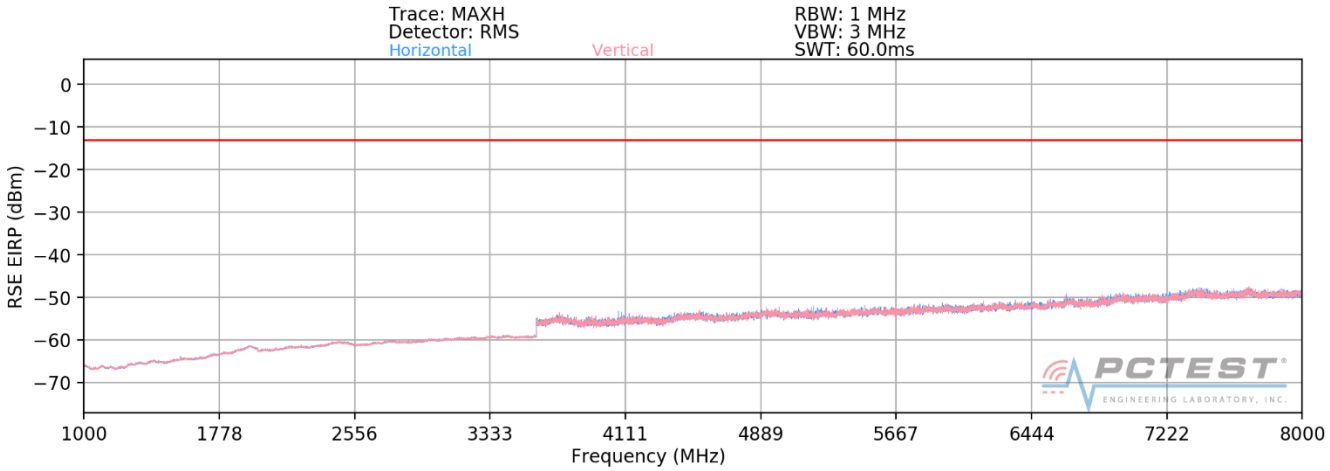
Table 7-13. Radiated Spurious Data (Band 12 – Mid Channel)

OPERATING FREQUENCY:	714.50	MHz
CHANNEL:	23165	
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]
1429.00	V	206	304	-69.31	2.96	-66.35	-53.3
2143.50	V	120	345	-65.52	3.59	-61.93	-48.9
2858.00	V	-	-	-67.46	5.11	-62.35	-49.4

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

Band 13



Plot 7-246. 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	V	112	62	-77.37	9.43	-67.94	-54.9

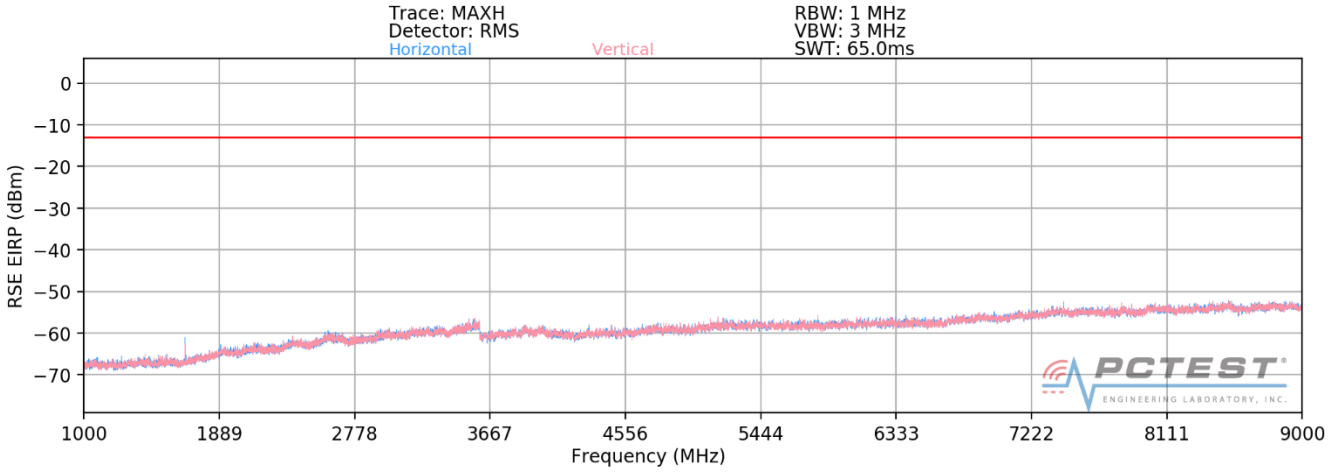
Table 7-15. Radiated Spurious Data (Band 13 – Mid Channel)

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	V	112	62	-75.07	8.53	-66.54	-26.5

Table 7-16. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

Band 26/5



Plot 7-247. Radiated Spurious Plot above 1GHz (Band 26/5)

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	165	35	-68.74	3.61	-65.13	-52.1
2487.00	H	306	32	-67.01	4.25	-62.76	-49.8
3316.00	H	-	-	-67.39	5.83	-61.56	-48.6

Table 7-17. 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	209	23	-67.59	3.62	-63.97	-51.0
2509.50	H	365	50	-67.19	4.33	-62.86	-49.9
3346.00	H	-	-	-66.93	5.92	-61.01	-48.0

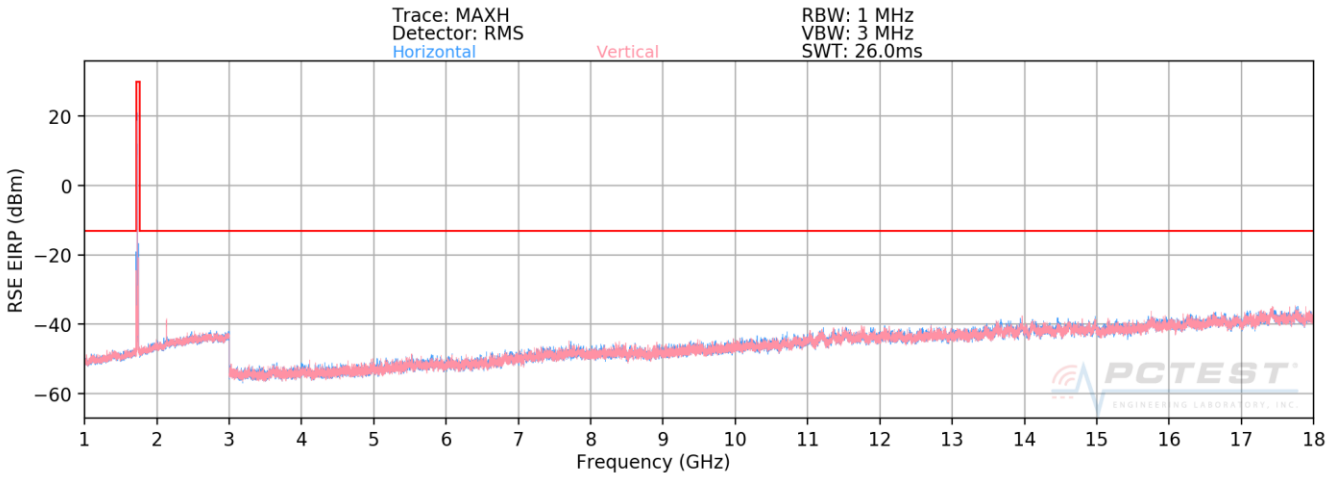
Table 7-18. Radiated Spurious Data (Band 26/5 – Mid Channel)

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	391	24	-68.79	3.63	-65.16	-52.2
2532.00	H	125	18	-67.06	4.47	-62.59	-49.6
3376.00	H	-	-	-67.28	6.05	-61.23	-48.2

Table 7-19. Radiated Spurious Data (Band 26/5 – High Channel)

Band 4



Plot 7-248. Radiated Spurious Plot above 1GHz (Band 4)

OPERATING FREQUENCY:	1717.50	MHz
CHANNEL:	20025	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3435.00	H	108	339	-66.97	6.21	-60.76	-47.8
5152.50	H	111	356	-68.25	8.67	-59.58	-46.6
6870.00	H	-	-	-65.25	8.76	-56.49	-43.5

Table 7-20. Radiated Spurious Data (Band 4 – Low Channel)

OPERATING FREQUENCY:	1732.50	MHz
CHANNEL:	20175	
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]
3465.00	H	152	151	-67.13	6.27	-60.86	-47.9
5197.50	H	322	358	-68.08	8.71	-59.36	-46.4
6930.00	H	-	-	-64.37	8.72	-55.66	-42.7

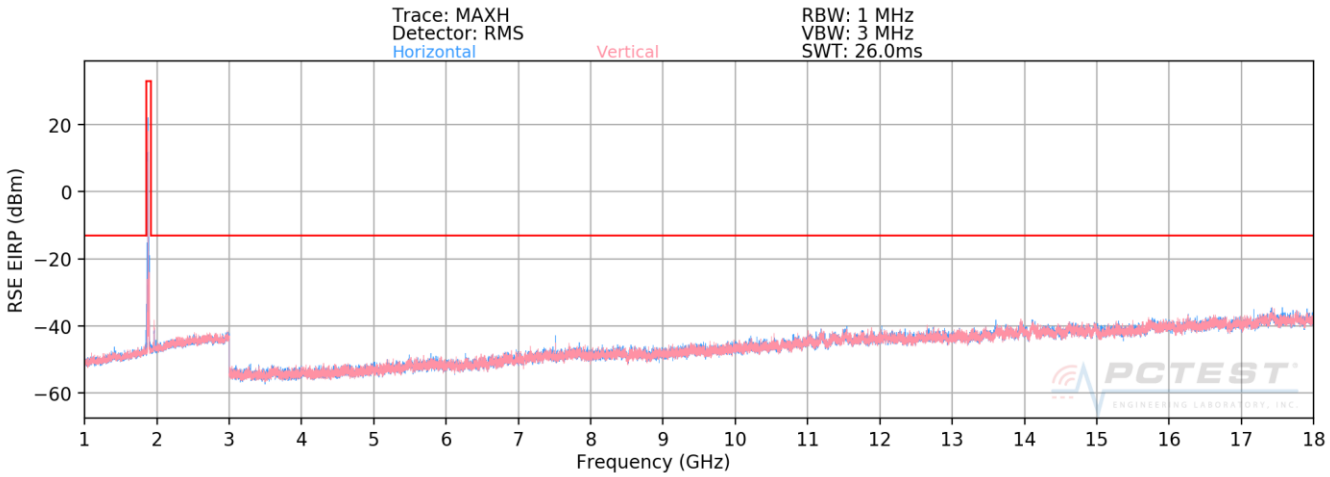
Table 7-21. Radiated Spurious Data (Band 4 – Mid Channel)

OPERATING FREQUENCY:	1747.50	MHz
CHANNEL:	20325	
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]
3495.00	H	276	158	-67.52	6.33	-61.18	-48.2
5242.50	H	-	-	-68.14	8.71	-59.43	-46.4

Table 7-22. Radiated Spurious Data (Band 4 – High Channel)

Band 25/2



Plot 7-249. Radiated Spurious Plot above 1GHz (Band 25/2)

OPERATING FREQUENCY:	1857.50	MHz
CHANNEL:	26115	
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	V	120	311	-71.25	9.53	-61.72	-48.7
5572.50	V	-	-	-72.39	10.97	-61.41	-48.4
7430.00	V	118	320	-68.56	10.98	-57.58	-44.6
9287.50	V	-	-	-69.13	11.61	-57.51	-44.5
11145.00	V	-	-	-67.94	12.73	-55.21	-42.2

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

OPERATING FREQUENCY:	1882.50	MHz
CHANNEL:	26365	
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]
3765.00	V	370	37	-72.35	9.36	-62.99	-50.0
5647.50	V	200	30	-72.46	11.19	-61.26	-48.3
7530.00	V	-	-	-69.74	11.13	-58.61	-45.6
9412.50	V	-	-	-68.19	11.57	-56.62	-43.6

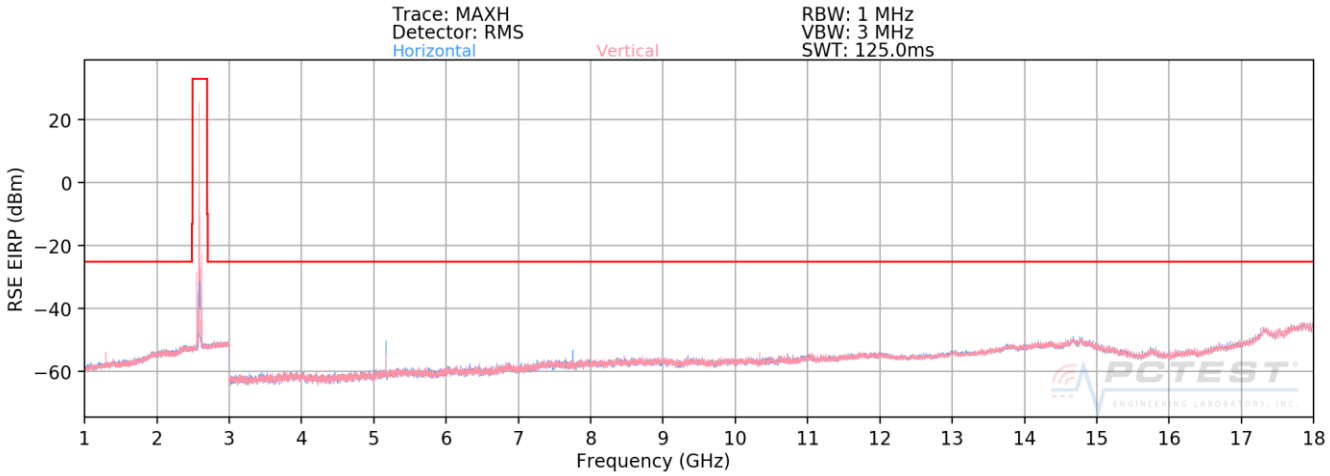
Table 7-24. Radiated Spurious Data (Band 25/2 – Mid Channel)

OPERATING FREQUENCY:	1907.50	MHz
CHANNEL:	26615	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

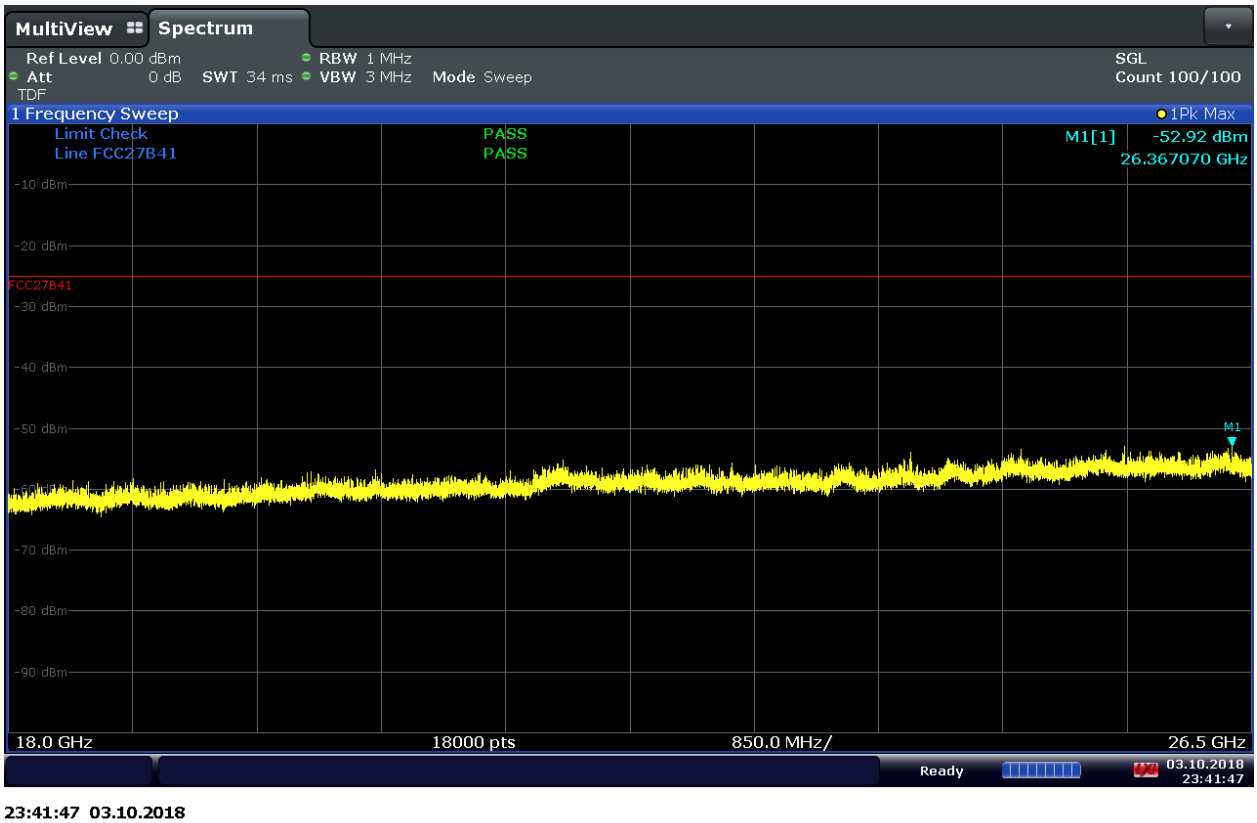
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3815.00	V	138	262	-71.87	9.30	-62.57	-49.6
5722.50	V	140	289	-72.15	11.37	-60.78	-47.8
7630.00	V	-	-	-69.16	11.31	-57.85	-44.9
9537.50	V	-	-	-68.31	11.76	-56.55	-43.5

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

Band 41 (PC2)



Plot 7-250. Radiated Spurious Plot 1GHz - 18GHz (Band 41)



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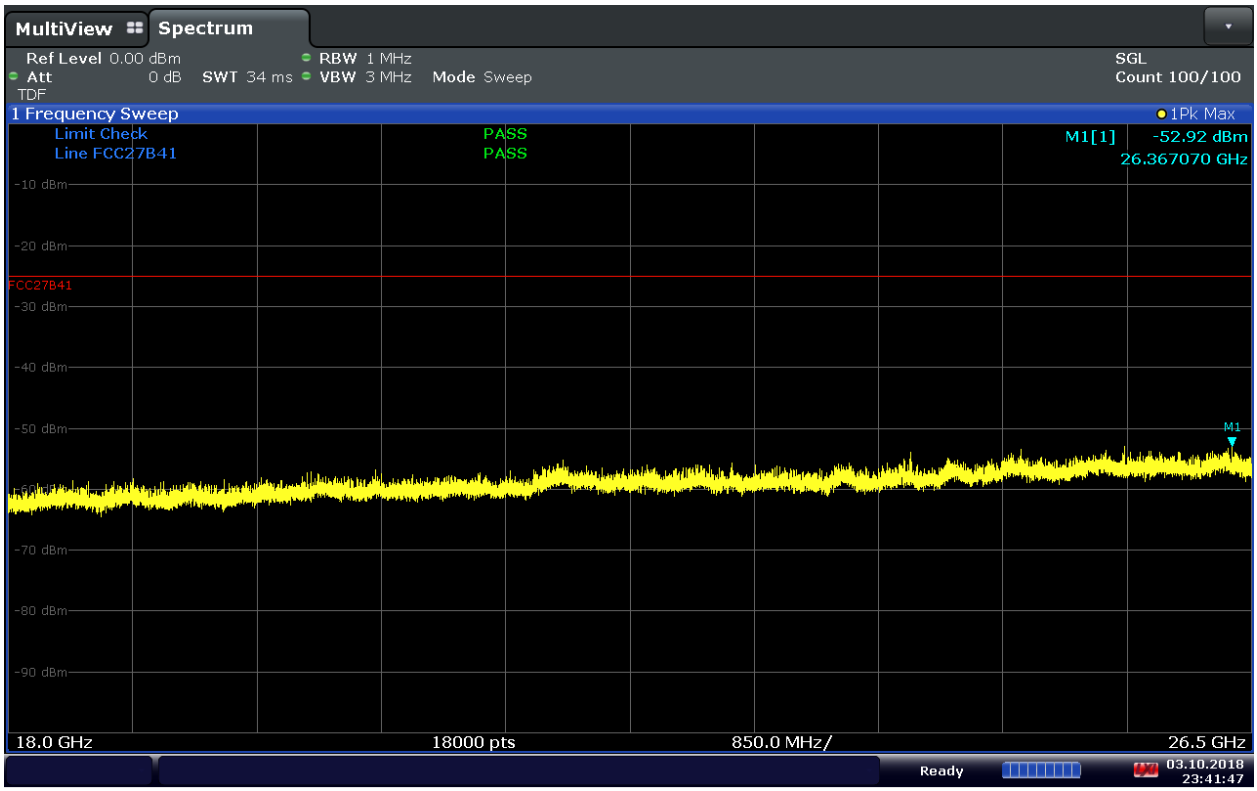
Plot 7-251. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41), H Pol.



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Plot 7-252. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41), V Pol.

OPERATING FREQUENCY:	2507.50	MHz
CHANNEL:	39765	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
5015.00	V	112	187	-61.54	10.90	-50.64	-25.6
7522.50	V	300	102	-62.81	11.12	-51.70	-26.7
10030.00	V	302	178	-62.06	11.99	-50.07	-25.1
12537.50	V	-	-	-66.58	13.56	-53.02	-28.0

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

OPERATING FREQUENCY:	2593.00	MHz
CHANNEL:	40620	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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	V	196	162	-64.74	10.74	-53.99	-29.0
7779.00	V	-	-	-70.78	11.44	-59.34	-34.3

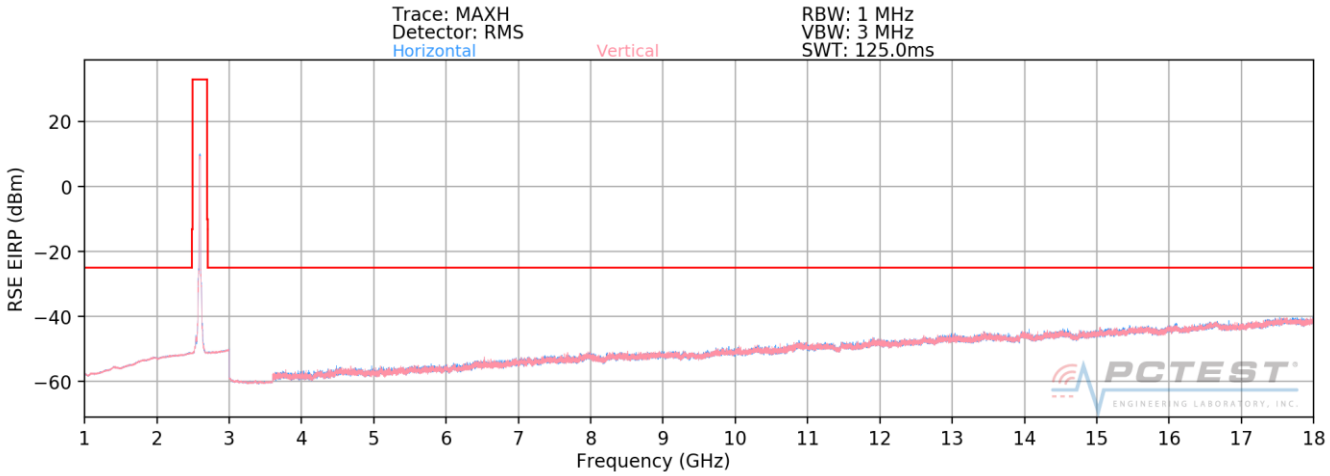
Table 7-27. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY:	2682.50	MHz
CHANNEL:	41515	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

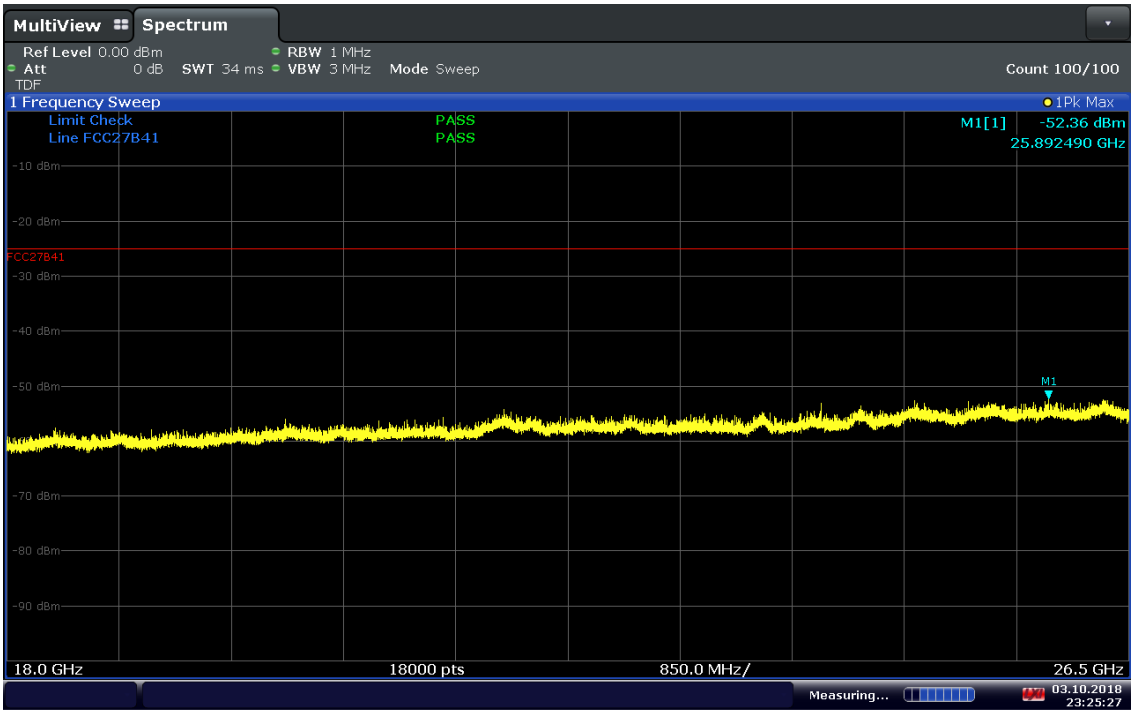
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5365.00	V	117	189	-60.31	10.69	-49.62	-24.6
8047.50	V	192	303	-62.15	11.16	-50.99	-26.0
10730.00	V	392	159	-61.15	12.60	-48.55	-23.5
13412.50	V	-	-	-65.13	12.59	-52.54	-27.5

Table 7-28. Radiated Spurious Data (Band 41 – High Channel)

Band 41 (PC3)



Plot 7-253. Radiated Spurious Plot 1GHz - 18GHz (Band 41)



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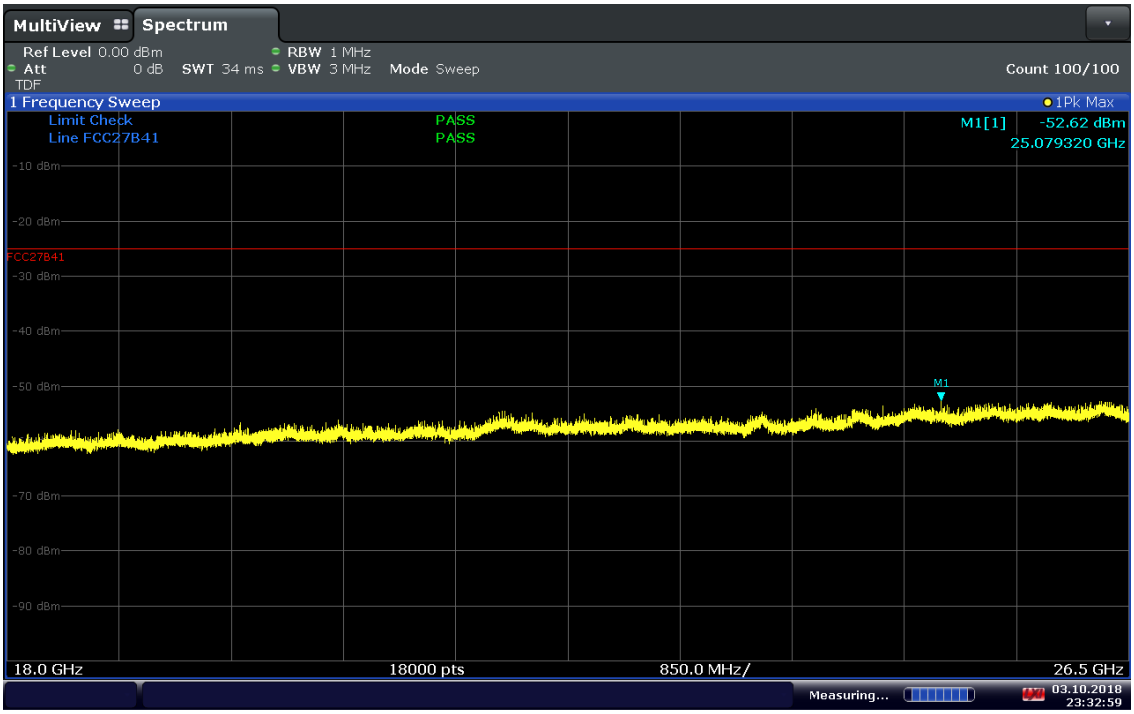
Plot 7-254. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41), H Pol.



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Plot 7-255. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41), V Pol.

OPERATING FREQUENCY:	2682.50	MHz
CHANNEL:	41515	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
5365.00	V	128	197	-61.98	10.69	-51.29	-26.3
8047.50	V	-	-	-67.45	11.16	-56.29	-31.3
10730.00	V	375	193	-63.88	12.60	-51.28	-26.3
13412.50	V	-	-	-65.26	12.59	-52.67	-27.7

Table 7-29. Radiated Spurious Data (Band 41 – High Channel)

7.9 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 Frequency Stability Measurements

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	
REFERENCE VOLTAGE:	4.21	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	707,499,944	-56	-0.0000079
100 %		- 30	707,499,994	-6	-0.0000008
100 %		- 20	707,499,968	-32	-0.0000046
100 %		- 10	707,499,820	-180	-0.0000255
100 %		0	707,499,916	-84	-0.0000119
100 %		+ 10	707,499,932	-68	-0.0000096
100 %		+ 20	707,499,805	-195	-0.0000276
100 %		+ 30	707,499,881	-119	-0.0000169
100 %		+ 40	707,499,979	-21	-0.0000030
100 %		+ 50	707,499,912	-88	-0.0000124
BATT. ENDPOINT	3.57	+ 20	707,499,822	-178	-0.0000252

Table 7-30. Frequency Stability Data (Band 12)

Note:

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

Band 12 Frequency Stability Measurements

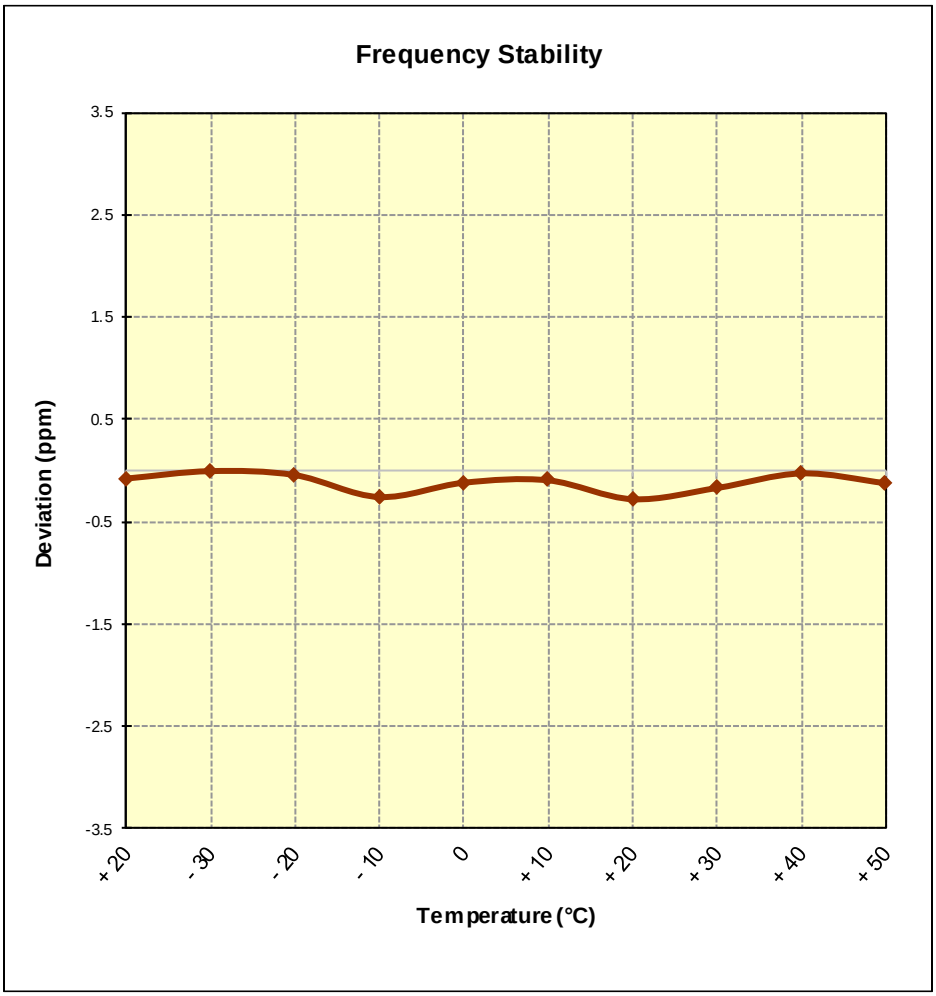

Figure 7-9. Frequency Stability Graph (Band 12)

Band 13 Frequency Stability Measurements

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	
REFERENCE VOLTAGE:	4.21	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	781,999,810	-190	-0.0000242
100 %		- 30	781,999,927	-73	-0.0000093
100 %		- 20	781,999,825	-175	-0.0000224
100 %		- 10	781,999,862	-138	-0.0000176
100 %		0	781,999,880	-120	-0.0000154
100 %		+ 10	781,999,926	-74	-0.0000095
100 %		+ 20	781,999,887	-113	-0.0000144
100 %		+ 30	781,999,906	-94	-0.0000120
100 %		+ 40	781,999,967	-33	-0.0000042
100 %		+ 50	781,999,807	-193	-0.0000247
BATT. ENDPOINT	3.57	+ 20	781,999,909	-91	-0.0000116

Table 7-31. 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

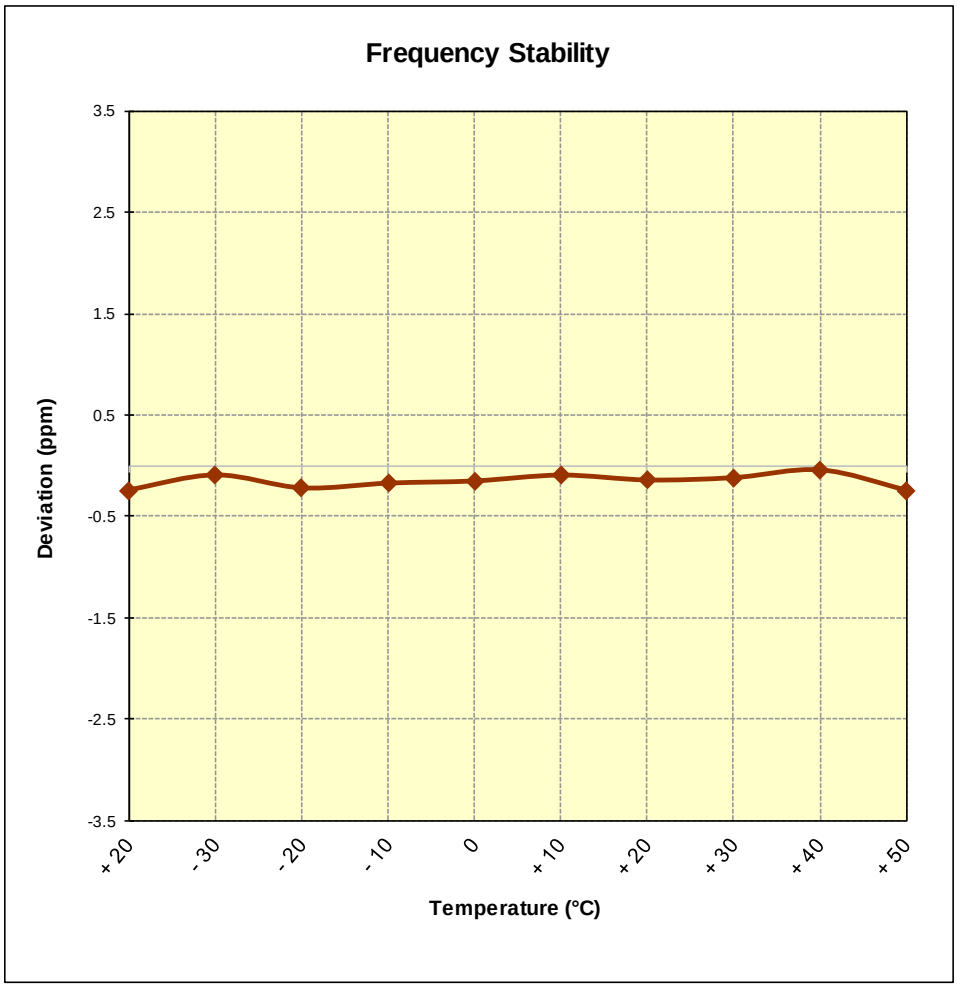

Figure 7-10. Frequency Stability Graph (Band 13)

Band 26/5 Frequency Stability Measurements

OPERATING FREQUENCY:	831,500,000	Hz
CHANNEL:	26865	
REFERENCE VOLTAGE:	4.21	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	831,499,993	-7	-0.0000009
100 %		- 30	831,499,880	-120	-0.0000145
100 %		- 20	831,499,810	-190	-0.0000229
100 %		- 10	831,499,841	-159	-0.0000191
100 %		0	831,499,988	-12	-0.0000015
100 %		+ 10	831,499,826	-174	-0.0000209
100 %		+ 20	831,499,959	-41	-0.0000049
100 %		+ 30	831,499,953	-47	-0.0000057
100 %		+ 40	831,499,914	-86	-0.0000103
100 %		+ 50	831,499,867	-133	-0.0000160
BATT. ENDPOINT	3.57	+ 20	831,499,953	-47	-0.0000056

Table 7-32. Frequency Stability Data (Band 26/5)

Band 26/5 Frequency Stability Measurements

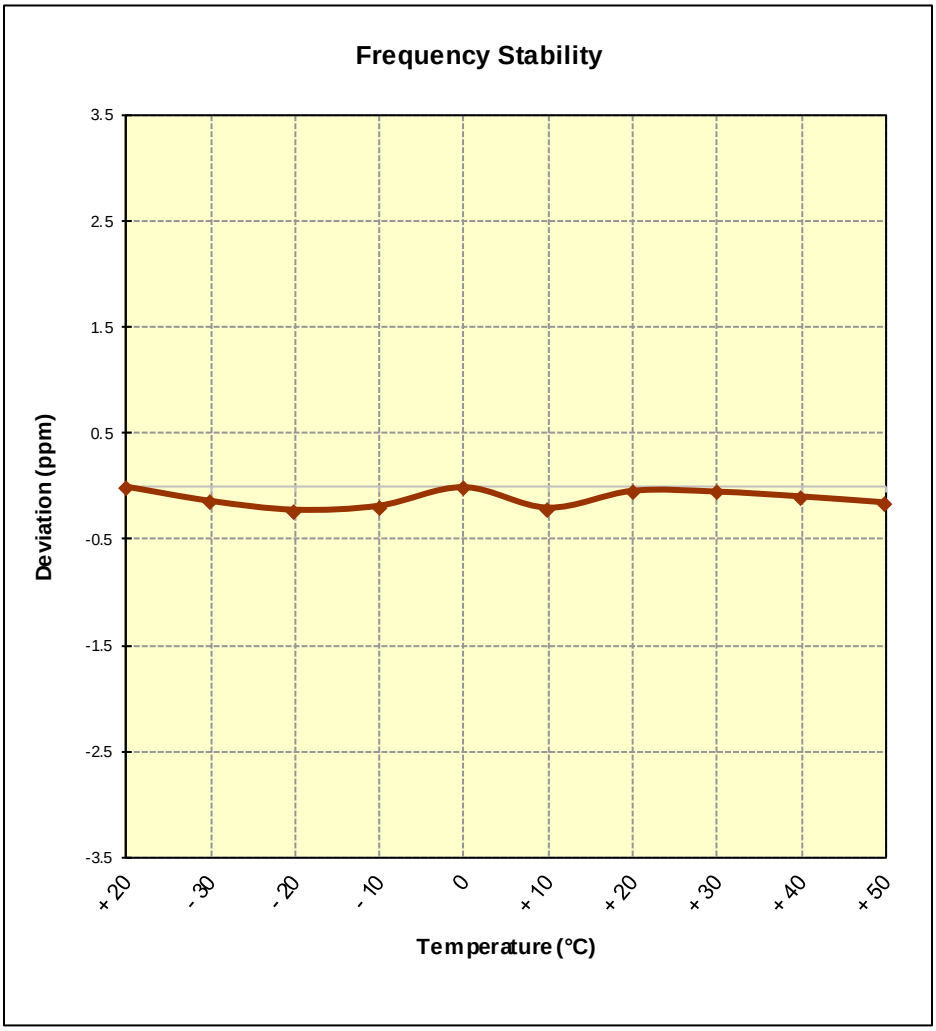

Figure 7-11. Frequency Stability Graph (Band 26/5)

Band 4 Frequency Stability Measurements

OPERATING FREQUENCY:	1,732,500,000	Hz
CHANNEL:	20175	
REFERENCE VOLTAGE:	4.21	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	1,732,499,844	-156	-0.0000090
100 %		- 30	1,732,499,988	-12	-0.0000007
100 %		- 20	1,732,499,867	-133	-0.0000077
100 %		- 10	1,732,499,909	-91	-0.0000052
100 %		0	1,732,499,883	-117	-0.0000067
100 %		+ 10	1,732,499,893	-107	-0.0000062
100 %		+ 20	1,732,499,807	-193	-0.0000111
100 %		+ 30	1,732,499,944	-56	-0.0000033
100 %		+ 40	1,732,499,824	-176	-0.0000101
100 %		+ 50	1,732,499,922	-78	-0.0000045
BATT. ENDPOINT	3.57	+ 20	1,732,500,000	0	0.0000000

Table 7-33. Frequency Stability Data (Band 4)

Note:

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

Band 4 Frequency Stability Measurements

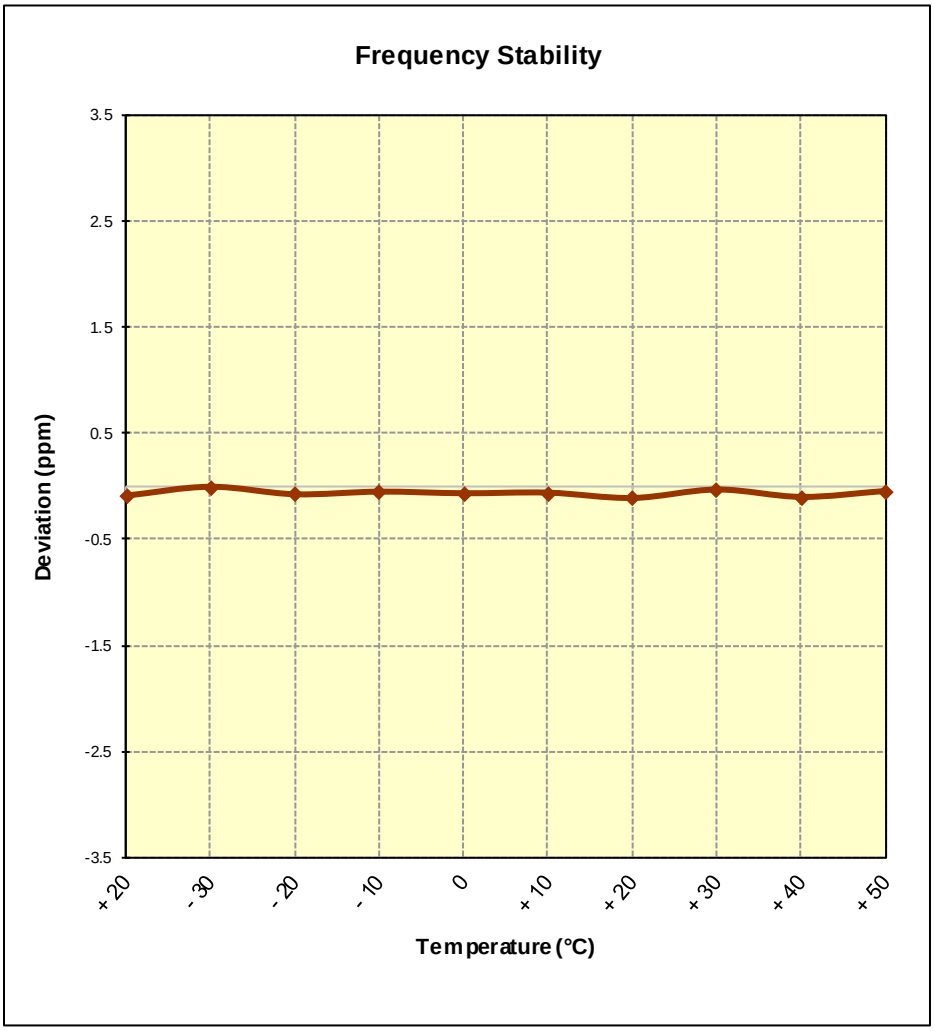

Figure 7-12. Frequency Stability Graph (Band 4)

Band 25/2 Frequency Stability Measurements

OPERATING FREQUENCY:	1,882,500,000	Hz
CHANNEL:	26365	
REFERENCE VOLTAGE:	4.21	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	1,882,499,939	-61	-0.0000032
100 %		- 30	1,882,499,999	-1	-0.0000001
100 %		- 20	1,882,499,888	-112	-0.0000059
100 %		- 10	1,882,499,881	-119	-0.0000063
100 %		0	1,882,499,885	-115	-0.0000061
100 %		+ 10	1,882,499,920	-80	-0.0000042
100 %		+ 20	1,882,499,941	-59	-0.0000031
100 %		+ 30	1,882,499,960	-40	-0.0000021
100 %		+ 40	1,882,499,850	-150	-0.0000080
100 %		+ 50	1,882,499,875	-125	-0.0000066
BATT. ENDPOINT	3.57	+ 20	1,882,499,914	-86	-0.0000046

Table 7-34. 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.

Band 25/2 Frequency Stability Measurements

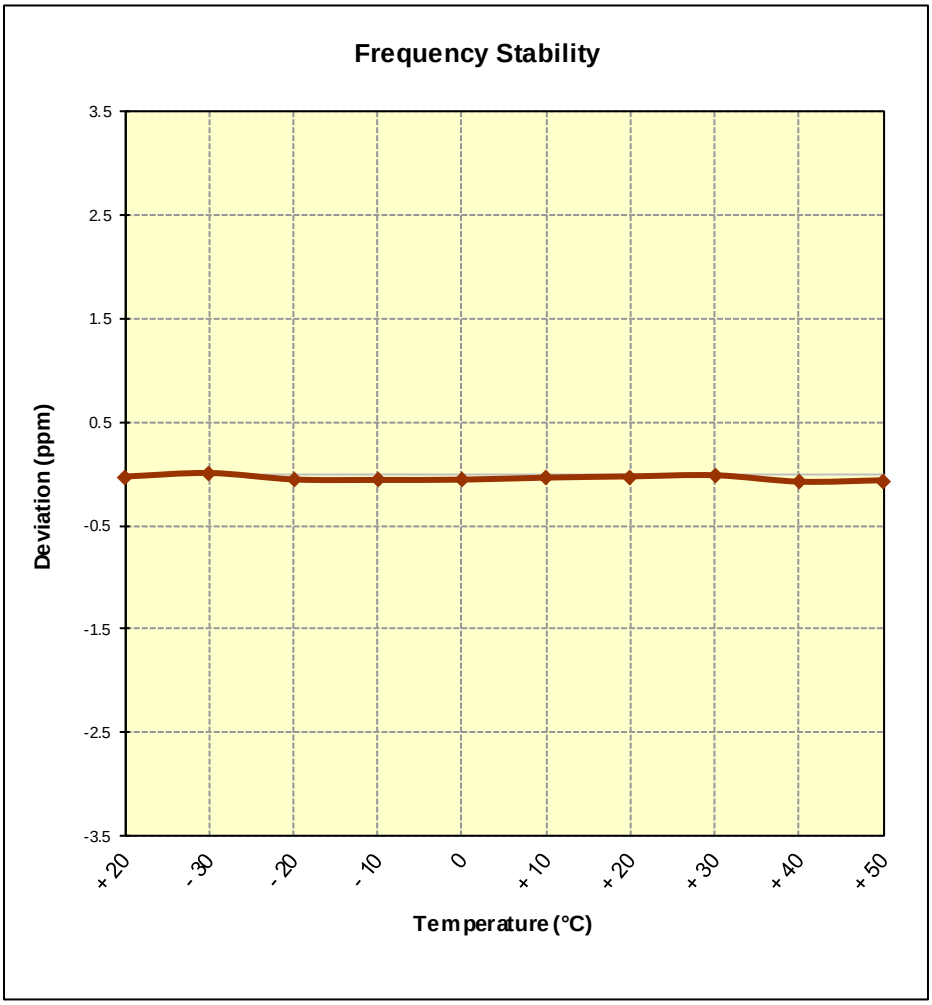

Figure 7-13. Frequency Stability Graph (Band 25/2)

Band 41 Frequency Stability Measurements

OPERATING FREQUENCY:	2,593,000,000	Hz
CHANNEL:	40620	
REFERENCE VOLTAGE:	4.21	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.21	+ 20 (Ref)	2,592,999,904	-96	-0.0000037
100 %		- 30	2,592,999,961	-39	-0.0000015
100 %		- 20	2,592,999,816	-184	-0.0000071
100 %		- 10	2,592,999,834	-166	-0.0000064
100 %		0	2,592,999,973	-27	-0.0000011
100 %		+ 10	2,592,999,858	-142	-0.0000055
100 %		+ 20	2,592,999,900	-100	-0.0000039
100 %		+ 30	2,592,999,855	-145	-0.0000056
100 %		+ 40	2,592,999,881	-119	-0.0000046
100 %		+ 50	2,592,999,954	-46	-0.0000018
BATT. ENDPOINT	3.57	+ 20	2,592,999,901	-99	-0.0000038

Table 7-35. 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

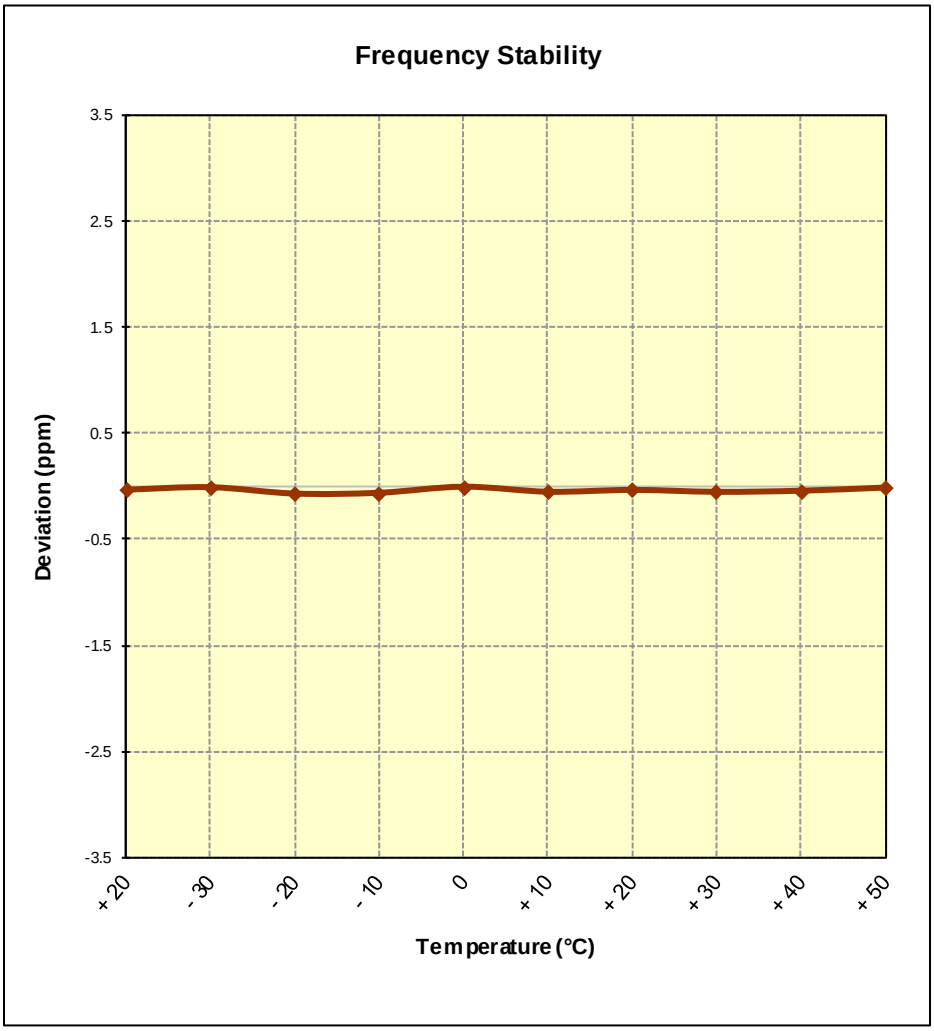

Figure 7-14. Frequency Stability Graph (Band 41)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LGE Portable Handset FCC ID: ZNFX220PM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.