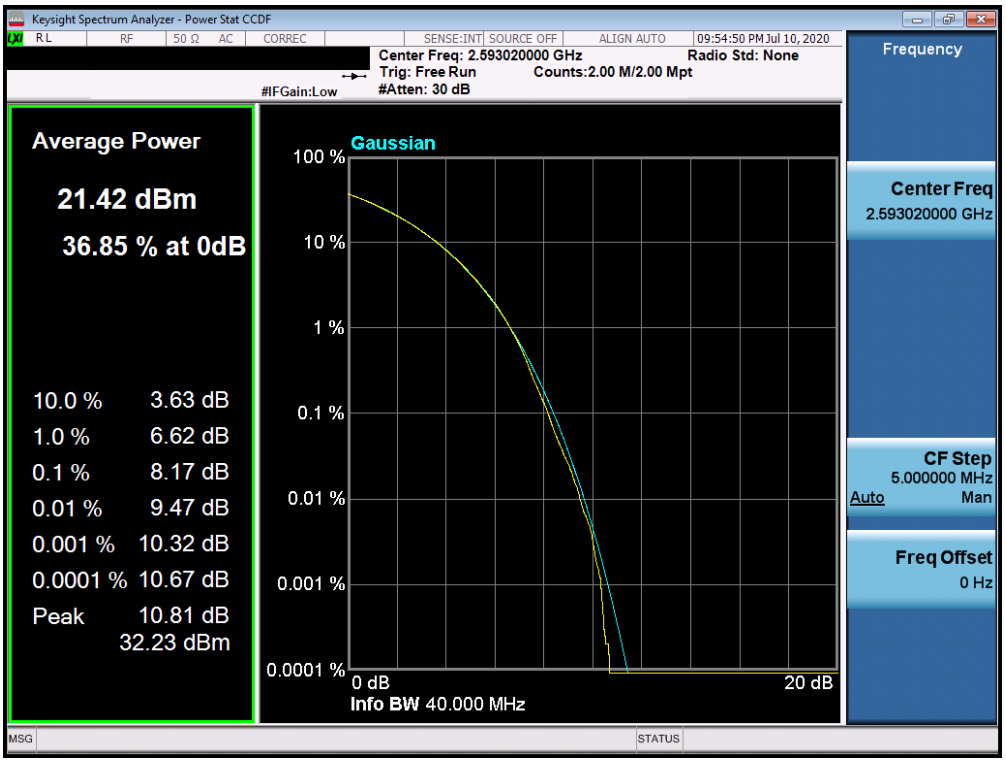
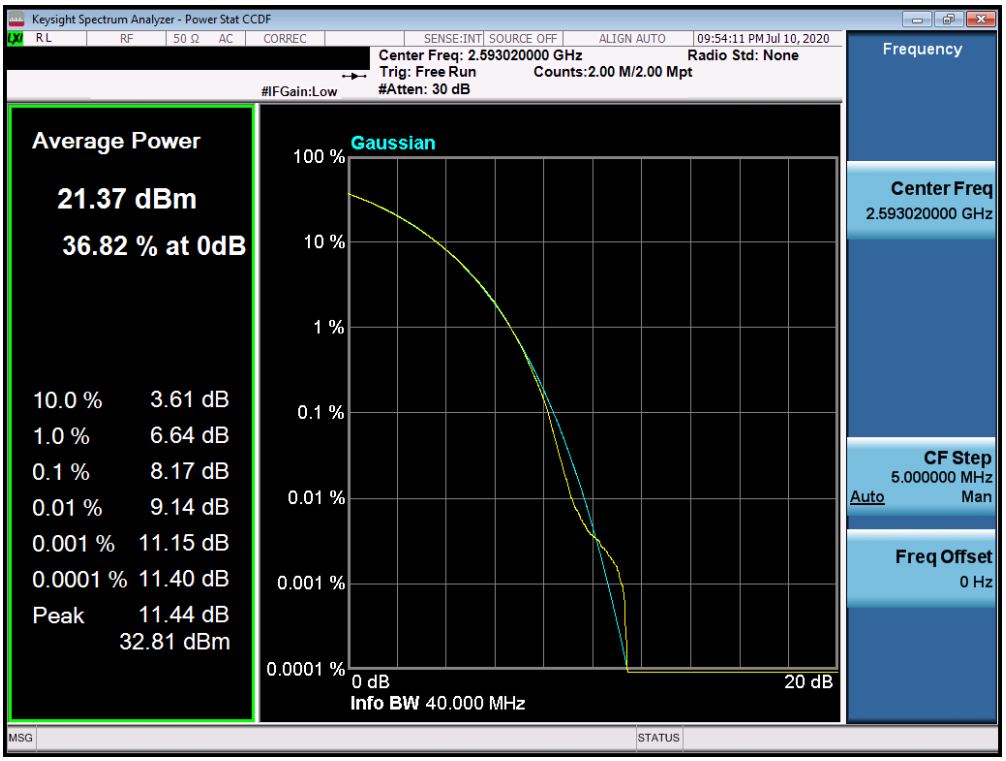


Plot 7-765. PAR Plot (n41 - 40.0MHz CP-OFDM-QPSK - Full RB Configuration)



Plot 7-766. PAR Plot (n41 - 40.0MHz CP-OFDM-16-QAM - Full RB Configuration)

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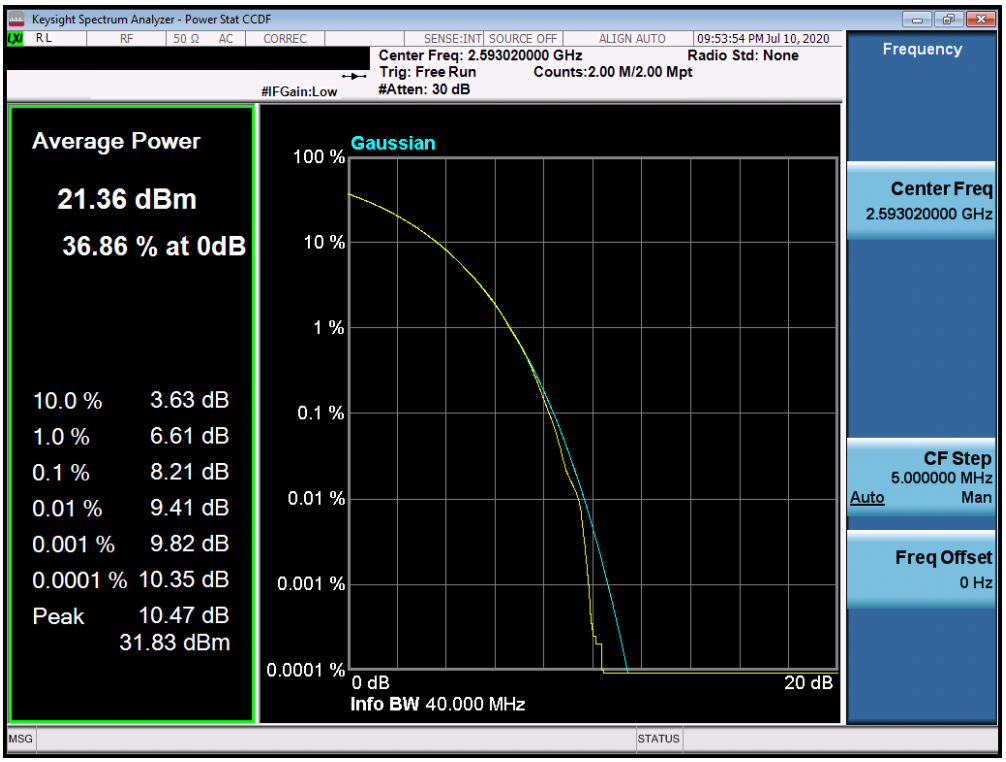
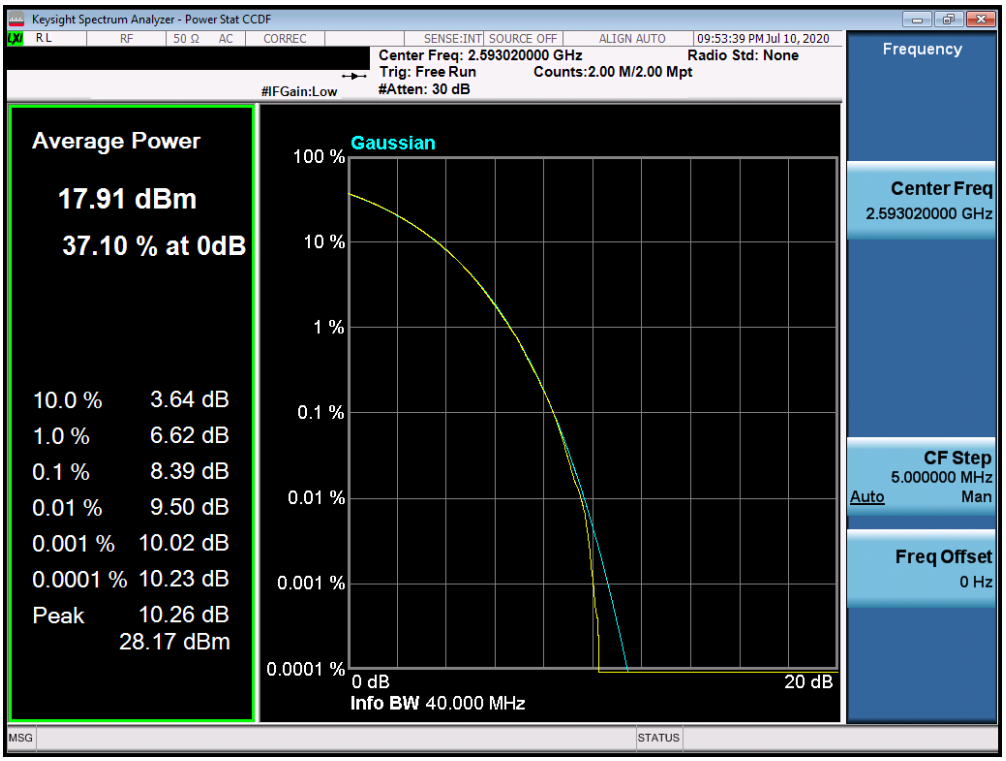


Plot 7-767. PAR Plot (n41 - 40.0MHz CP-OFDM-64-QAM - Full RB Configuration)



Plot 7-768. PAR Plot (n41 - 40.0MHz CP-OFDM-256-QAM - Full RB Configuration)

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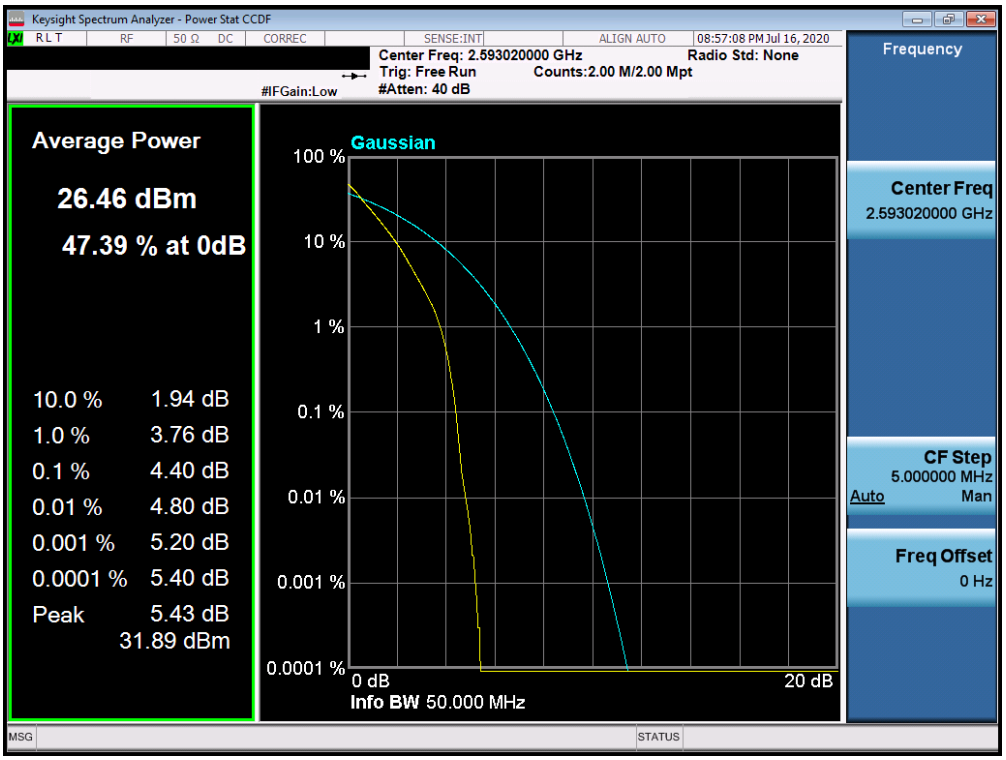
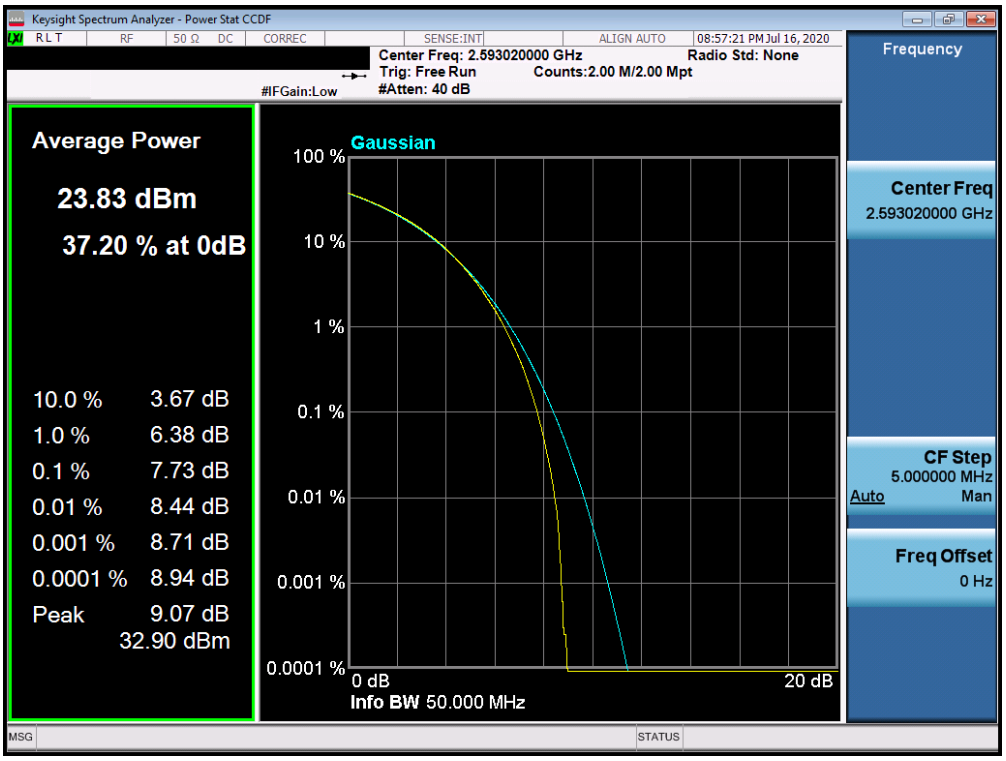


Plot 7-769. PAR Plot (n41 - 50.0MHz DFT-s-OFDM-BPSK - Full RB Configuration)



Plot 7-770. PAR Plot (n41 - 50.0MHz CP-OFDM-QPSK - Full RB Configuration)

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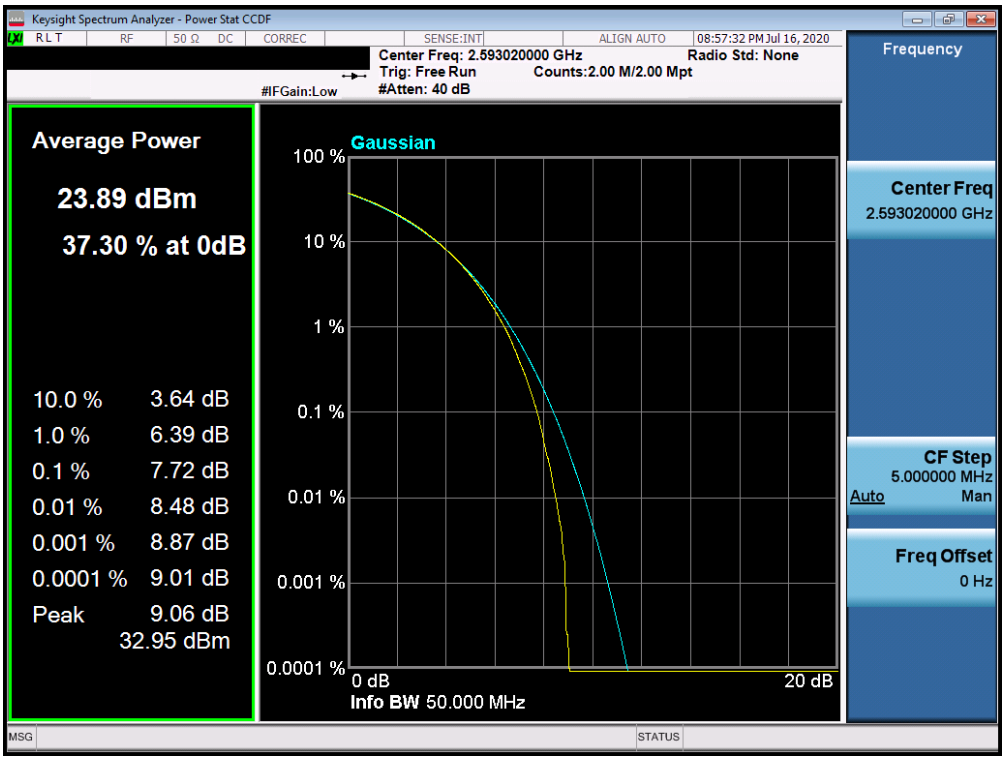
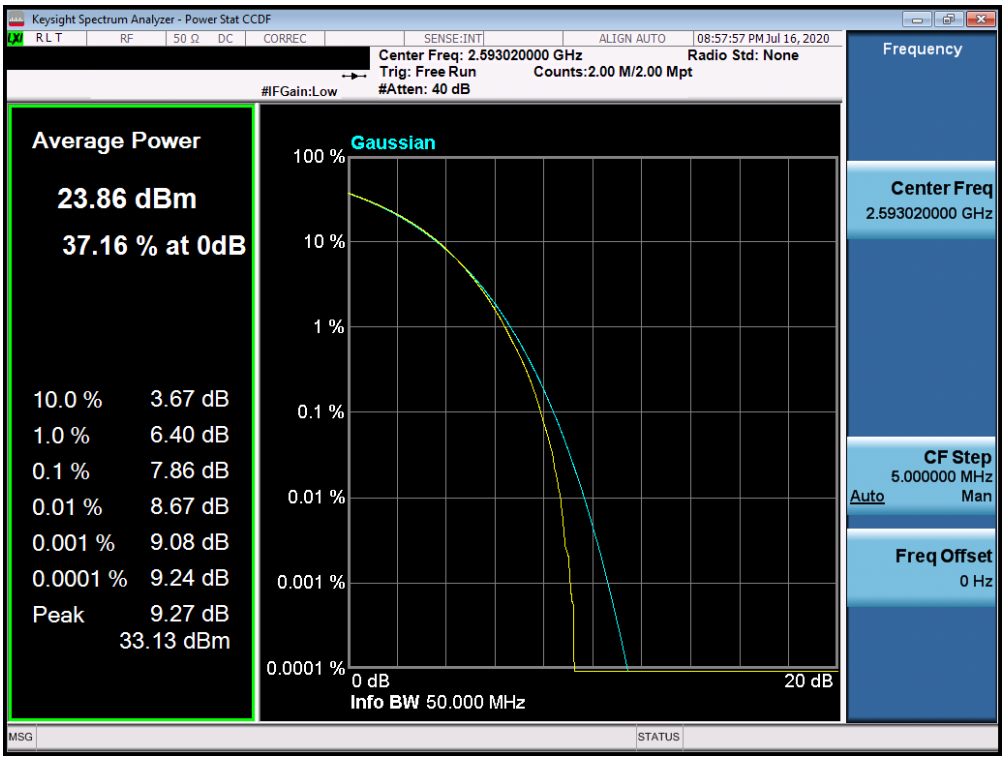


Plot 7-771. PAR Plot (n41 - 50.0MHz CP-OFDM-16-QAM - Full RB Configuration)



Plot 7-772. PAR Plot (n41 - 50.0MHz CP-OFDM-64-QAM - Full RB Configuration)

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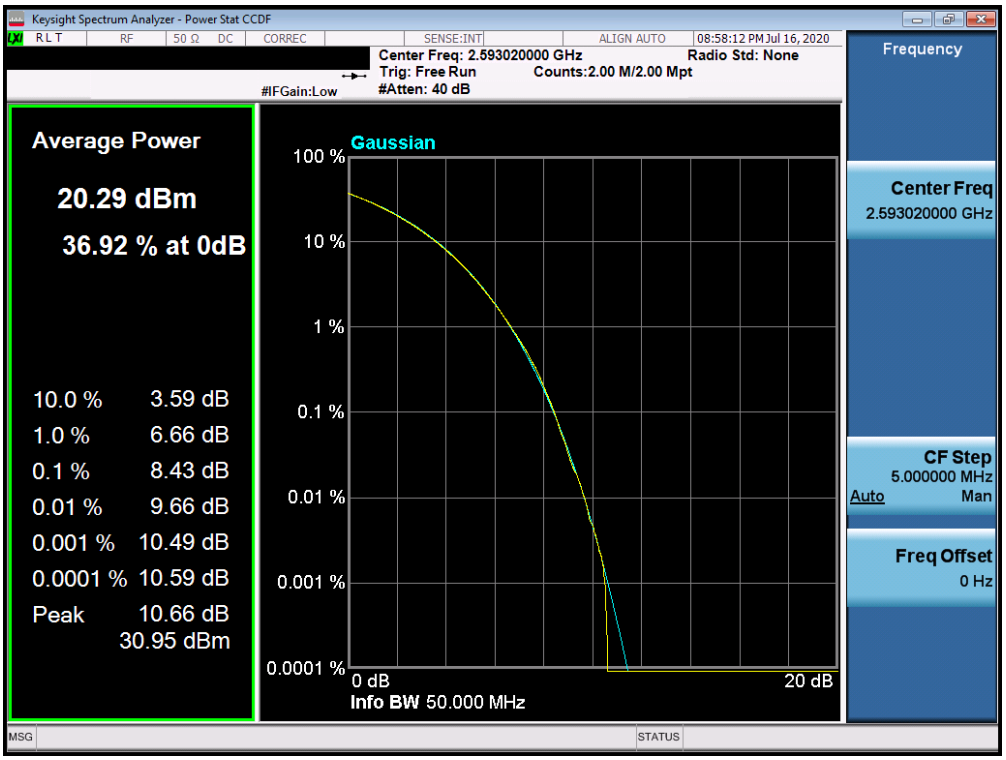
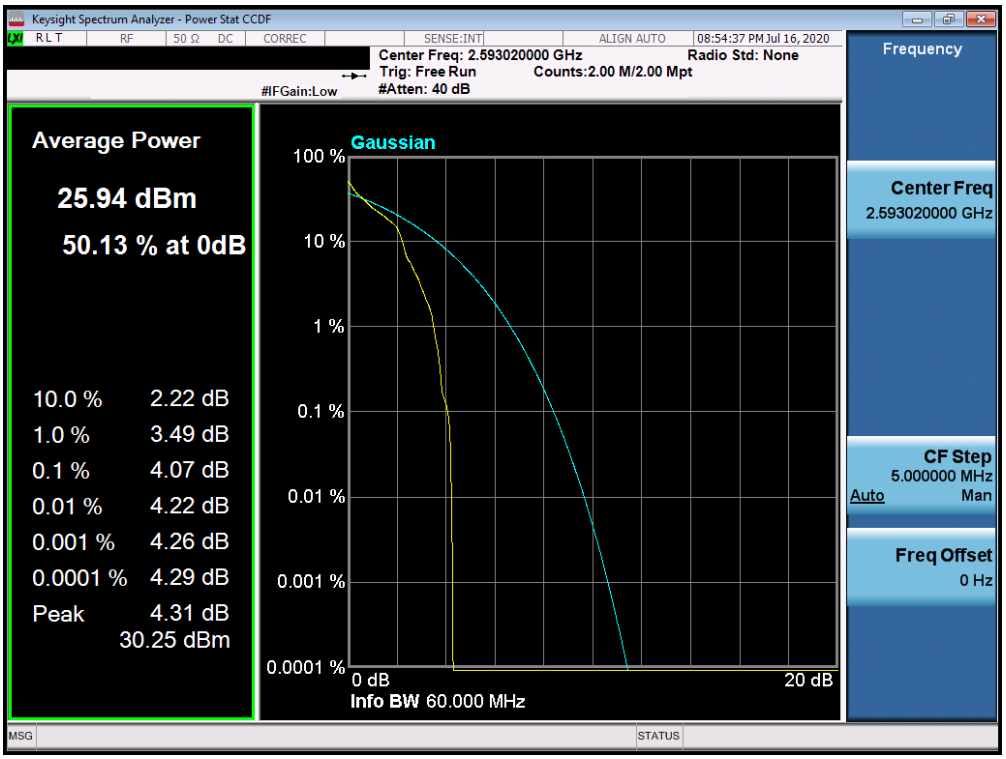


Plot 7-773. PAR Plot (n41 - 50.0MHz CP-OFDM-256-QAM - Full RB Configuration)



Plot 7-774. PAR Plot (n41 - 60.0MHz DFT-s-OFDM-BPSK - Full RB Configuration)

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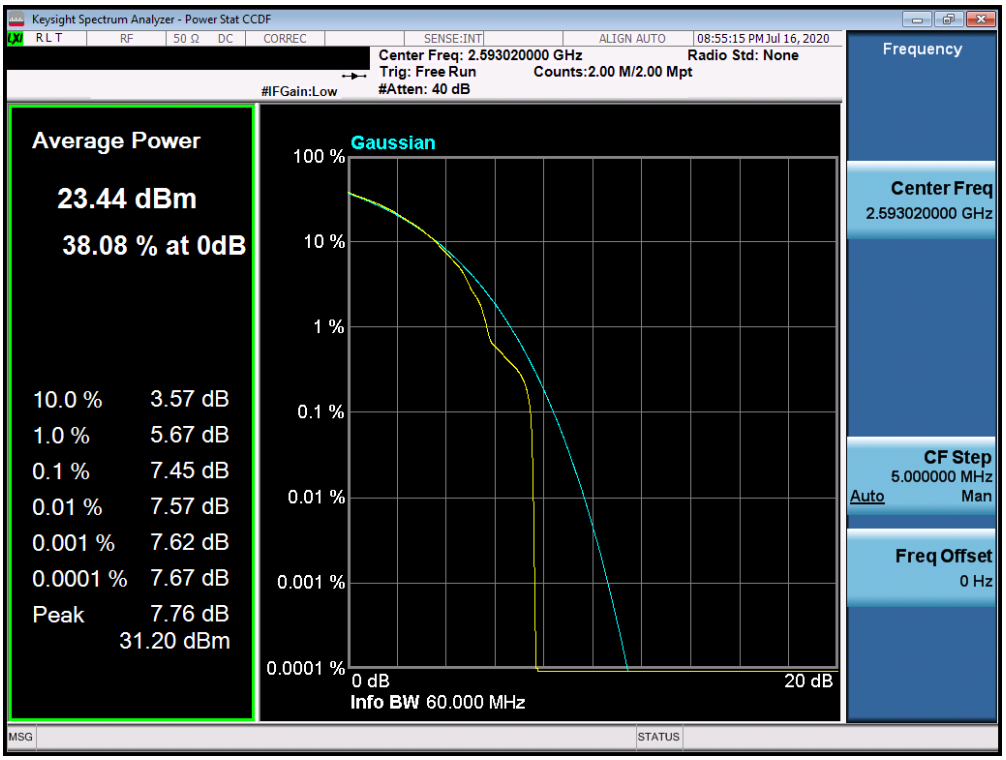
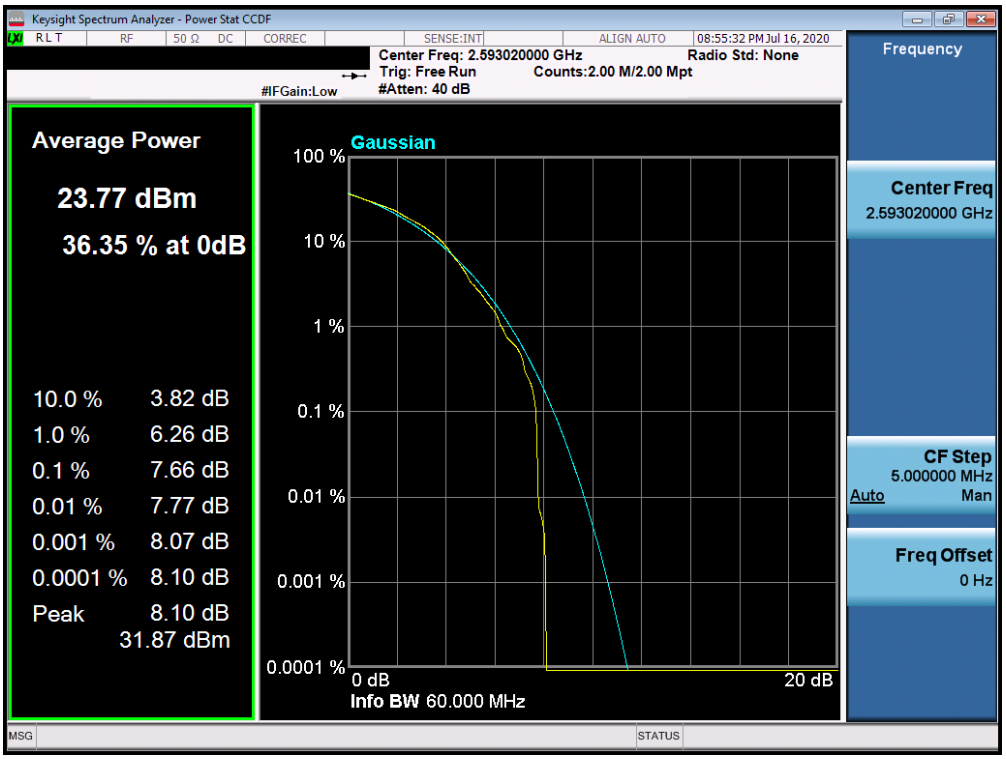


Plot 7-775. PAR Plot (n41 - 60.0MHz CP-OFDM-QPSK - Full RB Configuration)



Plot 7-776. PAR Plot (n41 - 60.0MHz CP-OFDM-16-QAM - Full RB Configuration)

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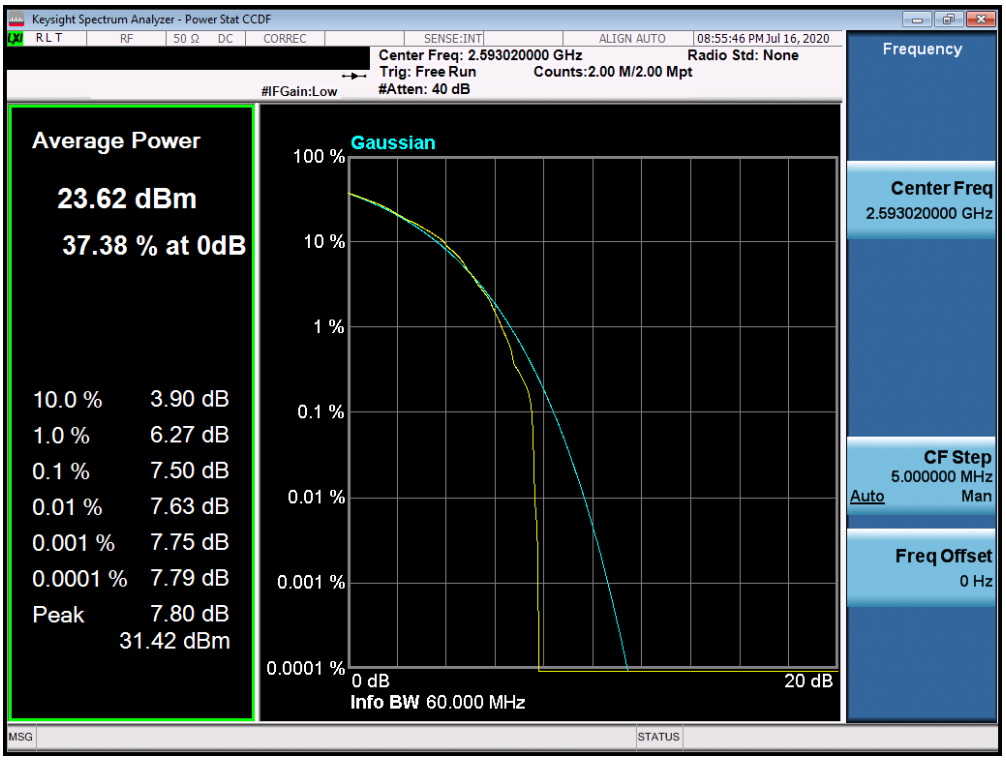
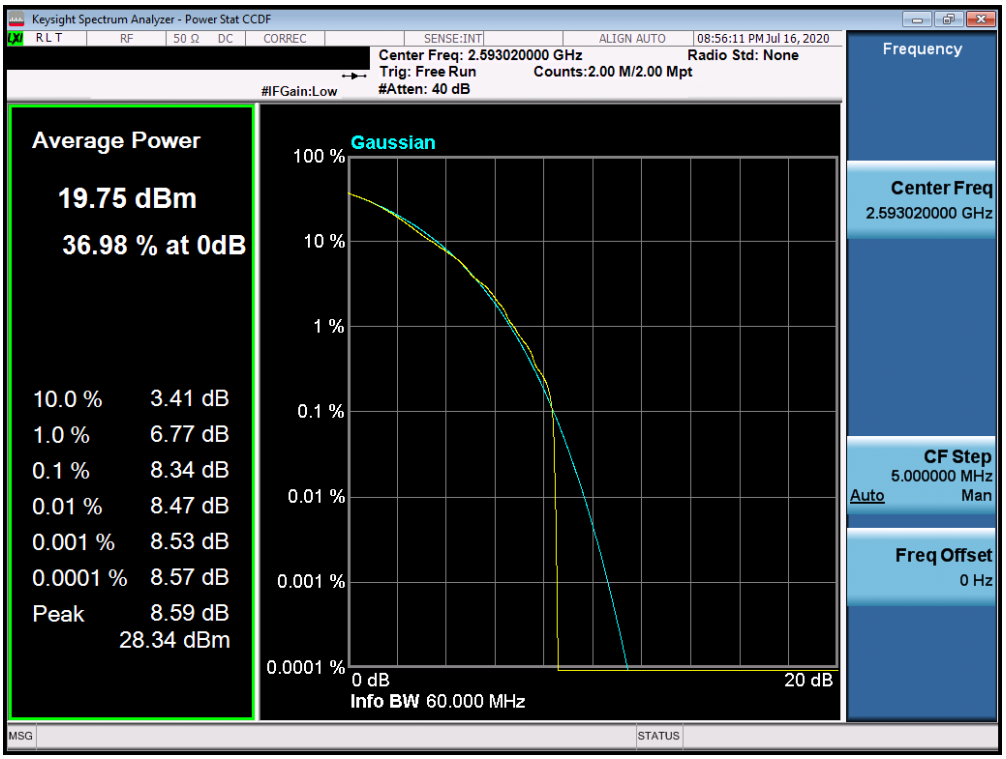


Plot 7-777. PAR Plot (n41 - 60.0MHz CP-OFDM-64-QAM - Full RB Configuration)



Plot 7-778. PAR Plot (n41 - 60.0MHz CP-OFDM-256-QAM - Full RB Configuration)

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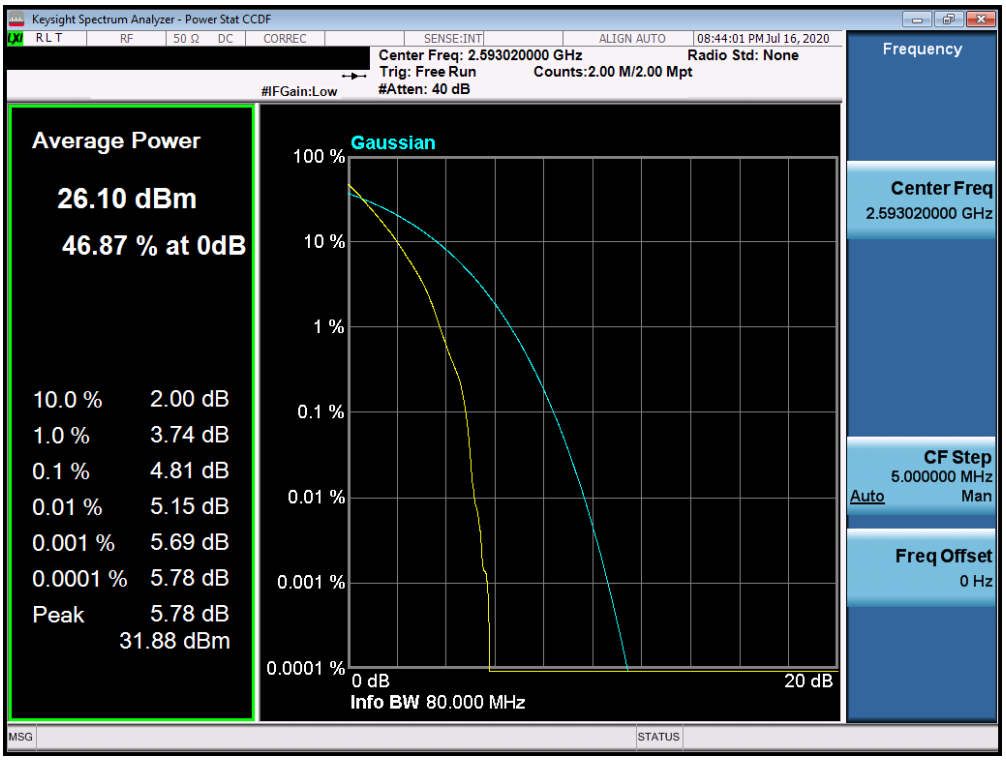
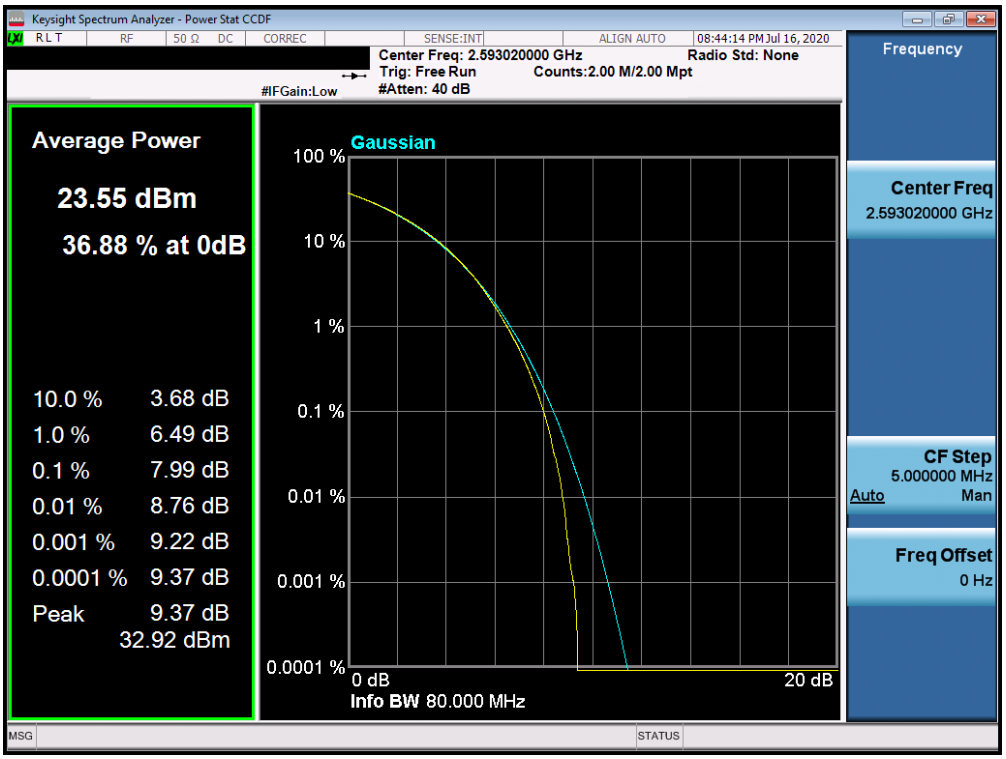


Plot 7-779. PAR Plot (n41 - 80.0MHz DFT-s-OFDM-BPSK - Full RB Configuration)



Plot 7-780. PAR Plot (n41 - 80.0MHz CP-OFDM-QPSK - Full RB Configuration)

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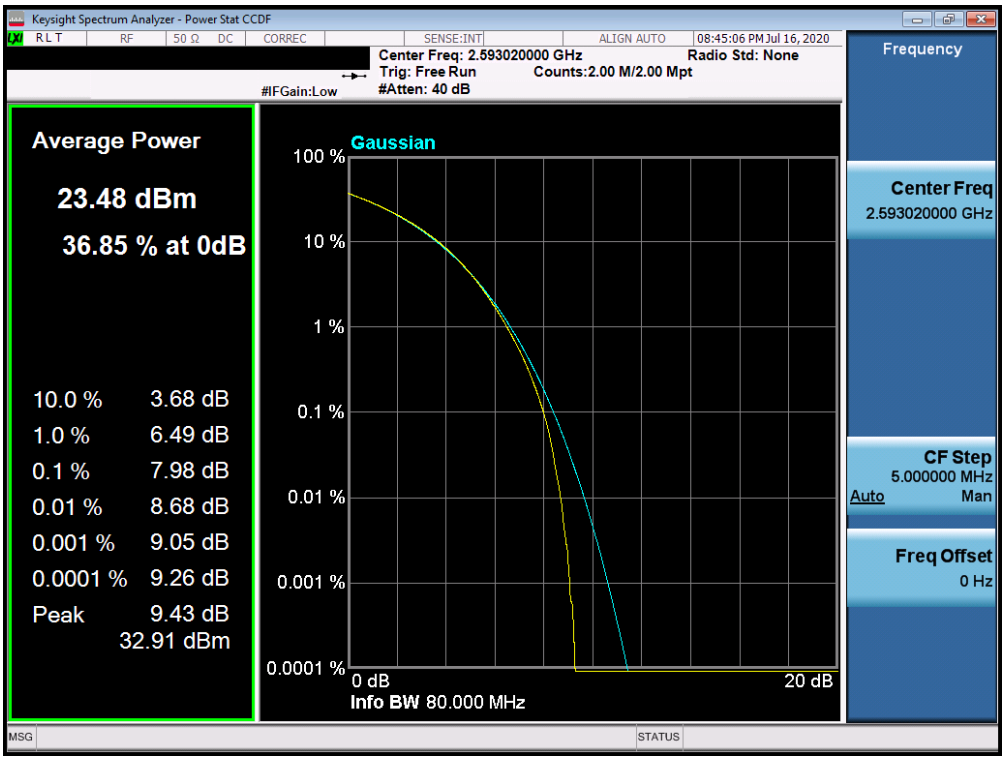
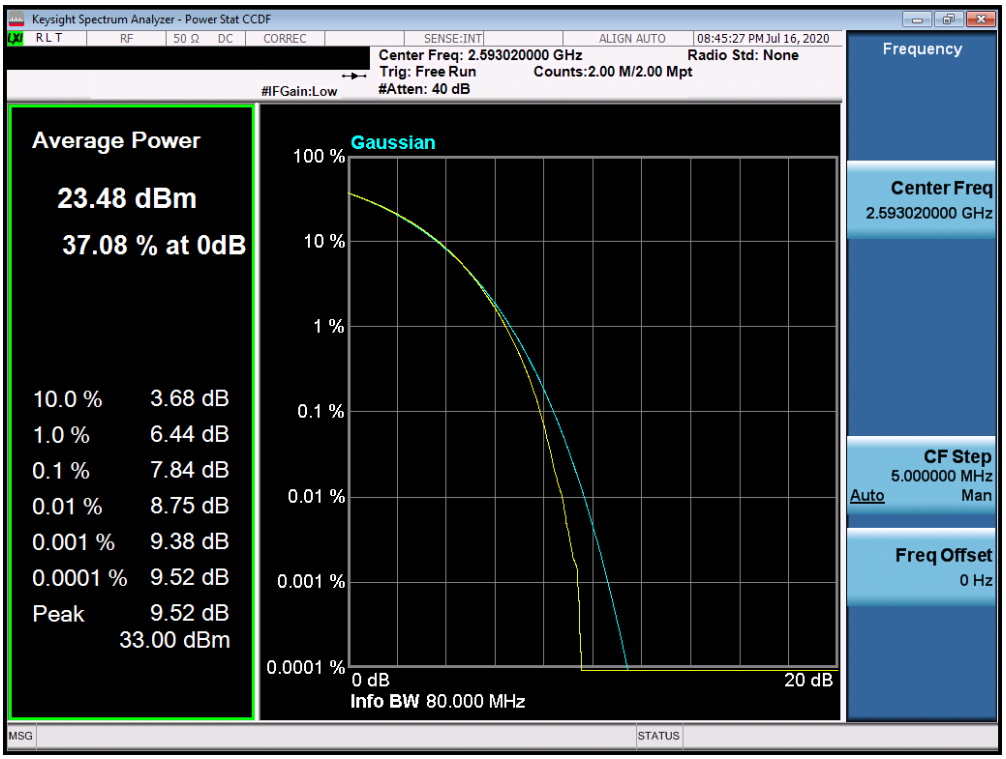


Plot 7-781. PAR Plot (n41 - 80.0MHz CP-OFDM-16-QAM - Full RB Configuration)



Plot 7-782. PAR Plot (n41 - 80.0MHz CP-OFDM-64-QAM - Full RB Configuration)

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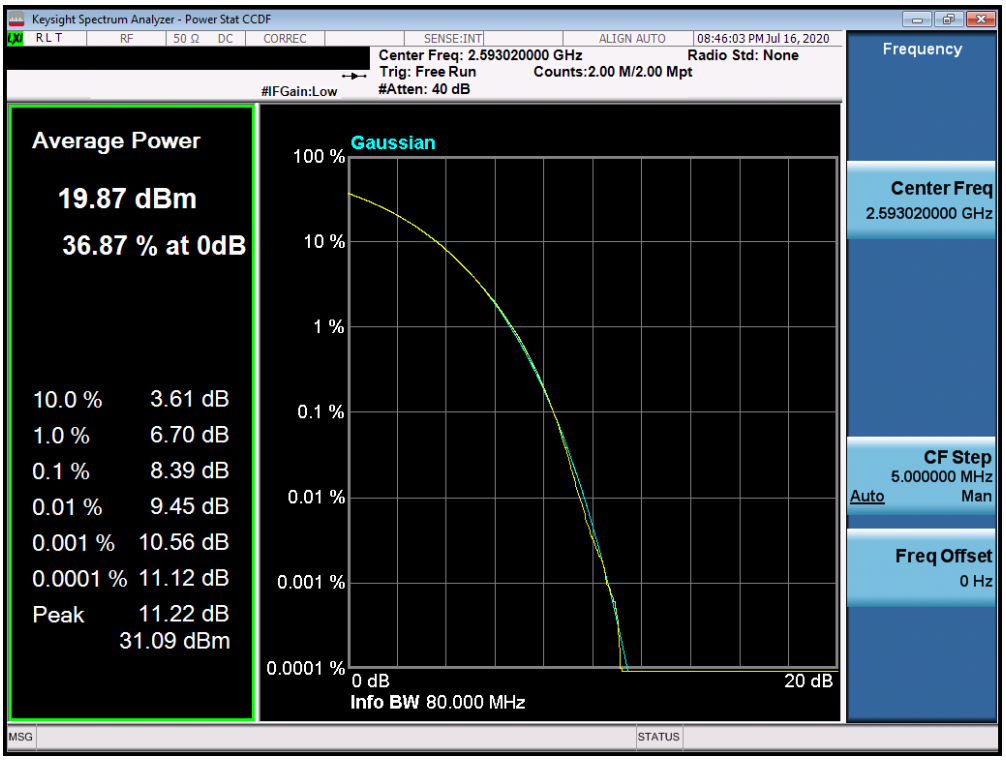
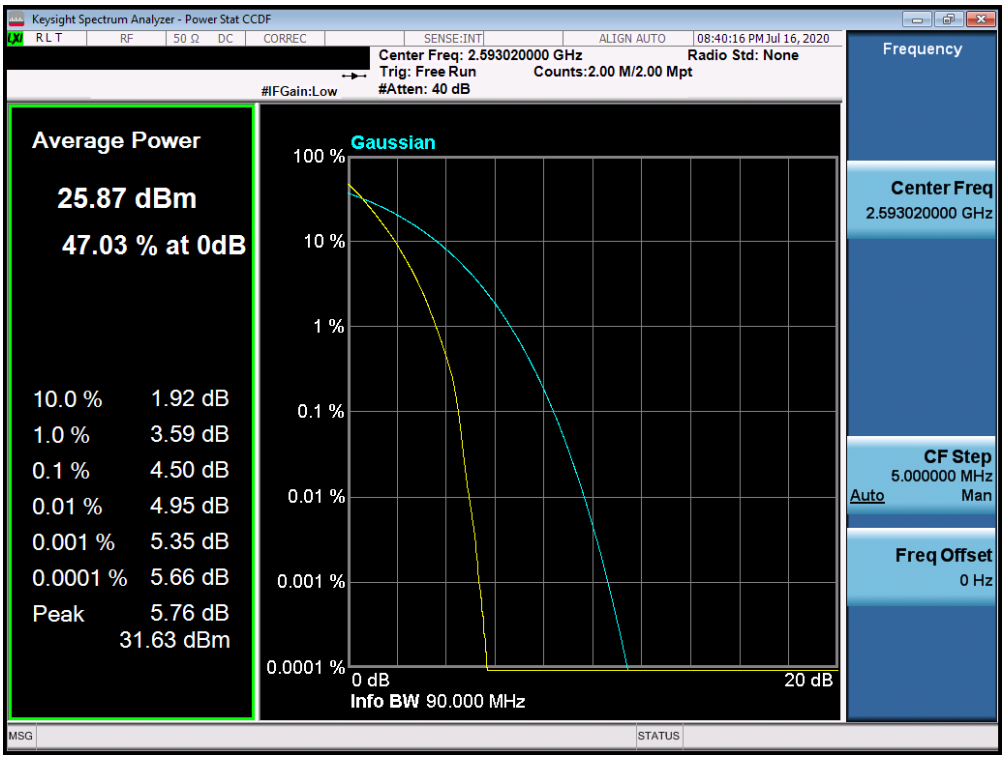


Plot 7-783. PAR Plot (n41 - 80.0MHz CP-OFDM-256-QAM - Full RB Configuration)



Plot 7-784. PAR Plot (n41 - 90.0MHz DFT-s-OFDM-BPSK - Full RB Configuration)

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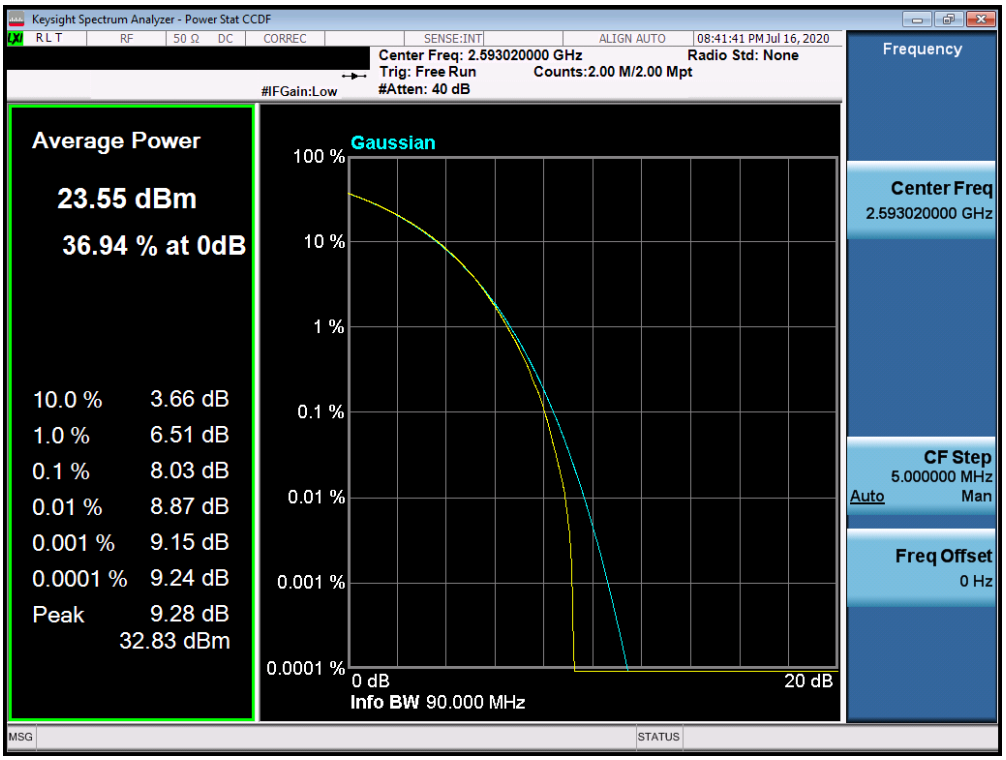
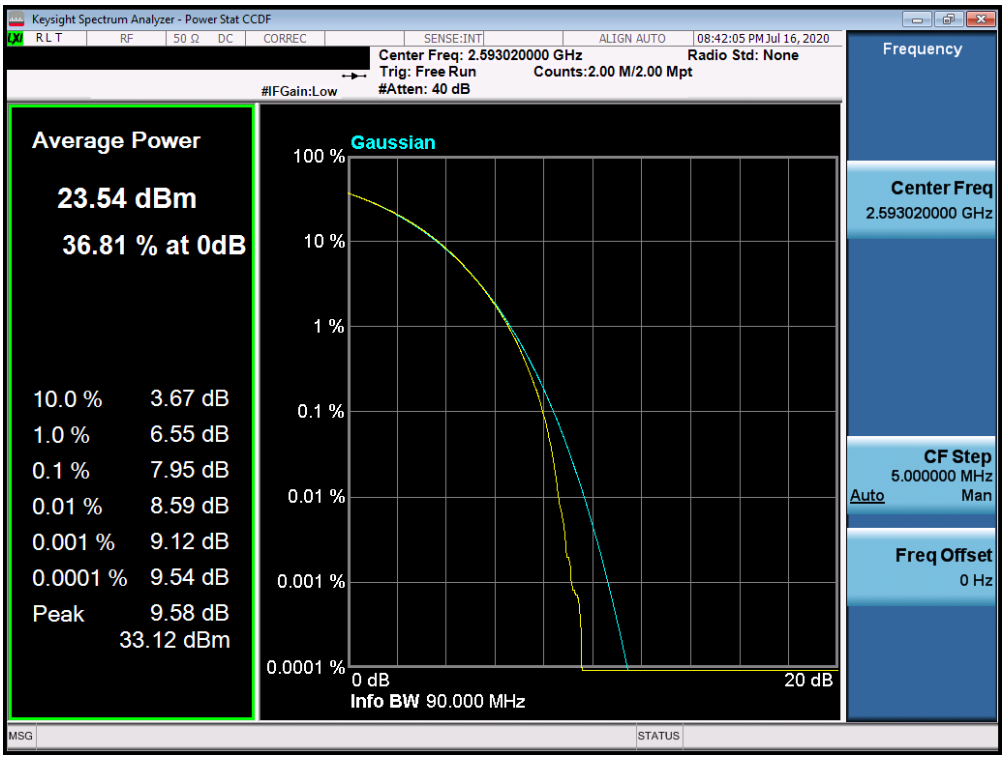


Plot 7-785. PAR Plot (n41 - 90.0MHz CP-OFDM-QPSK - Full RB Configuration)



Plot 7-786. PAR Plot (n41 - 90.0MHz CP-OFDM-16-QAM - Full RB Configuration)

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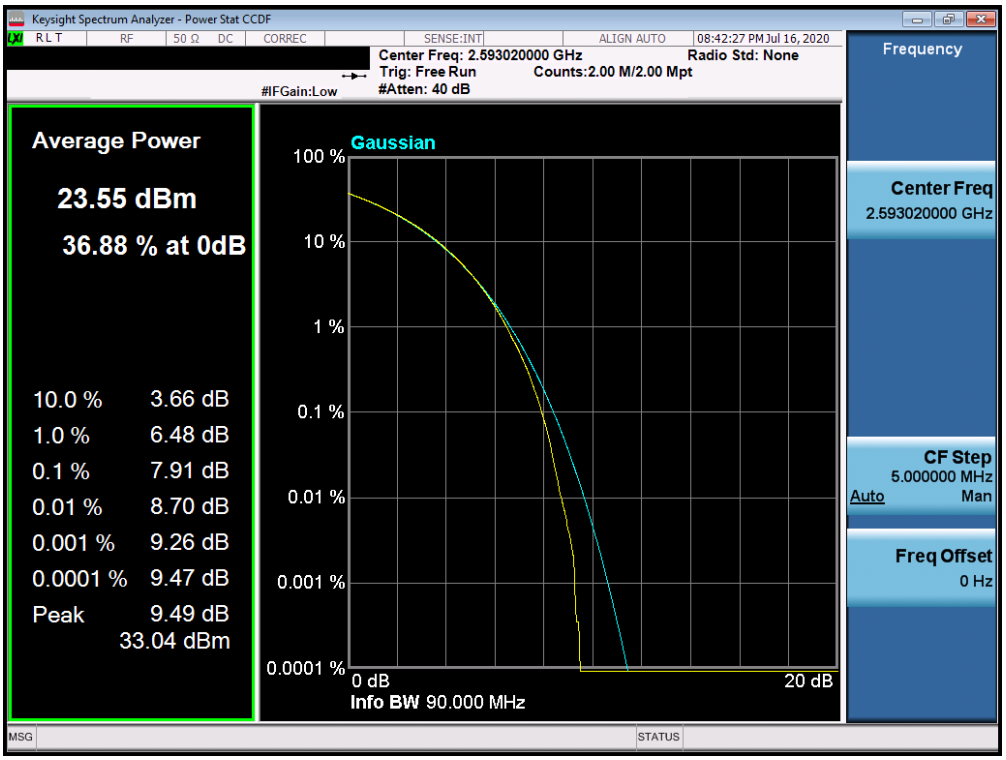
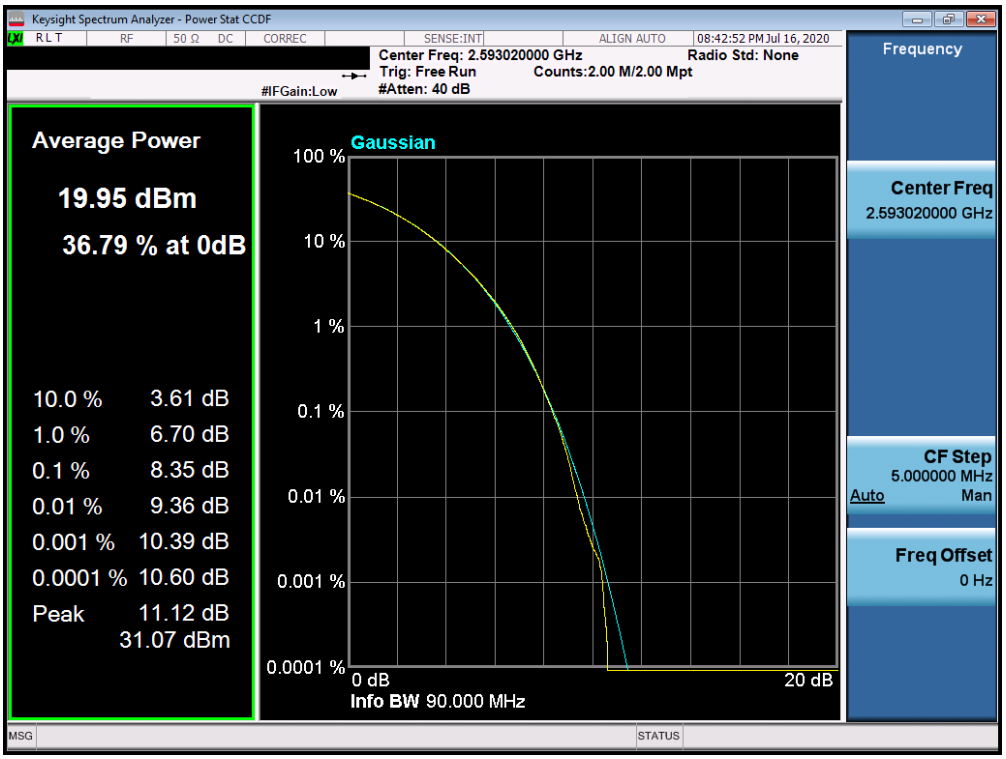


Plot 7-787. PAR Plot (n41 - 90.0MHz CP-OFDM-64-QAM - Full RB Configuration)



Plot 7-788. PAR Plot (n41 - 90.0MHz CP-OFDM-256-QAM - Full RB Configuration)

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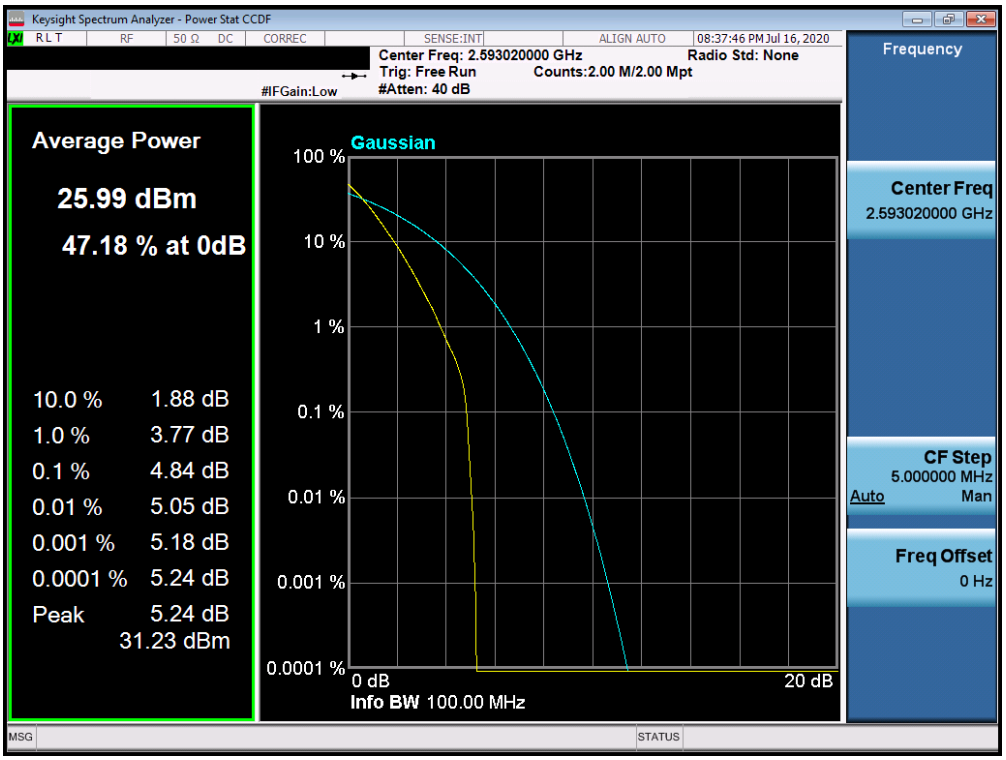
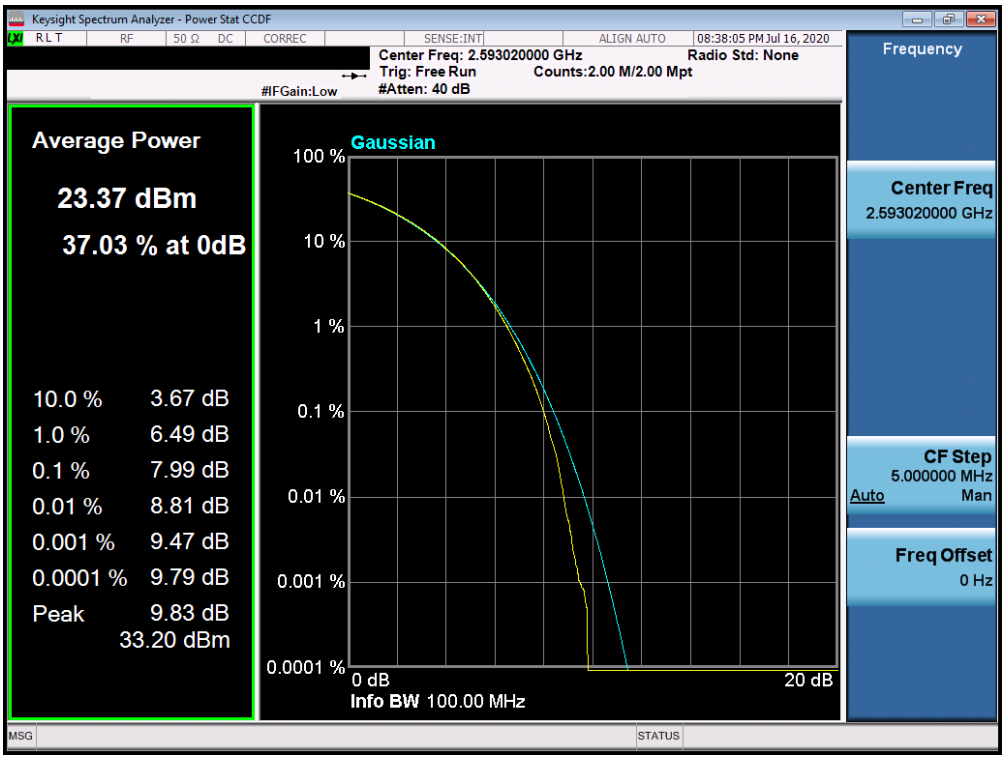


Plot 7-789. PAR Plot (n41 - 100.0MHz DFT-s-OFDM-BPSK - Full RB Configuration)



Plot 7-790. PAR Plot (n41 - 100.0MHz CP-OFDM-QPSK - Full RB Configuration)

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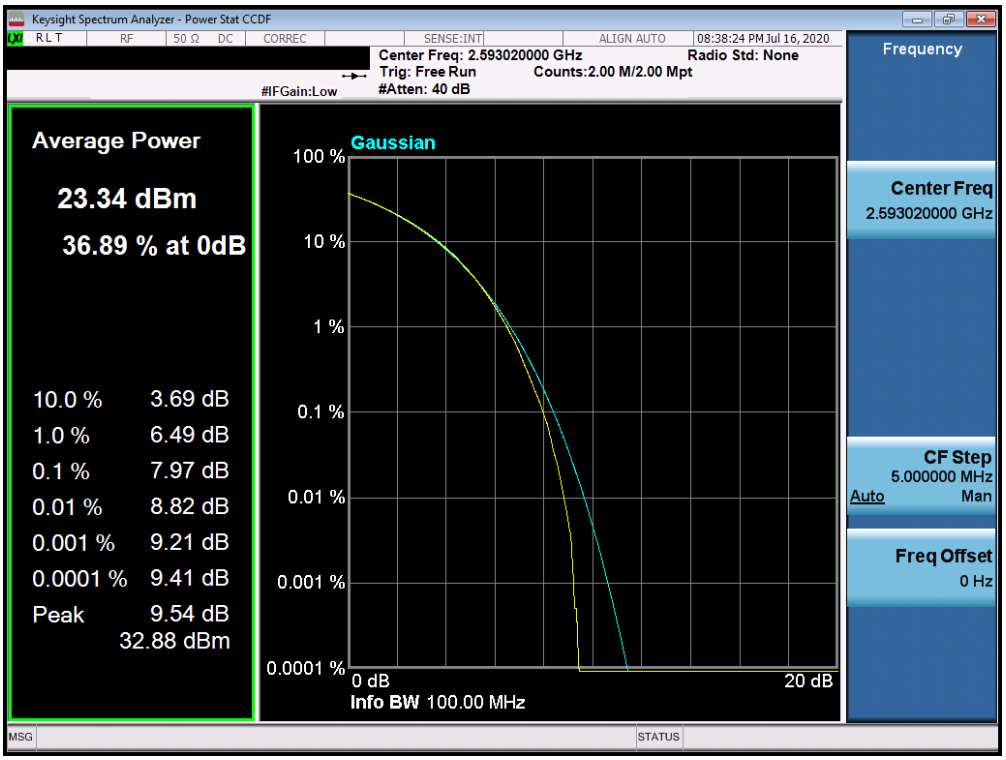
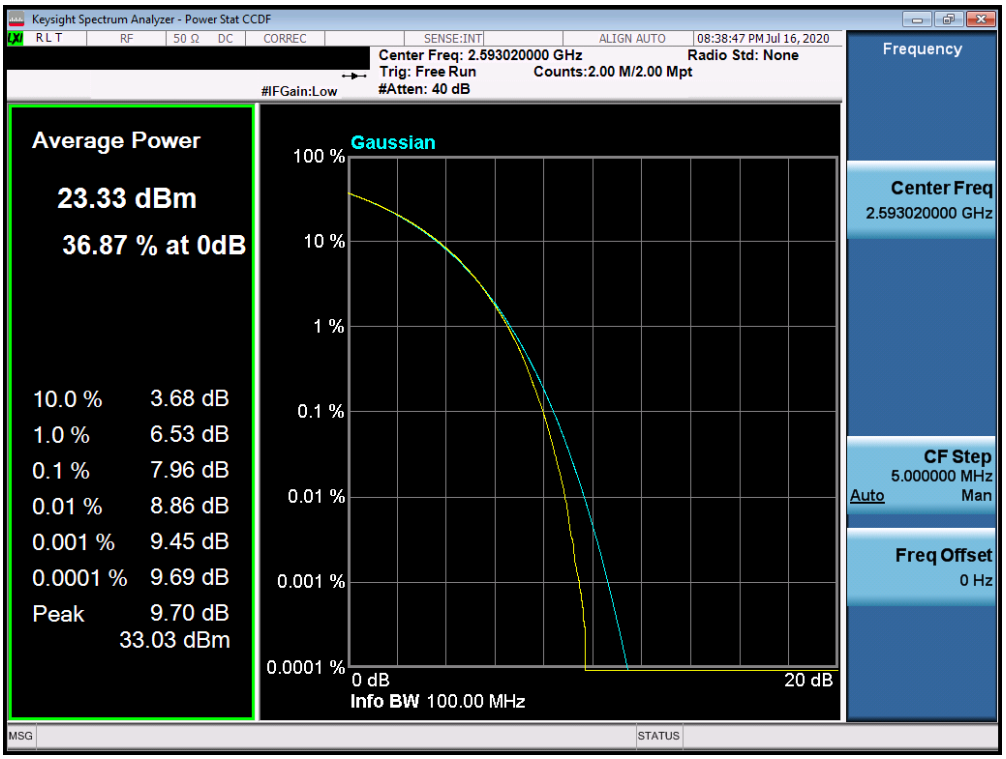


Plot 7-791. PAR Plot (n41 - 100.0MHz CP-OFDM-16-QAM - Full RB Configuration)



Plot 7-792. PAR Plot (n41 - 100.0MHz CP-OFDM-64-QAM - Full RB Configuration)

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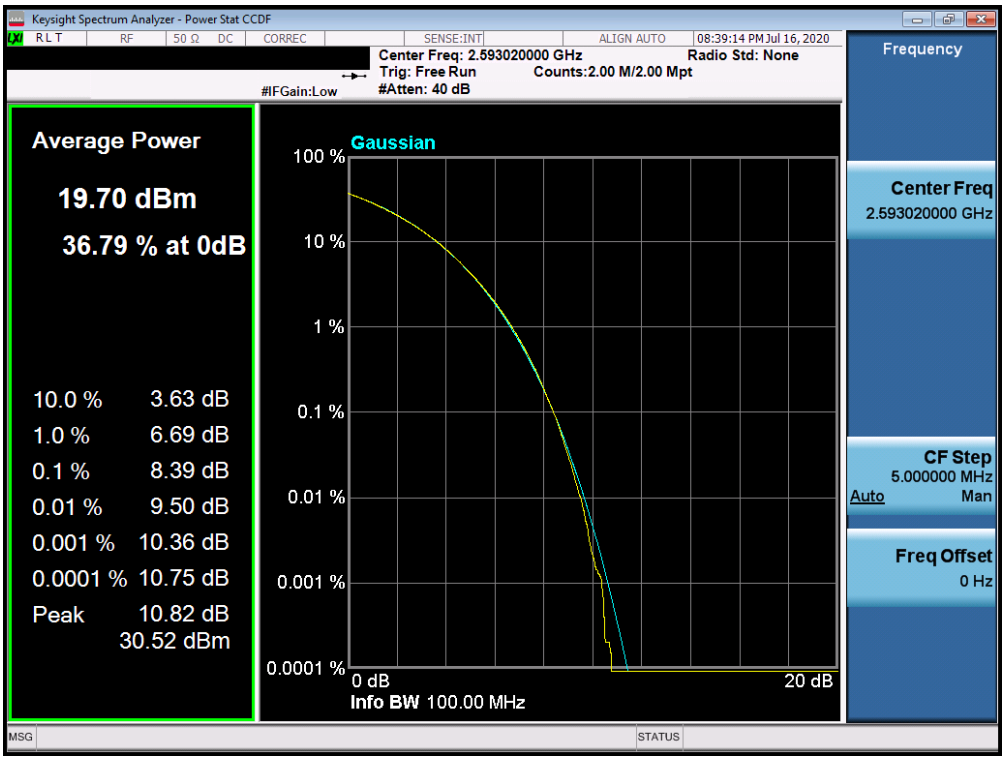

Plot 7-793. PAR Plot (n41 - 100.0MHz CP-OFDM-256-QAM - Full RB Configuration)

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7.6 Uplink Carrier Aggregation

§27.53(h), 22.913

Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

For Band 38/41, the minimum permissible attenuation level of any spurious emission is 55 + 10 $\log_{10}(P_{[Watts]})$.
For Band 66, the minimum permissible attenuation level of any spurious emission is 43 + 10 $\log_{10}(P_{[Watts]})$.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

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

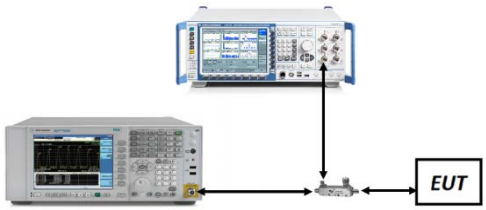

Figure 7-5. Test Instrument & Measurement Setup

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Test Notes

1. Conducted power and spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in Table 7-503 and 7-504 below, with both carriers set to transmit using 1RB.

2. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

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Uplink CA Configuration 41C

PCC							SCC							Power
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	26.45
LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	26.92
LTE B41	20	41490	2680	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	**27.32**

Table 7-3. Conducted Powers (B41 – Left Carrier: RB Size 1 Offset Max Right Carrier: RB Size 1 Offset 0)

PCC							SCC							Power
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
LTE B41	20	41490	2680	QPSK	100	0	LTE B41	20	41292	2660.2	QPSK	100	0	27.32
LTE B41	20	41490	2680	16-QAM	100	0	LTE B41	20	41292	2660.2	16-QAM	100	0	26.45
LTE B41	20	41490	2680	64-QAM	100	0	LTE B41	20	41292	2660.2	64-QAM	100	0	25.39
LTE B41	20	41490	2680	256-QAM	100	0	LTE B41	20	41292	2660.2	256-QAM	100	0	23.07

Table 7-4. Conducted Powers (B41 with Various Combinations for 20MHz Channel Bandwidth)

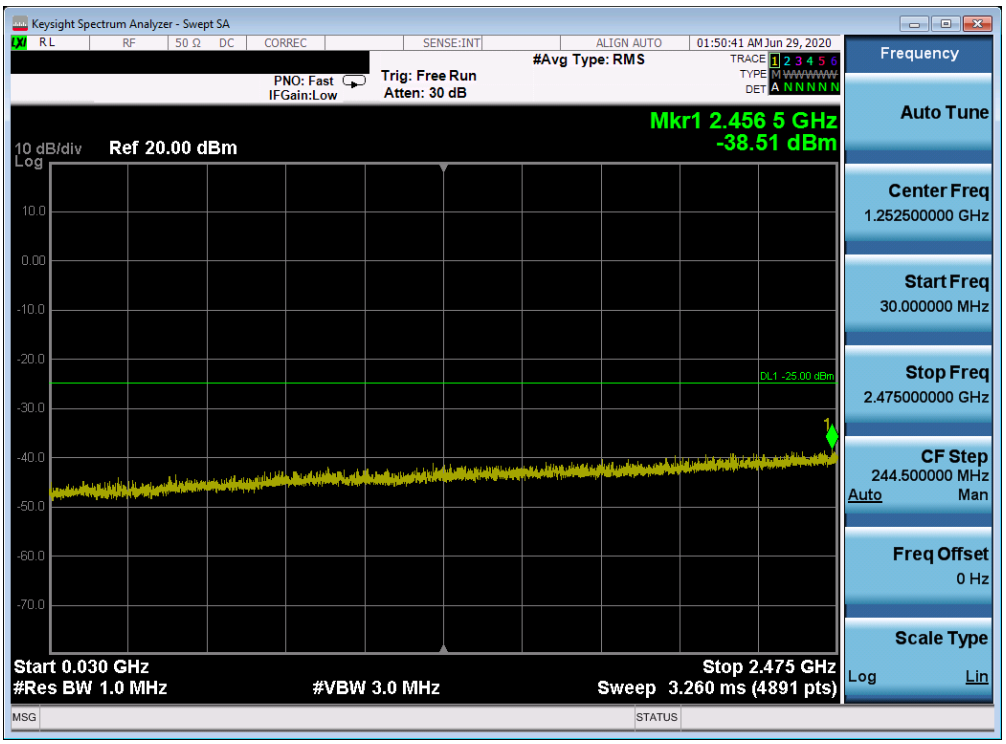

Table 7-794. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Low Channel)

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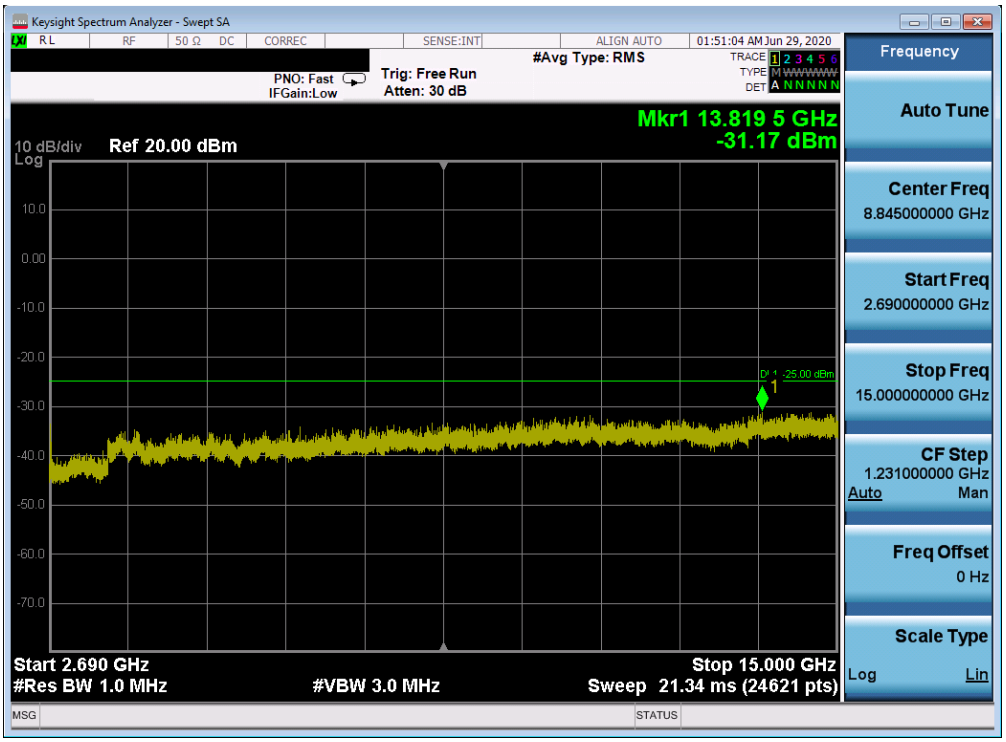

Table 7-795. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Low Channel)

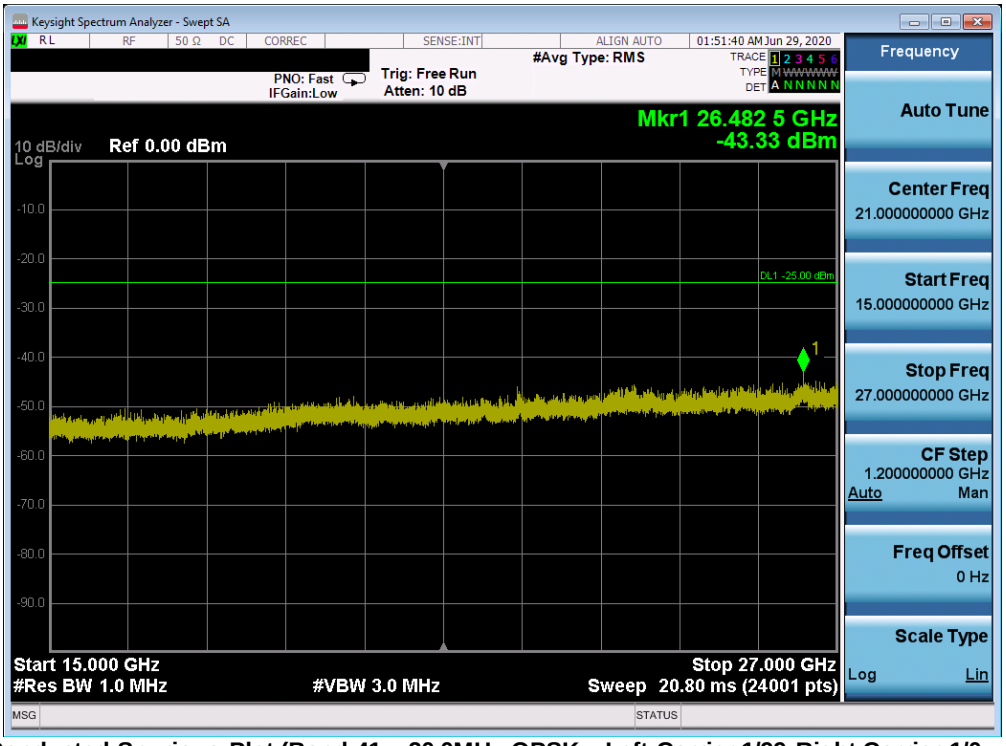

Table 7-796. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Low Channel)

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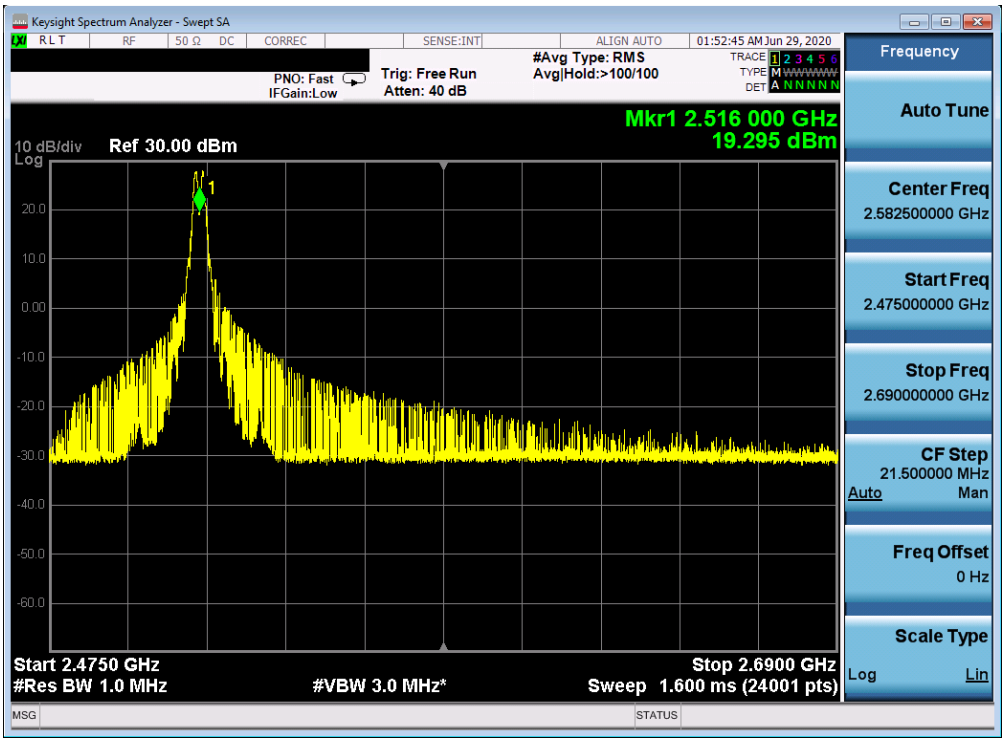

Table 7-797. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Low Channel)

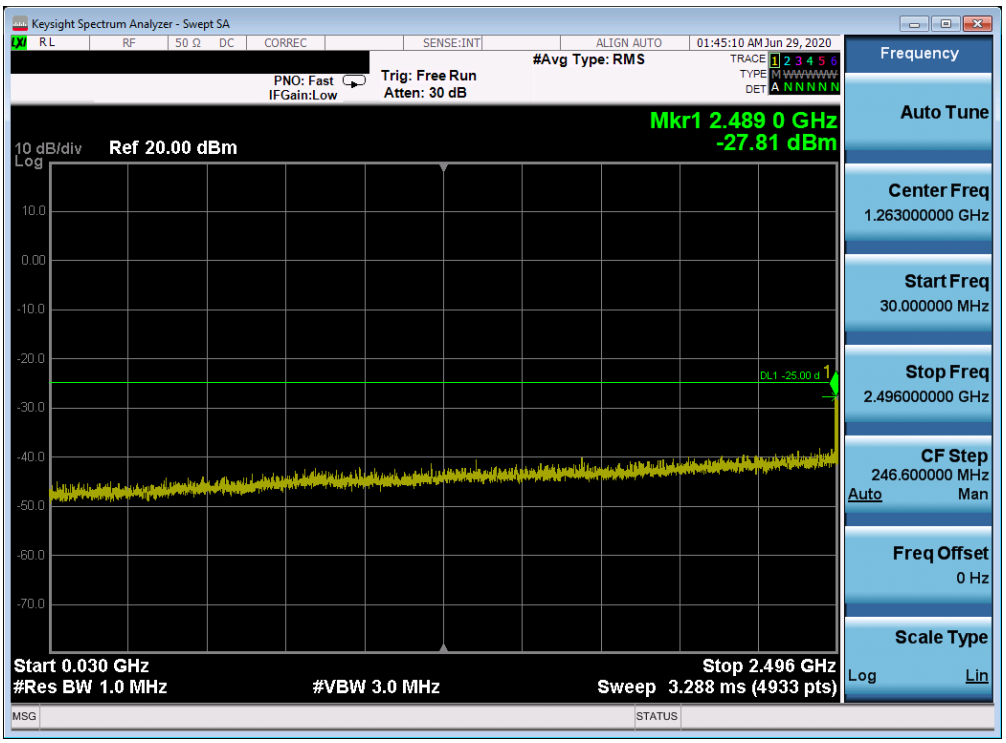

Table 7-798. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

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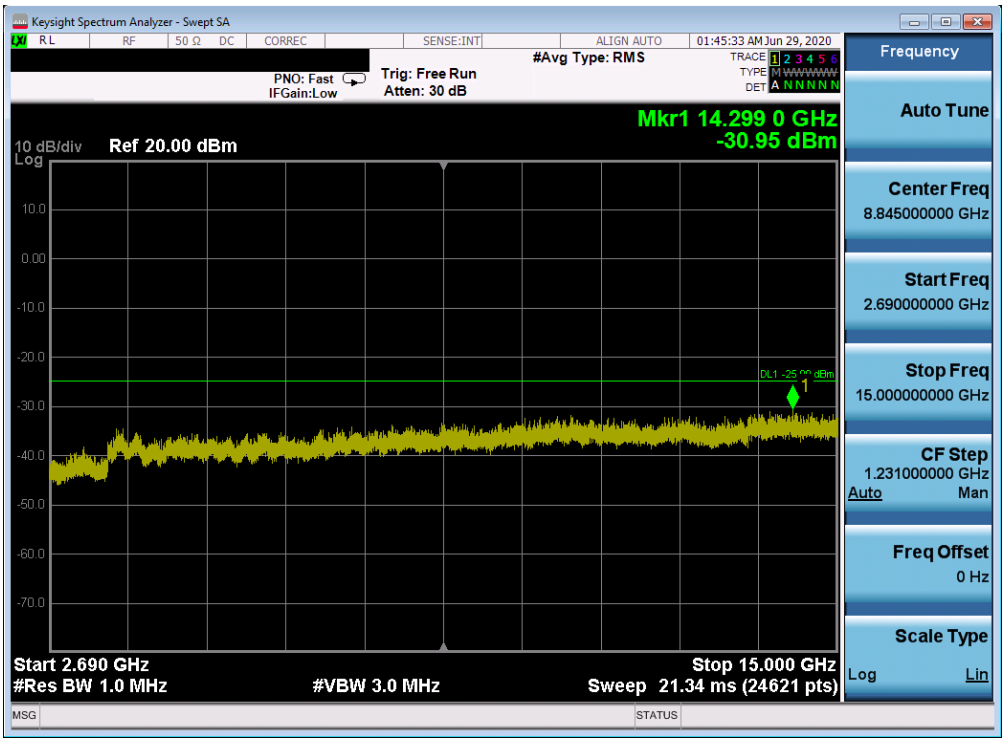

Table 7-799. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

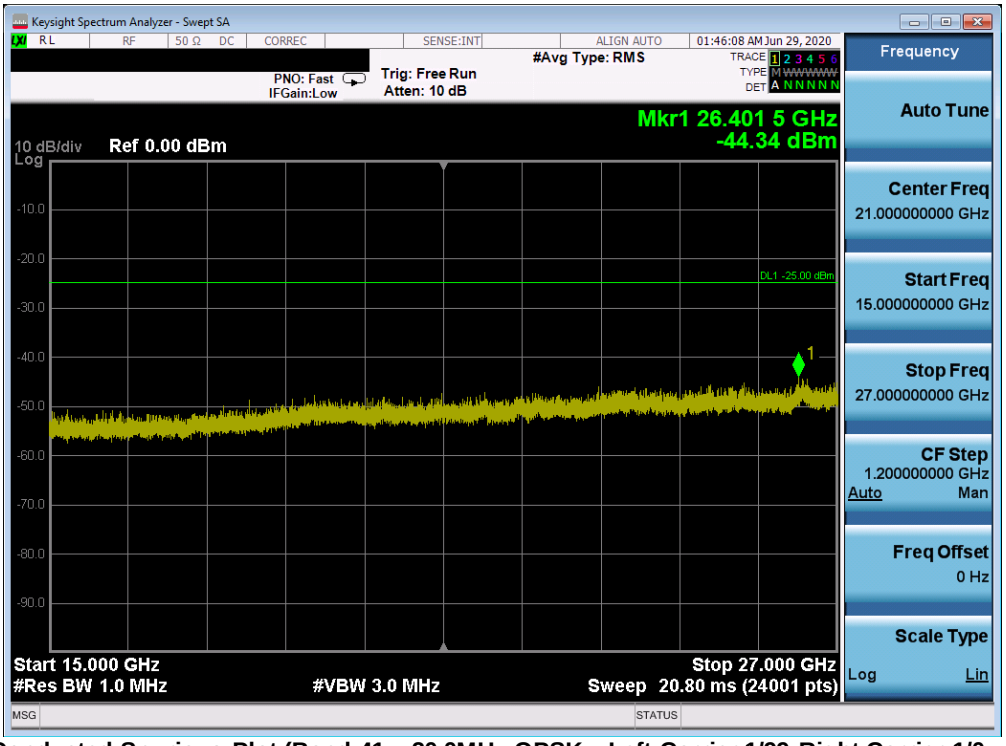

Table 7-800. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

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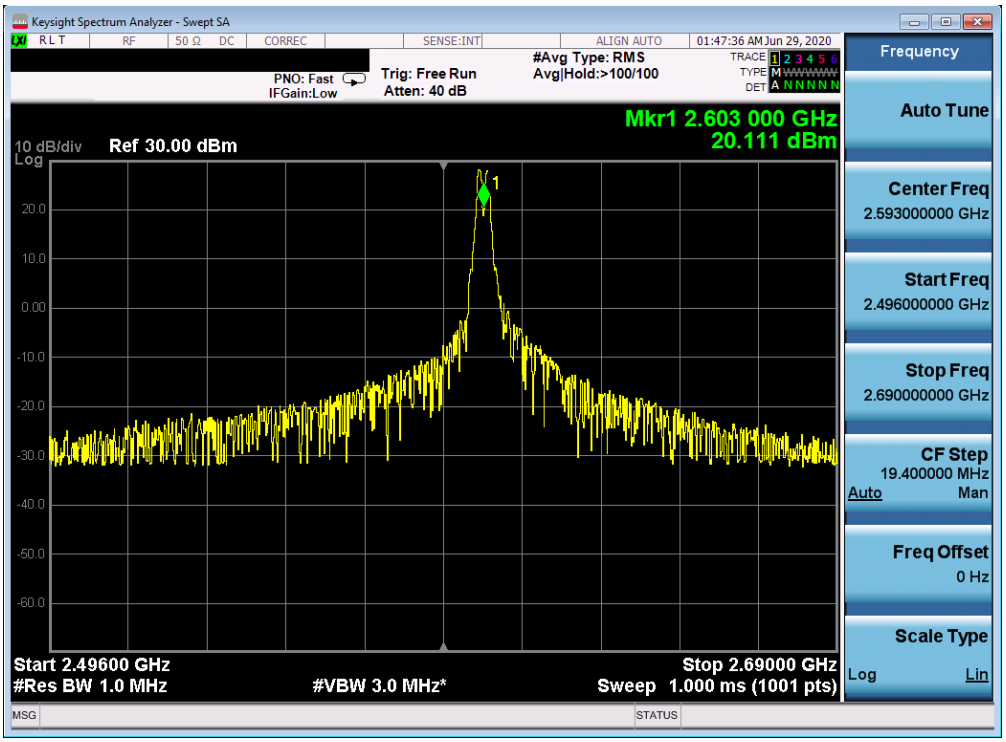

Table 7-801. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – Mid Channel)

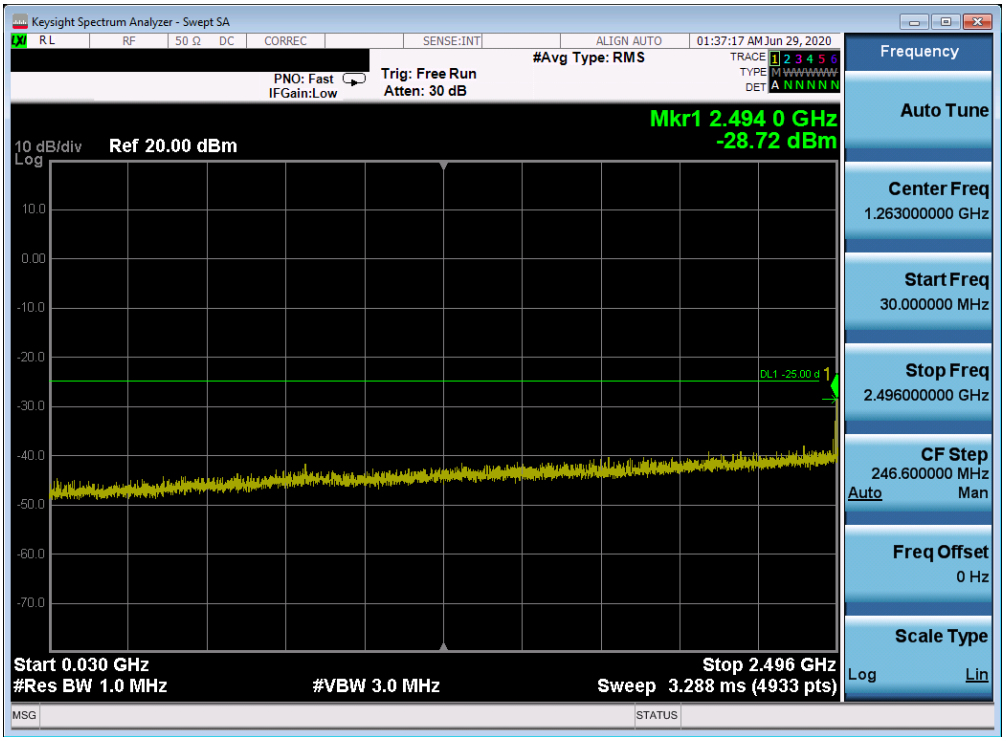

Table 7-802. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – High Channel)

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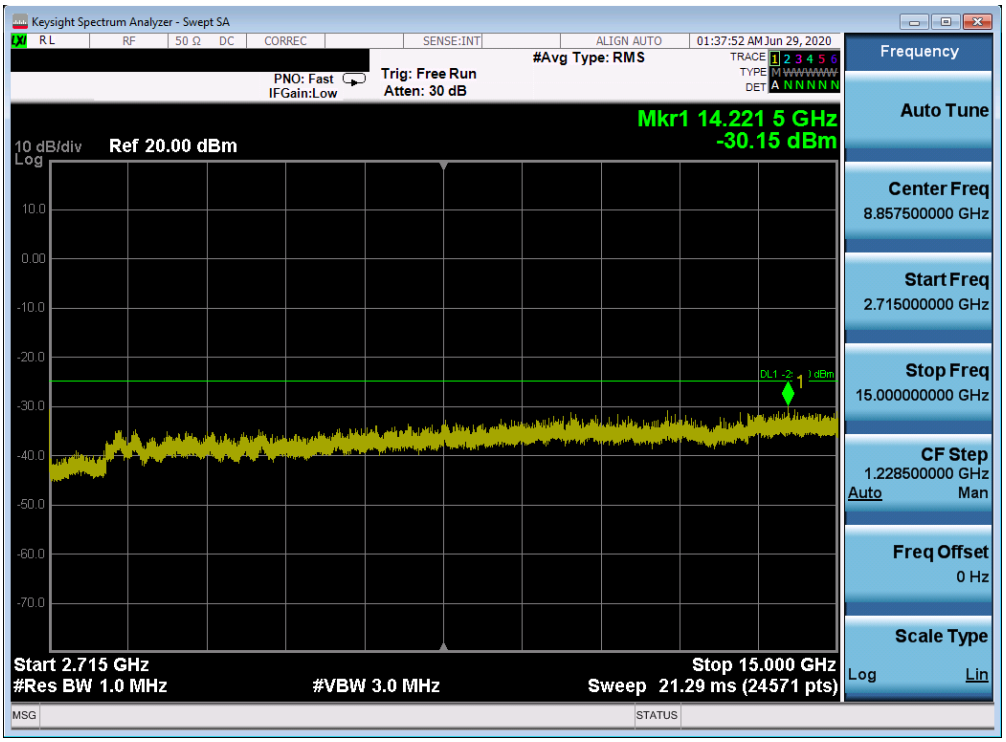

Table 7-803. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – High Channel)

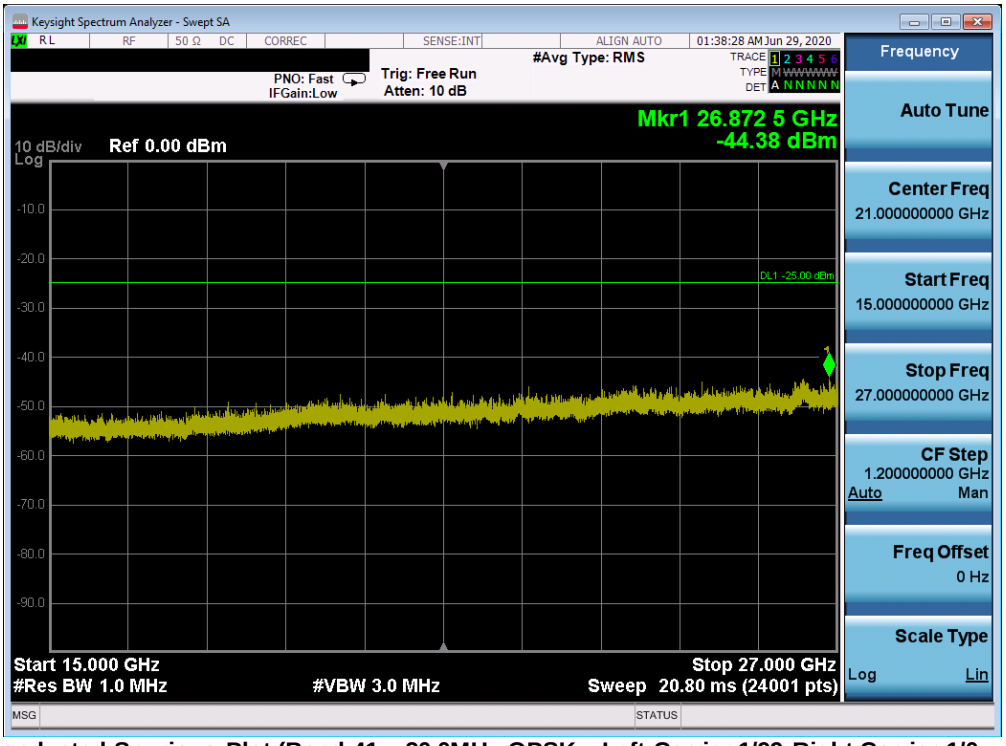

Table 7-804. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – High Channel)

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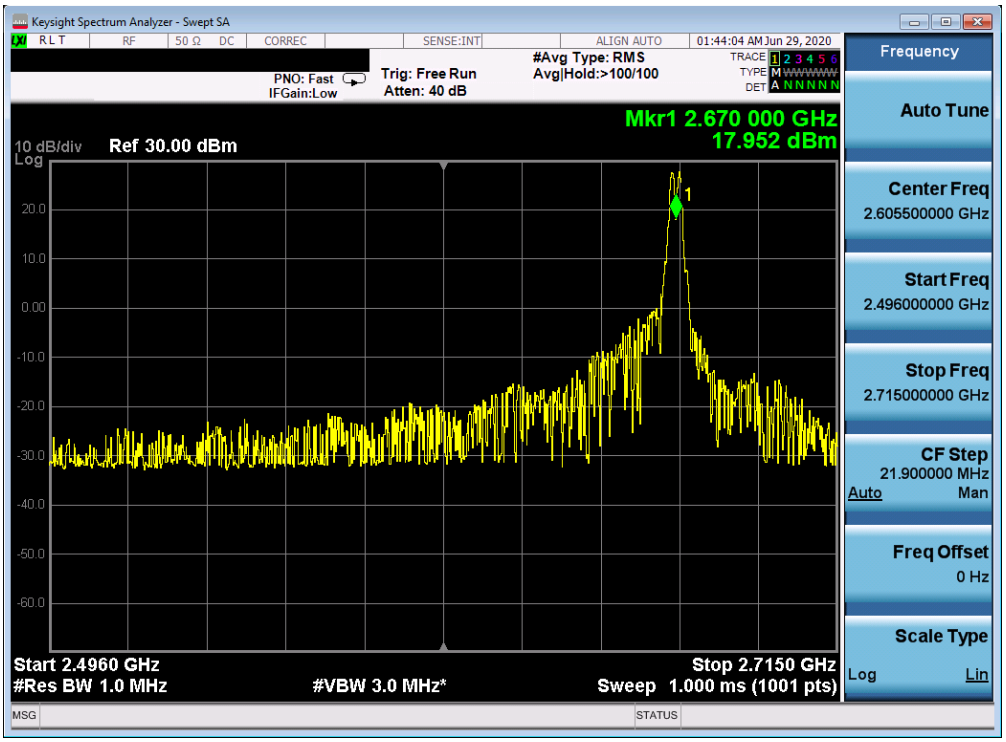
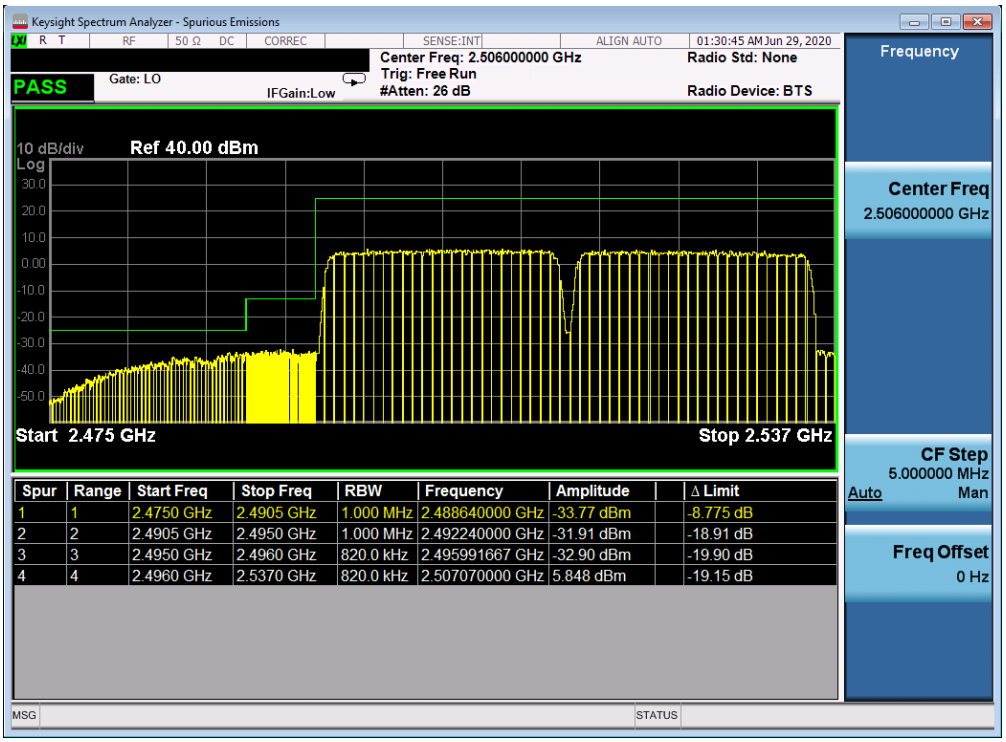


Table 7-805. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – Left Carrier 1/99 Right Carrier 1/0 – High Channel)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.488640000 GHz	-33.77 dBm	-8.775 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.492240000 GHz	-31.91 dBm	-18.91 dB
3	3	2.4950 GHz	2.4960 GHz	820.0 kHz	2.495991667 GHz	-32.90 dBm	-19.90 dB
4	4	2.4960 GHz	2.5370 GHz	820.0 kHz	2.507070000 GHz	5.848 dBm	-19.15 dB

Table 7-806. Lower ACP Plot (Band 41 QPSK – Left Carrier:20 MHz Right Carrier:20 MHz – Full RB)

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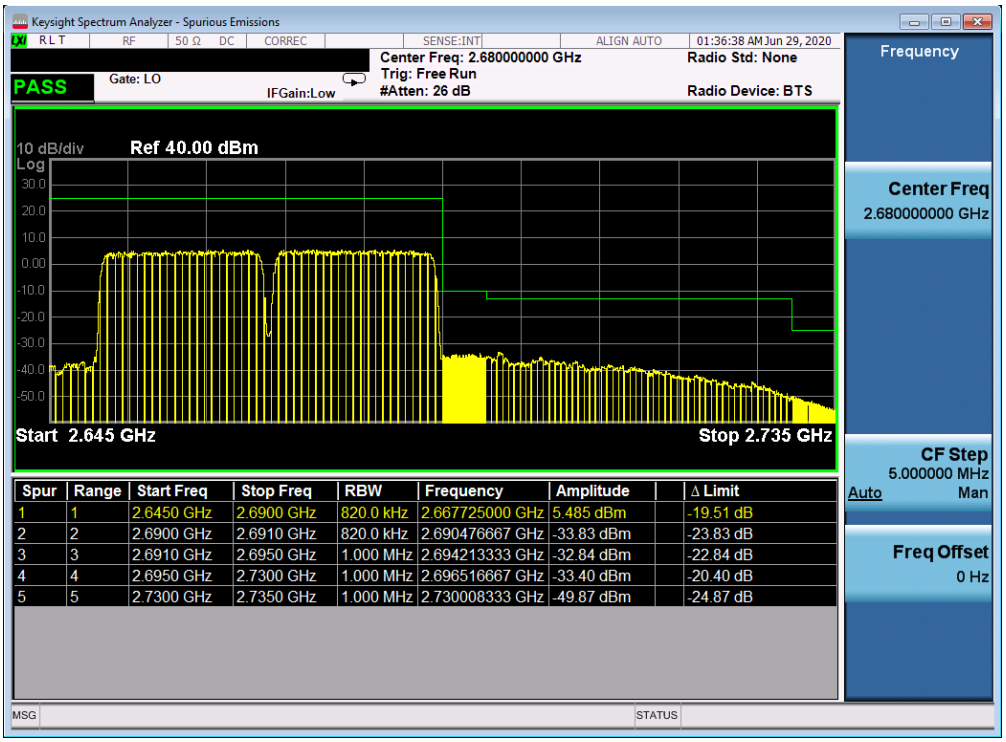

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude		Δ Limit
1	1	2.6450 GHz	2.6900 GHz	820.0 kHz	2.667725000 GHz	5.485 dBm		-19.51 dB
2	2	2.6900 GHz	2.6910 GHz	820.0 kHz	2.690476667 GHz	-33.83 dBm		-23.83 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.694213333 GHz	-32.84 dBm		-22.84 dB
4	4	2.6950 GHz	2.7300 GHz	1.000 MHz	2.696516667 GHz	-33.40 dBm		-20.40 dB
5	5	2.7300 GHz	2.7350 GHz	1.000 MHz	2.730008333 GHz	-49.87 dBm		-24.87 dB

Table 7-807. Upper ACP Plot (Band 41 QPSK – Left Carrier:20 MHz Right Carrier:20 MHz – Full RB)

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Inter-band Uplink CA Conducted Powers 12A-2A

Power State	SCC					PCC					B2	B12	Inter-Band ULCA Total Tx. Power (dBm)
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Frequency [MHz]	Mod.	PCC UL RB#/Offset	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Frequency [MHz]	Mod.	PCC UL RB#/Offset	SCC Power	PCC Power	
Max	B2	5	L	QPSK	1 / 0	B12	3	L	QPSK	1 / 0	17.67	23.29	24.34
Max	B2	5	L	QPSK	1 / 24	B12	3	M	QPSK	1 / 0	17.56	23.43	24.43
Max	B2	5	M	QPSK	1 / 0	B12	3	H	QPSK	1 / 14	17.45	23.28	24.29
Max	B2	10	M	QPSK	1 / 49	B12	3	L	QPSK	1 / 14	17.46	23.21	24.23
Max	B2	10	H	QPSK	1 / 0	B12	5	M	QPSK	1 / 0	17.53	23.27	24.30
Max	B2	10	H	QPSK	1 / 49	B12	5	H	QPSK	1 / 0	17.67	23.25	24.31
Max	B2	15	L	QPSK	1 / 0	B12	5	L	QPSK	1 / 49	17.55	23.21	24.25
Max	B2	15	L	QPSK	1 / 24	B12	5	M	QPSK	1 / 49	17.64	23.26	24.31
Max	B2	15	M	QPSK	1 / 49	B12	5	H	QPSK	1 / 49	17.54	23.31	24.33
Max	B2	20	L	QPSK	1 / 0	B12	10	M	QPSK	1 / 0	17.61	23.22	24.27
Max	B2	20	M	QPSK	1 / 0	B12	10	M	QPSK	1 / 0	17.35	23.27	24.26
Max	B2	20	H	QPSK	1 / 0	B12	10	M	QPSK	1 / 0	17.55	23.19	24.24
Max	B2	5	WC	16QAM	1 / 24	B12	3	WC	16QAM	1 / 0	16.55	22.21	23.25
Max	B2	5	WC	64QAM	1 / 24	B12	3	WC	64QAM	1 / 0	15.42	21.07	22.12

Table 7-5. Conducted Powers (12A-2A 1 RB)

Power State	SCC					PCC					B2	B12	Inter-Band ULCA Total Tx. Power (dBm)
	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Frequency [MHz]	Mod.	SCC UL RB#/Offset	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Frequency [MHz]	Mod.	PCC UL RB#/Offset	SCC Power	PCC Power	
Max	B2	5	L	QPSK	25 / 0	B12	3	L	QPSK	1 / 0	16.58	22.81	23.74
Max	B2	10	L	QPSK	50 / 0	B12	3	H	QPSK	1 / 0	16.61	22.84	23.77
Max	B2	20	H	QPSK	25 / 0	B12	5	L	QPSK	15 / 0	16.6	22.87	23.79
Max	B2	5	H	QPSK	50 / 0	B12	5	H	QPSK	15 / 0	16.59	22.81	23.74
Max	B2	10	L	QPSK	25 / 0	B12	10	L	QPSK	25 / 0	16.71	22.82	23.77
Max	B2	20	L	QPSK	50 / 0	B12	10	H	QPSK	25 / 0	16.66	22.83	23.77
Max	B2	5	H	QPSK	25 / 0	B12	3	L	QPSK	50 / 0	16.63	22.77	23.72
Max	B2	10	H	QPSK	50 / 0	B12	3	H	QPSK	50 / 0	16.66	22.98	23.89
Max	B2	20	L	QPSK	25 / 0	B12	5	L	QPSK	100 / 0	16.7	22.78	23.74
Max	B2	5	L	QPSK	50 / 0	B12	5	H	QPSK	100 / 0	16.62	22.83	23.76
Max	B2	10	L	QPSK	50 / 0	B12	10	L	QPSK	100 / 0	16.58	22.82	23.75
Max	B2	20	L	QPSK	50 / 0	B12	10	H	QPSK	100 / 0	16.73	22.86	23.81
Max	B2	10	H	QPSK	50 / 0	B12	10	L	QPSK	100 / 0	16.66	22.77	23.72
Max	B2	10	H	QPSK	50 / 0	B12	10	H	QPSK	100 / 0	16.68	22.72	23.69
Max	B2	WC BW	WC Ch.	16QAM	50 / 0	B12	WC BW	WC Ch.	16QAM	100 / 0	15.71	21.78	22.74
Max	B2	WC BW	WC Ch.	64QAM	50 / 0	B12	WC BW	WC Ch.	64QAM	100 / 0	14.83	20.82	21.80

Table 7-6. Conducted Powers (12A-2A Full RB)

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Inter-band Uplink CA Conducted Powers 12A-66A

Power State	PCC					SCC					B12	B66	Inter-Band ULCA Total Tx. Power (dBm)
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Frequency [MHz]	Mod.	PCC UL RB#/Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Frequency [MHz]	Mod.	SCC UL RB#/Offset	PCC Power	SCC Power	
Max	B12	5	L	QPSK	1 / 0	B66	1.4	L	QPSK	1 / 0	23.29	17.67	24.34
Max	B12	5	L	QPSK	1 / 24	B66	1.4	M	QPSK	1 / 0	23.46	17.56	24.45
Max	B12	5	M	QPSK	1 / 0	B66	3	H	QPSK	1 / 14	23.44	17.59	24.44
Max	B12	5	M	QPSK	1 / 24	B66	3	L	QPSK	1 / 14	23.41	17.62	24.43
Max	B12	5	H	QPSK	1 / 0	B66	5	M	QPSK	1 / 0	23.34	17.50	24.35
Max	B12	5	H	QPSK	1 / 24	B66	5	H	QPSK	1 / 0	23.40	17.46	24.39
Max	B12	10	M	QPSK	1 / 0	B66	10	L	QPSK	1 / 49	23.39	17.56	24.40
Max	B12	10	M	QPSK	1 / 24	B66	10	M	QPSK	1 / 49	23.42	17.42	24.39
Max	B12	10	M	QPSK	1 / 49	B66	10	H	QPSK	1 / 49	23.31	17.39	24.30
Max	B12	10	M	QPSK	1 / 0	B66	20	M	QPSK	1 / 0	23.32	17.48	24.33
Max	B12	10	M	QPSK	1 / 49	B66	20	H	QPSK	1 / 0	23.36	17.49	24.36
Max	B12	5	L	16QAM	1 / 24	B66	1.4	M	16QAM	1 / 0	22.51	16.41	23.46
Max	B12	5	L	64QAM	1 / 24	B66	1.4	M	64QAM	1 / 0	21.11	15.27	22.12

Table 7-7. Conducted Powers (12A-66A 1 RB)

Power State	PCC					SCC					B12	B66	Inter-Band ULCA Total Tx. Power (dBm)
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Frequency [MHz]	Mod.	PCC UL RB#/Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Frequency [MHz]	Mod.	SCC UL RB#/Offset	PCC Power	SCC Power	
Max	B12	5	L	QPSK	25 / 0	B66	1.4	L	QPSK	1 / 0	22.78	16.3	23.66
Max	B12	10	L	QPSK	50 / 0	B66	1.4	H	QPSK	1 / 0	22.77	16.35	23.66
Max	B12	5	H	QPSK	25 / 0	B66	3	L	QPSK	15 / 0	22.83	16.42	23.72
Max	B12	10	H	QPSK	50 / 0	B66	3	H	QPSK	15 / 0	22.82	16.46	23.72
Max	B12	5	L	QPSK	25 / 0	B66	5	L	QPSK	25 / 0	22.87	16.23	23.72
Max	B12	10	L	QPSK	50 / 0	B66	5	H	QPSK	25 / 0	22.77	16.53	23.70
Max	B12	5	H	QPSK	25 / 0	B66	10	L	QPSK	50 / 0	22.84	16.31	23.71
Max	B12	10	H	QPSK	50 / 0	B66	10	H	QPSK	50 / 0	23.1	16.54	23.97
Max	B12	5	L	QPSK	25 / 0	B66	15	L	QPSK	100 / 0	23.07	16.52	23.94
Max	B12	10	L	QPSK	50 / 0	B66	15	H	QPSK	100 / 0	23.03	16.42	23.89
Max	B12	10	L	QPSK	50 / 0	B66	20	L	QPSK	100 / 0	23.01	16.59	23.90
Max	B12	10	L	QPSK	50 / 0	B66	20	H	QPSK	100 / 0	22.84	16.55	23.76
Max	B12	10	H	QPSK	50 / 0	B66	20	L	QPSK	100 / 0	22.81	16.54	23.73
Max	B12	10	H	QPSK	50 / 0	B66	20	H	QPSK	100 / 0	22.82	16.53	23.74
Max	B12	WC BW	WC Ch.	16QAM	50 / 0	B66	WC BW	WC Ch.	16QAM	50 / 0	21.87	15.18	22.71
Max	B12	WC BW	WC Ch.	64QAM	50 / 0	B66	WC BW	WC Ch.	64QAM	50 / 0	20.52	14.04	21.40

Table 7-8. Conducted Powers (12A-66A Full RB)

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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

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Test Setup

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

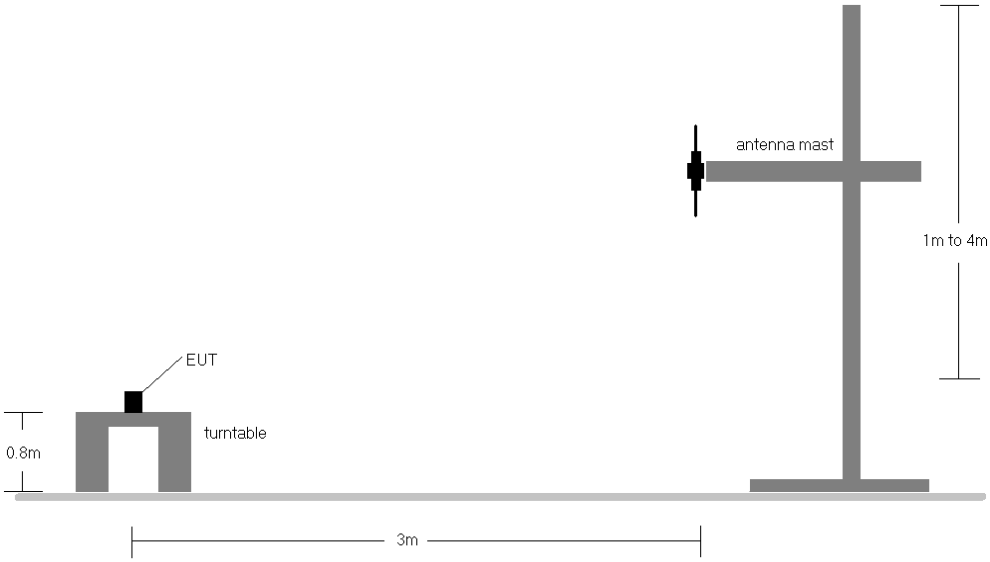

Figure 7-6. Radiated Test Setup <1GHz

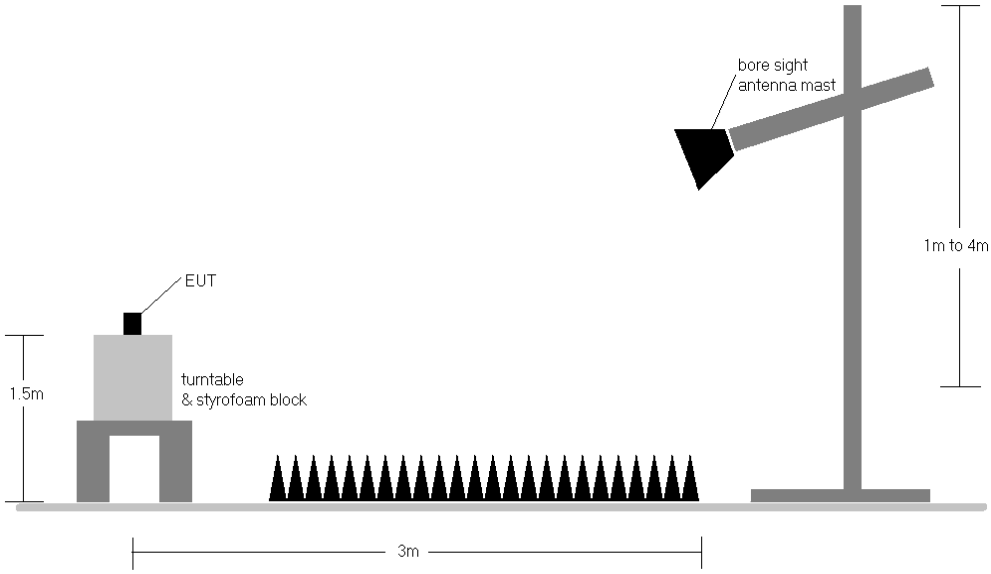

Figure 7-7. Radiated Test Setup >1GHz

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.

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
665.50	5	QPSK	H	313	100	1 / 0	14.68	2.99	15.52	0.036	34.77	-19.25
680.50	5	QPSK	H	172	116	1 / 0	14.61	3.19	**15.65**	0.037	34.77	-19.13
695.50	5	QPSK	H	136	98	1 / 0	12.78	3.38	14.00	0.025	34.77	-20.77
680.50	5	16-QAM	H	172	116	1 / 0	13.98	3.19	**15.02**	0.032	34.77	-19.76
680.50	5	64-QAM	H	172	116	1 / 0	13.84	3.19	**14.88**	0.031	34.77	-19.90
668.00	10	QPSK	H	316	100	1 / 0	14.65	3.02	**15.53**	0.036	34.77	-19.24
680.50	10	QPSK	H	175	106	1 / 0	14.36	3.19	15.40	0.035	34.77	-19.38
693.00	10	QPSK	H	136	92	1 / 0	12.60	3.34	13.79	0.024	34.77	-20.98
668.00	10	16-QAM	H	316	100	1 / 0	13.37	3.02	**14.25**	0.027	34.77	-20.52
680.50	10	64-QAM	H	175	106	1 / 0	13.64	3.19	**14.68**	0.029	34.77	-20.10
670.50	15	QPSK	H	316	105	1 / 0	14.53	3.06	**15.44**	0.035	34.77	-19.33
680.50	15	QPSK	H	175	110	1 / 0	14.37	3.19	15.41	0.035	34.77	-19.37
690.50	15	QPSK	H	136	92	1 / 0	12.64	3.31	13.80	0.024	34.77	-20.97
680.50	15	16-QAM	H	175	110	1 / 0	13.59	3.19	**14.63**	0.029	34.77	-20.15
680.50	15	64-QAM	H	175	110	1 / 0	13.33	3.19	**14.37**	0.027	34.77	-20.41
673.00	20	QPSK	H	316	100	1 / 0	14.76	3.09	**15.70**	**0.037**	34.77	-19.07
680.50	20	QPSK	H	172	104	1 / 0	14.58	3.19	15.62	0.036	34.77	-19.16
688.00	20	QPSK	H	136	92	1 / 0	12.73	3.28	13.86	0.024	34.77	-20.91
673.00	20	16-QAM	H	316	100	1 / 0	13.60	3.09	**14.54**	0.028	34.77	-20.23
680.50	20	64-QAM	H	172	104	1 / 0	13.68	3.19	**14.72**	0.030	34.77	-20.06
673.00	20	QPSK	V	169	355	1 / 0	13.47	3.09	14.41	0.028	34.77	-20.36
673.00	20 (WCP)	QPSK	H	152	95	1 / 0	9.84	3.09	10.78	0.012	34.77	-23.99

Table 7-9. ERP Data (Band 71)

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	673.0	V	142.0	118.0	4.09	1 / 53	14.16	16.10	0.041	34.77	-18.67
		680.5	V	138.0	107.0	4.24	1 / 53	14.27	16.36	0.043	34.77	-18.42
		688.0	V	140.0	109.0	4.48	1 / 53	14.06	**16.39**	0.044	34.77	-18.38
	QPSK	673.0	V	142.0	118.0	4.09	1 / 53	14.27	16.21	0.042	34.77	-18.56
		680.5	V	138.0	107.0	4.24	1 / 53	14.41	**16.50**	0.045	34.77	-18.28
		688.0	V	140.0	109.0	4.48	1 / 53	14.06	16.39	0.044	34.77	-18.38
	16-QAM	688.0	V	140.0	109.0	4.48	1 / 53	13.20	**15.53**	0.036	34.77	-19.24
	64-QAM	688.0	V	140.0	109.0	4.48	1 / 53	12.32	**14.65**	0.029	34.77	-20.12
	256-QAM	680.5	V	138.0	107.0	4.24	1 / 53	10.80	**12.89**	0.019	34.77	-21.89
15 MHz	π/2 BPSK	670.5	V	145.0	120.0	3.96	1 / 39	14.23	16.04	0.040	34.77	-18.73
		680.5	V	138.0	107.0	4.24	1 / 39	14.07	**16.16**	0.041	34.77	-18.62
		690.5	V	140.0	109.0	4.41	1 / 39	13.72	15.98	0.040	34.77	-18.79
	QPSK	670.5	V	145.0	120.0	3.96	1 / 39	14.30	16.11	0.041	34.77	-18.66
		680.5	V	138.0	107.0	4.24	1 / 39	14.49	**16.58**	0.045	34.77	-18.20
		690.5	V	140.0	109.0	4.41	1 / 39	14.01	16.27	0.042	34.77	-18.50
	16-QAM	690.5	V	140.0	109.0	4.41	1 / 39	13.28	**15.54**	0.036	34.77	-19.23
	64-QAM	690.5	V	140.0	109.0	4.41	1 / 39	12.36	**14.62**	0.029	34.77	-20.15
	256-QAM	680.5	V	138.0	107.0	4.24	1 / 39	10.77	**12.86**	0.019	34.77	-21.92
10 MHz	π/2 BPSK	668.0	V	145.0	120.0	3.82	1 / 26	14.27	15.95	0.039	34.77	-18.82
		680.5	V	140.0	110.0	4.24	1 / 26	14.07	16.16	0.041	34.77	-18.62
		693.0	V	142.0	110.0	4.44	1 / 26	13.93	**16.22**	0.042	34.77	-18.55
	QPSK	668.0	V	145.0	120.0	3.82	1 / 26	14.44	16.12	0.041	34.77	-18.65
		680.5	V	140.0	110.0	4.24	1 / 26	14.56	**16.65**	0.046	34.77	-18.13
		693.0	V	142.0	110.0	4.44	1 / 26	14.10	16.39	0.044	34.77	-18.38
	16-QAM	693.0	V	142.0	110.0	4.44	1 / 26	13.29	**15.58**	0.036	34.77	-19.19
	64-QAM	693.0	V	142.0	110.0	4.44	1 / 26	12.39	**14.68**	0.029	34.77	-20.09
	256-QAM	693.0	V	142.0	110.0	4.44	1 / 26	10.59	**12.88**	0.019	34.77	-21.89
5 MHz	π/2 BPSK	665.5	V	148.0	120.0	3.79	1 / 12	14.43	16.07	0.040	34.77	-18.70
		680.5	V	140.0	122.0	4.24	1 / 12	14.17	**16.26**	0.042	34.77	-18.52
		695.5	V	142.0	118.0	4.58	1 / 12	13.63	16.05	0.040	34.77	-18.72
	QPSK	665.5	V	148.0	120.0	3.79	1 / 12	14.55	16.19	0.042	34.77	-18.58
		680.5	V	140.0	122.0	4.24	1 / 12	14.56	**16.65**	0.046	34.77	-18.13
		695.5	V	142.0	118.0	4.58	1 / 12	13.91	16.33	0.043	34.77	-18.44
	16-QAM	695.5	V	142.0	118.0	4.58	1 / 12	13.20	**15.62**	0.036	34.77	-19.15
	64-QAM	695.5	V	142.0	118.0	4.58	1 / 12	12.28	**14.70**	0.030	34.77	-20.07
	256-QAM	680.5	V	140.0	122.0	4.24	1 / 12	10.83	12.92	0.020	34.77	-21.86
	QPSK (CP-OFDM)	680.5	V	138.0	107.0	4.24	1 / 53	13.79	**15.88**	0.039	34.77	-18.90
	QPSK (Opposite Pol.)	680.5	H	136.0	16.0	4.24	1 / 53	13.20	15.29	0.034	34.77	-19.49
	QPSK (WCP)	680.5	V	172.0	132.0	4.24	1 / 53	7.82	9.91	0.010	34.77	-24.87

Table 7-10. ERP Data (Band n71)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	142	101	1 / 0	13.76	3.43	15.04	0.032	34.77	-19.73
707.50	1.4	QPSK	H	121	98	1 / 0	13.70	3.72	**15.27**	0.034	34.77	-19.50
715.30	1.4	QPSK	H	144	109	1 / 0	13.46	3.72	15.03	0.032	34.77	-19.74
707.50	1.4	16-QAM	H	121	98	1 / 0	12.94	3.72	**14.51**	0.028	34.77	-20.26
707.50	1.4	64-QAM	H	121	98	1 / 0	11.85	3.72	**13.42**	0.022	34.77	-21.35
700.50	3	QPSK	H	135	105	1 / 0	13.90	3.44	15.19	0.033	34.77	-19.58
707.50	3	QPSK	H	118	99	1 / 0	13.68	3.72	15.25	0.034	34.77	-19.52
714.50	3	QPSK	H	144	110	1 / 0	13.72	3.71	**15.28**	0.034	34.77	-19.49
714.50	3	16-QAM	H	144	110	1 / 0	12.85	3.71	**14.41**	0.028	34.77	-20.36
707.50	3	64-QAM	H	118	99	1 / 0	11.87	3.72	**13.44**	0.022	34.77	-21.33
701.50	5	QPSK	H	132	100	1 / 0	13.78	3.45	15.08	0.032	34.77	-19.69
707.50	5	QPSK	H	120	98	1 / 0	13.67	3.72	**15.24**	0.033	34.77	-19.53
713.50	5	QPSK	H	143	111	1 / 0	13.64	3.70	15.19	0.033	34.77	-19.58
713.50	5	16-QAM	H	143	111	1 / 0	12.86	3.70	**14.41**	0.028	34.77	-20.36
707.50	5	64-QAM	H	120	98	1 / 0	11.96	3.72	**13.53**	0.023	34.77	-21.24
704.00	10	QPSK	H	132	100	1 / 0	13.68	3.58	15.11	0.032	34.77	-19.66
707.50	10	QPSK	H	118	95	1 / 0	13.72	3.72	**15.29**	**0.034**	34.77	-19.48
711.00	10	QPSK	H	143	109	1 / 0	13.59	3.67	15.11	0.032	34.77	-19.66
707.50	10	16-QAM	H	118	95	1 / 0	13.02	3.72	**14.59**	0.029	34.77	-20.18
707.50	10	64-QAM	H	118	95	1 / 0	11.90	3.72	**13.47**	0.022	34.77	-21.30
707.50	10	QPSK	V	164	100	1 / 0	12.77	3.72	14.34	0.027	34.77	-20.43
707.50	10 (WCP)	QPSK	H	156	92	1 / 0	7.66	3.72	9.23	0.008	34.77	-25.54

Table 7-11. ERP Data (Band 12)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	246	95	1 / 0	12.39	5.82	16.06	0.040	34.77	-18.72
782.00	5	QPSK	H	250	91	1 / 0	12.49	5.89	**16.23**	0.042	34.77	-18.54
784.50	5	QPSK	H	251	99	1 / 0	12.37	5.92	16.14	0.041	34.77	-18.63
782.00	5	16-QAM	H	250	91	1 / 0	11.38	5.89	**15.12**	0.033	34.77	-19.65
784.50	5	64-QAM	H	251	99	1 / 0	10.96	5.92	**14.73**	0.030	34.77	-20.04
782.00	10	QPSK	H	249	90	1 / 0	12.66	5.89	**16.40**	**0.044**	34.77	-18.37
782.00	10	16-QAM	H	249	90	1 / 0	11.67	5.89	**15.41**	0.035	34.77	-19.36
782.00	10	64-QAM	H	249	90	1 / 0	10.59	5.89	**14.33**	0.027	34.77	-20.44
782.00	10	QPSK	V	186	100	1 / 0	12.39	5.89	16.13	0.041	34.77	-18.64
782.00	10 (WCP)	QPSK	H	164	92	1 / 0	7.57	5.89	11.31	0.014	34.77	-23.46

Table 7-12. ERP Data (Band 13)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	144	88	1 / 0	11.45	6.76	16.05	0.040	38.45	-22.40
836.50	1.4	QPSK	H	142	91	1 / 0	11.74	6.68	16.27	0.042	38.45	-22.18
848.30	1.4	QPSK	H	142	100	1 / 0	11.80	6.70	**16.35**	0.043	38.45	-22.10
836.50	1.4	16-QAM	H	142	91	1 / 0	10.88	6.68	**15.41**	0.035	38.45	-23.04
848.30	1.4	64-QAM	H	142	100	1 / 0	9.96	6.70	**14.51**	0.028	38.45	-23.94
825.50	3	QPSK	H	139	88	1 / 0	11.60	6.76	16.21	0.042	38.45	-22.24
836.50	3	QPSK	H	142	91	1 / 0	11.71	6.68	**16.24**	0.042	38.45	-22.21
847.50	3	QPSK	H	145	105	1 / 0	11.65	6.69	16.20	0.042	38.45	-22.25
847.50	3	16-QAM	H	145	105	1 / 0	11.22	6.69	**15.77**	0.038	38.45	-22.68
847.50	3	64-QAM	H	145	105	1 / 0	9.81	6.69	**14.36**	0.027	38.45	-24.09
826.50	5	QPSK	H	140	89	1 / 0	11.22	6.77	15.84	0.038	38.45	-22.61
836.50	5	QPSK	H	142	95	1 / 0	11.67	6.68	**16.20**	0.042	38.45	-22.25
846.50	5	QPSK	H	142	100	1 / 0	11.25	6.68	15.78	0.038	38.45	-22.67
846.50	5	16-QAM	H	142	100	1 / 0	10.85	6.68	**15.38**	0.035	38.45	-23.07
846.50	5	64-QAM	H	142	100	1 / 0	9.90	6.68	**14.43**	0.028	38.45	-24.02
829.00	10	QPSK	V	144	89	1 / 0	11.72	6.80	16.37	0.043	38.45	-22.08
836.50	10	QPSK	V	145	92	1 / 0	11.90	6.68	**16.43**	**0.044**	38.45	-22.02
844.00	10	QPSK	V	142	101	1 / 0	11.82	6.66	16.33	0.043	38.45	-22.12
844.00	10	16-QAM	V	142	101	1 / 0	10.92	6.66	**15.43**	0.035	38.45	-23.02
844.00	10	64-QAM	V	142	101	1 / 0	9.89	6.66	**14.40**	0.028	38.45	-24.05
836.50	10	QPSK	H	248	90	1 / 0	11.07	6.68	15.60	0.036	38.45	-22.85

Table 7-13. 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]
831.50	15	QPSK	V	141	89	1 / 0	11.36	6.73	15.94	0.039	38.45	-22.51
836.50	15	QPSK	V	142	91	1 / 0	11.78	6.68	**16.31**	0.043	38.45	-22.14
841.50	15	QPSK	V	145	101	1 / 0	11.37	6.63	15.85	0.038	38.45	-22.60
841.50	15	16-QAM	V	145	101	1 / 0	10.78	6.63	**15.26**	0.034	38.45	-23.19
841.50	15	64-QAM	V	145	101	1 / 0	10.09	6.63	**14.57**	0.029	38.45	-23.88

Table 7-14. ERP Data (Band 26)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	101	201	1 / 5	12.03	9.47	21.50	0.141	30.00	-8.50
1745.00	1.4	QPSK	H	242	18	1 / 5	12.70	9.26	**21.96**	0.157	30.00	-8.04
1779.30	1.4	QPSK	H	145	20	1 / 0	11.83	9.29	21.12	0.129	30.00	-8.88
1745.00	1.4	16-QAM	H	242	18	1 / 0	12.18	9.26	**21.44**	0.139	30.00	-8.56
1745.00	1.4	64-QAM	H	242	18	1 / 0	10.66	9.26	**19.92**	0.098	30.00	-10.08
1711.50	3	QPSK	H	101	201	1 / 14	11.82	9.47	21.29	0.135	30.00	-8.71
1745.00	3	QPSK	H	240	18	1 / 14	12.72	9.26	**21.98**	0.158	30.00	-8.02
1778.50	3	QPSK	H	147	19	1 / 0	11.89	9.28	21.17	0.131	30.00	-8.83
1745.00	3	16-QAM	H	240	18	1 / 0	12.18	9.26	**21.44**	0.139	30.00	-8.56
1745.00	3	64-QAM	H	240	18	1 / 0	10.63	9.26	**19.89**	0.098	30.00	-10.11
1712.50	5	QPSK	H	102	200	1 / 24	12.08	9.46	21.54	0.143	30.00	-8.46
1745.00	5	QPSK	H	240	8	1 / 24	12.82	9.26	**22.08**	0.161	30.00	-7.92
1777.50	5	QPSK	H	144	21	1 / 0	11.89	9.28	21.17	0.131	30.00	-8.83
1745.00	5	16-QAM	H	240	8	1 / 0	12.45	9.26	**21.71**	0.148	30.00	-8.29
1745.00	5	64-QAM	H	240	8	1 / 0	11.07	9.26	**20.33**	0.108	30.00	-9.67
1715.00	10	QPSK	H	101	200	1 / 49	11.79	9.44	21.24	0.133	30.00	-8.76
1745.00	10	QPSK	H	240	18	1 / 0	12.96	9.26	**22.22**	0.167	30.00	-7.78
1775.00	10	QPSK	H	144	19	1 / 0	11.69	9.28	20.96	0.125	30.00	-9.04
1745.00	10	16-QAM	H	240	18	1 / 0	11.64	9.26	**20.90**	0.123	30.00	-9.10
1745.00	10	64-QAM	H	240	18	1 / 0	10.87	9.26	**20.13**	0.103	30.00	-9.87
1717.50	15	QPSK	H	100	203	1 / 74	11.72	9.43	21.15	0.130	30.00	-8.85
1745.00	15	QPSK	H	240	9	1 / 0	12.97	9.26	**22.23**	0.167	30.00	-7.77
1772.50	15	QPSK	H	145	19	1 / 0	11.70	9.27	20.97	0.125	30.00	-9.03
1745.00	15	16-QAM	H	240	9	1 / 0	12.06	9.26	**21.32**	0.136	30.00	-8.68
1745.00	15	64-QAM	H	240	9	1 / 0	10.56	9.26	**19.82**	0.096	30.00	-10.18
1720.00	20	QPSK	H	100	200	1 / 99	11.85	9.41	21.26	0.134	30.00	-8.74
1745.00	20	QPSK	H	240	8	1 / 0	13.05	9.26	**22.31**	**0.170**	30.00	-7.69
1770.00	20	QPSK	H	144	19	1 / 0	11.66	9.27	20.93	0.124	30.00	-9.07
1745.00	20	16-QAM	H	240	8	1 / 0	11.95	9.26	**21.21**	0.132	30.00	-8.79
1745.00	20	64-QAM	H	240	8	1 / 0	10.78	9.26	**20.04**	0.101	30.00	-9.96
1745.00	20	QPSK	V	147	141	1 / 0	12.93	9.26	22.19	0.166	30.00	-7.81
1745.00	20 (WCP)	QPSK	H	156	135	1 / 0	8.21	9.26	17.47	0.056	30.00	-12.53

Table 7-15. EIRP Data (Band 66/4)

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
40 MHz	π/2 BPSK	1720.0	H	155.0	340.0	9.41	1 / 50	13.82	**23.23**	0.211	30.00	-6.77
		1745.0	H	150.0	349.0	9.26	1 / 50	13.92	23.18	0.208	30.00	-6.82
		1770.0	H	164.0	345.0	9.27	1 / 50	13.73	23.00	0.199	30.00	-7.00
	QPSK	1720.0	H	155.0	340.0	9.41	1 / 50	13.58	**22.99**	0.199	30.00	-7.01
		1745.0	H	150.0	349.0	9.26	1 / 50	13.69	22.95	0.197	30.00	-7.05
		1770.0	H	164.0	345.0	9.27	1 / 50	13.53	22.80	0.190	30.00	-7.20
	16-QAM	1745.0	H	150.0	349.0	9.26	1 / 50	12.93	**22.19**	0.166	30.00	-7.81
	64-QAM	1745.0	H	150.0	349.0	9.26	1 / 50	12.25	**21.51**	0.142	30.00	-8.49
	256-QAM	1720.0	H	155.0	340.0	9.41	1 / 50	10.88	**20.29**	0.107	30.00	-9.71
20 MHz	π/2 BPSK	1715.0	H	155.0	340.0	9.44	1 / 53	12.41	21.86	0.153	30.00	-8.14
		1745.0	H	150.0	349.0	9.26	1 / 53	13.04	22.30	0.170	30.00	-7.70
		1775.0	H	164.0	345.0	9.28	1 / 53	13.05	**22.33**	0.171	30.00	-7.67
	QPSK	1715.0	H	155.0	340.0	9.44	1 / 53	11.94	21.39	0.138	30.00	-8.61
		1745.0	H	150.0	349.0	9.26	1 / 53	12.88	**22.14**	0.164	30.00	-7.86
		1775.0	H	164.0	345.0	9.28	1 / 53	12.60	21.88	0.154	30.00	-8.12
	16-QAM	1775.0	H	164.0	345.0	9.28	1 / 53	13.24	**22.52**	0.179	30.00	-7.48
	64-QAM	1745.0	H	150.0	349.0	9.26	1 / 53	12.39	**21.65**	0.146	30.00	-8.35
	256-QAM	1715.0	H	155.0	340.0	9.44	1 / 53	12.46	**21.90**	0.155	30.00	-8.10
15 MHz	π/2 BPSK	1712.5	H	155.0	340.0	9.46	1 / 38	12.03	21.49	0.141	30.00	-8.51
		1745.0	H	150.0	349.0	9.26	1 / 38	12.97	**22.23**	0.167	30.00	-7.77
		1777.5	H	164.0	345.0	9.28	1 / 38	12.64	21.93	0.156	30.00	-8.07
	QPSK	1712.5	H	155.0	340.0	9.46	1 / 38	11.74	21.20	0.132	30.00	-8.80
		1745.0	H	150.0	349.0	9.26	1 / 38	12.75	**22.01**	0.159	30.00	-7.99
		1777.5	H	164.0	345.0	9.28	1 / 38	12.55	21.84	0.153	30.00	-8.16
	16-QAM	1745.0	H	150.0	349.0	9.26	1 / 38	12.99	**22.25**	0.168	30.00	-7.75
	64-QAM	1712.5	H	155.0	340.0	9.46	1 / 38	12.26	**21.72**	0.149	30.00	-8.28
	256-QAM	1712.5	H	155.0	340.0	9.46	1 / 38	12.38	**21.84**	0.153	30.00	-8.16

Table 7-16. EIRP Data (Band n66)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
10 MHz	π/2 BPSK	1715.0	H	162.0	345.0	9.44	1 / 25	11.84	21.29	0.134	30.00	-8.71
		1745.0	H	150.0	349.0	9.26	1 / 25	12.61	21.87	0.154	30.00	-8.13
		1775.0	H	171.0	327.0	9.28	1 / 25	12.71	**21.99**	0.158	30.00	-8.01
	QPSK	1715.0	H	162.0	345.0	9.44	1 / 25	11.35	20.80	0.120	30.00	-9.20
		1745.0	H	150.0	349.0	9.26	1 / 25	12.43	**21.69**	0.148	30.00	-8.31
		1775.0	H	171.0	327.0	9.28	1 / 25	12.13	21.41	0.138	30.00	-8.59
	16-QAM	1775.0	H	171.0	327.0	9.28	1 / 25	12.79	**22.07**	0.161	30.00	-7.93
	64-QAM	1775.0	H	171.0	327.0	9.28	1 / 25	12.12	**21.39**	0.138	30.00	-8.61
	256-QAM	1715.0	H	162.0	345.0	9.44	1 / 25	10.86	**20.30**	0.107	30.00	-9.70
5 MHz	π/2 BPSK	1712.5	H	166.0	345.0	9.46	1 / 12	11.46	20.92	0.124	30.00	-9.08
		1745.0	H	151.0	349.0	9.26	1 / 12	12.54	**21.80**	0.151	30.00	-8.20
		1777.5	H	171.0	330.0	9.28	1 / 12	12.30	21.59	0.144	30.00	-8.41
	QPSK	1712.5	H	166.0	345.0	9.46	1 / 12	11.15	20.61	0.115	30.00	-9.39
		1745.0	H	151.0	349.0	9.26	1 / 12	12.30	**21.56**	0.143	30.00	-8.44
		1777.5	H	171.0	330.0	9.28	1 / 12	12.08	21.37	0.137	30.00	-8.63
	16-QAM	1777.5	H	171.0	330.0	9.28	1 / 12	12.26	**21.55**	0.143	30.00	-8.45
	64-QAM	1777.5	H	171.0	330.0	9.28	1 / 12	12.18	**21.46**	0.140	30.00	-8.54
	256-QAM	1712.5	H	166.0	345.0	9.46	1 / 12	10.78	20.24	0.106	30.00	-9.76
	QPSK (CP-OFDM)	1745.0	H	164.0	341.0	9.26	1 / 50	12.42	**21.68**	0.147	30.00	-8.32
	BPSK (Ant 3)	1745.0	H	139.0	346.0	9.26	1 / 37	12.07	21.33	0.136	30.00	-8.67
	QPSK (Opposite Pol.)	1745.0	V	128.0	115.0	9.26	1 / 50	13.86	23.12	0.205	30.00	-6.88
	QPSK (WCP)	1745.0	H	172.0	132.0	9.26	1 / 50	11.12	20.38	0.109	30.00	-9.62

Table 7-17. EIRP Data (Band n66)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	105	355	1 / 0	11.36	9.51	20.87	0.122	33.01	-12.14
1882.50	1.4	QPSK	H	120	5	1 / 0	11.97	9.96	21.93	0.156	33.01	-11.08
1914.30	1.4	QPSK	H	111	354	1 / 0	11.80	10.32	**22.12**	0.163	33.01	-10.89
1882.50	1.4	16-QAM	H	120	5	1 / 0	10.99	9.96	**20.95**	0.124	33.01	-12.06
1914.30	1.4	64-QAM	H	111	354	1 / 0	9.81	10.32	**20.13**	0.103	33.01	-12.88
1851.50	3	QPSK	H	107	355	1 / 0	11.15	9.52	20.67	0.117	33.01	-12.34
1882.50	3	QPSK	H	125	5	1 / 0	11.92	9.96	21.88	0.154	33.01	-11.13
1913.50	3	QPSK	H	111	354	1 / 0	11.78	10.31	**22.09**	0.162	33.01	-10.92
1913.50	3	16-QAM	H	111	354	1 / 0	10.49	10.31	**20.80**	0.120	33.01	-12.21
1882.50	3	64-QAM	H	125	5	1 / 0	10.08	9.96	**20.04**	0.101	33.01	-12.97
1852.50	5	QPSK	H	101	352	1 / 0	11.35	9.54	20.89	0.123	33.01	-12.12
1882.50	5	QPSK	H	125	12	1 / 0	12.10	9.96	22.06	0.161	33.01	-10.95
1912.50	5	QPSK	H	109	359	1 / 0	11.91	10.30	**22.21**	**0.166**	33.01	-10.80
1882.50	5	16-QAM	H	125	12	1 / 0	11.27	9.96	**21.23**	0.133	33.01	-11.78
1912.50	5	64-QAM	H	109	359	1 / 0	10.06	10.30	**20.36**	0.109	33.01	-12.65
1855.00	10	QPSK	H	101	354	1 / 0	11.06	9.57	20.63	0.116	33.01	-12.38
1882.50	10	QPSK	H	122	2	1 / 0	11.93	9.96	21.89	0.155	33.01	-11.12
1910.00	10	QPSK	H	116	354	1 / 0	11.89	10.28	**22.17**	0.165	33.01	-10.84
1910.00	10	16-QAM	H	116	354	1 / 0	10.94	10.28	**21.22**	0.133	33.01	-11.79
1882.50	10	64-QAM	H	122	2	1 / 0	10.15	9.96	**20.11**	0.103	33.01	-12.90
1857.50	15	QPSK	H	105	352	1 / 0	10.90	9.61	20.51	0.112	33.01	-12.50
1882.50	15	QPSK	H	121	3	1 / 0	11.95	9.96	21.91	0.155	33.01	-11.10
1907.50	15	QPSK	H	109	357	1 / 0	11.82	10.26	**22.08**	0.162	33.01	-10.93
1882.50	15	16-QAM	H	121	3	1 / 0	10.93	9.96	**20.89**	0.123	33.01	-12.12
1907.50	15	64-QAM	H	109	357	1 / 0	9.66	10.26	**19.92**	0.098	33.01	-13.09
1860.00	20	QPSK	H	101	352	1 / 0	10.94	9.64	20.58	0.114	33.01	-12.43
1882.50	20	QPSK	H	120	2	1 / 0	11.86	9.96	21.82	0.152	33.01	-11.19
1905.00	20	QPSK	H	109	354	1 / 0	11.74	10.24	**21.98**	0.158	33.01	-11.03
1905.00	20	16-QAM	H	109	354	1 / 0	10.80	10.24	**21.04**	0.127	33.01	-11.97
1882.50	20	64-QAM	H	120	2	1 / 0	10.02	9.96	**19.98**	0.100	33.01	-13.03
1912.50	5	QPSK	V	147	123	1 / 0	10.78	10.30	21.08	0.128	33.01	-11.93
1912.50	5 (WCP)	QPSK	H	142	186	1 / 0	7.00	10.30	17.30	0.054	33.01	-15.71

Table 7-18. EIRP Data (Band 25/2)

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
40 MHz	π/2 BPSK	1860.0	H	117.0	359.0	9.79	1 / 108	11.97	21.76	0.150	33.01	-11.25
		1880.0	H	109.0	5.0	9.96	1 / 108	11.94	**21.90**	0.155	33.01	-11.11
		1900.0	H	127.0	355.0	10.14	1 / 108	11.64	21.78	0.150	33.01	-11.24
	QPSK	1860.0	H	117.0	359.0	9.64	1 / 108	11.38	21.02	0.127	33.01	-11.99
		1880.0	H	109.0	5.0	9.93	1 / 108	11.46	**21.39**	0.138	33.01	-11.62
		1900.0	H	127.0	355.0	10.20	1 / 108	11.05	21.25	0.133	33.01	-11.76
	16-QAM	1900.0	H	127.0	355.0	10.20	1 / 108	10.30	**20.50**	0.112	33.01	-12.51
	64-QAM	1900.0	H	127.0	355.0	10.20	1 / 108	9.17	**19.37**	0.087	33.01	-13.64
	256-QAM	1900.0	H	127.0	355.0	10.20	1 / 108	8.38	**18.58**	0.072	33.01	-14.43
30 MHz	π/2 BPSK	1855.0	H	117.0	359.0	9.57	1 / 80	11.78	21.36	0.137	33.01	-11.65
		1880.0	H	109.0	5.0	9.93	1 / 80	12.42	**22.35**	0.172	33.01	-10.66
		1905.0	H	127.0	355.0	10.24	1 / 80	11.16	21.41	0.138	33.01	-11.61
	QPSK	1855.0	H	117.0	359.0	9.57	1 / 80	12.00	**21.57**	0.144	33.01	-11.44
		1880.0	H	109.0	5.0	9.93	1 / 80	11.00	20.93	0.124	33.01	-12.08
		1905.0	H	127.0	355.0	10.24	1 / 80	11.31	21.55	0.143	33.01	-11.46
	16-QAM	1905.0	H	127.0	355.0	10.24	1 / 80	10.28	**20.52**	0.113	33.01	-12.49
	64-QAM	1905.0	H	127.0	355.0	10.24	1 / 80	9.20	**19.44**	0.088	33.01	-13.57
	256-QAM	1905.0	H	127.0	355.0	10.24	1 / 80	8.81	**19.05**	0.080	33.01	-13.96
25 MHz	π/2 BPSK	1852.5	H	117.0	359.0	9.54	1 / 67	12.04	21.58	0.144	33.01	-11.43
		1880.0	H	109.0	5.0	9.93	1 / 67	12.42	**22.35**	0.172	33.01	-10.66
		1907.5	H	127.0	355.0	10.26	1 / 67	11.39	21.66	0.146	33.01	-11.36
	QPSK	1852.5	H	117.0	359.0	9.54	1 / 67	11.79	21.32	0.136	33.01	-11.69
		1880.0	H	109.0	5.0	9.93	1 / 67	11.40	21.33	0.136	33.01	-11.68
		1907.5	H	127.0	355.0	10.26	1 / 67	11.27	**21.53**	0.142	33.01	-11.48
	16-QAM	1907.5	H	127.0	355.0	10.26	1 / 67	10.41	**20.67**	0.117	33.01	-12.34
	64-QAM	1852.5	H	117.0	359.0	9.54	1 / 67	9.71	**19.24**	0.084	33.01	-13.77
	256-QAM	1907.5	H	127.0	355.0	10.26	1 / 67	8.83	**19.09**	0.081	33.01	-13.92

Table 7-19. EIRP Data (Band n25)

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
20 MHz	π/2 BPSK	1860.0	H	117.0	359.0	9.64	1 / 50	12.35	21.99	0.158	33.01	-11.02
		1880.0	H	109.0	5.0	9.93	1 / 50	12.41	22.34	0.171	33.01	-10.67
		1900.0	H	127.0	355.0	10.20	1 / 50	12.25	**22.45**	0.176	33.01	-10.56
	QPSK	1860.0	H	117.0	359.0	9.64	1 / 50	12.38	**22.02**	0.159	33.01	-10.99
		1880.0	H	109.0	5.0	9.93	1 / 50	10.52	20.45	0.111	33.01	-12.56
		1900.0	H	127.0	355.0	10.20	1 / 50	11.35	21.55	0.143	33.01	-11.46
	16-QAM	1860.0	H	117.0	359.0	9.64	1 / 50	11.19	**20.83**	0.121	33.01	-12.18
	64-QAM	1900.0	H	127.0	355.0	10.20	1 / 50	10.18	**20.38**	0.109	33.01	-12.63
	256-QAM	1900.0	H	127.0	355.0	10.20	1 / 50	8.64	**18.84**	0.077	33.01	-14.17
15 MHz	π/2 BPSK	1857.5	H	117.0	359.0	9.61	1 / 37	12.66	22.26	0.168	33.01	-10.75
		1880.0	H	109.0	5.0	9.93	1 / 37	12.31	22.24	0.167	33.01	-10.77
		1902.5	H	127.0	355.0	10.22	1 / 37	12.24	**22.46**	0.176	33.01	-10.55
	QPSK	1857.5	H	117.0	359.0	9.61	1 / 37	12.46	**22.06**	0.161	33.01	-10.95
		1880.0	H	109.0	5.0	9.93	1 / 37	10.43	20.36	0.109	33.01	-12.65
		1902.5	H	127.0	355.0	10.22	1 / 37	11.46	21.68	0.147	33.01	-11.33
	16-QAM	1857.5	H	117.0	359.0	9.61	1 / 37	11.32	**20.92**	0.124	33.01	-12.09
	64-QAM	1902.5	H	127.0	355.0	10.22	1 / 37	10.32	**20.54**	0.113	33.01	-12.47
	256-QAM	1880.0	H	109.0	5.0	9.93	1 / 37	9.35	**19.28**	0.085	33.01	-13.73
10 MHz	π/2 BPSK	1855.0	H	117.0	359.0	9.57	1 / 26	12.57	22.14	0.164	33.01	-10.87
		1880.0	H	109.0	5.0	9.93	1 / 26	12.64	22.57	0.181	33.01	-10.44
		1905.0	H	127.0	355.0	10.24	1 / 26	12.66	**22.90**	0.195	33.01	-10.11
	QPSK	1855.0	H	117.0	359.0	9.57	1 / 26	12.63	**22.20**	0.166	33.01	-10.81
		1880.0	H	109.0	5.0	9.93	1 / 26	10.84	20.77	0.119	33.01	-12.24
		1905.0	H	127.0	355.0	10.24	1 / 26	11.10	21.34	0.136	33.01	-11.67
	16-QAM	1880.0	H	109.0	5.0	9.93	1 / 26	11.04	**20.97**	0.125	33.01	-12.04
	64-QAM	1905.0	H	127.0	355.0	10.24	1 / 26	10.66	**20.90**	0.123	33.01	-12.11
	256-QAM	1880.0	H	109.0	5.0	9.93	1 / 26	9.42	**19.35**	0.086	33.01	-13.66
5 MHz	π/2 BPSK	1852.5	H	117.0	359.0	9.54	1 / 12	12.61	22.14	0.164	33.01	-10.87
		1880.0	H	109.0	5.0	9.93	1 / 12	12.28	22.21	0.166	33.01	-10.80
		1907.5	H	127.0	355.0	10.26	1 / 12	12.04	**22.30**	0.170	33.01	-10.71
	QPSK	1852.5	H	117.0	359.0	9.54	1 / 12	12.83	**22.36**	0.172	33.01	-10.65
		1880.0	H	109.0	5.0	9.93	1 / 12	10.90	20.83	0.121	33.01	-12.18
		1907.5	H	127.0	355.0	10.26	1 / 12	10.98	21.24	0.133	33.01	-11.77
	16-QAM	1852.5	H	117.0	359.0	9.54	1 / 12	11.25	**20.78**	0.120	33.01	-12.23
	64-QAM	1907.5	H	127.0	355.0	10.26	1 / 12	10.38	**20.64**	0.116	33.01	-12.37
	256-QAM	1880.0	H	109.0	5.0	9.93	1 / 12	9.26	19.19	0.083	33.01	-13.82
	QPSK (CP-OFDM)	1900.0	H	127.0	355.0	10.20	1 / 50	11.47	**21.67**	0.147	33.01	-11.34
	BPSK (Ant 2)	1900.0	H	109.0	5.0	9.96	1 / 50	11.94	**21.90**	0.155	33.01	-11.11
	QPSK (Opposite Pol.)	1900.0	V	115.0	311.0	10.20	1 / 50	11.27	21.47	0.140	33.01	-11.54
	QPSK (WCP)	1900.0	H	175.0	301.0	10.20	1 / 50	9.53	19.73	0.094	33.01	-13.28

Table 7-20. EIRP Data (Band n25)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	112	335	1 / 0	13.90	9.46	23.36	0.217	33.01	-9.66
2593.00	5	QPSK	H	133	55	1 / 0	14.38	9.58	23.96	0.249	33.01	-9.05
2687.50	5	QPSK	H	112	127	1 / 24	14.24	9.85	**24.09**	0.256	33.01	-8.92
2593.00	5	16-QAM	H	133	55	1 / 0	13.46	9.58	**23.04**	0.201	33.01	-9.97
2593.00	5	64-QAM	H	133	55	1 / 0	12.77	9.58	**22.35**	0.172	33.01	-10.66
2501.00	10	QPSK	H	110	335	1 / 0	13.71	9.46	23.16	0.207	33.01	-9.85
2593.00	10	QPSK	H	133	55	1 / 0	14.19	9.58	23.77	0.238	33.01	-9.24
2685.00	10	QPSK	H	110	125	1 / 49	14.17	9.85	**24.02**	0.252	33.01	-8.99
2685.00	10	16-QAM	H	110	125	1 / 49	12.95	9.85	**22.80**	0.190	33.01	-10.21
2685.00	10	64-QAM	H	110	125	1 / 49	12.05	9.85	**21.90**	0.155	33.01	-11.11
2503.50	15	QPSK	H	105	335	1 / 0	13.79	9.45	23.24	0.211	33.01	-9.77
2593.00	15	QPSK	H	133	56	1 / 0	14.09	9.58	23.67	0.233	33.01	-9.34
2682.50	15	QPSK	H	110	125	1 / 74	14.08	9.86	**23.94**	0.248	33.01	-9.07
2593.00	15	16-QAM	H	133	56	1 / 0	13.20	9.58	**22.78**	0.190	33.01	-10.23
2593.00	15	64-QAM	H	133	56	1 / 0	12.29	9.58	**21.87**	0.154	33.01	-11.14
2506.00	20	QPSK	V	102	333	1 / 0	13.81	9.45	23.26	0.212	33.01	-9.75
2593.00	20	QPSK	V	133	51	1 / 0	14.40	9.58	23.98	0.250	33.01	-9.03
2680.00	20	QPSK	V	107	123	1 / 99	14.23	9.86	**24.09**	**0.257**	33.01	-8.92
2593.00	20	16-QAM	V	133	51	1 / 0	13.41	9.58	**22.99**	0.199	33.01	-10.02
2593.00	20	64-QAM	V	133	51	1 / 0	12.32	9.58	**21.90**	0.155	33.01	-11.11
2680.00	20	QPSK	H	128	358	1 / 99	13.59	9.86	23.45	0.221	33.01	-9.56
2680.00	20 (WCP)	QPSK	V	156	195	1 / 99	11.21	9.86	21.07	0.128	33.01	-11.94

Table 7-21. EIRP Data (Band 41)

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	EUT Pol.	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	2546.0	H	Y	130.0	202.0	9.41	1 / 137	14.34	23.75	0.237	33.01	-9.26
		2593.0	H	Y	140.0	313.0	9.58	1 / 137	14.07	23.65	0.232	33.01	-9.36
		2640.0	H	Y	104.0	166.0	9.87	1 / 137	13.91	**23.78**	0.239	33.01	-9.23
	QPSK	2546.0	H	Y	130.0	202.0	9.41	1 / 137	13.94	23.35	0.216	33.01	-9.66
		2593.0	H	Y	140.0	313.0	9.58	1 / 137	13.88	**23.46**	0.222	33.01	-9.55
		2640.0	H	Y	104.0	166.0	9.87	1 / 137	13.53	23.40	0.219	33.01	-9.61
	16-QAM	2640.0	H	Y	104.0	166.0	9.87	1 / 137	12.82	**22.69**	0.186	33.01	-10.32
	64-QAM	2640.0	H	Y	104.0	166.0	9.87	1 / 137	11.60	**21.47**	0.140	33.01	-11.54
	256-QAM	2640.0	H	Y	104.0	166.0	9.87	1 / 137	9.56	**19.43**	0.088	33.01	-13.58
90 MHz	π/2 BPSK	2541.0	H	Y	130.0	202.0	9.42	1 / 123	13.40	22.81	0.191	33.01	-10.20
		2593.0	H	Y	140.0	313.0	9.58	1 / 123	13.27	22.85	0.193	33.01	-10.16
		2645.0	H	Y	104.0	166.0	9.90	1 / 123	13.85	**23.75**	0.237	33.01	-9.26
	QPSK	2541.0	H	Y	130.0	202.0	9.42	1 / 123	13.52	**22.93**	0.197	33.01	-10.08
		2593.0	H	Y	140.0	313.0	9.58	1 / 123	13.01	22.59	0.182	33.01	-10.42
		2645.0	H	Y	104.0	166.0	9.90	1 / 123	12.62	22.52	0.179	33.01	-10.49
	16-QAM	2593.0	H	Y	140.0	313.0	9.58	1 / 123	12.49	**22.07**	0.161	33.01	-10.94
	64-QAM	2645.0	H	Y	104.0	166.0	9.90	1 / 123	11.48	**21.38**	0.137	33.01	-11.63
	256-QAM	2593.0	H	Y	140.0	313.0	9.58	1 / 123	9.47	**19.05**	0.080	33.01	-13.96
80 MHz	π/2 BPSK	2536.0	H	Y	130.0	202.0	9.42	1 / 109	13.59	23.01	0.200	33.01	-10.00
		2593.0	H	Y	140.0	313.0	9.58	1 / 109	13.57	23.15	0.207	33.01	-9.86
		2650.0	H	Y	104.0	166.0	9.93	1 / 109	13.62	**23.55**	0.226	33.01	-9.46
	QPSK	2536.0	H	Y	130.0	202.0	9.42	1 / 109	14.13	**23.55**	0.227	33.01	-9.46
		2593.0	H	Y	140.0	313.0	9.58	1 / 109	13.13	22.71	0.187	33.01	-10.30
		2650.0	H	Y	104.0	166.0	9.93	1 / 109	12.96	22.89	0.195	33.01	-10.12
	16-QAM	2593.0	H	Y	140.0	313.0	9.58	1 / 109	12.57	**22.15**	0.164	33.01	-10.86
	64-QAM	2650.0	H	Y	104.0	166.0	9.93	1 / 109	11.34	**21.27**	0.134	33.01	-11.74
	256-QAM	2650.0	H	Y	104.0	166.0	9.93	1 / 109	9.47	**19.40**	0.087	33.01	-13.61
60 MHz	π/2 BPSK	2526.0	H	Y	130.0	202.0	9.43	1 / 81	13.54	22.97	0.198	33.01	-10.04
		2593.0	H	Y	140.0	313.0	9.58	1 / 81	13.70	23.28	0.213	33.01	-9.73
		2660.0	H	Y	104.0	166.0	9.91	1 / 81	13.57	**23.48**	0.223	33.01	-9.53
	QPSK	2526.0	H	Y	130.0	202.0	9.43	1 / 81	14.38	**23.81**	0.241	33.01	-9.20
		2593.0	H	Y	140.0	313.0	9.58	1 / 81	13.77	23.35	0.216	33.01	-9.66
		2660.0	H	Y	104.0	166.0	9.91	1 / 81	13.26	23.17	0.207	33.01	-9.84
	16-QAM	2593.0	H	Y	140.0	313.0	9.58	1 / 81	12.93	**22.51**	0.178	33.01	-10.50
	64-QAM	2660.0	H	Y	104.0	166.0	9.91	1 / 81	11.54	**21.45**	0.140	33.01	-11.56
	256-QAM	2660.0	H	Y	104.0	166.0	9.91	1 / 81	9.52	**19.43**	0.088	33.01	-13.58
50 MHz	π/2 BPSK	2521.0	H	Y	130.0	202.0	9.44	1 / 67	14.28	23.71	0.235	33.01	-9.30
		2593.0	H	Y	140.0	313.0	9.58	1 / 67	13.98	23.56	0.227	33.01	-9.45
		2665.0	H	Y	104.0	166.0	9.90	1 / 67	13.84	**23.74**	0.237	33.01	-9.27
	QPSK	2521.0	H	Y	130.0	202.0	9.44	1 / 67	14.49	**23.92**	0.247	33.01	-9.09
		2593.0	H	Y	140.0	313.0	9.58	1 / 67	13.58	23.16	0.207	33.01	-9.85
		2665.0	H	Y	104.0	166.0	9.90	1 / 67	13.16	23.06	0.202	33.01	-9.95
	16-QAM	2665.0	H	Y	104.0	166.0	9.90	1 / 67	12.79	**22.69**	0.186	33.01	-10.32
	64-QAM	2665.0	H	Y	104.0	166.0	9.90	1 / 67	11.60	**21.50**	0.141	33.01	-11.51
	256-QAM	2665.0	H	Y	104.0	166.0	9.90	1 / 67	9.18	**19.08**	0.081	33.01	-13.93
40 MHz	π/2 BPSK	2516.0	H	Y	130.0	202.0	9.44	1 / 53	13.78	23.22	0.210	33.01	-9.79
		2593.0	H	Y	140.0	313.0	9.58	1 / 53	13.76	23.34	0.216	33.01	-9.67
		2670.0	H	Y	104.0	166.0	9.89	1 / 53	13.57	**23.46**	0.222	33.01	-9.55
	QPSK	2516.0	H	Y	130.0	202.0	9.44	1 / 53	14.46	**23.90**	0.246	33.01	-9.11
		2593.0	H	Y	140.0	313.0	9.58	1 / 53	13.51	23.09	0.204	33.01	-9.92
		2670.0	H	Y	104.0	166.0	9.89	1 / 53	13.25	23.14	0.206	33.01	-9.87
	16-QAM	2670.0	H	Y	104.0	166.0	9.89	1 / 53	12.55	**22.44**	0.175	33.01	-10.57
	64-QAM	2670.0	H	Y	104.0	166.0	9.89	1 / 53	12.20	**22.09**	0.162	33.01	-10.92
	256-QAM	2670.0	H	Y	104.0	166.0	9.89	1 / 53	9.44	**19.33**	0.086	33.01	-13.68
20 MHz	π/2 BPSK	2506.0	H	Y	130.0	202.0	9.45	1 / 26	14.21	23.66	0.232	33.01	-9.35
		2593.0	H	Y	140.0	313.0	9.58	1 / 26	14.38	**23.96**	0.249	33.01	-9.05
		2680.0	H	Y	104.0	166.0	9.86	1 / 26	14.08	23.94	0.248	33.01	-9.07
	QPSK	2506.0	H	Y	130.0	202.0	9.45	1 / 26	14.39	**23.84**	0.242	33.01	-9.17
		2593.0	H	Y	140.0	313.0	9.58	1 / 26	13.74	23.32	0.215	33.01	-9.69
		2680.0	H	Y	104.0	166.0	9.86	1 / 26	13.73	23.59	0.229	33.01	-9.42
	16-QAM	2680.0	H	Y	104.0	166.0	9.86	1 / 26	12.99	**22.85**	0.193	33.01	-10.16
	64-QAM	2680.0	H	Y	104.0	166.0	9.86	1 / 26	11.87	**21.73**	0.149	33.01	-11.28
	256-QAM	2593.0	H	Y	140.0	313.0	9.58	1 / 26	10.07	**19.65**	0.092	33.01	-13.36
	QPSK (CP-OFDM)	2640.0	H	Y	104.0	166.0	9.87	1 / 137	12.67	22.54	0.179	33.01	-10.47
	BPSK (SA/NSA)	2640.0	H	Y	115.0	24.0	9.87	1 / 137	12.77	22.64	0.184	33.01	-10.37
	BPSK (PC3)	2640.0	H	Y	115.0	24.0	9.87	1 / 137	13.34	23.21	0.209	33.01	-9.80
	QPSK (Opposite Pol.)	2640.0	V	Z	135.0	12.0	9.87	1 / 137	13.66	23.53	0.225	33.01	-9.48
	QPSK (WCP)	2640.0	H	Y	106.0	232.0	9.87	1 / 137	9.80	19.67	0.093	33.01	-13.34

Table 7-22. EIRP Data (Band n41)

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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

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Test Setup

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

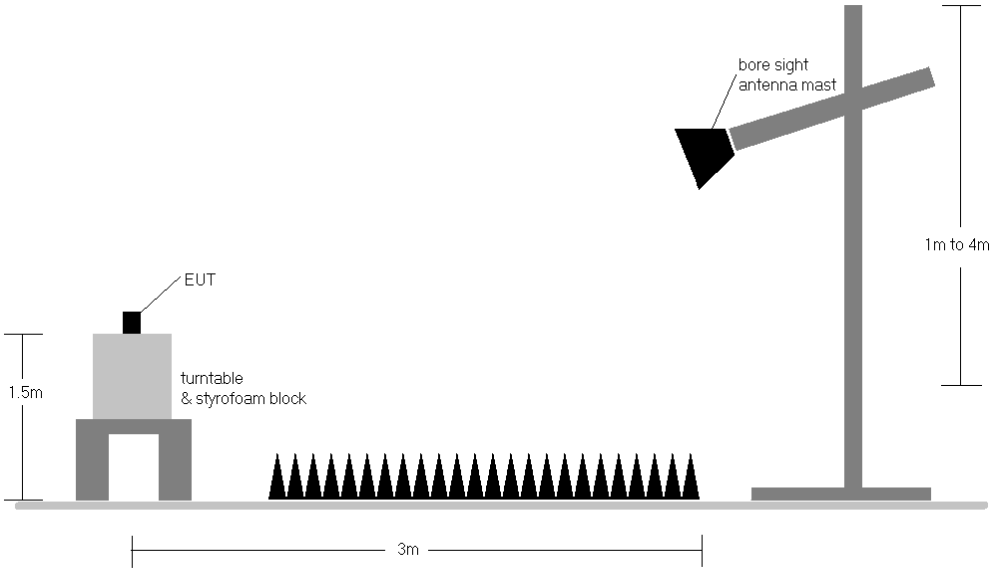

Figure 7-8. Test Instrument & Measurement Setup

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.

6) LTE NR bands n25 and n66 were investigated on two antennas (Ant2 and Ant3) and that the data shown in the report is the worst case.

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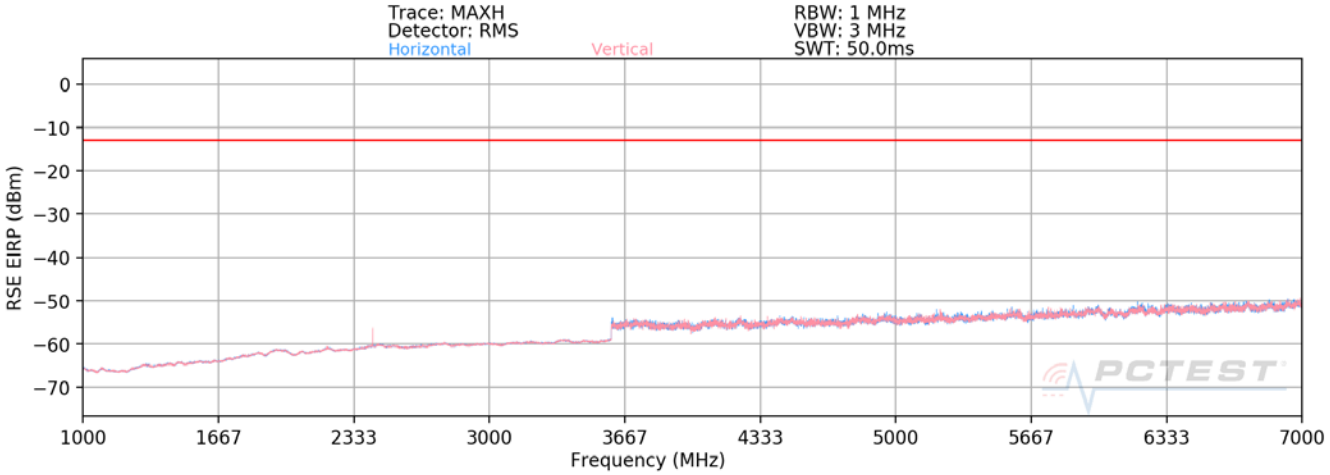
Band 71



Plot 7-808. Radiated Spurious Plot above 1GHz (Band 71)

OPERATING FREQUENCY:	673.00	MHz
CHANNEL:	133222	
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]
1346.00	H	344	327	-78.15	7.92	-70.23	-57.2
2019.00	H	400	2	-78.01	8.86	-69.14	-56.1
2692.00	H	-	-	-76.24	9.63	-66.61	-53.6

Table 7-23. Radiated Spurious Data (Band 71 – Low Channel)

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OPERATING FREQUENCY:	680.50	MHz
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]
1361.00	H	-	-	-79.86	7.93	-71.93	-58.9
2041.50	H	-	-	-78.26	8.98	-69.28	-56.3

Table 7-24. Radiated Spurious Data (Band 71 – Mid Channel)

OPERATING FREQUENCY:	688.00	MHz
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]
1376.00	H	339	53	-68.56	7.91	-60.65	-47.7
2064.00	H	398	190	-66.26	9.05	-57.21	-44.2
2752.00	H	-	-	-77.27	9.92	-67.35	-54.3

Table 7-25. Radiated Spurious Data (Band 71 – High Channel)

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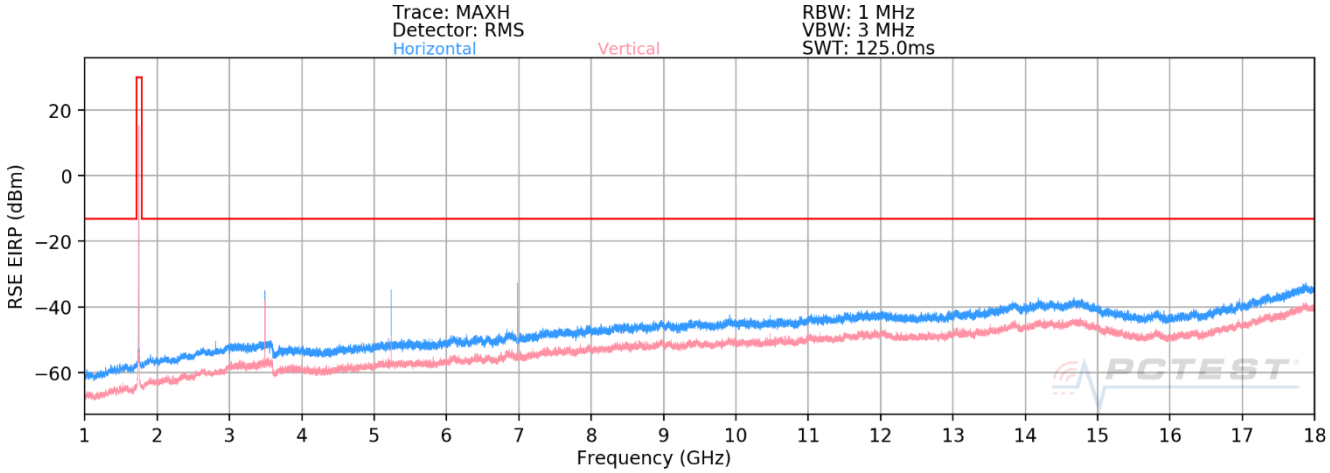
Band n71



Plot 7-809. Radiated Spurious Plot above 1GHz (Band n71+B66 EN-DC)

Bandwidth (MHz):	20
Frequency (MHz):	673.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 66

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1346.0	H	400	35	-76.88	2.86	32.98	-62.28	-13.00	-49.28
2019.0	H	-	-	-79.67	6.28	33.61	-61.65	-13.00	-48.65
2692.0	H	-	-	-78.61	9.95	38.34	-56.92	-13.00	-43.92

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3440.0	H	345	281	-59.62	2.80	50.18	-45.08	-13.00	-32.08
5160.0	H	291	162	-66.27	5.92	46.65	-48.61	-13.00	-35.61
6880.0	H	384	2	-58.21	9.24	58.03	-37.23	-13.00	-24.23
8600.0	H	305	359	-73.51	12.08	45.57	-49.68	-13.00	-36.68
10320.0	H	237	15	-77.81	12.70	41.89	-53.37	-13.00	-40.37
12040.0	H	246	38	-76.95	16.05	46.10	-49.15	-13.00	-36.15
13760.0	H	265	16	-78.94	17.79	45.85	-49.41	-13.00	-36.41
15480.0	H	400	358	-80.07	15.14	42.07	-53.19	-13.00	-40.19

Table 7-26. Radiated Spurious Data (Band n71+ B66 EN-DC – Low Channel)

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Bandwidth (MHz):	20
Frequency (MHz):	680.5
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 66

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1361.0	H	397	33	-75.79	3.17	34.38	-60.88	-13.00	-47.88
2041.5	H	397	276	-78.05	5.88	34.83	-60.43	-13.00	-47.43
2722.0	H	-	-	-78.03	9.80	38.77	-56.49	-13.00	-43.49
3402.5	H	-	-	-78.41	12.61	41.20	-54.06	-13.00	-41.06

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.0	H	397	296	-58.63	2.58	50.95	-44.31	-13.00	-31.31
5235.0	H	302	115	-65.31	6.00	47.69	-47.57	-13.00	-34.57
6980.0	H	391	21	-58.48	7.78	56.30	-38.96	-13.00	-25.96
8725.0	H	321	351	-72.04	11.80	46.76	-48.50	-13.00	-35.50
10470.0	H	247	9	-76.18	13.42	44.24	-51.02	-13.00	-38.02
12215.0	H	251	38	-74.98	15.17	47.19	-48.06	-13.00	-35.06
13960.0	H	209	10	-79.44	17.93	45.49	-49.77	-13.00	-36.77
15705.0	H	400	329	-80.71	14.89	41.18	-54.08	-13.00	-41.08

Table 7-27. Radiated Spurious Data (Band n71 + B66 EN-DC – Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	688.0
RB / Offset:	1 / 50
Mode:	EN-DC
Anchor Band:	LTE Band 66

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1376.0	H	392	64	-75.08	3.43	35.35	-59.91	-13.00	-46.91
2064.0	H	-	-	-78.35	5.89	34.54	-60.72	-13.00	-47.72
2752.0	H	-	-	-79.33	9.76	37.43	-57.83	-13.00	-44.83
Frequency [MHz]	**Ant. Pol. [H/V]**	**Antenna Height [cm]**	**Turntable Azimuth [degree]**	**Analyzer Level [dBm]**	**AFCL [dB/m]**	**Field Strength [dBµV/m]**	**EIRP Spurious Emission Level [dBm]**	**Limit [dBm]**	**Margin [dB]**
3540.00	H	349	302	-58.42	3.06	51.64	-43.62	-13.00	-30.62
5310.00	H	298	126	-64.99	5.77	47.78	-47.48	-13.00	-34.48
7080.00	H	390	29	-59.64	8.04	55.40	-39.86	-13.00	-26.86
8850.00	H	255	18	-76.61	11.93	42.32	-52.94	-13.00	-39.94
10620.00	H	212	16	-75.00	13.87	45.87	-49.39	-13.00	-36.39
12390.00	H	273	34	-76.08	14.83	45.75	-49.50	-13.00	-36.50
14160.00	H	200	15	-80.66	18.80	45.14	-50.11	-13.00	-37.11
15930.00	H	-	-	-81.16	14.67	40.51	-54.75	-13.00	-41.75

Table 7-28. Radiated Spurious Data (Band n71 +B66 EN-DC – High Channel)

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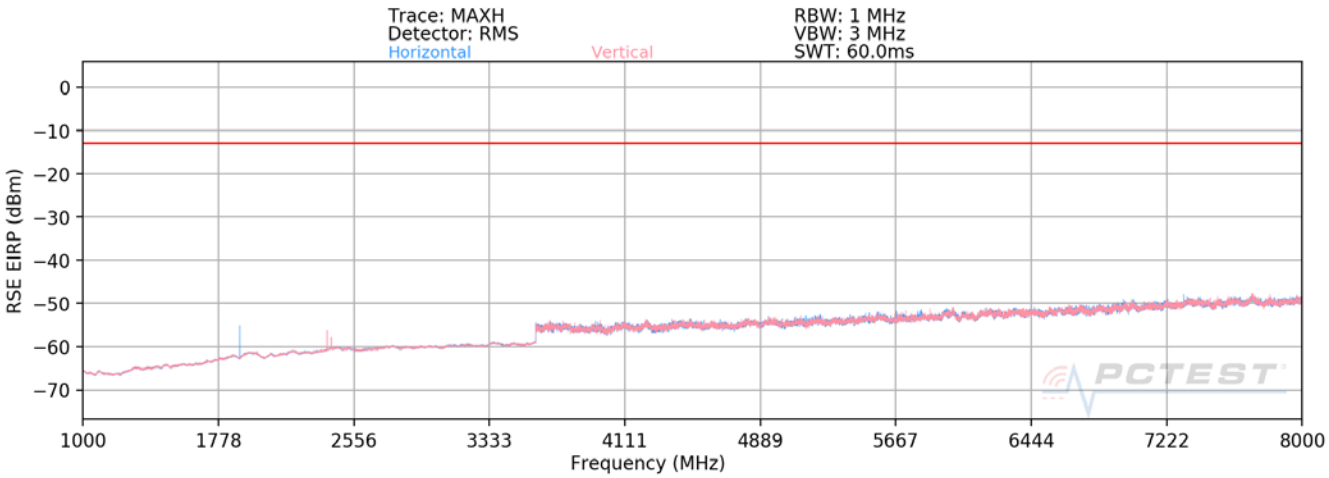
Band 12



Plot 7-810. Radiated Spurious Plot above 1GHz (Band 12)

OPERATING FREQUENCY:	704.00	MHz
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	-	-	-79.20	7.99	-71.20	-58.2
2112.00	H	-	-	-77.62	9.11	-68.51	-55.5

Table 7-29. Radiated Spurious Data (Band 12 – Low Channel)

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OPERATING FREQUENCY:	707.50	MHz
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	321	235	-79.05	8.09	-70.96	-58.0
2122.50	H	-	-	-77.49	9.11	-68.38	-55.4
2830.00	H	-	-	-77.13	10.14	-66.98	-54.0

Table 7-30. Radiated Spurious Data (Band 12 – Mid Channel)

OPERATING FREQUENCY:	711.00	MHz
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	-	-	-79.36	8.18	-71.18	-58.2
2133.00	H	-	-	-77.51	9.11	-68.40	-55.4

Table 7-31. Radiated Spurious Data (Band 12 – High Channel)

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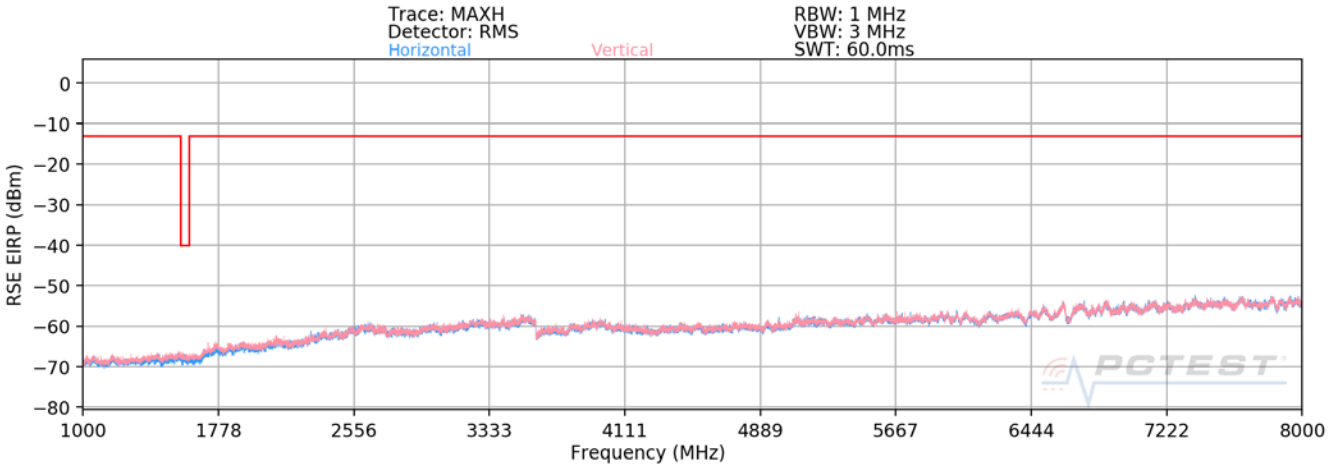
Band 13



Plot 7-811. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY:	782.00	MHz
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	395	264	-59.81	10.34	-49.47	-36.5
3128.00	V	-	-	-72.37	8.63	-63.74	-50.7

Table 7-32. Radiated Spurious Data (Band 13 – Mid Channel)

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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	400	300	-70.56	9.47	-61.09	-21.1

Table 7-33. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

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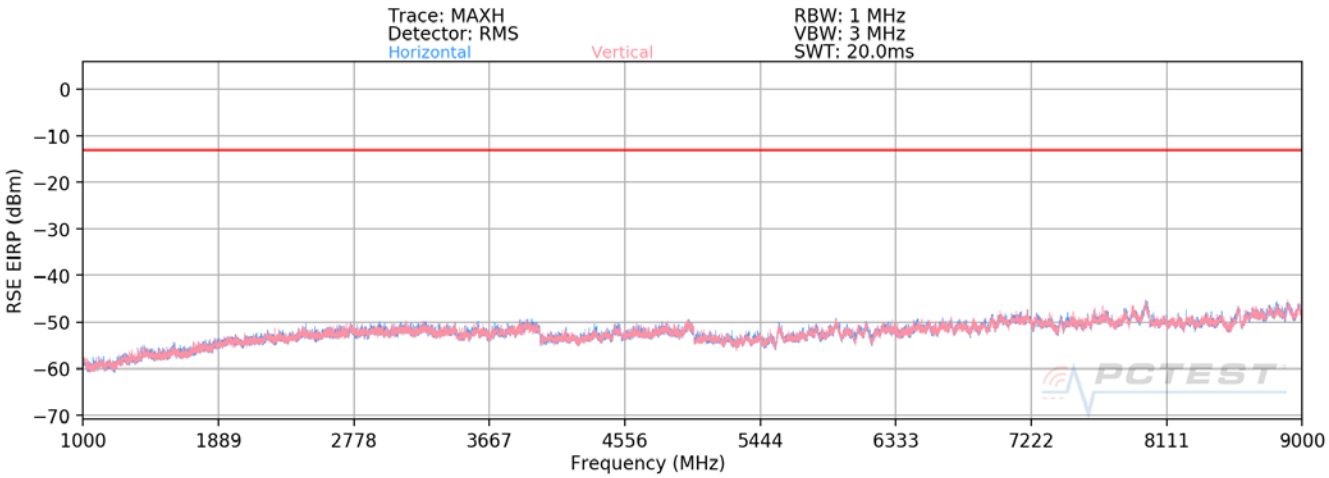
Band 26



Plot 7-812. Radiated Spurious Plot above 1GHz (Band 26)

OPERATING FREQUENCY:	829.00	MHz
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	-	-	-80.36	8.88	-71.48	-58.5
2487.00	H	-	-	-76.93	9.23	-67.70	-54.7

Table 7-34. Radiated Spurious Data (Band 26 – Low Channel)

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OPERATING FREQUENCY: 836.50 MHz
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	-	-	-79.85	8.78	-71.07	-58.1
2509.50	H	-	-	-76.62	9.27	-67.34	-54.3

Table 7-35. Radiated Spurious Data (Band 26 – Mid Channel)

OPERATING FREQUENCY: 844.00 MHz
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	-	-	-79.33	8.68	-70.66	-57.7
2532.00	H	-	-	-75.59	9.28	-66.31	-53.3

Table 7-36. Radiated Spurious Data (Band 26 – High Channel)

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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	394	332	-63.45	9.87	-53.58	-40.6
5160.00	V	397	16	-66.87	10.74	-56.13	-43.1
6880.00	V	-	-	-69.86	11.71	-58.15	-45.2
8600.00	V	-	-	-66.40	11.11	-55.29	-42.3

Table 7-37. Radiated Spurious Data (Band 66 – 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	395	15	-62.98	9.94	-53.04	-40.0
5235.00	V	400	336	-67.39	10.76	-56.63	-43.6
6980.00	V	-	-	-71.05	11.85	-59.20	-46.2
8725.00	V	-	-	-66.47	11.03	-55.45	-42.4

Table 7-38. Radiated Spurious Data (Band 66 – Mid Channel)

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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	400	22	-62.03	9.92	-52.11	-39.1
5310.00	V	112	350	-68.62	10.72	-57.91	-44.9
7080.00	V	-	-	-70.59	11.82	-58.77	-45.8
8850.00	V	-	-	-66.24	11.02	-55.21	-42.2

Table 7-39. Radiated Spurious Data (Band 66 – High Channel)

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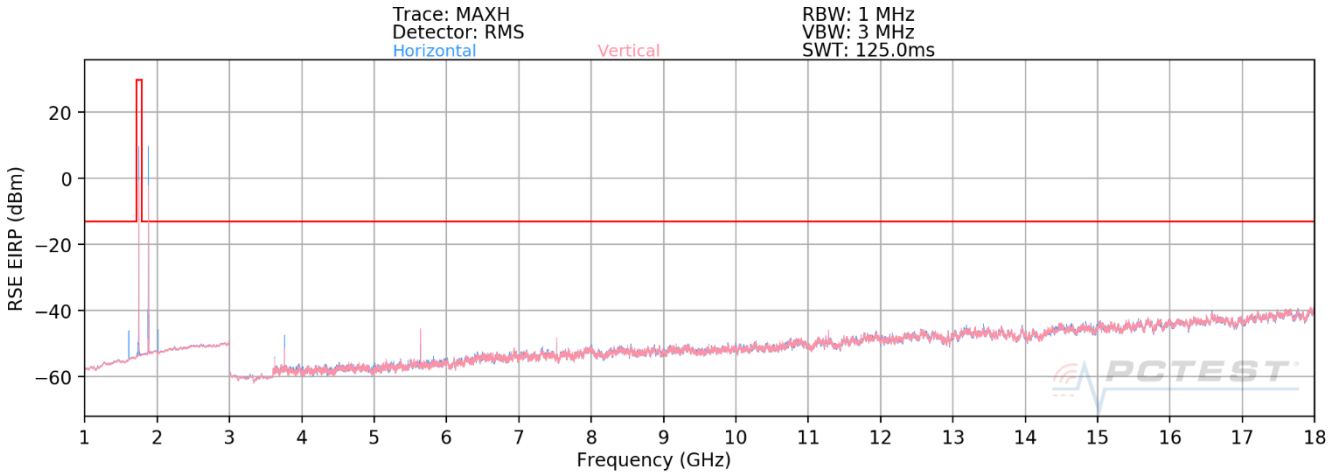
Band n66



Plot 7-813. Radiated Spurious Plot above 1GHz (Band n66 (Ant 3 NSA) + B2 EN-DC)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3420.0	H	115	177	-76.88	5.24	35.36	-59.90	-13.00	-46.90
5130.0	H	-	-	-78.77	7.65	35.88	-59.38	-13.00	-46.38
6840.0	H	-	-	-78.93	10.67	38.74	-56.52	-13.00	-43.52

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3720.0	H	155	201	-58.14	5.87	54.73	-40.53	-13.00	-27.53
5580.0	H	116	39	-61.87	7.92	53.05	-42.21	-13.00	-29.21
7440.0	H	108	156	-61.27	12.77	58.50	-36.75	-13.00	-23.75
9300.0	H	111	186	-75.18	14.87	46.69	-48.56	-13.00	-35.56
11160.0	H	118	57	-69.24	16.96	54.72	-40.54	-13.00	-27.54
13020.0	H	115	186	-78.66	19.73	48.07	-47.18	-13.00	-34.18
14880.0	H	-	-	-80.88	21.87	47.99	-47.27	-13.00	-34.27
16740.0	H	-	-	-80.72	24.63	50.91	-44.35	-13.00	-31.35

Table 7-40. Radiated Spurious Data (Band n66 (Ant 3 NSA) + B2– Low Channel)

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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.0	H	104	180	-76.36	5.31	35.95	-59.31	-13.00	-46.31
5235.0	H	-	-	-78.46	7.41	35.95	-59.30	-13.00	-46.30
6980.0	H	-	-	-79.69	10.81	38.12	-57.14	-13.00	-44.14

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3760.0	H	150	208	-57.14	6.04	55.90	-39.35	-13.00	-26.35
5640.0	H	114	42	-60.87	8.14	54.27	-40.99	-13.00	-27.99
7520.0	H	102	162	-60.41	12.84	59.43	-35.83	-13.00	-22.83
9400.0	H	106	184	-74.98	14.96	46.98	-48.28	-13.00	-35.28
11280.0	H	109	23	-68.11	17.65	56.54	-38.72	-13.00	-25.72
13160.0	H	102	234	-78.20	20.94	49.74	-45.52	-13.00	-32.52
15040.0	H	-	-	-80.90	22.80	48.90	-46.36	-13.00	-33.36
16920.0	H	-	-	-80.92	22.52	48.60	-46.66	-13.00	-33.66

Table 7-41. Radiated Spurious Data (Band n66 (Ant 3 NSA) + B2– Mid Channel)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3560.00	H	125	208	-76.86	5.34	35.48	-59.78	-13.00	-46.78
5340.00	H	-	-	-79.70	7.98	35.28	-59.98	-13.00	-46.98
7120.00	H	-	-	-80.53	12.08	38.55	-56.71	-13.00	-43.71

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3800.0	H	156	211	-56.42	5.59	56.17	-39.08	-13.00	-26.08
5700.0	H	125	46	-63.27	8.25	51.98	-43.28	-13.00	-30.28
7600.0	H	107	178	-61.24	13.07	58.83	-36.43	-13.00	-23.43
9500.0	H	128	165	-73.22	14.55	48.33	-46.93	-13.00	-33.93
11400.0	H	121	45	-67.78	17.35	56.57	-38.68	-13.00	-25.68
13300.0	H	105	228	-77.36	20.57	50.21	-45.05	-13.00	-32.05
15200.0	H	-	-	-80.78	22.70	48.92	-46.34	-13.00	-33.34
17100.0	H	-	-	-80.99	25.70	51.71	-43.55	-13.00	-30.55

Table 7-42. Radiated Spurious Data (Band n66 (Ant 3 NSA) + B2– High Channel)

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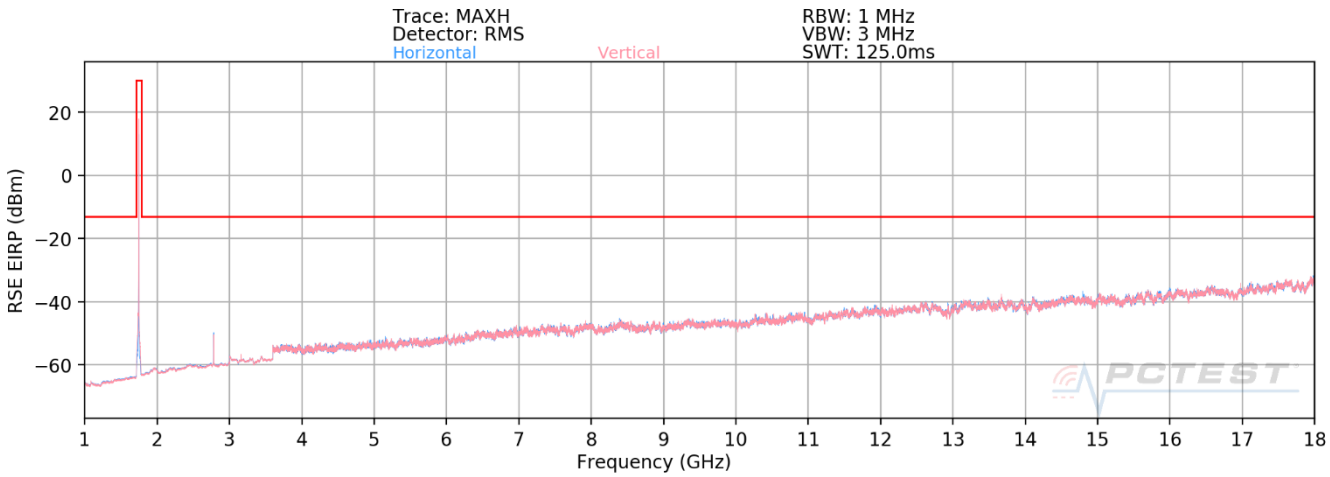

Plot 7-814. Radiated Spurious Plot above 1GHz (Band n66 (Ant 3 NSA) + B12 EN-DC)

Bandwidth (MHz):	20
Frequency (MHz):	1720.0
RB / Offset:	1 / 50
Detector / Trace Mode:	RMS / Average
RBW / VBW:	1MHz / 3MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3440.0	V	159	214	-78.94	6.21	34.27	-60.99	-13.00	-47.99
5160.0	V	255	21	-78.99	7.92	35.93	-59.33	-13.00	-46.33
6880.0	V	-	-	-79.49	11.83	39.34	-55.92	-13.00	-42.92
8600.0	V	-	-	-80.34	13.00	39.66	-55.60	-13.00	-42.60

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1408.0	V	-	-	-79.56	-1.96	25.48	-69.78	-13.00	-56.78
2112.0	V	-	-	-77.62	1.08	30.46	-64.80	-13.00	-51.80
2716.0	V	111	85	-69.82	3.53	40.71	-54.55	-13.00	-41.55
2816.0	V	-	-	-77.94	4.04	33.10	-62.16	-13.00	-49.16
3520.0	V	-	-	-78.04	5.73	34.69	-60.57	-13.00	-47.57

Table 7-43. Radiated Spurious Data (Band n66 (Ant 3 NSA) + B12– Low Channel)

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Bandwidth (MHz):	20
Frequency (MHz):	1745.0
RB / Offset:	1 / 50
Detector / Trace Mode:	RMS / Average
RBW / VBW:	1MHz / 3MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.0	V	153	228	-78.58	5.31	33.73	-61.53	-13.00	-48.53
5235.0	V	265	18	-78.49	7.41	35.92	-59.33	-13.00	-46.33
6980.0	V	-	-	-79.90	10.81	37.91	-57.35	-13.00	-44.35
8725.0	V	-	-	-80.07	12.64	39.57	-55.68	-13.00	-42.68

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1415.0	V	-	-	-77.34	-1.90	27.76	-67.50	-13.00	-54.50
2122.5	V	-	-	-78.41	1.27	29.86	-65.40	-13.00	-52.40
2782.0	V	109	82	-69.96	4.25	41.29	-53.96	-13.00	-40.96
2830.0	V	-	-	-77.90	3.49	32.59	-62.67	-13.00	-49.67
3537.5	V	-	-	-77.81	4.35	33.54	-61.72	-13.00	-48.72

Table 7-44. Radiated Spurious Data (Band n66 (Ant 3 NSA) + B12– Mid Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1770.0
RB / Offset:	1 / 50
Detector / Trace Mode:	RMS / Average
RBW / VBW:	1MHz / 3MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3540.00	V	166	11	-78.59	5.28	33.69	-61.56	-13.00	-48.56
5310.00	V	145	45	-78.66	7.32	35.66	-59.60	-13.00	-46.60
7080.00	V	-	-	-80.07	12.09	39.02	-56.23	-13.00	-43.23
8850.00	V	-	-	-81.13	13.65	39.52	-55.73	-13.00	-42.73

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1415.0	V	-	-	-77.34	-1.90	27.76	-67.50	-13.00	-54.50
2122.5	V	-	-	-78.41	1.27	29.86	-65.40	-13.00	-52.40
2782.0	V	109	82	-69.96	4.25	41.29	-53.96	-13.00	-40.96
2830.0	V	-	-	-77.90	3.49	32.59	-62.67	-13.00	-49.67
3537.5	V	-	-	-77.81	4.35	33.54	-61.72	-13.00	-48.72

Table 7-45. Radiated Spurious Data (Band n66 (Ant 3 NSA) + B12– High Channel)

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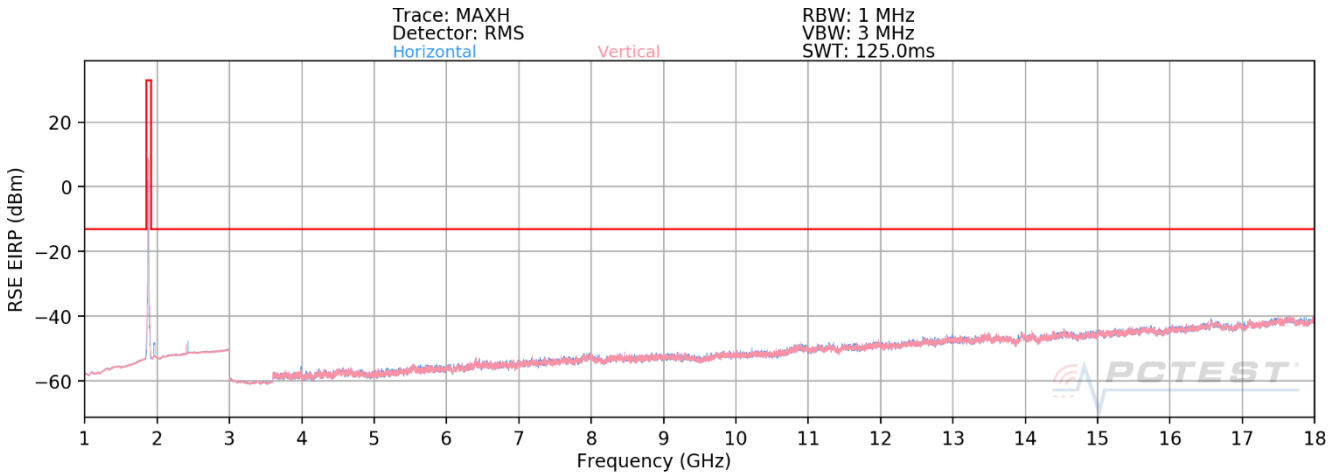
Band 25



Plot 7-815. Radiated Spurious Plot below 1GHz (Band 25)

OPERATING FREQUENCY:	1860.00	MHz
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	382	202	-62.94	6.08	-56.86	-43.9
5580.00	H	111	31	-71.18	12.13	-59.05	-46.1
7440.00	H	-	-	-69.20	12.52	-56.69	-43.7
9300.00	H	-	-	-64.88	8.99	-55.89	-42.9

Table 7-46. Radiated Spurious Data (Band 25 – Low Channel)

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OPERATING FREQUENCY: 1882.50 MHz
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	398	231	-63.62	5.92	-57.70	-44.7
5647.50	H	118	33	-72.18	12.32	-59.86	-46.9
7530.00	H	-	-	-69.55	12.59	-56.95	-44.0
9412.50	H	-	-	-64.20	9.10	-55.10	-42.1

Table 7-47. Radiated Spurious Data (Band 25 – Mid Channel)

OPERATING FREQUENCY: 1905.00 MHz
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	400	63	-67.53	5.87	-61.67	-48.7
5715.00	H	114	27	-71.08	12.46	-58.62	-45.6
7620.00	H	-	-	-69.37	12.42	-56.95	-44.0
9525.00	H	-	-	-64.42	9.28	-55.13	-42.1

Table 7-48. Radiated Spurious Data (Band 25 – High Channel)

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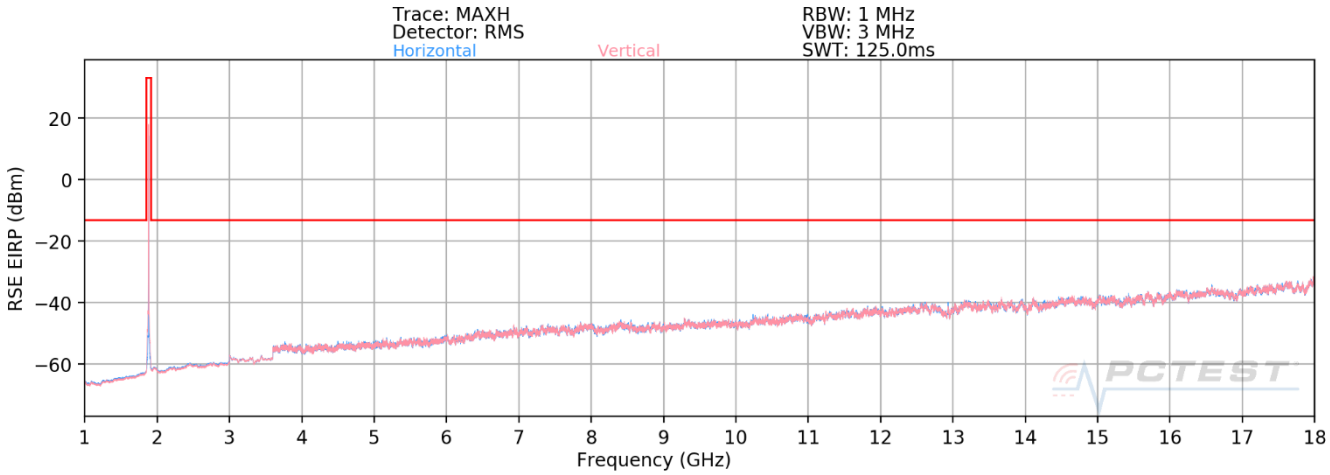
Band n25



Plot 7-816. Radiated Spurious Plot above 1GHz (Band n25 (Ant 3 NSA) +B12 EN-DC)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3720.0	H	141	52	-74.08	5.87	38.79	-56.47	-13.00	-43.47
5580.0	H	377	154	-77.31	7.92	37.61	-57.65	-13.00	-44.65
7440.0	H	-	-	-77.72	12.77	42.05	-53.20	-13.00	-40.20
9300.0	H	-	-	-78.09	14.87	43.78	-51.47	-13.00	-38.47

Table 7-49. Radiated Spurious Data (Band n25 (Ant 3 NSA) +B12 EN-DC – Low Channel)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3765.0	H	120	31	-73.03	6.16	40.13	-55.13	-13.00	-42.13
5647.5	H	383	136	-77.88	7.98	37.10	-58.15	-13.00	-45.15
7530.0	H	-	-	-78.61	12.50	40.89	-54.37	-13.00	-41.37
9412.5	H	-	-	-78.04	14.65	43.61	-51.64	-13.00	-38.64

Table 7-50. Radiated Spurious Data (Band n25 (Ant 3 NSA) +B12 EN-DC – Mid Channel)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3810.00	H	156	83	-73.51	5.46	38.95	-56.30	-13.00	-43.30
5715.00	H	379	155	-77.49	8.28	37.79	-57.47	-13.00	-44.47
7620.00	H	-	-	-78.66	13.25	41.59	-53.66	-13.00	-40.66
9525.00	H	-	-	-78.05	14.65	43.60	-51.65	-13.00	-38.65

Table 7-51. Radiated Spurious Data (Band n25 (Ant 3 NSA) +B12 EN-DC – High Channel)

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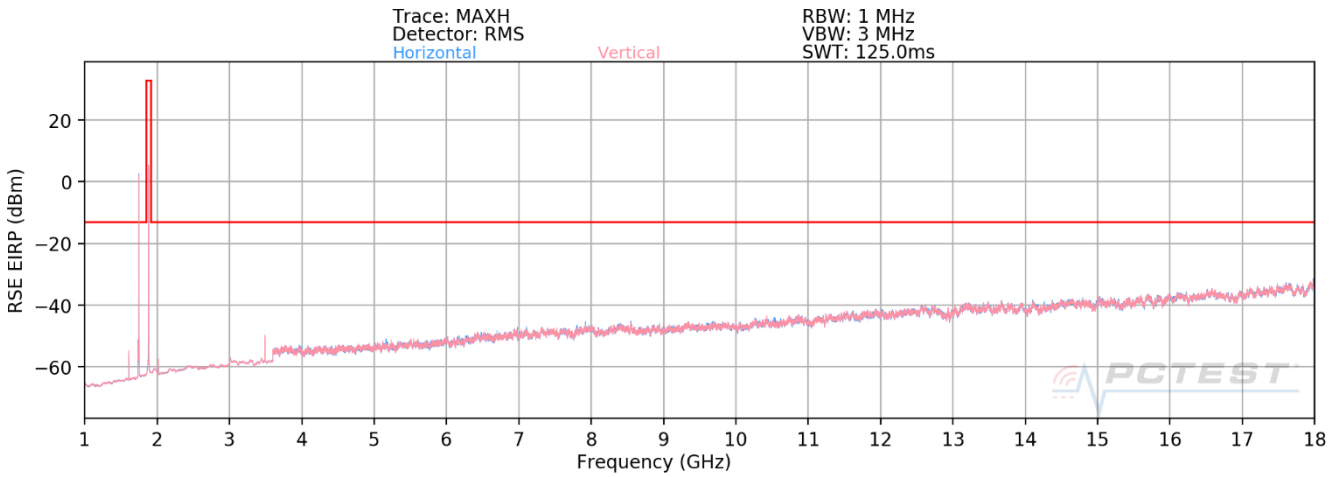

Plot 7-817. Radiated Spurious Plot above 1GHz (Band n25 (Ant 3 NSA) +B66 EN-DC)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3700.0	V	106	331	-76.78	4.96	35.18	-60.07	-13.00	-47.07
5550.0	V	-	-	-78.22	8.73	37.51	-57.74	-13.00	-44.74
7400.0	V	-	-	-79.46	13.49	41.03	-54.23	-13.00	-41.23

Table 7-52. Radiated Spurious Data (Band n25 (Ant 3 NSA) +B66 EN-DC – Low Channel)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3765.0	V	101	315	-76.19	6.16	36.97	-58.29	-13.00	-45.29
5647.5	V	-	-	-78.25	7.98	36.73	-58.52	-13.00	-45.52
7530.0	V	-	-	-78.59	12.50	40.91	-54.35	-13.00	-41.35

Table 7-53. Radiated Spurious Data (Band n25 (Ant 3 NSA) +B66 EN-DC – Mid Channel)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3830.00	V	116	337	-76.27	5.85	36.58	-58.68	-13.00	-45.68
5745.00	V	-	-	-79.34	8.18	35.84	-59.42	-13.00	-46.42
7660.00	V	-	-	-78.66	11.90	40.24	-55.02	-13.00	-42.02

Table 7-54. Radiated Spurious Data (Band n25 (Ant 3 NSA) +B66 EN-DC – High Channel)

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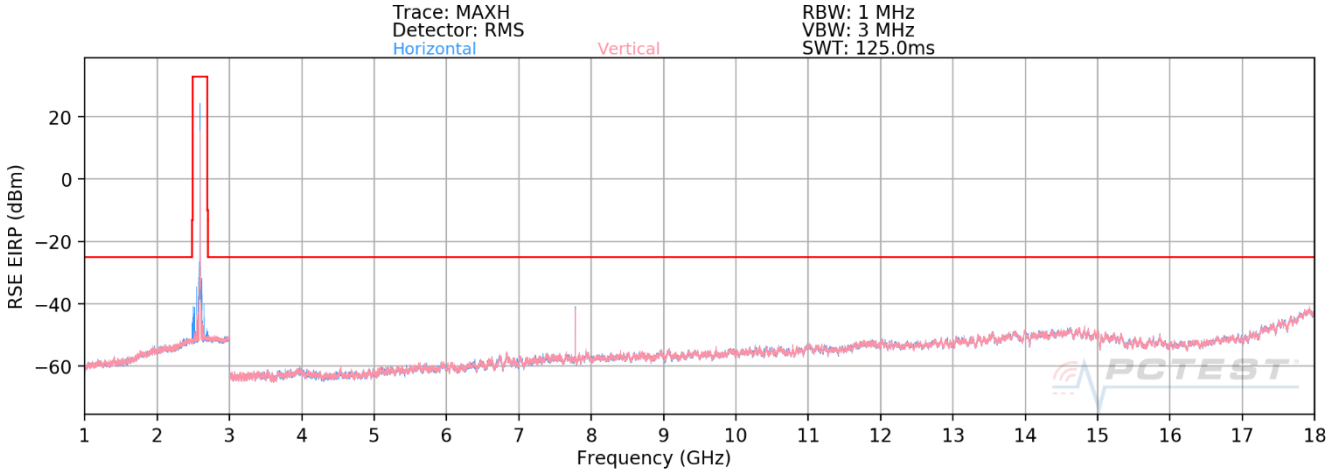
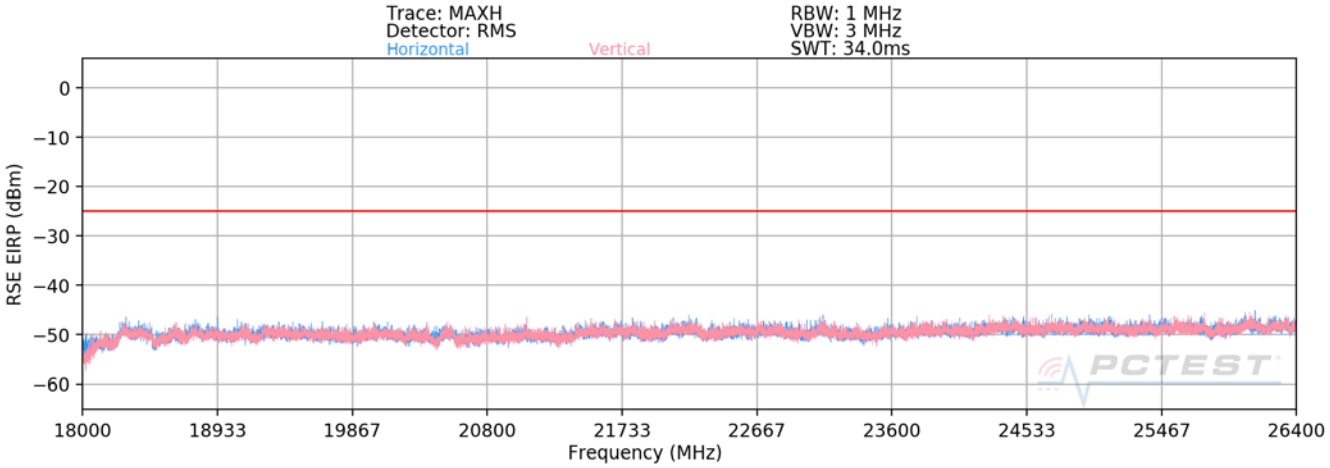
Band 41



Plot 7-818. Radiated Spurious Plot 1GHz - 18GHz (Band 41)



Plot 7-819. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41)

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OPERATING FREQUENCY: 2506.00 MHz
CHANNEL: 39750
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]
5012.00	H	-	-	-70.32	10.93	-59.39	-34.4
7518.00	H	228	307	-60.74	11.14	-49.60	-24.6
10024.00	H	-	-	-65.34	12.03	-53.31	-28.3
12530.00	H	162	357	-65.22	13.60	-51.62	-26.6
15036.00	H	-	-	-63.19	13.55	-49.64	-24.6

Table 7-55. 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	-	-	-69.57	10.77	-58.80	-33.8
7779.00	H	387	18	-46.92	11.47	-35.45	-10.4
10372.00	H	400	5	-64.63	12.48	-52.15	-27.1
12965.00	H	-	-	-64.57	13.34	-51.22	-26.2
15558.00	H	-	-	-68.42	16.37	-52.05	-27.0

Table 7-56. Radiated Spurious Data (Band 41 – Mid Channel)

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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	400	344	-70.20	10.73	-59.47	-34.5
8040.00	H	400	31	-60.65	11.19	-49.46	-24.5
10720.00	H	174	11	-63.32	12.63	-50.69	-25.7
13400.00	H	-	-	-62.79	12.62	-50.17	-25.2
16080.00	H	-	-	-68.71	16.73	-51.99	-27.0

Table 7-57. Radiated Spurious Data (Band 41 – High Channel)

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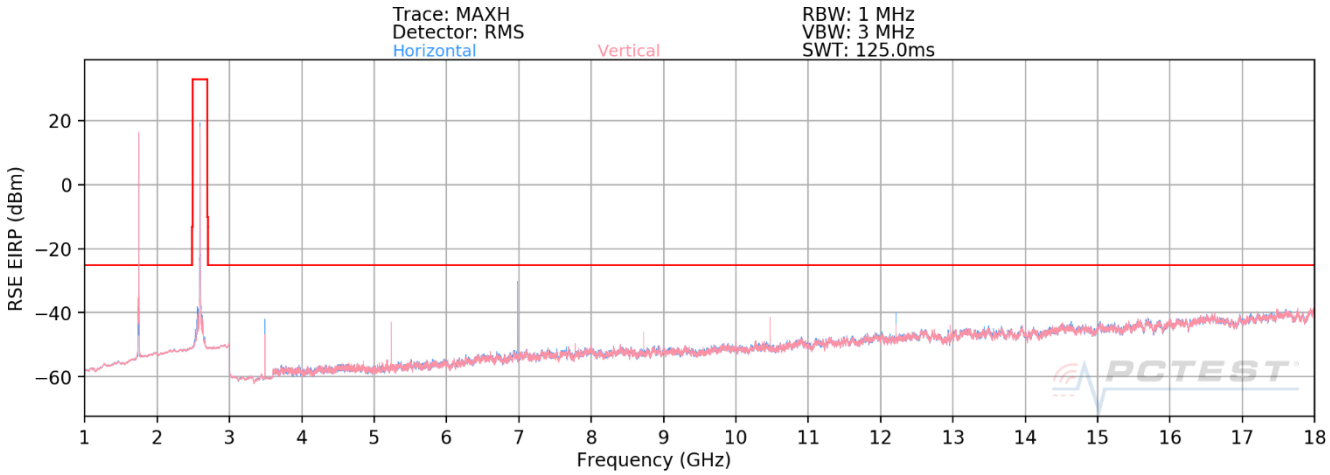
Band n41



Plot 7-820. Radiated Spurious Plot 1GHz - 18GHz (Band n41 +B66 EN-DC)

Bandwidth (MHz):	100
Frequency (MHz):	2546.0
RB / Offset:	1/135
Mode:	EN-DC
Anchor Band:	LTE Band 66

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5092.0	V	117	28	-75.04	6.61	38.57	-66.23	-25.00	-41.23
7638.0	V	-	-	-79.64	12.99	40.35	-64.45	-25.00	-39.45
10184.0	V	-	-	-80.52	14.01	40.49	-64.31	-25.00	-39.31

Table 7-58. Radiated Spurious Data (Band n41+B66 – Low Channel)

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Bandwidth (MHz):	100
Frequency (MHz):	2593.0
RB / Offset:	1/135
Mode:	EN-DC
Anchor Band:	LTE Band 66

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5186.0	V	107	17	-74.95	7.33	39.38	-65.42	-25.00	-40.42
7779.0	V	-	-	-79.54	12.83	40.29	-64.51	-25.00	-39.51
10372.0	V	-	-	-80.65	15.64	41.99	-62.81	-25.00	-37.81

Table 7-59. Radiated Spurious Data (Band n41+B66 – Mid Channel)

Bandwidth (MHz):	100
Frequency (MHz):	2640.0
RB / Offset:	1/135
Mode:	EN-DC
Anchor Band:	LTE Band 66

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5280.0	V	119	51	-75.07	6.97	38.90	-65.90	-25.00	-40.90
7920.0	V	-	-	-79.62	14.15	41.53	-63.27	-25.00	-38.27
10560.0	V	-	-	-80.41	15.79	42.38	-62.42	-25.00	-37.42

Table 7-60. Radiated Spurious Data (Band n41+B66 – High Channel)

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7.9 Uplink Carrier Aggregation Radiated Measurements

§2.1053,

Test Overview

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

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW ≥ 3 x RBW
3. No. of sweep points ≥ 2 x span / RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. The trace was allowed to stabilize

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Test Setup

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

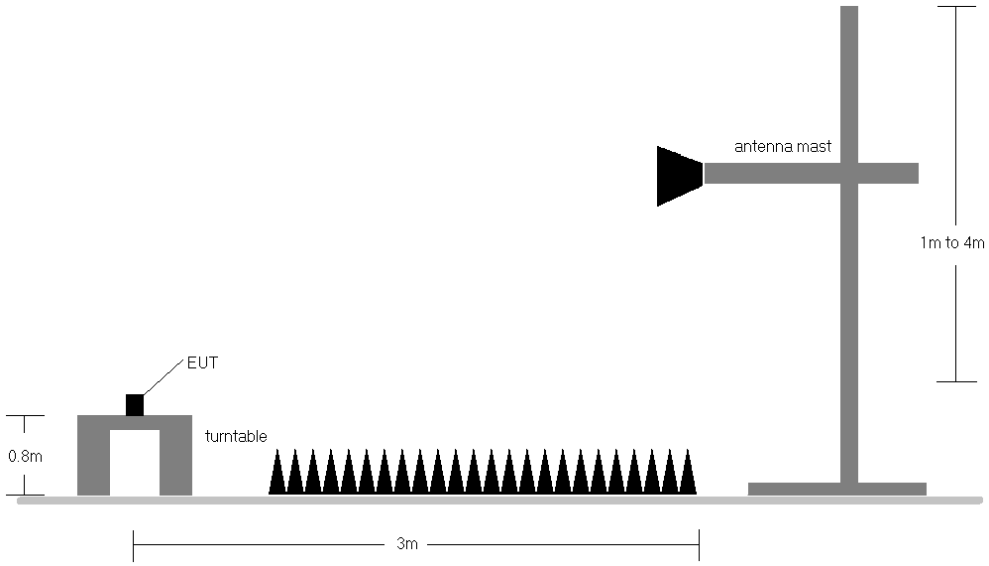

Figure 7-9. Test Instrument & Measurement Setup

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) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.

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

5) 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.

6) No significant emissions were found as a result of two uplink carriers operating contiguously.

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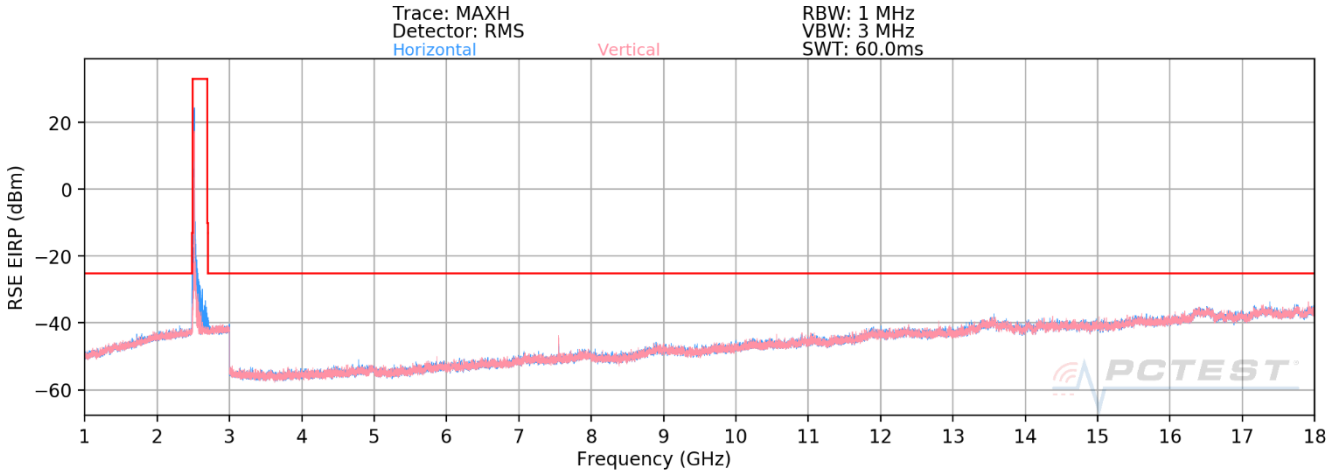
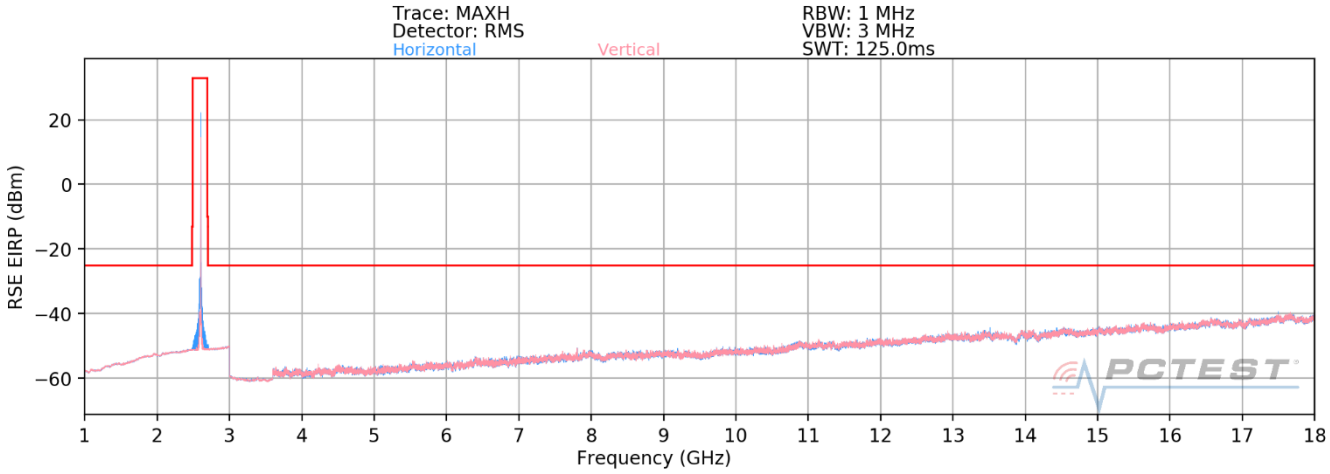
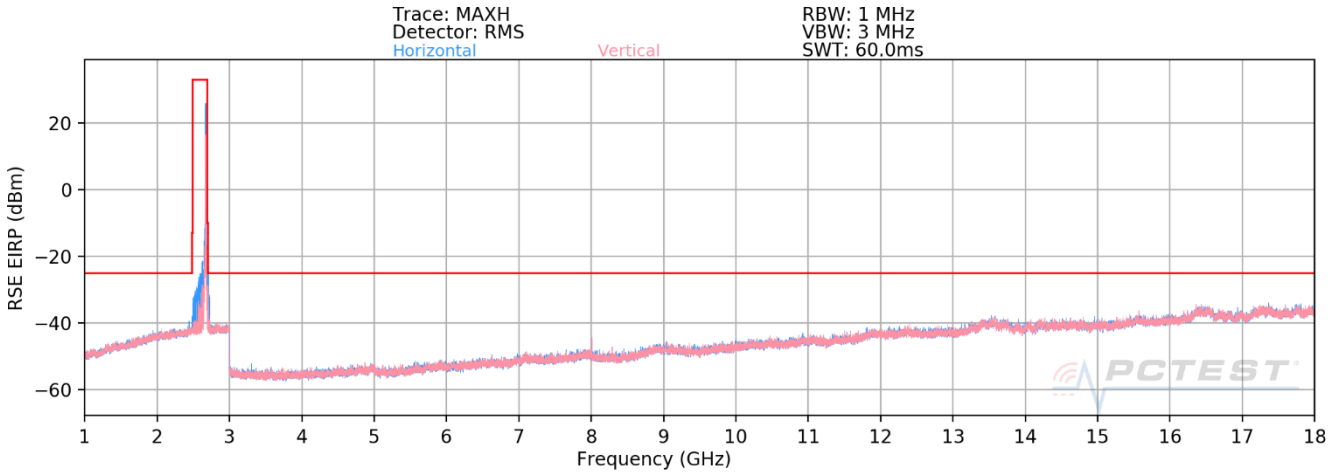
ULCA Band 41



Plot 7-821. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 41 Low Channel – PCC/SCC: 1RB)



Plot 7-822. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 41 Mid Channel – PCC/SCC: 1RB)



Plot 7-823. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 41 High Channel – PCC/SCC: 1RB)

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OPERATING FREQUENCY (PCC):	2506.00	MHz
OPERATING FREQUENCY (SCC):	2525.80	MHz
CHANNEL (PCC):	39750	
CHANNEL (SCC):	39948	
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]
5012.00	H	104	50	-67.13	10.93	-56.19	-31.2
7518.00	H	288	50	-58.57	11.14	-47.44	-22.4
10024.00	H	-	-	-64.13	12.03	-52.09	-27.1
12530.00	H	-	-	-62.76	13.60	-49.16	-24.2

Plot 7-61. Radiated Spurious Plot (ULCA B41 Left Carrier: RB 1 Offset 99, Right Carrier: RB 1 Offset 0)

OPERATING FREQUENCY (PCC):	2593.00	MHz
OPERATING FREQUENCY (SCC):	2612.80	MHz
CHANNEL (PCC):	40620	
CHANNEL (SCC):	40818	
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	102	20	-67.24	10.77	-56.47	-31.5
7779.00	H	150	351	-57.88	11.47	-46.40	-21.4
10372.00	H	-	-	-64.85	12.48	-52.37	-27.4
12965.00	H	-	-	-61.46	13.34	-48.11	-23.1

Plot 7-62. Radiated Spurious Plot (ULCA B41 Left Carrier: RB 100 Offset 0, Right Carrier: RB 100 Offset 0)

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OPERATING FREQUENCY (PCC):	2680.00	MHz
OPERATING FREQUENCY (SCC):	2660.20	MHz
CHANNEL (PCC):	41490	
CHANNEL (SCC):	41292	
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	164	53	-67.12	10.73	-56.39	-31.4
8040.00	H	175	192	-64.64	11.19	-53.45	-28.5
10720.00	H	252	5	-61.90	12.63	-49.26	-24.3
13400.00	H	-	-	-60.09	12.62	-47.47	-22.5
16080.00	H	-	-	-61.86	16.73	-45.13	-20.1

Plot 7-63. Radiated Spurious Data (ULCA B41 Left Carrier: RB 1 Offset 0, Right Carrier: RB 1 Offset 99)

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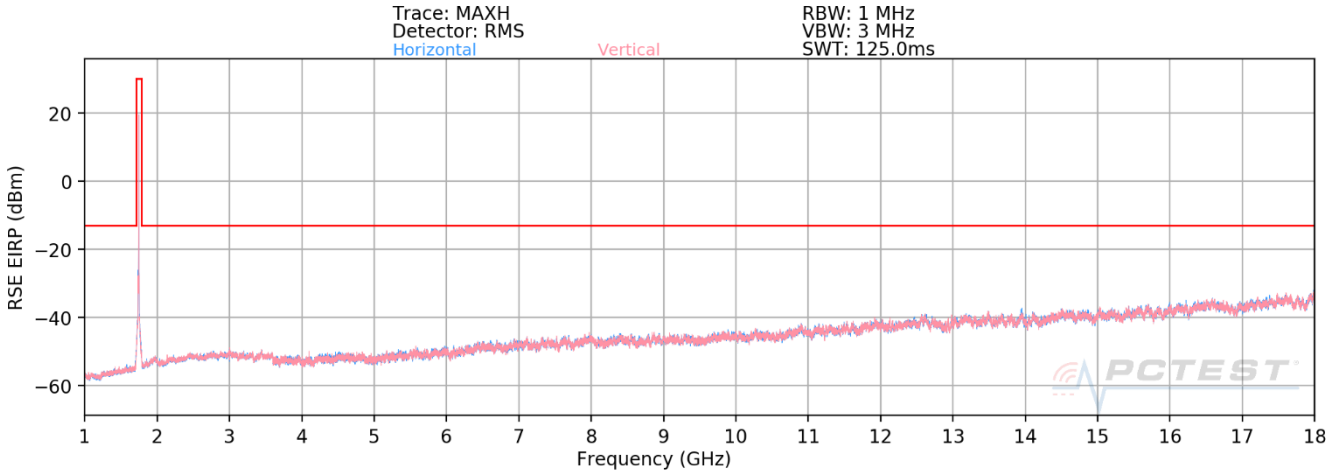
Inter-band ULCA 12A-66A



Plot 7-824. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 12A-66A – PCC/SCC: 1RB)

OPERATING FREQUENCY:	704 + 1720	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10 + 20	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]
3360.00	H	-	-	-72.43	9.87	-62.56	-49.6
4144.00	H	-	-	-73.03	10.74	-62.29	-49.3
5472.00	H	-	-	-71.57	11.71	-59.86	-46.9

Plot 7-64. Radiated Spurious Plot (ULCA Band 12A-66A – PCC/SCC: 1RB: Low)

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OPERATING FREQUENCY: 707.5 + 1745 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 10 + 20 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]
3442.50	H	-	-	-70.95	9.94	-61.00	-48.0
4197.00	H	219	358	-72.14	10.76	-61.38	-48.4
5565.00	H	-	-	-71.61	11.85	-59.76	-46.8

Plot 7-65. Radiated Spurious Plot (ULCA Band 12A-66A – PCC/SCC: 1RB: Mid)

OPERATING FREQUENCY: 711 + 1770 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 10 + 20 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]
3525.00	H	-	-	-72.10	9.92	-62.18	-49.2
4251.00	H	164	2	-71.27	10.72	-60.55	-47.6
5658.00	H	-	-	-72.09	11.82	-60.28	-47.3

Plot 7-66. Radiated Spurious Plot (ULCA Band 12A-66A – PCC/SCC: 1RB: High)

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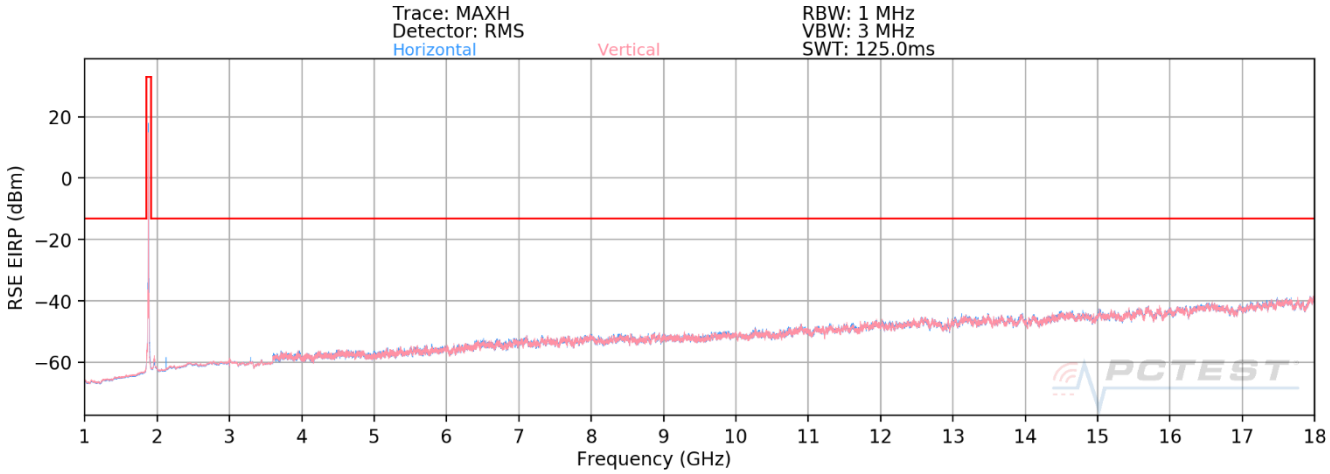
Inter-band ULCA 2A-12A



Plot 7-825. Radiated Spurious Plot 1GHz - 18GHz (ULCA Band 2A-12A – PCC/SCC: 1RB)

OPERATING FREQUENCY:	704 + 1860	MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20 + 10	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]
2112.00	H	237	245	-73.05	9.54	-63.51	-50.5
3268.00	H	142	9	-72.51	11.02	-61.49	-48.5
5128.00	H	-	-	-71.42	11.01	-60.40	-47.4

Plot 7-67. Radiated Spurious Plot (ULCA Band 2A-12A – PCC/SCC: 1RB: Low)

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OPERATING FREQUENCY: 707.5 + 1880 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 20 + 10 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]
2122.50	H	273	244	-72.74	9.39	-63.35	-50.3
3295.00	H	172	8	-70.76	11.22	-59.53	-46.5
5175.00	H	-	-	-70.91	11.16	-59.75	-46.8

Plot 7-68. Radiated Spurious Plot (ULCA Band 2A-12A – PCC/SCC: 1RB: Mid)

OPERATING FREQUENCY: 711 + 1900 MHz
MODULATION SIGNAL: QPSK
BANDWIDTH: 20 + 10 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]
2133.00	H	158	10	-72.60	9.32	-63.28	-50.3
3322.00	H	163	14	-71.89	11.38	-60.52	-47.5
5222.00	H	-	-	-71.71	11.32	-60.39	-47.4

Plot 7-69. Radiated Spurious Plot (ULCA Band 2A-12A – PCC/SCC: 1RB: High)

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7.10 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

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

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

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

None

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Band 71 Frequency Stability Measurements

OPERATING FREQUENCY: 680,500,000 Hz

CHANNEL: 133297

REFERENCE VOLTAGE: 4.33 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	680,499,850	-150	-0.0000220
100 %		- 20	680,500,177	177	0.0000260
100 %		- 10	680,499,840	-160	-0.0000235
100 %		0	680,500,245	245	0.0000360
100 %		+ 10	680,499,727	-273	-0.0000401
100 %		+ 20	680,500,124	124	0.0000182
100 %		+ 30	680,499,881	-119	-0.0000175
100 %		+ 40	680,500,043	43	0.0000063
100 %		+ 50	680,499,719	-281	-0.0000413
BATT. ENDPOINT	3.70	+ 20	680,500,035	35	0.0000051

Table 7-70. Frequency Stability Data (Band 71)

Note:

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

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Band 71 Frequency Stability Measurements

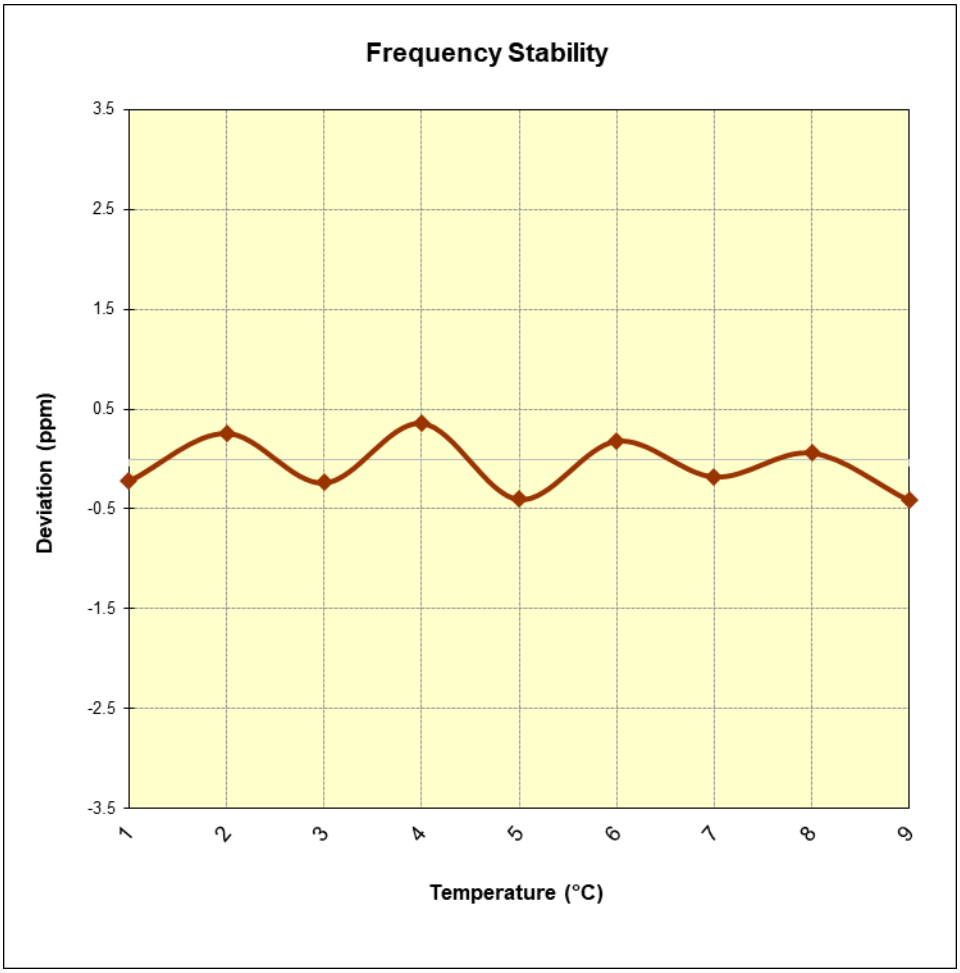

Figure 7-10. Frequency Stability Graph (Band 71)

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Band 12 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz

CHANNEL: 23790

REFERENCE VOLTAGE: 4.33 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	707,500,253	253	0.0000358
100 %		- 20	707,500,060	60	0.0000085
100 %		- 10	707,500,287	287	0.0000406
100 %		0	707,500,298	298	0.0000421
100 %		+ 10	707,499,968	-32	-0.0000045
100 %		+ 20	707,499,651	-349	-0.0000493
100 %		+ 30	707,499,998	-2	-0.0000003
100 %		+ 40	707,499,863	-137	-0.0000194
100 %		+ 50	707,499,719	-281	-0.0000397
BATT. ENDPOINT	3.70	+ 20	707,499,811	-189	-0.0000267

Table 7-71. Frequency Stability Data (Band 12)

Note:

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

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Band 12 Frequency Stability Measurements

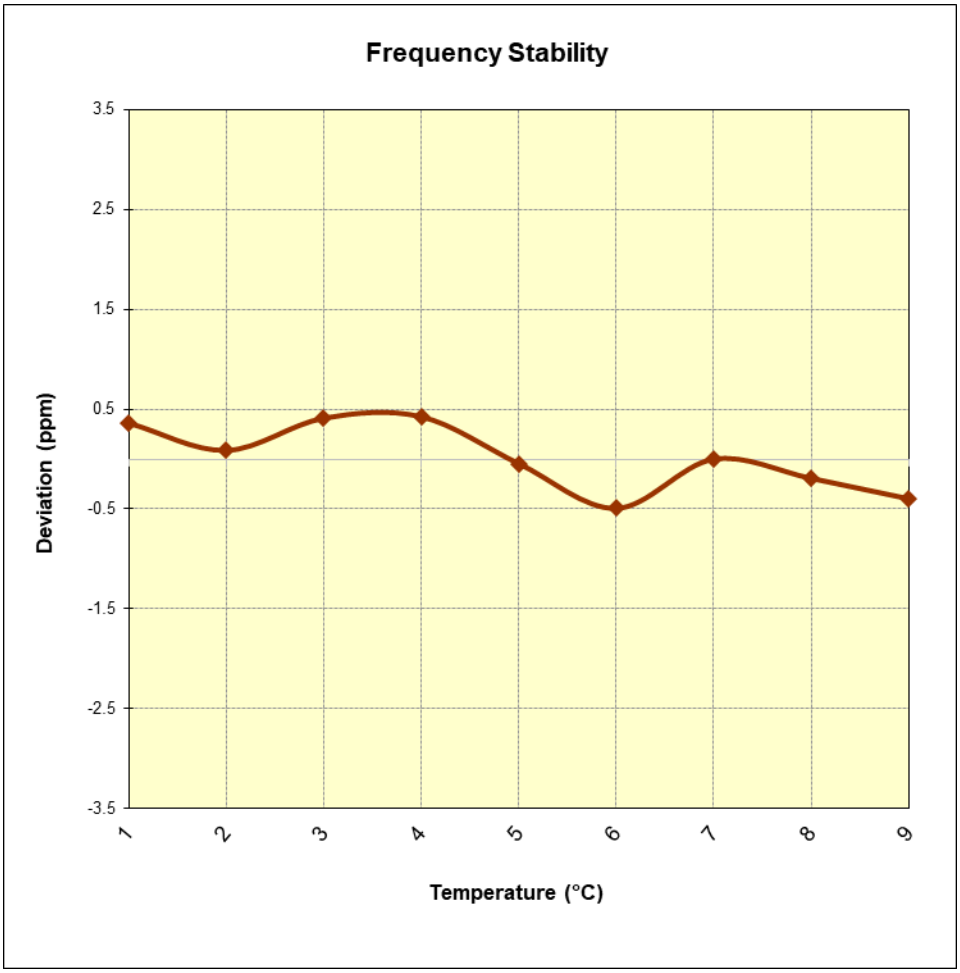

Figure 7-11. Frequency Stability Graph (Band 12)

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Band 13 Frequency Stability Measurements

OPERATING FREQUENCY: 782,000,000 Hz

CHANNEL: 23230

REFERENCE VOLTAGE: 4.33 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	782,000,062	62	0.0000079
100 %		- 20	782,000,112	112	0.0000143
100 %		- 10	781,999,809	-191	-0.0000244
100 %		0	781,999,691	-309	-0.0000395
100 %		+ 10	781,999,924	-76	-0.0000097
100 %		+ 20	781,999,846	-154	-0.0000197
100 %		+ 30	782,000,148	148	0.0000189
100 %		+ 40	782,000,240	240	0.0000307
100 %		+ 50	781,999,997	-3	-0.0000004
BATT. ENDPOINT	3.70	+ 20	781,999,990	-10	-0.0000013

Table 7-72. 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.

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Band 13 Frequency Stability Measurements

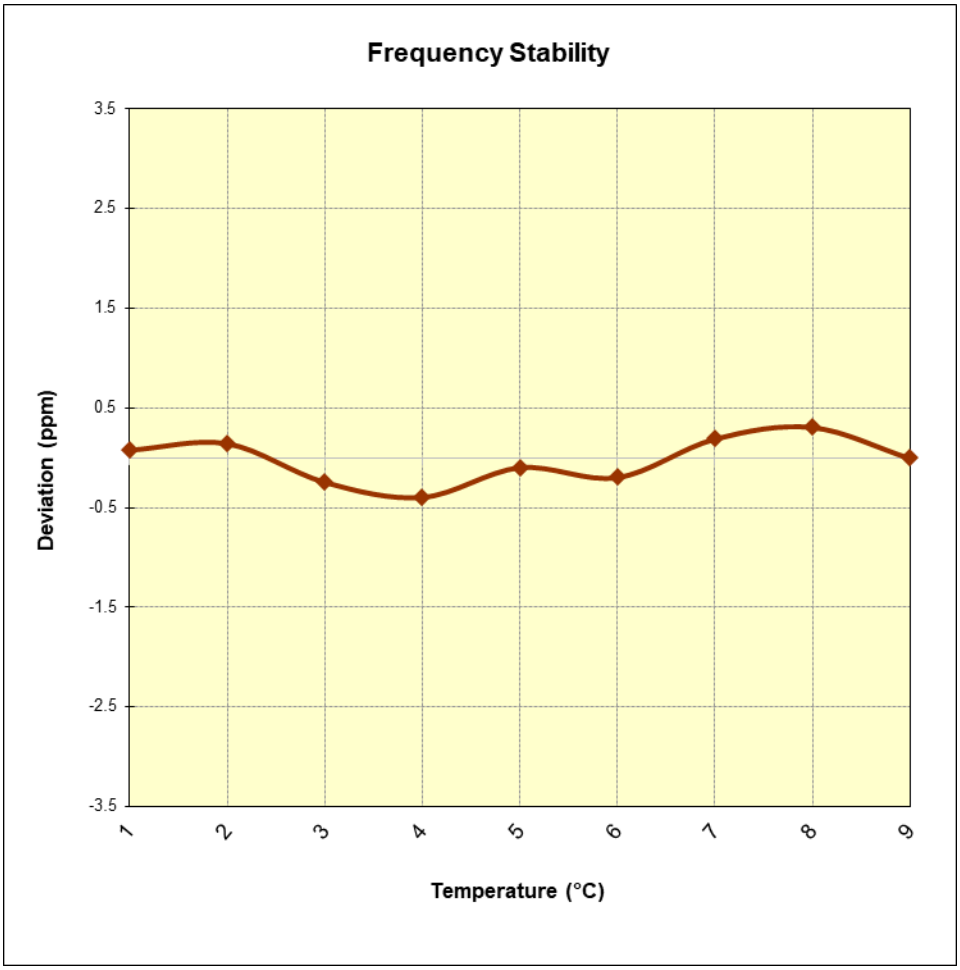

Figure 7-12. Frequency Stability Graph (Band 13)

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Band 26 Frequency Stability Measurements

OPERATING FREQUENCY:	831,500,000	Hz
CHANNEL:	26865	
REFERENCE VOLTAGE:	4.33	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	831,499,737	-263	-0.0000316
100 %		- 20	831,499,999	-1	-0.0000001
100 %		- 10	831,500,220	220	0.0000265
100 %		0	831,500,287	287	0.0000345
100 %		+ 10	831,499,782	-218	-0.0000262
100 %		+ 20	831,500,049	49	0.0000059
100 %		+ 30	831,499,919	-81	-0.0000097
100 %		+ 40	831,499,885	-115	-0.0000138
100 %		+ 50	831,499,809	-191	-0.0000230
BATT. ENDPOINT	3.70	+ 20	831,499,889	-111	-0.0000133

Table 7-73. Frequency Stability Data (Band 26)

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Band 26 Frequency Stability Measurements

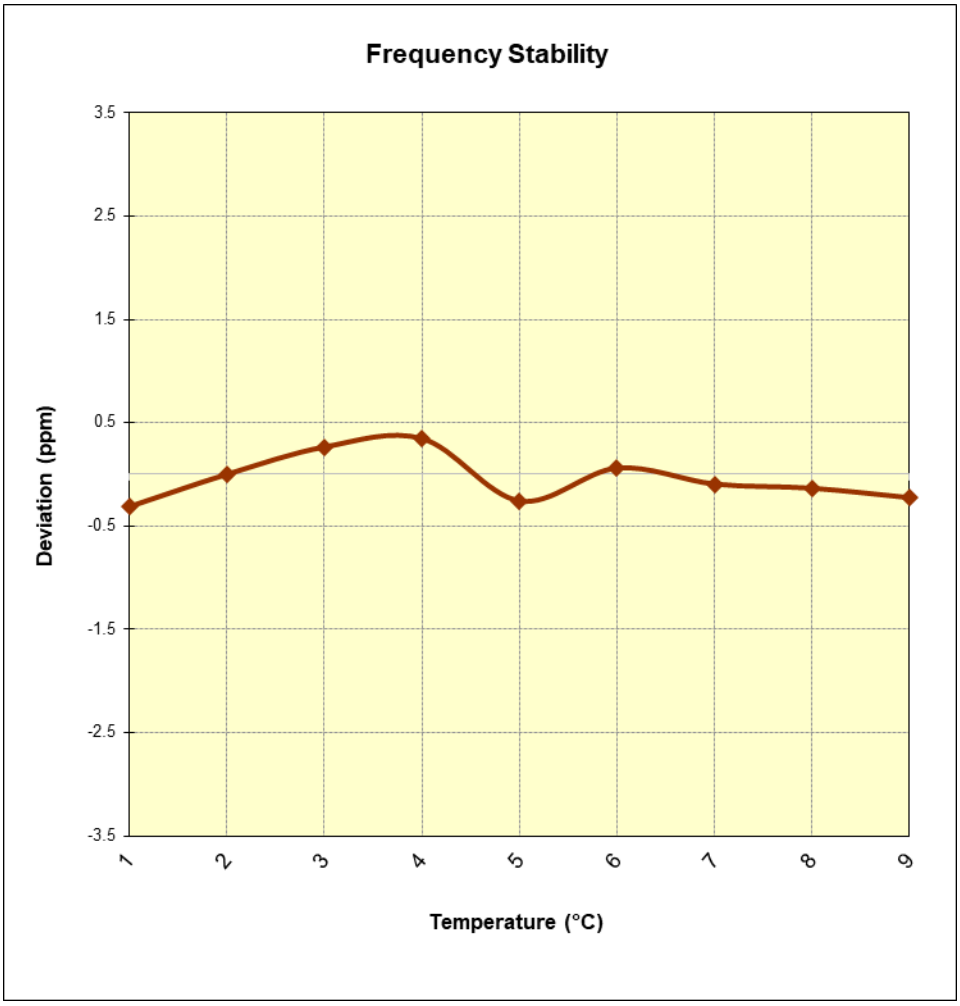

Figure 7-13. Frequency Stability Graph (Band 26)

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Band 66 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz

CHANNEL: 132322

REFERENCE VOLTAGE: 4.33 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{0}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	1,745,000,283	283	0.0000162
100 %		- 20	1,744,999,670	-330	-0.0000189
100 %		- 10	1,744,999,935	-65	-0.0000037
100 %		0	1,745,000,284	284	0.0000163
100 %		+ 10	1,744,999,909	-91	-0.0000052
100 %		+ 20	1,744,999,922	-78	-0.0000045
100 %		+ 30	1,744,999,655	-345	-0.0000198
100 %		+ 40	1,744,999,870	-130	-0.0000074
100 %		+ 50	1,745,000,079	79	0.0000045
BATT. ENDPOINT	3.70	+ 20	1,745,000,058	58	0.0000033

Table 7-74. Frequency Stability Data (Band 66)

Note:

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

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Band 66 Frequency Stability Measurements

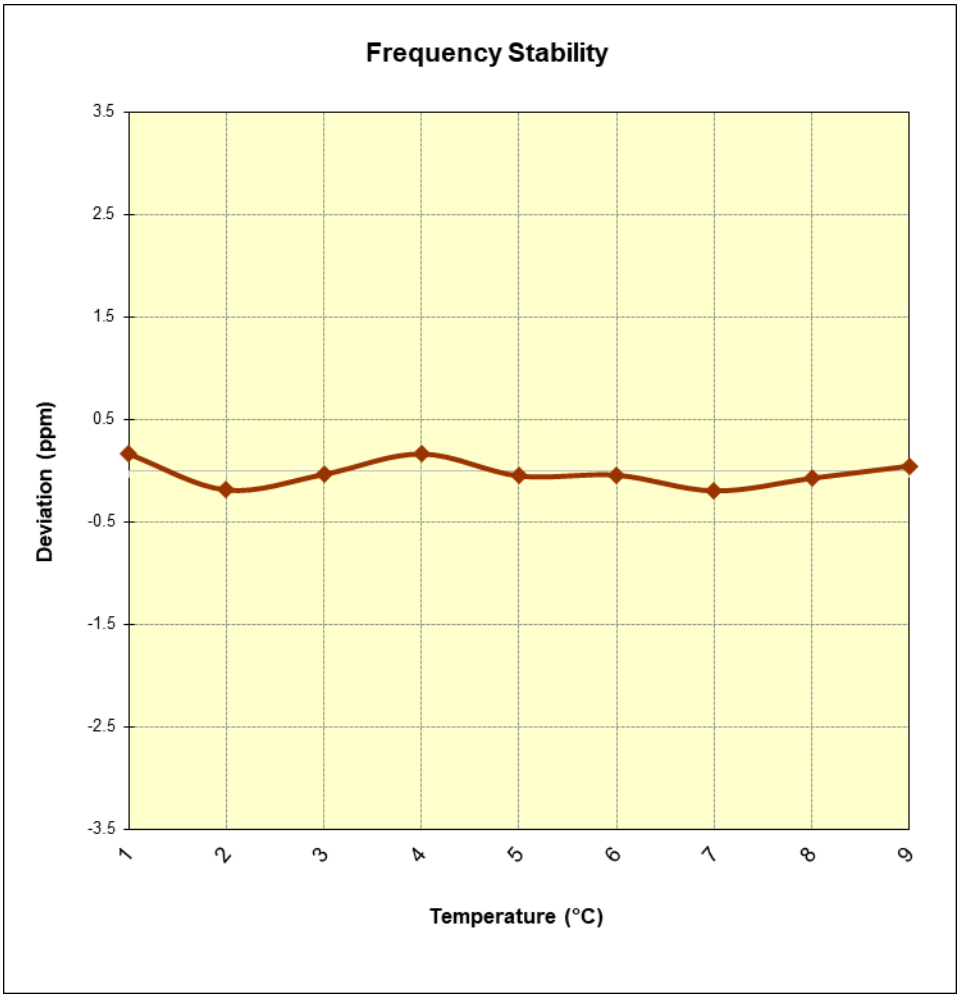

Figure 7-14. Frequency Stability Graph (Band 66)

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Band 25 Frequency Stability Measurements

OPERATING FREQUENCY: 1,882,500,000 Hz

CHANNEL: 26365

REFERENCE VOLTAGE: 4.33 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{o}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	1,882,499,746	-254	-0.0000135
100 %		- 20	1,882,499,965	-35	-0.0000019
100 %		- 10	1,882,500,007	7	0.0000004
100 %		0	1,882,500,071	71	0.0000038
100 %		+ 10	1,882,499,897	-103	-0.0000055
100 %		+ 20	1,882,499,829	-171	-0.0000091
100 %		+ 30	1,882,499,970	-30	-0.0000016
100 %		+ 40	1,882,500,260	260	0.0000138
100 %		+ 50	1,882,499,974	-26	-0.0000014
BATT. ENDPOINT	3.70	+ 20	1,882,499,802	-198	-0.0000105

Table 7-75. Frequency Stability Data (Band 25)

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Band 25 Frequency Stability Measurements

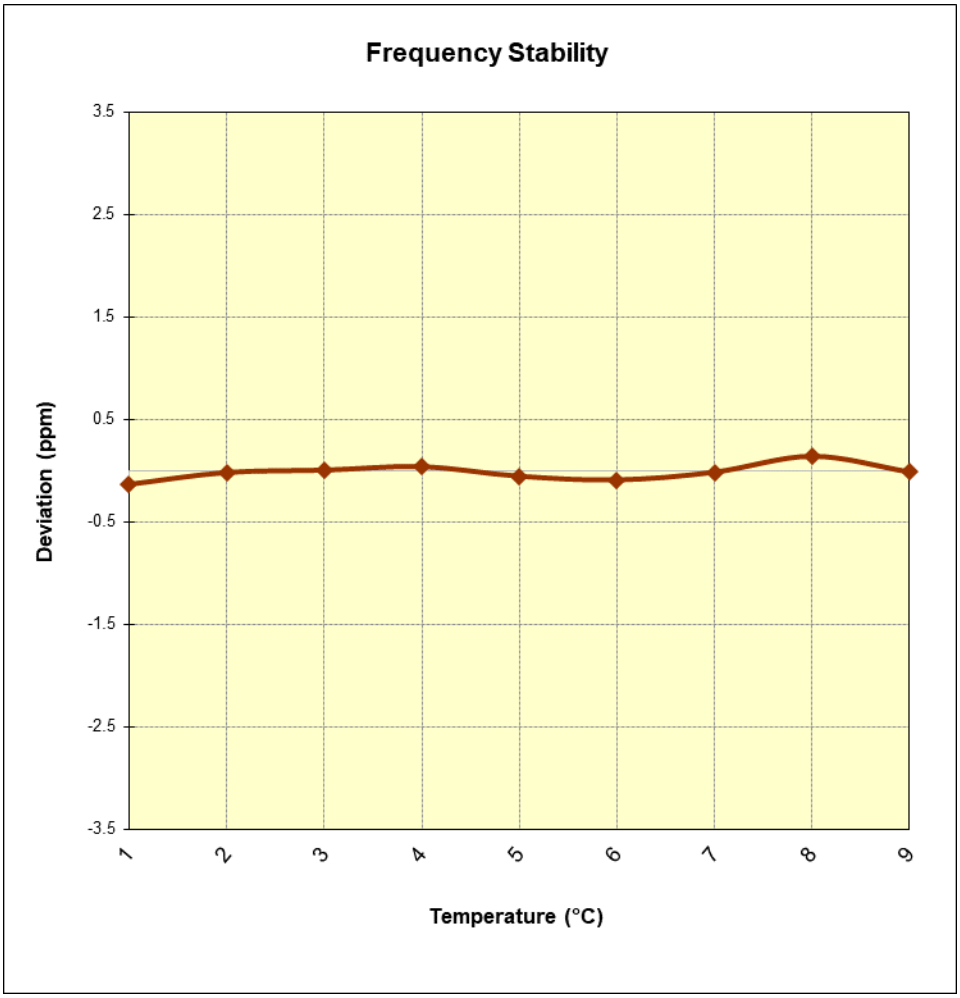

Figure 7-15. Frequency Stability Graph (Band 25)

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Band 41 Frequency Stability Measurements

OPERATING FREQUENCY: 2,593,000,000 Hz

CHANNEL: 40620

REFERENCE VOLTAGE: 4.33 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (^{0}C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.33	- 30	2,593,000,008	8	0.0000003
100 %		- 20	2,592,999,946	-54	-0.0000021
100 %		- 10	2,593,000,006	6	0.0000002
100 %		0	2,593,000,166	166	0.0000064
100 %		+ 10	2,592,999,634	-366	-0.0000141
100 %		+ 20	2,593,000,025	25	0.0000010
100 %		+ 30	2,592,999,961	-39	-0.0000015
100 %		+ 40	2,592,999,899	-101	-0.0000039
100 %		+ 50	2,592,999,837	-163	-0.0000063
BATT. ENDPOINT	3.70	+ 20	2,592,999,705	-295	-0.0000114

Table 7-76. 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.

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Band 41 Frequency Stability Measurements

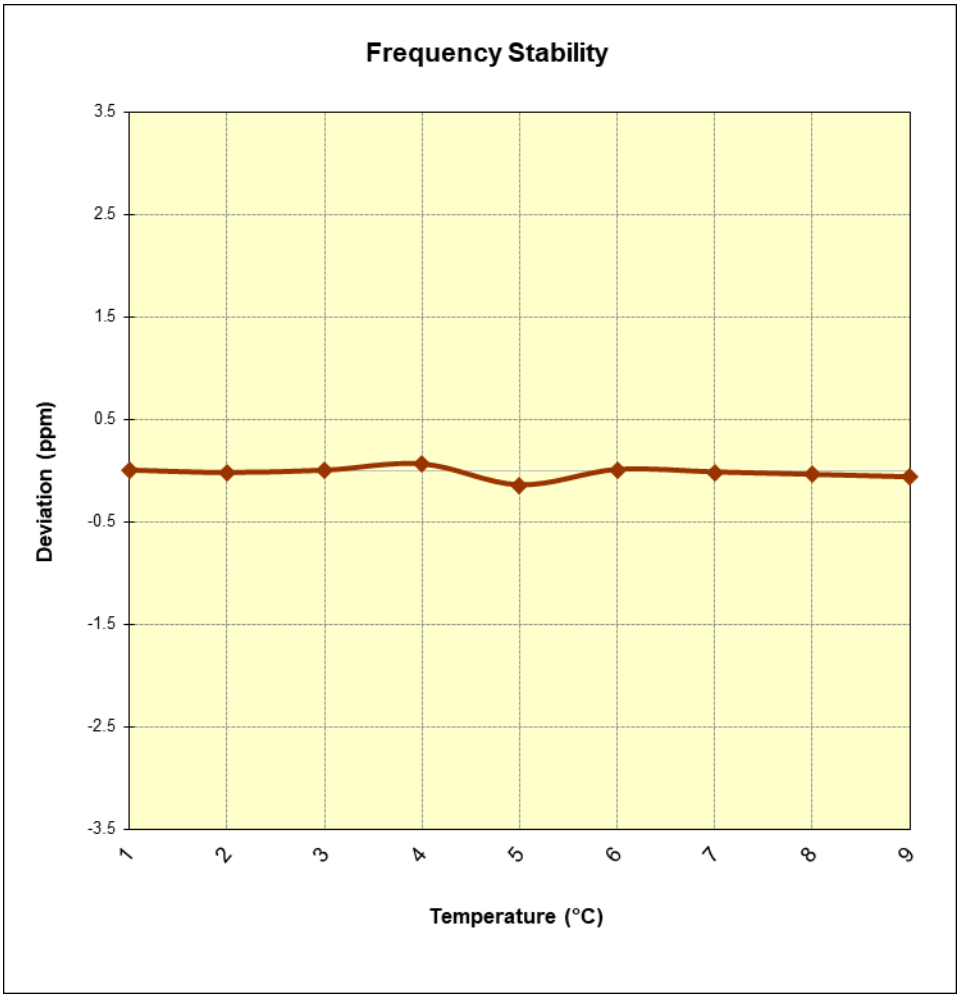

Figure 7-16. Frequency Stability Graph (Band 41)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFG900TM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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