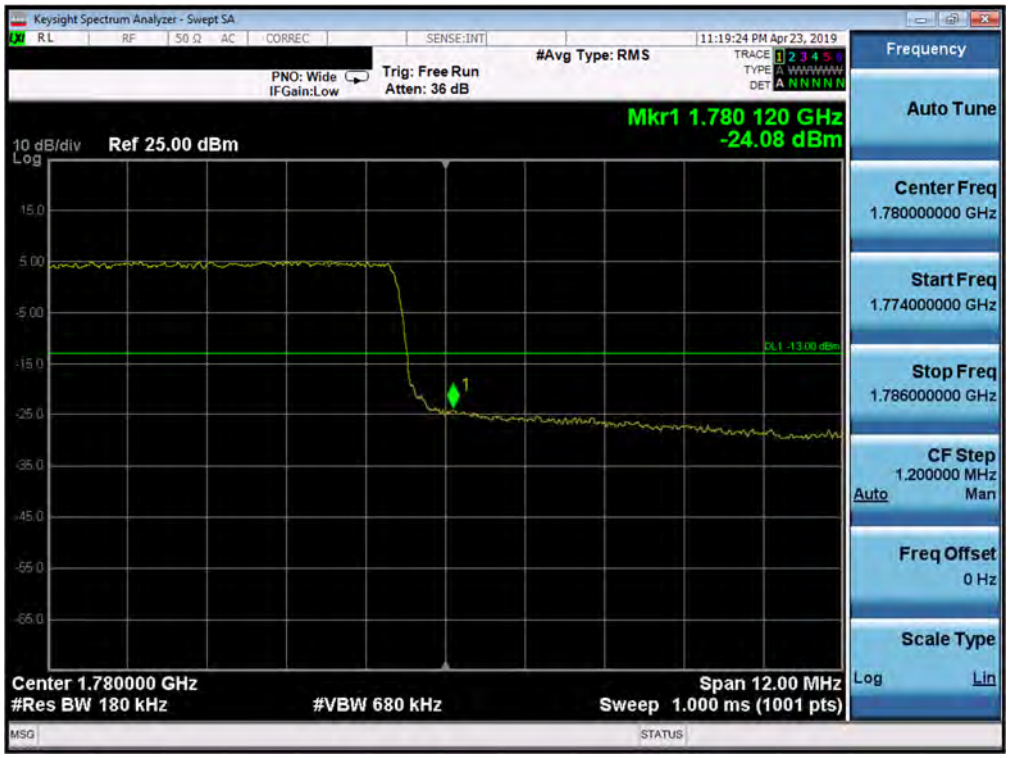
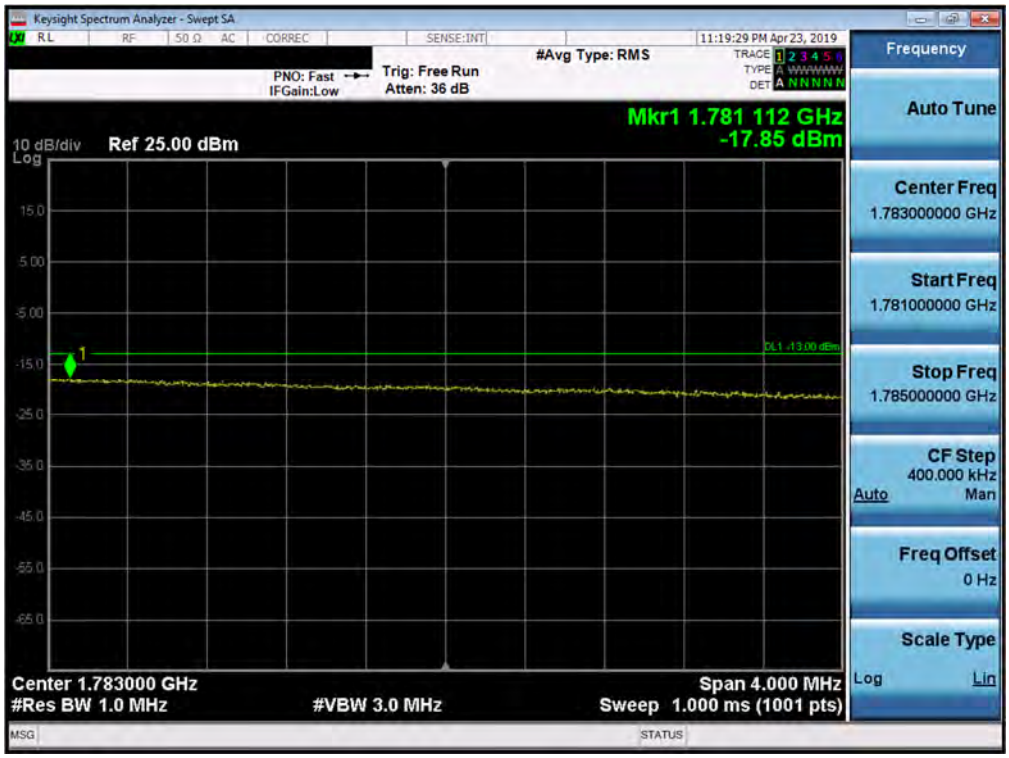


Plot 7-266. Upper Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-267. Upper Extended Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

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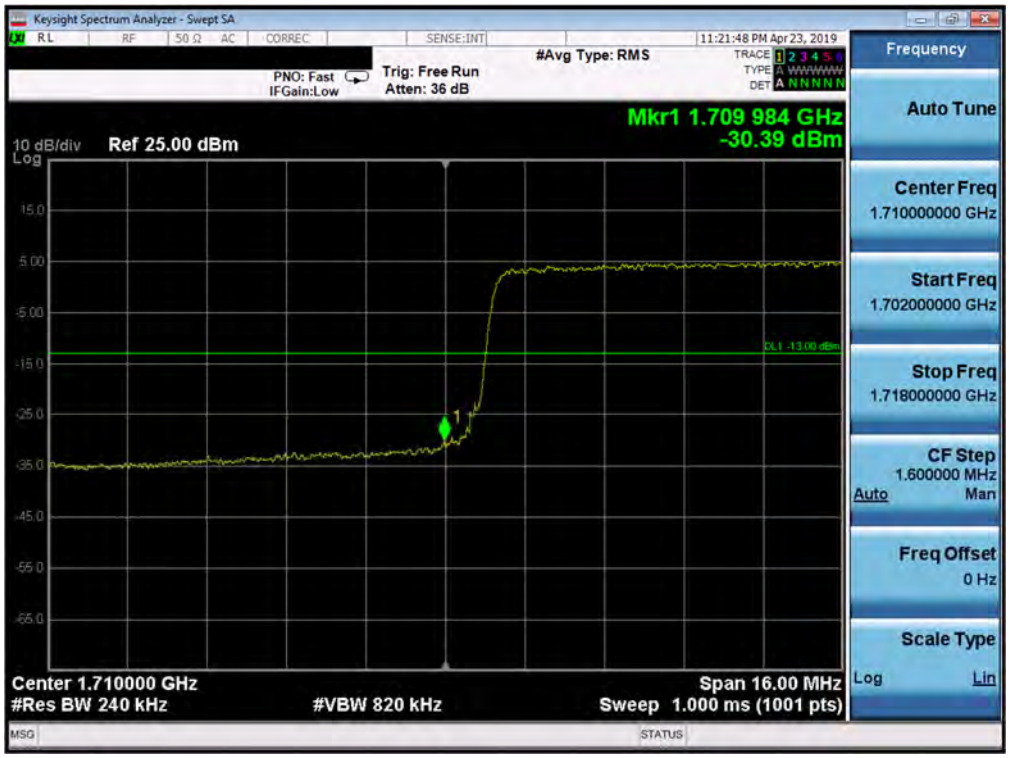
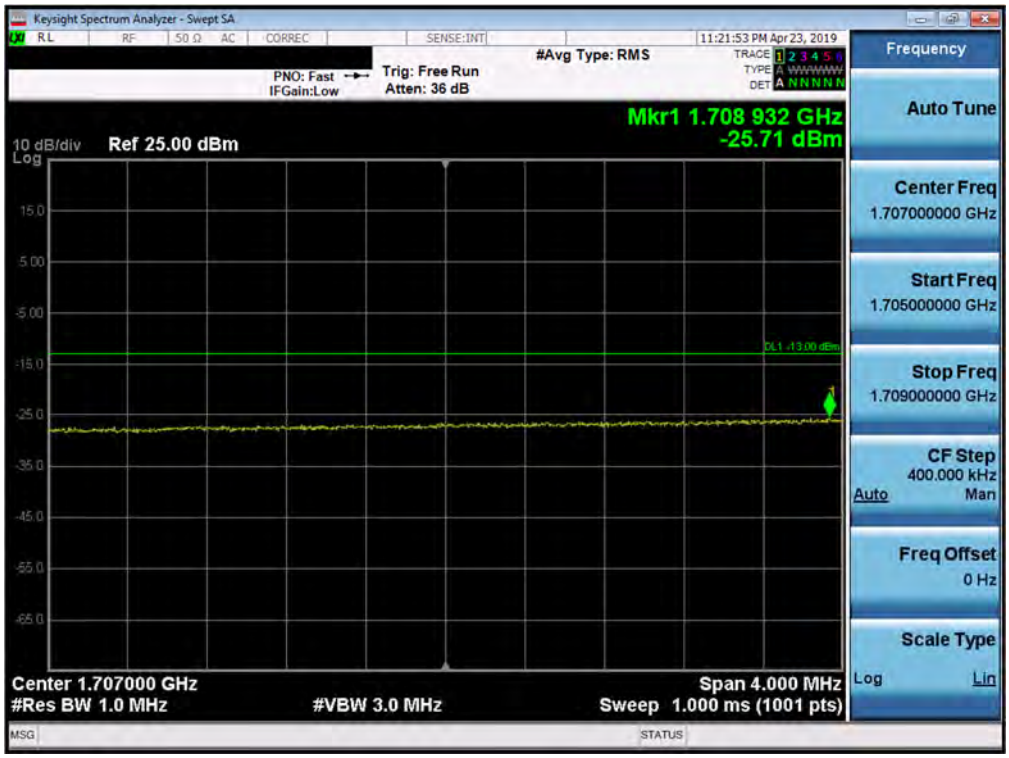


Plot 7-268. Lower Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-269. Lower Extended Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

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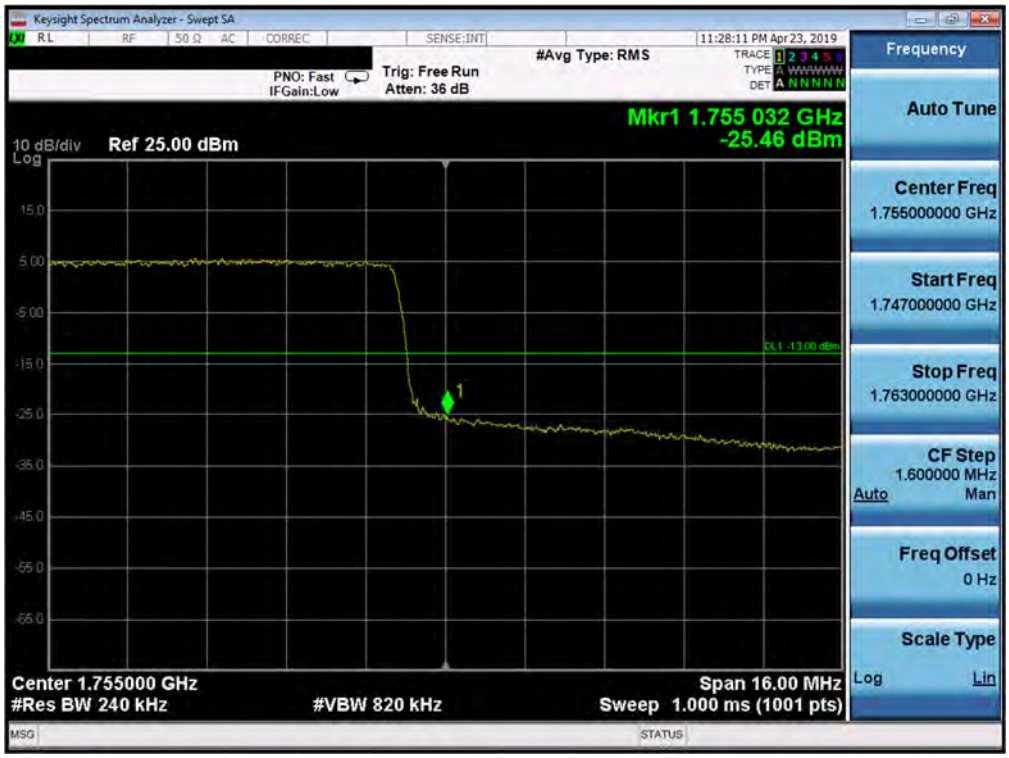
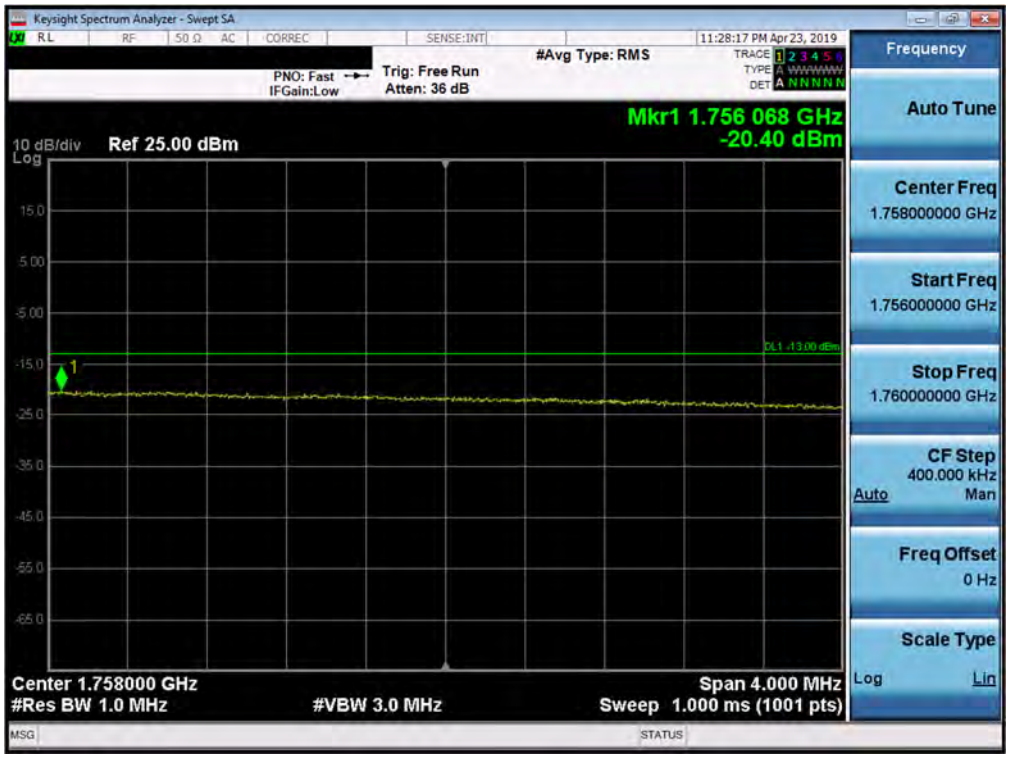


Plot 7-270. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-271. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

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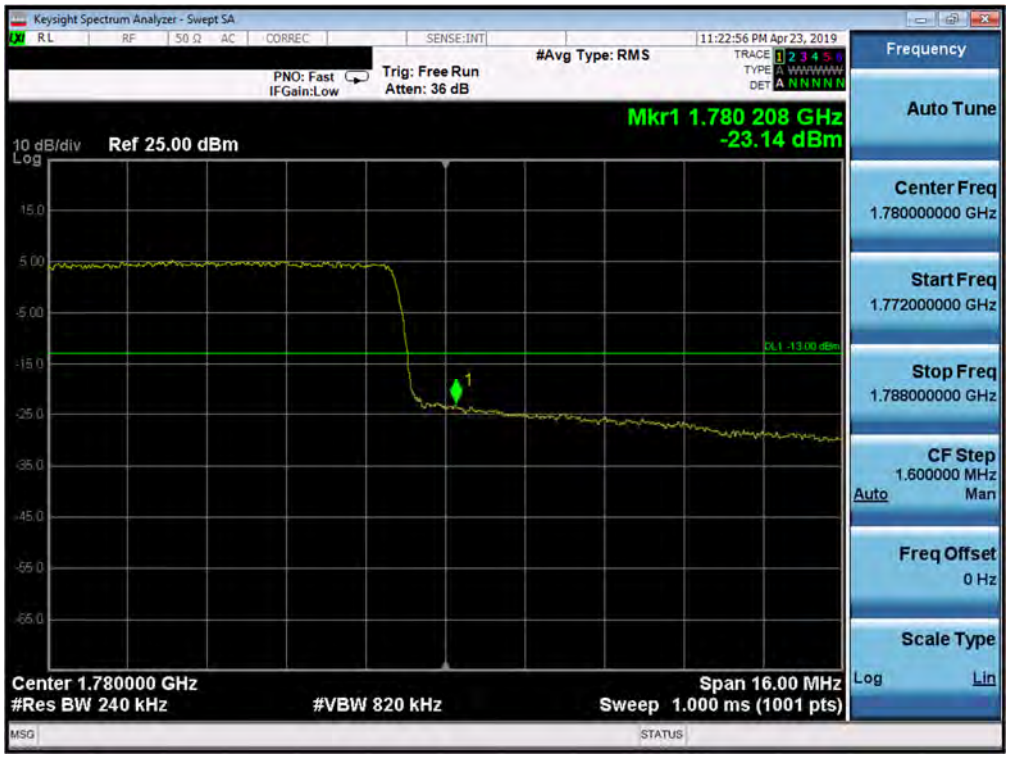
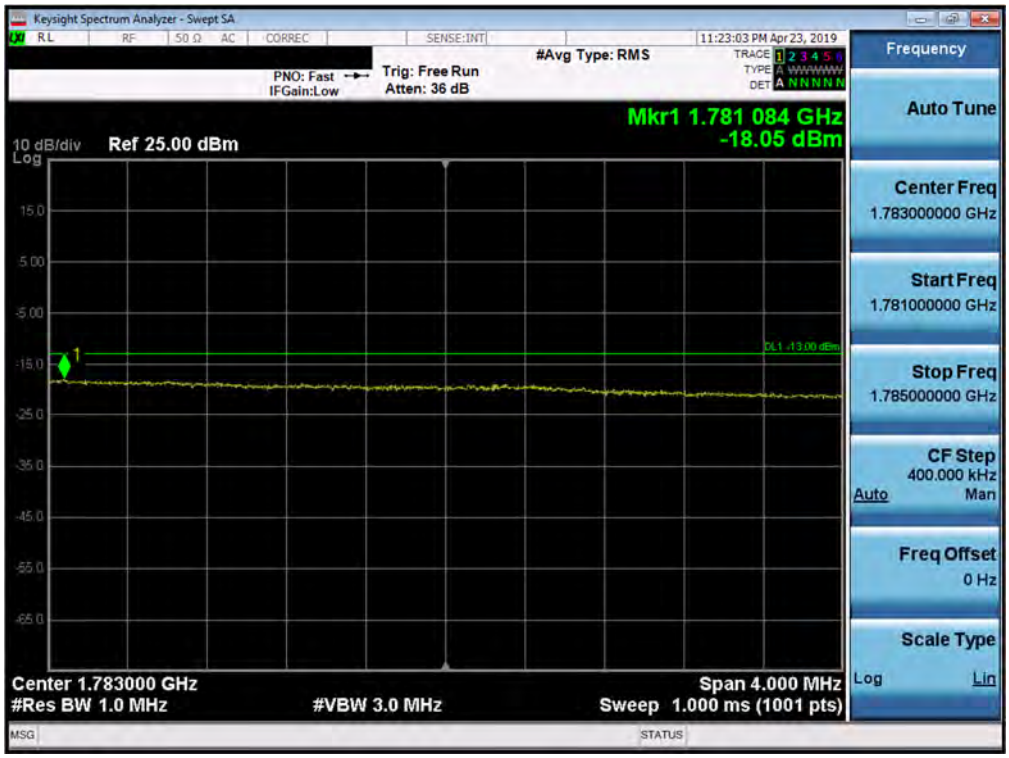


Plot 7-272. Upper Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-273. Upper Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

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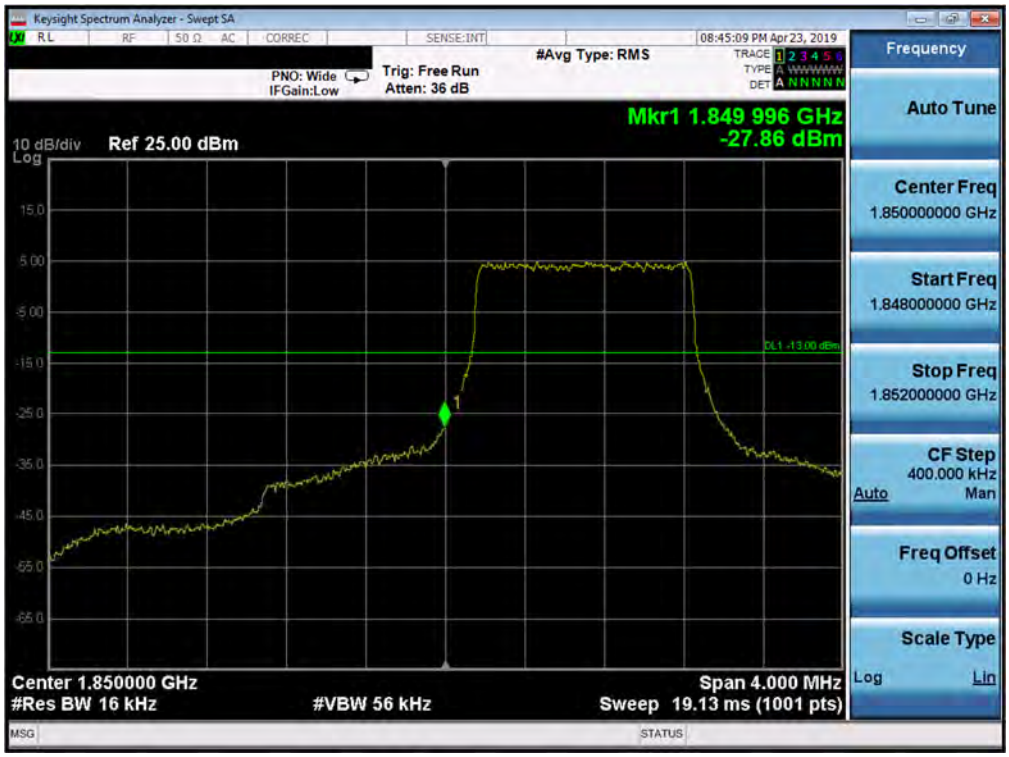
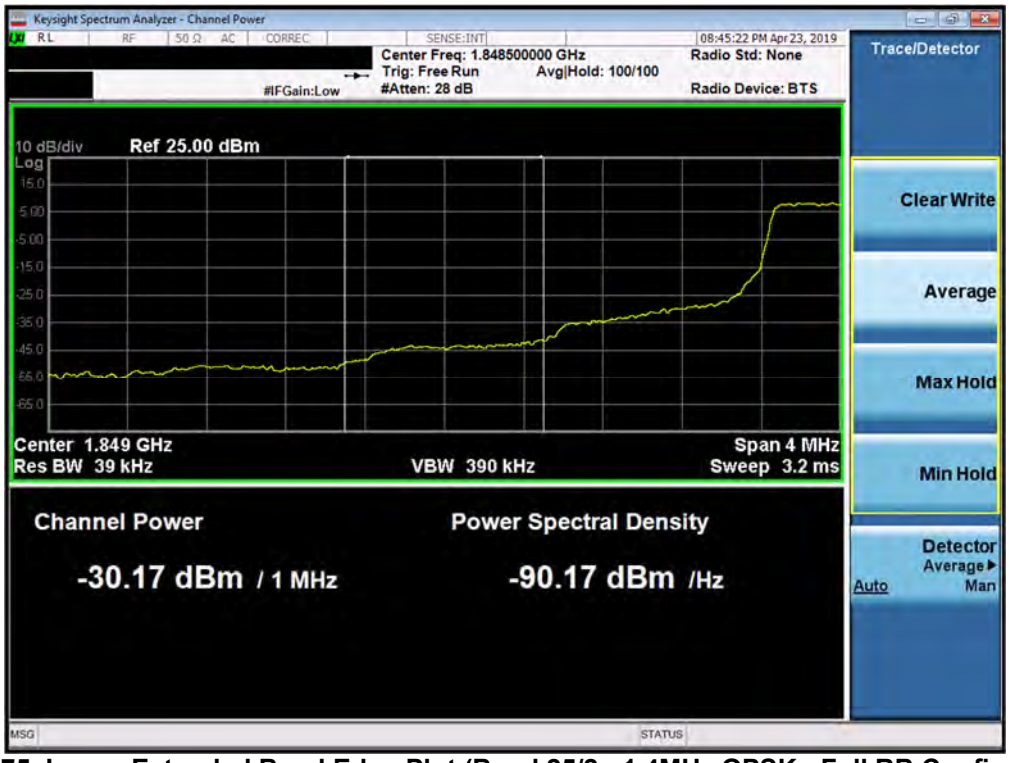
Band 25/2



Plot 7-274. Lower Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-275. Lower Extended Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

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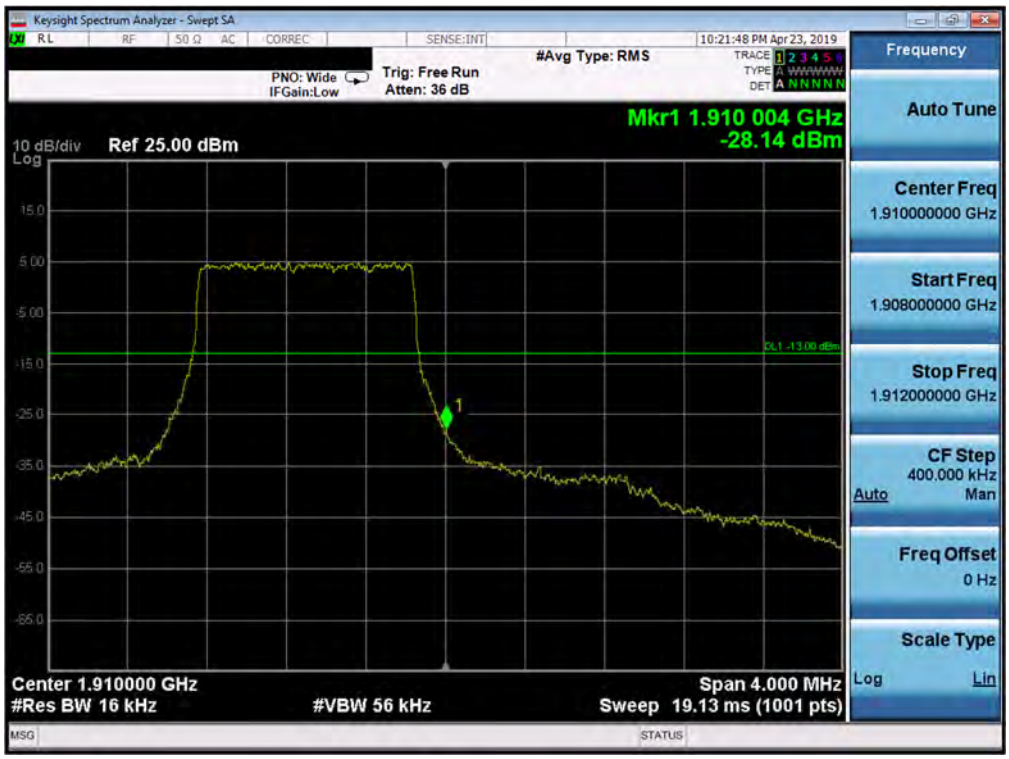
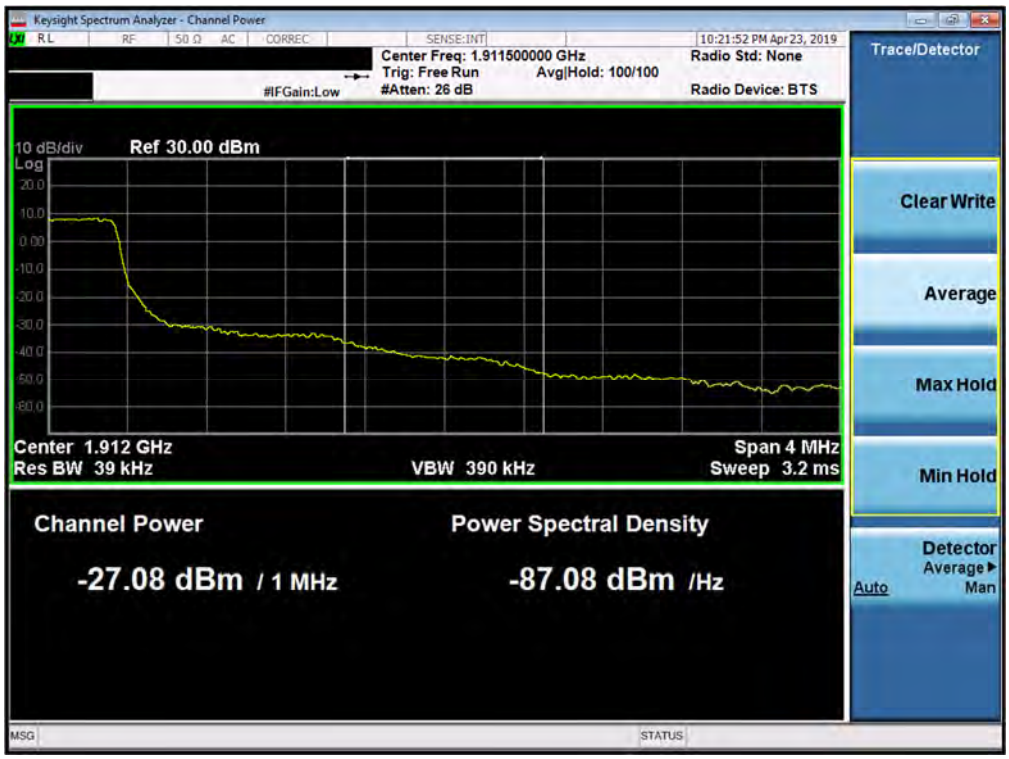


Plot 7-276. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-277. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

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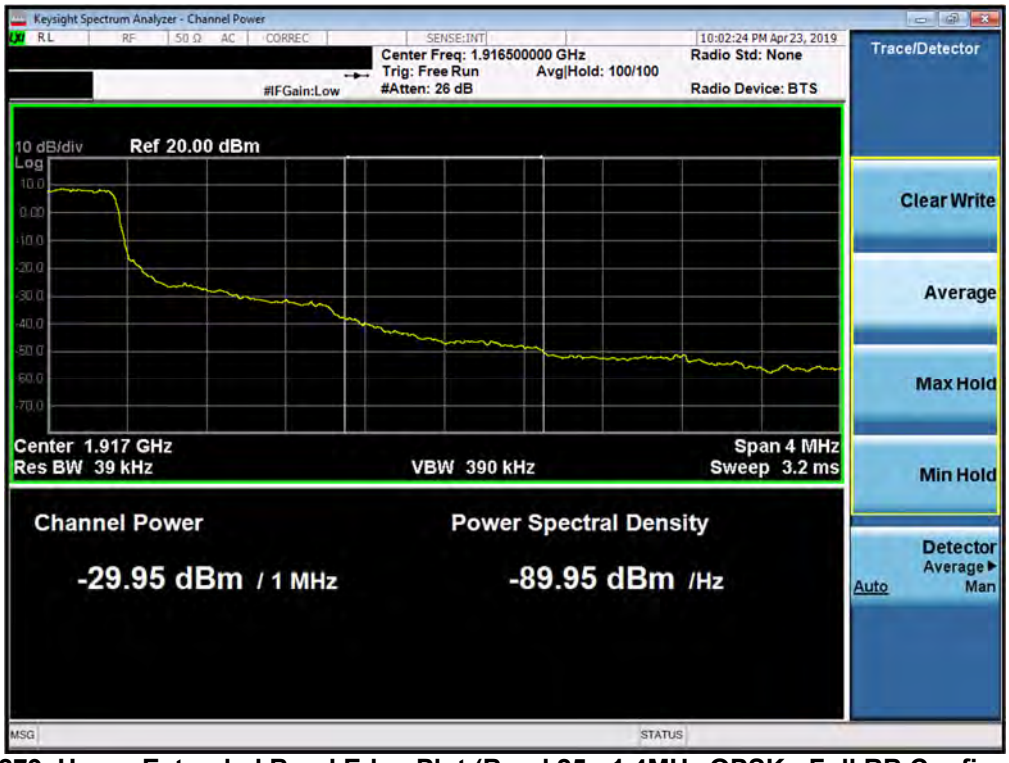
Plot 7-278. Upper Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-279. Upper Extended Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)

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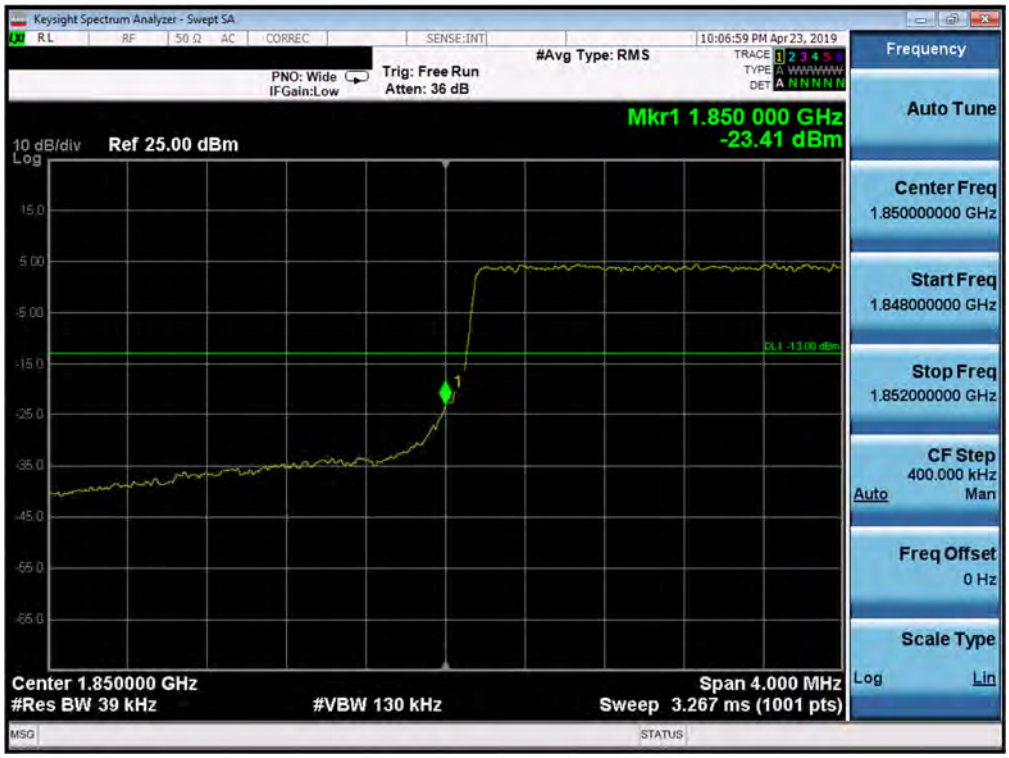
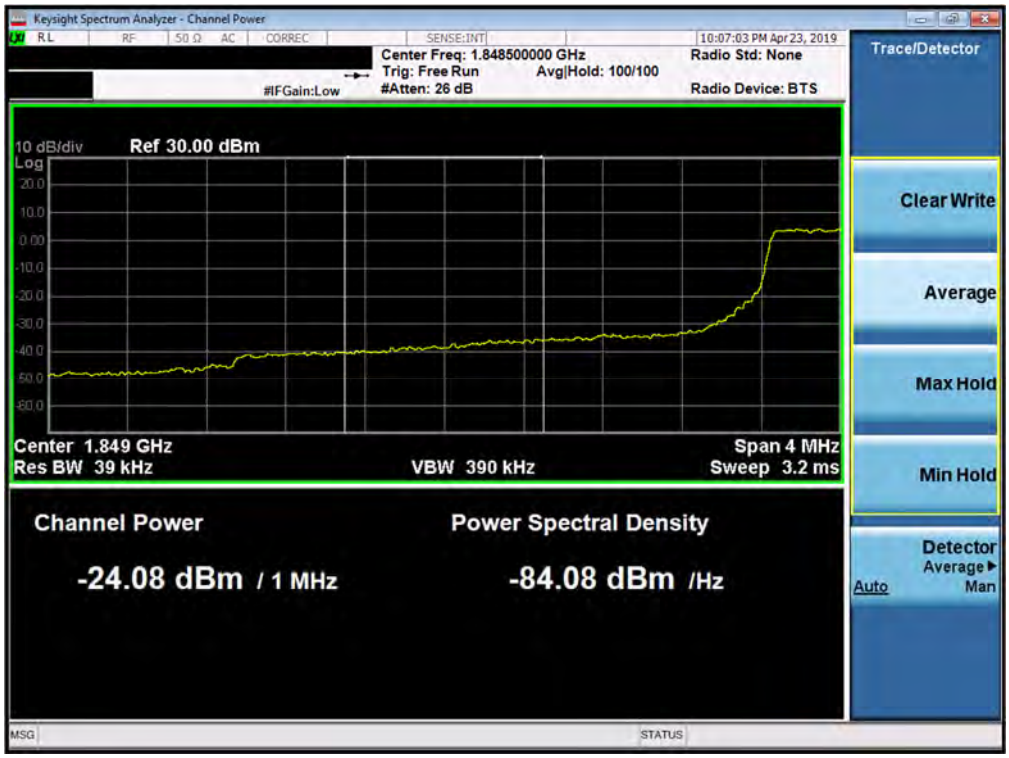


Plot 7-280. Lower Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-281. Lower Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

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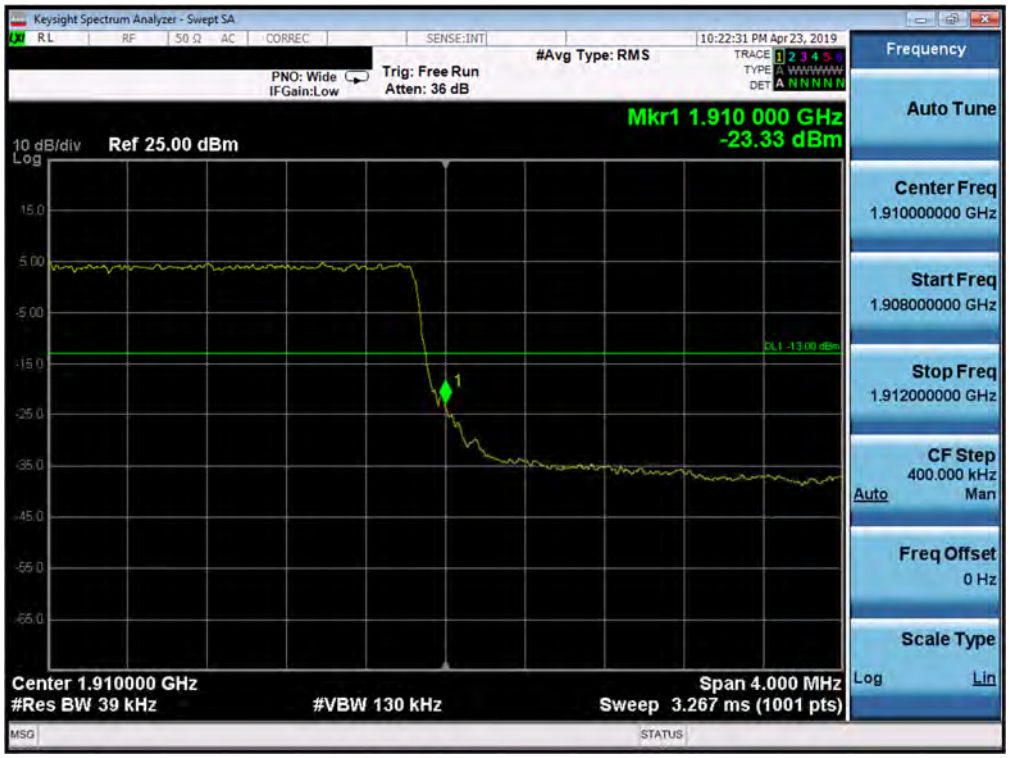
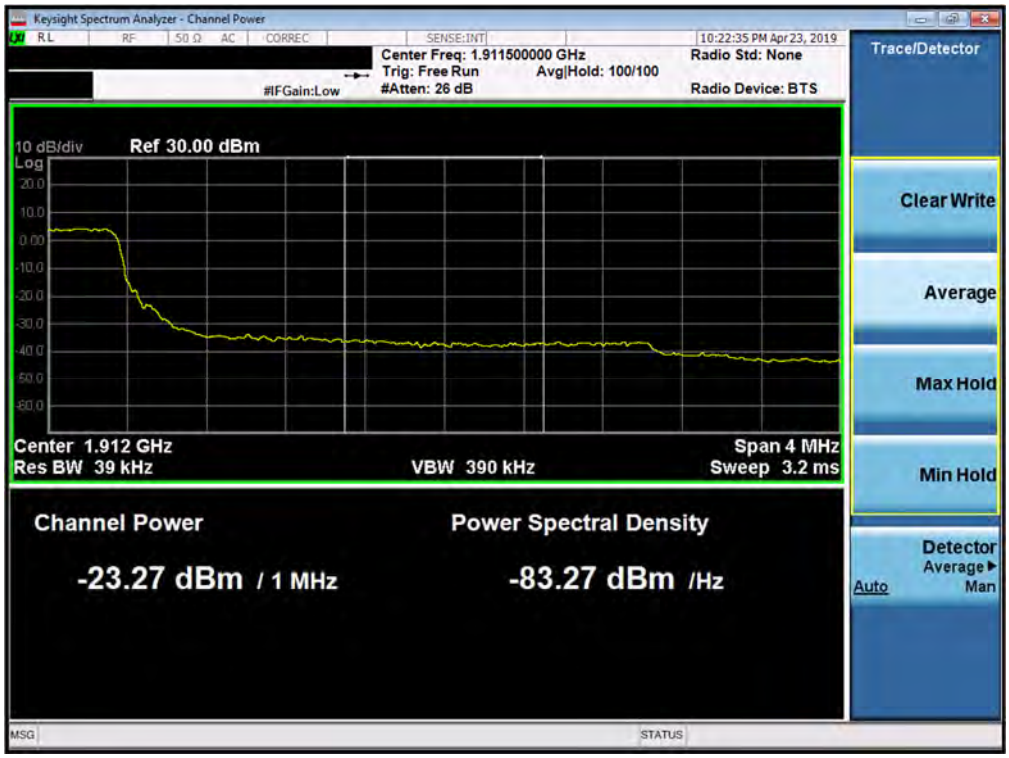


Plot 7-282. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-283. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

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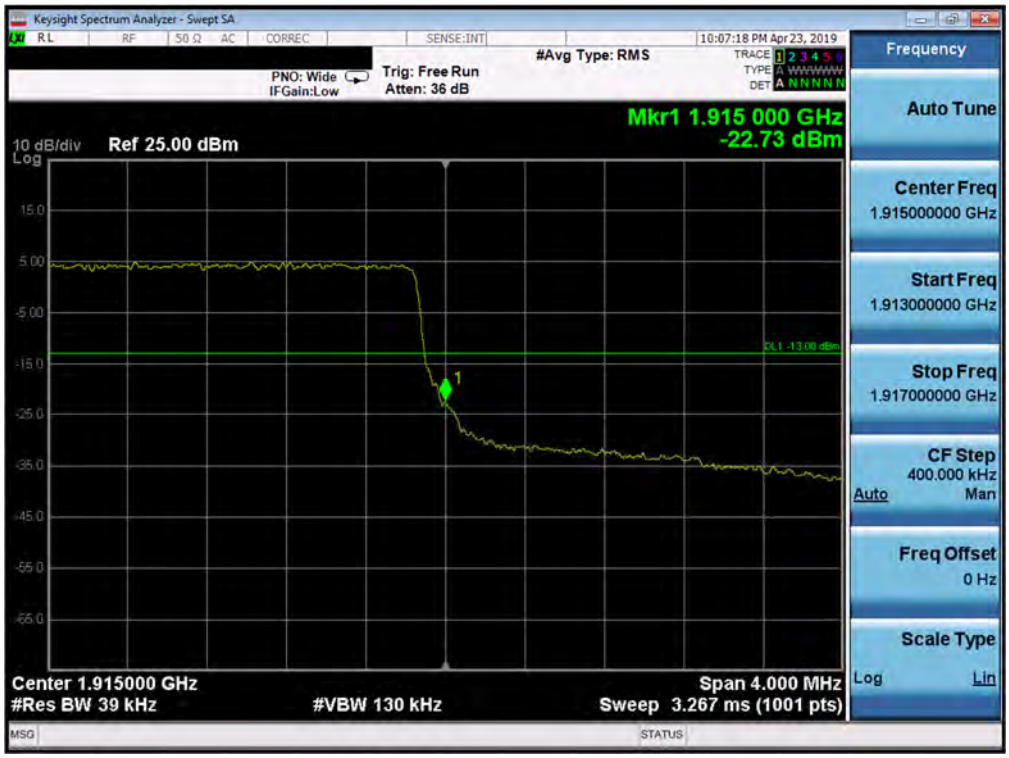
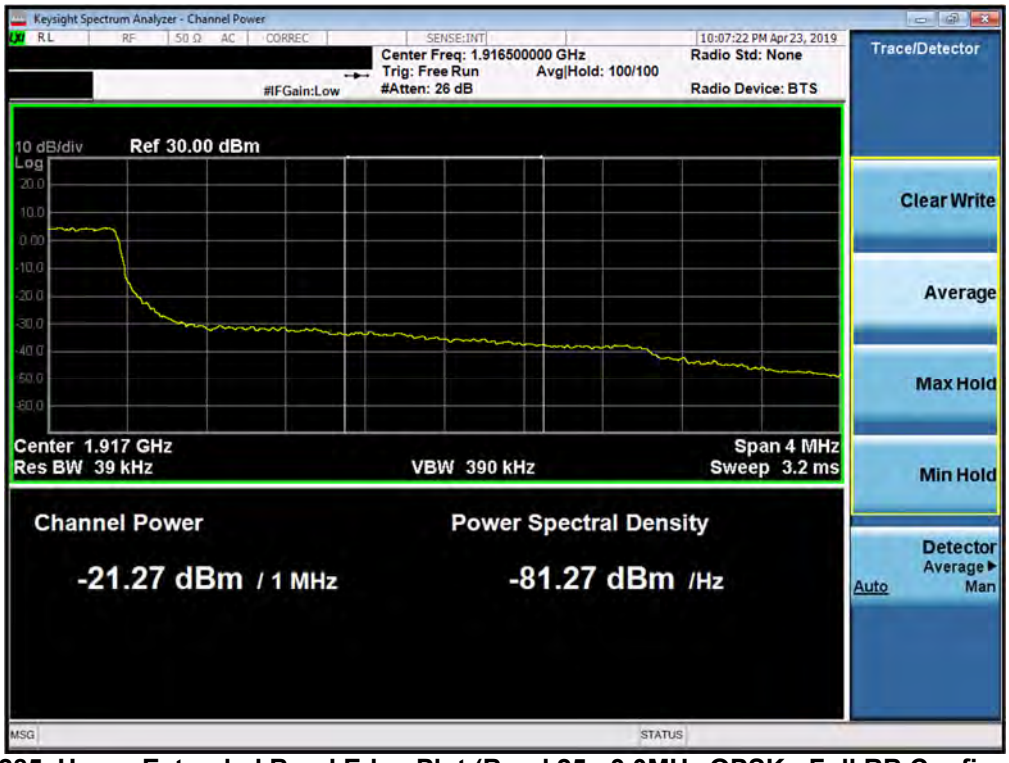


Plot 7-284. Upper Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-285. Upper Extended Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)

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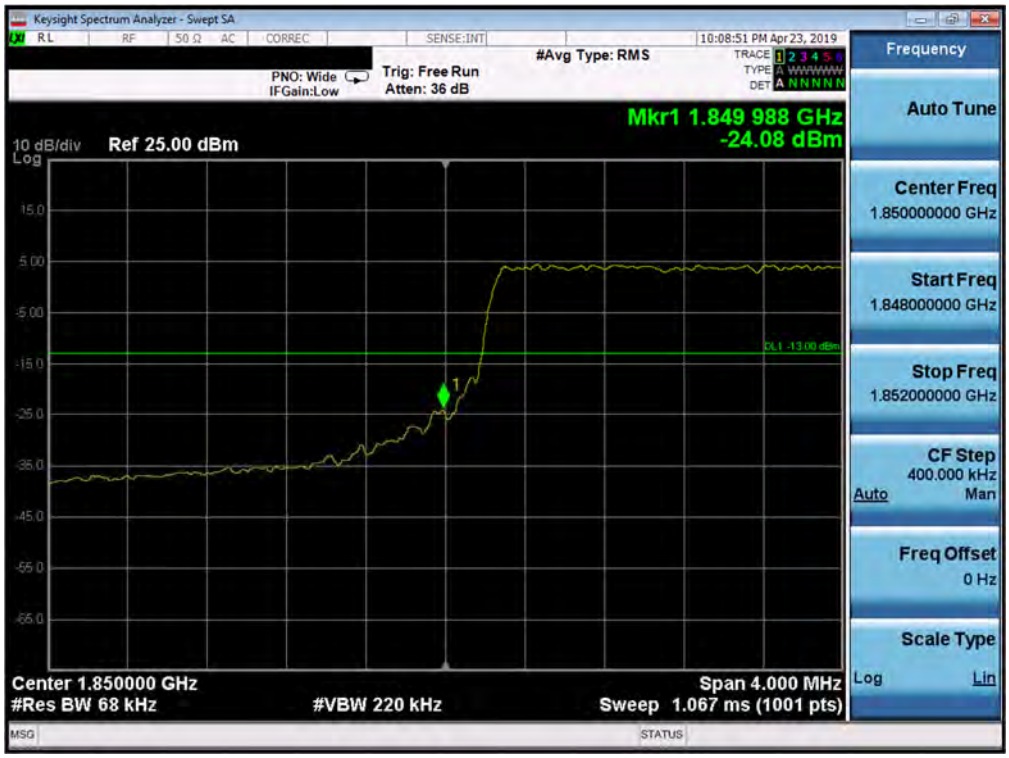
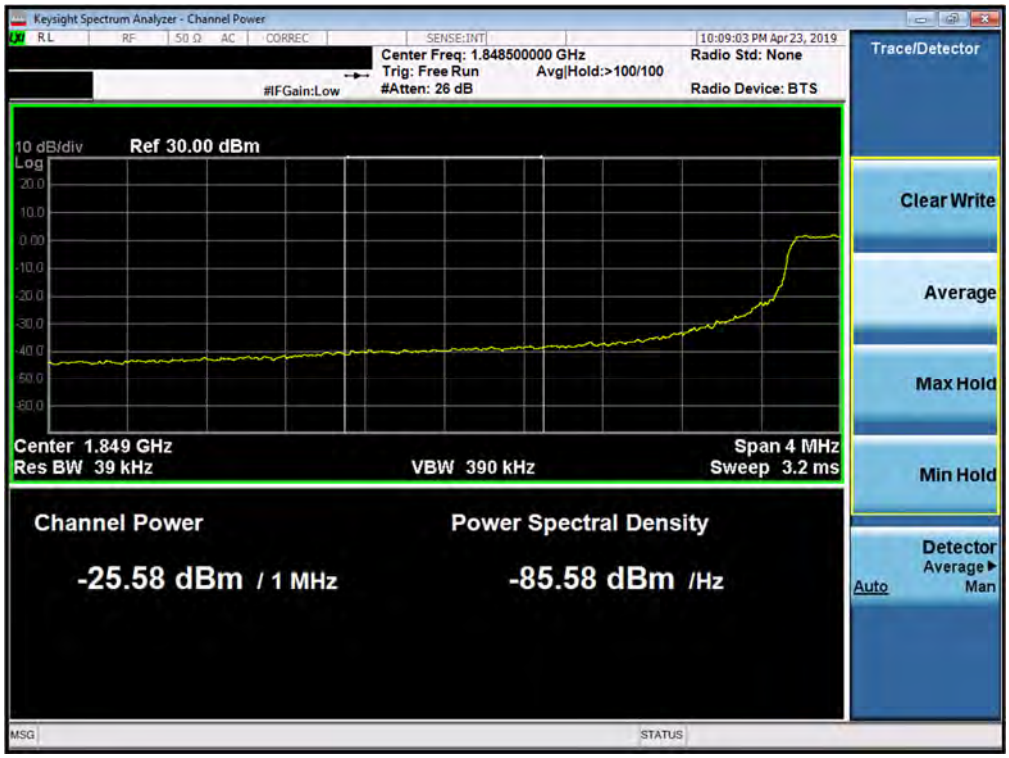


Plot 7-286. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-287. Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

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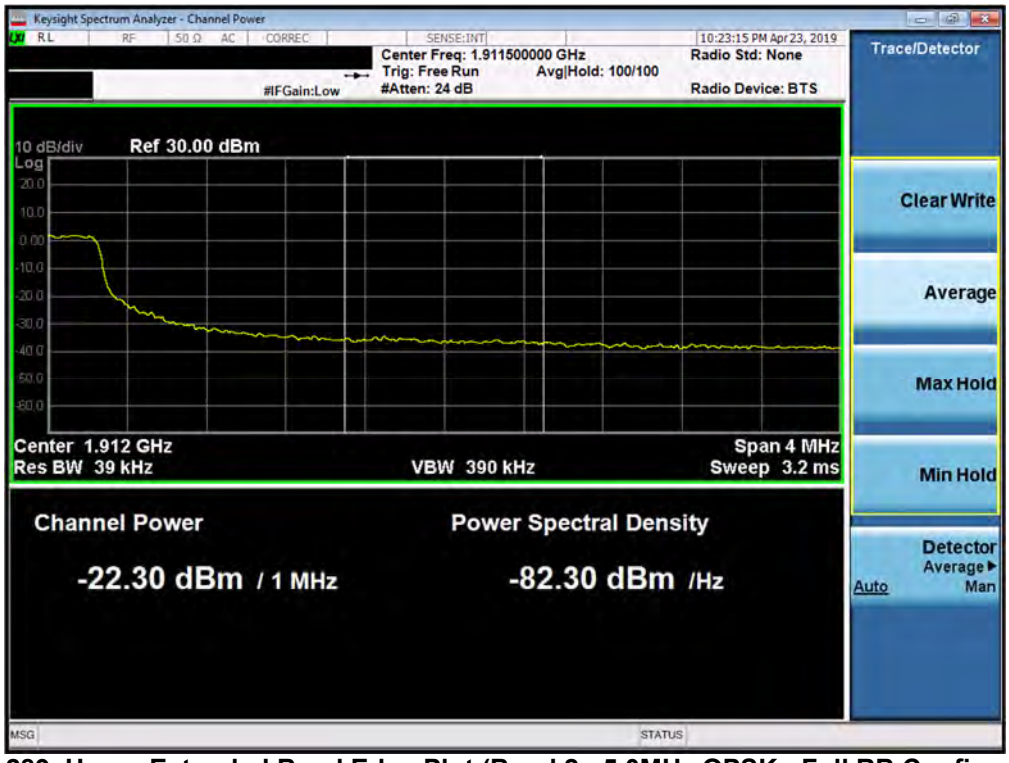
Plot 7-288. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-289. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

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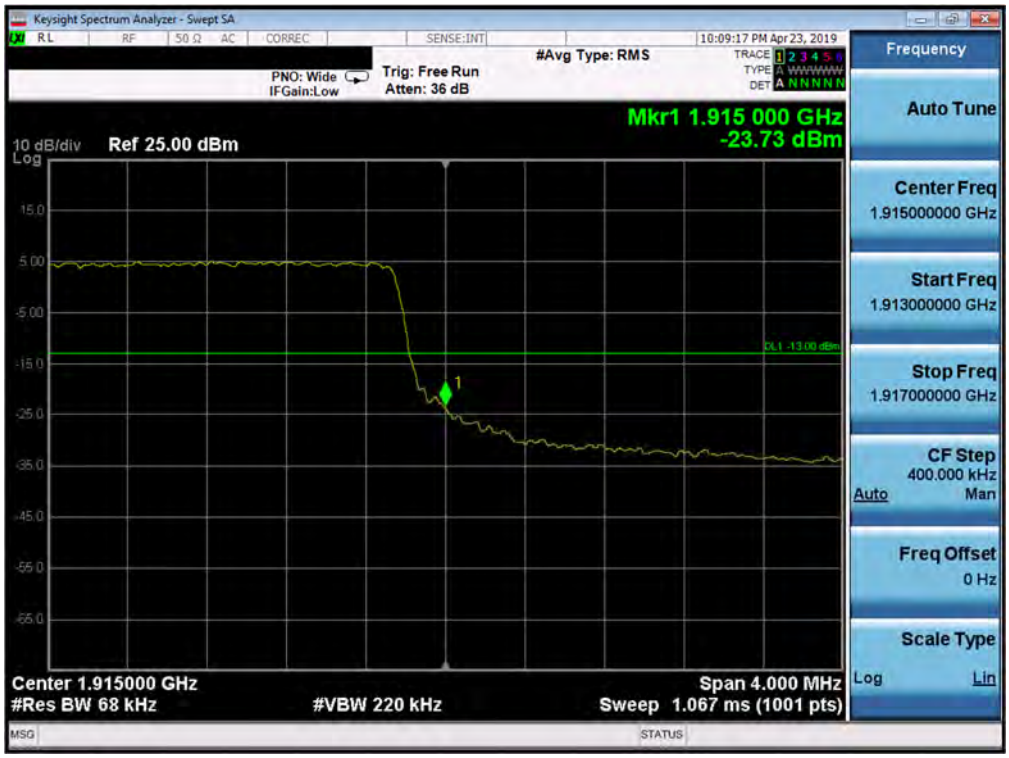
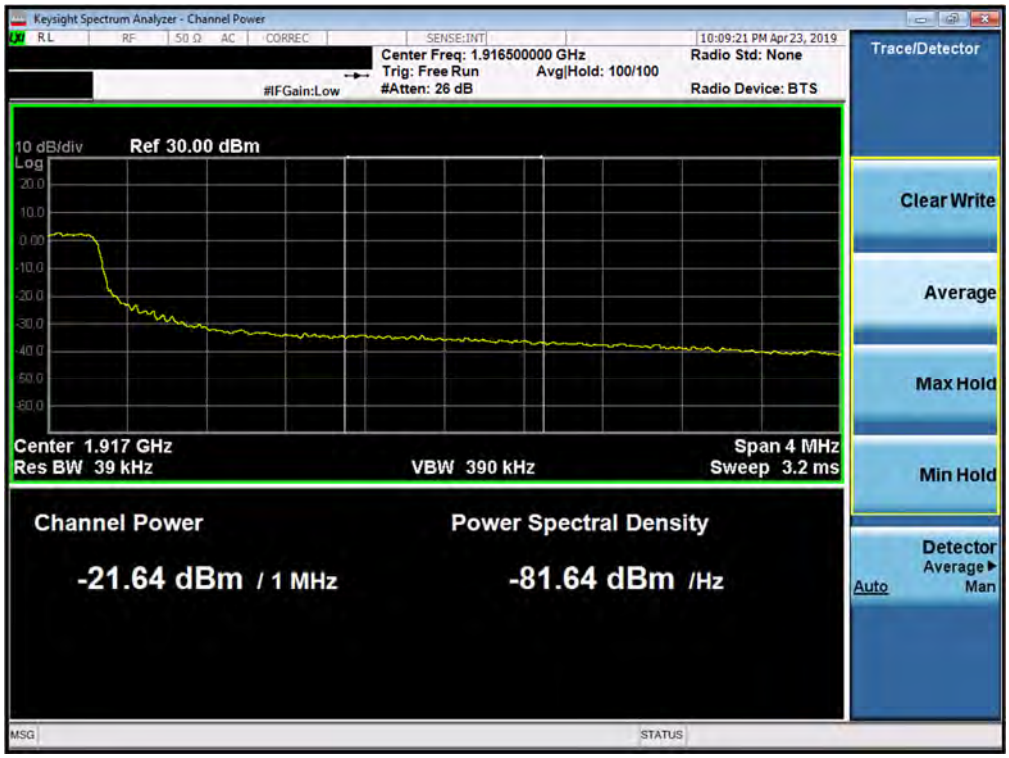


Plot 7-290. Upper Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-291. Upper Extended Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

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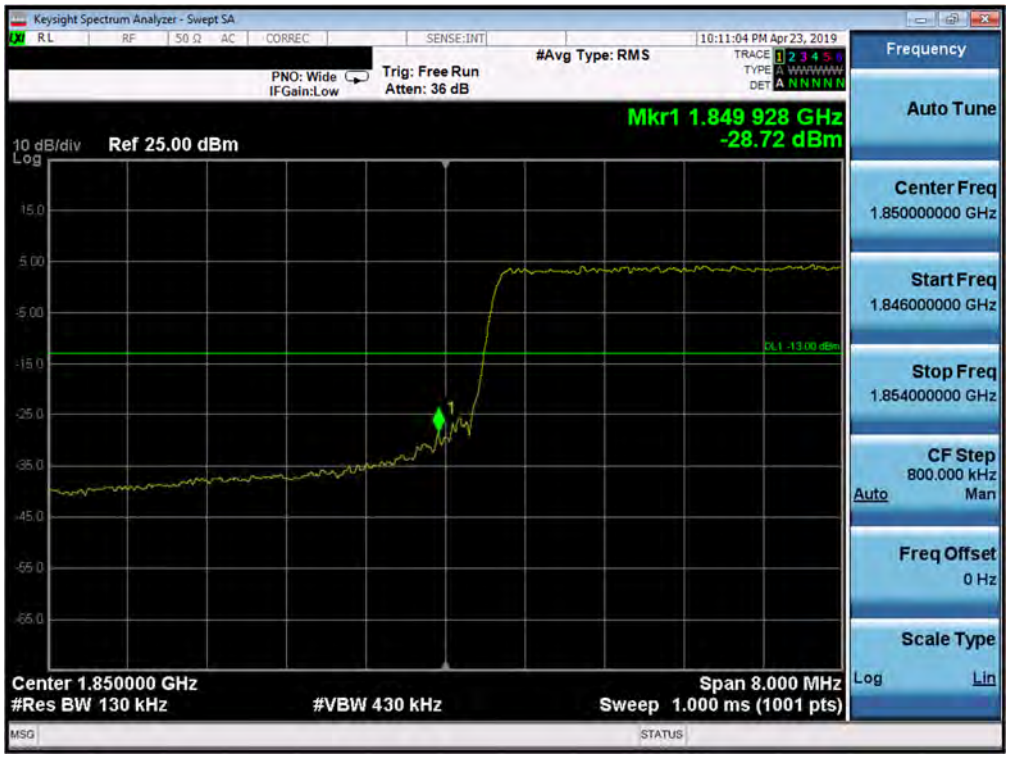
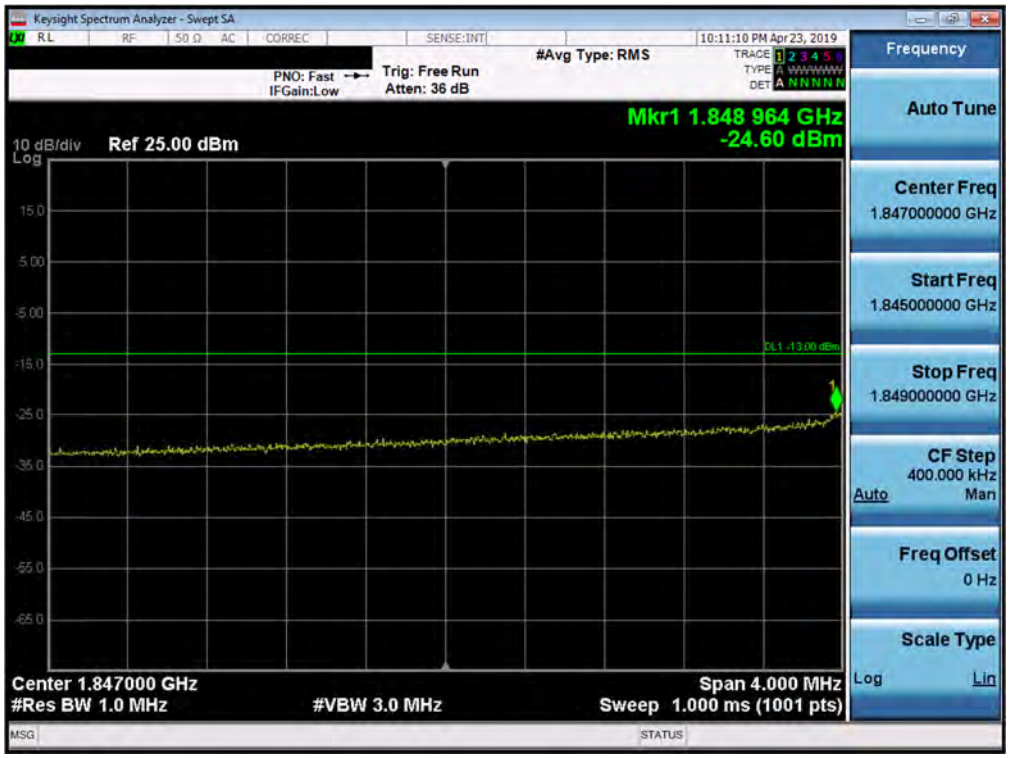


Plot 7-292. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-293. Lower Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

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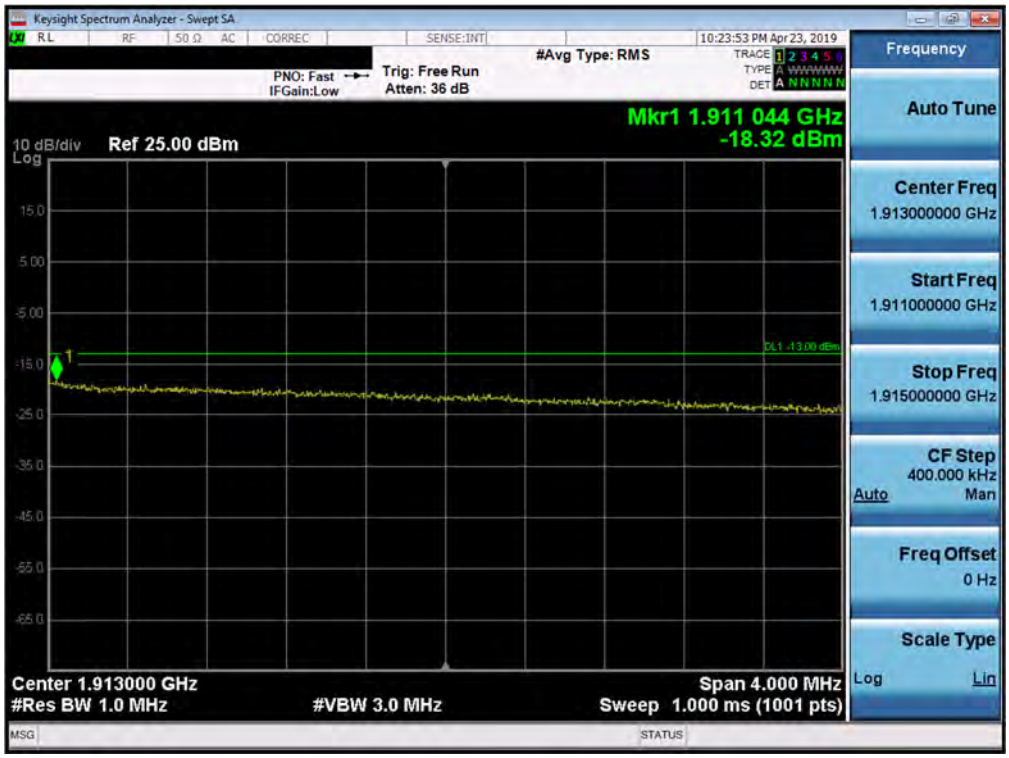
Plot 7-294. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-295. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

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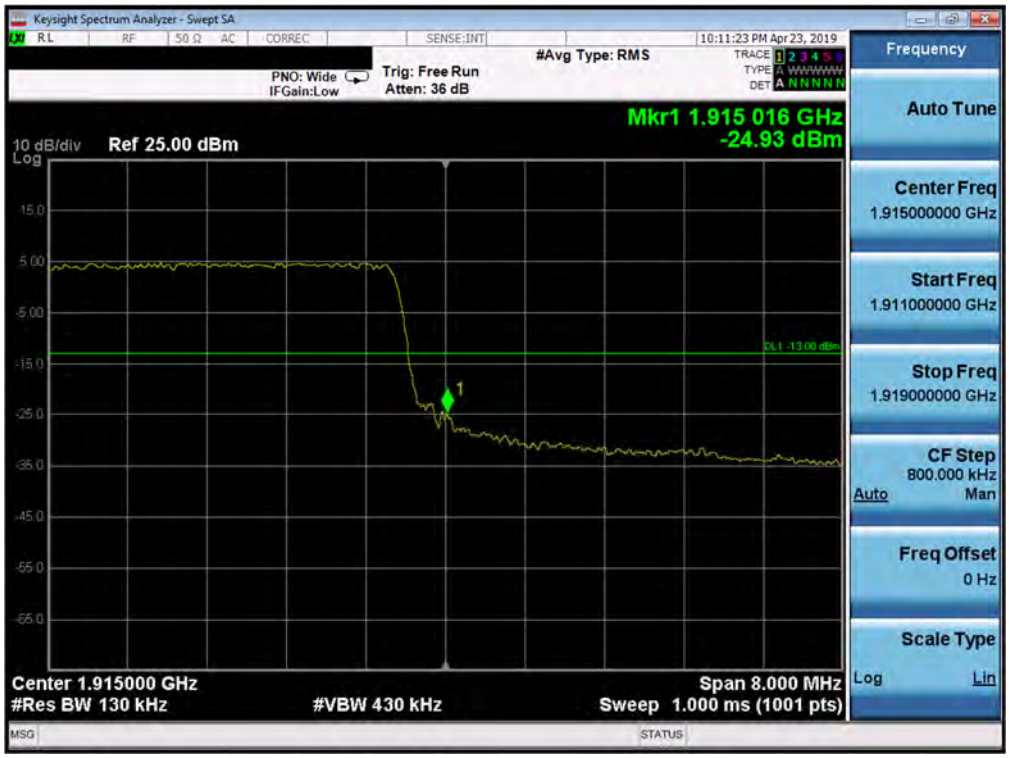
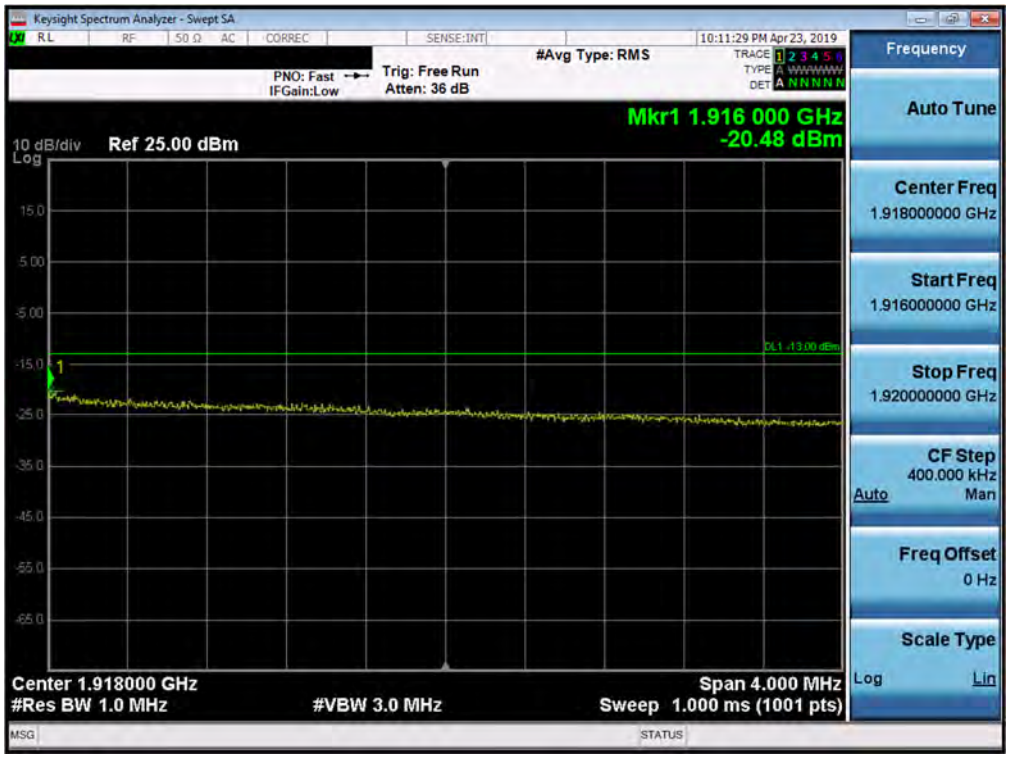


Plot 7-296. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-297. Upper Extended Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)

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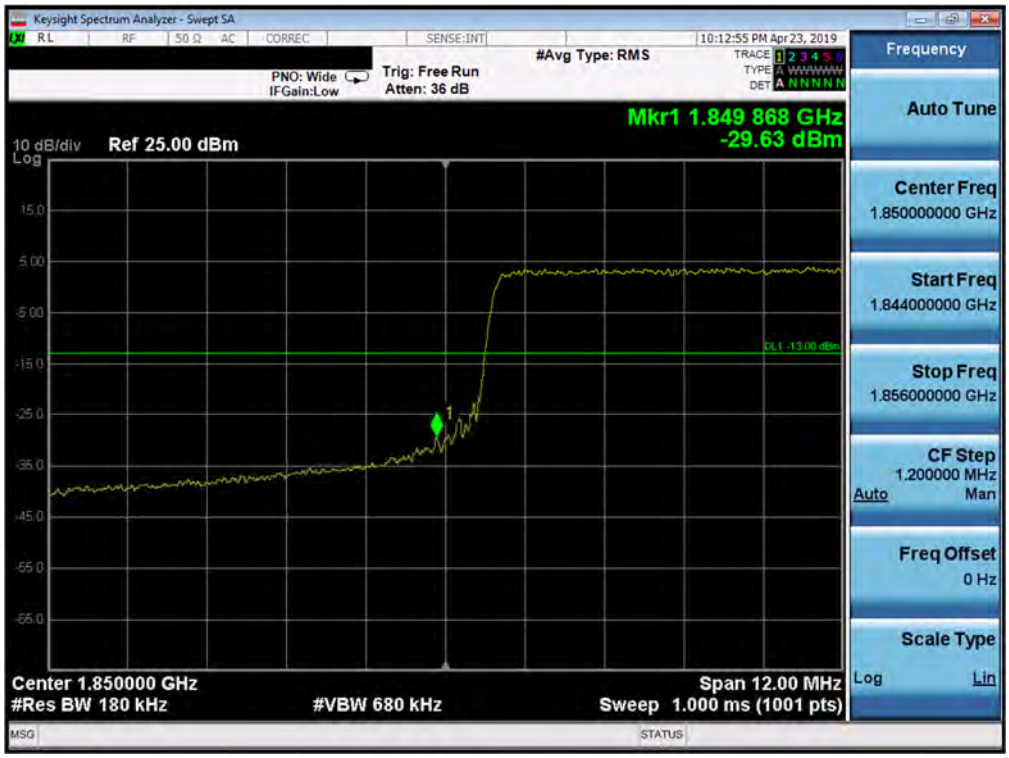
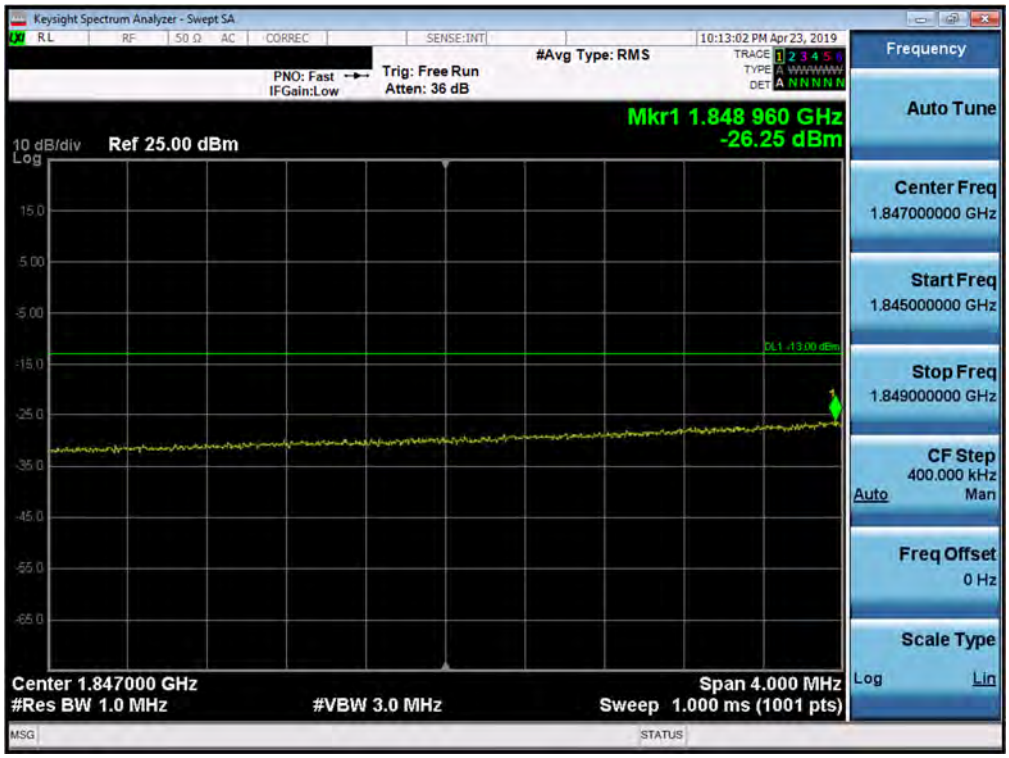


Plot 7-298. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-299. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

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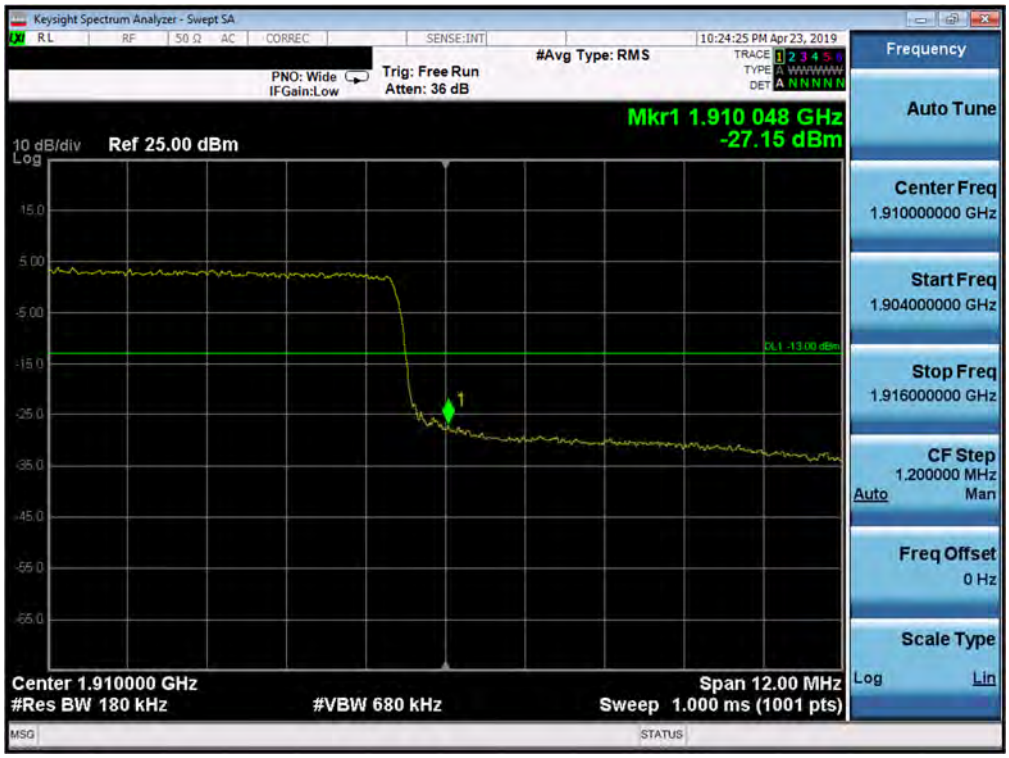
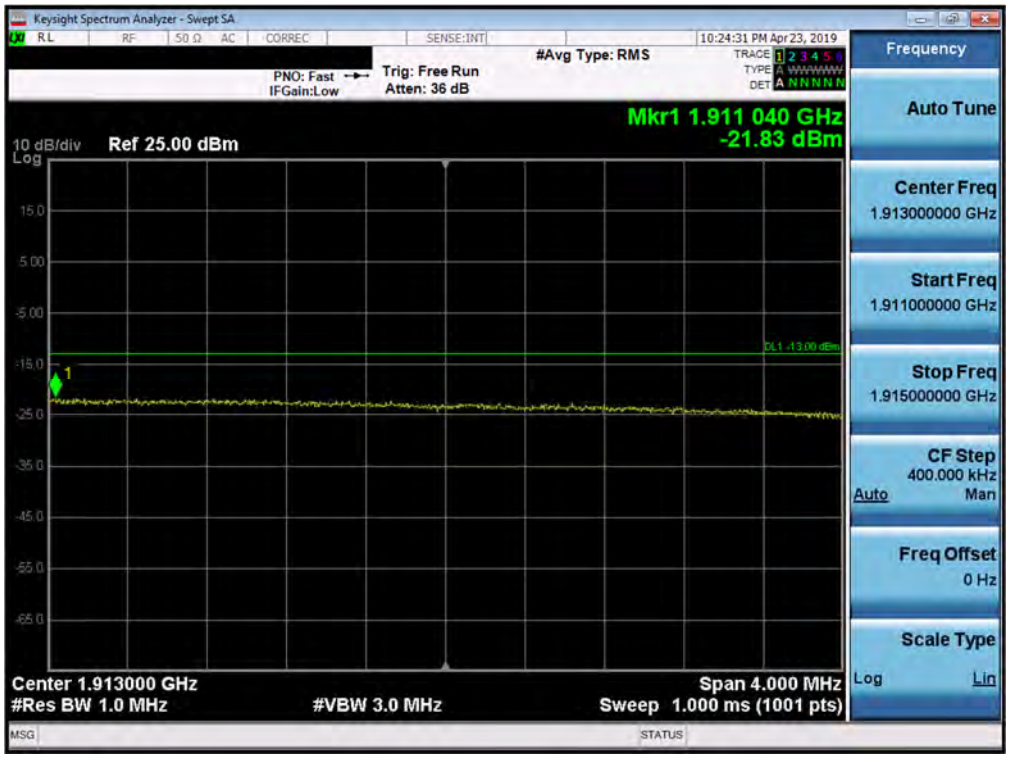


Plot 7-300. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-301. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

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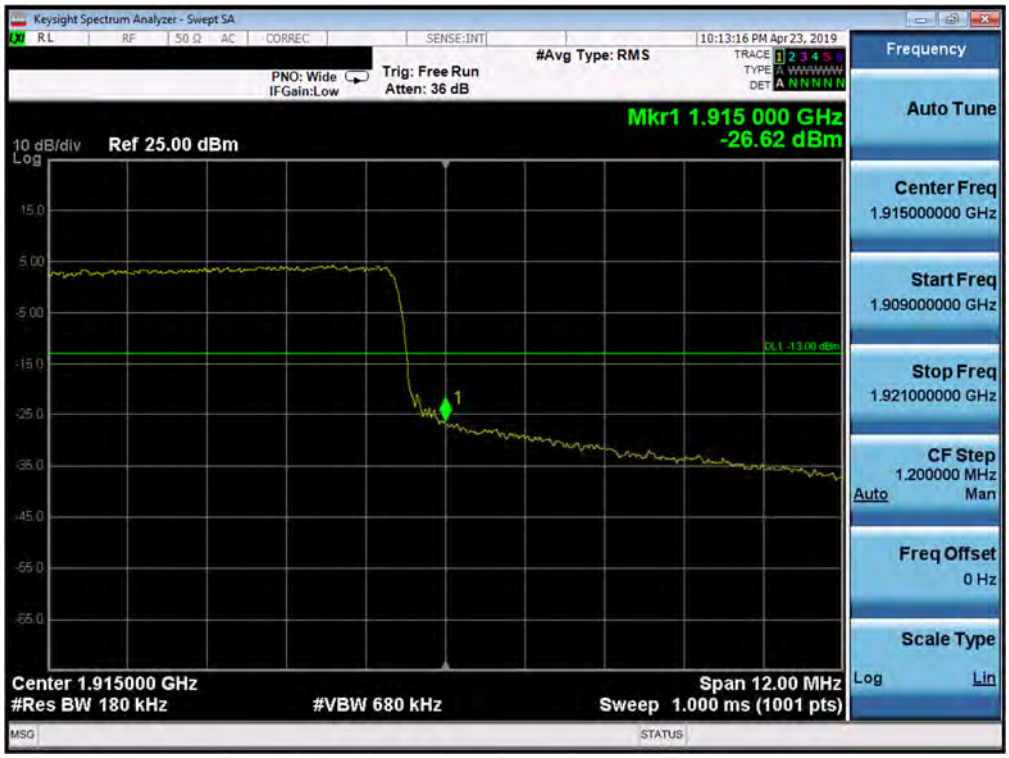
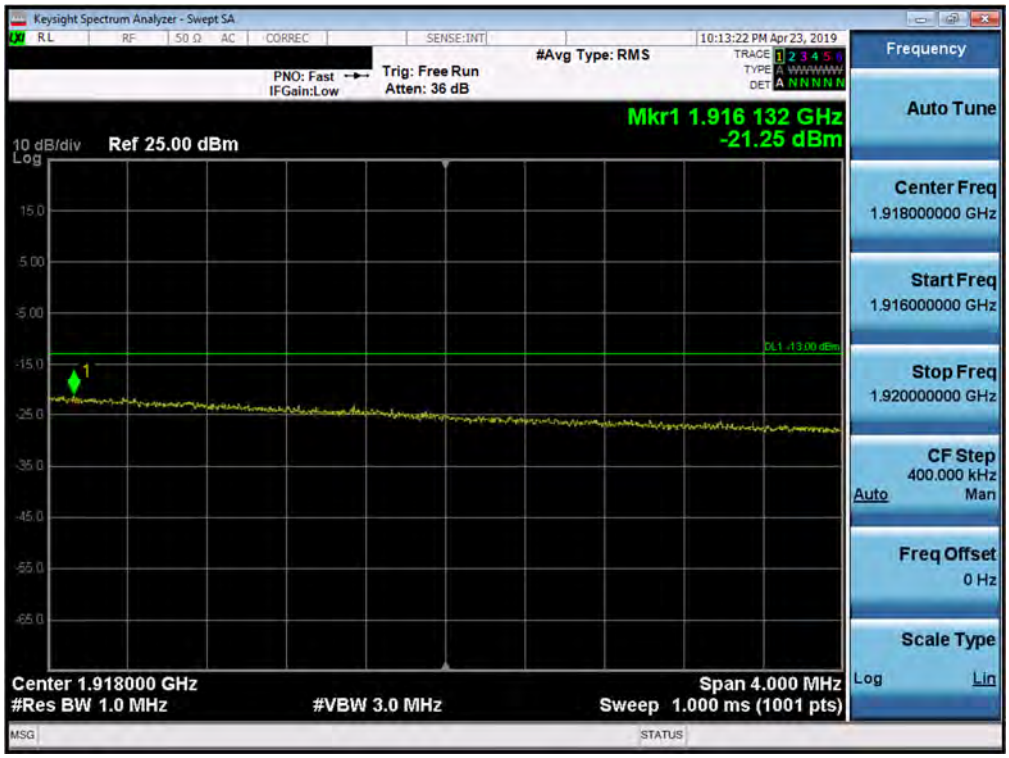


Plot 7-302. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-303. Upper Extended Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

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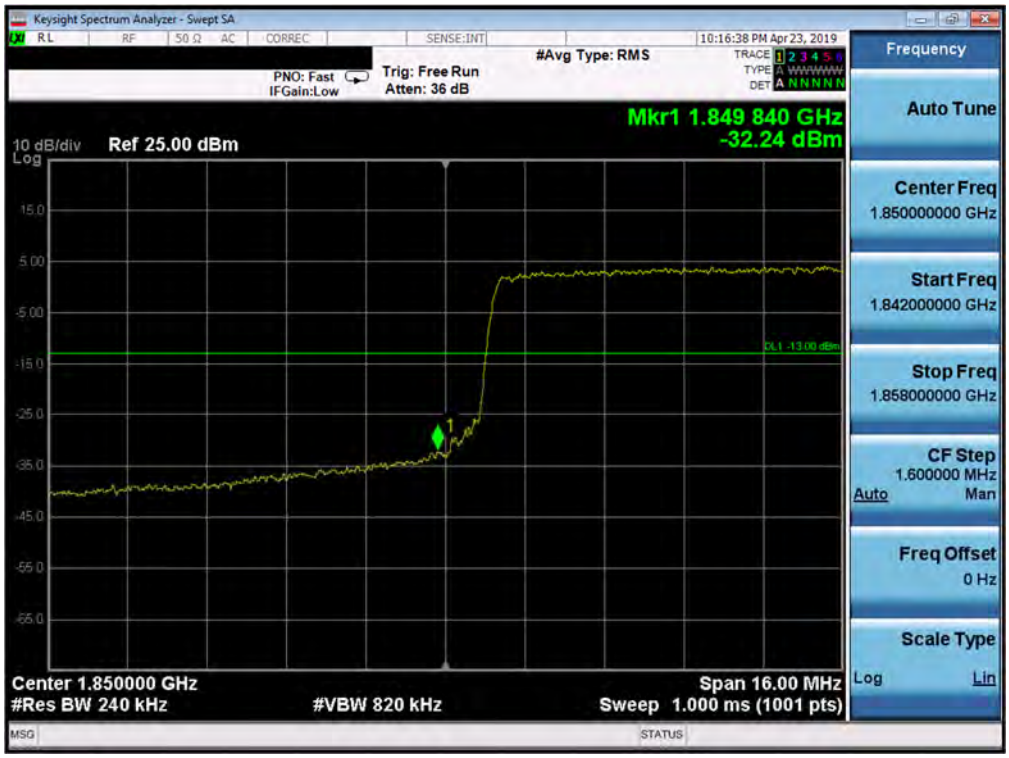
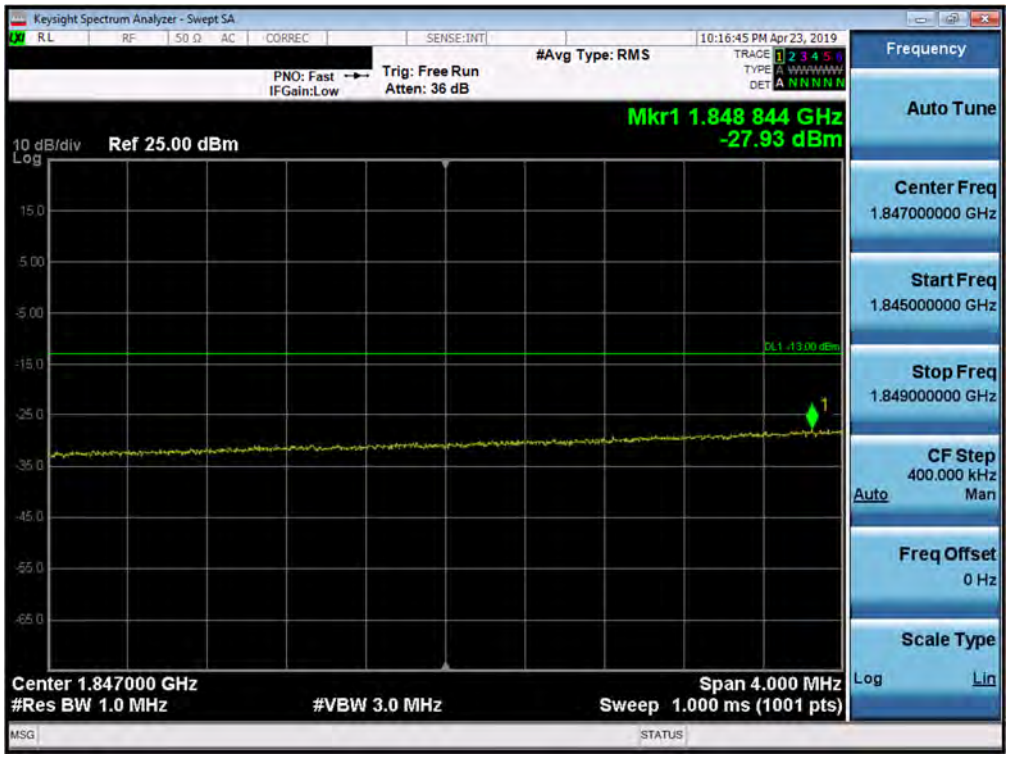


Plot 7-304. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-305. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

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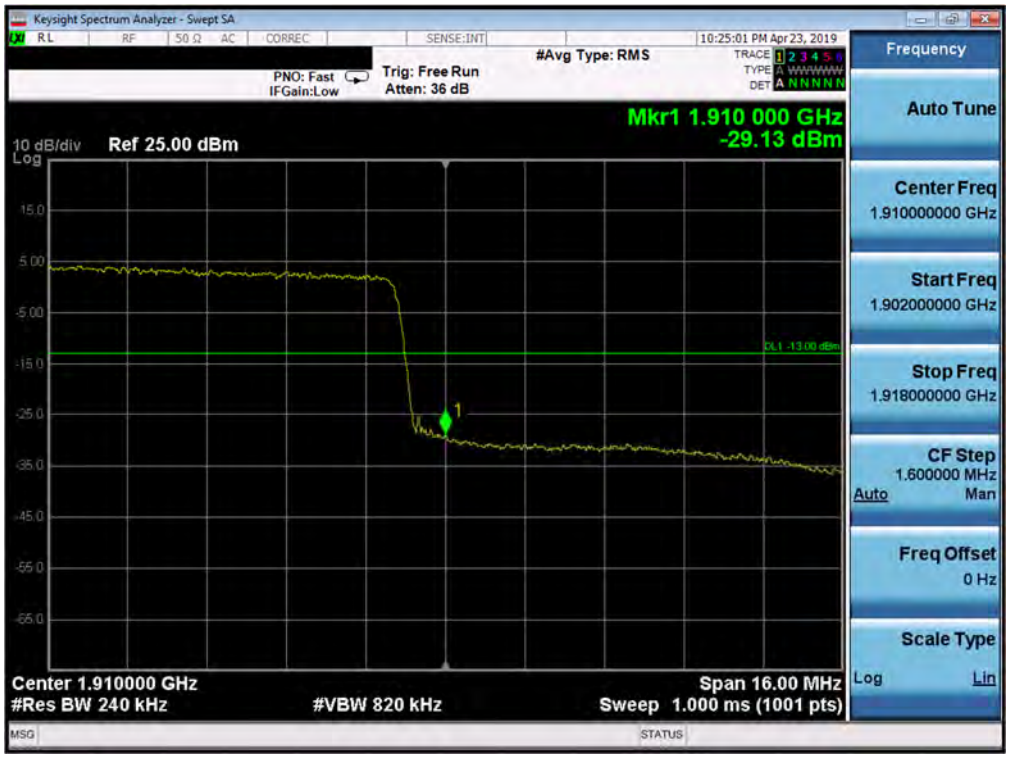
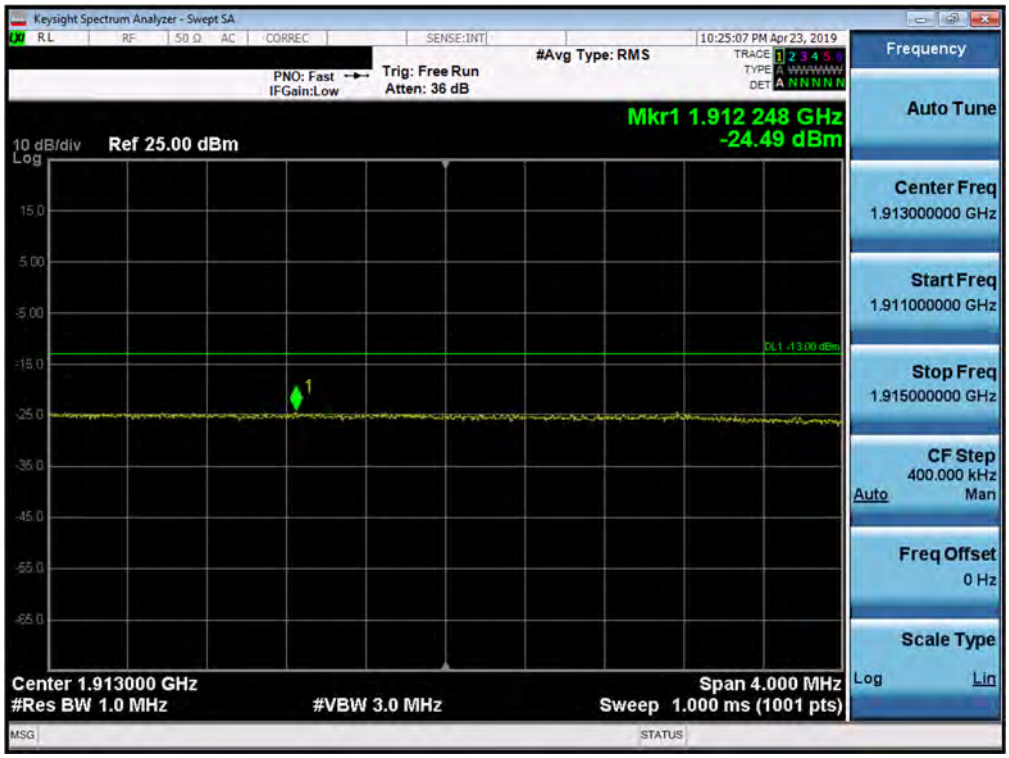


Plot 7-306. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-307. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

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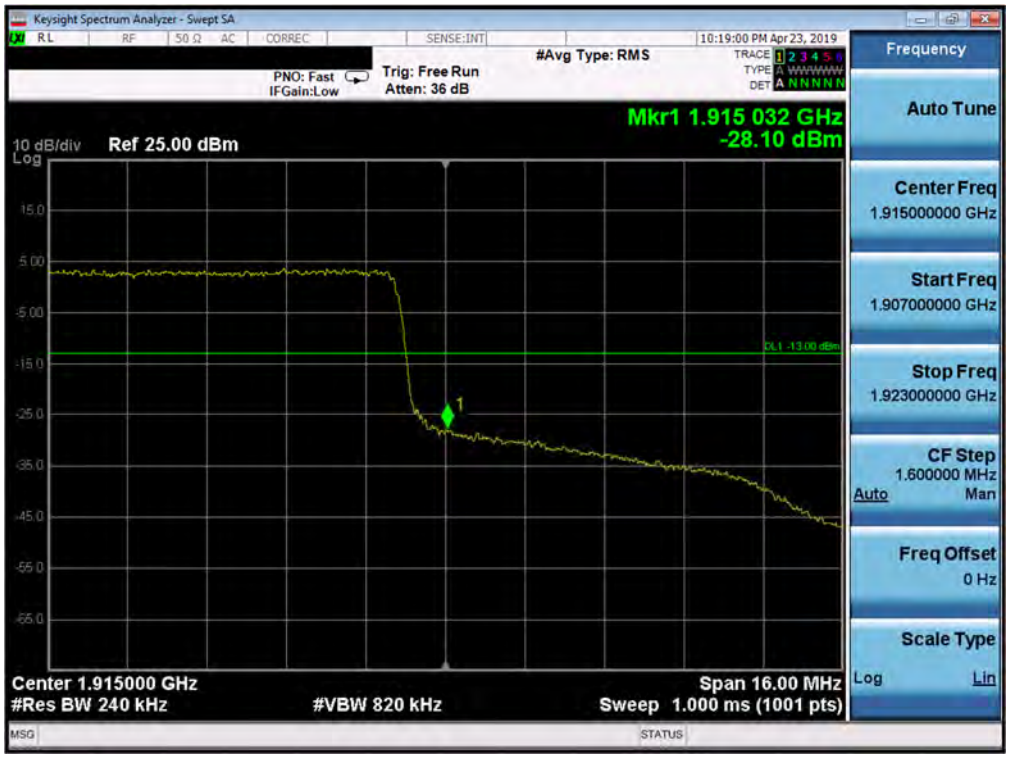
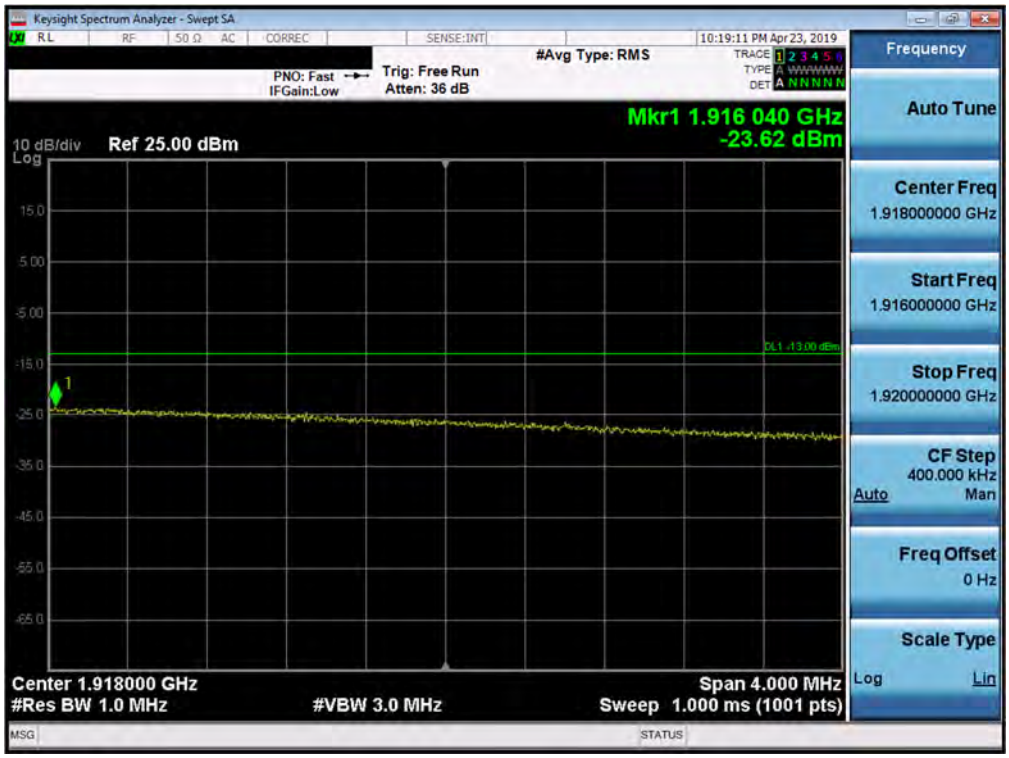


Plot 7-308. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-309. Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

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Band 30

Plot 7-310. Lower Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-311. Lower Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

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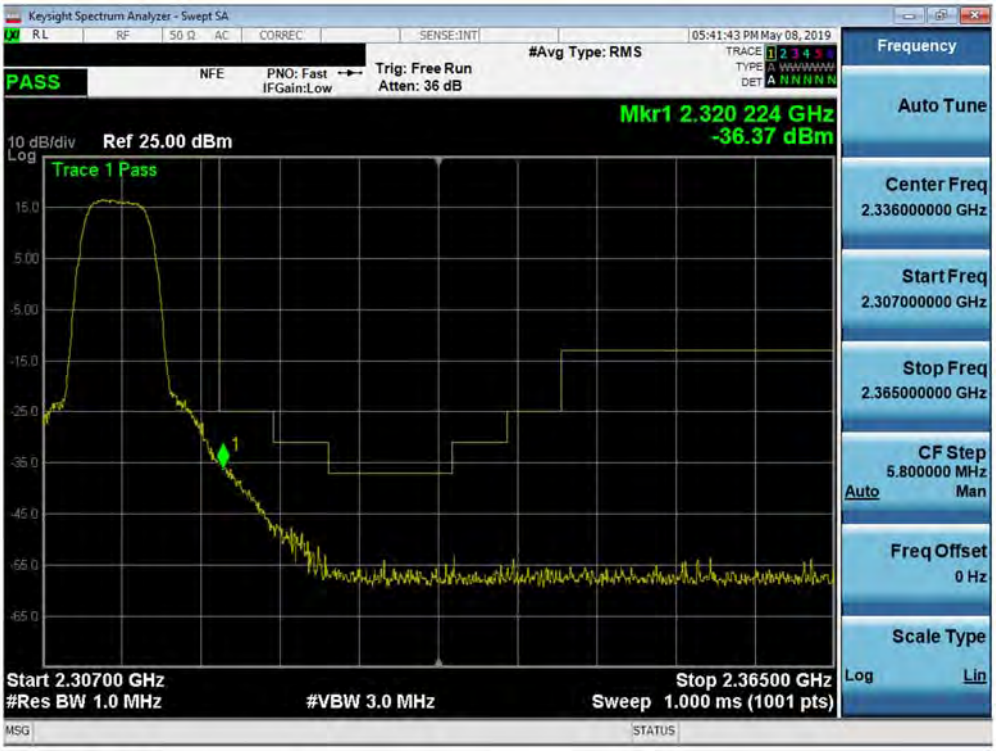
Plot 7-312. Upper Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-313. Upper Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

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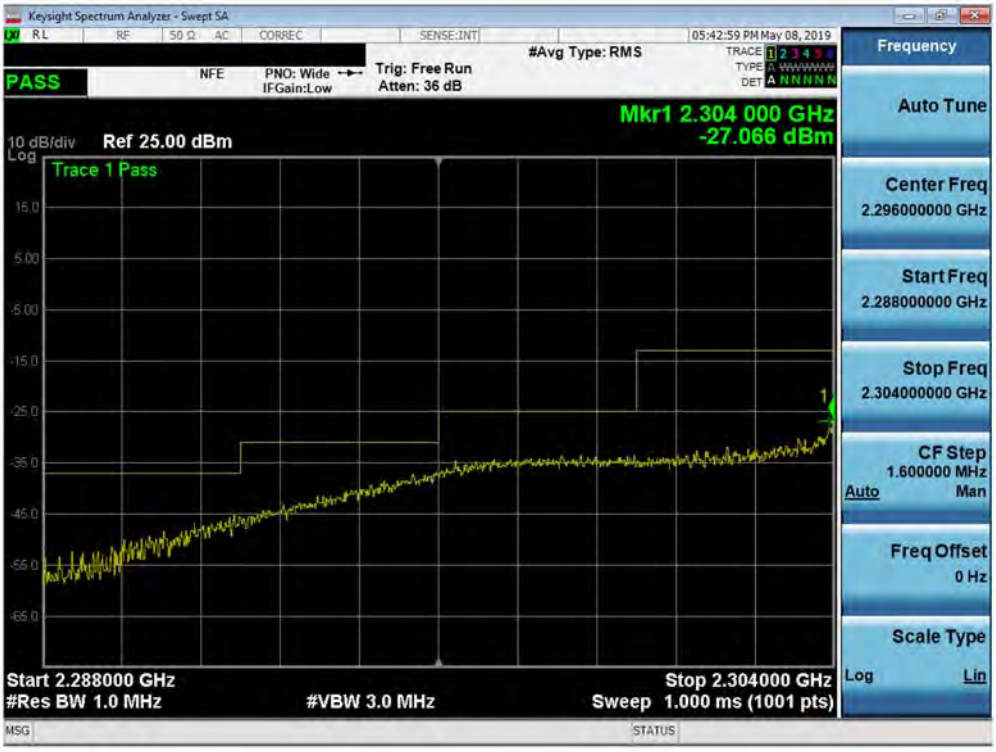
Plot 7-314. Lower Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-315. Lower Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

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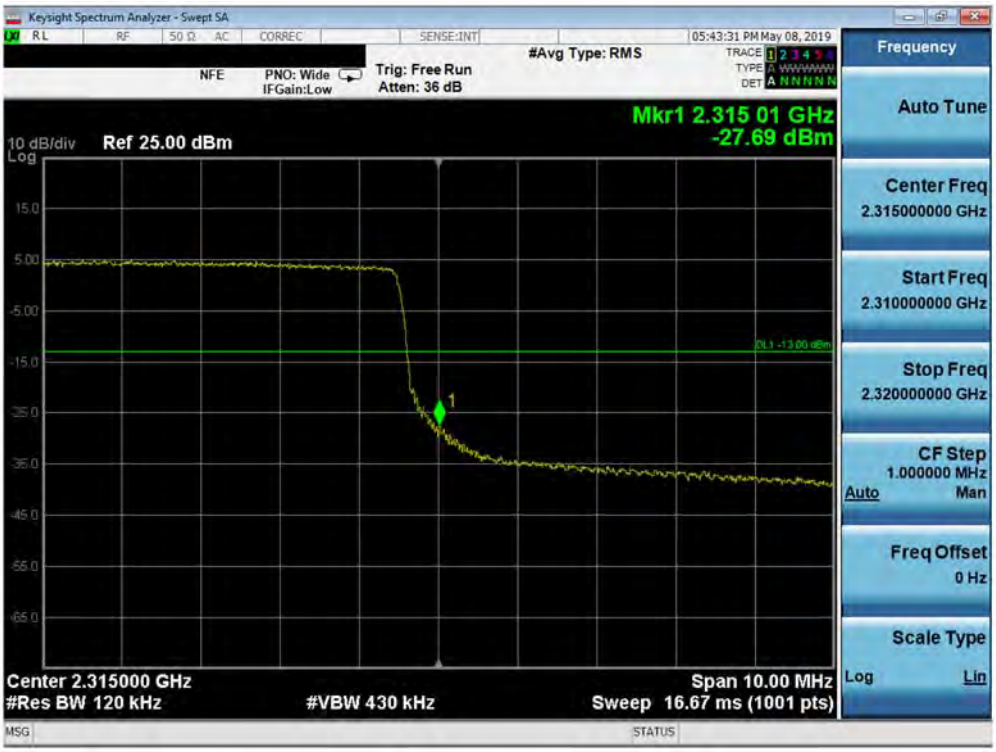
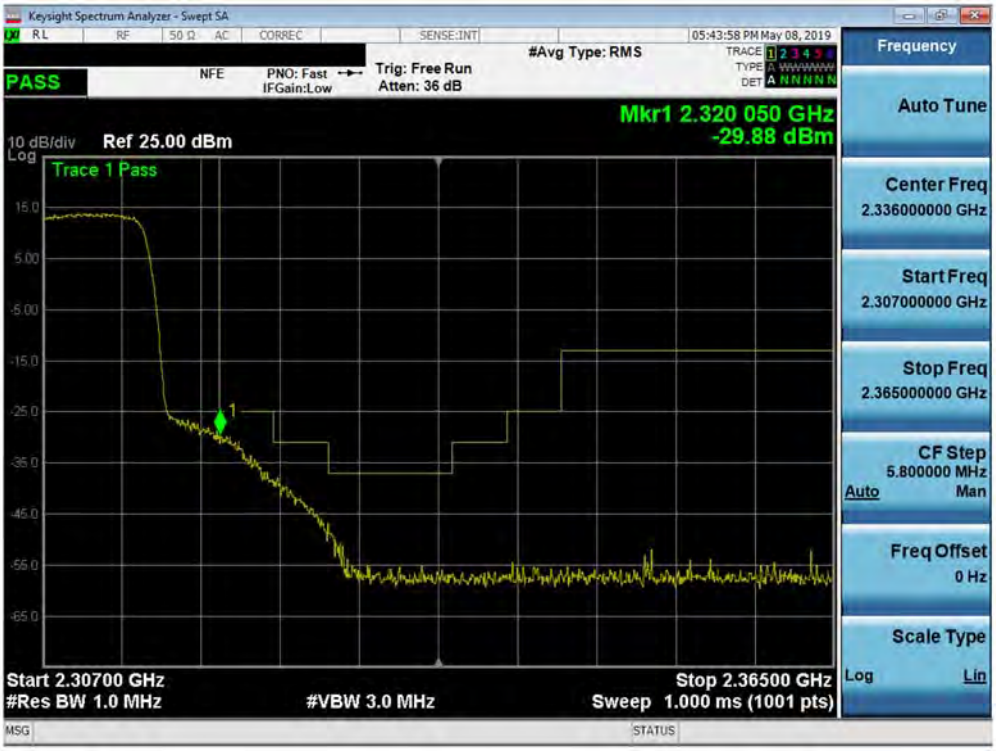


Plot 7-316. Upper Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-317. Upper Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

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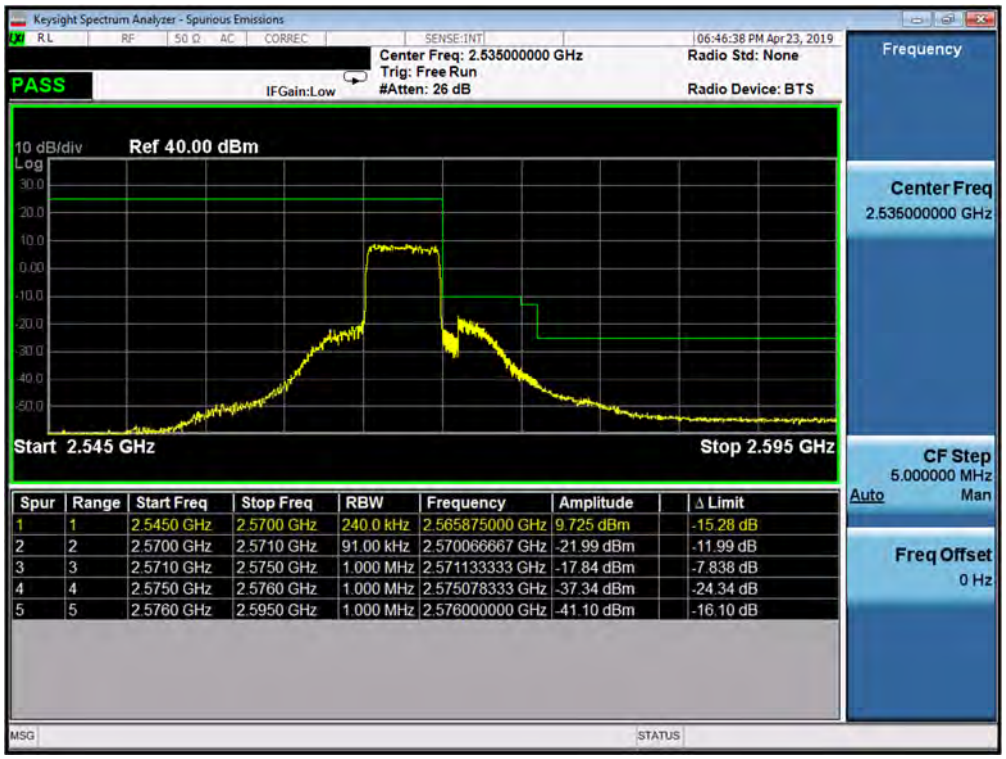
Band 7

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490422500 GHz	-52.17 dBm	-27.17 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495486667 GHz	-38.48 dBm	-25.48 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498920000 GHz	-26.60 dBm	-16.60 dB
4	4	2.4990 GHz	2.5000 GHz	100.0 kHz	2.499993333 GHz	-26.93 dBm	-16.93 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.503875000 GHz	9.135 dBm	-15.86 dB

Plot 7-318. Lower ACP Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.565875000 GHz	9.725 dBm	-15.28 dB
2	2	2.5700 GHz	2.5710 GHz	91.00 kHz	2.570066667 GHz	-21.99 dBm	-11.99 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571133333 GHz	-17.84 dBm	-7.838 dB
4	4	2.5750 GHz	2.5760 GHz	1.000 MHz	2.575078333 GHz	-37.34 dBm	-24.34 dB
5	5	2.5760 GHz	2.5950 GHz	1.000 MHz	2.576000000 GHz	-41.10 dBm	-16.10 dB

Plot 7-319. Upper ACP Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)

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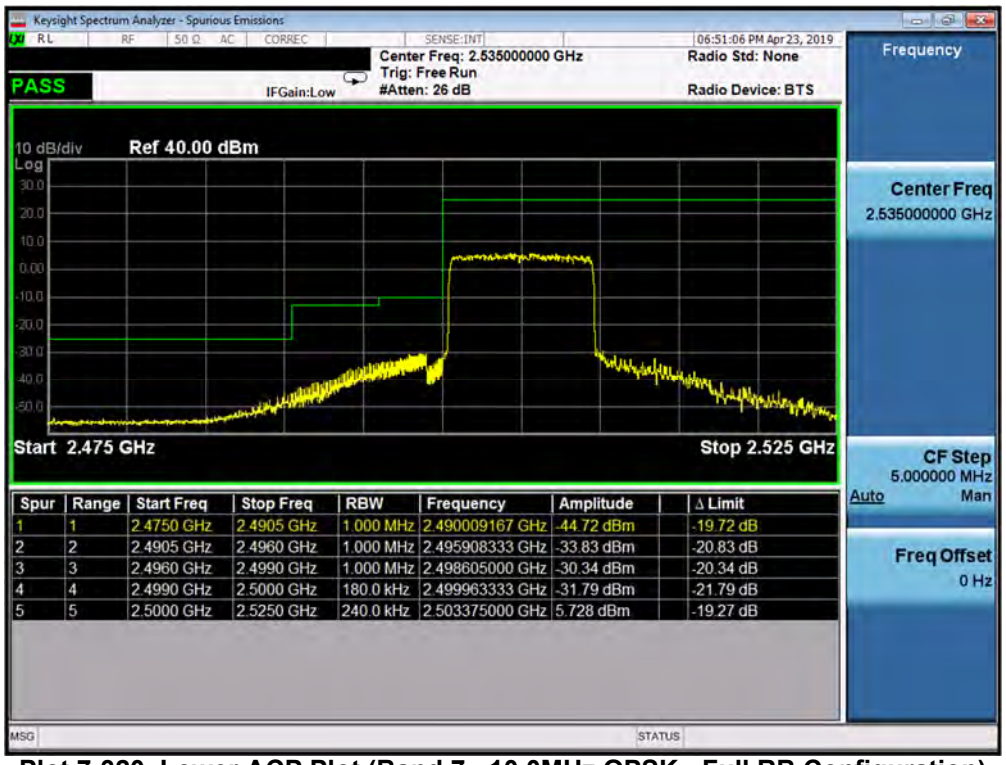
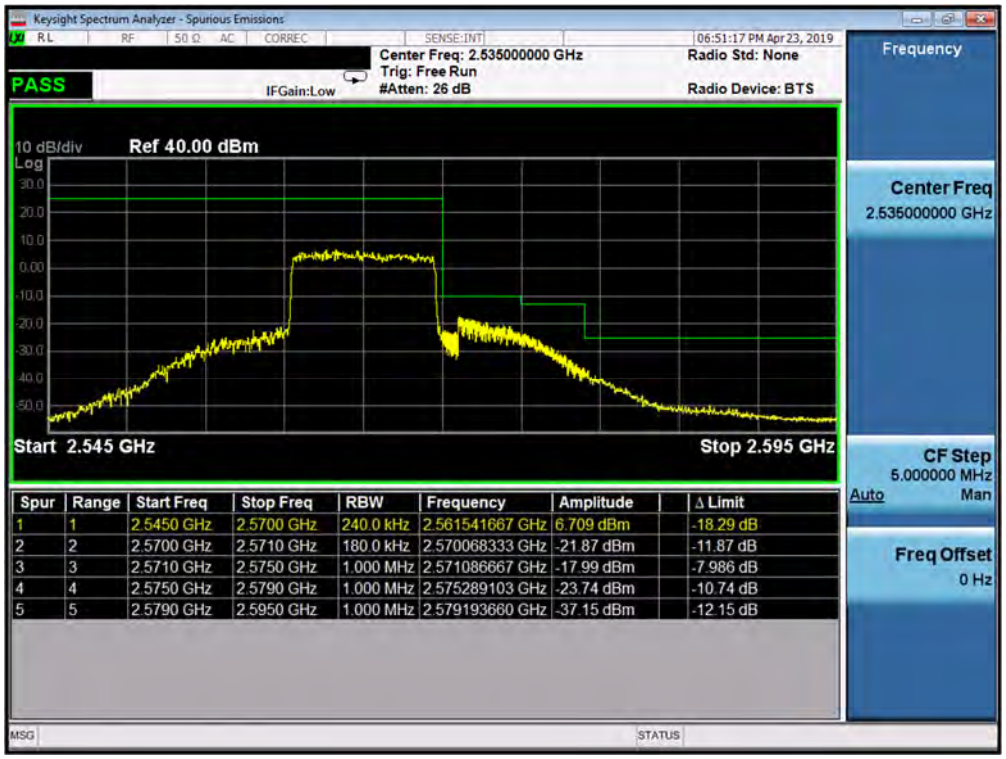


Plot 7-320. Lower ACP Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-321. Upper ACP Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

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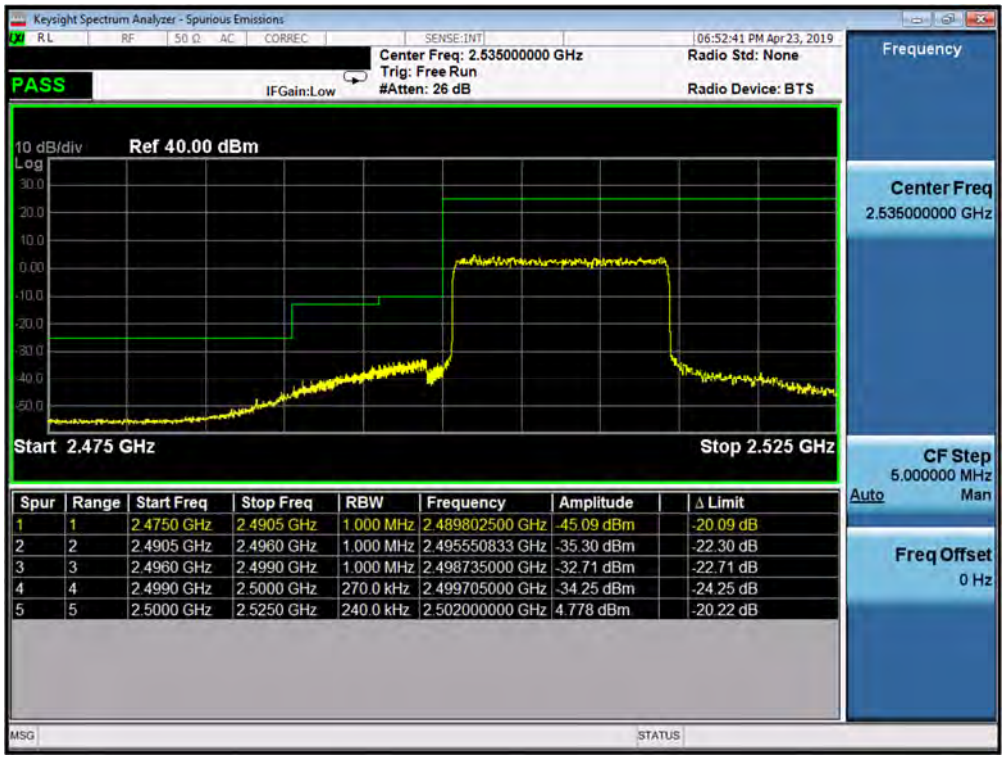
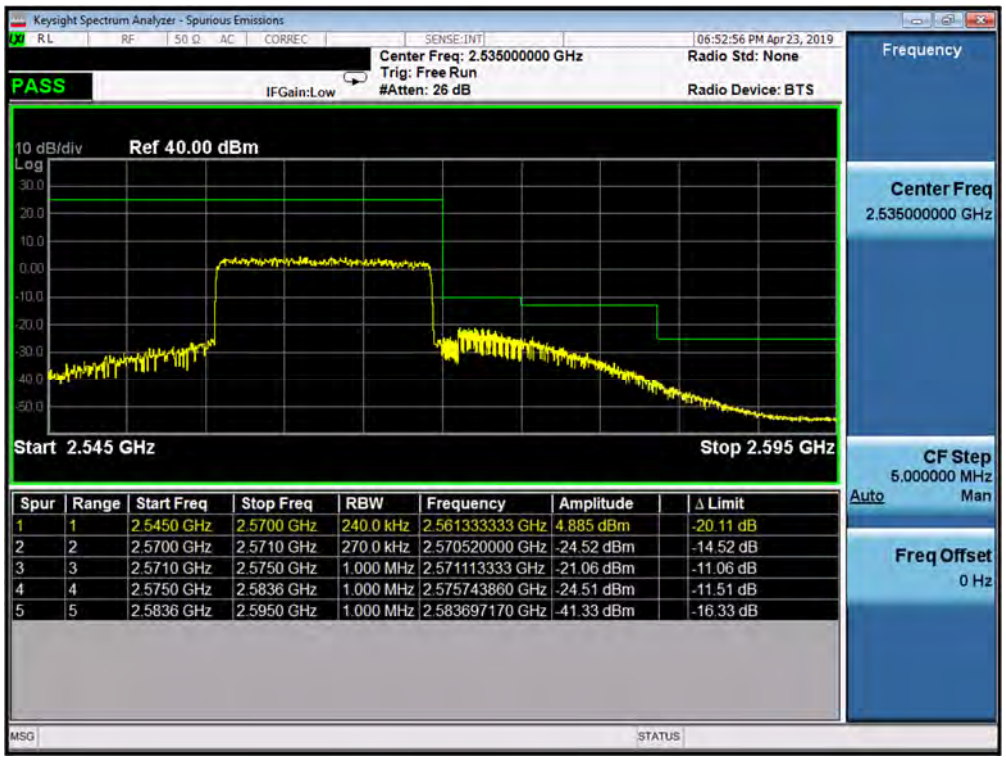


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489802500 GHz	-45.09 dBm	-20.09 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495550833 GHz	-35.30 dBm	-22.30 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.498735000 GHz	-32.71 dBm	-22.71 dB
4	4	2.4990 GHz	2.5000 GHz	270.0 kHz	2.499705000 GHz	-34.25 dBm	-24.25 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.502000000 GHz	4.778 dBm	-20.22 dB

Plot 7-322. Lower ACP Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.561333333 GHz	4.885 dBm	-20.11 dB
2	2	2.5700 GHz	2.5710 GHz	270.0 kHz	2.570520000 GHz	-24.52 dBm	-14.52 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571113333 GHz	-21.06 dBm	-11.06 dB
4	4	2.5750 GHz	2.5836 GHz	1.000 MHz	2.575743860 GHz	-24.51 dBm	-11.51 dB
5	5	2.5836 GHz	2.5950 GHz	1.000 MHz	2.583697170 GHz	-41.33 dBm	-16.33 dB

Plot 7-323. Upper ACP Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)

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Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490474167 GHz	-41.12 dBm	-16.12 dB
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495532500 GHz	-34.70 dBm	-21.70 dB
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.496985000 GHz	-33.56 dBm	-23.56 dB
4	4	2.4990 GHz	2.5000 GHz	360.0 kHz	2.499975000 GHz	-35.48 dBm	-25.48 dB
5	5	2.5000 GHz	2.5250 GHz	240.0 kHz	2.517458333 GHz	3.545 dBm	-21.45 dB

Plot 7-324. Lower ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.5450 GHz	2.5700 GHz	240.0 kHz	2.556833333 GHz	3.117 dBm	-21.88 dB
2	2	2.5700 GHz	2.5710 GHz	360.0 kHz	2.570216667 GHz	-27.07 dBm	-17.07 dB
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571046667 GHz	-24.41 dBm	-14.41 dB
4	4	2.5750 GHz	2.5881 GHz	1.000 MHz	2.575152285 GHz	-29.06 dBm	-16.06 dB
5	5	2.5881 GHz	2.5950 GHz	1.000 MHz	2.588064578 GHz	-46.32 dBm	-21.32 dB

Plot 7-325. Upper ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)

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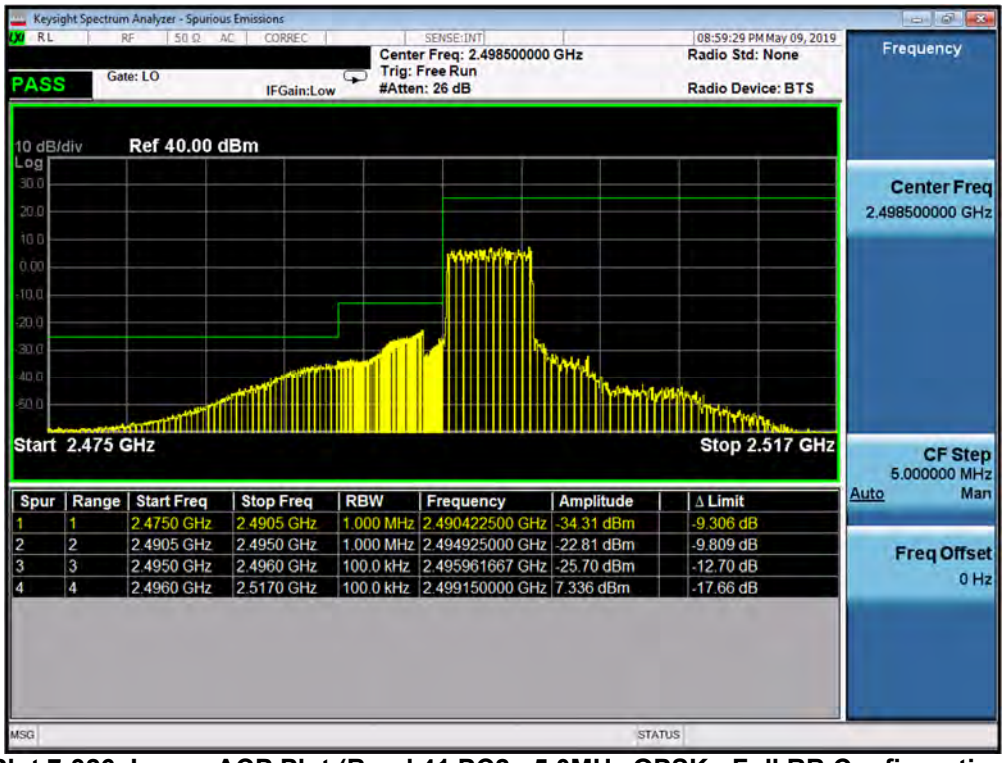
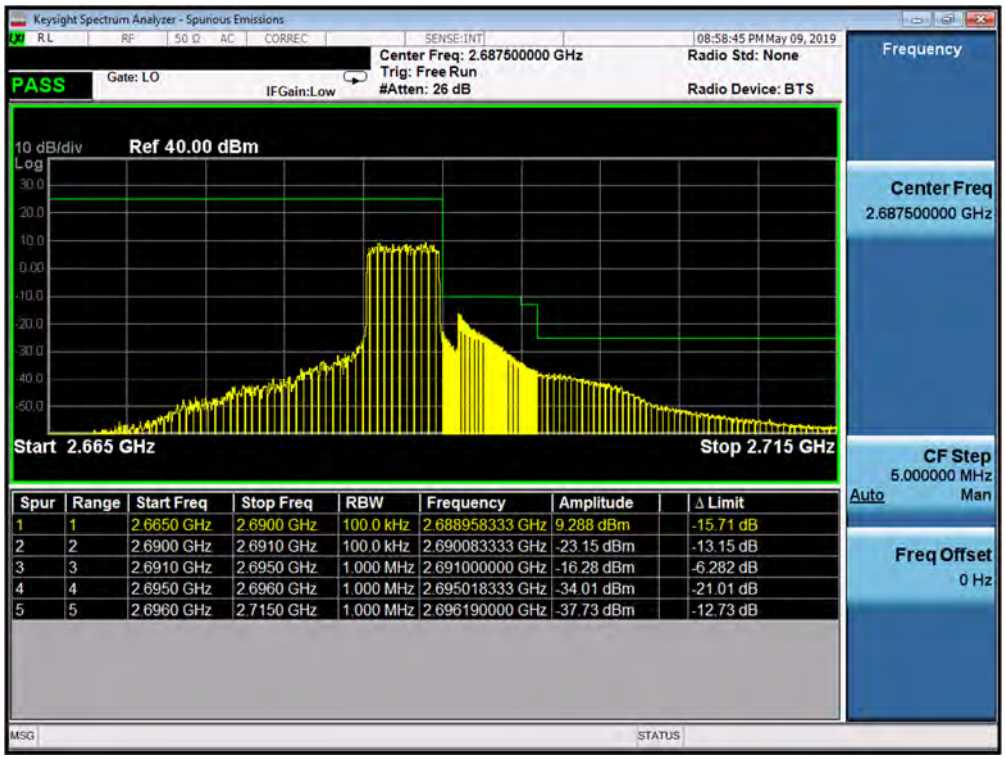
Band 41 (PC2)



Plot 7-326. Lower ACP Plot (Band 41 PC2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-327. Upper ACP Plot (Band 41 PC2 - 5.0MHz QPSK - Full RB Configuration)

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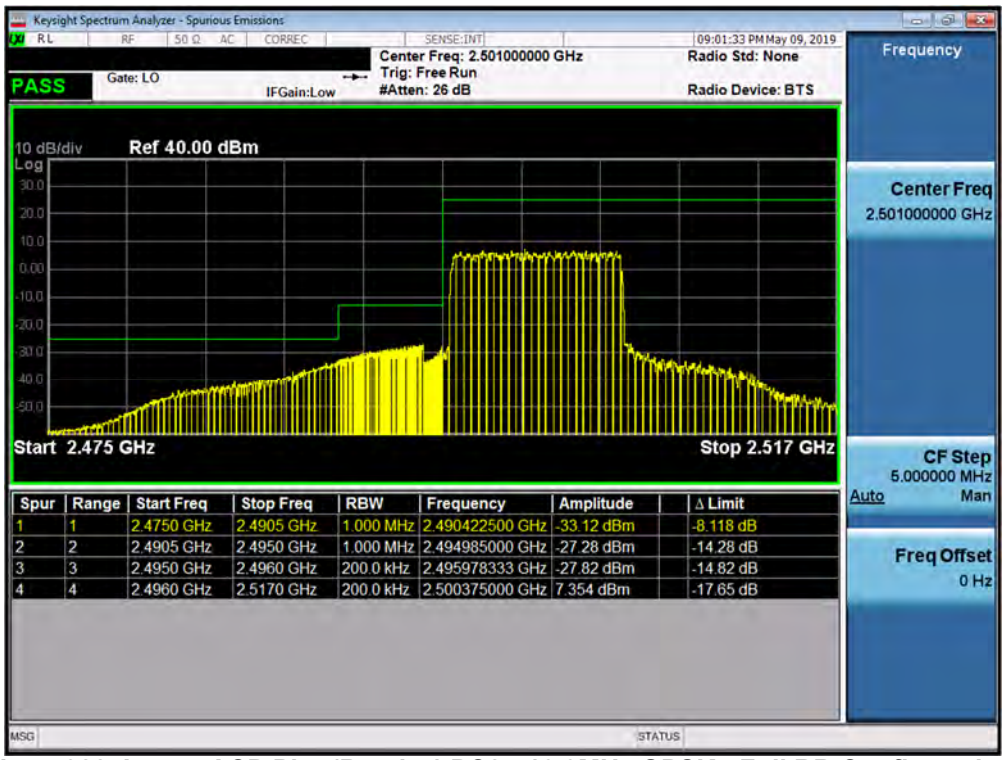
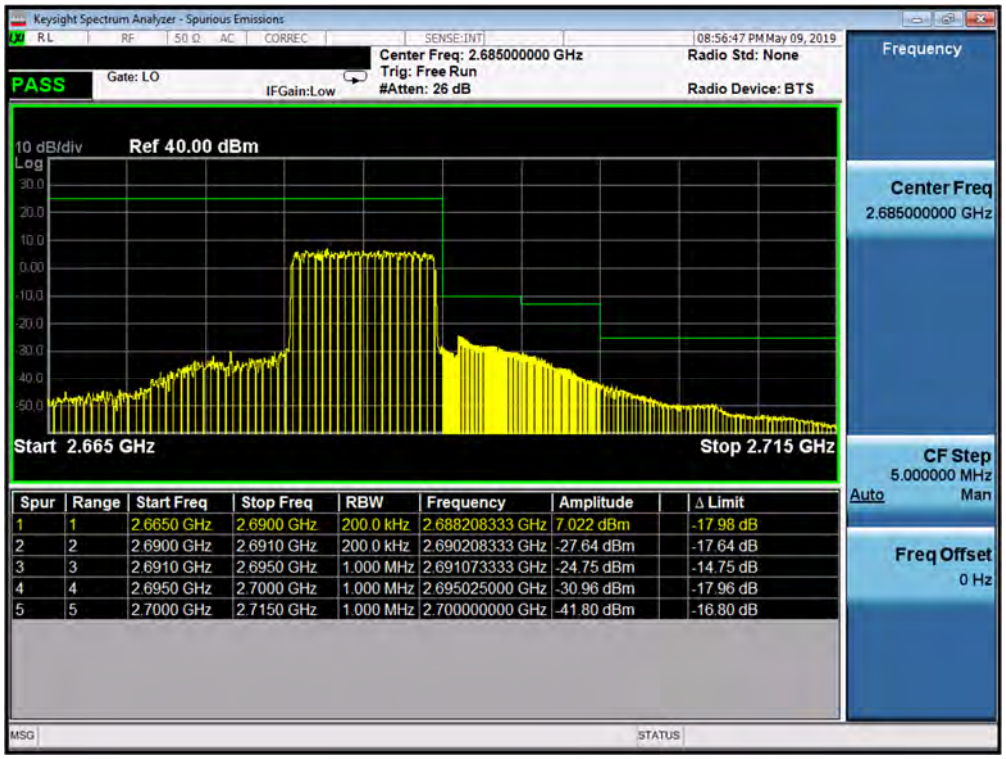


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490422500 GHz	-33.12 dBm	-8.118 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494985000 GHz	-27.28 dBm	-14.28 dB
3	3	2.4950 GHz	2.4960 GHz	200.0 kHz	2.495978333 GHz	-27.82 dBm	-14.82 dB
4	4	2.4960 GHz	2.5170 GHz	200.0 kHz	2.500375000 GHz	7.354 dBm	-17.65 dB

Plot 7-328. Lower ACP Plot (Band 41 PC2 - 10.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	200.0 kHz	2.688208333 GHz	7.022 dBm	-17.98 dB
2	2	2.6900 GHz	2.6910 GHz	200.0 kHz	2.690208333 GHz	-27.64 dBm	-17.64 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691073333 GHz	-24.75 dBm	-14.75 dB
4	4	2.6950 GHz	2.7000 GHz	1.000 MHz	2.695025000 GHz	-30.96 dBm	-17.96 dB
5	5	2.7000 GHz	2.7150 GHz	1.000 MHz	2.700000000 GHz	-41.80 dBm	-16.80 dB

Plot 7-329. Upper ACP Plot (Band 41 PC2 - 10.0MHz QPSK - Full RB Configuration)

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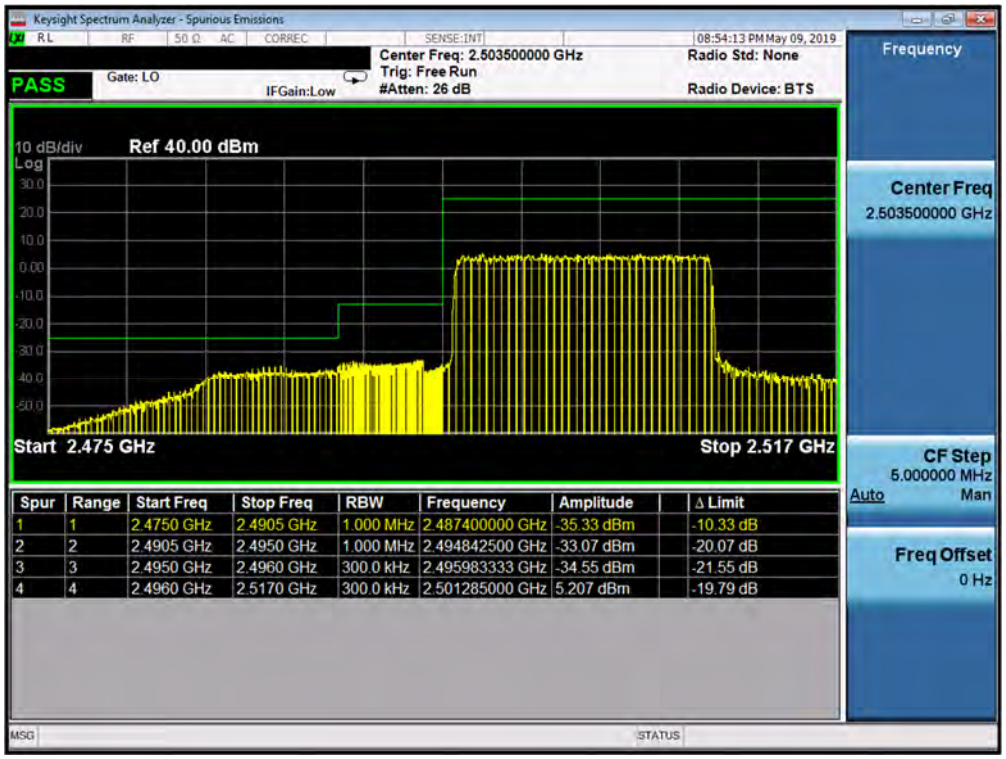
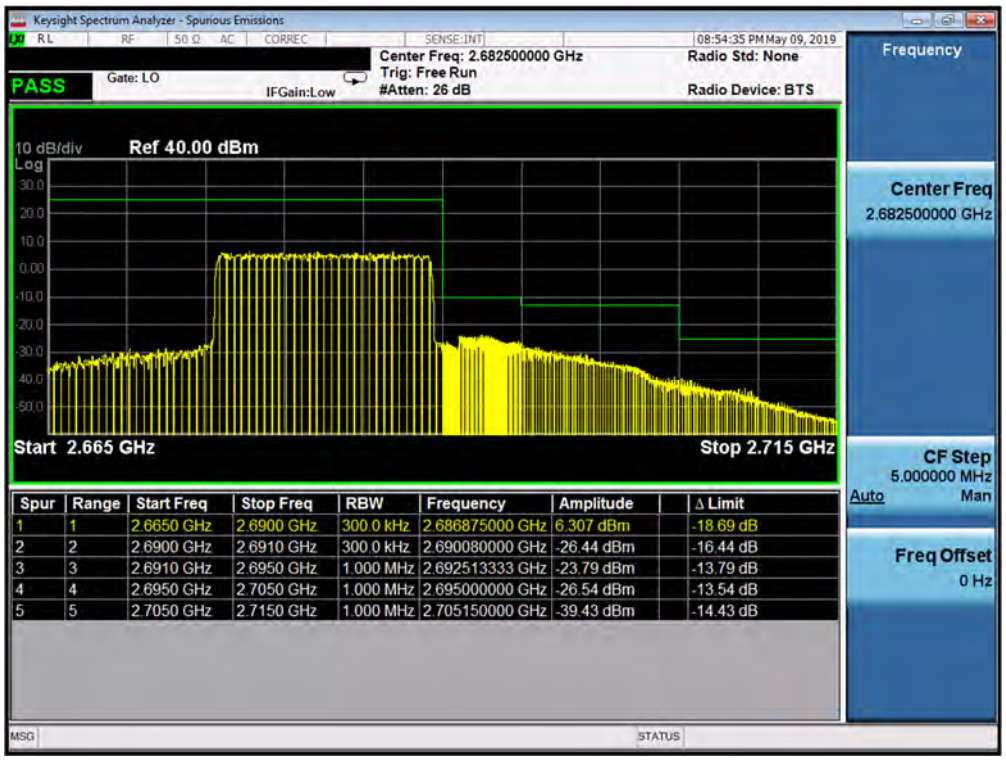


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.487400000 GHz	-35.33 dBm	-10.33 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494842500 GHz	-33.07 dBm	-20.07 dB
3	3	2.4950 GHz	2.4960 GHz	300.0 kHz	2.495983333 GHz	-34.55 dBm	-21.55 dB
4	4	2.4960 GHz	2.5170 GHz	300.0 kHz	2.501285000 GHz	5.207 dBm	-19.79 dB

Plot 7-330. Lower ACP Plot (Band 41 PC2 - 15.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	300.0 kHz	2.686875000 GHz	6.307 dBm	-18.69 dB
2	2	2.6900 GHz	2.6910 GHz	300.0 kHz	2.690080000 GHz	-26.44 dBm	-16.44 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692513333 GHz	-23.79 dBm	-13.79 dB
4	4	2.6950 GHz	2.7050 GHz	1.000 MHz	2.695000000 GHz	-26.54 dBm	-13.54 dB
5	5	2.7050 GHz	2.7150 GHz	1.000 MHz	2.705150000 GHz	-39.43 dBm	-14.43 dB

Plot 7-331. Upper ACP Plot (Band 41 PC2 - 15.0MHz QPSK - Full RB Configuration)

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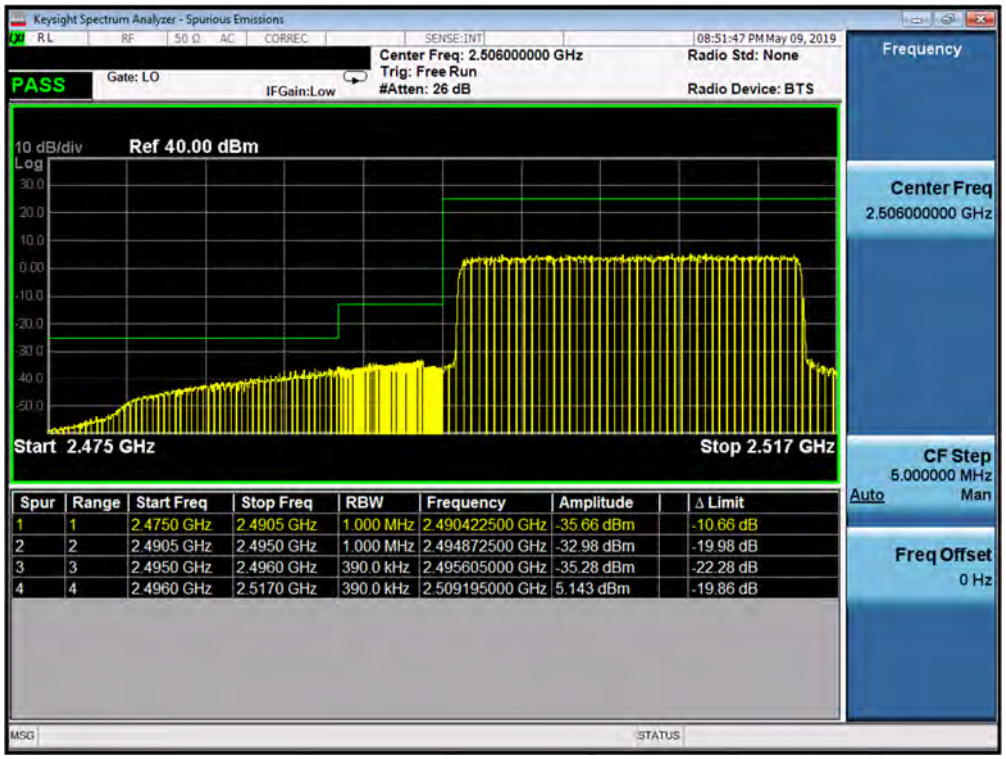
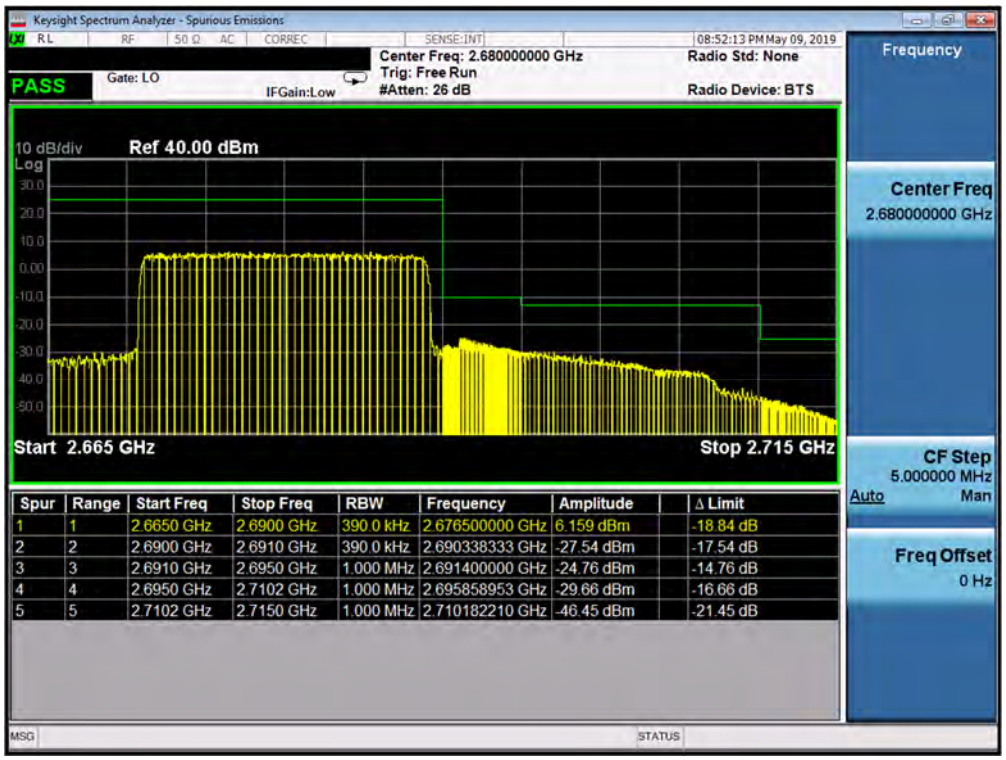


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490422500 GHz	-35.66 dBm	-10.66 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494872500 GHz	-32.98 dBm	-19.98 dB
3	3	2.4950 GHz	2.4960 GHz	390.0 kHz	2.495605000 GHz	-35.28 dBm	-22.28 dB
4	4	2.4960 GHz	2.5170 GHz	390.0 kHz	2.509195000 GHz	5.143 dBm	-19.86 dB

Plot 7-332. Lower ACP Plot (Band 41 PC2 - 20.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	390.0 kHz	2.676500000 GHz	6.159 dBm	-18.84 dB
2	2	2.6900 GHz	2.6910 GHz	390.0 kHz	2.690338333 GHz	-27.54 dBm	-17.54 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.691400000 GHz	-24.76 dBm	-14.76 dB
4	4	2.6950 GHz	2.7102 GHz	1.000 MHz	2.695858953 GHz	-29.66 dBm	-16.66 dB
5	5	2.7102 GHz	2.7150 GHz	1.000 MHz	2.710182210 GHz	-46.45 dBm	-21.45 dB

Plot 7-333. Upper ACP Plot (Band 41 PC2 - 20.0MHz QPSK - Full RB Configuration)

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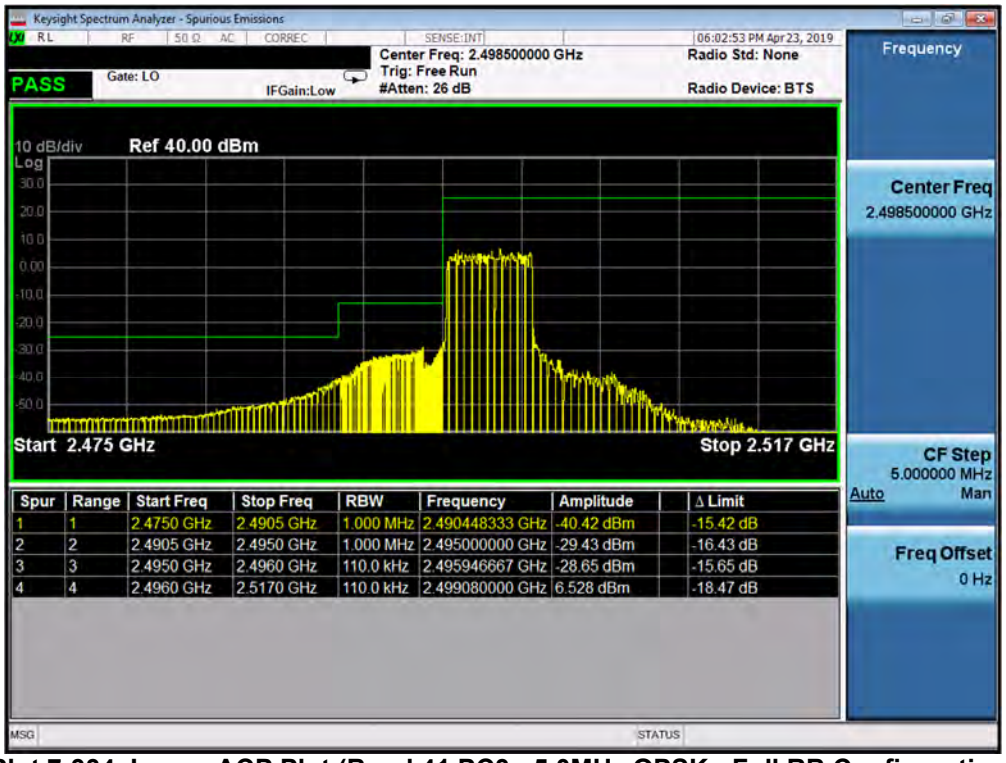
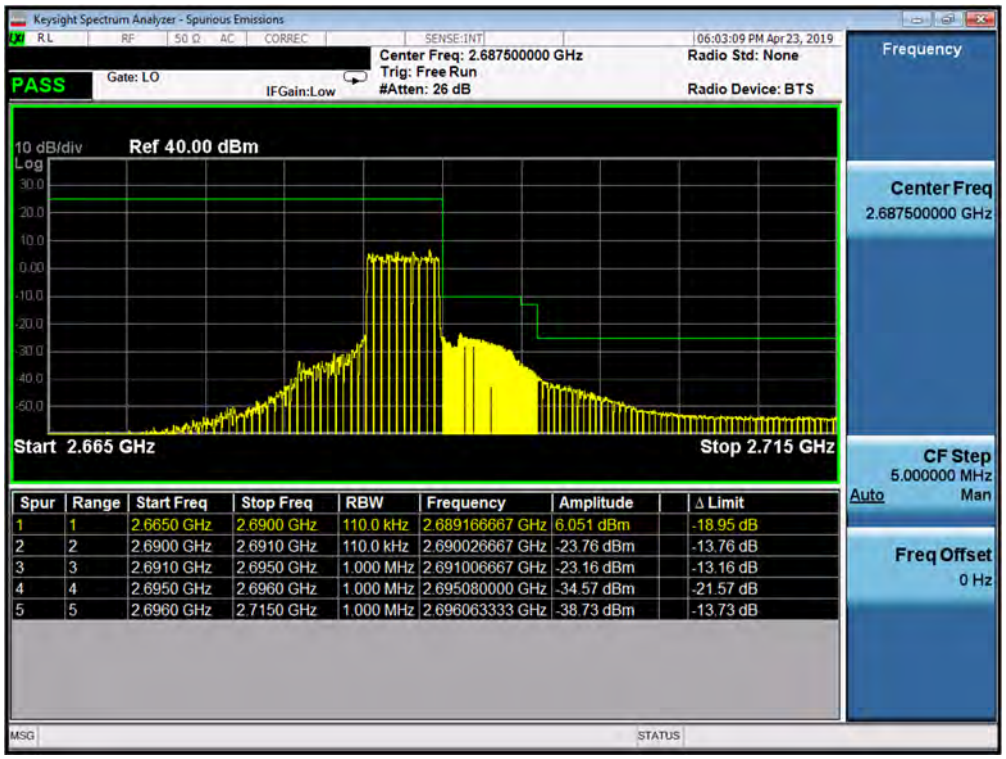
Band 41 (PC3)



Plot 7-334. Lower ACP Plot (Band 41 PC3 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-335. Upper ACP Plot (Band 41 PC3 - 5.0MHz QPSK - Full RB Configuration)

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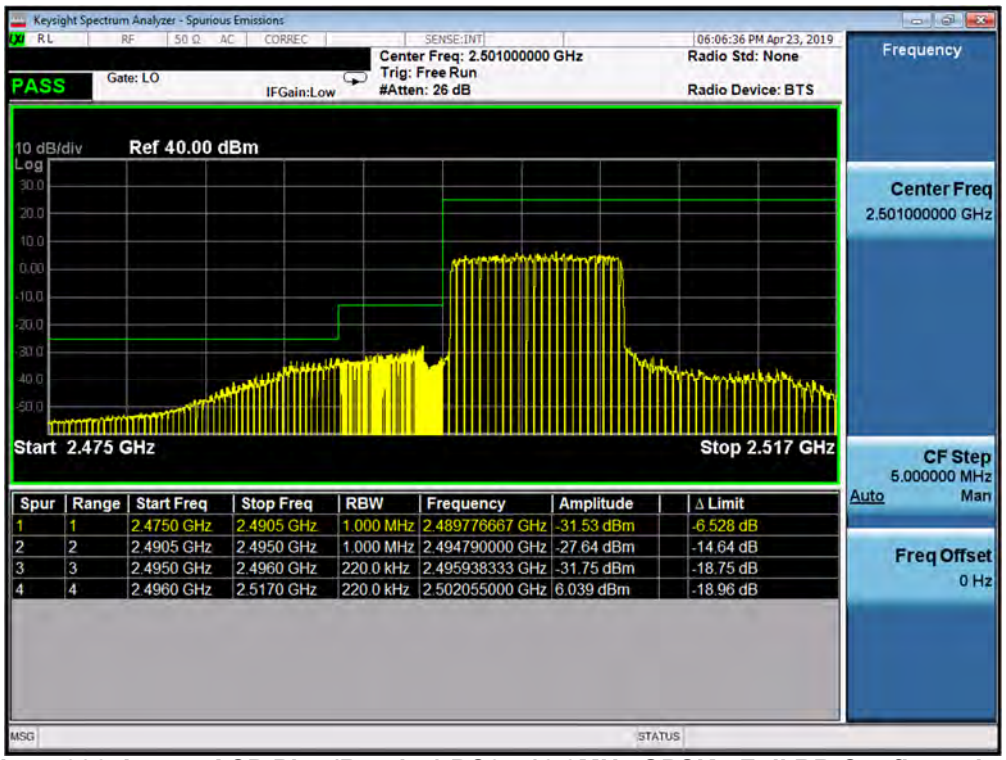
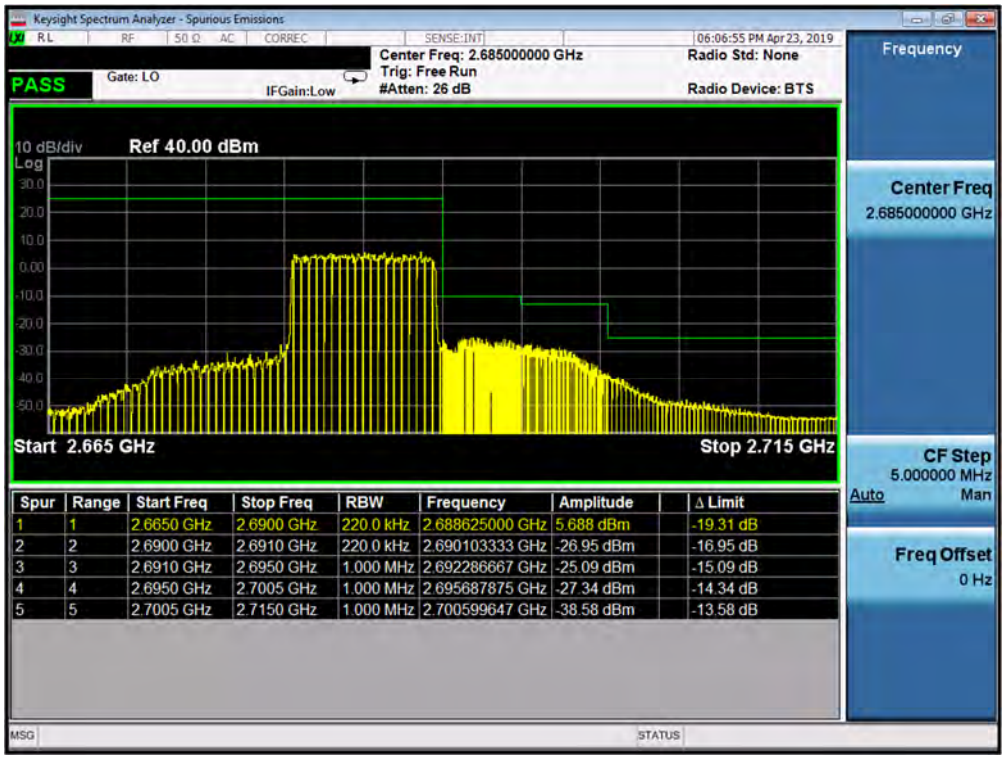


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.489776667 GHz	-31.53 dBm	-6.528 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.494790000 GHz	-27.64 dBm	-14.64 dB
3	3	2.4950 GHz	2.4960 GHz	220.0 kHz	2.495938333 GHz	-31.75 dBm	-18.75 dB
4	4	2.4960 GHz	2.5170 GHz	220.0 kHz	2.502055000 GHz	6.039 dBm	-18.96 dB

Plot 7-336. Lower ACP Plot (Band 41 PC3 - 10.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	220.0 kHz	2.688625000 GHz	5.688 dBm	-19.31 dB
2	2	2.6900 GHz	2.6910 GHz	220.0 kHz	2.690103333 GHz	-26.95 dBm	-16.95 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692286667 GHz	-25.09 dBm	-15.09 dB
4	4	2.6950 GHz	2.7005 GHz	1.000 MHz	2.695687875 GHz	-27.34 dBm	-14.34 dB
5	5	2.7005 GHz	2.7150 GHz	1.000 MHz	2.700599647 GHz	-38.58 dBm	-13.58 dB

Plot 7-337. Upper ACP Plot (Band 41 PC3 - 10.0MHz QPSK - Full RB Configuration)

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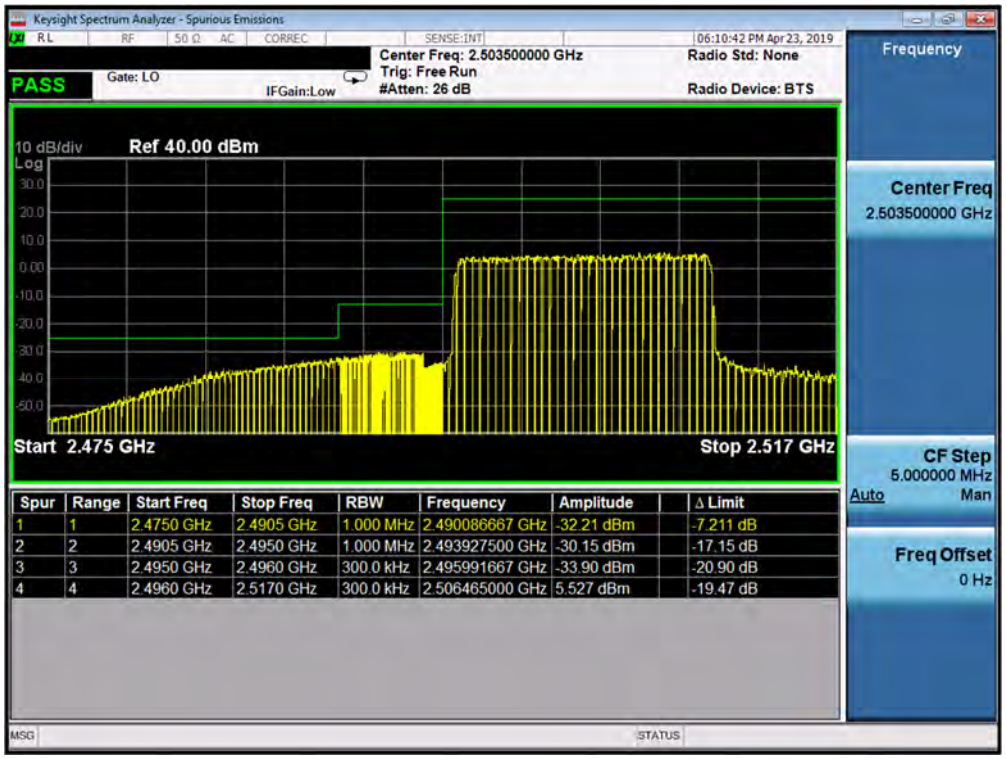
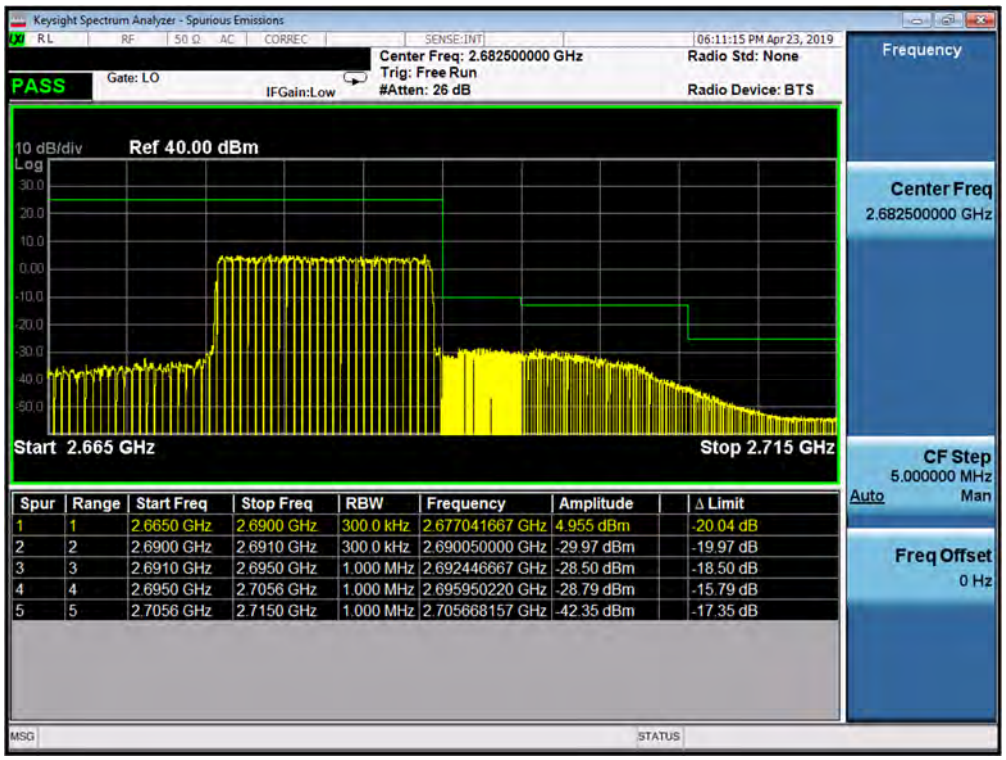


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.490086667 GHz	-32.21 dBm	-7.211 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.493927500 GHz	-30.15 dBm	-17.15 dB
3	3	2.4950 GHz	2.4960 GHz	300.0 kHz	2.495991667 GHz	-33.90 dBm	-20.90 dB
4	4	2.4960 GHz	2.5170 GHz	300.0 kHz	2.506465000 GHz	5.527 dBm	-19.47 dB

Plot 7-338. Lower ACP Plot (Band 41 PC3 - 15.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	300.0 kHz	2.677041667 GHz	4.955 dBm	-20.04 dB
2	2	2.6900 GHz	2.6910 GHz	300.0 kHz	2.690050000 GHz	-29.97 dBm	-19.97 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692446667 GHz	-28.50 dBm	-18.50 dB
4	4	2.6950 GHz	2.7056 GHz	1.000 MHz	2.695950220 GHz	-28.79 dBm	-15.79 dB
5	5	2.7056 GHz	2.7150 GHz	1.000 MHz	2.705668157 GHz	-42.35 dBm	-17.35 dB

Plot 7-339. Upper ACP Plot (Band 41 PC3 - 15.0MHz QPSK - Full RB Configuration)

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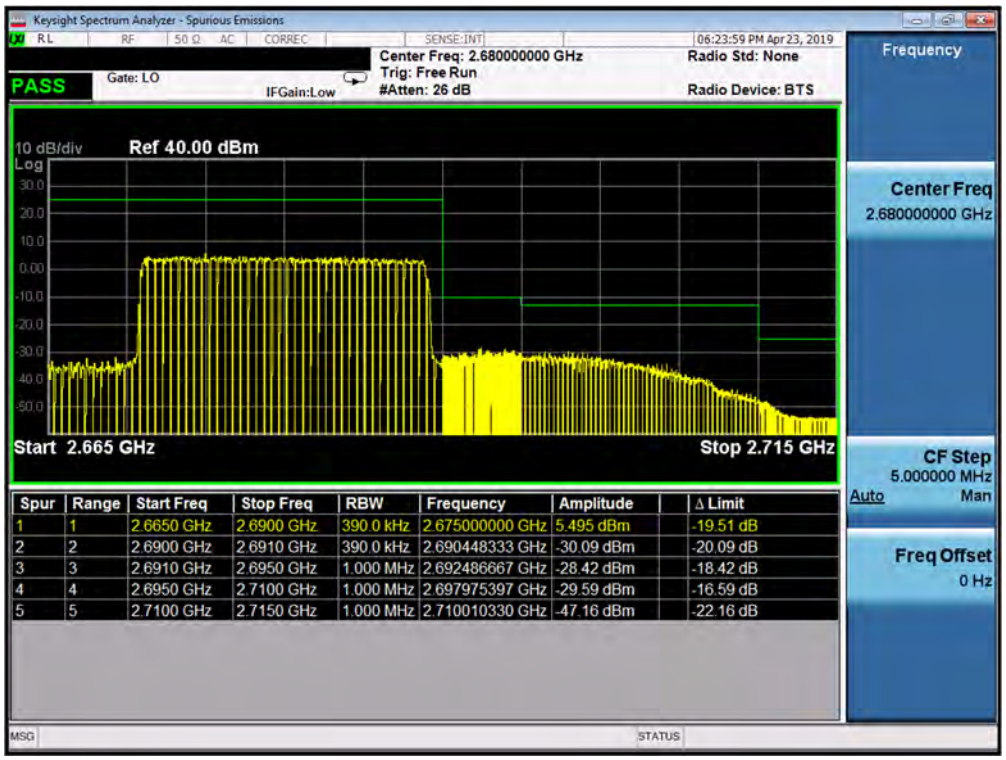
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.488097500 GHz	-32.55 dBm	-7.548 dB
2	2	2.4905 GHz	2.4950 GHz	1.000 MHz	2.493882500 GHz	-30.62 dBm	-17.62 dB
3	3	2.4950 GHz	2.4960 GHz	390.0 kHz	2.495821667 GHz	-34.69 dBm	-21.69 dB
4	4	2.4960 GHz	2.5170 GHz	390.0 kHz	2.514795000 GHz	5.381 dBm	-19.62 dB

Plot 7-340. Lower ACP Plot (Band 41 PC3 - 20.0MHz QPSK - Full RB Configuration)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	2.6650 GHz	2.6900 GHz	390.0 kHz	2.675000000 GHz	5.495 dBm	-19.51 dB
2	2	2.6900 GHz	2.6910 GHz	390.0 kHz	2.690448333 GHz	-30.09 dBm	-20.09 dB
3	3	2.6910 GHz	2.6950 GHz	1.000 MHz	2.692486667 GHz	-28.42 dBm	-18.42 dB
4	4	2.6950 GHz	2.7100 GHz	1.000 MHz	2.697975397 GHz	-29.59 dBm	-16.59 dB
5	5	2.7100 GHz	2.7150 GHz	1.000 MHz	2.710010330 GHz	-47.16 dBm	-22.16 dB

Plot 7-341. Upper ACP Plot (Band 41 PC3 - 20.0MHz QPSK - Full RB Configuration)

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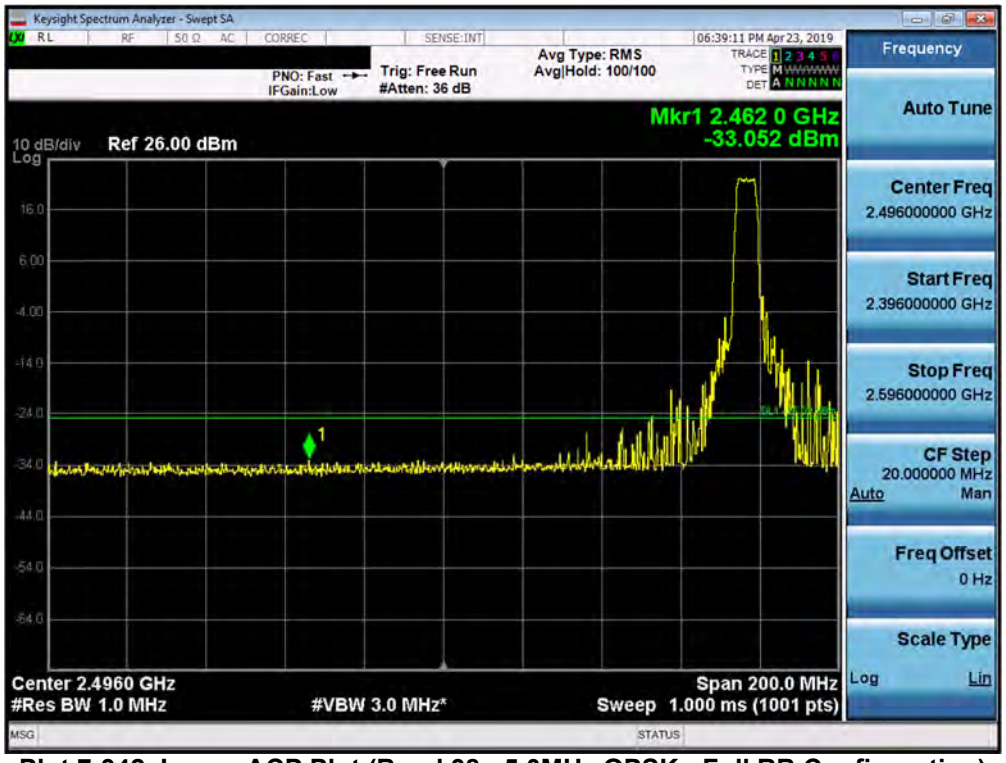
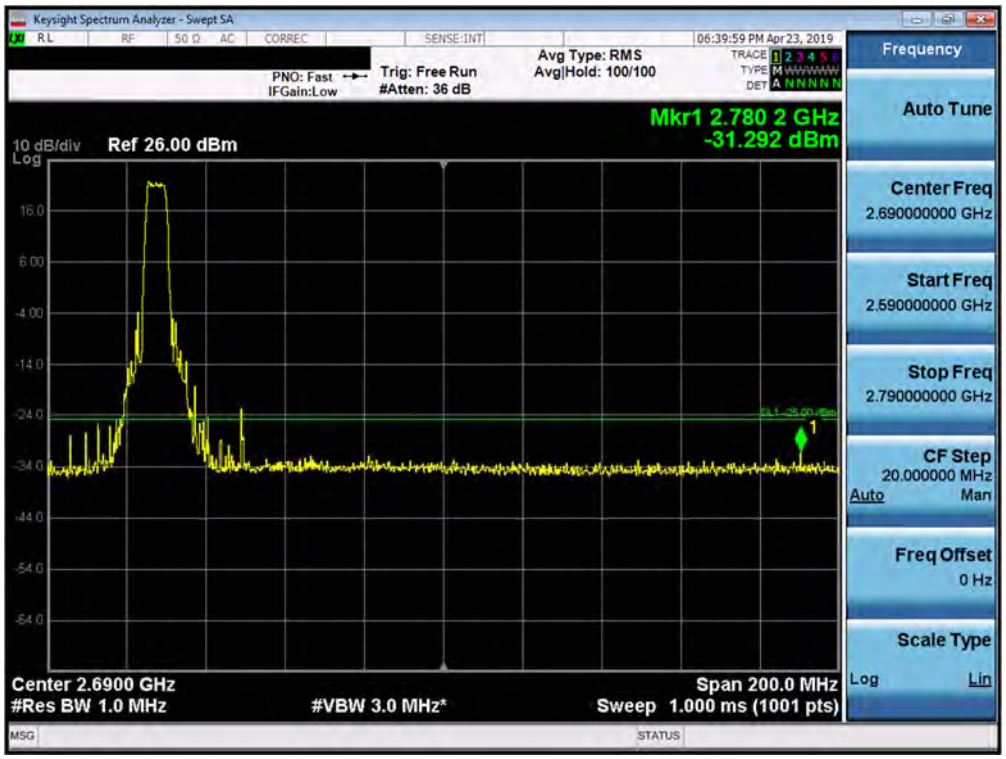
Band 38



Plot 7-342. Lower ACP Plot (Band 38 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-343. Upper ACP Plot (Band 38 - 5.0MHz QPSK - Full RB Configuration)

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Plot 7-344. Lower ACP Plot (Band 38 - 10.0MHz QPSK - Full RB Configuration)

Plot 7-345. Upper ACP Plot (Band 38 - 10.0MHz QPSK - Full RB Configuration)

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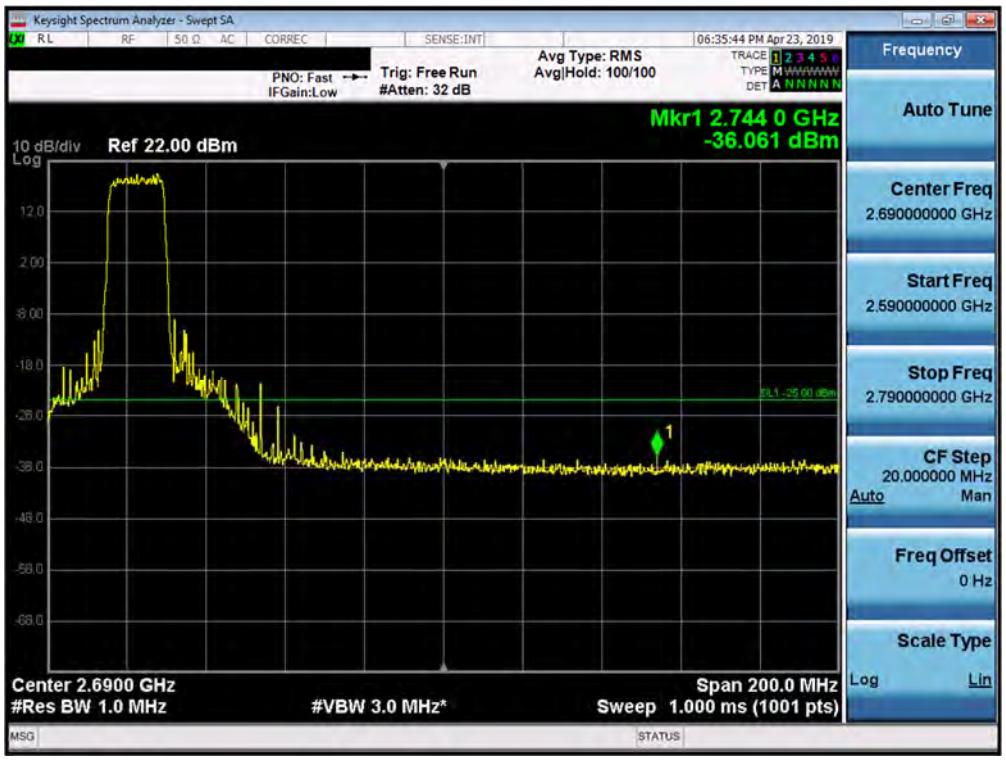
Plot 7-346. Lower ACP Plot (Band 38 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-347. Upper ACP Plot (Band 38 - 15.0MHz QPSK - Full RB Configuration)

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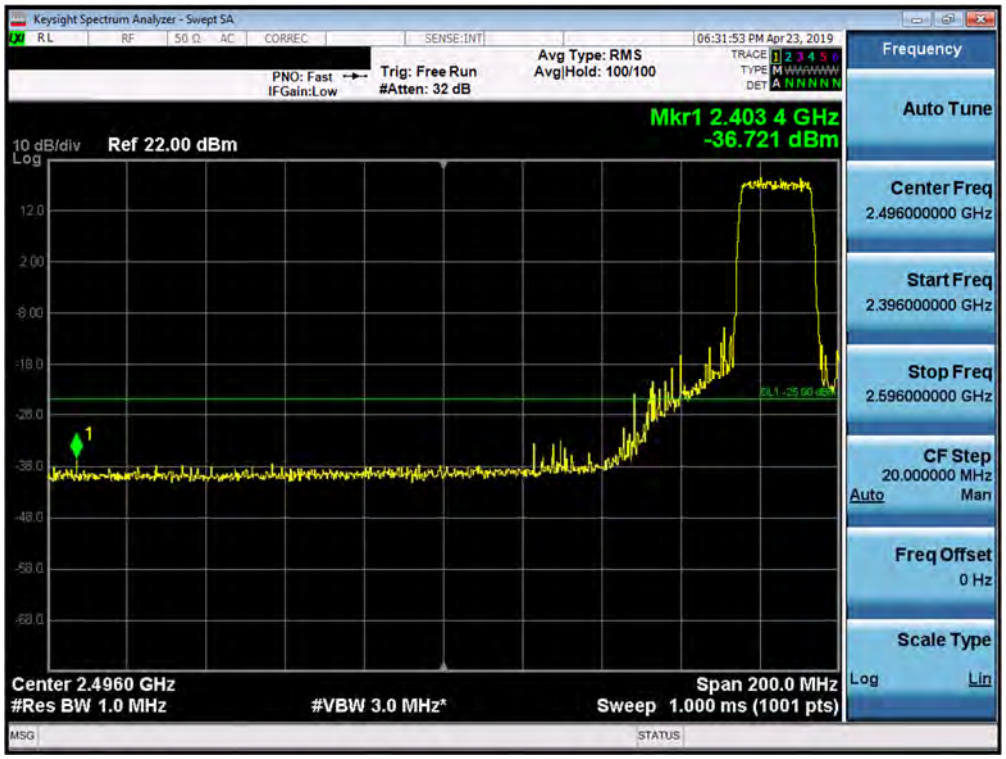
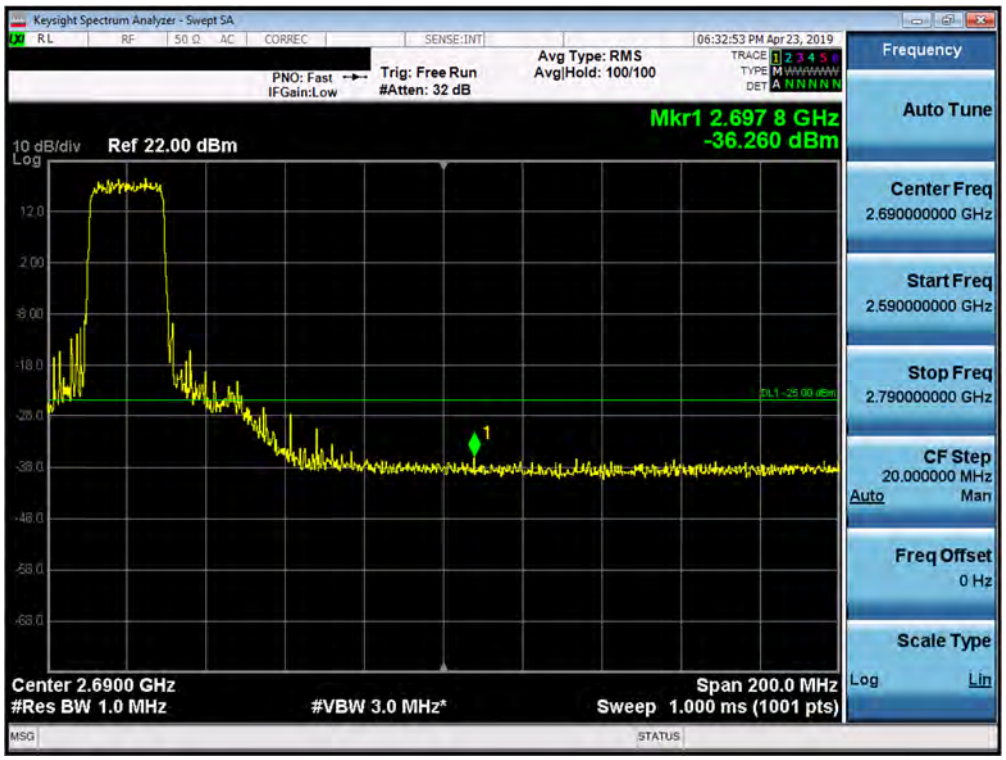


Plot 7-348. Lower ACP Plot (Band 38 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-349. Upper ACP Plot (Band 38 - 20.0MHz QPSK - Full RB Configuration)

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7.5 Peak-Average Ratio

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW ≥ OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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

Figure 7-4. Test Instrument & Measurement Setup

Test Notes

None.

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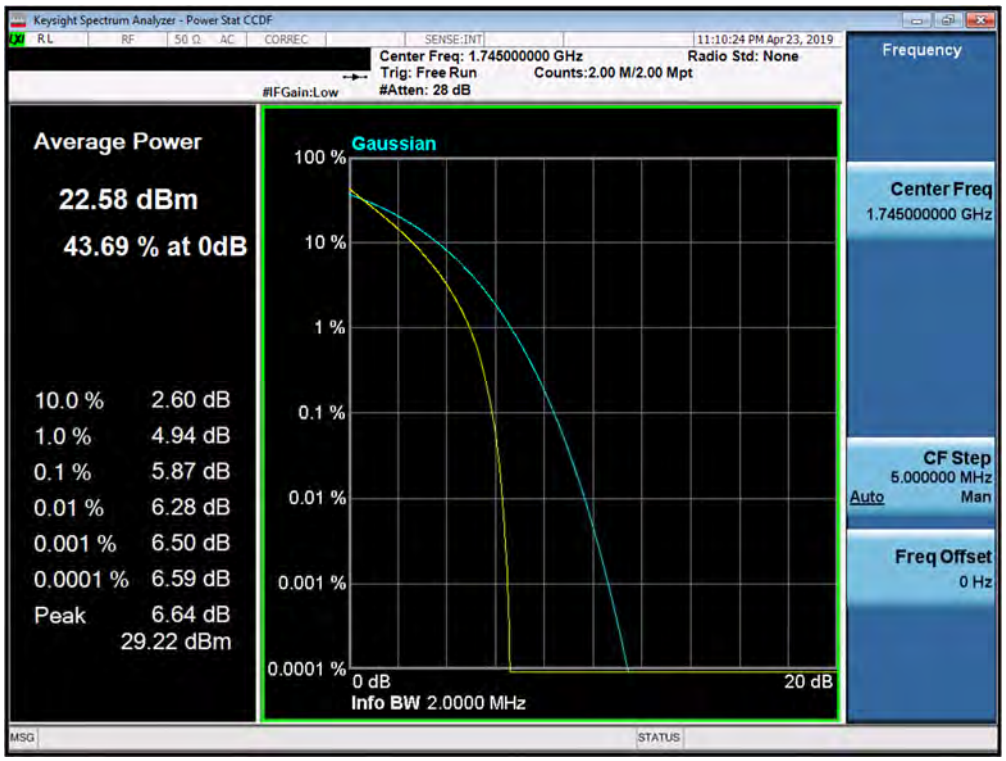
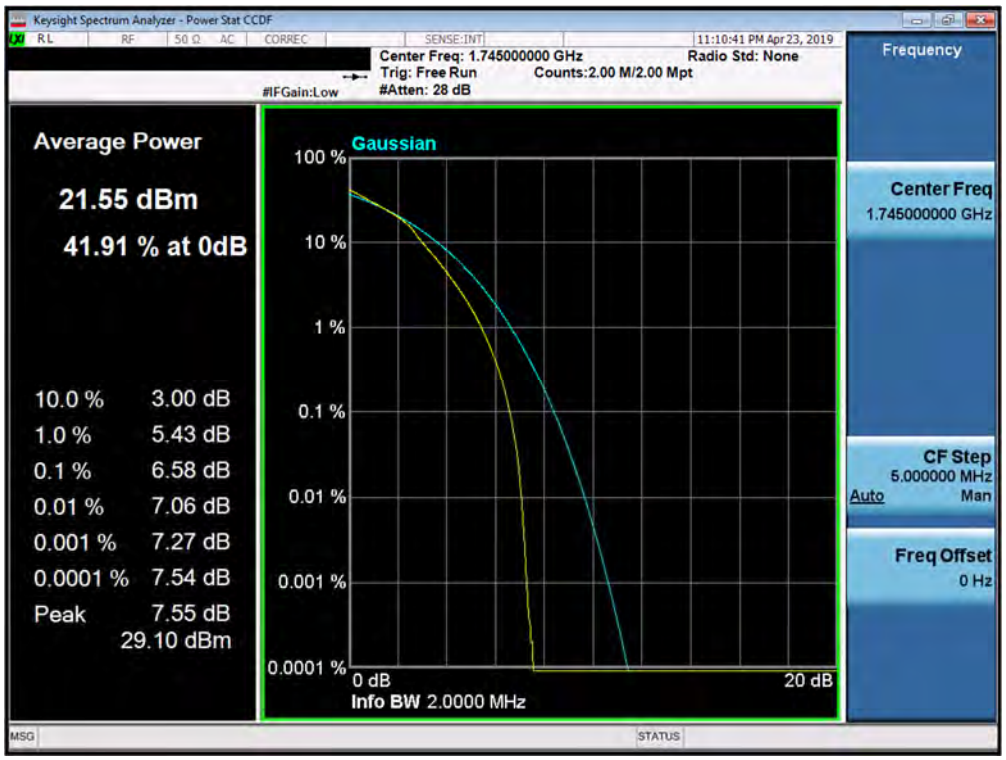
Band 66/4



Plot 7-350. PAR Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-351. PAR Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

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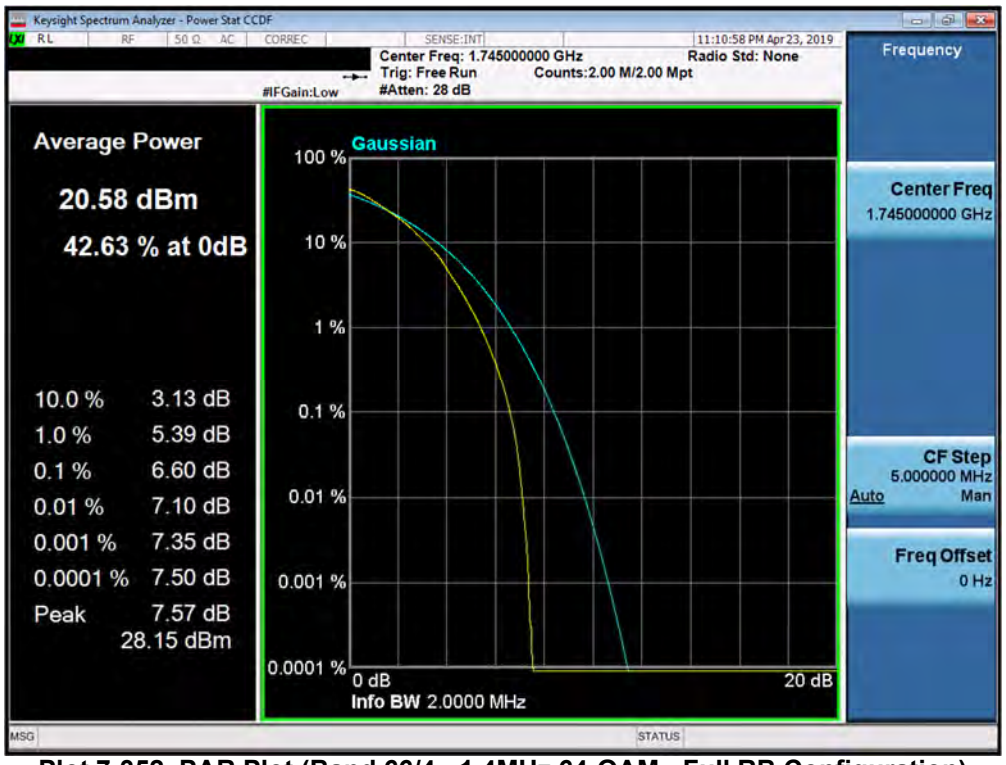
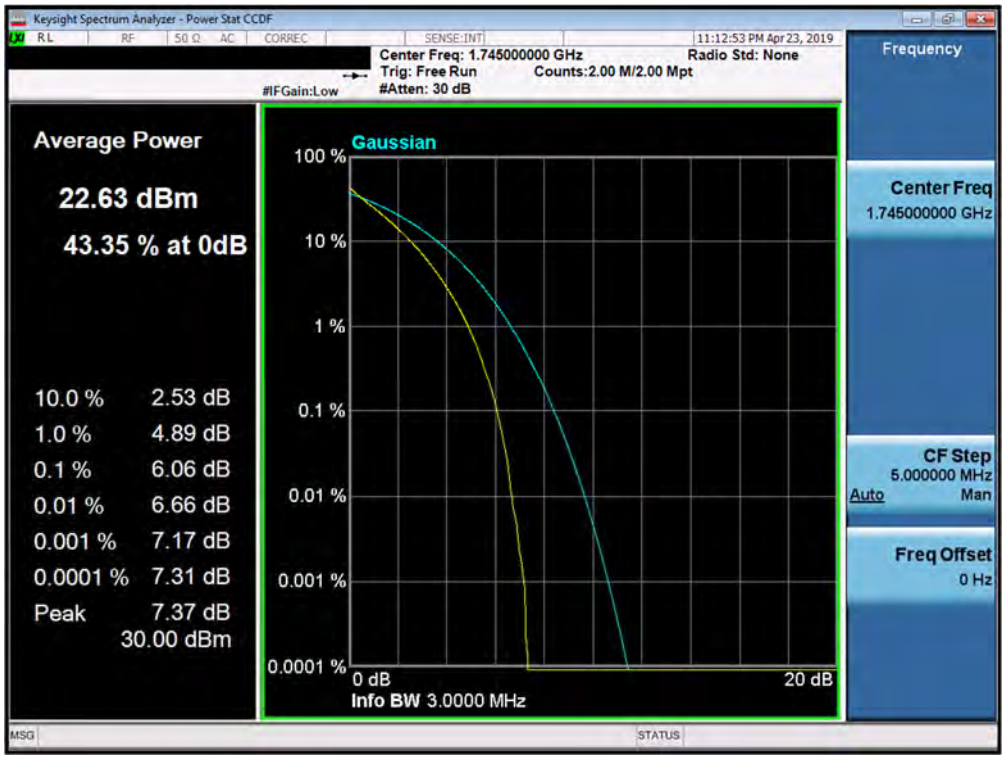


Plot 7-352. PAR Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)



Plot 7-353. PAR Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

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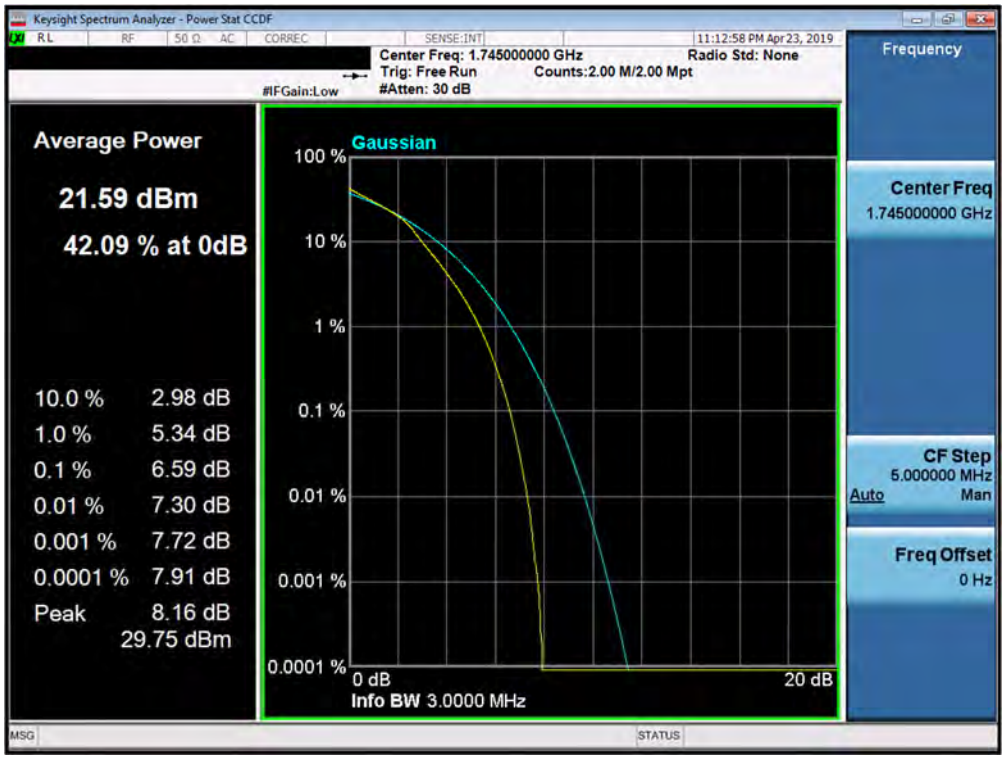
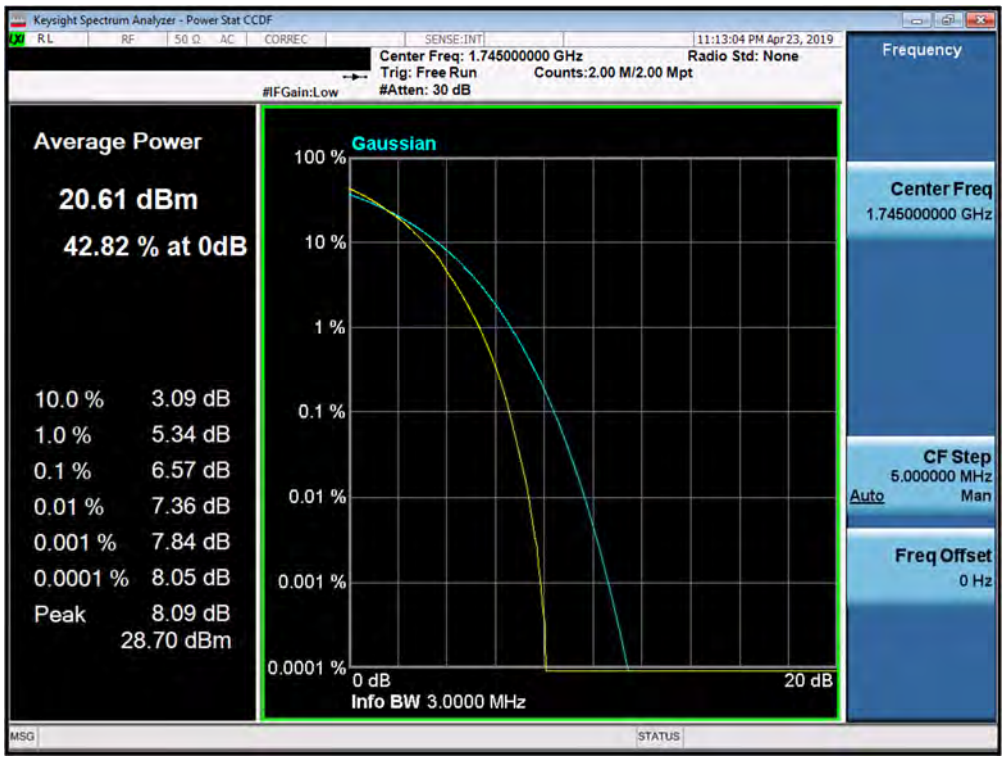


Plot 7-354. PAR Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)



Plot 7-355. PAR Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)

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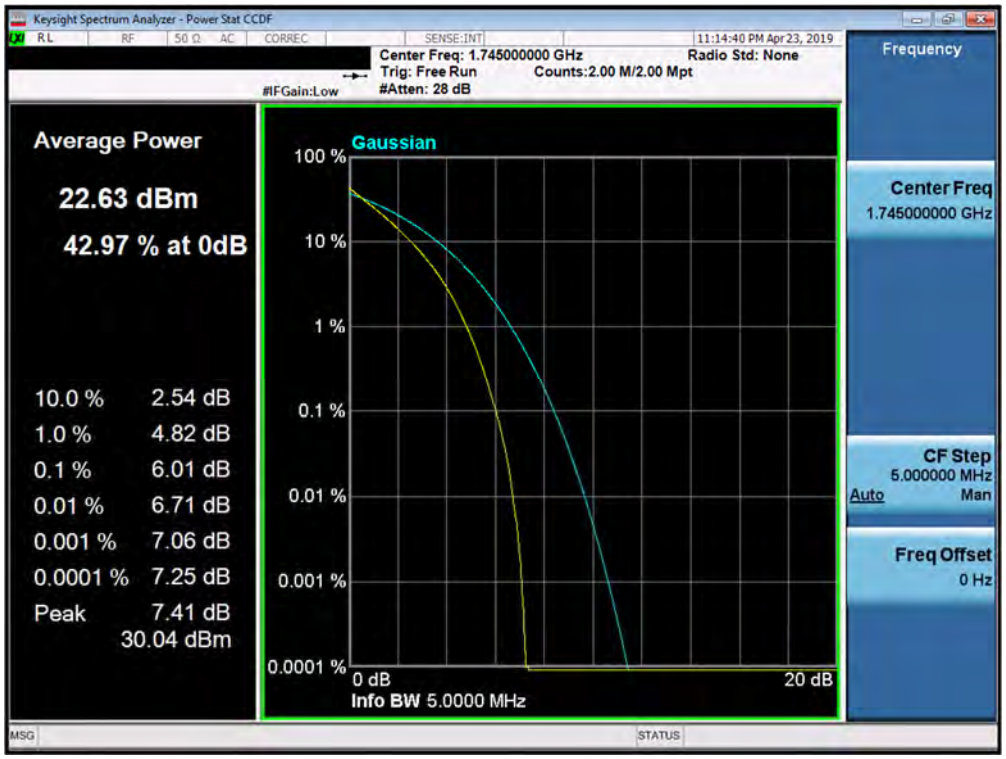
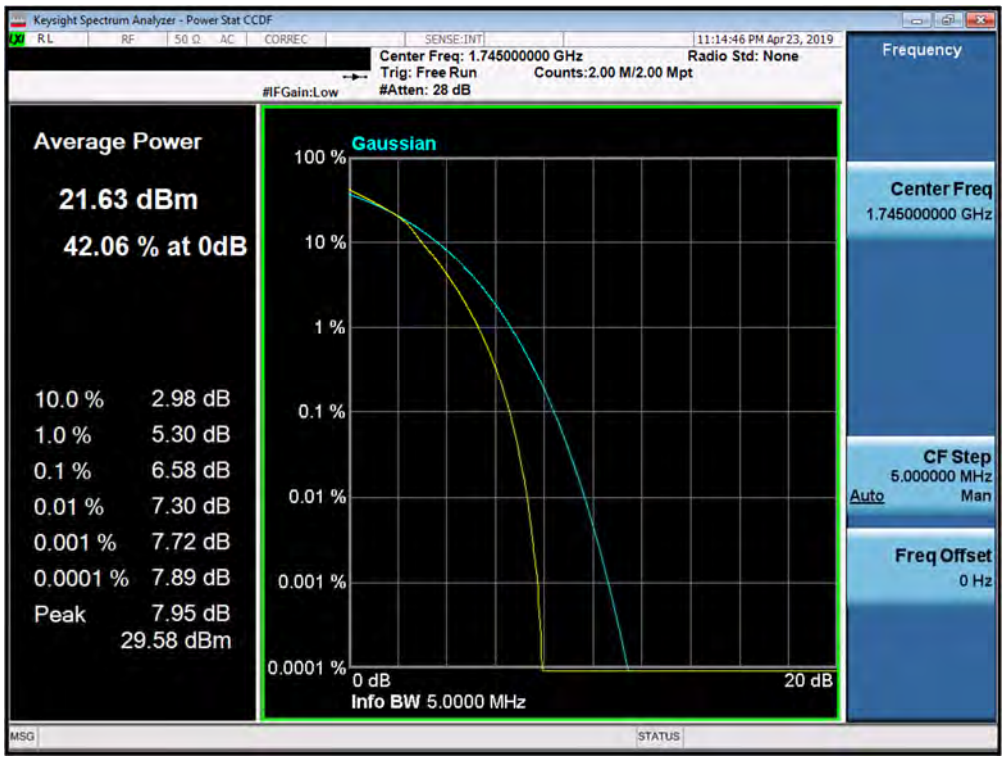


Plot 7-356. PAR Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-357. PAR Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)

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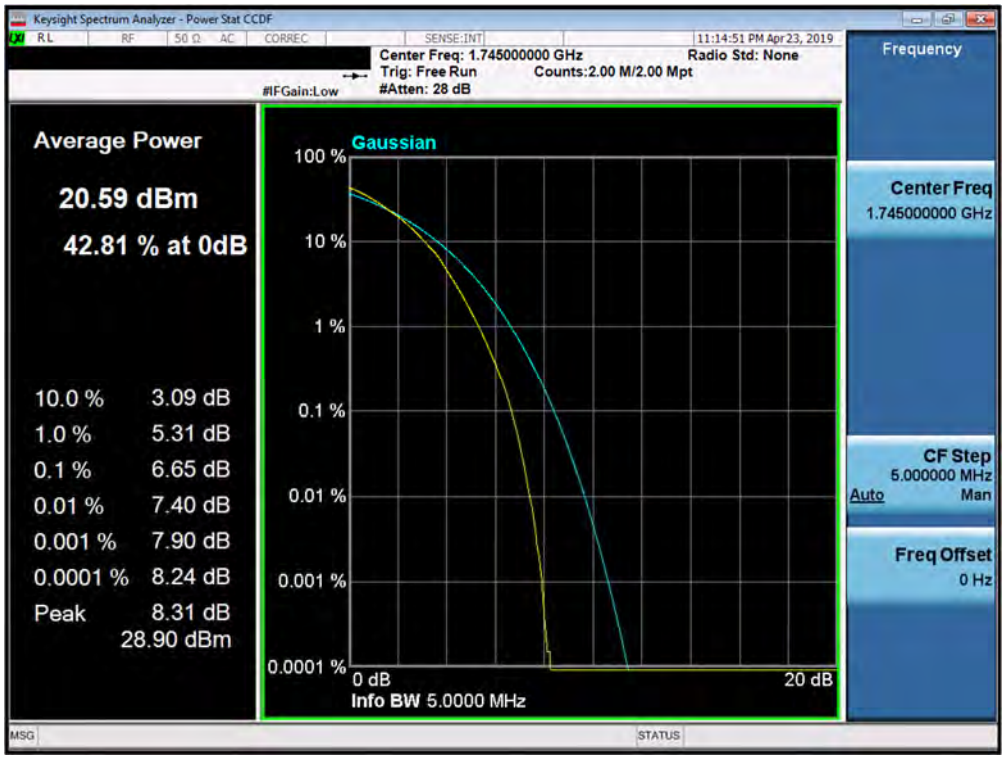
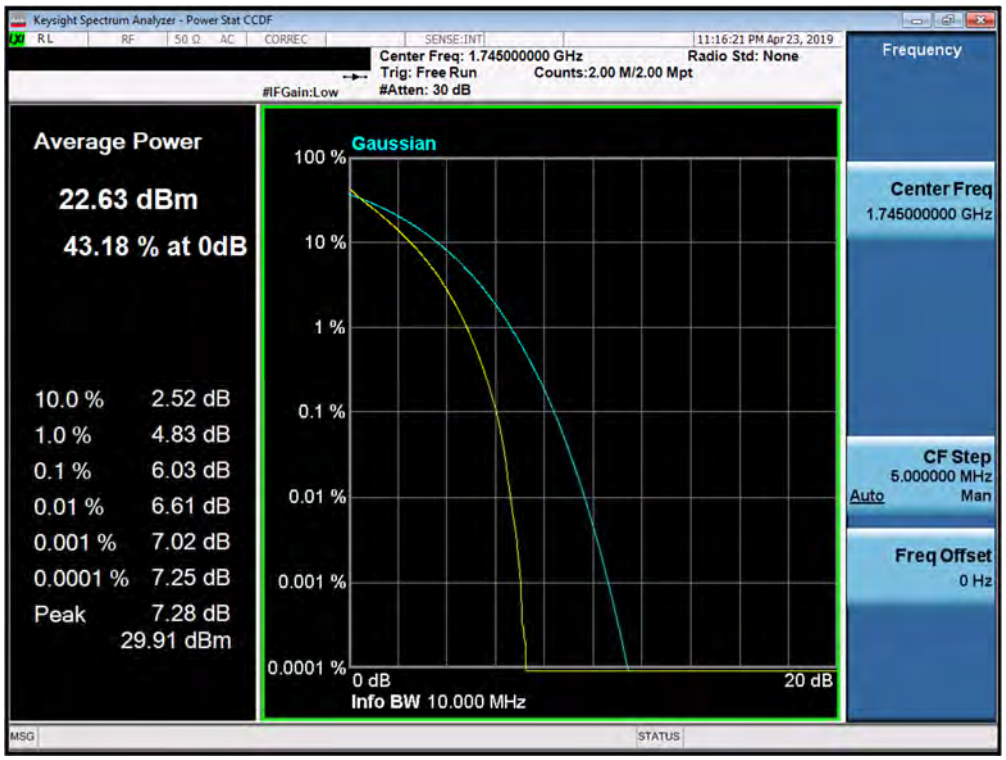


Plot 7-358. PAR Plot (Band 66/4 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-359. PAR Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

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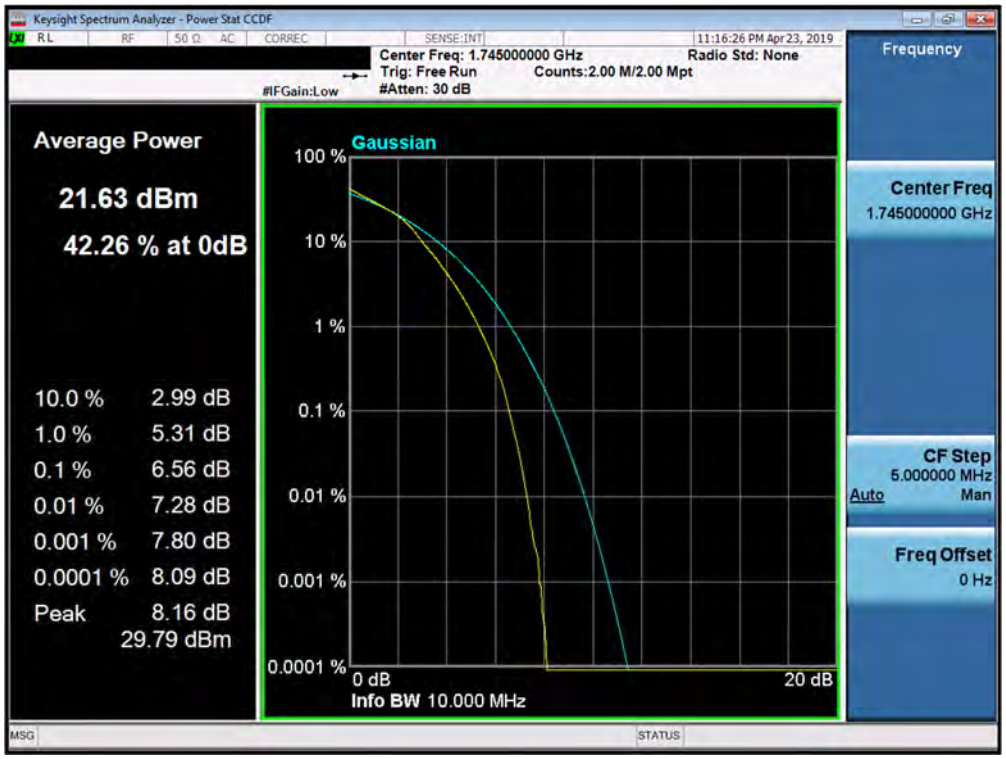
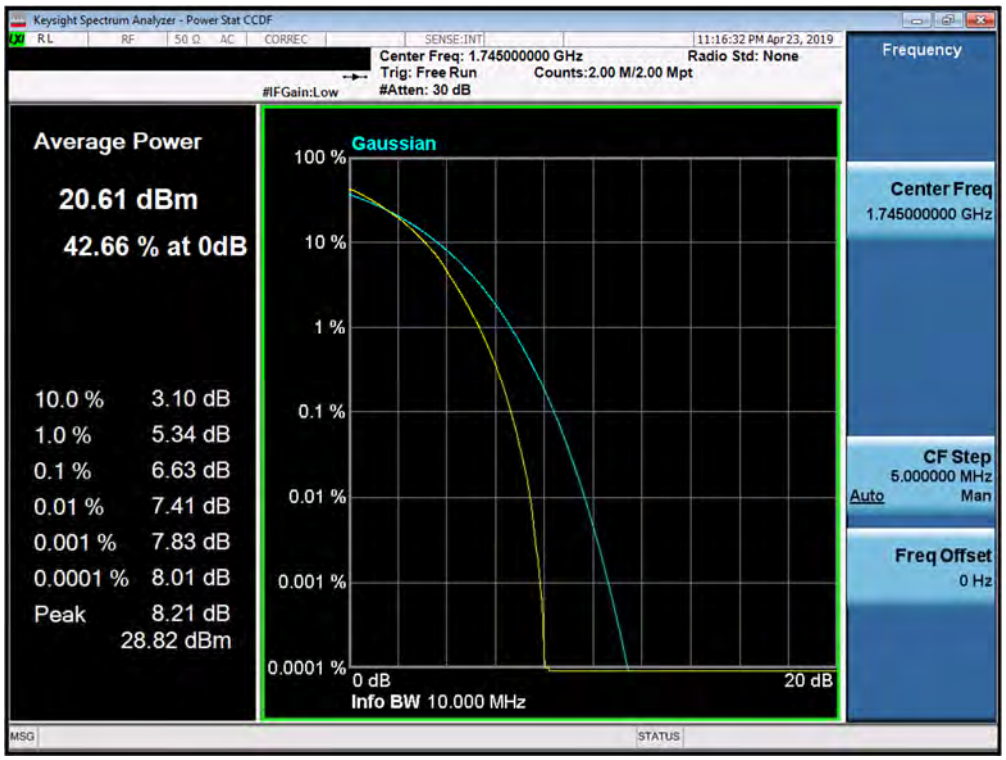


Plot 7-360. PAR Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-361. PAR Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)

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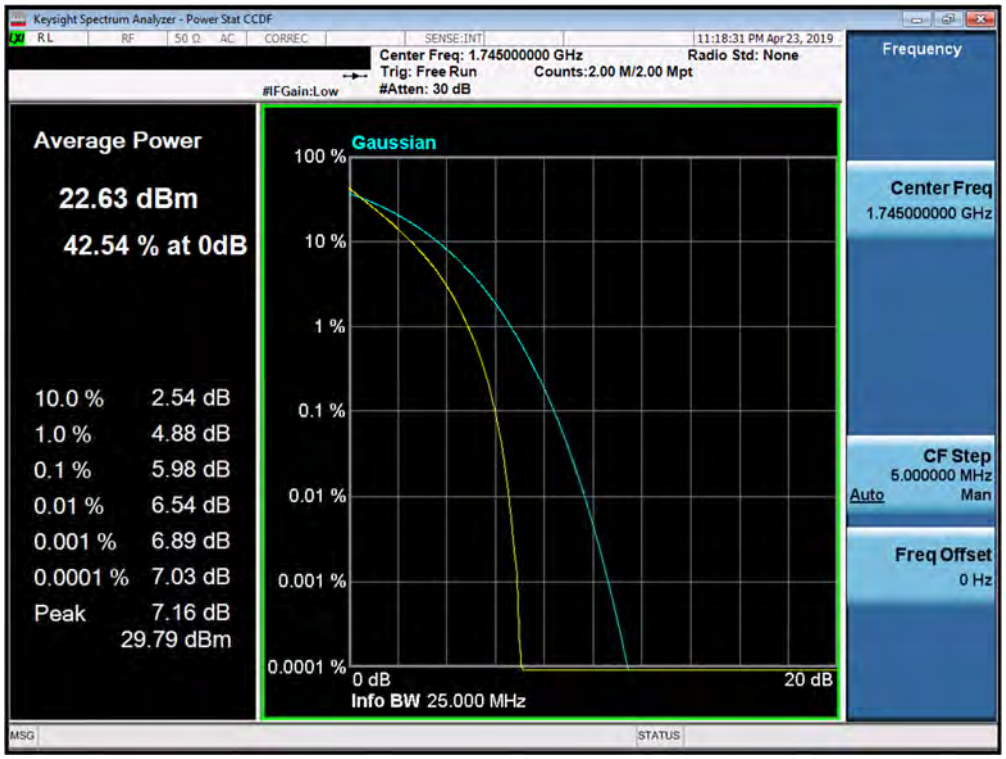
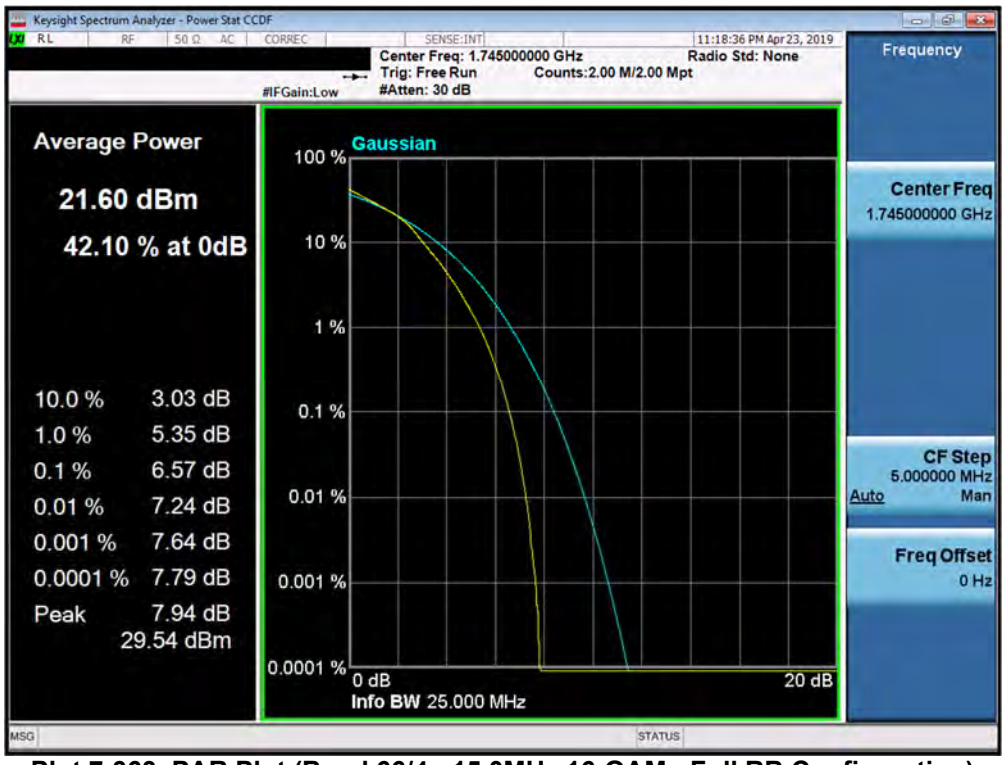


Plot 7-362. PAR Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-363. PAR Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)

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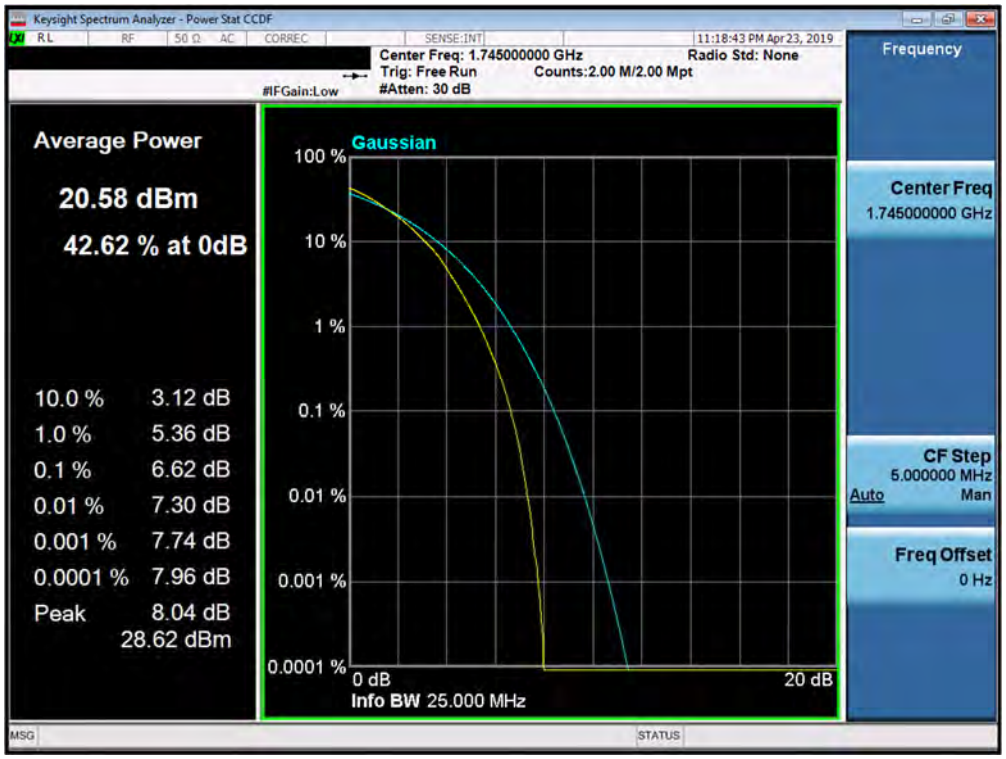
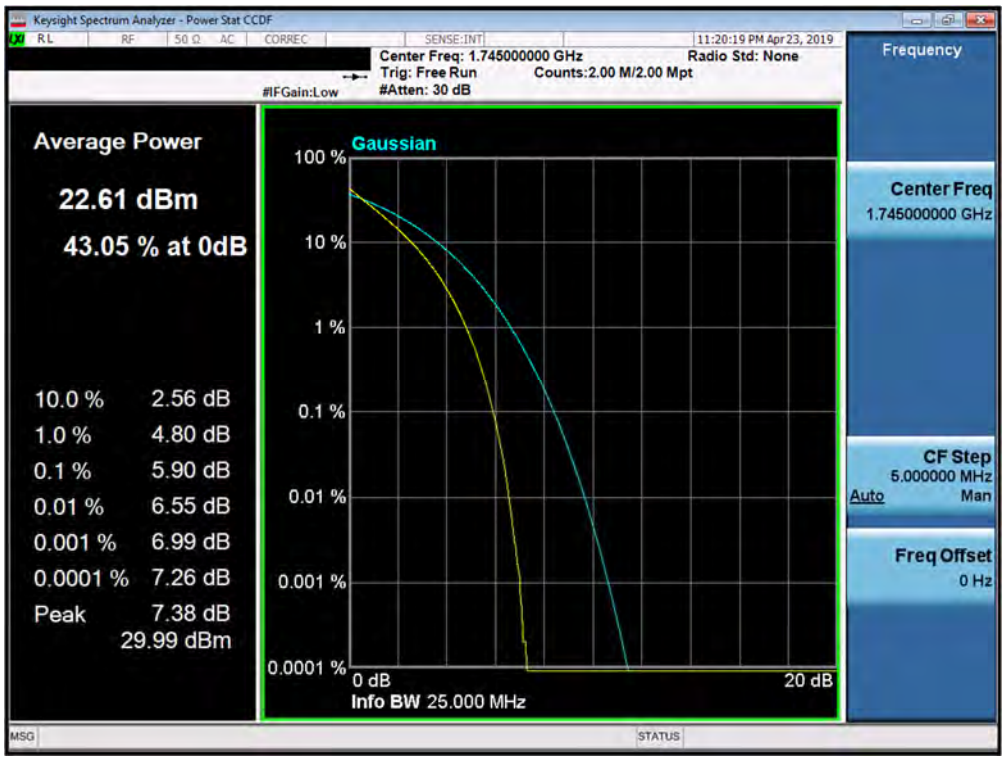


Plot 7-364. PAR Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-365. PAR Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

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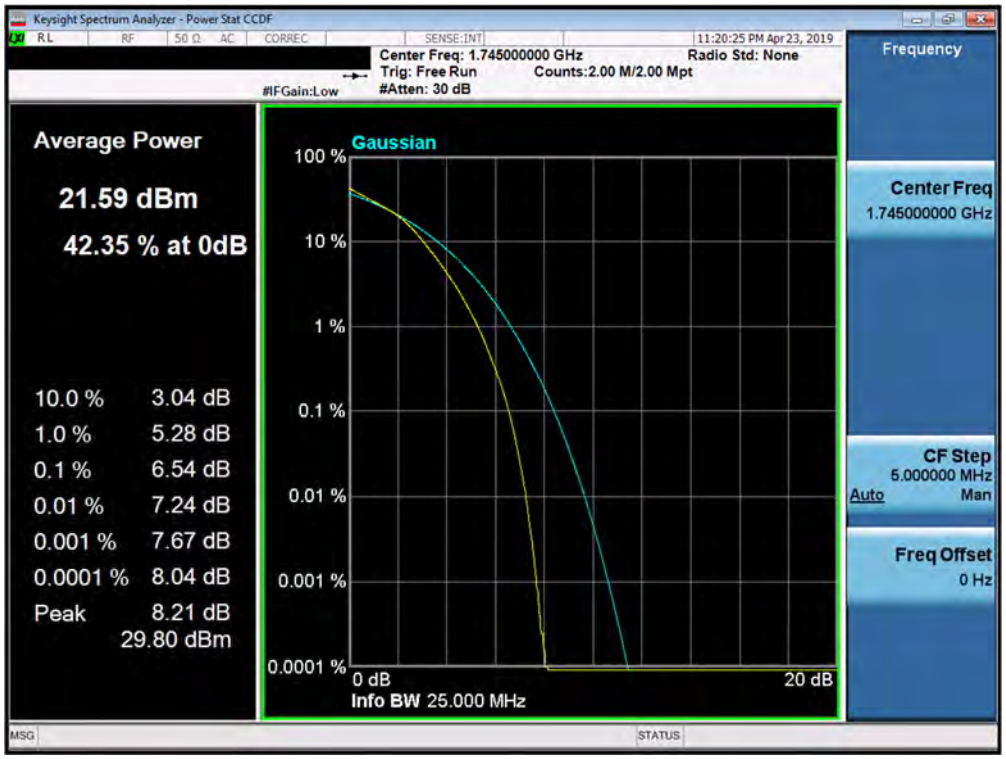
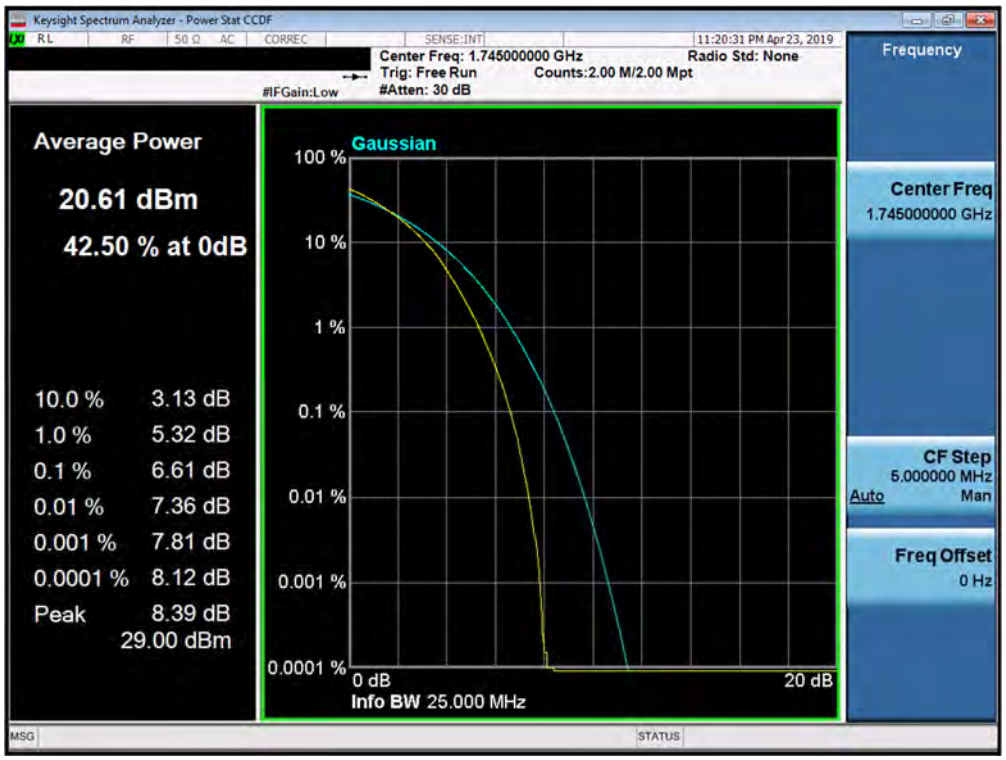


Plot 7-366. PAR Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-367. PAR Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

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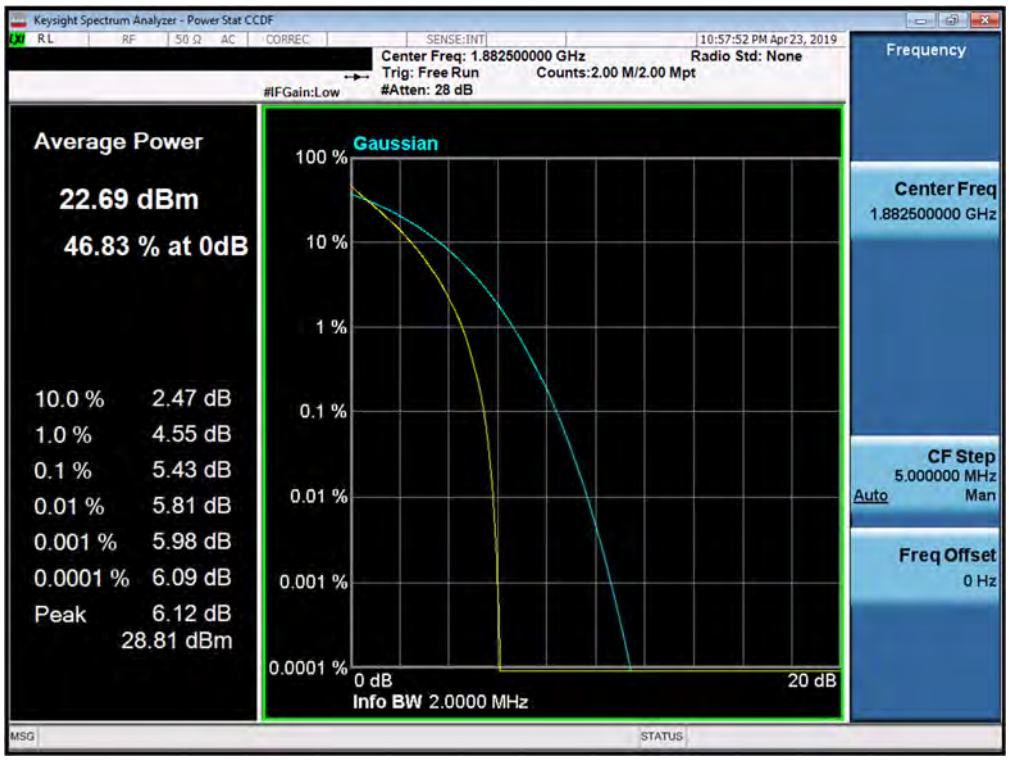
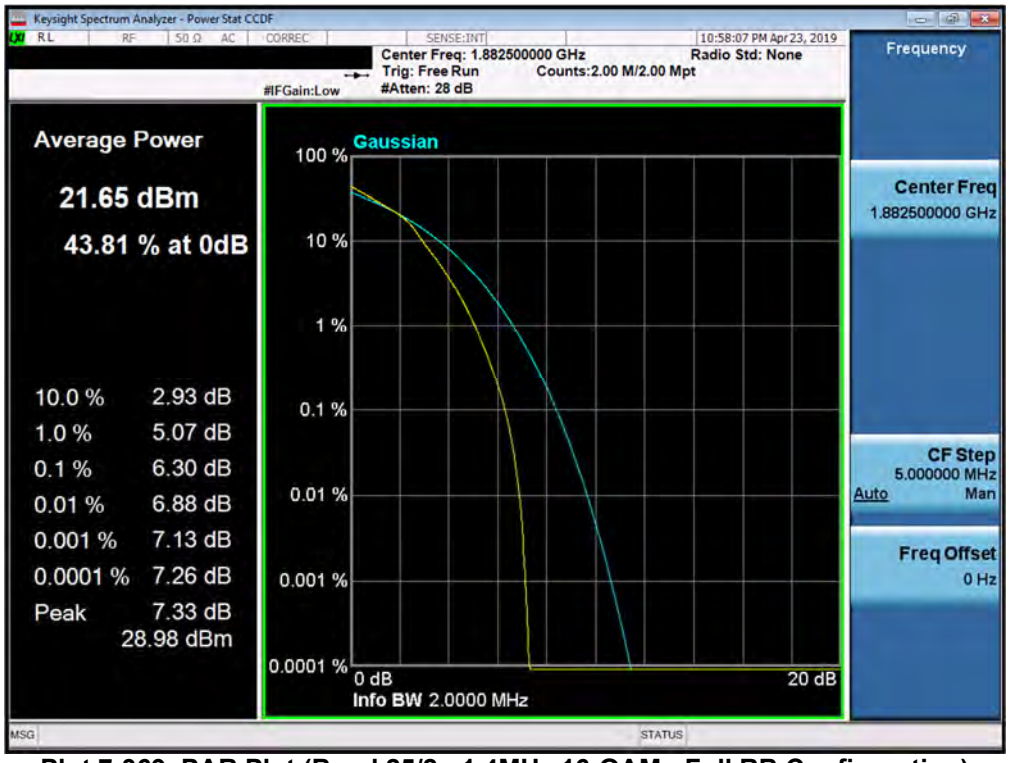
Band 25/2



Plot 7-368. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-369. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)

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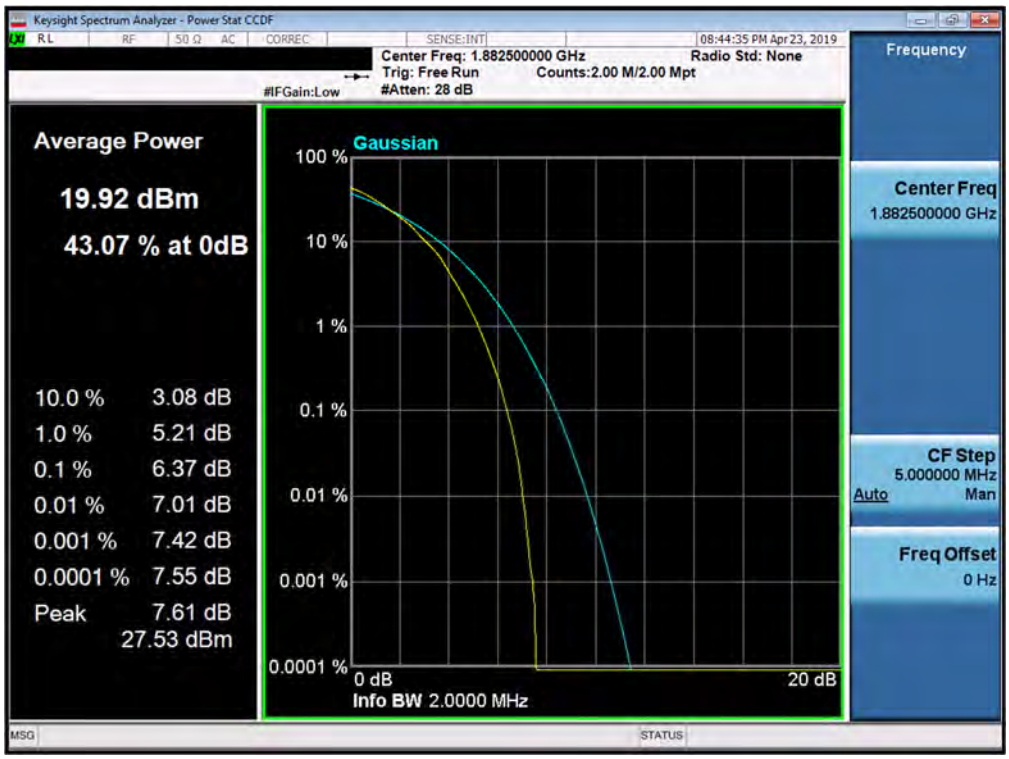
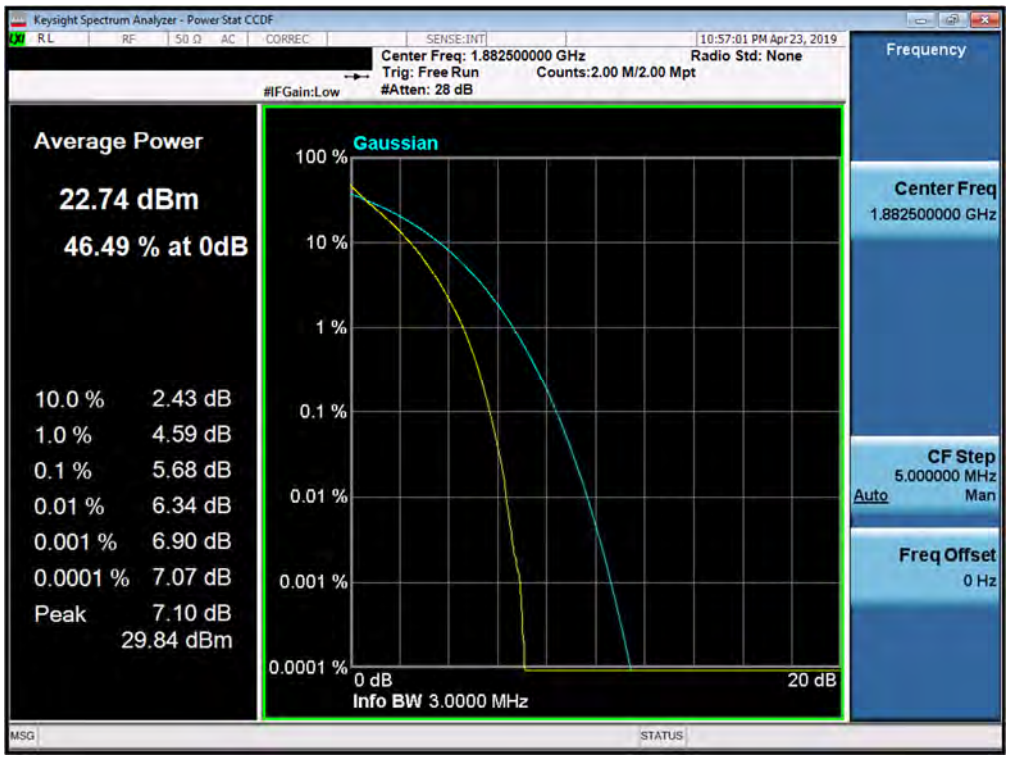


Plot 7-370. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)



Plot 7-371. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

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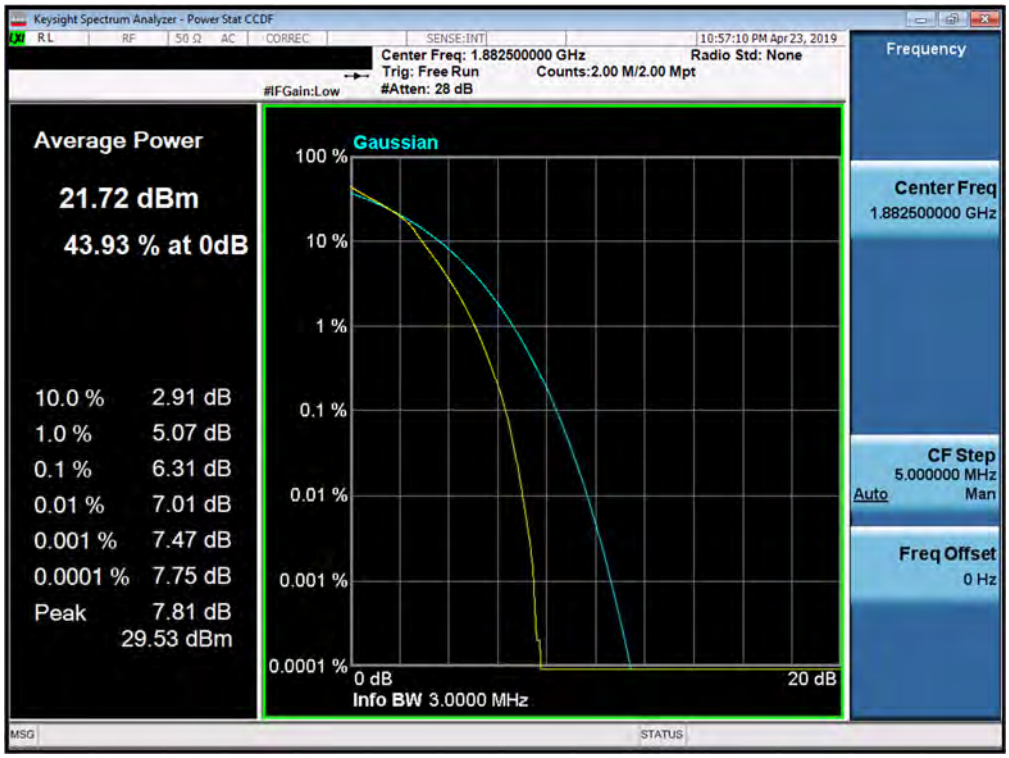
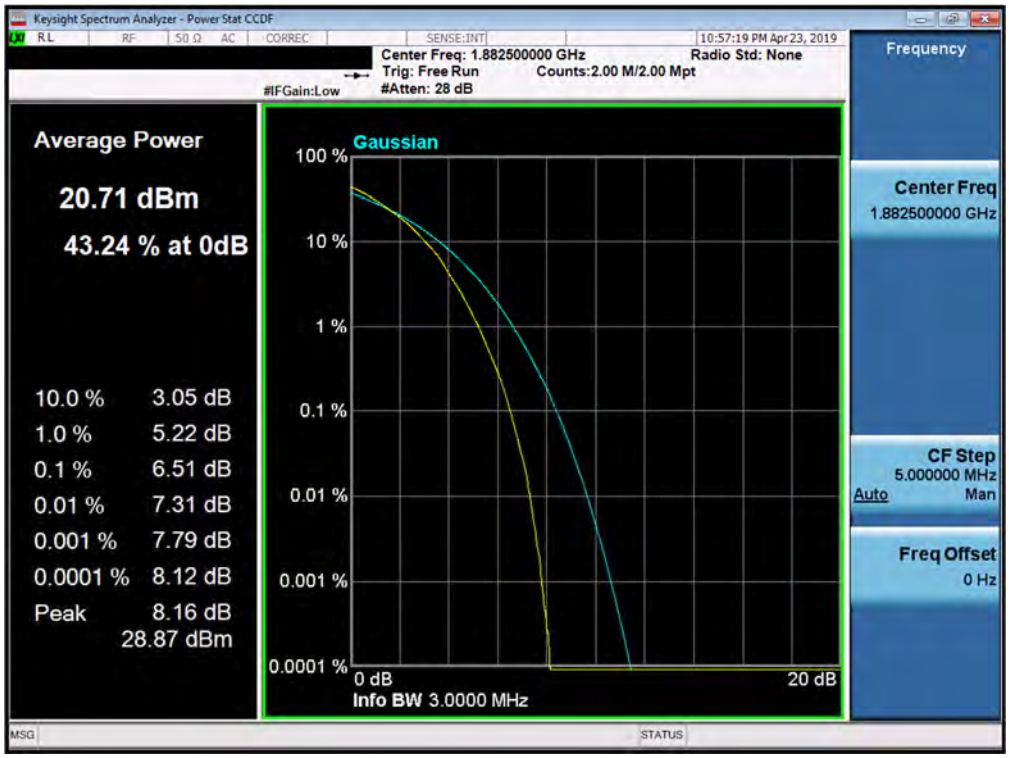


Plot 7-372. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



Plot 7-373. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)

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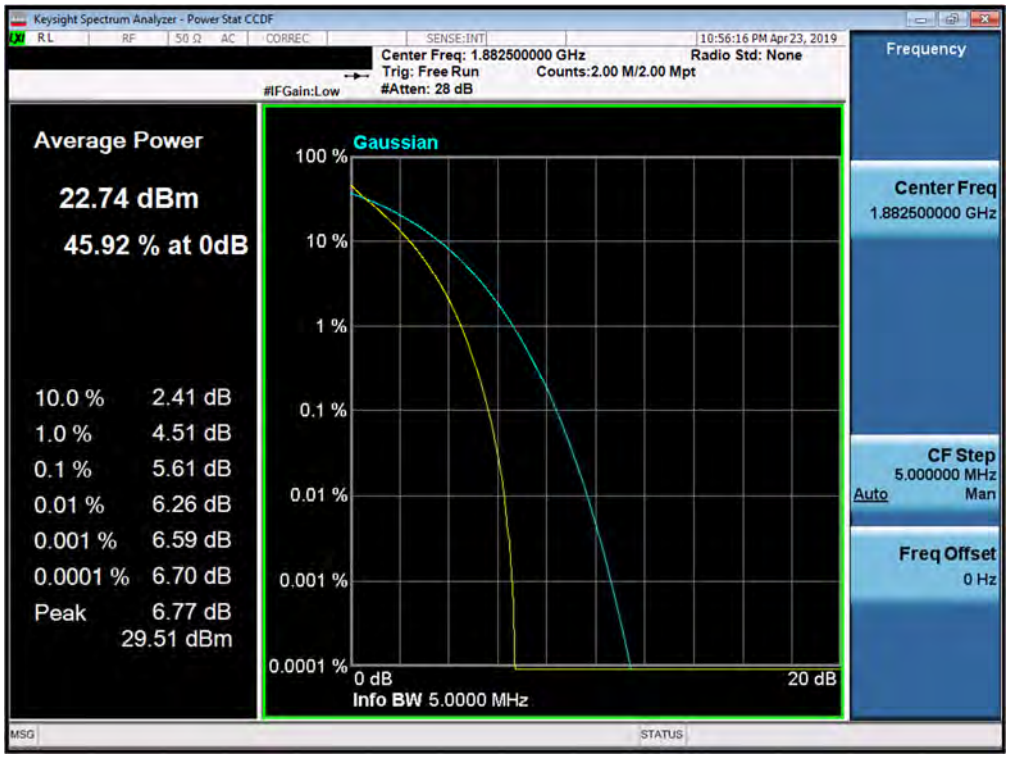
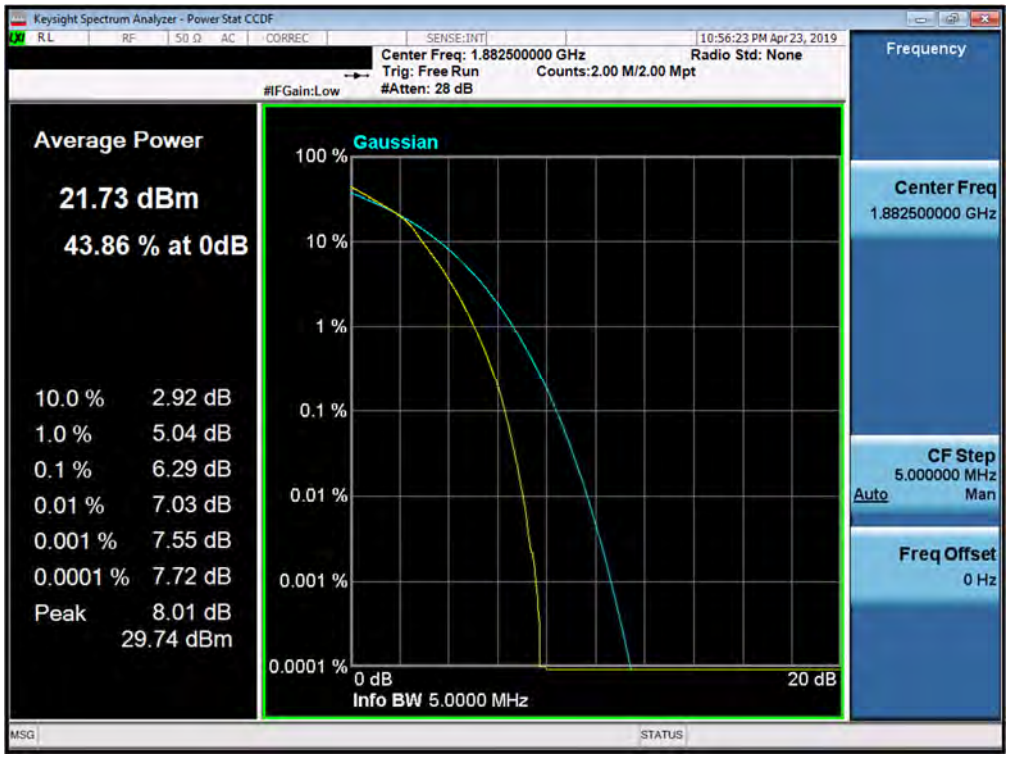


Plot 7-374. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-375. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

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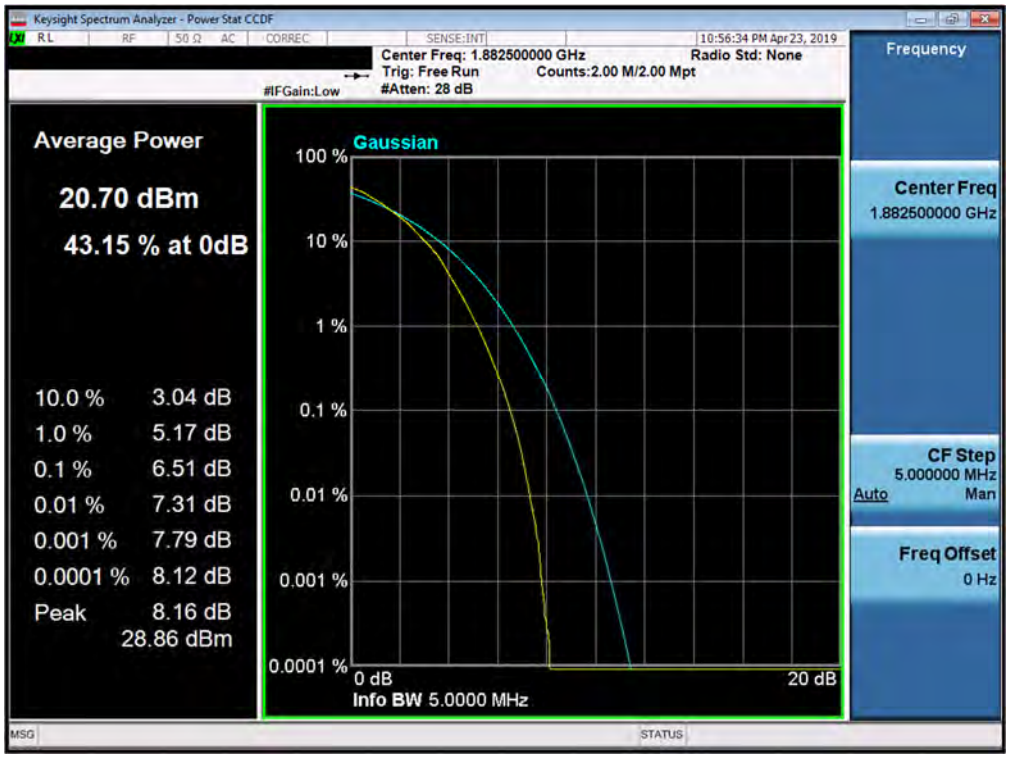
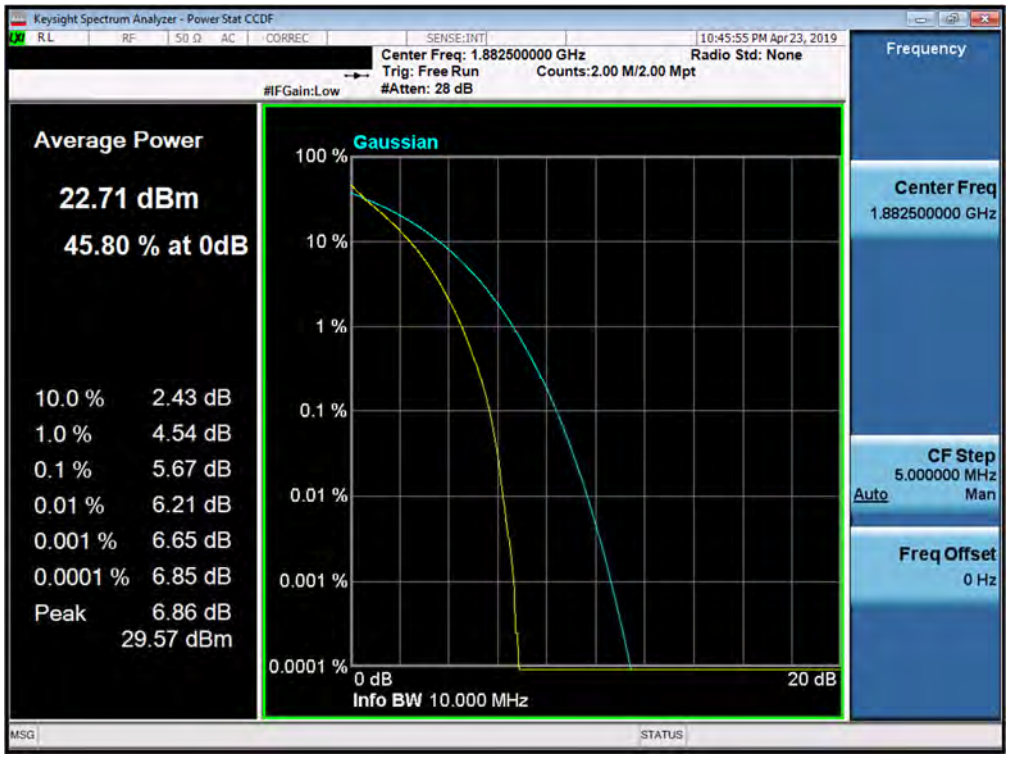


Plot 7-376. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)



Plot 7-377. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

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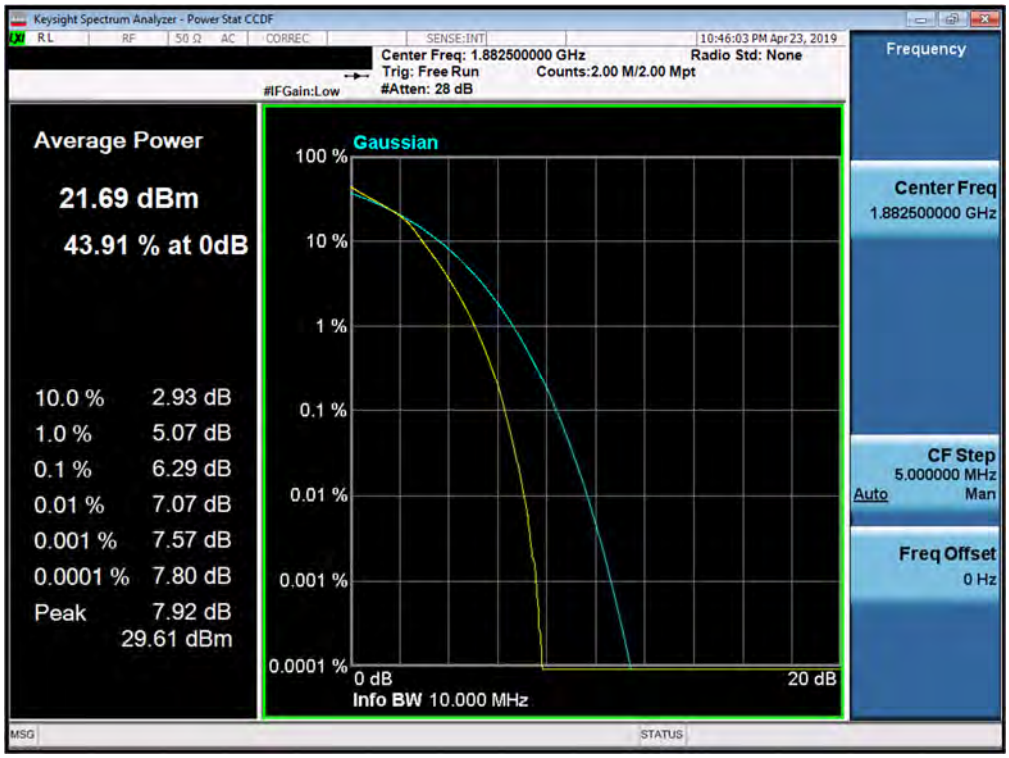
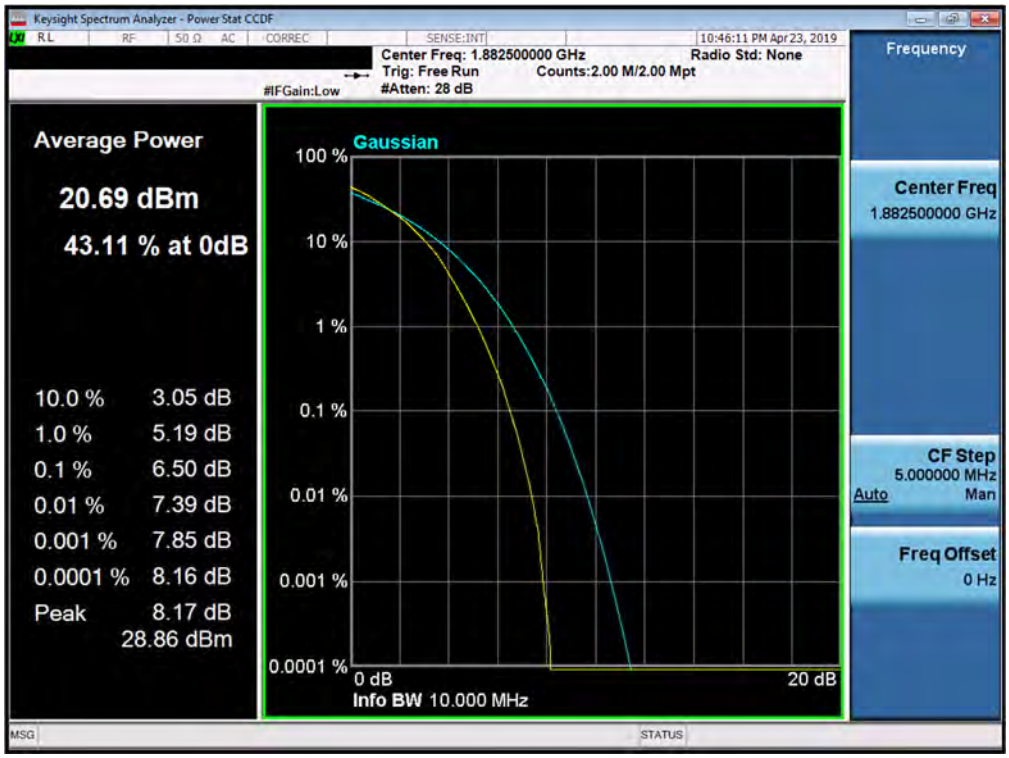


Plot 7-378. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



Plot 7-379. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)

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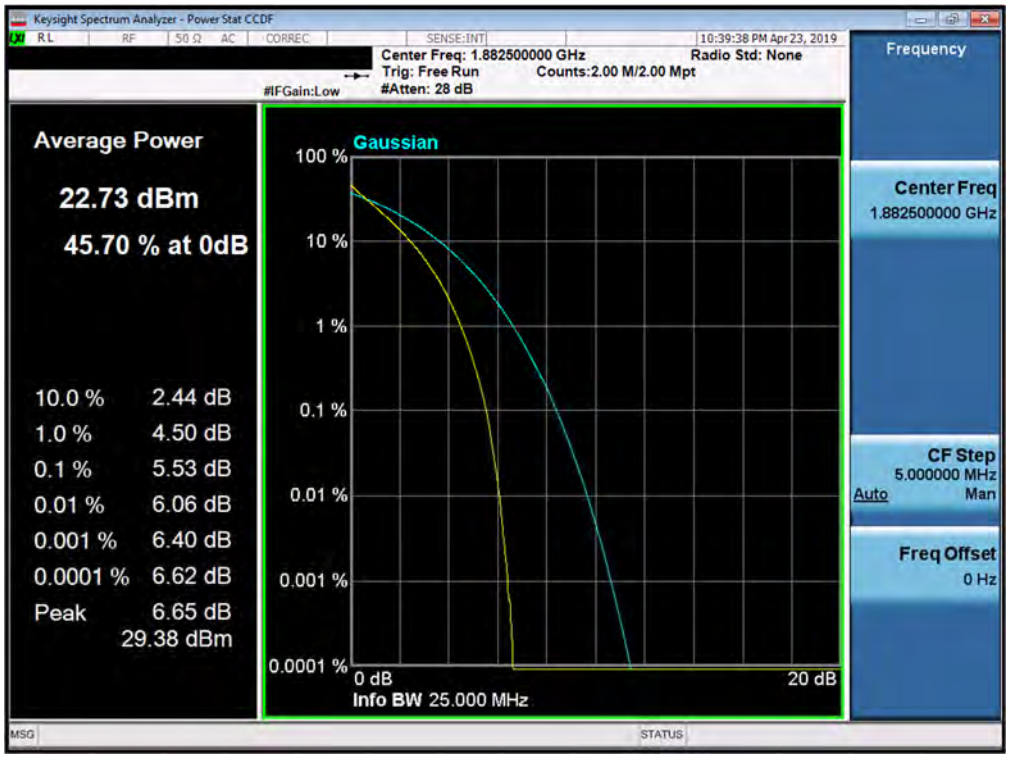
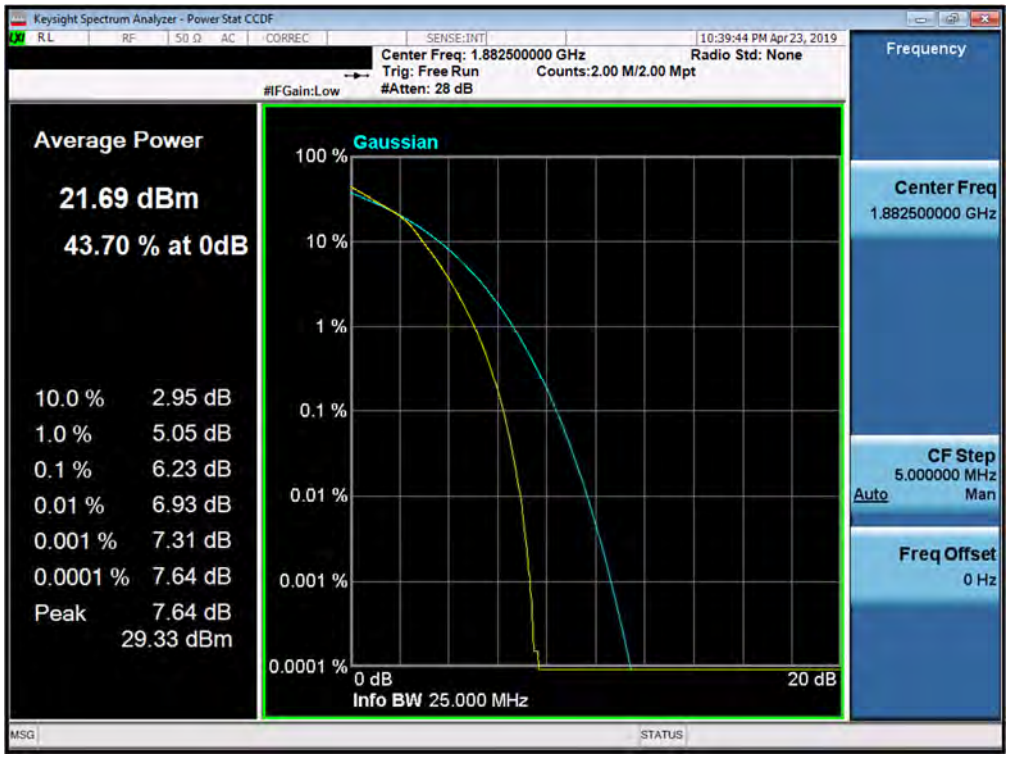


Plot 7-380. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-381. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

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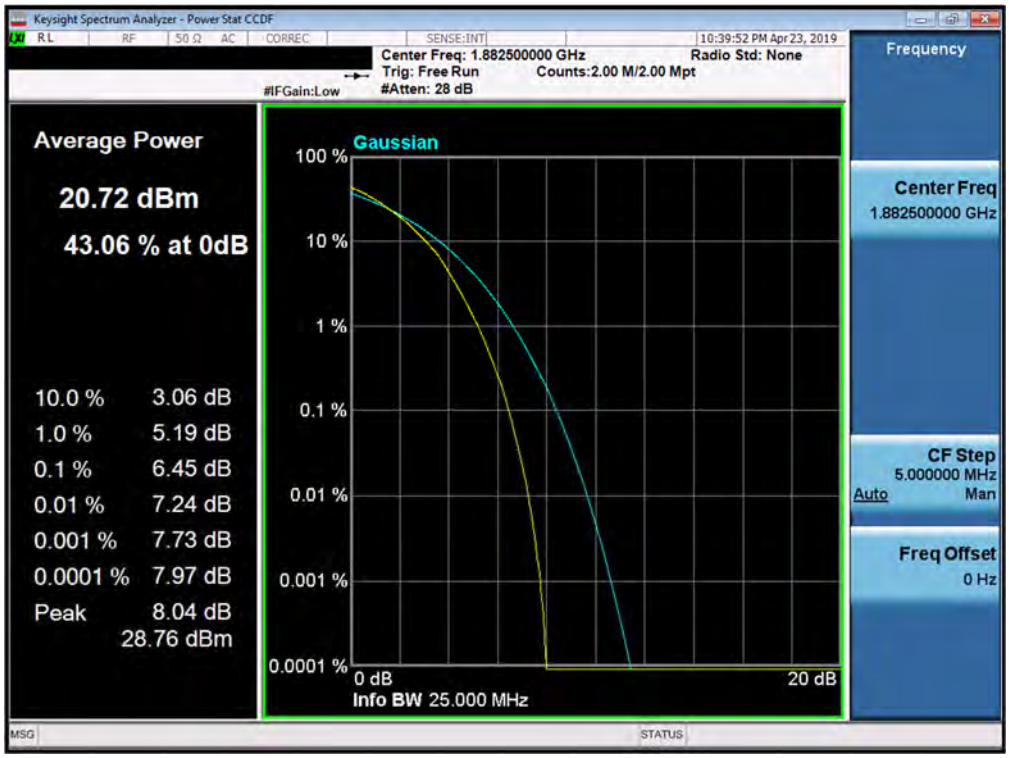
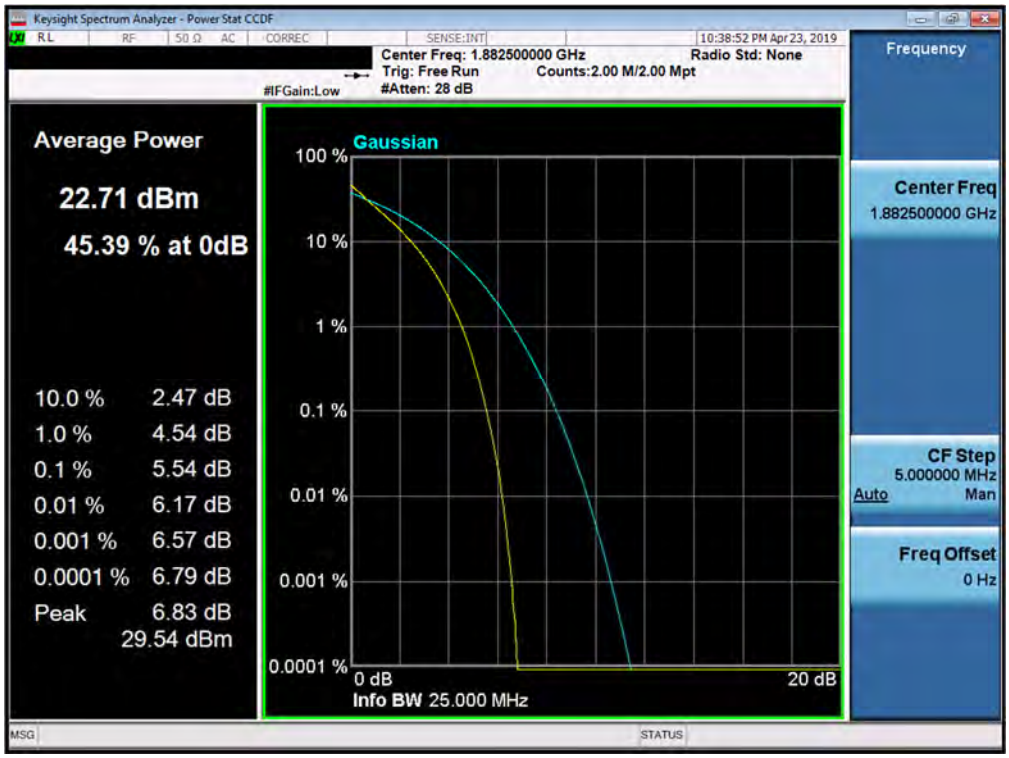


Plot 7-382. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)



Plot 7-383. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

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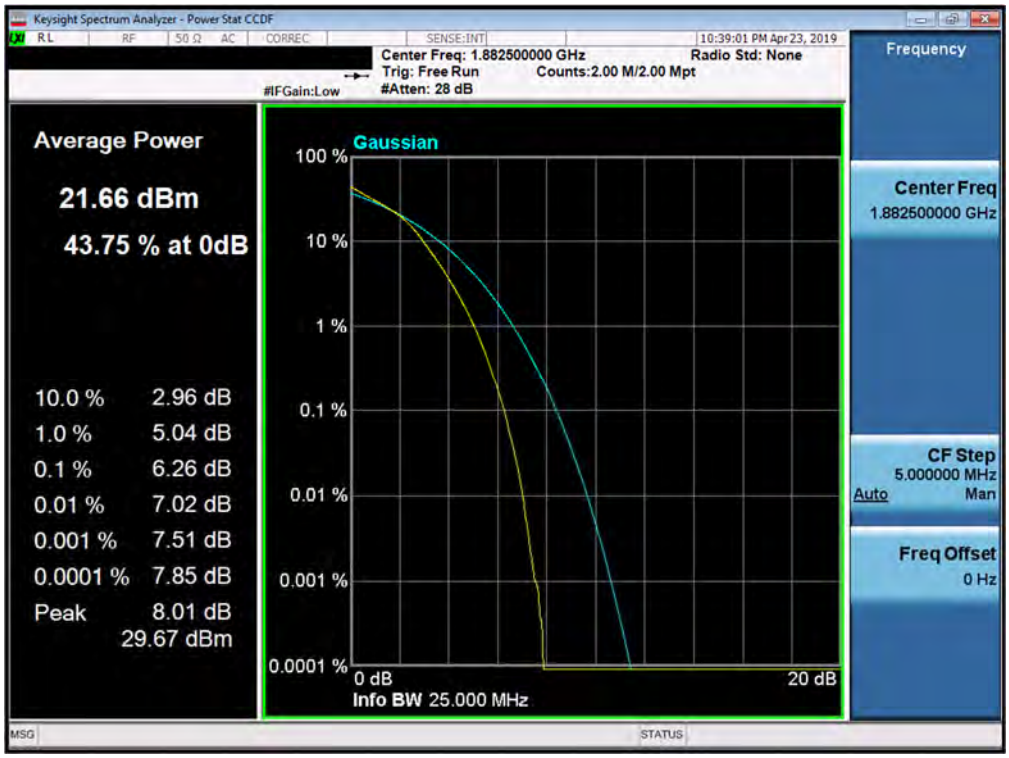
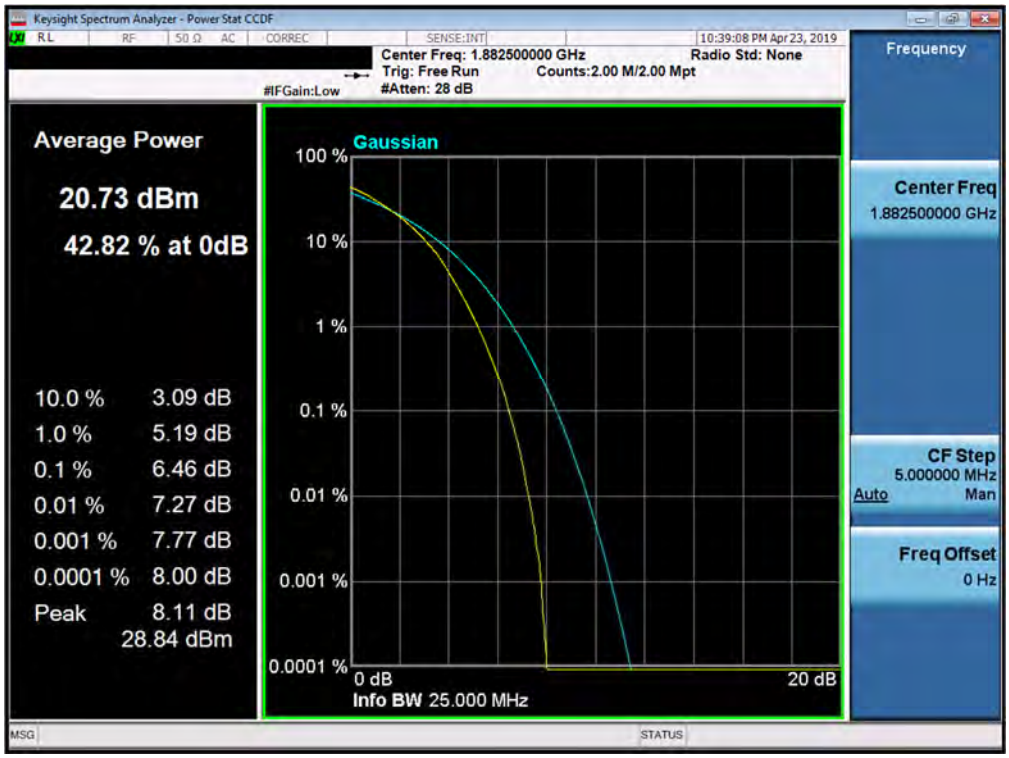


Plot 7-384. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-385. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

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7.6 Additional Maximum Power Reduction (A-MPR)
§2.1046

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.2.2

Test Settings

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

Test Setup

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

Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None.

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Test Case	NS	MCC	MNC	Channel BW [MHz]	Channel Number	Channel Frequency [MHz]	Modulation	RB Size	RB Offset	MPR [dB]	A-MPR [dB]	Measured Power [dBm]	Lowest Typical Power [dBm]	Delta [dB]
1	01	310	120	5	39675	2498.5	QPSK	1	0	0	≤ 3	24.99	23.0	**1.99**
							16-QAM			≤ 1		23.74	22.0	**1.74**
							64-QAM			≤ 2		22.61	21.0	**1.61**
2				5	39675	2498.5	QPSK	1	9	0	0	27.12	26.0	**1.12**
							16-QAM			≤ 1		26.56	25.0	**1.56**
							64-QAM			≤ 2		25.72	24.0	**1.72**
3				10	39700	2501	QPSK	1	0	0	≤ 5	22.90	21.0	**1.90**
							16-QAM	1	0	≤ 1		21.73	20.0	**1.73**
							64-QAM	1	0	≤ 2		20.24	19.0	**1.24**
4				10	39700	2501	QPSK	20	0	0	≤ 2	25.05	23.0	**2.05**
							16-QAM	20	0	≤ 1		24.07	22.0	**2.07**
							64-QAM	20	0	≤ 2		22.77	21.0	**1.77**
5				10	39700	2501	QPSK	50	0	0	≤ 3	23.97	22.0	**1.97**
							16-QAM	50	0	≤ 1		22.81	21.0	**1.81**
							64-QAM	50	0	≤ 2		21.80	20.0	**1.80**
6				10	39700	2501	QPSK	25	20	0	≤ 1	25.92	24.0	**1.92**
							16-QAM	25	20	≤ 1		25.06	23.0	**2.06**
							64-QAM	25	20	≤ 2		24.15	22.0	**2.15**
7				10	39700	2501	QPSK	1	36	0	0	26.51	26.0	**0.51**
							16-QAM	1	36	≤ 1		25.99	25.0	**0.99**
							64-QAM	1	36	≤ 2		25.85	24.0	**1.85**
8				15	39725	2503.5	QPSK	1	0	0	≤ 5	23.02	21.0	**2.02**
							16-QAM	1	0	≤ 1		21.89	20.0	**1.89**
							64-QAM	1	0	≤ 2		20.20	19.0	**1.20**
9				15	39725	2503.5	QPSK	20	0	0	≤ 2	25.02	23.0	**2.02**
							16-QAM	20	0	≤ 1		23.97	22.0	**1.97**
							64-QAM	20	0	≤ 2		22.92	21.0	**1.92**
10				15	39725	2503.5	QPSK	75	0	0	≤ 4	22.79	21.0	**1.79**
							16-QAM	75	0	≤ 1		21.90	20.0	**1.90**
							64-QAM	75	0	≤ 2		20.87	19.0	**1.87**
11				15	39725	2503.5	QPSK	50	15	0	≤ 3	24.09	22.0	**2.09**
							16-QAM	50	15	≤ 1		22.90	21.0	**1.90**
							64-QAM	50	15	≤ 2		21.90	20.0	**1.90**
12				15	39725	2503.5	QPSK	1	60	0	0	26.83	26.0	**0.83**
							16-QAM	1	60	≤ 1		25.02	25.0	**0.02**
							64-QAM	1	60	≤ 2		24.43	24.0	**0.43**
13				20	39750	2506	QPSK	1	0	0	≤ 5	23.07	21.0	**2.07**
							16-QAM	1	0	≤ 1		21.95	20.0	**1.95**
							64-QAM	1	0	≤ 2		20.41	19.0	**1.41**
14				20	39750	2506	QPSK	20	0	0	≤ 2	25.03	23.0	**2.03**
							16-QAM	20	0	≤ 1		24.10	22.0	**2.10**
							64-QAM	20	0	≤ 2		22.99	21.0	**1.99**
15				20	39750	2506	QPSK	100	0	0	≤ 4	22.78	21.0	**1.78**
							16-QAM	100	0	≤ 1		21.91	20.0	**1.91**
							64-QAM	100	0	≤ 2		20.88	19.0	**1.88**
16				20	39750	2506	QPSK	75	24	0	≤ 3	24.04	22.0	**2.04**
							16-QAM	75	24	≤ 1		22.92	21.0	**1.92**
							64-QAM	75	24	≤ 2		21.93	20.0	**1.93**
17				20	39750	2506	QPSK	1	77	0	0	26.65	26.0	**0.65**
							16-QAM	1	77	≤ 1		26.31	25.0	**1.31**
							64-QAM	1	77	≤ 2		25.28	24.0	**1.28**
18	01	311	490	5	39675	2498.5	QPSK	1	0	0	≤ 3	24.97	23.0	**1.97**
							16-QAM			≤ 1		23.78	22.0	**1.78**
							64-QAM			≤ 2		22.63	21.0	**1.63**
19	01	001	01	5	39675	2498.5	QPSK	1	0	0	0	27.08	26.0	**1.08**
							16-QAM			≤ 1		26.77	25.0	**1.77**
							64-QAM			≤ 2		25.93	24.0	**1.93**

Table 7-3. A-MPR Conducted Power Measurements

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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.

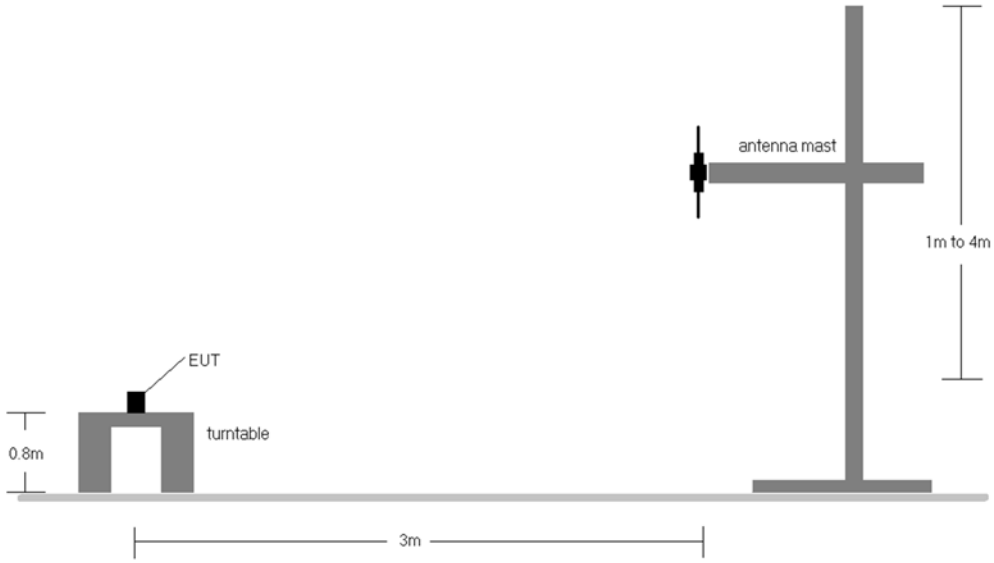

Figure 7-6. Radiated Test Setup <1GHz

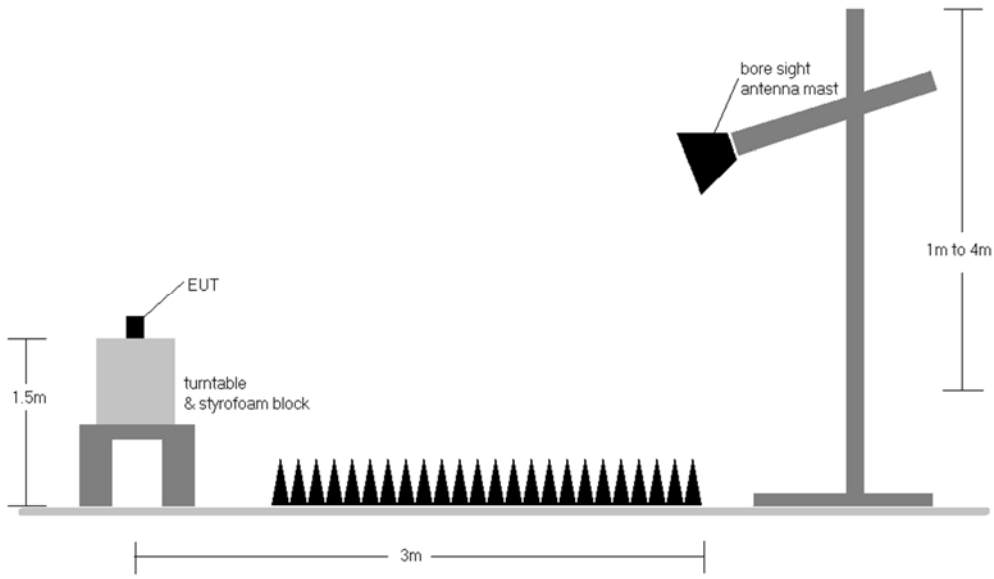

Figure 7-7. Radiated Test Setup >1GHz

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	103	182	1 / 0	18.80	2.90	19.55	0.090	34.77	-15.22
680.50	5	QPSK	H	98	187	1 / 24	18.63	3.20	19.68	0.093	34.77	-15.09
695.50	5	QPSK	H	102	185	1 / 0	18.62	3.30	**19.77**	0.095	34.77	-15.00
695.50	5	16-QAM	H	102	185	1 / 24	13.54	3.30	**14.69**	0.029	34.77	-20.08
695.50	5	64-QAM	H	102	185	1 / 0	12.48	3.30	**13.63**	0.023	34.77	-21.14
668.00	10	QPSK	H	105	186	1 / 49	18.74	2.90	19.49	0.089	34.77	-15.28
680.50	10	QPSK	H	100	180	1 / 0	18.67	3.20	19.72	0.094	34.77	-15.05
693.00	10	QPSK	H	104	188	1 / 0	18.70	3.30	**19.85**	0.097	34.77	-14.92
693.00	10	16-QAM	H	104	188	1 / 0	13.59	3.30	**14.74**	0.030	34.77	-20.03
693.00	10	64-QAM	H	104	188	1 / 49	12.52	3.30	**13.67**	0.023	34.77	-21.10
670.50	15	QPSK	H	103	181	1 / 0	18.47	3.00	19.32	0.086	34.77	-15.45
680.50	15	QPSK	H	96	181	1 / 74	18.70	3.20	**19.75**	0.094	34.77	-15.02
690.50	15	QPSK	H	94	179	1 / 0	18.51	3.30	19.66	0.092	34.77	-15.11
690.50	15	16-QAM	H	94	179	1 / 0	13.72	3.30	**14.87**	0.031	34.77	-19.90
680.50	15	64-QAM	H	96	181	1 / 74	12.65	3.20	**13.70**	0.023	34.77	-21.07
673.00	20	QPSK	H	100	183	1 / 99	19.03	3.10	19.98	0.100	34.77	-14.79
680.50	20	QPSK	H	100	181	1 / 99	19.03	3.20	20.08	0.102	34.77	-14.69
688.00	20	QPSK	H	100	187	1 / 99	18.99	3.30	**20.14**	**0.103**	34.77	-14.63
680.50	20	16-QAM	H	100	181	1 / 99	13.70	3.20	**14.75**	0.030	34.77	-20.02
680.50	20	64-QAM	H	100	181	1 / 99	12.64	3.20	**13.69**	0.023	34.77	-21.08
688.00	20	QPSK	V	154	232	1 / 99	14.17	5.14	17.16	0.052	34.77	-17.61

Table 7-4. ERP Data (Band 71)

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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	295	0	1 / 0	14.84	5.14	17.83	0.061	34.77	-16.94
707.50	1.4	QPSK	H	301	356	3 / 2	14.90	5.19	17.94	0.062	34.77	-16.83
715.30	1.4	QPSK	H	303	358	1 / 0	14.97	5.26	**18.08**	0.064	34.77	-16.70
715.30	1.4	16-QAM	H	100	190	3 / 2	14.05	5.26	**17.16**	0.052	34.77	-17.62
715.30	1.4	64-QAM	H	100	190	1 / 0	13.19	5.26	**16.30**	0.043	34.77	-18.48
700.50	3	QPSK	H	304	353	1 / 0	14.90	5.14	17.89	0.062	34.77	-16.88
707.50	3	QPSK	H	293	2	1 / 14	15.00	5.19	18.04	0.064	34.77	-16.73
714.50	3	QPSK	H	295	354	1 / 0	14.98	5.25	**18.08**	0.064	34.77	-16.69
714.50	3	16-QAM	H	100	184	1 / 14	13.99	5.25	**17.09**	0.051	34.77	-17.68
707.50	3	64-QAM	H	101	183	1 / 0	13.10	5.19	**16.14**	0.041	34.77	-18.63

Table 7-5. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
701.50	5	QPSK	H	300	6	1 / 24	14.86	5.15	17.86	0.061	34.77	-16.91
707.50	5	QPSK	H	305	9	1 / 24	15.14	5.19	18.18	0.066	34.77	-16.59
713.50	5	QPSK	H	312	5	1 / 24	15.16	5.24	**18.25**	0.067	34.77	-16.52
713.50	5	16-QAM	H	312	5	1 / 24	14.26	5.24	**17.35**	0.054	34.77	-17.42
713.50	5	64-QAM	H	312	5	1 / 24	13.20	5.24	**16.29**	0.043	34.77	-18.48
704.00	10	QPSK	H	299	359	1 / 49	15.11	5.17	18.13	0.065	34.77	-16.64
707.50	10	QPSK	H	296	8	1 / 49	15.08	5.19	18.12	0.065	34.77	-16.65
711.00	10	QPSK	H	311	9	1 / 49	15.19	5.22	**18.26**	**0.067**	34.77	-16.51
711.00	10	16-QAM	H	311	9	1 / 49	14.13	5.22	**17.20**	0.053	34.77	-17.57
711.00	10	64-QAM	H	311	9	1 / 49	13.19	5.22	**16.26**	0.042	34.77	-18.51
711.00	10	QPSK	V	176	322	1 / 49	14.68	5.22	17.75	0.060	34.77	-17.02

Table 7-6. ERP Data (Band 12/17)

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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	147	359	1 / 24	15.31	6.09	19.25	0.084	34.77	-15.52
782.00	5	QPSK	H	149	5	1 / 24	15.83	6.13	19.81	0.096	34.77	-14.96
784.50	5	QPSK	H	150	9	1 / 24	15.98	6.18	**20.01**	**0.100**	34.77	-14.76
784.50	5	16-QAM	H	150	9	1 / 24	14.86	6.18	**18.89**	0.077	34.77	-15.88
784.50	5	64-QAM	H	150	9	1 / 24	13.83	6.18	**17.86**	0.061	34.77	-16.91
782.00	10	QPSK	H	148	19	1 / 49	15.64	6.13	**19.62**	0.092	34.77	-15.15
782.00	10	16-QAM	H	148	19	1 / 49	14.67	6.13	**18.65**	0.073	34.77	-16.12
782.00	10	64-QAM	H	148	19	1 / 49	13.43	6.13	**17.41**	0.055	34.77	-17.36
784.50	5	QPSK	V	313	196	1 / 24	14.19	6.18	18.22	0.066	34.77	-16.55

Table 7-7. 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	V	130	170	1 / 5	19.59	1.23	**18.67**	0.074	38.45	-19.78
836.50	1.4	QPSK	V	130	170	1 / 0	19.39	1.29	18.53	0.071	38.45	-19.92
848.30	1.4	QPSK	V	130	173	1 / 0	16.77	1.34	15.96	0.039	38.45	-22.49
824.70	1.4	16-QAM	V	130	170	1 / 5	18.56	1.23	**17.64**	0.058	38.45	-20.81
824.70	1.4	64-QAM	V	130	170	1 / 5	17.63	1.23	**16.71**	0.047	38.45	-21.74
825.50	3	QPSK	V	130	168	1 / 14	19.57	1.24	**18.66**	0.073	38.45	-19.80
836.50	3	QPSK	V	130	170	1 / 0	19.29	1.29	18.43	0.070	38.45	-20.02
847.50	3	QPSK	V	130	165	1 / 0	16.66	1.34	15.85	0.038	38.45	-22.60
825.50	3	16-QAM	V	130	168	1 / 14	18.42	1.24	**17.51**	0.056	38.45	-20.95
825.50	3	64-QAM	V	130	168	1 / 14	17.30	1.24	**16.39**	0.044	38.45	-22.07
826.50	5	QPSK	V	130	170	1 / 24	19.90	1.24	**18.99**	0.079	38.45	-19.46
836.50	5	QPSK	V	130	170	1 / 0	19.75	1.29	18.89	0.077	38.45	-19.56
846.50	5	QPSK	V	130	167	1 / 0	17.17	1.34	16.36	0.043	38.45	-22.10
826.50	5	16-QAM	V	130	170	1 / 24	19.02	1.24	**18.11**	0.065	38.45	-20.34
826.50	5	64-QAM	V	130	170	1 / 24	17.80	1.24	**16.89**	0.049	38.45	-21.56
829.00	10	QPSK	V	130	167	1 / 49	20.46	1.25	19.56	0.090	38.45	-18.89
836.50	10	QPSK	V	130	170	1 / 0	20.77	1.29	**19.91**	**0.098**	38.45	-18.54
844.00	10	QPSK	V	130	160	1 / 0	18.22	1.32	17.39	0.055	38.45	-21.06
836.50	10	16-QAM	V	130	170	1 / 0	19.62	1.29	**18.76**	0.075	38.45	-19.69
836.50	10	64-QAM	V	130	170	1 / 49	17.65	1.29	**16.79**	0.048	38.45	-21.66
836.50	10	QPSK	H	121	201	1 / 0	11.80	7.08	16.73	0.047	38.45	-21.72

Table 7-8. 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	130	175	1 / 74	18.06	1.26	17.17	0.052	38.45	-21.28
836.50	15	QPSK	V	130	175	1 / 0	18.57	1.29	**17.71**	0.059	38.45	-20.74
841.50	15	QPSK	V	130	175	1 / 0	18.16	1.31	17.32	0.054	38.45	-21.13
836.50	15	16-QAM	V	130	175	1 / 0	17.27	1.29	**16.41**	0.044	38.45	-22.04
836.50	15	64-QAM	V	130	175	1 / 0	16.08	1.29	**15.22**	0.033	38.45	-23.23

Table 7-9. 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	140	25	1 / 0	13.66	8.48	22.14	0.164	30.00	-7.86
1745.00	1.4	QPSK	H	140	22	1 / 0	14.05	8.38	22.43	0.175	30.00	-7.57
1779.30	1.4	QPSK	H	140	14	1 / 0	14.30	8.29	**22.59**	0.181	30.00	-7.41
1779.30	1.4	16-QAM	H	140	14	1 / 0	13.21	8.29	**21.50**	0.141	30.00	-8.50
1779.30	1.4	64-QAM	H	140	14	1 / 0	12.14	8.29	**20.43**	0.110	30.00	-9.57
1711.50	3	QPSK	H	140	17	1 / 0	13.81	8.48	22.29	0.169	30.00	-7.71
1745.00	3	QPSK	H	140	20	1 / 0	14.24	8.38	22.62	0.183	30.00	-7.38
1778.50	3	QPSK	H	140	20	1 / 0	14.72	8.29	**23.01**	**0.200**	30.00	-6.99
1778.50	3	16-QAM	H	140	20	1 / 0	13.63	8.29	**21.92**	0.155	30.00	-8.08
1778.50	3	64-QAM	H	140	20	1 / 0	12.66	8.29	**20.95**	0.124	30.00	-9.05
1712.50	5	QPSK	H	140	21	1 / 0	13.88	8.48	22.36	0.172	30.00	-7.64
1745.00	5	QPSK	H	140	23	1 / 0	14.39	8.38	**22.77**	0.189	30.00	-7.23
1777.50	5	QPSK	H	140	14	1 / 0	14.46	8.29	22.75	0.188	30.00	-7.25
1777.50	5	16-QAM	H	140	14	1 / 0	13.47	8.29	**21.76**	0.150	30.00	-8.24
1777.50	5	64-QAM	H	140	14	1 / 0	13.33	8.29	**21.62**	0.145	30.00	-8.38
1715.00	10	QPSK	H	140	18	1 / 0	13.98	8.46	22.44	0.176	30.00	-7.56
1745.00	10	QPSK	H	140	20	1 / 0	14.62	8.38	**23.00**	0.199	30.00	-7.00
1775.00	10	QPSK	H	140	15	1 / 0	14.32	8.29	22.61	0.182	30.00	-7.39
1745.00	10	16-QAM	H	140	20	1 / 0	13.50	8.38	**21.88**	0.154	30.00	-8.12
1775.00	10	64-QAM	H	140	15	1 / 0	12.14	8.29	**20.43**	0.110	30.00	-9.57
1717.50	15	QPSK	H	140	20	1 / 0	14.03	8.45	22.48	0.177	30.00	-7.52
1745.00	15	QPSK	H	140	25	1 / 0	14.18	8.38	22.56	0.180	30.00	-7.44
1772.50	15	QPSK	H	140	22	1 / 0	14.31	8.30	**22.61**	0.182	30.00	-7.39
1772.50	15	16-QAM	H	140	22	1 / 0	13.20	8.30	**21.50**	0.141	30.00	-8.50
1772.50	15	64-QAM	H	140	22	1 / 0	12.26	8.30	**20.56**	0.114	30.00	-9.44
1720.00	20	QPSK	H	140	18	1 / 0	14.24	8.44	22.68	0.185	30.00	-7.32
1745.00	20	QPSK	H	140	20	1 / 0	14.27	8.38	22.65	0.184	30.00	-7.35
1770.00	20	QPSK	H	140	12	1 / 0	14.50	8.31	**22.81**	0.191	30.00	-7.19
1770.00	20	16-QAM	H	140	12	1 / 0	13.30	8.31	**21.61**	0.145	30.00	-8.39
1770.00	20	64-QAM	H	140	12	1 / 0	12.17	8.31	**20.48**	0.112	30.00	-9.52
1778.50	3	QPSK	V	130	125	1 / 0	13.36	8.31	21.67	0.147	30.00	-8.33

Table 7-10. EIRP Data (Band 66/4)

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	120	10	1 / 0	14.33	8.27	22.60	0.182	33.01	-10.41
1882.50	1.4	QPSK	H	120	20	1 / 0	14.34	8.29	**22.63**	0.183	33.01	-10.38
1914.30	1.4	QPSK	H	120	6	1 / 0	14.24	8.33	22.57	0.181	33.01	-10.44
1882.50	1.4	16-QAM	H	120	20	1 / 0	13.31	8.29	**21.60**	0.145	33.01	-11.41
1882.50	1.4	64-QAM	H	120	20	1 / 0	12.25	8.29	**20.54**	0.113	33.01	-12.47
1851.50	3	QPSK	H	120	10	1 / 0	14.35	8.27	22.62	0.183	33.01	-10.39
1882.50	3	QPSK	H	120	17	1 / 0	14.60	8.29	**22.89**	0.195	33.01	-10.12
1913.50	3	QPSK	H	120	5	1 / 0	14.35	8.33	22.68	0.185	33.01	-10.33
1882.50	3	16-QAM	H	120	17	1 / 0	13.62	8.29	**21.91**	0.155	33.01	-11.10
1882.50	3	64-QAM	H	120	17	1 / 0	12.56	8.29	**20.85**	0.122	33.01	-12.16
1852.50	5	QPSK	H	120	9	1 / 0	14.35	8.27	22.62	0.183	33.01	-10.39
1882.50	5	QPSK	H	120	19	1 / 0	14.82	8.29	**23.11**	0.205	33.01	-9.90
1912.50	5	QPSK	H	120	6	1 / 0	14.14	8.32	22.46	0.176	33.01	-10.55
1882.50	5	16-QAM	H	120	19	1 / 0	13.80	8.29	**22.09**	0.162	33.01	-10.92
1882.50	5	64-QAM	H	120	19	1 / 0	12.87	8.29	**21.16**	0.131	33.01	-11.85
1855.00	10	QPSK	H	120	12	1 / 0	14.20	8.28	22.48	0.177	33.01	-10.53
1882.50	10	QPSK	H	120	9	1 / 0	14.79	8.29	**23.08**	0.203	33.01	-9.93
1910.00	10	QPSK	H	120	5	1 / 0	13.99	8.32	22.31	0.170	33.01	-10.70
1882.50	10	16-QAM	H	120	9	1 / 0	13.62	8.29	**21.91**	0.155	33.01	-11.10
1882.50	10	64-QAM	H	120	9	1 / 0	12.58	8.29	**20.87**	0.122	33.01	-12.14
1857.50	15	QPSK	H	120	17	1 / 0	14.49	8.28	22.77	0.189	33.01	-10.24
1882.50	15	QPSK	H	120	15	1 / 0	14.85	8.29	**23.14**	**0.206**	33.01	-9.87
1907.50	15	QPSK	H	120	11	1 / 0	14.17	8.31	22.48	0.177	33.01	-10.53
1882.50	15	16-QAM	H	120	15	1 / 0	13.69	8.29	**21.98**	0.158	33.01	-11.03
1882.50	15	64-QAM	H	120	15	1 / 0	12.67	8.29	**20.96**	0.125	33.01	-12.05
1860.00	20	QPSK	H	120	16	1 / 0	14.64	8.28	22.92	0.196	33.01	-10.09
1882.50	20	QPSK	H	120	17	1 / 0	14.84	8.29	**23.13**	0.206	33.01	-9.88
1905.00	20	QPSK	H	120	13	1 / 0	14.79	8.30	23.09	0.204	33.01	-9.92
1905.00	20	16-QAM	H	120	13	1 / 0	13.77	8.30	**22.07**	0.161	33.01	-10.94
1882.50	20	64-QAM	H	120	17	1 / 0	12.64	8.29	**20.93**	0.124	33.01	-12.08
1882.50	15	QPSK	V	110	108	1 / 0	13.98	8.29	22.27	0.169	33.01	-10.74

Table 7-11. EIRP Data (Band 25/2)

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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]
2307.50	5	QPSK	H	110	355	1 / 24	13.50	8.71	22.21	0.166	23.98	-1.77
2312.50	5	QPSK	H	108	355	1 / 0	13.98	8.71	**22.69**	0.186	23.98	-1.29
2312.50	5	16-QAM	H	108	355	1 / 12	13.87	8.71	**22.58**	0.181	23.98	-1.40
2312.50	5	64-QAM	H	108	355	1 / 12	13.74	8.71	**22.45**	0.176	23.98	-1.53
2310.00	10	QPSK	H	110	356	1 / 25	14.27	8.71	**22.98**	**0.199**	23.98	-1.00
2310.00	10	16-QAM	H	110	356	1 / 25	14.16	8.71	**22.87**	0.194	23.98	-1.11
2310.00	10	64-QAM	H	110	356	1 / 25	13.95	8.71	**22.66**	0.185	23.98	-1.32
2310.00	10	QPSK	V	102	115	1 / 25	12.34	8.71	21.05	0.127	23.98	-2.93

Table 7-12. EIRP Data (Band 30)

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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]
2502.50	5	QPSK	V	100	322	1 / 24	13.55	8.34	21.89	0.154	33.01	-11.12
2535.00	5	QPSK	V	101	314	1 / 24	13.81	8.28	**22.09**	0.162	33.01	-10.92
2567.50	5	QPSK	V	107	317	1 / 24	13.67	8.17	21.84	0.153	33.01	-11.17
2502.50	5	16-QAM	V	100	322	1 / 24	12.90	8.34	**21.24**	0.133	33.01	-11.77
2502.50	5	64-QAM	V	100	322	1 / 0	11.64	8.34	**19.98**	0.100	33.01	-13.03
2505.00	10	QPSK	V	101	311	1 / 0	13.53	8.33	21.86	0.154	33.01	-11.15
2535.00	10	QPSK	V	107	323	1 / 0	13.90	8.28	**22.18**	0.165	33.01	-10.83
2565.00	10	QPSK	V	104	324	1 / 49	13.77	8.18	21.95	0.157	33.01	-11.06
2505.00	10	16-QAM	V	101	311	1 / 0	12.85	8.33	**21.18**	0.131	33.01	-11.83
2505.00	10	64-QAM	V	101	311	1 / 0	11.63	8.33	**19.96**	0.099	33.01	-13.05
2507.50	15	QPSK	V	102	319	1 / 0	13.49	8.33	21.82	0.152	33.01	-11.19
2535.00	15	QPSK	V	100	311	1 / 0	13.89	8.28	**22.17**	0.165	33.01	-10.84
2562.50	15	QPSK	V	101	323	1 / 74	13.76	8.19	21.95	0.157	33.01	-11.06
2507.50	15	16-QAM	V	102	319	1 / 0	13.06	8.33	**21.39**	0.138	33.01	-11.62
2507.50	15	64-QAM	V	102	319	1 / 0	11.62	8.33	**19.95**	0.099	33.01	-13.06
2510.00	20	QPSK	V	100	318	1 / 0	13.43	8.33	21.76	0.150	33.01	-11.25
2535.00	20	QPSK	V	102	303	1 / 50	13.90	8.28	**22.18**	**0.165**	33.01	-10.83
2560.00	20	QPSK	V	100	319	1 / 0	13.87	8.21	22.08	0.161	33.01	-10.93
2535.00	20	16-QAM	V	102	303	1 / 50	12.73	8.28	**21.01**	0.126	33.01	-12.00
2535.00	20	64-QAM	V	102	303	1 / 50	11.52	8.28	**19.80**	0.096	33.01	-13.21
2535.00	20	QPSK	H	119	208	13.90	13.06	8.28	21.34	0.136	33.01	-11.67

Table 7-13. EIRP Data (Band 7)

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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	102	341	1 / 0	16.57	8.35	**24.92**	0.310	33.01	-8.09
2593.00	5	QPSK	H	108	339	1 / 0	16.79	8.04	24.83	0.304	33.01	-8.18
2687.50	5	QPSK	H	111	340	1 / 0	15.79	7.94	23.73	0.236	33.01	-9.28
2498.50	5	16-QAM	H	102	341	1 / 0	16.04	8.35	**24.39**	0.275	33.01	-8.62
2498.50	5	64-QAM	H	102	341	1 / 0	15.61	8.35	**23.96**	0.249	33.01	-9.05
2501.00	10	QPSK	H	105	338	1 / 0	16.68	8.34	**25.02**	**0.318**	33.01	-7.99
2593.00	10	QPSK	H	104	332	1 / 0	16.81	8.04	24.85	0.305	33.01	-8.16
2685.00	10	QPSK	H	106	332	1 / 49	15.20	7.93	23.13	0.206	33.01	-9.88
2501.00	10	16-QAM	H	105	338	1 / 0	16.07	8.34	**24.41**	0.276	33.01	-8.60
2501.00	10	64-QAM	H	105	338	1 / 49	15.45	8.34	**23.79**	0.239	33.01	-9.22
2503.50	15	QPSK	H	107	344	1 / 0	16.61	8.34	**24.95**	0.312	33.01	-8.06
2593.00	15	QPSK	H	106	342	1 / 0	16.73	8.04	24.77	0.300	33.01	-8.24
2682.50	15	QPSK	H	100	337	1 / 0	15.77	7.92	23.69	0.234	33.01	-9.32
2503.50	15	16-QAM	H	107	344	1 / 0	16.20	8.34	**24.54**	0.284	33.01	-8.47
2503.50	15	64-QAM	H	107	344	1 / 74	15.43	8.34	**23.77**	0.238	33.01	-9.24
2506.00	20	QPSK	H	105	339	1 / 50	16.26	8.33	24.59	0.288	33.01	-8.42
2593.00	20	QPSK	H	100	338	1 / 99	16.75	8.04	**24.79**	0.301	33.01	-8.22
2680.00	20	QPSK	H	100	332	1 / 0	15.74	7.91	23.65	0.232	33.01	-9.36
2593.00	20	16-QAM	H	100	338	1 / 99	16.52	8.04	**24.56**	0.286	33.01	-8.45
2506.00	20	64-QAM	H	105	339	1 / 50	15.40	8.33	**23.73**	0.236	33.01	-9.28
2501.00	10	QPSK	V	152	333	1 / 0	15.80	8.04	23.84	0.242	33.01	-9.17

Table 7-14. EIRP Data (Band 41 PC2)

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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	128	337	1 / 24	14.75	8.35	**23.10**	**0.204**	33.01	-9.91
2593.00	5	QPSK	H	121	338	1 / 0	14.33	8.04	22.37	0.172	33.01	-10.64
2687.50	5	QPSK	H	127	337	1 / 0	12.17	7.94	20.11	0.103	33.01	-12.90
2498.50	5	16-QAM	H	128	337	1 / 24	14.16	8.35	**22.51**	0.178	33.01	-10.50
2498.50	5	64-QAM	H	128	337	1 / 0	13.59	8.35	**21.94**	0.156	33.01	-11.07
2501.00	10	QPSK	H	131	336	1 / 49	14.73	8.34	**23.07**	0.203	33.01	-9.94
2593.00	10	QPSK	H	121	338	1 / 0	14.33	8.04	22.37	0.172	33.01	-10.64
2685.00	10	QPSK	H	127	337	1 / 0	12.25	7.93	20.18	0.104	33.01	-12.83
2501.00	10	16-QAM	H	131	336	1 / 0	13.83	8.34	**22.17**	0.165	33.01	-10.84
2501.00	10	64-QAM	H	131	336	1 / 0	13.58	8.34	**21.92**	0.156	33.01	-11.09
2503.50	15	QPSK	H	122	343	1 / 74	14.75	8.34	**23.09**	0.204	33.01	-9.92
2593.00	15	QPSK	H	130	338	1 / 0	14.33	8.04	22.37	0.172	33.01	-10.64
2682.50	15	QPSK	H	117	339	1 / 0	12.17	7.92	20.09	0.102	33.01	-12.92
2503.50	15	16-QAM	H	122	343	1 / 74	14.16	8.34	**22.50**	0.178	33.01	-10.51
2503.50	15	64-QAM	H	122	343	1 / 0	13.59	8.34	**21.93**	0.156	33.01	-11.08
2506.00	20	QPSK	H	123	342	1 / 50	14.31	8.33	**22.64**	0.184	33.01	-10.37
2593.00	20	QPSK	H	108	337	1 / 50	14.46	8.04	22.50	0.178	33.01	-10.51
2680.00	20	QPSK	H	127	334	1 / 50	12.32	7.91	20.23	0.105	33.01	-12.78
2506.00	20	16-QAM	H	123	342	1 / 50	13.45	8.33	**21.78**	0.151	33.01	-11.23
2506.00	20	64-QAM	H	123	342	1 / 50	12.78	8.33	**21.11**	0.129	33.01	-11.90
2498.50	5	QPSK	V	259	238	1 / 50	14.29	8.33	**22.62**	**0.183**	33.01	-10.39

Table 7-15. EIRP Data (Band 41/38)

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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.

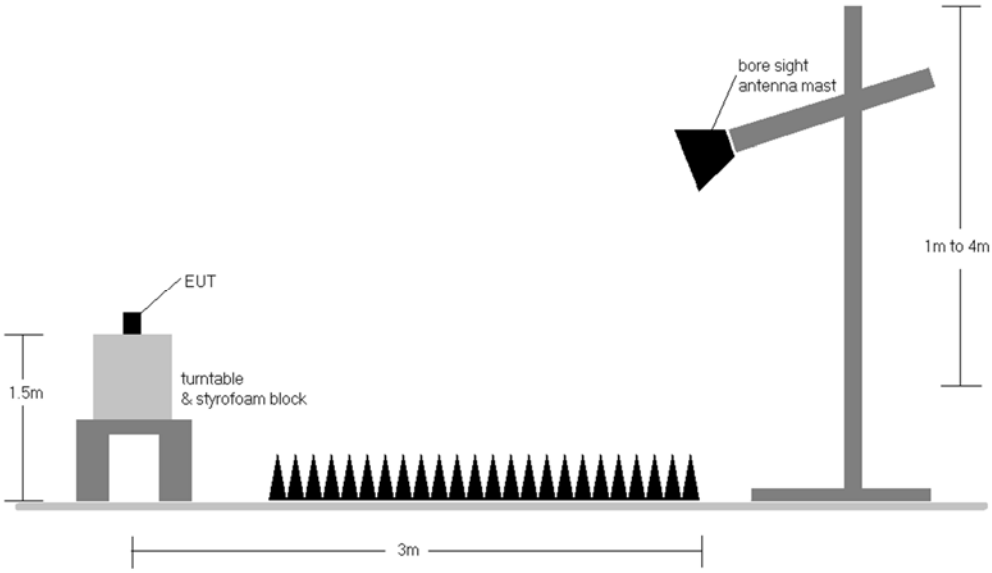

Figure 7-8. Test Instrument & Measurement Setup

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.

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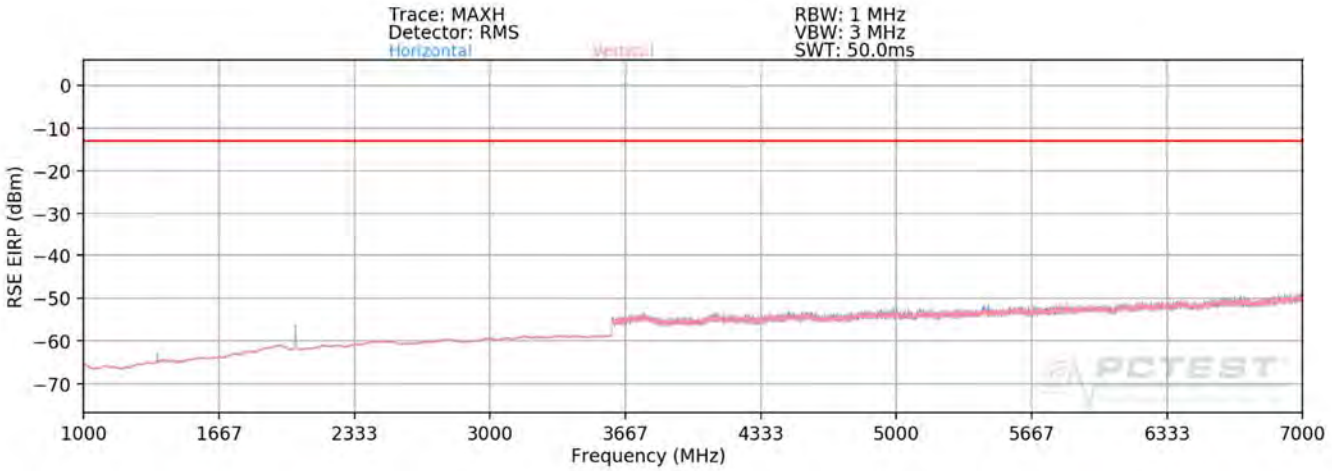
Band 71



Plot 7-386. 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	102	169	-66.55	3.15	-63.40	-50.4
2019.00	H	127	159	-55.49	3.52	-51.97	-39.0
2692.00	H	-	-	-67.01	4.77	-62.24	-49.2
3365.00	H	-	-	-66.91	6.00	-60.92	-47.9

Table 7-16. Radiated Spurious Data (Band 71 – Low Channel)

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OPERATING FREQUENCY:	680.50	MHz
CHANNEL:	133297	
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	160	181	-65.70	3.04	-62.66	-49.7
2041.50	H	160	326	-50.01	3.49	-46.53	-33.5
2722.00	H	-	-	-66.93	4.83	-62.10	-49.1
3402.50	H	-	-	-67.31	6.16	-61.15	-48.2

Table 7-17. Radiated Spurious Data (Band 71 – Mid Channel)

OPERATING FREQUENCY:	688.00	MHz
CHANNEL:	133372	
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	168	175	-67.14	2.88	-64.26	-51.3
2064.00	H	129	332	-57.00	3.50	-53.50	-40.5
2752.00	H	-	-	-67.03	4.88	-62.15	-49.2
3440.00	H	-	-	-67.35	6.22	-61.13	-48.1

Table 7-18. Radiated Spurious Data (Band 71 – High Channel)

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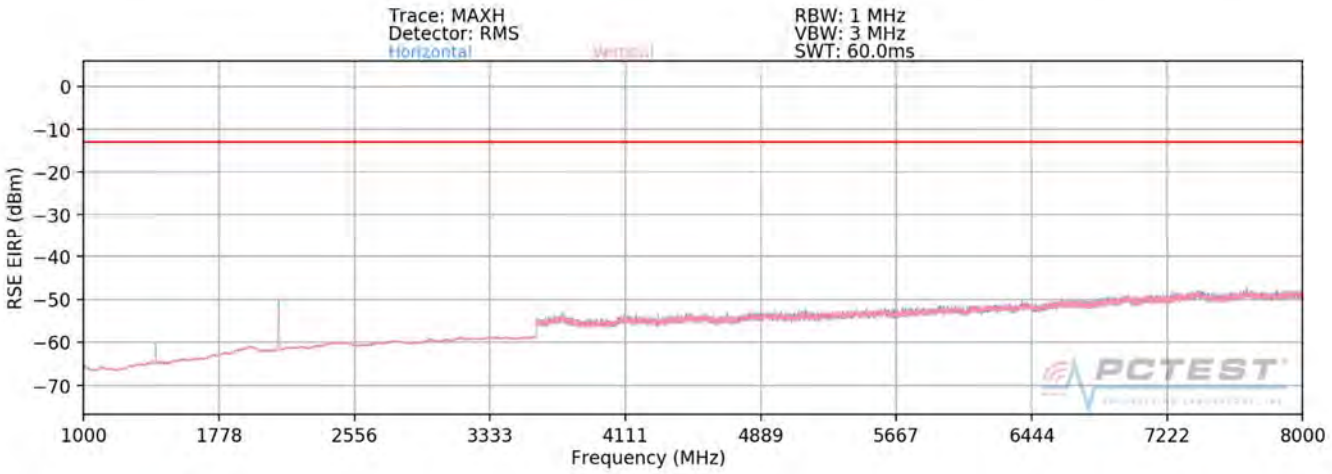
Band 12/17



Plot 7-387. Radiated Spurious Plot above 1GHz (Band 12/17)

OPERATING FREQUENCY:	704.00	MHz
CHANNEL:	23060.00	
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	152	329	-65.01	2.71	-62.29	-49.3
2112.00	H	116	325	-51.27	3.57	-47.70	-34.7
2816.00	H	-	-	-66.84	4.98	-61.86	-48.9
3520.00	H	-	-	-67.38	6.33	-61.05	-48.1

Table 7-19. Radiated Spurious Data (Band 12/17 – Low Channel)

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OPERATING FREQUENCY:	707.50	MHz
CHANNEL:	23095	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	160	138	-66.16	2.80	-63.36	-50.4
2122.50	H	113	325	-48.28	3.57	-44.70	-31.7
2830.00	H	-	-	-66.95	5.02	-61.93	-48.9
3537.50	H	-	-	-67.65	6.31	-61.34	-48.3

Table 7-20. Radiated Spurious Data (Band 12/17 – Mid Channel)

OPERATING FREQUENCY:	711.00	MHz
CHANNEL:	23130	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	154	323	-64.60	2.88	-61.72	-48.7
2133.00	H	151	332	-50.97	3.58	-47.39	-34.4
2844.00	H	-	-	-67.06	5.07	-61.99	-49.0
3555.00	H	-	-	-67.17	6.31	-60.86	-47.9

Table 7-21. Radiated Spurious Data (Band 12/17 – High Channel)

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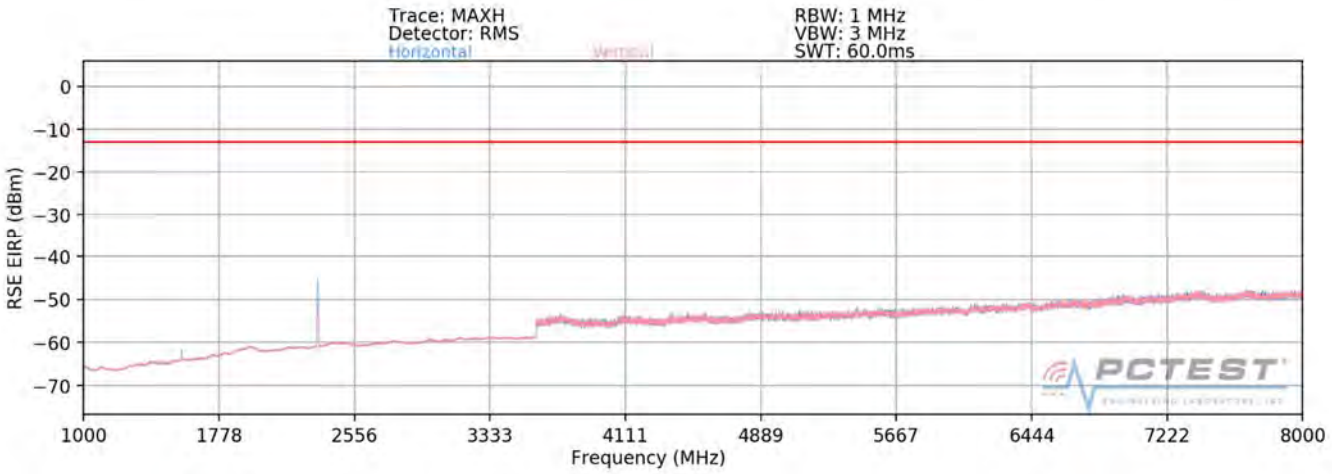
Band 13



Plot 7-388. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY:	779.50	MHz
CHANNEL:	23205	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	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]
2338.50	H	108	328	-50.45	3.99	-46.46	-33.5
3118.00	H	-	-	-67.02	5.37	-61.65	-48.7
3897.50	H	-	-	-68.22	7.06	-61.16	-48.2

Table 7-22. Radiated Spurious Data (Band 13 – Low Channel)

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OPERATING FREQUENCY:	782.00	MHz
CHANNEL:	23230	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	149	325	-49.48	4.00	-45.48	-32.5
3128.00	H	-	-	-66.99	5.38	-61.61	-48.6
3910.00	H	-	-	-68.37	7.09	-61.28	-48.3

Table 7-23. Radiated Spurious Data (Band 13 – Mid Channel)

OPERATING FREQUENCY:	784.50	MHz
CHANNEL:	23255	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.0	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]
2353.50	H	132	328	-48.44	4.02	-44.42	-31.4
3138.00	H	-	-	-66.85	5.40	-61.45	-48.5
3922.50	H	-	-	-68.31	7.13	-61.18	-48.2

Table 7-24. Radiated Spurious Data (Band 13 – High Channel)

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MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.00	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]
1559.00	H	231	20	-66.70	3.53	-63.18	-23.2
1564.00	H	234	41	-65.97	3.53	-62.44	-22.4
1569.00	H	130	32	-63.77	3.53	-60.24	-20.2

Table 7-25. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

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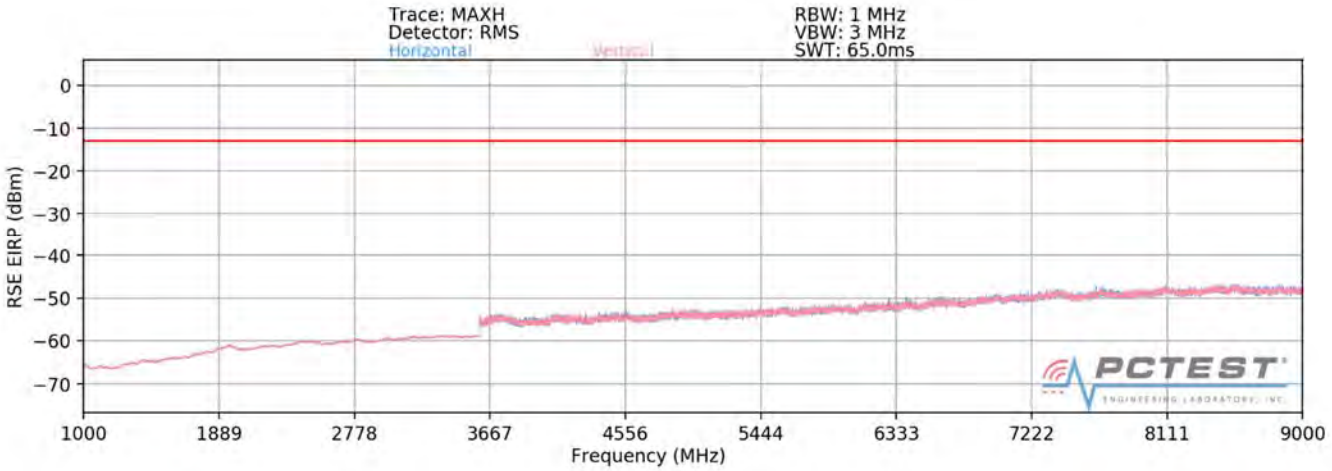
Band 26/5



Plot 7-389. Radiated Spurious Plot above 1GHz (Band 26/5)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	H	308	169	-64.96	3.61	-61.35	-48.4
2487.00	H	130	9	-40.31	4.25	-36.06	-23.1
3316.00	H	-	-	-67.06	5.83	-61.23	-48.2
4145.00	H	209	284	-67.88	7.66	-60.21	-47.2
4974.00	H	-	-	-68.80	8.56	-60.24	-47.2
5803.00	H	-	-	-66.78	8.87	-57.90	-44.9

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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	381	324	-65.03	3.62	-61.41	-48.4
2509.50	H	261	251	-47.80	4.33	-43.47	-30.5
3346.00	H	-	-	-66.61	5.92	-60.70	-47.7
4182.50	H	-	-	-67.98	7.69	-60.29	-47.3

Table 7-27. Radiated Spurious Data (Band 26/5 – Mid Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	H	248	6	-61.83	3.63	-58.20	-45.2
2532.00	H	111	36	-41.58	4.47	-37.11	-24.1
3376.00	H	-	-	-67.23	6.05	-61.18	-48.2
4220.00	H	146	35	-64.78	7.75	-57.03	-44.0
5064.00	H	-	-	-68.72	8.59	-60.13	-47.1
5908.00	H	-	-	-67.30	8.89	-58.41	-45.4

Table 7-28. Radiated Spurious Data (Band 26/5 – High Channel)

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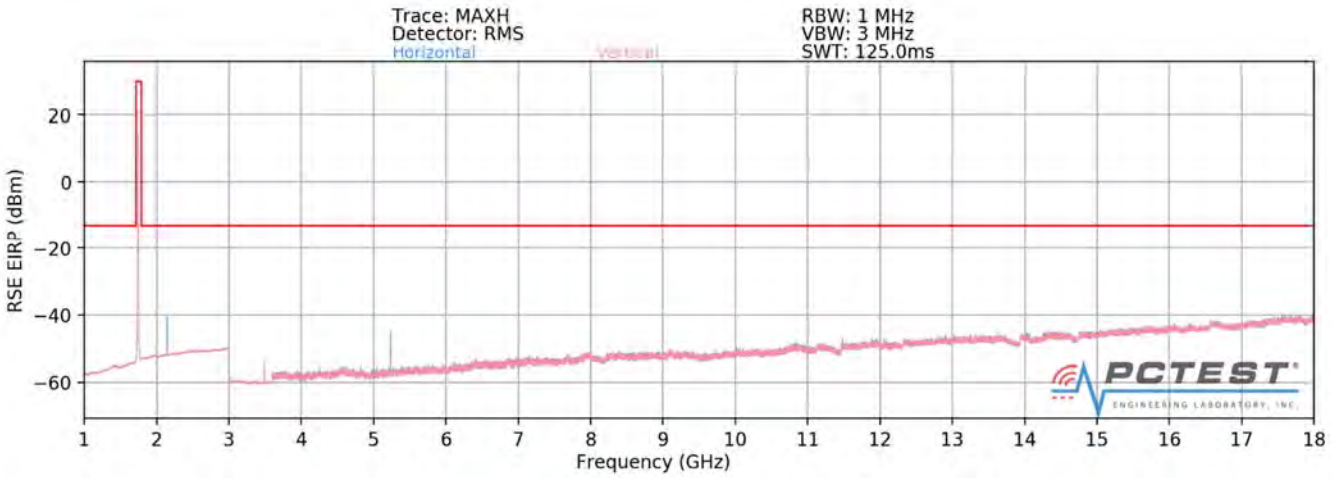
Band 66/4



Plot 7-390. Radiated Spurious Plot above 1GHz (Band 66/4)

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	329	359	-53.57	6.22	-47.35	-34.3
5160.00	V	124	95	-48.10	8.68	-39.43	-26.4
6880.00	V	100	31	-58.56	8.76	-49.80	-36.8
8600.00	V	-	-	-64.52	9.17	-55.34	-42.3
10320.00	V	211	6	-50.45	9.64	-40.81	-27.8
12040.00	V	201	2	-58.76	9.23	-49.53	-36.5
13760.00	V	-	-	-57.90	9.01	-48.89	-35.9
15480.00	V	-	-	-55.19	8.38	-46.81	-33.8

Table 7-29. Radiated Spurious Data (Band 66/4 – Low Channel)

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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	381	358	-49.12	6.32	-42.80	-29.8
5235.00	V	135	286	-43.60	8.71	-34.89	-21.9
6980.00	V	100	28	-55.07	8.74	-46.34	-33.3
8725.00	V	-	-	-64.76	9.42	-55.35	-42.3
10470.00	V	207	4	-53.43	9.62	-43.81	-30.8
12215.00	V	105	356	-57.86	9.09	-48.77	-35.8
13960.00	V	-	-	-57.63	8.90	-48.72	-35.7
15705.00	V	-	-	-54.18	8.15	-46.03	-33.0

Table 7-30. Radiated Spurious Data (Band 66/4 – Mid Channel)

OPERATING FREQUENCY:	1770.00	MHz
CHANNEL:	132572	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3540.00	V	334	350	-47.67	6.31	-41.36	-28.4
5310.00	V	114	165	-42.10	8.74	-33.37	-20.4
7080.00	V	109	355	-56.01	8.66	-47.35	-34.3
8850.00	V	-	-	-63.91	9.53	-54.38	-41.4
10620.00	V	100	4	-55.83	9.50	-46.33	-33.3
12390.00	V	236	349	-58.23	9.12	-49.10	-36.1
14160.00	V	-	-	-57.32	8.85	-48.47	-35.5
15930.00	V	-	-	-54.92	8.14	-46.78	-33.8

Table 7-31. Radiated Spurious Data (Band 66/4 – High Channel)

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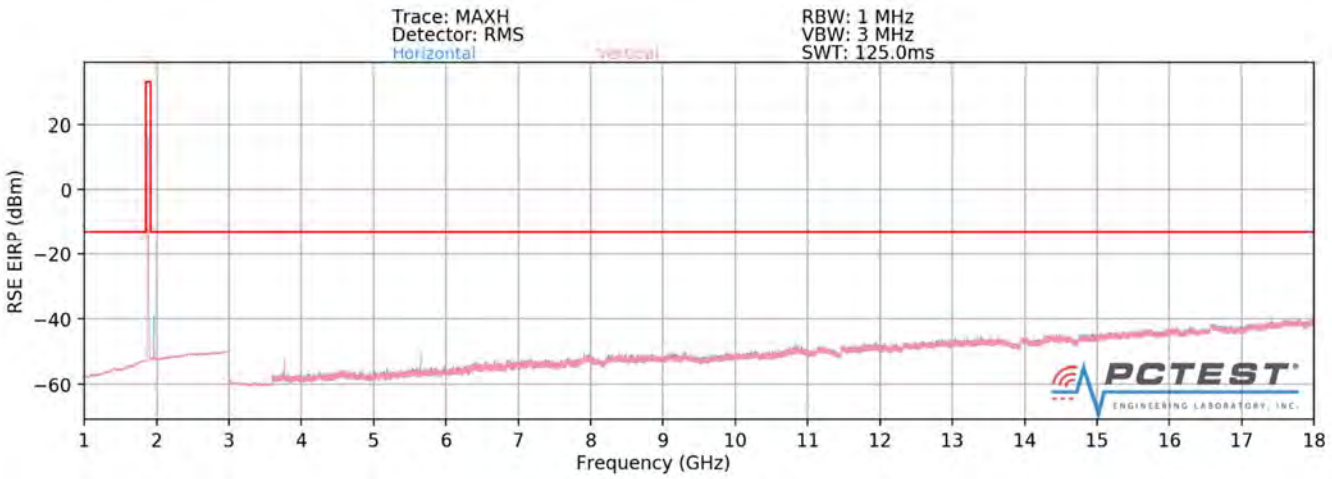
Band 25/2



Plot 7-391. Radiated Spurious Plot above 1GHz (Band 25/2)

OPERATING FREQUENCY:	1860.00	MHz
CHANNEL:	26140	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3720.00	V	362	356	-47.68	6.58	-41.10	-28.1
5580.00	V	100	189	-49.45	8.74	-40.72	-27.7
7440.00	V	125	27	-62.46	8.41	-54.05	-41.1
9300.00	V	-	-	-63.05	9.33	-53.72	-40.7
11160.00	V	-	-	-61.18	9.32	-51.86	-38.9

Table 7-32. Radiated Spurious Data (Band 25/2 – Low Channel)

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OPERATING FREQUENCY:	1882.50	MHz
CHANNEL:	26365	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3765.00	V	381	355	-49.16	6.70	-42.46	-29.5
5647.50	V	127	192	-46.19	8.83	-37.36	-24.4
7530.00	V	110	11	-61.93	8.46	-53.48	-40.5
9412.50	V	-	-	-63.25	9.32	-53.93	-40.9
11295.00	V	-	-	-61.28	9.23	-52.05	-39.1

Table 7-33. Radiated Spurious Data (Band 25/2 – Mid Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3810.00	V	316	305	-54.39	6.94	-47.45	-34.5
5715.00	V	140	58	-44.80	8.77	-36.04	-23.0
7620.00	V	112	20	-59.73	8.51	-51.22	-38.2
9525.00	V	-	-	-63.77	9.40	-54.37	-41.4
11430.00	V	-	-	-61.04	9.19	-51.84	-38.8

Table 7-34. Radiated Spurious Data (Band 25/2 – High Channel)

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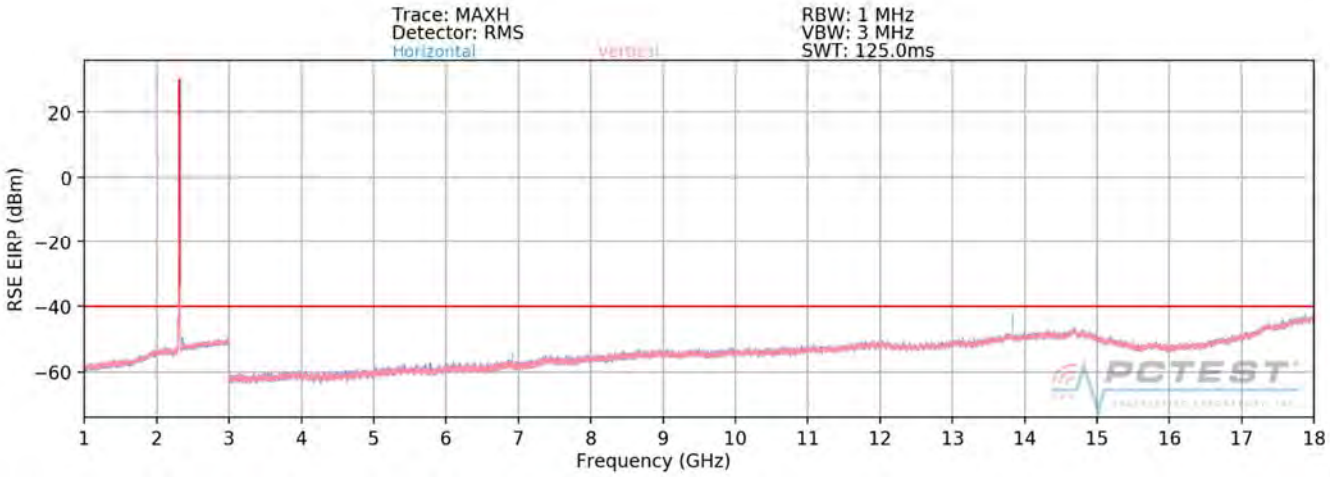
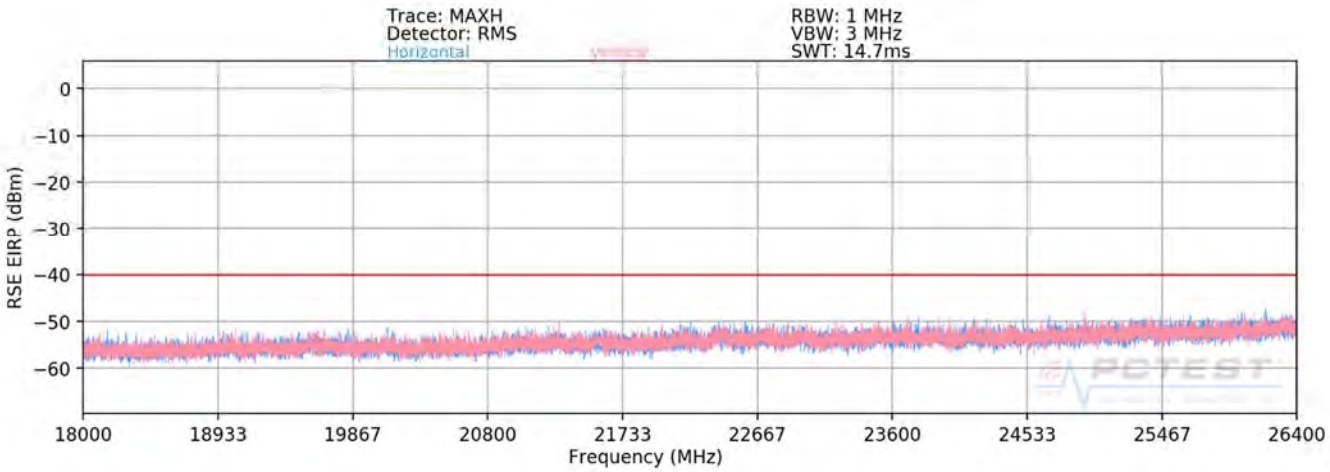
Band 30



Plot 7-392. Radiated Spurious Plot 1GHz - 18GHz (Band 30)



Plot 7-393. Radiated Spurious Plot 18GHz – 26.5GHz (Band 30)

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OPERATING FREQUENCY: 2307.50 MHz
CHANNEL: 27685
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 MHz
DISTANCE: 3 meters
LIMIT: -40 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]
4615.00	H	102	329	-67.46	8.41	-59.05	-19.0
6922.50	H	198	38	-57.47	9.39	-48.08	-8.1
9230.00	H	162	322	-63.25	9.47	-53.78	-13.8
11537.50	H	251	47	-58.06	9.47	-48.59	-8.6
13845.00	H	220	58	-53.12	8.77	-44.35	-4.4
16152.50	H	-	-	-54.37	8.39	-45.98	-6.0

Table 7-35. Radiated Spurious Data (Band 30 – Low Channel)

OPERATING FREQUENCY: 2312.50 MHz
CHANNEL: 27735
MODULATION SIGNAL: QPSK
BANDWIDTH: 5.0 MHz
DISTANCE: 3 meters
LIMIT: -40 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]
4625.00	H	223	25	-66.19	8.43	-57.75	-17.8
6937.50	H	215	297	-56.20	9.38	-46.83	-6.8
9250.00	H	105	335	-63.47	9.45	-54.02	-14.0
11562.50	H	266	50	-58.70	9.44	-49.26	-9.3
13875.00	H	207	68	-53.77	8.72	-45.05	-5.0
16187.50	H	-	-	-54.19	8.41	-45.78	-5.8

Table 7-36. Radiated Spurious Data (Band 30 – High Channel)

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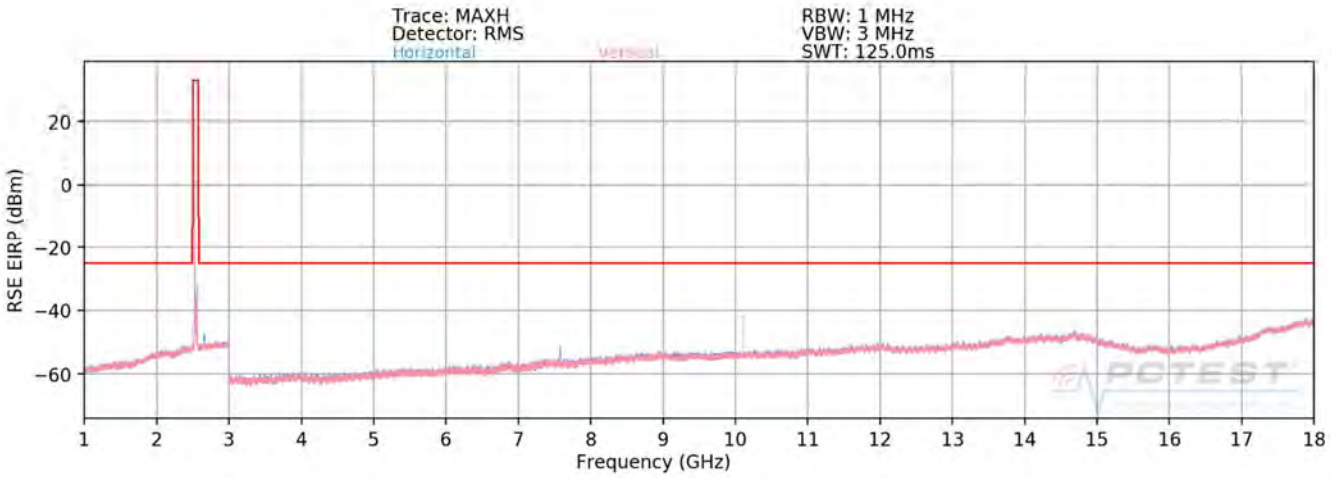
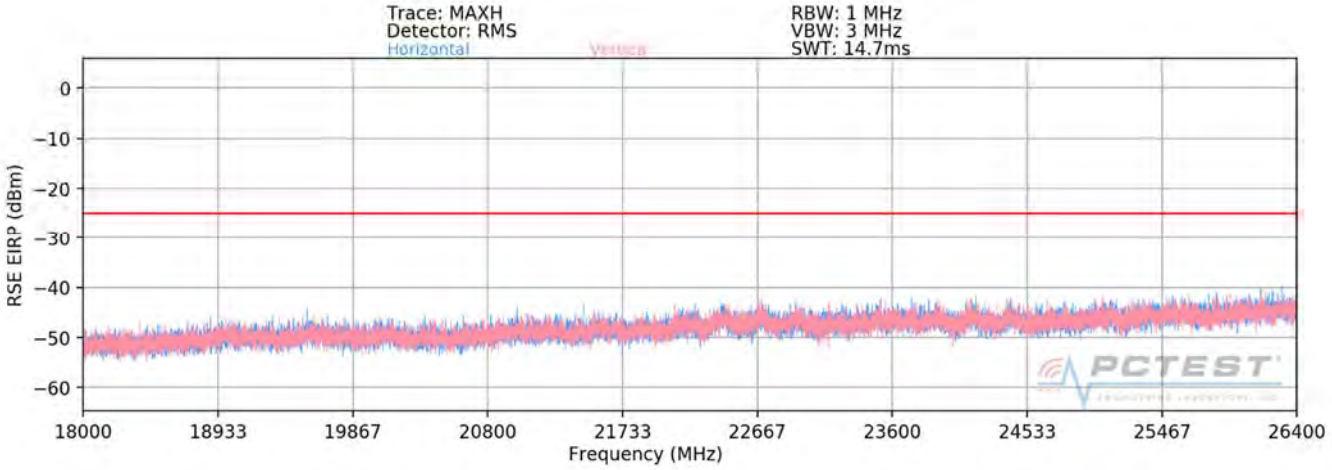
Band 7



Plot 7-394. Radiated Spurious Plot 1GHz - 18GHz (Band 7)



Plot 7-395. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7)

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OPERATING FREQUENCY:	2510.00	MHz
CHANNEL:	20850	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-25	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	185	312	-67.10	8.78	-58.32	-33.3
7530.00	H	141	356	-59.84	9.31	-50.54	-25.5
10040.00	H	149	299	-50.23	9.78	-40.44	-15.4
12550.00	H	-	-	-59.38	8.80	-50.58	-25.6
15060.00	H	-	-	-56.33	8.89	-47.45	-22.4

Table 7-37. Radiated Spurious Data (Band 7 – Low Channel)

OPERATING FREQUENCY:	2535.00	MHz
CHANNEL:	21100	
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]
5070.00	H	228	327	-67.68	8.89	-58.79	-33.8
7605.00	H	132	304	-61.13	9.25	-51.87	-26.9
10140.00	H	100	18	-54.79	9.75	-45.04	-20.0
12675.00	H	-	-	-58.67	8.89	-49.79	-24.8
15210.00	H	-	-	-55.84	8.73	-47.11	-22.1

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

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OPERATING FREQUENCY:	2560.00	MHz
CHANNEL:	21350	
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]
5120.00	H	108	321	-64.30	8.91	-55.38	-30.4
7680.00	H	124	292	-55.51	9.28	-46.24	-21.2
10240.00	H	144	22	-46.88	9.66	-37.22	-12.2
12800.00	H	-	-	-58.79	8.87	-49.91	-24.9
15360.00	H	-	-	-55.67	8.44	-47.24	-22.2

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

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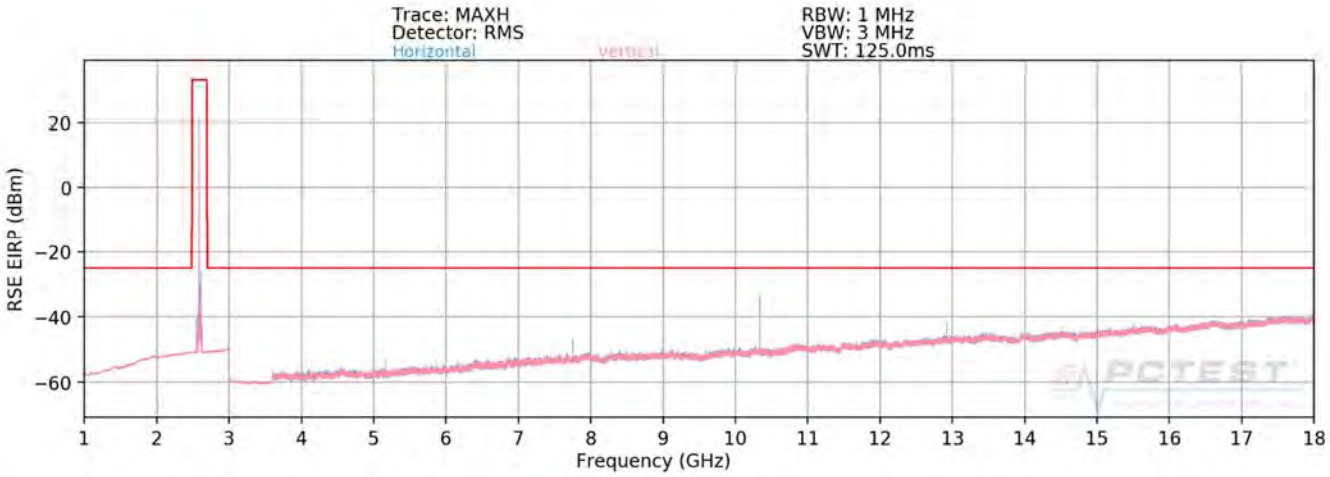
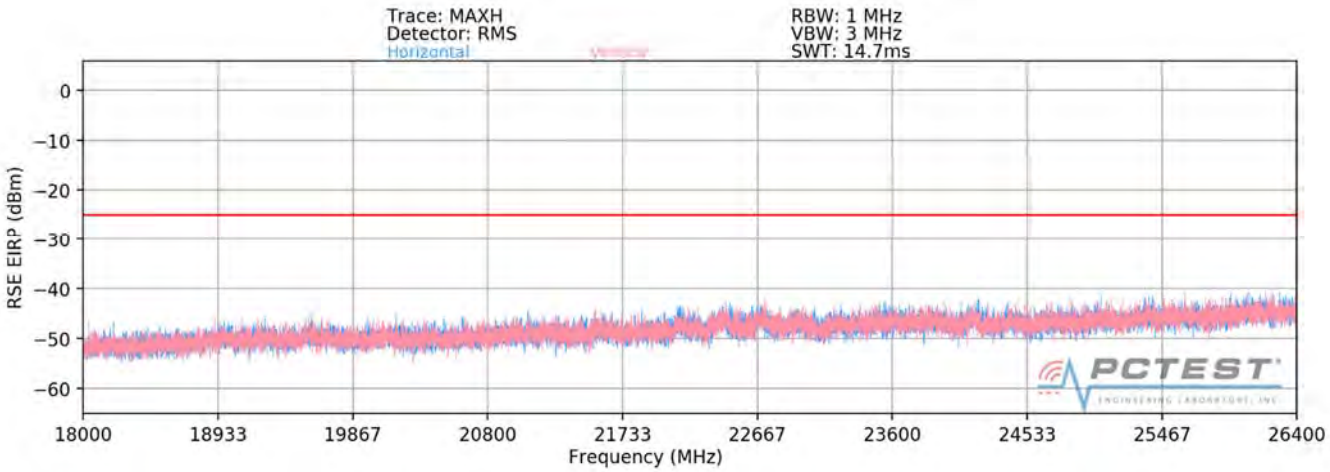
Band 41(PC2)



Plot 7-396. Radiated Spurious Plot 1GHz - 18GHz (Band 41 PC2)



Plot 7-397. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41 PC2)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	149	327	-56.03	8.78	-47.25	-22.2
7530.00	H	117	294	-47.01	9.31	-37.71	-12.7
10040.00	H	160	25	-39.11	9.78	-29.32	-4.3
12550.00	H	135	328	-49.60	8.80	-40.80	-15.8
15060.00	H	140	69	-49.50	8.89	-40.62	-15.6
17570.00	H	-	-	-48.87	7.78	-41.09	-16.1

Table 7-40. Radiated Spurious Data (Band 41 PC2 – 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	165	317	-55.66	9.03	-46.64	-21.6
7779.00	H	111	7	-47.70	9.29	-38.41	-13.4
10372.00	H	163	27	-38.89	9.50	-29.38	-4.4
12965.00	H	163	323	-52.74	8.75	-43.99	-19.0
15558.00	H	121	39	-47.21	8.47	-38.74	-13.7

Table 7-41. Radiated Spurious Data (Band 41 PC2 – 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	195	28	-54.20	8.99	-45.21	-20.2
8040.00	H	180	56	-48.78	9.35	-39.43	-14.4
10720.00	H	198	18	-38.04	9.39	-28.65	-3.7
13400.00	H	144	320	-40.12	8.67	-31.45	-6.4
16080.00	H	223	315	-42.42	8.46	-33.96	-9.0

Table 7-42. Radiated Spurious Data (Band 41 PC2 – High Channel)

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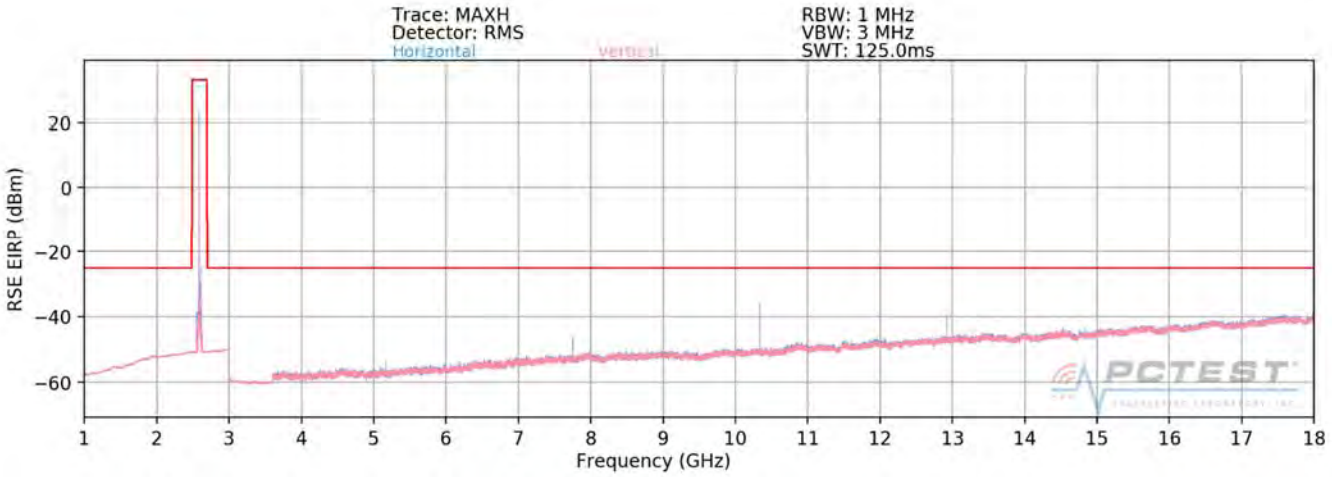
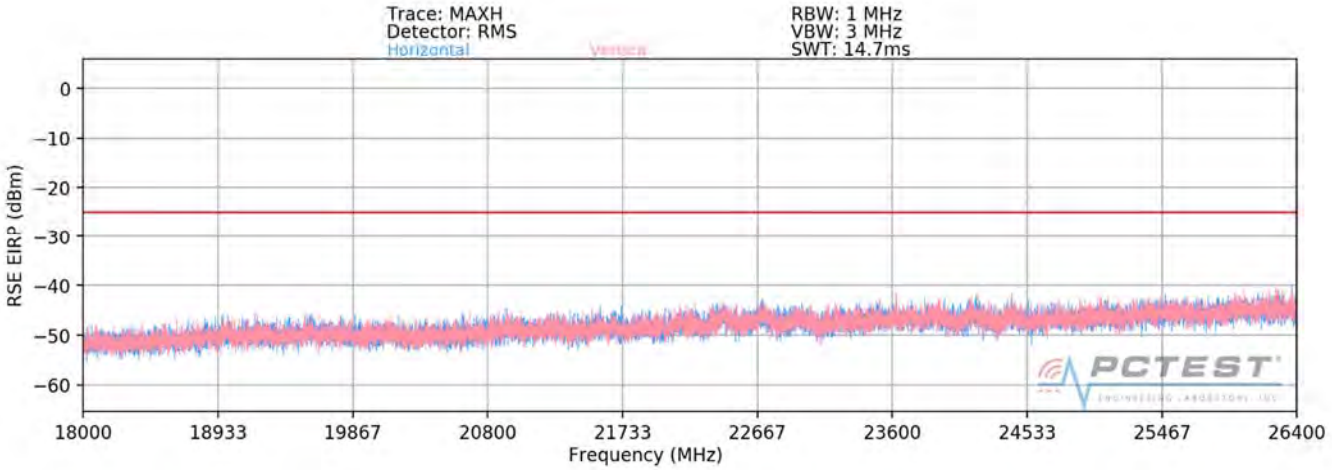
Band 41(PC3)



Plot 7-398. Radiated Spurious Plot 1GHz - 18GHz (Band 41 PC3)



Plot 7-399. Radiated Spurious Plot 18GHz – 26.5GHz (Band 41 PC3)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	105	323	-57.72	8.78	-48.94	-23.9
7530.00	H	124	303	-49.73	9.31	-40.43	-15.4
10040.00	H	100	22	-40.74	9.78	-30.95	-6.0
12550.00	H	138	1	-51.74	8.80	-42.94	-17.9
15060.00	H	196	36	-52.02	8.89	-43.14	-18.1
17570.00	H	-	-	-48.61	7.78	-40.83	-15.8

Table 7-43. Radiated Spurious Data (Band 41 PC3 – 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	188	321	-57.60	9.03	-48.58	-23.6
7779.00	H	108	8	-50.05	9.29	-40.76	-15.8
10372.00	H	100	23	-40.48	9.50	-30.97	-6.0
12965.00	H	124	321	-53.69	8.75	-44.94	-19.9
15558.00	H	118	39	-50.27	8.47	-41.80	-16.8

Table 7-44. Radiated Spurious Data (Band 41 PC3 – 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	185	25	-56.53	8.99	-47.54	-22.5
8040.00	H	157	10	-51.97	9.35	-42.62	-17.6
10720.00	H	220	19	-40.39	9.39	-31.00	-6.0
13400.00	H	147	323	-37.93	8.67	-29.26	-4.3
16080.00	H	206	32	-45.30	8.46	-36.84	-11.8

Table 7-45. Radiated Spurious Data (Band 41 PC3 – High Channel)

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7.9 Frequency Stability / Temperature Variation

Test Overview and Limit

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

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

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

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

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

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

Test Setup

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

Test Notes

None

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Band 71 Frequency Stability Measurements

OPERATING FREQUENCY: 680,500,000 Hz

CHANNEL: 133297

REFERENCE VOLTAGE: 4.31 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	680,500,126	126	0.0000185
100 %		- 20	680,500,025	25	0.0000037
100 %		- 10	680,500,103	103	0.0000151
100 %		0	680,499,851	-149	-0.0000219
100 %		+ 10	680,499,764	-236	-0.0000347
100 %		+ 20	680,500,010	10	0.0000015
100 %		+ 30	680,500,019	19	0.0000028
100 %		+ 40	680,500,008	8	0.0000012
100 %		+ 50	680,499,827	-173	-0.0000254
BATT. ENDPOINT	3.71	+ 20	680,499,874	-126	-0.0000185

Table 7-46. 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

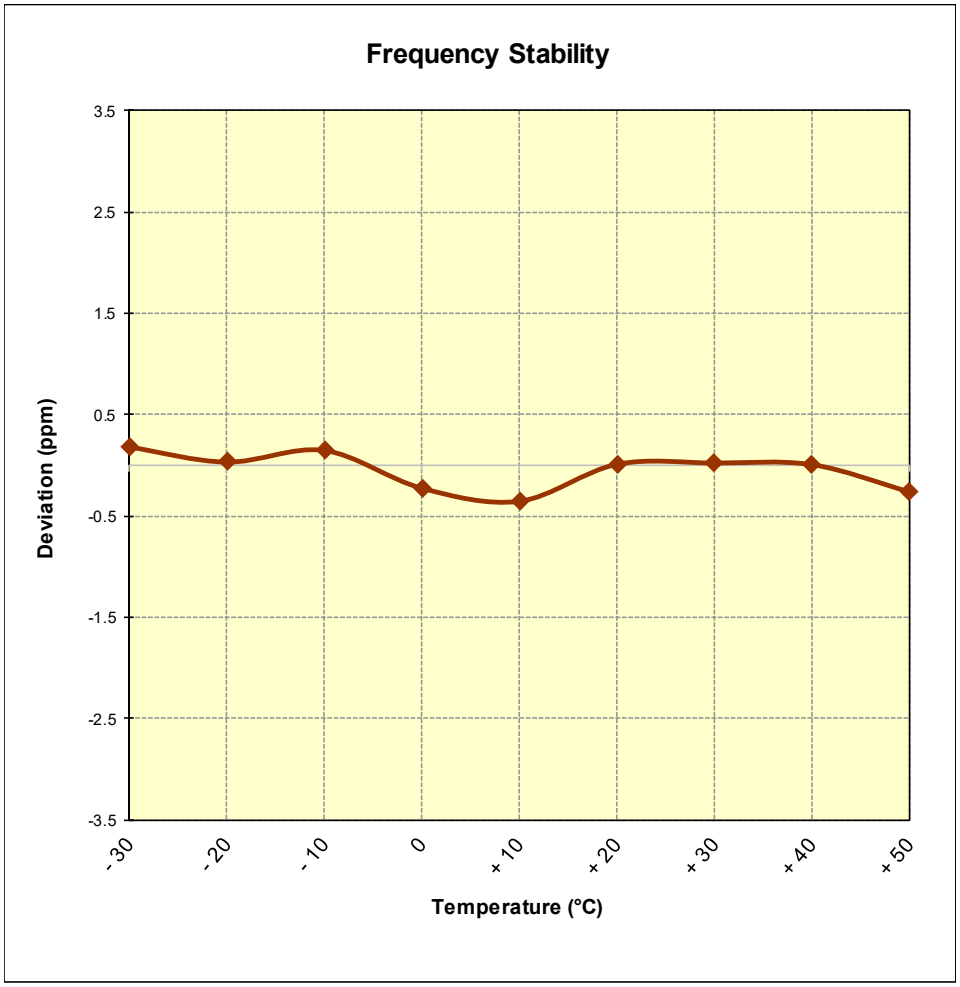

Figure 7-9. Frequency Stability Graph (Band 71)

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Band 12/17 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz

CHANNEL: 23790

REFERENCE VOLTAGE: 4.31 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	707,500,059	59	0.0000083
100 %		- 20	707,500,012	12	0.0000017
100 %		- 10	707,499,969	-31	-0.0000044
100 %		0	707,499,869	-131	-0.0000185
100 %		+ 10	707,499,806	-194	-0.0000274
100 %		+ 20	707,499,916	-84	-0.0000119
100 %		+ 30	707,500,032	32	0.0000045
100 %		+ 40	707,499,923	-77	-0.0000109
100 %		+ 50	707,499,944	-56	-0.0000079
BATT. ENDPOINT	3.71	+ 20	707,499,806	-194	-0.0000274

Table 7-47. Frequency Stability Data (Band 12/17)

Note:

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

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Band 12/17 Frequency Stability Measurements

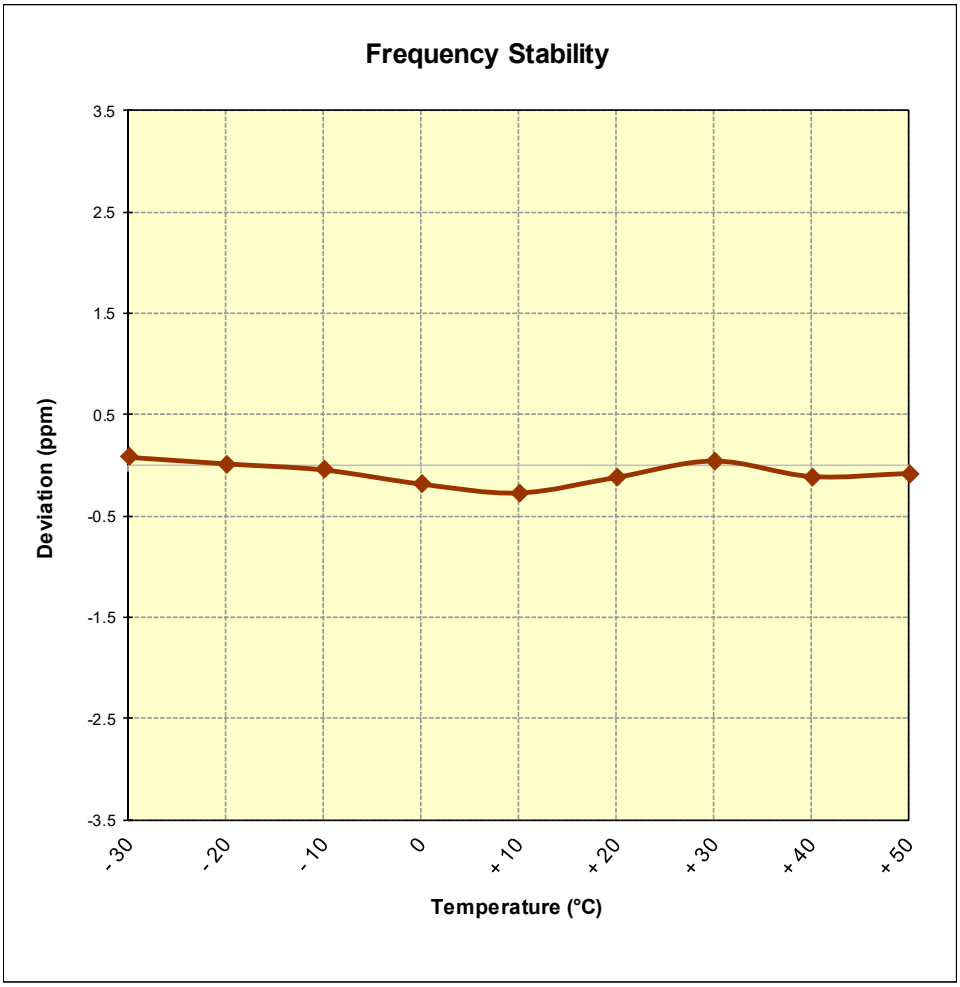

Figure 7-10. Frequency Stability Graph (Band 12/17)

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Band 13 Frequency Stability Measurements

OPERATING FREQUENCY: 782,000,000 Hz

CHANNEL: 23230

REFERENCE VOLTAGE: 4.31 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	781,999,945	-55	-0.0000070
100 %		- 20	781,999,953	-47	-0.0000060
100 %		- 10	782,000,042	42	0.0000054
100 %		0	782,000,193	193	0.0000247
100 %		+ 10	782,000,084	84	0.0000107
100 %		+ 20	781,999,977	-23	-0.0000029
100 %		+ 30	782,000,299	299	0.0000382
100 %		+ 40	782,000,152	152	0.0000194
100 %		+ 50	782,000,270	270	0.0000345
BATT. ENDPOINT	3.71	+ 20	781,999,814	-186	-0.0000238

Table 7-48. 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

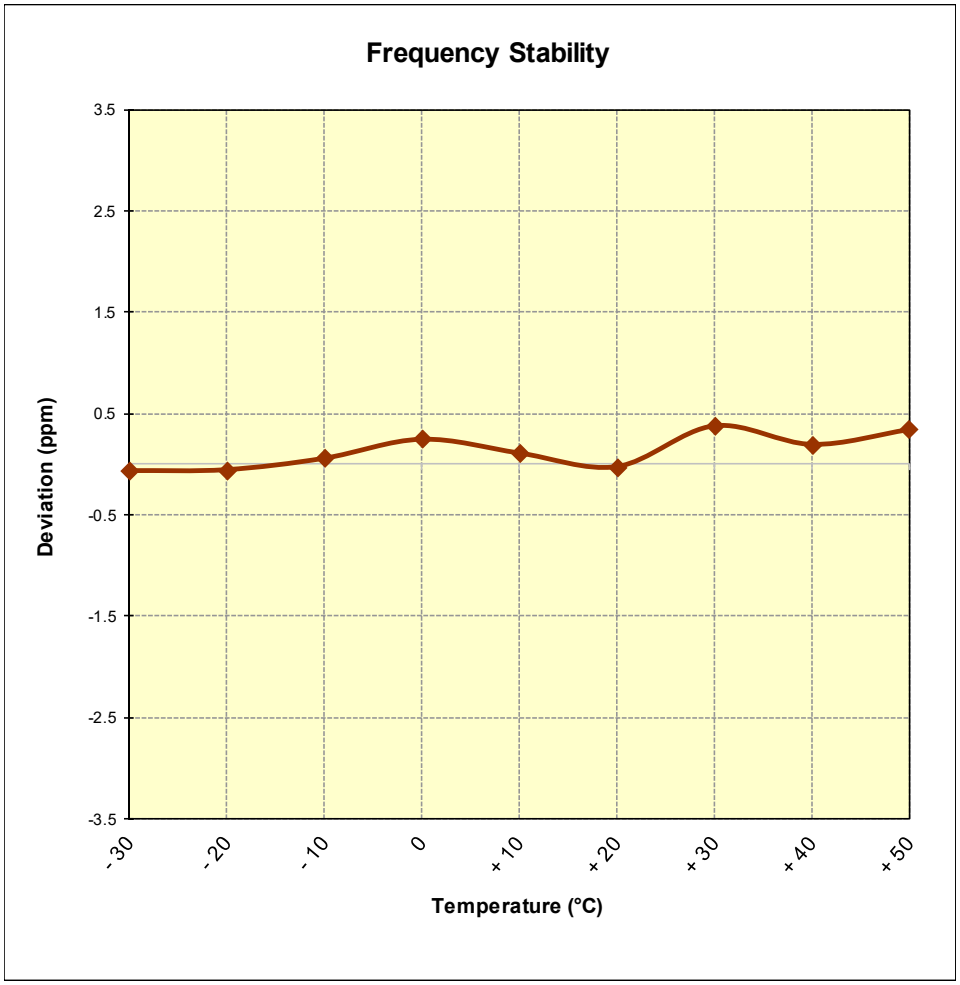

Figure 7-11. Frequency Stability Graph (Band 13)

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Band 26/5 Frequency Stability Measurements

OPERATING FREQUENCY: 831,500,000 Hz

CHANNEL: 26865

REFERENCE VOLTAGE: 4.31 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	831,500,047	47	0.0000057
100 %		- 20	831,500,179	179	0.0000215
100 %		- 10	831,500,159	159	0.0000191
100 %		0	831,500,026	26	0.0000031
100 %		+ 10	831,499,867	-133	-0.0000160
100 %		+ 20	831,500,287	287	0.0000345
100 %		+ 30	831,499,907	-93	-0.0000112
100 %		+ 40	831,499,583	-417	-0.0000502
100 %		+ 50	831,499,829	-171	-0.0000206
BATT. ENDPOINT	3.71	+ 20	831,500,421	421	0.0000506

Table 7-49. Frequency Stability Data (Band 26/5)

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Band 26/5 Frequency Stability Measurements

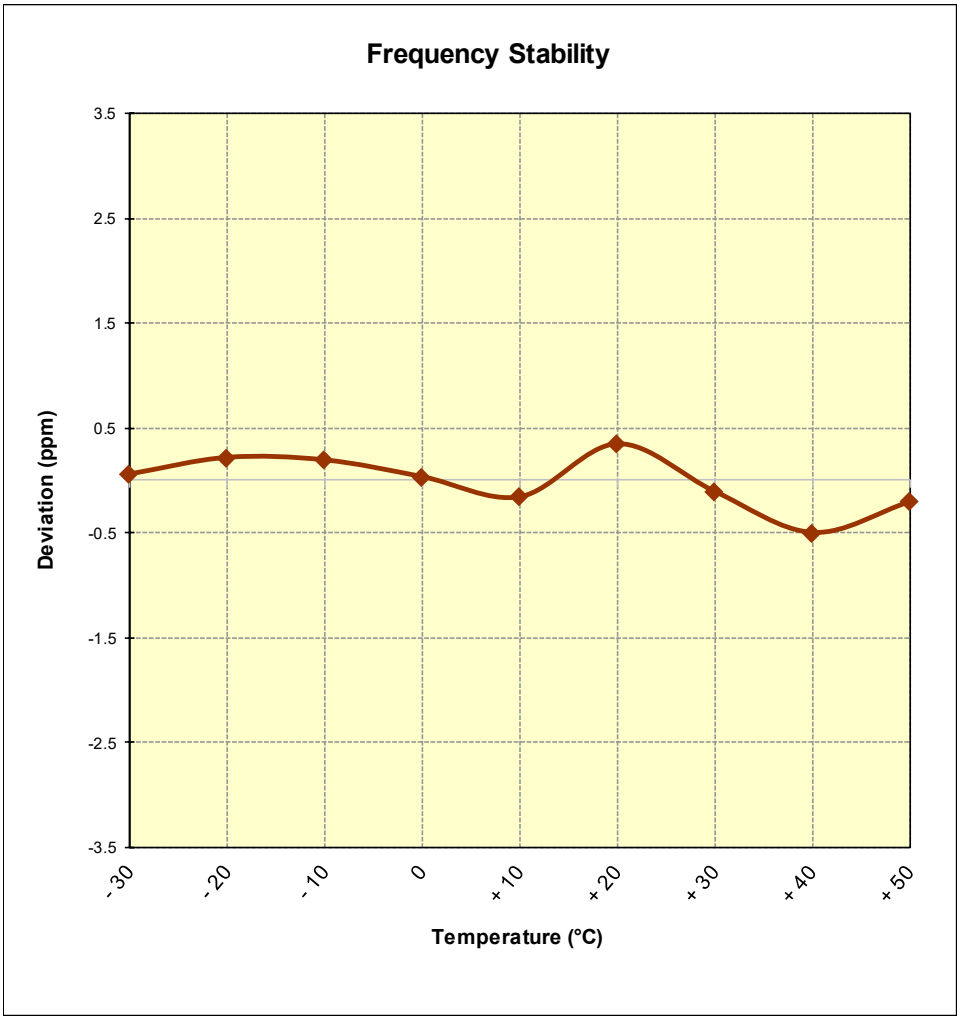

Figure 7-12. Frequency Stability Graph (Band 26/5)

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Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz

CHANNEL: 132322

REFERENCE VOLTAGE: 4.31 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	1,744,999,934	-66	-0.0000038
100 %		- 20	1,744,999,815	-185	-0.0000106
100 %		- 10	1,745,000,251	251	0.0000144
100 %		0	1,744,999,821	-179	-0.0000103
100 %		+ 10	1,744,999,701	-299	-0.0000171
100 %		+ 20	1,744,999,997	-3	-0.0000002
100 %		+ 30	1,744,999,889	-111	-0.0000064
100 %		+ 40	1,744,999,929	-71	-0.0000041
100 %		+ 50	1,744,999,710	-290	-0.0000166
BATT. ENDPOINT	3.71	+ 20	1,745,000,019	19	0.0000011

Table 7-50. Frequency Stability Data (Band 66/4)

Note:

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

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Band 66/4 Frequency Stability Measurements

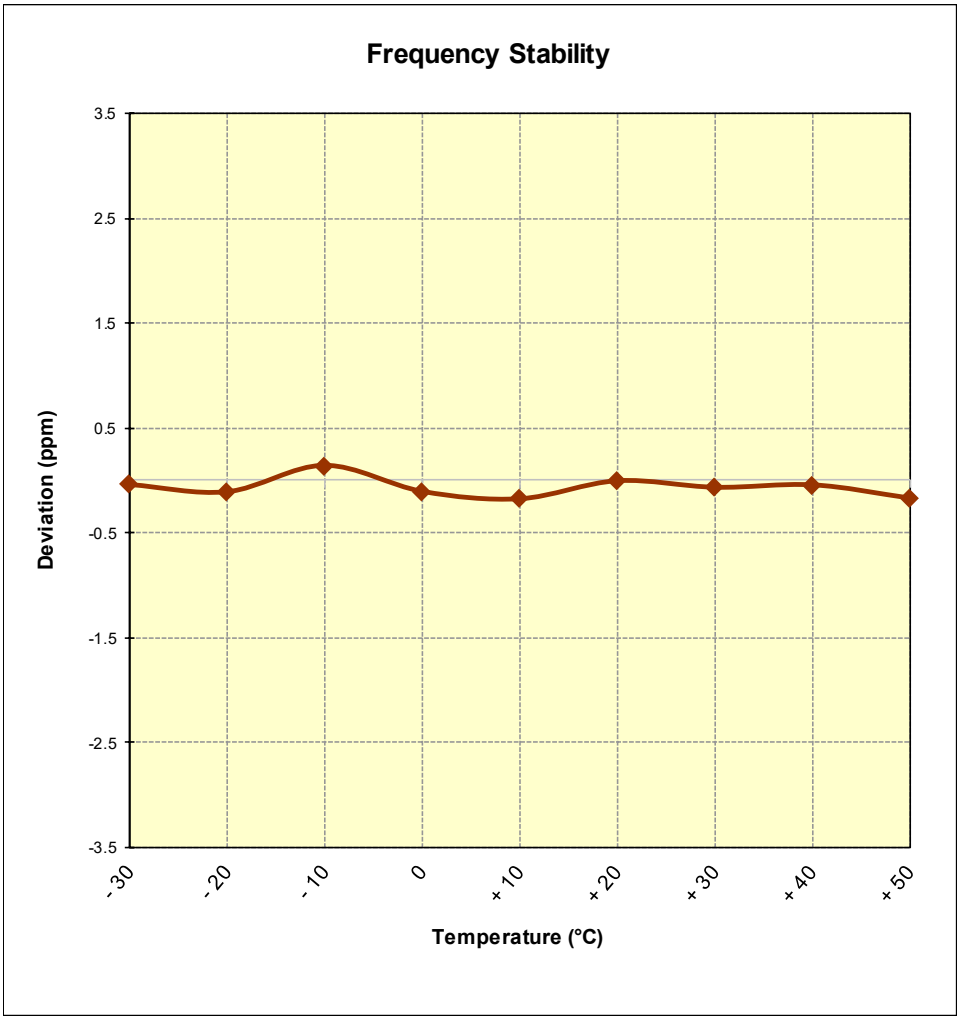

Figure 7-13. Frequency Stability Graph (Band 66/4)

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Band 25/2 Frequency Stability Measurements

OPERATING FREQUENCY: 1,882,500,000 Hz

CHANNEL: 26365

REFERENCE VOLTAGE: 4.31 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	1,882,499,855	-145	-0.0000077
100 %		- 20	1,882,500,097	97	0.0000052
100 %		- 10	1,882,500,086	86	0.0000046
100 %		0	1,882,500,163	163	0.0000087
100 %		+ 10	1,882,500,085	85	0.0000045
100 %		+ 20	1,882,500,072	72	0.0000038
100 %		+ 30	1,882,499,817	-183	-0.0000097
100 %		+ 40	1,882,499,826	-174	-0.0000092
100 %		+ 50	1,882,500,255	255	0.0000135
BATT. ENDPOINT	3.71	+ 20	1,882,499,829	-171	-0.0000091

Table 7-51. Frequency Stability Data (Band 25/2)

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Band 25/2 Frequency Stability Measurements

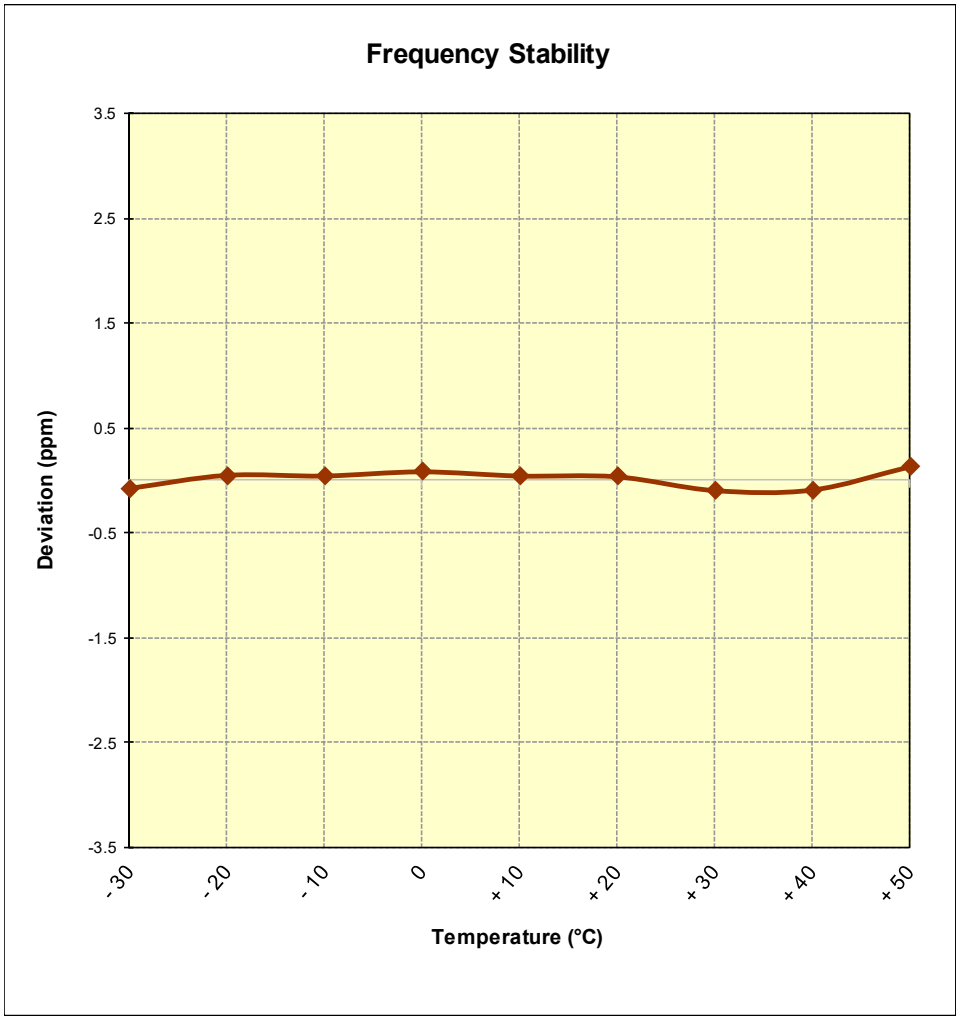

Figure 7-14. Frequency Stability Graph (Band 25/2)

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Band 30 Frequency Stability Measurements

OPERATING FREQUENCY: 2,310,000,000 Hz

CHANNEL: 27710

REFERENCE VOLTAGE: 4.31 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	2,309,999,985	-15	-0.0000006
100 %		- 20	2,309,999,999	-1	0.0000000
100 %		- 10	2,309,999,855	-145	-0.0000063
100 %		0	2,309,999,727	-273	-0.0000118
100 %		+ 10	2,309,999,962	-38	-0.0000016
100 %		+ 20	2,309,999,801	-199	-0.0000086
100 %		+ 30	2,310,000,270	270	0.0000117
100 %		+ 40	2,309,999,700	-300	-0.0000130
100 %		+ 50	2,310,000,218	218	0.0000094
BATT. ENDPOINT	3.71	+ 20	2,309,999,896	-104	-0.0000045

Table 7-52. Frequency Stability Data (Band 30)

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 30 Frequency Stability Measurements

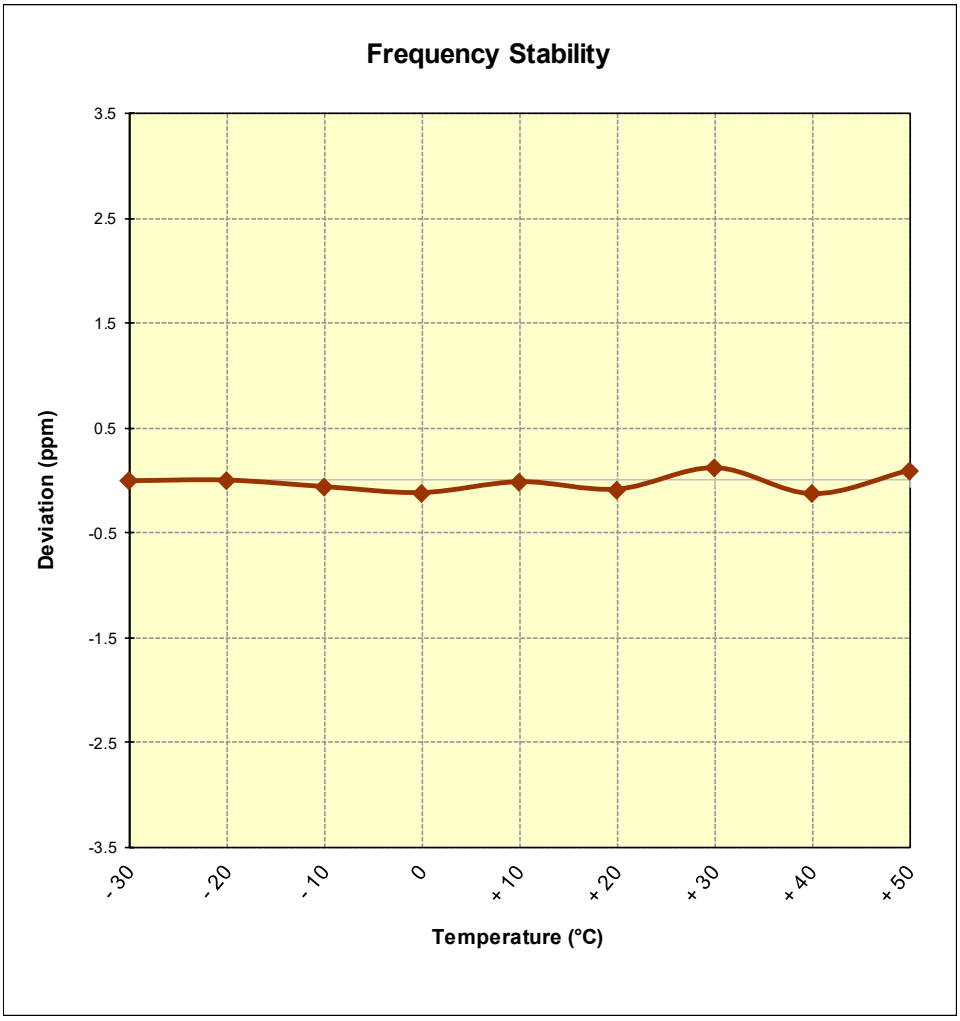

Figure 7-15. Frequency Stability Graph (Band 30)

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Band 7 Frequency Stability Measurements

OPERATING FREQUENCY: 2,535,000,000 Hz

CHANNEL: 21100

REFERENCE VOLTAGE: 4.31 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	2,535,000,098	98	0.0000039
100 %		- 20	2,535,000,261	261	0.0000103
100 %		- 10	2,535,000,102	102	0.0000040
100 %		0	2,534,999,928	-72	-0.0000028
100 %		+ 10	2,534,999,743	-257	-0.0000101
100 %		+ 20	2,534,999,687	-313	-0.0000123
100 %		+ 30	2,535,000,139	139	0.0000055
100 %		+ 40	2,535,000,177	177	0.0000070
100 %		+ 50	2,534,999,941	-59	-0.0000023
BATT. ENDPOINT	3.71	+ 20	2,534,999,916	-84	-0.0000033

Table 7-53. Frequency Stability Data (Band 7)

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 7 Frequency Stability Measurements

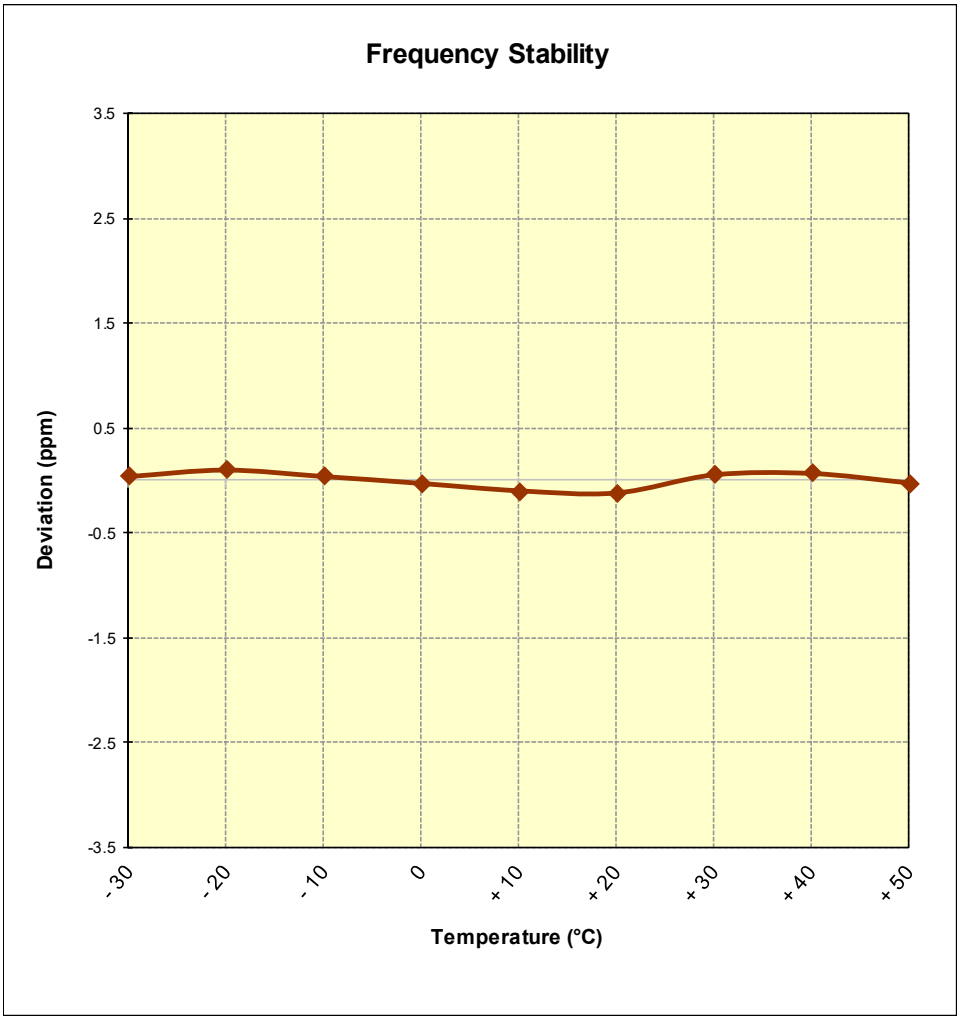

Figure 7-16. Frequency Stability Graph (Band 7)

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Band 41 Frequency Stability Measurements

OPERATING FREQUENCY: 2,593,000,000 Hz

CHANNEL: 40620

REFERENCE VOLTAGE: 4.31 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	2,592,999,937	-63	-0.0000024
100 %		- 20	2,592,999,687	-313	-0.0000121
100 %		- 10	2,593,000,233	233	0.0000090
100 %		0	2,593,000,008	8	0.0000003
100 %		+ 10	2,592,999,907	-93	-0.0000036
100 %		+ 20	2,592,999,669	-331	-0.0000128
100 %		+ 30	2,592,999,629	-371	-0.0000143
100 %		+ 40	2,593,000,029	29	0.0000011
100 %		+ 50	2,593,000,153	153	0.0000059
BATT. ENDPOINT	3.71	+ 20	2,593,000,232	232	0.0000089

Table 7-54. 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

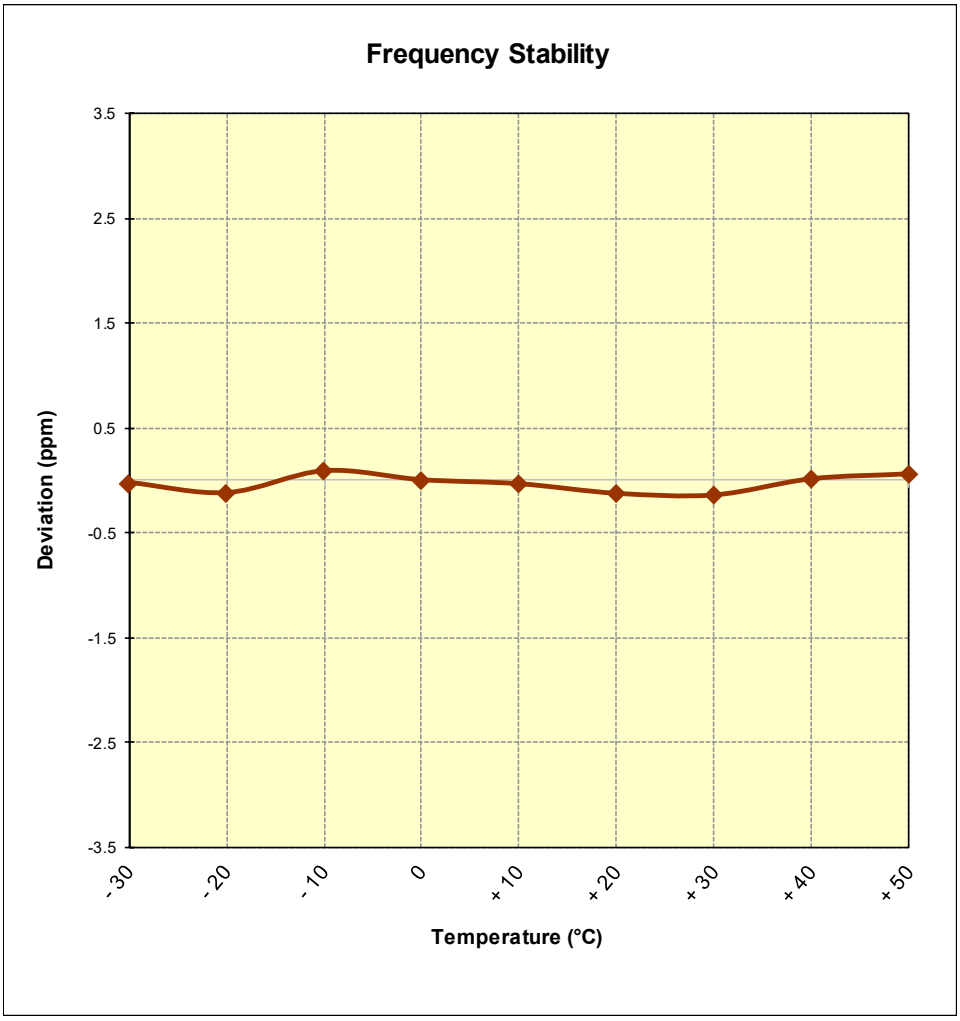

Figure 7-17. Frequency Stability Graph (Band 41)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMA102U** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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