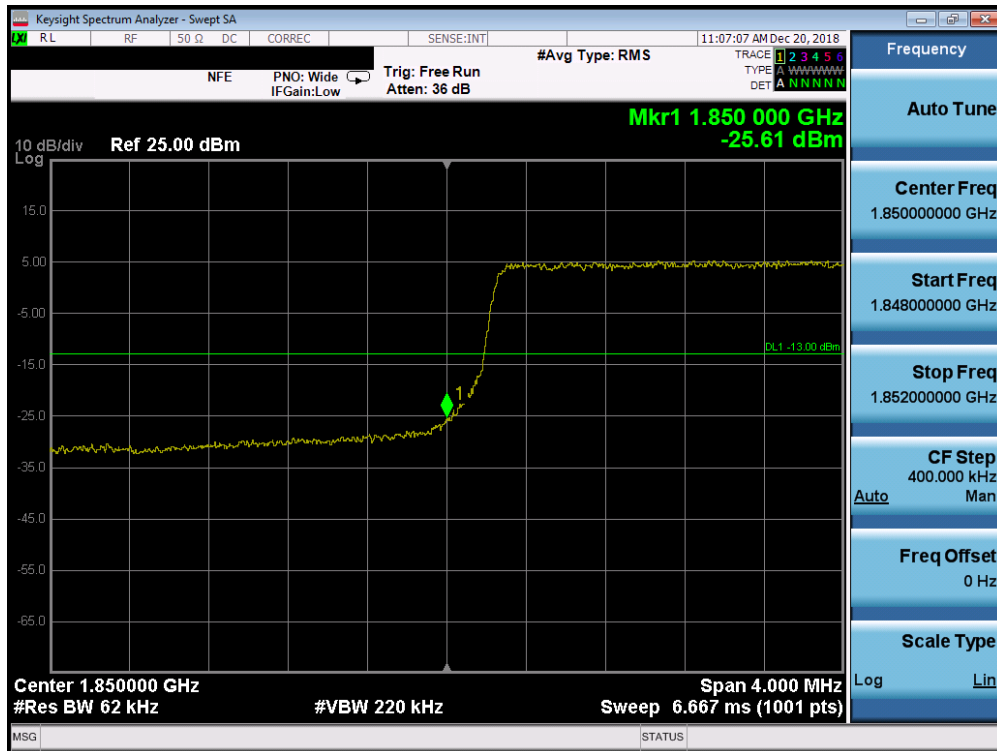
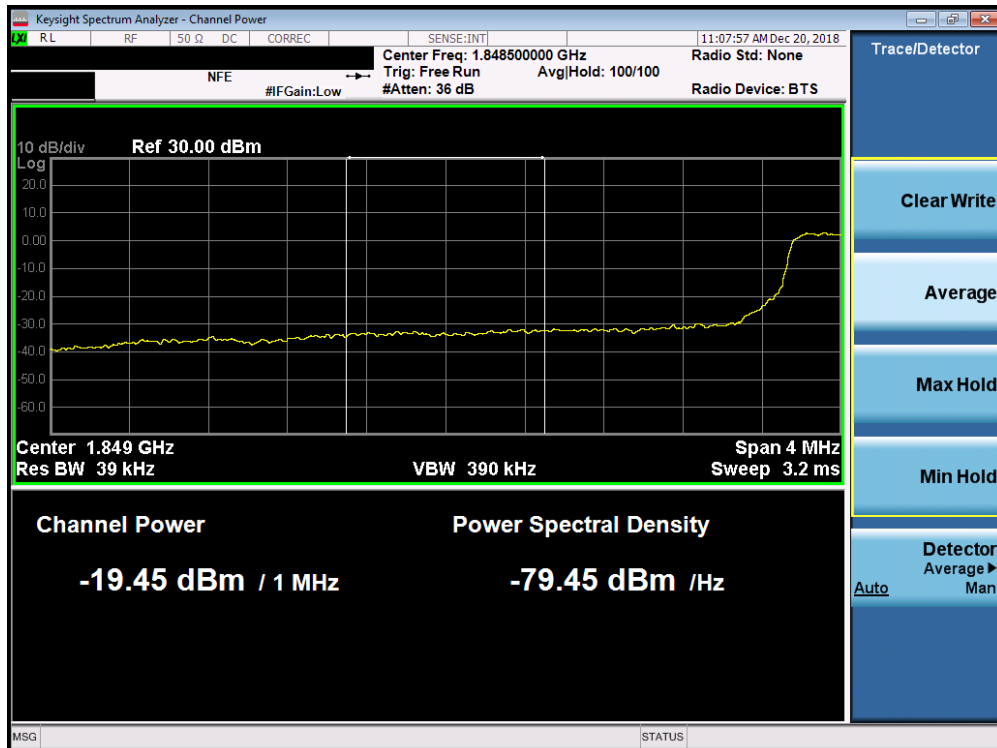


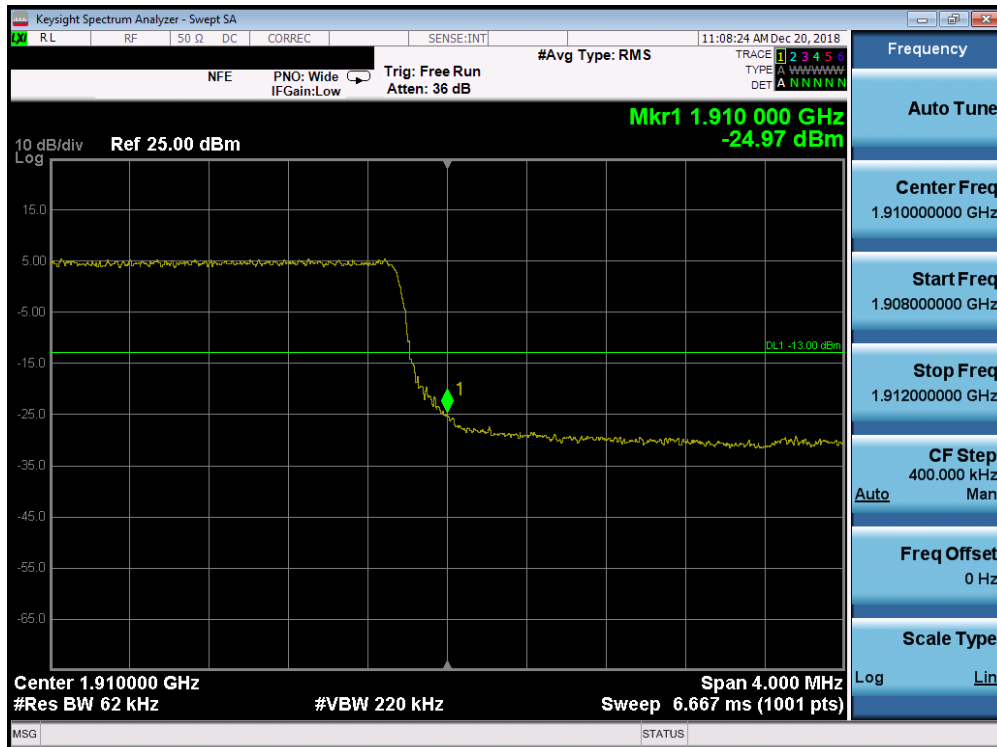


Plot 7-267. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

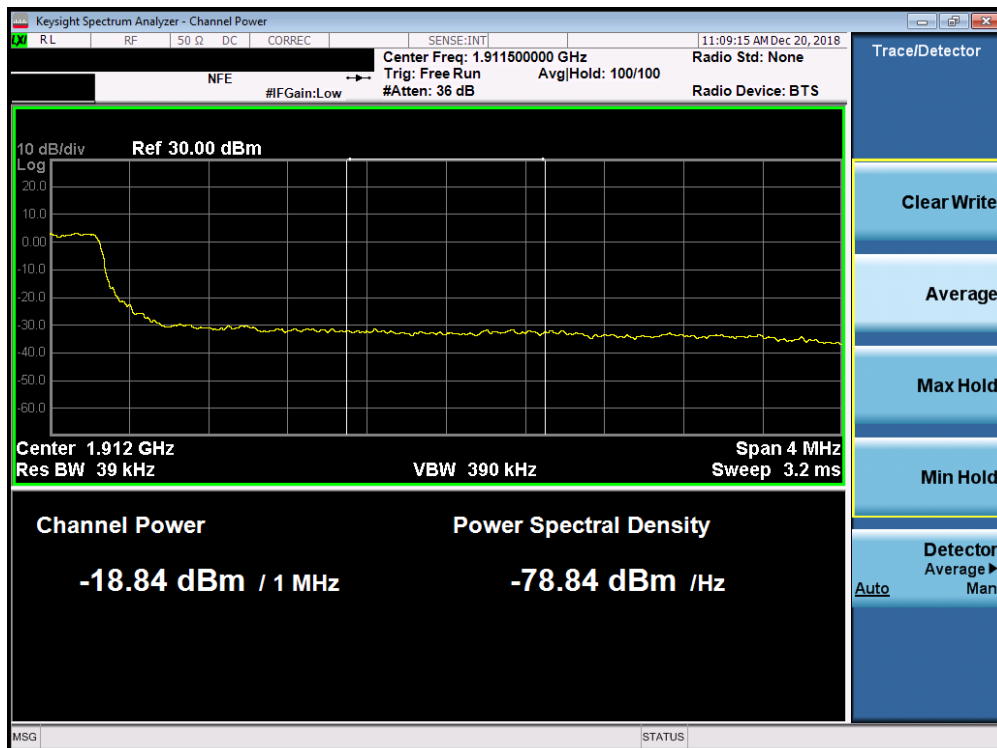


Plot 7-268. Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 159 of 290



Plot 7-269. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

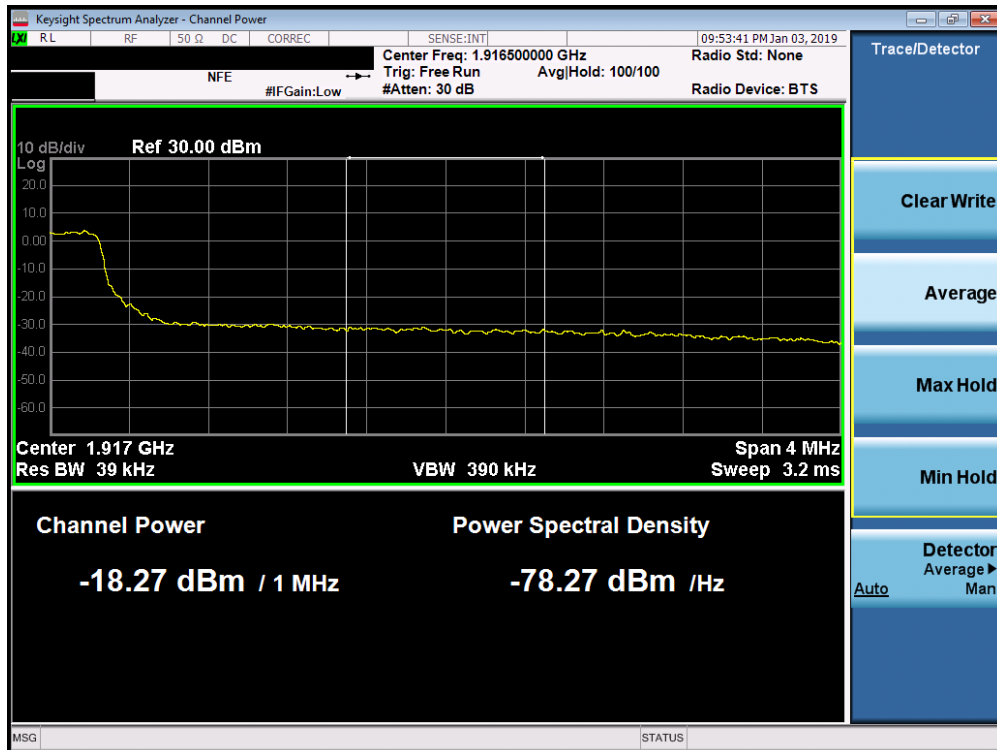


Plot 7-270. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 160 of 290

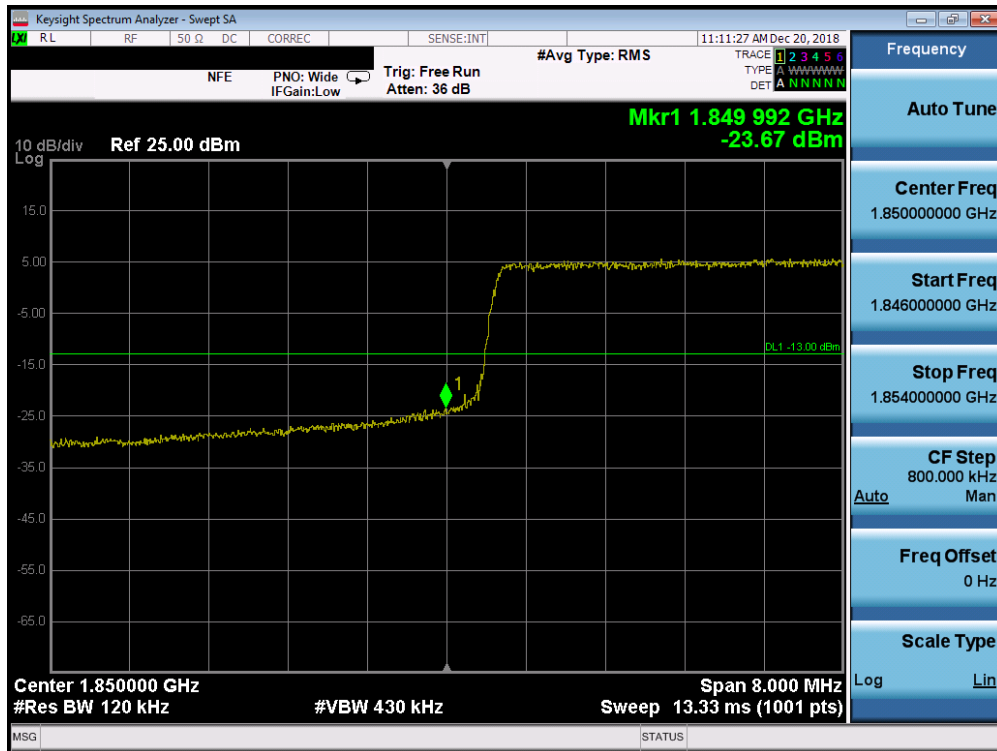


Plot 7-271. Upper Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

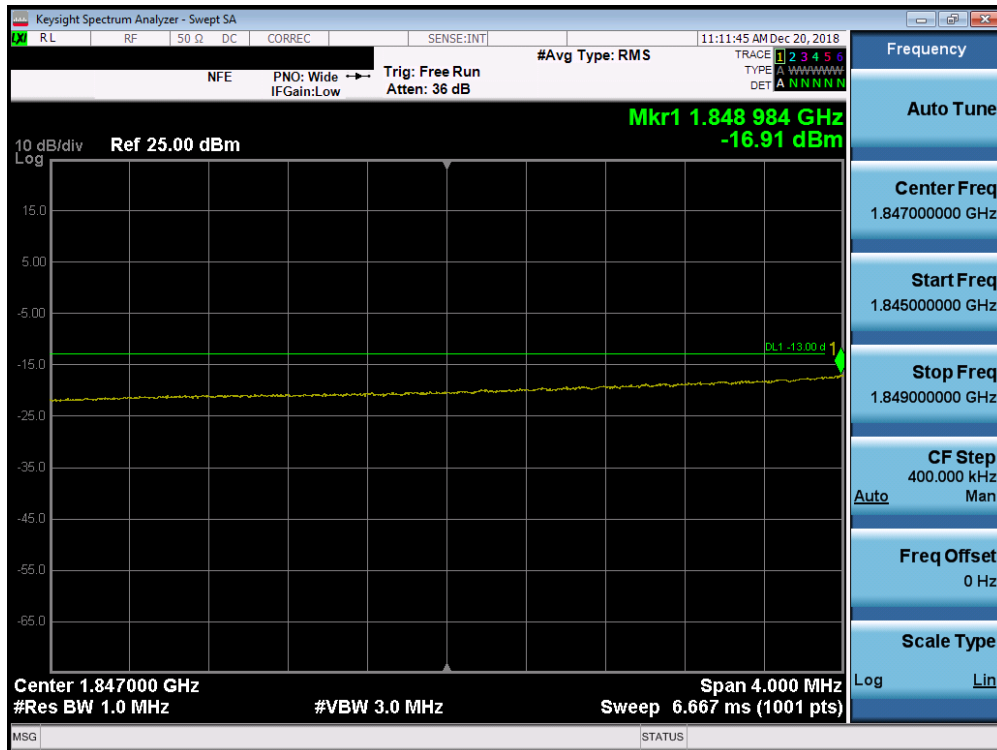


Plot 7-272. Upper Extended Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 161 of 290



Plot 7-273. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

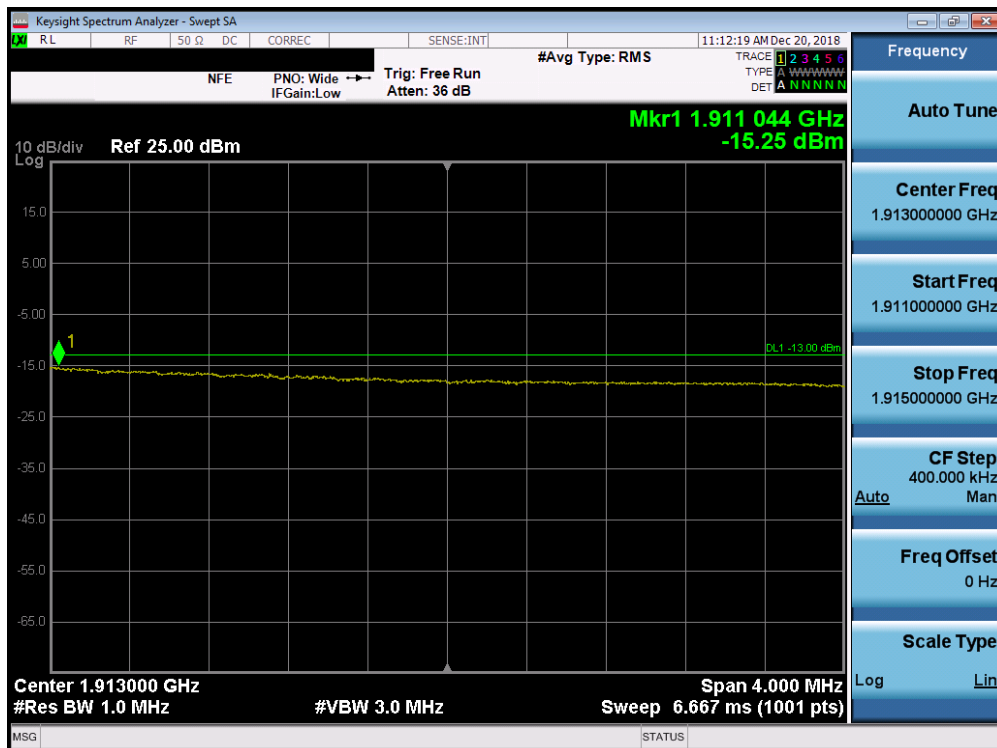


Plot 7-274. Lower Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 162 of 290

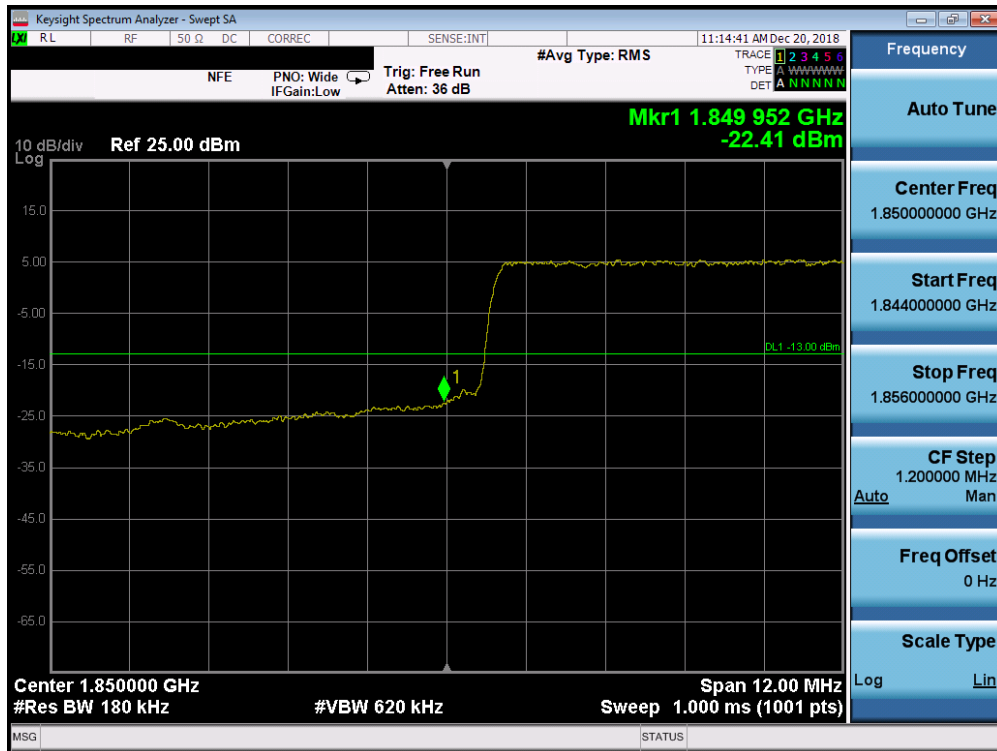


Plot 7-275. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

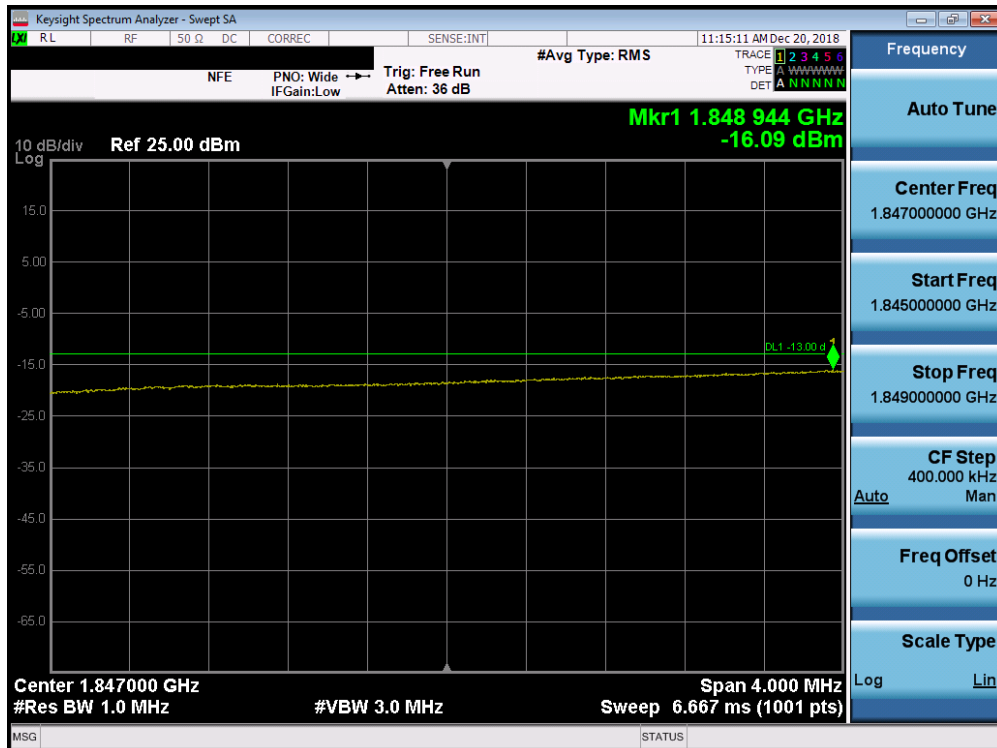


Plot 7-276. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 163 of 290

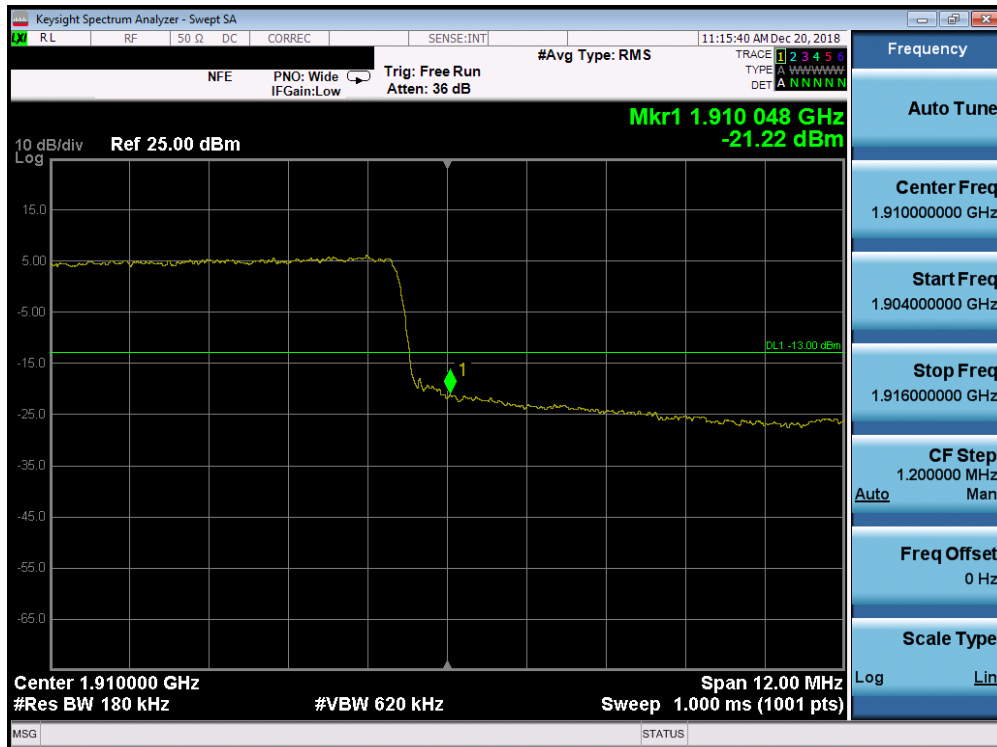


Plot 7-279. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

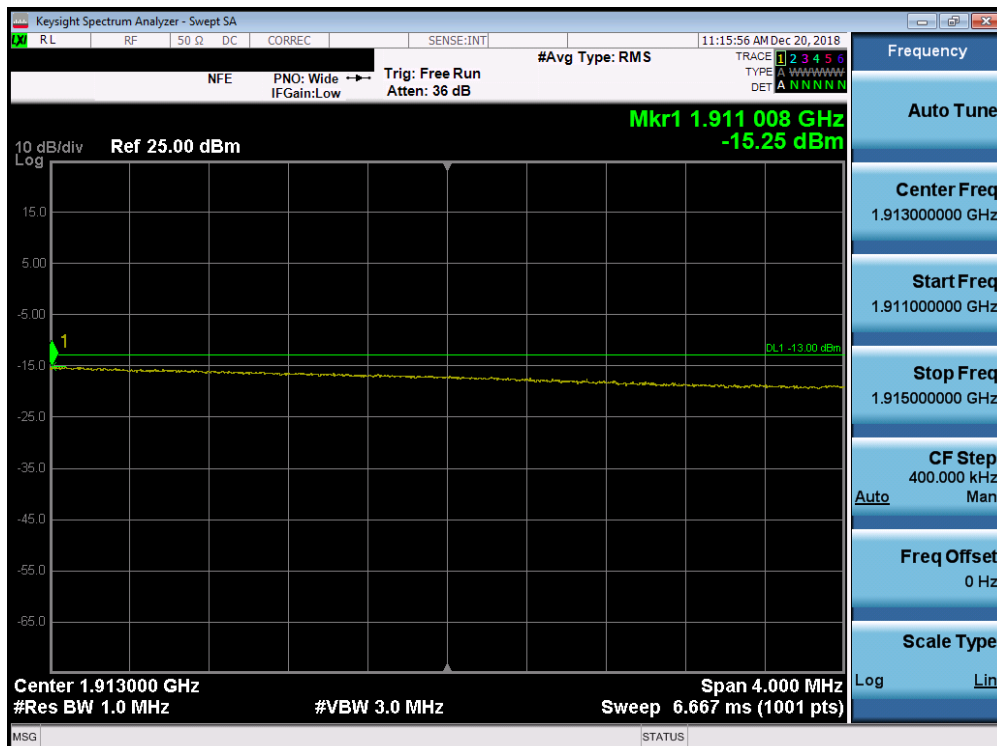


Plot 7-280. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 165 of 290

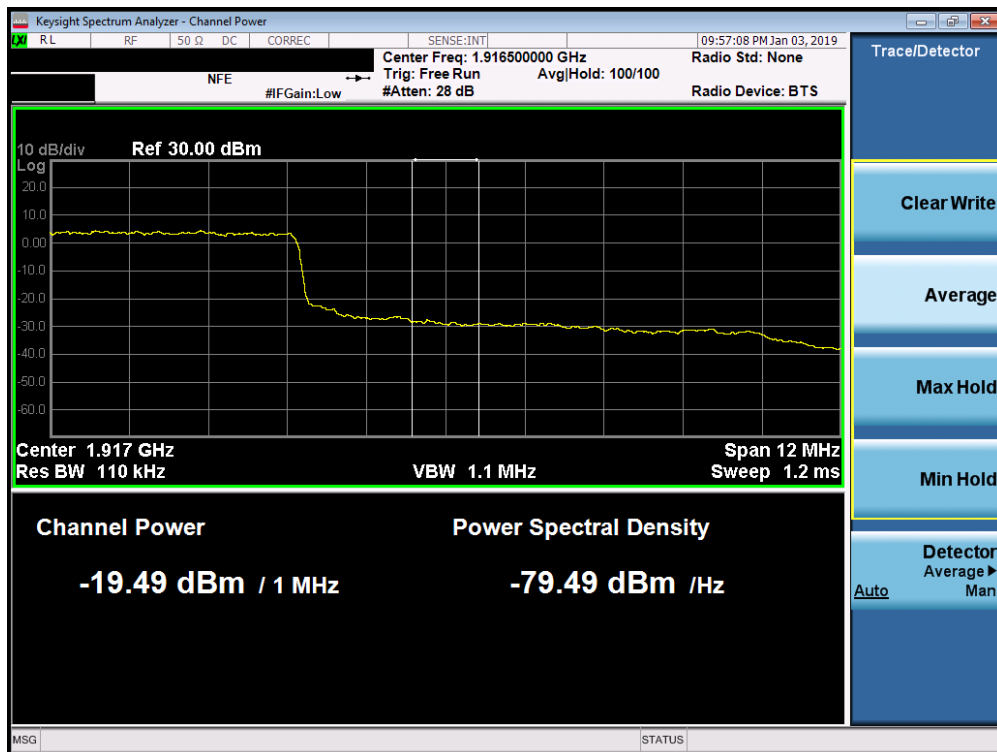


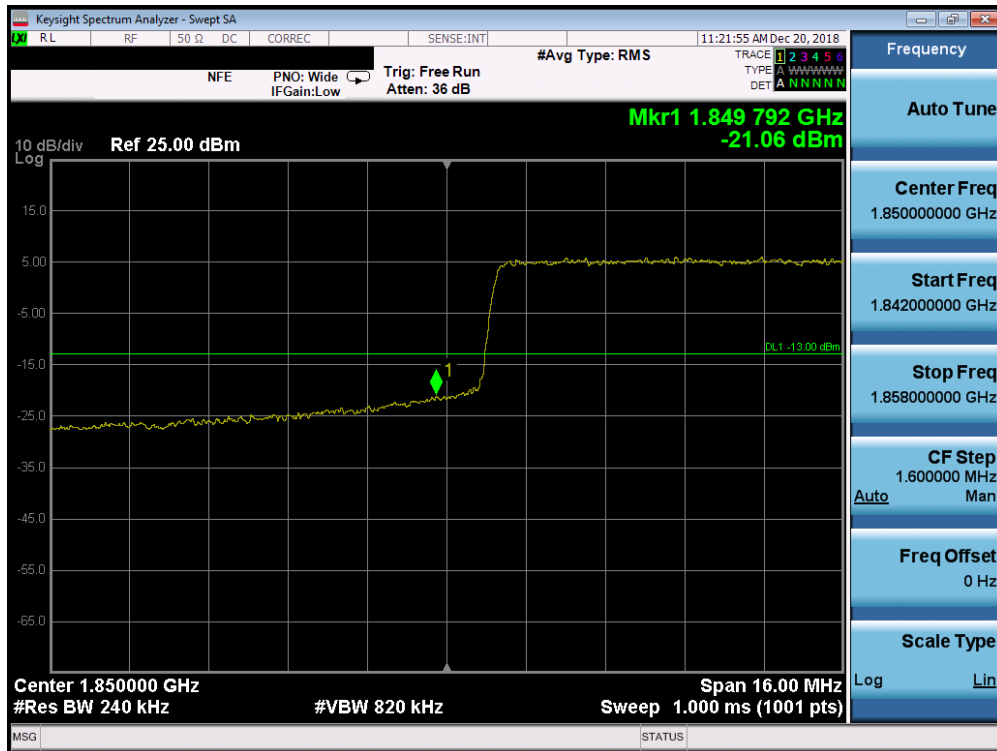
Plot 7-281. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



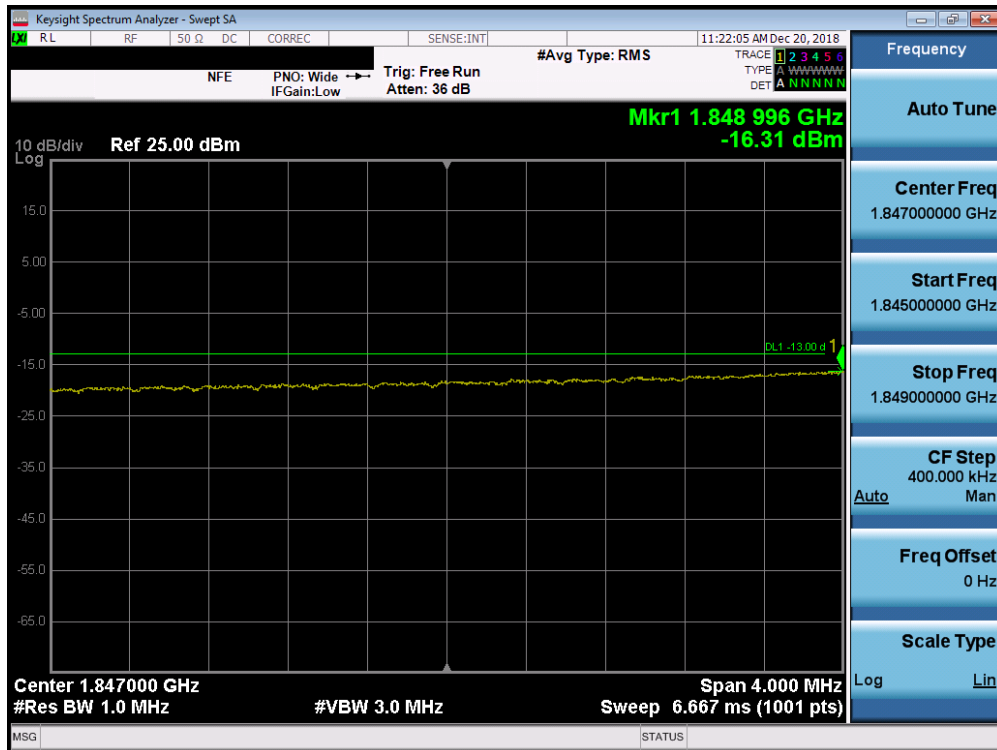
Plot 7-282. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 166 of 290



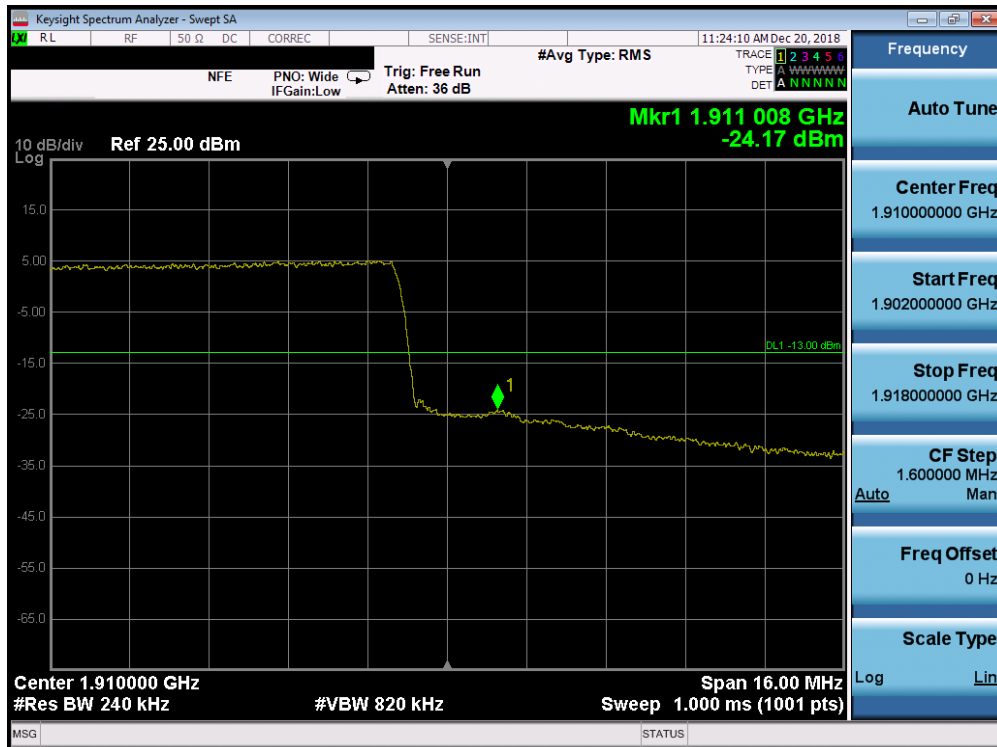


Plot 7-285. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

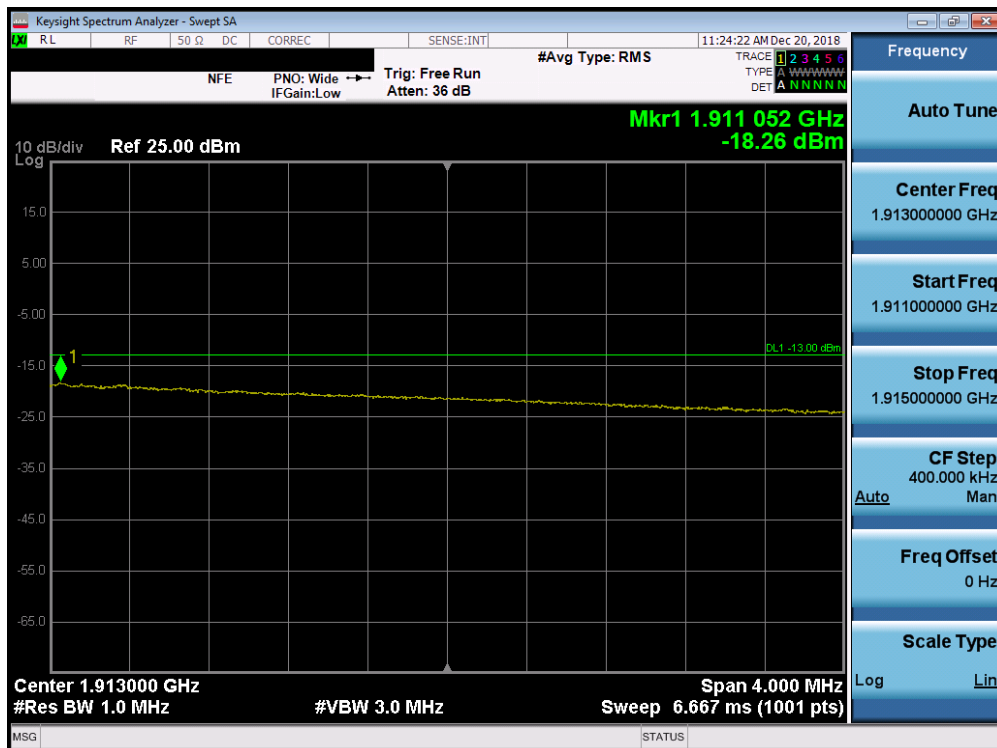


Plot 7-286. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1-ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 168 of 290



Plot 7-287. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

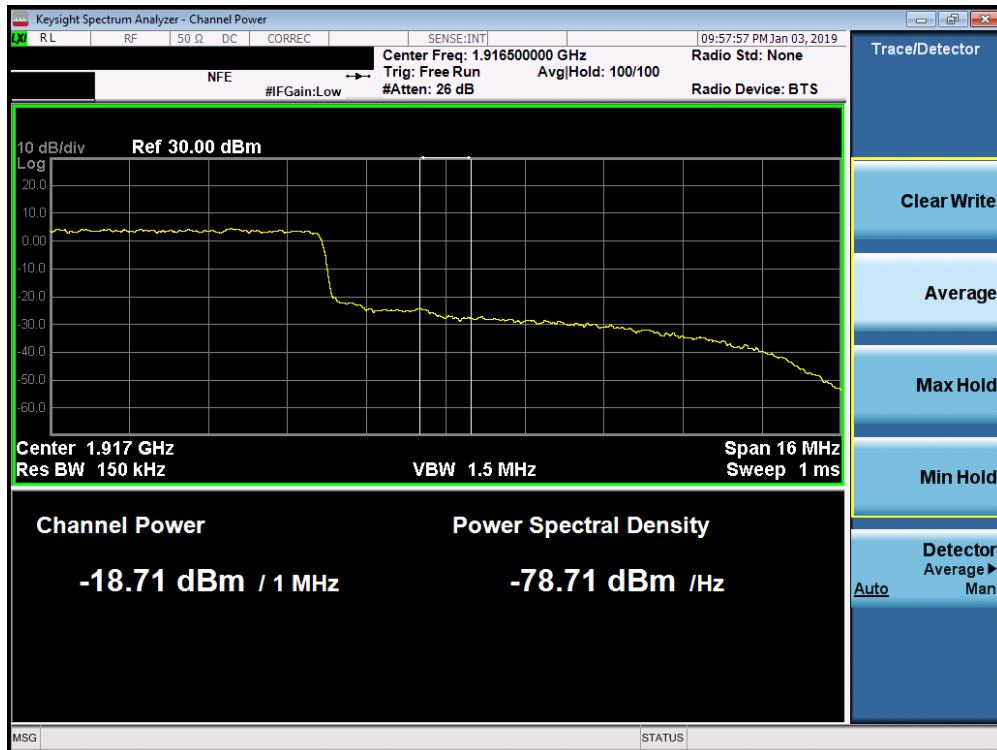


Plot 7-288. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 169 of 290



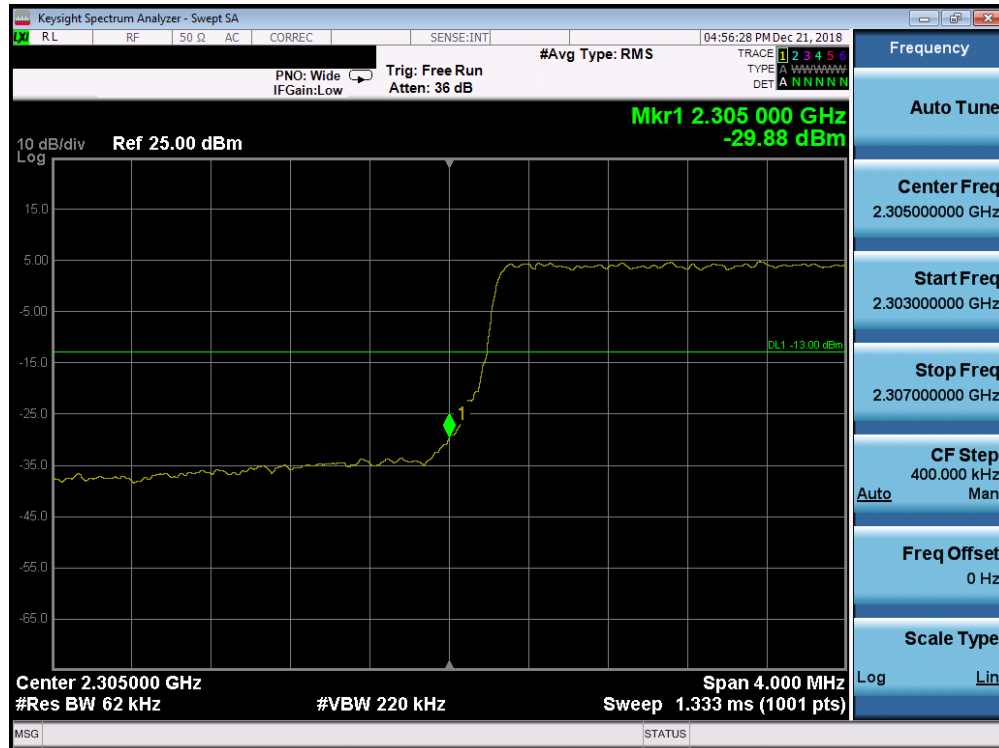
Plot 7-289. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



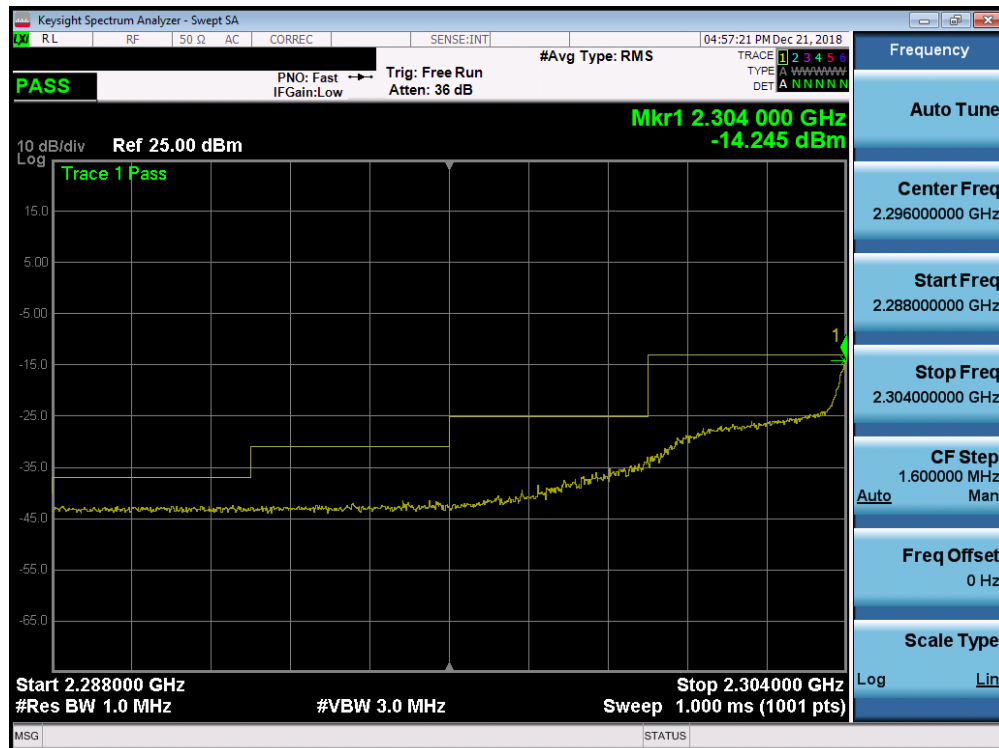
Plot 7-290. Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 170 of 290

Band 30

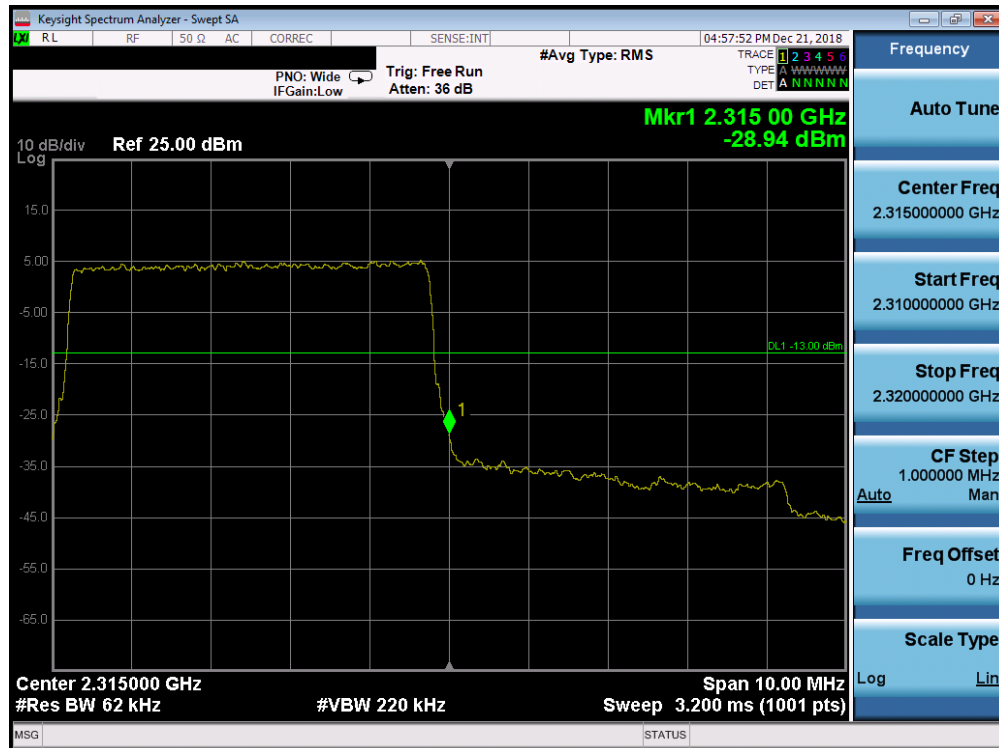


Plot 7-291. Lower Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-292. Lower Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 171 of 290

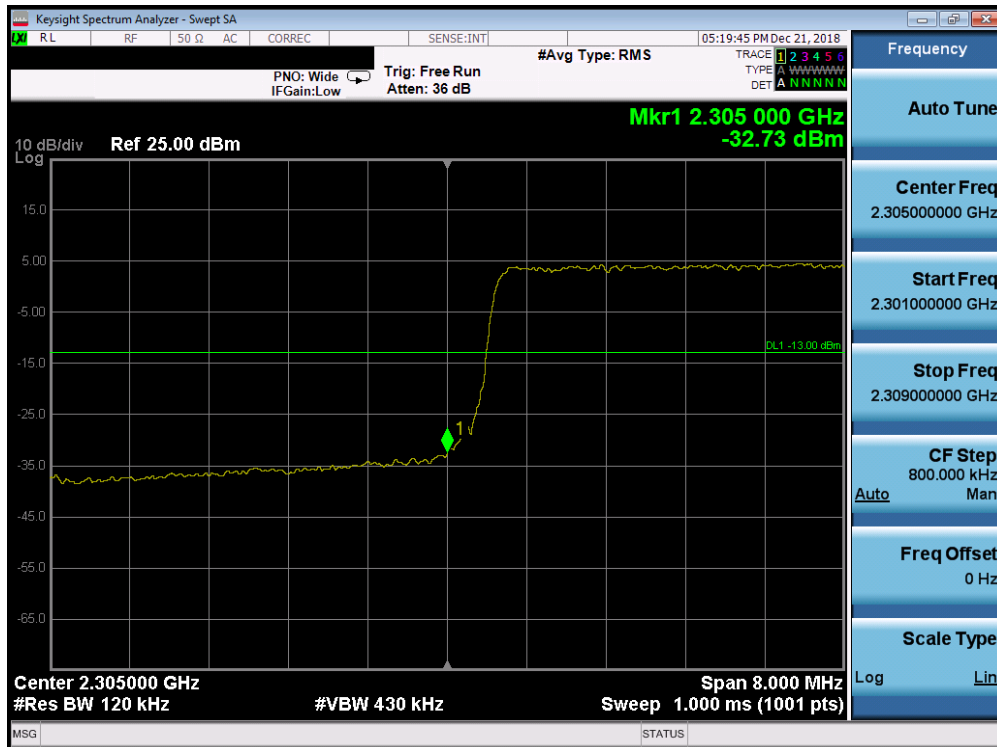


Plot 7-293. Upper Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-294. Upper Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 172 of 290

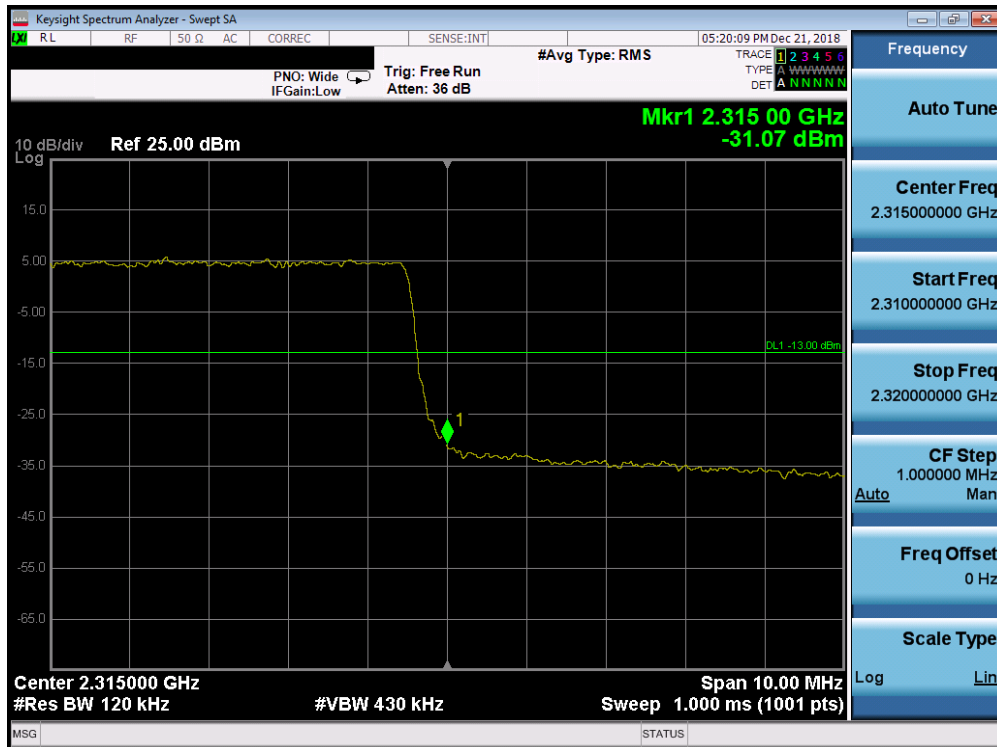


Plot 7-295. Lower Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-296. Lower Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1-ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 173 of 290



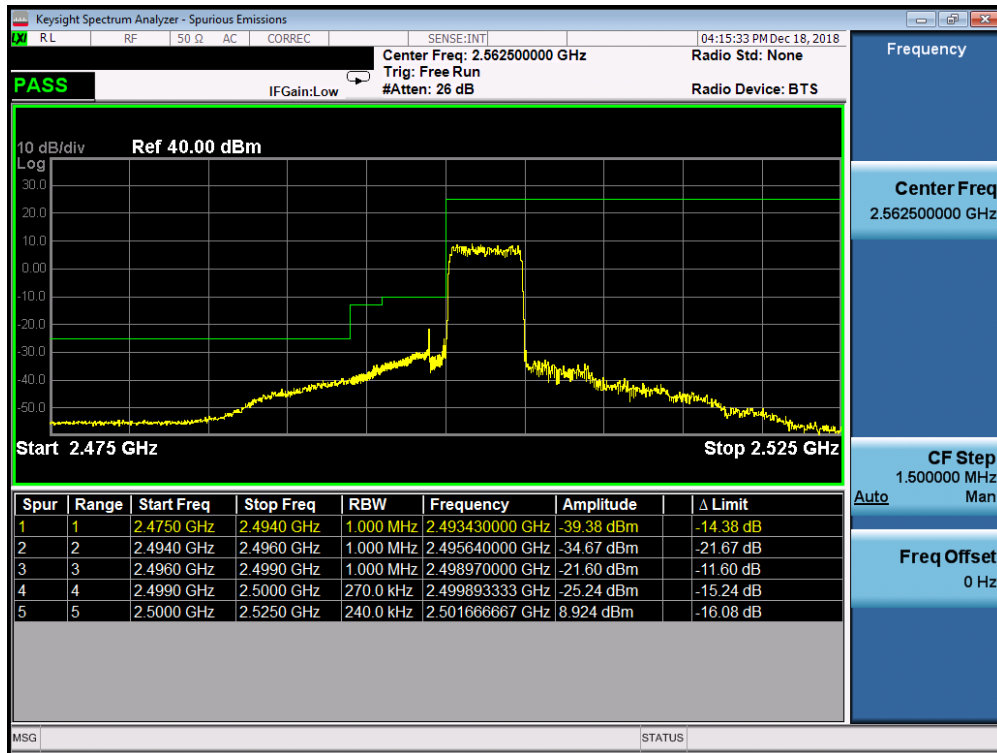
Plot 7-297. Upper Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)



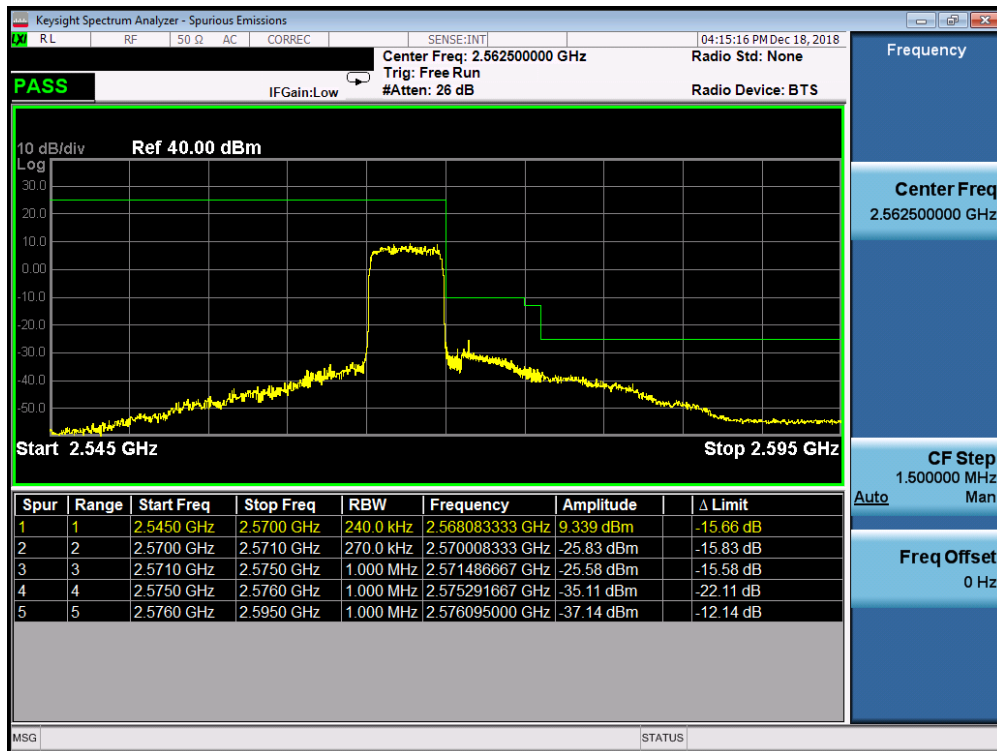
Plot 7-298. Upper Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 174 of 290

Band 7

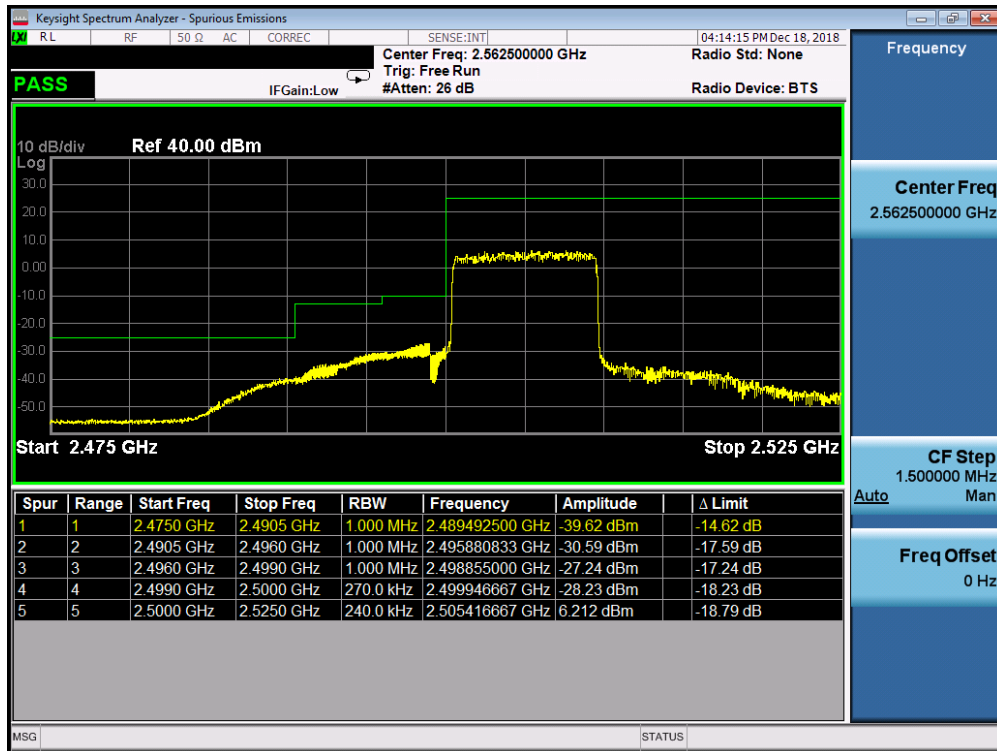


Plot 7-299. Lower ACP Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)

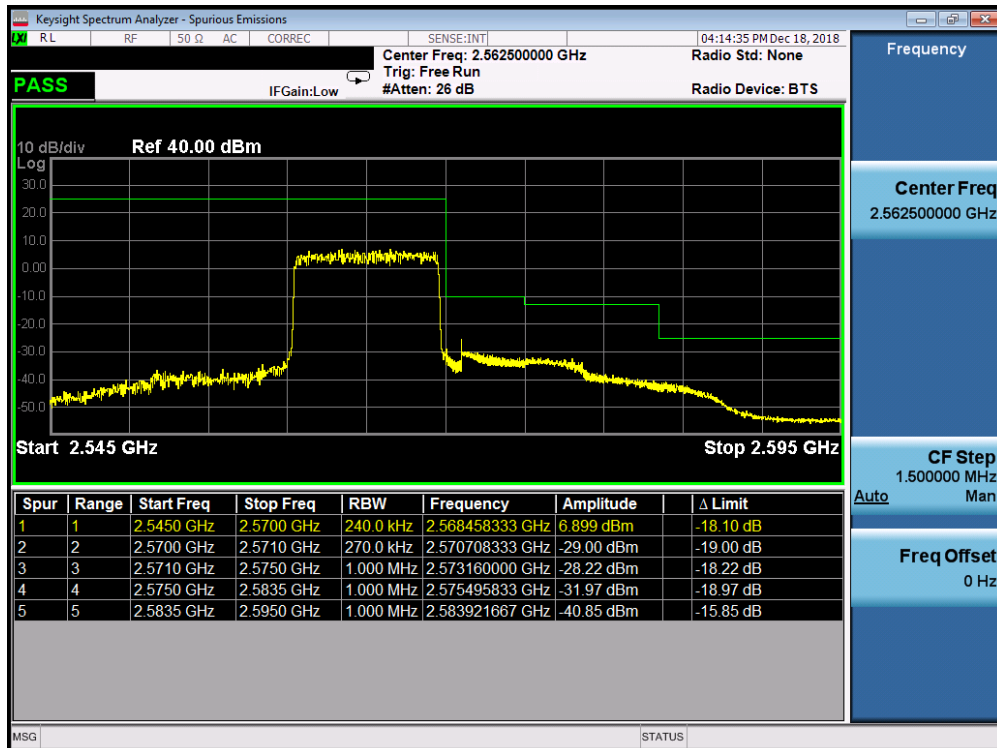


Plot 7-300. Upper ACP Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset			Page 175 of 290

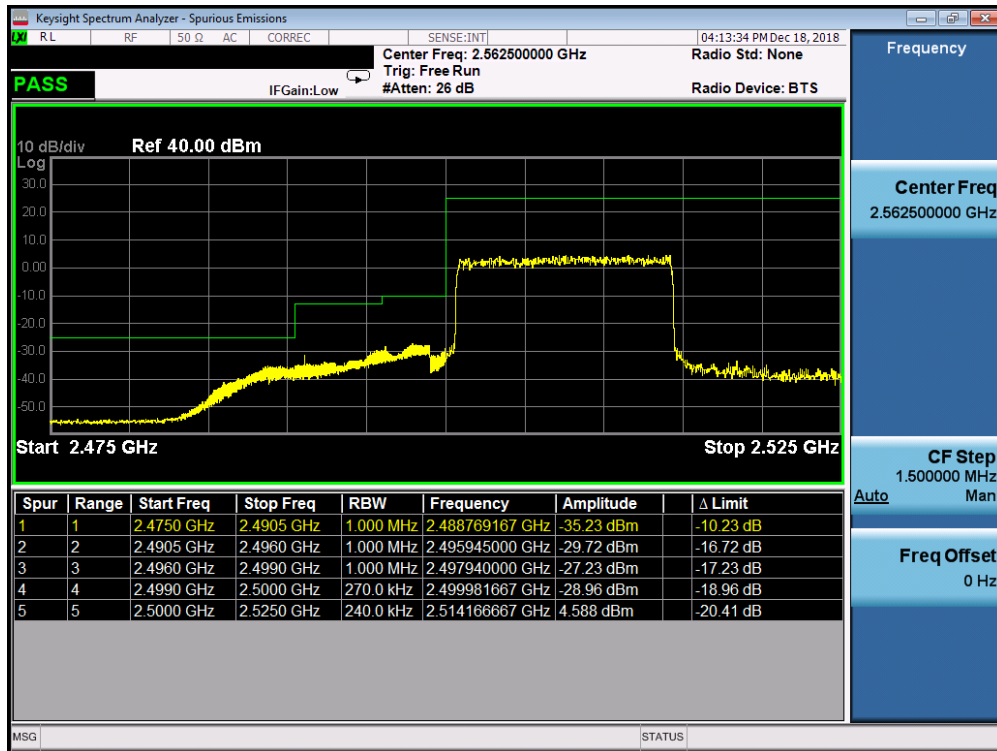


Plot 7-301. Lower ACP Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

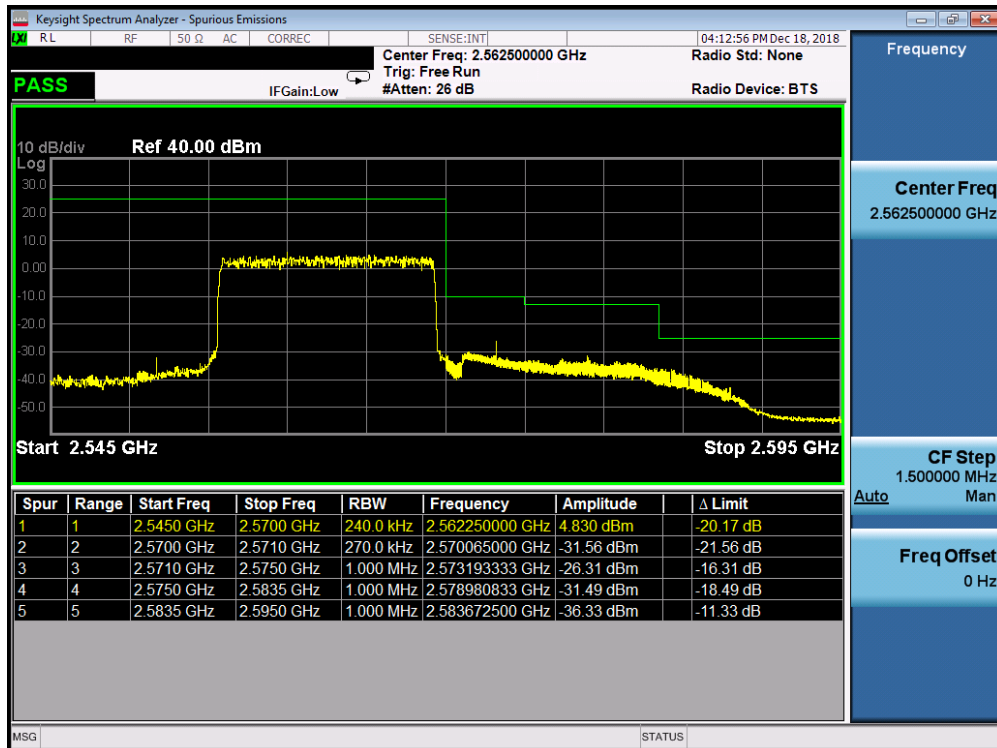


Plot 7-302. Upper ACP Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 176 of 290

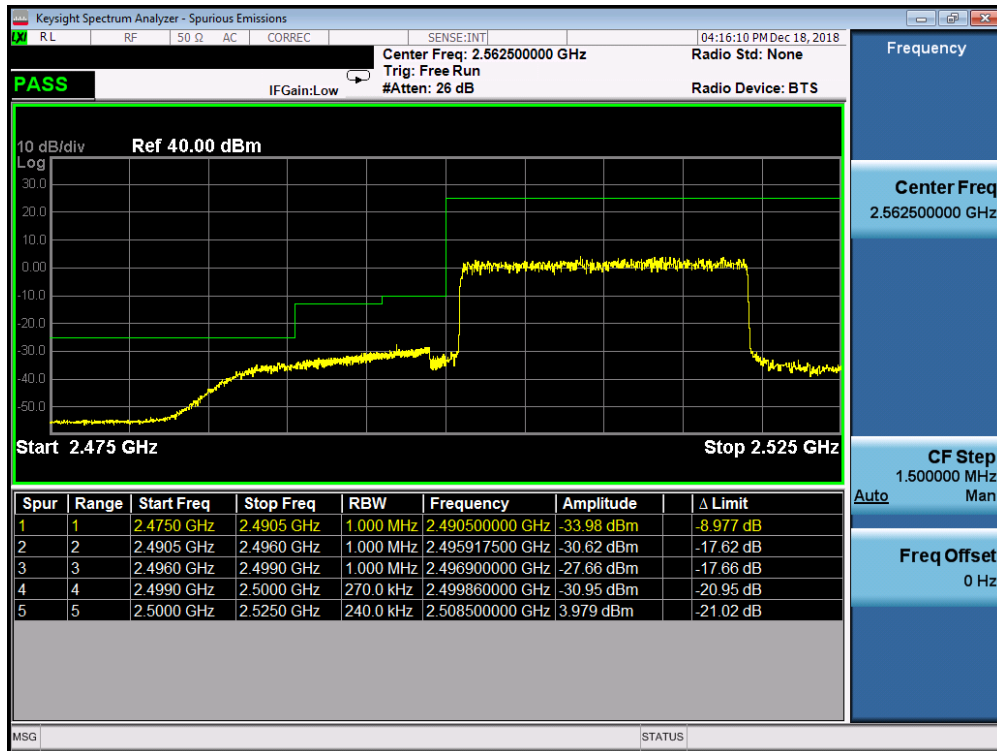


Plot 7-303. Lower ACP Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)

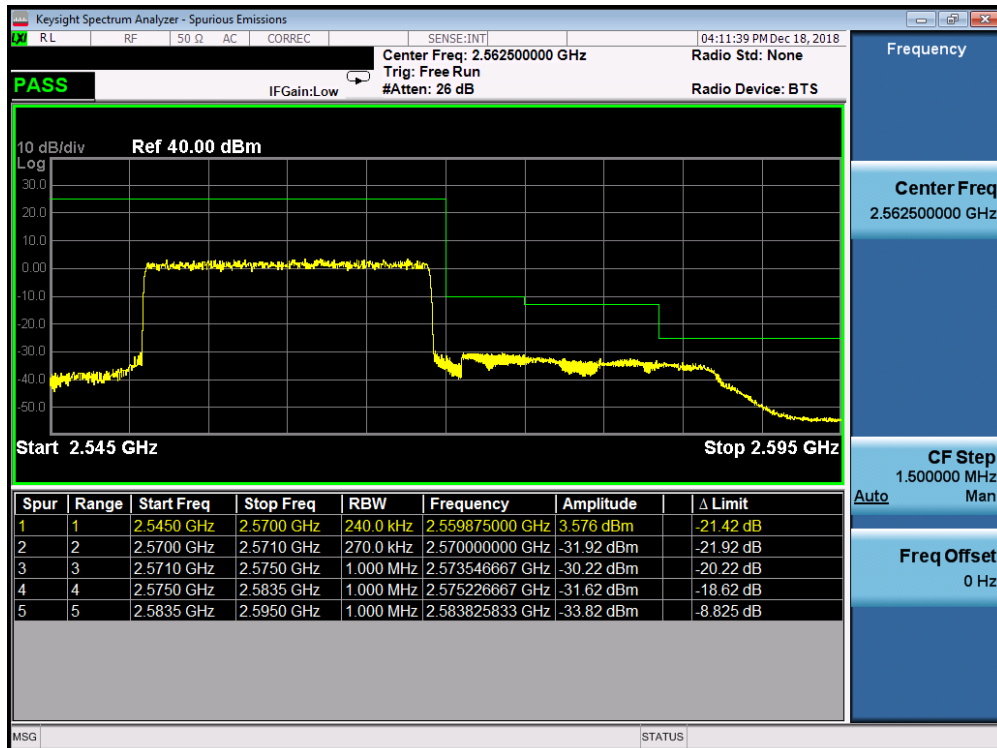


Plot 7-304. Upper ACP Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 177 of 290



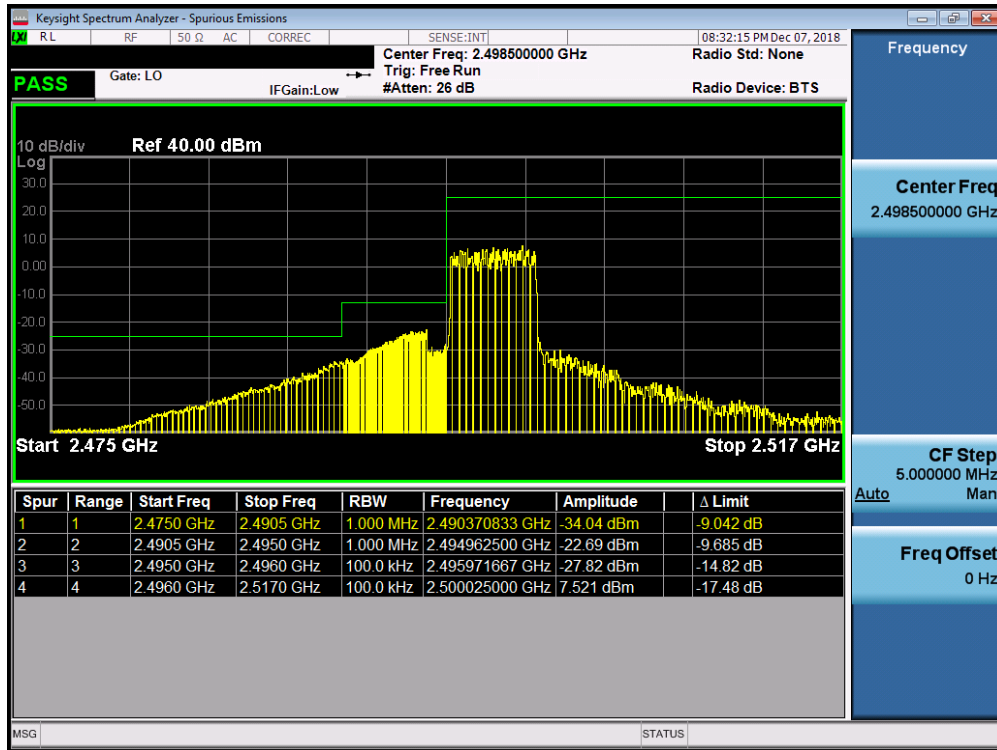
Plot 7-305. Lower ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)



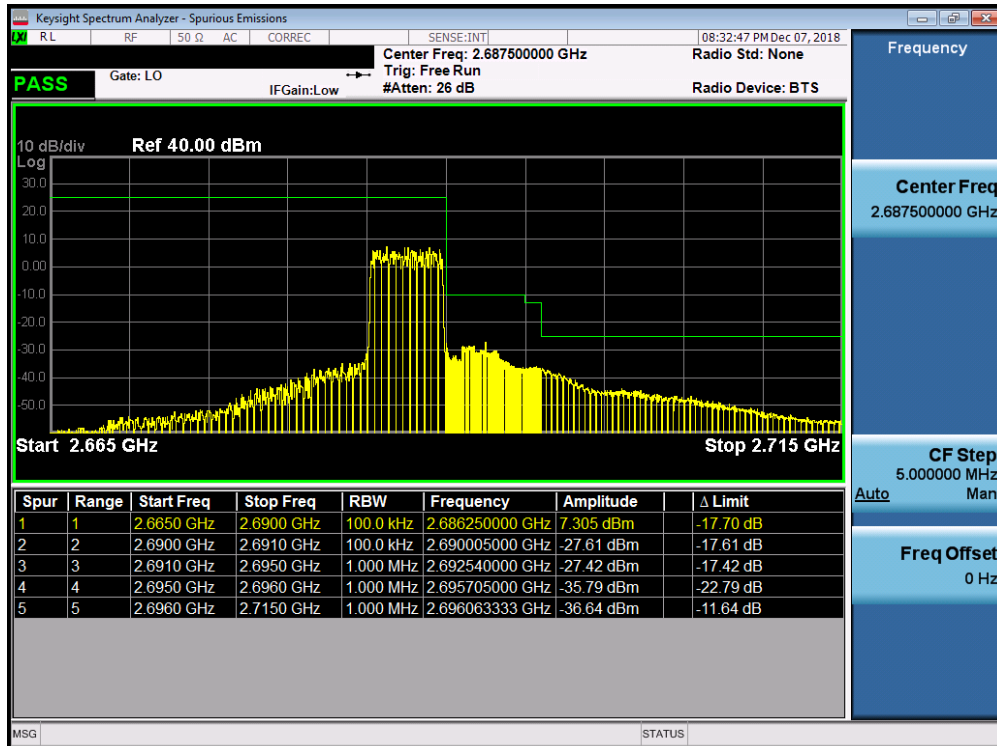
Plot 7-306. Upper ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 178 of 290

Band 41 PC2

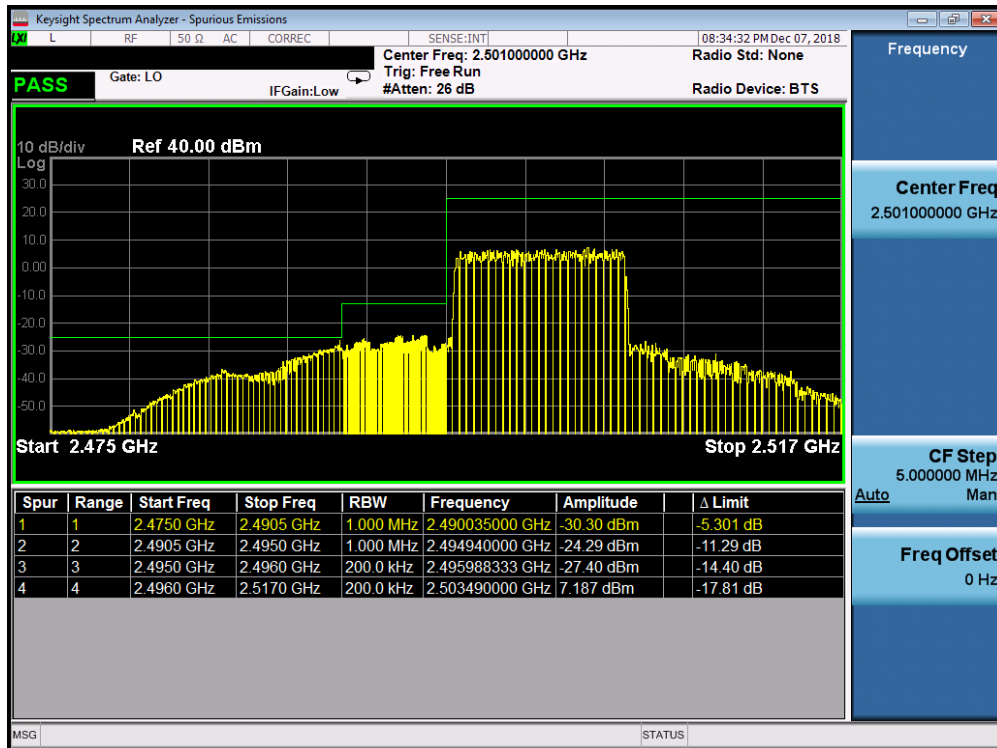


Plot 7-307. Lower ACP Plot at 2496 MHz (Band 41 PC2 - 5.0MHz QPSK - Full RB Configuration)

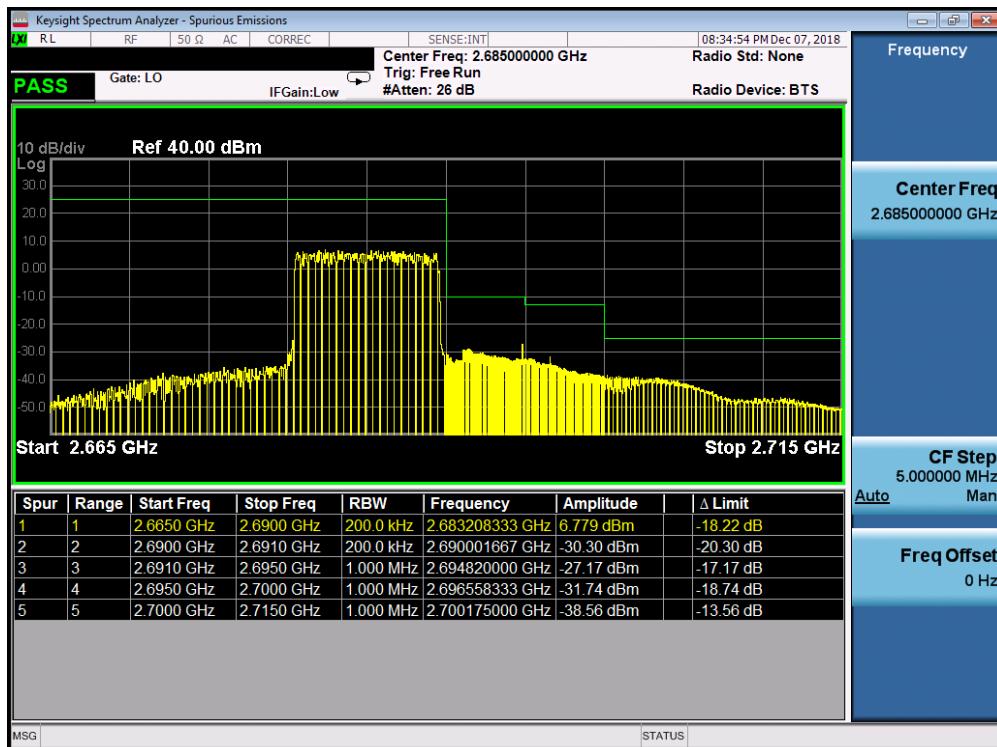


Plot 7-308. Upper ACP Plot (Band 41 PC2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 179 of 290

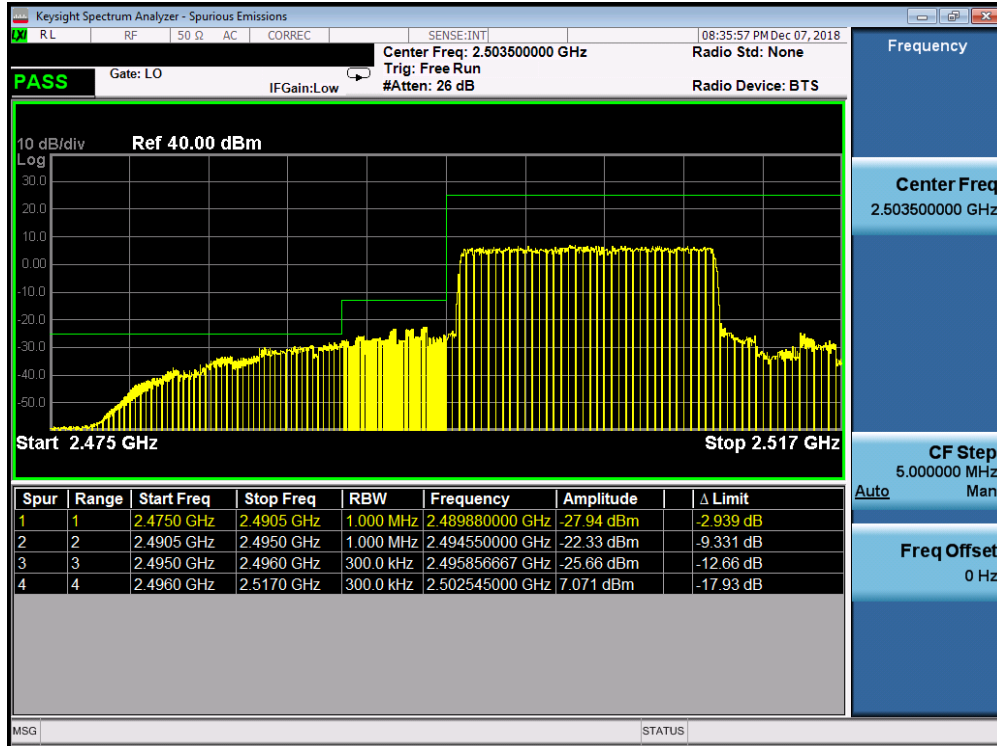


Plot 7-309. Lower ACP Plot at 2496 MHz (Band 41 PC2 - 10.0MHz QPSK - Full RB Configuration)

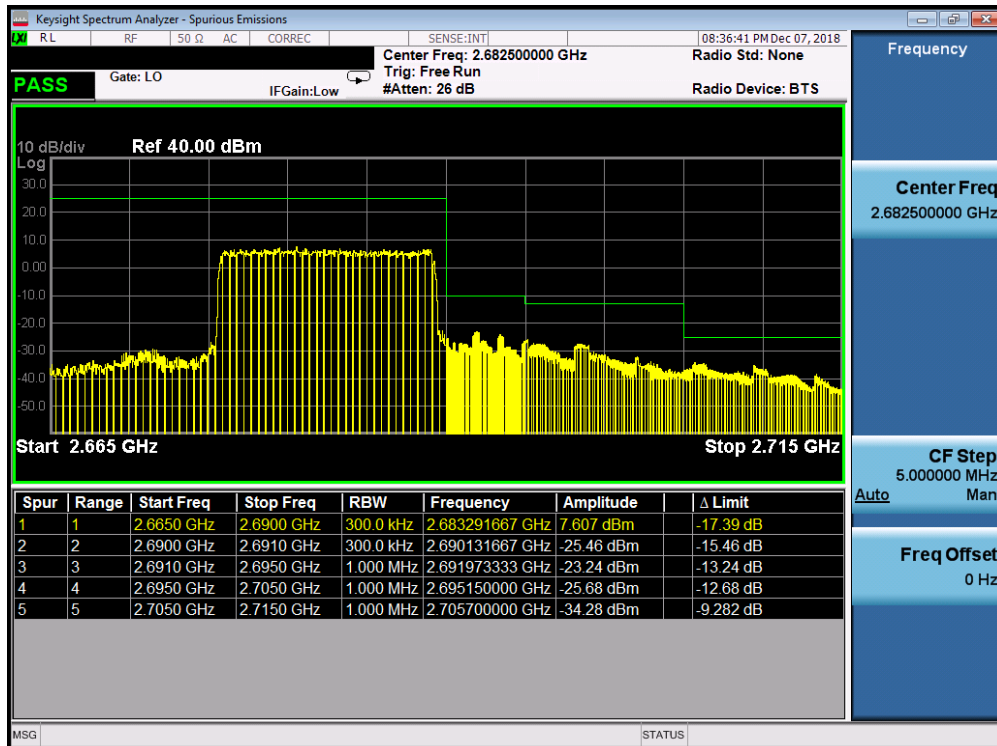


Plot 7-310. Upper ACP Plot (Band 41 PC2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 180 of 290

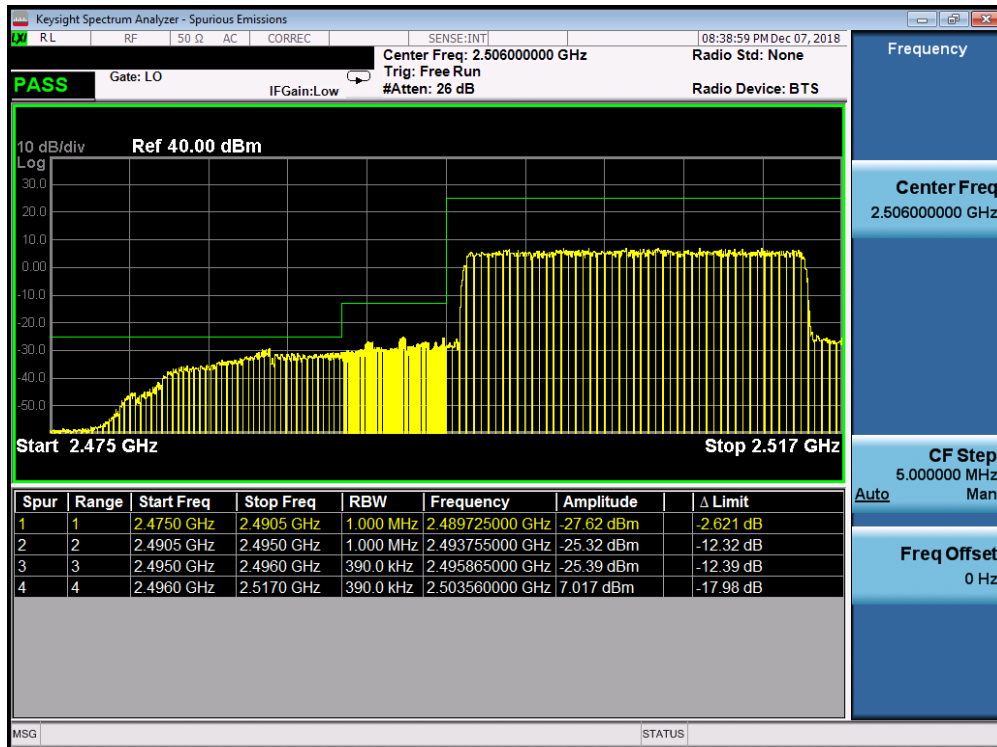


Plot 7-311. Lower ACP Plot at 2496 MHz (Band 41 PC2 - 15.0MHz QPSK - Full RB Configuration)

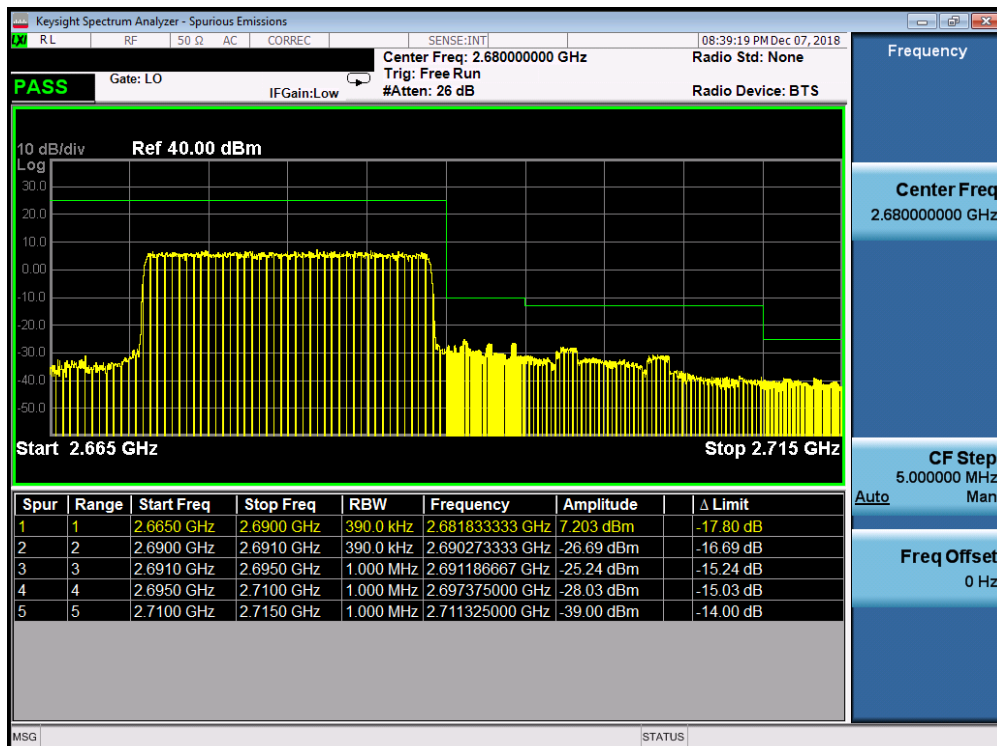


Plot 7-312. Upper ACP Plot (Band 41 PC2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 181 of 290



Plot 7-313. Lower ACP Plot at 2496 MHz (Band 41 PC2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-314. Upper ACP Plot (Band 41 PC2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 182 of 290

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 $\geq$ 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.

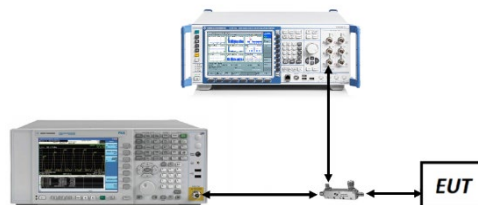


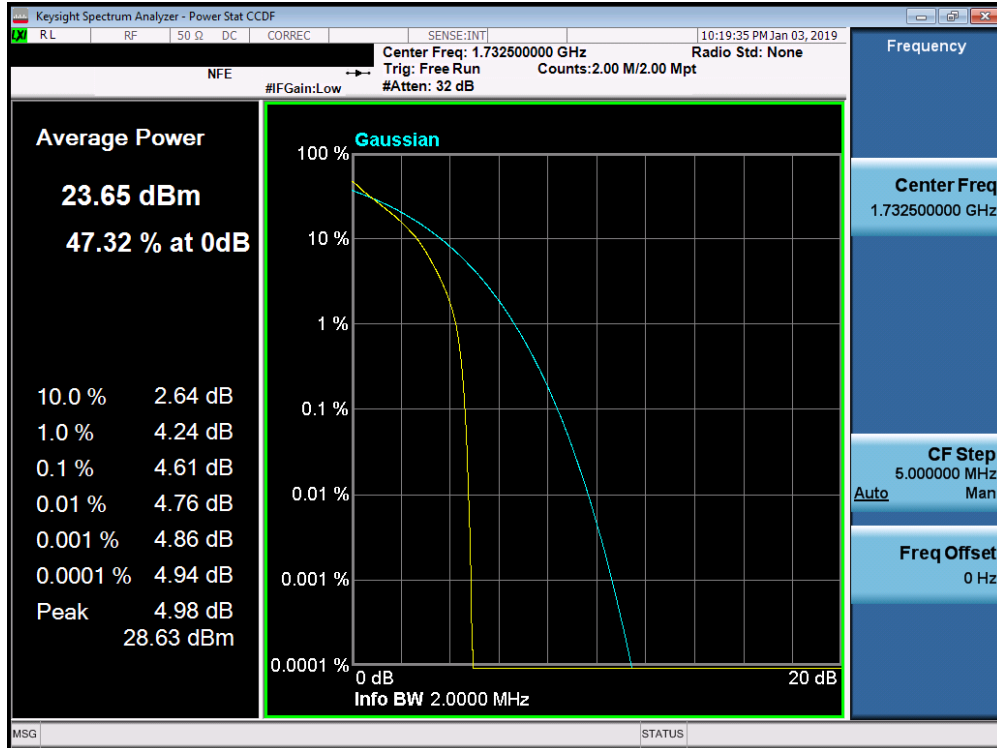
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

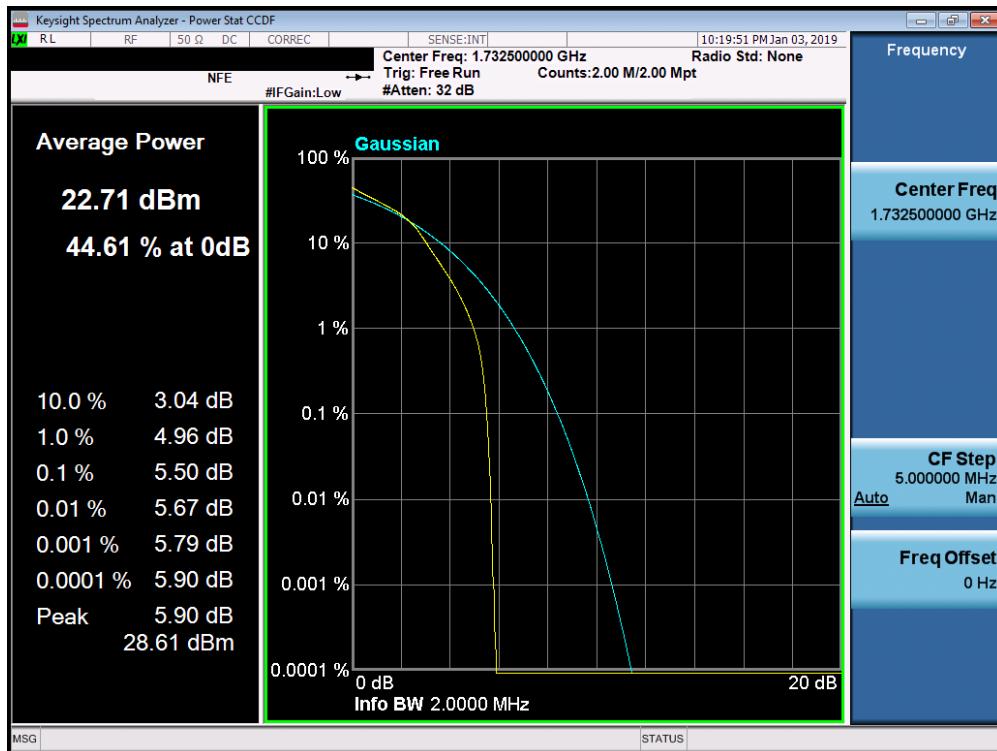
None.

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 183 of 290

Band 66/4

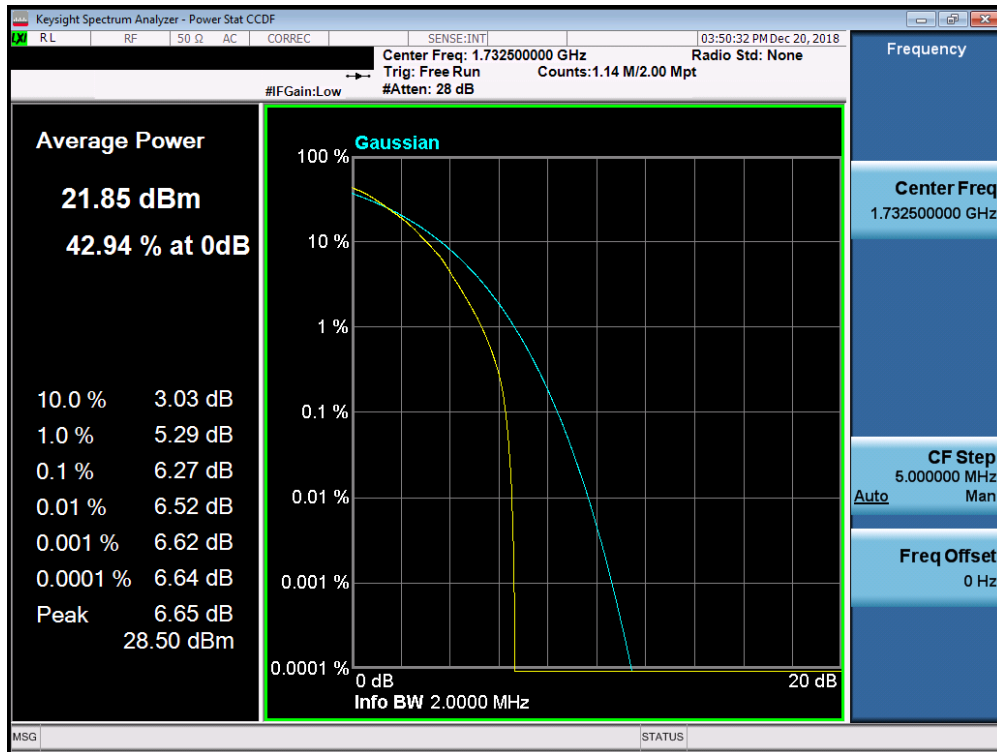


Plot 7-315. PAR Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

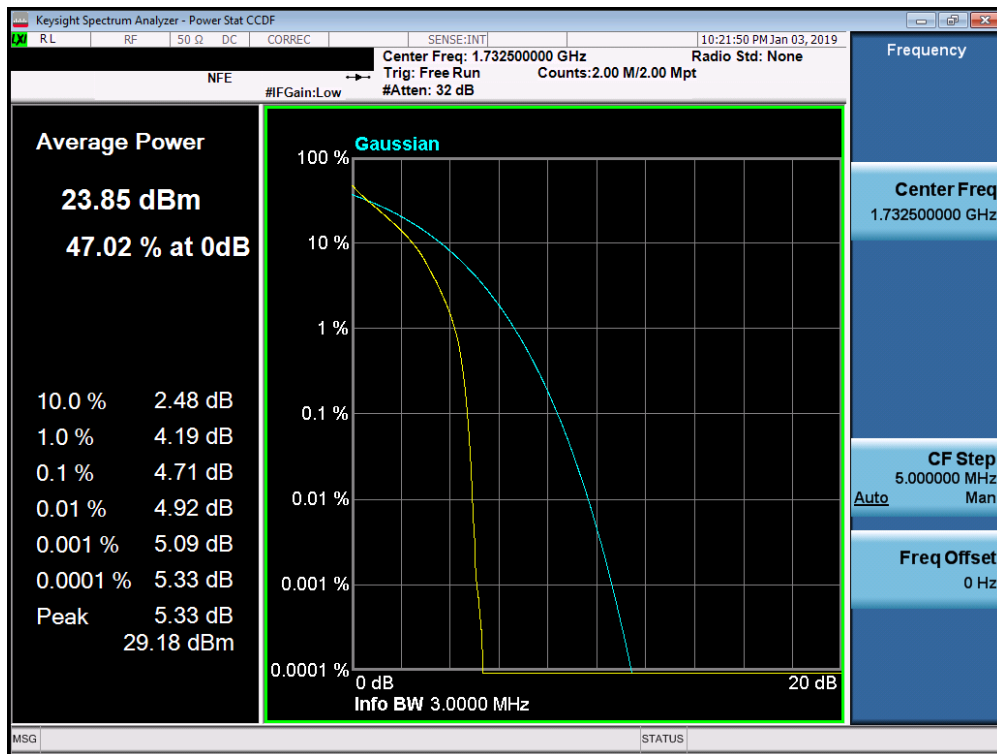


Plot 7-316. PAR Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 184 of 290

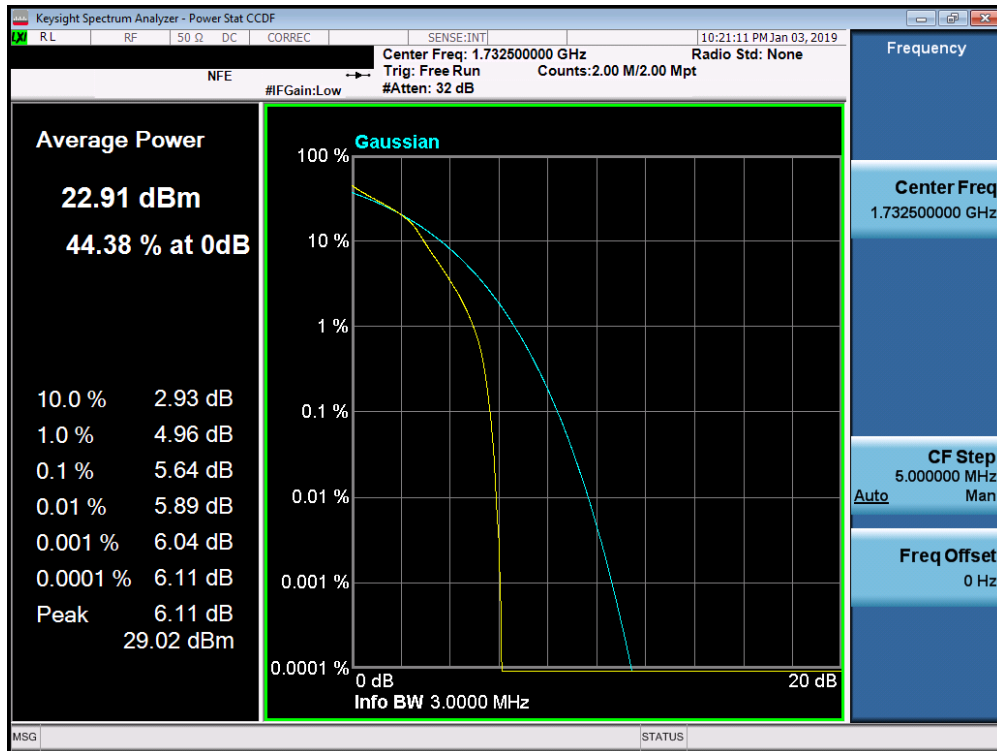


Plot 7-317. PAR Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

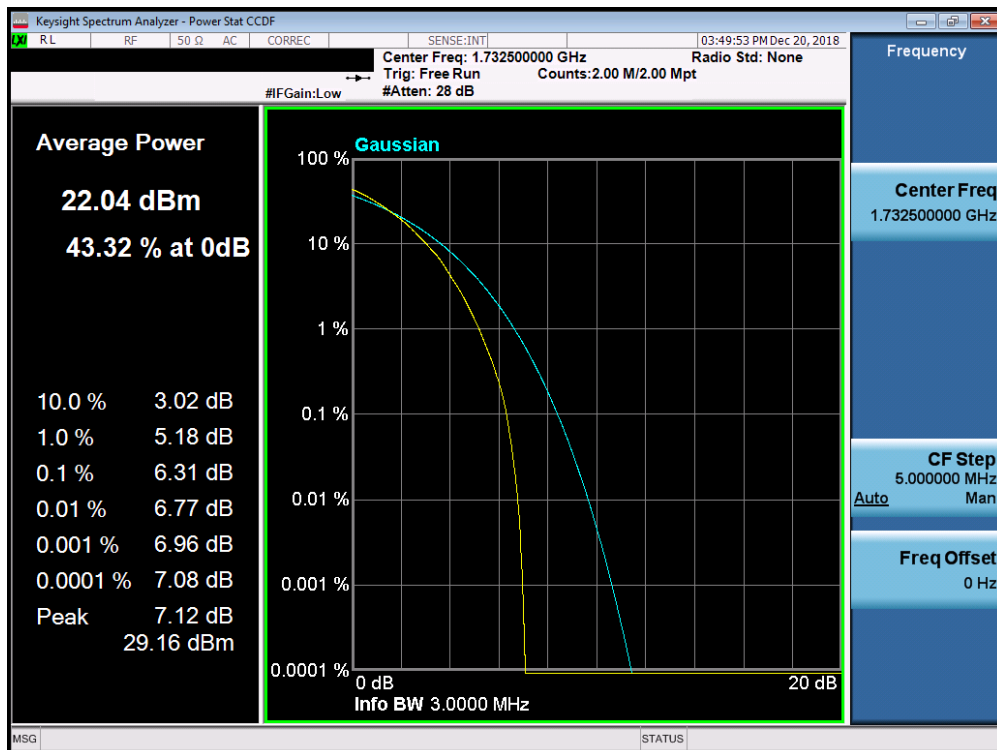


Plot 7-318. PAR Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 185 of 290

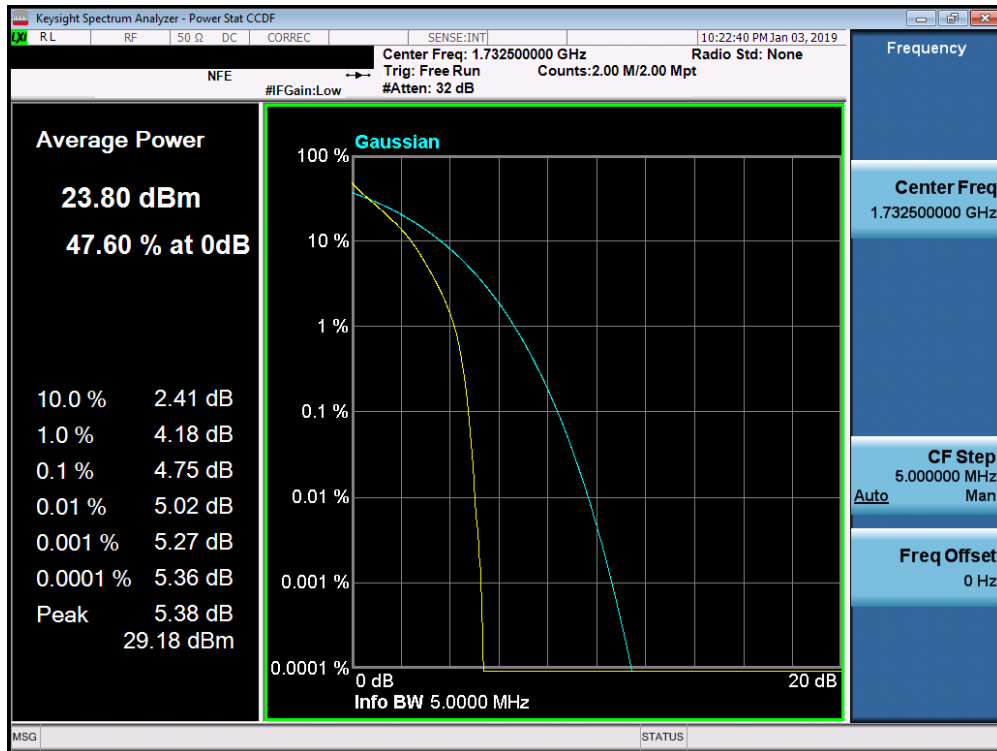


Plot 7-319. PAR Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)

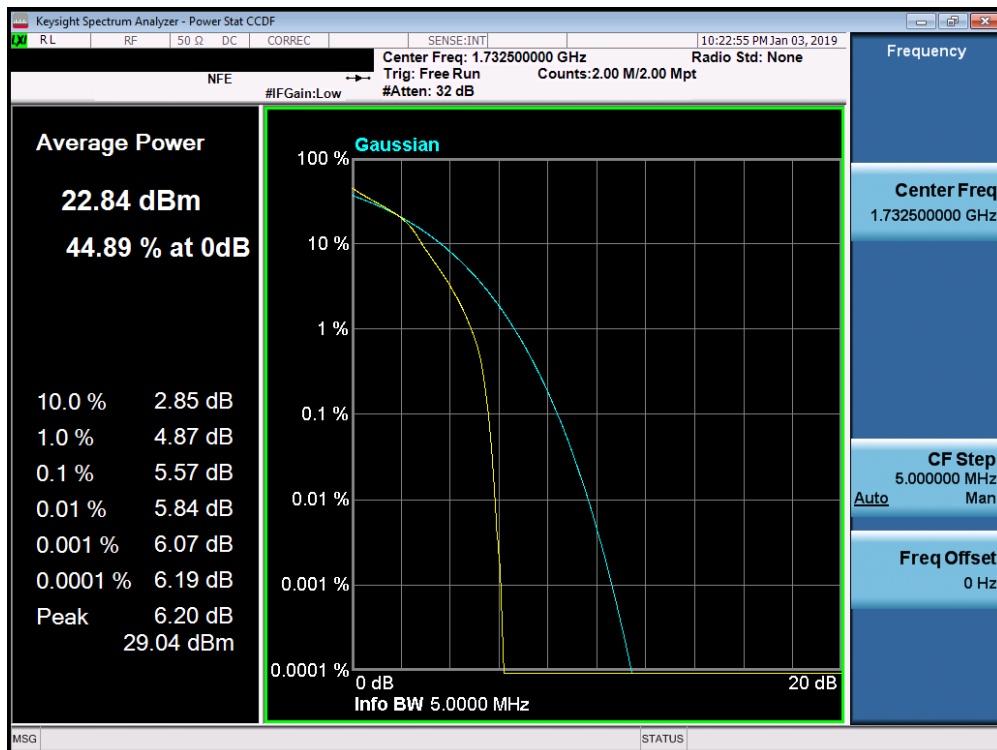


Plot 7-320. PAR Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset	Page 186 of 290

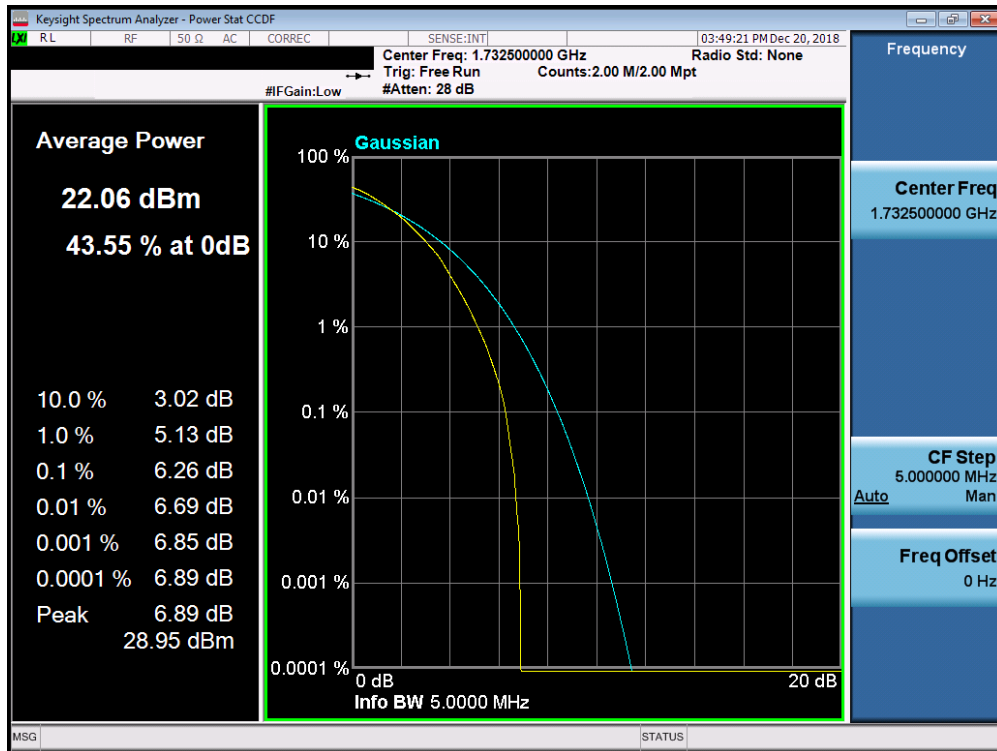


Plot 7-321. PAR Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)

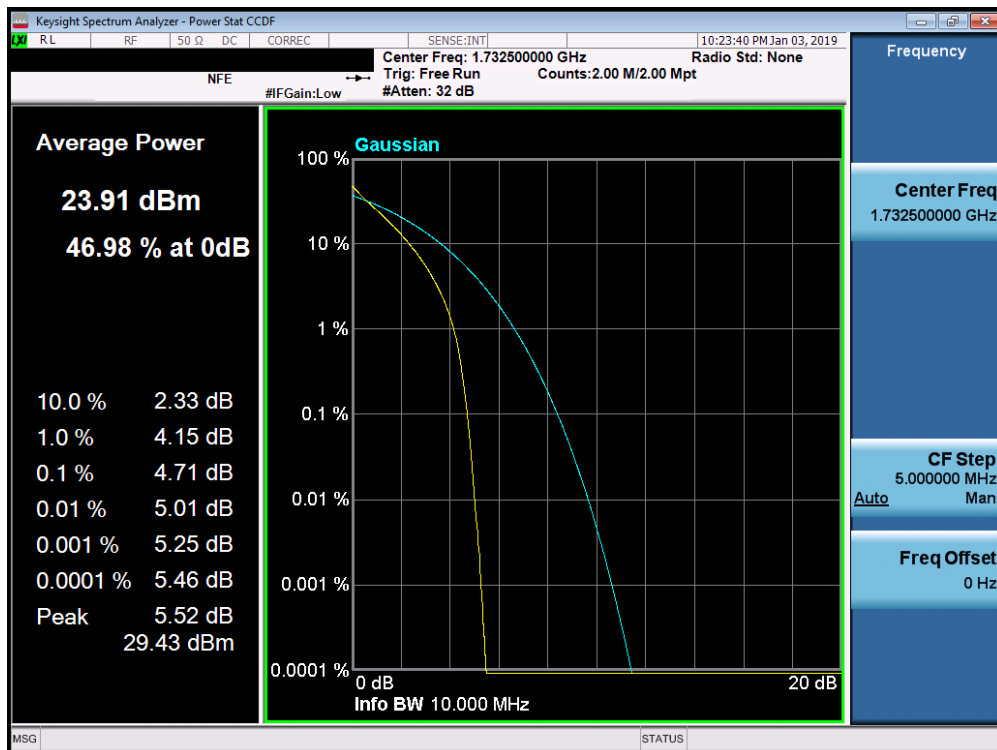


Plot 7-322. PAR Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 187 of 290

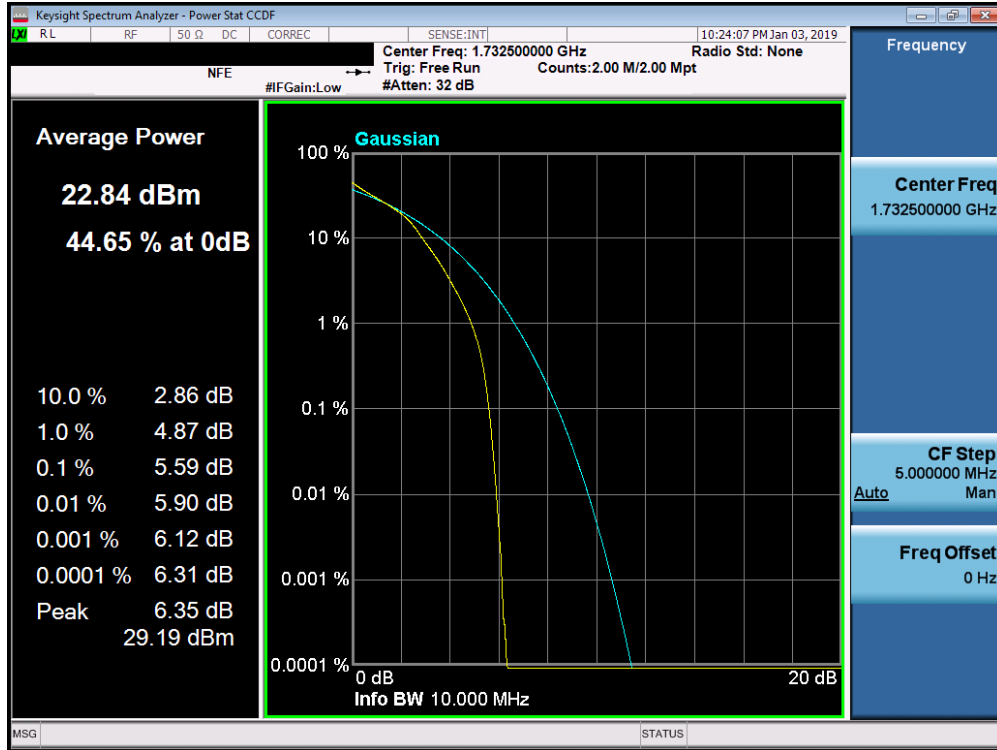


Plot 7-323. PAR Plot (Band 66/4 - 5.0MHz 64-QAM - Full RB Configuration)

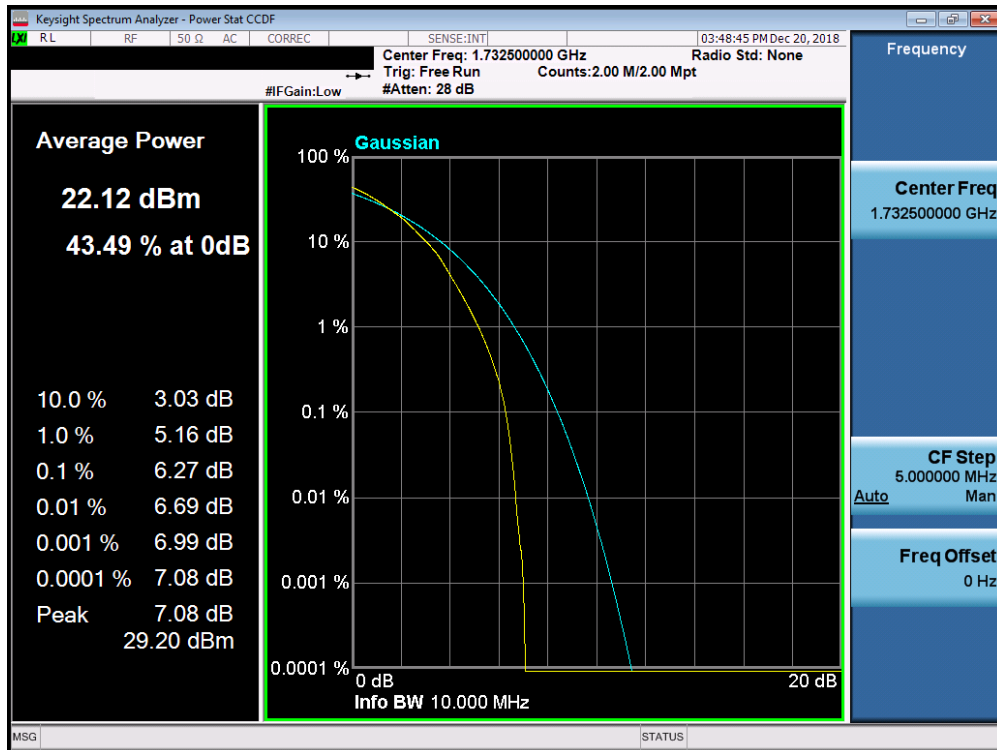


Plot 7-324. PAR Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 188 of 290

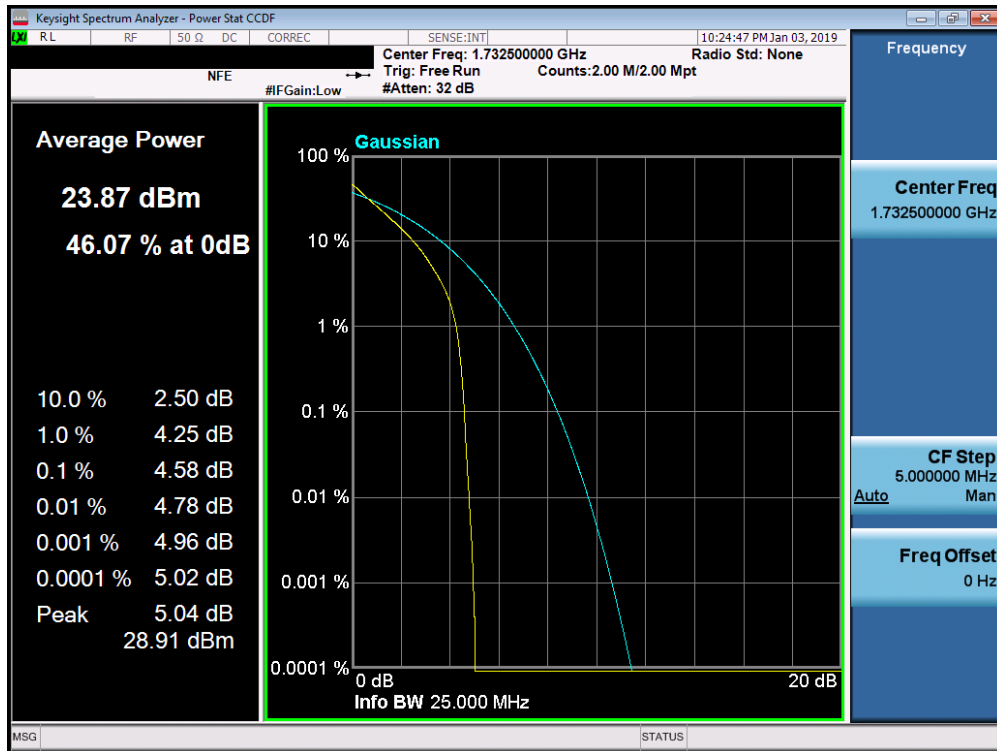


Plot 7-325. PAR Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)

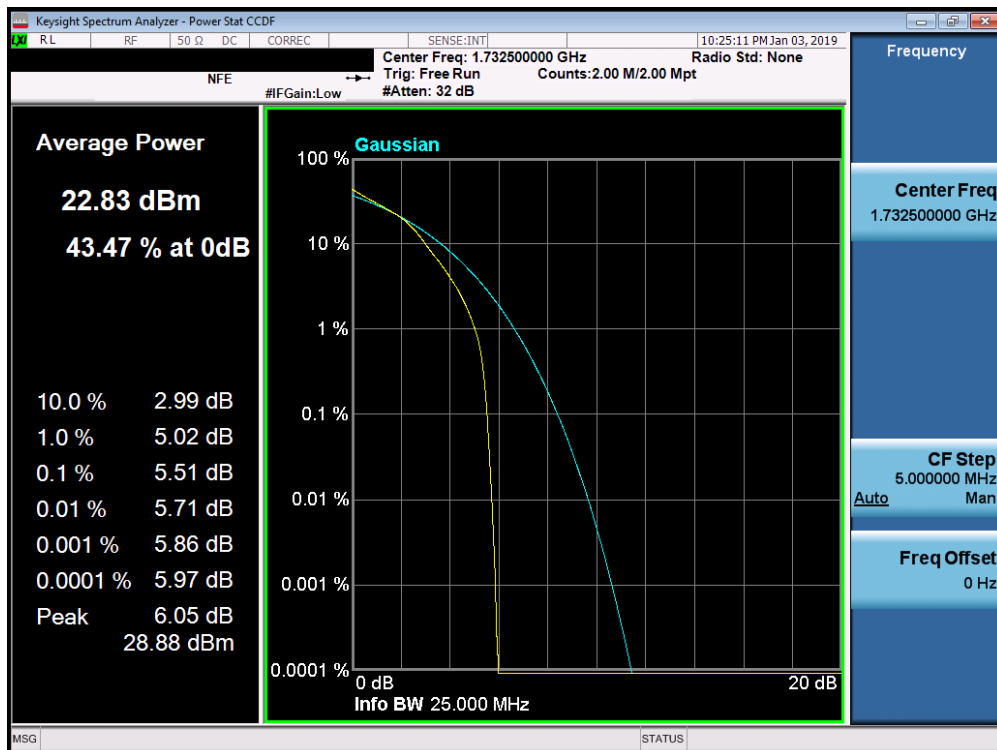


Plot 7-326. PAR Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1-ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset	Page 189 of 290

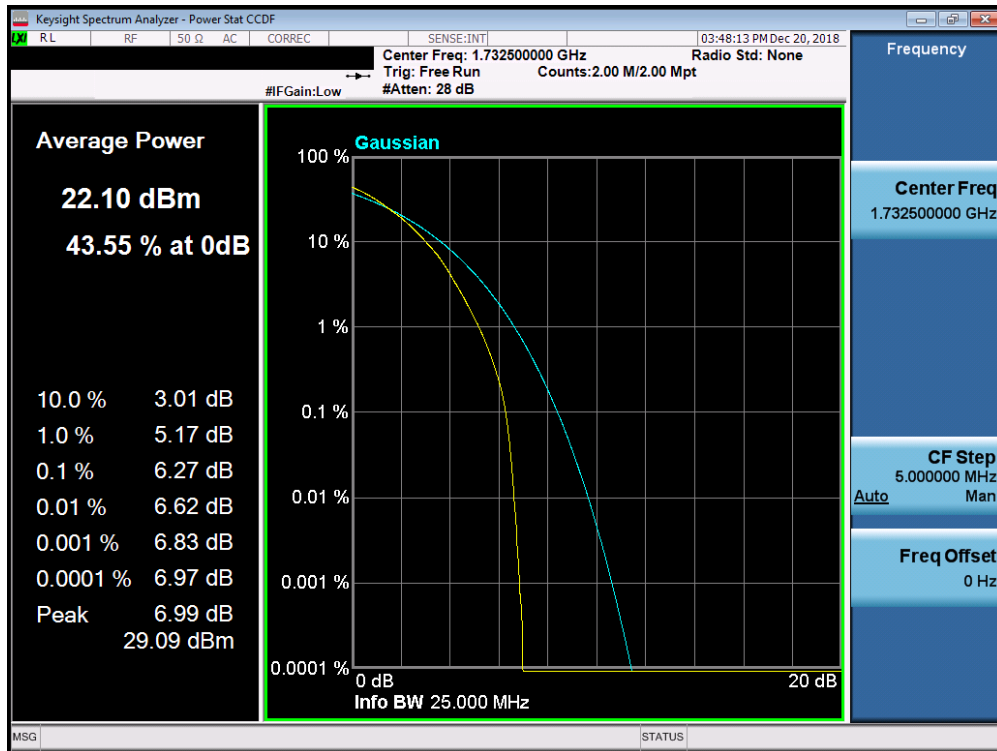


Plot 7-327. PAR Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

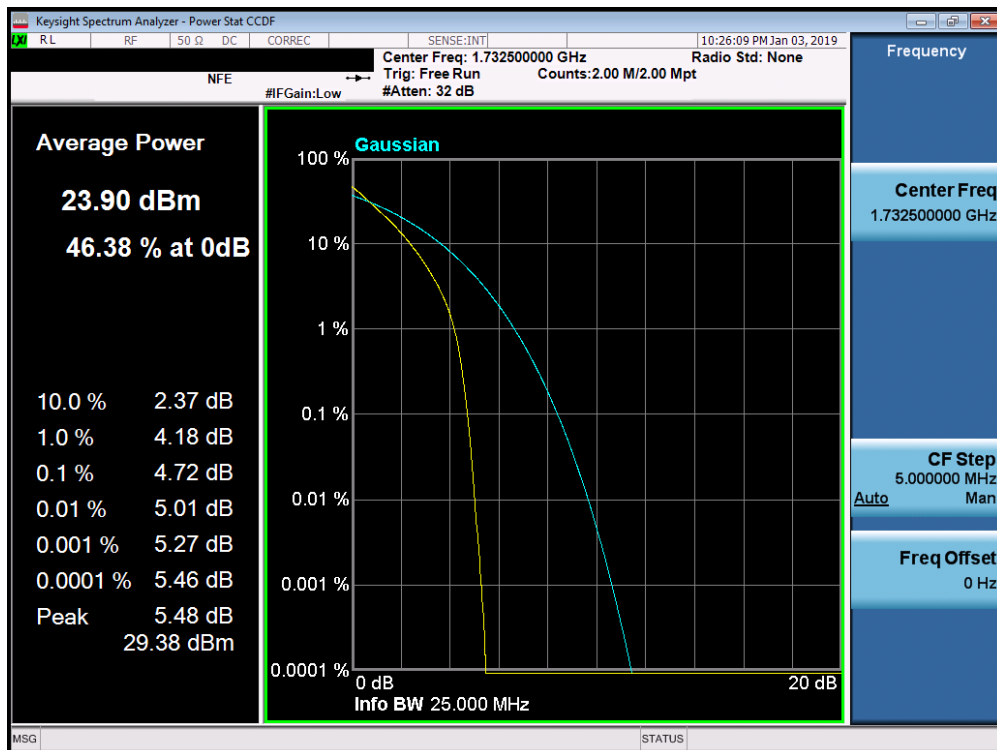


Plot 7-328. PAR Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 190 of 290

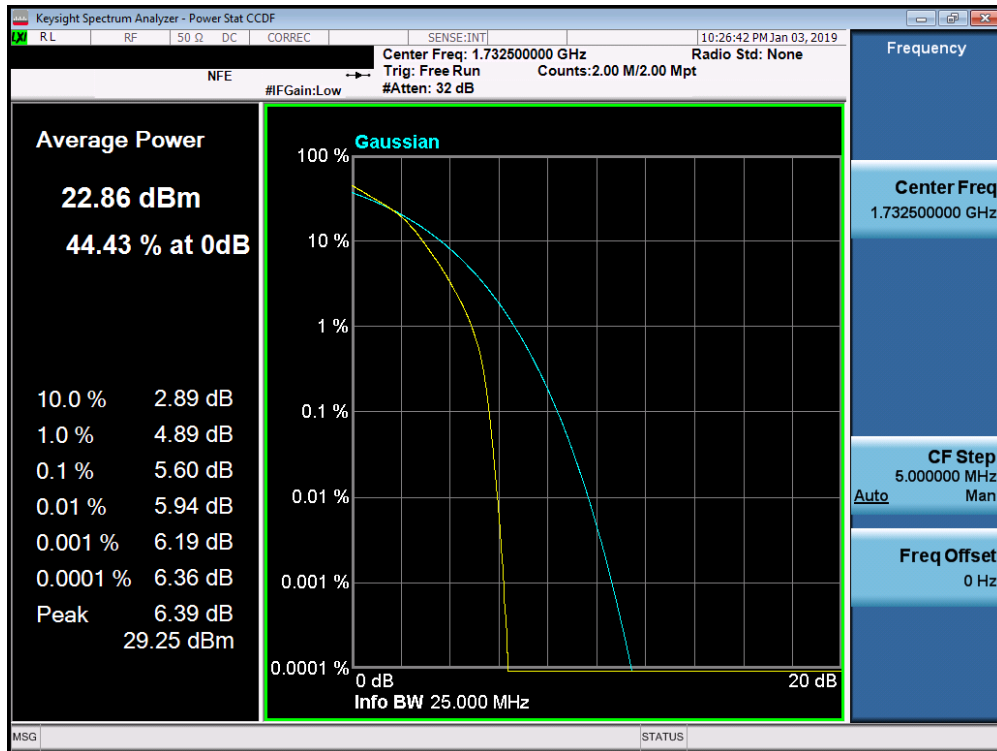


Plot 7-329. PAR Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)

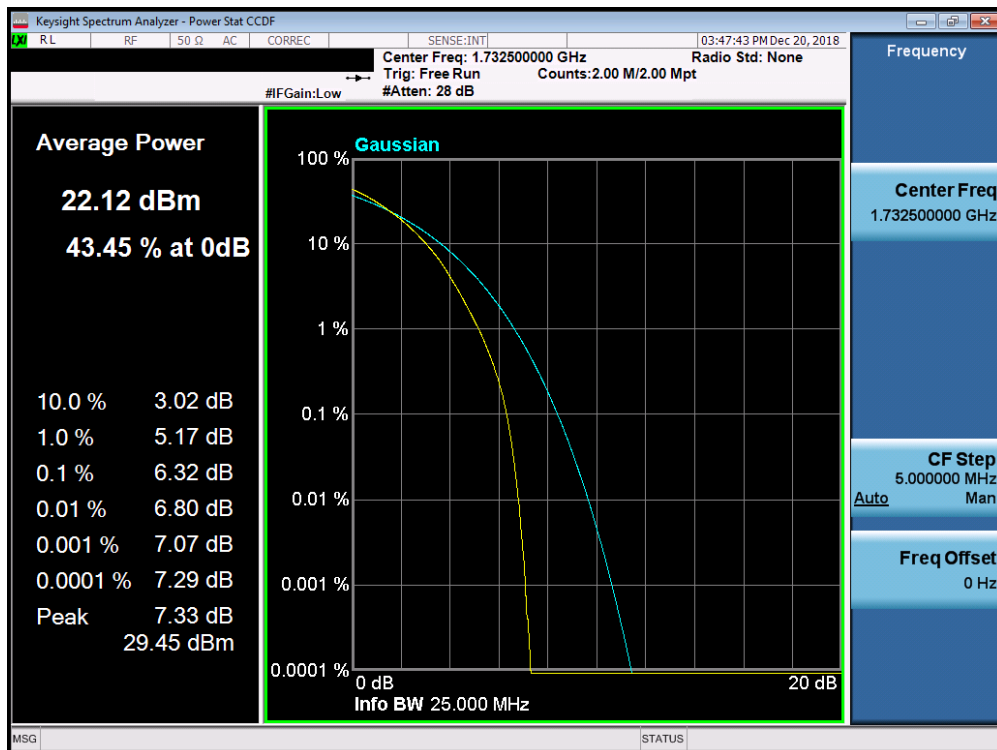


Plot 7-330. PAR Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1-ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 191 of 290



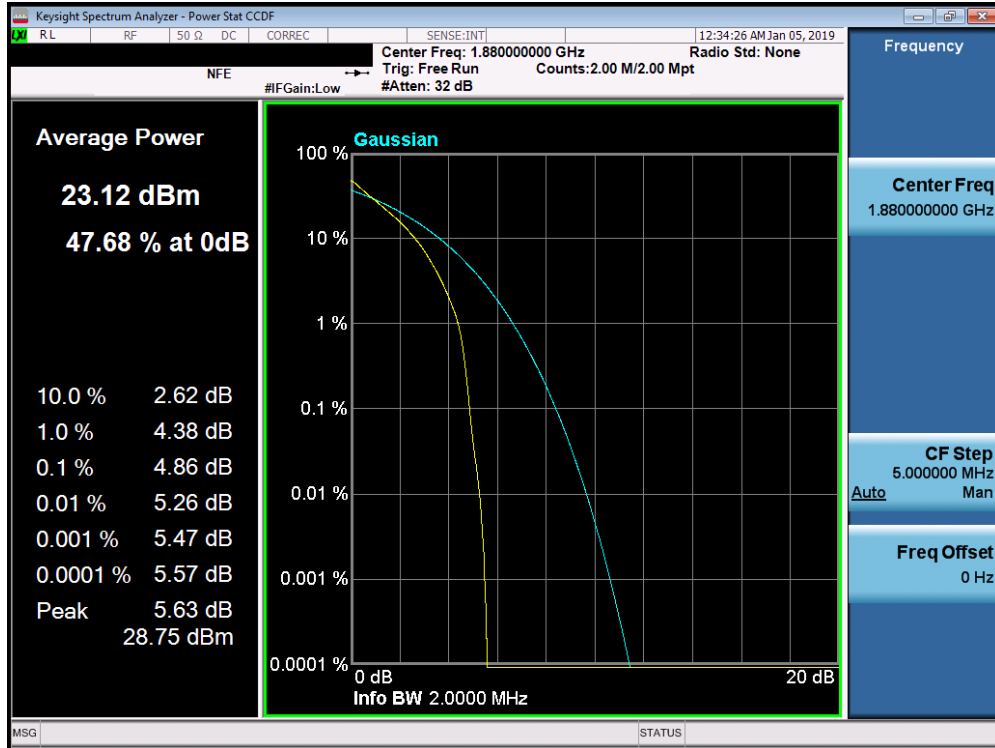
Plot 7-331. PAR Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)



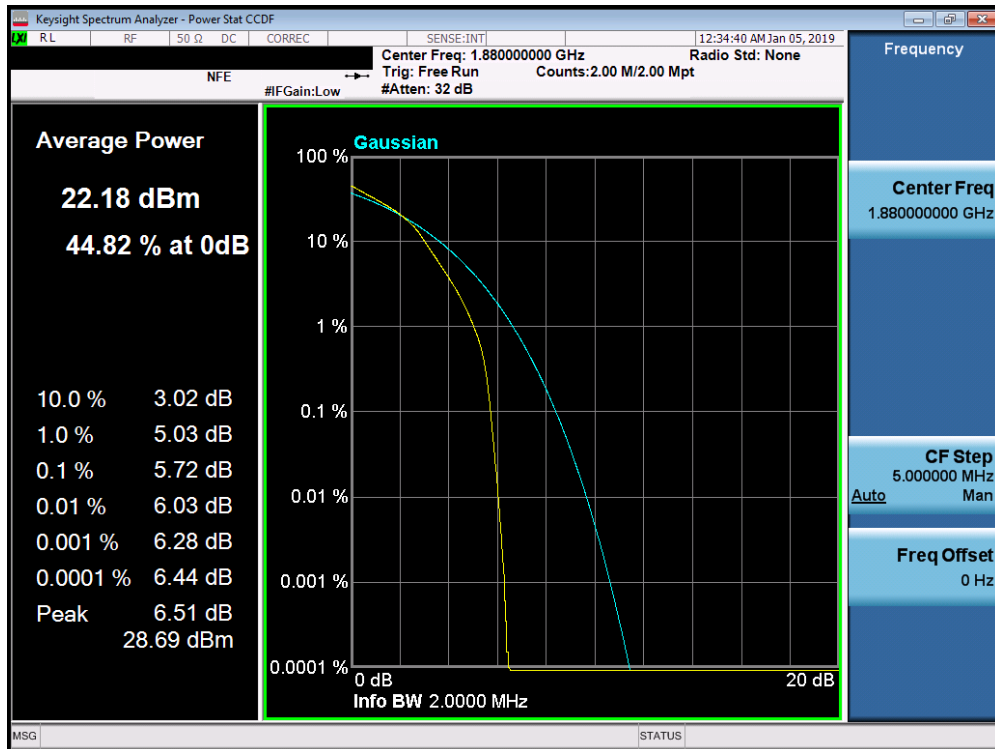
Plot 7-332. PAR Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 192 of 290

Band 25/2

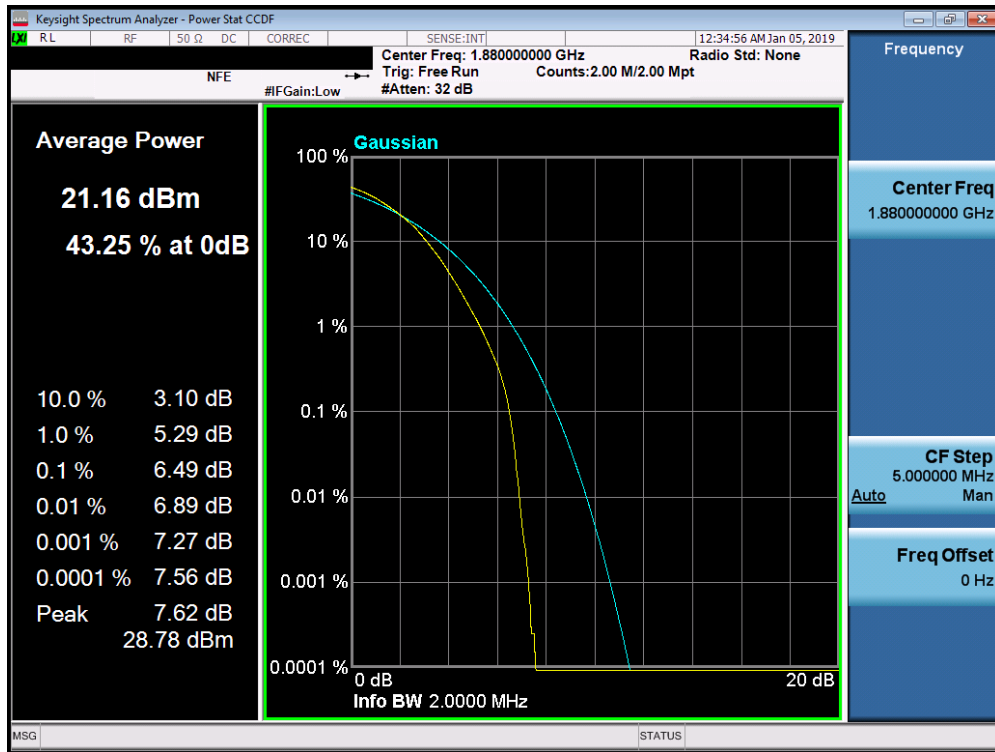


Plot 7-333. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

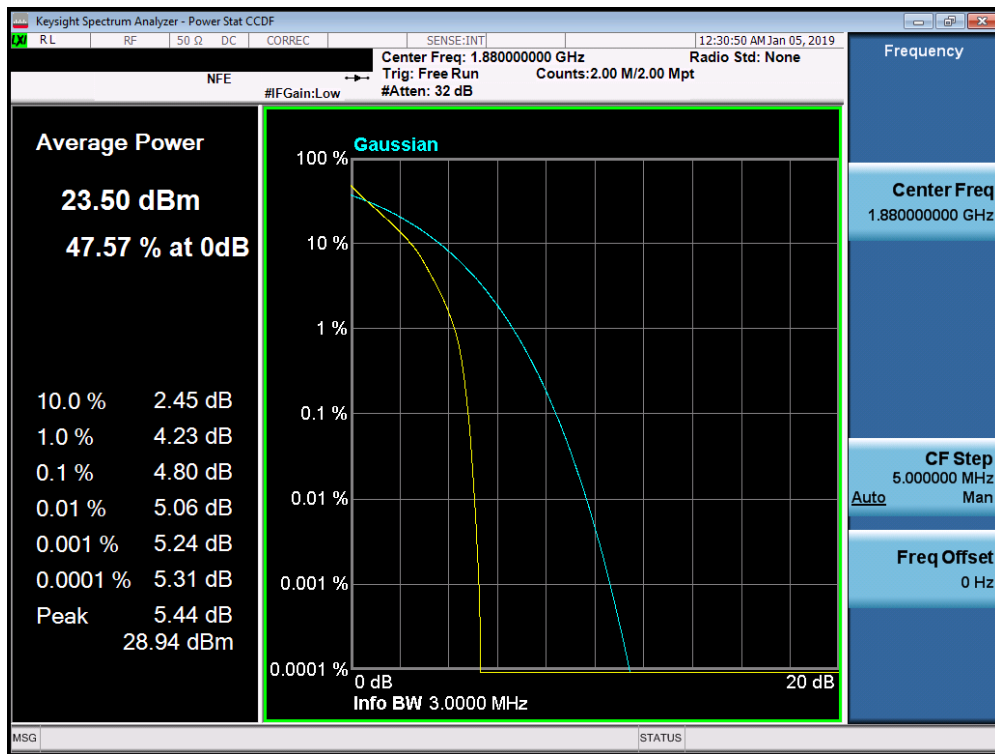


Plot 7-334. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 193 of 290

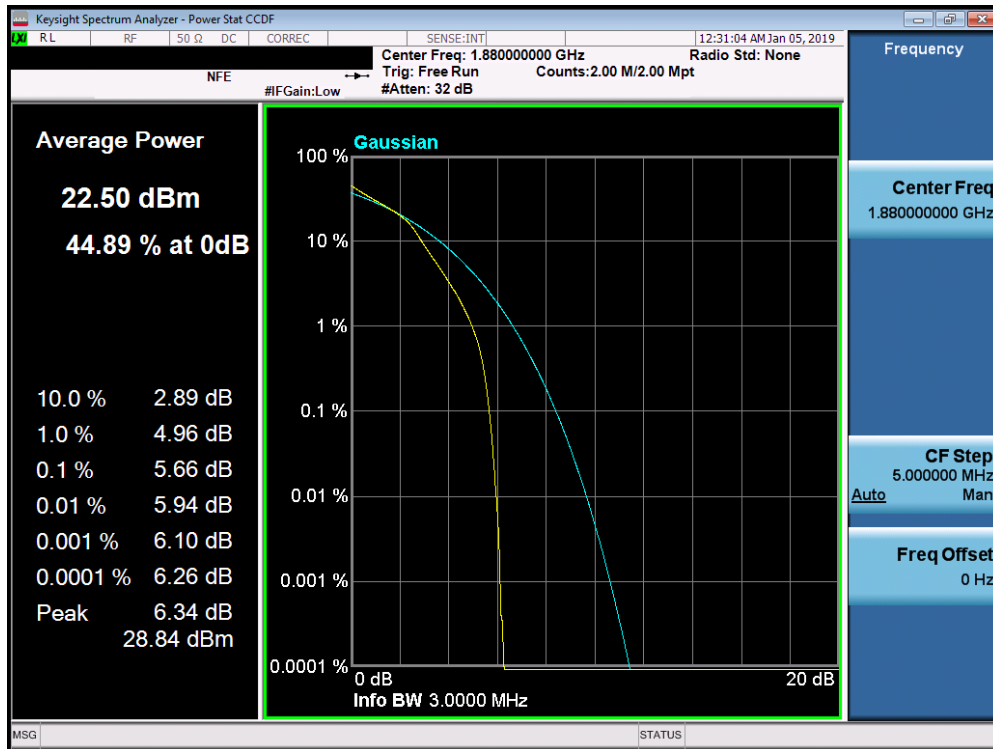


Plot 7-335. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)

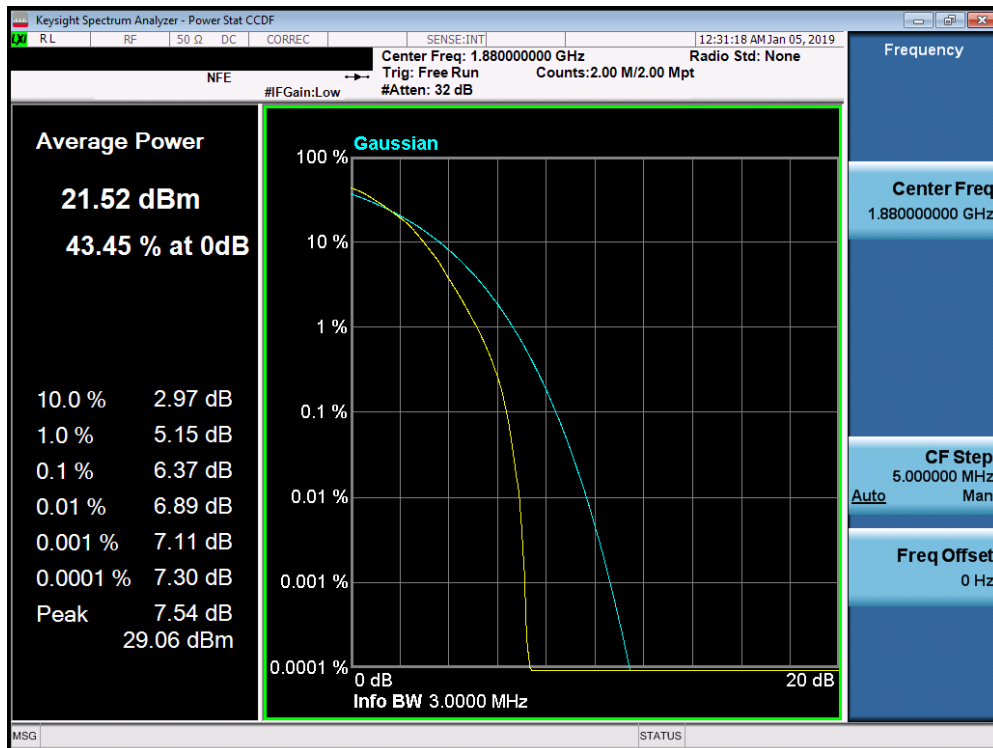


Plot 7-336. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset	Page 194 of 290

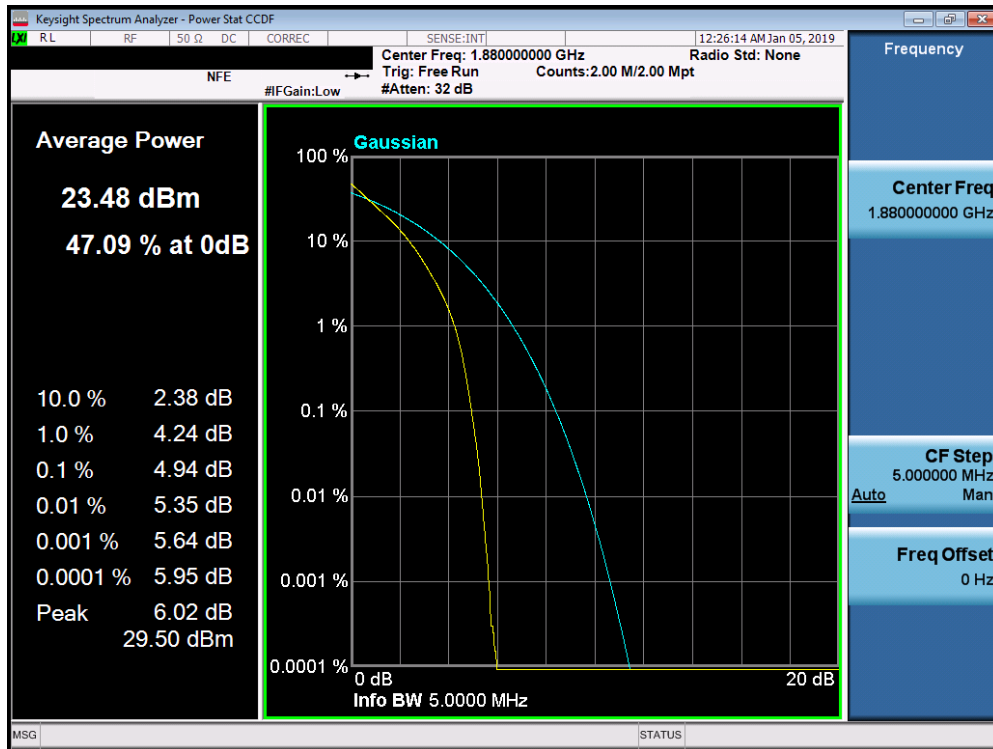


Plot 7-337. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)

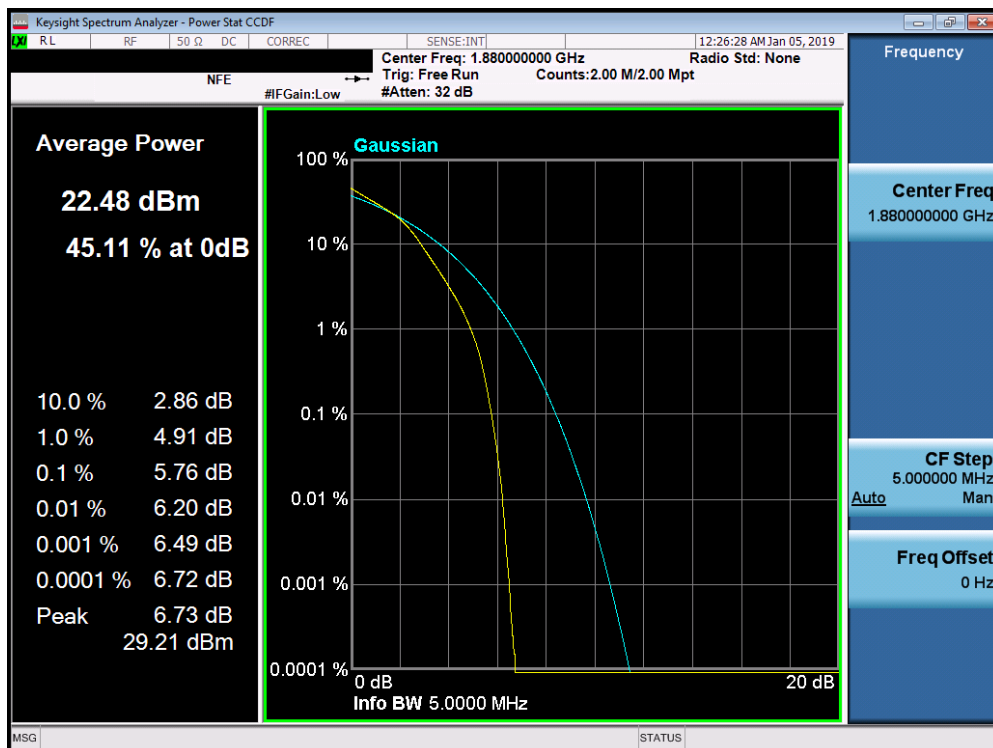


Plot 7-338. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 195 of 290

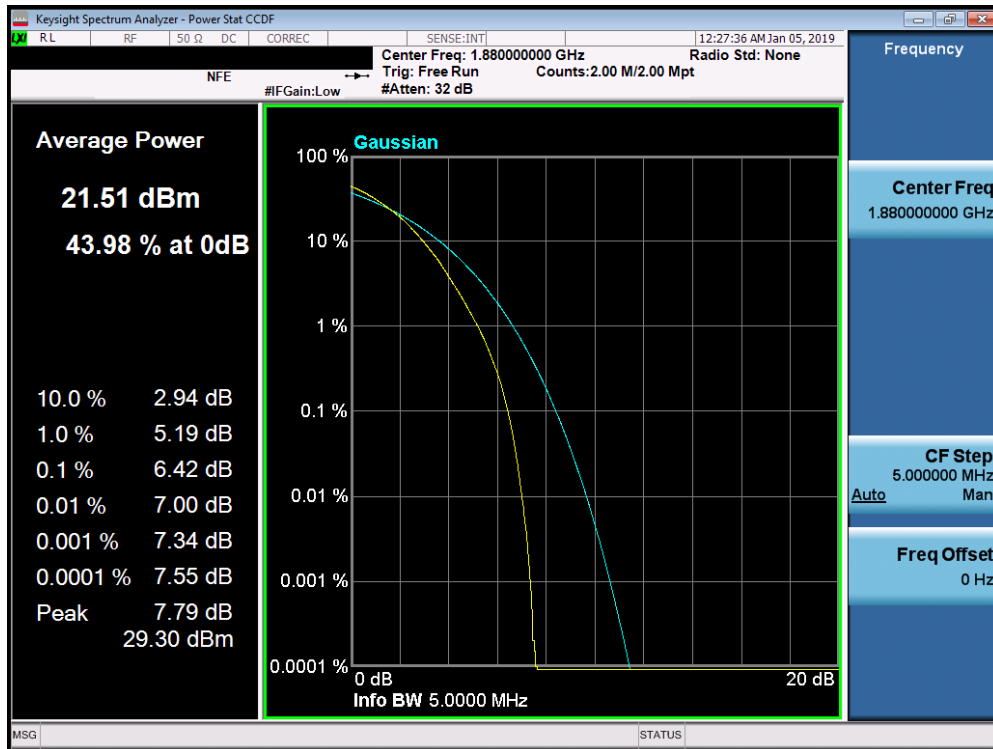


Plot 7-339. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

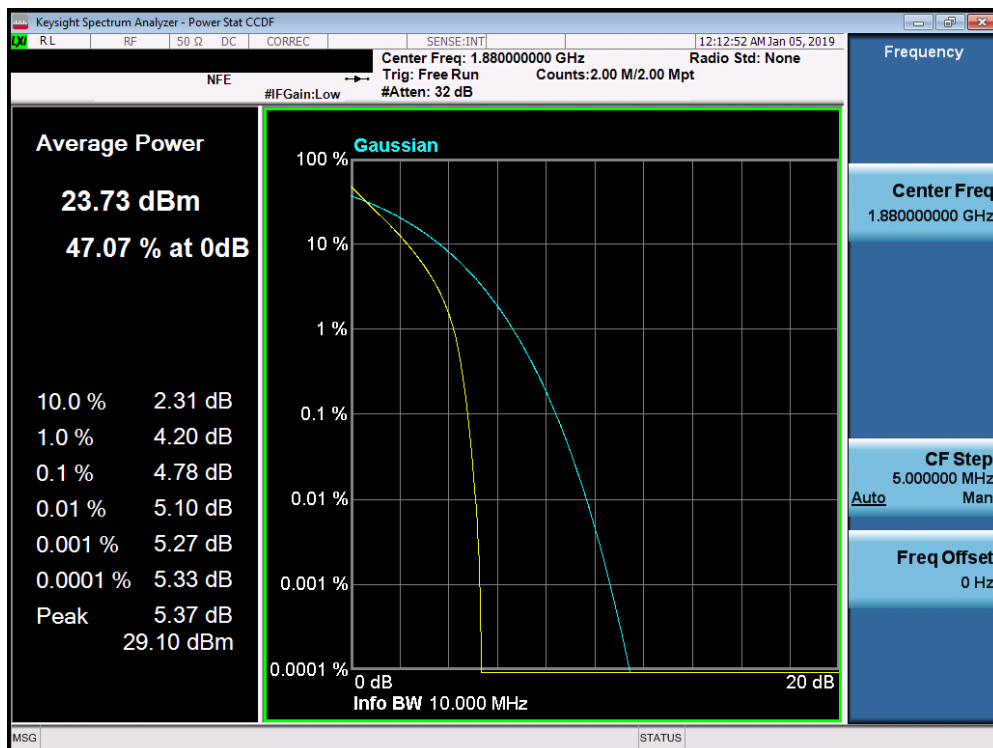


Plot 7-340. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1-ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 196 of 290

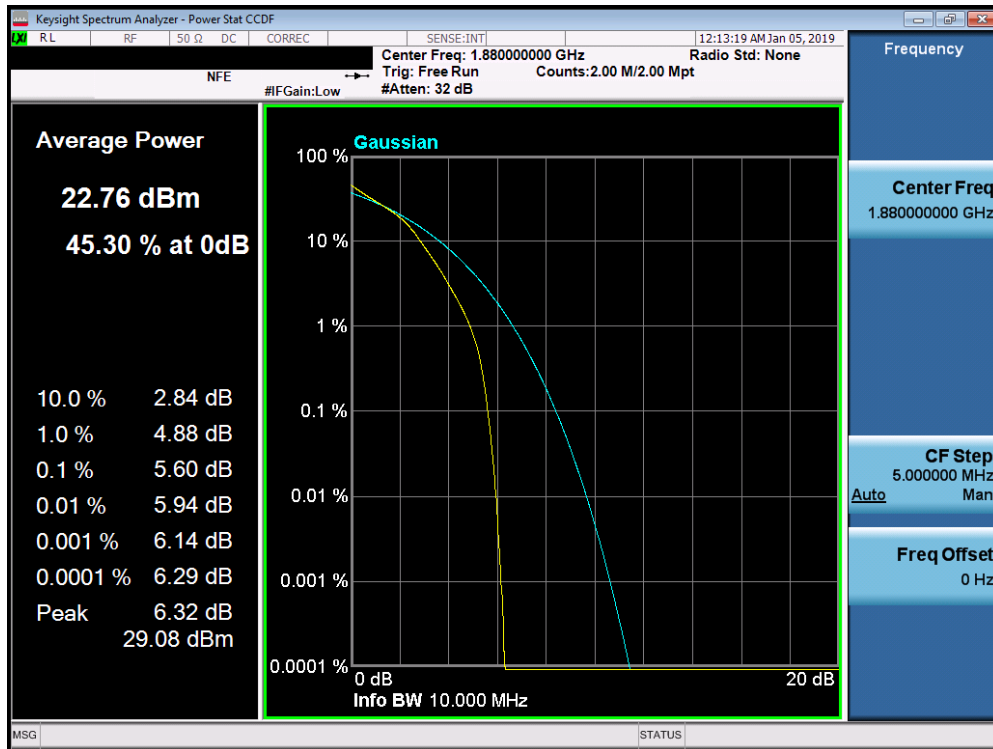


Plot 7-341. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)

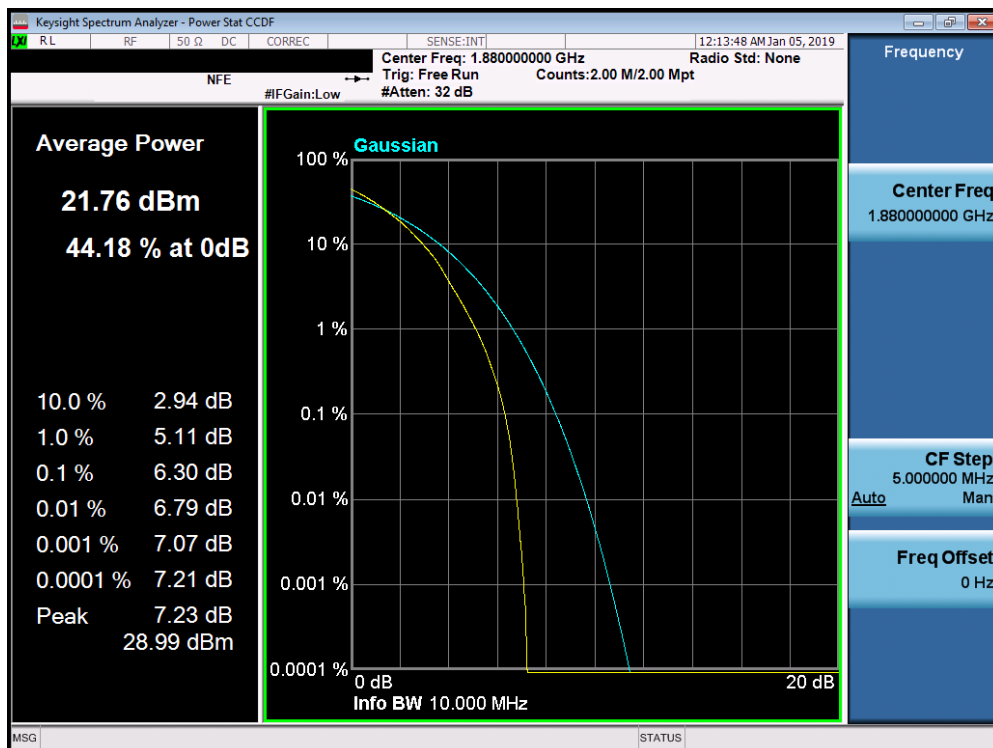


Plot 7-342. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 197 of 290

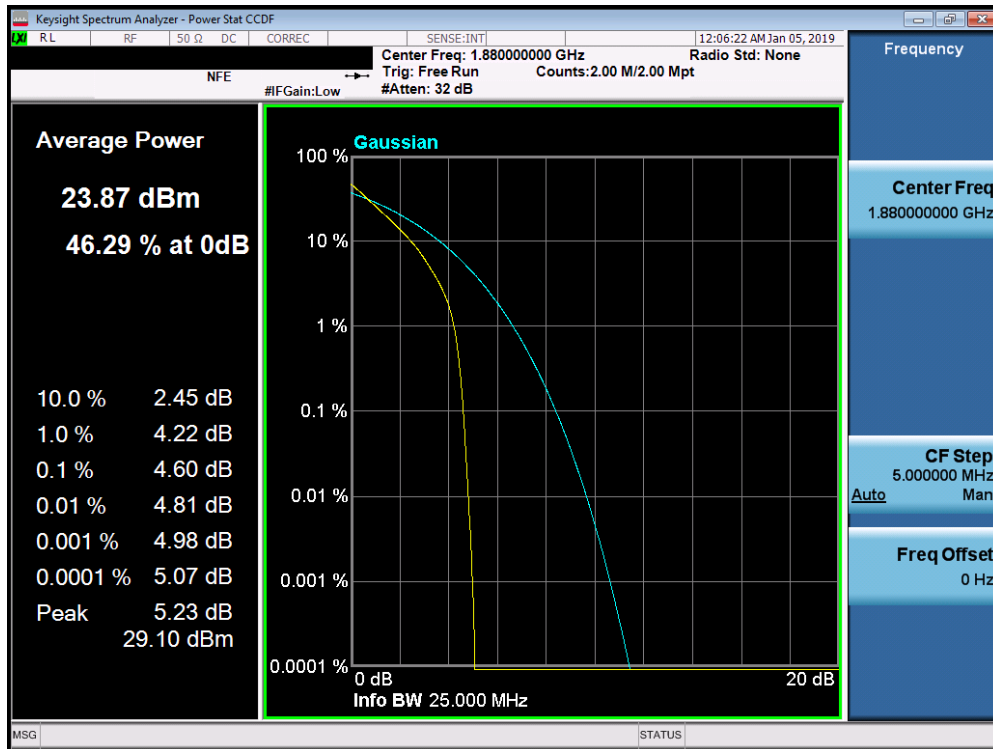


Plot 7-343. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)

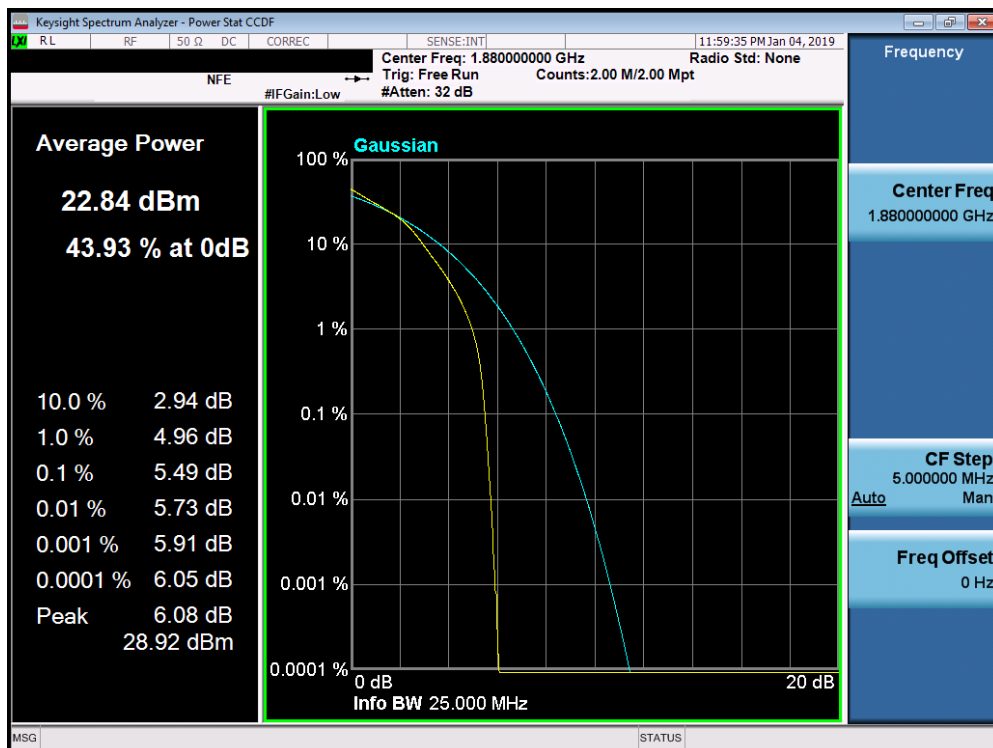


Plot 7-344. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 198 of 290

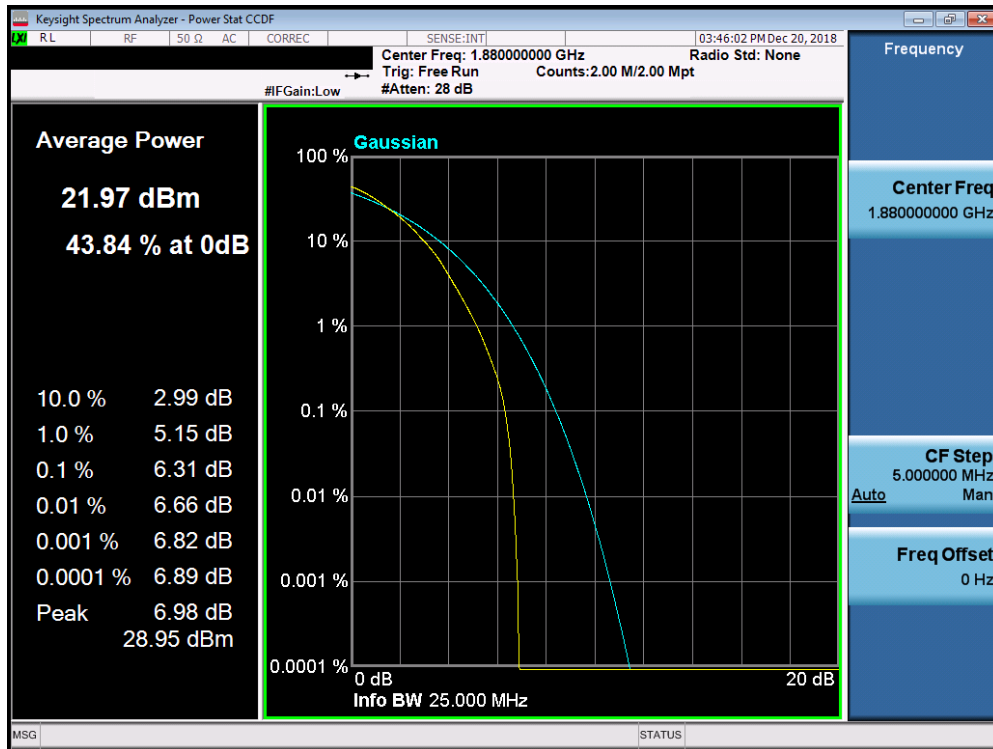


Plot 7-345. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

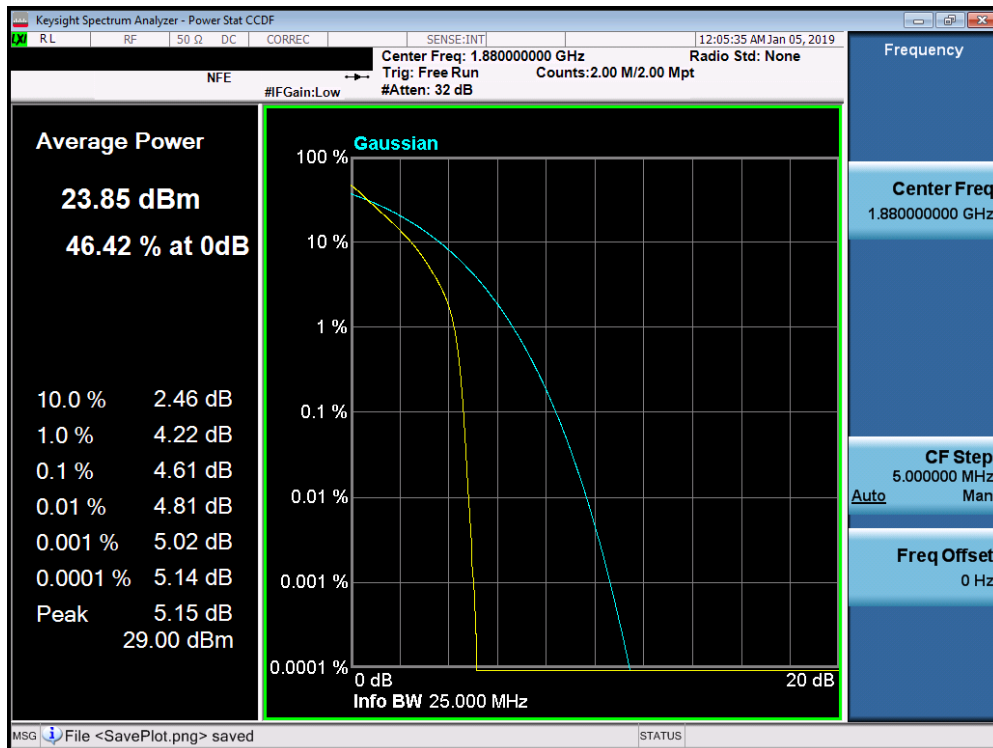


Plot 7-346. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1-ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 199 of 290

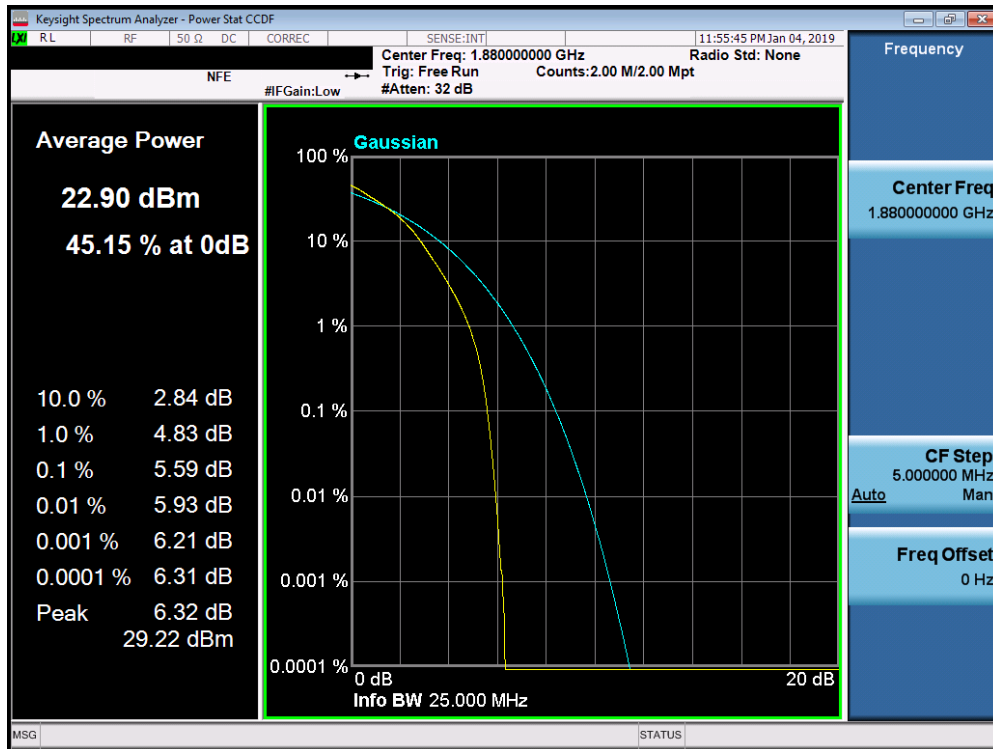


Plot 7-347. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)

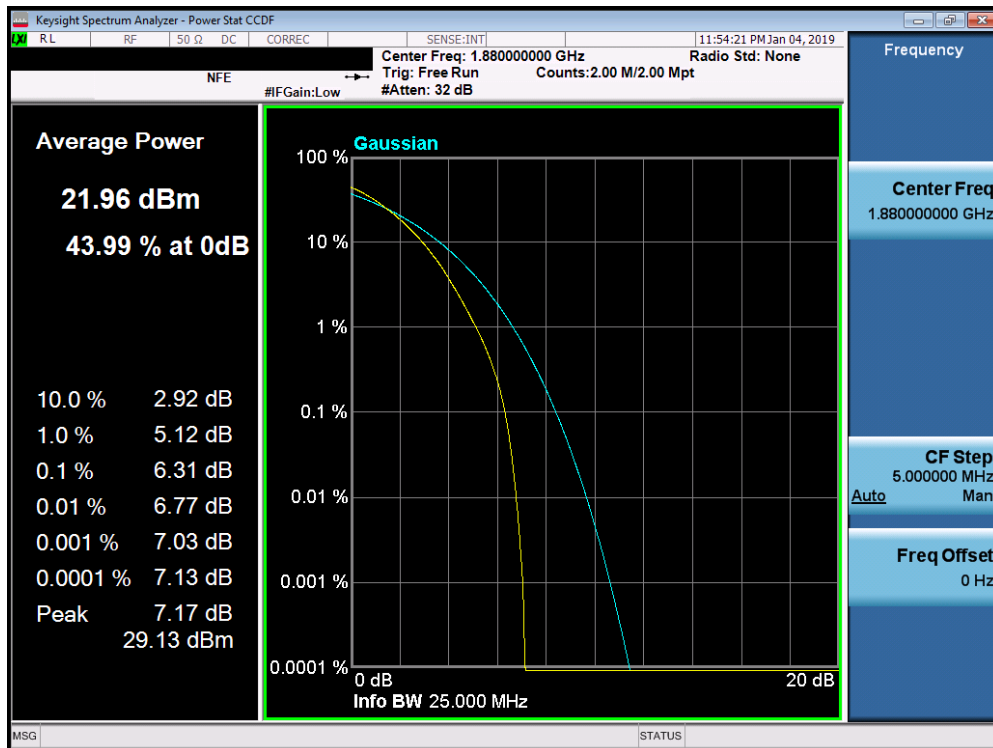


Plot 7-348. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 200 of 290



Plot 7-349. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-350. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 201 of 290

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 $\geq 2 \times \text{span} / \text{RBW}$
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.

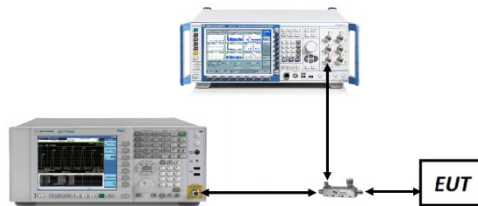


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 202 of 290

Test Case	NS	MCC	MNC	Channel BW [MHz]	Channel Number	Channel Frequency [MHz]	Modulation	RB Size	RB Offset	MPR [dB]	A-MPR [dB]	Measured Power [dBm]	Lowest Typical Power [dBm]	Delta [dB]
1	01	312	530	5	39675	2498.5	QPSK	1	0	0	≤ 3	24.11	23.7	0.41
							16-QAM			≤ 1		23.24	22.7	0.54
							64-QAM			≤ 2		22.21	21.7	0.51
2				5	39675	2498.5	QPSK	1	9	0	0	26.66	26.7	-0.04
							16-QAM			≤ 1		26.12	25.7	0.42
							64-QAM			≤ 2		24.96	24.7	0.26
3				10	39700	2501	QPSK	1	0	0	≤ 5	22.19	21.7	0.49
							16-QAM	1	0	≤ 1		21.48	20.7	0.78
							64-QAM	1	0	≤ 2		20.33	19.7	0.63
4				10	39700	2501	QPSK	20	0	0	≤ 2	24.05	23.7	0.35
							16-QAM	20	0	≤ 1		23.01	22.7	0.31
							64-QAM	20	0	≤ 2		22.03	21.7	0.33
5				10	39700	2501	QPSK	50	0	0	≤ 3	22.90	22.7	0.20
							16-QAM	50	0	≤ 1		21.91	21.7	0.21
							64-QAM	50	0	≤ 2		20.91	20.7	0.21
6				10	39700	2501	QPSK	25	20	0	≤ 1	24.72	24.7	0.02
							16-QAM	25	20	≤ 1		23.78	23.7	0.08
							64-QAM	25	20	≤ 2		22.86	22.7	0.16
7				10	39700	2501	QPSK	1	36	0	0	26.37	26.7	-0.33
							16-QAM	1	36	≤ 1		25.85	25.7	0.15
							64-QAM	1	36	≤ 2		24.68	24.7	-0.02
8				15	39725	2503.5	QPSK	1	0	0	≤ 5	21.99	21.7	0.29
							16-QAM	1	0	≤ 1		21.25	20.7	0.55
							64-QAM	1	0	≤ 2		20.08	19.7	0.38
9				15	39725	2503.5	QPSK	20	0	0	≤ 2	23.98	23.7	0.28
							16-QAM	20	0	≤ 1		22.93	22.7	0.23
							64-QAM	20	0	≤ 2		22.01	21.7	0.31
10				15	39725	2503.5	QPSK	75	0	0	≤ 4	21.84	21.7	0.14
							16-QAM	75	0	≤ 1		20.85	20.7	0.15
							64-QAM	75	0	≤ 2		19.86	19.7	0.16
11				15	39725	2503.5	QPSK	50	15	0	≤ 3	22.80	22.7	0.10
							16-QAM	50	15	≤ 1		21.80	21.7	0.10
							64-QAM	50	15	≤ 2		20.86	20.7	0.16
12				15	39725	2503.5	QPSK	1	60	0	0	26.49	26.7	-0.21
							16-QAM	1	60	≤ 1		26.00	25.7	0.30
							64-QAM	1	60	≤ 2		24.83	24.7	0.13
13				20	39750	2506	QPSK	1	0	0	≤ 5	22.23	21.7	0.53
							16-QAM	1	0	≤ 1		21.55	20.7	0.85
							64-QAM	1	0	≤ 2		20.40	19.7	0.70
14				20	39750	2506	QPSK	20	0	0	≤ 2	24.24	23.7	0.54
							16-QAM	20	0	≤ 1		23.26	22.7	0.56
							64-QAM	20	0	≤ 2		22.26	21.7	0.56
15				20	39750	2506	QPSK	100	0	0	≤ 4	21.94	21.7	0.24
							16-QAM	100	0	≤ 1		20.96	20.7	0.26
							64-QAM	100	0	≤ 2		19.98	19.7	0.28
16				20	39750	2506	QPSK	75	24	0	≤ 3	22.84	22.7	0.14
							16-QAM	75	24	≤ 1		21.87	21.7	0.17
							64-QAM	75	24	≤ 2		20.92	20.7	0.22
17				20	39750	2506	QPSK	1	77	0	0	26.50	26.7	-0.20
							16-QAM	1	77	≤ 1		26.04	25.7	0.34
							64-QAM	1	77	≤ 2		24.92	24.7	0.22

Table 7-3. A-MPR Conducted Power Measurements

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 203 of 290

7.7 Uplink Carrier Aggregation

\$27.53(m)

Test Overview

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

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

For Band 5 and 66, the minimum permissible attenuation level of any spurious emission is $43 + 10\log_{10}(P_{[Watts]})$.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

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

Test Setup

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

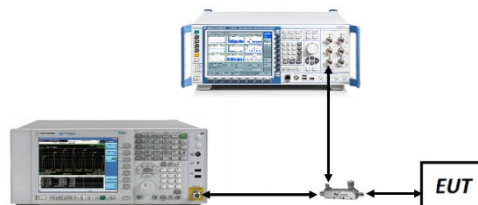


Figure 7-6. Test Instrument & Measurement Setup

FCC ID: ZNFG820UM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 204 of 290

Test Notes

1. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.
2. Conducted power and spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in Table 7-4 and 7-5 below, with both carriers set to transmit using 1RB.
3. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

FCC ID: ZNFG820UM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1811300215-03-R1.ZNF	Test Dates: 12/3/2018 -1/11/2019	EUT Type: Portable Handset		Page 205 of 290