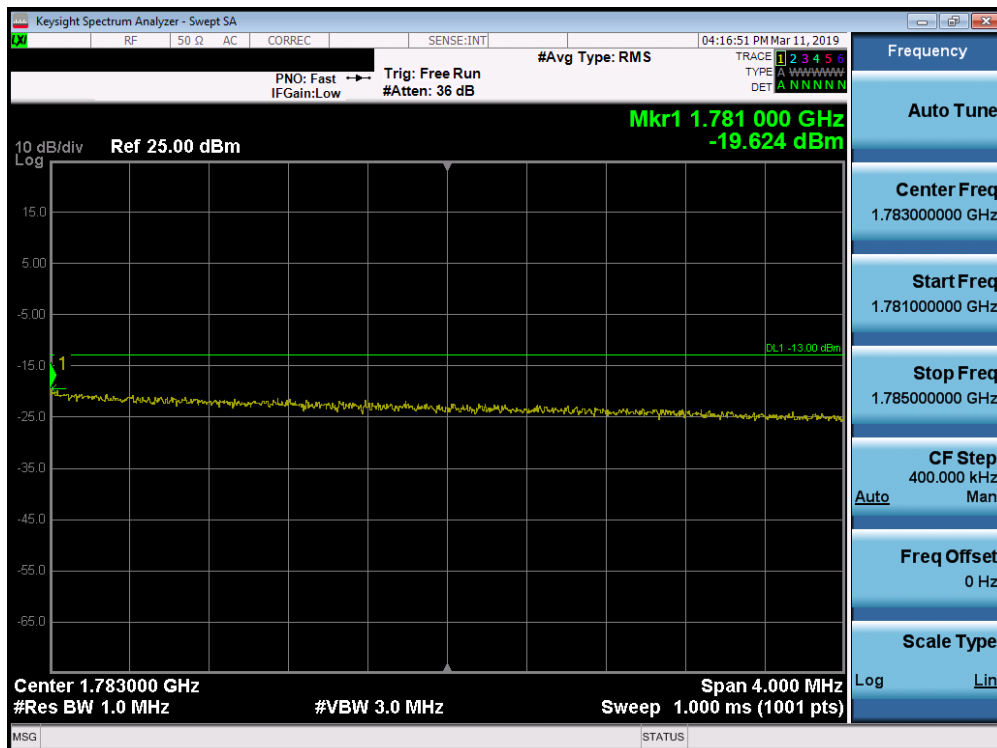


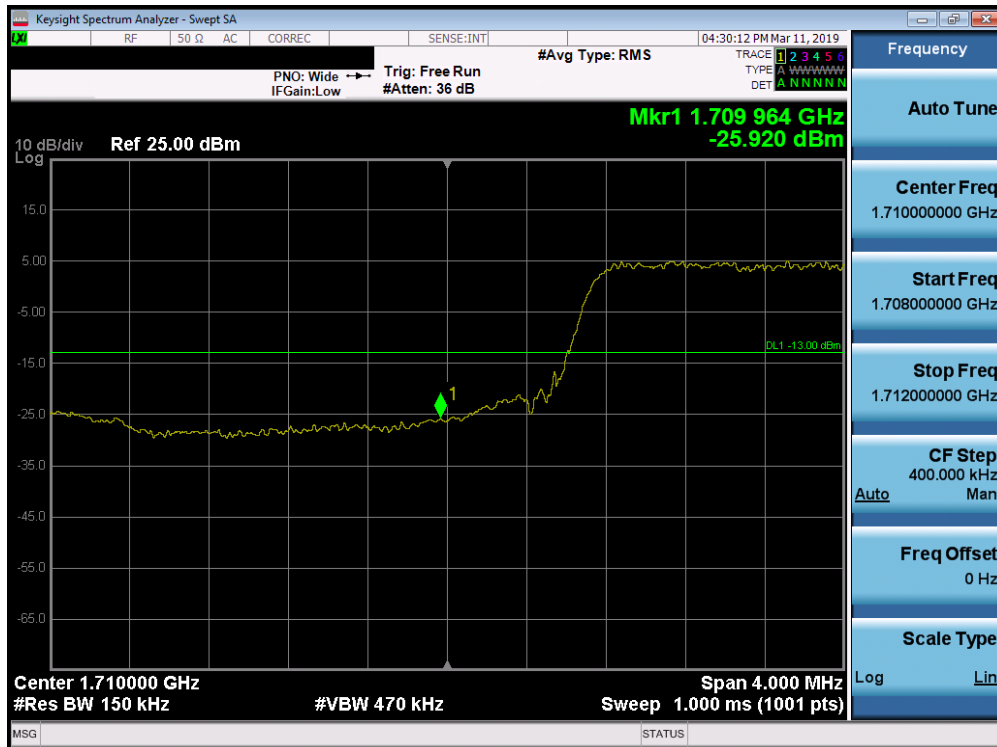


Plot 7-215. Upper Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

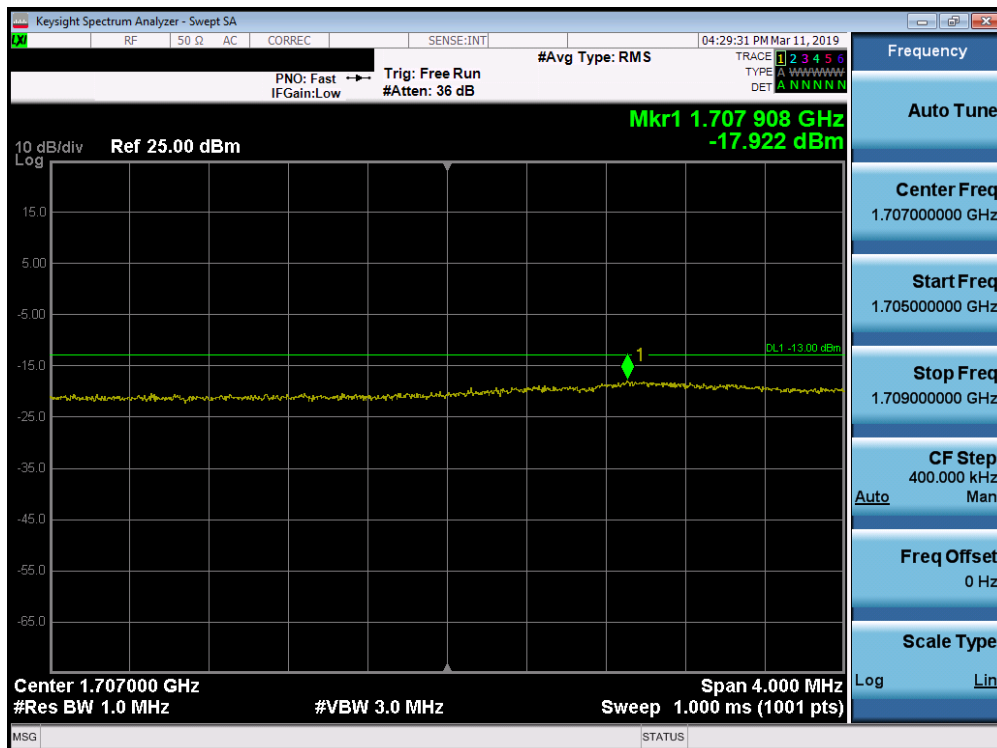


Plot 7-216. Upper Extended Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 132 of 227

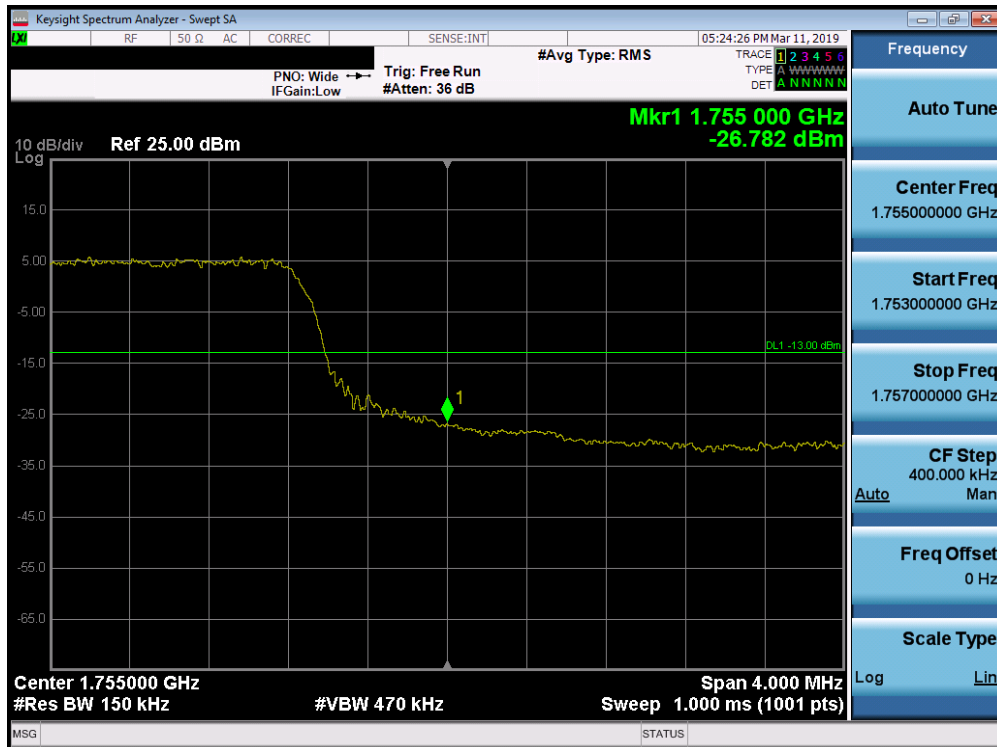


Plot 7-217. Lower Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

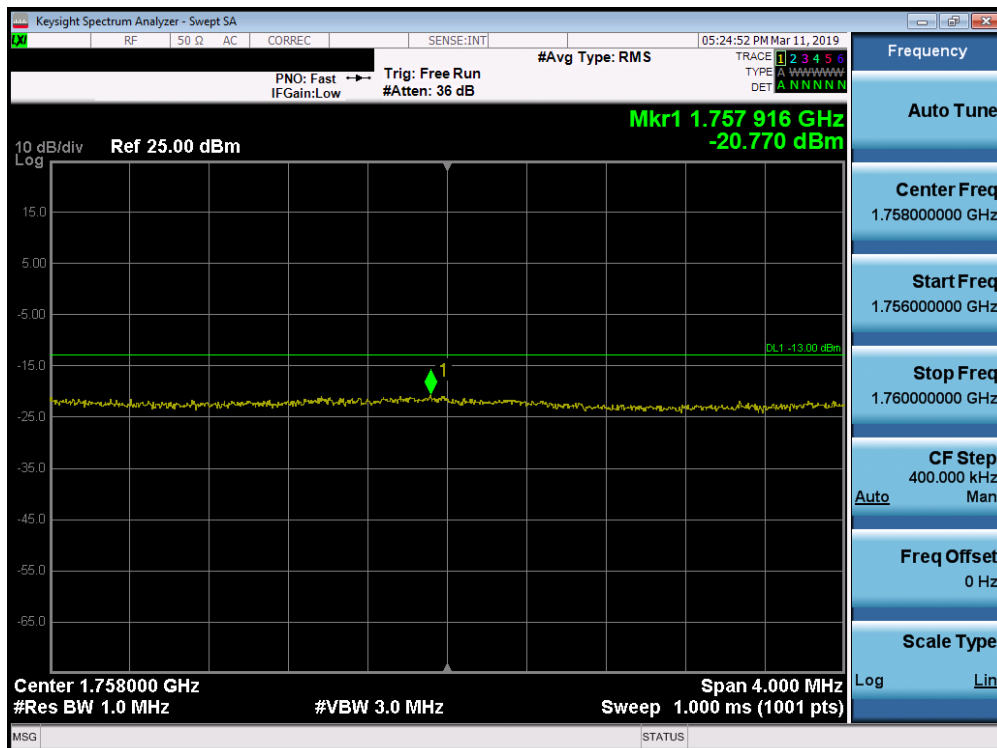


Plot 7-218. Lower Extended Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 133 of 227

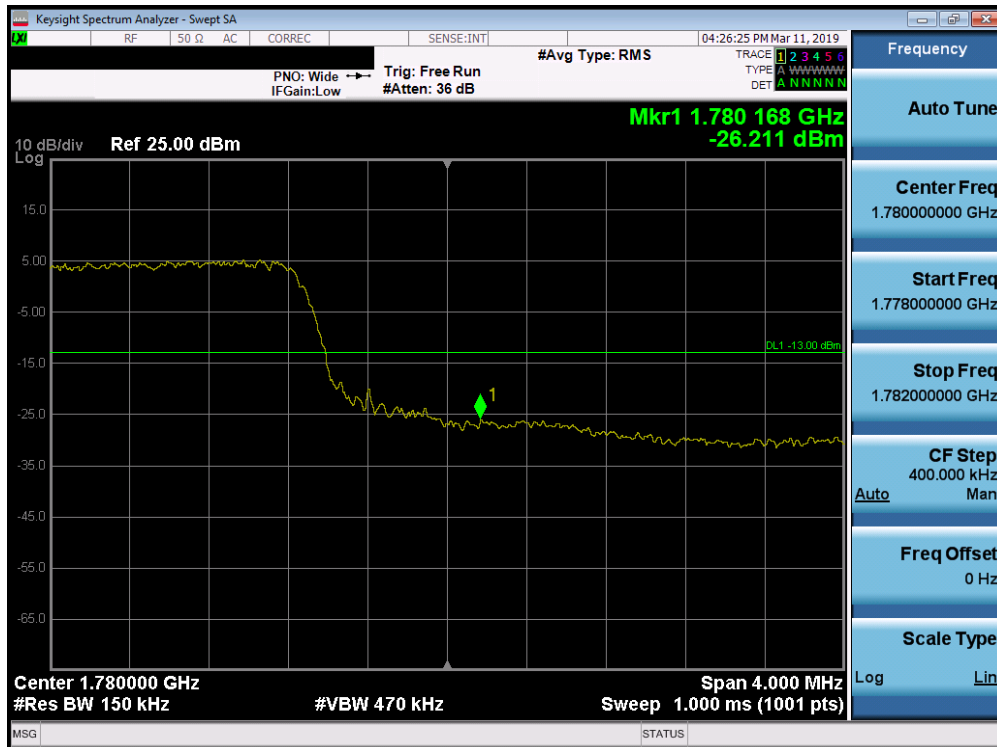


Plot 7-219. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

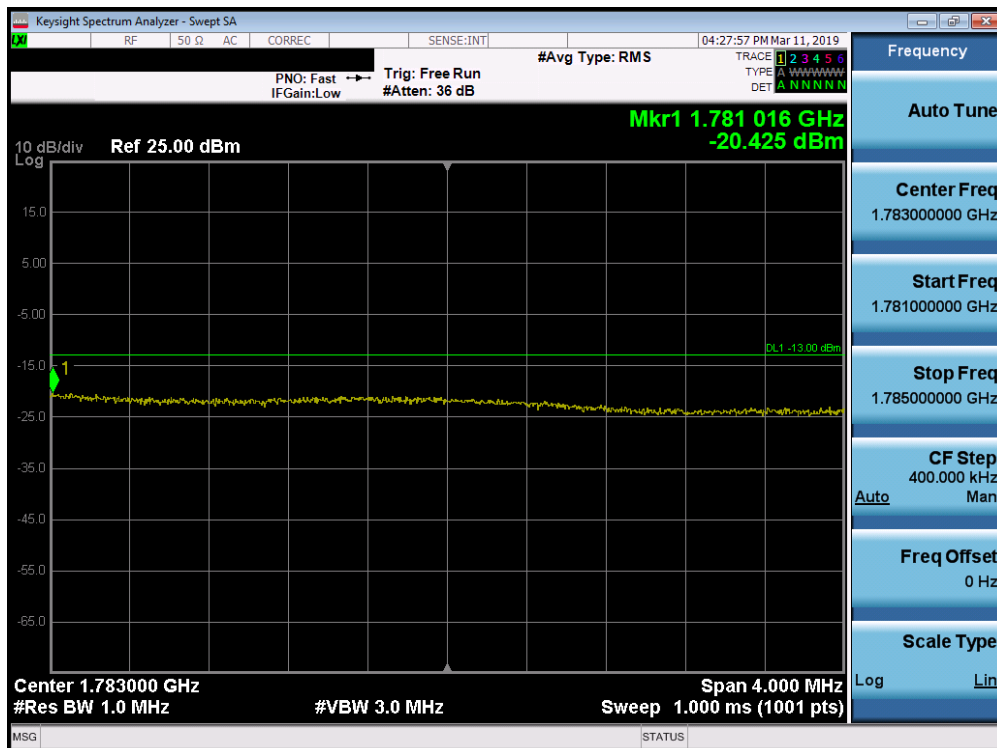


Plot 7-220. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 134 of 227

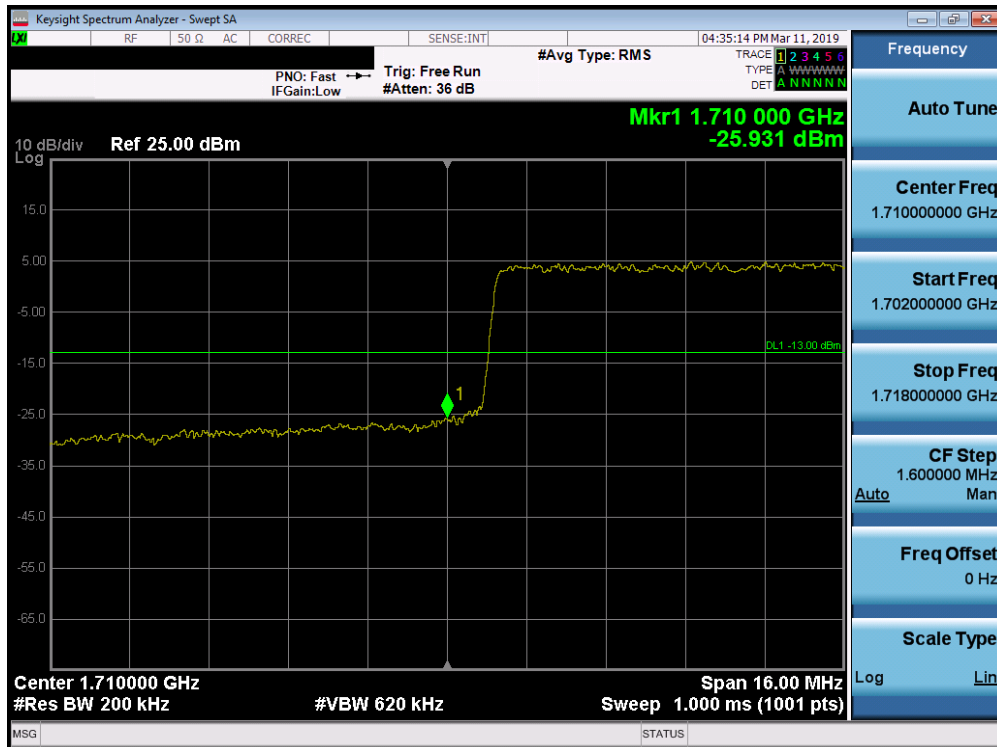


Plot 7-221. Upper Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

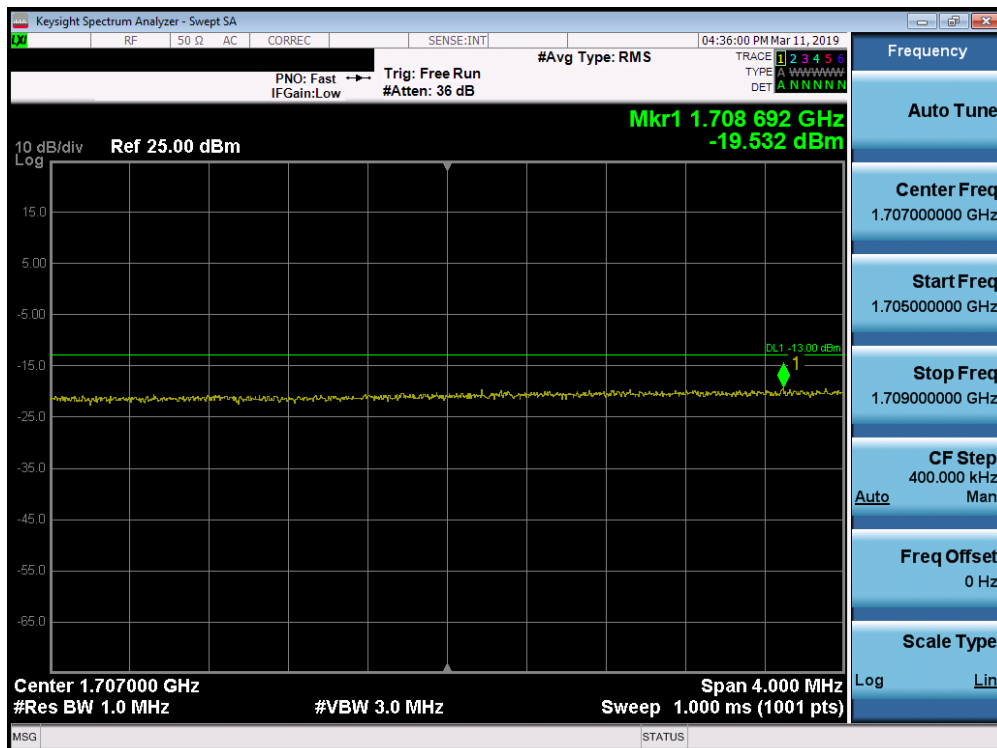


Plot 7-222. Upper Extended Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 135 of 227

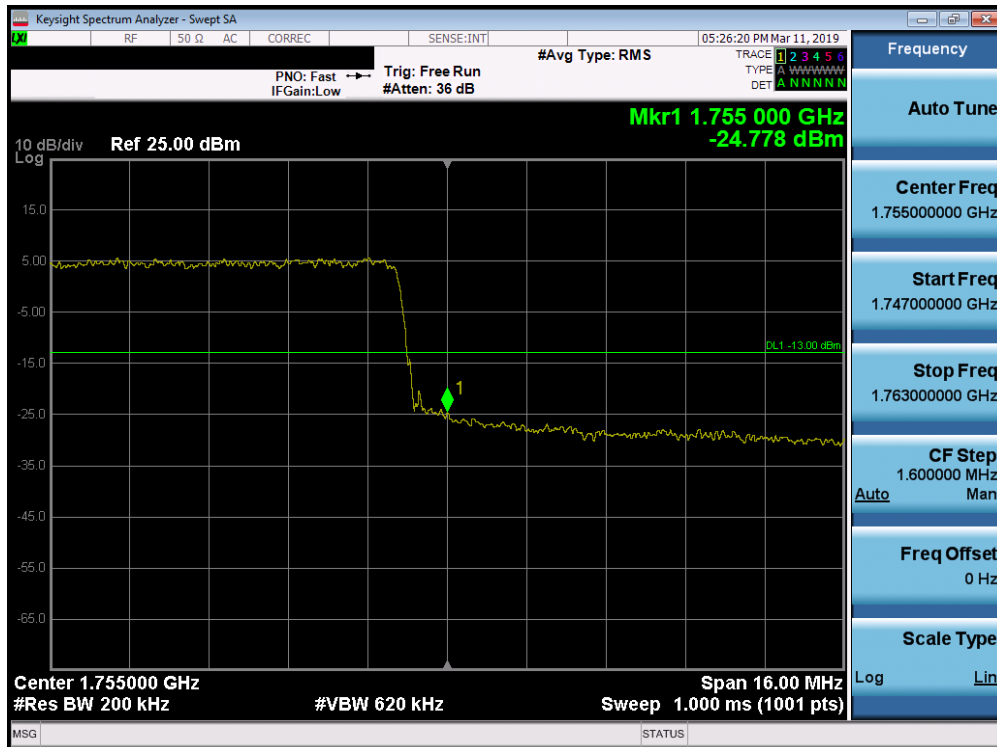


Plot 7-223. Lower Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

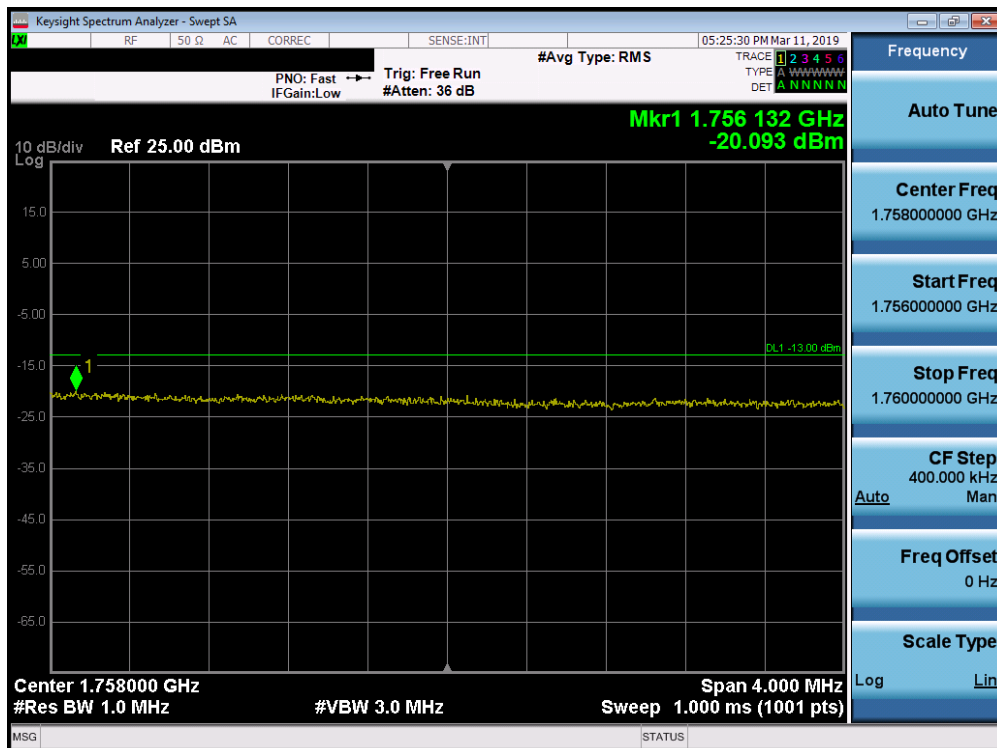


Plot 7-224. Lower Extended Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 136 of 227

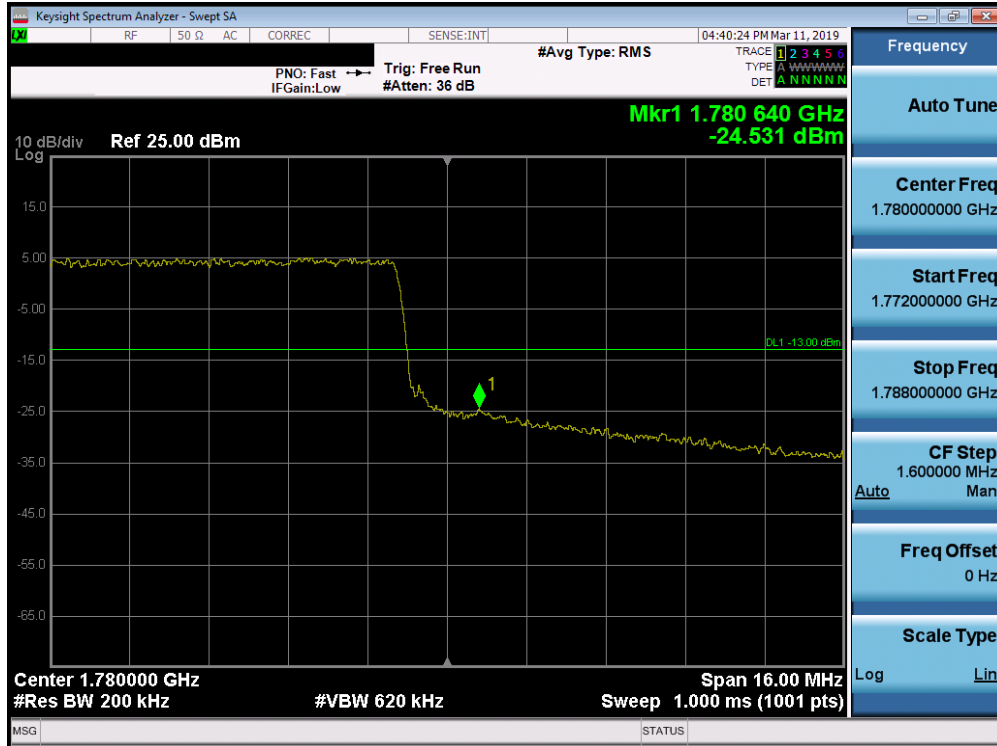


Plot 7-225. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

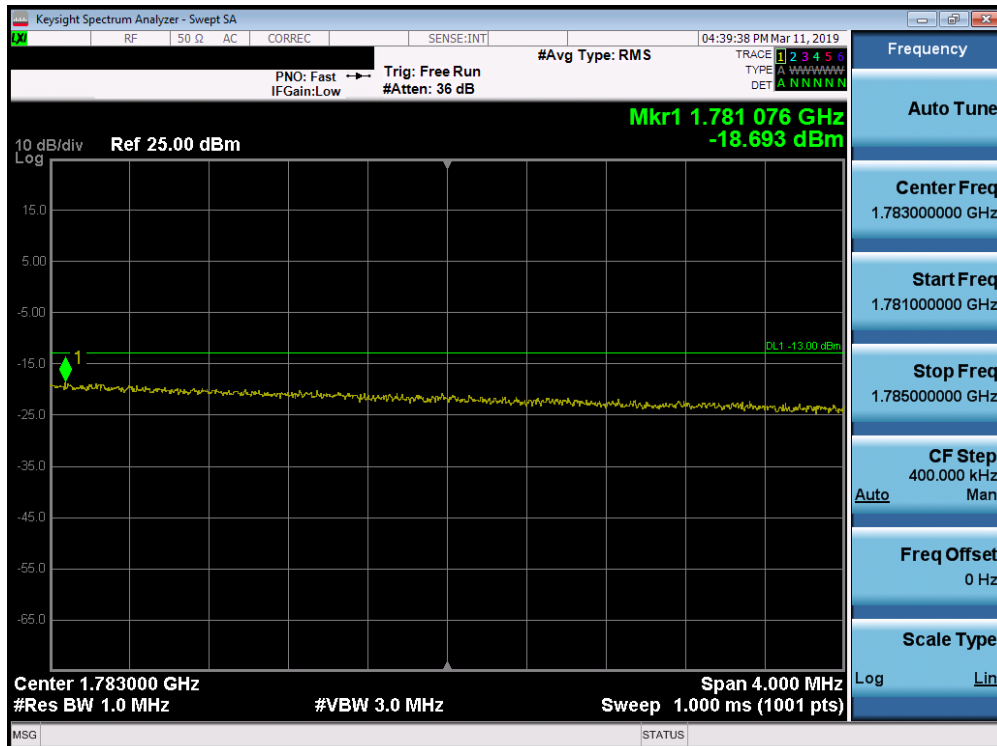


Plot 7-226. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 137 of 227



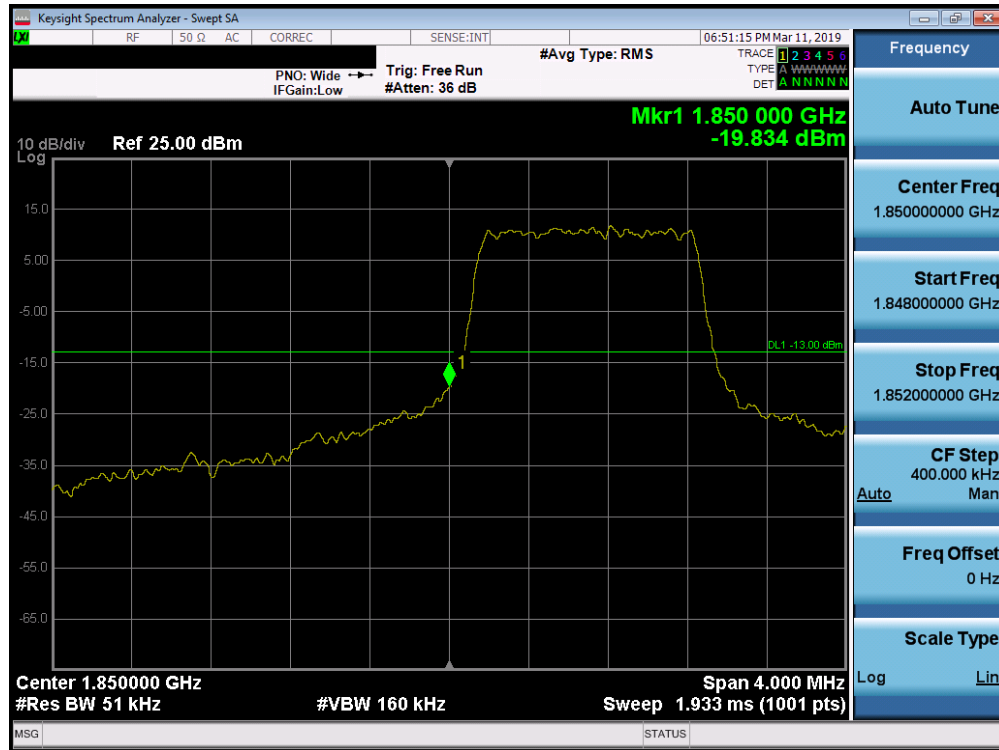
Plot 7-227. Upper Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)



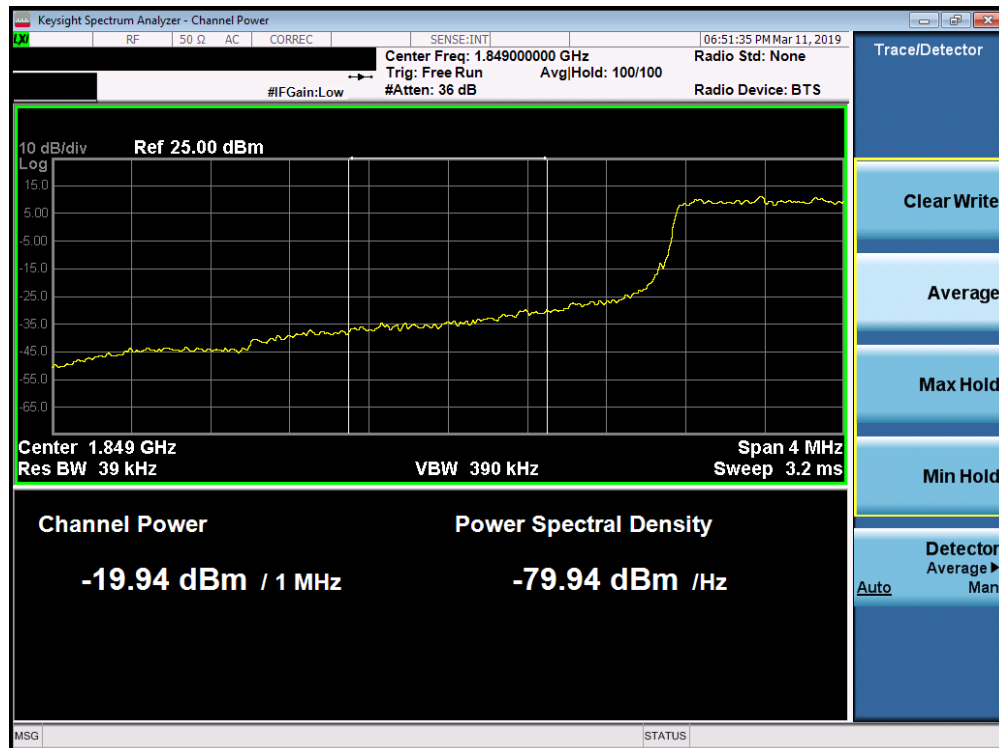
Plot 7-228. Upper Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 138 of 227

Band 25/2

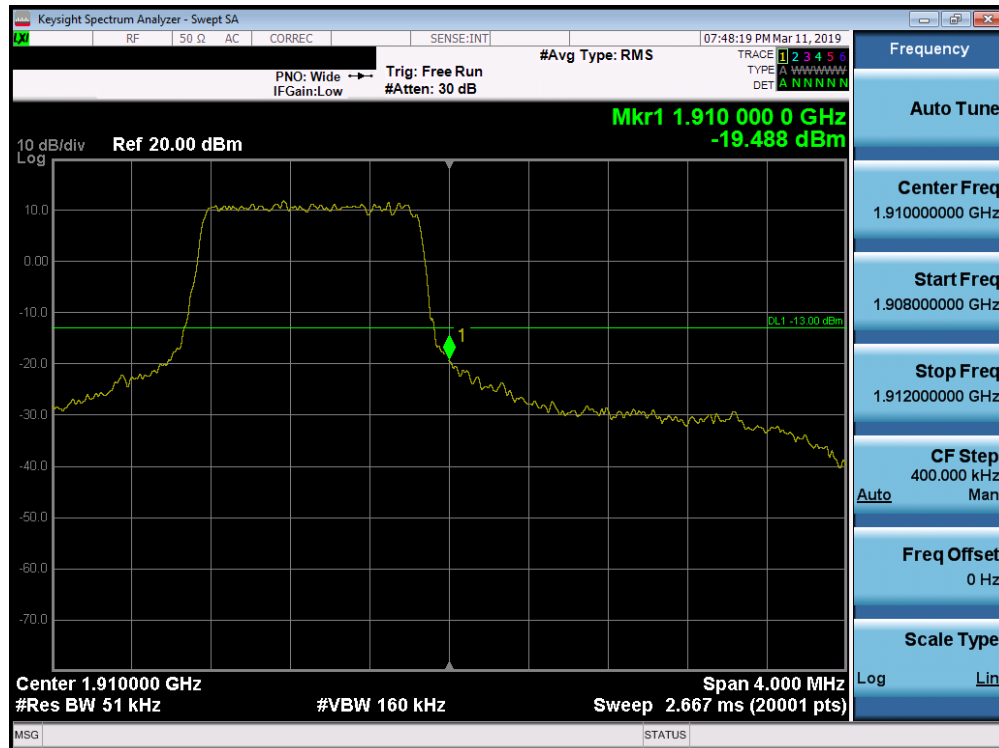


Plot 7-229. Lower Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-230. Lower Extended Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 139 of 227



Plot 7-231. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-232. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 140 of 227

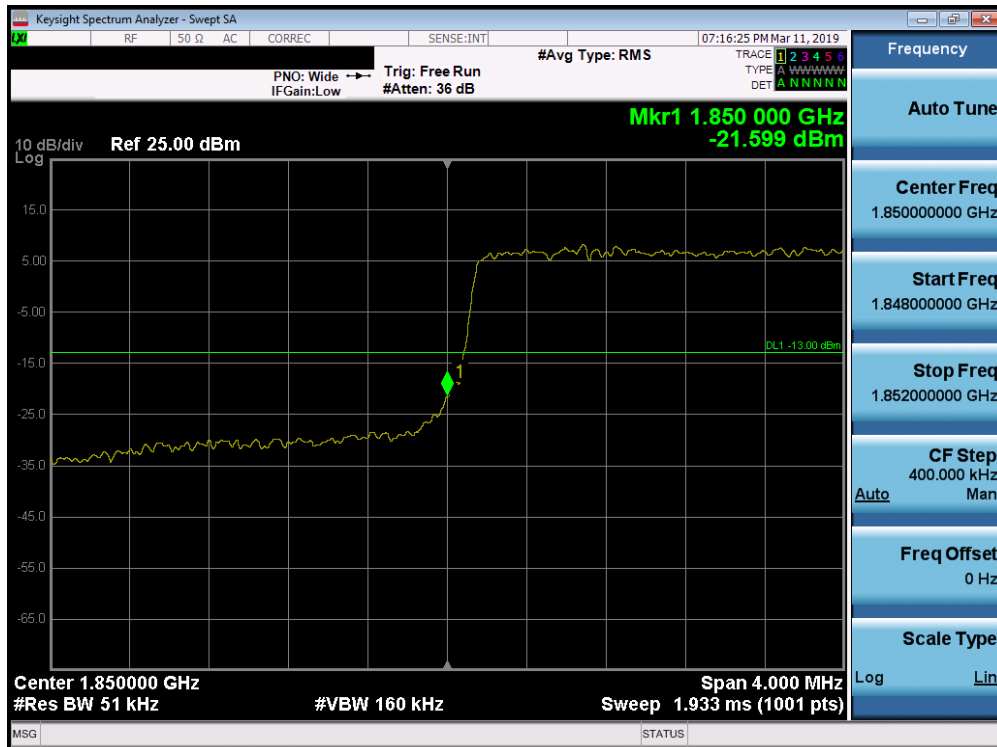


Plot 7-233. Upper Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)

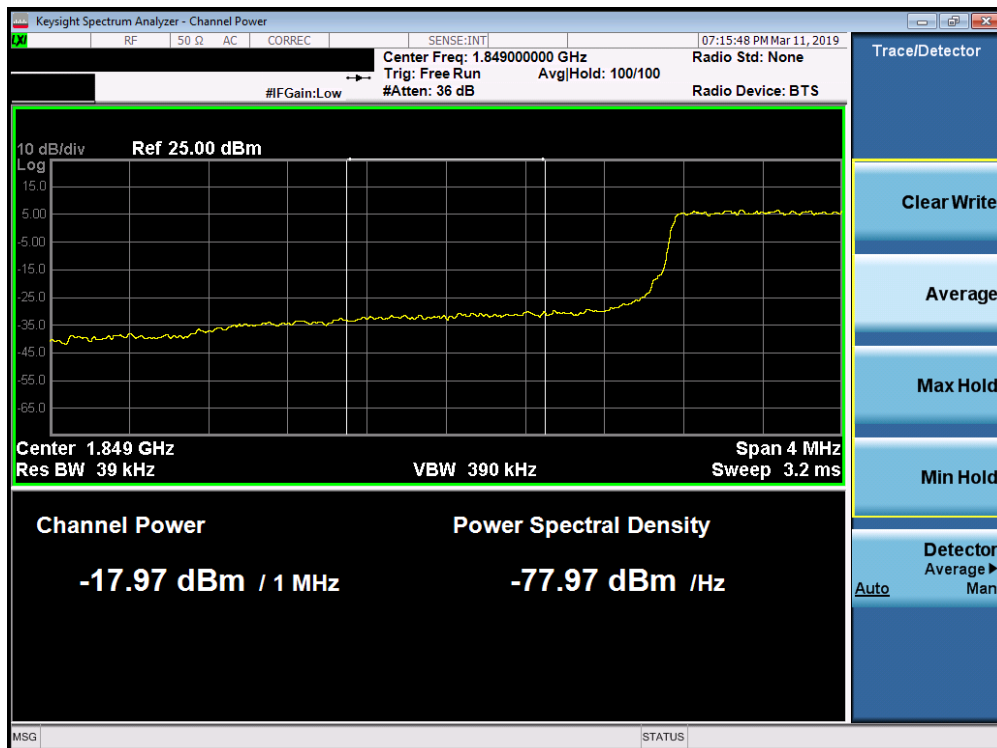


Plot 7-234. Upper Extended Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 141 of 227



Plot 7-235. Lower Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

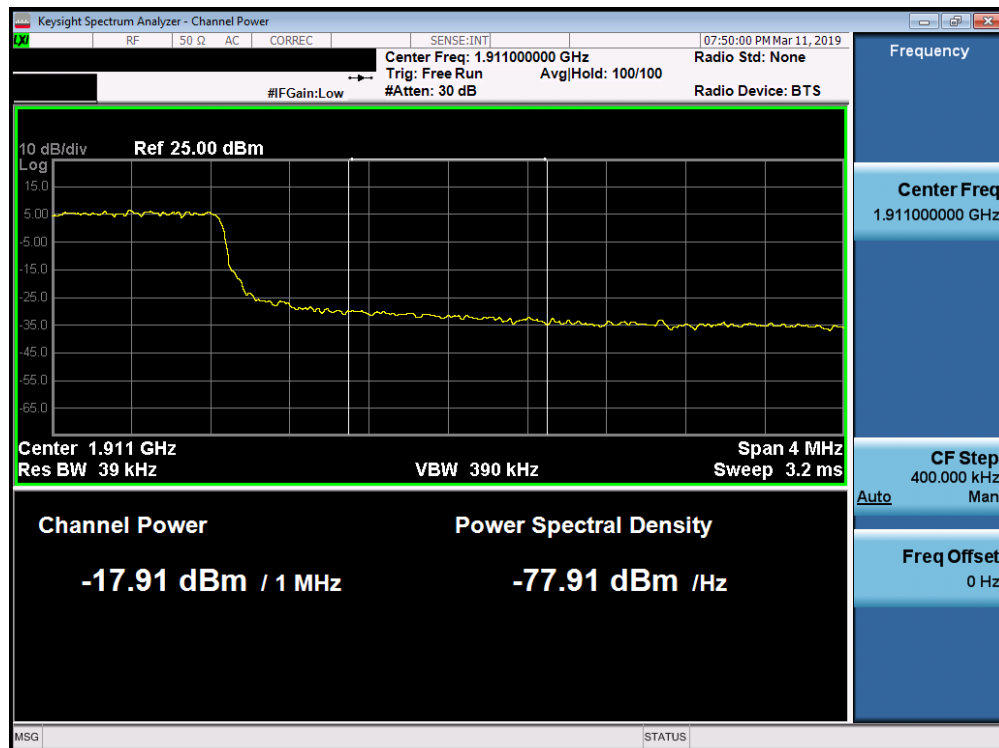


Plot 7-236. Lower Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 142 of 227

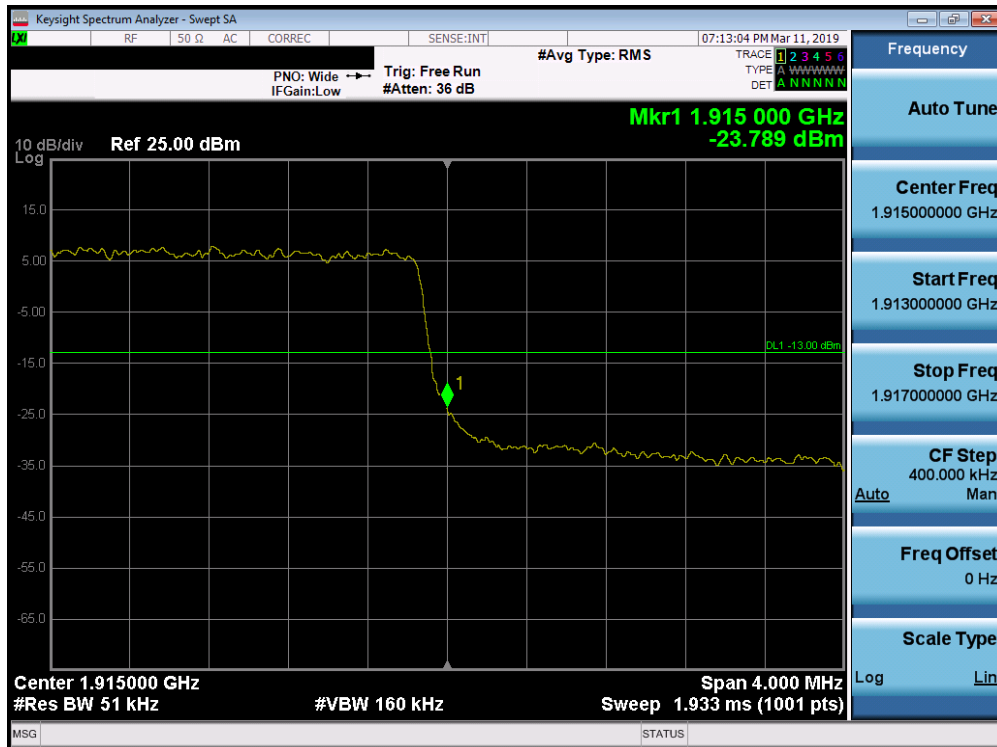


Plot 7-237. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

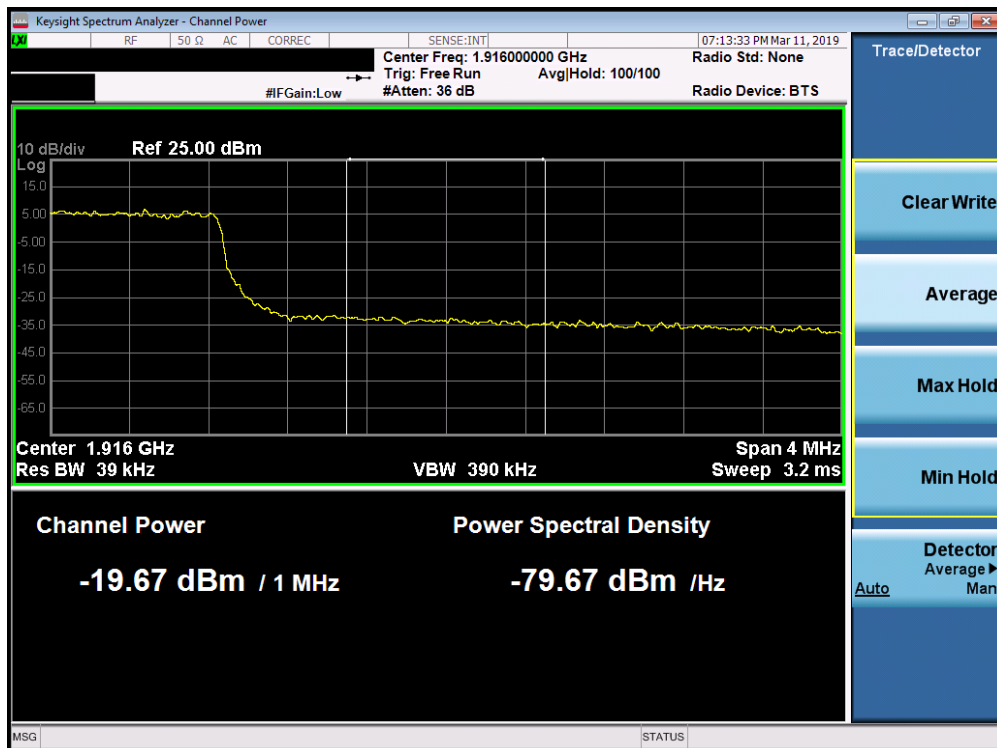


Plot 7-238. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 143 of 227

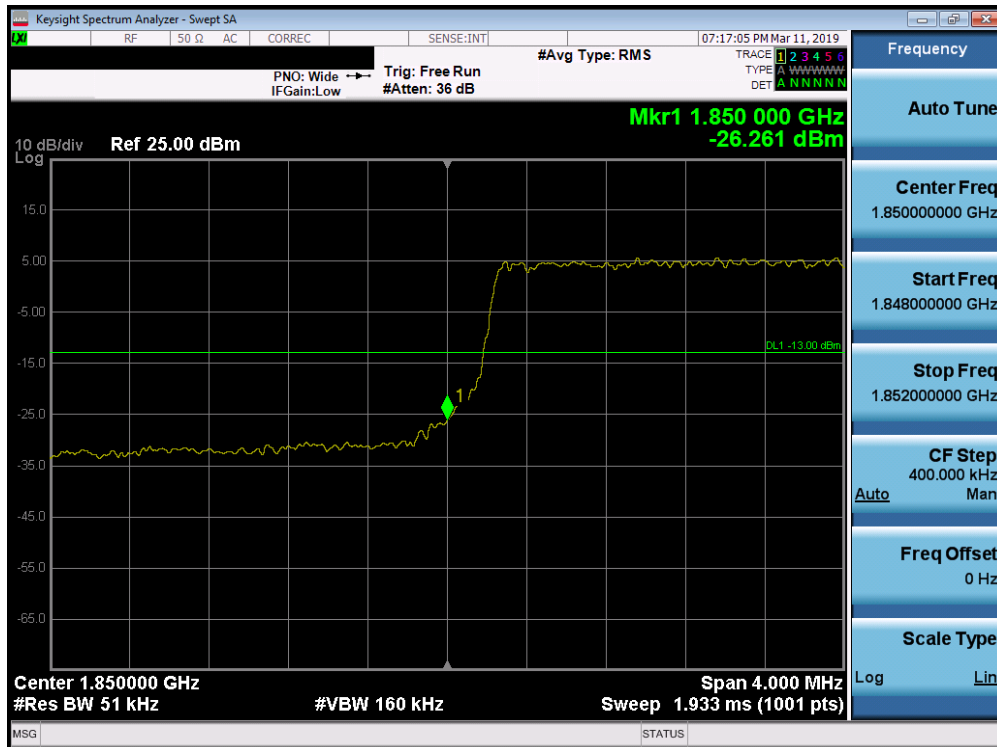


Plot 7-239. Upper Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)

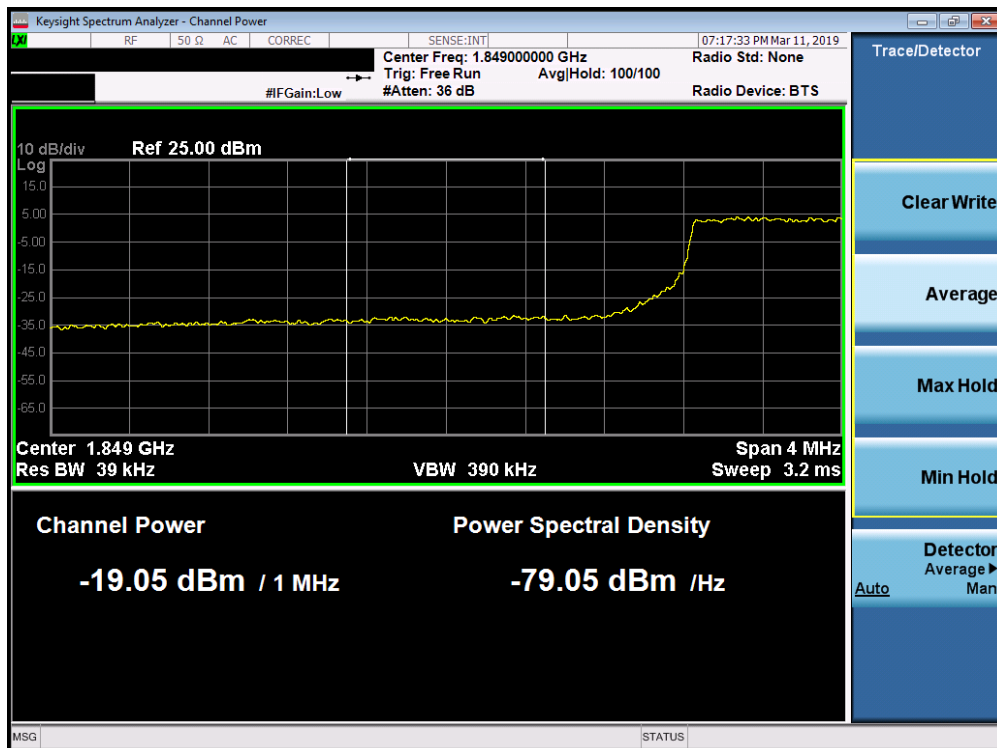


Plot 7-240. Upper Extended Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 144 of 227

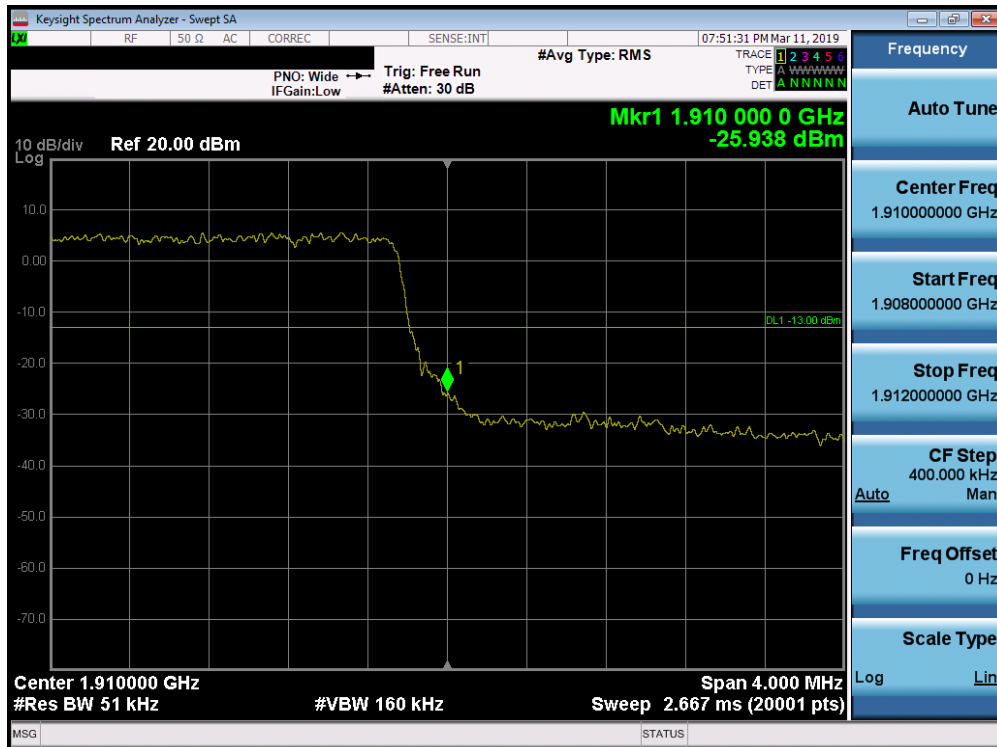


Plot 7-241. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

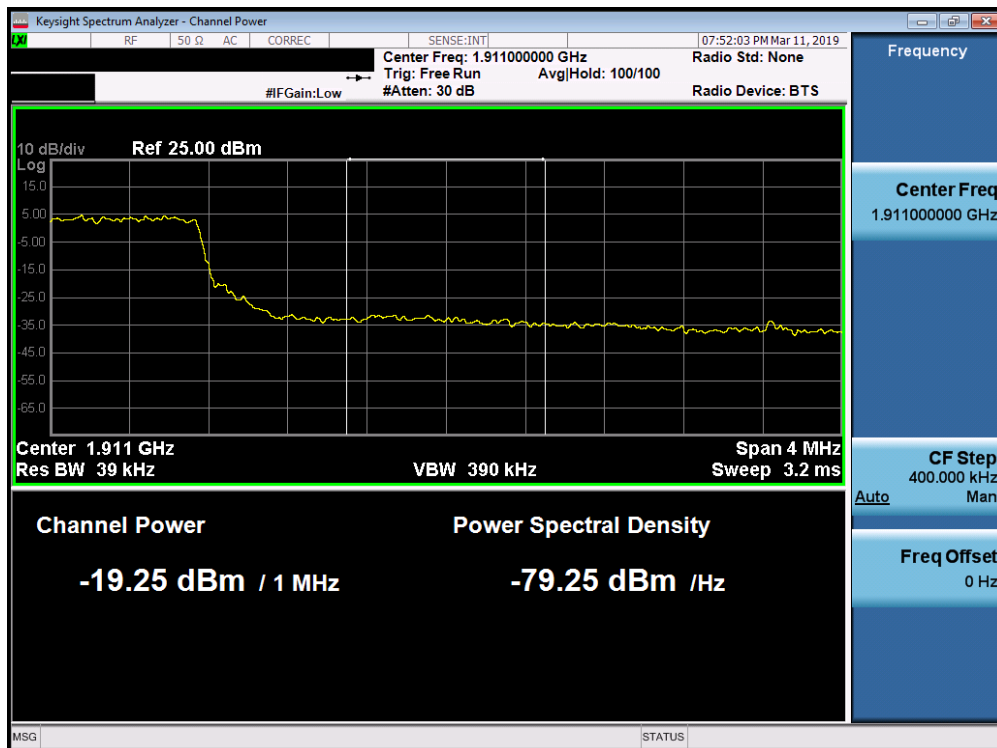


Plot 7-242. Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 145 of 227

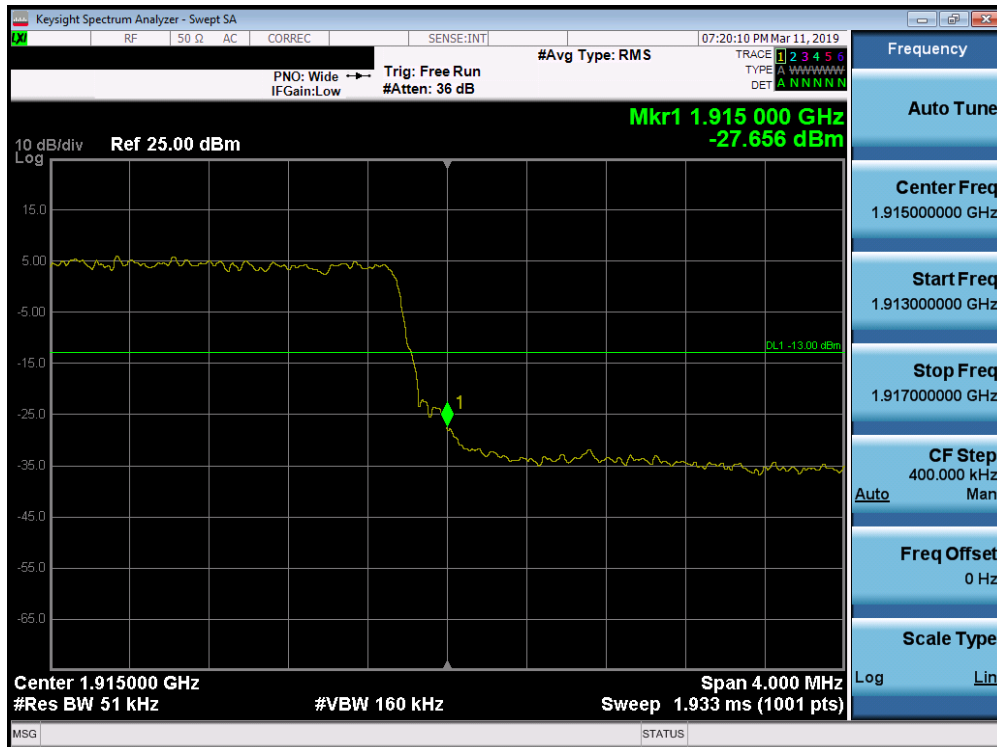


Plot 7-243. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

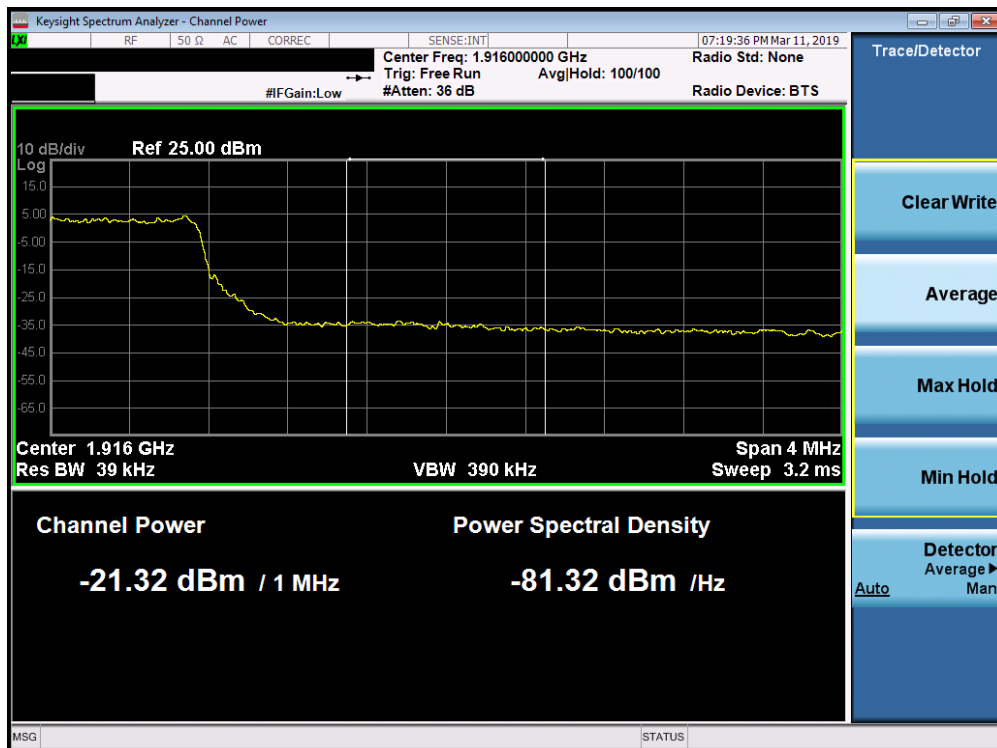


Plot 7-244. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 146 of 227

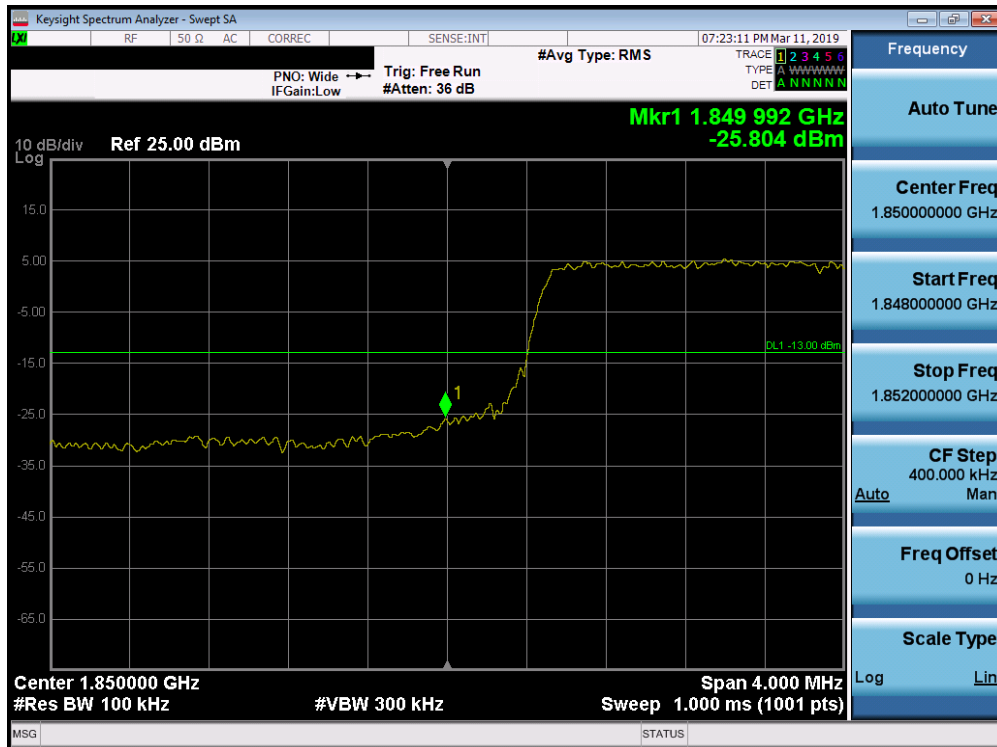


Plot 7-245. Upper Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

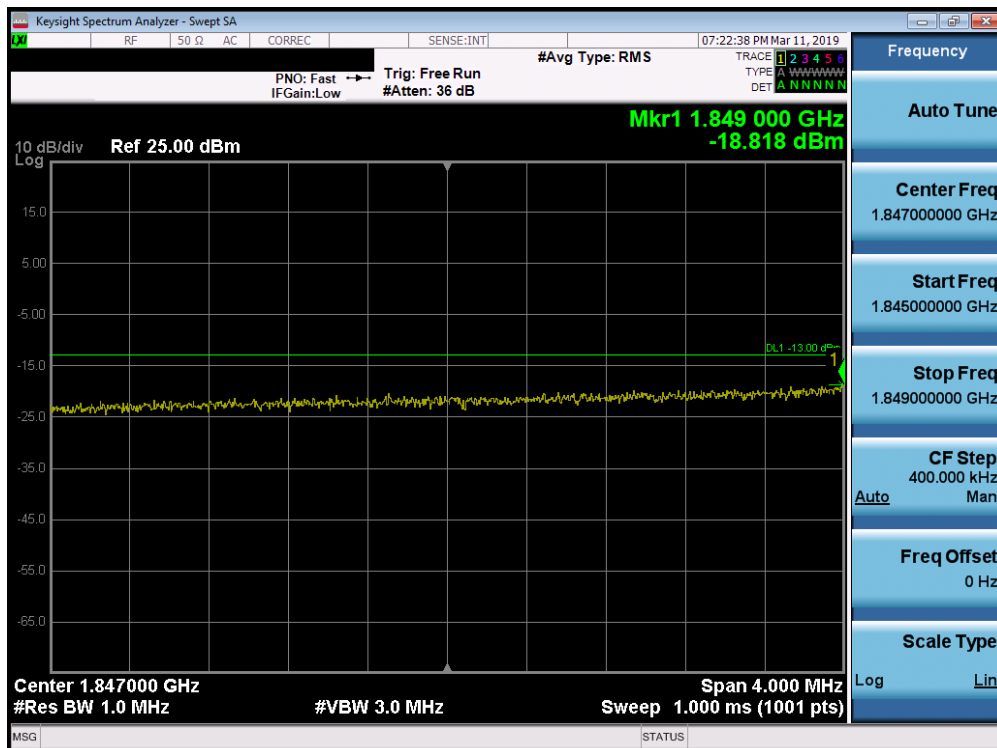


Plot 7-246. Upper Extended Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 147 of 227



Plot 7-247. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

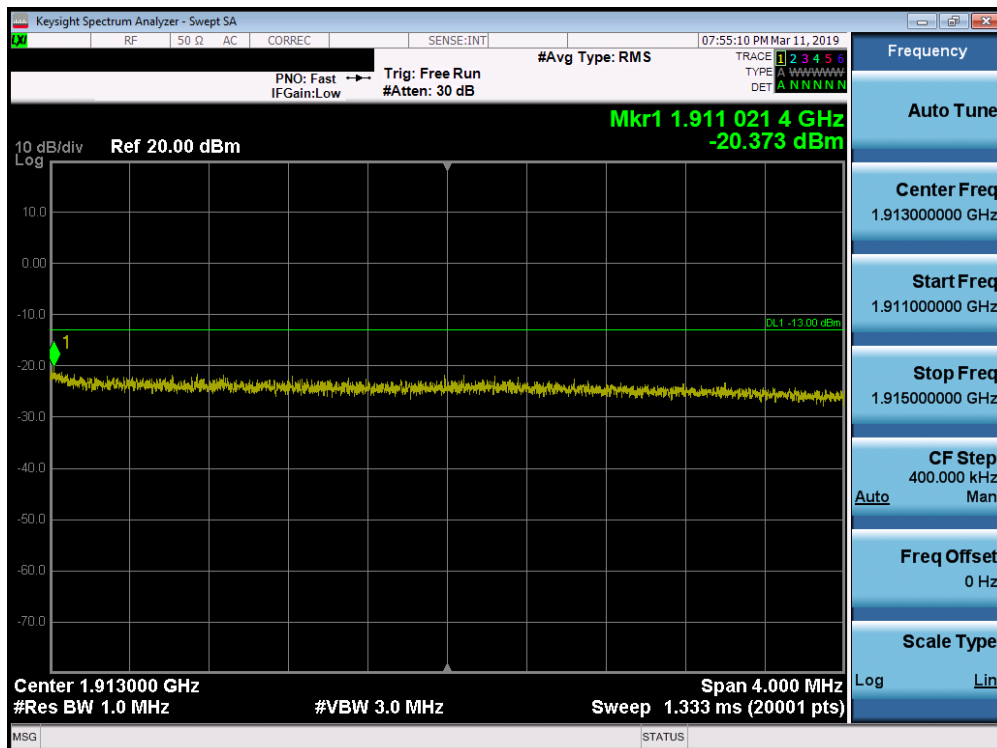


Plot 7-248. Lower Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 148 of 227

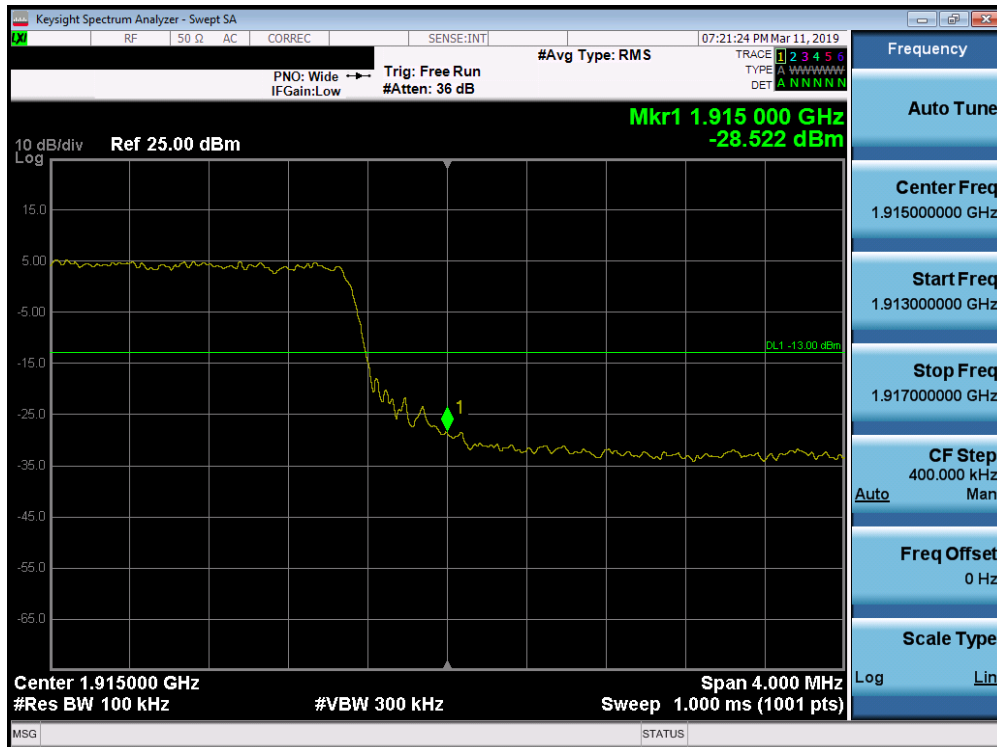


Plot 7-249. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

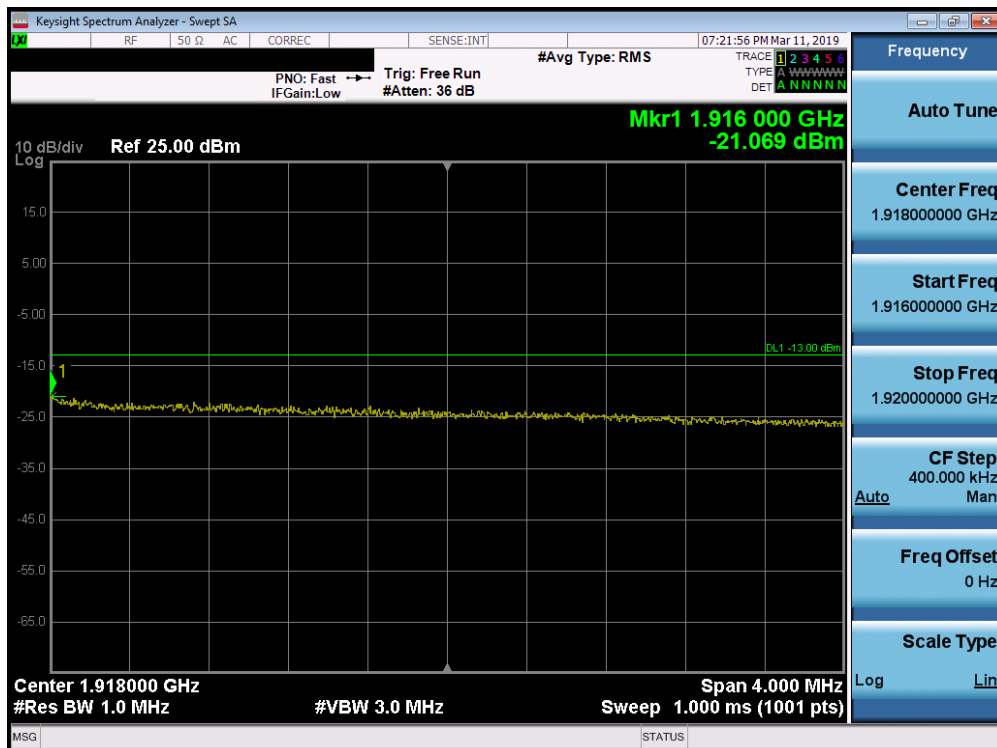


Plot 7-250. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 149 of 227

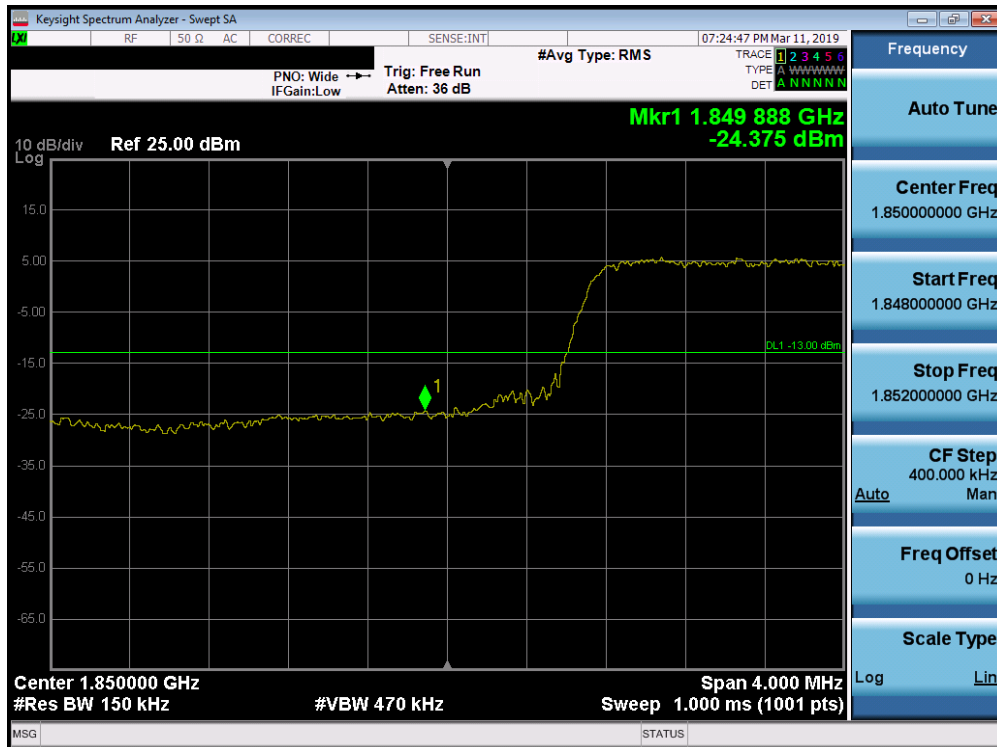


Plot 7-251. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)

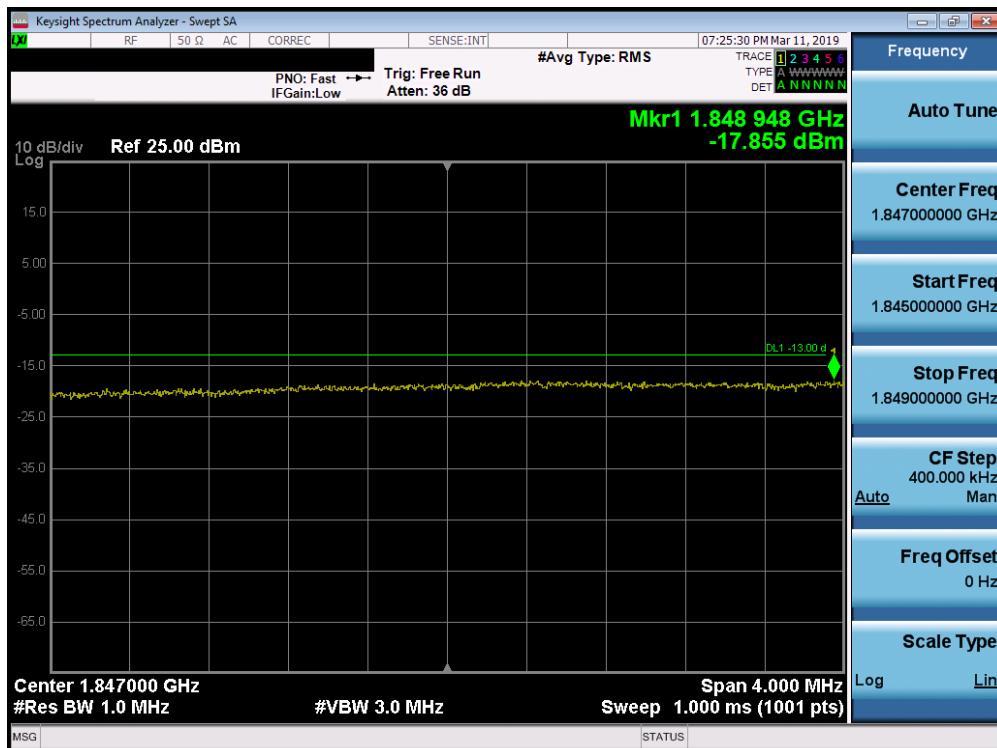


Plot 7-252. Upper Extended Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 150 of 227



Plot 7-253. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

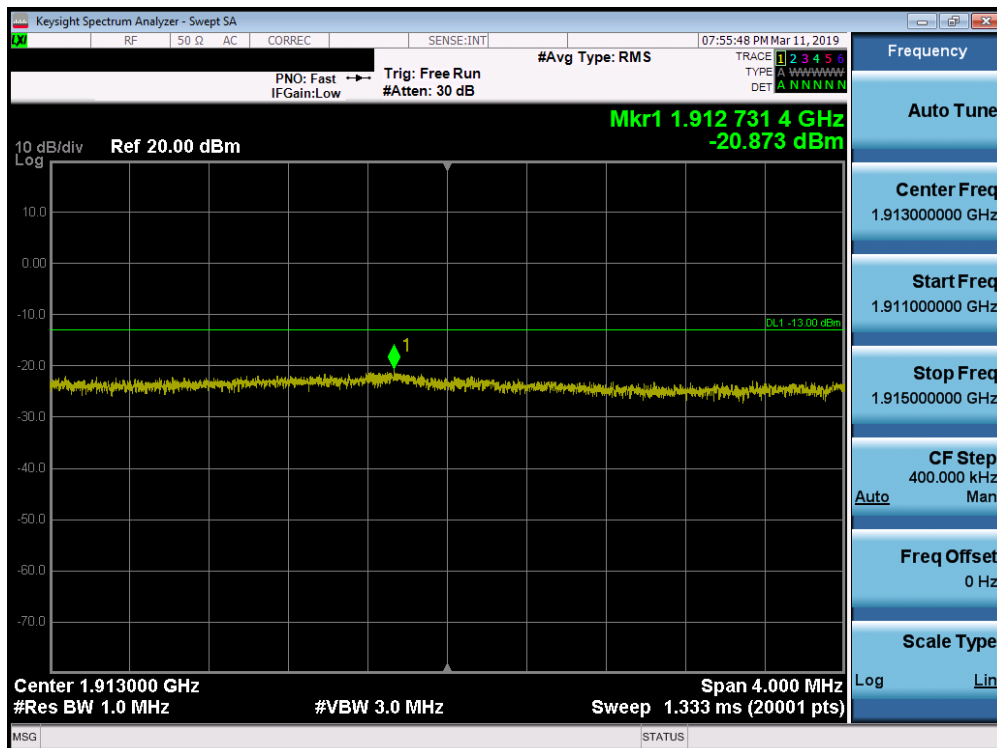


Plot 7-254. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 151 of 227



Plot 7-255. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

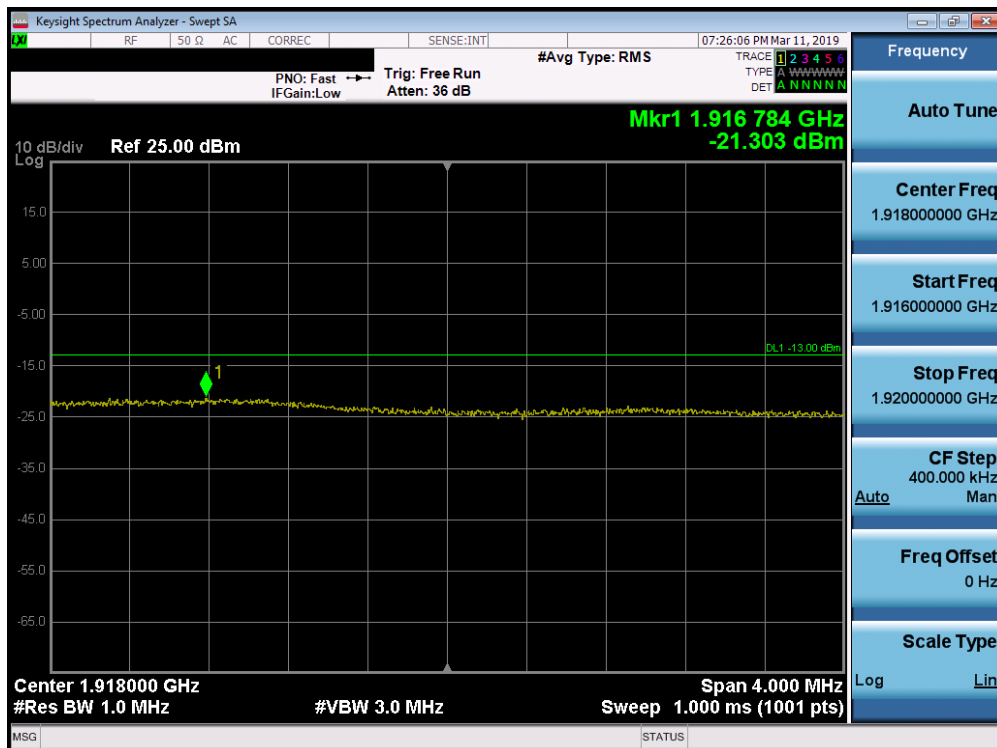


Plot 7-256. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 152 of 227

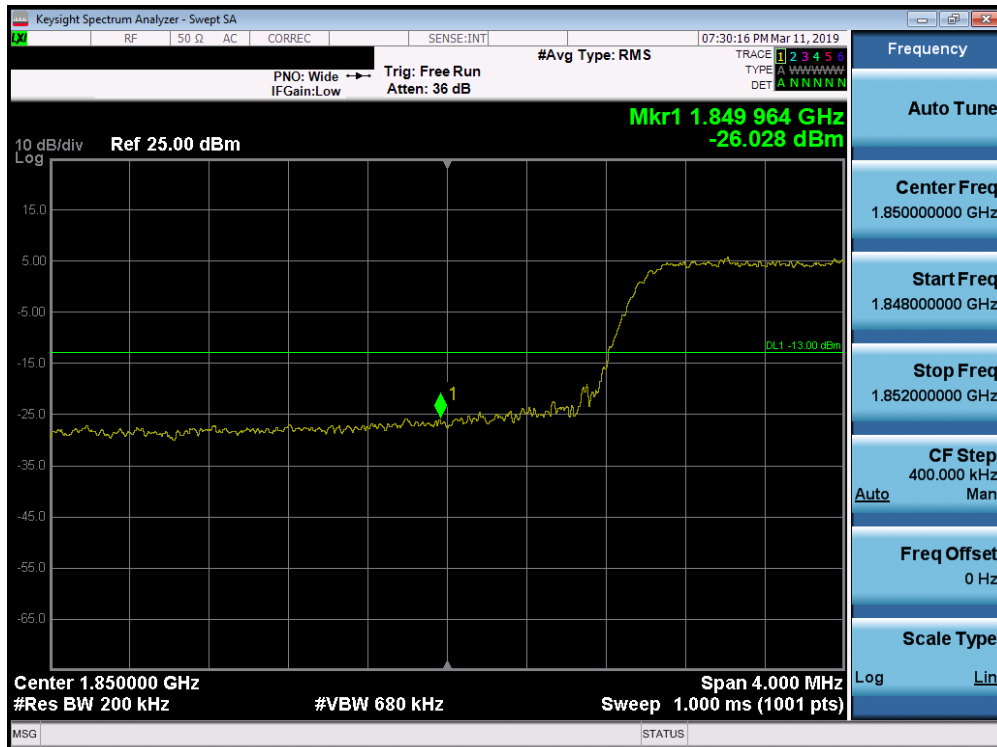


Plot 7-257. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

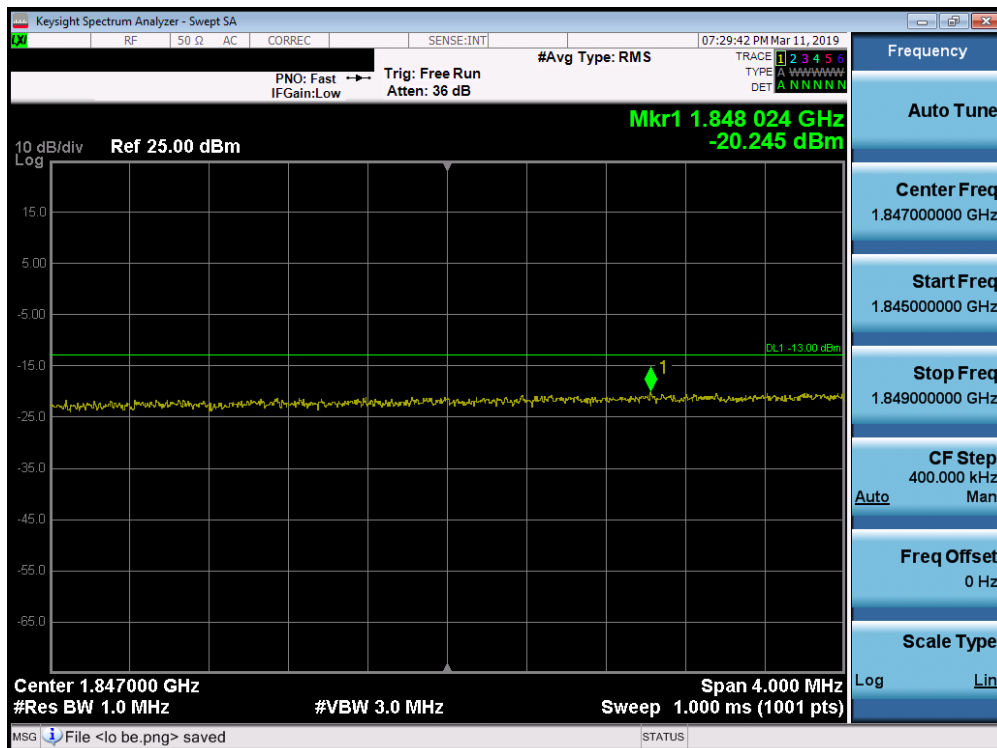


Plot 7-258. Upper Extended Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 153 of 227



Plot 7-259. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

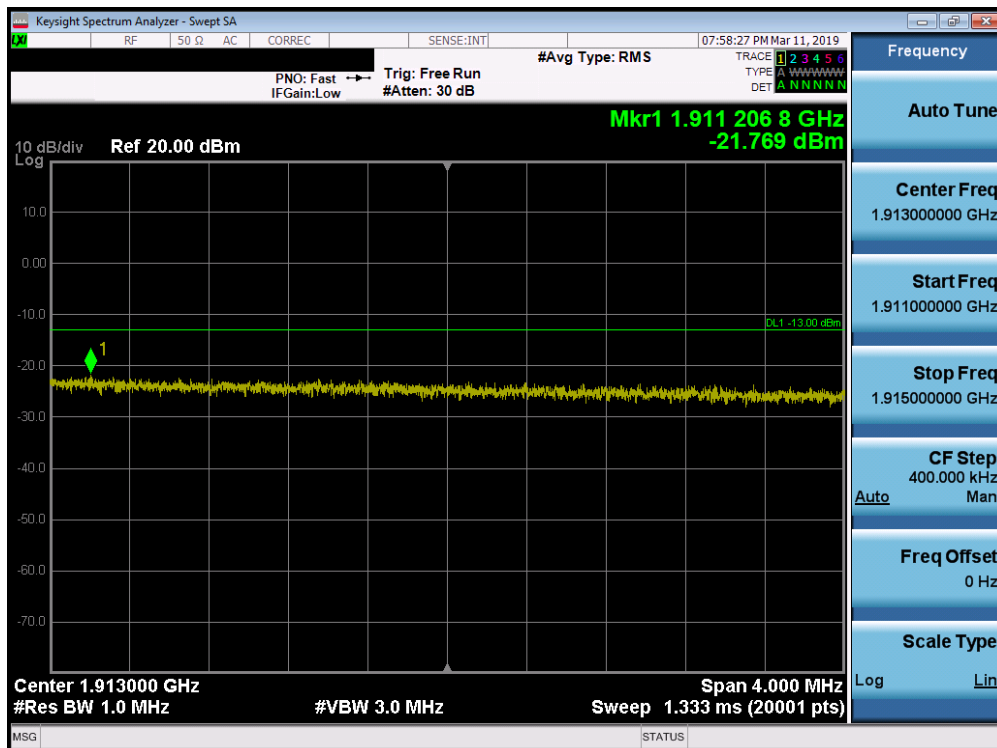


Plot 7-260. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 154 of 227



Plot 7-261. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

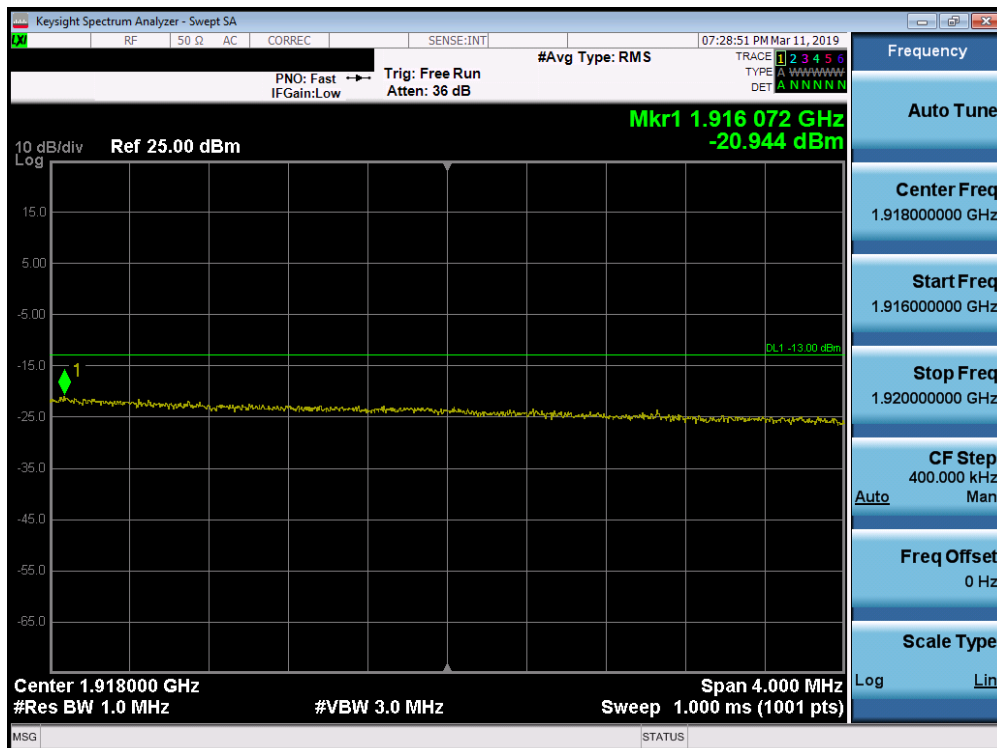


Plot 7-262. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 155 of 227



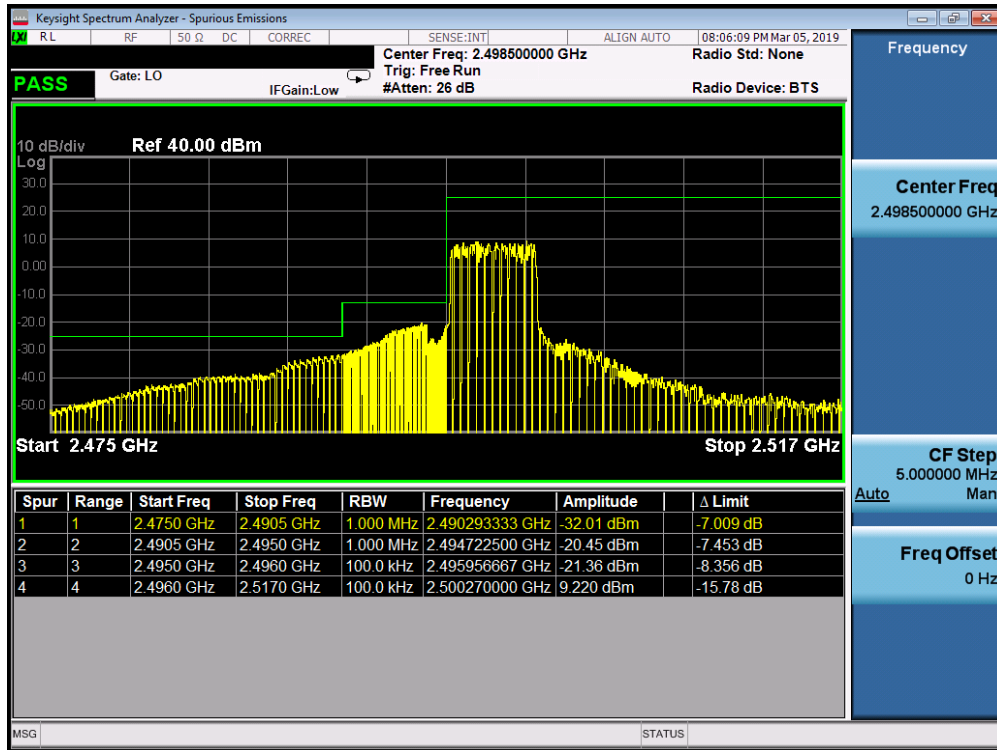
Plot 7-263. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



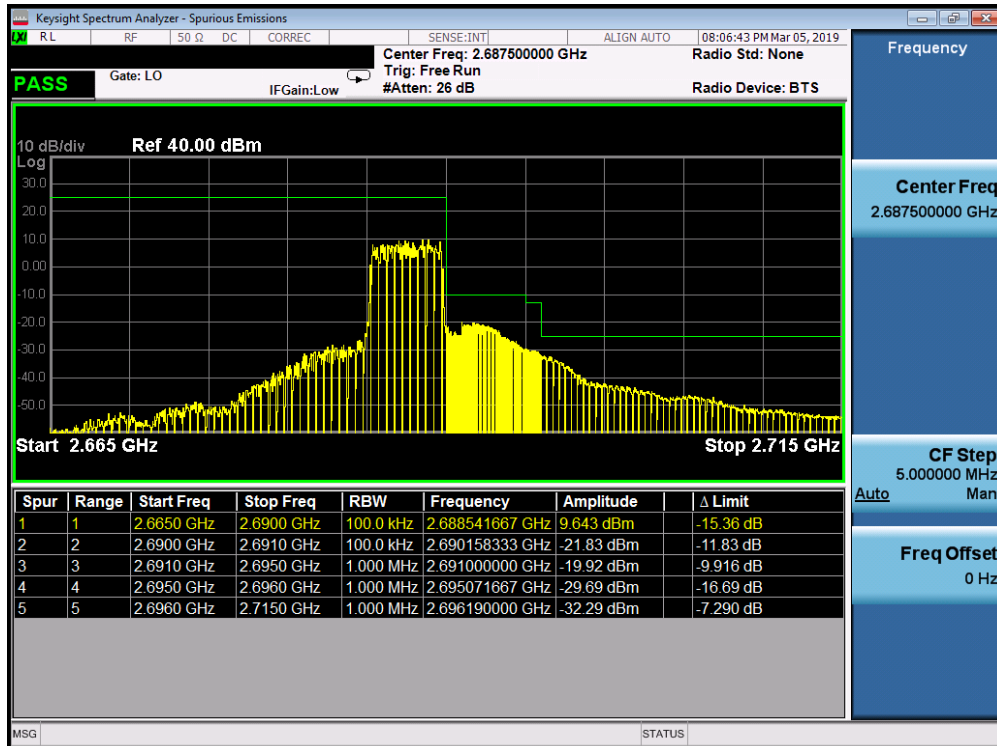
Plot 7-264. Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 156 of 227

Band 41 (PC2)

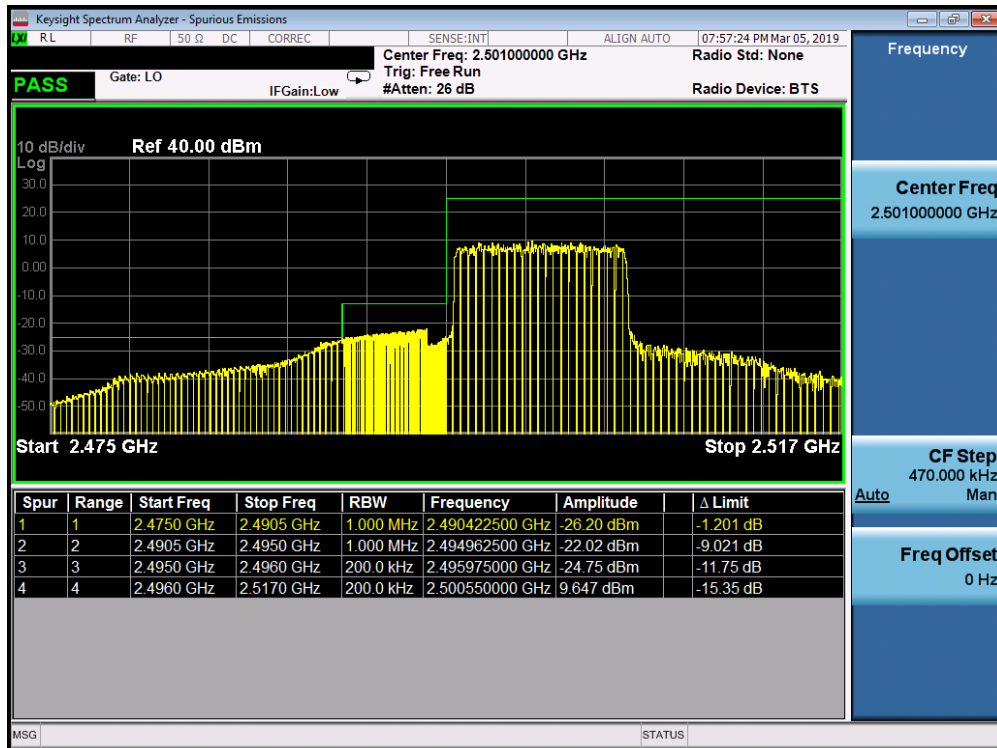


Plot 7-265. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - Full RB Configuration)

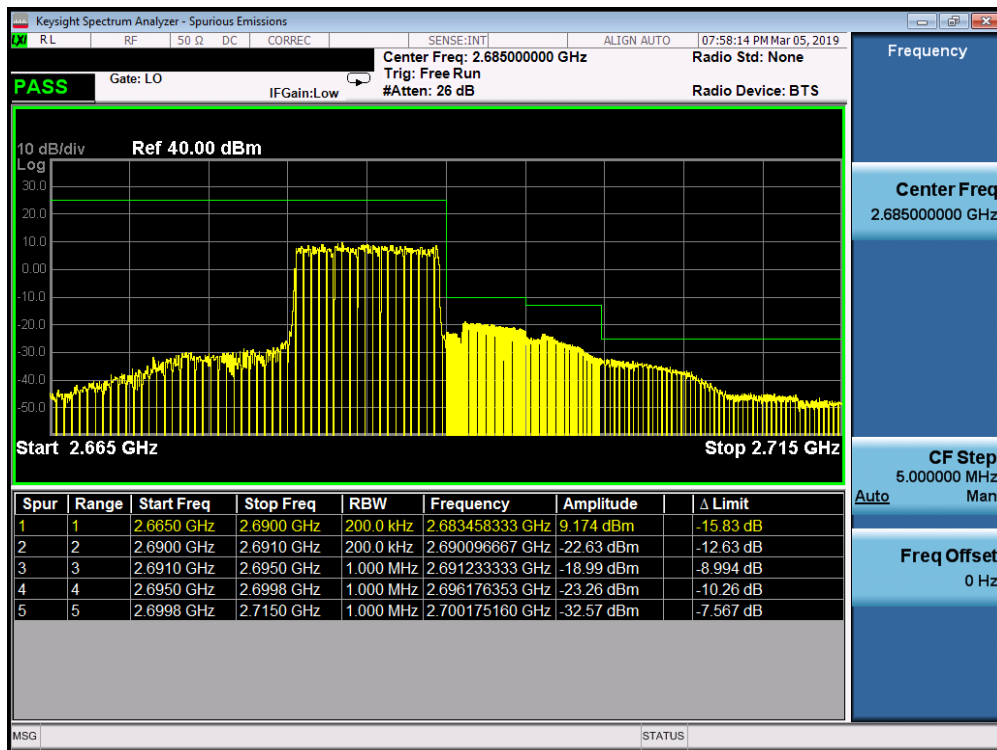


Plot 7-266. Upper ACP Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 157 of 227

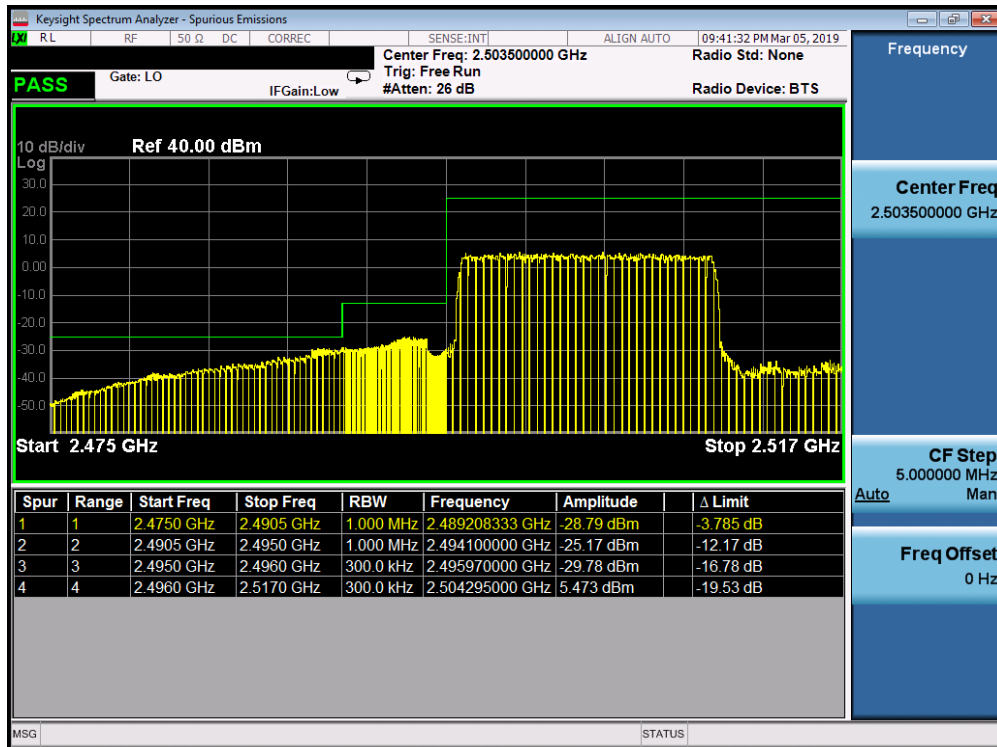


Plot 7-267. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - Full RB Configuration)

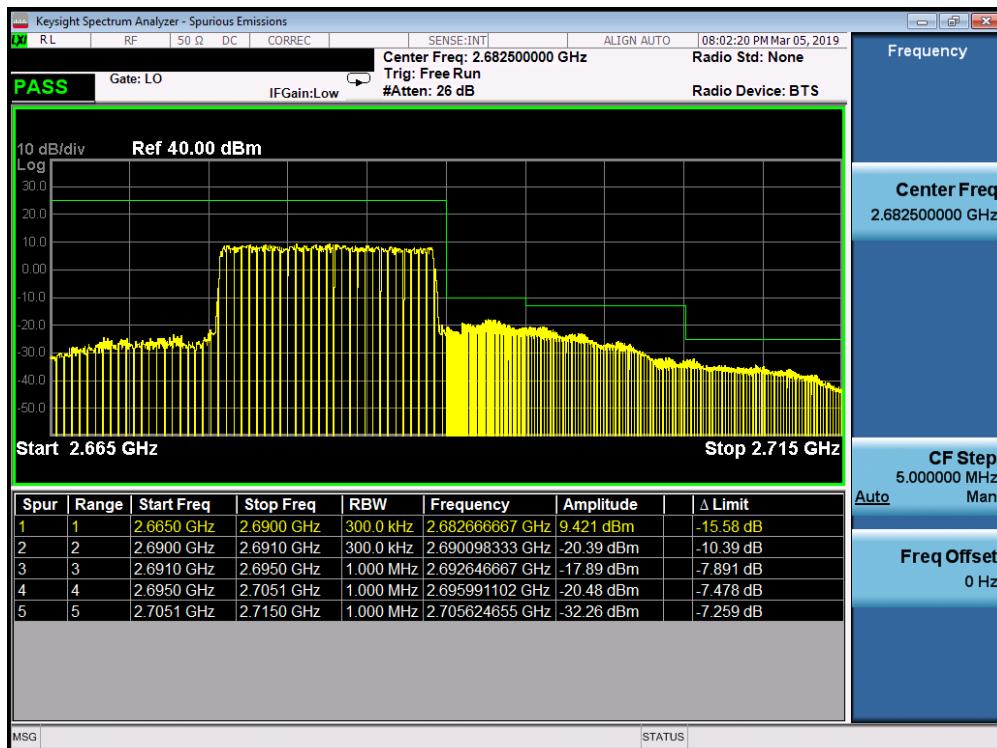


Plot 7-268. Upper ACP Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 158 of 227

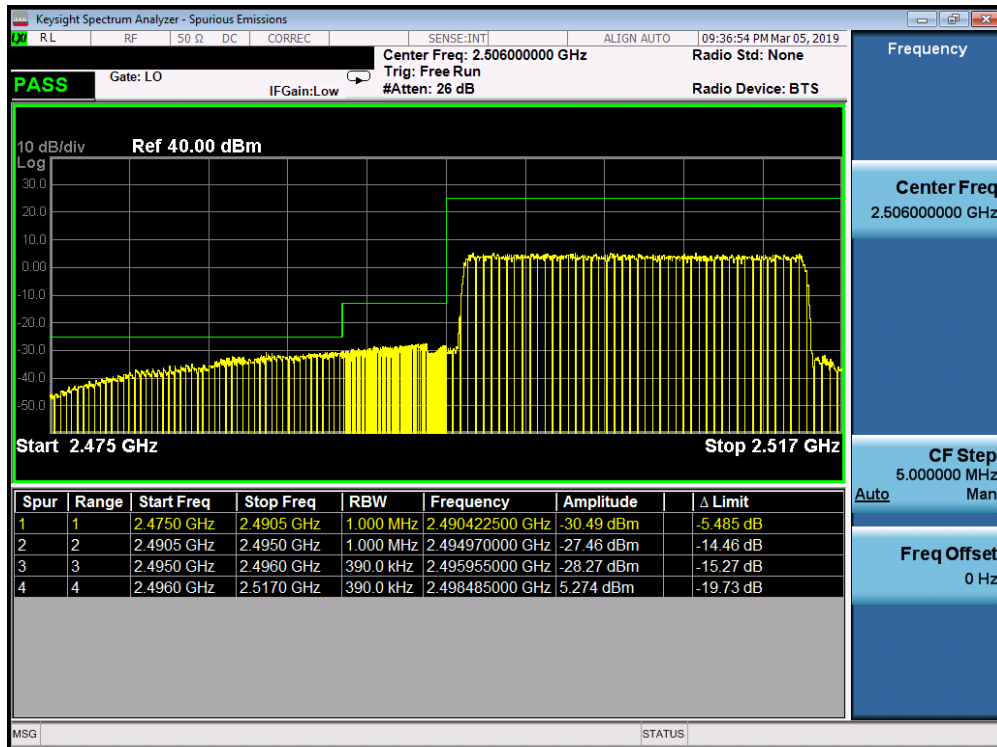


Plot 7-269. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - Full RB Configuration)

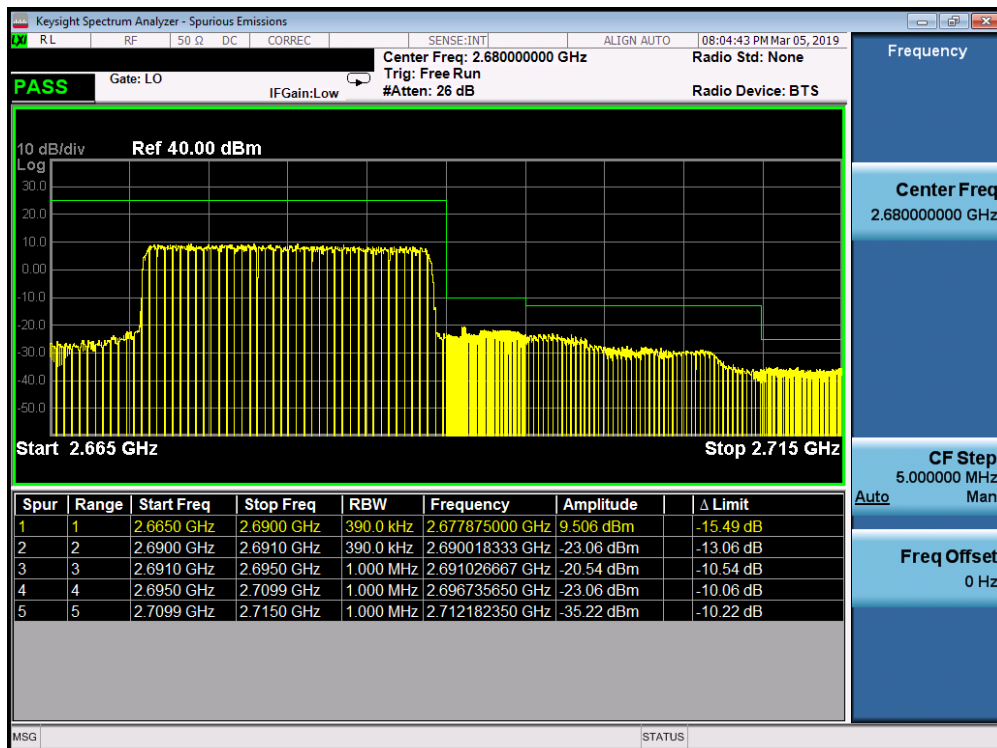


Plot 7-270. Upper ACP Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 159 of 227



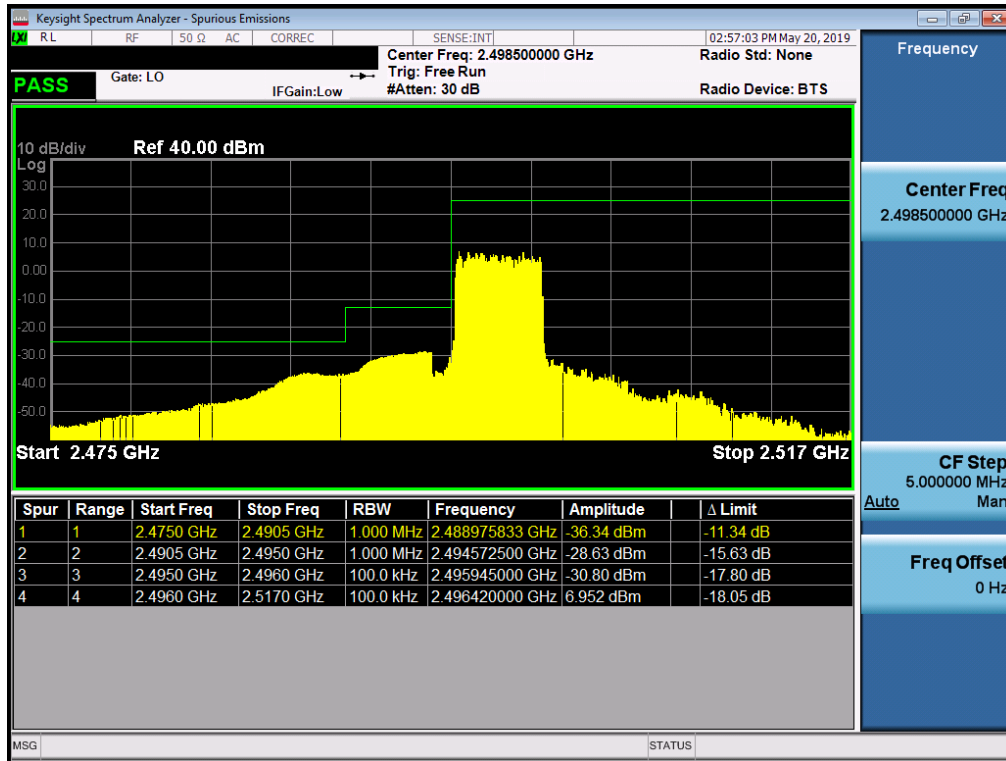
Plot 7-271. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - Full RB Configuration)



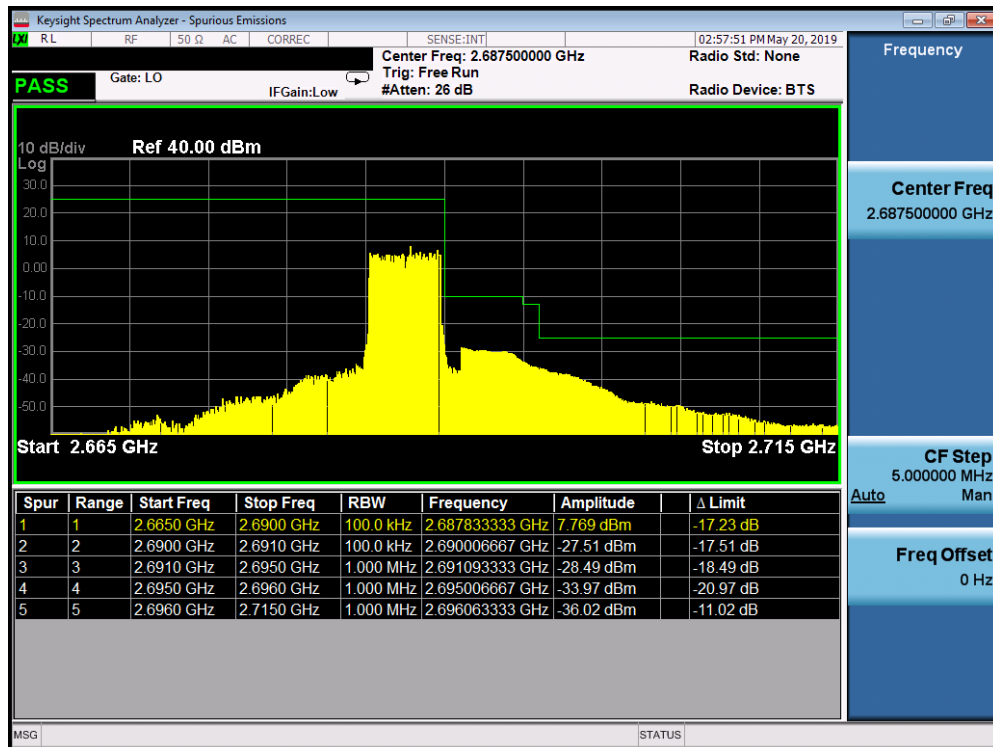
Plot 7-272. Upper ACP Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 160 of 227

Band 41 (PC3)

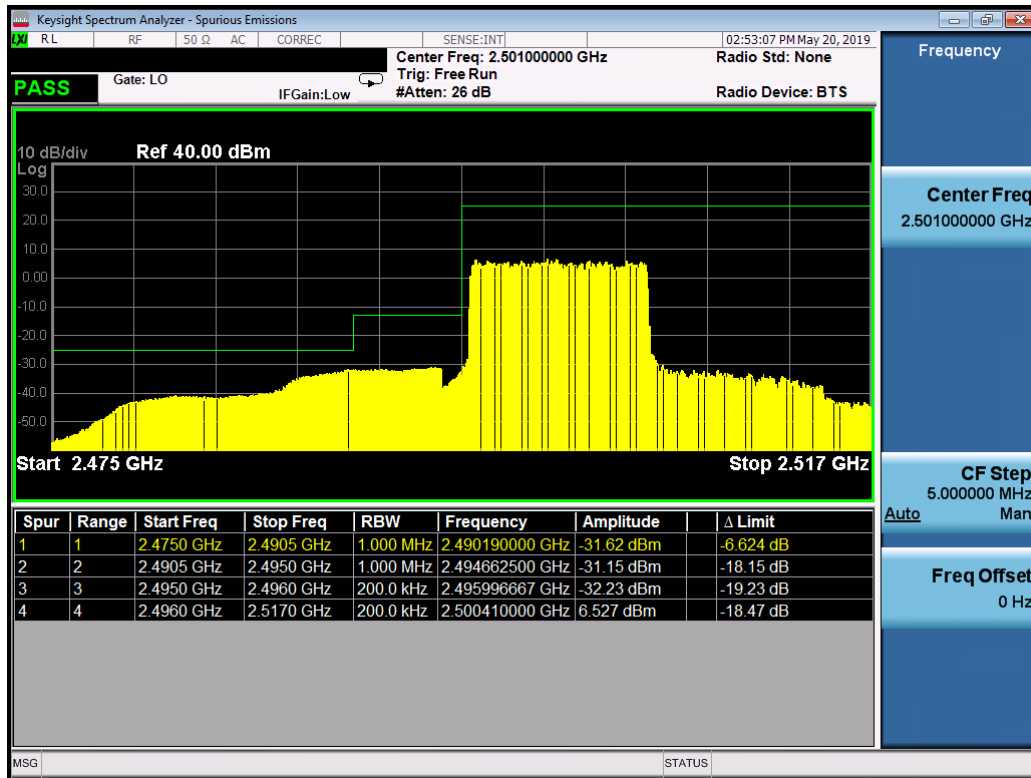


Plot 7-273. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - Full RB Configuration)

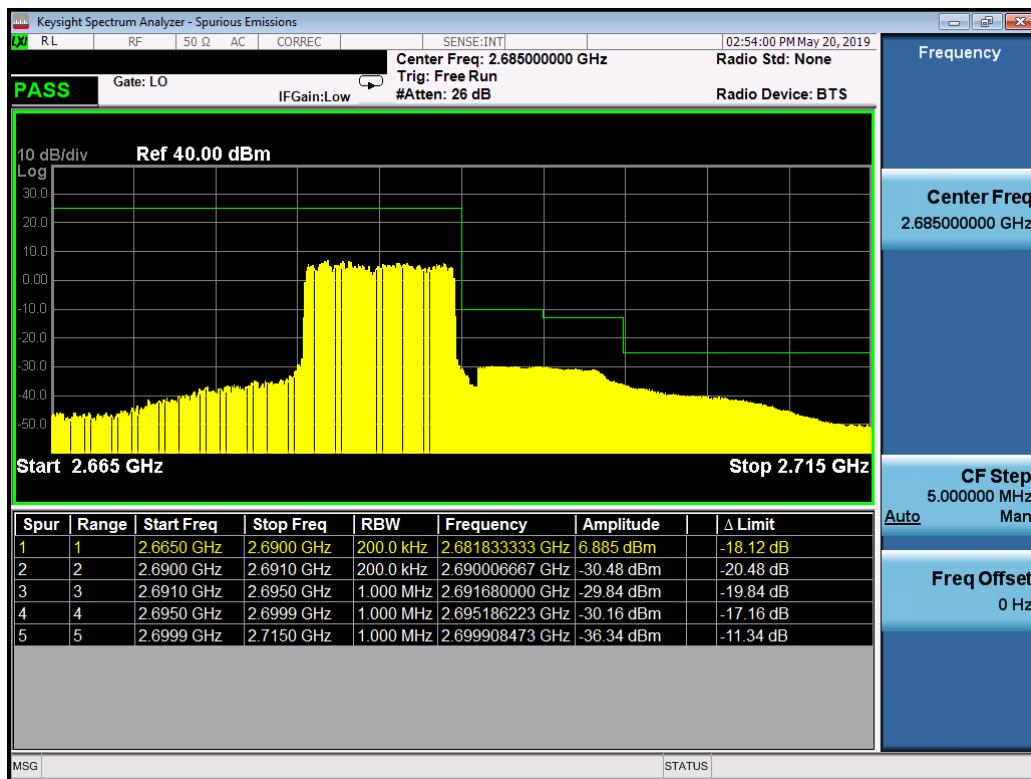


Plot 7-274. Upper ACP Plot (Band 41 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 161 of 227

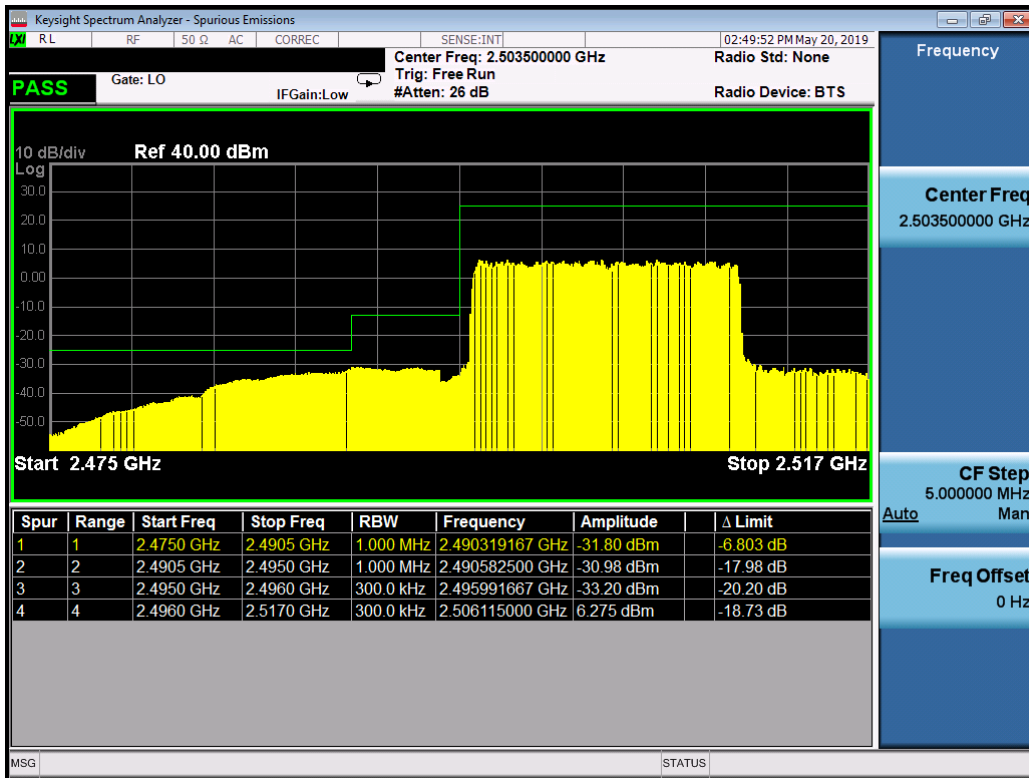


Plot 7-275. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - Full RB Configuration)

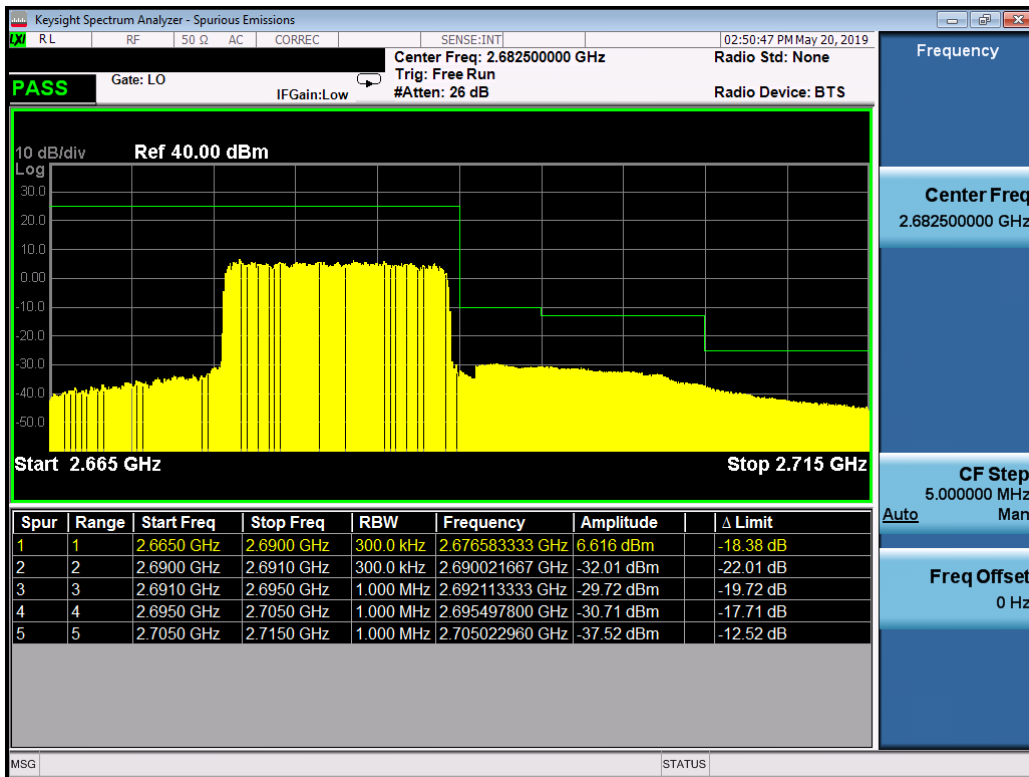


Plot 7-276. Upper ACP Plot (Band 41 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 162 of 227

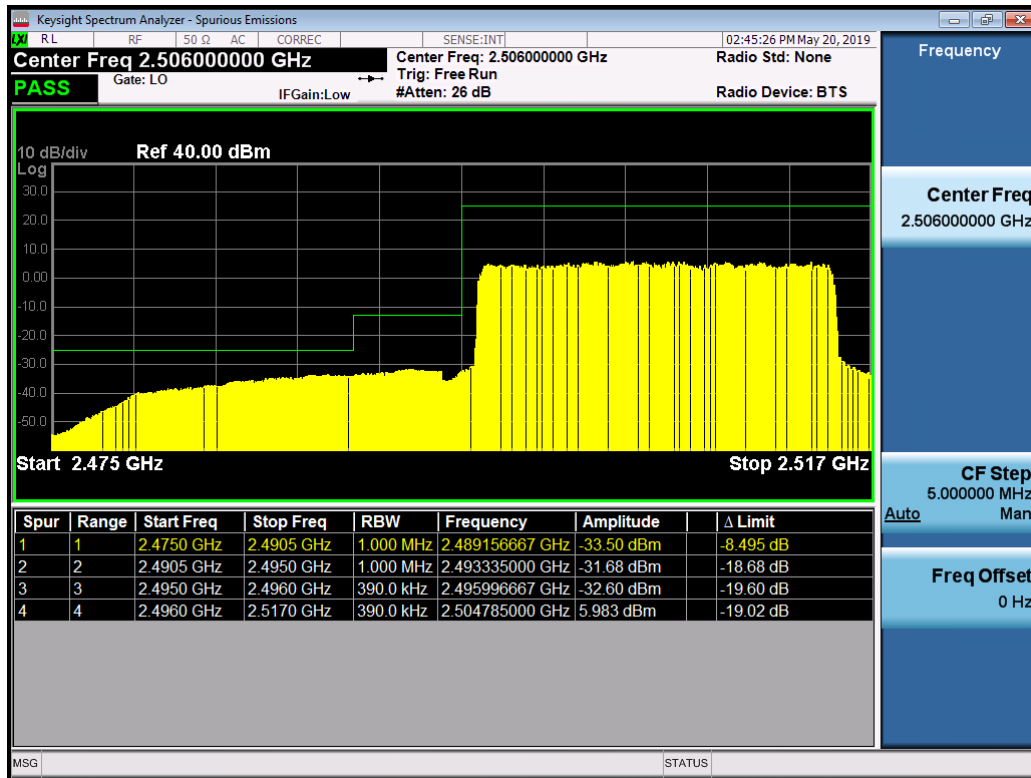


Plot 7-277. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - Full RB Configuration)

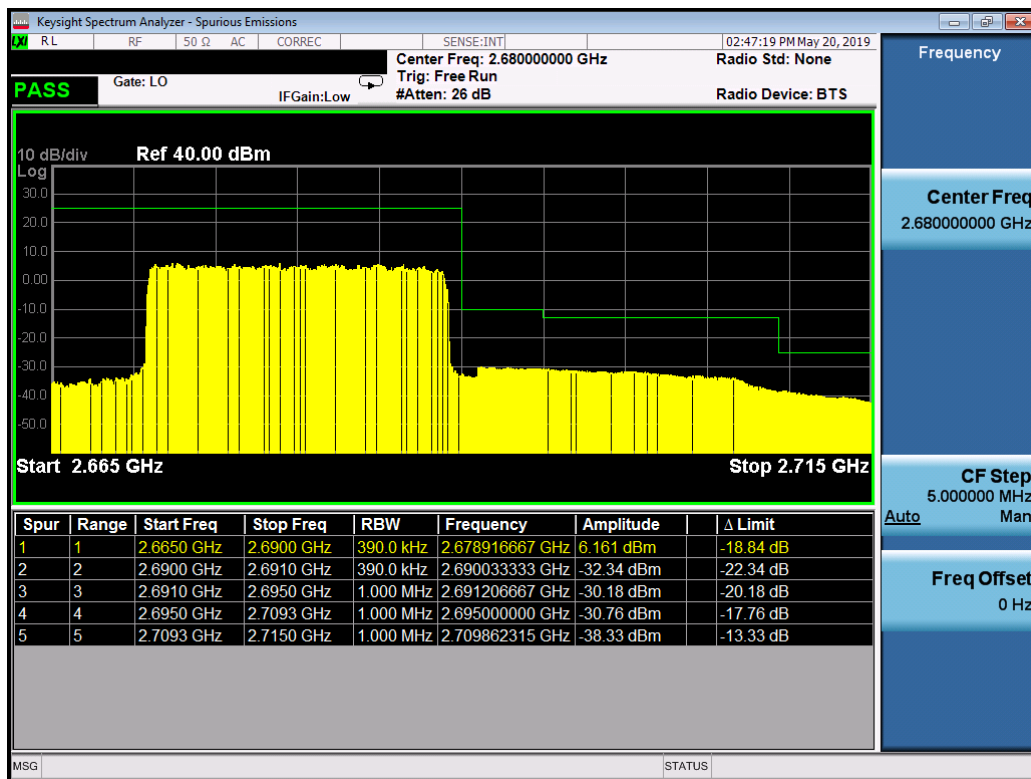


Plot 7-278. Upper ACP Plot (Band 41 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 163 of 227



Plot 7-279. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-280. Upper ACP Plot (Band 41 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset	Page 164 of 227

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.

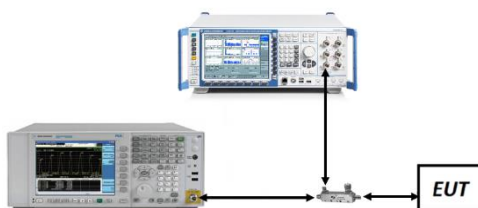


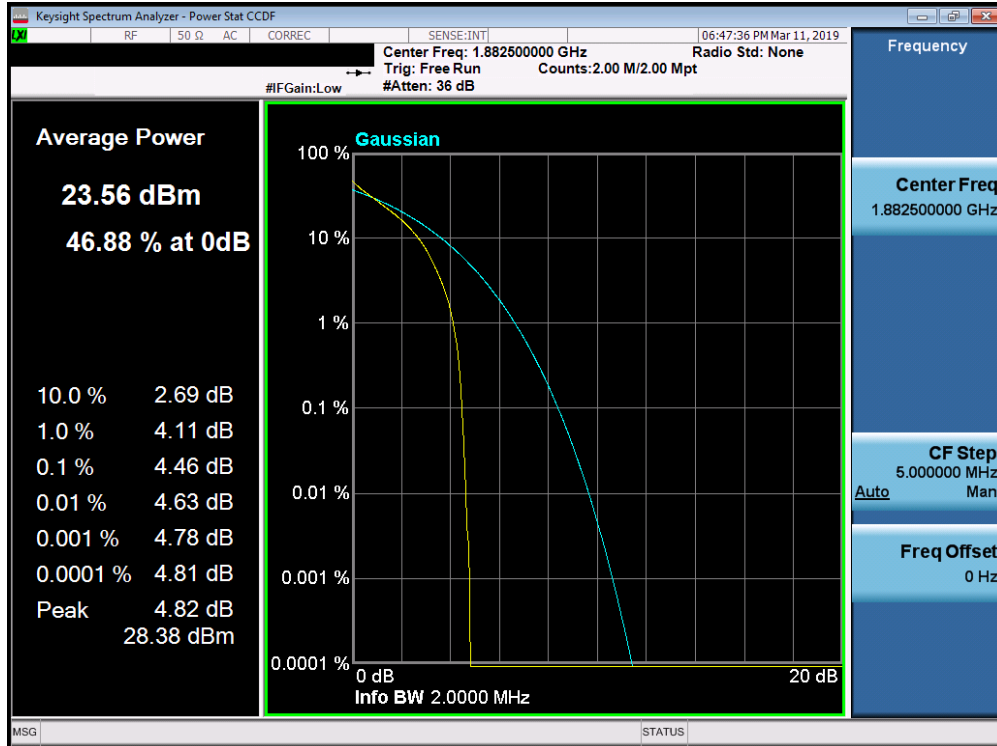
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

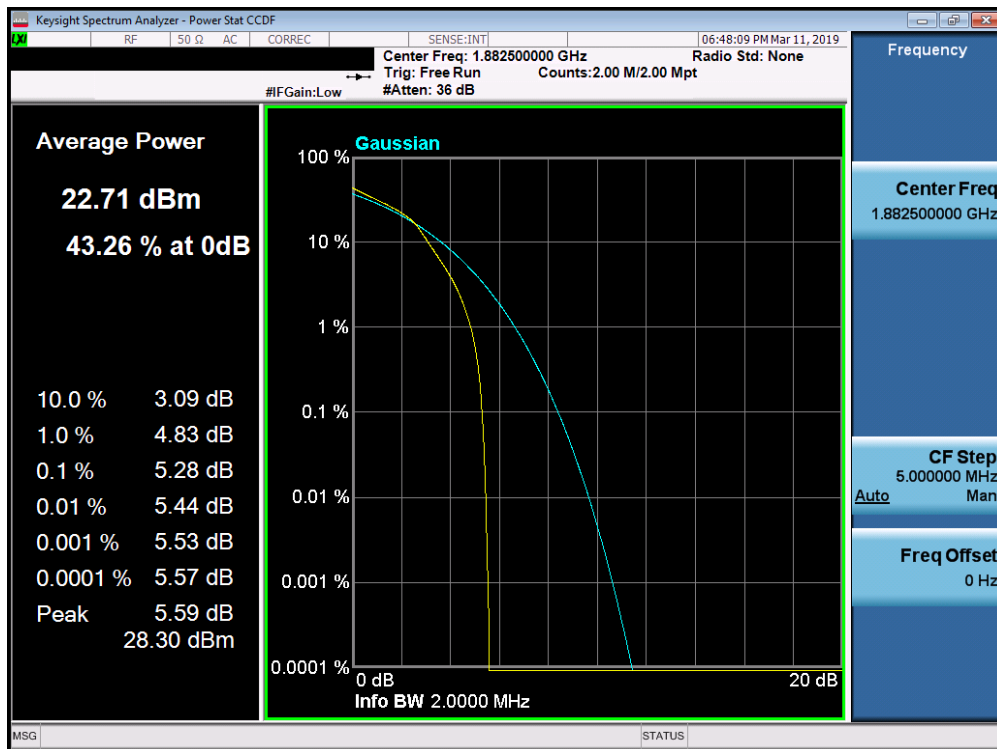
None.

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 165 of 227

Band 25/2

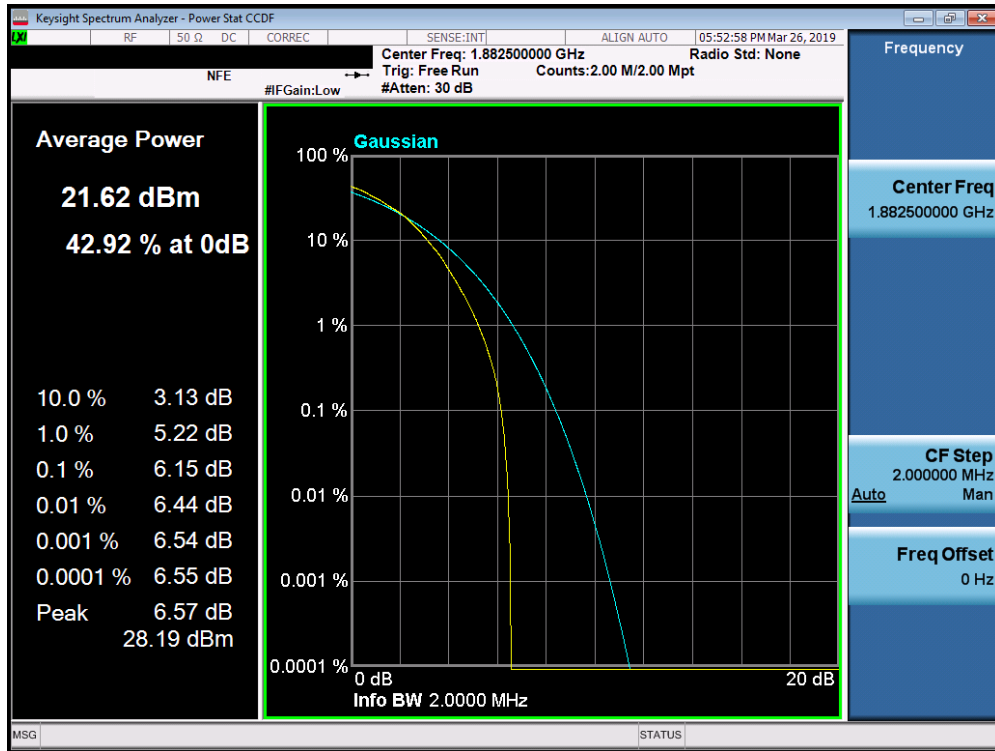


Plot 7-281. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

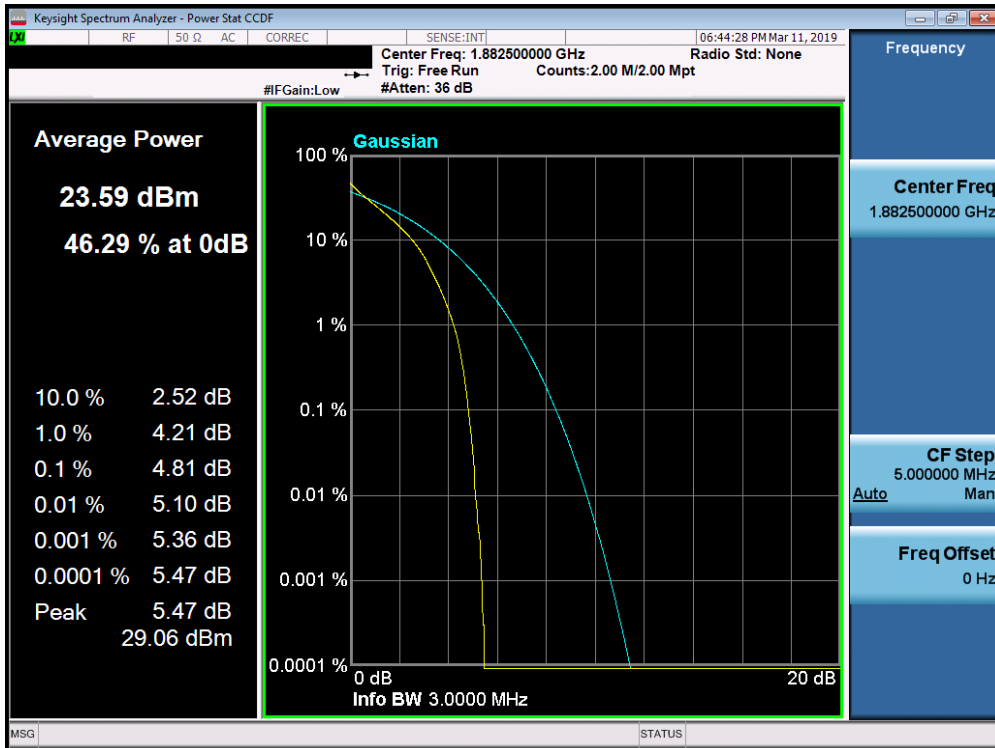


Plot 7-282. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 166 of 227

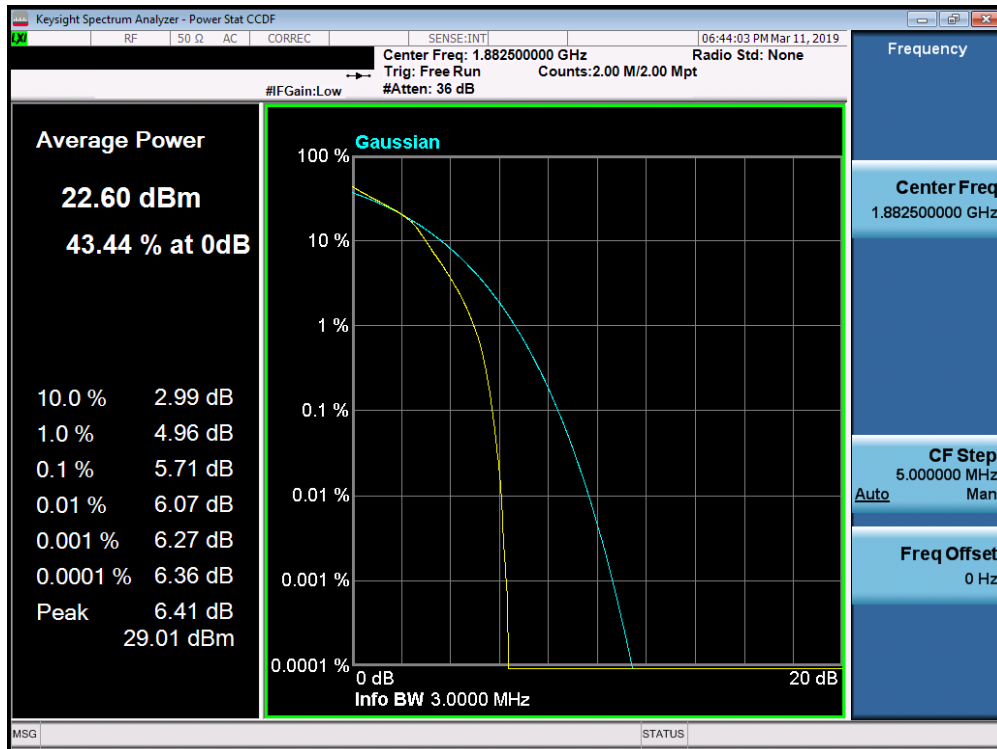


Plot 7-283. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)

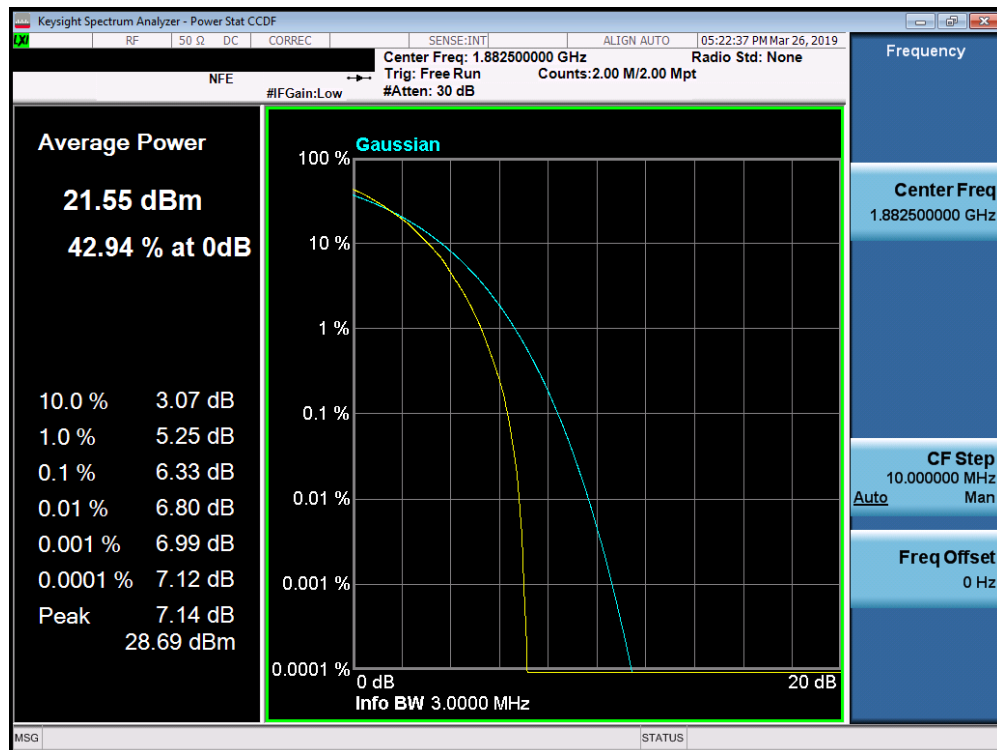


Plot 7-284. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 167 of 227

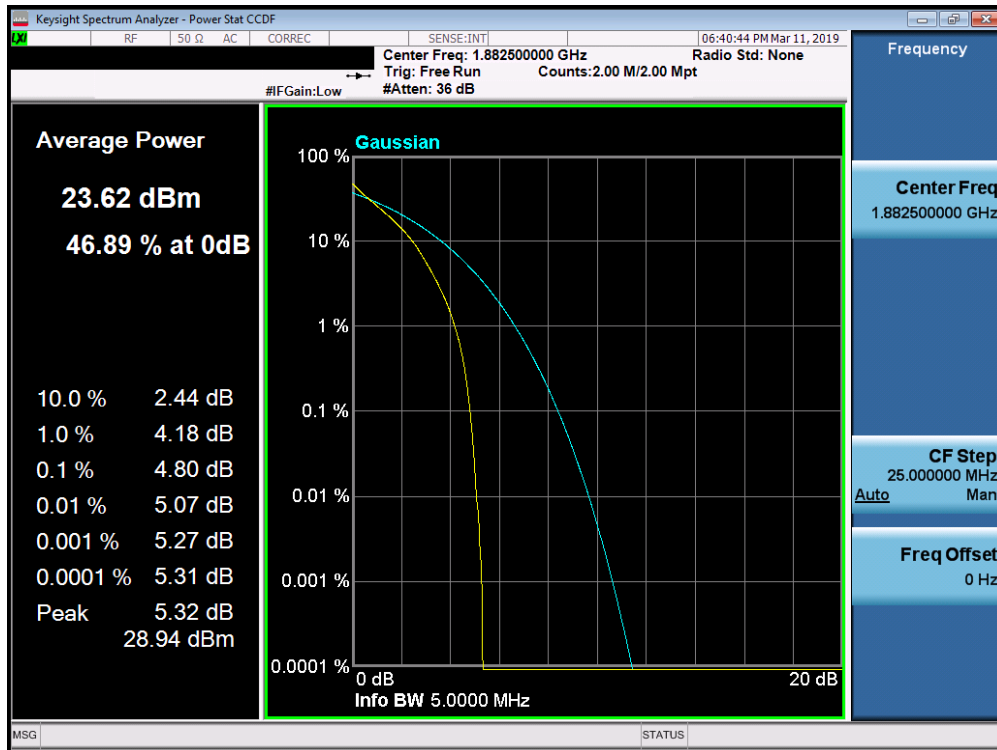


Plot 7-285. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)

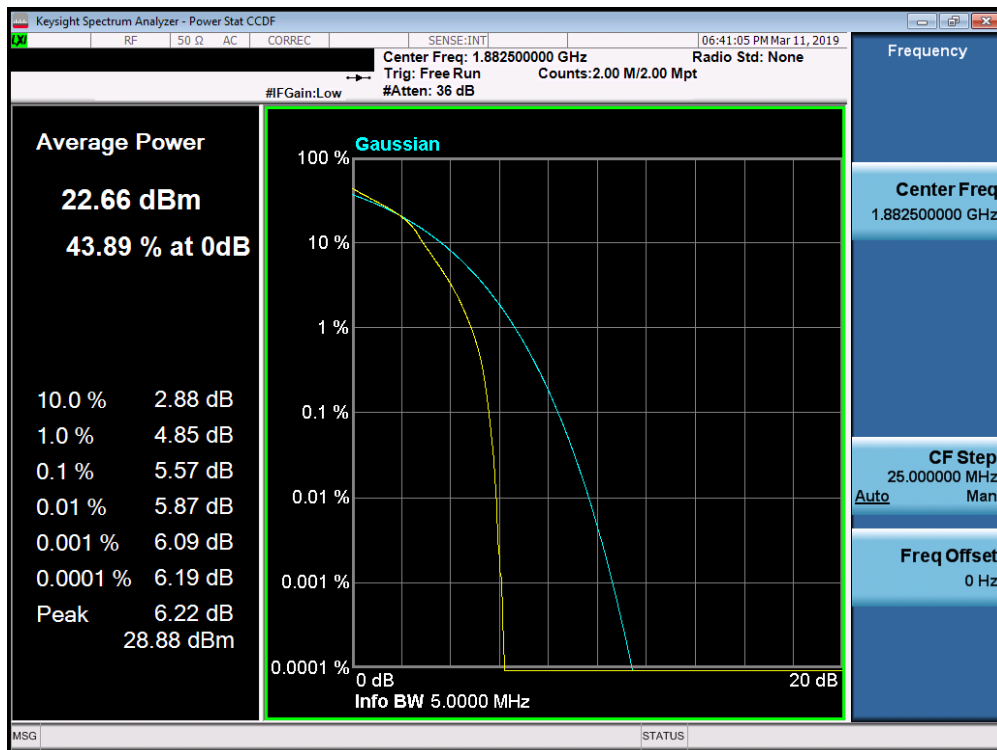


Plot 7-286. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 168 of 227

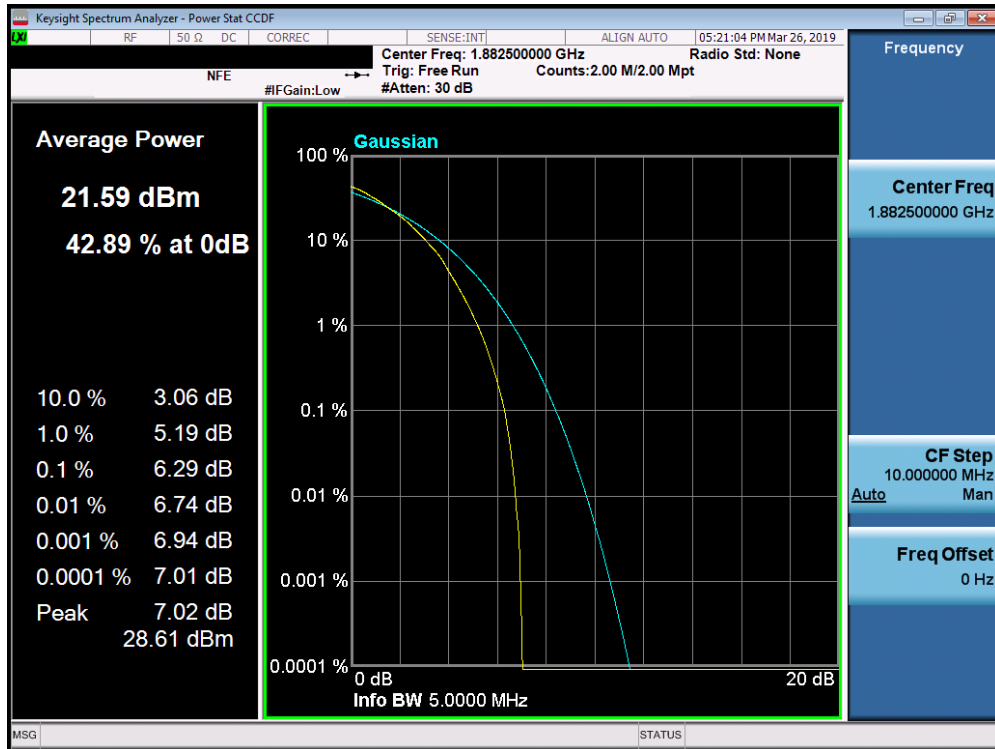


Plot 7-287. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

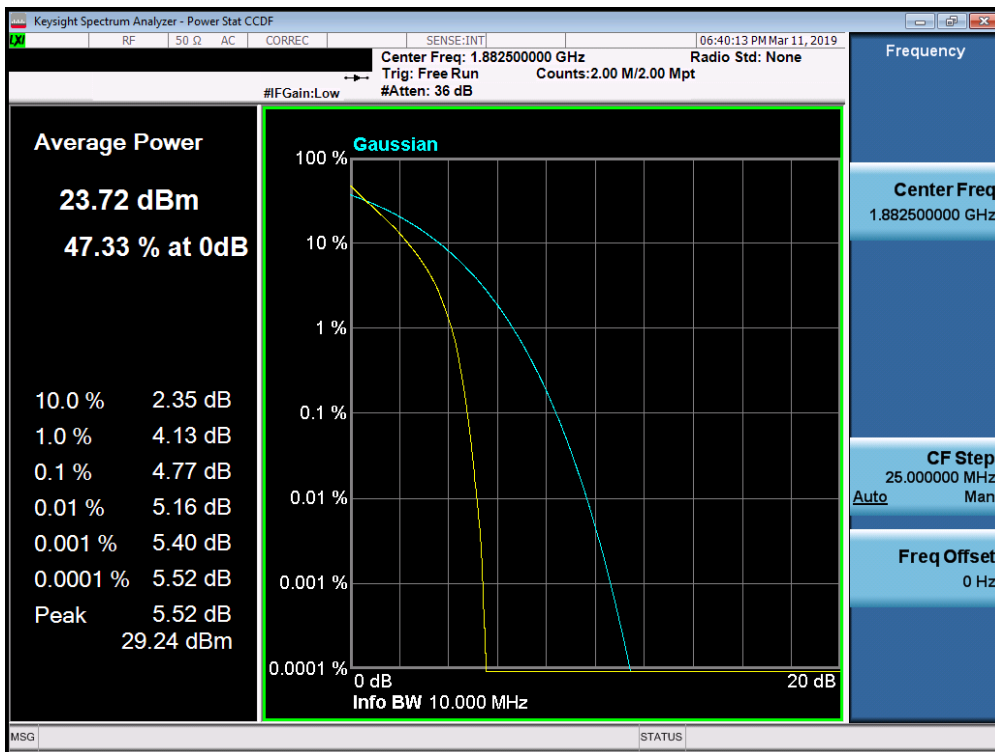


Plot 7-288. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	 MEASUREMENT REPORT (CERTIFICATION)		 Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset	Page 169 of 227

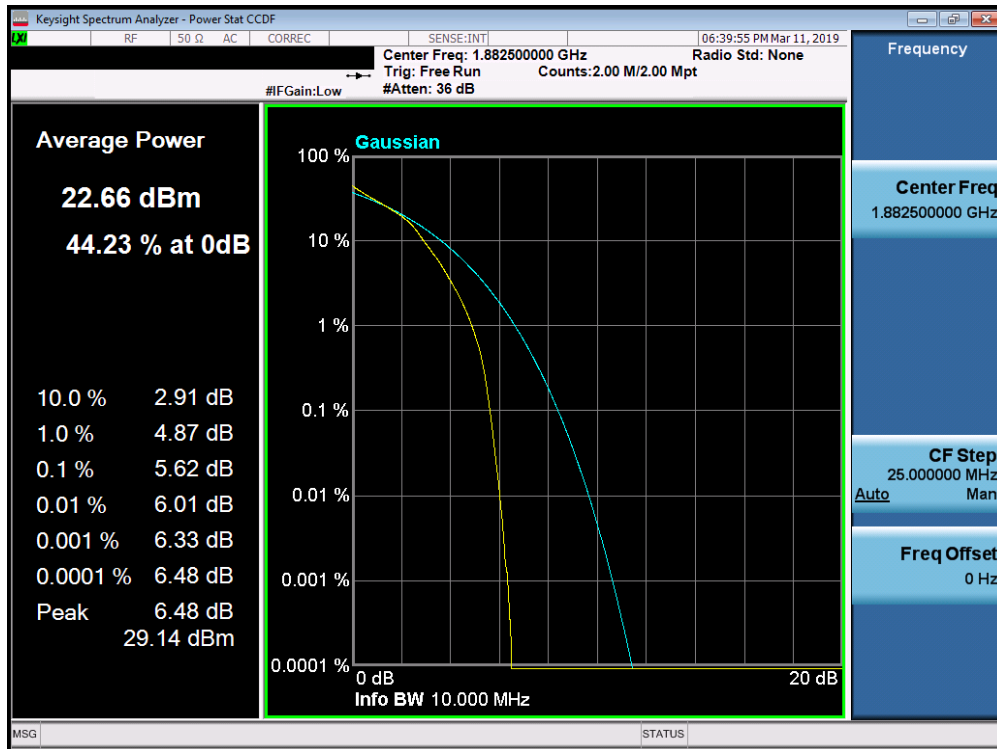


Plot 7-289. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)

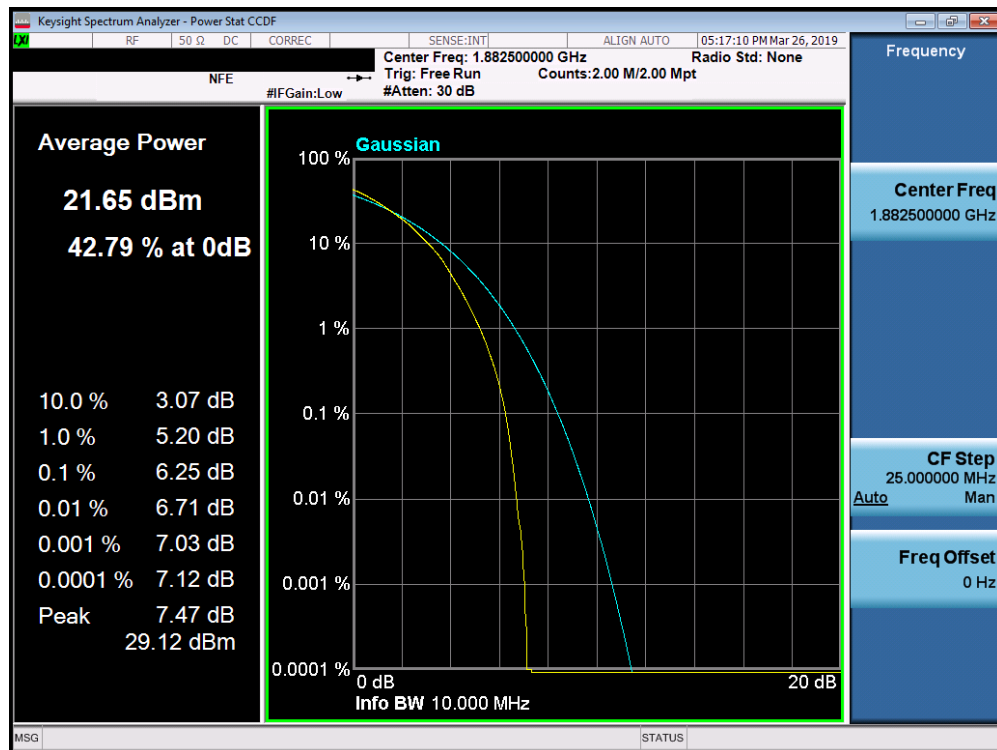


Plot 7-290. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 170 of 227

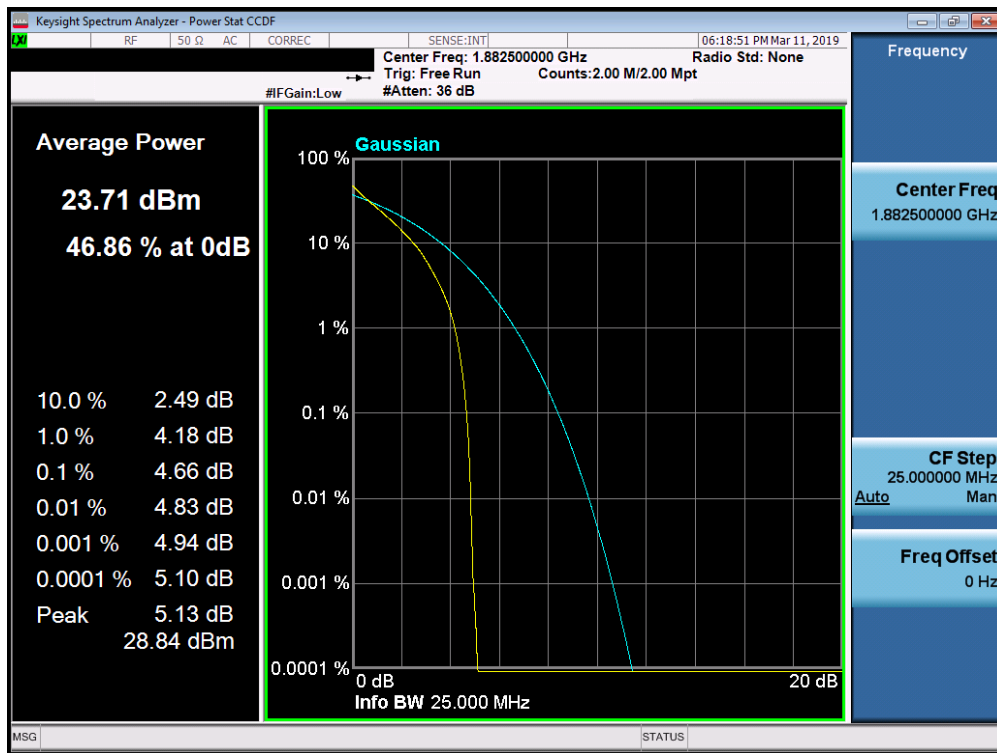


Plot 7-291. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)

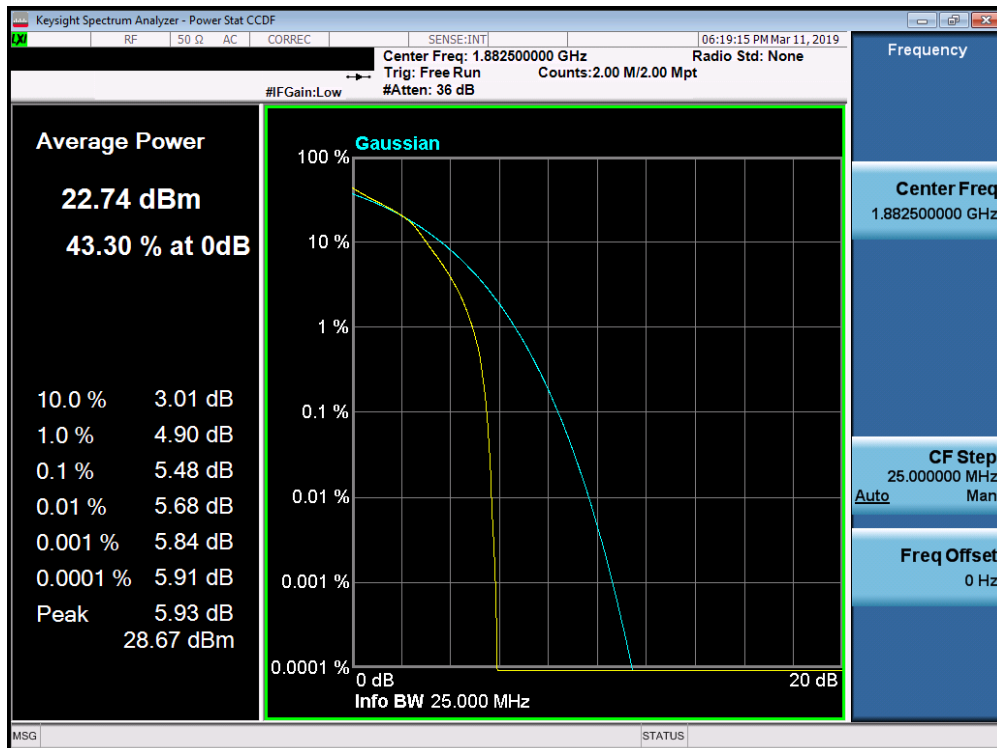


Plot 7-292. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 171 of 227

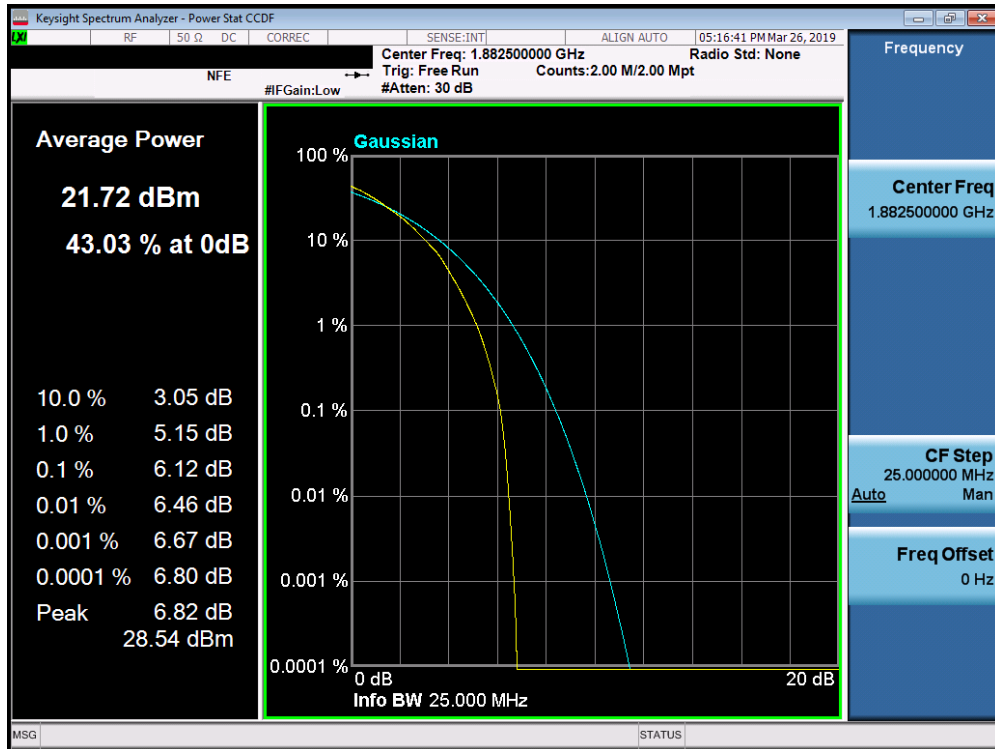


Plot 7-293. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

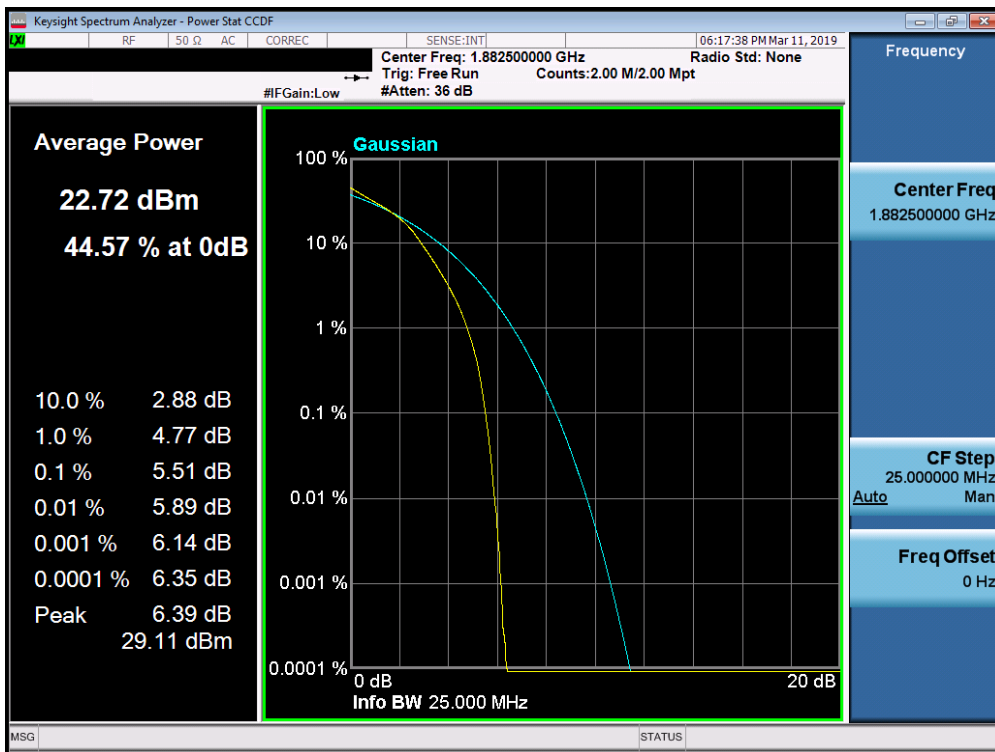


Plot 7-294. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 172 of 227

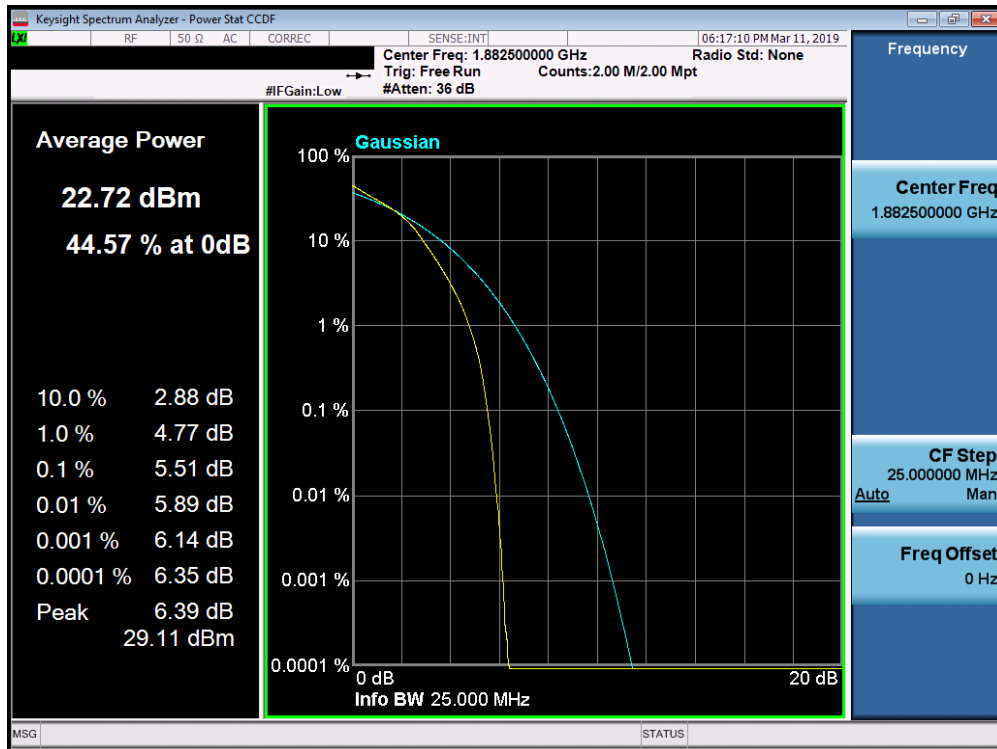


Plot 7-295. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)

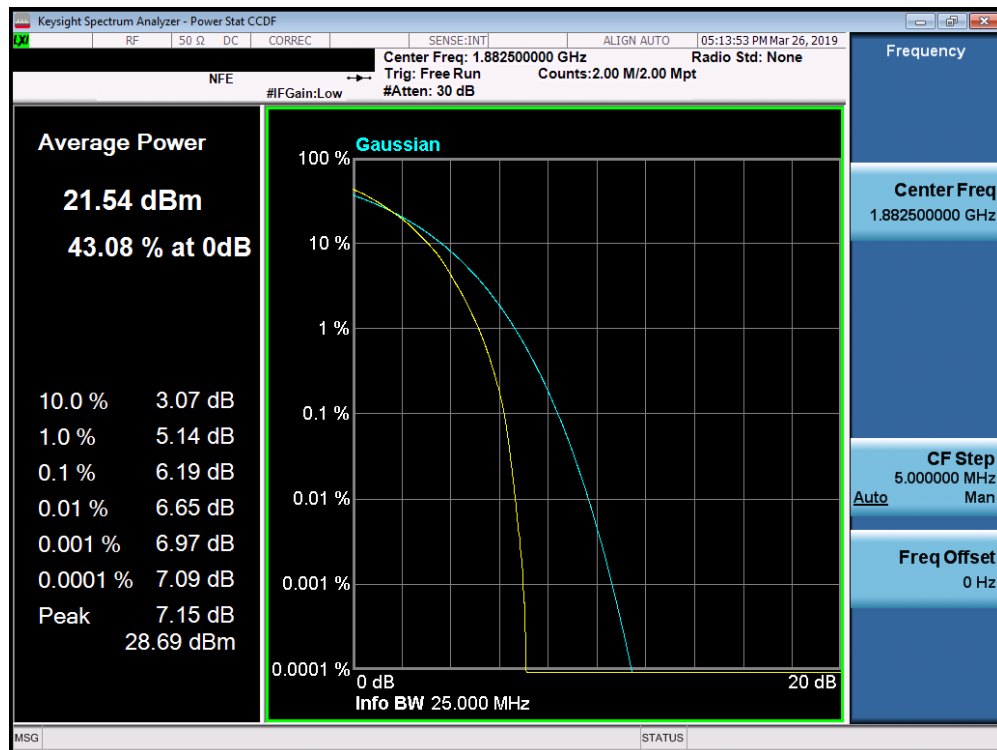


Plot 7-296. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 173 of 227



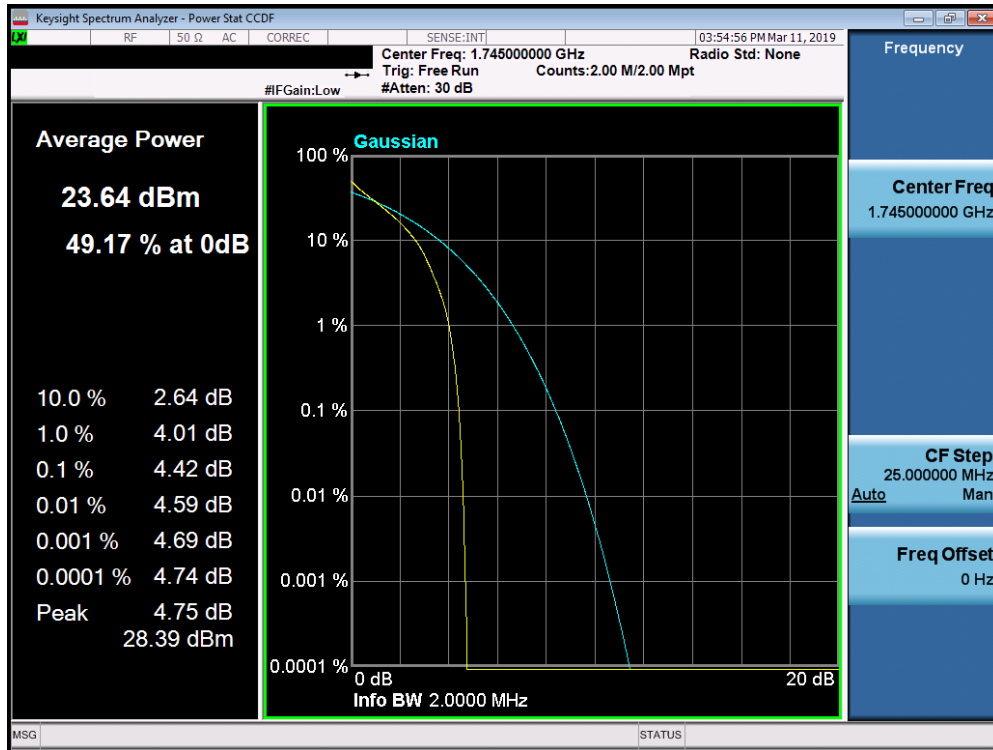
Plot 7-297. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



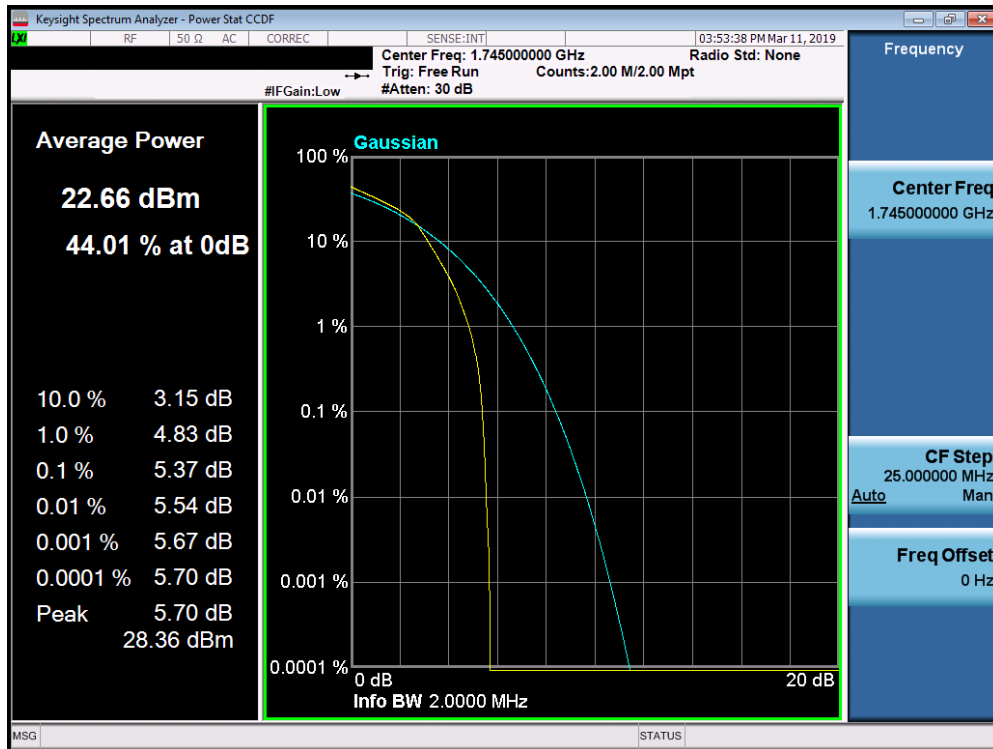
Plot 7-298. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 174 of 227

Band 66/4

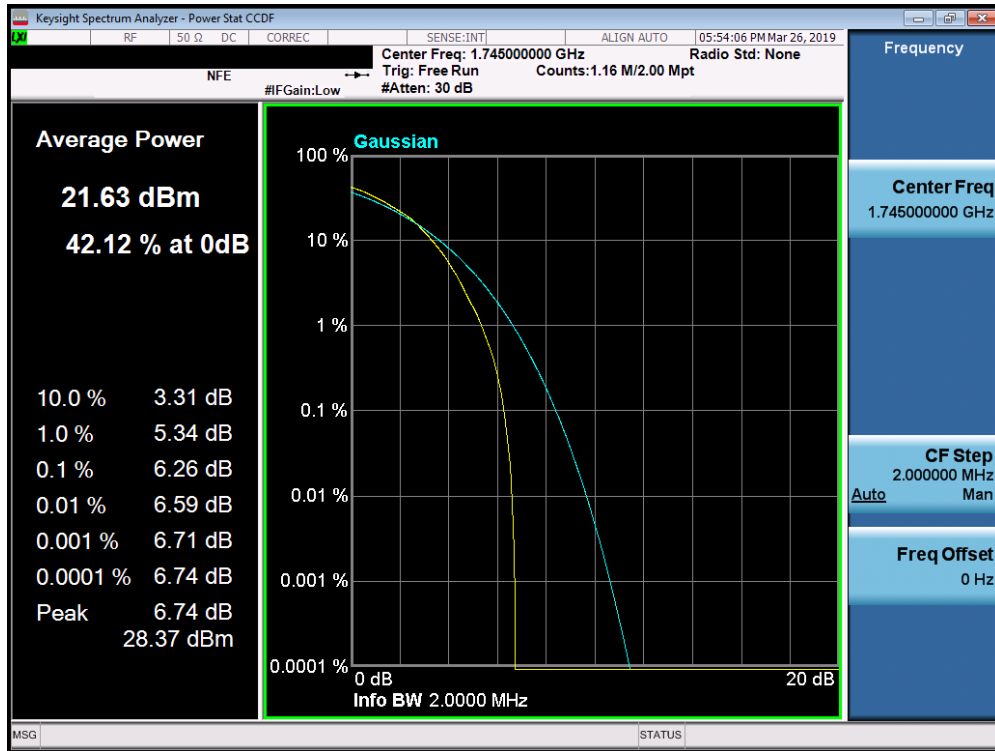


Plot 7-299. PAR Plot (Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

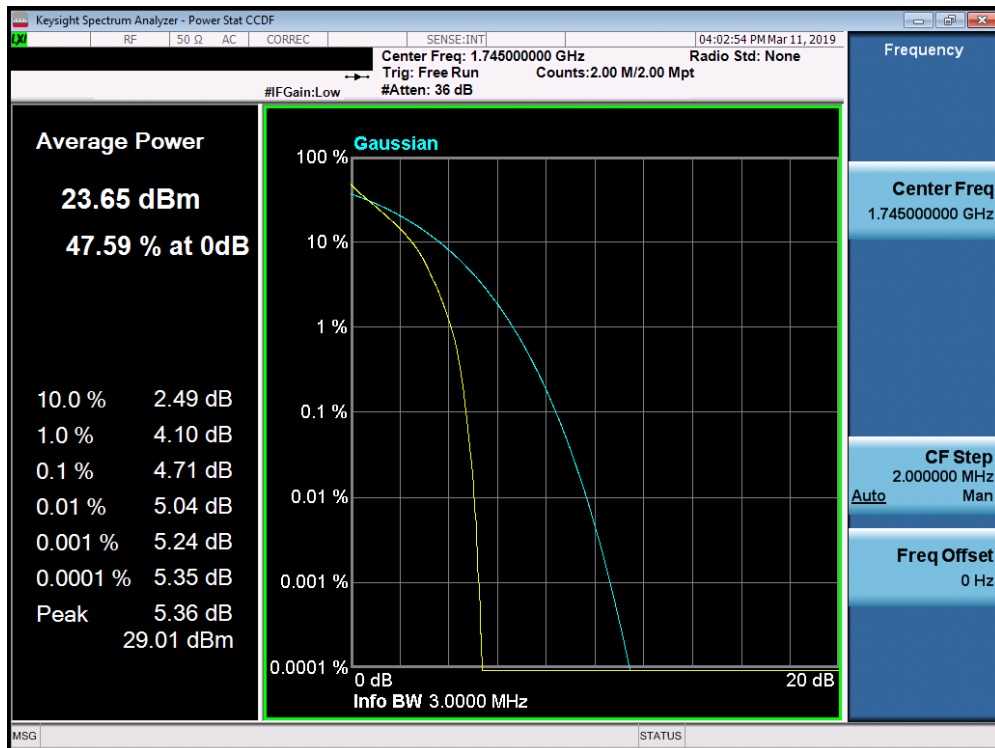


Plot 7-300. PAR Plot (Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 175 of 227

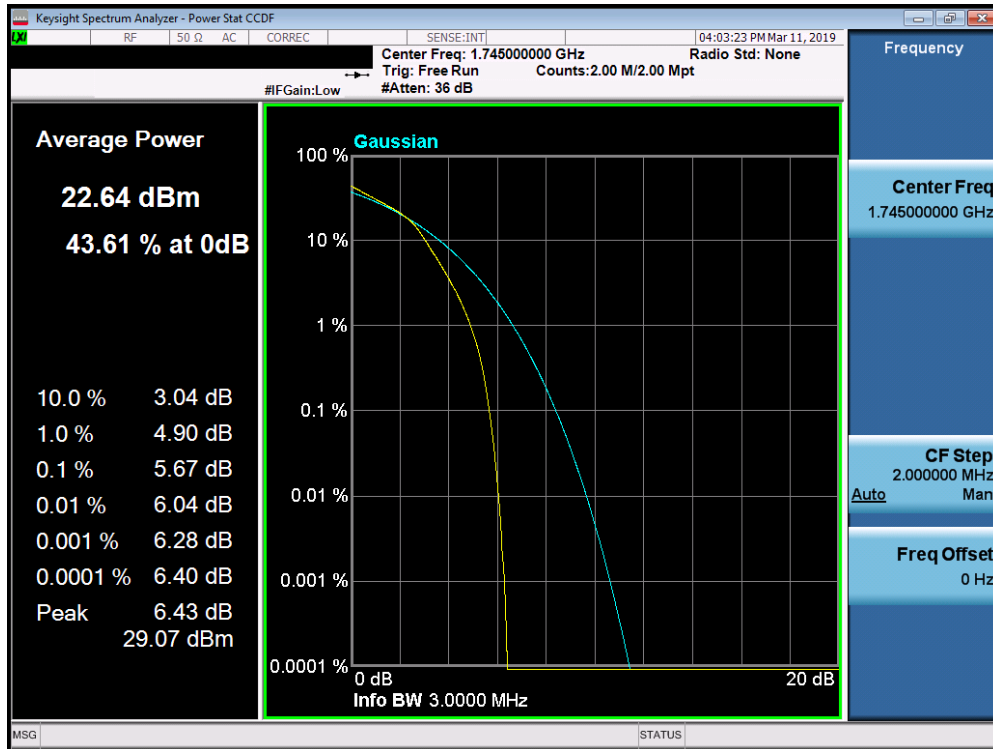


Plot 7-301. PAR Plot (Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

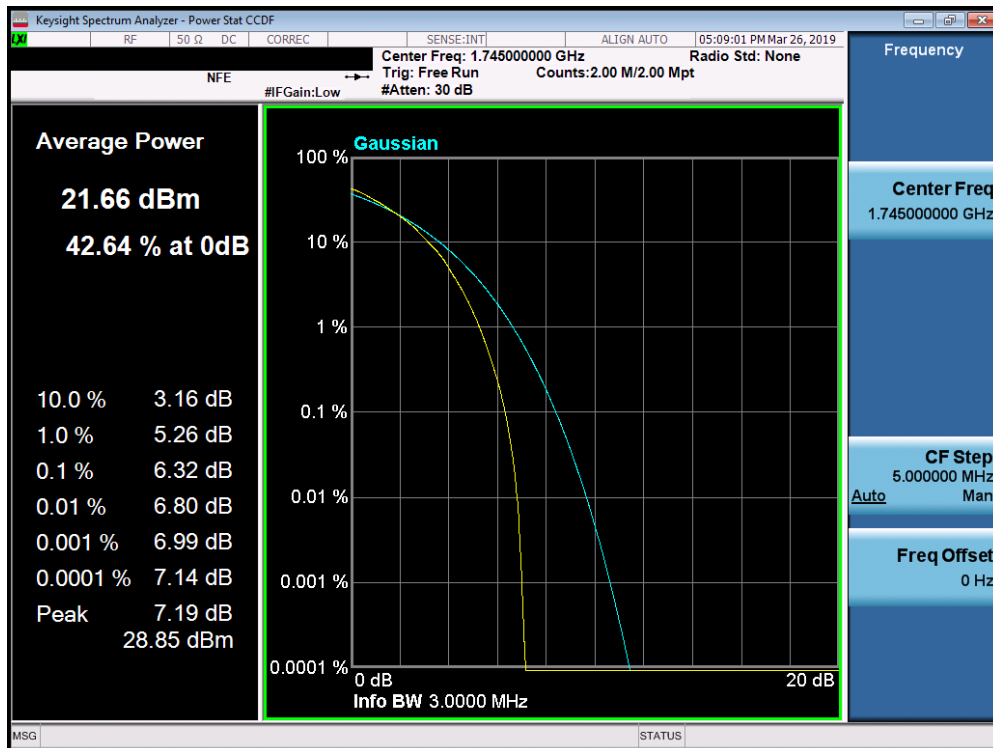


Plot 7-302. PAR Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 176 of 227

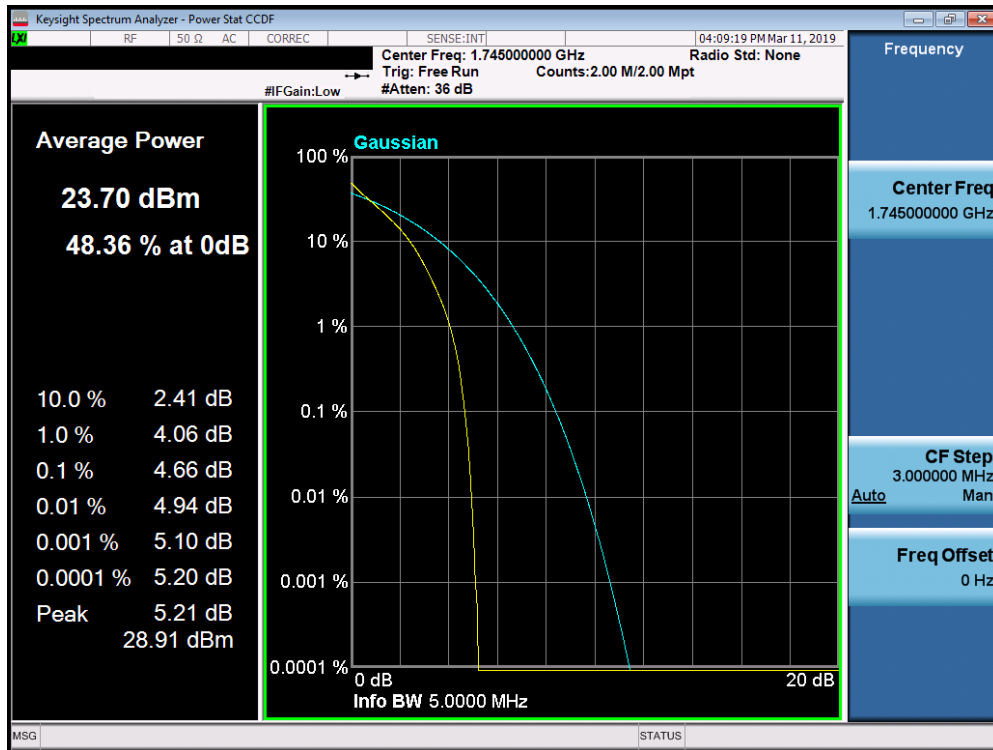


Plot 7-303. PAR Plot (Band 66/4 - 3.0MHz 16-QAM - Full RB Configuration)

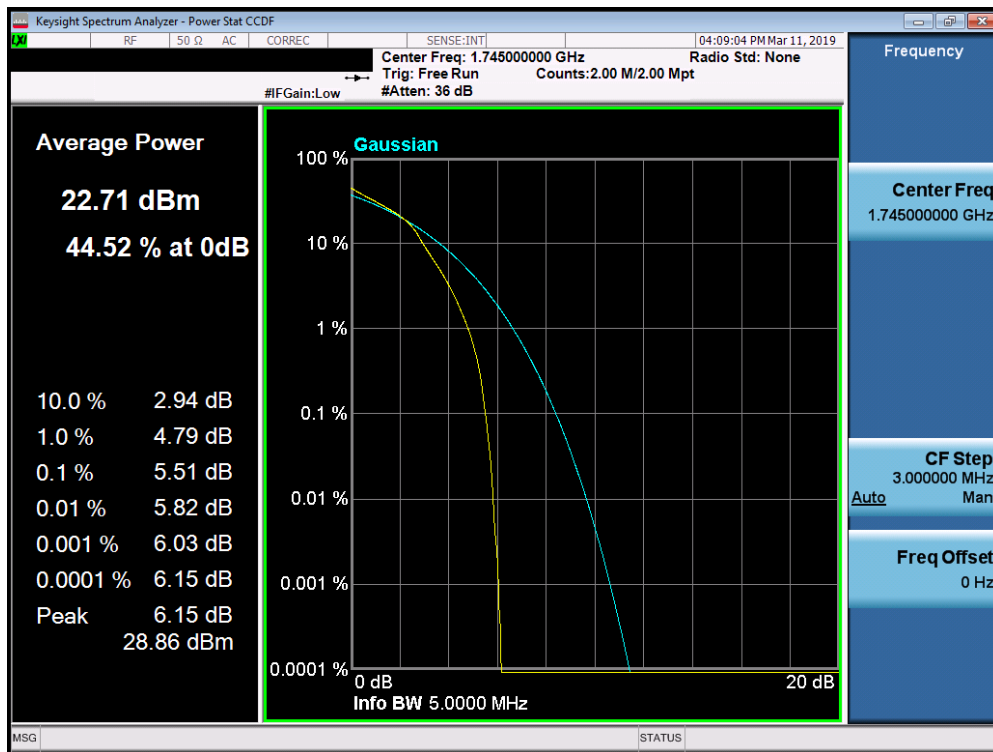


Plot 7-304. PAR Plot (Band 66/4 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 177 of 227

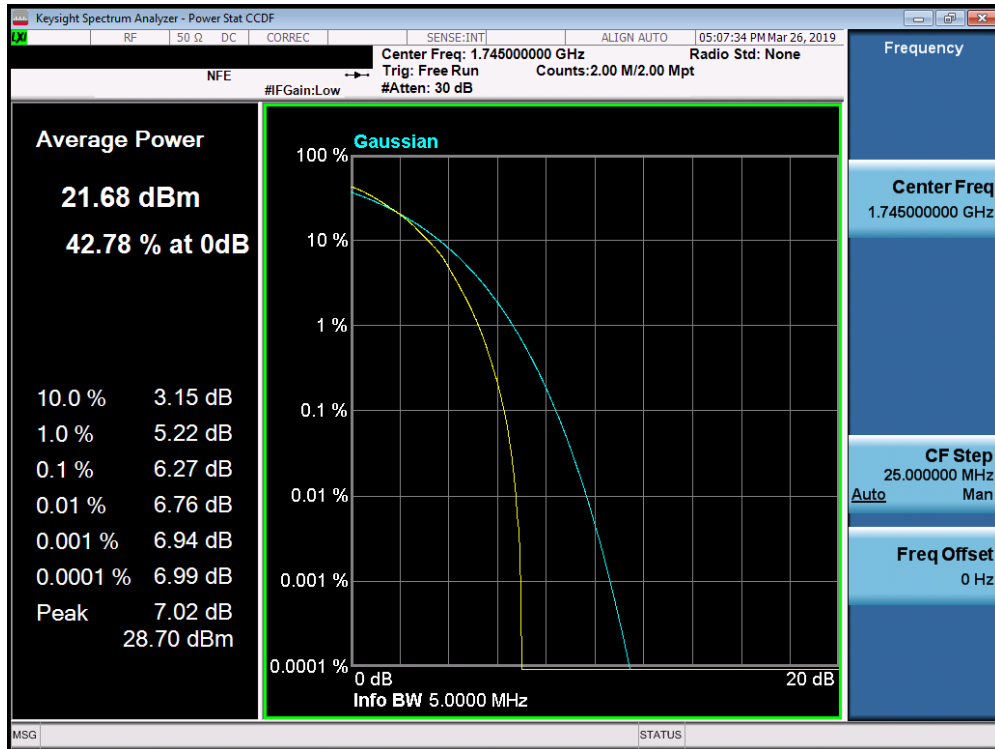


Plot 7-305. PAR Plot (Band 66/4 - 5.0MHz QPSK - Full RB Configuration)

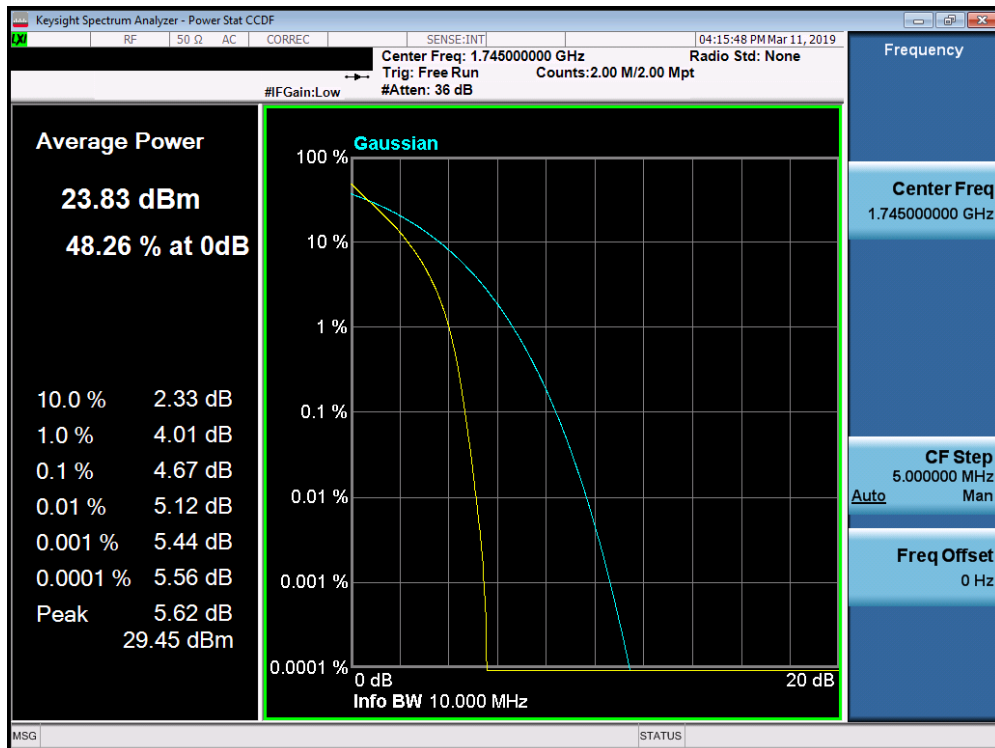


Plot 7-306. PAR Plot (Band 66/4 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	 MEASUREMENT REPORT (CERTIFICATION)		 Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset	Page 178 of 227

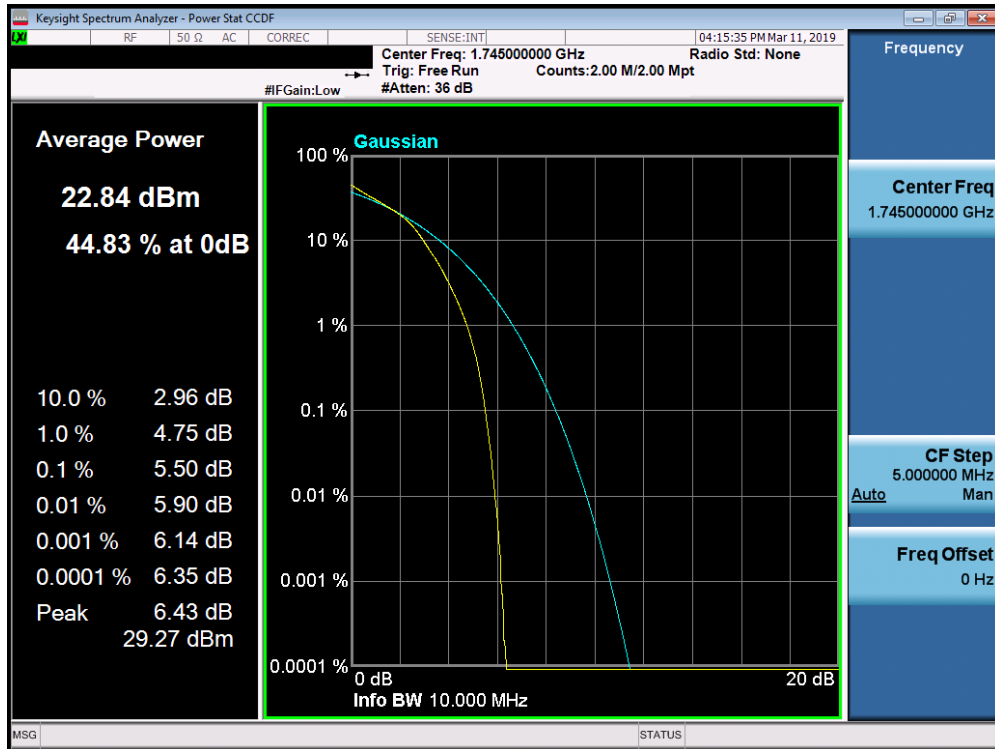


Plot 7-307. PAR Plot (Band 66/4 - 5.0MHz 64-QAM - Full RB Configuration)

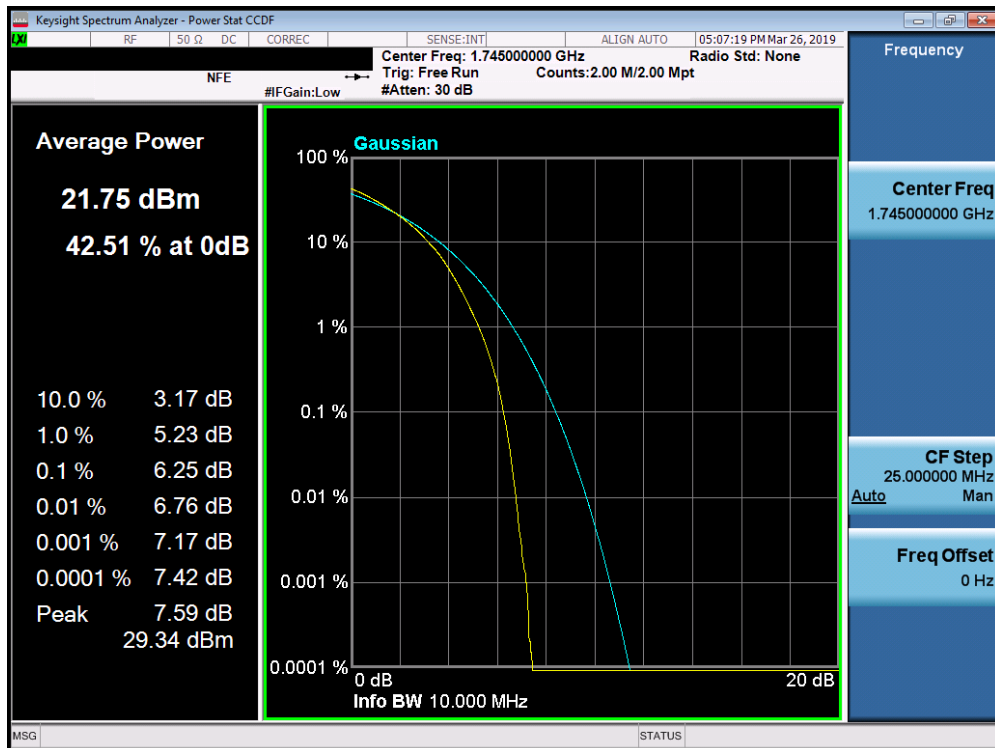


Plot 7-308. PAR Plot (Band 66/4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 179 of 227

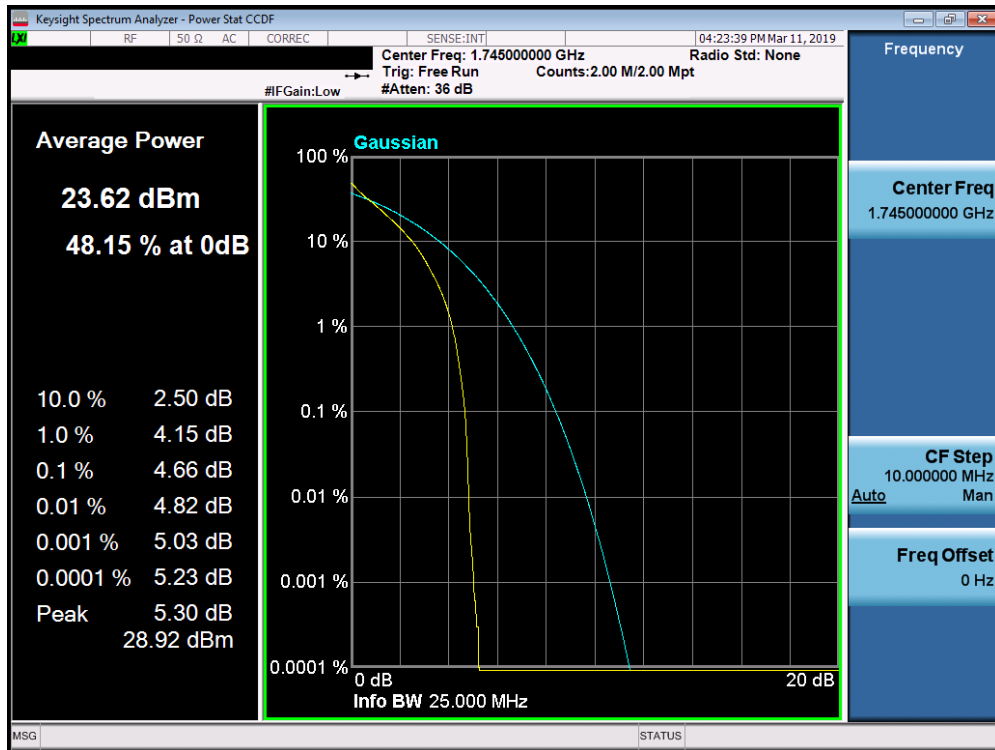


Plot 7-309. PAR Plot (Band 66/4 - 10.0MHz 16-QAM - Full RB Configuration)

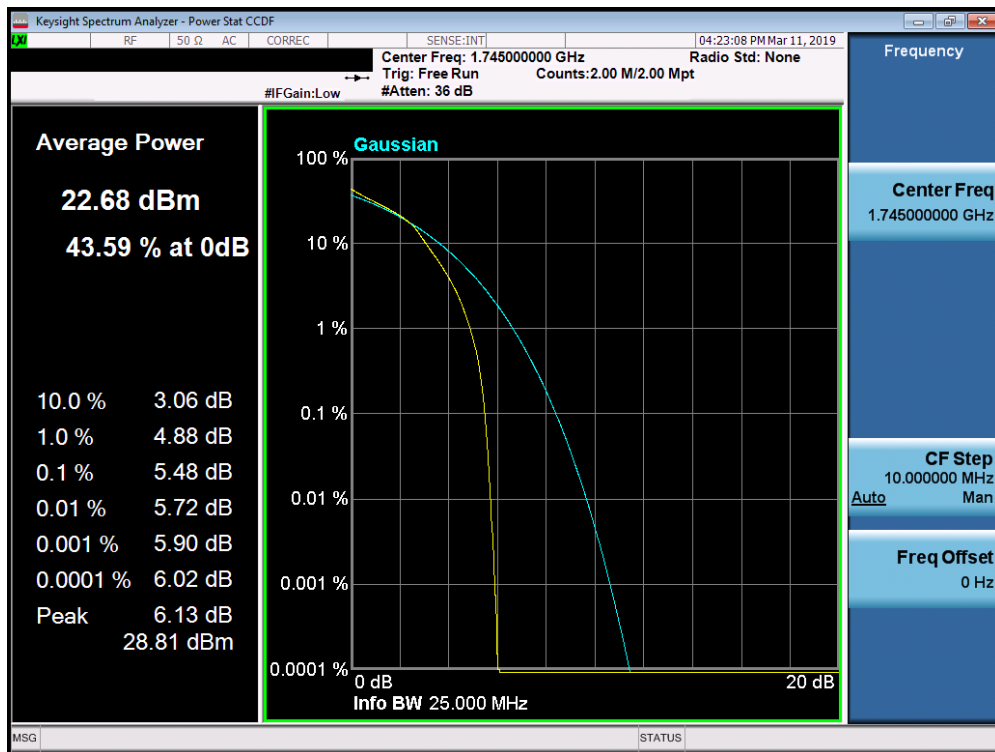


Plot 7-310. PAR Plot (Band 66/4 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 180 of 227

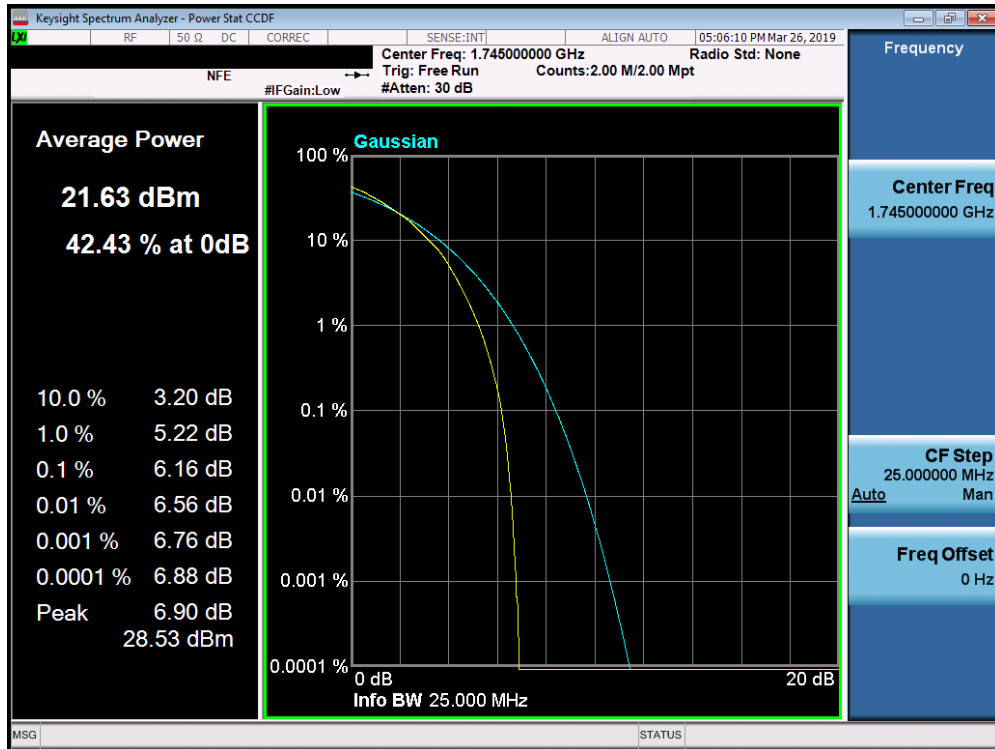


Plot 7-311. PAR Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

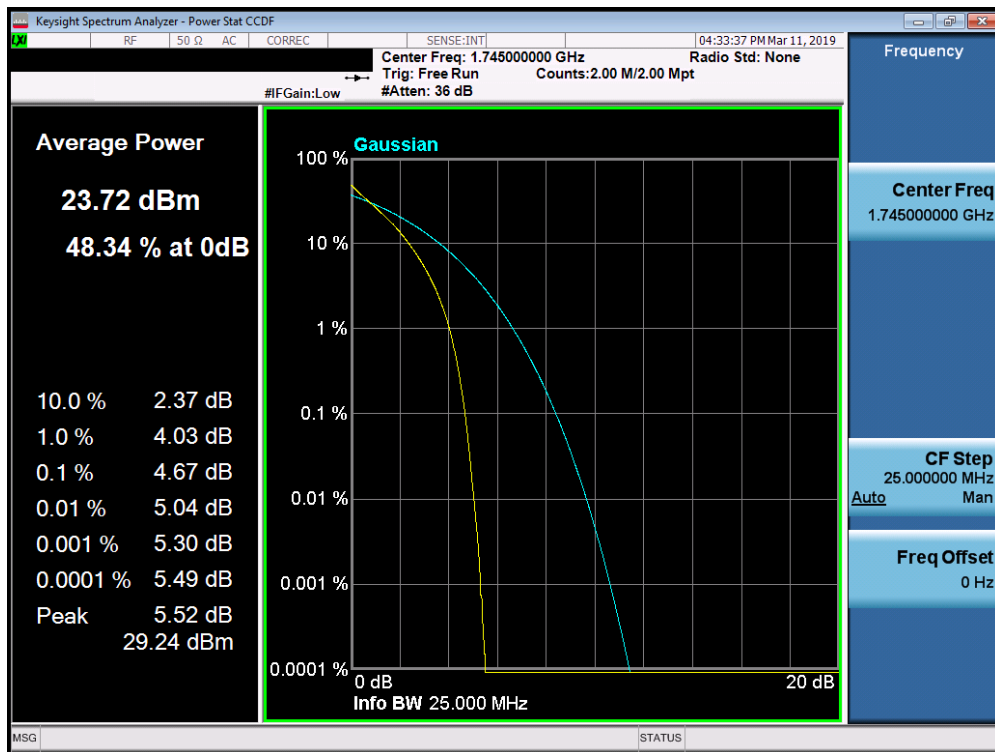


Plot 7-312. PAR Plot (Band 66/4 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	 MEASUREMENT REPORT (CERTIFICATION)		 Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset	Page 181 of 227

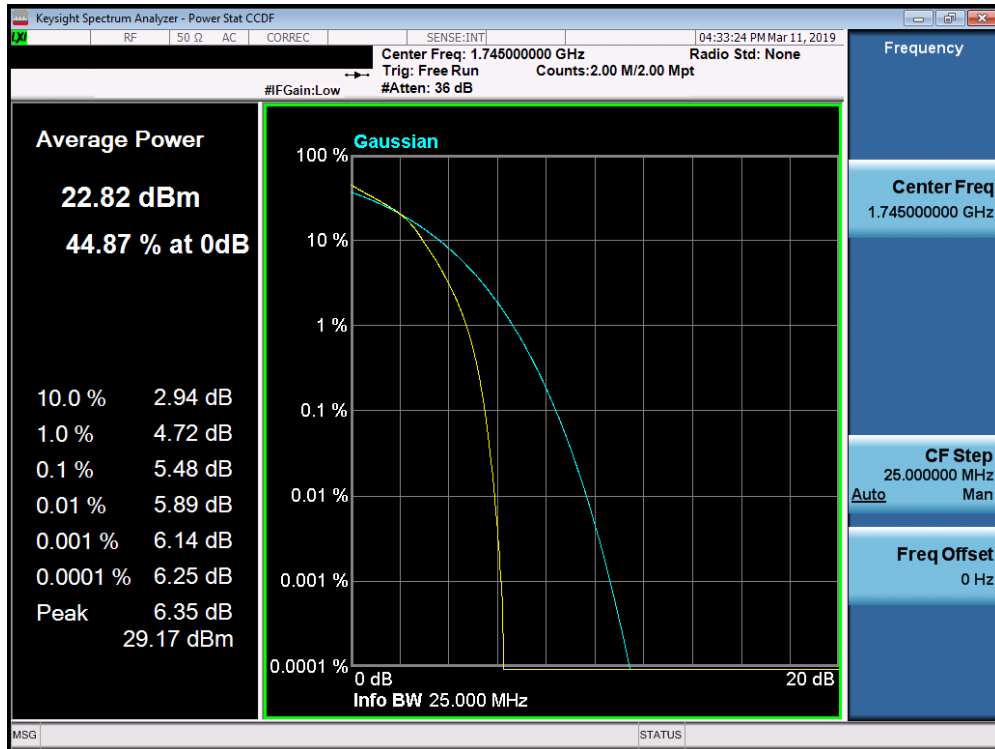


Plot 7-313. PAR Plot (Band 66/4 - 15.0MHz 64-QAM - Full RB Configuration)

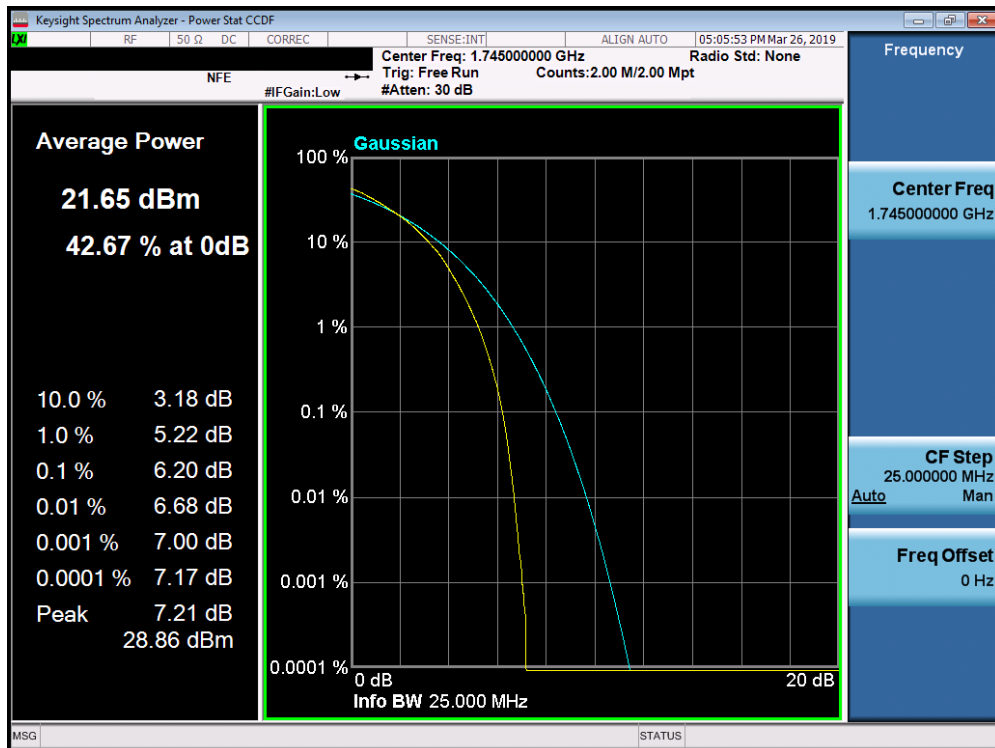


Plot 7-314. PAR Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 182 of 227



Plot 7-315. PAR Plot (Band 66/4 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-316. PAR Plot (Band 66/4 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1-ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 183 of 227

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.

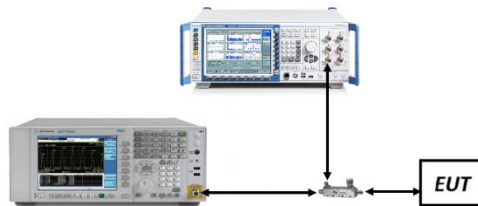


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: ZNFQ720TS	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 184 of 227

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	25.50	24.2	1.30
							16-QAM			≤ 1		24.90	23.2	1.70
							64-QAM			≤ 2		23.50	22.2	1.30
2				5	39675	2498.5	QPSK	1	9	0	0	27.30	27.2	0.10
							16-QAM			≤ 1		27.00	26.2	0.80
							64-QAM			≤ 2		25.30	25.2	0.10
3				10	39700	2501	QPSK	1	0	0	≤ 5	24.22	22.2	2.02
							16-QAM	1	0	≤ 1		23.43	21.2	2.23
							64-QAM	1	0	≤ 2		23.20	20.2	3.00
4				10	39700	2501	QPSK	20	0	0	≤ 2	25.22	24.2	1.02
							16-QAM	20	0	≤ 1		24.30	23.2	1.10
							64-QAM	20	0	≤ 2		23.51	22.2	1.31
5				10	39700	2501	QPSK	50	0	0	≤ 3	24.29	23.2	1.09
							16-QAM	50	0	≤ 1		23.30	22.2	1.10
							64-QAM	50	0	≤ 2		22.40	21.2	1.20
6				10	39700	2501	QPSK	25	20	0	≤ 1	25.20	25.2	0.00
							16-QAM	25	20	≤ 1		24.29	24.2	0.09
							64-QAM	25	20	≤ 2		23.50	23.2	0.30
7				10	39700	2501	QPSK	1	36	0	0	27.22	27.2	0.02
							16-QAM	1	36	≤ 1		26.37	26.2	0.17
							64-QAM	1	36	≤ 2		25.50	25.2	0.30
8				15	39725	2503.5	QPSK	1	0	0	≤ 5	26.10	22.2	3.90
							16-QAM	1	0	≤ 1		25.92	21.2	4.72
							64-QAM	1	0	≤ 2		24.65	20.2	4.45
9				15	39725	2503.5	QPSK	20	0	0	≤ 2	25.77	24.2	1.57
							16-QAM	20	0	≤ 1		24.82	23.2	1.62
							64-QAM	20	0	≤ 2		23.87	22.2	1.67
10				15	39725	2503.5	QPSK	75	0	0	≤ 4	22.70	22.2	0.50
							16-QAM	75	0	≤ 1		21.70	21.2	0.50
							64-QAM	75	0	≤ 2		20.70	20.2	0.50
11				15	39725	2503.5	QPSK	50	15	0	≤ 3	23.50	23.2	0.30
							16-QAM	50	15	≤ 1		22.50	22.2	0.30
							64-QAM	50	15	≤ 2		21.75	21.2	0.55
12				15	39725	2503.5	QPSK	1	60	0	0	27.53	27.2	0.33
							16-QAM	1	60	≤ 1		26.60	26.2	0.40
							64-QAM	1	60	≤ 2		25.65	25.2	0.45
13				20	39750	2506	QPSK	1	0	0	≤ 5	22.55	22.2	0.35
							16-QAM	1	0	≤ 1		21.70	21.2	0.50
							64-QAM	1	0	≤ 2		20.72	20.2	0.52
14				20	39750	2506	QPSK	20	0	0	≤ 2	24.50	24.2	0.30
							16-QAM	20	0	≤ 1		23.50	23.2	0.30
							64-QAM	20	0	≤ 2		22.65	22.2	0.45
15				20	39750	2506	QPSK	100	0	0	≤ 4	22.45	22.2	0.25
							16-QAM	100	0	≤ 1		21.50	21.2	0.30
							64-QAM	100	0	≤ 2		20.65	20.2	0.45
16				20	39750	2506	QPSK	75	24	0	≤ 3	23.35	23.2	0.15
							16-QAM	75	24	≤ 1		22.52	22.2	0.32
							64-QAM	75	24	≤ 2		21.57	21.2	0.37
17				20	39750	2506	QPSK	1	77	0	0	27.30	27.2	0.10
							16-QAM	1	77	≤ 1		26.6	26.2	0.40
							64-QAM	1	77	≤ 2		25.85	25.2	0.65

Table 7-3. A-MPR Conducted Power Measurements

FCC ID: ZNFQ720TS		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 185 of 227

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 $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ 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

FCC ID: ZNFQ720TS		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 186 of 227

Test Setup

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

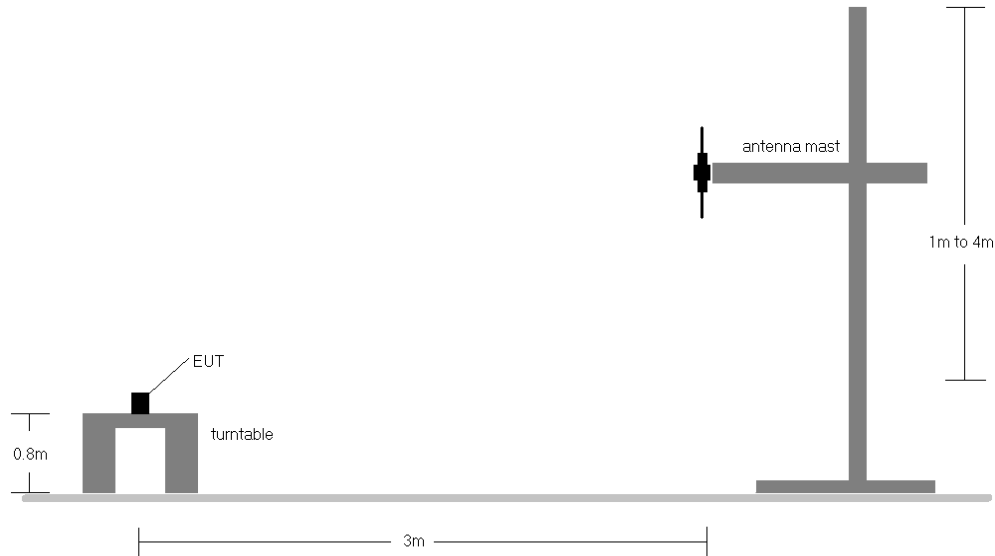


Figure 7-6. Radiated Test Setup <1GHz

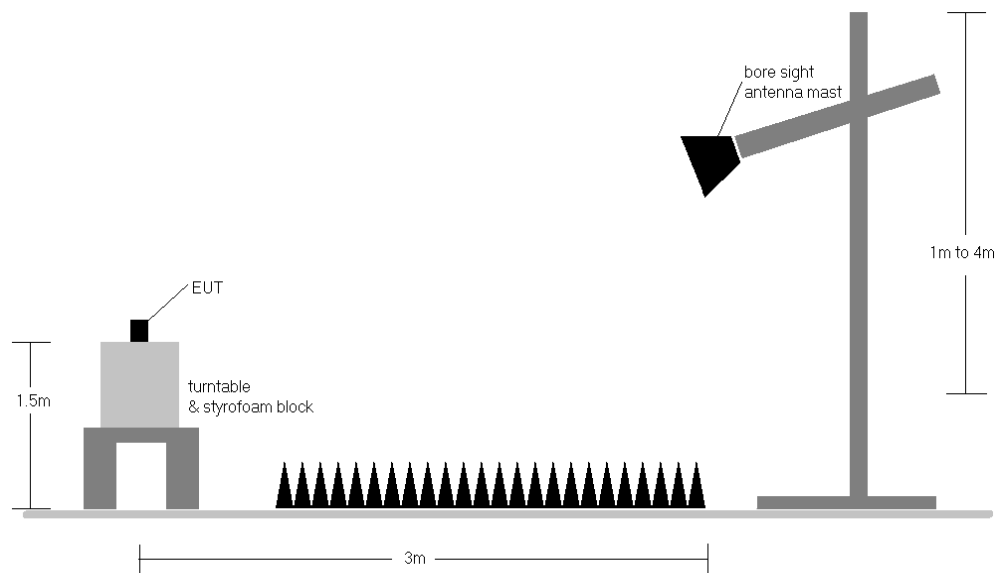


Figure 7-7. Radiated Test Setup >1GHz

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.

FCC ID: ZNFQ720TS		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 187 of 227

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	264	325	1 / 0	14.83	5.19	17.87	0.061	34.77	-16.90
680.50	5	QPSK	H	273	327	1 / 0	16.01	5.19	19.05	0.080	34.77	-15.72
695.50	5	QPSK	H	266	310	1 / 0	14.76	5.19	17.80	0.060	34.77	-16.97
680.50	5	16-QAM	H	273	327	1 / 0	15.19	5.19	18.23	0.067	34.77	-16.54
680.50	5	64-QAM	H	273	327	1 / 0	14.81	5.19	17.85	0.061	34.77	-16.92
668.00	10	QPSK	H	264	325	1 / 0	14.72	5.19	17.76	0.060	34.77	-17.01
680.50	10	QPSK	H	273	327	1 / 0	15.86	5.19	18.90	0.078	34.77	-15.87
693.00	10	QPSK	H	266	310	1 / 0	14.70	5.19	17.74	0.059	34.77	-17.03
680.50	10	16-QAM	H	273	327	1 / 0	15.49	5.19	18.53	0.071	34.77	-16.24
680.50	10	64-QAM	H	273	327	1 / 0	15.26	5.19	18.30	0.068	34.77	-16.47
670.50	15	QPSK	H	264	325	1 / 0	14.84	5.19	17.88	0.061	34.77	-16.89
680.50	15	QPSK	H	273	327	1 / 0	15.96	5.19	19.00	0.079	34.77	-15.77
690.50	15	QPSK	H	266	310	1 / 0	14.81	5.19	17.85	0.061	34.77	-16.92
680.50	15	16-QAM	H	273	327	1 / 0	15.59	5.19	18.63	0.073	34.77	-16.14
680.50	15	64-QAM	H	273	327	1 / 0	15.31	5.19	18.35	0.068	34.77	-16.42
673.00	20	QPSK	H	264	325	1 / 0	14.94	5.19	17.98	0.063	34.77	-16.79
680.50	20	QPSK	H	273	327	1 / 0	15.98	5.19	19.02	0.080	34.77	-15.75
688.00	20	QPSK	H	266	310	1 / 0	14.86	5.19	17.90	0.062	34.77	-16.87
680.50	20	16-QAM	H	273	327	1 / 0	15.83	5.19	18.87	0.077	34.77	-15.90
680.50	20	64-QAM	H	273	327	1 / 0	15.56	5.19	18.60	0.072	34.77	-16.17
680.50	20	QPSK	V	122	83	1 / 0	11.23	5.19	14.27	0.027	34.77	-20.50

Table 7-4. ERP Data (Band 71)

FCC ID: ZNFQ720TS	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset	Page 188 of 227

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	143	268	1 / 5	15.56	5.19	18.60	0.073	34.77	-16.17	20.75	0.119	36.99	-16.24
707.50	1.4	QPSK	H	144	263	1 / 5	14.81	5.19	17.85	0.061	34.77	-16.92	20.00	0.100	36.99	-16.99
715.30	1.4	QPSK	H	120	87	1 / 5	14.41	5.26	17.52	0.056	34.77	-17.26	19.67	0.093	36.99	-17.32
699.70	1.4	16-QAM	H	143	268	1 / 5	15.26	5.19	18.30	0.068	34.77	-16.47	20.45	0.111	36.99	-16.54
699.70	1.4	64-QAM	H	143	268	1 / 5	14.76	5.19	17.80	0.060	34.77	-16.97	19.95	0.099	36.99	-17.04
700.50	3	QPSK	H	143	273	1 / 14	15.71	5.14	18.70	0.074	34.77	-16.07	20.85	0.122	36.99	-16.14
707.50	3	QPSK	H	144	276	1 / 14	14.96	5.19	18.00	0.063	34.77	-16.77	20.15	0.104	36.99	-16.84
714.50	3	QPSK	H	122	89	1 / 14	14.56	5.25	17.66	0.058	34.77	-17.11	19.81	0.096	36.99	-17.18
700.50	3	16-QAM	H	143	273	1 / 14	15.31	5.14	18.30	0.068	34.77	-16.47	20.45	0.111	36.99	-16.54
700.50	3	64-QAM	H	143	273	1 / 14	14.81	5.14	17.80	0.060	34.77	-16.97	19.95	0.099	36.99	-17.04

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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
701.50	5	QPSK	H	145	272	1 / 24	15.80	5.15	18.80	0.076	34.77	-15.97	20.95	0.124	36.99	-16.04
707.50	5	QPSK	H	142	268	1 / 24	15.10	5.19	18.14	0.065	34.77	-16.63	20.29	0.107	36.99	-16.70
713.50	5	QPSK	H	124	188	1 / 24	14.69	5.24	17.78	0.060	34.77	-16.99	19.93	0.098	36.99	-17.06
701.50	5	16-QAM	H	145	272	1 / 24	15.46	5.15	18.46	0.070	34.77	-16.31	20.61	0.115	36.99	-16.38
701.50	5	64-QAM	H	145	272	1 / 24	15.06	5.15	18.06	0.064	34.77	-16.71	20.21	0.105	36.99	-16.78
704.00	10	QPSK	H	284	268	1 / 49	15.50	5.17	18.52	0.071	34.77	-16.25	20.67	0.117	36.99	-16.32
707.50	10	QPSK	H	286	269	1 / 49	15.36	5.19	18.40	0.069	34.77	-16.37	20.55	0.114	36.99	-16.44
711.00	10	QPSK	H	285	269	1 / 49	14.99	5.22	18.06	0.064	34.77	-16.71	20.21	0.105	36.99	-16.78
704.00	10	16-QAM	H	284	268	1 / 49	15.09	5.17	18.11	0.065	34.77	-16.66	20.26	0.106	36.99	-16.73
704.00	10	64-QAM	H	284	268	1 / 49	13.89	5.17	16.91	0.049	34.77	-17.86	19.06	0.080	36.99	-17.93
704.00	10	QPSK	V	171	221	1 / 49	14.03	5.22	17.10	0.051	34.77	-17.67	19.25	0.084	36.99	-17.74

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

FCC ID: ZNFQ720TS		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset		Page 189 of 227

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	235	290	1 / 0	14.85	6.09	18.79	0.076	34.77	-15.98	20.94	0.124	36.99	-16.05
782.00	5	QPSK	H	245	292	1 / 0	15.05	6.13	19.03	0.080	34.77	-15.74	21.18	0.131	36.99	-15.80
784.50	5	QPSK	H	255	300	1 / 0	14.95	6.18	18.98	0.079	34.77	-15.79	21.13	0.130	36.99	-15.86
782.00	5	16-QAM	H	245	292	1 / 0	14.70	6.13	18.68	0.074	34.77	-16.09	20.83	0.121	36.99	-16.15
782.00	5	64-QAM	H	245	292	1 / 0	13.20	6.13	17.18	0.052	34.77	-17.59	19.33	0.086	36.99	-17.65
782.00	10	QPSK	H	229	282	1 / 0	15.20	6.13	19.18	0.083	34.77	-15.59	21.33	0.136	36.99	-15.65
782.00	10	16-QAM	H	229	282	1 / 0	14.87	6.13	18.85	0.077	34.77	-15.92	21.00	0.126	36.99	-15.98
782.00	10	64-QAM	H	229	282	1 / 0	13.45	6.13	17.43	0.055	34.77	-17.34	19.58	0.091	36.99	-17.40
782.00	10	QPSK	V	160	328	1 / 0	12.25	6.13	16.23	0.042	34.77	-18.54	18.38	0.069	36.99	-18.60

Table 7-7. ERP Data (Band 13)

FCC ID: ZNFQ720TS	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset	Page 190 of 227

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	105	274	1 / 0	11.72	6.89	16.46	0.044	38.45	-21.99	18.61	0.073	40.61	-22.00
836.50	1.4	QPSK	H	102	273	1 / 0	11.77	7.08	16.70	0.047	38.45	-21.75	18.85	0.077	40.61	-21.75
848.30	1.4	QPSK	H	102	265	1 / 0	11.12	7.28	16.25	0.042	38.45	-22.20	18.40	0.069	40.61	-22.21
836.50	1.4	16-QAM	H	102	273	1 / 0	11.32	7.08	16.25	0.042	38.45	-22.20	18.40	0.069	40.61	-22.20
836.50	1.4	64-QAM	H	102	273	1 / 0	9.57	7.08	14.50	0.028	38.45	-23.95	16.65	0.046	40.61	-23.95
825.50	3	QPSK	H	105	274	1 / 0	11.92	6.90	16.67	0.046	38.45	-21.78	18.82	0.076	40.61	-21.79
836.50	3	QPSK	H	102	273	1 / 0	11.82	7.08	16.75	0.047	38.45	-21.70	18.90	0.078	40.61	-21.70
847.50	3	QPSK	H	102	265	1 / 0	11.27	7.26	16.38	0.043	38.45	-22.07	18.53	0.071	40.61	-22.07
836.50	3	16-QAM	H	102	273	1 / 0	11.42	7.08	16.35	0.043	38.45	-22.10	18.50	0.071	40.61	-22.10
836.50	3	64-QAM	H	102	273	1 / 0	9.52	7.08	14.45	0.028	38.45	-24.00	16.60	0.046	40.61	-24.00
826.50	5	QPSK	H	105	274	1 / 0	11.87	6.92	16.64	0.046	38.45	-21.81	18.79	0.076	40.61	-21.82
836.50	5	QPSK	H	102	273	1 / 0	11.72	7.08	16.65	0.046	38.45	-21.80	18.80	0.076	40.61	-21.80
846.50	5	QPSK	H	102	265	1 / 0	11.37	7.25	16.47	0.044	38.45	-21.98	18.62	0.073	40.61	-21.99
836.50	5	16-QAM	H	102	273	1 / 0	11.57	7.08	16.50	0.045	38.45	-21.95	18.65	0.073	40.61	-21.95
836.50	5	64-QAM	H	102	273	1 / 0	10.05	7.08	14.98	0.032	38.45	-23.47	17.13	0.052	40.61	-23.47
829.00	10	QPSK	H	105	274	1 / 0	12.02	6.96	16.83	0.048	38.45	-21.62	18.98	0.079	40.61	-21.63
836.50	10	QPSK	H	102	273	1 / 0	12.01	7.08	16.94	0.049	38.45	-21.51	19.09	0.081	40.61	-21.51
844.00	10	QPSK	H	102	265	1 / 0	11.52	7.21	16.58	0.045	38.45	-21.87	18.73	0.075	40.61	-21.88
836.50	10	16-QAM	H	102	273	1 / 0	11.48	7.08	16.41	0.044	38.45	-22.04	18.56	0.072	40.61	-22.04
829.00	10	64-QAM	H	105	274	1 / 0	10.12	6.96	14.93	0.031	38.45	-23.52	17.08	0.051	40.61	-23.53

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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
831.50	15	QPSK	H	105	274	1 / 0	11.97	7.00	16.82	0.048	38.45	-21.63	18.97	0.079	40.61	-21.64
836.50	15	QPSK	H	102	273	1 / 0	11.91	7.08	16.84	0.048	38.45	-21.61	18.99	0.079	40.61	-21.61
841.50	15	QPSK	H	102	265	1 / 0	11.43	7.17	16.45	0.044	38.45	-22.01	18.60	0.072	40.61	-22.01
831.50	15	16-QAM	H	105	274	1 / 0	11.53	7.00	16.38	0.043	38.45	-22.07	18.53	0.071	40.61	-22.08
836.50	15	16-QAM	H	102	273	1 / 0	11.52	7.08	16.45	0.044	38.45	-22.00	18.60	0.073	40.61	-22.00
841.50	15	16-QAM	H	102	265	1 / 0	10.94	7.17	15.96	0.039	38.45	-22.50	18.11	0.065	40.61	-22.50
831.50	15	64-QAM	H	105	274	1 / 0	10.60	7.00	15.45	0.035	38.45	-23.00	17.60	0.058	40.61	-23.01
836.50	15	64-QAM	H	102	273	1 / 0	10.52	7.08	15.45	0.035	38.45	-23.00	17.60	0.058	40.61	-23.00
841.50	15	64-QAM	H	102	265	1 / 0	10.32	7.17	15.34	0.034	38.45	-23.12	17.49	0.056	40.61	-23.12
836.50	15	QPSK	V	140	265	1 / 0	13.41	7.08	18.34	0.068	38.45	-20.11	20.49	0.112	40.61	-20.12

Table 7-9. ERP Data (Band 26)

FCC ID: ZNFQ720TS	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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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	110	359	1 / 0	10.84	9.44	20.28	0.107	30.00	-9.72
1745.00	1.4	QPSK	H	100	4	1 / 0	11.70	9.23	20.93	0.124	30.00	-9.07
1779.30	1.4	QPSK	H	280	2	1 / 0	10.10	9.26	19.36	0.086	30.00	-10.64
1745.00	1.4	16-QAM	H	100	4	1 / 0	11.10	9.23	20.33	0.108	30.00	-9.67
1745.00	1.4	64-QAM	H	100	4	1 / 0	10.40	9.23	19.63	0.092	30.00	-10.37
1711.50	3	QPSK	H	110	359	1 / 0	10.90	9.44	20.34	0.108	30.00	-9.66
1745.00	3	QPSK	H	100	4	1 / 0	11.78	9.23	21.01	0.126	30.00	-8.99
1778.50	3	QPSK	H	280	2	1 / 0	10.20	9.26	19.46	0.088	30.00	-10.54
1745.00	3	16-QAM	H	100	4	1 / 0	11.20	9.23	20.43	0.110	30.00	-9.57
1745.00	3	64-QAM	H	100	4	1 / 0	10.45	9.23	19.68	0.093	30.00	-10.32
1712.50	5	QPSK	H	110	359	1 / 0	10.95	9.43	20.38	0.109	30.00	-9.62
1745.00	5	QPSK	H	100	4	1 / 0	11.90	9.23	21.13	0.130	30.00	-8.87
1777.50	5	QPSK	H	280	2	1 / 0	10.25	9.26	19.51	0.089	30.00	-10.49
1745.00	5	16-QAM	H	100	4	1 / 0	11.40	9.23	20.63	0.116	30.00	-9.37
1745.00	5	64-QAM	H	100	4	1 / 0	10.10	9.23	19.33	0.086	30.00	-10.67
1715.00	10	QPSK	H	110	359	1 / 0	11.00	9.42	20.42	0.110	30.00	-9.58
1745.00	10	QPSK	H	100	4	1 / 0	11.95	9.23	21.18	0.131	30.00	-8.82
1775.00	10	QPSK	H	280	2	1 / 0	10.30	9.25	19.55	0.090	30.00	-10.45
1745.00	10	16-QAM	H	100	4	1 / 0	11.50	9.23	20.73	0.118	30.00	-9.27
1745.00	10	64-QAM	H	100	4	1 / 0	10.20	9.23	19.43	0.088	30.00	-10.57
1717.50	15	QPSK	H	110	359	1 / 0	10.84	9.40	20.24	0.106	30.00	-9.76
1745.00	15	QPSK	H	100	4	1 / 0	11.70	9.23	20.93	0.124	30.00	-9.07
1772.50	15	QPSK	H	280	2	1 / 0	10.40	9.25	19.65	0.092	30.00	-10.35
1745.00	15	16-QAM	H	100	4	1 / 0	11.20	9.23	20.43	0.110	30.00	-9.57
1745.00	15	64-QAM	H	100	4	1 / 0	10.00	9.23	19.23	0.084	30.00	-10.77
1720.00	20	QPSK	H	110	359	1 / 0	11.20	9.38	20.58	0.114	30.00	-9.42
1745.00	20	QPSK	H	100	4	1 / 0	12.20	9.23	21.43	0.139	30.00	-8.57
1770.00	20	QPSK	H	280	2	1 / 0	10.46	9.24	19.70	0.093	30.00	-10.30
1745.00	20	16-QAM	H	100	4	1 / 0	11.70	9.23	20.93	0.124	30.00	-9.07
1745.00	20	64-QAM	H	100	4	1 / 0	10.40	9.23	19.63	0.092	30.00	-10.37
1745.00	20	QPSK	V	133	90	1 / 0	9.93	9.23	19.16	0.082	30.00	-10.84

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

FCC ID: ZNFQ720TS	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
Test Report S/N: 1M1904010049-03-R1.ZNF	Test Dates: 2/28 - 5/2/2019	EUT Type: Portable Handset	Page 192 of 227

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	166	1	1 / 0	11.79	8.37	20.16	0.104	33.01	-12.85
1882.50	1.4	QPSK	H	163	3	1 / 0	13.20	8.42	21.62	0.145	33.01	-11.39
1914.30	1.4	QPSK	H	105	357	1 / 0	15.63	8.47	24.10	0.257	33.01	-8.91
1914.30	1.4	16-QAM	H	105	357	1 / 0	14.25	8.47	22.72	0.187	33.01	-10.29
1914.30	1.4	64-QAM	H	105	357	1 / 0	13.80	8.47	22.27	0.169	33.01	-10.74
1851.50	3	QPSK	H	166	1	1 / 0	11.85	8.37	20.22	0.105	33.01	-12.79
1882.50	3	QPSK	H	163	3	1 / 0	13.23	8.42	21.65	0.146	33.01	-11.36
1913.50	3	QPSK	H	105	357	1 / 0	15.70	8.47	24.17	0.261	33.01	-8.84
1913.50	3	16-QAM	H	105	357	1 / 0	14.45	8.47	22.92	0.196	33.01	-10.09
1913.50	3	64-QAM	H	105	357	1 / 0	13.90	8.47	22.37	0.172	33.01	-10.64
1852.50	5	QPSK	H	166	1	1 / 0	11.95	8.37	20.32	0.108	33.01	-12.69
1882.50	5	QPSK	H	163	3	1 / 0	13.33	8.42	21.75	0.150	33.01	-11.26
1912.50	5	QPSK	H	105	357	1 / 0	15.65	8.47	24.12	0.258	33.01	-8.89
1912.50	5	16-QAM	H	105	357	1 / 0	14.55	8.47	23.02	0.200	33.01	-9.99
1912.50	5	64-QAM	H	105	357	1 / 0	14.00	8.47	22.47	0.176	33.01	-10.54
1855.00	10	QPSK	H	166	1	1 / 0	12.05	8.37	20.42	0.110	33.01	-12.59
1882.50	10	QPSK	H	163	3	1 / 0	13.45	8.42	21.87	0.154	33.01	-11.14
1910.00	10	QPSK	H	105	357	1 / 0	15.71	8.46	24.17	0.261	33.01	-8.84
1910.00	10	16-QAM	H	105	357	1 / 0	14.59	8.46	23.05	0.202	33.01	-9.96
1910.00	10	64-QAM	H	105	357	1 / 0	13.95	8.46	22.41	0.174	33.01	-10.60
1857.50	15	QPSK	H	166	1	1 / 0	11.90	8.38	20.28	0.107	33.01	-12.73
1882.50	15	QPSK	H	163	3	1 / 0	12.95	8.42	21.37	0.137	33.01	-11.64
1907.50	15	QPSK	H	105	357	1 / 0	15.30	8.46	23.76	0.238	33.01	-9.25
1907.50	15	16-QAM	H	105	357	1 / 0	14.65	8.46	23.11	0.205	33.01	-9.90
1907.50	15	64-QAM	H	105	357	1 / 0	13.95	8.46	22.41	0.174	33.01	-10.60
1860.00	20	QPSK	H	166	1	1 / 0	11.95	8.38	20.33	0.108	33.01	-12.68
1882.50	20	QPSK	H	163	3	1 / 0	13.45	8.42	21.87	0.154	33.01	-11.14
1905.00	20	QPSK	H	105	357	1 / 0	14.80	8.45	23.25	0.212	33.01	-9.76
1905.00	20	16-QAM	H	105	357	1 / 0	13.95	8.45	22.40	0.174	33.01	-10.61
1905.00	20	64-QAM	H	105	357	1 / 0	13.20	8.45	21.65	0.146	33.01	-11.36
1905.00	20	QPSK	V	100	24	1 / 0	13.02	7.37	20.39	0.109	33.01	-12.62

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

FCC ID: ZNFQ720TS	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Quality Manager
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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	124	203	1 / 0	13.20	8.35	21.55	0.143	33.01	-11.46
2593.00	5	QPSK	H	116	338	1 / 0	14.30	8.04	22.34	0.171	33.01	-10.67
2687.50	5	QPSK	H	108	353	1 / 0	13.70	7.94	21.64	0.146	33.01	-11.37
2593.00	5	16-QAM	H	116	338	1 / 0	13.38	8.04	21.42	0.139	33.01	-11.59
2593.00	5	64-QAM	H	116	338	1 / 0	12.50	8.04	20.54	0.113	33.01	-12.47
2501.00	10	QPSK	H	124	203	1 / 0	13.05	8.34	21.39	0.138	33.01	-11.62
2593.00	10	QPSK	H	116	338	1 / 0	14.40	8.04	22.44	0.175	33.01	-10.57
2685.00	10	QPSK	H	108	353	1 / 0	13.80	7.93	21.73	0.149	33.01	-11.28
2593.00	10	16-QAM	H	116	338	1 / 0	13.30	8.04	21.34	0.136	33.01	-11.67
2593.00	10	64-QAM	H	116	338	1 / 0	12.50	8.04	20.54	0.113	33.01	-12.47
2503.50	15	QPSK	H	124	203	1 / 0	13.00	8.34	21.34	0.136	33.01	-11.67
2593.00	15	QPSK	H	116	338	1 / 0	14.35	8.04	22.39	0.173	33.01	-10.62
2682.50	15	QPSK	H	108	353	1 / 0	13.88	7.92	21.80	0.151	33.01	-11.21
2593.00	15	16-QAM	H	116	338	1 / 0	13.60	8.04	21.64	0.146	33.01	-11.37
2593.00	15	64-QAM	H	116	338	1 / 0	12.68	8.04	20.72	0.118	33.01	-12.29
2506.00	20	QPSK	H	124	203	1 / 0	12.97	8.33	21.30	0.135	33.01	-11.71
2593.00	20	QPSK	H	116	338	1 / 0	14.55	8.04	22.59	0.181	33.01	-10.42
2680.00	20	QPSK	H	108	353	1 / 0	13.68	7.91	21.59	0.144	33.01	-11.42
2593.00	20	16-QAM	H	116	338	1 / 0	13.80	8.04	21.84	0.153	33.01	-11.17
2593.00	20	64-QAM	H	116	338	1 / 0	13.30	8.04	21.34	0.136	33.01	-11.67
2593.00	20	QPSK	V	102	162	1 / 0	13.08	8.04	21.12	0.129	33.01	-11.89
2593.00	20	QPSK(PC3)	H	319	24	1 / 0	13.33	8.04	21.37	0.137	33.01	-11.64

Table 7-12. EIRP Data (Band 41, PC2)

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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 $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $\geq 2 \times$ 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.

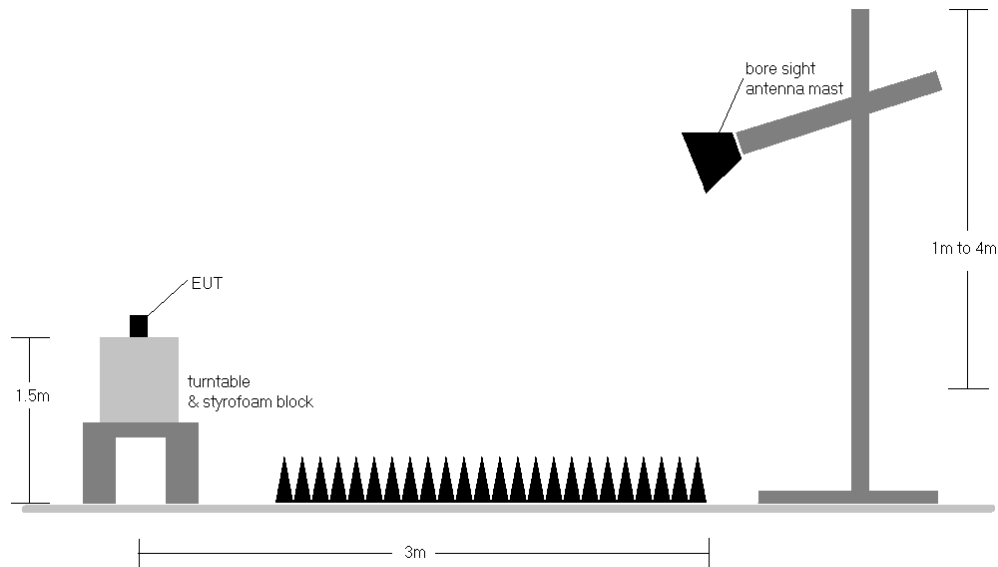


Figure 7-8. Test Instrument & Measurement Setup

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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