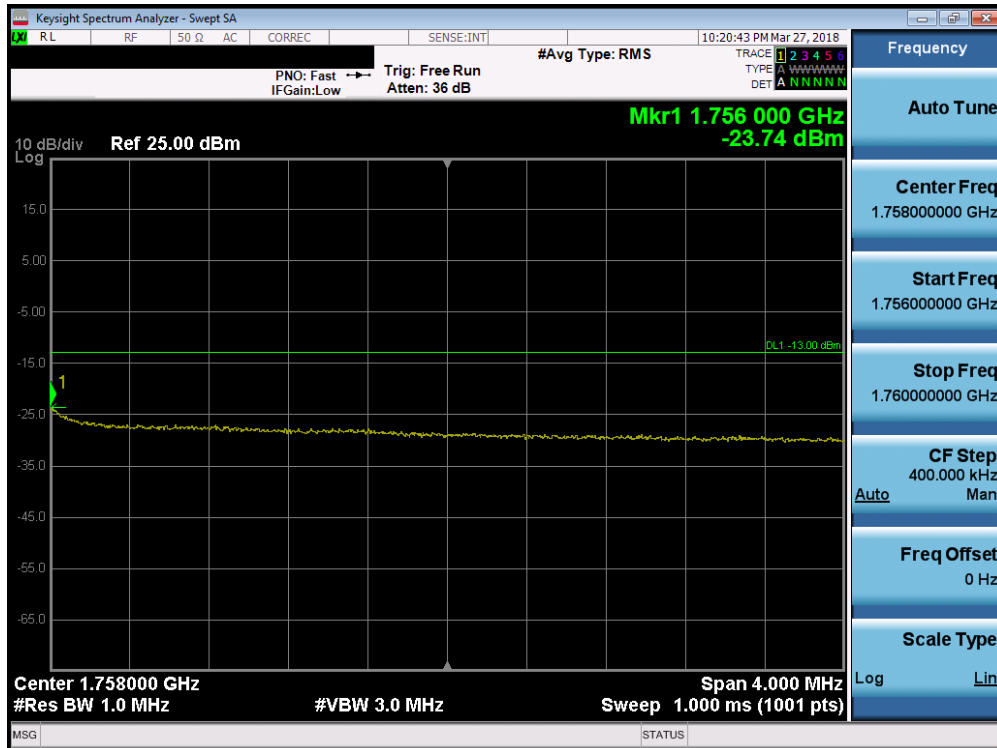


Plot 7-214. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

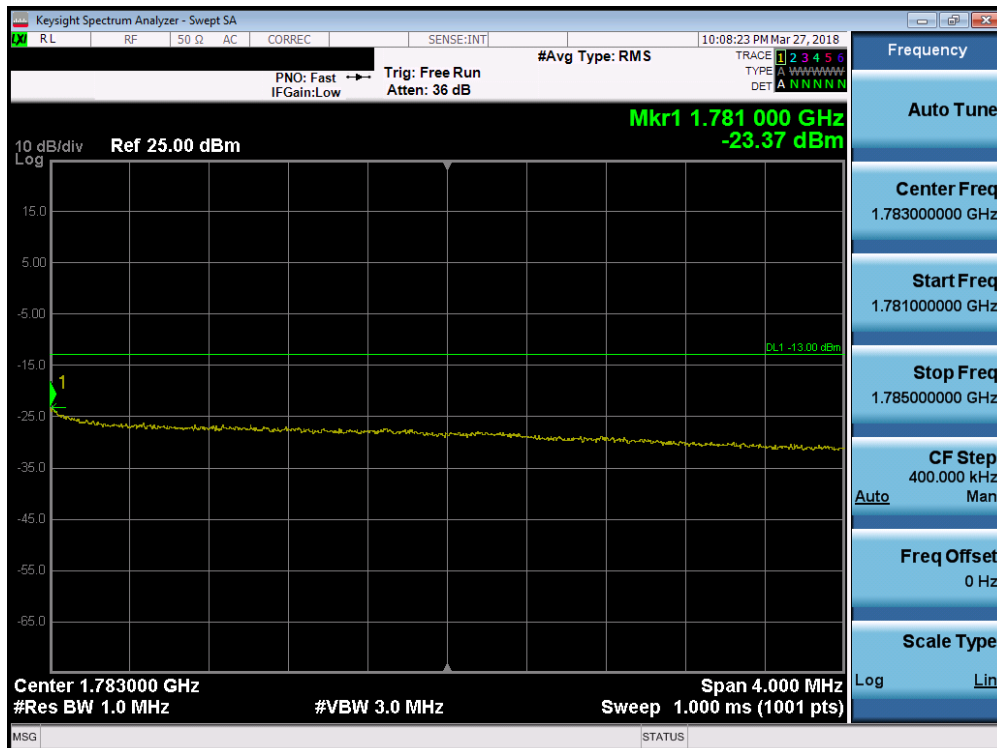


Plot 7-215. Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 131 of 263

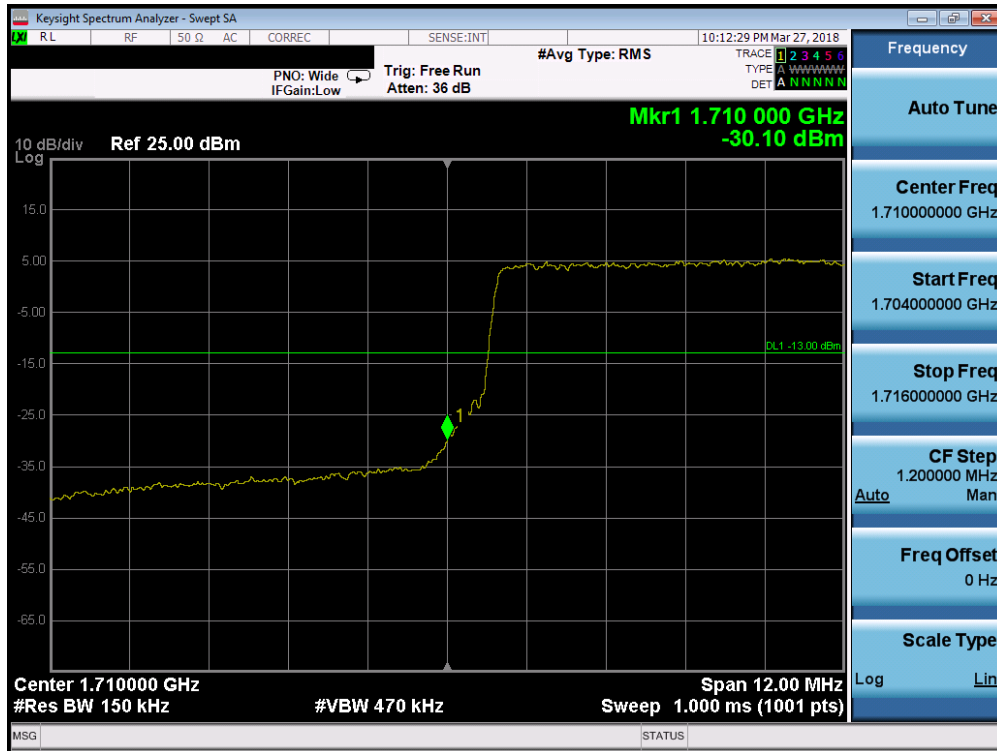


Plot 7-216. Upper Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

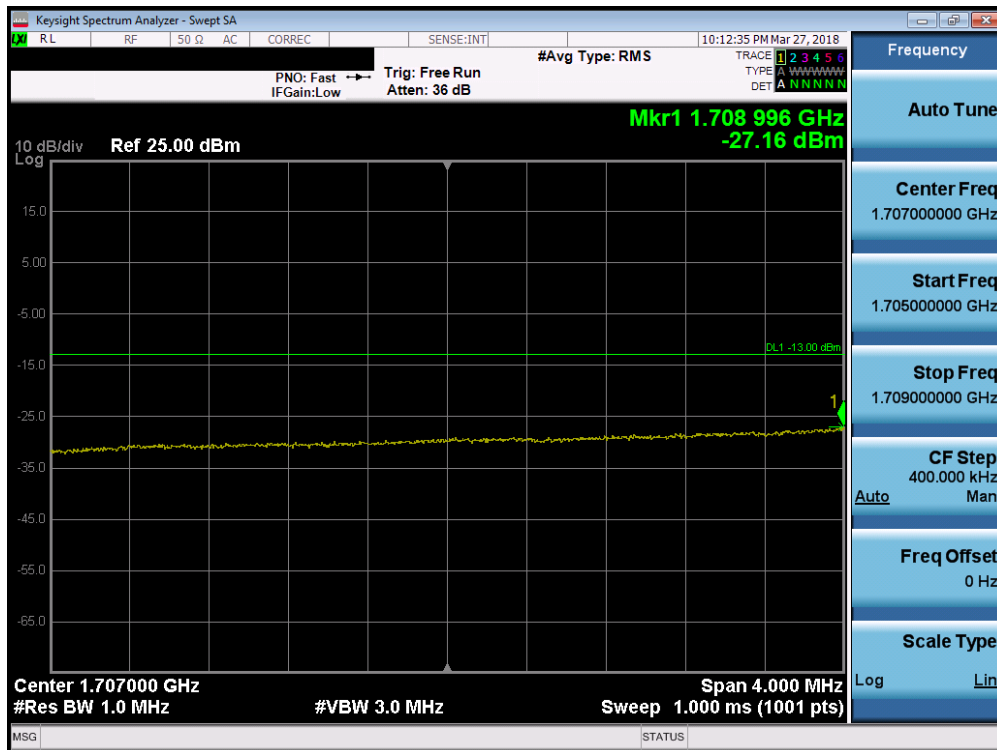


Plot 7-217. Upper Extended Band Edge Plot (Band 66 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 132 of 263

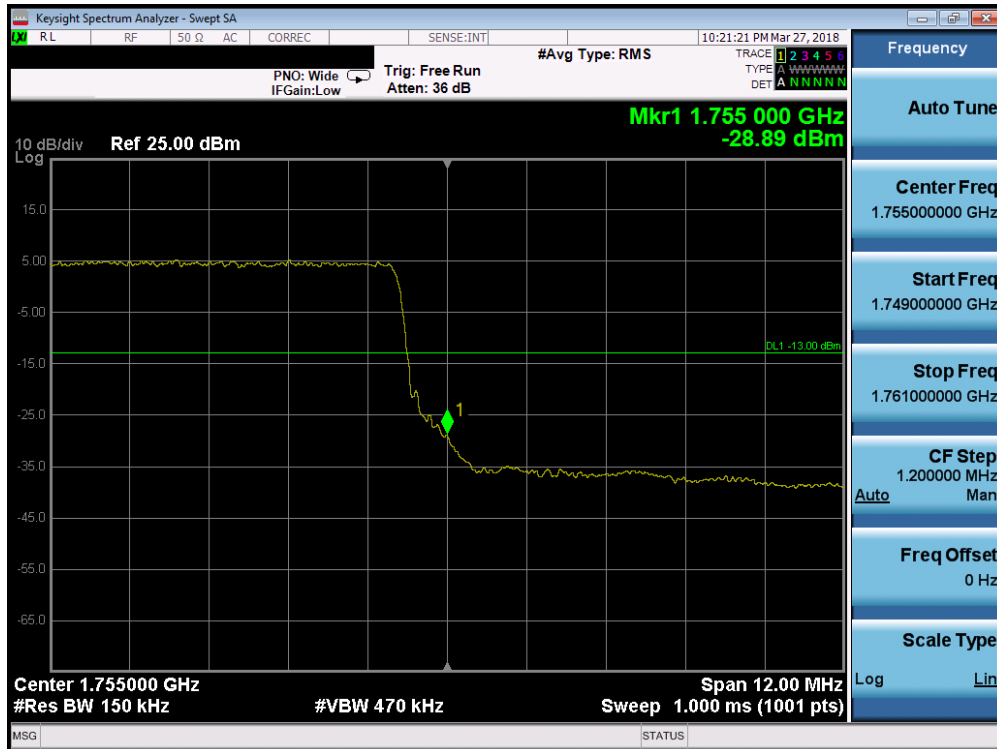


Plot 7-218. Lower Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

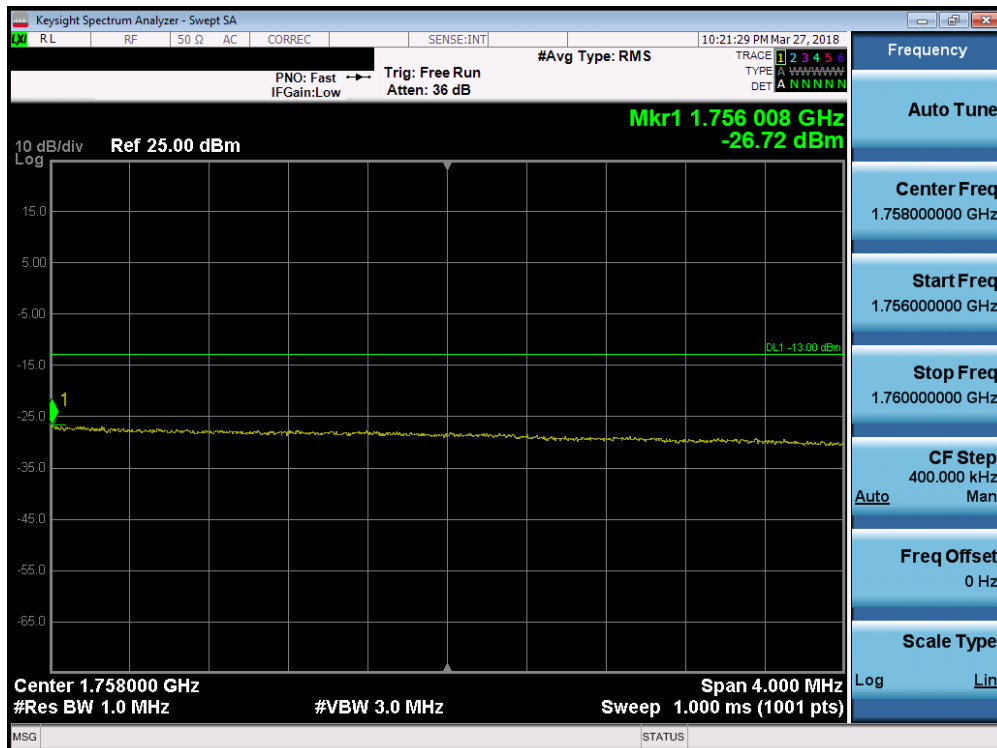


Plot 7-219. Lower Extended Band Edge Plot (Band 66/4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 133 of 263

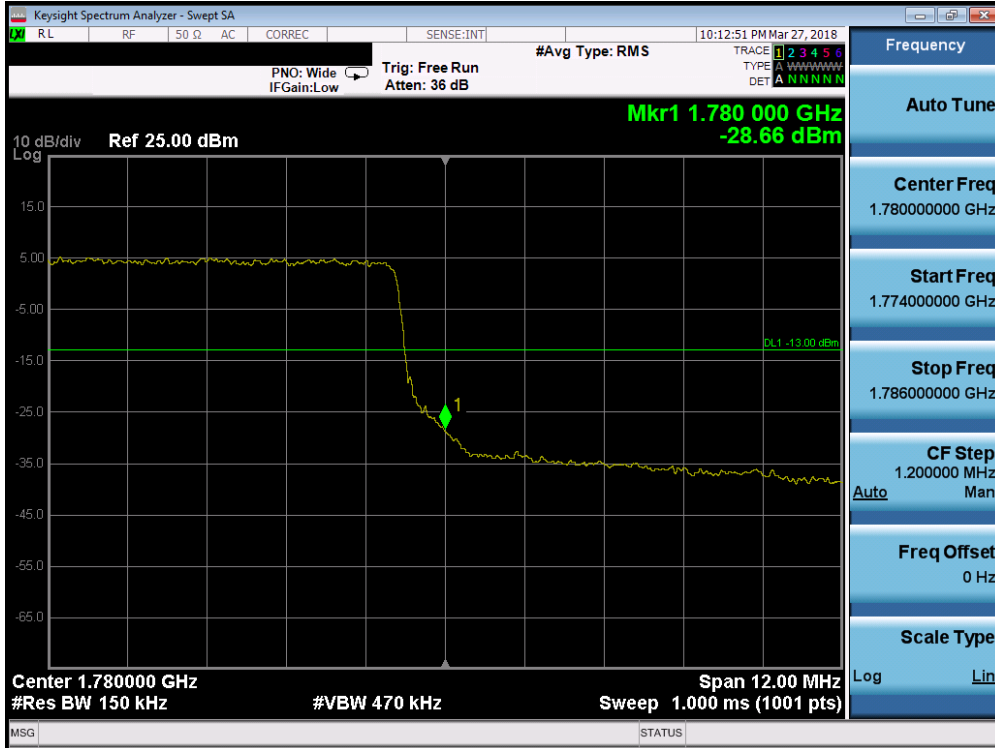


Plot 7-220. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

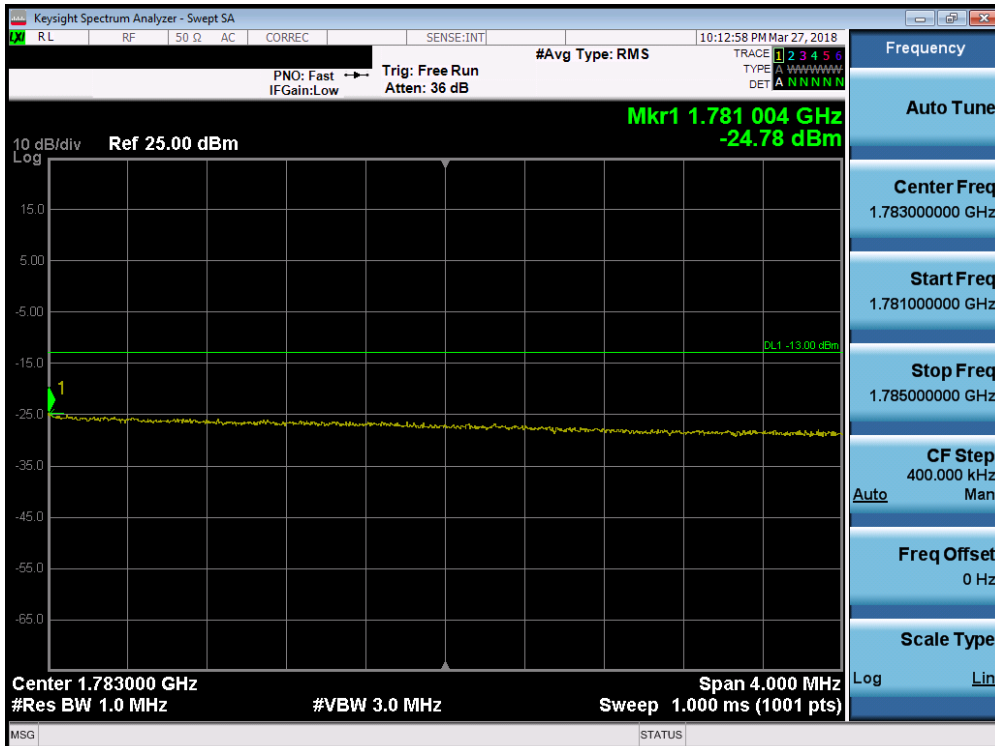


Plot 7-221. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 134 of 263

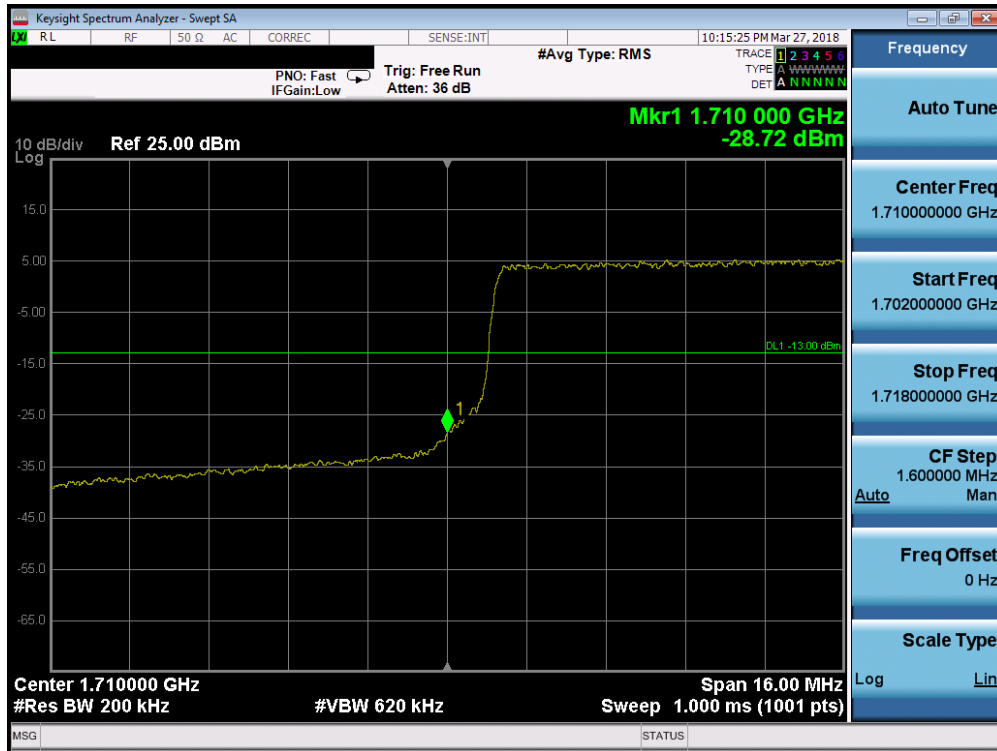


Plot 7-222. Upper Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

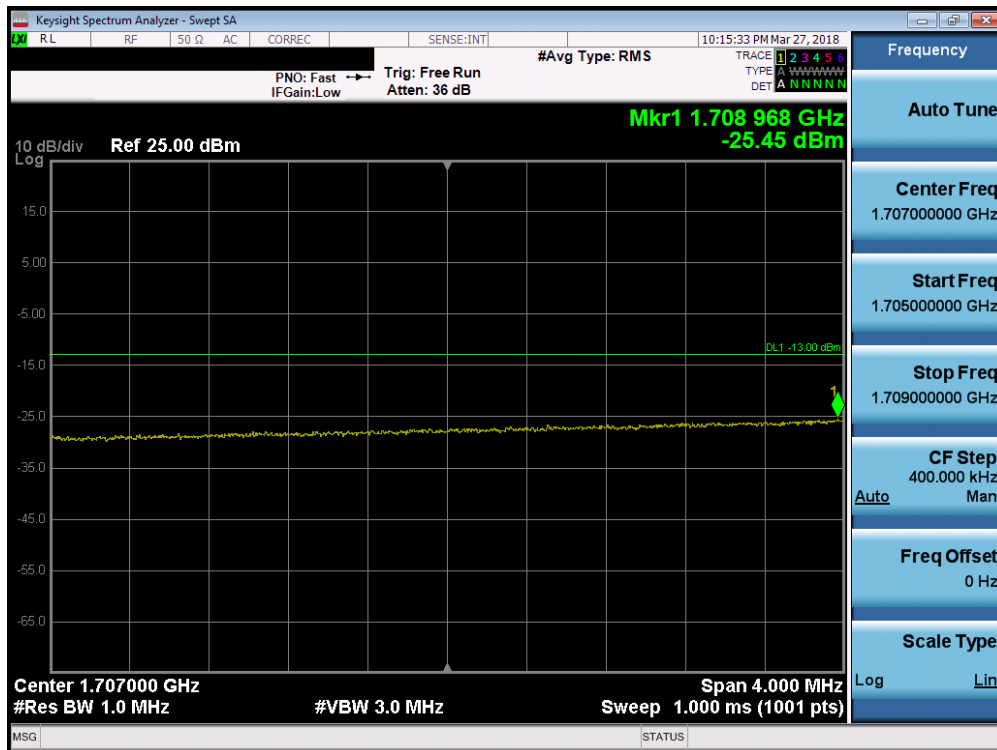


Plot 7-223. Upper Extended Band Edge Plot (Band 66 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 135 of 263

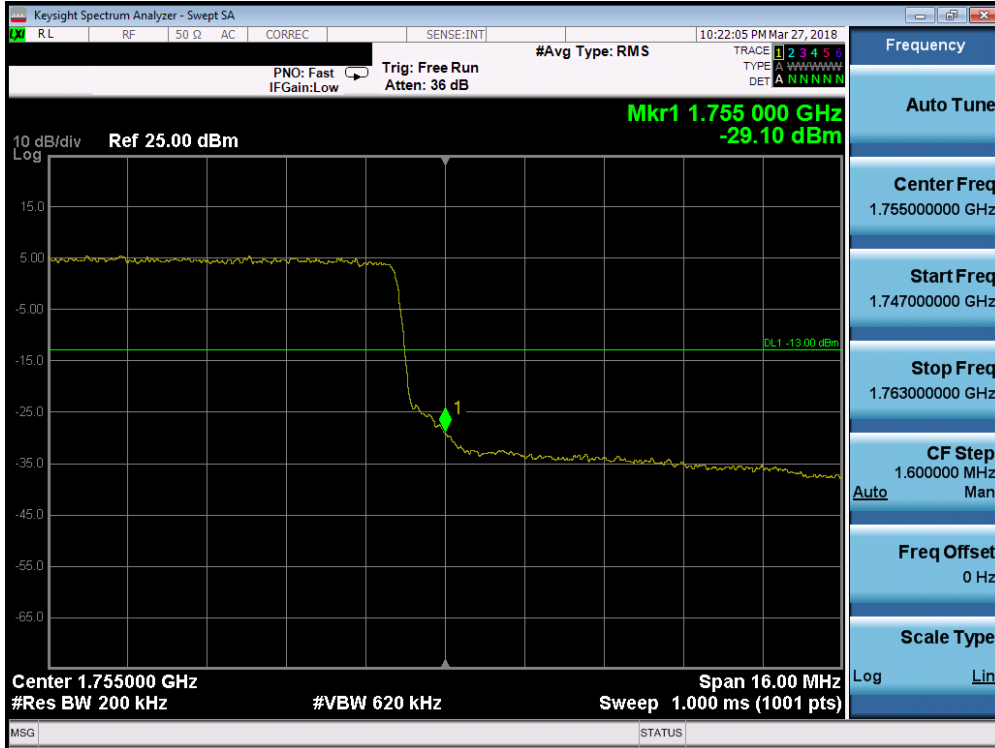


Plot 7-224. Lower Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

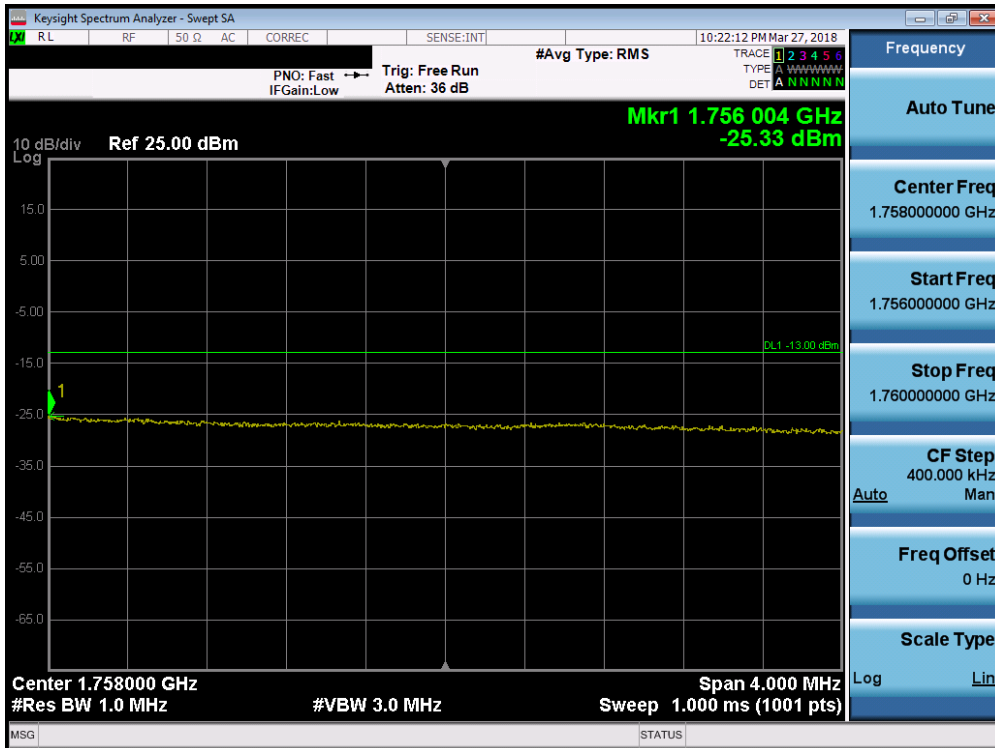


Plot 7-225. Lower Extended Band Edge Plot (Band 66/4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 136 of 263

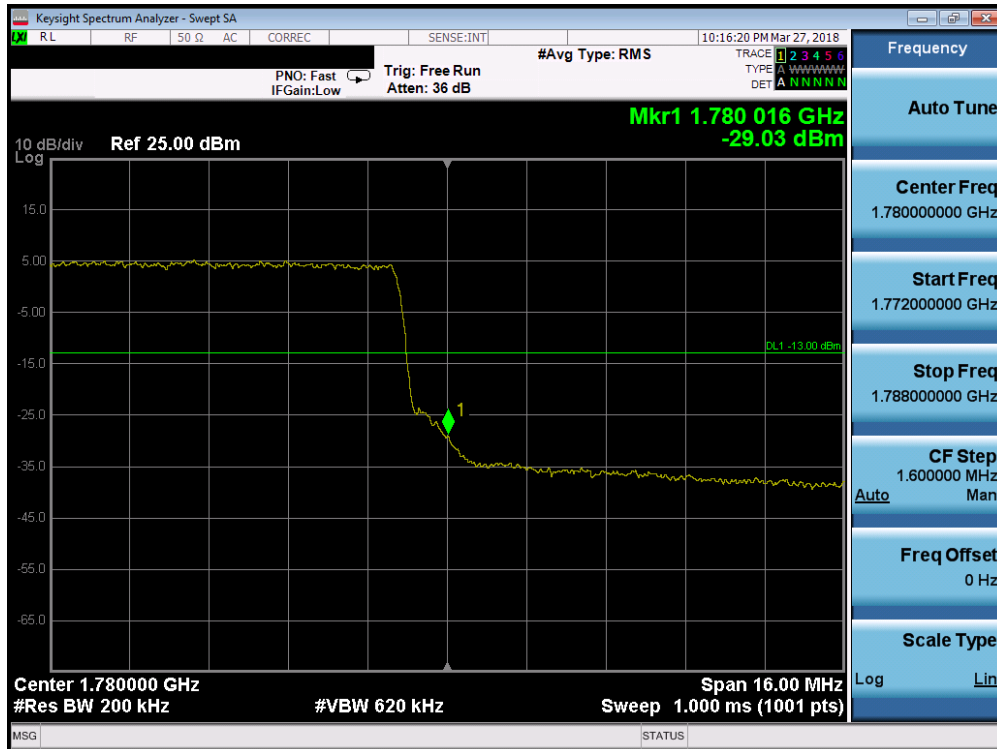


Plot 7-226. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

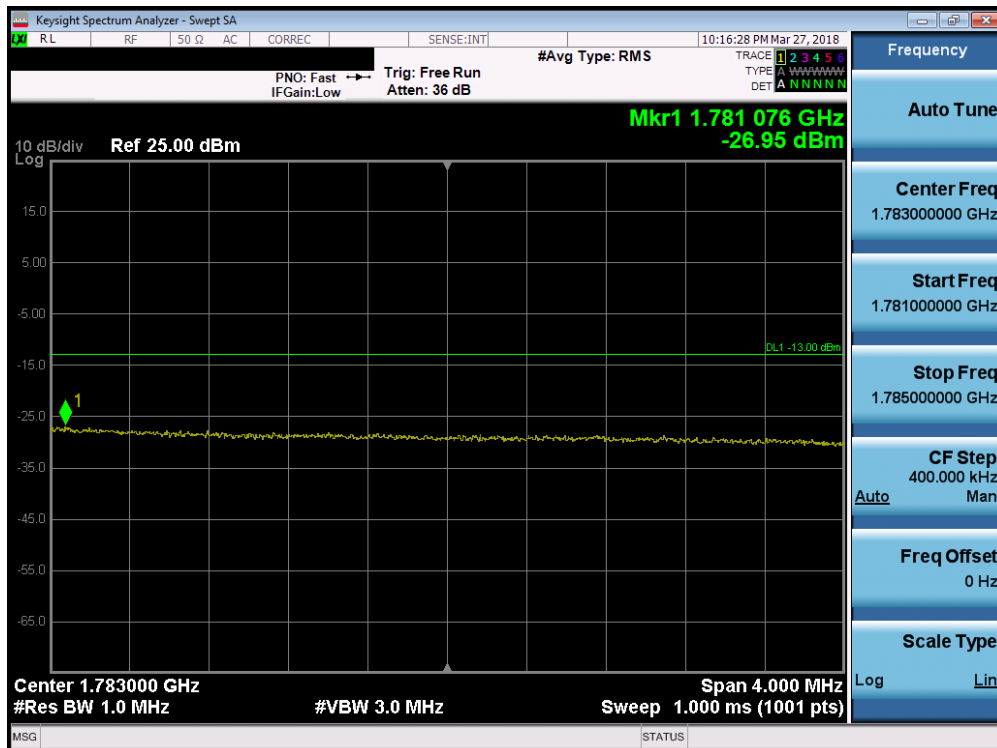


Plot 7-227. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 137 of 263



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

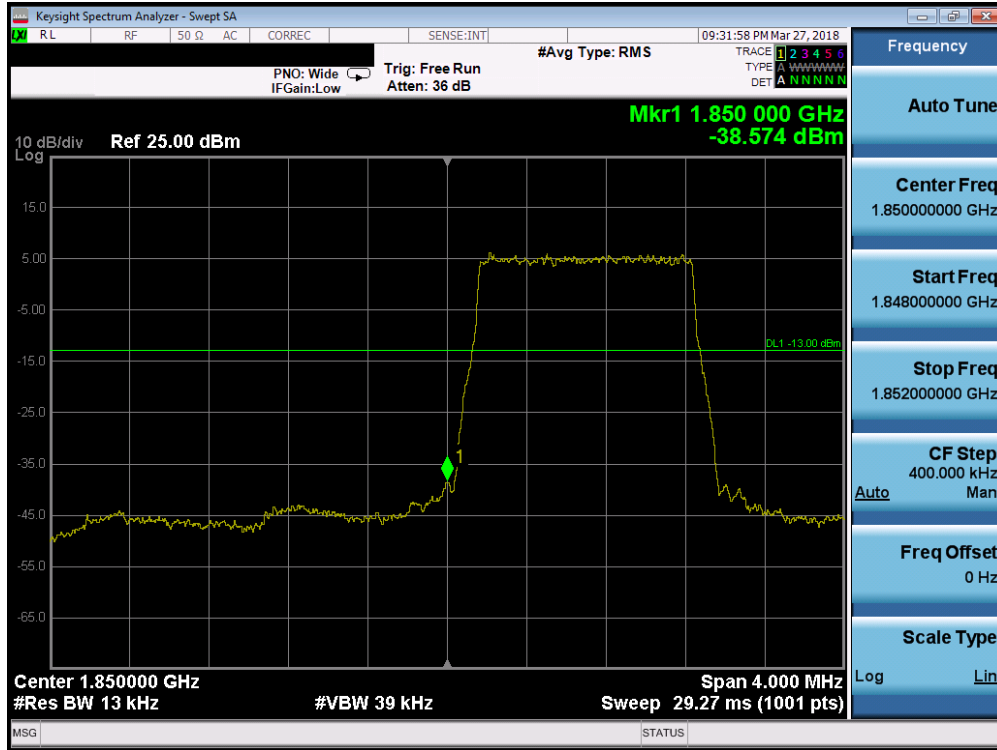


Plot 7-229. Upper Extended Band Edge Plot (Band 66 - 20.0MHz QPSK - Full RB Configuration)

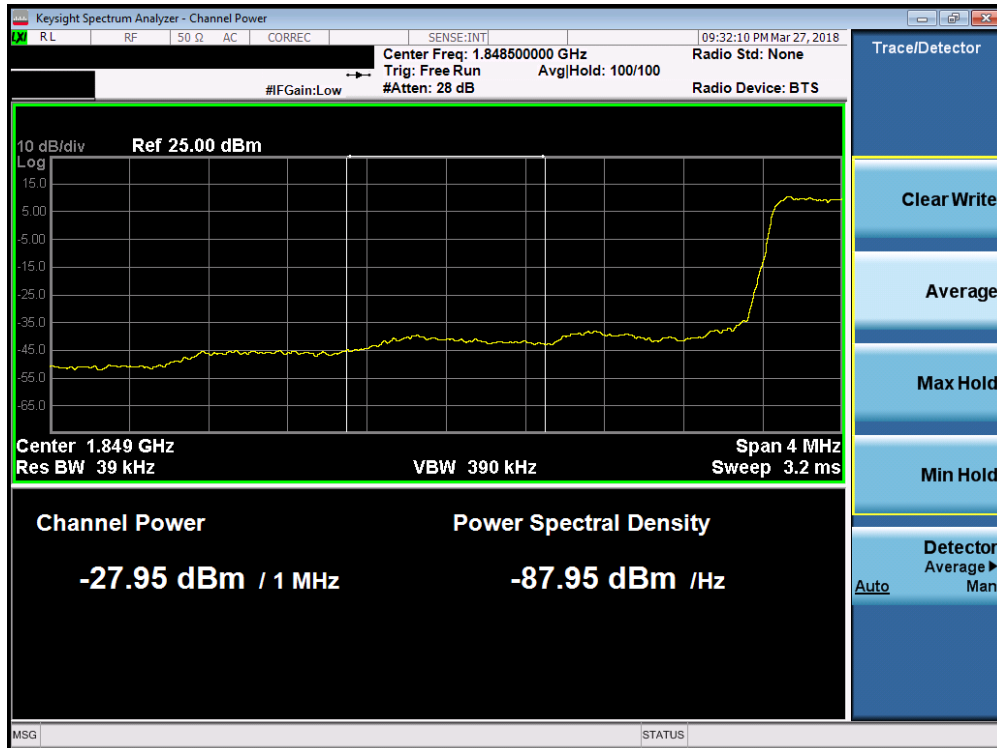
FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 138 of 263



**Band 25/2**



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

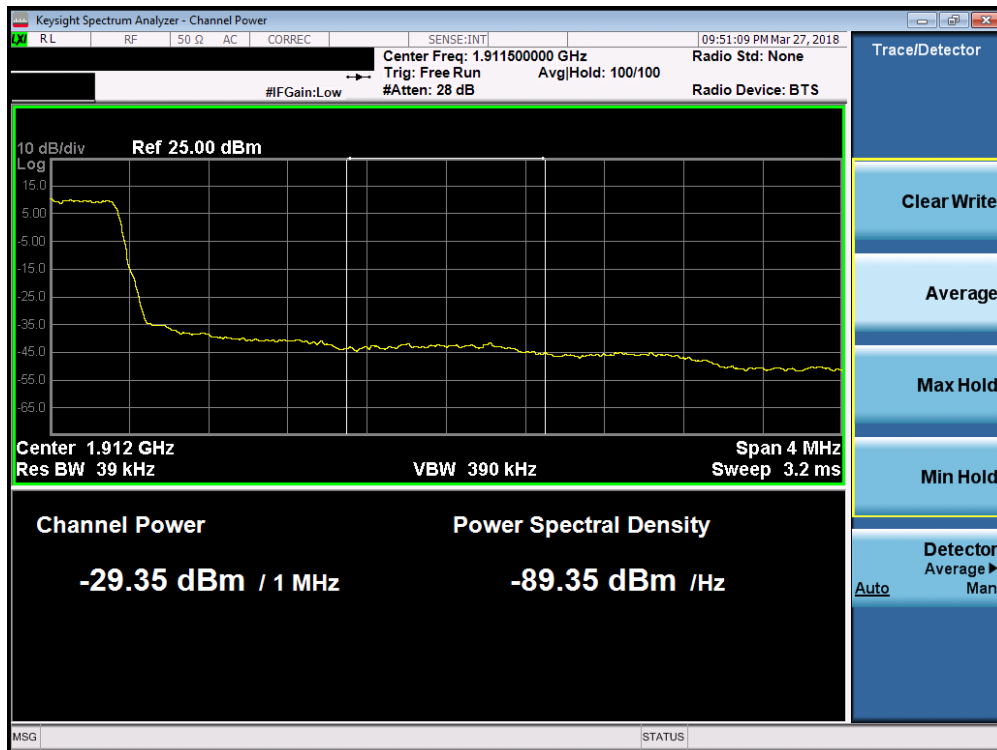


**Plot 7-231. Lower Extended Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)**

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 139 of 263

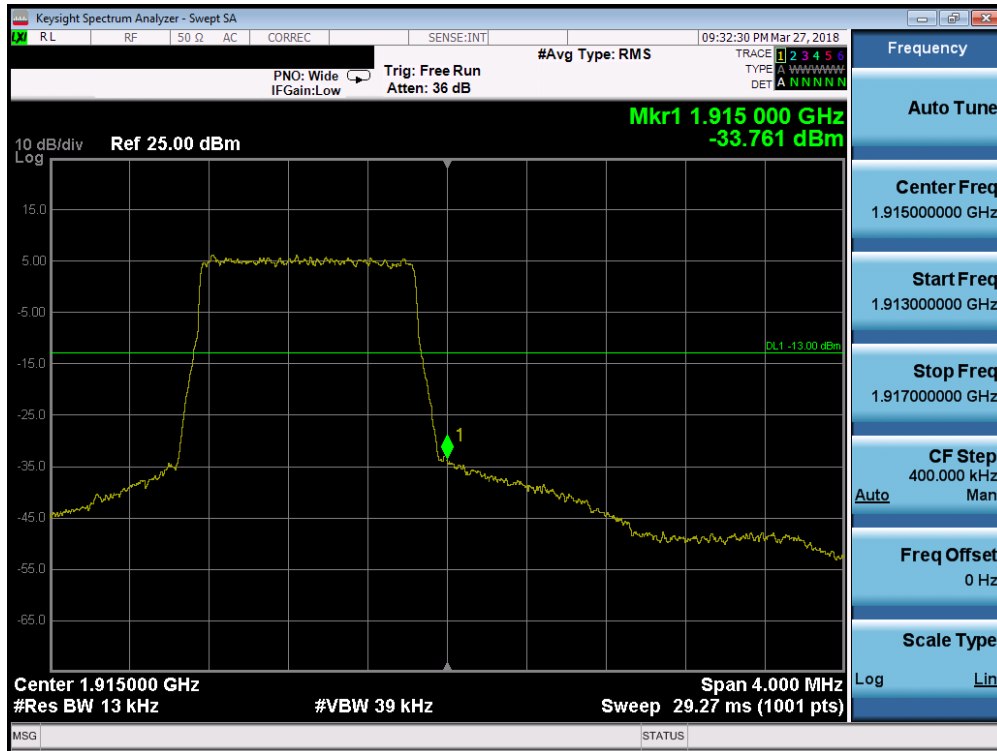


Plot 7-232. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

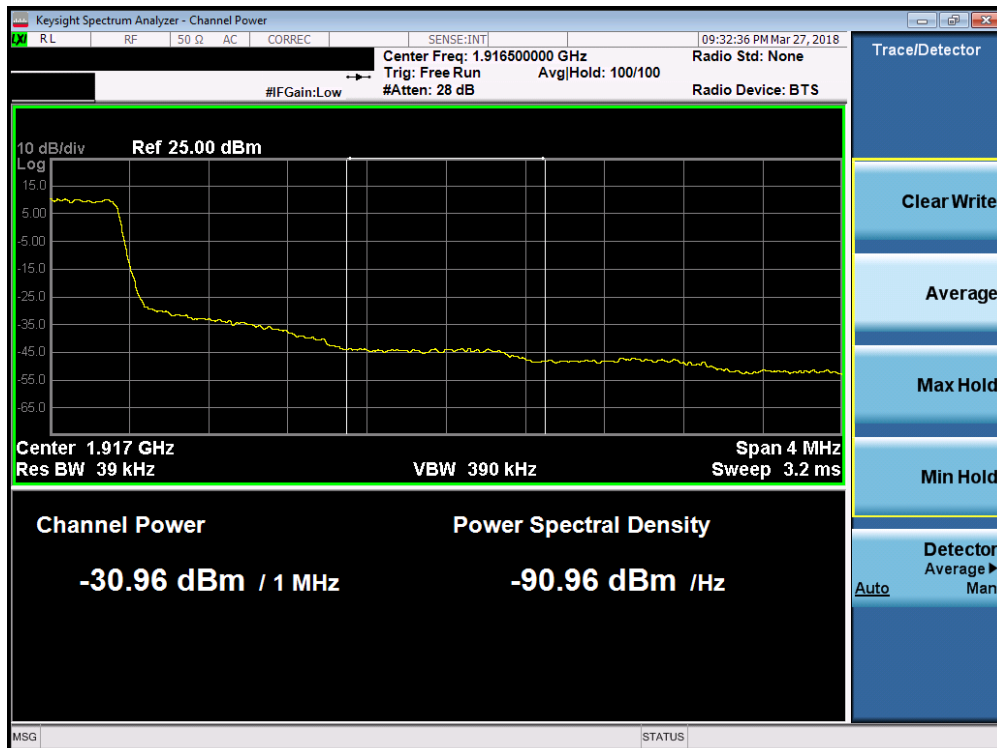


Plot 7-233. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 140 of 263

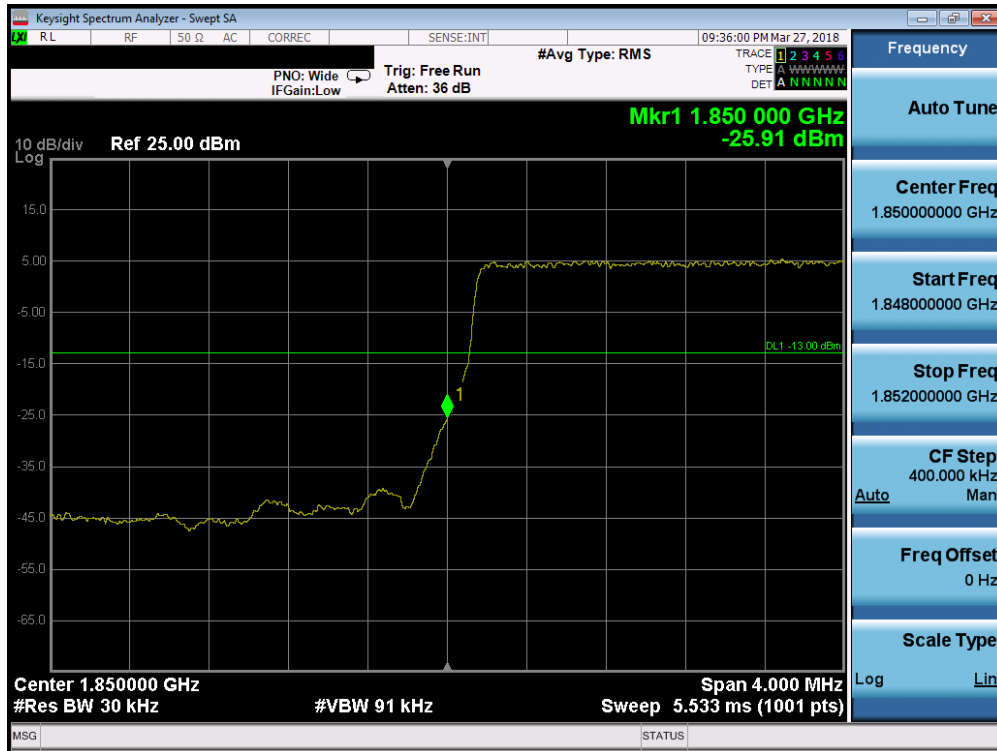


Plot 7-234. Upper Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)

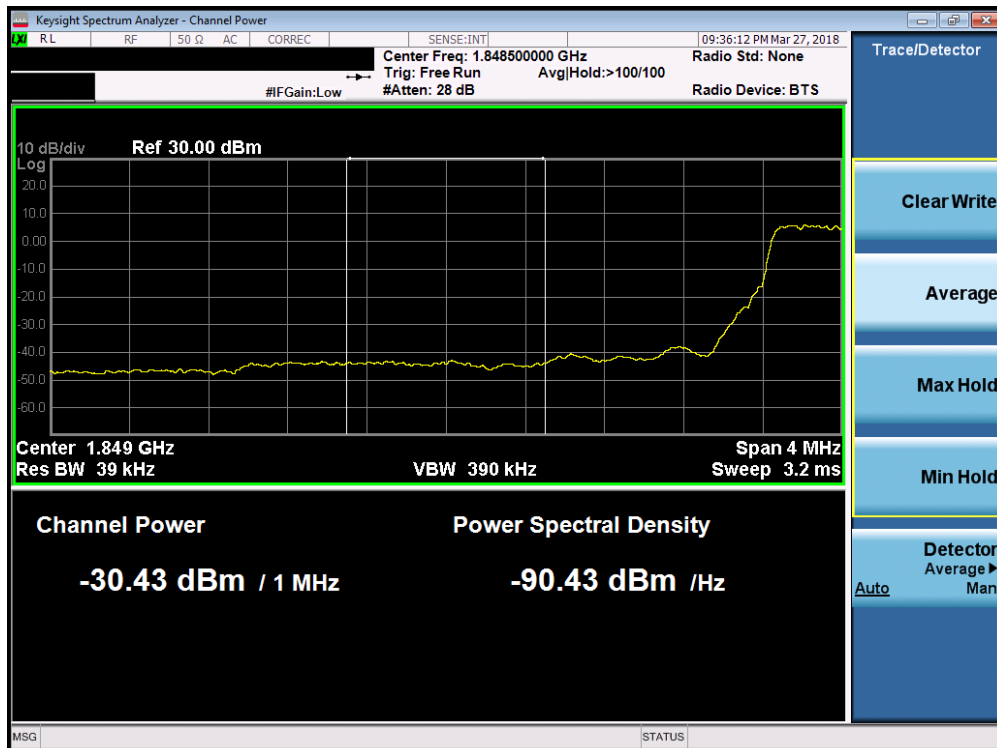


Plot 7-235. Upper Extended Band Edge Plot (Band 25 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 141 of 263

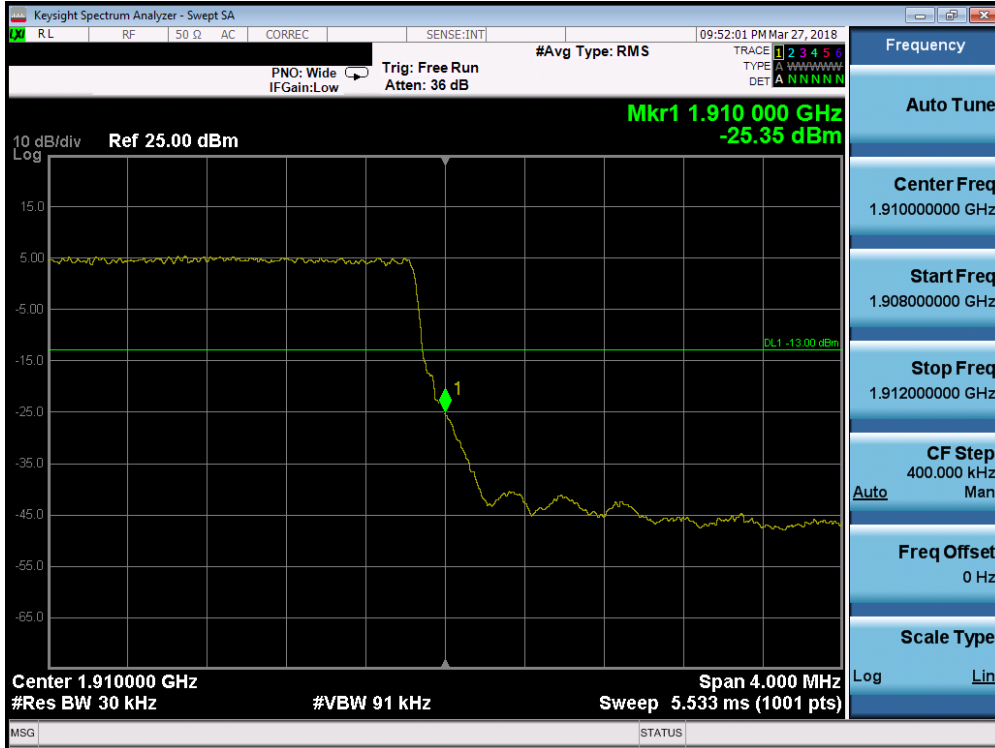


Plot 7-236. Lower Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

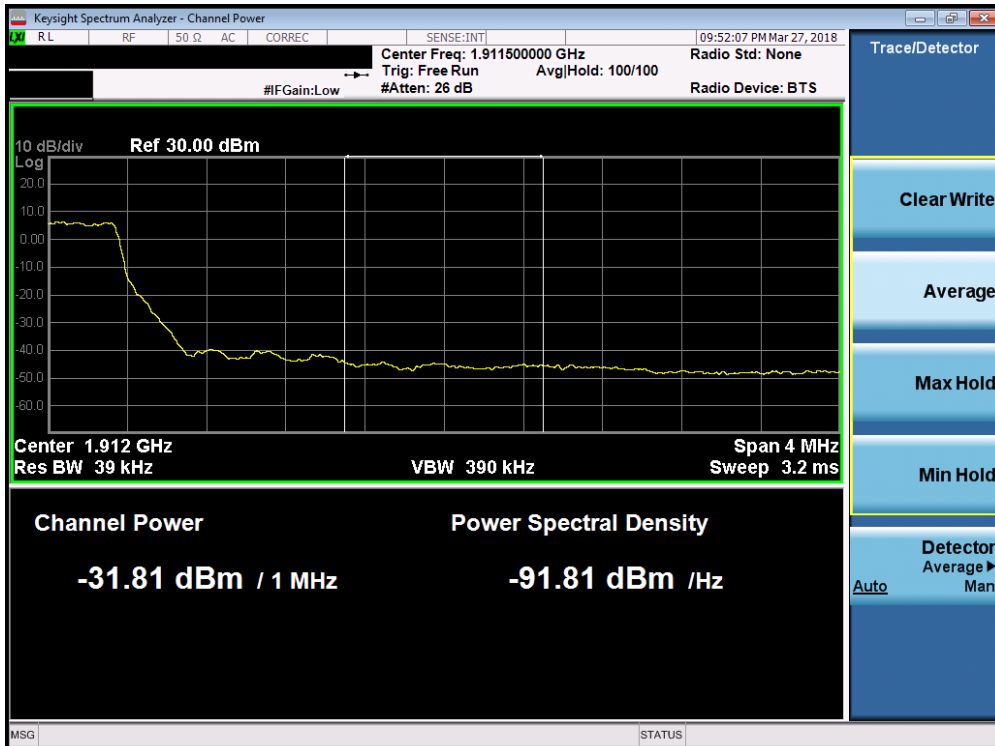


Plot 7-237. Lower Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 142 of 263

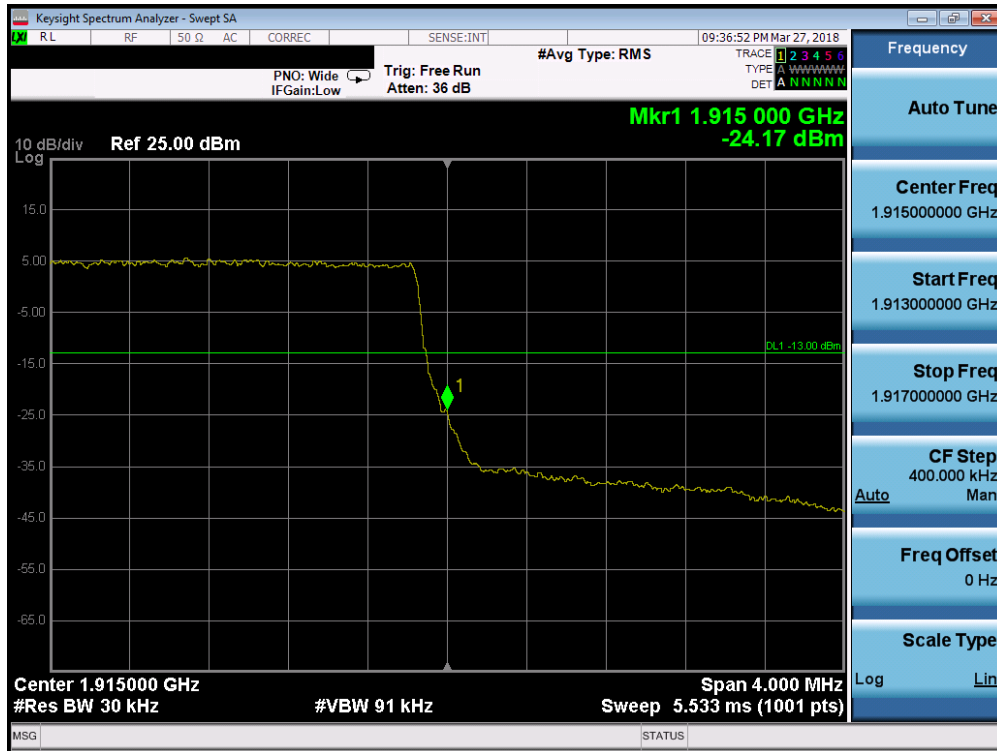


Plot 7-238. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

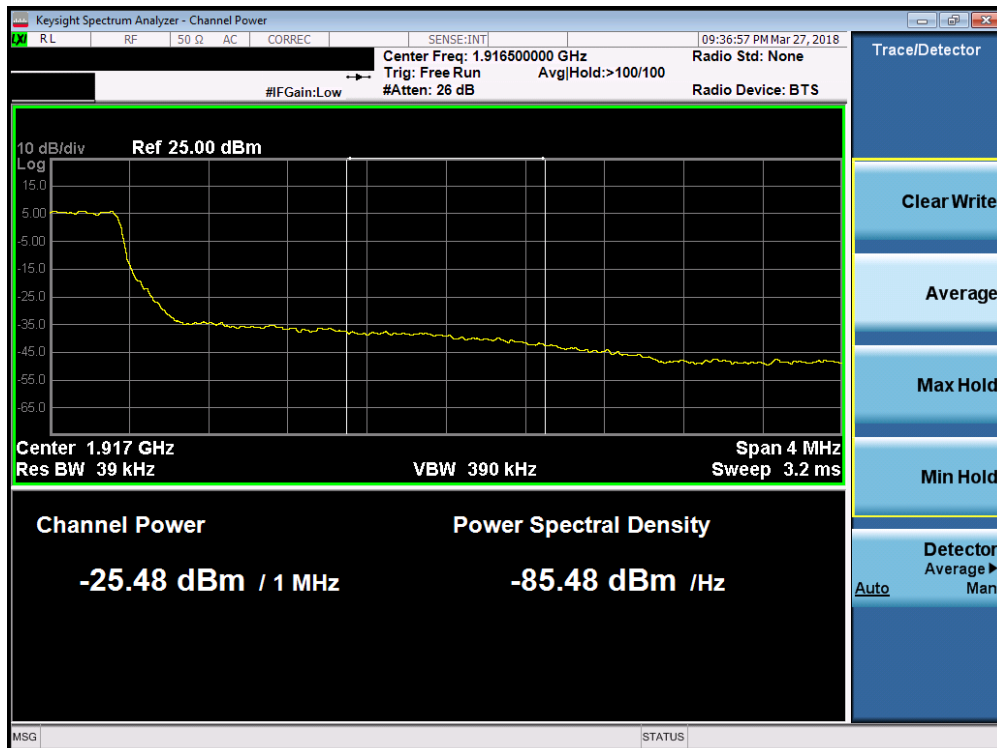


Plot 7-239. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 143 of 263

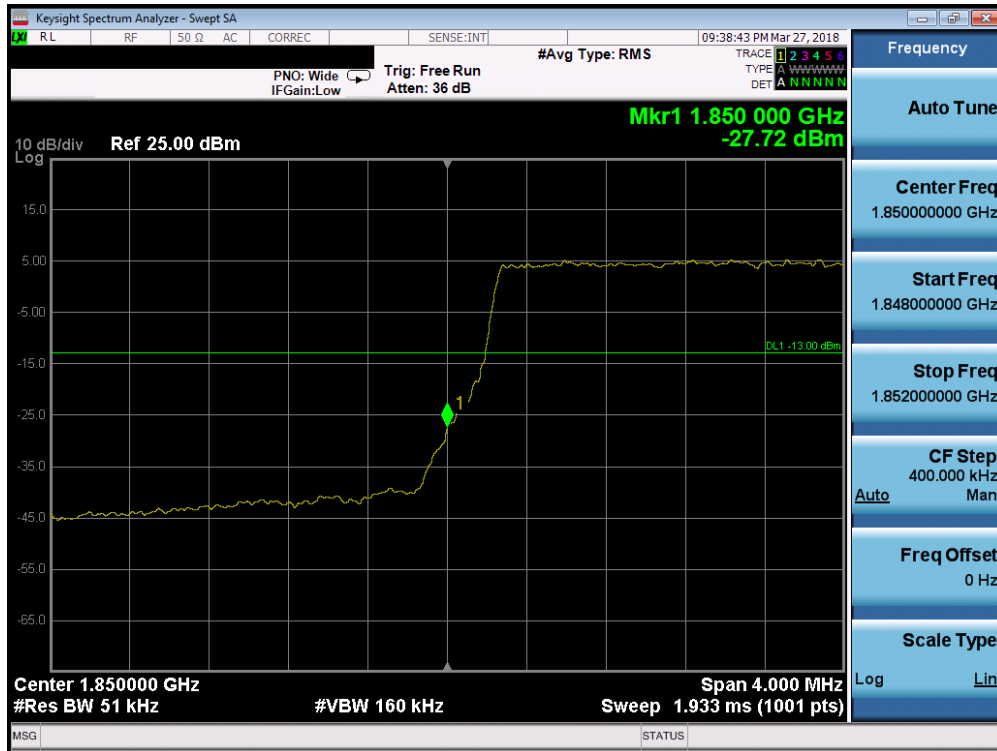


Plot 7-240. Upper Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)

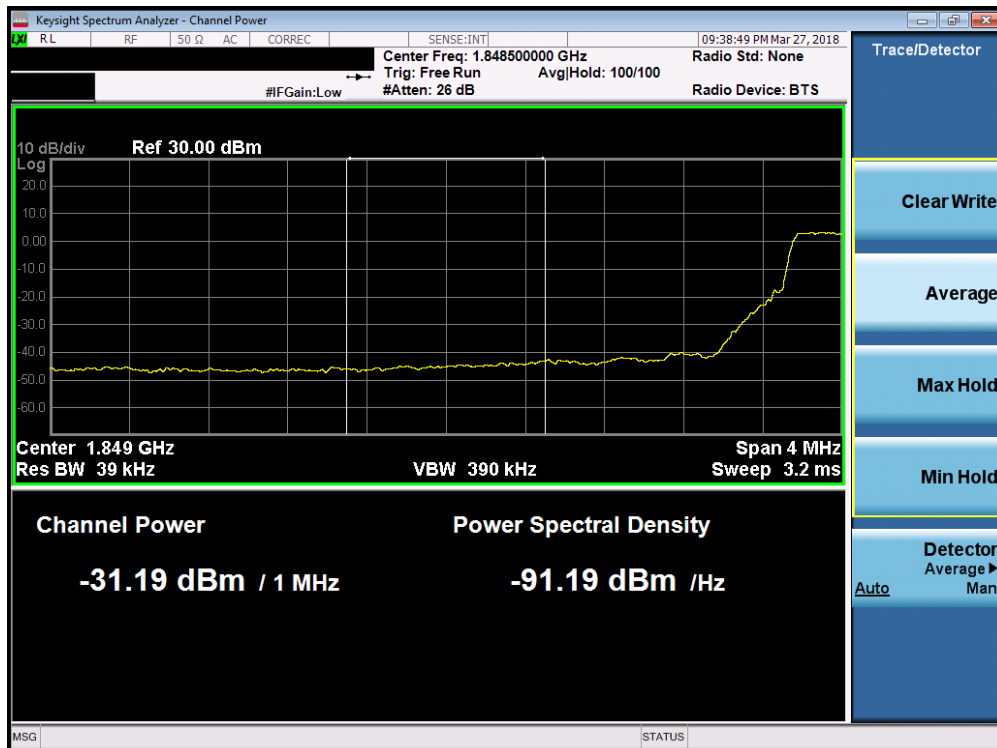


Plot 7-241. Upper Extended Band Edge Plot (Band 25 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 144 of 263

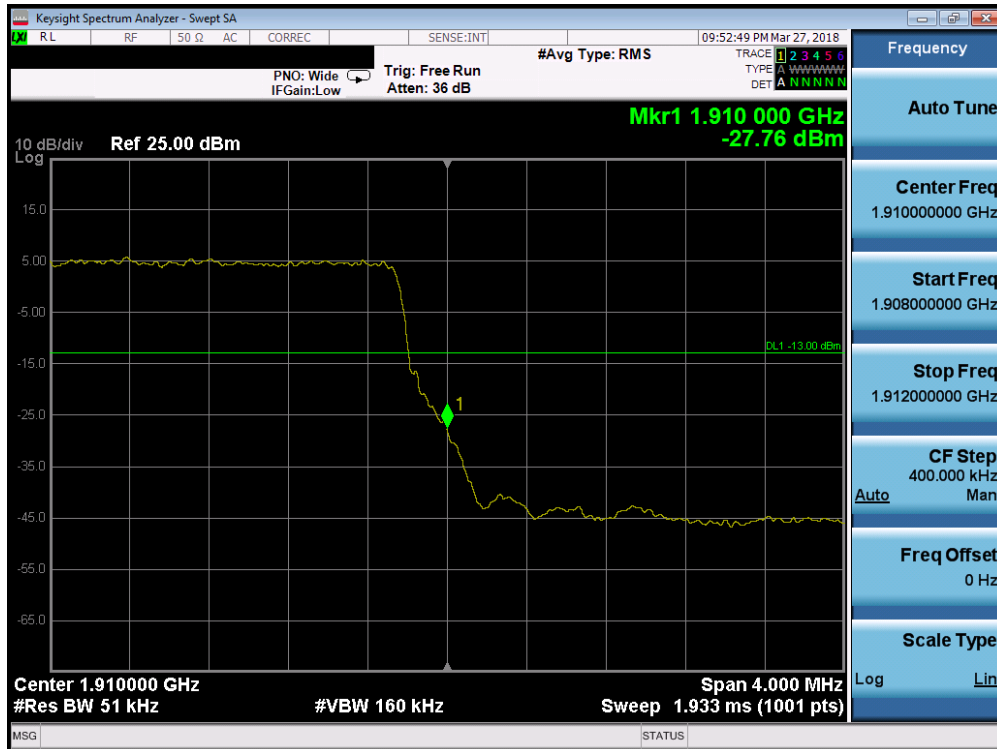


Plot 7-242. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

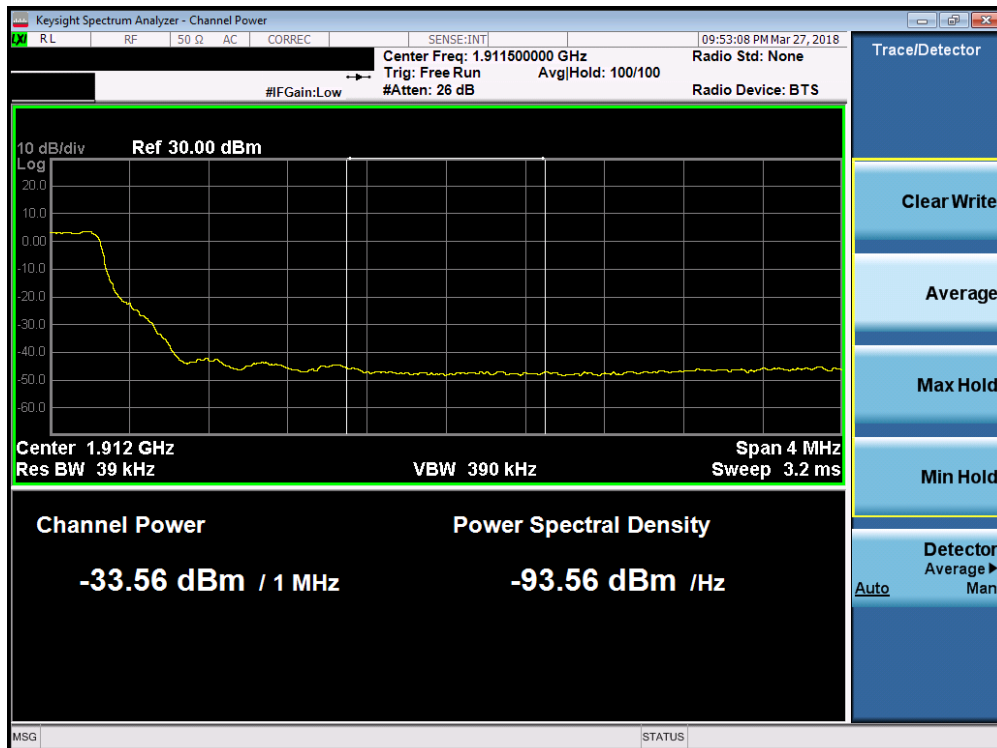


Plot 7-243. Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 145 of 263



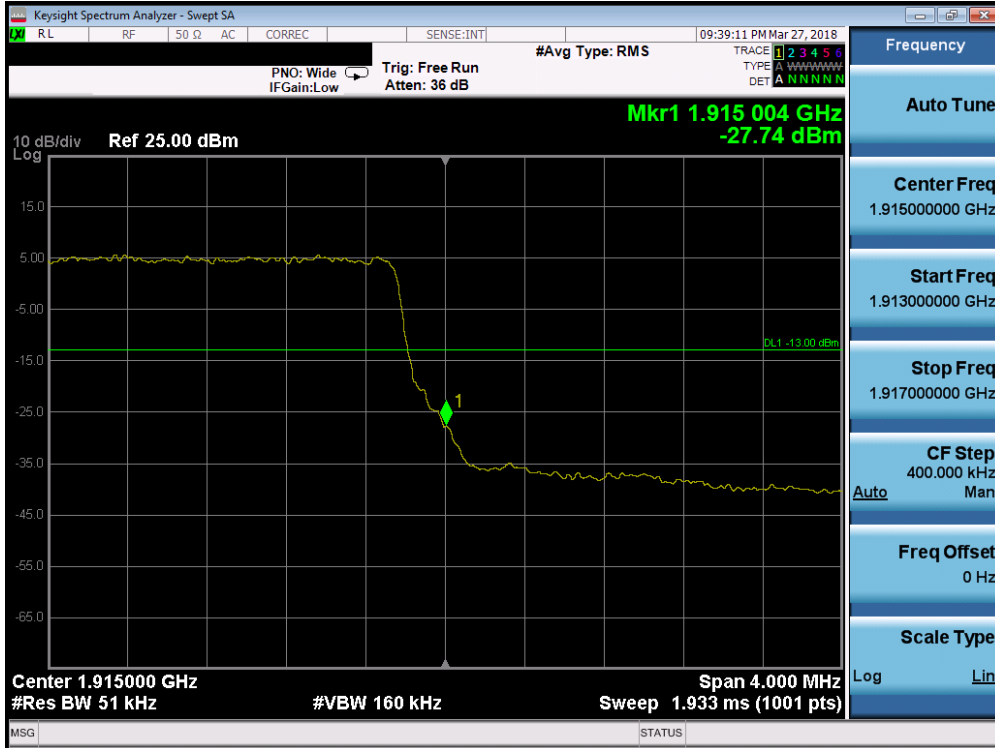
Plot 7-244. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



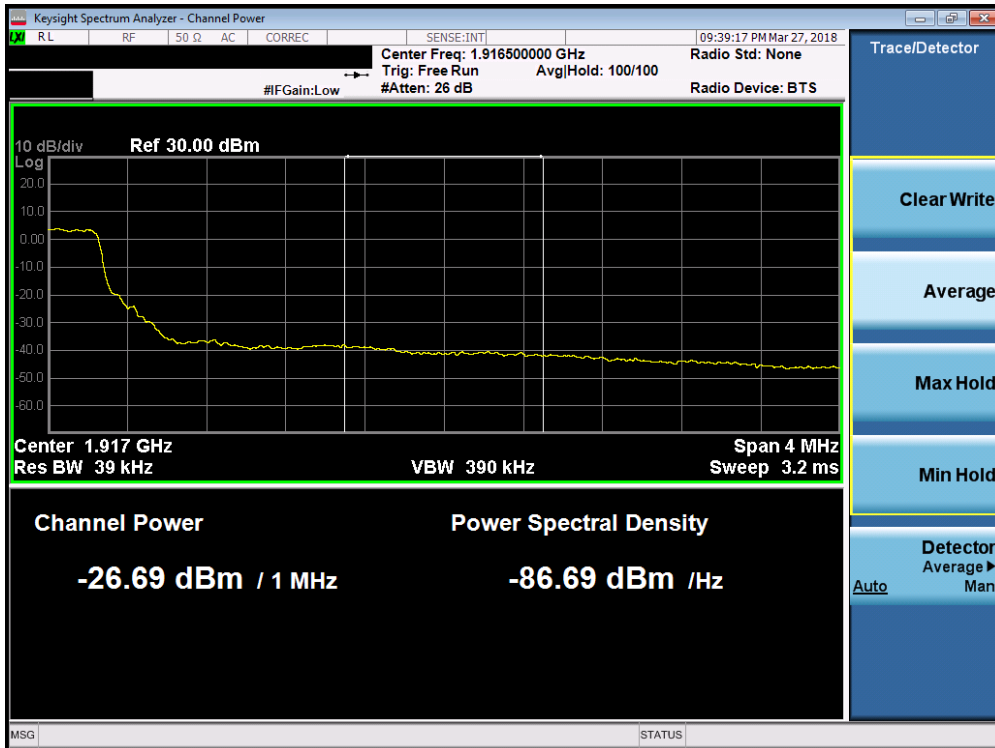
Plot 7-245. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 146 of 263



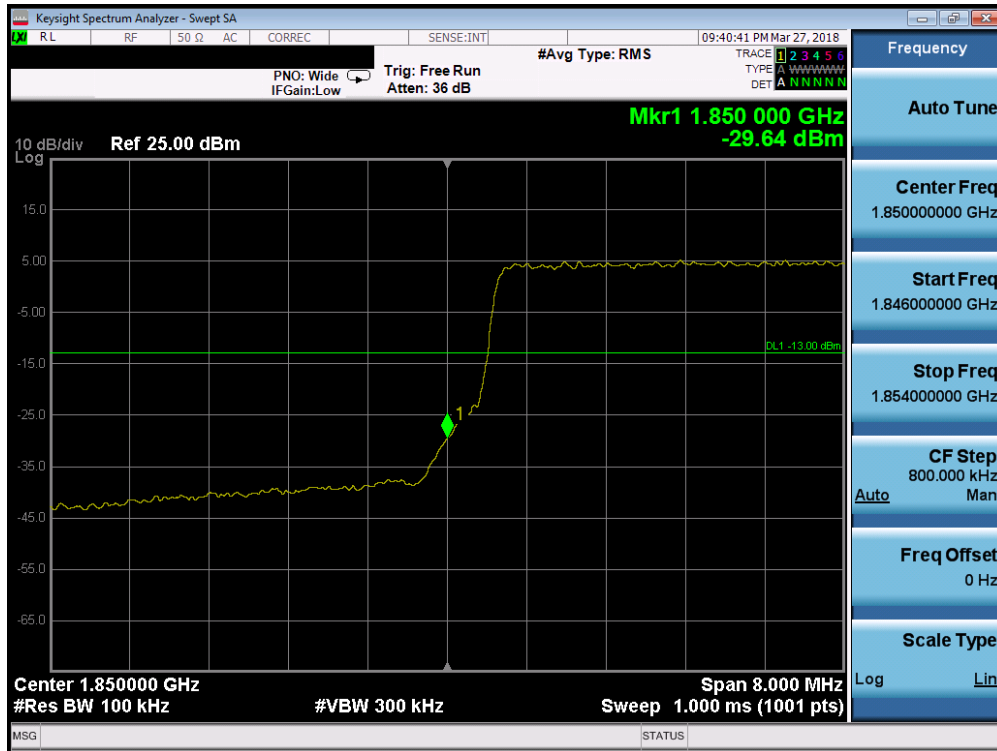


Plot 7-246. Upper Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

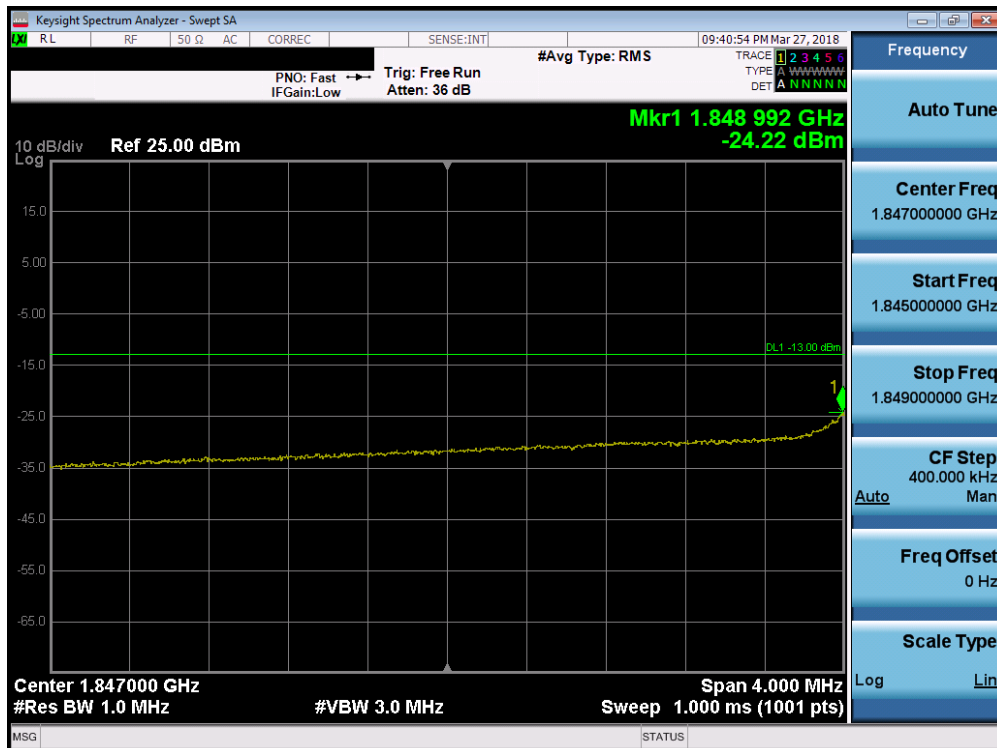


Plot 7-247. Upper Extended Band Edge Plot (Band 25 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 147 of 263

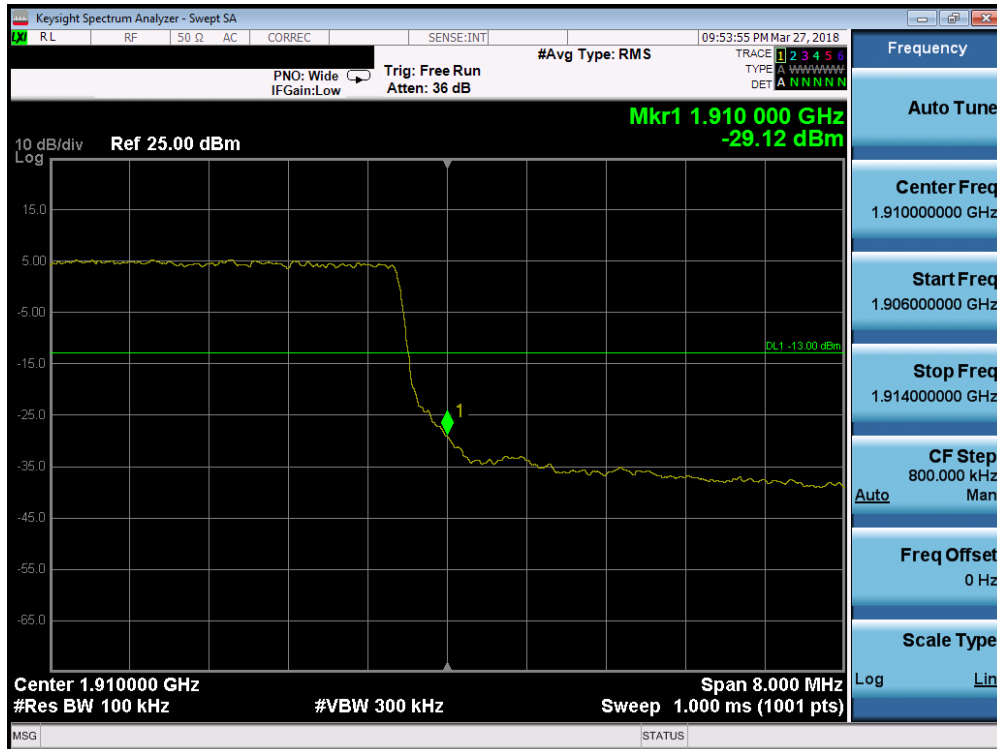


Plot 7-248. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

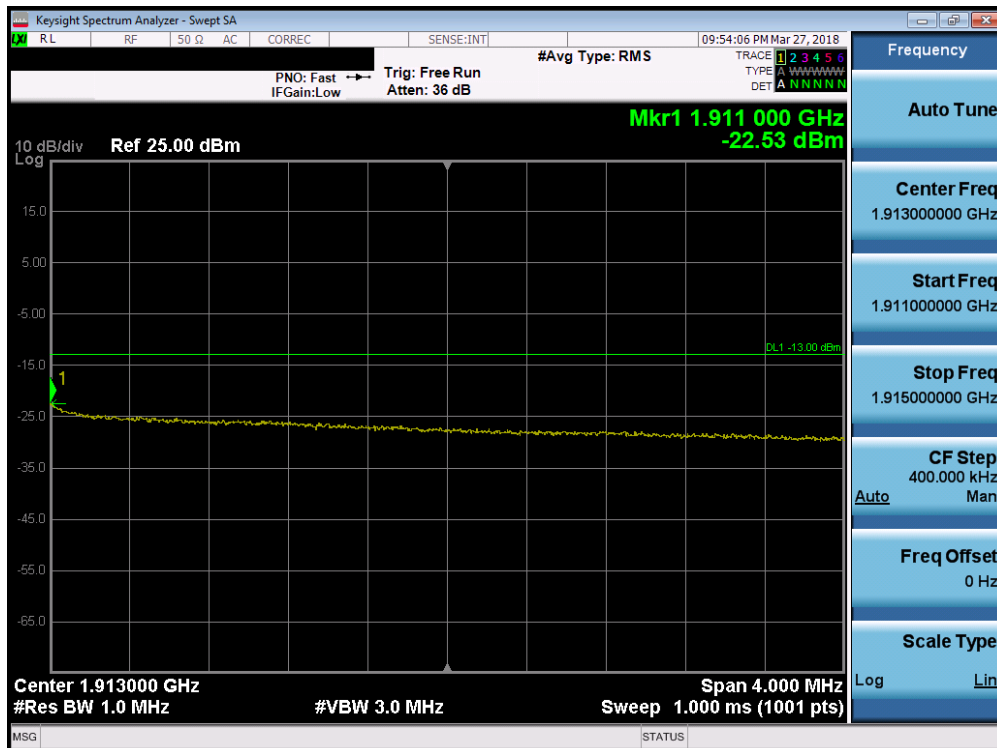


Plot 7-249. Lower Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 148 of 263

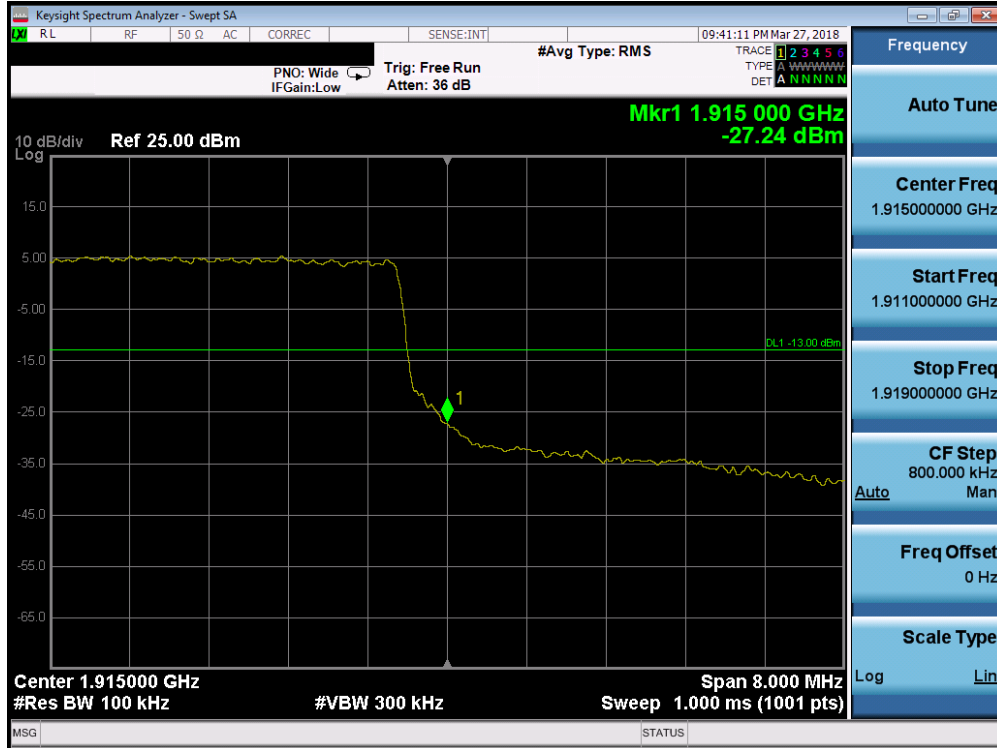


Plot 7-250. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-251. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 149 of 263

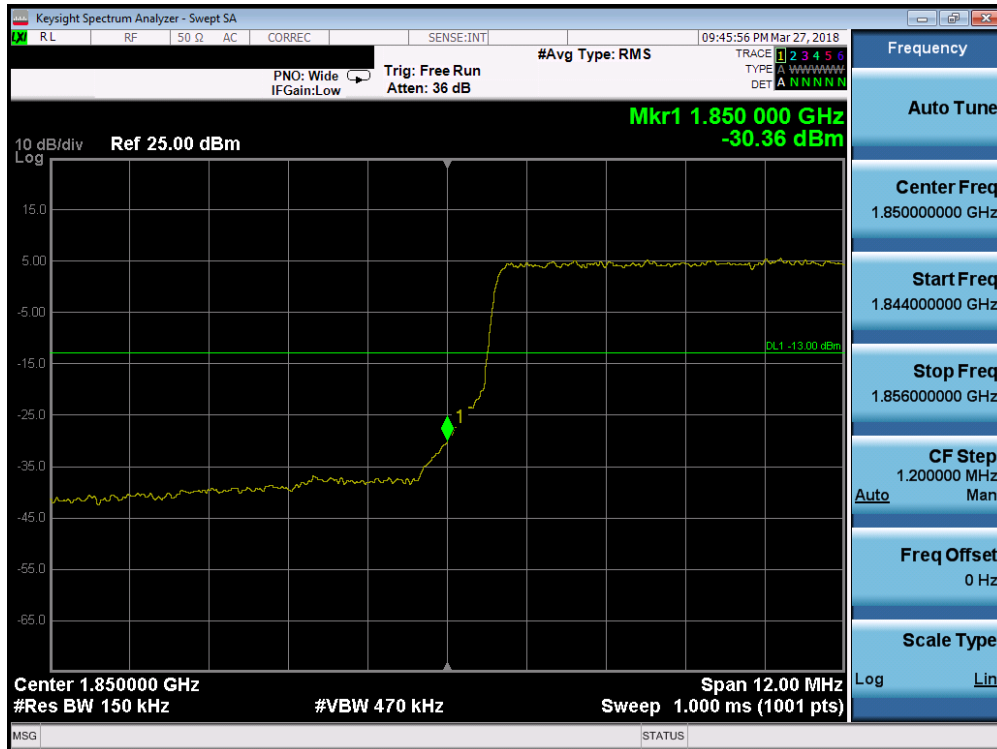


Plot 7-252. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)

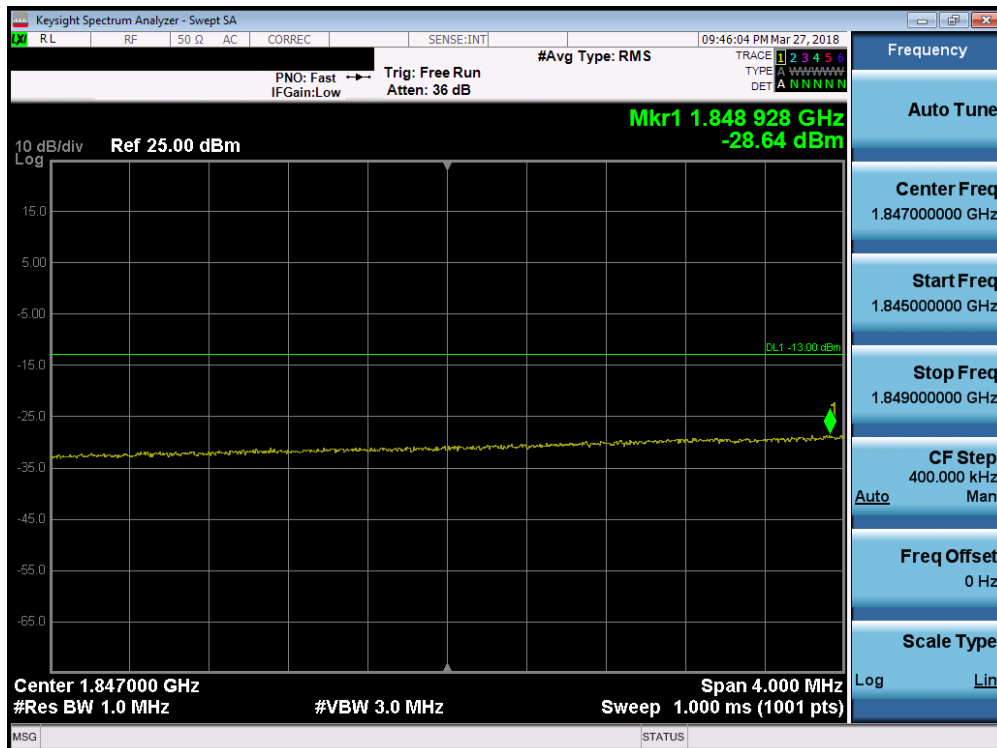


Plot 7-253. Upper Extended Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 150 of 263



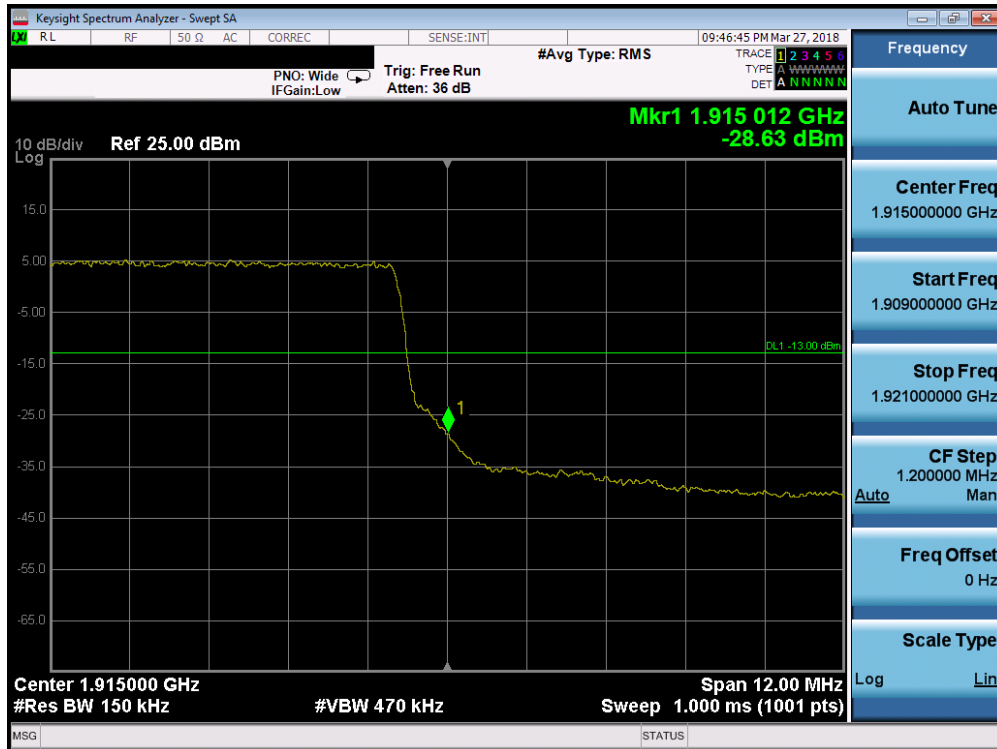
Plot 7-254. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



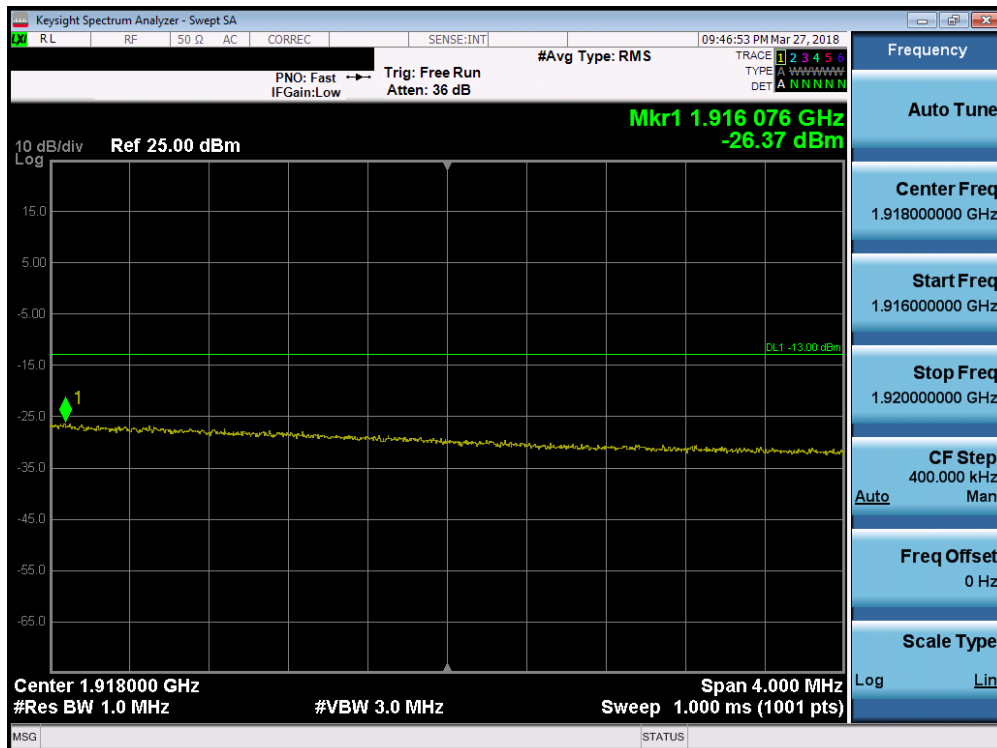
Plot 7-255. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 151 of 263



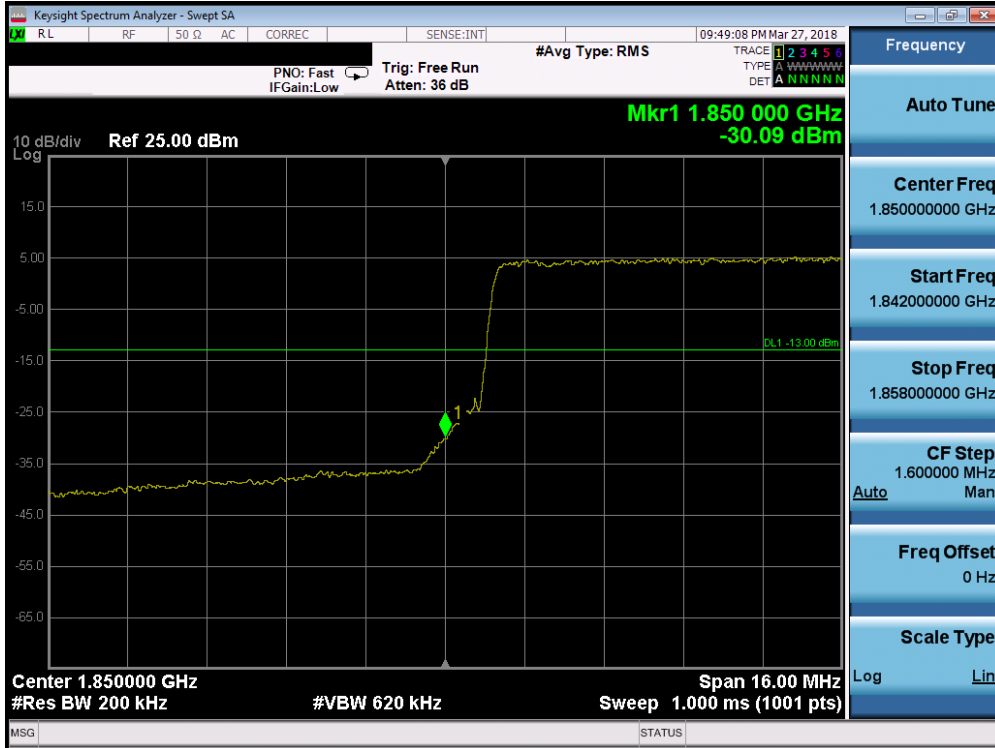


Plot 7-258. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

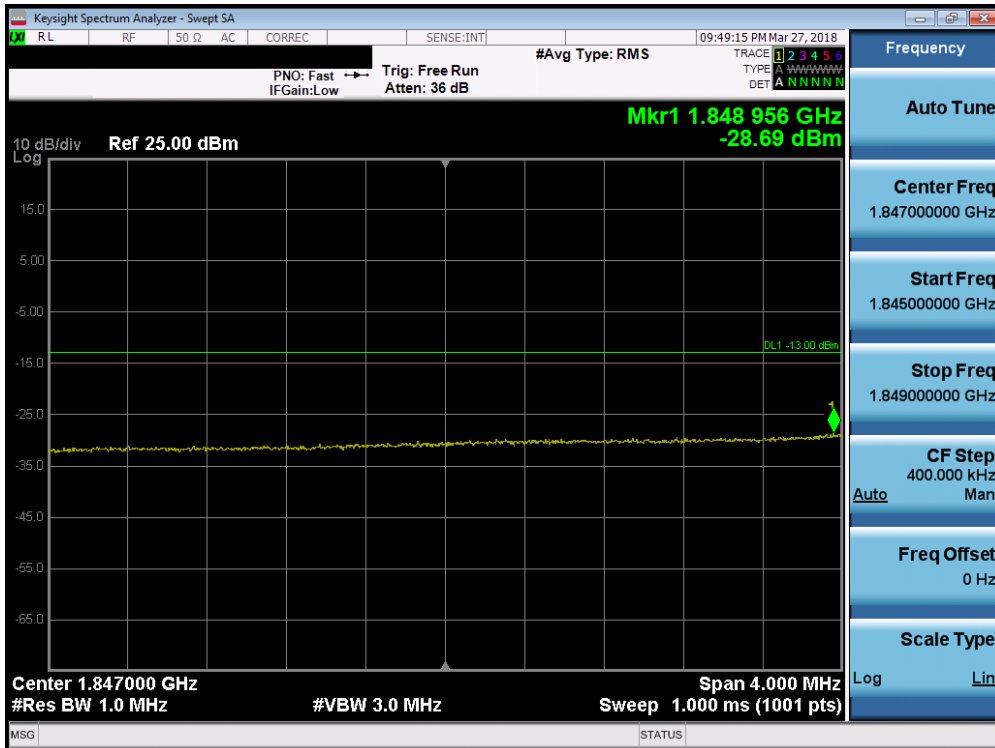


Plot 7-259. Upper Extended Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 153 of 263



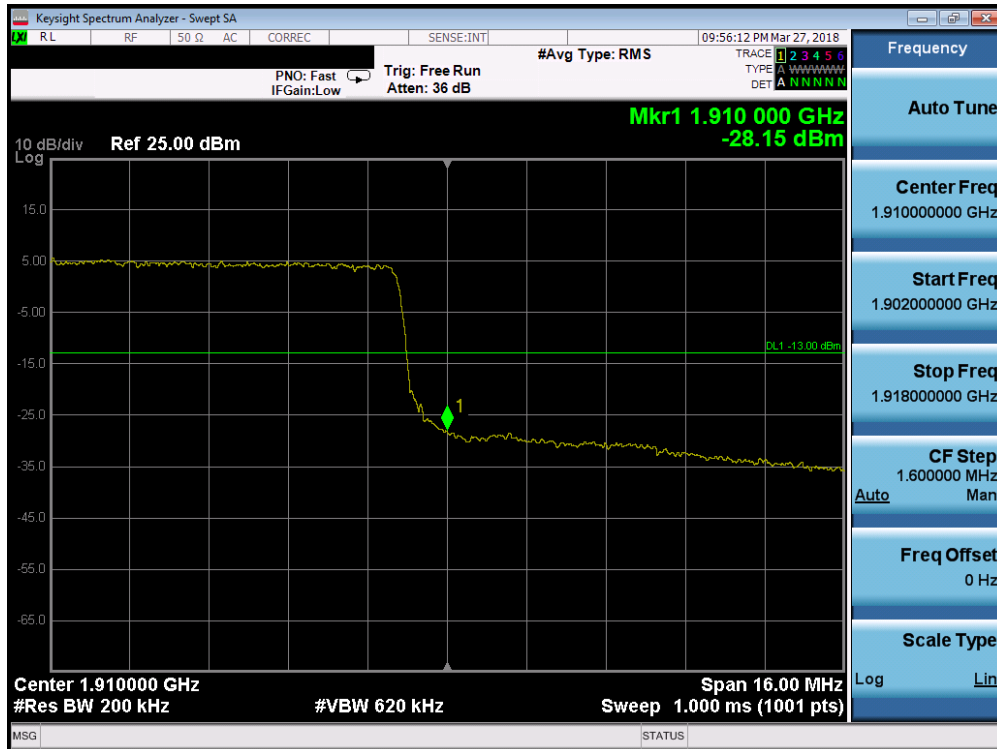
Plot 7-260. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



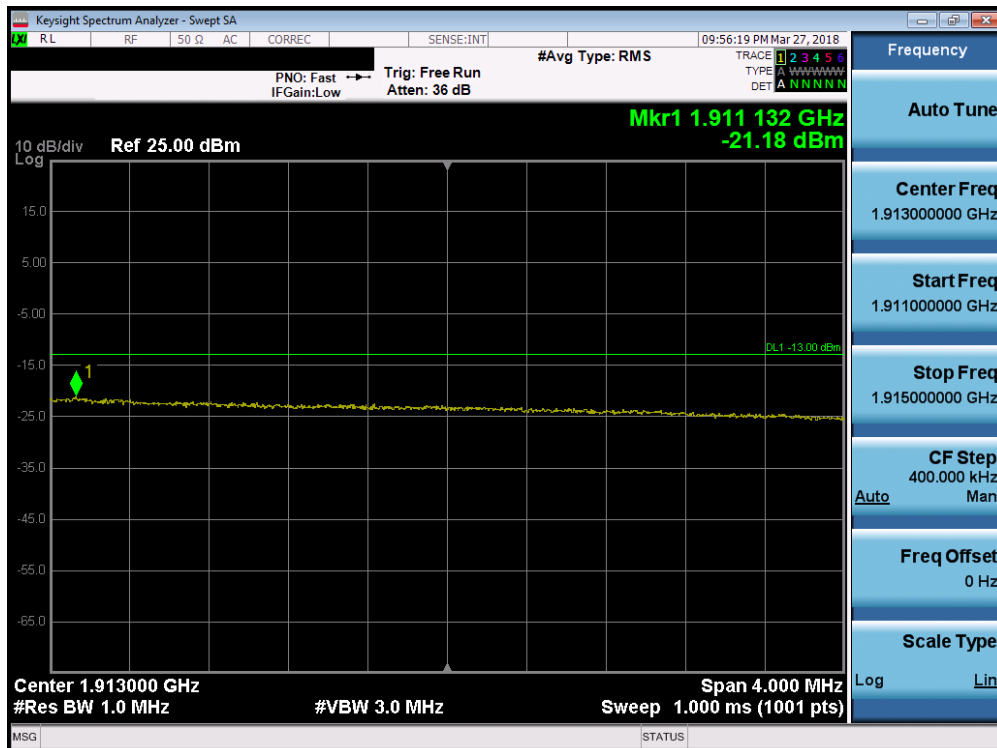
Plot 7-261. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 154 of 263



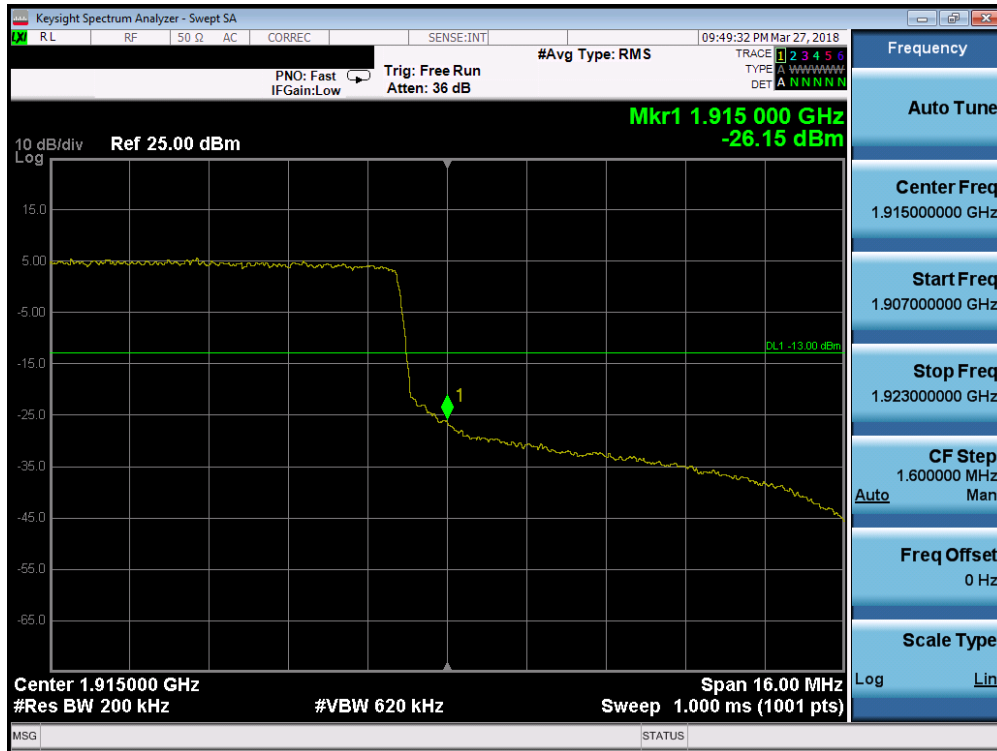


Plot 7-262. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

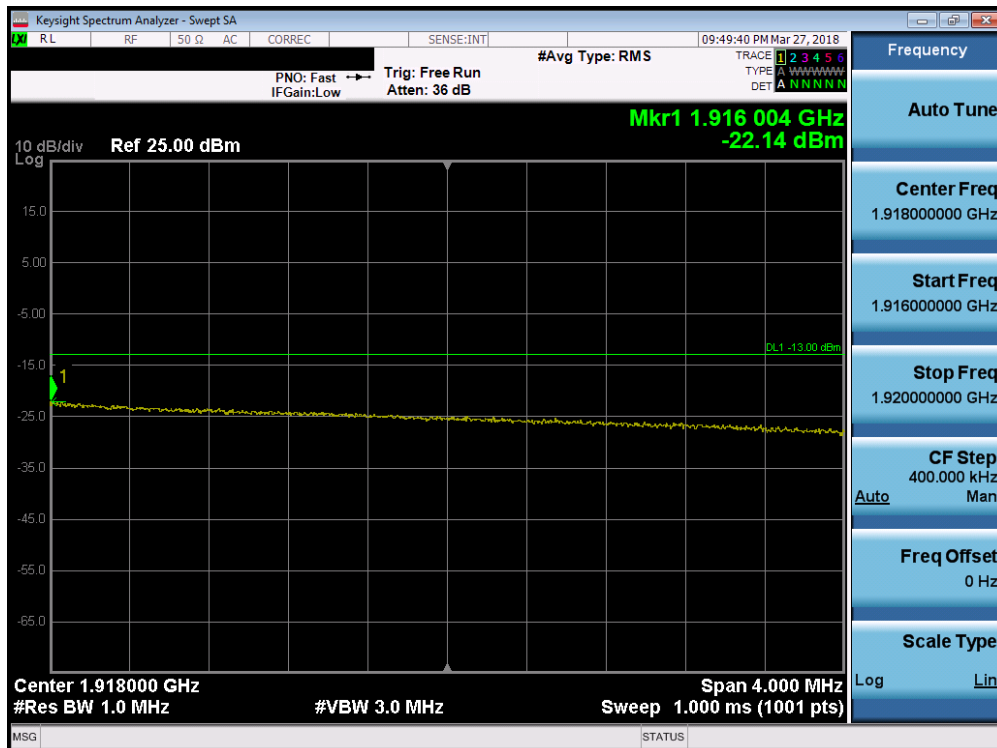


Plot 7-263. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 155 of 263



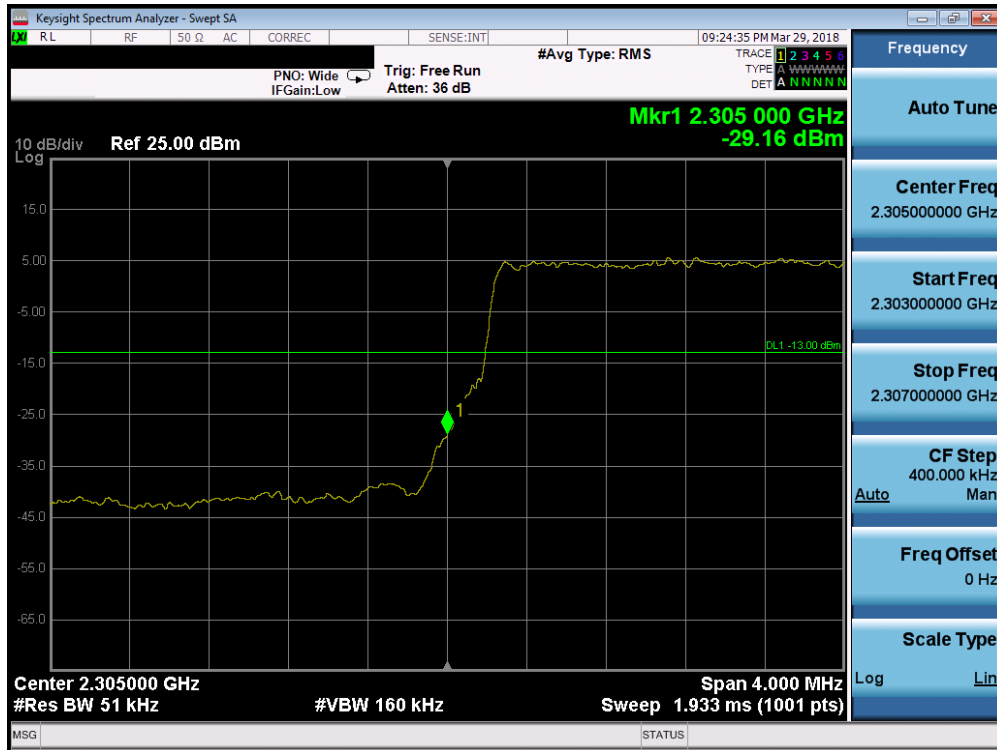
Plot 7-264. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-265. Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 156 of 263

**Band 30**



Plot 7-266. Lower Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-267. Lower Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 157 of 263

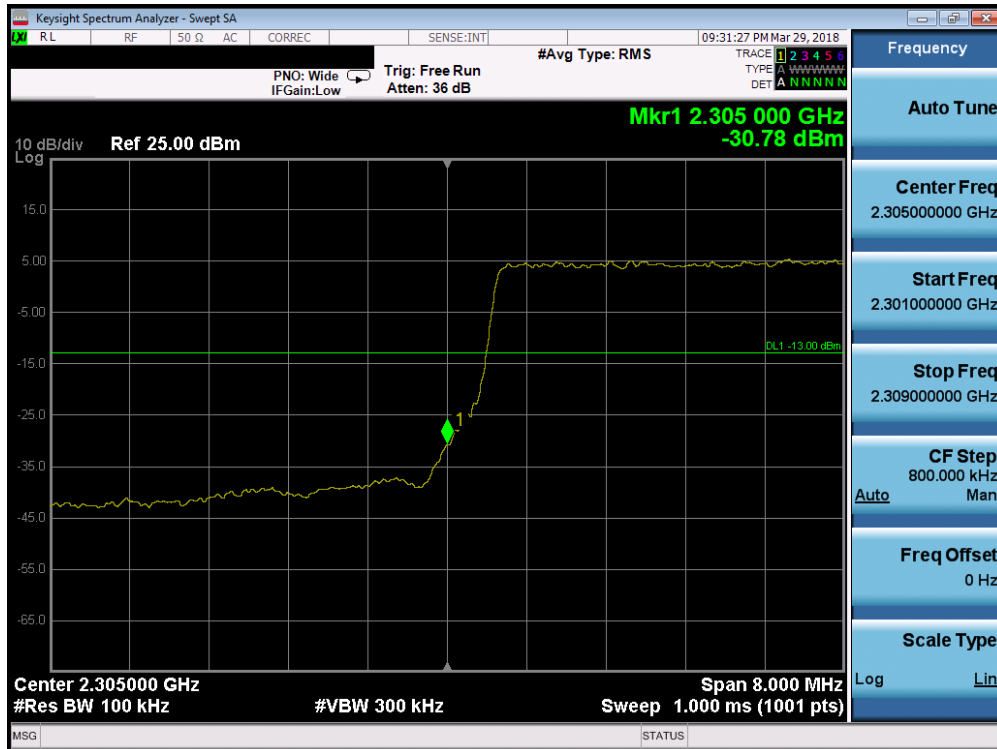


Plot 7-268. Upper Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

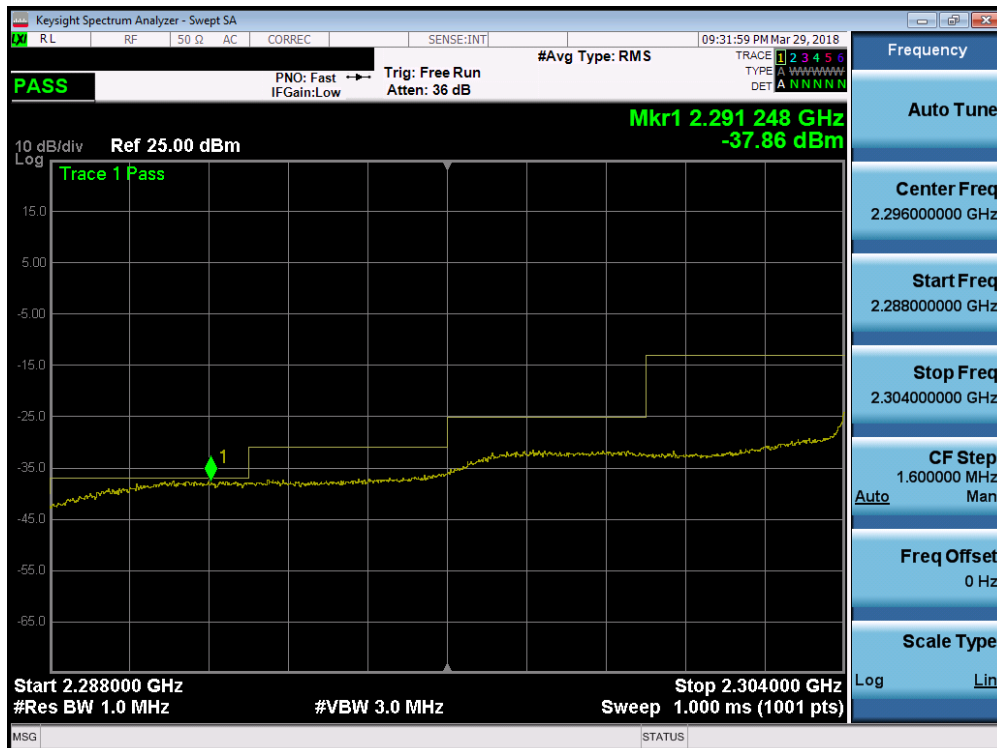


Plot 7-269. Upper Extended Band Edge Plot (Band 30 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 158 of 263



Plot 7-270. Lower Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-271. Lower Extended Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)

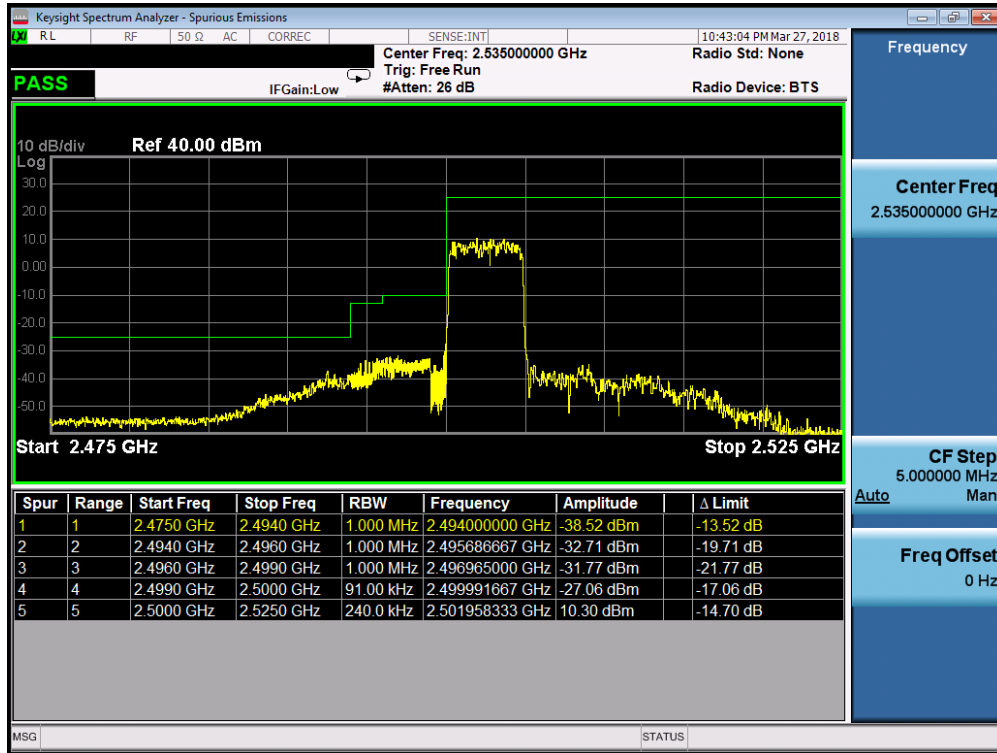
FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 159 of 263



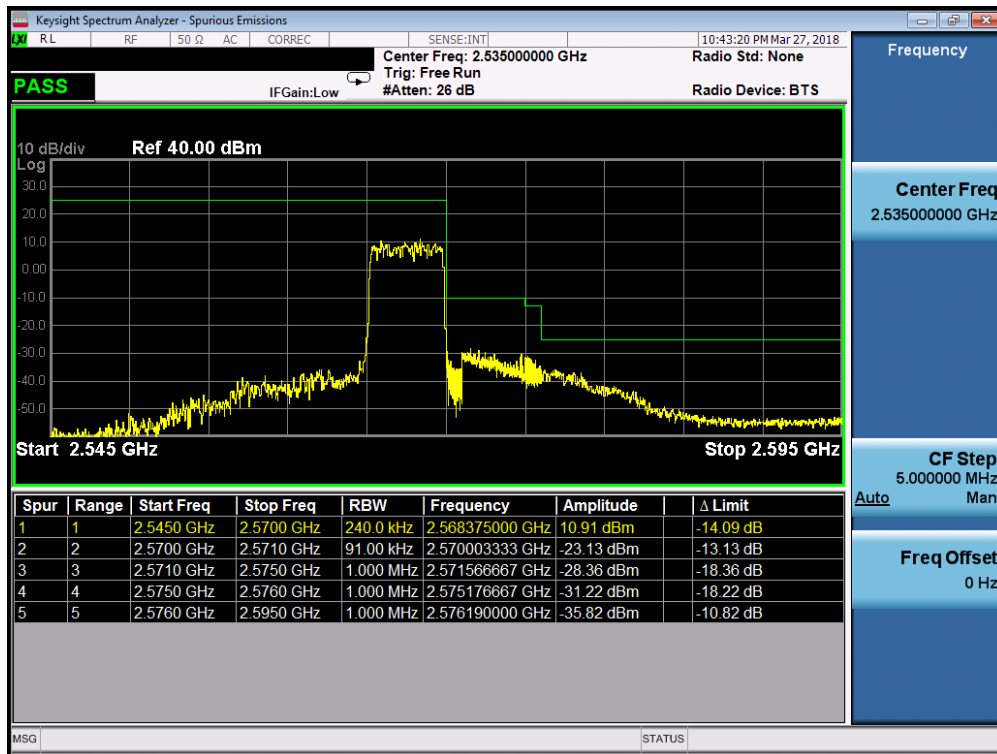
**Plot 7-272. Upper Band Edge Plot (Band 30 - 10.0MHz QPSK - Full RB Configuration)**

FCC ID: ZNFV350A	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 160 of 263	

**Band 7**

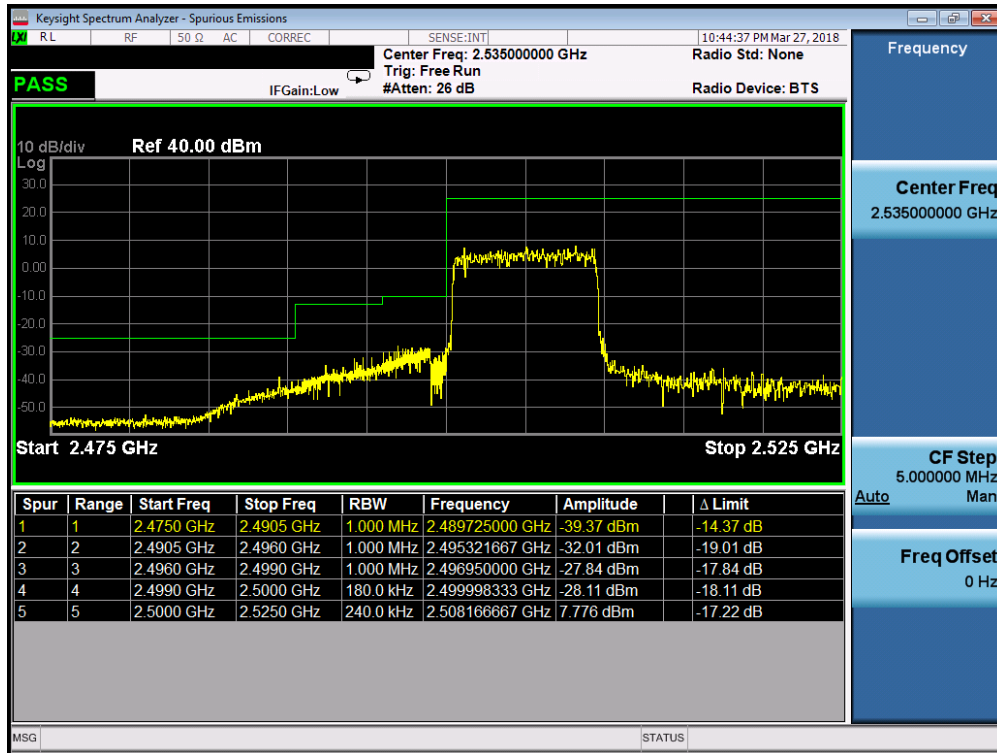


**Plot 7-3. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)**

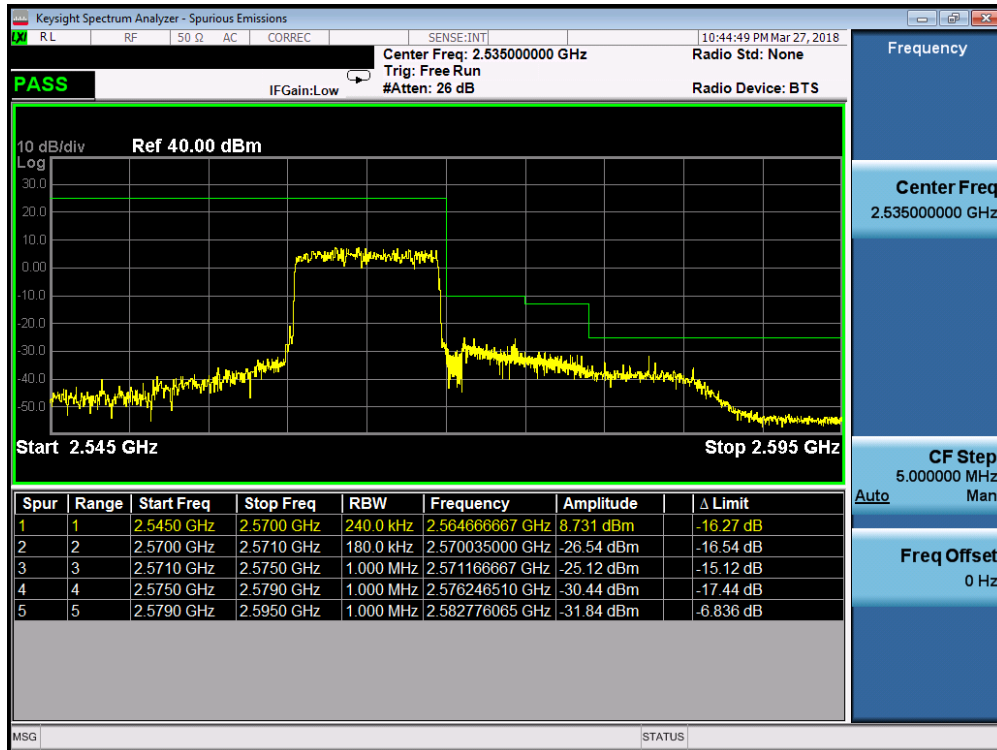


**Plot 7-4. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)**

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 161 of 263



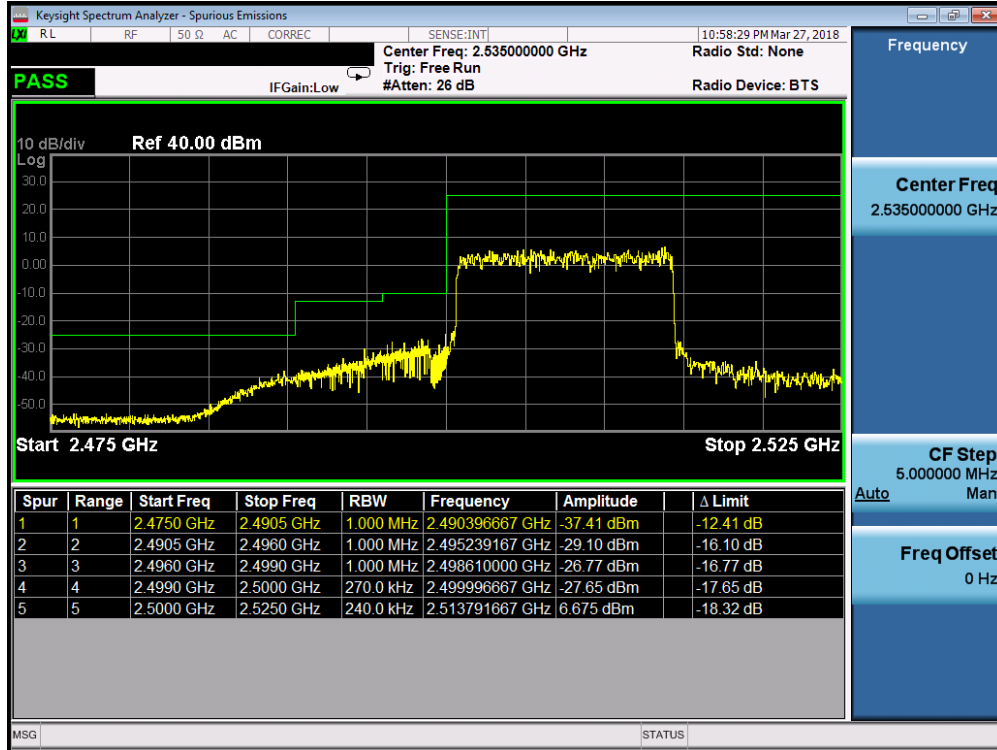
Plot 7-5. Lower ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)



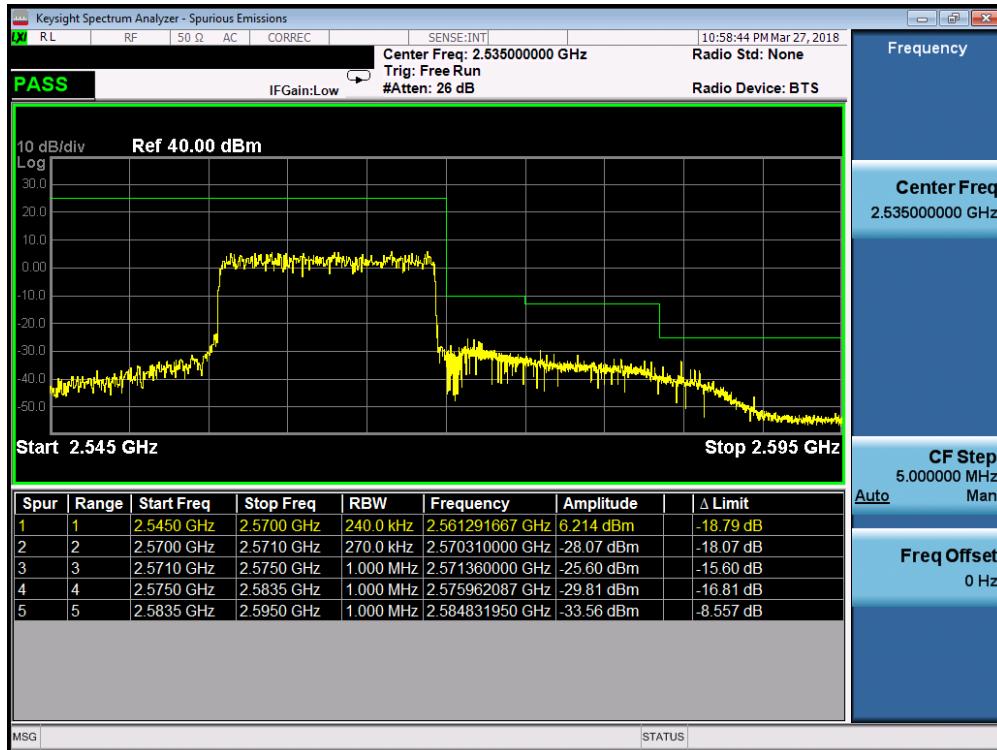
Plot 7-6. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 162 of 263



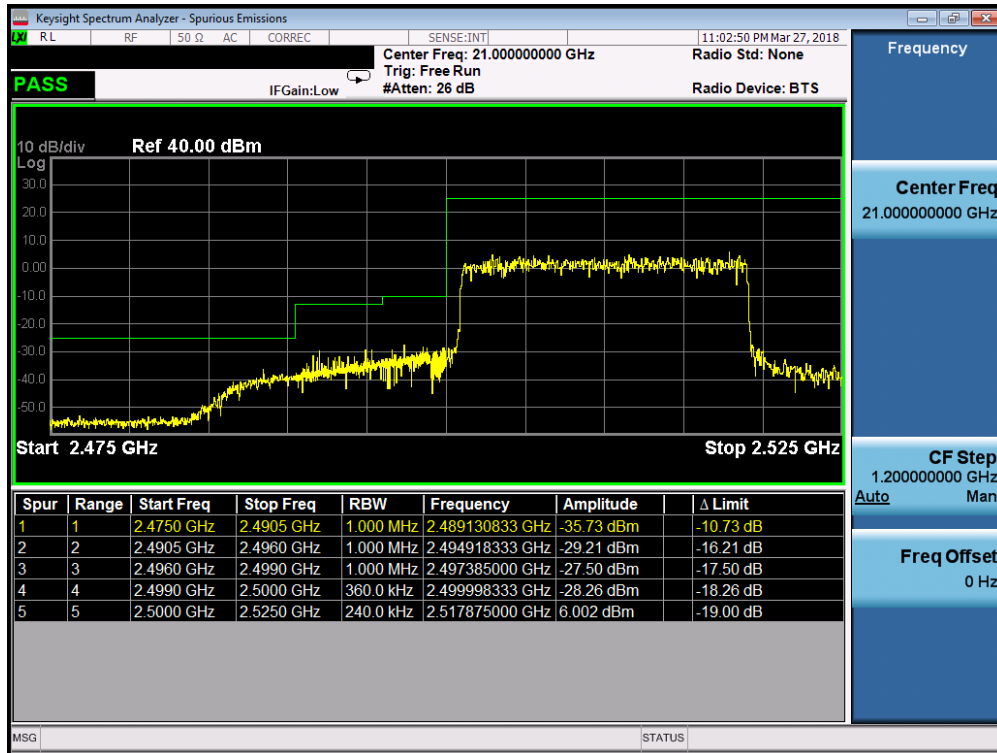


Plot 7-7. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)

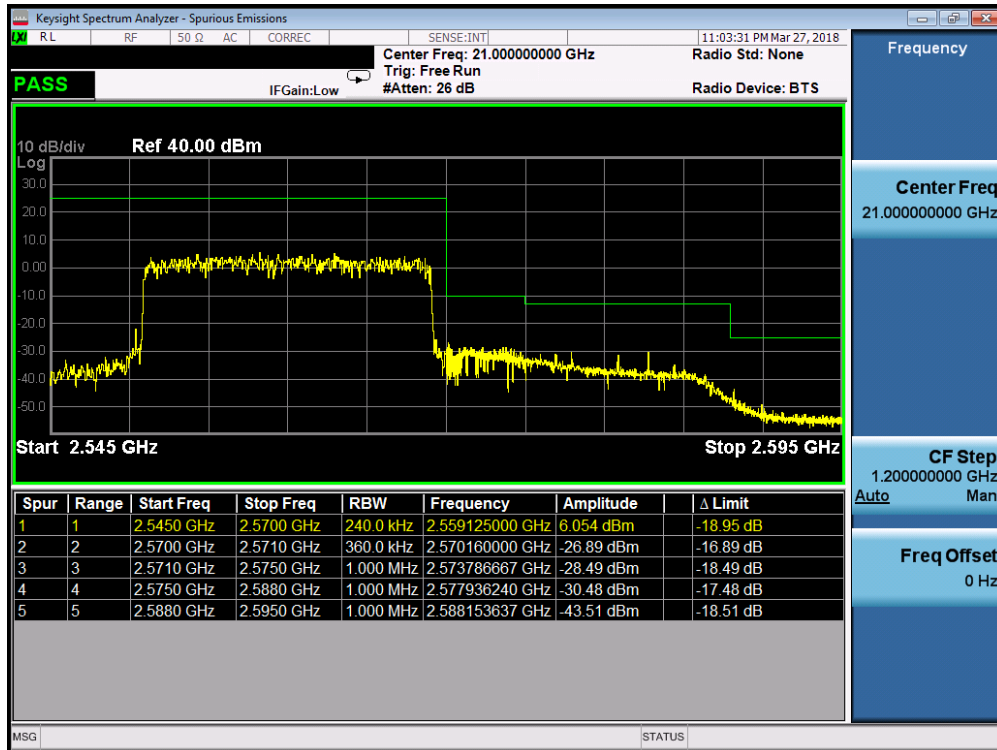


Plot 7-8. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 163 of 263



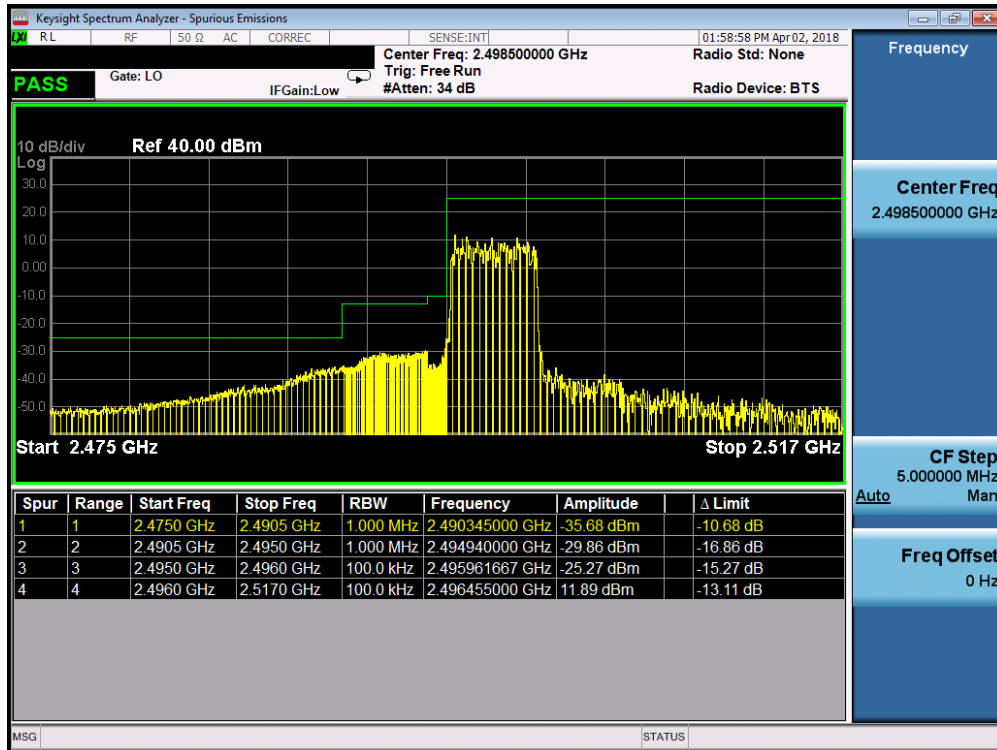
Plot 7-9. Lower ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)



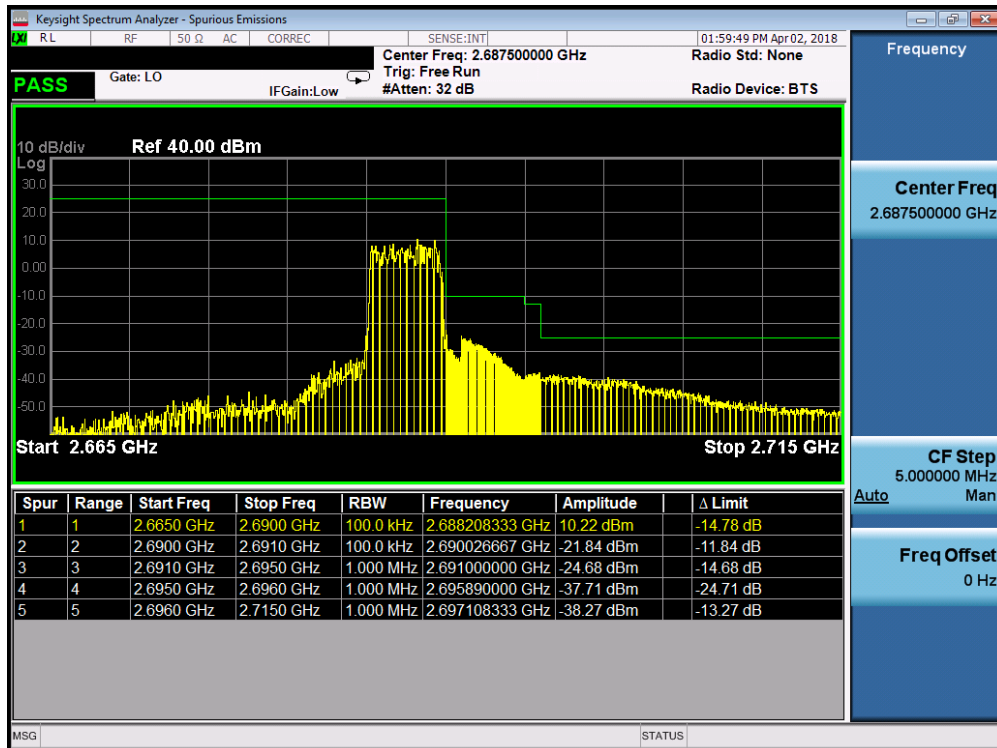
Plot 7-10. Upper ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 164 of 263

# Band 41

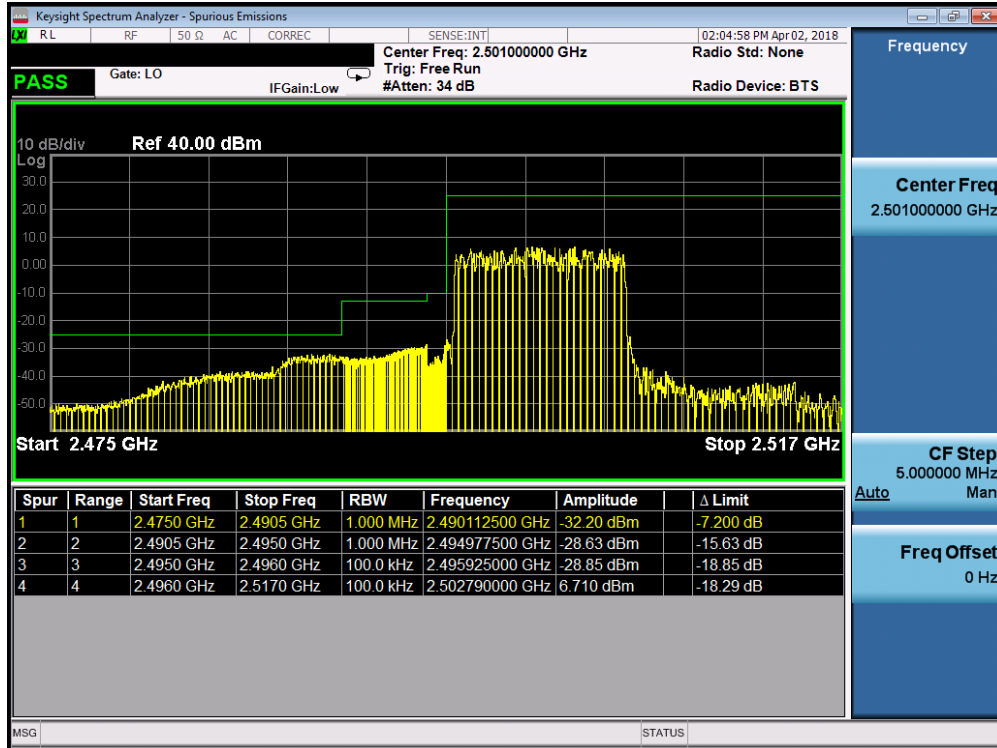


Plot 7-11. PC2 Lower ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)

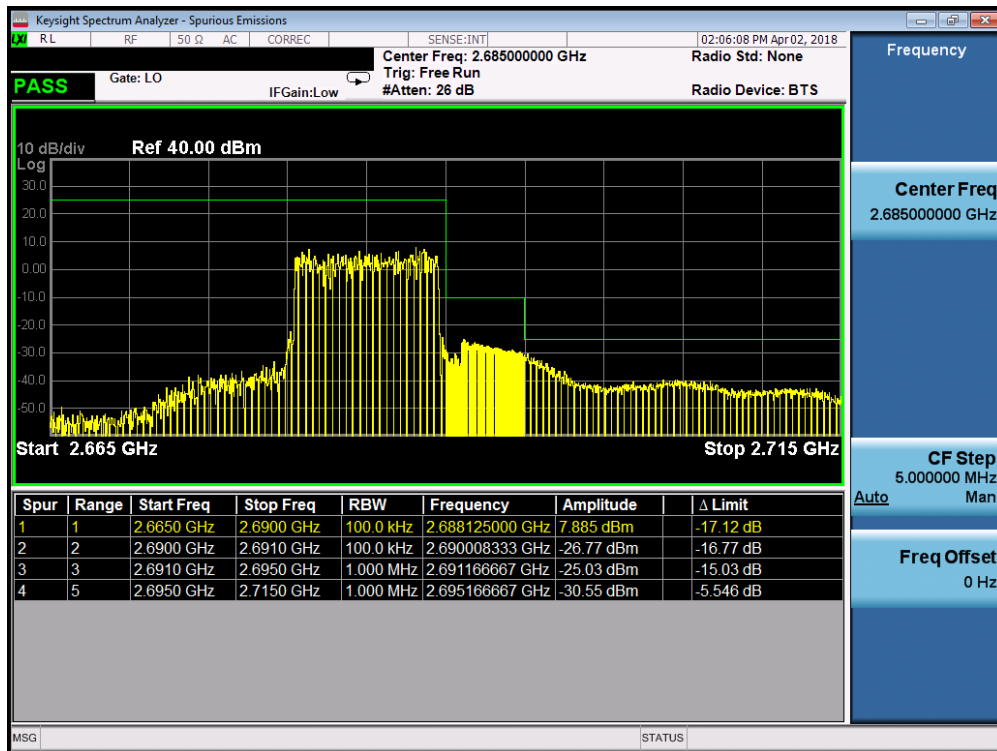


Plot 7-12. PC2 Upper ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 165 of 263

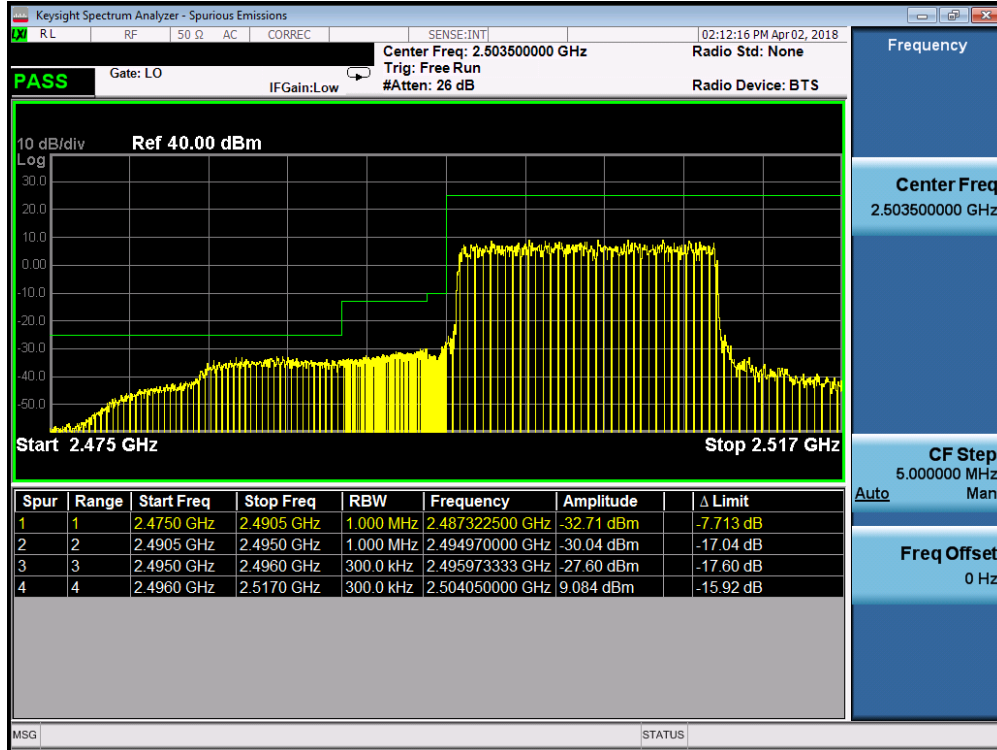


Plot 7-13. PC2 Lower ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)

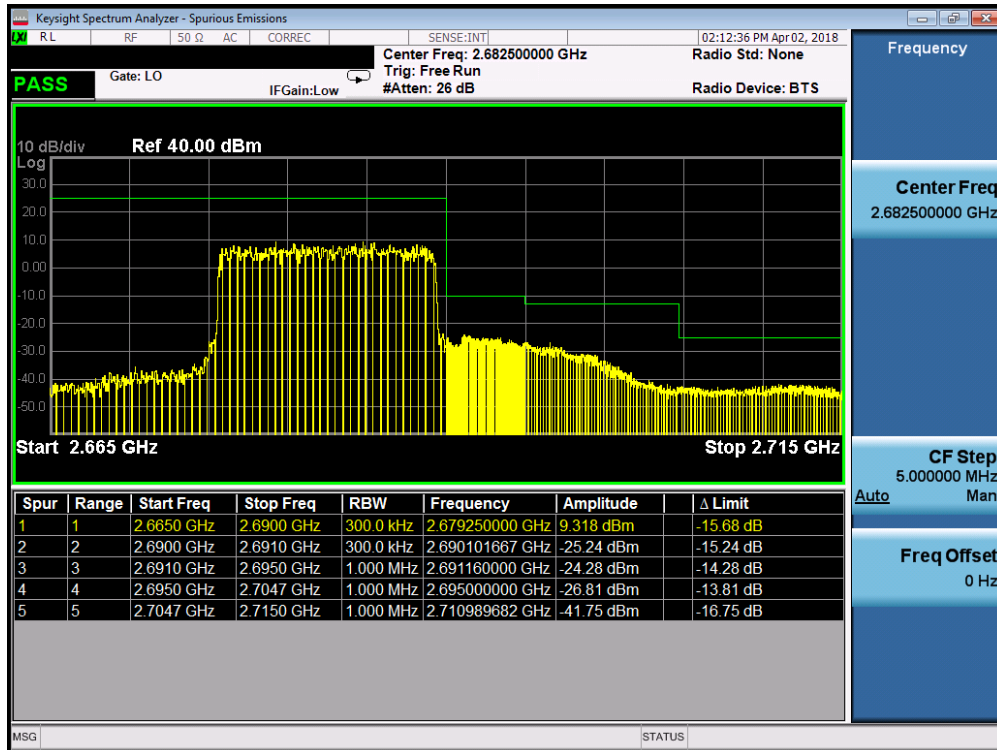


Plot 7-14. PC2 Upper ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 166 of 263

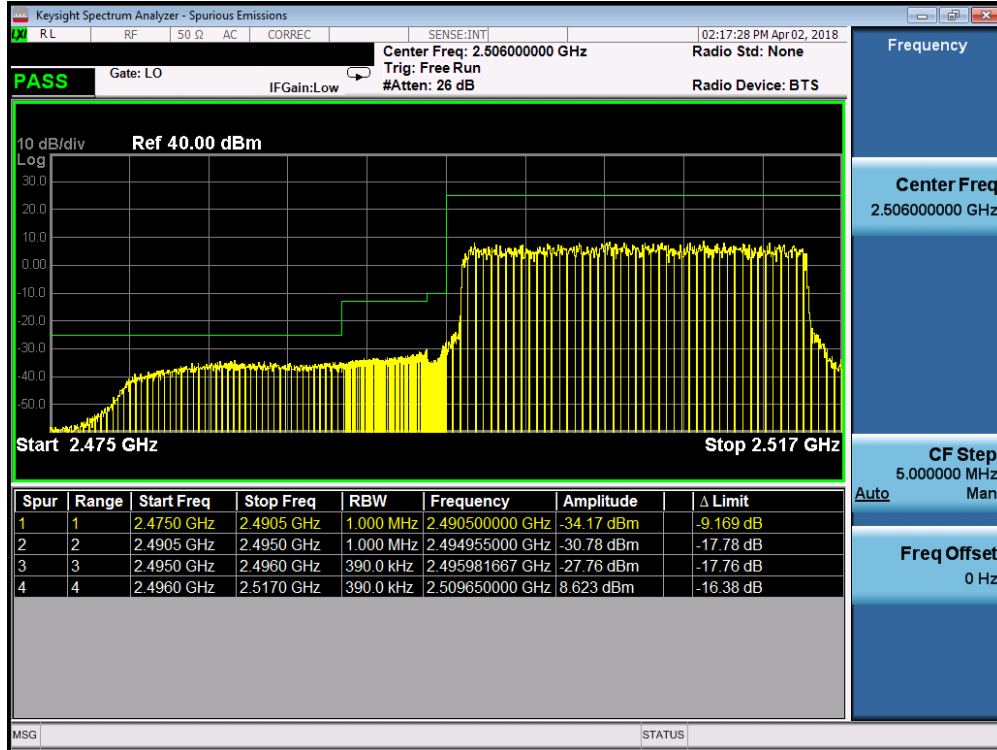


Plot 7-15. PC2 Lower ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)

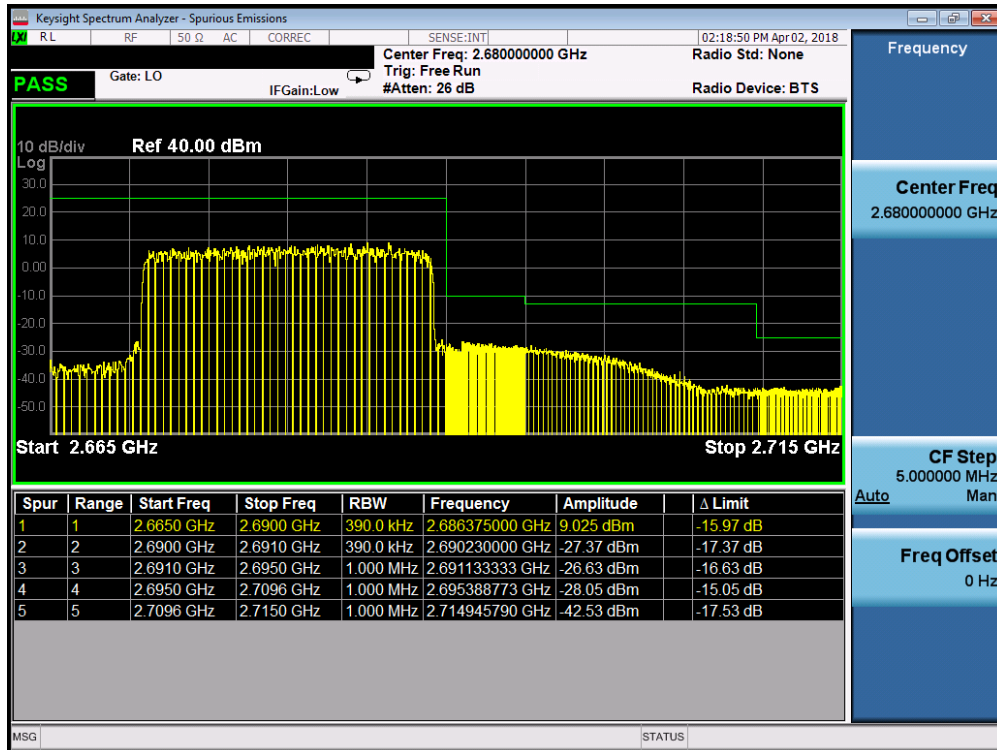


Plot 7-16. PC2 Upper ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 167 of 263



Plot 7-17. PC2 Lower ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)



Plot 7-18. PC2 Upper ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 168 of 263

## 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

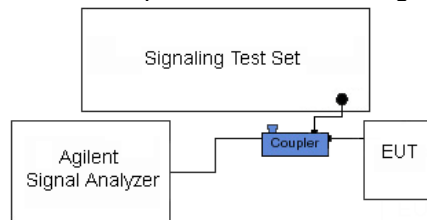
KDB 971168 D01 v03 – Section 5.7.1

### Test Settings

1. The signal analyzer’s CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
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.



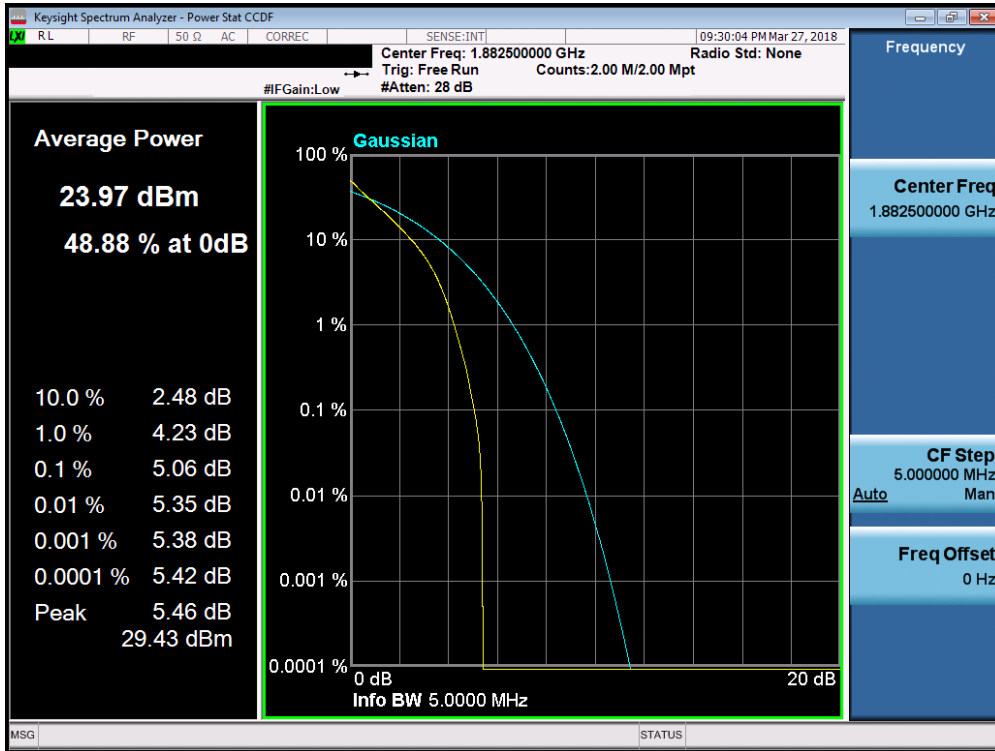
**Figure 7-4. Test Instrument & Measurement Setup**

### Test Notes

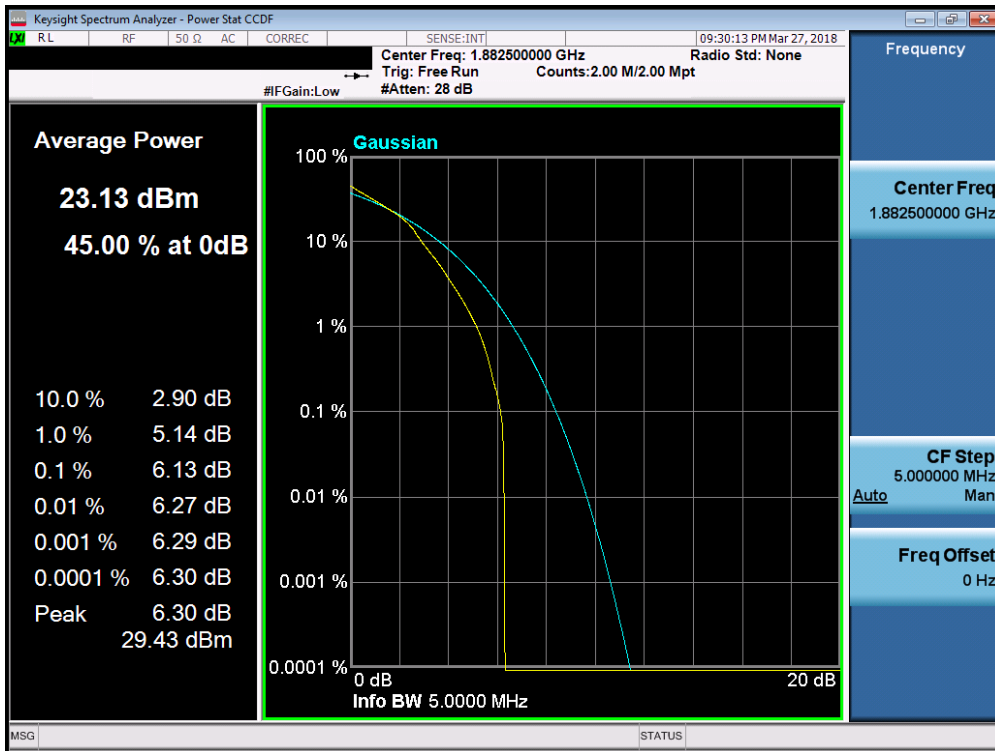
None.

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 169 of 263

**Band 25/2**



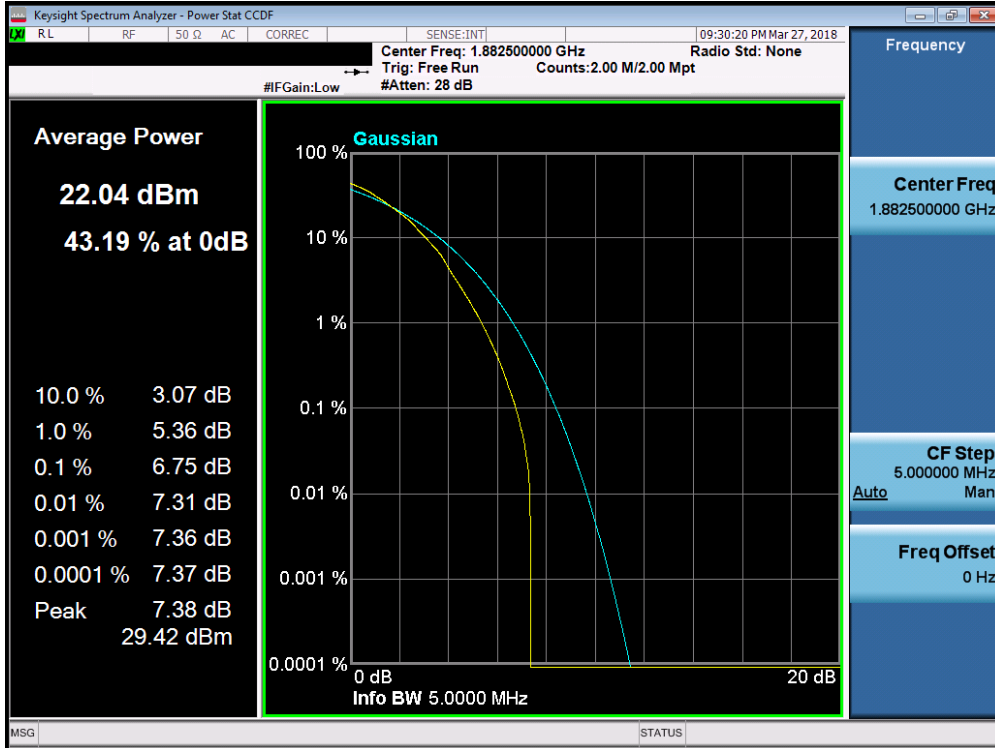
**Plot 7-273. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)**



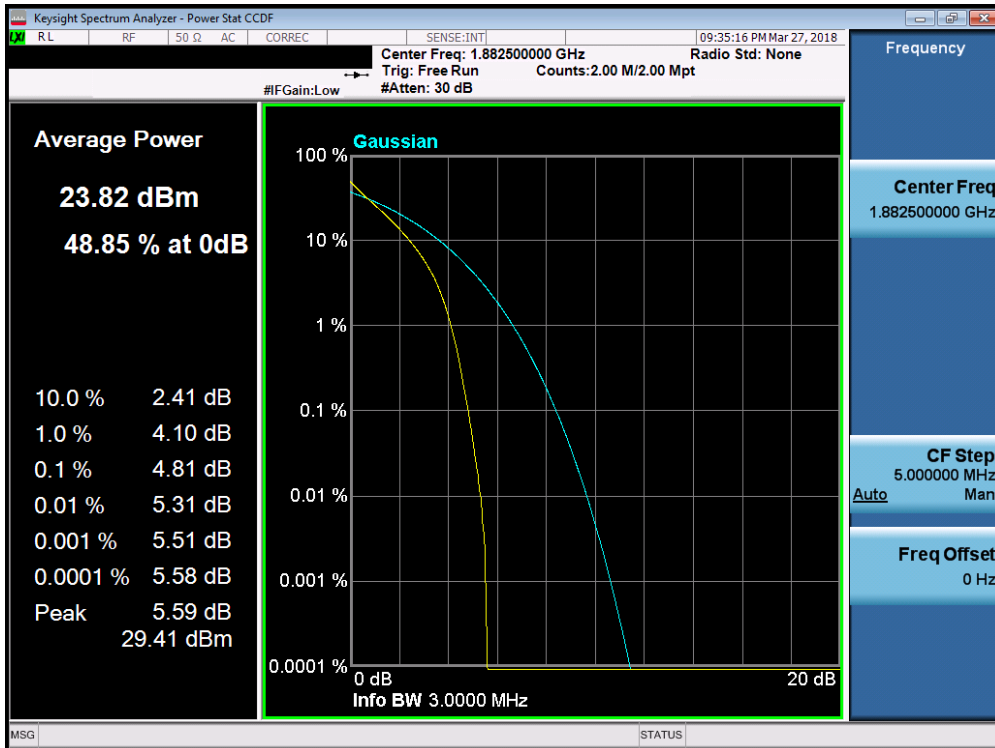
**Plot 7-274. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 170 of 263



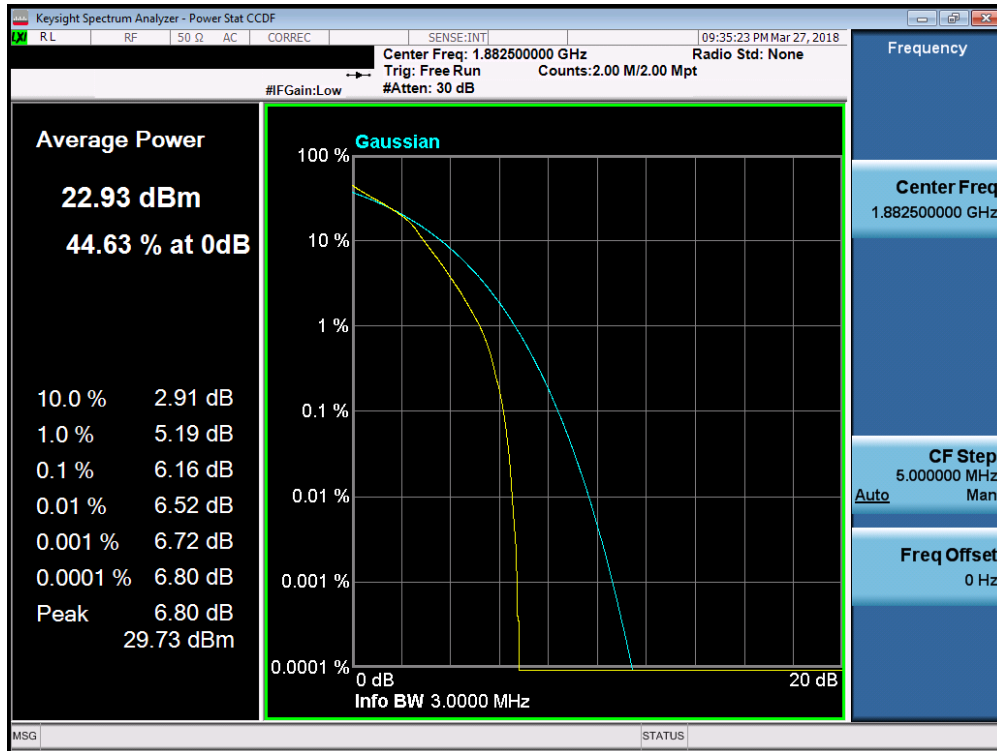


Plot 7-275. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)

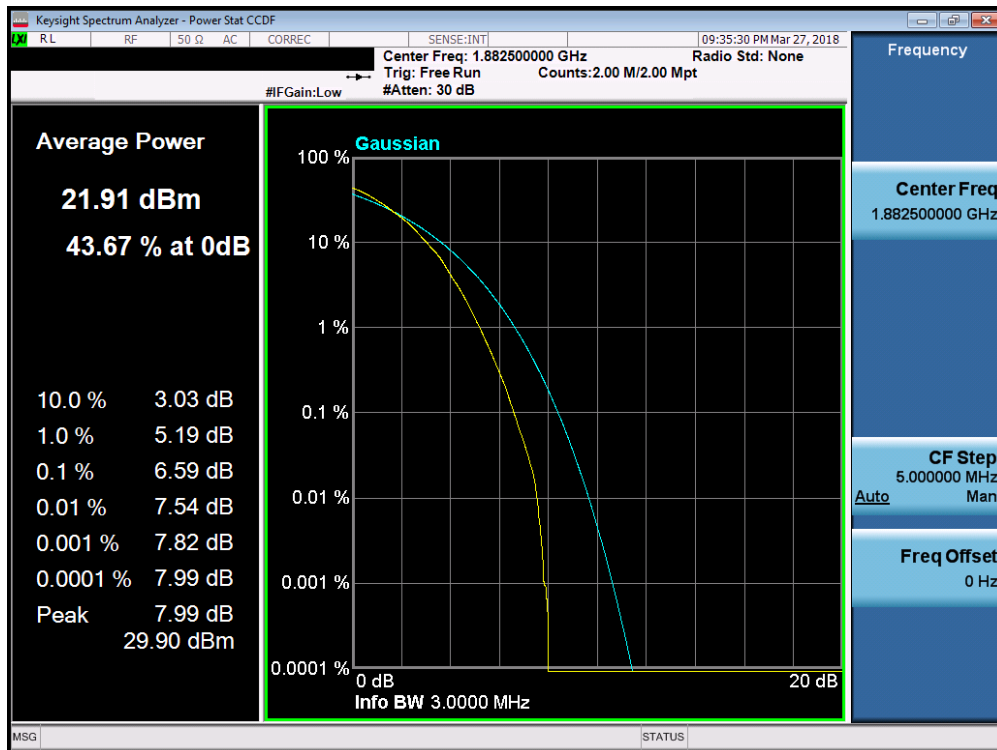


Plot 7-276. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 171 of 263

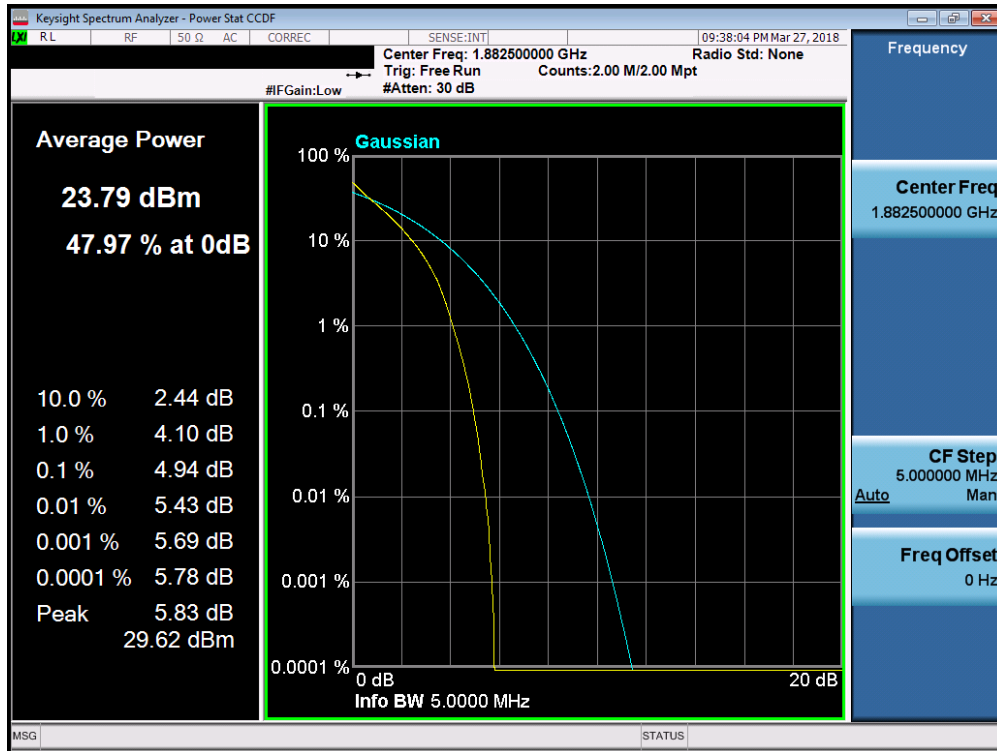


Plot 7-277. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)

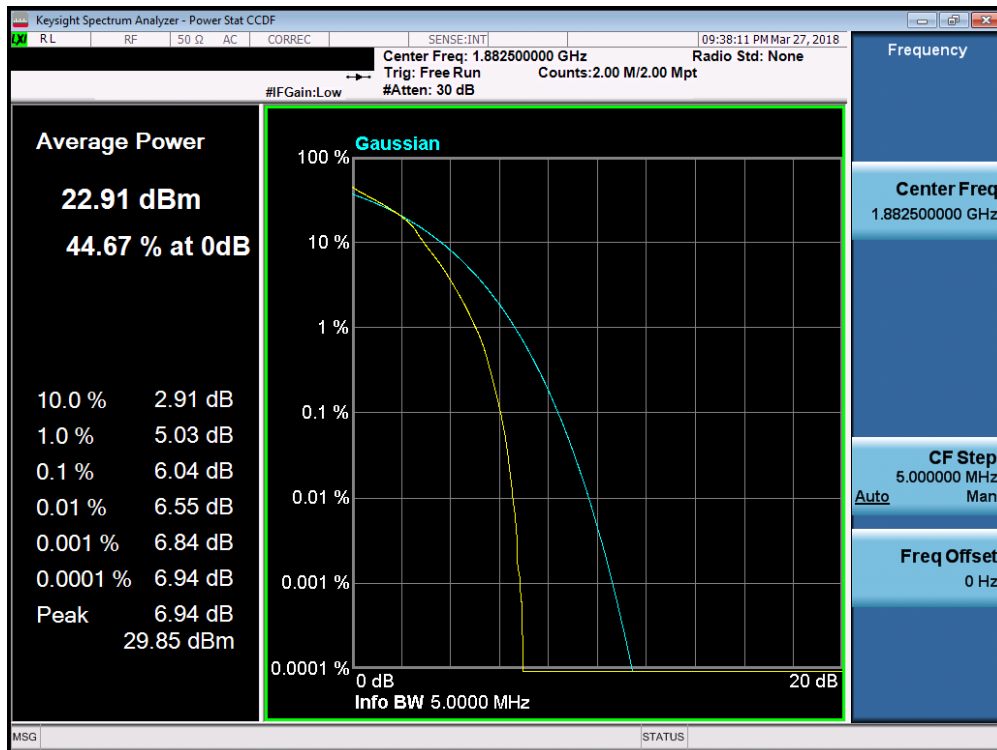


Plot 7-278. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFV350A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 172 of 263

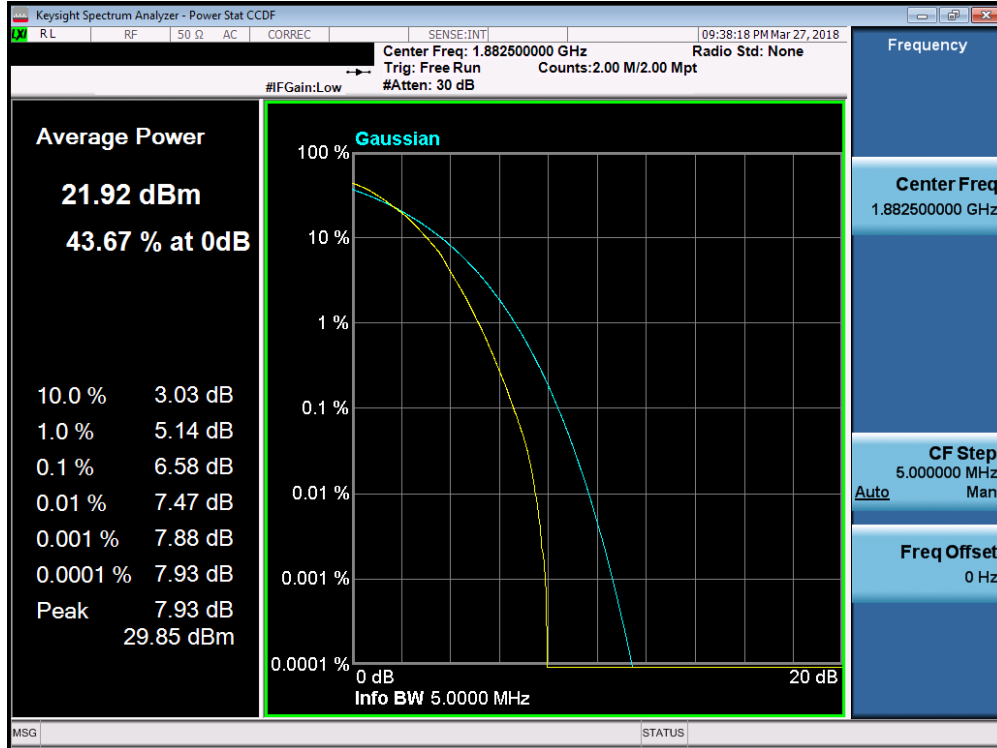


Plot 7-279. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

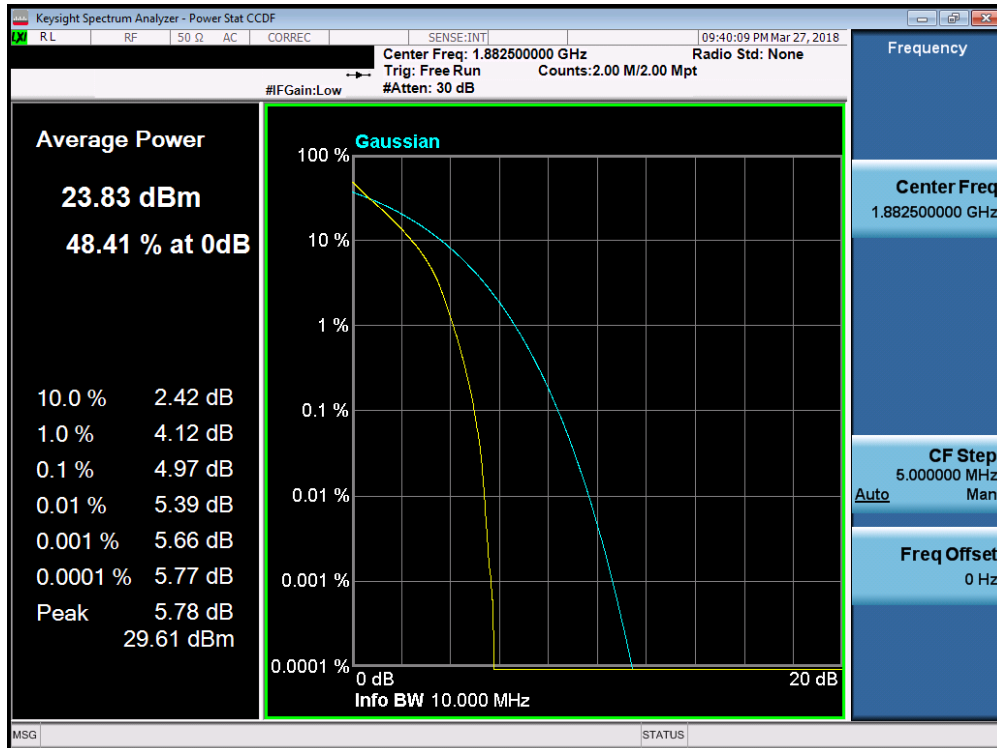


Plot 7-280. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFV350A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 173 of 263

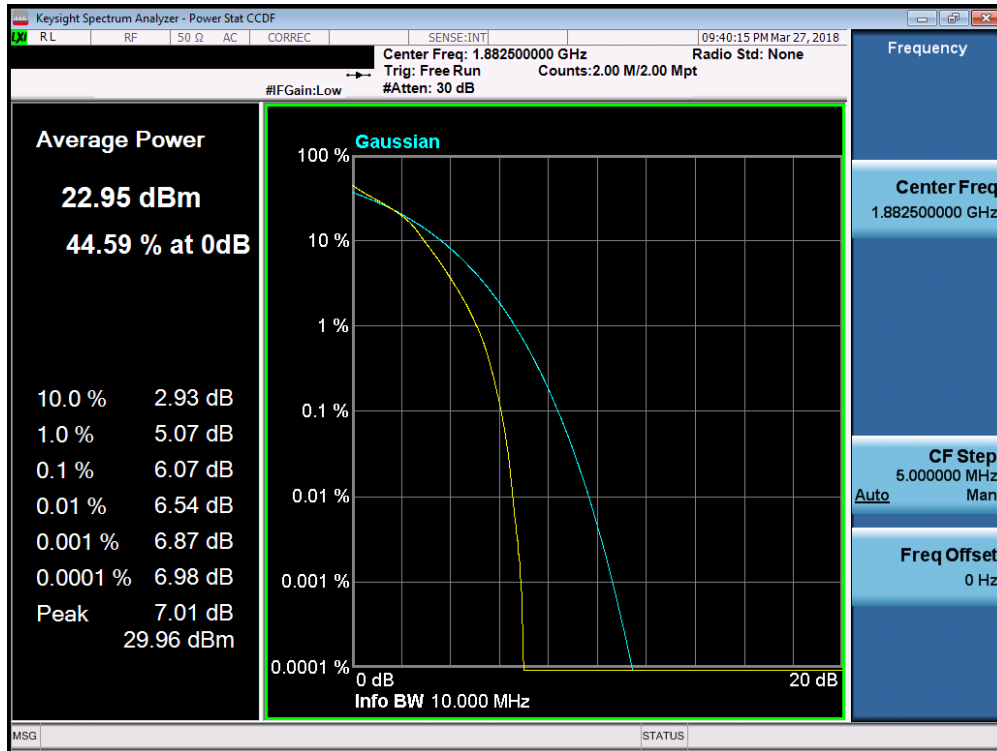


Plot 7-281. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)

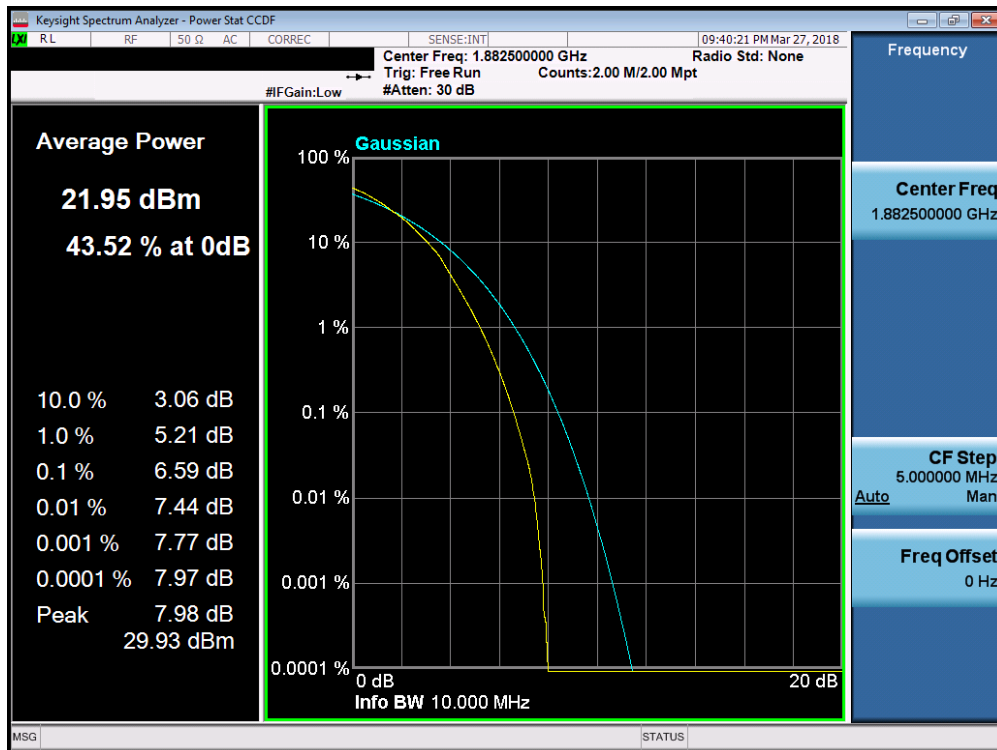


Plot 7-282. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 174 of 263

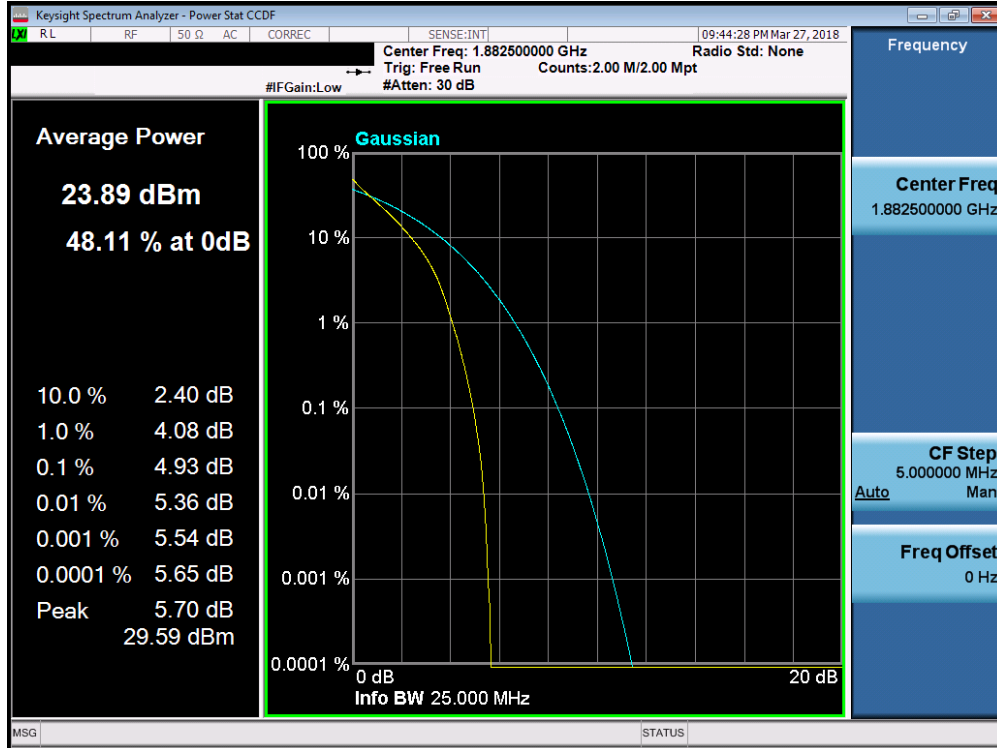


Plot 7-283. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)

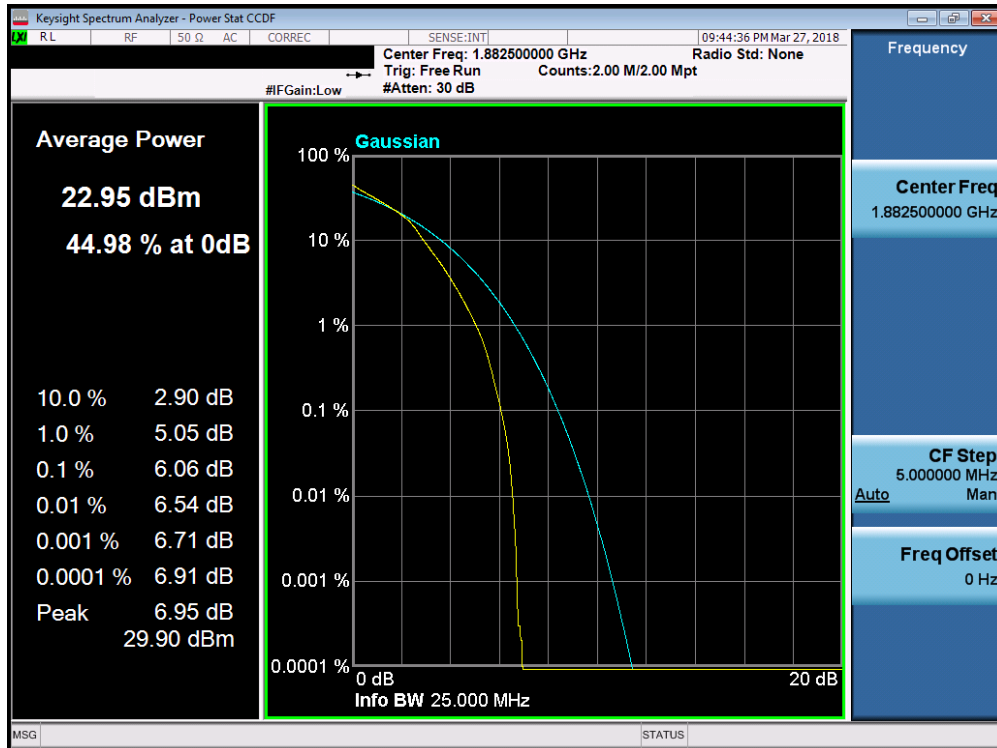


Plot 7-284. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFV350A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 175 of 263

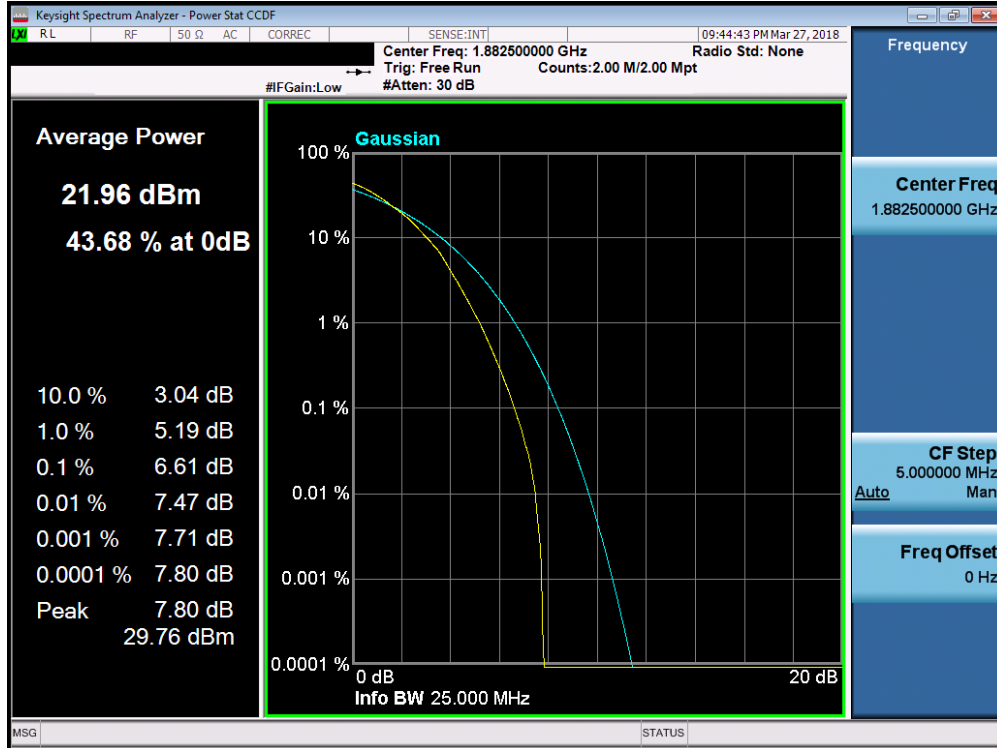


Plot 7-285. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

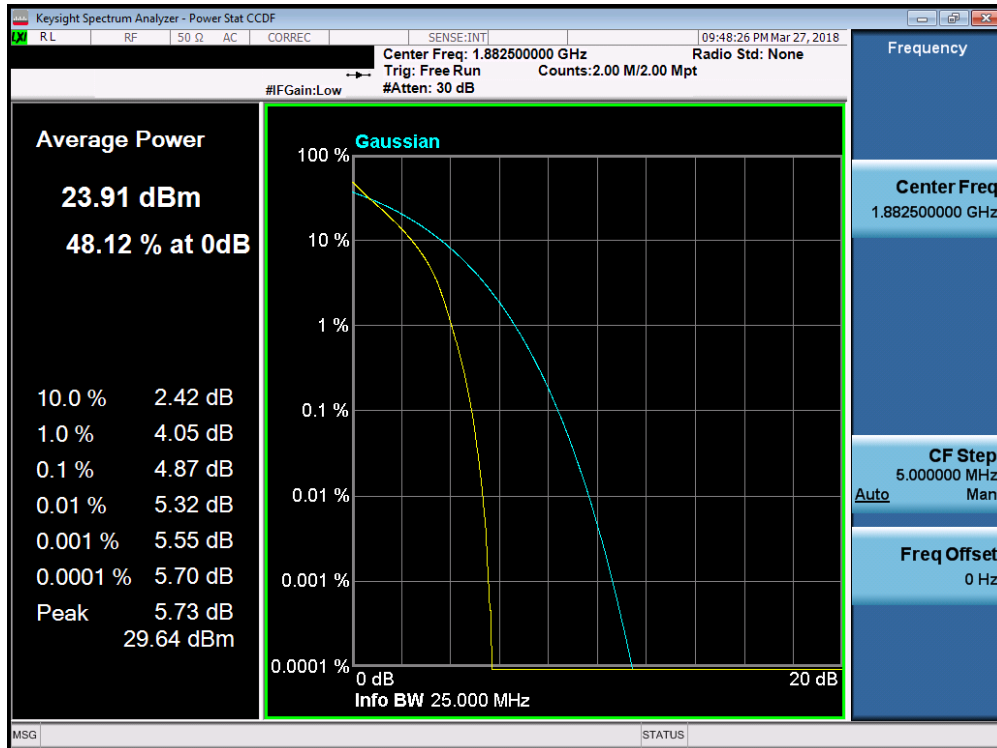


Plot 7-286. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 176 of 263

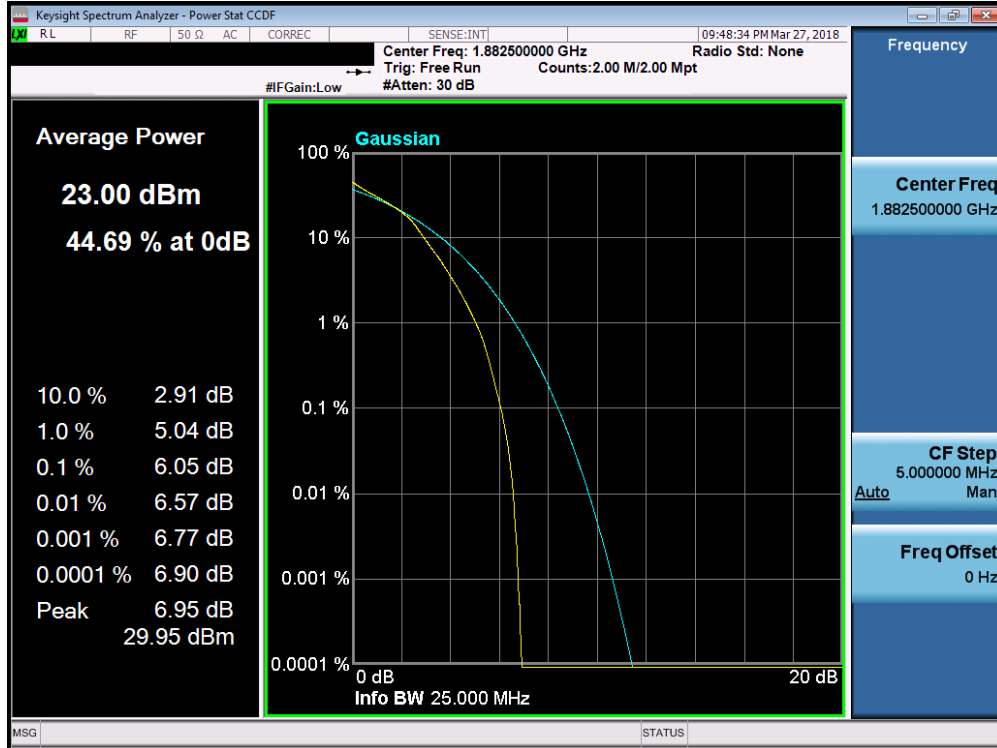


**Plot 7-287. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)**

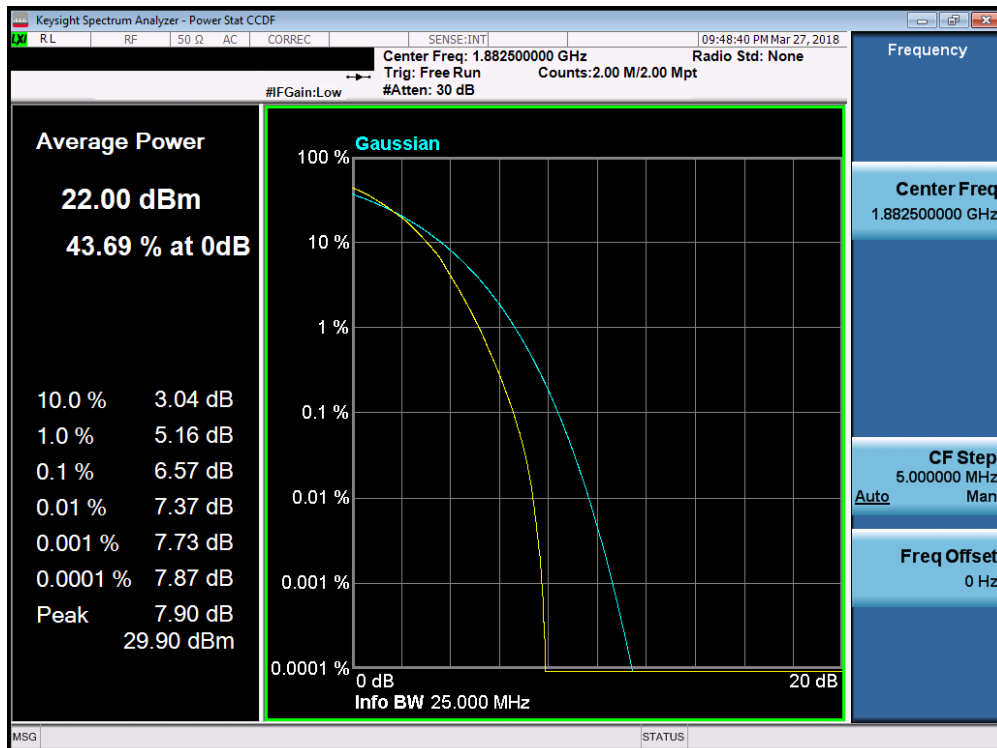


**Plot 7-288. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)**

FCC ID: ZNFV350A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 177 of 263



Plot 7-289. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-290. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 178 of 263



## 7.6 Uplink Carrier Aggregation Band 41 §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 10<sup>th</sup> 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 41, the minimum permissible attenuation level of any spurious emission is  $55 + \log_{10}(P_{[Watts]})$ .***

### Test Procedure Used

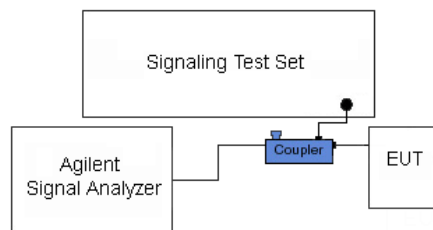
KDB 971168 D01 v03 – Section 6.0

### Test Settings

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

### Test Setup

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



**Figure 7-5. Test Instrument & Measurement Setup**

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 179 of 263

### 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 7-503 and 7-504 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.

Power State	PCC							SCC							Power ULCA Tx.Power (dBm)
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	
Max	LTE B41	10	39700	2501	QPSK	1	49	LTE B41	20	39844	2515.4	QPSK	1	0	23.60
Max	LTE B41	10	40620	2593	QPSK	1	49	LTE B41	20	40764	2607.4	QPSK	1	0	23.45
Max	LTE B41	20	41396	2670.6	QPSK	1	99	LTE B41	10	41540	2685	QPSK	1	0	23.23
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	15	39875	2518.5	QPSK	1	0	23.60
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	20	39896	2520.6	QPSK	1	0	23.51
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	15	40770	2608	QPSK	1	0	23.55
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	20	40791	2610.1	QPSK	1	0	23.47
Max	LTE B41	15	41365	2667.5	QPSK	1	74	LTE B41	15	41515	2682.5	QPSK	1	0	23.50
Max	LTE B41	20	41344	2665.4	QPSK	1	99	LTE B41	15	41515	2682.5	QPSK	1	0	23.46
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	10	39894	2520.4	QPSK	1	0	23.53
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	15	39921	2523.1	QPSK	1	0	23.44
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	23.56
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	10	40764	2607.4	QPSK	1	0	23.52
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	15	40791	2610.1	QPSK	1	0	23.50
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	23.59
Max	LTE B41	10	41346	2665.6	QPSK	1	49	LTE B41	20	41490	2680	QPSK	1	0	23.58
Max	LTE B41	15	41319	2662.9	QPSK	1	74	LTE B41	20	41490	2680	QPSK	1	0	23.51
Max	LTE B41	20	41292	2660.2	QPSK	1	99	LTE B41	20	41490	2680	QPSK	1	0	23.09

**Table 7-19. Conducted Powers (B41 – PCC: RB Size 1 Offset Max SCC: RB Size 1 Offset 0)**

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Power State	PCC								SCC						Power ULCA Tx.Power (dBm)
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	0	19.22
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	99	17.21
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	99	13.13
Max	LTE B41	20	39750	2506	QPSK	1	50	LTE B41	20	39948	2525.8	QPSK	1	50	18.29
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	23.54
Max	LTE B41	20	39750	2506	QPSK	100	0	LTE B41	20	39948	2525.8	QPSK	100	0	20.54
Max	LTE B41	20	39750	2506	16-QAM	100	0	LTE B41	20	39948	2525.8	16-QAM	100	0	19.49
Max	LTE B41	20	39750	2506	64-QAM	100	0	LTE B41	20	39948	2525.8	64-QAM	100	0	18.44

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

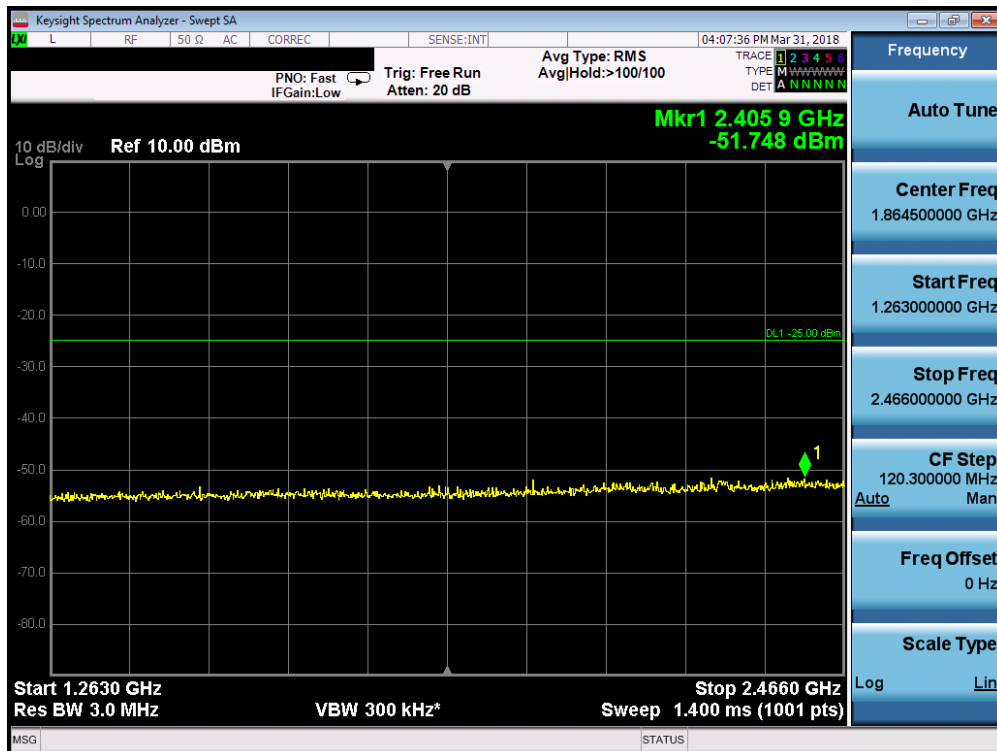


Table 7-291. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 181 of 263

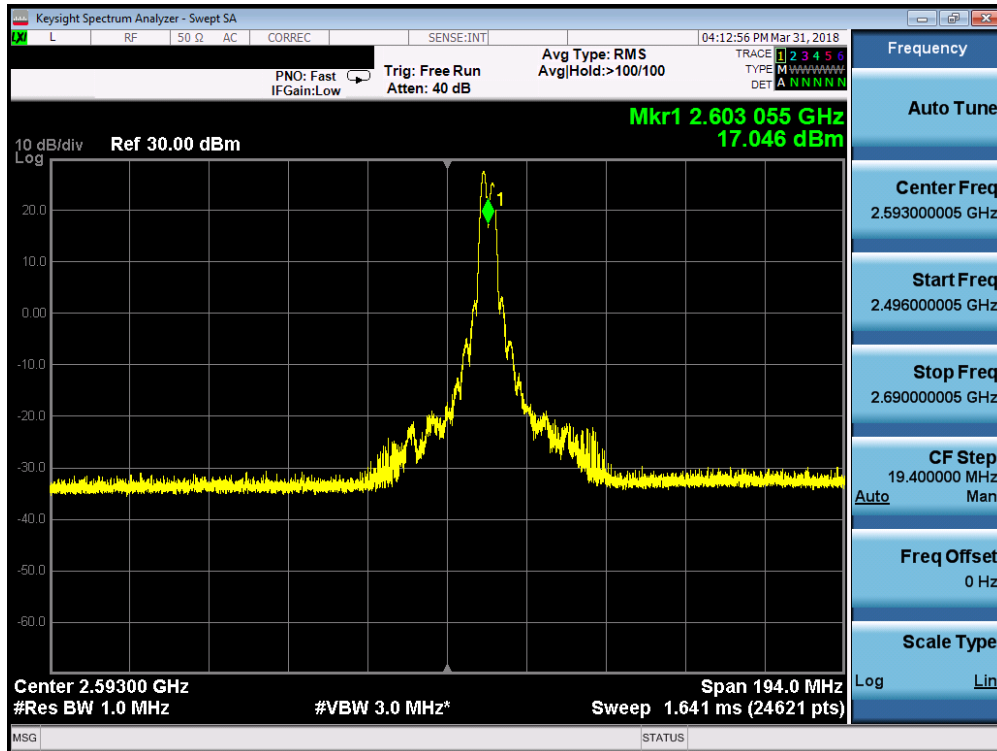


Table 7-292. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

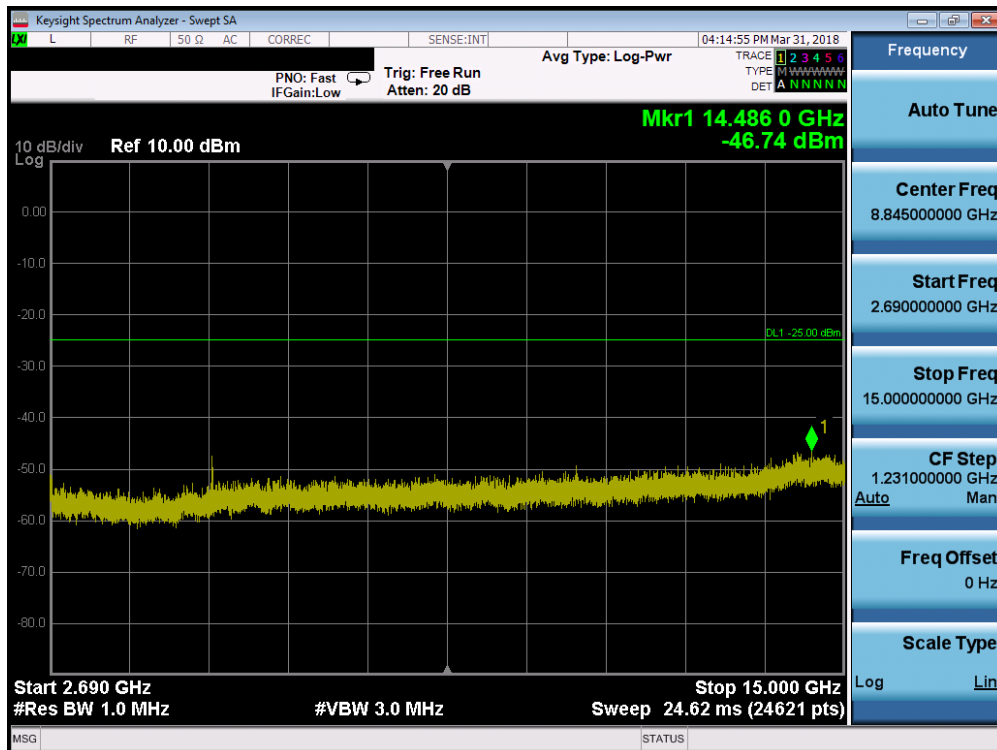


Table 7-293. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 182 of 263

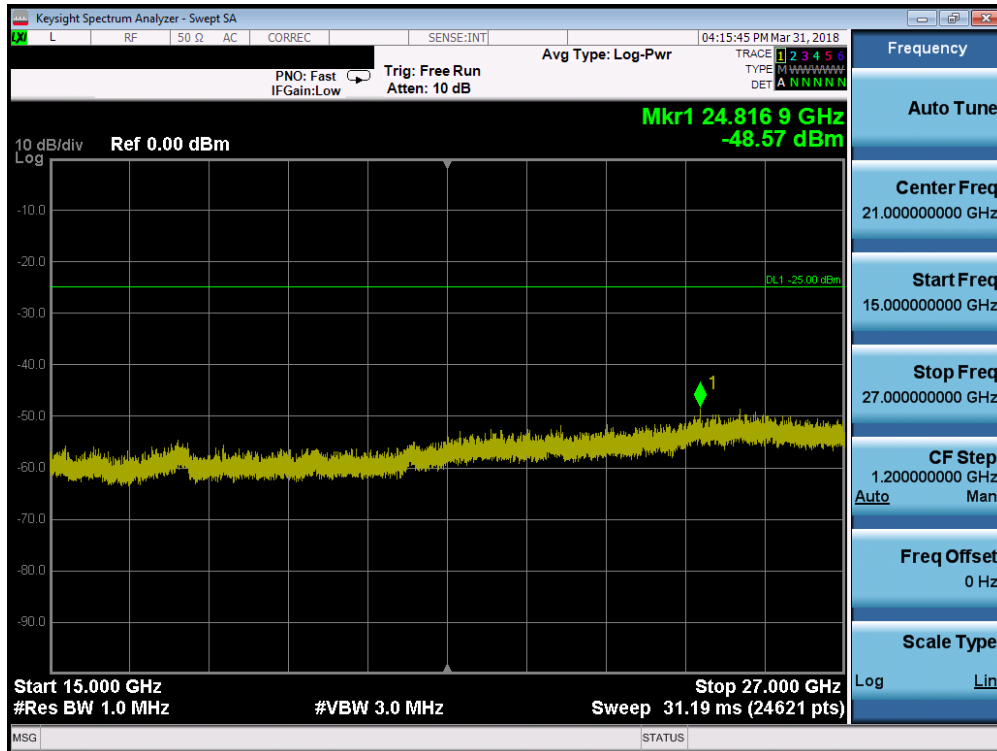


Table 7-294. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

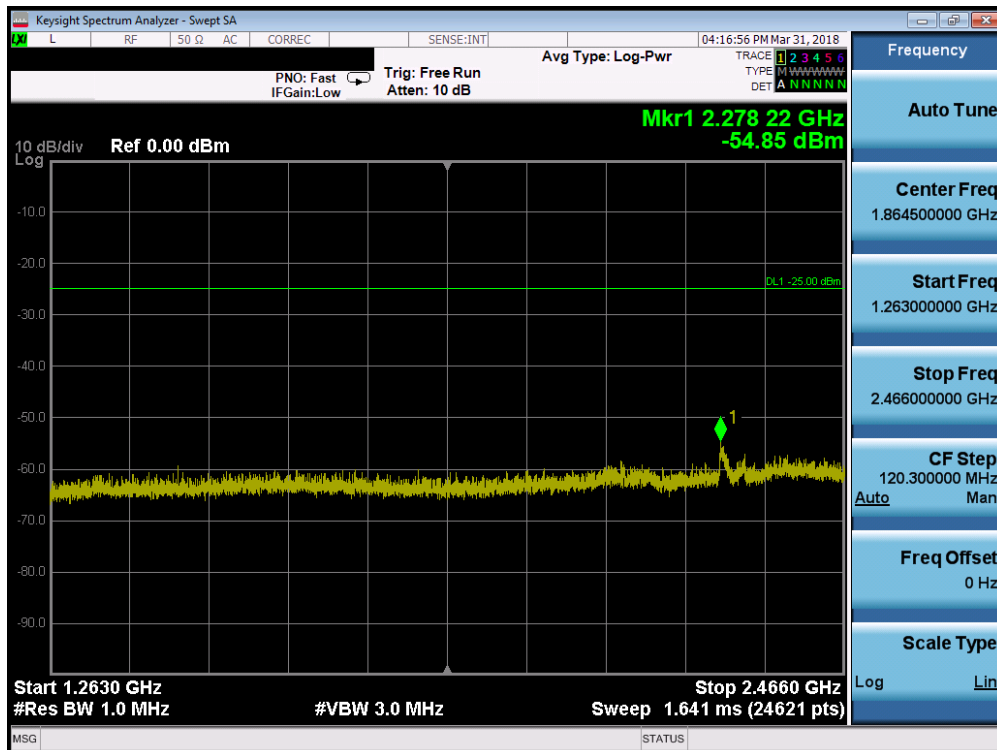


Table 7-295. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 183 of 263

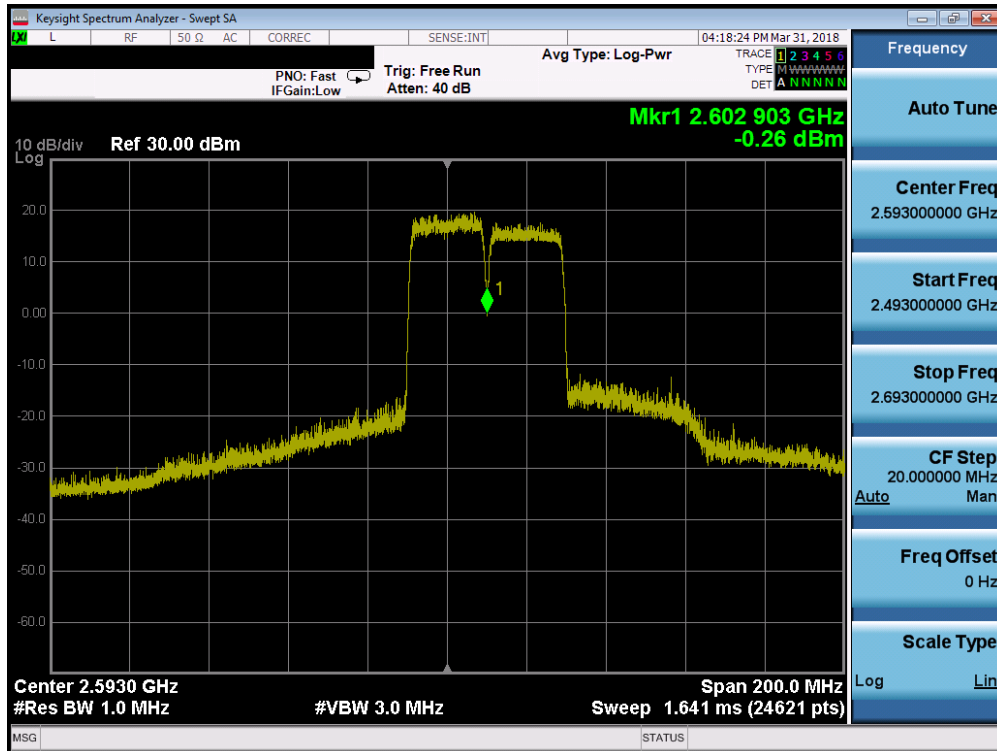


Table 7-296. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

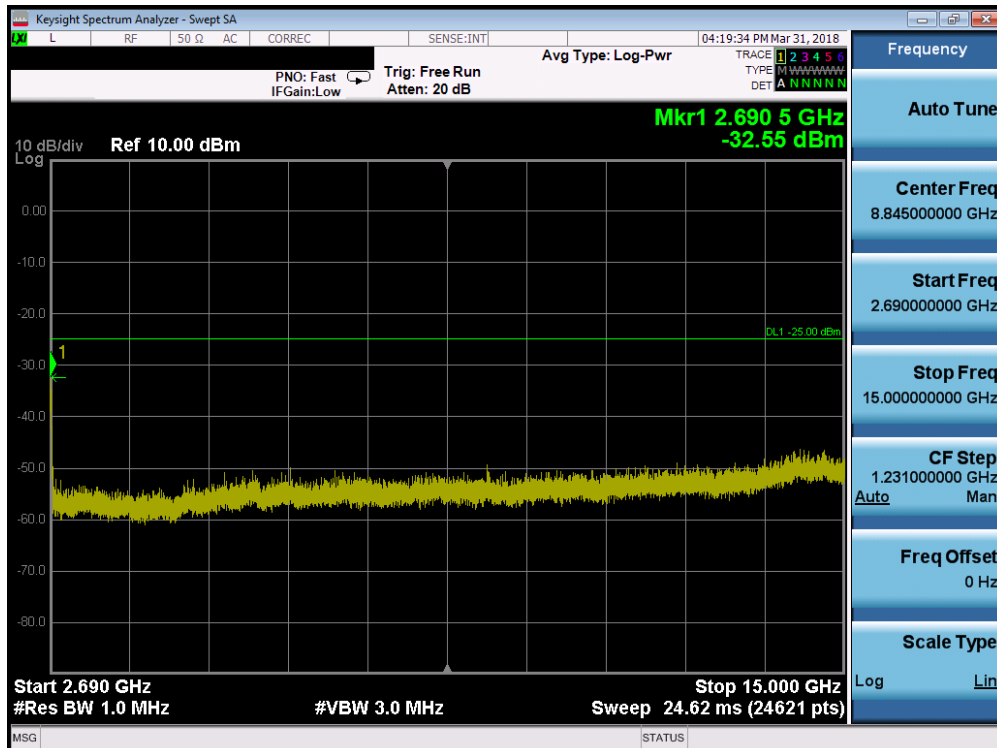


Table 7-297. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 184 of 263

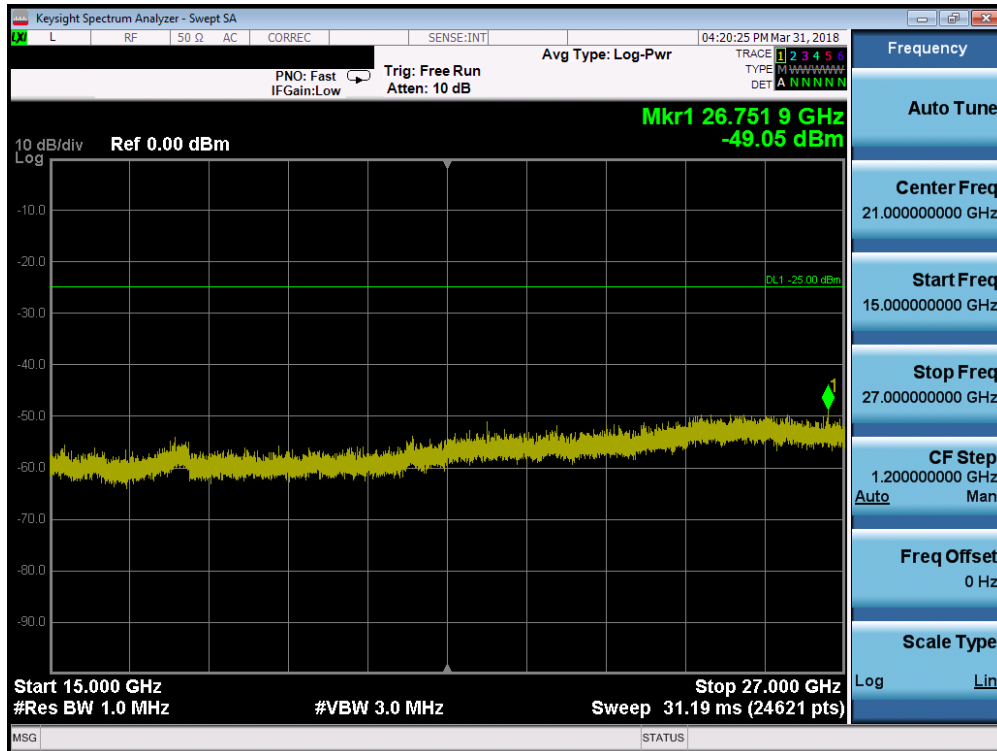


Table 7-298. Conducted Spurious Plot (Band 41 – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

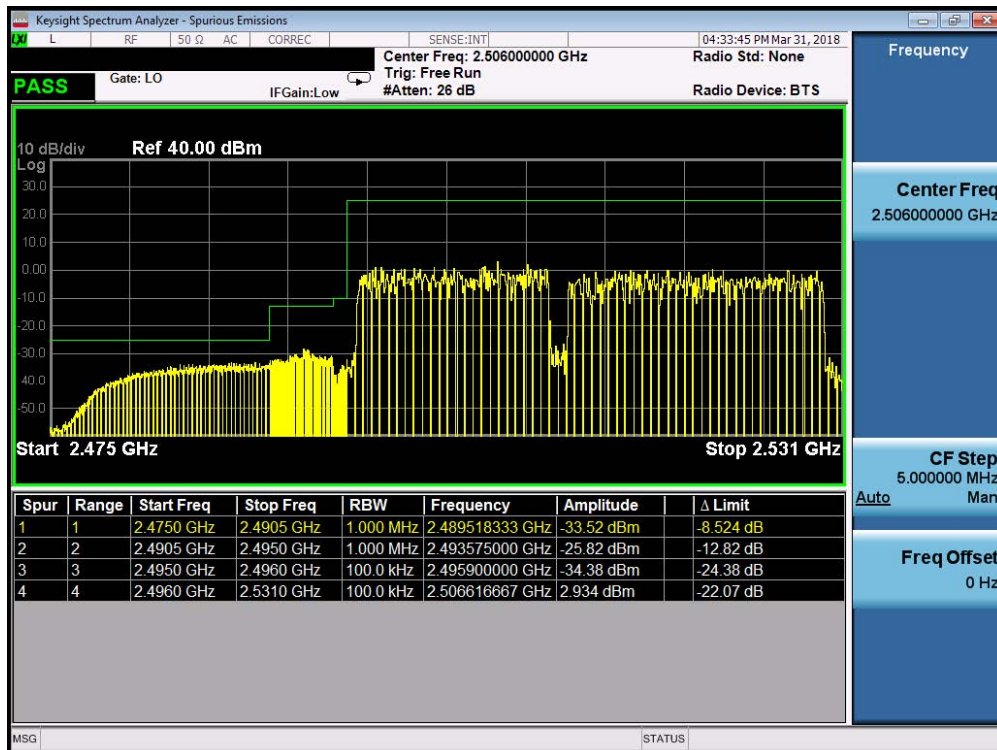


Table 7-299. Lower ACP Plot (Band 41 QPSK – PCC:15 MHz SCC:20 MHz – Full RB)

FCC ID: ZNFV350A	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 185 of 263