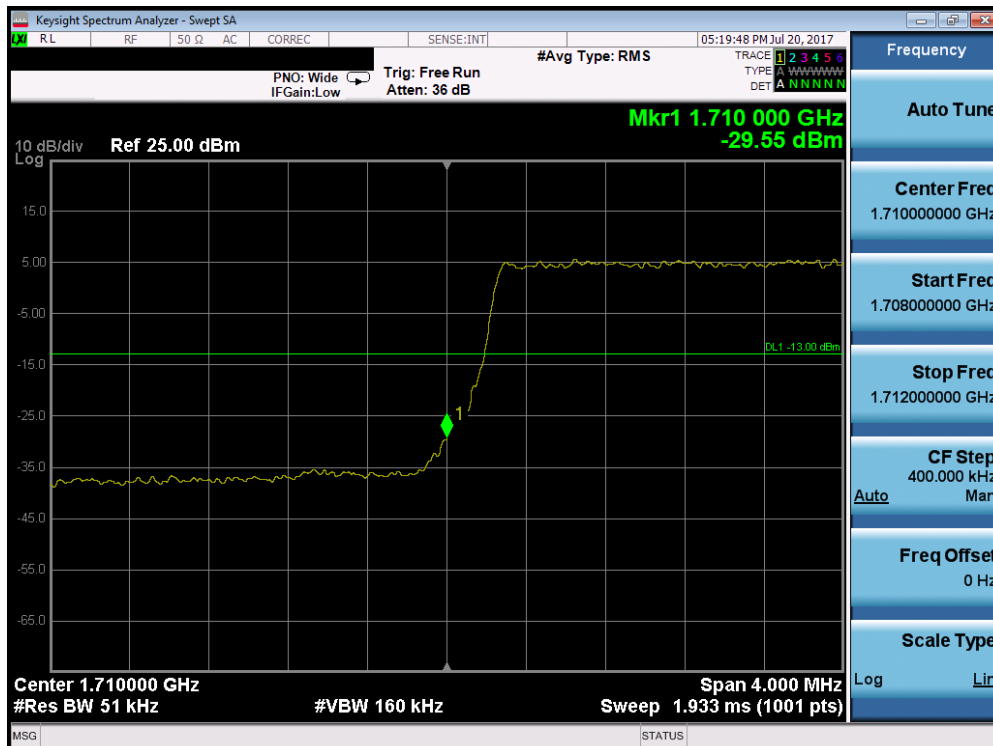
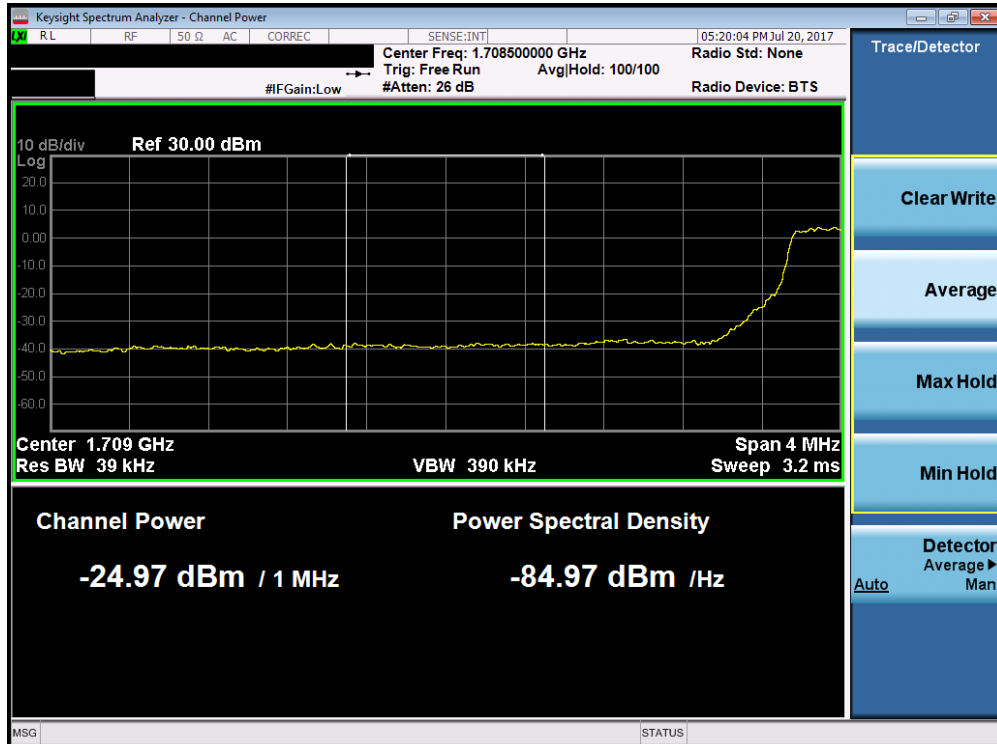


Plot 7-174. Upper Extended Band Edge Plot (Band 66 – 3.0MHz QPSK – RB Size 15)

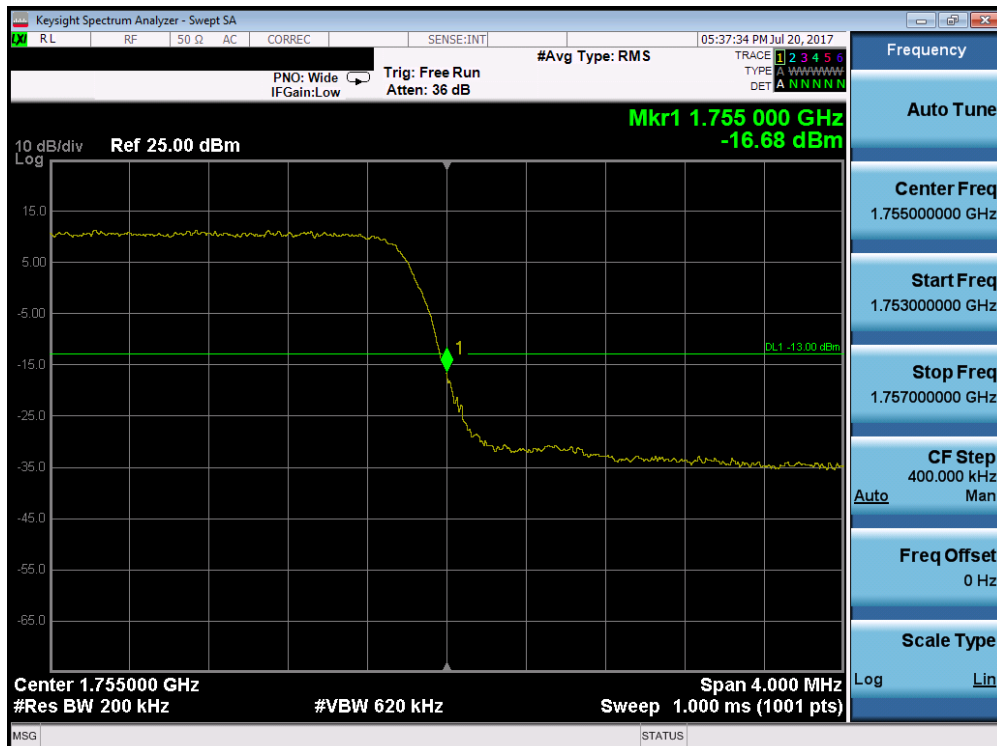


Plot 7-175. Lower Band Edge Plot (Band 4/66 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 106 of 178

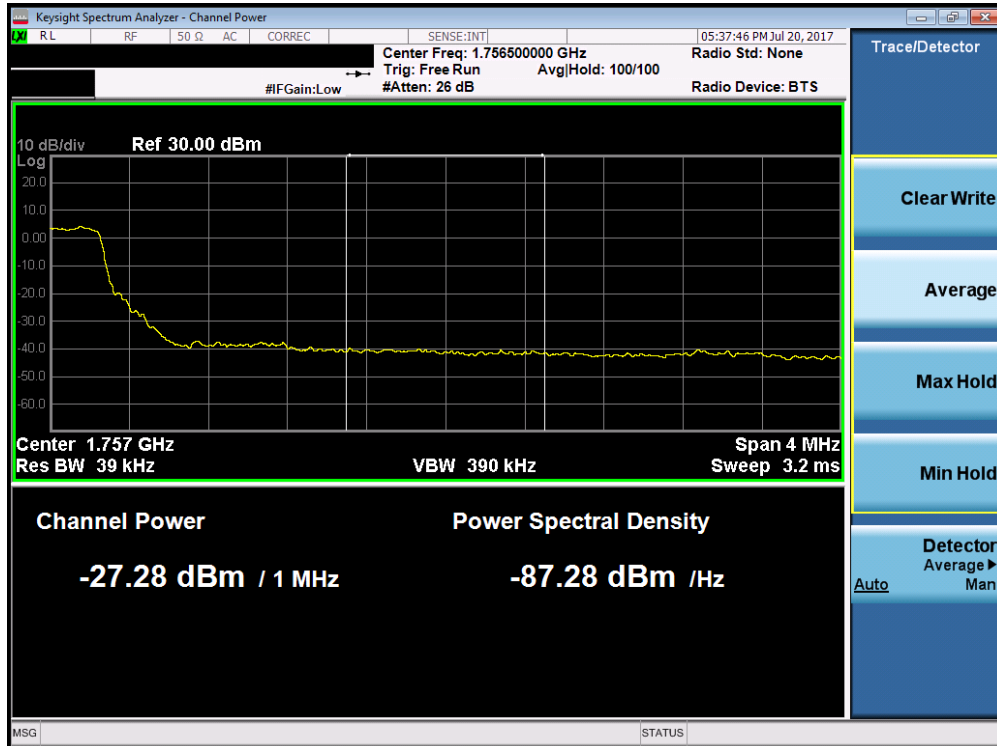


Plot 7-176. Lower Extended Band Edge Plot (Band 4/66 – 5.0MHz QPSK – RB Size 25)

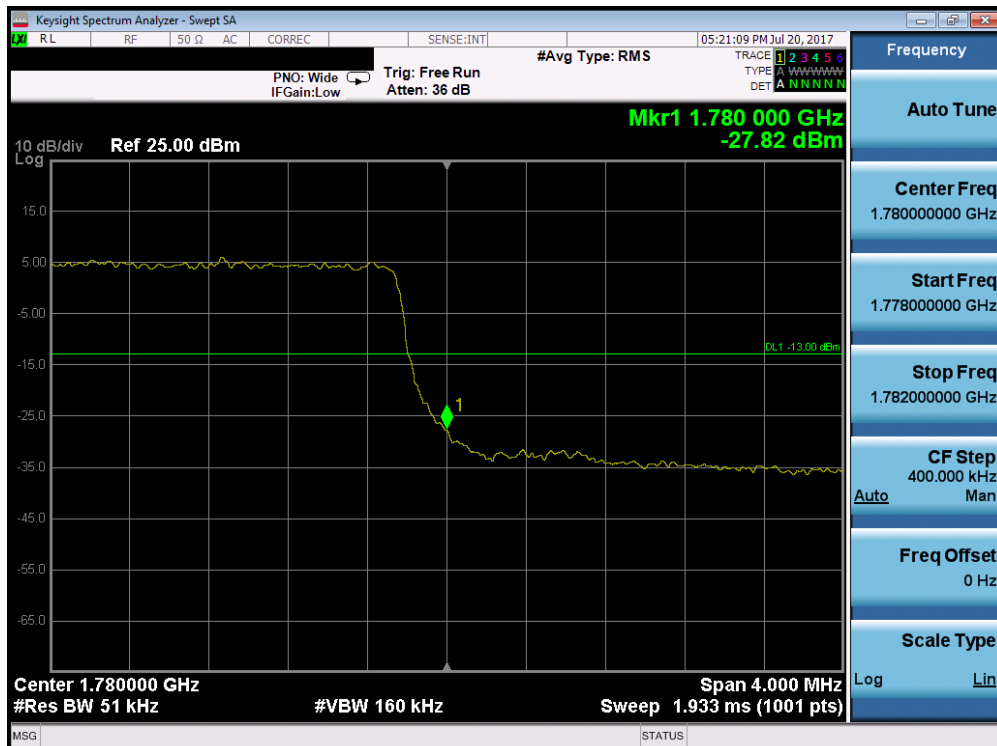


Plot 7-177. Upper Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 107 of 178

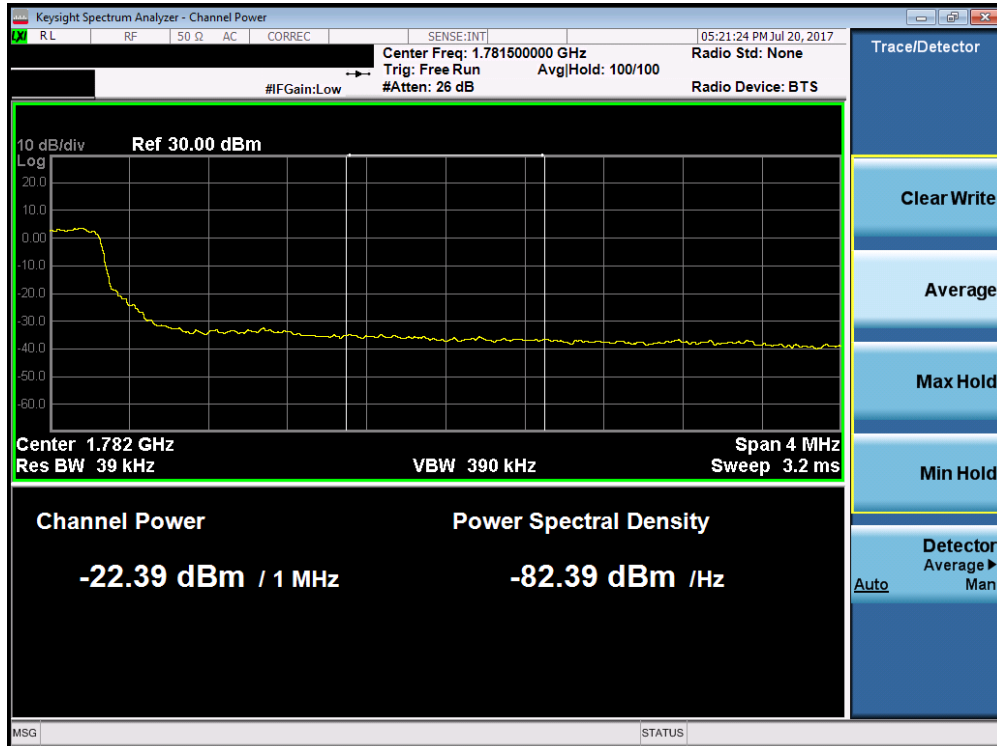


Plot 7-178. Upper Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

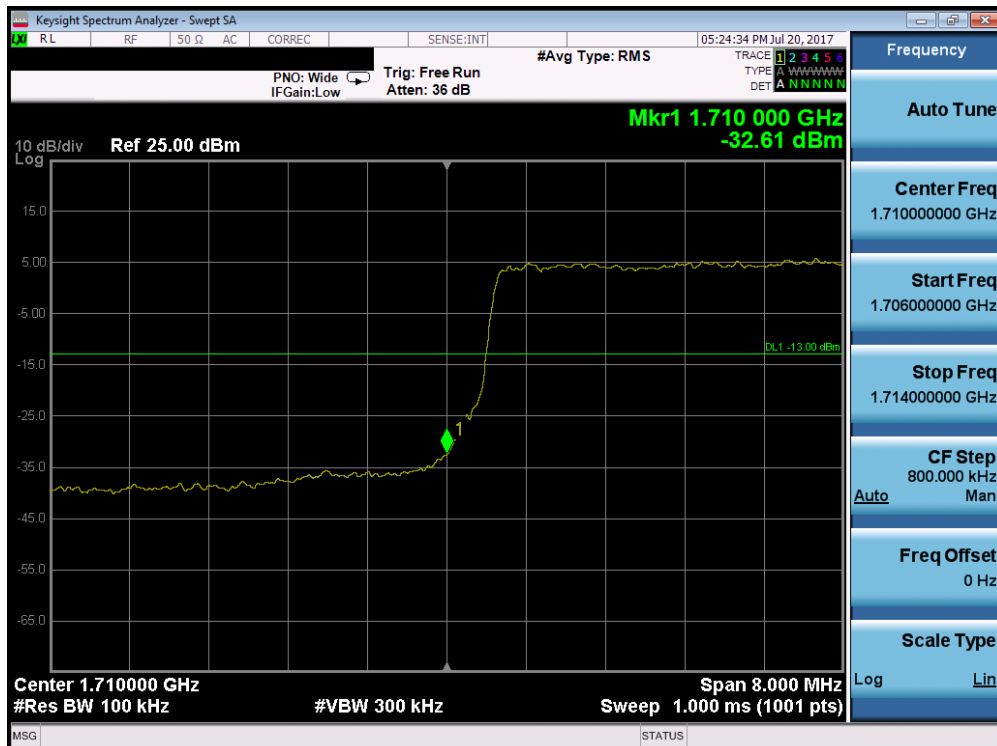


Plot 7-179. Upper Band Edge Plot (Band 66 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 108 of 178

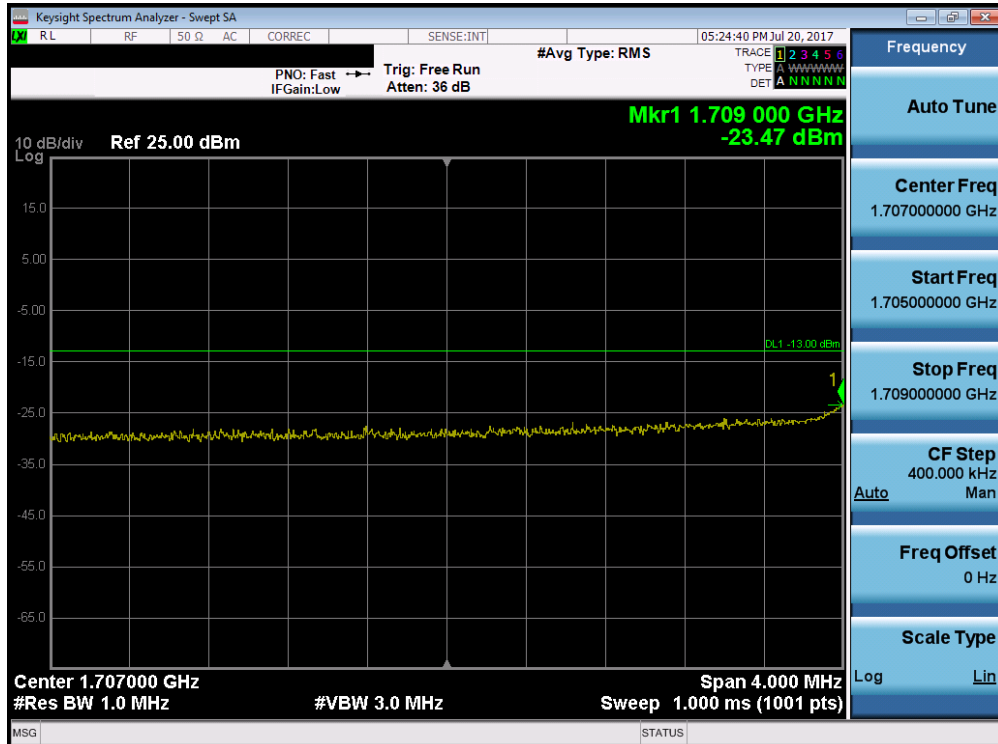


Plot 7-180. Upper Extended Band Edge Plot (Band 66 – 5.0MHz QPSK – RB Size 25)

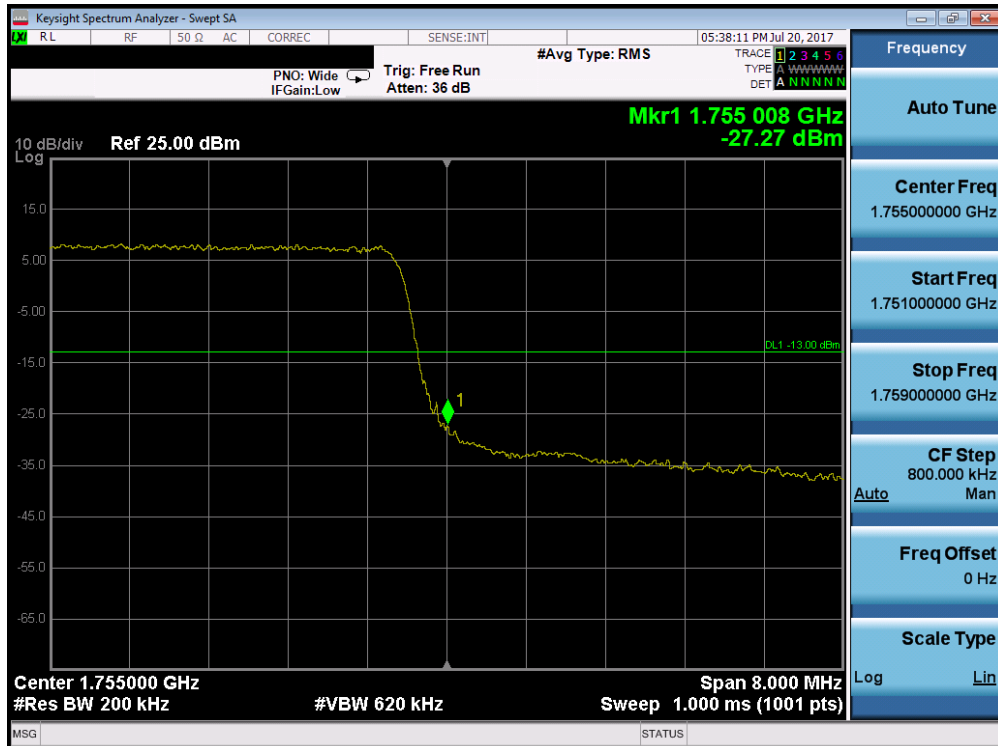


Plot 7-181. Lower Band Edge Plot (Band 4/66 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 109 of 178

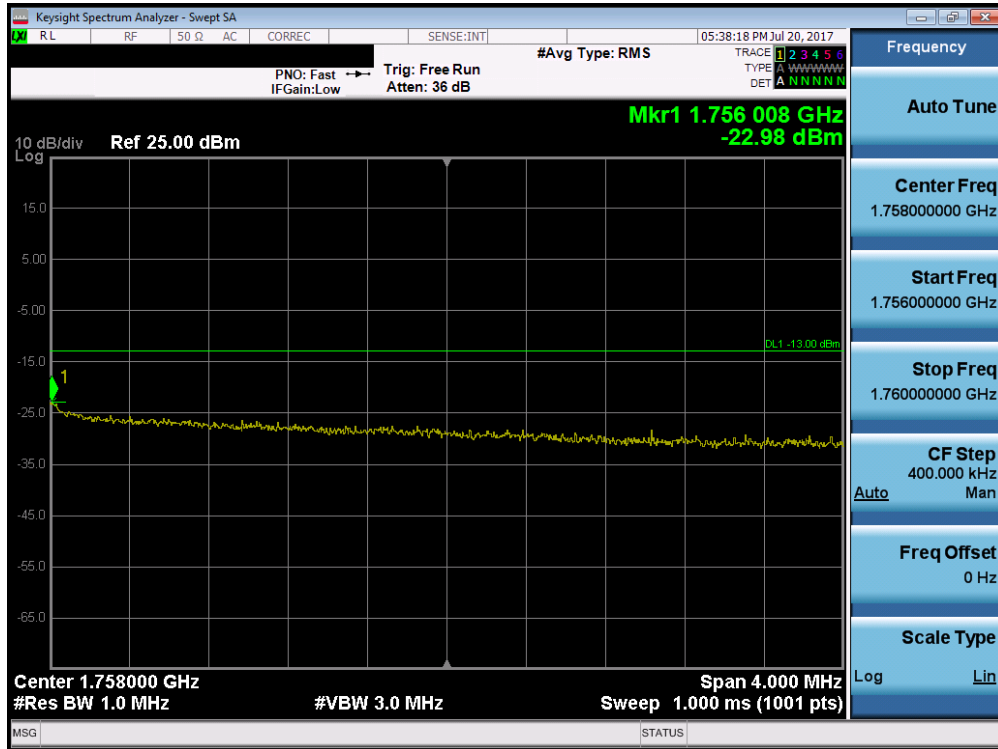


Plot 7-182. Lower Extended Band Edge Plot (Band 4/66 – 10.0MHz QPSK – RB Size 50)

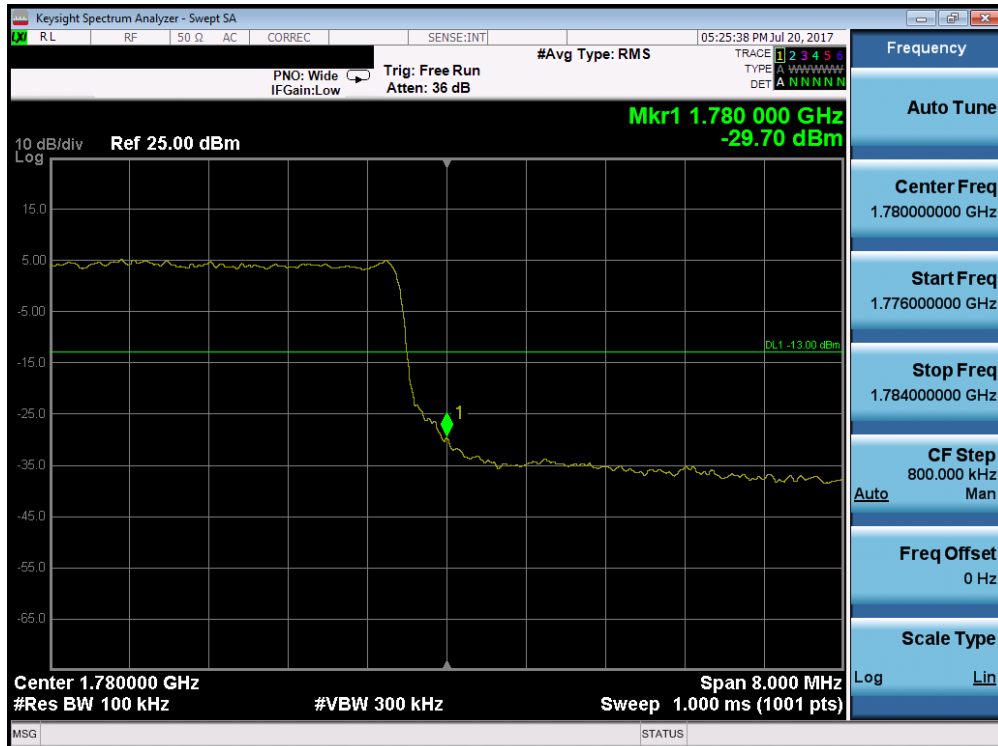


Plot 7-183. Upper Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 110 of 178

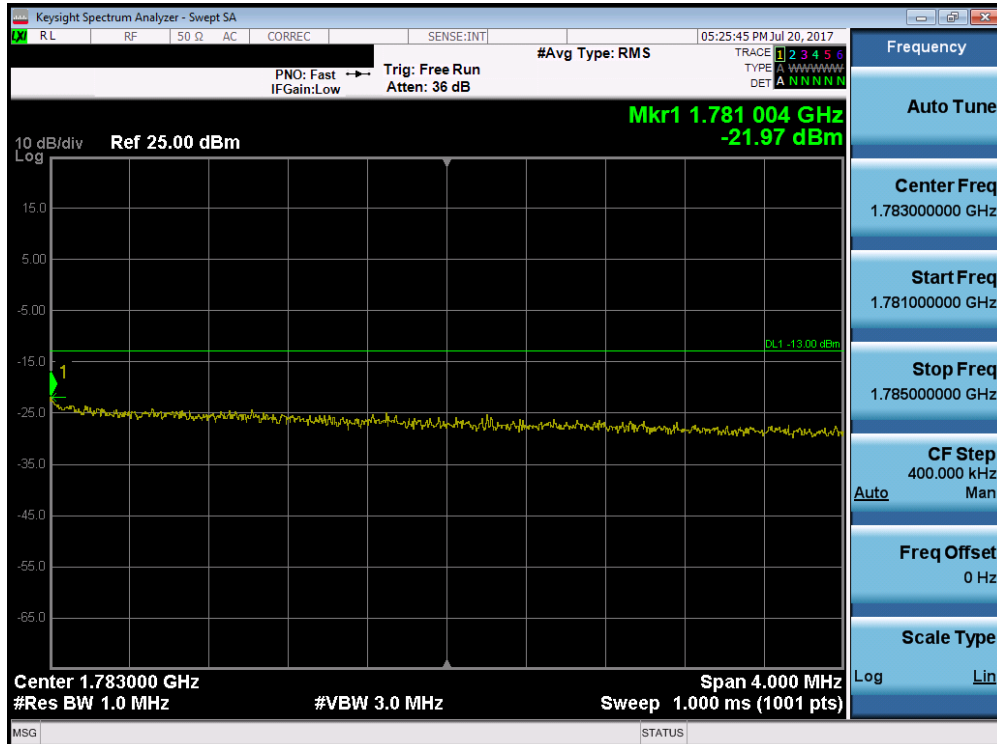


Plot 7-184. Upper Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

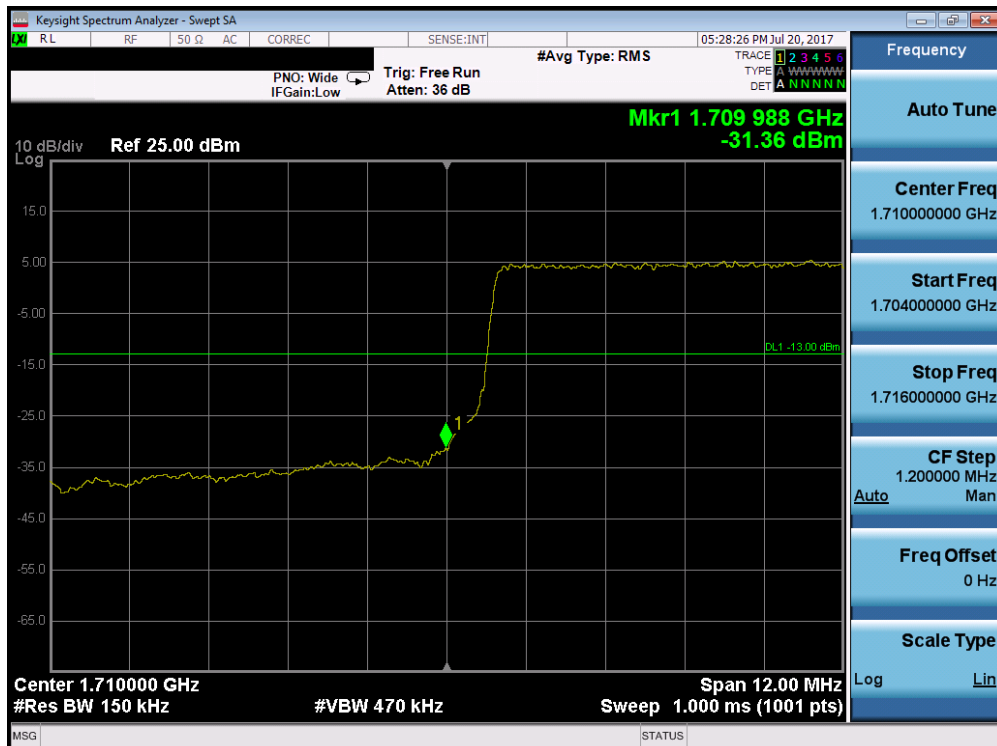


Plot 7-185. Upper Band Edge Plot (Band 66 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 111 of 178

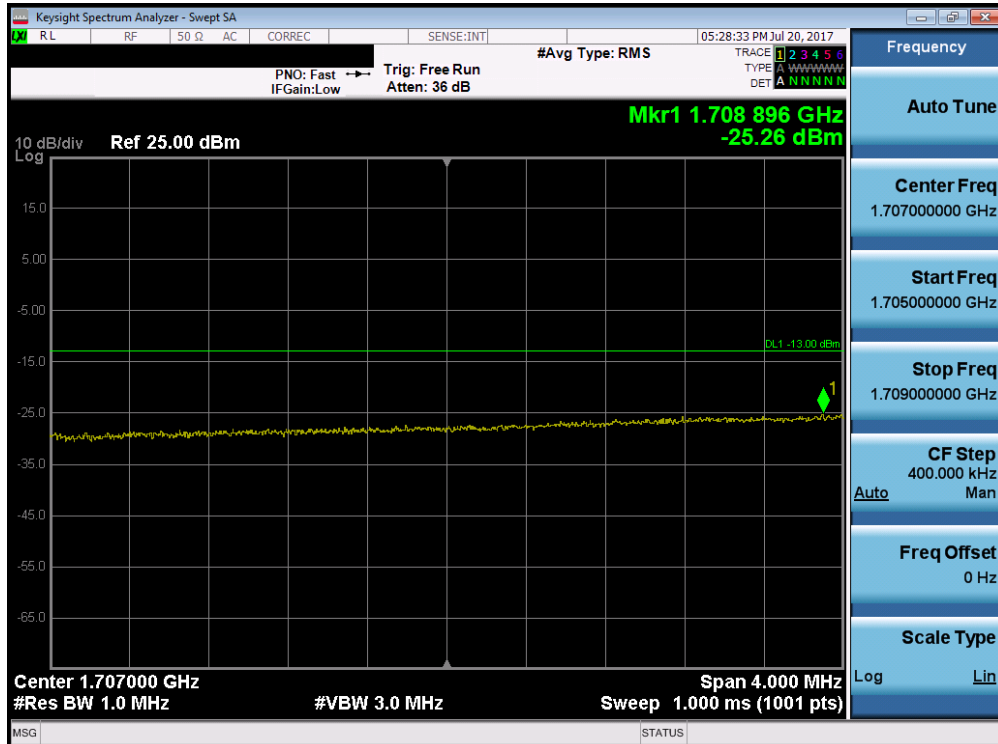


Plot 7-186. Upper Extended Band Edge Plot (Band 66 – 10.0MHz QPSK – RB Size 50)

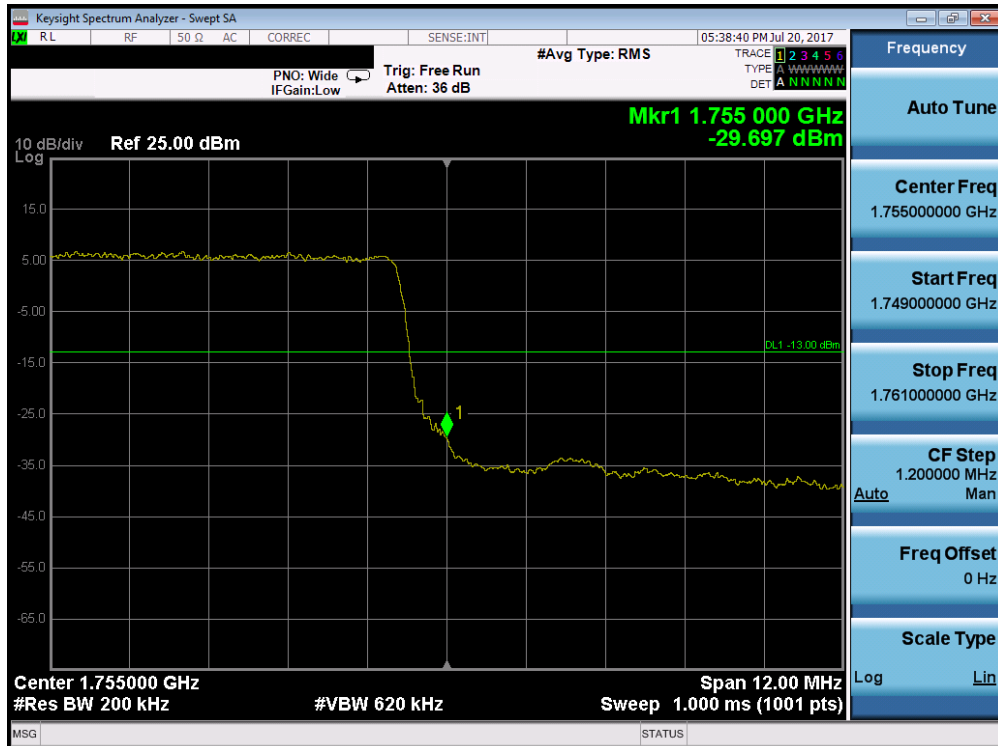


Plot 7-187. Lower Band Edge Plot (Band 4/66 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 112 of 178

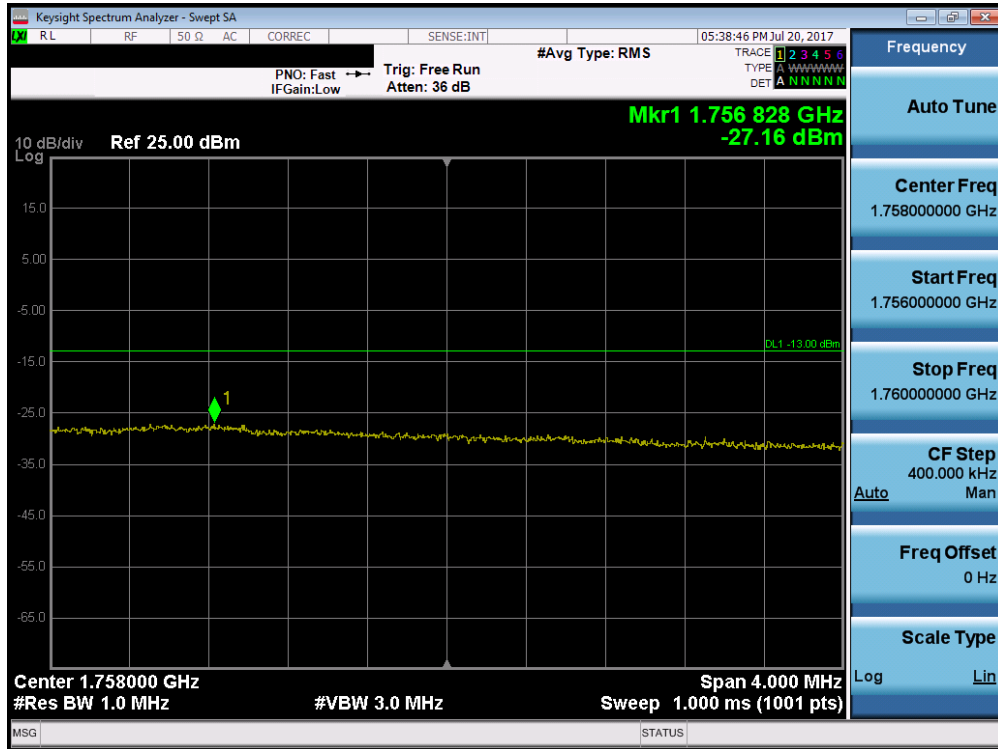


Plot 7-188. Lower Extended Band Edge Plot (Band 4/66 – 15.0MHz QPSK – RB Size 75)

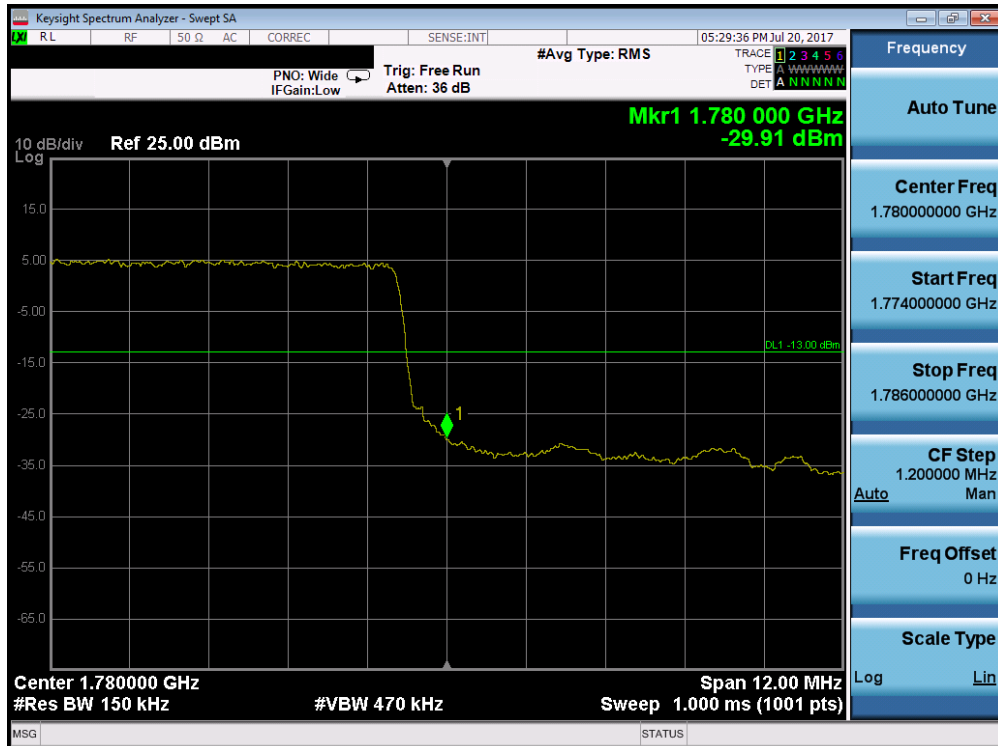


Plot 7-189. Upper Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 113 of 178

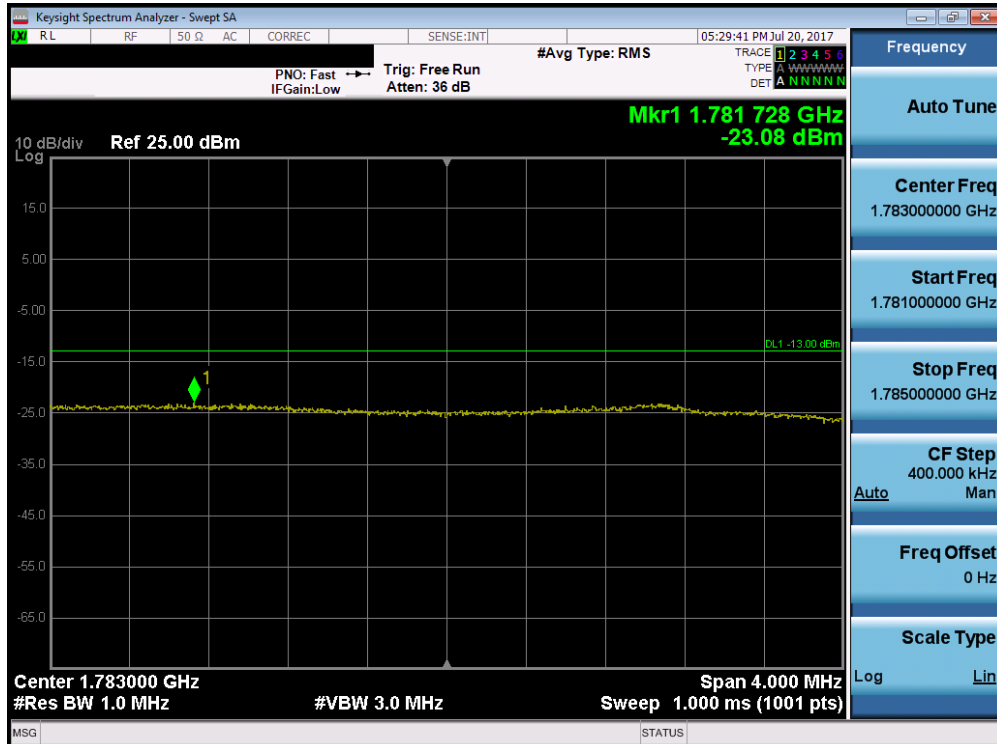


Plot 7-190. Upper Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

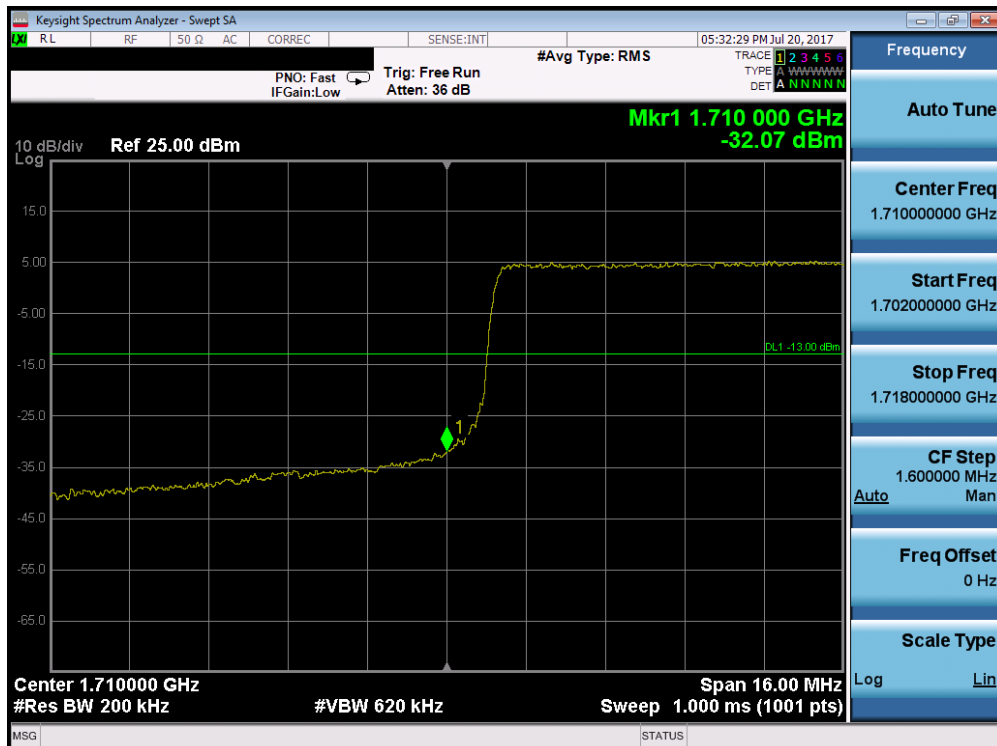


Plot 7-191. Upper Band Edge Plot (Band 66 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 114 of 178

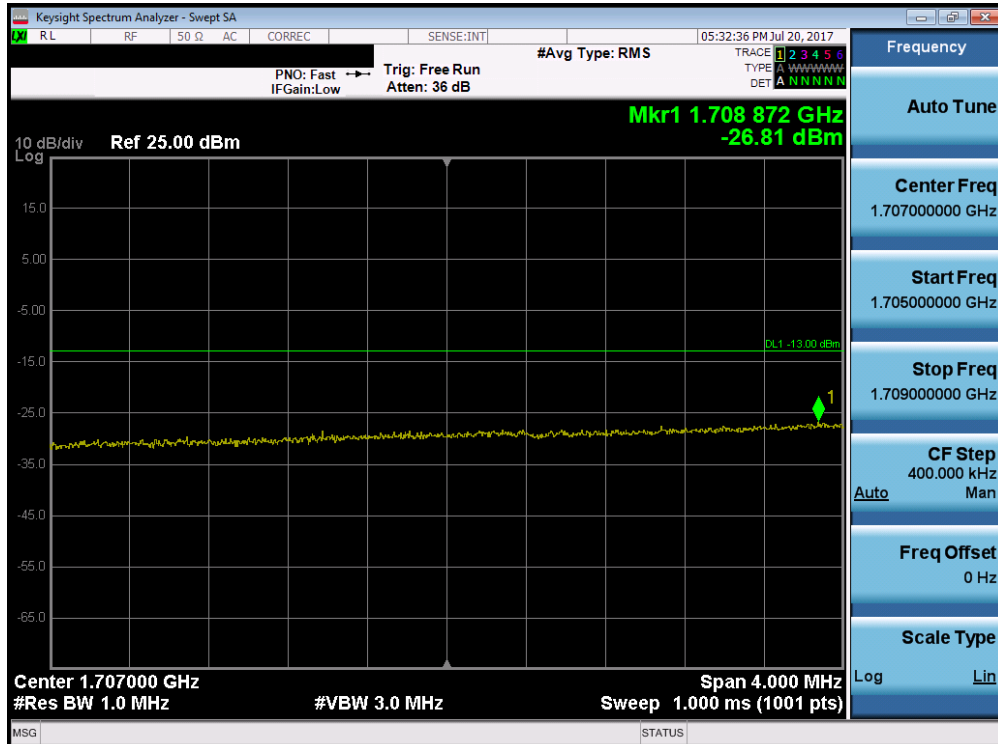


Plot 7-192. Upper Extended Band Edge Plot (Band 66 – 15.0MHz QPSK – RB Size 75)

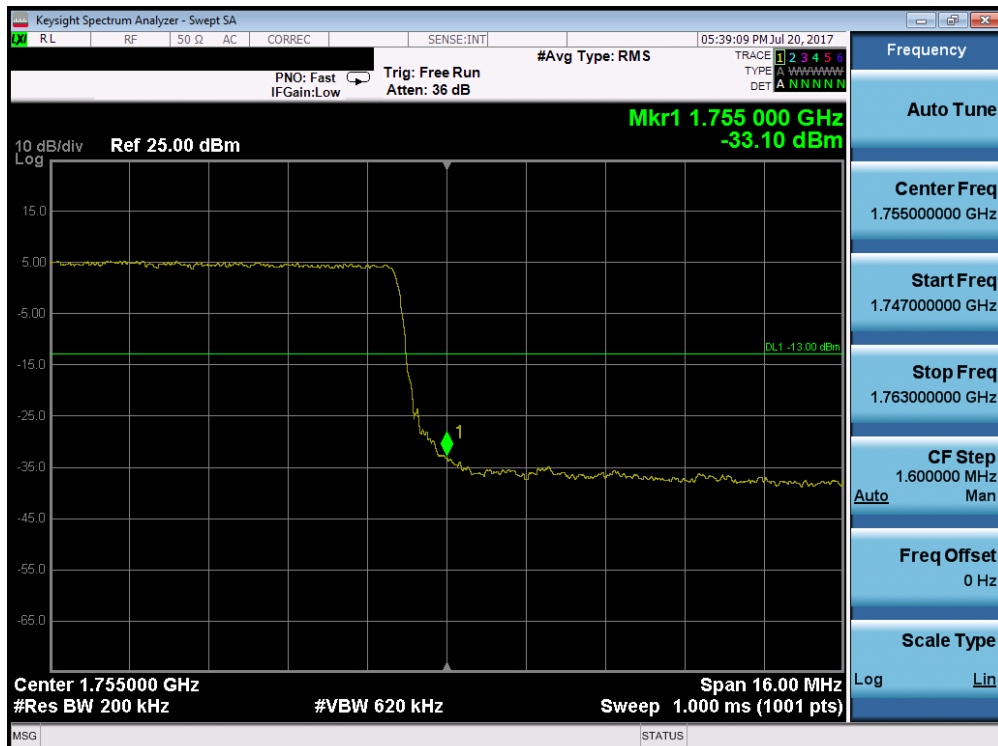


Plot 7-193. Lower Band Edge Plot (Band 4/66 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 115 of 178

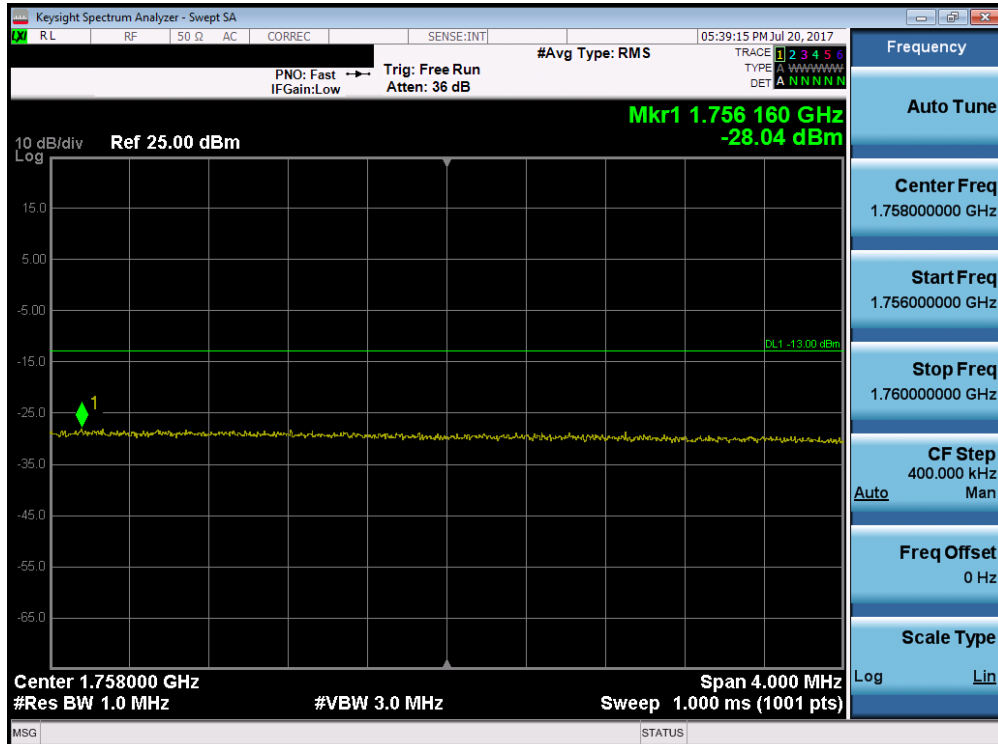


Plot 7-194. Lower Extended Band Edge Plot (Band 4/66 – 20.0MHz QPSK – RB Size 100)

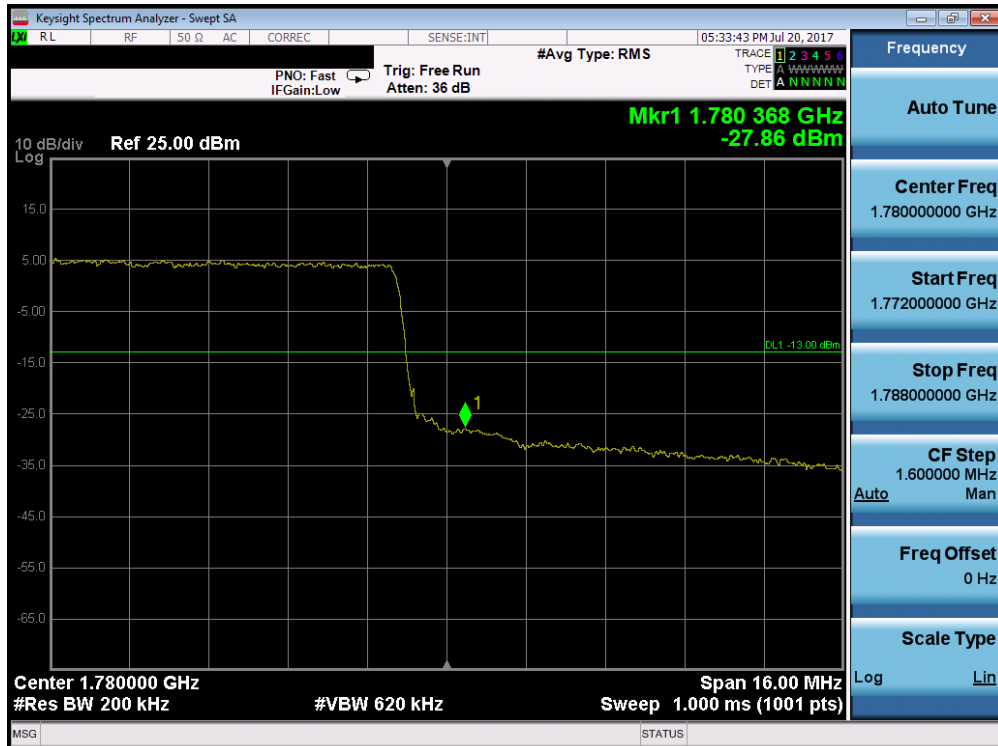


Plot 7-195. Upper Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 116 of 178

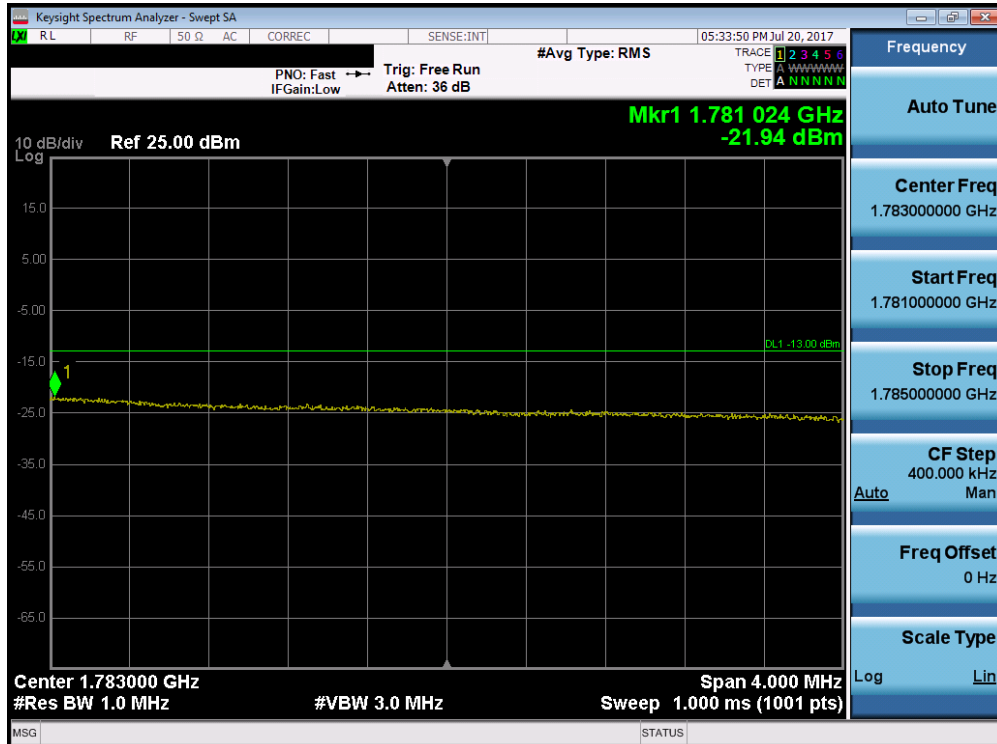


Plot 7-196. Upper Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

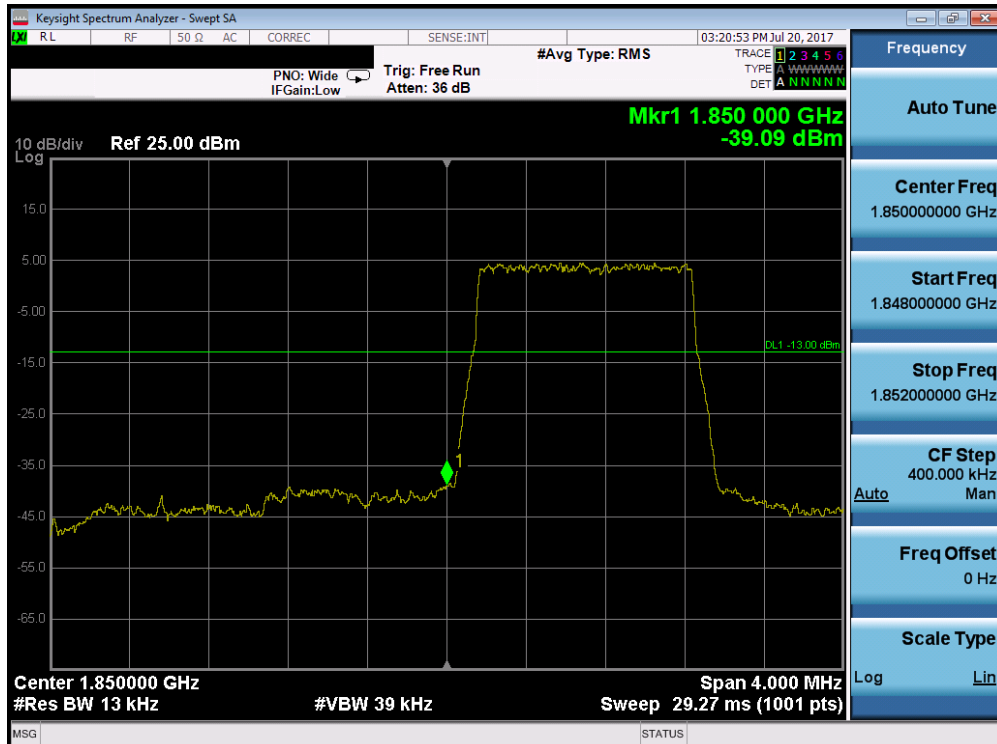


Plot 7-197. Upper Band Edge Plot (Band 66 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 117 of 178

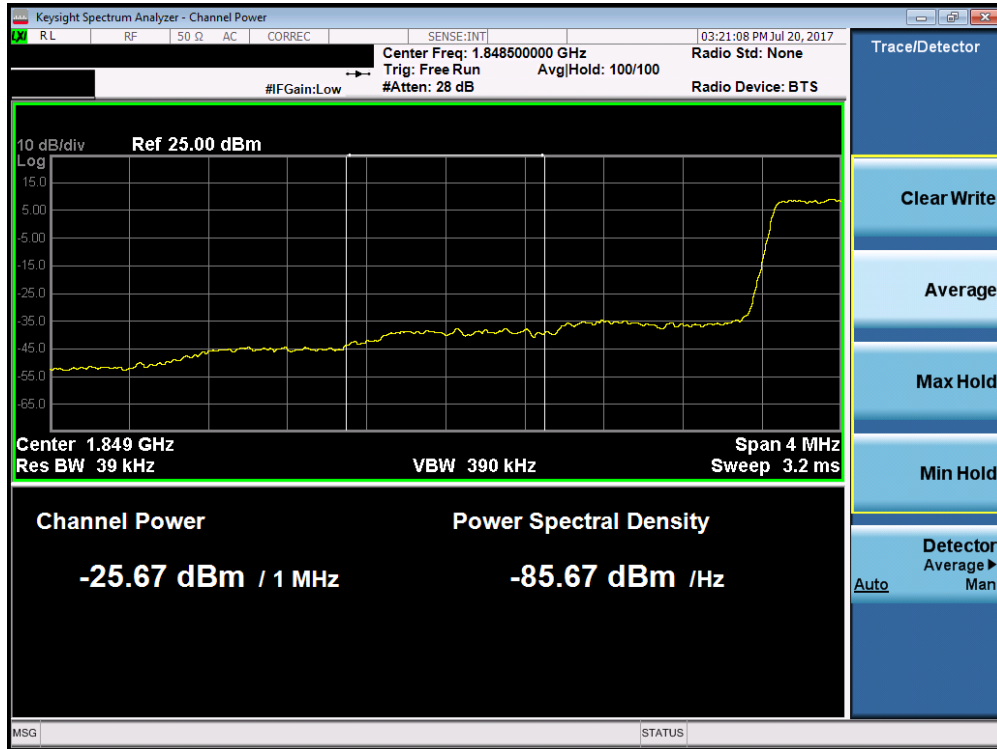


Plot 7-198. Upper Extended Band Edge Plot (Band 66 – 20.0MHz QPSK – RB Size 100)

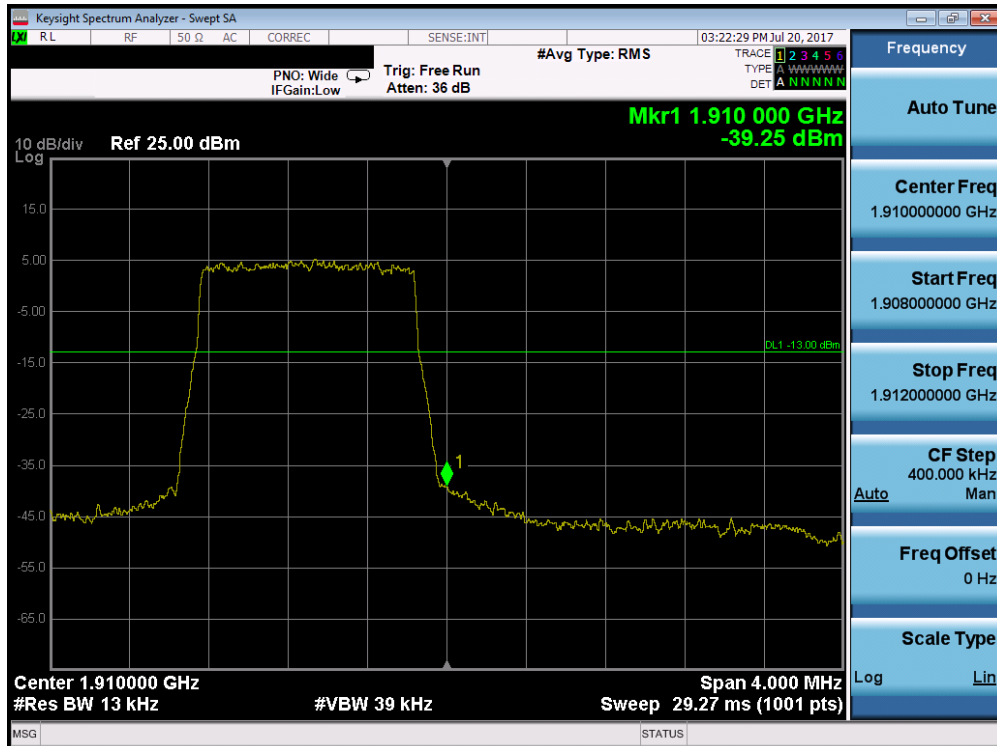


Plot 7-199. Lower Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 118 of 178

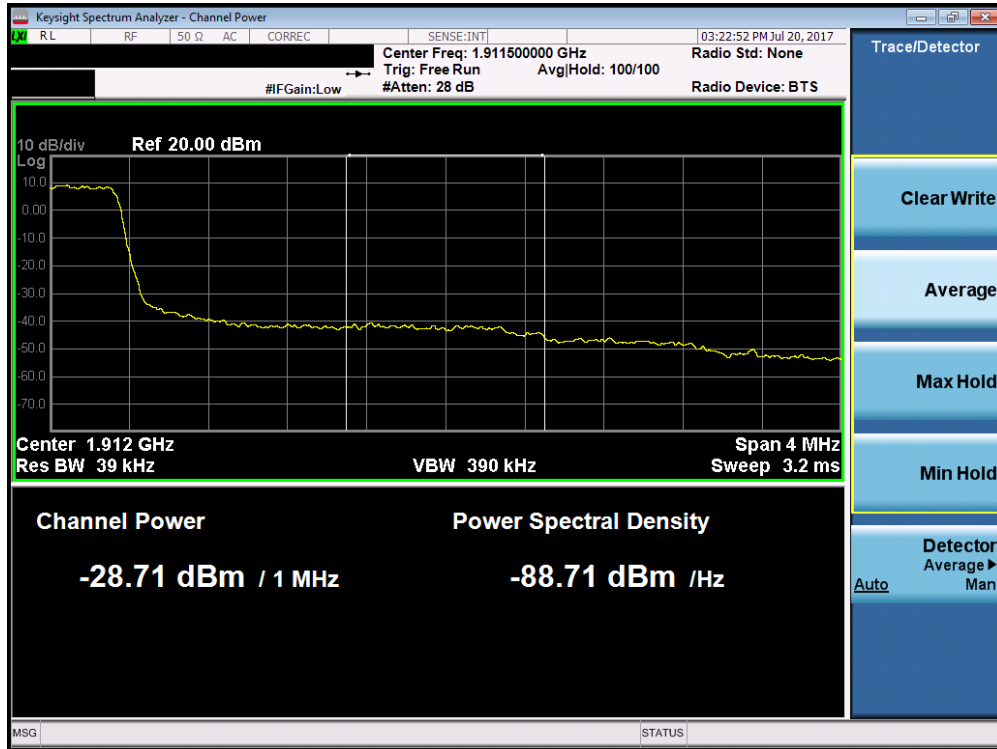


Plot 7-200. Lower Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

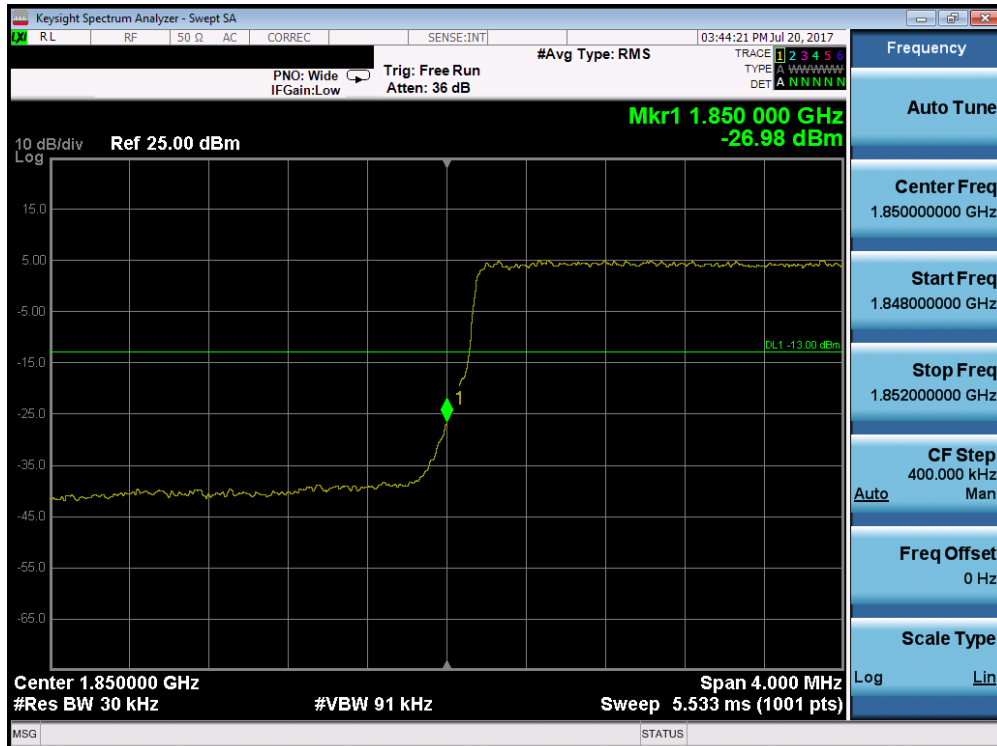


Plot 7-201. Upper Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 119 of 178

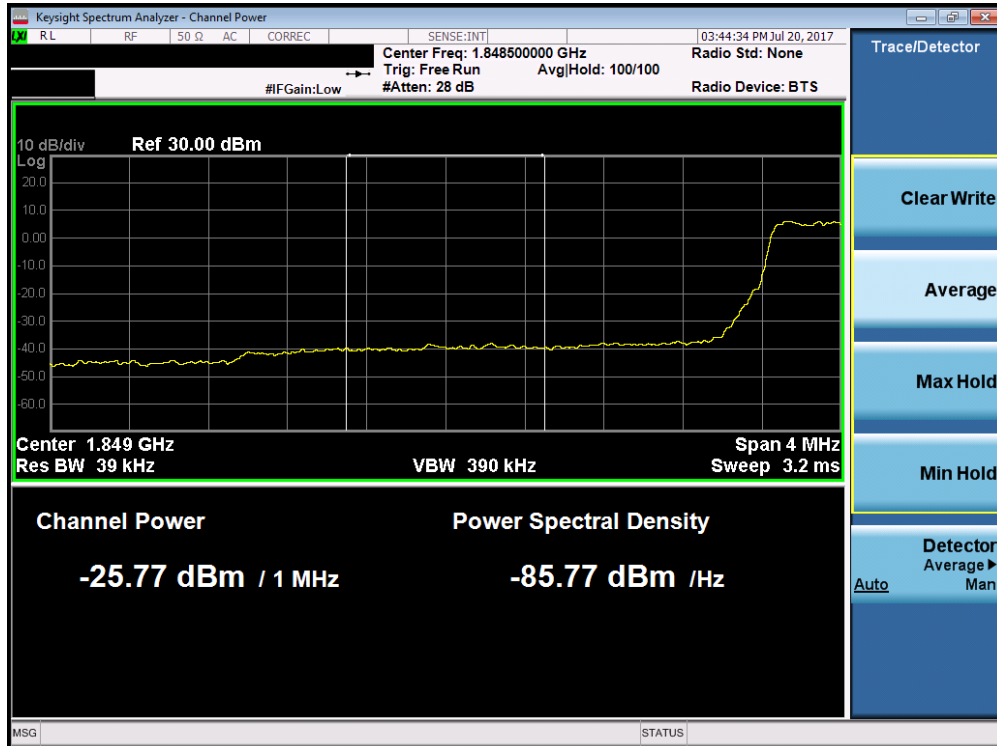


Plot 7-202. Upper Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)



Plot 7-203. Lower Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 120 of 178

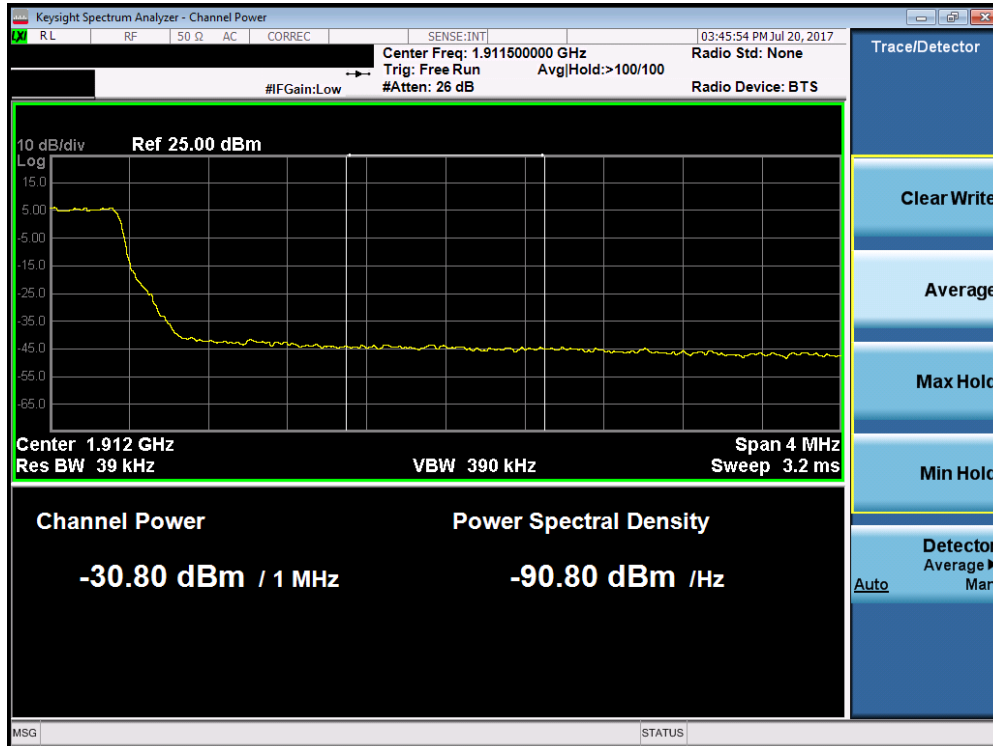


Plot 7-204. Lower Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

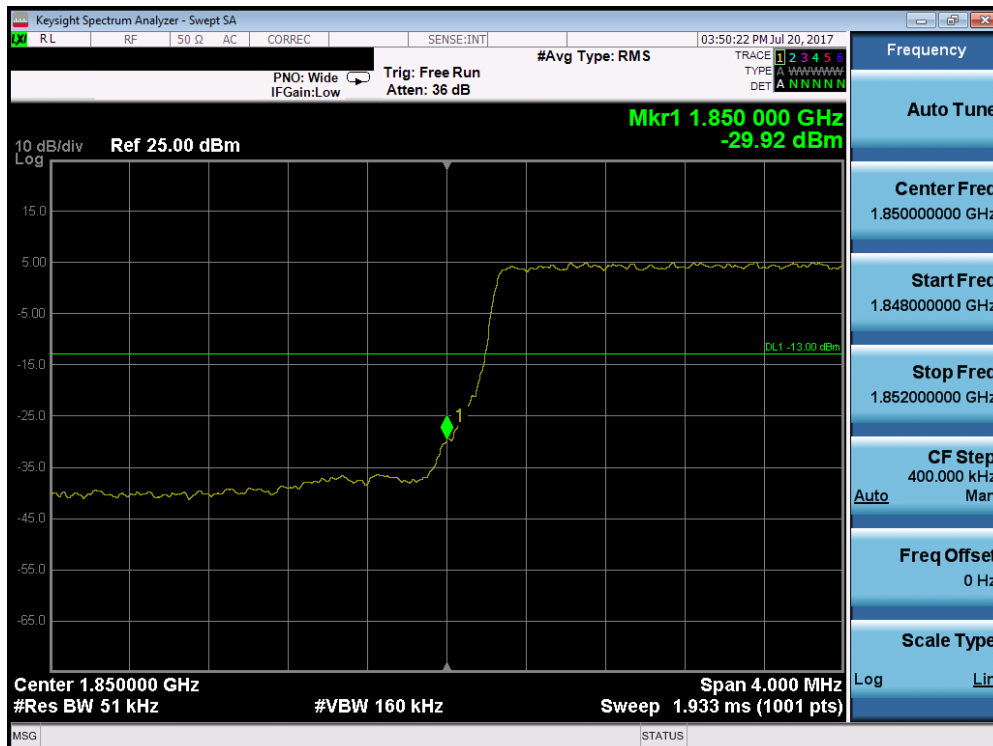


Plot 7-205. Upper Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 121 of 178

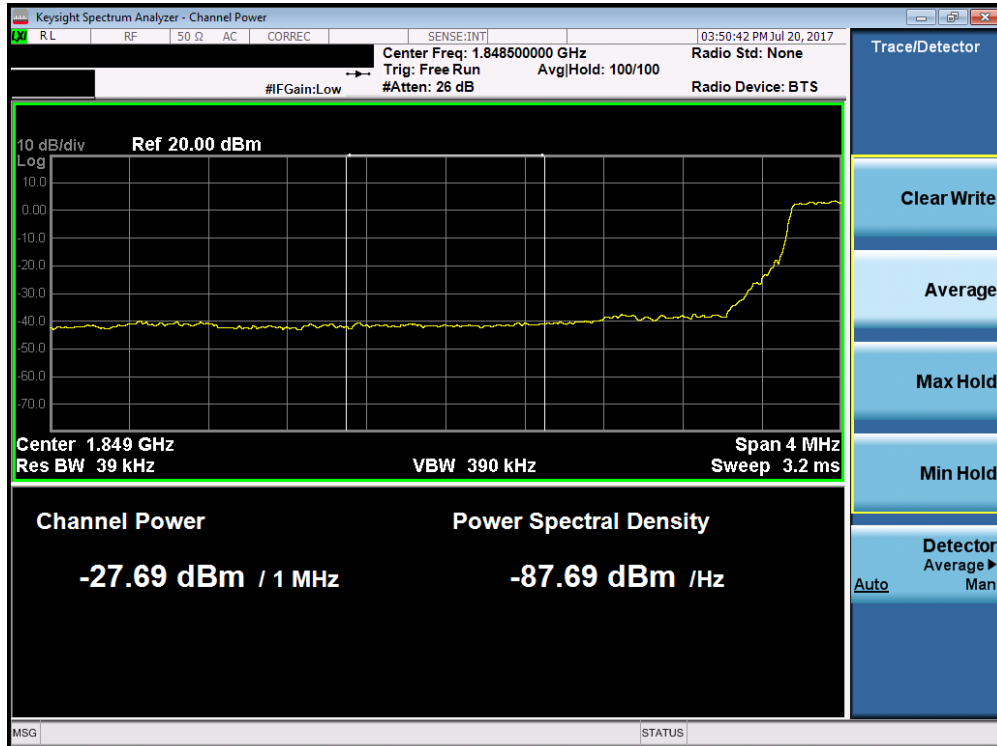


Plot 7-206. Upper Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

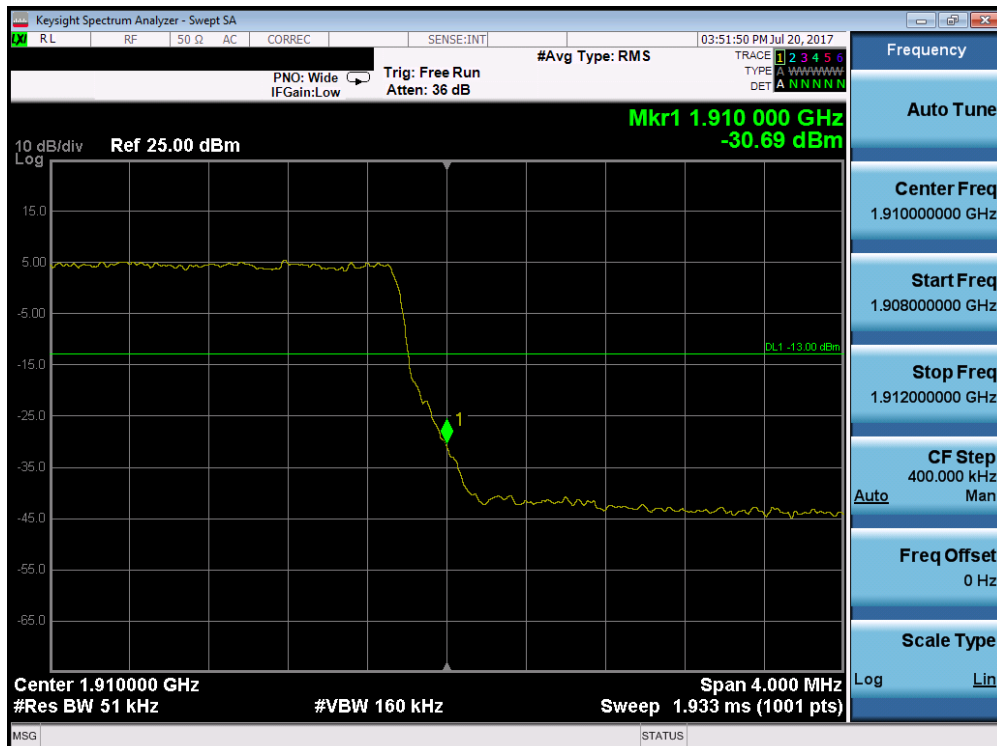


Plot 7-207. Lower Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 122 of 178

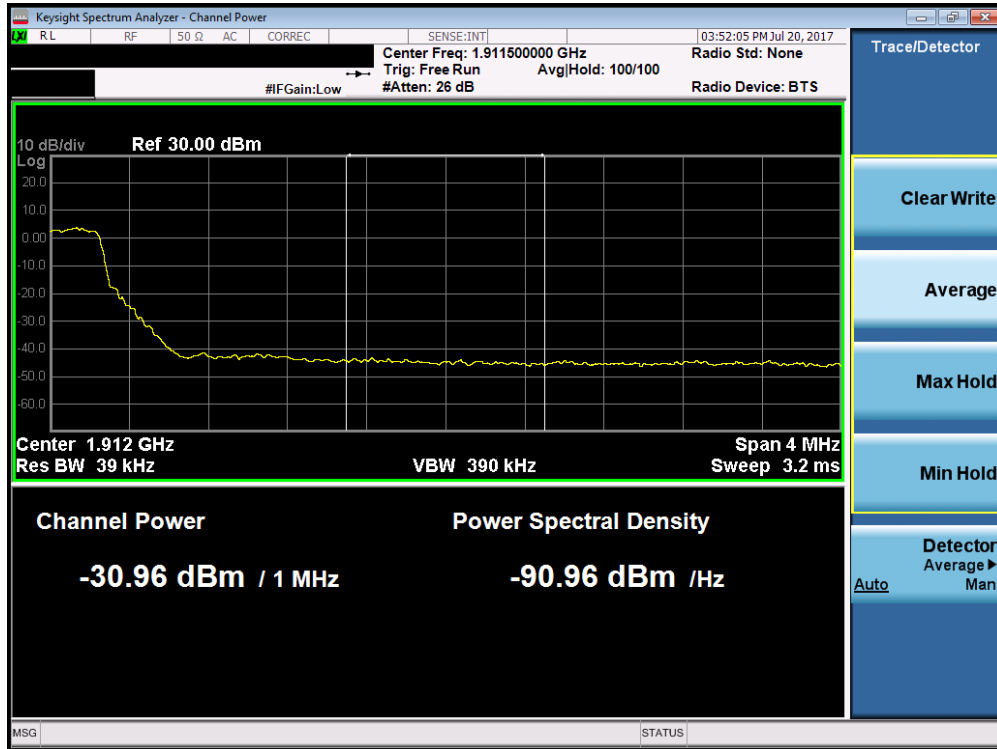


Plot 7-208. Lower Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

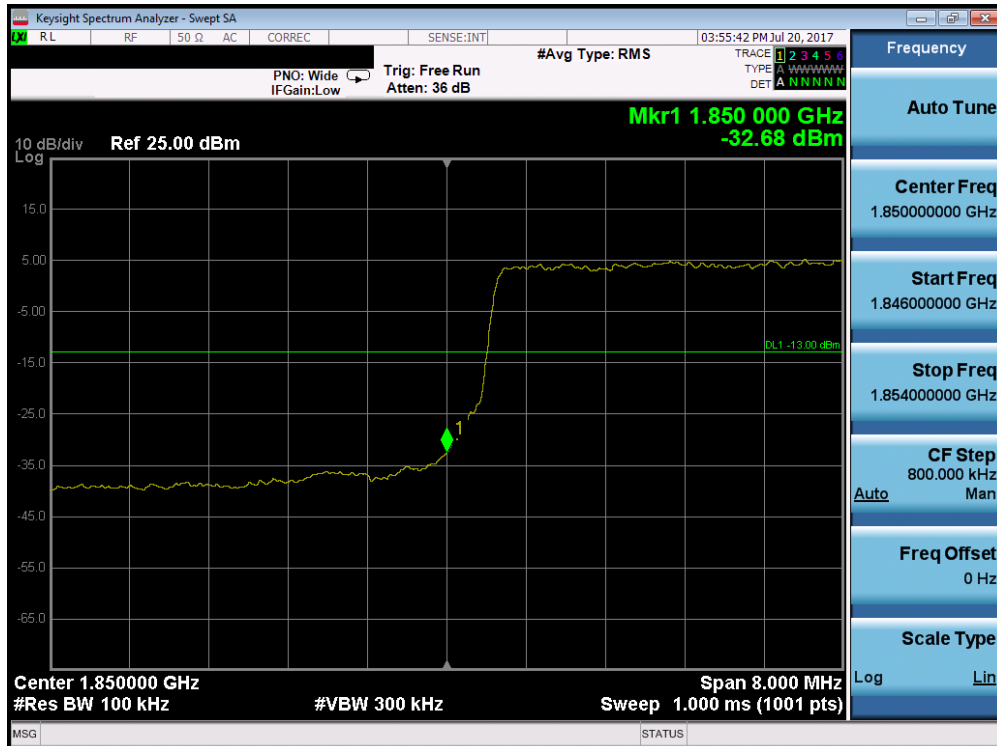


Plot 7-209. Upper Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 123 of 178

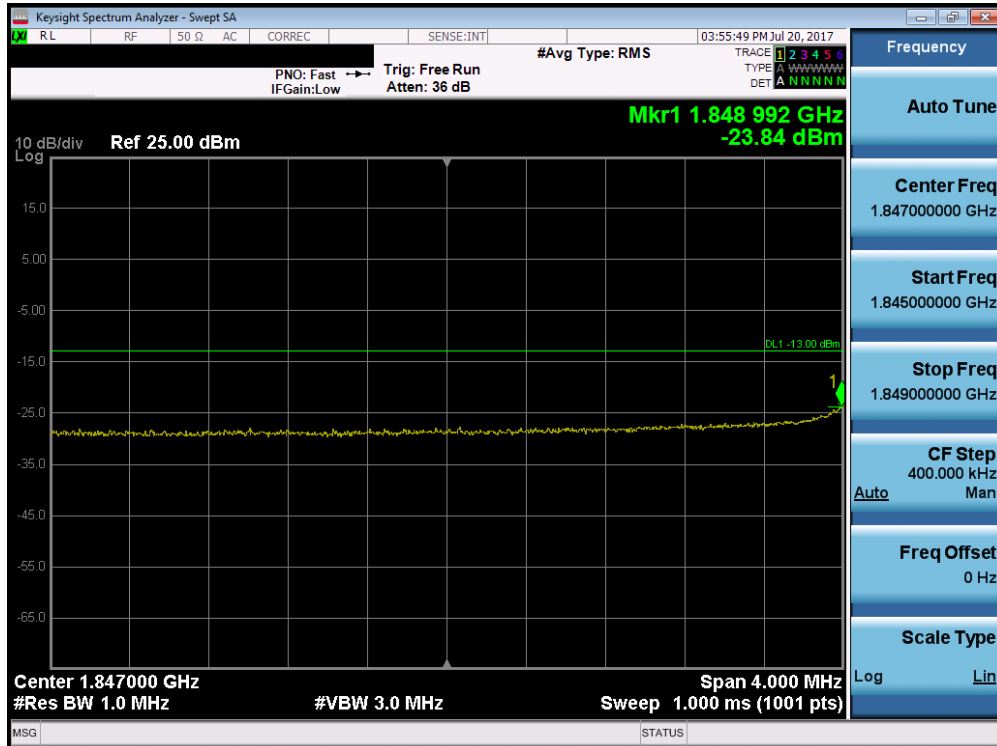


Plot 7-210. Upper Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

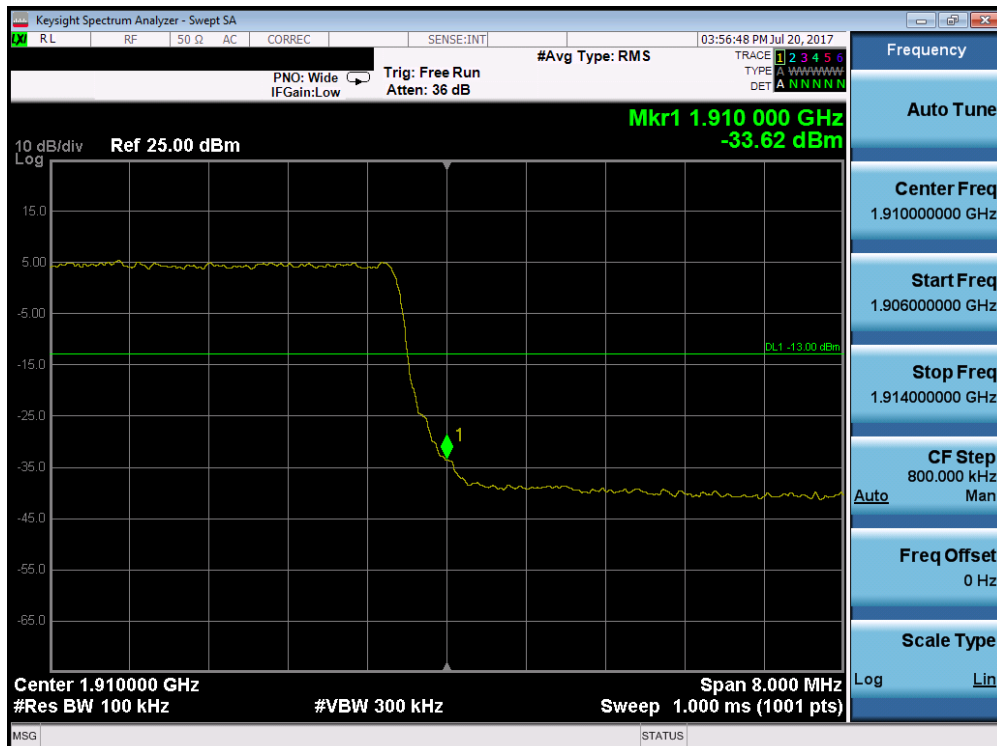


Plot 7-211. Lower Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 124 of 178

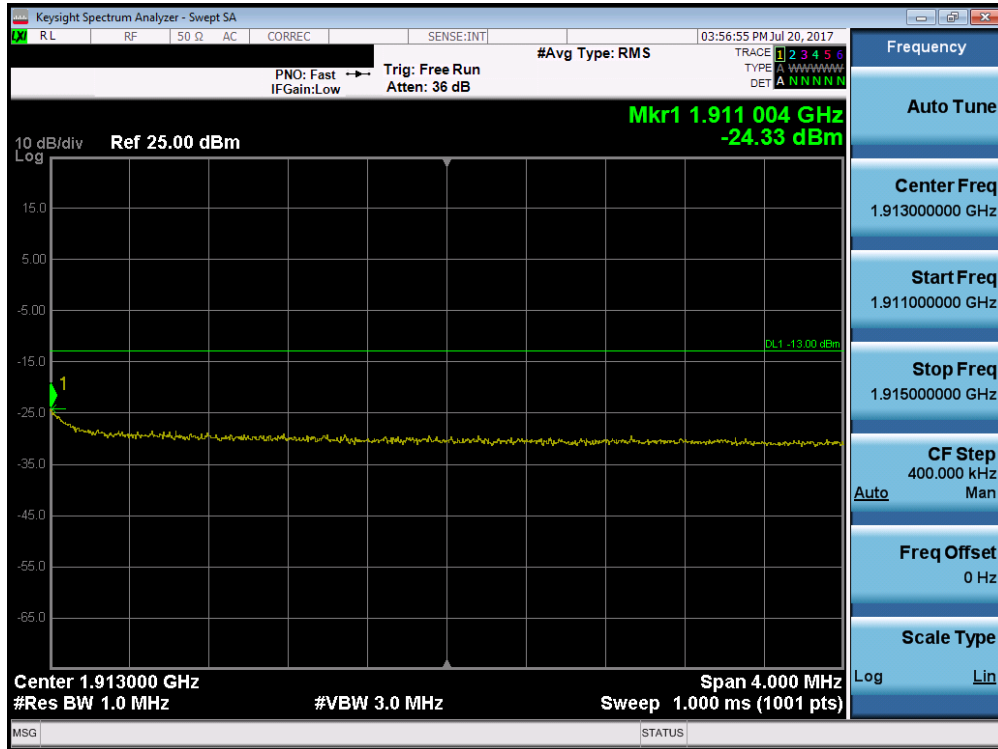


Plot 7-212. Lower Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

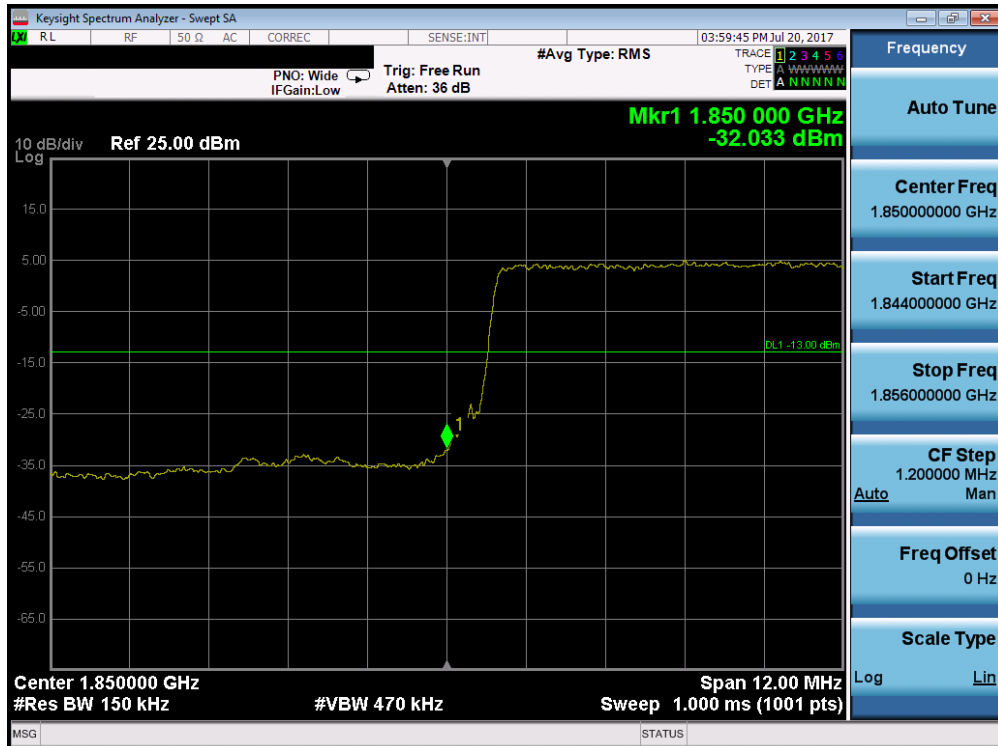


Plot 7-213. Upper Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 125 of 178

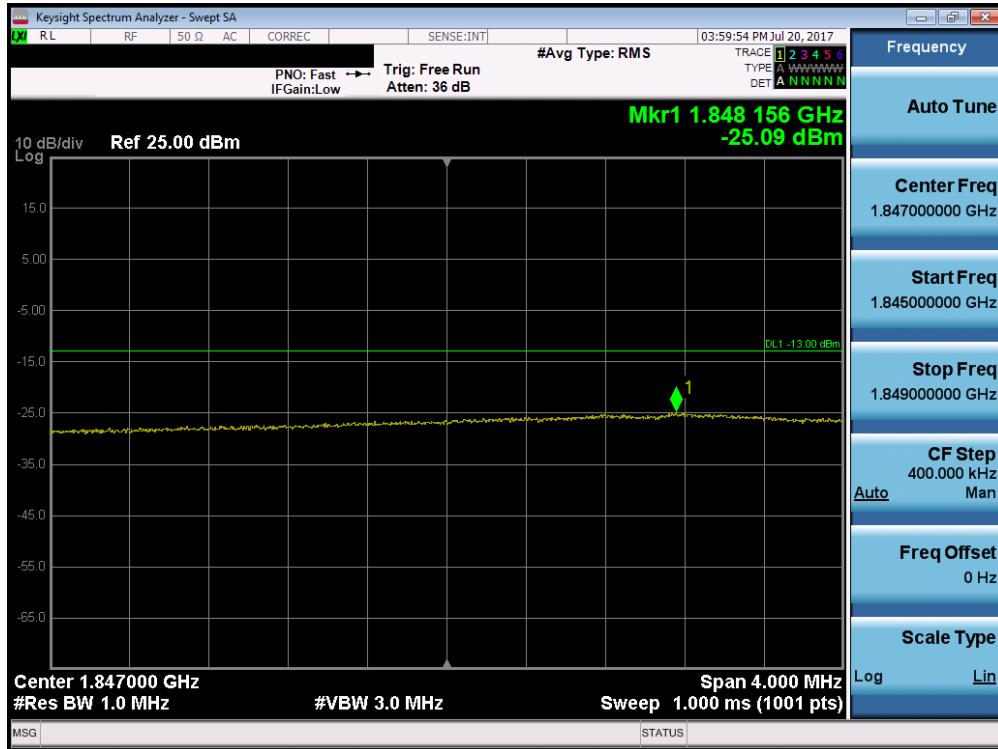


Plot 7-214. Upper Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

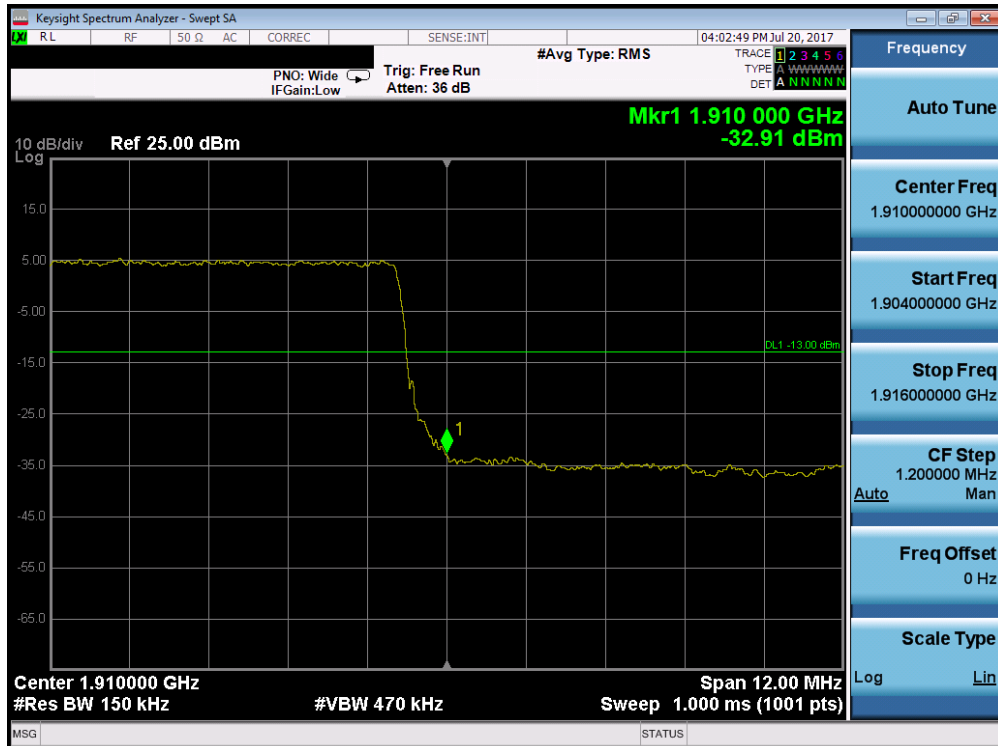


Plot 7-215. Lower Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 126 of 178

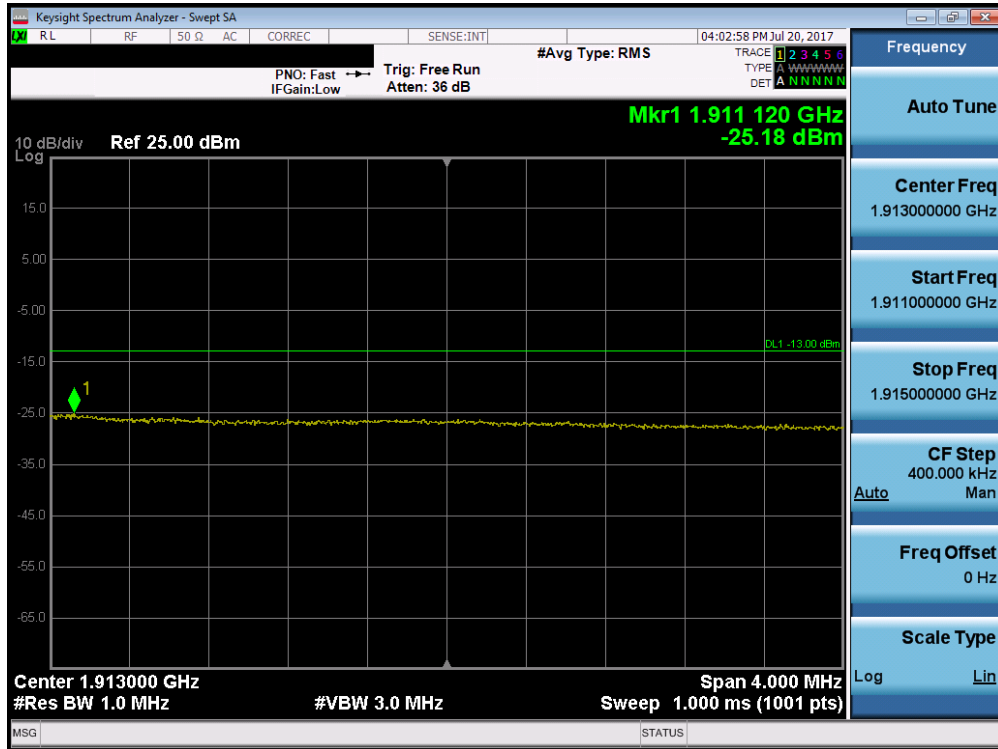


Plot 7-216. Lower Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

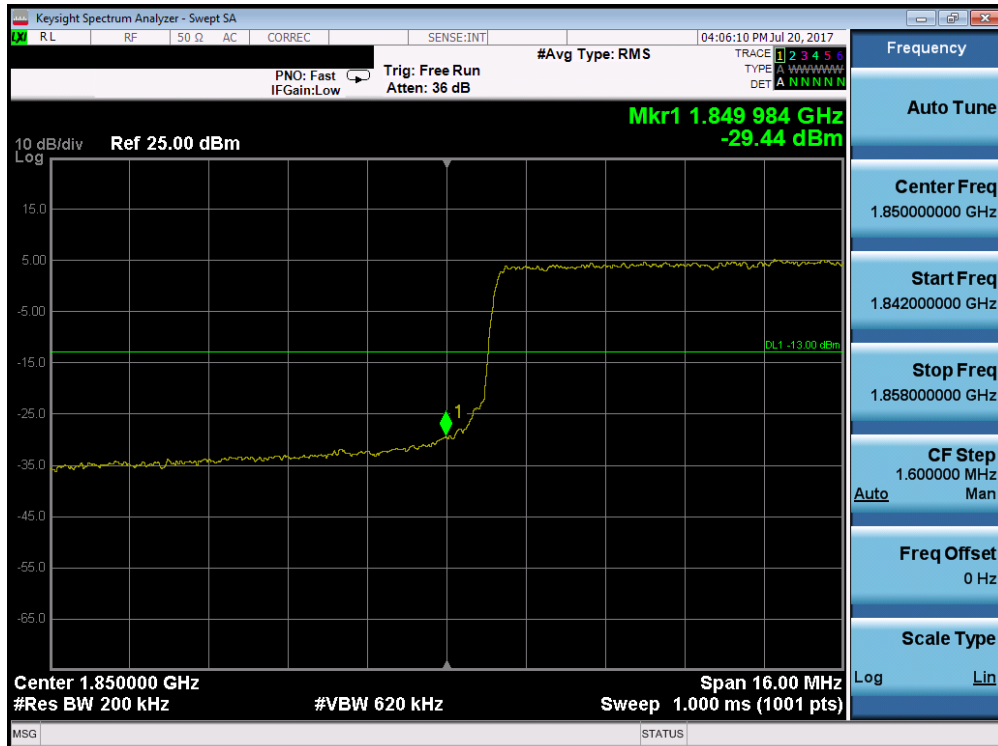


Plot 7-217. Upper Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 127 of 178

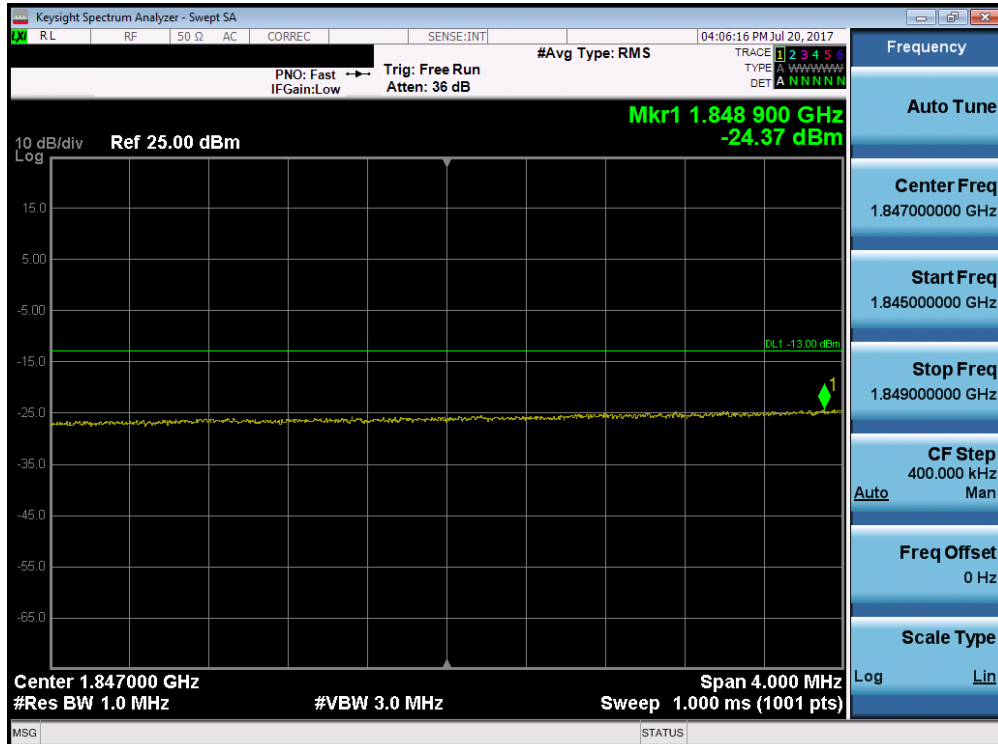


Plot 7-218. Upper Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

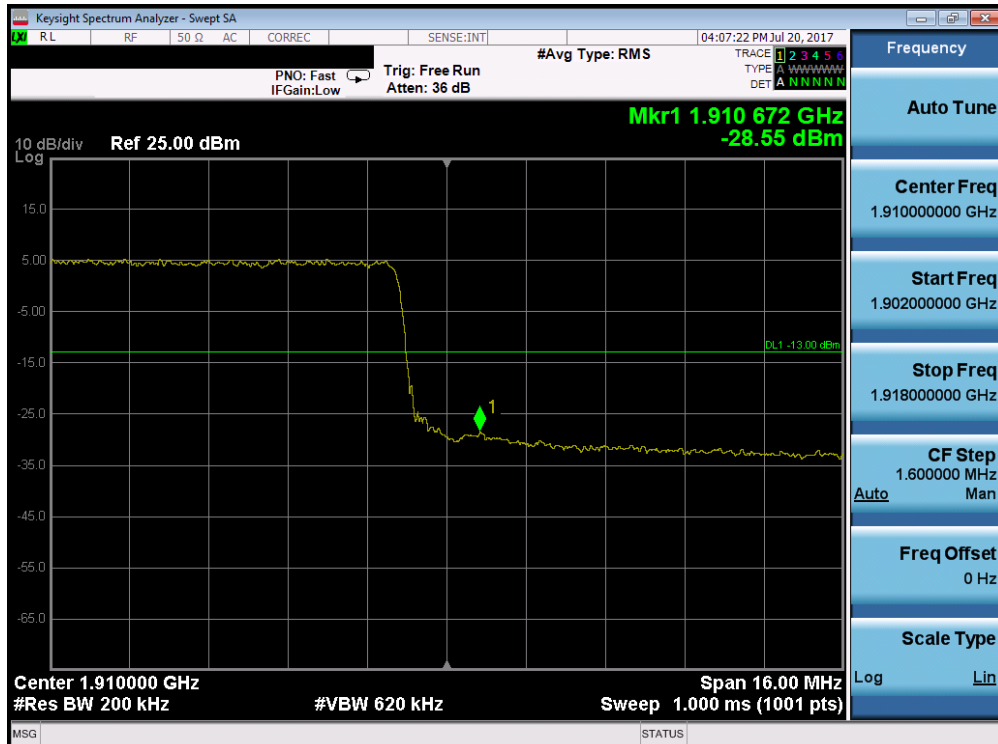


Plot 7-219. Lower Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 128 of 178

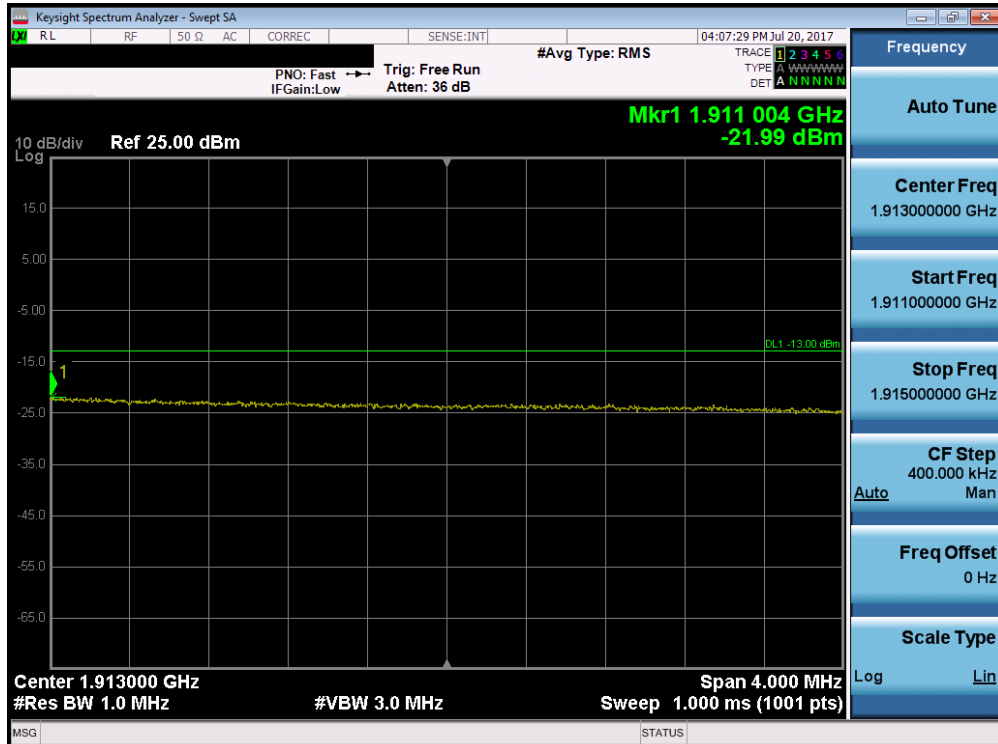


Plot 7-220. Lower Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

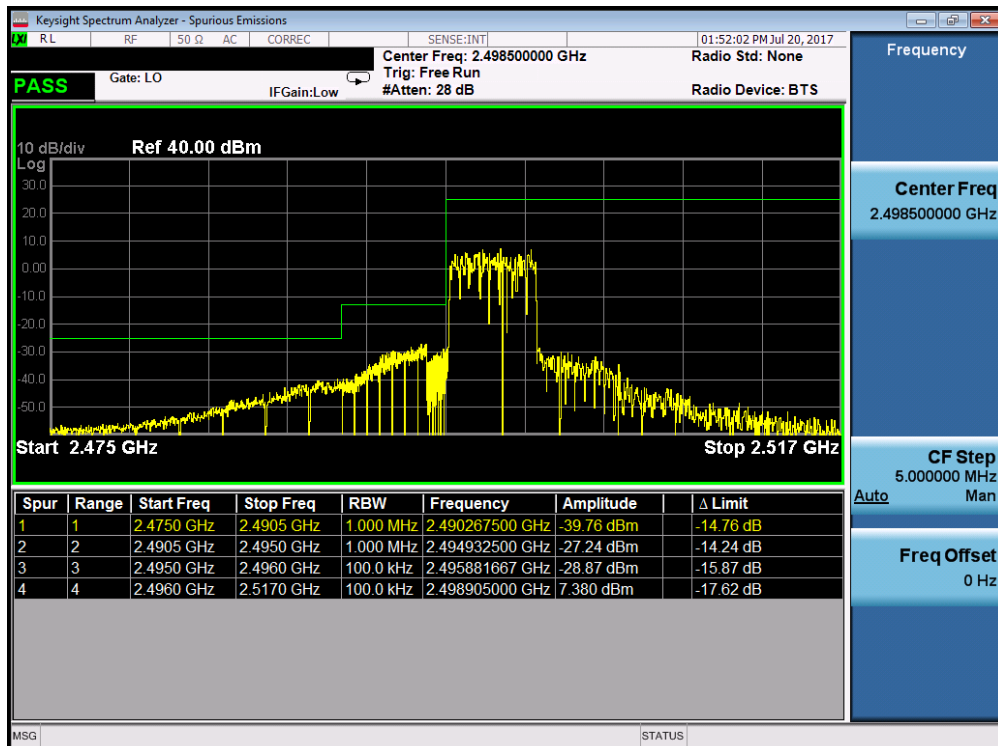


Plot 7-221. Upper Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 129 of 178

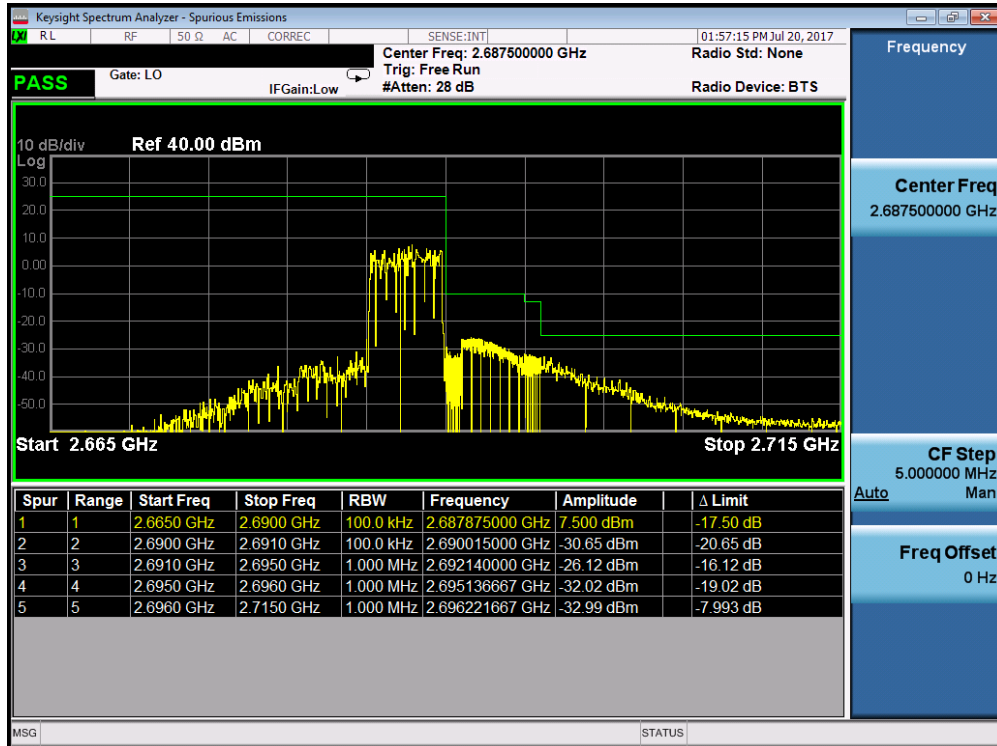


Plot 7-222. Upper Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

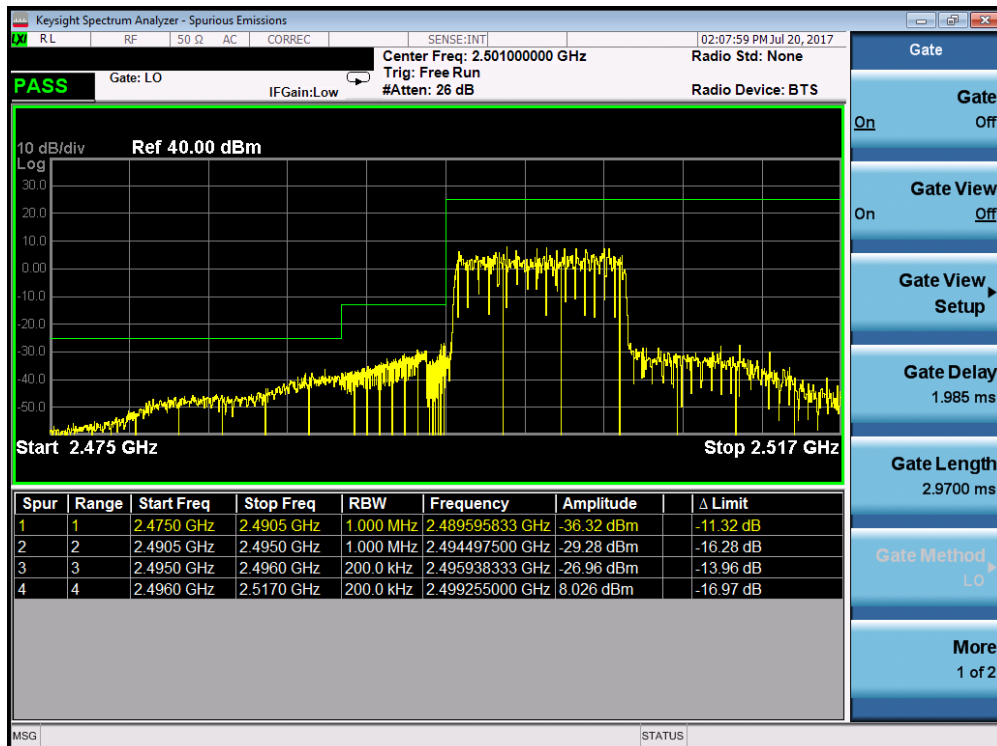


Plot 7-223. Lower ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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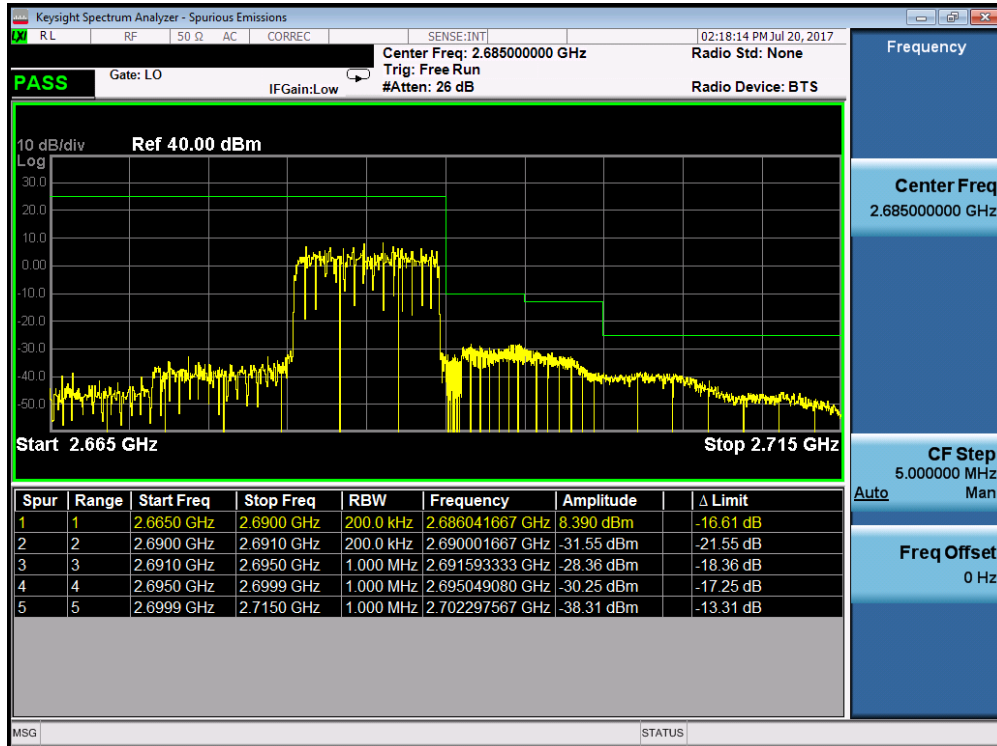


Plot 7-224. Upper ACP Plot (Band 41 – 5.0MHz QPSK – RB Size 25)

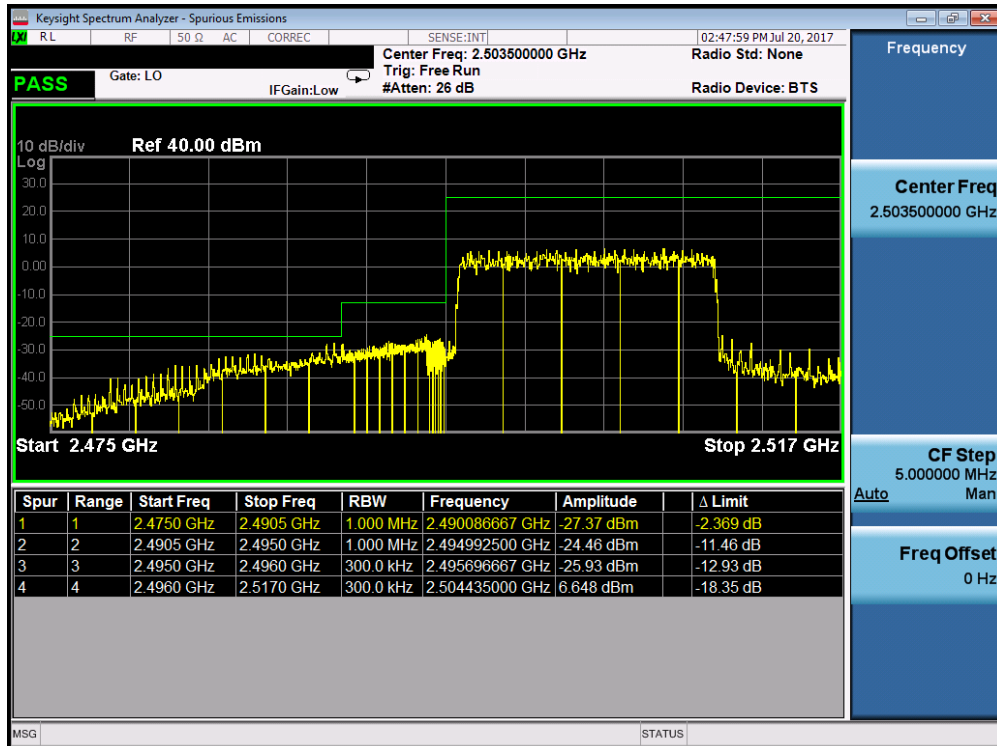


Plot 7-225. Lower ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 131 of 178

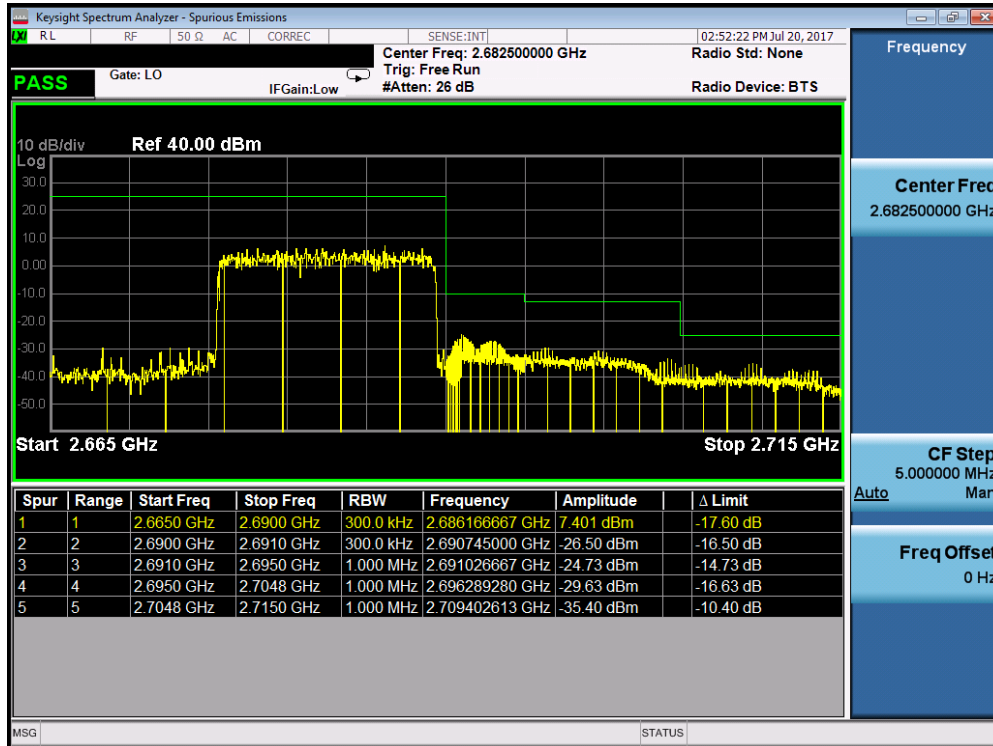


Plot 7-226. Upper ACP Plot (Band 41 – 10.0MHz QPSK – RB Size 50)

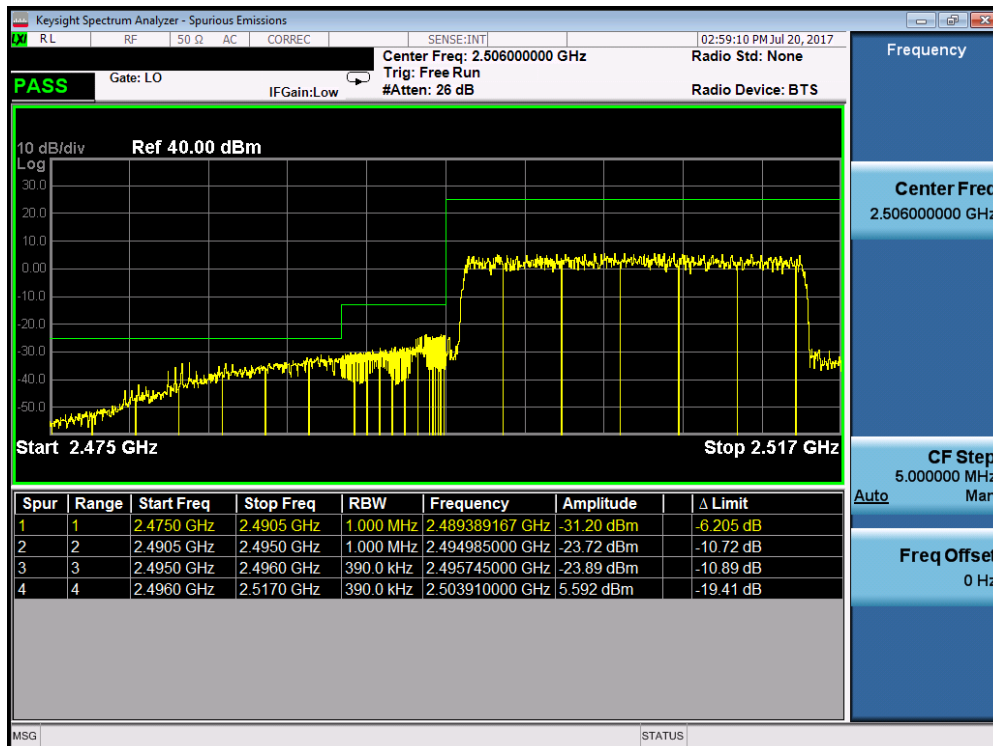


Plot 7-227. Lower ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 132 of 178

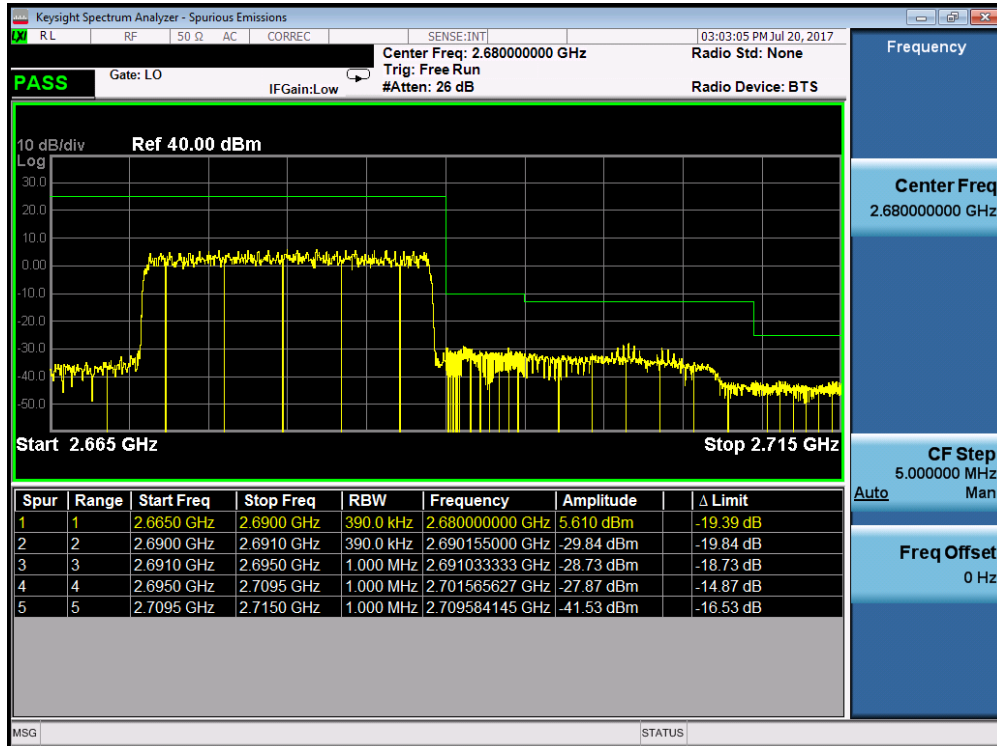


Plot 7-228. Upper ACP Plot (Band 41 – 15.0MHz QPSK – RB Size 75)



Plot 7-229. Lower ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 133 of 178



Plot 7-230. Upper ACP Plot (Band 41 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 134 of 178

7.5 Peak-Average Ratio

§24.232(d)

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 v02r02 – 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.

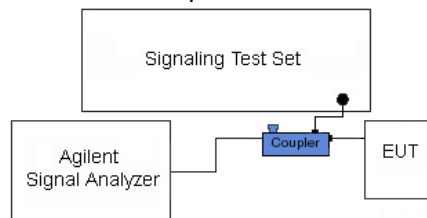
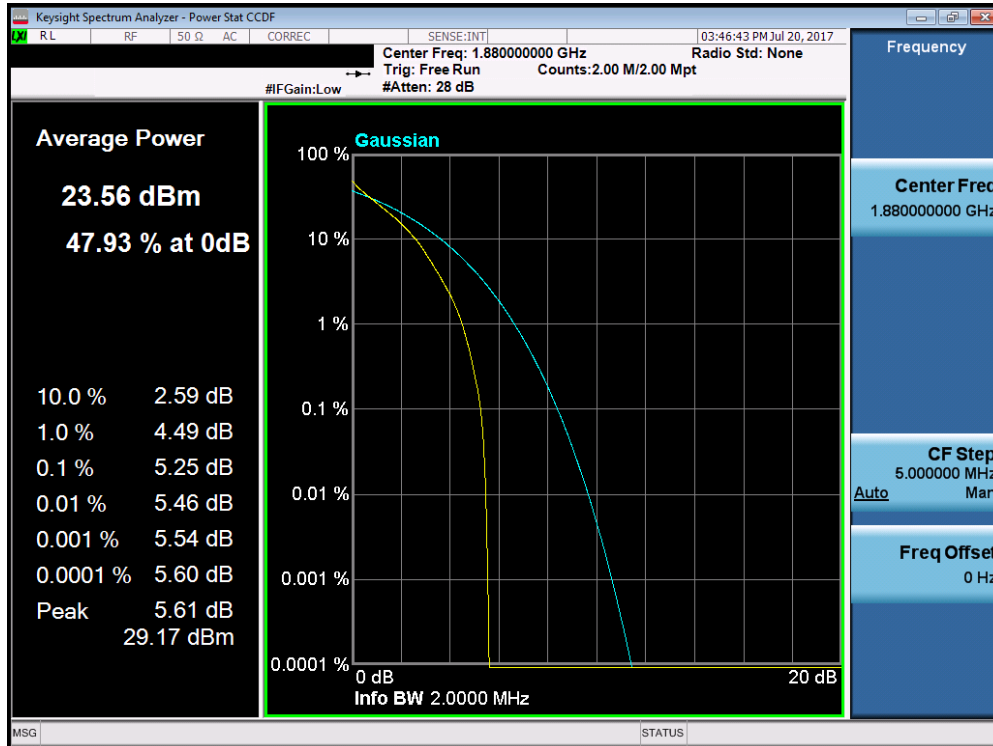


Figure 7-4. Test Instrument & Measurement Setup

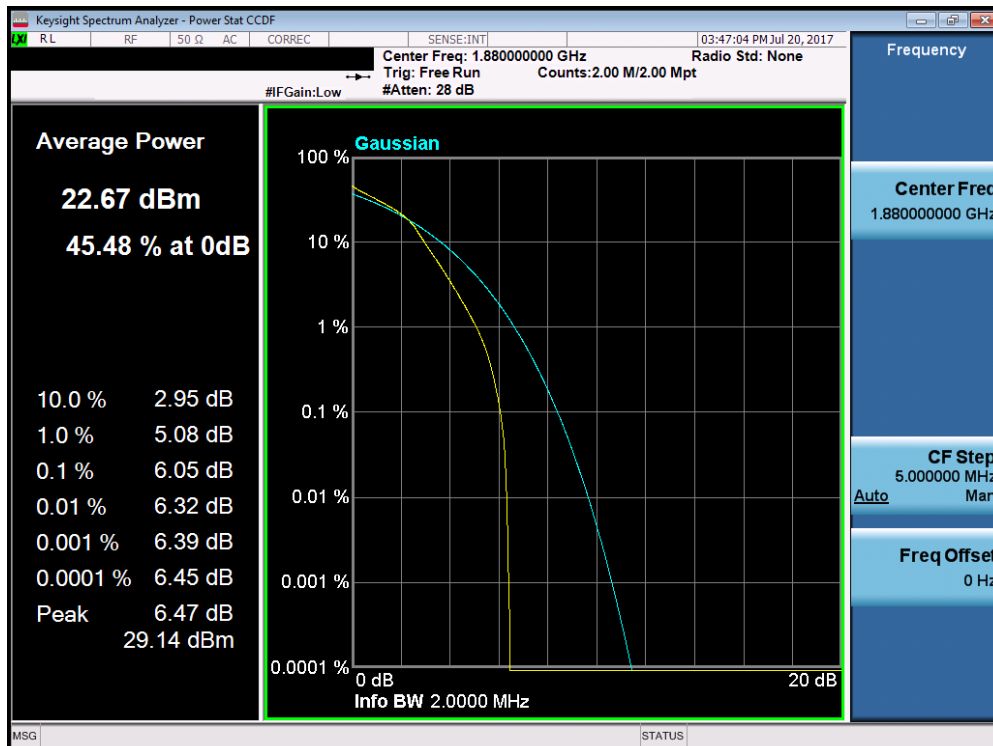
Test Notes

None.

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 135 of 178

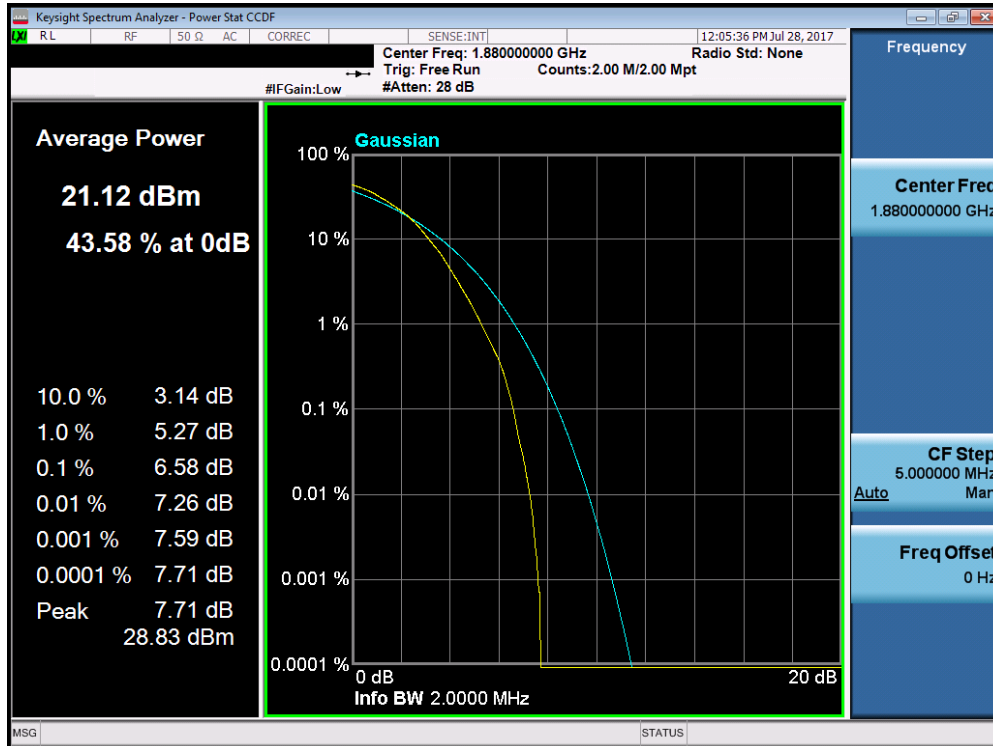


Plot 7-231. PAR Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

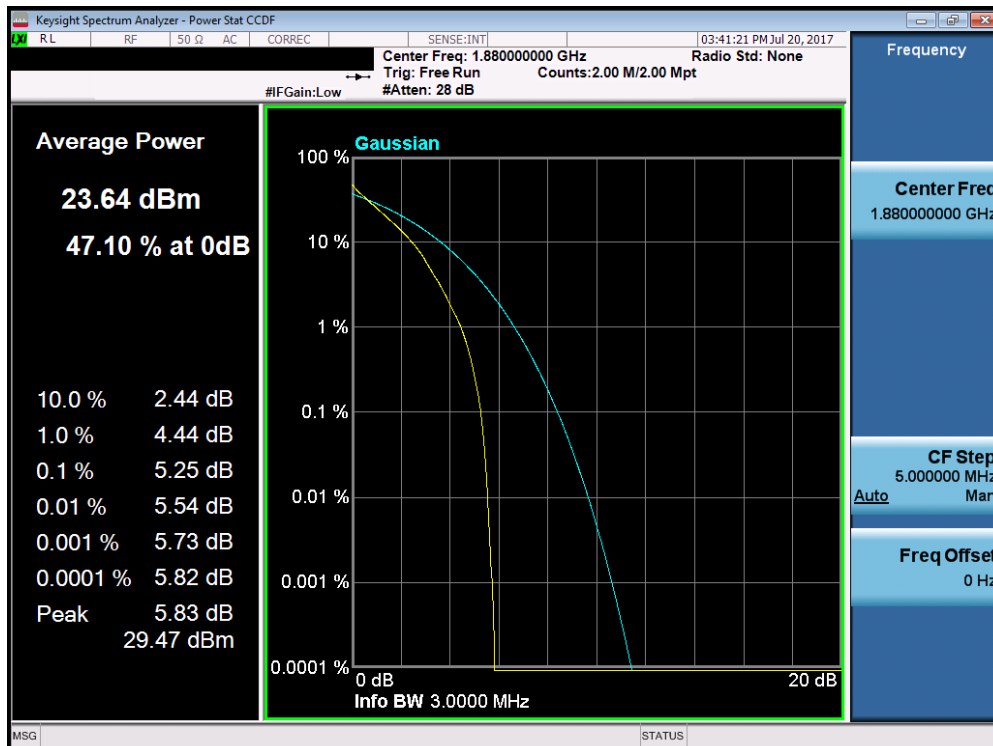


Plot 7-232. PAR Plot (Band 2 – 1.4MHz 16-QAM – RB Size 6)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 136 of 178

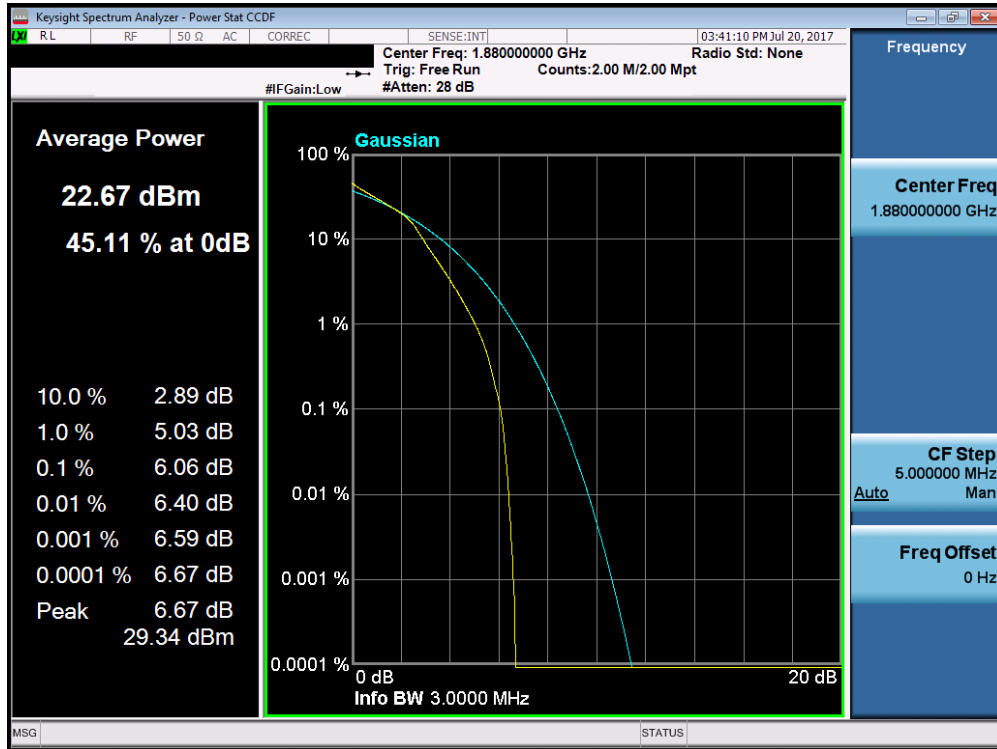


Plot 7-233. PAR Plot (Band 2 – 1.4MHz 64-QAM – RB Size 6)

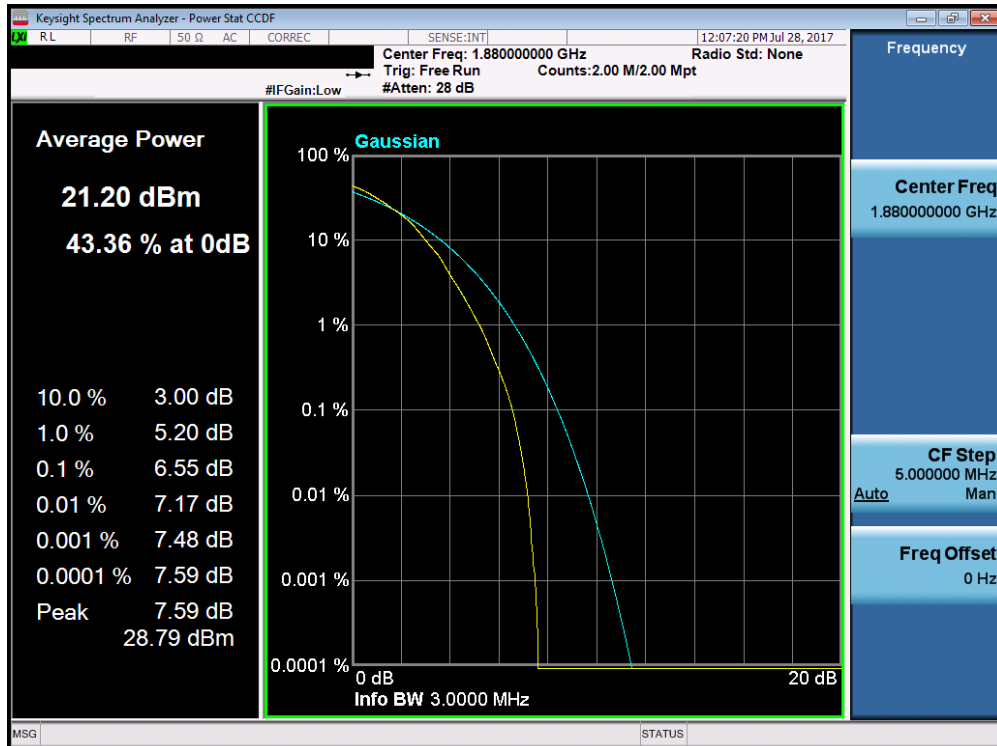


Plot 7-234. PAR Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 137 of 178

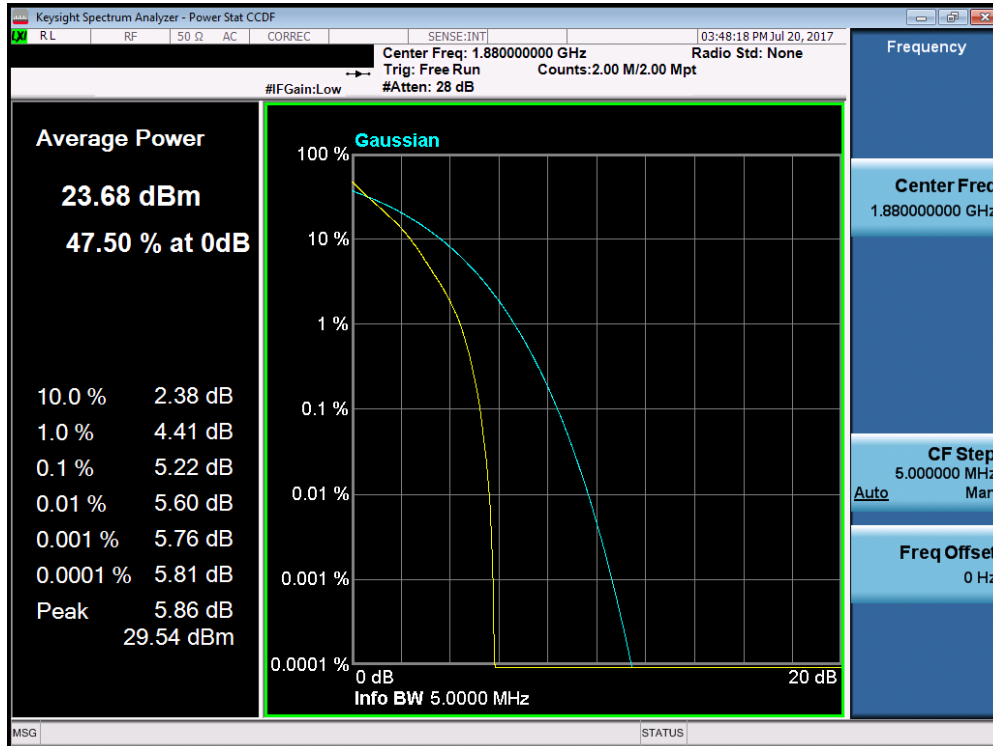


Plot 7-235. PAR Plot (Band 2 – 3.0MHz 16-QAM – RB Size 15)

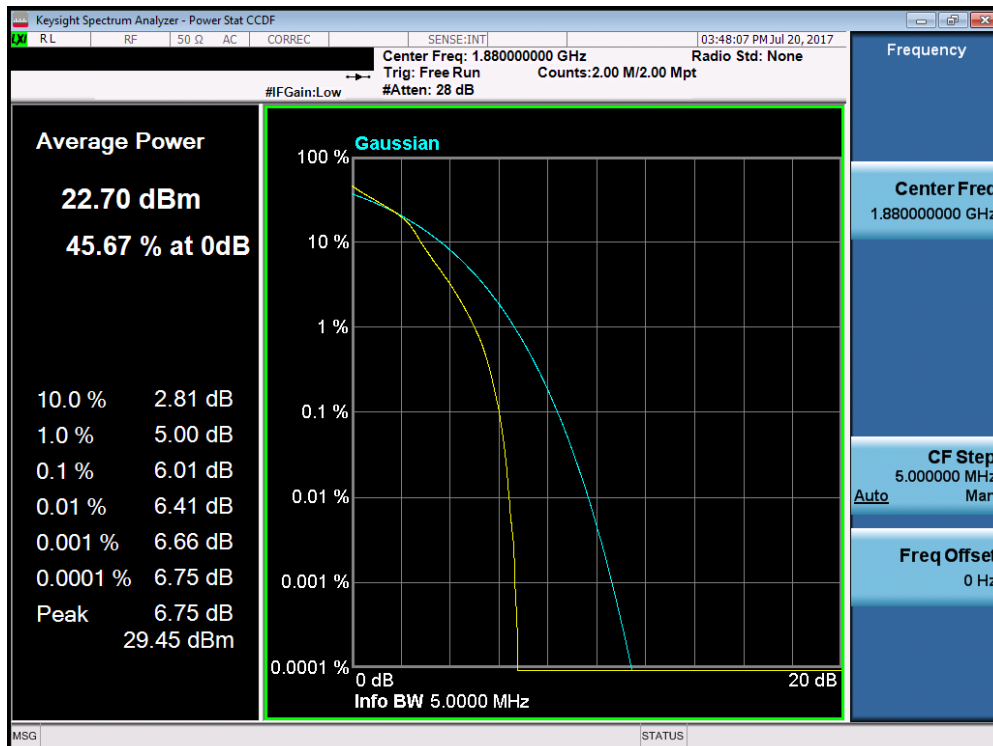


Plot 7-236. PAR Plot (Band 2 – 3.0MHz 64-QAM – RB Size 15)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 138 of 178

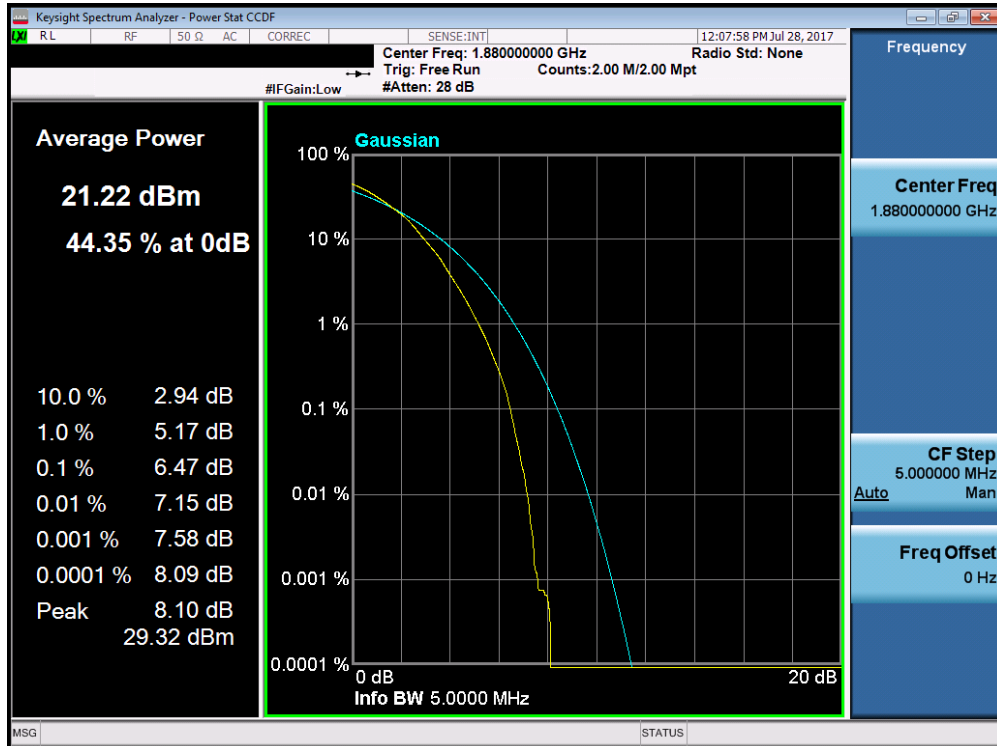


Plot 7-237. PAR Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

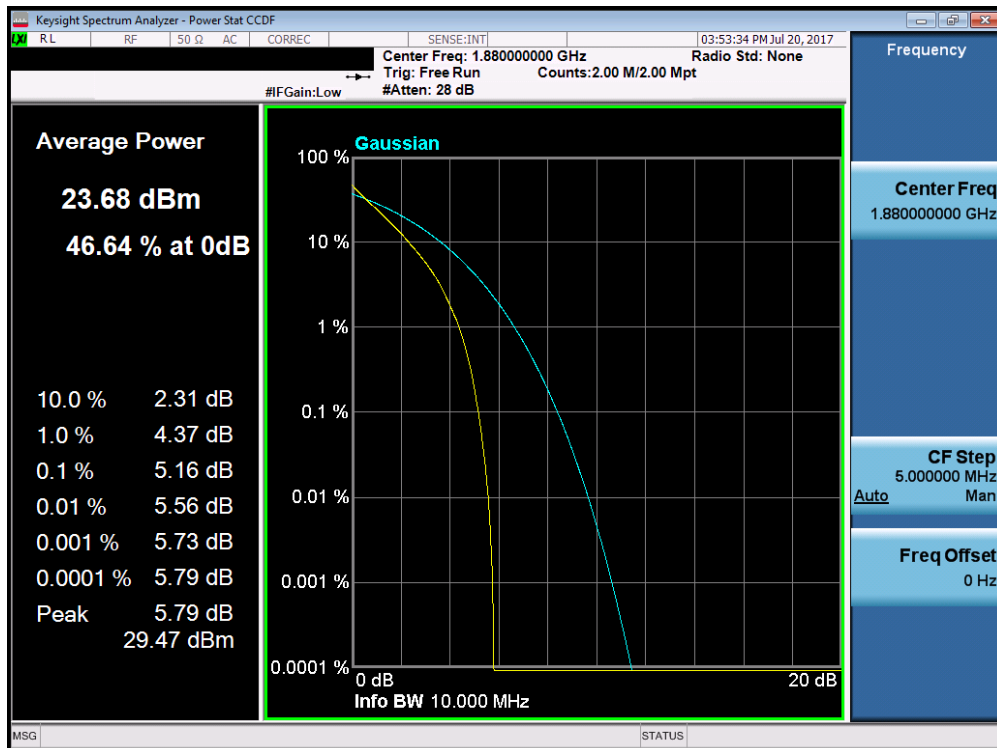


Plot 7-238. PAR Plot (Band 2 – 5.0MHz 16-QAM – RB Size 25)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 139 of 178

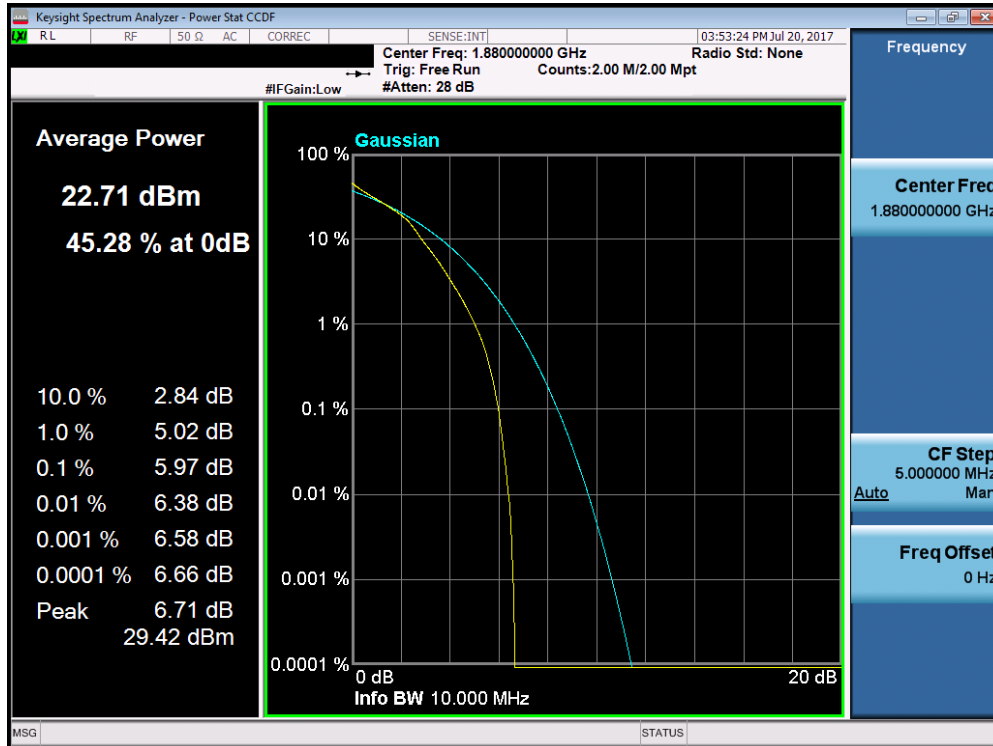


Plot 7-239. PAR Plot (Band 2 – 5.0MHz 64-QAM – RB Size 25)

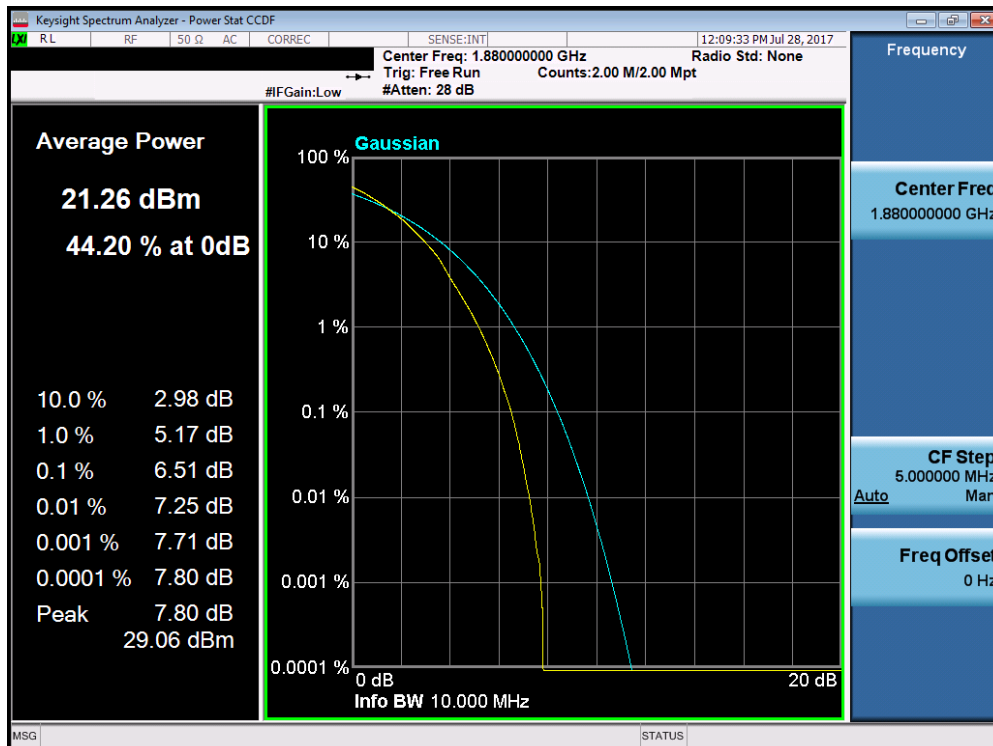


Plot 7-240. PAR Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 140 of 178

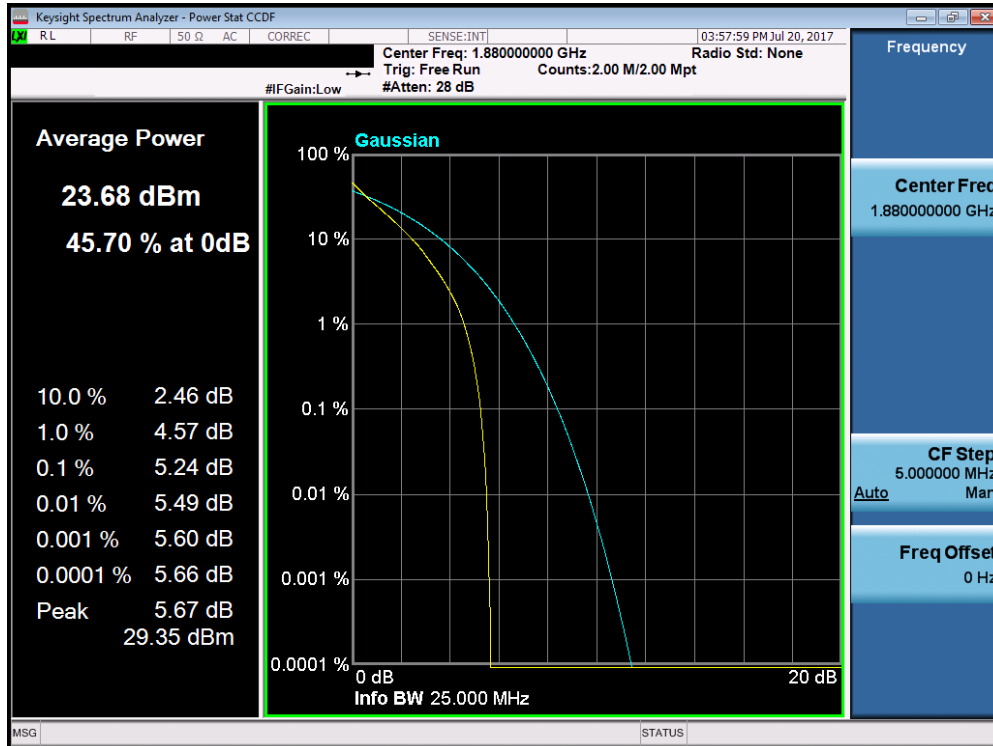


Plot 7-241. PAR Plot (Band 2 – 10.0MHz 16-QAM – RB Size 50)

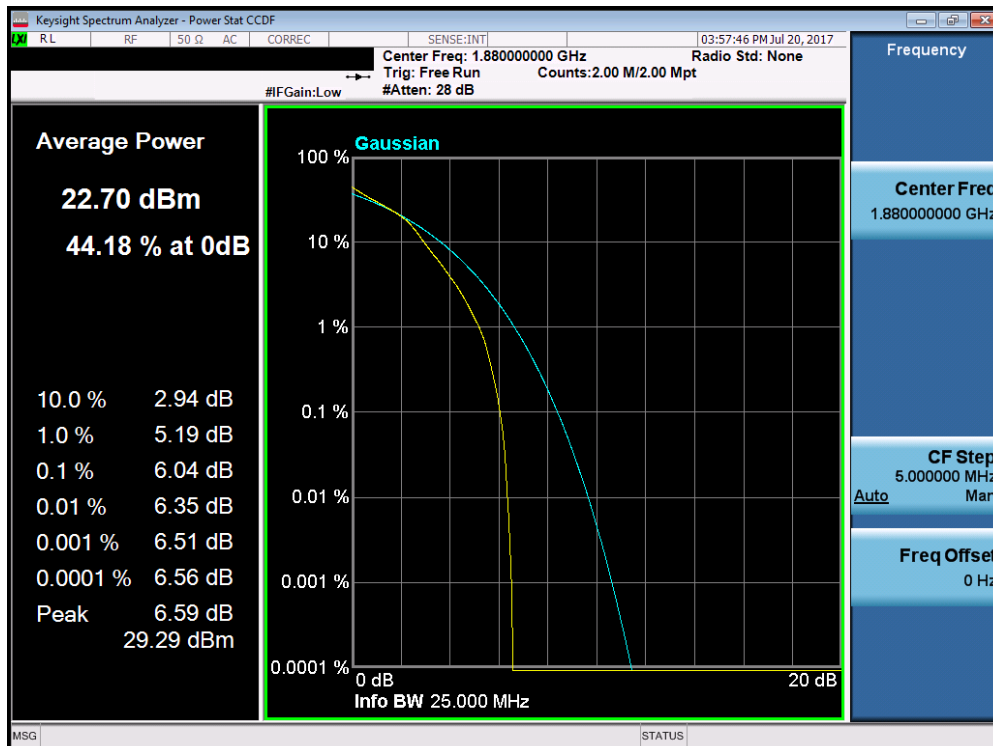


Plot 7-242. PAR Plot (Band 2 – 10.0MHz 64-QAM – RB Size 50)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 141 of 178

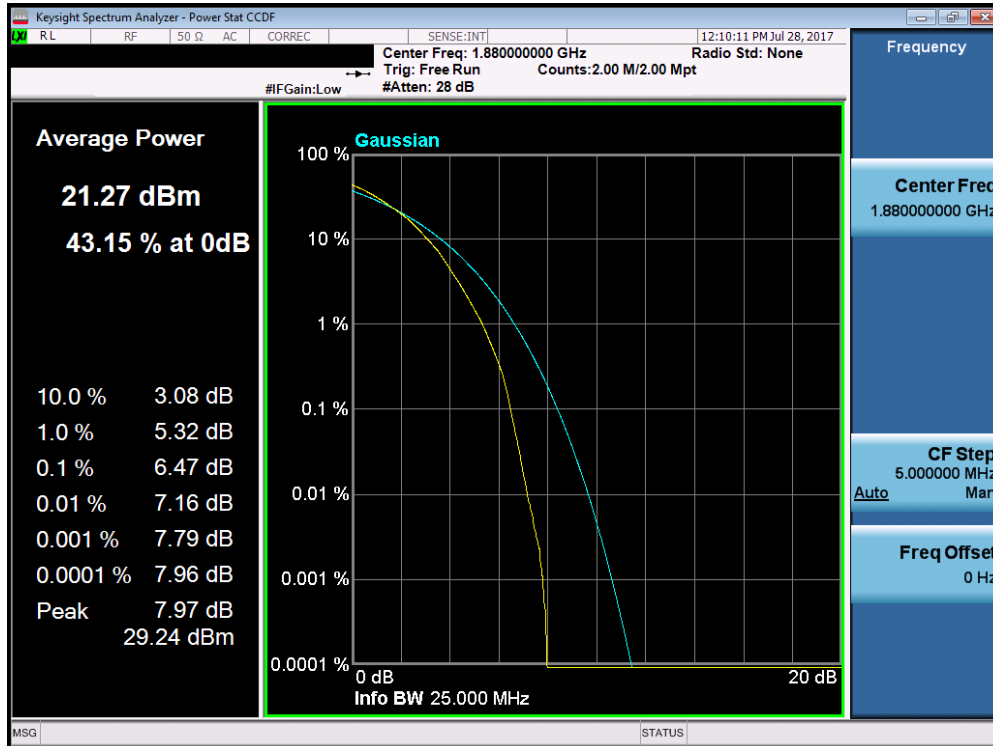


Plot 7-243. PAR Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

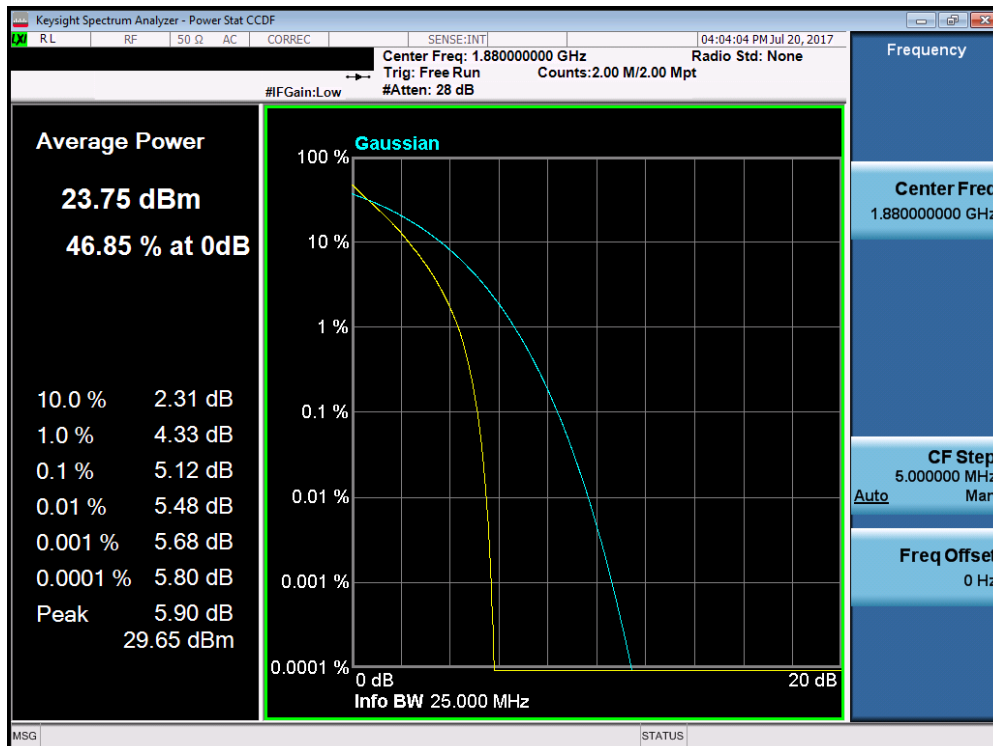


Plot 7-244. PAR Plot (Band 2 – 15.0MHz 16-QAM – RB Size 75)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 142 of 178

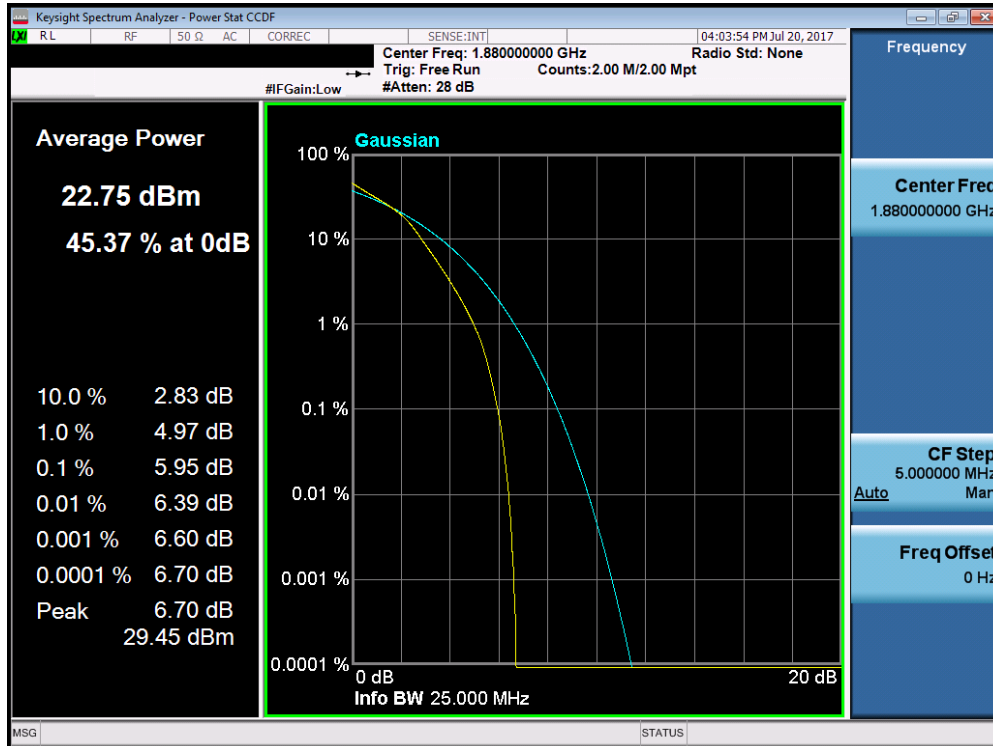


Plot 7-245. PAR Plot (Band 2 – 15.0MHz 64-QAM – RB Size 75)

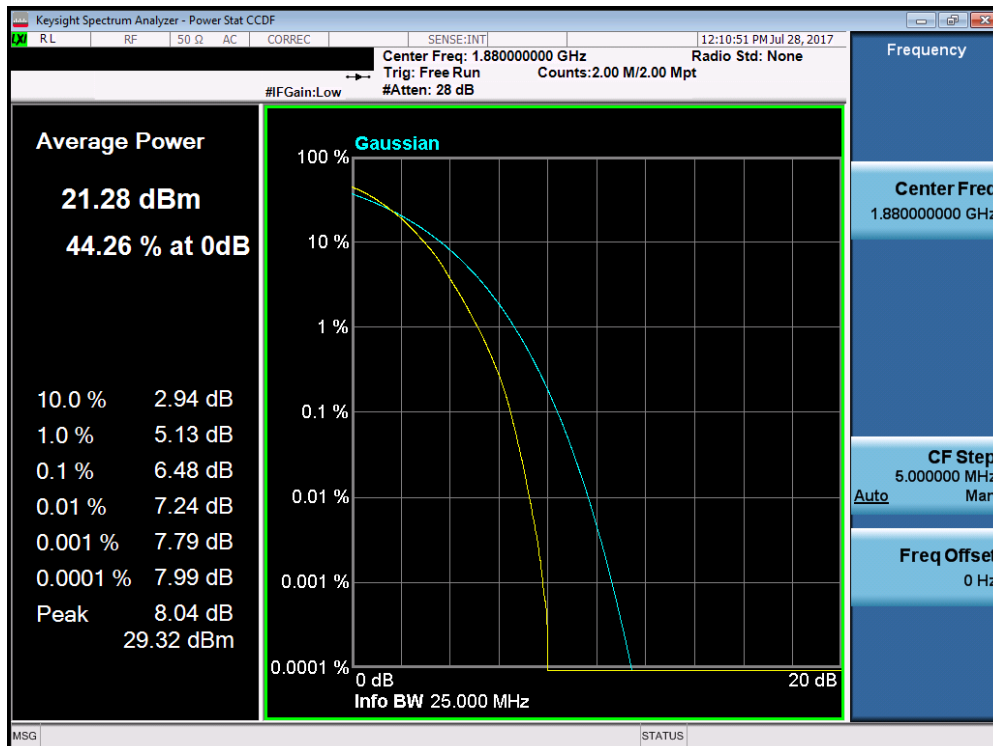


Plot 7-246. PAR Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Plot 7-247. PAR Plot (Band 2 – 20.0MHz 16-QAM – RB Size 100)



Plot 7-248. PAR Plot (Band 2 – 20.0MHz 64-QAM – RB Size 100)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset		Page 144 of 178

7.6 Radiated Power (ERP/EIRP)
§22.913(a.2) §24.232(c.2) §27.50(h.2) §27.50(c.10) §27.50(d.4)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as 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 v02r02 – Section 5.2.1

ANSI/TIA-603-D-2010 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer’s “channel power” measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer’s “time domain power” measurement capability is used
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to “free run” for signals with continuous operation with the sweep times set to “auto”.
Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the “gating” function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

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Test Setup

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

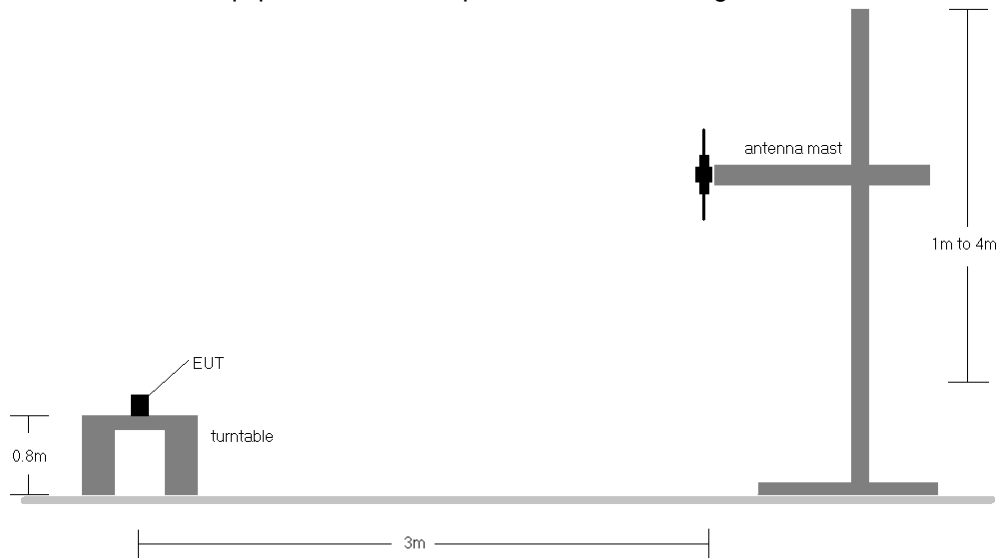


Figure 7-5. Radiated Test Setup <1GHz

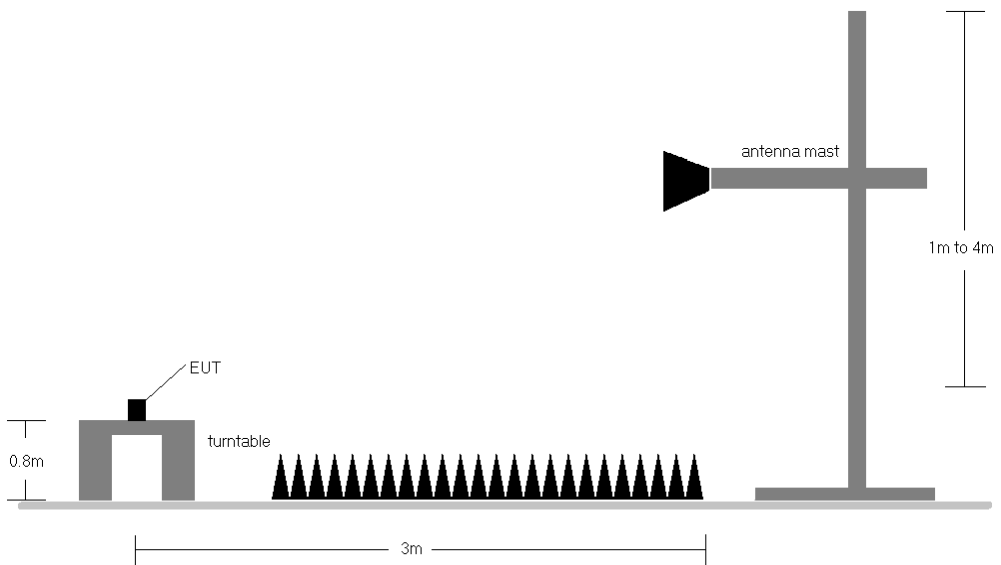


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
665.50	5	QPSK	V	150	7	1 / 0	13.86	-1.05	12.81	34.77	-21.96
680.50	5	QPSK	V	150	17	1 / 0	14.82	-1.05	13.77	34.77	-21.00
695.50	5	QPSK	V	150	7	1 / 0	14.76	-1.05	13.71	34.77	-21.06
680.50	5	16-QAM	V	150	17	1 / 0	14.40	-1.05	13.35	34.77	-21.42
680.50	5	64-QAM	V	150	17	1 / 0	13.37	-1.05	12.32	34.77	-22.45
668.00	10	QPSK	V	150	20	1 / 0	13.59	-1.05	12.54	34.77	-22.23
680.50	10	QPSK	V	150	7	1 / 0	15.03	-1.05	13.98	34.77	-20.79
693.00	10	QPSK	V	150	5	1 / 0	15.04	-1.05	13.99	34.77	-20.78
693.00	10	16-QAM	V	150	5	1 / 0	14.69	-1.05	13.64	34.77	-21.13
693.00	10	64-QAM	V	150	5	1 / 0	13.75	-1.05	12.70	34.77	-22.07
670.50	15	QPSK	V	150	10	1 / 0	13.87	-1.05	12.82	34.77	-21.95
680.50	15	QPSK	V	150	20	1 / 0	14.56	-1.05	13.51	34.77	-21.26
690.50	15	QPSK	V	150	25	1 / 0	15.08	-1.05	14.03	34.77	-20.74
690.50	15	16-QAM	V	150	25	1 / 0	14.70	-1.05	13.65	34.77	-21.12
690.50	15	64-QAM	V	150	25	1 / 0	13.80	-1.05	12.75	34.77	-22.02
673.00	20	QPSK	V	150	23	1 / 0	13.90	-1.05	12.85	34.77	-21.92
680.50	20	QPSK	V	150	12	1 / 0	14.88	-1.05	13.83	34.77	-20.94
688.00	20	QPSK	V	150	0	1 / 0	14.92	-1.05	13.87	34.77	-20.90
688.00	20	16-QAM	V	150	0	1 / 0	14.51	-1.05	13.46	34.77	-21.31
688.00	20	64-QAM	V	150	0	1 / 0	13.55	-1.05	12.50	34.77	-22.27
690.50	15	QPSK	H	150	39	1 / 0	13.85	-1.05	12.80	34.77	-21.98
690.50	15 (WCP)	QPSK	H	150	139	1 / 0	14.56	-1.05	13.51	34.77	-21.27

Table 7-2. ERP Data (Band 71)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	150	106	1 / 0	17.28	-1.05	16.23	34.77	-18.54
707.50	1.4	QPSK	V	150	105	1 / 0	17.70	-1.02	16.68	34.77	-18.09
715.30	1.4	QPSK	V	150	107	1 / 0	17.79	-0.99	16.80	34.77	-17.97
715.30	1.4	16-QAM	V	150	107	1 / 0	17.68	-0.99	16.69	34.77	-18.08
715.30	1.4	64-QAM	V	150	107	1 / 0	17.08	-0.99	16.09	34.77	-18.68
700.50	3	QPSK	V	150	110	1 / 0	17.83	-1.05	16.78	34.77	-17.99
707.50	3	QPSK	V	150	109	1 / 0	17.47	-1.02	16.45	34.77	-18.32
714.50	3	QPSK	V	150	108	1 / 0	17.97	-0.99	16.98	34.77	-17.79
714.50	3	16-QAM	V	150	108	1 / 0	17.91	-0.99	16.92	34.77	-17.85
714.50	3	64-QAM	V	150	108	1 / 0	17.20	-0.99	16.21	34.77	-18.56
701.50	5	QPSK	V	150	102	1 / 0	18.17	-1.04	17.13	34.77	-17.65
707.50	5	QPSK	V	150	103	1 / 0	17.06	-1.02	16.04	34.77	-18.73
713.50	5	QPSK	V	150	101	1 / 0	17.58	-1.00	16.58	34.77	-18.19
701.50	5	16-QAM	V	150	102	1 / 0	18.08	-1.04	17.04	34.77	-17.74
701.50	5	64-QAM	V	150	102	1 / 0	17.25	-1.04	16.21	34.77	-18.57
704.00	10	QPSK	V	150	112	1 / 0	17.43	-1.03	16.40	34.77	-18.37
707.50	10	QPSK	V	150	110	1 / 0	17.79	-1.02	16.77	34.77	-18.00
711.00	10	QPSK	V	150	108	1 / 0	17.85	-1.01	16.84	34.77	-17.93
711.00	10	16-QAM	V	150	108	1 / 0	17.77	-1.01	16.76	34.77	-18.01
711.00	10	64-QAM	V	150	108	1 / 0	16.86	-1.01	15.85	34.77	-18.92
701.50	5	QPSK	H	150	3	1 / 0	16.06	-1.04	15.02	34.77	-19.76
701.50	5 (WCP)	QPSK	H	150	126	1 / 0	18.06	-1.04	17.02	34.77	-17.76

Table 7-3. ERP Data (Band 12)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE 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 [dBd]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	150	136	1 / 0	18.45	-0.65	17.80	38.45	-20.65
836.50	1.4	QPSK	H	150	132	1 / 0	18.38	-0.65	17.73	38.45	-20.72
848.30	1.4	QPSK	H	150	135	1 / 0	19.22	-0.65	18.57	38.45	-19.88
848.30	1.4	16-QAM	H	150	135	1 / 0	18.10	-0.65	17.45	38.45	-21.00
848.30	1.4	64-QAM	H	150	135	1 / 0	17.81	-0.65	17.16	38.45	-21.29
825.50	3	QPSK	H	150	136	1 / 0	18.73	-0.65	18.08	38.45	-20.37
836.50	3	QPSK	H	150	139	1 / 0	19.04	-0.65	18.39	38.45	-20.06
847.50	3	QPSK	H	150	134	1 / 0	18.62	-0.65	17.97	38.45	-20.48
836.50	3	16-QAM	H	150	139	1 / 0	18.94	-0.65	18.29	38.45	-20.16
836.50	3	64-QAM	H	150	139	1 / 0	18.56	-0.65	17.91	38.45	-20.54
826.50	5	QPSK	H	150	139	1 / 0	18.93	-0.65	18.28	38.45	-20.17
836.50	5	QPSK	H	150	134	1 / 0	18.57	-0.65	17.92	38.45	-20.53
846.50	5	QPSK	H	150	131	1 / 0	18.63	-0.65	17.98	38.45	-20.47
826.50	5	16-QAM	H	150	139	1 / 0	18.87	-0.65	18.22	38.45	-20.23
826.50	5	64-QAM	H	150	139	1 / 0	18.63	-0.65	17.98	38.45	-20.47
829.00	10	QPSK	H	150	135	1 / 0	19.35	-0.65	18.70	38.45	-19.75
836.50	10	QPSK	H	150	131	1 / 0	19.00	-0.65	18.35	38.45	-20.10
844.00	10	QPSK	H	150	138	1 / 0	18.47	-0.65	17.82	38.45	-20.63
829.00	10	16-QAM	H	150	135	1 / 0	19.31	-0.65	18.66	38.45	-19.79
829.00	10	64-QAM	H	150	135	1 / 0	18.76	-0.65	18.11	38.45	-20.34
829.00	10	QPSK	V	150	105	1 / 0	18.99	-0.65	18.34	38.45	-20.11
829.00	10 (WCP)	QPSK	H	150	43	1 / 0	18.35	-0.65	17.70	38.45	-20.75

Table 7-4. ERP Data (Band 5)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset	Page 148 of 178	

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 Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	V	120	76	1 / 0	10.78	9.44	20.22	30.00	-9.78
1745.00	1.4	QPSK	V	115	87	1 / 0	10.76	9.25	20.01	30.00	-9.99
1779.30	1.4	QPSK	V	110	82	1 / 0	9.81	9.05	18.86	30.00	-11.14
1710.70	1.4	16-QAM	V	120	76	1 / 0	10.70	9.44	20.14	30.00	-9.86
1710.70	1.4	64-QAM	V	120	76	1 / 0	10.33	9.44	19.77	30.00	-10.23
1711.50	3	QPSK	V	134	82	1 / 0	11.17	9.44	20.61	30.00	-9.39
1745.00	3	QPSK	V	148	89	1 / 0	11.18	9.25	20.43	30.00	-9.57
1778.50	3	QPSK	V	138	87	1 / 0	10.56	9.06	19.62	30.00	-10.38
1711.50	3	16-QAM	V	134	82	1 / 0	11.07	9.44	20.51	30.00	-9.49
1711.50	3	64-QAM	V	134	82	1 / 0	10.28	9.44	19.72	30.00	-10.28
1712.50	5	QPSK	V	143	84	1 / 0	12.10	9.43	21.53	30.00	-8.47
1745.00	5	QPSK	V	150	84	1 / 0	12.15	9.25	21.40	30.00	-8.60
1777.50	5	QPSK	V	145	57	1 / 0	11.77	9.06	20.83	30.00	-9.17
1712.50	5	16-QAM	V	143	84	1 / 0	11.96	9.43	21.39	30.00	-8.61
1712.50	5	64-QAM	V	143	84	1 / 0	11.52	9.43	20.95	30.00	-9.05
1715.00	10	QPSK	V	143	89	1 / 0	12.41	9.42	21.83	30.00	-8.17
1745.00	10	QPSK	V	148	103	1 / 0	12.61	9.25	21.86	30.00	-8.14
1775.00	10	QPSK	V	135	113	1 / 0	12.38	9.08	21.46	30.00	-8.54
1745.00	10	16-QAM	V	148	103	1 / 0	12.40	9.25	21.65	30.00	-8.35
1745.00	10	64-QAM	V	148	103	1 / 0	12.02	9.25	21.27	30.00	-8.73
1717.50	15	QPSK	V	145	96	1 / 0	12.33	9.40	21.73	30.00	-8.27
1745.00	15	QPSK	V	148	98	1 / 0	12.59	9.25	21.84	30.00	-8.16
1772.50	15	QPSK	V	143	95	1 / 0	12.50	9.09	21.59	30.00	-8.41
1745.00	15	16-QAM	V	148	98	1 / 0	12.49	9.25	21.74	30.00	-8.26
1745.00	15	64-QAM	V	148	98	1 / 0	11.64	9.25	20.89	30.00	-9.11
1720.00	20	QPSK	V	144	91	1 / 0	12.56	9.39	21.95	30.00	-8.05
1745.00	20	QPSK	V	145	98	1 / 0	12.88	9.25	22.13	30.00	-7.87
1770.00	20	QPSK	V	145	98	1 / 0	12.67	9.10	21.77	30.00	-8.23
1745.00	20	16-QAM	V	145	98	1 / 0	12.77	9.25	22.02	30.00	-7.98
1745.00	20	64-QAM	V	145	98	1 / 0	12.31	9.25	21.56	30.00	-8.44
1745.00	20	QPSK	H	112	324	1 / 0	11.93	9.44	21.37	30.00	-8.63
1745.00	20 (WCP)	QPSK	V	145	262	1 / 0	11.47	9.25	20.72	30.00	-9.28

Table 7-5. EIRP Data (Band 4/66)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE 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 Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	112	305	1 / 0	15.93	4.82	20.75	33.01	-12.26
1880.00	1.4	QPSK	H	113	303	1 / 0	15.34	4.74	20.08	33.01	-12.93
1909.30	1.4	QPSK	H	110	309	1 / 0	15.84	4.68	20.52	33.01	-12.49
1850.70	1.4	16-QAM	H	112	305	1 / 0	15.86	4.82	20.68	33.01	-12.33
1850.70	1.4	64-QAM	H	112	305	1 / 0	14.90	4.82	19.72	33.01	-13.29
1851.50	3	QPSK	H	111	303	1 / 0	16.20	4.82	21.02	33.01	-11.99
1880.00	3	QPSK	H	113	302	1 / 0	15.63	4.74	20.37	33.01	-12.64
1908.50	3	QPSK	H	111	305	1 / 0	16.12	4.68	20.80	33.01	-12.21
1851.50	3	16-QAM	H	111	303	1 / 0	16.14	4.82	20.96	33.01	-12.05
1851.50	3	64-QAM	H	111	303	1 / 0	15.17	4.82	19.99	33.01	-13.02
1852.50	5	QPSK	H	117	306	1 / 0	17.39	4.81	22.20	33.01	-10.81
1880.00	5	QPSK	H	119	306	1 / 0	16.62	4.74	21.36	33.01	-11.65
1907.50	5	QPSK	H	110	310	1 / 0	16.43	4.68	21.11	33.01	-11.90
1852.50	5	16-QAM	H	117	306	1 / 0	17.15	4.81	21.96	33.01	-11.05
1852.50	5	64-QAM	H	117	306	1 / 0	16.56	4.81	21.37	33.01	-11.64
1855.00	10	QPSK	H	116	307	1 / 0	17.70	4.81	22.51	33.01	-10.50
1880.00	10	QPSK	H	118	302	1 / 0	16.93	4.74	21.67	33.01	-11.34
1905.00	10	QPSK	H	111	307	1 / 0	17.18	4.68	21.86	33.01	-11.15
1855.00	10	16-QAM	H	116	307	1 / 0	17.52	4.81	22.33	33.01	-10.68
1855.00	10	64-QAM	H	116	307	1 / 0	16.35	4.81	21.16	33.01	-11.85
1857.50	15	QPSK	H	115	305	1 / 0	17.68	4.80	22.48	33.01	-10.53
1880.00	15	QPSK	H	116	304	1 / 0	17.21	4.74	21.95	33.01	-11.06
1902.50	15	QPSK	H	117	304	1 / 0	17.73	4.69	22.42	33.01	-10.59
1857.50	15	16-QAM	H	115	305	1 / 0	17.54	4.80	22.34	33.01	-10.67
1857.50	15	64-QAM	H	115	305	1 / 0	16.78	4.80	21.58	33.01	-11.43
1860.00	20	QPSK	H	116	305	1 / 0	17.64	4.79	22.43	33.01	-10.58
1880.00	20	QPSK	H	115	302	1 / 0	17.41	4.74	22.15	33.01	-10.86
1900.00	20	QPSK	H	114	305	1 / 0	17.64	4.69	22.33	33.01	-10.68
1860.00	20	16-QAM	H	116	305	1 / 0	17.56	4.79	22.35	33.01	-10.66
1860.00	20	64-QAM	H	116	305	1 / 0	16.89	4.79	21.68	33.01	-11.33
1855.00	10	QPSK	V	154	214	1 / 0	15.44	4.80	20.24	33.01	-12.77
1855.00	10 (WCP)	QPSK	H	112	352	1 / 0	16.45	4.81	21.26	33.01	-11.75

Table 7-6. EIRP Data (Band 2)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE 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 Limit [dBm]	Margin [dB]
2498.50	5	QPSK	H	150	325	1 / 0	14.85	5.73	20.58	33.01	-12.43
2593.00	5	QPSK	H	150	332	1 / 0	14.62	6.07	20.69	33.01	-12.32
2687.50	5	QPSK	H	150	303	1 / 0	8.89	6.48	15.37	33.01	-17.64
2593.00	5	16-QAM	H	150	332	1 / 0	13.45	6.07	19.52	33.01	-13.49
2593.00	5	64-QAM	H	150	332	1 / 0	12.87	6.07	18.94	33.01	-14.07
2501.00	10	QPSK	H	150	319	1 / 0	15.22	5.73	20.95	33.01	-12.06
2593.00	10	QPSK	H	150	338	1 / 0	14.69	6.07	20.76	33.01	-12.25
2685.00	10	QPSK	H	150	22	1 / 0	9.17	6.47	15.64	33.01	-17.37
2501.00	10	16-QAM	H	150	319	1 / 0	15.03	5.73	20.76	33.01	-12.25
2501.00	10	64-QAM	H	150	319	1 / 0	13.53	5.73	19.26	33.01	-13.75
2503.50	15	QPSK	H	150	35	1 / 0	15.68	5.74	21.42	33.01	-11.59
2593.00	15	QPSK	H	150	25	1 / 0	12.21	6.07	18.28	33.01	-14.73
2682.50	15	QPSK	H	150	30	1 / 0	9.28	6.46	15.74	33.01	-17.27
2503.50	15	16-QAM	H	150	35	1 / 0	15.54	5.74	21.28	33.01	-11.73
2503.50	15	64-QAM	H	150	35	1 / 0	13.89	5.74	19.63	33.01	-13.38
2506.00	20	QPSK	H	150	37	1 / 0	16.31	5.75	22.06	33.01	-10.95
2593.00	20	QPSK	H	150	37	1 / 0	14.52	6.07	20.59	33.01	-12.42
2680.00	20	QPSK	H	150	212	1 / 0	11.43	6.45	17.88	33.01	-15.13
2506.00	20	16-QAM	H	150	37	1 / 0	15.03	5.75	20.78	33.01	-12.23
2506.00	20	64-QAM	H	150	37	1 / 0	13.70	5.75	19.45	33.01	-13.56
2506.00	20	QPSK	V	150	325	1 / 50	15.44	5.63	21.07	33.01	-11.94
2506.00	20 (WCP)	QPSK	H	150	314	1 / 0	13.52	5.75	19.27	33.01	-13.74

Table 7-7. EIRP Data (Band 41)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
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7.7 Radiated Spurious Emissions Measurements

§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.


Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW \geq 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points \geq 2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

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Test Setup

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

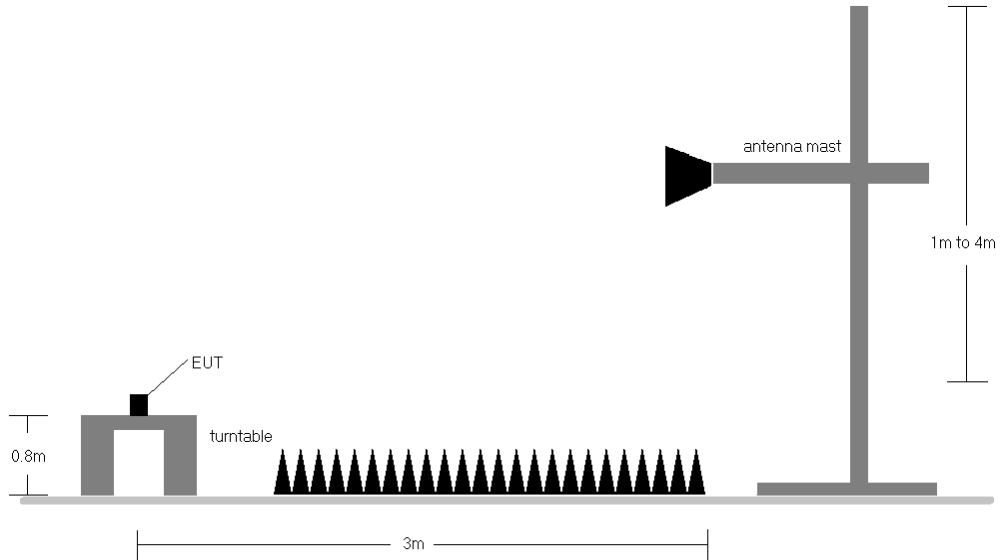



Figure 7-7. Test Instrument & Measurement Setup

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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OPERATING FREQUENCY: 670.50 MHz
 CHANNEL: 133197
 MEASURED OUTPUT POWER: 12.82 dBm = 0.019 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 25.82 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1341.00	H	150	20	-47.19	5.37	-41.81	54.6
2011.50	H	150	20	-41.50	5.43	-36.07	48.9
2682.00	H	150	1	-39.70	7.88	-31.83	44.7
3352.50	H	150	8	-53.02	7.85	-45.17	58.0
4023.00	H	150	304	-69.16	7.21	-61.96	74.8
4693.50	H	150	27	-67.49	8.13	-59.36	72.2
5364.00	H	150	86	-67.63	8.66	-58.97	71.8
6034.50	H	150	355	-66.62	7.85	-58.77	71.6
6705.00	H	150	10	-62.84	7.49	-55.36	68.2

Table 7-8. Radiated Spurious Data (Band 71 – Low Channel)

OPERATING FREQUENCY: 680.50 MHz
 CHANNEL: 133297
 MEASURED OUTPUT POWER: 13.51 dBm = 0.022 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 26.51 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1361.00	H	150	1	-41.28	5.46	-35.81	49.3
2041.50	H	150	0	-39.70	5.63	-34.07	47.6
2722.00	H	150	324	-48.71	7.86	-40.84	54.4
3402.50	H	150	14	-59.86	7.85	-52.01	65.5
4083.00	H	150	45	-58.58	7.35	-51.23	64.7
4763.50	H	150	325	-49.92	8.17	-41.75	55.3
5444.00	H	150	35	-50.47	8.59	-41.88	55.4
6124.50	H	150	1	-59.42	7.85	-51.57	65.1
6805.00	H	150	346	-63.25	7.45	-55.80	69.3

Table 7-9. Radiated Spurious Data (Band 71 – Mid Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 690.50 MHz
 CHANNEL: 133397
 MEASURED OUTPUT POWER: 14.03 dBm = 0.025 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 27.03 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1381.00	H	150	25	-45.85	5.55	-40.30	54.3
2071.50	H	150	0	-43.67	5.83	-37.84	51.9
2762.00	H	150	356	-46.96	7.86	-39.10	53.1
3452.50	H	150	16	-61.31	7.85	-53.46	67.5
4143.00	H	150	350	-68.71	7.50	-61.21	75.2
4833.50	H	150	0	-70.96	8.29	-62.67	76.7
5524.00	H	150	0	-67.63	8.55	-59.08	73.1
6214.50	H	150	77	-66.42	7.85	-58.57	72.6
6905.00	H	150	14	-59.85	7.45	-52.40	66.4

Table 7-10. Radiated Spurious Data (Band 71 – High Channel)

OPERATING FREQUENCY: 690.50 MHz
 CHANNEL: 133397
 MEASURED OUTPUT POWER: 13.51 dBm = 0.022 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 26.51 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1381.00	V	150	85	-48.98	5.55	-43.43	56.9
2071.50	V	150	294	-46.25	5.83	-40.42	53.9
2762.00	V	150	388	-48.22	7.86	-40.36	53.9
3452.50	V	150	0	-49.65	7.85	-41.80	55.3
4143.00	V	150	350	-70.15	7.50	-62.66	76.2
4833.50	V	-	-	-74.11	8.29	-65.82	79.3
5524.00	V	-	-	-68.70	8.55	-60.15	73.7
6214.50	V	-	-	-67.64	7.85	-59.79	73.3
6905.00	V	150	342	-65.76	7.45	-58.31	71.8

Table 7-11. Radiated Spurious Data with WCP (Band 71 – High Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset	Page 155 of 178	

OPERATING FREQUENCY: 701.50 MHz
 CHANNEL: 23035
 MEASURED OUTPUT POWER: 17.13 dBm = 0.052 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 30.13 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1403.00	H	160	43	-59.49	5.60	-53.89	71.0
2104.50	H	134	29	-62.68	6.67	-56.01	73.1
2806.00	H	119	64	-62.08	7.92	-54.16	71.3
3507.50	H	110	32	-68.64	7.80	-60.84	78.0
4209.00	H	-	-	-68.95	8.30	-60.65	77.8

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

OPERATING FREQUENCY: 707.50 MHz
 CHANNEL: 23095
 MEASURED OUTPUT POWER: 16.04 dBm = 0.040 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 29.04 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1415.00	H	161	39	-59.53	5.69	-53.84	69.9
2122.50	H	208	39	-62.15	6.75	-55.41	71.4
2830.00	H	118	60	-61.05	7.90	-53.15	69.2
3537.50	H	110	264	-68.60	7.81	-60.79	76.8
4245.00	H	-	-	-68.84	8.41	-60.43	76.5

Table 7-13. Radiated Spurious Data (Band 12 – Mid Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 713.50 MHz
 CHANNEL: 23155
 MEASURED OUTPUT POWER: 16.58 dBm = 0.046 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 29.58 dBc



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1427.00	H	152	34	-60.89	5.79	-55.10	71.7
2140.50	H	129	54	-61.98	6.82	-55.16	71.7
2854.00	H	119	76	-65.06	7.88	-57.18	73.8
3567.50	H	-	-	-69.00	7.82	-61.18	77.8

Table 7-14. Radiated Spurious Data (Band 12 – High Channel)

OPERATING FREQUENCY: 701.50 MHz
 CHANNEL: 23035
 MEASURED OUTPUT POWER: 17.02 dBm = 0.050 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 30.02 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1403.00	H	110	43	-60.83	5.60	-55.23	72.2
2104.50	H	121	47	-64.97	6.67	-58.30	75.3
2806.00	H	112	63	-62.62	7.92	-54.70	71.7
3507.50	H	111	176	-70.26	7.80	-62.46	79.5
4209.00	H	-	-	-71.21	8.30	-62.91	79.9

Table 7-15. Radiated Spurious Data with WCP (Band 12 – Low Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset	Page 157 of 178	

OPERATING FREQUENCY: 829.00 MHz
 CHANNEL: 20450
 MEASURED OUTPUT POWER: 18.70 dBm = 0.074 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 31.70 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1658.00	V	126	5	-58.01	6.75	-51.27	70.0
2487.00	V	122	3	-44.56	7.59	-36.98	55.7
3316.00	V	120	341	-64.75	7.51	-57.24	75.9
4145.00	V	-	-	-68.59	8.11	-60.48	79.2

Table 7-16. Radiated Spurious Data (Band 5 – Low Channel)

OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 20525
 MEASURED OUTPUT POWER: 18.35 dBm = 0.068 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 31.35 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1673.00	V	121	6	-58.77	6.77	-52.00	70.4
2509.50	V	119	354	-40.86	7.65	-33.21	51.6
3346.00	V	123	339	-63.37	7.53	-55.84	74.2
4182.50	V	-	-	-68.44	8.23	-60.21	78.6

Table 7-17. Radiated Spurious Data (Band 5 – Mid Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 844.00 MHz
 CHANNEL: 20600
 MEASURED OUTPUT POWER: 17.82 dBm = 0.061 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 30.82 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1688.00	V	121	350	-56.96	6.79	-50.17	68.0
2532.00	V	121	358	-42.47	7.63	-34.84	52.7
3376.00	V	119	336	-67.79	7.55	-60.25	78.1
4220.00	V	-	-	-69.07	8.34	-60.73	78.5

Table 7-18. Radiated Spurious Data (Band 5 – High Channel)

OPERATING FREQUENCY: 829.00 MHz
 CHANNEL: 20450
 MEASURED OUTPUT POWER: 17.70 dBm = 0.059 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 30.70 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	[dBc]
1658.00	V	141	33	-54.64	6.75	-47.90	65.6
2487.00	V	139	95	-49.69	7.59	-42.11	59.8
3316.00	V	117	177	-64.41	7.51	-56.90	74.6
4145.00	V	-	-	-68.60	8.11	-60.49	78.2

Table 7-19. Radiated Spurious Data with WCP (Band 5 – Low Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1720.00 MHz
 CHANNEL: 132072
 MEASURED OUTPUT POWER: 21.95 dBm = 0.157 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.95 dBc



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3440.00	V	110	355	-69.57	9.80	-59.77	81.7
5160.00	V	168	133	-66.40	10.67	-55.73	77.7
6880.00	V	152	340	-60.72	11.72	-49.00	70.9
8600.00	V	-	-	-58.17	11.03	-47.14	69.1

Table 7-20. Radiated Spurious Data (Band 4/66 – Low Channel)

OPERATING FREQUENCY: 1745.00 MHz
 CHANNEL: 132322
 MEASURED OUTPUT POWER: 22.13 dBm = 0.163 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.13 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3490.00	V	-	-	-69.71	9.90	-59.81	81.9
5235.00	V	-	-	-66.85	10.63	-56.23	78.4

Table 7-21. Radiated Spurious Data (Band 4/66 – Mid Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1770.00 MHz
 CHANNEL: 132572
 MEASURED OUTPUT POWER: 21.77 dBm = 0.150 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.77 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3540.00	V	-	-	-69.01	9.90	-59.10	80.9
5310.00	V	-	-	-67.25	10.70	-56.54	78.3

Table 7-22. Radiated Spurious Data (Band 4/66 – High Channel)

OPERATING FREQUENCY: 1745.00 MHz
 CHANNEL: 132322
 MEASURED OUTPUT POWER: 20.72 dBm = 0.118 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.72 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3490.00	V	-	-	-68.68	9.90	-58.78	79.5
5235.00	V	-	-	-67.03	10.63	-56.41	77.1

Table 7-23. Radiated Spurious Data with WCP (Band 4/66 – Mid Channel)

OPERATING FREQUENCY: 1855.00 MHz
 CHANNEL: 18650
 MEASURED OUTPUT POWER: 22.51 dBm = 0.178 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 35.51 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3710.00	H	-	-	-69.06	9.97	-59.09	81.6
5565.00	H	-	-	-67.77	11.23	-56.54	79.0

Table 7-24. Radiated Spurious Data (Band 2 – Low Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset	Page 161 of 178	

OPERATING FREQUENCY: 1880.00 MHz
 CHANNEL: 18900
 MEASURED OUTPUT POWER: 21.67 dBm = 0.147 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.67 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3760.00	H	-	-	-68.48	9.79	-58.70	80.4
5640.00	H	-	-	-67.62	11.35	-56.28	77.9

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

OPERATING FREQUENCY: 1905.00 MHz
 CHANNEL: 19150
 MEASURED OUTPUT POWER: 21.86 dBm = 0.154 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.86 dBc


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3810.00	H	195	120	-58.08	9.61	-48.48	70.3
5715.00	H	-	-	-67.28	11.43	-55.85	77.7

Table 7-26. Radiated Spurious Data (Band 2 – High Channel)

OPERATING FREQUENCY: 1855.00 MHz
 CHANNEL: 18650
 MEASURED OUTPUT POWER: 21.26 dBm = 0.134 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.26 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
3710.00	H	114	332	-67.57	9.61	-57.97	79.2
5565.00	H	-	-	-67.41	11.43	-55.98	77.2

Table 7-27. Radiated Spurious Data with WCP (Band 2 – Mid Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 2506.00 MHz
 CHANNEL: 39750
 MEASURED OUTPUT POWER: 22.06 dBm = 0.161 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 47.06 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5012.00	H	142	232	-67.04	10.91	-56.13	78.2
7518.00	H	136	104	-58.84	11.10	-47.74	69.8
10024.00	H	132	168	-58.29	12.07	-46.22	68.3
12530.00	H	-	-	-58.20	13.55	-44.64	66.7

Table 7-28. Radiated Spurious Data (Band 41 – Low Channel)

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MEASURED OUTPUT POWER: 20.59 dBm = 0.115 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 45.59 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5186.00	H	134	236	-64.88	10.75	-54.13	74.7
7779.00	H	130	178	-59.16	11.40	-47.76	68.4
10372.00	H	135	110	-60.09	12.59	-47.50	68.1
12965.00	H	-	-	-55.82	13.37	-42.45	63.0

Table 7-29. Radiated Spurious Data (Band 41 – Mid Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 2680.00 MHz
 CHANNEL: 41490
 MEASURED OUTPUT POWER: 17.88 dBm = 0.061 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 42.88 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5360.00	H	132	232	-65.71	10.74	-54.96	72.8
8040.00	H	135	149	-59.46	11.14	-48.32	66.2
10720.00	H	-	-	-60.52	12.77	-47.75	65.6

Table 7-30. Radiated Spurious Data (Band 41 – High Channel)

OPERATING FREQUENCY: 2506.00 MHz
 CHANNEL: 39750
 MEASURED OUTPUT POWER: 19.27 dBm = 0.085 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: $55 + 10 \log_{10}(W)$ 44.27 dBc

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	[dBc]
5012.00	H	-	-	-68.03	10.91	-57.12	76.4
7518.00	H	-	-	-59.41	11.10	-48.31	67.6

Table 7-31. Radiated Spurious Data with WCP (Band 41 – Low Channel)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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7.8 Frequency Stability / Temperature Variation

\$2.1055 \$22.355 \$24.235 \$27.54

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-D-2010. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

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

Test Procedure Used

ANSI/TIA-603-D-2010

Test Settings

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

Test Setup

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

Test Notes

None

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Band 71 Frequency Stability Measurements
\$2.1055 \$27.54

OPERATING FREQUENCY: 680,500,000 Hz
 CHANNEL: 133297
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	680,500,050	50	0.0000073
100 %		- 30	680,500,387	387	0.0000569
100 %		- 20	680,500,237	237	0.0000348
100 %		- 10	680,500,019	19	0.0000028
100 %		0	680,499,920	-80	-0.0000118
100 %		+ 10	680,500,048	48	0.0000071
100 %		+ 20	680,499,997	-3	-0.0000004
100 %		+ 30	680,499,961	-39	-0.0000057
100 %		+ 40	680,499,934	-66	-0.0000097
100 %		+ 50	680,500,254	254	0.0000373
BATT. ENDPOINT		3.45	+ 20	680,500,074	74

Table 7-32. Frequency Stability Data (Band 71)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 71 Frequency Stability Measurements
§2.1055 §27.54

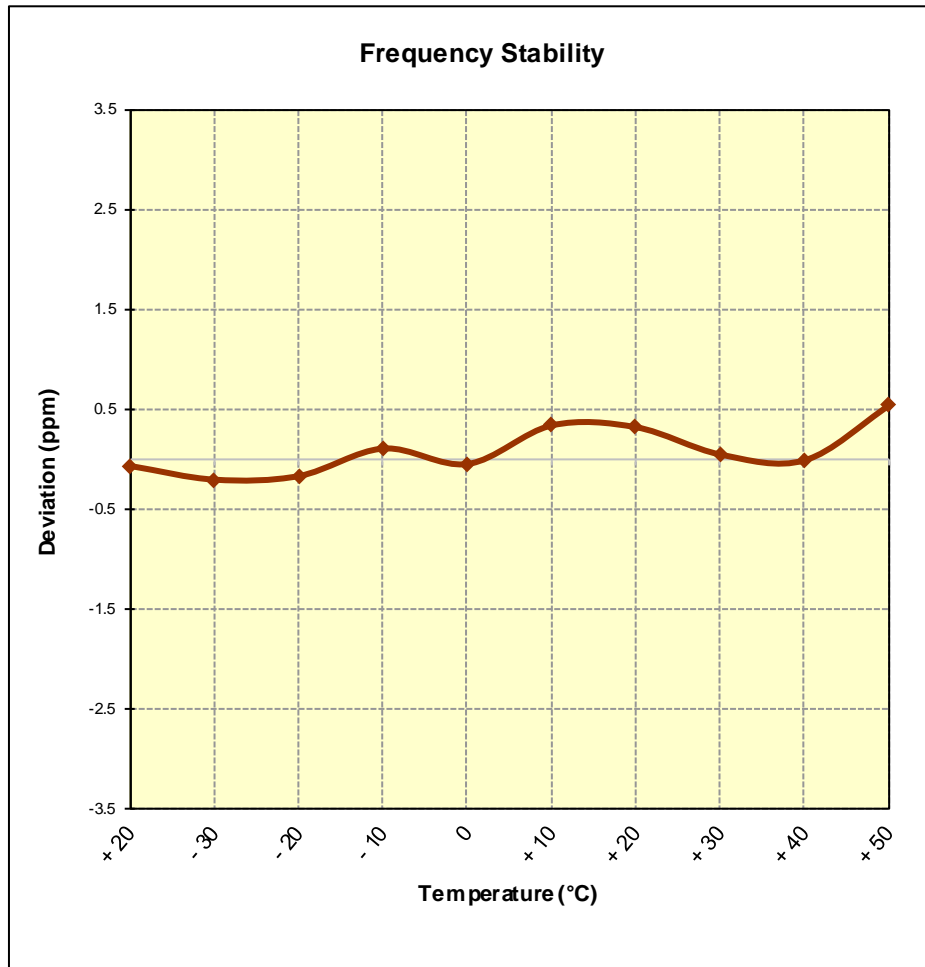


Figure 7-8. Frequency Stability Graph (Band 71)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Band 12 Frequency Stability Measurements

\$2.1055 \$27.54

OPERATING FREQUENCY: 707,500,000 Hz
 CHANNEL: 23790
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	707,499,945	-55	-0.0000078
100 %		- 30	707,499,846	-154	-0.0000218
100 %		- 20	707,499,873	-127	-0.0000180
100 %		- 10	707,500,072	72	0.0000102
100 %		0	707,499,960	-40	-0.0000057
100 %		+ 10	707,500,240	240	0.0000339
100 %		+ 20	707,500,226	226	0.0000319
100 %		+ 30	707,500,028	28	0.0000040
100 %		+ 40	707,499,987	-13	-0.0000018
100 %		+ 50	707,500,384	384	0.0000543
BATT. ENDPOINT	3.45	+ 20	707,500,352	352	0.0000498

Table 7-33. Frequency Stability Data (Band 12)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 12 Frequency Stability Measurements
\$2.1055 \$27.54

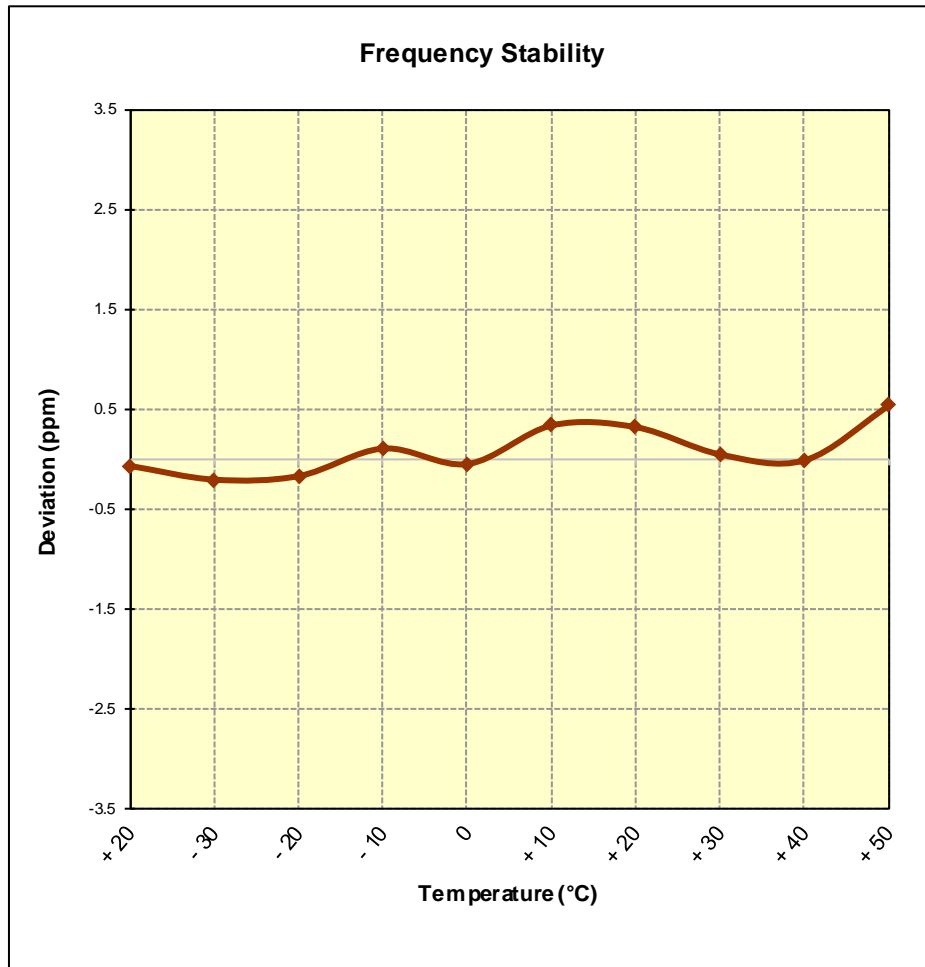


Figure 7-9. Frequency Stability Graph (Band 12)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Band 5 Frequency Stability Measurements

§2.1055 §22.355

OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 20525
 REFERENCE VOLTAGE: 3.85 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	836,500,032	32	0.0000038
100 %		- 30	836,499,887	-113	-0.0000135
100 %		- 20	836,499,865	-135	-0.0000161
100 %		- 10	836,499,796	-204	-0.0000244
100 %		0	836,499,748	-252	-0.0000301
100 %		+ 10	836,500,333	333	0.0000398
100 %		+ 20	836,499,916	-84	-0.0000100
100 %		+ 30	836,499,669	-331	-0.0000396
100 %		+ 40	836,499,875	-125	-0.0000149
100 %		+ 50	836,500,054	54	0.0000065
BATT. ENDPOINT	3.45	+ 20	836,499,818	-182	-0.0000218

Table 7-34. Frequency Stability Data (Band 5)

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 5 Frequency Stability Measurements
§2.1055 §22.355

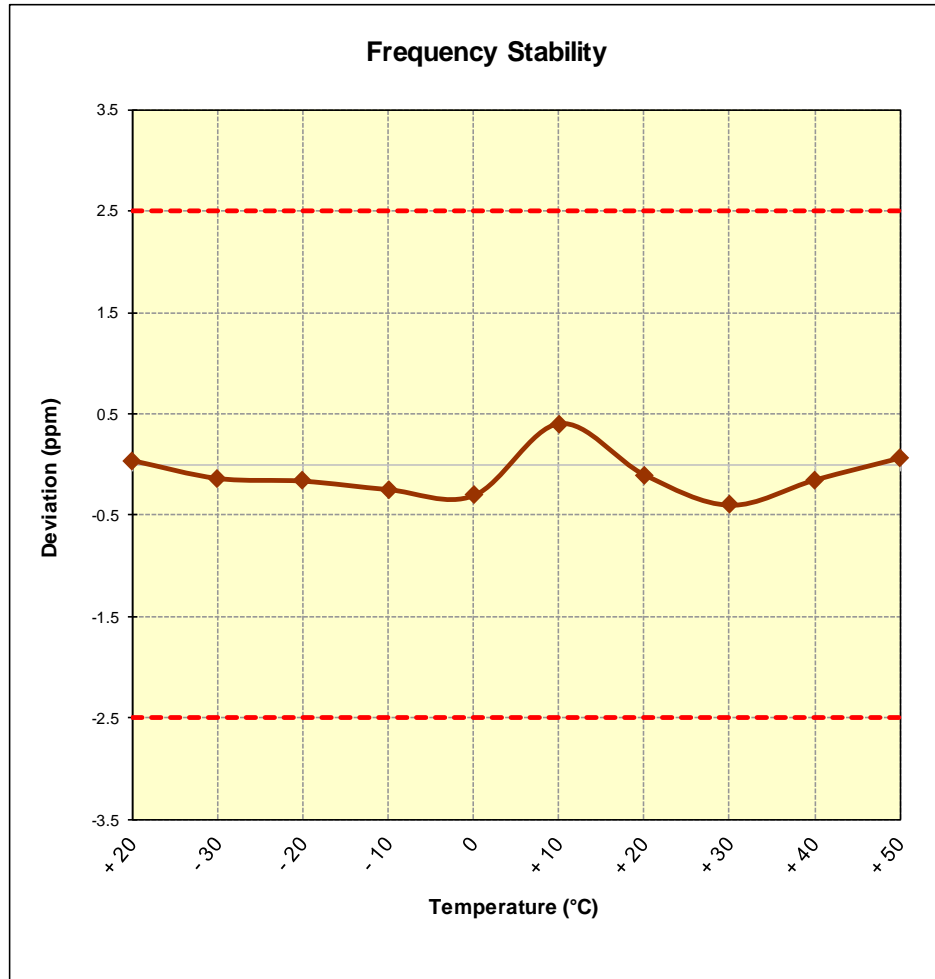


Figure 7-10. Frequency Stability Graph (Band 5)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Band 4/66 Frequency Stability Measurements
\$2.1055 \$\$27.54


OPERATING FREQUENCY: 1,745,000,000 Hz
 CHANNEL: 132322
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,745,000,110	110	0.0000063
100 %		- 30	1,744,999,919	-81	-0.0000046
100 %		- 20	1,745,000,027	27	0.0000015
100 %		- 10	1,745,000,044	44	0.0000025
100 %		0	1,744,999,987	-13	-0.0000007
100 %		+ 10	1,745,000,161	161	0.0000092
100 %		+ 20	1,745,000,154	154	0.0000088
100 %		+ 30	1,744,999,712	-288	-0.0000165
100 %		+ 40	1,745,000,060	60	0.0000034
100 %		+ 50	1,745,000,007	7	0.0000004
BATT. ENDPOINT	3.45	+ 20	1,744,999,865	-135	-0.0000077

Table 7-35. Frequency Stability Data (Band 4/66)

Note:

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

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 4/66 Frequency Stability Measurements
§2.1055 §§27.54

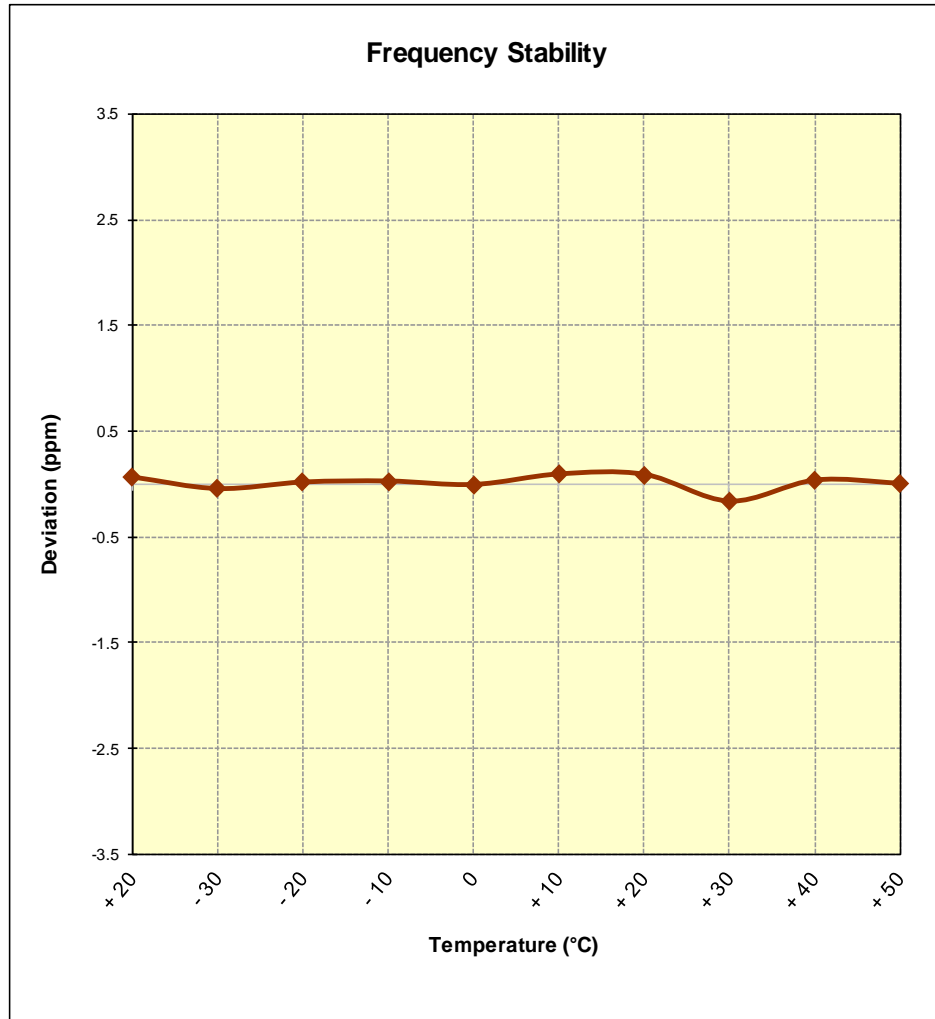


Figure 7-11. Frequency Stability Graph (Band 4/66)

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 2 Frequency Stability Measurements

§2.1055 §24.235

OPERATING FREQUENCY: 1,880,000,000 Hz
 CHANNEL: 18900
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	1,879,999,867	-133	-0.0000071
100 %		- 30	1,879,999,587	-413	-0.0000220
100 %		- 20	1,880,000,163	163	0.0000087
100 %		- 10	1,879,999,899	-101	-0.0000054
100 %		0	1,879,999,974	-26	-0.0000014
100 %		+ 10	1,880,000,279	279	0.0000148
100 %		+ 20	1,880,000,162	162	0.0000086
100 %		+ 30	1,880,000,298	298	0.0000159
100 %		+ 40	1,880,000,273	273	0.0000145
100 %		+ 50	1,879,999,864	-136	-0.0000072
BATT. ENDPOINT		3.45	+ 20	1,879,999,848	-152

Table 7-36. Frequency Stability Data (Band 2)

Note:

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

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 2 Frequency Stability Measurements
§2.1055 §§24.235

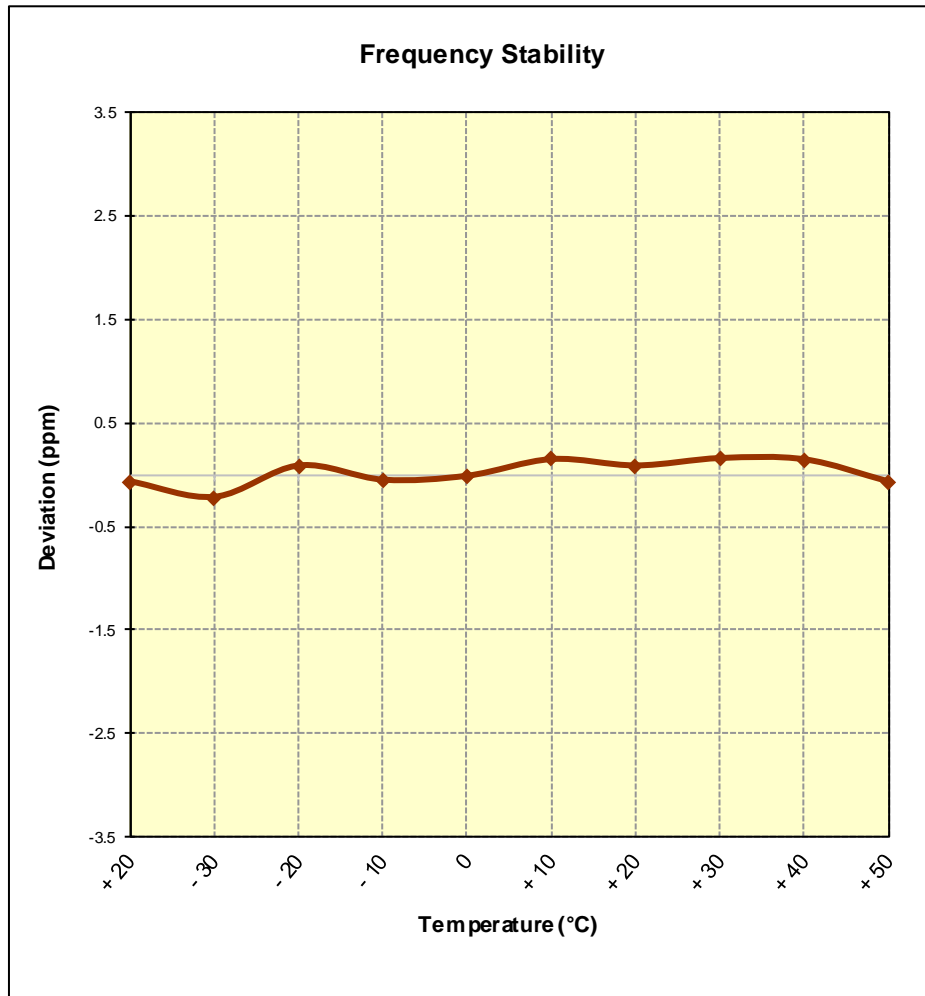


Figure 7-12. Frequency Stability Graph (Band 2)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Band 41 Frequency Stability Measurements

\$2.1055 \$27.54

OPERATING FREQUENCY: 2,593,000,000 Hz
 CHANNEL: 40620
 REFERENCE VOLTAGE: 3.85 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	+ 20 (Ref)	2,592,999,746	-254	-0.0000098
100 %		- 30	2,593,000,241	241	0.0000093
100 %		- 20	2,592,999,977	-23	-0.0000009
100 %		- 10	2,593,000,258	258	0.0000099
100 %		0	2,593,000,209	209	0.0000081
100 %		+ 10	2,592,999,802	-198	-0.0000076
100 %		+ 20	2,592,999,756	-244	-0.0000094
100 %		+ 30	2,592,999,608	-392	-0.0000151
100 %		+ 40	2,593,000,371	371	0.0000143
100 %		+ 50	2,593,000,243	243	0.0000094
BATT. ENDPOINT	3.45	+ 20	2,593,000,015	15	0.0000006

Table 7-37. Frequency Stability Data (Band 41)

Note:

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

FCC ID: ZNFH932	 PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 41 Frequency Stability Measurements
§2.1055 §27.54

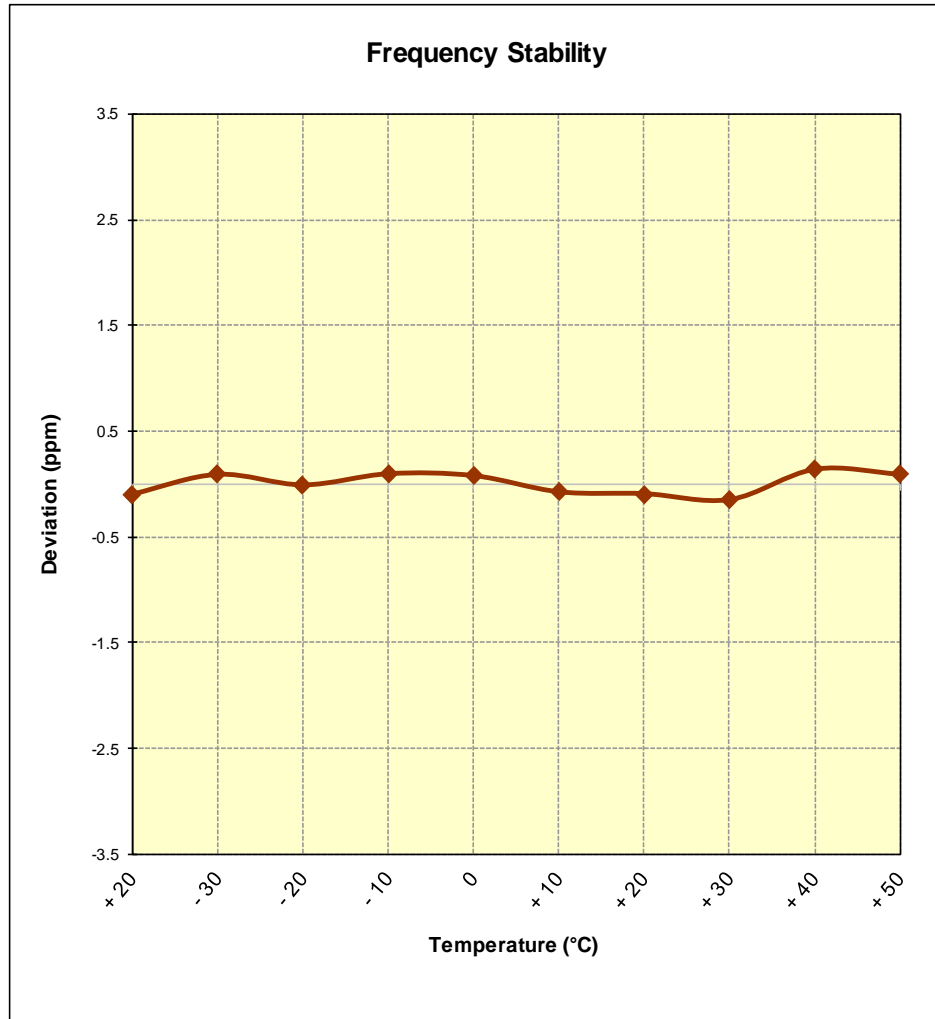


Figure 7-13. Frequency Stability Graph (Band 41)

FCC ID: ZNFH932	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFH932** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.

FCC ID: ZNFH932		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1707110215-03-R1.ZNF	Test Dates: 7/12/2017-8/8/2017	EUT Type: Portable Handset	Page 178 of 178	