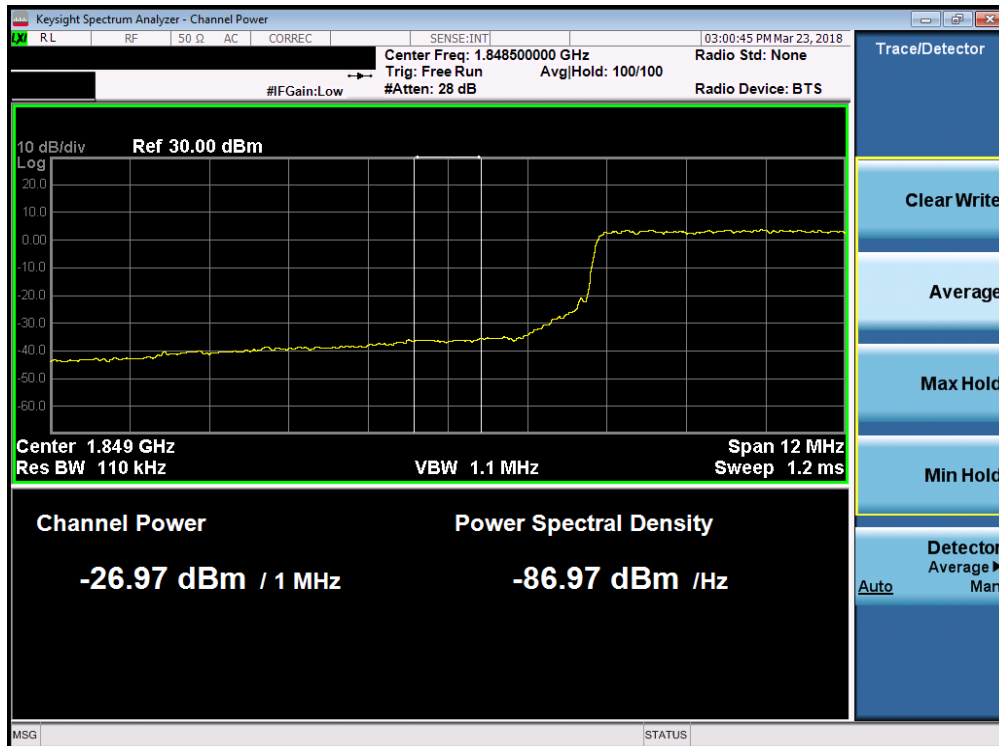
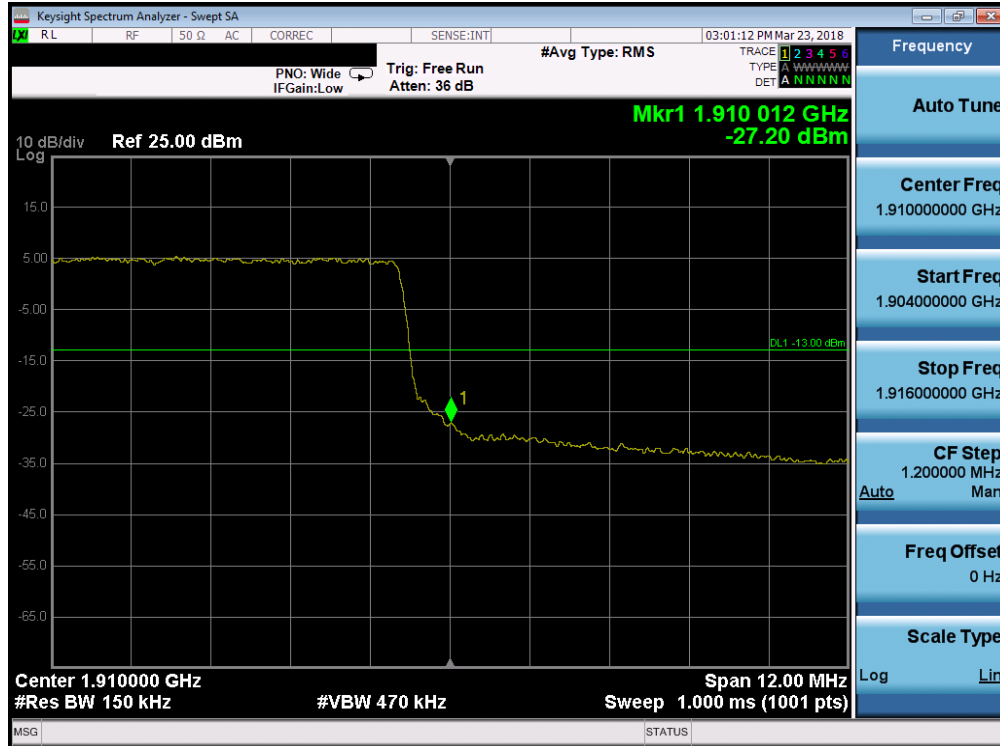


Plot 7-217. Lower Band Edge Plot (Band 2/25 - 15.0MHz QPSK - Full RB Configuration)

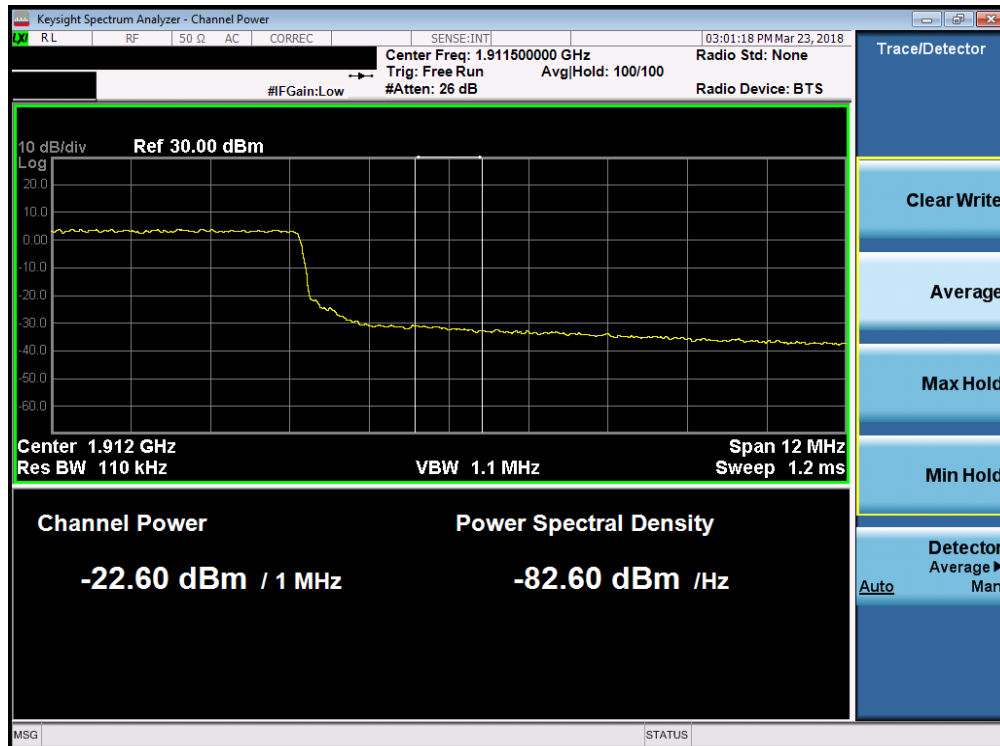


Plot 7-218. Extended Lower Band Edge Plot (Band 2/25 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 131 of 217

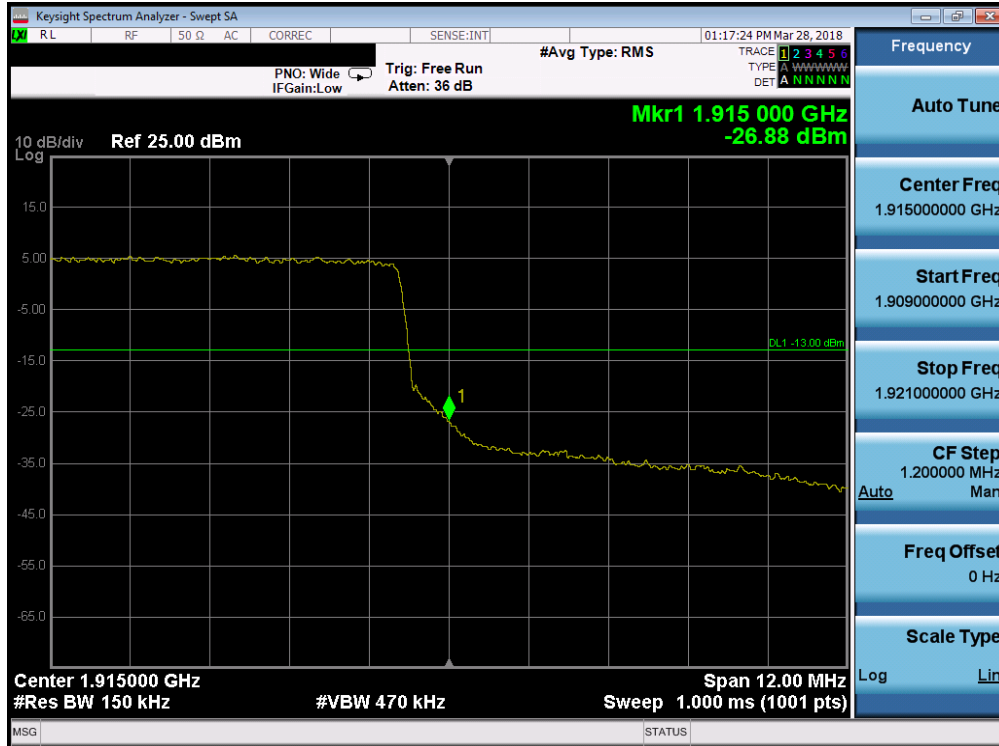


Plot 7-219. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

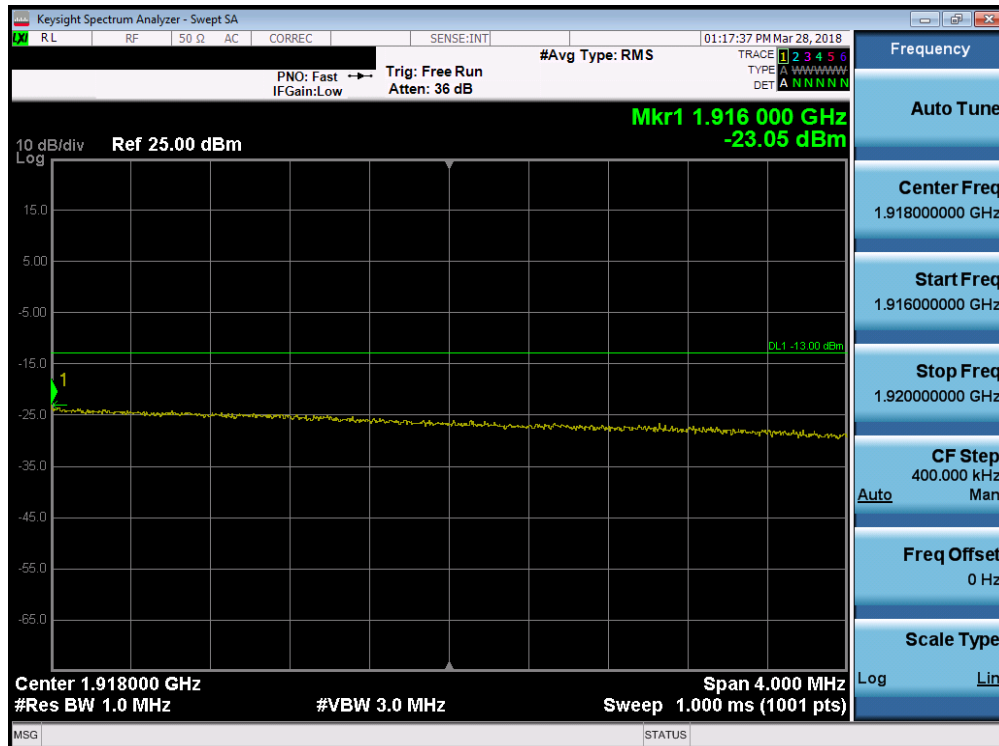


Plot 7-220. Extended Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 132 of 217

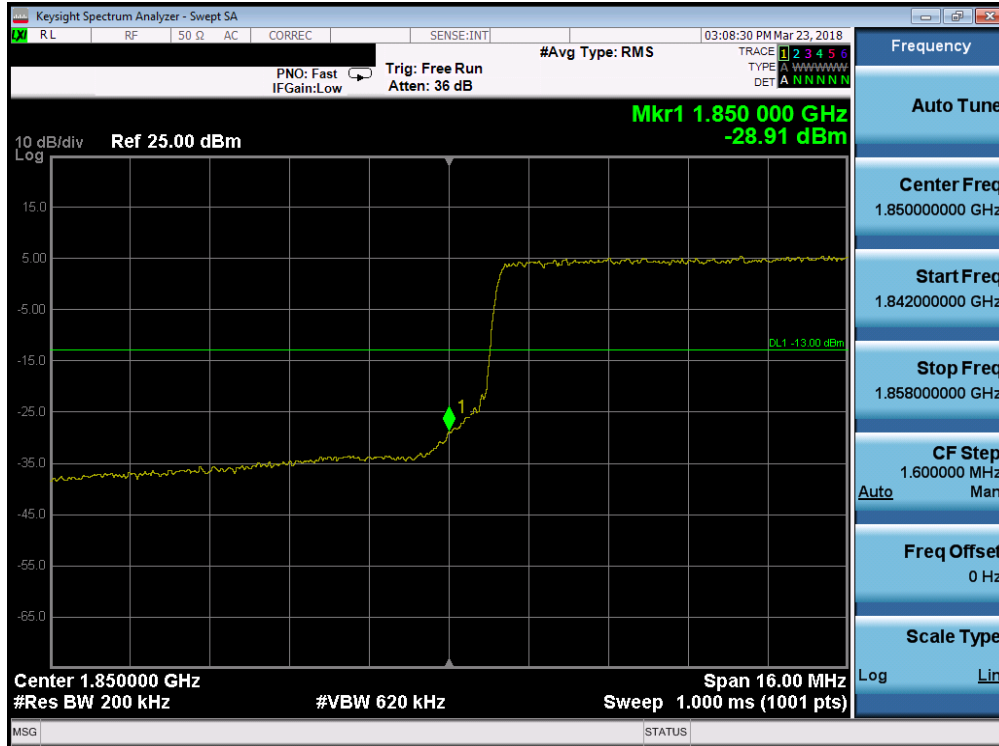


Plot 7-221. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

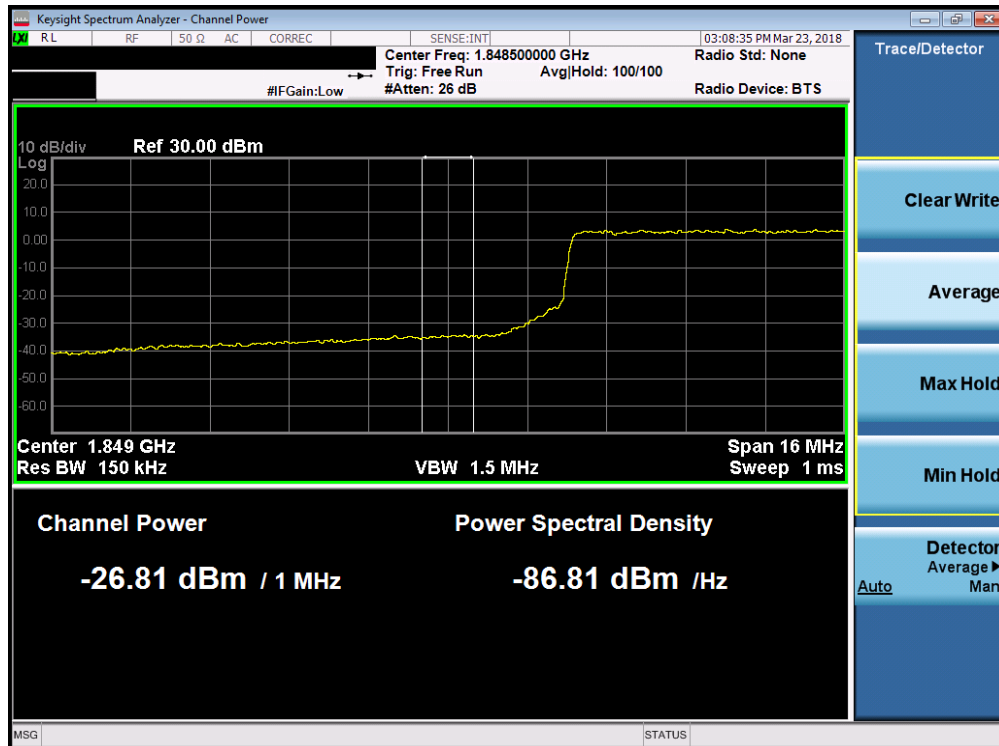


Plot 7-222. Extended Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 133 of 217

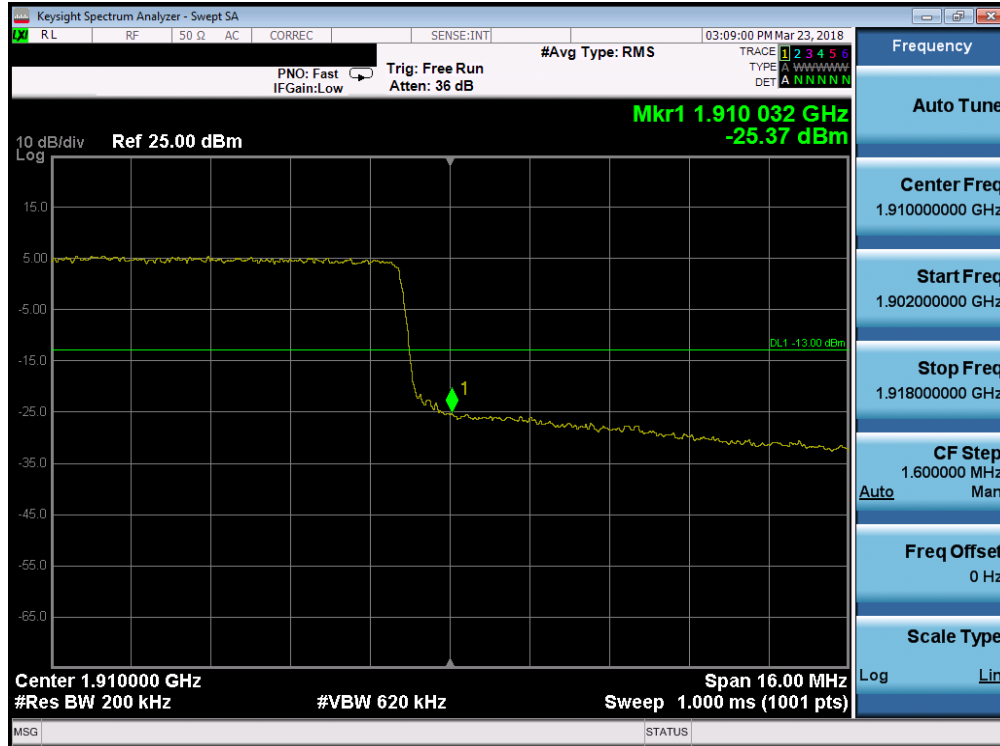


Plot 7-223. Lower Band Edge Plot (Band 2/25 - 20.0MHz QPSK - Full RB Configuration)

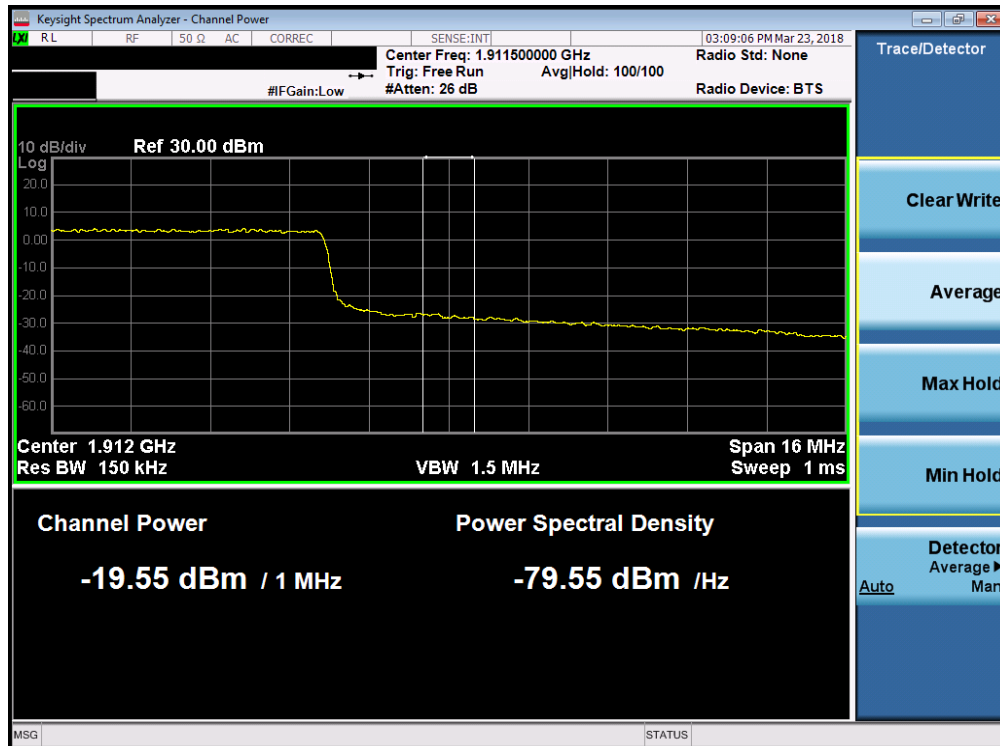


Plot 7-224. Extended Lower Band Edge Plot (Band 2/25 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 134 of 217

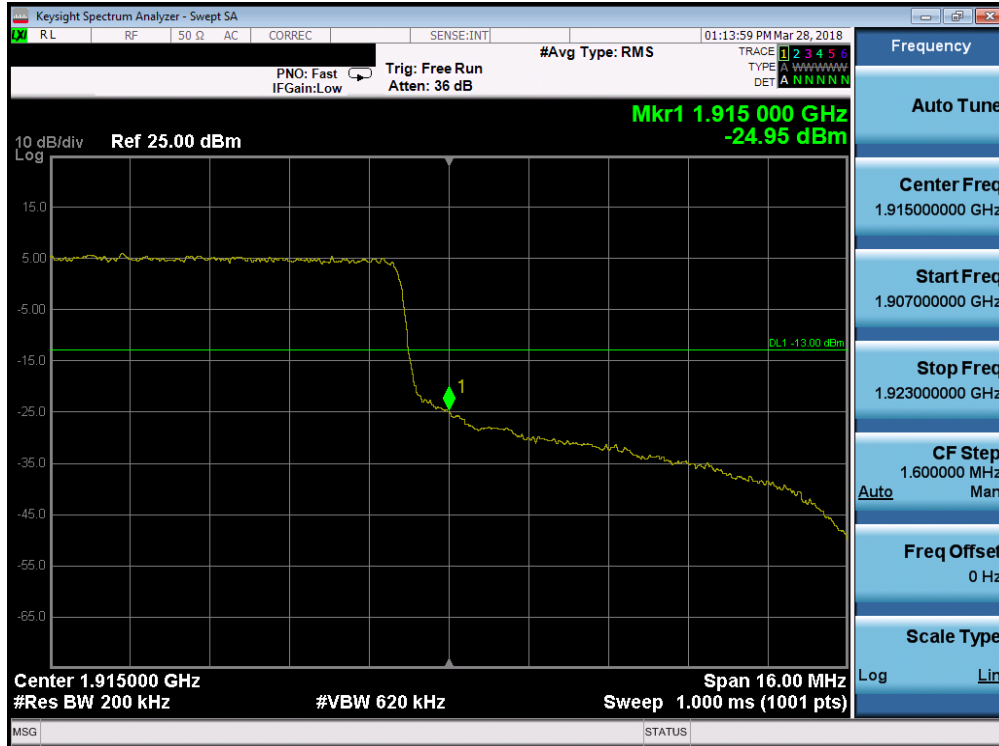


Plot 7-225. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-226. Extended Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 135 of 217



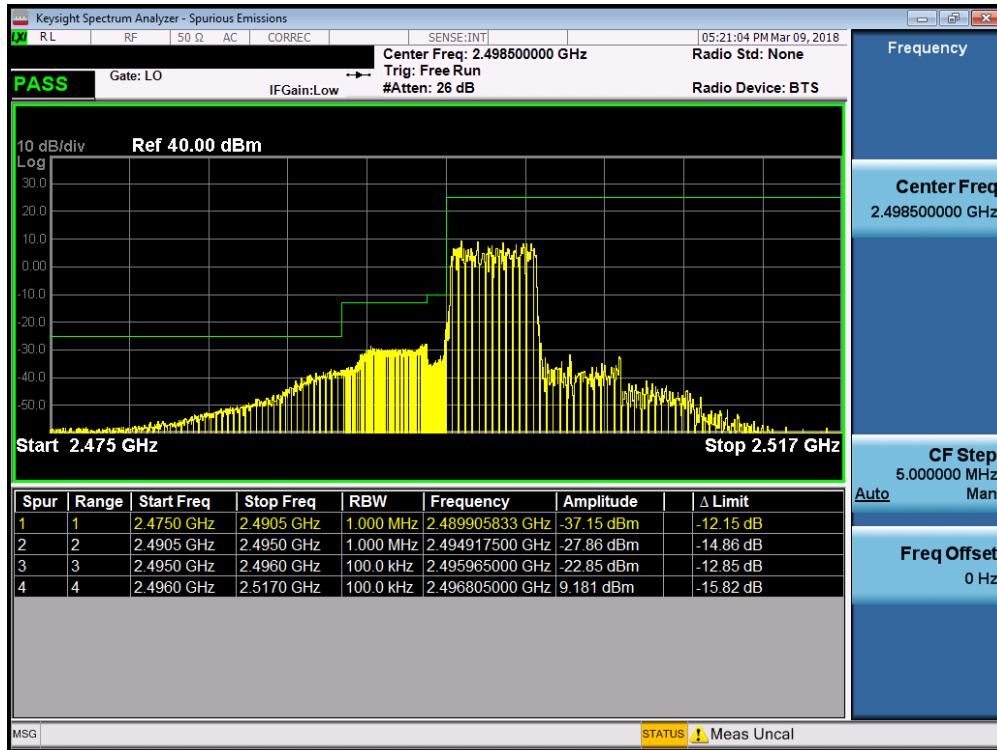
Plot 7-227. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



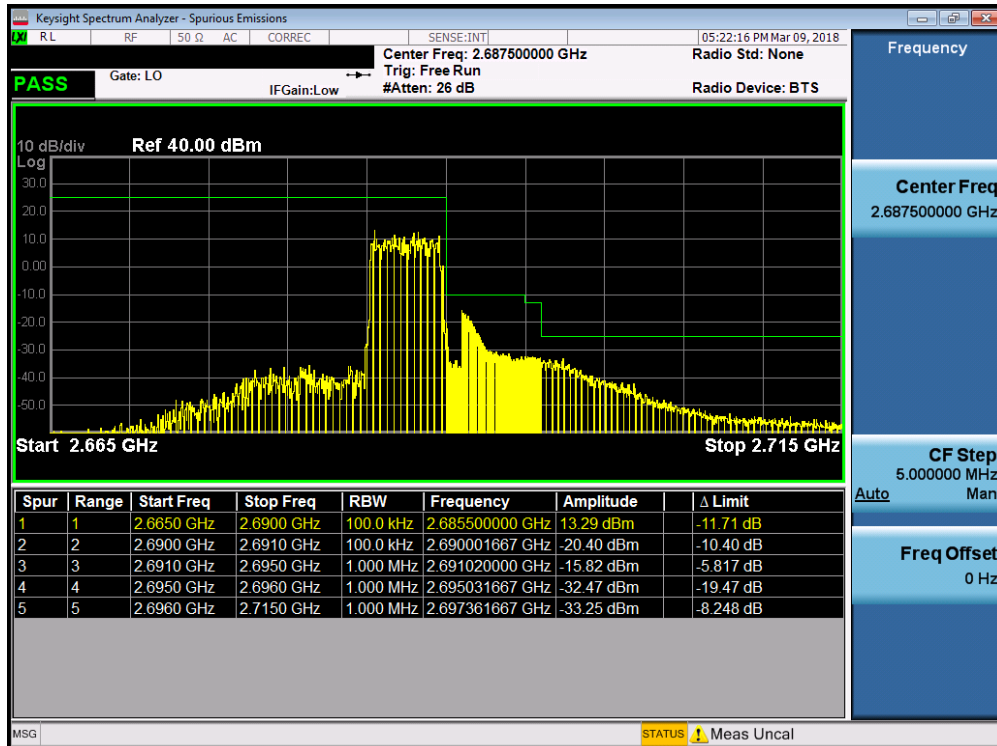
Plot 7-228. Extended Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 136 of 217

**Band 41**



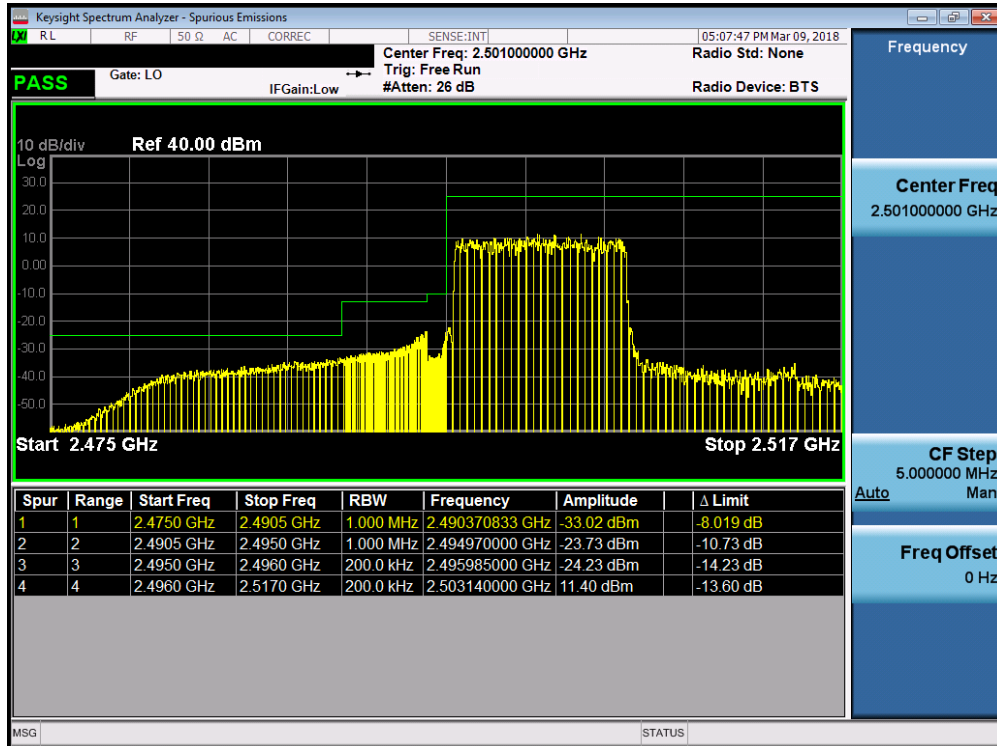
**Plot 7-229. Lower ACP Plot at 2496 MHz (Band 41 - 5.0MHz QPSK - RB Size 25)**



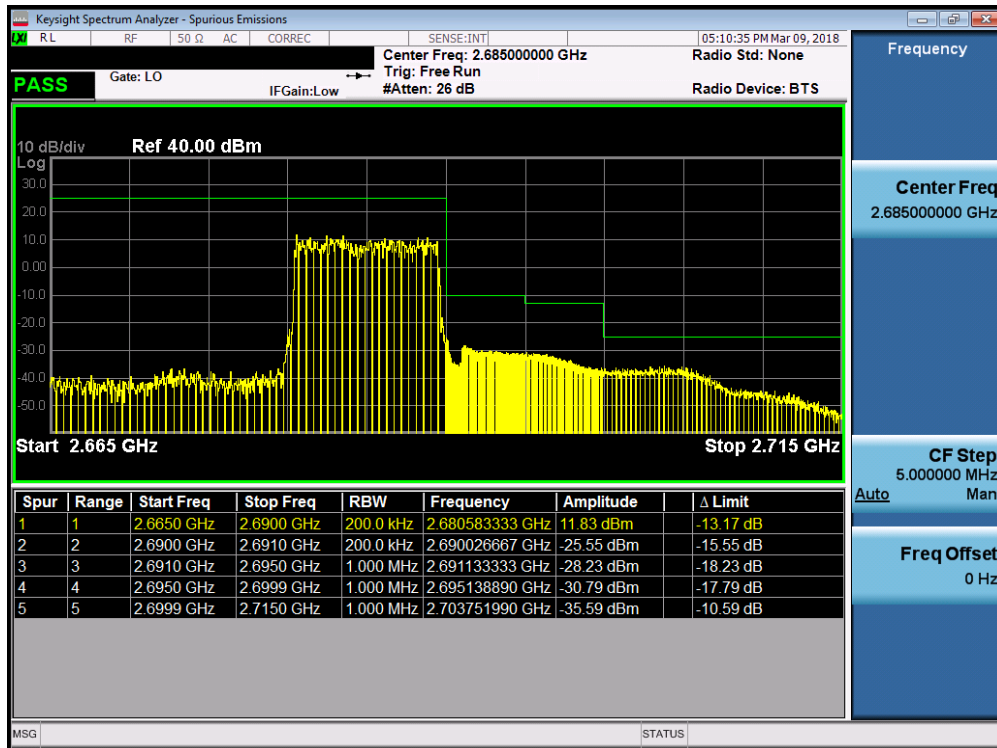
**Plot 7-230. Upper ACP Plot (Band 41 - 5.0MHz QPSK - RB Size 25)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1-ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 137 of 217





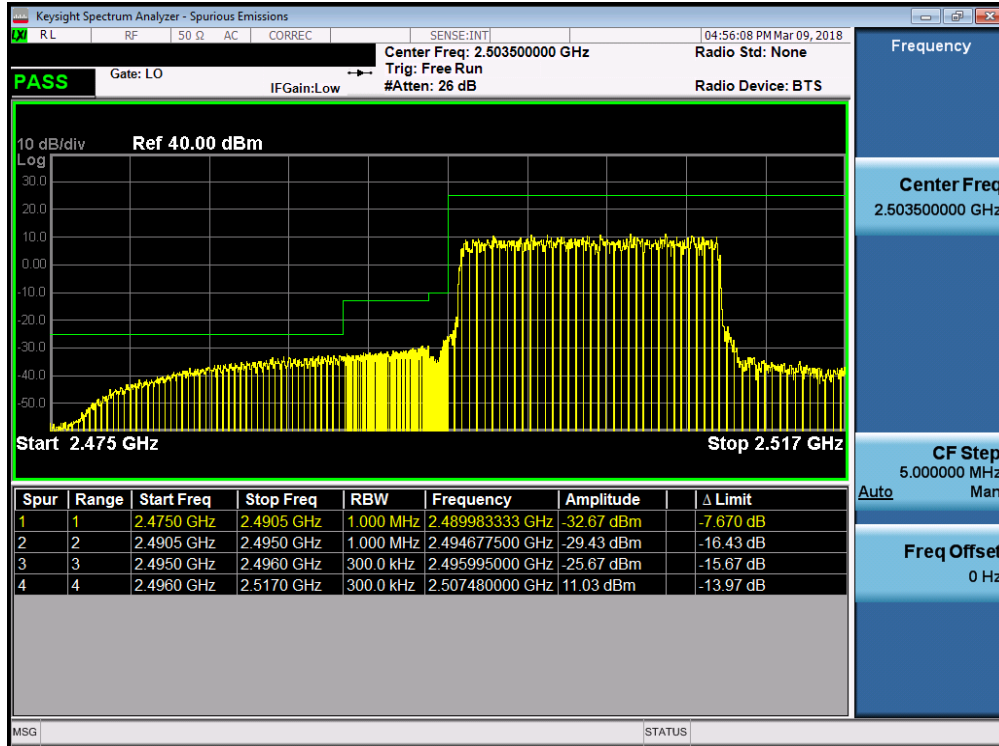
Plot 7-231. Lower ACP Plot at 2496 MHz (Band 41 - 10.0MHz QPSK - RB Size 25)



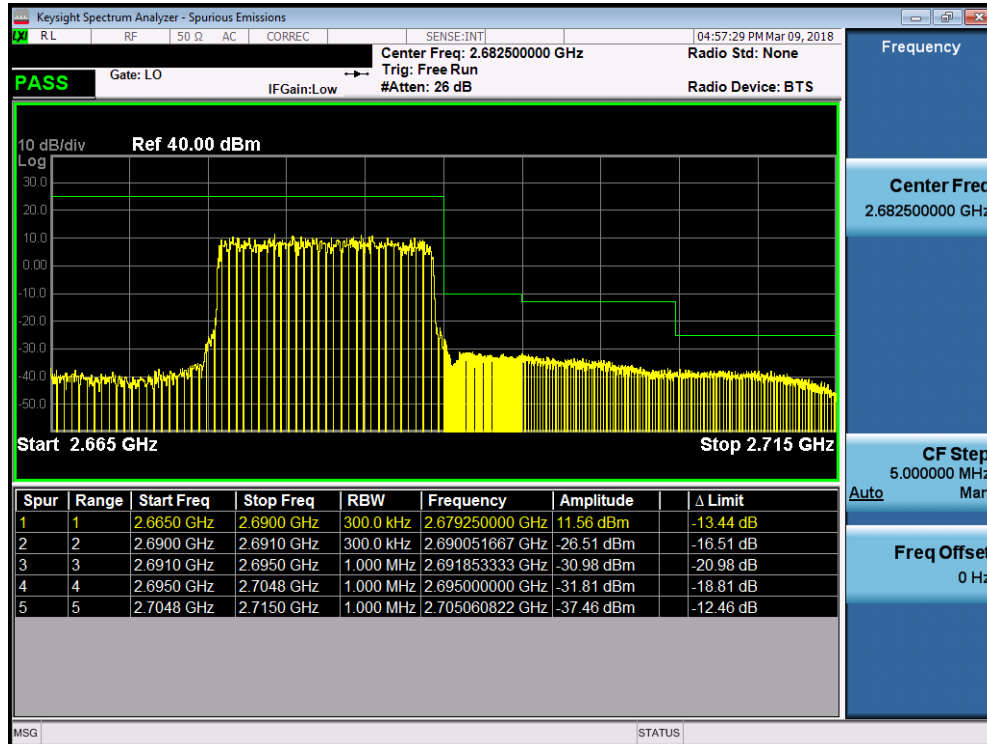
Plot 7-232. Upper ACP Plot (Band 41 - 10.0MHz QPSK - RB Size 25)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 138 of 217



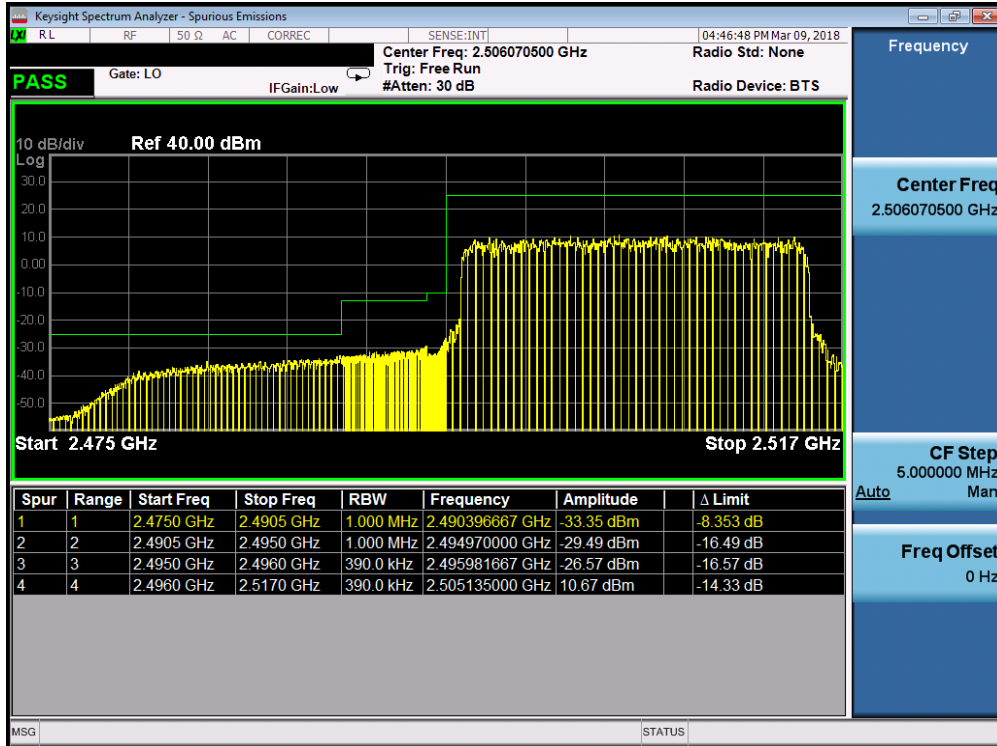


Plot 7-233. Lower ACP Plot at 2496 MHz (Band 41 - 15.0MHz QPSK - RB Size 75)

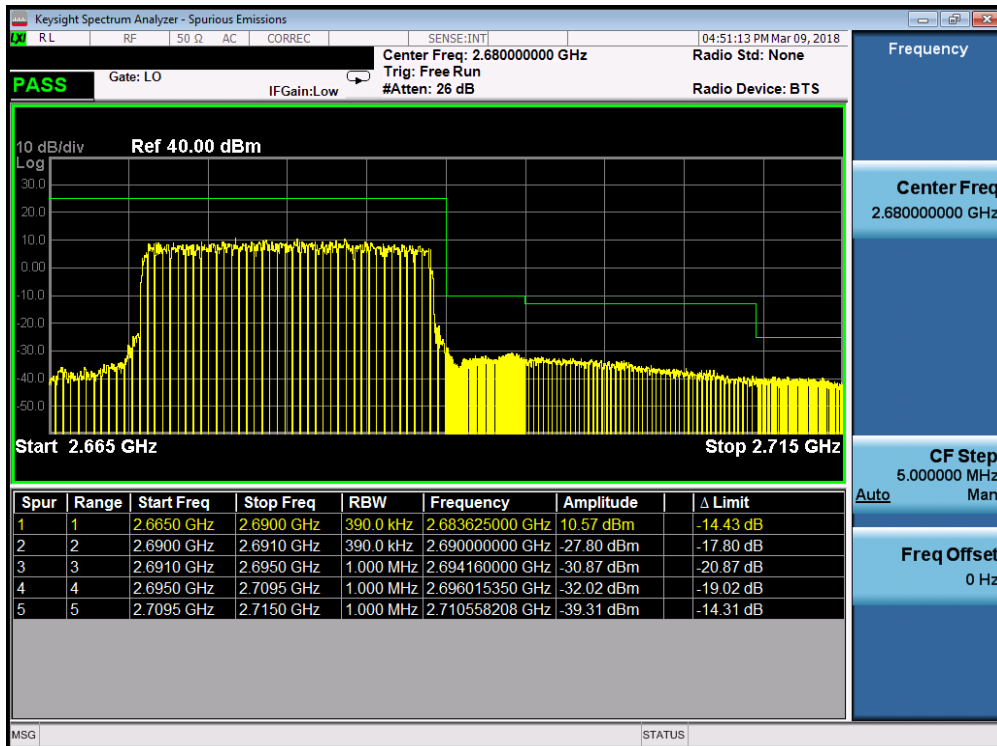


Plot 7-234. Upper ACP Plot (Band 41 - 15.0MHz QPSK - RB Size 75)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 139 of 217



Plot 7-235. Lower ACP Plot at 2496 MHz (Band 41 - 20.0MHz QPSK - RB Size 100)



Plot 7-236. Upper ACP Plot (Band 41 - 20.0MHz QPSK - RB Size 100)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 140 of 217

## 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

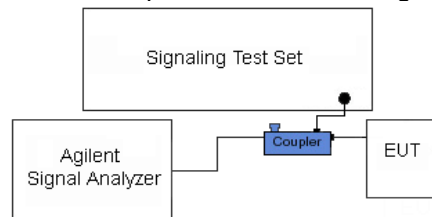
KDB 971168 D01 v03 – Section 5.7.1

### 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.



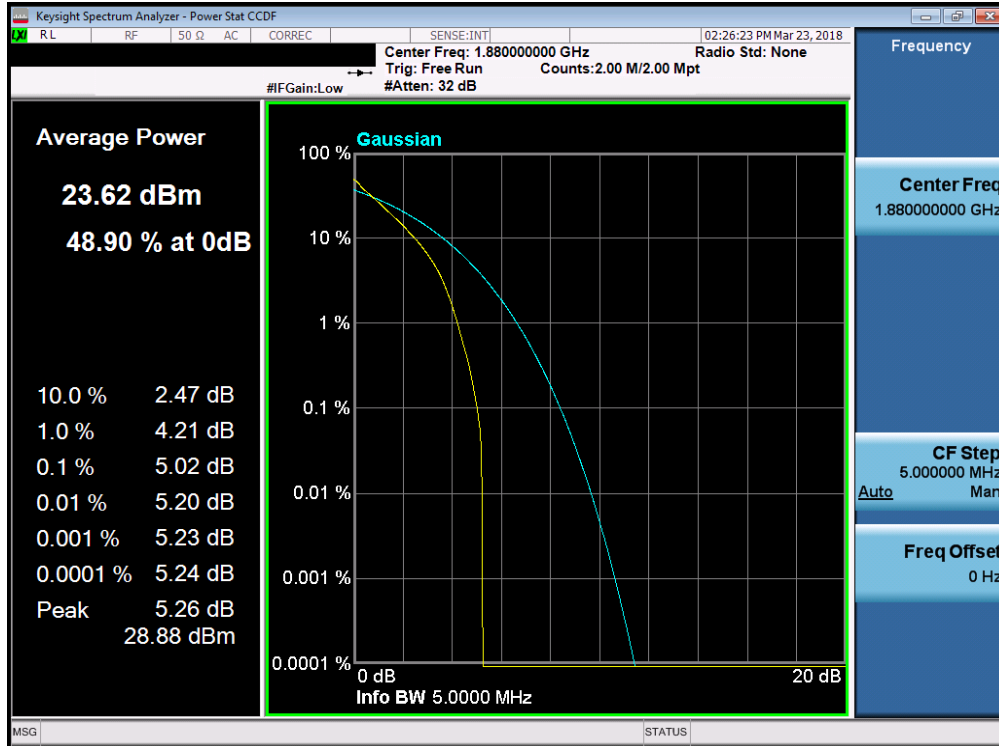
**Figure 7-4. Test Instrument & Measurement Setup**

### Test Notes

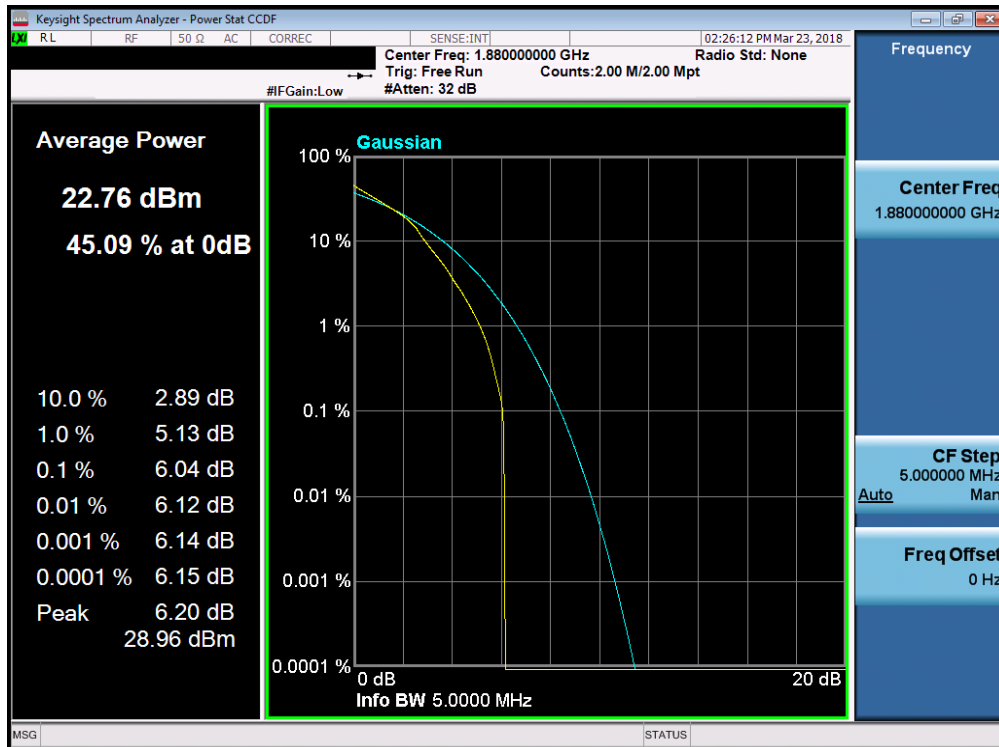
None.

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 141 of 217

**Band 25/2**

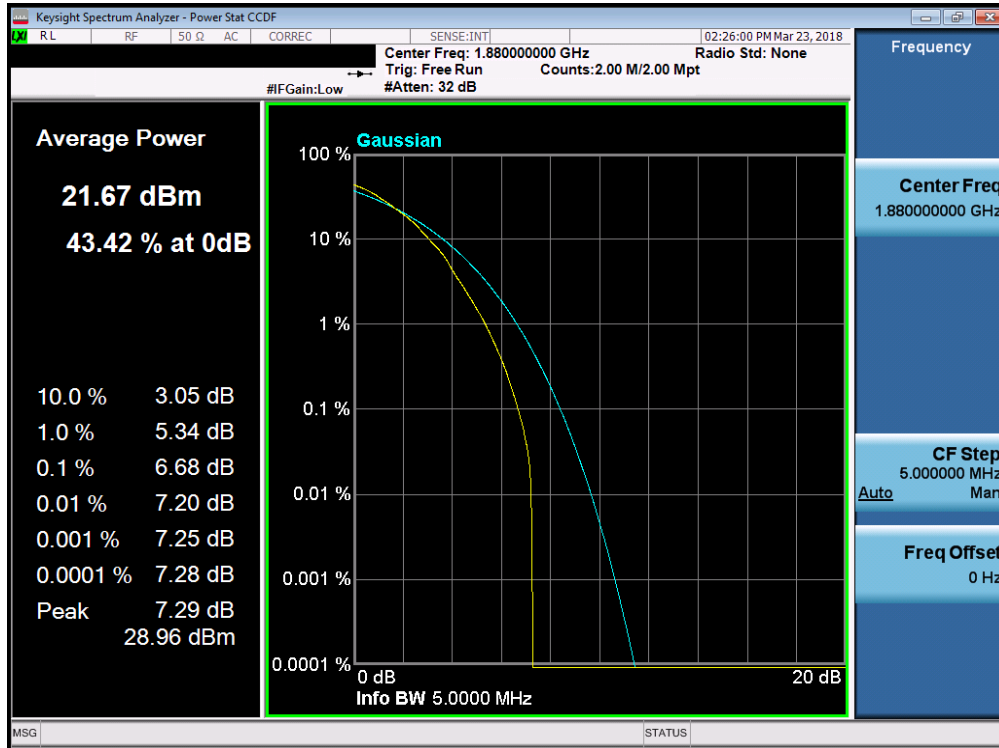


**Plot 7-237. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)**

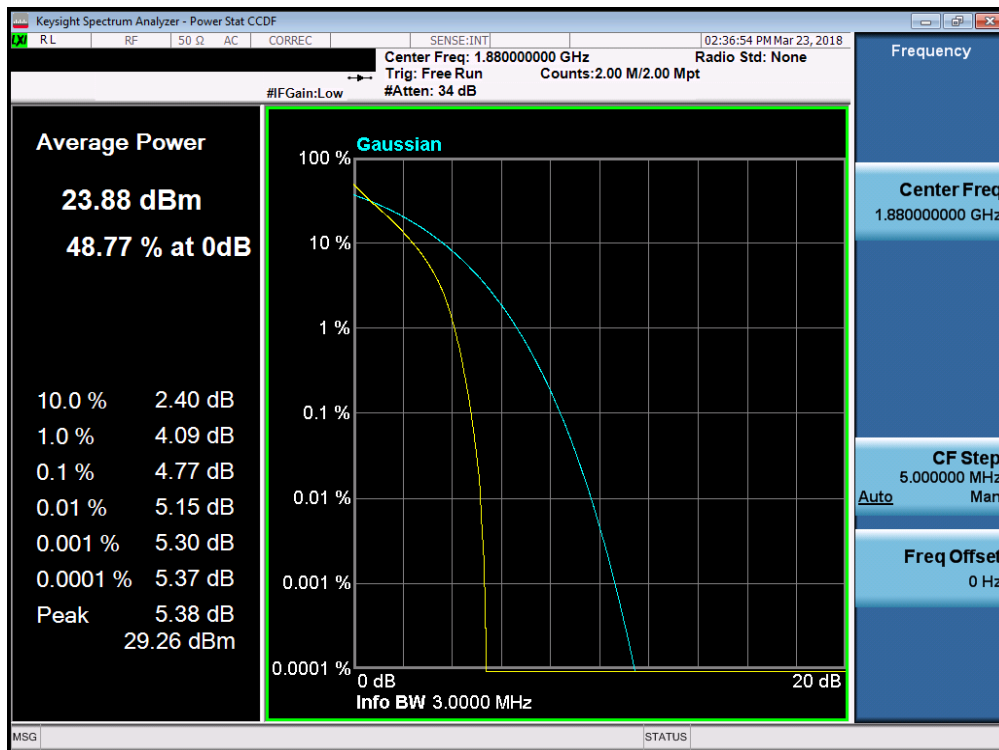


**Plot 7-238. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 142 of 217

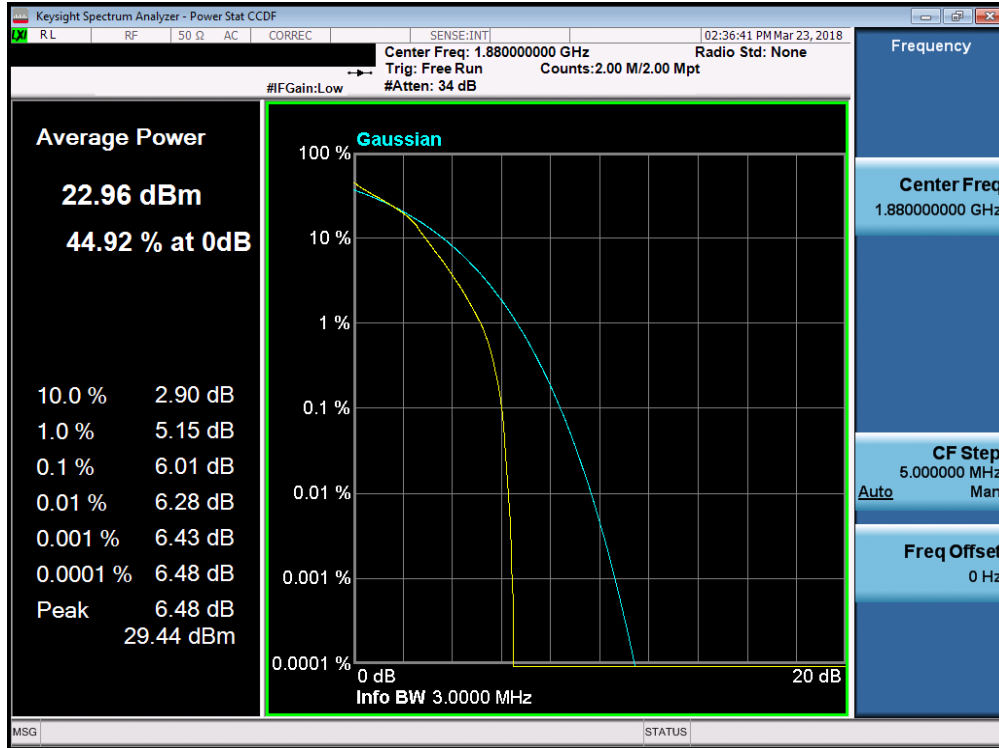


Plot 7-239. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)

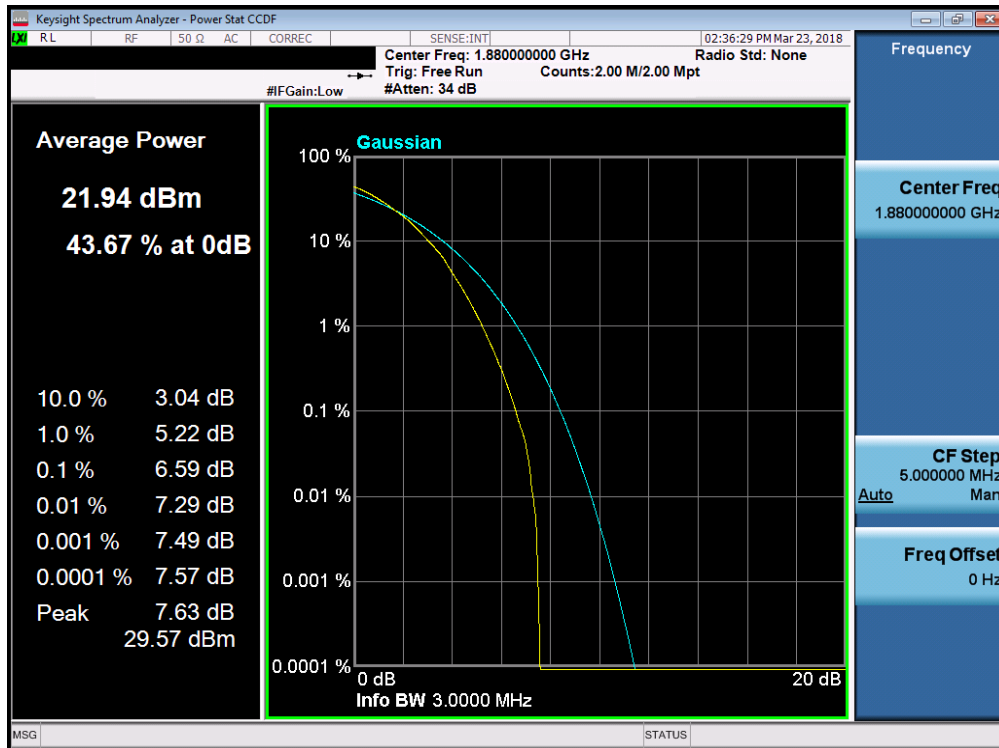


Plot 7-240. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 143 of 217

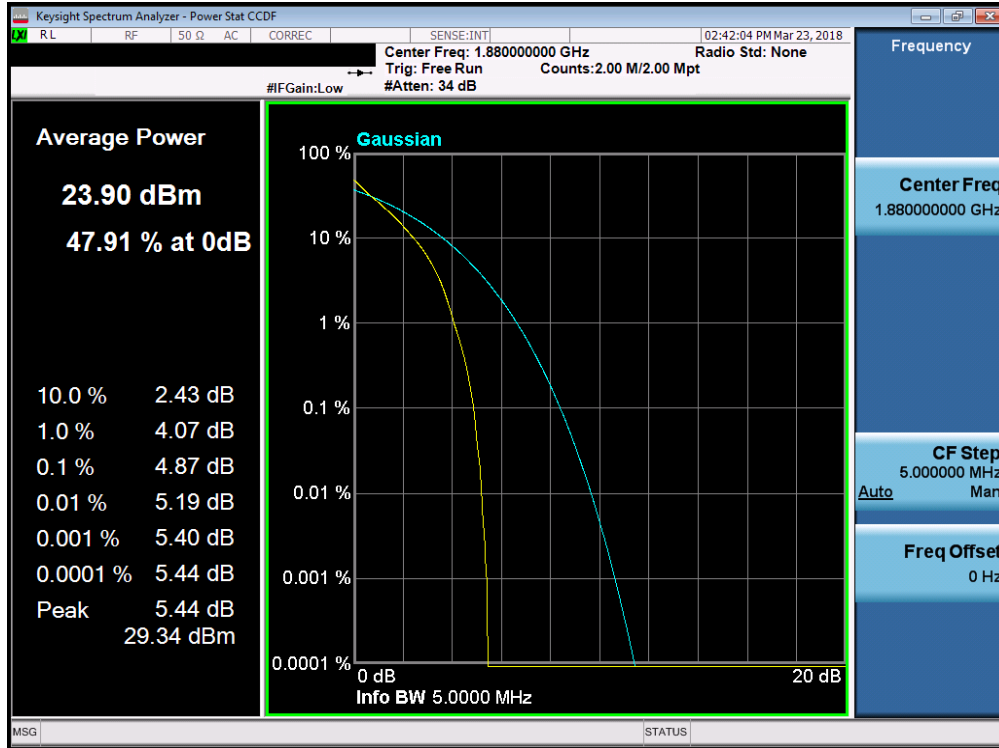


Plot 7-241. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)

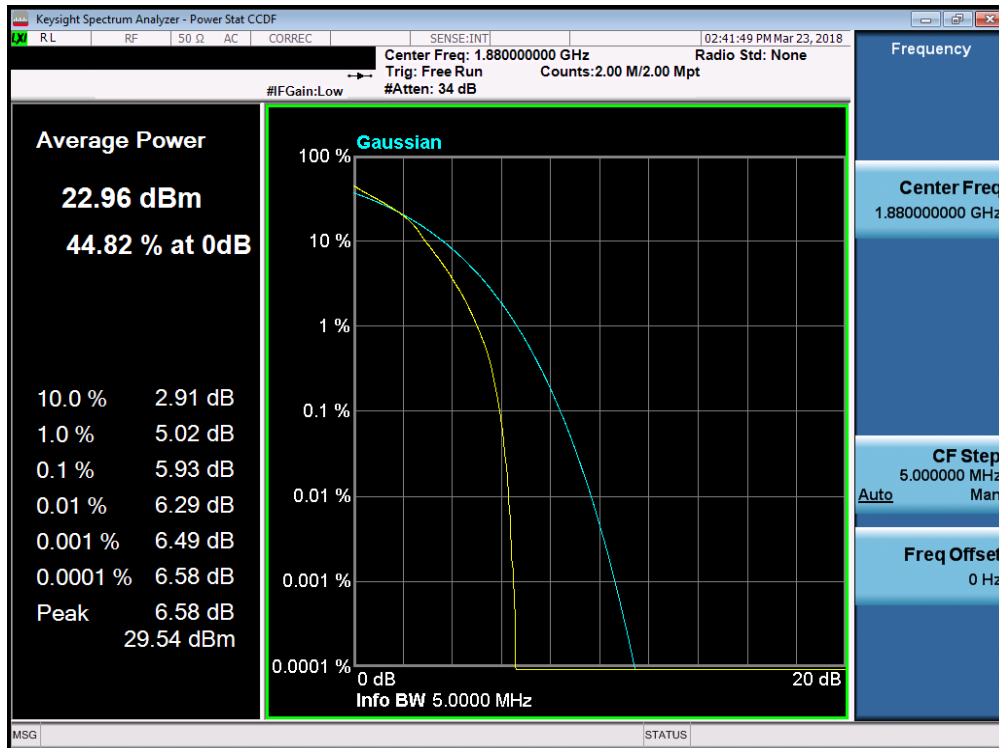


Plot 7-242. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 144 of 217



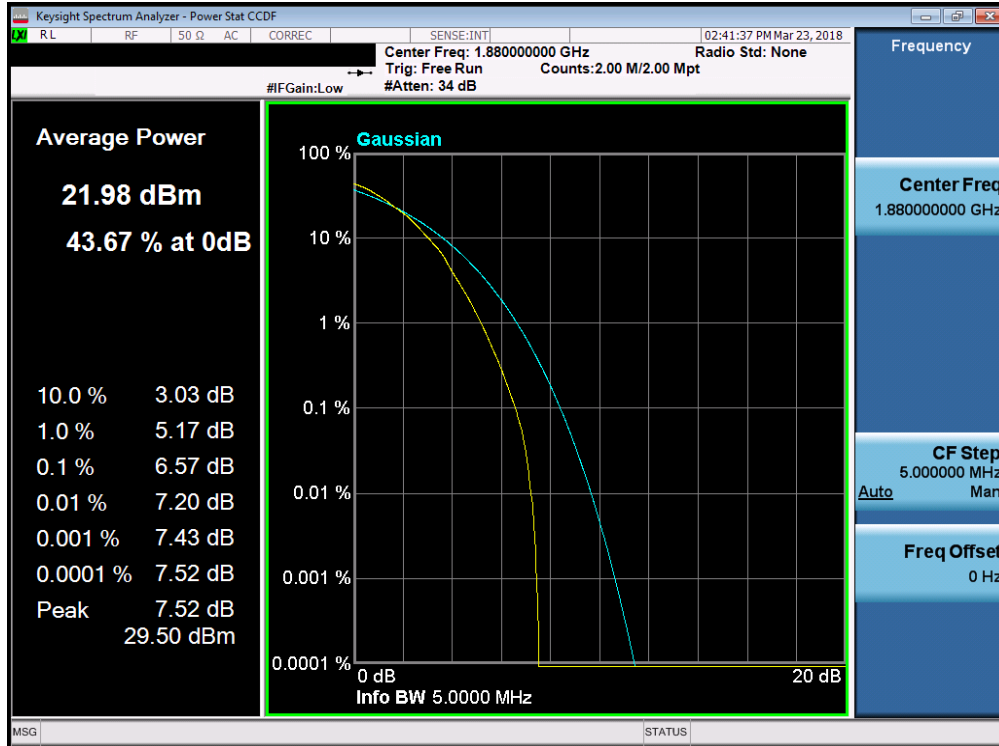
Plot 7-243. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



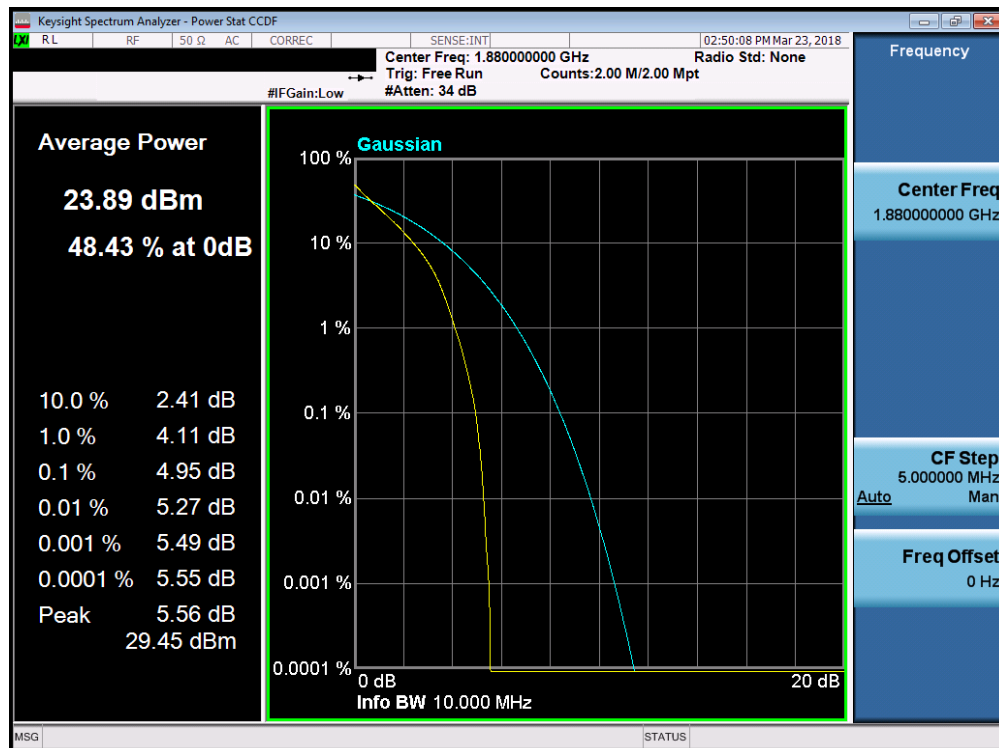
Plot 7-244. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 145 of 217



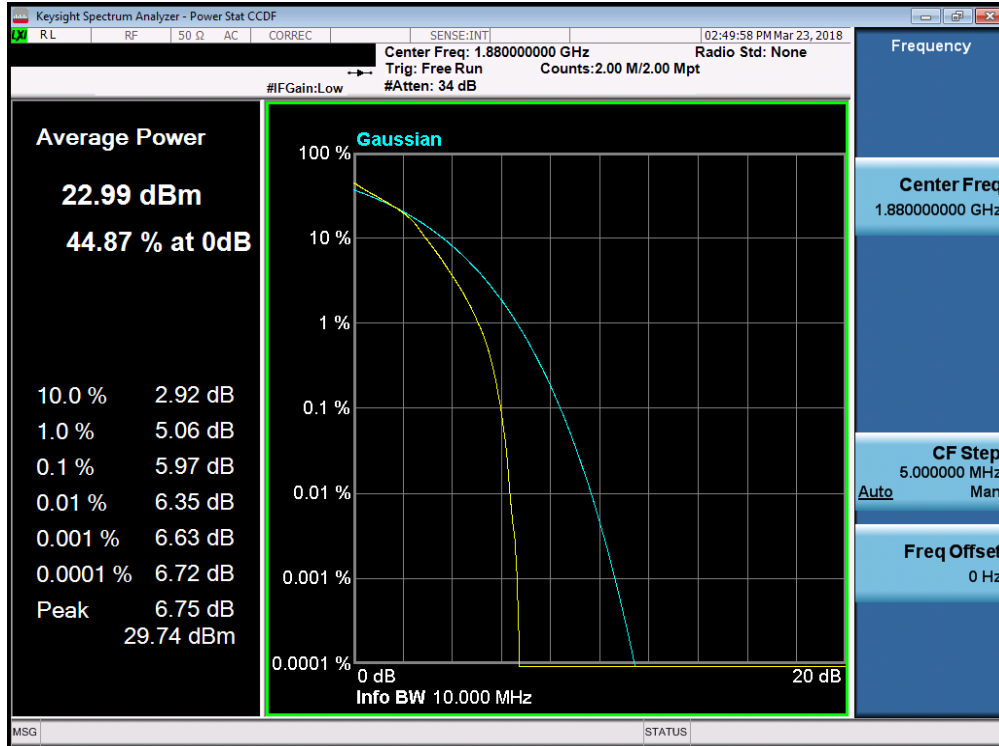


Plot 7-245. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)

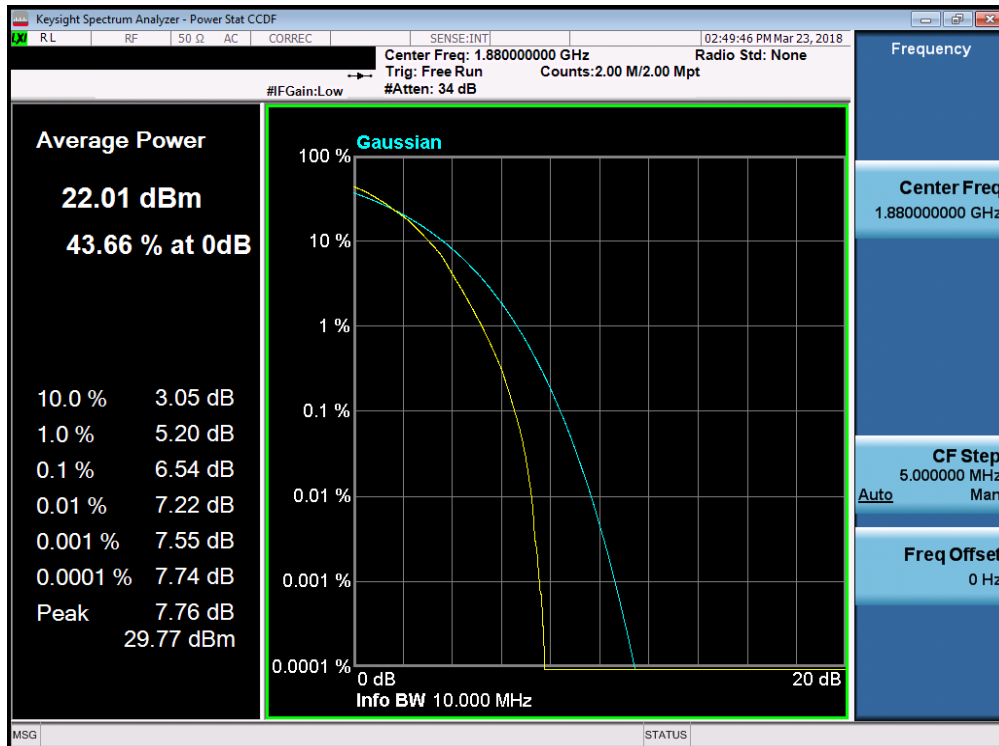


Plot 7-246. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 146 of 217

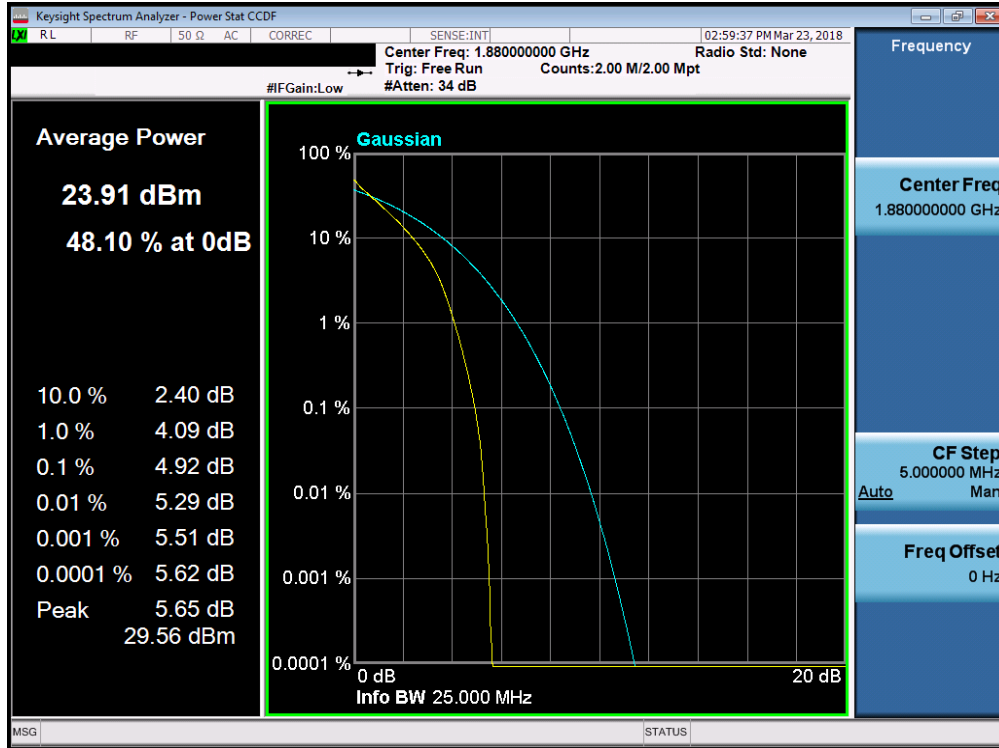


**Plot 7-247. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)**

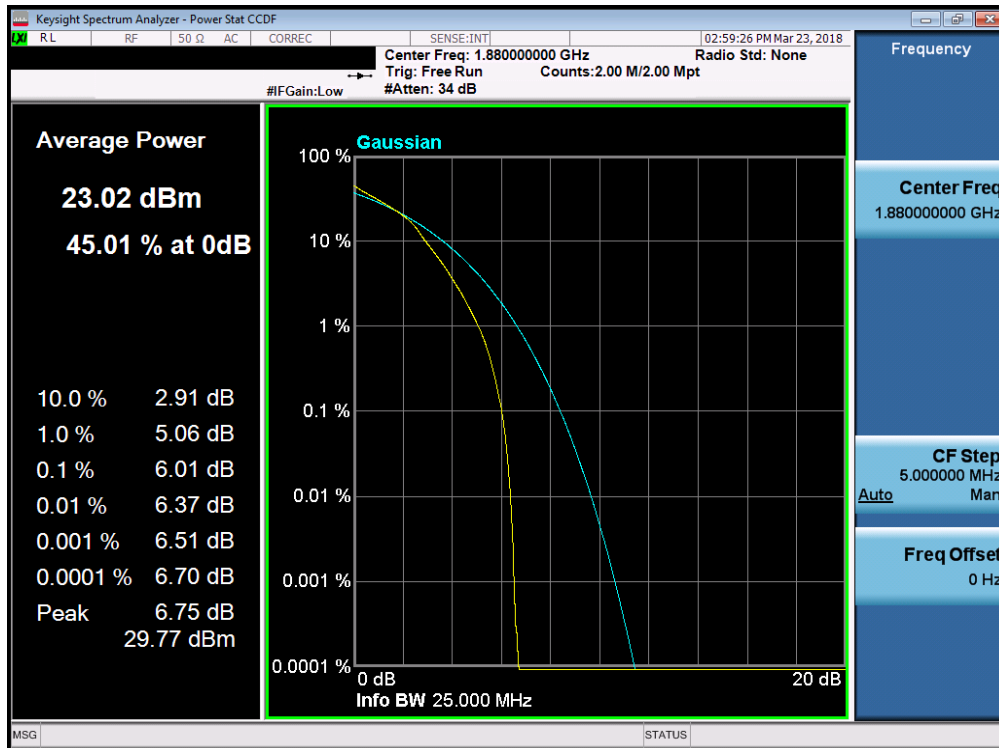


**Plot 7-248. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 147 of 217

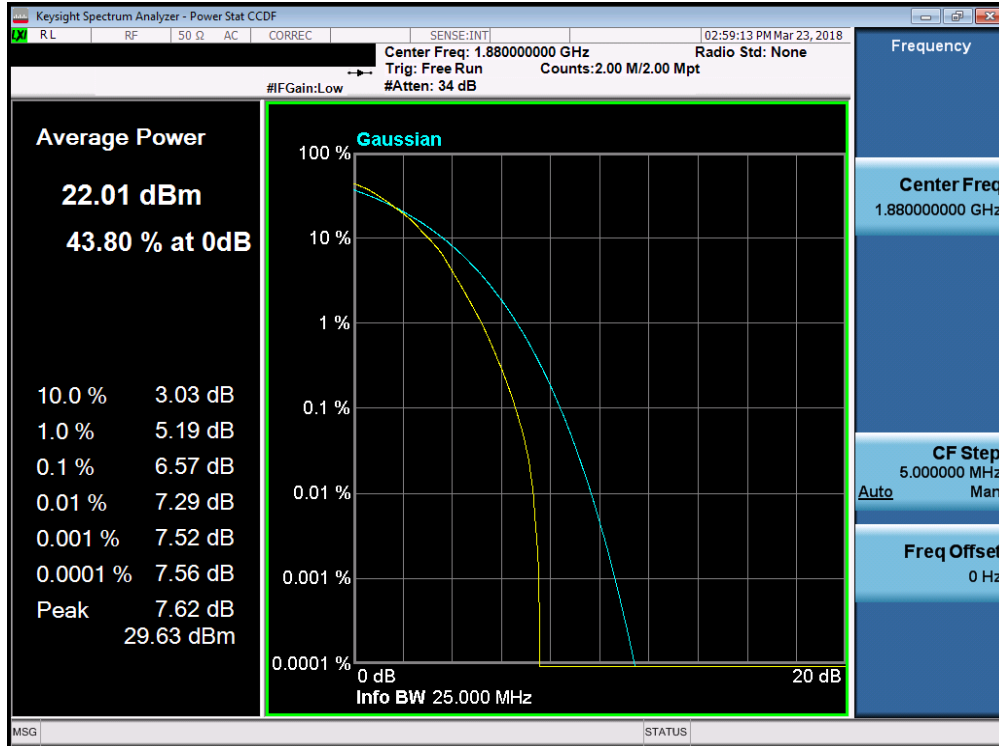


Plot 7-249. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

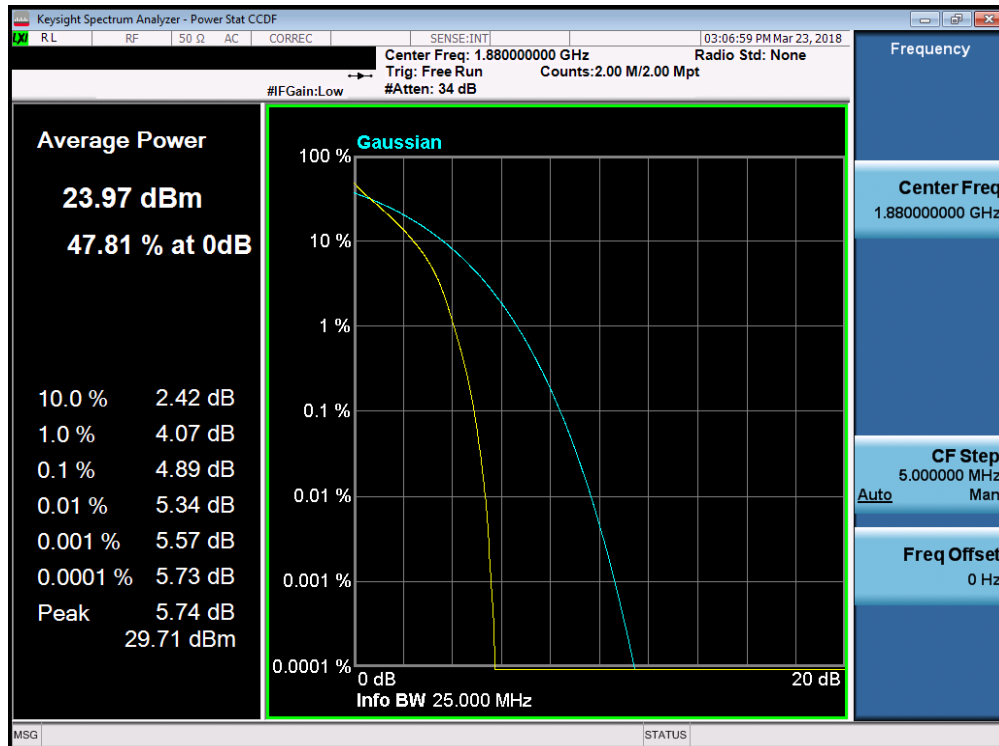


Plot 7-250. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 148 of 217

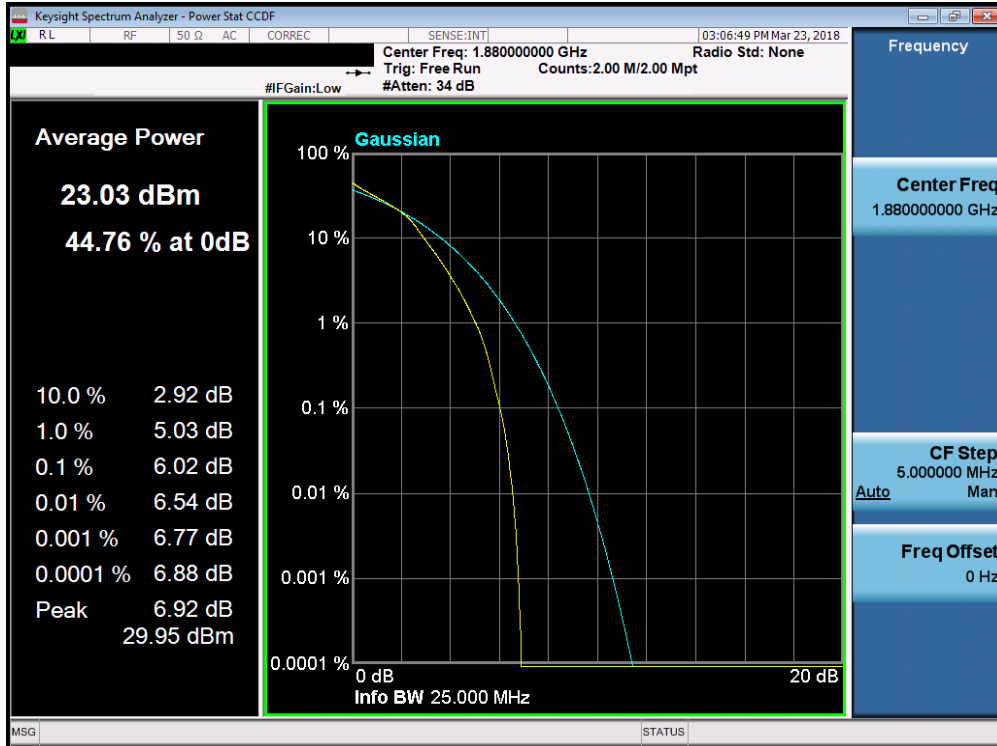


Plot 7-251. PAR Plot (Band 25/2 - 15.0MHz 64-QAM - Full RB Configuration)

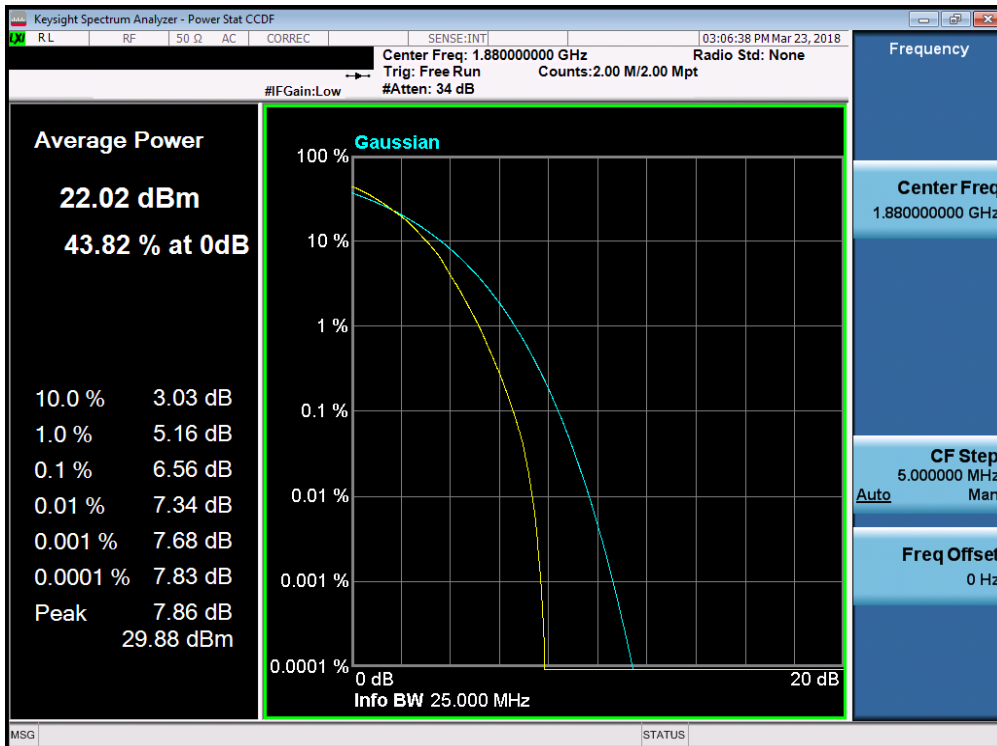


Plot 7-252. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 149 of 217



**Plot 7-253. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)**



**Plot 7-254. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)**

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 150 of 217

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

### Test Overview

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

### Test Procedure Used

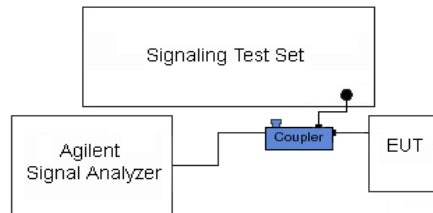
KDB 971168 D01 v03 – Section 5.2.2

### Test Settings

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

### Test Setup

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



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

### Test Notes

None.

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 151 of 217

Test Case	NS	MCC	MNC	Channel BW [MHz]	Channel Number	Channel Frequency [MHz]	Modulation	RB Size	RB Offset	MPR [dB]	A-MPR [dB]	Measured Power [dBm]	Lowest Typical Power [dBm]
1	04	310	120	5	39675	2498.5	QPSK	1	0	≤ 0	≤ 3	24.33	23.7
							16-QAM			≤ 1		23.57	22.7
							64-QAM			≤ 2		22.47	21.7
2				5	39675	2498.5	QPSK	1	9	≤ 0	≤ 0	27.31	26.7
							16-QAM			≤ 1		26.59	25.7
							64-QAM			≤ 2		25.55	24.7
3				10	39700	2501	QPSK	1	0	≤ 0	≤ 5	22.37	21.7
							16-QAM			≤ 1		21.54	20.7
							64-QAM			≤ 2		20.48	19.7
4				10	39700	2501	QPSK	20	0	≤ 1	≤ 2	24.31	23.7
							16-QAM			≤ 2		23.42	22.7
							64-QAM			≤ 3		22.59	21.7
5				10	39700	2501	QPSK	50	0	≤ 1	≤ 3	23.26	22.7
							16-QAM			≤ 2		22.39	21.7
							64-QAM			≤ 3		21.51	20.7
6				10	39700	2501	QPSK	25	20	≤ 1	≤ 1	25.25	24.7
							16-QAM			≤ 2		24.31	23.7
							64-QAM			≤ 3		23.43	22.7
7	10	39700	2501	QPSK	1	36	≤ 0	≤ 0	27.31	26.7			
				16-QAM			≤ 1		26.60	25.7			
				64-QAM			≤ 2		25.53	24.7			
8	15	39725	2503.5	QPSK	1	0	≤ 0	≤ 5	22.35	21.7			
				16-QAM			≤ 1		21.86	20.7			
				64-QAM			≤ 2		20.32	19.7			
9	15	39725	2503.5	QPSK	20	0	≤ 1	≤ 2	24.34	23.7			
				16-QAM			≤ 2		23.41	22.7			
				64-QAM			≤ 3		22.54	21.7			
10	15	39725	2503.5	QPSK	75	0	≤ 1	≤ 4	22.17	21.7			
				16-QAM			≤ 2		21.26	20.7			
				64-QAM			≤ 3		20.50	19.7			
11	15	39725	2503.5	QPSK	50	15	≤ 1	≤ 3	23.22	22.7			
				16-QAM			≤ 2		22.25	21.7			
				64-QAM			≤ 3		21.52	20.7			
12	15	39725	2503.5	QPSK	1	60	≤ 0	≤ 0	27.10	26.7			
				16-QAM			≤ 1		26.68	25.7			
				64-QAM			≤ 2		25.26	24.7			
13	20	39750	2506	QPSK	1	0	≤ 0	≤ 5	22.41	21.7			
				16-QAM			≤ 1		21.76	20.7			
				64-QAM			≤ 2		20.80	19.7			
14	20	39750	2506	QPSK	20	0	≤ 1	≤ 2	24.39	23.7			
				16-QAM			≤ 2		23.53	22.7			
				64-QAM			≤ 3		22.64	21.7			
15	20	39750	2506	QPSK	100	0	≤ 1	≤ 4	22.29	21.7			
				16-QAM			≤ 2		21.41	20.7			
				64-QAM			≤ 3		20.63	19.7			
16	20	39750	2506	QPSK	75	23	≤ 1	≤ 3	23.26	22.7			
				16-QAM			≤ 2		22.35	21.7			
				64-QAM			≤ 3		21.62	20.7			
17	20	39750	2506	QPSK	1	77	≤ 0	≤ 0	27.33	26.7			
				16-QAM			≤ 1		26.32	25.7			
				64-QAM			≤ 2		25.87	24.7			
18	04	312	530	5	39675	2498.5	QPSK	1	0	≤ 0	≤ 3	24.28	23.7
							16-QAM			≤ 1		23.76	22.7
							64-QAM			≤ 2		22.67	21.7
19	01	001	01	5	39675	2498.5	QPSK	1	0	≤ 0	≤ 0	27.3	26.7
							16-QAM			≤ 1		26.6	25.7
							64-QAM			≤ 2		25.72	24.7

**Table 7-3. A-MPR Conducted Power Measurements**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 152 of 217	



## 7.7 Uplink Carrier Aggregation

### §27.53(m)

#### Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 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 38/41, 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.

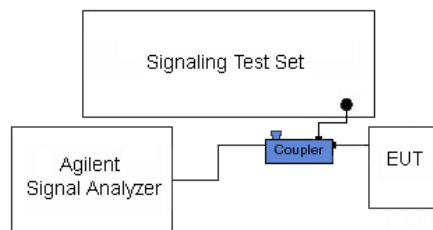


Figure 7-6. Test Instrument & Measurement Setup

FCC ID: ZNFG710VM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 153 of 217

### 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 Tables 7-4, 7-5, 7-6 and 7-7 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	24.81
Max	LTE B41	10	40620	2593	QPSK	1	49	LTE B41	20	40764	2607.4	QPSK	1	0	24.73
Max	LTE B41	20	41396	2670.6	QPSK	1	99	LTE B41	10	41540	2685	QPSK	1	0	24.79
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	15	39875	2518.5	QPSK	1	0	24.94
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	20	39896	2520.6	QPSK	1	0	24.78
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	15	40770	2608	QPSK	1	0	24.92
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	20	40791	2610.1	QPSK	1	0	24.75
Max	LTE B41	15	41365	2667.5	QPSK	1	74	LTE B41	15	41515	2682.5	QPSK	1	0	25.05
Max	LTE B41	20	41344	2665.4	QPSK	1	99	LTE B41	15	41515	2682.5	QPSK	1	0	24.98
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	10	39894	2520.4	QPSK	1	0	25.03
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	15	39921	2523.1	QPSK	1	0	25.12
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	25.08
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	10	40764	2607.4	QPSK	1	0	24.85
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	15	40791	2610.1	QPSK	1	0	24.97
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	24.82
Max	LTE B41	10	41346	2665.6	QPSK	1	49	LTE B41	20	41490	2680	QPSK	1	0	24.83
Max	LTE B41	15	41319	2662.9	QPSK	1	74	LTE B41	20	41490	2680	QPSK	1	0	24.84
Max	LTE B41	20	41292	2660.2	QPSK	1	99	LTE B41	20	41490	2680	QPSK	1	0	24.82

**Table 7-4. Conducted Powers (B41 ULCA – PCC: RB Size 1 Offset Max SCC: RB Size 1 Offset 0)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 154 of 217	

Power State	PCC							SCC							Power
	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	ULCA Tx.Power (dBm)
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	0	20.44
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	99	17.48
Max	LTE B41	20	39750	2506	QPSK	1	0	LTE B41	20	39948	2525.8	QPSK	1	99	13.40
Max	LTE B41	20	39750	2506	QPSK	1	50	LTE B41	20	39948	2525.8	QPSK	1	50	20.35
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	25.03
Max	LTE B41	20	39750	2506	QPSK	100	0	LTE B41	20	39948	2525.8	QPSK	100	0	21.73
Max	LTE B41	20	39750	2506	16-QAM	100	0	LTE B41	20	39948	2525.8	16-QAM	100	0	20.78
Max	LTE B41	20	39750	2506	64-QAM	100	0	LTE B41	20	39948	2525.8	64-QAM	100	0	19.86

**Table 7-5. Conducted Powers (B41 ULCA with Various Combinations for 20MHz Channel Bandwidth)**

Power State	PCC							SCC							Power
	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	ULCA Tx.Power (dBm)
Max	LTE B5	5	20425	826.5	QPSK	1	24	LTE B5	10	20497	833.7	QPSK	1	0	24.34
Max	LTE B5	5	20525	836.5	QPSK	1	0	LTE B5	10	20453	829.3	QPSK	1	49	24.51
Max	LTE B5	5	20625	846.5	QPSK	1	0	LTE B5	10	20553	839.3	QPSK	1	49	24.62
Max	LTE B5	10	20450	829	QPSK	1	49	LTE B5	10	20549	838.9	QPSK	1	0	24.63
Max	LTE B5	10	20525	836.5	QPSK	1	49	LTE B5	10	20624	846.4	QPSK	1	0	24.44
Max	LTE B5	10	20600	844	QPSK	1	0	LTE B5	10	20501	834.1	QPSK	1	0	24.27
Max	LTE B5	10	20450	829	QPSK	1	49	LTE B5	5	20522	836.2	QPSK	1	0	24.39
Max	LTE B5	10	20525	836.5	QPSK	1	49	LTE B5	5	20453	829.3	QPSK	1	0	24.47
Max	LTE B5	10	20600	844	QPSK	1	0	LTE B5	5	20528	836.8	QPSK	1	24	24.93

**Table 7-6. Conducted Powers (B5 ULCA – PCC: RB Size 1 Offset Max SCC: RB Size 1 Offset 0)**

Power State	PCC							SCC							Power
	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	ULCA Tx.Power (dBm)
Max	LTE B5	10	20450	829	QPSK	1	0	LTE B5	10	20549	838.9	QPSK	1	0	15.10
Max	LTE B5	10	20450	829	QPSK	1	49	LTE B5	10	20549	838.9	QPSK	1	49	15.01
Max	LTE B5	10	20450	829	QPSK	1	0	LTE B5	10	20549	838.9	QPSK	1	49	15.32
Max	LTE B5	10	20450	829	QPSK	1	25	LTE B5	10	20549	838.9	QPSK	1	25	15.43
Max	LTE B5	10	20450	829	QPSK	1	49	LTE B5	10	20549	838.9	QPSK	1	0	24.63
Max	LTE B5	10	20450	829	QPSK	50	0	LTE B5	10	20549	838.9	QPSK	50	0	22.82
Max	LTE B5	10	20450	829	16-QAM	50	0	LTE B5	10	20549	838.9	16-QAM	50	0	21.85
Max	LTE B5	10	20450	829	64-QAM	50	0	LTE B5	10	20549	838.9	64-QAM	50	0	20.78

**Table 7-7. Conducted Powers (B5 ULCA with Various Combinations for 20MHz Channel Bandwidth)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1-ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 155 of 217	

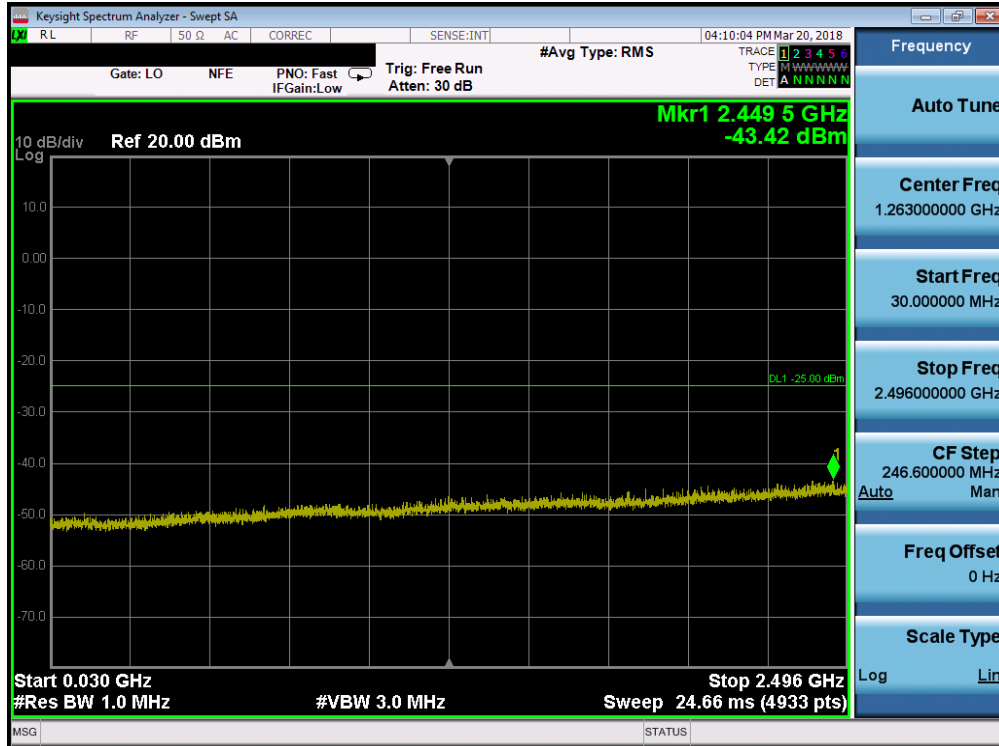


Table 7-255. Conducted Spurious Plot (Band 41 ULCA – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

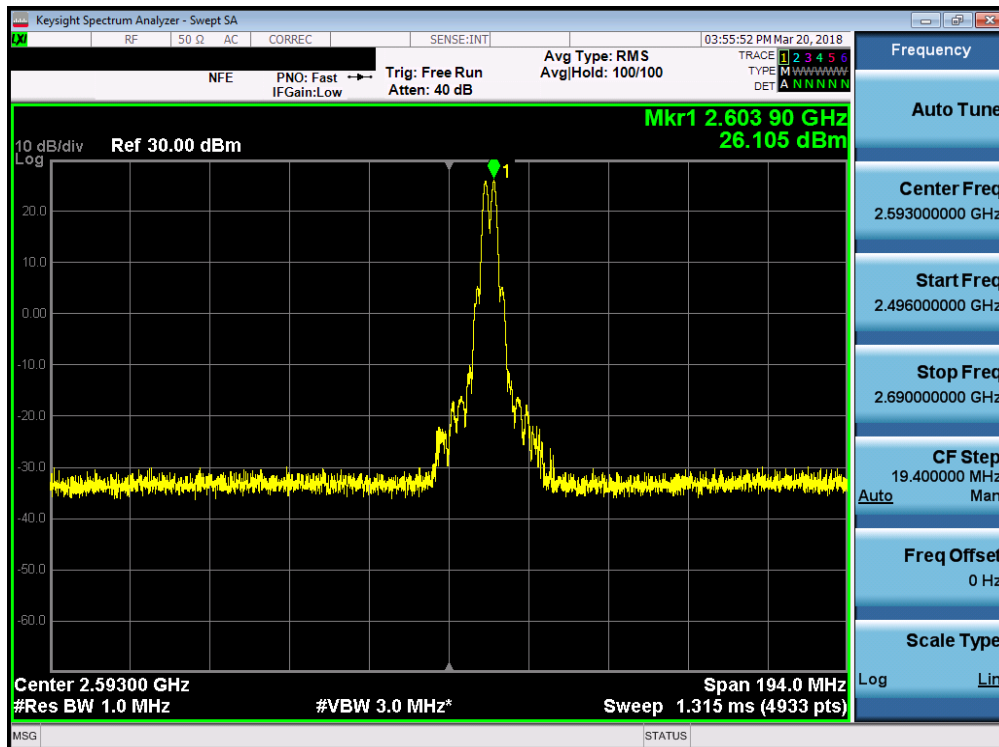


Table 7-256. Conducted Spurious Plot (Band 41 ULCA – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 156 of 217

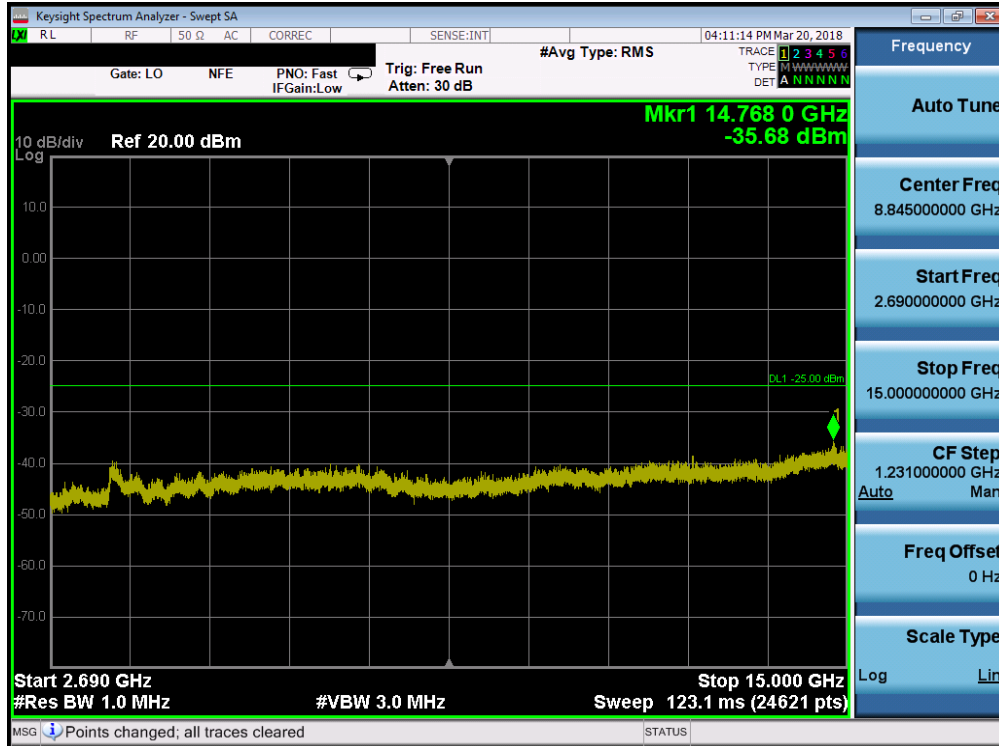


Table 7-257. Conducted Spurious Plot (Band 41 ULCA – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

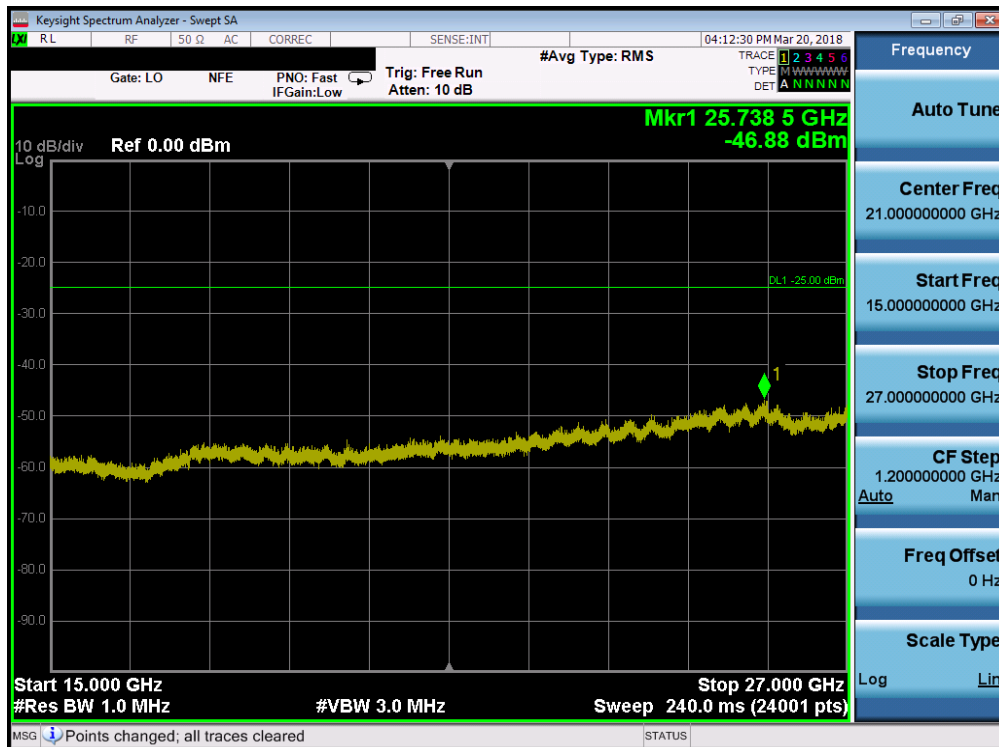


Table 7-258. Conducted Spurious Plot (Band 41 ULCA – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 157 of 217

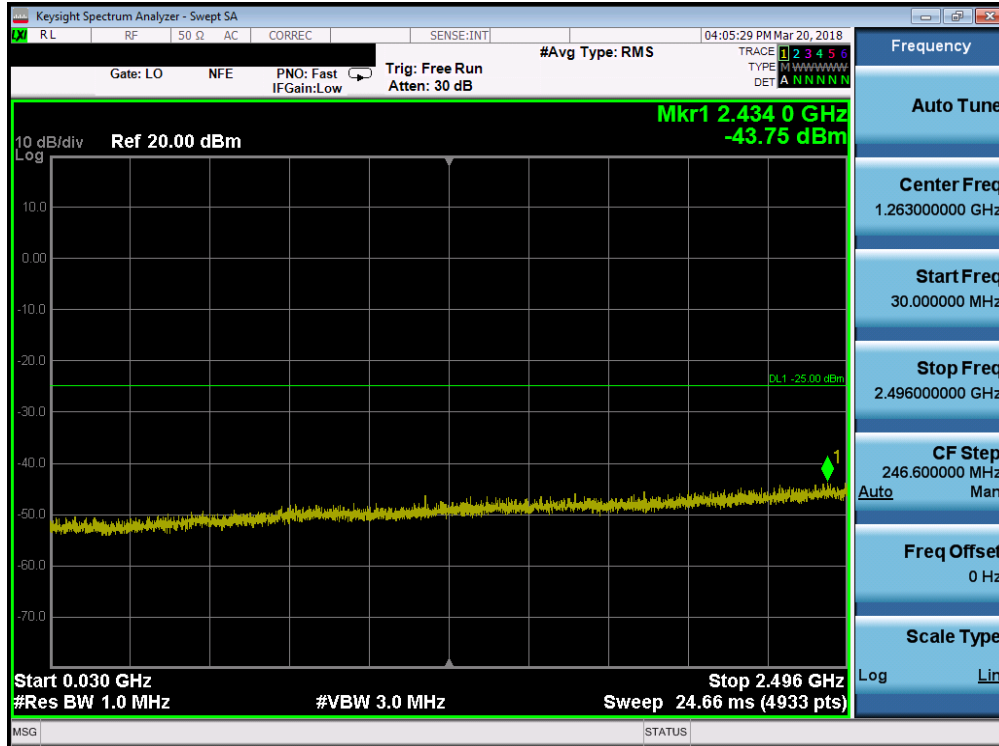


Table 7-259. Conducted Spurious Plot (Band 41 ULCA – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

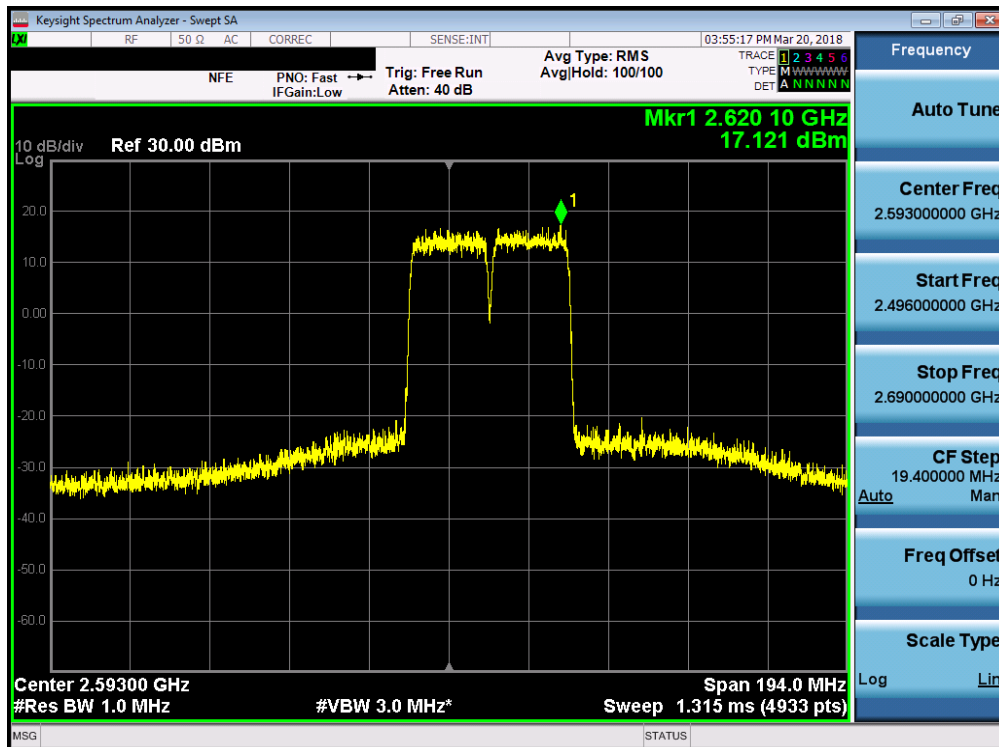


Table 7-260. Conducted Spurious Plot (Band 41 ULCA – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 158 of 217

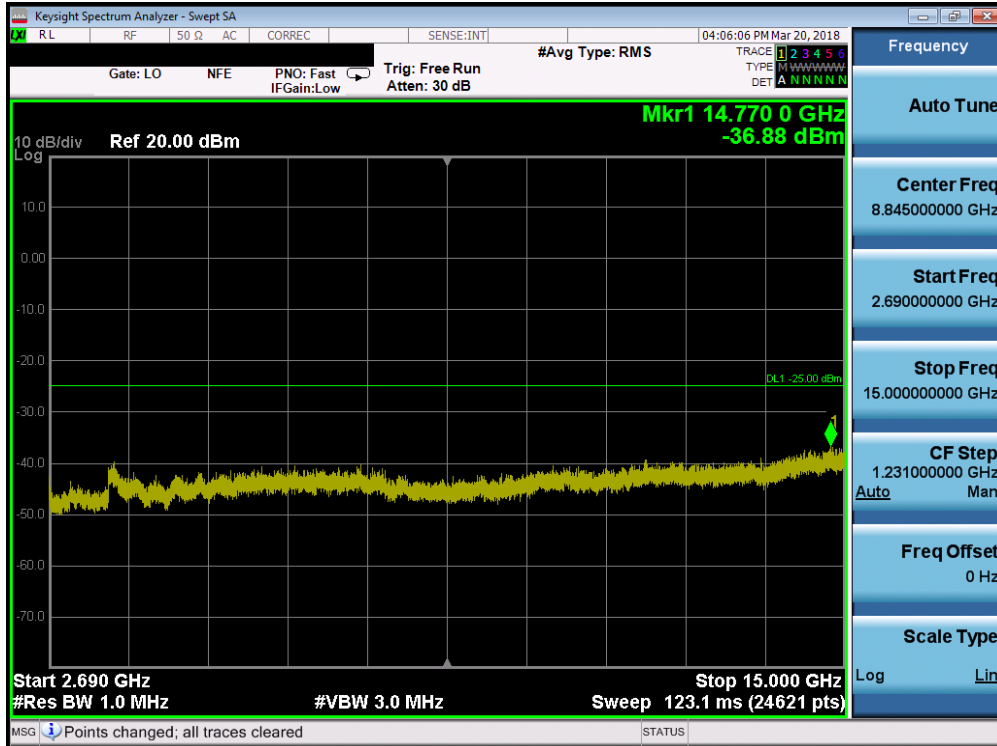


Table 7-261. Conducted Spurious Plot (Band 41 ULCA – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

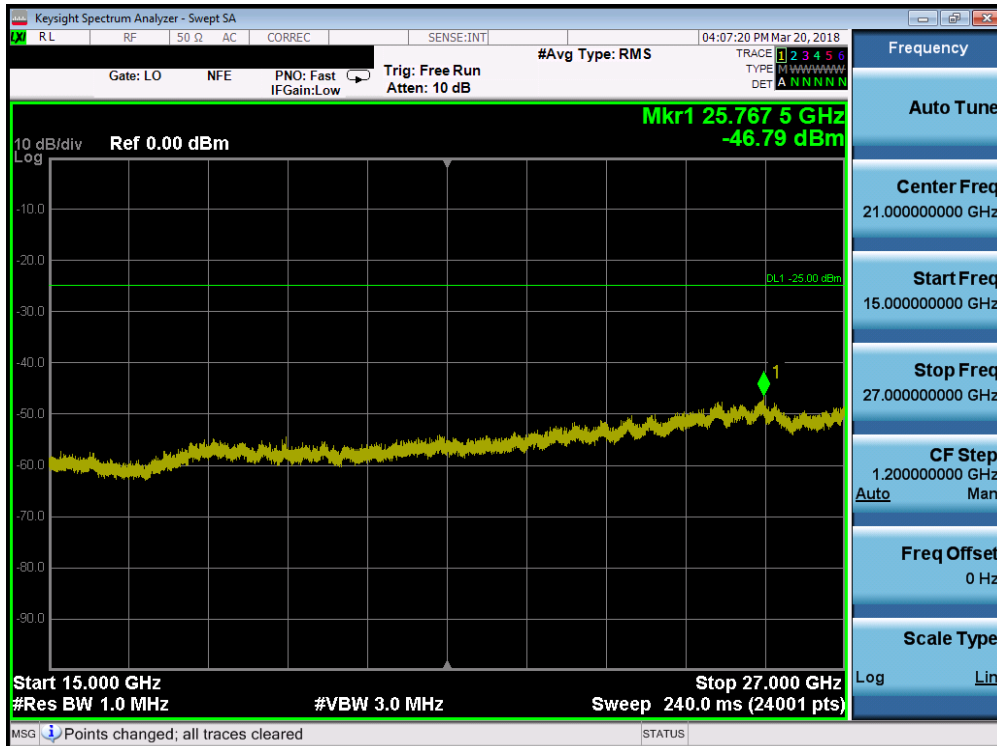


Table 7-262. Conducted Spurious Plot (Band 41 ULCA – 20.0MHz QPSK – PCC 100/0 SCC 100/0 – Mid Channel)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 159 of 217



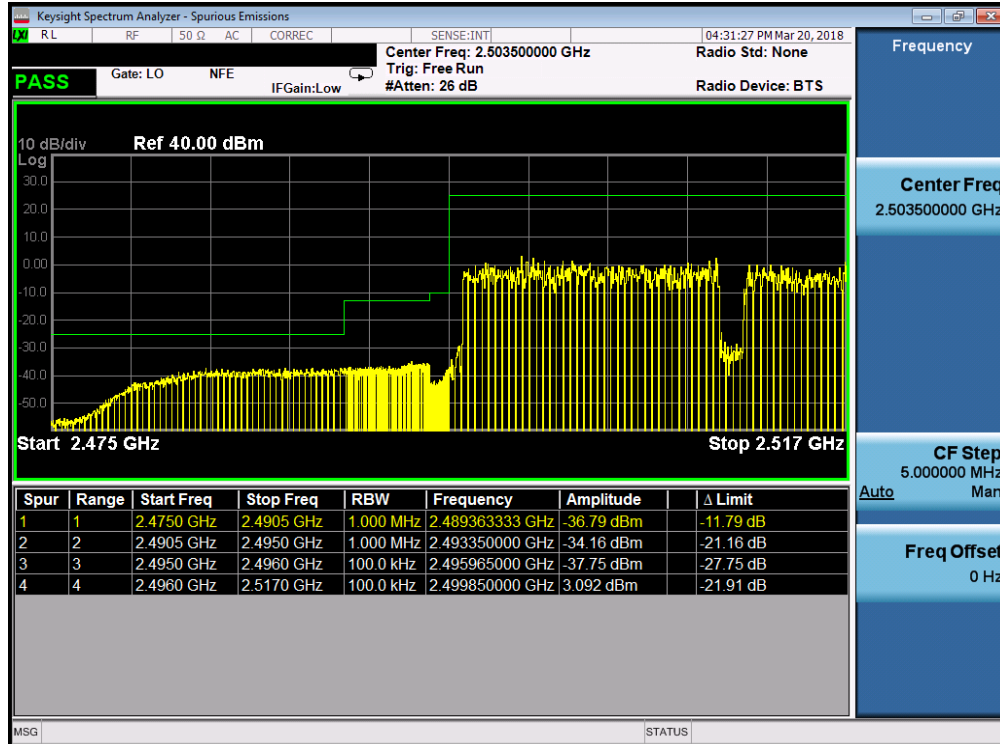


Table 7-263. Lower ACP Plot (Band 41 ULCA QPSK – PCC:15 MHz SCC:20 MHz – Full RB)

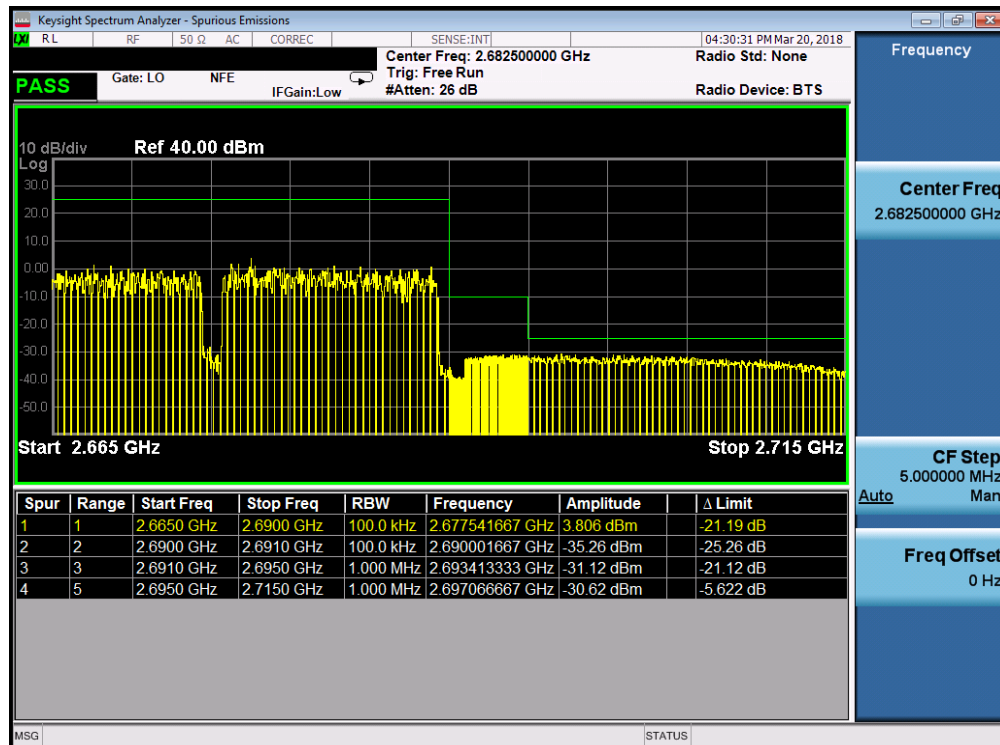


Table 7-264. Upper ACP Plot (Band 41 ULCA QPSK – PCC:15 MHz SCC:20 MHz – Full RB)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 160 of 217

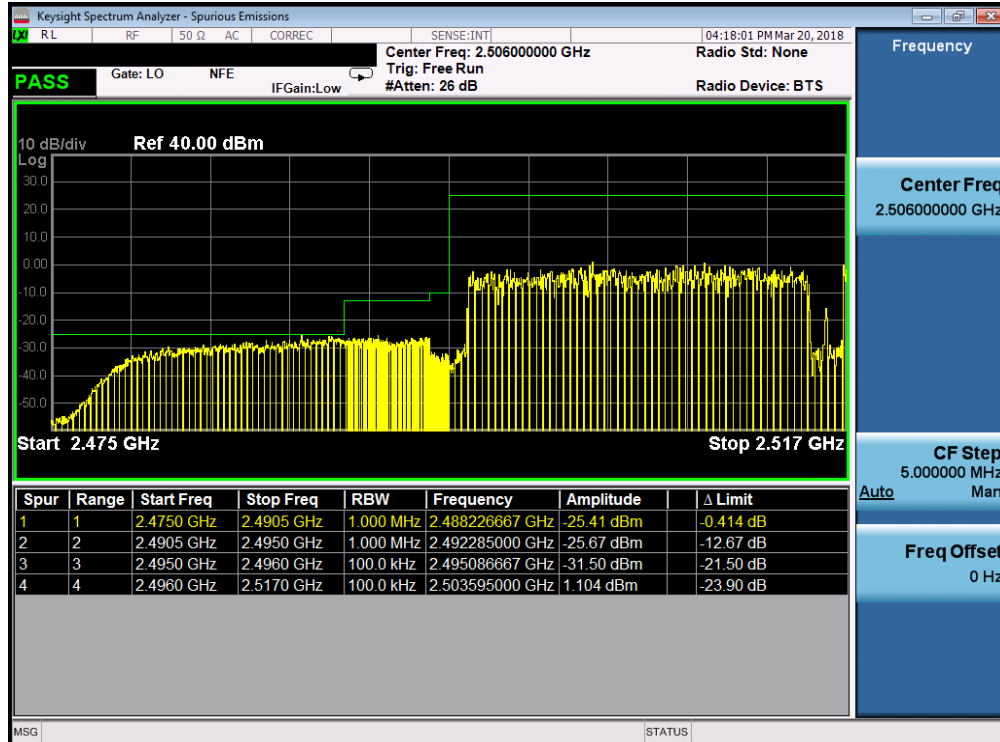


Table 7-265. Lower ACP Plot (Band 41 ULCA QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

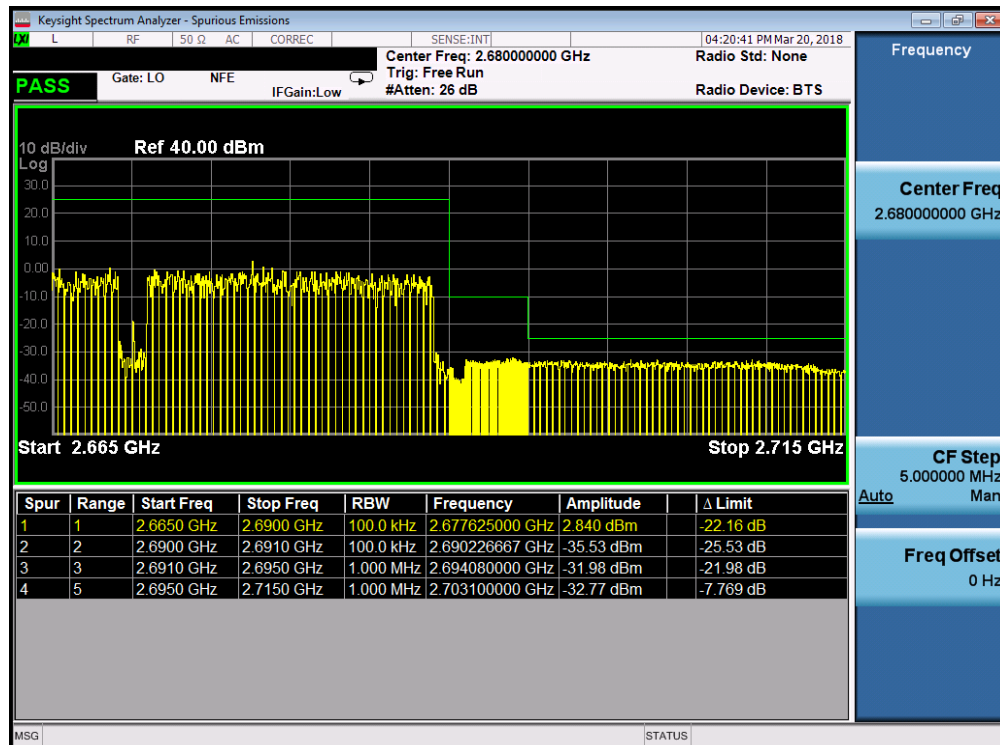


Table 7-266. Upper ACP Plot (Band 41 ULCA QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 161 of 217

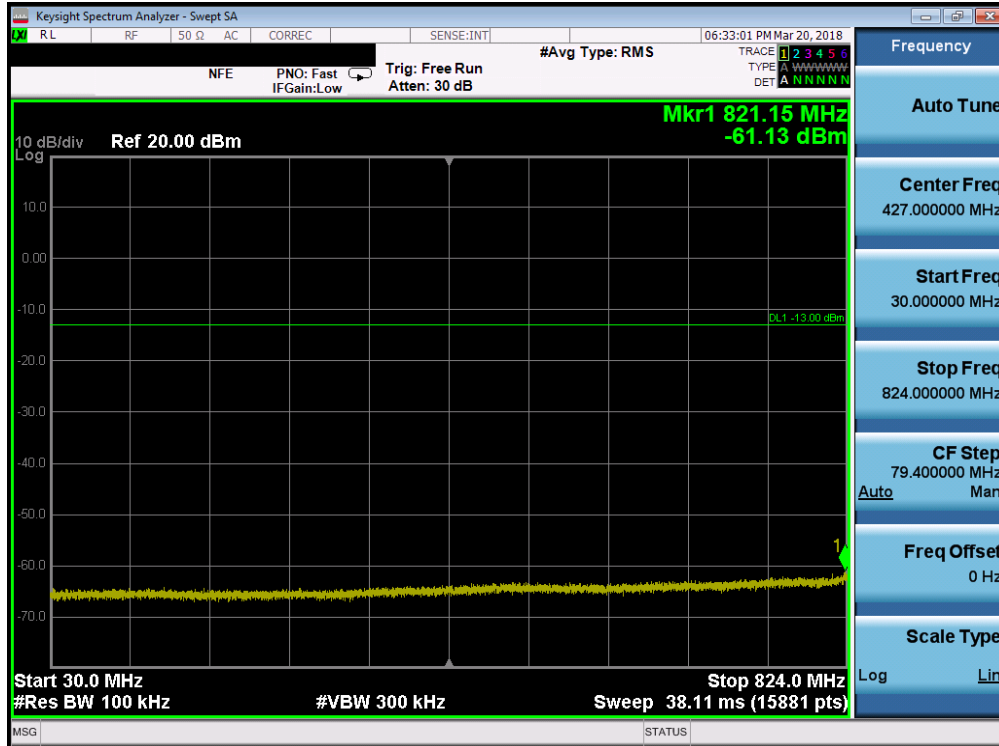


Table 7-267. Conducted Spurious Plot (Band 5 ULCA – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Mid Channel)

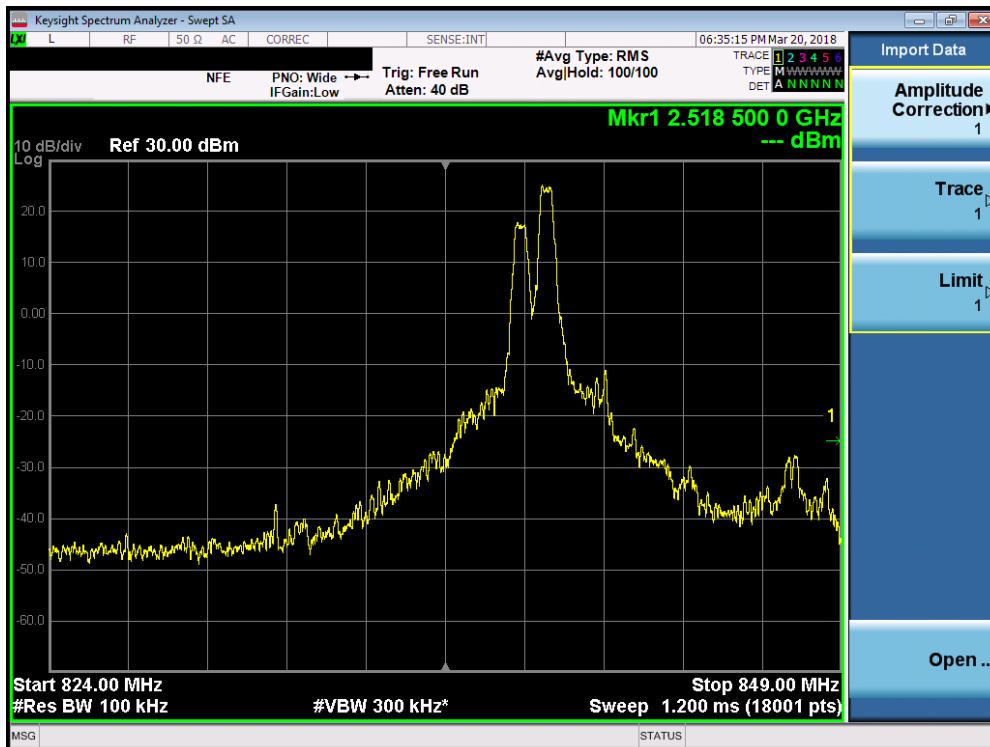


Table 7-268. Conducted Spurious Plot (Band 5 ULCA – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Mid Channel)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 162 of 217

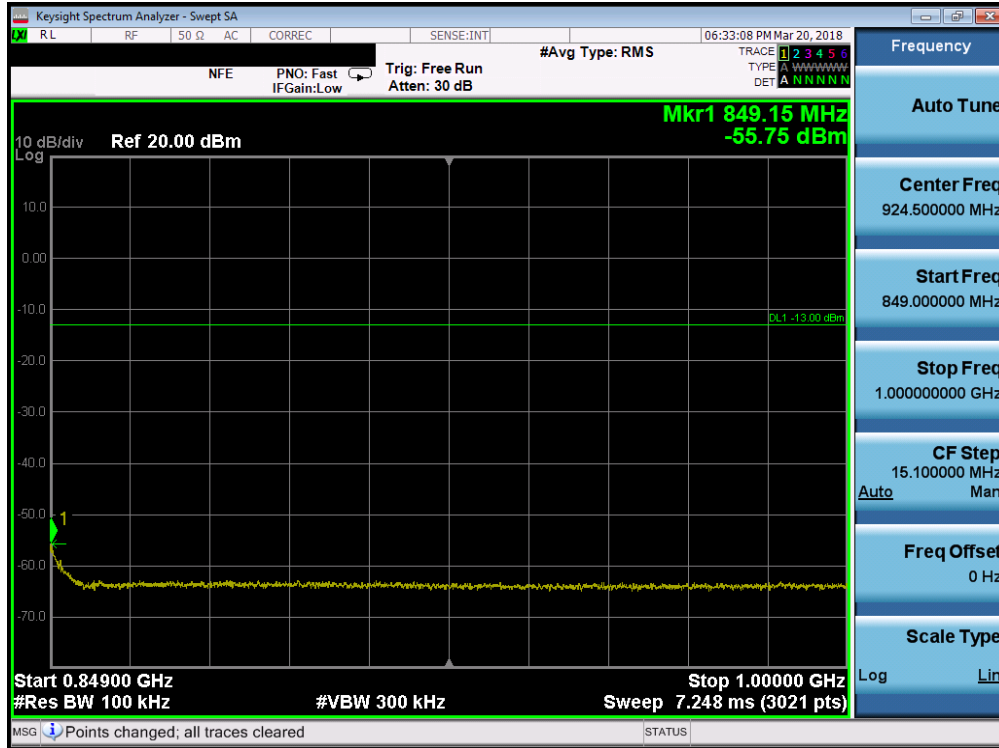


Table 7-269. Conducted Spurious Plot (Band 5 ULCA – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Mid Channel)

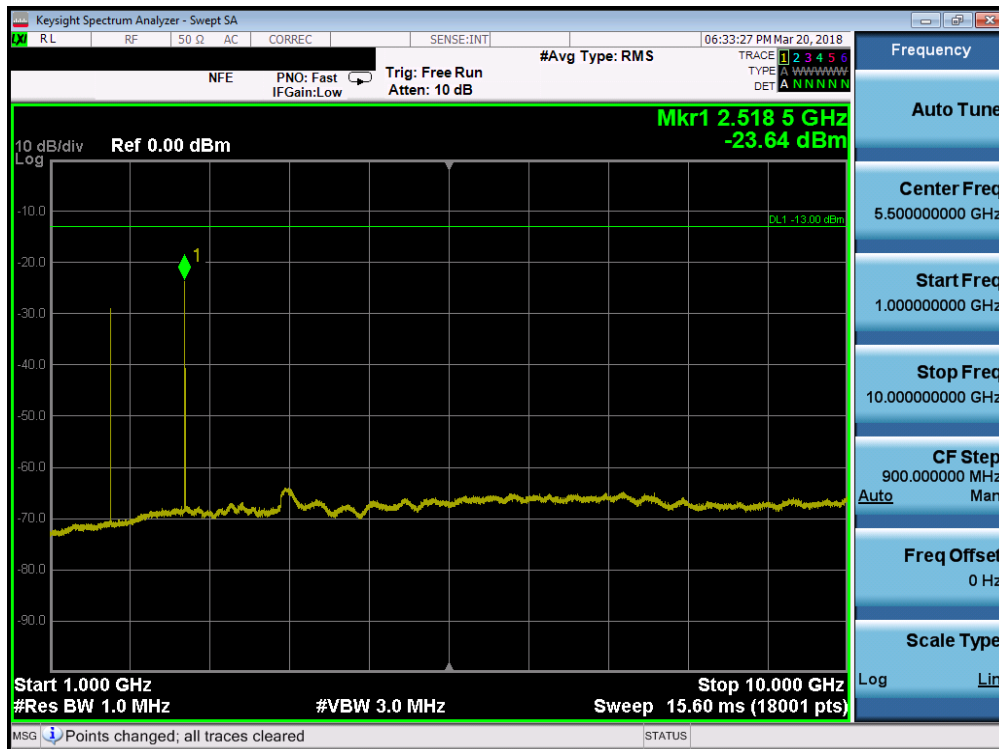


Table 7-270. Conducted Spurious Plot (Band 5 ULCA – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Mid Channel)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 163 of 217

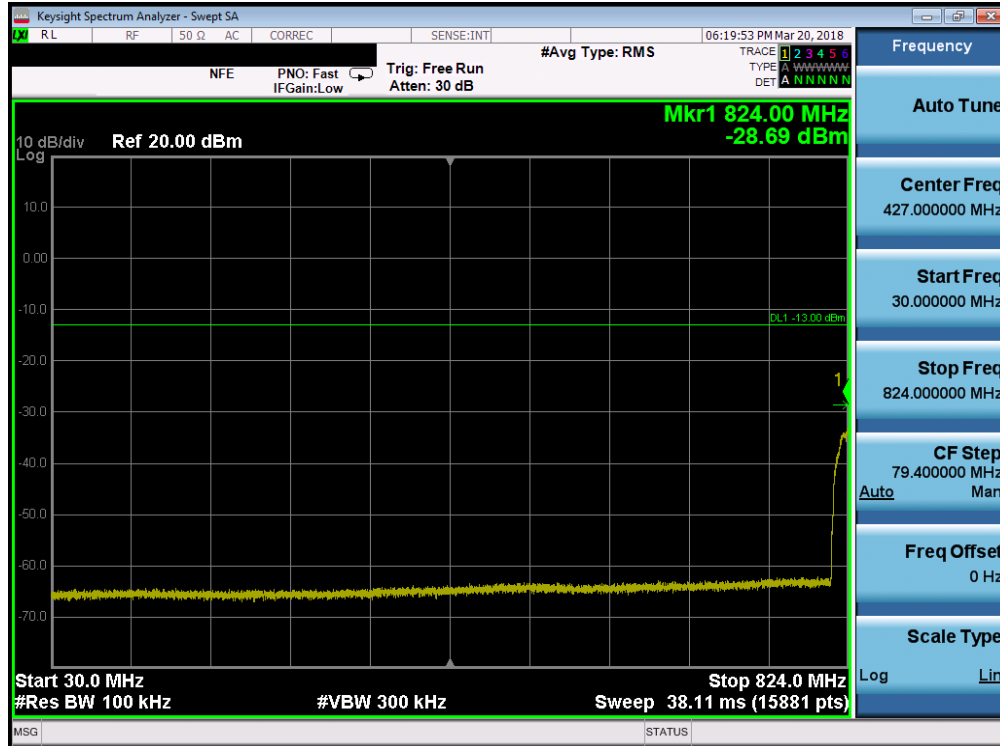


Table 7-271. Conducted Spurious Plot (Band 5 ULCA – 10.0MHz QPSK – PCC 50/0 SCC 50/0 – Mid Channel)

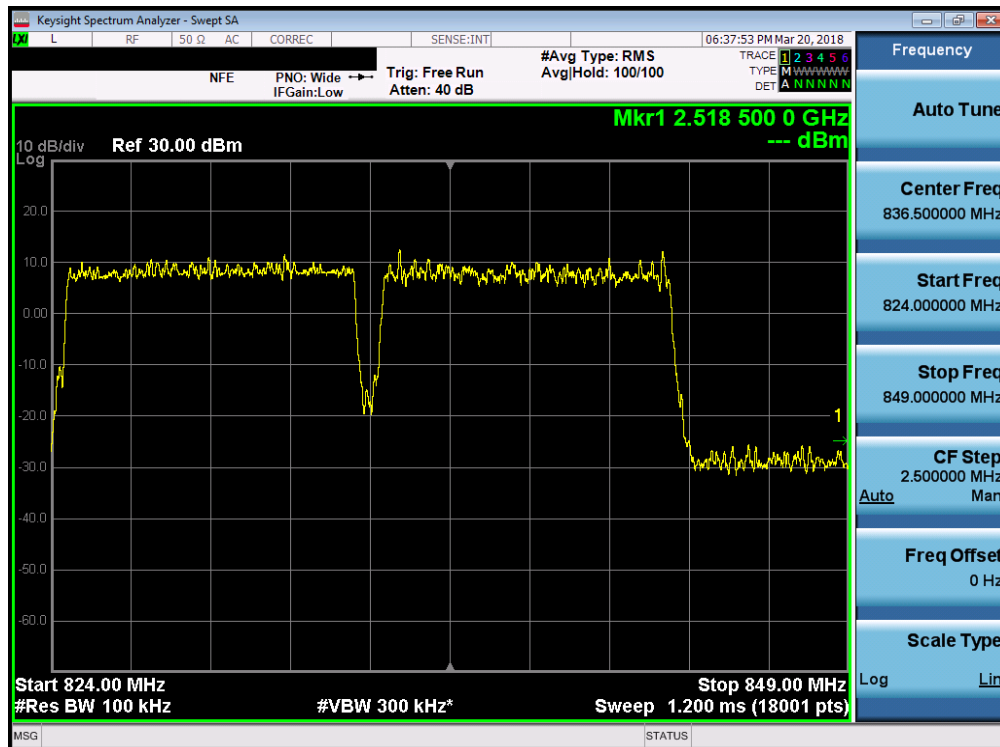


Table 7-272. Conducted Spurious Plot (Band 5 ULCA – 10.0MHz QPSK – PCC 50/0 SCC 50/0 – Mid Channel)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 164 of 217

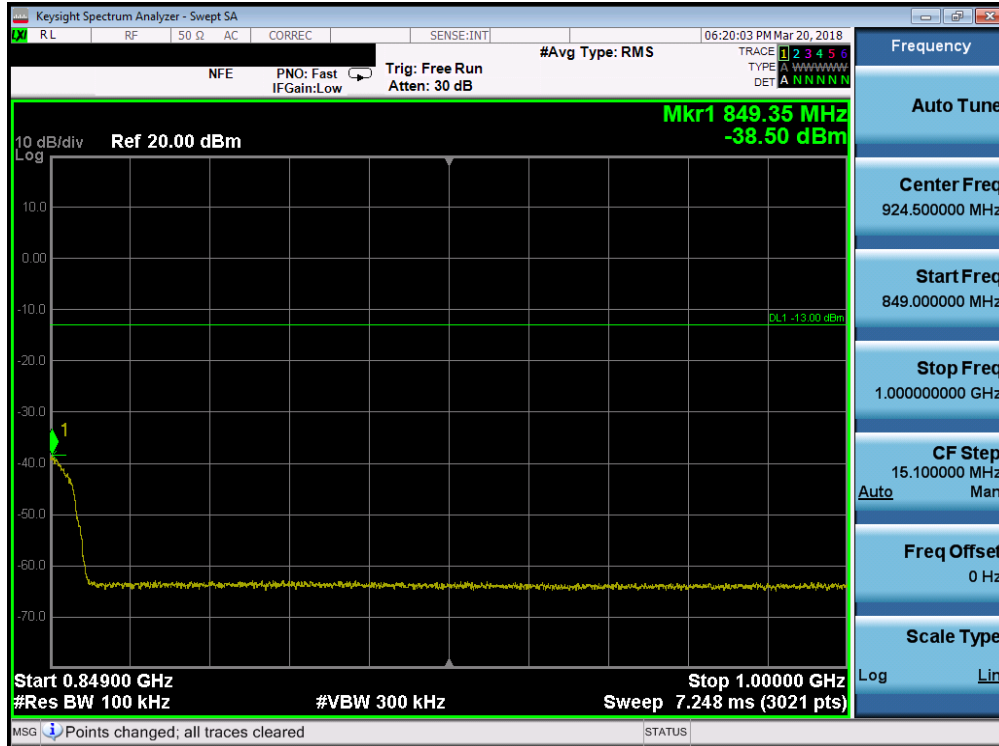


Table 7-273. Conducted Spurious Plot (Band 5 ULCA – 10.0MHz QPSK – PCC 50/0 SCC 50/0 – Mid Channel)

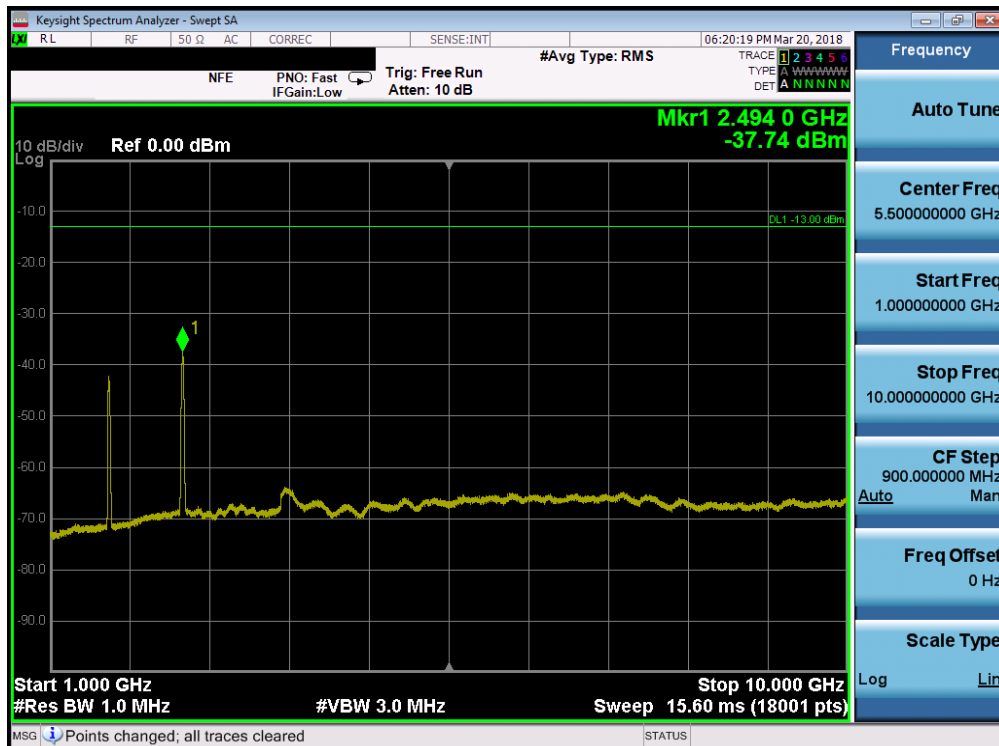


Table 7-274. Conducted Spurious Plot (Band 5 ULCA – 10.0MHz QPSK – PCC 50/0 SCC 50/0 – Mid Channel)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 165 of 217

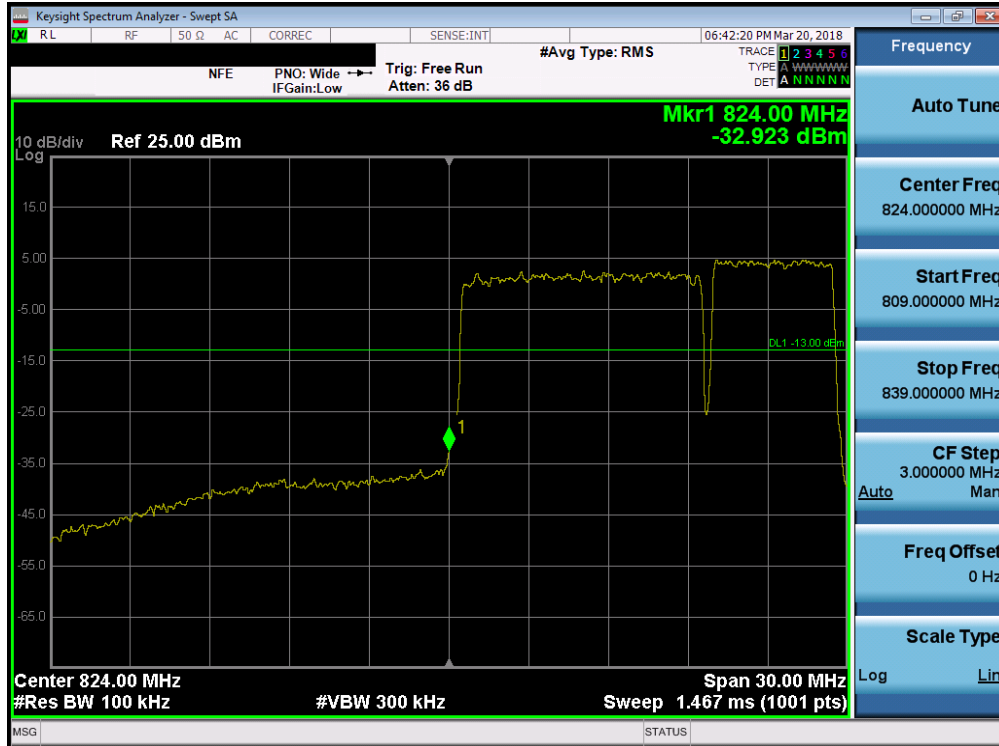


Table 7-275. Lower ACP Plot (Band 5 ULCA QPSK – PCC:10 MHz SCC:5 MHz – Full RB)



Table 7-276. Upper ACP Plot (Band 5 ULCA QPSK – PCC:10 MHz SCC:5 MHz – Full RB)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 166 of 217





Table 7-277. Lower ACP Plot (Band 5 ULCA QPSK – PCC:10 MHz SCC:10 MHz – Full RB)



Table 7-278. Upper ACP Plot (Band 5 ULCA QPSK – PCC:10 MHz SCC:10 MHz – Full RB)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 167 of 217

## 7.8 Radiated Power (ERP/EIRP)

### Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

### Test Procedures Used

KDB 971168 D01 v03 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

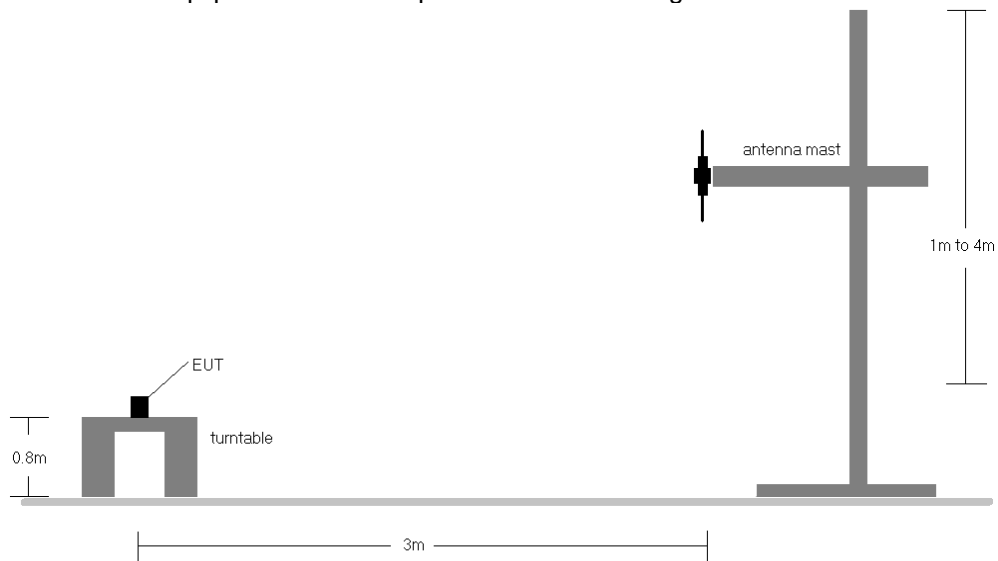
### Test Settings

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

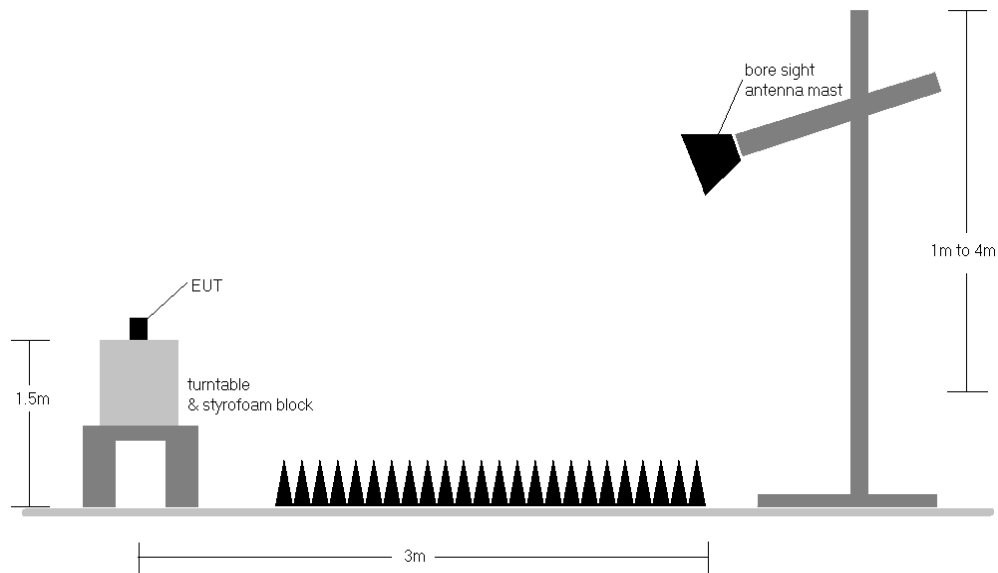
FCC ID: ZNFG710VM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 168 of 217

### Test Setup

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



**Figure 7-7. Radiated Test Setup <1GHz**



**Figure 7-8. Radiated Test Setup >1GHz**

### Test Notes

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

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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### 7.8.1 Radiated Power (ERP/EIRP)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	150	3	1 / 5	16.89	1.10	15.84	0.038	34.77	-18.93	17.99	0.063	36.99	-19.00
707.50	1.4	QPSK	H	150	8	1 / 5	17.68	1.13	16.66	0.046	34.77	-18.11	18.81	0.076	36.99	-18.18
715.30	1.4	QPSK	H	150	6	1 / 5	18.39	1.16	<b>17.40</b>	0.055	34.77	-17.37	<b>19.55</b>	0.090	36.99	-17.44
715.30	1.4	16-QAM	H	150	6	1 / 5	17.77	1.16	<b>16.78</b>	0.048	34.77	-17.99	<b>18.93</b>	0.078	36.99	-18.06
715.30	1.4	64-QAM	H	150	6	1 / 5	16.53	1.16	<b>15.54</b>	0.036	34.77	-19.23	<b>17.69</b>	0.059	36.99	-19.30
700.50	3	QPSK	H	150	9	1 / 14	17.27	1.10	16.22	0.042	34.77	-18.55	18.37	0.069	36.99	-18.62
707.50	3	QPSK	H	150	7	1 / 14	17.61	1.13	16.59	0.046	34.77	-18.18	18.74	0.075	36.99	-18.25
714.50	3	QPSK	H	150	14	1 / 14	18.42	1.16	<b>17.43</b>	<b>0.055</b>	34.77	-17.34	<b>19.58</b>	<b>0.091</b>	36.99	-17.41
714.50	3	16-QAM	H	150	14	1 / 14	17.58	1.16	<b>16.59</b>	0.046	34.77	-18.18	<b>18.74</b>	0.075	36.99	-18.25
714.50	3	64-QAM	H	150	14	1 / 14	16.47	1.16	<b>15.48</b>	0.035	34.77	-19.29	<b>17.63</b>	0.058	36.99	-19.36
701.50	5	QPSK	H	150	0	1 / 24	17.21	1.11	16.17	0.041	34.77	-18.61	18.32	0.068	36.99	-18.67
707.50	5	QPSK	H	150	6	1 / 24	17.73	1.13	16.71	0.047	34.77	-18.06	18.86	0.077	36.99	-18.13
713.50	5	QPSK	H	150	17	1 / 24	18.21	1.15	<b>17.21</b>	0.053	34.77	-17.56	<b>19.36</b>	0.086	36.99	-17.63
713.50	5	16-QAM	H	150	17	1 / 24	17.83	1.15	<b>16.83</b>	0.048	34.77	-17.94	<b>18.98</b>	0.079	36.99	-18.01
713.50	5	64-QAM	H	150	17	1 / 24	16.65	1.15	<b>15.65</b>	0.037	34.77	-19.12	<b>17.80</b>	0.060	36.99	-19.19
704.00	10	QPSK	H	150	356	1 / 49	17.46	1.12	16.43	0.044	34.77	-18.34	18.58	0.072	36.99	-18.41
707.50	10	QPSK	H	150	5	1 / 49	18.02	1.13	17.00	0.050	34.77	-17.77	19.15	0.082	36.99	-17.84
711.00	10	QPSK	H	150	4	1 / 49	18.41	1.14	<b>17.40</b>	0.055	34.77	-17.37	<b>19.55</b>	0.090	36.99	-17.44
711.00	10	16-QAM	H	150	4	1 / 49	17.86	1.14	<b>16.85</b>	0.048	34.77	-17.92	<b>19.00</b>	0.080	36.99	-17.99
707.50	10	64-QAM	H	150	5	1 / 49	16.74	1.13	<b>15.72</b>	0.037	34.77	-19.05	<b>17.87</b>	0.061	36.99	-19.12
714.50	3	QPSK	V	150	246	1 / 74	18.35	1.16	17.36	0.054	34.77	-17.41	19.51	0.089	36.99	-17.48
714.50	3 (WCP)	QPSK	H	150	98	1 / 74	17.42	1.16	16.43	0.044	34.77	-18.34	18.58	0.072	36.99	-18.41

Table 7-8. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
779.50	5	QPSK	H	266	63	1 / 0	13.98	6.13	<b>17.96</b>	<b>0.063</b>	34.77	-16.81	<b>20.11</b>	<b>0.103</b>	36.99	-16.88
782.00	5	QPSK	H	267	63	1 / 0	13.68	6.15	17.68	0.059	34.77	-17.09	19.83	0.096	36.99	-17.16
784.50	5	QPSK	H	266	63	1 / 0	13.66	6.18	17.69	0.059	34.77	-17.08	19.84	0.096	36.99	-17.15
779.50	5	16-QAM	H	266	63	1 / 0	13.05	6.13	<b>17.03</b>	0.050	34.77	-17.74	<b>19.18</b>	0.083	36.99	-17.81
779.50	5	64-QAM	H	266	63	1 / 0	12.19	6.13	<b>16.17</b>	0.041	34.77	-18.60	<b>18.32</b>	0.068	36.99	-18.67
782.00	10	QPSK	H	267	67	1 / 0	13.74	6.15	<b>17.74</b>	0.059	34.77	-17.03	<b>19.89</b>	0.098	36.99	-17.10
782.00	10	16-QAM	H	267	67	1 / 0	12.43	6.15	<b>16.43</b>	0.044	34.77	-18.34	<b>18.58</b>	0.072	36.99	-18.41
782.00	10	64-QAM	H	267	67	1 / 0	11.68	6.15	<b>15.68</b>	0.037	34.77	-19.09	<b>17.83</b>	0.061	36.99	-19.16
779.50	5	QPSK	V	150	227	1 / 0	13.04	6.13	17.02	0.050	34.77	-17.75	19.17	0.083	36.99	-17.82
779.50	5 (WCP)	QPSK	H	150	122	1 / 0	13.61	6.13	17.59	0.057	34.77	-17.18	19.74	0.094	36.99	-17.25

Table 7-9. ERP Data (Band 13)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1-ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 170 of 217	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	H	150	288	1 / 0	15.96	1.50	<b>15.31</b>	0.034	38.45	-23.14	<b>17.46</b>	0.056	40.61	-23.15
836.50	1.4	QPSK	H	150	295	3 / 2	15.85	1.50	15.20	0.033	38.45	-23.25	17.35	0.054	40.61	-23.26
848.30	1.4	QPSK	H	150	289	1 / 0	14.37	1.50	13.72	0.024	38.45	-24.73	15.87	0.039	40.61	-24.74
836.50	1.4	16-QAM	H	150	295	3 / 2	15.20	1.50	<b>14.55</b>	0.029	38.45	-23.90	<b>16.70</b>	0.047	40.61	-23.91
824.70	1.4	64-QAM	H	150	288	1 / 0	14.53	1.50	<b>13.88</b>	0.024	38.45	-24.57	<b>16.03</b>	0.040	40.61	-24.58
825.50	3	QPSK	H	150	273	1 / 0	15.88	1.50	<b>15.23</b>	0.033	38.45	-23.22	<b>17.38</b>	0.055	40.61	-23.23
836.50	3	QPSK	H	150	293	8 / 4	15.79	1.50	15.14	0.033	38.45	-23.31	17.29	0.054	40.61	-23.32
847.50	3	QPSK	H	150	284	1 / 0	14.48	1.50	13.83	0.024	38.45	-24.62	15.98	0.040	40.61	-24.63
825.50	3	16-QAM	H	150	273	1 / 0	15.21	1.50	<b>14.56</b>	0.029	38.45	-23.89	<b>16.71</b>	0.047	40.61	-23.90
825.50	3	64-QAM	H	150	273	1 / 0	14.46	1.50	<b>13.81</b>	0.024	38.45	-24.64	<b>15.96</b>	0.039	40.61	-24.65
826.50	5	QPSK	H	150	295	12 / 6	16.29	1.50	<b>15.64</b>	<b>0.037</b>	38.45	-22.81	<b>17.79</b>	<b>0.060</b>	40.61	-22.82
836.50	5	QPSK	H	150	287	1 / 0	16.07	1.50	15.42	0.035	38.45	-23.03	17.57	0.057	40.61	-23.04
846.50	5	QPSK	H	150	291	12 / 6	14.76	1.50	14.11	0.026	38.45	-24.34	16.26	0.042	40.61	-24.35
826.50	5	16-QAM	H	150	295	12 / 6	15.34	1.50	<b>14.69</b>	0.029	38.45	-23.76	<b>16.84</b>	0.048	40.61	-23.77
826.50	5	64-QAM	H	150	295	12 / 6	14.38	1.50	<b>13.73</b>	0.024	38.45	-24.72	<b>15.88</b>	0.039	40.61	-24.73
829.00	10	QPSK	H	150	280	1 / 0	16.12	1.50	<b>15.47</b>	0.035	38.45	-22.98	<b>17.62</b>	0.058	40.61	-22.99
836.50	10	QPSK	H	150	282	1 / 0	16.01	1.50	15.36	0.034	38.45	-23.09	17.51	0.056	40.61	-23.10
844.00	10	QPSK	H	150	274	1 / 0	14.30	1.50	13.65	0.023	38.45	-24.80	15.80	0.038	40.61	-24.81
836.50	10	16-QAM	H	150	282	1 / 0	15.25	1.50	<b>14.60</b>	0.029	38.45	-23.85	<b>16.75</b>	0.047	40.61	-23.86
829.00	10	64-QAM	H	150	280	1 / 0	14.31	1.50	<b>13.66</b>	0.023	38.45	-24.79	<b>15.81</b>	0.038	40.61	-24.80
831.50	15	QPSK	H	150	275	1 / 0	16.03	1.50	15.38	0.035	38.45	-23.07	17.53	0.057	40.61	-23.08
836.50	15	QPSK	H	150	282	1 / 0	16.04	1.50	<b>15.39</b>	0.035	38.45	-23.06	<b>17.54</b>	0.057	40.61	-23.07
841.50	15	QPSK	H	150	292	1 / 0	16.02	1.50	15.37	0.034	38.45	-23.08	17.52	0.056	40.61	-23.09
841.50	15	16-QAM	H	150	292	1 / 0	15.52	1.50	<b>14.87</b>	0.031	38.45	-23.58	<b>17.02</b>	0.050	40.61	-23.59
831.50	15	64-QAM	H	150	275	1 / 0	15.13	1.50	<b>14.48</b>	0.028	38.45	-23.97	<b>16.63</b>	0.046	40.61	-23.98
826.50	5	QPSK	V	150	214	1 / 0	15.65	1.50	15.00	0.032	38.45	-23.45	17.15	0.052	40.61	-23.46
826.50	5 (WCP)	QPSK	H	150	119	1 / 0	15.64	1.50	14.99	0.032	38.45	-23.46	17.14	0.052	40.61	-23.47

**Table 7-10. ERP Data (Band 26)**

FCC ID: ZNFG710VM		<b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset			Page 171 of 217

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	V	150	299	3 / 2	15.29	5.65	20.94	0.124	30.00	-9.06
1732.50	1.4	QPSK	V	150	295	1 / 5	16.33	5.41	<b>21.74</b>	0.149	30.00	-8.26
1754.30	1.4	QPSK	V	150	256	3 / 2	15.08	5.17	20.25	0.106	30.00	-9.75
1732.50	1.4	16-QAM	V	150	295	1 / 5	15.53	5.41	<b>20.94</b>	0.124	30.00	-9.06
1710.70	1.4	64-QAM	V	150	299	3 / 2	14.60	5.65	<b>20.25</b>	0.106	30.00	-9.75
1711.50	3	QPSK	V	150	291	8 / 4	15.21	5.64	20.85	0.122	30.00	-9.15
1732.50	3	QPSK	V	150	280	1 / 14	16.25	5.41	<b>21.66</b>	0.146	30.00	-8.34
1753.50	3	QPSK	V	150	201	8 / 4	15.03	5.18	20.21	0.105	30.00	-9.79
1732.50	3	16-QAM	V	150	280	1 / 14	15.54	5.41	<b>20.95</b>	0.124	30.00	-9.05
1732.50	3	64-QAM	V	150	280	1 / 14	15.10	5.41	<b>20.51</b>	0.112	30.00	-9.49
1712.50	5	QPSK	V	150	281	1 / 24	15.84	5.63	<b>21.47</b>	0.140	30.00	-8.53
1732.50	5	QPSK	V	150	291	1 / 24	15.32	5.41	20.73	0.118	30.00	-9.27
1752.50	5	QPSK	V	150	260	1 / 24	14.85	5.19	20.04	0.101	30.00	-9.96
1712.50	5	16-QAM	V	150	281	1 / 24	14.97	5.63	<b>20.60</b>	0.115	30.00	-9.40
1732.50	5	64-QAM	V	150	291	1 / 24	14.84	5.41	<b>20.25</b>	0.106	30.00	-9.75
1715.00	10	QPSK	V	150	291	1 / 49	16.19	5.60	<b>21.79</b>	0.151	30.00	-8.21
1732.50	10	QPSK	V	150	239	1 / 49	15.73	5.41	21.14	0.130	30.00	-8.86
1750.00	10	QPSK	V	150	244	25 / 12	16.35	5.22	21.57	0.143	30.00	-8.43
1715.00	10	16-QAM	V	150	291	1 / 49	15.32	5.60	<b>20.92</b>	0.124	30.00	-9.08
1715.00	10	64-QAM	V	150	291	1 / 49	14.47	5.60	<b>20.07</b>	0.102	30.00	-9.93
1717.50	15	QPSK	V	150	282	1 / 74	16.24	5.57	<b>21.81</b>	<b>0.152</b>	30.00	-8.19
1732.50	15	QPSK	V	150	237	1 / 74	15.72	5.41	21.13	0.130	30.00	-8.87
1747.50	15	QPSK	V	150	256	36 / 18	16.40	5.24	21.64	0.146	30.00	-8.36
1717.50	15	16-QAM	V	150	282	1 / 74	15.33	5.57	<b>20.90</b>	0.123	30.00	-9.10
1717.50	15	64-QAM	V	150	282	1 / 74	14.83	5.57	<b>20.40</b>	0.110	30.00	-9.60
1720.00	20	QPSK	V	150	290	1 / 99	16.05	5.54	<b>21.59</b>	0.144	30.00	-8.41
1732.50	20	QPSK	V	150	245	1 / 99	15.60	5.41	21.01	0.126	30.00	-8.99
1745.00	20	QPSK	V	150	242	1 / 99	16.17	5.27	21.44	0.139	30.00	-8.56
1720.00	20	16-QAM	V	150	290	1 / 99	15.41	5.54	<b>20.95</b>	0.125	30.00	-9.05
1745.00	20	64-QAM	V	150	242	1 / 99	14.67	5.27	<b>19.94</b>	0.099	30.00	-10.06
1717.50	15	QPSK	H	150	303	1 / 99	16.07	5.57	21.64	0.146	30.00	-8.36
1717.50	15 (WCP)	QPSK	H	150	180	1 / 99	16.12	5.57	21.69	0.148	30.00	-8.31

**Table 7-11. EIRP Data (Band 4/66)**

FCC ID: ZNFG710VM		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1-ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 172 of 217

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	V	150	270	3 / 2	16.66	4.79	21.45	0.140	33.01	-11.56
1880.00	1.4	QPSK	V	150	279	1 / 0	16.70	4.84	<b>21.54</b>	0.143	33.01	-11.47
1909.30	1.4	QPSK	V	150	271	3 / 2	16.49	4.86	21.35	0.137	33.01	-11.66
1909.30	1.4	16-QAM	V	150	271	3 / 2	16.17	4.86	<b>21.03</b>	0.127	33.01	-11.98
1909.30	1.4	64-QAM	V	150	271	3 / 2	15.26	4.86	<b>20.12</b>	0.103	33.01	-12.89
1851.50	3	QPSK	V	150	279	8 / 4	16.69	4.79	21.48	0.141	33.01	-11.53
1880.00	3	QPSK	V	150	278	1 / 0	16.77	4.84	<b>21.61</b>	<b>0.145</b>	33.01	-11.40
1908.50	3	QPSK	V	150	275	8 / 4	16.41	4.86	21.27	0.134	33.01	-11.74
1908.50	3	16-QAM	V	150	275	8 / 4	16.20	4.86	<b>21.06</b>	0.128	33.01	-11.95
1908.50	3	64-QAM	V	150	275	8 / 4	15.22	4.86	<b>20.08</b>	0.102	33.01	-12.93
1852.50	5	QPSK	V	150	284	1 / 0	16.22	4.79	21.01	0.126	33.01	-12.00
1880.00	5	QPSK	V	150	350	1 / 0	16.70	4.84	<b>21.54</b>	0.143	33.01	-11.47
1907.50	5	QPSK	V	150	347	1 / 24	16.40	4.87	21.27	0.134	33.01	-11.74
1907.50	5	16-QAM	V	150	347	1 / 24	15.78	4.87	<b>20.65</b>	0.116	33.01	-12.36
1907.50	5	64-QAM	V	150	347	1 / 24	14.92	4.87	<b>19.79</b>	0.095	33.01	-13.22
1855.00	10	QPSK	V	150	298	1 / 0	16.27	4.80	21.07	0.128	33.01	-11.94
1880.00	10	QPSK	V	150	351	1 / 0	16.68	4.84	<b>21.52</b>	0.142	33.01	-11.49
1905.00	10	QPSK	V	150	352	1 / 49	16.35	4.87	21.22	0.132	33.01	-11.79
1880.00	10	16-QAM	V	150	351	1 / 0	16.19	4.84	<b>21.03</b>	0.127	33.01	-11.98
1880.00	10	64-QAM	V	150	351	1 / 0	15.47	4.84	<b>20.31</b>	0.108	33.01	-12.70
1857.50	15	QPSK	V	150	355	1 / 0	16.73	4.80	<b>21.53</b>	0.142	33.01	-11.48
1880.00	15	QPSK	V	150	357	1 / 0	16.63	4.84	21.47	0.140	33.01	-11.54
1902.50	15	QPSK	V	150	357	1 / 74	16.03	4.88	20.91	0.123	33.01	-12.10
1880.00	15	16-QAM	V	150	357	1 / 0	16.19	4.84	<b>21.03</b>	0.127	33.01	-11.98
1880.00	15	64-QAM	V	150	357	1 / 0	15.41	4.84	<b>20.25</b>	0.106	33.01	-12.76
1860.00	20	QPSK	V	150	302	1 / 0	16.71	4.81	<b>21.52</b>	0.142	33.01	-11.50
1880.00	20	QPSK	V	150	353	1 / 0	16.67	4.84	21.51	0.142	33.01	-11.50
1900.00	20	QPSK	V	150	359	1 / 99	16.15	4.88	21.03	0.127	33.01	-11.98
1880.00	20	16-QAM	V	150	353	1 / 0	16.36	4.84	<b>21.20</b>	0.132	33.01	-11.81
1880.00	20	64-QAM	V	150	353	1 / 0	15.48	4.84	<b>20.32</b>	0.108	33.01	-12.69
1880.00	3	QPSK	H	150	118	1 / 0	16.48	4.84	21.32	0.136	33.01	-11.69
1880.00	3 (WCP)	QPSK	V	150	295	1 / 0	16.42	4.84	21.26	0.134	33.01	-11.75

Table 7-12. EIRP Data (Band 2/25)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 173 of 217	



Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5 (PC2)	QPSK	H	150	355	1 / 0	19.22	5.73	24.95	0.313	33.01	-8.06
2502.50	5 (PC2)	QPSK	H	150	359	1 / 0	19.93	5.74	<b>25.67</b>	0.369	33.01	-7.34
2593.00	5 (PC2)	QPSK	H	150	4	1 / 0	18.08	6.07	24.15	0.260	33.01	-8.86
2687.50	5 (PC2)	QPSK	H	150	355	1 / 0	15.95	6.48	22.43	0.175	33.01	-10.58
2502.50	5 (PC2)	16-QAM	H	150	359	1 / 0	18.99	5.74	<b>24.73</b>	0.297	33.01	-8.28
2502.50	5 (PC2)	64-QAM	H	150	359	1 / 0	18.18	5.74	<b>23.92</b>	0.247	33.01	-9.09
2501.00	10 (PC2)	QPSK	H	150	356	1 / 0	19.26	5.73	24.99	0.316	33.01	-8.02
2505.00	10 (PC2)	QPSK	H	150	2	1 / 0	19.98	5.75	<b>25.73</b>	<b>0.374</b>	33.01	-7.28
2593.00	10 (PC2)	QPSK	H	150	4	2.00	18.04	6.07	24.11	0.258	33.01	-8.90
2685.00	10 (PC2)	QPSK	H	150	7	1 / 0	16.02	6.47	22.49	0.178	33.01	-10.52
2505.00	10 (PC2)	16-QAM	H	150	2	1 / 0	19.46	5.75	<b>25.21</b>	0.332	33.01	-7.80
2505.00	10 (PC2)	64-QAM	H	150	2	1 / 0	18.41	5.75	<b>24.16</b>	0.261	33.01	-8.85
2503.50	15 (PC2)	QPSK	H	150	358	1 / 0	19.17	5.74	24.91	0.310	33.01	-8.10
2507.50	15 (PC2)	QPSK	H	150	3	1 / 74	19.50	5.76	<b>25.26</b>	0.336	33.01	-7.75
2593.00	15 (PC2)	QPSK	H	150	0	1 / 0	17.50	6.07	23.57	0.228	33.01	-9.44
2682.50	15 (PC2)	QPSK	H	150	3	1 / 74	15.21	6.46	21.67	0.147	33.01	-11.34
2507.50	15 (PC2)	16-QAM	H	150	3	1 / 74	18.68	5.76	<b>24.44</b>	0.278	33.01	-8.57
2507.50	15 (PC2)	64-QAM	H	150	3	1 / 74	17.63	5.76	<b>23.39</b>	0.218	33.01	-9.62
2506.00	20 (PC2)	QPSK	H	150	2	1 / 0	19.13	5.75	<b>24.88</b>	0.308	33.01	-8.13
2510.00	20 (PC2)	QPSK	H	150	8	1 / 0	18.90	5.77	24.67	0.293	33.01	-8.34
2593.00	20 (PC2)	QPSK	H	150	9	1 / 0	17.40	6.07	23.47	0.222	33.01	-9.54
2680.00	20 (PC2)	QPSK	H	150	355	1 / 99	15.56	6.45	22.01	0.159	33.01	-11.00
2510.00	20 (PC2)	16-QAM	H	150	8	1 / 0	18.07	5.77	<b>23.84</b>	0.242	33.01	-9.17
2506.00	20 (PC2)	64-QAM	H	150	2	1 / 0	17.19	5.75	<b>22.94</b>	0.197	33.01	-10.07
2505.00	10 (PC2)	QPSK	V	150	19	1 / 0	15.57	5.75	21.32	0.135	33.01	-11.69
2505.00	10 (PC2) (WCP)	QPSK	H	150	220	1 / 0	18.53	5.75	24.28	0.268	33.01	-8.73
2505.00	10 (PC3)	QPSK	H	150	344	1 / 0	17.70	5.75	23.45	0.221	33.01	-9.56
2505.00	10 (PC3)	16-QAM	H	150	344	1 / 0	16.64	5.75	22.39	0.173	33.01	-10.62
2505.00	10 (PC3)	64-QAM	H	150	344	1 / 0	15.71	5.75	21.46	0.140	33.01	-11.55

**Table 7-13. EIRP Data (Band 41)**

FCC ID: ZNFG710VM		<b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 174 of 217	

## 7.9 Radiated Spurious Emissions Measurements

### Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas.

### Test Procedures Used

KDB 971168 D01 v03 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

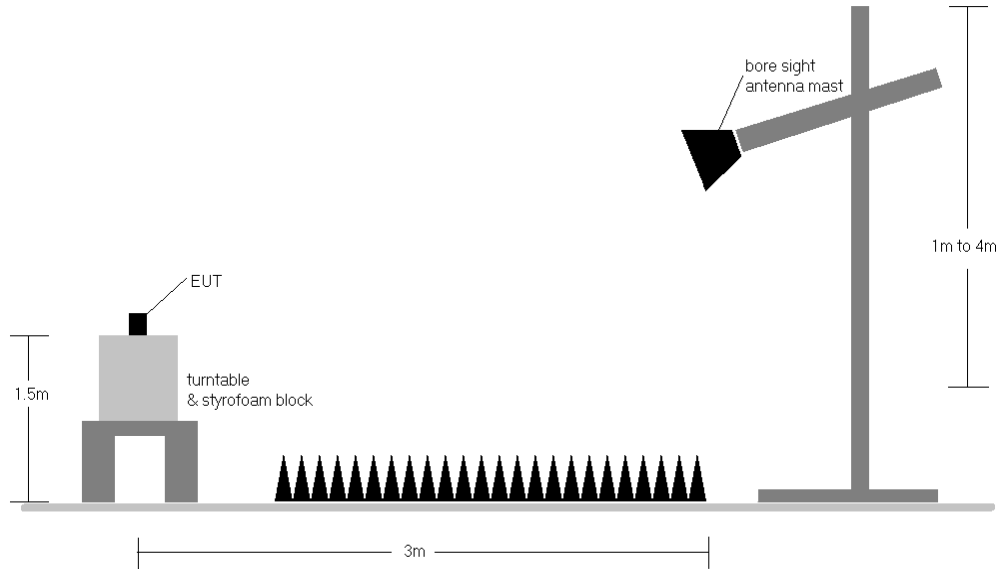
### Test Settings

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

FCC ID: ZNFG710VM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
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**Test Setup**

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



**Figure 7-9. Test Instrument & Measurement Setup**

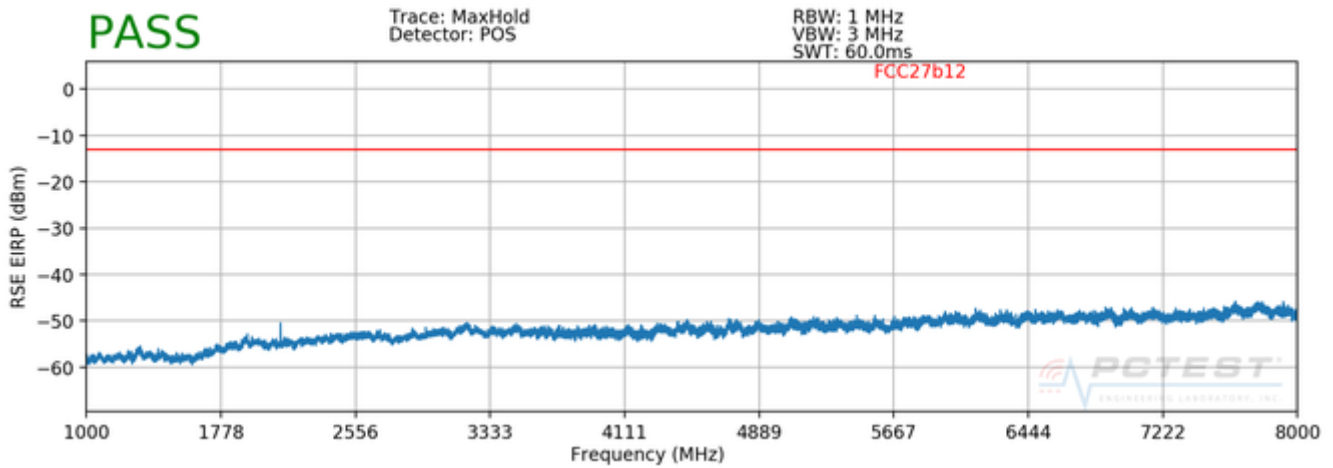
**Test Notes**

- 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.

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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## 7.9.1 Radiated Spurious Emissions Measurements

### Band 12



Plot 7-279. Radiated Spurious Plot above 1GHz (Band 12)

OPERATING FREQUENCY: 704.00 MHz  
 CHANNEL: 23060  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1408.00	H	162	165	-64.20	4.46	-59.73	-46.7
2112.00	H	133	12	-62.19	5.28	-56.91	-43.9
2816.00	H	-	-	-66.46	7.00	-59.46	-46.5

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

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 177 of 217

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	159	173	-63.85	4.56	-59.29	-46.3
2122.50	H	140	2	-62.21	5.31	-56.91	-43.9
2830.00	H	-	-	-65.62	7.02	-58.60	-45.6

**Table 7-15. Radiated Spurious Data (Band 12 – Mid Channel)**

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	149	160	-64.51	4.65	-59.85	-46.9
2133.00	H	122	20	-62.10	5.33	-56.77	-43.8
2844.00	H	-	-	-65.48	7.04	-58.45	-45.4

**Table 7-16. Radiated Spurious Data (Band 12 – High Channel)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 178 of 217	

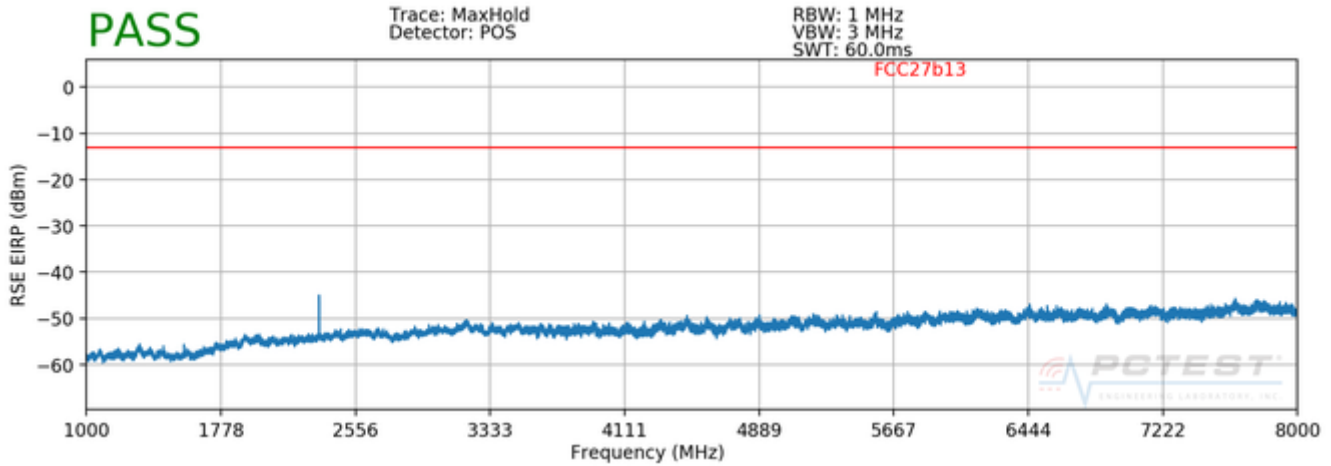
OPERATING FREQUENCY: 711.00 MHz  
 CHANNEL: 23130  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	167	133	-65.41	4.75	-60.67	-47.7
2133.00	H	170	89	-63.36	5.35	-58.01	-45.0
2844.00	H	-	-	-65.29	7.06	-58.23	-45.2

Table 7-17. Radiated Spurious Data with WCP (Band 12 – High Channel)

FCC ID: ZNFG710VM			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset			Page 179 of 217

### Band 13



**Plot 7-280. Radiated Spurious Plot above 1GHz (Band 13)**

OPERATING FREQUENCY: 782.00 MHz  
 CHANNEL: 23230  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	164	20	-51.25	5.72	-45.52	-32.5
3128.00	H	-	-	-64.98	6.93	-58.05	-45.0

**Table 7-18. Radiated Spurious Data (Band 13 – Mid Channel)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset			Page 180 of 217



MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.00 MHz  
 DISTANCE: 3 meters  
 NARROWBAND EMISSION LIMIT: -50 dBm  
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	170	54	-60.55	5.88	-54.67	-14.7

**Table 7-19. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)**

OPERATING FREQUENCY: 782.00 MHz  
 CHANNEL: 23230  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	H	189	129	-59.62	5.86	-53.75	-40.8
3128.00	H	-	-	-64.64	5.73	-58.92	-45.9

**Table 7-20. Radiated Spurious Data with WCP (Band 13 – Mid Channel)**

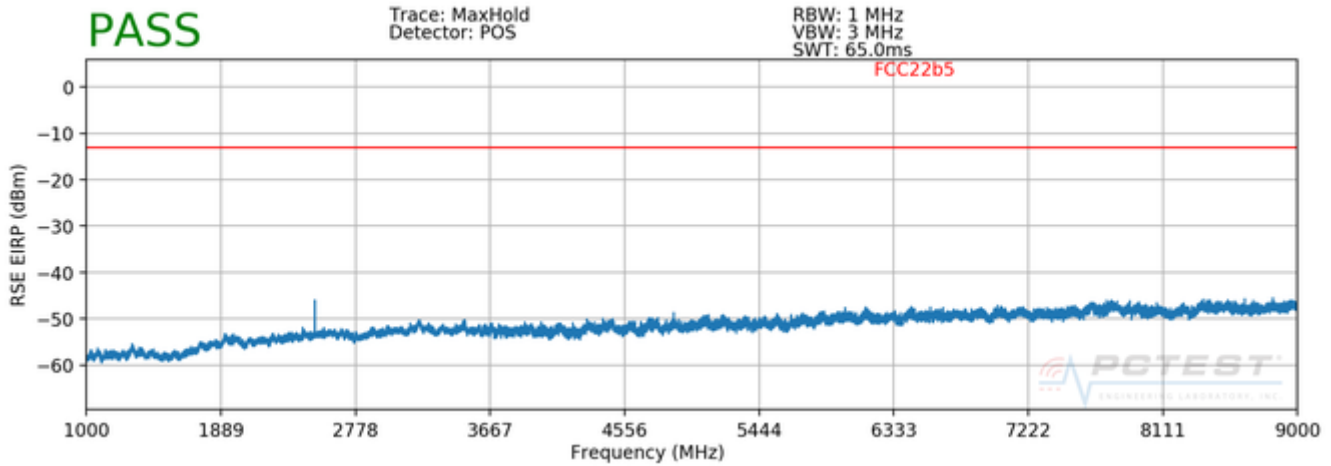
MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.00 MHz  
 DISTANCE: 3 meters  
 NARROWBAND EMISSION LIMIT: -50 dBm  
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	H	133	155	-63.20	5.88	-57.32	-17.3

**Table 7-21. Radiated Spurious Data with WCP (Band 13 – 1559-1610MHz Band)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 181 of 217

**Band 5/26**



**Plot 7-281. Radiated Spurious Plot above 1GHz (Band 5/26)**

OPERATING FREQUENCY: 826.50 MHz  
 CHANNEL: 26815  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1653.00	H	204	1	-67.56	5.80	-61.76	-48.8
2479.50	H	239	177	-50.94	5.73	-45.22	-32.2
3306.00	H	-	-	-66.77	7.86	-58.92	-45.9

**Table 7-22. Radiated Spurious Data (Band 5/26 – Low Channel)**

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 182 of 217

OPERATING FREQUENCY: 836.50 MHz  
 CHANNEL: 26915  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	146	93	-66.68	5.73	-60.95	-48.0
2509.50	H	238	178	-46.36	5.77	-40.60	-27.6
3346.00	H	-	-	-65.59	7.91	-57.68	-44.7

**Table 7-23. Radiated Spurious Data (Band 5/26 – Mid Channel)**

OPERATING FREQUENCY: 846.50 MHz  
 CHANNEL: 27015  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.00	H	159	107	-66.65	5.66	-60.99	-48.0
2539.50	H	240	175	-48.25	5.88	-42.37	-29.4
3386.00	H	-	-	-65.31	7.96	-57.35	-44.4

**Table 7-24. Radiated Spurious Data (Band 5/26 – High Channel)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 183 of 217

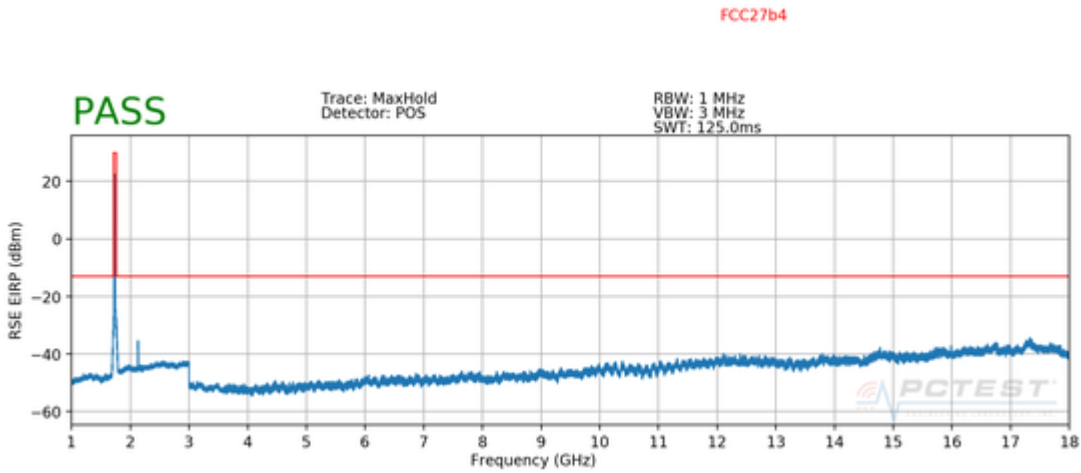
OPERATING FREQUENCY: 826.50 MHz  
 CHANNEL: 26815  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1653.00	H	162	136	-68.23	5.80	-62.43	-49.4
2479.50	H	198	180	-59.41	5.73	-53.69	-40.7
3306.00	H	-	-	-66.61	7.86	-58.76	-45.8

**Table 7-25. Radiated Spurious Data with WCP (Band 26 – Low Channel)**

FCC ID: ZNFG710VM			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset			Page 184 of 217

**Band 4/66**



**Plot 7-282. Radiated Spurious Plot above 1GHz (Band 4/66)**

OPERATING FREQUENCY: 1715.00 MHz  
 CHANNEL: 132022  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3430.00	H	100	136	-63.84	9.53	-54.32	-41.3
5145.00	H	115	44	-65.68	10.79	-54.89	-41.9
6860.00	H	109	28	-67.36	10.84	-56.52	-43.5
8575.00	H	113	298	-68.35	11.67	-56.67	-43.7
10290.00	H	117	12	-66.86	12.48	-54.38	-41.4
12005.00	H	-	-	-66.96	12.22	-54.74	-41.7

**Table 7-26. Radiated Spurious Data (Band 4/66 – Low Channel)**

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 185 of 217

OPERATING FREQUENCY: 1745.00 MHz  
 CHANNEL: 132322  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	H	100	162	-67.98	9.65	-58.33	-45.3
5235.00	H	104	46	-72.10	10.93	-61.17	-48.2
6980.00	H	-	-	-69.26	10.96	-58.30	-45.3

**Table 7-27. Radiated Spurious Data (Band 4/66 – Mid Channel)**

OPERATING FREQUENCY: 1775.00 MHz  
 CHANNEL: 132622  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3550.00	H	116	37	-71.63	9.70	-61.93	-48.9
5325.00	H	-	-	-73.58	10.98	-62.60	-49.6

**Table 7-28. Radiated Spurious Data (Band 4/66 – High Channel)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 186 of 217	

OPERATING FREQUENCY: 1745.00 MHz  
 CHANNEL: 132322  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

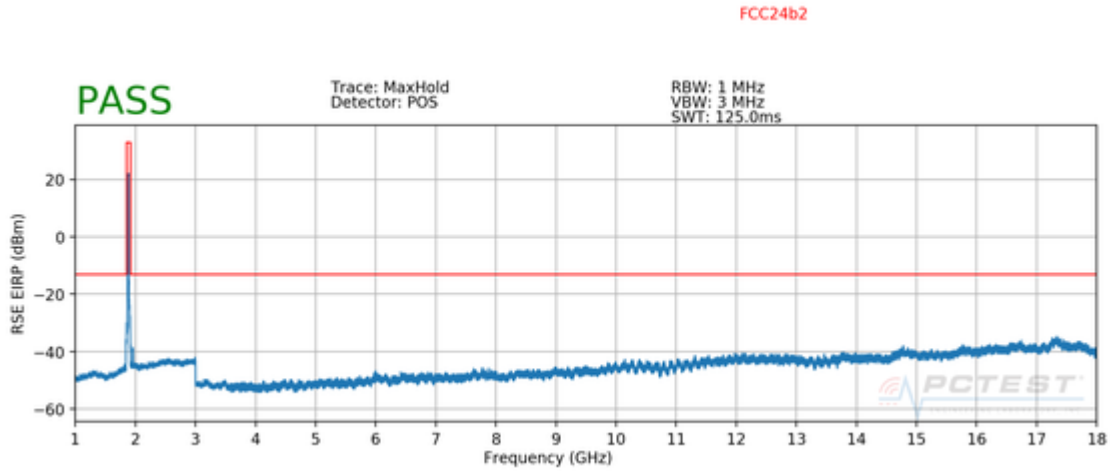
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	H	129	104	-71.79	9.65	-62.14	-49.1
5235.00	H	227	169	-73.51	10.93	-62.58	-49.6
6980.00	H	-	-	-70.35	10.96	-59.39	-46.4

**Table 7-29. Radiated Spurious Data with WCP (Band 4/66 – Mid Channel)**

FCC ID: ZNFG710VM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 187 of 217



**Band 2/25**



**Plot 7-283. Radiated Spurious Plot above 1GHz (Band 2/25)**

OPERATING FREQUENCY: 1851.50 MHz  
 CHANNEL: 18615  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3703.00	H	150	300	-53.22	6.76	-46.45	-33.5
5554.50	H	-	-	-57.95	8.44	-49.51	-36.5

**Table 7-30. Radiated Spurious Data (Band 2/25 – Low Channel)**

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 188 of 217

OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 18900  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	H	150	34	-51.89	6.84	-45.05	-32.0
5640.00	H	-	-	-58.06	8.52	-49.54	-36.5

Table 7-31. Radiated Spurious Data (Band 2/25 – Mid Channel)

OPERATING FREQUENCY: 1908.50 MHz  
 CHANNEL: 19185  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3817.00	H	150	1	-55.64	6.99	-48.65	-35.7
5725.50	H	-	-	-58.33	8.58	-49.75	-36.8

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

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 189 of 217	

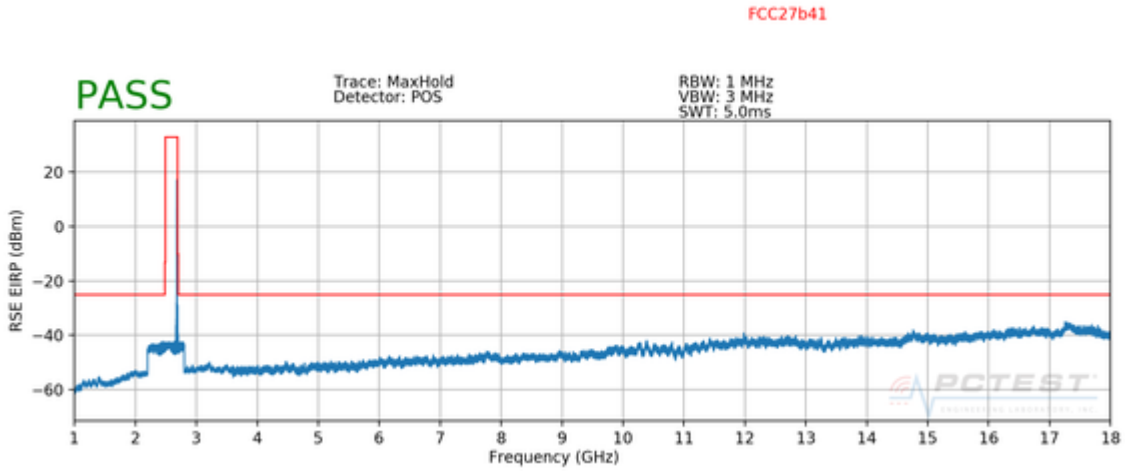
OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 18900  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 3.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	H	150	297	-55.71	6.84	-48.87	-35.9
5640.00	H	-	-	-59.77	8.52	-51.26	-38.3

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

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 190 of 217

**Band 41**



**Plot 7-284. Radiated Spurious Plot 1GHz - 18GHz (Band 41 PC2)**

OPERATING FREQUENCY: 2505.00 MHz  
 CHANNEL: 39740  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5010.00	V	-	-	-59.79	8.34	-51.45	-26.5
7515.00	V	150	330	-49.51	8.44	-41.07	-16.1
10020.00	V	-	-	-55.55	9.87	-45.68	-20.7

**Table 7-34. Radiated Spurious Data (Band 41 PC2 – Low Channel)**

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 191 of 217

OPERATING FREQUENCY: 2593.00 MHz  
 CHANNEL: 40620  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	V	150	56	-59.23	8.45	-50.78	-25.8
7779.00	V	150	293	-51.59	8.75	-42.85	-17.8
10372.00	V	-	-	-54.60	9.73	-44.87	-19.9

**Table 7-35. Radiated Spurious Data (Band 41 PC2 – Mid Channel)**

OPERATING FREQUENCY: 2685.00 MHz  
 CHANNEL: 41540  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5370.00	V	150	233	-59.17	8.40	-50.76	-25.8
8055.00	V	150	294	-55.01	9.21	-45.80	-20.8
10740.00	V	-	-	-54.03	9.51	-44.52	-19.5
13425.00	V	150	312	-43.61	9.06	-34.55	-9.5

**Table 7-36. Radiated Spurious Data (Band 41 PC2 – High Channel)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1-ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 192 of 217

OPERATING FREQUENCY: 2685.00 MHz  
 CHANNEL: 41540  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5370.00	V	150	184	-60.39	8.40	-51.98	-27.0
7875.00	V	150	87	-56.56	9.21	-47.35	-22.3
10380.00	V	-	-	-55.05	9.51	-45.53	-20.5
12885.00	V	150	188	-46.36	9.06	-37.30	-12.3

**Table 7-37. Radiated Spurious Data with WCP (Band 41 PC2 – High Channel)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 193 of 217

## 7.10 Uplink Carrier Aggregation Radiated Measurements

§2.1053, §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. All measurements are performed as peak 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 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

### Test Settings

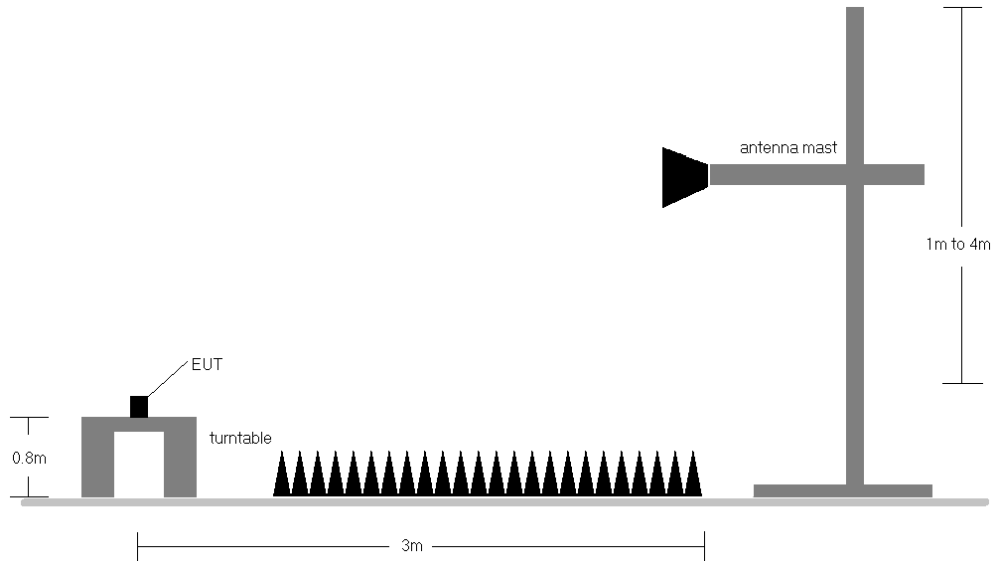
1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW  $\geq 3 \times$  RBW
3. No. of sweep points  $\geq 2 \times$  span / RBW
4. Detector = RMS
5. Trace mode = Max Hold
6. The trace was allowed to stabilize

FCC ID: ZNFG710VM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 194 of 217



**Test Setup**

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

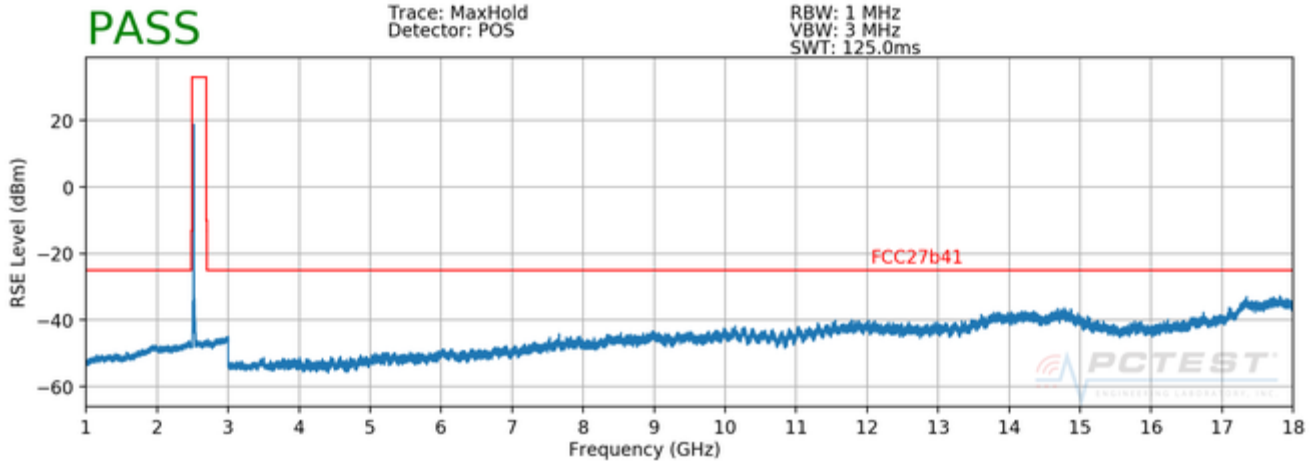


**Figure 7-10. Test Instrument & Measurement Setup**

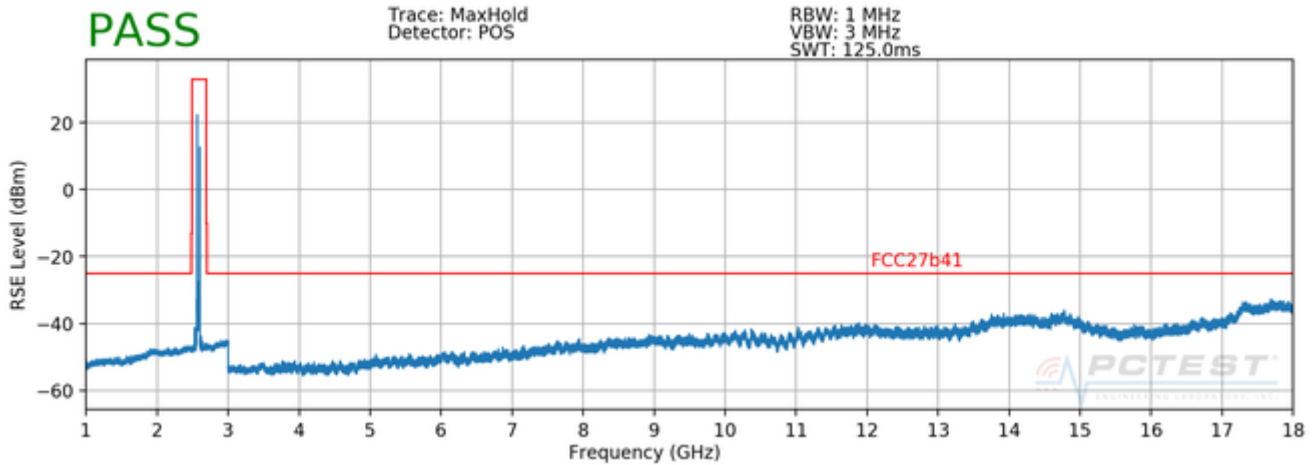
**Test Notes**

- 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) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) 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.
- 6) No significant emissions were found as a result of two uplink carriers operating contiguously.

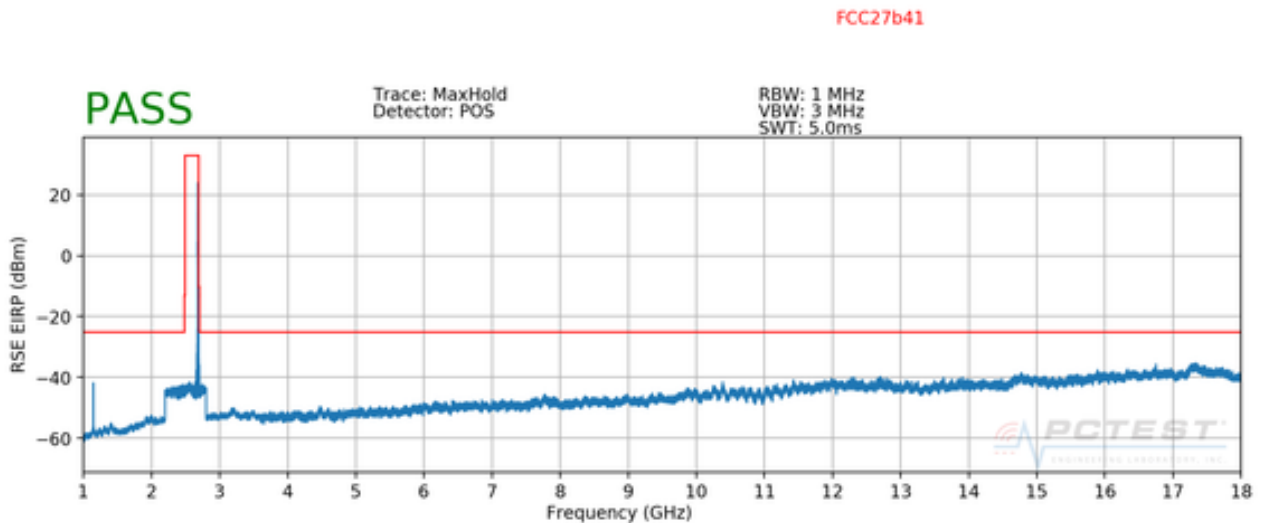
FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 195 of 217



Plot 7-38. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Low Channel)

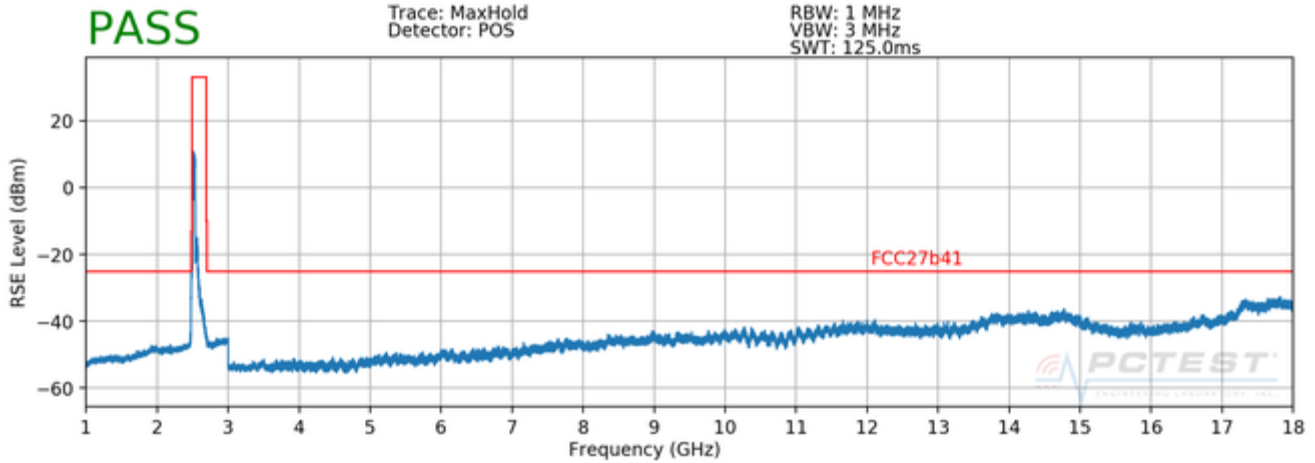


Plot 7-39. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Mid Channel)

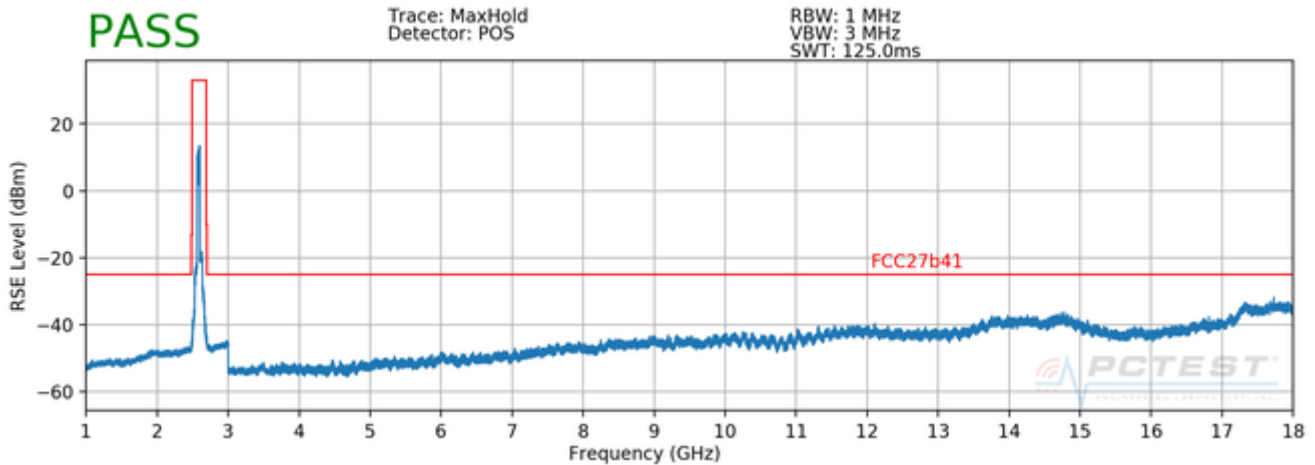


Plot 7-40. Radiated Spurious Plot (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 – High Channel)

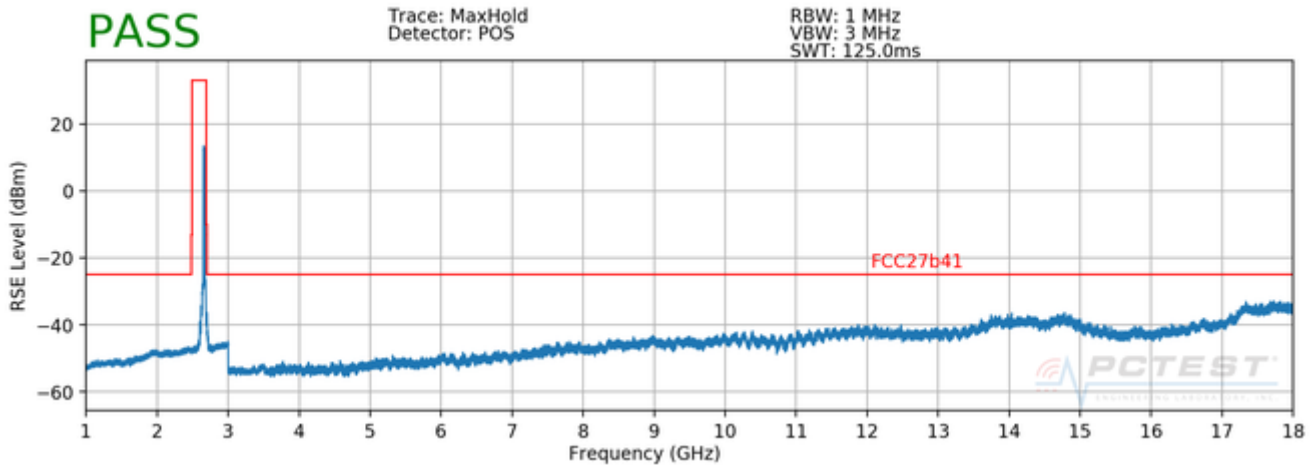
FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 196 of 217



Plot 7-41. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0 – Low Channel)



Plot 7-42. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0 – Mid Channel)



Plot 7-43. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0 – High Channel)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 197 of 217

OPERATING FREQUENCY: 2505.00 MHz  
 CHANNEL: 39740  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5010.00	H	-	-	-63.21	8.34	-54.88	-29.9
7515.00	H	150	68	-51.00	8.44	-42.56	-17.6
10020.00	H	-	-	-59.96	9.87	-50.09	-25.1

Table 7-44. Radiated Spurious Data (Band 41 ULCA – Low Channel)

OPERATING FREQUENCY: 2593.00 MHz  
 CHANNEL: 40620  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	H	-	-	-63.27	8.45	-54.82	-29.8
7779.00	H	150	145	-57.85	8.75	-49.10	-24.1
10372.00	H	-	-	-58.88	9.73	-49.15	-24.2

Table 7-45. Radiated Spurious Data (Band 41 ULCA – Mid Channel)

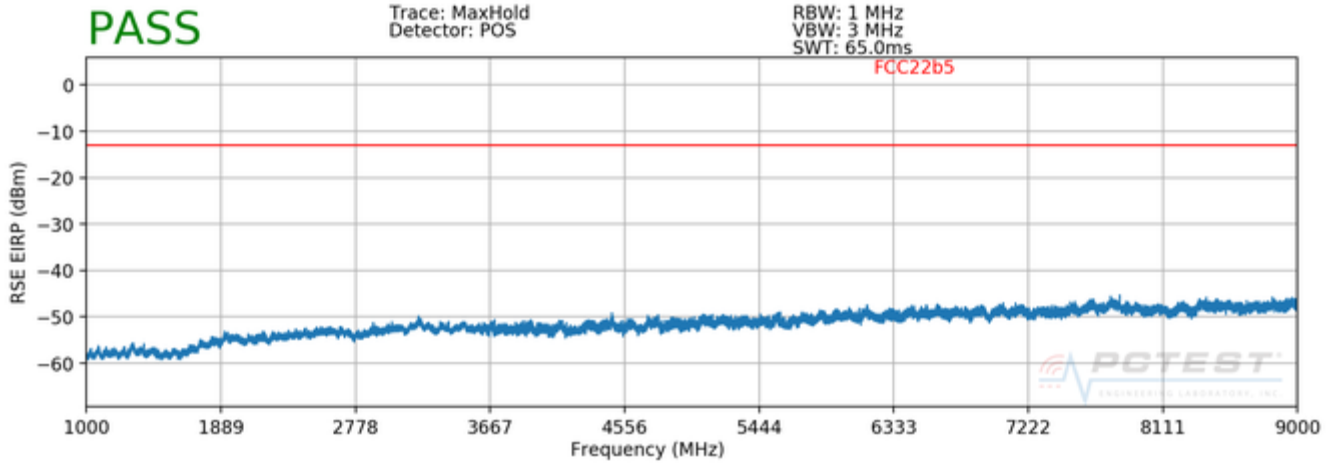
FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 198 of 217

OPERATING FREQUENCY: 2685.00 MHz  
 CHANNEL: 41540  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -25 dBm

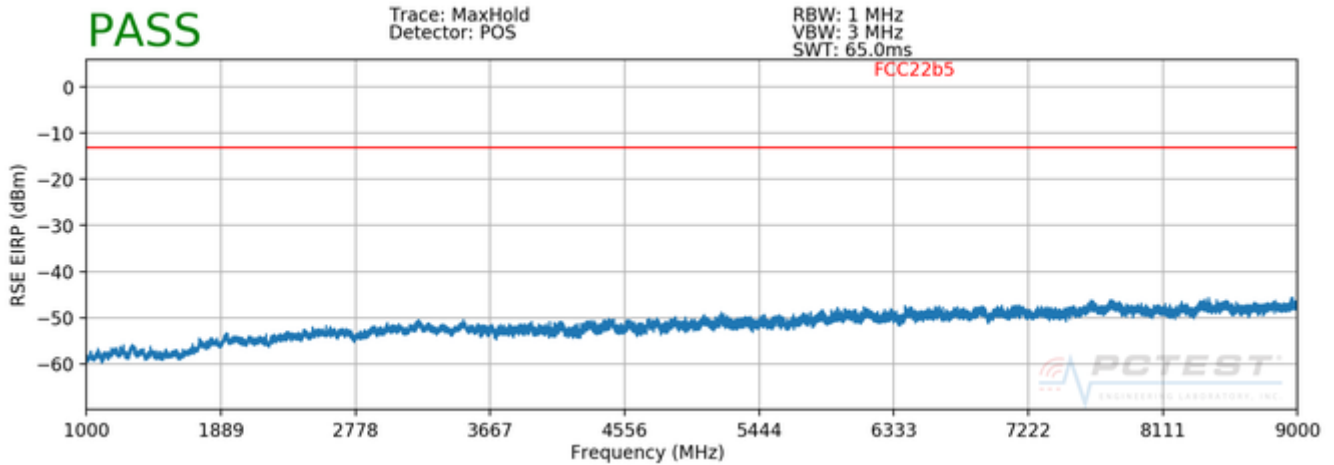
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5370.00	H	-	-	-63.73	8.40	-55.33	-30.3
8055.00	H	-	-	-61.31	9.21	-52.10	-27.1

**Table 7-46. Radiated Spurious Data (Band 41 ULCA – High Channel)**

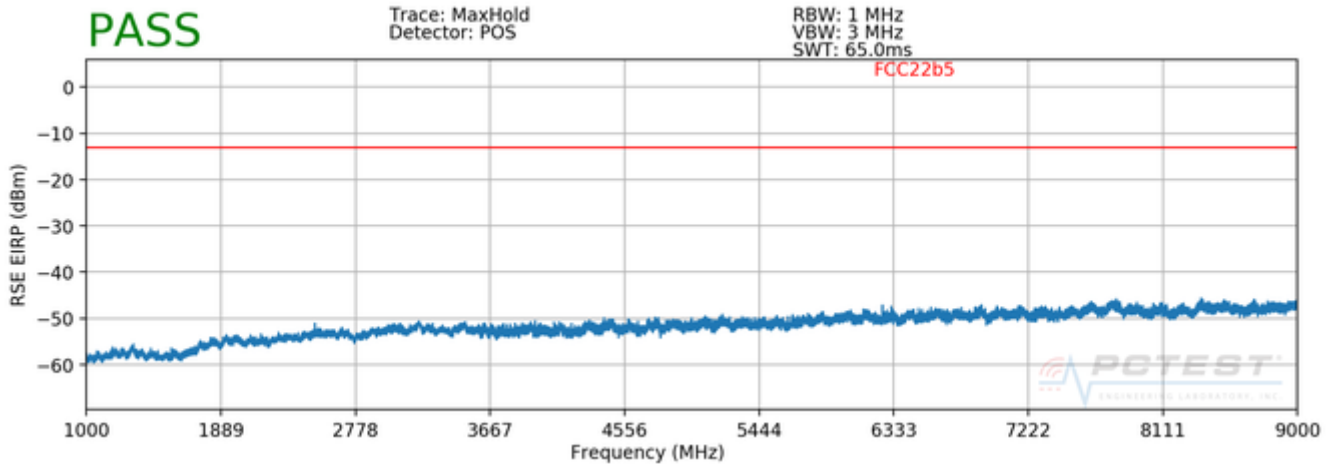
FCC ID: ZNFG710VM			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset			Page 199 of 217



Plot 7-47. Radiated Spurious Plot (ULCA 5 PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Low Channel)

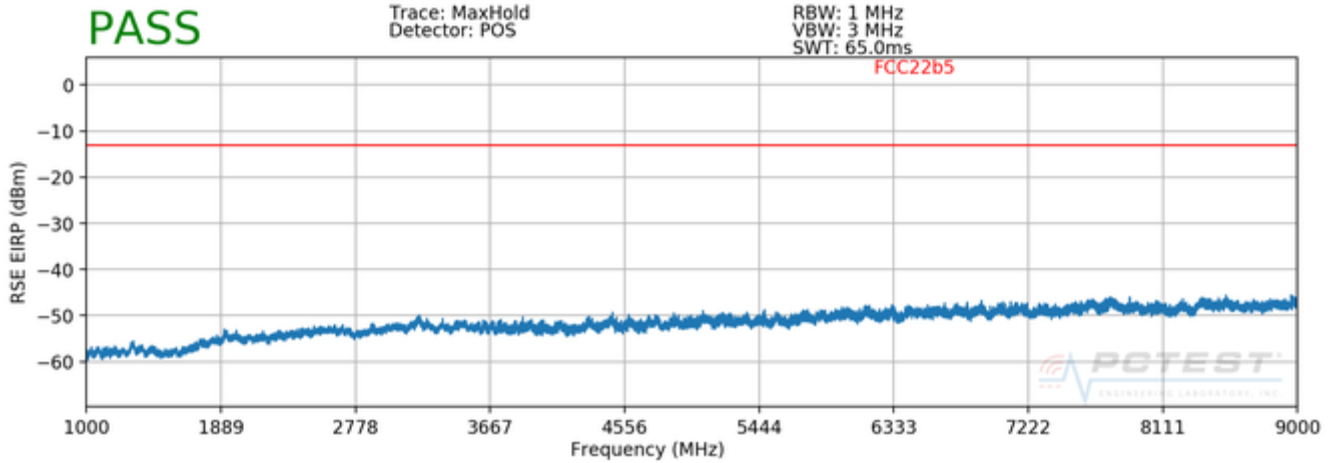


Plot 7-48. Radiated Spurious Plot (ULCA B5 PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Mid Channel)

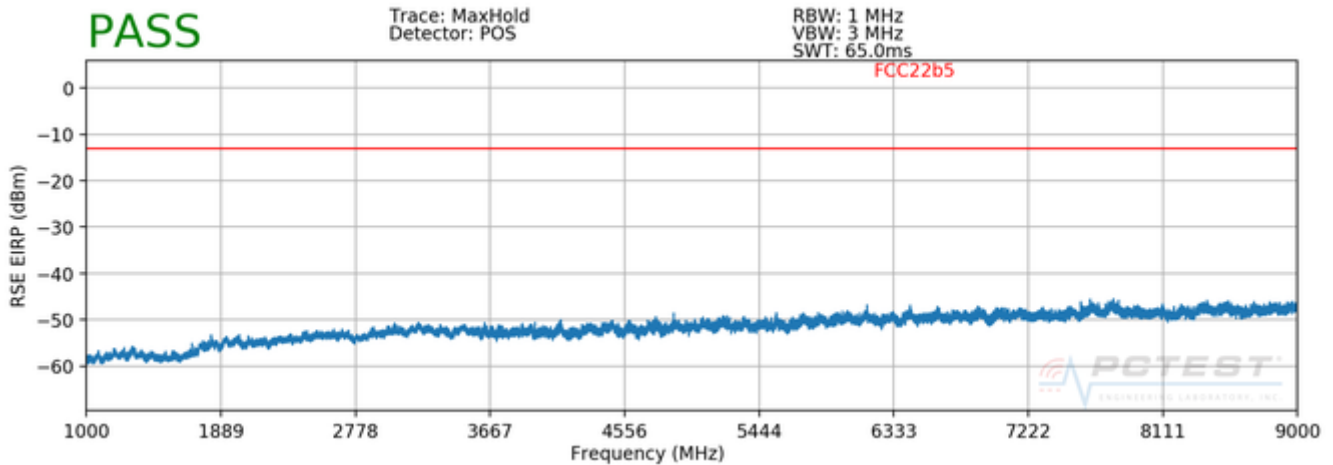


Plot 7-49. Radiated Spurious Plot (ULCA B5 PCC: RB 1 Offset 0, SCC: RB 1 Offset 49 – High Channel)

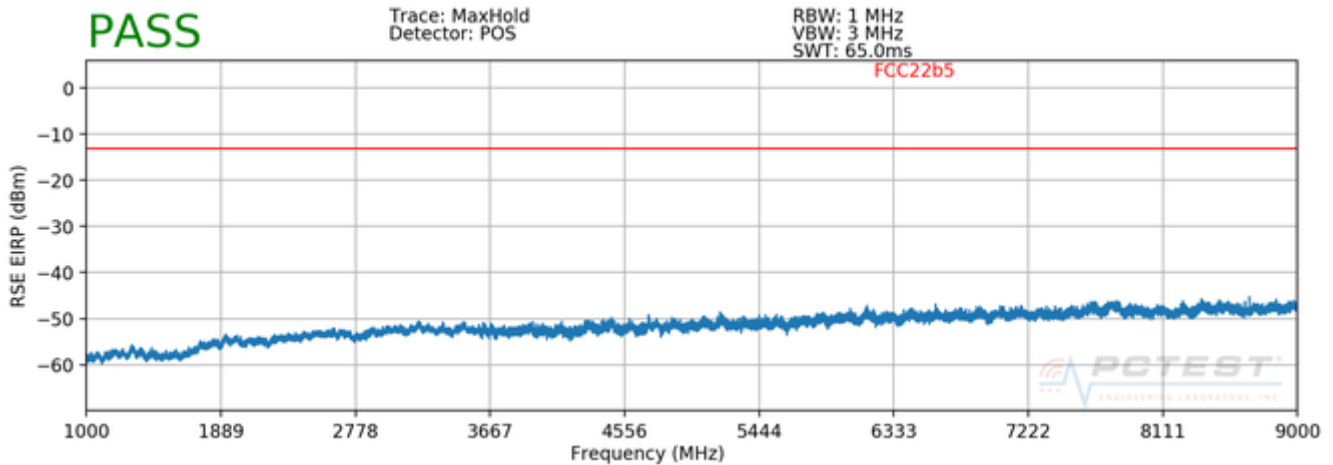
FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1-ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 200 of 217



Plot 7-50. Radiated Spurious Plot (ULCA B5 PCC: RB 50 Offset 0, SCC: RB 50 Offset 0 – Low Channel)



Plot 7-51. Radiated Spurious Plot (ULCA B5 PCC: RB 50 Offset 0, SCC: RB 50 Offset 0 – Mid Channel)



Plot 7-52. Radiated Spurious Plot (ULCA B5 PCC: RB 50 Offset 0, SCC: RB 50 Offset 0 – High Channel)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 201 of 217

OPERATING FREQUENCY: 826.50 MHz  
 CHANNEL: 26815  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1653.00	H	288	247	-68.03	5.80	-62.23	-49.2
2479.50	H	299	216	-56.14	5.73	-50.42	-37.4
3306.00	H	-	-	-66.21	7.86	-58.36	-45.4

Table 7-53. Radiated Spurious Data (Band 5 ULCA – Low Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	269	280	-67.64	5.73	-61.91	-48.9
2509.50	H	304	225	-54.36	5.77	-48.60	-35.6
3346.00	H	-	-	-65.13	7.91	-57.22	-44.2

Table 7-54. Radiated Spurious Data (Band 5 ULCA – Mid Channel)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 202 of 217



OPERATING FREQUENCY: 846.50 MHz  
 CHANNEL: 27015  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10.0 MHz  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.00	H	271	218	-67.43	5.66	-61.77	-48.8
2539.50	H	266	220	-57.53	5.88	-51.65	-38.7
3386.00	H	-	-	-66.37	7.96	-58.41	-45.4

Table 7-55. Radiated Spurious Data (Band 5 ULCA – High Channel)

FCC ID: ZNFG710VM			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset			Page 203 of 217

## 7.11 Frequency Stability / Temperature Variation

### Test Overview and Limit

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

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

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

### Test Procedure Used

ANSI/TIA-603-E-2016

### Test Settings

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

### Test Setup

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

### Test Notes

None

FCC ID: ZNFG710VM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		<b>Approved by:</b> Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 204 of 217

## Band 12 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz  
 CHANNEL: 23790  
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	707,500,227	227	0.0000321
100 %		- 30	707,500,180	180	0.0000254
100 %		- 20	707,500,068	68	0.0000096
100 %		- 10	707,500,051	51	0.0000072
100 %		0	707,499,611	-389	-0.0000550
100 %		+ 10	707,499,747	-253	-0.0000358
100 %		+ 20	707,500,238	238	0.0000336
100 %		+ 30	707,500,105	105	0.0000148
100 %		+ 40	707,500,112	112	0.0000158
100 %		+ 50	707,499,812	-188	-0.0000266
BATT. ENDPOINT		2.85	+ 20	707,499,758	-242

**Table 7-56. Frequency Stability Data (Band 12)**

**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: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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## Band 12 Frequency Stability Measurements

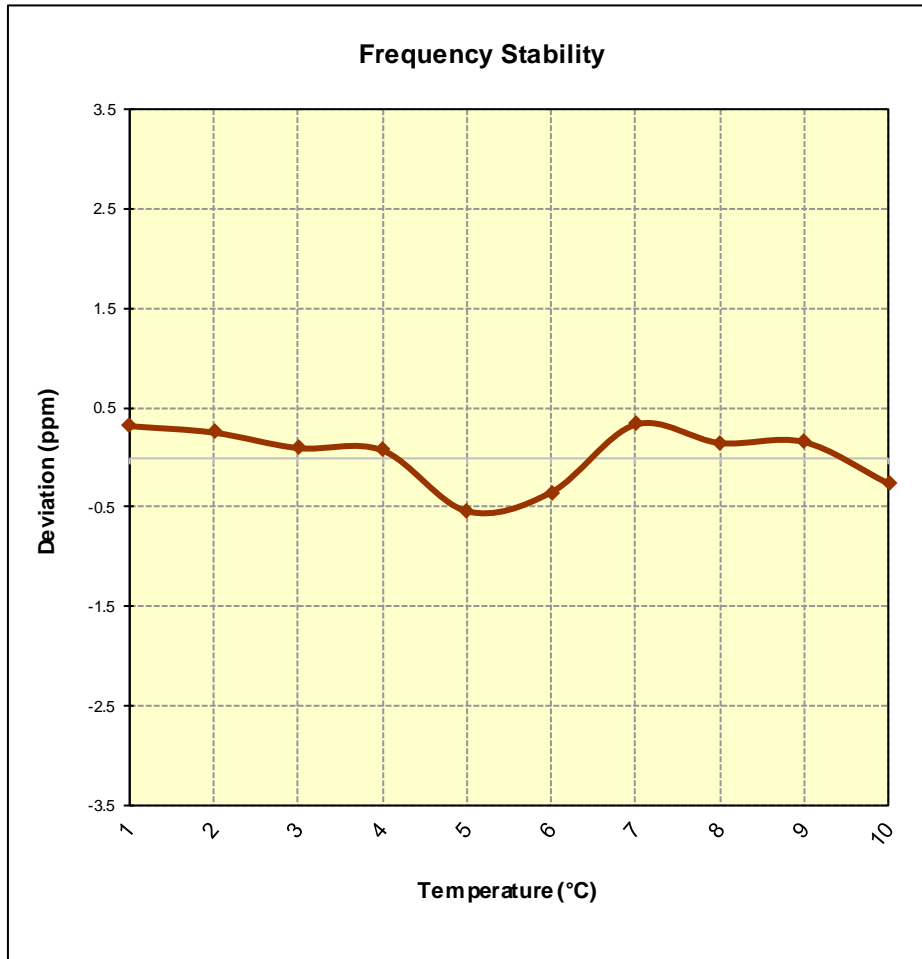


Figure 7-11. Frequency Stability Graph (Band 12)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 206 of 217

## Band 13 Frequency Stability Measurements

OPERATING FREQUENCY: 782,000,000 Hz  
 CHANNEL: 23230  
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	782,000,096	96	0.0000123
100 %		- 30	782,000,094	94	0.0000120
100 %		- 20	781,999,792	-208	-0.0000266
100 %		- 10	781,999,872	-128	-0.0000164
100 %		0	781,999,852	-148	-0.0000189
100 %		+ 10	781,999,882	-118	-0.0000151
100 %		+ 20	781,999,838	-162	-0.0000207
100 %		+ 30	782,000,304	304	0.0000389
100 %		+ 40	782,000,205	205	0.0000262
100 %		+ 50	782,000,341	341	0.0000436
BATT. ENDPOINT		2.85	+ 20	782,000,223	223

**Table 7-57. Frequency Stability Data (Band 13)**

**Note:**

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

FCC ID: ZNFG710VM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
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## Band 13 Frequency Stability Measurements

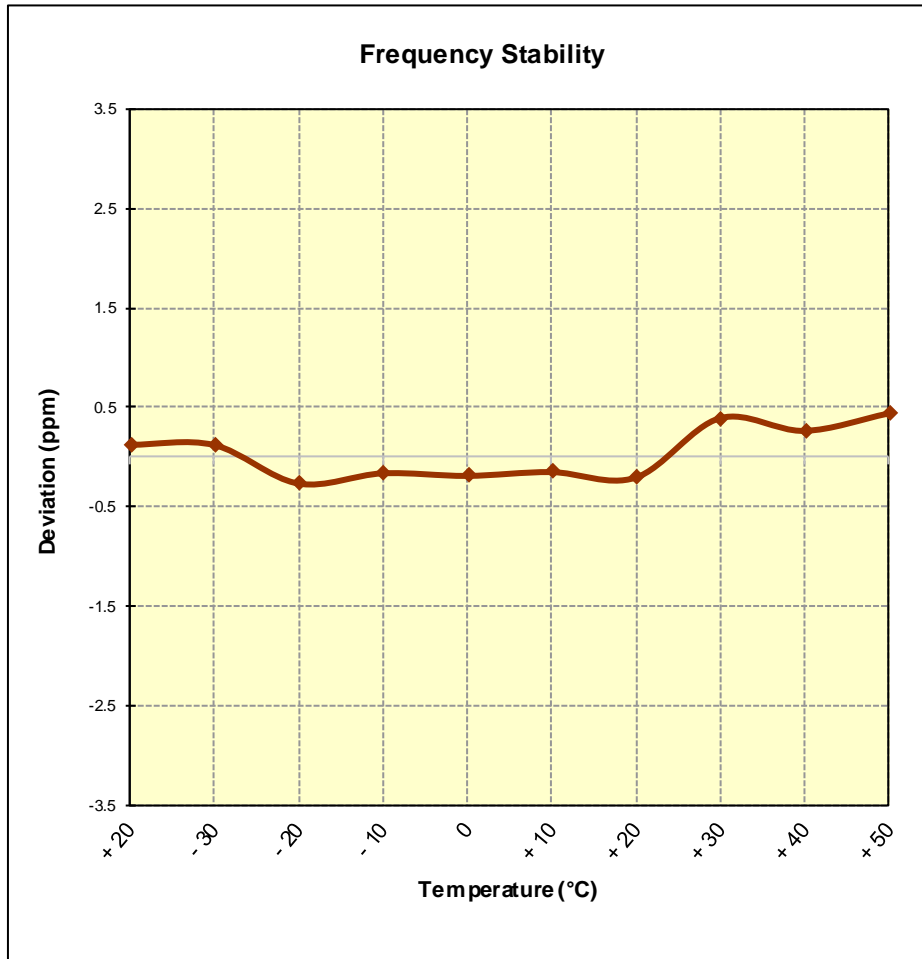


Figure 7-12. Frequency Stability Graph (Band 13)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 208 of 217

## Band 5/26 Frequency Stability Measurements

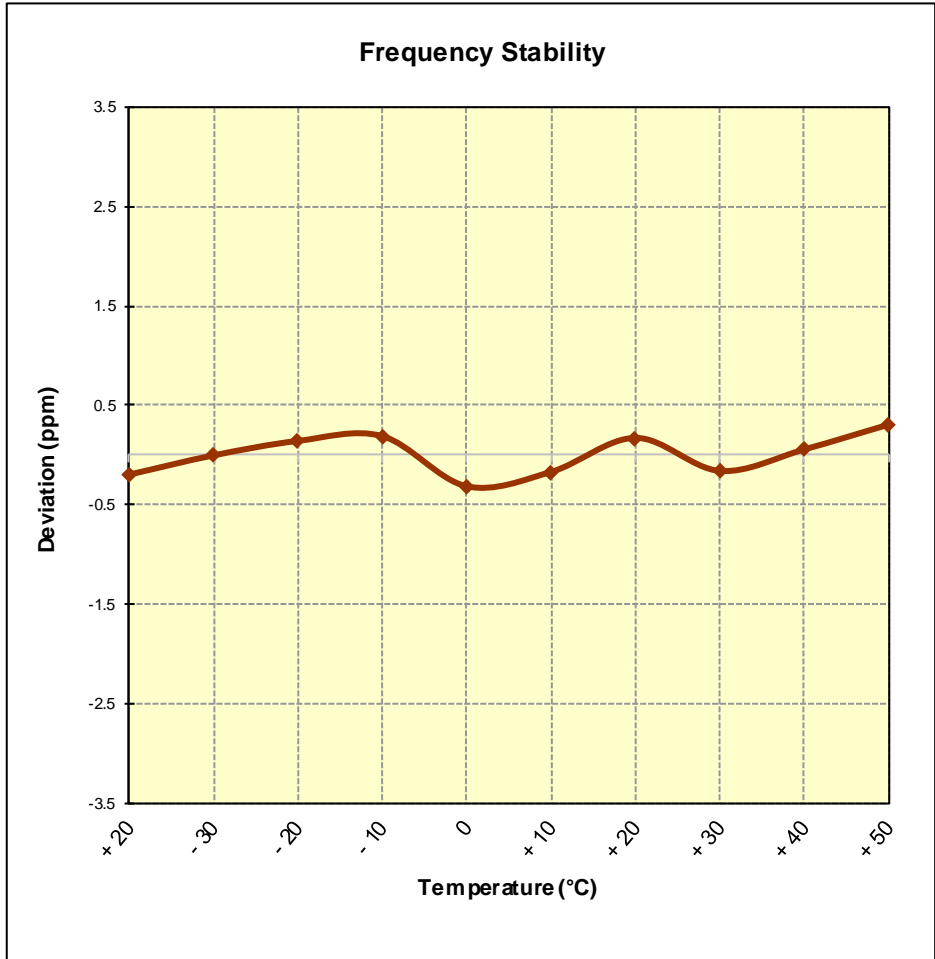
OPERATING FREQUENCY: 836,500,000 Hz  
 CHANNEL: 20525  
 REFERENCE VOLTAGE: 3.80 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,499,830	-170	-0.0000203
100 %		- 30	836,499,992	-8	-0.0000010
100 %		- 20	836,500,114	114	0.0000136
100 %		- 10	836,500,155	155	0.0000185
100 %		0	836,499,733	-267	-0.0000319
100 %		+ 10	836,499,854	-146	-0.0000175
100 %		+ 20	836,500,140	140	0.0000167
100 %		+ 30	836,499,862	-138	-0.0000165
100 %		+ 40	836,500,044	44	0.0000053
100 %		+ 50	836,500,253	253	0.0000302
BATT. ENDPOINT		2.85	+ 20	836,500,178	178

**Table 7-58. Frequency Stability Data (Band 5/26)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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**Band 5/26 Frequency Stability Measurements**



**Figure 7-13. Frequency Stability Graph (Band 5/26)**

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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## Band 4/66 Frequency Stability Measurements

OPERATING FREQUENCY: 1,732,500,000 Hz  
 CHANNEL: 20175  
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,732,499,999	-1	-0.0000001
100 %		- 30	1,732,499,949	-51	-0.0000029
100 %		- 20	1,732,499,558	-442	-0.0000255
100 %		- 10	1,732,499,632	-368	-0.0000212
100 %		0	1,732,500,138	138	0.0000080
100 %		+ 10	1,732,499,933	-67	-0.0000039
100 %		+ 20	1,732,499,986	-14	-0.0000008
100 %		+ 30	1,732,500,340	340	0.0000196
100 %		+ 40	1,732,499,818	-182	-0.0000105
100 %		+ 50	1,732,500,130	130	0.0000075
BATT. ENDPOINT		2.85	+ 20	1,732,500,083	83

**Table 7-59. 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: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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## Band 4/66 Frequency Stability Measurements

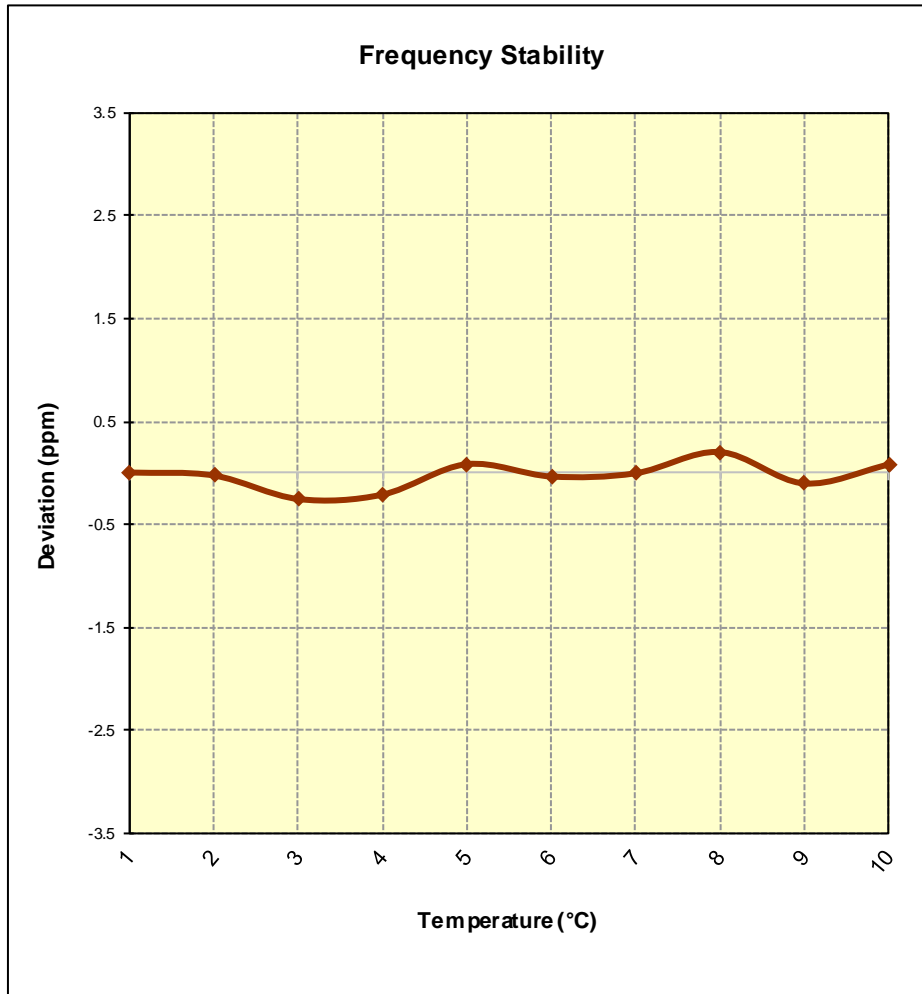


Figure 7-14. Frequency Stability Graph (Band 4/66)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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## Band 2/25 Frequency Stability Measurements

OPERATING FREQUENCY: 1,880,000,000 Hz  
 CHANNEL: 18900  
 REFERENCE VOLTAGE: 3.80 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,879,999,815	-185	-0.0000098
100 %		- 30	1,880,000,000	0	0.0000000
100 %		- 20	1,880,000,023	23	0.0000012
100 %		- 10	1,880,000,093	93	0.0000049
100 %		0	1,879,999,783	-217	-0.0000115
100 %		+ 10	1,879,999,746	-254	-0.0000135
100 %		+ 20	1,880,000,212	212	0.0000113
100 %		+ 30	1,879,999,942	-58	-0.0000031
100 %		+ 40	1,880,000,070	70	0.0000037
100 %		+ 50	1,880,000,232	232	0.0000123
BATT. ENDPOINT		2.85	+ 20	1,880,000,025	25

**Table 7-60. Frequency Stability Data (Band 2/25)**

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 213 of 217	

### Band 2/25 Frequency Stability Measurements

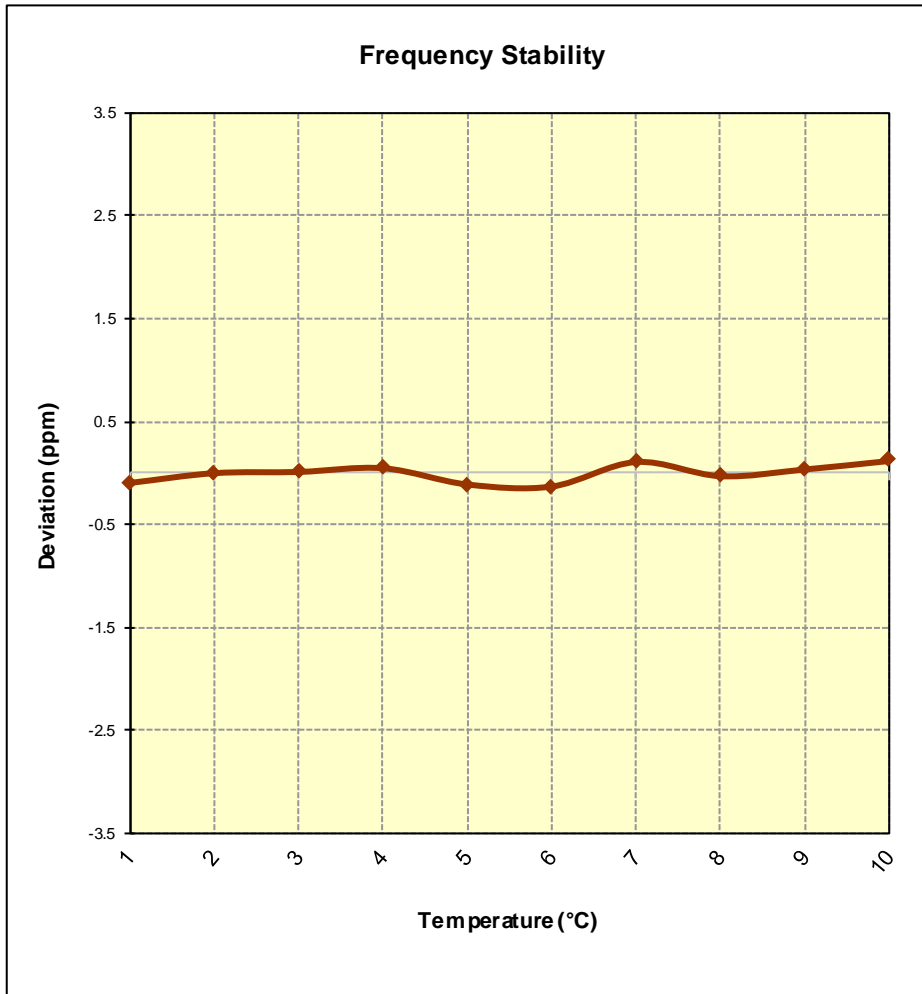


Figure 7-15. Frequency Stability Graph (Band 2/25)

FCC ID: ZNFG710VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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## Band 41 Frequency Stability Measurements

OPERATING FREQUENCY: 2,593,000,000 Hz  
 CHANNEL: 40620  
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	2,592,999,788	-212	-0.0000082
100 %		- 30	2,593,000,180	180	0.0000069
100 %		- 20	2,593,000,056	56	0.0000022
100 %		- 10	2,592,999,973	-27	-0.0000010
100 %		0	2,592,999,670	-330	-0.0000127
100 %		+ 10	2,593,000,012	12	0.0000005
100 %		+ 20	2,593,000,280	280	0.0000108
100 %		+ 30	2,592,999,696	-304	-0.0000117
100 %		+ 40	2,593,000,048	48	0.0000019
100 %		+ 50	2,592,999,903	-97	-0.0000037
BATT. ENDPOINT	2.85	+ 20	2,592,999,965	-35	-0.0000013

**Table 7-61. 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: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset	Page 215 of 217	

## Band 41 Frequency Stability Measurements

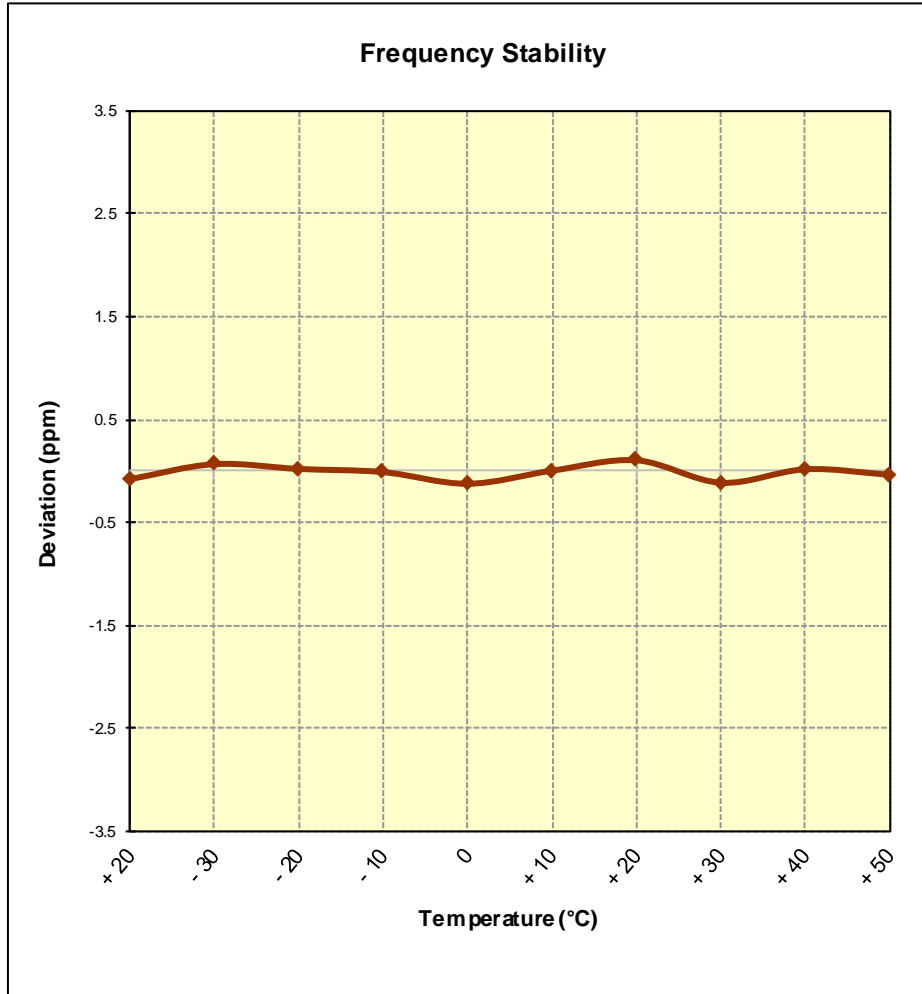


Figure 7-16. Frequency Stability Graph (Band 41)

FCC ID: ZNFG710VM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1802260032-08-R1.ZNF	Test Dates: 2/26 - 3/29/2018	EUT Type: Portable Handset		Page 216 of 217

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFG710VM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

FCC ID: ZNFG710VM	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1802260032-08-R1.ZNF	<b>Test Dates:</b> 2/26 - 3/29/2018	<b>EUT Type:</b> Portable Handset		Page 217 of 217