



Table 7-300. Upper ACP Plot (Band 41 QPSK – PCC:15 MHz SCC:20 MHz – Full RB)

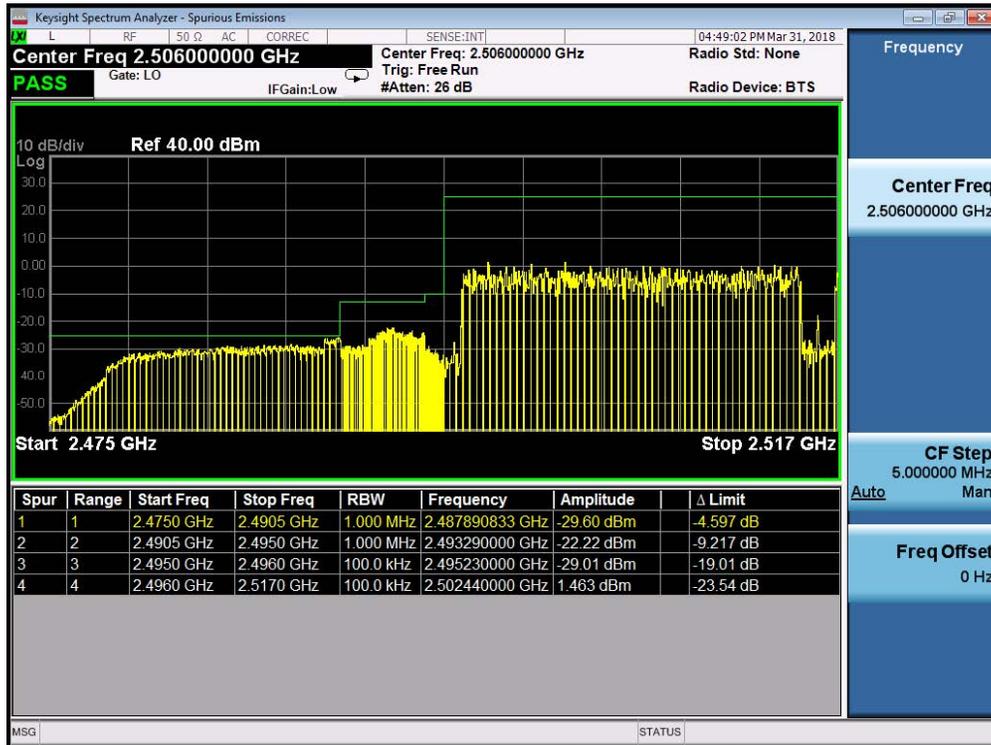


Table 7-301. Lower ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 186 of 263



Table 7-302. Upper ACP Plot (Band 41 QPSK – PCC:20 MHz SCC:20 MHz – Full RB)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 187 of 263

7.7 Uplink Carrier Aggregation Band 5

Test Overview

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

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

Test Procedure Used

KDB 971168 D01 v03 – Section 6.0

Test Settings

7. 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)
8. Detector = RMS
9. Trace mode = trace average for continuous emissions, max hold for pulse emissions
10. Sweep time = auto couple
11. The trace was allowed to stabilize
12. 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.

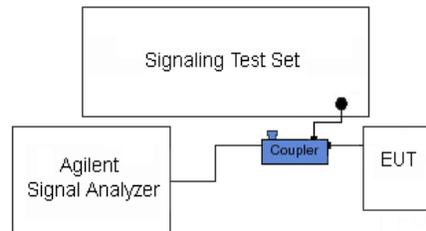


Figure 7-6. Test Instrument & Measurement Setup

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 188 of 263

Test Notes

4. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.
5. Conducted power and spurious emissions measurements were evaluated for the two contiguous channels (LTE CA-5B) using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in Table 7-3 and 7-4 below, with both carriers set to transmit using 1RB.
6. 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.

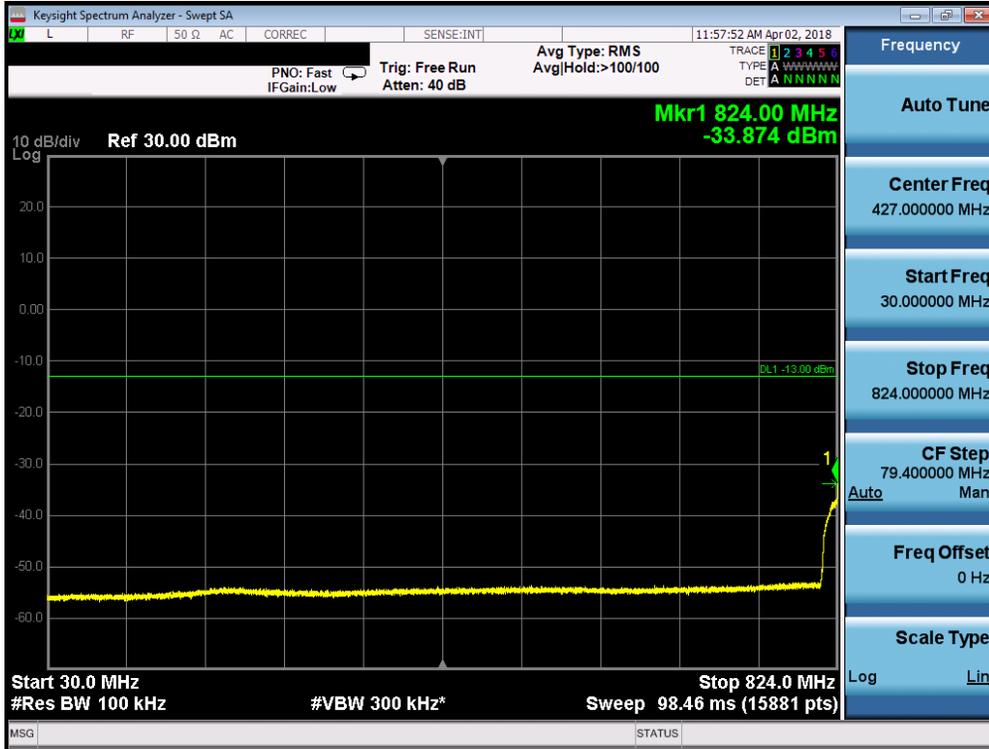
Power State	PCC							SCC							Power ULCA Tx.Power (dBm)
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	
Max	LTE B5	5	20425	826.50	QPSK	1	24	LTE B5	10	20497	833.7	QPSK	1	0	24.93
Max	LTE B5	5	20525	836.50	QPSK	1	24	LTE B5	10	20453	829.3	QPSK	1	0	24.88
Max	LTE B5	5	20625	846.5	QPSK	1	0	LTE B5	10	20553	839.3	QPSK	1	49	25.31
Max	LTE B5	10	20450	829	QPSK	1	49	LTE B5	5	20522	836.20	QPSK	1	0	24.85
Max	LTE B5	10	20600	836.5	QPSK	1	49	LTE B5	5	20597	843.70	QPSK	1	0	25.32
Max	LTE B5	10	20550	844	QPSK	1	49	LTE B5	5	20528	836.8	QPSK	1	0	25.27
Max	LTE B5	10	20450	829	QPSK	1	49	LTE B5	10	20549	838.9	QPSK	1	0	25.06
Max	LTE B5	10	20600	844	QPSK	1	49	LTE B5	10	20600	834.1	QPSK	1	0	25.41

Table 7-21. Conducted Powers (B5 – PCC: RB Size 1 Offset Max SCC: RB Size 1 Offset 0)

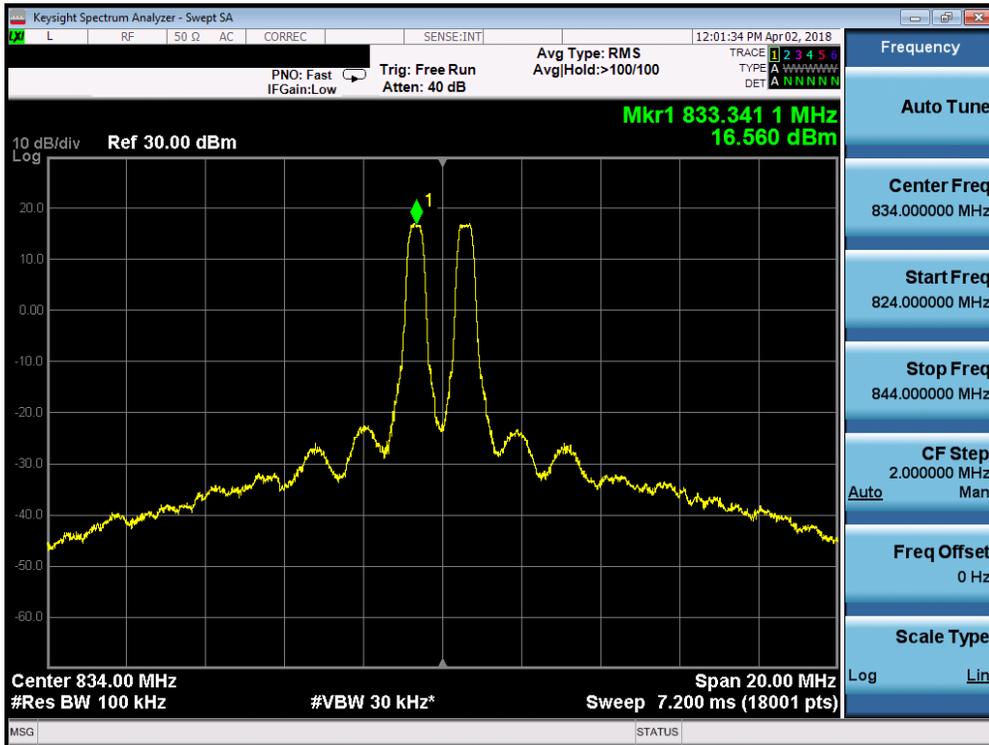
Power State	PCC							SCC							Power ULCA Tx.Power (dBm)
	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	SCC (UL) Frequency [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	
Max	LTE B5	10	20450	829	QPSK	1	0	LTE B5	10	20549	838.9	QPSK	1	49	14.98
Max	LTE B5	10	20450	829	QPSK	1	49	LTE B5	10	20549	838.9	QPSK	1	0	25.43
Max	LTE B5	10	20450	829	QPSK	50	0	LTE B5	10	20549	838.9	QPSK	50	0	23.29
Max	LTE B5	10	20450	829	16-QAM	50	0	LTE B5	10	20549	838.9	16-QAM	50	0	22.41
Max	LTE B5	10	20450	829	64-QAM	50	0	LTE B5	10	20549	838.9	64-QAM	50	0	21.44

Table 7-22. Conducted Powers (B5 with Various Combinations for 10MHz Channel Bandwidth)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 189 of 263	

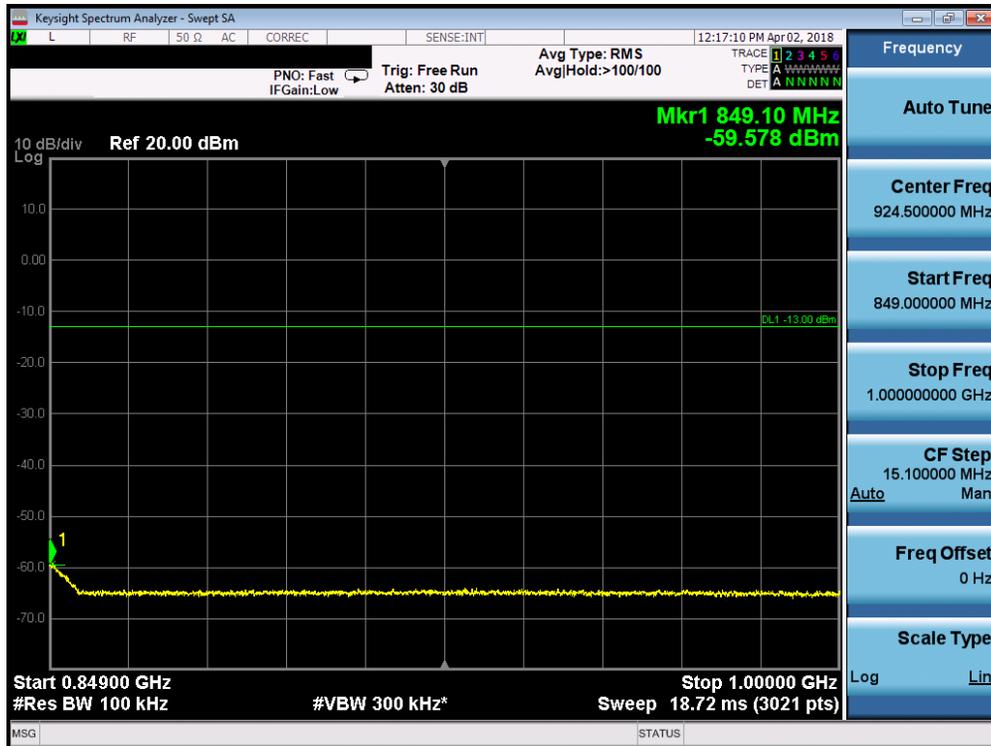


Plot 7-303. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Mid Channel)

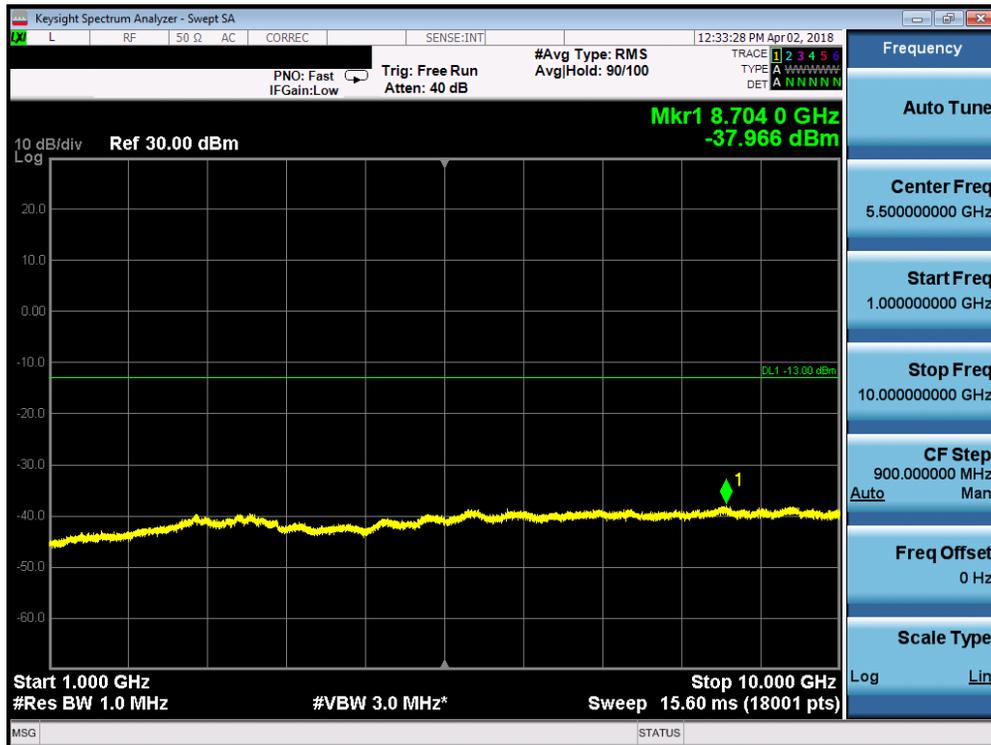


Plot 7-304. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Mid Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 190 of 263

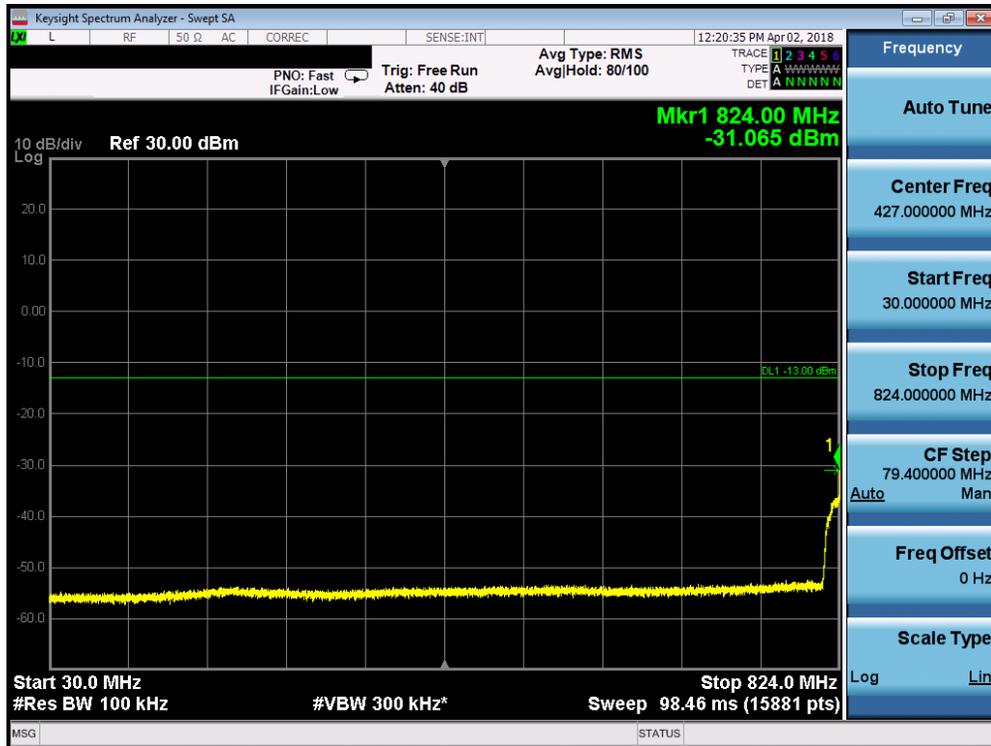


Plot 7-305. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Mid Channel)

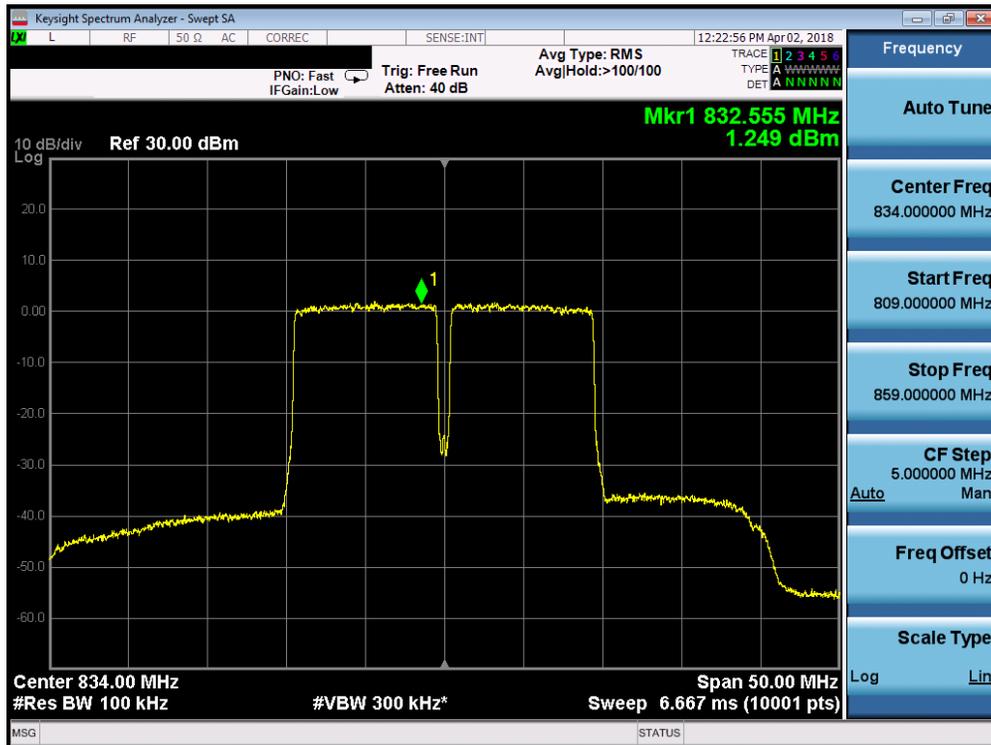


Plot 7-306. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 1/49 SCC 1/0 – Mid Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 191 of 263

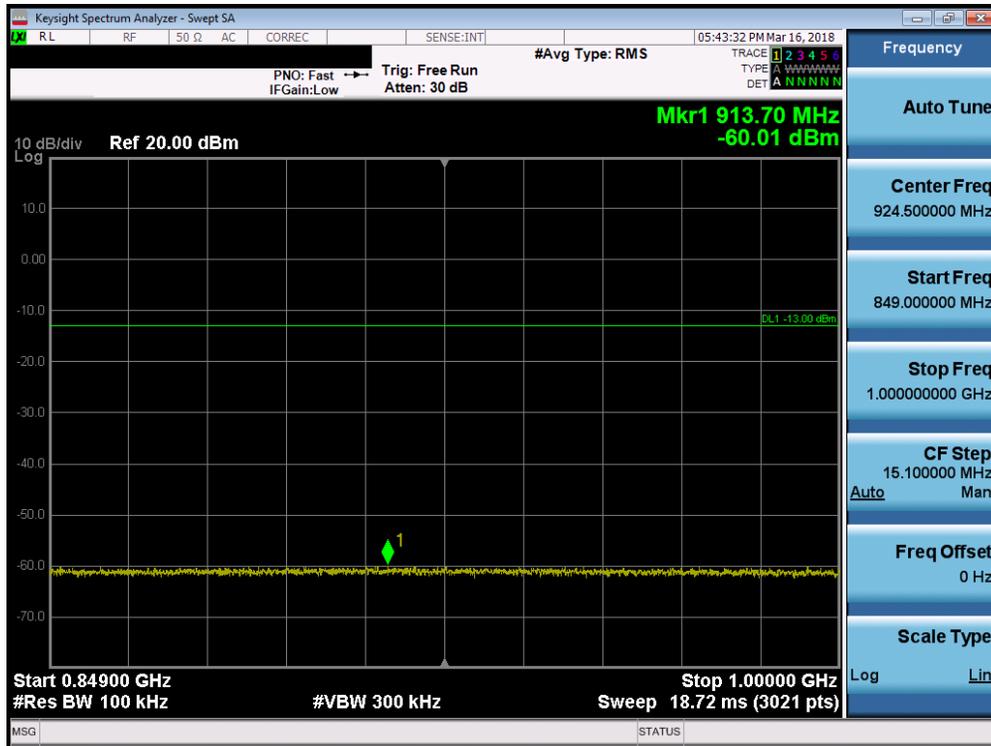


Plot 7-307. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 50/0 SCC 50/0 – Mid Channel)

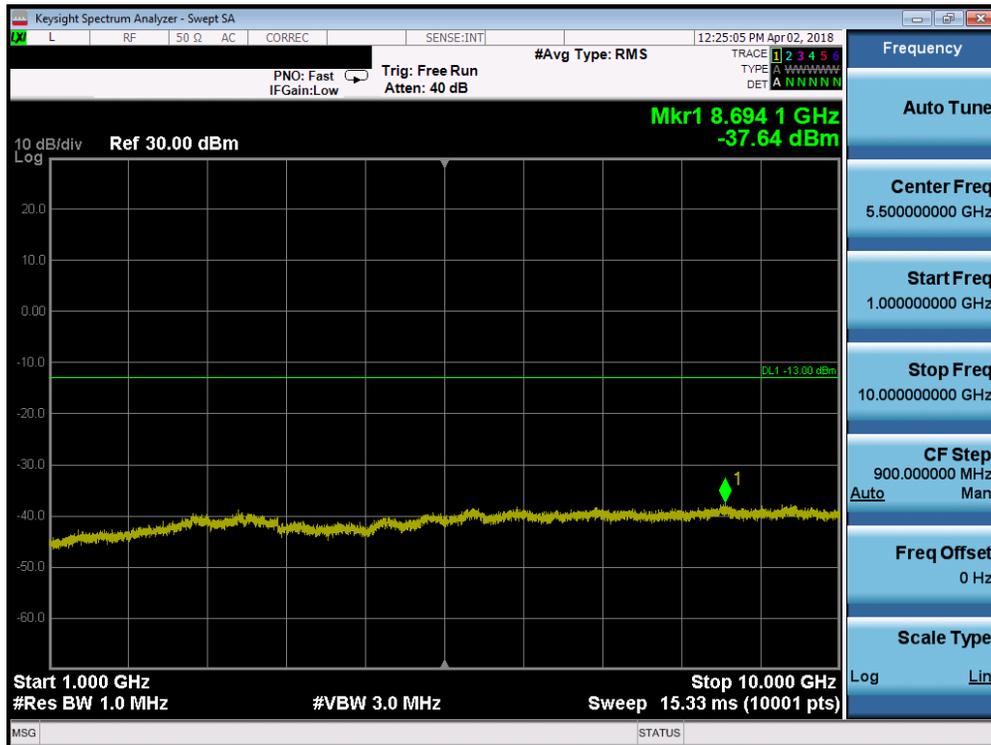


Plot 7-308. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 50/0 SCC 50/0 – Mid Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 192 of 263



Plot 7-309. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 50/0 SCC 50/0 – Mid Channel)

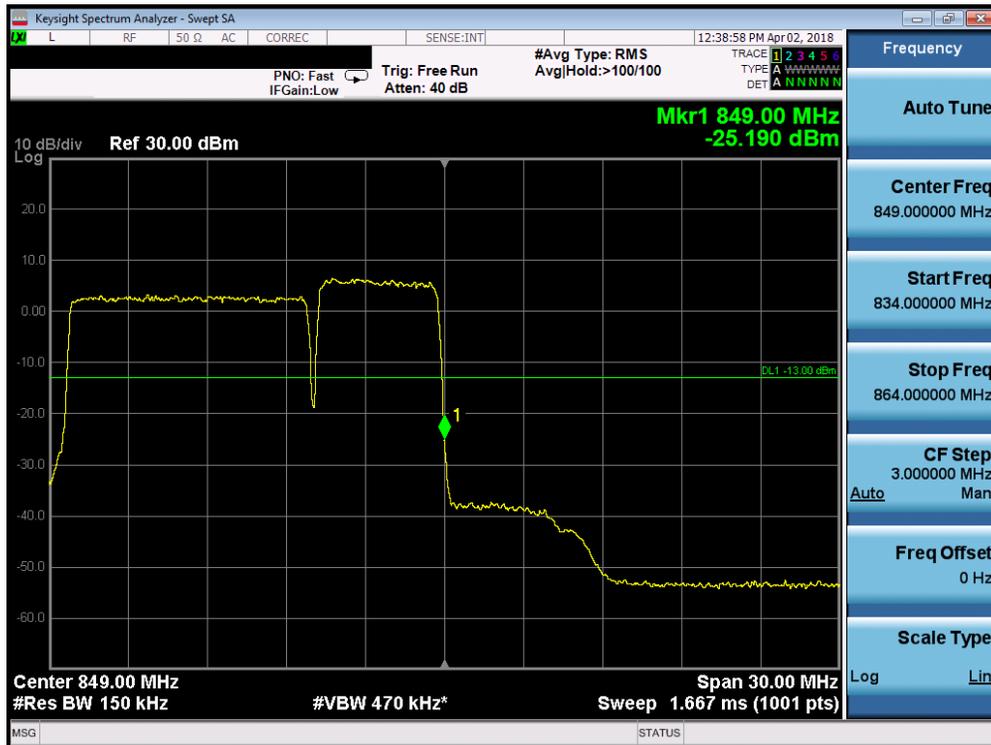


Plot 7-310. Conducted Spurious Plot (Band 5 – 10.0MHz QPSK – PCC 50/0 SCC 50/0 – Mid Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 193 of 263

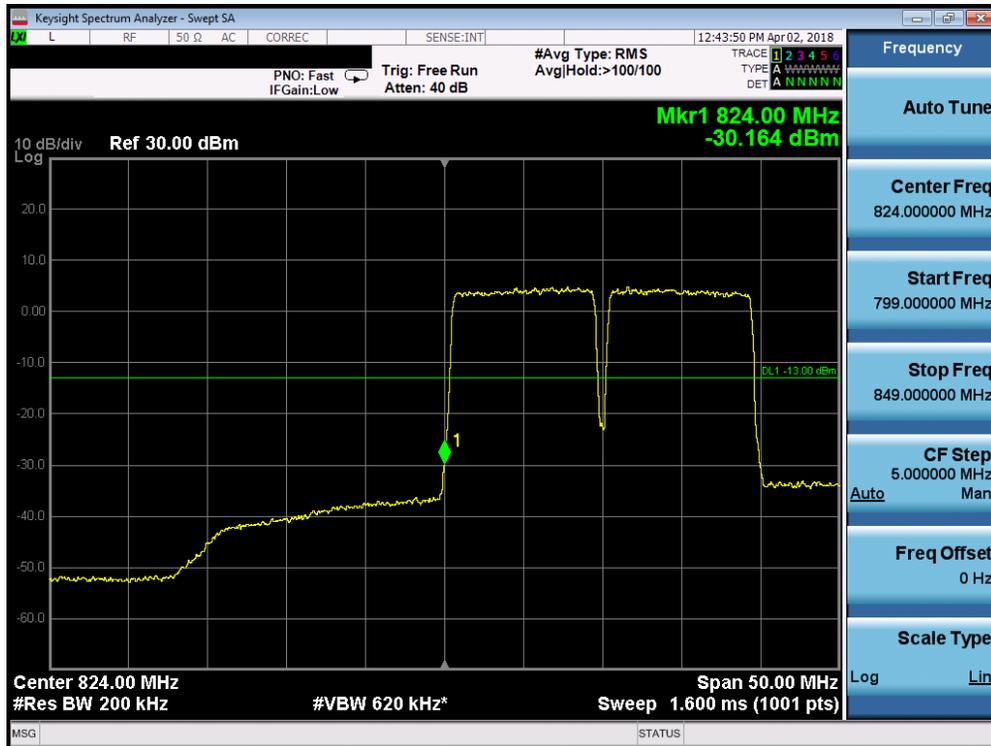


Plot 7-311. Lower Band Edge Plot (Band 5 - QPSK – PCC:5 MHz SCC:10 MHz – Full RB)

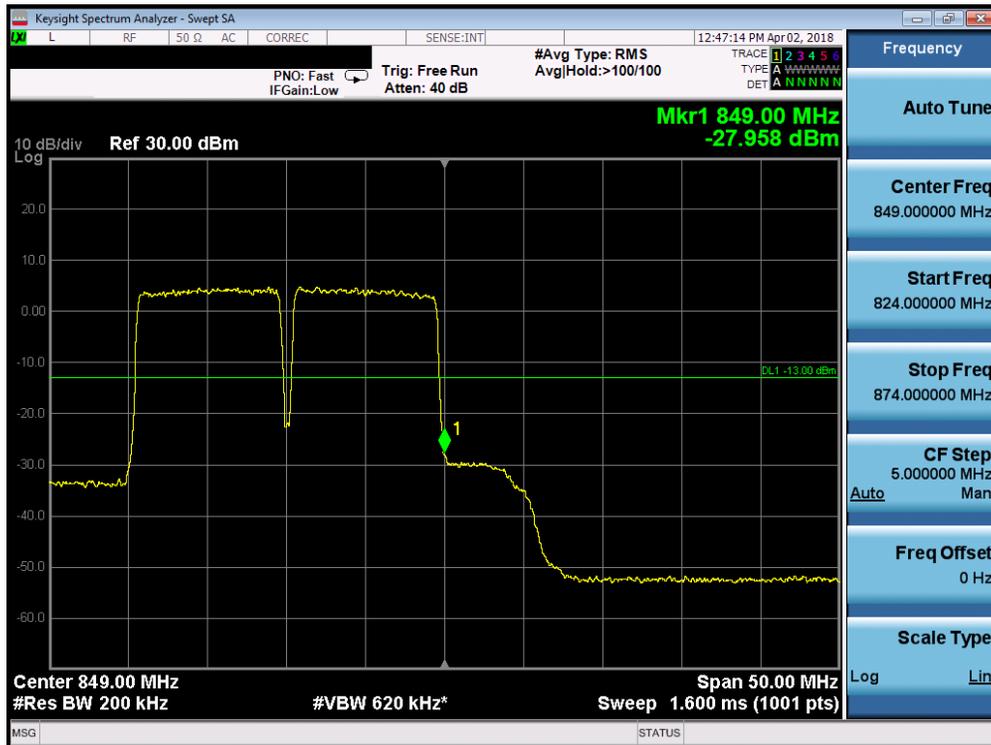


Plot 7-312. Upper Band Edge Plot (Band 5 - QPSK – PCC:10 MHz SCC:5 MHz – Full RB)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 194 of 263



Plot 7-313. Lower Band Edge Plot (Band 5 - QPSK – PCC:10 MHz SCC:10 MHz – Full RB)



Plot 7-314. Upper Band Edge Plot (Band 5 - QPSK – PCC:10 MHz SCC:10 MHz – Full RB)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 195 of 263

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 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points \geq 2 x span / RBW
6. Detector = RMS
7. Trigger is set to “free run” for signals with continuous operation with the sweep times set to “auto”. Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the “gating” function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Test Setup

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

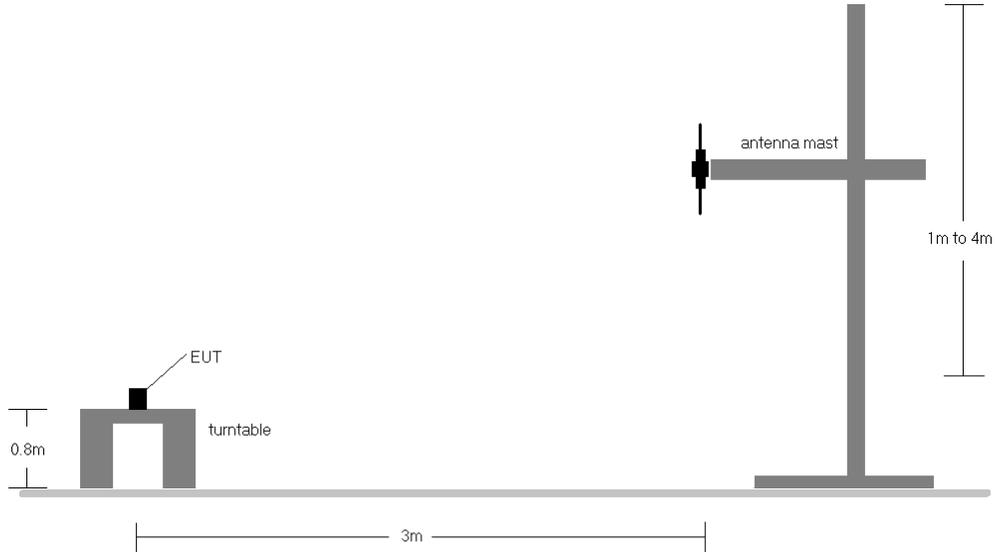


Figure 7-7. Radiated Test Setup <1GHz

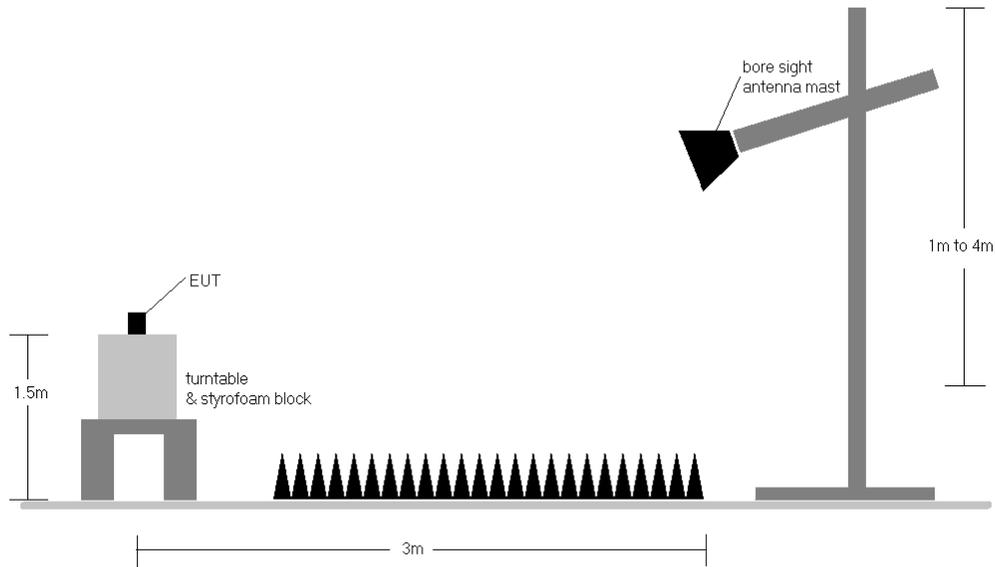


Figure 7-8. Radiated Test Setup >1GHz

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) N/A

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	150	21	1 / 0	18.81	1.10	17.76	0.060	34.77	-17.01	19.91	0.098	36.99	-17.08
707.50	1.4	QPSK	V	150	21	1 / 0	18.98	1.13	17.96	0.063	34.77	-16.81	20.11	0.103	36.99	-16.88
715.30	1.4	QPSK	V	150	21	1 / 5	18.93	1.16	17.94	0.062	34.77	-16.83	20.09	0.102	36.99	-16.90
715.30	1.4	16-QAM	V	150	21	1 / 5	18.77	1.16	17.78	0.060	34.77	-16.99	19.93	0.098	36.99	-17.06
715.30	1.4	64-QAM	V	150	21	1 / 5	18.53	1.16	17.54	0.057	34.77	-17.23	19.69	0.093	36.99	-17.30
700.50	3	QPSK	V	150	4	1 / 0	18.84	1.10	17.79	0.060	34.77	-16.98	19.94	0.099	36.99	-17.05
707.50	3	QPSK	V	150	4	1 / 14	19.10	1.13	18.08	0.064	34.77	-16.69	20.23	0.105	36.99	-16.76
714.50	3	QPSK	V	150	4	1 / 14	18.71	1.16	17.72	0.059	34.77	-17.05	19.87	0.097	36.99	-17.12
707.50	3	16-QAM	V	150	4	1 / 14	18.60	1.13	17.58	0.057	34.77	-17.19	19.73	0.094	36.99	-17.26
714.50	3	64-QAM	V	150	4	1 / 14	17.83	1.16	16.84	0.048	34.77	-17.93	18.99	0.079	36.99	-18.00

Table 7-23. ERP Data (Band 12/17)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
701.50	5	QPSK	V	150	1	1 / 0	18.96	1.11	17.92	0.062	34.77	-16.86	20.07	0.102	36.99	-16.92
707.50	5	QPSK	V	150	1	1 / 24	19.89	1.13	18.87	0.077	34.77	-15.90	21.02	0.126	36.99	-15.97
713.50	5	QPSK	V	150	1	1 / 0	19.09	1.15	18.09	0.064	34.77	-16.68	20.24	0.106	36.99	-16.75
713.50	5	16-QAM	V	150	1	1 / 0	18.73	1.15	17.73	0.059	34.77	-17.04	19.88	0.097	36.99	-17.11
713.50	5	64-QAM	V	150	1	1 / 0	17.74	1.15	16.74	0.047	34.77	-18.03	18.89	0.078	36.99	-18.10
704.00	10	QPSK	V	150	1	1 / 0	19.11	1.12	18.08	0.064	34.77	-16.69	20.23	0.105	36.99	-16.76
707.50	10	QPSK	V	150	1	1 / 0	19.17	1.13	18.15	0.065	34.77	-16.62	20.30	0.107	36.99	-16.69
711.00	10	QPSK	V	150	1	1 / 0	18.80	1.14	17.79	0.060	34.77	-16.98	19.94	0.099	36.99	-17.05
704.00	10	16-QAM	V	150	1	1 / 0	19.01	1.12	17.98	0.063	34.77	-16.79	20.13	0.103	36.99	-16.86
707.50	10	64-QAM	V	150	1	1 / 0	18.71	1.13	17.69	0.059	34.77	-17.08	19.84	0.096	36.99	-17.15
707.50	5	QPSK	H	150	345	36 / 18	18.09	1.13	17.07	0.051	34.77	-17.70	19.22	0.084	36.99	-17.77
707.50	5 (WCP)	QPSK	H	150	122	1 / 0	17.36	1.13	16.34	0.043	34.77	-18.43	18.49	0.071	36.99	-18.50

Table 7-24. ERP Data (Band 17)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
779.50	5	QPSK	V	150	357	1 / 0	17.45	1.32	16.62	0.046	34.77	-18.15	18.77	0.075	36.99	-18.22
782.00	5	QPSK	V	150	1	12 / 6	17.38	1.33	16.56	0.045	34.77	-18.21	18.71	0.074	36.99	-18.28
784.50	5	QPSK	V	150	9	1 / 0	17.58	1.34	16.77	0.048	34.77	-18.00	18.92	0.078	36.99	-18.07
784.50	5	16-QAM	V	150	9	1 / 0	17.33	1.34	16.52	0.045	34.77	-18.25	18.67	0.074	36.99	-18.32
784.50	5	64-QAM	V	150	9	1 / 0	16.93	1.34	16.12	0.041	34.77	-18.65	18.27	0.067	36.99	-18.72
782.00	10	QPSK	V	150	6	1 / 0	17.57	1.33	16.75	0.047	34.77	-18.02	18.90	0.078	36.99	-18.09
782.00	10	16-QAM	V	150	6	1 / 0	17.33	1.33	16.51	0.045	34.77	-18.26	18.66	0.073	36.99	-18.33
782.00	10	64-QAM	V	150	6	1 / 0	17.10	1.33	16.28	0.042	34.77	-18.49	18.43	0.070	36.99	-18.56
784.50	5	QPSK	H	150	9	1 / 0	15.63	1.34	14.82	0.030	34.77	-19.95	16.97	0.050	36.99	-20.02
784.50	5 (WCP)	QPSK	H	150	91	1 / 24	14.78	1.34	13.97	0.025	34.77	-20.80	16.12	0.041	36.99	-20.87

Table 7-25. ERP Data (Band 13)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 199 of 263

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	357	3 / 2	16.21	1.50	15.56	0.036	38.45	-22.89	17.71	0.059	40.61	-22.90
836.50	1.4	QPSK	H	150	6	1 / 0	16.21	1.50	15.56	0.036	38.45	-22.89	17.71	0.059	40.61	-22.90
848.30	1.4	QPSK	H	150	3	3 / 2	15.78	1.50	15.13	0.033	38.45	-23.32	17.28	0.053	40.61	-23.33
836.50	1.4	16-QAM	H	150	6	1 / 0	16.10	1.50	15.45	0.035	38.45	-23.00	17.60	0.058	40.61	-23.01
836.50	1.4	64-QAM	H	150	6	1 / 0	15.93	1.50	15.28	0.034	38.45	-23.17	17.43	0.055	40.61	-23.18
825.50	3	QPSK	H	150	349	1 / 0	16.34	1.50	15.69	0.037	38.45	-22.76	17.84	0.061	40.61	-22.77
836.50	3	QPSK	H	150	349	1 / 0	15.92	1.50	15.27	0.034	38.45	-23.18	17.42	0.055	40.61	-23.19
847.50	3	QPSK	H	150	349	1 / 0	15.64	1.50	14.99	0.032	38.45	-23.46	17.14	0.052	40.61	-23.47
825.50	3	16-QAM	H	150	349	1 / 0	16.21	1.50	15.56	0.036	38.45	-22.89	17.71	0.059	40.61	-22.90
825.50	3	64-QAM	H	150	349	1 / 0	15.92	1.50	15.27	0.034	38.45	-23.18	17.42	0.055	40.61	-23.19
826.50	5	QPSK	H	150	350	1 / 0	16.40	1.50	15.75	0.038	38.45	-22.70	17.90	0.062	40.61	-22.71
836.50	5	QPSK	H	150	10	1 / 0	16.24	1.50	15.59	0.036	38.45	-22.86	17.74	0.059	40.61	-22.87
846.50	5	QPSK	H	150	350	1 / 0	15.89	1.50	15.24	0.033	38.45	-23.21	17.39	0.055	40.61	-23.22
826.50	5	16-QAM	H	150	350	1 / 0	16.37	1.50	15.72	0.037	38.45	-22.73	17.87	0.061	40.61	-22.74
826.50	5	64-QAM	H	150	350	1 / 0	15.83	1.50	15.18	0.033	38.45	-23.27	17.33	0.054	40.61	-23.28
829.00	10	QPSK	H	150	8	1 / 0	16.22	1.50	15.57	0.036	38.45	-22.88	17.72	0.059	40.61	-22.89
836.50	10	QPSK	H	150	8	1 / 0	16.22	1.50	15.57	0.036	38.45	-22.88	17.72	0.059	40.61	-22.89
844.00	10	QPSK	H	150	8	1 / 0	15.91	1.50	15.26	0.034	38.45	-23.19	17.41	0.055	40.61	-23.20
829.00	10	16-QAM	H	150	8	1 / 0	16.21	1.50	15.56	0.036	38.45	-22.89	17.71	0.059	40.61	-22.90
829.00	10	64-QAM	H	150	8	1 / 0	15.81	1.50	15.16	0.033	38.45	-23.29	17.31	0.054	40.61	-23.30
831.50	15	QPSK	H	150	349	1 / 0	16.34	1.50	15.69	0.037	38.45	-22.76	17.84	0.061	40.61	-22.77
836.50	15	QPSK	H	150	349	1 / 0	16.42	1.50	15.77	0.038	38.45	-22.68	17.92	0.062	40.61	-22.69
841.50	15	QPSK	H	150	349	1 / 0	16.16	1.50	15.51	0.036	38.45	-22.94	17.66	0.058	40.61	-22.95
836.50	15	16-QAM	H	150	349	1 / 0	16.35	1.50	15.70	0.037	38.45	-22.75	17.85	0.061	40.61	-22.76
836.50	15	64-QAM	H	150	349	1 / 0	15.79	1.50	15.14	0.033	38.45	-23.31	17.29	0.054	40.61	-23.32
836.50	15	QPSK	V	150	9	1 / 0	16.48	1.50	15.83	0.038	38.45	-22.62	17.98	0.063	40.61	-22.63
836.50	15 (WCP)	QPSK	H	150	24	1 / 0	16.01	1.50	15.36	0.034	38.45	-23.09	17.51	0.056	40.61	-23.10

Table 7-26. ERP Data (Band 26/5)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset			Page 200 of 263

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	H	150	8	1 / 5	17.44	5.56	23.00	0.199	30.00	-7.00
1732.50	1.4	QPSK	H	150	8	1 / 5	17.10	5.41	22.51	0.178	30.00	-7.49
1754.30	1.4	QPSK	H	150	8	1 / 5	17.27	5.26	22.53	0.179	30.00	-7.47
1710.70	1.4	16-QAM	H	150	8	1 / 5	16.61	5.56	22.17	0.165	30.00	-7.83
1710.70	1.4	64-QAM	H	150	8	1 / 5	15.64	5.56	21.20	0.132	30.00	-8.80
1711.50	3	QPSK	H	150	8	1 / 0	17.42	5.55	22.97	0.198	30.00	-7.03
1732.50	3	QPSK	H	150	8	1 / 14	17.14	5.41	22.55	0.180	30.00	-7.45
1753.50	3	QPSK	H	150	8	1 / 0	17.32	5.26	22.58	0.181	30.00	-7.42
1711.50	3	16-QAM	H	150	8	1 / 14	16.60	5.55	22.15	0.164	30.00	-7.85
1753.50	3	64-QAM	H	150	8	1 / 0	15.42	5.26	20.68	0.117	30.00	-9.32
1712.50	5	QPSK	H	150	21	1 / 0	17.50	5.55	23.05	0.202	30.00	-6.95
1732.50	5	QPSK	H	150	21	1 / 0	17.22	5.41	22.63	0.183	30.00	-7.37
1752.50	5	QPSK	H	150	21	1 / 24	17.37	5.27	22.64	0.184	30.00	-7.36
1712.50	5	16-QAM	H	150	21	1 / 0	16.70	5.55	22.25	0.168	30.00	-7.75
1752.50	5	64-QAM	H	150	21	1 / 24	15.72	5.27	20.99	0.126	30.00	-9.01
1715.00	10	QPSK	H	150	8	1 / 0	17.40	5.53	22.93	0.196	30.00	-7.07
1732.50	10	QPSK	H	150	8	1 / 0	17.27	5.41	22.68	0.185	30.00	-7.32
1750.00	10	QPSK	H	150	8	1 / 49	17.18	5.29	22.47	0.177	30.00	-7.53
1715.00	10	16-QAM	H	150	8	1 / 0	16.61	5.53	22.14	0.164	30.00	-7.86
1750.00	10	64-QAM	H	150	8	1 / 49	15.33	5.29	20.62	0.115	30.00	-9.38
1717.50	15	QPSK	H	150	369	1 / 0	17.62	5.51	23.13	0.206	30.00	-6.87
1732.50	15	QPSK	H	150	369	1 / 0	17.46	5.41	22.87	0.194	30.00	-7.13
1747.50	15	QPSK	H	150	369	1 / 0	17.40	5.31	22.71	0.186	30.00	-7.29
1717.50	15	16-QAM	H	150	369	1 / 0	16.86	5.51	22.37	0.173	30.00	-7.63
1717.50	15	64-QAM	H	150	369	1 / 0	15.76	5.51	21.27	0.134	30.00	-8.73
1720.00	20	QPSK	H	150	12	1 / 0	17.69	5.49	23.18	0.208	30.00	-6.82
1732.50	20	QPSK	H	150	12	1 / 0	17.60	5.41	23.01	0.200	30.00	-6.99
1745.00	20	QPSK	H	150	12	1 / 0	17.52	5.32	22.84	0.192	30.00	-7.16
1732.50	20	16-QAM	H	150	12	1 / 0	16.74	5.41	22.15	0.164	30.00	-7.85
1732.50	20	64-QAM	H	150	12	1 / 0	15.72	5.41	21.13	0.130	30.00	-8.87
1720.00	20	QPSK	V	150	307	1 / 99	15.05	5.49	20.54	0.113	30.00	-9.46
1720.00	20 (WCP)	QPSK	H	150	7	1 / 0	17.65	5.49	23.14	0.206	30.00	-6.86

Table 7-27. EIRP Data (Band 66/4)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset			Page 201 of 263

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	324	1 / 5	17.05	4.79	21.84	0.153	33.01	-11.17
1880.00	1.4	QPSK	V	150	324	1 / 5	17.35	4.84	22.19	0.166	33.01	-10.82
1909.30	1.4	QPSK	V	150	319	1 / 0	18.50	4.86	23.36	0.217	33.01	-9.65
1909.30	1.4	16-QAM	V	150	319	1 / 0	17.57	4.86	22.43	0.175	33.01	-10.58
1880.00	1.4	64-QAM	V	150	324	1 / 5	16.70	4.84	21.54	0.143	33.01	-11.47
1851.50	3	QPSK	V	150	271	1 / 0	17.36	4.79	22.15	0.164	33.01	-10.86
1880.00	3	QPSK	V	150	271	1 / 14	16.96	4.84	21.80	0.152	33.01	-11.21
1908.50	3	QPSK	V	150	308	1 / 0	18.49	4.86	23.35	0.216	33.01	-9.66
1908.50	3	16-QAM	V	150	308	1 / 0	17.78	4.86	22.64	0.184	33.01	-10.37
1908.50	3	64-QAM	V	150	308	1 / 0	16.81	4.86	21.67	0.147	33.01	-11.34
1852.50	5	QPSK	V	150	310	1 / 24	18.65	4.79	23.44	0.221	33.01	-9.57
1880.00	5	QPSK	V	150	310	1 / 0	18.90	4.84	23.74	0.237	33.01	-9.27
1907.50	5	QPSK	V	150	310	1 / 0	18.71	4.87	23.58	0.228	33.01	-9.43
1880.00	5	16-QAM	V	150	310	1 / 0	18.13	4.84	22.97	0.198	33.01	-10.04
1880.00	5	64-QAM	V	150	310	1 / 0	17.01	4.84	21.85	0.153	33.01	-11.16
1855.00	10	QPSK	V	150	311	1 / 0	18.64	4.80	23.44	0.221	33.01	-9.57
1880.00	10	QPSK	V	150	311	1 / 0	18.86	4.84	23.70	0.235	33.01	-9.31
1905.00	10	QPSK	V	150	311	1 / 0	18.94	4.87	23.81	0.241	33.01	-9.20
1905.00	10	16-QAM	V	150	311	1 / 0	18.01	4.87	22.88	0.194	33.01	-10.13
1880.00	10	64-QAM	V	150	311	1 / 0	16.91	4.84	21.75	0.150	33.01	-11.26
1857.50	15	QPSK	V	150	315	1 / 74	18.81	4.80	23.61	0.230	33.01	-9.40
1880.00	15	QPSK	V	150	315	1 / 0	19.02	4.84	23.86	0.243	33.01	-9.15
1902.50	15	QPSK	V	150	315	1 / 0	19.29	4.88	24.17	0.261	33.01	-8.84
1902.50	15	16-QAM	V	150	315	1 / 0	18.45	4.88	23.33	0.215	33.01	-9.68
1902.50	15	64-QAM	V	150	315	1 / 0	17.46	4.88	22.34	0.171	33.01	-10.67
1860.00	20	QPSK	V	150	311	1 / 99	18.84	4.81	23.65	0.231	33.01	-9.37
1880.00	20	QPSK	V	150	311	1 / 0	19.00	4.84	23.84	0.242	33.01	-9.17
1900.00	20	QPSK	V	150	31	1 / 0	19.06	4.88	23.94	0.248	33.01	-9.07
1900.00	20	16-QAM	V	150	31	1 / 0	18.33	4.88	23.21	0.210	33.01	-9.80
1900.00	20	64-QAM	V	150	31	1 / 0	17.38	4.88	22.26	0.168	33.01	-10.75
1902.50	15	QPSK	H	150	9	1 / 74	19.43	4.88	24.31	0.270	33.01	-8.70
1902.50	15 (WCP)	QPSK	V	150	301	1 / 0	16.64	4.88	21.52	0.142	33.01	-11.49

Table 7-28. EIRP Data (Band 25/2)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset			Page 202 of 263

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]
2307.50	5	QPSK	H	150	70	1 / 24	14.94	5.74	20.68	0.117	23.98	-3.30
2310.00	5	QPSK	H	150	70	1 / 24	14.90	5.74	20.64	0.116	23.98	-3.34
2312.50	5	QPSK	H	150	70	1 / 24	14.92	5.74	20.66	0.116	23.98	-3.32
2312.50	5	16-QAM	H	150	70	1 / 24	14.28	5.74	20.02	0.100	23.98	-3.96
2312.50	5	64-QAM	H	150	70	1 / 24	13.70	5.74	19.44	0.088	23.98	-4.54
2310.00	10	QPSK	H	150	50	1 / 49	14.32	5.74	20.06	0.101	23.98	-3.92
2310.00	10	16-QAM	H	150	50	1 / 49	13.42	5.74	19.16	0.082	23.98	-4.82
2310.00	10	64-QAM	H	150	50	1 / 49	12.67	5.74	18.41	0.069	23.98	-5.57
2307.50	5	QPSK	V	150	269	1 / 24	12.75	5.74	18.49	0.071	23.98	-5.49
2307.50	5 (WCP)	QPSK	V	150	308	1 / 0	12.14	5.74	17.88	0.061	23.98	-6.10

Table 7-29. EIRP Data (Band 30)

FCC ID: ZNFV350A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 203 of 263	

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]
2502.50	5	QPSK	V	150	286	1 / 0	13.36	5.61	18.97	0.079	33.01	-14.04
2535.00	5	QPSK	V	150	286	1 / 0	13.08	5.85	18.93	0.078	33.01	-14.08
2567.50	5	QPSK	V	150	283	1 / 24	12.52	6.09	18.61	0.073	33.01	-14.40
2502.50	5	16-QAM	V	150	286	1 / 0	12.56	5.61	18.17	0.066	33.01	-14.84
2502.50	5	64-QAM	V	150	286	1 / 0	11.49	5.61	17.10	0.051	33.01	-15.91
2505.00	10	QPSK	V	150	294	1 / 0	13.42	5.63	19.05	0.080	33.01	-13.96
2535.00	10	QPSK	V	150	294	1 / 0	13.00	5.85	18.85	0.077	33.01	-14.16
2565.00	10	QPSK	V	150	294	1 / 0	12.77	6.07	18.84	0.077	33.01	-14.17
2535.00	10	16-QAM	V	150	294	1 / 0	12.31	5.85	18.16	0.065	33.01	-14.85
2505.00	10	64-QAM	V	150	294	1 / 0	11.39	5.63	17.02	0.050	33.01	-15.99
2507.50	15	QPSK	V	150	291	1 / 0	13.56	5.64	19.20	0.083	33.01	-13.81
2535.00	15	QPSK	V	150	291	1 / 0	13.14	5.85	18.99	0.079	33.01	-14.02
2562.50	15	QPSK	V	150	307	1 / 0	12.94	6.05	18.99	0.079	33.01	-14.02
2507.50	15	16-QAM	V	150	291	1 / 0	12.67	5.64	18.31	0.068	33.01	-14.70
2507.50	15	64-QAM	V	150	291	1 / 0	11.61	5.64	17.25	0.053	33.01	-15.76
2510.00	20	QPSK	V	150	290	1 / 99	13.81	5.66	19.47	0.089	33.01	-13.54
2535.00	20	QPSK	V	150	290	1 / 0	13.09	5.85	18.94	0.078	33.01	-14.07
2560.00	20	QPSK	V	150	290	1 / 0	12.90	6.03	18.93	0.078	33.01	-14.08
2535.00	20	16-QAM	V	150	290	1 / 0	12.29	5.85	18.14	0.065	33.01	-14.87
2535.00	20	64-QAM	V	150	290	1 / 0	11.36	5.85	17.21	0.053	33.01	-15.80
2510.00	20	QPSK	H	150	2	1 / 99	13.26	5.66	18.92	0.078	33.01	-14.09
2510.00	20 (WCP)	QPSK	V	150	279	1 / 0	13.78	5.66	19.44	0.088	33.01	-13.57

Table 7-30. EIRP Data (Band 7)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset			Page 204 of 263

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	V	150	349	1 / 0	15.89	5.61	21.50	0.141	33.01	-11.51
2593.00	5	QPSK	V	150	349	1 / 0	16.45	6.27	22.72	0.187	33.01	-10.29
2687.50	5	QPSK	V	150	349	1 / 0	14.69	6.47	21.16	0.131	33.01	-11.85
2593.00	5	16-QAM	V	150	349	1 / 0	15.41	6.27	21.68	0.147	33.01	-11.33
2593.00	5	64-QAM	V	150	349	1 / 0	14.32	6.27	20.59	0.115	33.01	-12.42
2501.00	10	QPSK	V	150	6	1 / 49	15.66	5.63	21.29	0.134	33.01	-11.72
2593.00	10	QPSK	V	150	6	1 / 0	15.65	6.27	21.92	0.156	33.01	-11.09
2685.00	10	QPSK	V	150	1	1 / 49	14.22	6.46	20.68	0.117	33.01	-12.33
2685.00	10	16-QAM	V	150	1	1 / 49	13.13	6.46	19.59	0.091	33.01	-13.42
2685.00	10	64-QAM	V	150	1	1 / 49	12.17	6.46	18.63	0.073	33.01	-14.38
2503.50	15	QPSK	V	150	176	1 / 0	14.48	5.64	20.12	0.103	33.01	-12.89
2593.00	15	QPSK	V	150	176	1 / 0	14.86	6.27	21.13	0.130	33.01	-11.88
2682.50	15	QPSK	V	150	176	1 / 0	14.01	6.46	20.47	0.111	33.01	-12.54
2593.00	15	16-QAM	V	150	176	1 / 0	14.48	6.27	20.75	0.119	33.01	-12.26
2593.00	15	64-QAM	V	150	176	1 / 0	13.41	6.27	19.68	0.093	33.01	-13.33
2506.00	20	QPSK	V	150	350	1 / 0	18.75	5.66	24.41	0.276	33.01	-8.60
2593.00	20	QPSK	V	150	350	1 / 99	17.13	6.27	23.40	0.219	33.01	-9.61
2680.00	20	QPSK	V	150	2	1 / 99	15.59	6.46	22.05	0.160	33.01	-10.96
2510.00	20	16-QAM	V	150	350	1 / 0	18.22	5.66	23.88	0.245	33.01	-9.13
2510.00	20	64-QAM	V	150	350	1 / 0	17.19	5.66	22.85	0.193	33.01	-10.16
2506.00	20	QPSK	H	150	274	1 / 0	18.49	5.66	24.15	0.260	33.01	-8.86
2506.00	20 (WCP)	QPSK	V	150	279	1 / 0	15.00	5.66	20.66	0.116	33.01	-12.35

Table 7-31. EIRP Data (Band 41)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 205 of 263	

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

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Test Setup

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

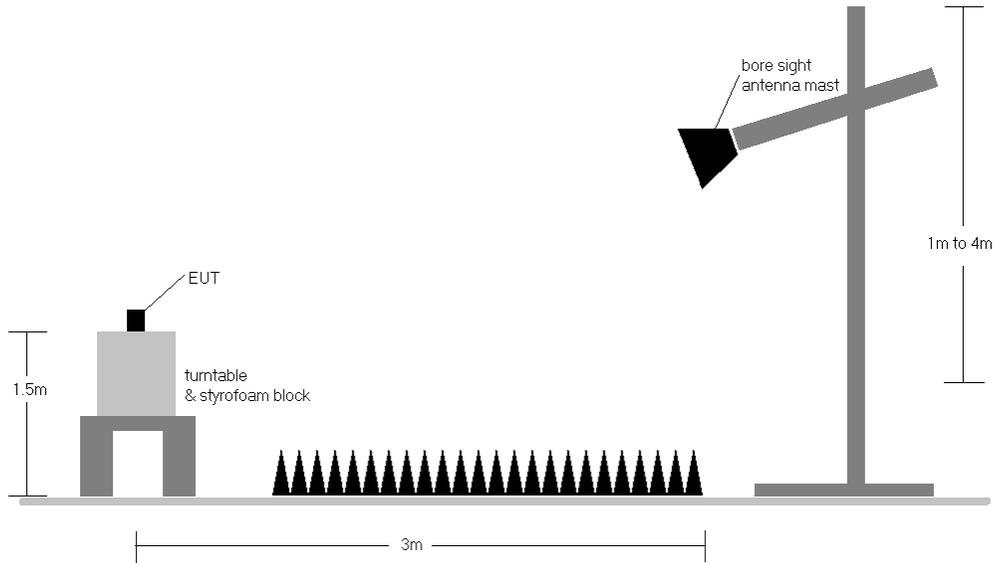


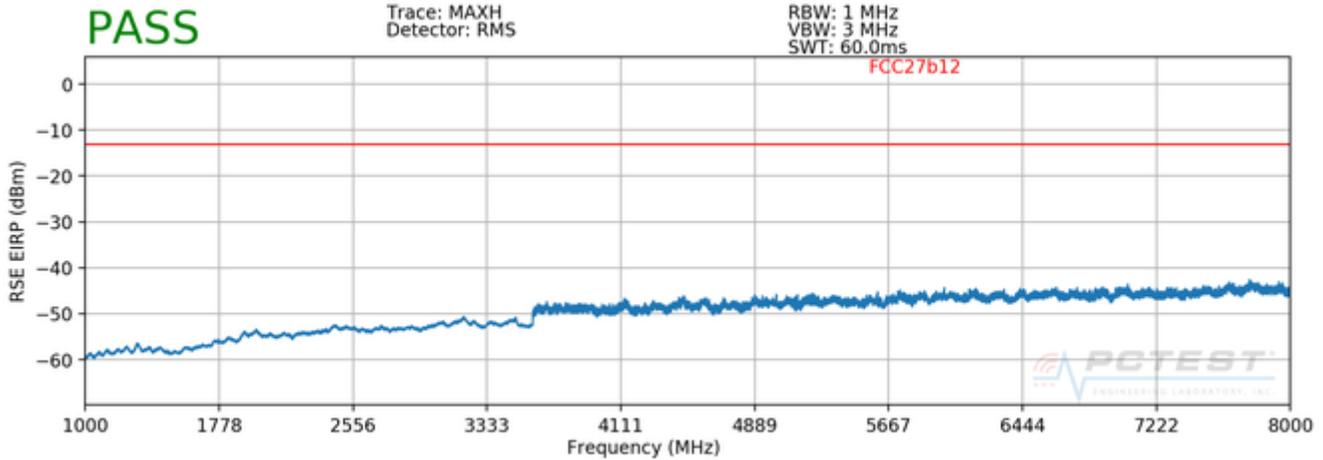
Figure 7-9. Test Instrument & Measurement Setup

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.

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Band 12/17



Plot 7-315. Radiated Spurious Plot above 1GHz (Band 12/17)

OPERATING FREQUENCY: 701.50 MHz
 CHANNEL: 23035
 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]
1403.00	H	-	-	-62.40	3.80	-58.60	-45.6
2104.50	H	150	358	-51.99	4.80	-47.19	-34.2
2806.00	H	-	-	-59.45	5.66	-53.79	-40.8

Table 7-32. Radiated Spurious Data (Band 12/17 – Low Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY: 707.50 MHz
 CHANNEL: 23095
 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]
1415.00	H	-	-	-62.20	3.90	-58.29	-45.3
2122.50	H	150	322	-56.27	4.78	-51.48	-38.5
2830.00	H	-	-	-60.01	5.73	-54.28	-41.3

Table 7-33. Radiated Spurious Data (Band 12/17 – Mid Channel)

OPERATING FREQUENCY: 713.50 MHz
 CHANNEL: 23155
 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]
1427.00	H	-	-	-63.51	4.01	-59.50	-46.5
2140.50	H	150	320	-56.68	4.77	-51.91	-38.9
2854.00	H	-	-	-60.11	5.79	-54.32	-41.3

Table 7-34. Radiated Spurious Data (Band 12/17 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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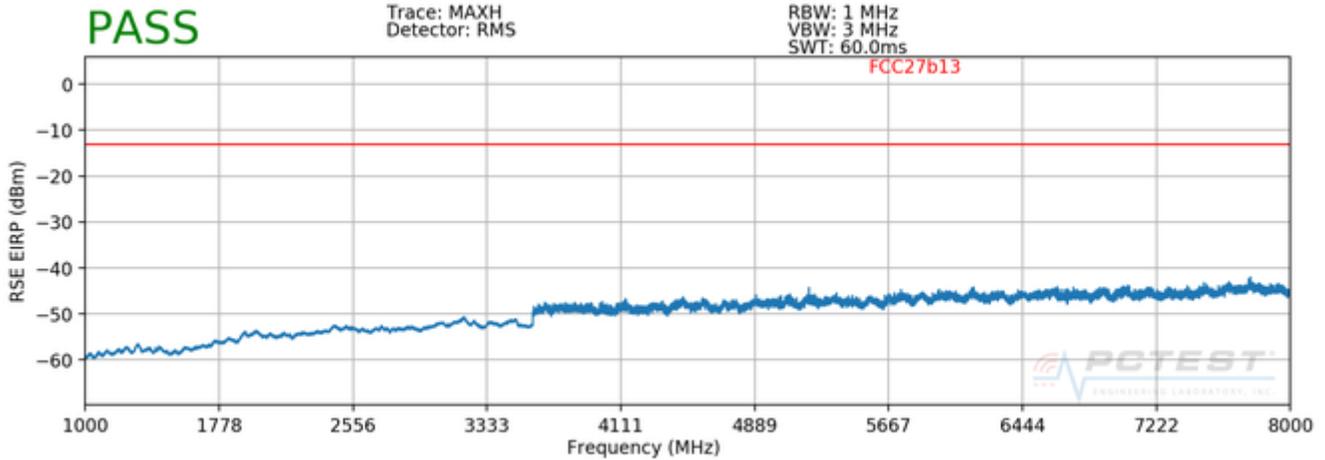
OPERATING FREQUENCY: 707.50 MHz
 CHANNEL: 23095
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
1415.00	H	-	-	-67.98	3.90	-64.08	-51.1

Table 7-35. Radiated Spurious Data (Band 12/17 – High Channel) with WCP

FCC ID: ZNFV350A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 13



Plot 7-316. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY: 779.50 MHz
 CHANNEL: 23205
 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]
2338.50	H	-	-	-65.11	5.73	-59.39	-46.4
3118.00	H	-	-	-65.06	7.00	-58.06	-45.1
3897.50	H	-	-	-66.43	8.55	-57.87	-44.9

Table 7-36. Radiated Spurious Data (Band 13 – Low Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 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]
2346.00	H	-	-	-64.26	5.72	-58.53	-45.5
3128.00	H	-	-	-64.49	6.93	-57.56	-44.6

Table 7-37. Radiated Spurious Data (Band 13 – Mid Channel)

OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 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]
2346.00	H	-	-	-64.22	5.72	-58.49	-45.5
3128.00	H	-	-	-64.51	6.93	-57.58	-44.6

Table 7-38. Radiated Spurious Data (Band 13 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.00 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]
1559.00	H	-	-	-69.87	5.86	-64.00	-24.0

Table 7-39. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

OPERATING FREQUENCY: 782.00 MHz
 CHANNEL: 23230
 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]
2346.00	H	-	-	-67.52	5.72	-61.80	-48.8

Table 7-40. Radiated Spurious Data (Band 13 – Mid Channel) with WCP

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
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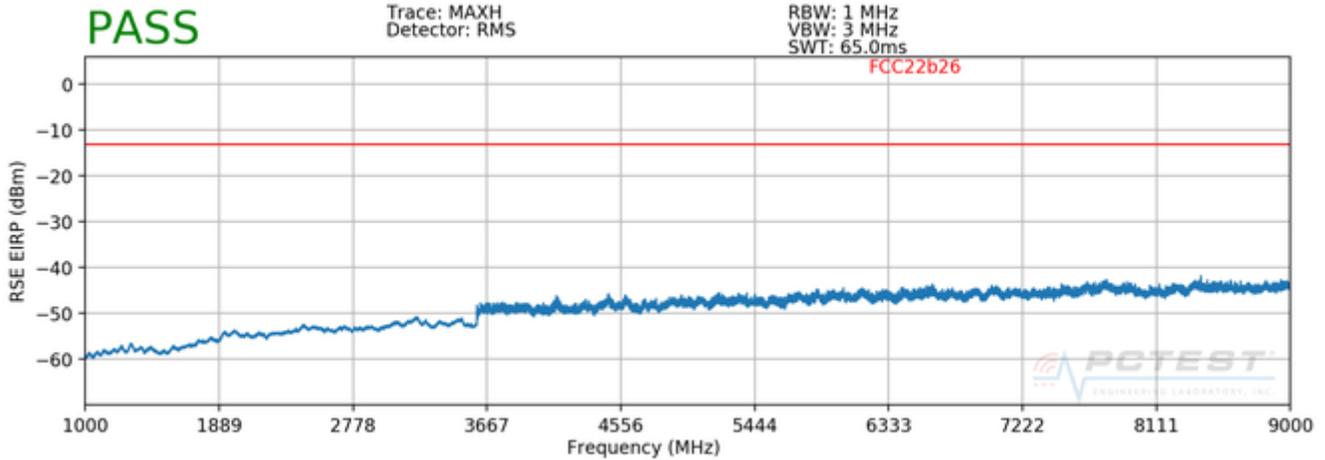
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	5.00	MHz
DISTANCE:	3	meters
NARROWBAND EMISSION LIMIT:	-50	dBm
WIDEBAND EMISSION LIMIT:	-40	dBm/MHz

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	-	-	-72.63	5.88	-66.75	-26.8

Table 7-41. Radiated Spurious Data (Band 13 – 1559-1610MHz Band) with WCP

FCC ID: ZNFV350A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 26/5



Plot 7-317. Radiated Spurious Plot above 1GHz (Band 26/5)

OPERATING FREQUENCY: 829.00 MHz
 CHANNEL: 26840
 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]
1658.00	V	-	-	-66.44	5.87	-60.57	-47.6
2487.00	V	-	-	-59.98	5.61	-54.37	-41.4
3316.00	V	-	-	-61.22	7.78	-53.44	-40.4

Table 7-42. Radiated Spurious Data (Band 26/5 – Low Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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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	V	-	-	-65.72	5.84	-59.88	-46.9
2509.50	V	-	-	-60.62	5.66	-54.96	-42.0
3346.00	V	-	-	-60.87	7.89	-52.98	-40.0

Table 7-43. Radiated Spurious Data (Band 26/5 – Mid Channel)

OPERATING FREQUENCY: 844.00 MHz
 CHANNEL: 26990
 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]
1688.00	V	-	-	-65.37	5.81	-59.55	-46.6
2532.00	V	-	-	-60.56	5.77	-54.79	-41.8
3376.00	V	-	-	-62.62	7.99	-54.62	-41.6

Table 7-44. Radiated Spurious Data (Band 26/5 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 836.50 MHz
 CHANNEL: 26915
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

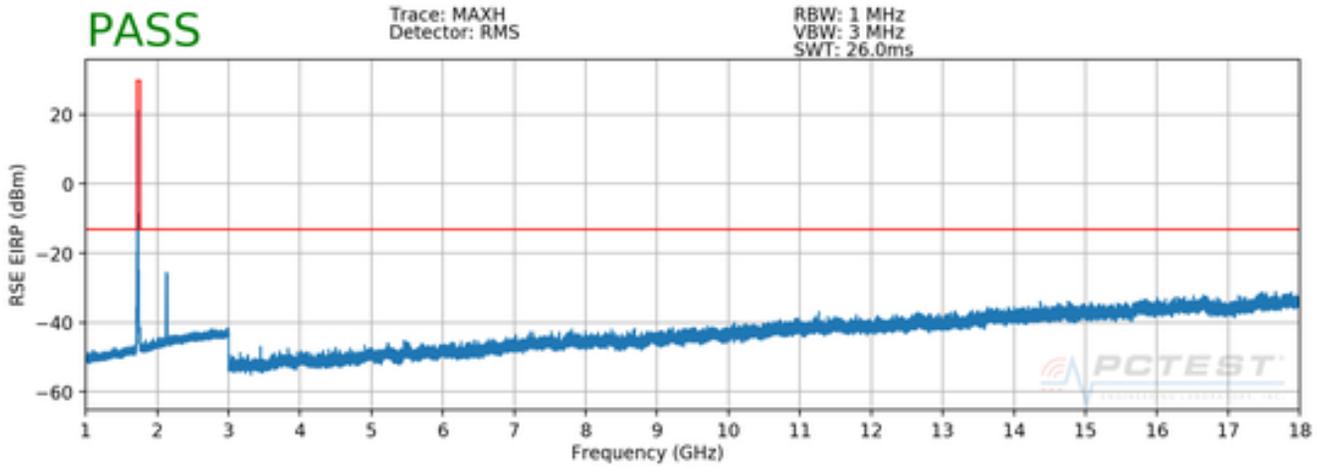
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	V	-	-	-65.32	5.84	-59.48	-46.5
2509.50	V	-	-	-60.88	5.66	-55.22	-42.2
3346.00	V	-	-	-61.05	7.89	-53.16	-40.2

Table 7-45. Radiated Spurious Data (Band 26/5 – Mid Channel) with WCP

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 66/4

FCC27b4



Plot 7-318. Radiated Spurious Plot above 1GHz (Band 66/4)

OPERATING FREQUENCY: 1720.00 MHz
 CHANNEL: 20050
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
3440.00	V	-	-	-62.99	6.51	-56.47	-43.5
5160.00	V	-	-	-62.36	8.44	-53.92	-40.9

Table 7-46. Radiated Spurious Data (Band 66/4 – Low Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY: 1732.50 MHz
 CHANNEL: 20175
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
3465.00	V	-	-	-52.31	6.56	-45.76	-32.8
5197.50	V	-	-	-57.79	8.45	-49.34	-36.3

Table 7-47. Radiated Spurious Data (Band 66/4 – Mid Channel)

OPERATING FREQUENCY: 1745.00 MHz
 CHANNEL: 20300
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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	V	-	-	-56.60	6.59	-50.01	-37.0
5235.00	V	-	-	-55.54	8.42	-47.12	-34.1

Table 7-48. Radiated Spurious Data (Band 66/4 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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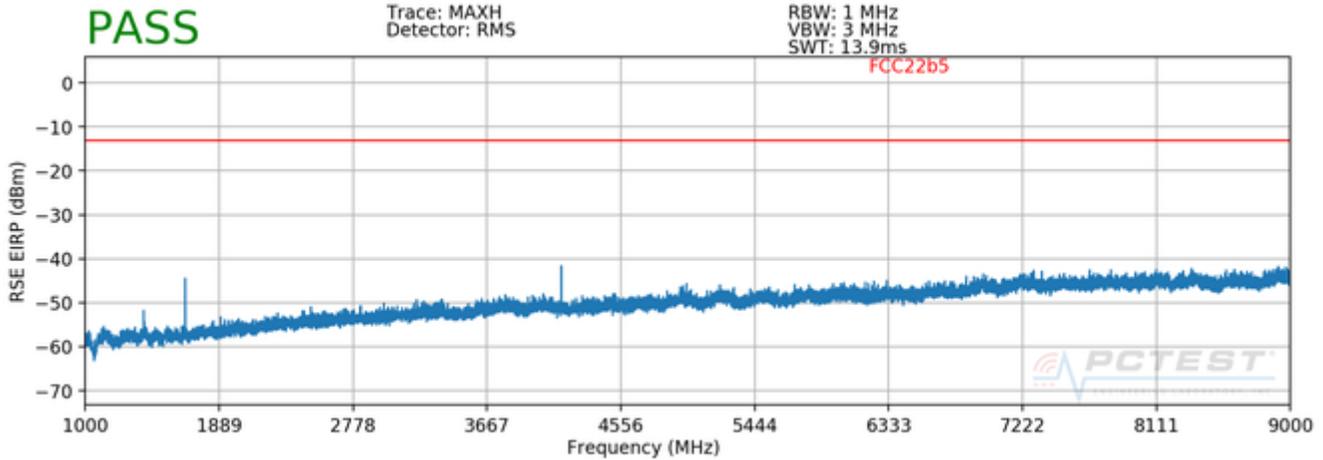
OPERATING FREQUENCY: 1720.00 MHz
 CHANNEL: 20050
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3440.00	V	260	24	-56.37	6.51	-49.85	-36.9
5160.00	V	-	-	-61.01	8.44	-52.57	-39.6
6880.00	V	-	-	-58.26	8.71	-49.54	-36.5

Table 7-49. Radiated Spurious Data (Band 66/4 – High Channel) with WCP

FCC ID: ZNFV350A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 25/2



Plot 7-319. Radiated Spurious Plot above 1GHz (Band 25/2)

OPERATING FREQUENCY: 1857.50 MHz
 CHANNEL: 18675
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 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]
3715.00	H	-	-	-49.93	6.78	-43.15	-30.1
5572.50	H	-	-	-61.44	8.44	-53.00	-40.0

Table 7-50. Radiated Spurious Data (Band 25/2 – Low Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1880.00 MHz
 CHANNEL: 18900
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 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	-	-	-61.03	6.84	-54.19	-41.2
5640.00	H	-	-	-60.80	8.52	-52.29	-39.3

Table 7-51. Radiated Spurious Data (Band 25/2 – Mid Channel)

OPERATING FREQUENCY: 1902.50 MHz
 CHANNEL: 19125
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 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]
3805.00	H	-	-	-54.47	6.95	-47.52	-34.5
5707.50	H	-	-	-54.55	8.57	-45.97	-33.0

Table 7-52. Radiated Spurious Data (Band 25 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY: 1902.50 MHz
 CHANNEL: 19125
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 15.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

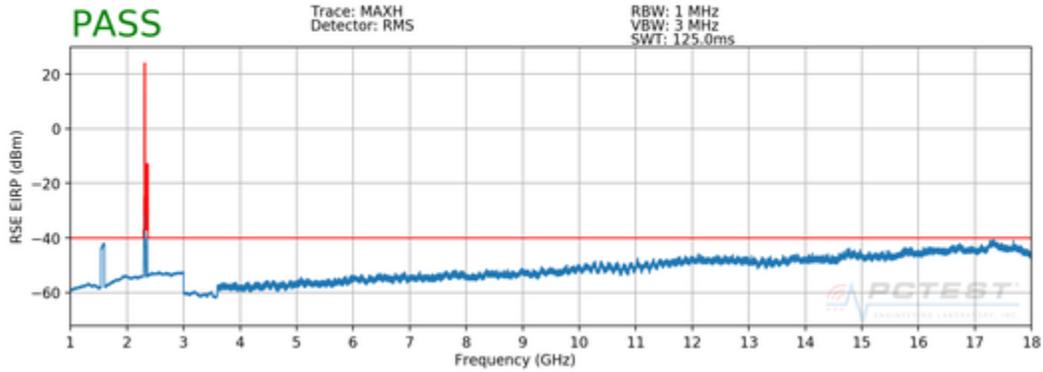
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3805.00	H	-	-	-66.82	6.85	-59.97	-47.0
5707.50	H	-	-	-66.73	8.53	-58.20	-45.2

Table 7-53. Radiated Spurious Data (Band 25 – High Channel) with WCP

FCC ID: ZNFV350A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 30

FCC27b30



Plot 7-320. Radiated Spurious Plot 1GHz - 18GHz (Band 30)

OPERATING FREQUENCY: 2307.50 MHz
 CHANNEL: 27685
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 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]
4615.00	H	-	-	-62.33	9.41	-52.92	-12.9
6922.50	H	-	-	-63.94	11.41	-52.52	-12.5
9230.00	H	-	-	-65.00	13.41	-51.59	-11.6

Table 7-54. Radiated Spurious Data (Band 30 – Low Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY: 2310.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 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]
1570.00	H	-	-	-51.78	8.74	-43.04	-3.0
4620.00	H	-	-	-65.09	9.42	-55.68	-15.7
6930.00	H	-	-	-64.27	11.42	-52.85	-12.9
9240.00	H	-	-	-65.10	13.41	-51.69	-11.7

Table 7-55. Radiated Spurious Data (Band 30 – Mid Channel)

OPERATING FREQUENCY: 2312.50 MHz
 CHANNEL: 27735
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 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]
4625.00	H	-	-	-65.62	9.43	-56.19	-16.2
6937.50	H	-	-	-64.53	11.43	-53.10	-13.1
9250.00	H	-	-	-65.16	13.41	-51.75	-11.8

Table 7-56. Radiated Spurious Data (Band 30 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 225 of 263	

OPERATING FREQUENCY: 2307.50 MHz
 CHANNEL: 27685
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

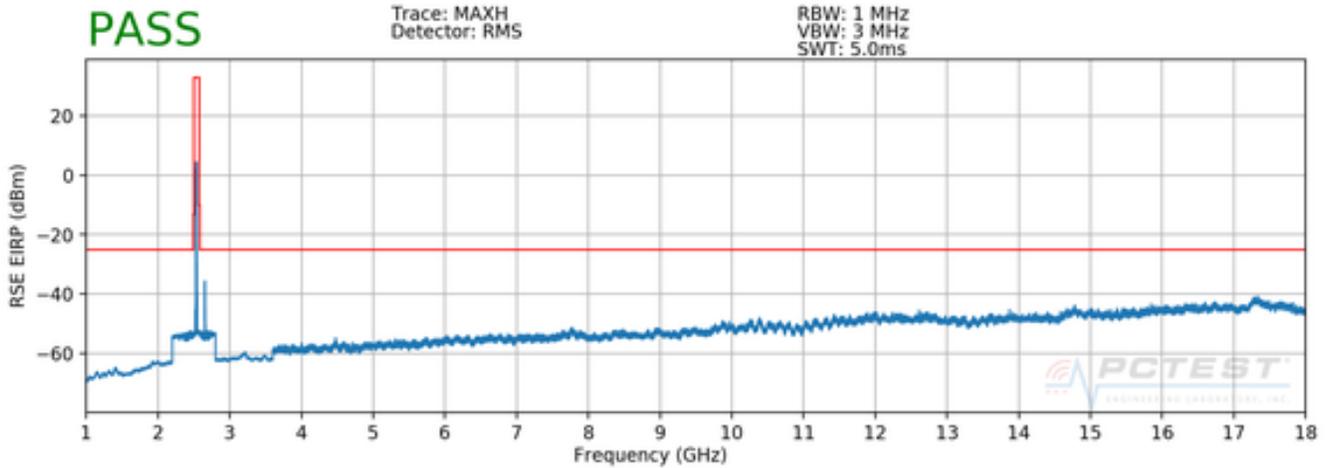
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
4615.00	H	-	-	-63.88	9.41	-54.47	-14.5
6922.50	H	-	-	-62.19	11.41	-50.77	-10.8
9230.00	H	-	-	-63.38	13.41	-49.97	-10.0

Table 7-57. Radiated Spurious Data (Band 30 – Low Channel) with WCP

FCC ID: ZNFV350A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 226 of 263	

Band 7

FCC27b7



Plot 7-321. Radiated Spurious Plot 1GHz - 18GHz (Band 7)

OPERATING FREQUENCY: 2510.00 MHz
 CHANNEL: 20850
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
5020.00	V	-	-	-62.22	8.35	-53.87	-28.9
7530.00	V	-	-	-58.46	8.45	-50.01	-25.0
10040.00	V	-	-	-57.81	9.84	-47.96	-23.0

Table 7-58. Radiated Spurious Data (Band 7 – Low Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 227 of 263		

OPERATING FREQUENCY: 2535.00 MHz
 CHANNEL: 21100
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
5070.00	V	-	-	-62.82	8.39	-54.43	-29.4
7605.00	V	-	-	-58.99	8.51	-50.48	-25.5
10140.00	V	-	-	-57.07	9.70	-47.37	-22.4

Table 7-59. Radiated Spurious Data (Band 7 – Mid Channel)

OPERATING FREQUENCY: 2560.00 MHz
 CHANNEL: 21350
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
5120.00	V	-	-	-61.36	8.42	-52.93	-27.9
7680.00	V	-	-	-57.84	8.63	-49.20	-24.2
10240.00	V	-	-	-56.12	9.71	-46.41	-21.4

Table 7-60. Radiated Spurious Data (Band 7 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 228 of 263	

OPERATING FREQUENCY: 2510.00 MHz
 CHANNEL: 20850
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

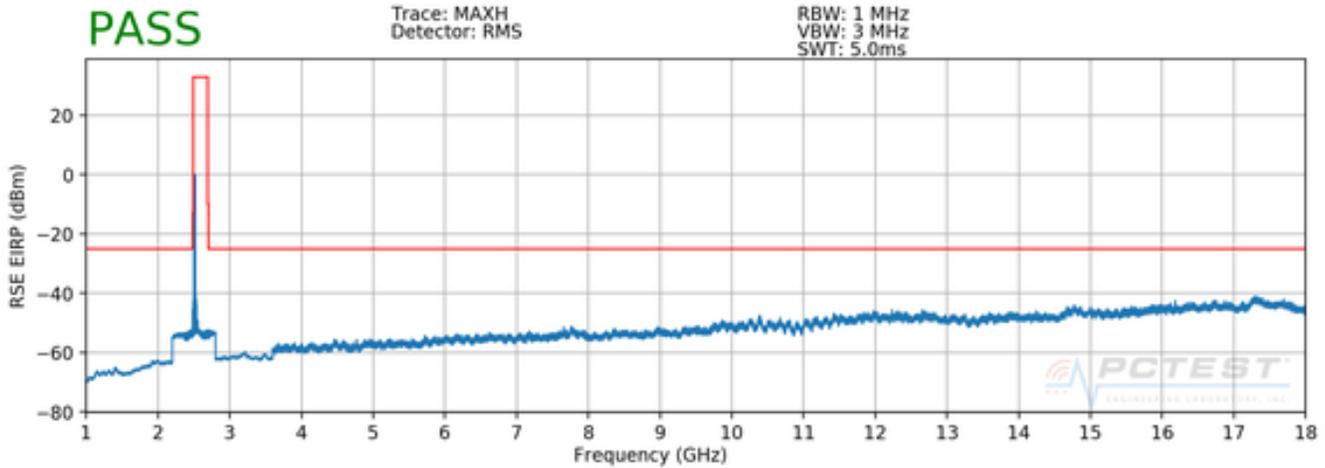
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5020.00	H	-	-	-63.93	8.35	-55.59	-30.6

Table 7-61. Radiated Spurious Data (Band 7 – High Channel) with WCP

FCC ID: ZNFV350A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset			Page 229 of 263

Band 41

FCC27b41



Plot 7-322. Radiated Spurious Plot 1GHz - 18GHz (Band 41)

OPERATING FREQUENCY: 2510.00 MHz
 CHANNEL: 39790
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
5020.00	H	-	-	-64.86	10.11	-54.75	-29.7
7530.00	H	-	-	-64.36	12.11	-52.25	-27.2
10040.00	H	-	-	-63.07	13.16	-49.91	-24.9
12550.00	H	-	-	-59.62	13.26	-46.36	-21.4

Table 7-62. Radiated Spurious Data (Band 41 – Low Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 230 of 263		

OPERATING FREQUENCY: 2593.00 MHz
 CHANNEL: 40620
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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	-	-	-65.49	10.27	-55.22	-30.2
7779.00	H	131	224	-62.26	12.28	-49.98	-25.0
10372.00	H	-	-	-61.07	13.12	-47.95	-23.0

Table 7-63. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY: 2680.00 MHz
 CHANNEL: 41490
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
5360.00	H	-	-	-65.47	10.40	-55.06	-30.1
8040.00	H	-	-	-65.37	12.55	-52.82	-27.8
10720.00	H	-	-	-62.82	13.11	-49.71	-24.7

Table 7-64. Radiated Spurious Data (Band 41 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 231 of 263

OPERATING FREQUENCY: 2510.00 MHz
 CHANNEL: 39790
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 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]
5020.00	H	-	-	-63.62	10.11	-53.51	-28.5
7530.00	H	-	-	-62.72	12.11	-50.61	-25.6

Table 7-65. Radiated Spurious Data (Band 41 – Low Channel) with WCP

FCC ID: ZNFV350A			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 232 of 263	

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: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 233 of 263

Test Setup

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

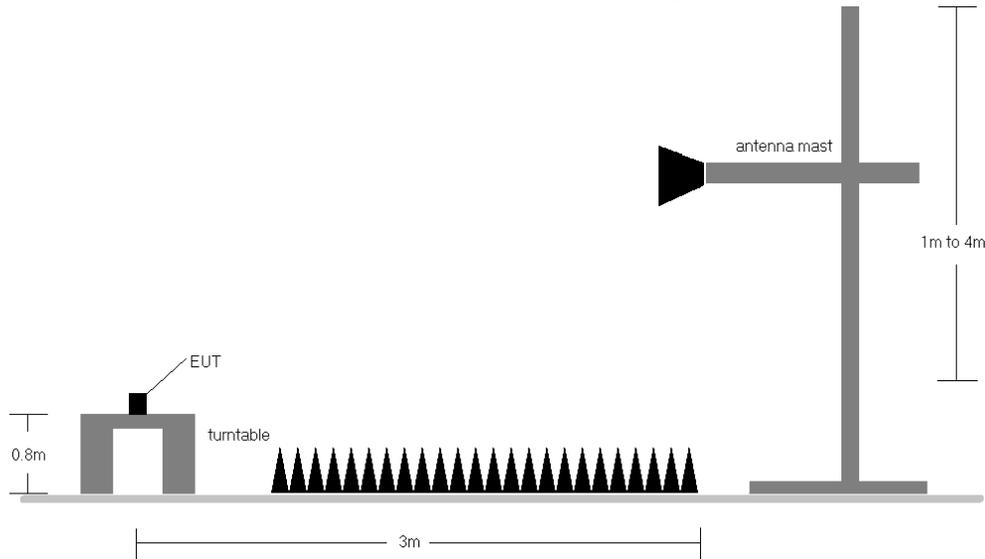


Figure 7-10. Test Instrument & Measurement Setup

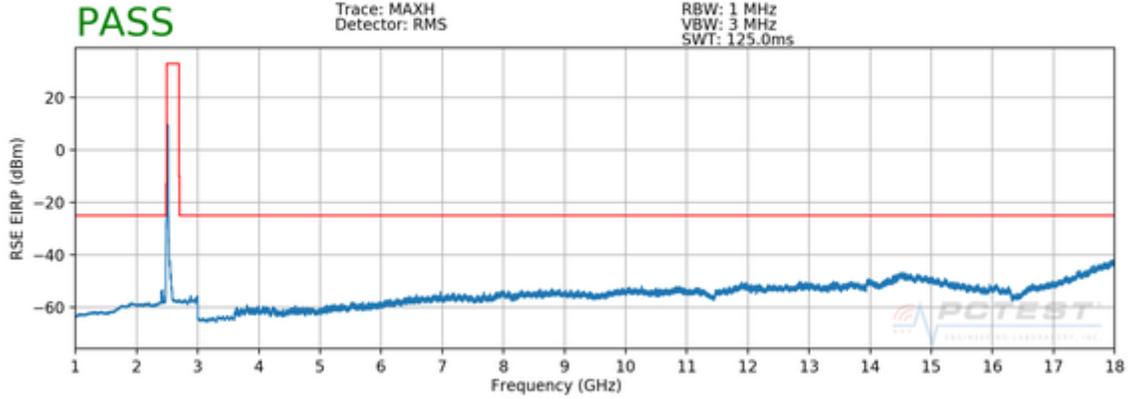
Test Notes

- 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) 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.
- 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) No significant emissions were found as a result of two uplink carriers operating contiguously.

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 234 of 263

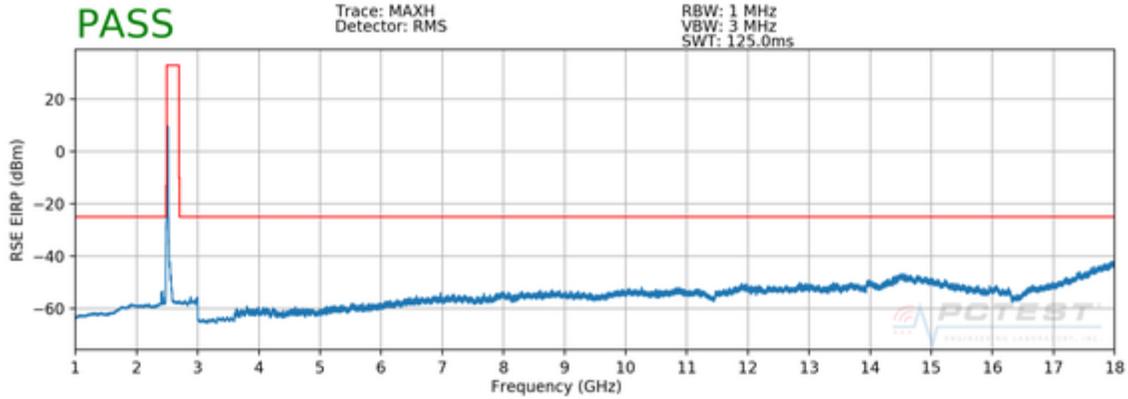
7.10.1 Uplink Carrier Aggregation Radiated Measurements Band 41

FCC27b41



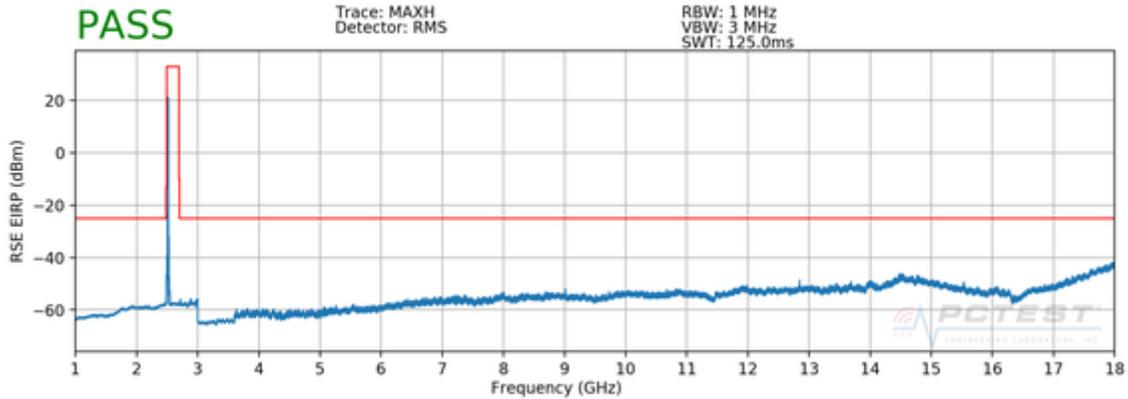
Plot 7-66. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0, Ant. Pol. H) – Low Channel

FCC27b41



Plot 7-67. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0, Ant. Pol. V) – Low Channel

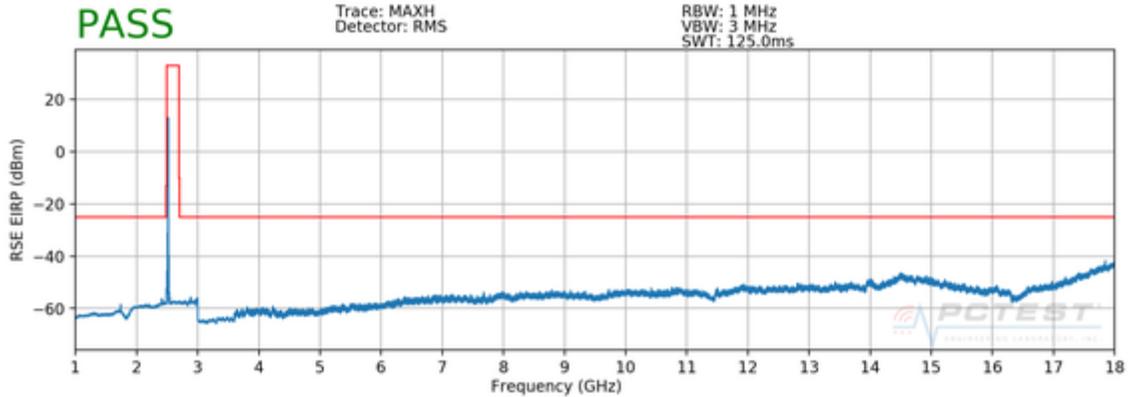
FCC27b41



Plot 7-68. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0, Ant. Pol. H) – Low Channel

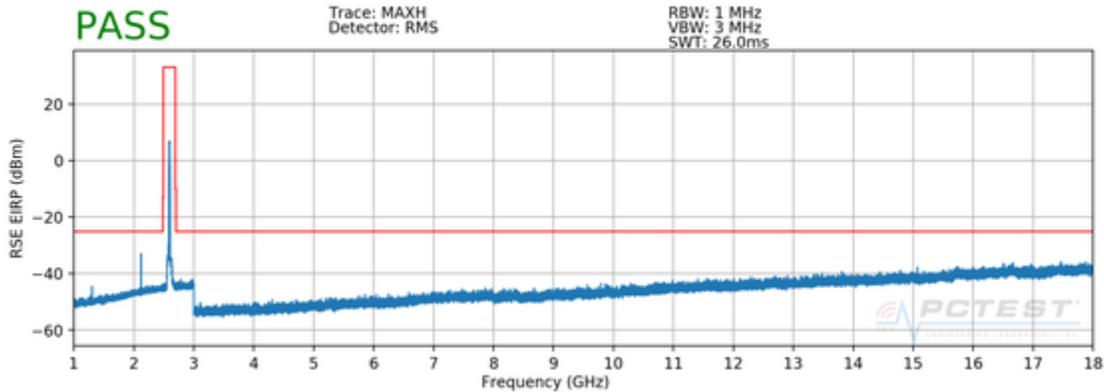
FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 235 of 263

FCC27b41



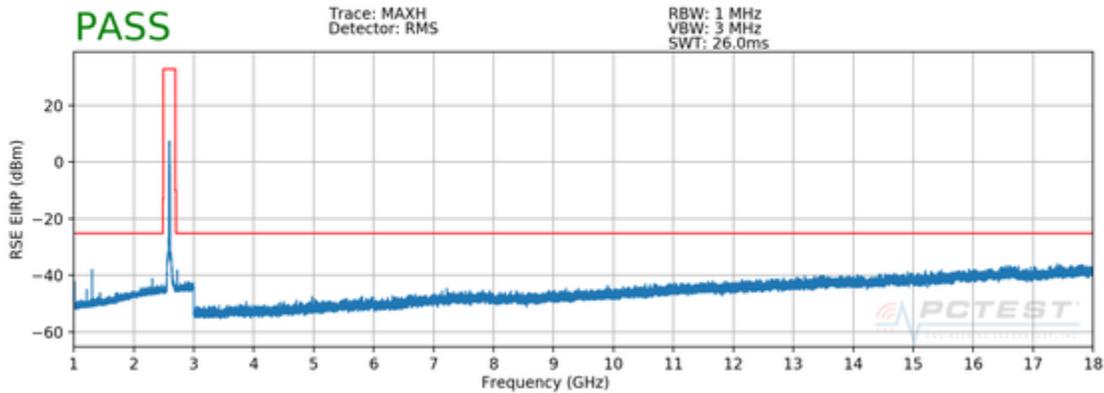
Plot 7-69. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0, Ant. Pol. V) – Low Channel

FCC27b41



Plot 7-70. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0, Ant. Pol. H) – Mid Channel

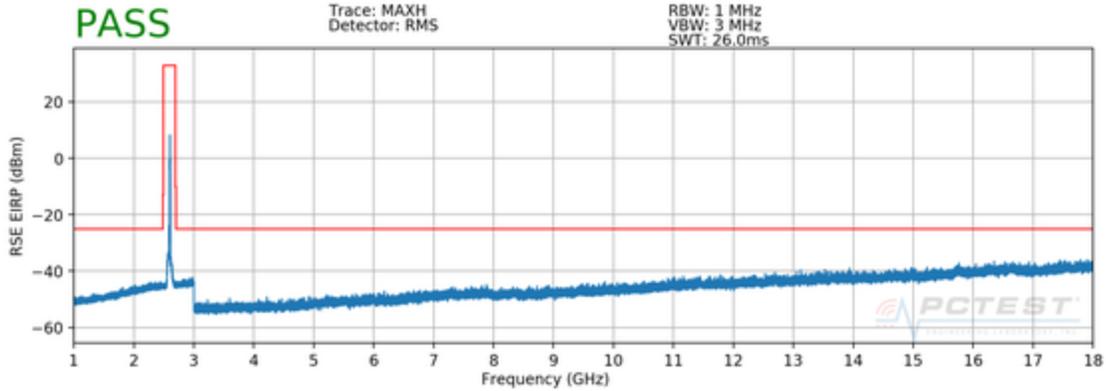
FCC27b41



Plot 7-71. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0, Ant. Pol. V) – Mid Channel

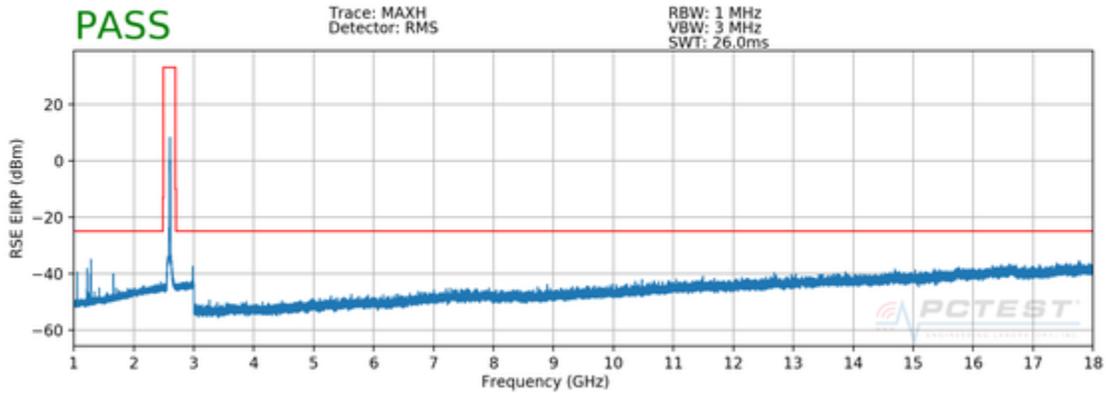
FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 236 of 263

FCC27b41



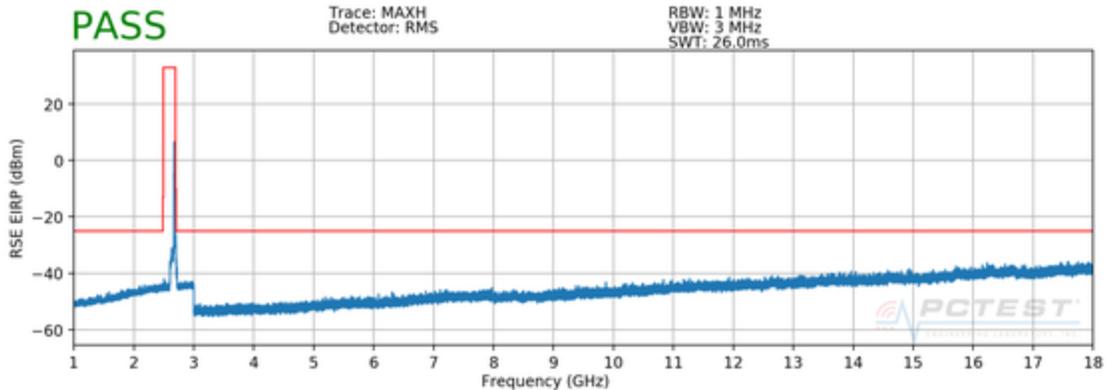
Plot 7-72. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0, Ant. Pol. H) – Mid Channel

FCC27b41



Plot 7-73. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0, Ant. Pol. V) – Mid Channel

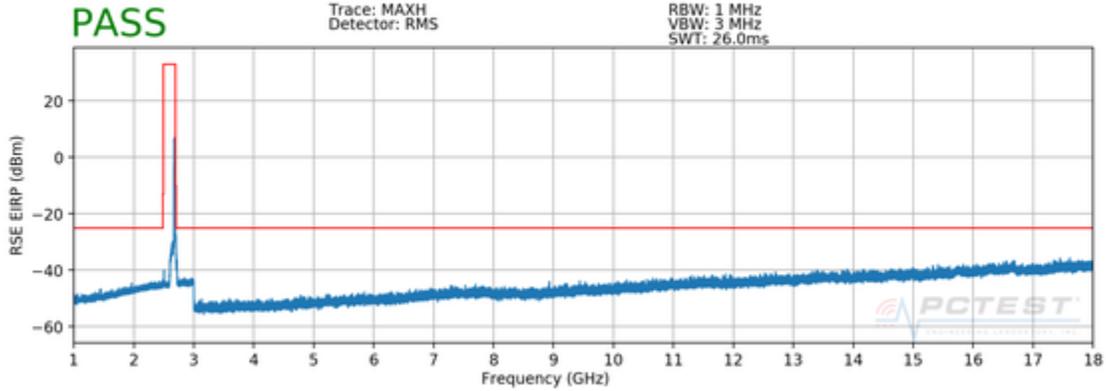
FCC27b41



Plot 7-74. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0, Ant. Pol. H) – High Channel

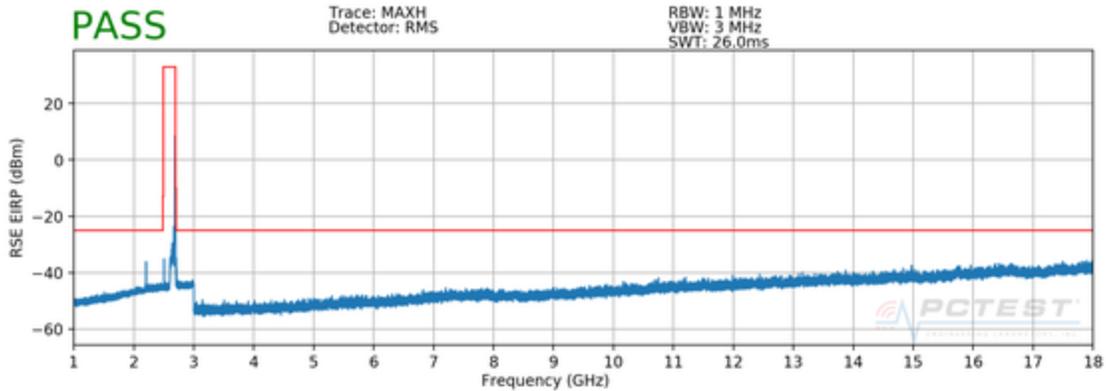
FCC ID: ZNFV350A	 PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 237 of 263

FCC27b41



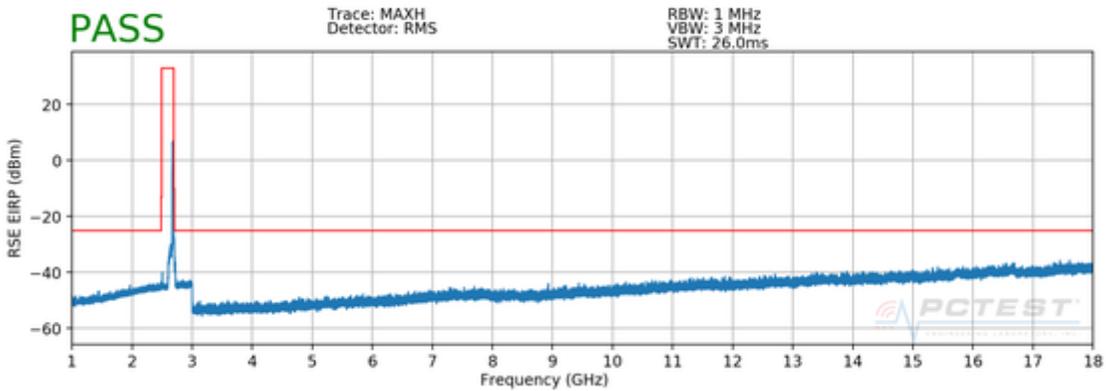
Plot 7-75. Radiated Spurious Plot (ULCA B41 PCC: RB 100 Offset 0, SCC: RB 100 Offset 0, Ant. Pol. V) – High Channel

FCC27b41



Plot 7-76. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0, Ant. Pol. H) – High Channel

FCC27b41



Plot 7-77. Radiated Spurious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0, Ant. Pol. V) – High Channel

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 238 of 263

OPERATING FREQUENCY (PCC): 2506.00 MHz
 OPERATING FREQUENCY (SCC): 2525.80 MHz
 CHANNEL (PCC): 39750
 CHANNEL (SCC): 39948
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20 + 20 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]
5012.00	H	-	-	-73.42	8.96	-64.46	-64.5
7518.00	H	-	-	-68.49	9.13	-59.36	-59.4
10024.00	H	-	-	-66.82	9.36	-57.46	-57.5

Table 7-78. Radiated Spurious Data (ULCA B41 - PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Low Channel)

OPERATING FREQUENCY (SCC): 2593.00 MHz
 OPERATING FREQUENCY (PCC): 2612.80 MHz
 CHANNEL (SCC): 40620
 CHANNEL (PCC): 40818
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20 + 20 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]
5186.00	H	-	-	-73.25	8.88	-64.37	-64.4
7779.00	H	-	-	-69.56	9.15	-60.41	-60.4
10372.00	H	-	-	-67.58	9.36	-58.22	-58.2

Table 7-79. Radiated Spurious Data (ULCA B41 - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Mid Channel)

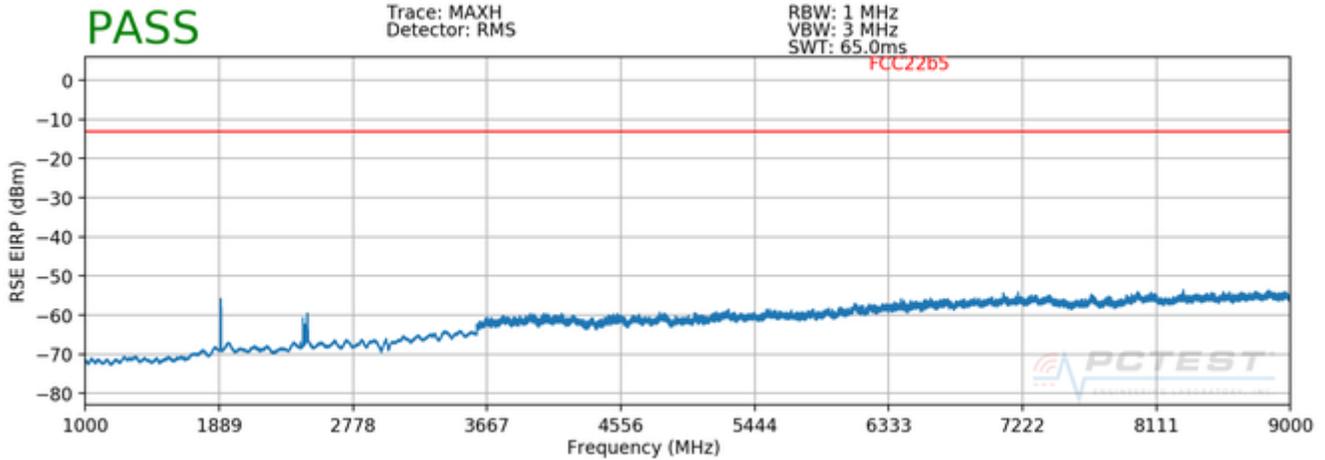
OPERATING FREQUENCY (PCC): 2660.20 MHz
 OPERATING FREQUENCY (SCC): 2680.00 MHz
 CHANNEL (PCC): 41292
 CHANNEL (SCC): 41490
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20 + 20 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
5320.40	H	-	-	-73.22	8.96	-64.26	-64.3
7980.60	H	-	-	-68.52	9.13	-59.39	-59.4
10640.80	H	-	-	-67.13	9.36	-57.77	-57.8

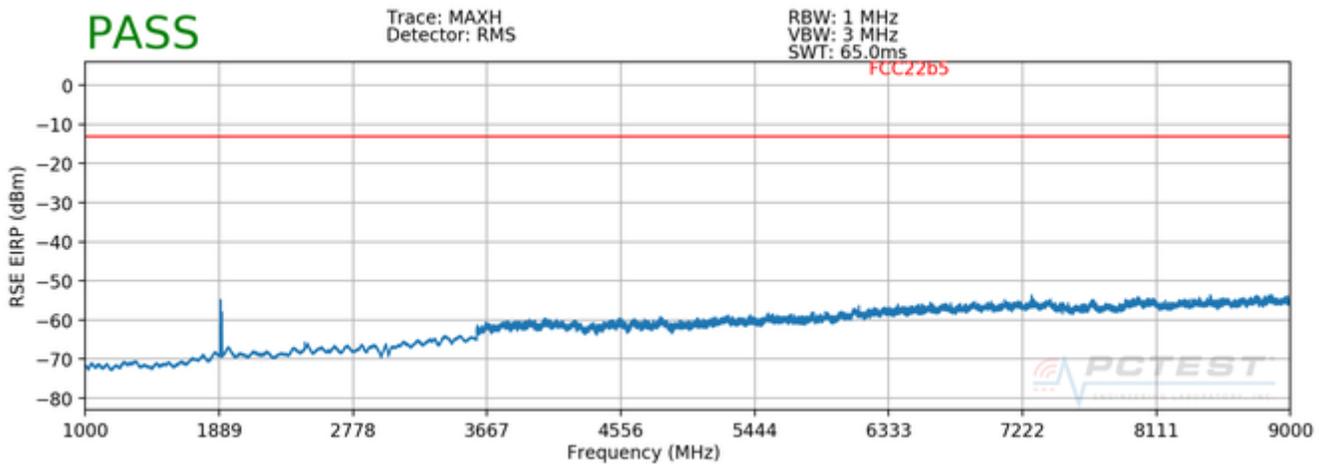
Table 7-80. Radiated Spurious Data (ULCA B41 - PCC: RB 1 Offset 0, SCC: RB 1 Offset 49 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 239 of 263	

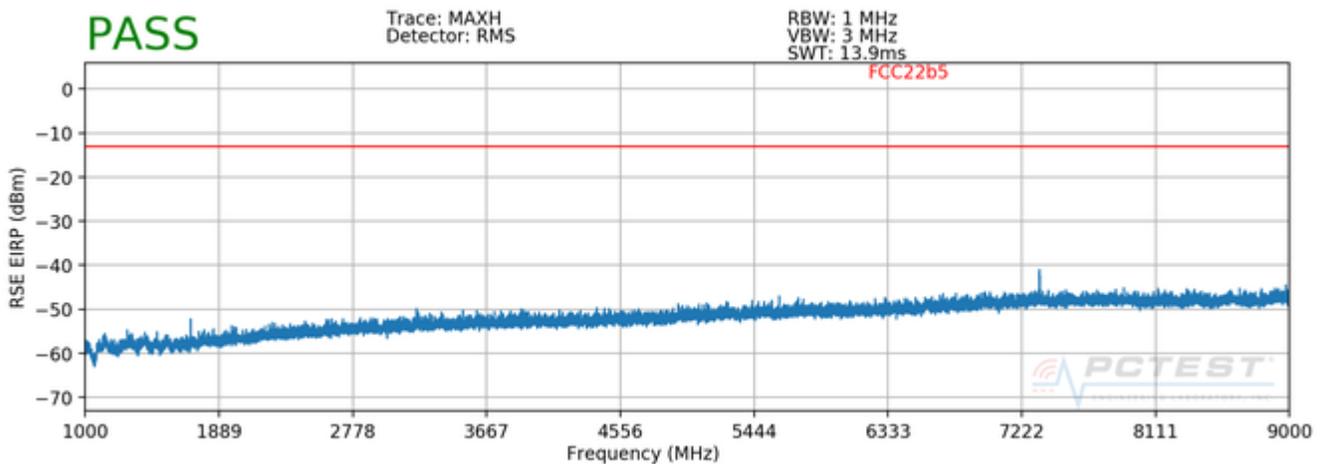
7.10.2 Uplink Carrier Aggregation Radiated Measurements Band 5



Plot 7-81. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. H – Low Channel)

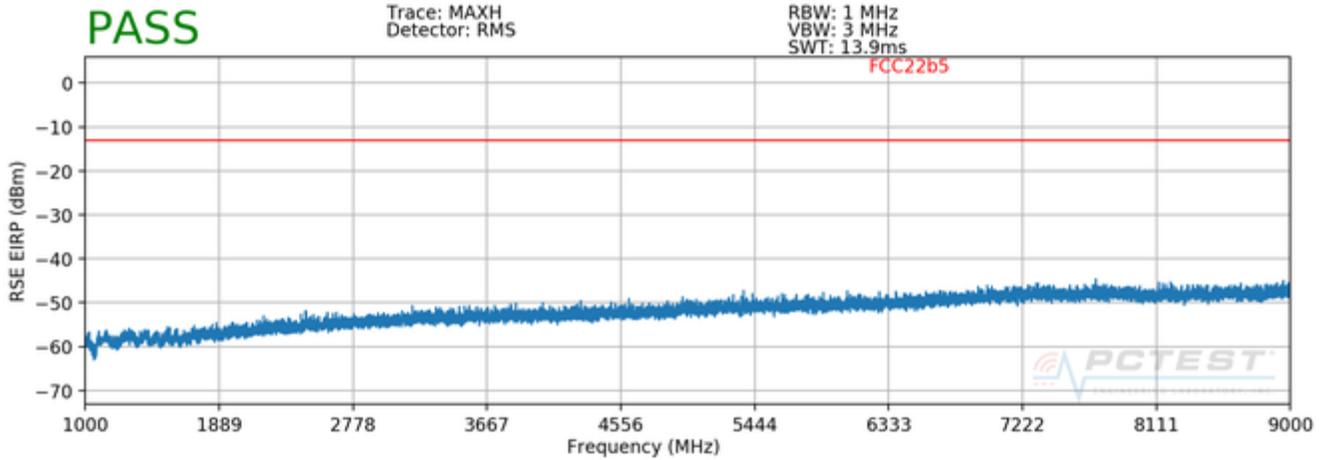


Plot 7-82. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. V – Low Channel)

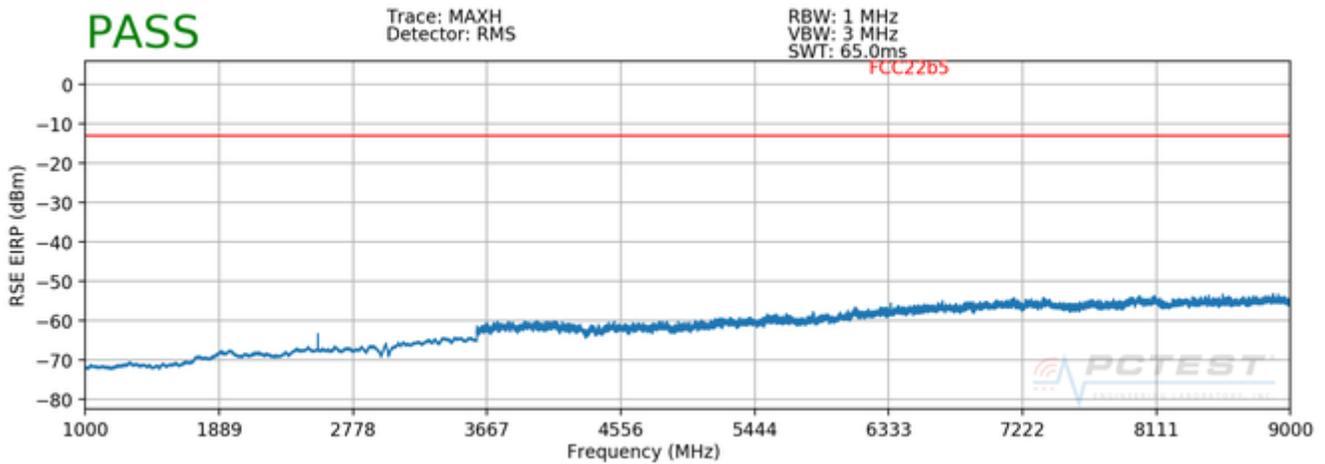


Plot 7-83. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. H – Mid Channel)

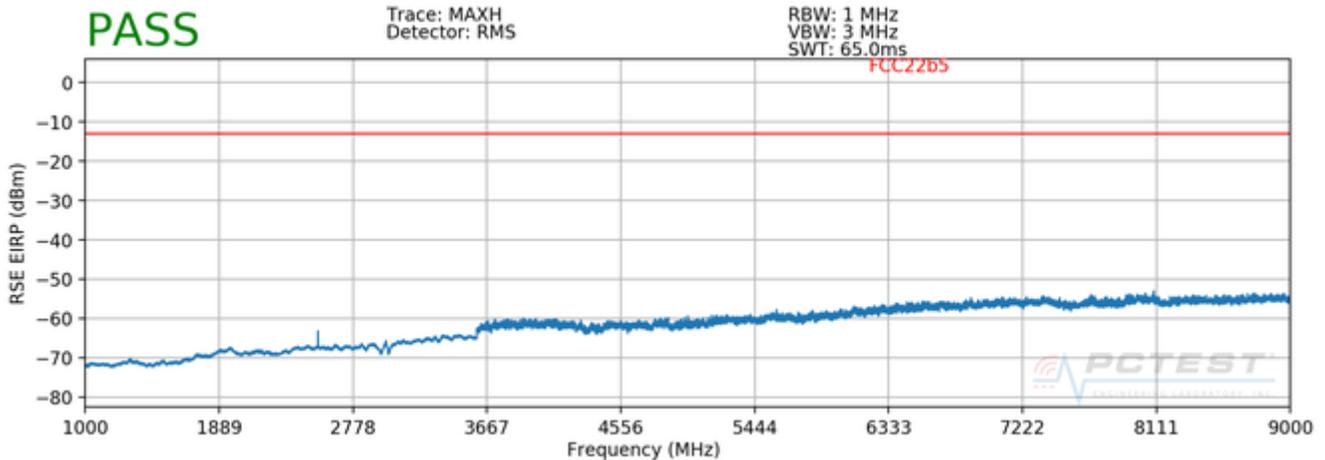
FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 240 of 263



Plot 7-84. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. V – Mid Channel)

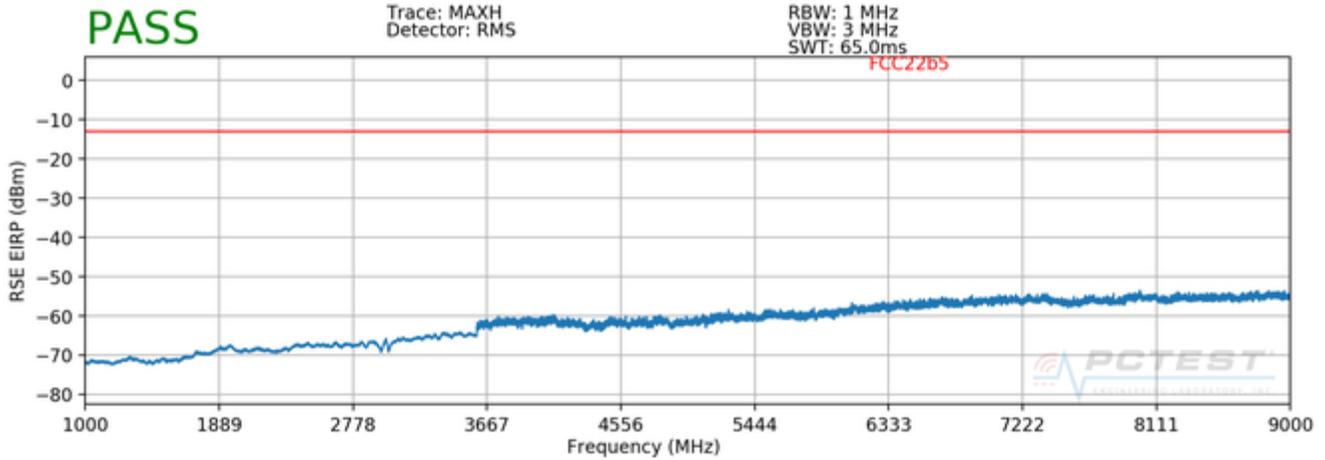


Plot 7-85. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. H – High Channel)

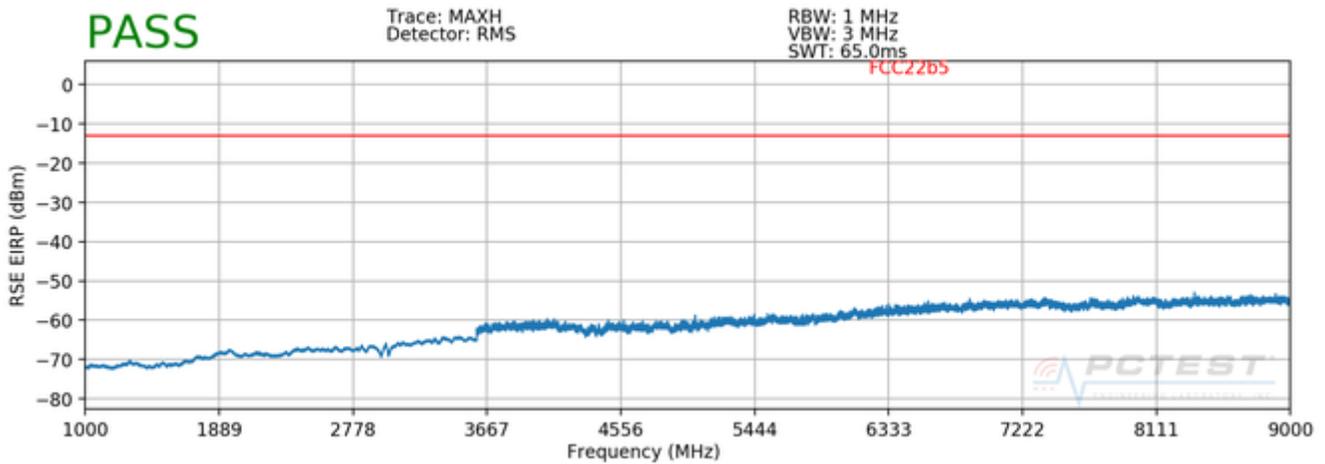


Plot 7-86. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. V – High Channel)

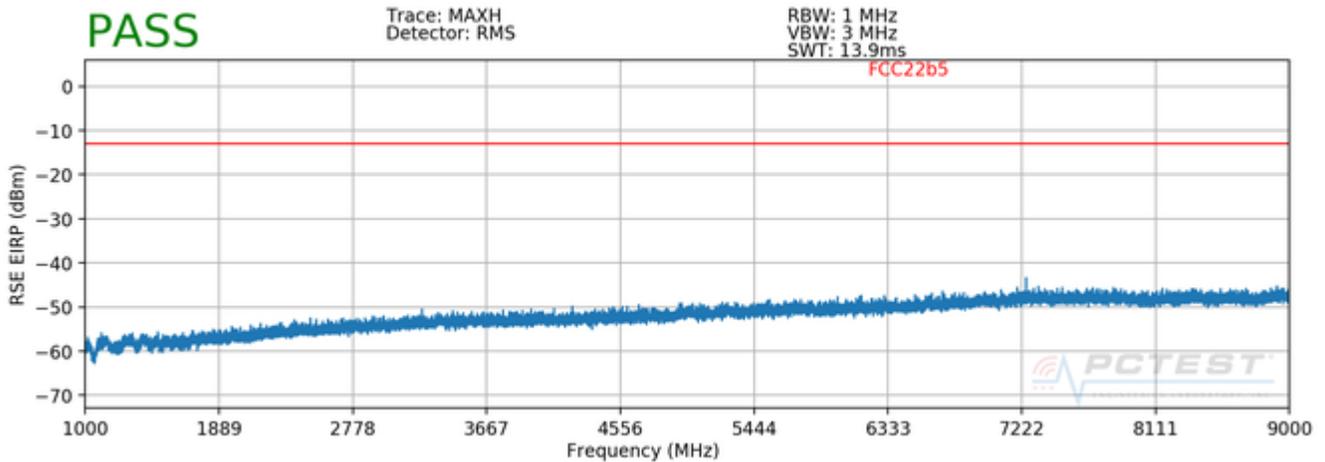
FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 241 of 263



Plot 7-87. Radiated Spurious Plot (ULCA B5- 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. H - Low Channel)

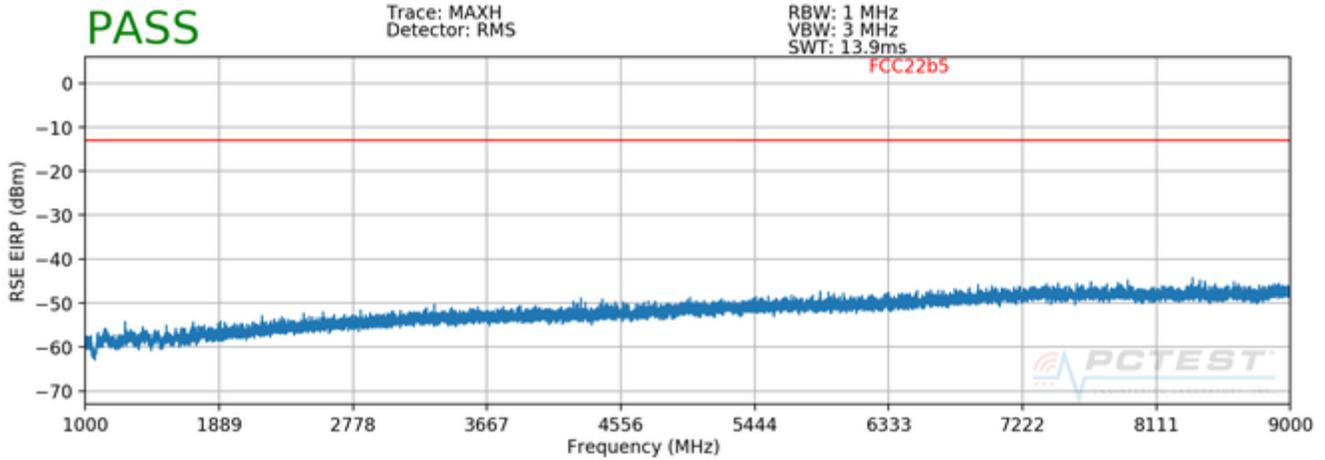


Plot 7-88. Radiated Spurious Plot (ULCA B5- 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. V - Low Channel)

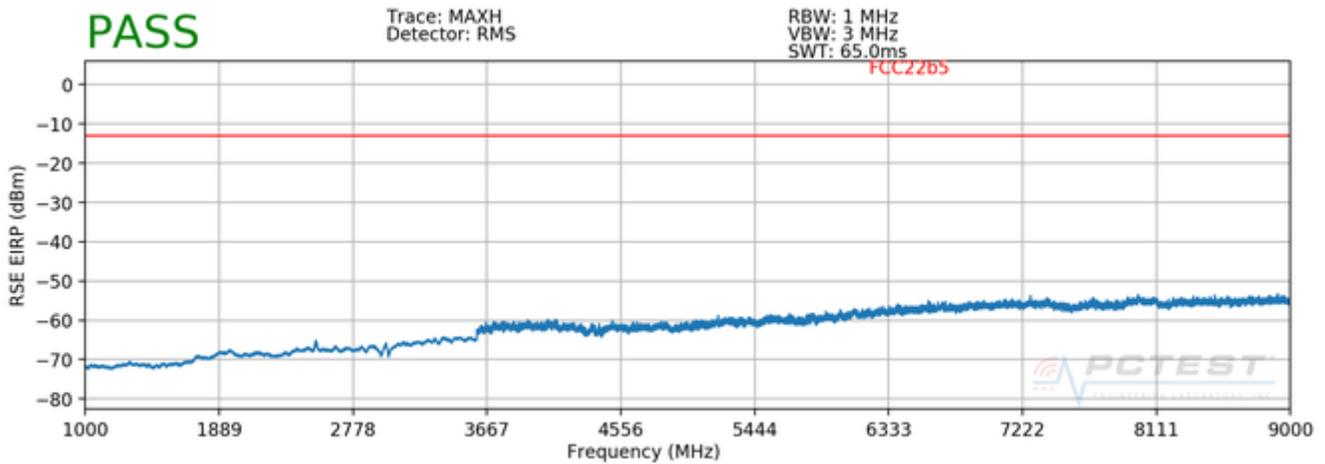


Plot 7-89. Radiated Spurious Plot (ULCA B5- 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. H - Mid Channel)

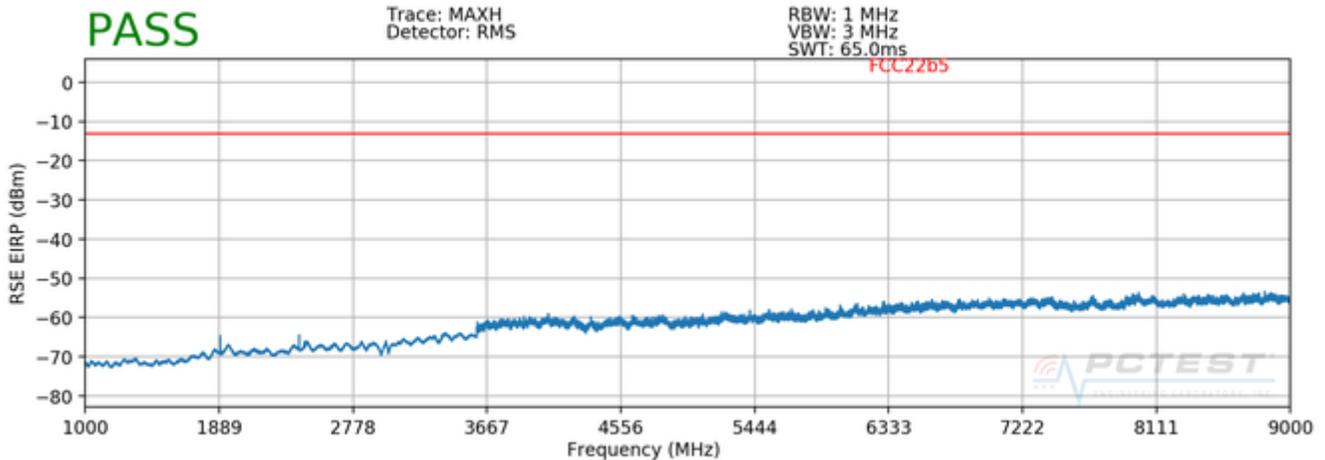
FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 242 of 263



Plot 7-90. Radiated Spurious Plot (ULCA B5- 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. V – Mid Channel)



Plot 7-91. Radiated Spurious Plot (ULCA B5- 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. H – High Channel)



Plot 7-92. Radiated Spurious Plot (ULCA B5- 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. V – High Channel)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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OPERATING FREQUENCY (PCC): _____ 829.00 MHz
 OPERATING FREQUENCY (SCC): _____ 838.90 MHz
 CHANNEL (PCC): _____ 20450
 CHANNEL (SCC): _____ 20549
 MODULATION SIGNAL: _____ QPSK
 BANDWIDTH: _____ 10 + 10 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]
1658.00	H	-	-	-73.50	8.96	-64.54	-64.5
1658.00	H	-	-	-67.32	9.13	-58.19	-58.2
1658.00	H	-	-	-64.69	9.36	-55.33	-55.3

Table 7-93. Radiated Spurious Data (ULCA B5 - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Low Channel)

OPERATING FREQUENCY (PCC): _____ 836.50 MHz
 OPERATING FREQUENCY (SCC): _____ 838.90 MHz
 CHANNEL (PCC): _____ 20450
 CHANNEL (SCC): _____ 20549
 MODULATION SIGNAL: _____ QPSK
 BANDWIDTH: _____ 10 + 10 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	-	-	-73.43	8.96	-64.47	-64.5
1673.00	H	-	-	-67.38	9.13	-58.25	-58.2
1673.00	H	-	-	-64.51	9.36	-55.15	-55.1

Table 7-94. Radiated Spurious Data (ULCA B5 - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0 – Mid Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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OPERATING FREQUENCY (SCC): _____ 834.10 _____ MHz
 OPERATING FREQUENCY (PCC): _____ 844.00 _____ MHz
 CHANNEL (SCC): _____ 20501 _____
 CHANNEL (PCC): _____ 20600 _____
 MODULATION SIGNAL: _____ QPSK _____
 BANDWIDTH: _____ 10 + 10 _____ MHz
 DISTANCE: _____ 3 _____ meters
 LIMIT: _____ 0 _____ 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]
1668.20	H	-	-	-71.74	8.88	-62.86	-62.9
1668.20	H	-	-	-68.31	9.15	-59.16	-59.2
1668.20	H	-	-	-65.79	9.36	-56.43	-56.4

Table 7-95. Radiated Spurious Data (ULCA B5 - PCC: RB 1 Offset 0, SCC: RB 1 Offset 49 – High Channel)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 245 of 263

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: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 12/17 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)	707,499,964	-36	-0.0000051
100 %		- 30	707,500,103	103	0.0000146
100 %		- 20	707,500,035	35	0.0000049
100 %		- 10	707,499,958	-42	-0.0000059
100 %		0	707,499,901	-99	-0.0000140
100 %		+ 10	707,500,029	29	0.0000041
100 %		+ 20	707,499,929	-71	-0.0000100
100 %		+ 30	707,499,899	-101	-0.0000143
100 %		+ 40	707,499,873	-127	-0.0000180
100 %		+ 50	707,500,004	4	0.0000006
BATT. ENDPOINT	3.40	+ 20	707,499,991	-9	-0.0000013

Table 7-96. Frequency Stability Data (Band 12/17)

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: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 247 of 263	

Band 12/17 Frequency Stability Measurements

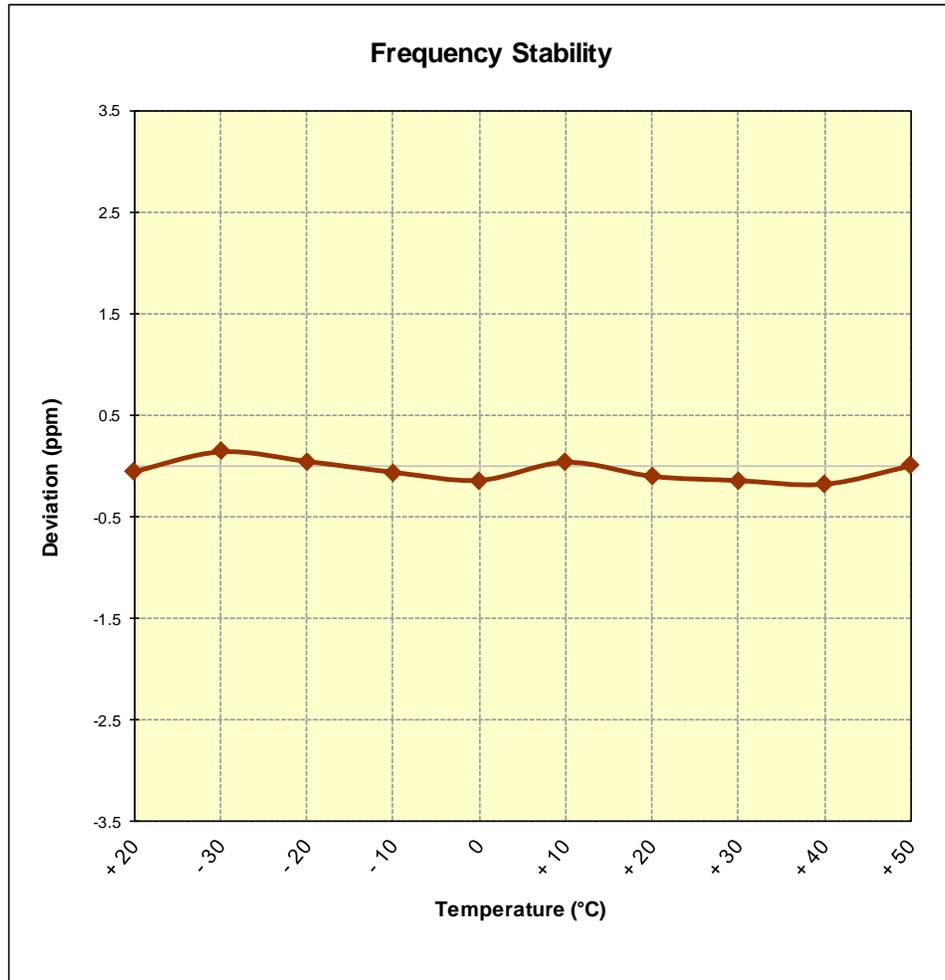


Figure 7-11. Frequency Stability Graph (Band 12/17)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 248 of 263

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)	782,000,045	45	0.0000058
100 %		- 30	781,999,904	-96	-0.0000123
100 %		- 20	782,000,046	46	0.0000059
100 %		- 10	781,999,905	-95	-0.0000121
100 %		0	781,999,886	-114	-0.0000146
100 %		+ 10	782,000,141	141	0.0000180
100 %		+ 20	781,999,979	-21	-0.0000027
100 %		+ 30	782,000,007	7	0.0000009
100 %		+ 40	782,000,073	73	0.0000093
100 %		+ 50	782,000,127	127	0.0000162
BATT. ENDPOINT		3.40	+ 20	782,000,046	46

Table 7-97. 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: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 249 of 263	

Band 13 Frequency Stability Measurements

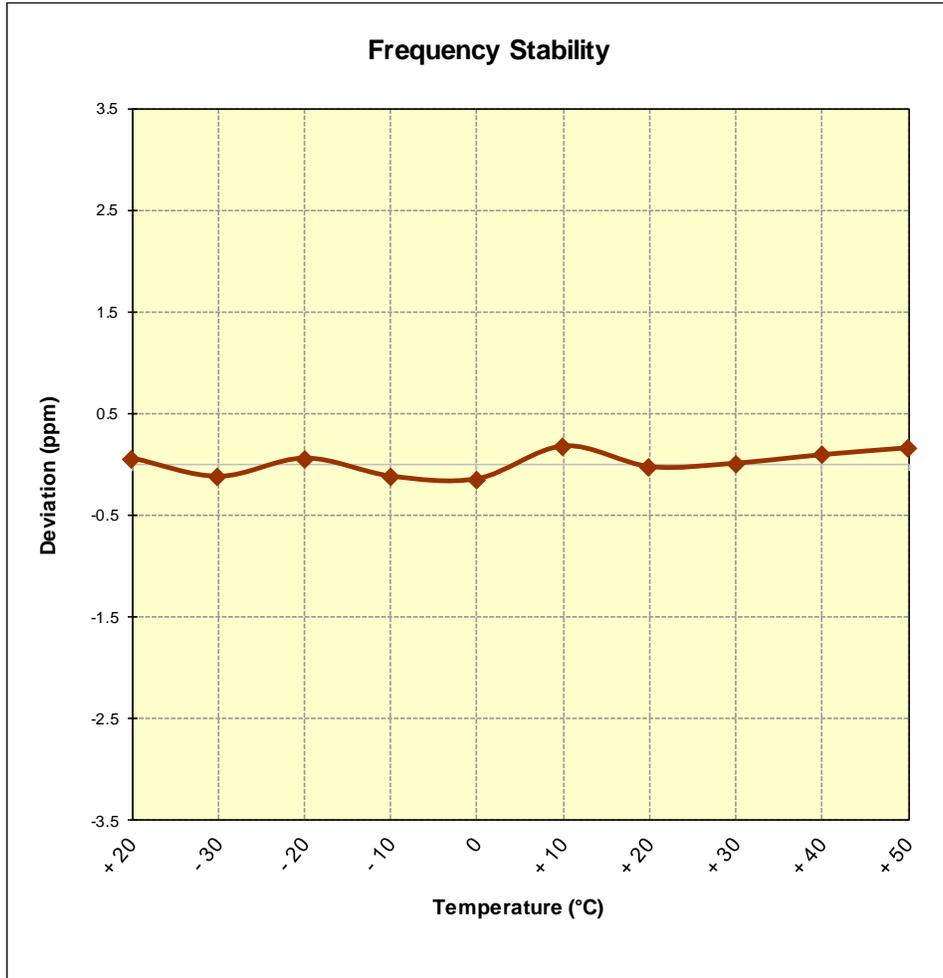


Figure 7-12. Frequency Stability Graph (Band 13)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 250 of 263

Band 26/5 Frequency Stability Measurements

OPERATING FREQUENCY: 831,500,000 Hz
 CHANNEL: 26865
 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)	831,499,889	-111	-0.0000133
100 %		- 30	831,499,887	-113	-0.0000136
100 %		- 20	831,499,913	-87	-0.0000105
100 %		- 10	831,499,977	-23	-0.0000028
100 %		0	831,499,933	-67	-0.0000081
100 %		+ 10	831,500,029	29	0.0000035
100 %		+ 20	831,500,131	131	0.0000158
100 %		+ 30	831,499,960	-40	-0.0000048
100 %		+ 40	831,500,069	69	0.0000083
100 %		+ 50	831,499,880	-120	-0.0000144
BATT. ENDPOINT		3.40	+ 20	831,499,958	-42

Table 7-98. Frequency Stability Data (Band 26/5)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset	Page 251 of 263	

Band 26/5 Frequency Stability Measurements

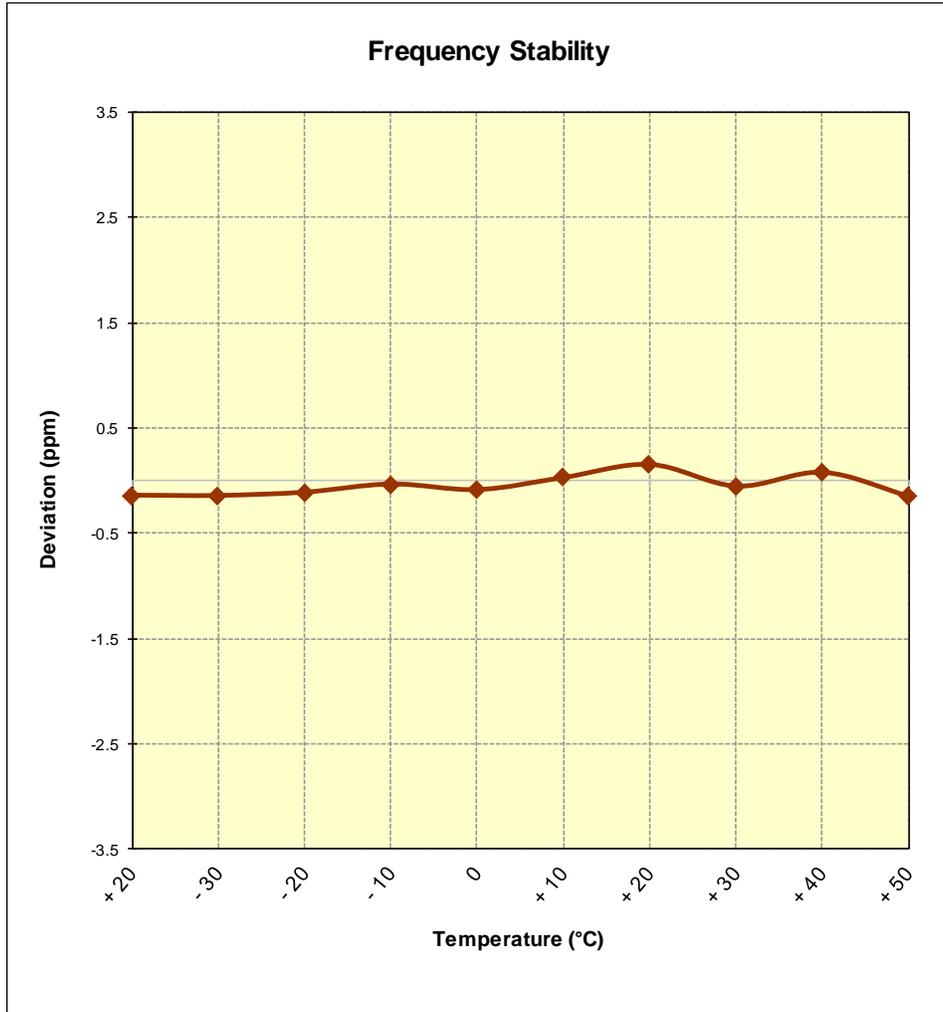


Figure 7-13. Frequency Stability Graph (Band 26/5)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 252 of 263

Band 66/4 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)	1,732,499,893	-107	-0.0000062
100 %		- 30	1,732,500,037	37	0.0000021
100 %		- 20	1,732,500,107	107	0.0000062
100 %		- 10	1,732,500,080	80	0.0000046
100 %		0	1,732,500,106	106	0.0000061
100 %		+ 10	1,732,499,994	-6	-0.0000003
100 %		+ 20	1,732,499,974	-26	-0.0000015
100 %		+ 30	1,732,500,075	75	0.0000043
100 %		+ 40	1,732,499,915	-85	-0.0000049
100 %		+ 50	1,732,499,977	-23	-0.0000013
BATT. ENDPOINT		3.40	+ 20	1,732,500,046	46

Table 7-99. Frequency Stability Data (Band 66/4)

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: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 66/4 Frequency Stability Measurements

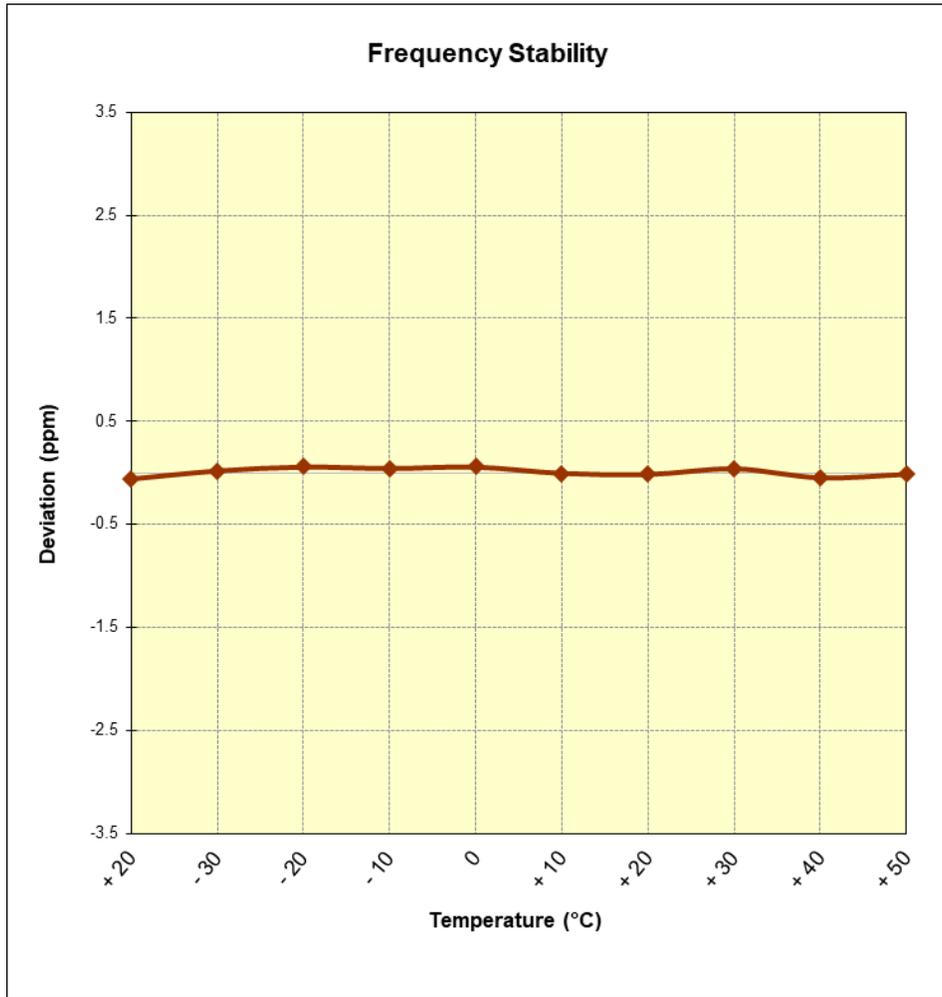


Figure 7-14. Frequency Stability Graph (Band 66/4)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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Band 25/2 Frequency Stability Measurements

OPERATING FREQUENCY: 1,882,500,000 Hz
 CHANNEL: 26365
 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)	1,882,499,983	-17	-0.0000009
100 %		- 30	1,882,499,939	-61	-0.0000032
100 %		- 20	1,882,500,029	29	0.0000015
100 %		- 10	1,882,499,904	-96	-0.0000051
100 %		0	1,882,499,871	-129	-0.0000069
100 %		+ 10	1,882,500,028	28	0.0000015
100 %		+ 20	1,882,499,916	-84	-0.0000045
100 %		+ 30	1,882,499,919	-81	-0.0000043
100 %		+ 40	1,882,499,916	-84	-0.0000045
100 %		+ 50	1,882,499,961	-39	-0.0000021
BATT. ENDPOINT	3.40	+ 20	1,882,500,019	19	0.0000010

Table 7-100. Frequency Stability Data (Band 25/2)

FCC ID: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset			Page 255 of 263

Band 25/2 Frequency Stability Measurements

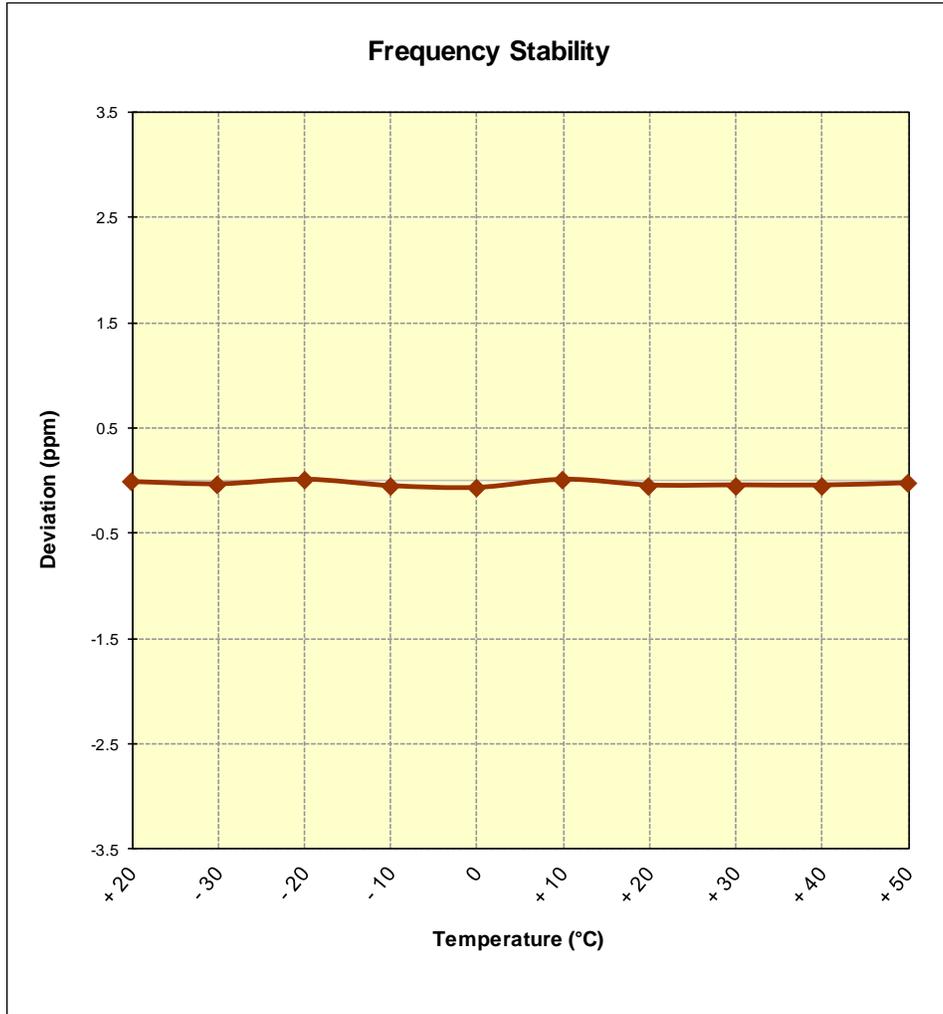


Figure 7-15. Frequency Stability Graph (Band 25/2)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 256 of 263

Band 30 Frequency Stability Measurements

OPERATING FREQUENCY: 2,310,000,000 Hz
 CHANNEL: 27710
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	2,310,000,088	88	0.0000038
100 %		- 30	2,309,999,927	-73	-0.0000032
100 %		- 20	2,310,000,001	1	0.0000000
100 %		- 10	2,309,999,894	-106	-0.0000046
100 %		0	2,310,000,088	88	0.0000038
100 %		+ 10	2,309,999,859	-141	-0.0000061
100 %		+ 20	2,309,999,969	-31	-0.0000013
100 %		+ 30	2,309,999,866	-134	-0.0000058
100 %		+ 40	2,309,999,974	-26	-0.0000011
100 %		+ 50	2,310,000,011	11	0.0000005
BATT. ENDPOINT	3.40	+ 20	2,310,000,043	43	0.0000019

Table 7-101. Frequency Stability Data (Band 30)

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: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 30 Frequency Stability Measurements

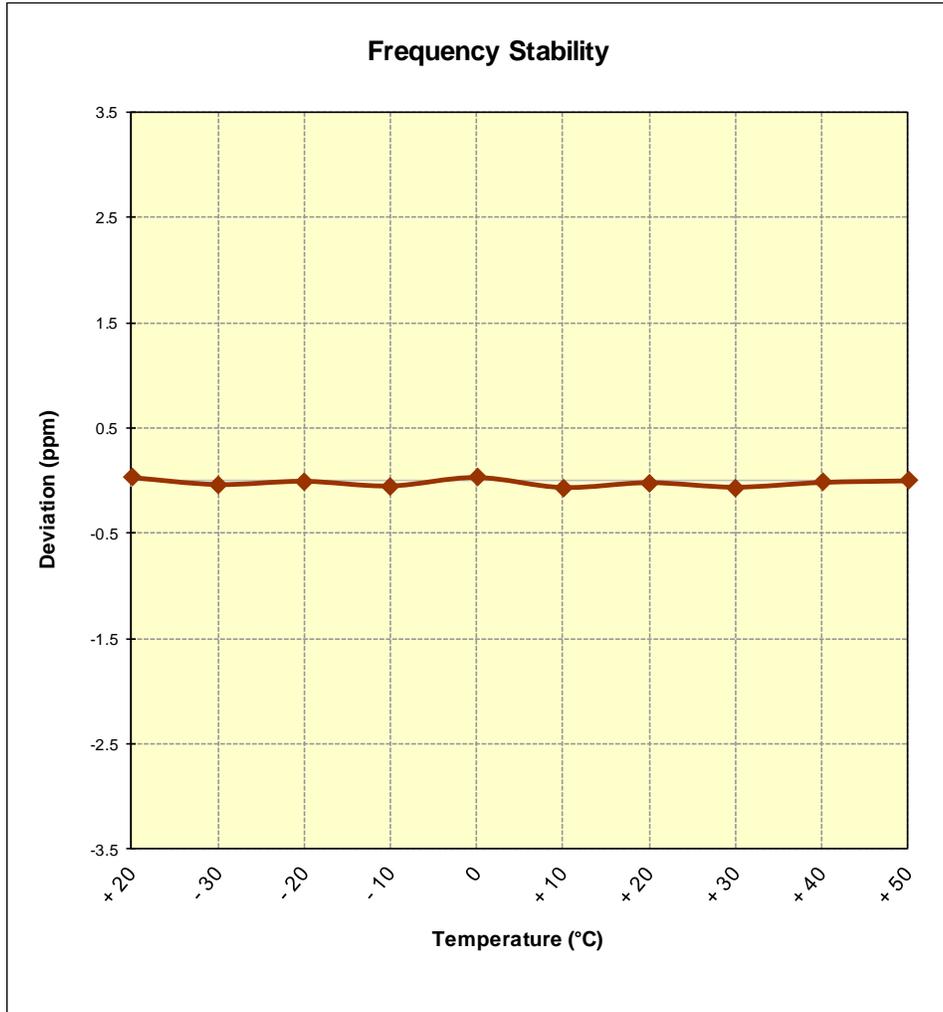


Figure 7-16. Frequency Stability Graph (Band 30)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 258 of 263

Band 7 Frequency Stability Measurements

OPERATING FREQUENCY: 2,535,000,000 Hz
 CHANNEL: 21100
 REFERENCE VOLTAGE: 3.80 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	2,535,000,125	125	0.0000049
100 %		- 30	2,535,000,031	31	0.0000012
100 %		- 20	2,534,999,939	-61	-0.0000024
100 %		- 10	2,534,999,961	-39	-0.0000015
100 %		0	2,534,999,905	-95	-0.0000037
100 %		+ 10	2,535,000,045	45	0.0000018
100 %		+ 20	2,534,999,980	-20	-0.0000008
100 %		+ 30	2,535,000,101	101	0.0000040
100 %		+ 40	2,534,999,946	-54	-0.0000021
100 %		+ 50	2,534,999,924	-76	-0.0000030
BATT. ENDPOINT	3.40	+ 20	2,535,000,082	82	0.0000032

Table 7-102. Frequency Stability Data (Band 7)

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: ZNFV350A		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Band 7 Frequency Stability Measurements

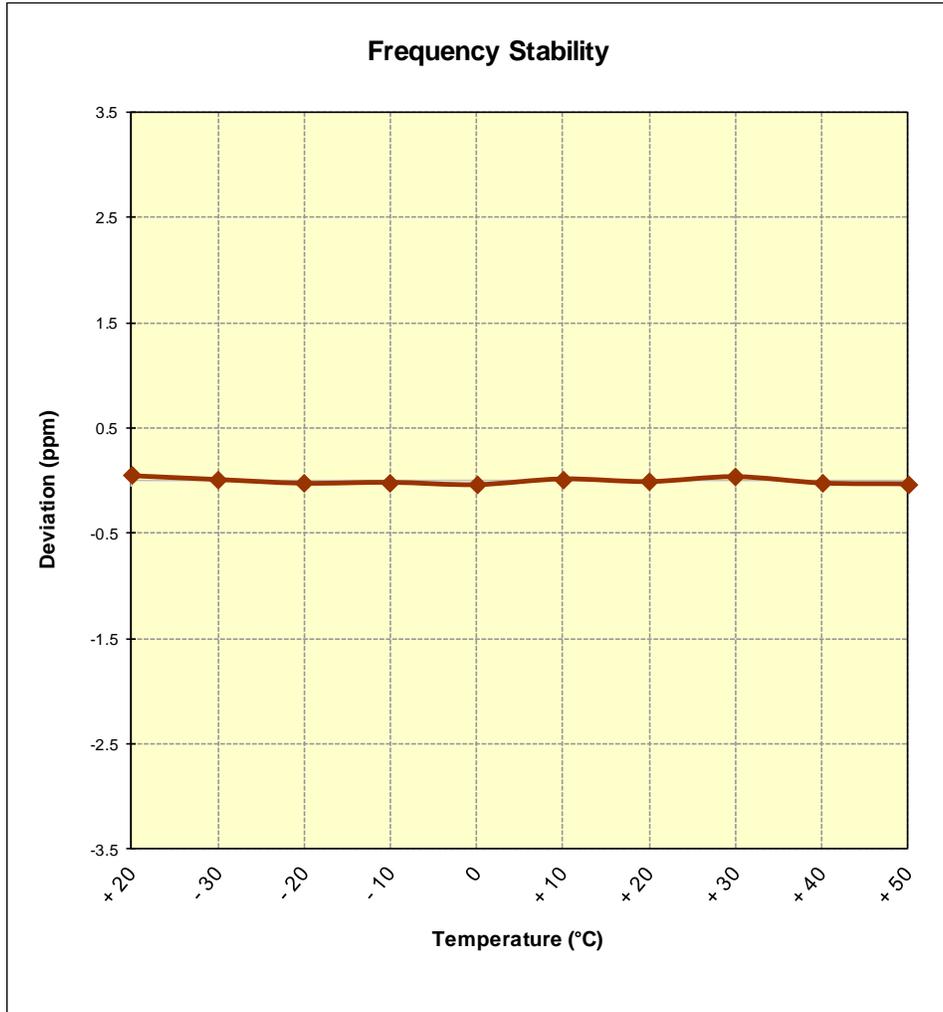


Figure 7-17. Frequency Stability Graph (Band 7)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M1803120039-03.ZNF	Test Dates: March 15 - April 4, 2018	EUT Type: Portable Handset		Page 260 of 263

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)	2,592,999,987	-13	-0.0000005
100 %		- 30	2,593,000,097	97	0.0000037
100 %		- 20	2,593,000,120	120	0.0000046
100 %		- 10	2,593,000,071	71	0.0000027
100 %		0	2,592,999,886	-114	-0.0000044
100 %		+ 10	2,593,000,042	42	0.0000016
100 %		+ 20	2,593,000,010	10	0.0000004
100 %		+ 30	2,592,999,971	-29	-0.0000011
100 %		+ 40	2,593,000,132	132	0.0000051
100 %		+ 50	2,592,999,963	-37	-0.0000014
BATT. ENDPOINT	3.40	+ 20	2,593,000,059	59	0.0000023

Table 7-103. 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.

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Band 41 Frequency Stability Measurements

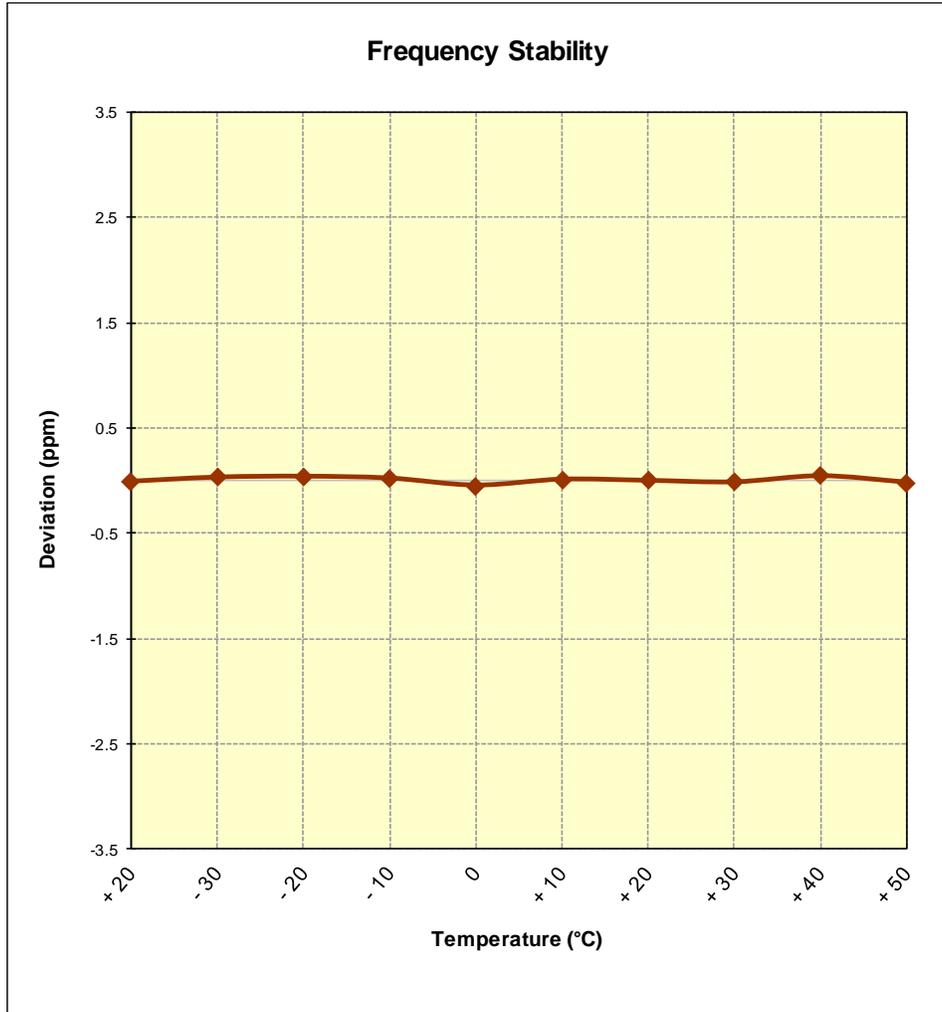


Figure 7-18. Frequency Stability Graph (Band 41)

FCC ID: ZNFV350A	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFV350A** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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