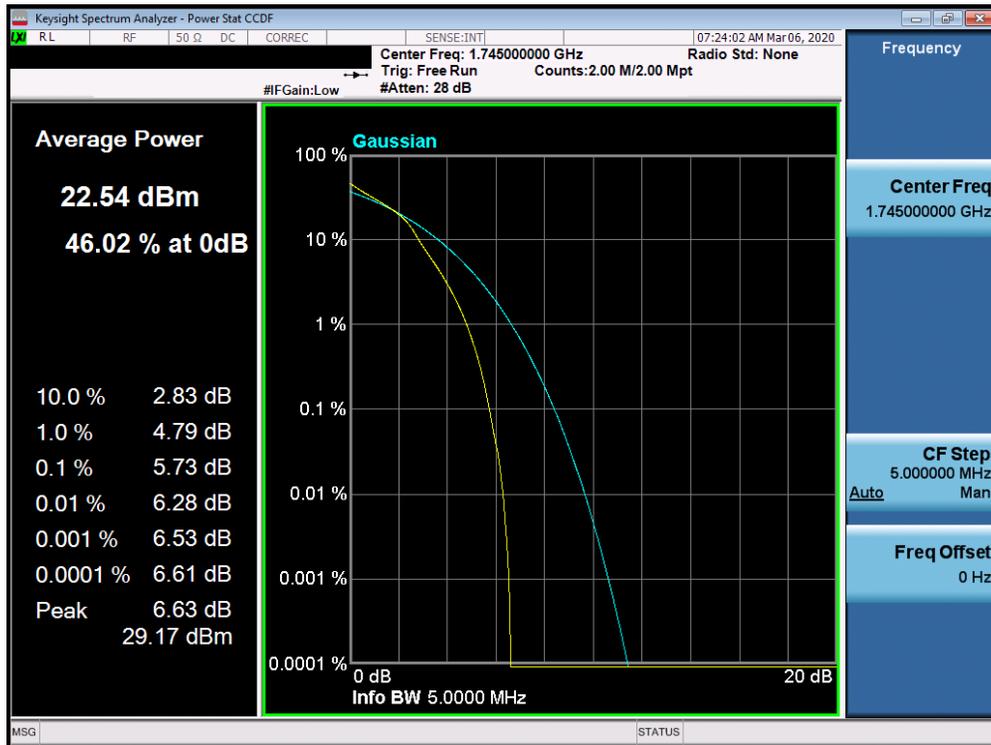
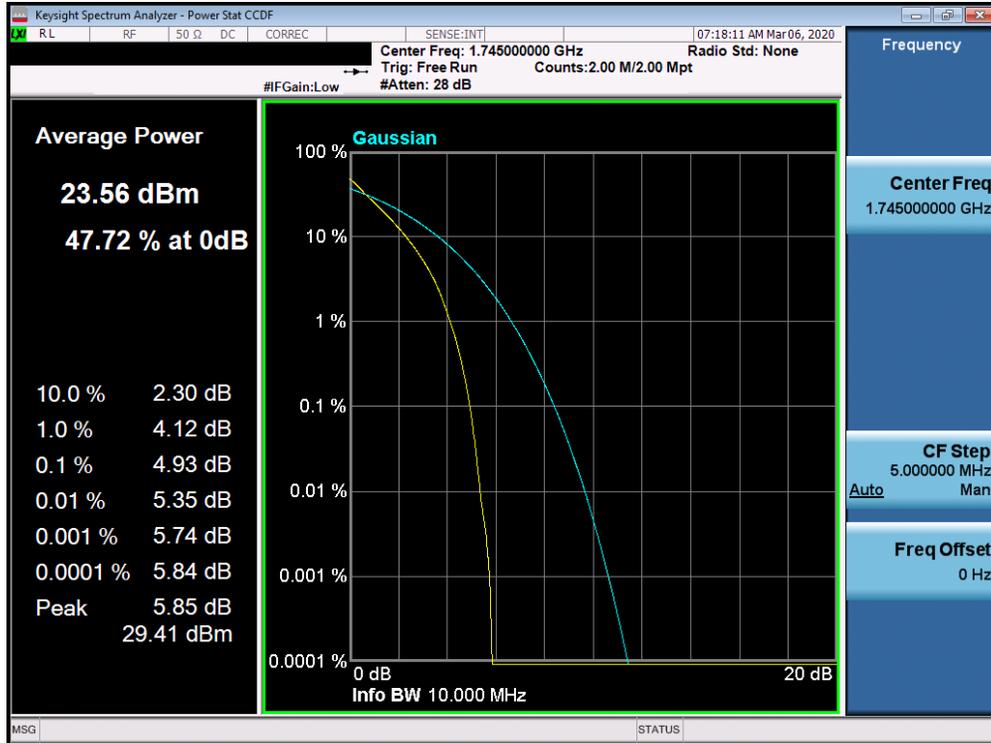


Plot 7-181. PAR Plot (Band 66/4 – 5MHz QPSK - Full RB Configuration)

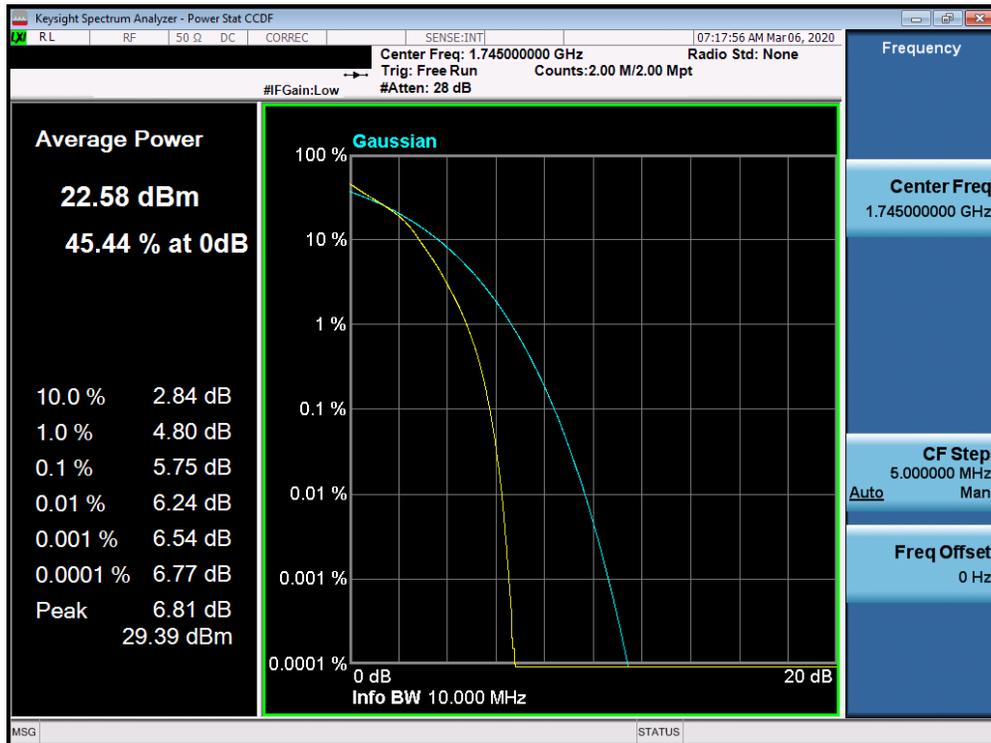


Plot 7-182. PAR Plot (Band 66/4 – 5MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 112 of 146

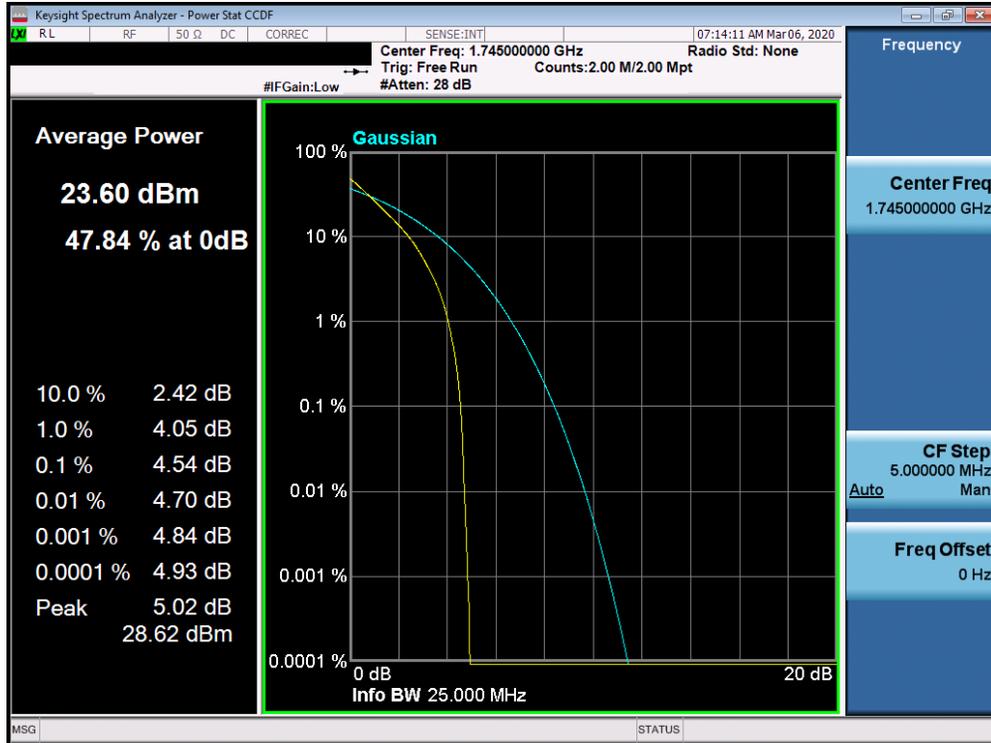


Plot 7-183. PAR Plot (Band 66/4 – 10MHz QPSK - Full RB Configuration)

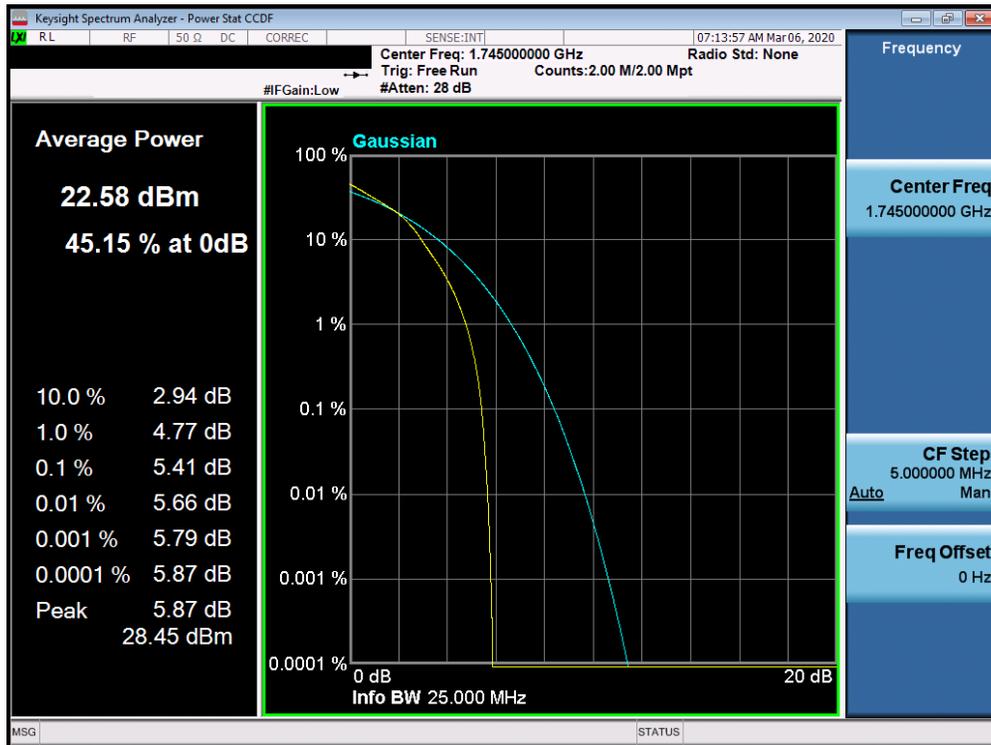


Plot 7-184. PAR Plot (Band 66/4 – 10MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 113 of 146

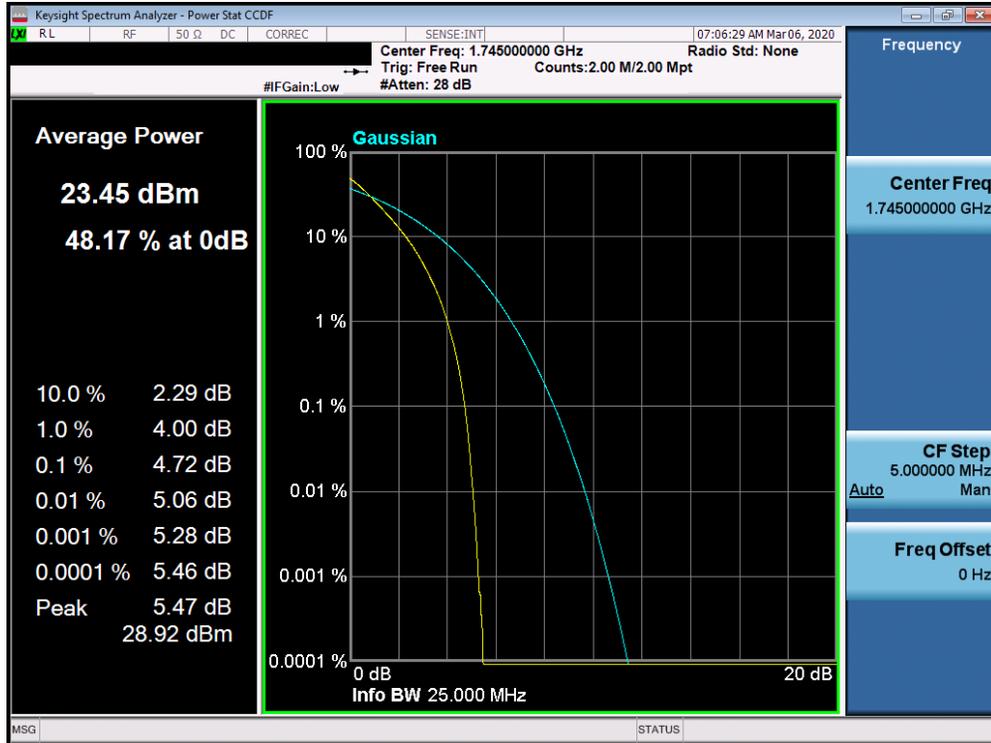


Plot 7-185. PAR Plot (Band 66/4 – 15MHz QPSK - Full RB Configuration)

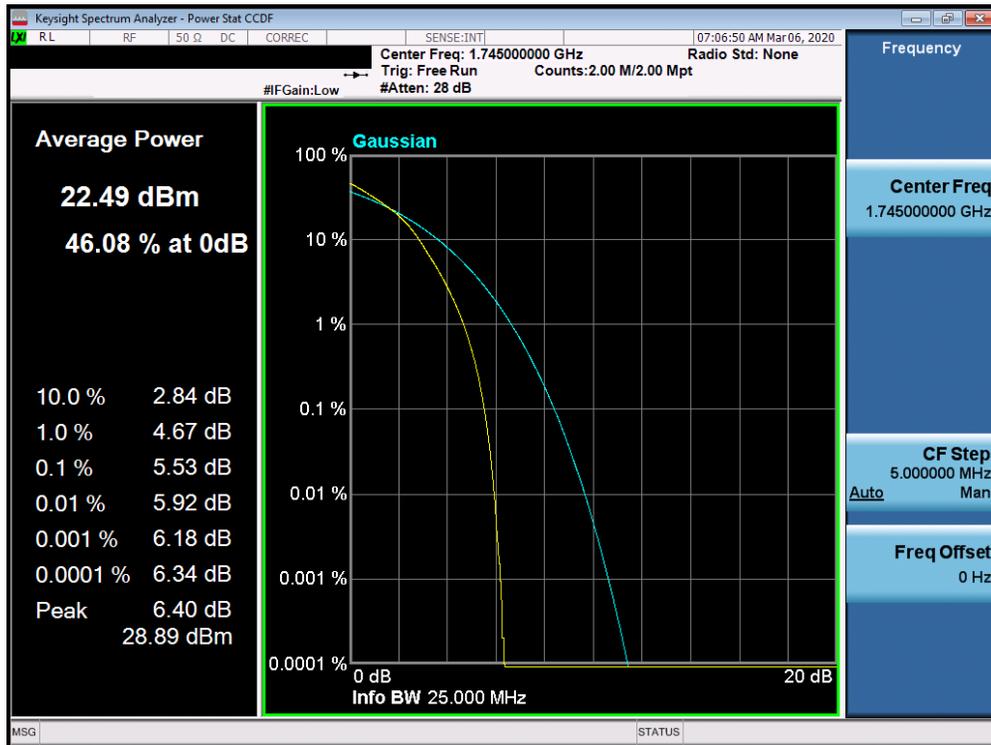


Plot 7-186. PAR Plot (Band 66/4 – 15MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 114 of 146



Plot 7-187. PAR Plot (Band 66/4 – 20MHz QPSK - Full RB Configuration)



Plot 7-188. PAR Plot (Band 66/4 – 20MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 115 of 146

7.6 Radiated Power (ERP/EIRP)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer’s “channel power” measurement capability for signals with continuous operation.
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”.
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 116 of 146

Test Setup

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

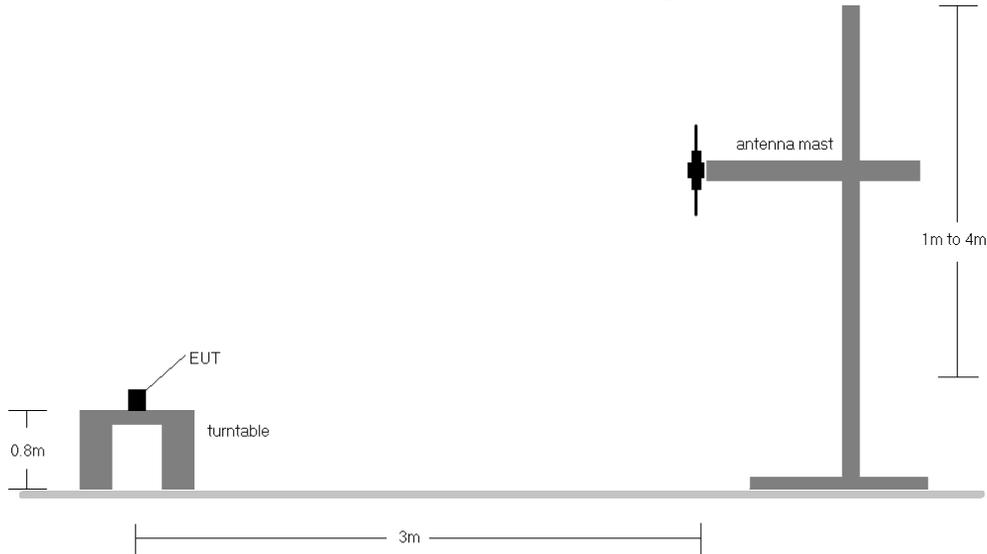


Figure 7-5. Radiated Test Setup <1GHz

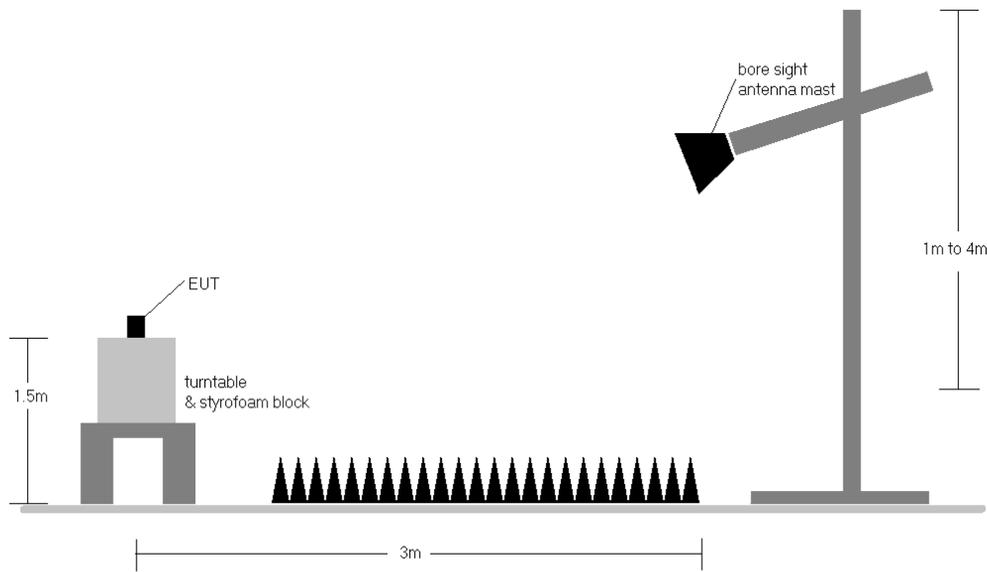


Figure 7-6. Radiated Test Setup >1GHz

Test Notes

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

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 117 of 146

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]
699.70	1.4	QPSK	V	167	4	1 / 2	17.69	4.56	20.10	0.102	34.77	-14.67
707.50	1.4	QPSK	V	179	19	1 / 2	17.31	4.62	19.78	0.095	34.77	-14.99
715.30	1.4	QPSK	V	162	318	1 / 2	17.33	4.72	19.90	0.098	34.77	-14.87
699.70	1.4	16-QAM	V	167	4	3 / 2	16.64	4.56	19.05	0.080	34.77	-15.72
700.50	3	QPSK	V	167	4	1 / 7	17.60	4.59	20.04	0.101	34.77	-14.73
707.50	3	QPSK	V	179	19	1 / 7	17.33	4.62	19.80	0.096	34.77	-14.97
714.50	3	QPSK	V	162	318	1 / 7	17.41	4.71	19.97	0.099	34.77	-14.80
700.50	3	16-QAM	V	167	4	1 / 7	16.54	4.59	18.98	0.079	34.77	-15.79
701.50	5	QPSK	V	167	4	1 / 12	17.67	4.60	20.12	0.103	34.77	-14.65
707.50	5	QPSK	V	179	19	1 / 12	17.42	4.62	19.89	0.098	34.77	-14.88
713.50	5	QPSK	V	162	318	1 / 12	17.40	4.70	19.95	0.099	34.77	-14.82
701.50	5	16-QAM	V	167	4	1 / 12	16.64	4.60	19.09	0.081	34.77	-15.68
704.00	10	QPSK	V	167	4	1 / 25	17.59	4.58	20.02	0.100	34.77	-14.75
707.50	10	QPSK	V	179	19	1 / 0	17.18	4.62	19.65	0.092	34.77	-15.12
711.00	10	QPSK	V	162	318	1 / 0	17.14	4.67	19.66	0.092	34.77	-15.11
704.00	10	16-QAM	V	167	4	1 / 25	16.60	4.58	19.03	0.080	34.77	-15.74
701.50	5	QPSK	H	250	17	1 / 12	17.82	3.58	19.25	0.084	34.77	-15.52

Table 7-3. ERP Data (Band 12)

FCC ID: ZNFK400AM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 118 of 146	

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]
824.70	1.4	QPSK	H	103	295	1 / 2	13.52	6.76	18.12	0.065	38.45	-20.33
836.50	1.4	QPSK	H	100	304	1 / 2	13.45	6.68	17.98	0.063	38.45	-20.47
848.30	1.4	QPSK	H	207	315	1 / 2	13.59	6.70	18.14	0.065	38.45	-20.31
848.30	1.4	16-QAM	H	207	315	1 / 2	12.56	6.70	17.11	0.051	38.45	-21.34
825.50	3	QPSK	H	103	295	1 / 14	13.41	6.76	18.02	0.063	38.45	-20.43
836.50	3	QPSK	H	100	304	1 / 7	13.43	6.68	17.96	0.062	38.45	-20.49
847.50	3	QPSK	H	207	315	1 / 7	13.55	6.69	18.10	0.065	38.45	-20.35
847.50	3	16-QAM	H	207	315	1 / 0	12.55	6.69	17.10	0.051	38.45	-21.35
826.50	5	QPSK	H	103	295	1 / 0	13.40	6.77	18.02	0.063	38.45	-20.43
836.50	5	QPSK	H	100	304	1 / 12	13.56	6.68	18.09	0.064	38.45	-20.36
846.50	5	QPSK	H	207	315	1 / 12	13.66	6.68	18.20	0.066	38.45	-20.25
846.50	5	16-QAM	H	207	315	1 / 12	12.68	6.68	17.22	0.053	38.45	-21.23
829.00	10	QPSK	H	103	295	1 / 49	13.31	6.80	17.96	0.063	38.45	-20.49
836.50	10	QPSK	H	100	304	1 / 0	13.35	6.68	17.88	0.061	38.45	-20.57
844.00	10	QPSK	H	207	315	1 / 49	13.68	6.66	18.19	0.066	38.45	-20.26
844.00	10	16-QAM	H	207	315	1 / 49	12.70	6.66	17.21	0.053	38.45	-21.24
846.50	5	QPSK	V	156	184	1 / 12	13.66	6.46	17.97	0.063	38.45	-20.48

Table 7-4. ERP Data (Band 5)

FCC ID: ZNFK400AM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 119 of 146	

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	22	1 / 2	13.77	9.44	23.21	0.210	30.00	-6.79
1745.00	1.4	QPSK	H	104	27	1 / 2	13.78	9.23	23.01	0.200	30.00	-6.99
1779.30	1.4	QPSK	H	136	22	1 / 2	13.19	9.26	22.45	0.176	30.00	-7.55
1710.70	1.4	16-QAM	H	150	22	1 / 2	12.75	9.44	22.19	0.166	30.00	-7.81
1711.50	3	QPSK	H	150	22	1 / 7	13.84	9.44	23.27	0.213	30.00	-6.73
1745.00	3	QPSK	H	104	27	1 / 7	13.76	9.23	22.99	0.199	30.00	-7.01
1778.50	3	QPSK	H	136	22	1 / 0	13.20	9.26	22.46	0.176	30.00	-7.54
1711.50	3	16-QAM	H	150	22	1 / 7	12.68	9.44	22.11	0.163	30.00	-7.89
1712.50	5	QPSK	H	150	22	1 / 12	13.94	9.43	23.37	0.218	30.00	-6.63
1745.00	5	QPSK	H	104	27	1 / 12	13.82	9.23	23.05	0.202	30.00	-6.95
1777.50	5	QPSK	H	136	22	1 / 0	13.25	9.26	22.51	0.178	30.00	-7.49
1712.50	5	16-QAM	H	150	22	1 / 12	12.93	9.43	22.36	0.172	30.00	-7.64
1715.00	10	QPSK	H	150	22	1 / 49	13.68	9.42	23.09	0.204	30.00	-6.91
1745.00	10	QPSK	H	104	27	1 / 25	13.74	9.23	22.97	0.198	30.00	-7.03
1775.00	10	QPSK	H	136	22	1 / 25	13.23	9.25	22.48	0.177	30.00	-7.52
1715.00	10	16-QAM	H	150	22	1 / 25	12.69	9.42	22.10	0.162	30.00	-7.90
1717.50	15	QPSK	H	150	22	1 / 36	14.00	9.40	23.40	0.219	30.00	-6.60
1745.00	15	QPSK	H	104	27	1 / 36	13.91	9.23	23.14	0.206	30.00	-6.86
1772.50	15	QPSK	H	136	22	1 / 36	13.33	9.25	22.58	0.181	30.00	-7.42
1717.50	15	16-QAM	H	150	22	1 / 36	12.90	9.40	22.30	0.170	30.00	-7.70
1720.00	20	QPSK	H	150	22	1 / 50	13.77	9.38	23.15	0.207	30.00	-6.85
1745.00	20	QPSK	H	104	27	1 / 50	13.83	9.23	23.06	0.202	30.00	-6.94
1770.00	20	QPSK	H	136	22	1 / 50	13.27	9.24	22.51	0.178	30.00	-7.49
1720.00	20	16-QAM	H	150	22	1 / 50	12.72	9.38	22.10	0.162	30.00	-7.90
1717.50	15	QPSK	V	131	64	1 / 36	12.62	9.28	21.90	0.155	30.00	-8.10

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

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 120 of 146

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	H	126	13	1 / 2	13.35	9.48	22.84	0.192	33.01	-10.17
1880.00	1.4	QPSK	H	118	15	1 / 2	12.84	9.90	22.74	0.188	33.01	-10.27
1909.30	1.4	QPSK	H	115	13	1 / 2	12.97	10.25	23.22	0.210	33.01	-9.79
1909.30	1.4	16-QAM	H	115	13	1 / 2	11.77	10.25	22.02	0.159	33.01	-10.99
1851.50	3	QPSK	H	126	13	1 / 7	13.35	9.50	22.85	0.193	33.01	-10.16
1880.00	3	QPSK	H	118	15	1 / 7	12.82	9.90	22.72	0.187	33.01	-10.29
1908.50	3	QPSK	H	115	13	1 / 7	13.06	10.25	23.31	0.214	33.01	-9.70
1908.50	3	16-QAM	H	115	13	1 / 7	12.03	10.25	22.28	0.169	33.01	-10.73
1852.50	5	QPSK	H	126	13	1 / 12	13.44	9.51	22.95	0.197	33.01	-10.06
1880.00	5	QPSK	H	118	15	1 / 12	12.92	9.90	22.82	0.191	33.01	-10.19
1907.50	5	QPSK	H	115	13	1 / 12	13.08	10.24	23.32	0.215	33.01	-9.69
1907.50	5	16-QAM	H	115	13	1 / 12	12.13	10.24	22.37	0.173	33.01	-10.64
1855.00	10	QPSK	H	126	13	1 / 25	13.26	9.55	22.81	0.191	33.01	-10.20
1880.00	10	QPSK	H	118	15	1 / 25	12.82	9.90	22.72	0.187	33.01	-10.29
1905.00	10	QPSK	H	115	13	1 / 25	13.13	10.22	23.35	0.216	33.01	-9.66
1905.00	10	16-QAM	H	115	13	1 / 25	12.15	10.22	22.37	0.173	33.01	-10.64
1857.50	15	QPSK	H	126	13	1 / 36	13.33	9.58	22.91	0.195	33.01	-10.10
1880.00	15	QPSK	H	118	15	1 / 36	12.74	9.90	22.64	0.184	33.01	-10.37
1902.50	15	QPSK	H	115	13	1 / 36	13.08	10.20	23.28	0.213	33.01	-9.73
1902.50	15	16-QAM	H	115	13	1 / 36	12.06	10.20	22.26	0.168	33.01	-10.75
1860.00	20	QPSK	H	126	13	1 / 50	13.17	9.62	22.79	0.190	33.01	-10.22
1880.00	20	QPSK	H	118	15	1 / 50	12.67	9.90	22.57	0.181	33.01	-10.44
1900.00	20	QPSK	H	115	13	1 / 50	13.04	10.18	23.22	0.210	33.01	-9.79
1900.00	20	16-QAM	H	115	13	1 / 50	11.85	10.18	22.03	0.160	33.01	-10.98
1905.00	10	QPSK	V	112	97	1 / 25	12.04	10.26	22.30	0.170	33.01	-10.71

Table 7-6. EIRP Data (Band 2)

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 121 of 146	

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	115	199	1 / 0	10.03	10.31	20.34	0.108	23.98	-3.64
2312.50	5	QPSK	H	115	199	1 / 0	10.01	10.31	20.32	0.108	23.98	-3.66
2307.50	5	16-QAM	H	115	199	1 / 0	9.06	10.31	19.37	0.086	23.98	-4.61
2310.00	10	QPSK	H	115	199	1 / 25	10.14	10.31	20.45	0.111	23.98	-3.53
2310.00	10	16-QAM	H	115	199	1 / 25	9.08	10.31	19.39	0.087	23.98	-4.59
2310.00	10	QPSK	V	185	263	1 / 25	10.16	10.22	20.38	0.109	23.98	-3.60

Table 7-7. EIRP Data (Band 30)

FCC ID: ZNFK400AM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 122 of 146	

7.7 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

FCC ID: ZNFK400AM	 MEASUREMENT REPORT (CERTIFICATION)			Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 123 of 146

Test Setup

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

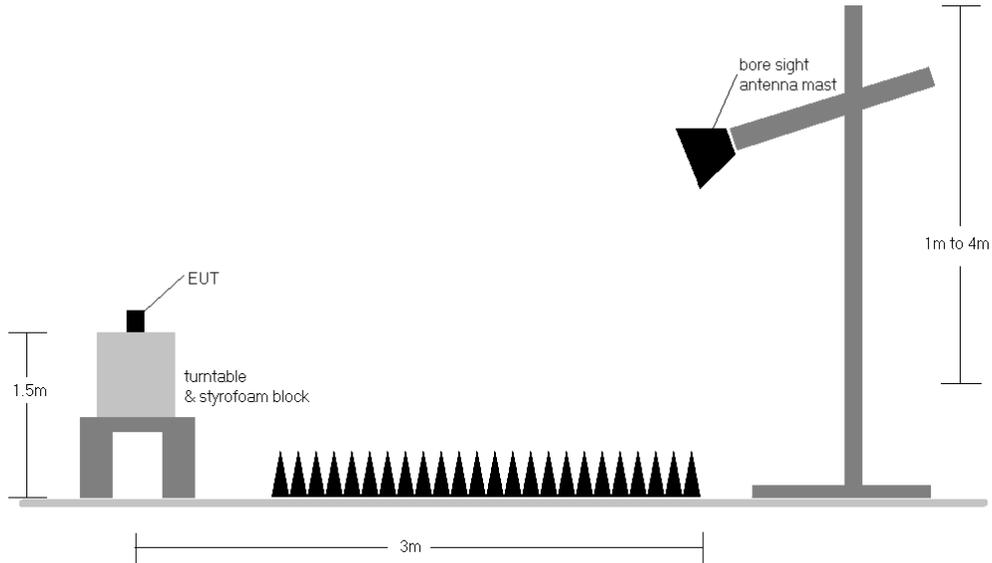


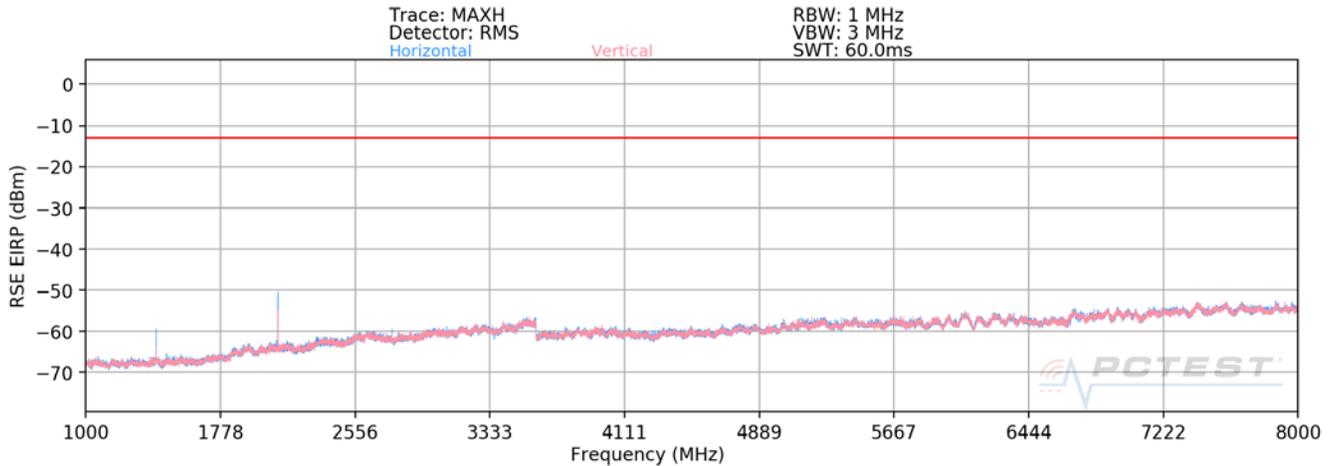
Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 124 of 146

Band 12



Plot 7-189. Radiated Spurious Plot above 1GHz (Band 12)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1408.00	H	162	53	-68.99	7.54	-61.45	-48.5
2112.00	H	313	347	-67.87	8.85	-59.02	-46.0
2816.00	H	-	-	-79.56	10.12	-69.44	-56.4
3520.00	H	-	-	-76.51	9.91	-66.60	-53.6

Table 7-8. Radiated Spurious Data (Band 12 – Low Channel)

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 125 of 146

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	132	327	-69.14	7.63	-61.51	-48.5
2122.50	H	206	241	-65.43	8.86	-56.56	-43.6
2830.00	H	-	-	-79.77	10.10	-69.67	-56.7
3537.50	H	-	-	-76.22	9.90	-66.32	-53.3

Table 7-9. Radiated Spurious Data (Band 12 – Mid Channel)

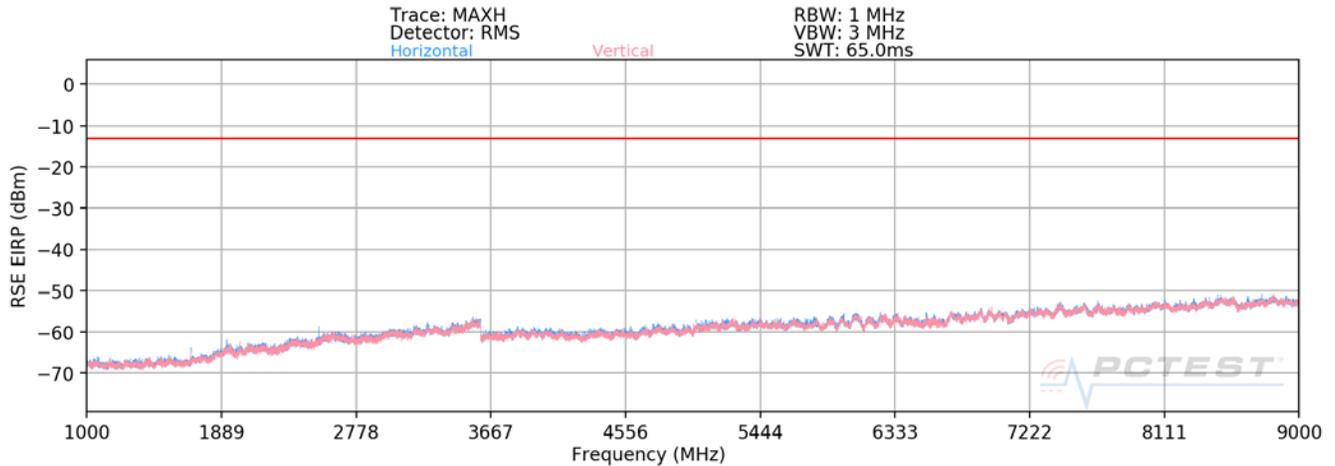
OPERATING FREQUENCY: 711.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	135	347	-71.35	7.72	-63.63	-50.6
2133.00	H	148	249	-64.23	8.87	-55.36	-42.4
2844.00	H	-	-	-79.52	10.07	-69.45	-56.5
3555.00	H	-	-	-76.59	9.89	-66.69	-53.7

Table 7-10. Radiated Spurious Data (Band 12 – High Channel)

FCC ID: ZNFK400AM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 126 of 146

Band 5



Plot 7-190. Radiated Spurious Plot above 1GHz (Band 5)

OPERATING FREQUENCY: 829.00 MHz

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	H	153	190	-78.43	8.95	-69.48	-56.5
2487.00	H	172	4	-77.67	9.70	-67.96	-55.0
3316.00	H	-	-	-77.22	9.59	-67.63	-54.6
4145.00	H	-	-	-76.39	10.22	-66.18	-53.2

Table 7-11. Radiated Spurious Data (Band 5 – Low Channel)

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 127 of 146

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	205	180	-77.32	8.95	-68.37	-55.4
2509.50	H	146	336	-75.49	9.75	-65.74	-52.7
3346.00	H	-	-	-77.20	9.60	-67.60	-54.6
4182.50	H	-	-	-77.55	10.34	-67.21	-54.2

Table 7-12. Radiated Spurious Data (Band 5 – Mid Channel)

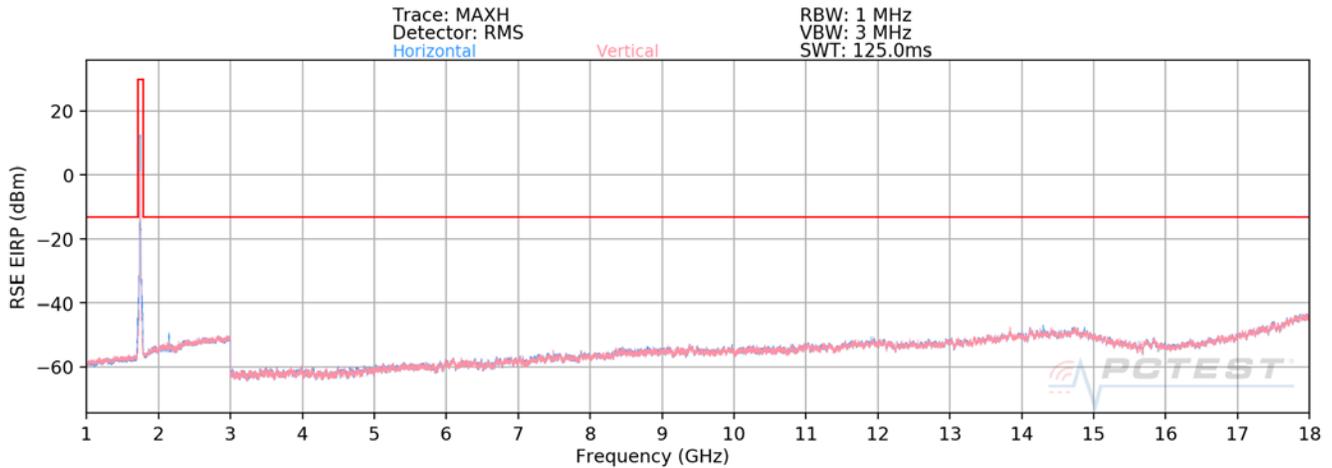
OPERATING FREQUENCY: 844.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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	H	270	9	-81.14	8.95	-72.18	-59.2
2532.00	H	137	352	-74.90	9.75	-65.15	-52.2
3376.00	H	-	-	-77.28	9.71	-67.58	-54.6
4220.00	H	-	-	-77.60	10.48	-67.11	-54.1

Table 7-13. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 128 of 146

Band 66/4



Plot 7-191. Radiated Spurious Plot above 1GHz (Band 66/4)

OPERATING FREQUENCY: 1720.00 MHz
 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	H	111	23	-65.57	6.28	-59.29	-46.3
5160.00	H	114	12	-66.90	8.98	-57.92	-44.9
6880.00	H	-	-	-70.49	9.42	-61.07	-48.1
8600.00	H	-	-	-68.69	9.62	-59.07	-46.1

Table 7-14. Radiated Spurious Data (Band 66/4 – Low Channel)

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 129 of 146

OPERATING FREQUENCY: 1745.00 MHz
 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	H	115	37	-65.84	6.47	-59.37	-46.4
5235.00	H	223	2	-69.39	8.97	-60.42	-47.4
6980.00	H	-	-	-69.11	9.23	-59.89	-46.9
8725.00	H	-	-	-67.46	9.59	-57.87	-44.9

Table 7-15. Radiated Spurious Data (Band 66/4 – Mid Channel)

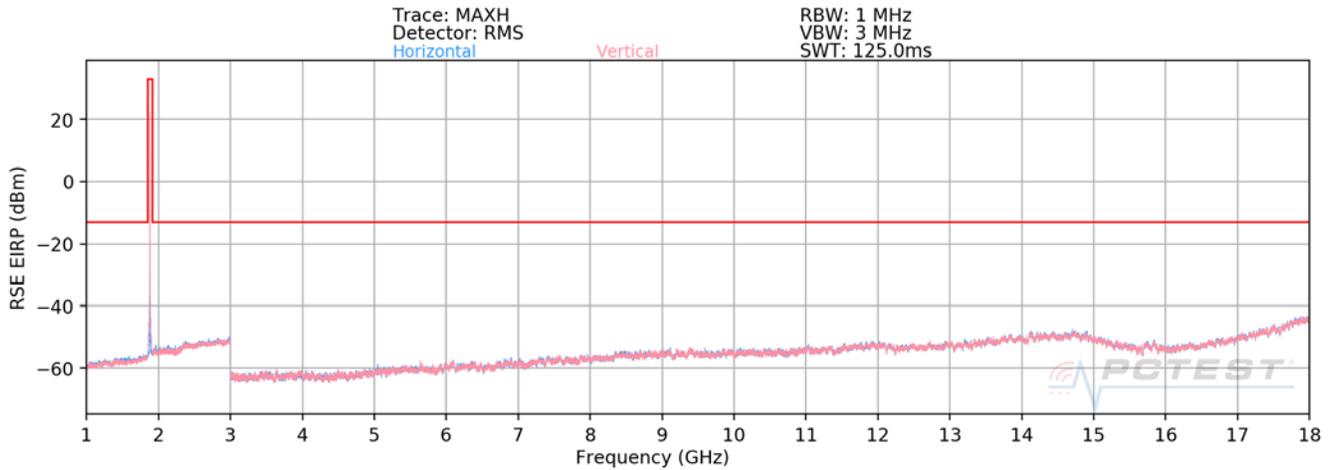
OPERATING FREQUENCY: 1770.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3540.00	H	101	44	-62.67	6.45	-56.22	-43.2
5310.00	H	113	360	-70.09	9.09	-61.00	-48.0
7080.00	H	-	-	-69.54	9.17	-60.37	-47.4
8850.00	H	-	-	-67.14	9.57	-57.57	-44.6

Table 7-16. Radiated Spurious Data (Band 66/4 – High Channel)

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 130 of 146

Band 2



Plot 7-192. Radiated Spurious Plot above 1GHz (Band 2)

OPERATING FREQUENCY: 1860.00 MHz

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]
3720.00	H	-	-	-74.30	9.51	-64.80	-51.8
5580.00	H	128	246	-74.93	10.99	-63.95	-50.9
7440.00	H	-	-	-72.36	10.99	-61.37	-48.4
9300.00	H	-	-	-71.21	11.61	-59.60	-46.6

Table 7-17. Radiated Spurious Data (Band 2 – Low Channel)

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 131 of 146

OPERATING FREQUENCY: 1880.00 MHz
 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]
3760.00	H	-	-	-76.19	9.37	-66.83	-53.8
5640.00	H	118	236	-74.75	11.17	-63.58	-50.6
7520.00	H	-	-	-72.83	11.11	-61.71	-48.7
9400.00	H	-	-	-70.79	11.57	-59.22	-46.2

Table 7-18. Radiated Spurious Data (Band 2 – Mid Channel)

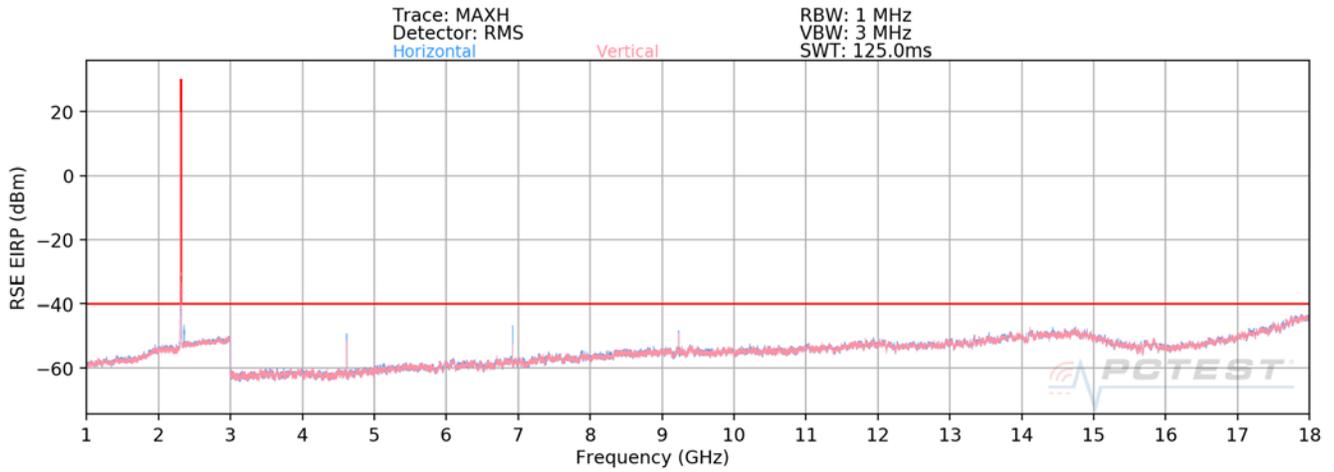
OPERATING FREQUENCY: 1900.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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]
3800.00	H	-	-	-75.73	9.28	-66.45	-53.4
5700.00	H	146	170	-75.27	11.31	-63.96	-51.0
7600.00	H	-	-	-73.15	11.24	-61.91	-48.9
9500.00	H	-	-	-71.34	11.67	-59.66	-46.7

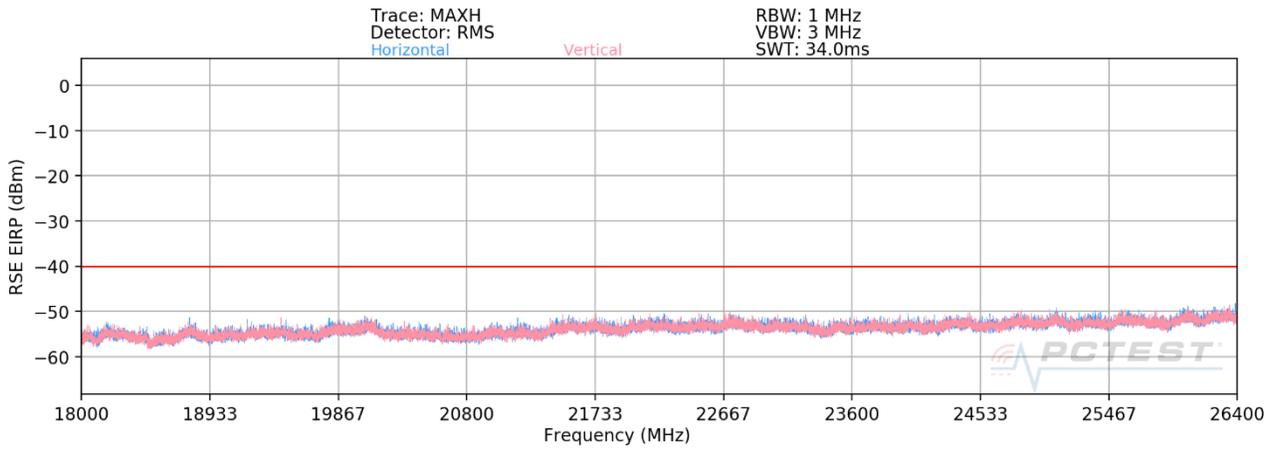
Table 7-19. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 132 of 146	

Band 30



Plot 7-193. Radiated Spurious Plot 1GHz - 18GHz (Band 30)



Plot 7-194. Radiated Spurious Plot 18GHz - 26.5GHz (Band 30)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 133 of 146	

OPERATING FREQUENCY: 2310.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 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]
4620.00	H	360	325	-59.37	10.92	-48.45	-8.4
6930.00	H	111	42	-60.50	11.74	-48.76	-8.8
9240.00	H	240	295	-61.76	11.62	-50.14	-10.1
11550.00	H	120	285	-68.84	12.72	-56.12	-16.1
13860.00	H	164	29	-63.94	11.99	-51.94	-11.9
16170.00	H	-	-	-71.95	16.59	-55.35	-15.4

Table 7-20. Radiated Spurious Data (Band 30 – Mid Channel)

FCC ID: ZNFK400AM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 134 of 146

7.8 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 $\pm 0.00025\%$ (± 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: ZNFK400AM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 135 of 146

Band 12 Frequency Stability Measurements

OPERATING FREQUENCY: 707,500,000 Hz
 CHANNEL: 23790
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	707,500,092	92	0.0000130
100 %		- 20	707,500,057	57	0.0000081
100 %		- 10	707,499,877	-123	-0.0000174
100 %		0	707,500,303	303	0.0000428
100 %		+ 10	707,500,223	223	0.0000315
100 %		+ 20	707,500,274	274	0.0000387
100 %		+ 30	707,500,266	266	0.0000376
100 %		+ 40	707,500,108	108	0.0000153
100 %		+ 50	707,500,002	2	0.0000003
BATT. ENDPOINT		3.48	+ 20	707,500,011	11

Table 7-21. Frequency Stability Data (Band 12)

Note:

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

FCC ID: ZNFK400AM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 136 of 146	

Band 12 Frequency Stability Measurements

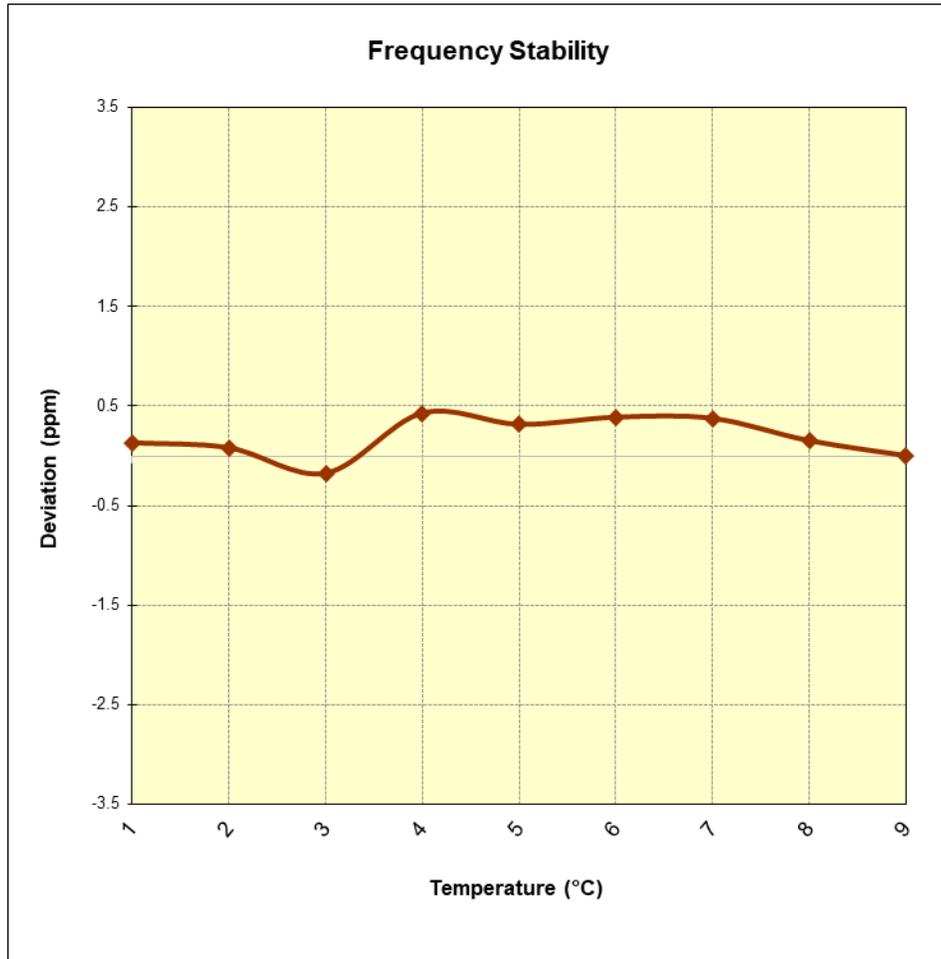


Figure 7-8. Frequency Stability Graph (Band 12)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 137 of 146

Band 5 Frequency Stability Measurements

OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 20525
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	836,499,895	-105	-0.0000126
100 %		- 20	836,500,209	209	0.0000250
100 %		- 10	836,500,176	176	0.0000210
100 %		0	836,499,927	-73	-0.0000087
100 %		+ 10	836,500,013	13	0.0000016
100 %		+ 20	836,500,118	118	0.0000141
100 %		+ 30	836,500,046	46	0.0000055
100 %		+ 40	836,499,924	-76	-0.0000091
100 %		+ 50	836,500,110	110	0.0000132
BATT. ENDPOINT		3.48	+ 20	836,500,049	49

Table 7-22. Frequency Stability Data (Band 5)

FCC ID: ZNFK400AM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 138 of 146	

Band 5 Frequency Stability Measurements

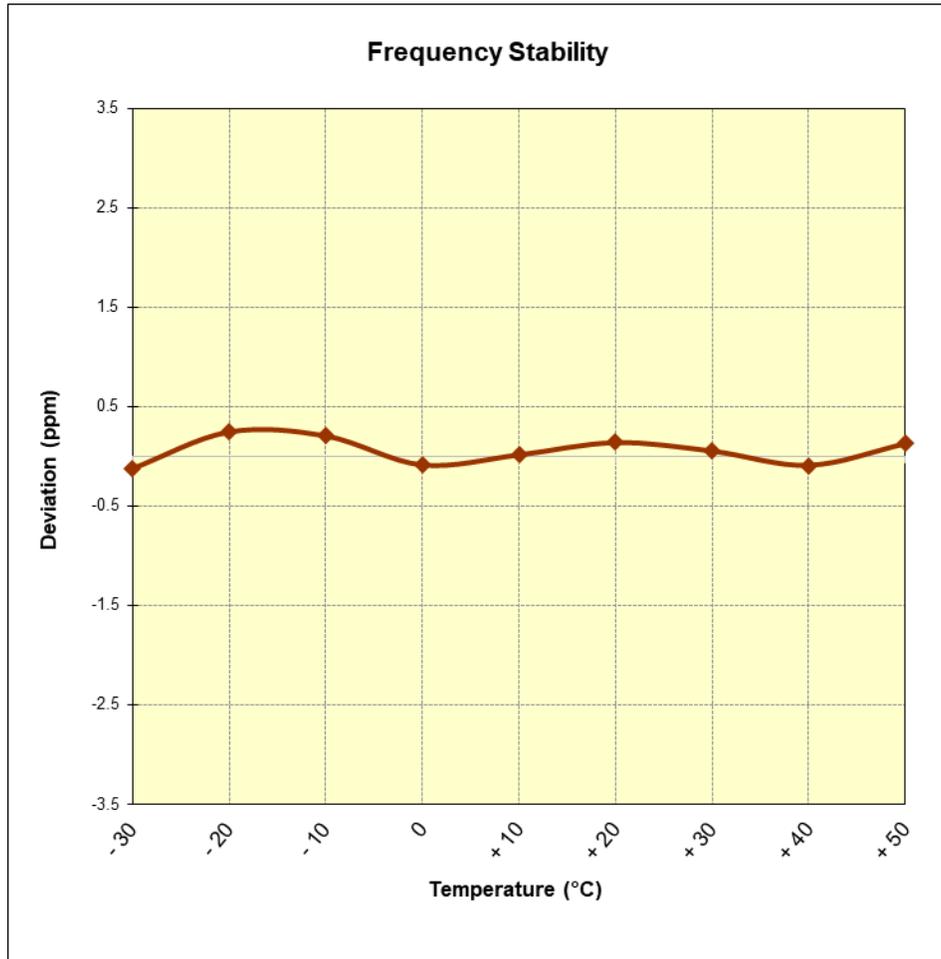


Figure 7-9. Frequency Stability Graph (Band 5)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 139 of 146

Band 66/4 Frequency Stability Measurements

OPERATING FREQUENCY: 1,745,000,000 Hz
 CHANNEL: 132322
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	1,744,999,655	-345	-0.0000198
100 %		- 20	1,744,999,965	-35	-0.0000020
100 %		- 10	1,745,000,011	11	0.0000006
100 %		0	1,745,000,063	63	0.0000036
100 %		+ 10	1,745,000,091	91	0.0000052
100 %		+ 20	1,745,000,150	150	0.0000086
100 %		+ 30	1,745,000,019	19	0.0000011
100 %		+ 40	1,745,000,349	349	0.0000200
100 %		+ 50	1,745,000,001	1	0.0000001
BATT. ENDPOINT		3.48	+ 20	1,744,999,603	-397

Table 7-23. 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: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 140 of 146	

Band 66/4 Frequency Stability Measurements

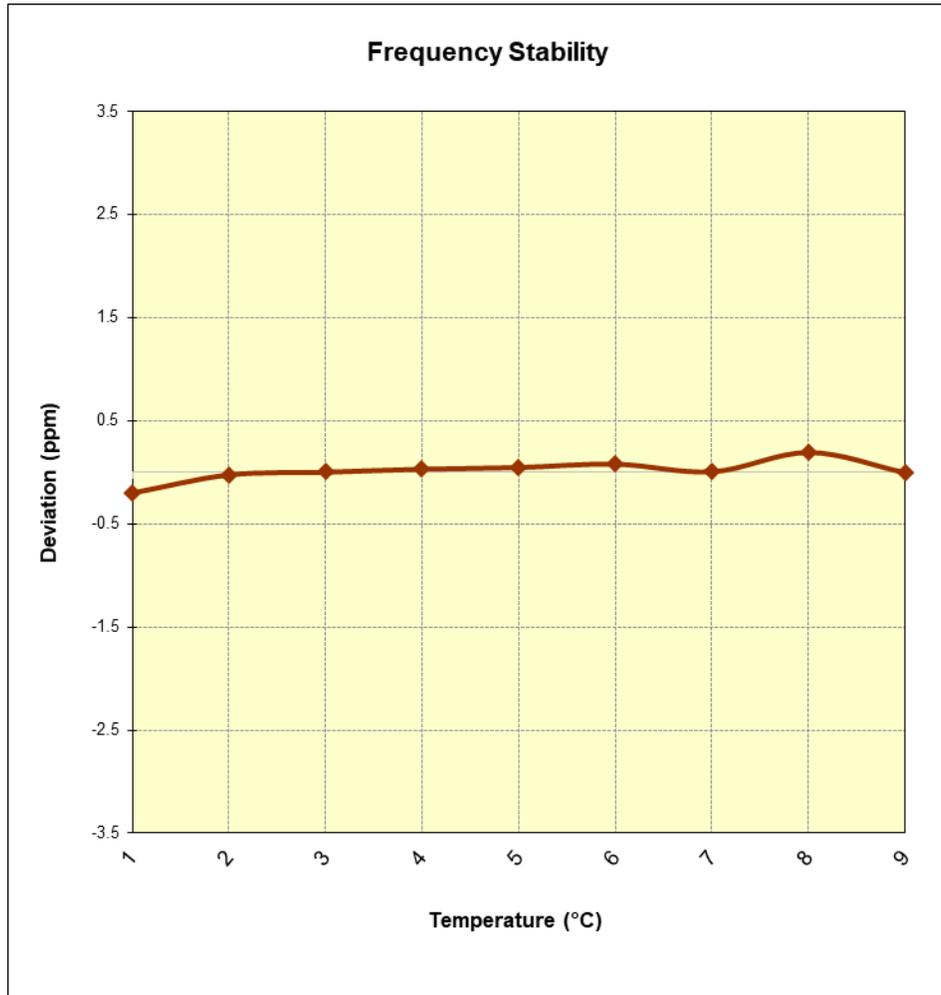


Figure 7-10. Frequency Stability Graph (Band 66/4)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 141 of 146

Band 2 Frequency Stability Measurements

OPERATING FREQUENCY: 1,880,000,000 Hz
 CHANNEL: 18900
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	1,879,999,995	-5	-0.0000003
100 %		- 20	1,880,000,183	183	0.0000097
100 %		- 10	1,879,999,620	-380	-0.0000202
100 %		0	1,880,000,196	196	0.0000104
100 %		+ 10	1,880,000,017	17	0.0000009
100 %		+ 20	1,880,000,065	65	0.0000035
100 %		+ 30	1,880,000,101	101	0.0000054
100 %		+ 40	1,880,000,153	153	0.0000081
100 %		+ 50	1,879,999,719	-281	-0.0000149
BATT. ENDPOINT		3.48	+ 20	1,880,000,019	19

Table 7-24. Frequency Stability Data (Band 2)

FCC ID: ZNFK400AM	 PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	 LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 142 of 146	

Band 2 Frequency Stability Measurements

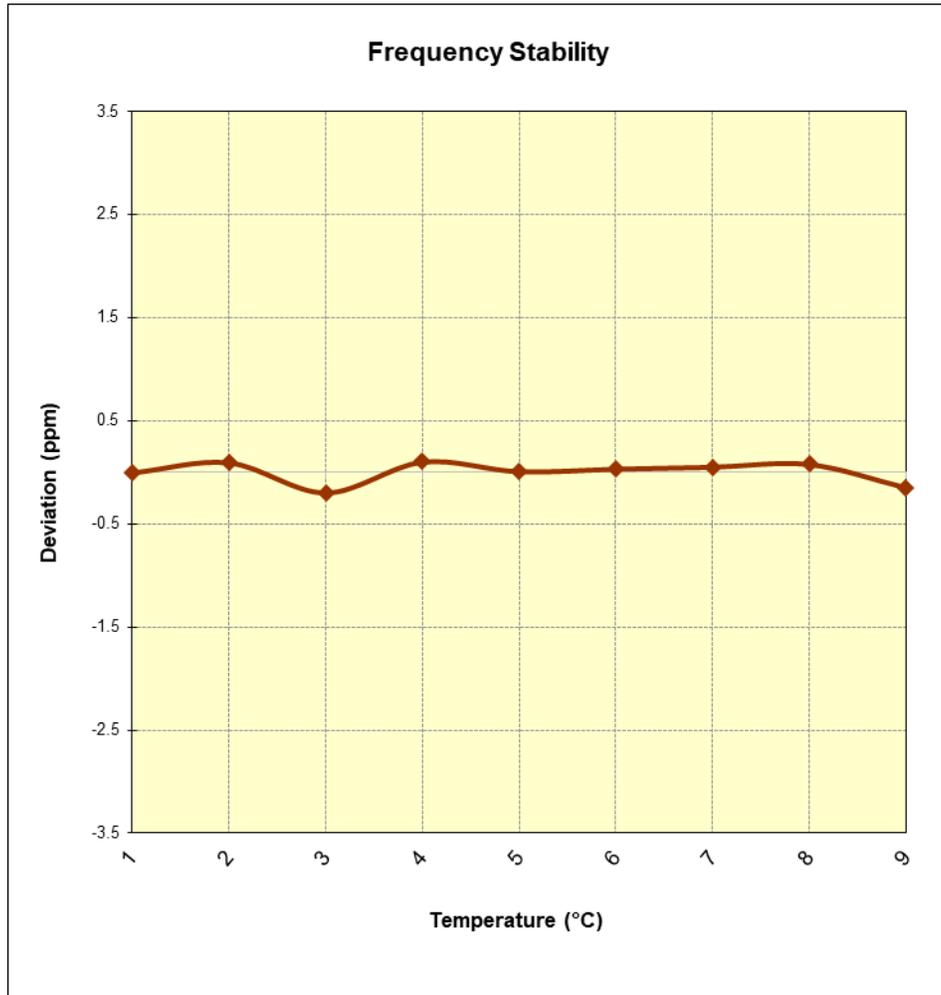


Figure 7-11. Frequency Stability Graph (Band 2)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 143 of 146

Band 30 Frequency Stability Measurements

OPERATING FREQUENCY: 2,310,000,000 Hz
 CHANNEL: 27710
 REFERENCE VOLTAGE: 4.39 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.39	- 30	2,310,000,150	150	0.0000065
100 %		- 20	2,310,000,100	100	0.0000043
100 %		- 10	2,310,000,197	197	0.0000085
100 %		0	2,309,999,857	-143	-0.0000062
100 %		+ 10	2,309,999,952	-48	-0.0000021
100 %		+ 20	2,309,999,886	-114	-0.0000049
100 %		+ 30	2,310,000,033	33	0.0000014
100 %		+ 40	2,309,999,917	-83	-0.0000036
100 %		+ 50	2,310,000,179	179	0.0000077
BATT. ENDPOINT		3.48	+ 20	2,309,999,935	-65

Table 7-25. 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: ZNFK400AM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset	Page 144 of 146	

Band 30 Frequency Stability Measurements

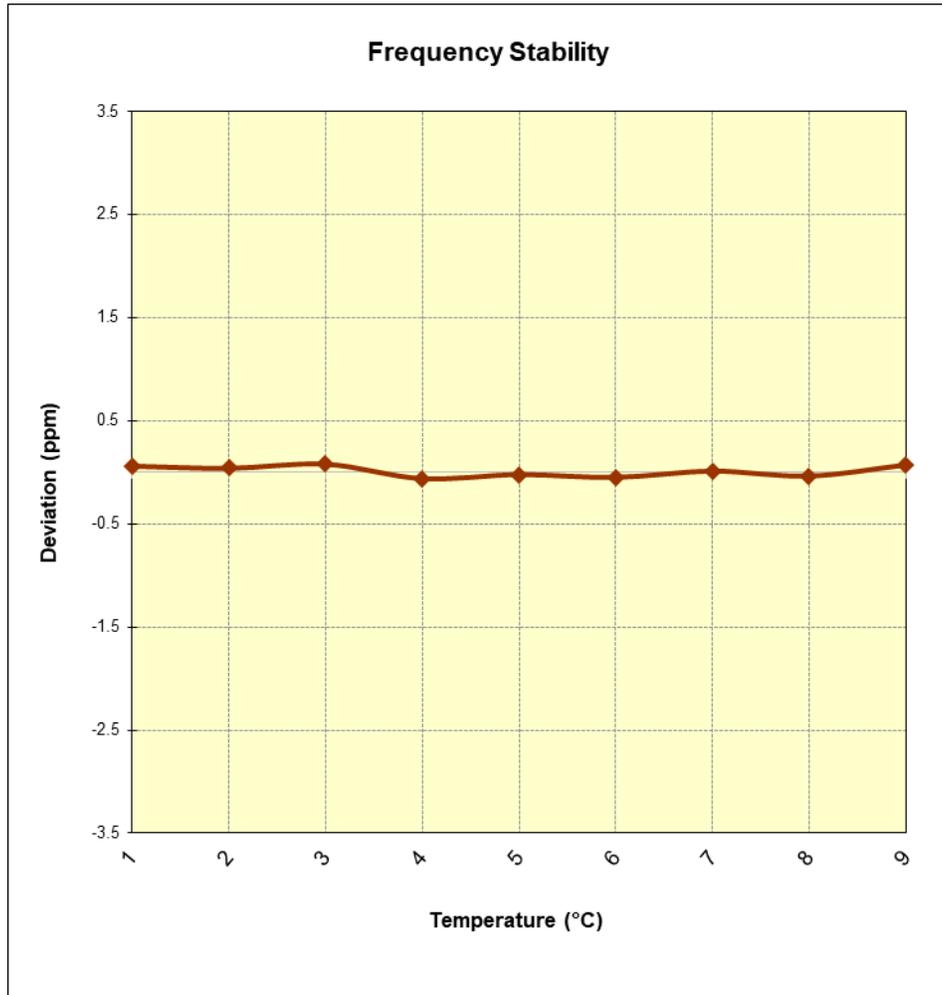


Figure 7-12. Frequency Stability Graph (Band 30)

FCC ID: ZNFK400AM	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 145 of 146

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFK400AM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

FCC ID: ZNFK400AM	 PCTEST <small>Proud to be part of  element</small>	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M2003020032-08-R1.ZNF	Test Dates: 3/2 - 4/1/2020	EUT Type: Portable Handset		Page 146 of 146