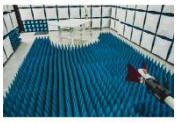
PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. 410.290.6652 / Fax 410.290.6654
http://www.pctest.com



MEASUREMENT REPORT
LTE

Applicant Name:
LG Electronics USA, Inc.
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
United States

Date of Testing:
02/14/2020-03/06/2020
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M2002120020-03.ZNF

FCC ID:	**ZNFK300AM**
APPLICANT:	**LG Electronics USA, Inc.**

Application Type:	Class II Permissive Change
Model:	LM-K300AM
Additional Model(s):	LM-K300CMR, LMK300AM, LMK300CMR, K300AM, K300CMR
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	22, 24, & 27
Test Procedure(s):	ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01
Class II Permissive Change:	Please see FCC change document

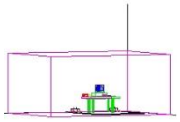
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

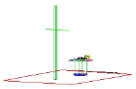
Randy Ortanez
President

ACCREDITED
TESTING CERT#2041.01

TABLE OF CONTENTS



MEASUREMENT REPORT
FCC Part 22, 24, & 27



Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)	
LTE Band 12	27	699.7 - 715.3	0.091	19.60	0.150	21.75	QPSK
LTE Band 12	27	699.7 - 715.3	0.075	18.74	0.123	20.89	16QAM
LTE Band 12	27	700.5 - 714.5	0.092	19.63	0.151	21.78	QPSK
LTE Band 12	27	700.5 - 714.5	0.076	18.81	0.125	20.96	16QAM
LTE Band 12	27	701.5 - 713.5	0.092	19.65	0.151	21.80	QPSK
LTE Band 12	27	701.5 - 713.5	0.076	18.82	0.125	20.97	16QAM
LTE Band 12	27	704 - 711	0.094	19.73	0.154	21.88	QPSK
LTE Band 12	27	704 - 711	0.076	18.81	0.125	20.96	16QAM
LTE Band 5	22H	824.7 - 848.3	0.072	18.58	0.118	20.73	QPSK
LTE Band 5	22H	824.7 - 848.3	0.056	17.52	0.093	19.67	16QAM
LTE Band 5	22H	825.5 - 847.5	0.072	18.57	0.118	20.72	QPSK
LTE Band 5	22H	825.5 - 847.5	0.058	17.65	0.095	19.80	16QAM
LTE Band 5	22H	826.5 - 846.5	0.072	18.59	0.119	20.74	QPSK
LTE Band 5	22H	826.5 - 846.5	0.059	17.68	0.096	19.83	16QAM
LTE Band 5	22H	829 - 844	0.072	18.60	0.119	20.75	QPSK
LTE Band 5	22H	829 - 844	0.058	17.61	0.095	19.76	16QAM

EUT Overview (<1 GHz)

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
LTE Band 4	27	1710.7 - 1754.3	0.217	23.36	QPSK
LTE Band 4	27	1710.7 - 1754.3	0.167	22.21	16QAM
LTE Band 4	27	1711.5 - 1753.5	0.219	23.40	QPSK
LTE Band 4	27	1711.5 - 1753.5	0.165	22.16	16QAM
LTE Band 4	27	1712.5 - 1752.5	0.214	23.30	QPSK
LTE Band 4	27	1712.5 - 1752.5	0.165	22.18	16QAM
LTE Band 4	27	1715 - 1750	0.217	23.37	QPSK
LTE Band 4	27	1715 - 1750	0.167	22.22	16QAM
LTE Band 4	27	1717.5 - 1747.5	0.220	23.41	QPSK
LTE Band 4	27	1717.5 - 1747.5	0.163	22.12	16QAM
LTE Band 4	27	1720 - 1745	0.199	22.99	QPSK
LTE Band 4	27	1720 - 1745	0.155	21.89	16QAM
LTE Band 2	24E	1850.7 - 1909.3	0.263	24.20	QPSK
LTE Band 2	24E	1850.7 - 1909.3	0.195	22.90	16QAM
LTE Band 2	24E	1851.5 - 1908.5	0.259	24.13	QPSK
LTE Band 2	24E	1851.5 - 1908.5	0.194	22.89	16QAM
LTE Band 2	24E	1852.5 - 1907.5	0.263	24.20	QPSK
LTE Band 2	24E	1852.5 - 1907.5	0.210	23.22	16QAM
LTE Band 2	24E	1855 - 1905	0.259	24.13	QPSK
LTE Band 2	24E	1855 - 1905	0.204	23.10	16QAM
LTE Band 2	24E	1857.5 - 1902.5	0.259	24.13	QPSK
LTE Band 2	24E	1857.5 - 1902.5	0.198	22.96	16QAM
LTE Band 2	24E	1860 - 1900	0.249	23.96	QPSK
LTE Band 2	24E	1860 - 1900	0.194	22.87	16QAM

EUT Overview (Mid Bands)

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
LTE Band 30	27	2307.5 - 2312.5	0.154	21.88	QPSK
LTE Band 30	27	2307.5 - 2312.5	0.127	21.04	16QAM
LTE Band 30	27	2310	0.161	22.07	QPSK
LTE Band 30	27	2310	0.130	21.13	16QAM

EUT Overview (High Bands)

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFK300AM**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 02725, 02741, 02733, 02717

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11 b/g/n, Bluetooth (1x, EDR, LE)

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

The measurement procedures described in the document titled "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems" (KDB 971168 D01 v03r01) were used in the measurement of the EUT**.**

3.2 Radiated Power and Radiated Spurious Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v03r01.

Per the guidance of ANSI/TIA-603-E-2016, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_{d\ [dBm]} = P_{g\ [dBm]} - \text{cable loss}_{\ [dB]} + \text{antenna gain}_{\ [dBd/dBi]}$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_{g\ [dBm]}$ – cable loss $_{[dB]}$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of 43 + 10 $\log_{10}$(Power $_{[Watts]}$).

All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx1	Licensed Transmitter Cable Set	6/4/2019	Annual	6/4/2020	LTx1
Agilent	E5515C	Wireless Communications Test Set	N/A			GB45360985
Agilent	N9020A	MXA Signal Analyzer	4/20/2019	Annual	4/20/2020	US46470561
Agilent	N9038A	MXE EMI Receiver	7/17/2019	Annual	7/17/2020	MY51210133
Agilent	N9030A	PXA Signal Analyzer (44GHz)	6/12/2019	Annual	6/12/2020	MY52350166
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	5/10/2019	Annual	5/10/2020	441112
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Keysight Technologies	N9020A	MXA Signal Analyzer	4/29/2019	Annual	4/29/2020	MY54500644
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	6/5/2019	Annual	6/5/2020	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/23/2019	Annual	9/23/2020	100348
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/11/2019	Annual	7/11/2020	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/8/2019	Annual	7/8/2020	102133
Seekonk	NC-100	Torque Wrench (8" lb)	5/10/2018	Biennial	5/10/2020	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 5-1. Test Equipment

Notes:

Equipment with a calibration date of “N/A” shown in this list was not used to make direct calibrated measurements.

6.0 SAMPLE CALCULATIONS

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of –81.0 dBm on the spectrum analzyer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

7.0 TEST RESULTS

7.1 Summary

Company Name: LG Electronics USA, Inc.

FCC ID: ZNFK300AM

FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(5)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 5)	< 7 Watts max. ERP	RADIATED	PASS	Section 7.2
27.50(c)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 12)	< 3 Watts max. ERP			Section 7.2
24.232(c)	Equivalent Isotropic Radiated Power (Band 2)	< 2 Watts max. EIRP			Section 7.2
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP			Section 7.2
27.50(a)(3)	Equivalent Isotropic Radiated Power (Band 30)	< 0.25 Watts max. EIRP			Section 7.2
2.1053 22.917(a) 24.238(a) 27.53(g) 27.53(h)	Undesirable Emissions (Band 12/5/4/2)	> 43 + 10 $\log_{10}$ (P[Watts]) for all out-of-band emissions			Section 7.3
27.53(a)	Undesirable Emissions (Band 30)	> 70 + 10$\log_{10}$ (P[Watts])			Section 7.3

Table 7-1. Summary of Radiated Test Results

Notes:

All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.

7.2 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 ≥ 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
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

Test Setup

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

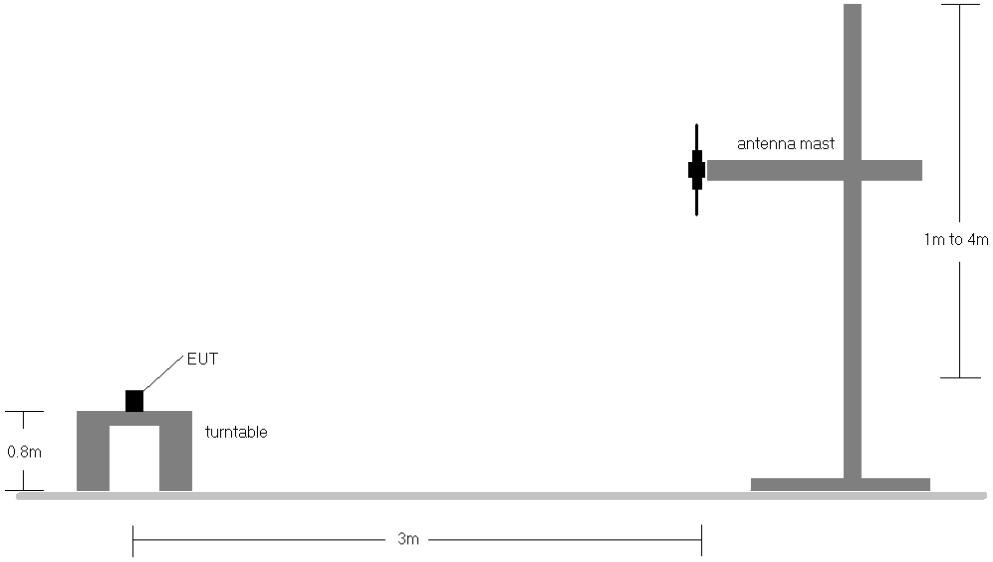


Figure 7-1. Radiated Test Setup <1GHz

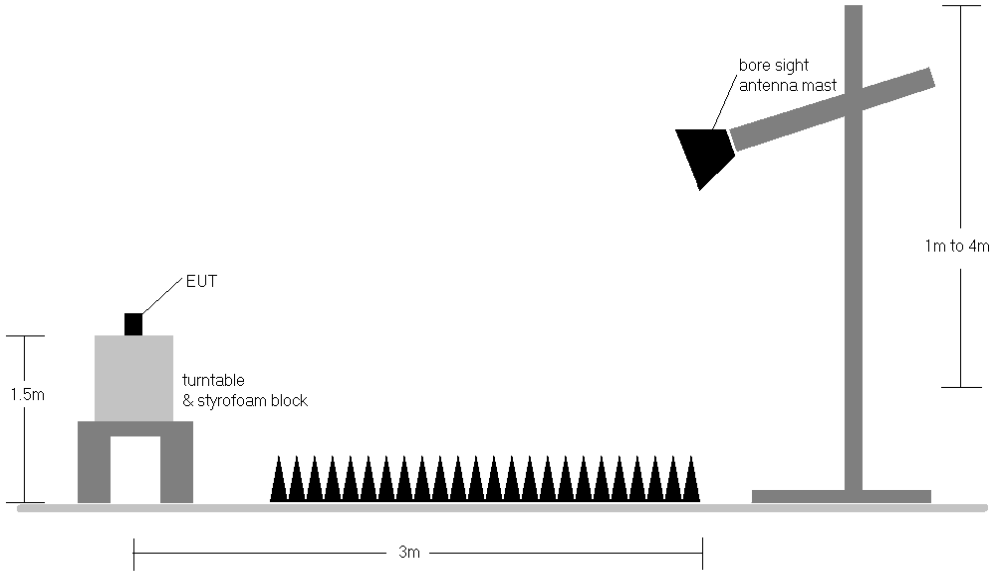


Figure 7-2. Radiated Test Setup >1GHz

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.

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	166	137	1 / 2	17.25	4.50	**19.60**	0.091	34.77	-15.17	**21.75**	0.150	36.99	-15.24
707.50	1.4	QPSK	V	163	128	1 / 2	16.74	4.60	19.19	0.083	34.77	-15.58	21.34	0.136	36.99	-15.65
715.30	1.4	QPSK	V	166	186	1 / 2	16.77	4.63	19.25	0.084	34.77	-15.52	21.40	0.138	36.99	-15.59
699.70	1.4	16-QAM	V	166	137	1 / 2	16.39	4.50	**18.74**	0.075	34.77	-16.03	**20.89**	0.123	36.99	-16.10
700.50	3	QPSK	V	166	137	1 / 7	17.23	4.55	**19.63**	0.092	34.77	-15.14	**21.78**	0.151	36.99	-15.21
707.50	3	QPSK	V	163	128	1 / 14	16.89	4.60	19.34	0.086	34.77	-15.43	21.49	0.141	36.99	-15.50
714.50	3	QPSK	V	166	186	1 / 7	16.94	4.60	19.39	0.087	34.77	-15.38	21.54	0.143	36.99	-15.45
700.50	3	16-QAM	V	166	137	1 / 7	16.41	4.55	**18.81**	0.076	34.77	-15.96	**20.96**	0.125	36.99	-16.03
701.50	5	QPSK	V	166	137	1 / 12	17.20	4.60	**19.65**	0.092	34.77	-15.12	**21.80**	0.151	36.99	-15.19
707.50	5	QPSK	V	163	128	1 / 12	16.86	4.60	19.31	0.085	34.77	-15.46	21.46	0.140	36.99	-15.53
713.50	5	QPSK	V	166	186	1 / 12	16.93	4.60	19.38	0.087	34.77	-15.39	21.53	0.142	36.99	-15.46
701.50	5	16-QAM	V	166	137	1 / 12	16.37	4.60	**18.82**	0.076	34.77	-15.95	**20.97**	0.125	36.99	-16.02
704.00	10	QPSK	V	166	137	1 / 0	17.38	4.50	**19.73**	**0.094**	34.77	-15.04	**21.88**	**0.154**	36.99	-15.11
707.50	10	QPSK	V	163	128	1 / 0	17.01	4.60	19.46	0.088	34.77	-15.31	21.61	0.145	36.99	-15.38
711.00	10	QPSK	V	166	186	1 / 0	17.02	4.60	19.47	0.089	34.77	-15.30	21.62	0.145	36.99	-15.37
704.00	10	16-QAM	V	166	137	1 / 0	16.46	4.50	**18.81**	0.076	34.77	-15.96	**20.96**	0.125	36.99	-16.03
704.00	10	QPSK	H	281	179	1 / 0	17.00	3.50	18.35	0.068	34.77	-16.42	20.50	0.112	36.99	-16.49

Table 7-2. ERP Data (Band 12)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	202	162	1 / 2	14.03	6.70	**18.58**	0.072	38.45	-19.87	**20.73**	0.118	40.61	-19.88
836.50	1.4	QPSK	V	199	168	1 / 2	13.94	6.70	18.49	0.071	38.45	-19.96	20.64	0.116	40.61	-19.97
848.30	1.4	QPSK	V	201	167	1 / 2	13.90	6.70	18.45	0.070	38.45	-20.00	20.60	0.115	40.61	-20.01
824.70	1.4	16-QAM	V	202	162	1 / 2	12.97	6.70	**17.52**	0.056	38.45	-20.93	**19.67**	0.093	40.61	-20.94
825.50	3	QPSK	V	202	162	1 / 0	14.02	6.70	**18.57**	0.072	38.45	-19.88	**20.72**	0.118	40.61	-19.89
836.50	3	QPSK	V	199	168	1 / 14	13.83	6.70	18.38	0.069	38.45	-20.07	20.53	0.113	40.61	-20.08
847.50	3	QPSK	V	201	167	1 / 0	13.86	6.65	18.36	0.069	38.45	-20.09	20.51	0.112	40.61	-20.10
825.50	3	16-QAM	V	202	162	1 / 0	13.10	6.70	**17.65**	0.058	38.45	-20.80	**19.80**	0.095	40.61	-20.81
826.50	5	QPSK	V	202	162	1 / 0	14.04	6.70	**18.59**	0.072	38.45	-19.86	**20.74**	0.119	40.61	-19.87
836.50	5	QPSK	V	199	168	1 / 0	13.68	6.70	18.23	0.067	38.45	-20.22	20.38	0.109	40.61	-20.23
846.50	5	QPSK	V	201	167	1 / 0	13.85	6.60	18.30	0.068	38.45	-20.15	20.45	0.111	40.61	-20.16
826.50	5	16-QAM	V	202	162	1 / 0	13.13	6.70	**17.68**	0.059	38.45	-20.77	**19.83**	0.096	40.61	-20.78
829.00	10	QPSK	V	202	162	1 / 25	14.05	6.70	**18.60**	**0.072**	38.45	-19.85	**20.75**	**0.119**	40.61	-19.86
836.50	10	QPSK	V	199	168	1 / 0	13.74	6.70	18.29	0.067	38.45	-20.16	20.44	0.111	40.61	-20.17
844.00	10	QPSK	V	201	167	1 / 25	12.92	6.60	17.37	0.055	38.45	-21.08	19.52	0.090	40.61	-21.09
829.00	10	16-QAM	V	202	162	1 / 25	13.06	6.70	**17.61**	0.058	38.45	-20.84	**19.76**	0.095	40.61	-20.85
829.00	10	QPSK	H	143	322	1 / 25	13.61	6.40	17.86	0.061	38.45	-20.59	20.01	0.100	40.61	-20.60

Table 7-3. ERP Data (Band 5)

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	137	341	1 / 2	13.92	9.44	**23.36**	0.217	30.00	-6.64
1732.50	1.4	QPSK	H	185	353	1 / 2	13.78	9.31	23.09	0.204	30.00	-6.91
1754.30	1.4	QPSK	H	126	342	1 / 5	14.14	9.21	23.35	0.216	30.00	-6.65
1710.70	1.4	16-QAM	H	137	341	1 / 2	12.77	9.44	**22.21**	0.167	30.00	-7.79
1711.50	3	QPSK	H	137	341	1 / 7	13.97	9.44	**23.40**	0.219	30.00	-6.60
1732.50	3	QPSK	H	185	353	1 / 7	13.74	9.31	23.05	0.202	30.00	-6.95
1753.50	3	QPSK	H	126	342	1 / 7	14.14	9.21	23.35	0.216	30.00	-6.65
1711.50	3	16-QAM	H	137	341	1 / 7	12.73	9.44	**22.16**	0.165	30.00	-7.84
1712.50	5	QPSK	H	137	341	1 / 12	13.87	9.43	**23.30**	0.214	30.00	-6.70
1732.50	5	QPSK	H	185	353	1 / 24	13.56	9.31	22.87	0.194	30.00	-7.13
1752.50	5	QPSK	H	126	342	1 / 24	14.06	9.21	23.26	0.212	30.00	-6.74
1712.50	5	16-QAM	H	137	341	1 / 12	12.75	9.43	**22.18**	0.165	30.00	-7.82
1715.00	10	QPSK	H	137	341	1 / 0	13.95	9.42	**23.37**	0.217	30.00	-6.63
1732.50	10	QPSK	H	185	353	25 / 12	13.79	9.31	23.10	0.204	30.00	-6.90
1750.00	10	QPSK	H	126	342	1 / 49	14.02	9.20	23.22	0.210	30.00	-6.78
1715.00	10	16-QAM	H	137	341	1 / 0	12.80	9.42	**22.22**	0.167	30.00	-7.78
1717.50	15	QPSK	H	137	341	1 / 0	14.01	9.40	**23.41**	**0.220**	30.00	-6.59
1732.50	15	QPSK	H	185	353	1 / 0	13.79	9.31	23.10	0.204	30.00	-6.90
1747.50	15	QPSK	H	126	342	1 / 36	14.09	9.22	23.30	0.214	30.00	-6.70
1717.50	15	16-QAM	H	137	341	1 / 0	12.72	9.40	**22.12**	0.163	30.00	-7.88
1720.00	20	QPSK	H	137	341	1 / 50	13.54	9.38	22.92	0.196	30.00	-7.08
1732.50	20	QPSK	H	185	353	1 / 0	13.24	9.31	22.55	0.180	30.00	-7.45
1745.00	20	QPSK	H	126	342	1 / 99	13.76	9.23	**22.99**	0.199	30.00	-7.01
1745.00	20	16-QAM	H	126	342	1 / 99	12.66	9.23	**21.89**	0.155	30.00	-8.11
1717.50	15	QPSK	V	161	131	1 / 0	13.11	9.11	22.22	0.167	30.00	-7.78

Table 7-4. EIRP Data (Band 4)

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	163	134	1 / 2	14.45	9.48	23.94	0.248	33.01	-9.07
1880.00	1.4	QPSK	H	152	131	1 / 2	14.30	9.90	**24.20**	**0.263**	33.01	-8.81
1909.30	1.4	QPSK	H	155	335	1 / 0	13.88	10.25	24.13	0.259	33.01	-8.88
1880.00	1.4	16-QAM	H	152	131	1 / 2	13.00	9.90	**22.90**	0.195	33.01	-10.11
1851.50	3	QPSK	H	163	134	1 / 7	14.49	9.50	23.99	0.250	33.01	-9.02
1880.00	3	QPSK	H	152	131	1 / 7	14.23	9.90	24.13	0.259	33.01	-8.88
1908.50	3	QPSK	H	155	335	1 / 7	13.88	10.25	**24.13**	0.259	33.01	-8.88
1908.50	3	16-QAM	H	155	335	1 / 7	12.64	10.25	**22.89**	0.194	33.01	-10.12
1852.50	5	QPSK	H	163	134	1 / 12	14.44	9.51	23.95	0.248	33.01	-9.06
1880.00	5	QPSK	H	152	131	1 / 12	14.30	9.90	**24.20**	0.263	33.01	-8.81
1907.50	5	QPSK	H	155	335	1 / 12	13.87	10.24	24.11	0.258	33.01	-8.90
1880.00	5	16-QAM	H	152	131	1 / 12	13.32	9.90	**23.22**	0.210	33.01	-9.79
1855.00	10	QPSK	H	163	134	1 / 25	14.38	9.55	23.93	0.247	33.01	-9.08
1880.00	10	QPSK	H	152	131	1 / 25	14.23	9.90	**24.13**	0.259	33.01	-8.88
1905.00	10	QPSK	H	155	335	1 / 0	13.84	10.22	24.06	0.255	33.01	-8.95
1880.00	10	16-QAM	H	152	131	1 / 25	13.20	9.90	**23.10**	0.204	33.01	-9.91
1857.50	15	QPSK	H	163	134	1 / 0	14.26	9.58	23.84	0.242	33.01	-9.17
1880.00	15	QPSK	H	152	131	1 / 36	14.21	9.90	24.11	0.258	33.01	-8.90
1902.50	15	QPSK	H	155	335	1 / 36	13.93	10.20	**24.13**	0.259	33.01	-8.88
1902.50	15	16-QAM	H	155	335	1 / 36	12.76	10.20	**22.96**	0.198	33.01	-10.05
1860.00	20	QPSK	H	163	134	1 / 99	13.99	9.62	23.61	0.229	33.01	-9.40
1880.00	20	QPSK	H	152	131	1 / 0	14.06	9.90	**23.96**	0.249	33.01	-9.05
1900.00	20	QPSK	H	155	335	1 / 0	13.66	10.18	23.84	0.242	33.01	-9.17
1880.00	20	16-QAM	H	152	131	1 / 0	12.97	9.90	**22.87**	0.194	33.01	-10.14
1880.00	1.4	QPSK	V	222	135	1 / 2	12.59	10.10	22.69	0.186	33.01	-10.32

Table 7-5. EIRP Data (Band 2)

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	117	15	1 / 0	11.51	10.31	21.82	0.152	23.98	-2.16
2312.50	5	QPSK	H	117	15	1 / 24	11.57	10.31	**21.88**	0.154	23.98	-2.10
2312.50	5	16-QAM	H	117	15	1 / 24	10.73	10.31	**21.04**	0.127	23.98	-2.94
2310.00	10	QPSK	H	117	15	1 / 25	11.76	10.31	**22.07**	**0.161**	23.98	-1.91
2310.00	10	16-QAM	H	117	15	1 / 25	10.82	10.31	21.13	0.130	23.98	-2.85
2310.00	10	QPSK	V	148	276	1 / 25	11.20	10.22	21.42	0.139	23.98	-2.56

Table 7-6. EIRP Data (Band 30)

7.3 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 ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

Test Setup

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

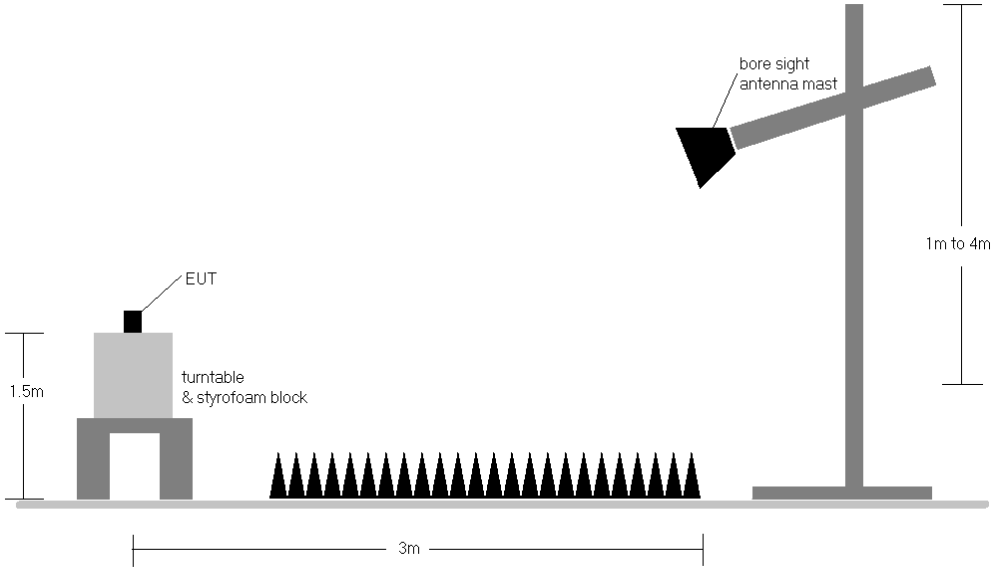


Figure 7-3. Test Instrument & Measurement Setup

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.

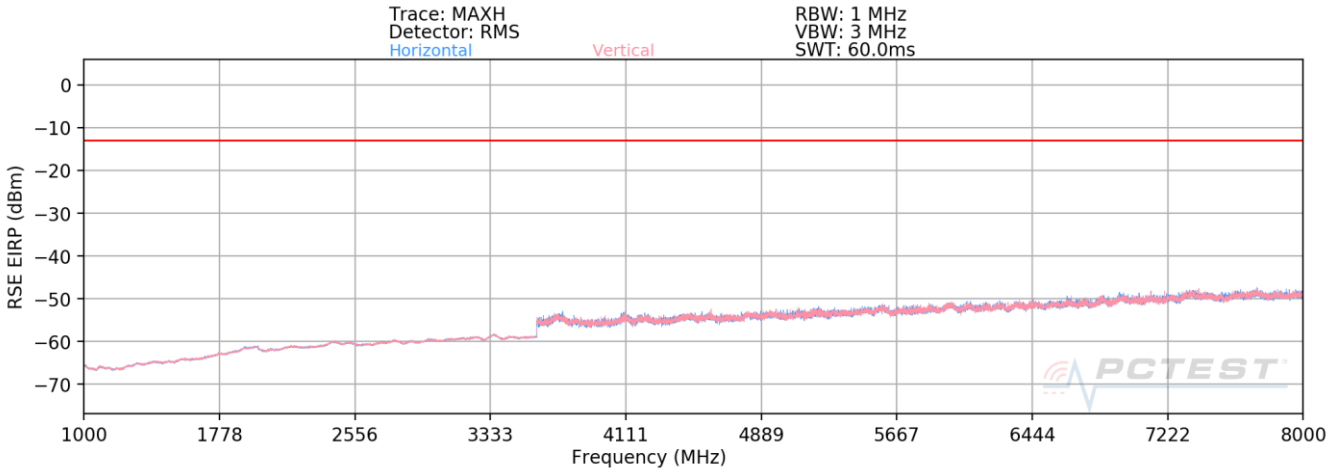
2) This unit was tested with its standard battery.

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.

Band 12



Plot 7-1. 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	-	-	-79.74	7.54	-72.20	-59.2
2112.00	H	143	338	-70.97	8.85	-62.12	-49.1
2816.00	H	-	-	-78.94	10.12	-68.82	-55.8
3520.00	H	-	-	-75.63	9.91	-65.72	-52.7

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

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	-	-	-79.36	7.63	-71.73	-58.7
2122.50	H	153	348	-70.45	8.86	-61.58	-48.6
2830.00	H	-	-	-78.55	10.10	-68.45	-55.5
3537.50	H	-	-	-75.47	9.90	-65.57	-52.6

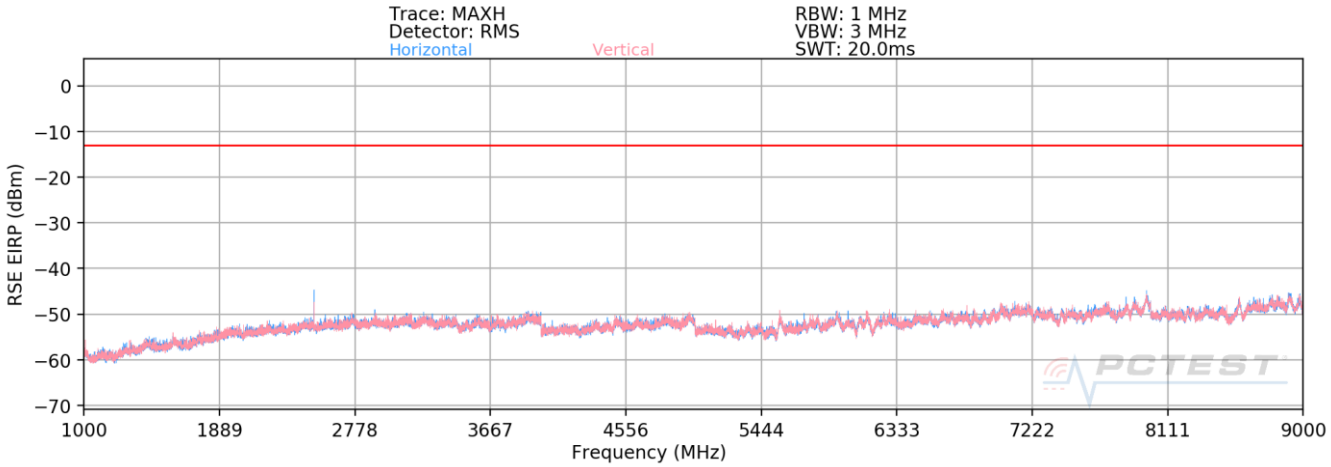
Table 7-8. Radiated Spurious Data (Band 12 – Mid Channel)

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	-	-	-79.71	7.72	-71.99	-59.0
2133.00	H	161	356	-72.00	8.87	-63.13	-50.1
2844.00	H	-	-	-78.81	10.07	-68.74	-55.7
3555.00	H	-	-	-75.83	9.89	-65.93	-52.9

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

Band 5



Plot 7-2. 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	154	219	-75.89	8.95	-66.94	-53.9
2487.00	H	198	50	-66.16	9.70	-56.45	-43.5
3316.00	H	-	-	-76.60	9.59	-67.01	-54.0
4145.00	H	-	-	-76.51	10.22	-66.30	-53.3

Table 7-10. Radiated Spurious Data (Band 5 – Low Channel)

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	149	223	-76.56	8.95	-67.61	-54.6
2509.50	H	149	42	-60.50	9.75	-50.75	-37.7
3346.00	H	-	-	-76.88	9.60	-67.28	-54.3
4182.50	H	-	-	-77.25	10.34	-66.91	-53.9

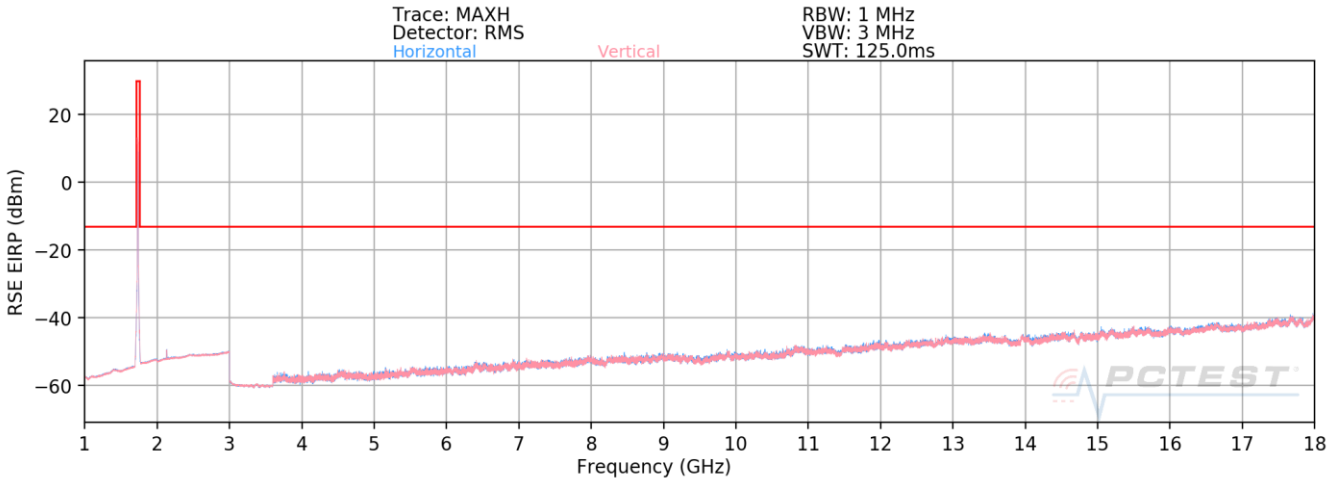
Table 7-11. Radiated Spurious Data (Band 5 – Mid Channel)

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	151	228	-76.78	8.95	-67.82	-54.8
2532.00	H	201	149	-61.17	9.75	-51.42	-38.4
3376.00	H	-	-	-76.72	9.71	-67.02	-54.0
4220.00	H	-	-	-77.21	10.48	-66.72	-53.7

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

Band 4



Plot 7-3. Radiated Spurious Plot above 1GHz (Band 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	151	-68.43	9.84	-58.58	-45.6
5160.00	H	112	328	-74.25	10.71	-63.54	-50.5
6880.00	H	112	303	-65.84	11.68	-54.16	-41.2
8600.00	H	-	-	-71.70	11.08	-60.62	-47.6
10320.00	H	178	16	-65.13	12.38	-52.75	-39.8
12040.00	H	-	-	-70.01	12.71	-57.30	-44.3
13760.00	H	-	-	-67.11	11.99	-55.12	-42.1

Table 7-13. Radiated Spurious Data (Band 4 – Low Channel)

OPERATING FREQUENCY:	1732.50	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]
3465.00	H	394	25	-65.26	9.88	-55.39	-42.4
5197.50	H	241	146	-74.64	10.76	-63.88	-50.9
6930.00	H	120	299	-66.88	11.74	-55.14	-42.1
8662.50	H	148	300	-70.08	11.02	-59.06	-46.1
10395.00	H	184	14	-64.91	12.44	-52.47	-39.5
12127.50	H	-	-	-70.94	12.96	-57.97	-45.0
13860.00	H	-	-	-66.65	11.99	-54.65	-41.7

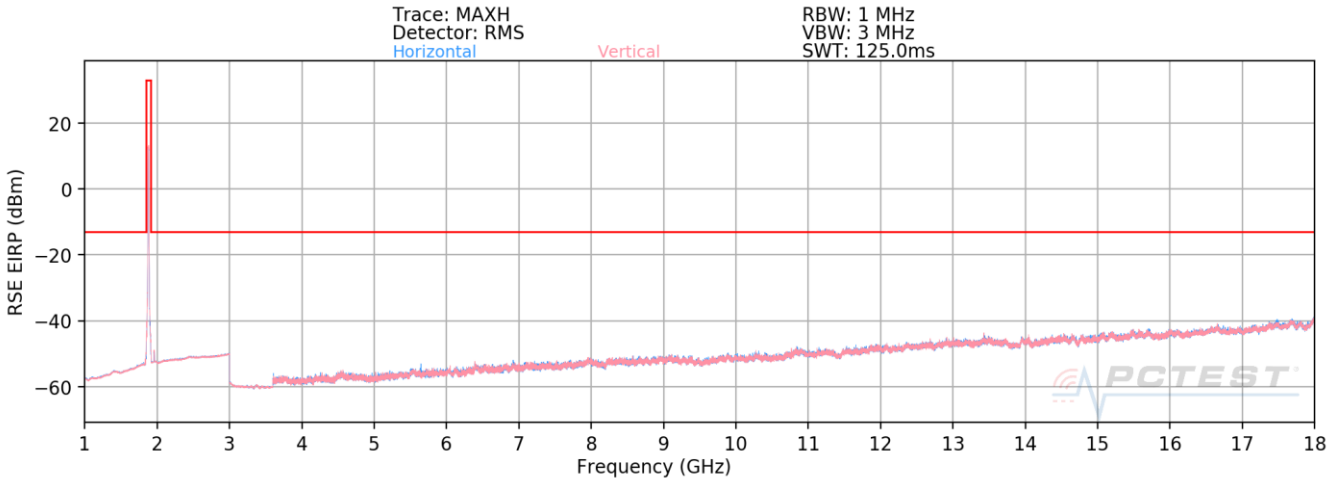
Table 7-14. Radiated Spurious Data (Band 4 – Mid Channel)

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	305	139	-65.38	9.91	-55.46	-42.5
5235.00	H	148	164	-61.96	10.73	-51.23	-38.2
6980.00	H	132	303	-67.88	11.82	-56.06	-43.1
8725.00	H	145	290	-70.64	11.00	-59.64	-46.6
10470.00	H	159	292	-66.36	12.58	-53.78	-40.8
12215.00	H	-	-	-71.31	13.11	-58.19	-45.2
13960.00	H	-	-	-66.83	11.85	-54.98	-42.0

Table 7-15. Radiated Spurious Data (Band 4 – High Channel)

Band 2



Plot 7-4. 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	161	155	-63.44	9.51	-53.94	-40.9
5580.00	H	143	318	-73.71	10.99	-62.73	-49.7
7440.00	H	398	313	-64.48	10.99	-53.49	-40.5
9300.00	H	-	-	-71.03	11.61	-59.42	-46.4
11160.00	H	112	347	-59.43	12.73	-46.70	-33.7
13020.00	H	253	63	-65.52	13.23	-52.29	-39.3
14880.00	H	-	-	-66.78	12.62	-54.17	-41.2

Table 7-16. Radiated Spurious Data (Band 2 – Low Channel)

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	148	145	-58.60	9.37	-49.24	-36.2
5640.00	H	192	313	-74.25	11.17	-63.08	-50.1
7520.00	H	395	316	-63.69	11.11	-52.57	-39.6
9400.00	H	-	-	-70.73	11.57	-59.16	-46.2
11280.00	H	150	344	-59.10	12.72	-46.38	-33.4
13160.00	H	264	55	-65.77	13.15	-52.63	-39.6
15040.00	H	-	-	-69.42	13.52	-55.90	-42.9
16920.00	H	-	-	-69.36	14.36	-54.99	-42.0

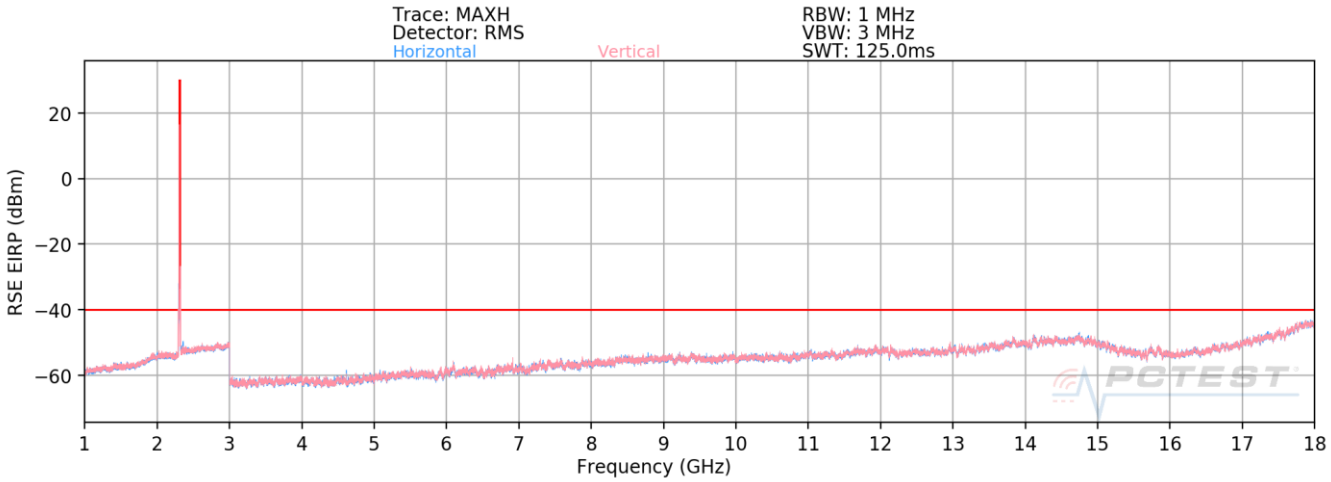
Table 7-17. Radiated Spurious Data (Band 2 – Mid Channel)

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	139	143	-62.49	9.28	-53.21	-40.2
5700.00	H	121	321	-75.60	11.31	-64.29	-51.3
7600.00	H	290	24	-69.96	11.24	-58.72	-45.7
9500.00	H	-	-	-71.07	11.67	-59.39	-46.4
11400.00	H	125	346	-63.64	12.84	-50.80	-37.8
13300.00	H	272	63	-68.94	12.81	-56.13	-43.1
15200.00	H	-	-	-70.88	14.68	-56.20	-43.2

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

Band 30



Plot 7-5. Radiated Spurious Plot above 1GHz (Band 30)

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	140	354	-60.64	8.42	-52.22	-12.2
6930.00	H	116	230	-64.56	9.38	-55.17	-15.2
9240.00	H	-	-	-68.64	9.46	-59.17	-19.2
11550.00	H	211	21	-62.02	9.48	-52.54	-12.5
13860.00	H	-	-	-59.73	8.74	-50.98	-11.0
16170.00	H	-	-	-57.25	8.40	-48.84	-8.8

Table 7-19. Radiated Spurious Data (Band 30 – Mid Channel)

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFK300AM** complies with all the requirements of Part **22, 24, & 27** of the FCC Rules for LTE operation only.