PCTEST ENGINEERING LABORATORY, INC.
7185 Oakland Mills Road, Columbia, MD 21046 USA
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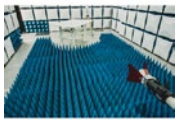

MEASUREMENT REPORT
LTE

Applicant Name:
LG Electronics MobileComm U.S.A
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
United States

Date of Testing:
4/7-4/17/2018
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M1804040064-03.ZNF

FCC ID:	**ZNFV350A**
APPLICANT:	**LG Electronics MobileComm U.S.A**

Application Type:	Class II Permissive Change
Model:	LM-V350AWM
Additional Model(s):	LMV350AWM, V350AWM, LM-V350AWA, LMV350AWA, V350AWA, LM-V350AWS, LMV350AWS, V350AWS, LM-V350ULA, LMV350ULA, V350ULA, LM-V350ULM, LMV350ULM, V350ULM, LM-V350ULS, LMV350ULS, V350ULS
EUT Type:	Portable Handset
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, KDB 648474 D03 v01r04
Class II Permissive Change:	Please see 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

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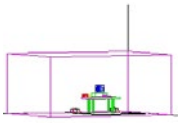
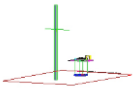


MEASUREMENT REPORT
Part 22, 24, & 27



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	0.125	20.98	0.206	23.13	QPSK
LTE Band 12	27	699.7 - 715.3	0.076	18.78	0.124	20.93	16QAM
LTE Band 12	27	699.7 - 715.3	0.071	18.54	0.117	20.69	64QAM
LTE Band 12	27	700.5 - 714.5	0.128	21.08	0.210	23.23	QPSK
LTE Band 12	27	700.5 - 714.5	0.072	18.58	0.118	20.73	16QAM
LTE Band 12	27	700.5 - 714.5	0.061	17.84	0.100	19.99	64QAM
LTE Band 12/17	27	701.5 - 713.5	0.128	21.07	0.210	23.22	QPSK
LTE Band 12/17	27	701.5 - 713.5	0.075	18.73	0.123	20.88	16QAM
LTE Band 12/17	27	701.5 - 713.5	0.059	17.74	0.098	19.89	64QAM
LTE Band 12/17	27	704 - 711	0.082	19.15	0.135	21.30	QPSK
LTE Band 12/17	27	704 - 711	0.079	18.98	0.130	21.13	16QAM
LTE Band 12/17	27	704 - 711	0.074	18.69	0.121	20.84	64QAM
LTE Band 13	27	779.5 - 784.5	0.035	15.48	0.058	17.63	QPSK
LTE Band 13	27	779.5 - 784.5	0.024	13.77	0.039	15.92	16QAM
LTE Band 13	27	779.5 - 784.5	0.017	12.20	0.027	14.35	64QAM
LTE Band 13	27	782	0.034	15.36	0.056	17.51	QPSK
LTE Band 13	27	782	0.021	13.23	0.035	15.38	16QAM
LTE Band 13	27	782	0.017	12.22	0.027	14.37	64QAM
LTE Band 26/5	22H	824.7 - 848.3	0.075	18.77	0.124	20.92	QPSK
LTE Band 26/5	22H	824.7 - 848.3	0.053	17.21	0.086	19.36	16QAM
LTE Band 26/5	22H	824.7 - 848.3	0.039	15.95	0.065	18.10	64QAM
LTE Band 26/5	22H	825.5 - 847.5	0.075	18.75	0.123	20.90	QPSK
LTE Band 26/5	22H	825.5 - 847.5	0.052	17.20	0.086	19.35	16QAM
LTE Band 26/5	22H	825.5 - 847.5	0.039	15.95	0.065	18.10	64QAM
LTE Band 26/5	22H	826.5 - 846.5	0.074	18.71	0.122	20.86	QPSK
LTE Band 26/5	22H	826.5 - 846.5	0.056	17.45	0.091	19.60	16QAM
LTE Band 26/5	22H	826.5 - 846.5	0.044	16.41	0.072	18.56	64QAM
LTE Band 26/5	22H	829 - 844	0.075	18.75	0.123	20.90	QPSK
LTE Band 26/5	22H	829 - 844	0.055	17.38	0.090	19.53	16QAM
LTE Band 26/5	22H	829 - 844	0.044	16.41	0.072	18.56	64QAM
LTE Band 26	22H	831.5 - 841.5	0.075	18.76	0.123	20.91	QPSK
LTE Band 26	22H	831.5 - 841.5	0.054	17.36	0.089	19.51	16QAM
LTE Band 26	22H	831.5 - 841.5	0.044	16.42	0.072	18.57	64QAM

EUT Overview (<1GHz)

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
LTE Band 66/4	27	1710.7 - 1779.3	0.112	20.51	QPSK
LTE Band 66/4	27	1710.7 - 1779.3	0.086	19.35	16QAM
LTE Band 66/4	27	1710.7 - 1779.3	0.068	18.31	64QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.104	20.17	QPSK
LTE Band 66/4	27	1711.5 - 1778.5	0.082	19.14	16QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.066	18.21	64QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.101	20.04	QPSK
LTE Band 66/4	27	1712.5 - 1777.5	0.081	19.07	16QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.063	18.01	64QAM
LTE Band 66/4	27	1715 - 1775	0.108	20.32	QPSK
LTE Band 66/4	27	1715 - 1775	0.082	19.14	16QAM
LTE Band 66/4	27	1715 - 1775	0.069	18.36	64QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.107	20.29	QPSK
LTE Band 66/4	27	1717.5 - 1772.5	0.088	19.47	16QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.065	18.11	64QAM
LTE Band 66/4	27	1720 - 1770	0.126	20.99	QPSK
LTE Band 66/4	27	1720 - 1770	0.100	20.01	16QAM
LTE Band 66/4	27	1720 - 1770	0.079	18.99	64QAM
LTE Band 25/2	24E	1850.7 - 1914.3	0.213	23.29	QPSK
LTE Band 25/2	24E	1850.7 - 1914.3	0.169	22.28	16QAM
LTE Band 25/2	24E	1850.7 - 1914.3	0.121	20.81	64QAM
LTE Band 25/2	24E	1851.5 - 1913.5	0.128	21.09	QPSK
LTE Band 25/2	24E	1851.5 - 1913.5	0.102	20.09	16QAM
LTE Band 25/2	24E	1851.5 - 1913.5	0.084	19.23	64QAM
LTE Band 25/2	24E	1852.5 - 1912.5	0.162	22.08	QPSK
LTE Band 25/2	24E	1852.5 - 1912.5	0.129	21.11	16QAM
LTE Band 25/2	24E	1852.5 - 1912.5	0.097	19.88	64QAM
LTE Band 25/2	24E	1855 - 1910	0.200	23.01	QPSK
LTE Band 25/2	24E	1855 - 1910	0.165	22.17	16QAM
LTE Band 25/2	24E	1855 - 1910	0.120	20.78	64QAM
LTE Band 25/2	24E	1857.5 - 1907.5	0.205	23.12	QPSK
LTE Band 25/2	24E	1857.5 - 1907.5	0.175	22.44	16QAM
LTE Band 25/2	24E	1857.5 - 1907.5	0.111	20.44	64QAM
LTE Band 25/2	24E	1860 - 1905	0.207	23.15	QPSK
LTE Band 25/2	24E	1860 - 1905	0.170	22.30	16QAM
LTE Band 25/2	24E	1860 - 1905	0.137	21.36	64QAM
LTE Band 30	27	2307.5 - 2312.5	0.077	18.87	QPSK
LTE Band 30	27	2307.5 - 2312.5	0.069	18.39	16QAM
LTE Band 30	27	2307.5 - 2312.5	0.053	17.28	64QAM
LTE Band 30	27	2310	0.067	18.28	QPSK
LTE Band 30	27	2310	0.063	17.99	16QAM
LTE Band 30	27	2310	0.053	17.25	64QAM
LTE Band 7	27	2502.5 - 2567.5	0.063	18.01	QPSK
LTE Band 7	27	2502.5 - 2567.5	0.063	17.97	16QAM
LTE Band 7	27	2502.5 - 2567.5	0.052	17.17	64QAM
LTE Band 7	27	2505 - 2565	0.060	17.78	QPSK
LTE Band 7	27	2505 - 2565	0.056	17.51	16QAM
LTE Band 7	27	2505 - 2565	0.050	16.95	64QAM
LTE Band 7	27	2507.5 - 2562.5	0.067	18.24	QPSK
LTE Band 7	27	2507.5 - 2562.5	0.062	17.93	16QAM
LTE Band 7	27	2507.5 - 2562.5	0.054	17.34	64QAM
LTE Band 7	27	2510 - 2560	0.066	18.18	QPSK
LTE Band 7	27	2510 - 2560	0.064	18.03	16QAM
LTE Band 7	27	2510 - 2560	0.056	17.50	64QAM
LTE Band 41	27	2498.5 - 2687.5	0.161	22.05	QPSK
LTE Band 41	27	2498.5 - 2687.5	0.146	21.65	16QAM
LTE Band 41	27	2498.5 - 2687.5	0.137	21.36	64QAM
LTE Band 41	27	2501 - 2685	0.163	22.12	QPSK
LTE Band 41	27	2501 - 2685	0.120	20.79	16QAM
LTE Band 41	27	2501 - 2685	0.096	19.81	64QAM
LTE Band 41	27	2503.5 - 2682.5	0.188	22.75	QPSK
LTE Band 41	27	2503.5 - 2682.5	0.162	22.10	16QAM
LTE Band 41	27	2503.5 - 2682.5	0.128	21.06	64QAM
LTE Band 41	27	2506 - 2680	0.175	22.42	QPSK
LTE Band 41	27	2506 - 2680	0.160	22.04	16QAM
LTE Band 41	27	2506 - 2680	0.130	21.15	64QAM

EUT Overview (>1GHz)

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 Engineering Laboratory, Inc. 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 Engineering Lab 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 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 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: ZNFV350A**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 19085, 19028

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ac WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC

LTE Band 12 (698 - 716 MHz) overlaps the entire frequency range of LTE Band 17 (704 - 716 MHz). Therefore, test data provided in this report covers Band 17 as well as Band 12.

LTE Band 26 (814.7 – 849 MHz) overlaps the entire frequency range of LTE Band 5 (824 – 849 MHz). Therefore, test data provided in this report covers Band 5 and the portion of Band 26 subject to Part 22.

LTE Band 66 (1710 - 1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 - 1755 MHz). Therefore, test data provided in this report covers Band 4 as well as Band 66.

LTE Band 25 (1850 - 1915 MHz) overlaps the entire frequency range of LTE Band 2 (1850 - 1910 MHz). Therefore, test data provided in this report covers Band 2 as well as Band 25.

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.

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

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 Block C Frequency Range

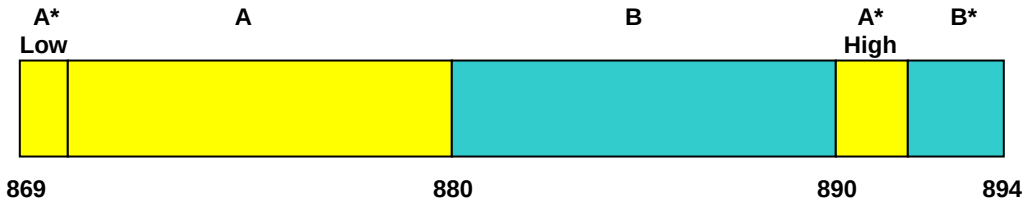
Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results do not satisfy the applicable reserve price, the spectrum in the 746-757 MHz and 776-787 MHz bands will instead be made available for assignment at a subsequent auction as follows: (i) Two paired channels of 6 megahertz each available for assignment in Block C1 in the 746-752 MHz and 776-782 MHz bands. (ii) Two paired channels of 5 megahertz each available for assignment in Block C2 in the 752-757 MHz and 782-787 MHz bands.

3.3 Block A Frequency Range

698-746 MHz band. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

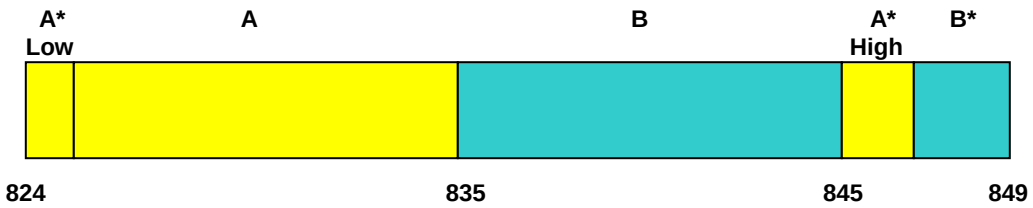
Block A: 698-704 MHz and 728-734 MHz;
Block B: 704-710 MHz and 734-740 MHz; and
Block C: 710-716 MHz and 740-746 MHz.

3.4 Cellular - Base Frequency Blocks



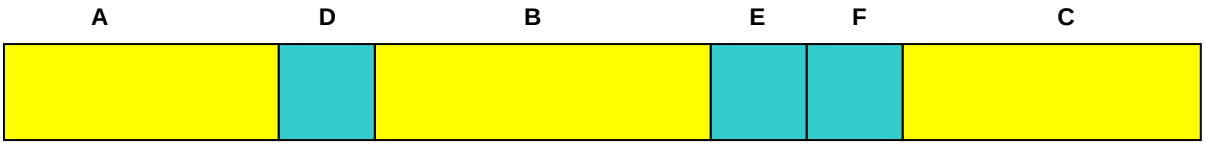
BLOCK 1: 869 – 880 MHz (A* Low + A)
BLOCK 2: 880 – 890 MHz (B)
BLOCK 3: 890 – 891.5 MHz (A* High)
BLOCK 4: 891.5 – 894 MHz (B*)

3.5 Cellular - Mobile Frequency Blocks



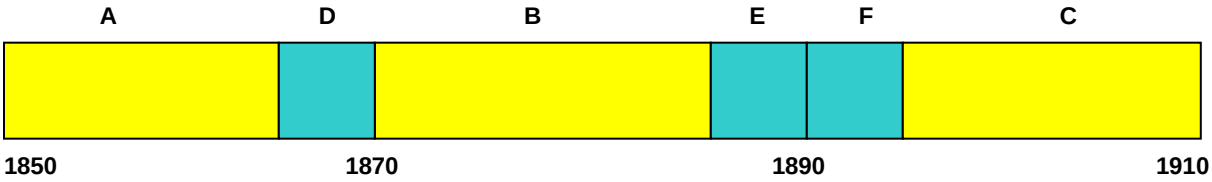
BLOCK 1: 824 – 835 MHz (A* Low + A)
BLOCK 2: 835 – 845 MHz (B)
BLOCK 3: 845 – 846.5 MHz (A* High)
BLOCK 4: 846.5 – 849 MHz (B*)

3.6 PCS - Base Frequency Blocks



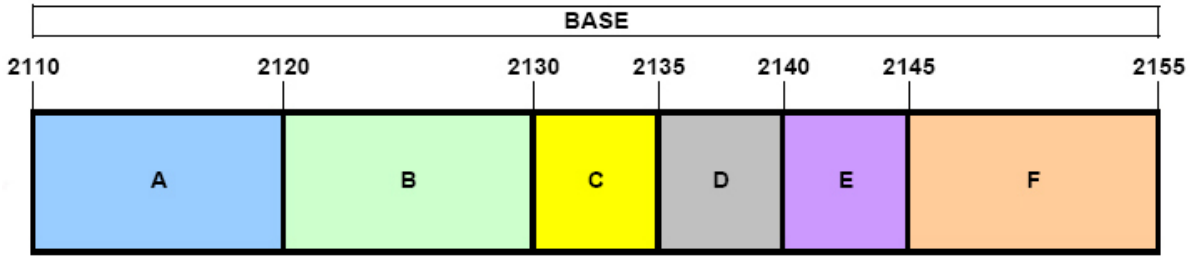
BLOCK 1: 1930 – 1945 MHz (A)
BLOCK 2: 1945 – 1950 MHz (D)
BLOCK 3: 1950 – 1965 MHz (B)
BLOCK 4: 1965 – 1970 MHz (E)
BLOCK 5: 1970 – 1975 MHz (F)
BLOCK 6: 1975 – 1990 MHz (C)

3.7 PCS - Mobile Frequency Blocks



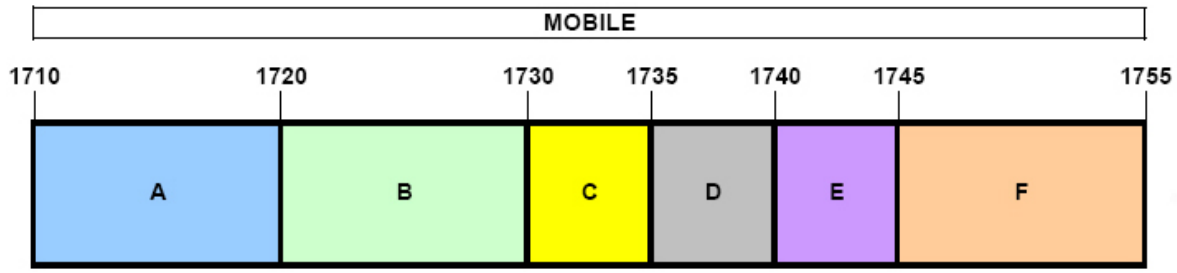
BLOCK 1: 1850 – 1865 MHz (A)
BLOCK 2: 1865 – 1870 MHz (D)
BLOCK 3: 1870 – 1885 MHz (B)
BLOCK 4: 1885 – 1890 MHz (E)
BLOCK 5: 1890 – 1895 MHz (F)
BLOCK 6: 1895 – 1910 MHz (C)

3.8 AWS - Base Frequency Blocks



BLOCK 1: 2110 – 2120 MHz (A)
BLOCK 2: 2120 – 2130 MHz (B)
BLOCK 3: 2130 – 2135 MHz (C)
BLOCK 4: 2135 – 2140 MHz (D)
BLOCK 5: 2140 – 2145 MHz (E)
BLOCK 6: 2145 – 2155 MHz (F)

3.9 AWS - Mobile Frequency Blocks



BLOCK 1: 1710 – 1720 MHz (A)
BLOCK 2: 1720 – 1730 MHz (B)
BLOCK 3: 1730 – 1735 MHz (C)
BLOCK 4: 1735 – 1740 MHz (D)
BLOCK 5: 1740 – 1745 MHz (E)
BLOCK 6: 1745 – 1755 MHz (F)

3.10 WCS – Mobile/Base Frequency Blocks

The following frequencies are available for WCS in the 2305-2320 MHz and 2345-2360 MHz bands:

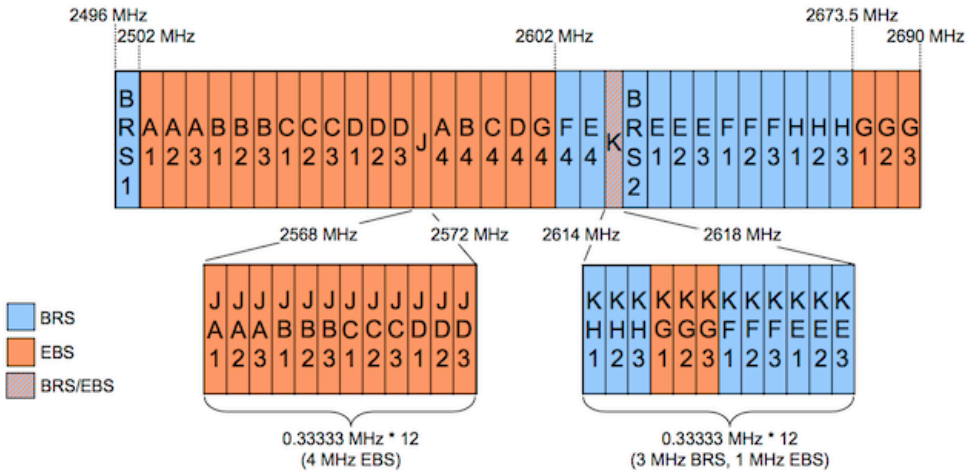
BLOCK 1: 2305-2310 and 2350-2355 MHz (A)

BLOCK 2: 2310-2315 and 2355-236 MHz (B)

BLOCK 3: 2315-2320 MHz (C)

BLOCK 4: 2345-2350 MHz (D)

3.11 BRS/EBS Frequency Block



3.12 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 + 10log$_{10}$(Power $_{[Watts]}$). For Band 7 and 41, the calculated P_d levels are compared to the absolute spurious emission limit of -25dBm which is equivalent to the required minimum attenuation of 55 + 10log$_{10}$(Power $_{[Watts]}$). For Band 30, the calculated P_d levels are compared to the absolute spurious emission limit of -40dBm which is equivalent to the required minimum attenuation of 70 + 10log$_{10}$(Power $_{[Watts]}$).

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)
Conducted Bench Top Measurements	1.13
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
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	6/21/2017	Annual	6/21/2018	RE1
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Agilent	N9038A	MXE EMI Receiver	4/26/2017	Annual	4/26/2018	MY51210133
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	8/28/2017	Annual	8/28/2018	MY49432391
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Com-Power	PAM-118A	Pre-Amplifier	6/21/2017	Annual	6/21/2018	551042
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	6/21/2017	Annual	6/21/2018	441119
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/23/2016	Biennial	8/23/2018	135427
Espec	ESX-2CA	Environmental Chamber	3/28/2018	Annual	3/28/2019	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	12/1/2016	Biennial	12/1/2018	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/30/2018	Annual	3/30/2019	11401010036
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Mini-Circuits	PWR-SEN-4RMS	USB Power Sensor	3/30/2018	Annual	3/30/2019	11210140001
Mini-Circuits	TVA-11-422	RF Power Amp	N/A			QA1303002
Rohde & Schwarz	CMW500	Radio Communication Tester	11/3/2017	Annual	11/3/2018	100976
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/11/2017	Annual	5/11/2018	100040
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	4/19/2017	Annual	4/19/2018	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/31/2017	Annual	7/31/2018	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/11/2017	Annual	8/11/2018	103200
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/3/2017	Annual	7/3/2018	102135
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/3/2017	Annual	7/3/2018	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/3/2017	Annual	7/3/2018	102133
Sunol	DRH-118	Horn Antenna (1-18GHz)	8/11/2017	Biennial	8/11/2019	A050307

Table 5-1. Test Equipment

Notes:

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

2. 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 MobileComm U.S.A

FCC ID: ZNFV350A

Classification: PCS Licensed Transmitter Held to Ear (PCE)

Mode(s): LTE

Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
22.913(a)(5)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 26/5)	< 7 Watts max. ERP	RADIATED	PASS	Section 7.2
27.50(b)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 13)	< 3 Watts max. ERP			Section 7.2
24.232(c) 27.50(h)(2)	Equivalent Isotropic Radiated Power (Band 2/25, 7, 41)	< 2 Watts max. EIRP			Section 7.2
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 66/4)	< 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(c) 27.53(h)	Undesirable Emissions	> 43 + 10log$_{10}$ (P[Watts]) for all out-of-band emissions			Section 7.3
27.53(f)	Undesirable Emissions (Band 13)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 – 1610 MHz			Section 7.3
27.53(a)	Undesirable Emissions (Band 30)	> 70 + 10log$_{10}$ (P[Watts])			Section 7.3
27.53(m)	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.3

Table 7-1. Summary of Radiated Test Results

Notes:

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

Test Setup

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

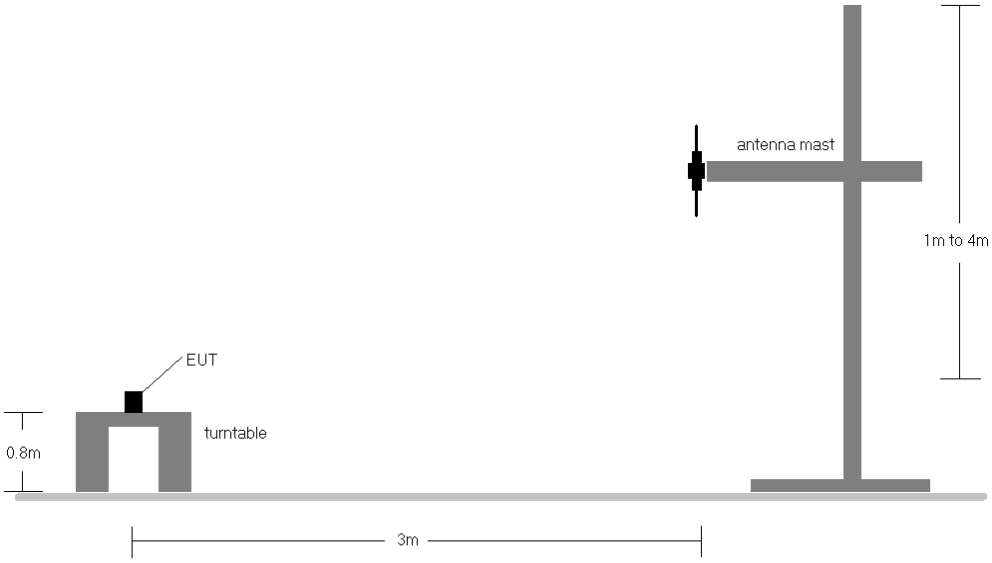


Figure 7-1. Radiated Test Setup <1GHz

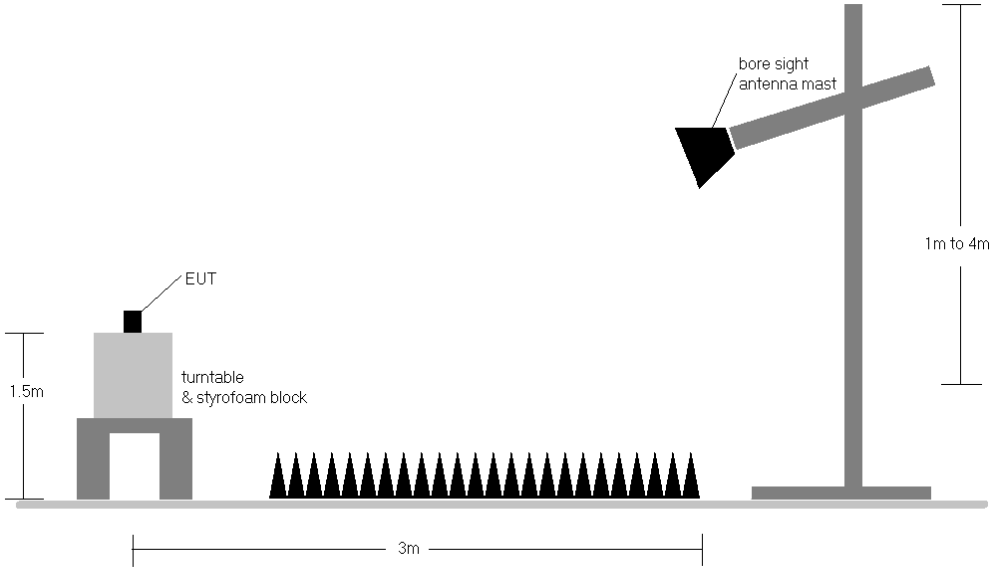


Figure 7-2. Radiated Test Setup >1GHz

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	H	150	129	1 / 0	19.81	1.10	18.76	0.075	34.77	-16.01	20.91	0.123	36.99	-16.08
707.50	1.4	QPSK	H	150	129	6 / 0	22.00	1.13	**20.98**	0.125	34.77	-13.79	**23.13**	0.206	36.99	-13.86
715.30	1.4	QPSK	H	150	129	1 / 5	19.93	1.16	18.94	0.078	34.77	-15.83	21.09	0.129	36.99	-15.90
715.30	1.4	16-QAM	H	150	129	1 / 5	19.77	1.16	**18.78**	0.076	34.77	-15.99	**20.93**	0.124	36.99	-16.06
715.30	1.4	64-QAM	H	150	129	1 / 5	19.53	1.16	**18.54**	0.071	34.77	-16.23	**20.69**	0.117	36.99	-16.30
700.50	3	QPSK	H	150	162	1 / 0	19.84	1.10	18.79	0.076	34.77	-15.98	20.94	0.124	36.99	-16.05
707.50	3	QPSK	H	150	162	15 / 0	22.10	1.13	**21.08**	**0.128**	34.77	-13.69	**23.23**	**0.210**	36.99	-13.76
714.50	3	QPSK	H	150	162	1 / 14	19.71	1.16	18.72	0.074	34.77	-16.05	20.87	0.122	36.99	-16.12
707.50	3	16-QAM	H	150	162	1 / 14	19.60	1.13	**18.58**	0.072	34.77	-16.19	**20.73**	0.118	36.99	-16.26
714.50	3	64-QAM	H	150	162	1 / 14	18.83	1.16	**17.84**	0.061	34.77	-16.93	**19.99**	0.100	36.99	-17.00
707.50	3	QPSK	V	150	32	15 / 0	18.46	1.16	17.47	0.056	34.77	-17.30	19.62	0.092	36.99	-17.37
707.50	3 (WCP)	QPSK	H	150	37	15 / 0	18.36	1.16	17.37	0.055	34.77	-17.40	19.52	0.090	36.99	-17.47

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]
701.50	5	QPSK	H	150	5	1 / 0	19.96	1.11	18.92	0.078	34.77	-15.86	21.07	0.128	36.99	-15.92
707.50	5	QPSK	H	150	5	12 / 6	22.09	1.13	**21.07**	0.128	34.77	-13.70	**23.22**	0.210	36.99	-13.77
713.50	5	QPSK	H	150	5	1 / 0	20.09	1.15	19.09	0.081	34.77	-15.68	21.24	0.133	36.99	-15.75
713.50	5	16-QAM	H	150	5	1 / 0	19.73	1.15	**18.73**	0.075	34.77	-16.04	**20.88**	0.123	36.99	-16.11
713.50	5	64-QAM	H	150	5	1 / 0	18.74	1.15	**17.74**	0.059	34.77	-17.03	**19.89**	0.098	36.99	-17.10
704.00	10	QPSK	H	150	133	1 / 0	20.11	1.12	19.08	0.081	34.77	-15.69	21.23	0.133	36.99	-15.76
707.50	10	QPSK	H	150	133	1 / 0	20.17	1.13	**19.15**	0.082	34.77	-15.62	**21.30**	0.135	36.99	-15.69
711.00	10	QPSK	H	150	133	1 / 0	19.80	1.14	18.79	0.076	34.77	-15.98	20.94	0.124	36.99	-16.05
704.00	10	16-QAM	H	150	133	1 / 0	20.01	1.12	**18.98**	0.079	34.77	-15.79	**21.13**	0.130	36.99	-15.86
707.50	10	64-QAM	H	150	133	1 / 0	19.71	1.13	**18.69**	0.074	34.77	-16.08	**20.84**	0.121	36.99	-16.15

Table 7-3. 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]
779.50	5	QPSK	H	150	111	1 / 0	16.06	1.32	15.23	0.033	34.77	-19.54	17.38	0.055	36.99	-19.61
782.00	5	QPSK	H	150	111	1 / 24	16.30	1.33	**15.48**	**0.035**	34.77	-19.29	**17.63**	**0.058**	36.99	-19.36
784.50	5	QPSK	H	150	111	1 / 24	16.17	1.34	15.36	0.034	34.77	-19.41	17.51	0.056	36.99	-19.48
779.50	5	16-QAM	H	150	111	1 / 24	14.60	1.32	**13.77**	0.024	34.77	-21.00	**15.92**	0.039	36.99	-21.07
784.50	5	64-QAM	H	150	111	1 / 24	13.01	1.34	12.20	0.017	34.77	-22.57	14.35	0.027	36.99	-22.64
782.00	10	QPSK	H	150	128	1 / 49	16.18	1.33	**15.36**	0.034	34.77	-19.41	**17.51**	0.056	36.99	-19.48
782.00	10	16-QAM	H	150	128	1 / 49	14.05	1.33	**13.23**	0.021	34.77	-21.54	**15.38**	0.035	36.99	-21.61
782.00	10	64-QAM	H	150	128	1 / 49	13.04	1.33	**12.22**	0.017	34.77	-22.55	**14.37**	0.027	36.99	-22.62
782.00	5	QPSK	V	150	39	1 / 24	14.14	1.33	13.32	0.021	34.77	-21.45	15.47	0.035	36.99	-21.52
782.00	5 (WCP)	QPSK	H	150	162	1 / 24	16.26	1.33	15.44	0.035	34.77	-19.33	17.59	0.057	36.99	-19.40

Table 7-4. ERP Data (Band 13)

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	336	1 / 0	19.39	1.50	18.74	0.075	38.45	-19.71	20.89	0.123	40.61	-19.72
836.50	1.4	QPSK	H	150	336	1 / 0	19.36	1.50	18.71	0.074	38.45	-19.74	20.86	0.122	40.61	-19.75
848.30	1.4	QPSK	H	150	336	1 / 0	19.42	1.50	**18.77**	**0.075**	38.45	-19.68	**20.92**	**0.124**	40.61	-19.69
836.50	1.4	16-QAM	H	150	336	1 / 0	17.86	1.50	**17.21**	0.053	38.45	-21.24	**19.36**	0.086	40.61	-21.25
836.50	1.4	64-QAM	H	150	336	1 / 0	16.60	1.50	**15.95**	0.039	38.45	-22.50	**18.10**	0.065	40.61	-22.51
825.50	3	QPSK	H	150	337	1 / 14	19.40	1.50	**18.75**	0.075	38.45	-19.70	**20.90**	0.123	40.61	-19.71
836.50	3	QPSK	H	150	337	1 / 14	18.92	1.50	18.27	0.067	38.45	-20.18	20.42	0.110	40.61	-20.19
847.50	3	QPSK	H	150	337	1 / 14	18.90	1.50	18.25	0.067	38.45	-20.20	20.40	0.110	40.61	-20.21
836.50	3	16-QAM	H	150	337	1 / 14	17.85	1.50	**17.20**	0.052	38.45	-21.25	**19.35**	0.086	40.61	-21.26
836.50	3	64-QAM	H	150	337	1 / 14	16.60	1.50	**15.95**	0.039	38.45	-22.50	**18.10**	0.065	40.61	-22.51
826.50	5	QPSK	H	150	341	1 / 24	18.69	1.50	18.04	0.064	38.45	-20.41	20.19	0.104	40.61	-20.42
836.50	5	QPSK	H	150	341	1 / 24	19.27	1.50	18.62	0.073	38.45	-19.83	20.77	0.119	40.61	-19.84
846.50	5	QPSK	H	150	341	1 / 24	19.36	1.50	**18.71**	0.074	38.45	-19.74	**20.86**	0.122	40.61	-19.75
846.50	5	16-QAM	H	150	341	1 / 24	18.10	1.50	**17.45**	0.056	38.45	-21.00	**19.60**	0.091	40.61	-21.01
836.50	5	64-QAM	H	150	341	1 / 24	17.06	1.50	**16.41**	0.044	38.45	-22.04	**18.56**	0.072	40.61	-22.05
829.00	10	QPSK	H	150	341	1 / 49	19.40	1.50	**18.75**	0.075	38.45	-19.70	**20.90**	0.123	40.61	-19.71
836.50	10	QPSK	H	150	341	1 / 49	19.07	1.50	18.42	0.070	38.45	-20.03	20.57	0.114	40.61	-20.04
844.00	10	QPSK	H	150	341	1 / 49	19.38	1.50	18.73	0.075	38.45	-19.72	20.88	0.122	40.61	-19.73
836.50	10	16-QAM	H	150	341	1 / 49	18.03	1.50	**17.38**	0.055	38.45	-21.07	**19.53**	0.090	40.61	-21.08
836.50	10	64-QAM	H	150	341	1 / 49	17.06	1.50	**16.41**	0.044	38.45	-22.04	**18.56**	0.072	40.61	-22.05
831.50	15	QPSK	H	150	346	1 / 74	19.36	1.50	18.71	0.074	38.45	-19.74	20.86	0.122	40.61	-19.75
836.50	15	QPSK	H	150	346	1 / 74	19.41	1.50	**18.76**	0.075	38.45	-19.69	**20.91**	0.123	40.61	-19.70
841.50	15	QPSK	H	150	346	1 / 74	19.41	1.50	**18.76**	0.075	38.45	-19.69	**20.91**	0.123	40.61	-19.70
841.50	15	16-QAM	H	150	346	1 / 74	18.01	1.50	**17.36**	0.054	38.45	-21.09	**19.51**	0.089	40.61	-21.10
836.50	15	64-QAM	H	150	346	1 / 74	17.07	1.50	**16.42**	0.044	38.45	-22.03	**18.57**	0.072	40.61	-22.04
848.30	1	QPSK	V	150	34	1 / 0	18.13	1.50	17.48	0.056	38.45	-20.97	19.63	0.092	40.61	-20.98
848.30	1.4 (WCP)	QPSK	H	150	4	1 / 0	18.06	1.50	17.41	0.055	38.45	-21.04	19.56	0.090	40.61	-21.05

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

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	150	178	1 / 0	14.95	5.56	**20.51**	0.112	30.00	-9.49
1732.50	1.4	QPSK	H	150	178	1 / 0	14.97	5.41	20.38	0.109	30.00	-9.62
1754.30	1.4	QPSK	H	150	178	1 / 0	14.83	5.26	20.09	0.102	30.00	-9.91
1710.70	1.4	16-QAM	H	150	178	1 / 0	13.79	5.56	**19.35**	0.086	30.00	-10.65
1732.50	1.4	64-QAM	H	150	178	1 / 0	12.90	5.41	**18.31**	0.068	30.00	-11.69
1711.50	3	QPSK	H	150	37	1 / 0	14.62	5.55	**20.17**	0.104	30.00	-9.83
1732.50	3	QPSK	H	150	37	1 / 0	14.48	5.41	19.89	0.097	30.00	-10.11
1753.50	3	QPSK	H	150	37	1 / 0	14.56	5.26	19.82	0.096	30.00	-10.18
1711.50	3	16-QAM	H	150	37	1 / 0	13.59	5.55	**19.14**	0.082	30.00	-10.86
1732.50	3	64-QAM	H	150	37	1 / 0	12.80	5.41	**18.21**	0.066	30.00	-11.79
1712.50	5	QPSK	H	150	350	1 / 24	14.49	5.55	**20.04**	0.101	30.00	-9.96
1732.50	5	QPSK	H	150	350	1 / 24	14.48	5.41	19.89	0.097	30.00	-10.11
1752.50	5	QPSK	H	150	350	1 / 24	14.52	5.27	19.79	0.095	30.00	-10.21
1752.50	5	16-QAM	H	150	350	1 / 24	13.80	5.27	**19.07**	0.081	30.00	-10.93
1732.50	5	64-QAM	H	150	350	1 / 24	12.60	5.41	**18.01**	0.063	30.00	-11.99
1715.00	10	QPSK	H	150	175	1 / 0	14.79	5.53	**20.32**	0.108	30.00	-9.68
1732.50	10	QPSK	H	150	175	1 / 0	14.73	5.41	20.14	0.103	30.00	-9.86
1750.00	10	QPSK	H	150	175	1 / 0	14.56	5.29	19.85	0.097	30.00	-10.15
1715.00	10	16-QAM	H	150	175	1 / 0	13.60	5.53	19.13	0.082	30.00	-10.87
1732.50	10	16-QAM	H	150	175	1 / 0	13.73	5.41	**19.14**	0.082	30.00	-10.86
1732.50	10	64-QAM	H	150	175	1 / 0	12.95	5.41	**18.36**	0.069	30.00	-11.64
1717.50	15	QPSK	H	150	31	1 / 74	14.78	5.51	**20.29**	0.107	30.00	-9.71
1732.50	15	QPSK	H	150	31	1 / 74	14.84	5.41	20.25	0.106	30.00	-9.75
1747.50	15	QPSK	H	150	31	1 / 74	14.59	5.31	19.90	0.098	30.00	-10.10
1732.50	15	16-QAM	H	150	31	1 / 74	14.06	5.41	**19.47**	0.088	30.00	-10.53
1732.50	15	64-QAM	H	150	31	1 / 74	12.70	5.41	**18.11**	0.065	30.00	-11.89
1720.00	20	QPSK	H	150	183	1 / 99	15.50	5.49	**20.99**	0.126	30.00	-9.01
1732.50	20	QPSK	H	150	183	1 / 99	15.32	5.41	20.73	0.118	30.00	-9.27
1745.00	20	QPSK	H	150	183	1 / 99	15.53	5.32	20.85	0.122	30.00	-9.15
1732.50	20	16-QAM	H	150	183	1 / 99	14.60	5.41	**20.01**	0.100	30.00	-9.99
1732.50	20	64-QAM	H	150	183	1 / 99	13.58	5.41	**18.99**	0.079	30.00	-11.01
1720.00	20	QPSK	V	150	39	1 / 99	13.93	5.49	19.42	0.088	30.00	-10.58
1720.00	20 (WCP)	QPSK	H	150	353	1 / 99	18.65	5.49	24.14	**0.260**	30.00	-5.86

Table 7-6. EIRP Data (Band 66/4)

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	150	54	1 / 5	18.44	4.82	23.26	0.212	33.01	-9.75
1882.50	1.4	QPSK	H	150	54	1 / 5	18.56	4.73	**23.29**	**0.213**	33.01	-9.72
1914.30	1.4	QPSK	H	150	54	1 / 5	18.29	4.68	22.97	0.198	33.01	-10.04
1882.50	1.4	16-QAM	H	150	54	1 / 5	17.55	4.73	**22.28**	0.169	33.01	-10.73
1882.50	1.4	64-QAM	H	150	54	1 / 5	16.08	4.73	**20.81**	0.121	33.01	-12.20
1851.50	3	QPSK	H	150	369	1 / 14	16.27	4.82	**21.09**	0.128	33.01	-11.92
1882.50	3	QPSK	H	150	369	1 / 14	16.33	4.73	21.06	0.128	33.01	-11.95
1913.50	3	QPSK	H	150	369	1 / 14	16.15	4.68	20.83	0.121	33.01	-12.18
1882.50	3	16-QAM	H	150	369	1 / 14	15.36	4.73	**20.09**	0.102	33.01	-12.92
1882.50	3	64-QAM	H	150	369	1 / 14	14.50	4.73	**19.23**	0.084	33.01	-13.78
1852.50	5	QPSK	H	150	32	1 / 24	17.27	4.81	**22.08**	0.162	33.01	-10.93
1882.50	5	QPSK	H	150	32	1 / 24	17.32	4.73	22.05	0.160	33.01	-10.96
1912.50	5	QPSK	H	150	32	1 / 24	17.37	4.68	22.05	0.160	33.01	-10.96
1852.50	5	16-QAM	H	150	32	1 / 24	16.30	4.81	**21.11**	0.129	33.01	-11.90
1882.50	5	64-QAM	H	150	32	1 / 24	15.15	4.73	**19.88**	0.097	33.01	-13.13
1855.00	10	QPSK	H	150	39	1 / 0	18.06	4.81	22.87	0.193	33.01	-10.14
1882.50	10	QPSK	H	150	39	1 / 0	18.28	4.73	**23.01**	0.200	33.01	-10.00
1910.00	10	QPSK	H	150	39	1 / 0	18.28	4.68	22.96	0.198	33.01	-10.05
1855.00	10	16-QAM	H	150	39	1 / 0	17.36	4.81	**22.17**	0.165	33.01	-10.84
1882.50	10	64-QAM	H	150	39	1 / 0	16.05	4.73	**20.78**	0.120	33.01	-12.23
1857.50	15	QPSK	H	150	66	1 / 74	18.17	4.80	22.97	0.198	33.01	-10.04
1882.50	15	QPSK	H	150	66	1 / 74	18.39	4.73	**23.12**	0.205	33.01	-9.89
1907.50	15	QPSK	H	150	66	1 / 74	18.26	4.68	22.94	0.197	33.01	-10.07
1907.50	15	16-QAM	H	150	66	1 / 0	17.76	4.68	**22.44**	0.175	33.01	-10.57
1907.50	15	64-QAM	H	150	66	1 / 0	15.76	4.68	**20.44**	0.111	33.01	-12.57
1860.00	20	QPSK	H	150	324	1 / 99	18.36	4.79	**23.15**	0.207	33.01	-9.86
1882.50	20	QPSK	H	150	324	1 / 99	18.23	4.73	22.96	0.198	33.01	-10.05
1905.00	20	QPSK	H	150	324	1 / 0	18.44	4.68	23.12	0.205	33.01	-9.89
1905.00	20	16-QAM	H	150	324	1 / 0	17.62	4.68	**22.30**	0.170	33.01	-10.71
1905.00	20	64-QAM	H	150	324	1 / 0	16.68	4.68	**21.36**	0.137	33.01	-11.65
1882.50	1	QPSK	V	150	7	1 / 5	16.66	4.73	21.39	0.138	33.01	-11.62
1882.50	1.4 (WCP)	QPSK	H	150	10	1 / 5	17.16	4.73	21.89	0.155	33.01	-11.12

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

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	V	150	283	1 / 24	13.93	4.89	18.82	0.076	23.98	-5.16
2312.50	5	QPSK	V	150	283	1 / 24	13.96	4.91	**18.87**	0.077	23.98	-5.11
2307.50	5	16-QAM	V	150	283	1 / 24	13.50	4.89	18.39	0.069	23.98	-5.59
2307.50	5	64-QAM	V	150	283	1 / 24	12.39	4.89	17.28	0.053	23.98	-6.70
2310.00	10	QPSK	V	150	266	1 / 0	13.38	4.90	**18.28**	0.067	23.98	-5.70
2310.00	10	16-QAM	V	150	266	1 / 0	13.09	4.90	17.99	0.063	23.98	-5.99
2310.00	10	64-QAM	V	150	266	1 / 0	12.35	4.90	17.25	0.053	23.98	-6.73
2312.50	5	QPSK	H	150	341	1 / 24	12.82	4.91	17.73	0.059	23.98	-6.25
2312.50	5 (WCP)	QPSK	H	150	357	1 / 24	14.27	4.91	19.18	**0.083**	23.98	-4.80

Table 7-8. EIRP Data (Band 30)

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	291	1 / 24	12.48	5.50	17.98	0.063	33.01	-15.03
2535.00	5	QPSK	V	150	291	1 / 24	12.47	5.54	**18.01**	0.063	33.01	-15.00
2567.50	5	QPSK	V	150	291	1 / 24	12.42	5.58	18.00	0.063	33.01	-15.01
2567.50	5	16-QAM	V	150	291	1 / 24	12.39	5.58	**17.97**	0.063	33.01	-15.04
2535.00	5	64-QAM	V	150	291	1 / 24	11.63	5.54	**17.17**	0.052	33.01	-15.84
2505.00	10	QPSK	V	150	295	1 / 0	12.26	5.51	17.77	0.060	33.01	-15.24
2535.00	10	QPSK	V	150	295	1 / 0	12.24	5.54	**17.78**	0.060	33.01	-15.23
2565.00	10	QPSK	V	150	295	1 / 0	12.19	5.58	17.77	0.060	33.01	-15.24
2565.00	10	16-QAM	V	150	295	1 / 0	11.93	5.58	**17.51**	0.056	33.01	-15.50
2535.00	10	64-QAM	V	150	295	1 / 0	11.41	5.54	**16.95**	0.050	33.01	-16.06
2507.50	15	QPSK	V	150	291	1 / 0	12.46	5.51	17.97	0.063	33.01	-15.04
2535.00	15	QPSK	V	150	291	1 / 0	12.70	5.54	**18.24**	0.067	33.01	-14.77
2562.50	15	QPSK	V	150	291	1 / 0	12.49	5.58	18.07	0.064	33.01	-14.94
2535.00	15	16-QAM	V	150	291	1 / 0	12.39	5.54	**17.93**	0.062	33.01	-15.08
2535.00	15	64-QAM	V	150	291	1 / 0	11.80	5.54	**17.34**	0.054	33.01	-15.67
2510.00	20	QPSK	V	150	351	1 / 0	12.46	5.51	17.97	0.063	33.01	-15.04
2535.00	20	QPSK	V	150	351	1 / 0	12.64	5.54	**18.18**	0.066	33.01	-14.83
2560.00	20	QPSK	V	150	351	1 / 0	12.56	5.57	18.13	0.065	33.01	-14.88
2535.00	20	16-QAM	V	150	351	1 / 0	12.49	5.54	**18.03**	0.064	33.01	-14.98
2535.00	20	64-QAM	V	150	351	1 / 0	11.96	5.54	**17.50**	0.056	33.01	-15.51
2535.00	15	QPSK	H	150	341	1 / 0	16.17	5.86	22.03	**0.160**	33.01	-10.98
2535.00	15 (WCP)	QPSK	V	150	17	1 / 0	15.64	5.86	21.50	0.141	33.01	-11.51

Table 7-9. EIRP Data (Band 7)

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	H	150	159	1 / 0	15.68	5.74	21.42	0.139	33.01	-11.59
2593.00	5	QPSK	H	150	159	1 / 0	15.75	6.07	21.82	0.152	33.01	-11.19
2687.50	5	QPSK	H	150	159	1 / 0	15.57	6.48	**22.05**	0.161	33.01	-10.96
2687.50	5	16-QAM	H	150	159	1 / 0	15.17	6.48	**21.65**	0.146	33.01	-11.36
2593.00	5	64-QAM	H	150	159	1 / 0	15.29	6.07	**21.36**	0.137	33.01	-11.65
2505.00	10	QPSK	H	150	167	1 / 49	15.75	5.75	21.50	0.141	33.01	-11.51
2593.00	10	QPSK	H	150	167	1 / 49	15.96	6.07	22.03	0.160	33.01	-10.98
2685.00	10	QPSK	H	150	167	1 / 49	15.65	6.47	**22.12**	0.163	33.01	-10.89
2593.00	10	16-QAM	H	150	167	1 / 49	14.72	6.07	**20.79**	0.120	33.01	-12.22
2593.00	10	64-QAM	H	150	167	1 / 49	13.74	6.07	**19.81**	0.096	33.01	-13.20
2507.50	15	QPSK	H	150	171	1 / 0	16.37	5.76	22.13	0.163	33.01	-10.88
2593.00	15	QPSK	H	150	171	1 / 0	16.43	6.07	22.50	0.178	33.01	-10.51
2682.50	15	QPSK	H	150	171	1 / 0	16.29	6.46	**22.75**	**0.188**	33.01	-10.26
2682.50	15	16-QAM	H	150	171	1 / 0	15.64	6.46	**22.10**	0.162	33.01	-10.91
2593.00	15	64-QAM	H	150	171	1 / 0	14.99	6.07	**21.06**	0.128	33.01	-11.95
2510.00	20	QPSK	H	150	163	1 / 0	15.94	5.77	21.71	0.148	33.01	-11.30
2593.00	20	QPSK	H	150	163	1 / 0	15.97	6.07	22.04	0.160	33.01	-10.97
2680.00	20	QPSK	H	150	163	1 / 0	15.97	6.45	**22.42**	0.175	33.01	-10.59
2680.00	20	16-QAM	H	150	163	1 / 0	15.59	6.45	**22.04**	0.160	33.01	-10.97
2593.00	20	64-QAM	H	150	163	1 / 0	15.08	6.07	**21.15**	0.130	33.01	-11.86
2682.50	15	QPSK	V	150	62	1 / 0	15.20	6.46	21.66	0.147	33.01	-11.35
2682.50	15 (WCP)	QPSK	H	150	34	1 / 0	13.78	6.46	20.24	0.106	33.01	-12.77

Table 7-10. EIRP Data (Band 41)

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.

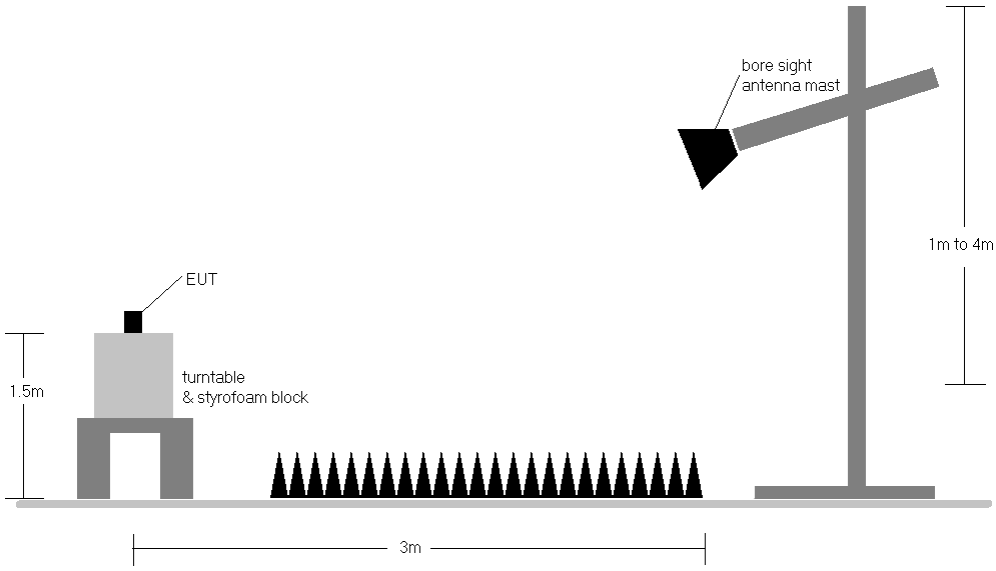


Figure 7-3. Test Instrument & Measurement Setup

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.

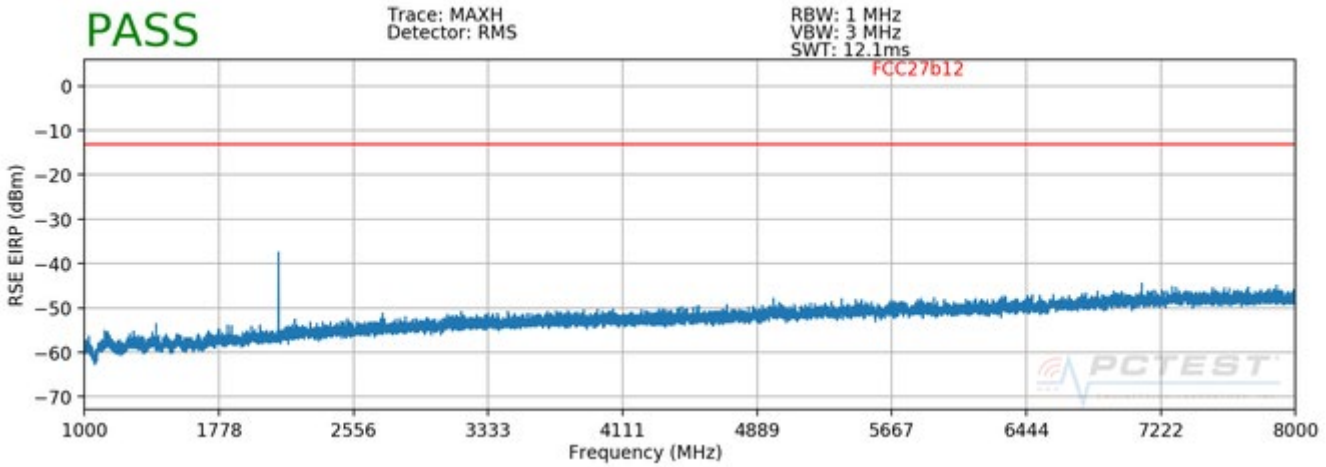
2) This unit was tested with its standard battery.

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 12/17



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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1408.00	H	182	238	-59.10	7.48	-51.62	-38.6
2112.00	H	174	234	-41.58	7.60	-33.98	-21.0
2816.00	H	242	131	-69.28	10.51	-58.77	-45.8
3520.00	H	317	44	-62.68	10.86	-51.82	-38.8
4224.00	H	-	-	-69.13	10.49	-58.64	-45.6

Table 7-11. Radiated Spurious Data (Band 12/17 – Low Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	136	241	-58.49	7.63	-50.86	-37.9
2122.50	H	173	236	-50.30	7.88	-42.42	-29.4
2830.00	H	-	-	-72.45	10.57	-61.88	-48.9

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

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	110	236	-57.67	7.77	-49.89	-36.9
2133.00	H	110	34	-48.62	8.16	-40.46	-27.5

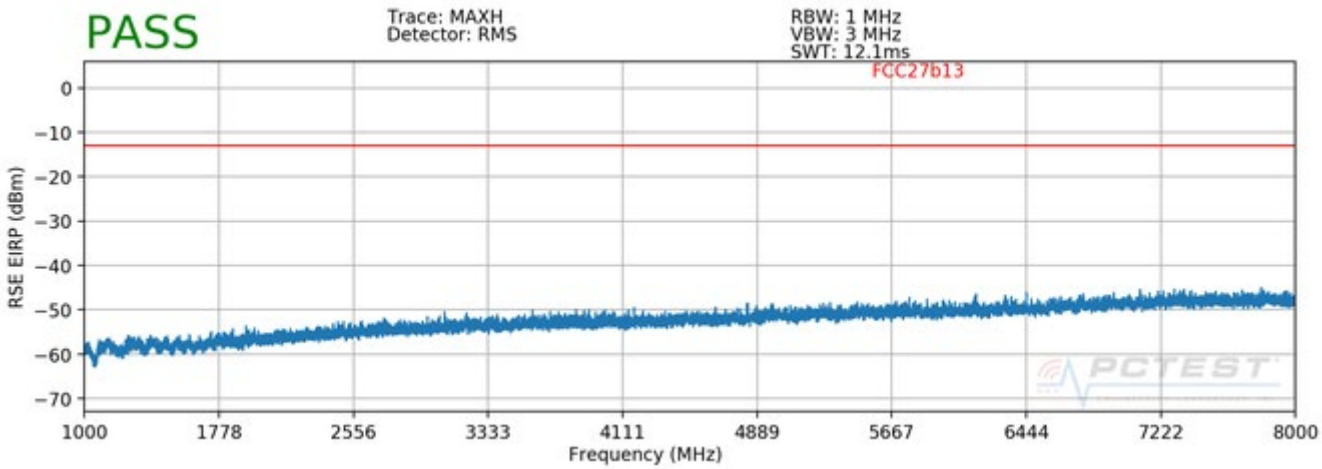
Table 7-13. Radiated Spurious Data (Band 12/17 – High Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	H	-	-	-58.75	0.00	-58.75	-45.7
2122.50	H	-	-	-57.42	0.00	-57.42	-44.4

Table 7-14. Radiated Spurious Data with WCP (Band 12/17 – Mid Channel)

Band 13



Plot 7-2. 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	118	187	-54.39	9.98	-44.41	-31.4
3118.00	H	-	-	-70.39	10.57	-59.82	-46.8

Table 7-15. Radiated Spurious Data (Band 13 – Low 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	132	168	-61.53	10.00	-51.53	-38.5
3128.00	H	-	-	-69.53	10.58	-58.95	-45.9

Table 7-16. Radiated Spurious Data (Band 13 – Mid Channel)

OPERATING FREQUENCY:	784.50	MHz
CHANNEL:	23255	
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]
2353.50	H	192	180	-55.43	10.02	-45.42	-32.4
3138.00	H	-	-	-69.79	10.59	-59.19	-46.2

Table 7-17. Radiated Spurious Data (Band 13 – High Channel)

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	176	181	-70.72	8.58	-62.14	-22.1
1564.00	H	114	226	-67.15	8.62	-58.53	-18.5
1569.00	H	172	227	-68.55	8.65	-59.90	-19.9

Table 7-18. 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	-	-	-58.62	0.00	-58.62	-45.6
3128.00	H	-	-	-53.43	0.00	-53.43	-40.4

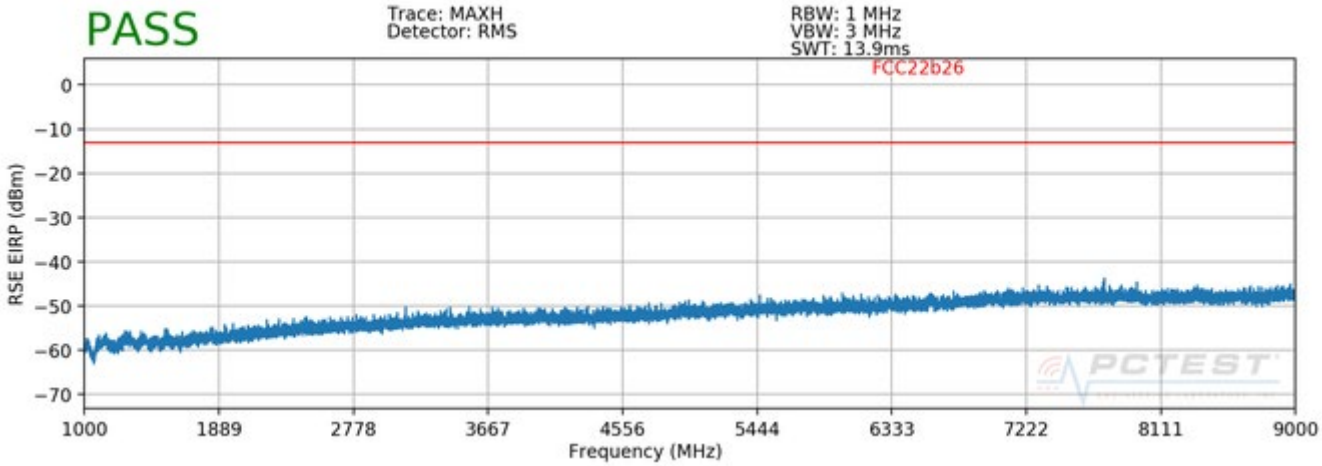
Table 7-19. Radiated Spurious Data with WCP (Band 13 – Mid Channel)

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	-	-	-70.45	8.62	-61.83	-21.8

Table 7-20. Radiated Spurious Data with WCP (Band 13 – 1559-1610MHz Band)

Band 26/5



Plot 7-3. 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	H	150	35	-71.70	9.27	-62.43	-49.4
2487.00	H	181	224	-63.01	10.15	-52.87	-39.9
3316.00	H	-	-	-69.10	10.80	-58.30	-45.3

Table 7-21. Radiated Spurious Data (Band 26/5 – Low Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	378	230	-65.96	9.38	-56.57	-43.6
2509.50	H	324	21	-65.12	10.16	-54.97	-42.0
3346.00	H	-	-	-66.47	10.77	-55.70	-42.7

Table 7-22. 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	H	150	36	-71.64	9.50	-62.14	-49.1
2532.00	H	254	76	-69.46	10.14	-59.31	-46.3
3376.00	H	-	-	-67.39	10.80	-56.60	-43.6

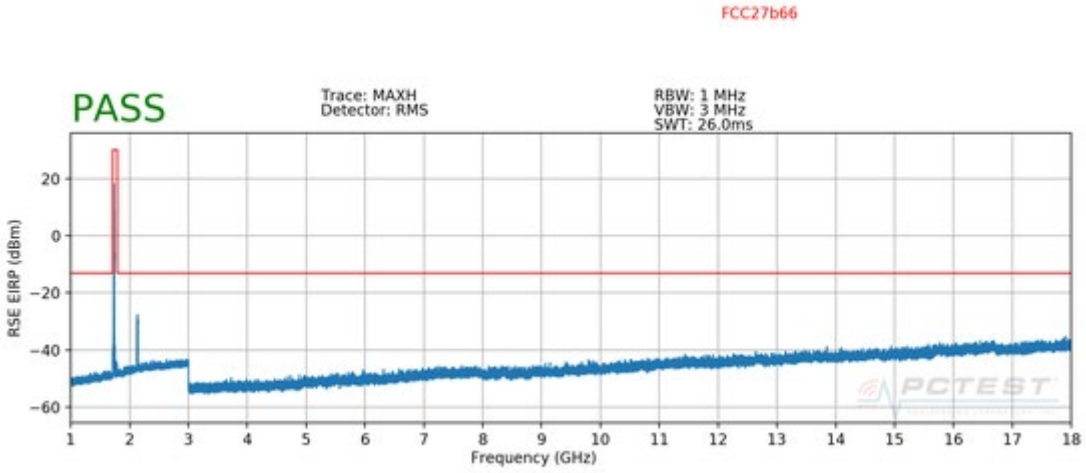
Table 7-23. Radiated Spurious Data (Band 26/5 – High Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	150	31	-71.03	9.38	-61.65	-48.6
2509.50	H	150	68	-68.36	10.16	-58.20	-45.2
3346.00	H	150	354	-62.98	10.77	-52.20	-39.2

Table 7-24. Radiated Spurious Data with WCP (Band 26/5 – Mid Channel)

Band 66/4



Plot 7-4. 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	H	-	-	-67.80	10.81	-56.99	-44.0
5160.00	H	-	-	-67.74	11.79	-55.95	-42.9

Table 7-25. Radiated Spurious Data (Band 66/4 – Low Channel)

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	H	-	-	-63.59	10.83	-52.76	-39.8
5197.50	H	-	-	-64.27	11.79	-52.48	-39.5

Table 7-26. 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	H	-	-	-65.11	10.85	-54.26	-41.3
5235.00	H	-	-	-67.40	11.82	-55.58	-42.6

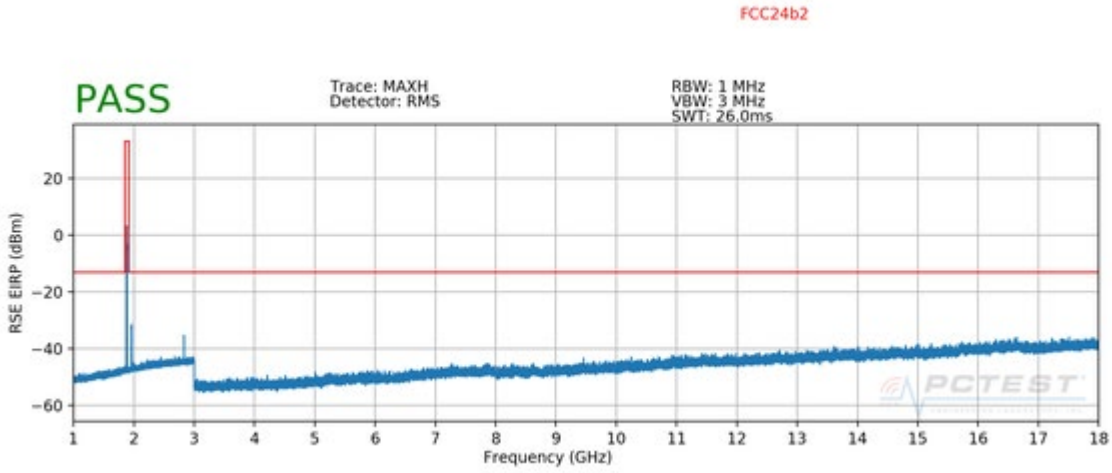
Table 7-27. Radiated Spurious Data (Band 66/4 – High Channel)

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	H	-	-	-60.45	10.81	-49.64	-36.6
5160.00	H	-	-	-61.39	11.79	-49.60	-36.6
6880.00	H	-	-	-55.73	10.32	-45.41	-32.4

Table 7-28. Radiated Spurious Data with WCP (Band 66/4 – Low Channel)

Band 25/2



Plot 7-5. Radiated Spurious Plot above 1GHz (Band 25/2

OPERATING FREQUENCY:	1850.70	MHz
CHANNEL:	26047	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	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]
3701.40	H	-	-	-65.02	10.59	-54.43	-41.4
5552.10	H	-	-	-67.13	11.68	-55.45	-42.4

Table 7-29. Radiated Spurious Data (Band 25/2 – Low Channel)

OPERATING FREQUENCY:	1882.50	MHz
CHANNEL:	26365	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	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]
3765.00	H	-	-	-65.46	10.45	-55.01	-42.0
5647.50	H	-	-	-61.11	11.64	-49.47	-36.5

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

OPERATING FREQUENCY:	1914.30	MHz
CHANNEL:	26683	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	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]
3828.60	H	-	-	-67.59	10.37	-57.22	-44.2
5742.90	H	-	-	-66.15	11.56	-54.59	-41.6

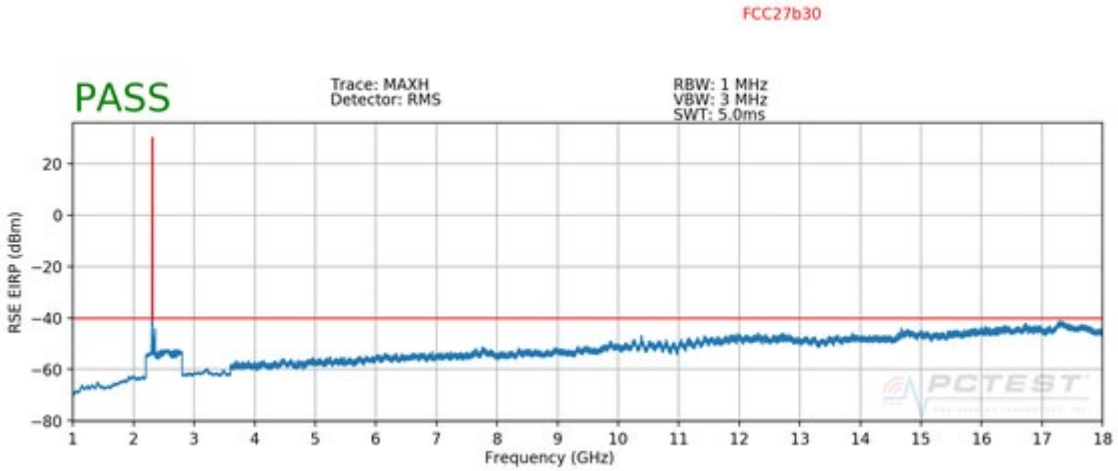
Table 7-31. Radiated Spurious Data (Band 25/2 – High Channel)

OPERATING FREQUENCY:	1882.50	MHz
CHANNEL:	26365	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	1.4	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]
3765.00	H	-	-	-62.59	10.45	-52.14	-39.1
5647.50	H	-	-	-61.36	11.64	-49.72	-36.7

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

Band 30



Plot 7-6. 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	V	-	-	-60.33	10.96	-49.37	-9.4
6922.50	V	-	-	-54.72	10.30	-44.42	-4.4

Table 7-33. Radiated Spurious Data (Band 30 – Low 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	V	-	-	-58.96	10.95	-48.01	-8.0
6937.50	V	-	-	-54.64	10.29	-44.35	-4.4

Table 7-34. Radiated Spurious Data (Band 30 – Mid Channel)

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	V	-	-	-60.83	10.96	-49.87	-9.9
6922.50	V	-	-	-55.11	10.30	-44.81	-4.8

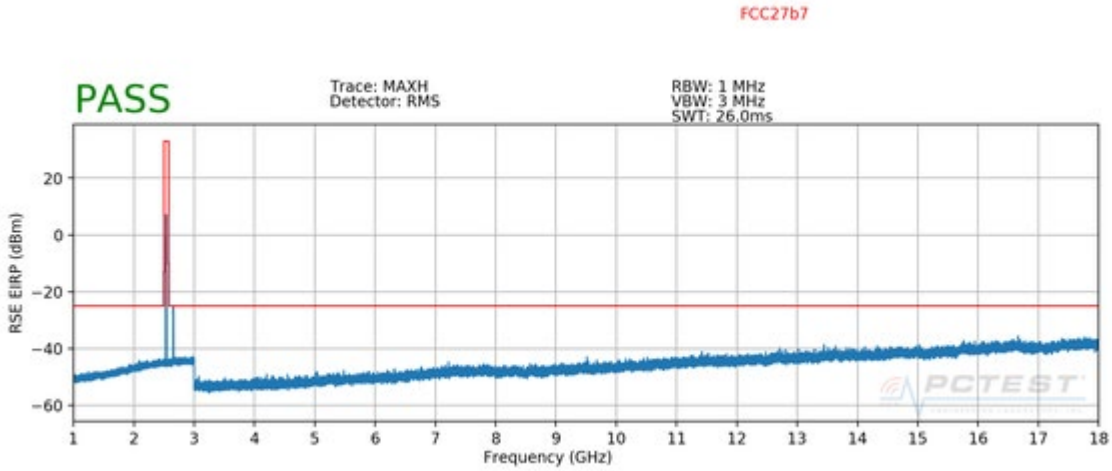
Table 7-35. Radiated Spurious Data (Band 30 – High Channel)

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	-	-	-62.02	10.95	-51.07	-11.1
6937.50	H	-	-	-56.80	10.29	-46.51	-6.5
9250.00	H	-	-	-55.62	11.07	-44.55	-4.5

Table 7-36. Radiated Spurious Data with WCP (Band 30 – Mid Channel)

Band 7



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

OPERATING FREQUENCY:	2507.50	MHz
CHANNEL:	20825	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
5015.00	H	-	-	-67.57	11.55	-56.02	-31.0
7522.50	H	-	-	-61.44	10.34	-51.10	-26.1

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

OPERATING FREQUENCY:	2535.00	MHz
CHANNEL:	21100	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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	H	-	-	-65.61	11.63	-53.98	-29.0
7605.00	H	-	-	-61.76	10.49	-51.27	-26.3

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

OPERATING FREQUENCY:	2562.50	MHz
CHANNEL:	21375	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
5125.00	H	-	-	-67.55	11.75	-55.80	-30.8
7687.50	H	-	-	-62.30	10.69	-51.61	-26.6

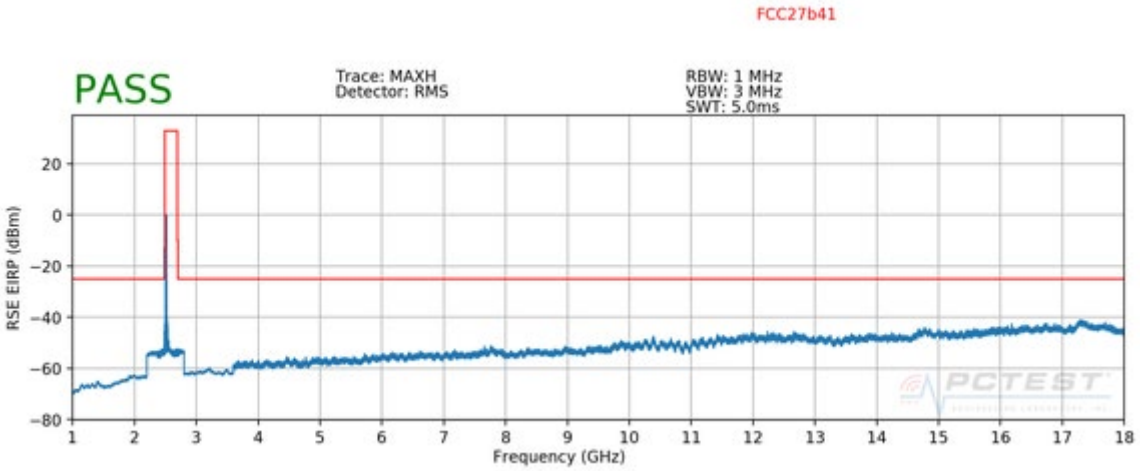
Table 7-39. Radiated Spurious Data (Band 7 – High Channel)

OPERATING FREQUENCY:	2535.00	MHz
CHANNEL:	21100	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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	H	-	-	-60.85	11.63	-49.22	-24.2
7605.00	H	-	-	-57.78	10.49	-47.29	-22.3
10140.00	H	-	-	-55.24	11.73	-43.51	-18.5

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

Band 41



Plot 7-8. Radiated Spurious Plot 1GHz - 18GHz (Band 41)

OPERATING FREQUENCY:	2507.50	MHz
CHANNEL:	39765	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
5015.00	H	-	-	-57.46	11.55	-45.91	-20.9
7522.50	H	-	-	-54.22	10.34	-43.88	-18.9

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

OPERATING FREQUENCY:	2593.00	MHz
CHANNEL:	40620	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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	-	-	-61.54	11.79	-49.75	-24.8
7779.00	H	-	-	-55.31	10.95	-44.36	-19.4

Table 7-42. Radiated Spurious Data (Band 41 – Mid Channel)

OPERATING FREQUENCY:	2682.50	MHz
CHANNEL:	41515	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
5365.00	H	-	-	-62.36	11.73	-50.63	-25.6
8047.50	H	-	-	-55.31	11.09	-44.22	-19.2

Table 7-43. Radiated Spurious Data (Band 41 – High Channel)

OPERATING FREQUENCY:	2682.50	MHz
CHANNEL:	41515	
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
5365.00	H	-	-	-59.31	11.73	-47.58	-22.6
8047.50	H	-	-	-56.77	11.09	-45.68	-20.7

Table 7-44. Radiated Spurious Data with WCP (Band 41 – High Channel)

7.4 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 ≥ 3 x RBW
3. No. of sweep points ≥ 2 x span / RBW
4. Detector = RMS
5. Trace mode = Max Hold
6. The trace was allowed to stabilize

Test Setup

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

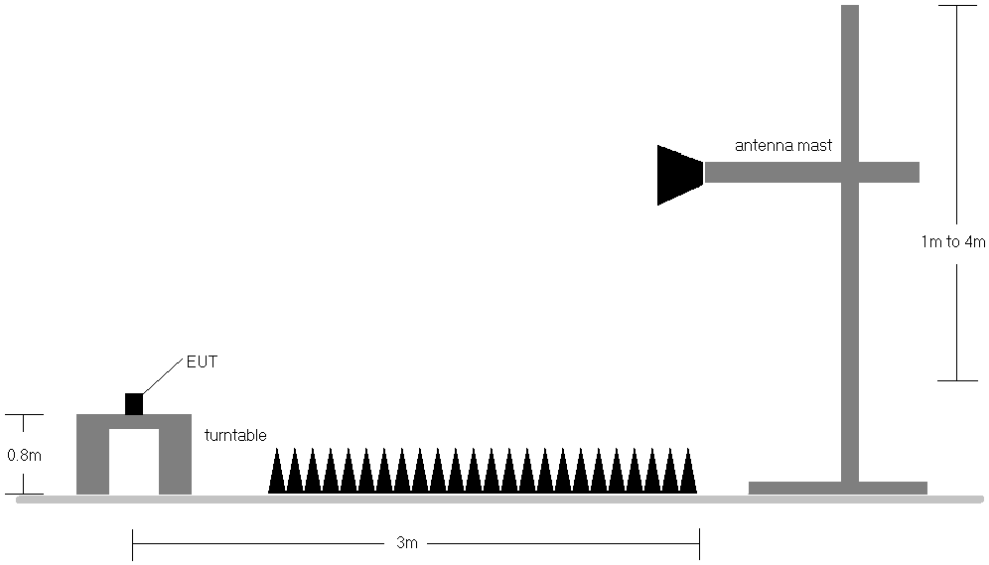


Figure 7-4. Test Instrument & Measurement Setup

Test Notes

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

2) This unit was tested with its standard battery.

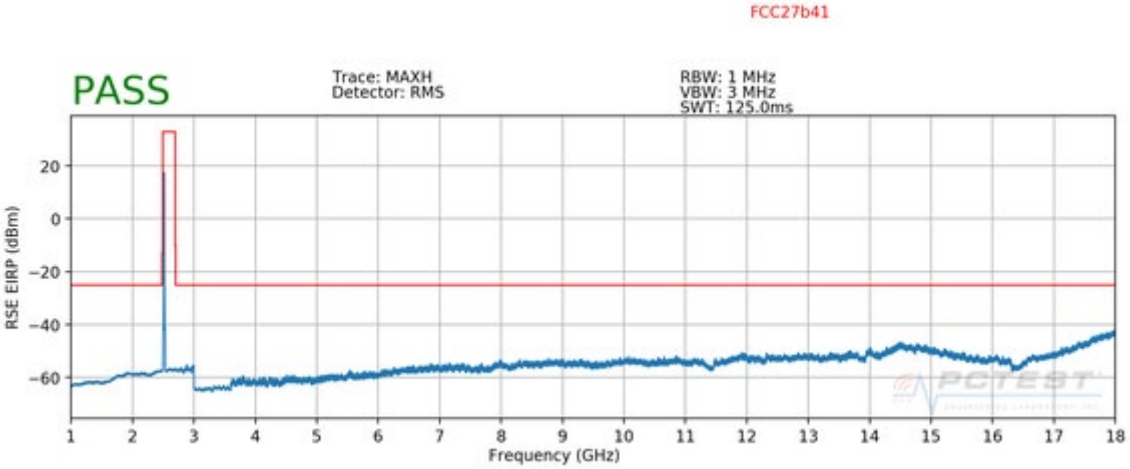
3) Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.

4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

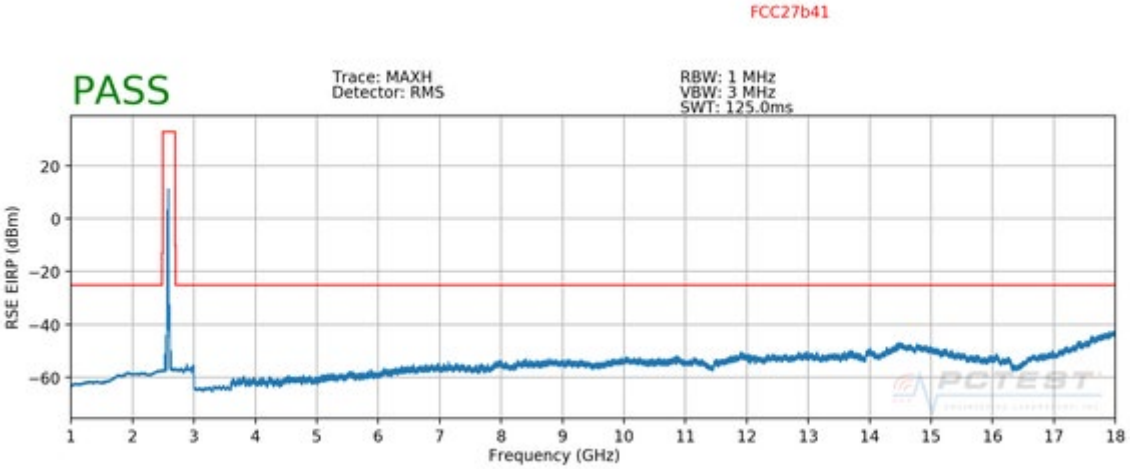
5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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

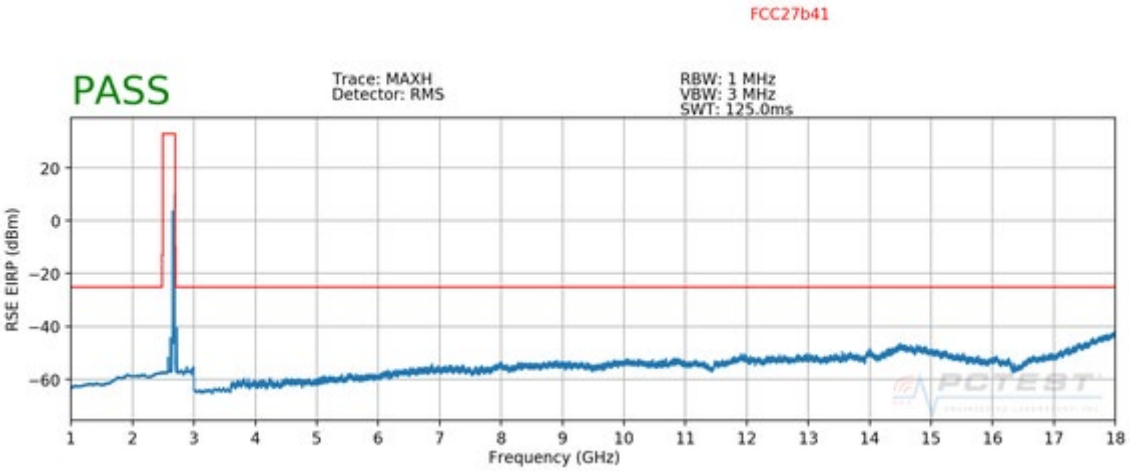
7.4.1 Uplink Carrier Aggregation Radiated Measurements Band 41



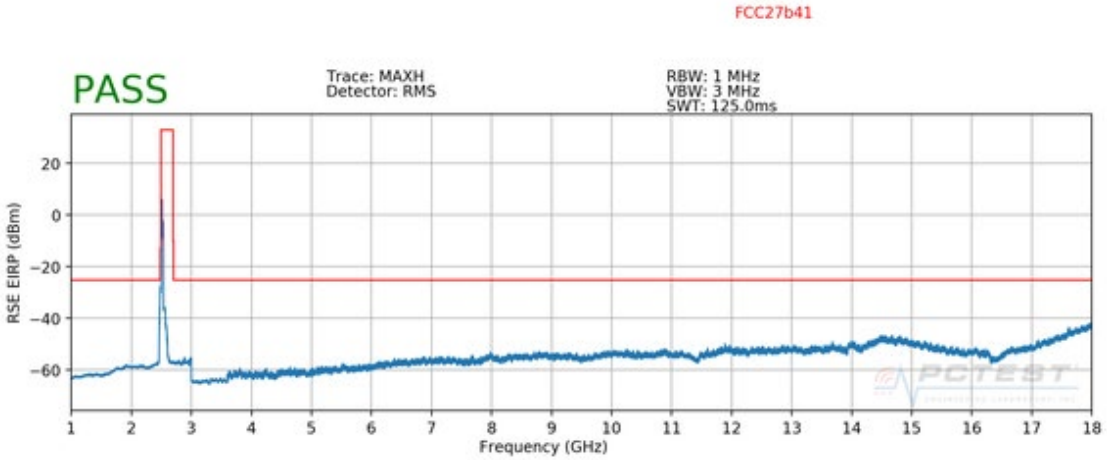
Plot 7-45. Radiated Spruious Plot (ULCA B41 - 20+20MHz - PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Low Channel)



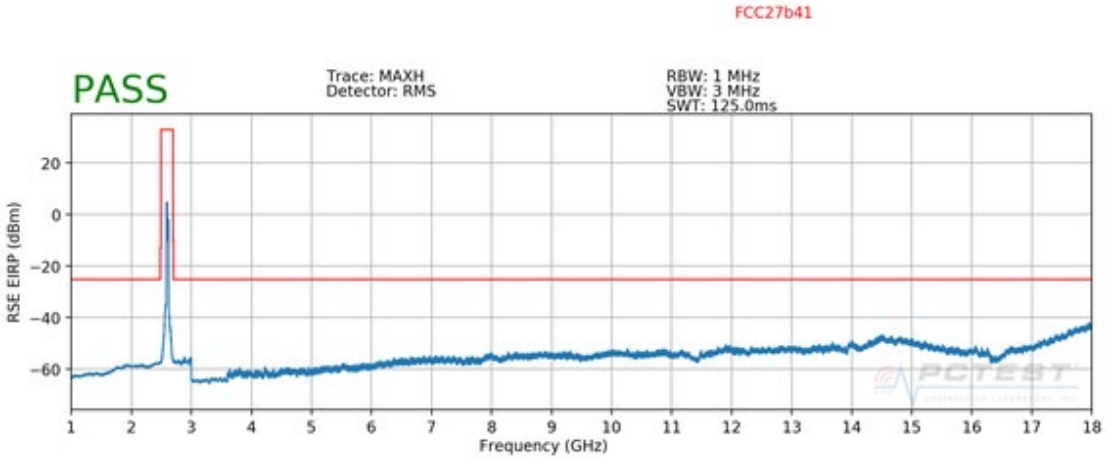
Plot 7-46. Radiated Spruious Plot (ULCA B41 - 20+20MHz - PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 – Mid Channel)



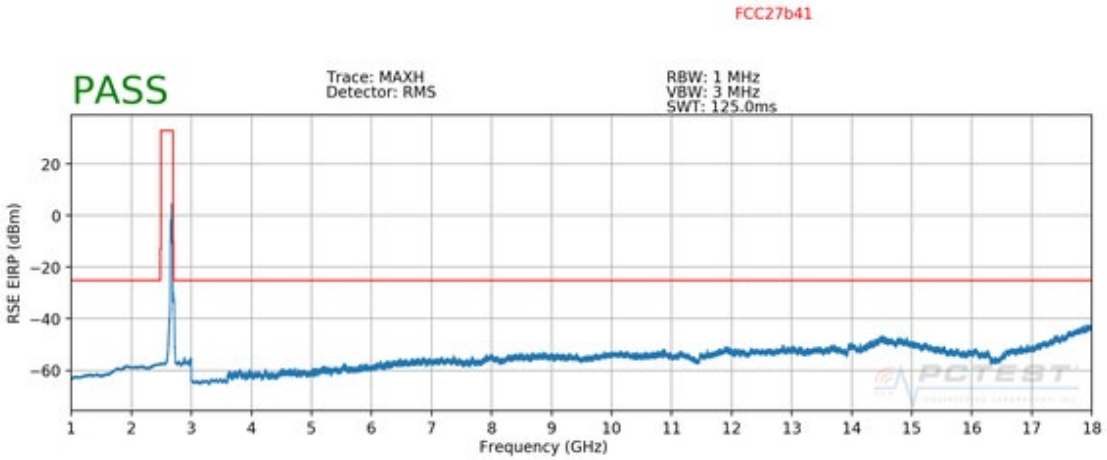
Plot 7-47. Radiated Spruious Plot (ULCA B41 - 20+20MHz - PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 – High Channel)



Plot 7-48. Radiated Spruious Plot (ULCA B41 - 20+20MHz - PCC: RB 100 Offset 0, SCC: RB 100 Offset 0 – Low Channel)

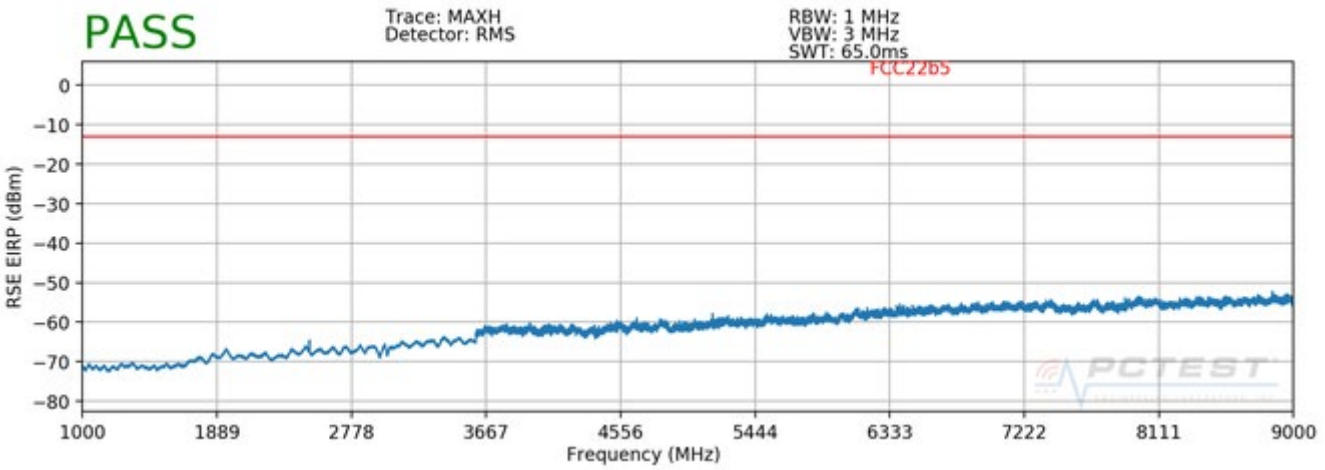


Plot 7-49. Radiated Spruious Plot (ULCA B41 - 20+20MHz - PCC: RB 100 Offset 0, SCC: RB 100 Offset 0 – Mid Channel)

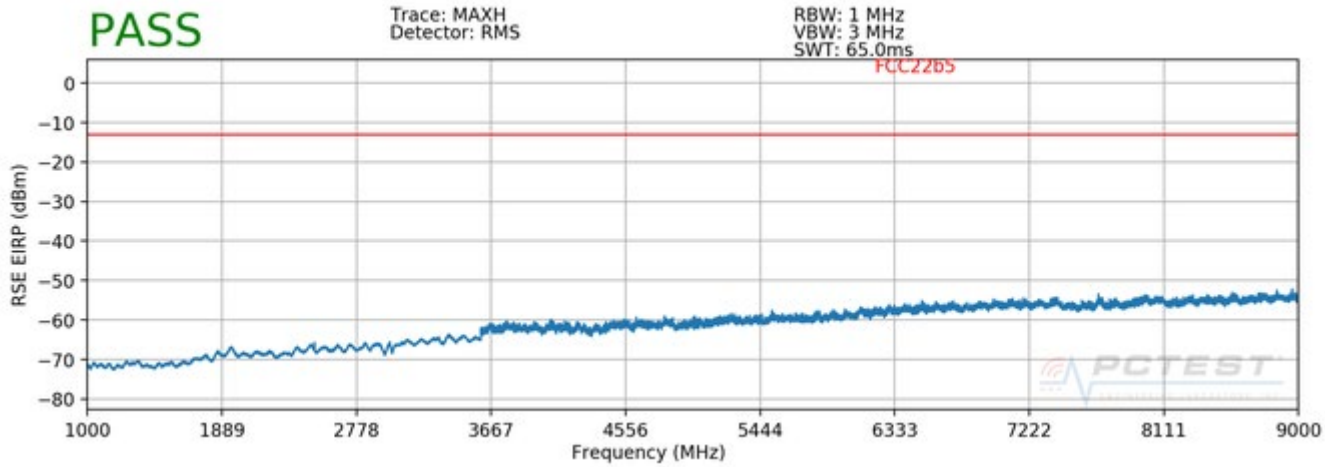


Plot 7-50. Radiated Spruious Plot (ULCA B41 - 20+20MHz - PCC: RB 100 Offset 0, SCC: RB 100 Offset 0 – High Channel)

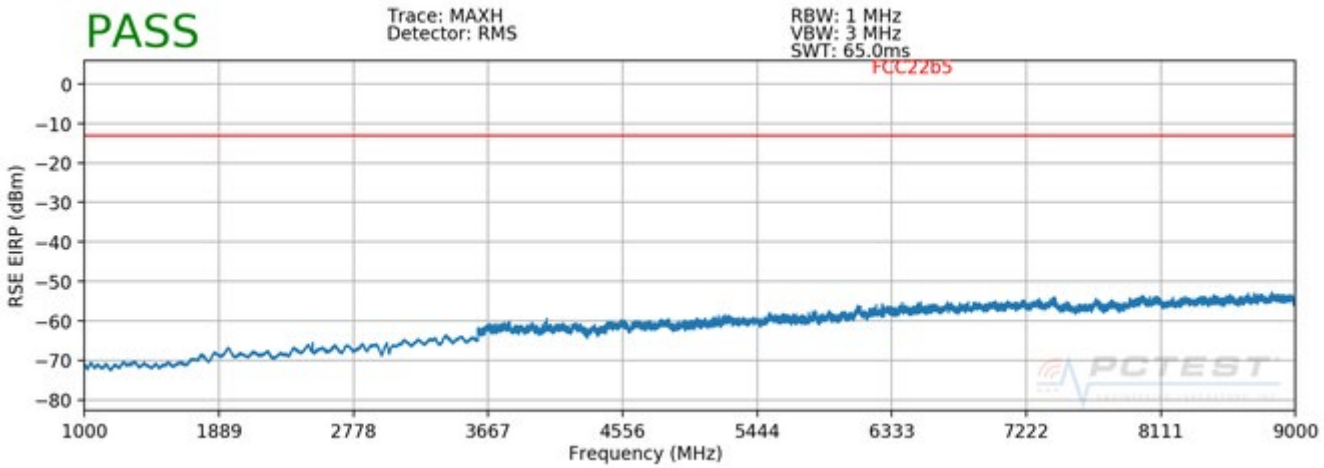
7.4.2 Uplink Carrier Aggregation Radiated Measurements Band 5



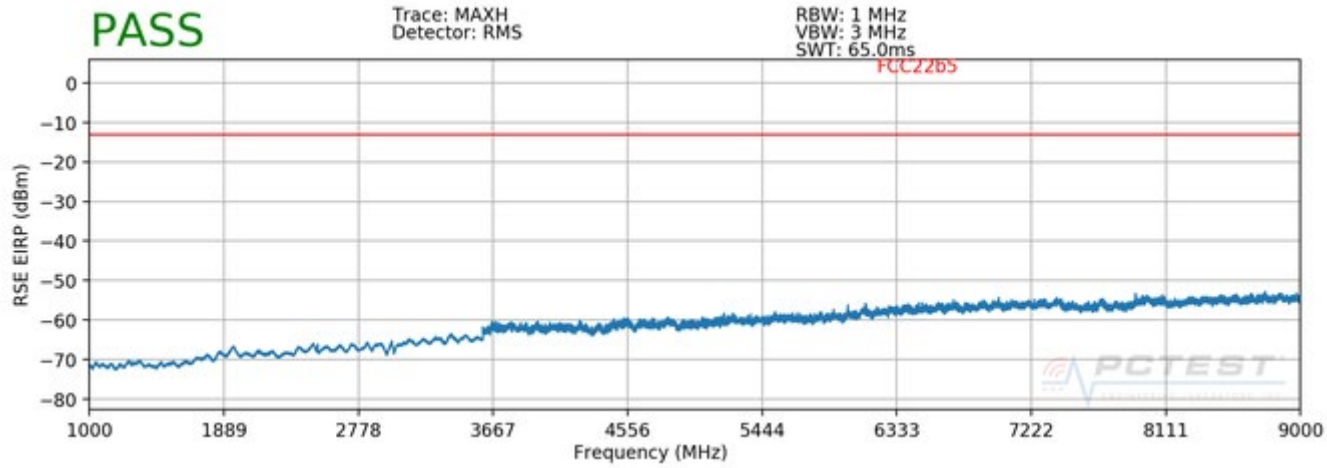
Plot 7-51. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. H – Low Channel)



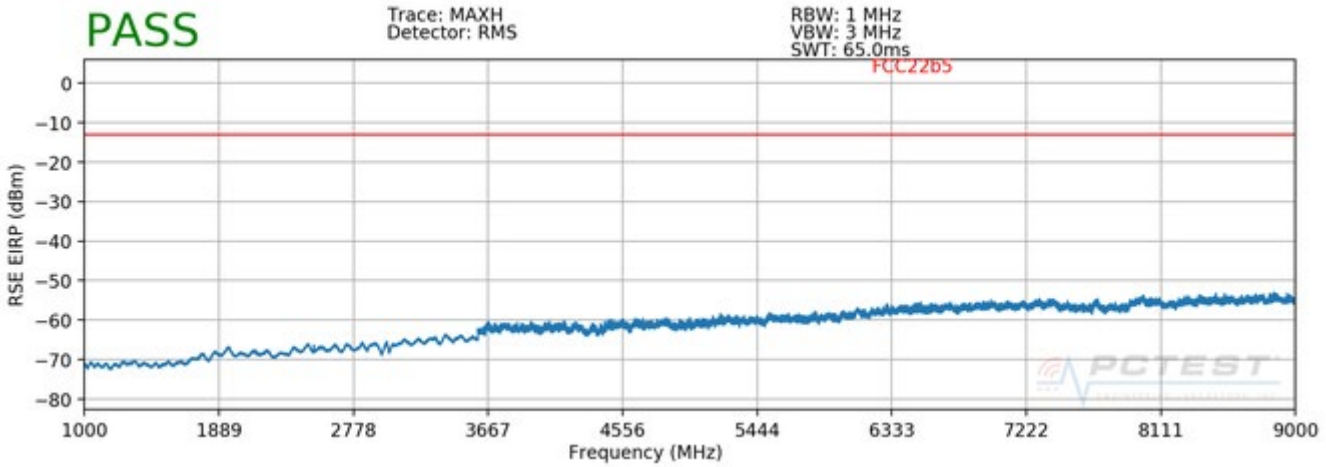
Plot 7-52. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. V – Low Channel)



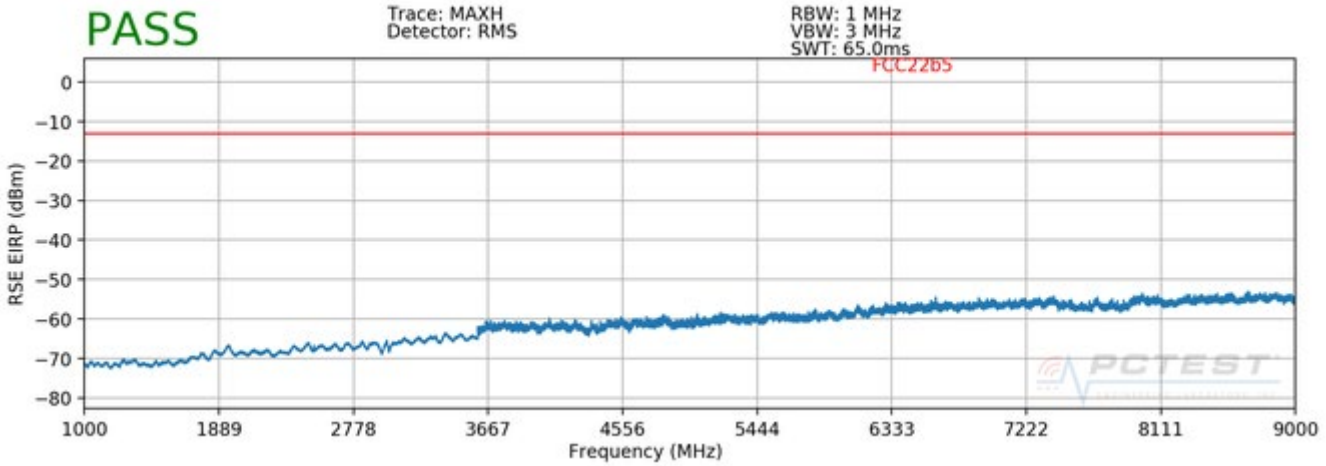
Plot 7-53. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. H – Mid Channel)



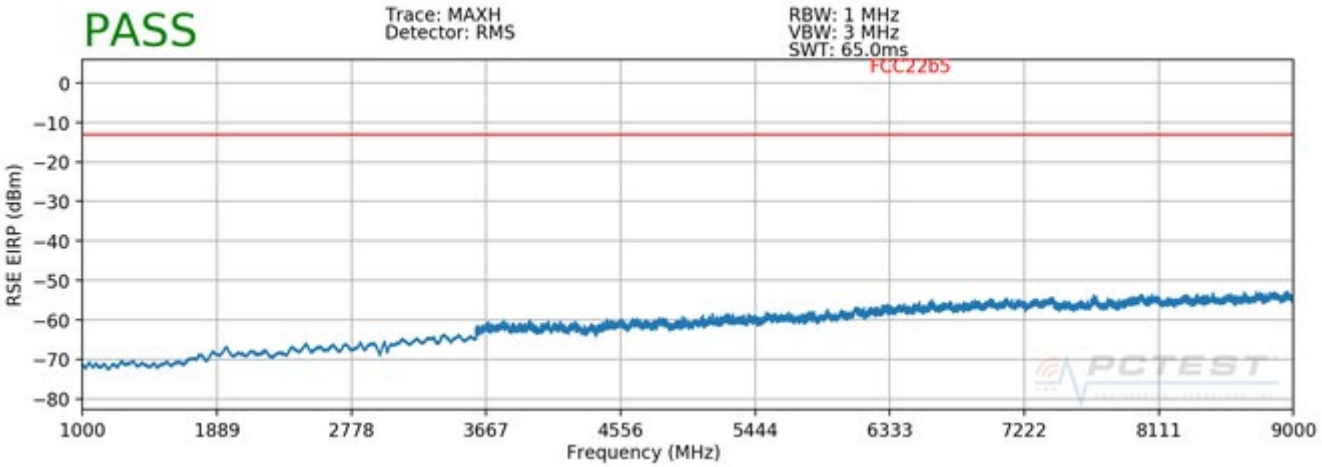
Plot 7-54. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. V – Mid Channel)



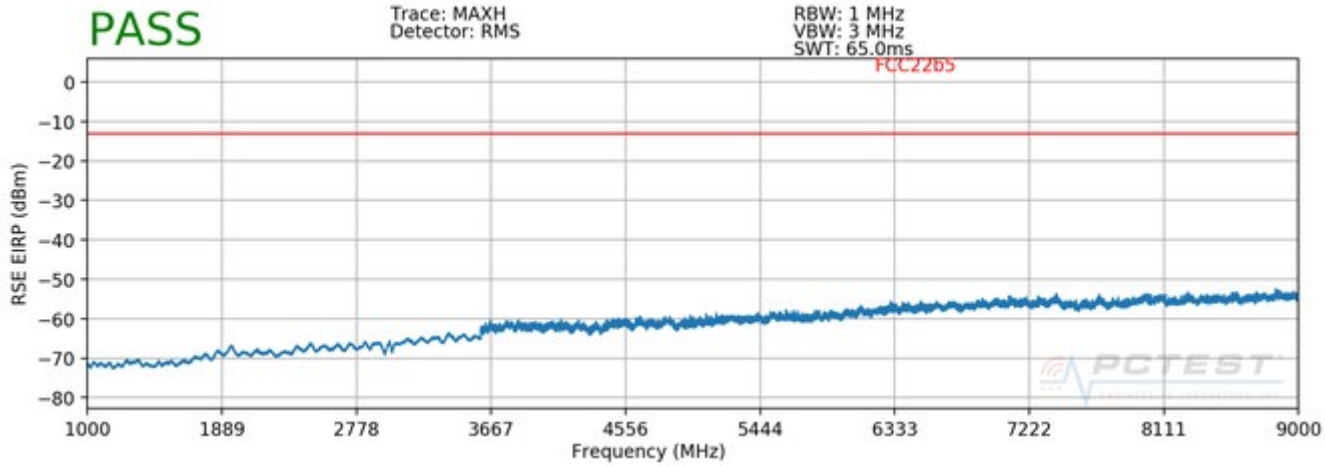
Plot 7-55. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. H – High Channel)



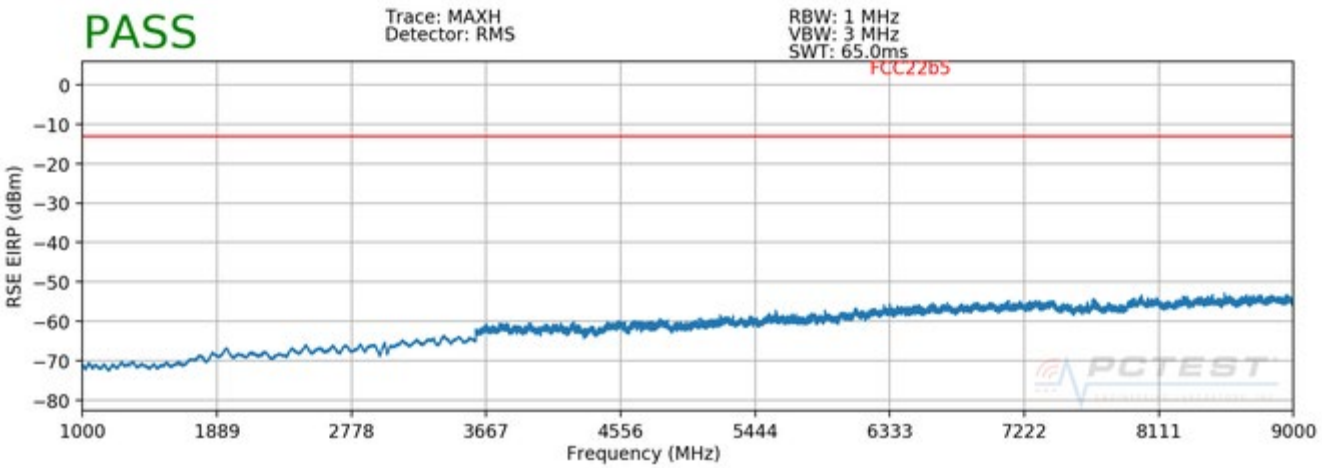
Plot 7-56. Radiated Spurious Plot (ULCA B5 – 10MHz+10MHz - PCC: RB 1 Offset 49, SCC: RB 1 Offset 0, Ant. Pol. V – High Channel)



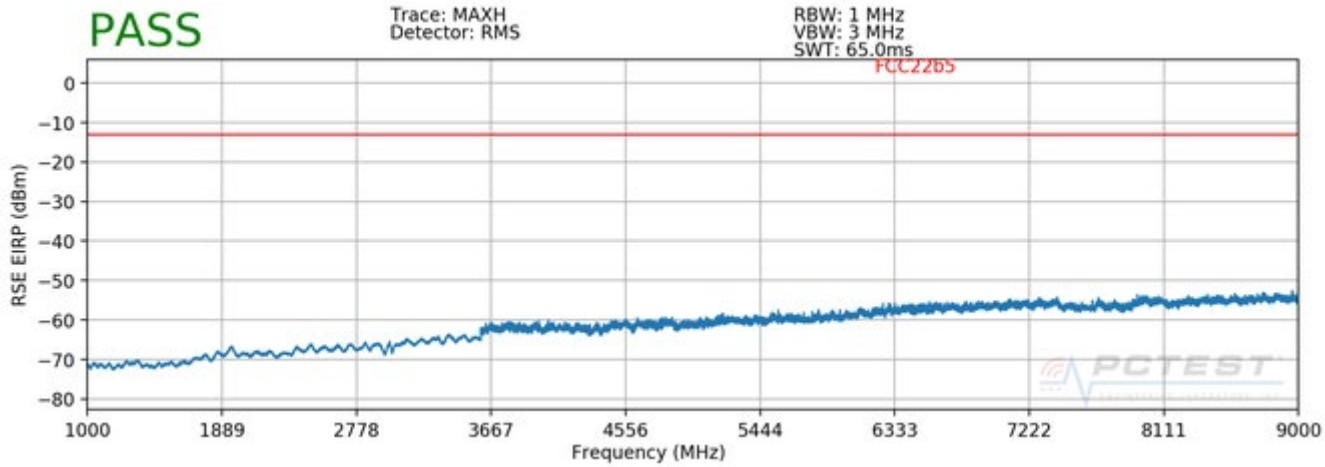
Plot 7-57. Radiated Spurious Plot (ULCA B5– 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. H – Low Channel)



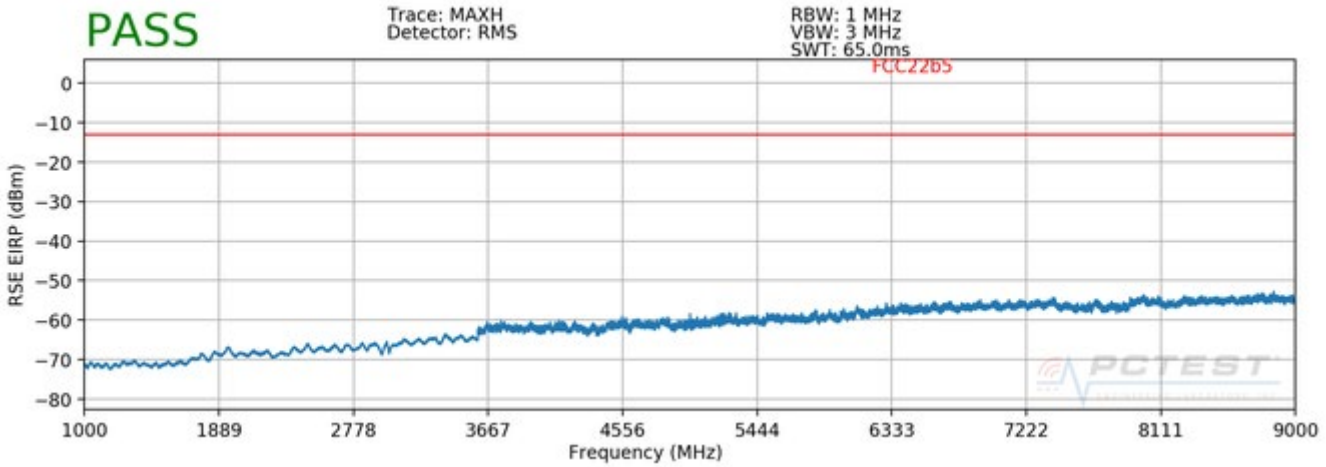
Plot 7-58. Radiated Spurious Plot (ULCA B5– 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. V – Low Channel)



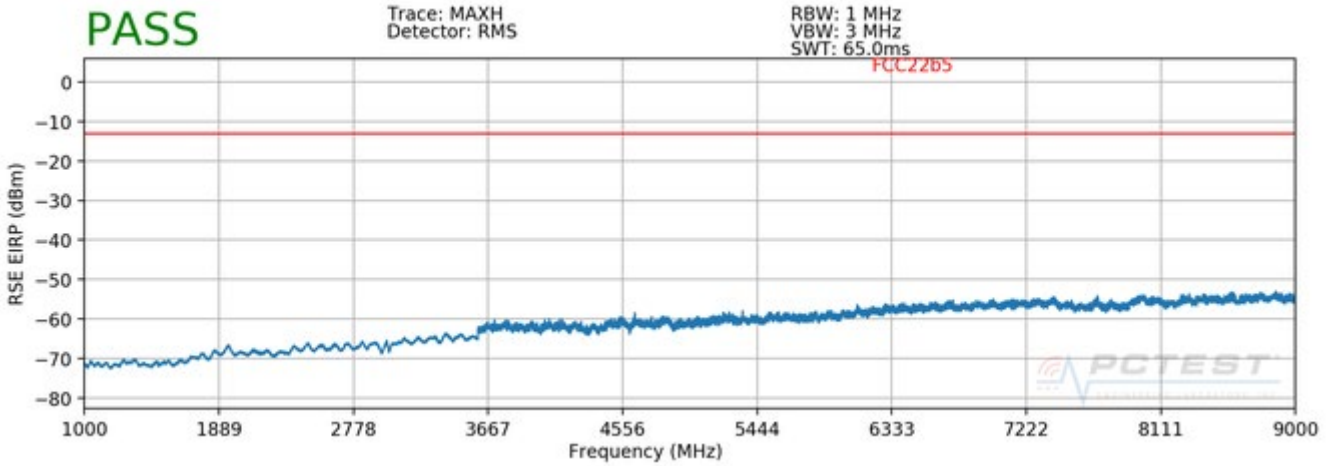
Plot 7-59. Radiated Spurious Plot (ULCA B5– 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. H – Mid Channel)



Plot 7-60. Radiated Spurious Plot (ULCA B5– 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. V – Mid Channel)



Plot 7-61. Radiated Spurious Plot (ULCA B5– 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. H – High Channel)



Plot 7-62. Radiated Spurious Plot (ULCA B5– 10MHz+10MHz - PCC:RB 50 Offset 0, SCC:RB 50 Offset 0, Ant. Pol. V – High Channel)

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.