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MEASUREMENT REPORT
LTE / Sub 6GHz NR

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

Date of Testing:
 01/02 - 02/21/2020
Test Site/Location:
 PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
 1M1912300227-03.ZNF

FCC ID:	ZNFV600VM
APPLICANT:	LG Electronics USA, Inc.

Application Type: Class II Permissive Change
Model: LM-V600VM
Additional Model(s): LMV600VM, V600VM, LM-V600QM5, LMV600QM5, V600QM5, LM-V600QM6, LMV600QM6, V600QM6
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

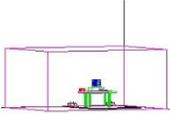


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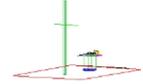
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FCC Part 22, 24, & 27



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	0.064	18.07	0.105	20.22	QPSK
LTE Band 12	27	699.7 - 715.3	0.049	16.89	0.080	19.04	16QAM
LTE Band 12	27	699.7 - 715.3	0.024	13.75	0.039	15.90	64QAM
LTE Band 12	27	699.7 - 715.3	0.010	10.09	0.017	12.24	256QAM
LTE Band 12	27	700.5 - 714.5	0.058	17.61	0.095	19.76	QPSK
LTE Band 12	27	700.5 - 714.5	0.050	16.97	0.082	19.12	16QAM
LTE Band 12	27	700.5 - 714.5	0.024	13.76	0.039	15.91	64QAM
LTE Band 12	27	700.5 - 714.5	0.011	10.22	0.017	12.37	256QAM
LTE Band 12	27	701.5 - 713.5	0.056	17.45	0.091	19.60	QPSK
LTE Band 12	27	701.5 - 713.5	0.049	16.93	0.081	19.08	16QAM
LTE Band 12	27	701.5 - 713.5	0.024	13.81	0.039	15.96	64QAM
LTE Band 12	27	701.5 - 713.5	0.011	10.53	0.019	12.68	256QAM
LTE Band 12	27	704 - 711	0.065	18.14	0.107	20.29	QPSK
LTE Band 12	27	704 - 711	0.044	16.46	0.073	18.61	16QAM
LTE Band 12	27	704 - 711	0.021	13.25	0.035	15.40	64QAM
LTE Band 12	27	704 - 711	0.011	10.26	0.017	12.41	256QAM
LTE Band 13	27	779.5 - 784.5	0.067	18.28	0.110	20.43	QPSK
LTE Band 13	27	779.5 - 784.5	0.050	16.99	0.082	19.14	16QAM
LTE Band 13	27	779.5 - 784.5	0.041	16.13	0.067	18.28	64QAM
LTE Band 13	27	779.5 - 784.5	0.020	12.99	0.033	15.14	256QAM
LTE Band 13	27	782	0.071	18.49	0.116	20.64	QPSK
LTE Band 13	27	782	0.051	17.05	0.083	19.20	16QAM
LTE Band 13	27	782	0.041	16.18	0.068	18.33	64QAM
LTE Band 13	27	782	0.021	13.15	0.034	15.30	256QAM
LTE Band 5	22H	824.7 - 848.3	0.069	18.40	0.114	20.55	QPSK
LTE Band 5	22H	824.7 - 848.3	0.051	17.08	0.084	19.23	16QAM
LTE Band 5	22H	824.7 - 848.3	0.037	15.67	0.061	17.82	64QAM
LTE Band 5	22H	824.7 - 848.3	0.020	12.92	0.032	15.07	256QAM
LTE Band 5	22H	825.5 - 847.5	0.069	18.41	0.114	20.56	QPSK
LTE Band 5	22H	825.5 - 847.5	0.051	17.11	0.084	19.26	16QAM
LTE Band 5	22H	825.5 - 847.5	0.039	15.89	0.064	18.04	64QAM
LTE Band 5	22H	825.5 - 847.5	0.020	12.94	0.032	15.09	256QAM
LTE Band 5	22H	826.5 - 846.5	0.071	18.51	0.116	20.66	QPSK
LTE Band 5	22H	826.5 - 846.5	0.052	17.14	0.085	19.29	16QAM
LTE Band 5	22H	826.5 - 846.5	0.039	15.91	0.064	18.06	64QAM
LTE Band 5	22H	826.5 - 846.5	0.020	12.96	0.032	15.11	256QAM
LTE Band 5	22H	829 - 844	0.086	19.33	0.141	21.48	QPSK
LTE Band 5	22H	829 - 844	0.061	17.83	0.100	19.98	16QAM
LTE Band 5	22H	829 - 844	0.046	16.60	0.075	18.75	64QAM
LTE Band 5	22H	829 - 844	0.021	13.27	0.035	15.42	256QAM

EUT Overview (<1 GHz)

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Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
LTE Band 66/4	27	1710.7 - 1779.3	0.070	18.46	QPSK
LTE Band 66/4	27	1710.7 - 1779.3	0.052	17.16	16QAM
LTE Band 66/4	27	1710.7 - 1779.3	0.042	16.23	64QAM
LTE Band 66/4	27	1710.7 - 1779.3	0.024	13.82	256QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.072	18.56	QPSK
LTE Band 66/4	27	1711.5 - 1778.5	0.054	17.34	16QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.045	16.49	64QAM
LTE Band 66/4	27	1711.5 - 1778.5	0.023	13.59	256QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.073	18.64	QPSK
LTE Band 66/4	27	1712.5 - 1777.5	0.058	17.61	16QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.038	15.82	64QAM
LTE Band 66/4	27	1712.5 - 1777.5	0.023	13.64	256QAM
LTE Band 66/4	27	1715 - 1775	0.069	18.37	QPSK
LTE Band 66/4	27	1715 - 1775	0.055	17.38	16QAM
LTE Band 66/4	27	1715 - 1775	0.044	16.44	64QAM
LTE Band 66/4	27	1715 - 1775	0.022	13.44	256QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.077	18.86	QPSK
LTE Band 66/4	27	1717.5 - 1772.5	0.060	17.75	16QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.052	17.19	64QAM
LTE Band 66/4	27	1717.5 - 1772.5	0.023	13.57	256QAM
LTE Band 66/4	27	1720 - 1770	0.076	18.83	QPSK
LTE Band 66/4	27	1720 - 1770	0.056	17.46	16QAM
LTE Band 66/4	27	1720 - 1770	0.045	16.50	64QAM
LTE Band 66/4	27	1720 - 1770	0.022	13.35	256QAM
LTE Band 2	24E	1850.7 - 1909.3	0.131	21.17	QPSK
LTE Band 2	24E	1850.7 - 1909.3	0.095	19.77	16QAM
LTE Band 2	24E	1850.7 - 1909.3	0.082	19.14	64QAM
LTE Band 2	24E	1850.7 - 1909.3	0.040	16.06	256QAM
LTE Band 2	24E	1851.5 - 1908.5	0.130	21.13	QPSK
LTE Band 2	24E	1851.5 - 1908.5	0.099	19.96	16QAM
LTE Band 2	24E	1851.5 - 1908.5	0.078	18.93	64QAM
LTE Band 2	24E	1851.5 - 1908.5	0.041	16.13	256QAM
LTE Band 2	24E	1852.5 - 1907.5	0.129	21.09	QPSK
LTE Band 2	24E	1852.5 - 1907.5	0.099	19.96	16QAM
LTE Band 2	24E	1852.5 - 1907.5	0.081	19.06	64QAM
LTE Band 2	24E	1852.5 - 1907.5	0.041	16.16	256QAM
LTE Band 2	24E	1855 - 1905	0.131	21.19	QPSK
LTE Band 2	24E	1855 - 1905	0.100	20.02	16QAM
LTE Band 2	24E	1855 - 1905	0.079	18.99	64QAM
LTE Band 2	24E	1855 - 1905	0.043	16.30	256QAM
LTE Band 2	24E	1857.5 - 1902.5	0.137	21.37	QPSK
LTE Band 2	24E	1857.5 - 1902.5	0.104	20.17	16QAM
LTE Band 2	24E	1857.5 - 1902.5	0.081	19.06	64QAM
LTE Band 2	24E	1857.5 - 1902.5	0.041	16.08	256QAM
LTE Band 2	24E	1860 - 1900	0.158	22.00	QPSK
LTE Band 2	24E	1860 - 1900	0.122	20.86	16QAM
LTE Band 2	24E	1860 - 1900	0.100	20.02	64QAM
LTE Band 2	24E	1860 - 1900	0.047	16.76	256QAM

EUT Overview (Mid Bands)

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Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
LTE Band 30	27	2307.5 - 2312.5	0.112	20.50	QPSK
LTE Band 30	27	2307.5 - 2312.5	0.091	19.59	16QAM
LTE Band 30	27	2307.5 - 2312.5	0.069	18.42	64QAM
LTE Band 30	27	2307.5 - 2312.5	0.035	15.49	256QAM
LTE Band 30	27	2310	0.118	20.73	QPSK
LTE Band 30	27	2310	0.092	19.63	16QAM
LTE Band 30	27	2310	0.074	18.69	64QAM
LTE Band 30	27	2310	0.034	15.36	256QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.219	23.40	QPSK
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.131	21.18	16QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.104	20.19	64QAM
LTE Band 41 (PC3)	27	2498.5 - 2687.5	0.071	18.49	256QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.222	23.47	QPSK
LTE Band 41 (PC3)	27	2501 - 2685	0.131	21.18	16QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.104	20.16	64QAM
LTE Band 41 (PC3)	27	2501 - 2685	0.070	18.48	256QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.228	23.58	QPSK
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.168	22.26	16QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.128	21.07	64QAM
LTE Band 41 (PC3)	27	2503.5 - 2682.5	0.071	18.49	256QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.226	23.53	QPSK
LTE Band 41 (PC3)	27	2506 - 2680	0.189	22.77	16QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.149	21.73	64QAM
LTE Band 41 (PC3)	27	2506 - 2680	0.074	18.67	256QAM

EUT Overview (High Bands)

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Mode	FCC Rule Part	Tx Frequency (MHz)	ERP		EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)	
n5	22H	824.7 - 848.3	0.020	12.97	0.032	15.12	QPSK
n5	22H	824.7 - 848.3	0.019	12.79	0.031	14.94	16QAM
n5	22H	824.7 - 848.3	0.013	11.11	0.021	13.26	64QAM
n5	22H	824.7 - 848.3	0.007	8.67	0.012	10.82	256QAM
n5	22H	825.5 - 847.5	0.020	13.00	0.033	15.15	QPSK
n5	22H	825.5 - 847.5	0.019	12.83	0.031	14.98	16QAM
n5	22H	825.5 - 847.5	0.015	11.69	0.024	13.84	64QAM
n5	22H	825.5 - 847.5	0.007	8.67	0.012	10.82	256QAM
n5	22H	826.5 - 846.5	0.018	12.59	0.030	14.74	QPSK
n5	22H	826.5 - 846.5	0.017	12.41	0.029	14.56	16QAM
n5	22H	826.5 - 846.5	0.012	10.71	0.019	12.86	64QAM
n5	22H	826.5 - 846.5	0.007	8.33	0.011	10.48	256QAM
n5	22H	829 - 844	0.024	13.72	0.039	15.87	QPSK
n5	22H	829 - 844	0.017	12.34	0.028	14.49	16QAM
n5	22H	829 - 844	0.016	12.04	0.026	14.19	64QAM
n5	22H	829 - 844	0.009	9.64	0.015	11.79	256QAM

EUT Overview (5G NR Low Bands)

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Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Modulation
			Max. Power (W)	Max. Power (dBm)	
n66	27	1712.5 - 1777.5	0.174	22.42	QPSK
n66	27	1712.5 - 1777.5	0.119	20.74	16QAM
n66	27	1712.5 - 1777.5	0.109	20.37	64QAM
n66	27	1712.5 - 1777.5	0.079	18.99	256QAM
n66	27	1715 - 1775	0.165	22.17	QPSK
n66	27	1715 - 1775	0.111	20.45	16QAM
n66	27	1715 - 1775	0.101	20.04	64QAM
n66	27	1715 - 1775	0.078	18.94	256QAM
n66	27	1717.5 - 1772.5	0.161	22.08	QPSK
n66	27	1717.5 - 1772.5	0.111	20.46	16QAM
n66	27	1717.5 - 1772.5	0.092	19.63	64QAM
n66	27	1717.5 - 1772.5	0.084	19.25	256QAM
n66	27	1720 - 1770	0.162	22.10	QPSK
n66	27	1720 - 1770	0.105	20.20	16QAM
n66	27	1720 - 1770	0.099	19.97	64QAM
n66	27	1720 - 1770	0.053	17.21	256QAM
n2	24E	1852.5 - 1907.5	0.227	23.56	QPSK
n2	24E	1852.5 - 1907.5	0.157	21.97	16QAM
n2	24E	1852.5 - 1907.5	0.134	21.28	64QAM
n2	24E	1852.5 - 1907.5	0.082	19.13	256QAM
n2	24E	1855 - 1905	0.212	23.27	QPSK
n2	24E	1855 - 1905	0.149	21.73	16QAM
n2	24E	1855 - 1905	0.136	21.33	64QAM
n2	24E	1855 - 1905	0.066	18.17	256QAM
n2	24E	1857.5 - 1902.5	0.227	23.56	QPSK
n2	24E	1857.5 - 1902.5	0.162	22.09	16QAM
n2	24E	1857.5 - 1902.5	0.154	21.88	64QAM
n2	24E	1857.5 - 1902.5	0.083	19.18	256QAM
n2	24E	1860 - 1900	0.238	23.76	QPSK
n2	24E	1860 - 1900	0.150	21.75	16QAM
n2	24E	1860 - 1900	0.135	21.31	64QAM
n2	24E	1860 - 1900	0.085	19.28	256QAM

EUT Overview (5G NR Mid Bands)

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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 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.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFV600VM**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

Test Device Serial No.: 02649, 02656

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (n66, n2, n5, n260, n261), 802.11b/g/n/ac/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC

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.

Sub 6GHz NR Band n5 (824 – 849 MHz) operates using 15kHz Subcarrier Spacing with both CP-OFDM and DFT-s OFDM waveforms. The band supports QPSK, 16QAM, 64QAM, and 256QAM modulation. The test data provided in this report represents the worst case configurations.

Sub 6GHz NR Band n66 (1710 – 1780 MHz) operates using 15kHz Subcarrier Spacing with both CP-OFDM and DFT-s OFDM waveforms. The band supports QPSK, 16QAM, 64QAM, and 256QAM modulation. The test data provided in this report represents the worst case configurations.

Sub 6GHz NR Band n2 (1850 – 1910 MHz) operates using 15kHz Subcarrier Spacing with both CP-OFDM and DFT-s OFDM waveforms. The band supports QPSK, 16QAM, 64QAM, and 256QAM modulation. The test data provided in this report represents the worst case configurations.

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) Model: PWMA-W815A while operating under normal conditions (at the same time, a Dual Display Cover was attached to the EUT to provide a secondary display on the inside of the cover) in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

The device was operated using FTM test software to broadcast Sub 6GHz functions as well as LTE during EN-DC operations.

2.4 EMI Suppression Device(s)/Modifications

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

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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:

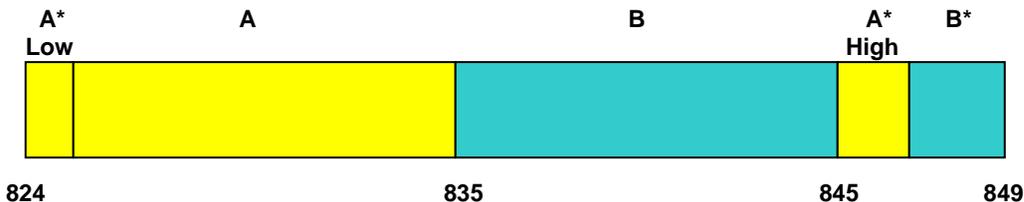
Block A: 698-704 MHz and 728-734 MHz;
 Block B: 704-710 MHz and 734-740 MHz; and
 Block C: 710-716 MHz and 740-746 MHz.

3.4 Cellular - Base Frequency Blocks



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

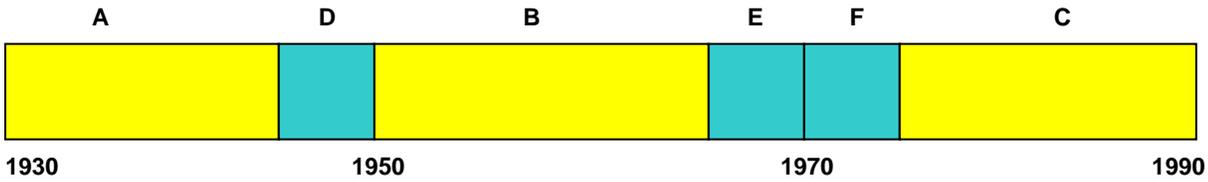
3.5 Cellular - Mobile Frequency Blocks



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

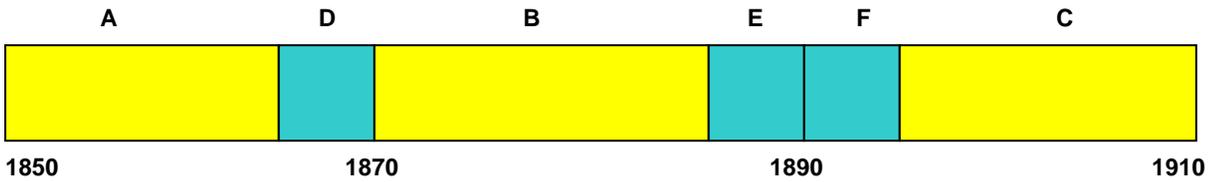
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3.6 PCS - Base Frequency Blocks



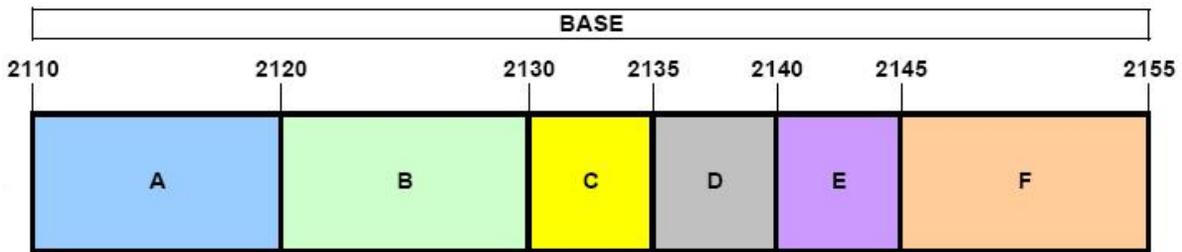
- BLOCK 1: 1930 – 1945 MHz (A)
- BLOCK 2: 1945 – 1950 MHz (D)
- BLOCK 3: 1950 – 1965 MHz (B)
- BLOCK 4: 1965 – 1970 MHz (E)
- BLOCK 5: 1970 – 1975 MHz (F)
- BLOCK 6: 1975 – 1990 MHz (C)

3.7 PCS - Mobile Frequency Blocks



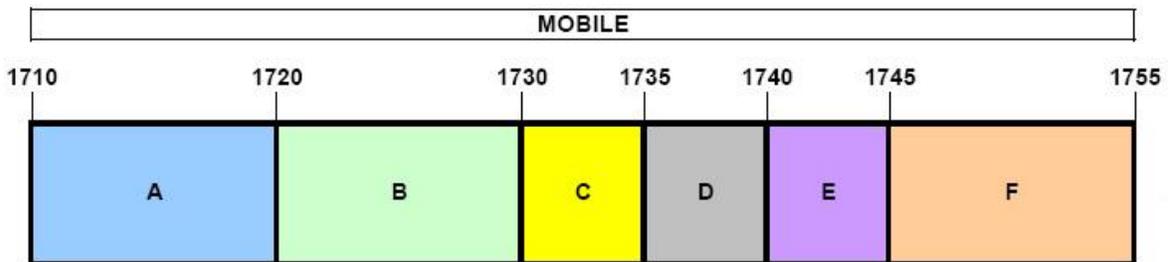
- BLOCK 1: 1850 – 1865 MHz (A)
- BLOCK 2: 1865 – 1870 MHz (D)
- BLOCK 3: 1870 – 1885 MHz (B)
- BLOCK 4: 1885 – 1890 MHz (E)
- BLOCK 5: 1890 – 1895 MHz (F)
- BLOCK 6: 1895 – 1910 MHz (C)

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)

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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 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 $P_g [dBm] - \text{cable loss} [dB]$.

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 $43 + 10 \log_{10}(\text{Power} [Watts])$. 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 $70 + 10 \log_{10}(\text{Power} [Watts])$.

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.

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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 (\pm dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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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
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	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	5/10/2019	Annual	5/10/2020	441112
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	2/22/2019	Biennial	2/22/2021	128338
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	4/19/2019	Annual	4/19/2020	11401010036
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Mini-Circuits	PWR-SEN-4RMS	USB Power Sensor	4/20/2019	Annual	4/20/2020	11210140001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11403100002
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			102060
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	1/31/2019	Annual	1/31/2020	100040
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
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511

Table 5-1. Test Equipment

Notes:

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

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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 analyzer. 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).

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7.0 TEST RESULTS

7.1 Summary

Company Name: LG Electronics USA, Inc.
 FCC ID: ZNFV600VM
 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
2.1046	Power Output	N/a	CONDUCTED	PASS	Section 7.2
22.913(a)(5)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 5)	< 7 Watts max. ERP	RADIATED	PASS	Section 7.3
27.50(b)(10) 27.50(c)(10)	Effective Radiated Power / Equivalent Isotropic Radiated Power (Band 12, 13)	< 3 Watts max. ERP			Section 7.3
24.232(c)	Equivalent Isotropic Radiated Power (Band 2, 41)	< 2 Watts max. EIRP			Section 7.3
27.50(d)(4)	Equivalent Isotropic Radiated Power (Band 4/66)	< 1 Watts max. EIRP			Section 7.3
27.50(a)(3)	Equivalent Isotropic Radiated Power (Band 30)	< 0.25 Watts max. EIRP			Section 7.3
2.1053 22.917(a) 24.238(a) 27.53(c) 27.53(g) 27.53(h)	Undesirable Emissions (Band 12, 13, 5, 66/4, 2)	> 43 + 10 log ₁₀ (P[Watts]) for all out-of-band emissions			Section 7.4
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 7.4
27.53(a)	Undesirable Emissions (Band 30)	> 70 + 10 log ₁₀ (P[Watts])			Section 7.4
27.53(m)	Undesirable Emissions (Band 41)	Undesirable emissions must meet the limits detailed in 27.53(m)			Section 7.4

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.

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7.2 Conducted Power Out Data

§2.1046

Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [Watts]
20 MHz	DFT-s-OFDM $\pi/2$ BPSK	344000	1720.0	1 / 53	22.72	0.187
		349000	1745.0	1 / 104	22.75	0.188
		354000	1770.0	1 / 53	22.62	0.183
	DFT-s-OFDM QPSK	344000	1720.0	1 / 104	22.73	0.187
		349000	1745.0	1 / 1	22.70	0.186
		354000	1770.0	1 / 1	22.61	0.182
	DFT-s-OFDM 16QAM	344000	1720.0	1 / 1	22.54	0.179
		349000	1745.0	1 / 1	22.57	0.181
		354000	1770.0	1 / 1	22.46	0.176
	CP-OFDM QPSK	344000	1720.0	1 / 1	22.71	0.187
		349000	1745.0	1 / 1	22.66	0.185
		354000	1770.0	1 / 1	22.59	0.182
15 MHz	DFT-s-OFDM $\pi/2$ BPSK	343500	1717.5	1 / 77	22.71	0.187
		349000	1745.0	1 / 1	22.56	0.180
		354500	1772.5	1 / 77	22.59	0.182
	DFT-s-OFDM QPSK	343500	1717.5	1 / 1	22.72	0.187
		349000	1745.0	1 / 77	22.53	0.179
		354500	1772.5	1 / 77	22.60	0.182
	DFT-s-OFDM 16QAM	343500	1717.5	1 / 1	22.61	0.182
		349000	1745.0	1 / 1	22.38	0.173
		354500	1772.5	1 / 1	22.40	0.174
	CP-OFDM QPSK	343500	1717.5	1 / 1	22.47	0.177
		349000	1745.0	1 / 1	22.27	0.169
		354500	1772.5	1 / 1	22.41	0.174
10 MHz	DFT-s-OFDM $\pi/2$ BPSK	343000	1715.0	1 / 1	22.71	0.187
		349000	1745.0	1 / 26	22.63	0.183
		355000	1775.0	50 / 0	22.58	0.181
	DFT-s-OFDM QPSK	344000	1715.0	1 / 1	22.70	0.186
		349000	1745.0	50 / 0	22.59	0.182
		354000	1775.0	50 / 0	22.57	0.181
	DFT-s-OFDM 16QAM	344000	1715.0	1 / 1	22.55	0.180
		349000	1745.0	1 / 1	22.47	0.177
		354000	1775.0	1 / 1	22.53	0.179
	CP-OFDM QPSK	344000	1715.0	1 / 1	22.67	0.185
		349000	1745.0	1 / 1	22.47	0.177
		354000	1775.0	1 / 1	22.46	0.176
5 MHz	DFT-s-OFDM $\pi/2$ BPSK	342500	1712.5	12 / 13	22.76	0.189
		349000	1745.0	12 / 7	22.68	0.185
		355500	1775.5	12 / 7	22.66	0.185
	DFT-s-OFDM QPSK	342500	1712.5	12 / 0	22.76	0.189
		349000	1745.0	1 / 13	22.70	0.186
		355500	1775.5	1 / 13	22.65	0.184
	DFT-s-OFDM 16QAM	342500	1712.5	1 / 1	22.63	0.183
		349000	1745.0	1 / 1	22.66	0.185
		355500	1775.5	1 / 1	22.58	0.181
	CP-OFDM QPSK	342500	1712.5	1 / 1	22.68	0.185
		349000	1745.0	1 / 1	22.58	0.181
		355500	1775.5	1 / 1	22.48	0.177

Table 7-2. Sub 6GHz NR n66 Conducted Power Output Data

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]	Conducted Power [Watts]
20 MHz	DFT-s-OFDM $\pi/2$ BPSK	372000	1860.0	50 / 56	23.63	0.231
		376000	1880.0	1 / 53	23.69	0.234
		380000	1900.0	1 / 104	23.70	0.234
	DFT-s-OFDM QPSK	372000	1860.0	50 / 28	23.61	0.230
		376000	1880.0	50 / 28	23.64	0.231
		380000	1900.0	50 / 56	23.53	0.225
	DFT-s-OFDM 16QAM	372000	1860.0	1 / 1	23.36	0.217
		376000	1880.0	1 / 1	23.03	0.201
		380000	1900.0	1 / 1	23.43	0.220
	CP-OFDM QPSK	372000	1860.0	1 / 1	23.7	0.234
		376000	1880.0	1 / 1	23.68	0.233
		380000	1900.0	1 / 1	23.47	0.222

Table 7-3. Sub 6GHz NR n2 Conducted Power Output Data

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
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7.3 Radiated Power (ERP/EIRP)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer’s “channel power” measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW \geq 3 x RBW
4. Span = 1.5 times the OBW
5. No. of sweep points \geq 2 x span / RBW
6. Detector = RMS
7. Trigger is set to “free run” for signals with continuous operation with the sweep times set to “auto”.
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The trace was allowed to stabilize

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Test Setup

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

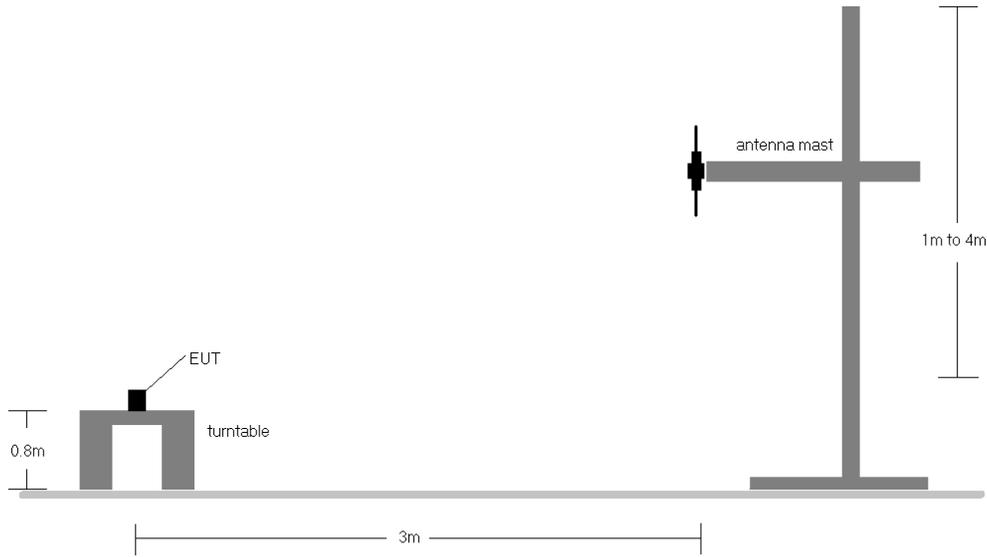


Figure 7-1. Radiated Test Setup <1GHz

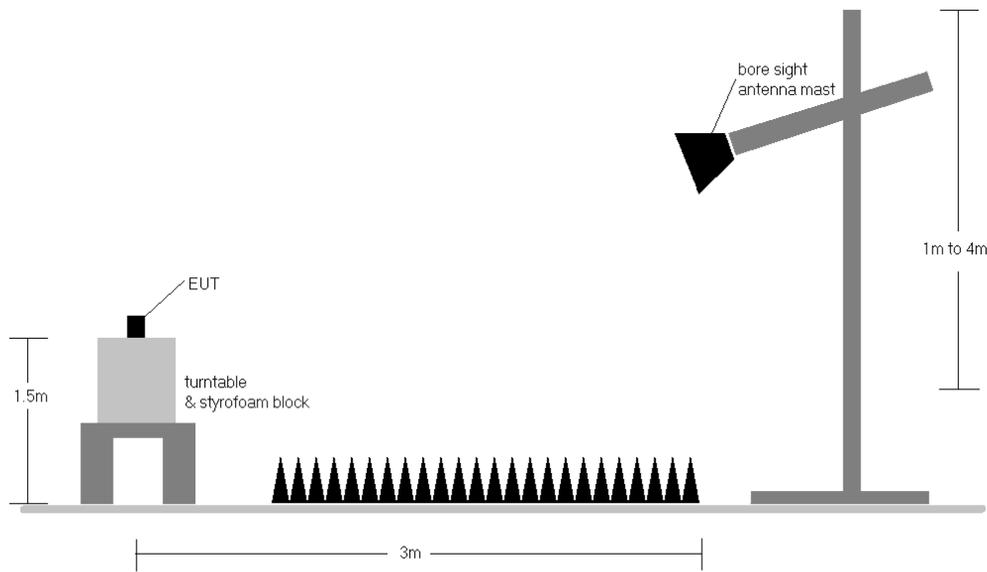


Figure 7-2. Radiated Test Setup >1GHz

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.

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	H	294	76	1 / 5	16.82	3.40	18.07	0.064	34.77	-16.70	20.22	0.105	36.99	-16.77
707.50	1.4	QPSK	H	296	84	1 / 0	16.08	3.65	17.58	0.057	34.77	-17.19	19.73	0.094	36.99	-17.26
715.30	1.4	QPSK	H	310	87	1 / 5	15.91	3.70	17.46	0.056	34.77	-17.31	19.61	0.091	36.99	-17.38
707.50	1.4	16-QAM	H	296	84	1 / 0	15.39	3.65	16.89	0.049	34.77	-17.88	19.04	0.080	36.99	-17.95
707.50	1.4	64-QAM	H	296	84	1 / 0	12.25	3.65	13.75	0.024	34.77	-21.02	15.90	0.039	36.99	-21.09
707.50	1.4	256-QAM	H	296	84	1 / 0	8.59	3.65	10.09	0.010	34.77	-24.68	12.24	0.017	36.99	-24.75
700.50	3	QPSK	H	296	79	1 / 14	16.02	3.40	17.27	0.053	34.77	-17.50	19.42	0.087	36.99	-17.57
707.50	3	QPSK	H	293	80	1 / 0	16.11	3.65	17.61	0.058	34.77	-17.16	19.76	0.095	36.99	-17.23
714.50	3	QPSK	H	305	96	1 / 14	15.92	3.70	17.47	0.056	34.77	-17.30	19.62	0.092	36.99	-17.37
707.50	3	16-QAM	H	293	80	1 / 0	15.47	3.65	16.97	0.050	34.77	-17.80	19.12	0.082	36.99	-17.87
707.50	3	64-QAM	H	293	80	1 / 0	12.26	3.65	13.76	0.024	34.77	-21.01	15.91	0.039	36.99	-21.08
707.50	3	256-QAM	H	293	80	1 / 0	8.72	3.65	10.22	0.011	34.77	-24.55	12.37	0.017	36.99	-24.62
701.50	5	QPSK	H	295	81	1 / 24	16.05	3.40	17.30	0.054	34.77	-17.47	19.45	0.088	36.99	-17.54
707.50	5	QPSK	H	294	84	1 / 0	15.95	3.65	17.45	0.056	34.77	-17.32	19.60	0.091	36.99	-17.39
713.50	5	QPSK	H	306	99	1 / 24	15.90	3.70	17.45	0.056	34.77	-17.32	19.60	0.091	36.99	-17.39
707.50	5	16-QAM	H	294	84	1 / 24	15.43	3.65	16.93	0.049	34.77	-17.84	19.08	0.081	36.99	-17.91
707.50	5	64-QAM	H	294	84	1 / 24	12.31	3.65	13.81	0.024	34.77	-20.96	15.96	0.039	36.99	-21.03
707.50	5	256-QAM	H	294	84	1 / 24	9.03	3.65	10.53	0.011	34.77	-24.24	12.68	0.019	36.99	-24.31
704.00	10	QPSK	H	296	84	1 / 49	16.13	3.50	17.48	0.056	34.77	-17.29	19.63	0.092	36.99	-17.36
707.50	10	QPSK	H	292	86	1 / 49	16.07	3.65	17.57	0.057	34.77	-17.20	19.72	0.094	36.99	-17.27
711.00	10	QPSK	H	305	94	1 / 49	16.59	3.70	18.14	0.065	34.77	-16.63	20.29	0.107	36.99	-16.70
711.00	10	16-QAM	H	305	94	1 / 49	14.91	3.70	16.46	0.044	34.77	-18.31	18.61	0.073	36.99	-18.38
711.00	10	64-QAM	H	305	94	1 / 49	11.70	3.70	13.25	0.021	34.77	-21.52	15.40	0.035	36.99	-21.59
711.00	10	256-QAM	H	305	94	1 / 49	8.71	3.70	10.26	0.011	34.77	-24.51	12.41	0.017	36.99	-24.58
711.00	10	QPSK	V	174	28	1 / 49	16.00	3.65	17.50	0.056	34.77	-17.27	19.65	0.092	36.99	-17.34

Table 7-4. ERP Data (Band 12)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 21 of 61	

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]
779.50	5	QPSK	V	152	96	12 / 6	14.72	5.70	18.27	0.067	34.77	-16.50
782.00	5	QPSK	V	137	105	12 / 6	14.63	5.80	18.28	0.067	34.77	-16.49
784.50	5	QPSK	V	143	95	1 / 0	14.58	5.80	18.23	0.067	34.77	-16.54
782.00	5	16-QAM	V	137	105	12 / 6	13.34	5.80	16.99	0.050	34.77	-17.78
782.00	5	64-QAM	V	137	105	12 / 6	12.48	5.80	16.13	0.041	34.77	-18.64
782.00	5	256-QAM	V	137	105	12 / 6	9.34	5.80	12.99	0.020	34.77	-21.78
782.00	10	QPSK	V	149	11	25 / 12	14.84	5.80	18.49	0.071	34.77	-16.28
782.00	10	16-QAM	V	149	11	25 / 12	13.40	5.80	17.05	0.051	34.77	-17.72
782.00	10	64-QAM	V	149	11	25 / 12	12.53	5.80	16.18	0.041	34.77	-18.59
782.00	10	256-QAM	V	149	11	25 / 12	9.50	5.80	13.15	0.021	34.77	-21.62
782.00	10	QPSK	H	158	319	25 / 12	14.09	5.80	17.74	0.059	34.77	-17.03

Table 7-5. ERP Data (Band 13)

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 22 of 61

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	154	80	1 / 0	14.14	6.30	18.29	0.067	38.45	-20.16	20.44	0.111	40.61	-20.17
836.50	1.4	QPSK	V	147	78	1 / 0	14.13	6.40	18.38	0.069	38.45	-20.07	20.53	0.113	40.61	-20.08
848.30	1.4	QPSK	V	156	74	1 / 0	14.05	6.50	18.40	0.069	38.45	-20.05	20.55	0.114	40.61	-20.06
848.30	1.4	16-QAM	V	156	74	1 / 0	12.73	6.50	17.08	0.051	38.45	-21.37	19.23	0.084	40.61	-21.38
848.30	1.4	64-QAM	V	156	74	1 / 0	11.32	6.50	15.67	0.037	38.45	-22.78	17.82	0.061	40.61	-22.79
848.30	1.4	256-QAM	V	156	74	1 / 0	8.57	6.50	12.92	0.020	38.45	-25.53	15.07	0.032	40.61	-25.54
825.50	3	QPSK	V	153	86	1 / 0	14.26	6.30	18.41	0.069	38.45	-20.04	20.56	0.114	40.61	-20.05
836.50	3	QPSK	V	141	81	1 / 0	14.13	6.40	18.38	0.069	38.45	-20.07	20.53	0.113	40.61	-20.08
847.50	3	QPSK	V	140	74	1 / 0	13.80	6.50	18.15	0.065	38.45	-20.30	20.30	0.107	40.61	-20.31
825.50	3	16-QAM	V	153	86	1 / 0	12.96	6.30	17.11	0.051	38.45	-21.34	19.26	0.084	40.61	-21.35
825.50	3	64-QAM	V	153	86	1 / 0	11.74	6.30	15.89	0.039	38.45	-22.56	18.04	0.064	40.61	-22.57
825.50	3	256-QAM	V	153	86	1 / 0	8.79	6.30	12.94	0.020	38.45	-25.51	15.09	0.032	40.61	-25.52
826.50	5	QPSK	V	157	69	1 / 0	14.30	6.30	18.45	0.070	38.45	-20.00	20.60	0.115	40.61	-20.01
836.50	5	QPSK	V	138	65	1 / 0	14.15	6.40	18.40	0.069	38.45	-20.05	20.55	0.114	40.61	-20.06
846.50	5	QPSK	V	156	88	1 / 0	14.16	6.50	18.51	0.071	38.45	-19.94	20.66	0.116	40.61	-19.95
846.50	5	16-QAM	V	156	88	1 / 0	12.79	6.50	17.14	0.052	38.45	-21.31	19.29	0.085	40.61	-21.32
846.50	5	64-QAM	V	156	88	1 / 0	11.56	6.50	15.91	0.039	38.45	-22.54	18.06	0.064	40.61	-22.55
846.50	5	256-QAM	V	156	88	1 / 0	8.61	6.50	12.96	0.020	38.45	-25.49	15.11	0.032	40.61	-25.50
829.00	10	QPSK	V	157	77	1 / 0	14.35	6.30	18.50	0.071	38.45	-19.95	20.65	0.116	40.61	-19.96
836.50	10	QPSK	V	144	72	1 / 49	14.80	6.40	19.05	0.080	38.45	-19.40	21.20	0.132	40.61	-19.41
844.00	10	QPSK	V	148	82	1 / 49	15.08	6.40	19.33	0.086	38.45	-19.12	21.48	0.141	40.61	-19.13
844.00	10	16-QAM	V	148	82	1 / 49	13.58	6.40	17.83	0.061	38.45	-20.62	19.98	0.100	40.61	-20.63
844.00	10	64-QAM	V	148	82	1 / 49	12.35	6.40	16.60	0.046	38.45	-21.85	18.75	0.075	40.61	-21.86
844.00	10	256-QAM	V	148	82	1 / 49	9.02	6.40	13.27	0.021	38.45	-25.18	15.42	0.035	40.61	-25.19
844.00	10	QPSK	H	216	92	1 / 49	12.22	6.40	16.47	0.044	38.45	-21.98	18.62	0.073	40.61	-21.99

Table 7-6. ERP Data (Band 5)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 23 of 61	

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	192	221	1 / 0	8.96	9.35	18.31	0.068	30.00	-11.69
1745.00	1.4	QPSK	H	175	228	1 / 0	9.33	9.11	18.44	0.070	30.00	-11.56
1779.30	1.4	QPSK	H	163	221	1 / 0	9.29	9.17	18.46	0.070	30.00	-11.54
1779.30	1.4	16-QAM	H	163	221	1 / 0	7.99	9.17	17.16	0.052	30.00	-12.84
1779.30	1.4	64-QAM	H	163	221	1 / 0	7.06	9.17	16.23	0.042	30.00	-13.77
1779.30	1.4	256-QAM	H	163	221	1 / 0	4.65	9.17	13.82	0.024	30.00	-16.18
1711.50	3	QPSK	H	194	240	1 / 0	8.70	9.34	18.04	0.064	30.00	-11.96
1745.00	3	QPSK	H	178	232	1 / 0	9.27	9.11	18.38	0.069	30.00	-11.62
1778.50	3	QPSK	H	177	232	1 / 0	9.39	9.17	18.56	0.072	30.00	-11.44
1778.50	3	16-QAM	H	177	232	1 / 0	8.17	9.17	17.34	0.054	30.00	-12.66
1778.50	3	64-QAM	H	177	232	1 / 0	7.32	9.17	16.49	0.045	30.00	-13.51
1778.50	3	256-QAM	H	177	232	1 / 0	4.42	9.17	13.59	0.023	30.00	-16.41
1712.50	5	QPSK	H	179	229	1 / 0	8.93	9.34	18.27	0.067	30.00	-11.73
1745.00	5	QPSK	H	179	239	1 / 0	9.37	9.11	18.48	0.070	30.00	-11.52
1777.50	5	QPSK	H	175	234	1 / 0	9.48	9.16	18.64	0.073	30.00	-11.36
1777.50	5	16-QAM	H	175	234	1 / 0	8.45	9.16	17.61	0.058	30.00	-12.39
1777.50	5	64-QAM	H	175	234	1 / 0	6.66	9.16	15.82	0.038	30.00	-14.18
1777.50	5	256-QAM	H	175	234	1 / 0	4.48	9.16	13.64	0.023	30.00	-16.36
1715.00	10	QPSK	H	194	223	1 / 0	9.05	9.32	18.37	0.069	30.00	-11.63
1745.00	10	QPSK	H	168	237	1 / 0	9.25	9.11	18.36	0.069	30.00	-11.64
1775.00	10	QPSK	H	179	220	1 / 0	9.18	9.16	18.34	0.068	30.00	-11.66
1715.00	10	16-QAM	H	194	223	1 / 0	8.06	9.32	17.38	0.055	30.00	-12.62
1715.00	10	64-QAM	H	194	223	1 / 0	7.12	9.32	16.44	0.044	30.00	-13.56
1715.00	10	256-QAM	H	194	223	1 / 0	4.12	9.32	13.44	0.022	30.00	-16.56
1717.50	15	QPSK	H	188	230	1 / 0	9.36	9.30	18.66	0.073	30.00	-11.34
1745.00	15	QPSK	H	182	243	1 / 0	9.46	9.11	18.57	0.072	30.00	-11.43
1772.50	15	QPSK	H	179	227	1 / 0	9.71	9.15	18.86	0.077	30.00	-11.14
1772.50	15	16-QAM	H	179	227	1 / 0	8.60	9.15	17.75	0.060	30.00	-12.25
1772.50	15	64-QAM	H	179	227	1 / 0	8.04	9.15	17.19	0.052	30.00	-12.81
1772.50	15	256-QAM	H	179	227	1 / 0	4.42	9.15	13.57	0.023	30.00	-16.43
1720.00	20	QPSK	H	185	231	1 / 0	9.45	9.28	18.73	0.075	30.00	-11.27
1745.00	20	QPSK	H	176	233	1 / 0	8.94	9.11	18.05	0.064	30.00	-11.95
1770.00	20	QPSK	H	171	227	1 / 99	9.69	9.14	18.83	0.076	30.00	-11.17
1770.00	20	16-QAM	H	171	227	1 / 99	8.32	9.14	17.46	0.056	30.00	-12.54
1770.00	20	64-QAM	H	171	227	1 / 99	7.36	9.14	16.50	0.045	30.00	-13.50
1770.00	20	256-QAM	H	171	227	1 / 99	4.21	9.14	13.35	0.022	30.00	-16.65
1772.50	15	QPSK	V	102	341	1 / 0	9.49	9.11	18.60	0.072	30.00	-11.40

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

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 24 of 61	

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	100	230	1 / 0	11.69	9.48	21.17	0.131	33.01	-11.84
1880.00	1.4	QPSK	H	115	243	1 / 0	11.17	9.90	21.07	0.128	33.01	-11.94
1909.30	1.4	QPSK	H	148	116	1 / 0	10.87	10.25	21.12	0.129	33.01	-11.89
1850.70	1.4	16-QAM	H	100	230	1 / 0	10.29	9.48	19.77	0.095	33.01	-13.24
1850.70	1.4	64-QAM	H	100	230	1 / 0	9.66	9.48	19.14	0.082	33.01	-13.87
1850.70	1.4	256-QAM	H	100	230	1 / 0	6.58	9.48	16.06	0.040	33.01	-16.95
1851.50	3	QPSK	H	100	238	1 / 0	11.47	9.50	20.97	0.125	33.01	-12.04
1880.00	3	QPSK	H	117	236	1 / 0	11.23	9.90	21.13	0.130	33.01	-11.88
1908.50	3	QPSK	H	147	129	1 / 0	10.83	10.25	21.08	0.128	33.01	-11.93
1880.00	3	16-QAM	H	117	236	1 / 0	10.06	9.90	19.96	0.099	33.01	-13.05
1880.00	3	64-QAM	H	117	236	1 / 0	9.03	9.90	18.93	0.078	33.01	-14.08
1880.00	3	256-QAM	H	117	236	1 / 0	6.23	9.90	16.13	0.041	33.01	-16.88
1852.50	5	QPSK	H	104	242	1 / 0	11.43	9.51	20.94	0.124	33.01	-12.07
1880.00	5	QPSK	H	110	229	1 / 0	11.19	9.90	21.09	0.129	33.01	-11.92
1907.50	5	QPSK	H	149	130	1 / 0	10.80	10.24	21.04	0.127	33.01	-11.97
1880.00	5	16-QAM	H	110	229	1 / 0	10.06	9.90	19.96	0.099	33.01	-13.05
1880.00	5	64-QAM	H	110	229	1 / 0	9.16	9.90	19.06	0.081	33.01	-13.95
1880.00	5	256-QAM	H	110	229	1 / 0	6.26	9.90	16.16	0.041	33.01	-16.85
1855.00	10	QPSK	H	100	228	1 / 0	11.52	9.55	21.07	0.128	33.01	-11.94
1880.00	10	QPSK	H	101	232	1 / 0	11.28	9.90	21.18	0.131	33.01	-11.83
1905.00	10	QPSK	H	148	125	1 / 0	10.97	10.22	21.19	0.131	33.01	-11.82
1905.00	10	16-QAM	H	148	125	1 / 0	9.80	10.22	20.02	0.100	33.01	-12.99
1905.00	10	64-QAM	H	148	125	1 / 0	8.77	10.22	18.99	0.079	33.01	-14.02
1905.00	10	256-QAM	H	148	125	1 / 0	6.08	10.22	16.30	0.043	33.01	-16.71
1857.50	15	QPSK	H	112	246	1 / 0	11.79	9.58	21.37	0.137	33.01	-11.64
1880.00	15	QPSK	H	104	231	1 / 0	11.20	9.90	21.10	0.129	33.01	-11.91
1902.50	15	QPSK	H	147	128	1 / 0	11.14	10.20	21.34	0.136	33.01	-11.67
1857.50	15	16-QAM	H	112	246	1 / 0	10.59	9.58	20.17	0.104	33.01	-12.84
1857.50	15	64-QAM	H	112	246	1 / 0	9.48	9.58	19.06	0.081	33.01	-13.95
1857.50	15	256-QAM	H	112	246	1 / 0	6.50	9.58	16.08	0.041	33.01	-16.93
1860.00	20	QPSK	H	107	238	1 / 99	11.67	9.62	21.29	0.134	33.01	-11.72
1880.00	20	QPSK	H	111	237	1 / 0	12.10	9.90	22.00	0.158	33.01	-11.01
1900.00	20	QPSK	H	147	123	1 / 0	11.42	10.18	21.60	0.145	33.01	-11.41
1880.00	20	16-QAM	H	111	237	1 / 0	10.96	9.90	20.86	0.122	33.01	-12.15
1880.00	20	64-QAM	H	111	237	1 / 0	10.12	9.90	20.02	0.100	33.01	-12.99
1880.00	20	256-QAM	H	111	237	1 / 0	6.86	9.90	16.76	0.047	33.01	-16.25

Table 7-8. EIRP Data (Band 2)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 25 of 61	

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	122	312	1 / 24	10.29	10.21	20.50	0.112	23.98	-3.48
2312.50	5	QPSK	V	120	310	1 / 24	10.20	10.21	20.41	0.110	23.98	-3.57
2307.50	5	16-QAM	V	122	312	1 / 24	9.36	10.23	19.59	0.091	23.98	-4.39
2307.50	5	64-QAM	V	122	312	1 / 24	8.19	10.23	18.42	0.069	23.98	-5.56
2307.50	5	256-QAM	V	122	312	1 / 24	5.26	10.23	15.49	0.035	23.98	-8.49
2310.00	10	QPSK	V	123	317	1 / 49	10.51	10.22	20.73	0.118	23.98	-3.25
2310.00	10	16-QAM	V	123	317	1 / 49	9.41	10.22	19.63	0.092	23.98	-4.35
2310.00	10	64-QAM	V	123	317	1 / 49	8.47	10.22	18.69	0.074	23.98	-5.29
2310.00	10	256-QAM	V	123	317	1 / 49	5.14	10.22	15.36	0.034	23.98	-8.62
2310.00	10	QPSK	H	226	180	1 / 49	7.60	10.22	17.82	0.061	23.98	-6.16
2310.00	10 (WCP+DD)	QPSK	H	224	202	1 / 49	7.47	10.22	17.69	0.059	23.98	-6.29

Table 7-9. EIRP Data (Band 30)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 26 of 61	

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2498.50	5	QPSK	V	122	316	1 / 0	13.72	9.40	23.12	0.205	33.01	-9.89
2593.00	5	QPSK	V	109	335	1 / 0	13.84	9.56	23.40	0.219	33.01	-9.61
2687.50	5	QPSK	V	106	332	1 / 0	13.50	9.69	23.19	0.208	33.01	-9.82
2593.00	5	16-QAM	V	109	335	1 / 0	11.62	9.56	21.18	0.131	33.01	-11.83
2593.00	5	64-QAM	V	109	335	1 / 0	10.63	9.56	20.19	0.104	33.01	-12.82
2593.00	5	256-QAM	V	109	335	1 / 0	8.93	9.56	18.49	0.071	33.01	-14.52
2501.00	10	QPSK	V	138	310	1 / 0	13.83	9.40	23.23	0.210	33.01	-9.78
2593.00	10	QPSK	V	116	342	1 / 0	13.91	9.56	23.47	0.222	33.01	-9.54
2685.00	10	QPSK	V	100	329	1 / 0	13.60	9.68	23.28	0.213	33.01	-9.73
2593.00	10	16-QAM	V	116	342	1 / 0	11.62	9.56	21.18	0.131	33.01	-11.83
2593.00	10	64-QAM	V	116	342	1 / 0	10.60	9.56	20.16	0.104	33.01	-12.85
2593.00	10	256-QAM	V	116	342	1 / 0	8.92	9.56	18.48	0.070	33.01	-14.53
2503.50	15	QPSK	V	128	325	1 / 0	14.00	9.39	23.39	0.219	33.01	-9.62
2593.00	15	QPSK	V	106	332	1 / 0	14.02	9.56	23.58	0.228	33.01	-9.43
2682.50	15	QPSK	V	100	333	1 / 0	13.70	9.68	23.38	0.218	33.01	-9.63
2593.00	15	16-QAM	V	106	332	1 / 0	12.70	9.56	22.26	0.168	33.01	-10.75
2593.00	15	64-QAM	V	106	332	1 / 0	11.51	9.56	21.07	0.128	33.01	-11.94
2593.00	15	256-QAM	V	106	332	1 / 0	8.93	9.56	18.49	0.071	33.01	-14.52
2506.00	20	QPSK	V	128	318	1 / 50	14.14	9.39	23.53	0.226	33.01	-9.48
2593.00	20	QPSK	V	116	333	1 / 50	13.34	9.56	22.90	0.195	33.01	-10.11
2680.00	20	QPSK	V	101	329	1 / 50	12.58	9.68	22.26	0.168	33.01	-10.75
2506.00	20	16-QAM	V	128	318	1 / 50	13.38	9.39	22.77	0.189	33.01	-10.24
2506.00	20	64-QAM	V	128	318	1 / 50	12.34	9.39	21.73	0.149	33.01	-11.28
2680.00	20	256-QAM	V	101	329	1 / 99	8.99	9.68	18.67	0.074	33.01	-14.34
2506.00	20	QPSK	H	121	189	1 / 0	11.11	9.56	20.67	0.117	33.01	-12.34
2506.00	20	QPSK	V	254	251	1 / 0	2.86	9.56	12.42	0.017	33.01	-20.59

Table 7-10. EIRP Data (Band 41 – PC3)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 27 of 61	

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]
826.50	5	QPSK	V	125	74	3 / 2	8.42	6.70	12.97	0.020	38.45	-25.49	15.12	0.032	40.61	-25.49
836.50	5	QPSK	V	135	88	3 / 2	7.63	6.70	12.18	0.017	38.45	-26.27	14.33	0.027	40.61	-26.27
846.50	5	QPSK	V	141	82	3 / 2	7.88	6.60	12.33	0.017	38.45	-26.12	14.48	0.028	40.61	-26.13
824.70	5	16-QAM	V	125	74	3 / 2	8.24	6.70	12.79	0.019	38.45	-25.66	14.94	0.031	40.61	-25.67
824.70	5	64-QAM	V	125	74	3 / 2	6.56	6.70	11.11	0.013	38.45	-27.35	13.26	0.021	40.61	-27.35
824.70	5	256-QAM	V	125	74	3 / 2	4.12	6.70	8.67	0.007	38.45	-29.78	10.82	0.012	40.61	-29.79
829.00	10	QPSK	V	126	81	8 / 4	8.45	6.70	13.00	0.020	38.45	-25.45	15.15	0.033	40.61	-25.46
836.50	10	QPSK	V	140	81	8 / 4	8.01	6.70	12.56	0.018	38.45	-25.89	14.71	0.030	40.61	-25.90
844.00	10	QPSK	V	136	86	8 / 4	8.05	6.60	12.50	0.018	38.45	-25.95	14.65	0.029	40.61	-25.96
825.50	10	16-QAM	V	126	81	8 / 4	8.28	6.70	12.83	0.019	38.45	-25.62	14.98	0.031	40.61	-25.63
825.50	10	64-QAM	V	126	81	8 / 4	7.14	6.70	11.69	0.015	38.45	-26.77	13.84	0.024	40.61	-26.77
825.50	10	256-QAM	V	126	81	8 / 4	4.12	6.70	8.67	0.007	38.45	-29.78	10.82	0.012	40.61	-29.79
831.50	15	QPSK	V	133	76	12 / 6	8.04	6.70	12.59	0.018	38.45	-25.86	14.74	0.030	40.61	-25.87
836.50	15	QPSK	V	134	87	12 / 6	7.39	6.70	11.94	0.016	38.45	-26.51	14.09	0.026	40.61	-26.52
841.50	15	QPSK	V	139	89	12 / 6	7.60	6.60	12.05	0.016	38.45	-26.40	14.20	0.026	40.61	-26.41
831.50	15	16-QAM	V	133	76	12 / 6	7.86	6.70	12.41	0.017	38.45	-26.04	14.56	0.029	40.61	-26.05
831.50	15	64-QAM	V	133	76	12 / 6	6.16	6.70	10.71	0.012	38.45	-27.75	12.86	0.019	40.61	-27.75
831.50	15	256-QAM	V	133	76	12 / 6	3.78	6.70	8.33	0.007	38.45	-30.12	10.48	0.011	40.61	-30.13
834.00	20	QPSK	V	130	79	1 / 53	9.17	6.70	13.72	0.024	38.45	-24.73	15.87	0.039	40.61	-24.74
836.50	20	QPSK	V	136	83	1 / 53	8.71	6.70	13.26	0.021	38.45	-25.19	15.41	0.035	40.61	-25.20
839.00	20	QPSK	V	137	86	1 / 53	8.36	6.70	12.91	0.020	38.45	-25.54	15.06	0.032	40.61	-25.55
834.00	20	16-QAM	V	130	79	1 / 53	7.79	6.70	12.34	0.017	38.45	-26.11	14.49	0.028	40.61	-26.12
834.00	20	64-QAM	V	130	79	1 / 53	7.49	6.70	12.04	0.016	38.45	-26.41	14.19	0.026	40.61	-26.42
834.00	20	256-QAM	V	130	79	1 / 53	5.09	6.70	9.64	0.009	38.45	-28.81	11.79	0.015	40.61	-28.82
834.00	20	QPSK	H	153	74	1 / 53	7.67	6.70	12.22	0.017	38.45	-26.23	14.37	0.027	40.61	-26.24
834.00	20 (WCP+DD)	QPSK	H	136	83	1 / 53	6.82	6.70	11.37	0.014	38.45	-27.08	13.52	0.022	40.61	-27.09

Table 7-11. ERP Data (5G NR n5)

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 28 of 61	

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]
1712.50	5	QPSK	H	134	329	1 / 0	12.60	9.43	22.03	0.160	30.00	-7.97
1745.00	5	QPSK	H	127	339	1 / 0	12.53	9.23	21.76	0.150	30.00	-8.24
1777.50	5	QPSK	H	131	322	1 / 0	13.16	9.26	22.42	0.174	30.00	-7.58
1777.50	5	16-QAM	H	131	322	1 / 0	11.49	9.26	20.74	0.119	30.00	-9.26
1777.50	5	64-QAM	H	131	322	1 / 0	11.11	9.26	20.37	0.109	30.00	-9.63
1777.50	5	256-QAM	H	131	322	1 / 0	9.73	9.26	18.99	0.079	30.00	-11.01
1715.00	10	QPSK	H	134	331	1 / 0	12.41	9.42	21.82	0.152	30.00	-8.18
1745.00	10	QPSK	H	131	340	1 / 0	12.54	9.23	21.77	0.150	30.00	-8.23
1775.00	10	QPSK	H	130	326	1 / 0	12.92	9.25	22.17	0.165	30.00	-7.83
1775.00	10	16-QAM	H	130	326	1 / 0	11.20	9.25	20.45	0.111	30.00	-9.55
1775.00	10	64-QAM	H	130	326	1 / 0	10.79	9.25	20.04	0.101	30.00	-9.96
1775.00	10	256-QAM	H	130	326	1 / 0	9.69	9.25	18.94	0.078	30.00	-11.06
1717.50	15	QPSK	H	133	334	1 / 0	12.42	9.40	21.82	0.152	30.00	-8.18
1745.00	15	QPSK	H	131	339	1 / 0	12.45	9.23	21.68	0.147	30.00	-8.32
1772.50	15	QPSK	H	130	327	1 / 0	12.83	9.25	22.08	0.161	30.00	-7.92
1772.50	15	16-QAM	H	130	327	1 / 0	11.21	9.25	20.46	0.111	30.00	-9.54
1772.50	15	64-QAM	H	130	327	1 / 0	10.39	9.25	19.63	0.092	30.00	-10.37
1772.50	15	256-QAM	H	130	327	1 / 0	10.01	9.25	19.25	0.084	30.00	-10.75
1720.00	20	QPSK	H	135	331	1 / 1	12.31	9.38	21.69	0.148	30.00	-8.31
1745.00	20	QPSK	H	127	337	1 / 1	12.59	9.23	21.82	0.152	30.00	-8.18
1770.00	20	QPSK	H	126	324	1 / 1	12.86	9.24	22.10	0.162	30.00	-7.90
1770.00	20	16-QAM	H	126	324	1 / 1	10.96	9.24	20.20	0.105	30.00	-9.80
1770.00	20	64-QAM	H	126	324	1 / 1	10.73	9.24	19.97	0.099	30.00	-10.03
1770.00	20	256-QAM	H	126	324	1 / 1	7.97	9.24	17.21	0.053	30.00	-12.79
1777.50	5	QPSK	V	376	220	1 / 0	18.15	9.23	27.38	0.547	30.00	-2.62
1777.50	5 (WCP+DD)	QPSK	H	132	341	1 / 0	10.86	9.26	20.12	0.103	30.00	-9.88

Table 7-12. EIRP Data (5G NR n66)

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 29 of 61	

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]
1852.50	5	QPSK	H	146	344	1 / 0	13.54	9.51	23.05	0.202	33.01	-9.96
1880.00	5	QPSK	H	136	325	1 / 0	13.66	9.90	23.56	0.227	33.01	-9.45
1907.50	5	QPSK	H	104	330	1 / 0	13.03	10.24	23.27	0.212	33.01	-9.74
1880.00	5	16-QAM	H	136	325	1 / 0	12.07	9.90	21.97	0.157	33.01	-11.04
1880.00	5	64-QAM	H	136	325	1 / 0	11.38	9.90	21.28	0.134	33.01	-11.73
1880.00	5	256-QAM	H	136	325	1 / 0	9.23	9.90	19.13	0.082	33.01	-13.88
1855.00	10	QPSK	H	150	326	1 / 0	13.58	9.55	23.13	0.205	33.01	-9.89
1880.00	10	QPSK	H	134	342	1 / 0	13.37	9.90	23.27	0.212	33.01	-9.74
1905.00	10	QPSK	H	106	335	1 / 0	12.87	10.22	23.09	0.204	33.01	-9.92
1880.00	10	16-QAM	H	134	342	1 / 0	11.83	9.90	21.73	0.149	33.01	-11.28
1880.00	10	64-QAM	H	134	342	1 / 0	11.43	9.90	21.33	0.136	33.01	-11.68
1880.00	10	256-QAM	H	134	342	1 / 0	8.27	9.90	18.17	0.066	33.01	-14.84
1857.50	15	QPSK	H	155	334	1 / 0	13.56	9.58	23.14	0.206	33.01	-9.87
1880.00	15	QPSK	H	137	339	1 / 0	13.66	9.90	23.56	0.227	33.01	-9.45
1902.50	15	QPSK	H	105	337	1 / 0	13.09	10.20	23.29	0.213	33.01	-9.72
1880.00	15	16-QAM	H	137	339	1 / 0	12.19	9.90	22.09	0.162	33.01	-10.92
1880.00	15	64-QAM	H	137	339	1 / 0	11.98	9.90	21.88	0.154	33.01	-11.13
1880.00	15	256-QAM	H	137	339	1 / 0	9.28	9.90	19.18	0.083	33.01	-13.83
1860.00	20	QPSK	H	151	334	1 / 1	13.87	9.62	23.49	0.223	33.01	-9.52
1880.00	20	QPSK	H	138	335	1 / 1	13.86	9.90	23.76	0.238	33.01	-9.25
1900.00	20	QPSK	H	107	338	1 / 1	13.35	10.18	23.53	0.225	33.01	-9.48
1880.00	20	16-QAM	H	138	335	1 / 1	11.85	9.90	21.75	0.150	33.01	-11.26
1880.00	20	64-QAM	H	138	335	1 / 1	11.41	9.90	21.31	0.135	33.01	-11.70
1880.00	20	256-QAM	H	138	335	1 / 1	9.38	9.90	19.28	0.085	33.01	-13.73
1880.00	20	QPSK	V	310	250	1 / 1	11.84	10.10	21.94	0.156	33.01	-11.07
1880.00	20 (WCP+DD)	QPSK	H	115	343	1 / 1	11.83	9.90	21.73	0.149	33.01	-11.28

Table 7-13. EIRP Data (5G NR n2)

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
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7.4 Radiated Spurious Emissions Measurements

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

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

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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Test Setup

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

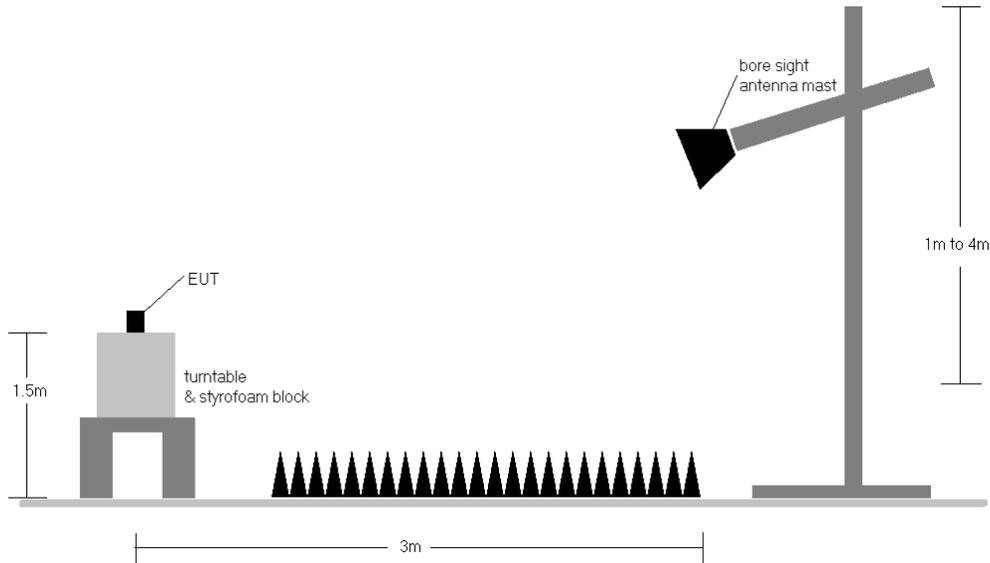


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

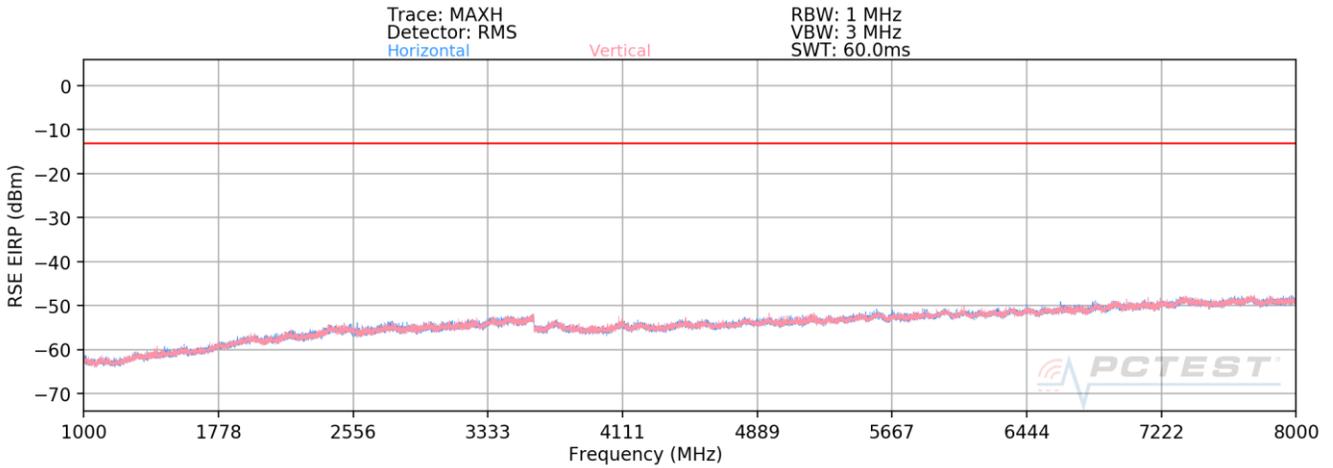
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with 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.
- 6) All SCS's and Waveforms (CP-OFDM vs DFT-s OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Per FCC Guidance, KDB 328880, Radiated Spurious Measurements were made based of the worst case modulation and RB configuraton as determined by EIRP measurement, and grouping the available combinations by Low Band, Mid Band, and High Band.

Spurious emissions shown in this section are measured while operating in EN-DC mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor). Per KDB 968740, spurious emissions from the NR carrier device, is subject to the rules under which the NR carrier operates. Spurious emission caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates. If the spurious emission is caused by the simultaneous operation of both devices, the limit is the highest level allowed by either rule part.

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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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	-	-	-67.68	2.71	-64.97	-52.0
2112.00	H	-	-	-65.50	3.57	-61.93	-48.9

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

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 33 of 61	

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	324	31	-67.87	2.80	-65.07	-52.1
2122.50	H	-	-	-65.67	3.57	-62.10	-49.1

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

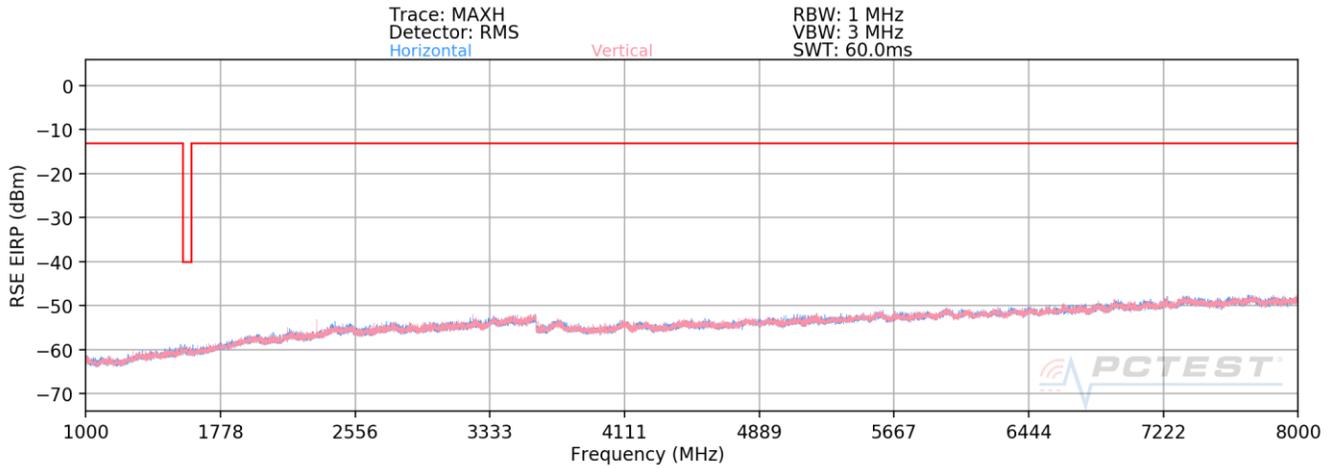
OPERATING FREQUENCY: 711.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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	-	-	-67.89	2.88	-65.00	-52.0
2133.00	H	-	-	-65.42	3.58	-61.84	-48.8

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

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 34 of 61

Band 13



Plot 7-2. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY: 782.00 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]
2346.00	V	143	128	-73.92	9.43	-64.49	-51.5
3128.00	V	-	-	-75.21	9.34	-65.87	-52.9

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

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 35 of 61	

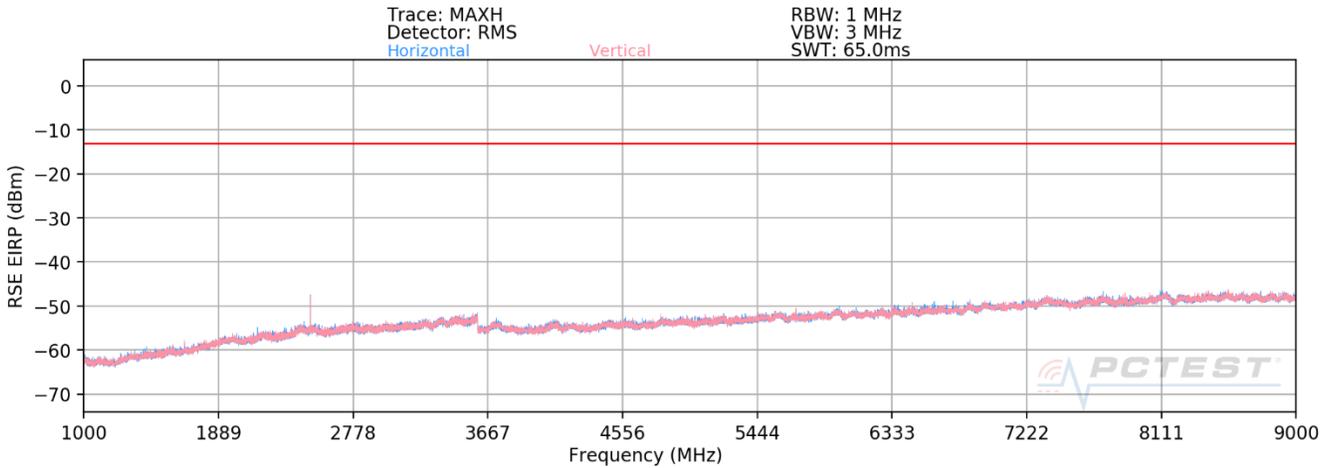
MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.00 MHz
 DISTANCE: 3 meters
 NARROWBAND EMISSION LIMIT: -50 dBm
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	V	-	-	-79.44	8.53	-70.91	-30.9

Table 7-18. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 36 of 61

Band 5



Plot 7-3. 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	V	144	147	-73.52	8.95	-64.57	-51.6
2487.00	V	-	-	-77.47	9.70	-67.76	-54.8

Table 7-19. Radiated Spurious Data (Band 5 – Low Channel)

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 37 of 61	

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	V	171	144	-72.82	8.95	-63.87	-50.9
2509.50	V	-	-	-78.51	9.75	-68.76	-55.8

Table 7-20. Radiated Spurious Data (Band 5 – Mid Channel)

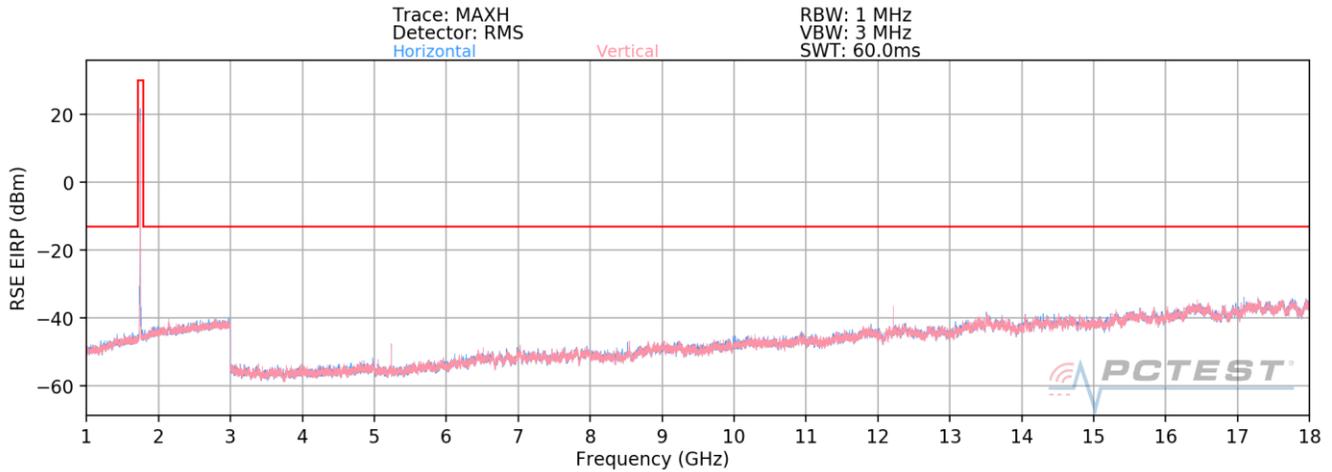
OPERATING FREQUENCY: 844.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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	V	147	129	-70.40	8.95	-61.44	-48.4
2532.00	V	144	124	-70.52	9.75	-60.77	-47.8
3376.00	V	-	-	-74.65	9.71	-64.95	-51.9

Table 7-21. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 38 of 61	

Band 66/4



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

OPERATING FREQUENCY: 1720.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3440.00	V	169	183	-70.22	9.84	-60.37	-47.4
5160.00	V	-	-	-72.61	10.71	-61.90	-48.9

Table 7-22. Radiated Spurious Data (Band 66/4 – Low Channel)

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 39 of 61	

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	V	398	211	-70.08	9.91	-60.16	-47.2
5235.00	V	-	-	-72.11	10.73	-61.38	-48.4

Table 7-23. Radiated Spurious Data (Band 66/4 – Mid Channel)

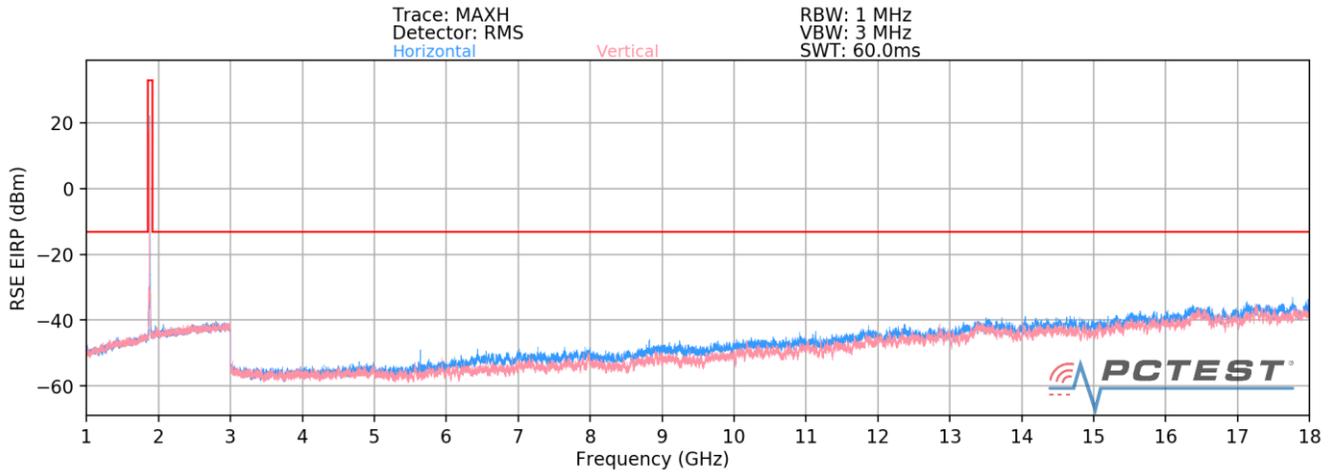
OPERATING FREQUENCY: 1770.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3540.00	V	396	195	-72.39	9.89	-62.50	-49.5
5310.00	V	150	345	-65.14	10.69	-54.46	-41.5
7080.00	V	-	-	-68.77	11.79	-56.99	-44.0

Table 7-24. Radiated Spurious Data (Band 66/4 – High Channel)

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset			Page 40 of 61

Band 2



Plot 7-5. 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	V	114	341	-69.44	6.58	-62.86	-49.9
5580.00	V	107	100	-67.68	8.74	-58.94	-45.9
7440.00	V	-	-	-67.00	8.41	-58.58	-45.6

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

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 41 of 61	

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	V	128	184	-70.96	6.67	-64.30	-51.3
5640.00	V	104	329	-65.62	8.81	-56.81	-43.8
7520.00	V	-	-	-67.73	8.48	-59.24	-46.2

Table 7-26. Radiated Spurious Data (Band 2 – Mid Channel)

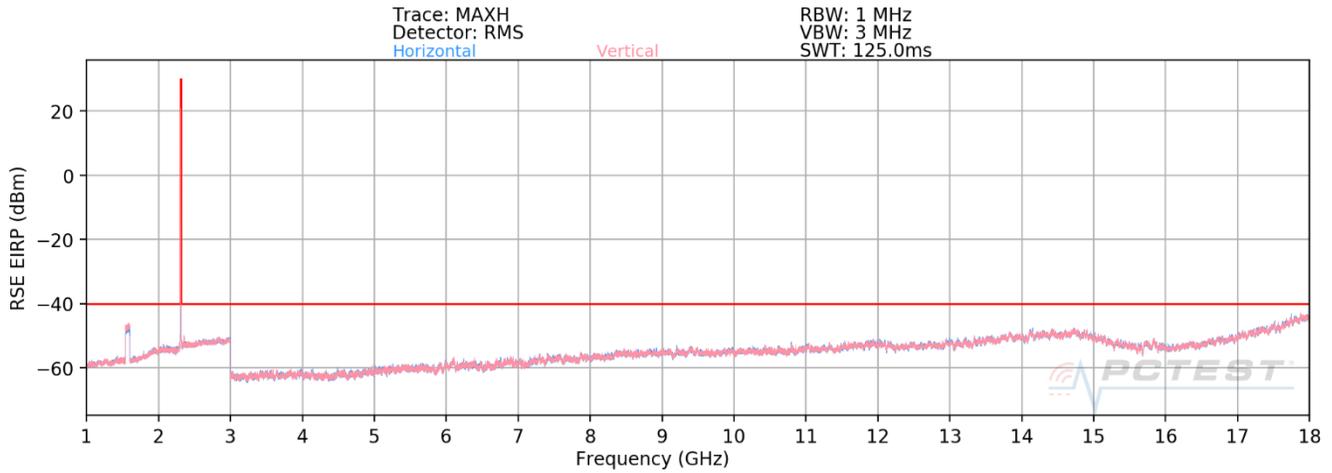
OPERATING FREQUENCY: 1900.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

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	V	394	162	-71.55	6.87	-64.67	-51.7
5700.00	V	-	-	-70.81	8.76	-62.05	-49.0

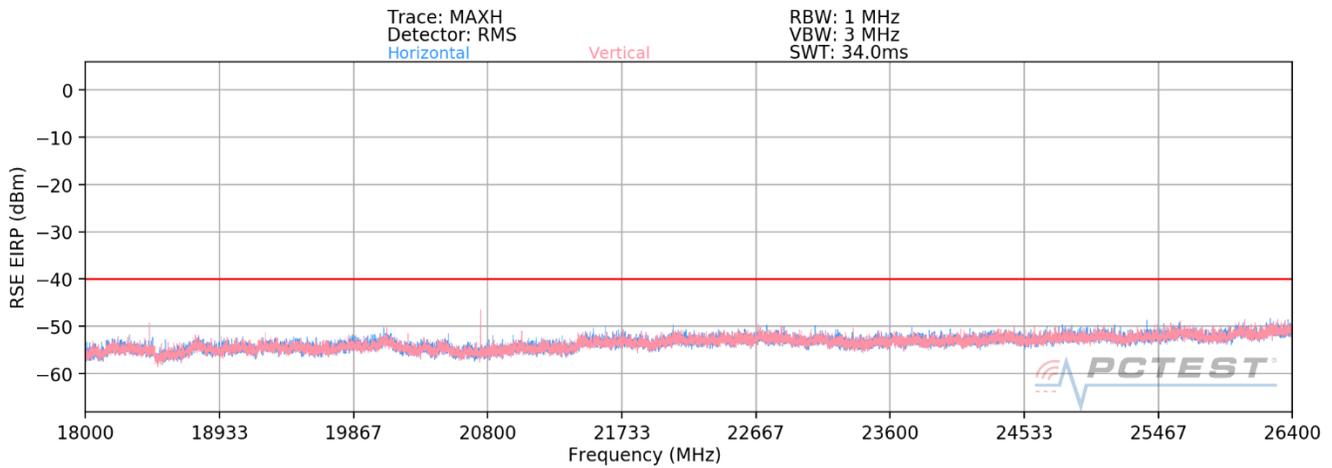
Table 7-27. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 42 of 61

Band 30



Plot 7-6. Radiated Spurious Plot 1GHz - 18GHz (Band 30)



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

FCC ID: ZNFV600VM	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 43 of 61



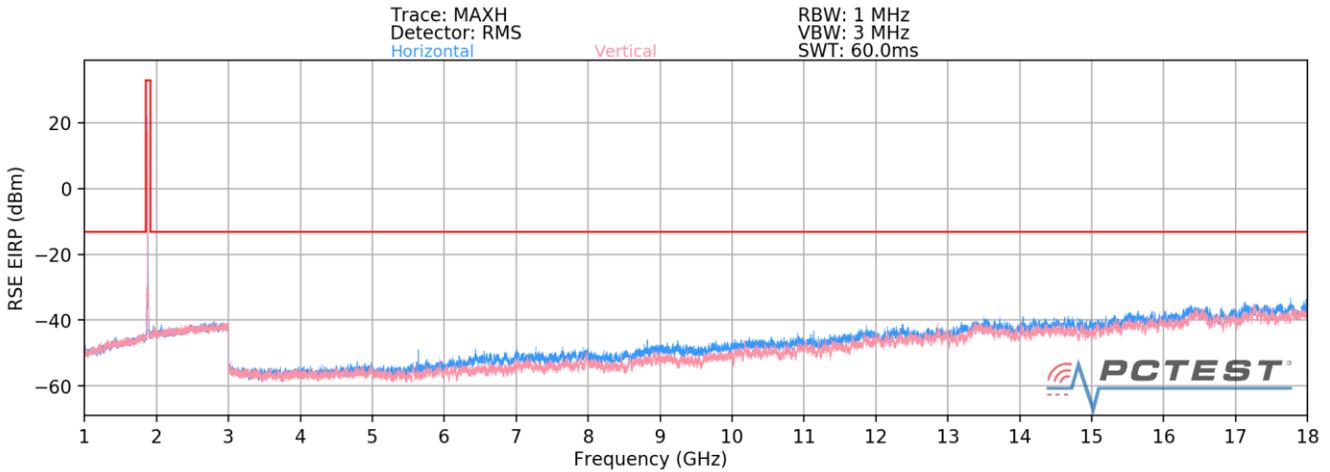
OPERATING FREQUENCY: 2310.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -40 dBm

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	-	-	-70.34	8.42	-61.92	-21.9
6930.00	H	-	-	-67.95	9.38	-58.56	-18.6

Table 7-28. Radiated Spurious Data (Band 30 – Mid Channel)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 44 of 61

Band 41



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

OPERATING FREQUENCY: 2501.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5002.00	H	385	22	-60.15	8.61	-51.54	-26.5
7503.00	H	-	-	-58.75	8.43	-50.33	-25.3

Table 7-29. Radiated Spurious Data (Band 41 – Low Channel)

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

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5186.00	H	-	-	-60.53	8.75	-51.78	-26.8
7779.00	H	-	-	-58.42	8.65	-49.77	-24.8

Table 7-30. Radiated Spurious Data (Band 41 – Mid Channel)

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 45 of 61	



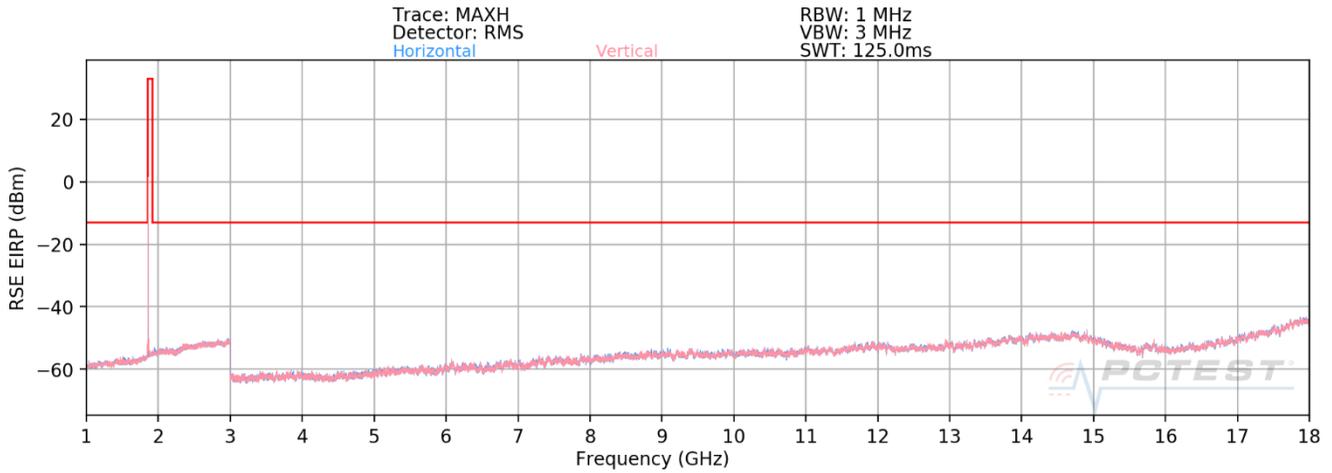
OPERATING FREQUENCY: 2685.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -25 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5370.00	H	-	-	-59.85	8.69	-51.16	-26.2
8055.00	H	-	-	-58.26	8.86	-49.40	-24.4

Table 7-31. Radiated Spurious Data (Band 41 – High Channel)

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 46 of 61

5G NR n2 + B5



Plot 7-9. Radiated Spurious Plot above 1GHz (5G NR n2 + B5)

n2 OPERATING FREQUENCY	1860.00	MHz
n2 MODULATION SIGNAL	QPSK-DFT-s-OFDM	
n2 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	836.50	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3720.00	H	-	-	-50.93	3.09	-47.84	-34.8
5580.00	H	-	-	-48.81	3.92	-44.89	-31.9

Table 7-32. Radiated Spurious Data (5G NR n2 + B5 – Low Channel)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 47 of 61	

n2 OPERATING FREQUENCY	1880.00	MHz
n2 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n2 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	836.50	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	H	-	-	-50.74	3.10	-47.64	-34.6
5640.00	H	-	-	-48.78	4.02	-44.77	-31.8

Table 7-33. Radiated Spurious Data (5G NR n2 + B5 – Mid Channel)

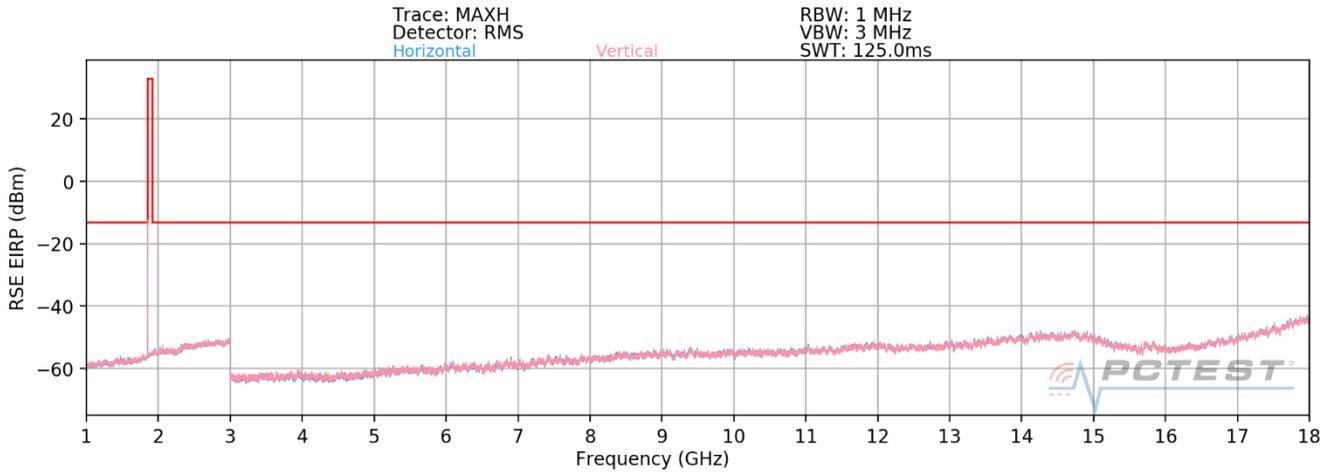
n2 OPERATING FREQUENCY	1900.00	MHz
n2 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n2 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	836.50	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3800.00	H	-	-	-50.62	3.13	-47.49	-34.5
5700.00	H	-	-	-48.81	4.05	-44.76	-31.8

Table 7-34. Radiated Spurious Data (5G NR n2 + B5– High Channel)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset	Page 48 of 61	

5G NR n5 + B2



Plot 7-10. Radiated Spurious Plot above 1GHz (5G NR n5 + B2)

n5 OPERATING FREQUENCY	834.00	MHz
n5 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n5 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	1880.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	20	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1668.00	H	-	-	-55.75	3.62	-52.13	-39.1
2502.00	H	-	-	-53.56	4.29	-49.27	-36.3

Table 7-35. Radiated Spurious Data (5G NR n5 + B2 – Low Channel)

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset			Page 49 of 61

n5 OPERATING FREQUENCY	836.50	MHz
n5 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n5 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	1880.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	20	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	-	-	-55.84	3.62	-52.22	-39.2
2509.50	H	-	-	-53.72	4.33	-49.39	-36.4

Table 7-36. Radiated Spurious Data (5G NR n5 + B2 – Mid Channel)

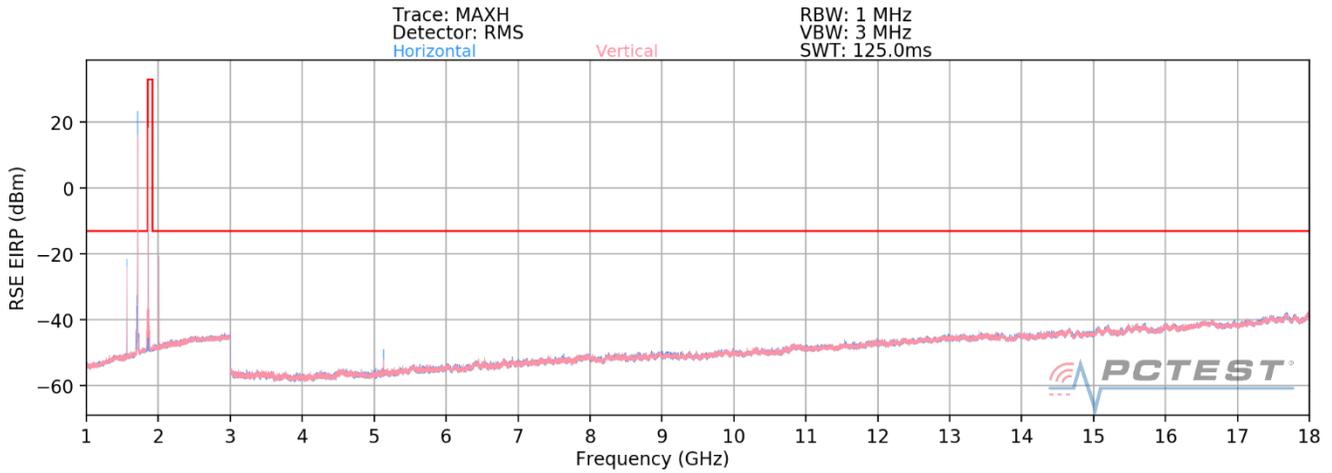
n5 OPERATING FREQUENCY	839.00	MHz
n5 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n5 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	1880.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	20	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1678.00	H	-	-	-55.66	3.62	-52.04	-39.0
2517.00	H	-	-	-53.62	4.38	-49.24	-36.2

Table 7-37. Radiated Spurious Data (5G NR n5 + B2– High Channel)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 50 of 61

5G NR n2 + B66



Plot 7-11. Radiated Spurious Plot above 1GHz (5G NR n2 + B66)

n2 OPERATING FREQUENCY	1860.00	MHz
n2 MODULATION SIGNAL	QPSK-DFT-s-OFDM	
n2 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	1745.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3720.00	V	-	-	-65.58	6.58	-59.00	-46.0
5580.00	V	-	-	-64.98	8.74	-56.25	-43.2

Table 7-38. Radiated Spurious Data (5G NR n2 + B66 – Low Channel)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
Test Report S/N: 1M1912300227-03.ZNF	Test Dates: 01/02 - 02/21/2020	EUT Type: Portable Handset		Page 51 of 61	

n2 OPERATING FREQUENCY	1880.00	MHz
n2 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n2 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	1745.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	V	-	-	-65.10	6.67	-58.43	-45.4
5640.00	V	-	-	-65.23	8.81	-56.42	-43.4

Table 7-39. Radiated Spurious Data (5G NR n2 + B66 – Mid Channel)

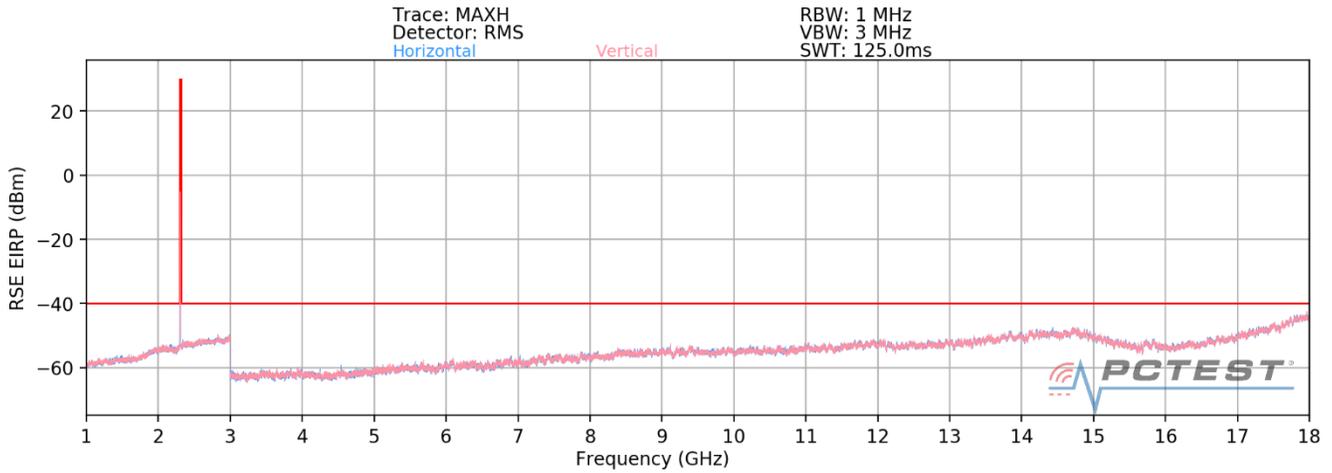
n2 OPERATING FREQUENCY	1900.00	MHz
n2 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n2 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	1745.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3800.00	V	-	-	-65.78	6.87	-58.90	-45.9
5700.00	V	-	-	-65.31	8.76	-56.54	-43.5

Table 7-40. Radiated Spurious Data (5G NR n2 + B66– High Channel)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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5G NR n5 + B30



Plot 7-12. Radiated Spurious Plot above 1GHz (5G NR n5 + B30)

n5 OPERATING FREQUENCY	834.00	MHz
n5 MODULATION SIGNAL	QPSK-DFT-s-OFDM	
n5 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	2310.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1668.00	H	-	-	-55.91	3.62	-52.29	-39.3
2502.00	H	-	-	-53.69	4.29	-49.40	-36.4

Table 7-41. Radiated Spurious Data (5G NR n5 + B30 – Low Channel)

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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n5 OPERATING FREQUENCY	836.50	MHz
n5 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n5 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	2310.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	H	-	-	-56.00	3.62	-52.38	-39.4
2509.50	H	-	-	-53.85	4.33	-49.52	-36.5

Table 7-42. Radiated Spurious Data (5G NR n5 + B30 – Mid Channel)

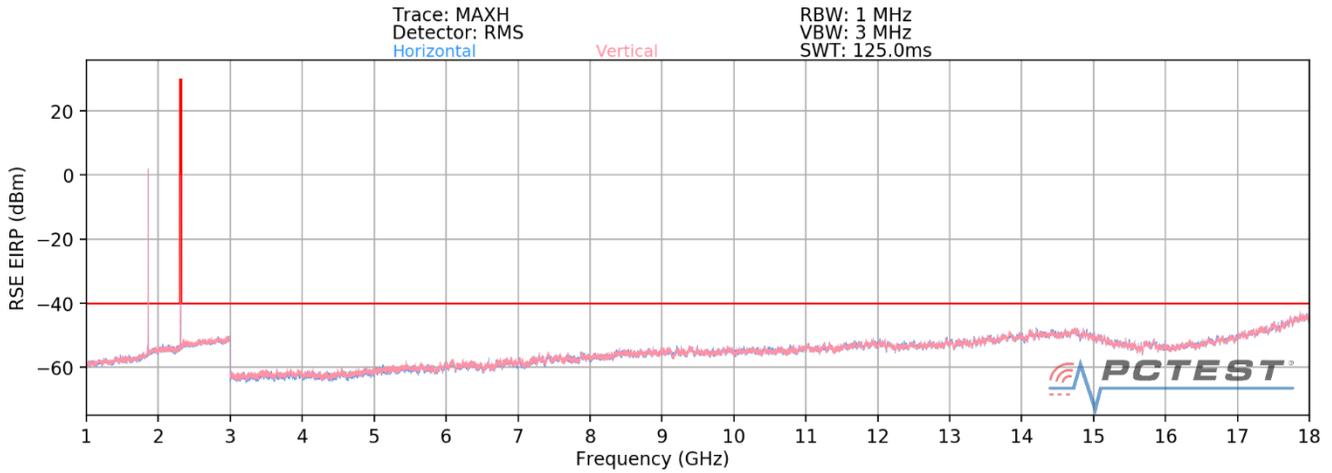
n5 OPERATING FREQUENCY	839.00	MHz
n5 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n5 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	2310.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1678.00	H	-	-	-55.77	3.62	-52.15	-39.1
2517.00	H	-	-	-53.66	4.38	-49.28	-36.3

Table 7-43. Radiated Spurious Data (5G NR n5 + B30– High Channel)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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5G NR n2 + B30



Plot 7-13. Radiated Spurious Plot above 1GHz (5G NR n2 + B30)

n2 OPERATING FREQUENCY	1860.00	MHz
n2 MODULATION SIGNAL	QPSK-DFT-s-OFDM	
n2 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	2310.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3720.00	H	-	-	-71.37	3.09	-68.28	-55.3
5580.00	H	-	-	-69.45	3.92	-65.53	-52.5

Table 7-44. Radiated Spurious Data (5G NR n2 + B30 – Low Channel)

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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n2 OPERATING FREQUENCY	1880.00	MHz
n2 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n2 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	2310.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	H	-	-	-71.55	3.10	-68.45	-55.5
5640.00	H	-	-	-69.55	4.02	-65.54	-52.5

Table 7-45. Radiated Spurious Data (5G NR n2 + B30 – Mid Channel)

n2 OPERATING FREQUENCY	1900.00	MHz
n2 MODULATION SIGNAL	QPSK-DFT-s-ODFM	
n2 BANDWIDTH	20.0	MHz
LTE OPERATING FREQUENCY	2310.00	MHz
LTE MODULATION SIGNAL	QPSK	
LTE BANDWIDTH	10	MHz
DISTANCE	3	meters
LIMIT	-13	dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3800.00	H	-	-	-71.00	3.13	-67.87	-54.9
5700.00	H	-	-	-69.38	4.05	-65.33	-52.3

Table 7-46. Radiated Spurious Data (5G NR n2 + B30– High Channel)

FCC ID: ZNFV600VM		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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7.5 Uplink Carrier Aggregation Radiated Measurements

§2.1053, §27.53(m)

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW \geq 3 x RBW
3. No. of sweep points \geq 2 x span / RBW
4. Detector = RMS
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. The trace was allowed to stabilize

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Test Setup

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

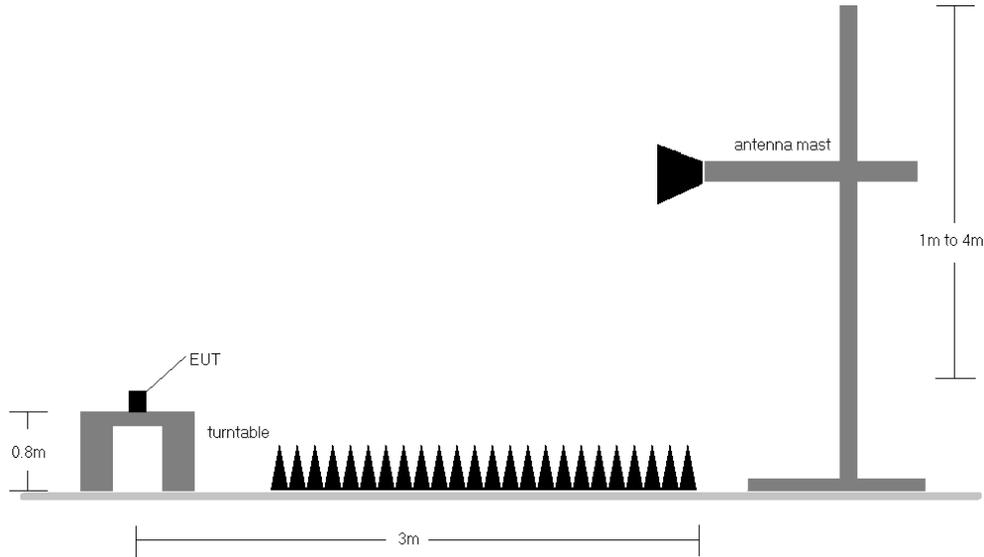
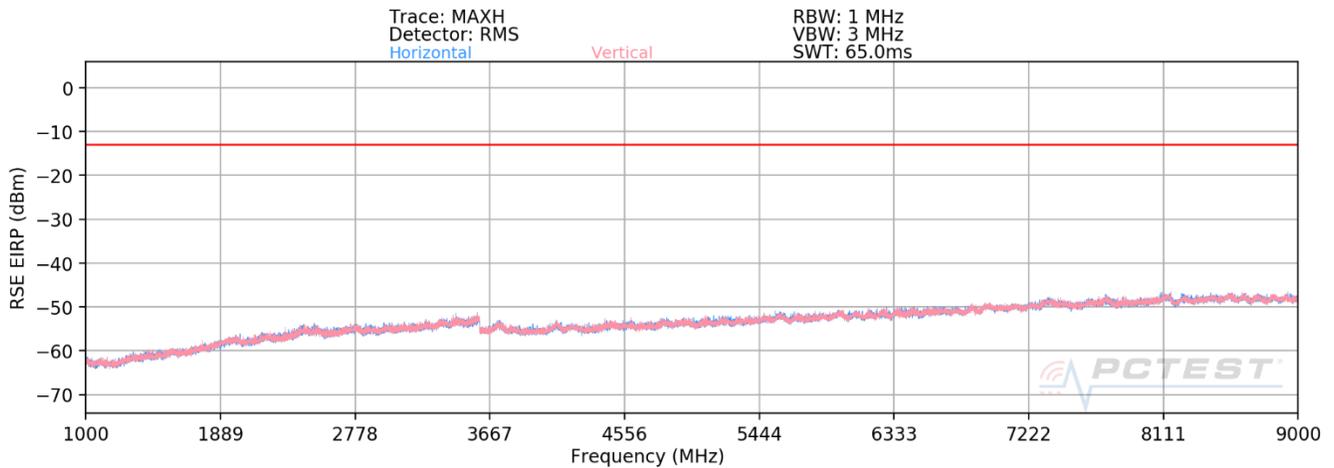


Figure 7-4. Test Instrument & Measurement Setup

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.

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Plot 7-47. Radiated Spurious Plot (ULCA B5 Left Carrier: RB 1 Offset 49, Right Carrier: RB 1 Offset 0)

OPERATING FREQUENCY (PCC): 829.00 MHz
 OPERATING FREQUENCY (SCC): 838.90 MHz
 CHANNEL (PCC): 20450
 CHANNEL (SCC): 20549
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1658.00	V	141	147	-67.10	3.61	-63.48	-50.5
2487.00	V	128	344	-65.35	4.25	-61.10	-48.1
3316.00	V	-	-	-68.01	5.83	-62.18	-49.2
4145.00	V	-	-	-69.34	7.66	-61.67	-48.7

Table 7-48. Radiated Spurious Data (ULCA B5 Left Carrier: RB 1 Offset 49, Right Carrier: RB 1 Offset 0)

FCC ID: ZNFV600VM			MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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OPERATING FREQUENCY (PCC): 844.00 MHz
 OPERATING FREQUENCY (SCC): 834.10 MHz
 CHANNEL (PCC): 20600
 CHANNEL (SCC): 20501
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 10.0 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1688.00	V	169	143	-67.77	3.63	-64.15	-51.1
2532.00	V	191	139	-62.02	4.47	-57.55	-44.5
3376.00	V	-	-	-67.60	6.05	-61.56	-48.6
4220.00	V	-	-	-68.86	7.75	-61.12	-48.1

Table 7-49. Radiated Spurious Data (ULCA B5 Left Carrier: RB 1 Offset 49, Right Carrier: RB 1 Offset 0)

FCC ID: ZNFV600VM	 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)			Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFV600VM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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