

PCTEST

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



PART 27 / RSS-130 / RSS-139 MEASUREMENT REPORT

Applicant Name:

LG Electronics USA, Inc. 111 Sylvan Avenue, North Building Englewood Cliffs, NJ 07632 United States Date of Testing: 8/26/2020 - 10/30/2020 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M2009230153-13.ZNF

FCC ID:

APPLICANT:

IC:

ZNFK200QM 2703C-K200QM

LG Electronics USA, Inc.

Application Type: Model/HVIN: Additional Model(s)/HVIN(s): EUT Type: FCC Classification: FCC Rule Part: ISED Specification: Test Procedure(s):

Certification LM-K200QM LMK200QM, K200QM Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 27 RSS-130 Issue 2, RSS-139 Issue 3 ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01

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



FCC ID: ZNFK200QM	Proved to be part of the element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 1 of 118
© 2020 PCTEST	8/20/2020 - 10/30/2020	Fortable Halluset		



TABLE OF CONTENTS

1.0	INTR	ODUCTION	4
	1.1	Scope	4
	1.2	PCTEST Test Location	4
	1.3	Test Facility / Accreditations	4
2.0	PRO	DUCT INFORMATION	5
	2.1	Equipment Description	5
	2.2	Device Capabilities	5
	2.3	Test Configuration	5
	2.4	EMI Suppression Device(s)/Modifications	5
3.0	DESC	CRIPTION OF TESTS	6
	3.1	Evaluation Procedure	6
	3.2	Radiated Power and Radiated Spurious Emissions	6
4.0	MEAS	SUREMENT UNCERTAINTY	7
5.0	TEST	EQUIPMENT CALIBRATION DATA	8
6.0	SAMF	PLE CALCULATIONS	9
7.0	TEST	RESULTS	10
	7.1	Summary	10
	7.2	Occupied Bandwidth	11
	7.3	Band Edge Emissions at Antenna Terminal	
	7.4	Spurious and Harmonic Emissions at Antenna Terminal	61
	7.5	Peak-Average Ratio	79
	7.6	Radiated Power (EIRP)	
	7.7	Radiated Spurious Emissions Measurements	104
	7.8	Frequency Stability / Temperature Variation	113
8.0	CON	CLUSION	118

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dago 2 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 2 of 118
© 2020 PCTEST		•		•





MEASUREMENT REPORT FCC Part 27

				EII	RP	EF	RP	Emission
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	Designator
		QPSK	704.0 - 711.0	0.174	22.40	0.106	20.25	8M95G7D
	10 MHz	16QAM	704.0 - 711.0	0.121	20.83	0.074	18.68	8M95W7D
LTE Dand 40/47		64QAM	704.0 - 711.0	0.116	20.63	0.070	18.48	8M98W7D
LTE Band 12/17		QPSK	701.5 - 713.5	0.176	22.45	0.107	20.30	4M49G7D
	5 MHz	16QAM	701.5 - 713.5	0.122	20.86	0.074	18.71	4M50W7D
		64QAM	701.5 - 713.5	0.116	20.63	0.070	18.48	4M50W7D
	3 MHz	QPSK	700.5 - 714.5	0.169	22.28	0.103	20.13	2M71G7D
		16QAM	700.5 - 714.5	0.127	21.03	0.077	18.88	2M71W7D
		64QAM	700.5 - 714.5	0.109	20.38	0.067	18.23	2M72W7D
LTE Band 12		QPSK	699.7 - 715.3	0.175	22.44	0.107	20.29	1M11G7D
	1.4 MHz	16QAM	699.7 - 715.3	0.130	21.13	0.079	18.98	1M10W7D
		64QAM	699.7 - 715.3	0.108	20.33	0.066	18.18	1M09W7D
		QPSK	782.0	0.319	25.03	0.194	22.88	9M01G7D
	10 MHz	16QAM	782.0	0.238	23.77	0.145	21.62	9M00W7D
LTE Band 13		64QAM	782.0	0.213	23.29	0.130	21.14	9M00W7D
		QPSK	779.5 - 784.5	0.355	25.51	0.217	23.36	4M57G7D
	5 MHz	16QAM	779.5 - 784.5	0.249	23.95	0.151	21.80	4M53W7D
		64QAM	779.5 - 784.5	0.208	23.18	0.127	21.03	4M53W7D

Overview Table (<1GHz Bands)

				EI	RP	Funiacian
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	Max. Power [W]	Max. Power [dBm]	Emission Designator
WCDMA1700	N/A	Spread Spectrum	1712.4 - 1752.6	0.210	23.22	4M15F9W
		QPSK	1720.0 - 1770.0	0.235	23.70	18M0G7D
	20 MHz	16QAM	1720.0 - 1770.0	0.203	23.08	18M0W7D
		64QAM	1720.0 - 1770.0	0.162	22.10	18M0W7D
		QPSK	1717.5 - 1772.5	0.236	23.72	13M5G7D
	15 MHz	16QAM	1717.5 - 1772.5	0.183	22.61	13M5W7D
		64QAM	1717.5 - 1772.5	0.144	21.57	13M5W7D
	10 MHz	QPSK	1715.0 - 1775.0	0.236	23.72	9M00G7D
		16QAM	1715.0 - 1775.0	0.186	22.68	9M00W7D
LTE Band 66/4		64QAM	1715.0 - 1775.0	0.153	21.83	9M01W7D
LIE Dallu 66/4	5 MHz	QPSK	1712.5 - 1777.5	0.251	23.99	4M54G7D
		16QAM	1712.5 - 1777.5	0.190	22.78	4M54W7D
		64QAM	1712.5 - 1777.5	0.166	22.19	4M56W7D
		QPSK	1711.5 - 1778.5	0.237	23.74	2M71G7D
	3 MHz	16QAM	1711.5 - 1778.5	0.190	22.79	2M71W7D
		64QAM	1711.5 - 1778.5	0.143	21.55	2M72W7D
		QPSK	1710.7 - 1779.3	0.240	23.79	1M11G7D
	1.4 MHz	16QAM	1710.7 - 1779.3	0.186	22.68	1M11W7D
		64QAM	1710.7 - 1779.3	0.147	21.67	1M10W7D

Overview Table (>1GHz Bands)

FCC ID: ZNFK200QM	Poul to be part of & element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 2 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 3 of 118
© 2020 PCTEST			



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.

FCC ID: ZNFK200QM	PCTEST* Proud to be part of @ element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 4 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 4 of 118
© 2020 PCTEST	•			•

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFK200QM**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 00368, 00145, 00350

2.2 Device Capabilities

This device contains the following capabilities:

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

2.3 Test Configuration

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

2.4 EMI Suppression Device(s)/Modifications

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

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 5 of 118
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	/30/2020 Portable Handset	
© 2020 PCTEST			



3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

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

3.2 Radiated Power and Radiated Spurious Emissions

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

The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 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:

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

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].

For fundamental radiated power measurements, the guidance of KDB 971168 D01 v03r01 is used to record the EUT power level that is subsequently matched via the aforementioned substitution method given in ANSI/TIA-603-E-2016.

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.

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage C of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	0 Portable Handset		Page 6 of 118

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



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

FCC ID: ZNFK200QM	Poul to be part of & element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 7 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 7 of 118
© 2020 PCTEST	•		



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
-	LTx2	Licensed Transmitter Cable Set	4/9/2020	Annual	4/9/2021	LTx2
-	LTx3	Licensed Transmitter Cable Set	10/30/2019	Annual	10/30/2020	LTx3
Anritsu	MT8821C	Radio Communication Analyzer	3/10/2020	Annual	3/10/2021	6200901190
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biemial	10/10/2021	121034
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biernial	6/18/2022	9704-5182
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	2/14/2019	Biemial	2/14/2021	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biemial	3/12/2022	128337
ETS-Lindgren	3115	Double Ridged Guide Horn 750MHz - 18GHz	3/12/2020	Biernial	3/12/2022	150693
Hewlett-Packard	8648D	(9kHz-4GHz) Signal Generator	6/23/2020	Annual	6/23/2021	3613A00315
Keysight Technologies	N9020A	MXA Signal Analyzer	8/14/2020	Annual	8/14/2021	US46470561
Keysight Technologies	N9038A	MXE EMI Receiver	8/11/2020	Annual	8/11/2021	MY51210133
Mini Circuits	TVA-11-422	RFPower Amp		N/A		QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11208010032
Rohde & Schwarz	CMU200	Base Station Simulator		N/A		107826
Rohde & Schwarz	CMU200	Base Station Simulator		N/A		836536/0005
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	11/1/2019	Annual	11/1/2020	100040
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
Rohde & Schwarz	TC-TA18	Cross-Pol Antenna 400MHz-18GHz	7/8/2020	Biemial	7/8/2022	101058
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/10/2020	Annual	2/10/2021	102134
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biernial	10/3/2021	A050307
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biemial	8/27/2021	A042511
Sunol Science	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biemial	7/27/2022	A051107

Table 5-1. Summary of Test Results

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.

FCC ID: ZNFK200QM	Poul to be part of & element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 9 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 8 of 118
© 2020 PCTEST				



6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz G = Phase Modulation 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission, telemetry, telecommand

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).

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 0 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 9 of 118
© 2020 PCTEST				



7.0 TEST RESULTS

7.1 Summary

Company Name:	LG Electronics USA, Inc.
FCC ID:	ZNFK200QM
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	WCDMA/LTE

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
	Occupied Bandwidth	2.1049	RSS-Gen(6.7)	N/A	PASS	Section 7.2
Ð	Conducted Band Edge / Spurious Emissions	2.1051, 27.53	RSS-139(6.6)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of- band emissions	PASS	Sections 7.3, 7.4
CONDUCTED	Transmitter Conducted Output Power	2.1046	RSS-139(4.1)	N/A	PASS	See RF Exposure Report
CON	Peak-Average Ratio	24.232 (d)27.50 (d)(5)	RSS-130(4.6.1), RSS-139(6.5)	< 13 dB	PASS	Section 7.5
	Frequency Stability	2.1055, 27.54	RSS-139(6.4)	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 12/17)	27.50(b)(10)	RSS-130(4.4)	< 3 Watts max. ERP < 5 Watts max. EIRP	PASS	Section 7.6
	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 13)	27.50(c)(10)	RSS-130(4.4)	< 3 Watts max. ERP < 5 Watts max. EIRP	PASS	Section 7.6
RADIATED	Equivalent Isotropic Radiated Power (WCDMA)	07.50(4)(4)	BOD 420(C 5)		PASS	Section 7.6
RADI	Equivalent Isotropic Radiated Power (LTE Band 4/66)		RSS-139(6.5)	< 1 Watts max. EIRP	PASS	Section 7.6
	Radiated Spurious Emissions (LTE Band 13)	2.1053, 27.53(f)	RSS-139(6.6)	< -70 dBW/MHz (for wideband signals) < -80 dBW (for discrete emissions less than 700Hz BW) For all emissions in the band 1559 - 1610 MHz	PASS	Section 7.7
	Radiated Spurious Emissions	2.1053, 27.53	RSS-139(6.6)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions	PASS	Section 7.7

Table 7-1. Summary of 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.
- 2) The analyzer plots shown in Section 7.0 were taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST 2G/3G Automation Version 4.2.

FCC ID: ZNFK200QM	PCTEST* Proud to be part of @ element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 10 of 110	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 10 of 118	
© 2020 PCTEST	•				



7.2 Occupied Bandwidth

Test Overview

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 4.2

Test Settings

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within

1-5% of the 99% occupied bandwidth observed in Step 7

Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

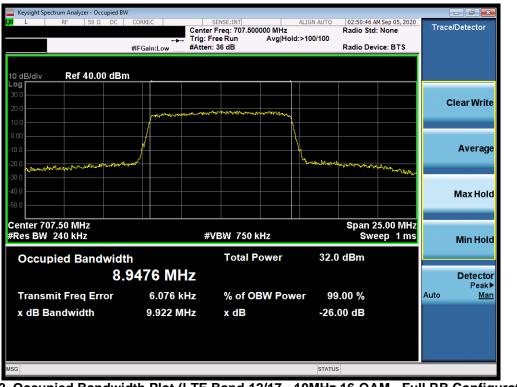
FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 11 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 11 of 118
© 2020 PCTEST	•	•		



LTE Band 12/17



Plot 7-1. Occupied Bandwidth Plot (LTE Band 12/17 - 10MHz QPSK - Full RB Configuration)



Plot 7-2. Occupied Bandwidth Plot (LTE Band 12/17 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 12 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 12 of 118
© 2020 PCTEST			



— К	eysight Spect	rum Analy	/zer - Occ	upied BW											- • •
L <mark>X</mark> I	L	RF	50 Ω	DC	CORRE	C		NSE:INT eq: 707.500	000 MHz	A	LIGN AUTO	02:51:07 A Radio Std	M Sep 05, 2020	Trac	e/Detector
						+	Trig: Free	Run	Avg Hol	ld:>	100/100				
	_				#IFGa	in:Low	#Atten: 3	6 dB				Radio Dev	ice: BTS		
	B/div	Ref	40.00) dBm											
Log 30.0															
20.0	1														Clear Write
10.0	1					- Rapplerson and	man	ᡣᠬᡐ᠆᠆ᠳ᠕᠕ᢧᡗ	mmy						
	1														
0.00					ſ					٦					A
-10.0				h M	md					٦	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Mangh			Average
-20.0	W Brownie	altra and a	ትምትግም	all when it is								·····································	May Purparte without		
-30.0															
-40.0) 														Max Hold
-50.0															
	nter 707	EO M										0	5.00 8411-		
	es BW 🔅						#VE	SW 750 k	Hz				5.00 MHz ep 1 ms		
<i></i>		5-1 V IN	11-				" 0		.112			Univ			Min Hold
	Occup	ied E	and	width				Total P	ower		32.5	dBm			
						2 MI	7								Detector
				0.0			12								Peak
	ransm	it Fre	q Err	or	2	7.178	kHz	% of O	3W Pow	ve	r 99	.00 %		Auto	<u>Man</u>
Ι,	dB Ba	ndwi	dth		(9.923 N	1Hz	x dB			-26 (00 dB			
1			aun				11 12	A GD			-20.0				
MSG											STATUS				

Plot 7-3. Occupied Bandwidth Plot (LTE Band 12/17 - 10MHz 64-QAM - Full RB Configuration)



Plot 7-4. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be part of the element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 12 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 13 of 118
© 2020 PCTEST	•	•		



🔤 Keysight Spectrum Analyzer - Occupied BW	
txt L RF 50 Ω CORREC SENSE:INT ALIGN AUTO 02:48:41 AM Sep Center Freq: 707.500000 MHz Radio Std: Noi	
→→→ Trig: Free Run Avg Hold: 100/100	ne
#IFGain:Low #Atten: 36 dB Radio Device:	BTS
10 dB/div Ref 40.00 dBm	
30.0	Clear Write
20.0	
-10.0	Average
200 annothing the second and the sec	²⁰ c104 4
-30.0	
-40.0	May Hald
-50.0	Max Hold
-50.0	
Center 707.500 MHz Span 12.5	0 MHz
#Res BW 120 kHz #VBW 390 kHz Sweep	1 ms Min Hold
Occupied Bandwidth Total Power 34.1 dBm	
4.4978 MHz	Detector
	Peak►
Transmit Freq Error 5.629 kHz % of OBW Power 99.00 %	Auto <u>Man</u>
x dB Bandwidth 4.983 MHz x dB -26.00 dB	
MSG STATUS	

Plot 7-5. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz 16-QAM - Full RB Configuration)



Plot 7-6. Occupied Bandwidth Plot (LTE Band 12/17 - 5MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be part of & element	PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 14 of 118
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		
© 2020 PCTEST	•			



Keysight Spectrum Analyzer - Occupied BW	000050	action that		02.45.42.49.6		
(X) L RF 50 Ω DC	Center Trig: F	SENSE:INT Freq: 707.500000 MHz iree Run Avg H : 36 dB	ALIGN AUTO	02:45:18 AM Sep (Radio Std: Non Radio Device: E	e Tra	ce/Detector
10 dB/div Ref 40.00 dBm		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Clear Write
10.0 0.00 -10.0 -20.0				- hour years for the		Average
40.0 						Max Hold
Center 707.500 MHz #Res BW 68 kHz Occupied Bandwidtl		VBW 220 kHz Total Power	32.4	Span 7.500 Sweep 3.		Min Hole
2.7	7106 MHz					Detecto Peak
Transmit Freq Error x dB Bandwidth	6.348 kHz 3.015 MHz	% of OBW Po x dB		0.00 % 00 dB	Auto	<u>Mar</u>
SG			STATUS	3		

Plot 7-7. Occupied Bandwidth Plot (LTE Band 12 - 3MHz QPSK - Full RB Configuration)



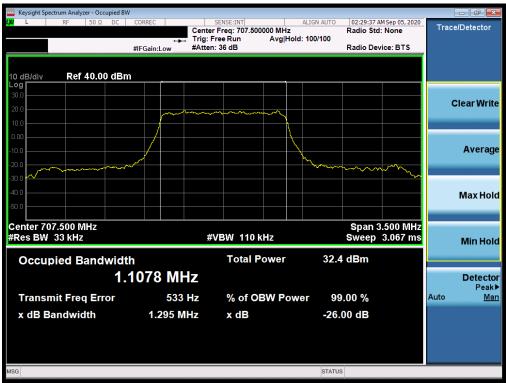
Plot 7-8. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 15 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 15 of 118
© 2020 PCTEST	•	•		



🔤 Keysight Spectrum Analyzer - Occupied BW					
L RF 50 Ω DC	CORREC	SENSE:INT Center Freg: 707.500		02:46:08 AM Sep (Radio Std: Non	
		Trig: Free Run	Avg Hold:>100/100	Raulo Stu. Non	e
	#IFGain:Low	#Atten: 36 dB		Radio Device: B	STS
10 dB/div Ref 40.00 dB	3m				
Log 30.0					
					Clear Write
20.0	man	home mark mark	manna		
10.0	1				
0.00	/				
-10.0					Average
-20.0	"Marhart		*YWWUILE*WYW	Mansanan	the City of
-30.0					
-40.0					Max Hold
-50.0					Max Fiolu
Center 707.500 MHz				Span 7.500	
#Res BW 68 kHz		#VBW 220 k	Hz	Sweep 3.	.8 ms Min Hold
	-141-	Total P	owor 22 () dBm	
Occupied Bandwig			0wei 52.0	J UBIII	
2	2.7238 M	Hz			Detector
	2 205	www.	3W Power 99	9.00 %	Peak▶ Auto Man
Transmit Freq Error	-2.285		SW Fower 98	9.00 %	
x dB Bandwidth	3.006	MHz xdB	-26.	00 dB	
MSG			STATU	5	
MSG			STATU	S	

Plot 7-9. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 64-QAM - Full RB Configuration)



Plot 7-10. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 16 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 16 of 118
© 2020 PCTEST	•		





Plot 7-11. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 16-QAM - Full RB Configuration)



Plot 7-12. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 64-QAM - Full RB Configuration)

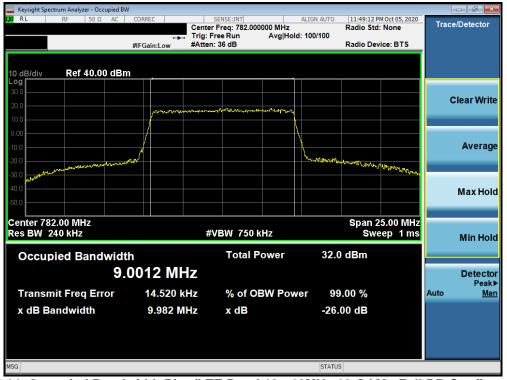
FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 17 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 17 of 118
© 2020 PCTEST	•	•		



LTE Band 13



Plot 7-13. Occupied Bandwidth Plot (LTE Band 13 - 10MHz QPSK - Full RB Configuration)



Plot 7-14. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 10 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 18 of 118
© 2020 PCTEST		-	



🔤 Keysight Spectrum Analyzer - Occupied BW 💿 🚱 💌							
L <mark>X/</mark> R L RF 50 Ω AC	CORREC	SENSE:INT Center Freg: 782.000		GN AUTO 11:49:36 P Radio Std	M Oct 05, 2020	Trace	e/Detector
	+ - +-	Trig: Free Run	Avg Hold: 10	00/100			
	#IFGain:Low	#Atten: 36 dB		Radio Dev	vice: BTS		
10 dB/div Ref 40.00 dBm							
30.0							
20.0						C	Clear Write
10.0	parono	Man Mary Mary	mound				
0.00	/						
-10.0	/						Average
20.0				A			
-30.0 - Write Manuely Mark Mark Mark	194 ₁ -1			Www.y.Jule Johnshy Trading 10	un minully		
-40.0					-1		
-50.0							Max Hold
-30.0							
Center 782.00 MHz					25.00 MHz		
Res BW 240 kHz		#VBW 750 k	(Hz	Swe	eep 1 ms		Min Hold
Occupied Bandwidt	-	Total P	ower	30.8 dBm			
				50.0 dBm			
8.	9965 MH	Z					Detector Peak▶
Transmit Freq Error	17.242 kł	lz % of O	BW Power	99.00 %		Auto	Peak ₽ <u>Man</u>
x dB Bandwidth	9.953 MI	lz xdB		-26.00 dB			
MSG				STATUS			

Plot 7-15. Occupied Bandwidth Plot (LTE Band 13 - 10MHz 64-QAM - Full RB Configuration)



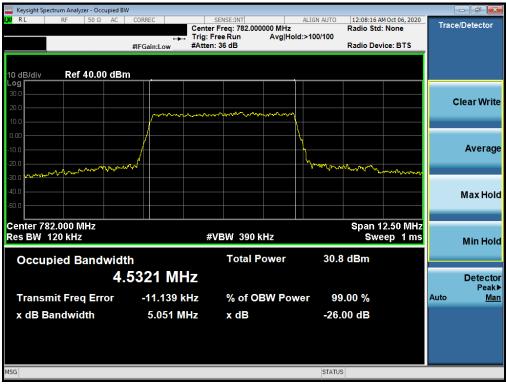
Plot 7-16. Occupied Bandwidth Plot (LTE Band 13 - 5MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200QM	PCTEST Proad to be part of the element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 10 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 19 of 118
© 2020 PCTEST		•		•



🔤 Keysight Spectrum Analyzer - Occupie	ed BW				
L <mark>XI</mark> RL RF 50ΩA	C CORREC	SENSE:INT Center Freg: 782.000	ALIGN AUTO	12:08:04 AM Oct 06, 2020 Radio Std: None	Trace/Detector
		Trig: Free Run	Avg Hold: 100/100		
	#IFGain:Low	#Atten: 36 dB		Radio Device: BTS	-
10 dB/div Ref 40.00 d	IBm				
Log 30.0					
20.0					Clear Writ
10.0	mon	\sim	many		
0.00	1				
-10.0			V		Averac
	1		<u> </u>		Aronug
-20.0 -30.0	and and a second		- Arear	mon was and the soul of the so	
-40.0					
					Max Ho
-50.0					
Center 782.000 MHz				Span 12.50 MHz	
Res BW 120 kHz		#VBW 390 k	Hz	Sweep 1 ms	Min Ho
Occupied Dandur	i al fila	Total P	ower 31 P	5 dBm	
Occupied Bandwi			Jwei 51.	Jubin	
	4.5333 M⊦	Z			Detecto
Transmit Freq Error	3.321 k	Hz % of OE	3W Power 99	0.00 %	Peak Auto <u>M</u> a
-					
x dB Bandwidth	5.056 M	Hz xdB	-20.	00 dB	
MSG			STATU	S	

Plot 7-17. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 16-QAM - Full RB Configuration)



Plot 7-18. Occupied Bandwidth Plot (LTE Band 13 - 5MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be port of the element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 20 of 118
© 2020 PCTEST	•		<u> </u>



WCDMA AWS

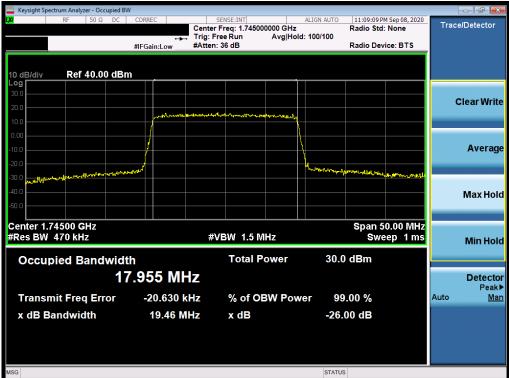
🔤 Keysight Spectrum Analyzer - Occupied B	W				
RL RF 50Ω DC	Trig:	SENSE:INT er Freq: 1.732600000 GHz Free Run Avg Holc n: 26 dB	Ra 1: 100/100	8:55:39 AM Sep 04, 2020 dio Std: None dio Device: BTS	Trace/Detector
10 dB/div Ref 35.00 dB Log	m				
15.0 5.00 -5.00					Clear Write
-15.0				my warm	Average
-45.0					Max Hold
Center 1.732600 GHz Res BW 150 kHz Occupied Bandwid		¢VBW 910 kHz Total Power	33.4 dE	pan 15.00 MHz Sweep 1 ms Bm	Min Hold
	.1489 MHz				Detecto Peak
Transmit Freq Error x dB Bandwidth	-198.26 kHz 4.808 MHz	% of OBW Pow x dB	er 99.00 -26.00		Auto <u>Mar</u>
ISG			STATUS		

Plot 7-19. Occupied Bandwidth Plot (WCDMA, Ch. 1413)

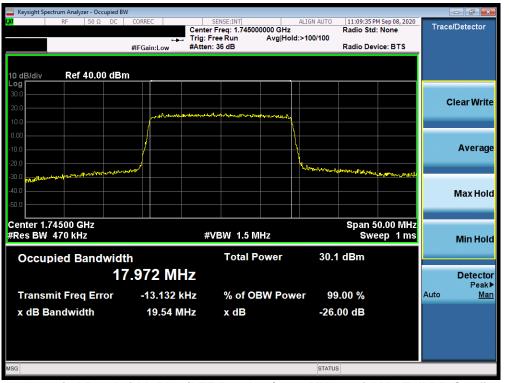
FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 21 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 21 of 118
© 2020 PCTEST	•	•		



LTE Band <u>66/4</u>



Plot 7-20. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz QPSK - Full RB Configuration)



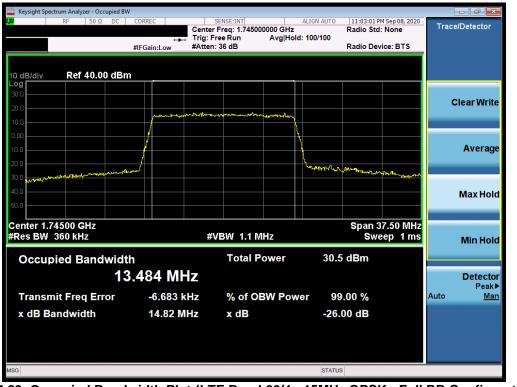
Plot 7-21. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 22 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 22 of 118
© 2020 PCTEST			· · · · ·



🔤 Keysight Sp	pectrum Analyze	er - Occu	upied BW											
l XI	RF	50 Ω	DC (ORRE	0		ENSE:INT Frea: 1.7450	0000 GHz		ALIGN AUTO	11:09:56 Pf Radio Std:	4 Sep 08, 2020	Trac	e/Detector
					+	Trig: Fr	ee Run			>100/100				
			#	IFGai	n:Low	#Atten: 36 dB Ra						ice: BTS		
10 dB/div	Ref 4	40.00	dBm						_					
Log 30.0														
20.0														Clear Write
10.0					مەمەرەر مەمەمەر مەرە	wer have been been the	apla to man	the second second						
				1					Ì					
0.00				1					ì					Average
-10.0		1 Martin	-	m/						Hermolessin	Mumumula	a		Average
1 AU	the second second	-SIV - OT	1.4.								a starting the factor	Mary Constant		
-30.0														
-40.0														Max Hold
-50.0														
Center 1	.74500 GI	<u> </u>									Snan 5	0.00 MHz		
#Res BW						#V	BW 1.5 N	1Hz				ep 1 ms		Min Hold
Occu	pied Ba	andv	width				Total F	ower		31.4	dBm			
			18	01	5 MI	47								Detector
														Peak▶
Trans	mit Freq	Erro	or	-5	6.026	kHz	% of O	BW Pov	Ne	er 99	.00 %		Auto	Man
x dB E	Bandwid	th		1	9.58 N	١Hz	x dB			-26.	00 dB			
MSG										STATUS				
mou										STATUS				

Plot 7-22. Occupied Bandwidth Plot (LTE Band 66/4 - 20MHz 64-QAM - Full RB Configuration)



Plot 7-23. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 23 of 118
© 2020 PCTEST				



🔤 Keysight Spe	ctrum Analyze	er - Occu	upied BW											- • •
l XI	RF	50 Ω	DC	CORRE	C		INSE:INT reg: 1.74500	0000 GHz		ALIGN AUTO	11:05:23 P Radio Std	M Sep 08, 2020	Trac	e/Detector
						. Trig: Fre	e Run	Avg Ho		100/100				
			#	IFGai	n:Low	#Atten: 36 dB Ra						rice: BTS		
10 dB/div	Ref 4	10.00) dBm					,	_					
Log 30.0														
20.0														Clear Write
10.0					mound	๛๛๛	ano manager	monostan						
0.00				1					Ì					
				ľ					١					Average
-10.0										Ļ				Average
-20.0		man	موراكم رحدوم	3						Larannan	Mugnewig	with a second		
-30.0 -30.0	- ANDRE BRANC													
-40.0														Max Hold
-50.0														
Center 1.7	74500 GI	H7									Snan 3	7.50 MHz		
#Res BW						#V	BW 1.1 M	Hz				ep 1 ms		Min Hold
														WIIITTOIG
Occup	bied Ba	and	width				Total P	ower		30.5	i dBm			
			13.	48	4 Mł	Ηz								Detector
		_												Peak▶
Transn	nit Freq	Erro	or	-	6.839 I	(Hz	% of O	3W Pov	ve	er 99	.00 %		Auto	<u>Man</u>
x dB B	andwid	th		1	4.82 N	IHz	x dB			-26.	00 dB			
MSG										STATUS	3			

Plot 7-24. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 16-QAM - Full RB Configuration)



Plot 7-25. Occupied Bandwidth Plot (LTE Band 66/4 - 15MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be part of @ element	PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 24 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 24 of 118
© 2020 PCTEST	•			





Plot 7-26. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz QPSK - Full RB Configuration)



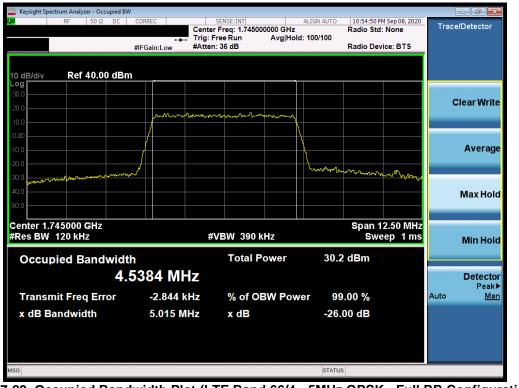
Plot 7-27. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 25 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 25 of 118
© 2020 PCTEST	•	•	



Keysight Spect														
L <mark>XI</mark>	RF	50Ω I	DC CO	RREC			NSE:INT reg: 1.74500	0000 GHz	AL	IGN AUTO	11:01:24 Pr Radio Std:	4 Sep 08, 2020	Trac	e/Detector
					••	Trig: Fre	e Run	Avg Hol	ld: 1	100/100				
			#IF	Gain:	:Low	#Atten: 36 dB R						ice: BTS		
10 dB/div Log	Ref 4	0.00	dBm	<u> </u>					_					
30.0														
20.0													(Clear Write
10.0				\uparrow		fm/l	eren and and the							
0.00				1					Į					
-10.0				/					<u>۱</u>					Average
	- An	Mysem	manymond						<u> </u>	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	∿∿⊷n-∿⊪u _{ng-b} m	A		J
-20.0 7														
-40.0														
-50.0														Max Hold
Center 1.74												5.00 MHz		
#Res BW 🔅	240 kHz					#VE	3W 750 k	Hz			Swe	ep 1 ms		Min Hold
Occup	ied Ba	ndw	idth				Total P	ower		31.7	dBm			
Occup	leu Da			0		-	l otal l	01101		• …				
			9.00	38	3 IVIF	1Z								Detector Peak►
Transm	it Frea	Erro	r	4	.902 k	Hz	% of OE	3W Pov	ver	r 99	.00 %		Auto	Man
x dB Ba					962 M		x dB				00 dB			
	mawiat			9.	902 IVI	ΠZ	хub			-20.	JU UB			
MSG										STATUS				

Plot 7-28. Occupied Bandwidth Plot (LTE Band 66/4 - 10MHz 64-QAM - Full RB Configuration)



Plot 7-29. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 26 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 26 of 118
© 2020 PCTEST				



Keysight Spectrum Analyzer - Occupied BW				
K RF 50 Ω DC CORREC	SENSE:INT Center Freg: 1.745000000 GHz		PM Sep 08, 2020	Trace/Detector
	Trig: Free Run Avg Ho	old:>100/100		
#IFGain:Lov	w #Atten: 36 dB	Radio D	evice: BTS	
10 dB/div Ref 40.00 dBm				
Log 30.0				
20.0				Clear Write
10.0	······································			
0.00		N I		
-10.0				Average
				Average
-20.0		monorm	Co math and	
-30.0 mars marsha				
-40.0				Max Hold
-50.0				
Center 1.745000 GHz		Span	12.50 MHz	
#Res BW 120 kHz	#VBW 390 kHz		veep 1 ms	Min Hold
				MITTION
Occupied Bandwidth	Total Power	30.2 dBm		
4.5383	MHz			Detector
				Peak▶
Transmit Freq Error -2.84	49 kHz % of OBW Po	wer 99.00 %		Auto <u>Man</u>
x dB Bandwidth 5.01	5 MHz x dB	-26.00 dB		
MSG		STATUS		

Plot 7-30. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 16-QAM - Full RB Configuration)



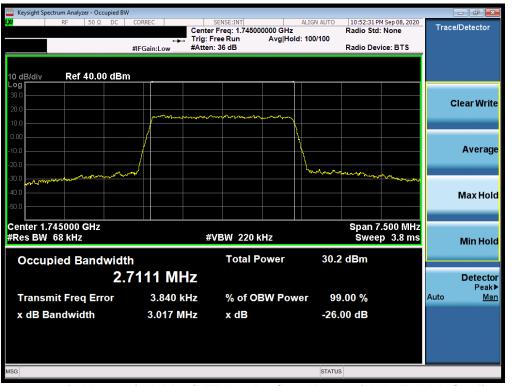
Plot 7-31. Occupied Bandwidth Plot (LTE Band 66/4 - 5MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be part of @ element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 27 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 27 of 118
© 2020 PCTEST	•	·		



Keysight Spectrum Analyz	Keysight Spectrum Analyzer - Occupied BW												
LXI RF	50 Ω	DC	CORREC	0		NSE:INT reg: 1.74500	0000 GH-	ALIGN AUTO	10:52:12 P Radio Std	M Sep 08, 2020	Trac	e/Detector	
				.	Trig: Free	e Run		d: 100/100	Radio Stu	: None			
			#IFGair	n:Low	#Atten: 3	6 dB			Radio Dev	rice: BTS			
	40.00) dBm											
Log 30.0													
20.0												Clear Write	
10.0			/	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mar and a second	man							
0.00													
-10.0												Average	
								1,				Average	
-20.0		-	\sim					moun	mon				
-30.0 why man and	and mark		الا ک							a A grant and a grant of the second s			
-40.0			الا ک									Max Hold	
-50.0			و م								_		
Center 1.745000	GH7								Snan 7	.500 MHz			
#Res BW 68 kHz					#VE	3W 220 k	Hz			p 3.8 ms		Min Hold	
												Wint Hora	
Occupied Ba	and	width	n			Total P	ower	30.2	2 dBm				
		2.7	710	7 M⊦	IZ							Detector	
												Peak▶	
Transmit Free	q Erro	or	4	4.082 k	Hz	% of OE	3W Pow	ver 99	9.00 %		Auto	<u>Man</u>	
x dB Bandwid	dth		3	.013 M	Hz	x dB		-26.	00 dB				
MSG								STATU	s				

Plot 7-32. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz QPSK - Full RB Configuration)



Plot 7-33. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200QM	Poud to be part of @ element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 20 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 28 of 118
© 2020 PCTEST			



🔤 Keysight Sp	Keysight Spectrum Analyzer - Occupied BW														
<mark>LXI</mark>	RF	50 Ω	DC	CORRE	C	Cent	SENSE:		00000 GHz		ALIGN AUTO	10:52:48 Pf Radio Std:	4 Sep 08, 2020	Tra	ce/Detector
						Trig	Trig: Free Run Avg Hold: 100/100								
				#IFGa	in:Low	#Att	#Atten: 36 dB Radio Dev						ice: BTS		
10 dB/div Log	Ref 4	40.00) dBm							_					
30.0															
20.0															Clear Write
10.0					mm	`~~ ~~~	~~~~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		mmy						
0.00				_ /						Ì,					
-10.0				1						١					Average
-10.0		n feallant	. Anoral	1							morninghing	mall the second			Average
-20.0	nd march allowed	1 Page	APUL -									and the full of the second	WWWWWWWWWW		
-30.0															
-40.0										T					Max Hold
-50.0															
Center 1.	745000 (GHz										Span 7	.500 MHz		
#Res BW							#VBW	220 k	٢Hz				p 3.8 ms		Min Hold
							_								
Occu	pied Ba	and					T	otal P	ower		30.8	dBm			
			2.7	719	9 M	Hz									Detector
T	:4 🗖				2 755		0/	- 6 01				00.0/		Auto	Peak►
Transi	mit Freq	Em	ог		2.755		70		BW Pov	NE	er 99	.00 %		Auto	<u>Man</u>
x dB E	landwid	th			3.011	MHz	X	dB			-26.	00 dB			
MSG											STATUS	3			
		-	_	_		_	_	_		-				_	

Plot 7-34. Occupied Bandwidth Plot (LTE Band 66/4 - 3MHz 64-QAM - Full RB Configuration)



Plot 7-35. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 29 of 118
© 2020 PCTEST				



Keysight Spectrum Analyzer - Occupied BW					
μα RF 50 Ω DC		SENSE:INT Center Freq: 1.745000000 GHz rig: Free Run Avg Holo Atten: 36 dB	Radio 1: 100/100	5:53 PM Sep 08, 2020 o Std: None o Device: BTS	Trace/Detector
10 dB/div Ref 40.00 dBm			1 1		
20.0					Clear Write
-10.0					Average
-30.0				man and a second	Max Hold
Center 1.745000 GHz #Res BW 33 kHz		#VBW 110 kHz	Sp Swe	an 3.500 MHz eep 3.067 ms	Min Hold
Occupied Bandwidth		Total Power	30.1 dBr	n 🖣	
	1085 MHz				Detector Peak►
Transmit Freq Error x dB Bandwidth	148 Hz 1.289 MHz		er 99.00 9 -26.00 di		uto <u>Man</u>
MSG			STATUS		

Plot 7-36. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 16-QAM - Full RB Configuration)



Plot 7-37. Occupied Bandwidth Plot (LTE Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration

FCC ID: ZNFK200QM	Proved to be part of the element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 30 of 118
© 2020 PCTEST	•	•		



7.3 Band Edge Emissions at Antenna Terminal

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission is $43 + 10 \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW \geq 1% of the emission bandwidth
- 4. VBW \geq 3 x RBW
- 5. Detector = RMS
- 6. Number of sweep points \geq 2 x Span/RBW
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. 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

LTE Band 12/17

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dago 21 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 31 of 118
© 2020 PCTEST	•			







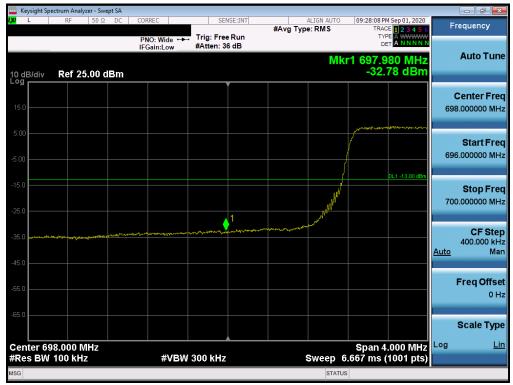
Plot 7-39. Lower Band Edge Plot (LTE Band 17 - 10MHz QPSK – Full RB Configuration

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 22 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 32 of 118
© 2020 PCTEST	•		





Plot 7-40. Upper Band Edge Plot (LTE Band 12 - 10MHz QPSK – Full RB Configuration



Plot 7-41. Lower Band Edge Plot (LTE Band 12 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM	Poud to be part of @ element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 22 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 33 of 118
© 2020 PCTEST				



	trum Analyzer - Swept	SA				
X/ RL	RF 50 Ω	AC CORREC PNO: Wide PIC: Wide	SENSE:INT Trig: Free Run Atten: 36 dB	ALIGN AUTO #Avg Type: RMS	12:22:21 AM Oct 06, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN	Frequency
10 dB/div	Ref 25.00 dB		Atten: 50 db	Mk	r1 703.988 MHz -23.48 dBm	Auto Tune
15.0						Center Free 704.000000 MH
5.00				gaf menyadakan sayah menyadakan da		Start Fre 702.000000 MH
25.0			1		DL1 -13.00 dBm	Stop Fre 706.000000 MH
45.0	www.organilary.organilaria	hand and a second a	and all all all all all all all all all al			CF Ste 400.000 kH <u>Auto</u> Ma
55.0						Freq Offse 0 H
-65.0						Scale Typ
Center 704 #Res BW	4.000 MHz 100 kHz	#VBW	300 kHz	Sweep 6	Span 4.000 MHz 5.667 ms (1001 pts)	Log <u>Li</u>
ISG				STATUS	S	

Plot 7-42. Lower Band Edge Plot (LTE Band 17 - 5MHz QPSK - Full RB Configuration)



Plot 7-43. Upper Band Edge Plot (LTE Band 12 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dega 24 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 34 of 118
© 2020 PCTEST			



Keysight Spectru		DC	CORREC	SE	NSE:INT		ALIGN AUTO	09:18:47 PI	M Sep 01, 2020		
			PNO: Wide +	Trig: Fre #Atten: 3		#Avg Typ	e: RMS	TY	E 1 2 3 4 5 6 E A WWWW A NNNNN	Fi	requency
IO dB/div R	ef 25.00 d	dBm	IFGall:Low	#Atten. C			Mk	r1 697.9 -29.	68 MHz 61 dBm		Auto Tun
15.0								for the second second	aget and the the table		Center Fre 3.000000 M⊦
5.00										696	Start Fre 5.000000 M⊦
25.0					1				DL1 -13.00 dBm	700	Stop Fre 0.000000 MH
35.0 45.0		Sant Marys As	tues and the second	and the second	and the second					<u>Auto</u>	CF Ste 400.000 kH Ma
55.0											Freq Offs 0 H
65.0											Scale Typ
Center 698.0 Res BW 10			#VB	W 300 kHz			Sweep 6	Span 4 .667 ms		Log	Li

Plot 7-44. Lower Band Edge Plot (LTE Band 12 - 3MHz QPSK - Full RB Configuration)



Plot 7-45. Upper Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be part of the element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 25 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 35 of 118
© 2020 PCTEST	•	•		





Plot 7-46. Lower Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)



Plot 7-47. Upper Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 20 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 36 of 118
© 2020 PCTEST	•		



LTE Band 13

Keysight Spectrum Analyzer - Swept SA					- 7 🗾
KI RL RF 50Ω A	C CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	12:05:01 AM Oct 06, 2020 TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide 🖵 IFGain:Low	Trig: Free Run Atten: 36 dB	#Avg Type. Rivis		
IO dB/div Ref 25.00 dBn	n		MI	r1 776.992 MHz -29.15 dBm	Auto Tun
15.0					Center Fre 777.000000 Mi
5.00		/ mm	and a second	and a second	Start Fre 773.000000 Mi
25.0		1. d		DL1 -13.00 dBm	Stop Fr 781.000000 M
45.0	and a state of the	herenge and a second			CF Str 800.000 k <u>Auto</u> M
55.0					Freq Offs 0
65.0					Scale Ty
Center 777.000 MHz Res BW 100 kHz	#VBW	300 kHz	Sweep	Span 8.000 MHz 13.33 ms (1001 pts)	Log <u>l</u>
ISG			STATU		

Plot 7-48. Lower Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)



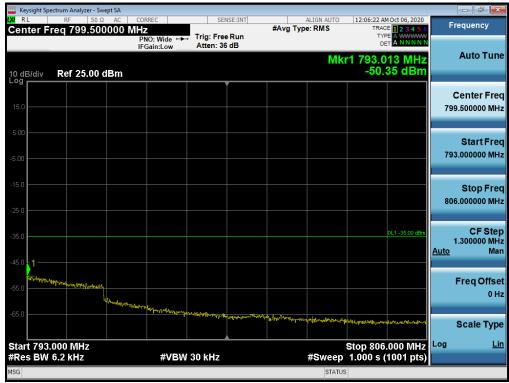
Plot 7-49. Lower Emission Mask Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dago 27 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 37 of 118
© 2020 PCTEST	•			



	ectrum Analyzer - Swept SA					- đ ×
<mark>(</mark> RL	RF 50 Ω AC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	12:06:04 AM Oct 06, 2020	Frequency
		PNO: Wide 🖵 IFGain:Low	Trig: Free Run Atten: 36 dB	#Avg Type. RMS	TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN	
0 dB/div	Ref 25.00 dBm			Mk	r1 787.008 MHz -28.18 dBm	Auto Tun
15.0						Center Fre 787.000000 MH
5.00		~gftg==2 ⁵ *ffffgftgftg==77				Start Fre 783.000000 M⊦
25.0			1		DL1 -13.00 dBm	Stop Fre 791.000000 M⊦
15.0				NAR MALINE (TO MARKAN (MARKAN)	and a the base of a second	CF Ste 800.000 kH <u>Auto</u> Ma
i5.0						Freq Offs 0 F
65.0						Scale Typ
enter 78 Res BW	7.000 MHz 100 kHz	#VBW	300 kHz	Sweep 1	Span 8.000 MHz 3.33 ms (1001 pts)	Log <u>L</u> i
SG				STATUS	3	

Plot 7-50. Upper Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)



Plot 7-51. Upper Emission Mask Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM	PCTEST* Proud to be part of Stement	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dago 20 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 38 of 118
© 2020 PCTEST	•			



RL	ectrum Analyz RF	50 Ω		CORREC			NSE:INT		ALIGN AUTO	12:00:27	M Oct 06, 2020	_	
κι	ΓLΓ	20.22	AC		ide 🖵		e Run	#Avg T	/pe: RMS	TRA	CE 1 2 3 4 5 6 (PE A WWWWW DET A NNNN	F	requency
0 dB/div	Ref 25	.00 dE	Зm	IFGaili.	Jow	/			MI	kr1 777. -22	000 MHz .78 dBm		Auto Tun
og									مردر ورواد ورواد ورواد ورواد و		an una pro normalistana frances		Center Fre 7.000000 MH
.00											DL1 -13.00 dBm	77	Start Fre 5.000000 M⊦
5.0						مريد) ¹					77	Stop Fre 9.000000 Mi
5.0	aran tan			-filserantura	San Maria	Autor Autor Au						<u>Auto</u>	CF Ste 400.000 kl Ma
5.0													Freq Offs 0 I
5.0												Log	Scale Typ
	7.000 M 100 kHz				#VBW	300 kHz	2		Sweep	، Span 6.667 ms	1.000 MHz (1001 pts)		

Plot 7-52. Lower Band Edge Plot (LTE Band 13 - 5MHz QPSK - Full RB Configuration)



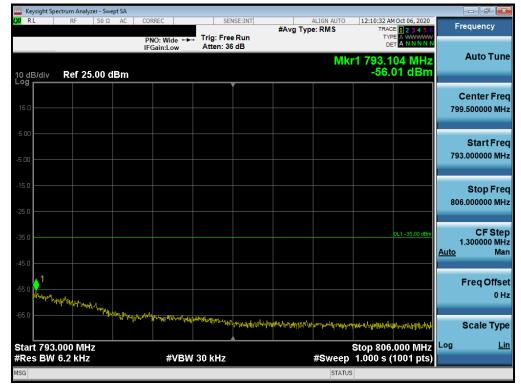
Plot 7-53. Lower Emission Mask Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be part of the element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 39 of 118
© 2020 PCTEST	•	•		



Keysight Spectrum Analyzer - Swept SA		11701 (1777		
RL RF 50Ω AC	CORREC SENSE:INT	#Avg Type: RMS	12:10:21 AM Oct 06, 2020 TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide Trig: Free Run IFGain:Low Atten: 36 dB	- //	DET A WWWWW	Auto Tur
0 dB/div Ref 25.00 dBm			1 787.004 MHz -22.51 dBm	
				Center Fre
15.0				787.000000 M
5.00	and a stand and and a stand and as			
5.00				Start Fr
5.00				785.000000 M
			DL1 -13.00 dBm	
5.0	*\1			Stop Fr
25.0				789.000000 M
	الامهريسي مر	and	and the second second second	CF St
5.0				400.000
15.0				<u>Auto</u> N
				Freq Offs
55.0				
55.0				
5.0				Scale Ty
enter 787.000 MHz			Span 4.000 MHz	Log
Res BW 100 kHz	#VBW 300 kHz	Sweep 6.	667 ms (1001 pts)	
G		STATUS		

Plot 7-54. Upper Band Edge Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)



Plot 7-55. Upper Emission Mask Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)

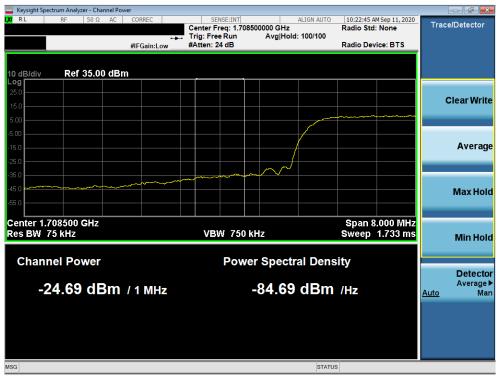
FCC ID: ZNFK200QM	Poud to be part of @ element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 40 of 118
© 2020 PCTEST				



WCDMA AWS

Keysight Spectrum Analyzer - Swept					
α RL RF 50Ω I		SENSE:INT	ALIGN AUTO #Avg Type: RMS	08:58:09 AM Sep 04, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWW	Frequency
10 dB/div Ref 30.00 dB	IFGain:Low	Atten: 40 dB	Mkr	DET A NNNNN 1 1.710 000 GHz -19.52 dBm	Auto Tur
20.0		Ĭ			Center Fre 1.710000000 GH
0.00					Start Fr 1.702500000 G
		1		DL1 -13.00 dBm	Stop Fr 1.717500000 G
0.0		~~~/		Martin Martin	CF Sto 1.500000 M <u>Auto</u> M
0.0					Freq Offs 0
60.0					Scale Ty
enter 1.710000 GHz Res BW 100 kHz	#VBW 3	800 kHz	Sweep	Span 15.00 MHz 1.000 ms (1001 pts)	Log <u>l</u>
G			STATU	JS	

Plot 7-56. Lower Band Edge Plot (WCDMA AWS – Ch.1312)



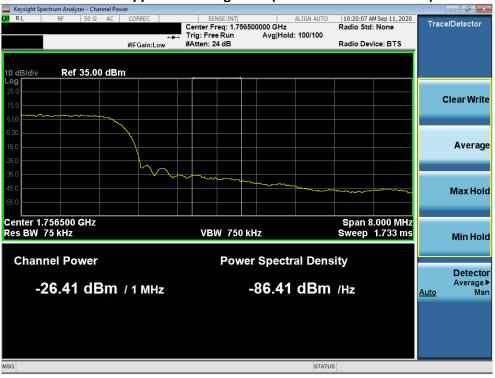
Plot 7-57. Lower Extended Band Edge Plot (WCDMA AWS- Ch. 1312)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 41 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 41 of 118
© 2020 PCTEST	•			



RL	ectrum Analyzer - Swept SA RF 50 Ω DC	CORREC	SENSE:INT		ALIGN AUTO	00.02.22 0	M Sep 04, 2020		a 🔁
KL.	NFE	PNO: Wide	Trig: Free Run Atten: 40 dB	#Avg Typ		TRAC	E 1 2 3 4 5 6 A WWWW A N N N N N	Freque	
dB/div	Ref 30.00 dBm				Mkr	1 1.755 0 -27.	60 GHz 70 dBm	Aut	o Tur
0.0								Cent 1.755000	er Fre 000 GH
00		man man						St a 1.747500	ort Fre
).0).0							DL1 -13.00 dBm	Sto 1.762500	o p Fr 000 GI
).0).0	~~~~			www.	4				CF Ste DOO MI M
).0 ———					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www	ww	Free	Offs 0 I
enter 1.	755000 GHz					Span 1	5.00 MHz	Sca	le Typ ∟
	100 kHz	#V/RM	300 kHz		Sween	1 000 ms (1001 pts)		

Plot 7-58. Upper Band Edge Plot (WCDMA AWS – Ch.1513)



Plot 7-59. Upper Extended Band Edge Plot (WCDMA AWS- Ch.1513)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕞 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 42 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 42 of 118
© 2020 PCTEST	•			



LTE Band 66/4

Keysight Sp	ectrum Analy													
XI L	RF	50 Ω	DC	CORREC			NSE:INT		#Avg Typ	ALIGN AUTO e: RMS	TR	PM Sep 01, 2020 ACE 1 2 3 4 5 6	F	requency
				PNO: Wide IFGain:Low		Trig: Free #Atten: 3								Auto Tur
10 dB/div Log	Ref 2	5.00 di	3m							Mkr	1 1.709 -33	792 GHz 6.14 dBm		Auto Tu
														Center Fre
15.0													1.7	10000000 G
5.00									wanne	and the second second	Mar mar	and the second second		Otest Fr
-5.00								\int					1.70	Start Fr 2000000 G
0.00												DL1 -13.00 dBm		
-15.0													47	Stop Fr 18000000 G
-25.0							1.5						1.7	18000000 G
-35.0				1 amount of the		www.www	now .							CF St
man	monor	mm	ᢉᡎᠧᡬᡎ᠆ᢤ᠆᠊ᢩᠰᠬ	Martine									<u>Auto</u>	1.600000 M M
-45.0														
-55.0														Freq Offs 0
-65.0														
														Scale Ty
Center 1. #Res BW				#V	BW	820 kHz				Sween	Span 1 000 ms	16.00 MHz (1001 pts)	Log	L
/ISG										STAT		(noor pro)		

Plot 7-60. Lower Band Edge Plot (LTE Band 66/4 - 20MHz QPSK - Full RB Configuration)



Plot 7-61. Lower Extended Band Edge Plot (LTE Band 66/4 - 20MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 42 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 43 of 118
© 2020 PCTEST			



L Keysight S	pectrum Ana RF	50 Ω		CORREC			SE:INT			10-54-07	DM Aug 21, 2020		
L	KF	50 52	AC		ast ↔		Run	#Avg Typ	e:RMS	TR	PM Aug 31, 2020 ACE 1 2 3 4 5 6 YPE A WWWW DET A NNNN	Fn	equency
dB/div	Ref 2	25.00 d	Bm	ii Gain.					Mkr	1 1.755 -29	012 GHz .09 dBm		Auto Tui
5.0													Center Fr 5000000 GI
		J-Myrot	haardfyllowsb	harn-yar	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~						1.747	Start Fr 7000000 G
5.0							1				DL1 -13.00 dBm	1.763	Stop Fr 3000000 G
5.0						¥	A A A A A A A A A A A A A A A A A A A	hours	m. March	n		1 <u>Auto</u>	CF St .600000 M N
5.0												F	Freq Offs 0
5.0													Scale Ty
	.755000				4) (D) (J)	000 1.11-				Span	16.00 MHz	Log	L
tes BN	/ 240 kł	1Z			₩VBW	820 kHz			sweep	1.000 ms	(1001 pts)		

Plot 7-62. Upper Band Edge Plot (LTE Band 4 - 20MHz QPSK – Full RB Configuration)



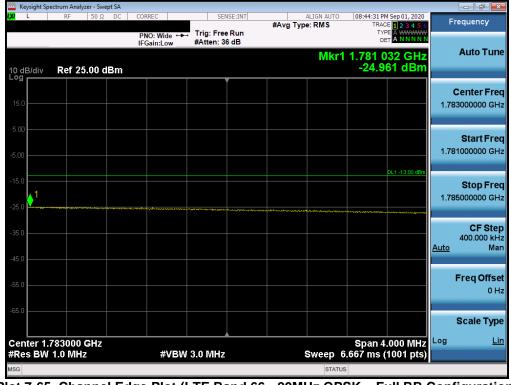
Plot 7-63. Upper Extended Band Edge Plot (LTE Band 4 - 20MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 44 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 44 of 118
© 2020 PCTEST			



Keysight Spec L	RF	50 Ω C		RREC		SENSE:INT		ALIGN AUTO	08:37:52 PM 9	Sep 01, 2020		
			Р	NO: Wide •		Free Run	#Avg Typ	be:RMS	TRACE TYPE DET	1 2 3 4 5 6 A WWWWW A N N N N N	Freque	ncy
0 dB/div	Ref 25	.00 dBi		Gain:Low	#Atte	en. 36 dB		Mkr1	1.780 03		Auto	o Tur
.og 15.0											Cente 1.7800000	
5.00		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	man man	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	and 1						Sta 1.7720000	rt Fre
25.0						<u>n</u> 1				L1 -13.00 dBm	Sto 1.7880000	p Fr 000 G
45.0						Manson	man ser freezen		v	M-Manna and	C 1.6000 <u>Auto</u>	F Ste 100 M M
i5.0											Freq	Offs 0
65.0											Scal	е Ту
enter 1.7 Res BW 2				#VB	W 820 I	<hz< td=""><td></td><td>Sweep 1</td><td>Span 16 .000 ms (1</td><td>.00 MHz 001 pts)</td><td>Log</td><td>L</td></hz<>		Sweep 1	Span 16 .000 ms (1	.00 MHz 001 pts)	Log	L
SG								STATU				

Plot 7-64. Upper Band Edge Plot (LTE Band 66 - 20MHz QPSK - Full RB Configuration)



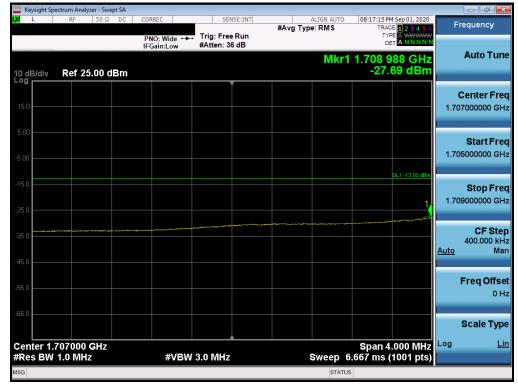
Plot 7-65. Channel Edge Plot (LTE Band 66 - 20MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM	PCTEST Proud to be part of (® element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 45 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 45 of 118
© 2020 PCTEST		•	



	ectrum Analyz	50 Ω		CORREC	SE	NSE:INT		ALIGN AUTO	08·21·25 PM	4 Sep 01, 2020	_	
	N	50.35					#Avg Typ		TRAC	E 1 2 3 4 5 6	F	requency
				PNO: Wide ↔ IFGain:Low	Trig: Fre #Atten: 3				DE			
								Mkr1	1.709 9	28 GHz		Auto Tun
10 dB/div	Ref 25.	.00 dB	Sm						-32.	60 dBm		
						Ĭ						Center Fre
15.0												0000000 GH
												00000000
5.00												
												Start Fre
-5.00						+ +					1.70	4000000 GH
										DL1 -13.00 dBm		
-15.0												Stop Fre
											1.71	6000000 GH
-25.0						1						
-35.0					- m	N. Y						CF Ste
-35.0	-		and the second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	and a start of the							1.200000 MI
-45.0											<u>Auto</u>	Ma
-55.0												Freq Offs
												01
-65.0												
												Scale Typ
Center 1.	710000 C	SHz							Span 1	2.00 MHz	Log	L
	180 kHz			#VBV	V 620 kHz			Sweep 1	.000 ms (1001 pts)		
ASG								STATU				

Plot 7-66. Lower Band Edge Plot (LTE Band 66/4 - 15MHz QPSK - Full RB Configuration)



Plot 7-67. Lower Extended Band Edge Plot (LTE Band 66/4 - 15MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dega 46 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 46 of 118
© 2020 PCTEST			



Keysight Spectrum Analyzer - Swept SA	CORDEC		or mit			10.51.53.0		
L RF 50 Ω AC	PNO: Wide	Trig: Free #Atten: 36		#Avg Typ	e:RMS	TRAC	MAug 31, 2020 E 1 2 3 4 5 6 E A WWWW	Frequency
0 dB/div Ref 25.00 dBm	IFGain:Low	#Atten: 36	, ab		Mkr	1 1.755 0		Auto Tu
5.0								Center Fr 1.755000000 G
00	an and a second and a second as	\sim					DL1 -13.00 dBm	Start Fr 1.749000000 G
5.0		- have	1					Stop Fr 1.761000000 G
5.0				har	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		en ant	CF St 1.200000 M <u>Auto</u> M
5.0								Freq Offs 0
5.0 enter 1.755000 GHz						Span 1	2.00 MHz	Scale Ty
Res BW 180 kHz	#VBW	620 kHz			Sweep	1.000 ms (1001 pts)	
G					STATU	IS		

Plot 7-68. Upper Band Edge Plot (LTE Band 4 - 15MHz QPSK – Full RB Configuration)

d L	RF	50 Ω	AC	CORREC	SE	NSE:INT			10:50:06 P	M Aug 31, 2020		
				PNO: Fast ↔	Trig: Free #Atten: 3		#Avg Ty	pe: RMS	TRAC	DE 1 2 3 4 5 6 DE A WWWW ET A NNNNN	F	requency
0 dB/div	Ref 2	5.00 d	Bm	IFGain:Low	#Atten: 3	6 aB		Mkr	1 1.756 (Auto Tun
15.0												Center Fre 58000000 G⊢
5.00											1.75	Start Fre 6600000 GF
15.0										DL1 -13.00 dBm	1.76	Stop Fre
35.0						••	× · · · · · · · · ·			an a	<u>Auto</u>	CF Ste 400.000 kł Mi
55.0												Freq Offs 0 I
65.0												Scale Typ
Center 1. #Res BW				#\/D\	N 3.0 MHz				Span 4 13.33 ms (Log	L

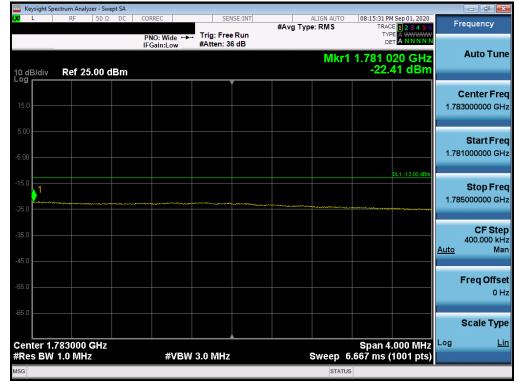
Plot 7-69. Upper Extended Band Edge Plot (LTE Band 4 - 15MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM	PCTEST. Proud to be part of @ element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	oort S/N: Test Dates: EUT Type:			Dage 47 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 47 of 118
© 2020 PCTEST	•			



	RF	50 Ω	DC	CORREC	SE	NSE:INT	#Avg Ty	ALIGN AUTO		M Sep 01, 2020	Fre	quency
				PNO: Wide IFGain:Low	+++ Trig: Fre #Atten: 3		#Avg iy	pe: RIVIS	TYI	ET A NNNNN		
0 dB/div	Ref 2	5.00 d	Bm					Mkr1	1.780 (-28.)60 GHz 03 dBm		Auto Tui
. og 15.0												enter Fre
5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	un eta	~~~~		m							Start Fr 000000 G
25.0					- h	↓ 1				DL1 -13.00 dBm		Stop Fr 000000 G
35.0							· · · · · · · · · · · · · · · · · · ·	4			1.2 <u>Auto</u>	CF St 200000 M M
i5.0											F	r eq Off s 0
65.0											S	cale Ty
enter 1.7 Res BW				#VE	3W 620 kHz			Sweep 1	Span 1 .000 ms (2.00 MHz (1001 pts)	Log	L

Plot 7-70. Upper Band Edge Plot (LTE Band 66 - 15MHz QPSK - Full RB Configuration)



Plot 7-71. Upper Extended Band Edge Plot (LTE Band 66 - 15MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 49 of 119
1M2009230153-13.ZNF	Portable Handset	Page 48 of 118	
© 2020 PCTEST			



	C SEN : Wide Trig: Free in:Low #Atten: 36		#Avg Typ		TRACI TYP DE 1.709 9	14ug 31, 2020 2 2 3 4 5 6 4 WINNIN 92 GHz 71 dBm	(1.71	Auto Tune Auto Tune Center Freq 0000000 GHz Start Freq 6000000 GHz
0 dB/div Ref 25.00 dBm	In:Low #Atten. of		an a	Mkr1	1.709 9 -32.7	71 dBm	1.71	Center Freq 0000000 GHz Start Freq
5.00			an -again ta'an Albaran Lagad	and the second second second	an the second	where the contraction of	1.71	0000000 GHz Start Fred
5.00			45-76-81)-\$44-484-484-97-88-73	gy nanyang tinang ti			1.70	
15.0						DL1 -13.00 dBm		
25.0		11					1.71	Stop Fre 4000000 GH
35.0 45.0	and the second	J ^{ri}					Auto	CF Ste 800.000 kH Ma
55.0								Freq Offse 0 H
65.0 Center 1.710000 GHz					Span 8.	000 MHz		Scale Type Lii
Res BW 120 kHz	#VBW 430 kHz		#	Sweep 1	3.33 ms (*	1001 pts)		

Plot 7-72. Lower Band Edge Plot (LTE Band 66/4 - 10MHz QPSK - Full RB Configuration)



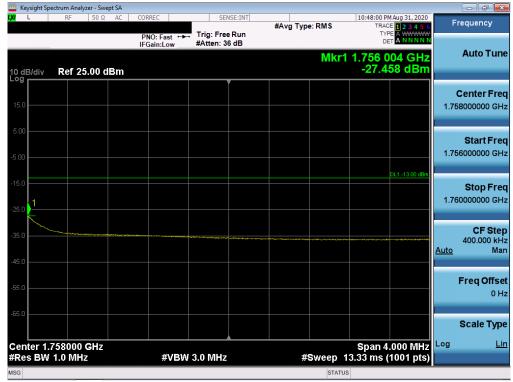
Plot 7-73. Lower Extended Band Edge Plot (LTE Band 66/4 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 119	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 49 of 118	
© 2020 PCTEST	•				



Keysight Spectrum Analyzer - Swept Sector						
XI L RF 50 Ω /	AC CORREC PNO: Wide ↔	SENSE:I	#Avg Typ		10:45:27 PM Aug 31, 2020 TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
10 dB/div Ref 25.00 dB	IFGain:Low	#Atten: 36 dB		Mkr1 1	.755 004 GHz -27.48 dBm	Auto Tune
15.0						Center Freq 1.755000000 GHz
5.00	nn Maarinen andriker fan de gegenaan de				DL1 -13.00 dBm	Start Fred 1.751000000 GHz
-25.0		have 1				Stop Fred 1.759000000 GH2
.35.0			La companya	un martin Marco a	And No	CF Step 800.000 kH <u>Auto</u> Mar
55.0						Freq Offse 0 Ha
-65.0 Center 1.755000 GHz					Span 8.000 MHz	Scale Type
#Res BW 120 kHz	#VBW	430 kHz	#	Sweep 13.	33 ms (1001 pts)	
ISG				STATUS		

Plot 7-74. Upper Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB Configuration)



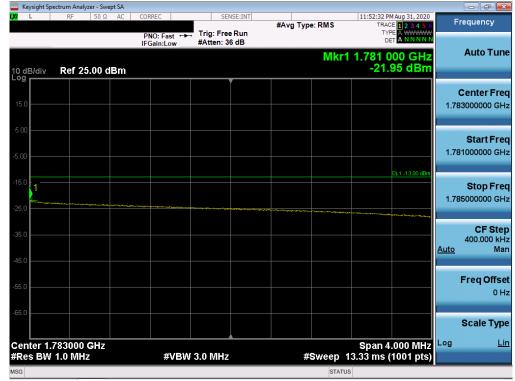
Plot 7-75. Upper Extended Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Daga 50 of 110	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 50 of 118	
© 2020 PCTEST					



Keysight Spectrum Analyzer - Swept SA									
L RF 50 Ω AC	CORREC	. Trig: Free		#Avg Typ	e: RMS	TRAC	MAug 31, 2020 E 1 2 3 4 5 6 E A WWW	F	requency
0 dB/div Ref 25.00 dBm	IFGain:Low	#Atten: 36	6 dB		Mkr	1 1.780 0	000 GHz 54 dBm		Auto Tune
15.0									Center Freq 0000000 GHz
5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							1.77	Start Fred
25.0			1				DL1 -13.00 dBm	1.78	Stop Fred 4000000 GH:
35.0			a give an an an a farm	under men general and an	un en	and the second sec	and the second second second	<u>Auto</u>	CF Step 800.000 kH Mar
55.0									Freq Offse 0 H:
65.0						Cnor-O	000 844	Log	Scale Type
Center 1.780000 GHz Res BW 120 kHz	#VBW	430 kHz		#	Sweep	Span 8 13.33 ms (209	<u></u>
SG					STAT				

Plot 7-76. Upper Band Edge Plot (LTE Band 66 - 10MHz QPSK – Full RB Configuration)



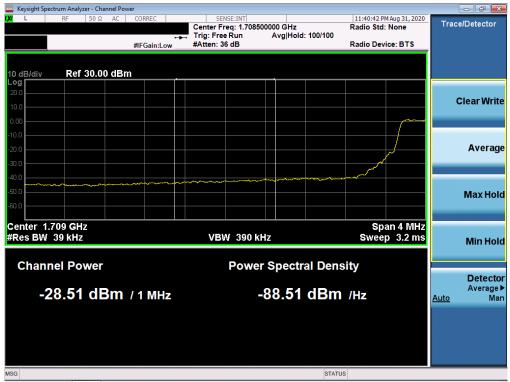
Plot 7-77. Upper Extended Band Edge Plot (LTE Band 66 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be part of the element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 51 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 51 of 118	
© 2020 PCTEST	•			



Keysight Spectrum Analyzer - Swept SA									
X/L RF 50Ω AC	CORREC PNO: Wide ↔	Trig: Free		#Avg Typ	e: RMS	TRACI TYP	Aug 31, 2020 1 2 3 4 5 6 A WWWWWW	Fr	equency
10 dB/div Ref 25.00 dBm	IFGain:Low	#Atten: 36	dB		Mkr1	1.710 0	00 GHz 52 dBm		Auto Tune
15.0									Center Fred
5.00			ſ	n an martine	- Mark - Marked - Marke			1.708	Start Fre 3000000 GH
25.0			,1 (L					1.712	Stop Fre 2000000 GH
35.0 	ware and the second	and a second sec						<u>Auto</u>	CF Ste 400.000 kH Ma
55.0								-	Freq Offso 0 ⊦
65.0 Center 1.710000 GHz #Res BW 62 kHz	#\/B14	200 kHz			Swoon	Span 4. 5.733 ms (*	000 MHz		Scale Typ <u>Li</u>
	#VDV	200 KHZ		#	Sweep o		ioo r pis)		

Plot 7-78. Lower Band Edge Plot (LTE Band 66/4 - 5MHz QPSK - Full RB Configuration)



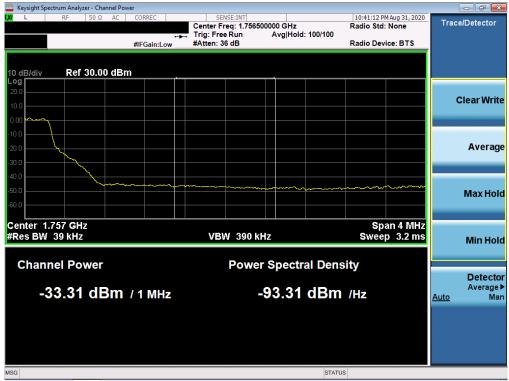
Plot 7-79. Lower Extended Band Edge Plot (LTE Band 66/4 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be part of @ element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dege 52 of 119	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 52 of 118	
© 2020 PCTEST	•				



Keysight Spectrum Analyzer - Swept SA									
XI L RF 50 Ω AC	CORREC	Trig: Free		#Avg Typ	e: RMS	TRACE	Aug 31, 2020 1 2 3 4 5 6 A WWWWW	Fr	requency
10 dB/div Ref 25.00 dBm	IFGain:Low	#Atten: 36	8 dB		Mkr1	1.755 0	04 GHz 09 dBm		Auto Tune
15.0									Center Fred 5000000 GH
5.00 www.w.w.w.w.w.w.w.	yemine manyyeine						DL1 -13.00 dBm	1.75	Start Fre 3000000 GH
25.0		- Lo A	1					1.75	Stop Fre 7000000 GH
45.0				- Martin Martin	when the second	n Constalut on the surger	the for the second the	Auto	CF Ste 400.000 k⊢ Ma
55.0									Freq Offse 0 H
65.0 Center 1.755000 GHz						Snan 4	000 MHz	Log	Scale Typ Li
#Res BW 62 kHz	#VBW	220 kHz		#	Sweep 6	5,733 ms (_
ISG					STATUS				

Plot 7-80. Upper Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB Configuration)



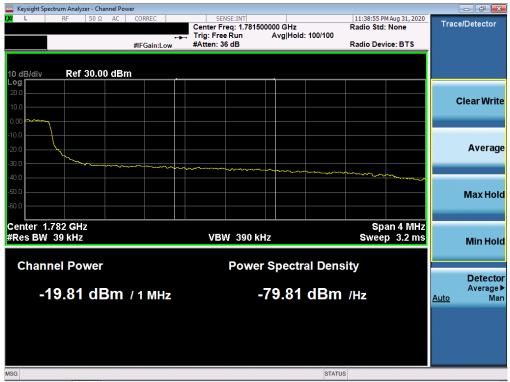
Plot 7-81. Upper Extended Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM	Proved to be part of @ element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dege 52 of 119	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 53 of 118	
© 2020 PCTEST	•				



Keysight Spectrum Analyzer - Swept SA									
L RF 50Ω AC	CORREC		ISE:INT	#Avg Typ	e: RMS	TRAC	MAug 31, 2020	Fr	equency
	PNO: Wide +++ IFGain:Low	Trig: Free #Atten: 36							
10 dB/div Ref 25.00 dBm					Mkr	1 1.780 0 -25.	04 GHz 48 dBm		Auto Tune
15.0									Center Freq 0000000 GHz
5.00							DL1 -13.00 dBm	1.778	Start Freq 8000000 GHz
-15.0			1					1.782	Stop Freq 2000000 GHz
-35.0							······	<u>Auto</u>	CF Step 400.000 kHz Man
-55.0								I	Freq Offset 0 Hz
-65.0									Scale Type
Center 1.780000 GHz #Res BW 62 kHz	#\/B)A(200 kHz			Sween	Span 4 1.333 ms (Log	<u>Lin</u>
	# V D V V	200 1112			oweeh	line fille	roor pis)		

Plot 7-82. Upper Band Edge Plot (LTE Band 66 - 5MHz QPSK - Full RB Configuration)



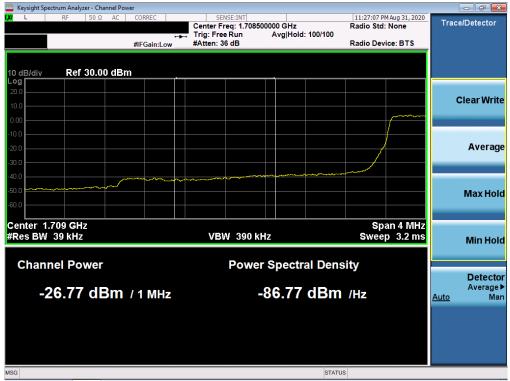
Plot 7-83. Upper Extended Band Edge Plot (LTE Band 66 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo E4 of 110	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 54 of 118	
© 2020 PCTEST		•			



	ectrum Analyzer - Swe									_	
I <mark>XI</mark> L	RF 50 Ω		ORREC			#Avg Typ	e:RMS	TRAC	MAug 31, 2020 E 1 2 3 4 5 6 E A WWWW	F	requency
10 dB/div Log	Ref 25.00 d	I	Gain:Low	#Atten: 3	6 dB		Mkr'	1.710 0	00 GHz 35 dBm		Auto Tune
15.0											Center Freq 0000000 GHz
-5.00								A.,		1.70	Start Freq 8000000 GHz
-15.0					ĩ				DL1 -13.00 dBm	1.71	Stop Fred 2000000 GHz
-35.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m						<u>Auto</u>	CF Step 400.000 kHz Mar
-55.0											Freq Offse 0 Hi
-65.0	710000 GHz							Span 4	.000 MHz	Log	Scale Type
#Res BW			#VBV	V 130 kHz			Sweep	3.800 ms (1001 pts)		
MSG							STATU	IS			

Plot 7-84. Lower Band Edge Plot (LTE Band 66/4 - 3MHz QPSK - Full RB Configuration)



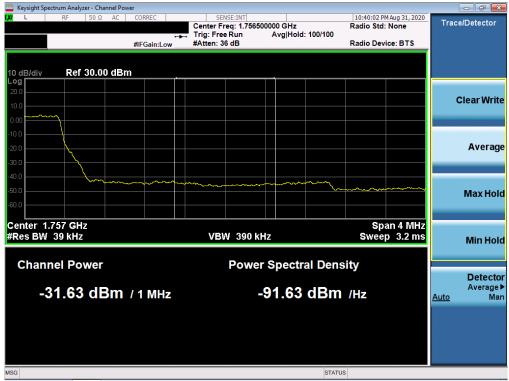
Plot 7-85. Lower Extended Band Edge Plot (LTE Band 66/4 - 3MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo FE of 110	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 55 of 118	
© 2020 PCTEST	-	•		· · · · · ·	



Keysight Spectrum Analyzer - Swept SA								_	
XI L RF 50 Ω AC	CORREC PNO: Wide ↔			#Avg Typ	e:RMS	TRAC TYI	M Aug 31, 2020 CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Fi	requency
10 dB/div Ref 25.00 dBm	IFGain:Low	#Atten: 30			Mkr1	1.755 ()04 GHz 95 dBm		Auto Tune
15.0									Center Freq 5000000 GHz
5.00	-Weener Warner						DL1 -13.00 dBm	1.75	Start Fred 3000000 GH;
-25.0		- t	1					1.75	Stop Fred 7000000 GH:
45.0			Lange	manager	Metersen	-	hanne	<u>Auto</u>	CF Stej 400.000 kH Ma
65.0									Freq Offse 0 H
Center 1.755000 GHz						Snan-4	.000 MHz		Scale Type <u>Lir</u>
#Res BW 36 kHz	#VBW	130 kHz		#	Sweep 6	6.733 ms ((1001 pts)		_
ASG					STATU				

Plot 7-86. Upper Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB Configuration)



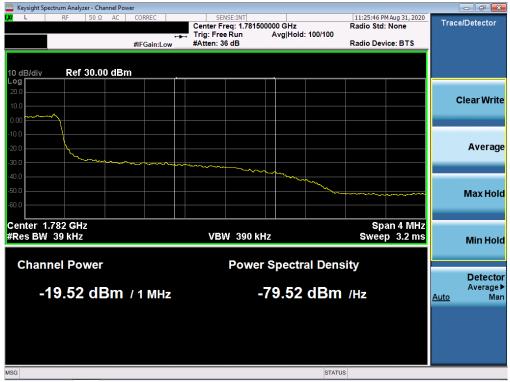
Plot 7-87. Upper Extended Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Daga EC of 110	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 56 of 118	
© 2020 PCTEST					



Keysight Spectrum A										
XI L RF	50 Ω AC	CORREC	. Trig: Free		#Avg Typ	e: RMS	TRAC TYP	Aug 31, 2020 E 1 2 3 4 5 6 E A WWWW T A N N N N N	Fr	requency
10 dB/div Ref	25.00 dBm	IFGain:Low	#Atten: 3	6 dB		Mkr1	1.780 0			Auto Tune
15.0										Center Fred 0000000 GH:
5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							DL1 -13.00 dBm	1.77	Start Free 8000000 GH
-15.0				1					1.78	Stop Free 2000000 GH
45.0				han the second s		•••••		and the second	Auto	CF Ste 400.000 kH Ma
55.0										Freq Offse 0 H
65.0 Center 1.78000	00 GHz						Snan 4	.000 MHz	Log	Scale Typ
#Res BW 36 kl		#VBW	/ 130 kHz			Sweep 3	span 4 8.800 ms (
ISG						STATUS				

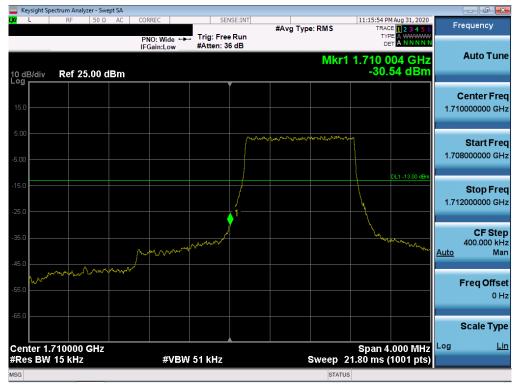
Plot 7-88. Upper Band Edge Plot (LTE Band 66 - 3MHz QPSK - Full RB Configuration)



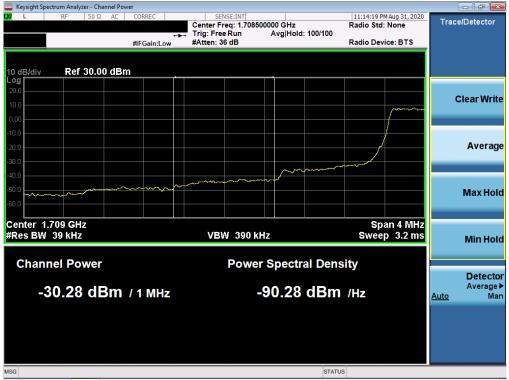
Plot 7-89. Upper Extended Band Edge Plot (LTE Band 66 - 3MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo FZ of 110	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 57 of 118	
© 2020 PCTEST		•			





Plot 7-90. Lower Band Edge Plot (LTE Band 66/4 – 1.4MHz QPSK – Full RB Configuration)



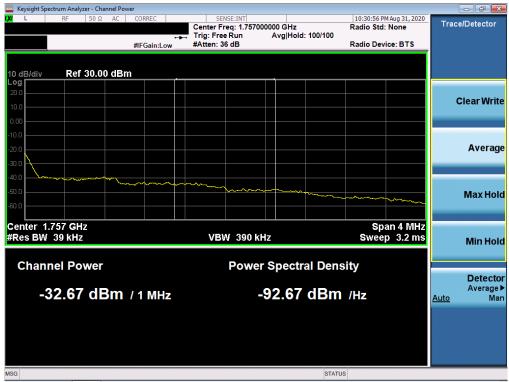
Plot 7-91. Lower Extended Band Edge Plot (LTE Band 66/4 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	rt 🕕 LG	
Test Report S/N:	Test Dates:	EUT Type:		Dage 50 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 58 of 118
© 2020 PCTEST	•			



Keysight Spectrum Analyzer - Swept SA						
XI L RF 50 Ω AC	PNO: Wide ↔ Trig: Free IFGain:Low #Atten: 3		#Avg Type: RM	S TRACI TYP	I Aug 31, 2020 E 1 2 3 4 5 6 E A WWWW T A N N N N	Frequency
10 dB/div Ref 25.00 dBm			N	lkr1 1.755 0 -27.4	04 GHz 48 dBm	Auto Tune
15.0						Center Free 1.755000000 GH
5.00	and the second				DL1 -13.00 dBm	Start Fre 1.753000000 GH
25.0		1				Stop Fre 1.757000000 G⊦
45.0		June	munu			CF Ste 400.000 k⊦ <u>Auto</u> Ma
55.0				mm	Margare M	Freq Offso 0 ⊦
65.0 Center 1.755000 GHz				Span 4	000 MHz	Scale Typ
Res BW 16 kHz	#VBW 56 kHz		Swee	ep 19.13 ms (*	1001 pts)	
ISG			1	STATUS		

Plot 7-92. Upper Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB Configuration)



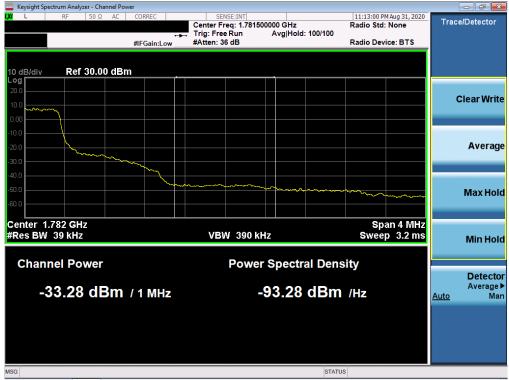
Plot 7-93. Upper Extended Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 50 of 110	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 59 of 118	
© 2020 PCTEST	-	•		· · · · · ·	





Plot 7-94. Upper Band Edge Plot (LTE Band 66 – 1.4MHz QPSK – Full RB Configuration)



Plot 7-95. Upper Extended Band Edge Plot (LTE Band 66 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 60 of 119	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 60 of 118	
© 2020 PCTEST	-	÷		· · · · · ·	



7.4 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

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

The minimum permissible attenuation level of any spurious emission is $43 + 10 \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 18GHz (separated into at least two plots per channel)
- 2. RBW \geq 100kHz
- 3. VBW \geq 3 x RBW
- 4. Detector = RMS
- 5. Trace mode = max hold
- 6. Sweep time = auto couple
- 7. The trace was allowed to stabilize

Test Setup

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



Figure 7-4. Test Instrument & Measurement Setup

Test Notes

Per Part 27 and RSS-139, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 61 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 61 of 118
© 2020 PCTEST			

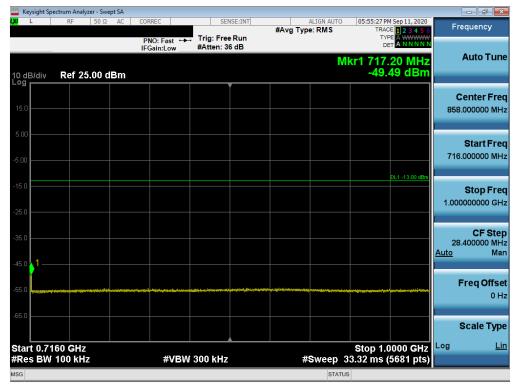
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



LTE Band 12/17

🔤 Keysight Spo	ectrum Analyzer - Swe										
<mark>l)XI</mark> L	RF 50 Ω	AC	PNO: Fast		Run	#Avg Typ	ALIGN AUTO e: RMS	TRAC TYP	E 1 2 3 4 5 6 E A WWWW	Fr	equency
10 dB/div Log	Ref 25.00 c		IFGain:Low	#Atten: 3	6 dB		М	kr1 690.	80 MHz 60 dBm		Auto Tune
15.0											Center Fred 9.950000 MHz
-5.00										30	Start Fred
-15.0									DL1 -13.00 dBm	697	Stop Free .900000 MH
-35.0										66 <u>Auto</u>	CF Stej 5.790000 MH Ma
-45.0	Manuer, where the structure paints										Freq Offse 0 H
-65.0											Scale Type
Start 30.0 #Res BW			#VBW	/ 300 kHz		#S	weep 32	Stop 6 2.95 ms (1	97.9 MHz 3359 pts)	Log	Lir
MSG							STATUS				

Plot 7-96. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



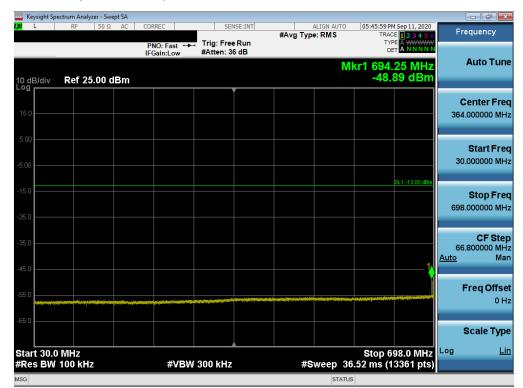
Plot 7-97. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 62 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 62 of 118
© 2020 PCTEST			



	ctrum Analyzer - Swe										×
LXI L	RF 50 Ω	AC COF	RREC	SEN	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS		E 1 2 3 4 5 6	Frequency	/
			NO: Fast 🔸 Gain:Low	Trig: Free #Atten: 3				DE			
10 dB/div Log	Ref 25.00 d	Bm					Mł	(r1 6.45 -37.0	5 GHz 05 dBm	Auto T	une
15.0										Center F 5.500000000	
-5.00										Start F 1.000000000	
-15.0									DL1 -13.00 dBm	Stop F 10.000000000	_
-35.0		,	~~~		~~~	1	~~~~			CF S 900.000000 <u>Auto</u>	
-55.0										Freq Of	f fset 0 Hz
-65.0										Scale T	
Start 1.000 #Res BW 1) GHz 1.0 MHz		#VBW	3.0 MHz		#S	weep 33		.000 GHz 8001 pts)	Log	<u>Lin</u>
MSG							STATUS				

Plot 7-98. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-99. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200QM	Proved to be part of @ element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 62 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 63 of 118
© 2020 PCTEST	•		



	ectrum Analyzer - Swept SA					
L <mark>XI</mark> L	RF 50 Ω AC	CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	05:47:47 PM Sep 11, 2020 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast ↔ IFGain:Low	↓ Trig: Free Run #Atten: 36 dB		TYPE A WWWW DET A NNNNN	Auto Tune
10 dB/div Log	Ref 25.00 dBm				lkr1 720.75 MHz -52.837 dBm	
15.0						Center Freq
15.0						858.000000 MHz
5.00						Start Freq
-5.00						716.000000 MHz
-15.0					DL1 -13.00 dBm	Stop Freq
-25.0						1.000000000 GHz
-35.0						CF Step
						28.400000 MHz <u>Auto</u> Man
-45.0						Freq Offset
-55.0	and the second secon	******	n de la declara ana se dina de la construcción de la construcción de la construcción de la construcción de la c	land ty if shifting as jugine you, it does not a part of	- 1949 - 1979 - 1999 - 1999 - 1999 - 1999 - 1999 -	0 Hz
-65.0						Scale Type
Start 0.71	60 CH 7				Stop 1.0000 GHz	
#Res BW		#VBW	/ 300 kHz	#Sweep	36.73 ms (5681 pts)	
MSG				STATU	JS	

Plot 7-100. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



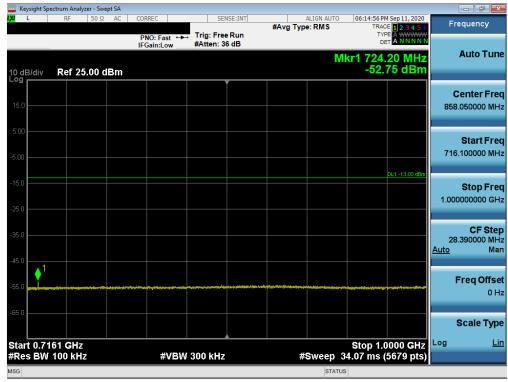
Plot 7-101. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200QM	Proved to be part of @ element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 64 of 119
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 64 of 118
© 2020 PCTEST	•		•



🔤 Keysight Spectrum Analyzer - Swept					
L RF 50 Ω	AC CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	06:13:07 PM Sep 11, 2020 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast ↔ IFGain:Low	Trig: Free Run #Atten: 36 dB		TYPE A WWWWW DET A NNNNN	
10 dB/div Ref 25.00 dB	m		М	kr1 696.50 MHz -54.42 dBm	Auto Tune
15.0					Center Freq 364.000000 MHz
-5.00				DL1 -13.00 dBm	Start Freq 30.000000 MHz
-15.0					Stop Freq 698.000000 MHz
-35.0					CF Step 66.800000 MHz <u>Auto</u> Man
-55.0	and the state of the			<u>t</u>	Freq Offset 0 Hz
-65.0					Scale Type
Start 30.0 MHz #Res BW 100 kHz	#VBW	300 kHz	#Sweep 33	Stop 698.0 MHz 3.85 ms (13361 pts)	
MSG			STATU		

Plot 7-102. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-103. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFK200QM	Poul to be part of @ element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage CE of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 65 of 118
© 2020 PCTEST	•			



	rum Analyzer - Swept SA								
L <mark>XI</mark> L	RF 50 Ω AC	CORREC	SEN	SE:INT	#Avg Typ	ALIGN AUTO e: RMS	06:17:28 PM 9 TRACE	Sep 11, 2020	Frequency
		PNO: Fast ++- IFGain:Low	Trig: Free #Atten: 36				TYPE	A WWWWW A N N N N N	
10 dB/div Log	Ref 25.00 dBm					Mk	r1 6.462 -36.89	0 GHz 4 dBm	Auto Tun
15.0				, 					Center Fre 5.500000000 GH
-5.00									Start Fre 1.000000000 GH
-15.0								L1 -13.00 dBm	Stop Fre 10.000000000 GH
-35.0					1				CF Ste 900.000000 MH <u>Auto</u> Ma
-45.0									Freq Offse 0 H
-65.0									Scale Typ
Start 1.000 #Res BW 1.		#VBW	3.0 MHz		#S	weep 34	Stop 10.0 80 ms (18.		Log <u>Li</u>
MSG						STATUS			

Plot 7-104. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFK200QM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage CC of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 66 of 118
© 2020 PCTEST				

^{© 2020} PCTEST All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



LTE Band 13

#Res BW 100		#VE	300 kHz	Sweep 3	5.86 ms (14941 pts)	
Start 30.0 MHz	:				Stop 777.0 MHz	Log <u>Lin</u>
						Scale Type
-70.0						
-60.0						Freq Offse 0 Ha
-50.0						
						74.700000 MH <u>Auto</u> Mar
-40.0						CF Step
-30.0						777.000000 MH:
-20.0						Stop Fred
-10.0					DL1 -13.00 dBm	
-10.0						Start Free 30.000000 MHz
0.00						
10.0						403.500000 MH2
						Center Free
	20.00 dBr	n		IV	-31.39 dBm	
		IFGain:Low	Atten: 30 dB		DET <mark>ANNNNN</mark> Ikr1 777.00 MHz	Auto Tune
	5032 6	PNO: Fast		#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNN	Frequency
X RL RF	50 Ω A	C CORREC	SENSE:INT	ALIGN AUTO	11:50:48 PM Oct 05, 2020	

Plot 7-105. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

	ectrum Analyzer - Sw									di 💌
RL	RF 50 Ω	AC	CORREC PNO: Fast C IFGain:Low		#Avg Typ	ALIGN AUTO De: RMS	TYPE A	2 3 4 5 6 WWWWW NNNNN	Freque	ency
0 dB/div	Ref 40.00 (dBm				Μ	kr1 887.95 -41.91	dBm	Aut	o Tur
30.0									Cent 893.500	erFre 000 MH
10.0									Sta 787.000	ntFre 000 MH
0.00							DL1	-13.00 dBm	Sto 1.000000	op Fre 000 GI
0.0									0 21.300 <u>Auto</u>	CFSte 000 MI Ma
0.0	h, ang dagang da Jitta dan arang di	and the second second	٩	1	 un an	9 ⁴ 10		night, geoladad	Fred	Offs ۱
50.0										le Typ
tart 0.78 Res BW	370 GHz 100 kHz		#VB	W 300 kHz		Sweep 1	Stop 1.000 0.22 ms (42	O GIIZ	Log	L
SG						STATUS	5			

Plot 7-106. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200QM	Poud to be part of & element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 67 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 67 of 118
© 2020 PCTEST		-	÷



	ectrum Analyz	er - Swep	ot SA										
X/RL	RF	50 Ω	AC	CORREC		SEN	ISE:INT	#Avg Ty	ALIGN AUTO		CE 1 2 3 4 5 6	Fre	quency
	_			PNO: Fa IFGain:L		Trig: Free #Atten: 30		#ring iy	56.14115	T) [
10 dB/div	Ref 0.0	0 dB	m						N	/kr1 9.99 -43	3 5 GHz .30 dBm		Auto Tune
-10.0											DL1 -13.00 dBm		enter Fred 000000 GH2
30.0													Start Free 000000 GH
40.0											1	10.000	Stop Free
70.0												900. <u>Auto</u>	CF Step 000000 MH Mar
30.0												F	req Offse 0 H
90.0												s	cale Typ
Start 1.00 #Res BW	00 GHz 1.0 MHz			#	VBW	3.0 MHz			Sweep	Stop 10 15.60 m <u>s (</u>	0.000 GHz 18001 pts)	Log	Lir
1SG									STA			-	

Plot 7-107. Conducted Spurious Plot (LTE Band 13 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200QM	Potest*	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 68 of 118
© 2020 PCTEST				

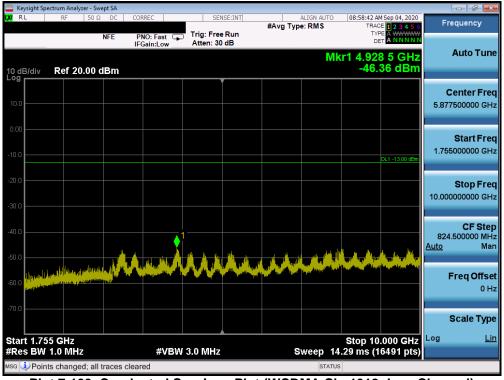
^{© 2020} PCTEST All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.



WCDMA AWS

	pectrum Analy												7 X
(<mark>RL</mark>	RF	50 Ω NF		CORREC PNO: Fa	st 🕞	SEI	Run	#Avg Typ	ALIGN AUTO	TRA	M Sep 04, 2020 CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Frequen	су
0 dB/div	Ref 20).00 dB		IFGain:Lo		Atten: 30	dB		M	(r1 1.70	5 0 GHz 98 dBm	Auto	Tur
10.0												Center 867.50000	
10.0											DL1 -13.00 dBm	Start 30.00000	
80.0											1	Stop 1.70500000	
io.o												CF 167.50000 <u>Auto</u>	Ste 0 Mi M
Sult day	Blooghoutly by to A	un and a star	den de la	اليناوليونية.	لىر بەر بەر بەر بەر بەر بەر بەر بەر بەر بە		ann sadhidan da ta	an plately and third	direitase tiped and		ing water provide	Freq (Offs 0 I
10.0	300 GHz									Stop 1	7050 GHz	Scale	Typ
	V 1.0 MH			#	VBW 3	.0 MHz			Sweep 2	.233 ms	(3351 pts)		
SG									STATUS	3			

Plot 7-108. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)



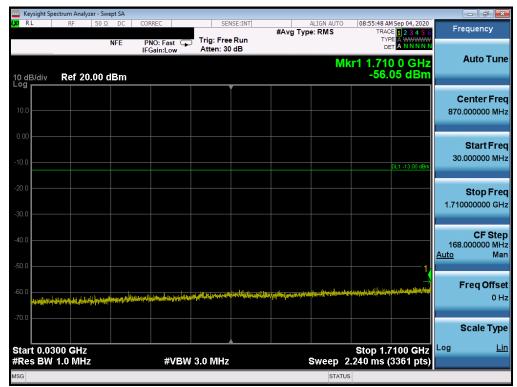
Plot 7-109. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

FCC ID: ZNFK200QM	PCTEST Proud to be part of @ element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset	Page 69 of 118
© 2020 PCTEST	•	•	<u>. </u>



	ctrum Analyzer - S								
LXU RL	RF 50 9	Ω DC	CORREC		#Avg Typ	ALIGN AUTO	TRAC	M Sep 04, 2020	Frequency
10 dB/div	Ref 10.00	NFE dBm	PNO: Fast	Atten: 20		Mkr	1 19.56	8 5 GHz 37 dBm	Auto Tune
0.00									Center Fred 15.000000000 GH:
20.0								DL1 -13.00 dBm	Start Free 10.000000000 GH
-30.0									Stop Free 20.000000000 GH
-50.0					de litteritierer		ر معرف الألب المراجع الم		CF Step 1.000000000 GH <u>Auto</u> Mar
70.0									Freq Offse 0 H
									Scale Type
Start 10.00 #Res BW				/ 3.0 MHz	s	weep 17	.33 ms (2	.000 GHz 0001 pts)	Log <u>Lir</u>

Plot 7-110. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)



Plot 7-111. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

FCC ID: ZNFK200QM	Pout to be part of @ element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 70 of 110
1M2009230153-13.ZNF	8/26/2020 - 10/30/2020	Portable Handset		Page 70 of 118
© 2020 PCTEST	•			