

PART 27 MEASUREMENT REPORT

Applicant Name:

LG Electronics USA, Inc.
111 Sylvan Avenue, North Building
Englewood Cliffs, NJ 07632
United States

Date of Testing:

11/9/2020 - 11/19/2020

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M2011050175-04-R1.ZNF

FCC ID:

ZNFF100VM

Applicant Name:

LG Electronics USA, Inc.

Application Type:

Class II Permissive Change

Model:

LM-F100VM

Additional Model(s):

LM-F100VM, F100VM, LM-F101V, LMF101V, F101V

EUT Type:

Portable Handset

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part:

27

Test Procedure(s):

ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, KDB 648474 D03 v01r04

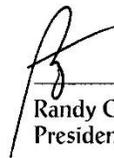
Class II Permissive Change:

Please see FCC change document

Note: This revised Test Report (S/N: 1M2011050175-04-R1.ZNF) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 1 of 77

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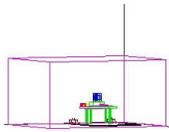
TABLE OF CONTENTS

1.0	INTRODUCTION	4
1.1	Scope	4
1.2	PCTEST Test Location.....	4
1.3	Test Facility / Accreditations.....	4
2.0	PRODUCT 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	DESCRIPTION OF TESTS	6
3.1	Evaluation Procedure	6
3.2	Radiated Power and Radiated Spurious Emissions	6
4.0	MEASUREMENT UNCERTAINTY	7
5.0	TEST EQUIPMENT CALIBRATION DATA	8
6.0	SAMPLE CALCULATIONS	9
7.0	TEST RESULTS.....	10
7.1	Summary.....	10
7.2	Conducted Power Output Data	12
7.3	Occupied Bandwidth	14
7.4	Spurious and Harmonic Emissions at Antenna Terminal	33
7.5	Band Edge Emissions at Antenna Terminal.....	39
7.6	Radiated Power (EIRP)	48
7.7	Radiated Spurious Emissions Measurements.....	51
7.8	Peak-Average Ratio.....	58
8.0	CONCLUSION.....	77

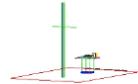
FCC ID: ZNFF100VM	 <small>Proud to be part of element</small>	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 2 of 77

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PART 27 MEASUREMENT REPORT



Overview Table						
Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
NR Band n77	100 MHz	π/2 BPSK	3750.0-3930.0	0.153	21.84	96M4G7D
		QPSK	3750.0-3930.0	0.132	21.21	96M5G7D
		16QAM	3750.0-3930.0	0.127	21.03	96M2W7D
		64QAM	3750.0-3930.0	0.105	20.20	96M2W7D
		256QAM	3750.0-3930.0	0.079	18.99	96M4W7D
	90 MHz	π/2 BPSK	3745.0-3935.0	0.158	21.99	86M4G7D
		QPSK	3745.0-3935.0	0.137	21.37	87M3G7D
		16QAM	3745.0-3935.0	0.107	20.28	87M5W7D
		64QAM	3745.0-3935.0	0.110	20.42	87M1W7D
		256QAM	3745.0-3935.0	0.077	18.84	87M3W7D
	80 MHz	π/2 BPSK	3740.0-3940.0	0.161	22.07	77M3G7D
		QPSK	3740.0-3940.0	0.157	21.96	77M4G7D
		16QAM	3740.0-3940.0	0.111	20.45	77M5W7D
		64QAM	3740.0-3940.0	0.101	20.04	77M4W7D
		256QAM	3740.0-3940.0	0.094	19.71	77M4W7D
	60 MHz	π/2 BPSK	3730.0-3950.0	0.169	22.29	57M8G7D
		QPSK	3730.0-3950.0	0.146	21.64	57M8G7D
		16QAM	3730.0-3950.0	0.125	20.98	57M8W7D
		64QAM	3730.0-3950.0	0.076	18.79	57M8W7D
		256QAM	3730.0-3950.0	0.082	19.12	57M9W7D
	50 MHz	π/2 BPSK	3725.0-3955.0	0.176	22.45	45M7G7D
		QPSK	3725.0-3955.0	0.164	22.14	47M6G7D
		16QAM	3725.0-3955.0	0.126	21.01	47M5W7D
		64QAM	3725.0-3955.0	0.100	20.02	47M5W7D
		256QAM	3725.0-3955.0	0.088	19.44	47M6W7D
	40 MHz	π/2 BPSK	3720.0-3960.0	0.170	22.31	36M0G7D
		QPSK	3720.0-3960.0	0.160	22.04	37M9G7D
		16QAM	3720.0-3960.0	0.126	21.02	38M0W7D
		64QAM	3720.0-3960.0	0.091	19.58	38M0W7D
		256QAM	3720.0-3960.0	0.093	19.68	38M0W7D
	20 MHz	π/2 BPSK	3710.0-3970.0	0.165	22.18	18M0G7D
		QPSK	3710.0-3970.0	0.147	21.67	18M4G7D
		16QAM	3710.0-3970.0	0.116	20.66	18M3W7D
		64QAM	3710.0-3970.0	0.094	19.73	18M4W7D
		256QAM	3710.0-3970.0	0.095	19.77	18M3W7D

EUT Overview Table

FCC ID: ZNFF100VM		PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 3 of 77	

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1.0 INTRODUCTION

1.1 Scope

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

1.2 PCTEST Test Location

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

1.3 Test Facility / Accreditations

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

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

FCC ID: ZNFF100VM	 PART 27 MEASUREMENT REPORT 		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 4 of 77

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFF100VM**. The test data contained in this report pertains only to the emissions due to the EUT's n77 transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 16522/ 16498

2.2 Device Capabilities

This device contains the following capabilities:

CDMA, GSM/GPRS/EDGE, WCDMA/HSPA, LTE, NR, WLAN, UNII, BT(1x,EDR,LE), NFC

2.3 Test Configuration

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

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT lying flat on an authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

2.4 EMI Suppression Device(s)/Modifications

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

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 5 of 77	

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3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-E-2016) and “Measurement Guidance for Certification of Licensed Digital Transmitters” (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

3.2 Radiated Power and Radiated Spurious Emissions

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

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

For radiated power measurements, substitution method is used per the guidance of ANSI/TIA-603-E-2016. A half-wave dipole is 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:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]};$$

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

For radiated spurious emissions measurements and calculations, conversion method is used per the formulas in KDB 971168 Section 5.8.4. Field Strength (EIRP) is calculated using the following formulas:

$$E_{\text{[dB}\mu\text{V/m]}} = \text{Measured amplitude level}_{\text{[dBm]}} + 107 + \text{Cable Loss}_{\text{[dB]}} + \text{Antenna Factor}_{\text{[dB/m]}}$$

And

$$\text{EIRP}_{\text{[dBm]}} = E_{\text{[dB}\mu\text{V/m]}} + 20\log D - 104.8; \text{ where } D \text{ is the measurement distance in meters.}$$

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.

Radiated power and radiated spurious emission levels are investigated with the receive antenna horizontally and vertically polarized per ANSI/TIA-603-E-2016.

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 6 of 77	

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4.0 MEASUREMENT UNCERTAINTY

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

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

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 7 of 77

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5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	N9020A	MXA Signal Analyzer	8/4/2020	Annual	8/4/2021	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	7/17/2020	Annual	7/17/2021	MY52350166
Emco	3115	Horn Antenna (1-18GHz)	6/18/2020	Biennial	6/18/2022	9704-5182
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	7/15/2020	Annual	7/15/2021	100342
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/10/2020	Annual	2/10/2021	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	2/21/2020	Annual	2/21/2021	102133
Sunol	DRH-118	Horn Antenna (1-18GHz)	10/3/2019	Biennial	10/3/2021	A050307
Sunol	DRH-118	Horn Antenna (1-18 GHz)	8/27/2019	Biennial	8/27/2021	A042511

Table 5-1. Test Equipment

Notes:

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.
2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 8 of 77	

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6.0 SAMPLE CALCULATIONS

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

Example: Spurious emission at 3700.40 MHz

The receive 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 3700.40 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm $- (-24.80) = 50.3$ dBc.

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 9 of 77	

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7.0 TEST RESULTS

7.1 Summary

Company Name: LG Electronics USA, Inc.
 FCC ID: ZNFF100VM
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): NR

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1046	Transmitter Conducted Output Power	N/A	CONDUCTED	PASS	Section 7.2
2.1049	Occupied Bandwidth	N/A			Section 7.3
2.1051 27.53(l)(2)	Out of Band Emissions	> 43 + 10 log ₁₀ (P[Watts]) at Band Edge and for all out-of-band emissions			Section 7.4
27.53(l)	Out of Band Emissions	Undesirable emissions must meet the limits detailed in 27.53(l)			Section 7.5
27.50(j)(4)	Peak-Average Ratio	< 13 dB			Section 7.8

Table 7-1. Summary of Conducted Test Results

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
27.50(j)(4)	Radiated Power (Band n77 Standalone)	< 1Watt EIRP	RADIATED	PASS	Section 7.6
27.53(l)(2)	Radiated spurious Emission (n77 standalone/ ENDC n77+B2/ n77+B13)	> 43 + 10 log ₁₀ (P[Watts]) for all out-of-band emissions			Section 7.7

Table 7-2. Summary of Radiated Test Results

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 10 of 77	

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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 were all 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.

FCC ID: ZNFF100VM	 PART 27 MEASUREMENT REPORT 		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 11 of 77

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7.2 Conducted Power Output Data

Test Overview

The EUT is set up to transmit at maximum power for LTE and NR channels. All power levels are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, 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.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

1. Span = 2 x OBW to 3 x OBW
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

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

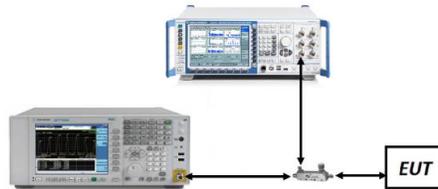


Figure 7-1. Test Instrument & Measurement Setup

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 12 of 77

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Bandwidth	Modulation	Channel	Frequency [MHz]	RB Size/Offset	Conducted Power [dBm]
100 MHz	π/2 BPSK	650000	3750.0	1 / 0	23.28
		656000	3840.0	1 / 0	23.51
		662000	3930.0	1 / 0	22.99
	QPSK	650000.0	3750.0	1 / 0	22.55
		656000	3840.0	1 / 0	23.64
		662000	3930.0	1 / 0	23.11
	16-QAM	662000	3930.0	1 / 0	22.88
	64-QAM	662000	3930.0	1 / 0	21.14
256-QAM	662000	3930.0	1 / 0	18.77	
90 MHz	π/2 BPSK	649666	3745.0	1 / 0	23.28
		656000	3840.0	1 / 0	23.56
		662666	3935.0	1 / 0	23.14
	QPSK	649666	3745.0	1 / 0	23.13
		656000	3840.0	1 / 0	23.23
		662666	3935.0	1 / 0	22.78
	16-QAM	656000	3840.0	1 / 0	22.29
	64-QAM	656000	3840.0	1 / 0	21.83
256-QAM	656000	3840.0	1 / 0	19.04	
80 MHz	π/2 BPSK	649333	3740.0	1 / 0	23.52
		656000	3840.0	1 / 0	23.60
		662666	3940.0	1 / 0	23.22
	QPSK	649333	3740.0	1 / 0	23.72
		656000	3840.0	1 / 0	23.86
		662666	3940.0	1 / 0	23.58
	16-QAM	656000	3840.0	1 / 0	22.46
	64-QAM	656000	3840.0	1 / 0	21.45
256-QAM	656000	3840.0	1 / 0	19.91	
60 MHz	π/2 BPSK	648666	3730.0	1 / 0	23.38
		656000	3840.0	1 / 0	23.58
		663333	3950.0	1 / 0	23.44
	QPSK	648666	3730.0	1 / 0	23.40
		656000	3840.0	1 / 0	23.46
		663333	3950.0	1 / 0	23.53
	16-QAM	656000	3840.0	1 / 0	22.99
	64-QAM	656000	3840.0	1 / 0	20.20
256-QAM	656000	3840.0	1 / 0	19.32	
50 MHz	π/2 BPSK	648333	3725.0	1 / 0	23.78
		656000	3840.0	1 / 0	23.67
		663666	3955.0	1 / 0	23.60
	QPSK	648333	3725.0	1 / 0	23.90
		656000	3840.0	1 / 0	23.74
		663666	3955.0	1 / 0	22.83
	16-QAM	648333	3725.0	1 / 0	22.78
	64-QAM	648333	3725.0	1 / 0	21.47
256-QAM	648333	3725.0	1 / 0	19.48	
40 MHz	π/2 BPSK	648000	3720.0	1 / 0	23.58
		656000	3840.0	1 / 0	24.05
		664000	3960.0	1 / 0	23.42
	QPSK	648000	3720.0	1 / 0	23.80
		656000	3840.0	1 / 0	24.12
		664000	3960.0	1 / 0	22.28
	16-QAM	648000	3720.0	1 / 0	22.79
	64-QAM	648000	3720.0	1 / 0	21.03
256-QAM	648000	3720.0	1 / 0	19.72	
20 MHz	π/2 BPSK	647333	3710.0	1 / 0	23.59
		656000	3840.0	1 / 0	23.62
		664666	3970.0	1 / 0	23.33
	QPSK	647333	3710.0	1 / 0	23.43
		656000	3840.0	1 / 0	23.48
		664666	3970.0	1 / 0	22.45
	16-QAM	656000	3840.0	1 / 0	22.67
	64-QAM	656000	3840.0	1 / 0	21.14
256-QAM	656000	3840.0	1 / 0	19.97	

Table 7.3 Conducted Power Data (NR Band n77)

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 13 of 77	

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7.3 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.

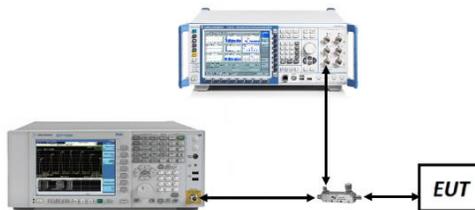


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

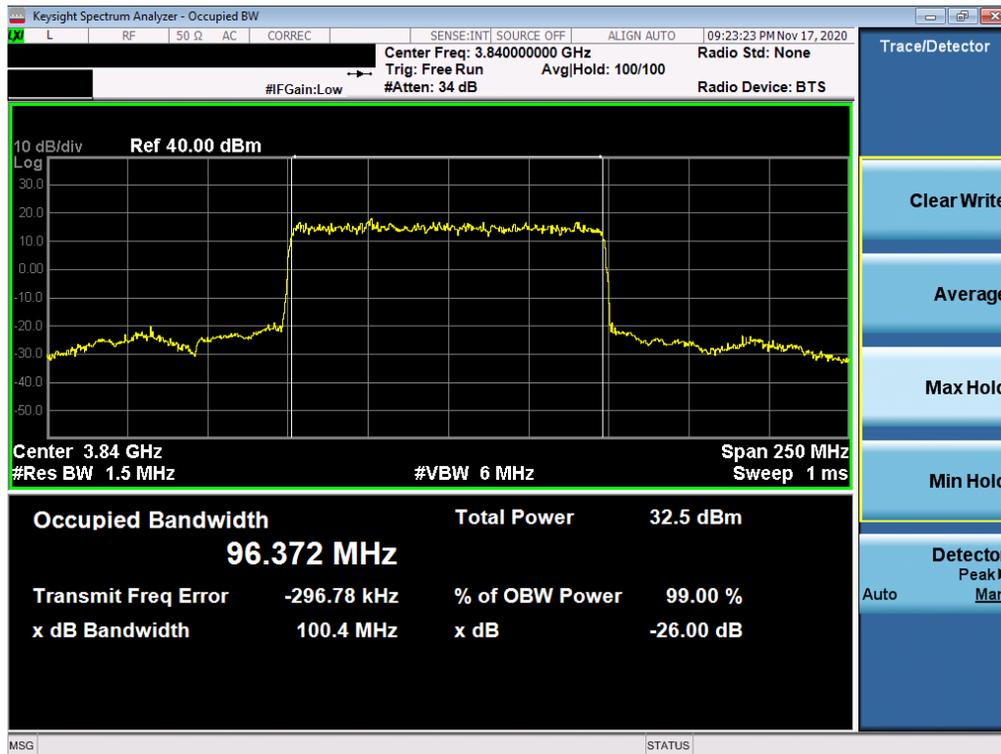
None.

FCC ID: ZNFF100VM	 PCTEST Proud to be part of 	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 14 of 77	

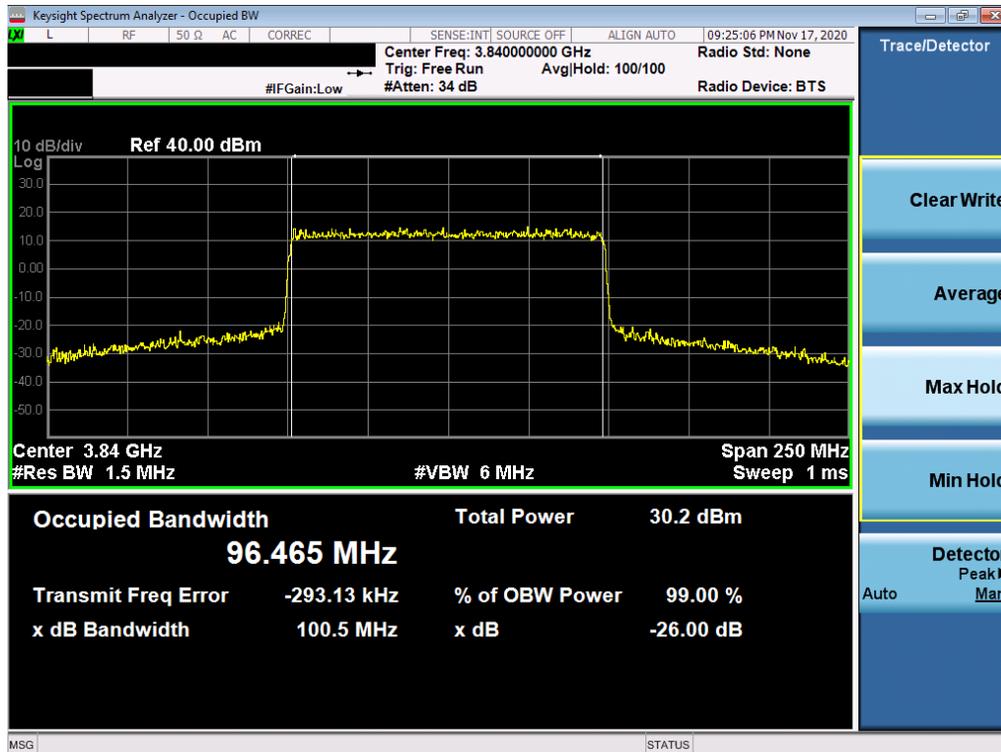
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NR Band n77



Plot 7-1. Occupied Bandwidth Plot (NR Band n77 - 100MHz $\pi/2$ BPSK - Full RB Configuration)

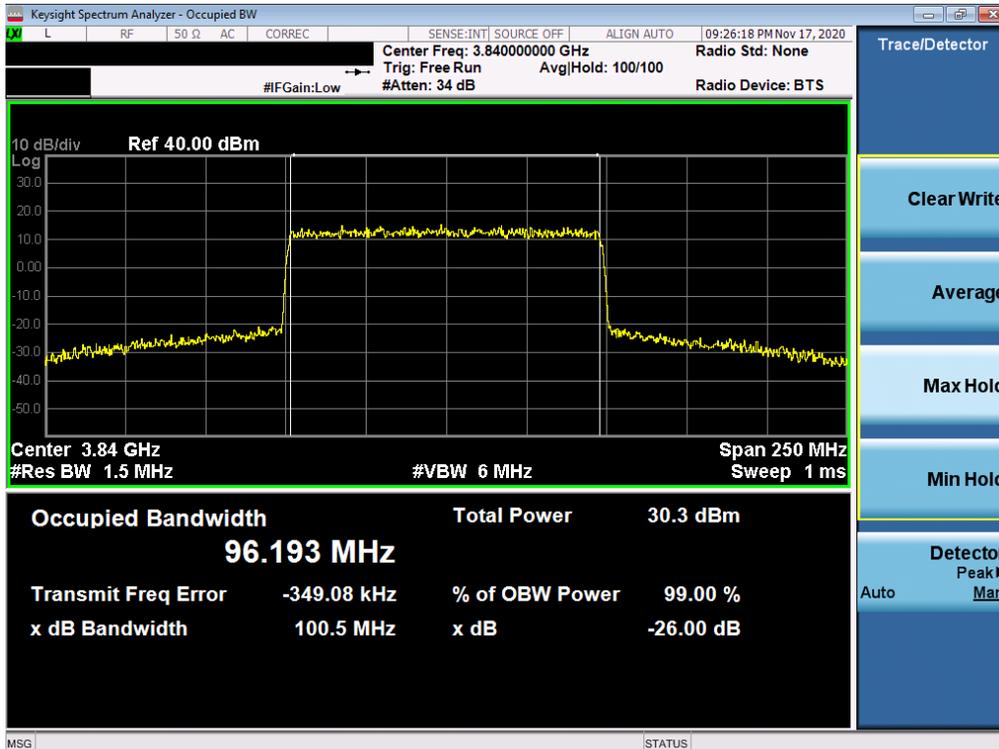


Plot 7-2. Occupied Bandwidth Plot (NR Band n77 - 100MHz QPSK - Full RB Configuration)

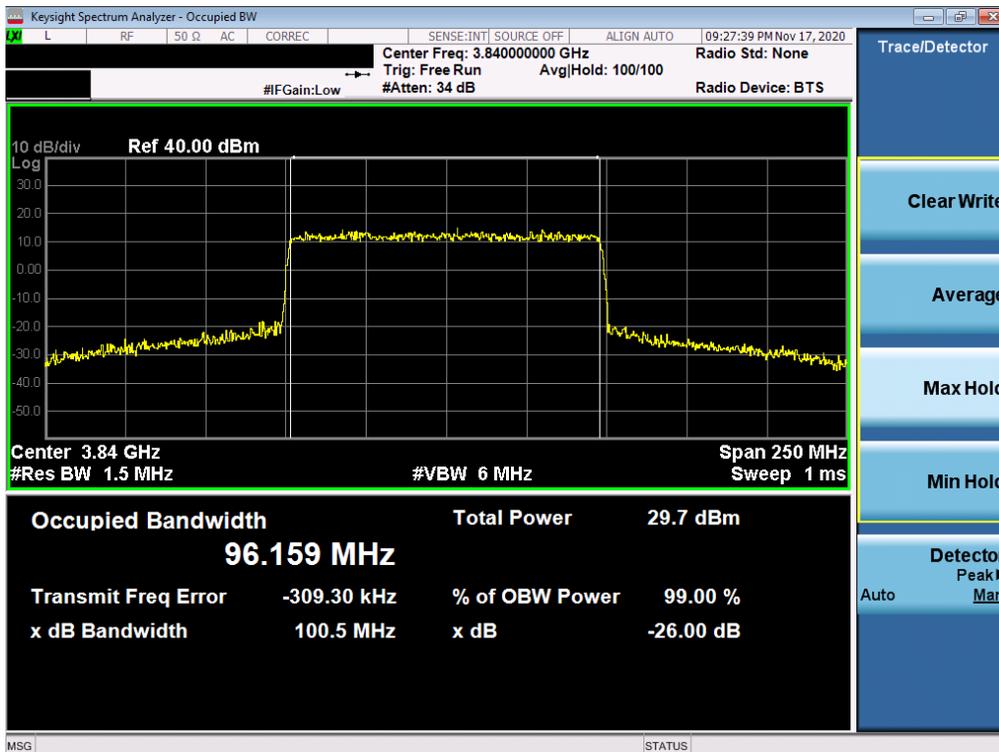
FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 15 of 77

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Plot 7-3. Occupied Bandwidth Plot (NR Band n77 - 100MHz 16-QAM - Full RB Configuration)



Plot 7-4. Occupied Bandwidth Plot (NR Band n77 - 100MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 16 of 77

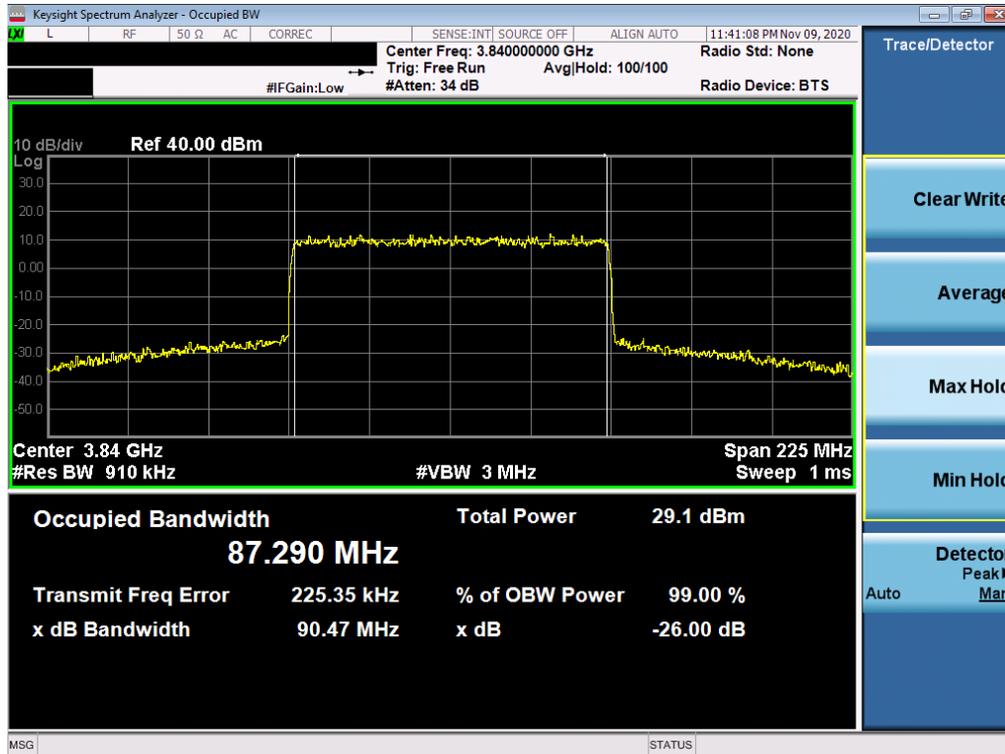


Plot 7-5. Occupied Bandwidth Plot (NR Band n77 - 100MHz 256-QAM - Full RB Configuration)

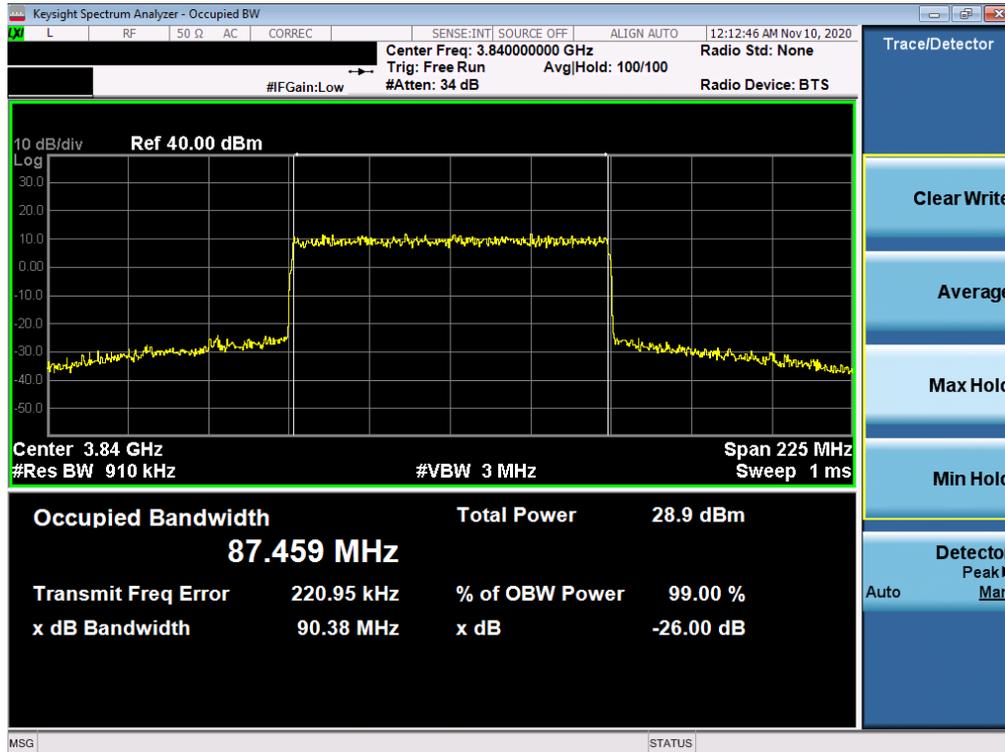


Plot 7-6. Occupied Bandwidth Plot (NR Band n77 - 90MHz $\pi/2$ BPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 17 of 77



Plot 7-7. Occupied Bandwidth Plot (NR Band n77 - 90MHz QPSK - Full RB Configuration)



Plot 7-8. Occupied Bandwidth Plot (NR Band n77 - 90MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 18 of 77

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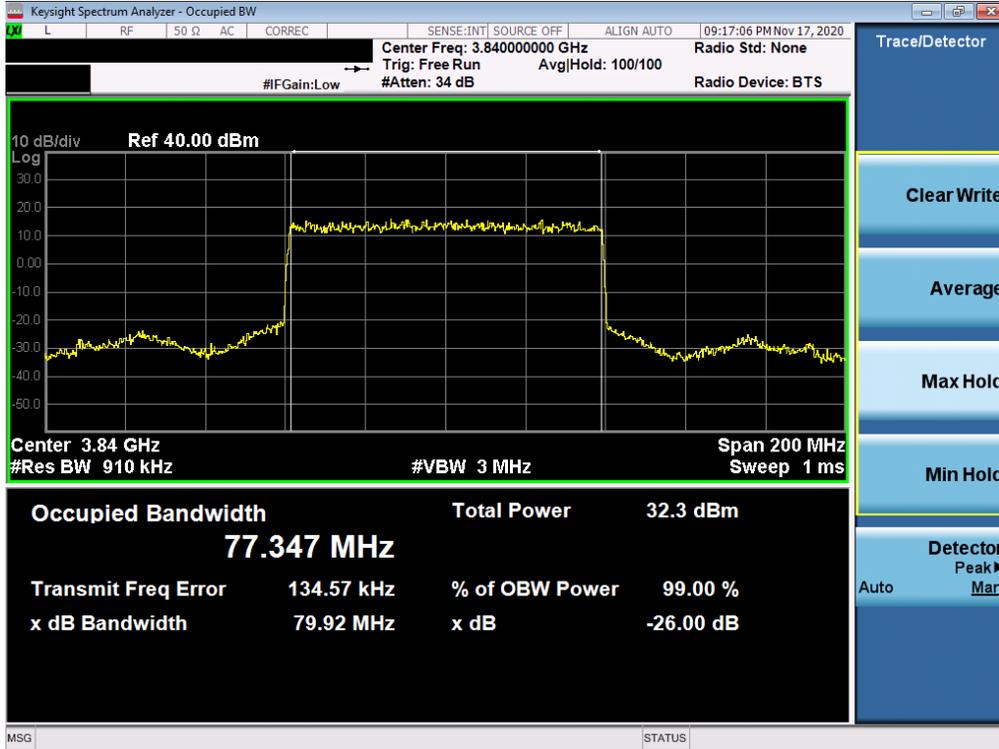


Plot 7-9. Occupied Bandwidth Plot (NR Band n77 - 90MHz 64-QAM - Full RB Configuration)

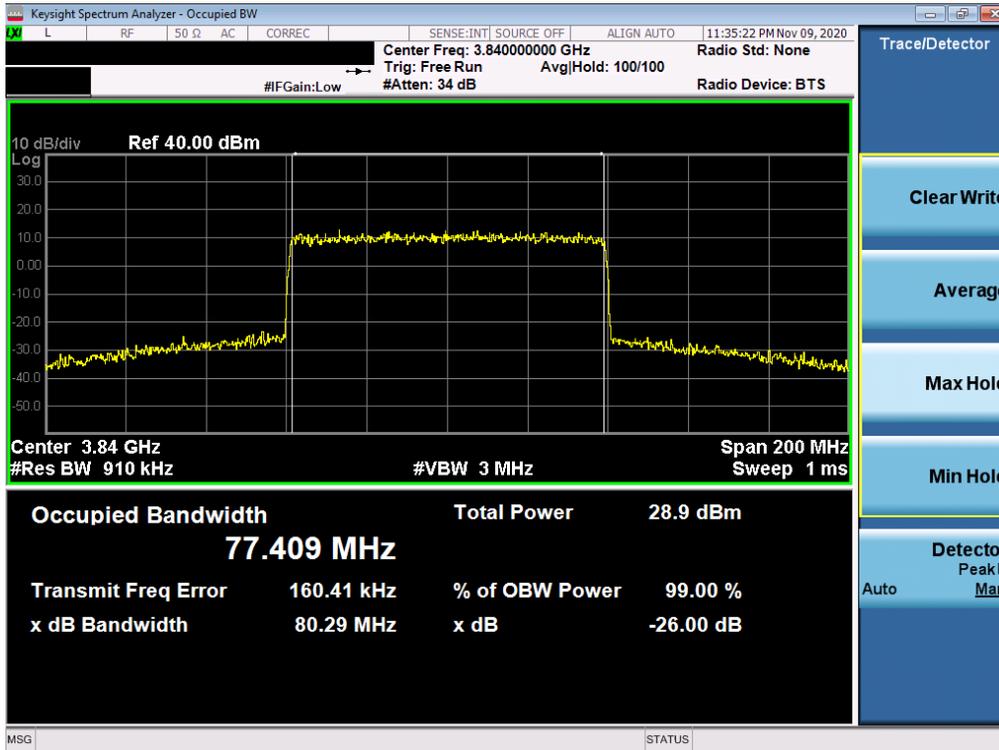


Plot 7-10. Occupied Bandwidth Plot (NR Band n77 - 90MHz 256-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 19 of 77

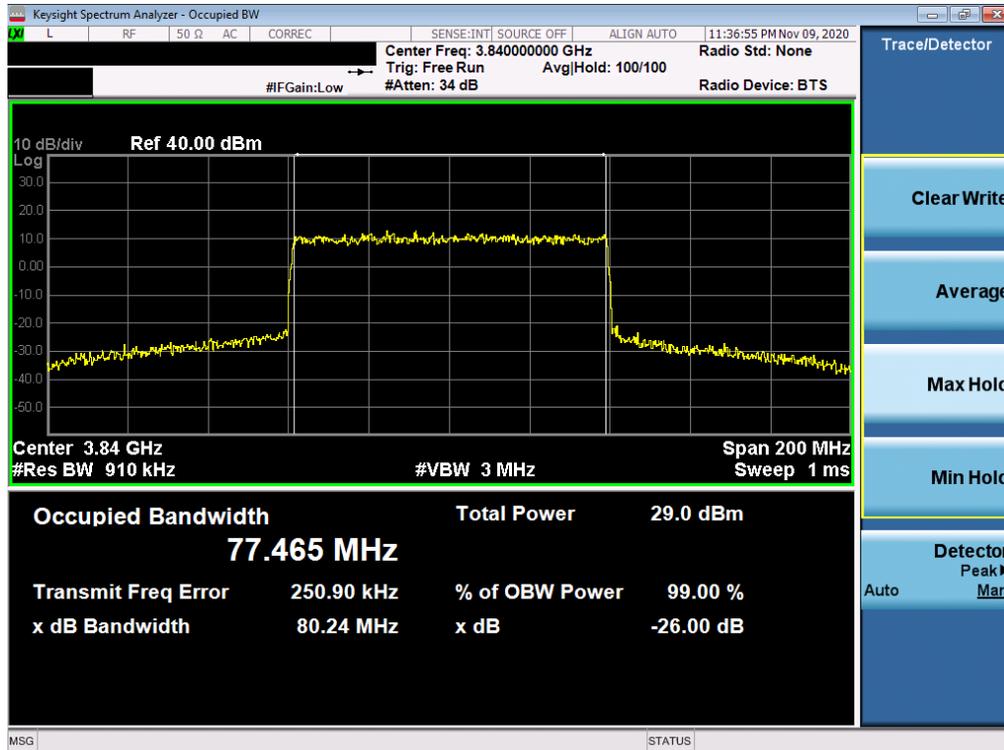


Plot 7-11. Occupied Bandwidth Plot (NR Band n77 - 80MHz $\pi/2$ BPSK - Full RB Configuration)

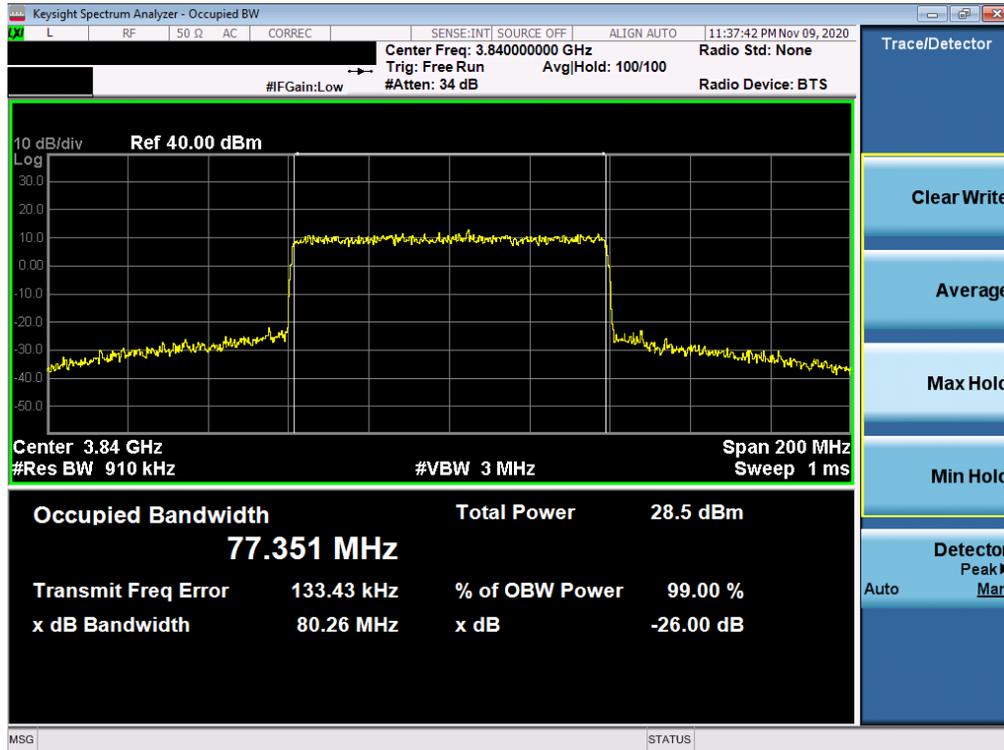


Plot 7-12. Occupied Bandwidth Plot (NR Band n77 - 80MHz QPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 20 of 77

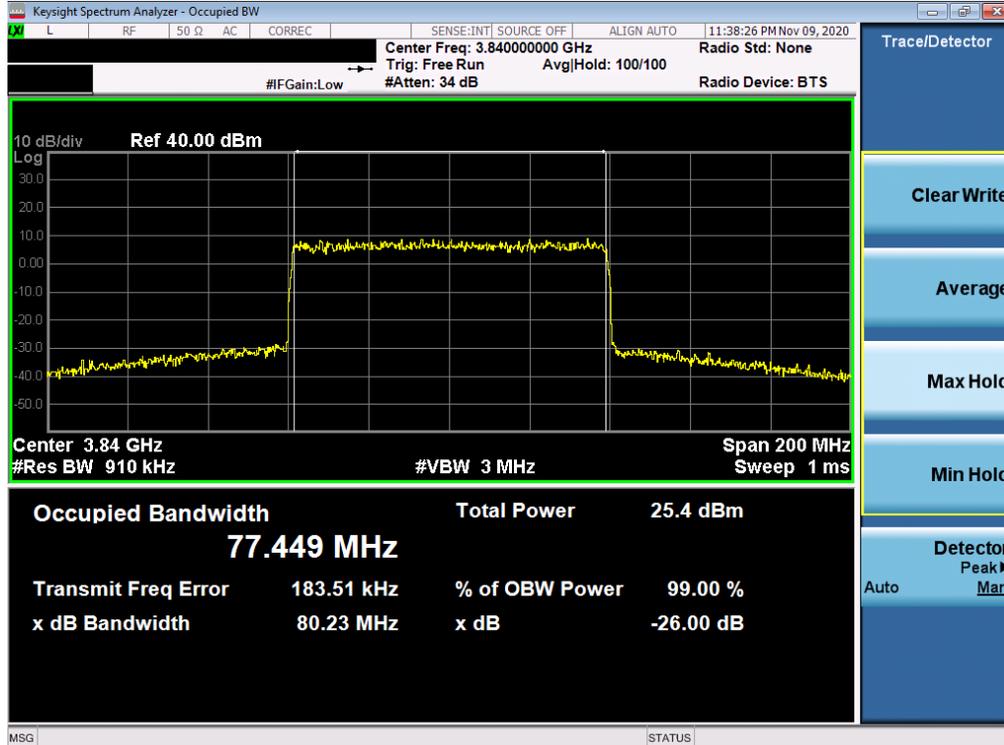


Plot 7-13. Occupied Bandwidth Plot (NR Band n77 - 80MHz 16-QAM - Full RB Configuration)

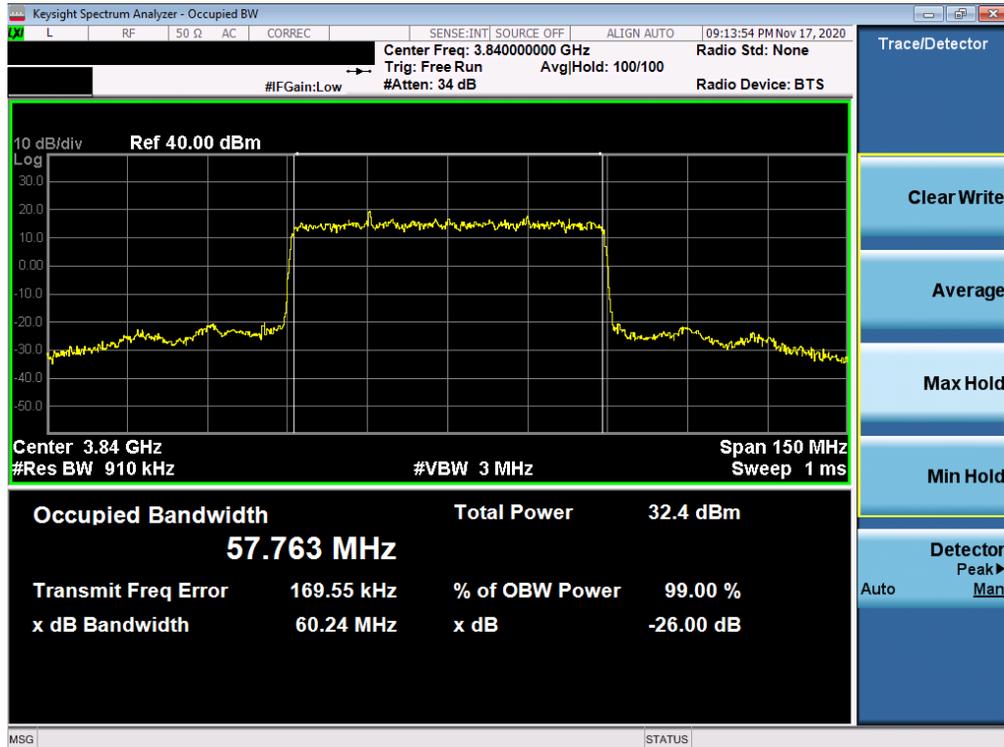


Plot 7-14. Occupied Bandwidth Plot (NR Band n77 - 80MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 21 of 77

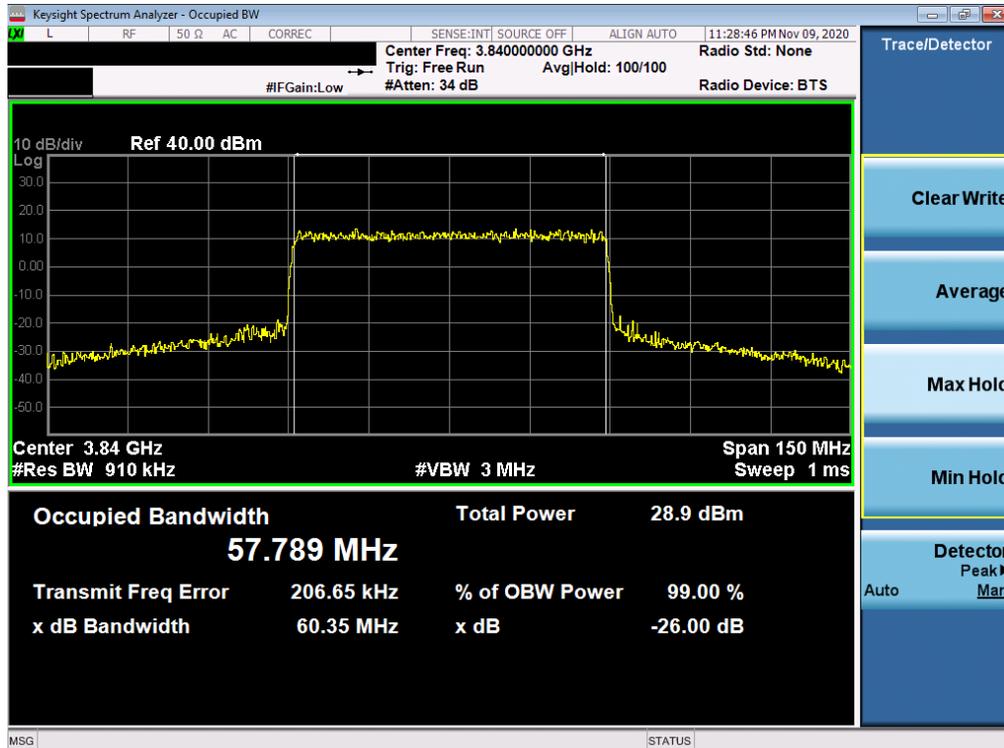


Plot 7-15. Occupied Bandwidth Plot (NR Band n77 - 80MHz 256-QAM - Full RB Configuration)



Plot 7-16. Occupied Bandwidth Plot (NR Band n77 - 60MHz $\pi/2$ BPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 22 of 77

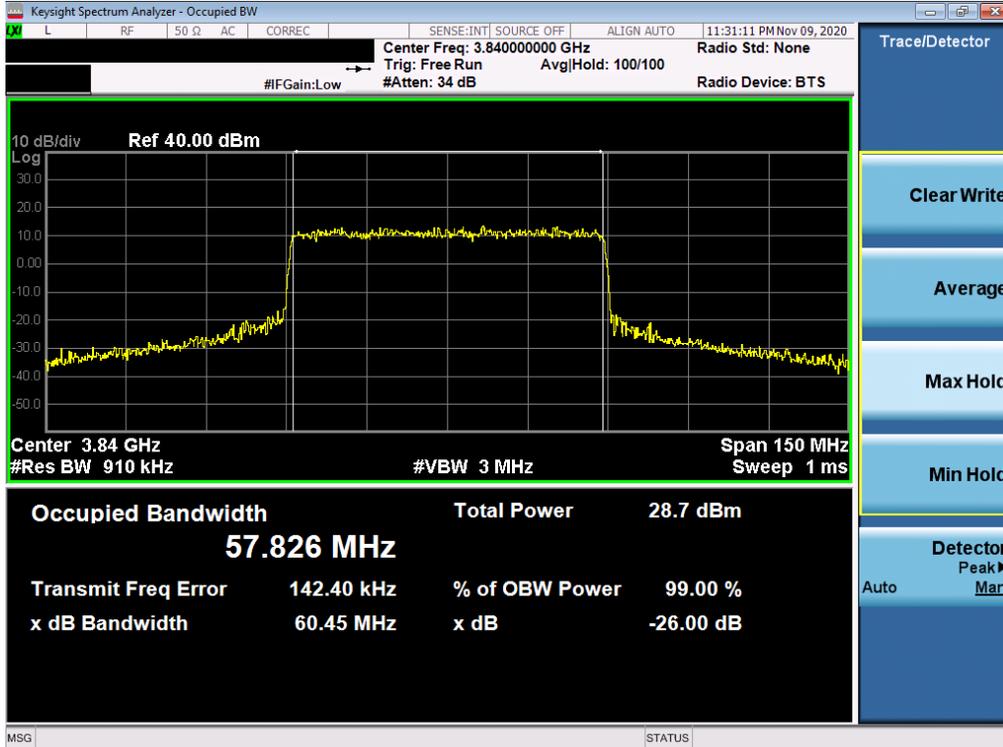


Plot 7-17. Occupied Bandwidth Plot (NR Band n77 - 60MHz QPSK - Full RB Configuration)

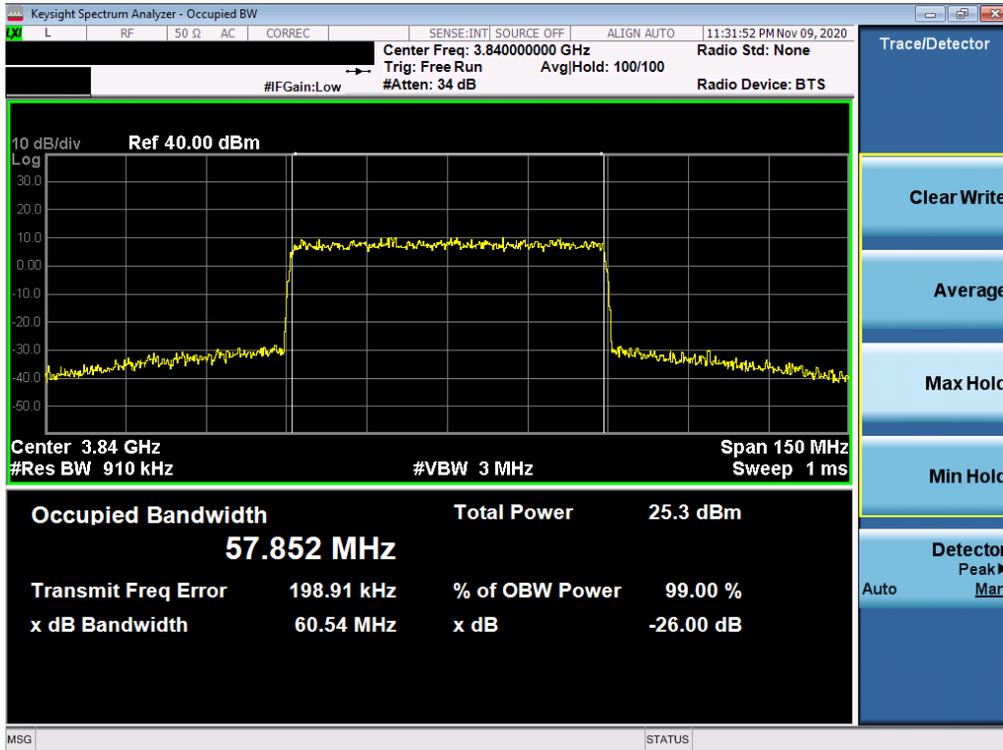


Plot 7-18. Occupied Bandwidth Plot (NR Band n77 - 60MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 23 of 77

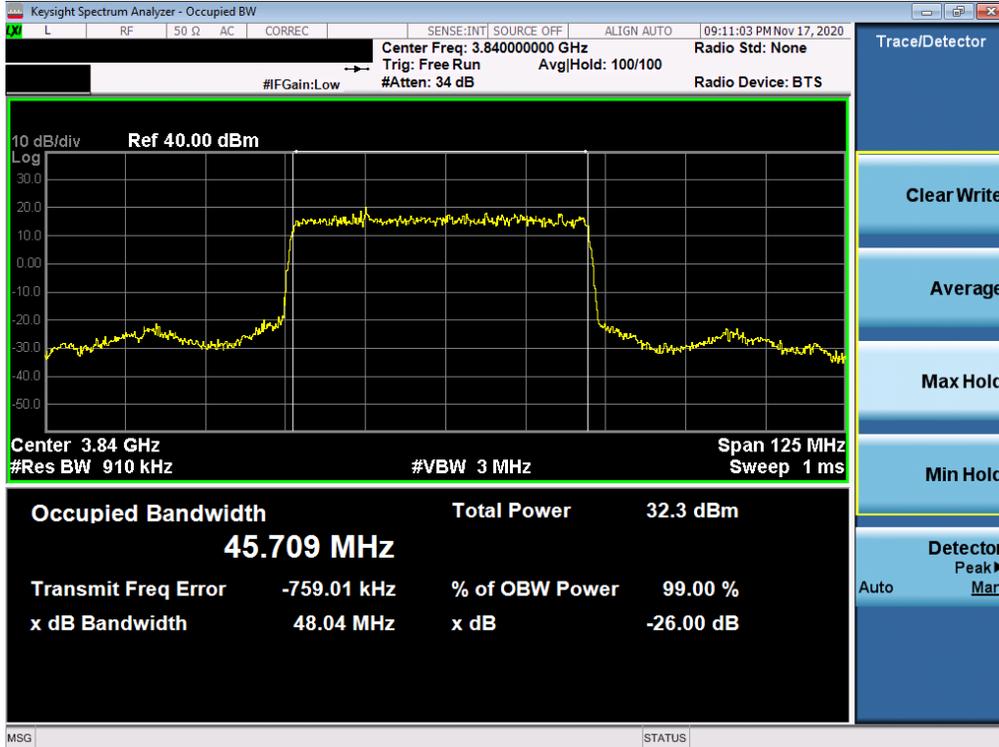


Plot 7-19. Occupied Bandwidth Plot (NR Band n77 - 60MHz 64-QAM - Full RB Configuration)

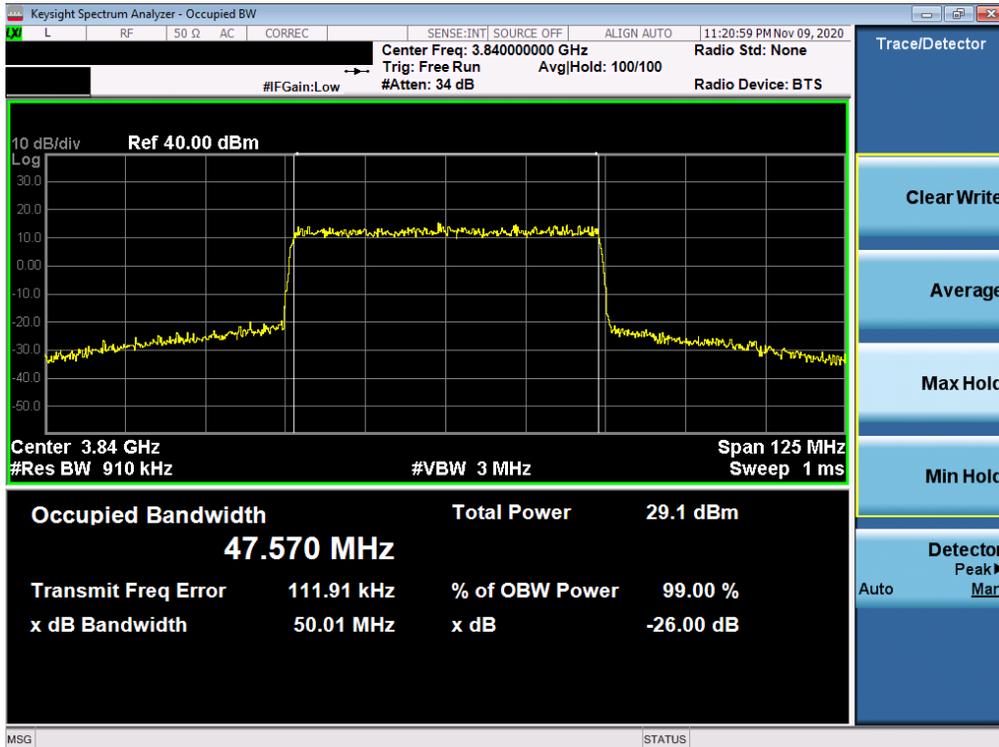


Plot 7-20. Occupied Bandwidth Plot (NR Band n77 - 60MHz 256-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 24 of 77



Plot 7-21. Occupied Bandwidth Plot (NR Band n77 - 50MHz $\pi/2$ BPSK - Full RB Configuration)



Plot 7-22. Occupied Bandwidth Plot (NR Band n77 - 50MHz QPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 25 of 77

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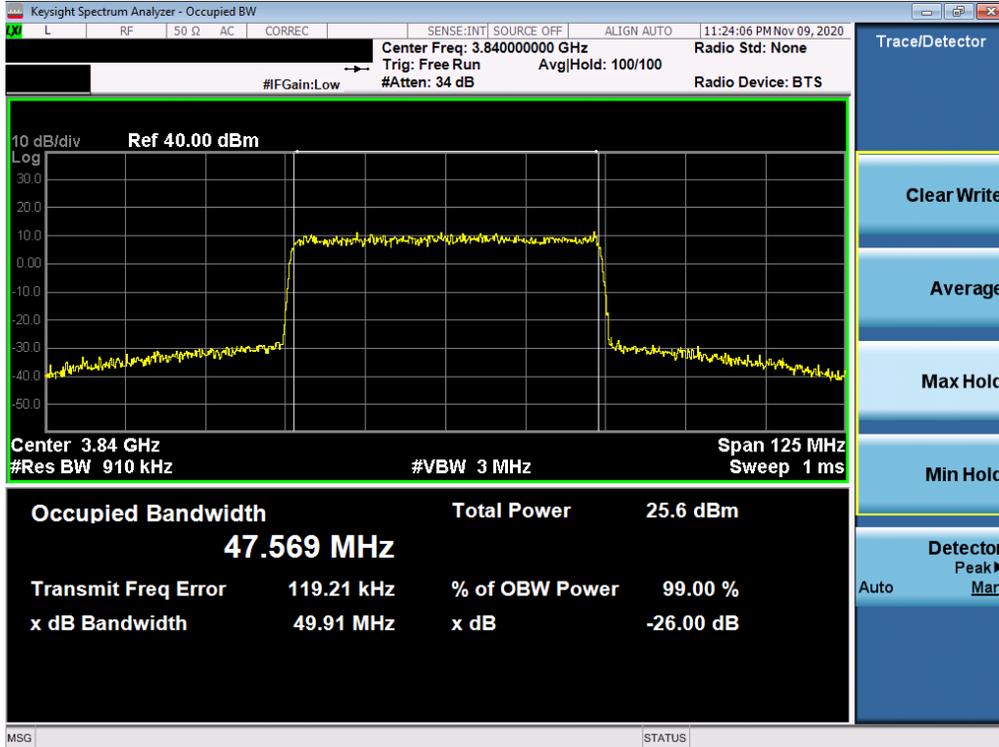


Plot 7-23. Occupied Bandwidth Plot (NR Band n77 - 50MHz 16-QAM - Full RB Configuration)

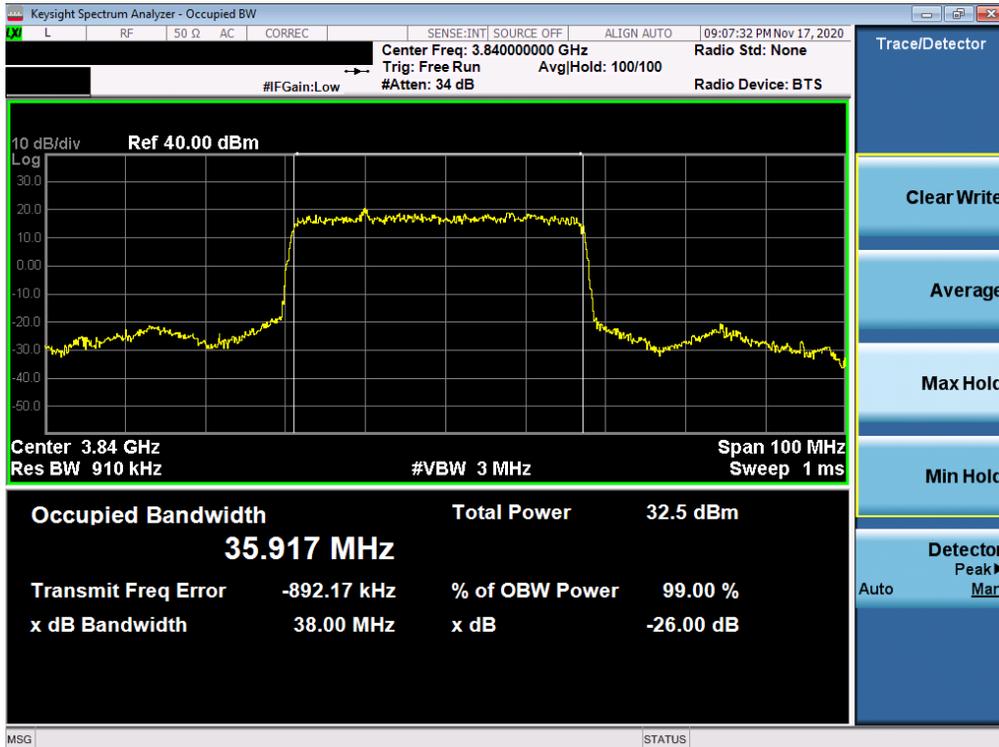


Plot 7-24. Occupied Bandwidth Plot (NR Band n77 - 50MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 26 of 77

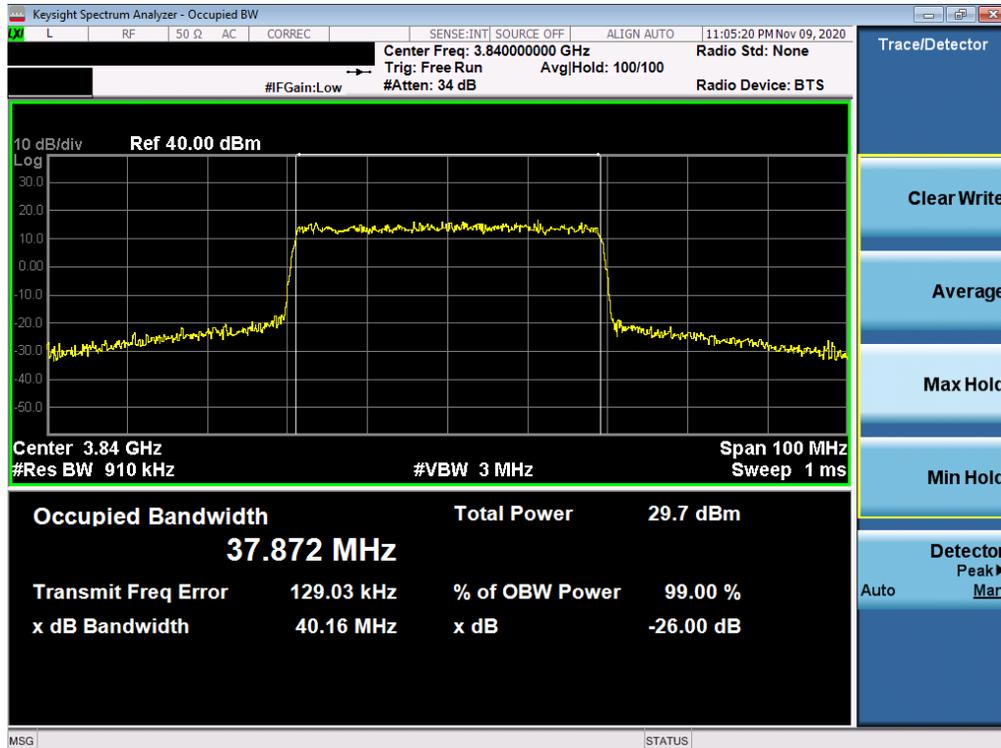


Plot 7-25. Occupied Bandwidth Plot (NR Band n77 - 50MHz 256-QAM - Full RB Configuration)

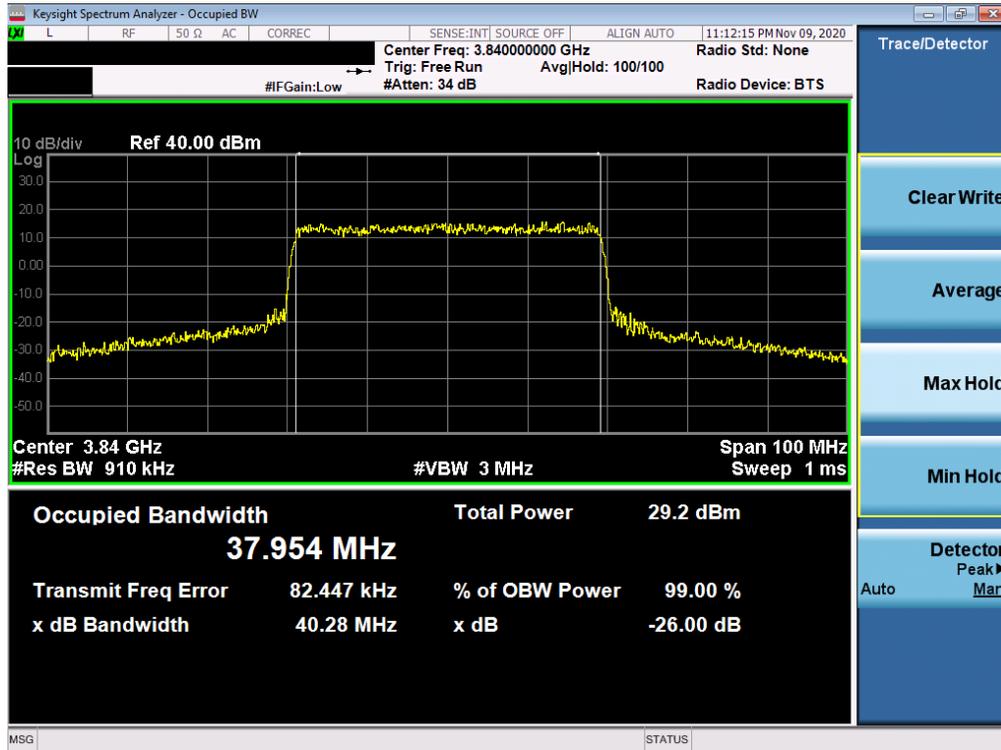


Plot 7-26. Occupied Bandwidth Plot (NR Band n77 - 40MHz $\pi/2$ BPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 27 of 77



Plot 7-27. Occupied Bandwidth Plot (NR Band n77 - 40MHz QPSK - Full RB Configuration)

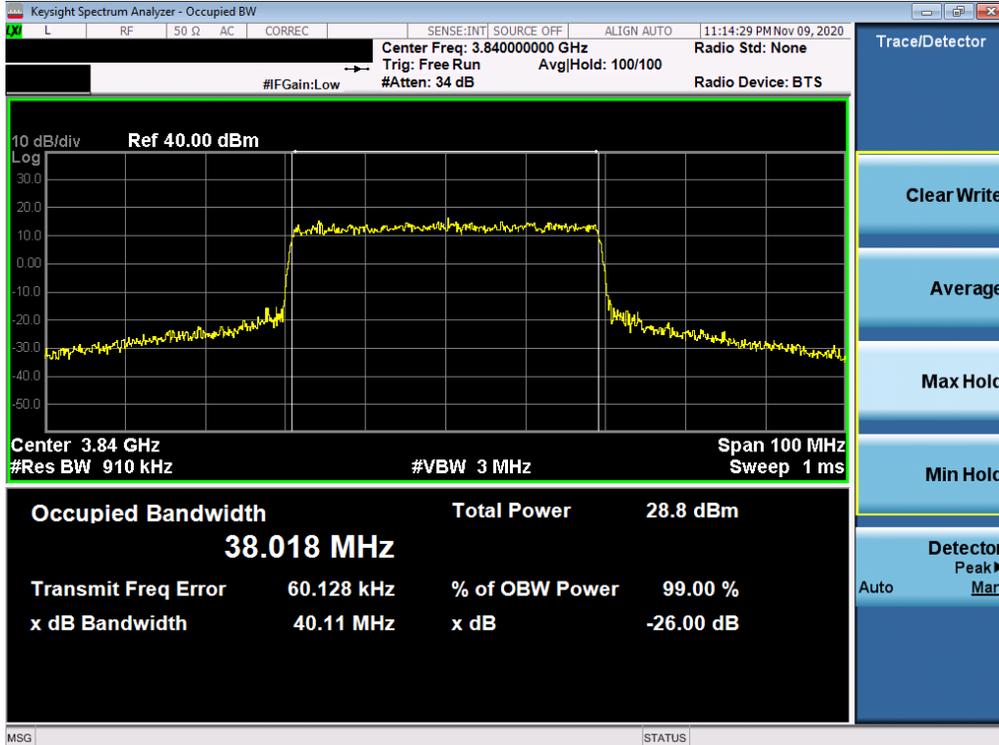


Plot 7-28. Occupied Bandwidth Plot (NR Band n77 - 40MHz 16-QAM - Full RB Configuration)

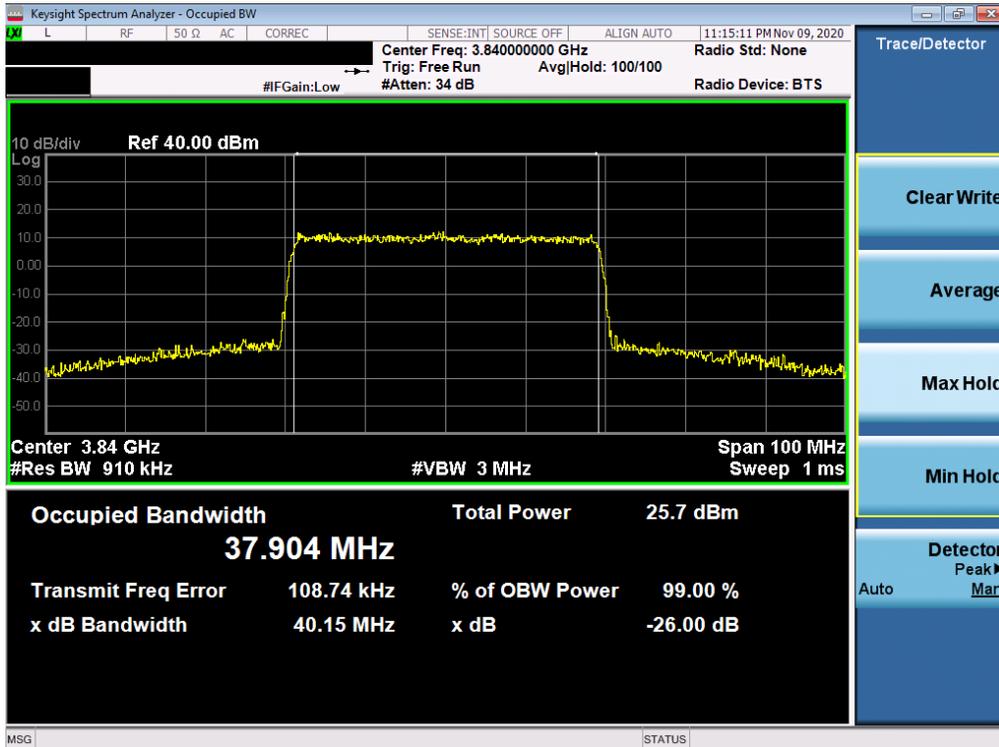
FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 28 of 77

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Plot 7-29. Occupied Bandwidth Plot (NR Band n77 - 40MHz 64-QAM - Full RB Configuration)

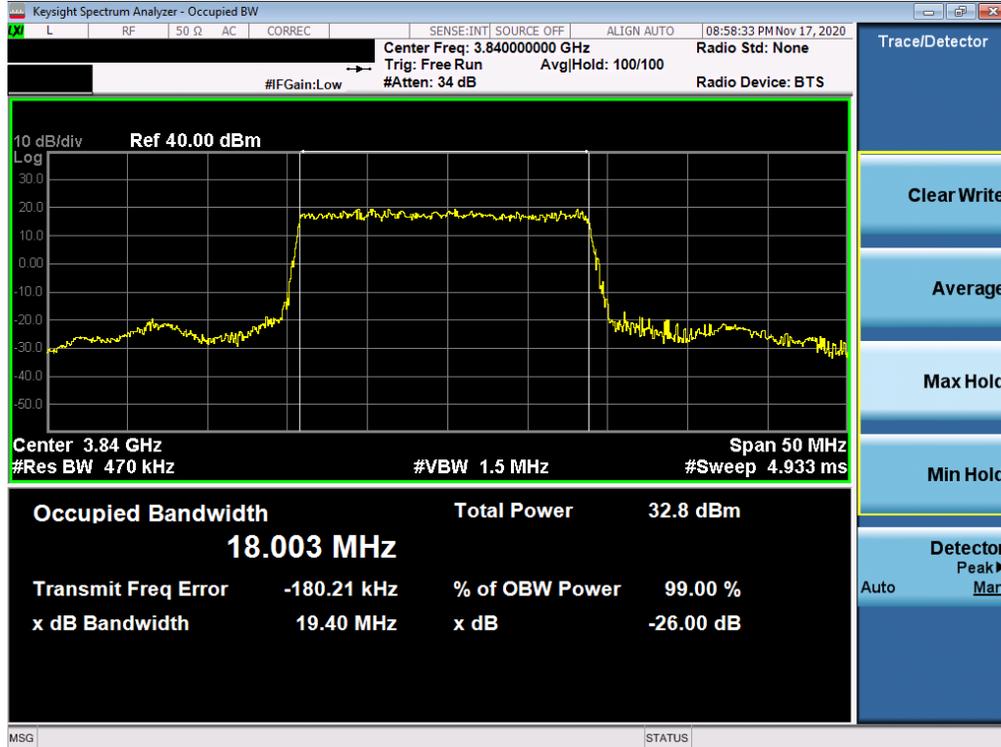


Plot 7-30. Occupied Bandwidth Plot (NR Band n77 - 40MHz 256-QAM - Full RB Configuration)

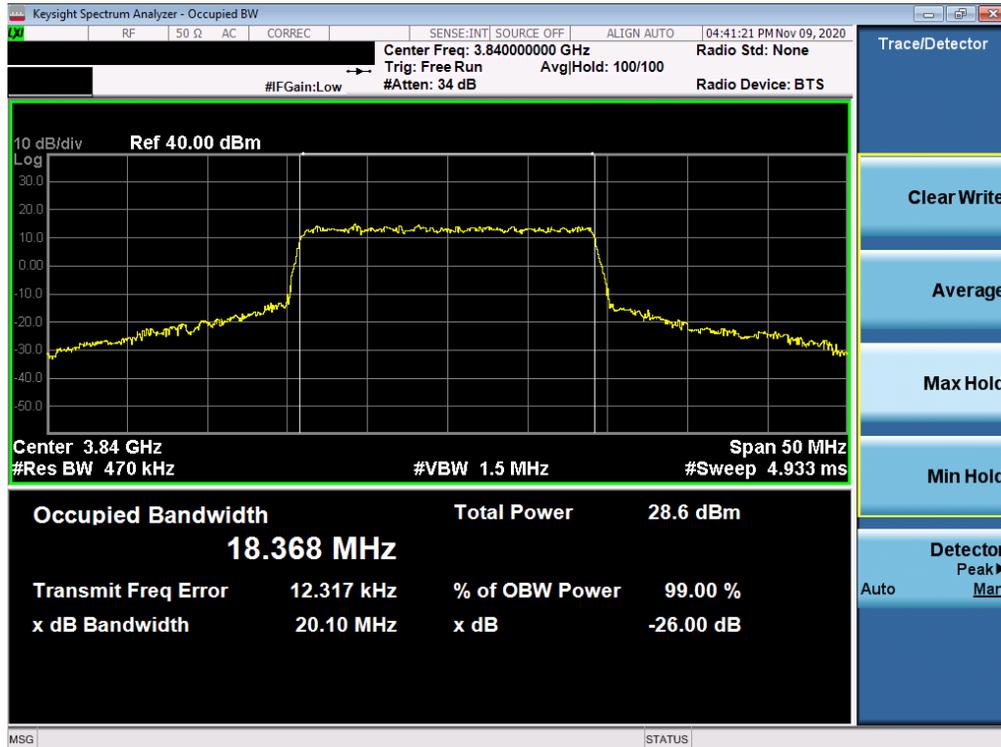
FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 29 of 77

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Plot 7-31. Occupied Bandwidth Plot (NR Band n77 - 20MHz $\pi/2$ BPSK - Full RB Configuration)



Plot 7-32. Occupied Bandwidth Plot (NR Band n77 - 20MHz QPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 30 of 77

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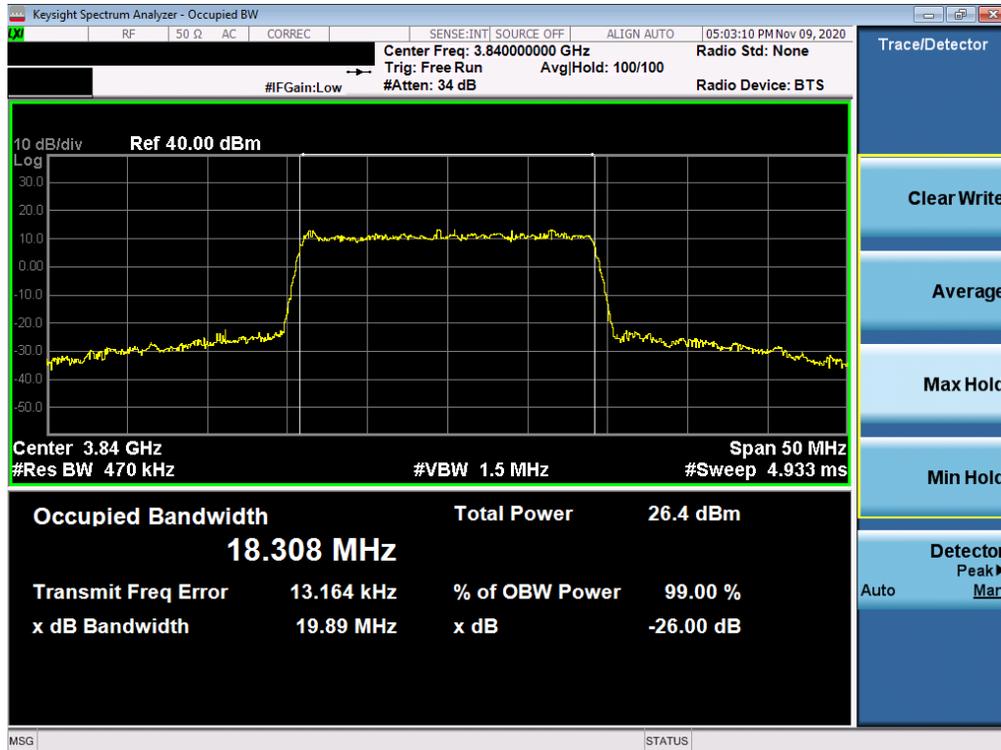


Plot 7-33. Occupied Bandwidth Plot (NR Band n77 - 20MHz 16-QAM - Full RB Configuration)



Plot 7-34. Occupied Bandwidth Plot (NR Band n77 - 20MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 31 of 77



Plot 7-35. Occupied Bandwidth Plot (NR Band n77 - 20MHz 256-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1-ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 32 of 77

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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 10GHz (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

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

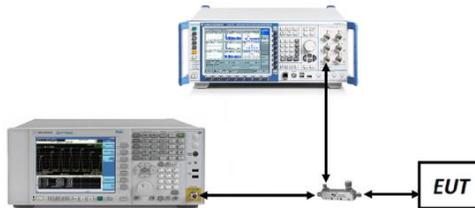


Figure 7-3. Test Instrument & Measurement Setup

Test Notes

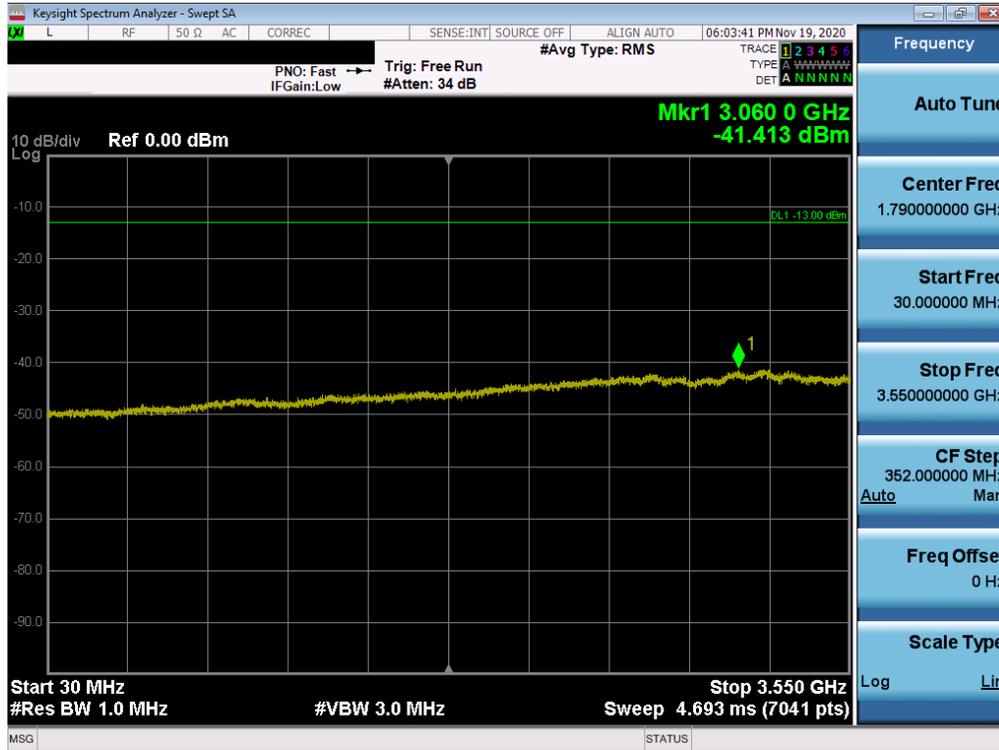
1. Per Part 27, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 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.
2. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 33 of 77	

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NR Band n77



Plot 7-36. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

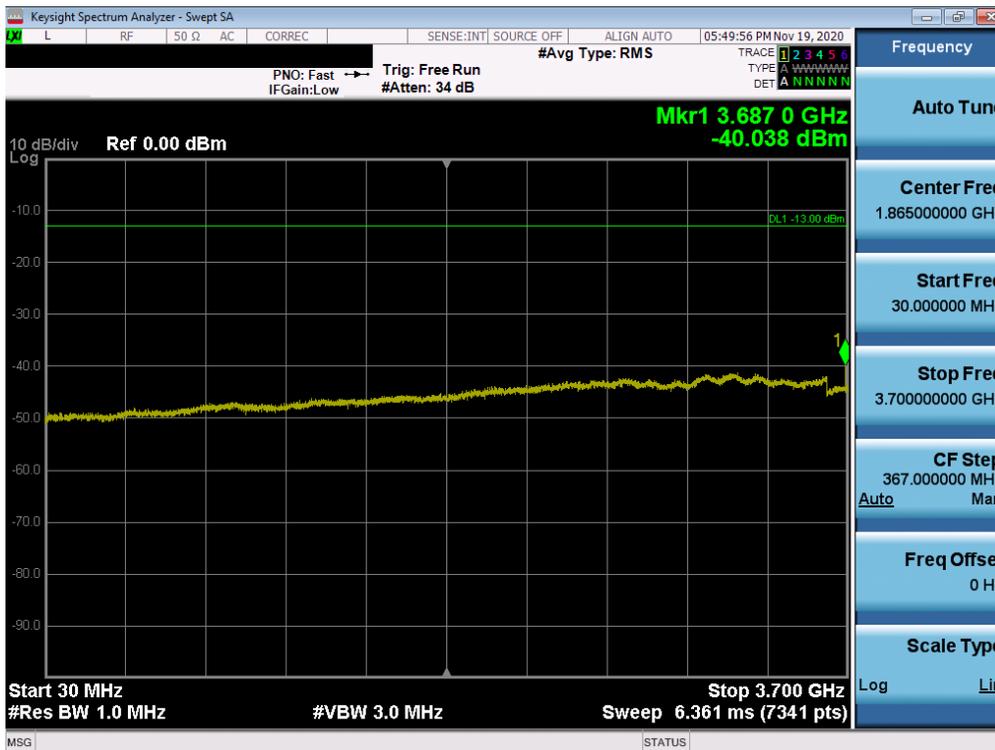


Plot 7-37. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 34 of 77



Plot 7-38. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

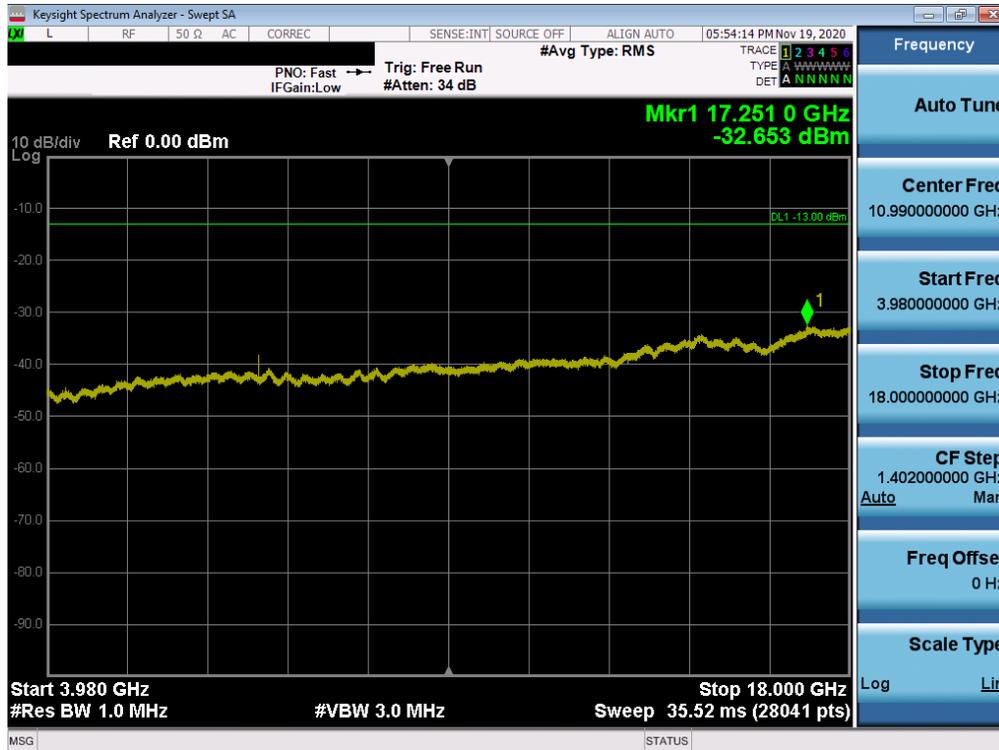


Plot 7-39. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

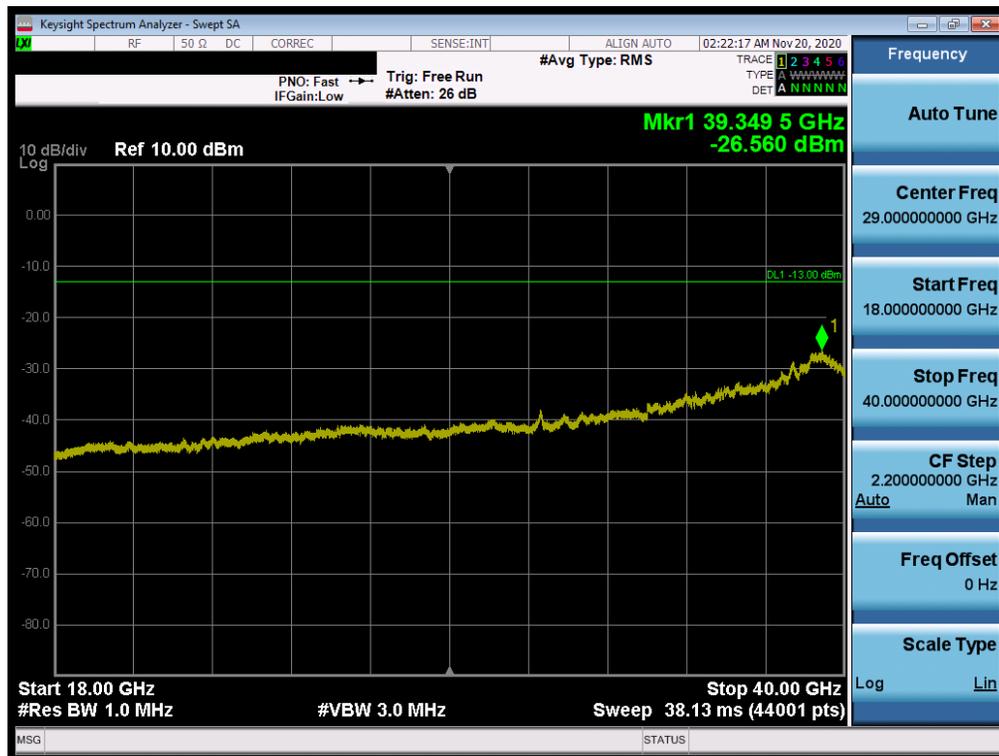
FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 35 of 77

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Plot 7-40. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

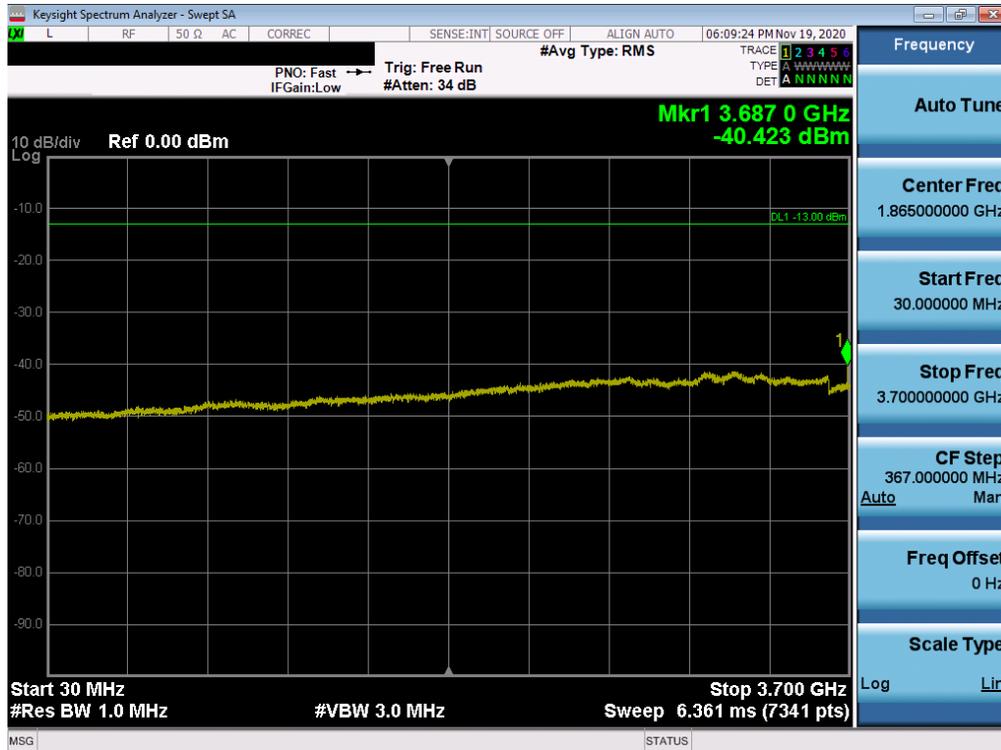


Plot 7-41. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

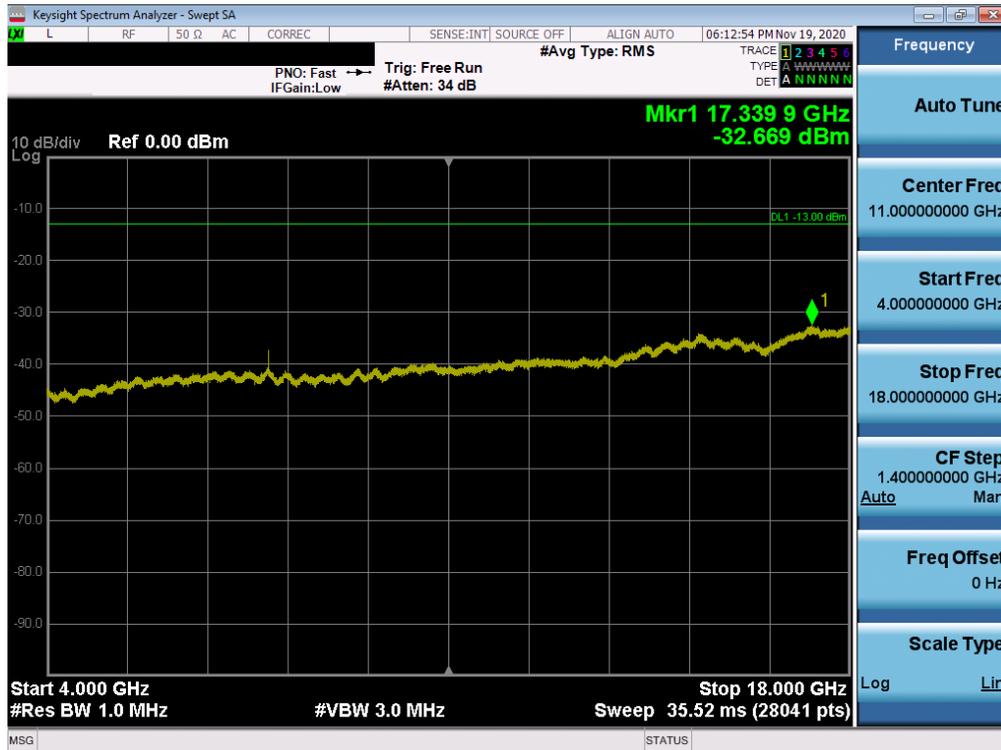
FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 36 of 77

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Plot 7-42. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

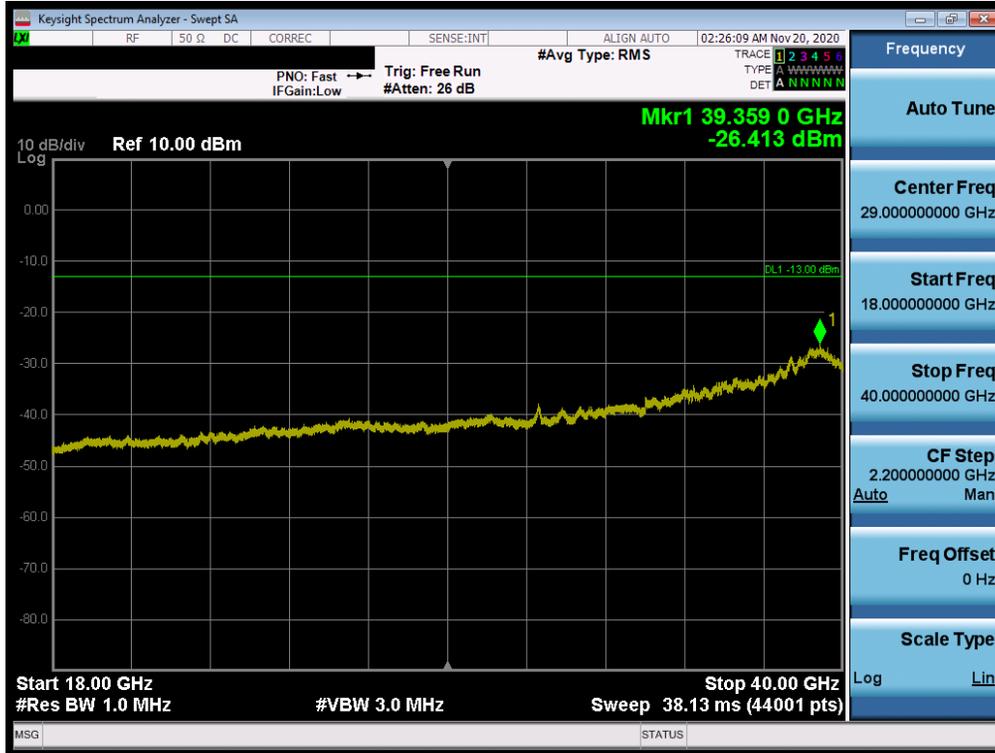


Plot 7-43. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 37 of 77

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Plot 7-44. Conducted Spurious Plot (NR Band n77 - 100MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1-ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 38 of 77

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7.5 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. $VBW \geq 3 \times RBW$
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span}/RBW$
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.

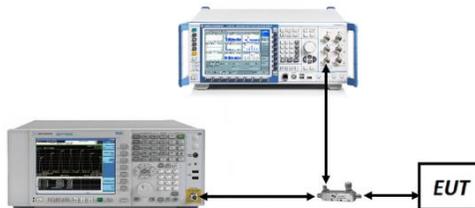


Figure 7-4. Test Instrument & Measurement Setup

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 39 of 77

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Test Notes

1. For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.
2. For 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with this paragraph (l)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. The 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. However, we have used the higher resolution BW of 1MHz for testing than what was required to show compliance.

FCC ID: ZNFF100VM	 PART 27 MEASUREMENT REPORT 		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 40 of 77

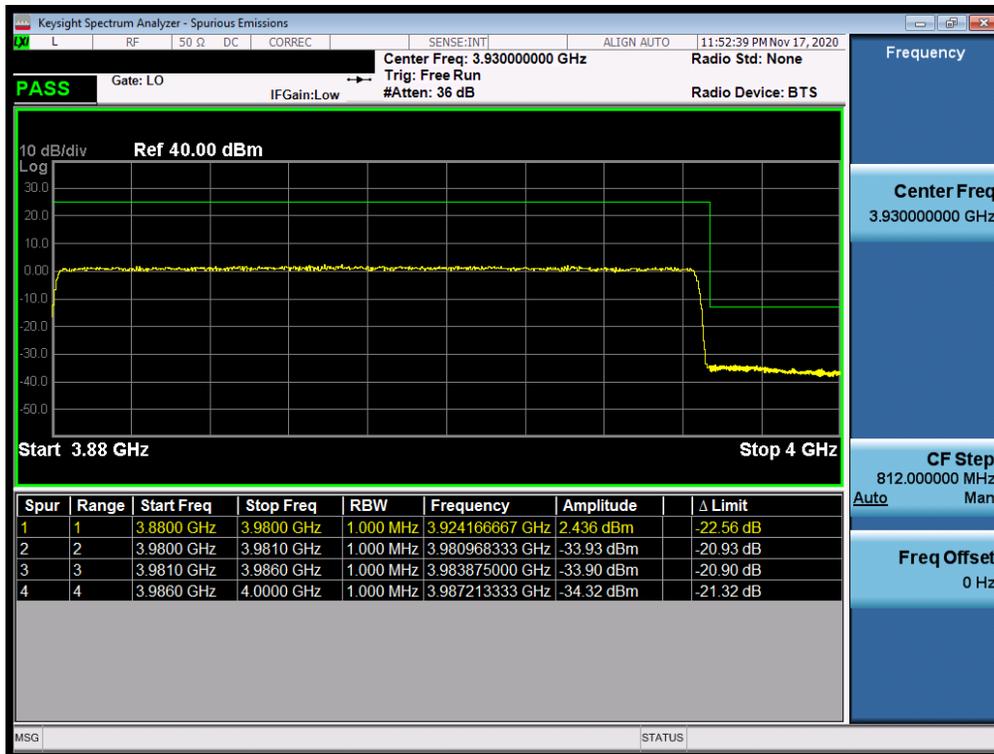
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NR Band n77



Plot 7-45. Lower Band Edge Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB Configuration)

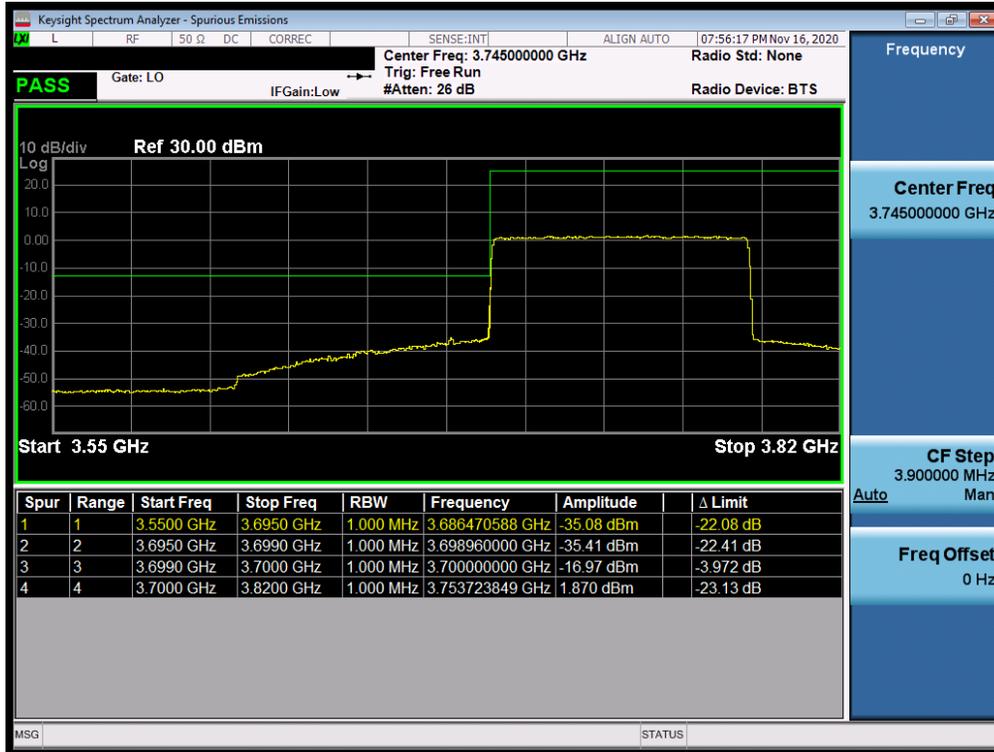


Plot 7-46. Upper Band Edge Plot (NR Band n77 - 100MHz CP-OFDM-QPSK – Full RB Configuration)

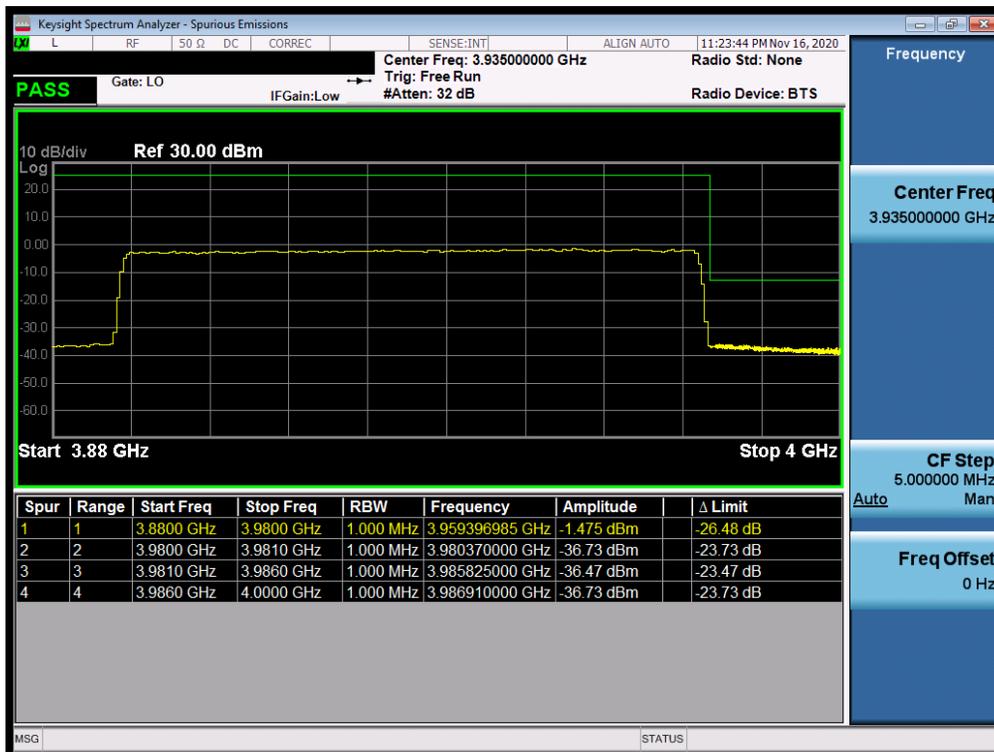
FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 41 of 77

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Plot 7-47. Lower Band Edge Plot (NR Band n77 - 90MHz CP-OFDM-QPSK – Full RB Configuration)

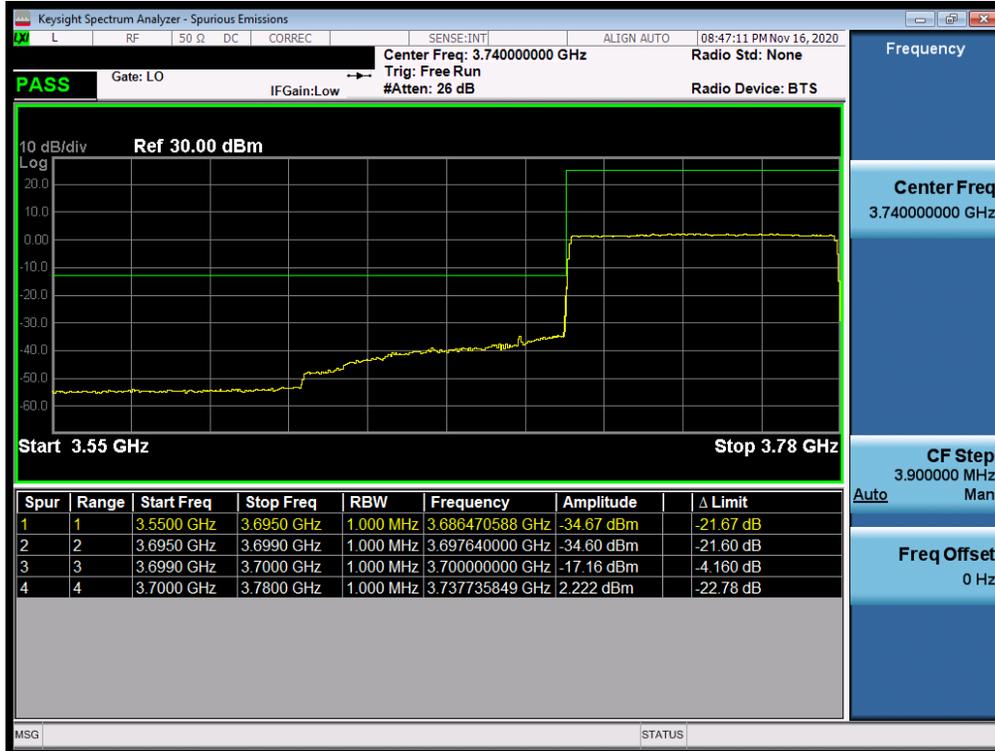


Plot 7-48. Upper Band Edge Plot (NR Band n77 - 90MHz CP-OFDM-QPSK – Full RB Configuration)

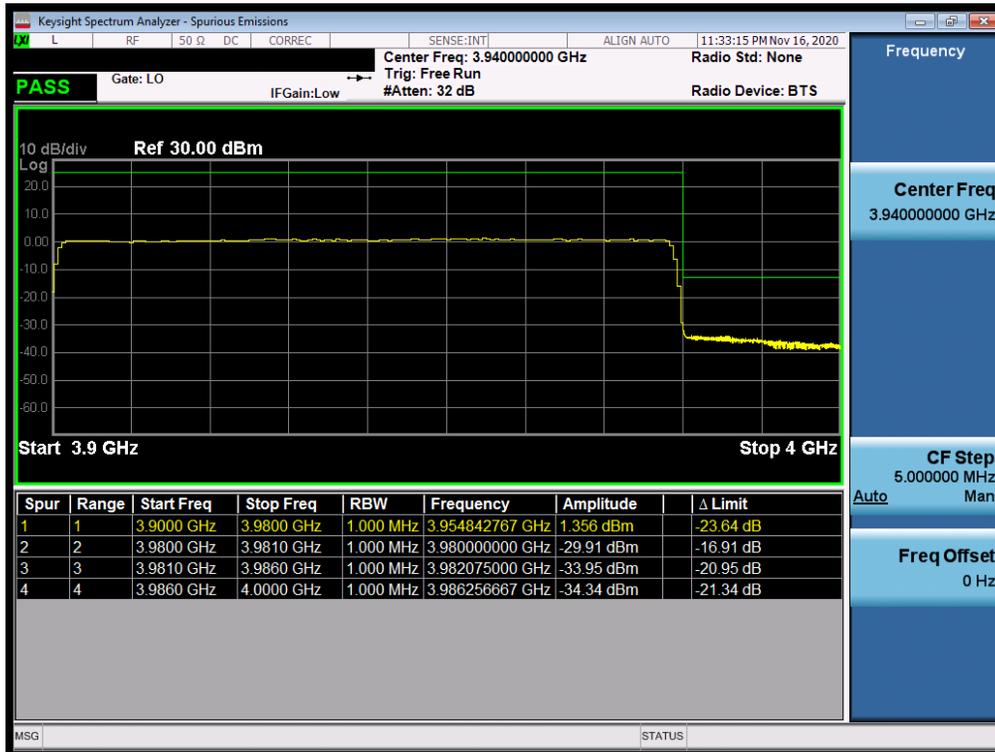
FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 42 of 77

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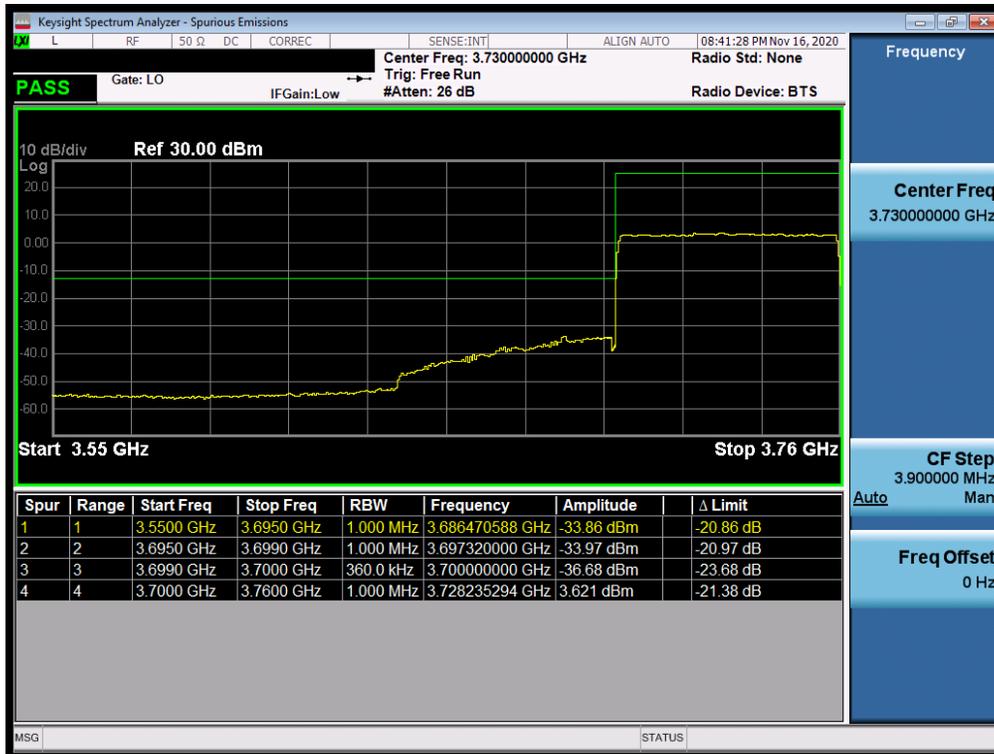


Plot 7-49. Lower Band Edge Plot (NR Band n77 - 80MHz CP-OFDM-QPSK – Full RB Configuration)

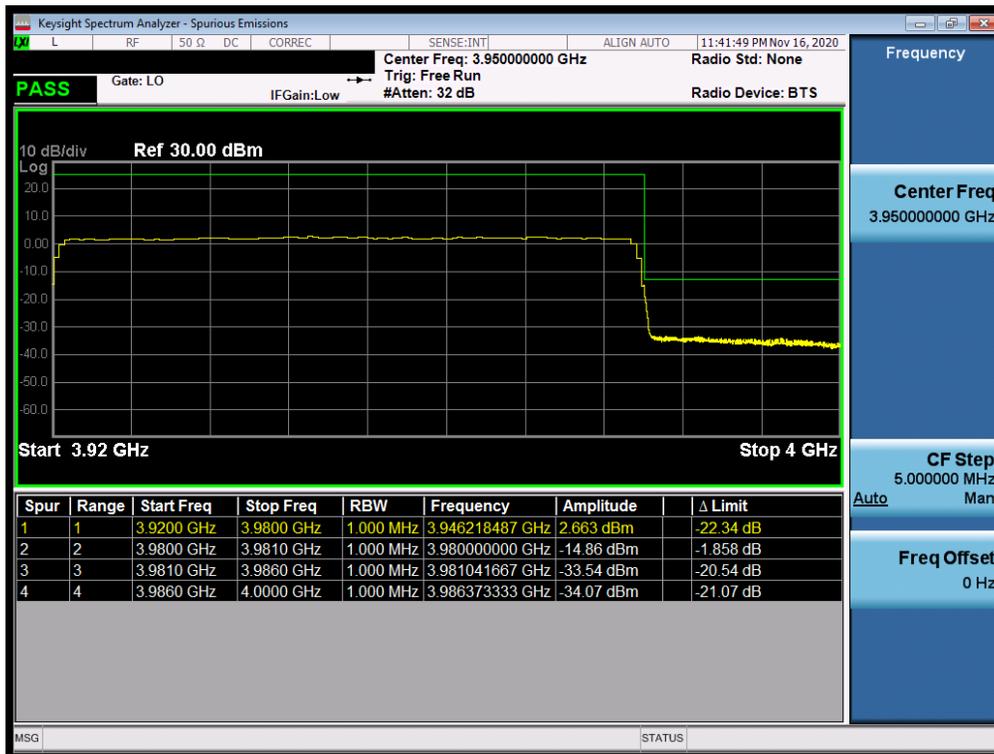


Plot 7-50. Upper Band Edge Plot (NR Band n77 - 80MHz CP-OFDM-QPSK – Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 43 of 77



Plot 7-51. Lower Band Edge Plot (NR Band n77 - 60MHz CP-OFDM-QPSK – Full RB Configuration)

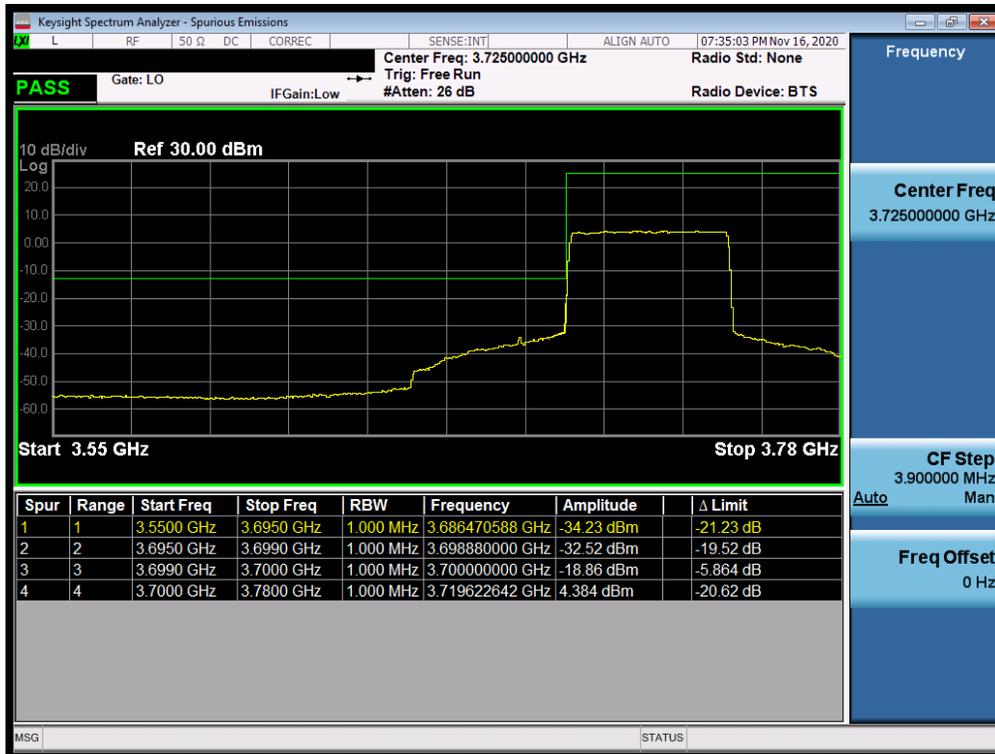


Plot 7-52. Upper Band Edge Plot (NR Band n77 - 60MHz CP-OFDM-QPSK – Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 44 of 77

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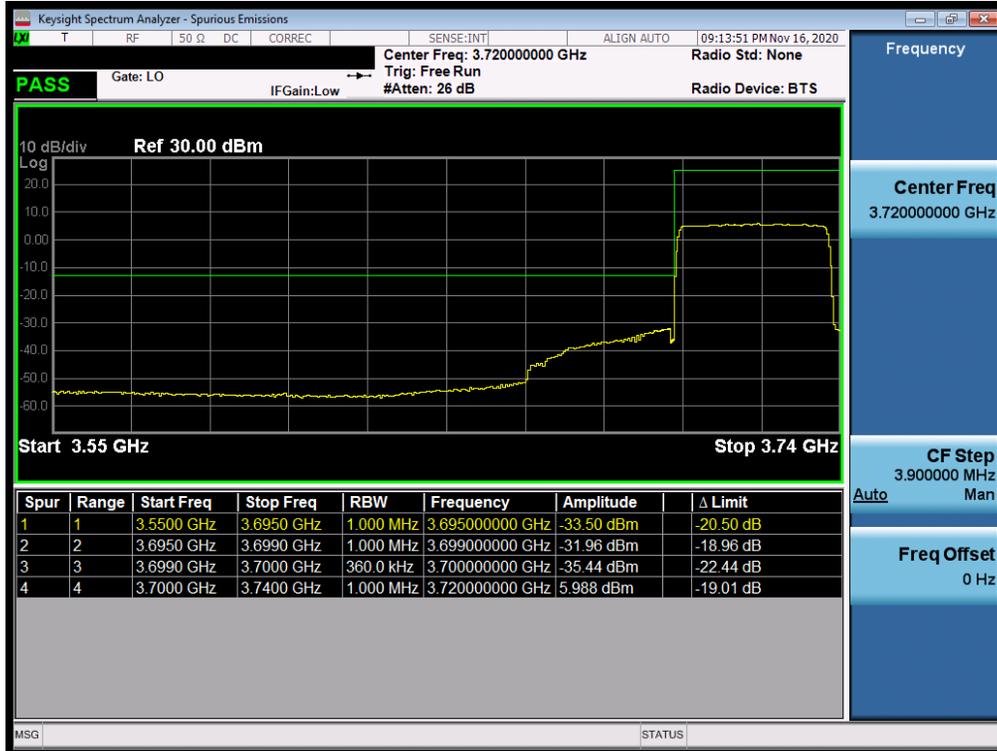


Plot 7-53. Lower Band Edge Plot (NR Band n77 - 50MHz CP-OFDM-QPSK – Full RB Configuration)



Plot 7-54. Upper Band Edge Plot (NR Band n77 - 50MHz CP-OFDM-QPSK – Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 45 of 77



Plot 7-55. Lower Band Edge Plot (NR Band n77 - 40MHz CP-OFDM-QPSK – Full RB Configuration)

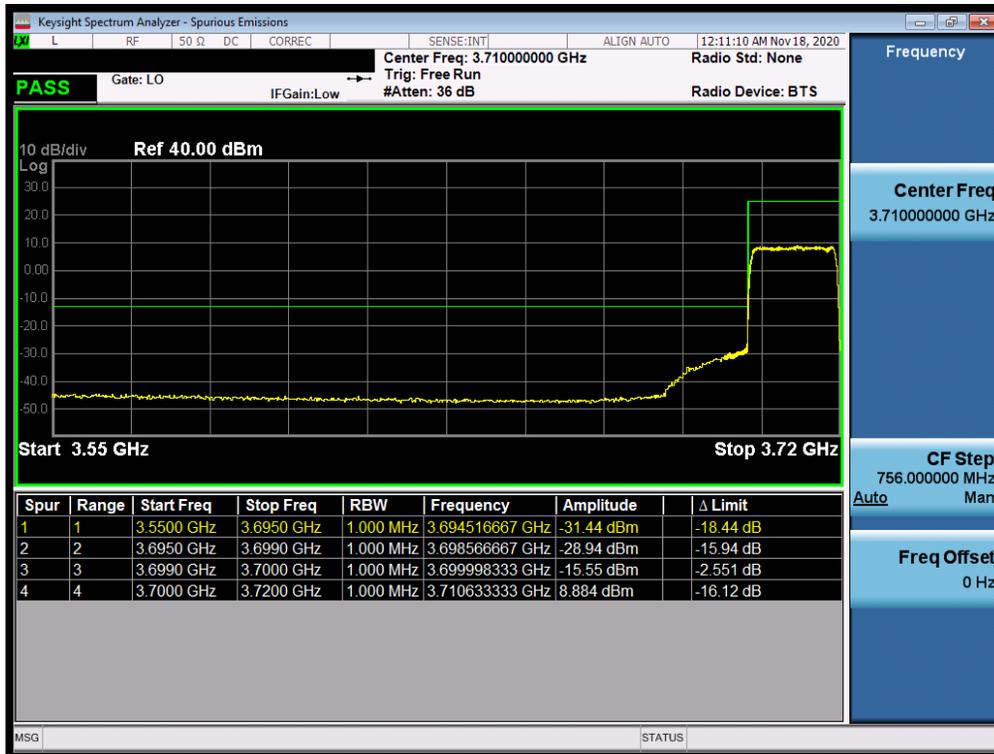


Plot 7-56. Upper Band Edge Plot (NR Band n77 - 40MHz CP-OFDM-QPSK – Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 46 of 77

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Plot 7-57. Lower Band Edge Plot (NR Band n77 - 20MHz CP-OFDM-QPSK – Full RB Configuration)



Plot 7-58. Upper Band Edge Plot (NR Band n77 - 20MHz CP-OFDM-QPSK – Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 47 of 77

7.6 Radiated Power (EIRP)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

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

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 48 of 77

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Test Setup

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

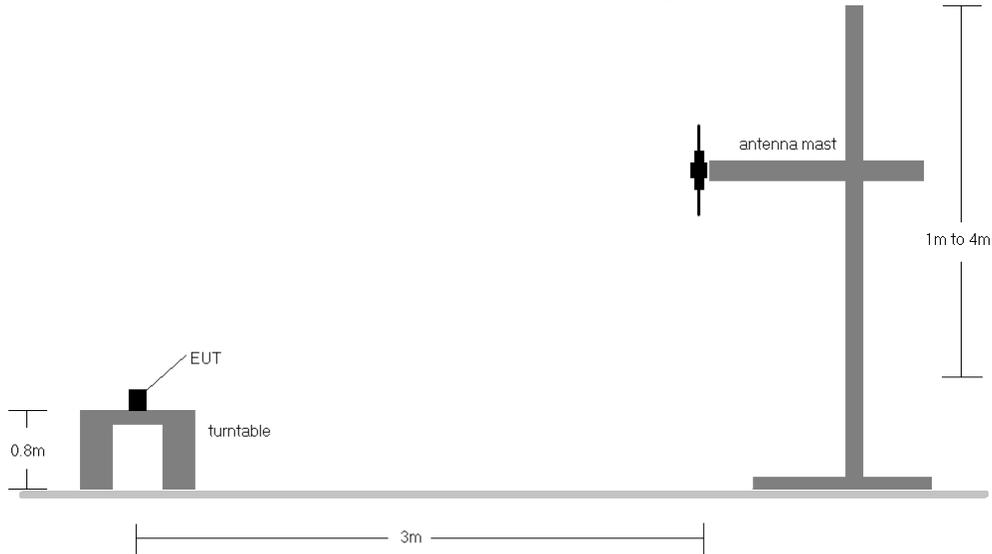


Figure 7-5. Radiated Test Setup <1GHz

Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 4) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 49 of 77	

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NR Band n77

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
100 MHz	π/2 BPSK	3750.00	V	322.0	267.0	6.82	1 / 68	14.36	21.18	0.131	30.00	-8.82
		3840.00	V	310.0	278.0	6.76	1 / 68	15.01	21.77	0.150	30.00	-8.23
		3930.00	V	312.0	275.0	6.65	1 / 68	15.19	21.84	0.153	30.00	-8.16
	QPSK	3750.00	V	322.0	267.0	6.82	1 / 68	13.97	20.79	0.120	30.00	-9.21
		3840.00	V	310.0	278.0	6.76	1 / 68	14.45	21.21	0.132	30.00	-8.79
		3930.00	V	312.0	275.0	6.65	1 / 68	14.43	21.08	0.128	30.00	-8.92
		16-QAM	3930.00	V	312.0	275.0	6.65	1 / 68	14.38	21.03	0.127	30.00
64-QAM	3930.00	V	312.0	275.0	6.65	1 / 68	13.55	20.20	0.105	30.00	-9.80	
256-QAM	3930.00	V	312.0	275.0	6.65	1 / 68	12.34	18.99	0.079	30.00	-11.01	
90 MHz	π/2 BPSK	3744.99	V	322.0	267.0	6.78	1 / 61	14.40	21.18	0.131	30.00	-8.82
		3840.00	V	310.0	278.0	6.76	1 / 61	15.06	21.82	0.152	30.00	-8.18
		3935.00	V	312.0	275.0	6.65	1 / 61	15.34	21.99	0.158	30.00	-8.01
	QPSK	3744.99	V	322.0	267.0	6.78	1 / 61	14.59	21.37	0.137	30.00	-8.63
		3840.00	V	310.0	278.0	6.76	1 / 61	14.04	20.80	0.120	30.00	-9.20
		3935.00	V	312.0	275.0	6.65	1 / 61	14.10	20.75	0.119	30.00	-9.25
		16-QAM	3840.00	V	310.0	278.0	6.76	1 / 61	13.52	20.28	0.107	30.00
64-QAM	3840.00	V	310.0	278.0	6.76	1 / 61	13.66	20.42	0.110	30.00	-9.58	
256-QAM	3840.00	V	310.0	278.0	6.76	1 / 61	12.08	18.84	0.077	30.00	-11.16	
80 MHz	π/2 BPSK	3740.00	V	322.0	267.0	6.74	1 / 54	14.68	21.42	0.139	30.00	-8.58
		3840.00	V	310.0	278.0	6.76	1 / 54	15.10	21.86	0.153	30.00	-8.14
		3939.99	V	312.0	275.0	6.65	1 / 54	15.42	22.07	0.161	30.00	-7.93
	QPSK	3740.00	V	322.0	267.0	6.74	1 / 54	15.22	21.96	0.157	30.00	-8.04
		3840.00	V	310.0	278.0	6.76	1 / 54	14.67	21.43	0.139	30.00	-8.57
		3939.99	V	312.0	275.0	6.65	1 / 54	14.90	21.55	0.143	30.00	-8.45
		16-QAM	3840.00	V	310.0	278.0	6.76	1 / 54	13.69	20.45	0.111	30.00
64-QAM	3840.00	V	310.0	278.0	6.76	1 / 54	13.28	20.04	0.101	30.00	-9.96	
256-QAM	3840.00	V	310.0	278.0	6.76	1 / 54	12.95	19.71	0.094	30.00	-10.29	
60 MHz	π/2 BPSK	3729.99	V	322.0	267.0	6.66	1 / 40	14.62	21.28	0.134	30.00	-8.72
		3840.00	V	310.0	278.0	6.76	1 / 40	15.08	21.84	0.153	30.00	-8.16
		3950.00	V	312.0	275.0	6.65	1 / 40	15.64	22.29	0.169	30.00	-7.71
	QPSK	3729.99	V	322.0	267.0	6.66	1 / 40	14.98	21.64	0.146	30.00	-8.36
		3840.00	V	310.0	278.0	6.76	1 / 40	14.27	21.03	0.127	30.00	-8.97
		3950.00	V	312.0	275.0	6.65	1 / 40	14.85	21.50	0.141	30.00	-8.50
		16-QAM	3840.00	V	310.0	278.0	6.76	1 / 40	14.22	20.98	0.125	30.00
64-QAM	3840.00	V	310.0	278.0	6.76	1 / 40	12.03	18.79	0.076	30.00	-11.21	
256-QAM	3840.00	V	310.0	278.0	6.76	1 / 40	12.36	19.12	0.082	30.00	-10.88	
50 MHz	π/2 BPSK	3725.00	V	322.0	267.0	6.62	1 / 33	15.06	21.68	0.147	30.00	-8.32
		3840.00	V	310.0	278.0	6.76	1 / 33	15.17	21.93	0.156	30.00	-8.07
		3954.99	V	312.0	275.0	6.65	1 / 33	15.80	22.45	0.176	30.00	-7.55
	QPSK	3725.00	V	322.0	267.0	6.62	1 / 33	15.52	22.14	0.164	30.00	-7.86
		3840.00	V	310.0	278.0	6.76	1 / 33	14.55	21.31	0.135	30.00	-8.69
		3954.99	V	312.0	275.0	6.65	1 / 33	14.15	20.80	0.120	30.00	-9.20
		16-QAM	3725.00	V	322.0	267.0	6.62	1 / 33	14.39	21.01	0.126	30.00
64-QAM	3725.00	V	322.0	267.0	6.62	1 / 33	13.40	20.02	0.100	30.00	-9.98	
256-QAM	3725.00	V	322.0	267.0	6.62	1 / 33	12.82	19.44	0.088	30.00	-10.56	
40 MHz	π/2 BPSK	3720.00	V	322.0	267.0	6.58	1 / 26	14.90	21.48	0.141	30.00	-8.52
		3840.00	V	310.0	278.0	6.76	1 / 26	15.55	22.31	0.170	30.00	-7.69
		3960.00	V	312.0	275.0	6.65	1 / 26	15.62	22.27	0.169	30.00	-7.73
	QPSK	3720.00	V	322.0	267.0	6.58	1 / 26	15.46	22.04	0.160	30.00	-7.96
		3840.00	V	310.0	278.0	6.76	1 / 26	14.93	21.69	0.148	30.00	-8.31
		3960.00	V	312.0	275.0	6.65	1 / 26	13.60	20.25	0.106	30.00	-9.75
		16-QAM	3720.00	V	322.0	267.0	6.58	1 / 26	14.44	21.02	0.126	30.00
64-QAM	3720.00	V	322.0	267.0	6.58	1 / 26	13.00	19.58	0.091	30.00	-10.42	
256-QAM	3720.00	V	322.0	267.0	6.58	1 / 26	13.10	19.68	0.093	30.00	-10.32	
20 MHz	π/2 BPSK	3710.00	V	322.0	267.0	6.50	1 / 13	14.99	21.49	0.141	30.00	-8.51
		3840.00	V	310.0	278.0	6.76	1 / 13	15.12	21.88	0.154	30.00	-8.12
		3969.99	V	312.0	275.0	6.66	1 / 13	15.52	22.18	0.165	30.00	-7.82
	QPSK	3710.00	V	322.0	267.0	6.50	1 / 13	15.17	21.67	0.147	30.00	-8.33
		3840.00	V	310.0	278.0	6.76	1 / 13	14.29	21.05	0.127	30.00	-8.95
		3969.99	V	312.0	275.0	6.66	1 / 13	13.76	20.42	0.110	30.00	-9.58
		16-QAM	3840.00	V	310.0	278.0	6.76	1 / 13	13.90	20.66	0.116	30.00
64-QAM	3840.00	V	310.0	278.0	6.76	1 / 13	12.97	19.73	0.094	30.00	-10.27	
256-QAM	3840.00	V	310.0	278.0	6.76	1 / 13	13.01	19.77	0.095	30.00	-10.23	
100 MHz	Opposite Pol.	3930.0	H	103.0	211.0	6.21	1 / 68	14.81	21.02	0.126	30.000	-8.98
	WCP	3930.0	V	151.0	223.0	6.65	1 / 68	10.62	17.27	0.053	30.000	-12.73

Table 7.4 EIRP Data (Band n77)

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 50 of 77

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7.7 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in KDB 971168 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

Test Settings

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

FCC ID: ZNFF100VM	 PCTEST® Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 51 of 77	

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Test Setup

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

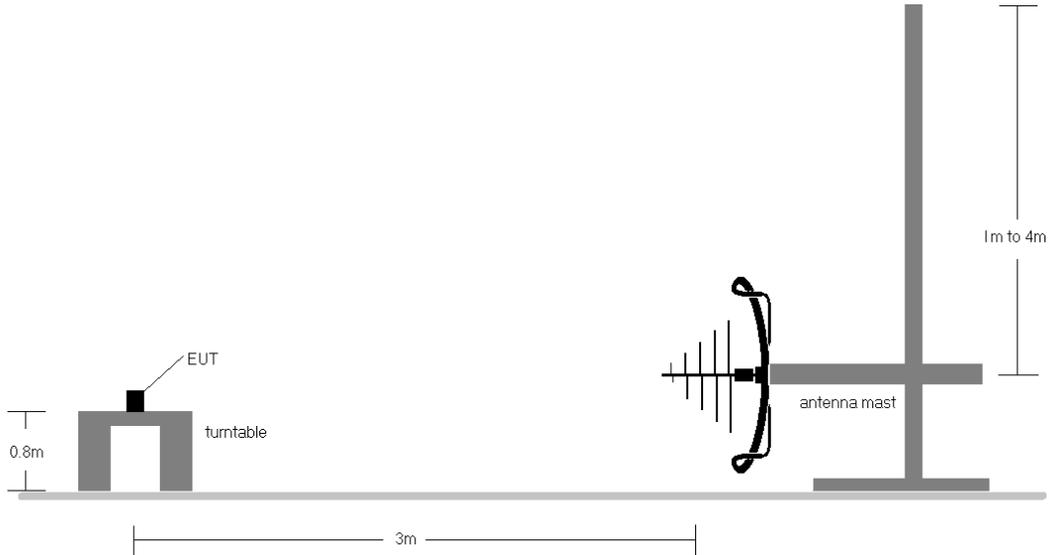


Figure 7-6. Test Instrument & Measurement Setup < 1GHz

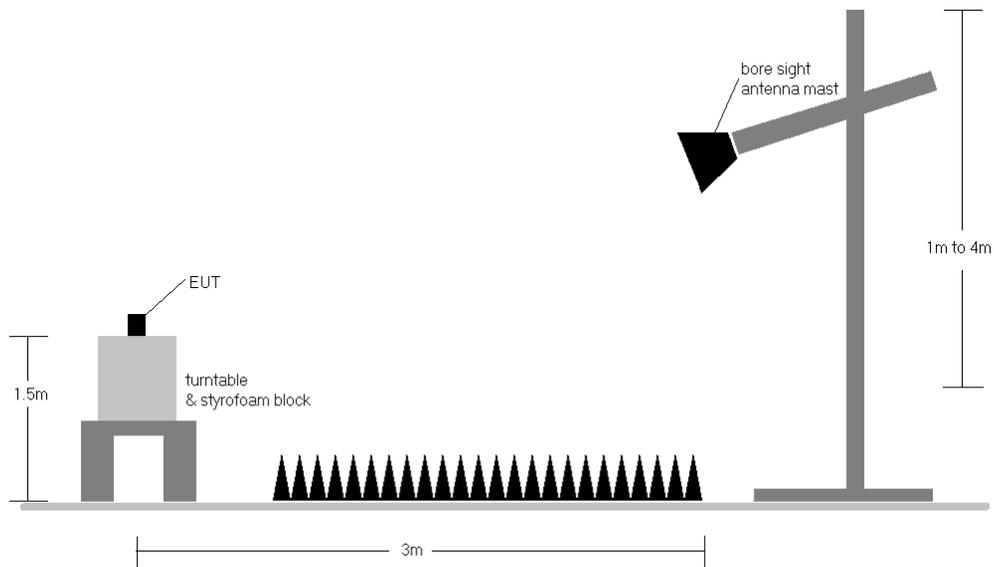


Figure 7-7. Test Instrument & Measurement Setup >1 GHz

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 52 of 77	

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Test Notes

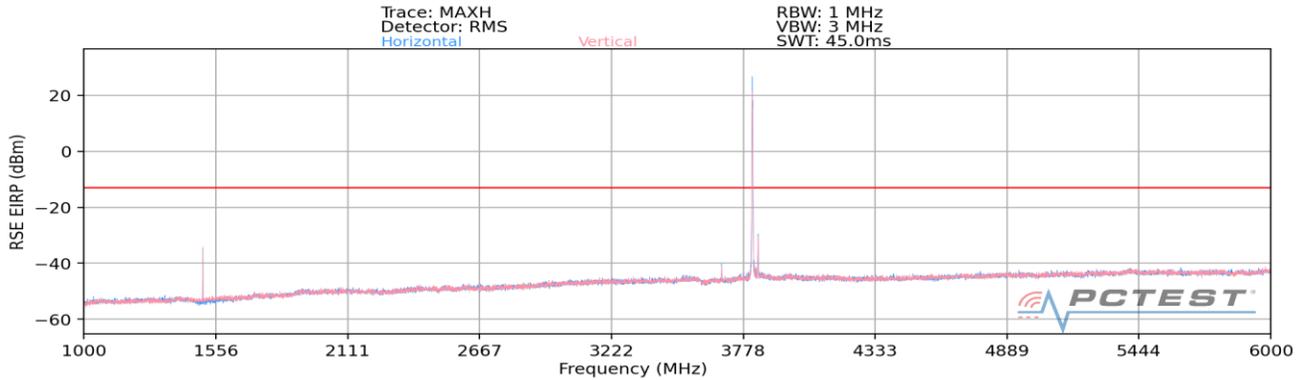
- 1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
 - b) $E(\text{dB}\mu\text{V}/\text{m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
 - d) $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V}/\text{m}) + 20\log D - 104.8$; where D is the measurement distance in meters.
- 2) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 3) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 6) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 7) For NR operation, all subcarrier spacings (SCS) and transmission schemes (e.g. CP-OFDM and DFT-s-OFDM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.
- 8) Spurious emissions shown in this section are measured while operating in EN-DC mode with Sub 6GHz NR carrier as well as an LTE carrier (anchor). Spurious emissions from the NR carrier device, is subject to the rules under which the NR carrier operates. Spurious emission caused by the LTE carrier must meet the requirements of the rules under which the LTE carrier operates.

FCC ID: ZNFF100VM	 PART 27 MEASUREMENT REPORT 		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 53 of 77

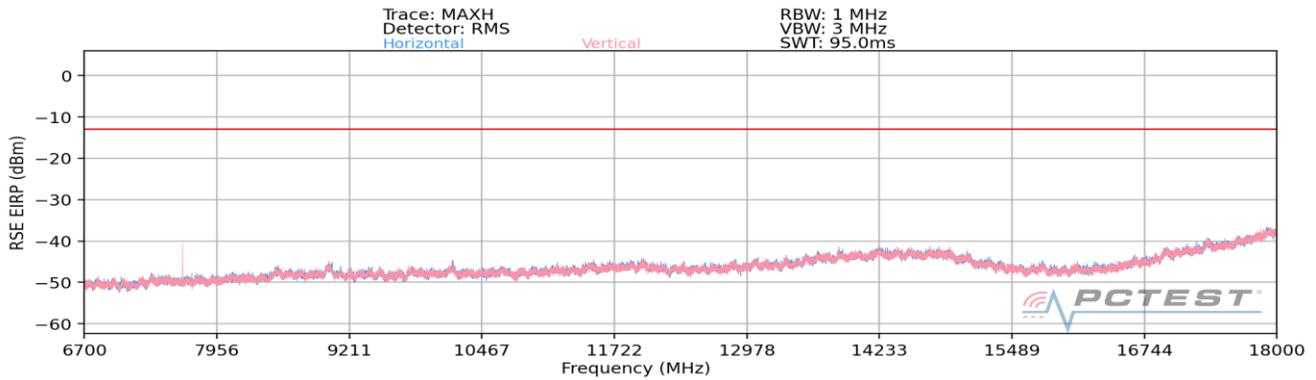
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NR Band n77 (Standalone)



Plot 7-59. Radiated Spurious Plot 1GHz – 6GHz (NR Band n77 – 1RB Case)



Plot 7-60. Radiated Spurious Plot 6.7GHz - 18GHz (NR Band n77 – 1RB)

Bandwidth (MHz):	100
Frequency (MHz):	3750.0
RB / Offset:	1/68
Mode:	Stand Alone

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7500.0	H	204	13	-76.25	15.72	46.47	-48.78	-13.00	-35.78
11250.0	H	116	172	-75.73	20.91	52.18	-43.08	-13.00	-30.08
15000.0	H	-	-	-75.10	26.78	58.68	-36.58	-13.00	-23.58
18750.0	H	-	-	-71.50	23.73	59.23	-36.03	-13.00	-23.03

Table 7-5. Radiated Spurious Data (NR Band n77 RB 1 Offset 68 – Low Channel)

FCC ID: ZNFF100VM	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 54 of 77

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Bandwidth (MHz):	100
Frequency (MHz):	3840.0
RB / Offset:	1/68
Mode:	Stand Alone

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB μ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7680.0	H	103	31	-73.86	16.04	49.18	-46.08	-13.00	-33.08
11520.0	H	-	-	-75.06	22.14	54.08	-41.18	-13.00	-28.18
15360.0	H	-	-	-74.28	27.42	60.14	-35.12	-13.00	-22.12
19200.0	H	-	-	-72.48	23.62	58.68	-36.58	-13.00	-23.58

Table 7-6. Radiated Spurious Data (NR Band n77 RB 1 Offset 68 – Mid Channel)

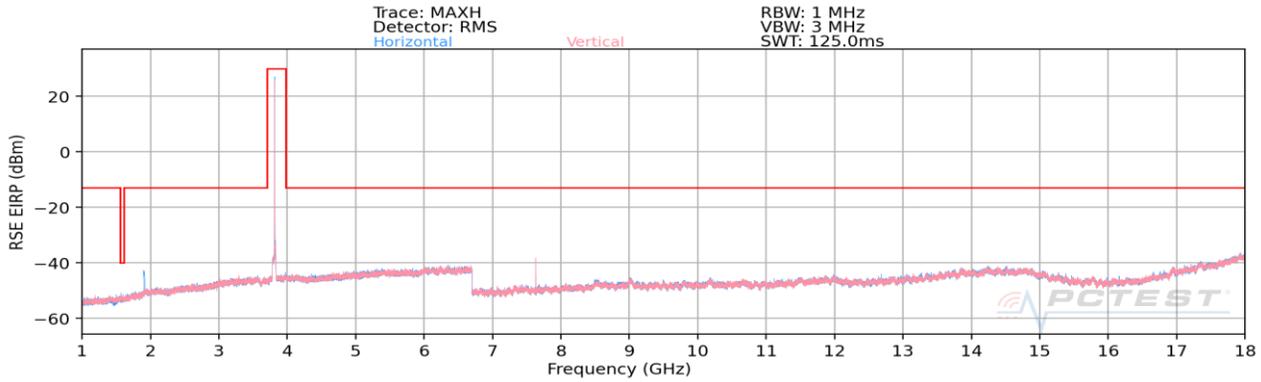
Bandwidth (MHz):	100
Frequency (MHz):	3930.0
RB / Offset:	1/68
Mode:	Stand Alone

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB μ V/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
7860.0	H	386	96	-74.84	16.16	48.32	-46.94	-13.00	-33.94
11790.0	H	-	-	-73.09	21.63	55.54	-39.71	-13.00	-26.71
15720.0	H	-	-	-74.74	27.90	60.16	-35.10	-13.00	-22.10
19650.0	H	-	-	-73.13	23.56	57.43	-37.82	-13.00	-24.82

Table 7-7. Radiated Spurious Data (NR Band n77 1 Offset 68 – High Channel)

FCC ID: ZNFF100VM	 PART 27 MEASUREMENT REPORT		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 55 of 77

NR Band n77+B13 (ENDC)



Plot 7-61. Radiated Spurious Plot 1GHz - 18GHz (NR Band n77+B13 Mid Channel – 1RB Case)

Note: The emission at 1.9GHz and 7.6GHz were investigated and found to be not coming from the EUT.

Bandwidth (MHz):	100/10
Frequency (MHz):	3840.0
RB / Offset:	1/68 & 1/25
Mode:	EN-DC n77+13
Anchor Band:	B13

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
6898.0	V	-	-	-78.97	22.75	50.78	-44.48	-13.00	-31.48
2276.0	V	-	-	-77.06	13.50	43.44	-51.82	-13.00	-38.82
9956.0	V	-	-	-78.99	28.34	56.35	-38.91	-13.00	-25.91
5334.0	V	-	-	-82.83	19.79	43.96	-51.30	-13.00	-38.30
13014.0	V	-	-	-81.41	33.19	58.78	-36.48	-13.00	-23.48
8392.0	V	-	-	-84.33	26.20	48.87	-55.93	-13.00	-42.93

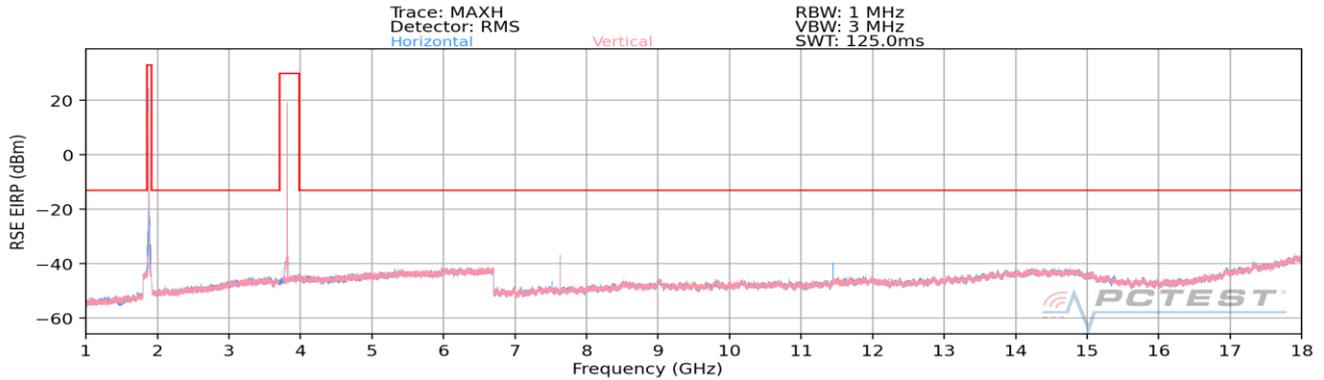
Table 7-8 Radiated Spurious Data (NR Band n77+B13 RB 1 Offset 68 – Mid Channel)

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 56 of 77	

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NR Band n77+B2 (ENDC)



Plot 7-62. Radiated Spurious Plot 1GHz - 18GHz (NR Band n77+B2 Mid Channel - 1RB)

Note: The emission at 11.4GHz was investigated and found to be not coming from the EUT.

Bandwidth (MHz):	100/20
Frequency (MHz):	3840.0
RB / Offset:	1/68 & 1/50
Mode:	EN-DC n77+b2
Anchor Band:	Band 2

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
5800.0	H	370	295	-73.22	21.09	54.87	-40.39	-13.00	-27.39
7760.0	H	355	281	-74.50	25.01	57.51	-37.75	-13.00	-24.75
2040.0	H	282	49	-70.38	12.61	49.23	-46.03	-13.00	-33.03
9720.0	H	-	-	-73.62	28.46	61.84	-33.42	-13.00	-20.42
4000.0	H	-	-	-74.17	16.99	49.82	-54.98	-13.00	-41.98
11680.0	H	-	-	-75.11	31.15	63.04	-41.76	-13.00	-28.76

Table 7-9. Radiated Spurious Data (NR Band n77+B2 RB 1 Offset 68 - Mid Channel)

FCC ID: ZNFF100VM	 PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 57 of 77	

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7.8 Peak-Average Ratio

Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

Test Procedure Used

KDB 971168 D01 v03r01 – Section 5.7.1

Test Settings

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW \geq OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.

Test Setup

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

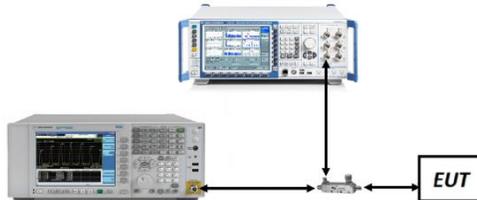


Figure 7-8. Test Instrument & Measurement Setup

Test Notes

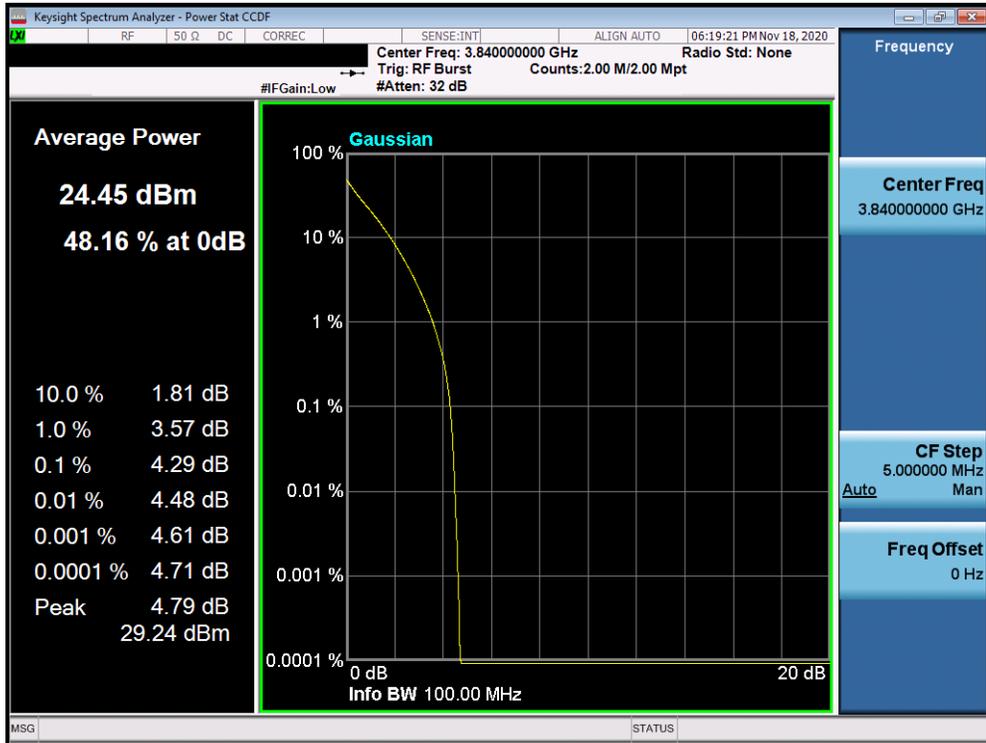
None.

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 58 of 77	

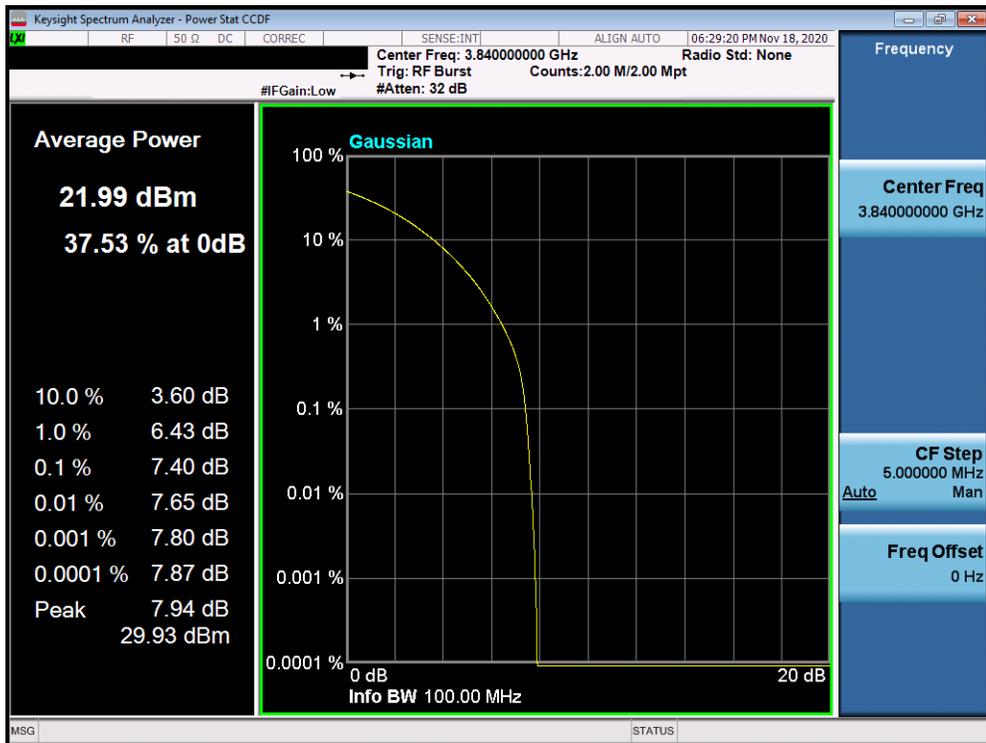
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NR Band n77

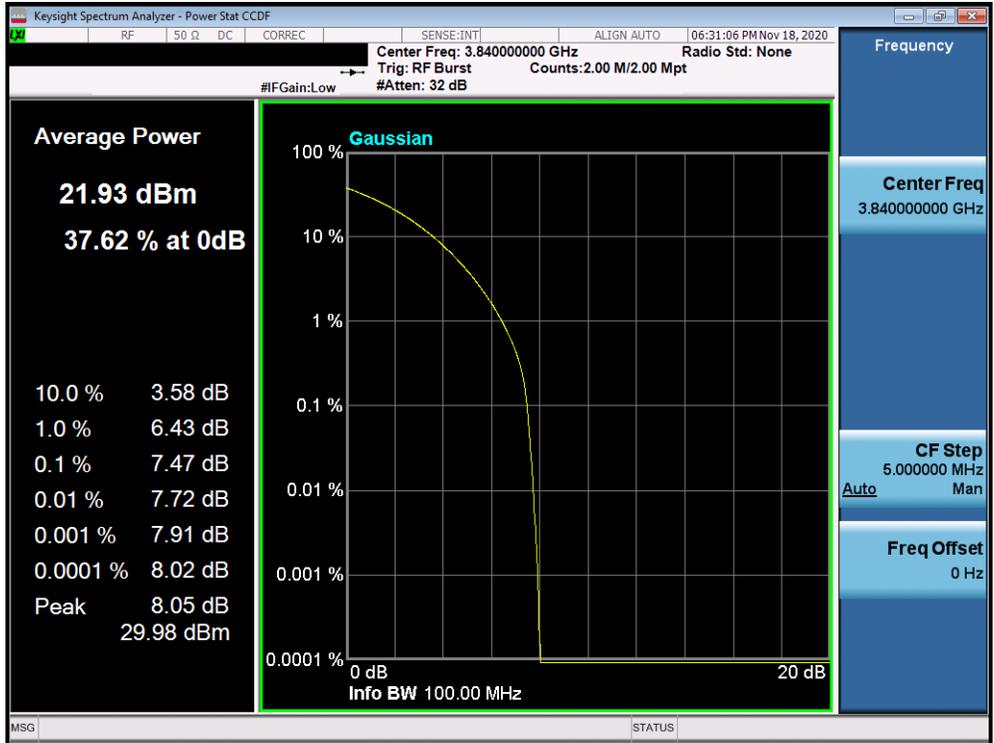


Plot 7-63. Peak to Average Ratio Plot (NR Band n77 - 100MHz $\pi/2$ DFT-S -BPSK - Full RB Configuration)

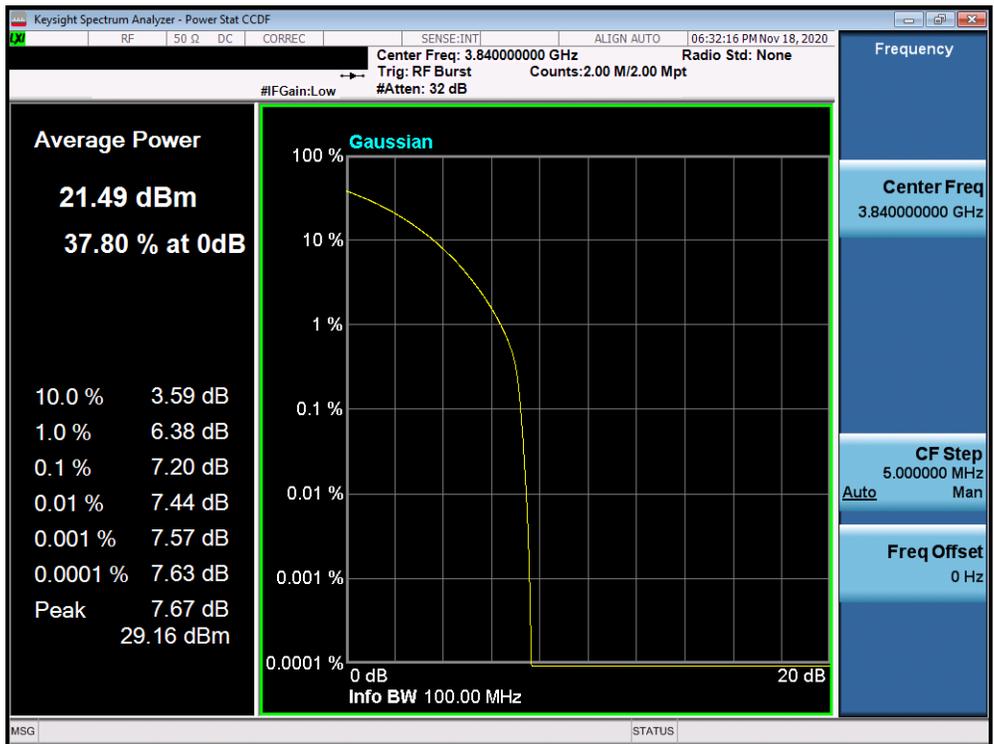


Plot 7-64. Peak to Average Ratio Plot (NR Band n77 - 100MHz CP-QPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 59 of 77

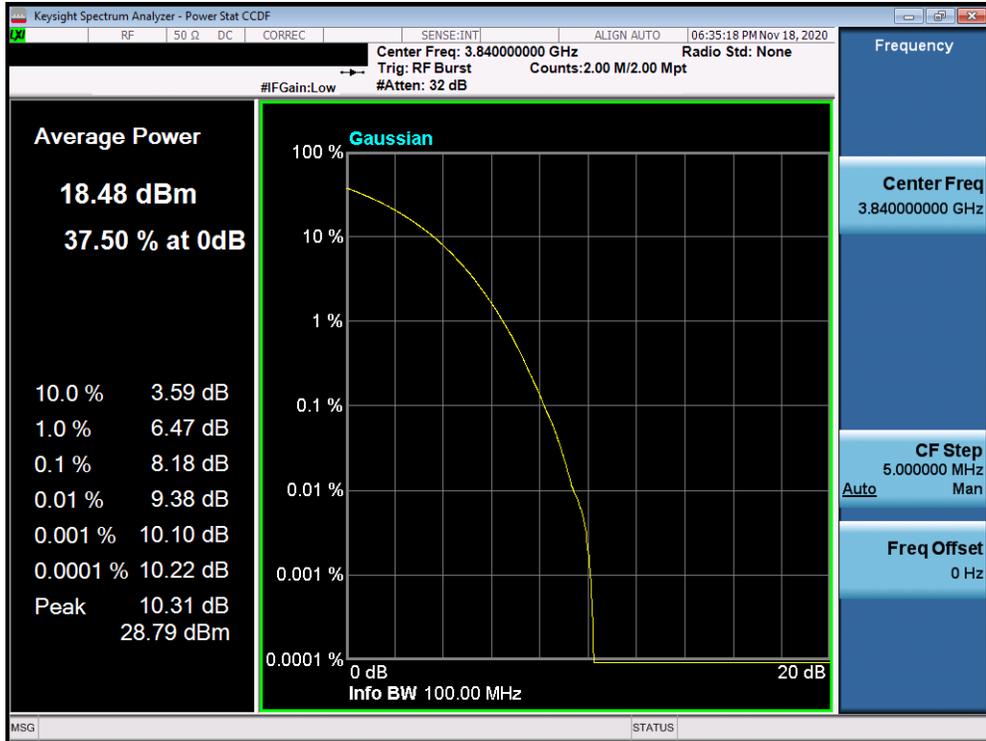


Plot 7-65. Peak to Average Ratio (NR Band n77 - 100MHz CP 16-QAM - Full RB Configuration)

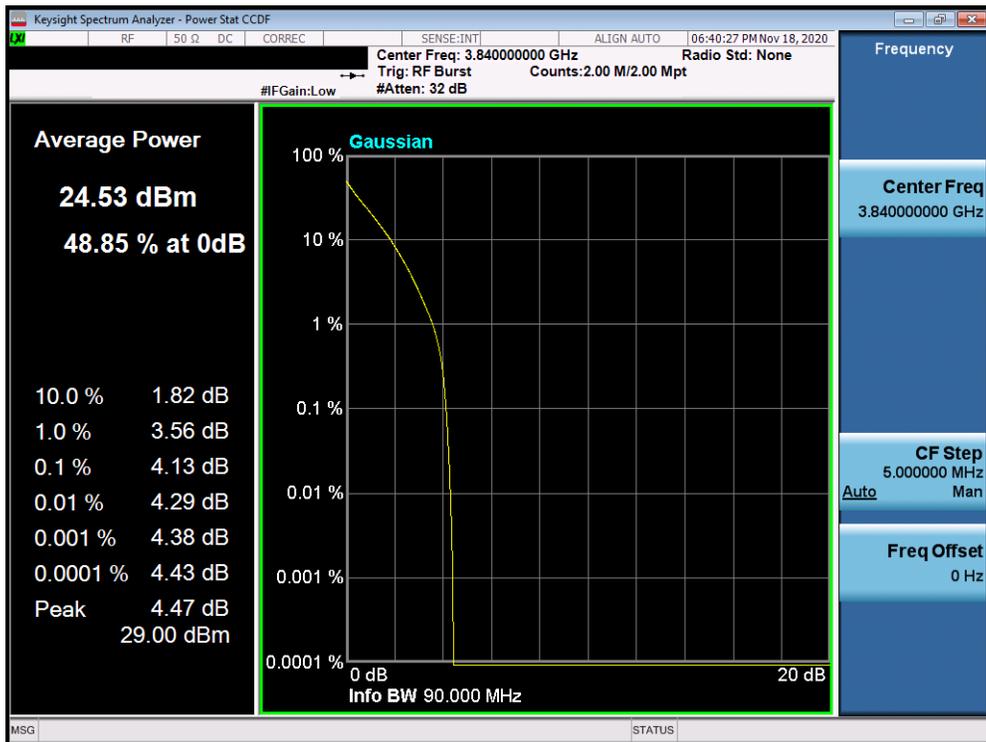


Plot 7-66. Peak to Average Ratio (NR Band n77 - 100MHz CP 64-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 60 of 77

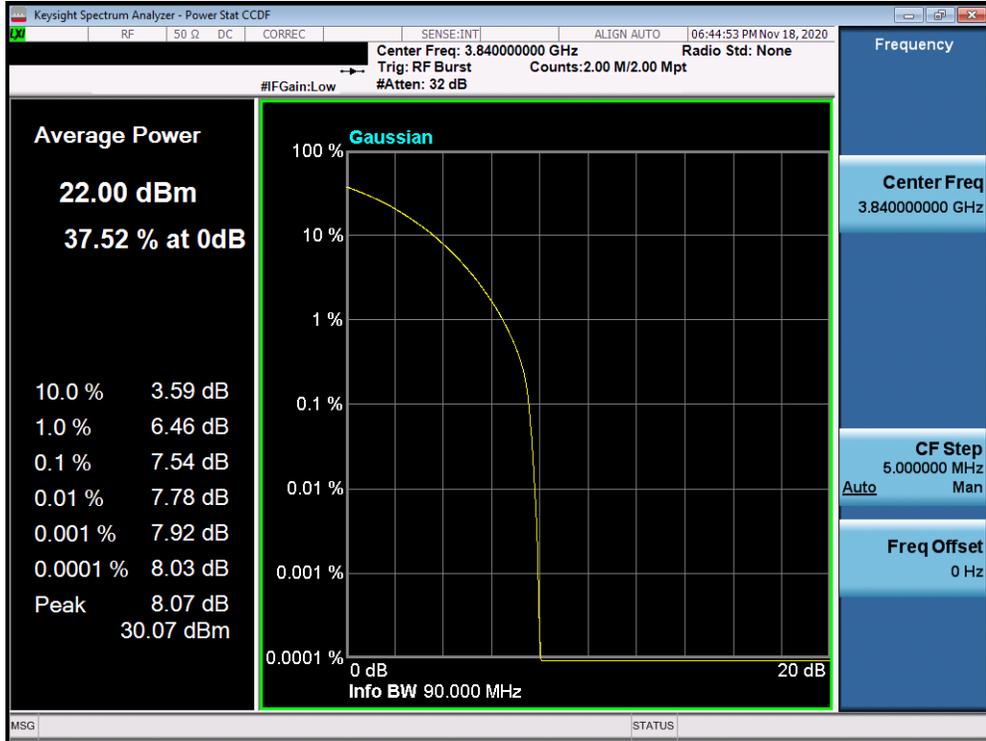


Plot 7-67. Peak to Average Ratio (NR Band n77 - 100MHz CP 256-QAM - Full RB Configuration)

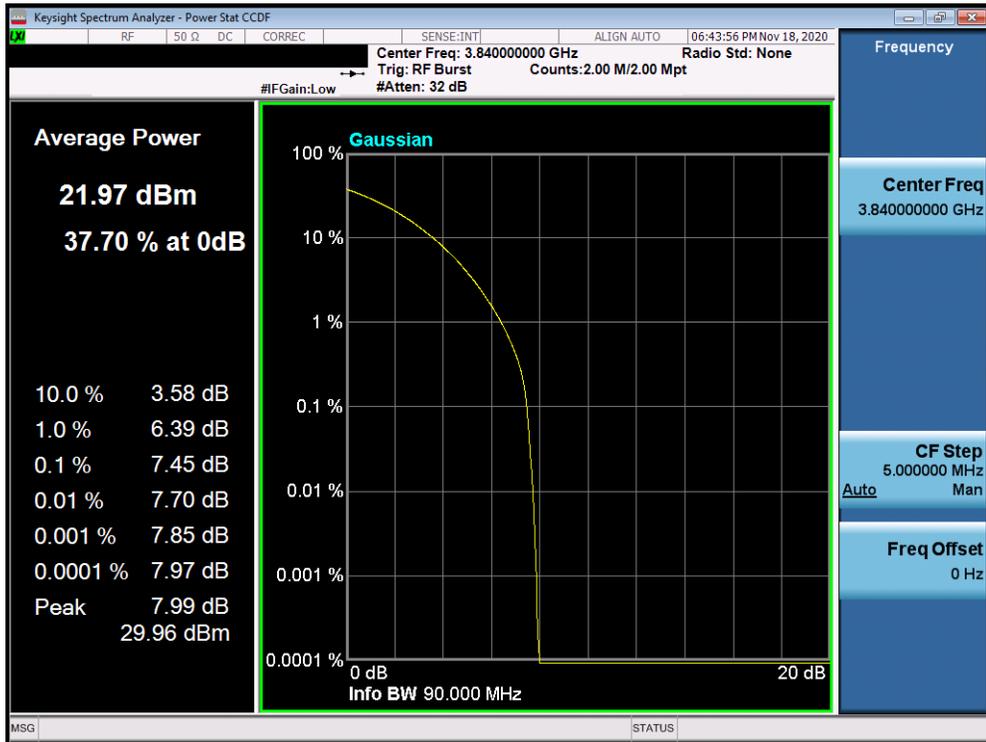


Plot 7-68. Peak to Average Ratio Plot (NR Band n77 - 90MHz $\pi/2$ DFT-S BPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 61 of 77

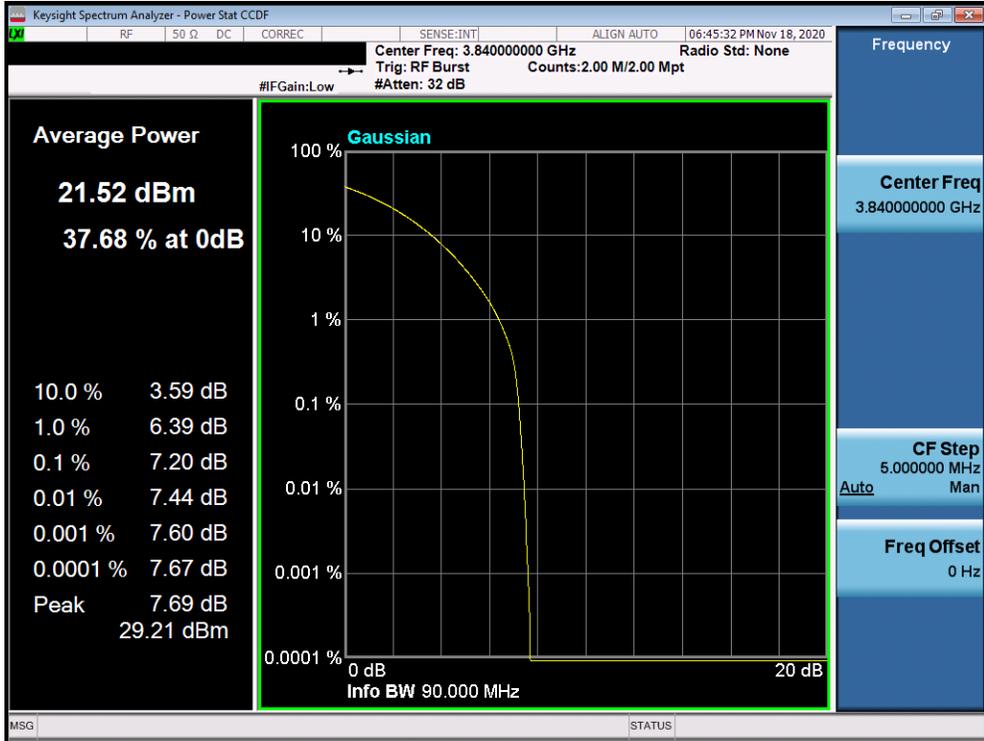


Plot 7-69. Peak to Average Ratio Plot (NR Band n77 – 90MHz CP QPSK - Full RB Configuration)

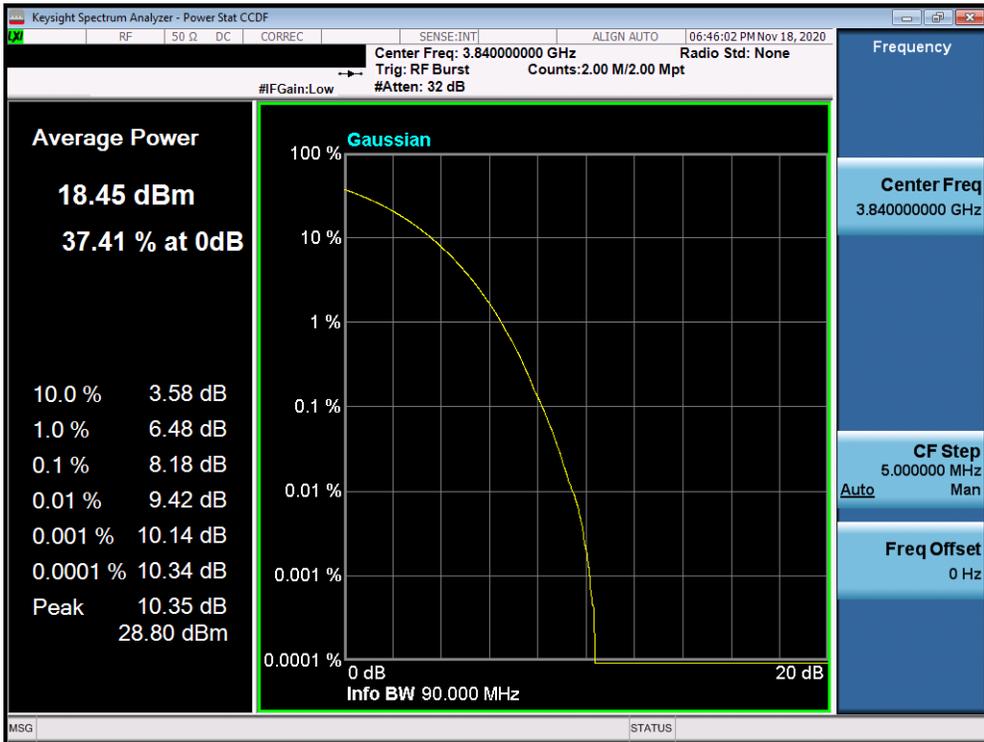


Plot 7-70. Peak to Average Ratio (NR Band n77 - 90MHz CP 16-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 62 of 77

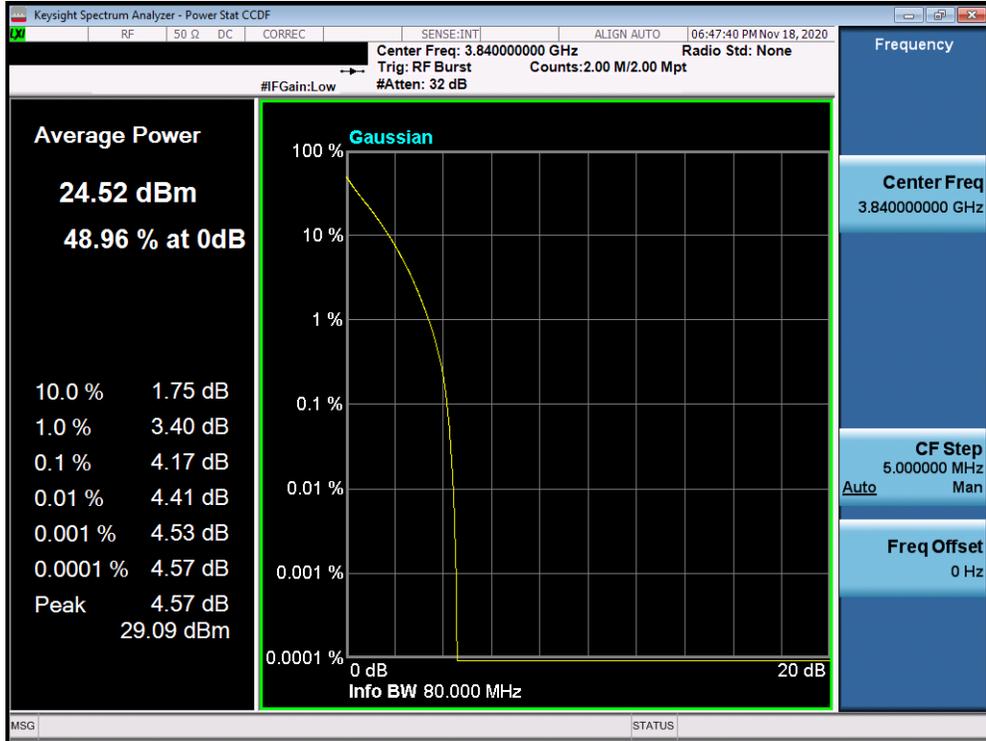


Plot 7-71. Peak to Average Ratio (NR Band n77 - 90MHz CP 64-QAM - Full RB Configuration)

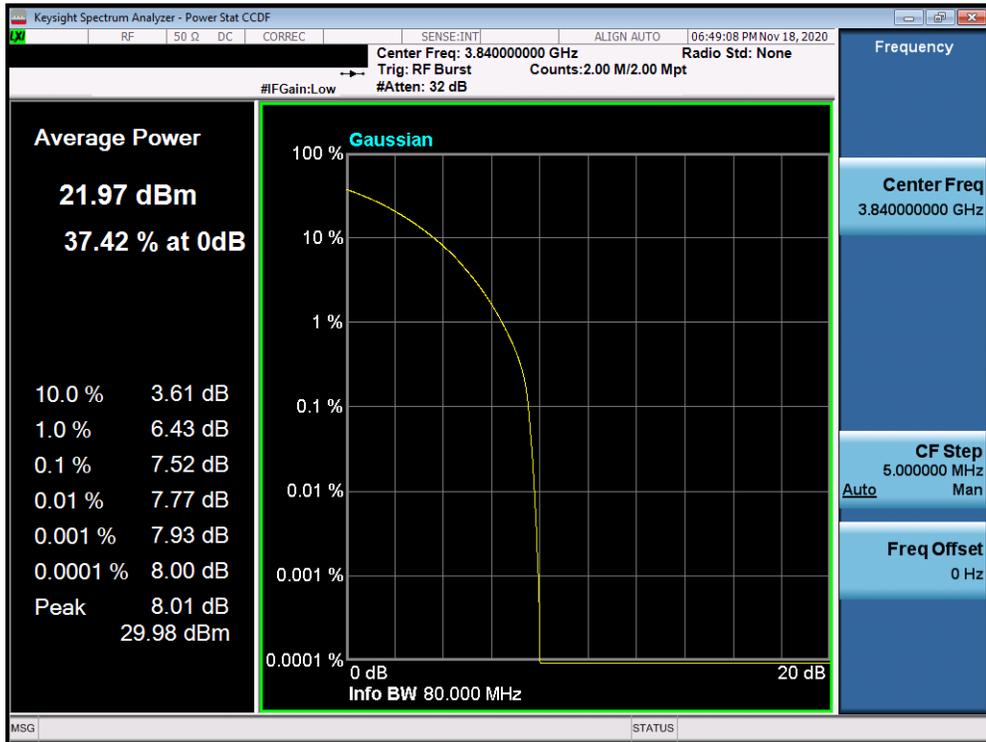


Plot 7-72. Peak to Average Ratio (NR Band n77 - 90MHz CP 256-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 63 of 77

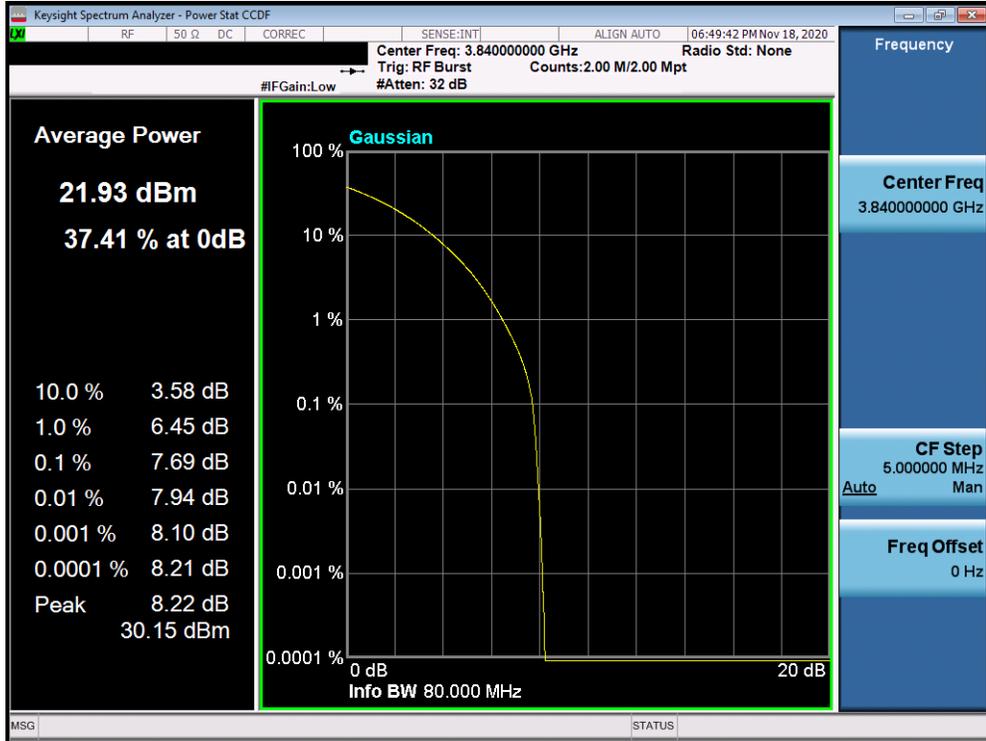


Plot 7-73. Peak to Average Ratio Plot (NR Band n77 - 80MHz $\pi/2$ DFT-S BPSK - Full RB Configuration)

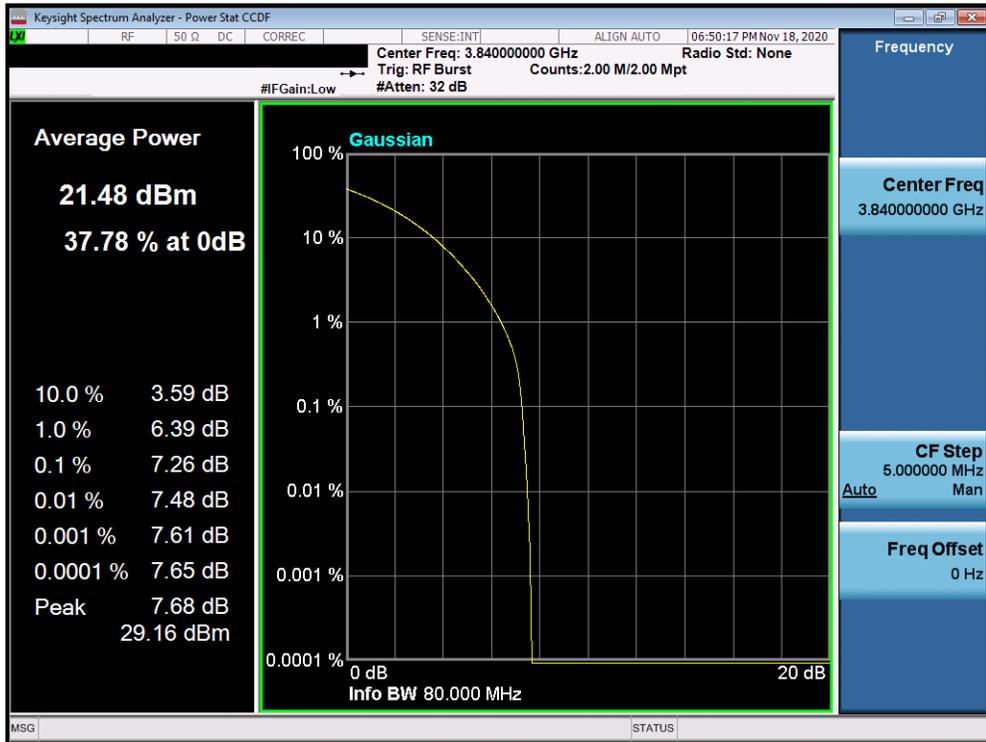


Plot 7-74. Peak to Average Ratio Plot (NR Band n77 - 80MHz CP QPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 64 of 77

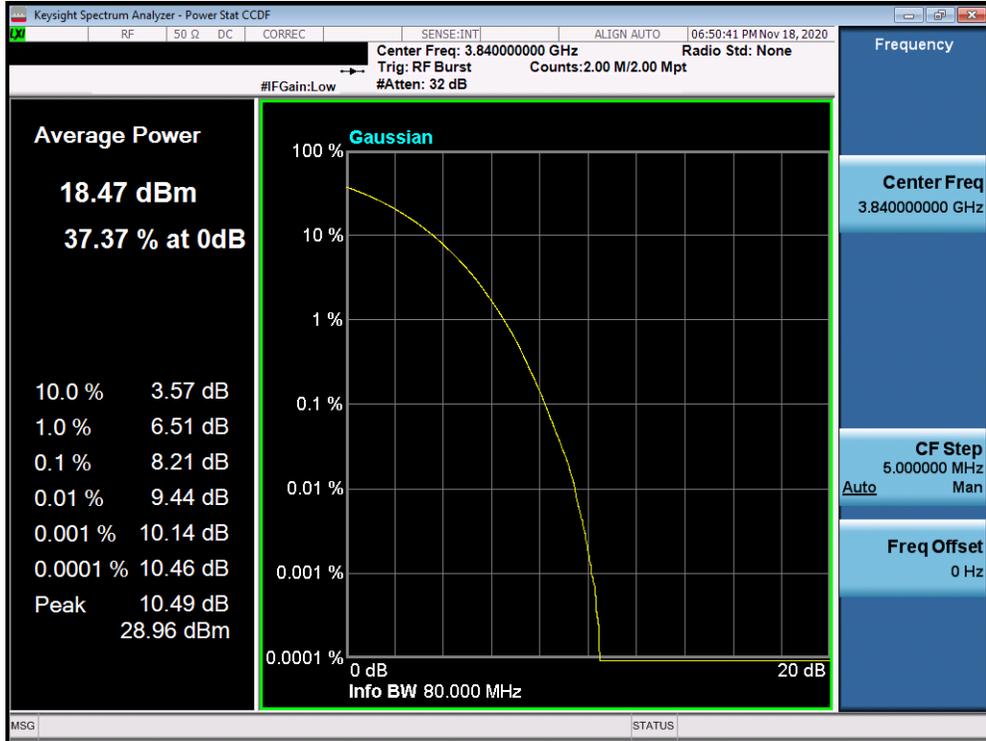


Plot 7-75. Peak to Average Ratio (NR Band n77 - 80MHz CP 16-QAM - Full RB Configuration)

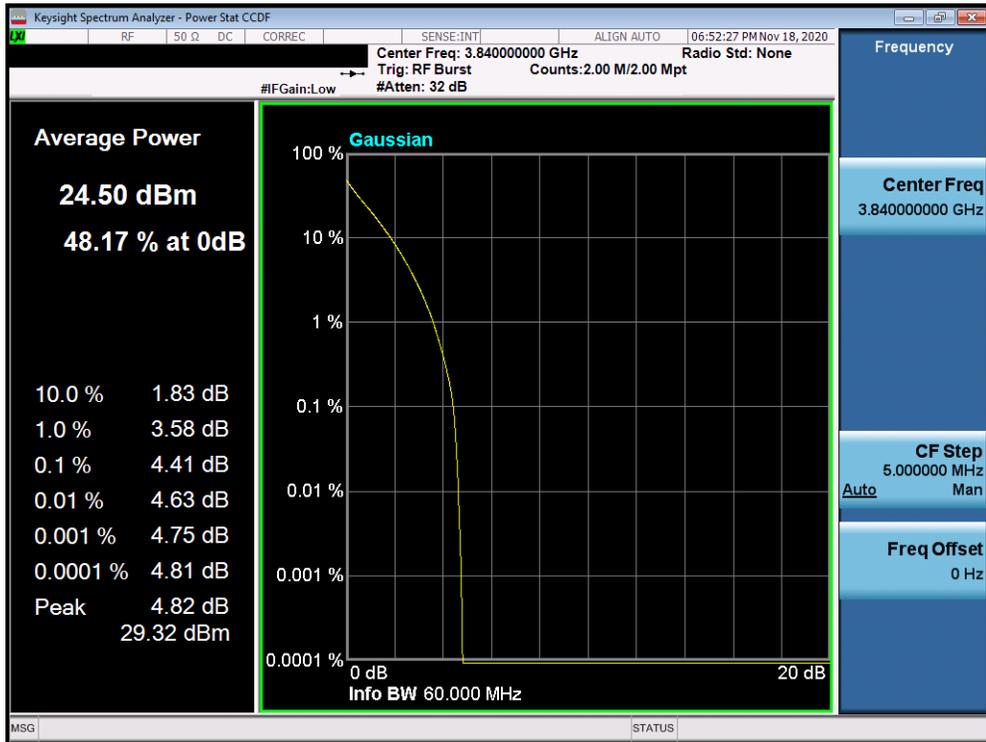


Plot 7-76. Peak to Average Ratio (NR Band n77 - 80MHz CP 64-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 65 of 77

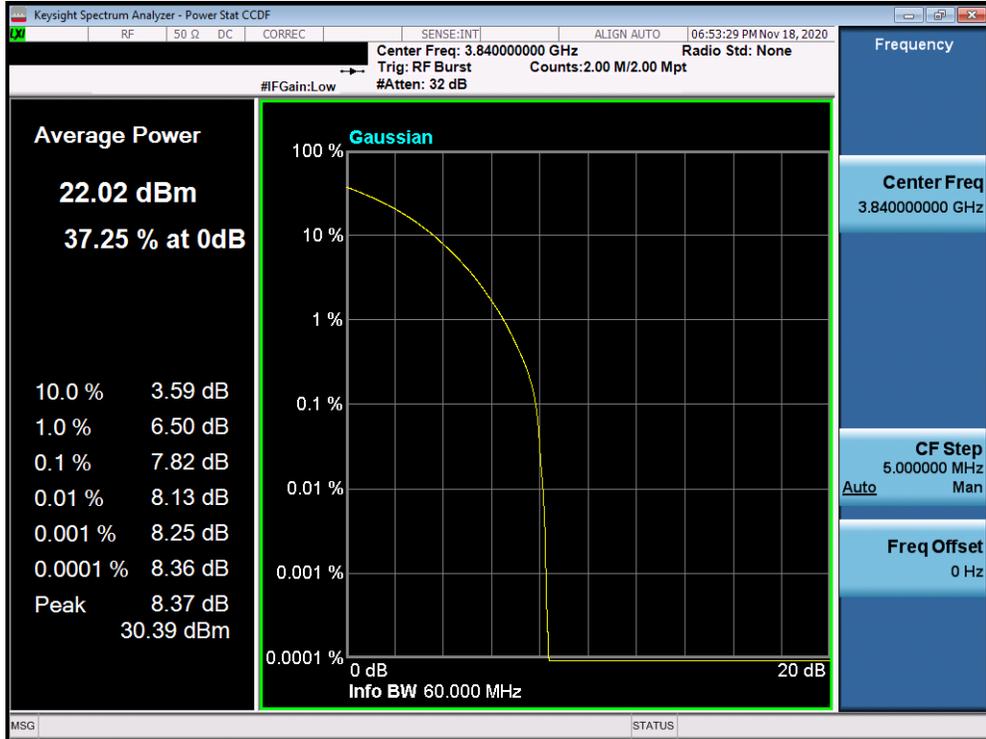


Plot 7-77. Peak to Average Ratio (NR Band n77 - 80MHz CP 256-QAM - Full RB Configuration)

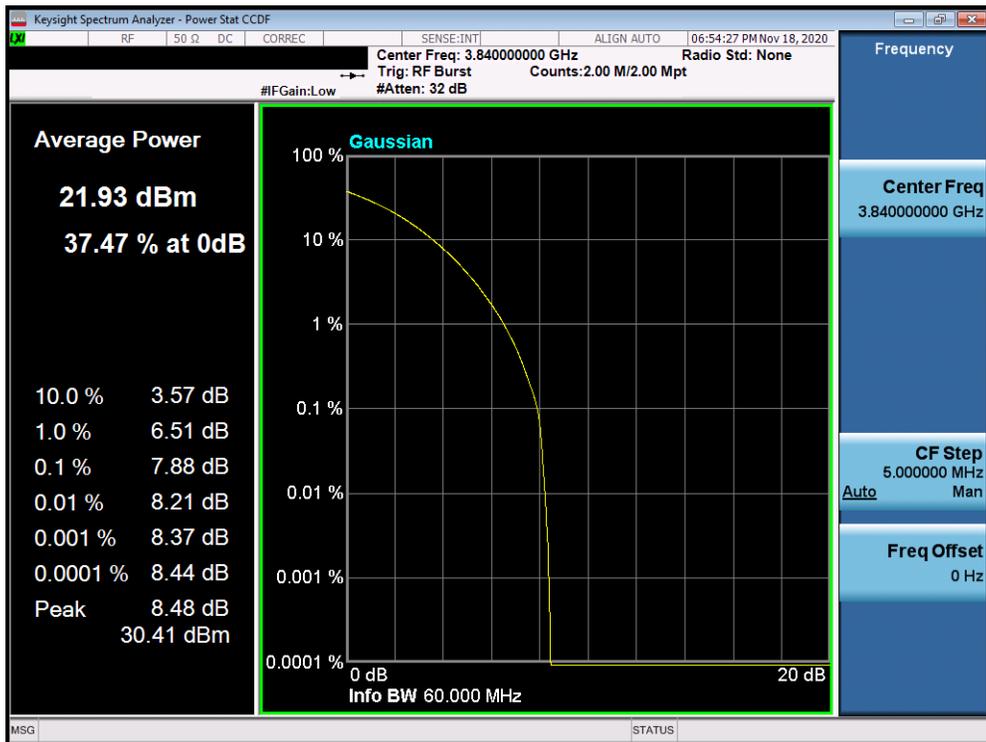


Plot 7-78. Peak to Average Ratio Plot (NR Band n77 - 60MHz $\pi/2$ DFT-S BPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 66 of 77

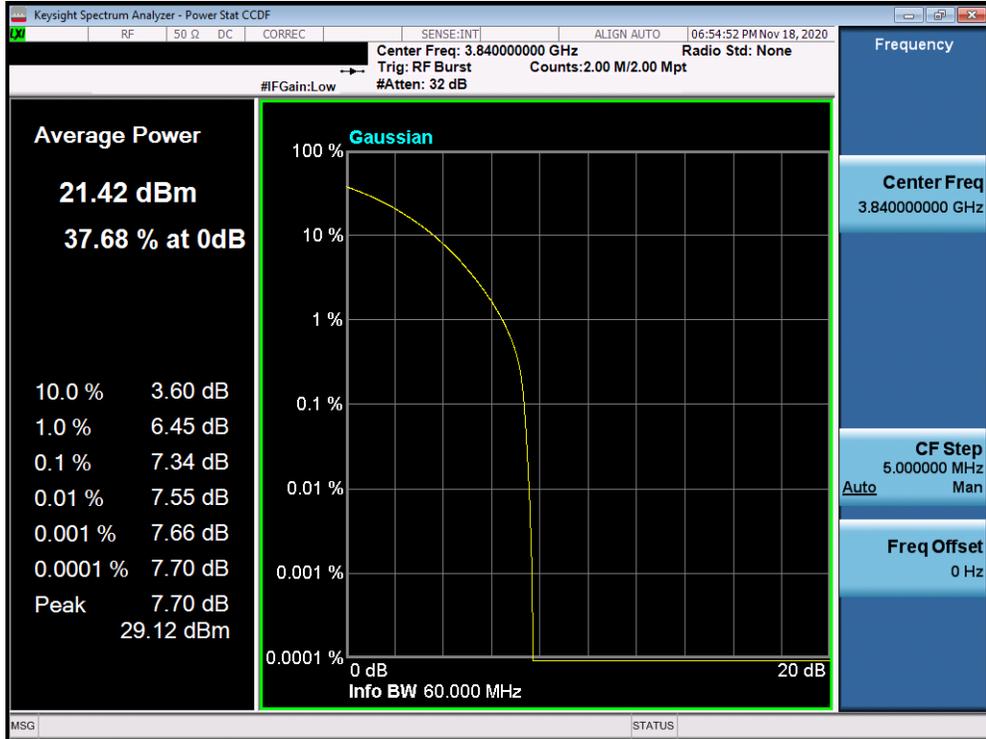


Plot 7-79. Peak to Average Ratio Plot (NR Band n77 – 60MHz CP QPSK - Full RB Configuration)

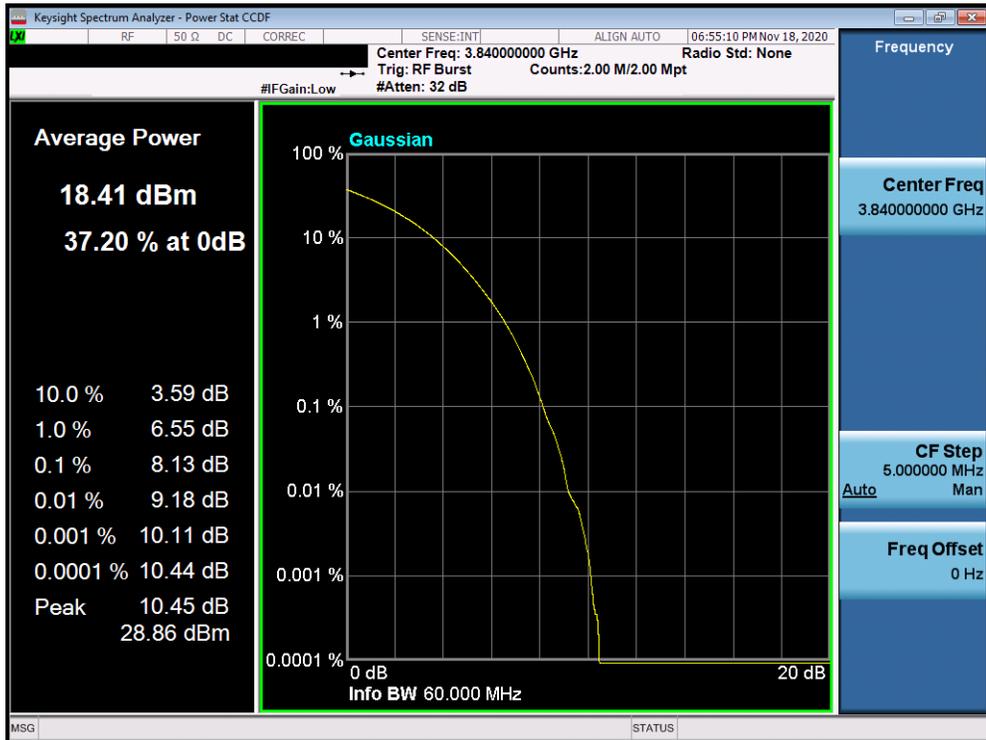


Plot 7-80. Peak to Average Ratio (NR Band n77 - 60MHz CP 16-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 67 of 77

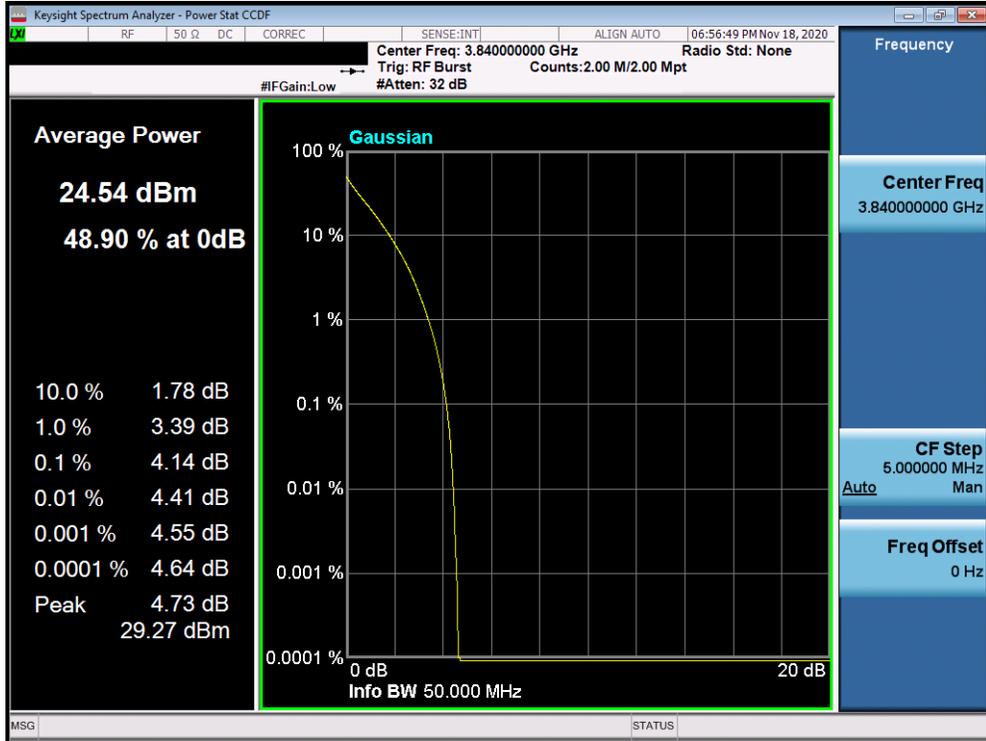


Plot 7-81. Peak to Average Ratio (NR Band n77 - 60MHz CP 64-QAM - Full RB Configuration)

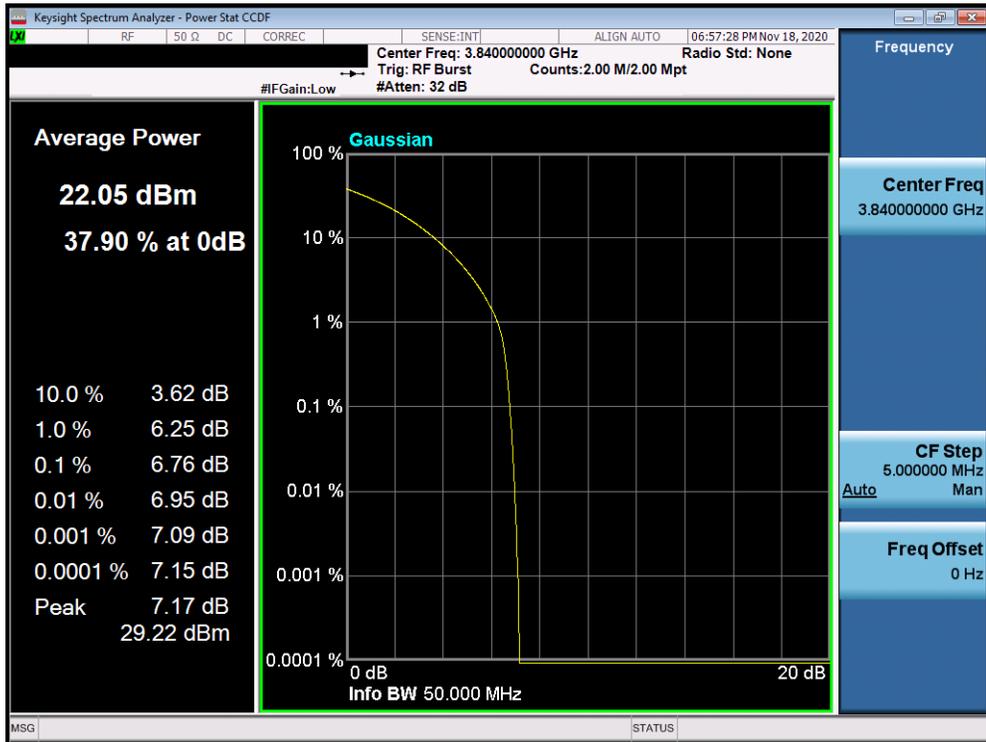


Plot 7-82. Peak to Average Ratio (NR Band n77 - 60MHz CP 256-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 68 of 77

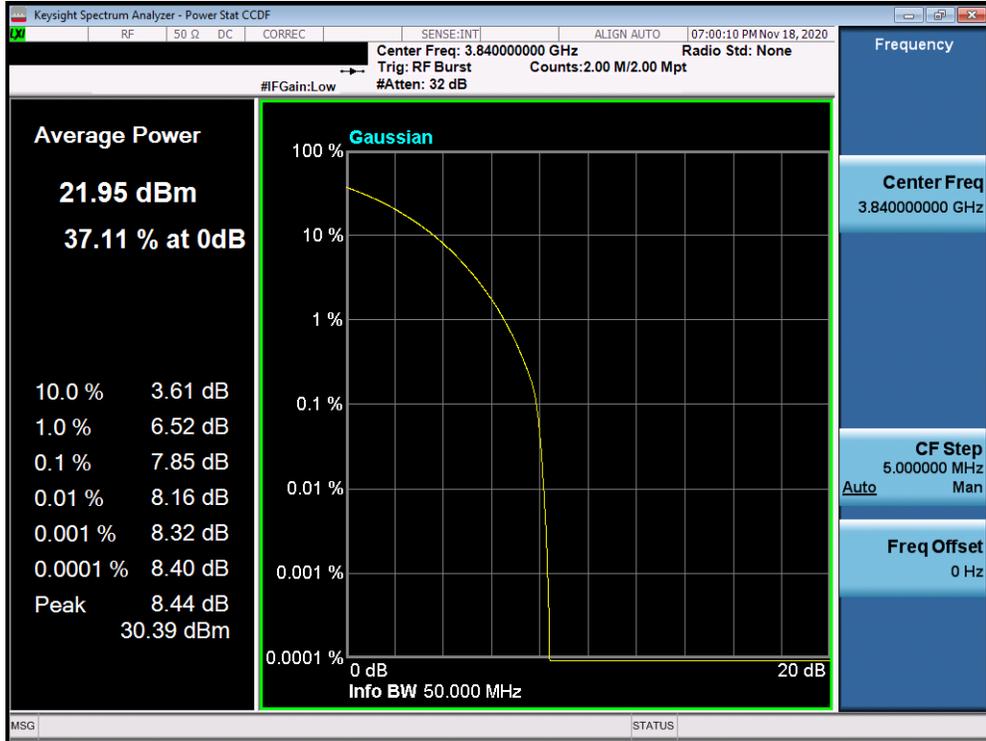


Plot 7-83. Peak to Average Ratio Plot (NR Band n77 - 50MHz $\pi/2$ DFT-S BPSK - Full RB Configuration)

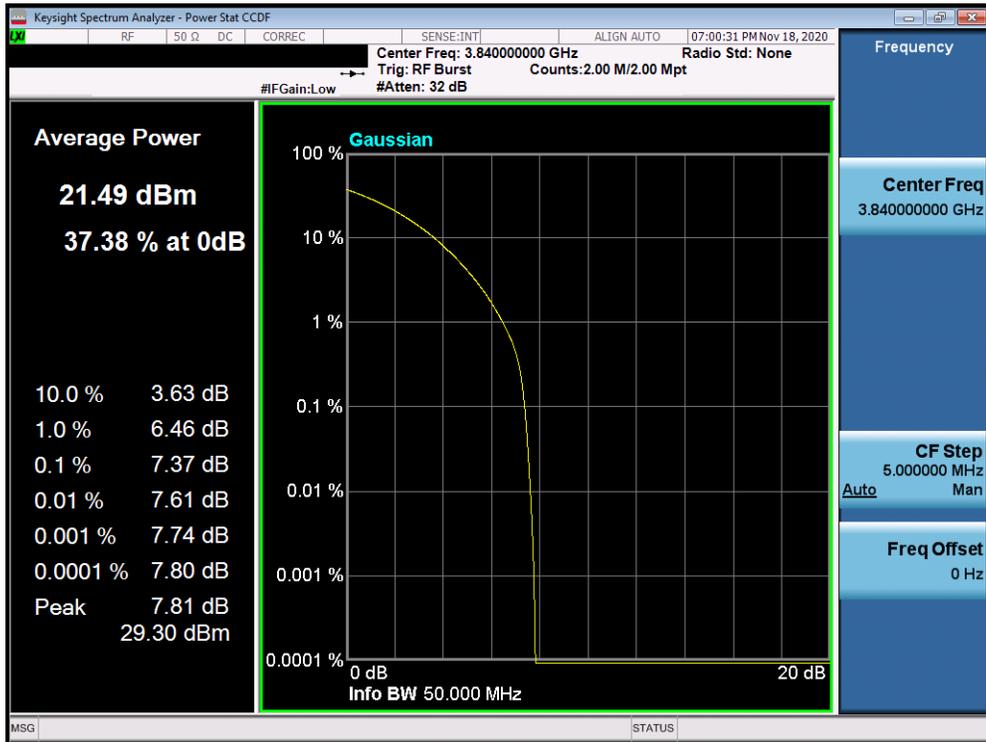


Plot 7-84. Peak to Average Ratio Plot (NR Band n77 - 50MHz CP QPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 69 of 77

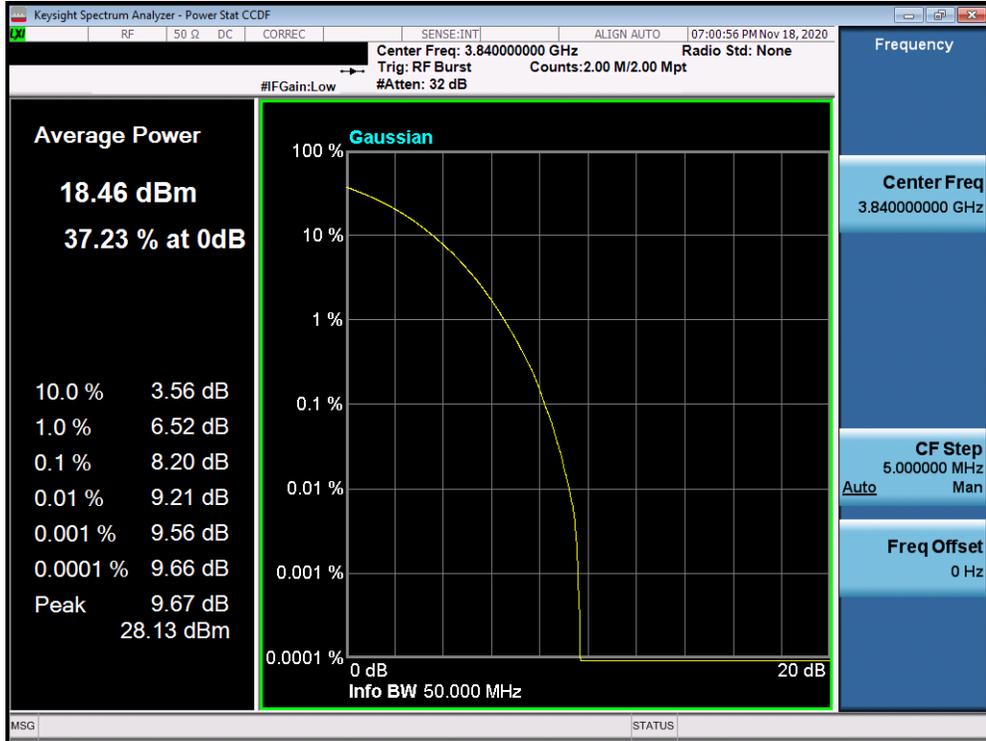


Plot 7-85. Peak to Average Ratio (NR Band n77 - 50MHz CP 16-QAM - Full RB Configuration)

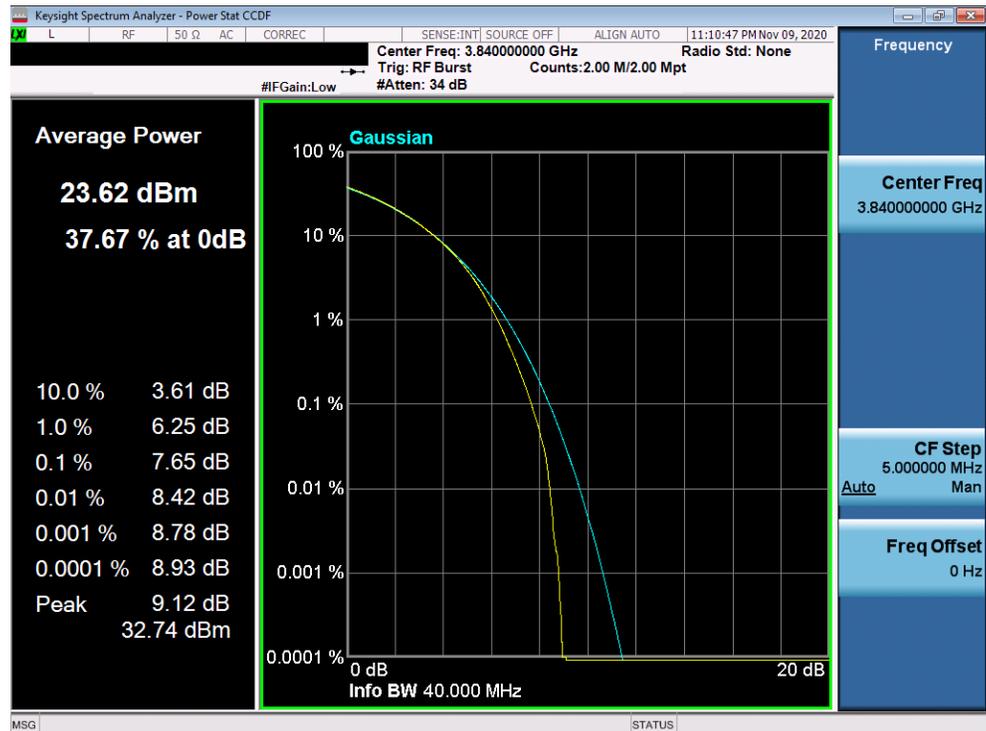


Plot 7-86. Peak to Average Ratio (NR Band n77 - 50MHz CP 64-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 70 of 77

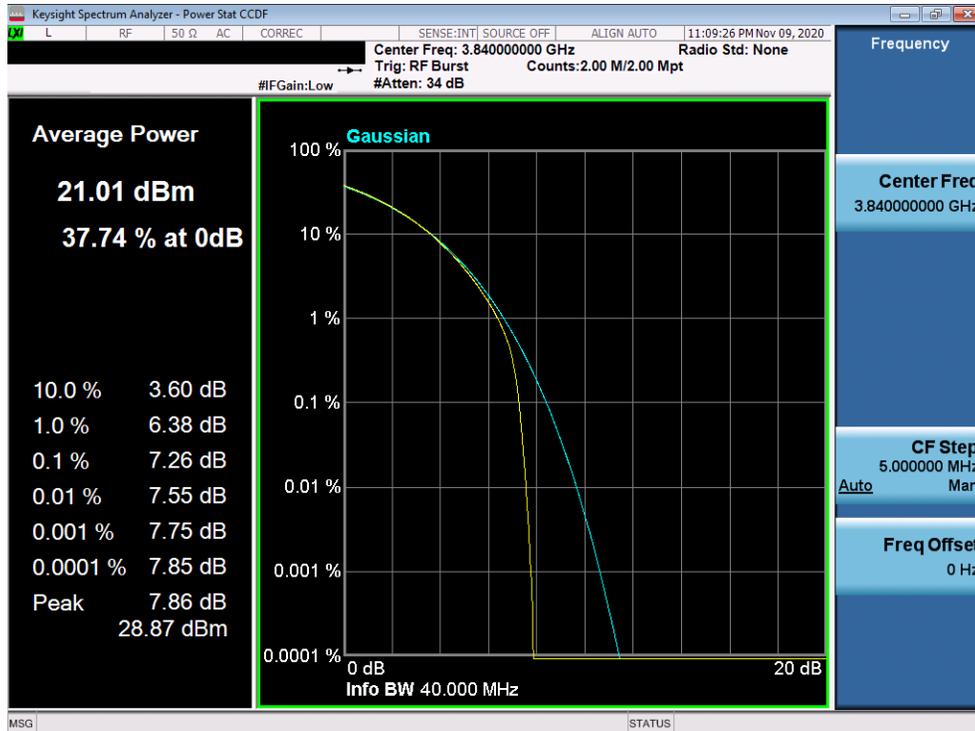


Plot 7-87. Peak to Average Ratio (NR Band n77 - 50MHz CP 256-QAM - Full RB Configuration)

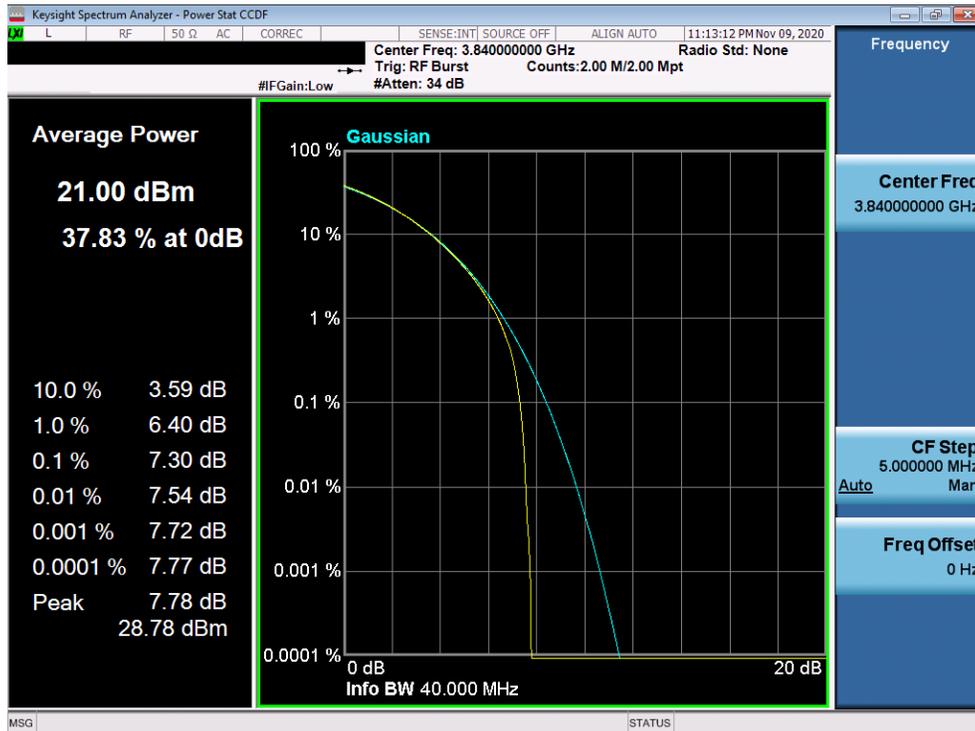


Plot 7-88. Peak to Average Ratio Plot (NR Band n77 - 40MHz $\pi/2$ DFT-S BPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 71 of 77



Plot 7-89. Peak to Average Ratio Plot (NR Band n77 – 40MHz CP QPSK - Full RB Configuration)

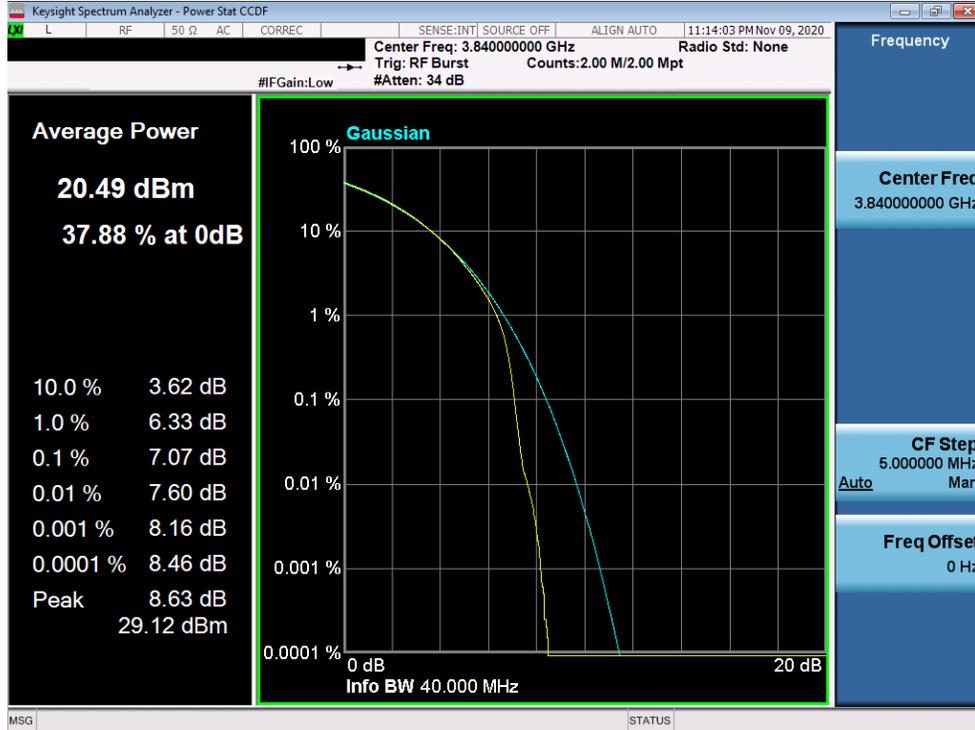


Plot 7-90. Peak to Average Ratio Plot (NR Band n77 - 40MHz CP 16-QAM - Full RB Configuration)

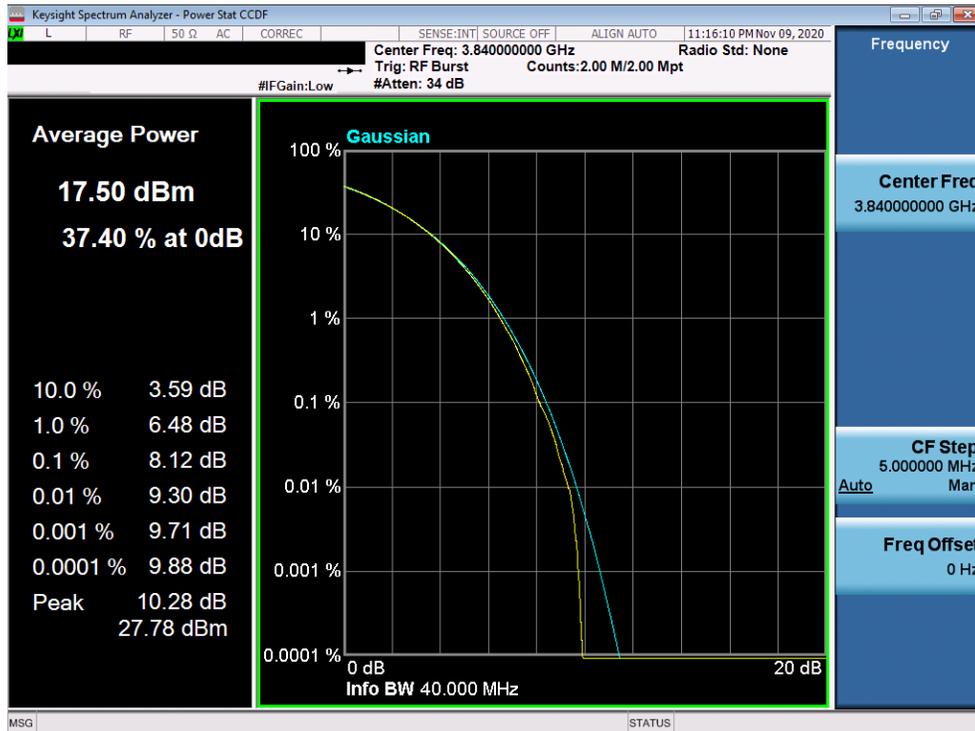
FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 72 of 77

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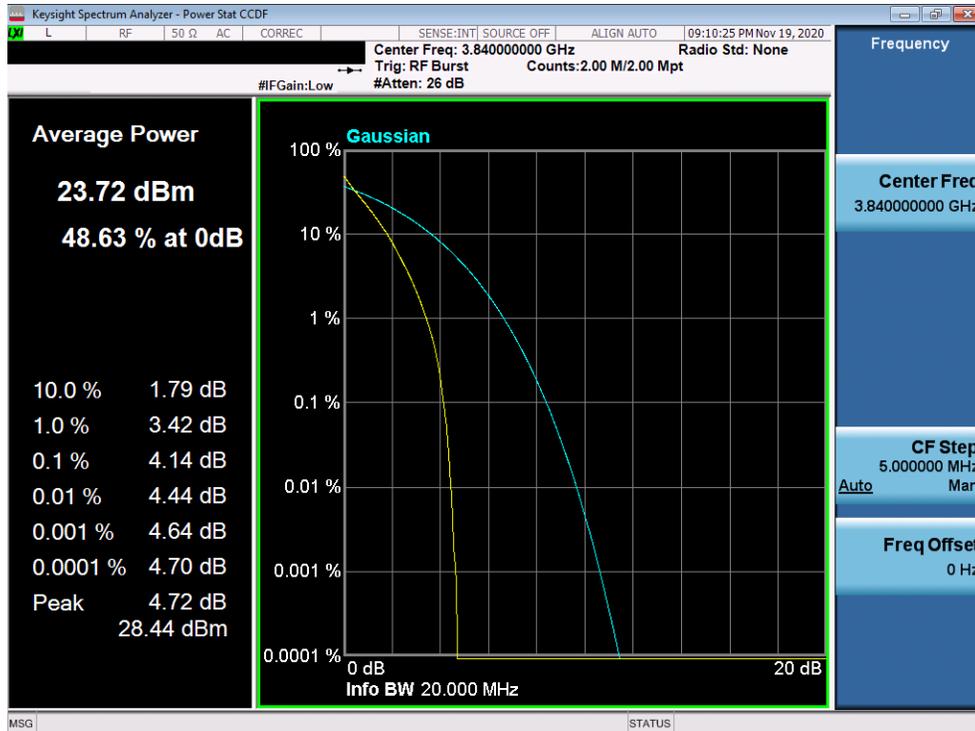


Plot 7-91. Peak to Average Ratio (NR Band n77 - 40MHz CP 64-QAM - Full RB Configuration)

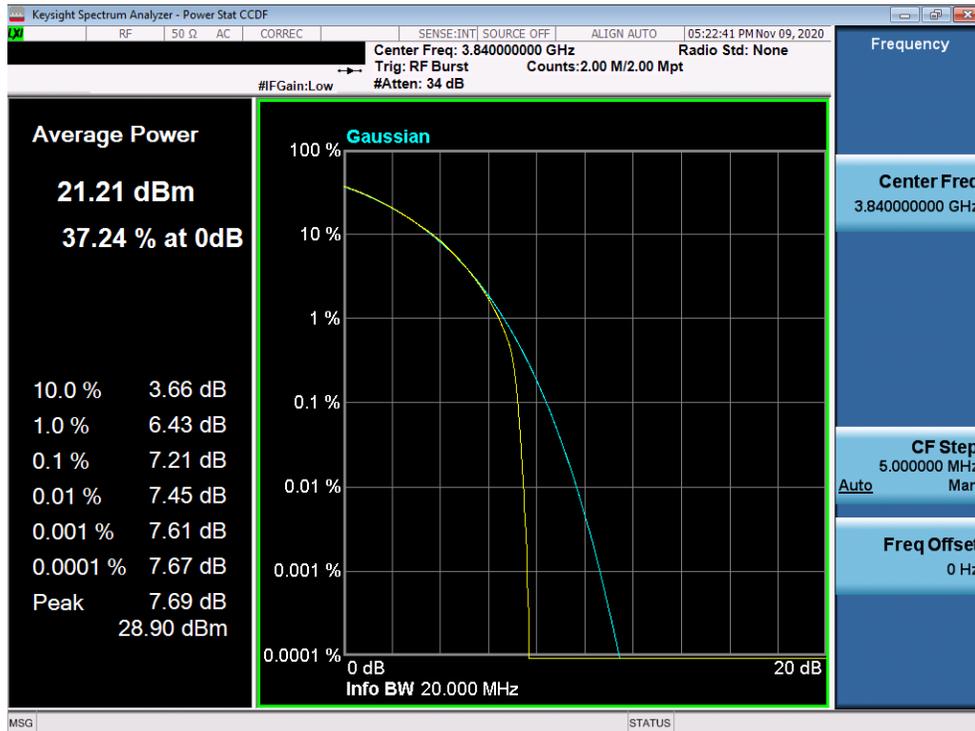


Plot 7-92. Peak to Average Ratio (NR Band n77 - 40MHz CP 256-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 73 of 77

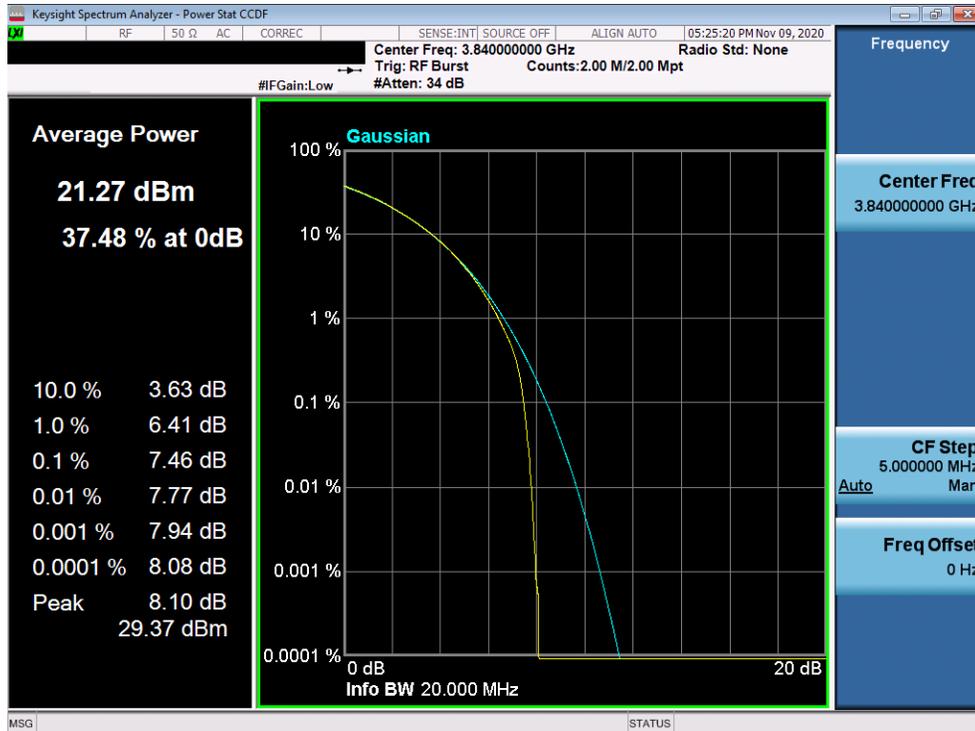


Plot 7-93. Peak to Average Ratio Plot (NR Band n77 - 20MHz $\pi/2$ DFT-S BPSK - Full RB Configuration)

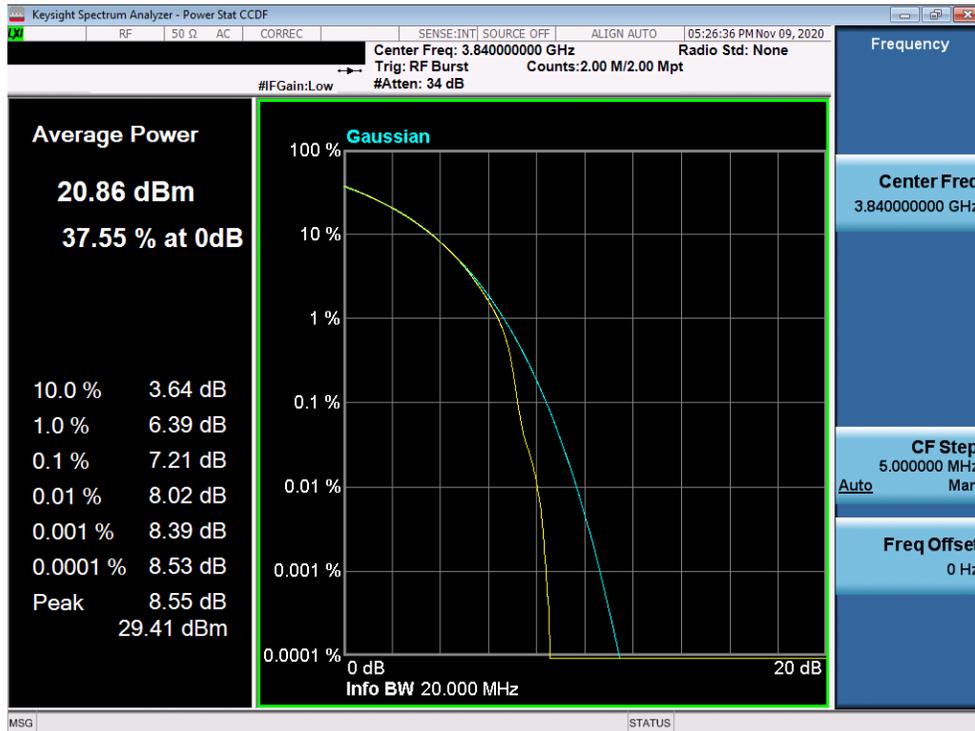


Plot 7-94. Peak to Average Ratio Plot (NR Band n77 - 20MHz CP QPSK - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 74 of 77



Plot 7-95. Peak to Average Ratio (NR Band n77 - 20MHz CP 16-QAM - Full RB Configuration)

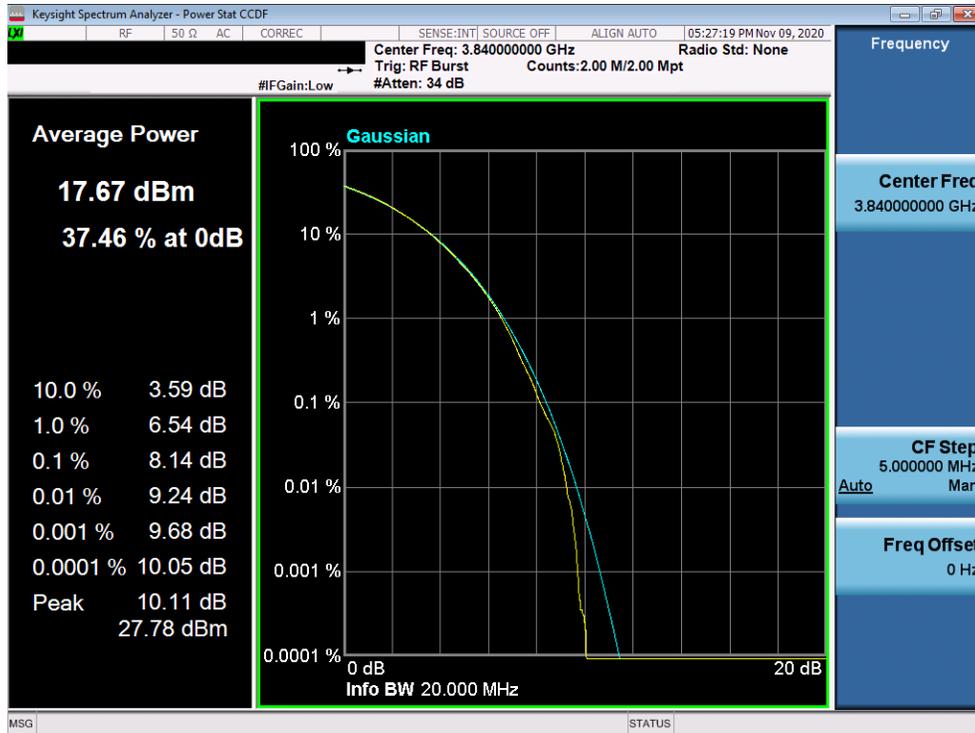


Plot 7-96. Peak to Average Ratio (NR Band n77 - 20MHz CP 64-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 75 of 77

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Plot 7-97. Peak to Average Ratio (NR Band n77 - 20MHz CP 256-QAM - Full RB Configuration)

FCC ID: ZNFF100VM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset		Page 76 of 77

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the LG **Portable Handset** **FCC ID: ZNFF100VM** operating in n77 mode complies with all the requirements of Part 27 of the FCC rules.

FCC ID: ZNFF100VM	 PART 27 MEASUREMENT REPORT 		Approved by: Technical Manager
Test Report S/N: 1M2011050175-04-R1.ZNF	Test Dates: 11/9/2020 - 11/19/2020	EUT Type: Portable Handset	Page 77 of 77

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