



PART 27 MEASUREMENT REPORT

Applicant Name:

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

Date of Testing:

11/24/2020 – 1/4/2021

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M2011240185-04.ZNF

FCC ID:

ZNFK200AM

APPLICANT:

LG Electronics USA, Inc.

Application Type:

Certification

Model:

LM-K200AM

Additional Model(s):

LMK200AM, K200AM, LM-K200CMR, LMK200CMR, K200CMR

EUT Type:

Portable Handset

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part:

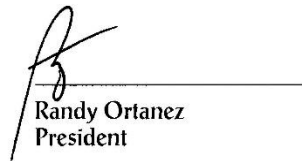
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Test Procedure(s):

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

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

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



Randy Ortanez
President







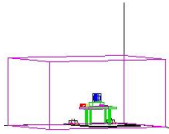
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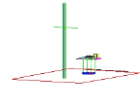
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FCC Part 27





Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	ERP		EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]	
LTE Band 12	10 MHz	QPSK	704.0 - 711.0	0.093	19.70	0.153	21.85	8M97G7D
		16QAM	704.0 - 711.0	0.069	18.38	0.113	20.53	8M97W7D
		64QAM	704.0 - 711.0	0.047	16.73	0.077	18.88	8M95W7D
	5 MHz	QPSK	701.5 - 713.5	0.100	20.01	0.165	22.16	4M49G7D
		16QAM	701.5 - 713.5	0.069	18.40	0.114	20.55	4M52W7D
		64QAM	701.5 - 713.5	0.055	17.44	0.091	19.59	4M52W7D
	3 MHz	QPSK	700.5 - 714.5	0.096	19.82	0.158	21.97	2M70G7D
		16QAM	700.5 - 714.5	0.073	18.62	0.120	20.77	2M70W7D
		64QAM	700.5 - 714.5	0.059	17.72	0.097	19.87	2M70W7D
	1.4 MHz	QPSK	699.7 - 715.3	0.091	19.57	0.149	21.72	1M10G7D
		16QAM	699.7 - 715.3	0.073	18.60	0.119	20.75	1M10W7D
		64QAM	699.7 - 715.3	0.056	17.51	0.092	19.66	1M10W7D

Overview Table (<1GHz Bands)

Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	EIRP		Emission Designator
				Max. Power [W]	Max. Power [dBm]	
LTE Band 4	20 MHz	QPSK	1720.0 - 1745.0	0.190	22.78	17M9G7D
		16QAM	1720.0 - 1745.0	0.158	21.97	18M0W7D
		64QAM	1720.0 - 1745.0	0.129	21.10	17M9W7D
	15 MHz	QPSK	1717.5 - 1747.5	0.212	23.26	13M4G7D
		16QAM	1717.5 - 1747.5	0.169	22.28	13M5W7D
		64QAM	1717.5 - 1747.5	0.136	21.33	13M5W7D
	10 MHz	QPSK	1715.0 - 1750.0	0.214	23.30	8M99G7D
		16QAM	1715.0 - 1750.0	0.168	22.24	8M97W7D
		64QAM	1715.0 - 1750.0	0.125	20.98	9M01W7D
	5 MHz	QPSK	1712.5 - 1752.5	0.214	23.30	4M51G7D
		16QAM	1712.5 - 1752.5	0.162	22.09	4M52W7D
		64QAM	1712.5 - 1752.5	0.118	20.73	4M52W7D
	3 MHz	QPSK	1711.5 - 1753.5	0.203	23.07	2M70G7D
		16QAM	1711.5 - 1753.5	0.168	22.25	2M70W7D
		64QAM	1711.5 - 1753.5	0.120	20.78	2M70W7D
	1.4 MHz	QPSK	1710.7 - 1754.3	0.208	23.18	1M10G7D
		16QAM	1710.7 - 1754.3	0.170	22.29	1M11W7D
		64QAM	1710.7 - 1754.3	0.126	21.01	1M09W7D

Mode	FCC Rule Part	Tx Frequency (MHz)	EIRP		Emission Designator
			Max. Power (W)	Max. Power (dBm)	
WCDMA1700	27	1712.4 - 1752.6	0.224	23.51	4M15F9W

Overview Table (>1GHz Bands)

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1.0 INTRODUCTION

1.1 Scope

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



1.2 PCTEST Test Location

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

1.3 Test Facility / Accreditations

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

- PCTEST is an ISO 17025-2017 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 ISSED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISSED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFK200AM**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 11951, 11811

2.2 Device Capabilities

This device contains the following capabilities:



GSM/GPRS/EDGE, WCDMA/HSPA, Multi-band LTE, WLAN, BT (1x, EDR, LE)

2.3 Test Configuration

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

2.4 EMI Suppression Device(s)/Modifications

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

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3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

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

3.2 Radiated Power and Radiated Spurious Emissions

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

The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer “Channel Power” function with the integration band set to the emissions’ occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v03r01.



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

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

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 (dBi) or an isotropic source (dBd). The substitute level is equal to $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

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



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

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4.0 MEASUREMENT UNCERTAINTY

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

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

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5.0 TEST EQUIPMENT CALIBRATION DATA



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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTX2	Licensed Transmitter Cable Set	4/9/2020	Annual	4/9/2021	LTX2
-	LTX4	Licensed Transmitter Cable Set	7/9/2020	Annual	7/9/2021	LTX4
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
Anritsu	MT8820C	Radio Communication Analyzer	N/A			6201300731
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201381794
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2019	Biennial	10/10/2021	121034
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
Mini Circuits	TVA-11-422	RF Power Amp	N/A			QA1317001
Mini Circuits	PWR-4GHS	USB Power Sensor	6/18/2020	Annual	6/18/2021	12001070013
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A			11208010032
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			836371/0079
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			100976
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/9/2020	Annual	9/9/2021	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/10/2020	Annual	8/10/2021	103200
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
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/27/2020	Biennial	7/27/2022	A051107

Table 5-1. Test Equipment

Note:

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

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6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated



7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – LTE Band

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

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

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7.0 TEST RESULTS

7.1 Summary



Company Name: LG Electronics USA, Inc.
 FCC ID: ZNFK200AM
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE/WCDMA

Test Condition	Test Description	FCC Part Section(s)	RSS Section(s)	Test Limit	Test Result	Reference
CONDUCTED	Occupied Bandwidth	2.1049	RSS-Gen(6.7)	N/A	PASS	Section 7.2
	Conducted Band Edge / Spurious Emissions	2.1051, 27.53	RSS-139(6.6)	> 43 + 10log10(P[Watts]) at Band Edge and for all out-of-band emissions	PASS	Sections 7.3, 7.4
	Transmitter Conducted Output Power	2.1046	RSS-139(4.1)	N/A	PASS	See RF Exposure Report
	Frequency Stability	2.1055, 27.54	RSS-139(6.4)	Fundamental emissions stay within authorized frequency block	PASS	Section 7.8
RADIATED	Effective Radiated Power / Equivalent Isotropic Radiated Power (LTE Band 12)	27.50(b)(10)	RSS-130(4.4)	< 3 Watts max. ERP < 5 Watts max. EIRP	PASS	Section 7.6
	Equivalent Isotropic Radiated Power (WCDMA)	27.50(d)(4)	RSS-139(6.5)	< 1 Watts max. EIRP	PASS	Section 7.6
	Equivalent Isotropic Radiated Power (LTE Band 4)				PASS	Section 7.6
	Radiated Spurious Emissions	2.1053, 27.53	RSS-139(6.6)	> 43 + 10 log10 (P[Watts]) for all out-of-band emissions	PASS	Section 7.7

Table 7-1. Summary of Test Results

Notes:

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

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7.2 Occupied Bandwidth

Test Overview

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 4.2

Test Settings

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

Test Setup

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

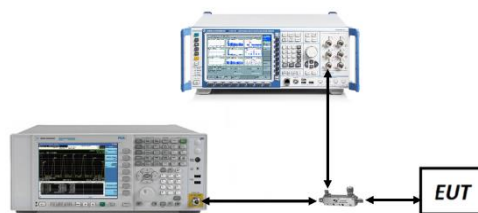


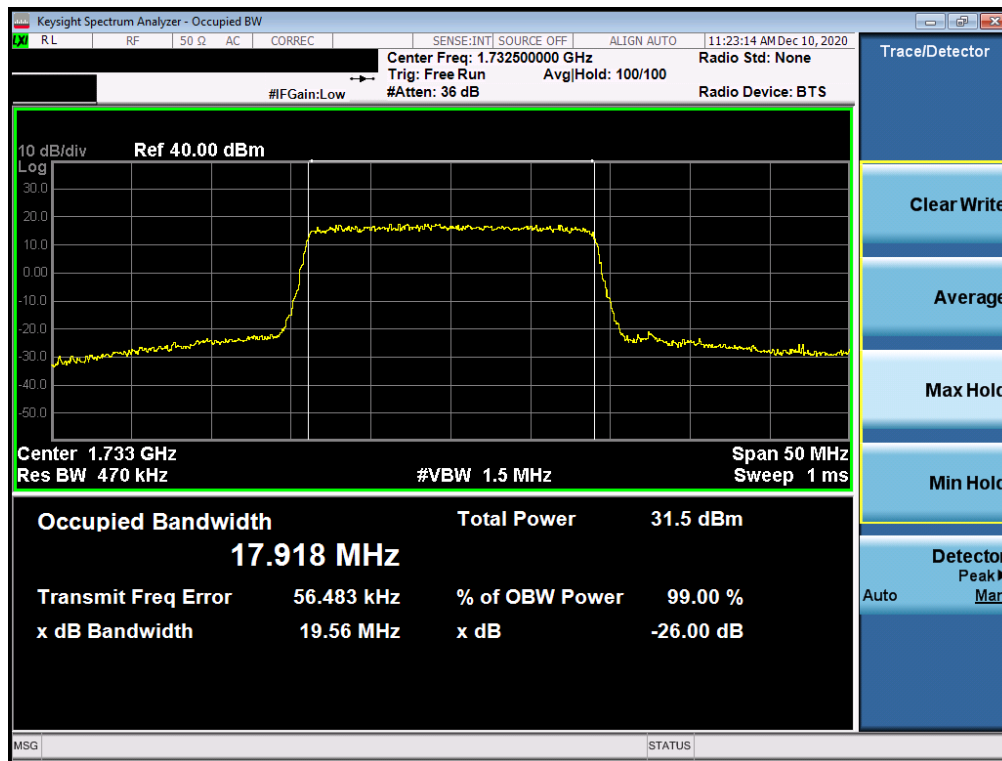
Figure 7-1. Test Instrument & Measurement Setup

Test Notes

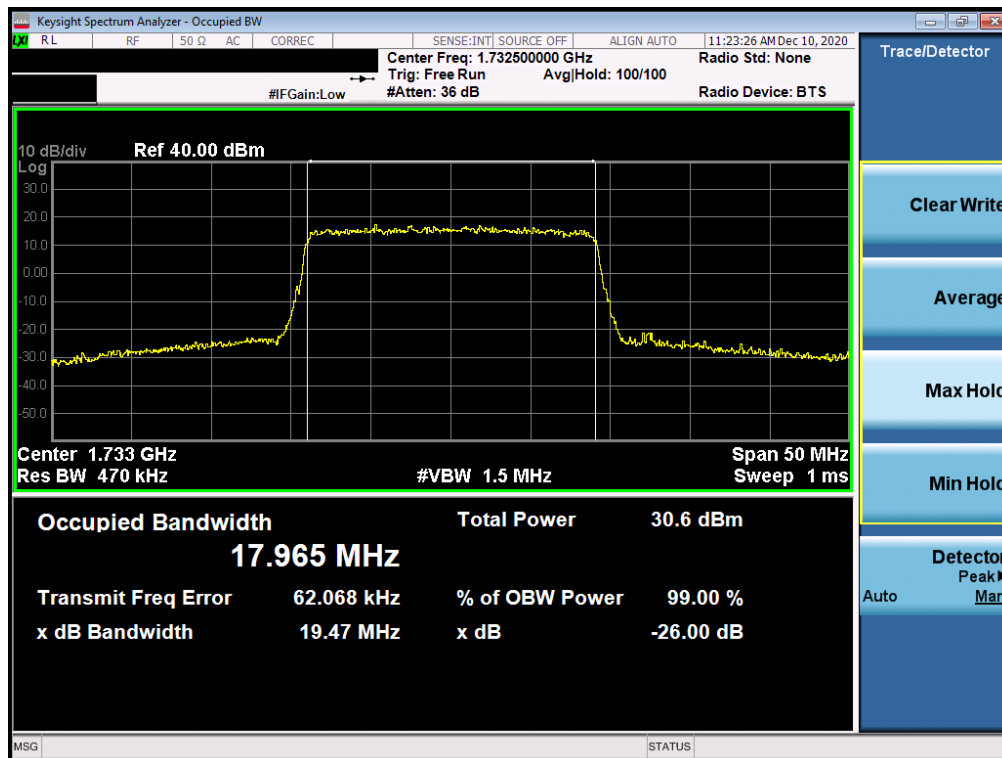
None.

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LTE Band 4

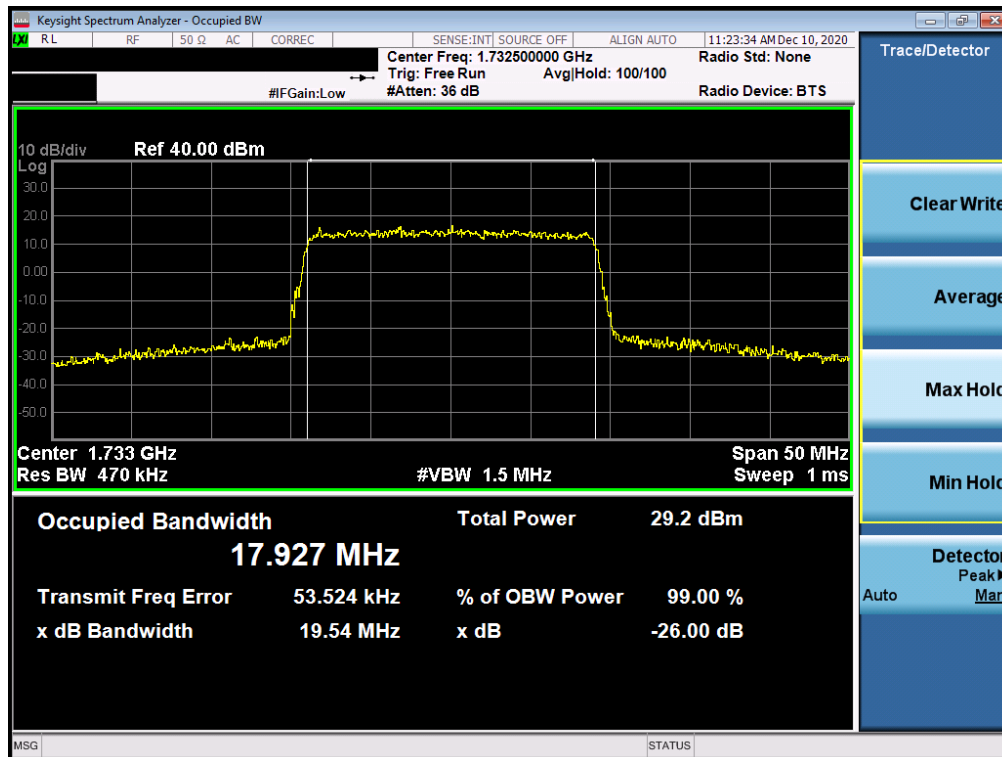


Plot 7-1. Occupied Bandwidth Plot (LTE Band 4 - 20MHz QPSK - Full RB Configuration)

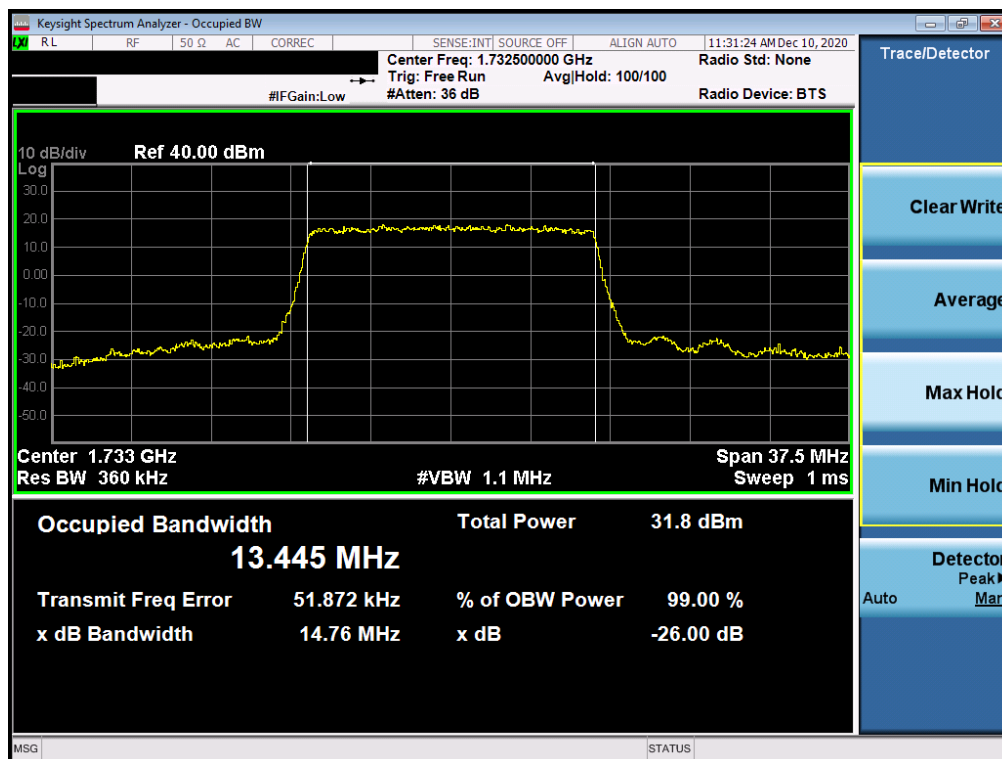


Plot 7-2. Occupied Bandwidth Plot (LTE Band 4 - 20MHz 16-QAM - Full RB Configuration)

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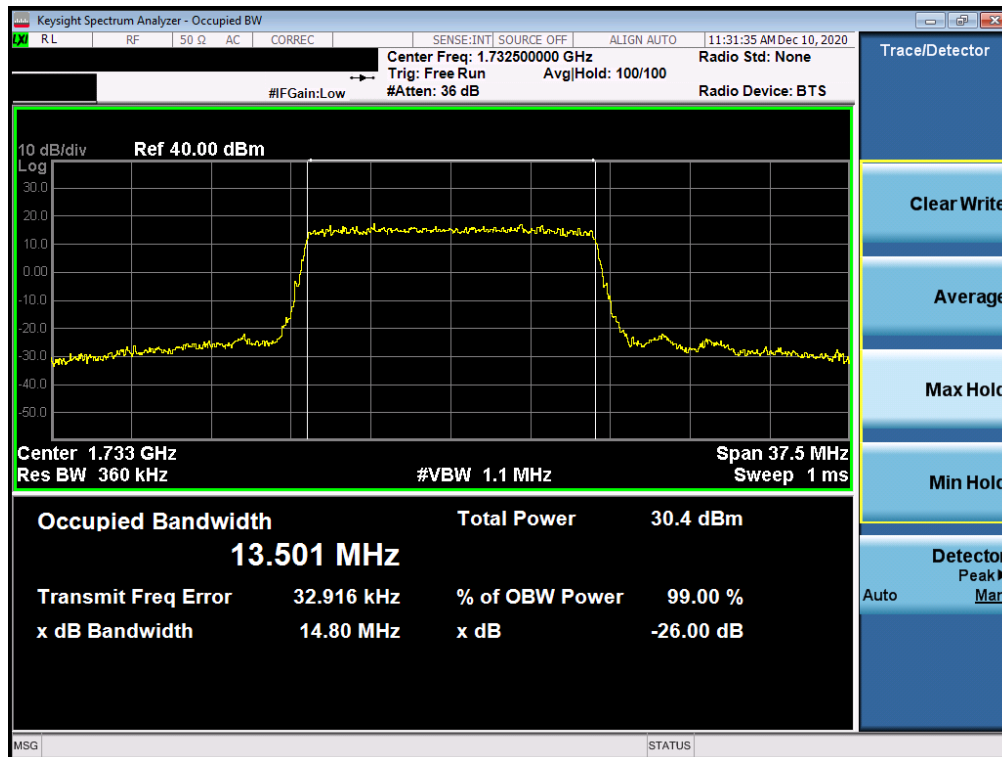


Plot 7-3. Occupied Bandwidth Plot (LTE Band 4 - 20MHz 64-QAM - Full RB Configuration)

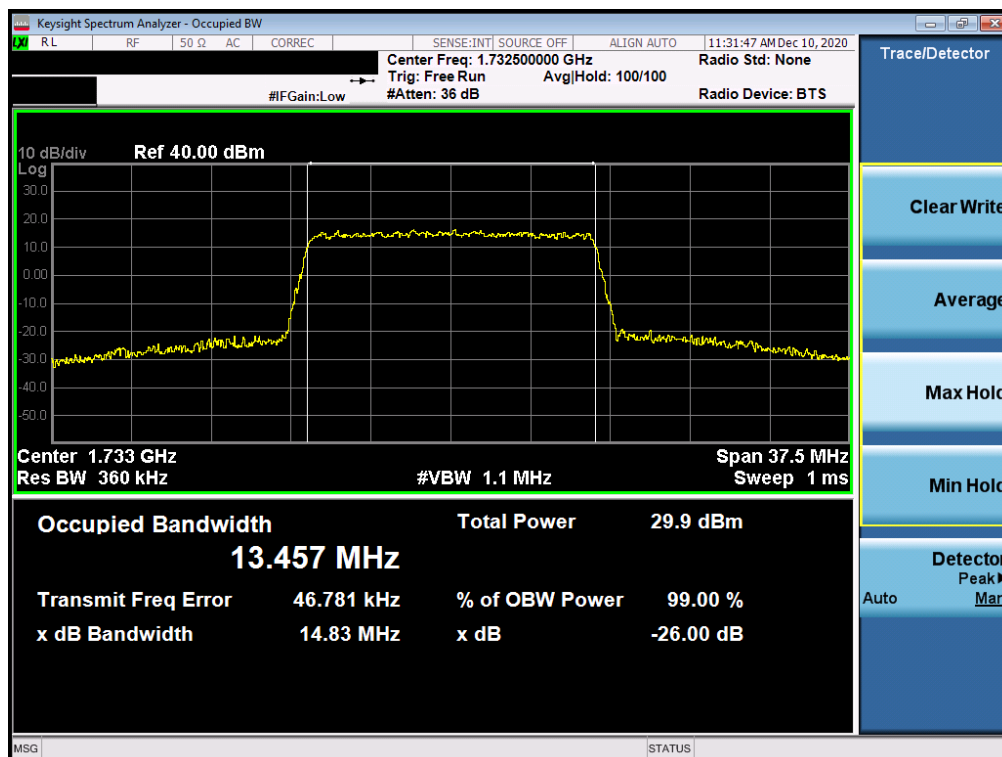


Plot 7-4. Occupied Bandwidth Plot (LTE Band 4 - 15MHz QPSK - Full RB Configuration)

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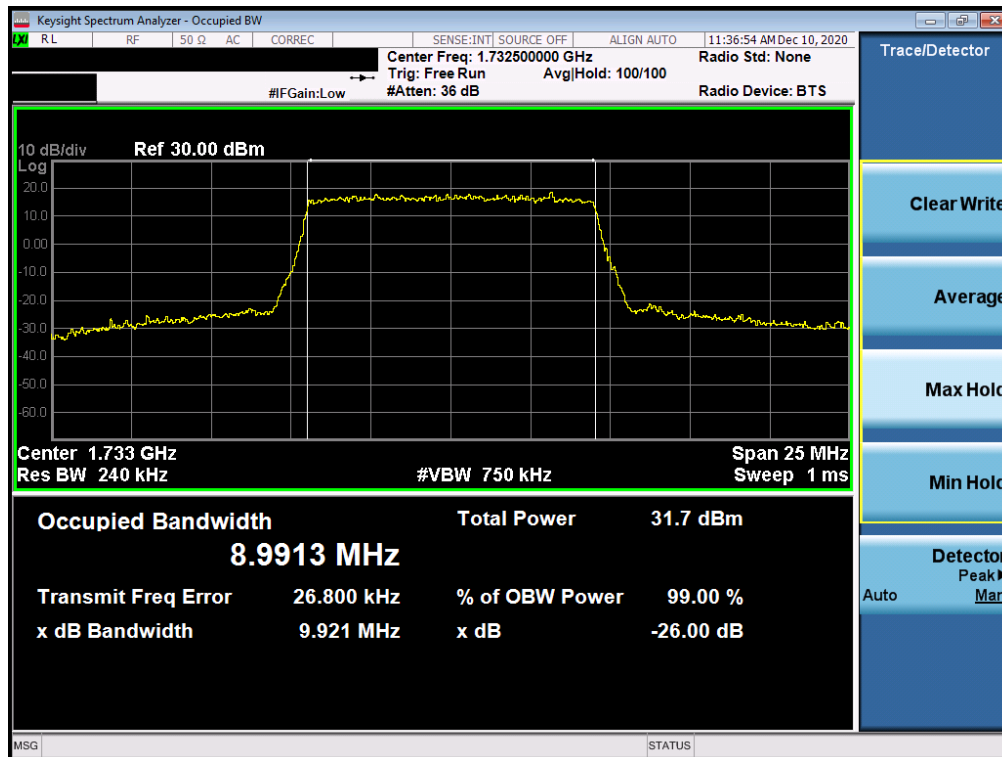


Plot 7-5. Occupied Bandwidth Plot (LTE Band 4 - 15MHz 16-QAM - Full RB Configuration)

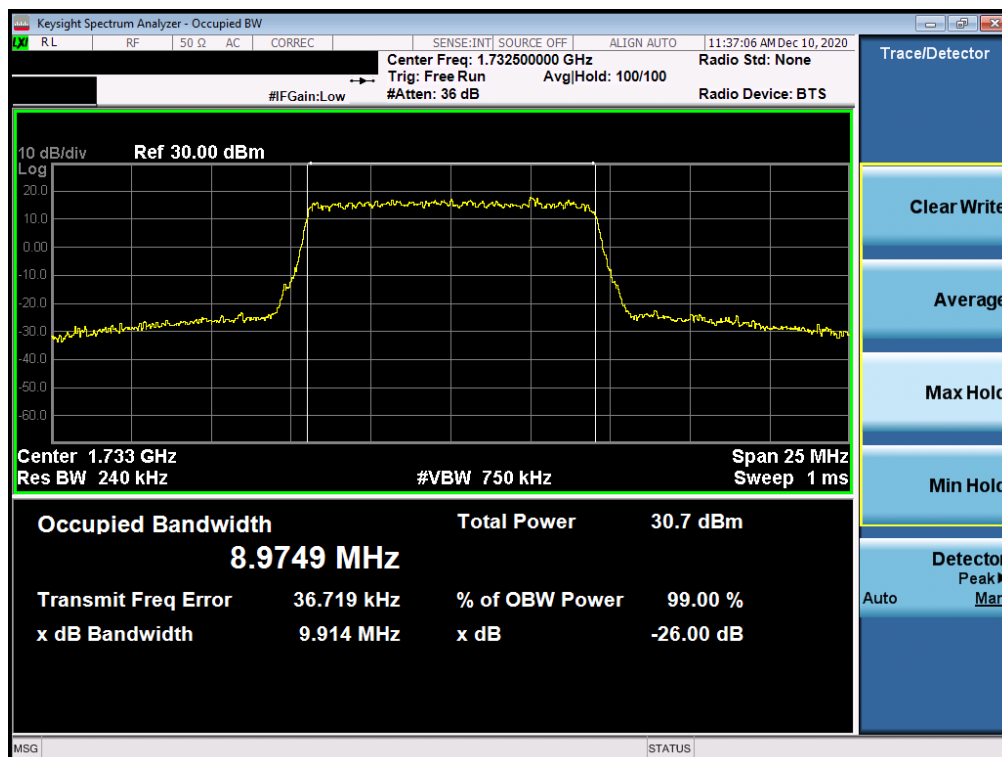


Plot 7-6. Occupied Bandwidth Plot (LTE Band 4 - 15MHz 64-QAM - Full RB Configuration)

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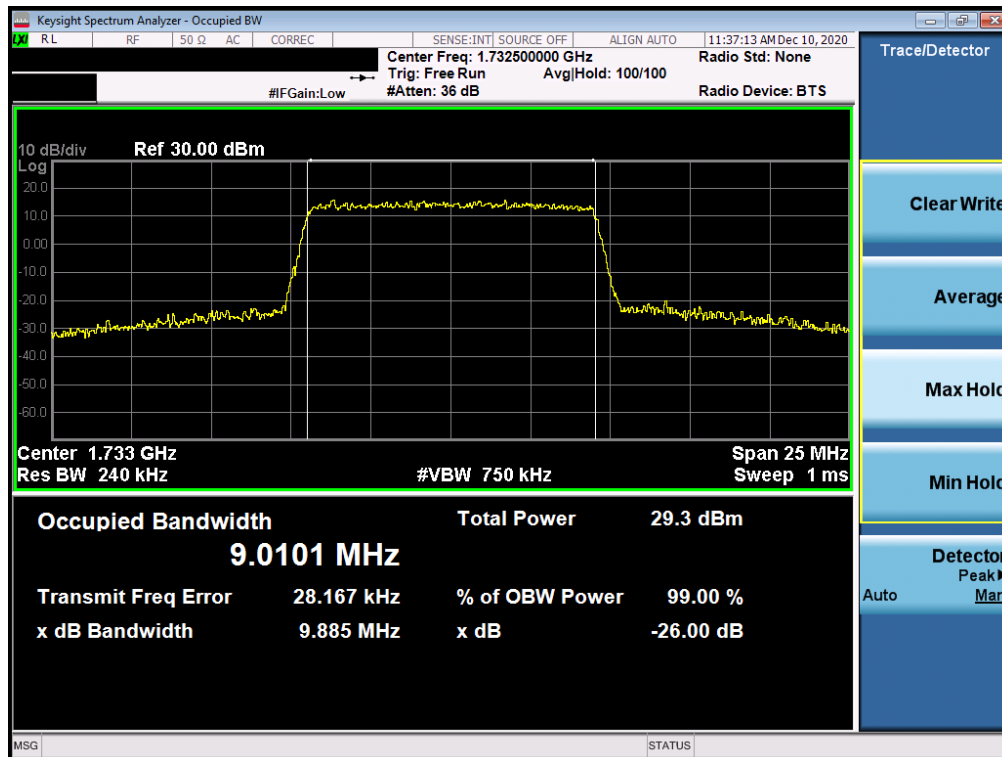


Plot 7-7. Occupied Bandwidth Plot (LTE Band 4 - 10MHz QPSK - Full RB Configuration)

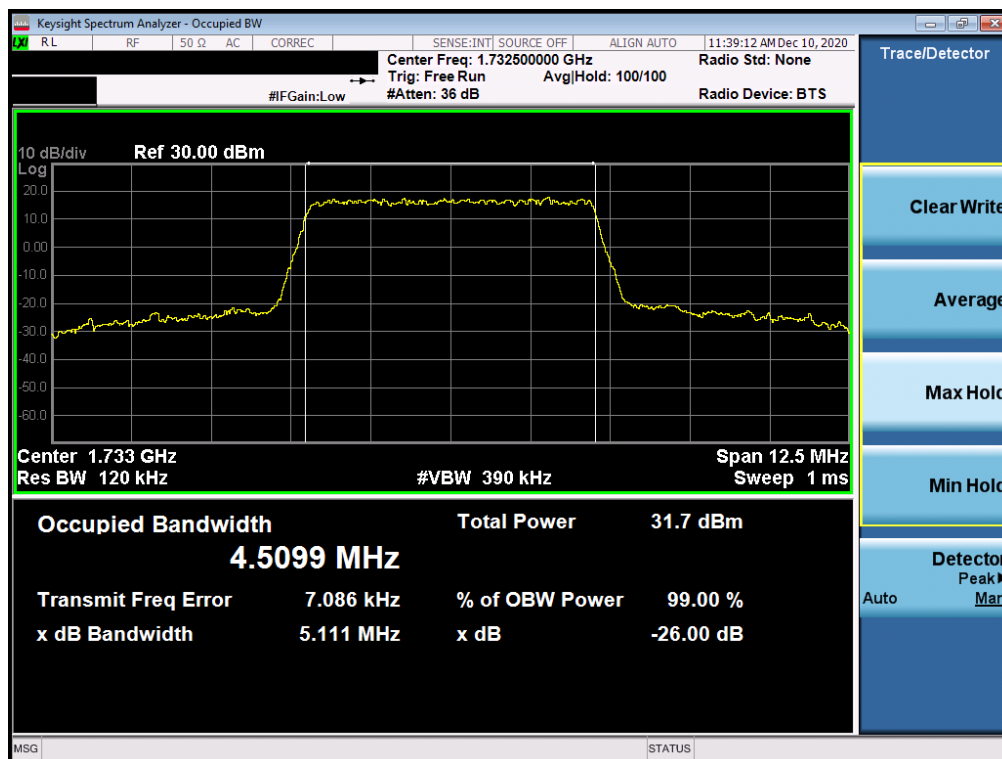


Plot 7-8. Occupied Bandwidth Plot (LTE Band 4 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 15 of 100

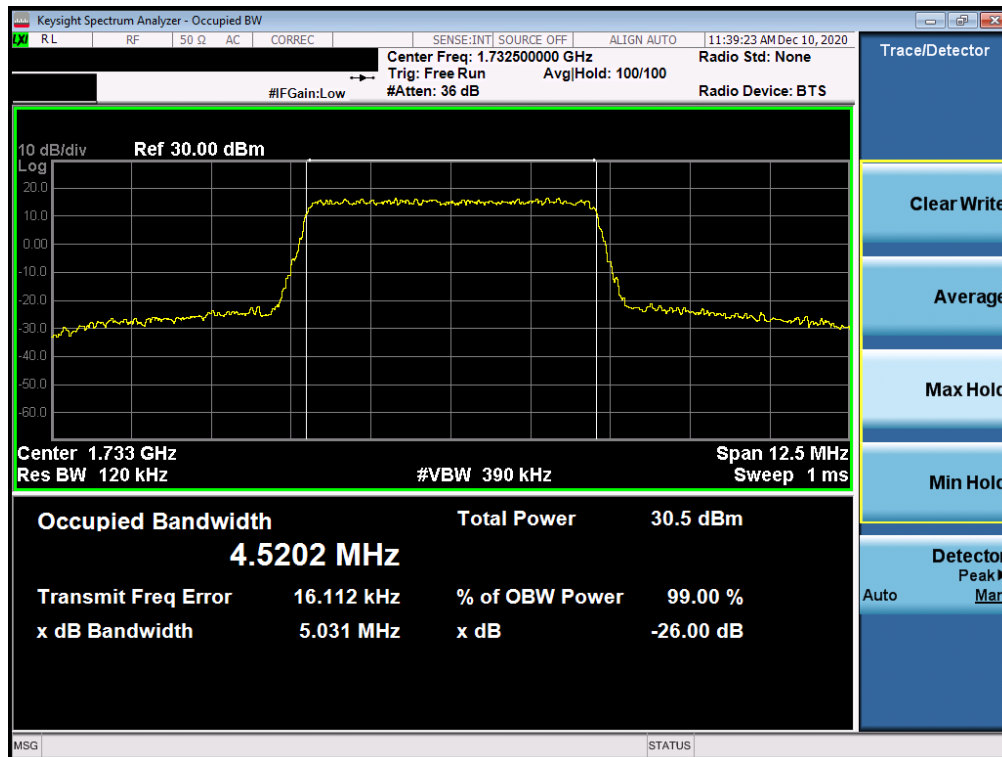


Plot 7-9. Occupied Bandwidth Plot (LTE Band 4 - 10MHz 64-QAM - Full RB Configuration)

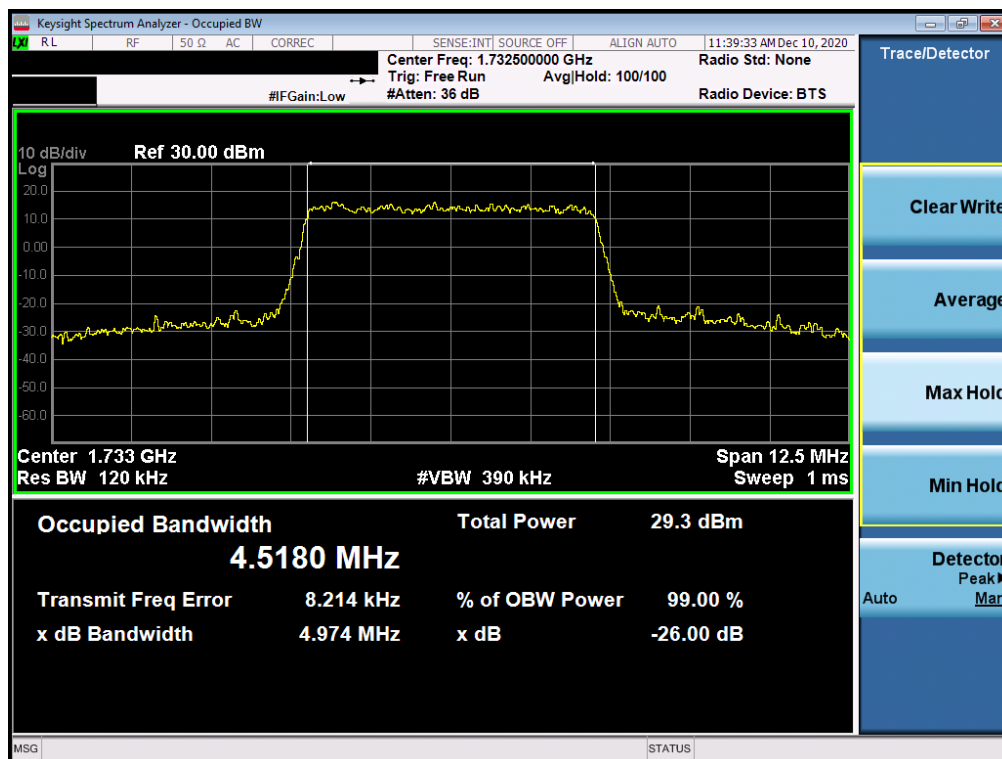


Plot 7-10. Occupied Bandwidth Plot (LTE Band 4 - 5MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 16 of 100

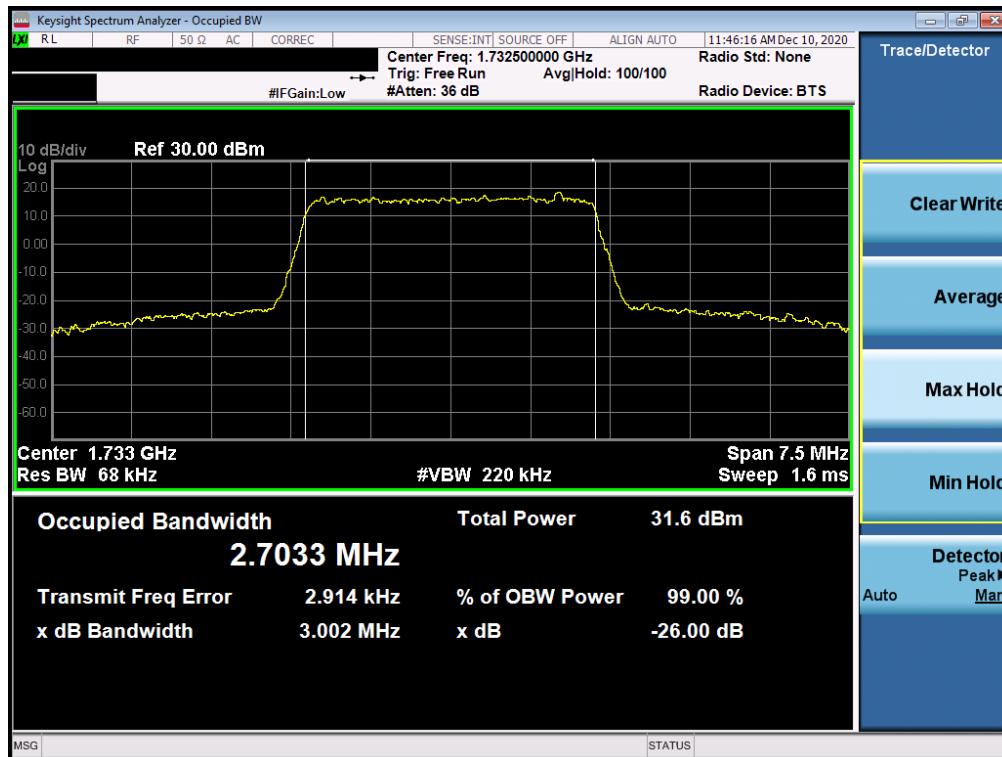


Plot 7-11. Occupied Bandwidth Plot (LTE Band 4 - 5MHz 16-QAM - Full RB Configuration)

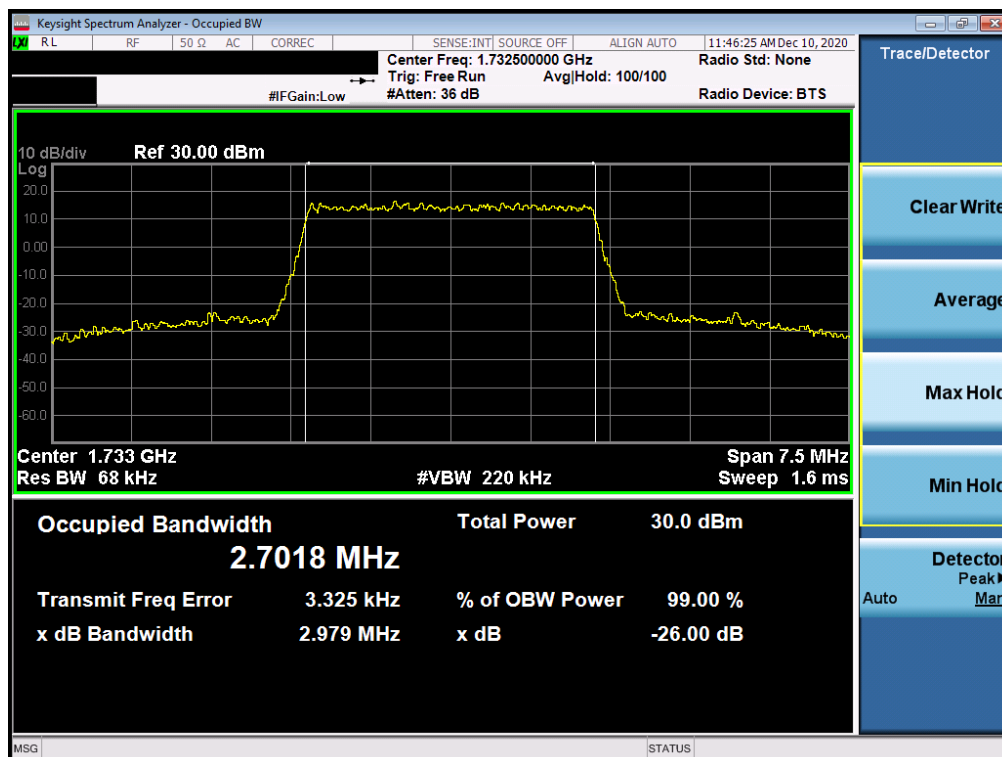


Plot 7-12. Occupied Bandwidth Plot (LTE Band 4 - 5MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 17 of 100

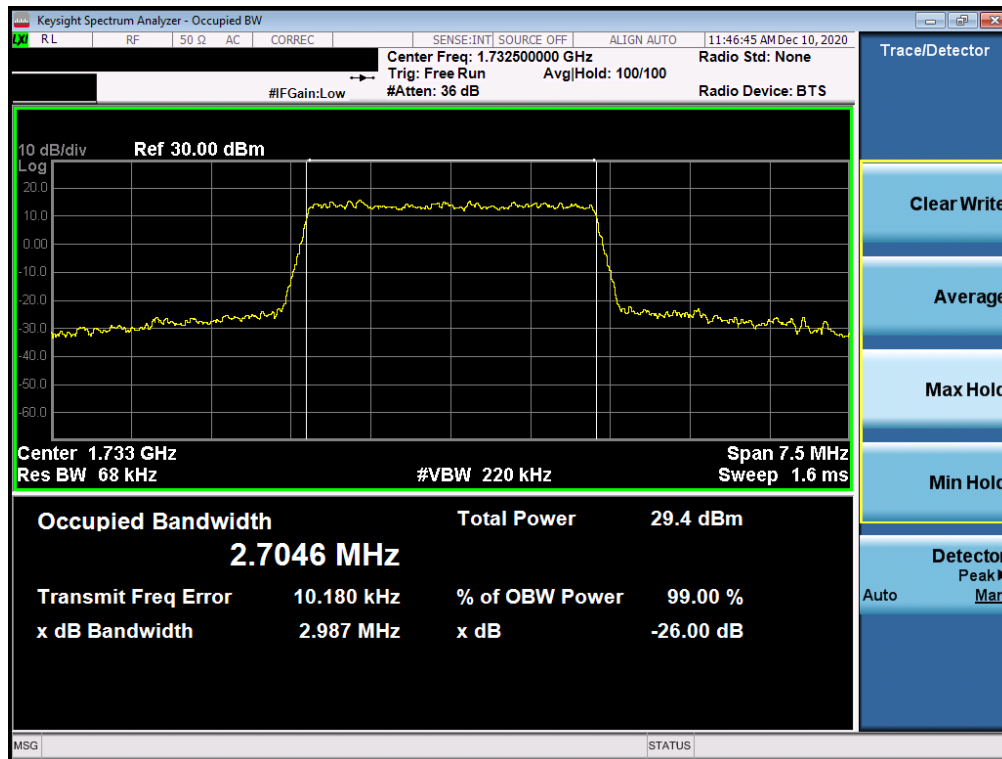


Plot 7-13. Occupied Bandwidth Plot (LTE Band 4 - 3MHz QPSK - Full RB Configuration)

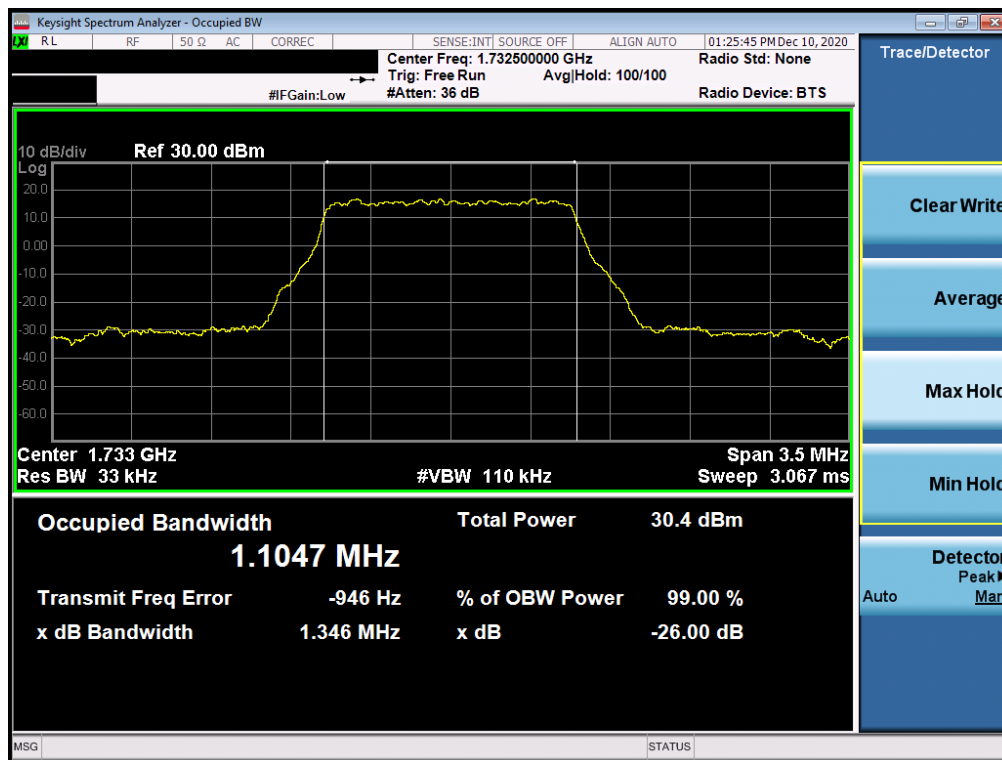


Plot 7-14. Occupied Bandwidth Plot (LTE Band 4 - 3MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 18 of 100

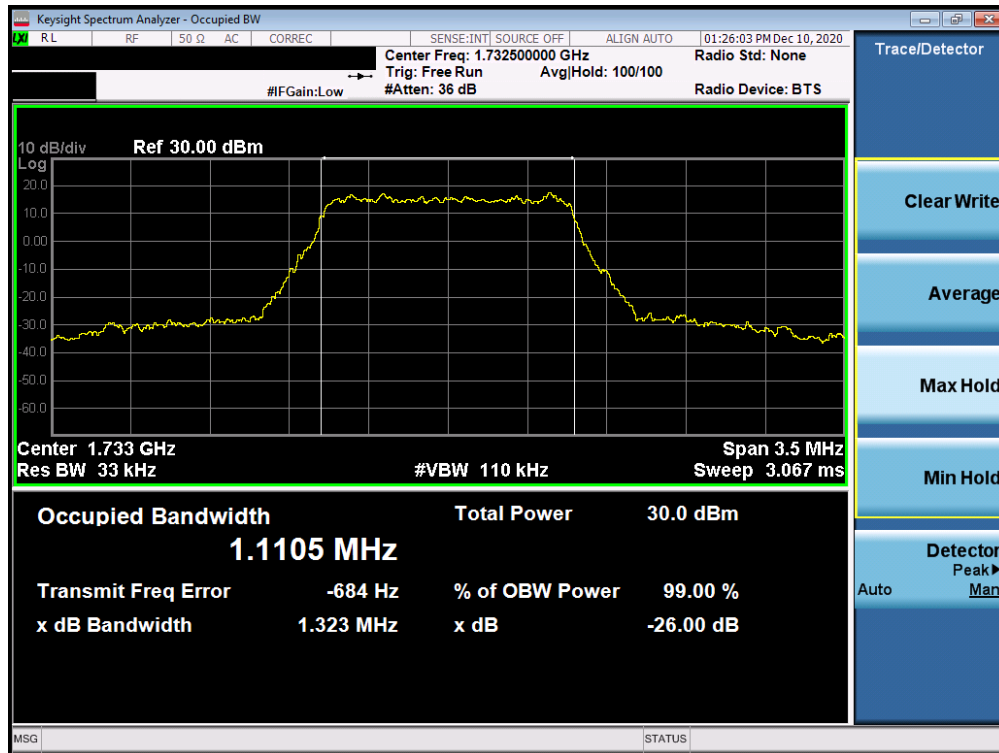


Plot 7-15. Occupied Bandwidth Plot (LTE Band 4 - 3MHz 64-QAM - Full RB Configuration)



Plot 7-16. Occupied Bandwidth Plot (LTE Band 4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 19 of 100



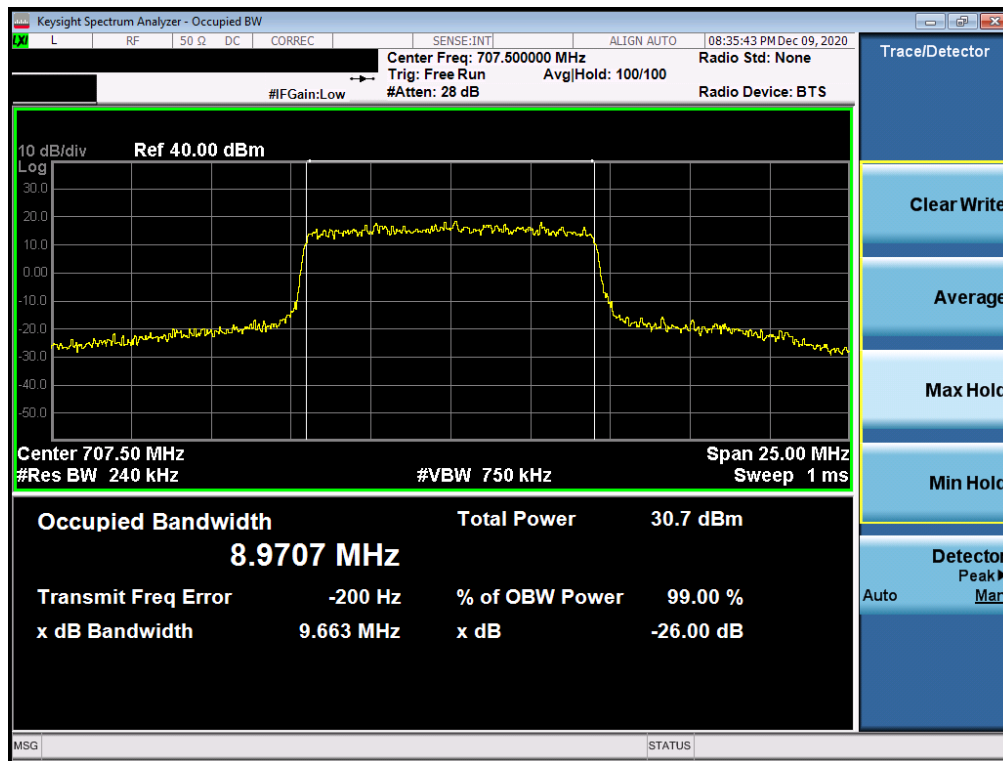
Plot 7-17. Occupied Bandwidth Plot (LTE Band 4 - 1.4MHz 16-QAM - Full RB Configuration)



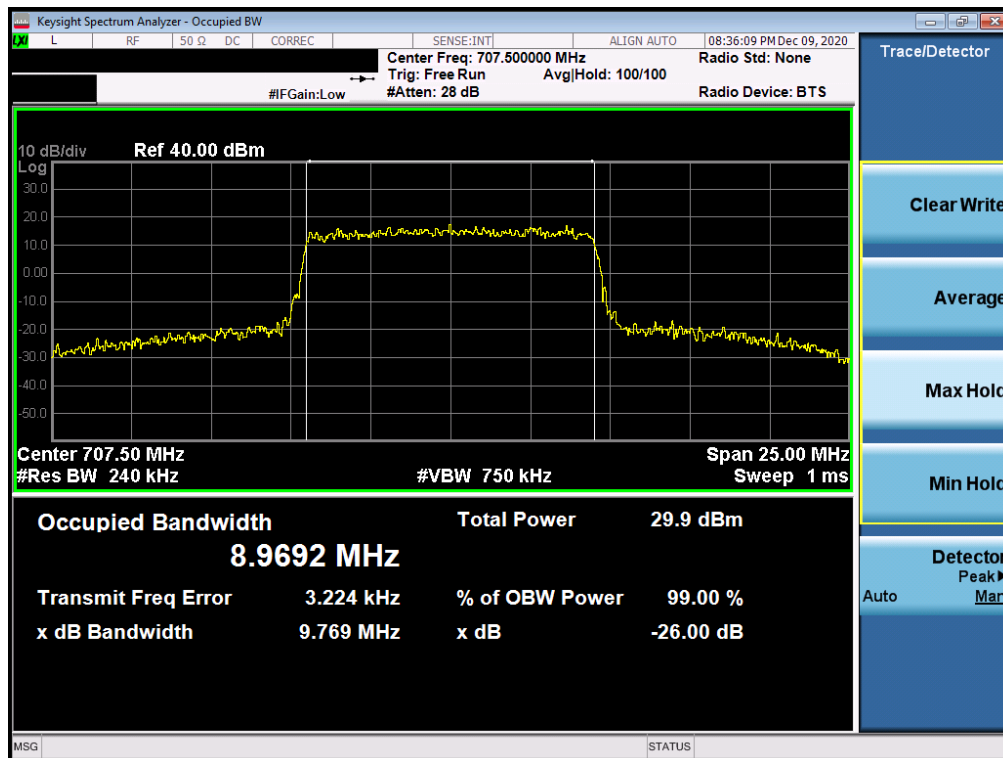
Plot 7-18. Occupied Bandwidth Plot (LTE Band 4 - 1.4MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 20 of 100

LTE Band 12

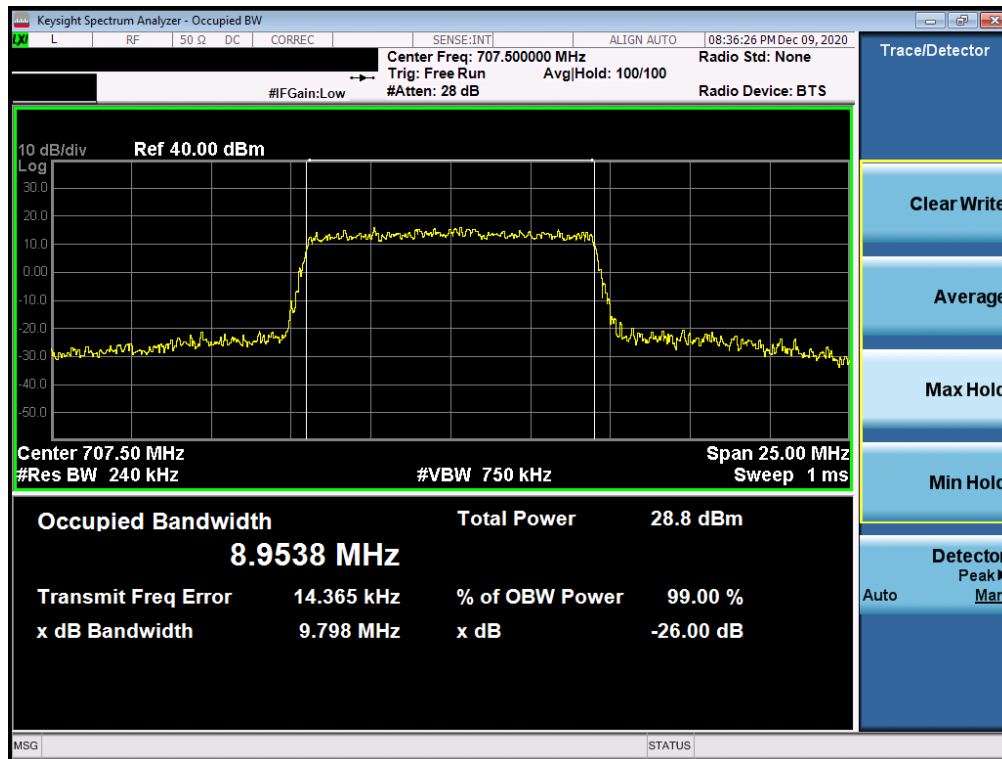


Plot 7-19. Occupied Bandwidth Plot (LTE Band 12 - 10MHz QPSK - Full RB Configuration)

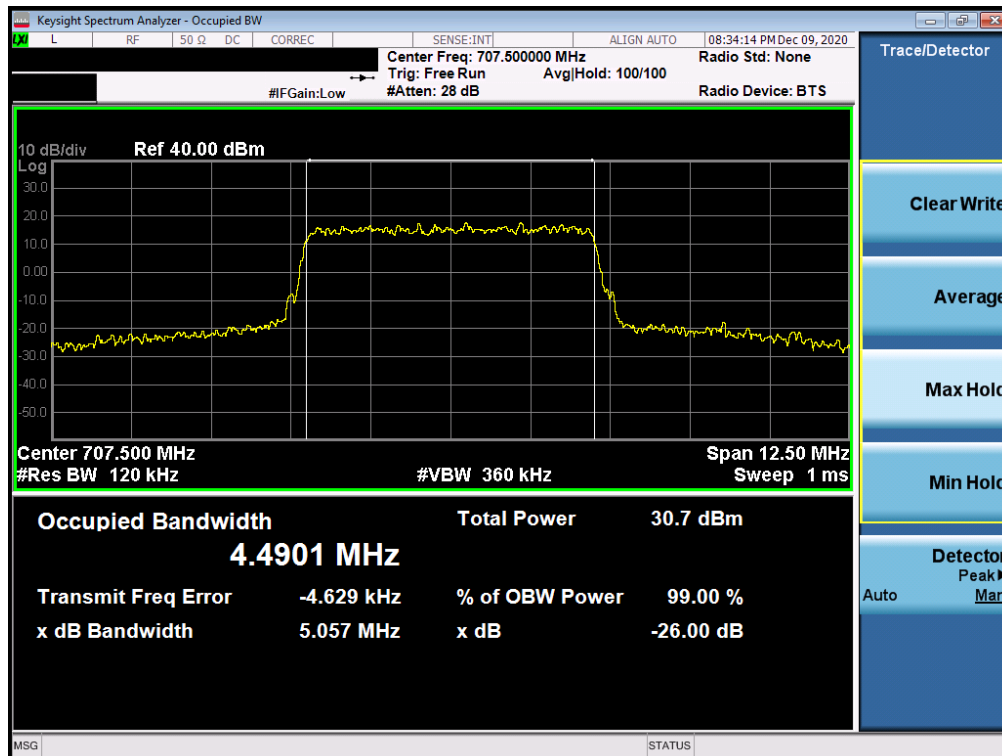


Plot 7-20. Occupied Bandwidth Plot (LTE Band 12 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 21 of 100

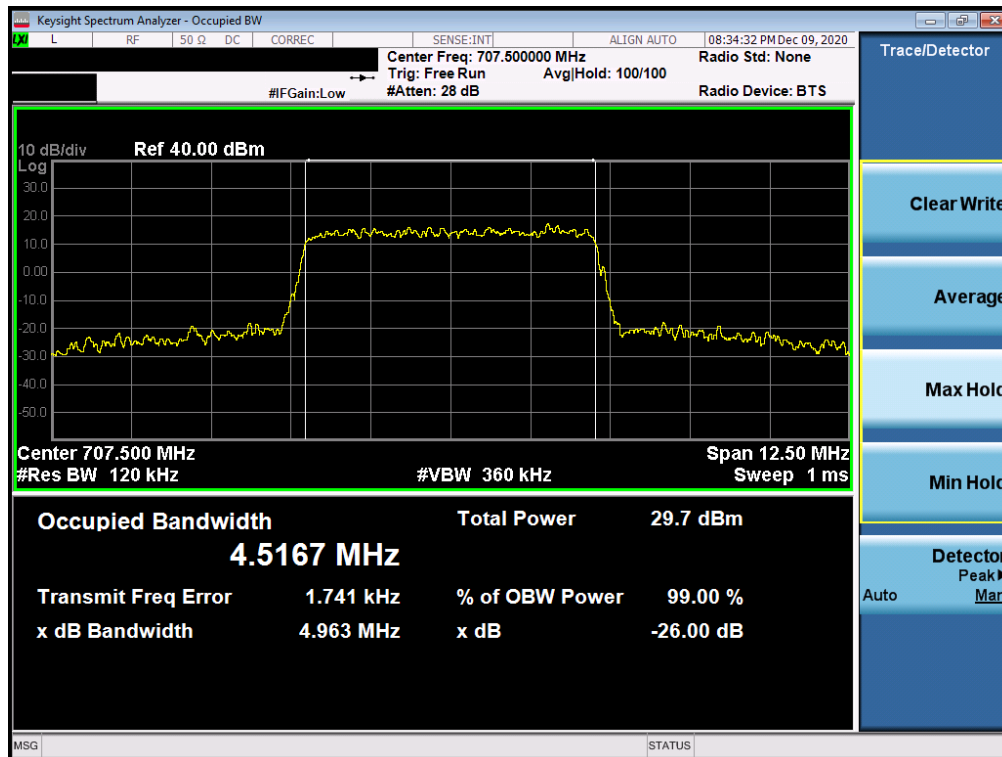


Plot 7-21. Occupied Bandwidth Plot (LTE Band 12 - 10MHz 64-QAM - Full RB Configuration)

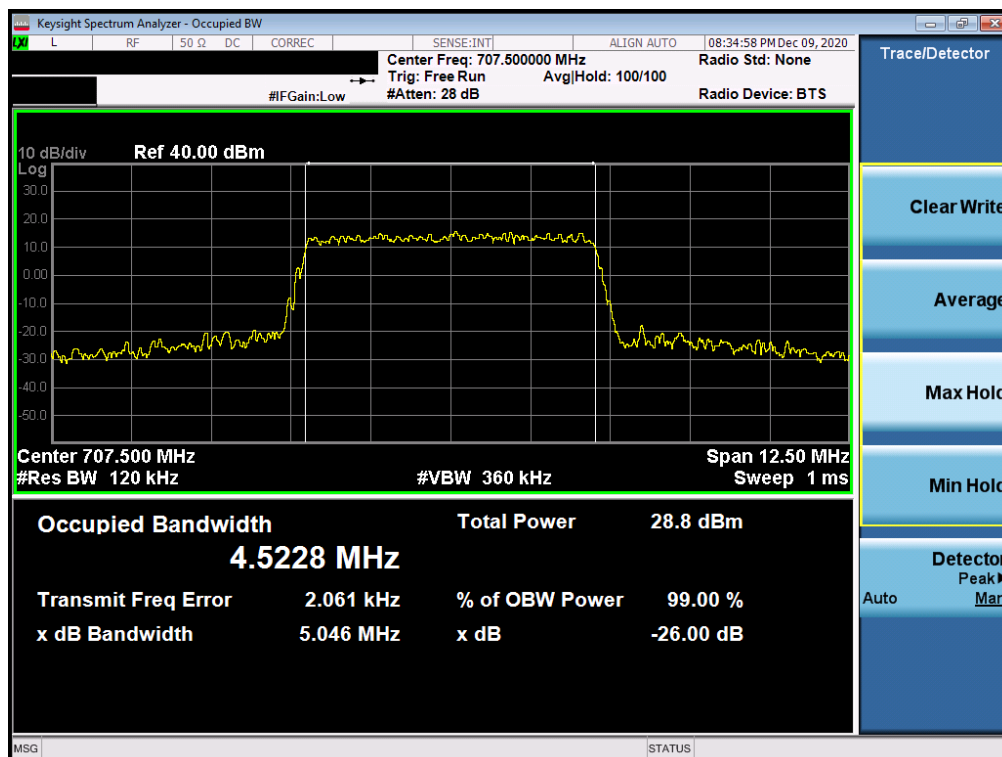


Plot 7-22. Occupied Bandwidth Plot (LTE Band 12 - 5MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 22 of 100

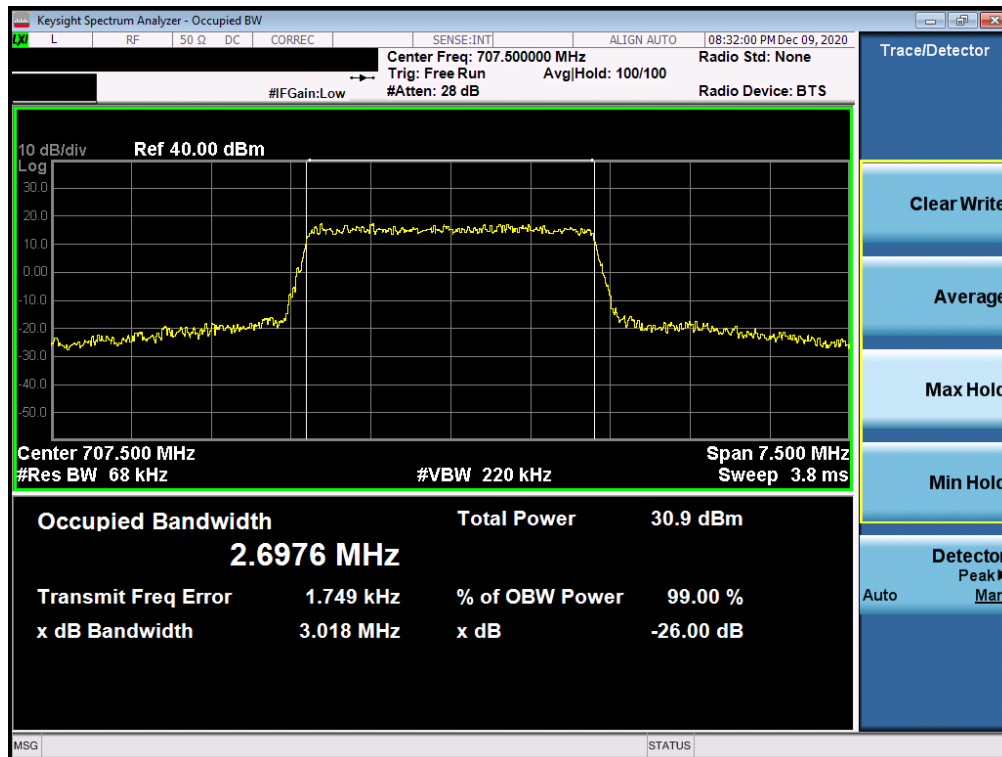


Plot 7-23. Occupied Bandwidth Plot (LTE Band 12 - 5MHz 16-QAM - Full RB Configuration)

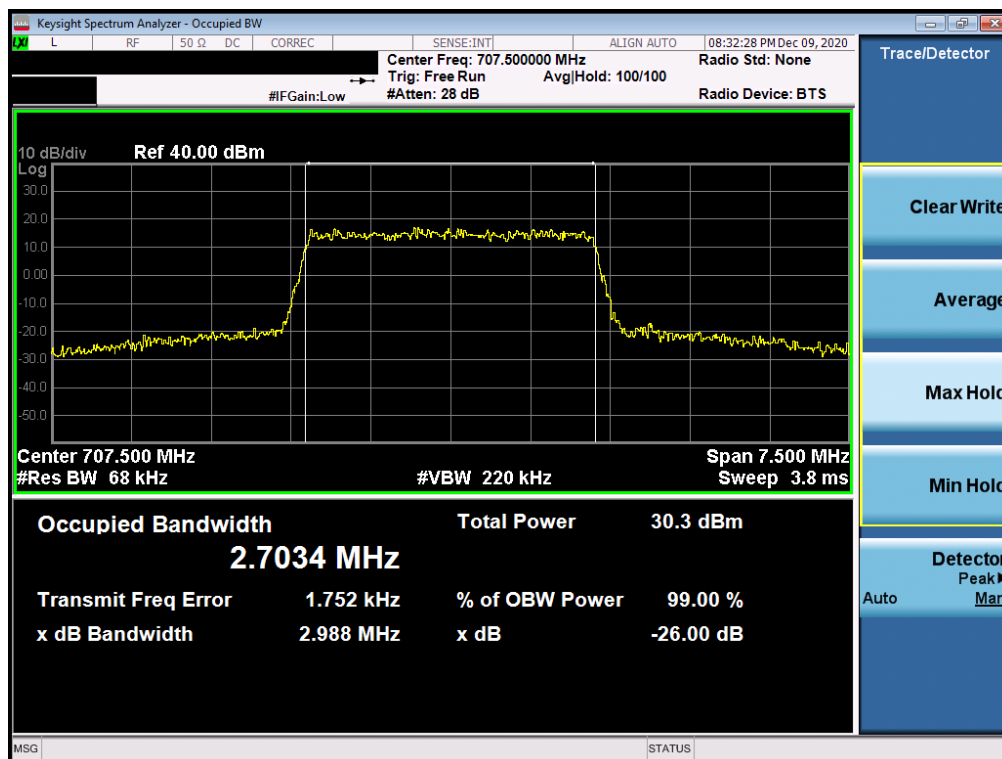


Plot 7-24. Occupied Bandwidth Plot (LTE Band 12 - 5MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 23 of 100

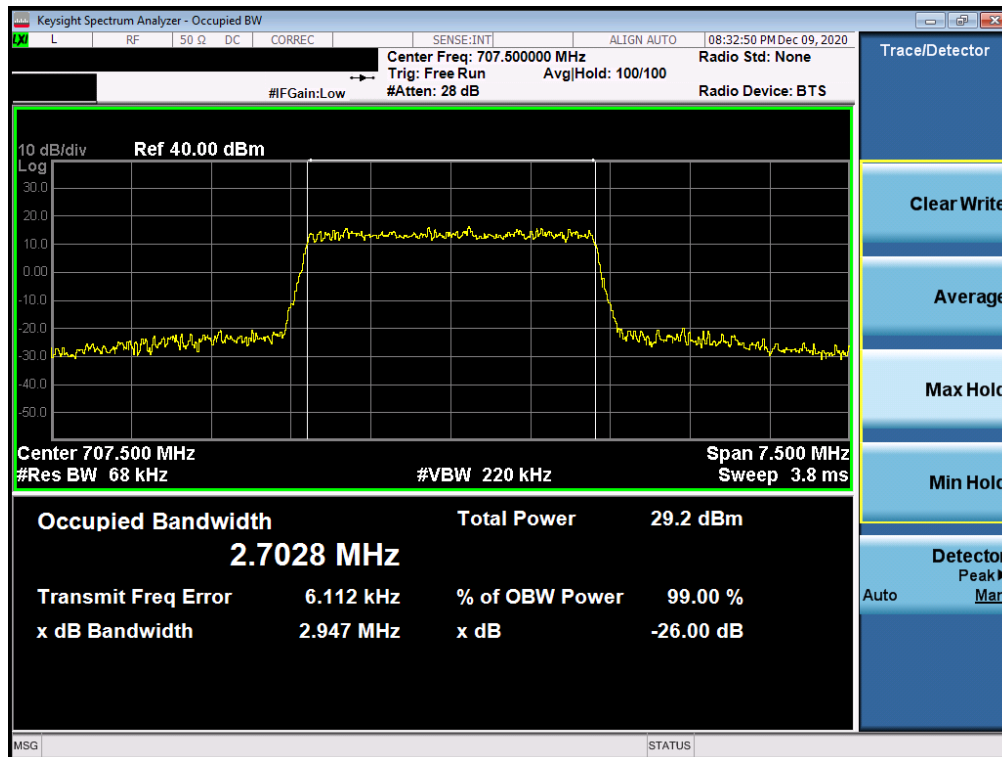


Plot 7-25. Occupied Bandwidth Plot (LTE Band 12 - 3MHz QPSK - Full RB Configuration)

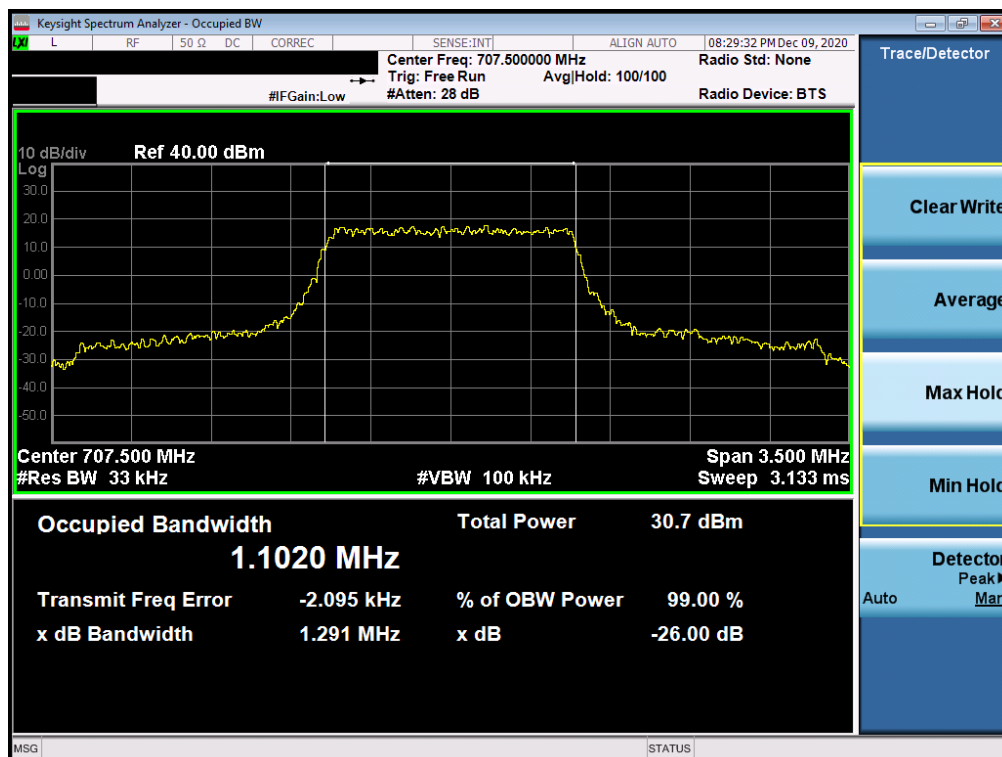


Plot 7-26. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 24 of 100

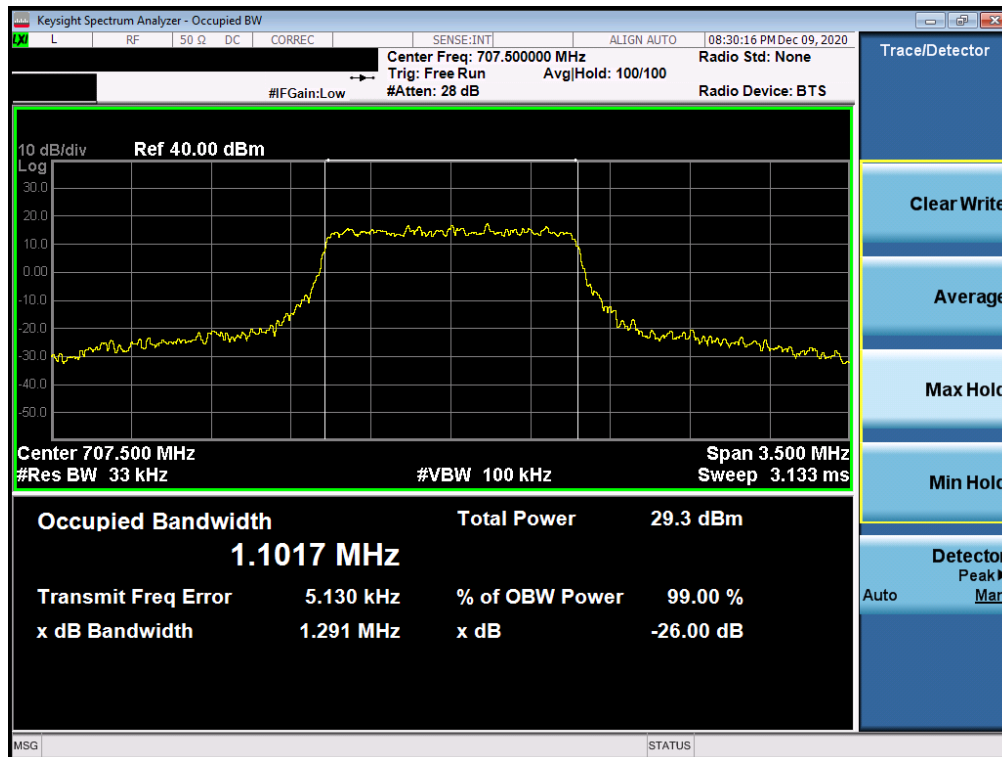


Plot 7-27. Occupied Bandwidth Plot (LTE Band 12 - 3MHz 64-QAM - Full RB Configuration)

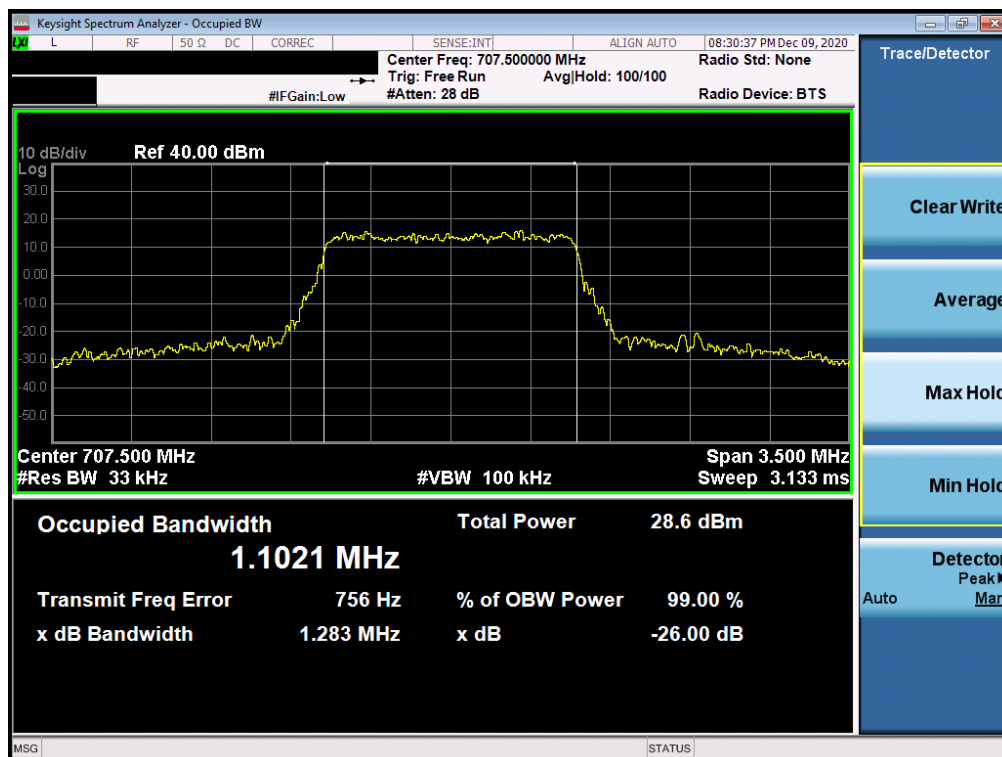


Plot 7-28. Occupied Bandwidth Plot (LTE Band 12 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 25 of 100



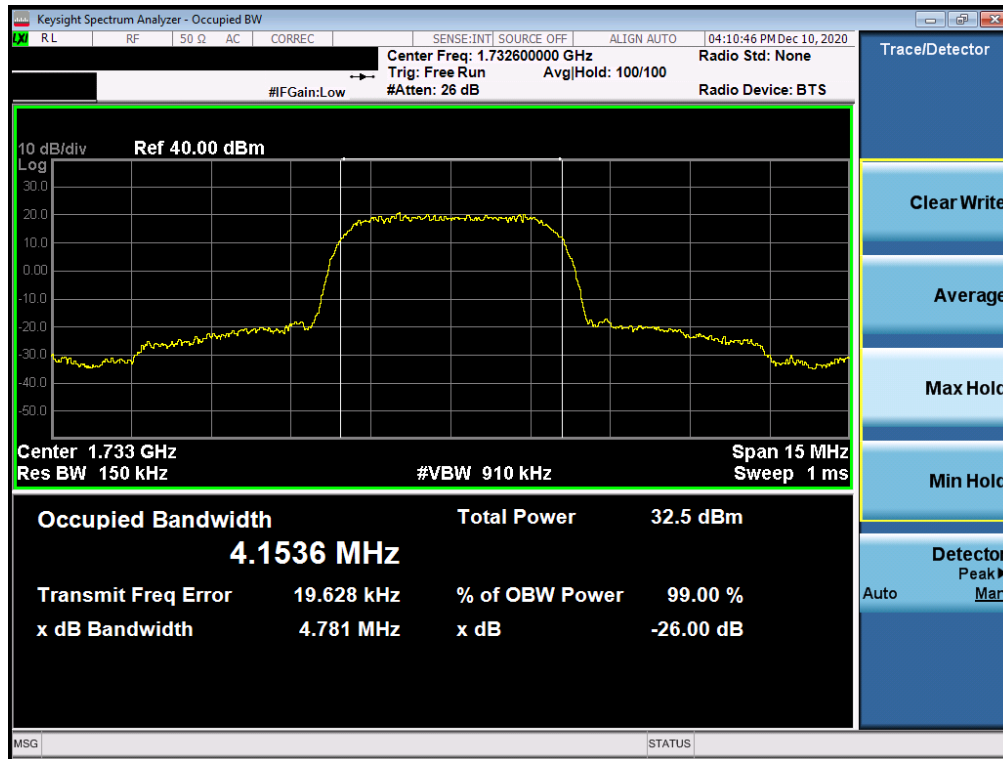
Plot 7-29. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 16-QAM - Full RB Configuration)



Plot 7-30. Occupied Bandwidth Plot (LTE Band 12 – 1.4MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 26 of 100

WCDMA AWS



Plot 7-31. Occupied Bandwidth Plot (WCDMA, Ch. 1413)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 27 of 100

7.3 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

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

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

Test Procedure Used

KDB 971168 D01 v03r01 – Section 6.0

Test Settings

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

Test Setup

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

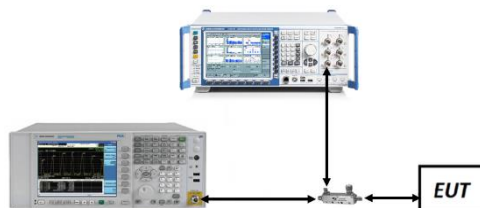


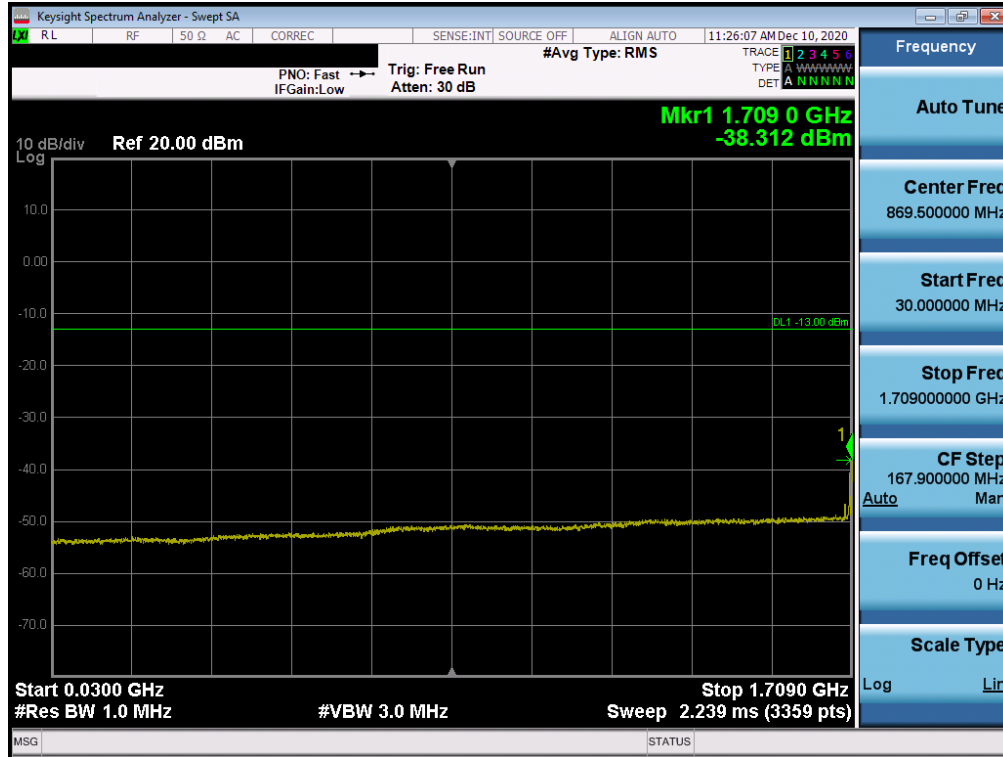
Figure 7-2. Test Instrument & Measurement Setup

Test Note

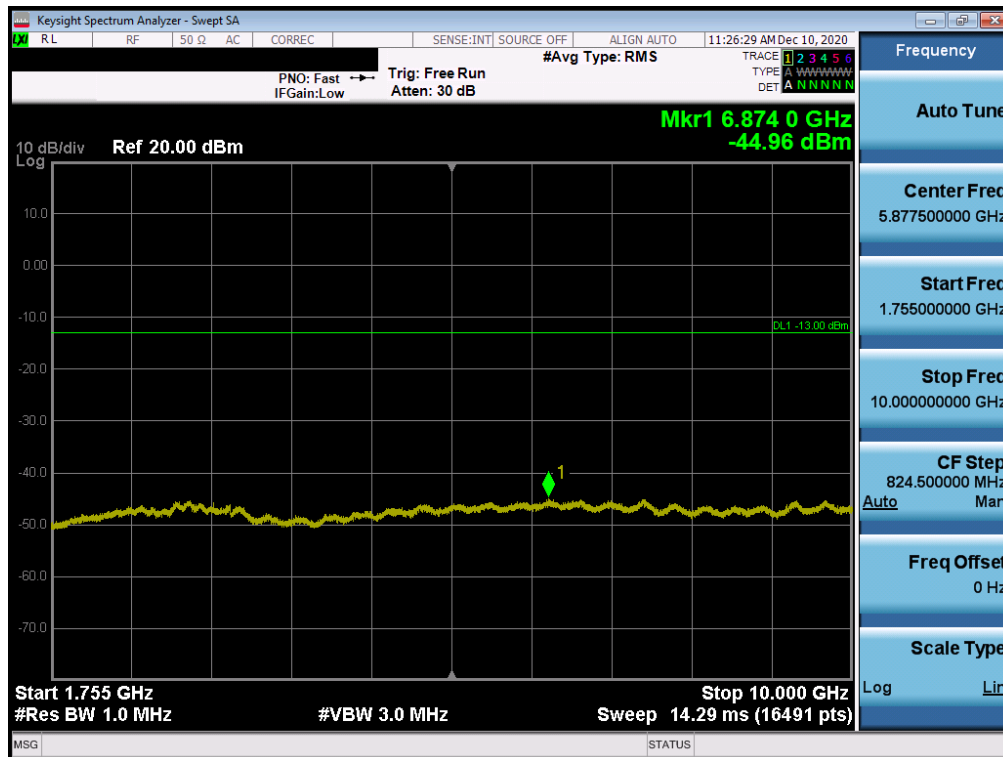
Per Part 27 and RSS-139, compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth 100 kHz or greater for measurements below 1GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth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

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 28 of 100

LTE Band 4

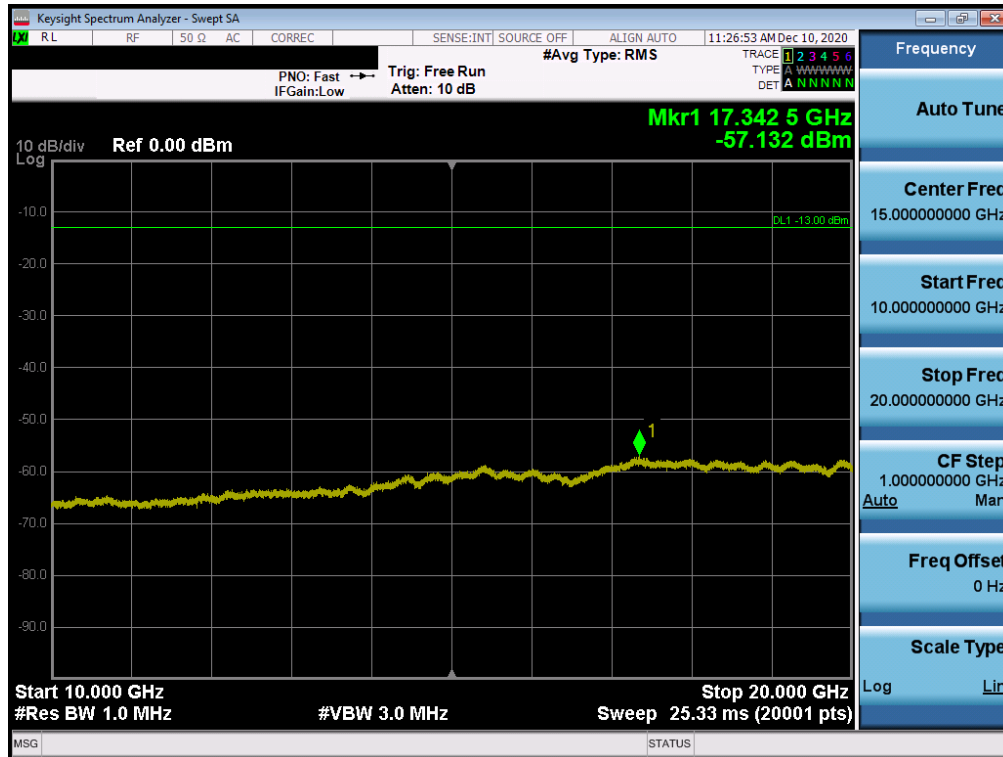


Plot 7-32. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 7-33. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 29 of 100

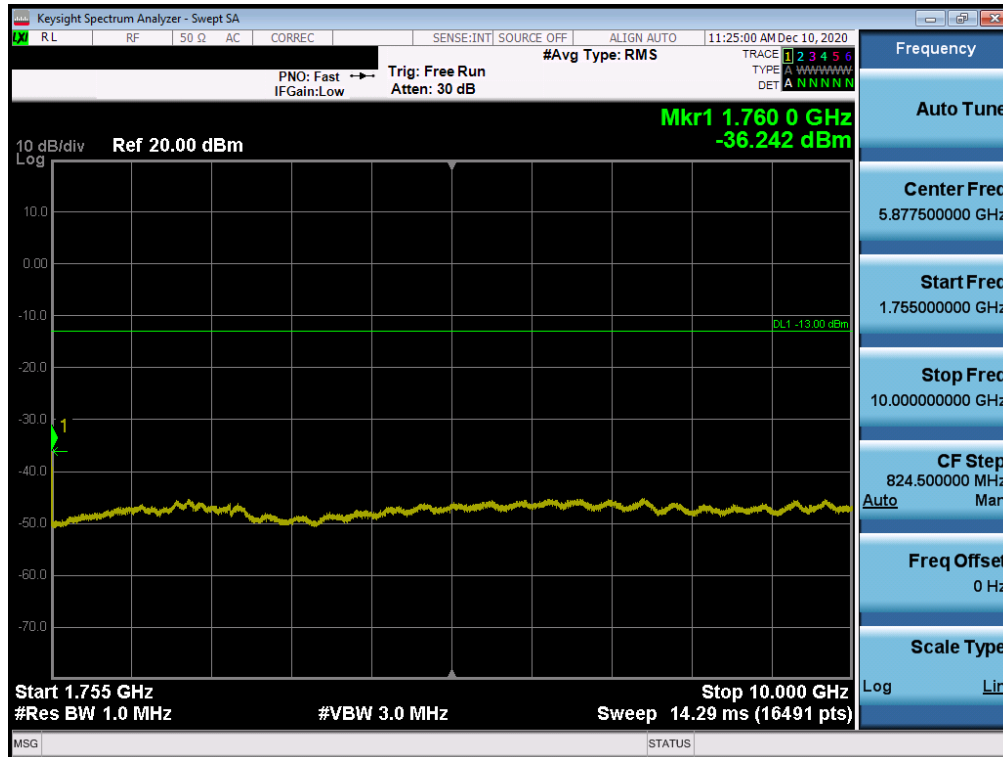


Plot 7-34. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

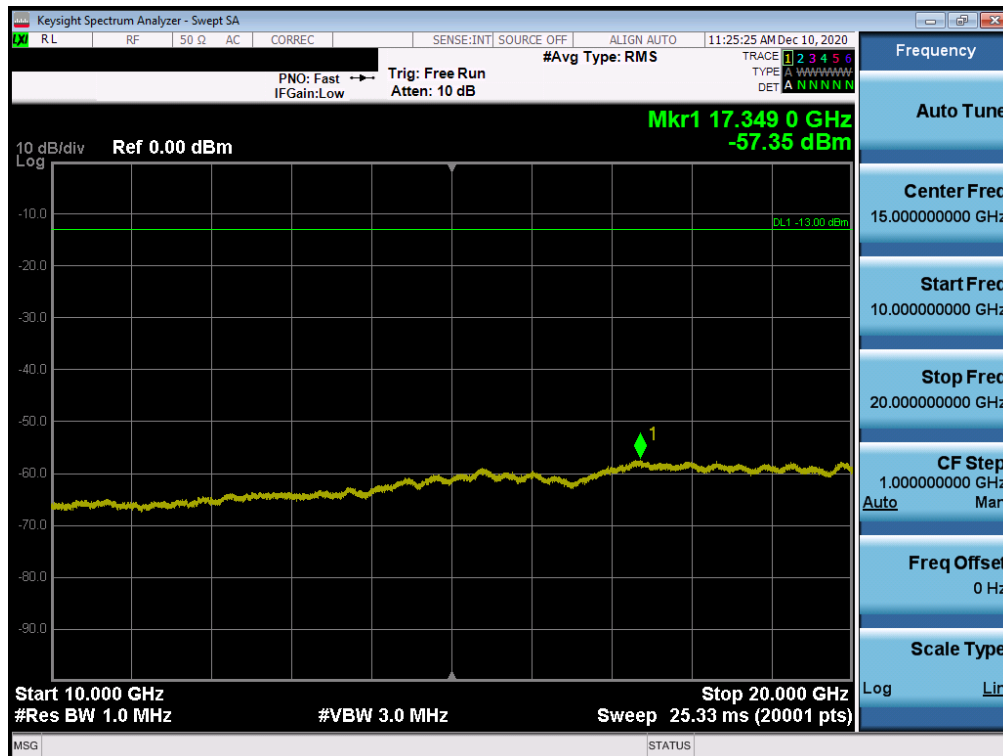


Plot 7-35. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 30 of 100



Plot 7-36. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

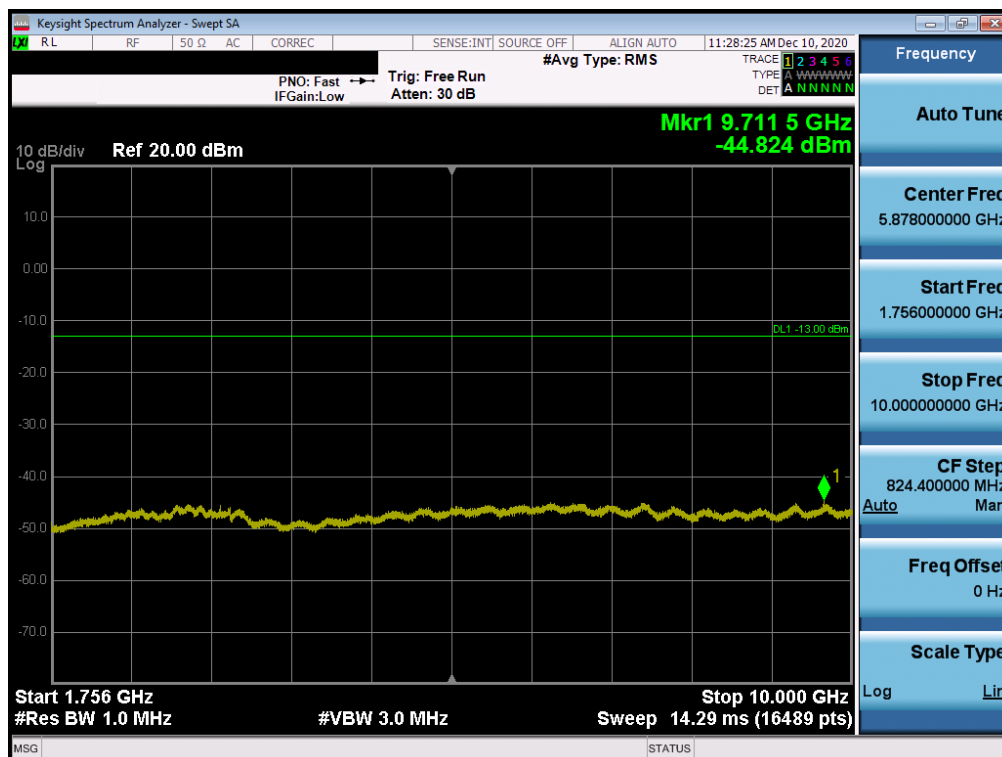


Plot 7-37. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 31 of 100

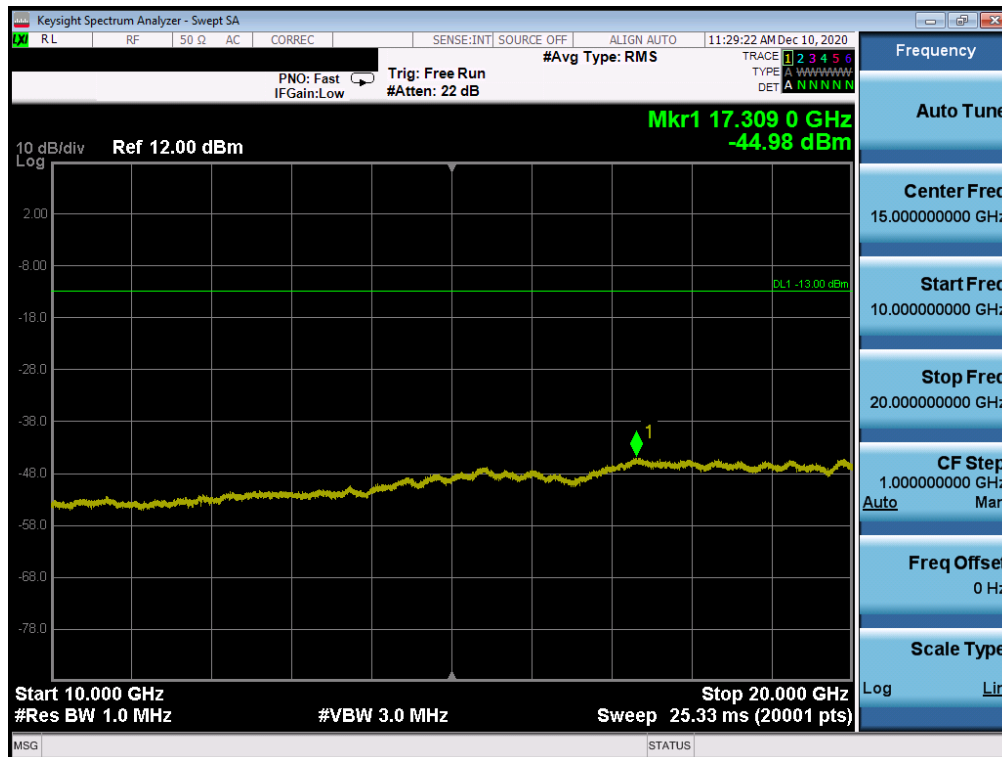


Plot 7-38. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-39. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

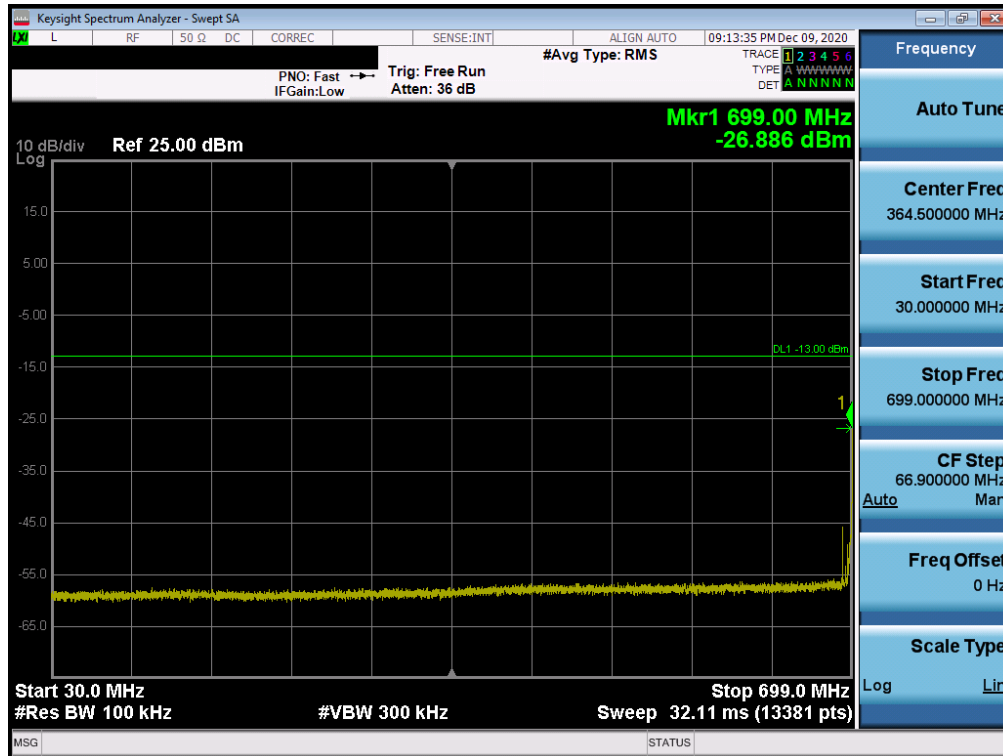
FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 32 of 100



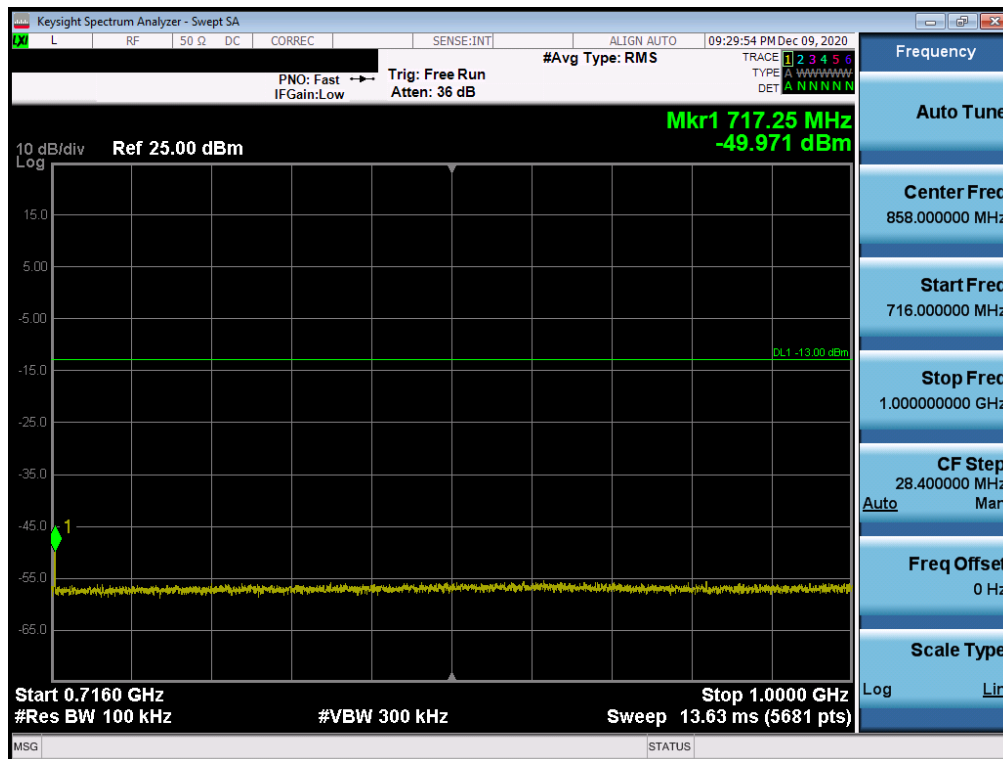
Plot 7-40. Conducted Spurious Plot (LTE Band 4 - 20MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 33 of 100

LTE Band 12

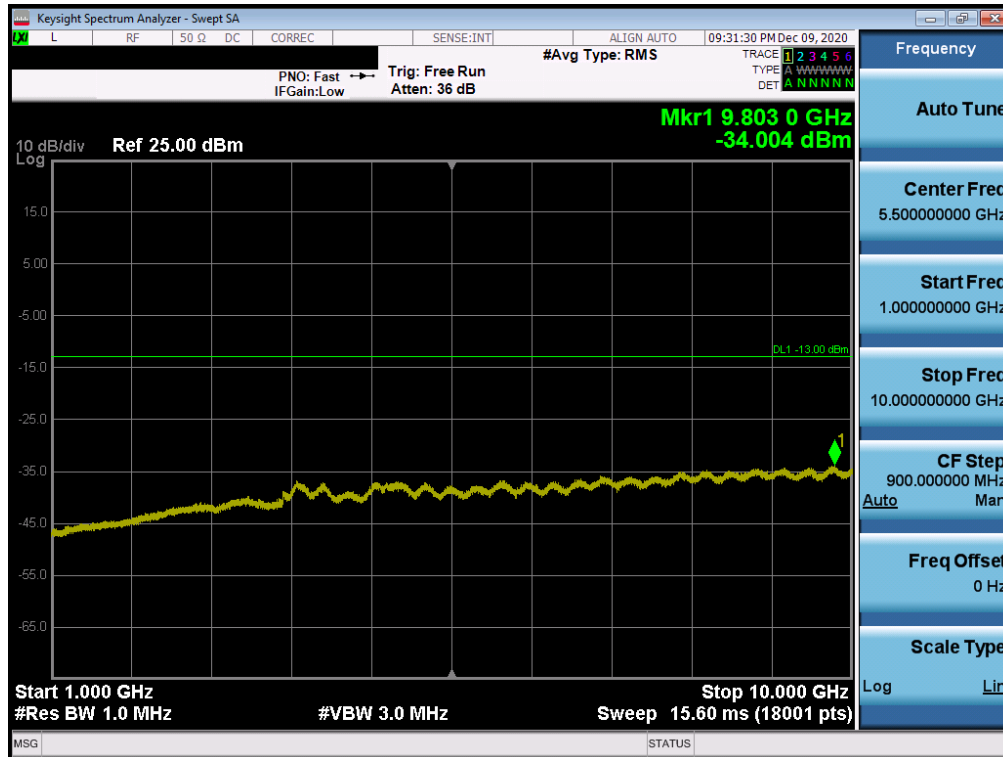


Plot 7-41. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

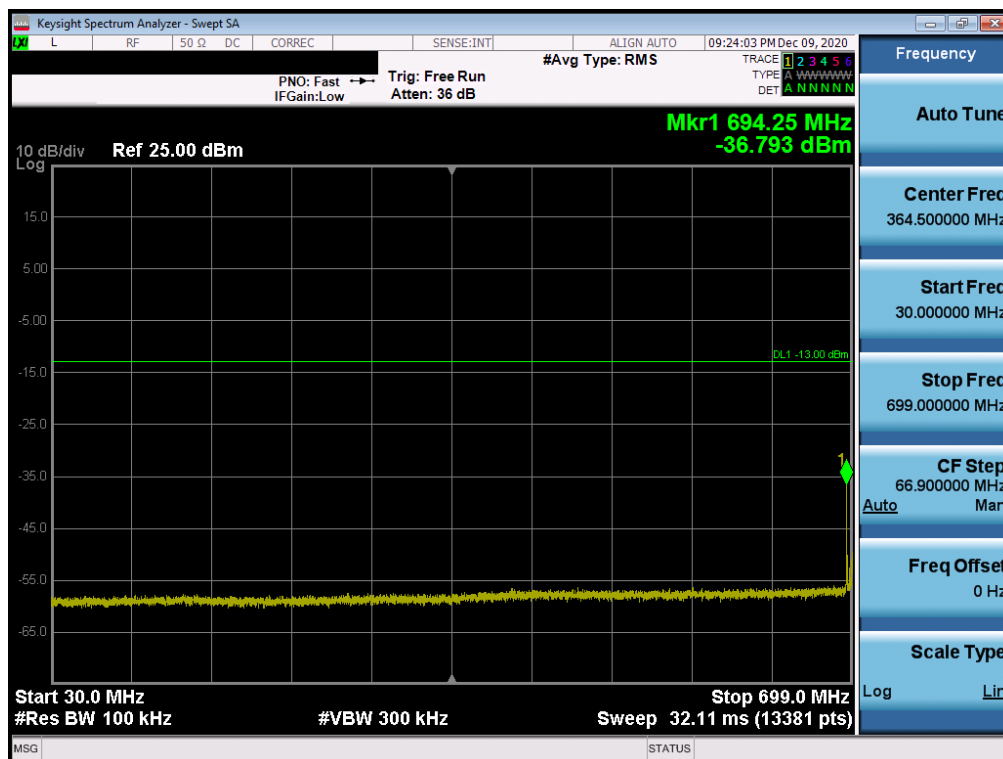


Plot 7-42. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 34 of 100

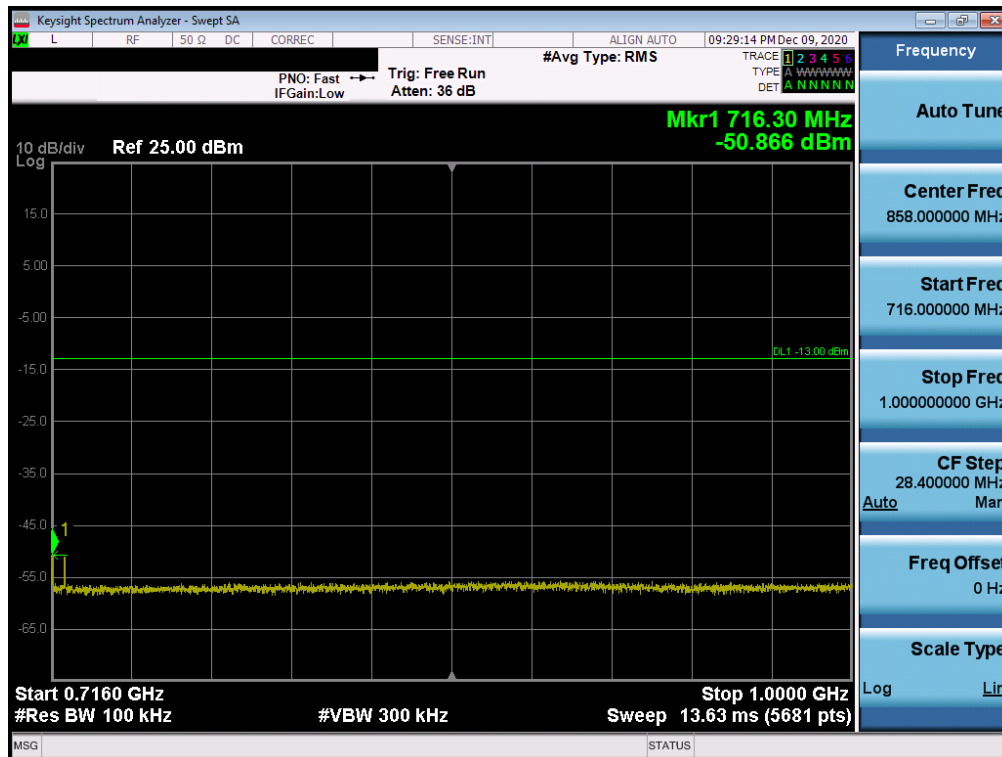


Plot 7-43. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

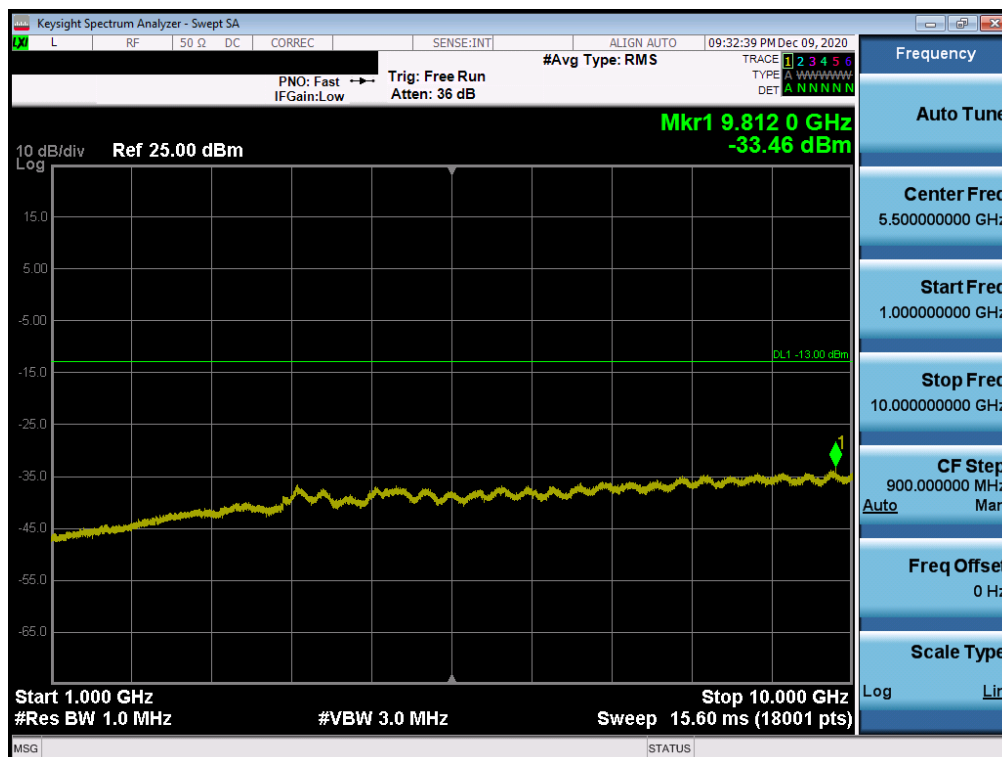


Plot 7-44. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 35 of 100

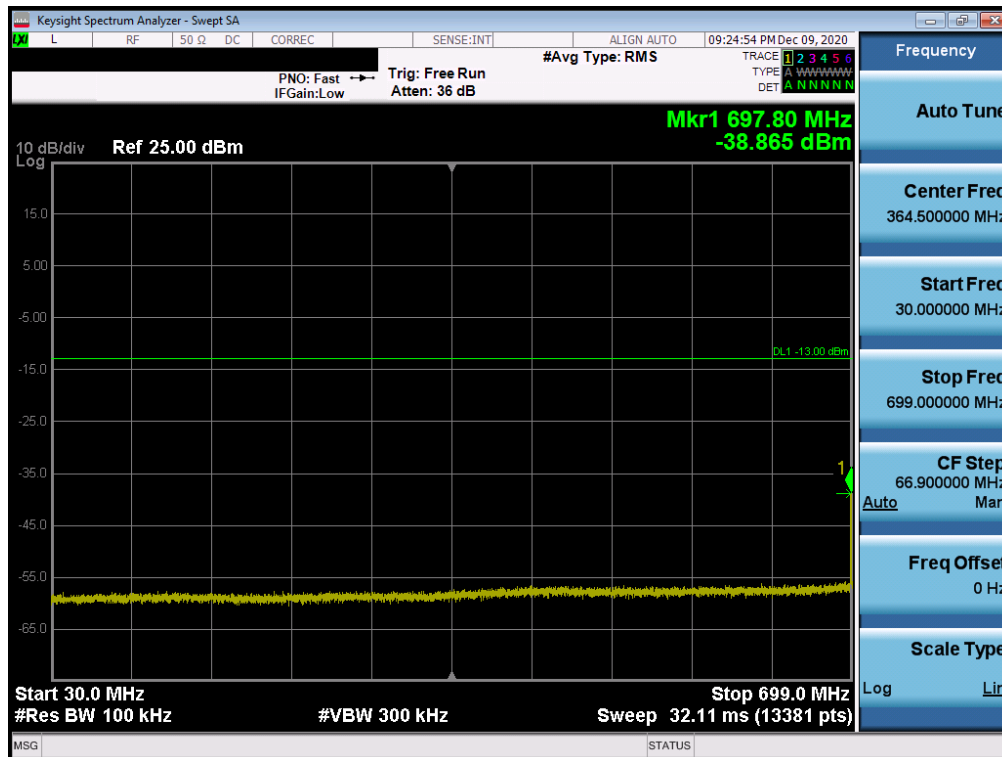


Plot 7-45. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

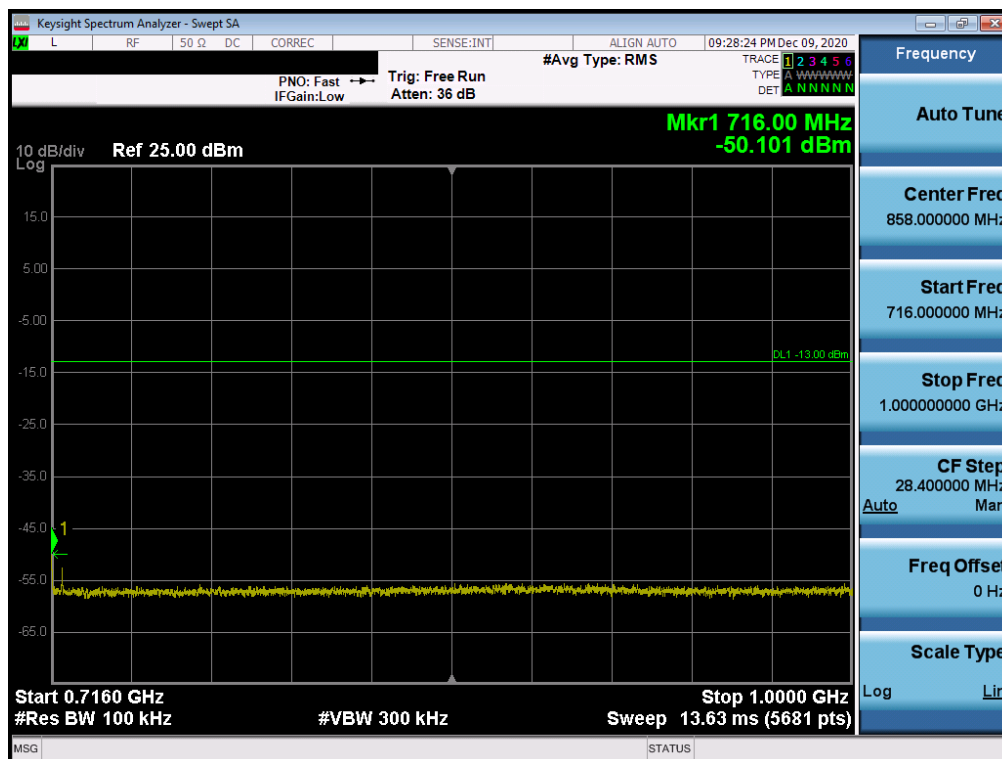


Plot 7-46. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 - 1/4/2021	EUT Type: Portable Handset		Page 36 of 100

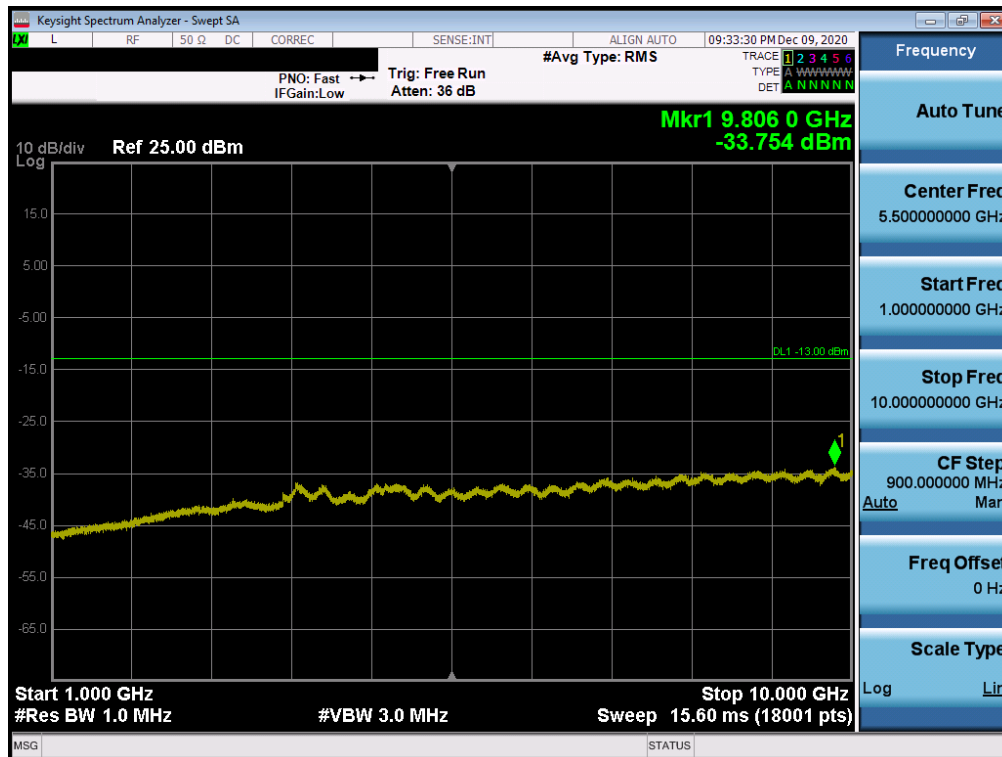


Plot 7-47. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 7-48. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

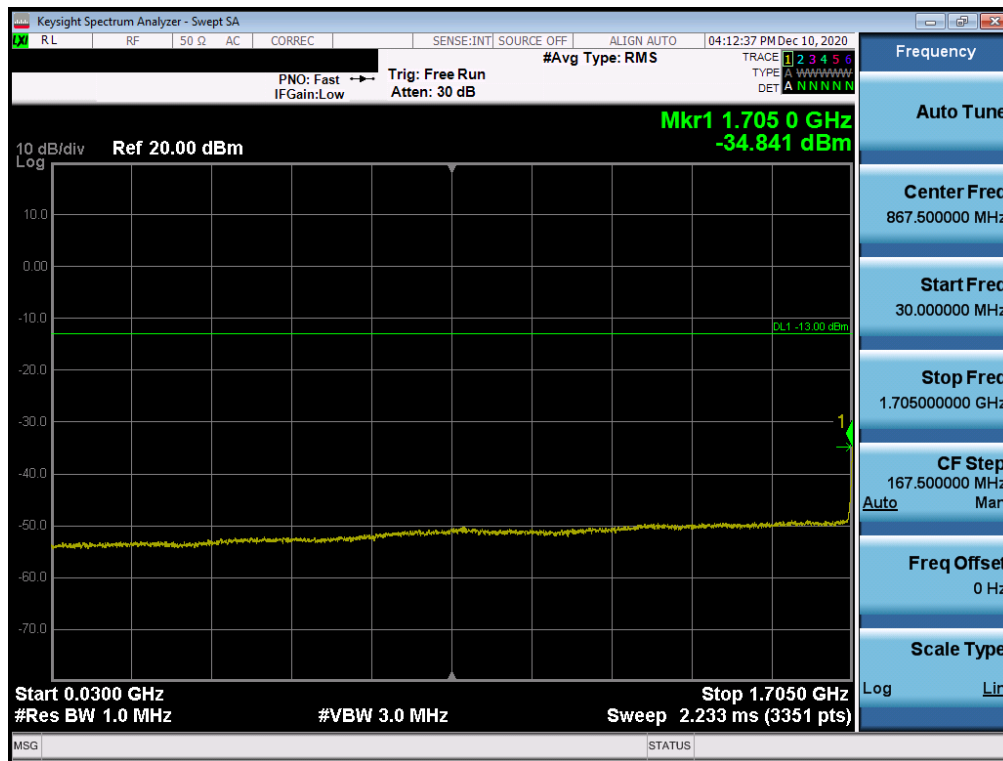
FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 37 of 100



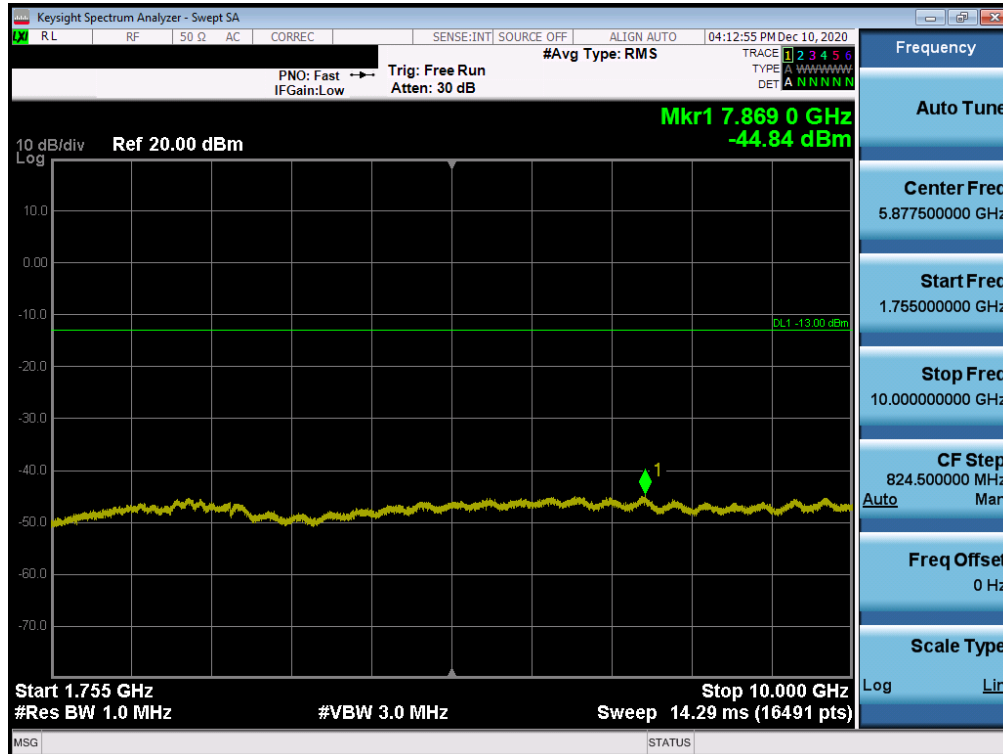
Plot 7-49. Conducted Spurious Plot (LTE Band 12 - 10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 38 of 100

WCDMA AWS

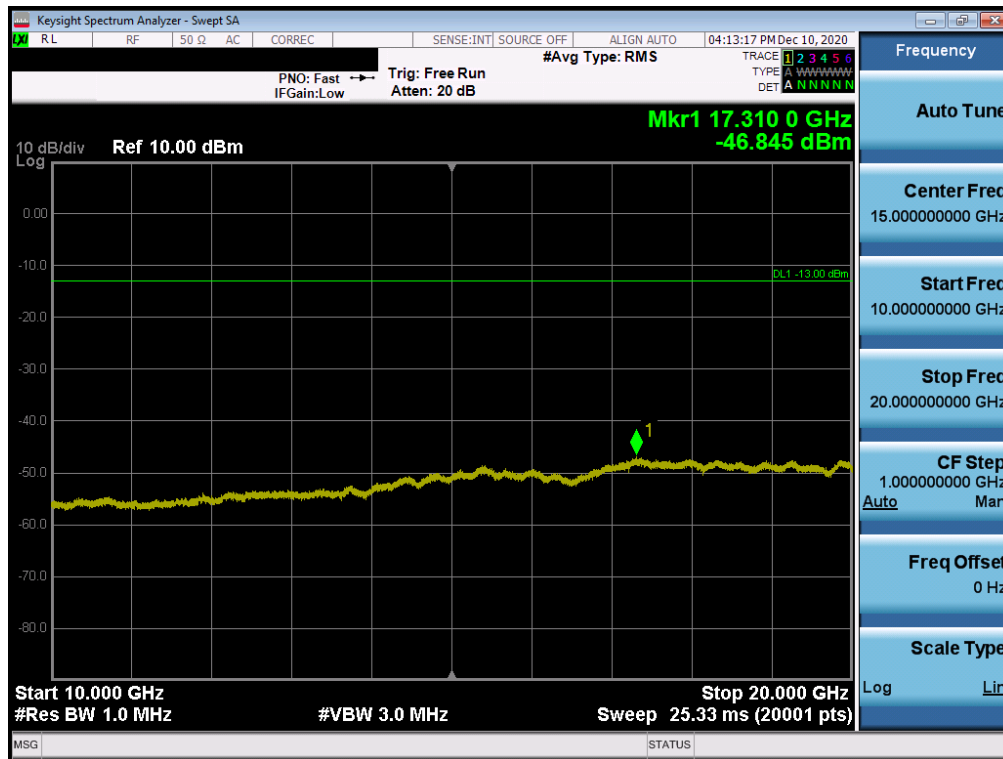


Plot 7-50. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)



Plot 7-51. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 39 of 100

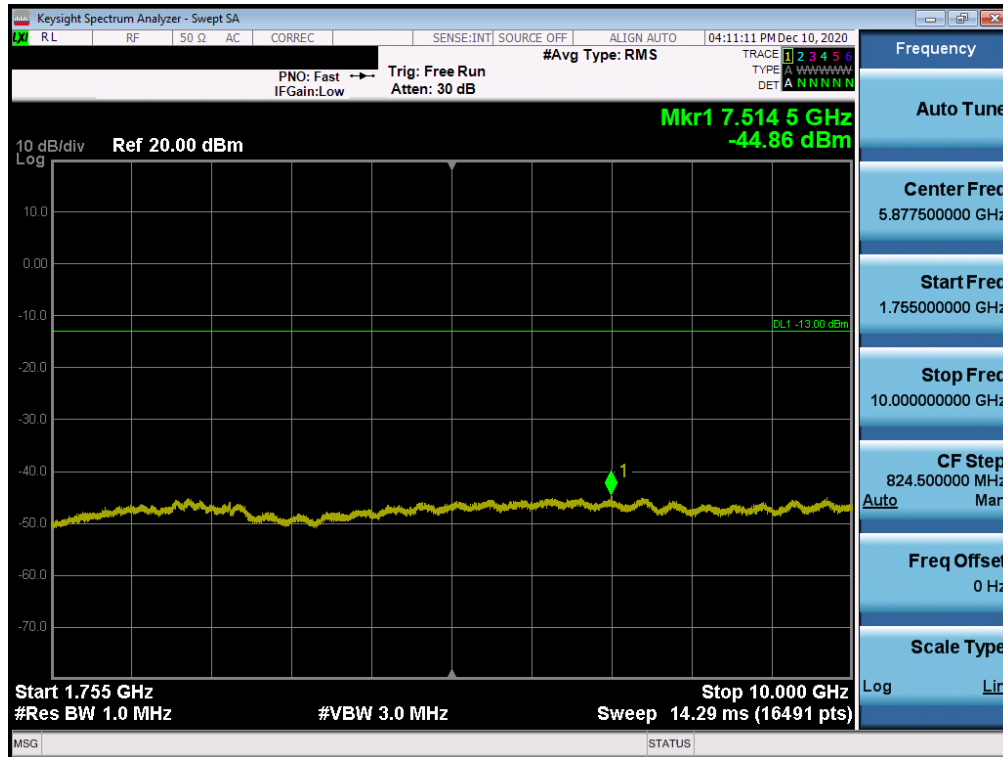


Plot 7-52. Conducted Spurious Plot (WCDMA Ch. 1312- Low Channel)

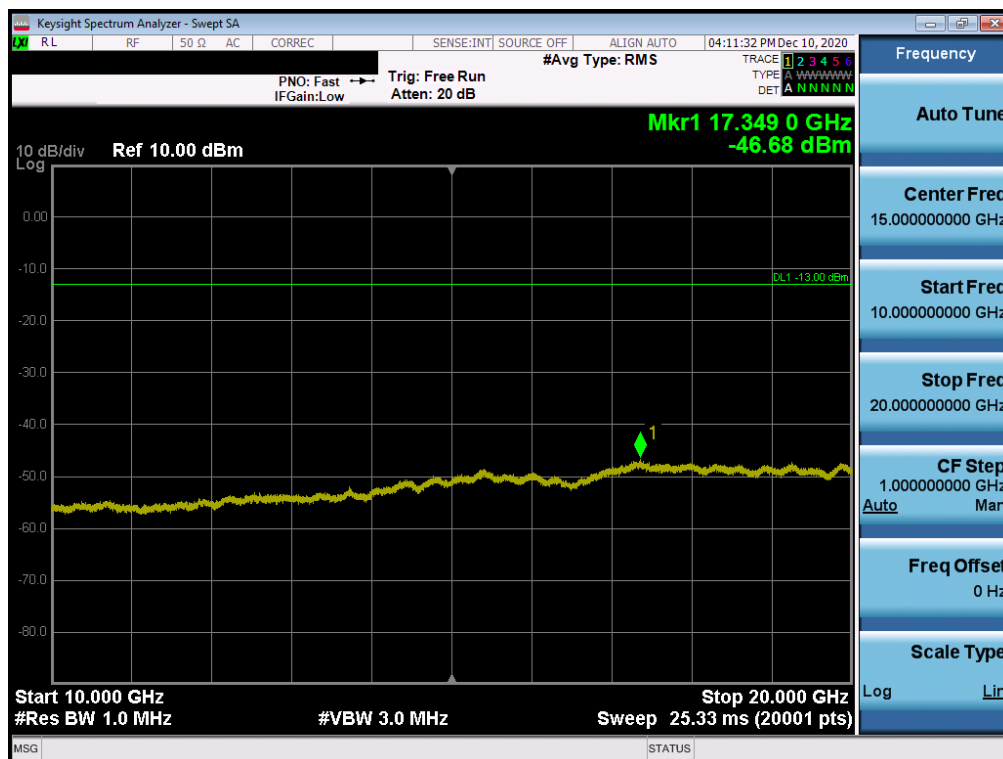


Plot 7-53. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 40 of 100

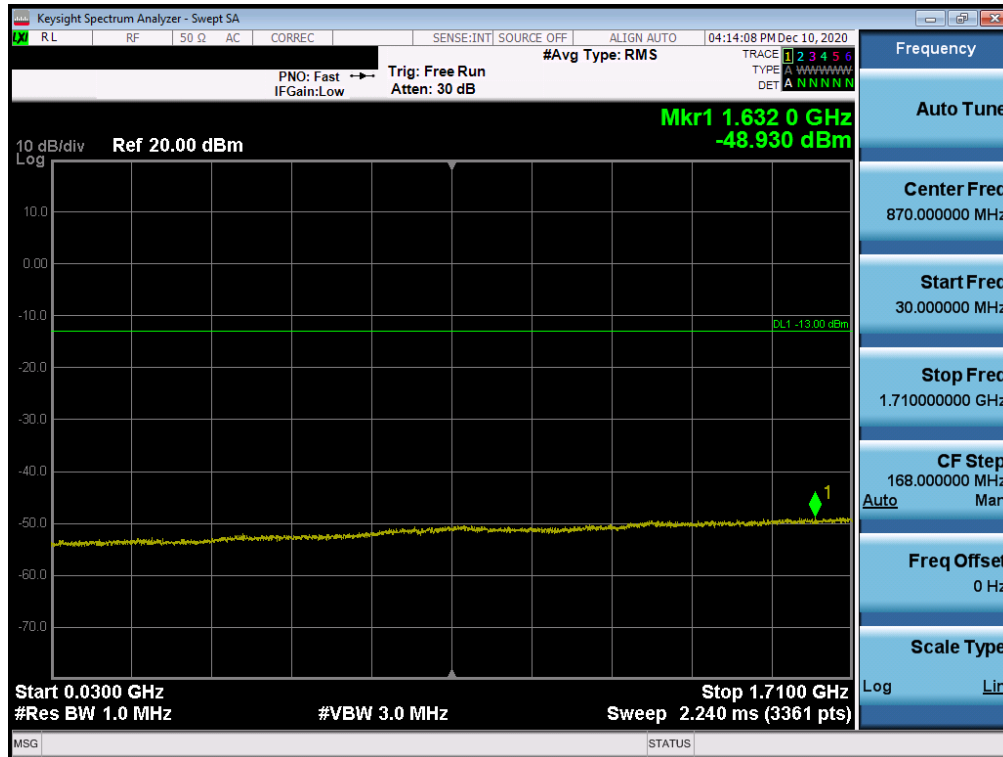


Plot 7-54. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

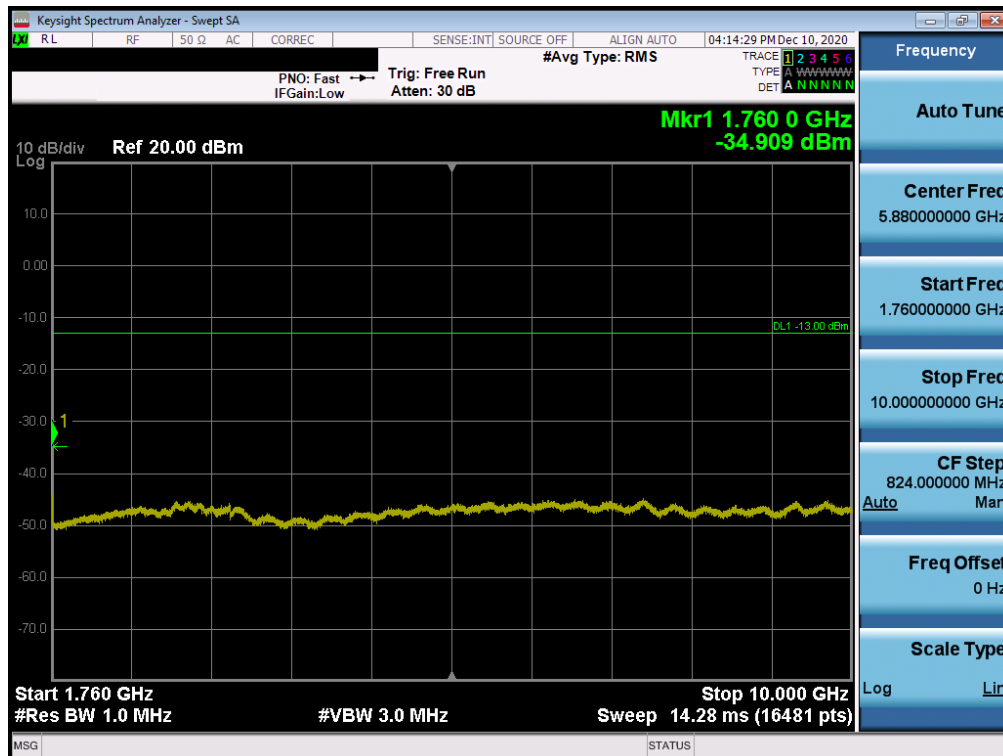


Plot 7-55. Conducted Spurious Plot (WCDMA Ch. 1413- Mid Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 41 of 100

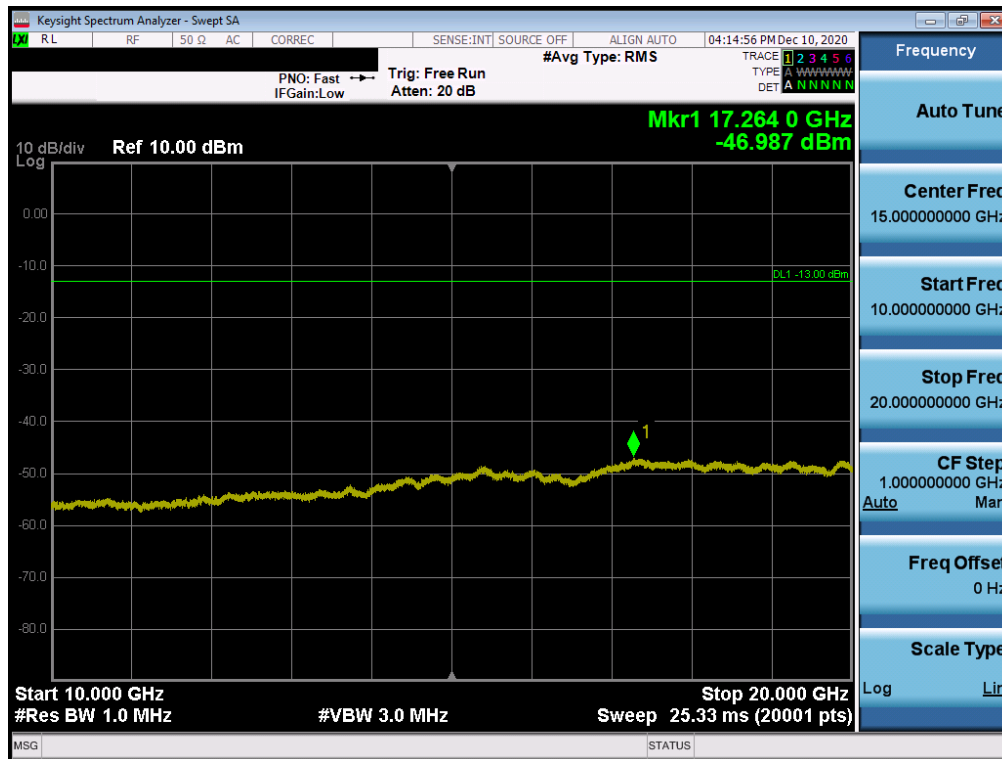


Plot 7-56. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)



Plot 7-57. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 42 of 100



Plot 7-58. Conducted Spurious Plot (WCDMA Ch. 1513- High Channel)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 43 of 100

7.4 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 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.

The minimum permissible attenuation level of any spurious emission is $43 + 10 \log_{10}(P_{\text{Watts}})$, 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 > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

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

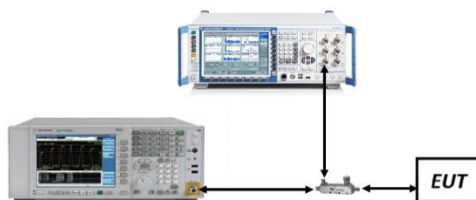



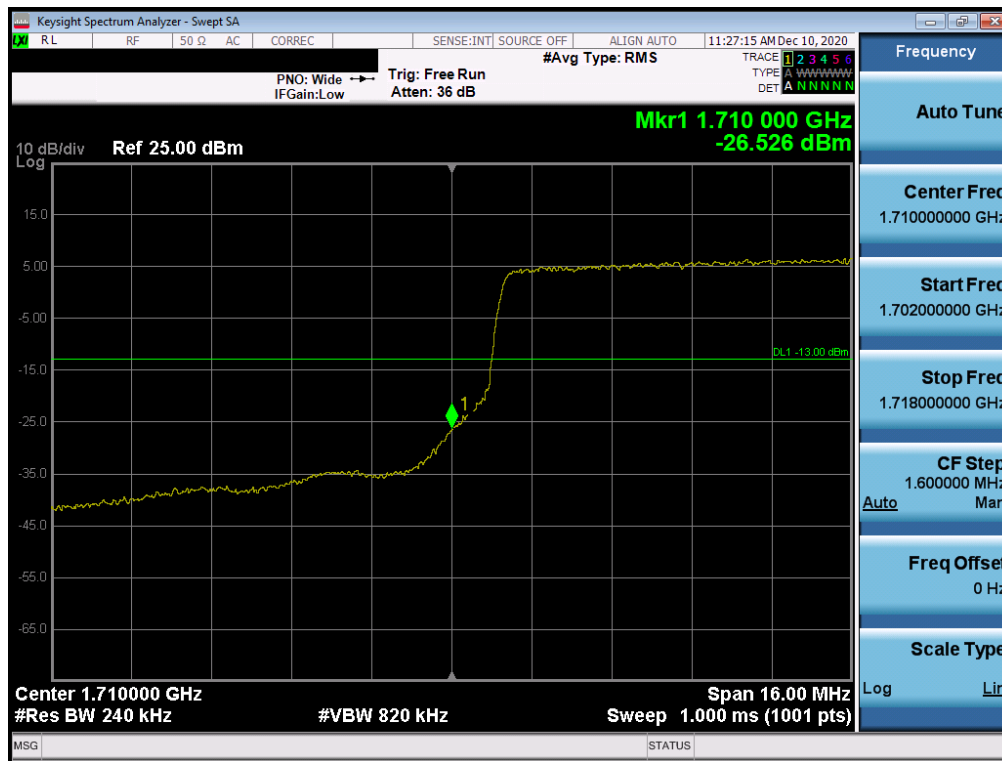


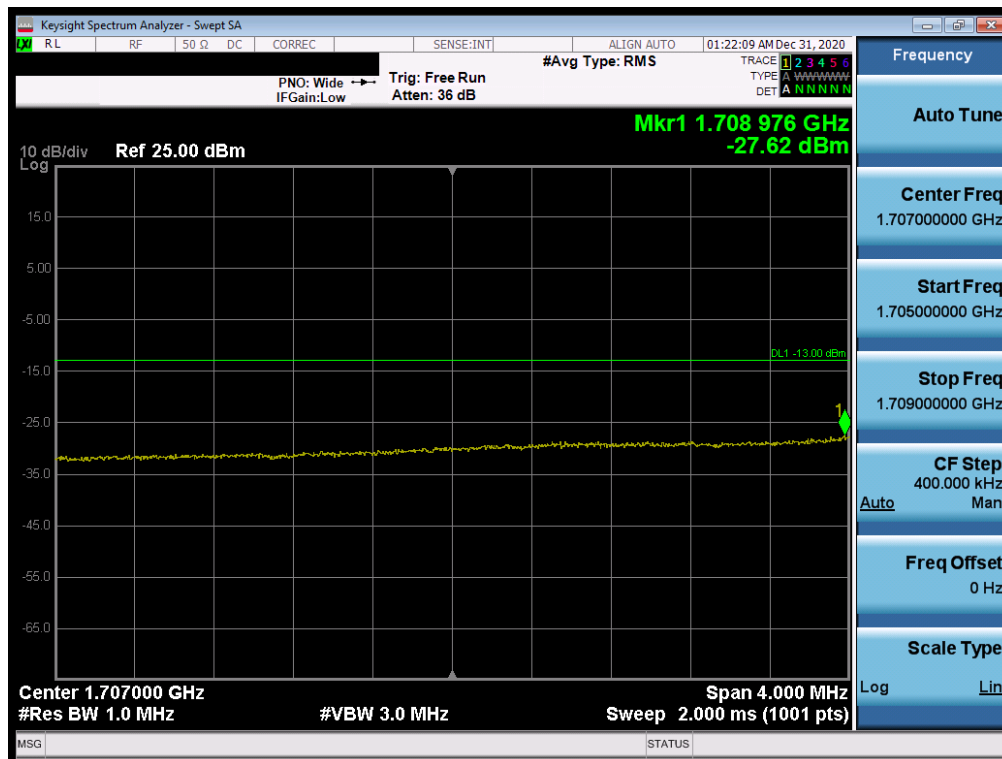
Figure 7-3. Test Instrument & Measurement Setup

FCC ID: ZNFK200AM	 PCTEST Proud to be part of 	PART 27 MEASUREMENT REPORT	 LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset	Page 44 of 100	

LTE Band 4

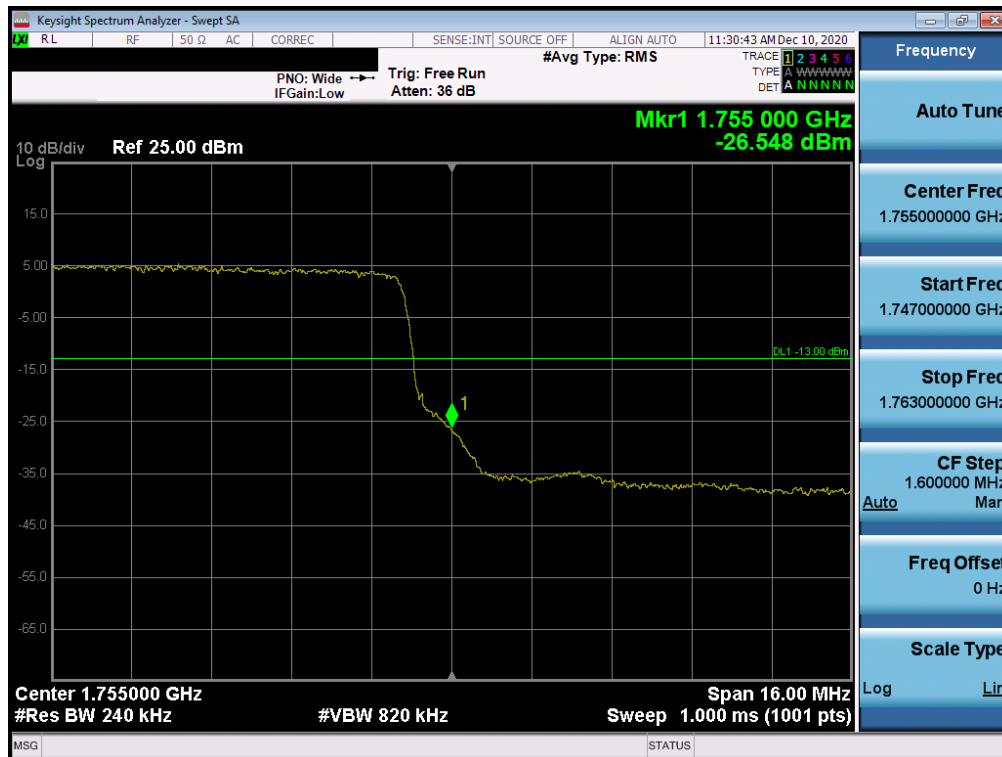


Plot 7-59. Lower Band Edge Plot (LTE Band 4 - 20MHz QPSK – Full RB Configuration)

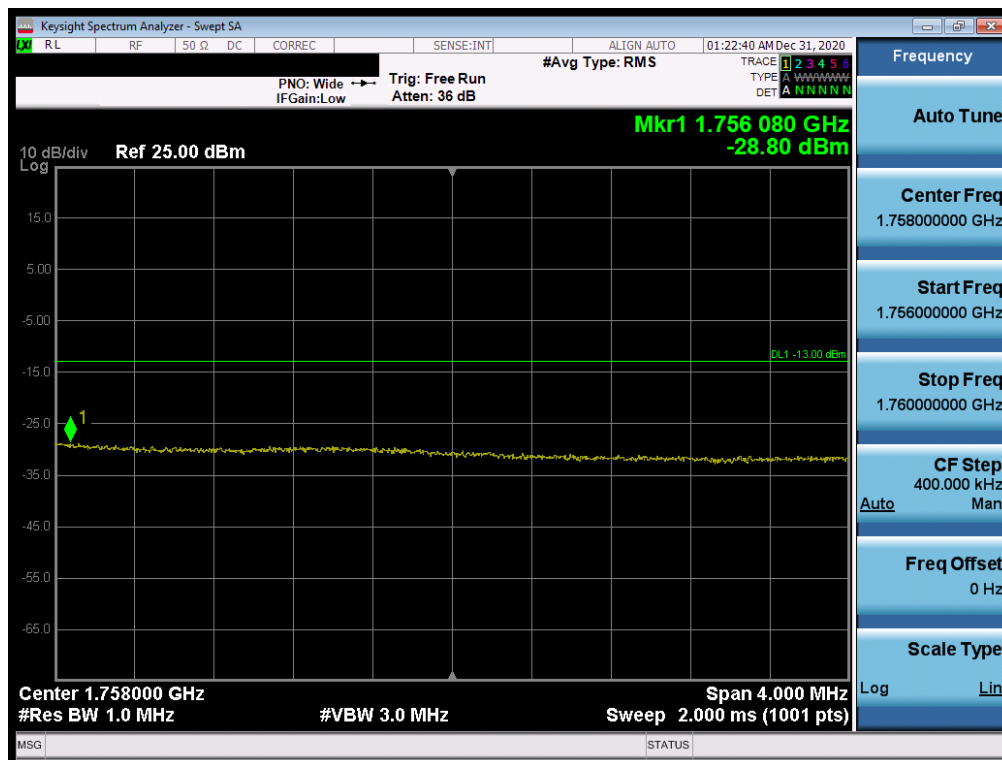


Plot 7-60. Lower Extended Band Edge Plot (LTE Band 4 - 20MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 45 of 100

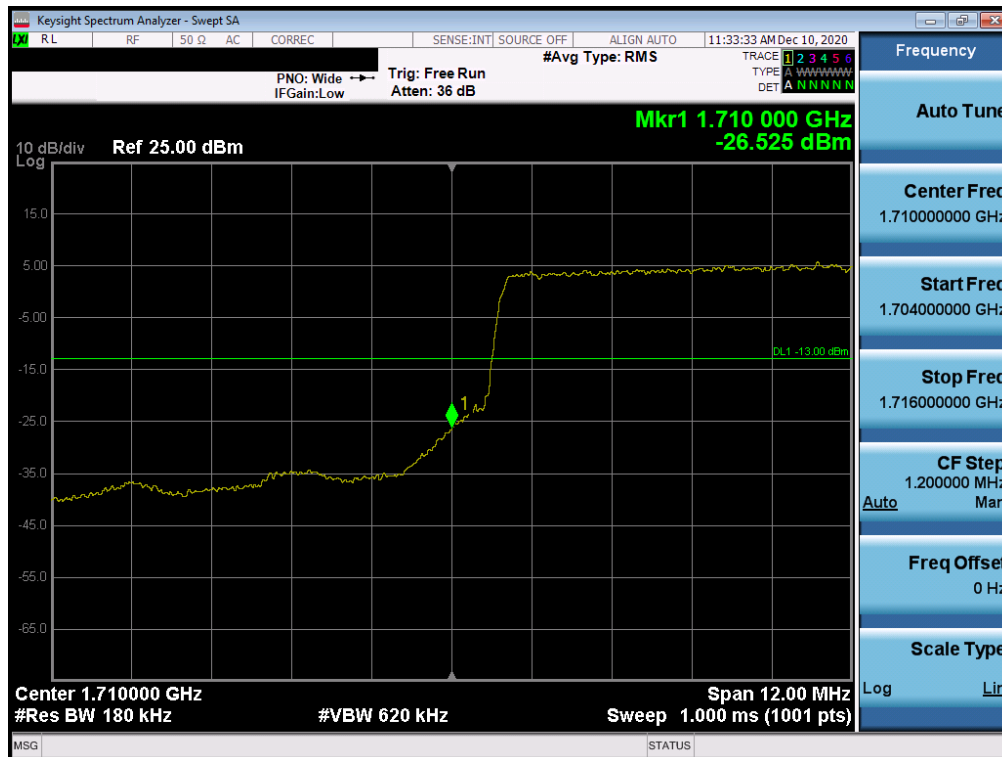


Plot 7-61. Upper Band Edge Plot (LTE Band 4 - 20MHz QPSK – Full RB Configuration)



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

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 46 of 100

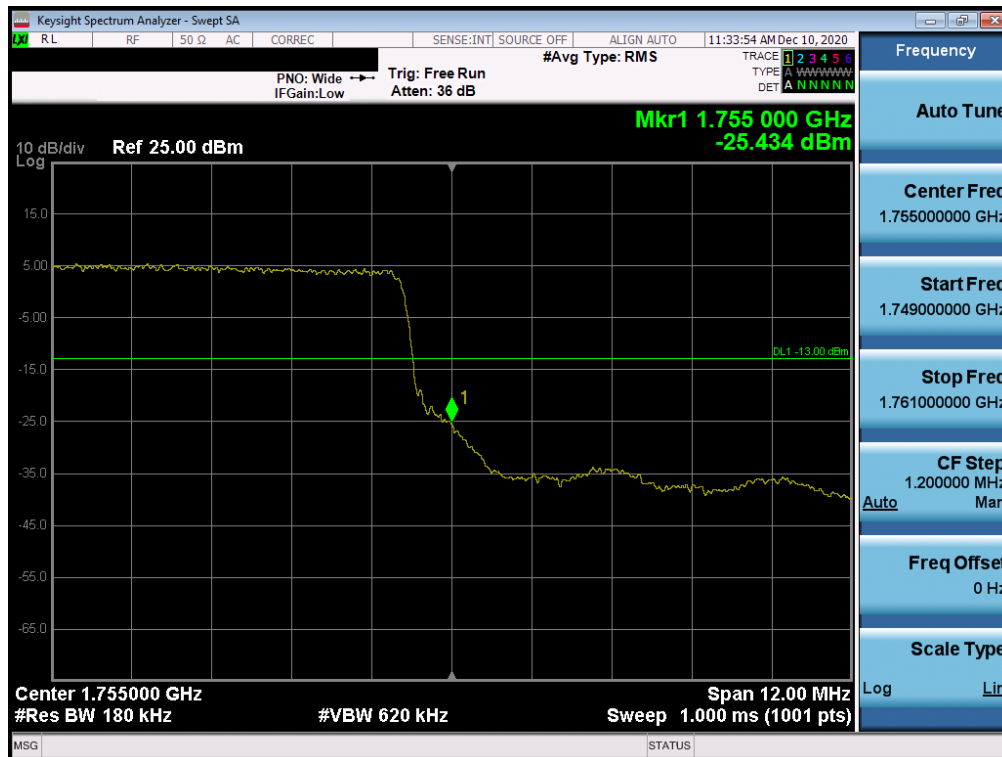


Plot 7-63. Lower Band Edge Plot (LTE Band 4 - 15MHz QPSK – Full RB Configuration)



Plot 7-64. Lower Extended Band Edge Plot (LTE Band 4 - 15MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 47 of 100

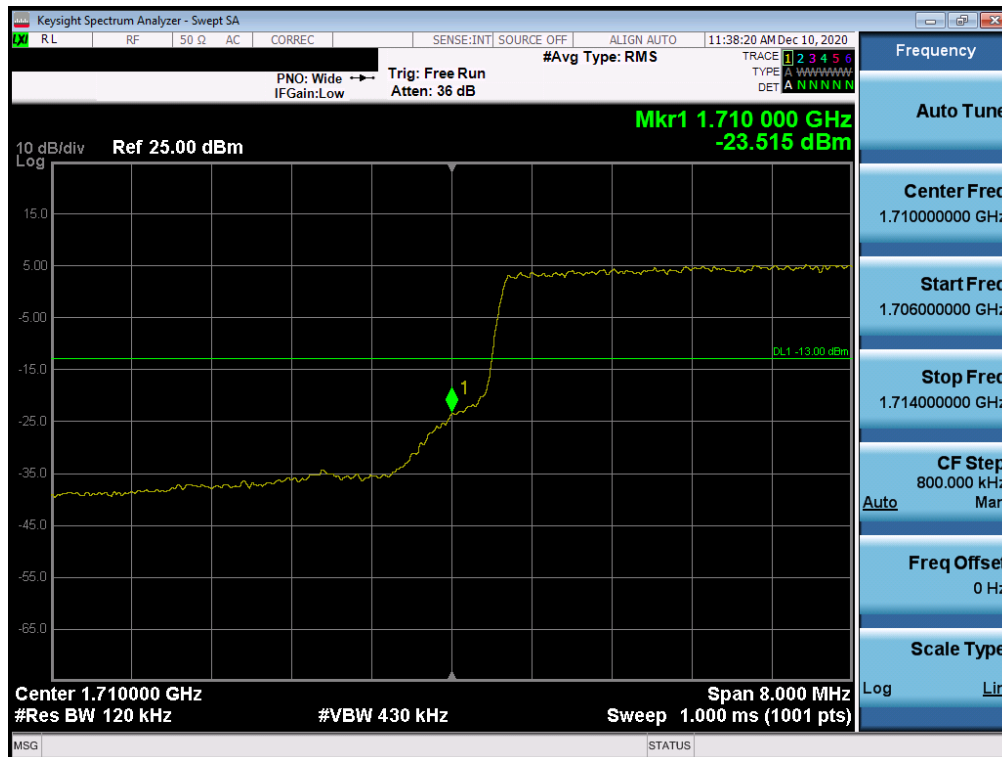


Plot 7-65. Upper Band Edge Plot (LTE Band 4 - 15MHz QPSK – Full RB Configuration)

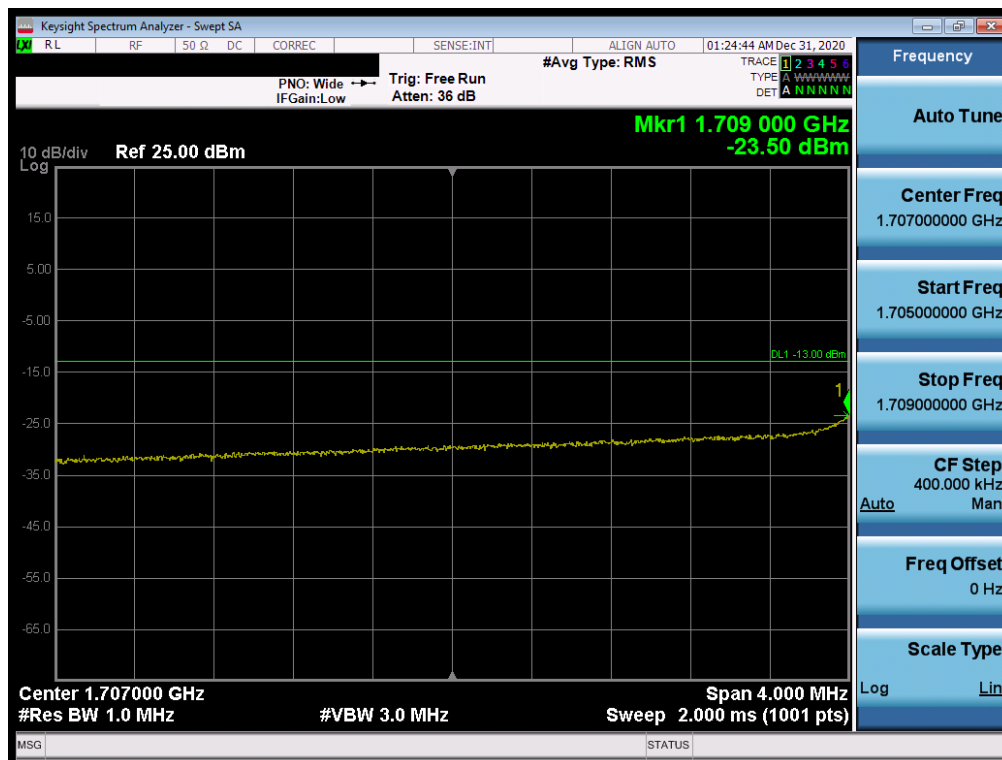


Plot 7-66. Upper Extended Band Edge Plot (LTE Band 4 - 15MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 48 of 100

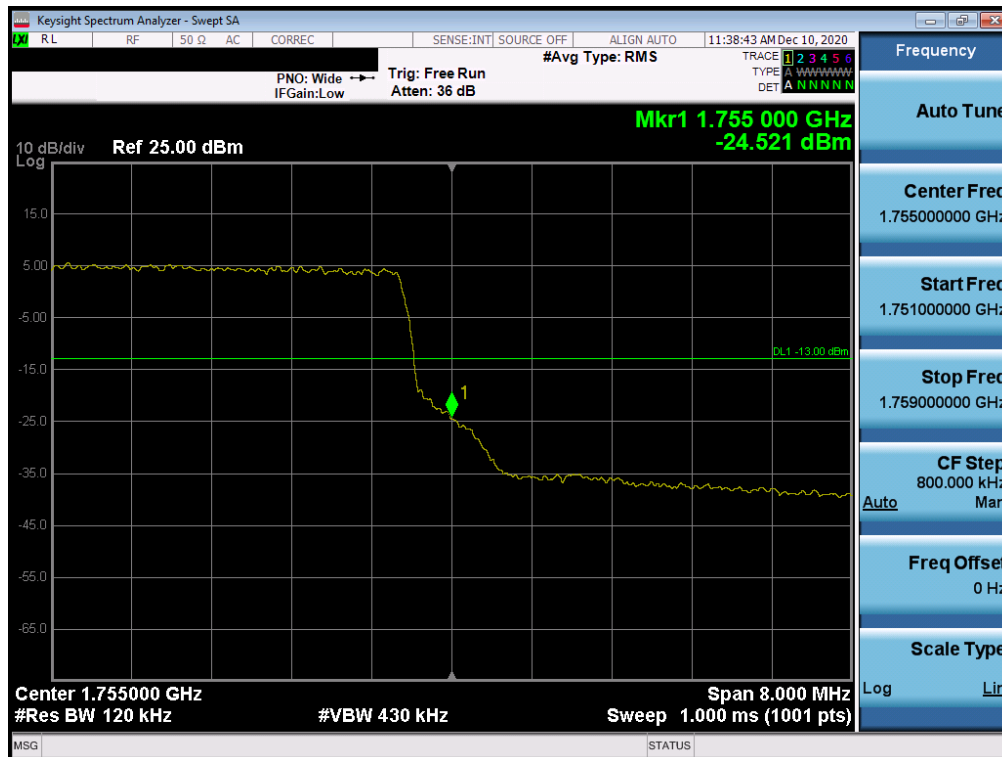


Plot 7-67. Lower Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB Configuration)

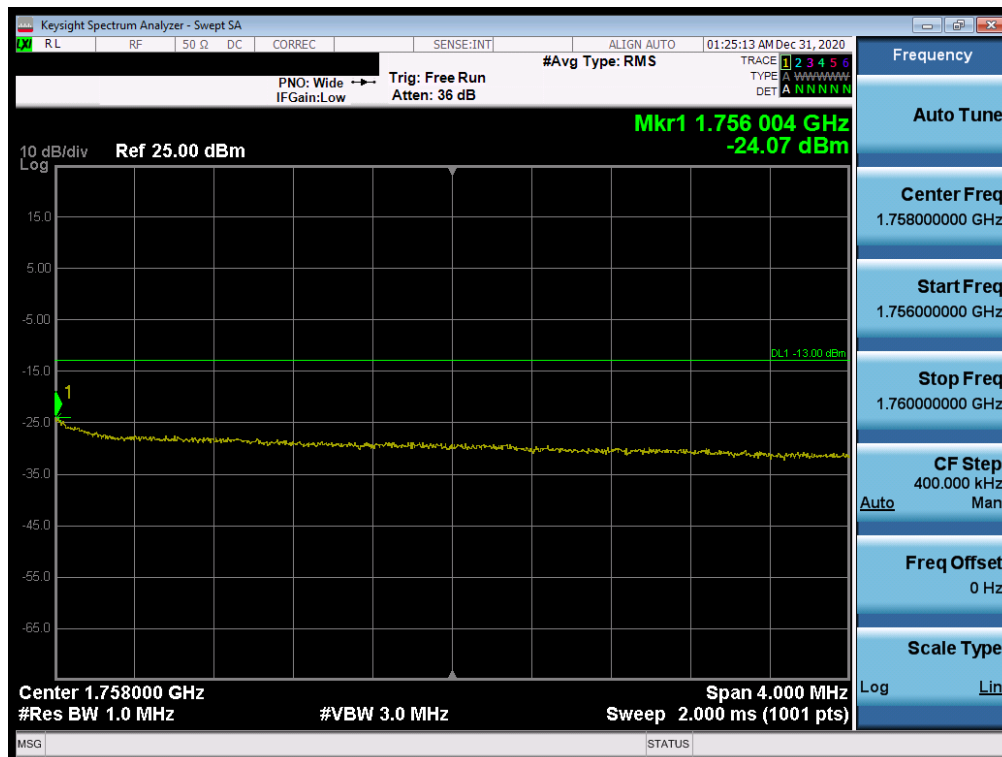


Plot 7-68. Lower Extended Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 49 of 100

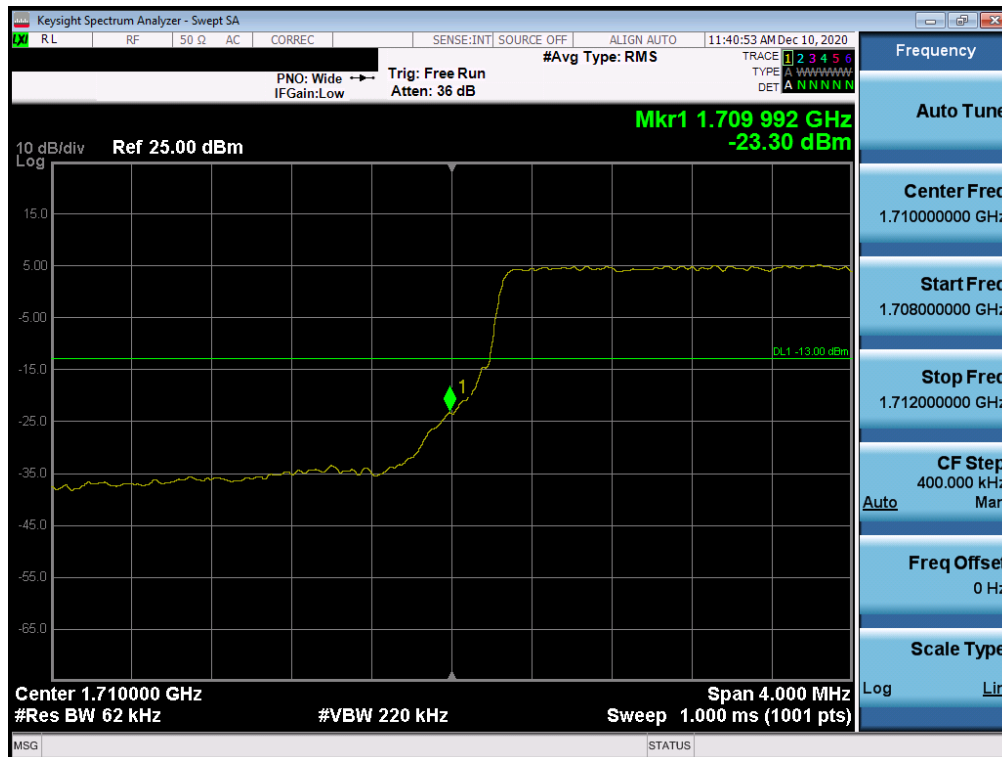


Plot 7-69. Upper Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB Configuration)

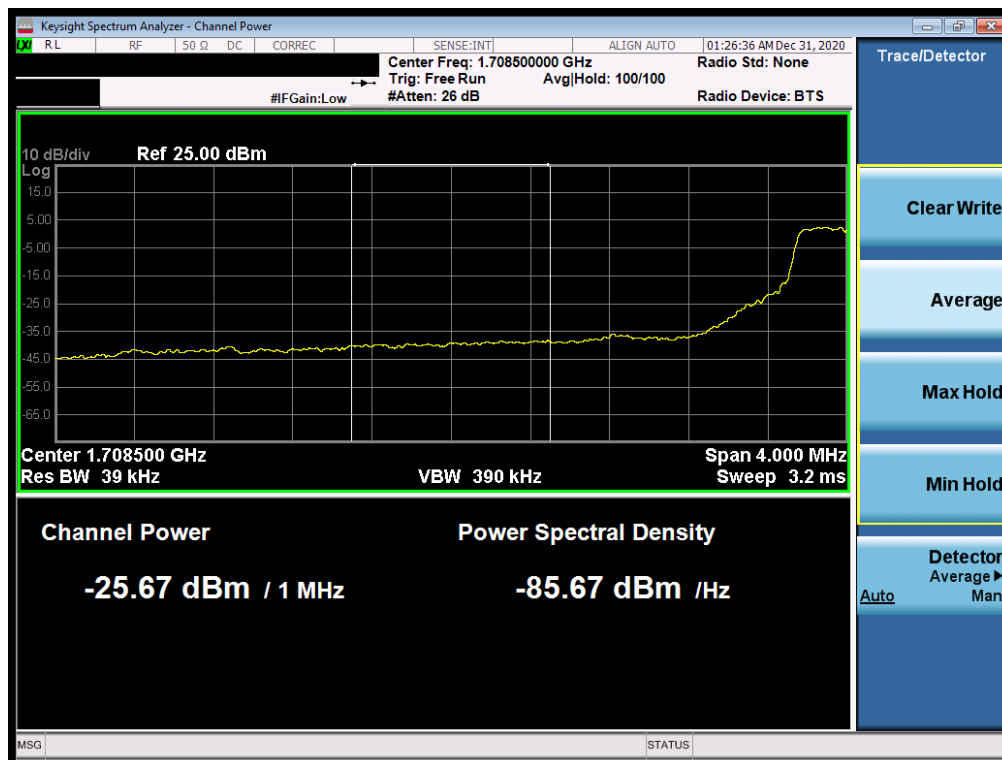


Plot 7-70. Upper Extended Band Edge Plot (LTE Band 4 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 50 of 100

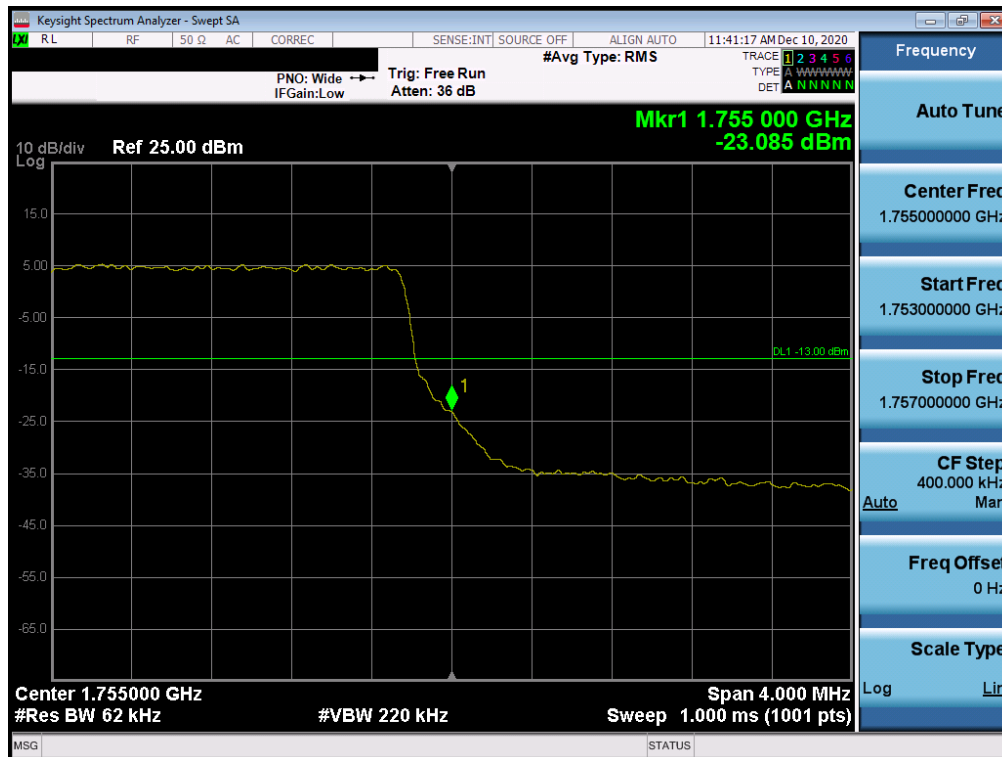


Plot 7-71. Lower Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB Configuration)

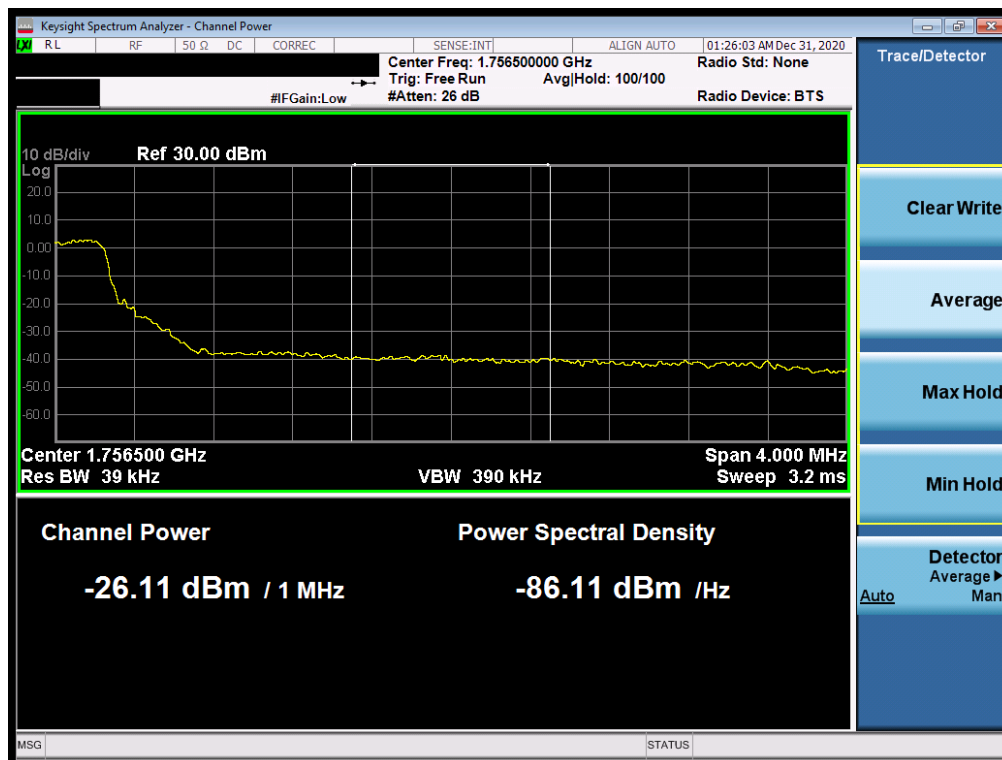


Plot 7-72. Lower Extended Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 51 of 100

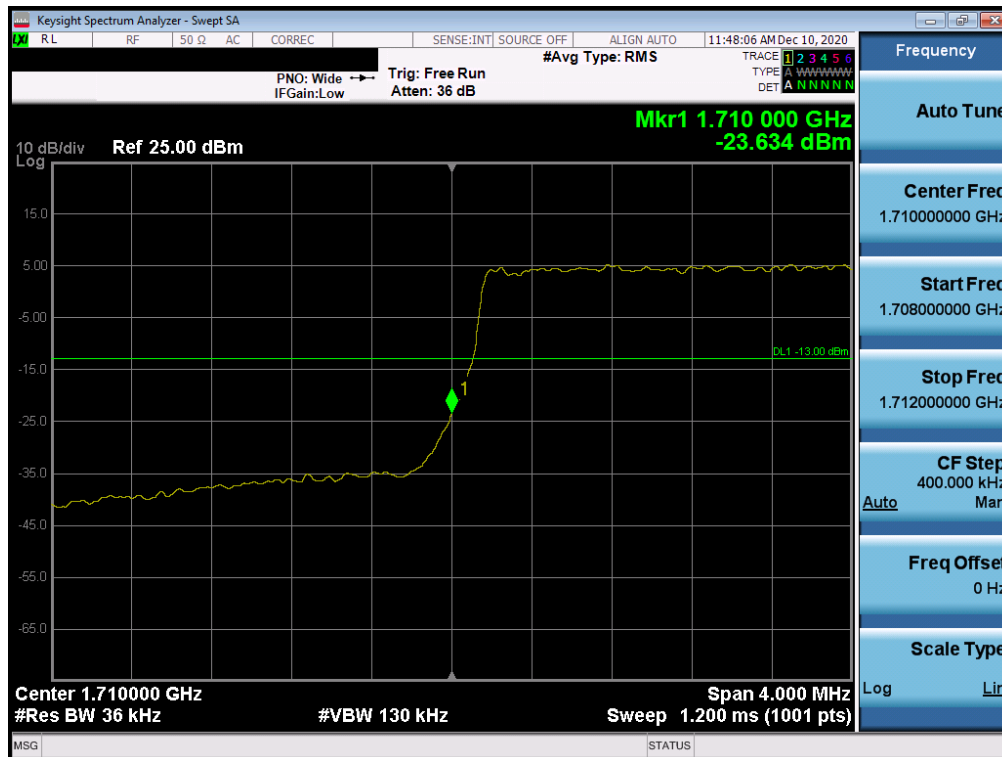


Plot 7-73. Upper Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB Configuration)

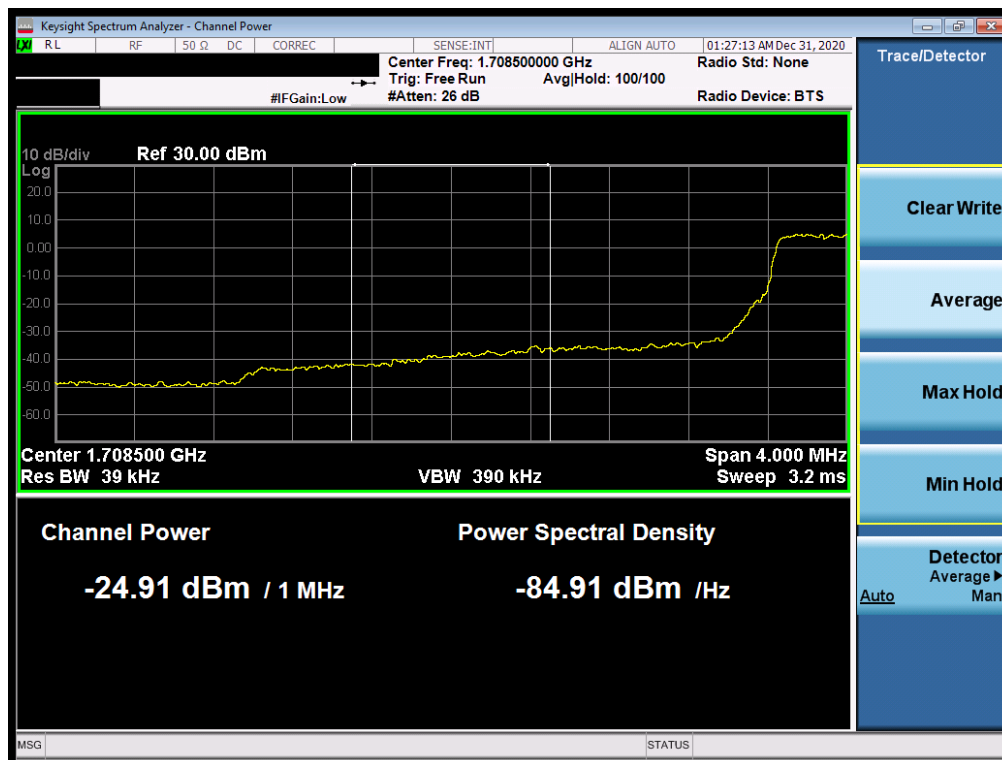


Plot 7-74. Upper Extended Band Edge Plot (LTE Band 4 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 52 of 100

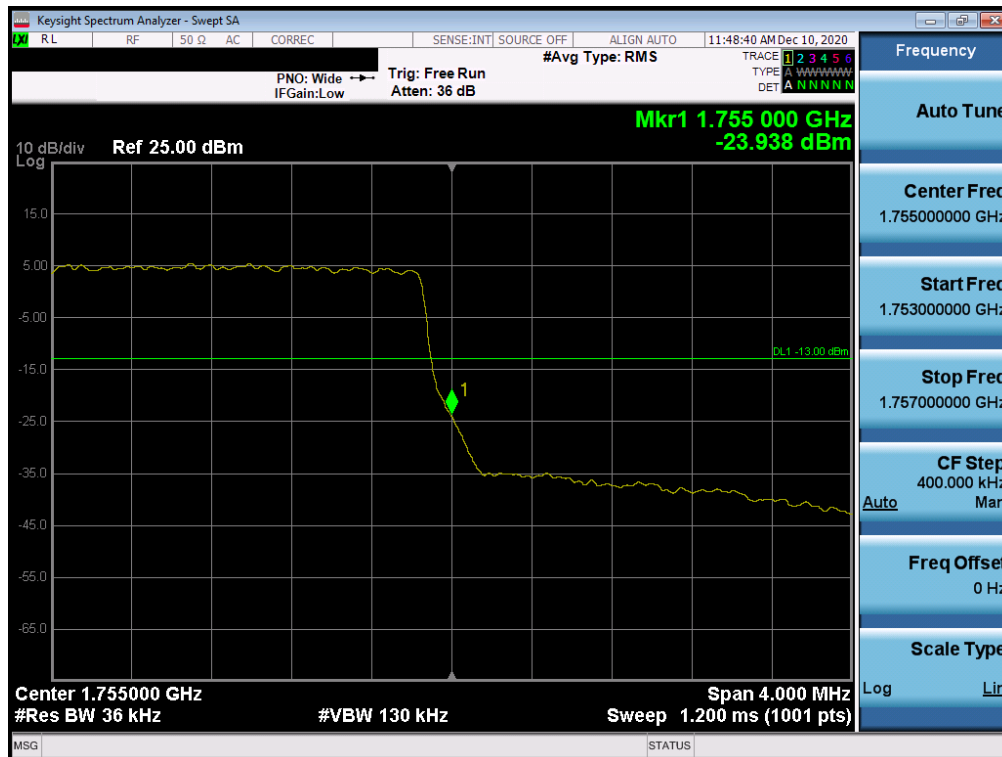


Plot 7-75. Lower Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB Configuration)

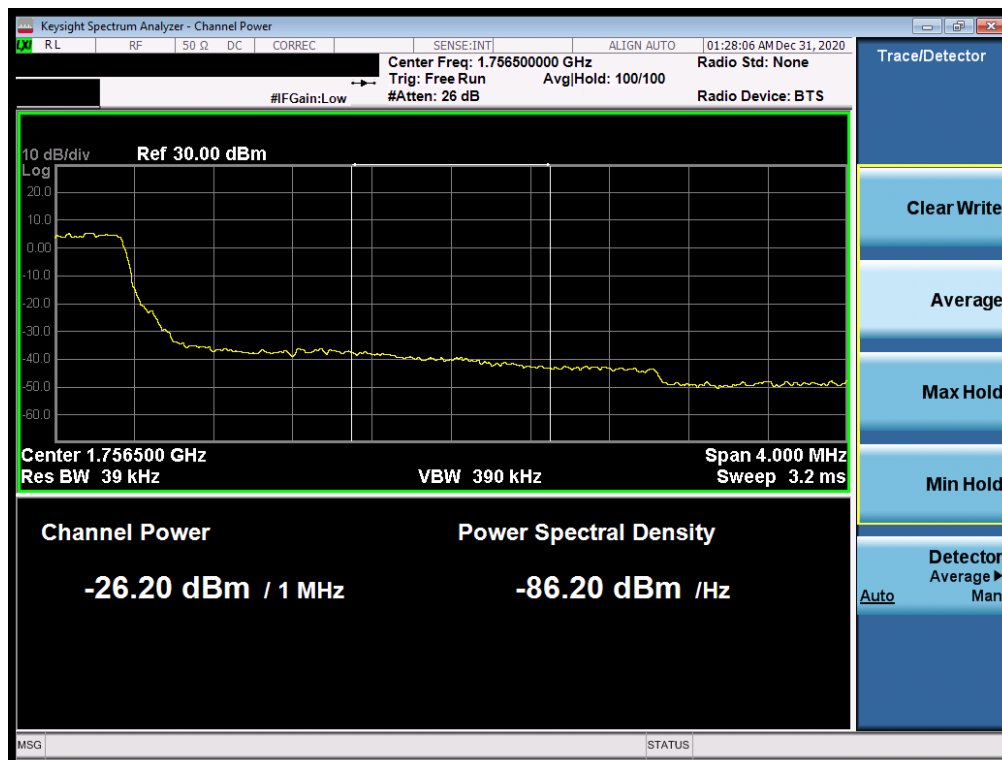


Plot 7-76. Lower Extended Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 53 of 100

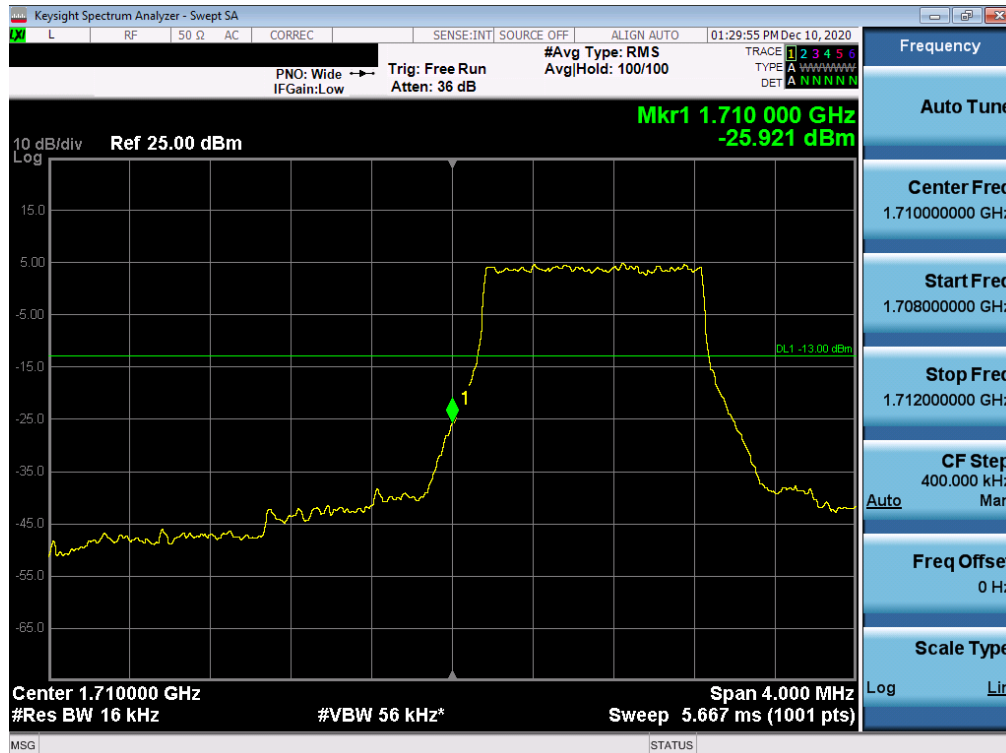


Plot 7-77. Upper Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB Configuration)

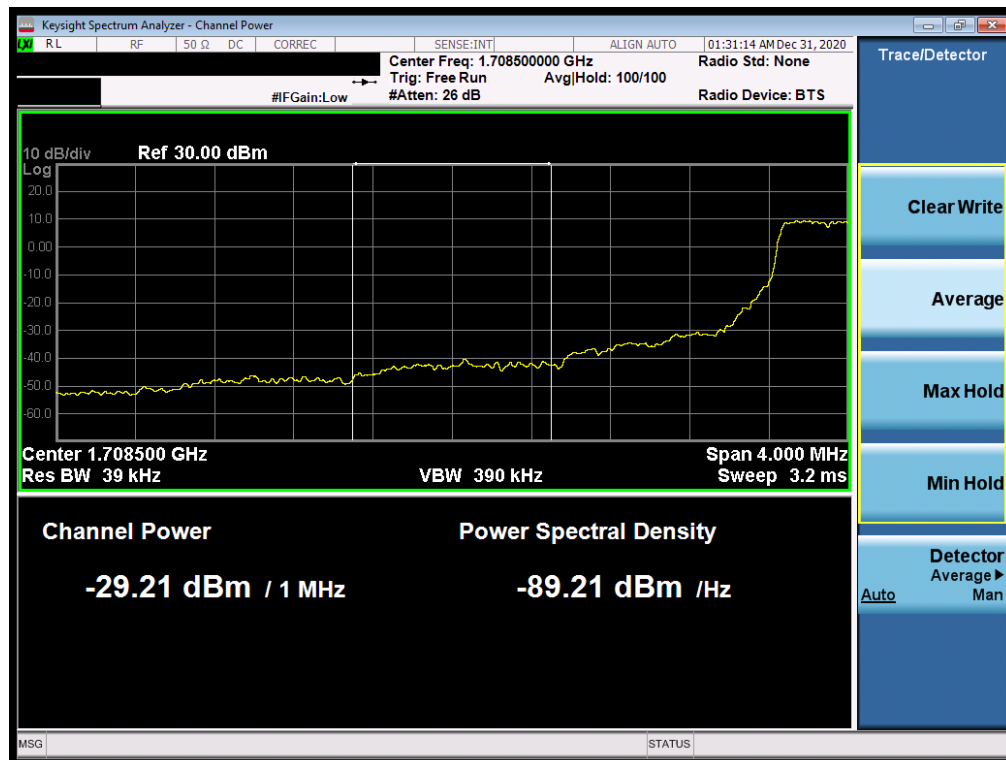


Plot 7-78. Upper Extended Band Edge Plot (LTE Band 4 - 3MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 54 of 100



Plot 7-79. Lower Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB Configuration)

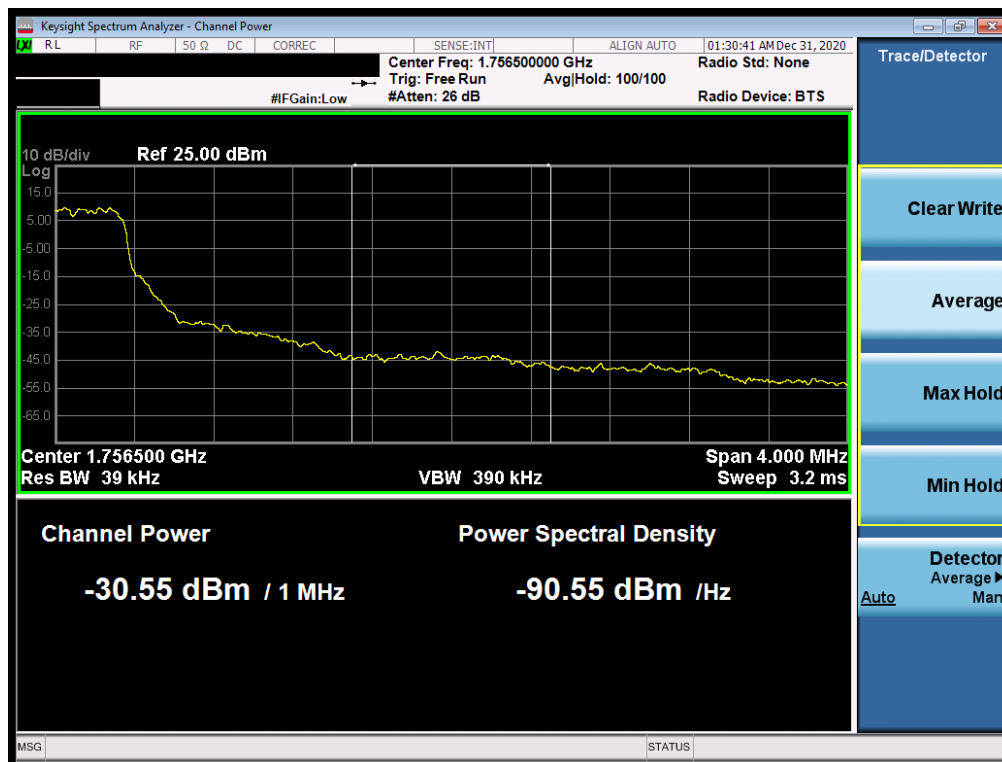


Plot 7-80. Lower Extended Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 55 of 100



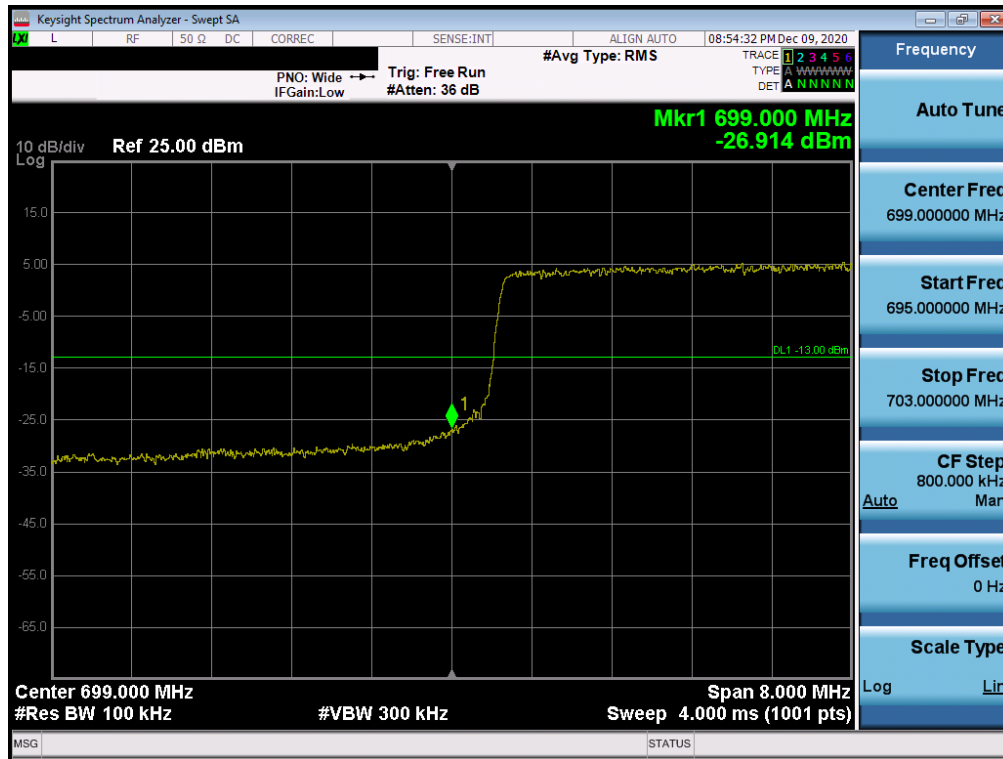
Plot 7-81. Upper Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB Configuration)



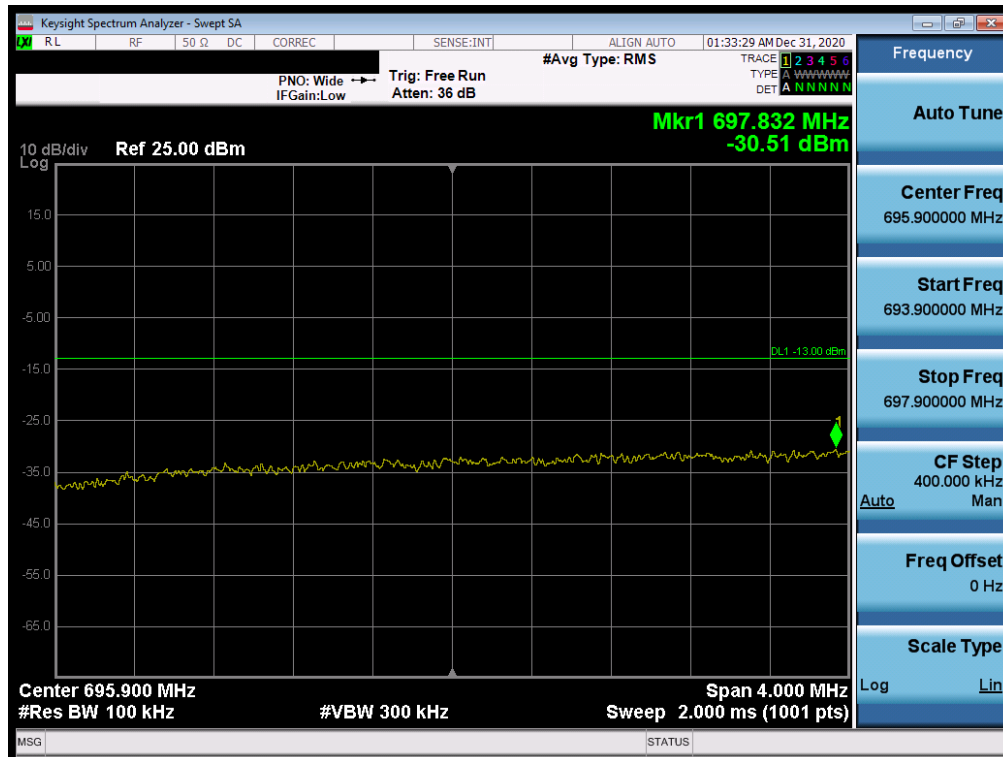
Plot 7-82. Upper Extended Band Edge Plot (LTE Band 4 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 56 of 100

LTE Band 12

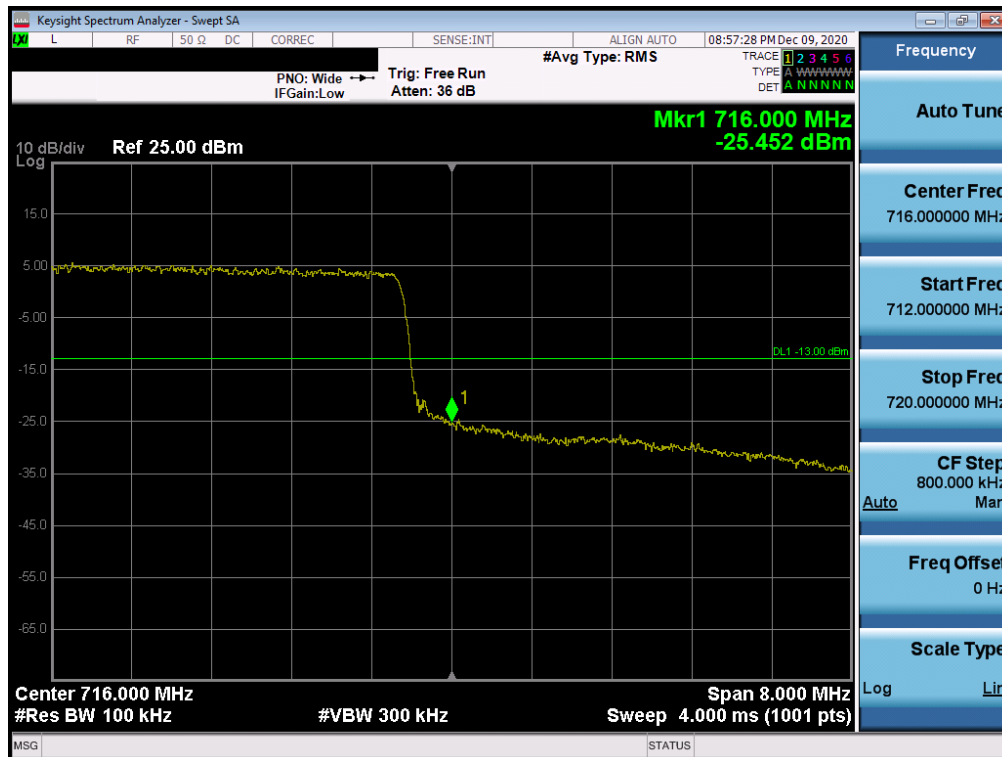


Plot 7-83. Lower Band Edge Plot (LTE Band 12 - 10MHz QPSK – Full RB Configuration)

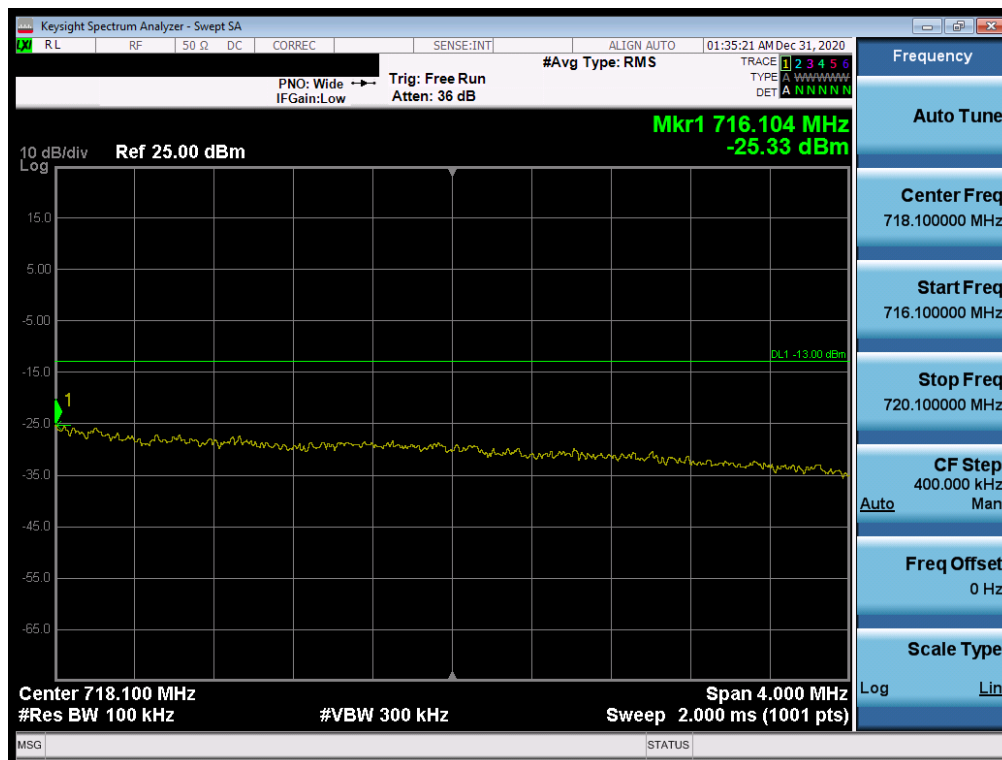


Plot 7-84. Lower Extended Band Edge Plot (LTE Band 12 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 57 of 100

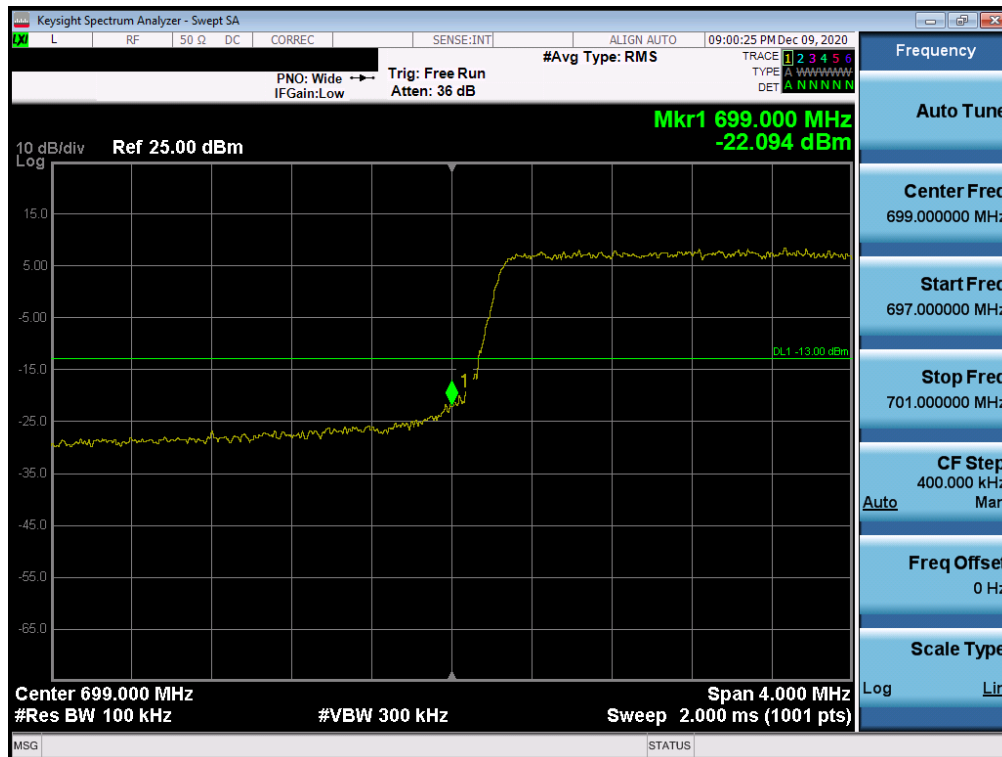


Plot 7-85. Upper Band Edge Plot (LTE Band 12 - 10MHz QPSK – Full RB Configuration)

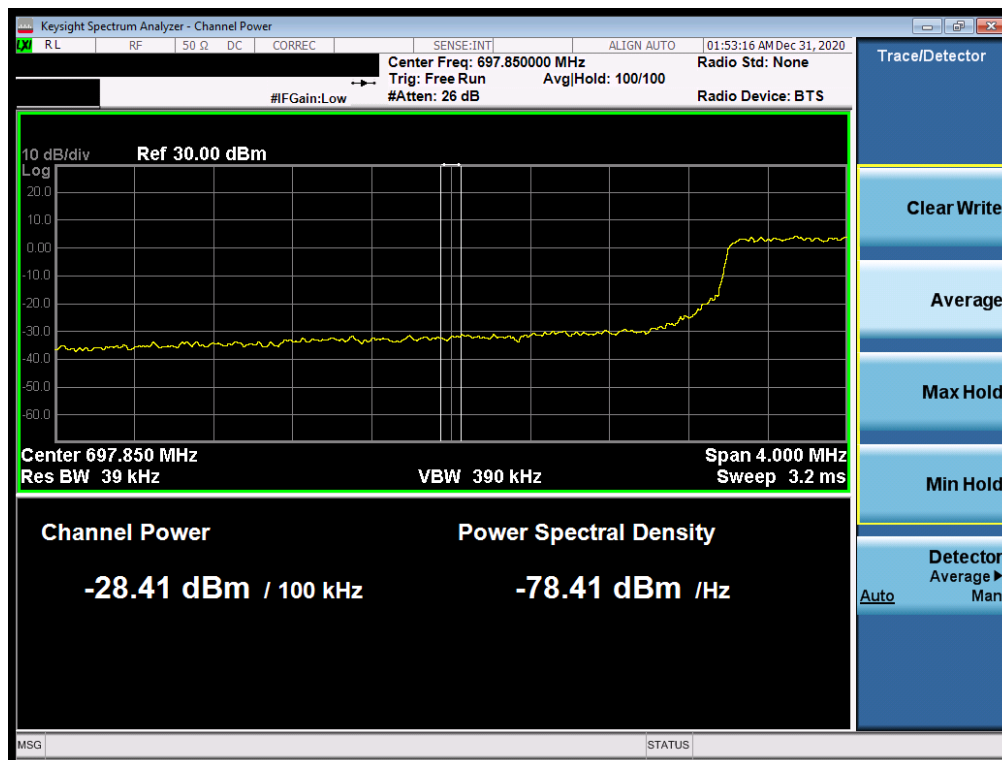


Plot 7-86. Upper Extended Band Edge Plot (LTE Band 12 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 58 of 100

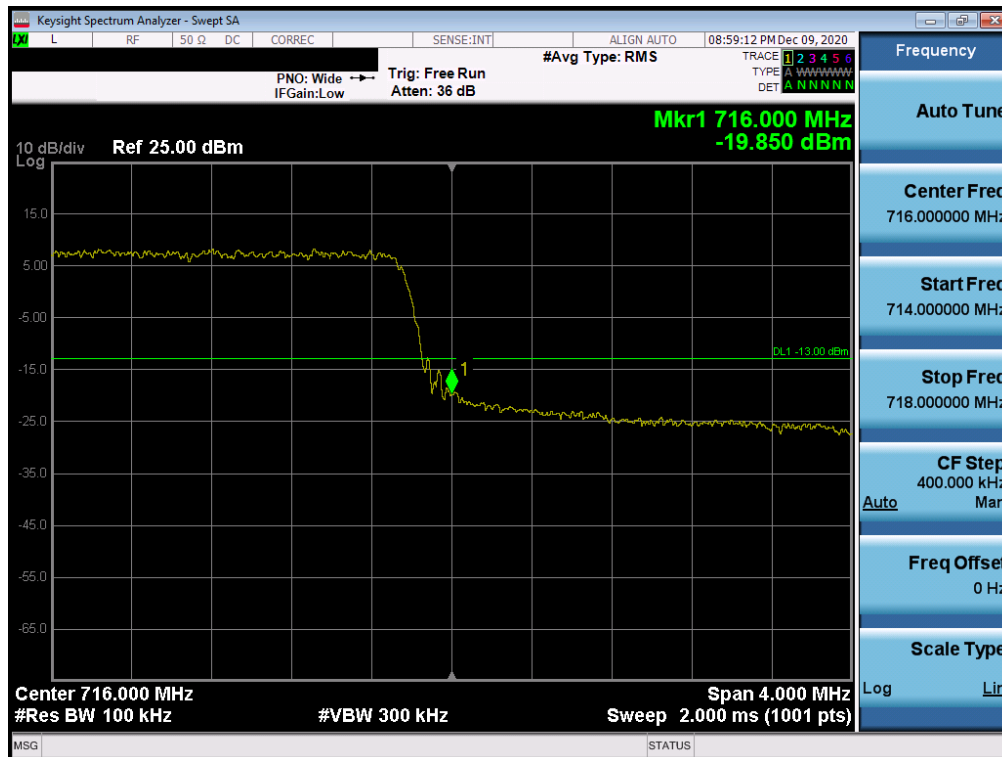


Plot 7-87. Lower Band Edge Plot (LTE Band 12 - 5MHz QPSK – Full RB Configuration)

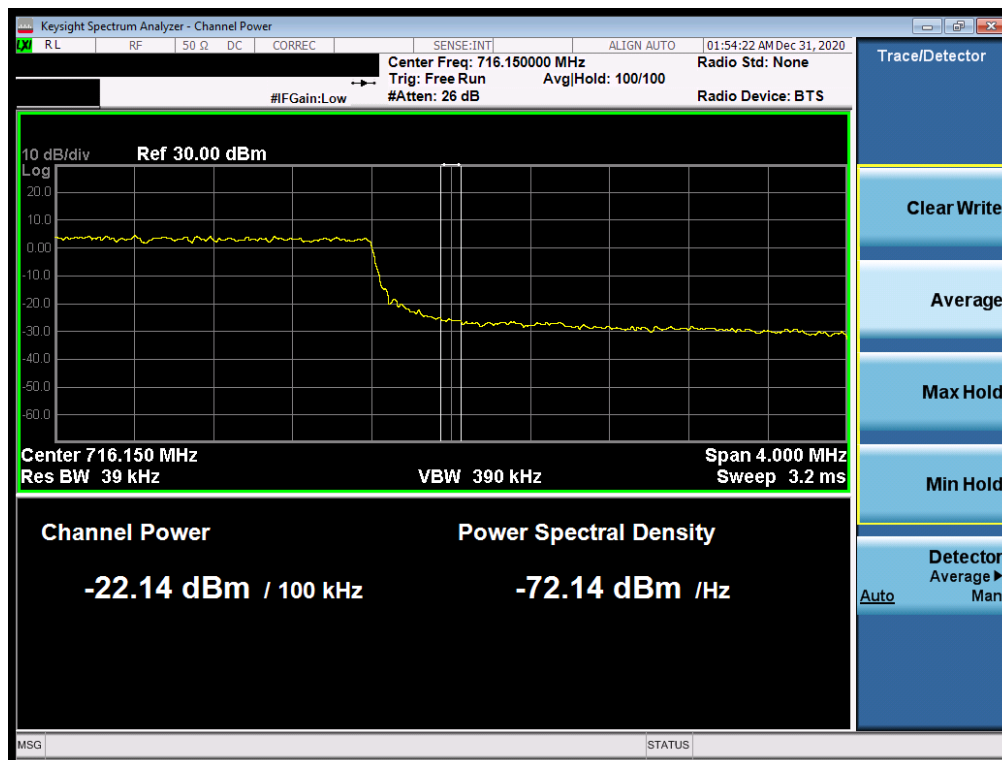


Plot 7-88. Lower Extended Band Edge Plot (LTE Band 12 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 59 of 100

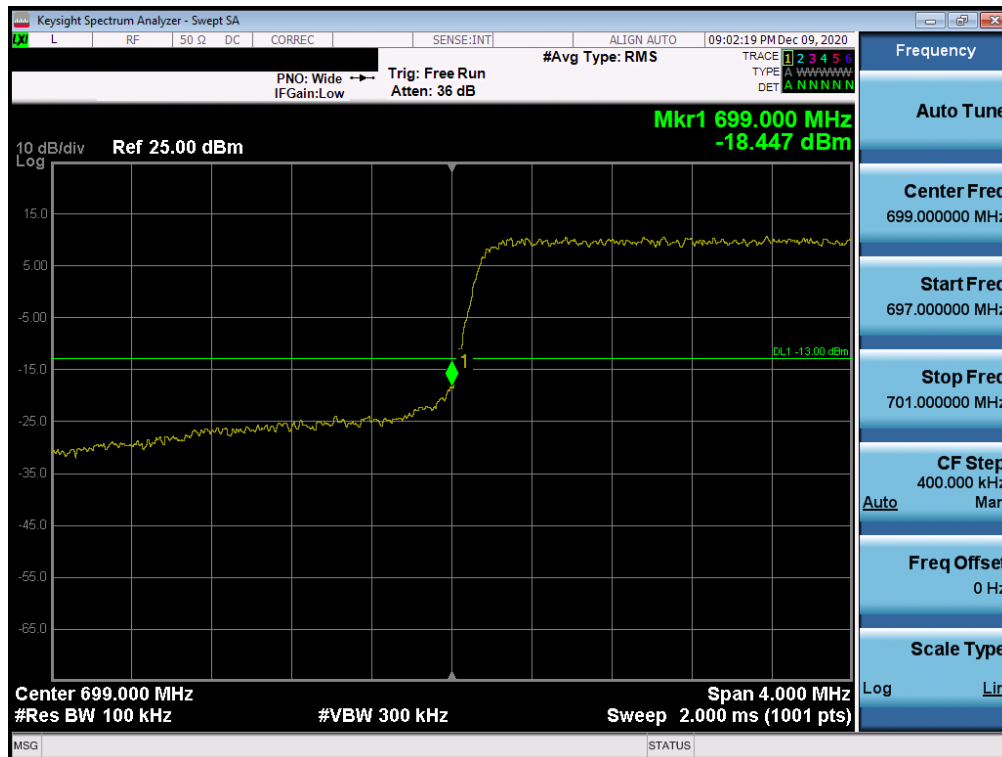


Plot 7-89. Upper Band Edge Plot (LTE Band 12 - 5MHz QPSK – Full RB Configuration)

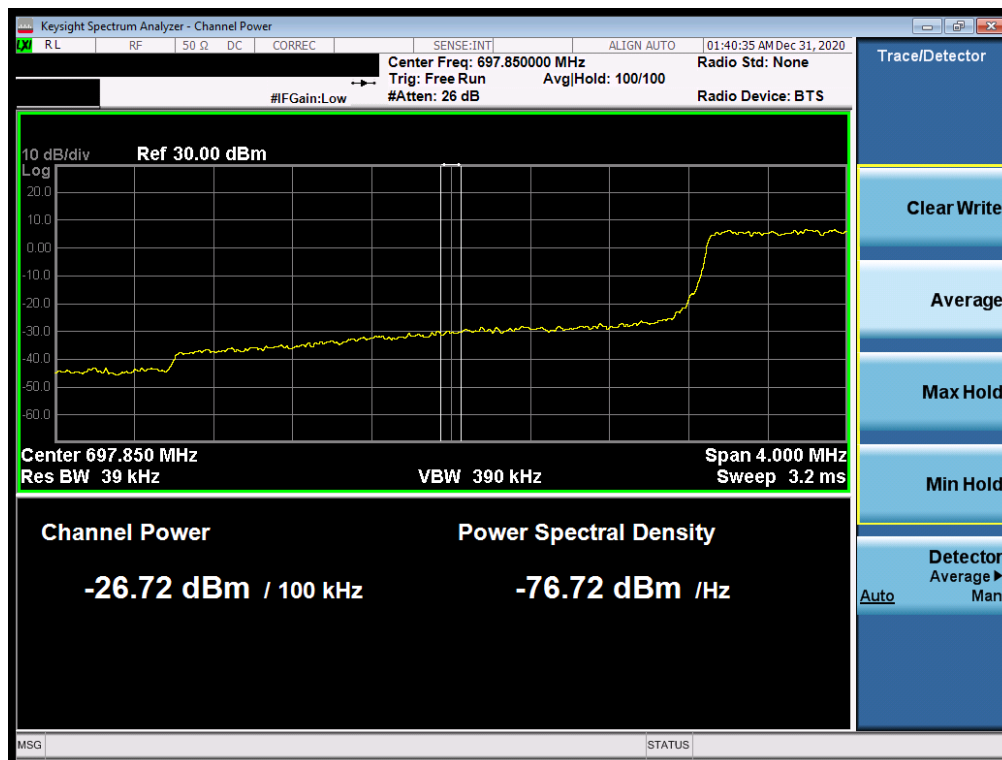


Plot 7-90. Upper Extended Band Edge Plot (LTE Band 12 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 60 of 100

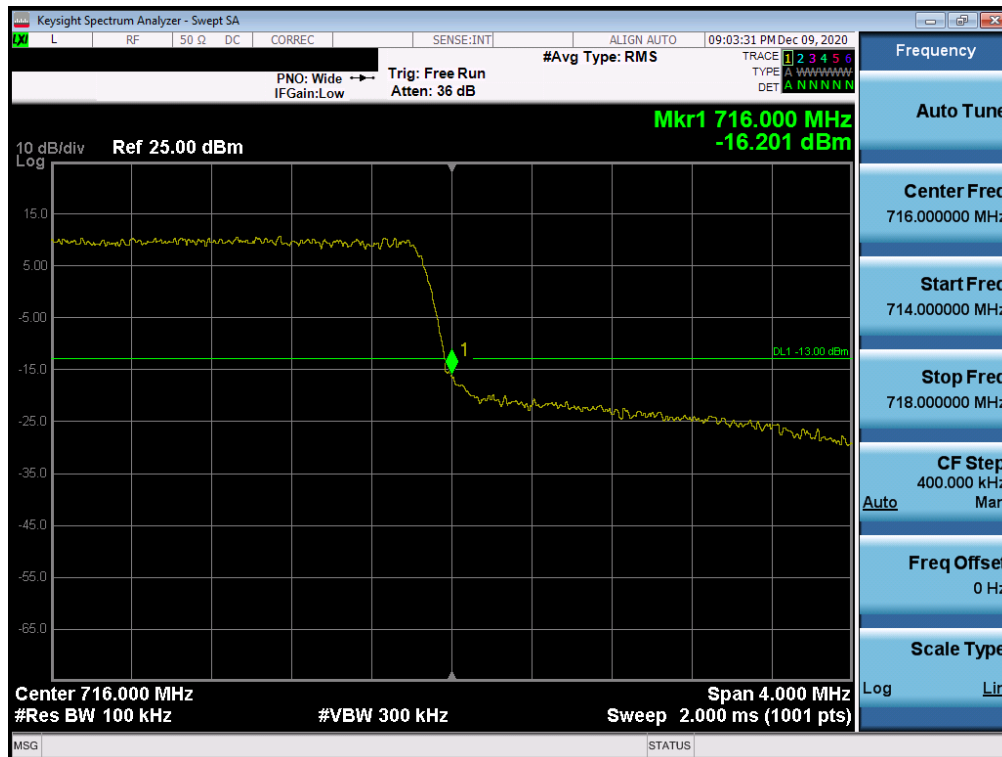


Plot 7-91. Lower Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB Configuration)

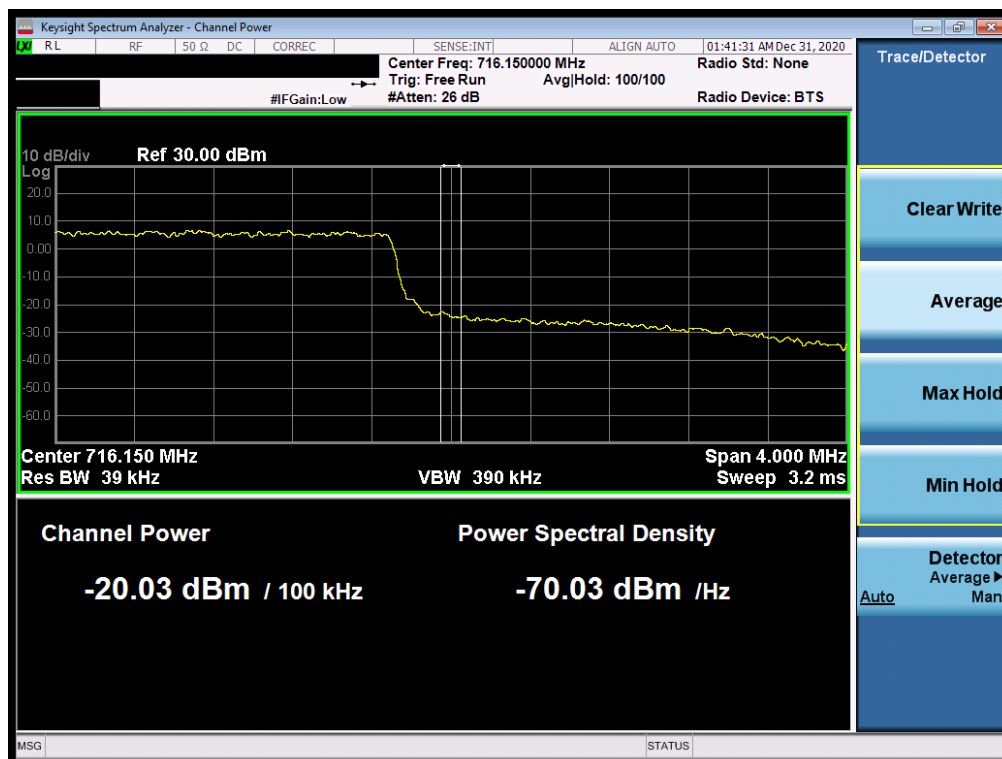


Plot 7-92. Lower Extended Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 61 of 100

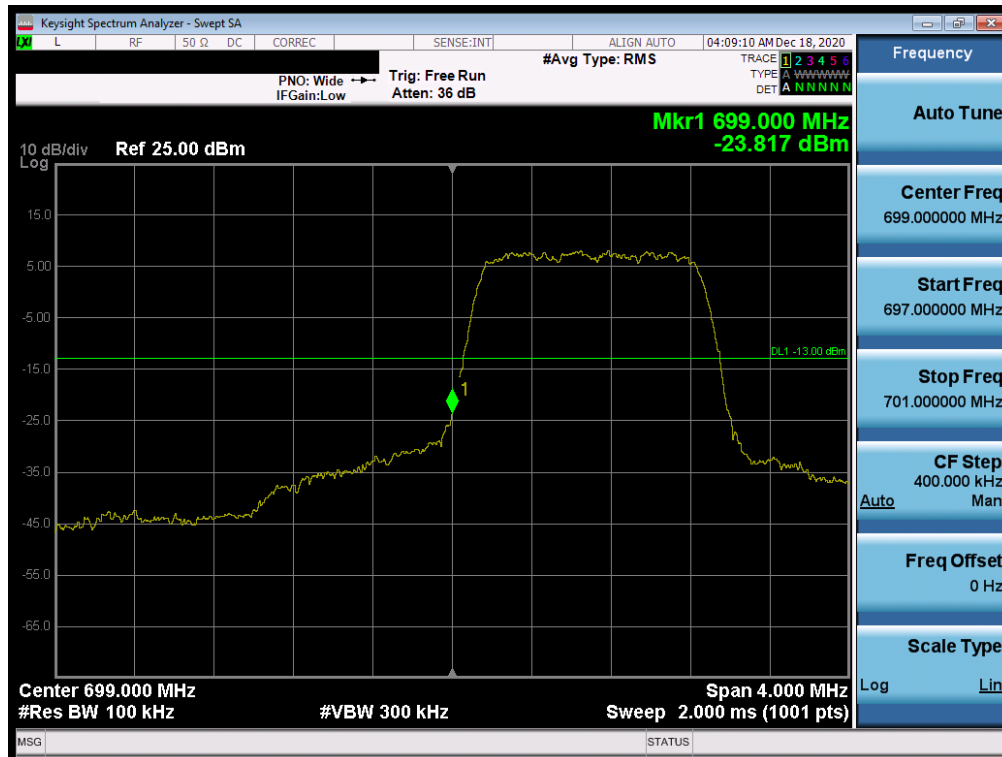


Plot 7-93. Upper Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB Configuration)

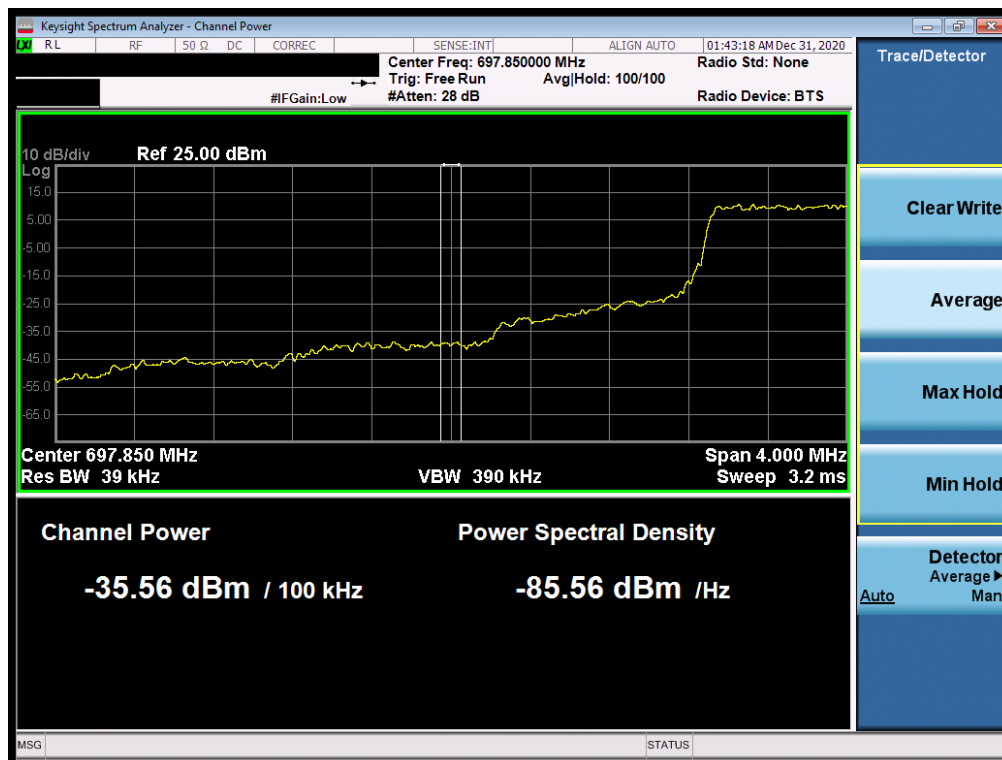


Plot 7-94. Upper Extended Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 62 of 100



Plot 7-95. Lower Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)

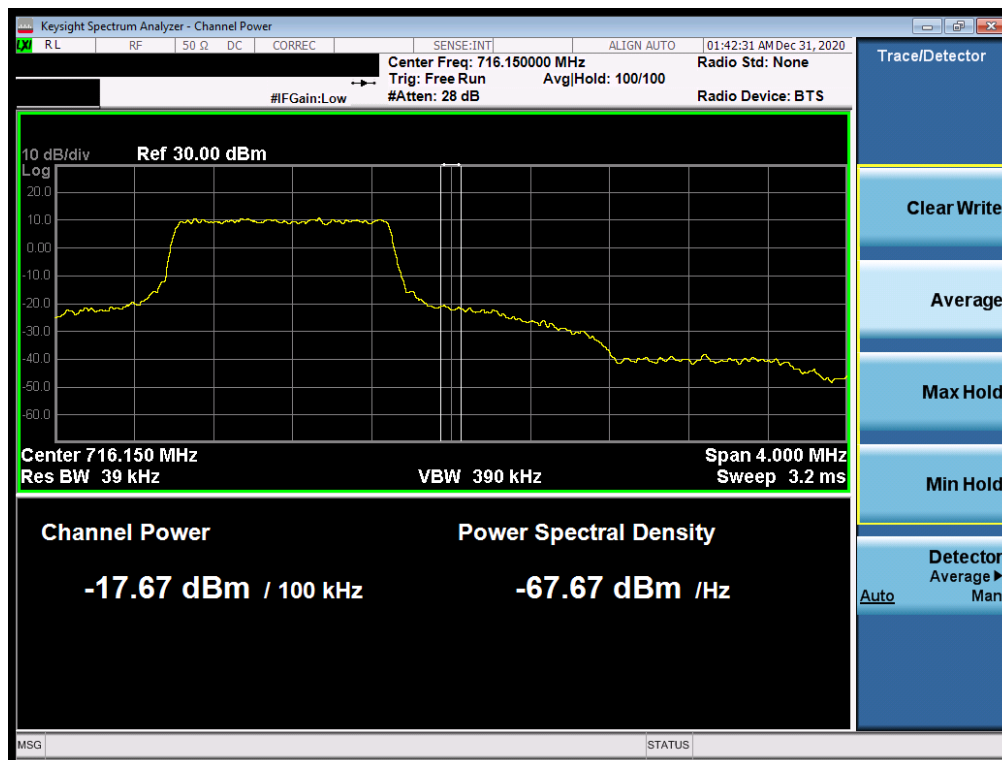


Plot 7-96. Lower Extended Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 63 of 100



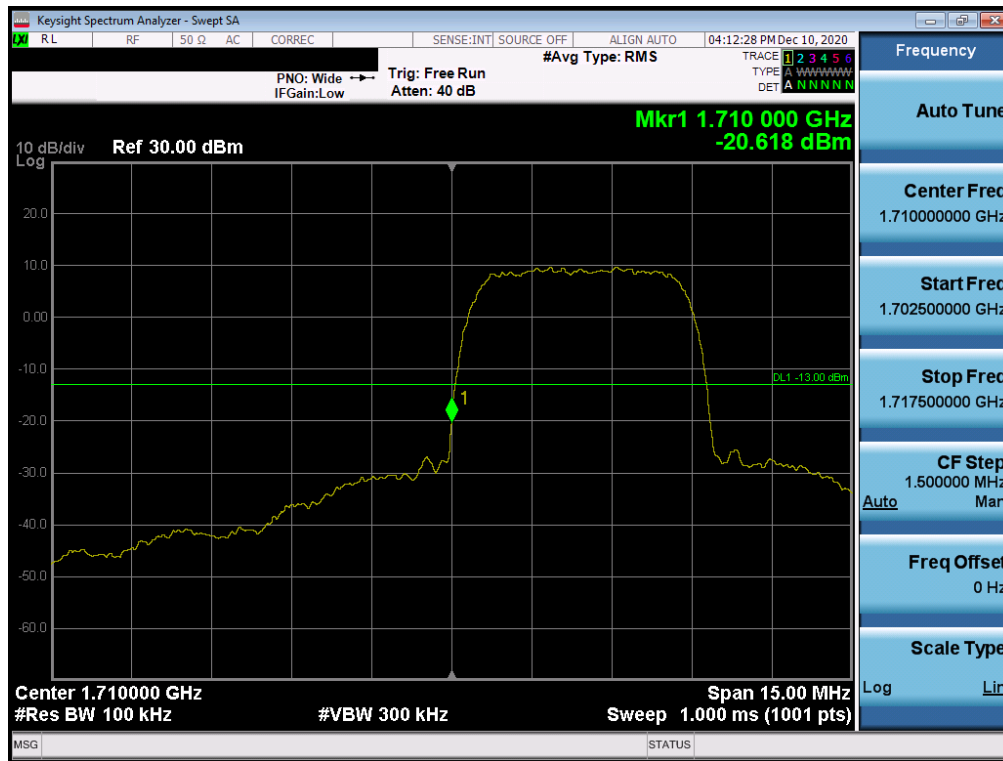
Plot 7-97. Upper Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)



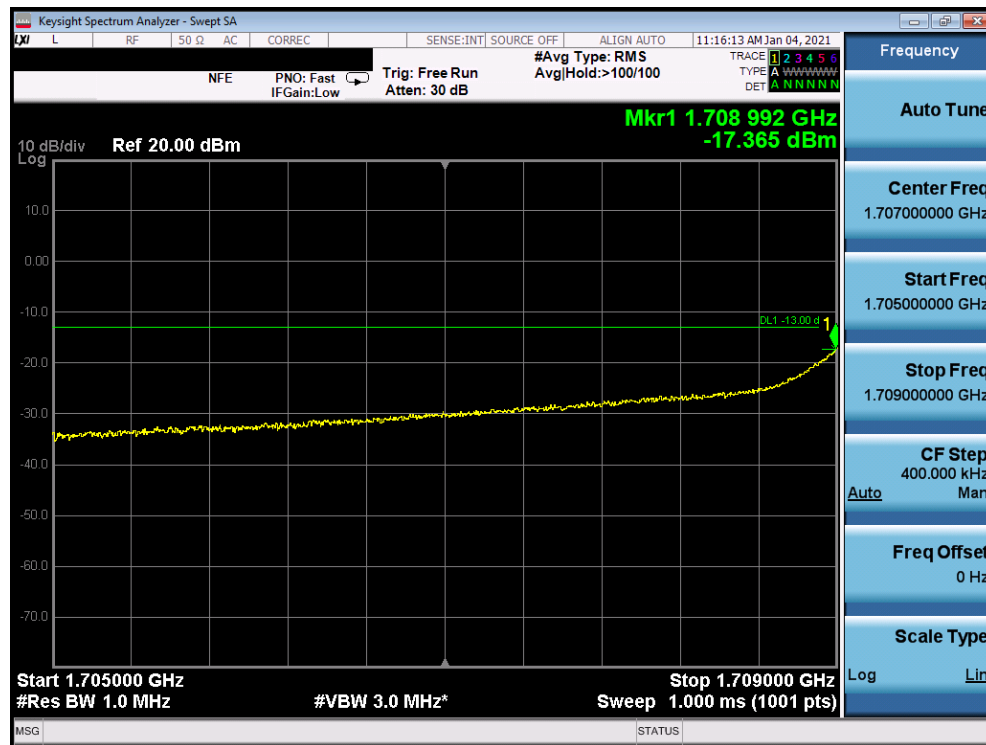
Plot 7-98. Upper Extended Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 64 of 100

WCDMA AWS



Plot 7-99. Lower Band Edge Plot (WCDMA AWS – Ch. 1312)

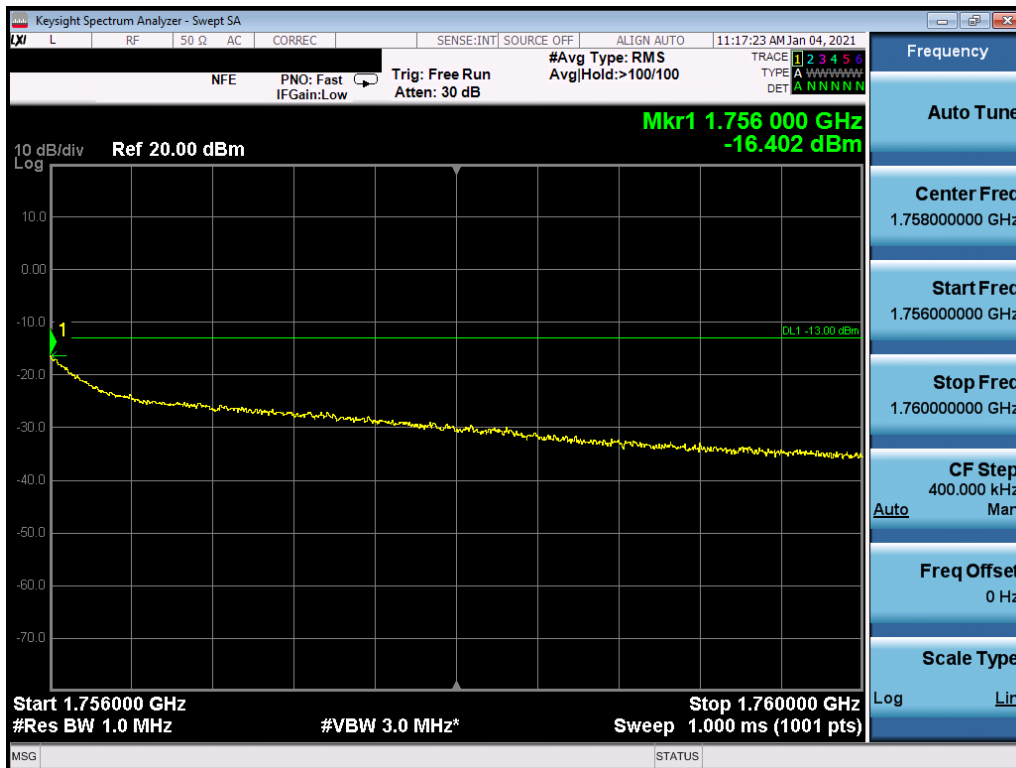


Plot 7-100. Lower Extended Band Edge Plot (WCDMA AWS – Ch. 1312)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 65 of 100



Plot 7-101. Upper Band Edge Plot (WCDMA AWS – Ch. 1513)



Plot 7-102. Upper Extended Band Edge Plot (WCDMA AWS – Ch. 1312)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 66 of 100

7.5 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. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Setup

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

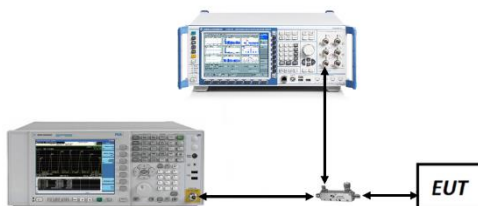


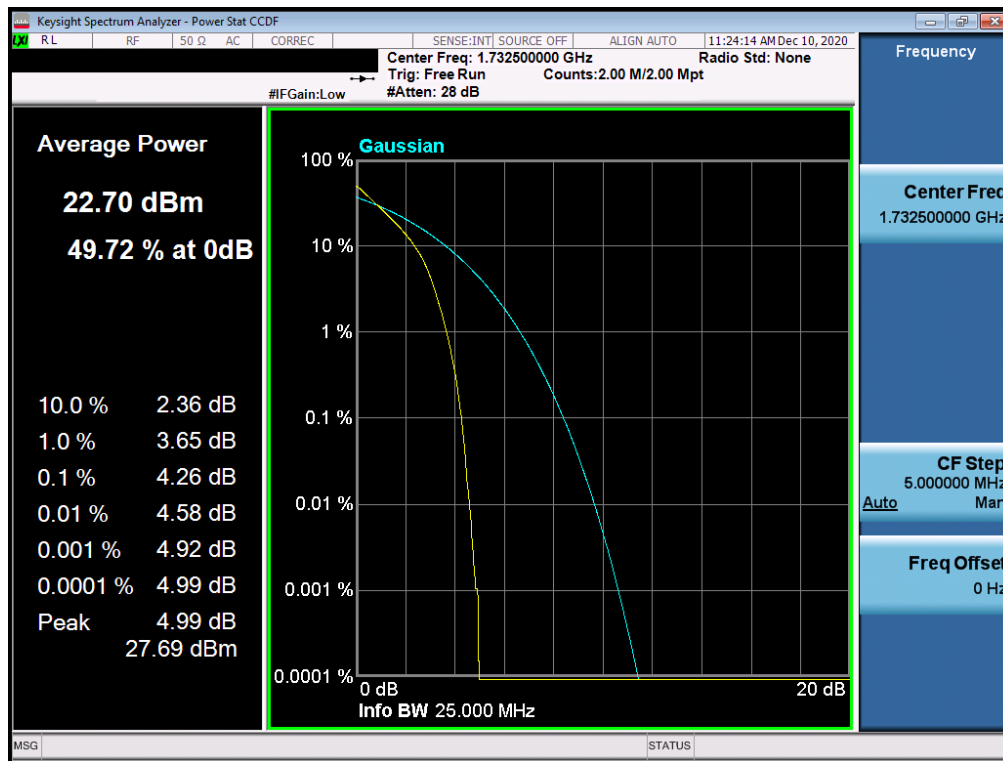
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

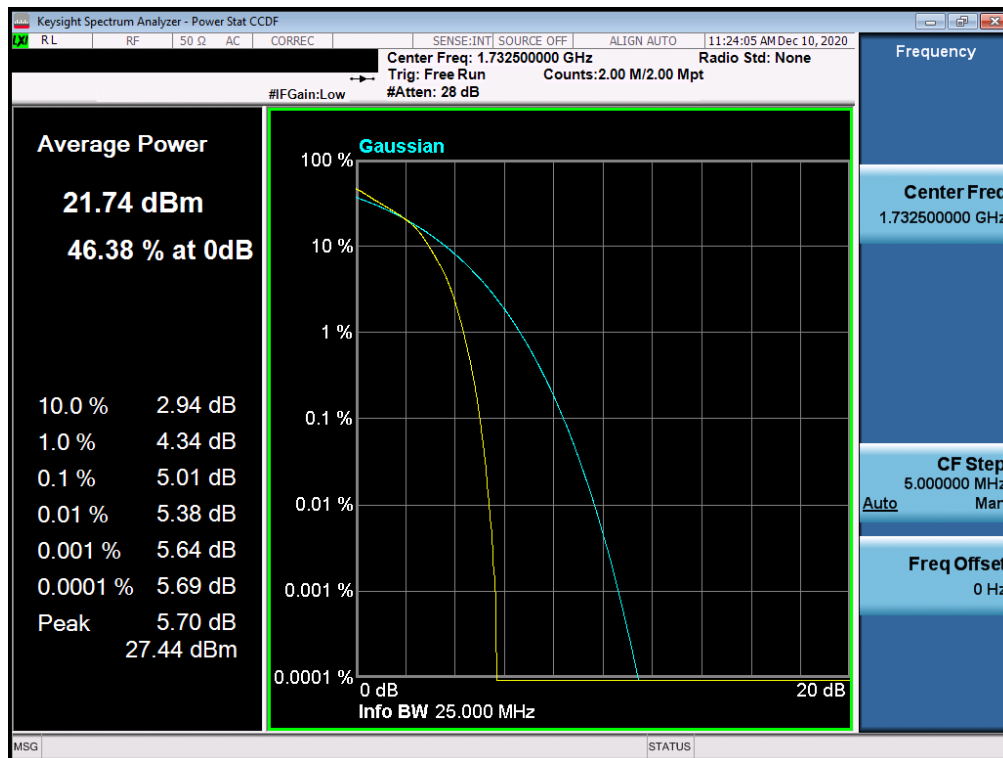
None.

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset	Page 67 of 100	

LTE Band 4



Plot 7-103. PAR Plot (LTE Band 4 - 20MHz QPSK - Full RB Configuration)



Plot 7-104. PAR Plot (LTE Band 4 - 20MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK200AM	PCTEST Proud to be part of element	PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager
Test Report S/N: 1M2011240185-04.ZNF	Test Dates: 11/24/2020 – 1/4/2021	EUT Type: Portable Handset		Page 68 of 100