

PCTEST ENGINEERING LABORATORY, INC.

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### MEASUREMENT REPORT CDMA / GSM / GPRS / EDGE / WCDMA

#### **Applicant Name:**

LG Electronics USA, INC 1000 Sylvan Avenue Englewood Cliffs, NJ 07632 United States Date of Testing: 6/29 - 7/31/2018 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1806290137-02.ZNF

FCC ID:	ZNFQ910QM
IC:	2703C-Q910UM
APPLICANT:	LG Electronics USA, INC
Application Type:	Certification
Model:	LM-Q910QM
Additional Model(s):	LMQ910QM, Q910QM, LM-Q910UM, LMQ910UM, Q910UM
HVIN(s):	LM-Q910UM, LMQ910UM, Q910UM
EUT Type:	Portable Handset
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s):	22, 24, & 27
ISED Specification:	RSS-132, RSS-133, RSS-139
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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			Ef	RP	EI	RP	
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)	Emission Designator
GPRS850	22H	824.2 - 848.8	0.764	28.83	1.253	30.98	242KGXW
EDGE850	22H	824.2 - 848.8	0.153	21.83	0.250	23.98	246KG7W
CDMA850	22H	824.70 - 848.31	0.100	20.00	0.164	22.15	1M28F9W
WCDMA850	22H	826.4 - 846.6	0.126	21.02	0.207	23.17	4M15F9W
WCDMA1700	27	1712.4 - 1752.6			0.159	22.01	4M15F9W
GPRS1900	24E	1850.2 - 1909.8			0.472	26.74	244KGXW
EDGE1900	24E	1850.2 - 1909.8			0.222	23.46	247KG7W
CDMA1900	24E	1851.25 - 1908.75			0.126	21.00	1M28F9W
WCDMA1900	24E	1852.4 - 1907.6			0.114	20.58	4M15F9W

**EUT Overview** 

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# **1.0 INTRODUCTION**

### 1.1 Scope

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

### 1.2 PCTEST Test Location

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

#### **1.3** Test Facility / Accreditations Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

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

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# 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFQ910QM**. The test data contained in this report pertains only to the emissions due to the EUT's 2G/3G licensed transmitters.

Test Device Serial No.: 04258, 04217, 04241

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ac WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC

### 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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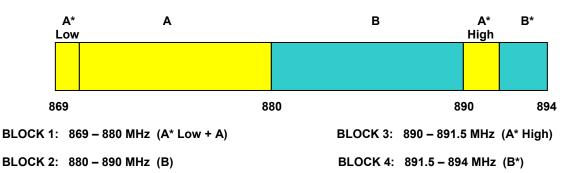
# 3.0 DESCRIPTION OF TESTS

### 3.1 Evaluation Procedure

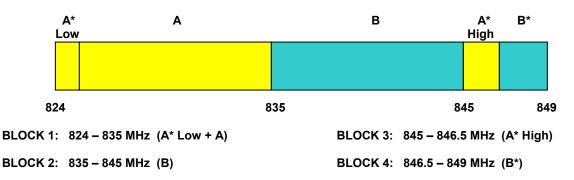
The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

#### Deviation from Measurement Procedure.....None

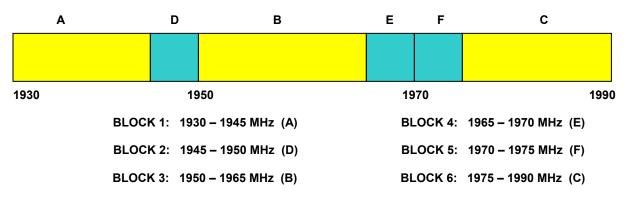
### 3.2 Cellular - Base Frequency Blocks



### 3.3 Cellular - Mobile Frequency Blocks



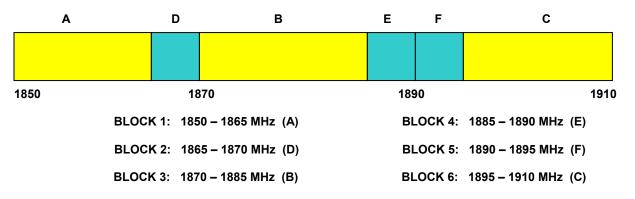
### 3.4 PCS - Base Frequency Blocks



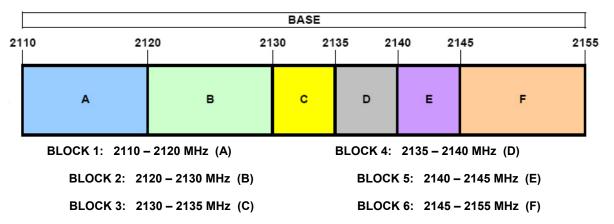
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### 3.5 PCS - Mobile Frequency Blocks



### 3.6 AWS - Base Frequency Blocks



### 3.7 AWS - Mobile Frequency Blocks

	MOBILE							
17	10	1	720 1 	730 17 	735 17	' <b>40</b> 17	45	1755
		A	в	с	D	E	F	
			710 – 1720 MHz (A) 720 – 1730 MHz (B)				1740 MHz (D) 1745 MHz (E)	
			730 – 1735 MHz (C)				1755 MHz (F)	

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### 3.8 Radiated Measurements

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.

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

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

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

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

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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  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

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

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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	8/10/2017	Annual	8/10/2018	LTx2
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	5/25/2018	Annual	5/25/2019	MY52350166
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/23/2016	Biennial	8/23/2018	135427
Espec	ESX-2CA	Environmental Chamber	3/28/2018	Annual	3/28/2019	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	12/1/2016	Biennial	12/1/2018	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
Huber + Suhner	Sucoflex 102A	40GHz Radiated Cable Set	1/23/2018	Annual	1/23/2019	251425001
Keysight Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	3/20/2018	Annual	3/20/2019	MY49430494
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/30/2018	Annual	3/30/2019	11401010036
Mini Circuits	TVA-11-422	RF Power Amp	N/A		N/A	QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator	N/A		N/A	11208010032
Rohde & Schwarz	CMW500	Radio Communication Tester	10/13/2017	Annual	10/13/2018	102060
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/21/2018	Annual	5/21/2019	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/31/2017	Annual	7/31/2018	100348
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	8/11/2017	Annual	8/11/2018	103200
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	9/11/2017	Annual	9/11/2018	102132
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/18/2018	Annual	6/18/2019	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/25/2018	Annual	6/25/2019	102133
Anritsu	MT8820C	Radio Communication Analyzer	10/25/2017	Annual	10/25/2018	6201144419
Rohde & Schwarz	TC-TA18	Cross-Pol Antenna 400MHz-18GHz	10/30/2017	Annual	10/30/2018	101058
Schwarzbeck	UHA 9105	Dipole Antenna	8/26/2016	Biennial	8/26/2018	2696
Rohde & Schwarz	TS-PR8	Preamplifier-Antenna SYS; 30MHz-8GHz	10/19/2017	Annual	10/19/2018	102324
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	1/24/2018	Annual	1/24/2019	100040
Seekonk	NC-100	Torque Wrench	12/28/2017	Annual	12/28/2018	N/A
Sunol	DRH-118	Horn Antenna (1-18GHz)	8/11/2017	Biennial	8/11/2019	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 5-1. Test Equipment

#### Notes:

1. 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

### **GPRS Emission Designator**

#### Emission Designator = 250KGXW

GPRS BW = 250 kHz G = Phase Modulation X = Cases not otherwise covered W = Combination (Audio/Data)

### **EDGE Emission Designator**

#### Emission Designator = 250KG7W

EDGE BW = 250 kHz G = Phase Modulation 7 = Quantized/Digital Info W = Combination (Audio/Data)

### **CDMA Emission Designator**

#### Emission Designator = 1M25F9W

CDMA BW = 1.25 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data)

### WCDMA Emission Designator

#### Emission Designator = 4M16F9W

WCDMA BW = 4.16 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data)

#### **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.

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# 7.0 TEST RESULTS

### 7.1 Summary

Company Name:	LG Electronics USA, INC
FCC ID:	ZNFQ910QM
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>CDMA / GSM / GPRS / EDGE / WCDMA</u>

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	RSS-Gen (4.6.1) RSS-133(2.3) RSS-139(2.3)	Occupied Bandwidth	N/A		PASS	Section 7.2
2.1051 22.917(a) 24.238(a) 27.53(h)	RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Conducted Band Edge / Spurious Emissions	> 43 + log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of-band emissions		PASS	Sections 7.3, 7.4
24.232(d)	RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)	Peak-Average Ratio	< 13 dB	CONDUCTED	PASS	Section 7.5
2.1046	RSS-132(5.4) RSS-133(4.1) RSS-139(4.1)	Transmitter Conducted Output Power	N/A		PASS	RF Exposure Report
2.1055 22.355 24.235 27.54	RSS-132(5.3) RSS-133(6.3) RSS-139(6.4)	Frequency Stability	< 2.5 ppm (Part 22) Emission must remain in band (Part 24, 27)		PASS	Section 7.8
22.913(a)(5)	RSS-132(5.4)	Effective Radiated Power	< 7 Watts max. ERP		PASS	Section 7.6
24.232(c)	RSS-133(6.4)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS	Section 7.6
27.50(d)(4)	RSS-139(6.5)	Equivalent Isotropic Radiated Power	< 1 Watts max. EIRP	RADIATED	PASS	Section 7.6
2.1053 22.917(a) 24.238(a) 27.53(h)	RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Radiated Spurious Emissions	> 43 + log <sub>10</sub> (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 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.
- 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 3.11.

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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 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within
  - 1-5% of the 99% occupied bandwidth observed in Step 7

#### Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

### <u>Test Notes</u>

None.

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Plot 7-1. Occupied Bandwidth Plot (Cellular GPRS Mode)



Plot 7-2. Occupied Bandwidth Plot (EDGE850 Mode)

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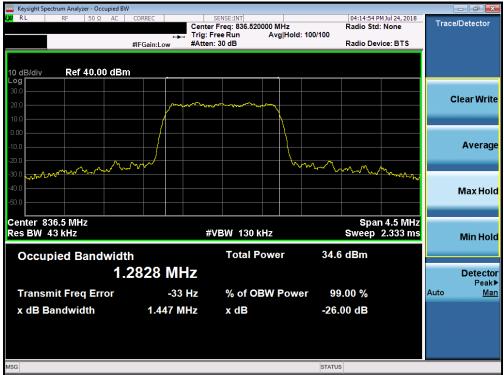
Plot 7-3. Occupied Bandwidth Plot (PCS GPRS Mode)



Plot 7-4. Occupied Bandwidth Plot (EDGE1900 Mode)

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Plot 7-5. Occupied Bandwidth Plot (Cellular CDMA Mode)



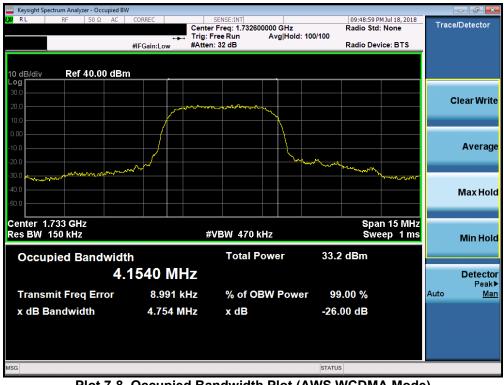
Plot 7-6. Occupied Bandwidth Plot (PCS CDMA Mode)

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Plot 7-7. Occupied Bandwidth Plot (Cellular WCDMA Mode)



Plot 7-8. Occupied Bandwidth Plot (AWS WCDMA Mode)

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Plot 7-9. Occupied Bandwidth Plot (PCS WCDMA Mode)

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### 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 10<sup>th</sup> 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 $43 + \log_{10}(P_{[Watts]})$ , 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 for Cell, 20GHz for AWS, 20GHz for PCS (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 7-2. Test Instrument & Measurement Setup

#### Test Notes

Per 24.238(b), 27.53(h)(3), and RSS-133(6.5), RSS-139(6.5), compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz, and 100 kHz or greater for Part 22 and RSS-132 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.

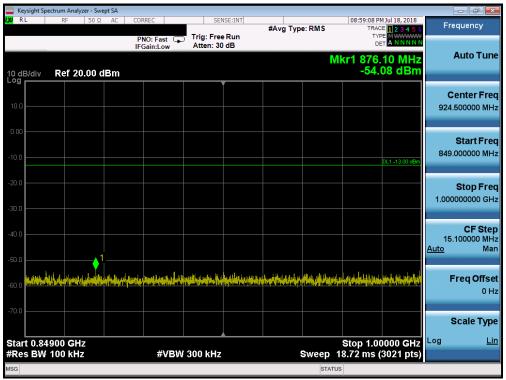
FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	ها 😗	Approved by: Quality Manager
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## Cellular GPRS Mode

	Spectrum Analy											
LXVI RL	RF	50 Ω	F	NO: Fast			#Avg Typ	e:RMS	TRAC TYP	MJUI 18, 2018 E 1 2 3 4 5 6 E M WWWWW A N N N N N	Frec	luency
10 dB/div Log	Ref 20	).00 dl		Sameow					Mkr1 823. -23.	00 MHz 88 dBm	A	uto Tune
10.0												nter Fred 00000 MH:
-10.0										DL1 -13.00 dBm		Start Fred 00000 MH:
-20.0										1,		<b>Stop Fred</b> 00000 мн:
-40.0											79.3 <u>Auto</u>	CF Stej 00000 MH Mar
and the	lingung birning postatio	n Malaka da	an a	la di Dolman anti provi Mandal Alimana Mandi	an a film an a state and a	Neg spotfor (priste Neg spotfor (priste)	and months and a feature of the	an angan Watanga	ogel <mark>a a hospische de la 1919</mark> ontropolitie de la televit	ang dina ta dhaala Mgaalaan waxaya	Fr	e <b>q Offse</b> 0 Ha
-70.0	.0 MHz								Stop 8	23.0 MHz	So Log	cale Type <u>Lir</u>
	V 100 kH	z		#VBW	/ 300 kHz		s	weep	98.33 ms (1	5861 pts)		
MSG								STA	TUS			

Plot 7-10. Conducted Spurious Plot (Cellular GPRS Mode - Low Channel)

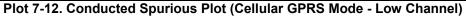


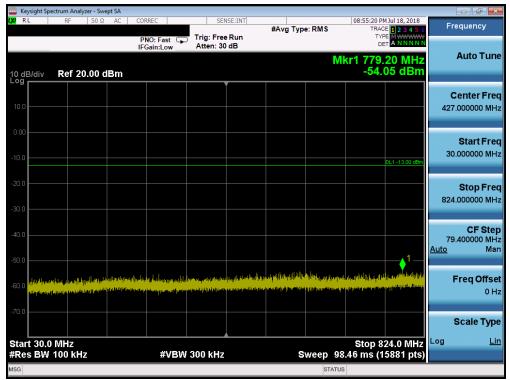
#### Plot 7-11. Conducted Spurious Plot (Cellular GPRS Mode - Low Channel)

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	ectrum Analyzer -	- Swept SA									
LXU RL	RF 5		PNO: Fast	Trig: Free		#Avg Typ	e: RMS	TRAC	M Jul 18, 2018 CE <mark>1 2 3 4 5 6</mark> DE M <del>WWWWW</del>	Freq	uency
10 dB/div	Ref 30.0	IF	Gain:Low	Atten: 40	dB		Μ	kr1 3.27	1 0 GHz 99 dBm	A	uto Tune
20.0											n <b>ter Freq</b> 00000 GHz
0.00											t <b>art Freq</b> 00000 GHz
-10.0									DL1 -13.00 dBm		t <b>op Freq</b> 00000 GHz
-30.0	and an and a second	1 Annal Andreas Anna Anna Anna Anna Anna Anna Anna An	ja, dipalippingan dipengan ng palipangan ang pangan dipengan	a sector a s	an a state and a state of the s	theory year without the second se	n paparan di kacamata Lanita da mga saa da di	nta pinta baharing ta	) sayat in shaqaa fi	900.00 <u>Auto</u>	CF Step 00000 MHz Man
-50.0										Fr	e <b>q Offsel</b> 0 Hz
-60.0										Sc Log	ale Type
Start 1.00 #Res BW			#VBW	/ 3.0 MHz		S	weep 1	Stop 10 5.60 ms (1	.000 GHz 8001 pts)	LUg	<u>Lin</u>
MSG							STATU	IS			





Plot 7-13. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)

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Keysight	Spectrum Analy	zer - Swep	t SA									×
L <mark>XI</mark> RL	RF	<u>50 Ω</u>		NO: Fast			#Avg Typ	e: RMS	TRAC	MJul 18, 2018 E <b>1 2 3 4 5</b> 6 E M	Frequency	y
				NO: Fast 🕞 Gain:Low	Atten: 30						Auto T	une
10 dB/div Log	Ref 20	).00 dl	Зm					N	lkr1 972. -52.	65 MHz 92 dBm		unc
					Ì						Center F	Freq
10.0											924.500000	MHz
0.00											Start F	Frea
-10.0										DL1 -13.00 dBm	849.000000	MHz
-20.0											Stop F	From
											1.000000000	
-30.0											CE C	Stop
-40.0											CF S 15.100000 Auto	
-50.0									∳ <sup>1</sup>			Man
-60.0	ad we have the set	, iliulaj eng				hadalahiy diniana	a shi ka shi		<u>Yan diphya</u> tak	na shi ka ka shi ka	Freq Of	f <b>fset</b> 0 Hz
-70.0												0112
											Scale T	Гуре
	84900 GH W 100 kH			#\/R\A	300 kHz			Sween	Stop 1.00 18.72 ms (	0000 GHz	Log	Lin
MSG	Ne TOO KHI				-500 KHZ			STATU		ooz i pisj		

Plot 7-14. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)



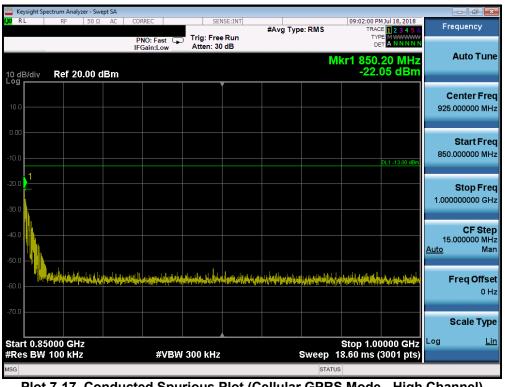
Plot 7-15. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)

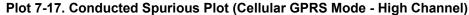
FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 22 of 112
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			yzer - Swej	pt SA											
l <b>XI</b> RL		RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	e: RMS	09:	TRACE	Jul 18, 2018		Frequency
					PNO: IFGain	Fast 🖵 :Low	Trig: Fre Atten: 30					TYPE DET	M WWWWW A N N N N N		
											Mkr1	783.	55 MHz		Auto Tune
10 dB Log r	/div	Ref 2	0.00 d	Bm								-53.3	32 dBm		
								Ĭ							Center Freq
10.0														4	27.000000 MHz
0.00															Start Freq
-10.0															30.000000 MHz
													0L1 -13.00 dBm		
-20.0															Stop Freq
														8	24.000000 MHz
-30.0															
-40.0															CF Step 79.400000 MHz
													4	Auto	
-50.0													—• ' —		
-60.0	analipher	and a spect	apple starse	traine (1990)						line na sele	ngaliti padapo	4unner	and a second provides and a second se		Freq Offset
100.0	والمراجع المراجع	an Antonia (1999)	ne distingtion in the	ALC: NO. 12		in in the second second	integration de la constante de La constante de la constante de			a an	dina sur di la	an manual s			0 Hz
-70.0															
															Scale Type
	30.0										Si	top 82	4.0 MHz	Log	Lin
	BW 1	100 kH	Z			#VBW	300 kHz		S			ms (15	5881 pts)		
MSG										ST	ATUS				

Plot 7-16. Conducted Spurious Plot (Cellular GPRS Mode - High Channel)





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	ectrum Analyzer -	Swept SA						
L <mark>X/</mark> RL	RF 5	0Ω AC	CORREC PNO: Fast	SENSE:I	#Avg Typ	e:RMS	09:02:18 PM Jul 18, 2018 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET A N N N N N	Frequency
10 dB/div Log	Ref 30.0	0 dBm	IFGain:Low	Atten: 40 dB		М	kr1 8.981 0 GHz -29.99 dBm	Auto Tune
20.0								Center Free 5.500000000 GH
0.00								<b>Start Free</b> 1.000000000 GH
-10.0							DL1 -13.00 dBm	Stop Free 10.000000000 GH
30.0	ence line Allert Control	entre segue d'al al sel a references entre la sel an	tille statistik (nedaletik) <sup>Nati</sup> le statistik (nedaletik)	n and the second states of	ng ang an	a hyfferhad a fallan fallan fallan Da chafallan a chafallan		CF Stej 900.000000 MH <u>Auto</u> Ma
50.0								Freq Offse 0 H
-60.0							Stop 10.000 GHz	Scale Type
	1.0 MHz		#VBW	3.0 MHz	s	weep 1	5.60 ms (18001 pts)	
MSG						STATU	IS	

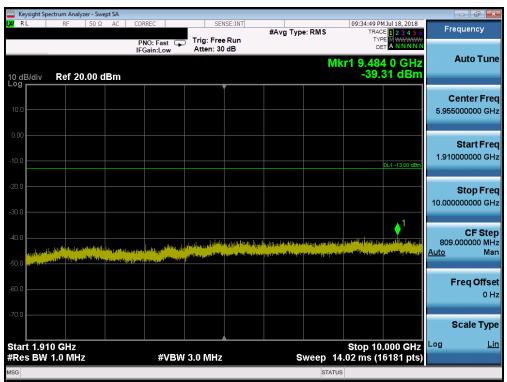
Plot 7-18. Conducted Spurious Plot (Cellular GPRS Mode - High Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	فا 😗	Approved by: Quality Manager
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	ctrum Analyzer - S									
KU RL	RF 50	F	NO: Fast	Trig: Free		#Avg Typ	e: RMS	TRAC TYP	4 Jul 18, 2018 E 1 2 3 4 5 6 PE M WWWW T A N N N N N	Frequency
10 dB/div	Ref 20.00		Gain:Low	Atten: 30	) dB		Mk	r1 1.844	4 0 GHz 04 dBm	Auto Tur
10.0										Center Fre 937.500000 M⊦
10.0									DL1 -13.00 dBm	Start Fre 30.000000 MH
30.0									1,	<b>Stop Fre</b> 1.845000000 GH
40.0		in en an half an scale and an an	n isi yalayiki siriasida	andreagen and a data da	ling distance inc	an di sin dina katik		laban jaut kin titu,	antinet in the state	CF Ste 181.500000 Mł <u>Auto</u> Ma
60.0										Freq Offs 01
70.0										Scale Typ
Start 0.03 Res BW			#VBN	/ 3.0 MHz			Sweep 2	Stop 1.8 .420 ms (	450 GHz 3631 pts)	Log <u>L</u>
ISG							STATUS			

Plot 7-19. Conducted Spurious Plot (PCS GPRS Mode - Low Channel)



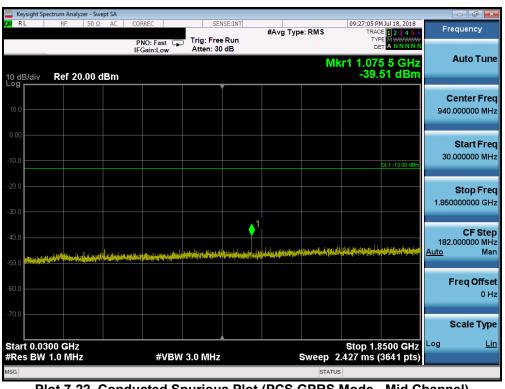
#### Plot 7-20. Conducted Spurious Plot (PCS GPRS Mode - Low Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	pectrum Analy	zer - Swept	SA									- ē 🖻
X/ RL	RF	50 Ω		ORREC PNO: Fas FGain:Lo		Trig: Free Atten: 20		#Avg Typ	e:RMS	TRA	PMJul 18, 2018 ACE 1 2 3 4 5 6 YPE M WWWWWW DET A N N N N N	Frequency
10 dB/div	Ref 10	).00 dE		FGain:Lo	w	Atten: 20	dB		M	kr1 16.9	54 5 GHz .38 dBm	Auto Tun
0.00												Center Fre 15.00000000 GF
20.0											DL1 -13.00 dBm	Start Fre 10.000000000 GF
40.0									1			<b>Stop Fre</b> 20.000000000 GF
	tin waxan katalogo an Mana katalogo an	en al an	an a	equineteri Fili	na ta di Ta di ta di	plate restained as to	landron vitelile Vitelan vitelile	a ta a la da a da a da a da a da a da a		ng par pang bang banan dapang Pang bang bang bang bang bang bang bang b	niki sepat kiran semp Al-Maple isteration	CF Ste 1.00000000 GH <u>Auto</u> Ma
'0.0 <b></b>												Freq Offs 01
80.0	000 GHz									Stop 2	0.000 GHz	Scale Typ
	/ 1.0 MH			#\	ИВW	3.0 MHz		ş	weep	25.33 ms (	20001 pts)	
SG									STA	TUS		

Plot 7-21. Conducted Spurious Plot (PCS GPRS Mode - Low Channel)



Plot 7-22. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager				
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			lyzer - Swe											
LXI RI		RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	e: RMS		PMJul 18, 2018 ACE 1 2 3 4 5 6	Fr	equency
					PNO: IFGain	Fast 🖵	Trig: Fre				1			
					IFGain	LOW	Attent o	0 db		N	Akr1 Q 1	44 5 GHz		Auto Tune
10 dE	3/div	Ref 2	0.00 d	Bm							-39	0.44 dBm		
Log								Ĭ						_
10.0														Center Freq
10.0													5.95	5000000 GHZ
0.00														
														Start Freq
-10.0												DL1 -13.00 dBm	1.91	0000000 GHz
-20.0														Stop Freq
													10.00	0000000 GHz
-30,0												. 1		
-40.0												<b>•</b>		CF Step
		ويعاو اللو	nan <sup>ka</sup> tanji,	and part of the	(Kiter - pa	ala se la baryada	a teleshy da	AND DURANT STREET					809 Auto	.000000 MHz Man
-50.0	ang to the sale	يوينان الأسير	and the second	atuş eti ti s	عمط الدرام	a sa ang ang ang ang ang ang ang ang ang an	and in the second second	and all a second		c selentere la				
														Freq Offset
-60.0														0 Hz
70														
-70.0														Scale Type
		0 GHz	-			-40 (1914)			_		Stop 1	0.000 GHz	Log	Lin
	SBW	1.0 MI	12			#VBW	3.0 MHz		S			(16181 pts)		
MSG										STA	105			

Plot 7-23. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)



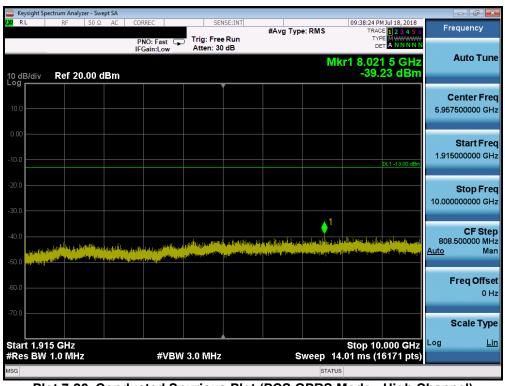
Plot 7-24. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕚 La	Approved by: Quality Manager
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	sight Spect			ot SA										
<b>lxi</b> ri		RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	e: RMS		MJul 18, 2018 CE 1 2 3 4 5 6	Fr	equency
					PNO:	Fast 🖵	Trig: Fre		• ,,		TΥ	PE MWWWWW		
					IFGain	Low	Atten: 5	0 00		84	ke4 4 60	5.0.04		Auto Tune
10 dE	2 Aiu	Ref 20	00 d	Bm						IVI	-42	5 0 GHz 37 dBm		
Log	Salv		u	DIII				Y						
													C	enter Freq
10.0													940	.000000 MHz
0.00														Start Freq
-10.0													30	.000000 MHz
-10.0												DL1 -13.00 dBm		
-20.0														
													4.050	Stop Freq
-30.0													1.850	0000000 GHz
-40.0												_ <mark>♦</mark> 1	192	CF Step .000000 MHz
		ار ريانا بلمه		سأنقح روريا	فر الله المرادم	la sandi taniha tan	A DATE OF LAND		المتقادية ومحاذ وسار	and the second	n in the second seco	<b>HALLAND</b>	Auto	Man
-50.0		Start Bull		dia dia dia	de al acia	a te metre et a	وحورا المرووي وال	den sen in på se helpe beter se help Notes se helpe beter s	A loop out and a					
													F	reg Offset
-60.0														0 Hz
-70.0														Scale Type
														ocure rype
	t 0.030										Stop 1.	8500 GHz	Log	<u>Lin</u>
#Res	s BW 1	.0 MH:	Z			#VBW	3.0 MHz			Sweep 2	2.427 ms	(3641 pts)		
MSG										STATU	JS			

Plot 7-25. Conducted Spurious Plot (PCS GPRS Mode - High Channel)



Plot 7-26. Conducted Spurious Plot (PCS GPRS Mode - High Channel)

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	pectrum Analyze	er - Swept SA								
LXU RL	RF	50 Ω AC	CORREC	Trig: Free		#Avg Typ	e: RMS	TRAC	M Jul 18, 2018 E 1 2 3 4 5 6 E M WWWW A N N N N N	Frequency
10 dB/div	Ref 10.	00 dBm	IFGain:Low	Atten: 20	dB		Mkr	1 16.95	3 5 GHz 14 dBm	Auto Tune
0.00										Center Free 15.000000000 GH
-10.0									DL1 -13.00 dBm	Start Free 10.000000000 GH
-30.0							1			Stop Free 20.000000000 GH
	gi produkter population Oranization population	NAMES AND ADDRESS OF A DESCRIPTION OF A DES	en for er på start for er fakten d - Maria er er er bler er ef den start for	na dina di kilangin Manaka indukti na f				llen geröfen geför Ten geröffen gefö	international and an	<b>CF Ste</b> 1.000000000 GH <u>Auto</u> Ma
70.0										<b>Freq Offse</b> 0 H
-80.0	000 GHz 1.0 MHz		#)/[]]]	/ 3.0 MHz				Stop 20	.000 0112	Scale Type
	1.0 MHZ		#VBV	5.0 MHZ		5	status		0001 pts)	

Plot 7-27. Conducted Spurious Plot (PCS GPRS Mode - High Channel)

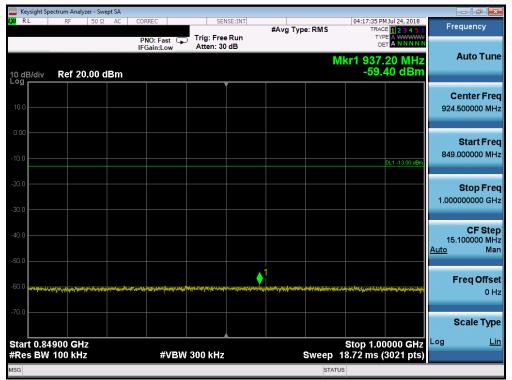
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### Cellular CDMA Mode

	ectrum Analyzer - Swep										r x
L <mark>XVI</mark> RL	RF 50 Ω	AC CORF	EC D:Fast 😱 ain:Low			#Avg Type	RMS	TRAC	1 Jul 24, 2018 E 1 2 3 4 5 6 E A WWWWW T A N N N N N	Frequ	ency
10 dB/div	Ref 20.00 dE						Mł	(r1 823. -32.9	00 MHz 99 dBm	Au	to Tune
10.0											e <b>r Freq</b> 000 MHz
-10.0									DL1 -13.00 dBm		a <b>rt Freq</b> 000 MHz
-20.0									1		o <b>p Freq</b> 000 MHz
-40.0										( 79.300 <u>Auto</u>	C <b>F Step</b> 000 MHz Man
-60.0 programmed	a a fa su an port à la suite a suite de la suite d La state de la suite de la s	a fan de statute en service de narrie de statute en service de service en s	n og sog fil ten sen sen skal for før Vet fil bedese skal sen	lana ana amin'ny fisiana	Madana se Sharan Di	sta esta ella della sola sola bala por d Alte petto barregione della stata e	a Shera will be buye da s Diga kapagisi sa kalan in	l ja mana kana sa kata kata kata kata kata kata kata		Free	<b>Offset</b> 0 Hz
-70.0										Sca	le Type
Start 30.0 #Res BW			#VBW	300 kHz		Sv	veep 98.	Stop 8: .33 ms (1	23.0 MHz 5861 pts)	Log	Lin
MSG							STATUS				

Plot 7-28. Conducted Spurious Plot (Cellular CDMA Mode - Low Channel)



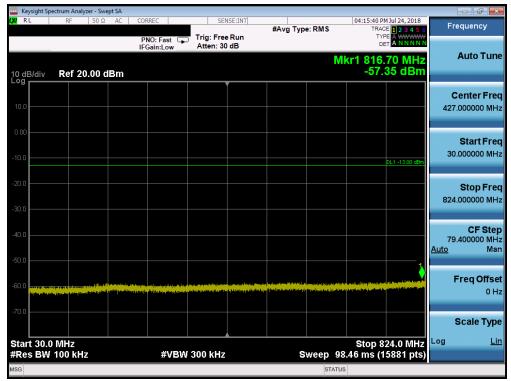
Plot 7-29. Conducted Spurious Plot (Cellular CDMA Mode - Low Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dago 20 of 110
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	pectrum Analyzer -	- Swept SA						
L <mark>X/</mark> RL	RF 5	0Ω AC	CORREC	SENSE:IN	T #Avg Typ	e: RMS	04:17:45 PM Jul 24, 2018 TRACE 1 2 3 4 5 6	Frequency
	_		PNO: Fast G	Trig: Free Run #Atten: 32 dB				
10 dB/div Log	Ref 10.0	0 dBm				MI	r1 9.423 5 GHz -41.25 dBm	Auto Tune
								Center Freq
0.00								5.500000000 GHz
-10.0							DL1 -13.00 dBm	Start Freq
-20.0								1.000000000 GHz
-30.0								
							<b>▲</b> 1	Stop Freq 10.00000000 GHz
-40.0						in a second third is specified in		
								CF Step 900.000000 MHz <u>Auto</u> Man
-60.0								Freq Offset
-70.0								0 Hz
-80.0								Scale Type
							Stop 10 000 Ollo	
Start 1.0 #Res BW	00 GHZ / 1.0 MHz		#VBV	V 3.0 MHz	s	weep 1	Stop 10.000 GHz 5.60 ms (18001 pts)	
MSG						STATU	S	

Plot 7-30. Conducted Spurious Plot (Cellular CDMA Mode - Low Channel)

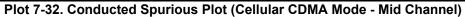


Plot 7-31. Conducted Spurious Plot (Cellular CDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	La	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 21 of 112
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	ectrum Analyz		it SA										×
LXU RL	RF	<b>50</b> Ω	AC	CORREC	ast 😱	Trig: Free		#Avg Typ	e: RMS	TRA	PMJul 24, 2018 CE 1 2 3 4 5 6 (PE A WWWWW DET A NNNNN	Frequency	У
10 dB/div Log	Ref 20	.00 di	Зm	IFGain:L		Atten: 30	dB		N	/kr1 853	.10 MHz .15 dBm	Auto T	ſune
10.0												Center   924.500000	
-10.0											DL1 -13.00 dBm	<b>Start F</b> 849.000000	
-20.0												Stop I 1.000000000	
-40.0												CF \$ 15.100000 <u>Auto</u>	
-60.0	Warehourser	unter da factoria	Ċ, I <sup>n</sup> territation	wara (gili latagin	en de marin	anna ann an a	a talan in da san anga sa	And D. No. of Street Sectors	l ang sa	Negelind gegene internet work	*****	Freq Of	f <b>fset</b> 0 Hz
Start 0.84	900 CH					,				Stop 1-0	00000 GHz	Scale 1	Гуре <sub>Lin</sub>
#Res BW				\$	¢VB₩	300 kHz				18.72 ms	(3021 pts)		
MSG									STAT	US			





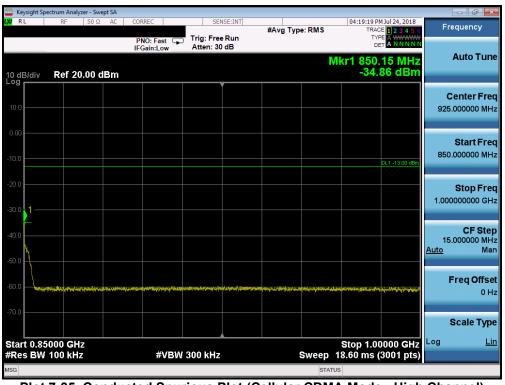
Plot 7-33. Conducted Spurious Plot (Cellular CDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕚 La	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 112
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🔤 Keysigh	nt Spectrum Analy	zer - Swep	t SA								-0	
L <mark>XI</mark> RL	RF	50 Ω	AC C	ORREC		NSE:INT	#Avg Typ	e: RMS	TRAC	M Jul 24, 2018 E <b>1 2 3 4 5</b> 6	Frequ	ency
				PNO: Fast 🕞 IFGain:Low	Trig: Free Atten: 30				TYF DE			
								Μ	kr1 808.	25 MHz	Au	to Tune
10 dB/di Log	v Ref 20	).00 dE	3m						-57.	49 dBm		_
						Í					Cen	ter Freg
10.0												0000 MHz
0.00											St	art Freq
-10.0										DL1 -13.00 dBm	30.000	0000 MHz
-20.0												op Freq
-30.0											824.000	0000 MHz
-40.0												CF Step
-50.0											<u>Auto</u>	Man
-50.0										4		
	المتلد وتواريس ومتعاديته	- to optional	and the firm and a				la algoritació por esperado Algoritación de la constante d	the shear of the second	المحركة المحمول المحركة المركز المحركة. المحركة المحمول المركز المركز المحركة ا		Fre	q Offset 0 Hz
	التثنائة نصيعتهم	and and and and a										0 H2
-70.0											Sca	ale Type
	0.0 MHz W 100 kH:	7		#\/R\/	/ 300 kHz		9	ween 0		24.0 MHz 5881 pts)	Log	Lin
MSG	100 KH			#VDV	7 300 KH2		3	statu		Joor pisj		

Plot 7-34. Conducted Spurious Plot (Cellular CDMA Mode - High Channel)



Plot 7-35. Conducted Spurious Plot (Cellular CDMA Mode - High Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analy:	zer - Swep	it SA									
XI RL	RF	50 Ω	AC	CORREC	ast 😱	Trig: Fre		#Avg Typ	e: RMS	TRAC	M Jul 24, 2018 DE <b>1 2 3 4 5</b> 6 PE A WWWWW ET A N N N N N	Frequency
10 dB/div	Ref 20	.00 di	Bm	IFGain:	_ow	#Atten: \$	32 dB		MI	kr1 8.68	2 0 GHz 99 dBm	Auto Tun
10.0												<b>Center Fre</b> 5.500000000 GH
10.0											DL1 -13.00 dBm	<b>Start Fre</b> 1.000000000 GH
30.0												Stop Fre 10.000000000 GH
40.0				~		~~~				1		CF Ste 900.000000 MH <u>Auto</u> Ma
60.0												Freq Offse 0 ⊢
-70.0	IN GHZ									Stop 10	.000 GHz	Scale Typ
#Res BW		z		-	#VBW	3.0 MHz		S	weep 1	5.60 ms (1	8001 pts)	
ISG									STATU	S		

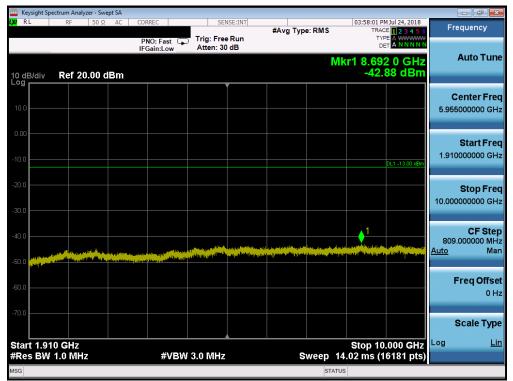
Plot 7-36. Conducted Spurious Plot (Cellular CDMA Mode - High Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	ويا 😗	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 24 of 112
1M1806290137-02.ZNF	6/29 - 7/31/2018	Portable Handset		Page 34 of 112
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Keysight Spectrum Analyz										
RL RF		PNO: Fast			#Avg Type	e: RMS	TRA	M Jul 24, 2018 DE <b>1 2 3 4 5 6</b> PE A WWWWW ET A N N N N N	Freque	ency
0 dB/div Ref 20.	.00 dBm	FGain:Low	Atten: 50	10		Mk	r1 1.84 -45.	5 0 GHz 49 dBm	Aut	o Tur
10.0									Cent 937.500	er Fre 000 M⊦
10.0								DL1 -13.00 dBm	Sta 30.000	art Fre
20.0									<b>Sto</b> 1.845000	o <b>p Fre</b> 000 Gi
0.0	. us a contraction		yeldar <sup>fer</sup> angeneza, secontin 1997a	all suggest these	and a state of the	g galant i yang mala kalang pangka dalamba	والجادود الجال سدود الجام	1	( 181.500 <u>Auto</u>	CF Ste 000 MI Mi
0.0									Free	<b>Offs</b> 0
70.0										le Typ
Start 0.0300 GHz Res BW 1.0 MHz		#VBW	3.0 MHz			Sweep 2	Stop 1. .420 ms	8450 GHz (3631 pts)	Log	L
SG						STATUS				

Plot 7-37. Conducted Spurious Plot (PCS CDMA Mode - Low Channel)



#### Plot 7-38. Conducted Spurious Plot (PCS CDMA Mode - Low Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	فا 🕕	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 25 of 112
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	ectrum Analyzer	- Swept SA					
LXU RL	RF	50 Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	03:58:08 PM Jul 24, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWW	Frequency
			PNO: Fast G	Trig: Free Run Atten: 20 dB		DET A NNNN	Auto Tune
10 dB/div Log	Ref 10.0	0 dBm			M	kr1 17.001 5 GHz -46.51 dBm	
				Ĭ			Center Free
0.00							15.00000000 GH:
-10.0						DL1 -13.00 dBm	Start Free
-20.0							10.00000000 GH
-30.0							
-50.0							Stop Free 20.000000000 GH
-40.0					1		
-50.0	مسادر .						CF Step 1.000000000 GH
-60.0	An alternative and a second	ali ne de la constantia de la	Malainele, und State Diff. Ball				<u>Auto</u> Mai
-70.0							Freq Offse
10.0							0 H
-80.0							Scale Type
Start 10.0						Stop 20.000 GHz	Log <u>Lir</u>
#Res BW	1.0 MHz		#VB\	N 3.0 MHz		25.33 ms (20001 pts)	
MSG					STA	TUS	

Plot 7-39. Conducted Spurious Plot (PCS CDMA Mode - Low Channel)



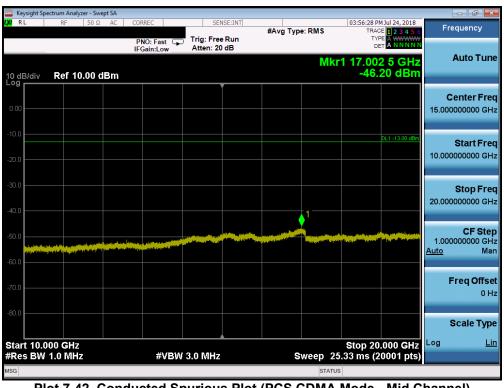
Plot 7-40. Conducted Spurious Plot (PCS CDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕚 La	Approved by: Quality Manager
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	ectrum Analyz												
XI RL	RF	<b>50</b> Ω	AC	CORREC	ast 🕞	SE	e Run	#Avg Typ	e: RMS	TF	PMJul 24, 2018 ACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN	Fre	quency
10 dB/div	Ref 20	.00 dl	Зm	IFGain:L		Atten: 3	0 dB		Μ	kr1 8.6	62 5 GHz 3.36 dBm		Auto Tune
10.0													<b>enter Freq</b> 000000 GHz
-10.0											DL1 -13.00 dBm		<b>Start Freq</b> 000000 GHz
-20.0													<b>Stop Freq</b> 000000 GHz
-40.0		And any										809.0 <u>Auto</u>	CF Step 000000 MHz Man
-60.0												F	<b>req Offsel</b> 0 Hz
Start 1.91	0 GHz									Stop 1	0.000 GHz	S Log	cale Type <u>Lin</u>
#Res BW				#	VBW	3.0 MHz		S		4.02 ms	(16181 pts)		
ISG									STAT	US			

Plot 7-41. Conducted Spurious Plot (PCS CDMA Mode - Mid Channel)



Plot 7-42. Conducted Spurious Plot (PCS CDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕚 La	Approved by: Quality Manager
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	ectrum Analyzer - S										×
L <mark>XI</mark> RL	RF 50	Ω AC	CORREC			#Avg Type	e: RMS	TRAC	M Jul 24, 2018 E 1 2 3 4 5 6 E A WWWW A N N N N N	Frequency	у
10 dB/div Log	Ref 20.00	dBm	IFGain:Low	Atten: 30			M	kr1 1.81		Auto T	Гune
10.0										<b>Center</b> 940.000000	
-10.0									DL1 -13.00 dBm	Start   30.000000	
-20.0										<b>Stop I</b> 1.850000000	
-40.0	an and the second se		periode states		Anna an			anter		CF \$ 182.000000 <u>Auto</u>	Step ) MHz Man
-60.0										Freq O	o <b>ffset</b> 0 Hz
Start 0.03								Stop 1.8	5000 GHZ	Scale 1	Type Lin
#Res BW	1.0 MHz		#VBW	/ 3.0 MHz			Sweep	2.427 ms (	3641 pts)		

Plot 7-43. Conducted Spurious Plot (PCS CDMA Mode - High Channel)



Plot 7-44. Conducted Spurious Plot (PCS CDMA Mode - High Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyz											×
L <mark>XI</mark> RL	RF	50 Ω A	C COI	RREC	SE	NSE:INT	#Avg Typ	e: RMS		MJul 24, 2018 CE 1 2 3 4 5 6	Frequency	y
			P	NO:Fast ⊂ Gain:Low	Trig: Fre Atten: 20	e Run ) dB	• ,,		TΥ			
10 dB/div Log	Ref 10	.00 dBr	m					Mk	r1 16.88 -46	4 5 GHz 33 dBm	Auto T	une
0.00											Center F 15.000000000	
-10.0										DL1 -13.00 dBm	Start F 10.000000000	
-30.0								1			Stop F 20.000000000	
-50.0	المراجع ويروم المراجع المراجع مراجع المراجع ال	The Part of the Pa	an fan fan skielen						n de Theory and a statistical part of the statistical part	a Barray continent of the design of the d	CF S 1.000000000 <u>Auto</u>	
-70.0											Freq Of	f <b>fset</b> 0 Hz
-80.0											Scale T	
Start 10.0 #Res BW				#VB	W 3.0 MHz		s	weep <u>2</u> :	Stop 20 5.33 ms (2	).000 GHz 20001 pts)	Log	Lin
MSG								STATU				

Plot 7-45. Conducted Spurious Plot (PCS CDMA Mode - High Channel)

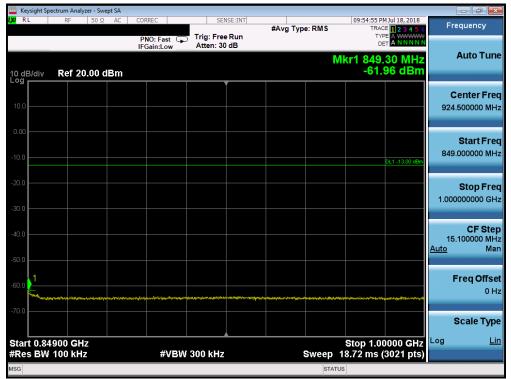
FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	لما 🕕	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 112
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# Cellular WCDMA Mode

	ctrum Analyzer - Swept S					
LXU RL	RF 50 Ω /	AC CORREC PNO: Fast PIC IFGain:Low	SENSE:INT Trig: Free Run Atten: 30 dB	#Avg Type: RMS	09:54:46 PM Jul 18, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
10 dB/div	Ref 20.00 dB			Μ	kr1 822.95 MHz -30.94 dBm	Auto Tune
10.0						Center Fred 426.500000 MH:
-10.0					DL1 -13.00 dBm	Start Free 30.000000 MH
-20.0					1,	Stop Fre 823.000000 MH
-40.0						<b>CF Ste</b> 79.300000 MH <u>Auto</u> Ma
-60.0		ne filosofie and a second s Ne second seco	ne der se lite set den an jacom son den set bereiten bei einer son der set bei einer bei einer son der set bei einer bei e	stime bandlang stime analy stategisticities the particular program is the particular program.		Freq Offse 0 H
-70.0						Scale Typ
Start 30.0 #Res BW		#VBW	300 kHz	Sweep 9	Stop 823.0 MHz 8.33 ms (15861 pts)	Log <u>Lir</u>
MSG				STATU	S	

Plot 7-46. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)

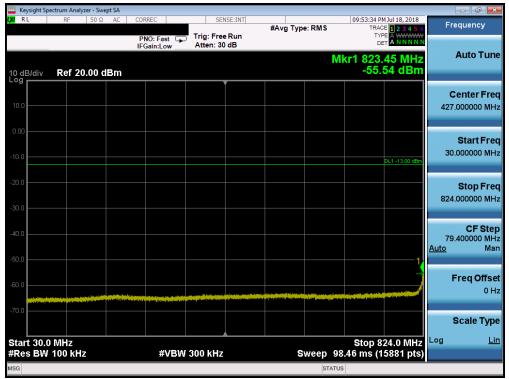


Plot 7-47. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	فلا 🌐	Approved by: Quality Manager
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	ectrum Analyz	er - Swept SA										
LXVI RL	RF	50 Ω AC	COR	REC		NSE:INT	#Avg Type:	RMS	TRAC	MJul 18, 2018 E <b>1 2 3 4 5 6</b>	Frequ	uency
			PN IFG	0: Fast 🕞 ain:Low	Trig: Fre Atten: 30				TYF			
	Dof 20	00 dBm						Mk	r1 1.65	45 GHz 70 dBm	Αι	ito Tune
10 dB/div	Ref 20	.00 dBm	1			<b>Y</b>			-40.			
												nter Freq
10.0											5.50000	0000 GHz
0.00												
												tart Freq
-10.0										DL1 -13.00 dBm	1.00000	0000 GHz
-20.0												_
-20.0												top Freq 0000 GHz
-30.0											10.00000	0000 0112
												CF Step
-40.0	↓ <sup>1</sup>										900.00	0000 MHz Mar
-50.0			A Maintain	heles and an	-						<u>Auto</u>	Iviali
											Fre	eq Offset
-60.0												0 Hz
-70.0												
											Sc	ale Type
Start 1.00	0 GHz								Stop 10	.000 GHz	Log	Lin
#Res BW				#VBW	/ 3.0 MHz		Sw	eep 15	.60 ms (1	8001 pts)		
MSG								STATUS				



Plot 7-49. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	ها 🕕	Approved by: Quality Manager
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	ectrum Analyz		t SA										
LXU RL	RF	50 Ω	AC	CORREC	st (	Trig: Free		#Avg Typ	e: RMS	TRAC	M Jul 18, 2018 CE 1 2 3 4 5 6 PE A WWWWW T A N N N N N	Freq	uency
10 dB/div Log	Ref 20	.00 dE	3m	IFGain:L		Atten: 30	dB		N	lkr1 849		A	uto Tune
10.0													<b>nter Freq</b> 00000 MHz
-10.0											DL1 -13.00 dBm		<b>Start Freq</b> 200000 MHz
-20.0													<b>Stop Freq</b> D0000 GHz
-40.0												15.10 <u>Auto</u>	CF Step 00000 MHz Man
-60.0		1.com.magai-144	an the second	elpenge .ut ==etc.ed.e.k.d	ybite Machaidhea	attent fattentant	ft i staat fan de fan en jard yn st	۲۰۰۶۵ <sup>1</sup> ۹۰۰۰۹۰۰۹۰۰۹۰۵	anaturphe descripted	1yn 20n- yw marwy o fysion filad	halfan fan Tardegaan fan hjillijk kastanan	Fr	e <b>q Offset</b> 0 Hz
													ale Type
Start 0.84 #Res BW				#	VBW	300 kHz				18.72 ms (	0000 0112	Log	Lin
MSG									STATI	JS			

Plot 7-50. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

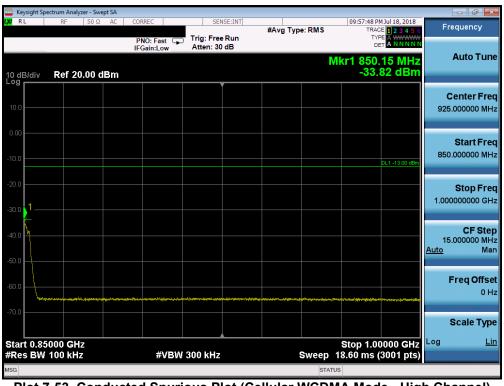


Plot 7-51. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕑 La	Approved by: Quality Manager
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	ectrum Analyzer -							
XI RL	RF 50	Ω AC	CORREC PNO: Fast	Trig: Free R	#Avg Typ un	e: RMS	09:57:39 PM Jul 18, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N	Frequency
10 dB/div	Ref 20.0	) dBm	IFGain:Low	Atten: 30 di	,	MI	kr1 824.00 MHz -60.58 dBm	Auto Tune
10.0								Center Fred 427.000000 MHz
-10.0							DL1 -13.00 dBm	Start Free 30.000000 MH;
-20.0								Stop Fred 824.000000 MH:
40.0								CF Step 79.400000 MH <u>Auto</u> Mar
60.0				a de presidente de tradeción de la decimitada de la decimitada de la decimitada de la decimitada de la decimita		ti da ta ing pangang ting ta pangang tang ta pangang tang tang tang tang tang tang tan	1	Freq Offse 0 H
-70.0								Scale Type
Start 30.0 #Res BW			#VBV	v 300 kHz	s	weep 98	Stop 824.0 MHz .46 ms (15881 pts)	Log <u>Lin</u>
MSG						STATUS		



Plot 7-53. Conducted Spurious Plot (Cellular WCDMA Mode - High Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	لما 🕕	Approved by: Quality Manager
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	ectrum Analy	zer - Swej	ot SA										- • •
LXU RL	RF	<u>50</u> Ω	AC	CORREC	ast 😱	Trig: Fre		#Avg Typ	e: RMS	TRA	PM Jul 18, 2018 CE 1 2 3 4 5 6 (PE A WWWWW DET A NNNNN	Fre	quency
10 dB/div	Ref 20	).00 d	Bm	IFGain:L	.ow	Atten: 30	) dB		M	(r1 1.69	1 5 GHz .00 dBm		Auto Tune
10.0													<b>enter Freq</b> 000000 GHz
-10.00											DL1 -13.00 dBm		<b>Start Freq</b> 000000 GHz
-20.0													<b>Stop Freq</b> 000000 GHz
-40.0	•1											900. <u>Auto</u>	CF Step 000000 MHz Man
-60.0						A MARINE AND A MARIN						F	r <b>eq Offset</b> 0 Hz
-70.0 Start 1.00										Stop 1	0.000 GHz	S	Cale Type
#Res BW		z		\$	¢νΒ₩	3.0 MHz		S	weep 15	5.60 ms (	18001 pts)		
MSG									STATUS	S			

Plot 7-54. Conducted Spurious Plot (Cellular WCDMA Mode - High Channel)

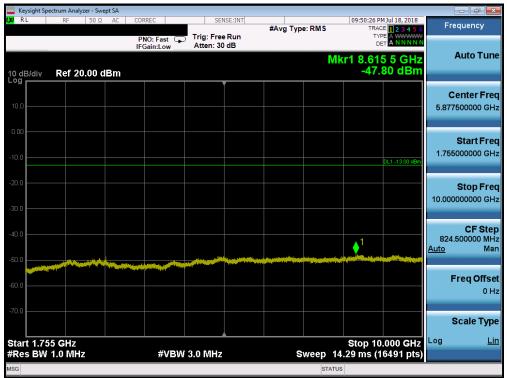
FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	فا 😗	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 44 af 440
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# AWS WCDMA Mode

Keysight Spectrum A						
XV RL RF	50 Ω AC	PNO: Fast	Trig: Free Run Atten: 30 dB	#Avg Type: RM	09:50:17 PM Jul 18, 2018 S TRACE 1 2 3 4 5 TYPE A WWWW DET A N N N	6 Frequency
10 dB/div Ref	20.00 dBm	II Guilleow			Mkr1 1.705 0 GH -30.45 dBr	z Auto Tun n
10.0						Center Fre 867.500000 MH
10.0					DL1 -13.00 dB	Start Fre 30.000000 MH
30.0						Stop Fre 1.705000000 GH
40.0						CF Ste 167.500000 MH <u>Auto</u> Ma
60.0	hanangnun ang panunang na mang kanang ka	ha far fan de werden gener	ىيىدايە (يالارلىۋەلەرلىۋەلەرلىۋە يەلىلىيە) بەرىلىرىكى	2801.000 y costantyperotest of the 100 mm	un namen an	Freq Offse 0 H
-70.0						Scale Typ
Start 0.0300 G #Res BW 1.0 N		#VBW	3.0 MHz	Swee	Stop 1.7050 GH 2.233 ms (3351 pt	5)
ISG					STATUS	

Plot 7-55. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)



# Plot 7-56. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	فا 🌐	Approved by: Quality Manager
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	ectrum Analyze	- Swept SA								
L <mark>XI</mark> RL	RF	50Ω AC	CORREC			#Avg Typ	e: RMS	TRAC	MJul 18, 2018 E 1 2 3 4 5 6	Frequency
			PNO: Fast IFGain:Low	Atten: 20						Auto Tune
10 dB/div Log	Ref 10.0	00 dBm					Mki	1 17.01 -51.	6 0 GHz 06 dBm	Auto Tune
				Ì	Ĭ					Center Freq
0.00										15.00000000 GHz
-10.0									DL1 -13.00 dBm	Start Fred
-20.0										10.00000000 GHz
-30.0										
-30.0										Stop Freq 20.00000000 GHz
-40.0							4			
-50.0							<u>}</u>			CF Step 1.00000000 GHz
-60.0										<u>Auto</u> Man
										Freq Offset
-70.0										0 Hz
-80.0										Scale Type
Start 10.0				<u> </u>				Stop 20	.000 GHz	Log Lin
#Res BW			#VBW	/ 3.0 MHz		s	weep 2	5.33 ms (2	.000 GH2 0001 pts)	
MSG							STATU	5		

Plot 7-57. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)



Plot 7-58. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	لما 🕕	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 40 of 140	
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	ectrum Analy		it SA									(	
LXI RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	e: RMS	TRA	PMJul 18, 2018 CE 1 2 3 4 5 6	Fre	quency
				PNO: Fa	ast 🖵	Trig: Fre Atten: 30				T I			
				il Guille					М	kr1 8.66	3 5 GHz		Auto Tune
10 dB/div Log	Ref 20	.00 dE	Вm							-47	.76 dBm		
												С	enter Freq
10.0													500000 GHz
0.00													Start Freq
-10.0													000000 GHz
											DL1 -13.00 dBm		
-20.0													Stop Freq
-30.0												10.000	000000 GHz
-30.0													
-40.0												824	CF Step 500000 MHz
										<b>♦</b> '		Auto	Man
-50.0	and the				and the second								
-60.0												F	req Offset
													0 Hz
-70.0													
													Scale Type
Start 1.75										Stop 1	0.000 0112	Log	Lin
#Res BW	1.0 MH	Z		7	¢γΒ₩	3.0 MHz		S			16491 pts)		
MSG									STATU	15			

Plot 7-59. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)



Plot 7-60. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	ها 🌐	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 47 of 110	
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	ectrum Analyzer - S									c	
LXI RL	RF 50	Ω AC	CORREC			#Avg Type	e: RMS	TRAC	M Jul 18, 2018 E 1 2 3 4 5 6 PE A WWWW T A N N N N N	Freq	uency
10 dB/div Log	Ref 20.00	dBm	IFGain:Low	Atten: 30	dB		M	kr1 1.55 <sup>.</sup>		A	uto Tune
10.0											<b>nter Freq</b> 00000 MHz
-10.0									DL1 -13.00 dBm		<b>Start Freq</b> 200000 MHz
-20.0											<b>Stop Freq</b> 00000 GHz
-40.0									1	168.00 <u>Auto</u>	CF Step 00000 MHz Man
-60.0				graaf beergertanderstander	an a	<u>ant en antenis de constant de la cons</u>	a y na Balanda ( ) ( ( n the same the form)			Fr	e <b>q Offsel</b> 0 Hz
Start 0.03 #Res BW			#\/B\A	/ 3.0 MHz			Sween	Stop 1.7 2.240 ms (	/100 GHz 3361 pts)	So Log	ale Type: <u>Lin</u>
MSG	179 WIL12			-SAV WITZ			STATU		550 i prs)		

Plot 7-61. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)



Plot 7-62. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)

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	ectrum Analyz	er - Swep	t SA									
XI RL	RF	50 Ω	AC	CORREC	ast 🖵	Trig: Fr Atten:		#Avg Typ	e:RMS		RACE 1 2 3 4 5 6 TYPE A WWWWW DET A NNNNN	Frequency
10 dB/div	Ref 10	.00 dE	3m	IFGain:L	.ow	Atten: a	20 88		MI	kr1 16.9 -5	940 0 GHz 0.95 dBm	Auto Tune
0.00												Center Fred 15.000000000 GH:
-10.0											DL1 -13.00 dBm	Start Free 10.000000000 GH
-30.0												Stop Free 20.000000000 GH
50.0												CF Step 1.000000000 GH <u>Auto</u> Ma
70.0												Freq Offse 0 H
-80.0	000 GH <u>z</u>									Stop	20.000 GHz	Scale Type
#Res BW				\$	¢VB₩	3.0 MH	Z		stat	25.33 ms	(20001 pts)	

Plot 7-63. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	اللا	Approved by: Quality Manager
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	ectrum Analyzer - Swe									
0 RL	RF 50 Ω	AC COR	REC			#Avg Typ	e: RMS	09:47:17 PM Jul 18, 2 TRACE 1 2 3 TYPE A WW DET A NN	<del>156</del>	Frequency
0 dB/div	Ref 20.00 d						MI	(r1 1.845 0 G -34.93 dl	Hz Bm	Auto Tun
10.0									93	Center Fre 37.500000 M⊦
10.0								DL1 -13.0		Start Fre 30.000000 M⊦
30.0									- <b>1</b> /	Stop Fre 45000000 G⊦
40.0									→ 18 <u>Auto</u>	CF Ste 31.500000 MF Ma
60.0	and the second	an a		an Alla falle antique y d'un falle e	4-13-03-24-2-0-1944			ng a la anna agtreoitean fann fran Anna Anna Anna Anna Anna Anna Anna A		Freq Offs 0 H
70.0										Scale Typ
Start 0.03 ≇Res BW			#VBW	3.0 MHz			Sweep 2	Stop 1.8450 C   420 ms (3631	iHz <sup>Log</sup> ots)	L
ISG							STATU	S		

Plot 7-64. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)



Plot 7-65. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕚 La	Approved by: Quality Manager
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	m Analyzer - Swep	ot SA								
X/RL	RF 50 Ω	AC COF	RREC		NSE:INT	#Avg Typ	e: RMS	TRAC	MJul 18, 2018 DE <mark>1 2 3 4 5 6</mark>	Frequency
		PI IF(	NO: Fast 🔾 Gain:Low	Atten: 20						
10 dB/div R	ef 10.00 di	Bm					Mkr	1 16.91: -50.	2 5 GHz 91 dBm	Auto Tun
0.00										Center Fre 15.000000000 GH
-10.0									DL1 -13.00 dBm	Start Fre 10.000000000 GH
-30.0										Stop Fre
40.0							1			20.00000000 GH
60.0				a a the second se						1.000000000 GH <u>Auto</u> Ma
70.0										Freq Offs 0 F
80.0										Scale Typ
Start 10.000 #Res BW 1.0			#VBW	3.0 MHz		s	weep 25	Stop 20 .33 ms (2	.000 GHz 20001 pts)	Log <u>L</u>
ISG							STATUS	;		

Plot 7-66. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)



Plot 7-67. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ght Spectru			ot SA									_	
L <mark>XI</mark> RL		RF	50 Ω	AC	CORREC		S	ENSE:INT	#Avg Typ	e: RMS	TRA	PM Jul 18, 2018 CE 1 2 3 4 5 6	Fre	quency
					PNO: IFGain	Fast 🖵	Trig: Fr Atten:		• ,,		T			
					IFGain	LOW	Atten			M				Auto Tune
10 dB/	div R	lef 20.0	00 dl	Bm							-47	7 5 GHz .75 dBm		
Log								Ĭ						
10.0														<b>enter Freq</b> 000000 GHz
10.0													5.955	000000 GHZ
0.00														
														Start Freq
-10.0												DL1 -13.00 dBm	1.910	000000 GHz
-20.0														Stop Freq
-30.0													10.000	000000 GHz
-30.0														
-40.0														CF Step
													Auto	000000 MHz Man
-50.0	and the second secon			in a second second						the state of the				
	and different second	in the second		and the second	to period by felores								F	req Offset
-60.0														0 Hz
-70.0														
-70:0													S	Scale Type
	1.910 ( BW 1.0					#VRW	3.0 MH	-		ween 1	Stop 1	0.000 GHz 16181 pts)	Log	Lin
MSG	DW 1.0					#9099	3.0 Win	-	3	STATL		ional pis)		
										STAT				

Plot 7-68. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)



Plot 7-69. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕒 La	Approved by: Quality Manager
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	ectrum Analyze											
LXI RL	RF	50 Ω A0				ISE:INT	#Avg Typ	e: RMS	TRAC	MJul 18, 2018	Frequer	ісу
10 dB/div	Ref 20.	00 dBn	IFO	Ю:Fast ⊂ Sain:Low	Atten: 30			M	kr1 1.84	1 5 GHz 07 dBm	Auto	Tune
10.0											<b>Cente</b> 940.0000	
-10.0										DL1 -13.00 dBm	Star 30.0000	<b>t Freq</b> 00 MHz
-20.0											<b>Sto</b> 1.8500000	p <b>Freq</b> 00 GHz
-40.0										1	CI 182.0000 <u>Auto</u>	<b>= Step</b> 00 MHz Man
-60.0		ing the lay dama of particular	ang ding ding ter generation of the second		an a farma a su a	1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	ngana Barri Makalangkan Balayan Anana An		generalise das de 1999 (1999) (1999) (1999)	-18.994, 9.944 (19.97) <del>-</del> 19.447	Freq	Offset 0 Hz
-70.0												е Туре
Start 0.03 #Res BW				#VBW	/ 3.0 MHz			Sweep 2	Stop 1.8 2.427 ms (	3500 GHz 3641 pts)	Log	Lin
MSG								STATU	s			

Plot 7-70. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)



Plot 7-71. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕚 La	Approved by: Quality Manager
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	ectrum Analyze	er - Swept S	А													- 6 ×
XI RL	RF	50 Ω A		ORREC	st 🖵	Trig:			#Avg	Type: RM	IS		TRACE	II 18, 2018 <b>2 3 4 5 6</b> <b>A WWWWW</b> <b>A NNNNN</b>	Fr	equency
10 dB/div	Ref 10.	.00 dBr		FGain:Lo	ow	Απει	n: 20	dВ			Mkr	1 16.9 -5		5 GHz 7 dBm		Auto Tune
0.00																Center Fred
20.0													DL	1 -13.00 dBm	10.00	Start Free
40.0															20.00	<b>Stop Fre</b> 0000000 GH
50.0										1 •••••					1.00 <u>Auto</u>	CF Stej 0000000 GH Ma
70.0																F <b>req Offs</b> e 0 H
-80.0 Start 10.0												Stop	20.0	00 GHz	Log	Scale Type Lir
#Res BW	1.0 MHz			#	VBW	3.0 N	lHz			Swee	р 25 STATUS		s (200	001 pts)		

Plot 7-72. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)

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# 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 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 $43 + \log_{10}(P_{[Watts]})$ , 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 > 1% of the emission bandwidth
- 4. VBW  $\geq$  3 x 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.



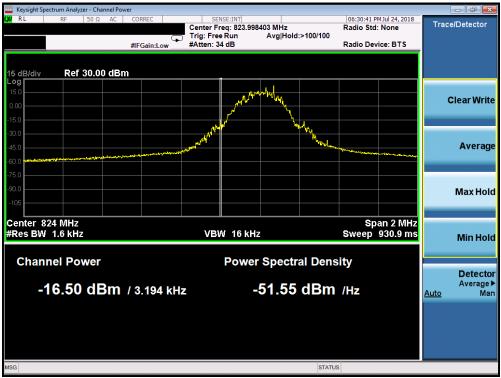
Figure 7-3. Test Instrument & Measurement Setup

#### Test Notes

Per 22.917(b), 24.238(b), 27.53(h)(3), and RSS-132(5.5), RSS-133(6.5), RSS-139(6.5), 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 to demonstrate compliance with the out-of-band emissions limit. 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.

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Plot 7-73. Band Edge Plot (PCS GSM Mode - Low Channel)



## Plot 7-74. Band Edge Plot (PCS GSM Mode - High Channel)

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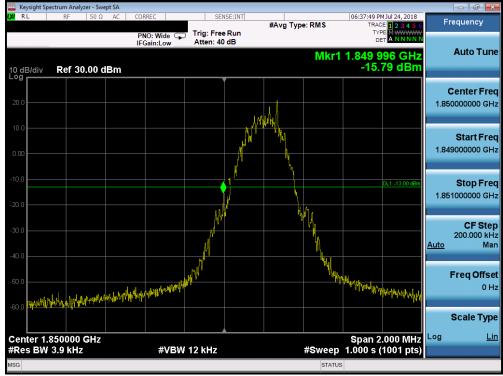
#### Note:

Both GSM and GPRS mode were investigated, and GSM mode was found to be the worst case for band edge emission. So, GSM mode is included in the report instead of GPRS mode.

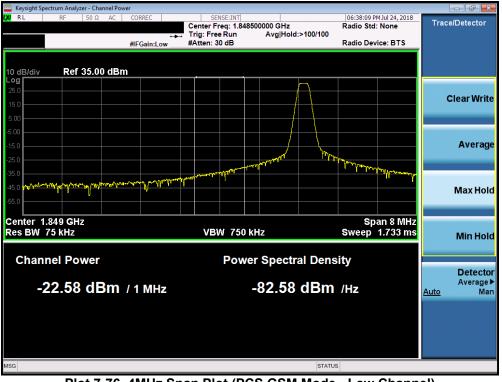
FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕕 La	Approved by: Quality Manager
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# PCS GSM Mode



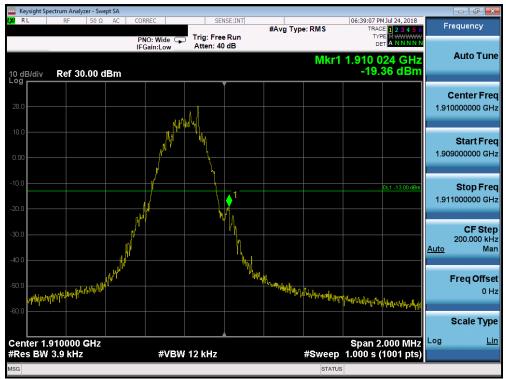
Plot 7-75. Band Edge Plot (PCS GSM Mode - Low Channel)



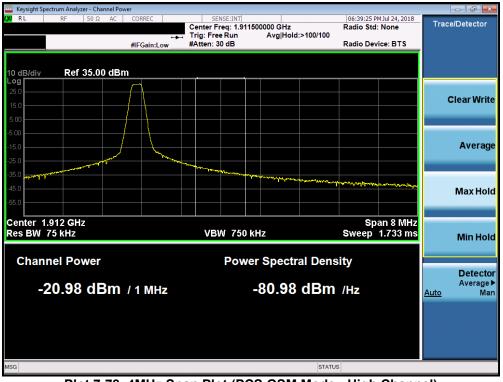
Plot 7-76. 4MHz Span Plot (PCS GSM Mode - Low Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	ها 😗	Approved by: Quality Manager
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Plot 7-77. Band Edge Plot (PCS GSM Mode - High Channel)



Plot 7-78. 4MHz Span Plot (PCS GSM Mode - High Channel)

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#### Note:

Both GSM and GPRS mode were investigated, and GSM mode was found to be the worst case for band edge emission. So, GSM mode is included in the report instead of GPRS mode.

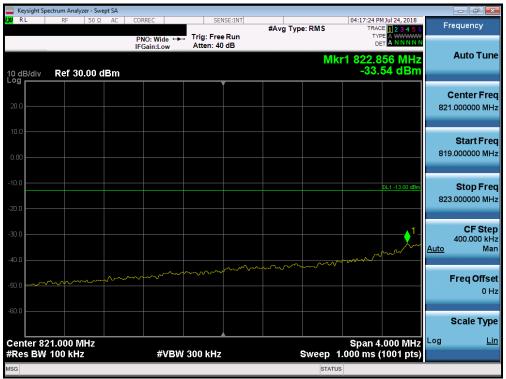
FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕚 La	Approved by: Quality Manager
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# Cellular CDMA Mode



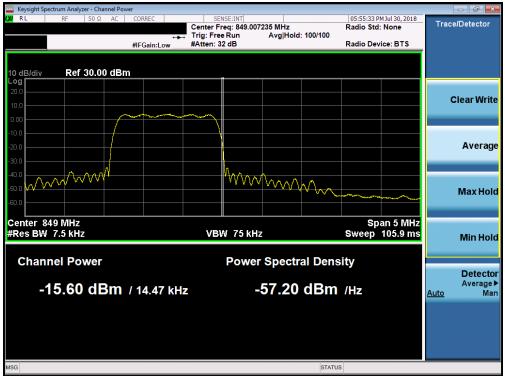
Plot 7-79. Band Edge Plot (Cellular CDMA Mode - Low Channel)



# Plot 7-80. 4MHz Span Plot (Cellular CDMA Mode - Low Channel)

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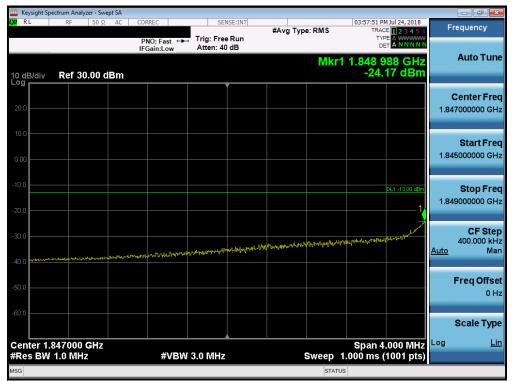
Plot 7-82. 4MHz Span Plot (Cellular CDMA Mode - High Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	ما 😗	Approved by: Quality Manager
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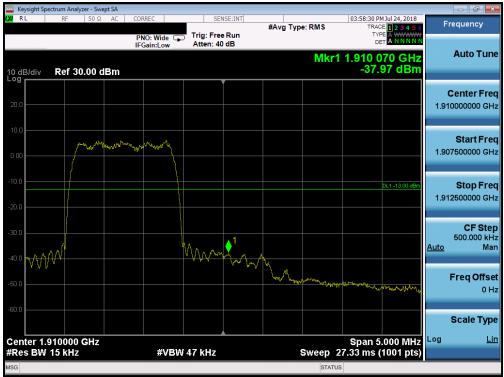
Plot 7-83. Band Edge Plot (PCS CDMA Mode - Low Channel)



## Plot 7-84. 4MHz Span Plot (PCS CDMA Mode - Low Channel)

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Plot 7-85. Band Edge Plot (PCS CDMA Mode - High Channel)



Plot 7-86. 4MHz Span Plot (PCS CDMA Mode - High Channel)

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# Cellular WCDMA Mode



Plot 7-87. Band Edge Plot (Cellular WCDMA Mode - Low Channel)



## Plot 7-88. Band Edge Plot (Cellular WCDMA Mode - High Channel)

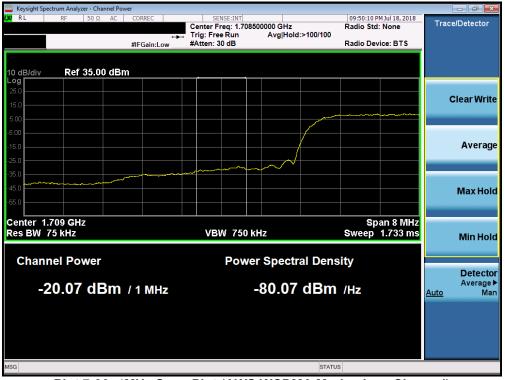
FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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# AWS WCDMA Mode



Plot 7-89. Band Edge Plot (AWS WCDMA Mode - Low Channel)



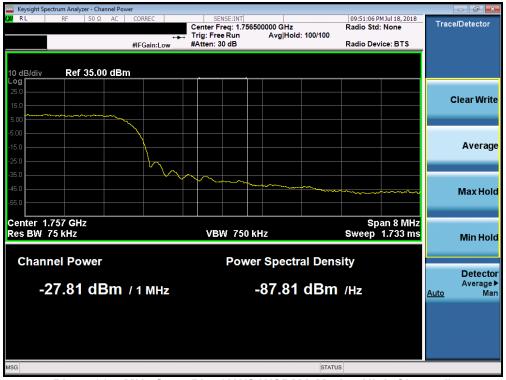
## Plot 7-90. 4MHz Span Plot (AWS WCDMA Mode - Low Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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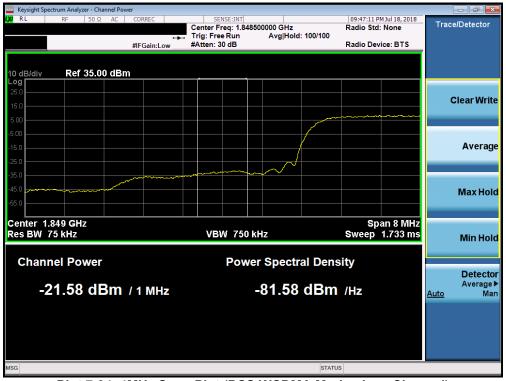
#### Plot 7-92. 4MHz Span Plot (AWS WCDMA Mode - High Channel)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)	🕦 La	Approved by: Quality Manager
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Plot 7-93. Band Edge Plot (PCS WCDMA Mode - Low Channel)



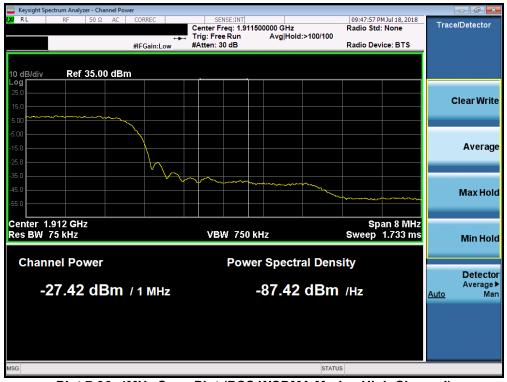
## Plot 7-94. 4MHz Span Plot (PCS WCDMA Mode - Low Channel)

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Keysight Spectrum Analyzer - Sv					
0 RL RF 50 S	PNO: Fast	Trig: Free Run	#Avg Type: RMS	09:47:51 PM Jul 18, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Frequency
0 dB/div Ref 30.00	IFGain:Low	Atten: 40 dB	Mkr1	1.910 000 GHz -18.95 dBm	Auto Tun
20.0					<b>Center Fre</b> 1.910000000 GF
0.00					<b>Start Fre</b> 1.902500000 GF
20.0		1		DL1 -13.00 dBm	Stop Fre 1.917500000 G⊦
		м М	www.		CF Ste 1.500000 MH <u>Auto</u> Ma
50.0				warden and a start and a start and a start and a start	Freq Offs 0 F
50.0					Scale Typ
enter 1.910000 GHz Res BW 100 kHz		V 300 kHz	Sweep	Span 15.00 MHz I.867 ms (1001 pts)	Log <u>L</u>

Plot 7-95. Band Edge Plot (PCS WCDMA Mode - High Channel)



Plot 7-96. 4MHz Span Plot (PCS WCDMA Mode - High Channel)

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# 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 > Emission bandwidth of signal
- 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.



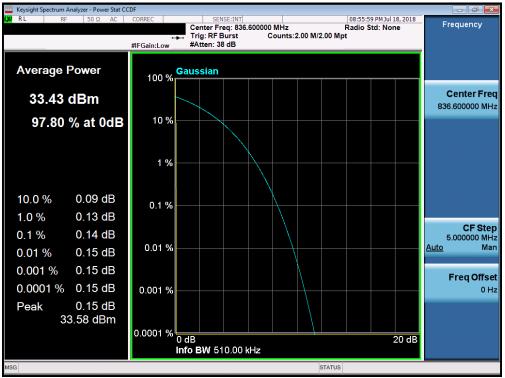
Figure 7-4. Test Instrument & Measurement Setup

# Test Notes

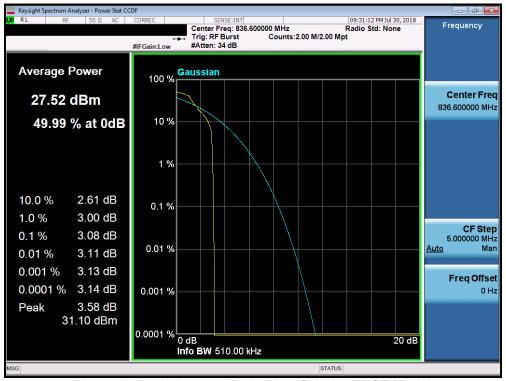
None

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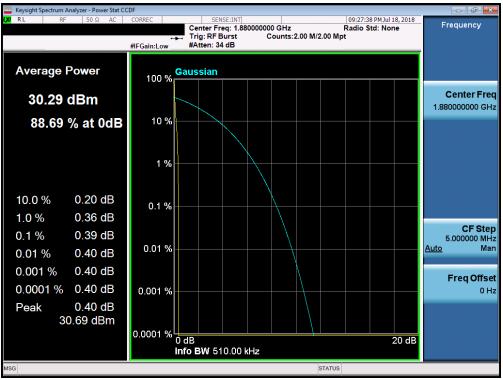




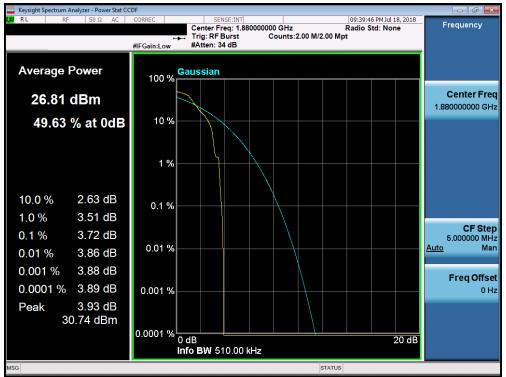
#### Plot 7-98. Peak-Average Ratio Plot (Cellular EDGE Mode)

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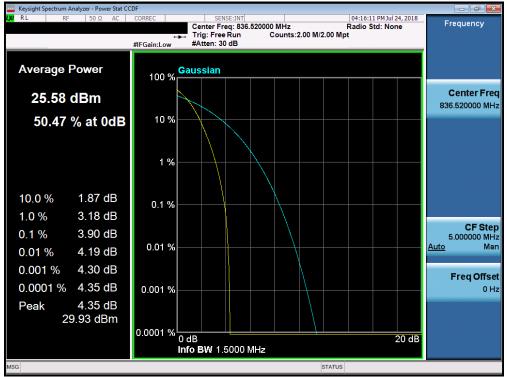




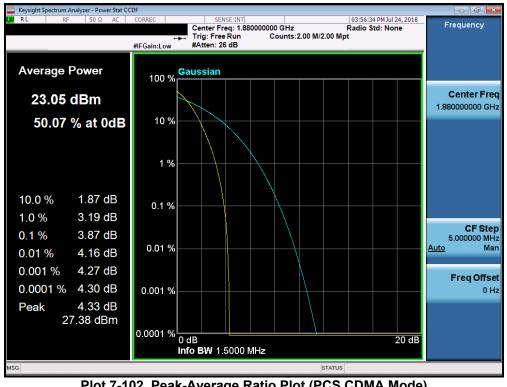
Plot 7-100. Peak-Average Ratio Plot (PCS EDGE Mode)

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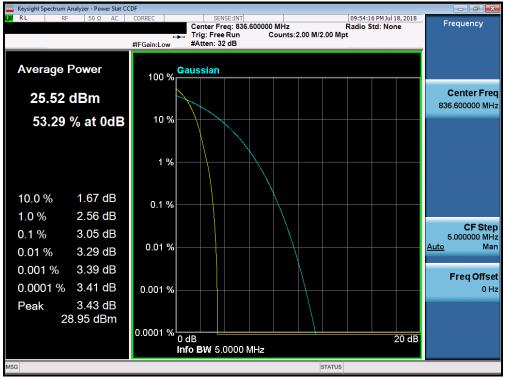




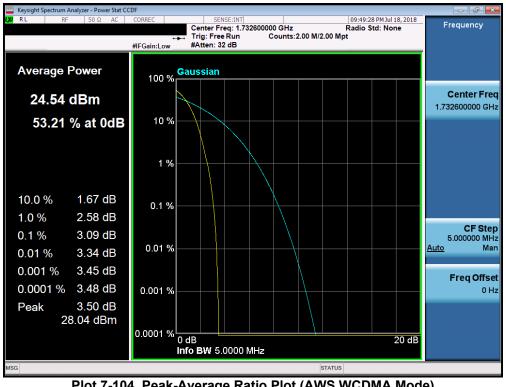
Plot 7-102. Peak-Average Ratio Plot (PCS CDMA Mode)

FCC ID: ZNFQ910QM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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Plot 7-104. Peak-Average Ratio Plot (AWS WCDMA Mode)

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