

PCTEST ENGINEERING LABORATORY, INC.

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MEASUREMENT REPORT GSM/GPRS/EDGE/CDMA/WCDMA

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea

Date of Testing: 11/1-12/7/2017 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1711010281-02-R1.A3L

FCC ID: IC: APPLICANT:

A3LSMG960U

649E-SMG960U

Samsung Electronics Co., Ltd.

Application Type: Model: HVIN: EUT Type: FCC Classification: FCC Rule Part(s): ISED Specification: Test Procedure(s): Certification SM-G960U, SM-G960U1, SM-G960W, SM-G960XU SM-G960W Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 22, 24, & 27 RSS-132, RSS-133, RSS-139 ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03, KDB 648474 D03 v01r04

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.

This revised Test Report (S/N: 1M1711010281-02-R1.A3L) supersedes and replaces the previously issued test report (S/N: 1M1711010281-02.A3L) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

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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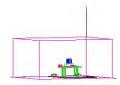


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MEASUREMENT REPORT GSM/GPRS/EDGE/CDMA/WCDMA



			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	0.794	29.00	1.303	31.15	246KGXW
EDGE850	22H	824.2 - 848.8	0.166	22.21	0.273	24.36	247KG7W
WCDMA850	22H	826.4 - 846.6	0.110	20.41	0.180	22.56	4M14F9W
CDMA850	22H	824.70 - 848.31	0.124	20.94	0.204	23.09	1M28F9W
WCDMA1700	27	1712.4 - 1752.6			0.159	22.02	4M14F9W
GPRS1900	24E	1850.2 - 1909.8			1.191	30.76	241KGXW
EDGE1900	24E	1850.2 - 1909.8			0.302	24.80	245KG7W
WCDMA1900	24E	1852.4 - 1907.6			0.223	23.49	4M15F9W
CDMA1900	24E	1851.25 - 1908.75			0.210	23.22	1M28F9W

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 (22831) 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 **Samsung Portable Handset FCC ID: A3LSMG960U**. 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.: 20E63, 20EDE, 20EF4, 20EF1, 20EE2

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 WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC, ANT+

The following capabilities are not supported in Canada and for USA only: 850/1900 CDMA/EvDO Rev0/A.

This device uses a tuner circuit that dynamically updates the antenna impedance parameters to optimize antenna performance for certain bands and modes of operation. The tuner for this device was set to simulate a "free space" condition where the transmit antenna is matched to the medium into which it is transmitting and, thus, the power is at its maximum level.

2.3 Test Configuration

The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

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

2.4 EMI Suppression Device(s)/Modifications

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

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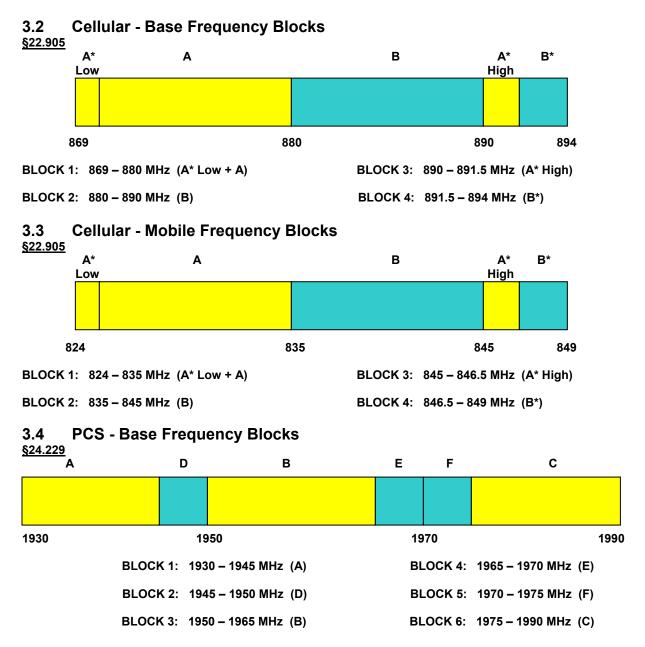


3.0 DESCRIPTION OF TESTS

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 v03) were used in the measurement of the EUT.

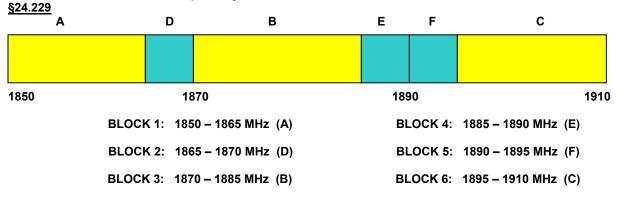
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Deviation from Measurement Procedure......None
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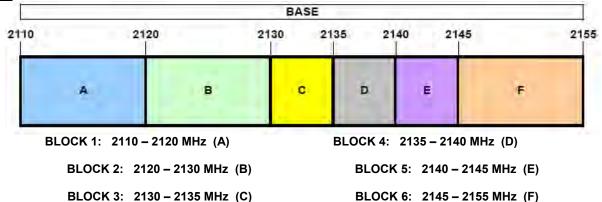


3.5 PCS - Mobile Frequency Blocks



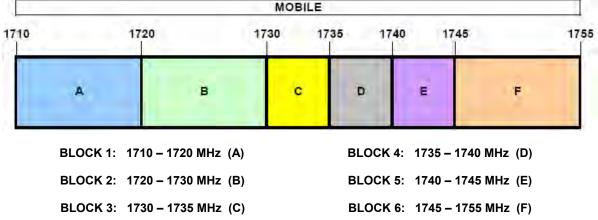


<u>§27.5(h)</u>



3.7 AWS - Mobile Frequency Blocks

<u>§27.5(h)</u>



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3.8 Radiated Measurements §2.1053 §22.913(a)(2) §22.917(a) §24.232(c) §24.238(a) §27.50(d)(10) §27.53(h)

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_{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	12/28/2016	Annual	12/28/2017	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	3/27/2017	Annual	3/27/2018	MY52350166
COM-Power	AL-130R	Active Loop Antenna	6/5/2017	Annual	6/5/2018	121085
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/23/2016	Biennial	8/23/2018	135427
Espec	ESX-2CA	Environmental Chamber	4/11/2017	Annual	4/11/2018	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	4/26/2016	Biennial	4/26/2018	128337
Huber+Suhner	Sucoflex 102A	40GHz Radiated Cable	5/19/2017	Annual	5/19/2018	251425001
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/24/2017	Annual	3/24/2018	11401010036
Mini Circuits	TVA-11-422	RF Power Amp		N/A		QA1317001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		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)	4/19/2017	Annual	4/19/2018	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	7/3/2017	Annual	7/3/2018	102135
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/3/2017	Annual	7/3/2018	102134
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/3/2017	Annual	7/3/2018	102133
Rohde & Schwarz	TC-TA18	Cross-Pol Antenna 400MHz-18GHz	10/30/2017	Annual	10/30/2018	101058
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/11/2017	Annual	5/11/2018	100040
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	3/30/2016	Biennial	3/30/2018	9105-2404
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
Sunol	DRH-118	Horn Antenna (1-18GHz)	8/11/2017	Biennial	8/11/2019	A050307
Sunol Sciences	JB6	JB6 Antenna	9/27/2016	Biennial	9/27/2018	A082816

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

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:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMG960U
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>GSM / GPRS / EDGE / CDMA / 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 ₁₀ (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			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)(2)	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 ₁₀ (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 3.9.

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7.2 Occupied Bandwidth §2.1049 RSS-Gen (4.6.1) RSS-133(2.3) RSS-139(2.3)

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 v03 - Section 4.2

Test Settings

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

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

Test Setup

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

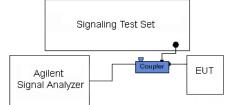


Figure 7-1. Test Instrument & Measurement Setup

Test Notes

None.

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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)



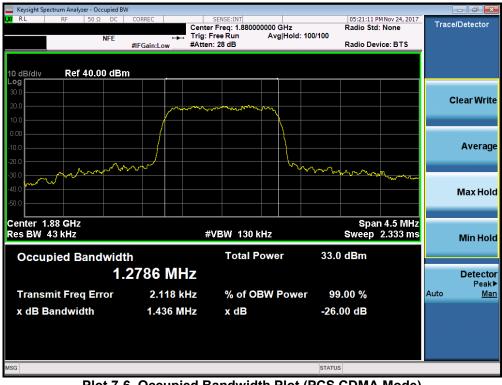
Plot 7-4. Occupied Bandwidth Plot (EDGE1900 Mode)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 45 af 444
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Keysight Spectrum Analyzer - Occupied BW				e ē 🔀
XIRL RF 50Ω DC		SENSE:INT r Freq: 836.520000 MHz	05:46:34 PM Nov 24, 20 Radio Std: None	Trace/Detector
NFE	Trig: F	ree Run Avg Hold:>10	00/100	
	#IFGain:Low #Atten	n: 30 dB	Radio Device: BTS	-
10 dB/div Ref 40.00 dBm				
30.0				
20.0	m	a monte and a start of the star		Clear Write
10.0				
0.00	/			
-10.0				Average
-20.0			man and a man and	
-30.0 mmmmm	M/M ⁴		- Mar Marine Marine	A
-40.0				Max Hold
-50.0				Maxilon
Center 836.5 MHz Res BW 43 kHz	#	VBW 130 kHz	Span 4.5 MH Sweep 2.333 m	0
	"		GHCCP 2.000 III	S Min Hold
Occupied Bandwidt	h	Total Power	33.2 dBm	
1	2810 MHz			Detecto
				Peak
Transmit Freq Error	-25 Hz	% of OBW Power	99.00 %	Auto <u>Mar</u>
x dB Bandwidth	1.443 MHz	x dB	-26.00 dB	
ISG			STATUS	

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



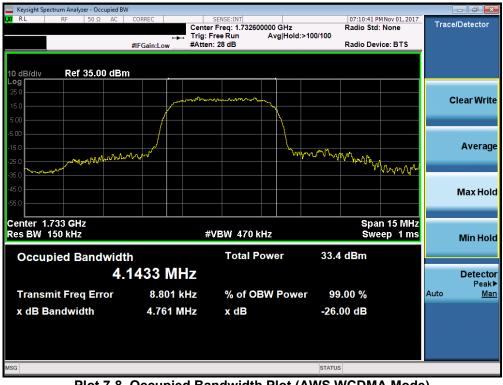
Plot 7-6. Occupied Bandwidth Plot (PCS CDMA Mode)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-7. Occupied Bandwidth Plot (Cellular WCDMA Mode)



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 17 of 111
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Keysight Spectru															
IXI RL	RF 50)Ω A	IC CO	ORREC			ENSE:INT Freg: 1.880	000000	GHz		07:07:19 PM Nov 01, 2017 Radio Std: None			Trac	e/Detector
					+	Taken Fra	ee Run			100/100	Dealle	Radio Device: BTS			
			#1	FGain:L	ow	#Atten:	28 dB				Radio	Devic	:e: B I S		
10 dB/div	Ref 35	00.6	Bm												
Log	INCI 33														
25.0					-	man	-	man.							Clear Write
15.0					Anna										orear mile
5.00					1				\mathbf{i}						
-5.00															
-15.0				5					h	man					Average
-25.0	and may	www	~~~~^	w/*						1000 C	Martine Martine	man h	mont		
00.0													- • • • • • • • • • • • • • • • • • • •		
-45.0															Max Hold
-55.0														_	_
Center 1.88													15 MHz		
Res BW 15	0 kHz					#V	BW 470) kHz				Swee	ep 1ms		Min Hold
Occupi	ed Ban	dw	idth				Total	Powe	ər	33	.2 dBn	n			
Occupi	cu Dan			- 20											D ata dan
	4.1539 MHz											Detector Peak►			
Transmi	t Freq E	rror		11.	285 k	Hz	% of (DBW	Powe	er 🤉	9.00 %	6		Auto	<u>Man</u>
x dB Bar	ndwidth			4.7	58 M	Hz	x dB			-26	5.00 dE	3			
MSG										STAT	US				
		_	_	_	_			_	_		_	_			

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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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7.3 Spurious and Harmonic Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(h) RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)

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 $43 + \log_{10}(P_{[Watts]})$, where P is the transmitter power in Watts.

Test Procedure Used

KDB 971168 D01 v03 – 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.

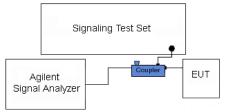


Figure 7-2. Test Instrument & Measurement Setup

Test Notes

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz for Part 24/27 and RSS-133/RSS-139, 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.

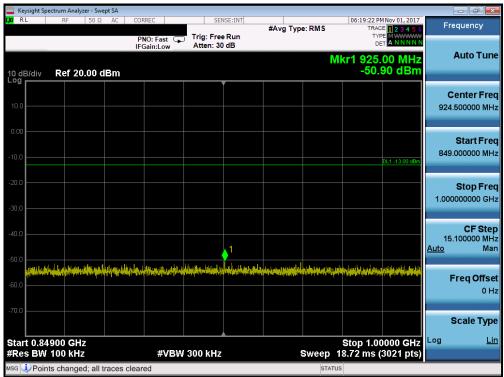
FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 10 of 111
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Cellular GPRS Mode

	ectrum Analyzer -										
LXU RL	RF 5	Ω AC	PNO: Fast	Trig: Free		#Avg Type	e:RMS	TR/	PM Nov 01, 2017 ACE 1 2 3 4 5 6 (PE M WWWWWW A N N N N N N	Frequ	ency
10 dB/div	Ref 20.0	0 dBm	IFGain:Low	Atten: 30	dB			Mkr1 822		Au	to Tune
10.0											e r Freq 000 MHz
-10.0									DL1 -13.00 dBm		art Frec 000 MHz
-20.0											o p Freq 000 MHz
-40.0									1		C F Step 000 MH: Mar
-50.0 -60.0	ang talan <mark>penghanyan ka</mark> Ang mang ang pang talan an ^{ang}	aana ka daha da baba da Marang mengerakan da	a line l ^{an} ne balance et je val gant sale Manina et e sedene e sedene	n ayan daga ya ya ya da da ya	galan tinyili dan Antoni dan kanan	la tipela ang ^{da} talan Ang sa tikang sa tinang sa	arkalışı (ç. diya) Arkalı Arkalı (c. a. a. a. a. a.	(sparg) o _{pen} s ¹ peterlepisterisetti taatuse assestatistik openetistik	par da ana ang Pilipina. Ng Panganan tang Pilipina	Free	q Offse 0 Hz
-70.0	MHz							Stop	823.0 MHz	Sca Log	le Type <u>Lir</u>
#Res BW			#VBW	/ 300 kHz		S		98.33 ms (15861 pts)		
MSG							STA	TUS			

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

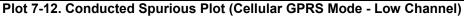


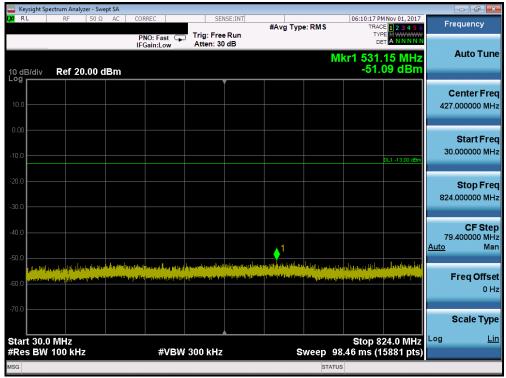
Plot 7-11. Conducted Spurious Plot (Cellular GPRS Mode - Low Channel)

Test Report S/N: Test Dates: EUT Type:	FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
	Test Report S/N:	ort S/N: Test Dates:	EUT Type:		Dego 20 of 111
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		Analyzer - Sv	vept SA									X
(XI RL	RI	= 50 Ω	2 AC	CORREC	SEI	NSE:INT	#Avg Typ	e: RMS	TRAC	MNov 01, 2017	Frequency	/
				PNO: Fast G	Trig: Free Atten: 30		•		TYI Di			
10 dB/di Log —	iv Re	f 20.00	dBm					Μ	kr1 1.64 -30.	8 5 GHz 98 dBm	Auto T	une
10.0											Center F 5.500000000	
-10.0										DL1 -13.00 dBm	Start F 1.000000000	
-20.0	∮ ¹										Stop F 10.000000000	
-40.0	and an and a	n an	Stypesser(A)	an langu barnang takt Kata militi yang analara		an a	nen gester den kommensen Nen gester den kommensen	landi energenit Apolisi Angela	palalandi ^b adi dababi pitasi banik ^{sita} si dab	<mark>den sin bilin senengan</mark> Alaring bili senengkan	CF S 900.000000 <u>Auto</u>	
-60.0											Freq Of	f fse 0 H:
-70.0											Scale T	уре
	.000 GI			10 (21)						.000 GHz	Log	Lin
	3W 1.0	VIHZ		#VBV	V 3.0 MHz		s		5.60 ms (1	8001 pts)		
ISG								STATU	55			





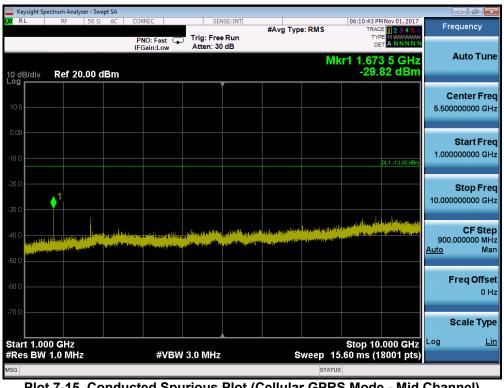
Plot 7-13. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer - Sw									
LXI RL	RF 50 Ω	AC (CORREC	SEN	ISE:INT	#Avg Typ	e: RMS		MNov 01, 2017	Frequency
			PNO: Fast IFGain:Low	Trig: Free Atten: 30				TYF DE		Auto Tune
10 dB/div Log	Ref 20.00	dBm							49 dBm	
										Center Freq
0.00										924.500000 MHz
0.00										Start Freq
-10.0									DL1 -13.00 dBm	849.000000 MHz
-20.0										Stop Freq
-30.0										1.000000000 GHz
-40.0										CF Step
-50.0							∮ ¹			15.100000 MHz <u>Auto</u> Man
h n di s	in de stad faind, in st	insight distant	de astro de Millionado	iniyi assini (ili Inge	iner and	يعاج المحصلي المنع		بالشياب وتشعيبان		Freq Offset
-60.0										0 Hz
-70.0										
										Scale Type
Start 0.84 #Res BW			#VBW	300 kHz			Sweep 1	Stop 1.00 8.72 ms (0000 GHz 3021 pts)	Log <u>Lin</u>
мsg 連 Poin	ts changed; all	traces cle	ared				STATUS			

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 111
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		trum Analy	zer - Swej	pt SA										
l ,XI RI		RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	e RMS		M Nov 01, 2017 CE 1 2 3 4 5 6	Fr	requency
					PNO: F	Fast 🖵	Trig: Fre				TY			
					IFGain:	Low	Atten: 3	D dB				,		Auto Tune
				_							Mkr1 816	.85 MHZ 11 dBm		
10 dE Log	3/div	Ref 20	1.UU a	Bm				•			-30.	TT GBIII		
													(Center Freq
10.0													427	.000000 MHz
0.00														04
													20	Start Freq 0.000000 MHz
-10.0												DL1 -13.00 dBm	50	
-20.0														Stop Freq
-30.0													824	1.000000 MHz
-30.0														
-40.0														CF Step
40.0												1.	79 Auto	400000 MHz. Man
-50.0													Auto	Wall
											aganan biraharan birasi			
-60.0	تعاقدها والأمر	i sejata kingat		1		لتلتقعه	a) water water in the	and a state of a state	and a latter	i stradita	ang an airing agus in an air			Freq Offset 0 Hz
														UHZ
-70.0														
														Scale Type
Star	t 30.0	MH7									Stop 8	24.0 MHz	Log	Lin
		100 kHz	z			#VBW	300 kHz		S	weep	98.46 ms (1	5881 pts)		
MSG											ATUS			

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



Plot 7-17. Conducted Spurious Plot (Cellular GPRS Mode - High Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 111
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	ectrum Analy											
X/RL	RF	50 Ω	AC C	ORREC	SE	NSE:INT	#Avg Typ	e: RMS		MNov 01, 2017 CE 1 2 3 4 5 6	Frequ	ency
				PNO:Fast G IFGain:Low	Trig: Fre		•		TΥ			
				IFGam.Low	, Attention	ub .		М	lkr1 1.69	7 5 GHz	Au	to Tune
10 dB/div	Ref 20).00 d	Bm						-29	18 dBm		
						Ĭ					Can	ter Frec
10.0												0000 GHz
0.00											St	artFred
-10.0												0000 GHz
-10.0										DL1 -13.00 dBm		
-20.0											St	op Fred
	≜ 1										10.00000	
-30.0												
-40.0			u	and a state of the second state	المعلية وراله اللهمي		and the second second	ay Usura and	u tegen participation participation produced and a second s	e na stale her berge berge A tea stale hans at stale s		CF Step
	al an	A REAL PROPERTY.	ومالواتهمي	na di sina ling sont da kaj	a particular and a second second	متأمير وماوالا أساط معر	No. 1 Contraction	أرجارهم ومتتعاليهم	IC UNIT		900.000 Auto	0000 MHz Mar
-50.0												
											Fre	q Offset
-60.0												0 Hz
-70.0												
											Sca	ale Type
Start 1.00	0 GHz								Stop 10	0.000 GHz	Log	Lin
#Res BW		z		#VB\	V 3.0 MHz		S	weep 1	5.60 ms (18001 pts)		
ISG								STAT	US			

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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	trum Analyzer - Sv									
XI RL	RF 50 Ω	Р	RREC	Trig: Free		#Avg Typ	e: RMS	TRAC	M Nov 01, 2017 DE 1 2 3 4 5 6 PE M WWWWW ET A N N N N N	Frequency
10 dB/div Log	Ref 20.00		Gain:Low	Atten: 30	dB		Mł	(r1 1.69	2 5 GHz 63 dBm	Auto Tune
10.0										Center Free 937.500000 MH
-10.0									DL1 -13.00 dBm	Start Fre 30.000000 MH
-20.0										Stop Fre 1.845000000 GH
40.0 Jania jada 50.0	ajaithainna dialamh	n jaha (Keli jahu) Kunggin japan sarang	bristylyn gyndal I ddyda		levil (light) or		and a state of the		<mark>↓</mark> 1 Anglagan salat	CF Ste 181.500000 MH <u>Auto</u> Ma
60.0										Freq Offs 0 F
70.0										Scale Typ
Start 0.030 #Res BW 1			#VBW	/ 3.0 MHz			Sweep 2	Stop 1. 420 ms	8450 GHz (3631 pts)	Log <u>Li</u>
MSG							STATUS	6		

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



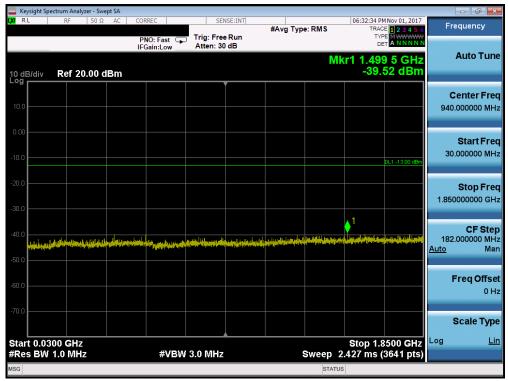
Plot 7-20. Conducted Spurious Plot (PCS GPRS Mode - Low Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 25 of 111
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🔤 Keysight Spectrum Analyzer - Sw	vept SA				
<mark>μχύ</mark> RL RF 50 Ω	PNO: Fast 😱	SENSE:INT	#Avg Type: RMS	06:35:23 PM Nov 01, 2017 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET A N N N N N	Frequency
10 dB/div Ref 10.00 d	in Gameow	Atten: 20 dB	Mkr	1 17.026 5 GHz -36.30 dBm	Auto Tune
0.00					Center Fre 15.000000000 GH
-10.0				DL1 -13.00 dBm	Start Fre 10.000000000 GH
-30.0	te beathers area in give or correspond in the second	a an	1 A second	Ta da ang kanalang sa katalang sa kanalang sa kanalang sa kanalang sa kanalang sa kanalang sa kanalang sa kana Kanalang sa kanalang sa kana	Stop Fre 20.000000000 GH
 CODE CONTRACTOR SECTION CONTRACTOR SEC					CF Ste 1.000000000 G⊦ <u>Auto</u> Ma
70.0					Freq Offso 0 ⊦
-80.0 Start 10.000 GHz				Stop 20.000 GHz	Scale Typ
#Res BW 1.0 MHz	#VBW 3	.0 MHz	Sweep 25	.33 ms (20001 pts)	
MSG			STATUS		

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 26 of 111
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		Analyzer - Swe									_	
L <mark>XI</mark> RL	R	- 50 Ω	AC C	ORREC	SEI	ISE:INT	#Avg Typ	e: RMS		MNov 01, 2017 DE 1 2 3 4 5 6	Fr	equency
				PNO:Fast 🖵 FGain:Low	Trig: Free Atten: 30		• //		TY	PE MWWWWW ET A N N N N N		
				FGain:Low	Atten. 30	ub .		M	kr1 0 3/	7 0 GHz		Auto Tune
10 dB/c	div Re	f 20.00 c	IBm						-32.	63 dBm		
Log					,	Ĩ						
												enter Freq
10.0											5.955	5000000 GHz
0.00												
0.00												Start Freq
-10.0											1.910	000000 GHz
										DL1 -13.00 dBm		
-20.0												Stop Freq
										4	10.000	0000000 GHz
-30.0										 ♦'		
									(Line West, and	ulte Anal-traductor		CF Step
-40.0	Product Lung	and the second		and the second second second			nagen gesterening strage	persona and a dade	a a second base of a second	to or a fit half the and have done	809	.000000 MHz
	All and a second second second	CONTRACTOR OF STREET	and and the state of the state	A STREET, MARKED STREET, STREE	1. 1.1.1.1						<u>Auto</u>	Man
-50.0												
-60.0											F	Freq Offset
-00.0												0 Hz
-70.0												
											:	Scale Type
		-			<u> </u>						Log	Lin
	1.910 GI BW 1.0			#VRM	3.0 MHz		9	ween 1	Stop 10	.000 GHz 6181 pts)		
MSG	5471.0	WILLS		#VD90	5.0 141112			STATL		o to i pis)		
mod								STATC				

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



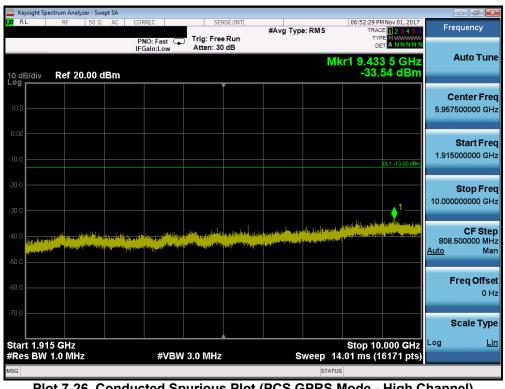
Plot 7-24. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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		Analyzer - Sw										x
LXI RL	R	- 50 Ω	AC	CORREC		SENSE:INT	#Avg Typ	e: RMS		Nov 01, 2017	Frequency	
				PNO: Fast IFGain:Low		ree Run 30 dB			TYP DE		Auto Tu	ne
10 dB/c	div Re	f 20.00 (dBm					M	kr1 1.334 -38.9	5 GHz 95 dBm	Auto Tu	TIE
						Ĭ					Center Fr	
10.0											940.000000 M	Hz
0.00											Start Fr	eq
-10.0										DL1 -13.00 dBm	30.000000 M	iHz
-20.0											Stop Fr	ea
-30.0 —											1.850000000 G	
								♦1			CF Ste	en
-40.0	in the state of the	i ainiyyayaha fi	وإيرا والمطور وا	and the second	بالجلي والمرطاويي					n i kara <mark>in in i k</mark> i ana	182.000000 M	
-50.0												
-60.0											Freq Offs 0	set Hz
-70.0												
											Scale Ty	ре
	0.0300 (BW 1.0			#V	BW 3.0 MH	z		Sweep 2	Stop 1.8 2.427 ms (3	500 GHz 3641 pts)	-	<u>Lin</u>
MSG								STATU				

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 29 of 111
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	pectrum Analyzer -	Swept SA									×
L <mark>XI</mark> RL	RF 50)Ω AC (CORREC	SEN	SE:INT	#Avg Typ	e: RMS		Nov 01, 2017 E 1 2 3 4 5 6	Frequency	
	-		PNO: Fast 🖵 IFGain:Low	Trig: Free Atten: 20				TYF DE		Auto Ti	
10 dB/div Log	Ref 10.00) dBm					Mkr	1 17.028 -35.	3 0 GHz 51 dBm	Auto Tu	une
0.00										Center F 15.000000000	
-10.0									DL1 -13.00 dBm	Start F 10.000000000	
-30.0	allowdowd yngyweddaethau	utual scatter be of	1 ta	, i ve ^{of} nesie jeter ve f ^{ils}	an a	A THE AVER A DECISION OF A DECISIONO OF A DECISION OF A DE	1 Leonditeter	adadayan ^k awata ku	la la la présidencia de	Stop F 20.000000000	
-50.0	ente autoritat (programati frantistat) Alterna finitat (programati frantistat)	a partin ta fini interación partin tablecia de constantes	and the pipeline stand provide a standard standard standard standard standard standard standard standard standa Standard standard stan	an dhaa ka dhi ka sof	and a second the sys	Mr.OWACO				CF S 1.000000000 (<u>Auto</u>	t ep GHz Man
-70.0										Freq Off (f set 0 Hz
-80.0 Start 10.	000 GHz							Stop 20	.000 GHz	Scale Ty	ype Lin
#Res BW	/ 1.0 MHz		#VBW	3.0 MHz		S	weep 2:	5.33 ms (2	0000 GH2 0001 pts)		
MSG							STATU	5			

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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 111
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Cellular CDMA Mode

	ectrum Analyzer - Swept SA					
XU RL	RF 50 Ω DC	PNO: Fast	Trig: Free Run Atten: 30 dB	#Avg Type: RMS	05:49:53 PM Nov 24, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N	Frequency
10 dB/div	Ref 20.00 dBm	II Guilleon		N	lkr1 823.00 MHz -33.44 dBm	Auto Tun
10.0						Center Fre 426.500000 MH
10.0					DL1 -13.00 dBm	Start Fre 30.000000 M⊦
30.0					1	Stop Fre 823.000000 M⊦
40.0						CF Ste 79.300000 MH <u>Auto</u> Ma
60.0	geingen Agenstitt anglestet Asterna (Agengenet		A formation of second and the second			Freq Offs 0 F
-70.0						Scale Typ
Start 30.0 Res BW		#VBW	300 kHz	Sweep 3	Stop 823.0 MHz 8.06 ms (15861 pts)	
ISG				STATU	JS	

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

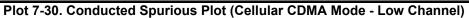


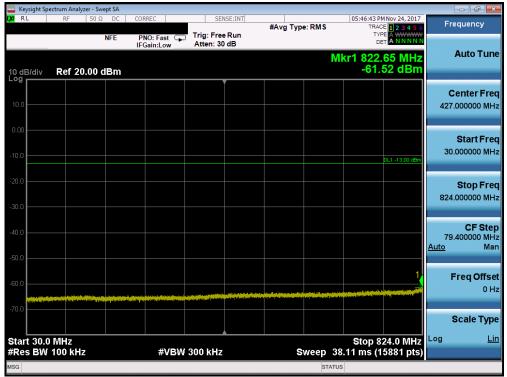
Plot 7-29. Conducted Spurious Plot (Cellular CDMA Mode - Low Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dago 20 of 111
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Keysight Spectr	um Analyzer - Sv	vept SA									
LXI RL	RF 50 \$	DC (CORREC	SEN	SE:INT	#Avg Type	RMS	TRAC	MNov 24, 2017 DE 1 2 3 4 5 6	Fr	equency
		NFE	PNO: Fast G	Trig: Free #Atten: 30				TY D			
10 dB/div	Ref 10.00	dBm					M	(r1 9.77 -41.	3 5 GHz 79 dBm		Auto Tune
0.00											enter Freq
-10.0									DL1 -13.00 dBm	2.000	Start Freq
-30.0									1	10.000	Stop Fred 0000000 GH2
-50.0		<u> </u>		~~~						800 <u>Auto</u>	CF Step .000000 MH: Mar
-70.0										i	F req Offse 0 Ha
-80.0											Scale Type
Start 2.000 #Res BW 1.			#VBW	/ 3.0 MHz		S	weep 13	Stop 10 3.87 ms (1	.000 GHz 6001 pts)	Log	Lin
MSG							STATU	3			



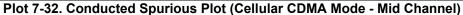


Plot 7-31. Conducted Spurious Plot (Cellular CDMA Mode - Mid Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 21 of 111
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Keysight Spectrum						-					ð X
X RL R			RREC	Trig: Free		#Avg Typ	e: RMS	TRAI TY	M Nov 24, 2017 CE 1 2 3 4 5 6 PE A WWWW	Freque	ncy
10 dB/div Re	ef 20.00 dE	IF	Gain:Low	Atten: 30	dB		Mkr	1 1.672	60 GHz 74 dBm	Aut	o Tune
10.0										Cente 1.4245000	e r Freq 000 GHz
-10.0									DL1 -13.00 dBm	Sta 849.0000	rt Fred
-20.0										Sto 2.0000000	p Frec 000 GHz
-40.0							↓1	a des arcs of Low e and alcohol	er an blev to yangan bitan yan	C 115.1000 <u>Auto</u>	F Step 000 MHz Mar
-60.0	41))))))))))))))))))))))))))))))))))))									Freq	Offse 0 Ha
											е Туре
Start 0.8490 (#Res BW 1.0			#VBW	3.0 MHz		S	weep 1.	Stop 2. 535 ms (2	0000 GHz 23021 pts)	Log	Lin
wsg 🗼 Points ch	anged; all tra	aces clear	ed				STATU	S			



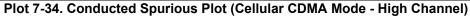


Plot 7-33. Conducted Spurious Plot (Cellular CDMA Mode - Mid Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 20 af 111
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- RF 50 Ω DC CORREC SENSE:INT 005:55:22 PM/0v 24, 2017 #Avg Type: RMS TRACE 02:34:55 NFE PNO: Fast Trig: Free Run IF Gain: Low Atten: 30 dB DET ANNINN Mkr1 816.15 MHz -61.29 dBm -61.29 dBm
NFE PNO: Fast Trig: Free Run IFGain:Low Atten: 30 dB DET ANNINN N Mkr1 816.15 MHz Auto TL
WIKT 1 816.15 MHZ
Center Fi 427.00000 N
Start Fi 30.000000 M
Stop Fr 824.00000 M
CF St 79.40000 M Auto
Freq Off O
Scale Ty
t 30.0 MHz Stop 824.0 MHz Log s BW 100 kHz #VBW 300 kHz Sweep 38.11 ms (15881 pts)
STATUS





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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 22 of 111
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	ectrum Analyzer -										
I <mark>XI</mark> RL	RF 5	0Ω DC	CORREC	SEN	ISE:INT	#Avg Type	RMS		MNov 24, 2017	Frequer	ncy
		NFE	PNO: Fast 📮 IFGain:Low	Trig: Free #Atten: 3		#/(1 8 1)p		TYF DE		Auto	Tune
10 dB/div Log	Ref 10.0	0 dBm					Mk	r1 9.99 -41.	5 0 GHz 70 dBm	Auto	Tune
0.00				Ì						Cente 6.0000000	er Freq
-10.0										0.0000000	00 GHZ
									DL1 -13.00 dBm		rt Freq
-20.0										2.0000000	00 GHz
-30.0										Sto 10.0000000	p Freq
-40.0									<u>`</u>	10.0000000	00 GH2
-50.0		_~_		\sim	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					C 800.0000	F Step
-60.0										Auto	Man
-70.0										Freq	Offset 0 Hz
-80.0											
										Scale	е Туре
Start 2.00 #Res BW			#VBW	3.0 MHz		S	weep <u>13</u>	Stop 10 .87 ms <u>(</u> 1	.000 GHz 6001 pts)	Log	<u>Lin</u>
MSG							STATUS				

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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Keysight Spectrum Analyzer								
CRL RF 5	NFE	ORREC PNO: Fast 🕞 FGain:Low			#Avg Typ	e: RMS	05:23:38 PM Nov 24, 201 TRACE 1 2 3 4 5 TYPE A WWWW DET A N N N	6 Frequency
0 dB/div Ref 20.0	0 dBm					Mkr	1 1.845 0 GH -46.46 dBr	z Auto Tur n
10.0								Center Fre 937.500000 MH
10.0							DL1 -13.00 dE	Start Fre 30.000000 MH
30.0								Stop Fre 1.845000000 GH
40.0								CF Ste 181.500000 MH Auto Ma
60.0	**************************************	put, and any discinging of the Bar	a an				ŢŢĸĸŢĊġġġĊĸĊĬĬŢĹĸġĬŢĊĸŢĬŢĸĊĬŊĹŢĸŎŎġĹĬĸĬŢĬĸŢĬĸĸŢĬĸĸĬŶŊŢ	Freq Offs 0 H
70.0								Scale Typ
Start 0.0300 GHz Res BW 1.0 MHz		#VBW	3.0 MHz			Sweep 2.4	Stop 1.8450 GH 20 ms (3631 pt	z Log L 5)
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: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Spectrum Analy	zer - Swept SA					
LX/RL RF	50 Ω DC	CORREC	SENSE:INT	#Avg Type: RMS	05:24:50 PM Nov 24, 2017 TRACE 1 2 3 4 5 6	Frequency
	NFE	PNO: Fast IFGain:Low	Trig: Free Run Atten: 20 dB			
10 dB/div Ref 10	.00 dBm			Mk	r1 19.598 5 GHz -46.71 dBm	Auto Tune
0.00						Center Freq 15.000000000 GHz
-10.0					DL1 -13.00 dBm	Start Freq 10.000000000 GHz
-30.0						Stop Fred 20.000000000 GHz
-50.0						CF Step 1.00000000 GH: <u>Auto</u> Mar
-70.0						Freq Offse 0 H
-80.0					Stop 20.000 GHz	Scale Type
#Res BW 1.0 MH	z	#VBW	3.0 MHz	Sweep 1	7.33 ms (20001 pts)	
мsg 🗼 Points change	d; all traces c	eared		STATU	IS	

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 26 of 111	
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Keysight Spectrum.		it SA									
l,X/ R L RF	50 Ω	DC CO	RREC	SEN	ISE:INT	#Avg Typ	e RMS		MNov 24, 2017 CE 1 2 3 4 5 6	Freq	uency
	N	IFE P	NO: Fast 🖵 Gain:Low	Trig: Free Atten: 30				TΥ			
10 dB/div Ref	f 20.00 di		Gamesn				N	1kr1 9.76 -41	5 0 GHz .57 dBm	A	uto Tune
10.0											n ter Freq 00000 GHz
-10.0									DL1 -13.00 dBm		t art Freq 00000 GHz
-20.0											top Freq 00000 GHz
-40.0		\sim		\sim	~~~		· · · · ·		↓ 1	809.00 <u>Auto</u>	CF Step 00000 MHz Man
-60.0										Fr	e q Offset 0 Hz
-70.0											ale Type
Start 1.910 GH #Res BW 1.0 I			#VBW	3.0 MHz		s	weep	Stop 10 14.02 m <u>s (</u> ′	0.000 GHz 16181 pts)	LUg	Lin
мsg 🕕 Points cha		aces clea	red				STAT				

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 27 of 111
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	pectrum Analyzer										- 0 -
L <mark>XI</mark> RL	RF 5	50 Ω DC	CORREC	SEN	SE:INT	#Avg Typ	e: RMS		Nov 24, 2017	Fre	equency
	_	NFE	PNO: Fast 😱 IFGain:Low	Trig: Free Atten: 30				TYP			
10 dB/div Log	Ref 20.0	0 dBm					Mk	(r1 1.738 -50.4	3 5 GHz 41 dBm		Auto Tune
10.0											enter Freq 000000 MHz
-10.0									DL1 -13.00 dBm	30.	Start Freq 000000 MHz
-20.0										1.850	Stop Freq 000000 GHz
-40.0									↓ ¹	182. <u>Auto</u>	CF Step 000000 MHz Man
-60.0	Muhiging ya _{na} n _a nya Jamas ya	an a	ferenne herrete en finsen er finsen er beste er		5 ₇₇ 10-2000-070-0 ⁷⁴⁴⁻⁰⁷⁴⁶	i de la companya de la				F	F req Offset 0 Hz
-70.0										:	Scale Type
Start 0.03 #Res BW			#VBW	3.0 MHz			Sweep 2	Stop 1.8 .427 ms (500 GHz 3641 pts)	Log	<u>Lin</u>
MSG							STATUS	6			

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		De 22 20 of 111
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		zer - Swept SA									
LXI RL	RF	50 Ω DC	CORREC	SEN	SE:INT	#Avg Typ	e: RMS		HNov 24, 2017	Freq	uency
		NFE	PNO: Fast 🕞 IFGain:Low	Trig: Free Atten: 20		0 ,1		TYP			
10 dB/div Log	Ref 1).00 dBm					Mkr	1 19.60 -46.	0 0 GHz 48 dBm		uto Tune
0.00											nter Freq 00000 GHz
-10.0									DL1 -13.00 dBm		Start Freq 00000 GHz
-30.0									1-		Stop Freq 00000 GHz
-50.0										1.0000 <u>Auto</u>	CF Step 00000 GHz Man
-70.0										Fr	eq Offset 0 Hz
-80.0 Start 10.0	000 GHz							Stop <u>20</u>	.000 GHz	So Log	c <mark>ale Type</mark> <u>Lin</u>
#Res BW	1.0 MH	z	#VBN	/ 3.0 MHz		S	weep 17	.33 ms (2	0001 pts)		
MSG							STATUS	;			

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

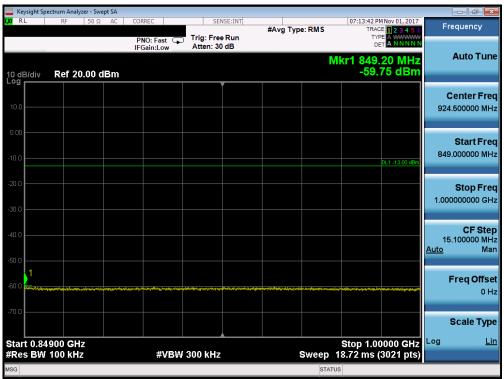
FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 111
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Cellular WCDMA Mode

www.www.www.com.com/www.com.com/www.com.com/www.com/www.com/www.com/www.com/www.com/www.com/www.com/www.com/www					
X RL RF 50 Ω	AC CORREC PNO: Fast IFGain:Low	SENSE:INT Trig: Free Run Atten: 30 dB	#Avg Type: RMS	07:13:35 PM Nov 01, 2017 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	lkr1 822.85 MHz -27.99 dBm	Auto Tune
10.0					Center Freq 426.500000 MHz
-10.0				DL1 -13.00 dBm	Start Free 30.000000 MHz
-20.0				1 →	Stop Free 823.000000 MH;
-40.0					CF Step 79.300000 MH: <u>Auto</u> Mar
	n Galatin, kasala sa kasala sa mang na sa sa sa sa sa sa sa Mang na sa	na promoti de sua presenta a como de la como de atilizada (nom genera esta de la como de la como genera esta de la como		ng na pang maninang pang na pan Ng pang ng pang na pang	Freq Offse 0 H:
-70.0					Scale Type
Start 30.0 MHz #Res BW 100 kHz	#VBW	300 kHz	Sweep 9	Stop 823.0 MHz 8.33 ms (15861 pts)	Log <u>Lir</u>
MSG			STATU	IS	

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

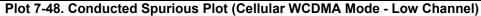


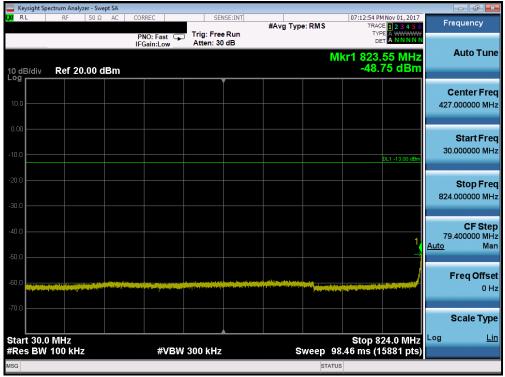
Plot 7-47. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analy	zer - Swej	ot SA									
LXI RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Typ	e: RMS	TRAC	MNov 01, 2017 DE 1 2 3 4 5 6	Frequency
				PNO: F IFGain:L	ast ⊊ ∟ow	Trig: Free Atten: 20				DI		Auto Turo
10 dB/div Log	Ref 10	.00 d	Bm						Μ	kr1 1.65 -44.	1 5 GHz 67 dBm	Auto Tun
												Center Free
0.00												5.500000000 GH
-10.0											DL1 -13.00 dBm	Start Free
-20.0												1.000000000 GH
-30.0												Stop Free 10.00000000 GH
-40.0	¹											
-50.0												CF Ster 900.000000 MH
-60.0												<u>Auto</u> Mar
												Freq Offse
-70.0												он
-80.0												Scale Type
Start 1.00 #Res BW		z		;	#VBW	3.0 MHz		s	weep 1	Stop 10 5.60 ms (1	.000 GHz 8001 pts)	Log <u>Li</u> i
MSG									STAT			



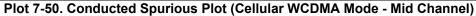


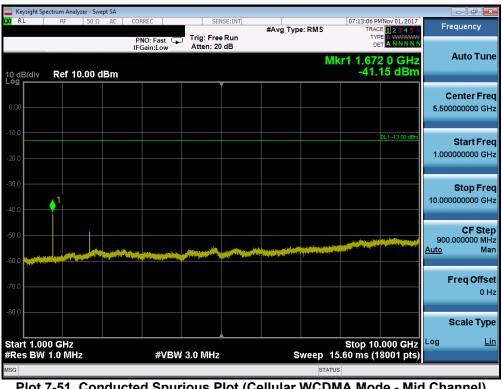
Plot 7-49. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ctrum Analyzer - Sw										
LXI RL	RF 50 Ω	AC	CORREC	SEN	SE:INT	#Avg Typ	e: RMS		Nov 01, 2017	Frequer	псу
			PNO: Fast IFGain:Low	Trig: Free Atten: 30		•		TYP			
			IFGalli.LOW	/ttell: 00	45		N	lkr1 849.	65 MHz	Auto	Tune
10 dB/div	Ref 20.00 c	dBm						-49.	92 dBm		
										Cente	r Freq
10.0										924.5000	
0.00										Sta	tFreq
-10.0										849.0000	
10.0									DL1 -13.00 dBm		
-20.0										Sto	p Freq
										1.0000000	
-30.0											
-40.0										CI 15,1000	F Step
1										Auto	Man
-50.0											
-60.0										Freq	Offset
	Maranda Marana Marana ang kila	and the second	an shu nga tangka nga kanga tangka sa sa	18. (. 1999) A. A. M. M.	an a	an a	البدرية يعللهم والحوادي	******	48.43.46.4 (Antoine (0 Hz
-70.0											
										Scale	е Туре
Start 0.84		_						Stop 1.00	JUOU GIIZ	Log	Lin
#Res BW				300 kHz			Sweep	18.72 ms (3021 pts)		
мsg 🗼 Point	s changed; all	traces cl	eared				STATU	JS			



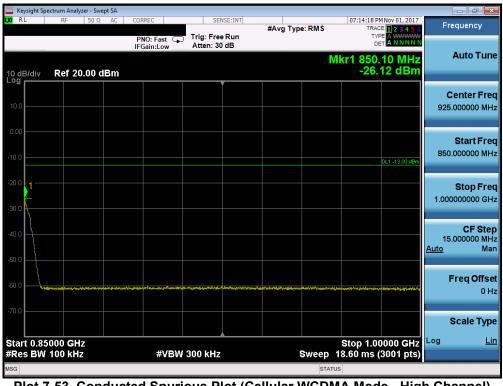


Plot 7-51. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 42 of 111
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	pectrum Analy											- 0 -
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC	SE	NSE:INT	#Avg Typ	e: RMS		MNov 01, 2017 DE 1 2 3 4 5 6	Fre	equency
				PNO: Fast (IFGain:Low	Trig: Fre Atten: 3		•		TY			
				IFGain:Low	Atten: 0	000		M	kr1 823	85 MHz		Auto Tune
10 dB/div	Ref 20).00 dE	3m						-47.	40 dBm		
						Ĭ						antan Enan
10.0												enter Freq 000000 MHz
											421	
0.00												
												Start Freq
-10.0										DL1 -13.00 dBm	30.	000000 MHz
-20.0												Stop Freq
-30.0											824	000000 MHz
-30.0												
-40.0											70	CF Step 400000 MHz
										1	Auto	400000 MHZ Man
-50.0												
										I /	F	req Offset
-60.0	and a second	and a drawn of	مي والمراجعة المراجعة. مراجعة المراجعة المراجع	ويعدد والتوي								0 Hz
70.0												
-70.0											:	Scale Type
Start 30. #Res BW				#\/D	W 200 kH		_			24.0 MHz	Log	Lin
	100 KH2			#VD	W 300 kHz		5			5881 pts)		
MSG								STATUS				



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 42 - f 444
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	ectrum Analyzer	- Swept S	SA								
LX/IRL	RF	50Ω/	AC COF	RREC	SEI	ISE:INT	#Avg Typ	e: RMS		MNov 01, 2017 DE 1 2 3 4 5 6	Frequency
			PI IF(NO:Fast 🕞 Gain:Low	Trig: Free Atten: 20		0.71		TY D		Auto Tune
10 dB/div Log	Ref 10.0	0 dB	m					Mk	r1 1.69 -41.	1 5 GHz 43 dBm	Auto Tune
0.00											Center Freq 5.50000000 GHz
-10.0										DL1 -13.00 dBm	Start Freq 1.000000000 GHz
-30.0	♦ ¹										Stop Freq 10.000000000 GHz
-50.0										e en al Distriction de la companya de la companya La companya de la comp	CF Step 900.000000 MHz <u>Auto</u> Man
-70.0											Freq Offset 0 Hz
-80.0											Scale Type
Start 1.00 #Res BW				#VBV	/ 3.0 MHz		s	weep 15	Stop 10 .60 ms (1	.000 GHz 8001 pts)	
MSG								STATUS			

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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	m Analyzer - Swept SA				1		
RL	RF 50 Ω AC	PNO: Fast	Trig: Free Run Atten: 30 dB	#Avg Type: R	TYPE	ov 01, 2017 Free 1 2 3 4 5 6 A A NNNNN A	quency
0 dB/div R	ef 20.00 dBm				Mkr1 1.705 -37.7	0 GHz 1 dBm	uto Tur
10.0							enter Fre 00000 MH
0.00					DL		Start Fre
80.0							Stop Fr 00000 GI
0.0						167.5 <u>Auto</u>	CF Ste 00000 M M
i0.0	affred for a second and a second	ana		(New and a second s	aygardydraeth effol y ffar y can fyr y dyn effor y g	Fr	e q Offs 0
0.0							cale Ty
tart 0.0300 Res BW 1.0		#VBV	/ 3.0 MHz	Sw	Stop 1.70 reep 2.233 ms (33	50 GHz 351 pts)	Ĺ
G					STATUS		

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

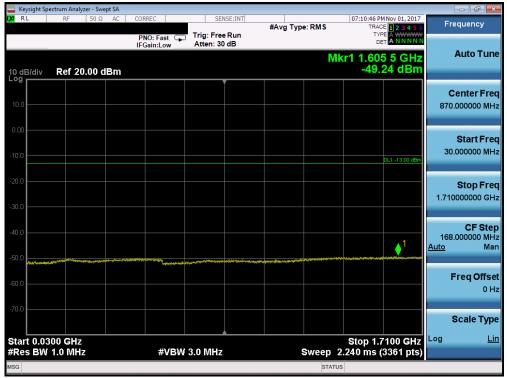


Plot 7-56. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ctrum Analyzer -	Swept SA									- • · ×
LX/RL	RF 5	Ω AC	CORREC	SE	NSE:INT	#Avg Typ	e: RMS	TRAC	MNov 01, 2017	Freq	uency
			PNO: Fast IFGain:Low	, Trig: Fre Atten: 2		•		TYP De			
10 dB/div Log	Ref 10.0	0 dBm					Mkr	1 16.96 -43.	9 0 GHz 42 dBm	A	uto Tune
0.00											nter Freq 00000 GHz
-10.0									DL1 -13.00 dBm		tart Freq 00000 GHz
-30.0							1				Stop Freq
-50.0	t en fan te fel en gegen de te bester te be	ati ati yang kang di salarang di								1.0000 <u>Auto</u>	CF Step 00000 GHz Man
-70.0										Fr	e q Offse 0 Hz
-80.0										So	ale Type
Start 10.0 #Res BW			#V	BW 3.0 MHz		s	weep 25	Stop 20 5.33 ms <u>(2</u>	.000 GHz 0001 pts)	Log	Lin
MSG							STATU		النف وحد		



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 46 of 111
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	ectrum Analyze										
LXI RL	RF	50 Ω A	C COR	REC	SEI	NSE:INT	#Avg Typ	e: RMS		M Nov 01, 2017 CE 1 2 3 4 5 6	Frequency
			PI	NO:Fast 🖵 Gain:Low	Trig: Free Atten: 30				TY	PE A WWWWW ET A N N N N N	
			IF	Sain:Low	Atten: 00	ub .		M	cr1 9 45	5 0 GHz	Auto Tur
10 dB/div Log	Ref 20.	00 dBn	n						-41.	02 dBm	
209						Í					Center Fre
10.0											5.877500000 GH
0.00											Start Fre
-10.0										DL1 -13.00 dBm	1.755000000 GH
										DET -13.00 GBM	
-20.0											Stop Fre
-30.0											10.00000000 GH
-30.0										. 1	
-40.0									and a state		CF Ste 824.500000 MH
. danska										and the state of the state of the	<u>Auto</u> Ma
-50.0	and the second se			and a loss of a loss of the							
-60.0											Freq Offs
											0 H
-70.0											Coole Tra
											Scale Typ
Start 1.75									Stop 10	.000 GHz	Log <u>L</u>
#Res BW	1.0 MHz			#VBW	3.0 MHz		S		_	l6491 pts)	
MSG								STATUS	5		

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer - Sw							
LXI RL	RF 50 Ω	AC	CORREC	SENSE:	INT #Avg Typ	e: RMS	07:12:09 PM Nov 01, 2017 TRACE 1 2 3 4 5 6	Frequency
			PNO: Fast 😱 IFGain:Low	Trig: Free Ru Atten: 30 dE	un		TYPE A WWWW DET A NNNNN r1 1.708 5 GHz -49.21 dBm	Auto Tune
10 dB/div Log	Ref 20.00 (:IBm					-49.21 dBm	
10.0								Center Freq 870.000000 MHz
-10.0							DL1 -13.00 dBm	Start Freq 30.000000 MHz
-20.0								Stop Freq 1.710000000 GHz
-40.0							<u>t</u>	CF Step 168.000000 MHz <u>Auto</u> Man
-60.0				, age of the second				Freq Offset 0 Hz
-70.0								Scale Type
Start 0.03 #Res BW			#VBW	3.0 MHz		Sweep 2.	Stop 1.7100 GHz 240 ms (3361 pts)	Log <u>Lin</u>
MSG						STATUS		

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyze	r - Swept SA									x
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC	SE	NSE:INT	#Avg Typ	e: RMS		M Nov 01, 2017	Frequency	
			PNO: Fast IFGain:Lov	Trig: Fre				TY	PE A WWWWW ET A N N N N N		
10 dB/div Log	Ref 10.0	00 dBm					Mk	r1 16.99 -43.	8 5 GHz 25 dBm	Auto Tu	JNE
0.00										Center Fr 15.000000000 0	
-10.0									DL1 -13.00 dBm	Start Fr 10.000000000 G	
-30.0							1			Stop Fi 20.000000000 G	
-50.0			n fall fann tearry yn yw ar fwra fwr fan yn fal Lyf Malaman, af y fan ywr y fal yn ar y f							CF St 1.000000000 G <u>Auto</u> M	
-70.0										Freq Off 0	set) Hz
-80.0										Scale Ty	
Start 10.0 #Res BW			#V	BW 3.0 MHz		s	weep 2	Stop 20 5.33 ms (2	0.000 GHz 20001 pts)	Log	Lin
MSG							STATU				

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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer						
KI RL	RF 5	iOΩ AC	PNO: Fast	SENSE:INT	#Avg Type: RMS	07:08:29 PM Nov 01, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
10 dB/div	Ref 20.0	0 dBm	IFGain:Low	Atten: 30 dB	N	/kr1 1.845 0 GHz -35.70 dBm	Auto Tun
10.0							Center Fre 937.500000 MH
10.00						DL1 -13.00 dBm	Start Fre 30.000000 MH
20.0 30.0							Stop Fre 1.845000000 G⊢
40.0							CF Ste 181.500000 M⊦ <u>Auto</u> Ma
60.0			analysee and the feetback of the feetback	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Freq Offs 0 H
70.0							Scale Typ
Start 0.03 Res BW	300 GHz 1.0 MHz		#VBW	3.0 MHz	Sweep	Stop 1.8450 GHz 2.420 ms (3631 pts)	Log <u>Li</u>
SG					STA	TUS	

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 50 of 111
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Mikr 1 10.99 3 CGH2 Center Fr 0.00		ectrum Analyzer - S	Swept SA						- 5
Income Auto Turne 000 Income Income	LX/IRL	RF 50	Ω AC	PNO: Fast	Trig: Free Run	#Avg Type:		TRACE 1 2 3 4 5 6	Frequency
0.00 0.01 - 1300 cm Center Fr 0.00 0.01 - 1300 cm Start Fr 0.00 0.01 - 100 cm Start Fr 0.00 0.01 - 100 cm Start Fr 0.00 0.01 - 100 cm Freq Off 0.00 0.01 - 100 cm Start Fr 0.00 0.01 - 100 cm Freq Off 0.00 0.01 - 00 cm Start Fr 0.00 0.01 - 00 cm Fr		Ref 10.00	dBm	IFGain:Low	Atten: 20 dB		Mkr1 16	.993 5 GHz	Auto Tune
200 DL1-13000EF Start Fr 300 1 10.00000000000000000000000000000000000									Center Fred 15.000000000 GH
400 1 Stop Fr 500 1 CF St 600 CF St 1.00000000 C 600 Freq Offs 700 Stop 20.000 GHz								DL1 -13.00 dBm	Start Fred 10.000000000 GH
-500 -500 -1.00000000 G -600 -500 -500 -500 -700 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -800 -500 -500 -500 -500 -500 -500 -500 -500 -500 -500 -500 -500 -500 -500 -500 -50									Stop Fre 20.000000000 GH
									CF Ste 1.000000000 GH <u>Auto</u> Ma
Start 10.000 GHz Stop 20.000 GHz									Freq Offse 0 H
Start 10.000 GHZ									Scale Type
	#Res BW			#VBW	/ 3.0 MHz	Sw	eep 25.33 n	0 20.000 0112	

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer - Sv	vept SA									
LXI RL	RF 50 S	2 AC	CORREC	SEN	ISE:INT	#Avg Typ	e RMS		MNov 01, 2017	Freque	ncy
			PNO: Fast 🖵	Trig: Free				TYP			
			IFGain:Low	Atten: 30	dB					Aut	o Tune
	B-5 00 00	-1170					IVIE	(F1 9.43) -/11	0 5 GHz 31 dBm		
10 dB/div	Ref 20.00	dBm						-41.			
										Cent	er Freg
10.0										5.9550000	000 GHz
0.00										0 1-	
										1.910000	rt Freq
-10.0									DL1 -13.00 dBm	1.9100000	00 GH2
-20.0										Sto	p Freq
										10.000000	000 GHz
-30.0											
-40.0											F Step
-40.0				and the state		والمروب والمحرب و				809.0000 Auto	00 MHz Man
-50.0	and the second data									Auto	Ivian
										_	
-60.0										Freq	Offset
											0 Hz
-70.0											
										Scal	е Туре
Start 1.9								Stop 10	.000 GHz	Log	Lin
#Res BW			#VBW	3.0 MHz		s	weep 14	.02 ms (1	6181 pts)	-	
MSG							STATUS				
		_									

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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-09 Center Freq 100 000 000 011-1300 dHz 200 011-1300 dHz 201 011-1300 dHz <th></th> <th>pectrum Analyzer - Sw</th> <th></th>		pectrum Analyzer - Sw										
Pho: Fast Trig: Free Run Atten: 30 dB Mkr1 1.658 0 GHz -49.04 dBm Auto Tune 10 dB/div Ref 20.00 dBm -49.04 dBm -49.04 dBm Center Freq 940.000000 MHz 00	LXI RL	RF 50 Ω	AC	CORREC	SEN	ISE:INT	#Avg Tvp	e: RMS			Freque	ency
-09 Center Freq 100 000 000 011-1300 dHz 200 011-1300 dHz 201 011-1300 dHz <th></th> <th>_</th> <th></th> <th>PNO: Fast IFGain:Low</th> <th></th> <th></th> <th>0 ,1</th> <th></th> <th>TYP DE</th> <th></th> <th>Aut</th> <th>o Tune</th>		_		PNO: Fast IFGain:Low			0 ,1		TYP DE		Aut	o Tune
100 Image: Center Freq 940.000000 MHz 000 Image: Center Freq 940.000000 MHz 000 Image: Center Freq 940.000000 MHz 100 Image: Center Freq 940.00000 MHz 100 Image: Center Freq 940.00000 MHz 100 Image: Center Freq 940.00000 MHz 11 Image: Center Freq 182.000000 MHz 120 Image: Center Freq 182.000000 MHz 120 <td< th=""><th>10 dB/div Log</th><th>Ref 20.00</th><th>dBm</th><th></th><th></th><th></th><th></th><th></th><th>-49.0</th><th>04 dBm</th><th></th><th></th></td<>	10 dB/div Log	Ref 20.00	dBm						-49.0	04 dBm		
000 0000 000												
100 DL1 13 00 dem Start Freq 200 DL1 13 00 dem Stop Freq 300 DL1 13 00 dem Stop Freq 400 DL1 13 00 dem Stop Freq 182.00000 MHz Man Auto Man Freq Offset 0 Hz 500 Stop 1.8500 GHz #Xes BW 1.0 MHz #VBW 3.0 MHz Sweep 2.427 ms (3641 pts)	10.0										940.000	000 MHz
1000 10000 100000	0.00										Sta	art Freq
Stop Freq 1.85000000 GHz 40.0 40.	-10.0									DL1 -13.00 dBm	30.000	000 MHz
30.0 40.0 40.0 50.0	-20.0										Sto	op Freq
4400 1	-30.0										1.850000	000 GHz
-50 0 -60 0 -60 0 -70 0 -7											(F Step
60.0 70.0 Start 0.0300 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Start 0.0300 GHz #VBW 3.0 MHz Start 0.0300 GHz #VBW 3.0 MHz Start 0.0300 GHz Start 0.041 pts)	-40.0									1		
4000 4000 4000 0 Hz 70.0 5000 5000 5000 Start 0.0300 GHz #VBW 3.0 MHz Sweep 2.427 ms (3641 pts)	-50.0	and the second sec		and a second and a second and a second as a second	*****	a the by so the abie for	A CONTRACTOR OF THE OWNER					
Start 0.0300 GHz Stop 1.8500 GHz #Res BW 1.0 MHz #VBW 3.0 MHz	-60.0										Free	-
Start 0.0300 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 2.427 ms (3641 pts)	-70.0											0 H2
#Res BW 1.0 MHz #VBW 3.0 MHz Sweep 2.427 ms (3641 pts)											Sca	Іе Туре
				#\/B\M	3 0 MHz			Sween_2	Stop 1.8	500 GHz	Log	Lin
	#Res DW	1.0 10112		#VDVV	5.0 WHZ			sweep z		our pis)		

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



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	pectrum Analy:												
I,XI RL	RF	50 Ω	AC	CORREC		SEI	ISE:INT	#Avg Typ	e: RMS		MNov 01, 2017 CE 1 2 3 4 5 6	Frequ	ency
				PNO: Fa	ast 🖵	Trig: Free Atten: 20				T١			
				II Guille					Mk	r1 16.98	3 0 GHz	Au	to Tune
10 dB/div Log	Ref 10	.00 dE	3m							-43	.38 dBm		
												Cen	ter Freg
0.00												15.000000	
-10.0											DL1 -13.00 dBm	St	artFreq
-20.0												10.00000	
-30.0												St	op Freq
									1			20.00000	
-40.0									2				
-50.0			والمسترجب والمراف	THE PERSON NAMES						al industrial days of		1 00000	CF Step
	Statistical Science	a line and the second	an debelant, ari	Marrie and Article	a hand have							<u>Auto</u>	Man
-60.0													
-70.0												Fre	q Offset
-70.0													0 Hz
-80.0													
												Sca	ale Type
	000 GHz									Stop 20	0.000 GHz	Log	<u>Lin</u>
#Res BV	/ 1.0 MHz	4		#	¢VBW	3.0 MHz		s	weep 2	5.33 ms (:	20001 pts)		
MSG									STATU	IS			

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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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7.4 Band Edge Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(h) RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)

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 v03 - 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 <u>></u> 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.

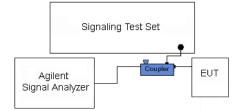


Figure 7-3. Test Instrument & Measurement Setup

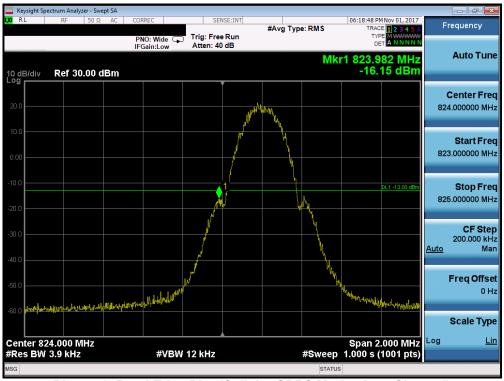
Test Notes

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.

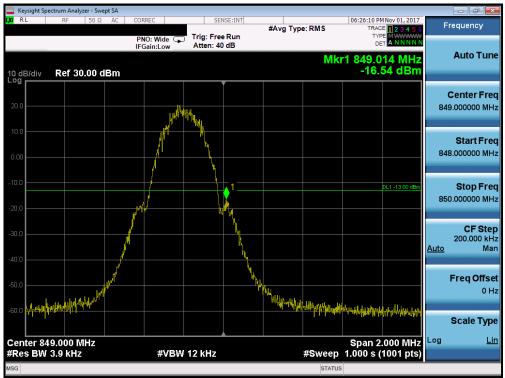
FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 55 of 111
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Cellular GPRS Mode



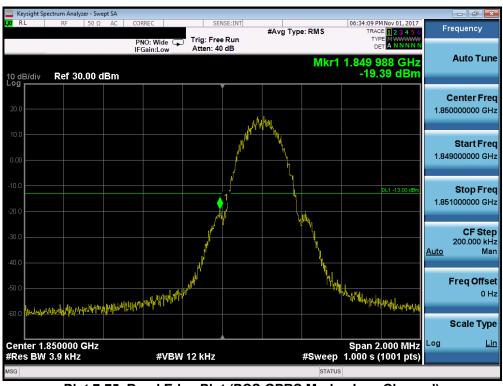
Plot 7-73. Band Edge Plot (Cellular GPRS Mode - Low Channel)



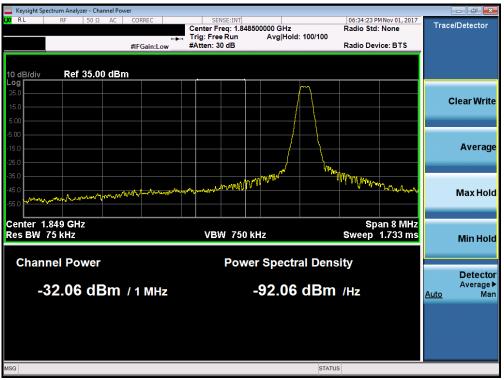
Plot 7-74. Band Edge Plot (Cellular GPRS Mode - High Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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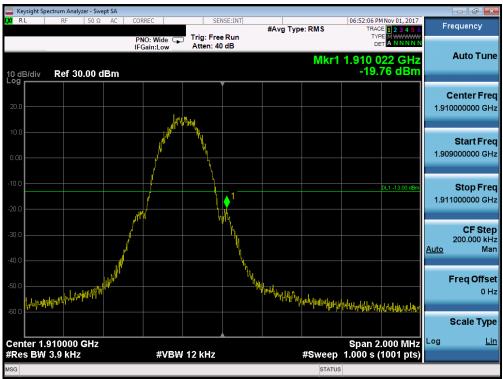
Plot 7-75. Band Edge Plot (PCS GPRS Mode - Low Channel)



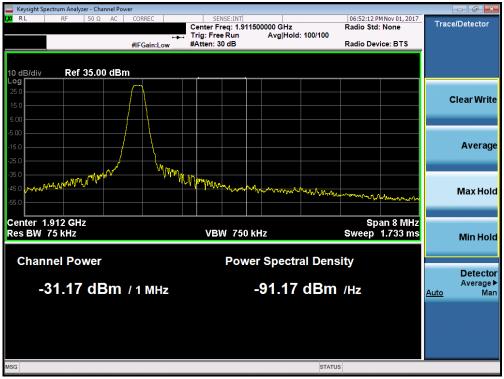
Plot 7-76. 4MHz Span Plot (PCS GPRS Mode - Low Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 57 of 111
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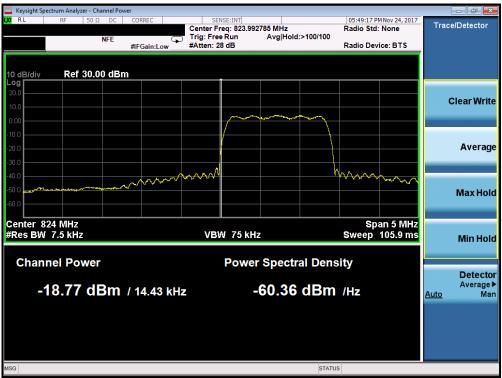


Plot 7-78. 4MHz Span Plot (PCS GPRS Mode - High Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Cellular CDMA Mode



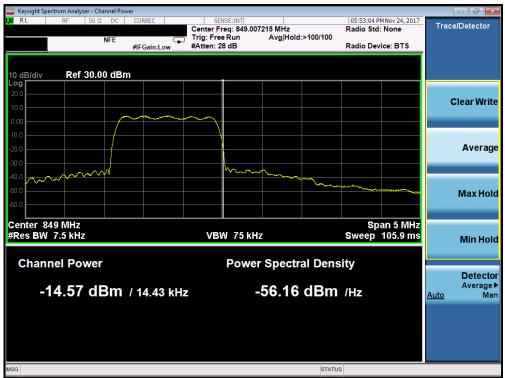
Plot 7-79. Band Edge Plot (Cellular CDMA Mode - Low Channel)



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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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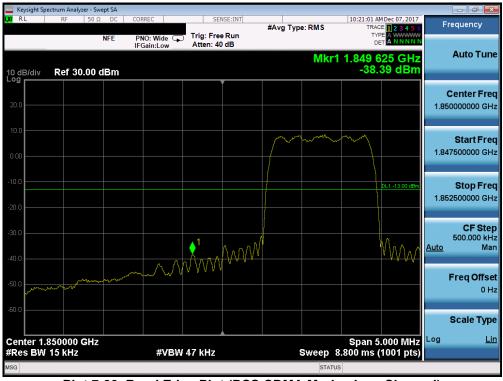




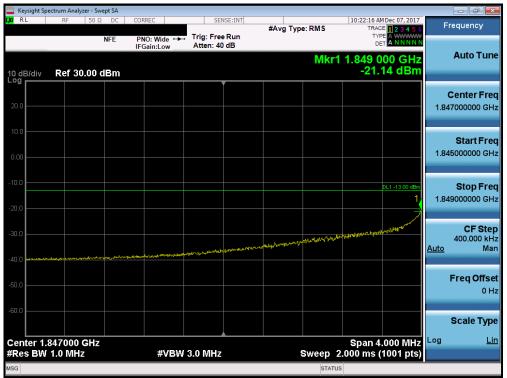
Plot 7-82. 4MHz Span Plot (Cellular CDMA Mode - High Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	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)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-86. 4MHz Span Plot (PCS CDMA Mode - High Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 62 of 111
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Cellular WCDMA Mode



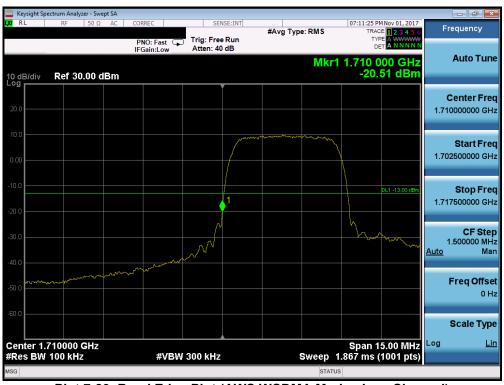
Plot 7-87. Band Edge Plot (Cellular WCDMA Mode - Low Channel)



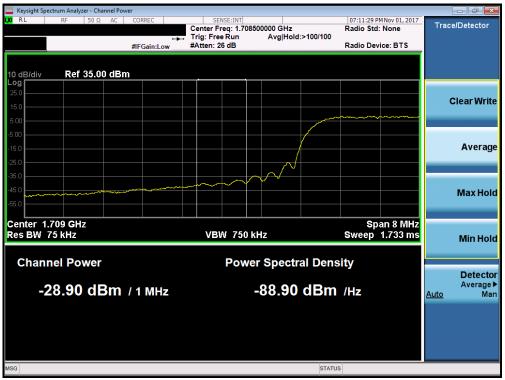
Plot 7-88. Band Edge Plot (Cellular WCDMA Mode - High Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 62 of 111
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Plot 7-89. Band Edge Plot (AWS WCDMA Mode - Low Channel)



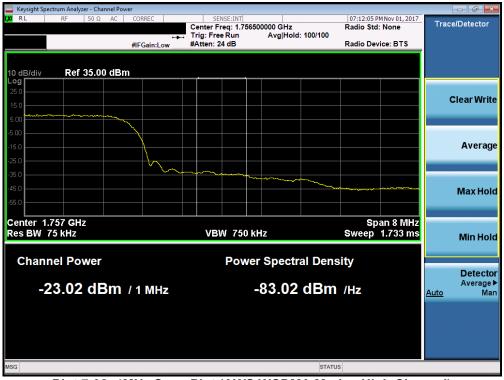
Plot 7-90. 4MHz Span Plot (AWS WCDMA Mode - Low Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 64 of 111
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Keysight Spectrum Ana						- 6 🔀
XIRL RF	50 Ω AC	CORREC PNO: Fast	SENSE:INT Trig: Free Run Atten: 40 dB	#Avg Type: RMS	07:12:00 PM Nov 01, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N	Frequency
10 dB/div Ref 3	0.00 dBm	II Gain.Low		Mkr	1 1.755 000 GHz -19.29 dBm	Auto Tune
20.0						Center Fred 1.755000000 GH:
0.00		- Commenter				Start Fre 1.747500000 GH
-20.0			1		DL1 -13.00 dBm	Stop Free 1.762500000 GH
30.0 40.0				munny		CF Ste 1.50000 MH <u>Auto</u> Ma
50.0					mann	Freq Offse 0 H
-60.0						Scale Typ
Center 1.755000 #Res BW 100 kH		#VBW	300 kHz	Sweep	Span 15.00 MHz 1.867 ms (1001 pts)	Log <u>Lir</u>
ISG				STATU	JS	





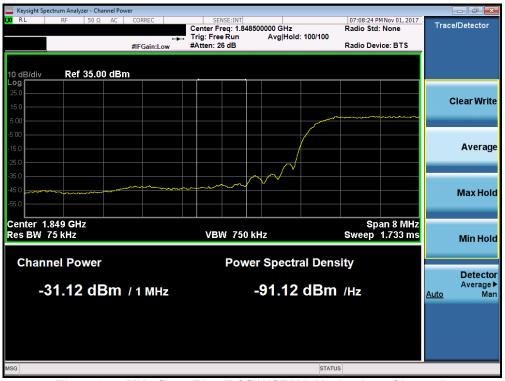
Plot 7-92. 4MHz Span Plot (AWS WCDMA Mode - High Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-93. Band Edge Plot (PCS WCDMA Mode - Low Channel)



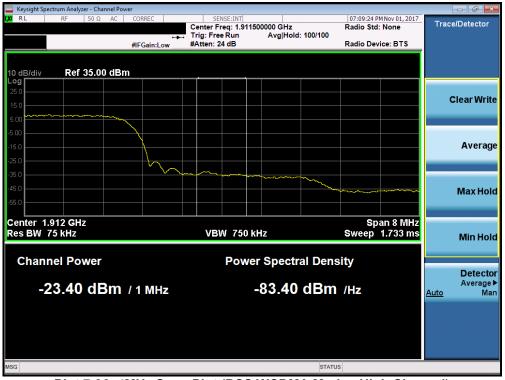
Plot 7-94. 4MHz Span Plot (PCS WCDMA Mode - Low Channel)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer - Swept SA					
XV RL	RF 50 Ω AC	PNO: Fast	SENSE:INT Trig: Free Run Atten: 40 dB	#Avg Type: RMS	07:09:15 PM Nov 01, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Frequency
0 dB/div	Ref 30.00 dBm			Mkr	1 1.910 000 GHz -18.85 dBm	Auto Tun
20.0						Center Free 1.910000000 GH
0.00		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Start Fre 1.902500000 GH
20.0			1		DL1 -13.00 dBm	Stop Fre 1.917500000 GH
30.0			- War	y		CF Ste 1.50000 MH <u>Auto</u> Ma
50.0				Viv	weeken war	Freq Offse 0 H
60.0						Scale Typ
Center 1.9 Res BW	910000 GHz 100 kHz	#VBW	300 kHz	Sweep	Span 15.00 MHz 1.867 ms (1001 pts)	Log <u>Li</u>
ISG				STATU	JS	





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

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 67 of 111
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FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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7.5 Peak-Average Ratio §24.232(d) RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)

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 v03 - 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.

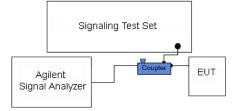


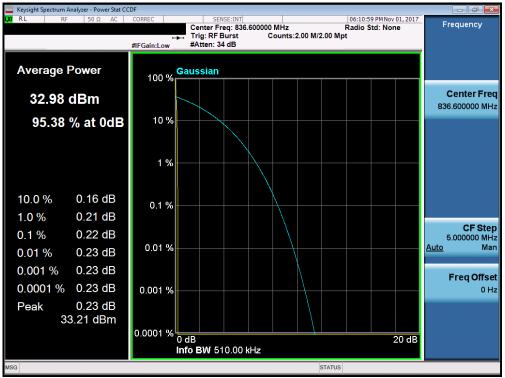
Figure 7-4. Test Instrument & Measurement Setup

Test Notes

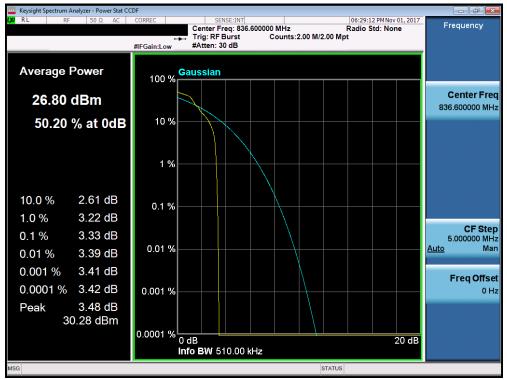
None

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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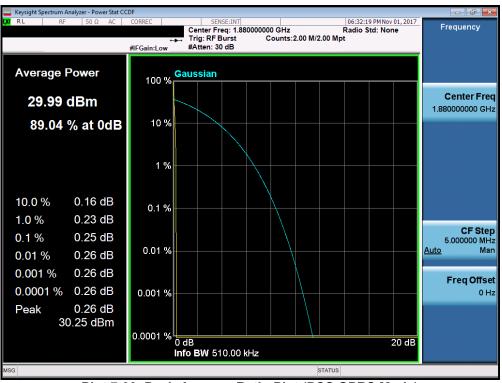




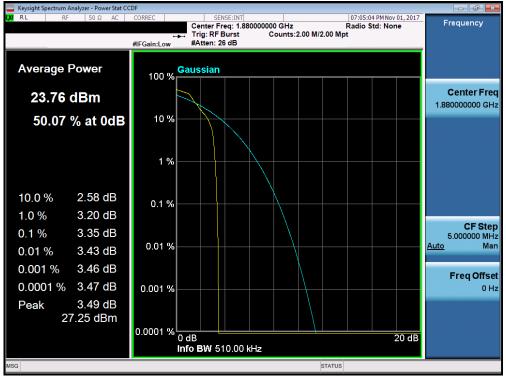
Plot 7-98. Peak-Average Ratio Plot (EDGE850 Mode)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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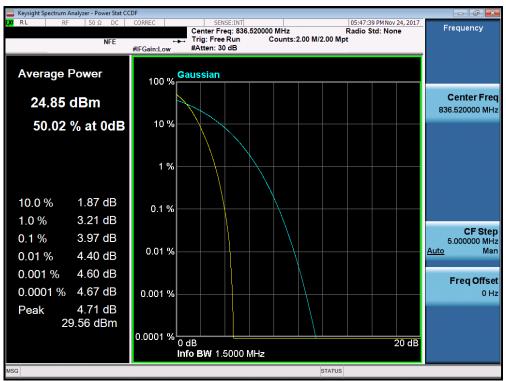




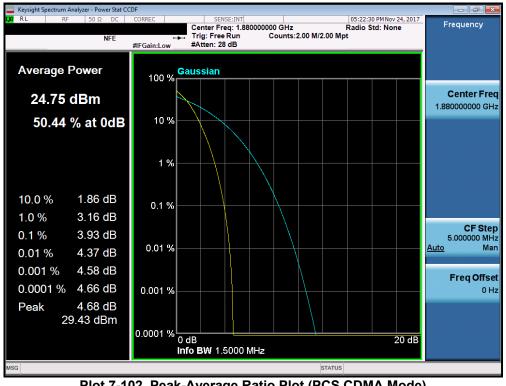
Plot 7-100. Peak-Average Ratio Plot (EDGE1900 Mode)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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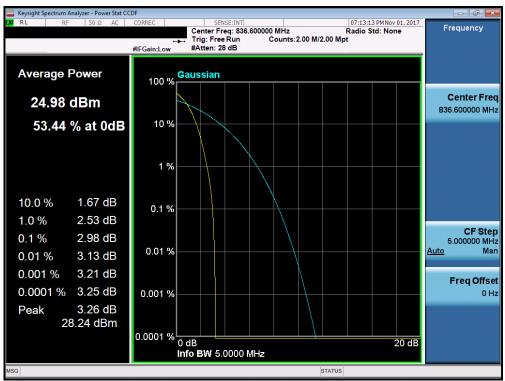




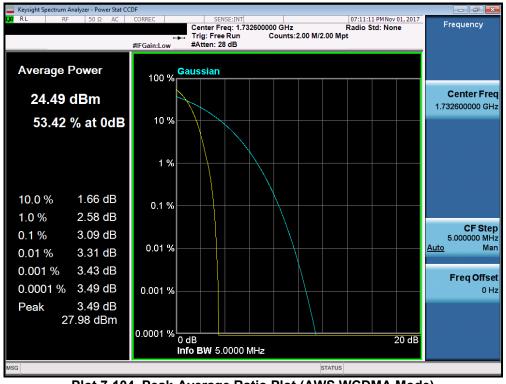
Plot 7-102. Peak-Average Ratio Plot (PCS CDMA Mode)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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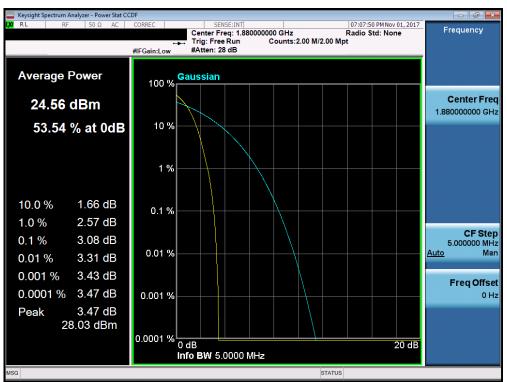




Plot 7-104. Peak-Average Ratio Plot (AWS WCDMA Mode)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-105. Peak-Average Ratio Plot (PCS WCDMA Mode)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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7.6 Radiated Power (ERP/EIRP) §22.913(a)(2) 24.232(c) 27.50(d)(4) RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03 - Section 5.2.1

ANSI/TIA-603-E-2016 - Section 2.2.17

Test Settings

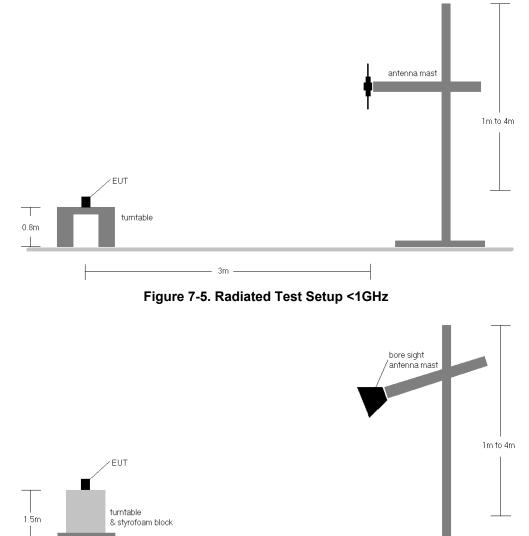
- Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
- 2. RBW = 1 5% of the expected OBW, not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

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Test Setup

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



ه» _____ Figure 7-6. Radiated Test Setup >1GHz

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- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) This device was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.20	GPRS850	V	150	346	27.85	1.50	27.20	0.524	38.45	-11.25	29.35	0.860	40.61	-11.26
836.60	GPRS850	V	150	346	28.66	1.50	28.01	0.633	38.45	-10.44	30.16	1.038	40.61	-10.44
848.80	GPRS850	V	150	351	29.65	1.50	29.00	0.794	38.45	-9.45	31.15	1.303	40.61	-9.46
848.80	GPRS850	н	150	242	28.89	1.50	28.24	0.667	38.45	-10.21	30.39	1.094	40.61	-10.22
848.80	EDGE850	V	150	351	22.86	1.50	22.21	0.166	38.45	-16.24	24.36	0.273	40.61	-16.25
848.80	GPRS850 (WCP)	V	150	2	23.07	1.50	22.42	0.174	38.45	-16.04	24.57	0.286	40.61	-16.04

 Table 7-2. ERP/EIRP (Cellular GPRS/EDGE)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	CDMA850	Н	150	17	21.56	1.50	20.91	0.123	38.45	-17.54	23.06	0.202	40.61	-17.55
836.52	CDMA850	н	150	22	21.59	1.50	20.94	0.124	38.45	-17.51	23.09	0.204	40.61	-17.52
848.31	CDMA850	н	150	14	21.49	1.50	20.84	0.121	38.45	-17.61	22.99	0.199	40.61	-17.62
836.52	CDMA850	V	150	10	21.35	1.50	20.70	0.117	38.45	-17.75	22.85	0.193	40.61	-17.76
836.52	CDMA850 (WCP)	Н	150	296	17.07	1.50	16.42	0.044	38.45	-22.03	18.57	0.072	40.61	-22.04

Table 7-3. ERP/EIRP (Cellular CDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
826.40	WCDMA850	V	150	51	21.06	1.50	20.41	0.110	38.45	-18.04	22.56	0.180	40.61	-18.05
836.60	WCDMA850	V	150	51	20.69	1.50	20.04	0.101	38.45	-18.41	22.19	0.166	40.61	-18.42
846.60	WCDMA850	V	150	51	20.63	1.50	19.98	0.100	38.45	-18.47	22.13	0.163	40.61	-18.48
826.40	WCDMA850	Н	150	351	19.76	1.50	19.11	0.081	38.45	-19.34	21.26	0.134	40.61	-19.35
826.40	WCDMA850 (WCP)	Н	150	8	20.72	1.50	20.07	0.102	38.45	-18.38	22.22	0.167	40.61	-18.39

020.40		150	0	20.72 1.50	20.07 0.10	2 30	-10.00	22.22	0.107 40.	-10.53		
	Table 7-4. ERP/EIRP (Cellular WCDMA)											
Frequence [MHz]	y Mode	Ant. Pol. [H/V]	Antenn Height [cm]		Substitute Level [dBm]	e Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]		
1712.40	WCDMA1700	V	150	325	15.83	5.63	21.46	0.140	30.00	-8.54		
1732.60	WCDMA1700	V	150	342	16.07	5.41	21.48	0.140	30.00	-8.52		
1752.60	WCDMA1700	V	150	337	16.83	5.19	22.02	0.159	30.00	-7.98		
1752.60	WCDMA1700	н	150	235	16.08	5.19	21.27	0.134	30.00	-8.73		
1752.60	WCDMA1700 (WCP)	V	150	305	15.00	5.19	20.19	0.104	30.00	-9.81		

Table 7-5. EIRP (AWS WCDMA)

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Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.20	GPRS1900	Н	150	305	25.94	4.82	30.76	1.191	33.01	-2.25
1880.00	GPRS1900	Н	150	125	23.94	4.74	28.68	0.738	33.01	-4.33
1909.80	GPRS1900	Н	150	300	23.35	4.68	28.03	0.635	33.01	-4.98
1850.20	GPRS1900	V	150	126	20.34	4.79	25.13	0.326	33.01	-7.88
1850.20	EDGE1900	н	150	305	20.06	4.74	24.80	0.302	33.01	-8.21
1850.20	GPRS1900 (WCP)	Н	150	306	24.06	4.74	28.80	0.759	33.01	-4.21

Table 7-6. EIRP (PCS GPRS/EDGE)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1851.25	CDMA1900	V	150	125	17.57	4.79	22.36	0.172	33.01	-10.65
1880.00	CDMA1900	V	150	311	18.38	4.84	23.22	0.210	33.01	-9.79
1908.75	CDMA1900	V	150	294	16.73	4.86	21.59	0.144	33.01	-11.42
1880.00	CDMA1900	Н	150	295	17.90	4.68	22.58	0.181	33.01	-10.43
1880.00	CDMA1900 (WCP)	V	150	297	14.46	4.84	19.30	0.085	33.01	-13.71

Table 7-7. EIRP (PCS CDMA)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1852.40	WCDMA1900	V	150	344	18.70	4.79	23.49	0.223	33.01	-9.52
1880.00	WCDMA1900	V	150	345	17.80	4.84	22.64	0.184	33.01	-10.37
1907.60	WCDMA1900	V	150	324	18.10	4.87	22.97	0.198	33.01	-10.04
1852.40	WCDMA1900	Н	150	37	17.38	4.81	22.19	0.166	33.01	-10.82
1852.40	WCDMA1900 (WCP)	V	150	300	16.36	4.79	21.15	0.130	33.01	-11.86

Table 7-8. EIRP (PCS WCDMA)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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7.7 Radiated Spurious Emissions Measurements §2.1053 §22.917(a) 24.238(a) 27.53(h) RSS-132(5.5) RSS-133(5.5) RSS-139(6.6)

Test Overview

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

Test Procedures Used

KDB 971168 D01 v03 – Section 5.8

ANSI/TIA-603-E-2016 - Section 2.2.12

Test Settings

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

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Lurntable styrofoam block 3m

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

Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) This device was tested under all RC and SO combinations and the worst case is reported with RC3/SO55 with "All Up" power control bits.
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 6) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 7) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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OPERATING FREQUENCY:	824	4.20	MHz
CHANNEL:	1	_	
MODULATION SIGNAL:	GPRS (GMSK)	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1648.40	Н	106	38	-67.18	9.01	-58.17	-45.2
2472.60	Н	170	360	-43.91	9.12	-34.79	-21.8
3296.80	Н	-	-	-61.23	9.37	-51.86	-38.9

Table 7-9. Radiated Spurious Data (Cellular GPRS Mode – Ch. 128)

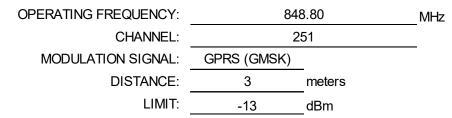
OPERATING FREQUENCY:836.60MHzCHANNEL:190MODULATION SIGNAL:GPRS (GMSK)DISTANCE:3LIMIT:-13dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.20	Н	357	171	-71.29	8.85	-62.44	-49.4
2509.80	Н	276	343	-53.27	9.17	-44.11	-31.1
3346.40	Н	-	-	-63.45	9.36	-54.09	-41.1
4183.00	Н	191	316	-63.55	10.19	-53.36	-40.4
5019.60	Н	-	-	-64.98	11.09	-53.89	-40.9

Table 7-10. Radiated Spurious Data (Cellular GPRS Mode – Ch. 190)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1697.60	Н	192	215	-66.94	8.67	-58.27	-45.3
2546.40	Н	348	360	-52.12	9.28	-42.84	-29.8
3395.20	Н	-	-	-61.71	9.46	-52.25	-39.2

Table 7-11. Radiated Spurious Data (Cellular GPRS Mode – Ch. 251)

OPERATING FREQUENCY:	848	3.80	MHz
CHANNEL:	2	_	
MODULATION SIGNAL:	GPRS (GMSK)	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1697.60	V	150	0	-61.59	4.91	-56.68	-43.7
2546.40	V	150	233	-48.05	5.28	-42.77	-29.8
3395.20	V	-	-	-58.40	6.39	-52.01	-39.0

Table 7-12. Radiated Spurious Data with WCP (Cellular GPRS Mode – Ch. 251)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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OPERATING FREQUENCY:	82	4.70	MHz
CHANNEL:	1	013	_
MODULATION SIGNAL:	CDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1649.40	н	-	-	-79.90	9.38	-70.52	-57.5
2474.10	Н	164	148	-72.59	8.57	-64.02	-51.0
3298.80	Н	-	-	-70.94	8.23	-62.70	-49.7

Table 7-13. Radiated Spurious Data (Cellular CDMA Mode – Ch. 1013)

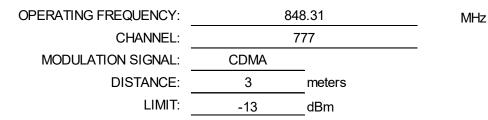
OPERATING FREQUENCY:	8	36.52	MHz
CHANNEL:	384		_
MODULATION SIGNAL:	CDMA		-
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

F	requency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
	1673.04	Н	-	-	-81.23	9.52	-71.71	-58.7
	2509.56	Н	100	339	-74.99	8.43	-66.56	-53.6
	3346.08	Н	-	-	-73.35	8.58	-64.77	-51.8

Table 7-14. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1696.62	Н	-	-	-80.22	9.66	-70.56	-57.6
2544.93	Н	100	339	-73.59	8.53	-65.06	-52.1
3393.24	Н	-	-	-71.39	8.92	-62.46	-49.5

Table 7-15. Radiated Spurious Data (Cellular CDMA Mode – Ch. 777)

OPERATING FREQUENCY:		836.52	
CHANNEL:		384	
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.04	Н	-	-	-80.33	9.52	-70.81	-57.8
2509.56	Н	294	76	-74.08	8.43	-65.65	-52.6
3346.08	Н	-	-	-72.46	8.58	-63.88	-50.9

Table 7-16. Radiated Spurious Data with WCP (Cellular CDMA Mode – Ch. 384)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	82	6.40	MHz
CHANNEL:	4132		_
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1652.80	Н	-	-	-79.62	8.85	-70.77	-57.8
2479.20	Н	-	-	-77.93	9.69	-68.24	-55.2
3305.60	Н	-	-	-73.78	9.53	-64.25	-51.2

Table 7-17. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

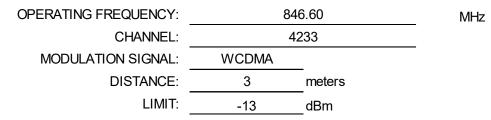
MHz	36.60	8	OPERATING FREQUENCY:
_	4183		CHANNEL:
' '		WCDMA	MODULATION SIGNAL:
	meters	3	DISTANCE:
	dBm	-13	LIMIT:

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.20	Н	-	-	-79.63	8.85	-70.79	-57.8
2509.80	Н	-	-	-77.32	9.78	-67.54	-54.5
3346.40	Н	-	-	-73.58	9.67	-63.91	-50.9

Table 7-18. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.20	Н	-	-	-79.11	8.85	-70.27	-57.3
2539.80	Н	-	-	-76.90	9.75	-67.15	-54.1
3386.40	Н	-	-	-73.97	9.80	-64.17	-51.2

Table 7-19. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

OPERATING FREQUENCY:	84	MHz	
CHANNEL:	4	_	
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.20	Н	-	-	-79.65	8.85	-70.80	-57.8
2539.80	Н	-	-	-77.81	9.69	-68.12	-55.1
3386.40	Н	-	-	-73.90	9.53	-64.37	-51.4

Table 7-20. Radiated Spurious Data with WCP (Cellular WCDMA Mode – Ch. 4233)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	171	2.40	MHz
CHANNEL:	1;	312	_
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3424.80	Н	158	214	-69.98	9.87	-60.11	-47.1
5137.20	Н	-	-	-71.66	10.76	-60.90	-47.9
6849.60	Н	-	-	-70.58	11.67	-58.91	-45.9

Table 7-21. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1312)

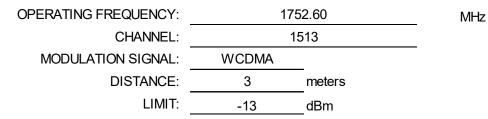
MHz	732.60	1	OPERATING FREQUENCY:
_	1413		CHANNEL:
-		WCDMA	MODULATION SIGNAL:
	meters	3	DISTANCE:
	dBm	-13	LIMIT:

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3465.20	Н	390	200	-72.07	9.91	-62.16	-49.2
5197.80	Н	-	-	-70.85	10.75	-60.11	-47.1
6930.40	Н	-	-	-70.20	11.76	-58.44	-45.4

Table 7-22. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1413)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3505.20	Н	281	200	-72.38	9.95	-62.43	-49.4
5257.80	Н	-	-	-71.38	10.71	-60.67	-47.7
7010.40	Н	-	-	-70.59	11.83	-58.76	-45.8

Table 7-23. Radiated Spurious Data (AWS WCDMA Mode – Ch. 1513)

OPERATING FREQUENCY:	17	12.40	MHz
CHANNEL:	1		
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3424.80	Н	187	191	-71.54	9.87	-61.67	-48.7
5137.20	Н	-	-	-71.68	10.76	-60.92	-47.9
6849.60	Н	-	-	-70.61	11.67	-58.94	-45.9

Table 7-24. Radiated Spurious Data with WCP (AWS WCDMA Mode – Ch. 1312)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	18	50.20	MHz
CHANNEL:	5	512	_
MODULATION SIGNAL:	GPRS (GMSK)	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3700.40	Н	309	235	-63.17	9.74	-53.43	-40.4
5550.60	Н	-	-	-68.47	10.97	-57.49	-44.5
7400.80	Н	-	-	-63.52	10.77	-52.75	-39.8
9251.00	Н	-	-	-64.46	12.28	-52.18	-39.2

Table 7-25. Radiated Spurious Data (PCS GPRS Mode – Ch. 512)

1880.00

661

meters

MHz

OPERATING FREQUENCY:

CHANNEL:

MODULATION SIGNAL:

ON SIGNAL: <u>GPRS (GMSK)</u> DISTANCE: 3

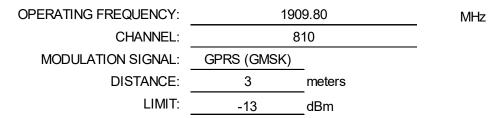
LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	Н	149	223	-64.10	9.50	-54.60	-41.6
5640.00	Н	150	358	-66.26	11.16	-55.10	-42.1
7520.00	Н	-	-	-64.65	11.03	-53.62	-40.6
9400.00	Н	-	-	-63.80	12.19	-51.61	-38.6
11280.00	Н	-	-	-64.07	13.15	-50.92	-37.9

Table 7-26. Radiated Spurious Data (PCS GPRS Mode – Ch. 661)

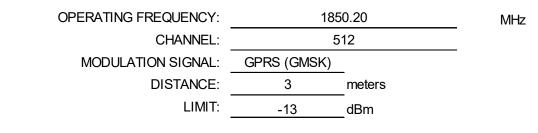
FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3819.60	Н	152	306	-62.08	9.29	-52.78	-39.8
5729.40	Н	-	-	-69.32	11.34	-57.98	-45.0
7639.20	Н	-	-	-65.25	11.28	-53.97	-41.0
9549.00	Н	-	-	-63.79	12.24	-51.56	-38.6

Table 7-27. Radiated Spurious Data (PCS GPRS Mode – Ch. 810)



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3700.40	V	150	328	-59.60	6.76	-52.84	-39.8
5550.60	V	150	27	-56.99	8.43	-48.56	-35.6
7400.80	V	-	-	-54.79	8.26	-46.53	-33.5
9251.00	V	-	-	-62.43	9.88	-52.55	-39.6

Table 7-28. Radiated Spurious Data with WCP (PCS GPRS Mode – Ch. 512)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	185	51.25	MHz
CHANNEL:	:	25	_
MODULATION SIGNAL:	CDMA	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3702.50	Н	116	46	-71.67	9.52	-62.15	-49.1
5553.75	Н	-	-	-71.61	11.02	-60.59	-47.6

Table 7-29. Radiated Spurious Data (PCS CDMA Mode – Ch. 25)

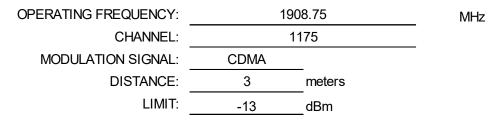
18	MHz	
(600	
CDMA		
3	meters	
-13	_dBm	
	CDMA 3	CDMA 3 meters

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	Н	115	49	-73.54	9.39	-64.15	-51.2
5640.00	Н	-	-	-72.73	11.22	-61.51	-48.5

Table 7-30. Radiated Spurious Data (PCS CDMA Mode – Ch. 600)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3817.50	Н	359	229	-71.03	9.32	-61.71	-48.7
5726.25	Н	-	-	-71.58	11.36	-60.22	-47.2

Table 7-31. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

OPERATING FREQUENCY:	18	MHz	
CHANNEL:	600		
MODULATION SIGNAL:	CDMA		
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

F	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
	3760.00	Н	-	-	-73.62	9.39	-64.23	-51.2

Table 7-32. Radiated Spurious Data with WCP (PCS CDMA Mode - Ch. 600)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	185	52.40	MHz
CHANNEL:	92	262	_
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	_meters	
LIMIT:	-13	_dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3704.80	Н	-	-	-71.99	9.52	-62.47	-49.5
5557.20	н	-	-	-71.15	11.03	-60.12	-47.1
7409.60	Н	-	-	-68.65	10.95	-57.69	-44.7

Table 7-33. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

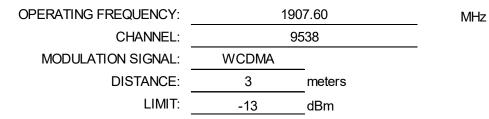
OPERATING FREQUENCY:	18	80.00	MHz
CHANNEL:	9400		_
MODULATION SIGNAL:	WCDMA		-
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	Н	312	31	-70.25	9.39	-60.86	-47.9
5640.00	Н	-	-	-72.54	11.22	-61.32	-48.3
7520.00	Н	-	-	-67.94	11.10	-56.84	-43.8

Table 7-34. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3815.20	Н	393	194	-70.91	9.32	-61.59	-48.6
5722.80	Н	-	-	-71.38	11.35	-60.03	-47.0
7630.40	Н	-	-	-67.12	11.32	-55.80	-42.8

Table 7-35. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

OPERATING FREQUENCY:	18	MHz	
CHANNEL:	ç		
MODULATION SIGNAL:	WCDMA		-
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	Н	173	75	-70.68	9.39	-61.29	-48.3
5640.00	н	-	-	-72.28	11.22	-61.06	-48.1
7520.00	Н	-	-	-67.93	11.10	-56.83	-43.8

Table 7-36. Radiated Spurious Data with WCP (PCS WCDMA Mode - Ch. 9400)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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7.8 Frequency Stability / Temperature Variation §2.1055 §22.355 §24.235 §27.54 RSS-132(5.3) RSS-133(6.3) RSS-139(6.4)

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, RSS-132 and RSS-133, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24 Part 27 and RSS-139, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test Procedure Used

ANSI/TIA-603-E-2016

Test Settings

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None

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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	190	
REFERENCE VOLTAGE:	4.30	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	836,600,110	110	0.0000131
100 %		- 30	836,600,017	17	0.0000020
100 %		- 20	836,599,920	-80	-0.0000096
100 %		- 10	836,600,156	156	0.0000186
100 %		0	836,600,026	26	0.0000031
100 %		+ 10	836,599,649	-351	-0.0000420
100 %		+ 20	836,599,986	-14	-0.0000017
100 %		+ 30	836,600,227	227	0.0000271
100 %		+ 40	836,600,065	65	0.0000078
100 %		+ 50	836,600,094	94	0.0000112
BATT. ENDPOINT	3.70	+ 20	836,600,121	121	0.0000145

 Table 7-37. Frequency Stability Data (Cellular GPRS Mode – Ch. 190)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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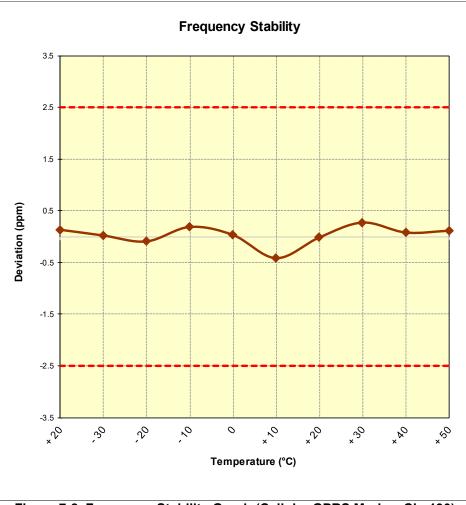


Figure 7-8. Frequency Stability Graph (Cellular GPRS Mode – Ch. 190)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	836,520,000	Hz
CHANNEL:	384	
REFERENCE VOLTAGE:	4.30	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	836,520,112	112	0.0000134
100 %		- 30	836,519,841	-159	-0.0000190
100 %		- 20	836,519,836	-164	-0.0000196
100 %		- 10	836,520,131	131	0.0000157
100 %		0	836,520,127	127	0.0000152
100 %		+ 10	836,519,930	-70	-0.0000084
100 %		+ 20	836,520,351	351	0.0000420
100 %		+ 30	836,520,309	309	0.0000369
100 %		+ 40	836,520,116	116	0.0000139
100 %		+ 50	836,520,070	70	0.0000084
BATT. ENDPOINT	3.70	+ 20	836,519,862	-138	-0.0000165

Table 7-38. Frequency Stability Data (Cellular CDMA Mode – Ch. 384)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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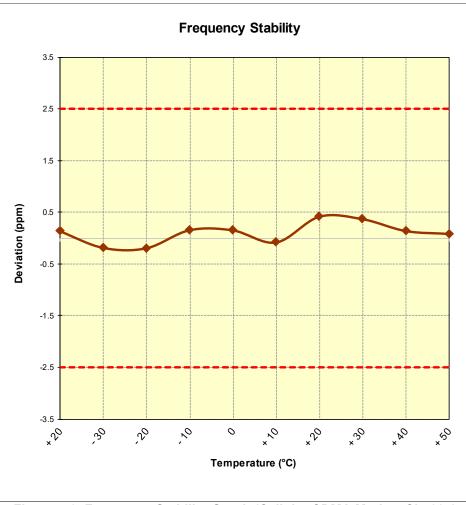


Figure 7-9. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	4183	
REFERENCE VOLTAGE:	4.30	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	_

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	836,599,802	-198	-0.0000237
100 %		- 30	836,600,325	325	0.0000388
100 %		- 20	836,600,176	176	0.0000210
100 %		- 10	836,600,083	83	0.0000099
100 %		0	836,599,909	-91	-0.0000109
100 %		+ 10	836,599,726	-274	-0.0000328
100 %		+ 20	836,600,377	377	0.0000451
100 %		+ 30	836,600,137	137	0.0000164
100 %		+ 40	836,600,066	66	0.0000079
100 %		+ 50	836,599,754	-246	-0.0000294
BATT. ENDPOINT	3.70	+ 20	836,599,685	-315	-0.0000377

Table 7-39. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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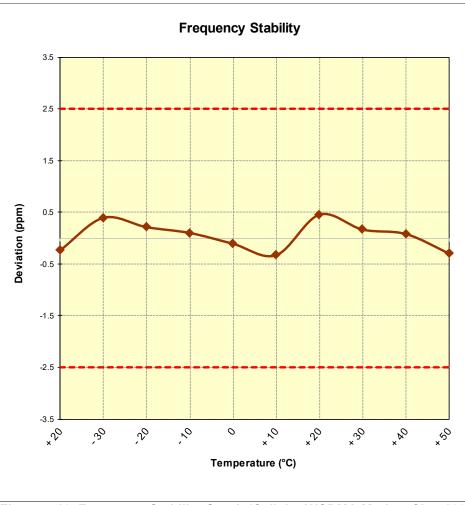


Figure 7-10. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,732,600,000	Hz
CHANNEL:	1413	
REFERENCE VOLTAGE:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	1,732,599,954	-46	-0.0000027
100 %		- 30	1,732,600,108	108	0.0000062
100 %		- 20	1,732,599,604	-396	-0.0000229
100 %		- 10	1,732,600,008	8	0.0000005
100 %		0	1,732,600,055	55	0.0000032
100 %		+ 10	1,732,600,036	36	0.0000021
100 %		+ 20	1,732,599,653	-347	-0.0000200
100 %		+ 30	1,732,600,073	73	0.0000042
100 %		+ 40	1,732,600,031	31	0.0000018
100 %		+ 50	1,732,600,216	216	0.0000125
BATT. ENDPOINT	3.70	+ 20	1,732,600,183	183	0.0000106

Table 7-40. Frequency Stability Data (AWS WCDMA Mode – Ch. 1413)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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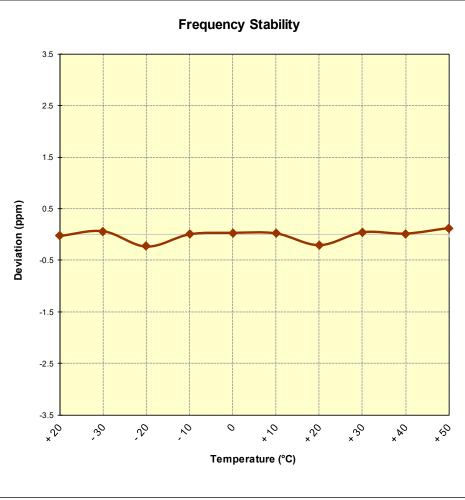


Figure 7-11. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	661	_
REFERENCE VOLTAGE:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	1,879,999,943	-57	-0.0000030
100 %		- 30	1,880,000,129	129	0.0000069
100 %		- 20	1,879,999,847	-153	-0.0000081
100 %		- 10	1,879,999,889	-111	-0.0000059
100 %		0	1,879,999,593	-407	-0.0000216
100 %		+ 10	1,879,999,836	-164	-0.0000087
100 %		+ 20	1,880,000,003	3	0.0000002
100 %		+ 30	1,879,999,976	-24	-0.0000013
100 %		+ 40	1,879,999,941	-59	-0.0000031
100 %		+ 50	1,880,000,184	184	0.0000098
BATT. ENDPOINT	3.70	+ 20	1,880,000,213	213	0.0000113

Table 7-41. Frequency Stability Data (PCS GPRS Mode – Ch. 661)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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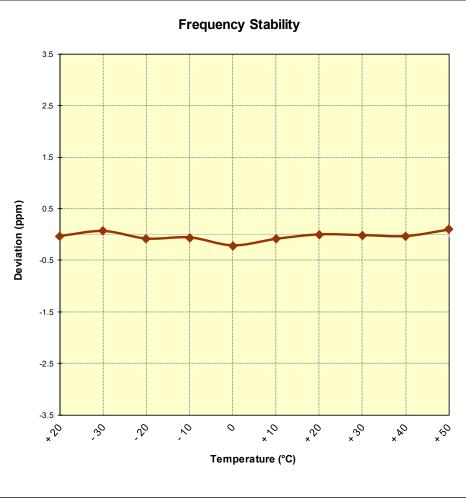


Figure 7-12. Frequency Stability Graph (PCS GPRS Mode – Ch. 661)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	600	
REFERENCE VOLTAGE:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	1,880,000,102	102	0.0000054
100 %		- 30	1,880,000,185	185	0.0000098
100 %		- 20	1,880,000,425	425	0.0000226
100 %		- 10	1,879,999,654	-346	-0.0000184
100 %		0	1,880,000,074	74	0.0000039
100 %		+ 10	1,880,000,152	152	0.0000081
100 %		+ 20	1,880,000,051	51	0.0000027
100 %		+ 30	1,879,999,914	-86	-0.0000046
100 %		+ 40	1,880,000,105	105	0.0000056
100 %		+ 50	1,879,999,945	-55	-0.0000029
BATT. ENDPOINT	3.70	+ 20	1,879,999,986	-14	-0.0000007

Table 7-42. Frequency Stability Data (PCS CDMA Mode – Ch. 600)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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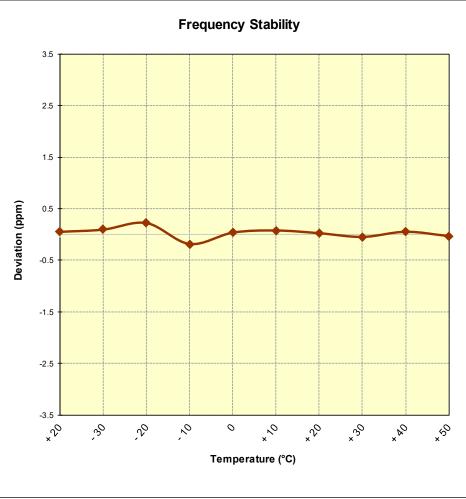


Figure 7-13. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	9400	
REFERENCE VOLTAGE:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	1,879,999,802	-198	-0.0000105
100 %		- 30	1,879,999,700	-300	-0.0000160
100 %		- 20	1,879,999,963	-37	-0.0000020
100 %		- 10	1,879,999,912	-88	-0.0000047
100 %		0	1,879,999,891	-109	-0.0000058
100 %		+ 10	1,880,000,207	207	0.0000110
100 %		+ 20	1,880,000,363	363	0.0000193
100 %		+ 30	1,879,999,908	-92	-0.0000049
100 %		+ 40	1,879,999,858	-142	-0.0000076
100 %		+ 50	1,879,999,865	-135	-0.0000072
BATT. ENDPOINT	3.70	+ 20	1,879,999,554	-446	-0.0000237

Table 7-43. Frequency Stability Data (PCS WCDMA Mode - Ch. 9400)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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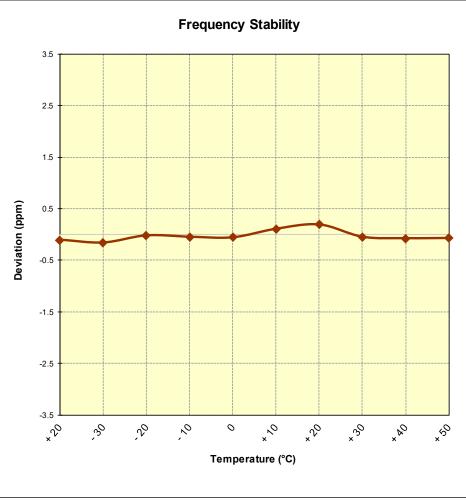


Figure 7-14. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG960U** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules and RSS-132, RSS-133, RSS-139 of the Innovation, Science and Economic Development Canada Rules.

FCC ID: A3LSMG960U IC: 649E-SMG960U		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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