

PCTEST ENGINEERING LABORATORY, INC.

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

#### **Applicant Name:**

Samsung Electronics Co., Ltd. 129, Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea Date of Testing: 11/02/2017-11/29/2017 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1711020282-02.A3L

#### FCC ID:

#### A3LSMJ250M

**APPLICANT:** 

Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: FCC Classification: FCC Rule Part(s): Test Procedure(s): Certification SM-J250M SM-J250M/DS Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 22, 24 & 27 ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03

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

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

Randy Ortanez President



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### MEASUREMENT REPORT GSM / GPRS / EDGE / 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
GSM850	22H	824.2 - 848.8	0.682	28.34	1.118	30.49	244KGXW
EDGE850	22H	824.2 - 848.8	0.248	23.94	0.406	26.09	243KG7W
WCDMA850	22H	826.4 - 846.6	0.076	18.78	0.124	20.93	4M17F9W
WCDMA1700	27	1712.4 - 1752.6			0.271	24.33	4M13F9W
GSM1900	24E	1850.2 - 1909.8			1.409	31.49	246KGXW
EDGE1900	24E	1850.2 - 1909.8			0.454	26.57	248KG7W
WCDMA1900	24E	1852.4 - 1907.6			0.295	24.70	4M14F9W

**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 facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. 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: A3LSMJ250M**. 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.: 05954, 03770, 06306

#### 2.2 Device Capabilities

This device contains the following capabilities:

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

#### 2.3 Test Configuration

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

#### 2.4 EMI Suppression Device(s)/Modifications

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

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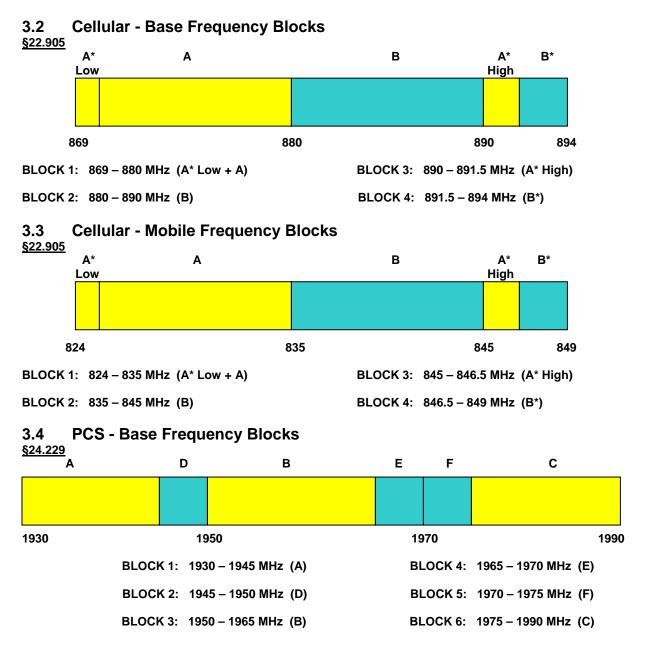


### 3.0 DESCRIPTION OF TESTS

#### 3.1 Evaluation Procedure

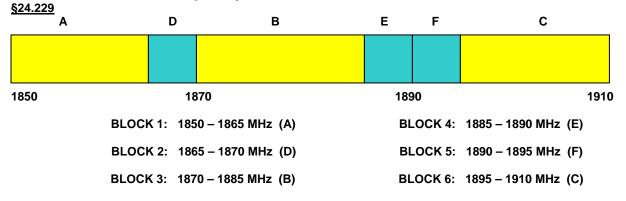
The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03) were used in the measurement of the EUT.

```
Deviation from Measurement Procedure......None
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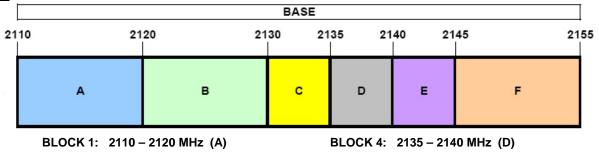




### 3.5 PCS - Mobile Frequency Blocks

## 3.6 AWS - Base Frequency Blocks





BLOCK 2: 2120 - 2130 MHz (B)

BLOCK 3: 2130 - 2135 MHz (C)

BLOCK 5: 2140 - 2145 MHz (E)

BLOCK 6: 2145 - 2155 MHz (F)

3.7 AWS - Mobile Frequency Blocks
-----------------------------------

<u>§27.5(h)</u>

	MOBILE						
17	10 17 	20 17	30 17	35 17	40 17	1 <b>45</b> 1	755
	A	В	с	D	E	F	
	BLOCK 1: 17	10 – 1720 MHz (A)		BLOCK	4: 1735 –	1740 MHz (D)	
	BLOCK 2: 17	20 – 1730 MHz (B)		BLOCK	5: 1740 –	1745 MHz (E)	
	BLOCK 3: 17	30 – 1735 MHz (C)		BLOCK	6: 1745 –	1755 MHz (F)	

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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	5/3/2017	Annual	5/3/2018	LTx2
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	6/21/2017	Annual	6/21/2018	RE1
Agilent	N9030A	PXA Signal Analyzer (44GHz)	3/27/2017	Annual	3/27/2018	MY52350166
Agilent	N9038A	MXE EMI Receiver	4/26/2017	Annual	4/26/2018	MY51210133
Agilent	E5515C	Wireless Communications Test Set	1/29/2016	Biennial	1/29/2018	GB46310798
COM-Power	AL-130R	Active Loop Antenna	6/5/2017	Annual	6/5/2018	121085
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	6/21/2017	Annual	6/21/2018	441119
Com-Power	PAM-118A	Pre-Amplifier	6/21/2017	Annual	6/21/2018	551042
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
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
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	12/5/2016	Biennial	12/5/2018	128338
Huber+Suhner	Sucoflex 102A	40GHz Radiated Cable	5/19/2017	Annual	5/19/2018	251425001
Mini Circuits	TVA-11-422	RF Power Amp	N/A		QA1317001	
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11403100002
Mini-Circuits	PWR-SEN-4RMS	USB Power Sensor	3/24/2017	Annual	3/24/2018	11210140001
PCTEST	-	EMC Switch System	6/21/2017	Annual	6/21/2018	N M2
Rhode & Schwarz	CMU 200	Base Station Simulator		N/A		107826
Rohde & Schwarz	ESU 26	EMI Test Receiver (26.5GHz)	4/19/2017	Annual	4/19/2018	100342
Rohde & Schwarz	SFUNIT-RX	Shielded Filter Unit	7/3/2017	Annual	7/3/2018	102133
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	102135
Schwarzbeck	U HA 9105	Dipole Antenna (400 - 1GHz) Rx	3/30/2016	Biennial	3/30/2018	9105-2404
Schwarzbeck	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/14/2016	Biennial	3/14/2018	A051107

#### Table 5-1. Test Equipment

#### Notes:

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

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### 6.0 SAMPLE CALCULATIONS

#### **GSM Emission Designator**

#### Emission Designator = 250KGXW

GSM 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)

#### 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:	A3LSMJ250M
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>GSM / GPRS / EDGE / WCDMA</u>

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	RSS-Gen (4.6.1) RSS-133(2.3) RSS-139(2.3)	Occupied Bandwidth	N/A		PASS	Section 7.2
2.1051 22.917(a) 24.238(a) 27.53(h)	RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Conducted Band Edge / Spurious Emissions	> 43 + log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of-band emissions		PASS	Sections 7.3, 7.4
24.232(d)	RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)	Peak-Average Ratio	< 13 dB	CONDUCTED	PASS	Section 7.5
2.1046	RSS-132(5.4) RSS-133(4.1) RSS-139(4.1)	Transmitter Conducted Output Power	N/A		PASS	RF Exposure Report
2.1055 22.355 24.235 27.54	RSS-132(5.3) RSS-133(6.3) RSS-139(6.4)	Frequency Stability	< 2.5 ppm (Part 22) Emission must remain in band (Part 24, 27)		PASS	Section 7.8
22.913(a.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 <sub>10</sub> (P[Watts]) for all out-of-band emissions		PASS	Section 7.7

#### Table 7-1. Summary of Test Results

#### Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "2G/3G Automation," Version 3.9.

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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.

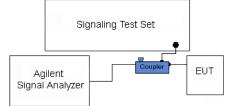


Figure 7-1. Test Instrument & Measurement Setup

#### Test Notes

#### None.

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



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

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



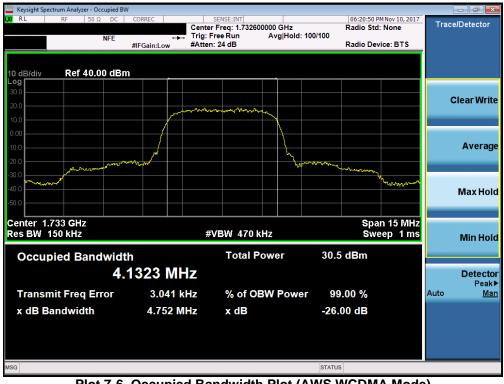
Plot 7-4. Occupied Bandwidth Plot (EDGE1900 Mode)

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



Plot 7-6. Occupied Bandwidth Plot (AWS WCDMA Mode)

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🪾 Keysight Spectrum Analyzer - Occupied B	W				
<b>LX/</b> RL RF 50Ω DC	CORREC	SENSE:INT r Freq: 1.88000000 GHz	08:06:09 PM Nov 08, 2017 Radio Std: None	Trace/Detector	
NFE	🛶 Trig: I	Free Run Avg Hold: 100/			
,	#IFGain:Low #Atter	n: 24 dB	Radio Device: BTS		
10 dB/div Ref 30.00 dBi	m				
20.0		ma malemente			
10.0				Clear Write	
0.00	/				
-10.0	/				
-20.0	/	\ \		Average	
-30.0			man		
-40.0			" Throwson		
-50.0				Max Hold	
-60.0				Maxitora	
Center 1.88 GHz Res BW 150 kHz	#	VBW 470 kHz	Span 15 MHz Sweep 1 ms	Min Hold	
NCS BW 150 KHZ	"		Owcep This		
Occupied Bandwid	th	Total Power	30.6 dBm		
4	.1441 MHz			Detector	
				Peak	
Transmit Freq Error	-2.256 kHz	% of OBW Power	99.00 %	Auto <u>Mar</u>	
x dB Bandwidth	4.747 MHz	x dB	-26.00 dB		
MSG			STATUS		

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

FCC ID: A3LSMJ250M		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 10<sup>th</sup> harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

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

#### Test Procedure Used

KDB 971168 D01 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.

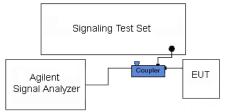


Figure 7-2. Test Instrument & Measurement Setup

#### Test Notes

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1MHz, 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.

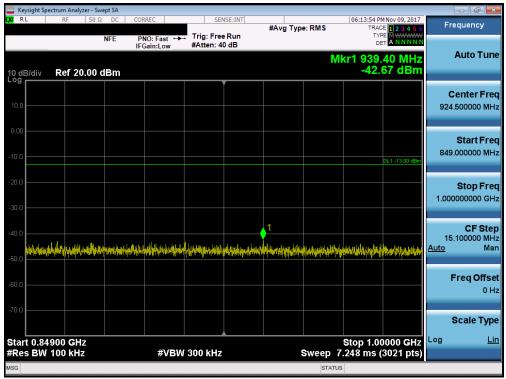
FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 40 af 04
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### Cellular GSM Mode

	oectrum Analyzer									- P	X
LXU RL	RF 5	i0Ω DC C	ORREC		SE:INT	#Avg Typ	e: RMS	TRAC	Nov 09, 2017 E 1 2 3 4 5 6	Frequenc	У
			PNO: Fast ↔ FGain:Low	Trig: Free #Atten: 40				TYP DE			
10 dB/div	Ref 20.0	0 dBm					Μ	kr1 822. -34.9	45 MHz 96 dBm	Auto T	Tune
				Ĭ						Center	Free
10.0										426.500000	) MH2
0.00										Start	Free
-10.0									DL1 -13.00 dBm	30.000000	MH2
-20.0										Stop	Ero
										823.000000	
-30.0											-
-40.0		an fan ar te san dae sta st			بالمراجع والمراجع المراجع		risk romanica da	والمعادية المحد الراري وال	e and second for the filler	79.300000 Auto	Step MHz Mar
-50.0	n (na tanàn tanàn mandritra Kaominina dia kaominina dia kaominina dia kaominina dia kaominina dia kaominina dia	an a	gelagengen generaliser Antoningka Mitorika Anto	and the first state of the second state of the	n te digen dan periodekan kal	an amala an Jaka	ر بنان المراجع المراجع المراجع المراجع	فأفهده ففقعا ساحرية ر	an a	Auto	Iviai
-60.0										Freq O	
											0 H:
-70.0										Scale 1	Туре
Start 30.0								Stop 8	2010 10112	Log	Lir
	100 kHz		#VBW	300 kHz		S			5861 pts)		
	0 MHz 100 kHz		#VBW	/ 300 kHz		s	STATUS	3.06 ms (1	2010 10112	Log	

Plot 7-8. Conducted Spurious Plot (Cellular GSM Mode - Low Channel)



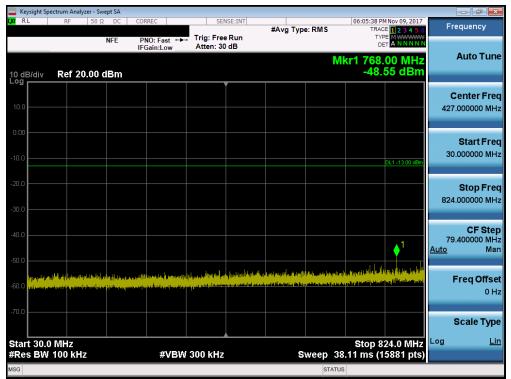
#### Plot 7-9. Conducted Spurious Plot (Cellular GSM Mode - Low Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer	- Swept SA					
LXU RL	RF 5	50 Ω DC	CORREC	SENSE:IN	#Avg Type:	06:14:05 PM Nov 09 RMS TRACE 1 2 3	456 Frequency
		NFE	PNO: Fast ++ IFGain:Low	#Atten: 40 dB			
10 dB/div	Ref 10.0	0 dBm				Mkr1 9.775 0 0 -20.76 d	
				Ĭ			Center Free
0.00							5.50000000 GH
-10.0						DL1 -13.0	Start Free
-20.0							1.00000000 GH:
-30.0		WINE DESIGN	patricipality and a second	alaan kangdilan (jarangila) Alaan kangdilan (jarangila)	and the second se	ng balan ng manang tinang silang silah ng Pang baran n Nang salah ng manang silan gitak ng silah ng si	Stop Free
-40.0			No.	induluila). Mila (n <sup>a</sup> la, siñon	and the state of the second se		10.000000000 GH
							CF Ste
-50.0							900.000000 MH Auto Ma
-60.0							
-70.0							Freq Offse
-80.0							
							Scale Type
Start 1.00 #Res BW	00 GHz 1.0 MHz		#VBW	3.0 MHz	Sw	Stop 10.000 ( eep 15.60 ms (18001	GHz Log <u>Li</u> pts)
MSG						STATUS	

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



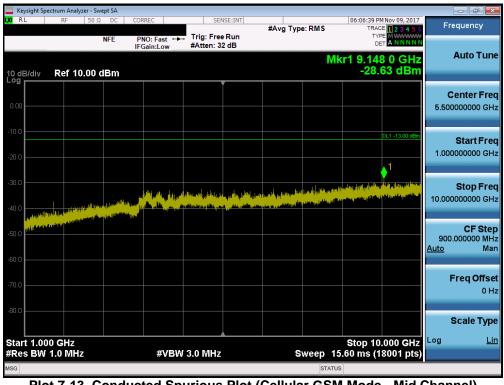
Plot 7-11. Conducted Spurious Plot (Cellular GSM Mode - Mid Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager					
Test Report S/N:	Test Dates:	EUT Type:		Dama 00 -4 04					
1M1711020282-02.A3L	11/02/2017-11/29/2017 Portable Handset			Page 20 of 84					
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	pectrum Analyzer -									
XIRL	RF 50	DΩ DC	CORREC	SEN	ISE:INT	#Avg Type	E: RMS		M Nov 09, 2017	Frequency
		NFE	PNO: Fast ++-	Trig: Free Atten: 30				TY		
			IFGain:Low	Atten: 30	ав					Auto Tu
10 dB/div	Ref 20.00	0 dBm					IVI	-49	40 MHz 12 dBm	
	Rei 20.00	UBIII								
										Center Fr
10.0										924.500000 M
0.00										Start Fr
										849.000000 M
-10.0									DL1 -13.00 dBm	
-20.0										
20.0										Stop Fr
-30.0										1.000000000 G
-40.0										CF Ste 15.100000 M
									1	Auto M
-50.0										
	تتقاول فالغاولية والمراجع	and the state of the second second	encemples and a second			rie dia anti-	المتلاية بالمرابط	and the other states in	With the second	Freq Offs
-60.0		11	or action as a fi			and the second secon	alore for a face.	- Andre Constraints	ten er en ditte da e	0
-70.0										Scale Ty
	4900 GHz								0000 GHz	
#Res BW	100 kHz		#VBW	300 kHz			sweep 7	.248 ms (	3021 pts)	
ISG							STATU	s		

Plot 7-12. Conducted Spurious Plot (Cellular GSM Mode - Mid Channel)



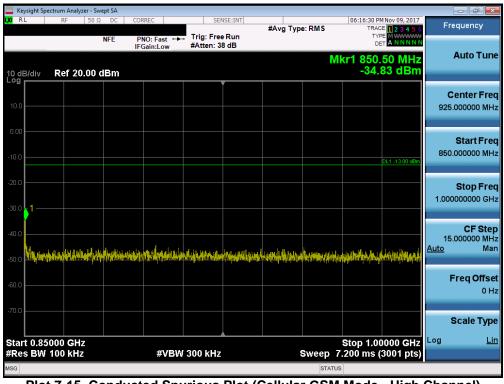
Plot 7-13. Conducted Spurious Plot (Cellular GSM Mode - Mid Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:						
1M1711020282-02.A3L	11/02/2017-11/29/2017	Portable Handset		Page 21 of 84				
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	pectrum Analyz											
XI RL	RF	50 Ω DC	COR	REC	SE	NSE:INT	#Avg Typ	e: RMS		MNov 09, 2017	Fr	equency
		NFE		O: Fast ↔	Trig: Fre				TYF			
	-		IFG	ain:Low	Atten: 3	0 00						Auto Tune
10 dB/div	Dof 20	.00 dBn	~					N	1kr1 815. -51	25 dBm		
	Rel 20	.00 UBII				<b>T</b>						
											(	Center Freq
10.0											427	.000000 MHz
0.00												Start Freq
40.0											30	0.000000 MHz
-10.0										DL1 -13.00 dBm		
-20.0												
												Stop Freq
-30.0											824	1.000000 WHZ
-40.0											70	CF Step .400000 MHz
										1	<u>Auto</u>	Man
-50.0												
and bard	undelse des Alder	hange over sales	lucitor plan	A. Depth Distance	, and the production	anne dennede	ayar kayana ayana	lock-belle (b) (As	and the state of the	a a constantination A survey of the state		Freq Offset
-60.0 1000 -60.0		a sha na	أ من شقة	and the standing of	in the second	الدان ما الألاف عام مولا. [19]	ية إليار بنتية. هذا المتحالي بلغ ا	i aladining taka ing	and the second part of here	and at the s		0 Hz
70.0												
-70.0												Scale Type
Start 30.									Stop 8	24.0 MHz	Log	Lin
	/ 100 kHz			#VBN	/ 300 kHz	:	s		8.11 ms (1	5881 pts)		
MSG								STATU	US			

Plot 7-14. Conducted Spurious Plot (Cellular GSM Mode - High Channel)



Plot 7-15. Conducted Spurious Plot (Cellular GSM Mode - High Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager				
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 84				
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	pectrum Analyze	er - Swept SA						
XI RL	RF	50 Ω DC	CORREC	SENS		ype: RMS	06:16:54 PM Nov 09, 2017 TRACE 1 2 3 4 5 6	Frequency
		NFE	PNO: Fast ↔ IFGain:Low	Trig: Free F #Atten: 38 d	lun	,,	TYPE M WWWWW DET A NNNN	
10 dB/div Log	Ref 10.	.00 dBm				M	kr1 9.130 5 GHz -22.59 dBm	Auto Tune
0.00								Center Freq 5.500000000 GHz
-10.0							DL1 -13.00 dBm 1 1 1 vib. p. 6 att.	<b>Start Freq</b> 1.000000000 GHz
-30.0	hopepest (techterste				, Marya Mala, Bandara ya Anton Marya Marya Marya Marya Antonia Marya Marya Marya Marya Marya Marya		الا تألف المراجعة واللغة والتكولي مراجع معالم المراجع والتكولي المراجع والتعليم والتعليم والتعليم والمراجع وال المراجع المراجع والتعليم والتع	<b>Stop Freq</b> 10.000000000 GHz
-50.0								CF Step 900.000000 MHz <u>Auto</u> Man
-70.0								Freq Offset 0 Hz
-80.0								Scale Type
Start 1.0 #Res BW	00 GHz / 1.0 MHz		#VB\	N 3.0 MHz		Sweep 1	Stop 10.000 GHz 5.60 ms (18001 pts)	Log <u>Lin</u>
MSG						STATU	S	

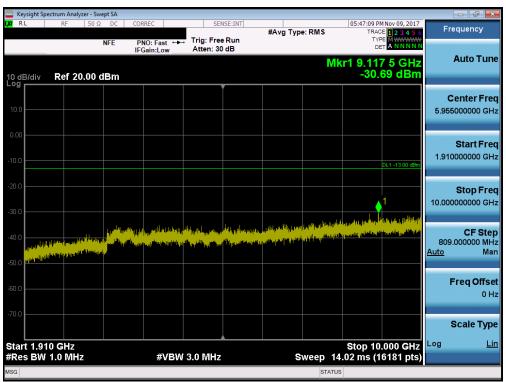
Plot 7-16. Conducted Spurious Plot (Cellular GSM Mode - High Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 22 of 84
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Keysight Spectrum Analyzer -						
C RL RF 50	NFE	PNO: Fast	SENSE:INT	#Avg Type: RMS	05:46:57 PM Nov 09, 2017 TRACE 1 2 3 4 5 6 TYPE M WWWWW DET A N N N N N	
10 dB/div Ref 20.00		IFGain:Low	Atten: 30 dB	М	kr1 1.575 0 GHz -40.96 dBm	• · · · • • •
10.0						Center Fre 937.500000 мн
10.0					DL1 -13.00 dBm	Start Fre 30.000000 M⊦
20.0						Stop Fre 1.845000000 G⊦
40.0	() of the second se	teriologic station of the		alala ne na	1 Rén di Santan di Manalangka santa Manalangka santa	CF Ste 181.500000 M⊢ <u>Auto</u> Ma
60.0						Freq Offs 0 H
70.0						Scale Typ
Start 0.0300 GHz Res BW 1.0 MHz		#VBW	3.0 MHz	Sweep	Stop 1.8450 GHz 2.420 ms (3631 pts)	Log <u>Li</u>
SG				STAT		

Plot 7-17. Conducted Spurious Plot (PCS GSM Mode - Low Channel)



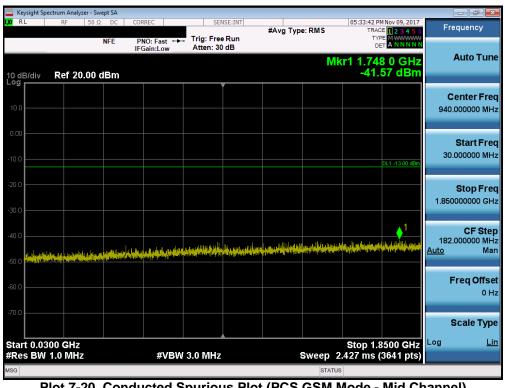
#### Plot 7-18. Conducted Spurious Plot (PCS GSM Mode - Low Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 24 of 84
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OBJ   Ref 10.00 dBm   355.22 dBm     0000   -355.22 dBm   -355.22 dBm     0000   -11   -11     00000   -11   -11		pectrum Analyze	r - Swept SA					
Indiana Documentation   Mikr1 19.610 5 GHz -35.22 dBm   Auto Turn     0 dB/div   Ref 10.00 dBm   -35.22 dBm   Center Fre     0 dB/div   Ref 10.00 dBm   -21.1300 dPm   Start Fre     10 0   -21.1300 dPm   -21.1300 dPm   -21.1300 dPm     20 0   -21.1300 dPm   -2	X/RL	RF		PNO: Fast	Trig: Free Run	#Avg Type: RMS	TRACE 1 2 3 4 5 6	Frequency
Center Free Center Free Cente	10 dB/div	Ref 10.	00 dBm	IFGain:Low	Atten: 20 dB	Μ	kr1 19.610 5 GHz	Auto Tune
200   2	0.00							Center Fre 15.000000000 GH
40 0   In the set of t	-10.0						DL1 -13.00 dBm	<b>Start Fre</b> 10.000000000 GH
500   CF Ste     600   CF Ste     700   CF Ste	-30.0	المعرب الألب والشعر	oblaine de companya de comp	dana	al day of the part of the set of spectra of the set		Annah yang digang bina da <sup>yan</sup> a ta <mark>yang digang bina da yang digang bi Bina da yang digang bina da yang digang digang digang digang digang bina da yang digang digang</mark>	<b>Stop Fre</b> 20.000000000 GH
70.0 20.0	50.0	di <sup>da</sup> ta da patrice este.	, sénéteten néres sittésteré	i De Berde <sub>re en d</sub> e se de la <sup>disertit</sup> e de la	nya yaninya danya katalan ani amini da			CF Ste 1.00000000 G⊢ <u>Auto</u> Ma
start 10.000 GHz Res BW 1.0 MHz #VBW 3.0 MHz Sweep 17.33 ms (20001 pts)								
Res BW 1.0 MHz     #VBW 3.0 MHz     Sweep     17.33 ms (20001 pts)	80.0	000 GHz					Stop 20 000-GHz	Scale Typ
	Res BW	1.0 MHz		#VBW	3.0 MHz		17.33 ms (20001 pts)	

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



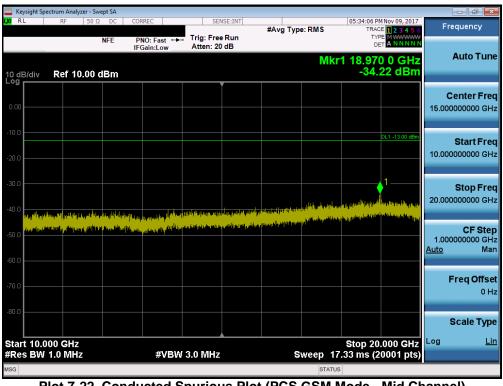
Plot 7-20. Conducted Spurious Plot (PCS GSM Mode - Mid Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 25 of 94
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	oectrum Analyzer -									-	5 ×
LXI RL	RF 50	0Ω DC	CORREC		NSE:INT	#Avg Typ	e: RMS	TRA	MNov 09, 2017 CE 1 2 3 4 5 6	Frequen	су
		NFE	PNO: Fast ++- IFGain:Low	Trig: Free Atten: 30				D			
10 dB/div Log	Ref 20.0	0 dBm					Μ	kr1 9.66 -30.	3 5 GHz 50 dBm	Auto	Tune
10.0										Center 5.95500000	
-10.0									DL1 -13.00 dBm	Start 1.91000000	t Freq 00 GHz
-20.0									1 dueste su dividuit	Stop 10.00000000	<b>Freq</b> 00 GHz
-40.0	Later de la Provinsi de Calendaria La ferra de la constante de Calendaria		kan di kang di sahiji di kang d Magang di kang d Magang di kang d	n Hispatis Angentingen Mare	Ally falling as yo Ally registered as a solution	l politik pyraf fan Sand Pi genetik sy p <sup>yle</sup> n yn <sup>parte</sup> r g	an a	na an ann an Albar Al an an Ann an Albar		CF 809.00000 <u>Auto</u>	Step MH: Mar
-60.0										FreqC	Offse 0 Hi
-70.0										Scale	
Start 1.9′ #Res BW			#VBW	3.0 MHz		s	weep 1	Stop 10 4.02 ms (*	).000 GHz 16181 pts)		Lin
MSG							STATU	JS			

Plot 7-21. Conducted Spurious Plot (PCS GSM Mode - Mid Channel)



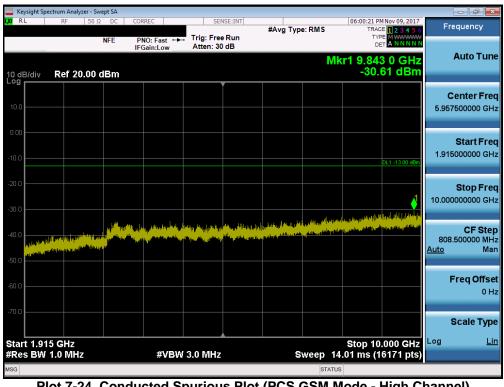
Plot 7-22. Conducted Spurious Plot (PCS GSM Mode - Mid Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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- ē ×								m Analyzer - Swej		
456 Frequency	06:00:06 PM Nov 09, 2017 TRACE 1 2 3 4 5 6	e: RMS	#Avg Typ	ISE:INT	SEI	REC	DC COF	RF 50 Ω	L	I <mark>XI</mark> RL
N N N	DET A N N N N				Trig: Free Atten: 30	O: Fast ↔→ ain:Low		١		
	r1 1.786 5 GHz -40.59 dBm	Mk					Bm	ef 20.00 d	3/div R	10 dB Log r
Center Fred										
940.000000 MHz										10.0
Start Fred										0.00
30.000000 MHz	DL1 -13.00 dBm									-10.0
Stop Fred										-20.0
1.850000000 GHz										-30.0
1 CF Step	<b>_</b> 1									-30.0
182.000000 MHz	and the second			والمتعادية والمتعادين	la, einigen die kiefen die	والمتعلقان فيعاريان	وفرورانية ورزيانه			-40.0
						a his grant, the time of the	and a straight of			-50.0
Freq Offset										-60.0
										-70.0
Scale Type										
	Stop 1.8500 GHz .427 ms (3641 pts)	Sween _2			3.0 MHz	#\/R\4			t 0.0300 s BW 1.0	
		Sweep Z.			5.0 14112	<i></i> 0 EVV		-141112	5 0 1 1.0	MSG

Plot 7-23. Conducted Spurious Plot (PCS GSM Mode - High Channel)



Plot 7-24. Conducted Spurious Plot (PCS GSM Mode - High Channel)

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	pectrum Analyze	er - Swept SA								
X/RL	RF	50 Ω DC NFE	CORREC	Trig: Free		#Avg Type	e:RMS	TRAC	M Nov 09, 2017 DE <b>1 2 3 4 5</b> 6 PE M WWWWW ET A N N N N N	Frequency
10 dB/div Log	Ref 10.	00 dBm	IFGain:Low	Atten: 20	dB		Mkr	1 18.84	9 5 GHz 27 dBm	Auto Tu
0.00										Center Fr 15.000000000 G
-10.0									DL1 -13.00 dBm	Start Fr 10.000000000 G
-30.0		, states of the system by the	Laborer and the second s	an in a subsection of the subsection of	nt herd fraules and seat	Apple and the	Lowerstweetst	Augher of the second second second	1 Narral Vy Pransalagang Antonio Katalagang	Stop Fr 20.000000000 G
50.0 <b>4.1.4</b> 10	allarit algorit	Lining of all printing in	la ben de la processa (na ben de la proces Martina de la processa (na ben de la proces Martina de la processa (na ben de la process	a gana Malayes Achatra (	et to Last of Design	in dia si anifa kanan ingenina.				CF St 1.00000000 G <u>Auto</u> M
70.0										Freq Offs 0
-80.0	000 GHz							Stop 20	.000 GHz	Scale Ty
	1.0 MHz		#VBV	V 3.0 MHz		S	weep 17	.33 ms (2	20001 pts)	
ISG							STATUS	5		

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

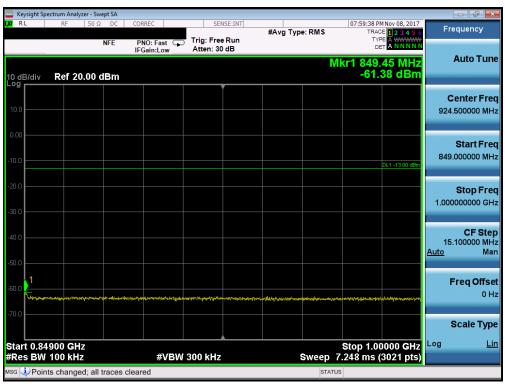
FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager					
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 94					
1M1711020282-02.A3L	11711020282-02.A3L 11/02/2017-11/29/2017 Portable Handset			Page 28 of 84					
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#### Cellular WCDMA Mode

	ectrum Analyzer - S										- 6 💌
X/RL	RF 50	Ω DC	CORREC			#Avg Type:	RMS	TRAC	E 1 2 3 4 5 6 E A WWWW A N N N N N	Free	quency
10 dB/div	Ref 20.00	dBm	IFGain:Low	Atten: 30	dВ		M	(r1 822.	80 MHz 03 dBm	4	Auto Tun
10.0											enter Fre
10.00									DL1 -13.00 dBm		Start Fre 000000 M⊦
20.0 30.0									1		<b>Stop Fre</b> Ю0000 МН
40.0										79.3 <u>Auto</u>	CF Ste 00000 M⊦ Ma
60.0									and the state of the	Fi	r <b>eq Offs</b> 0 H
70.0											cale Typ
Start 30.0 ≉Res BW	) MHz 100 kHz		#VBI	N 300 kHz		Sw	eep 38.	Stop 8: .06 ms (1	23.0 MHz 5861 pts)	Log	Li
SG							STATUS				

Plot 7-26. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)



Plot 7-27. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)

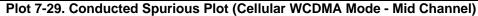
FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 20 of 84
1M1711020282-02.A3L	11/02/2017-11/29/2017	Portable Handset		Page 29 of 84
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Keysight Spectru											
XV RL	RF 50 \$	2 DC C	ORREC	SEI	ISE:INT	#Avg Typ	e: RMS		MNov 08, 2017 CE 1 2 3 4 5 6	Frequ	ency
		NFE	PNO: Fast 📮 FGain:Low	Trig: Free #Atten: 2		• //		TY	PE A WWWWW ET A N N N N N		
			FGain:Low	#Atten. 2	4 00		MI	<u>r1 9 15</u>	2 0 GHz	Au	to Tune
10 dB/div R	ef 10.00	dBm						-44.	53 dBm		
										Cent	er Freq
0.00										5.500000	
-10.0									DL1 -13.00 dBm	Sta	art Freq
-20.0										1.000000	
-30.0										St	op Freq
										10.000000	
-40.0									<b>♦</b> 1		
-50.0				Contraction of the second second						(	CF Step
				وي الأردة الأردة ال	fe different for a fi	and the second				900.000 <u>Auto</u>	000 MHz Mar
-60.0	and a state of the										
70.0										Free	q Offset
-70.0											0 Hz
-80.0											
										Sca	le Type
Start 1.000 (	GHz							Stop 10	0.000 GHz	Log	Lin
#Res BW 1.0			#VBW	3.0 MHz		S	weep 15	i.60 ms (1	18001 pts)		
MSG							STATUS	5			

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





FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		
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Keysight Spect				000050		_	CALOR TATE			07.55.55			ð   <b>-</b> 2
RL	RF	50 Ω	DC (	CORREC			ENSE:INT	#Avg Ty	pe: RMS	TRA	PM Nov 08, 2017 CE 1 2 3 4 5 6	Frequen	су
		NF		PNO: Fa IFGain:L	st 🖵 ow	Trig: Fr Atten: 3							
0 dB/div	Ref 20.	00 dB	m						Ν	/lkr1 849 -57	.65 MHz .24 dBm	Auto	Tur
							Ť						
10.0												Cente	
0.0												924.50000	
.00													
												Star 849.0000	
0.0											DL1 -13.00 dBm	849.00000	
0.0													-
												Stop 1.0000000	
0.0												1.00000000	50 01
												CF	= Ste
0.0												15.10000	
0.0												<u>Auto</u>	IVI
• <sup>1</sup>												Freq	Offe
0.0	abied to a start		te en la fabrica	- 100		and although to the						Treq	01
0.0													
												Scale	ту
tart 0.849										Stop 1.0	0000 GHz	Log	L
Res BW 1				#	VBW	300 kH	z		Sweep	7.248 ms	(3021 pts)		
3 🕕 Points	changed	t: all tra	ces cle	ared					STAT				





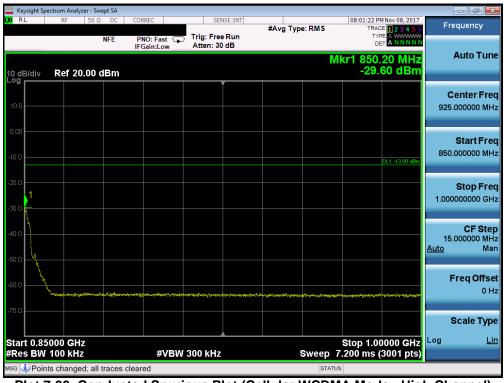
Plot 7-31. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		
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	ectrum Analyz										a X
X/RL	RF	50 Ω DC	CORREC	SE	NSE:INT	#Avg Type	RMS	TRA	MNov 08, 2017 CE 1 2 3 4 5 6	Freque	ency
		NFE	PNO: Fast IFGain:Low	Trig: Fre				TY	PE A WWWWW ET A NNNNN		
			IFGain:Low	Attent s	U U D		N		.00 MHz	Aut	o Tune
10 dB/div	Ref 20.	.00 dBm						-61.	35 dBm		
					Ĭ					Cent	er Freg
10.0										427.000	
0.00										Sta	art Freq
-10.0											000 MHz
									DL1 -13.00 dBm		
20.0										Sto	op Freq
										824.000	
30.0											
40.0											F Step
										79.400 Auto	000 MHz Man
50.0											
									1	Fred	Offset
-60.0	والمتحر والمرجوع والمحر والمحر		وبالمعاهد لعالما ورجرارهم و		a de palacemente de clasico	Line balles de la settime					0 Hz
70.0	in the second shall be set of the	dites source dails down	A REAL PROPERTY OF A REAL PROPERTY OF A	and a second distribution of the little distribu			to be a second				
										Sca	le Type
Start 30.0	MHz				<b></b>			Stop 8	24.0 MHz	Log	Lin
#Res BW			#V	BW 300 kHz	2	S	weep 3	8.11 ms (1	15881 pts)		
ISG							STATU	IS			

Plot 7-32. Conducted Spurious Plot (Cellular WCDMA Mode - High Channel)



Plot 7-33. Conducted Spurious Plot (Cellular WCDMA Mode - High Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 94
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	ectrum Analyze									C	
L <mark>XI</mark> RL	RF	50 Ω DC	CORREC	SEN	SE:INT	#Avg Typ	e' RMS		MNov 08, 2017 CE 1 2 3 4 5 6	Freq	uency
		NFE	PNO: Fast 🕞	Trig: Free #Atten: 26				TY	PE A WWWWW ET A N N N N N		
10 dB/div Log	Ref 10.0	00 dBm					M	(r1 9.82 -42	9 0 GHz .69 dBm	A	uto Tune
0.00											<b>nter Freq</b> 00000 GHz
-10.0									DL1 -13.00 dBm		S <b>tart Freq</b> 00000 GHz
-30.0											Stop Freq 00000 GHz
-50.0										900.00 <u>Auto</u>	<b>CF Step</b> 00000 MHz Man
-70.0										Fr	e <b>q Offset</b> 0 Hz
-80.0										So	c <b>ale Type</b> Lin
Start 1.00 #Res BW			#VBW	3.0 MHz		S	weep 15	Stop 10 6.60 ms (*	).000 GHz 18001 pts)	Log	
MSG							STATUS	-			

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

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 94
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### AWS WCDMA Mode

	ectrum Analyzer - S						
RL	RF 50	Ω DC NFE	CORREC PNO: Fast ↔ IFGain:Low	Trig: Free Run Atten: 30 dB	#Avg Type: RMS	06:25:01 PM Nov 10, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
) dB/div	Ref 20.00	dBm	IFGain:Low	Atten: 30 dB	N	lkr1 1.705 0 GHz -35.52 dBm	Auto Tur
0.0							Center Fre 867.500000 MH
.00 D.0						DL1 -13.00 dBm	Start Fre 30.000000 Mi
0.0 0.0							<b>Stop Fre</b> 1.705000000 GH
).0							CF Sto 167.500000 M <u>Auto</u> M
).0 <b></b>	anter-epi a plantati et Pertine	aliferaturi eta altiko	nan ar an	an a	arganun arginega ayan sayan sayangan ang masari ang masari ang masari ang masari ang masari ang masari ang mas Ing masari ang masari a		Freq Offs 01
tart 0.03	00 GHz					Stop 1.7050 GHz	Scale Typ
	1.0 MHz		#VBV	V 3.0 MHz	Sweep	Stop 1.7050 GHz 2.233 ms (3351 pts)	

Plot 7-35. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)



#### Plot 7-36. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		
1M1711020282-02.A3L	11/02/2017-11/29/2017	Portable Handset		Page 34 of 84
© 2017 PCTEST Engineering La	horatory Inc			V 7 1 10/25/2017



	ectrum Analyze							- 6 <b>-</b> X
L <mark>XI</mark> RL	RF	50 Ω DC	CORREC	SENSE:IN	#Avg Typ	e: RMS	06:25:44 PM Nov 10, 2017 TRACE 1 2 3 4 5 6	Frequency
		NFE	PNO: Fast ++-	Trig: Free Run Atten: 20 dB			TYPE A WAWWAW DET A N N N N N	
10 dB/div	Ref 10.	00 dBm	II GUILLEON			Mkr	1 18.924 5 GHz -42.60 dBm	Auto Tune
0.00								Center Freq 15.00000000 GHz
-10.0							DL1 -13.00 dBm	Start Freq
-20.0								10.000000000 GHz
-30.0								Stop Freq 20.00000000 GHz
-40.0								
-50.0				er gegen het og gen det er en sin som et ble het et er met gen var het over det ikke opgenerer var til det det				CF Step 1.000000000 GHz <u>Auto</u> Man
-70.0								Freq Offsel 0 Hz
-80.0								Scale Type
Start 10.0 #Res BW			#VBW	3.0 MHz	s	weep 17.	Stop 20.000 GHz .33 ms (20001 pts)	Log <u>Lin</u>
MSG						STATUS		

Plot 7-37. Conducted Spurious Plot (AWS WCDMA Mode - Low Channel)



Plot 7-38. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 25 of 04
1M1711020282-02.A3L	11/02/2017-11/29/2017	Portable Handset		Page 35 of 84
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	ctrum Analyz										×
LXI RL	RF	50 Ω DC	CORREC	SE	NSE:INT	#Avg Typ	e: RMS		PM Nov 10, 2017 ACE 1 2 3 4 5 6	Frequency	
		NFE	PNO: Fast					T	YPE A WWWWW DET A NNNN		
			IFGain:Lov	Atten: 3	Uab		_			Auto Tu	une
10 dB/div Log	Ref 20.	.00 dBm						-38	38 0 GHz .38 dBm		
					Ĭ					Center F	rea
10.0										5.877500000 0	
0.00										Oter at E	
										Start F 1.755000000 0	
-10.0									DL1 -13.00 dBm	1.755000000	312
-20.0											
-20.0										Stop F	
-30.0										10.00000000 0	GHz
									4		
-40.0								Mure allower all the second		CF St 824,500000 M	tep
			When the state					and its officers and the	and have a set of the set of the		Man
-50.0		and a standard and a									
										Freq Off	fset
-60.0											0 Hz
70.0											
-70.0										Scale T	vpe
Start 1.75								Stop 1	0.000 GHz	-	Lin
#Res BW	1.0 MHz		#V	BW 3.0 MHz		s			16491 pts)		
MSG							STA	TUS			

Plot 7-39. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)



Plot 7-40. Conducted Spurious Plot (AWS WCDMA Mode - Mid Channel)

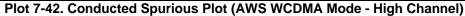
FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 26 of 94
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	ectrum Analyzer										
L <mark>XI</mark> RL	RF	50 Ω DC	CORREC	SEN	SE:INT	#Avg Type	e RMS		MNov 10, 2017	Fre	equency
		NFE	PNO: Fast ++- IFGain:Low	Trig: Free Atten: 30				TYF DE			
10 dB/div Log	Ref 20.0	00 dBm					M	kr1 1.66 -50.	2 5 GHz 51 dBm		Auto Tune
10.0											enter Freq .000000 MHz
-10.0									DL1 -13.00 dBm	30	Start Freq .000000 MHz
-20.0										1.710	Stop Freq
-40.0									1	168 <u>Auto</u>	CF Step 000000 MHz Man
-60.0	1997) - Miles Miles (1997) - All	Yangi da ang katang	ng ng kang ng mga ng kang ng ka	and the second secon	94494-19-3 <b>0094</b> 4-4494-8		n han pala an di fi 'n di fi na di na di			F	F <b>req Offset</b> 0 Hz
-70.0										:	Scale Type
Start 0.03 #Res BW			#VBW	3.0 MHz			Sweep 2	Stop 1.7 2.240 ms (	7100 GHz 3361 pts)	Log	<u>Lin</u>
MSG							STATU				

Plot 7-41. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)





FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		
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	ectrum Analyze							
X/RL	RF	50 Ω DC	CORREC	SENSE	INT #Avg Typ	e: RMS	06:27:45 PM Nov 10, 2017 TRACE 1 2 3 4 5 6	Frequency
		NFE	PNO: Fast ++- IFGain:Low	Trig: Free R #Atten: 36 d				
10 dB/div Log	Ref 10.	00 dBm				Mkr	1 19.228 0 GHz -26.69 dBm	Auto Tune
0.00								Center Freq 15.000000000 GHz
-10.0							DL1 -13.00 dBm	Start Fred 10.000000000 GHz
-30.0								Stop Fred 20.000000000 GHz
50.0								<b>CF Step</b> 1.000000000 GHz <u>Auto</u> Mar
70.0								Freq Offset 0 Hz
-80.0								Scale Type
Start 10.0 #Res BW			#VBW	3.0 MHz	S	Sweep 17	Stop 20.000 GHz .33 ms (20001 pts)	Log <u>Lin</u>
MSG						STATUS		

Plot 7-43. Conducted Spurious Plot (AWS WCDMA Mode - High Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 94
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Keysight R L	t Spectrum Analyzer	- Swept SA	CORREC	SENSE:INT		08:08:19 PM Nov 08, 2017	
KL	KF 3	NFE	PNO: Fast	Trig: Free Run Atten: 30 dB	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
0 dB/div	v Ref 20.0	0 dBm			M	kr1 1.845 0 GHz -41.37 dBm	Auto Tur
10.0							Center Fre 937.500000 Mi
.00 D.0						DL1 -13.00 dBm	Start Fr 30.000000 M
0.0 0.0							<b>Stop Fr</b> 1.845000000 G
						1	CF Sto 181.500000 M <u>Auto</u> M
0.0	national and a state of the sta		****	9-20-20-20-20-20-20-20-20-20-20-20-20-20-		9 wy anno 2000 a air an 19	Freq Offs 0
	0300 GHz					Stop 1.8450 GHz	Scale Ty
G G	W 1.0 MHz		#VBW	3.0 MHz	Sweep /	2.420 ms (3631 pts)	

Plot 7-44. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)



Plot 7-45. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 39 of 84
1M1711020282-02.A3L	11/02/2017-11/29/2017	Portable Handset	Fage 39 01 64
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	ectrum Analyz										- • •
XI RL	RF	50 Ω DC	CORREC	SE	NSE:INT	#Avg Typ	e: RMS		Nov 08, 2017	Freq	uency
		NFE	PNO: Fast	Trig: Fre				TYP			
			IFGain:Low	Atten: 2	Uab		MIL	r1 18.993		A	uto Tune
10 dB/div Log	Ref 10.	00 dBm						-41.9	98 dBm		
					Ĭ					Ce	nter Fred
0.00											00000 GHz
-10.0									DL1 -13.00 dBm		tart Fred
											00000 GHz
-20.0											
-30.0											
											top Fred
-40.0										20.00000	00000 GH2
				and the distance of	. Indunia and	And the part of the last of the second	<b>Hereiter</b>	for a free particular and the	and a state of a state of a		05.04
-50.0	line and a state of the	and the second secon	in the second	فيمع ونظر وأنتاف الترجي وال					'	1.00000	CF Step
										<u>Auto</u>	Man
-60.0											
-70.0										En	eq Offset
10.0											0 Hz
-80.0											
										Sc	ale Type
Start 10.0	000 GHz							Stop 20	.000 GHz	Log	Lin
	1.0 MHz		#VE	3W 3.0 MHz		s	weep 1	7.33 ms (2	0001 pts)	_	
ısg 🕕 Poir	nts changed	; all traces (	cleared				STATU				

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



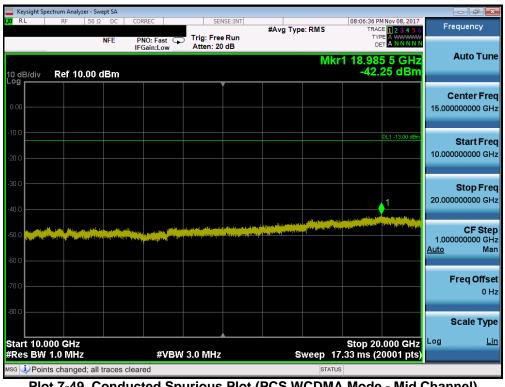
Plot 7-47. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 40 of 94
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	ectrum Analyze										
XI RL	RF	50 Ω DC	CORREC	SEN	ISE:INT	#Avg Typ	e RMS		MNov 08, 2017 DE 1 2 3 4 5 6	Freq	uency
		NFE	PNO: Fast	Trig: Free		#/ US 1 ) P		TY			
			IFGain:Low	Atten: 30	dB						uto Tune
							Mk	r1 9.78	6 5 GHz		
10 dB/div Log	Ref 20.	00 dBm						-38.	36 dBm		
				· `	Í					Ce	nter Freq
10.0											00000 GHz
										0.5000	00000 0112
0.00											
										S	start Freq
-10.0									DL1 -13.00 dBm	1.9100	00000 GHz
									DL1 -13.00 dBm		
-20.0											stop Freq
											00000 GHz
-30.0										10.0000	J0000 GH2
									1		
-40.0						<u> </u>		THE OWNER WHEN		800.00	CF Step
				No. No.			and the second	and the set of the set	fam. of a	Auto	Man
-50.0											
-turner										Er	eq Offset
-60.0										ГІ	eq Onsei 0 Hz
											0 112
-70.0											
										So	ale Type
Start 1.9 <sup>°</sup>								Stop 40	.000 GHz	Log	Lin
	1.0 GH2		#VBW	/ 3.0 MHz		s	weep 14	.02 ms (1	6181 pts)		
		; all traces c					STATUS	·			
	no enungeu	, an traces c	louiou				0				

Plot 7-48. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)



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

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		
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	ectrum Analyze										
L <mark>XI</mark> RL	RF	50 Ω DC	CORREC	SEN	ISE:INT	#Avg Typ	e: RMS		MNov 08, 2017	Fr	equency
		NFE	PNO: Fast	Trig: Free Atten: 30		• •		TYP			
			IFGdIII.LOW	The second	45		M	r1 1 84	2 0 GH7		Auto Tune
10 dB/div Log	Ref 20.	00 dBm						-50.	2 0 GHz 31 dBm		
209										C	enter Freg
10.0											.000000 MHz
0.00											Start Freq
-10.0										30	.000000 MHz
									DL1 -13.00 dBm		
-20.0											Stop Freq
										1.850	000000 GHz
-30.0											
-40.0											CF Step
									1	182 <u>Auto</u>	.000000 MHz Man
-50.0						and the state of t					
		- Andrew Construction								F	req Offset
-60.0											0 Hz
-70.0											
										:	Scale Type
Start 0.03	00 GHz							Stop 1.8	3500 GHz	Log	Lin
#Res BW			#VBW	3.0 MHz			Sweep 2	.427 ms (	3641 pts)		
MSG							STATUS				

Plot 7-50. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)



Plot 7-51. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ctrum Analyz										
LX/RL	RF	50 Ω DC	CORREC	SEN	SE:INT	#Avg Typ	e: RMS		MNov 08, 2017 DE 1 2 3 4 5 6	Frequ	ency
		NFE	PNO: Fast G	Trig: Free Atten: 20				TY	PE A WWWWW A NNNNN		
			IFGall:LOW	Atten: 20	ub		Mk	(r1 19.12	0 5 GHZ	Au	to Tune
10 dB/div Log	Ref 10.	.00 dBm						-42.	61 dBm		
Log										Cent	ter Freg
0.00										15.000000	
-10.0									DL1 -13.00 dBm	Sta	art Freq
-20.0										10.00000	000 GHz
-30.0										St	op Freq
-40.0									<b>1</b>	20.00000	000 GHz
-40.0							الفريسية بعانين	and the second second second second			
-50.0			And and a state of the		ar a far an			Contraction of the local division of the loc			CF Step
										Auto	Man
-60.0											
-70.0										Fre	q Offset
10.0											0 Hz
-80.0											
										Sca	le Type
Start 10.0								Stop 20	.000 GHz	Log	Lin
#Res BW				V 3.0 MHz		S		17.33 ms (2	20001 pts)		
мsg 횢 Point	s changed	d; all traces	cleared				STAT	US			

Plot 7-52. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)

FCC ID: A3LSMJ250M		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.

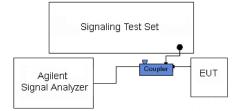


Figure 7-3. Test Instrument & Measurement Setup

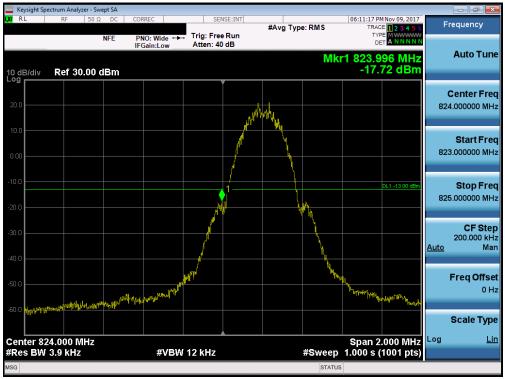
#### Test Notes

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.

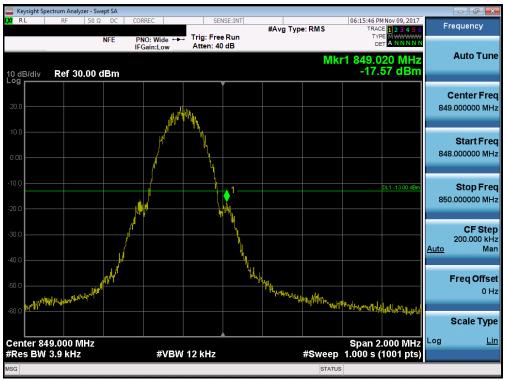
FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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## Cellular GSM Mode



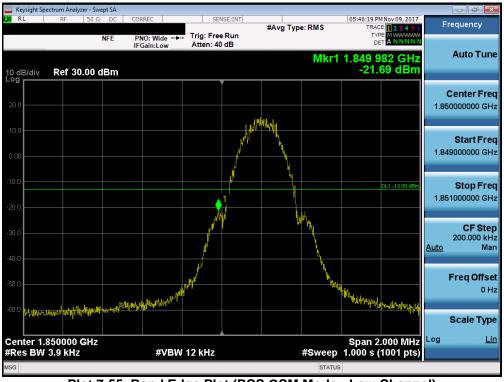
Plot 7-53. Band Edge Plot (Cellular GSM Mode - Low Channel)



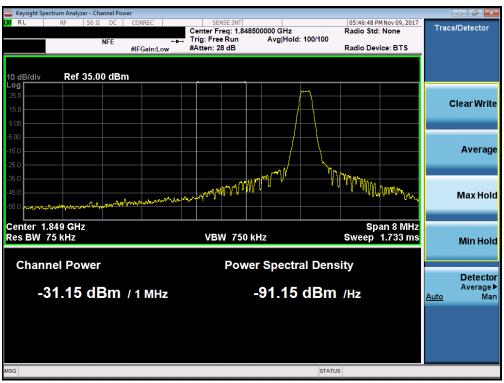
#### Plot 7-54. Band Edge Plot (Cellular GSM Mode - High Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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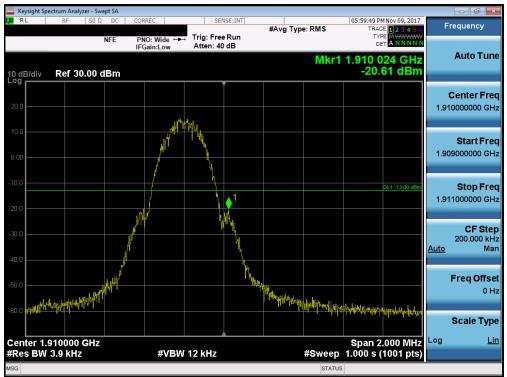
Plot 7-55. Band Edge Plot (PCS GSM Mode - Low Channel)



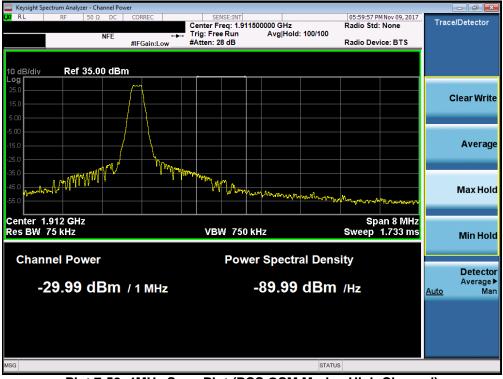
#### Plot 7-56. 4MHz Span Plot (PCS GSM Mode - Low Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-57. Band Edge Plot (PCS GSM Mode - High Channel)



Plot 7-58. 4MHz Span Plot (PCS GSM Mode - High Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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### Cellular WCDMA Mode



Plot 7-59. Band Edge Plot (Cellular WCDMA Mode - Low Channel)



#### Plot 7-60. Band Edge Plot (Cellular WCDMA Mode - High Channel)

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## AWS WCDMA Mode



Plot 7-61. Band Edge Plot (AWS WCDMA Mode - Low Channel)



#### Plot 7-62. 4MHz Span Plot (AWS WCDMA Mode - Low Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	pectrum Analyze	r - Swept SA						- 6 - ×
XI RL	RF	50 Ω DC NFE	CORREC	SENSE:IN	#Avg Typ	e:RMS	06:26:17 PM Nov 10, 2017 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A N N N N N	Frequency
10 dB/div	Ref 30.0	00 dBm	IFGain:Low	Atten: 40 dB		Mkr	1 1.755 000 GHz -23.021 dBm	
20.0								Center Fre 1.755000000 GH
0.00		$\int$	an a frances and the second					<b>Start Fre</b> 1.747500000 GH
-10.0				<sup>1</sup>			DL1 -13.00 dBm	<b>Stop Fre</b> 1.762500000 GH
30.0	m	N			Same and the second sec	w		CF Ste 1.500000 M⊦ <u>Auto</u> Ma
50.0							- marine	Freq Offs 0 F
60.0								Scale Typ
	.755000 G 100 kHz	HŻ	#VBV	V 300 kHz		Sweep	Span 15.00 MHz 1.000 ms (1001 pts)	
ISG						STATU	IS	

Plot 7-63. Band Edge Plot (AWS WCDMA Mode - High Channel)



Plot 7-64. 4MHz Span Plot (AWS WCDMA Mode - High Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-65. Band Edge Plot (PCS WCDMA Mode - Low Channel)



#### Plot 7-66. 4MHz Span Plot (PCS WCDMA Mode - Low Channel)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer -										
LXI RL	RF 5	DΩ DC	CORREC	SE	NSE:INT	#Avg Typ	e: RMS	08:09:32 F	CE 1 2 3 4 5 6	F	requency
		NFE	PNO: Wide					TY			
			IFGain:Low	Atten: 4			Miles				Auto Tune
	D-6 20 0	0 dDm					IVIKE	-24	000 GHz .18 dBm		
10 dB/div Log	Ref 30.0	и авт									
										(	Center Freq
20.0										1.91	0000000 GHz
10.0											Start Freq
		مسمر	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m						1.00	2500000 GHz
0.00		1								1.90	2500000 GH2
-10.0									DL1 -13.00 dBm		Stop Freq
-20.0					1					1.91	7500000 GHz
-20.0					• '						
-30.0	[	√ _			h						CF Step
-30.0										Auto	1.500000 MHz Man
-40.0	~~~~				M					Auto	Ivian
~~~~							200				_
-50.0							- may	hmm	-		Freq Offset
											0 Hz
-60.0											
											Scale Type
Center 1	910000 GF	7						Snap	15.00 MHz	Log	Lin
#Res BW		12	#V	BW 300 kHz			Sweep	1.000 ms	15.00 MHz (1001 pts)		
MSG							STAT				

Plot 7-67. Band Edge Plot (PCS WCDMA Mode - High Channel)



Plot 7-68. 4MHz Span Plot (PCS WCDMA Mode - High Channel)

FCC ID: A3LSMJ250M		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.

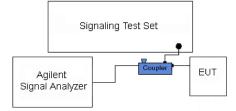


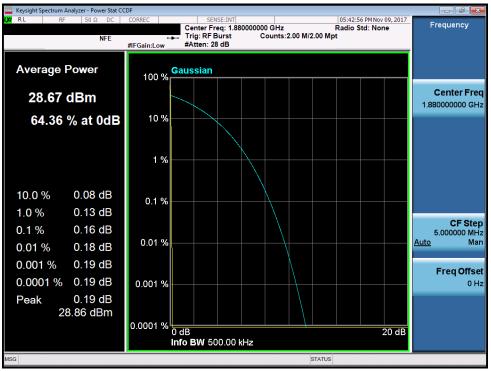
Figure 7-4. Test Instrument & Measurement Setup

#### Test Notes

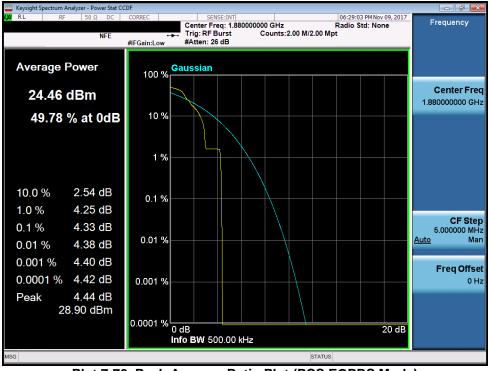
None

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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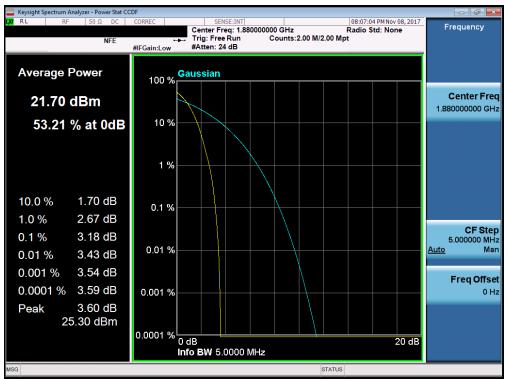






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Plot 7-71. Peak-Average Ratio Plot (PCS WCDMA Mode)

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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.

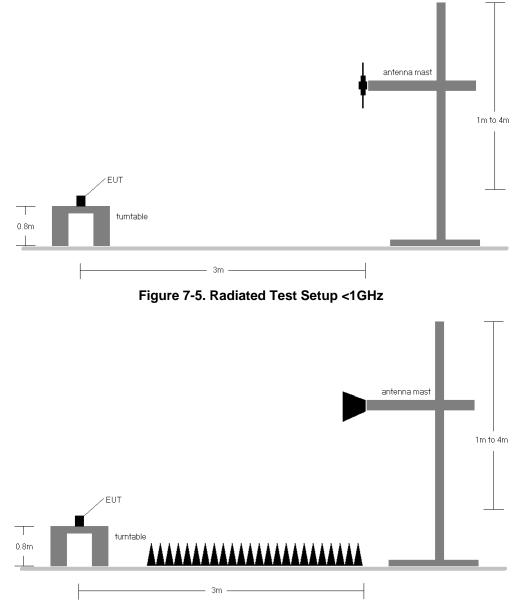


Figure 7-6. Radiated Test Setup >1GHz

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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 GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1."
- 3) This unit was tested with its standard battery.
- 4) 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	GSM850	н	150	0	28.98	1.50	28.32	0.680	38.45	-10.13	30.47	1.115	40.61	-10.13
836.60	GSM850	н	150	3	28.93	1.50	28.28	0.673	38.45	-10.17	30.43	1.104	40.61	-10.18
848.80	GSM850	н	150	0	28.99	1.50	28.34	0.682	38.45	-10.11	30.49	1.118	40.61	-10.12
848.80	GSM850	V	150	8	28.83	1.50	28.18	0.657	38.45	-10.28	30.33	1.078	40.61	-10.28
848.80	EDGE850	н	150	15	24.59	1.50	23.94	0.248	38.45	-14.51	26.09	0.406	40.61	-14.52

Table 7-2. ERP/EIRP (Cellular GSM)

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	Н	150	0	19.21	1.50	18.56	0.072	38.45	-19.89	20.71	0.118	40.61	-19.90
836.60	WCDMA850	н	150	8	19.22	1.50	18.57	0.072	38.45	-19.88	20.72	0.118	40.61	-19.89
846.60	WCDMA850	н	150	7	19.43	1.50	18.78	0.076	38.45	-19.67	20.93	0.124	40.61	-19.68
846.60	WCDMA850	V	150	12	19.09	1.50	18.44	0.070	38.45	-20.01	20.59	0.115	40.61	-20.02

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

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]
1712.40	WCDMA1700	V	150	204	18.78	5.55	24.33	0.271	30.00	-5.67
1732.60	WCDMA1700	V	150	209	18.28	5.41	23.69	0.234	30.00	-6.31
1752.60	WCDMA1700	V	150	199	18.48	5.27	23.75	0.237	30.00	-6.25
1712.40	WCDMA1700	н	150	239	18.08	5.55	23.63	0.230	30.00	-6.37

Table 7-4. EIRP (AWS WCDMA)

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	GSM1900	Н	150	12	26.67	4.82	31.49	1.409	33.01	-1.52
1880.00	GSM1900	Н	150	10	26.39	4.74	31.13	1.297	33.01	-1.88
1909.80	GSM1900	Н	150	7	26.04	4.68	30.73	1.182	33.01	-2.29
1850.20	GSM1900	V	150	11	26.38	4.82	31.20	1.317	33.01	-1.81
1850.20	EDGE1900	Н	150	12	21.75	4.82	26.57	0.454	33.01	-6.44

Table 7-5. EIRP (PCS GSM)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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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]
1852.40	WCDMA1900	Н	150	13	18.52	4.81	23.33	0.215	33.01	-9.68
1880.00	WCDMA1900	н	150	12	19.31	4.74	24.05	0.254	33.01	-8.96
1907.60	WCDMA1900	н	150	12	20.02	4.68	24.70	0.295	33.01	-8.31
1907.60	WCDMA1900	V	150	325	15.84	4.74	20.58	0.114	33.01	-12.43

Table 7-6. EIRP (PCS WCDMA)

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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

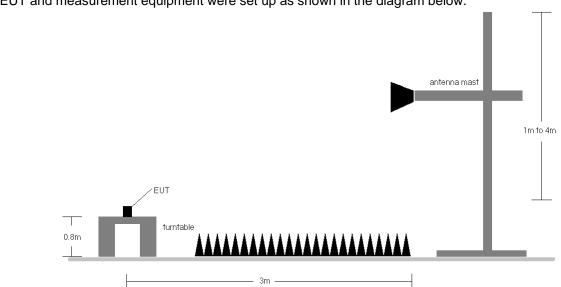
ANSI/TIA-603-E-2016 - Section 2.2.12

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

Figure 7-7. Test Instrument & Measurement Setup

#### Test Notes

- This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GSM mode using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1."
- 3) This unit was tested with its standard battery.
- 4) 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.
- 5) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 6) 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.
- 7) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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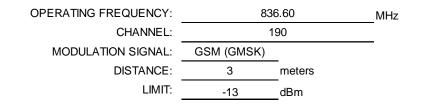


## Cellular GSM Mode

OPERATING FREQUENCY:	82	MHz	
CHANNEL:	1	_	
MODULATION SIGNAL:	GSM (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	109	102	-54.68	9.01	-45.67	-32.7
2472.60	Н	133	1	-47.36	9.12	-38.25	-25.2
3296.80	Н	115	220	-46.91	9.37	-37.55	-24.5
4121.00	Н	118	7	-57.29	9.83	-47.46	-34.5
4945.20	Н	128	88	-67.49	11.24	-56.25	-43.2
5769.40	Н	117	55	-53.82	11.36	-42.46	-29.5
6593.60	Н	110	62	-58.86	11.25	-47.61	-34.6
7417.80	Н	115	66	-54.16	10.81	-43.35	-30.4
8242.00	Н	-	-	-62.34	11.72	-50.62	-37.6

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



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	114	40	-55.54	8.85	-46.69	-33.7
2509.80	Н	163	121	-38.62	9.17	-29.46	-16.5
3346.40	Н	104	321	-47.88	9.36	-38.52	-25.5
4183.00	Н	114	165	-56.83	10.19	-46.64	-33.6
5019.60	Н	-	-	-70.89	11.09	-59.80	-46.8
5856.20	Н	133	163	-53.70	11.32	-42.38	-29.4
6692.80	Н	295	171	-60.01	10.93	-49.08	-36.1
7529.40	Н	122	20	-56.99	11.05	-45.94	-32.9
8366.00	Н	-	-	-65.21	11.76	-53.44	-40.4

Table 7-8. Radiated Spurious Data (Cellular GSM Mode – Ch. 190)

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OPERATING FREQUENCY:	84	MHz	
CHANNEL:	2	51	_
MODULATION SIGNAL:	GSM (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	Н	104	10	-55.29	8.67	-46.62	-33.6
2546.40	Н	115	109	-40.79	9.28	-31.51	-18.5
3395.20	Н	123	316	-47.77	9.46	-38.31	-25.3
4244.00	Н	104	149	-60.97	10.48	-50.49	-37.5
5092.80	Н	-	-	-70.13	10.88	-59.25	-46.2
5941.60	Н	114	159	-55.08	11.23	-43.85	-30.9
6790.40	Н	122	170	-62.12	10.81	-51.30	-38.3
7639.20	Н	104	155	-56.67	11.28	-45.40	-32.4
8488.00	Н	-	-	-65.53	11.69	-53.84	-40.8

Table 7-9. Radiated Spurious Data (Cellular GSM Mode – Ch. 251)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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## Cellular WCDMA Mode

OPERATING FREQUENCY:	8	326.40		MHz
CHANNEL:	4132			
MODULATION SIGNAL:	WCDMA			
DISTANCE:	3	meters		
LIMIT:	-13	dBm		

Fr	equency [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	119	28	-64.53	8.85	-55.68	-42.7
	2479.20	Н	143	108	-72.38	9.69	-62.69	-49.7
	3305.60	Н	-	-	-73.12	9.53	-63.59	-50.6

Table 7-10. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

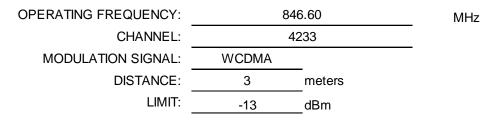
OPERATING FREQUENCY:	83	36.60	MHz
CHANNEL:	4	183	'
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]
1673.20	Н	151	18	-67.77	8.85	-58.93	-45.9
2509.80	Н	160	339	-75.23	9.78	-65.45	-52.5
3346.40	Н	-	-	-73.01	9.67	-63.34	-50.3

Table 7-11. Radiated Spurious Data (Cellular WCDMA Mode - Ch. 4183)

FCC ID: A3LSMJ250M		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	160	50	-69.67	8.85	-60.83	-47.8
2539.80	Н	127	327	-73.39	9.75	-63.64	-50.6
3386.40	н	-	-	-73.43	9.80	-63.63	-50.6

Table 7-12. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	17	12.40	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	104	112	-48.02	9.52	-38.50	-25.5
5137.20	Н	-	-	-73.35	10.81	-62.54	-49.5

Table 7-13. Radiated Spurious Data (AWS WCDMA Mode - Ch. 1312)

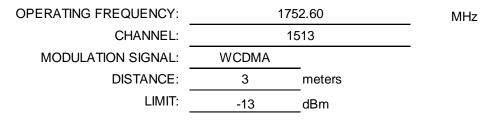
OPERATING FREQUENCY:	17	32.60	MHz
CHANNEL:	1413		_
MODULATION SIGNAL:	WCDMA		_
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]
3465.20	H	114	112	-48.58	9.59	-38.99	-26.0
5197.80	H	116	222	-72.36	10.83	-61.52	-48.5
6930.40	Н	-	-	-69.40	10.90	-58.50	-45.5

Table 7-14. Radiated Spurious Data (AWS WCDMA Mode - Ch. 1413)

FCC ID: A3LSMJ250M		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	114	110	-50.32	9.67	-40.65	-27.6
5257.80	Н	-	-	-73.32	10.97	-62.36	-49.4

Table 7-15. Radiated Spurious Data (AWS WCDMA Mode - Ch. 1513)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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OPERATING FREQUENCY:	185	MHz	
CHANNEL:	5	_	
MODULATION SIGNAL:	GSM (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	114	17	-61.72	9.53	-52.19	-39.2
5550.60	Н	113	294	-40.65	11.01	-29.65	-16.6
7400.80	Н	315	34	-50.20	10.94	-39.25	-26.3
9251.00	Н	249	351	-50.79	11.52	-39.27	-26.3
11101.20	Н	245	313	-60.83	12.81	-48.02	-35.0
12951.40	Н	-	-	-59.67	13.37	-46.30	-33.3

Table 7-16. Radiated Spurious Data (PCS GSM Mode – Ch. 512)

1880.00

OPERATING FREQUENCY:

MODULATION SIGNAL:

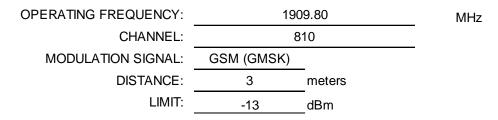
CHANNEL: 661 DN SIGNAL: GSM (GMSK) DISTANCE: 3 meters LIMIT: -13 dBm MHz

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	129	162	-59.72	9.39	-50.33	-37.3
5640.00	Н	109	293	-36.20	11.22	-24.98	-12.0
7520.00	Н	350	320	-48.06	11.10	-36.96	-24.0
9400.00	Н	259	349	-47.95	11.54	-36.41	-23.4
11280.00	Н	278	309	-55.07	12.76	-42.30	-29.3
13160.00	Н	393	322	-58.20	13.05	-45.14	-32.1
15040.00	Н	-	-	-59.18	13.61	-45.57	-32.6
		Table 7-1	7 Radiated	Spurious Data (P	CS GSM Mode -	Ch 661)	

Table 7-17. Radiated Spurious Data (PCS GSM Mode – Ch. 661)

FCC ID: A3LSMJ250M		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	111	341	-62.91	9.32	-53.59	-40.6
5729.40	Н	109	288	-32.71	11.37	-21.34	-8.3
7639.20	Н	120	234	-47.60	11.33	-36.27	-23.3
9549.00	Н	350	349	-60.01	11.78	-48.23	-35.2
11458.80	Н	276	322	-52.25	12.69	-39.56	-26.6
13368.60	Н	202	362	-57.92	12.64	-45.29	-32.3

Table 7-18. Radiated Spurious Data (PCS GSM Mode - Ch. 810)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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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]
3704.80	Н	124	199	-59.30	9.72	-49.58	-36.6
5557.20	Н	104	163	-64.78	10.99	-53.80	-40.8
7409.60	Н	104	164	-65.70	10.79	-54.91	-41.9
9262.00	Н	-	-	-67.65	12.28	-55.37	-42.4

Table 7-19. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

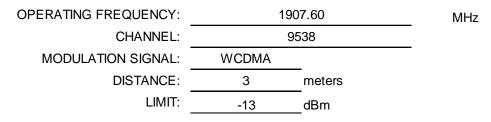
OPERATING FREQUENCY:	18	MHz	
CHANNEL:			
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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	104	162	-62.97	9.50	-53.47	-40.5
5640.00	Н	104	158	-65.62	11.16	-54.46	-41.5
7520.00	Н	104	176	-66.12	11.03	-55.09	-42.1
9400.00	Н	-	-	-67.03	12.19	-54.84	-41.8

Table 7-20. Radiated Spurious Data (PCS WCDMA Mode - Ch. 9400)

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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	133	162	-58.86	9.30	-49.56	-36.6
5722.80	Н	122	169	-67.08	11.33	-55.75	-42.8
7630.40	Н	114	158	-63.46	11.26	-52.20	-39.2
9538.00	Н	-	-	-66.77	12.23	-54.54	-41.5

Table 7-21. Radiated Spurious Data (PCS WCDMA Mode - Ch. 9538)

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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  $\pm 0.00025\%$  ( $\pm 2.5$  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:	3.80	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	_

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,600,086	86	0.0000103
100 %		- 30	836,599,828	-172	-0.0000206
100 %		- 20	836,599,888	-112	-0.0000134
100 %		- 10	836,600,027	27	0.0000032
100 %		0	836,600,181	181	0.0000216
100 %		+ 10	836,599,804	-196	-0.0000234
100 %		+ 20	836,600,006	6	0.0000007
100 %		+ 30	836,599,921	-79	-0.0000094
100 %		+ 40	836,599,619	-381	-0.0000455
100 %		+ 50	836,599,908	-92	-0.0000110
BATT. ENDPOINT	3.42	+ 20	836,599,993	-7	-0.000008

Table 7-22. Frequency Stability Data (Cellular GSM Mode – Ch. 190)

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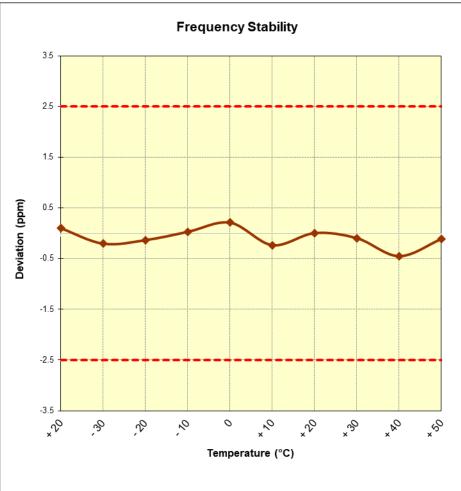


Figure 7-8. Frequency Stability Graph (Cellular GSM Mode – Ch. 190)

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Hz	836,600,000	OPERATING FREQUENCY:
	4183	CHANNEL:
VDC	3.80	REFERENCE VOLTAGE:
_	± 0.00025 % or 2.5 ppm	<b>DEVIATION LIMIT:</b>

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,599,987	-13	-0.0000016
100 %		- 30	836,599,990	-10	-0.0000012
100 %		- 20	836,599,747	-253	-0.0000302
100 %		- 10	836,599,750	-250	-0.0000299
100 %		0	836,600,069	69	0.0000082
100 %		+ 10	836,600,004	4	0.0000005
100 %		+ 20	836,600,022	22	0.0000026
100 %		+ 30	836,599,631	-369	-0.0000441
100 %		+ 40	836,600,002	2	0.0000002
100 %		+ 50	836,599,597	-403	-0.0000482
BATT. ENDPOINT	3.42	+ 20	836,600,205	205	0.0000245

Table 7-23. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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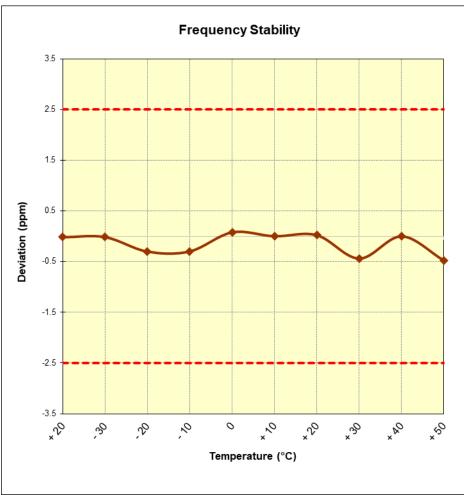


Figure 7-9. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,732,600,000	Hz
CHANNEL:	1413	
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,732,599,895	-105	-0.0000061
100 %		- 30	1,732,600,110	110	0.0000063
100 %		- 20	1,732,599,837	-163	-0.0000094
100 %		- 10	1,732,600,098	98	0.0000057
100 %		0	1,732,599,654	-346	-0.0000200
100 %		+ 10	1,732,600,086	86	0.0000050
100 %		+ 20	1,732,599,911	-89	-0.0000051
100 %		+ 30	1,732,600,051	51	0.0000029
100 %		+ 40	1,732,600,401	401	0.0000231
100 %		+ 50	1,732,599,825	-175	-0.0000101
BATT. ENDPOINT	3.42	+ 20	1,732,599,734	-266	-0.0000154

Table 7-24. 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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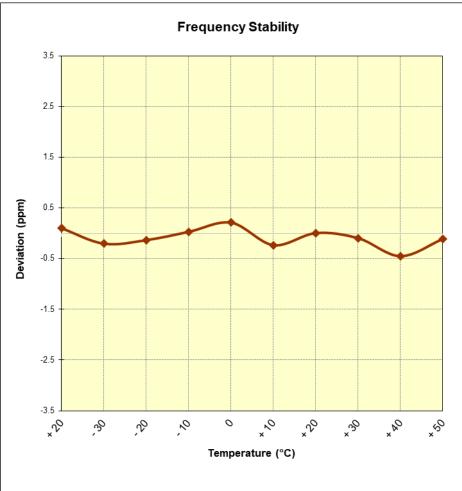


Figure 7-10. Frequency Stability Graph (AWS WCDMA Mode – Ch. 1413)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Hz	1,880,000,000	OPERATING FREQUENCY:		
	661	CHANNEL:		
VDC	3.80	REFERENCE VOLTAGE:		
_				

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,880,000,017	17	0.0000009
100 %		- 30	1,879,999,856	-144	-0.0000077
100 %		- 20	1,879,999,877	-123	-0.0000065
100 %		- 10	1,879,999,899	-101	-0.0000054
100 %		0	1,880,000,009	9	0.0000005
100 %		+ 10	1,879,999,862	-138	-0.0000073
100 %		+ 20	1,880,000,004	4	0.0000002
100 %		+ 30	1,879,999,820	-180	-0.0000096
100 %		+ 40	1,880,000,004	4	0.0000002
100 %		+ 50	1,880,000,302	302	0.0000161
BATT. ENDPOINT	3.42	+ 20	1,880,000,224	224	0.0000119

Table 7-25. Frequency Stability Data (PCS GSM Mode – Ch. 661)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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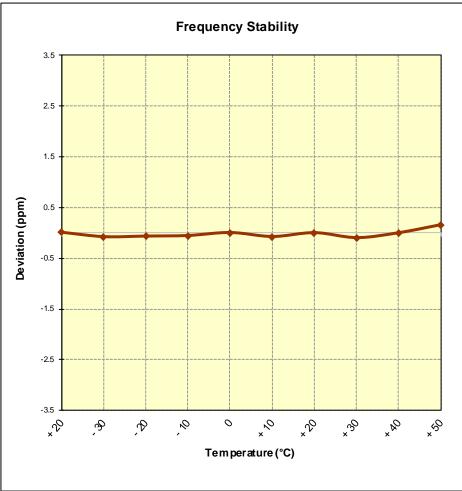


Figure 7-11. Frequency Stability Graph (PCS GSM Mode – Ch. 661)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	9400	_
REFERENCE VOLTAGE:	3.80	VDC
<b>DEVIATION LIMIT:</b>	± 0.00025 % or 2.5 ppm	_

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,879,999,729	-271	-0.0000144
100 %		- 30	1,879,999,973	-27	-0.0000014
100 %		- 20	1,880,000,049	49	0.0000026
100 %		- 10	1,879,999,966	-34	-0.0000018
100 %		0	1,879,999,733	-267	-0.0000142
100 %		+ 10	1,879,999,844	-156	-0.000083
100 %		+ 20	1,879,999,890	-110	-0.0000059
100 %		+ 30	1,879,999,646	-354	-0.0000188
100 %		+ 40	1,879,999,760	-240	-0.0000128
100 %		+ 50	1,880,000,284	284	0.0000151
BATT. ENDPOINT	3.42	+ 20	1,880,000,252	252	0.0000134

Table 7-26. Frequency Stability Data (PCS WCDMA Mode - Ch. 9400)

FCC ID: A3LSMJ250M		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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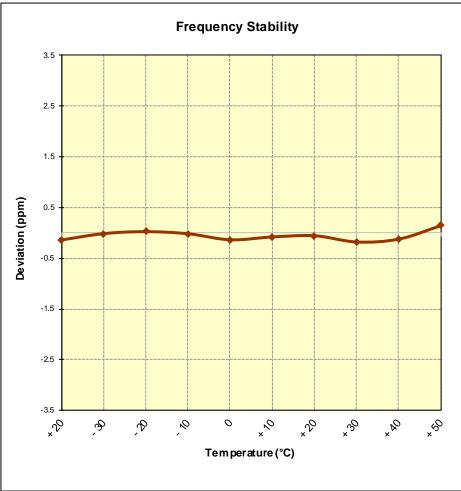


Figure 7-12. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMJ250M		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: A3LSMJ250M** complies with all the requirements of Part 22, 24, &27 of the FCC Rules.

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