

PCTEST ENGINEERING LABORATORY, INC.

7185 Oakland Mills Road, Columbia, MD 21046 USA Tel. 410.290.6652 / Fax 410.290.6654 http://www.pctest.com



# 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: 12/19/2019-1/1/2019 Test Site/Location: PCTEST Lab. Columbia, MD, USA Test Report Serial No.: 1M1811120202-02.A3L

# FCC ID:

#### A3LSMG9750

APPLICANT:

# Samsung Electronics Co., Ltd.

Application Type: Model: Additional Model(s): EUT Type: FCC Classification: FCC Rule Part(s): Test Procedure(s): Certification SM-G9750 SM-G9758 Portable Handset PCS Licensed Transmitter Held to Ear (PCE) 22 & 24 ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01, KDB 648474 D03 v01r04

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

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

Randy Ortanez President



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			Ef	RP	EI	RP	
Mode	FCC Rule Part	Tx Frequency (MHz)	Max. Power (W)	Max. Power (dBm)	Max. Power (W)	Max. Power (dBm)	Emission Designator
GPRS850	22H	824.2 - 848.8	0.392	25.93	0.643	28.08	245KGXW
EDGE850	22H	824.2 - 848.8	0.085	19.28	0.139	21.43	248KG7W
WCDMA850	22H	826.4 - 846.6	0.080	19.04	0.131	21.19	4M17F9W
GPRS1900	24E	1850.2 - 1909.8			0.518	27.14	242KGXW
EDGE1900	24E	1850.2 - 1909.8			0.185	22.67	250KG7W
WCDMA1900	24E	1852.4 - 1907.6			0.204	23.09	4M20F9W

**EUT Overview** 

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# **1.0 INTRODUCTION**

# 1.1 Scope

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

# 1.2 PCTEST Test Location

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

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

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

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# 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG9750**. 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.: 1726M, 1687M

#### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, ANT+

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

### 2.3 Test Configuration

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

This device supports wireless charging capability and, thus, is subject to the test requirements of KDB 648474 D03 v01r04. Additional radiated spurious emission measurements were performed with the EUT inclined at a 45 degree angle on an authorized wireless charging pad (WCP) Model: EP-N5100 while operating under normal conditions in a simulated call or data transmission configuration. The worst case radiated emissions data is shown in this report.

# 2.4 EMI Suppression Device(s)/Modifications

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

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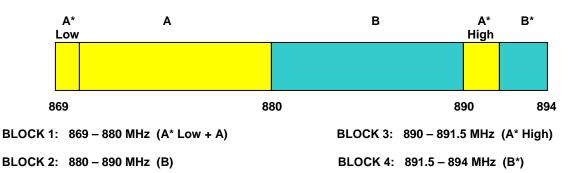
# 3.0 DESCRIPTION OF TESTS

### 3.1 Evaluation Procedure

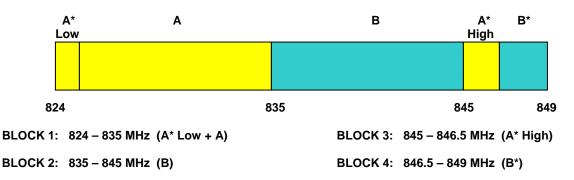
The measurement procedures described in the "Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards" (ANSI/TIA-603-E-2016) and "Measurement Guidance for Certification of Licensed Digital Transmitters" (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

Deviation from Measurement Procedure.....None

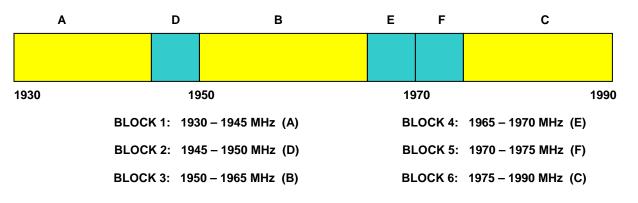
# 3.2 Cellular - Base Frequency Blocks



# 3.3 Cellular - Mobile Frequency Blocks



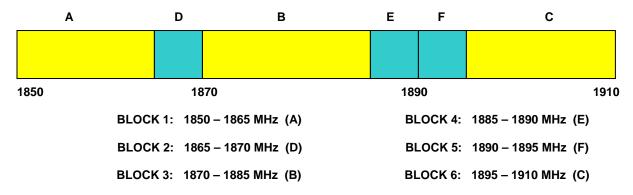
# 3.4 PCS - Base Frequency Blocks



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### 3.5 PCS - Mobile Frequency Blocks



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### 3.6 Radiated Measurements

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

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

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

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

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

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

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

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# 4.0 MEASUREMENT UNCERTAINTY

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

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

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# 5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx3	LIcensed Transmitter Cable Set	8/23/2018	Annual	8/23/2019	LTx3
Agilent	E4448A	PSA (3Hz-50GHz) Spectrum Analyzer	6/15/2018	Annual	6/15/2019	US42510244
Agilent	E5515C	Wireless Communications Test Set	1/29/2016	Triennial	1/29/2019	GB46310798
Agilent	N9020A	MXA Signal Analyzer	1/24/2018	Annual	1/24/2019	US46470561
Agilent	N9038A	MXE EMI Receiver	6/11/2018	Annual	6/11/2019	MY51210133
Agilent	N5183A	MXG Analog Signal Generator	3/30/2018	Annual	3/30/2019	MY50141900
Agilent	N9030A	PXA Signal Analyzer (44GHz)	5/25/2018	Annual	5/25/2019	MY52350166
Anritsu	MT8821C	Radio Communication Analyzer	11/6/2018	Annual	11/6/2019	6200901190
Anritsu	MS46322A	Vector Network Analyzer	7/11/2018	Annual	7/11/2019	1521001
Anritsu	36585K-2F	Precision Autocal 2-Port	7/16/2018	Annual	7/16/2019	1628014
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	9/17/2018	Annual	9/17/2019	441119
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/9/2018	Biennial	8/9/2020	135427
Espec	ESX-2CA	Environmental Chamber	3/28/2018	Annual	3/28/2019	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/28/2018	Biennial	3/28/2020	128337
ETS-Lindgren	3115	Double Ridged Guide Horn 750MHz - 18GHz	3/28/2018	Annual	3/28/2019	150693
Mini Circuits	TVA-11-422	RF Power Amp		N/A		QA1317001
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/30/2018	Annual	3/30/2019	11401010036
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	5/21/2018	Annual	5/21/2019	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	8/9/2018	Annual	8/9/2019	100348
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	6/18/2018	Annual	6/18/2019	102134
Seekonk	NC-100	Torque Wrench (8" lb)	5/10/2018	Biennial	5/10/2020	N/A
Sunol	DRH-118	Horn Antenna (1-18GHz)	8/11/2017	Biennial	8/11/2019	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107

Table 5-1. Test Equipment

#### Notes:

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

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# 6.0 SAMPLE CALCULATIONS

### **GPRS Emission Designator**

#### Emission Designator = 250KGXW

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

### **EDGE Emission Designator**

#### Emission Designator = 250KG7W

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

### 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:	<u>A3LSMG9750</u>
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	<u>GSM / GPRS / EDGE / WCDMA</u>

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A		PASS	Section 7.2
2.1051 22.917(a) 24.238(a)	Conducted Band Edge / Spurious Emissions	> 43 + 10log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of- band emissions		PASS	Sections 7.3, 7.4
24.232(d)	Peak-Average Ratio	< 13 dB	CONDUCTED	PASS	Section 7.5
2.1046	Transmitter Conducted Output Power	N/A		PASS	RF Exposure Report
2.1055 22.355 24.235	Frequency Stability	< 2.5 ppm (Part 22) Emission must remain in band (Part 24)		PASS	Section 7.8
22.913(a)(5)	Effective Radiated Power	< 7 Watts max. ERP		PASS	Section 7.6
24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP	RADIATED	PASS	Section 7.6
2.1053 22.917(a) 24.238(a)	Radiated Spurious Emissions	> 43 + 10log <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 4.11.

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# 7.2 Occupied Bandwidth

#### **Test Overview**

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

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 4.2

#### **Test Settings**

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

#### Test Setup

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



Figure 7-1. Test Instrument & Measurement Setup

#### Test Notes

None.

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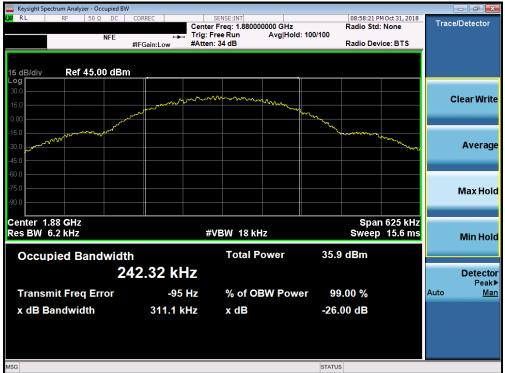
Plot 7-1. Occupied Bandwidth Plot (Cellular GPRS Mode)



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

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



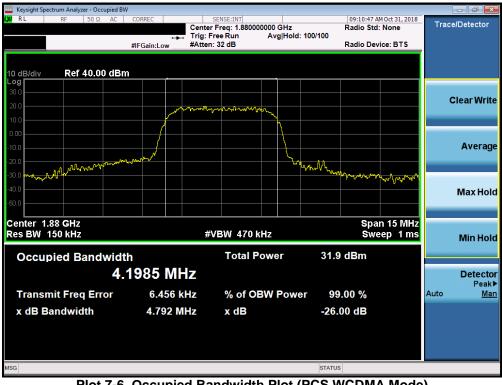
Plot 7-4. Occupied Bandwidth Plot (EDGE1900 Mode)

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



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

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# 7.3 Spurious and Harmonic Emissions at Antenna Terminal

#### **Test Overview**

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

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

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

#### Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to 10GHz for Cell, 20GHz for AWS, 20GHz for PCS (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

#### Test Setup

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



Figure 7-2. Test Instrument & Measurement Setup

#### Test Notes

Per 24.238(b) 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 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.

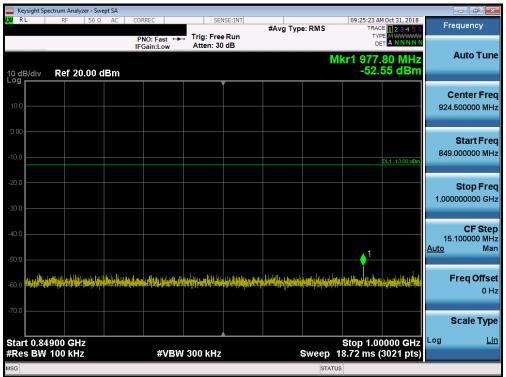
FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 17 of 70	
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# **Cellular GPRS Mode**

	ectrum Analyze											
XI RL	RF	50 Ω AC	CORREC		SEN Trig: Free Atten: 30		#Avg Typ	e: RMS	TRA TY	M Oct 31, 2018 CE 1 2 3 4 5 6 PE M WWWWWW ET A N N N N N	F	requency
10 dB/div	Ref 20.0	00 dBm	IFGain:L	ow	Atten: 30	ab			Mkr1 823			Auto Tune
10.0												Center Fred 6.500000 MH
-10.0										DL1 -13.00 dBm	31	Start Fre 0.000000 MH
30.0										1	82	<b>Stop Fre</b> 3.000000 MH
40.0											7: <u>Auto</u>	<b>CF Ste</b> 9.300000 M⊢ Ma
60.0 <b>1 1 1 1 1</b>	lah suki ku juga jihangi Manangan ng mangangan		ingen den gilt giben begrennen mit mit den en der gesterte	an fan fan fan steren fan steren General fan steren fan s	agaag ng dig by Mangalag sint	a gan hiyo ka nyari www.wanga sa sa		n an gan a site o - D I an gan a site o -	Jana Jaka Jaka Jaka Jaka Jaka Jaka Jaka	a a gine in pagina in a sub a su Sub a sub		Freq Offse 0 H
70.0	MH <sub>2</sub>								Ston 8	323.0 MHz	Log	Scale Typ
	100 kHz		#	VBW 3	00 kHz		s	weep	98.33 ms (	15861 pts)		
ISG								STA	TUS			

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



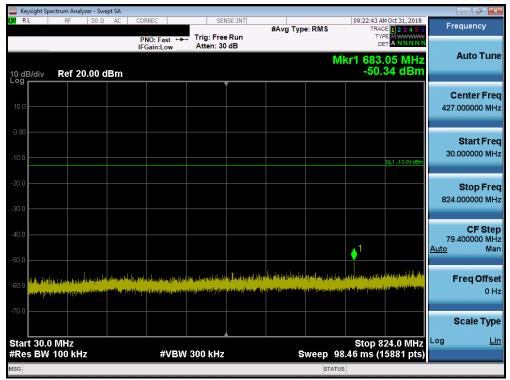
#### Plot 7-8. Conducted Spurious Plot (Cellular GPRS Mode - Low Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	Spectrum An	alyzer - Swe	pt SA									
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC		NSE:INT	#Avg Typ	e: RMS	TR	AM Oct 31, 2018 ACE 1 2 3 4 5 6 TYPE M	Fr	equency
				PNO: Fast + IFGain:Low	#Atten: 3				Mkr1 1.6	48 5 GHz 706 dBm		Auto Tune
10 dB/div Log	Ref	10.00 d	Bm						-00.			enter Fred
-10.0										DL1 -13.00 dBm	1.000	Start Fred
-30.0		a th	and the second	The part proves the	a with the state of the state o	a particul and built	dia, nystropostro	A State of S		And the first state of parts	10.000	<b>Stop Fred</b> 0000000 GH:
-50.0			n kom die officie in the last	and and produce the second			An free of product the Bookston				900 <u>Auto</u>	<b>CF Step</b> .000000 MH Mar
-70.0												F <b>req Offse</b> 0 H
-80,0												Scale Type
	000 GHz W 1.0 MI			#VB	W 3.0 MHz		s	weep	Stop 1 15.60 ms	0.000 GHz (18001 pts)	Log	Lir
MSG								ST/	ATUS			

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



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer - S	Swept SA								
LXI RL	RF 50	Ω AC	CORREC		SE:INT	#Avg Type	e: RMS	TRAC	4 Oct 31, 2018 E <b>1 2 3 4 5</b> 6	Frequency
			PNO: Fast ++ IFGain:Low	Trig: Free Atten: 30				TYF DE		
10 dB/div	Ref 20.00	dBm					М	kr1 990. -51.	20 MHz 63 dBm	Auto Tune
										Center Freq
10.0										924.500000 MHz
0.00										
0.00										Start Freq
-10.0									DL1 -13.00 dBm	849.000000 MHz
-20.0										
										Stop Freq 1.00000000 GHz
-30.0										
-40.0										CF Step 15.100000 MHz
									<b>1</b>	Auto Man
-50.0										
-60.0	with the second second	han an a	putation and page		in stranger		danini Afrikada	entropy beneficial and	eye in function	Freq Offset 0 Hz
-70.0										0112
										Scale Type
Start 0.84	900 GHz							Stop 1.00	0000 GHz	Log <u>Lin</u>
#Res BW			#VBW	300 kHz		:	Sweep 1	18.72 ms (		
MSG							STATU	S		

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



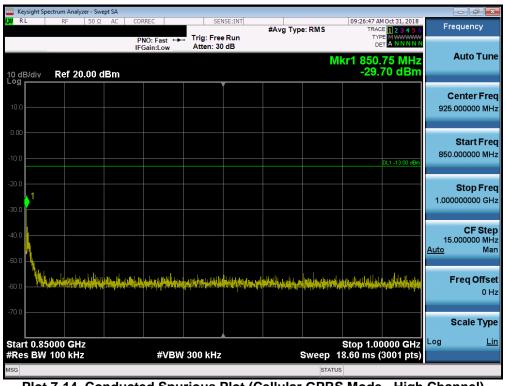
Plot 7-12. Conducted Spurious Plot (Cellular GPRS Mode - Mid Channel)

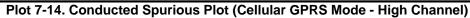
FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Sp	ectrum Analyze	r - Swept SA									r X
LXI RL	RF	50 Ω AC	CORREC	SEN	ISE:INT	#Avg Type	: RMS		M Oct 31, 2018 DE 1 2 3 4 5 6	Freque	ncy
			PNO: Fast ← IFGain:Low	Trig: Free Atten: 30		0 ,1		TYF DE			_
10 dB/div Log	Ref 20.0	00 dBm					Μ	kr1 695. -49.	.20 MHz 79 dBm	Aut	o Tune
10.0										Cento 427.0000	e <b>r Freq</b> 000 MHz
-10.0									DL1 -13.00 dBm		I <b>rt Freq</b> DOO MHz
-20.0										Sto 824.0000	<b>p Freq</b> 000 MHz
-40.0								↓ <sup>1</sup>		<b>C</b> 79.4000 <u>Auto</u>	F Step 000 MHz Mar
-60.0 <mark>(11)</mark>	l print provident	barpadas terradas atas esternitas pero	antible departmente materie approvedente	pul olymendiallynada <sup>b</sup> ana Ar ydynynadaiol (daelyna	terstanne probletigen av det talende fan de fan	de appression de la pression de la m La constant de la pression de la pres	er flegeljeveret det gede	and in advanta	u de la Competentia Norde - Martine Anna	Freq	I Offset 0 Hz
-70.0											le Type
Start 30.( #Res BW			#VB	W 300 kHz		S	weep <u>98</u>		24.0 MHz 5881 pts)	Log	Lin
MSG							STATU				

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





FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	pectrum Analy												×
U RL	RF	50 Ω	AC (	CORREC			ISE:INT	#Avg Typ	e: RMS	TRA	AM Oct 31, 2018 CE 1 2 3 4 5 6	Frequency	4
	_			PNO: Fa IFGain:L		#Atten: 3						Auto T	- Lun
0 dB/div	Ref 10	.00 dE	3m						M	kr1 1.69 -27	8 0 GHz .50 dBm	Autor	u
												Center F	
3.00												5.500000000	Gŀ
10.0											DL1 -13.00 dBm	Start F	Fre
20.0												1.000000000	
:0.0	• <b>'</b>												
												Stop F 10.000000000	
40.0 1 <sub>011</sub> 111	tel pet your legitions	and particular	and a state of the second s	Plan Names	(ITTO-HAT)	polantik seate	apperte appearants according to the second	an Day ang	يدركا الحيريونيون. معاملة بي يطلبان	an gan directive etc. Mangan directive direction	<mark>al nyatin'ny panyina.</mark> Na amin'ny fitataona si ana		
50.0 <b>4</b>				and a start of the	issinihitika a	an analana						CF S 900.000000	
50.0												<u>Auto</u>	Ma
												Freq Of	ffs
70.0													0 H
:0.0												Scale T	í yr
itart 1.0	00 GH7									Stop 1	0.000 GHz	Log	L
Res BW	/ 1.0 MHz	z		#	VBW	3.0 MHz		s	weep 1	5.60 ms (	18001 pts)		
SG									STATU	JS			

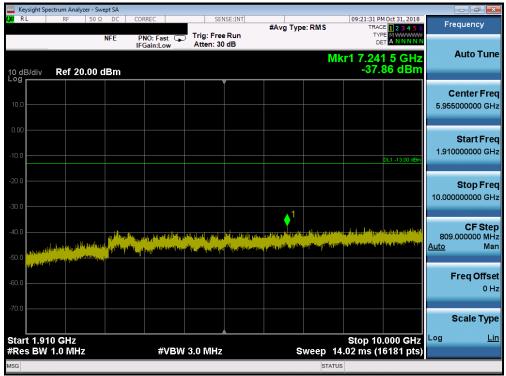
Plot 7-15. Conducted Spurious Plot (Cellular GPRS Mode - High Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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@ 2010 DOTECT Engineering Labor	ton loo			V 0 0 44/40/2040



	trum Analyzer - Swe									
U RL	RF 50 Ω	NFE PI	REC NO:Fast 🖵 Gain:Low			#Avg Typ	e: RMS	TRACE	Oct 31, 2018	Frequency
0 dB/div	Ref 20.00 d						Mk	r1 1.836 -44.1	5 GHz 13 dBm	Auto Tun
10.0										Center Fre 937.500000 M⊦
10.0									DL1 -13.00 dBm	Start Fre 30.000000 M⊦
20.0										<b>Stop Fre</b> 1.845000000 GH
40.0		same fallanda		Lat. Lat. Prostility	u transferige for stille for	an contraction		n i i sufficie na si i su na si i su na si su n Na si su	1 Lingtonati	CF Ste 181.500000 MH <u>Auto</u> Ma
										Freq Offs 0 H
70.0										Scale Typ
tart 0.030 Res BW 1			#VBW	3.0 MHz			Sweep 2.	Stop 1.8 420 ms (:	100 012	Log <u>L</u>
SG							STATUS			

Plot 7-16. Conducted Spurious Plot (PCS GPRS Mode - Low Channel)



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	g	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 02 of 72
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	Spectrum Analyzer	r - Swept SA									×
LXI RL	RF	50 Ω DC	CORREC	SEN	SE:INT	#Avg Typ	e: RMS	TRAC	1 Oct 31, 2018	Frequency	у
	_	NFE	PNO: Fast G	Trig: Free Atten: 20				TYF			
10 dB/div	Ref 10.0	00 dBm					Mkı	1 19.43 -42.	7 5 GHz 64 dBm	Auto T	rune
										Center	
0.00										15.00000000	) GHz
-10.0									DL1 -13.00 dBm	Start	From
-20.0										10.000000000	
-30.0										Stop I	
-40.0									<b>↓</b> 1	20.000000000	) GHz
-50.0 <mark>(m/m/t</mark> )	, and the second states of the second se	polanta postantes	History and the statility	, tensoletike kolener		a trapetro policy leading	a progetitier (* 19 19 maail 19 maail 19 19 maail 19 m	a legal provide particular	fan Depart de Desponsjo Anne jier anne ser sy	CF \$ 1.000000000	
-60.0	and a state of the second s	and the second	Alisahapaten Indanasi Utan galakun lan <sup>anari</sup> da		aliter and a special second	a debuedella i attala a dis.				<u>Auto</u>	Mar
										Freq O	ffse
-70.0											0 Hz
-80.0										Scale 1	Туре
Start 10	.000 GHz							Stop 20	JUDU GHIZ	Log	Lin
#Res BV	V 1.0 MHz		#VBW	/ 3.0 MHz		S	weep 17	7.33 ms (2	0001 pts)		
MSG							STATU	S			

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

🔤 Keysig	ght Spectru	m Analyze	er - Swep	ot SA											
X/RL		RF	50 Ω	DC	CORR	EC			NSE:INT	#Avg Typ	e: RMS	TF	B PM Oct 31, 2018 RACE 1 2 3 4 5 6	Fr	equency
10 dB/c	div R	ef 20.		IFE BM		): Fast iin:Low	÷	Trig: Free Atten: 30			М	kr1 1.8	36 0 GHz 5.34 dBm		Auto Tune
10.0															Center Fre 0.000000 MH
-10.0													DL1 -13.00 dBm	30	Start Fre 0.000000 MH
-20.0														1.85	<b>Stop Fre</b> 0000000 GH
-40.0	a i for Utan - M	1		dan te Alfred Sta	ant luter	يدا معد	بقارزوني	وينافز البراري	an ha da a da a sa	ti anisi tinita	de subsettes tit		ndreisel will be bestel	182 <u>Auto</u>	CF Ste 2.000000 M⊢ Ma
60.0			and a second	hinny fair											FreqOffso 0⊦
-70.0															Scale Typ
	0.0300 BW 1.0					#VI	BW 3	3.0 MHz			Sweep		1.8500 GHz 5 (3641 pts)	Log	Li
MSG											STATU	JS			

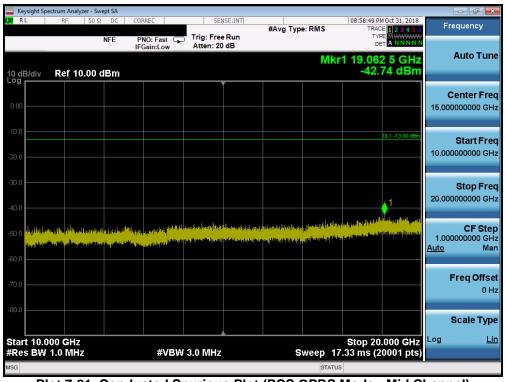
Plot 7-19. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 04 of 70
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	ectrum Analyze										×
LXI RL	RF	50 Ω DC	CORREC	SEI	SE:INT	#Avg Typ	e: RMS		M Oct 31, 2018	Frequency	/
		NFE	PNO: Fast 😱	Trig: Free Atten: 30				TY	PE M WWWWW		
			IFGain:Low	Atten: 30	ab			-		Auto T	une
10 dB/div	Bof 20	00 dBm					IV	lkr1 9.68 -37	12 dBm		
	Rei Zu.	UU UBIII									
										Center F	Freq
10.0										5.955000000	GHz
0.00										Start F	Frea
-10.0										1.910000000	
-10.0									DL1 -13.00 dBm		
-20.0											
20.0										Stop F 10.000000000	
-30.0									,-	10.00000000	GHZ
									<b>♦</b> <sup>1</sup>		
-40.0		an hard		Martin antes	ويعام أفقاه وريافه	a an ing a start of the second se	والمربية والمراجع	no and a second second	te <sub>nn</sub> dheidel	CF S 809.000000	
وفيدا بد	pilente avecent	and the state of the	Santa Dan Bashalia	والمراجع والتدريق	hin na dalata kata	د. الأكلير والأكرين الاحد د	ومطأفات معاظمان	والفلار ومكر	internation of the second		Man
	Alimente des la constantes de la constantes de la constantes de la constante de la constante de la constante d	in a state of the									
r										Freq Of	fset
-60.0											0 Hz
70.0											
-70.0										Scale T	vpe
Start 1.91									.000 GHz	Log	Lin
#Res BW	1.0 MHz		#VBW	3.0 MHz		s		4.02 ms (1	6181 pts)		
MSG							STAT	US			

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



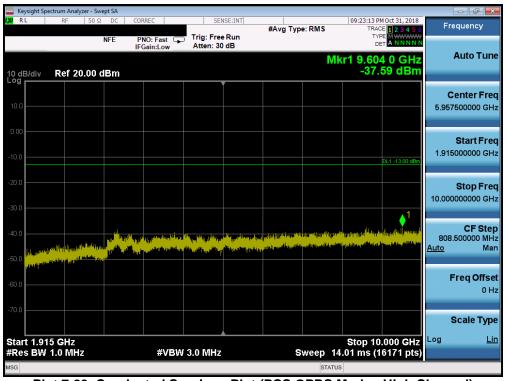
Plot 7-21. Conducted Spurious Plot (PCS GPRS Mode - Mid Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	ectrum Analyze	r - Swept SA								
LXI RL	RF	50 Ω DC	CORREC	SE	NSE:INT	#Avg Typ	e: RMS		M Oct 31, 2018 CE 1 2 3 4 5 6	Frequency
		NFE	PNO: Fast G	Trig: Free Atten: 30				TY	PE M WWWWW ET A N N N N N	
			IFGain:Low	Atten: 30						Auto Tune
10 dB/div	Ref 20.0	00 dBm					IV	1kr1 1.68 -45	06 dBm	
	KCI ZU.									
										Center Freq
10.0										940.000000 MHz
0.00										Start Fred
-10.0										30.000000 MHz
									DL1 -13.00 dBm	
-20.0										Stop Freq
										1.850000000 GHz
-30.0										
										CF Step
-40.0									<b>™</b> 1 ───	182.000000 MHz
-50.0		the state of the s	الإطارية مرتبع وتجربه والمل	and the last of the state		الأربنيا الفارية		a de la de autoria	ender Hiteling	<u>Auto</u> Man
-50.0				a hite and a provide state	No. of the local division of the local divis					
-60.0										Freq Offset
										0 Hz
-70.0										
										Scale Type
Start 0.03	300 GHz							Stop 1	8500 GHz	Log <u>Lin</u>
#Res BW			#VBV	V 3.0 MHz			Sweep	2.427 ms	(3641 pts)	
MSG							STAT			

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



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer	- Swept SA									J X
XI RL	RF 5	οΩ DC NFE	CORREC	Trig: Free		#Avg Typ	e: RMS	TRAC	M Oct 31, 2018 E 1 2 3 4 5 6 PE M W N N N N	Frequenc	сy
10 dB/div	Ref 10.0	0 dBm	IFGain:Low	Atten: 20	dB		Mkr	1 19,50	8 0 GHz 31 dBm	Auto <sup>-</sup>	Tune
0.00										Center 15.00000000	
20.0									DL1 -13.00 dBm	Start 10.00000000	
-40.0									<b>1</b>	Stop 20.00000000	
	allen (he jylkyddin) Alwelle arthuwelyd	denganggi palasising plinasi nggi palasisin	sandiya Dahasa ta ƙasartiki ƙasar Ta zanga sanani Manaki ƙasarti	en en fan de ferferen en feren en fer de kommen en feren en feren kommen en feren en f	riger og stan og som forsen for af blev de stan stan på det passe	alan kalendari kala bay Karapati kalendari yan	an a	ang pang pang pang pang pang pang pang p	(488-y kayo di 1974 may dang) Gala <u>di kada</u> n kaning di Jacobara.	CF 1.000000000 <u>Auto</u>	0 GH Ma
70.0										Freq C	Offse 0⊢
80.0	000 GHz							Stop 20	.000 GHz	Scale	<b>Тур</b> <u>Li</u>
	1.0 MHz		#VBW	3.0 MHz		s	weep 17	.33 ms (2	0001 pts)		
SG							STATUS	5			

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

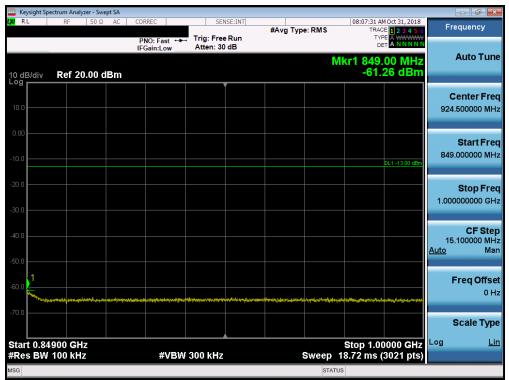
FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 07 of 70
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# Cellular WCDMA Mode

	ectrum Analyzer - Swept SA					
<mark>X/</mark> RL	RF 50 Ω AC	CORREC PNO: Fast ↔→	SENSE:INT Trig: Free Run Atten: 30 dB	#Avg Type: RMS	08:07:16 AM Oct 31, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Frequency
10 dB/div	Ref 20.00 dBm	II Gam.Low		N	lkr1 819.10 MHz -42.26 dBm	Auto Tun
10.0						Center Fre 425.000000 MH
10.00					DL1 -13.00 dBm	Start Fre 30.000000 MH
20.0						Stop Fre 820.000000 M⊦
40.0					1	CF Ste 79.000000 MH <u>Auto</u> Ma
60.0		Ministration of the second				Freq Offs 0 H
70.0						Scale Typ
Start 30.0 Res BW		#VBW	300 kHz	Sweep 9	Stop 820.0 MHz 8.33 ms (15861 pts)	Log <u>Li</u>
#Res BW		#VBW	300 kHz	Sweep 9	8.33 ms (15861 pts)	

Plot 7-25. Conducted Spurious Plot (Cellular WCDMA Mode - Low Channel)



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

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Keysight Spectrur		et SA								- 5 💌
(X/RL	RF 50 Ω	AC CO	RREC	SEI	NSE:INT	#Avg Type	e: RMS		M Oct 31, 2018 E 1 2 3 4 5 6	Frequency
			NO: Fast ↔ Gain:Low	Trig: Free #Atten: 2				TYI Di		
10 dB/div R	ef 10.00 di	Bm					MI	kr1 1.65 -45.	1 5 GHz 43 dBm	Auto Tune
										Center Freq
0.00										5.50000000 GHz
-10.0									DL1 -13.00 dBm	Start Fred
-20.0										1.000000000 GHz
-30.0										Stop Freq
-40.0										10.00000000 GHz
-50.0										CF Step
	and the state of the			-						900.000000 MHz <u>Auto</u> Man
-60.0										<b>F</b> 0%
-70.0										Freq Offset 0 Hz
-80.0										
										Scale Type
Start 1.000 G #Res BW 1.0			#\/B\A	/ 3.0 MHz			ween 1	Stop 10	.000 GHz 8001 pts)	Log <u>Lin</u>
#RES DW T.U	10112		#VDV	- <b>5.0</b> Win2		3	STATU		800 T prs)	





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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 72
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	ctrum Analyze		t SA									- 6 📄
XI RL	RF	50 Ω	AC	CORREC	ast 🔸		e Run	#Avg Typ	e: RMS	TRAC	M Oct 31, 2018 DE <b>1 2 3 4 5 6</b> DE A WWWWW A N N N N N	Frequency
				IFGain:		Atten: 3			N	lkr1 849.	00 MHz	Auto Tun
10 dB/div Log	Ref 20.	00 dE	3m							-53.	07 dBm	
10.0							<b>.</b>					Center Fre 924.500000 MH
0.00												Start Fre
-10.0											DL1 -13.00 dBm	849.000000 MH
-20.0												<b>Stop Fre</b> 1.000000000 GH
-30.0												CF Ste
-40.0												15.100000 MH <u>Auto</u> Ma
-60.0												Freq Offse
-70.0	naveral for the set	n ang sing performance of	Anter-Property	hai mungan kina	alester, 1/ freeder	(แม่มีรูการสุด <sub>ก</sub> ารตั้งในรูก	haren gilage medicana	angin vi ninalada (la albainde	<i>محد اللونية والمح</i> افة الم	fyrddirforgonorystribir byg	Nederland Constraints	
												Scale Typ
Start 0.84 #Res BW					#VBW	300 kHz			Sweep	Stop 1.0 18.72 ms (	0000 GHz (3021 pts)	Log <u>Li</u>
ISG									STATU	JS		

Plot 7-29. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)



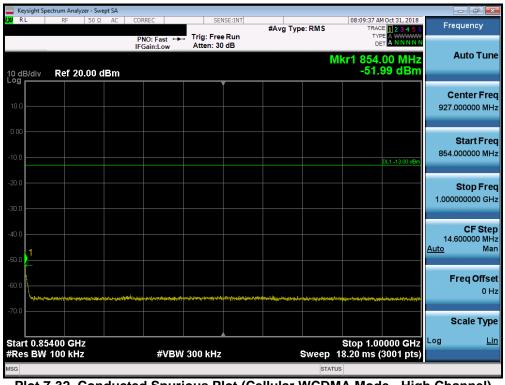
Plot 7-30. Conducted Spurious Plot (Cellular WCDMA Mode - Mid Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 20 of 72
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	ectrum Analyz												
LXI RL	RF	50 Ω	AC	CORREC		SI	ENSE:INT	#Avg Type	: RMS	TRAC	M Oct 31, 2018	Fr	equency
				PNO: F	ast ⊶⊶ .ow	Trig: Fro Atten: 3				TY	PE A WWWWW ET A N N N N N		
									N	lkr1 823	.85 MHz		Auto Tune
10 dB/div Log	Ref 20	.00 dE	Зm							-59.	33 dBm		
												C	enter Freq
10.0													.000000 MHz
0.00													Start Freq
-10.0											DL1 -13.00 dBm	30	.000000 MHz
											DL1 -13.00 dBm		
-20.0													Stop Freq
-30.0												824	.000000 MHz
-30.0													
-40.0												79	CF Step 400000 MHz
												Auto	Man
-50.0											1		
-60.0												F	req Offset
and the second			-Dillion Dillion	and benefits for a second						an dan balan bahar bahar ba			0 Hz
-70.0													Scale Type
Start 30.0 #Res BW					#\/D\/	300 kH:	,		woon 0	Stop 8	24.0 MHz 5881 pts)	Log	Lin
#Res DW	TUU KH2				FV DVV	300 KH		5	STATL		568 F pts)		
			_										

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



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Sp												_	
XI RL	RF	50 Ω	AC		ist ⊶►→	Trig: Free		#Avg Type	e: RMS	TRA	AM Oct 31, 2018 ACE 1 2 3 4 5 6 YPE A WWWWW DET A NNNN	Frec	luency
10 dB/div	Ref 1	0.00 d	Bm	IFGain:L	ow	#Atten: 2	8 dB		M	(r1 1.69	92 0 GHz 513 dBm	A	uto Tune
0.00													nter Fred 00000 GH
20.0											DL1 -13.00 dBm		Start Free 00000 GH
40.0	1												<b>Stop Fre</b> 00000 GH
50.0		and the		***								900.0 <u>Auto</u>	CF Ste 00000 M⊢ Ma
70.0												Fr	eqOffse 0⊦
80.0 Start 1.00 #Res BW										Stop 1	0.000 GHZ	So Log	cale Typ <u>Li</u>
	T.U IVIH	2		#	VBW .	3.0 MHz		5	меер 1а status		18001 pts)		

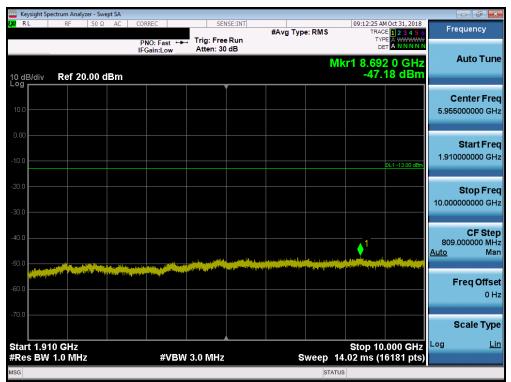
Plot 7-33. Conducted Spurious Plot (Cellular WCDMA Mode - High Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 22 of 72
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Keysight Spect RL	rum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT		09:12:18 AM Oct 31, 2018	
NL.	N 20.32 AC	PNO: Fast ++		#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNNN	Frequency
0 dB/div	Ref 20.00 dBm			М	kr1 1.845 0 GHz -30.79 dBm	Auto Tur
10.0						Center Fre 937.500000 MH
10.0					DL1 -13.00 dBm	Start Fre 30.000000 MH
20.0					1,	<b>Stop Fre</b> 1.845000000 GF
i0.0						CF Ste 181.50000 Mi <u>Auto</u> Ma
0.0	ang panganan aka kang pangan kang pang	ngan derposit metalet produktion and derber zwierbeitet.	nanftalle Franciskiller under Party Palagodissi rei	and in the stand of the stand o	<u>, , , , , , , , , , , , , , , , , , , </u>	Freq Offs 0 F
70.0						Scale Typ
tart 0.030 Res BW 1		#VBW	3.0 MHz	Sweep	Stop 1.8450 GHz 2.420 ms (3631 pts)	Log <u>L</u>
G				STATU	IS	

Plot 7-34. Conducted Spurious Plot (PCS WCDMA Mode - Low Channel)



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 22 of 72
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	ght Spectru												
L <mark>XI</mark> RL		RF	50 Ω	AC		Fast ↔		SENSE:INT	#Avg Ty	e: RMS	TRAC	M Oct 31, 2018 DE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	Frequency
10 dB/c	div R	Ref 10	.00 d	Bm	IFGain	:Low	Atten	: 20 dB		Mk	r1 17.05		Auto Tune
0.00													Center Free 15.000000000 GH
-10.0												DL1 -13.00 dBm	Start Fre 10.000000000 GH
-30.0													<b>Stop Fre</b> 20.000000000 GH
-50.0								~~~~		1 			CF Ste 1.00000000 G⊢ <u>Auto</u> Ma
70.0 —													Freq Offs 0 F
-80.0													Scale Typ
#Res I	10.000 BW 1.0		2			#VBW	V 3.0 M	Hz	ş		5.33 ms (2	.000 GHz 20001 pts)	Log <u>Li</u>
MSG										STATU	IS		

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



Plot 7-37. Conducted Spurious Plot (PCS WCDMA Mode - Mid Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 24 of 72
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	ectrum Analyzer										
L <mark>XI</mark> RL	RF	50 Ω		ORREC		ENSE:INT	#Avg Typ	e: RMS	TR/	AM Oct 31, 2018 CE 1 2 3 4 5 6	Frequency
				NO: Fast Gain:Low	Trig: Fr Atten:						Auto Tun
10 dB/div Log	Ref 20.0	00 dE	3m					M	kr1 8.66 -47	0 5 GHz .31 dBm	Auto Tuli
10.0											Center Fre 5.955000000 GH
-10.0										DL1 -13.00 dBm	<b>Start Fre</b> 1.910000000 GH
-20.0											<b>Stop Fre</b> 10.000000000 GH
-40.0							a particul to data sectored lifetice angle	a farmer and a strengthered to the	1 name of the line same of		<b>CF Ste</b> 809.000000 MH <u>Auto</u> Ma
-60.0							, and provide a state of the St		jer posisk fillen og skon		Freq Offse 0 H
-70.0											Scale Typ
Start 1.91 #Res BW				#VE	3W 3.0 MH	z	s	weep 1	Stop 1 4.02 ms (	0.000 GHz 16181 pts)	Log <u>Li</u>
MSG								STATU	IS		

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



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 25 of 72
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	ectrum Analyz												d X
<b>lxi</b> Rl	RF	50 Ω	AC	CORREC			SENSE:INT	#Avg Typ	e: RMS	TRA	M Oct 31, 2018	Frequen	су
				PNO: F IFGain:I	ast ⊶⊶ ∟ow		Free Run : 30 dB						
10 dB/div	Ref 20.	.00 dE	3m						М	kr1 1.60 -51.	7 5 GHz 48 dBm	Auto	Tune
							Ĭ					Cente	
10.0												940.0000	00 MHz
0.00												Star 30.00000	tFreq
-10.0											DL1 -13.00 dBm	30.00000	
-20.0												Stop 1.8500000	<b>Freq</b>
-30.0													
-40.0										. 1		CF 182.00000 Auto	<b>Step</b> 00 MHz Man
-50.0			indus grante			A. Protection of the							
-60.0												Freq	0 Hz
-70.0												Scale	туре
Start 0.03										Stop 1.	0000 0112	Log	Lin
#Res BW	1.0 MHz				#VBW	3.0 M	HZ		Sweep		(3641 pts)		

Plot 7-40. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)



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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: Test Dates:		EUT Type:		Dega 26 of 72
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	ectrum Analyze	er - Swept S	SA									
L <mark>XU</mark> RL	RF	50Ω A	P	RREC		Trig: Fre		#Avg Typ	e: RMS	TRA	AM Oct 31, 2018 CE 1 2 3 4 5 6 (PE A WWWWW DET A NNNNN	Frequency
10 dB/div Log	Ref 10.	00 dBi		Gain:Lo	w	Atten: 2	0 dB		Mk	r1 16.94	4 5 GHz .88 dBm	Auto Tune
0.00												Center Fre 15.000000000 GH
-10.0											DL1 -13.00 dBm	Start Fre 10.000000000 GH
40.0												<b>Stop Fre</b> 20.000000000 GH
-50.0									1			<b>CF Ste</b> 1.000000000 GH <u>Auto</u> Ma
70.0												Freq Offse 0 ⊢
-80.0 Start 10.0										Stop 2	0.000 GHZ	Scale Typ
#Res BW	1.0 MHz			#`	VBW	3.0 MHz		S	weep 2		20001 pts)	

Plot 7-42. Conducted Spurious Plot (PCS WCDMA Mode - High Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 27 of 72
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### 7.4 Band Edge Emissions at Antenna Terminal

#### **Test Overview**

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

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

#### **Test Procedure Used**

KDB 971168 D01 v03r01 - Section 6.0

#### **Test Settings**

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW > 1% of the emission bandwidth
- 4. VBW  $\geq$  3 x RBW
- 5. Detector = RMS
- 6. Number of sweep points  $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

#### Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

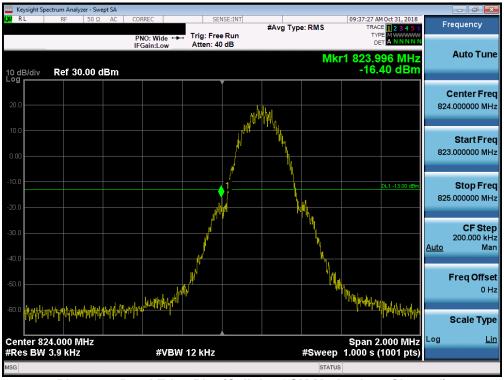
#### Test Notes

Per 22.917(b) and 24.238(b) 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.

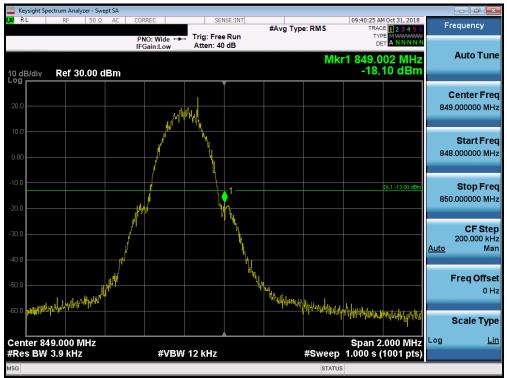
FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 20 of 72
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# Cellular GSM Mode



Plot 7-43. Band Edge Plot (Cellular GSM Mode - Low Channel)

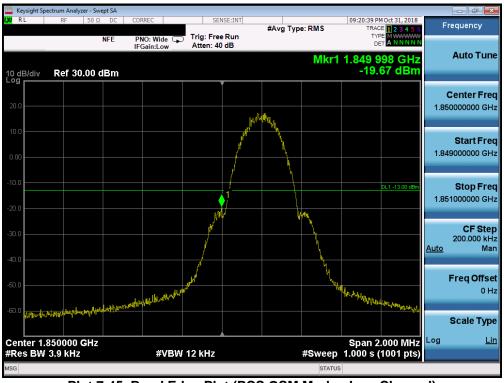


#### Plot 7-44. Band Edge Plot (Cellular GSM Mode - High Channel)

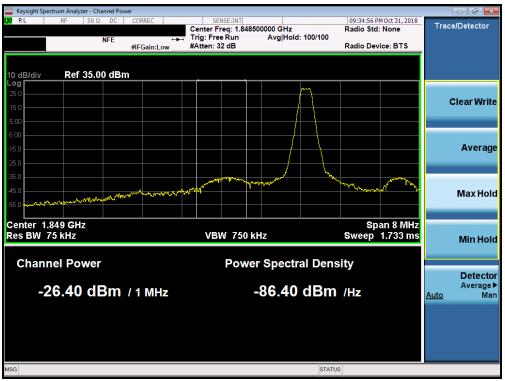
FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 72
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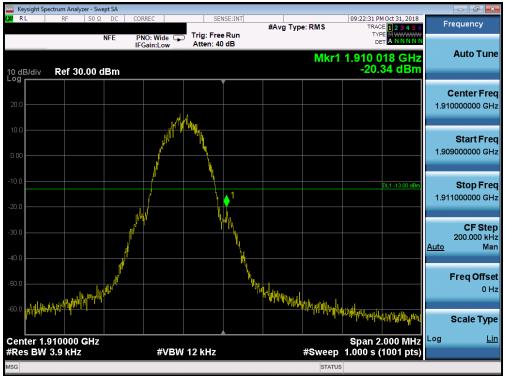
Plot 7-45. Band Edge Plot (PCS GSM Mode - Low Channel)



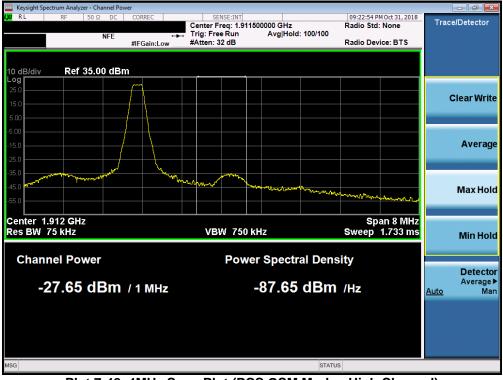
#### Plot 7-46. 4MHz Span Plot (PCS GSM Mode - Low Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 70
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Plot 7-47. Band Edge Plot (PCS GSM Mode - High Channel)



Plot 7-48. 4MHz Span Plot (PCS GSM Mode - High Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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### Cellular WCDMA Mode



Plot 7-49. Band Edge Plot (Cellular WCDMA Mode - Low Channel)



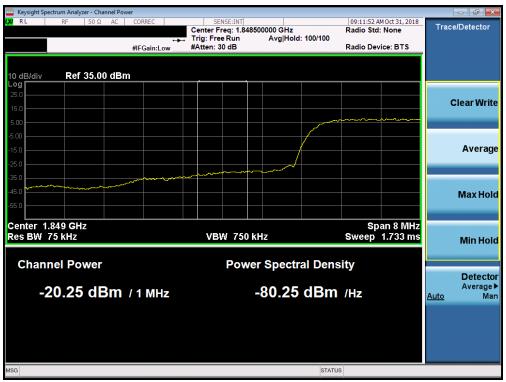
#### Plot 7-50. Band Edge Plot (Cellular WCDMA Mode - High Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 40 of 70
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Plot 7-51. Band Edge Plot (PCS WCDMA Mode - Low Channel)



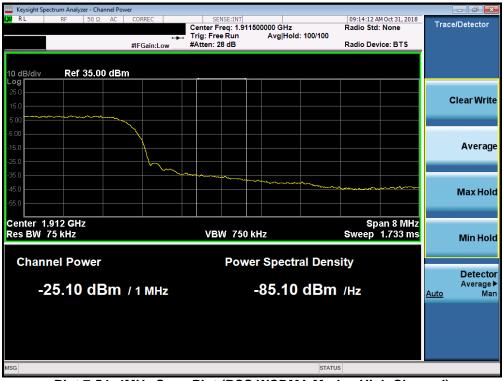
#### Plot 7-52. 4MHz Span Plot (PCS WCDMA Mode - Low Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	ING	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 42 of 72
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© 2010 DCTEST Engineering Loborg	ton/ Inc			1/ 0 0 11/10/2010



	ectrum Analyzei												
U RL	RF	50 Ω	AC	PNO:	Fast ↔			#Avg Ty	pe: RMS	TR	AM Oct 31, 2018 ACE 1 2 3 4 5 6 TYPE A WWWW DET A NNNN	Fr	equency
0 dB/div	Ref 30.0	00 d	Bm	IFGain	LOW	Atten: 4	u u u		Mki	1 1.910 <sup>-1</sup> -18.	000 GHz 317 dBm		Auto Tun
20.0													Center Fre
10.0 J.00			/~~	r and a second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	many						1.90	<b>Start Fre</b> 2500000 G⊦
10.0 20.0							1				DL1 -13.00 dBm	1.91	<b>Stop Fre</b> 7500000 G⊦
30.0 ~~~~~ 40.0	Vunnen	<u></u>					hor was	- May May	why			1 <u>Auto</u>	CF Ste .500000 MH Ma
60.0									~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www.ww	Margare Margare		FreqOffso 0 H
50.0													Scale Typ
	910000 G 100 kHz	Hz			#VBW	/ 300 kHz			Sweep		15.00 MHz (1001 pts)	LUg	L

Plot 7-53. Band Edge Plot (PCS WCDMA Mode - High Channel)



Plot 7-54. 4MHz Span Plot (PCS WCDMA Mode - High Channel)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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## 7.5 Peak-Average Ratio

#### **Test Overview**

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

#### Test Procedure Used

KDB 971168 D01 v03r01 - Section 5.7.1

#### **Test Settings**

- 1. The signal analyzer's CCDF measurement profile is enabled
- 2. Frequency = carrier center frequency
- 3. Measurement BW > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

#### Test Setup

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



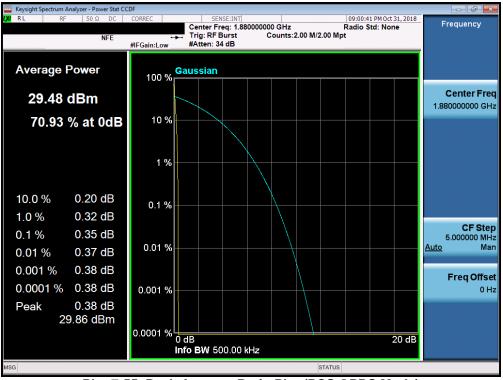
Figure 7-4. Test Instrument & Measurement Setup

#### Test Notes

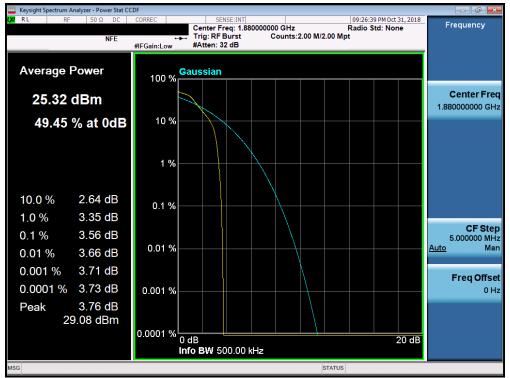
None

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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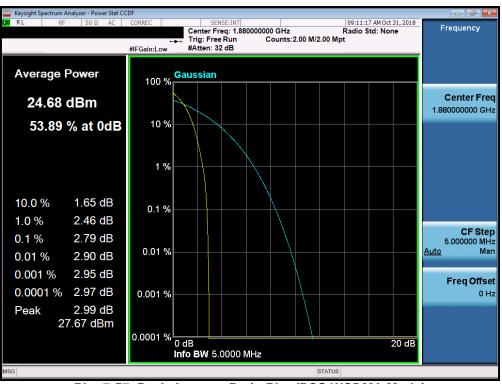




Plot 7-56. Peak-Average Ratio Plot (PCS EDGE Mode)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-57. Peak-Average Ratio Plot (PCS WCDMA Mode)

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# 7.6 Radiated Power (ERP/EIRP)

#### **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 v03r01 - Section 5.2.1

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

#### Test Settings

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

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### Test Setup

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

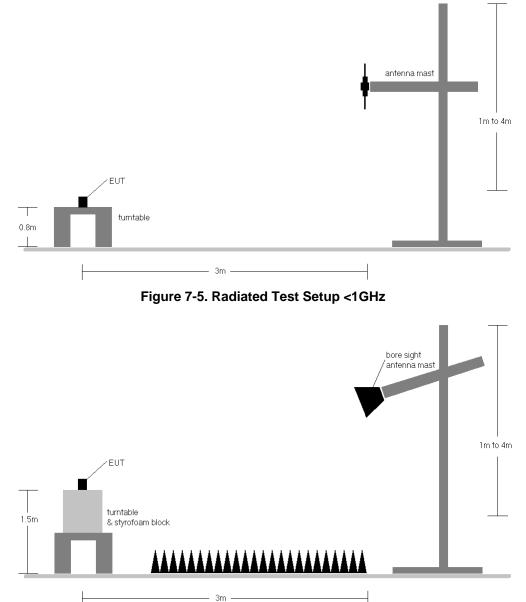


Figure 7-6. Radiated Test Setup >1GHz

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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 GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) This 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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Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level	Gain	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
GPRS850	н	102	290	21.33	6.75	25.93	0.392	38.45	-12.52	28.08	0.643	40.61	-12.53
GPRS850	Н	102	294	18.78	6.78	23.41	0.219	38.45	-15.05	25.56	0.359	40.61	-15.05
GPRS850	н	118	304	19.49	6.80	24.14	0.259	38.45	-14.31	26.29	0.426	40.61	-14.32
GPRS850	V	136	296	21.15	6.78	25.78	0.378	38.45	-12.68	27.93	0.620	40.61	-12.68
EDGE850	Н	102	290	14.65	6.78	19.28	0.085	38.45	-19.18	21.43	0.139	40.61	-19.18
GPRS850 (WCP)	н	123	38	21.08	6.75	25.68	0.370	38.45	-12.77	27.83	0.607	40.61	-12.78
	GPRS850 GPRS850 GPRS850 GPRS850 EDGE850	[H/V]   GPRS850 H   GPRS850 H   GPRS850 H   GPRS850 V   EDGE850 H	[H/V] [cm]   GPRS850 H 102   GPRS850 H 102   GPRS850 H 118   GPRS850 V 136   EDGE850 H 102	[H/V] [cm] [degree]   GPRS850 H 102 290   GPRS850 H 102 294   GPRS850 H 118 304   GPRS850 H 118 296   GPRS850 V 136 296   EDGE850 H 102 290   GPRS850 H 102 38	[H/V] [cm] [degree] [dBm]   GPRS850 H 102 290 21.33   GPRS850 H 102 294 18.78   GPRS850 H 102 294 18.78   GPRS850 H 118 304 19.49   GPRS850 V 136 296 21.15   EDGE850 H 102 290 14.65   GPRS850 (WCP) H 123 38 21.08	[H/V] [cm] [degree] [dBm] [dBi]   GPRS850 H 102 290 21.33 6.75   GPRS850 H 102 294 18.78 6.78   GPRS850 H 102 294 18.78 6.78   GPRS850 H 118 304 19.49 6.80   GPRS850 V 136 296 21.15 6.78   EDGE850 H 102 290 14.65 6.78   GPRS850 (WCP) H 123 38 21.08 6.75	[H/V] [cm] [degree] [dBm] [dBm] [dBm]   GPRS850 H 102 290 21.33 6.75 25.93   GPRS850 H 102 294 18.78 6.78 23.41   GPRS850 H 102 294 19.49 6.80 24.14   GPRS850 H 118 304 19.49 6.78 25.78   GPRS850 V 136 296 21.15 6.78 25.78   EDGE850 H 102 290 14.65 6.78 19.28   GPRS850 (WCP) H 123 38 21.08 6.75 25.68	[H/V] [cm] [degree] [dBm] [dBi] [dBm] [Watts]   GPRS850 H 102 290 21.33 6.75 25.93 0.392   GPRS850 H 102 294 18.78 6.78 23.41 0.219   GPRS850 H 118 304 19.49 6.80 24.14 0.259   GPRS850 H 118 304 19.49 6.80 24.14 0.259   GPRS850 H 1136 296 21.15 6.78 25.78 0.378   EDGE850 H 102 290 14.65 6.78 19.28 0.085   GPRS850 (WCP) H 123 38 21.08 6.75 25.68 0.370	[H/V] [cm] [degree] [dBm] [dBm] [dBm] [Watts] [dBm]   GPRS850 H 102 290 21.33 6.75 25.93 0.392 38.45   GPRS850 H 102 294 18.78 6.78 23.41 0.219 38.45   GPRS850 H 118 304 19.49 6.80 24.14 0.259 38.45   GPRS850 H 118 296 21.15 6.78 25.78 0.378 38.45   GPRS850 V 136 296 21.15 6.78 25.78 0.378 38.45   EDGE850 H 102 290 14.65 6.78 19.28 0.085 38.45   GPRS850 (WCP) H 123 38 21.08 6.75 25.68 0.370 38.45	[H/V] [cm] [degree] [dBm] <	Image: Harmonic condition Image: Harmonic condititeonImage: Harmonic condititeon <td>Image: Harmonic condition Image: C</td> <td>Image: Harmonic biase Image: Harmonic biase</td>	Image: Harmonic condition Image: C	Image: Harmonic biase

#### Table 7-2. ERP (Cellular GPRS)

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	100	294	14.43	6.76	19.04	0.080	38.45	-19.42	21.19	0.131	40.61	-19.42
836.60	WCDMA850	Н	218	286	13.69	6.78	18.32	0.068	38.45	-20.14	20.47	0.111	40.61	-20.14
846.60	WCDMA850	н	201	280	12.94	6.80	17.59	0.057	38.45	-20.86	19.74	0.094	40.61	-20.87
826.40	WCDMA850	V	134	274	14.15	6.78	18.78	0.075	38.45	-19.68	20.93	0.124	40.61	-19.68
826.40	WCDMA850 (WCP)	Н	153	262	14.09	6.76	18.70	0.074	38.45	-19.76	20.85	0.121	40.61	-19.76

#### Table 7-3. ERP (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]
1850.20	GPRS1900	н	184	225	16.29	8.37	24.66	0.292	33.01	-8.35
1880.00	GPRS1900	н	155	234	18.73	8.41	27.14	0.518	33.01	-5.87
1909.80	GPRS1900	н	144	217	18.31	8.46	26.77	0.476	33.01	-6.24
1880.00	GPRS1900	V	148	285	17.65	8.41	26.06	0.404	33.01	-6.95
1880.00	EDGE1900	н	155	234	14.26	8.41	22.67	0.185	33.01	-10.34
1880.00	GPRS1900 (WCP)	н	112	28	15.92	8.41	24.33	0.271	33.01	-8.68

### Table 7-4. EIRP (PCS GPRS)

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	148	348	11.54	8.37	19.91	0.098	33.01	-13.10
1880.00	WCDMA1900	Н	157	1	14.53	8.41	22.94	0.197	33.01	-10.07
1907.60	WCDMA1900	Н	110	6	14.63	8.46	23.09	0.204	33.01	-9.92
1907.60	WCDMA1900	V	141	337	12.13	8.41	20.54	0.113	33.01	-12.47
1907.60	WCDMA1900 (WCP)	Н	113	29	13.22	8.46	21.68	0.147	33.01	-11.33

### Table 7-5. EIRP (PCS WCDMA)

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### 7.7 Radiated Spurious Emissions Measurements

#### **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 v03r01 - 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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EUT turntable 8. styrofoam block.

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

Figure 7-7. Test Instrument & Measurement Setup

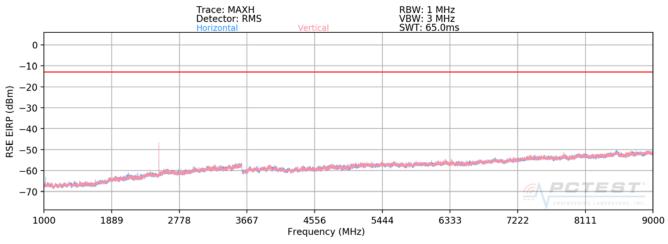
#### Test Notes

- 1) This device employs GSM, GPRS, and EDGE capabilities. The EUT was tested under all configurations and the highest power is reported in GPRS mode while transmitting with one slot active.
- 2) This device employs UMTS technology with WCDMA (AMR/RMC), HSDPA, and HSUPA capabilities. For WCDMA and HSUPA transmission, all configurations were investigated and the worst case UMTS emissions were found in RMC WCDMA mode at 12.2kbps with HSDPA inactive and TPC bits all set to "1."
- 3) This 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 GPRS Mode**



#### Plot 7-58. Radiated Spurious Plot above 1GHz (Cellular GPRS Mode)

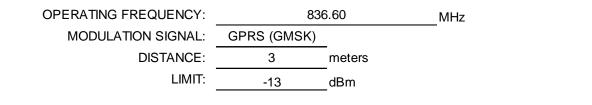
OPERATING FREQUENCY:	824	MHz	
MODULATION SIGNAL:	GPRS (GMSK)	_	
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1648.40	Н	157	146	-60.74	8.94	-51.80	-38.8
2472.60	Н	117	127	-37.66	9.64	-28.01	-15.0
3296.80	Н	-	-	-68.44	9.57	-58.86	-45.9
4121.00	Н	114	158	-62.05	10.17	-51.89	-38.9
4945.20	Н	190	250	-69.23	10.90	-58.33	-45.3
5769.40	Н	-	-	-70.92	11.47	-59.46	-46.5

Table 7-6. Radiated Spurious Data (Cellular GPRS Mode – Ch. 128)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo E4 of 70
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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]
1673.20	Н	145	148	-68.67	8.95	-59.72	-46.7
2509.80	Н	121	145	-51.62	9.75	-41.87	-28.9
3346.40	Н	-	-	-68.06	9.60	-58.45	-45.5

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

OPERATING FREQUENCY:	848	8.80	MHz
MODULATION SIGNAL:	GPRS (GMSK)		_
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1697.60	Н	250	226	-63.76	8.95	-54.80	-41.8
2546.40	Н	123	219	-47.33	9.74	-37.59	-24.6
3395.20	Н	-	-	-69.08	9.78	-59.30	-46.3
4244.00	Н	118	175	-68.03	10.58	-57.46	-44.5
5092.80	Н	-	-	-70.43	10.69	-59.74	-46.7

Table 7-8. Radiated Spurious Data (Cellular GPRS Mode – Ch. 251)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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OPERATING FREQUENCY:	824.20	MHz
MODULATION SIGNAL:	GPRS (GMSK)	
DISTANCE:	3	meters
LIMIT:	-13	dBm

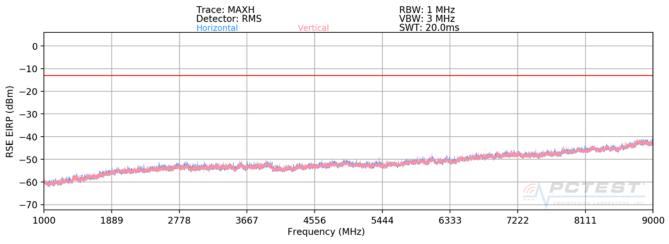
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1648.40	Н	189	186	-55.94	8.94	-47.00	-34.0
2472.60	Н	117	169	-49.06	9.64	-39.41	-26.4
3296.80	Н	-	-	-68.62	9.57	-59.04	-46.0
4121.00	Н	400	186	-70.35	10.17	-60.19	-47.2
4945.20	Н	-	-	-71.26	10.90	-60.36	-47.4

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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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### **Cellular WCDMA Mode**



#### Plot 7-59. Radiated Spurious Plot above 1GHz (Cellular WCDMA Mode)

OPERATING FREQUENCY:	82	6.40	MHz
MODULATION SIGNAL:	WCDMA	_	
DISTANCE:	3	_meters	
LIMIT:	-13	_dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1652.80	Н	-	-	-68.65	3.09	-65.55	-52.6
2479.20	Н	102	4	-61.55	3.91	-57.64	-44.6
3305.60	Н	-	-	-68.29	6.00	-62.28	-49.3

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

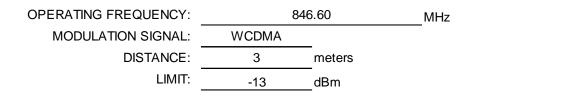
OPERATING FREQUENCY:	83	86.60	MHz
MODULATION SIGNAL:	WCDMA		
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

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	-	-	-69.02	3.10	-65.92	-52.9
2509.80	Н	101	9	-64.16	4.02	-60.14	-47.1
3346.40	Н	-	-	-67.65	6.03	-61.62	-48.6

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

FCC ID: A3LSMG9750		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	-	-	-69.01	3.17	-65.84	-52.8
2539.80	Н	123	350	-63.77	4.13	-59.65	-46.6
3386.40	Н	-	-	-68.27	6.20	-62.08	-49.1

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

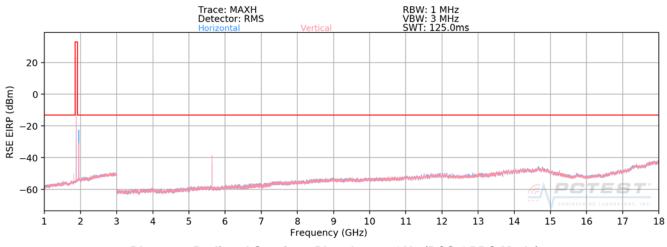
OPERATING FREQUENCY:	82	6.40	MHz
MODULATION SIGNAL:	WCDMA		_
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1652.80	Н	-	-	-68.71	3.09	-65.61	-52.6
2479.20	Н	145	183	-66.08	3.91	-62.17	-49.2
3305.60	Н	-	-	-68.30	6.00	-62.29	-49.3

Table 7-13. Radiated Spurious Data with WCP (Cellular WCDMA Mode - Ch. 4183)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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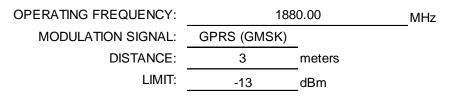


#### Plot 7-60. Radiated Spurious Plot above 1GHz (PCS GPRS Mode)

OPERATING FREQUENCY:	18	50.20	MHz
MODULATION SIGNAL:	GPRS (GMSK)	_	
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3700.40	Н	112	8	-64.76	9.58	-55.17	-42.2
5550.60	Н	128	291	-54.08	10.94	-43.14	-30.1
7400.80	Н	-	-	-66.89	10.96	-55.94	-42.9

Table 7-14. Radiated Spurious Data (PCS GPRS Mode - Ch. 512)



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	112	4	-63.75	9.37	-54.38	-41.4
5640.00	Н	112	286	-45.14	11.17	-33.97	-21.0
7520.00	Н	-	-	-67.16	11.11	-56.05	-43.0

#### Table 7-15. Radiated Spurious Data (PCS GPRS Mode - Ch. 661)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 50 of 72
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OPERATING FREQUENCY:	190	9.80	MHz
MODULATION SIGNAL:	GPRS (GMSK)	_	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3819.60	Н	115	6	-65.85	9.30	-56.54	-43.5
5729.40	Н	112	285	-43.83	11.39	-32.44	-19.4
7639.20	н	-	-	-67.24	11.33	-55.91	-42.9

Table 7-16. Radiated Spurious Data (PCS GPRS Mode - Ch. 810)

OPERATING FREQUENCY: MODULATION SIGNAL

REQUENCY:	1909.80			
ON SIGNAL:	GPRS (GMSK)	_		
DISTANCE:	3	meters		
LIMIT:	-13	dBm		

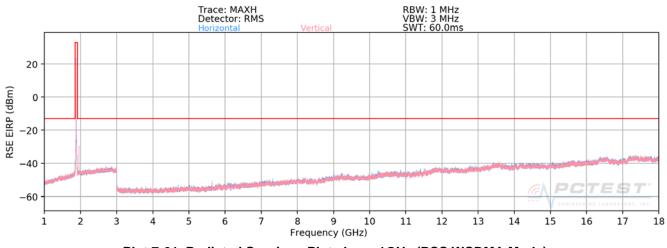
MHz

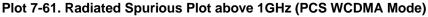
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3819.60	V	124	217	-60.48	9.30	-51.17	-38.2
5729.40	V	151	188	-43.03	11.39	-31.64	-18.6
7639.20	V	-	-	-67.13	11.33	-55.80	-42.8

Table 7-17. Radiated Spurious Data with WCP (PCS GPRS Mode – Ch. 810)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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18	52.40	MHz
WCDMA	_	
3	meters	
-13	dBm	
	WCDMA 3	<u> </u>

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	V	-	-	-68.22	6.89	-61.33	-48.3
5557.20	V	-	-	-68.84	9.03	-59.81	-46.8

Table 7-18. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

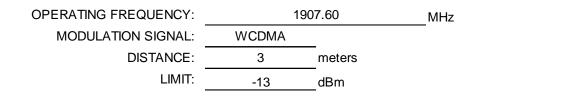
OPERATING FREQUENCY:	188	30.00	MHz
MODULATION SIGNAL:	WCDMA		_
DISTANCE:	3	meters	
LIMIT:	-13	_dBm	

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	V	-	-	-68.67	6.93	-61.74	-48.7
5640.00	V	156	11	-64.98	9.15	-55.83	-42.8
7520.00	V	-	-	-66.19	9.31	-56.87	-43.9

Table 7-19. Radiated Spurious Data (PCS WCDMA Mode - Ch. 9400)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 61 of 70
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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	V	-	-	-68.40	7.09	-61.31	-48.3
5722.80	V	244	321	-65.34	9.04	-56.30	-43.3
7630.40	V	-	-	-65.76	9.28	-56.48	-43.5

Table 7-20. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

1880.00

MHz

OPERATING FREQUENCY:

MODULATION SIGNAL:

DN 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	V	-	-	-68.81	6.93	-61.88	-48.9
5640.00	V	152	188	-63.14	9.15	-53.99	-41.0
7520.00	V	-	-	-66.21	9.31	-56.89	-43.9

Table 7-21. Radiated Spurious Data with WCP (PCS WCDMA Mode - Ch. 9400)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dage 62 of 72		
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#### **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, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency. For Part 24, 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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	190	
REFERENCE VOLTAGE:	4.29	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	836,600,012	12	0.0000014
100 %		- 20	836,600,241	241	0.0000288
100 %		- 10	836,600,221	221	0.0000264
100 %		0	836,600,157	157	0.0000188
100 %		+ 10	836,599,771	-229	-0.0000274
100 %		+ 20	836,599,958	-42	-0.0000050
100 %		+ 30	836,599,779	-221	-0.0000264
100 %		+ 40	836,599,788	-212	-0.0000253
100 %		+ 50	836,599,921	-79	-0.0000094
BATT. ENDPOINT	3.67	+ 20	836,600,022	22	0.0000026

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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 64 of 70
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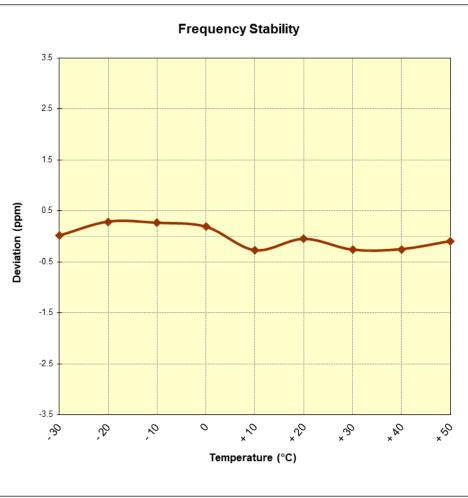


Figure 7-8. Frequency Stability Graph (Cellular GPRS Mode – Ch. 190)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage (E of 7)
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OPERATING FREQUENCY:	836,600,000	Hz
CHANNEL:	4183	
REFERENCE VOLTAGE:	4.29	VDC
<b>DEVIATION LIMIT</b> :	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	836,600,356	356	0.0000426
100 %		- 20	836,599,808	-192	-0.0000230
100 %		- 10	836,599,966	-34	-0.0000041
100 %		0	836,599,835	-165	-0.0000197
100 %		+ 10	836,600,051	51	0.0000061
100 %		+ 20	836,600,231	231	0.0000276
100 %		+ 30	836,600,140	140	0.0000167
100 %		+ 40	836,600,100	100	0.0000120
100 %		+ 50	836,600,009	9	0.0000011
BATT. ENDPOINT	3.67	+ 20	836,600,095	95	0.0000114

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

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage CC of 70
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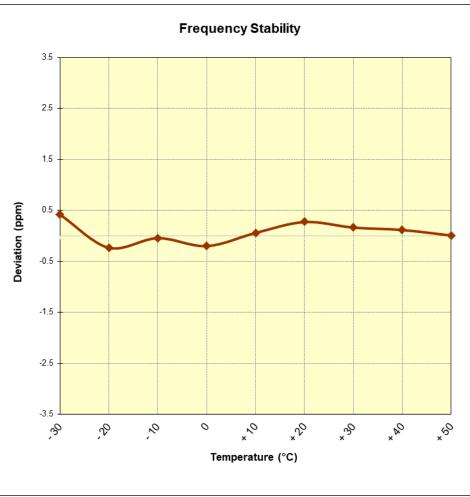


Figure 7-9. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 67 of 70
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	661	
REFERENCE VOLTAGE:	4.29	VDC
<b>DEVIATION LIMIT</b> :	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	1,880,000,081	81	0.0000043
100 %		- 20	1,880,000,182	182	0.0000097
100 %		- 10	1,879,999,868	-132	-0.0000070
100 %		0	1,880,000,197	197	0.0000105
100 %		+ 10	1,880,000,304	304	0.0000162
100 %		+ 20	1,879,999,983	-17	-0.0000009
100 %		+ 30	1,880,000,048	48	0.0000026
100 %		+ 40	1,879,999,965	-35	-0.0000019
100 %		+ 50	1,879,999,999	-1	-0.0000001
BATT. ENDPOINT	3.67	+ 20	1,879,999,906	-94	-0.0000050

Table 7-24. Frequency Stability Data (PCS GPRS Mode – Ch. 661)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege C0 of 70
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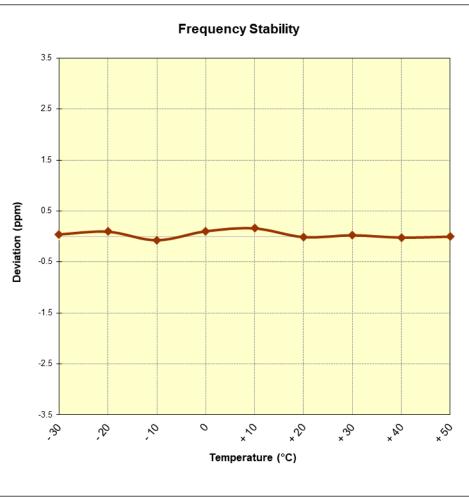


Figure 7-10. Frequency Stability Graph (PCS GPRS Mode – Ch. 661)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 60 of 70
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OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	9400	
REFERENCE VOLTAGE:	4.29	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.29	- 30	1,879,999,667	-333	-0.0000177
100 %		- 20	1,879,999,967	-33	-0.0000018
100 %		- 10	1,879,999,732	-268	-0.0000143
100 %		0	1,879,999,833	-167	-0.000089
100 %		+ 10	1,880,000,102	102	0.0000054
100 %		+ 20	1,880,000,069	69	0.0000037
100 %		+ 30	1,880,000,208	208	0.0000111
100 %		+ 40	1,879,999,984	-16	-0.0000009
100 %		+ 50	1,880,000,442	442	0.0000235
BATT. ENDPOINT	3.67	+ 20	1,880,000,008	8	0.0000004

Table 7-25. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 70 of 70
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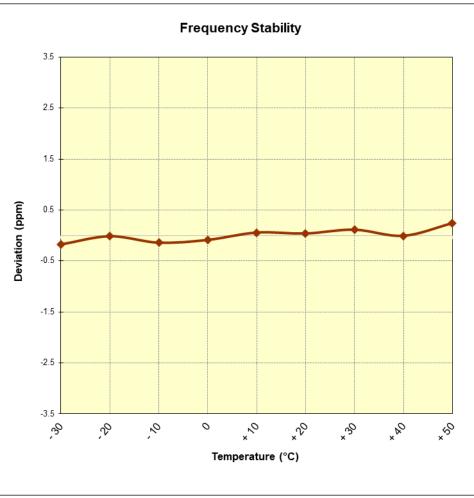


Figure 7-11. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

FCC ID: A3LSMG9750		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 71 of 70
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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: A3LSMG9750** complies with all the requirements of Part 22 & 24 of the FCC Rules.

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Test Report S/N:	Test Dates:	EUT Type:		Dogo 72 of 72
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