



PCTEST ENGINEERING LABORATORY, INC.

6660-B Dobbin Road, Columbia, MD 21045 USA
Tel. 410.290.6652 / Fax 410.290.6554
<http://www.pctestlab.com>



CERTIFICATE OF COMPLIANCE FCC Part 15.249 Certification

Applicant Name:

Samsung Electronics, Co. Ltd.
18600 Broadwick St.
Rancho Dominguez, CA 90220
United States

Date of Testing:

October 22, 2007

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Test Report Serial No.:

0710221230.A3L

FCC ID: A3LSGHF110

APPLICANT: Samsung Electronics, Co. Ltd.

Model(s): SGH-F110

EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver

Frequency Range: 2403 – 2426.3MHz

FCC Classification: Part 15 Low Power Communication Device Transmitter (DXX)

FCC Rule Part(s): FCC Part 15 Subpart C (15.249)

The device bearing the FCC Identifier specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 (See Test Report). These measurements were performed with no deviation from the standards.

I authorize and 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.

NVLAP accreditation does not constitute any product endorsement by NVLAP or any agency of the United States Government. PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.


Randy Ortanez
President

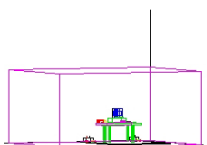


FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver	Page 1 of 22	

TABLE OF CONTENTS

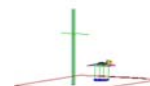
FCC Part 15.249 MEASUREMENT REPORT	3
1.0 INTRODUCTION	4
1.1 EVALUATION PROCEDURE	4
1.2 SCOPE	4
1.3 PCTEST TEST LOCATION	4
2.0 PRODUCT INFORMATION.....	5
2.1 EQUIPMENT DESCRIPTION	5
2.2 OPERATION MODE.....	5
2.3 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS	5
2.4 LABELING REQUIREMENTS	5
3.0 DESCRIPTION OF TEST	6
3.1 CONDUCTED EMISSIONS.....	6
3.2 RADIATED EMISSIONS.....	7
4.0 SAMPLE CALCULATIONS	8
4.1 CONDUCTED EMISSION MEASUREMENT SAMPLE CALCULATION	8
4.2 RADIATED EMISSION MEASUREMENT SAMPLE CALCULATION	8
5.0 TEST EQUIPMENT CALIBRATION DATA	9
6.0 ENVIRONMENTAL CONDITIONS.....	10
7.0 TEST DATA.....	11
7.1 SUMMARY	11
7.2 RADIATED SPURIOUS EMISSION MEASUREMENTS	12
7.3 IN-BAND RADIATED SPURIOUS EMISSION MEASUREMENTS.....	13
7.4 OUT-OF-BAND RADIATED SPURIOUS EMISSION MEASUREMENTS	14
7.5 20DB BANDWIDTH MEASUREMENTS.....	18
7.6 LINE CONDUCTED MEASUREMENT DATA	20
8.0 CONCLUSION.....	22

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver	Page 2 of 22	



MEASUREMENT REPORT

FCC Part 15.249



§ 2.1033 General Information

APPLICANT: Samsung Electronics, Co. Ltd.
APPLICANT ADDRESS: 18600 Broadwick St.
 Rancho Dominguez, CA 90220, United States
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S): Part 15 Subpart C (15.249)
MODEL: SGH-F110
FCC ID: A3LSGHF110
Test Device Serial No.: FE-165-S ☐ Production ☒ Pre-Production ☐ Engineering
FCC CLASSIFICATION: Part 15 Low Power Communication Device Transmitter (DXX)
DATE(S) OF TEST: October 22, 2007
TEST REPORT S/N: 0710221230.A3L

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21045, U.S.A.



- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (IC-2451).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (IC-2451) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 3 of 22

1.0 INTRODUCTION

1.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) was used in the measurement of the **Samsung 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver FCC ID: A3LSGHF110**.

Deviation from measurement procedure.....None

1.2 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.

1.3 PCTEST Test Location

The map at the right shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity are, the Baltimore-Washington Intern't'l (BWI) airport, the city of Baltimore and the Washington, DC area. (see Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on January 27, 2006 and Industry Canada.

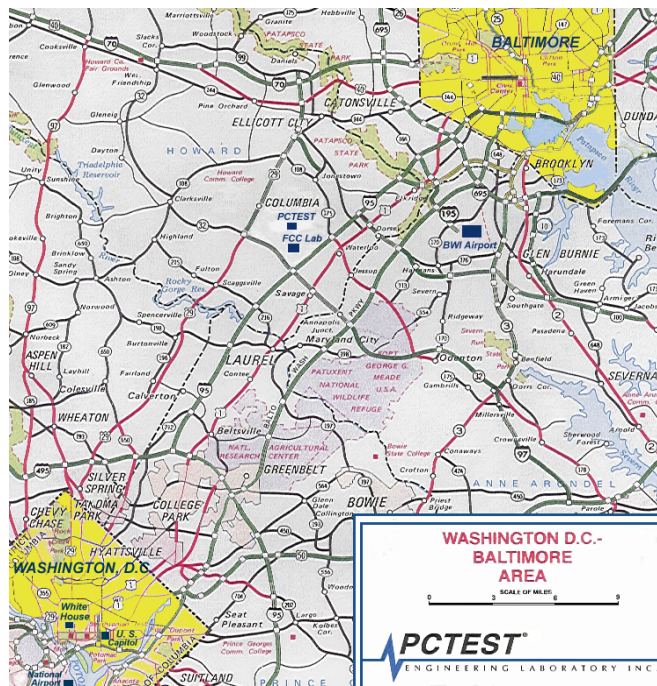


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

FCC ID: A3LSGHF110	FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver	Page 4 of 22

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver FCC ID: A3LSGHF110**. The test data contained in this report pertains only to the emissions due to the 2.4GHz transmitter of the EUT.

Manufacturer / Model	FCC ID	Description
Samsung / Model: SGH-F110	A3LSGHF110	850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver

Table 2-1. EUT Equipment Description

2.2 Operation Mode

The Samsung 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver FCC ID: A3LSGHF110 was set to transmit in the 2.4GHz band using test codes.

Please see Section 7.0 for more information on the test setup. The test setup photographs can be found as an appendix to this report.

2.3 EMI Suppression Device(s)/Modifications

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

2.4 Labeling Requirements

Per 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver	Page 5 of 22	

3.0 DESCRIPTION OF TEST

3.1 Conducted Emissions

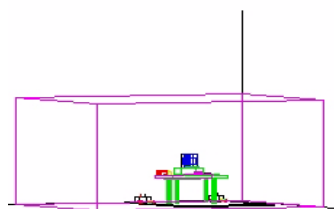


Figure 3-1. Shielded Enclosure Line-Conducted Test Facility

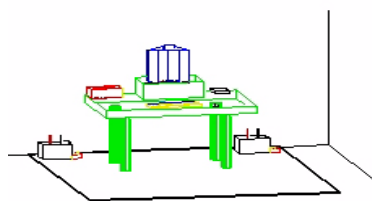


Figure 3-2. Line Conducted Emission Test Set-Up

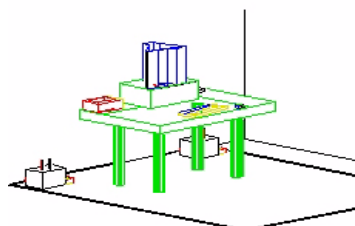


Figure 3-3. Wooden Table & Bonded LISNs

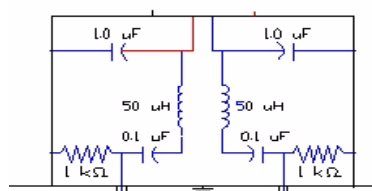


Figure 3-4. LISN Schematic Diagram

The line-conducted facility is located inside a 16'x20'x10' shielded enclosure, manufactured by Ray Proof Series 81 (see *Figure 3-1*). The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 1.5m away from the sidewall of the shielded room (see *Figure 3-2*). Solar Electronics and EMCO Model 3725/2 (10kHz-30MHz) 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room (see *Figure 3-3*). The EUT is powered from the Solar LISN and the support equipment is powered from the EMCO LISN. Power to the LISNs are filtered by a high-current high-insertion loss Ray Proof power line filter (100dB 14Hz-10GHz). The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure. All electrical cables are shielded by braided tinned copper zipper tubing with an inner diameter of ½". If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the Solar LISN. The LISN schematic diagram is shown (see *Figure 3-4*). All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion). Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.

The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to CISPR quasi-peak and average mode. The bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in the test setup photographs. Each EME reported was calibrated using the Agilent E8257D (250kHz – 20GHz) PSG Signal Generator.

FCC ID: A3LSGHF110	 FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 6 of 22

3.2 Radiated Emissions



Figure 3-5. 3-Meter Test Site

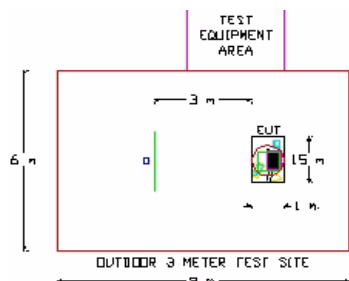


Figure 3-6. Dimensions of Outdoor Test Site



Figure 3-7. Turntable and System Setup



Figure 3-8. Normalized Site Attenuation Curves (H&V)

Preliminary measurements were made indoors at 1-meter using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, and turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 to 200 MHz using a bi-conical antenna and from 200 to 1000 MHz using a log-spiral antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 3-meter test range using RobertsTM Dipole antennas or horn antennas (see Figure 3-5). The test equipment was placed on a wooden and plastic bench situated on a 1.5m x 2m area adjacent to the measurement area (see Figure 3-6). Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 100kHz for frequencies below 1GHz or 1MHz for frequencies above 1GHz. Above 1GHz the detector function was set to average mode (RBW = 1MHz, VBW = 10Hz).

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table (see Figure 3-7). The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in the test setup photographs. Each EME reported was calibrated using the Agilent E8257D (250kHz – 20GHz) PSG Signal Generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3-8.

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 7 of 22

4.0 SAMPLE CALCULATIONS

4.1 Conducted Emission Measurement Sample Calculation

@ 20.3 MHz

Class B limit = 60.0 dB μ V (Quasi-peak limit)
Reading = - 57.8 dBm (calibrated quasi-peak level)
Convert to dB μ V = - 57.8 + 107 = 49.2 dB μ V

Margin = 49.2 - 60.0 = - 10.8 dB
= 10.8 dB below limit

4.2 Radiated Emission Measurement Sample Calculation

@ 66.7 MHz

Class B limit = 100 μ V/m = 40.0 dB μ V/m
Reading = - 76.0 dBm (calibrated level)
Convert to dB μ V = - 76.0 + 107 = 31.0 dB μ V
Antenna Factor + Cable Loss = 5.8 dB/m
Total = 36.8 dB μ V/m

Margin = 36.8 - 40.0 = - 3.2 dB
= 3.2 dB below limit

Note:

$$\text{Level}_{[\text{dB}\mu\text{V}]} = 20 \log_{10} (\text{Level}_{[\mu\text{V}/\text{m}]})$$

$$\text{Level}_{[\text{dB}\mu\text{V}]} = \text{Level}_{[\text{dBm}]} + 107$$

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 8 of 22

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model / Equipment	Calibration Date	Cal Interval	Calibration Due	Serial No.
Agilent	E4407B ESA Spectrum Analyzer	04/29/07	Annual	04/28/08	US39210313
Agilent	N4010A Wireless Connectivity Test Set	06/11/07	Annual	06/10/08	GB46170464
EMCO	Model 3115 (1-18GHz) Horn Antenna	09/24/06	Biennial	09/23/08	9203-2178
EMCO	Model 3115 (1-18GHz) Horn Antenna	09/25/06	Biennial	09/24/08	9704-5182
Rohde & Schwarz	NRVS Power Meter	07/03/07	Biennial	07/02/09	835360/079
Rohde & Schwarz	NRV-Z53 Power Sensor	07/03/07	Biennial	07/02/09	846076/007
Rohde & Schwarz	CMU200 Base Station Simulator	05/24/07	Annual	05/23/08	836371/079
Agilent	HP 8566B (100Hz-22GHz) Spectrum Analyzer	12/21/06	Annual	12/21/07	3638A08713
Agilent	E4448A (3Hz-50GHz) Spectrum Analyzer	10/01/07	Annual	10/01/08	US42510244
Agilent	E8257D (250kHz-20GHz) Signal Generator	03/08/07	Annual	03/07/08	MY45470194
CCA-7	CISPR QP Adapter	12/21/06	Annual	12/21/07	0194-04082
Agilent	HP 85650A Quasi-Peak Adapter	12/21/06	Annual	12/21/07	2043A00301
CCA-7	CISPR QP Adapter	12/21/06	Annual	12/21/07	0194-04082
Agilent	HP 85650A Quasi-Peak Adapter	12/21/06	Annual	12/21/07	2043A00301
Agilent	HP 8449B (1-26.5GHz) Pre-Amplifier	12/12/06	Annual	12/12/07	3008A00985
Agilent	HP 11713A Attenuation/Switch Driver	12/12/06	Annual	12/12/07	N/A
Agilent	HP 85685A (20Hz-2GHz) Preselector	12/12/06	Annual	12/12/07	N/A
Agilent	HP 8566B Opt. 462 Impulse Bandwidth	12/12/06	Annual	12/12/07	3701A22204
EMCO	Dipole Pair	09/21/06	Biennial	09/20/08	23951
SOLAR	8012-50 LISN (2)	11/18/05	Biennial	11/18/07	0313233, 0310234
Agilent	HP 8495A (0-70dB) DC-4GHz Attenuator	N/A		N/A	N/A
-	263-10dB (DC-18GHz) 10 dB Attenuator	N/A		N/A	N/A
Pasternack	PE7000-6 6 dB Attenuator	N/A		N/A	N/A
Pasternack	PE2209-10 Bidirectional Coupler	N/A		N/A	N/A
-	No.165 (30MHz - 1000MHz) RG58 Coax Cable	N/A		N/A	N/A
-	No.166 (1000-26500MHz) Microwave RF Cable	N/A		N/A	N/A
-	No.167 (100kHz - 100MHz) RG58 Coax Cable	N/A		N/A	N/A

Table 5-1. Annual Test Equipment Calibration Schedule

FCC ID: A3LSGHF110	 FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver	Page 9 of 22

6.0 ENVIRONMENTAL CONDITIONS

The temperature is controlled within range of 15°C to 35°C.

The relative humidity is controlled within range of 10% to 75%.

The atmospheric pressure is controlled within the range 86-106kPa (860-1060mbar).

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver	Page 10 of 22	

7.0 TEST DATA

7.1 Summary

Company Name: Samsung Electronics, Co. Ltd.
 FCC ID: A3LSGHF110
 EUT: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver
 Frequencies Examined: 2403MHz, 2414.65MHz, 2426.3MHz

FCC Part Section(s)	RSS Section	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (Tx)						
15.249(a),(e)	RSS-210 [A2.9](a)	In-Band Emissions	< 50,000 μ V/m within band	RADIATED	PASS	Section 7.3
15.249(a),(d) 15.209	RSS-210 [A2.9](b)	Out-of-Band Emissions	Emissions outside of the specified band must meet the radiated limits detailed in 15.209 (RSS-210 table 3 limits)		PASS	Section 7.4
15.249(d)	RSS-210 (A2.9)(b)	20dB Bandwidth	N/A		PASS	Section 7.5
15.207	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits or < RSS-Gen table 2 limits	LINE CONDUCTED	PASS	Section 7.6
RECEIVER MODE (Rx) / DIGITAL DEVICE						
15.107	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.107 limits or < RSS-Gen table 2 limits	LINE CONDUCTED	PASS	Part 15B Test Report
15.109	RSS-Gen [7.2.3.2]	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.109 limits or < RSS-Gen limits [Section 6; Table1]	RADIATED (30MHz-1GHz) (1-25 GHz)	PASS	Part 15B Test Report

Table 7-1 Summary of Test Results

FCC ID: A3LSGHF110	 FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION) 			Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 11 of 22

7.2 Radiated Spurious Emission Measurements

§15.249 / §15.209; RSS-210 (A2.9)

The EUT was tested from 9kHz up to the 10th harmonic of the highest in-band frequency of the transmitter. All measurements were recorded with a spectrum analyzer employing an average detector. Above 1 GHz, a linearly polarized horn antenna was used for measurements. All out-of-band emissions must not exceed the limits shown in Table 7-2 per Section 15.209.

Frequency	Field Strength [μV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-2. Radiated Limits

Sample Calculation

- o Field Strength Level [dBμV/m] = Analyzer Level [dBm] + 107 + AFCL [dB]

Notes:

- o AFCL = Antenna Factor [dB] + Cable Loss [dB]

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 12 of 22

7.3 In-Band Radiated Spurious Emission Measurements

§15.249 (a),(e); RSS-210 (A2.9)(a)

Frequencies: 2403MHz, 2414.65MHz, 2426.3MHz

Measurement Detector: Average

Measurement Distance: 3 Meters

Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
2403.00	-67.74	34.21	H	73.48	93.98	-20.50
2414.60	-68.67	34.27	H	72.60	93.98	-21.38
2426.30	-69.00	34.32	H	72.32	93.98	-21.66

Table 7-3. In-Band Radiated Measurements

NOTES:

1. All measurements were recorded using a spectrum analyzer employing an average detector with RBW = 1MHz and VBW = 10Hz.
2. All peak measurements are within 20dB of the maximum permitted average limit.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is configured to transmit through test codes.
5. Within the permitted band of 2403 – 2426.3MHz the radiated limit is 50,000 μV/m (93.979dBμV/m) at 3 meters.

FCC ID: A3LSGHF110	 FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver	Page 13 of 22

7.4 Out-of-Band Radiated Spurious Emission Measurements

§15.249 (a) / §15.209; RSS-210 (A2.9)(b)

Operating frequency: 2403MHz

Measurement Detector: Average

Measurement Distance: 3 Meters

Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4806.00	-106.76	41.04	H	41.27	53.98	-12.71
7209.00	-110.91	46.80	H	42.89	53.98	-11.09
9612.00	-135.00	49.21	H	21.21	53.98	-32.77
12015.00	-135.00	52.95	H	24.95	53.98	-29.02

Table 7-4. Radiated Measurements

NOTES:

1. All measurements were recorded using a spectrum analyzer employing an average detector with RBW = 1MHz and VBW = 10Hz.
2. All peak measurements are within 20dB of the maximum permitted average limit.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is configured to transmit through test codes.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the sixth harmonic for this device.
6. The radiated limits at 3-meters are as specified above in Table 7-2.
7. Outside the band of 2403 – 2426.3MHz all emissions except harmonics are to be attenuated by at least 50dBc or comply with the limits of §15.209 whichever is the lesser attenuation.

FCC ID: A3LSGHF110	 FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver	Page 14 of 22

Out-of-Band Radiated Spurious Emission Measurements (Cont'd)

§15.249 (a) / §15.209; RSS-210 (A2.9)(b)

Operating frequency: 2414.65MHz

Measurement Detector: Average

Measurement Distance: 3 Meters

Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4829.20	-106.35	41.11	H	41.76	53.98	-12.22
7243.80	-103.95	46.83	H	49.88	53.98	-4.10
9658.40	-135.00	49.24	H	21.24	53.98	-32.74
12073.00	-135.00	52.94	H	24.94	53.98	-29.04

Table 7-5. Radiated Measurements

NOTES:

1. All measurements were recorded using a spectrum analyzer employing an average detector with RBW = 1MHz and VBW = 10Hz.
2. All peak measurements are within 20dB of the maximum permitted average limit.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is configured to transmit through test codes.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the sixth harmonic for this device.
6. The radiated limits at 3-meters are as specified above in Table 7-2.
7. Outside the band of 2403 – 2426.3MHz all emissions except harmonics are to be attenuated by at least 50dBc or comply with the limits of §15.209 whichever is the lesser attenuation.

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 15 of 22

Out-of-Band Radiated Spurious Emission Measurements (Cont'd)

§15.249 (a) / §15.209; RSS-210 (A2.9)(b)

Operating frequency: 2426.3MHz

Measurement Detector: Average

Measurement Distance: 3 Meters

Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4852.60	-106.99	41.19	H	41.20	53.98	-12.78
7278.90	-103.53	46.86	H	50.32	53.98	-3.66
9705.20	-135.00	49.27	H	21.27	53.98	-32.71
12131.50	-135.00	52.93	H	24.93	53.98	-29.05

Table 7-6. Radiated Measurements

NOTES:

1. All measurements were recorded using a spectrum analyzer employing an average detector with RBW = 1MHz and VBW = 10Hz.
2. All peak measurements are within 20dB of the maximum permitted average limit.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is configured to transmit through test codes.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the sixth harmonic for this device.
6. The radiated limits at 3-meters are as specified above in Table 7-2.
7. Outside the band of 2403 – 2426.3MHz all emissions except harmonics are to be attenuated by at least 50dBc or comply with the limits of §15.209 whichever is the lesser attenuation.

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 16 of 22

Out-of-Band Radiated Spurious Emission Measurements (Band Edge)

§15.249 (d) / §15.209; RSS-210 (A2.9)(b)

Operating frequency: 2403MHz

Measurement Detector: Average

Measurement Distance: 3 Meters

Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
2400.00	-76.30	34.21	H	32.68	53.98	-21.30
2400.00	-78.10	34.21	V	30.88	53.98	-23.10

Table 7-7. Radiated Band Edge Measurements

NOTES:

1. All measurements were recorded using a spectrum analyzer employing an average detector with RBW = 1MHz and VBW = 10Hz.
2. All peak measurements are within 20dB of the maximum permitted average limit.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is configured to transmit through test codes.
5. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the sixth harmonic for this device.
6. The radiated limits at 3-meters are as specified above in Table 7-2.
7. Outside the band of 2403 – 2426.3MHz all emissions except harmonics are to be attenuated by at least 50dBc or comply with the limits of §15.209 whichever is the lesser attenuation.

FCC ID: A3LSGHF110	FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 17 of 22

7.5 20dB Bandwidth Measurements

§15.249 (d) / §15.209; RSS-210 (A2.9)(b)

Frequency [MHz]	20dB Bandwidth Test Results	
	[kHz]	Pass/Fail
2403	804	Pass
2414.6	826	Pass
2426.3	784	Pass

Table 7-8. 20dB Bandwidth Measurements

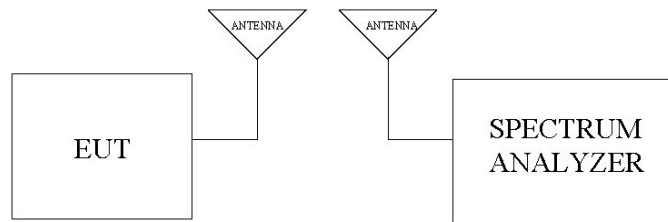
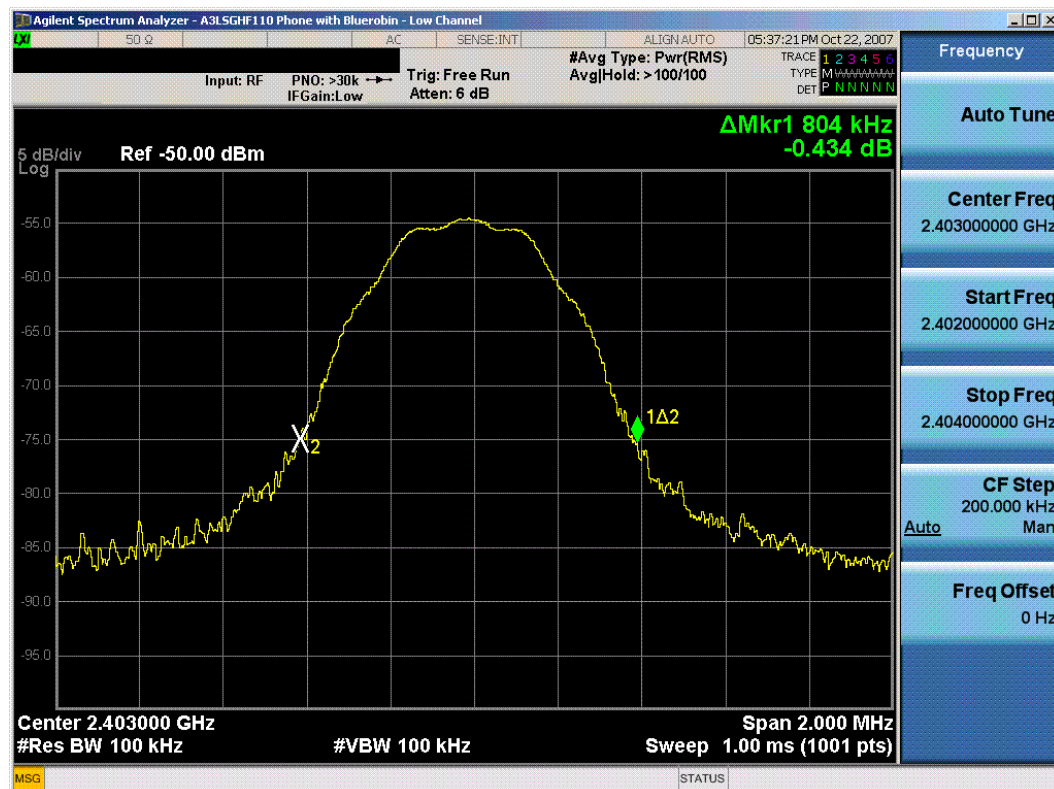
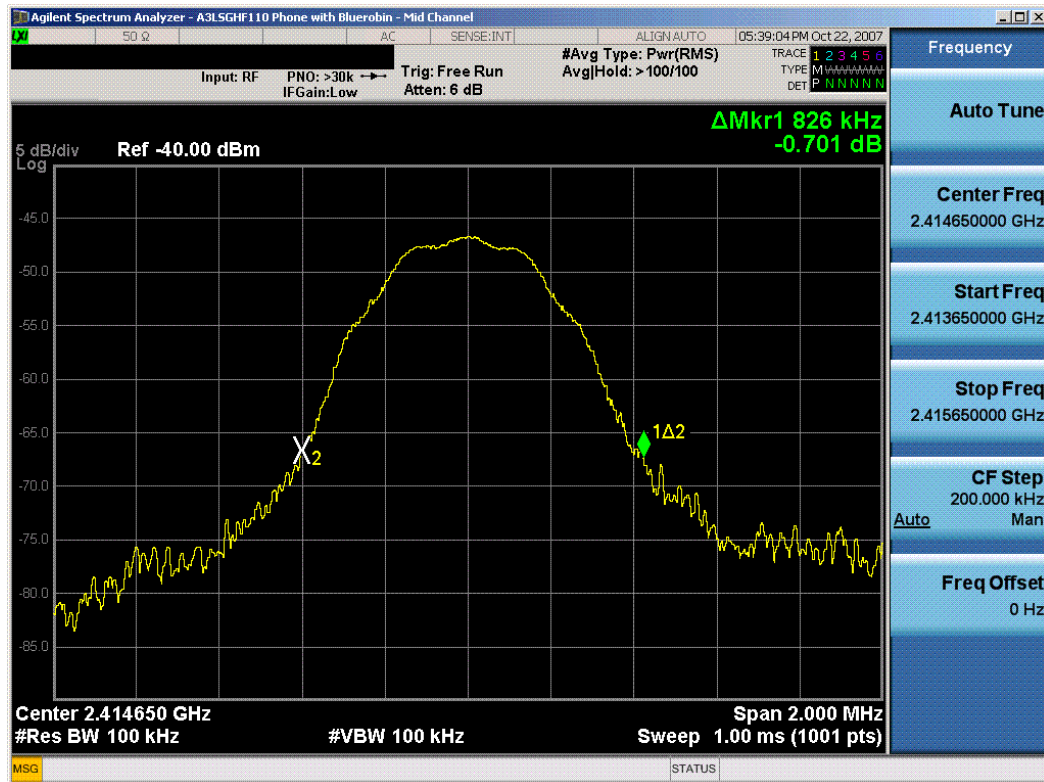


Figure 7-1. Test Instrument & Measurement Setup

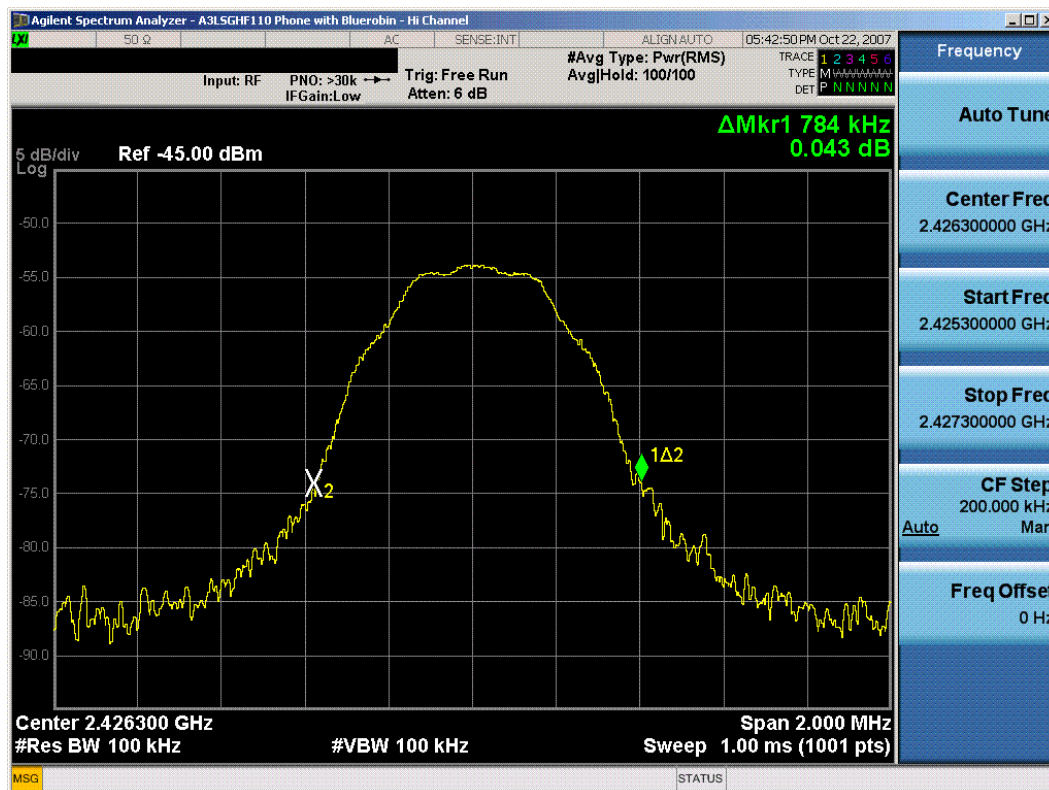


Plot 7-1. 20dB Bandwidth (Low Frequency)

FCC ID: A3LSGHF110	PCTEST w i r e l e s s	FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 18 of 22



Plot 7-2. 20dB Bandwidth (Mid Frequency)



Plot 7-3. 20dB Bandwidth (High Frequency)

FCC ID: A3LSGHF110	 FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 19 of 22

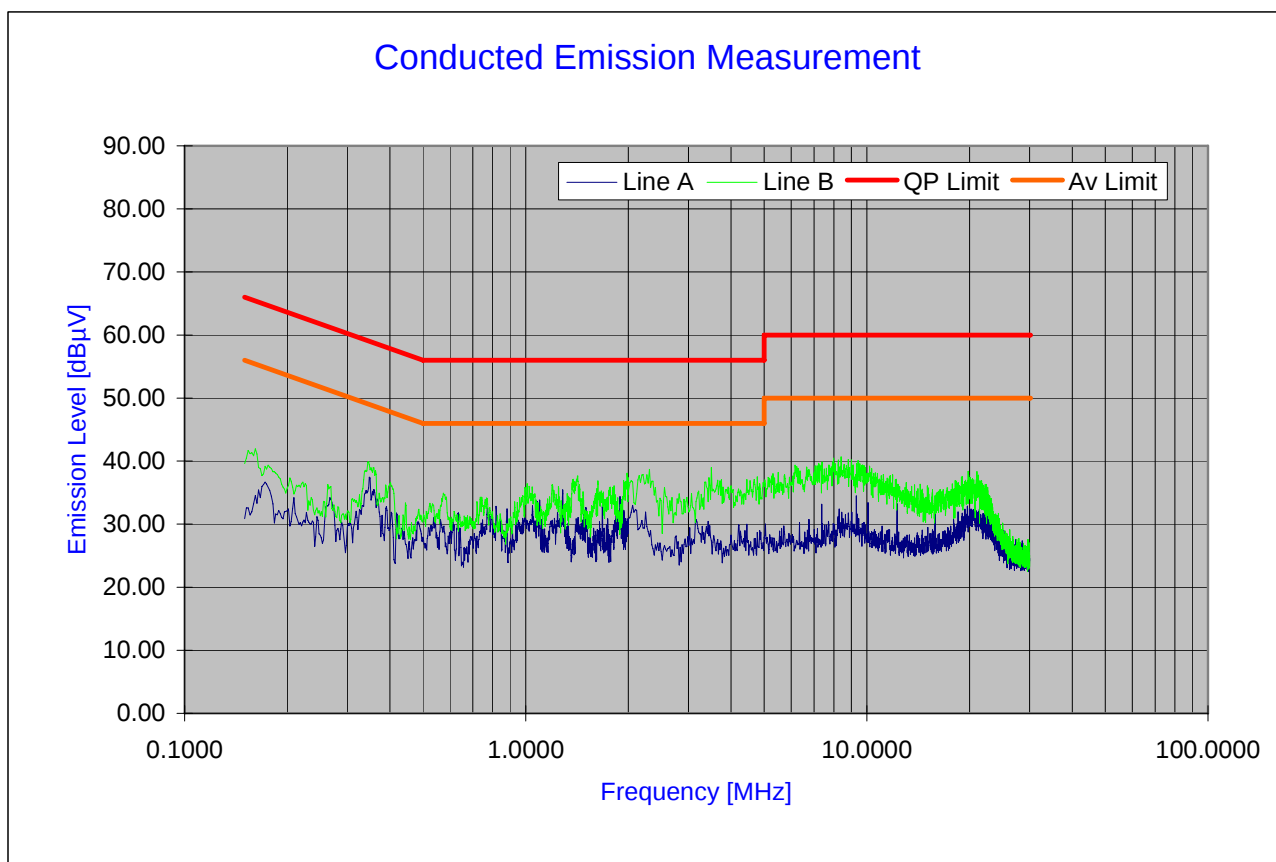
7.6 Line Conducted Measurement Data

§15.207; RSS-Gen (7.2.2)

PCTEST Engineering Laboratory Inc.

Company : Samsung Electronics, Co. Ltd.
 Model Number : SGH-F110
 Standard : FCC Part 15B class B

Power Source : AC120V/60Hz
 Tested Date : 10/23/2007
 Note : None



Ver.1.1 ©PCTEST 2006.08

Plot 7-4. Line-Conducted Test Plot

Notes:

1. All Modes of operation were investigated and the worst-case emissions are reported.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.107 of the Title 47 CFR.
3. Line A = Phase; Line B = Neutral
4. Traces shown in plot are made using a peak detector.
5. Deviations to the Specifications: None.

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver		Page 20 of 22

Line Conducted Measurement Data (Cont'd)

§15.207; RSS-Gen (7.2.2)

No.	Line	Frequency [MHz]	Factor [dB]	QP [dBμV]	Limit [dBμV]	Margin [dB]	Average [dBμV]	Limit [dBμV]	Margin [dB]
1	A	0.328	7.55	31.59	59.50	-27.91	24.18	49.50	-25.32
2	A	0.803	7.36	25.09	56.00	-30.91	19.86	46.00	-26.14
3	A	1.064	7.32	28.39	56.00	-27.61	21.01	46.00	-24.99
4	A	1.067	7.32	28.97	56.00	-27.03	21.03	46.00	-24.97
5	A	1.082	7.31	28.90	56.00	-27.10	20.99	46.00	-25.01
6	A	1.276	7.33	26.48	56.00	-29.52	21.04	46.00	-24.96
7	A	1.672	7.37	25.39	56.00	-30.61	19.89	46.00	-26.11
8	A	1.887	7.38	26.03	56.00	-29.97	20.56	46.00	-25.44
9	A	1.907	7.38	26.61	56.00	-29.39	20.11	46.00	-25.89
10	A	2.144	7.40	29.69	56.00	-26.31	21.58	46.00	-24.42
11	B	0.346	7.53	37.23	59.05	-21.82	31.13	49.05	-17.92
12	B	1.415	7.35	32.63	56.00	-23.37	24.19	46.00	-21.81
13	B	1.936	7.39	30.65	56.00	-25.35	22.49	46.00	-23.51
14	B	1.993	7.39	32.83	56.00	-23.17	23.38	46.00	-22.62
15	B	2.210	7.40	34.13	56.00	-21.87	25.52	46.00	-20.48
16	B	3.453	7.46	32.04	56.00	-23.96	23.43	46.00	-22.57
17	B	4.446	7.49	32.10	56.00	-23.90	23.74	46.00	-22.26
18	B	4.577	7.50	32.14	56.00	-23.86	23.71	46.00	-22.29
19	B	4.639	7.50	32.17	56.00	-23.83	23.81	46.00	-22.19
20	B	4.796	7.50	32.00	56.00	-24.00	23.62	46.00	-22.38

Table 7-9. Line-Conducted Test Data

Notes:

1. All Modes of operation were investigated and the worst-case emissions are reported.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.107 of the Title 47 CFR.
3. Line A = Phase; Line B = Neutral
4. Traces shown in plot are made using a peak detector.
5. Deviations to the Specifications: None.

FCC ID: A3LSGHF110			FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver			Page 21 of 22

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver FCC ID: A3LSGHF110** has been tested to comply with the requirements specified in §15.249 of the FCC Rules.

FCC ID: A3LSGHF110		FCC Pt. 15.249 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0710221230.A3L	Test Dates: October 22, 2007	EUT Type: 850/1900 GSM/EDGE Phone with Bluetooth and 2.4GHz Low Power Transceiver	Page 22 of 22	