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MEASUREMENT REPORT
FCC PART 15.249 ANT+

Applicant Name:
Samsung Electronics, Co. Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do 443-742, Korea

Date of Testing:
2/24 - 2/25/2014
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
0Y1402210463.A3L

FCC ID:	**A3LGTI9515L**
APPLICANT:	**Samsung Electronics, Co. Ltd.**

Application Type:	Certification
Model:	GT-I9515L
EUT Type:	Portable Handset
Frequency Range:	2402 – 2480MHz
FCC Classification:	Low Power Transceiver, Rx Verified (DXT)
FCC Rule Part(s):	Part 15 Subpart C (15.249)
Test Procedure(s):	ANSI C63.10-2009

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 ANSI C63.10-2009. 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

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

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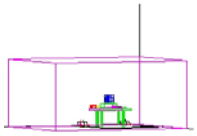
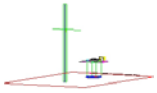


MEASUREMENT REPORT
FCC Part 15.249

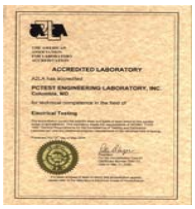


§ 2.1033 General Information

APPLICANT:	Samsung Electronics, Co. Ltd.
APPLICANT ADDRESS:	129, Samsung-ro, Maetan dong,
	Yeongtong-gu, Suwon-si, Gyeonggi-do 443-742, Korea
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS:	7185 Oakland Mills Road, Columbia, MD 21046 USA
FCC RULE PART(S):	Part 15 Subpart C (15.249)
IC SPECIFICATION(S):	RSS-210 Issue 8
MODEL:	GT-I9515L
FCC ID:	A3LGTI9515L
Test Device Serial No.:	C,D ☐ Production ☒ Pre-Production ☐ Engineering
FCC CLASSIFICATION:	Low Power Transceiver, Rx Verified (DXT)
DATE(S) OF TEST:	2/24 - 2/25/2014
TEST REPORT S/N:	0Y1402210463.A3L

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.



- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) 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 (2451B-1).
- 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 (2451B-1) 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.

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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 Industry Canada Certification and Engineering Bureau.

1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Internt'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 located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on February 15, 2012.

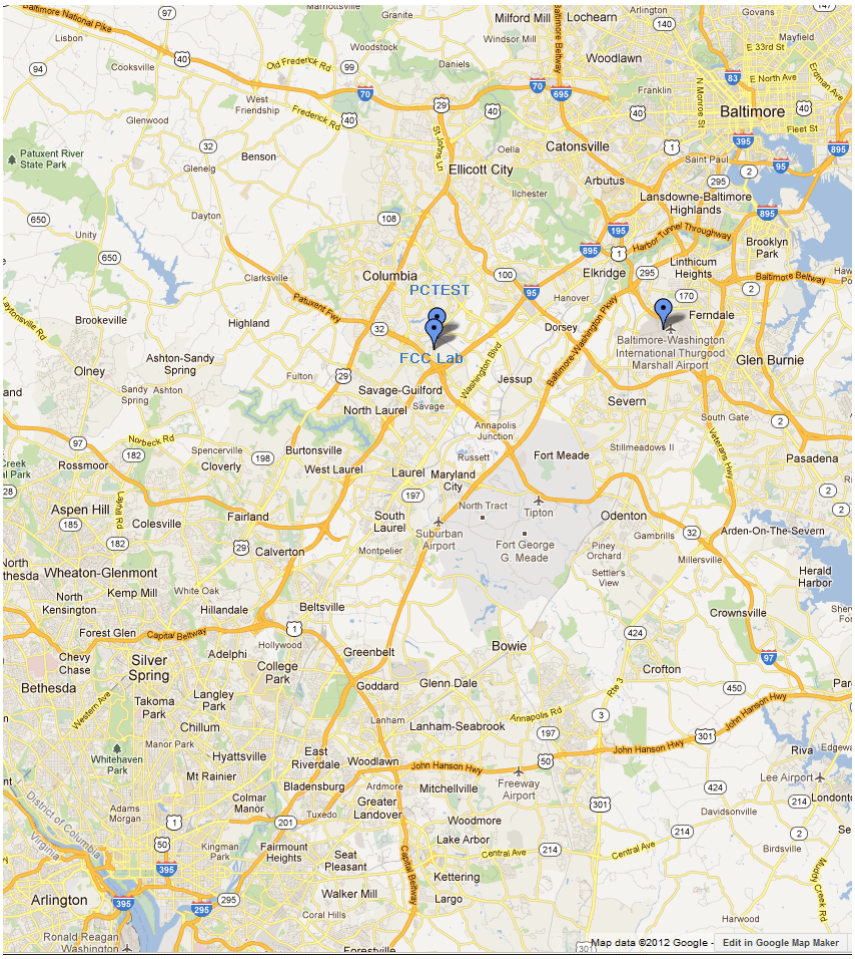

Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LGTI9515L**. The test data contained in this report pertains only to the emissions due to the EUT's ANT+ transmitter.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, Band 2 (1.4/3/5/10/15/20 MHz BW), 4 (1.4/3/5/10/15/20 MHz BW), 5 (1.4/3/5/10 MHz BW), 17 (5/10 MHz BW)LTE, 802.11a/b/g/n/ac WLAN (DTS/NII), Bluetooth (1x,EDR, LE), ANT+, NFC

Note: This device is capable of operating in hopping and non-hopping mode. The EUT can hop between 79 different channels in the 2400 – 2483.5MHz band.

2.3 Test Configuration

The Samsung Portable Handset FCC ID: A3LGTI9515L was tested per the guidance of ANSI C63.10-2009. See Sections 3.2, 3.3, and 6.1 of this test report for a description of the AC line conducted emissions, radiated emissions, and antenna port conducted emissions test setups, respectively.

2.4 EMI Suppression Device(s)/Modifications

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

2.5 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(a)(5). Please see attachment for FCC ID label and label location.

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3.0 DESCRIPTION OF TEST

3.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009) was used in the measurement of the **Samsung Portable Handset FCC ID: A3LGTI9515L.**

Deviation from measurement procedure…….....None

3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 10'x16'x9' shielded enclosure. The shielded enclosure is manufactured by ETS Lindgren RF Enclosures. 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 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is an ETS Lindgren Model LPRX-4X30 (100dB Attenuation, 14kHz-18GHz) and the two EMI/RFI filters are ETS Lindgren Model LRW-2030-S1 (100dB Minimum Insertion Loss, 14kHz – 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. 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 second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

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 and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or resolution, clock or data exchange speed, scrolling H pattern to the EUT and/or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 6.7. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 8.51.0.

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3.3 Radiated Emissions

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. For measurements above 1GHz 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 below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It 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. A 78cm high PVC support structure is placed on top of the turntable. A ¾" (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. 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 test set-up was placed on top of the 0.8 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees 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 rate, scrolling H pattern to the EUT and/or support equipment, and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

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4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:
"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antennas of the Samsung Portable Handset are **permanently attached.**
- There are no provisions for connection to an external antenna.

Conclusion:

The **Samsung Portable Handset FCC ID: A3LGTI9515L** unit complies with the requirement of §15.203.

Ch.	Frequency (MHz)
00	2402
:	:
39	2441
:	:
78	2480

Table 4-1. Frequency/ Channel Operations

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5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	3/29/2013	Annual	3/29/2014	N/A
-	WL25-2	Conducted Cable Set (25GHz)	11/6/2013	Annual	11/6/2014	N/A
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	4/17/2013	Annual	4/17/2014	3008A00985
Agilent	N9030A	PXA Signal Analyzer (44GHz)	1/17/2014	Annual	1/17/2015	MY52350166
Agilent	8447D	Broadband Amplifier	5/31/2013	Annual	5/31/2014	1937A03348
Agilent	N9020A	MXA Signal Analyzer	10/29/2013	Annual	10/29/2014	US46470561
Agilent	N9038A	MXE EMI Receiver	1/3/2014	Annual	1/3/2015	MY51210133
Anritsu	MA2411B	Pulse Sensor	10/31/2013	Annual	10/31/2014	1027293
Anritsu	ML2495A	Power Meter	10/31/2013	Annual	10/31/2014	1039008
Emco	3116	Horn Antenna (18 - 40GHz)	1/20/2012	Triennial	1/20/2015	9203-2178
Emco	3816/2	LISN	2/12/2013	Biennial	2/12/2015	9707-1077
Emco	6502	Active Loop Antenna (10k - 30 MHz)	5/31/2012	Biennial	5/31/2014	267
Huber+Suhner	Sucoflex 102A	40GHz Radiated Cable	3/1/2013	Annual	3/1/2014	251425001
Mini-Circuits	VHF-3100+	High Pass Filter	1/29/2014	Bi-annual	7/29/2014	31144
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	5/31/2013	Annual	5/31/2014	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/31/2013	Annual	5/31/2014	100040
Rohde & Schwarz	TS-PR40	26.5-40 GHz Pre-Amplifier	6/6/2012	Biennial	6/6/2014	100037
Schwarzbeck	VULB-9161SE	Trilog Super Broadband Test Antenna	10/23/2013	Biennial	10/23/2015	9161-4075
Sunol	DRH-118	Horn Antenna (1-18 GHz)	6/19/2013	Biennial	6/19/2015	A042511

Table 5-1. Annual Test Equipment Calibration Schedule

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6.0 TEST RESULTS

6.1 Summary

Company Name: Samsung Electronics, Co. Ltd.

FCC ID: A3LGTI9515L

Method/System: Frequency Hopping Spread Spectrum (FHSS)

Number of Channels: 79

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (Tx)						
2.1049	RSS-Gen (4.6.1)	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 6.2
15.35(c)	N/A	Duty Cycle Calculation	N/A	RADIATED	N/A	Section 6.3
15.249(a)(e)	RSS-210 (A2.9(a))	Fundamental Field Strength Level	< 50 mV/m		PASS	Section 6.4
15.249(a)(e)	RSS-210 (A2.9(a))	Harmonic Field Strength Level	< 500 μV/m		PASS	Section 6.5
15.205, 15.209, 15.249(d)(e)	RSS-210 (A2.9(b))	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	< 15.209 limits (RSS-210 table 3 limits) or 50dB below the level of the fundamental		PASS	Sections 6.5, 6.6
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 6.7

Table 6-1. Summary of Test Results

Notes:

1) All modes of operation were investigated. The test results shown in the following sections represent the worst case emissions.
2) 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.

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6.2 Occupied Bandwidth Measurement

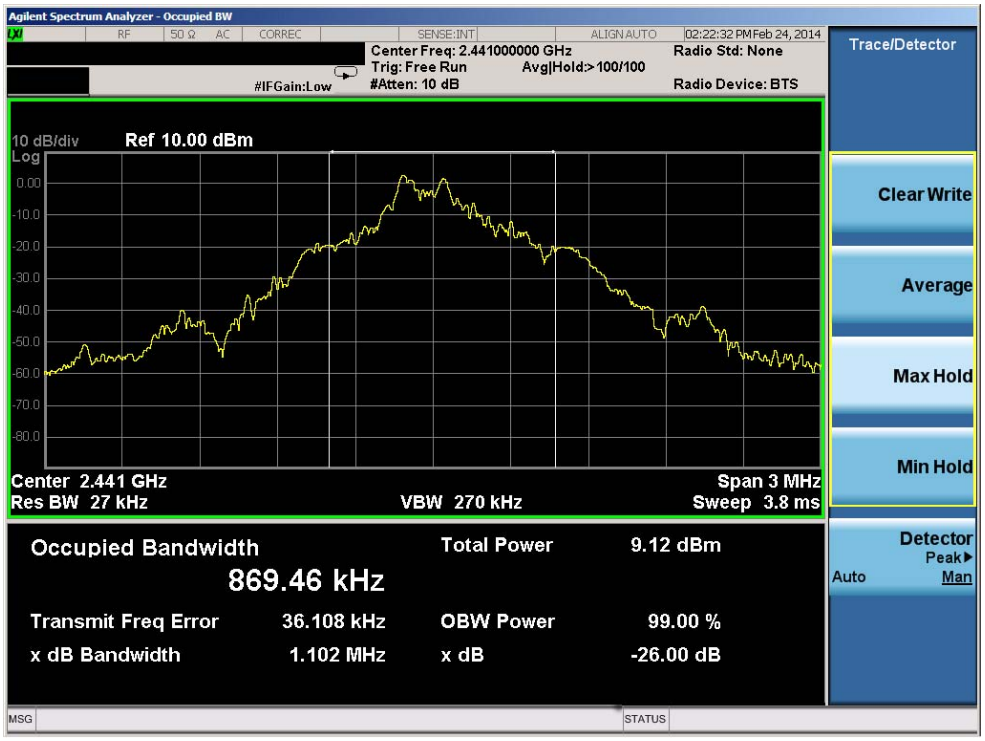
§2.1049

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. The spectrum analyzers' "occupied bandwidth" measurement function was used to record the occupied bandwidth.

Frequency [MHz]	Channel No.	Operating Mode	Measured Bandwidth [kHz]
2441	39	ANT+ (non-hop)	869.46

Table 6-2. Occupied Bandwidth Measurement

Figure 6-1. Test Instrument & Measurement Setup



Plot 6-1. Occupied Bandwidth Plot (ANT+ – Ch. 39)

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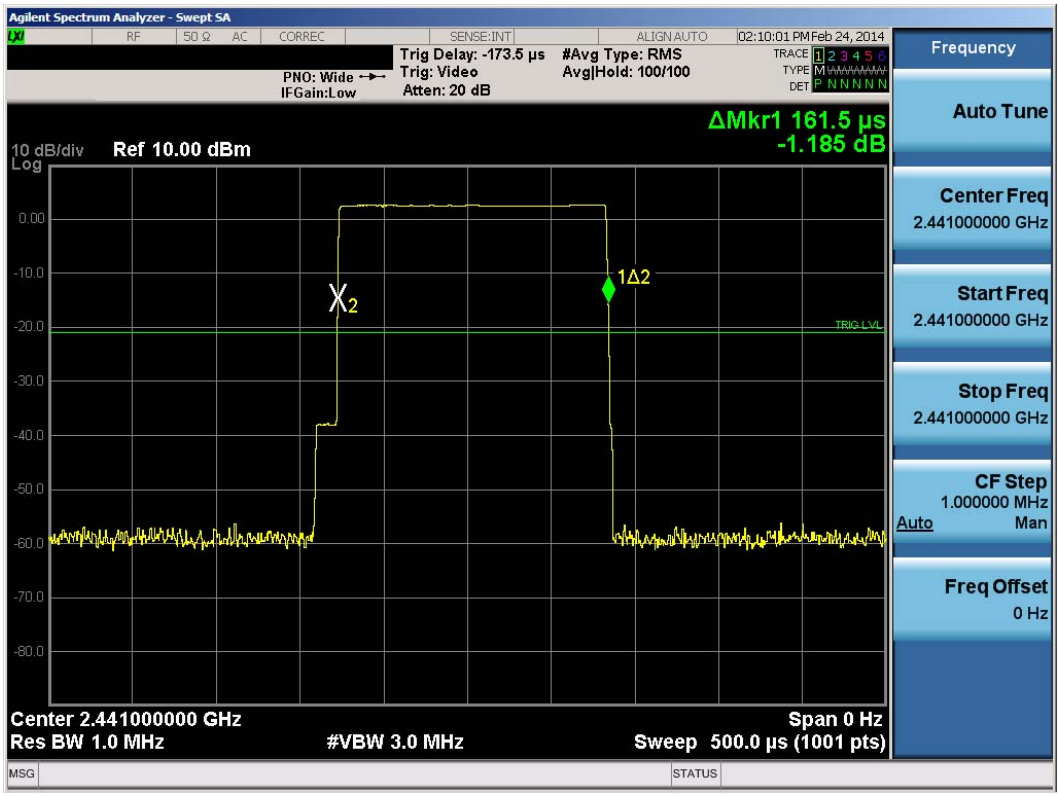
6.3 Duty Cycle Calculation

§15.35(c)

Per FCC Part 15.35(c), an average radiated field strength can be determined by applying a duty cycle correction factor to a measured peak radiated field strength level. The duty cycle correction factor is determined based on the worst case operation over a 100ms time period on any given channel. Two plots are included below to determine the appropriate duty cycle correction factor.

In Plot 6-2 below, it is shown that the pulse width for one transmission burst of the ANT+ transmitter while operating in non-hopping mode is 161.5µs.



Plot 6-2. Pulse Width Measurement

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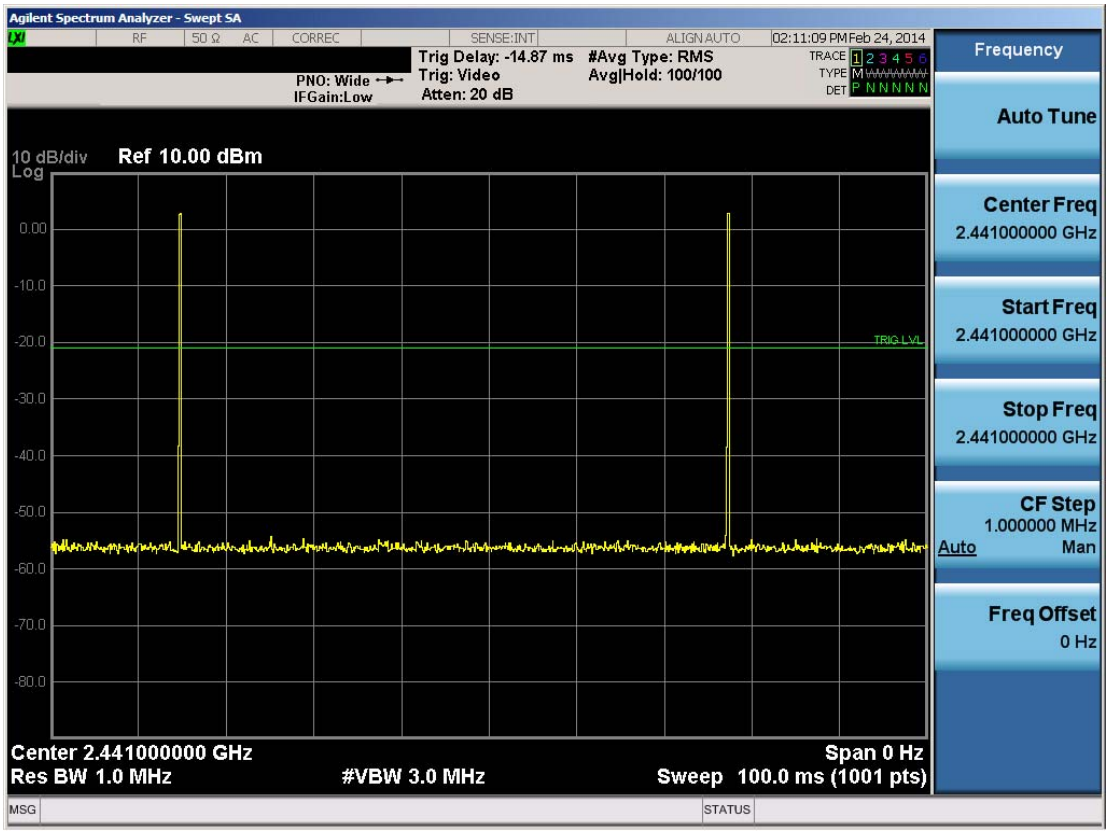
Duty Cycle Calculation (Cont'd)

§15.35(c)

In Plot 6-3 below, a video trigger is used to determine the maximum number of times the transmitter operates at maximum power over a 100ms period.



Plot 6-3. Worst Case 100ms Operation

Since it is determined that the transmitter burst appears a maximum of 2 times over a 100ms window with a pulse width of 161.5µs, then the appropriate duty cycle correction factor is determined from the following formula, based on 15.35(c):

DCCF = $10\log_{10}$ (number of hits x (worst case 100ms operation / 100ms))
= $10\log_{10}$ (2 x (0.1615ms/100ms)) = -24.9dB

DCCF = -24.9dB

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6.4 Fundamental Field Strength Level Measurement

§15.249(a)(e); RSS-210 (A2.9(a))

Measurement is made while the EUT is operating in non-hopping transmission mode. The field strengths shown below were measured using a spectrum analyzer. Peak field strength measurements are performed in the analyzers' swept spectrum mode using a peak detector with RBW = 3MHz and VBW ≥ RBW. Average field strength data is determined by applying the duty cycle correction factor (DCCF) found in Section 6.3 to the measured peak field strength values.

The maximum permissible average field strength level is 50mV/m (93.98dBμV/m). The maximum permissible peak field strength level is 500mV/m (113.98 dBμV/m).

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Field Strength [dBμV/m]	Duty Cycle Correction [dB]	Corrected Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
2402.00	-46.10	Peak	H	35.32	96.22	-24.90	71.32	93.98	-22.65
2402.00	-46.10	Peak	H	35.32	96.22	0.00	96.22	113.98	-17.75
2441.00	-40.86	Peak	H	35.61	101.75	-24.90	76.85	93.98	-17.14
2441.00	-40.86	Peak	H	35.61	101.75	0.00	101.75	113.98	-12.24
2480.00	-44.03	Peak	H	35.91	98.88	-24.90	73.98	93.98	-20.00
2480.00	-44.03	Peak	H	35.91	98.88	0.00	98.88	113.98	-15.10

Table 6-3. Field Strength Measurements

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6.5 Radiated Spurious Emission Measurements

§15.205 & §15.209, §15.249 (d)(e); RSS-210 (A2.9(b))

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 6-4. Radiated Limits

Sample Calculation

- Avg. Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB/m]}$ + Duty Cycle Correction $_{[dB]}$
- Pk. Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB/m]}$
- AFCL $_{[dB/m]}$ = Antenna Factor $_{[dB/m]}$ + Cable Loss $_{[dB]}$
- Margin $_{[dB]}$ = Field Strength Level $_{[dB\mu V/m]}$ – Limit $_{[dB\mu V/m]}$

Test Notes

1. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported. There were no non-harmonic emissions detected whose levels were within 20dB of the applicable limits so only harmonic emissions data is shown in this section.
2. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-4. Per 15.249(d), the radiated emissions limits from 15.209 were used since they were less than the limit of 50dB of attenuation from the measured fundamental field strength level.
3. Peak measurements > 1GHz using RBW = 1MHz and VBW = 3MHz.
4. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
5. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery. The standard battery for this device contains an embedded NFC antenna.
6. Peak levels at -125dBm represent the analyzer noise floor and signify that no emission was detected. No detectable emissions were found. Since the peak measurements are shown to comply with the average limits, no average spurious emissions measurements were recorded.

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Radiated Spurious Emission Measurements (Cont'd)

§15.205 & §15.209, §15.249 (d)(e); RSS-210 (A2.9(b))

Worst Case Mode: ANT+ (non-hopping)
Measurement Distance: 3 Meters
Operating Frequency: 2402MHz
Channel: 0

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4804.00	-125.00	Peak	H	41.41	23.41	53.98	-30.57
12010.00	-125.00	Peak	H	64.79	10.75	53.98	-43.23

Table 6-5. Radiated Measurements

Worst Case Mode: ANT+ (non-hopping)
Measurement Distance: 3 Meters
Operating Frequency: 2441MHz
Channel: 39

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
4882.00	-125.00	Peak	H	41.83	23.83	53.98	-30.15
7323.00	-125.00	Peak	H	48.56	30.56	53.98	-23.42
12205.00	-125.00	Peak	H	68.23	50.23	53.98	-3.75

Table 6-6. Radiated Measurements

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Radiated Spurious Emission Measurements (Cont'd)

§15.205 & §15.209, §15.249 (d)(e); RSS-210 (A2.9(b))

Worst Case Mode:	ANT+ (non-hopping)
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Channel:	78

Frequency [MHz]	Analyzer Level [dBm]	Detector	Pol [H/V]	AFCL [dB]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
4960.00	-125.00	Peak	H	42.17	24.17	53.98	-29.80
7440.00	-125.00	Peak	H	48.61	30.61	53.98	-23.37
12400.00	-125.00	Peak	H	71.03	53.03	53.98	-0.95

Table 6-7. Radiated Measurements

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6.6 Radiated Restricted Band Edge Measurements

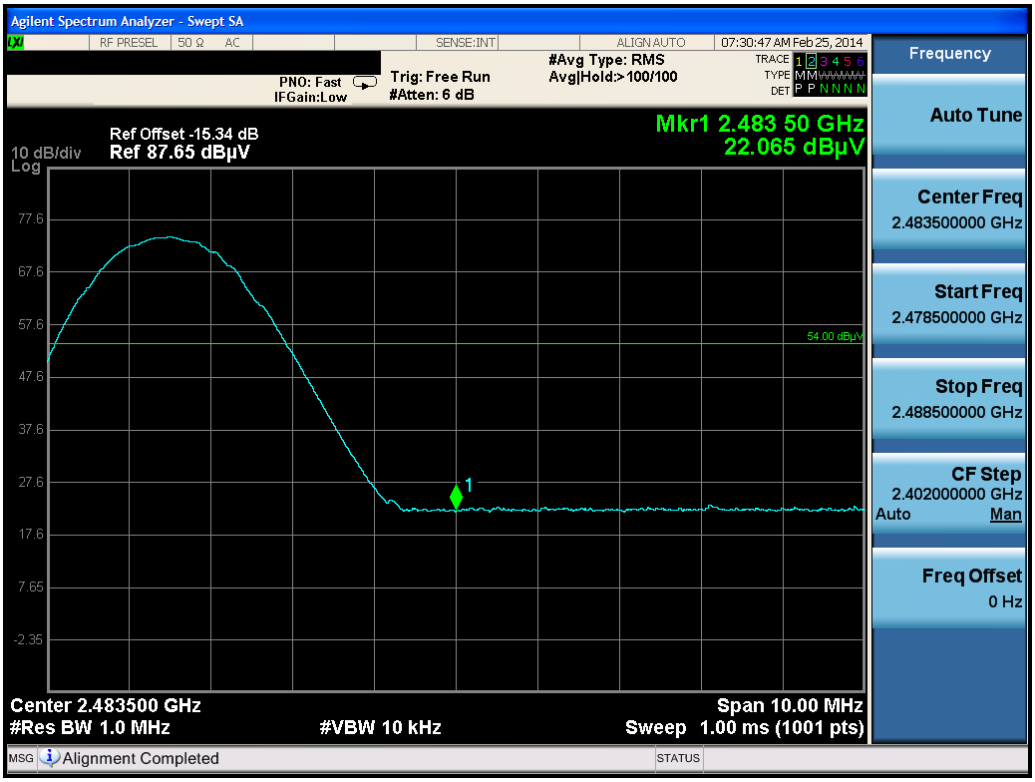
§15.205 & §15.209, §15.249(d)(e); RSS-210 (A8.5)

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting. Two different amplitude offsets were used depending on whether peak or average measurements were measured. The average measurements use a duty cycle correction factor (DCCF).

The amplitude offset shown in the following plots for average measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss+ 10dB Atten.) – Preamplifier Gain + DCCF

Worst Case Mode:	ANT+ (non-hopping)
Measurement Distance:	3 Meters
Operating Frequency:	2480MHz
Back Cover	Standard
Channel:	78



Plot 6-4. Radiated Restricted Upper Band Edge Measurement (Average)

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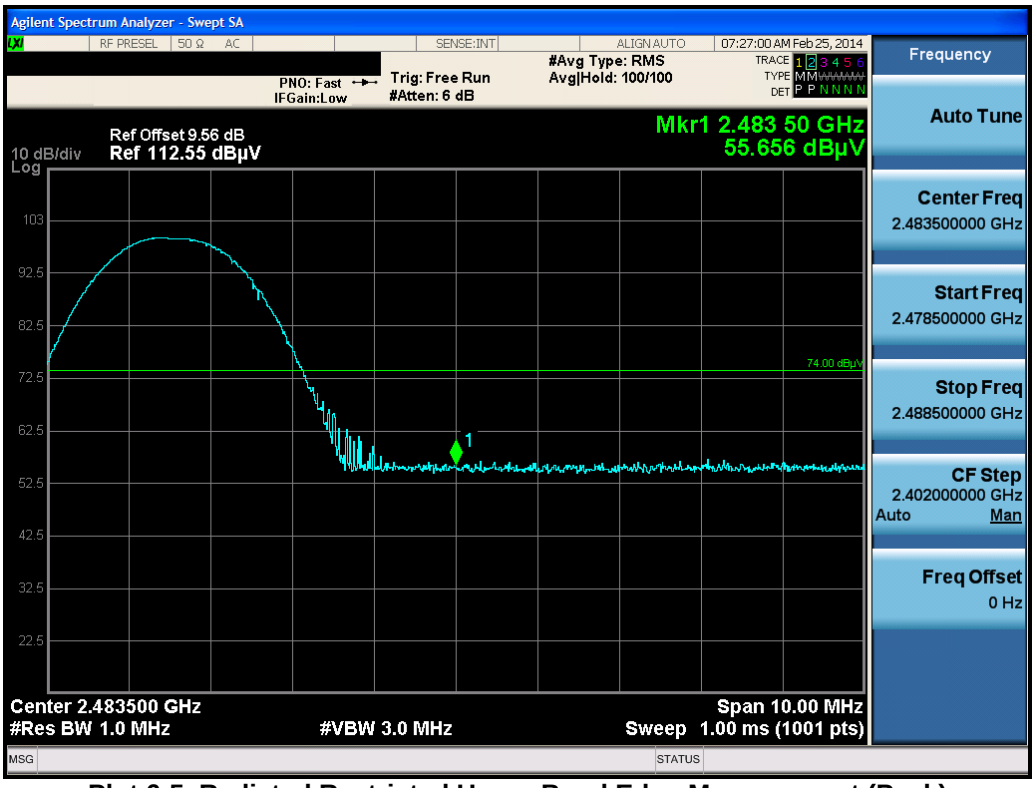
Radiated Restricted Band Edge Measurements (Cont'd)

§15.205 & §15.209, §15.249(d)(e); RSS-210 (A8.5)

The amplitude offset shown in the following plots for peak measurements was calculated using the formula:

Offset (dB) = (Antenna Factor + Cable Loss+10dB Atten.) – Preamplifier Gain



Plot 6-5. Radiated Restricted Upper Band Edge Measurement (Peak)

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6.7 Line Conducted Measurement Data

§15.207; RSS-Gen (7.2.2)

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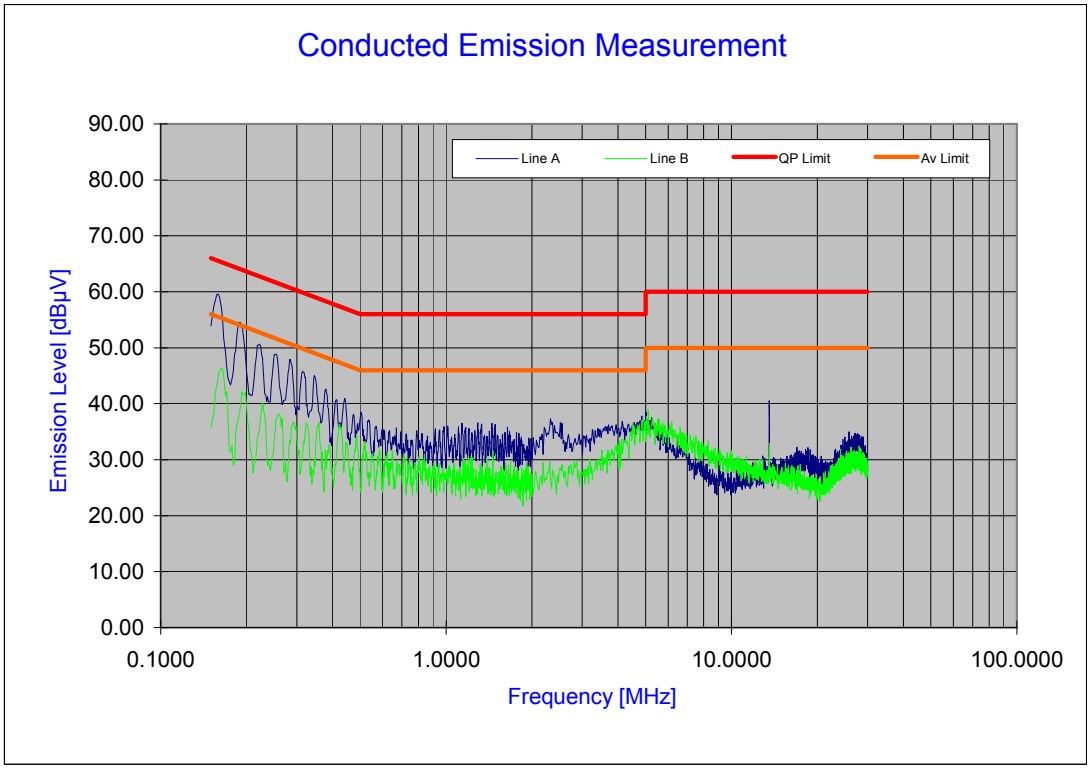
Company : Samsung Electronics, Co. Ltd.
Model Number : GT-I9515L
FCC ID Code : A3LGTI9515L
Standard : FCC Part 15C, 15.207

Power Source : AC120V/60Hz
Tested Date : 02/24/2014
Note : Tested with ANT+ ON



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Plot 6-6. Line-Conducted Test Plot

Notes:

1. All Modes of operation were investigated and the worst-case emissions are reported. Worst case emissions were found while transmitting on Ch. 39.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
4. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
5. Margin (dB) = QP/AV Limit (dBµV) - QP/AV Level (dBµV)
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

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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	0.167	6.86	53.56	65.09	-11.53	38.85	55.09	-16.24
2	A	0.200	6.87	48.53	63.63	-15.10	34.09	53.63	-19.54
3	A	0.232	6.89	44.57	62.40	-17.83	31.15	52.40	-21.25
4	A	0.264	6.90	42.11	61.31	-19.20	29.88	51.31	-21.43
5	A	0.296	6.91	39.96	60.36	-20.40	27.81	50.36	-22.55
6	A	0.328	6.92	38.27	59.50	-21.23	20.79	49.50	-28.71
7	A	0.360	6.93	36.67	58.72	-22.05	19.75	48.72	-28.97
8	A	0.393	6.94	34.38	58.00	-23.62	20.65	48.00	-27.35
9	A	0.455	6.96	34.79	56.78	-21.99	24.77	46.78	-22.01
10	A	0.424	6.95	33.78	57.36	-23.58	25.80	47.36	-21.56
11	B	0.171	6.85	43.71	64.91	-21.20	32.83	54.91	-22.08
12	B	0.204	6.87	38.45	63.45	-25.00	28.85	53.45	-24.60
13	B	0.237	6.89	35.70	62.21	-26.51	26.77	52.21	-25.44
14	B	0.367	6.93	33.50	58.57	-25.07	25.42	48.57	-23.15
15	B	0.432	6.95	33.97	57.22	-23.25	26.99	47.22	-20.23
16	B	0.497	6.97	31.24	56.05	-24.81	24.64	46.05	-21.41
17	B	4.595	7.40	34.00	56.00	-22.00	25.56	46.00	-20.44
18	B	4.818	7.41	35.03	56.00	-20.97	26.18	46.00	-19.82
19	B	4.912	7.42	34.82	56.00	-21.18	25.55	46.00	-20.45
20	B	5.322	7.44	34.82	60.00	-25.18	25.23	50.00	-24.77

Table 6-8. Line-Conducted Test Data

Notes:

1. All Modes of operation were investigated and the worst-case emissions are reported. Worst case emissions were found while transmitting on Ch. 39.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
4. QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
5. Margin (dB) = QP/AV Limit (dBμV) - QP/AV Level (dBμV)
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

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7.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LGTI9515L** is in compliance with Part 15 Subpart C (15.249) of the FCC Rules.

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