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 15.407 Certification

Applicant Name:
Samsung Electronics, Co. Ltd.
18600 Broadwick St.
Rancho Dominguez, CA 90220 USA

Date of Testing:
October 23 - 27, 2006
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0610190907

FCC ID:	**A3LSHP2100**
APPLICANT:	**Samsung Electronics, Co. Ltd.**

Model(s):	SHP-2100
EUT Type:	ICE PAD Wireless Multimedia Transceiver (Monitor)
Max. RF Output Power:	10.08 dBm Conducted (UNII Low Band)
Frequency Range:	5180MHz – 5220MHz (UNII Low Band)
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part 15.407

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 C-63.4-2003.

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.

Grant Conditions: *Listed output power is conducted. This device is restricted to indoor use for the 5.15 – 5.25GHz range.*

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

2041.01

© 2006 PCTEST Engineering Laboratory, Inc.

TABLE OF CONTENTS

FCC PART 15.407 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 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS 5

3.0 DESCRIPTION OF TEST 6

3.1 CONDUCTED EMISSIONS 6

3.2 RADIATED EMISSIONS 7

4.0 ANTENNA REQUIREMENTS 8

5.0 TEST EQUIPMENT CALIBRATION DATA 9

6.0 TEST RESULTS 10

6.1 26DB BANDWIDTH MEASUREMENT 11

6.2 OUTPUT POWER MEASUREMENT – UNII (LOW BAND) 14

6.3 PEAK POWER SPECTRAL DENSITY 15

6.4 PEAK EXCURSION RATIO 19

6.5 RADIATED MEASUREMENTS 22

6.6 RADIATED RESTRICTED BAND MEASUREMENTS 26

7.0 CONCLUSION 27

EXHIBIT A – LABELING REQUIREMENTS 28

SAMPLE LABEL & LOCATION 28

EXHIBIT B – TEST SETUP PHOTOGRAPHS 29

EXHIBIT C – EUT EXTERNAL/INTERNAL PHOTOGRAPHS 30

EXHIBIT D – USER'S MANUAL 31

© 2006 PCTEST Engineering Laboratory, Inc.

MEASUREMENT REPORT

FCC Part 15.407

A. § 2.1033 General Information

APPLICANT:	Samsung Electronics, Co. Ltd.
APPLICANT ADDRESS:	18600 Broadwick St. Rancho Dominguez, CA 90220 USA
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS:	6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S):	Part 15.407
MODEL NAME:	SHP-2100
FCC ID:	A3LSHP2100
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC CLASSIFICATION:	Unlicensed National Information Infrastructure (UNII)
DATE(S) OF TEST:	October 23 - 27, 2006
TEST REPORT S/N:	0610190907

A.1 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.

© 2006 PCTEST Engineering Laboratory, Inc.

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) and FCC Public Notice DA 02-2138 dated August 30, 2002 entitled "Measurement Procedure Updated for Peak Transmit Power in the Unlicensed National Information Infrastructure (U-NII) Bands" were used in the measurement of the **Samsung ICE PAD Wireless Multimedia Transceiver (Monitor) FCC ID: A3LSHP2100.**

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 Internt'l (BWI) airport, the city of Baltimore and the Washington, DC area. (see Figure 1.3-1).

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 and Industry Canada on January 27, 2006.

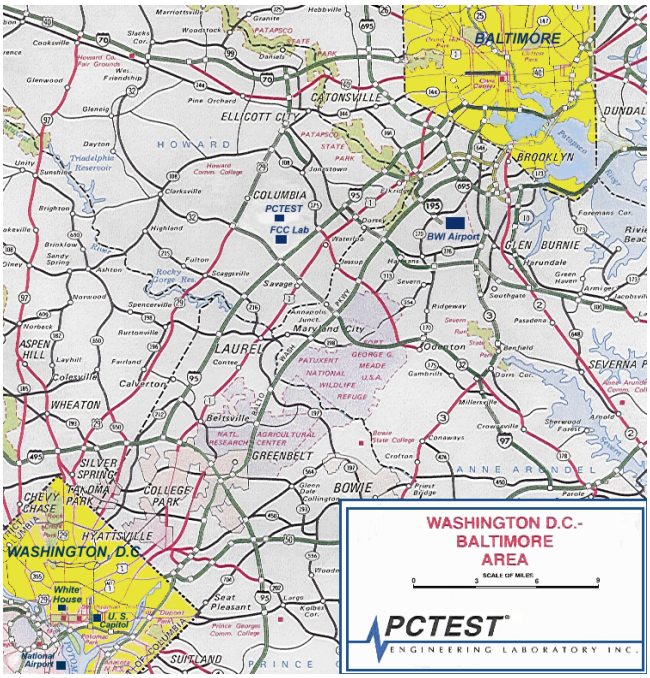


Figure 1.3-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

© 2006 PCTEST Engineering Laboratory, Inc.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung ICE PAD Wireless Multimedia Transceiver (Monitor) FCC ID: A3LSHP2100** mounted in refrigerator. The EUT consisted of the following component(s):

Manufacturer / Description	FCC ID	Model
Samsung ICE PAD Wireless Multimedia Transceiver (Monitor) [EUT]	A3LSHP2100	SHP-2100
Samsung ICE PAD Wireless Multimedia Transceiver	A3LSTR2100	STR-2100

Table 2-1. EUT Equipment Description

802.11 Band Mode	FCC Rule Part	Frequency [MHz]	Notes
a (UNII)	15.407	5180 - 5220	This report contains data pertaining only to the UNII low band.

Table 2-2. Supported Bands in WLAN Transmitter

2.2 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing.

- None

© 2006 PCTEST Engineering Laboratory, Inc.

3.0 DESCRIPTION OF TEST

3.1 Conducted Emissions

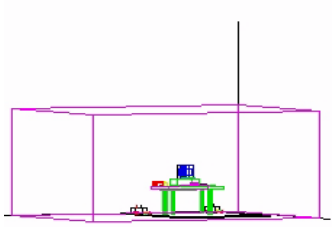


Figure 3.1-1. Shielded Enclosure Line-Conducted Test Facility

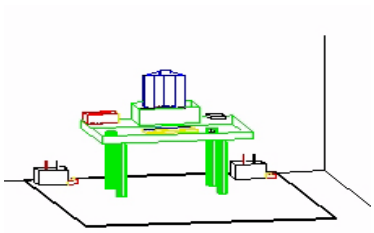


Figure 3.1-2. Line Conducted Emission Test Set-Up

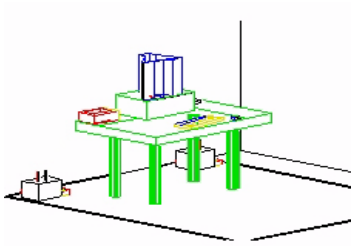


Figure 3.1-3. Wooden Table & Bonded LISNs

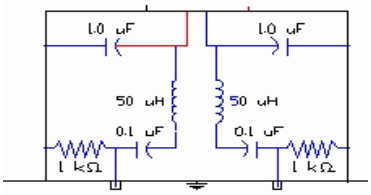


Figure 3.1-4. LISN Schematic Diagram

The line-conducted facility is located inside a 16'x20'x10' shielded enclosure, manufactured by Ray Proof Series 81 (*see Figure 3.1-1*). 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 3.1-2*). Solar Electronics and EMCO Model 3725/2 (10kHz-30MHz) 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room (*See Figure 3.1-3).* 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 3.1-4*). 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 frequencies producing the maximum level were re-examined using an EMI/Field Intensity Meter and Quasi-Peak adapter. The detector function was set to CISPR quasi-peak and average mode. The bandwidth of the receiver 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 Exhibit B. Each EME reported was calibrated using the Agilent E8257D (250kHz – 20GHz) PSG Signal Generator.

© 2006 PCTEST Engineering Laboratory, Inc.

3.2 Radiated Emissions

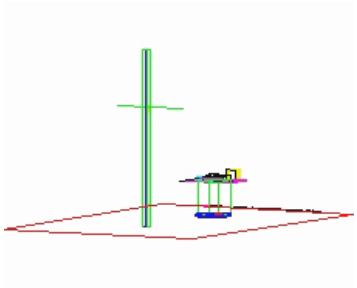


Figure 3.2-1. 3-Meter Test Site

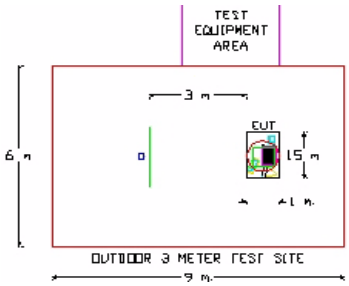


Figure 3.2-2. Dimensions of Outdoor Test Site

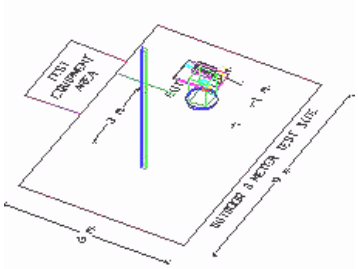


Figure 3.2-3. Turntable and System Setup

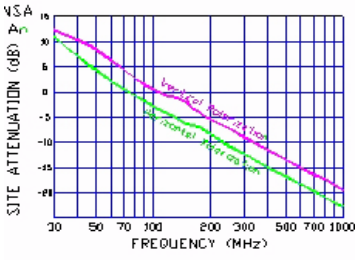


Figure 3.2-4. Normalized Site Attenuation Curves (H&V)

Preliminary measurements were made indoors at 1-meter using broadband antennas, broadband amplifier, and spectrum analyzer 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 Roberts™ Dipole antennas or horn antennas (*see Figure 3.2-1*). 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 3.2-2*). Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using EMI/Field Intensity Meter and Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 100kHz or 1MHz depending on the frequency or type of signal. Above 1GHz the detector function was set to CISPR 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 3.2-3). The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or 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 Exhibit B. 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 3.2-4.

© 2006 PCTEST Engineering Laboratory, Inc.

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 ICE PAD Wireless Multimedia Transceiver (Monitor) are **permanently attached.**
- There are no provisions for connection to an external antenna.

Conclusion:

The **Samsung ICE PAD Wireless Multimedia Transceiver (Monitor) FCC ID: A3LSHP2100** unit complies with the requirement of §15.203.

UNII Low Band

Ch.	Frequency (MHz)
36	5180
:	:
40	5200
:	:
44	5220

Table 4.1 Frequency / Channel Operations

© 2006 PCTEST Engineering Laboratory, Inc.

5.0 TEST EQUIPMENT CALIBRATION DATA

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

TYPE	MODEL	CAL. DUE DATE	CAL. INTERVAL	SERIAL No.
Microwave Spectrum Analyzer	Agilent E4448A (3Hz-50GHz)	09/22/07	Annual	US42510244
Spectrum Analyzer	HP 8566B (100Hz-22GHz)	12/22/06	Annual	3638A08713
PSG Signal Generator	Agilent E8257D (250kHz-20GHz)	02/11/07	Annual	MY45470194
Universal Power Meter	Gigatronics 8651A (50MHz-18GHz)	07/28/07	Annual	1834052
Power Sensor	Gigatronics 80701A	04/11/07	Annual	1833460
Quasi-Peak Adapter	HP 85650A	12/22/06	Annual	2043A00301
Preamplifier	HP 8449B (1-26.5GHz)	12/22/06	Annual	3008A00985
Attenutation/Switch Driver	HP 11713A	12/22/06	Annual	N/A
Preselector	HP 85685A (20Hz-2GHz)	12/22/06	Annual	N/A
Horn Antenna	EMCO Model 3115 (1-18GHz)	08/25/07	Bi-Annual	9704-5182
Horn Antenna	EMCO Model 3116 (18-40GHz)	08/25/07	Bi-Annual	9203-2178
Roberts Dipoles	Compliance Design (1 set) A100	08/31/07	Bi-Annual	5118
EMCO Dipoles (2)	N/A	09/20/08	Bi-Annual	00023951
SOLAR LISN (2)	8012-50	11/18/07	Bi-Annual	0313233, 0310234
Microwave Cables	MicroCoax (1.0-26.5GHz)	02/26/07	Annual	N/A

Table 5-1. Annual Test Equipment Calibration Schedule

© 2006 PCTEST Engineering Laboratory, Inc.

6.0 TEST RESULTS

Summary

The intentional radiator has been tested in a simulated typical installation to demonstrate compliance with the relevant FCC performance and procedural standards. The radio was transmitting at full power on the specified channels and at the data rate(s) specified below. The channels tested are high, middle and low of the allocated bands. Final system data was gathered in a mode that tended to maximize emissions by varying the orientation of the EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization. This unit was tested with all possible data rate and transmission mode combinations and the worst case is reported with the unit transmitting at 6 Mbps.

Method/System: Unlicensed National Information Infrastructure (UNII)

Data Rate(s) Tested: 6, 9, 12, 18, 24, 36, 48, 54Mbps

FCC Part Section(s)	RSS Section	Test Description	Test Limit	Test Condition	Test Result
TRANSMITTER MODE (TX)					
N/A	RSS-210 [A8.2 (1)]	26 dB Bandwidth	> 500kHz	Conducted	PASS
15.407 (a)(1)	RSS-210 [A9.2 (1)]	Maximum Conducted Output Power	< 4 + 10log$_{10}$(BW) dBm (5150-5250) (IC: < 10 + 10log10(B) dBm)		PASS
15.407 (a)(1), (5)	RSS-210 [A9.2 (1)]	Peak Power Spectral Density	< 4 dBm/MHz (5150-5250) (IC: <10 dBm)		PASS
15.407(a)(6)	N/A	Peak Excursion	< 13 dB/MHz maximum difference		PASS
15.407(b)(1), (6)	RSS-210 [A9.3 (1)]	Undesirable Emissions	-27 dBm/MHz EIRP (5150-5250)	Radiated	PASS
15.205, 15.407(b)(1), (5), (6)	RSS-210 [A8.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	< FCC 15.209 limits or < RSS-210 table 3 limits (Emissions in restricted bands must meet the radiated limits detailed in 15.209)		PASS
15.207	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	EN55022	Line Conducted	PASS
RECEIVER MODE (RX)					
15.107	RSS-Gen [7.2.2]	AC Conducted Emissions 150kHz – 30MHz	Class B = 250µV	Line Conducted	PASS
15.109	RSS-Gen [7.2.3.2]	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.209 limits or < RSS-210 table 3 limits	Radiated (30MHz-1GHz) (1-25 GHz)	PASS
RF EXPOSURE (SAR OR MPE)					
15.407(f), 2.1093/2.1091	RSS-102	SAR Test or MPE	1.6 W/kg (SAR Limit) 1 mW/cm² (MPE Limit)	3 Channels	PASS

Table 6-1. Summary of Test Results

© 2006 PCTEST Engineering Laboratory, Inc.

6.1 26dB Bandwidth Measurement

RSS-210 [A8.2(1)]

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies. ***The 26dB bandwidth should be at least 500 kHz.***

The spectrum analyzer is set to:

RBW =	30 kHz (10 dB/div)
VBW =	300 kHz
Span =	30 MHz
Ref. Level =	Please See Plots
Sweep =	97.32 ms

Frequency	Channel No.	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
5180	36	16.378	0.500	Pass
5200	40	16.406	0.500	Pass
5220	44	16.408	0.500	Pass

Table 6-2. Conducted Bandwidth Measurements

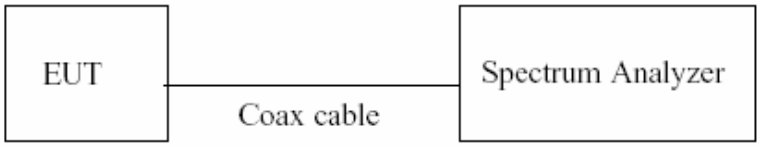
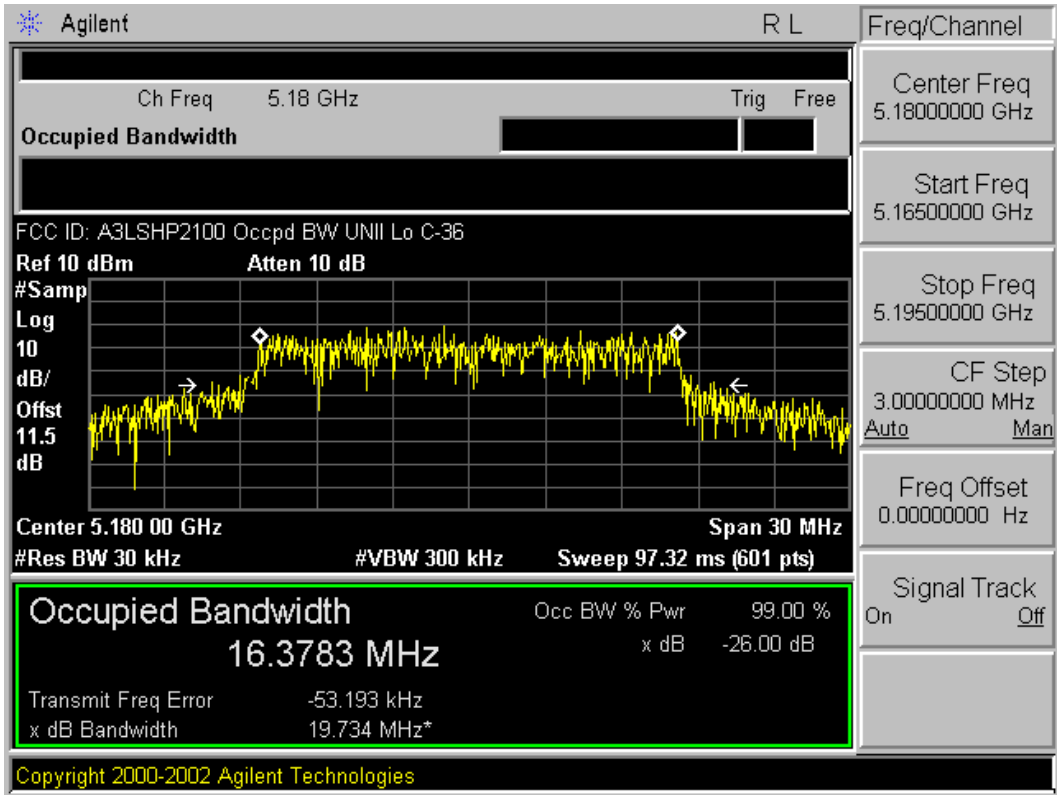
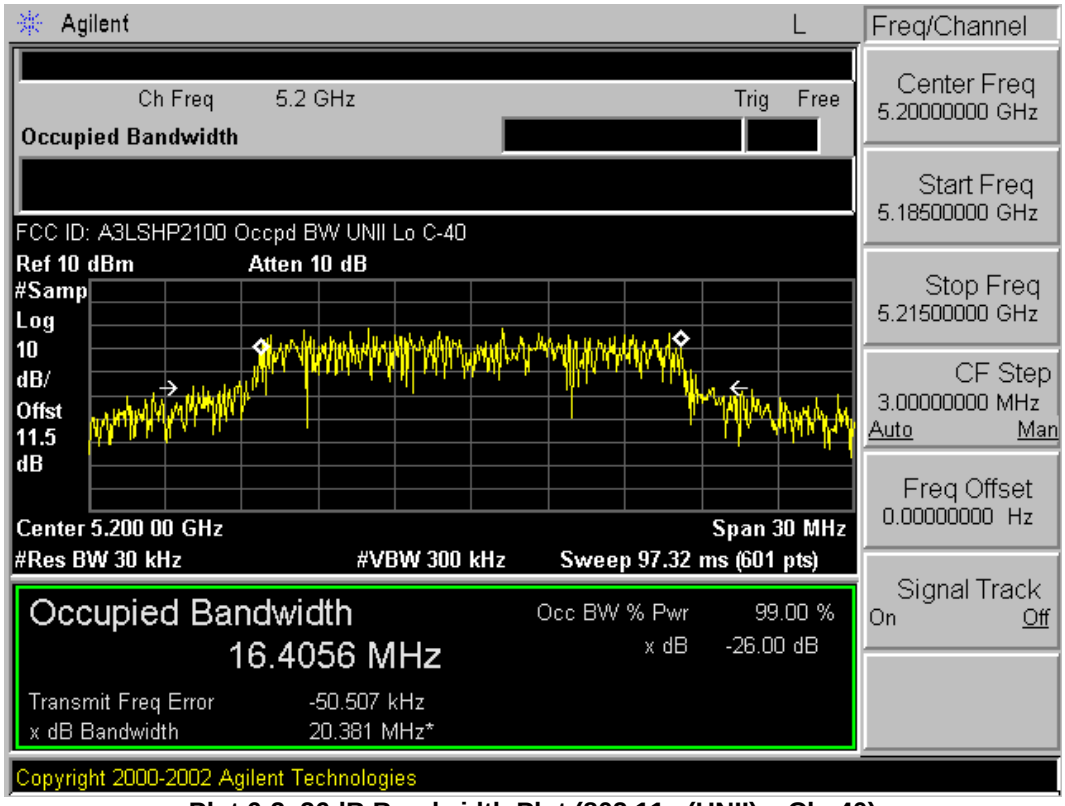


Figure 6-1. Test Instrument & Measurement Setup

© 2006 PCTEST Engineering Laboratory, Inc.

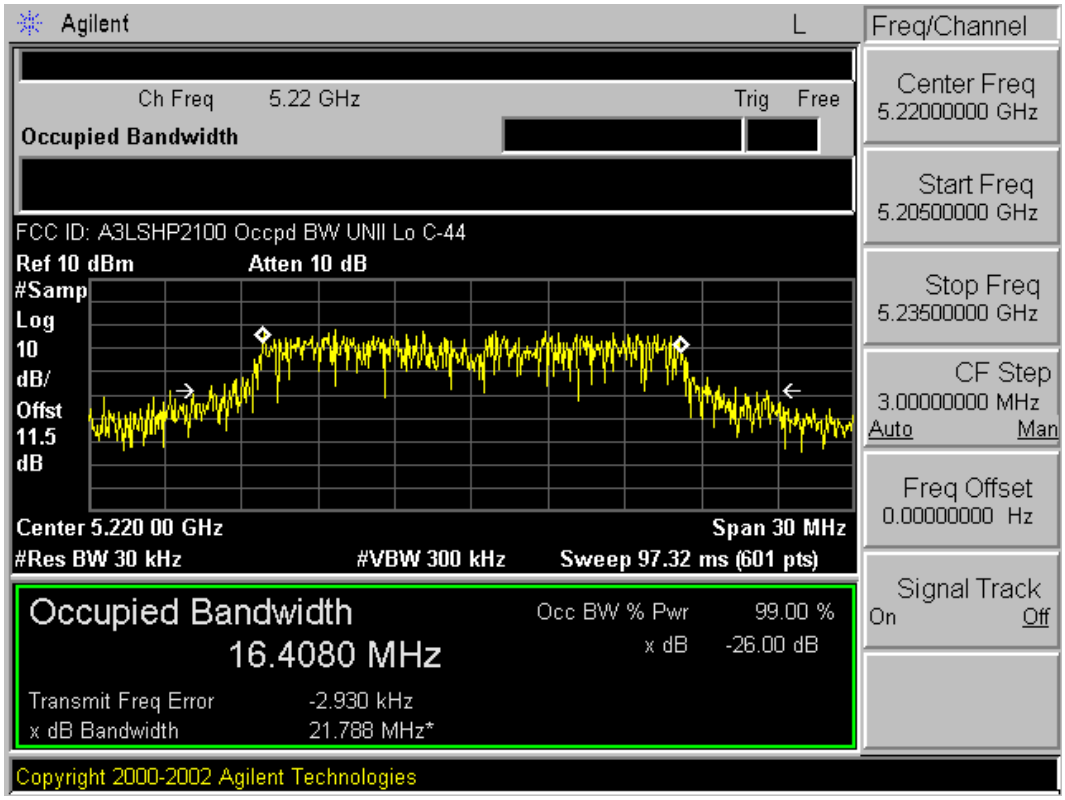


Plot 6-1. 26dB Bandwidth Plot (802.11a (UNII) – Ch. 36)



Plot 6-2. 26dB Bandwidth Plot (802.11a (UNII) – Ch. 40)

© 2006 PCTEST Engineering Laboratory, Inc.



Plot 6-3. 26dB Bandwidth Plot (802.11a (UNII) – Ch. 44)

© 2006 PCTEST Engineering Laboratory, Inc.

6.2 Output Power Measurement – UNII (Low Band)

§15.407 (a)(1); RSS-210 [A9.2(1)]

A transmitter antenna terminal of EUT is connected to the input of a RF power sensor. Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies. ***The maximum permissible conducted output power is 4 dBm + 10log$_{10}$(26dB BW) = 16.151 dBm.***

Freq [MHz]	Channel	Data Rate [Mbps]	Main Ant. Measured Power [dBm]	Aux Ant. Measured Power [dBm]
5180	36	6	9.15	9.95
		9	9.13	9.94
		12	9.10	9.92
		18	9.07	9.90
		24	9.07	9.89
		36	9.05	9.88
		48	9.03	9.85
		54	9.01	10.03
5200	40	6	8.98	9.74
		9	8.98	9.76
		12	8.98	9.76
		18	8.94	9.74
		24	9.00	9.72
		36	9.05	9.69
		48	9.04	9.67
		54	9.05	9.68

Freq [MHz]	Channel	Data Rate [Mbps]	Main Ant. Measured Power [dBm]	Aux. Ant. Measured Power [dBm]
5220	44	6	9.52	**10.08**
		9	9.51	10.08
		12	9.51	10.07
		18	9.51	10.05
		24	9.50	10.04
		36	9.48	10.03
		48	9.45	10.00
		54	9.45	10.01

Table 6-3. Conducted Output Power Measurements

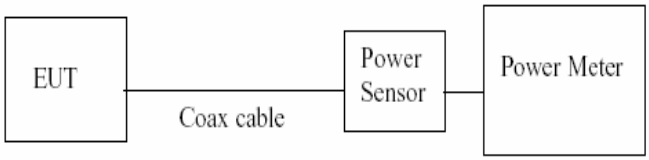


Figure 6-2. Test Instrument & Measurement Setup

© 2006 PCTEST Engineering Laboratory, Inc.

6.3 Peak Power Spectral Density

§15.407 (a)(1),(5); RSS-210 [A9.2(1)]

The spectrum analyzer was connected to the antenna teminal while the EUT was operating in a continuous transmission mode at the appropriate center frequencies. ***The maximum permissible peak power spectral density is 4 dBm/MHz in the 5.15GHz – 5.25GHz band (10dBm/MHz for Industry Canada).***

The spectrum analyzer was set to: RBW=1 MHz, VBW=3MHz, mode=Sample "on" for FCC (Measurement Method 2 from FCC Public Notice DA 02-2138).

The spectrum analyzer is set to:

RBW	1 MHz (10dB/div)
VBW	3 MHz
Span	20 MHz
Ref. Level	Please See Plots
Sweep	1 ms
Detector	Sampling with power averaging (100 sweeps)

Frequency [MHz]	Channel No.	Measured Power Density [dBm]	Maximum Permissible Power Density [dBm/MHz]	Margin [dB]
5180	36	-2.741	4.0	-6.7
5200	40	-3.078	4.0	-7.1
5220	44	-2.728	4.0	-6.7

Table 6-5. Power Density Measurements

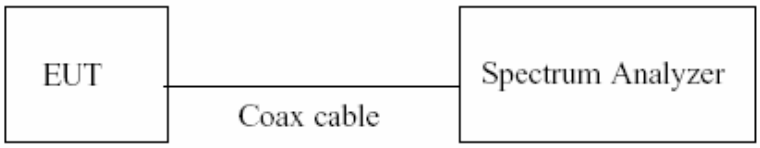
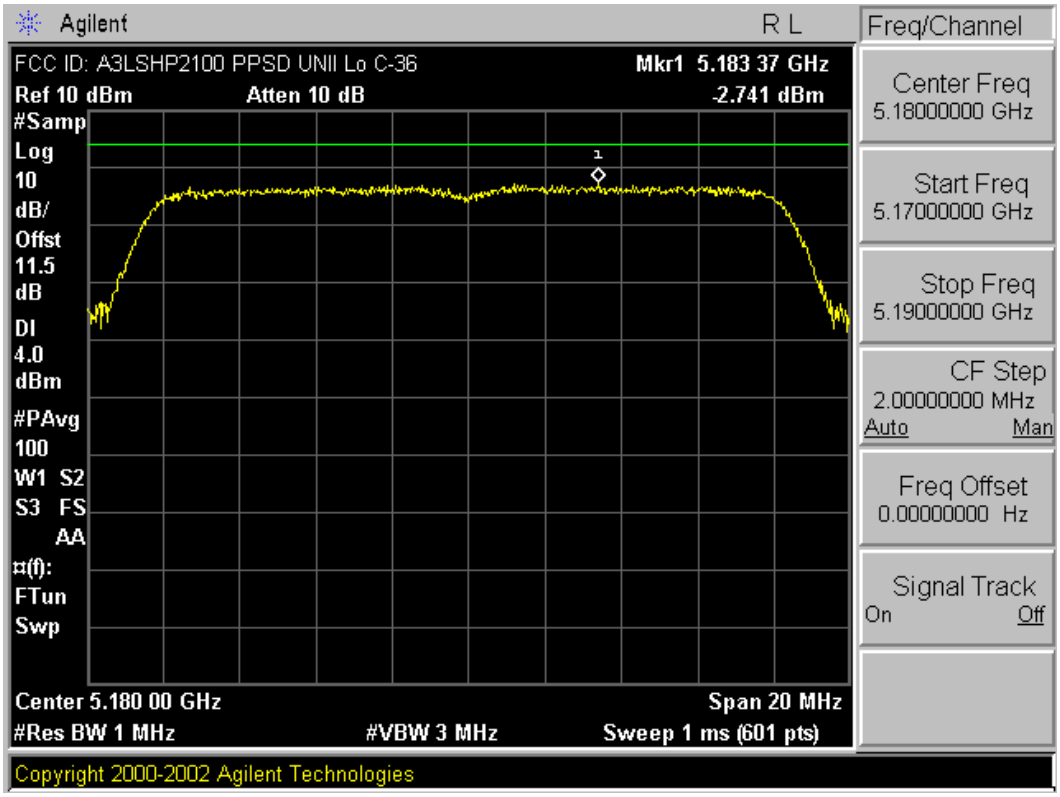
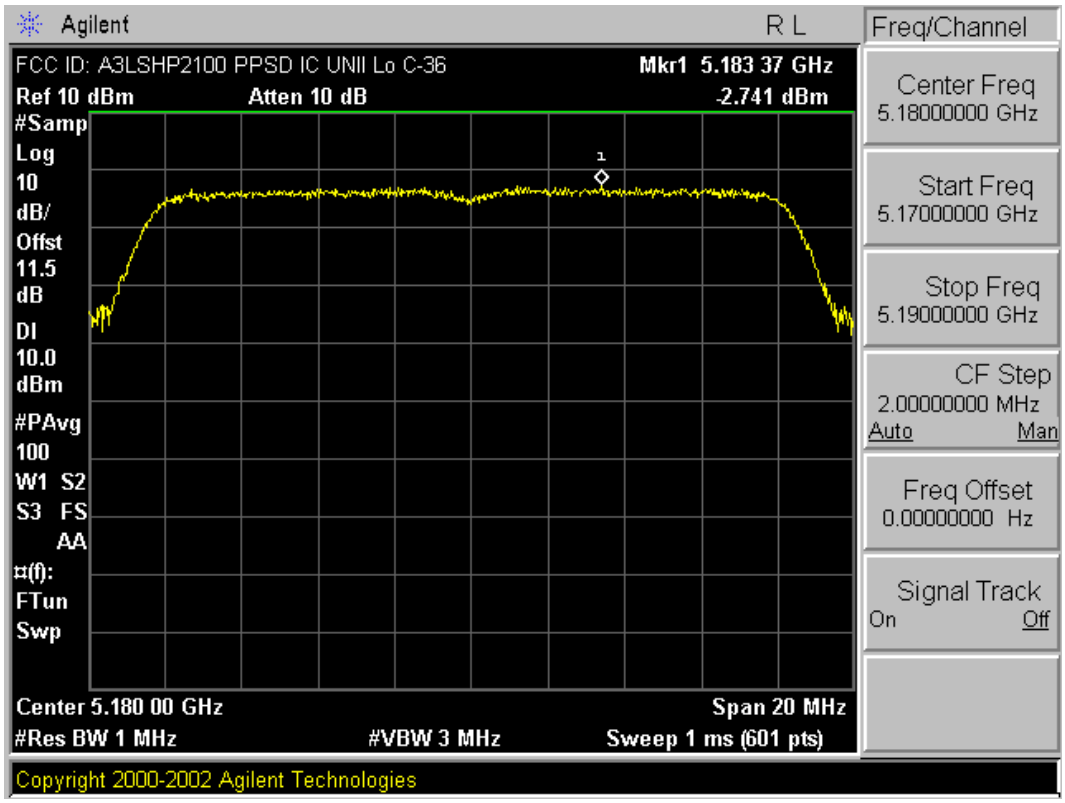


Figure 6-4. Test Instrument & Measurement Setup

© 2006 PCTEST Engineering Laboratory, Inc.

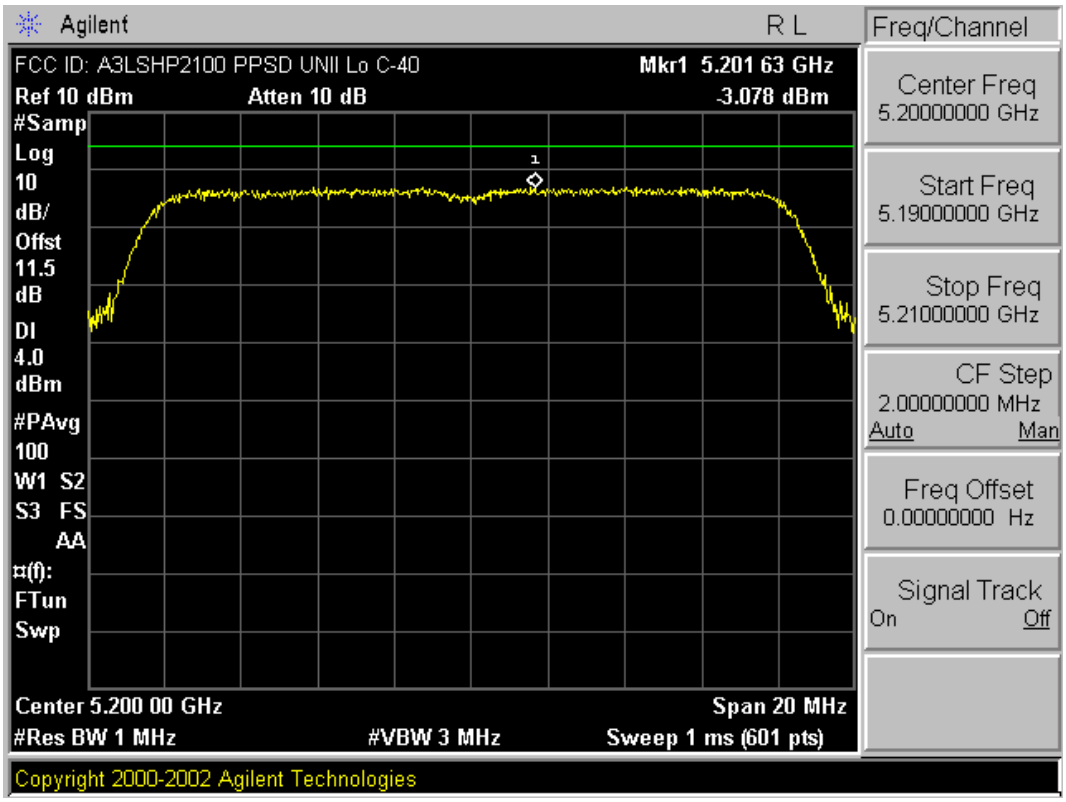


Plot 6-4. Peak Power Spectral Density Plot (802.11a (UNII) – Ch. 36)

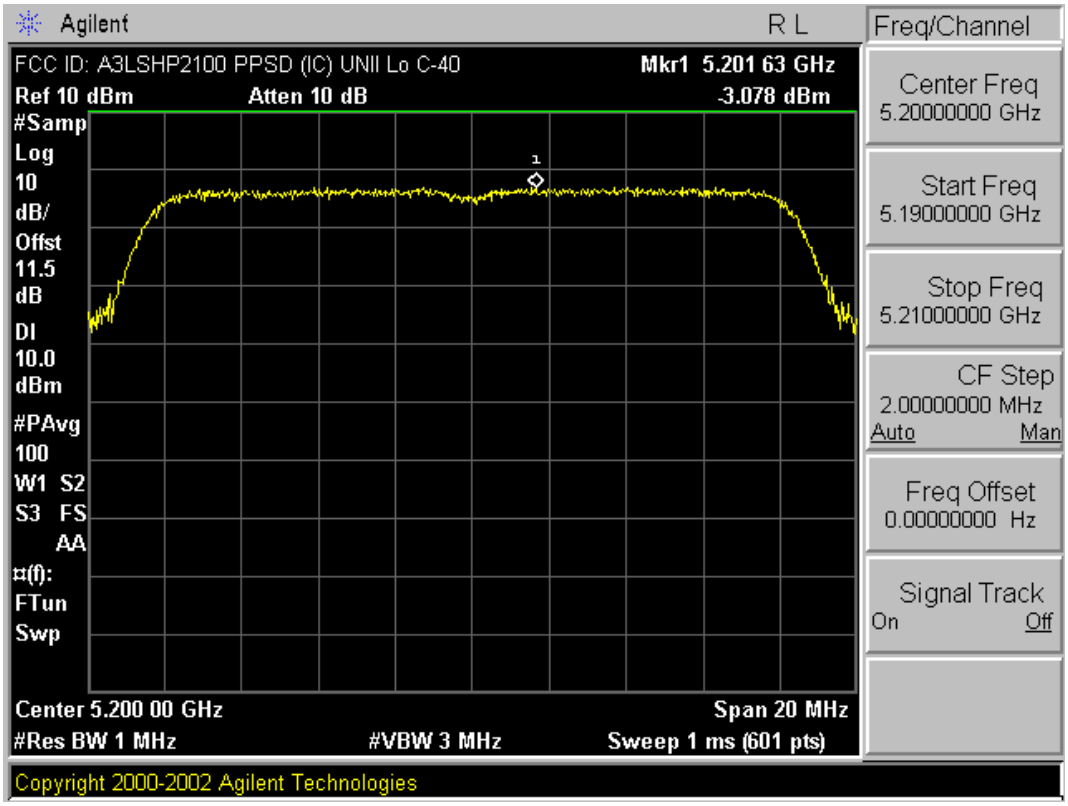


Plot 6-5. Peak Power Spectral Density Plot [Industry Canada] (802.11a (UNII) – Ch. 36)

© 2006 PCTEST Engineering Laboratory, Inc.

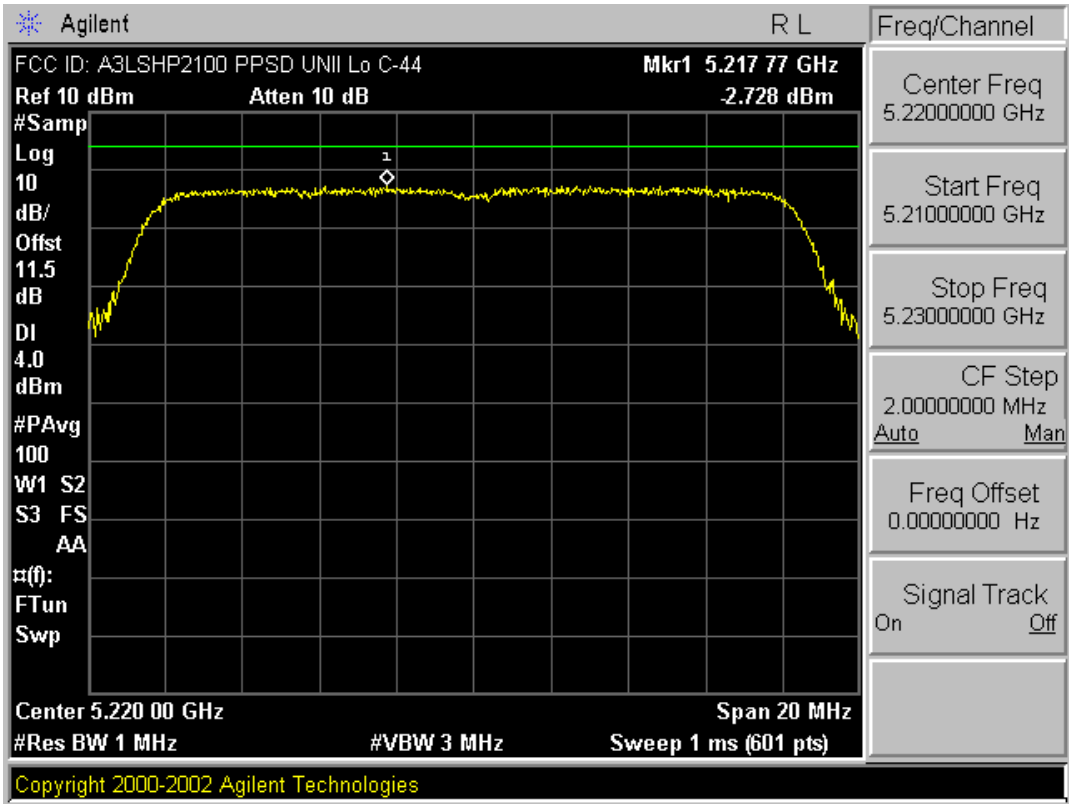


Plot 6-6. Peak Power Spectral Density Plot (802.11a (UNII) – Ch. 40)

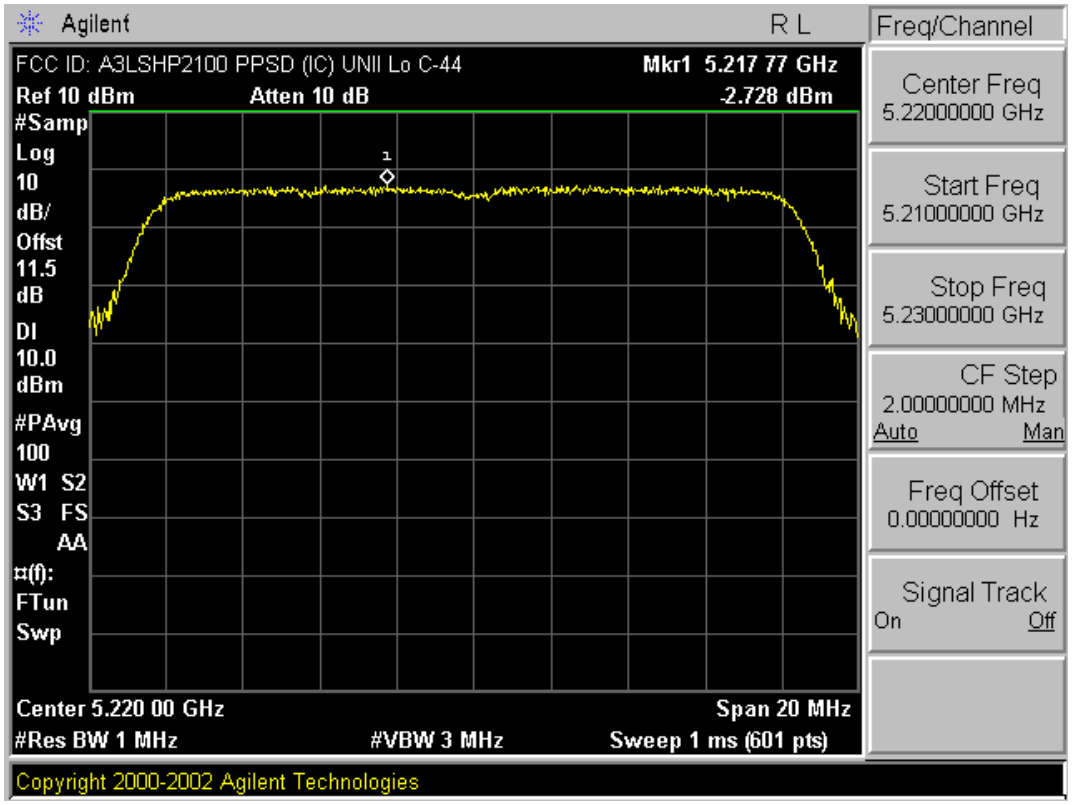


Plot 6-7. Peak Power Spectral Density Plot [Industry Canada] (802.11a (UNII) – Ch. 40)

© 2006 PCTEST Engineering Laboratory, Inc.



Plot 6-8. Peak Power Spectral Density Plot (802.11a (UNII) – Ch. 44)



Plot 6-9. Peak Power Spectral Density Plot [Industry Canada] (802.11a (UNII) – Ch. 44)

© 2006 PCTEST Engineering Laboratory, Inc.

6.4 Peak Excursion Ratio
§15.407(a)(6)

The spectrum analyzer was connected to the antenna terminal while the EUT was operating in the continuous transmission mode at the appropriate center frequencies. ***The largest permissible difference (Peak Excursion) between the following two specified traces is 13 dBm/MHz.***

The spectrum analyzer is set to:

1st Trace:

The spectrum analyzer was set to: RBW = 1 MHz, VBW = 3 MHz, mode = peak detector and max hold.

2nd Trace:

The spectrum analyzer was set to: RBW = 1 MHz, VBW = 1 MHz, trigger=free run, mode=sample detector "on" using 100 sweeps of power averaging (settings tend to present similar results compared to the power meter).

Frequency [MHz]	Channel No.	Measured Peak Excursion Ratio [dBm]	Maximum Permissible Peak Excursion Ratio [dBm/MHz]	Margin [dB]
5180	36	10.47	13.0	-2.5
5200	40	11.59	13.0	-1.4
5220	44	10.47	13.0	-2.5

Table 6-6. Peak Excursion Ratio Measurements

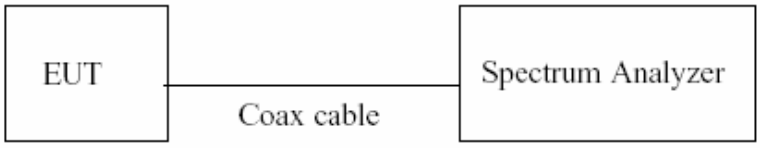
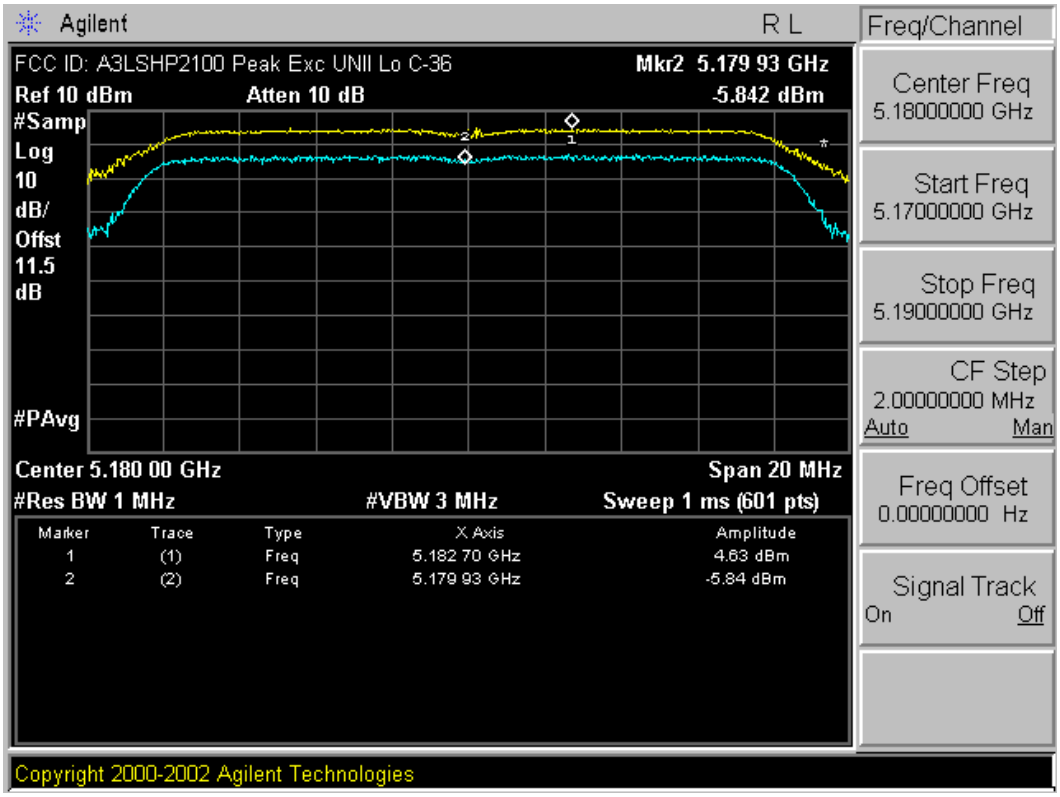
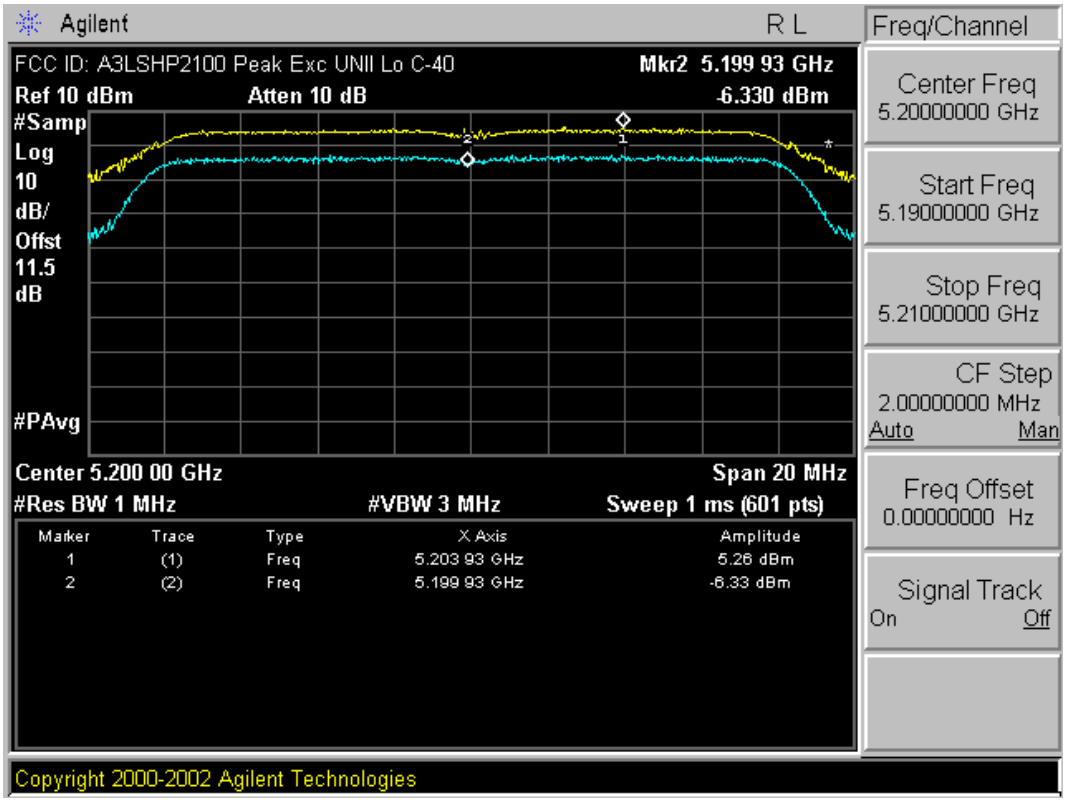


Figure 6-5. Test Instrument & Measurement Setup

© 2006 PCTEST Engineering Laboratory, Inc.

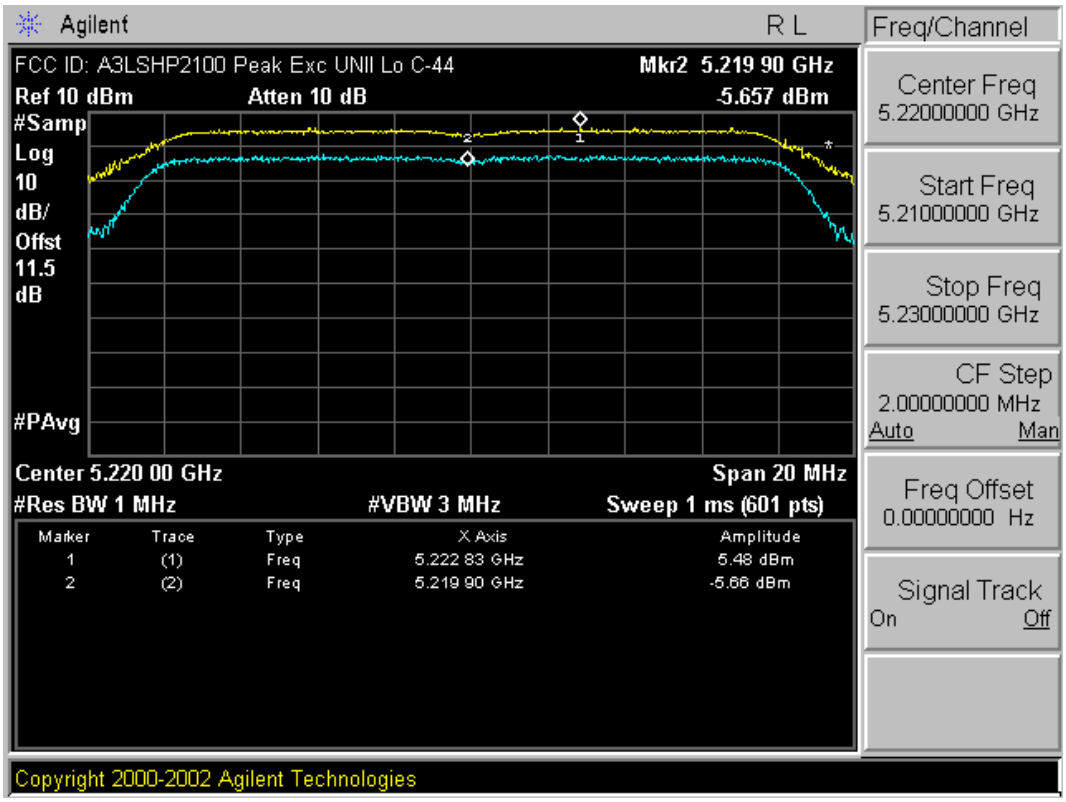


Plot 6-10. Peak Excursion Ratio Plot (802.11a (UNII) – Ch. 36)



Plot 6-11. Peak Excursion Ratio Plot (802.11a (UNII) – Ch. 40)

© 2006 PCTEST Engineering Laboratory, Inc.



Plot 6-12. Peak Excursion Ratio Plot (802.11a (UNII) – Ch. 44)

© 2006 PCTEST Engineering Laboratory, Inc.

6.5 Radiated Measurements

§15.407(b)(1), (6), §15.205, §15.209; RSS-210 [A8.5]

The EUT was tested from 9kHz to the tenth harmonic of the fundamental frequency of the transmitter. Below 1GHZ a CISPR quasi peak detector was used. Above 1 GHz average measurements were taken, using RBW= 1MHz, VBW= 10Hz, and linearly polarized horn antennas. In addition, peak measurements (RBW= 1MHz, VBW= 1MHz) were taken to ensure that the peak levels are not more than 20dB above the average limit. No harmonics/spurs peak emissions are more than 20dB above the average limit. Special attention is taken for the EUT's harmonic and spurious radiated emissions in the restricted bands of operations, as defined in Section 15.205.

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 6-7. Radiated Limits

© 2006 PCTEST Engineering Laboratory, Inc.

Radiated Measurements (Cont.)

§15.407(b)(1), (6), §15.205, §15.209; RSS-210 [A8.5]

Mode: 802.11a

Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36

	Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol. [H/V]	Field Strength [dBμV/m]	Field Strength [μV/m]	Margin [dB]
	10360.00	-114.50	40.6	H	37.4	74.0	-30.70
*	15540.00	-135.00	45.8	H	17.8	7.8	-36.18
*	20720.00	-135.00	49.6	H	21.6	12.0	-32.38
	25900.00	-135.00	52.1	H	24.1	16.0	-43.98

Table 6-8. Radiated Measurements @ 3 meters

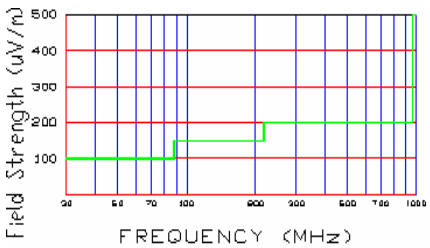


Figure 6-6. Radiated limits at 3 meters.

NOTES:

1. The limit listed in Section 15.407(b) is –27 dBm/MHz EIRP. This is equivalent to a field strength of 68.24 dBuV/m @ 3m. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table 6-7. (Note: * = Restricted Band measured frequency)

2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz

3. Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz

4. The peak emissions above 1 GHz are not more than 20 dB above the average limit.

5. The antenna is manipulated through typical positions, polarity and length during the tests.

6. The EUT is supplied with nominal AC voltage or/and a new/fully-recharged battery.

7. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.

8. < - 135 dBm are below the analyzer floor level.

9. Above 1 GHz, the limit is 500 μV/m (54dBμV/m) at 3 meters radiated.

© 2006 PCTEST Engineering Laboratory, Inc.

Radiated Measurements (Cont.)

§15.407(b)(1), (6), §15.205, §15.209; RSS-210 [A8.5]

Mode: 802.11a

Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5200MHz

Channel: 40

	Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol. [H/V]	Field Strength [dBμV/m]	Field Strength [μV/m]	Margin [dB]
	10400.00	-116.20	40.50	H	36.16	64.3	-32.79
*	15600.00	-135.00	47.30	H	19.30	9.2	-34.68
*	20800.00	-135.00	50.05	H	22.05	12.7	-31.93
	26000.00	-135.00	52.50	H	24.50	16.8	-44.45

Table 6-9. Radiated Measurements @ 3 meters

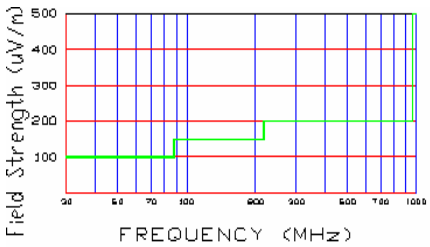


Figure 6-7. Radiated limits at 3 meters.

NOTES:

1. The limit listed in Section 15.407(b) is –27 dBm/MHz EIRP. This is equivalent to a field strength of 68.24 dBuV/m @ 3m. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table 6-7. (Note: * = Restricted Band measured frequency)

2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz

3. Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz

4. The peak emissions above 1 GHz are not more than 20 dB above the average limit.

5. The antenna is manipulated through typical positions, polarity and length during the tests.

6. The EUT is supplied with nominal AC voltage or/and a new/fully-recharged battery.

7. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.

8. < - 135 dBm are below the analyzer floor level.

9. Above 1 GHz, the limit is 500 μV/m (54dBμV/m) at 3 meters radiated.

© 2006 PCTEST Engineering Laboratory, Inc.

Radiated Measurements (Cont.)

§15.407(b)(1), (6), §15.205, §15.209; RSS-210 [A8.5]

Mode: 802.11a

Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5220MHz

Channel: 44

	Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol. [H/V]	Field Strength [dBμV/m]	Field Strength [μV/m]	Margin [dB]
	10440.00	-116.30	40.60	H	36.35	65.7	-31.95
*	15660.00	-135.00	45.90	H	17.90	7.9	-36.08
*	20880.00	-135.00	49.39	H	21.39	11.7	-32.59
	26100.00	-135.00	53.35	H	25.35	18.5	-42.95

Table 6-10. Radiated Measurements @ 3 meters

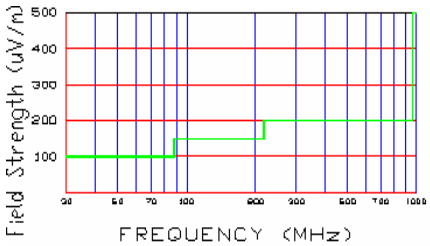


Figure 6-8. Radiated limits at 3 meters.

NOTES:

1. The limit listed in Section 15.407(b) is –27 dBm/MHz EIRP. This is equivalent to a field strength of 68.24 dBuV/m @ 3m. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table 6-7. (Note: * = Restricted Band measured frequency)

2. All harmonics/spurs are at least 20 dB below the highest emission in the authorized band using RBW = 100kHz

3. Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz

4. The peak emissions above 1 GHz are not more than 20 dB above the average limit.

5. The antenna is manipulated through typical positions, polarity and length during the tests.

6. The EUT is supplied with nominal AC voltage or/and a new/fully-recharged battery.

7. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.

8. < - 135 dBm are below the analyzer floor level.

9. Above 1 GHz, the limit is 500 μV/m (54dBμV/m) at 3 meters radiated.

© 2006 PCTEST Engineering Laboratory, Inc.

6.6 Radiated Restricted Band Measurements

§15.407(b)(1), (6), §15.205, §15.209; RSS-210 [A8.5]

Note:
Special attention is made for the EUT's harmonic and spurious radiated emission in the restricted bands of operation.

Mode: 802.11a

Transfer Rate: 6 Mbps

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36

Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol. [H/V]	Field Strength [dBμV/m]	Field Strength [μV/m]	Margin [dB]
5141.87	-113.8	40.11	H	33.31	46.29	-20.67
5143.69	-113.3	40.13	H	33.83	49.12	-20.15
5144.47	-113.3	40.14	H	33.83	49.15	-20.15
5147.28	-113.3	40.16	H	33.85	49.23	-20.13
5149.03	-113.0	40.18	H	34.16	51.05	-19.82
5149.78	-113.0	40.19	H	34.17	51.08	-19.81

Table 6-11. Radiated Restricted Band Measurements at 3-meters

NOTES:

1. The antenna is manipulated through typical positions, polarity and length during the testing.
2. The EUT is supplied with the minimal AC voltage or/and a new/fully re-charged battery.
3. The spectrum is measured from 9 kHz up to the 10th harmonic and the worst-case emissions are reported.
4. Above 1 GHz the limit is 500μV/m.
5. < -135 dBm is below the analyzer measurement floor level.
6. The data in the table are Average Measurements > 1GHz using RBW = 1 MHz VBW = 10 Hz
7. The peak emissions above 1 GHz are not more than 20 dB above the average limit.

© 2006 PCTEST Engineering Laboratory, Inc.

7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Samsung ICE PAD Wireless Multimedia Transceiver (Monitor) FCC ID: A3LSHP2100** is in compliance with Part 15E of the FCC Rules. Measurement uncertainty was not taken into account in this determination.

© 2006 PCTEST Engineering Laboratory, Inc.

EXHIBIT A – LABELING REQUIREMENTS

Sample Label & Location

New Labeling Requirements:

Per 2.1074 & 15.19; Docket 95-19

The sample label shown below 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, FCC ID, and the FCC logo must be displayed on the device per Section 15.19(b)(2).

Note: The FCC ID shown will be readily visible at the time of purchase.

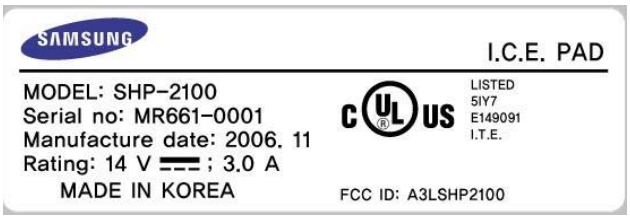


Figure A-1. FCC ID Label

Figure A-2. FCC ID Label Location

© 2006 PCTEST Engineering Laboratory, Inc.

EXHIBIT B – TEST SETUP PHOTOGRAPHS

The Line-Conducted and Radiated Test Pictures show the worst-case configuration and cable placement with a minimum margin to the specifications.

© 2006 PCTEST Engineering Laboratory, Inc.

EXHIBIT C – EUT EXTERNAL/INTERNAL PHOTOGRAPHS

© 2006 PCTEST Engineering Laboratory, Inc.

EXHIBIT D – USER'S MANUAL

© 2006 PCTEST Engineering Laboratory, Inc.