PCTEST ENGINEERING LABORATORY, INC.

6660 – B Dobbin Road · Columbia, MD 21045 · USA
Telephone 410.290.6652 / Fax 410.290.6654
http://www.pctestlab.com (email: randy@pctestlab.com)

CERTIFICATE OF COMPLIANCE

MANUFACTURER NAME & ADDRESS:
SAMSUNG ELECTRONICS CO., LTD.
18600 Broadwick Street
Rancho Dominguez, CA 90220

DATE & LOCATION OF TESTING:
Date(s) of Tests: March 14, 2006
Test Report S/N: 0603070161-R1
Test Site: PCTEST Lab, Columbia, MD

FCC ID:	**A3LSCHA915**
APPLICANT:	**SAMSUNG ELECTRONICS CO., LTD.**

SUMMARY:

Model No.:	**SCH-A915**
Equipment EUT Type:	**Dual-Band CDMA Phone with Bluetooth**
Max. Output Power:	**0.0009 W Conducted**
Frequency Range:	**2402 – 2480 MHz**
FCC Classification:	**FCC Part 15 Frequency Hopping Spread Spectrum Transceiver (DSS)**
FCC Rule Part(s):	**Parts 15.247; ANSI C-63.4-2001**

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-63.4-2001.

Grant Conditions: Listed output power is conducted.

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.

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

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Attestation Statements

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MEASUREMENT REPORT

FCC Part 15.247 Measurement Report Cover Page

A. General Information

APPLICANT	**SAMSUNG ELECTRONICS CO., LTD.**
APPLICANT ADDRESS	**18600 Broadwick Street**
	Rancho Dominguez, CA 90220
TEST SITE	**PCTEST ENGINEERING LABORATORY, INC.**
TEST SITE ADDRESS	**6660-B Dobbin Road, Columbia, MD 21045 USA**
FCC RULE PART(S)	**Parts 15.247; ANSI C-63.4-2001**
MODEL NAME	**SCH-A915**
FCC ID	**A3LSCHA915**
Test Device Serial No.:	**S/N FD-024-G** ☐ Production ☒ Pre-Production ☐ Engineering
FCC CLASSIFICATION	**FCC Part 15 Spread Spectrum Transceiver (DSS)**
Method/ System:	**FHSS Sequence Spread Spectrum (FHSS)**
DATE(S) OF TEST	**March 14, 2006**
TESTS REPORT S/N:	**0603070161-R1**

A.1 Test Facility / NVLAP Accreditation

Measurements were performed at PCTEST Engineering Lab 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 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) in EMC, Telecommunication, and FCC for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. (NVLAP Lab code: 100431-0).**
- **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.**
- **PCTEST facility is an IC registered (IC-2451) test laboratory with the site description on file at Industry Canada.**

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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 C63.4-2001) and FCC Public Notice dated July 12, 1995 entitled "Guidance on Measurement for Direct Sequence Spread Spectrum System" were used in the measurement of **Dual-Band CDMA Phone with Bluetooth.**

1.2 Scope

Measurement & 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 1.2-1).

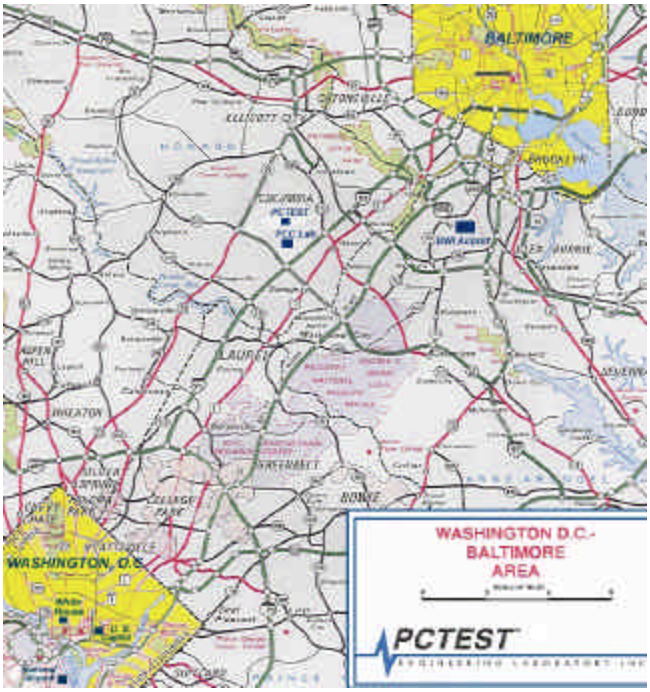

Figure 1.3-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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 on October 19, 2002.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Dual-Band CDMA Phone with Bluetooth.**

- This Bluetooth module has been tested by Bluetooth Qualification Lab, and we confirm the following:

  A) The hopping sequence is pseudorandom

  B) All channels were used equally on average

  C) The receiver input bandwidth equals the transmit bandwidth

  D) The receiver hops in sequence with the transmit signal

- 15.247(g): In accordance with the Bluetooth Industry Standard, the system is designed to comply with all of the regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) system.

- 15.247(h): In accordance with the Bluetooth Industry Standard, the system does not coordinate it channels selection/ hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

2.2 EMI Suppression Device(s)/Modifications

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

- None

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3.0 DESCRIPTION OF TEST

3.1 Conducted Emissions

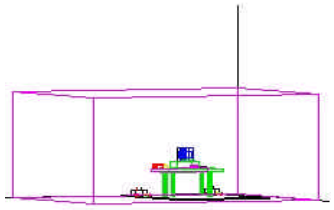

Figure 3.1-1. Shielded Enclosure Line-Conducted Test Facility

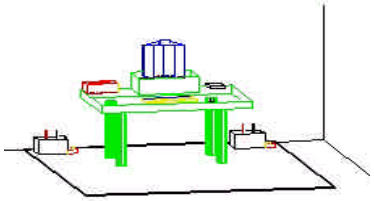

Figure 3.1-2. Line Conducted Emission Test Set-Up

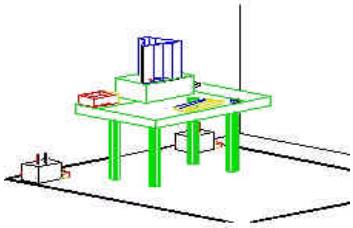

Figure 3.1-3. Wooden Table & Bonded LISNs

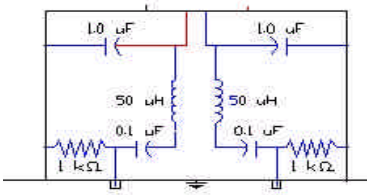

Figure 3.1-4. LISN Schematic Diagram

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 20msec. sweep time. 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 patter 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 M. Each EME reported was calibrated using the HP8640B signal generator.

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3.2 Radiated Emissions

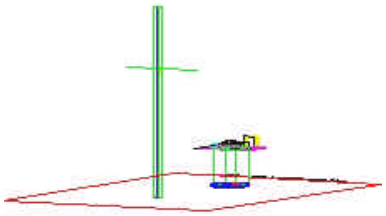

Figure 3.2-1. Meter Test Site

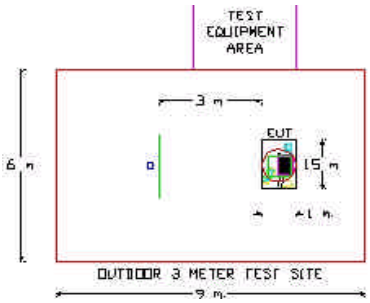

Figure 3.2-2. Dimensions of Outdoor Test Site

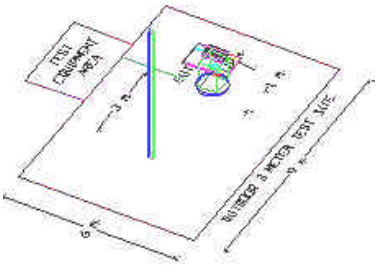

Figure 3.2-3. Turntable and System Setup

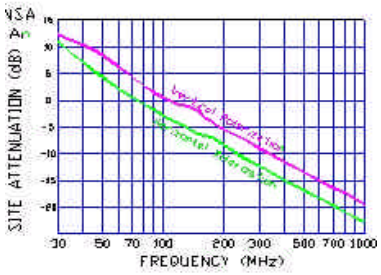

Figure 3.2-4. Normalized Site Attenuation Curves (H&V)

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, turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 to 200 MHz using bi-conical antenna and from 200 to 1000 MHz using 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 antenna (see Figure 3.2-1). The test equipment was placed on a wooden and plastic bench situated on a 1.5 x 2 meter 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 1 MHz 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 E-G. Each EME reported was calibrated using the HP8640B signal generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3.2-4.

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4.0 ANTENNA REQUIREMENTS

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the applicant 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 this requirement.

The antennas are **permanently attached antennae**.

There are no provisions for connection to an external antenna.

Conclusion:

The **Phone w/ Bluetooth** 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

TYPE	MODEL	CAL DUE DATE	S/N
Microwave Spectrum Analyzer	HP 8566 (100Hz–22GHz)	12/5/2006	3638A08713
Microwave Spectrum Analyzer	HP 8566 (100Hz-22GHz)	4/17/2006	2542A11898
Spectrum Analyzer/Tracking Generator	HP 8591A (9kHz-1.8GHz)	3/24/2007	3144A02458
Spectrum Analyzer	HP 8591A (9kHz-1.8GHz)	4/23/2006	3108A02053
Spectrum Analyzer	HP 8594A (9kHz-2.9GHz)	11/2/2006	3051A00187
Signal Generator	HP 8650B (500Hz-1GHz)	6/2/2006	2232A19558
Signal Generator	HP 8640B (500Hz-1GHz)	6/2/2006	1851A09816
Signal Generator	Rohde & Schwarz (0.1-1GHz)	9/22/2006	894215/012
Ailtech/Eaton Receiver	NM 37/57A-SL (30MHz-1GHz)	4/12/2006	0792-03271
Ailtech/Eaton Receiver	NM 37/57A (30MHz-1GHz)	3/11/2007	0805-03334
Ailtech/Eaton Receiver	NM 17/27A (0.1-32MHz)	9/17/2006	0608-03241
Quasi-Peak Adapter	HP 85650A	8/9/2006	2043A00301
Ailtech/Eaton Adapter	CCA-7 CISPR/ANSI QP Adapter	3/11/2007	0194-04082
RG58 Coax Test Cable	No.167	3/26/2007	n/a
Harmonic/Flicker Test System	HP 6841A (IEC 555-2/3)	11/15/2006	3531A00115
Broadband Amplifier	HP 8447D	2/26/2007	1145A00470
Broadband Amplifier	HP 8447D	2/26/2007	1937A03348
Horn Antenna (2)	EMCO Model 3115 (1-18GHz)	3/15/2007	9704-5182, 9205-3874
Horn Antenna	EMCO Model 3116 (18-40GHz)	3/28/2007	9203-2178
Biconical Antenna (3)	Eaton 94455-1	1/26/2007	1295, 1332, 1277
Roberts Dipoles	Compliance Design (1 set) A100	8/11/2006	5118
EMCO LISN (3)	3816/2, 3816/2, 3725/2	10/26/2006	1077, 1079, 2099
50-ohm Terminator	n/a	n/a	n/a
Microwave Preamp 30dB Gain	HP 83017A (0.5-26.5GHz)	3/26/2007	3123A00181
Microwave Cables	MicroCoax (1.0-26.5GHz)	2/26/2007	n/a
Spectrum Analyzer	HP 8591A	6/18/2006	3034A01395
Modulation Analyzer	HP 8901A	6/26/2006	2432A03467
Microwave Survey Meter	Holaday Model 1501 (2.45GHz)	2/21/2007	80931
Digital Thermometer	Extech Instruments 421305	3/15/2007	426966
Attenuator	4108 (6dB)	3/26/2007	n/a
Shielded Screen Room	RF Lindgren Model 26-2/2-0	n/a	6710 (PCT270)
Shielded Semi-Anechoic Chamber	Ray Proof Model S81	4/15/2006	R2437 (PCT278)
Environmental Chamber	Associated Systems 1025	8/8/2006	PCT285
OATS	n/a	12/31/2006	n/a

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

Table 5-1. Annual Test Equipment Calibration Schedule

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6.0 CONCLUSION

The data collected relate only the item(s) tested and show that the Dual-Band CDMA Phone with Bluetooth is in compliance with Part 15C of the FCC Rules.

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EXHIBIT A – 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 a data rate(s) specified above. 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.

Method/System: Frequency Hopping Spread Spectrum (FHSS)

Number of channels: 79

FCC Part Section(s)	RSS 210 Section	Test Description	Test Limit	Result
TRANSMITTER MODE (TX)				
15.247(a)(2)		20dB Bandwidth	> 1 MHz	Pass
15.247(b)	6.22(o)(a3)	Transmitter Output Power	< 1 Watt	Pass
15.247(c)	5.9.1 6.2.2(o) (e1)	Occupied BandEdge Out-of-Band Emissions (BandEdge at 20dB below)	Radiated <20dBc. Emissions in restricted bands must meet the radiated limits detailed in 15.207	Pass
15.205 15.209	6.2.1 6.3	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	6.6	AC Conducted Emissions 150kHz – 30MHz	EN55022	Pass
RECEIVER MODE (RX)				
15.207	7.4	AC Conducted Emissions 150kHz – 30MHz	Class B = 250µV	Pass
15.209	7.3	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.209 limits or < RSS-210 table 3 limits	Pass

Table A-1. Summary of Test Results

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EXHIBIT A – Test Results (Cont.)

20dB Bandwidth Measurement (Handset)

§15.247(a)(2)

The bandwidth at 20dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies.

Minimum Standard – The transmitter shall have a maximum 20dB bandwidth of 1 MHz.

The spectrum analyzer is set to:

RBW =	30 kHz (10dB/div)
VBW =	30 kHz
Span =	3.0 MHz
Ref. Level =	-0.9 dBm
Sweep =	4.04 ms

Frequency (MHz)	Channel No.	Test Results	
		20dB Bandwidth (MHz)	Pass/Fail
2402	0	1,050	Pass
2441	39	1,045	Pass
2480	78	1,045	Pass

– See next pages for actual measured spectrum plots

Table A-2. Conducted Bandwidth Measurements

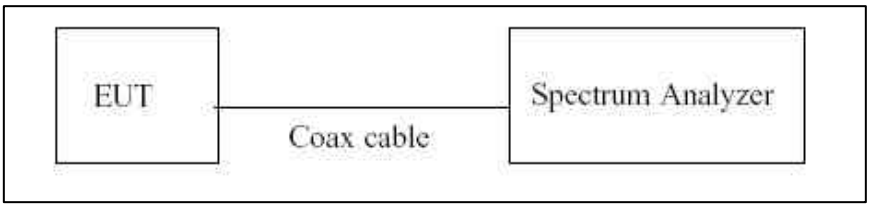

Figure A-1. Test Instrument & Measurement Setup

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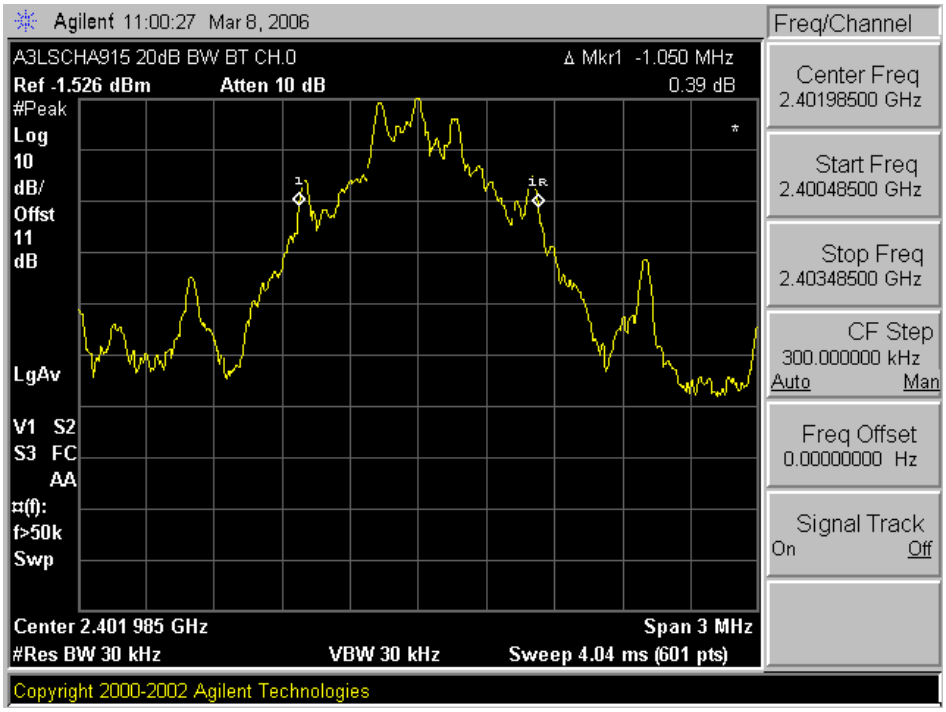

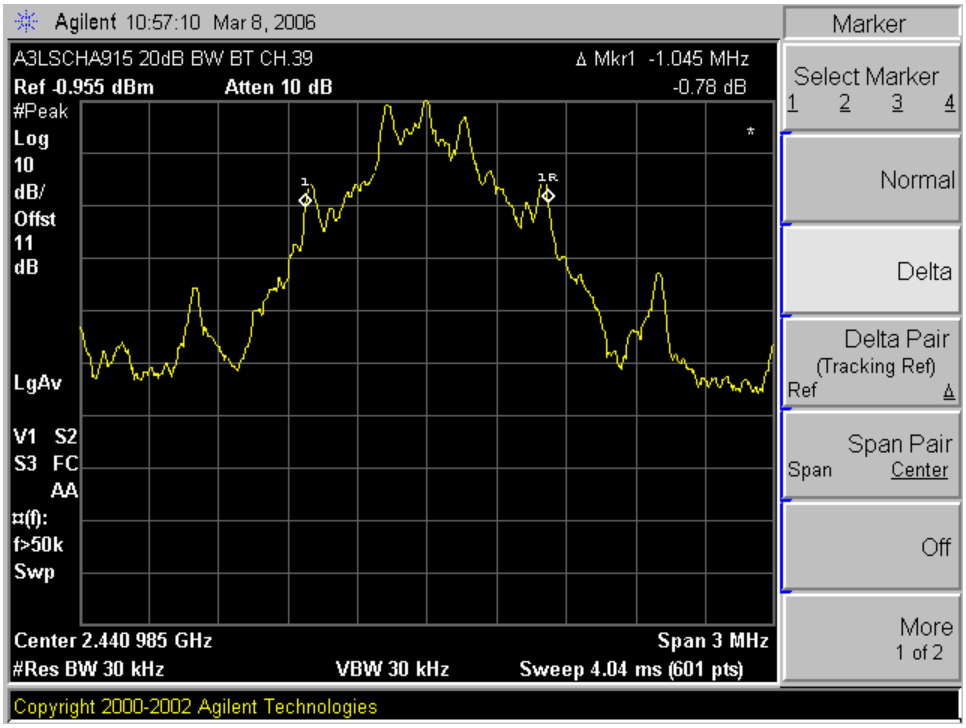

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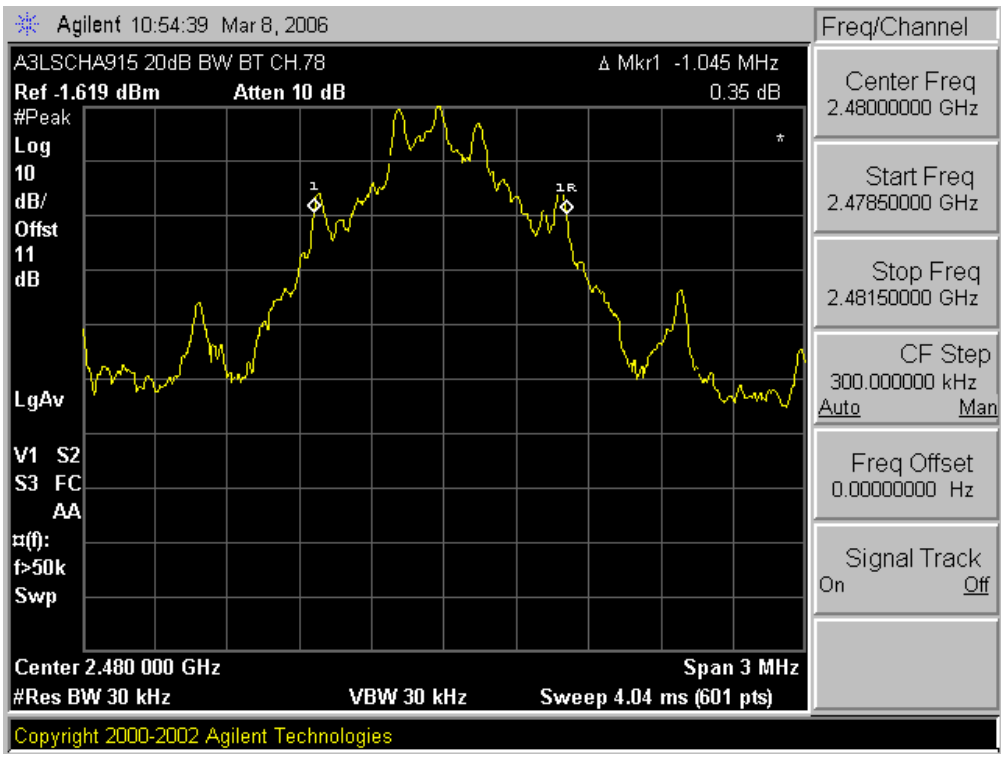

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EXHIBIT A – Test Results (Cont.)

Output Power Measurement

§15.247(b)

Measurement is made while the EUT is operating in non-hopping transmission mode

Minimum Standard – The transmitter peak output power shall not exceed 1 watt.

Frequency (MHz)	Channel No.	Test Results
		Power Output (W)
2402	0	0.0008
2441	39	0.0009
2480	78	0.00075

See next pages for spectrum plots (Reference Only).
Max. Peak Power + Attenuation = dBm ⇒ Watts.

Table A-3. Output Power Measurements

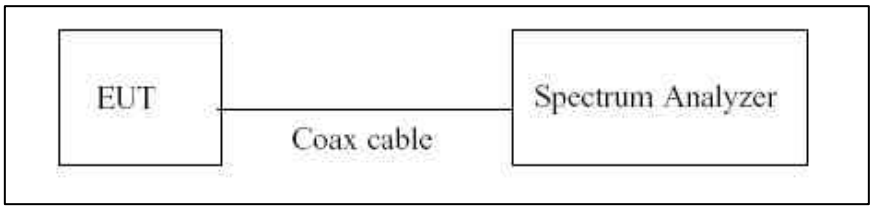

Figure A-3. Test Instrument & Measurement Setup

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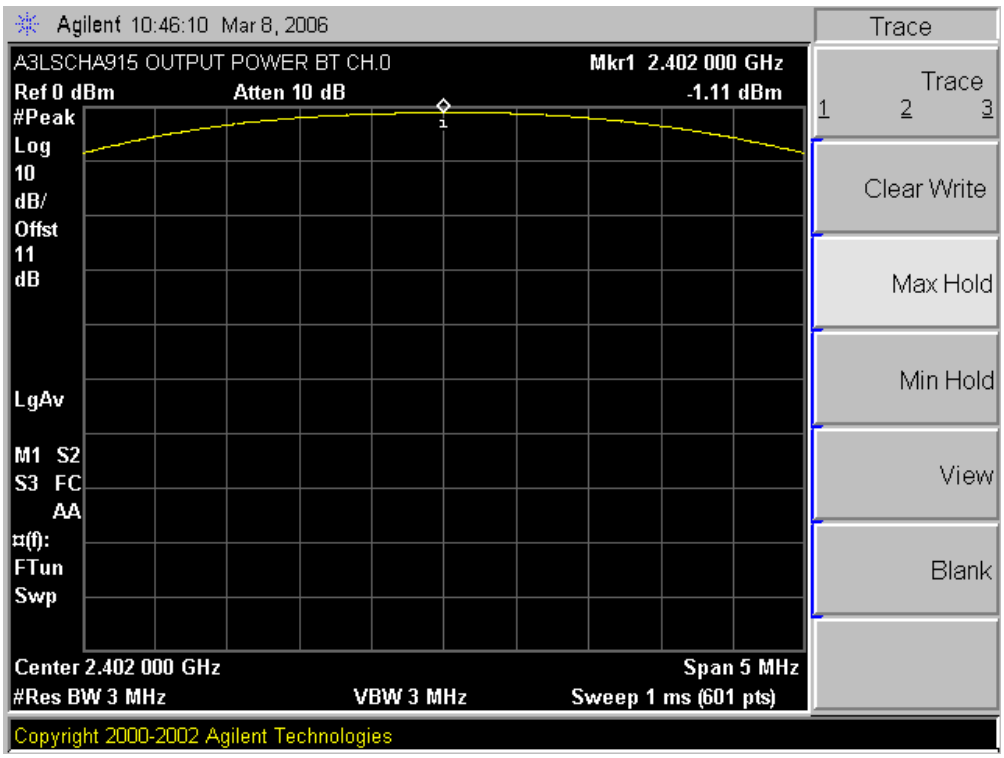

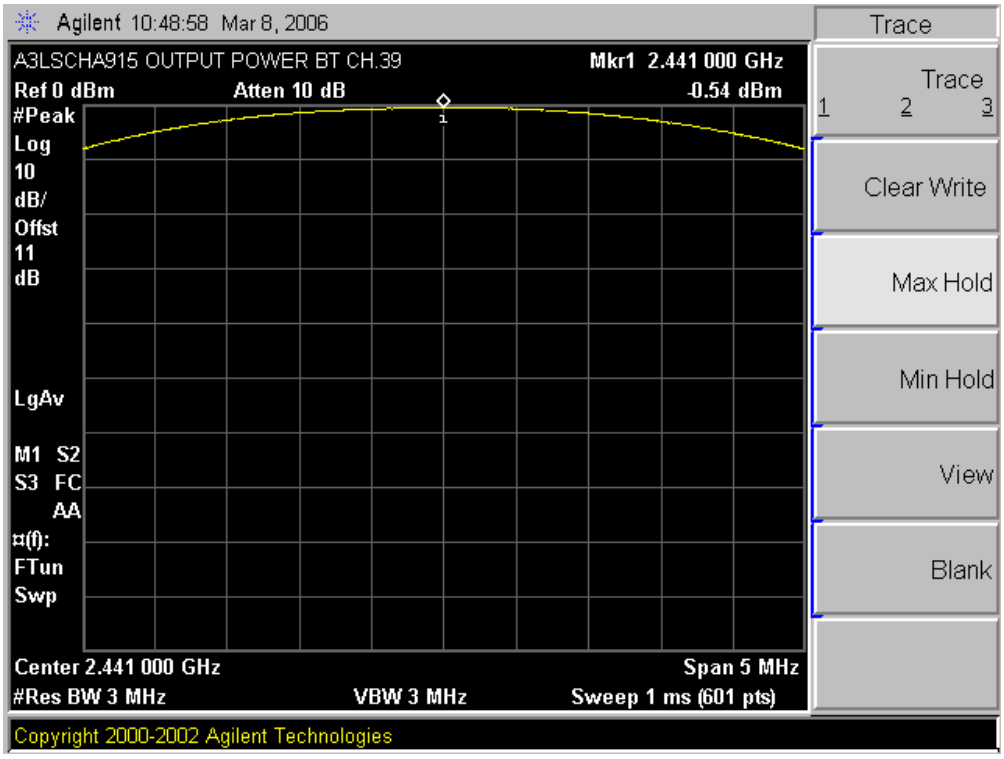

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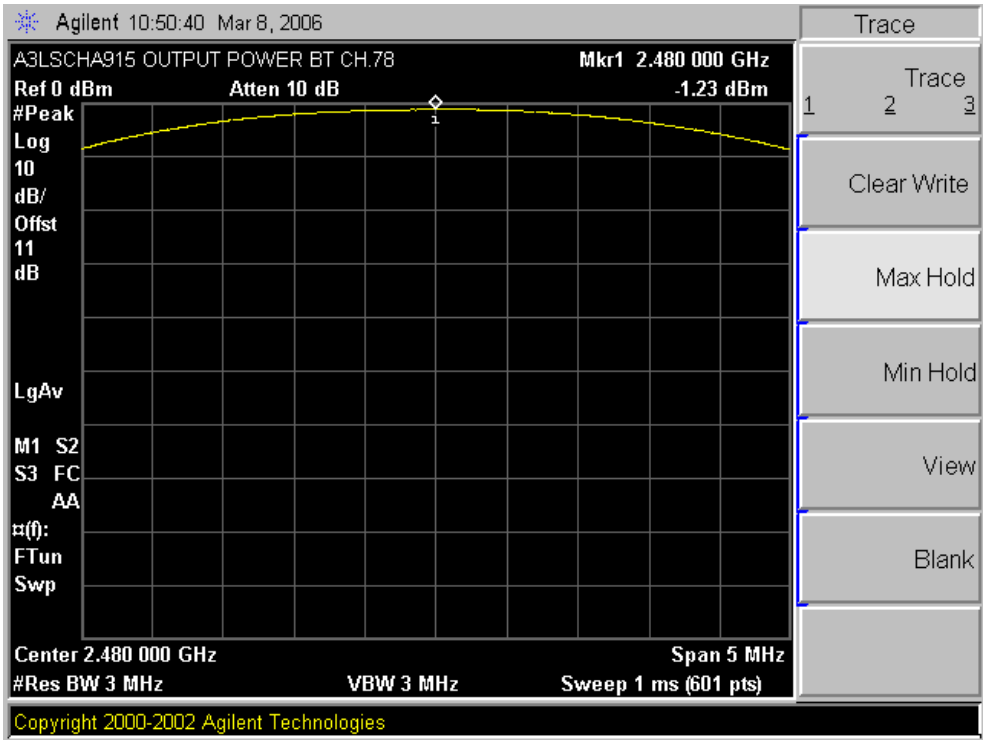

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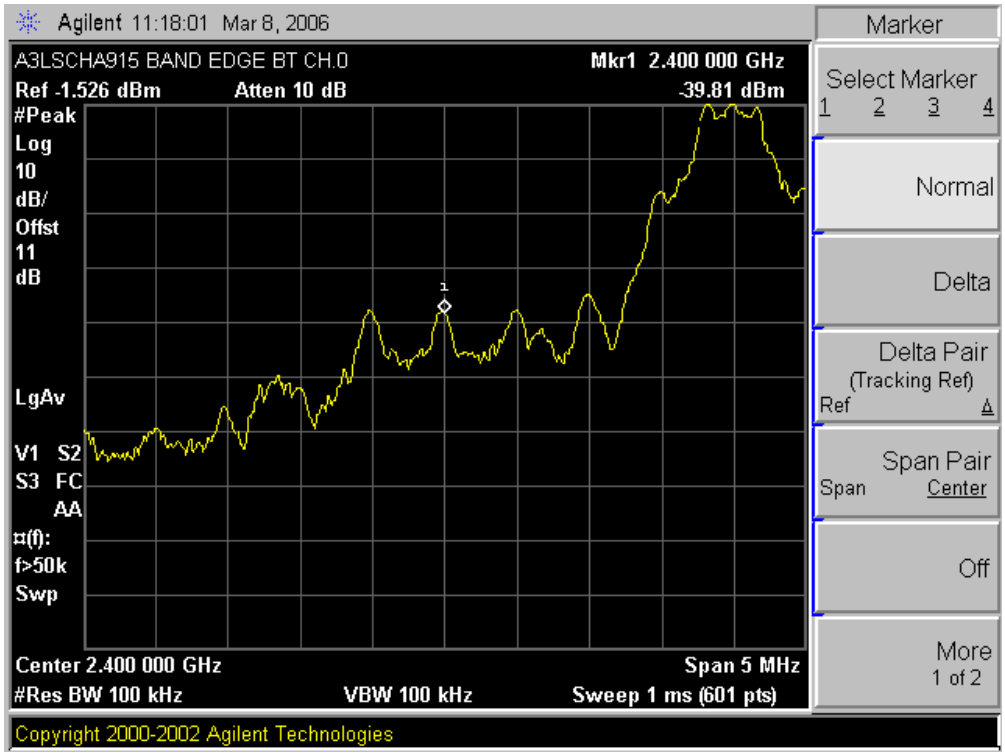
EXHIBIT A – Test Results (Cont.)

Band Edge Compliance



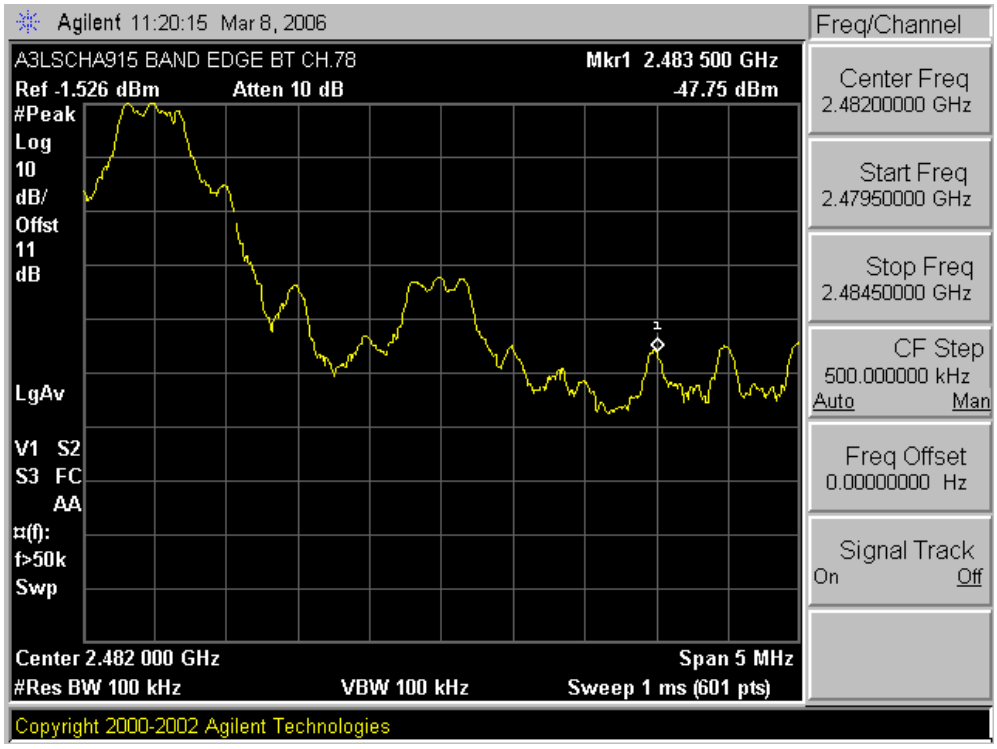


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EXHIBIT A – Test Results (Cont.)

Carrier Frequency Separation

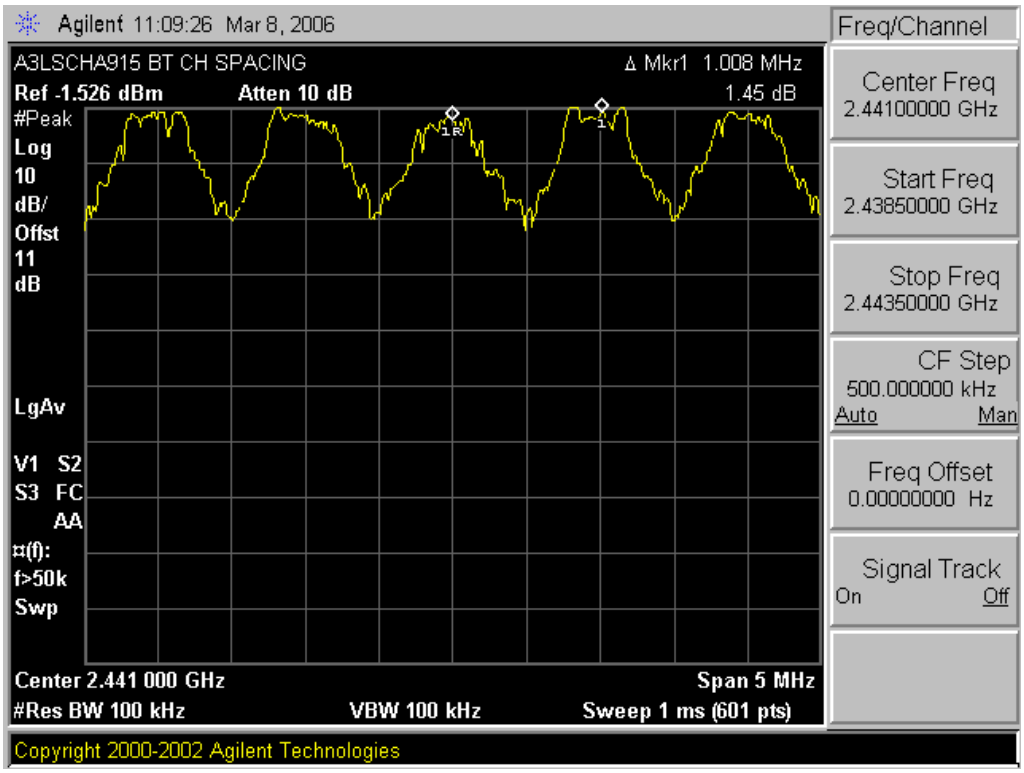

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EXHIBIT A – Test Results (Cont.)

Dwell Time

§15.247(b) / §15.205 & §15.209

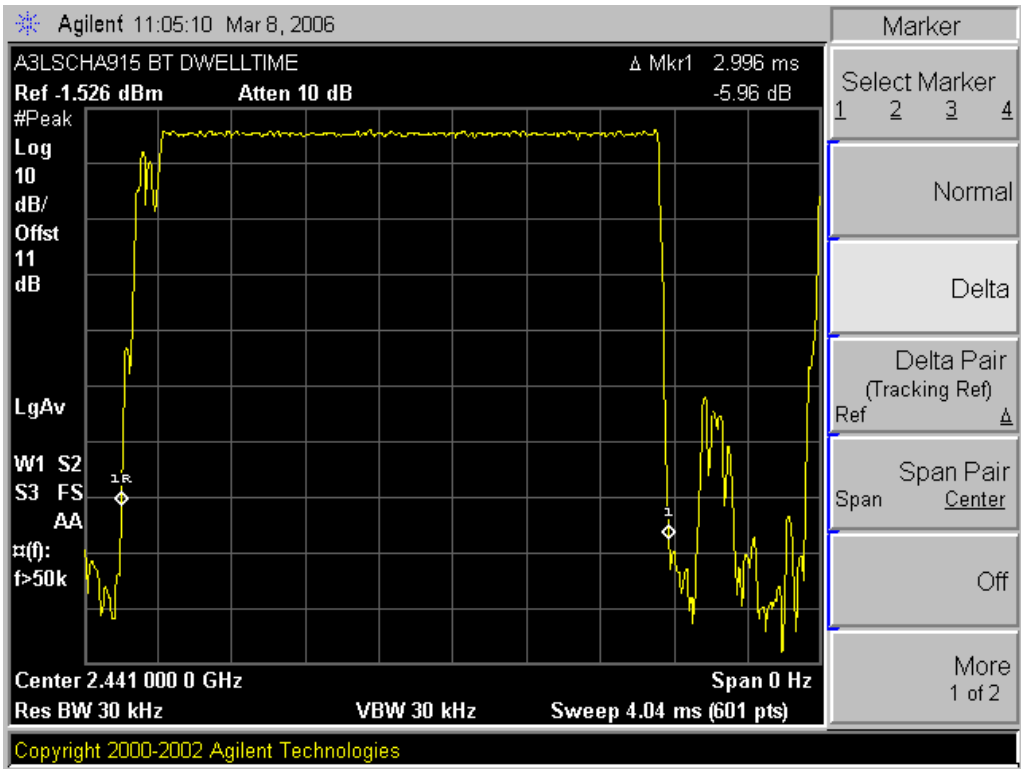

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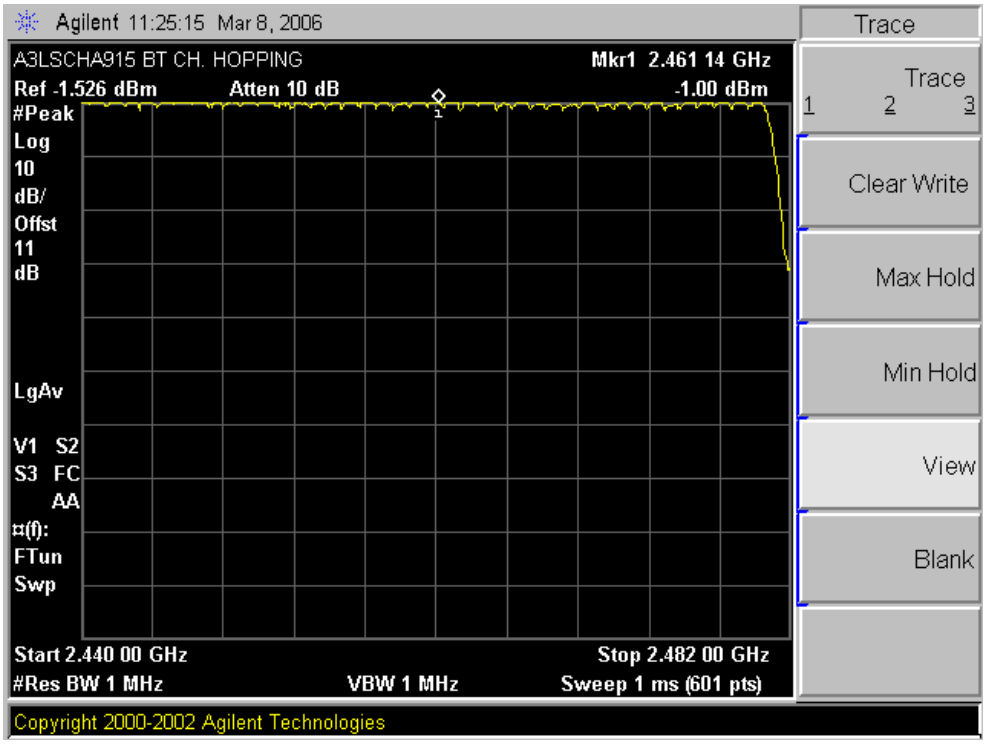
EXHIBIT A – Test Results (Cont.)

Number of Hopping Channels

§15.247(b) / §15.205 & §15.209



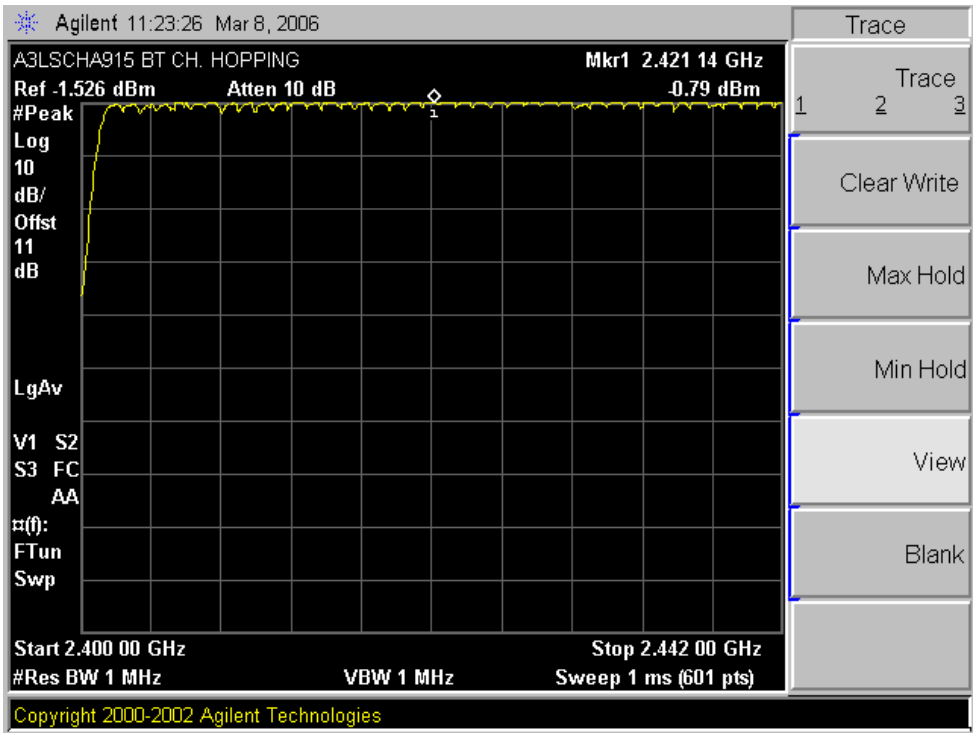


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EXHIBIT A – Test Results (Cont.)

Radiated Harmonic Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Distance of Measurements: 3 Meters

Channel: 00

FREQ. (MHz)	LEVEL (dBm)	AFCL (dB)	POL (H/V)	F/S (dBuV/m)	F/S (uV/m)	MARGIN (dB)
4804.00	-99.90	40.6	H	47.7	242.7	-6.3
7206.00	-112.30	45.8	H	40.5	105.9	-13.5
9608.00	-114.00	49.6	H	42.6	134.9	-11.4
12010.00	-135.00	52.1	H	24.1	16.0	-29.9

Table A-8. Harmonic Measurements

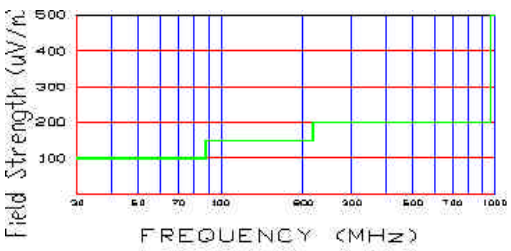

Figure A-7. Radiated limits at 3 meters.

NOTES:

1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (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 (54dBµ/m) at 3 meters radiated.

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EXHIBIT A – Test Results (Cont.)

Radiated Harmonic Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Distance of Measurements: 3 Meters

Channel: 39

FREQ. (MHz)	LEVEL (dBm)	AFCL (dB)	POL (H/V)	F/S (dBuV/m)	F/S (uV/m)	MARGIN (dB)
4882.00	-98.40	40.5	H	49.1	285.1	-4.9
7323.00	-105.00	47.3	V	49.3	291.7	-4.7
9764.00	-112.50	50.1	V	44.6	169.8	-9.4
12205.00	-135.00	52.5	V	24.5	16.8	-29.5

Table A-9. Radiated Fundamental & Harmonic Measurements

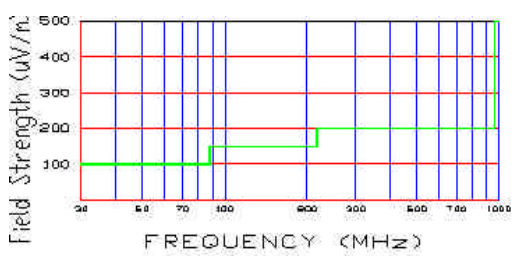

Figure A-8. Radiated limits at 3 meters.

NOTES:

1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (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 (54dBµ/m) at 3 meters radiated.

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EXHIBIT A – Test Results (Cont.)

Radiated Harmonic Measurements (Cont.)

§15.247(b) / §15.205 & §15.209

Distance of Measurements: 3 Meters

Channel: 78

FREQ. (MHz)	LEVEL (dBm)	AFCL (dB)	POL (H/V)	TOTAL (dBuV/m)	F/S (uV/m)	MARGIN (dB)
4960.00	-98.60	40.6	V	49.0	281.8	-5.0
7440.00	-104.00	45.9	H	48.9	278.6	-5.1
9920.00	-115.30	49.4	V	41.1	113.5	-12.9
12400.00	-135.00	53.4	V	25.4	18.5	-28.7

Table A-10. Radiated Fundamental & Harmonic Measurements

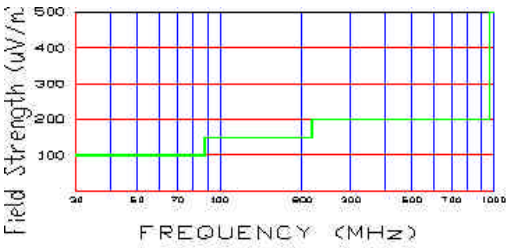

Figure A-9. Radiated limits at 3 meters.

NOTES:

1. All harmonics in the restricted bands specified in §15.205 are below the limit shown in Table G-1. (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 (54dBµ/m) at 3 meters radiated.

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EXHIBIT A – Test Results (Cont.)

Radiated Restricted Band Measurements

§15.205 / §15.209

Special attention is made for the EUT's harmonic and spurious radiated emission in the restricted bands of operations. The EUT was tested from 9kHz and up to the tenth harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHZ. Above 1 GHz, average measurement was used, using RBW 1MHz – VBW 10Hz and linearly polarized horn antennas. All harmonics/spurs are at least 20dB below the highest emission in the authorized band using RBW = 100kHz. In addition, peak measurements were taken to ensure that the peak levels are not more than 20dB above the average limit. All out of band emissions, other than those created by the spreading sequence, data sequence, and the carrier modulation must not exceed the limits show in Table G-1 per Section 15.209.

Frequency	F/S (mV/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 A-18. Restricted Band Limits

TEST MEASUREMENT EQUIPMENT

Agilent E4448A	PSA Spectrum Analyzer 3 Hz - 50GHz
HP 8566B	Spectrum Analyzer 100Hz – 22GHz
HP 83017A	Microwave Analyzer 40dB Gain (0.5 – 26.5GHz)
HP 3784A	Digital Transmission Analyzer
EMCO 3115	Horn Antenna (1 – 18GHz)
HP 8495A	20dB Attenuator (DC-40GHz) 0 –70dB
HP 8493B	10dB Attenuator
MicroCoax Cables	Low Loss Microwave Cables (1 – 26.5GHz)
CDI Dipoles	Dipole Antennas (30 – 1000MHz)
EMCO 3116	Horn Antenna (18 – 40GHz)

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EXHIBIT A – Test Results (Cont.)

Radiated Restricted Band Measurements (Cont.)

§15.205 / §15.209 courtesy

Operating Frequency: 2480 MHz

Channel Number: 78

FREQ (MHz)	Level (dBm)	AFCL (dB/m)	POL (H/V)	F/S (dBµV/m)	F/S (uV/M)	Margin (dB)
2484.3	-104.7	33.0	H	34.1	50.7	-19.9
2487.3	-104.8	33.0	H	34.0	50.1	-20.0
2489.8	-105.7	33.1	H	33.1	45.2	-20.9
2491.6	-104.6	33.1	H	34.2	51.3	-19.8
2496.5	-104.7	33.2	H	34.1	50.7	-19.9
2497.6	-104.2	33.2	H	34.6	53.7	-23.1

Table A-19. 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 9kHz up to the 10th harmonic and the worst-case emissions are reported.
4. The conducted limits are shown on Figure A-14. Above 1 GHz the limit is 500µV/m.
5. < -135 dBm is below the analyzer measurement floor level.
6. The peak emissions above 1 GHz are not more than 20 dB above the average limit.

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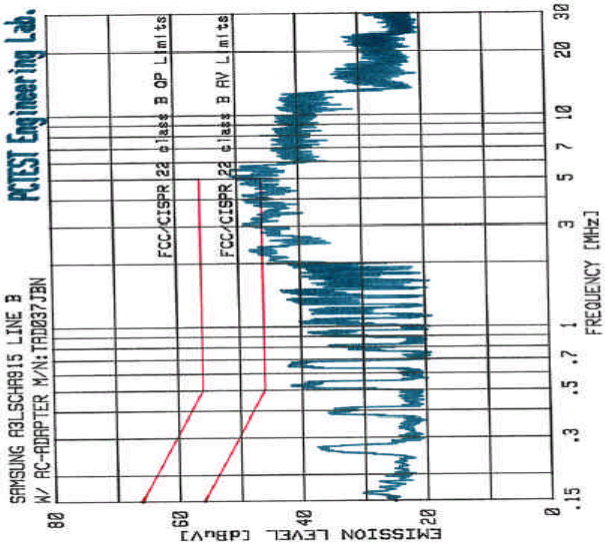
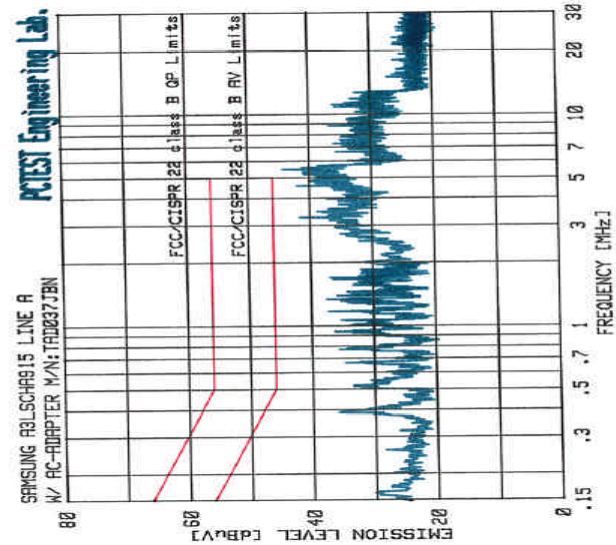
EXHIBIT A – Test Results (Cont.)

Line-Conducted Test Data

§15.207



No.	Freq. [MHz]	Quasi-Pk [dBuV]	Limit [dBuV]	Margin [dB]	Average [dBuV]	Limit [dBuV]	Margin [dB]
1	4.971	44.23	56.00	-11.77	26.10	46.00	-19.90
2	4.700	40.35	56.00	-15.65	27.05	46.00	-18.95
3	3.120	40.67	56.00	-15.33	25.23	46.00	-20.77
4	4.014	40.08	56.00	-15.92	24.80	46.00	-21.20
5	3.869	38.96	56.00	-17.04	24.46	46.00	-21.54
6	4.740	39.38	56.00	-16.62	26.25	46.00	-19.75
7	2.260	41.14	56.00	-14.86	25.17	46.00	-20.83
8	3.788	38.12	56.00	-17.88	25.35	46.00	-20.65
9	5.141	43.60	60.00	-16.40	26.82	50.00	-23.18
10	4.463	43.02	56.00	-12.98	26.67	46.00	-19.33



No.	Freq. [MHz]	Quasi-Pk [dBuV]	Limit [dBuV]	Margin [dB]	Average [dBuV]	Limit [dBuV]	Margin [dB]
1	4.619	34.07	56.00	-21.93	24.69	46.00	-21.31
2	3.284	31.73	56.00	-24.27	24.13	46.00	-21.87
3	5.581	37.95	60.00	-22.05	26.16	50.00	-23.84
4	4.865	34.79	56.00	-21.21	25.06	46.00	-20.94
5	4.737	34.23	56.00	-21.77	25.33	46.00	-20.67
6	3.398	32.62	56.00	-23.38	23.90	46.00	-22.10
7	1.328	33.51	56.00	-22.49	23.94	46.00	-22.06
8	1.161	36.87	56.00	-19.13	24.52	46.00	-21.48
9	4.003	31.01	56.00	-24.99	23.43	46.00	-22.57
10	5.548	38.06	60.00	-21.94	25.55	50.00	-24.45

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 EN55022.
3. Line A = Phase; Line B = Neutral
4. Deviations to the Specifications: *None*.

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EXHIBIT B – Block Diagram/Schematics

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EXHIBIT C – Operational Description

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EXHIBIT D – Test Setup Photographs

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EXHIBIT E – EUT External / Internal Photographs

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EXHIBIT F – User's Manual

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