LS Research, LLC

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ENGINEERING TEST REPORT 306447 TX

Compliance Testing of:
Fossil Caller ID Watch

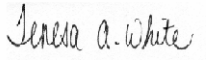
Test Date(s):
September 12th to 19th 2006

Prepared For:
Fossil Partners L.P.
2280 North Greenville Avenue
Richardson, TX 75082

In accordance with:
Federal Communications Commission (FCC)
Part 15, Subpart C, Section 15.247 FHSS TX
Frequency Hopping Spread Spectrum Operating in the
Frequency Band 2400 MHz – 2483.5 MHz

This Test Report is issued under the Authority of:
Brian E. Petted, VP of Engineering

Signature: Date: October 24, 2006

Test Report Prepared by:	**Tested by:**
Teresa A. White, Document Coordinator	Khairul Aidi Zainal, EMC Engineer.
Signature: 	Signature: 
Date: October 24, 2006	Date: October 24, 2006

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LSR Revision Control

Date	Revision #	Revised By

EXHIBIT 1. INTRODUCTION

1.1 SCOPE

References:	FCC Part 15, Subpart C, Section 15.247
Title:	Telecommunication – Code of Federal Regulations, CFR 47, Part 15
Purpose of Test:	To gain FCC Certification Authorization for Digital Modulation Transmitters operating in the Frequency Band of 2400 MHz – 2483.5 MHz
Test Procedures:	Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
Environmental Classification:	• Commercial, Industrial or Business • Residential

1.2 NORMATIVE REFERENCES

Publication	Year	Title
47 CFR, Parts 0-15 (FCC)	2005	Code of Federal Regulations - Telecommunications
ANSI C63.4	2004	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
CISPR 16-1-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus.
CISPR 16-2-1	2003	Specification for radio disturbance and immunity measuring apparatus and methods. Part 201: Conducted disturbance measurement.
FCC Public Notice DA 00-1407	2000	Part 15 Unlicensed Modular Transmitter Approval
FCC ET Docket No. 99-231	2002	Amendment to FCC Part 15 of the Commission's Rules Regarding Spread Spectrum Devices.

1.3 LS RESEARCH, LLC TEST FACILITY

LS Research, LLC is accredited by A2LA (American Association for Laboratory Accreditation) to conform to ISO/IEC 17025, 2005 "General Requirements for the Competence of Calibration and Testing Laboratories".

LS Research, LLC's scope of accreditation includes all test methods listed herein, unless otherwise noted. A copy of the accreditation may be accessed on our web site: www.lsr.com. Accreditation status can be verified at A2LA's web site: www.a2la2.net.

1.4 LOCATION OF TESTING

All testing was performed at LS Research, LLC, W66 N220 Commerce Court, Cedarburg, Wisconsin, 53012 USA, utilizing the facilities listed below, unless otherwise noted.

List of Facilities Located at LS Research, LLC:

- Compact Chamber
- Semi-Anechoic Chamber
- Open Area Test Site (OATS)

1.5 TEST EQUIPMENT UTILIZED

A complete list of equipment utilized in testing is provided in Appendix A of this test report. Calibration dates are indicated in Appendix A. All test equipment is calibrated in accordance with A2LA standards.

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1 CLIENT INFORMATION

Manufacturer Name:	**Fossil Partners, L.P.**
Address:	**2280 North Greenville Avenue Richardson, TX 75082**
Contact Person:	**David Rosales**
Contact Phone:	**(972) 629-2605**
Contact Email:	**drosales@fossil.com**

2.2 EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information has been supplied by the applicant.

Product Name:	Caller ID Wristwatch
Model Number:	**FX6001**
Serial Number:	0016B80C83E2 (Radiated Emissions Mode 1) LS05 (Radiated Emissions Mode 2 and 3) 0016B80C83E7 (Conducted Emissions)

2.3 ASSOCIATED ANTENNA DESCRIPTION

The only antenna available on the device is a 2.45 GHz surface mount high frequency ceramic antenna. The antenna is manufactured by Johanson Technology with part number P/N 2450AT18A100. The listed gain of the antenna is 0.5 dBi peak.

2.4 EUT'S TECHNICAL SPECIFICATIONS

Additional Information:

Frequency Range (in MHz)	2402 MHz to 2480 MHz
RF Power in Watts	0.002 Watts
Operating Voltage	3.7 VDC
Field Strength (and at what distance)	79.9 dBµV/m at 1m (2480 MHz)
Occupied Bandwidth (99% BW)	720 kHz
Type of Modulation	GFSK
Emission Designator	F1D720K
Transmitter Spurious (worst case)	54.7 dBµV/m at 1m (4804 MHz)
Frequency Tolerance %, Hz, ppm	Better than 100 ppm
Microprocessor Model # (if applicable)	Philips BGB203
EUT will be operated under FCC Rule Part(s)	47 CFR 15.247 and 15.207 IC: RSS-GEN and RSS-210
Portable/Mobile	☒ Portable ☐ Mobile
Modular Filing	☐ Yes ☒ No

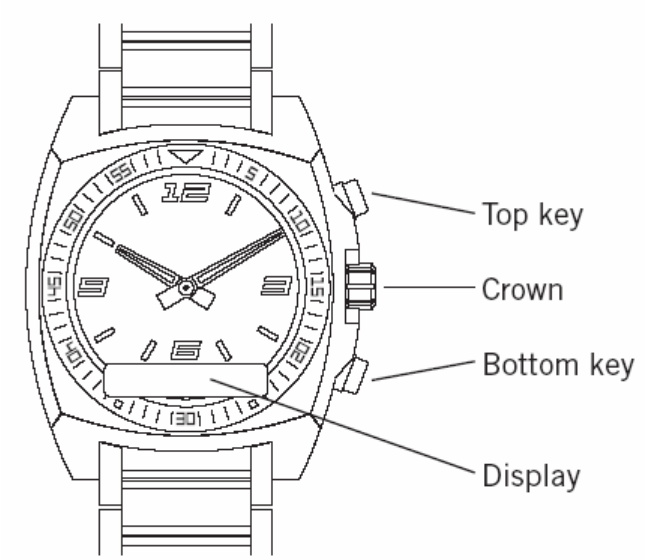
RF Technical Information:

Type of Evaluation (check one)		SAR Evaluation: Device Used in the Vicinity of the Human Head
		SAR Evaluation: Body-worn Device
	√	RF Evaluation

If RF Evaluation checked above, test engineer to complete the following:

- Evaluated against exposure limits: ☒ General Public Use ☐ Controlled Use
- Duty Cycle used in evaluation: 100 %
- Standard used for evaluation: OET Bulletin 65, IC Safety Code 6
- Measurement Distance: 1 m
- RF Value: 0.010 ☒ V/m ☐ A/m ☐ W/m^2
  ☒ Measured ☐ Computed ☐ Calculated

2.5 PRODUCT DESCRIPTION



The product is a wrist watch that contains a Bluetooth wireless radio. The watch contains analog hands for timekeeping, a Bluetooth radio and an antenna system, user operated buttons and a display. The watch is worn on the wrist of the user and is used to communicate with other Bluetooth devices wirelessly.

The product uses a 2.4 GHz, Bluetooth specification modulation (GFSK) and channelization. The internal power source is a Lithium-Ion rechargeable coin-cell battery. It is also possible to connect an external AC power source using a 5 VAC charging adapter or a powered USB bus (that also charges the watch). There are two electrical contacts on the watch to connect to VCC and GND of the external power source. A charging clip is used to connect the external power source to the two electrical contacts on the back of the watch. The antenna is a 2.45 GHz surface mount ceramic resonator from Johanson Technology P/N 2450AT18A100.

The EUT has the ability to be connected to a Bluetooth device in charging state and battery operated state.

EXHIBIT 3. EUT OPERATING CONDITIONS & CONFIGURATIONS DURING TESTING

3.1 CLIMATE TEST CONDITIONS

Temperature:	71º Fahrenheit
Humidity:	50 %
Pressure:	745 mmHg

3.2 APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Paragraph	Test Requirements	Compliance (yes/no)
15.207	Power Line Conducted Emissions Measurements	Yes
15.247(a)(1)	Bandwidth of an FHSS System	Yes
15.247(b) & 1.1310	Maximum Output Power	Yes
15.247(i), 1.1307, 1.1310, 2.1091 & 2.1093	RF Exposure Limit	Yes
15.247(d)	RF Spurious Emissions	Yes
15.247(b), 15.209 & 15.205	Transmitter Radiated Emissions	Yes
The transmitter circuit portion of the EUT has been tested and verified to comply with FCC Part 15, Subpart B and the associated Radio Receiver and Digital Circuitry has also been tested and found to comply with Part 15, Subpart B – Radio Receivers. The Receiver Test Report is available upon request.		

3.3 MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

☒ **None** ☐ **Yes (explain below)**

3.4 DEVIATIONS & EXCLUSIONS FROM TEST SPECIFICATIONS

☒ **None** ☐ **Yes (explain below)**

3.5 TEST SPECIFICATIONS AND RELATED DOCUMENTS

Document	Date	Title
FCC CFR Title 47	2004	Code of Federal Regulations Title 47, Chapter 1, Federal Communications Commission, Part 15-Radio Frequency Device
ANSI C63.4	2003	Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
IC RSS-210 Issue 6	2005	Low Power License-Exempt Radio Communication Devices (All Frequency Bands)
IC RSS-212 Issue 1		Test Methods for Radio Equipment
RSS-GEN	2005	General Requirements and Information for the Certification of Radio Communication Equipment

The test procedures used are in accordance with ANSI document C63.4-2003, "Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The specific procedures are described herein. Radiated testing was performed at an antenna to EUT distance of 3 meters. The antenna was raised and lowered from 1 to 4 meters.

EXHIBIT 4. DECLARATION OF CONFORMITY

The EUT was found to MEET the requirements as described within the specification of FCC Title 47, CFR Part 15.247, and Industry Canada RSS-210 (2005), Section Annex 8 (section 8.1) for a Frequency Hopping Spread Spectrum (FHSS) transmitter.

If some emissions are seen to be within 3 dB of their respective limits:
As these levels are within the tolerances of the test equipment and site employed, there is a possibility that this unit, or a similar unit selected out of production may not meet the required limit specification if tested by another agency.

LS Research, LLC certifies that the data contained herein was taken under conditions that meet or exceed the requirements of the test specifications. The results in this Test Report apply only to the item(s) tested on the above-specified dates. Any modifications made to the EUT subsequent to the indicated test date(s) will invalidate the data herein, and void this certification.

EXHIBIT 5. RADIATED EMISSIONS TEST

5.1 Test Setup

The test setup was assembled in accordance with Title 47, CFR FCC Part 15 and ANSI C63.4-2003. The EUT was placed on an 80cm high non-conductive pedestal, centered on a flush mounted 2-meter diameter turntable inside a 3 meter Semi-Anechoic, FCC listed Chamber. The EUT was operated in continuous transmit modes for final testing, using power as provided by a 3.7 battery. The unit has the capability to operate on 79 channels, controllable via commands on the Hyper-terminal software.
Since the EUT is able to connect to a Bluetooth device while battery operated and while it is charging, the EUT was tested for all possible mode of communication (3 modes; battery operated, charging with wall charger and charging with USB charger).
In charging modes (wall charger and USB), the EUT was under normal operation. Measurements of emissions were made while the EUT was set to look for a link while charging. It was found that the EUT will continuously send a signal to establish a link with a Bluetooth device for approximately 15 minutes. Testing method was adjusted to account for the actual time the EUT was transmitting. Every care was taken to ensure that while measurements were made, the EUT was still transmitting.

The table below gives a matrix of radiated emissions tests performed on the 3 modes of operation of the EUT.

Mode 1: EUT transmit while powered by battery.
Mode 2: EUT transmit while charging via a wall charger.
Mode 3: EUT transmit while charging via USB charger.

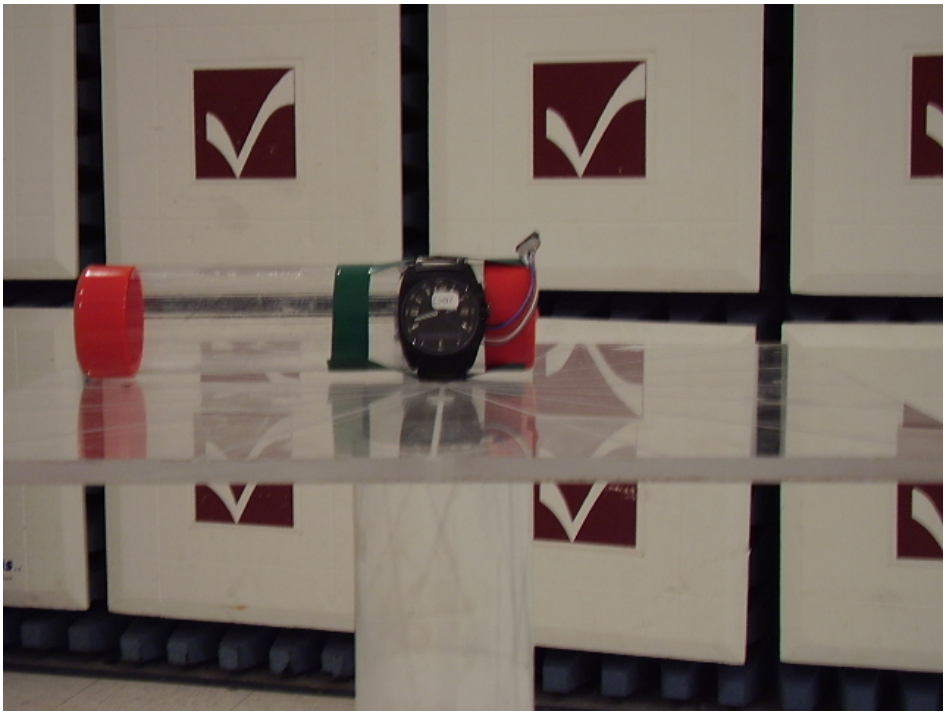
Emissions test			
Radiated Emissions	Mode 1	Mode 2	Mode 3
30MHz < f < 300 MHz	Performed	Performed	Performed
300MHz < f < 1000 MHz	Performed	Performed	Performed
1000MHz < f < 5000 MHz	Performed	Note 1	Note 1
5000MHz < f < 18000 MHz	Performed	Note 1	Note 1
18000MHz < f < 25000 MHz	Performed	Note 1	Note 1
AC mains conducted	N/A	Performed (Note 2)	N/A

Note:
1. EUT in this mode is in normal operation. Measurements cannot be made due to the hop rate. Applicable test modes were not available for this unit
2. The AC mains conducted test was performed while the EUT was in normal operation. The EUT was not able to be set to different channels.

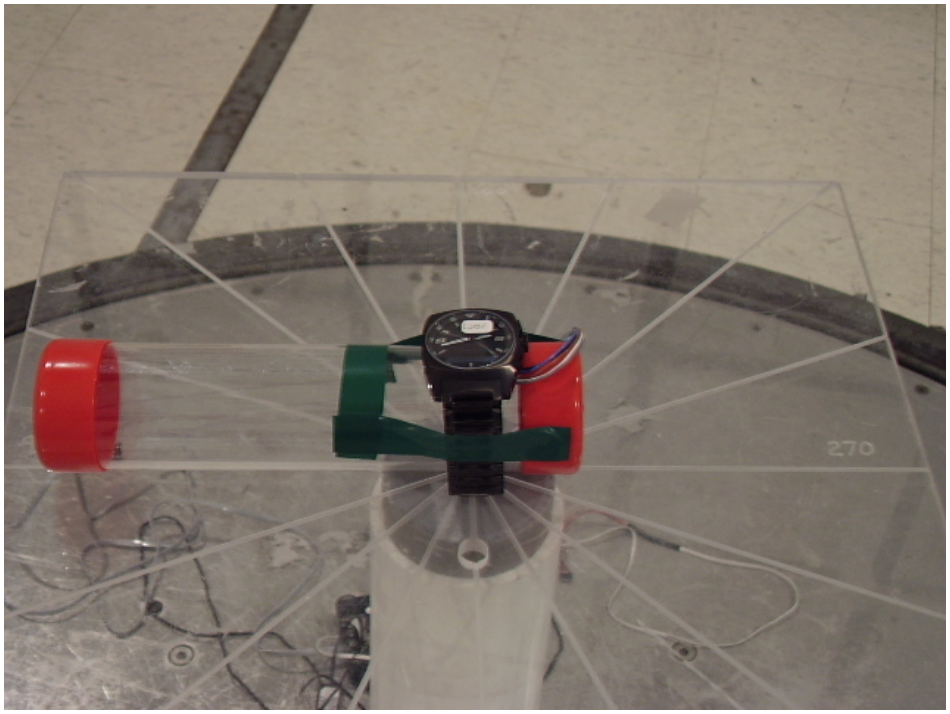
The applicable limits apply at a 3 meter distance. Measurements above 1 GHz were performed at a 1.0 meter separation distance. The calculations to determine these limits are detailed in the following pages. Please refer to Appendix A for a complete list of test equipment. The test sample was operated on one of three (3) standard channels: 00 (2402MHz), 39 (2441MHz) and 78 (2480MHz) to comply with FCC Part 15.35. The channels and operating modes were changed via commands on the Hyper-terminal software.

5.2 Test Setup Photo(s) – Radiated Emissions Test

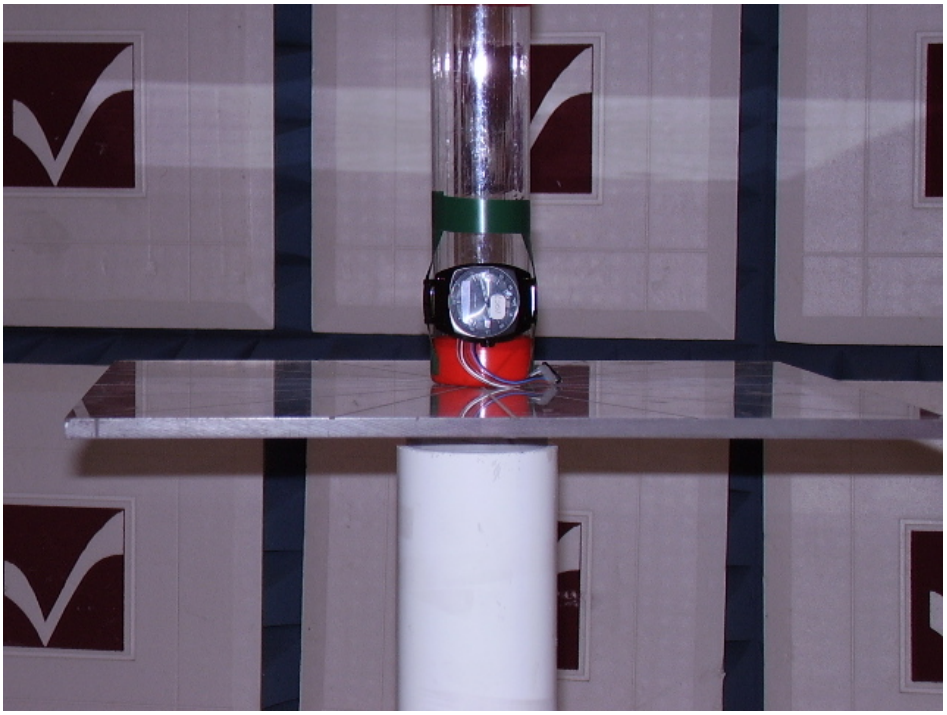
Vertical Orientation



Horizontal Orientation



Side Orientation



Left: EUT for charging mode Right: EUT for Conducted emissions

Battery chargers used in testing (USB and direct wall charger)

5.3 Test Procedure

Radiated RF measurements were performed on the EUT in a 3 meter Semi-Anechoic, FCC listed Chamber. The frequency range from 30 MHz to 25000 MHz was scanned and investigated. The radiated RF emission levels were manually noted at the various fixed degree settings of azimuth on the turntable and antenna height. The EUT was placed on a non-conductive pedestal in the 3 meter Semi-Anechoic Chamber, with the antenna mast placed such that the antenna was 3 meters from the EUT. A Biconical Antenna was used to measure emissions from 30 MHz to 300 MHz, and a Log Periodic Antenna was used to measure emissions from 300 MHz to 1000 MHz. A Double-Ridged Waveguide Horn Antenna was used from 1 GHz to 18 GHz. The maximum radiated RF emissions were found by raising and lowering the antenna between 1 and 4 meters in height, using both horizontal and vertical antenna polarities. From 18 GHz to 25 GHz, the EUT was measured at a 0.3 meter separation, using a standard gain Horn Antenna and pre-amplifier.

The battery voltage was checked frequently, and the batteries were replaced as necessary.

The EUT was rotated along three orthogonal axis during the investigations to find the highest emission levels.

5.4 Test Equipment Utilized

A list of the test equipment and antennas utilized for the Radiated Emissions test can be found in Appendix A. This list includes calibration information and equipment descriptions. All equipment is calibrated and used according to the operation manuals supplied by the manufacturers. All calibrations of the antennas used were performed at an N.I.S.T. traceable site. In addition, the Connecting Cables were measured for losses using a calibrated Signal Generator and a HP 8546A EMI Receiver. The resulting correction factors and the cable loss factors from these calibrations were entered into the HP 8546A EMI Receiver database. As a result, the data taken from the HP 8546A EMI Receiver accounts for the antenna correction factor as well as cable loss or other corrections, and can therefore be entered into the database as a corrected meter reading. The HP 8546A EMI Receiver was operated with a resolution bandwidth of 120 kHz for measurements below 1 GHz (video bandwidth of 300 kHz), and a bandwidth of 1 MHz for measurements above 1 GHz (video bandwidth of 10 Hz) From 1 GHz to 18 GHz, an HP E4407B Spectrum Analyzer and an EMCO Horn Antenna were used. From 18 GHz to 25 GHz, the HP E4407B Spectrum Analyzer with a standard gain horn, and preamp were used.

Test Equipment	Manufacturer	Model No.	Serial No.
EMI Receiver	HP	8546A	3520A00260
EMI Receiver Pre-Select.	HP	85460A	3448A00296
Spectrum Analyzer	HP	E4407B	US39160256
Spectrum Analyzer	Agilent	E4446A	US45300564
Log Periodic Antenna	EMCO	93146	9701-4855
Horn Antenna	EMCO	3115	6907
Bicon Antenna	EMCO	93110B	9702-2918
Pre-Amp (5-18 GHz)	Adv. Microwave	WLA612	0123101
Pre-Amp (18-15 GHz)	Adv. Microwave	WLA622-4	0123001
Horn Antenna – Std. Gain	EMCO	3160.09	9809-1120

5.5 Test Results

The EUT was found to **MEET** the Radiated Emissions requirements of Title 47 CFR, FCC Part 15.247 for an FHSS transmitter [Canada RSS-210 (2005), Annex 8 (section 8.1). The frequencies with significant RF signal strength were recorded and plotted as shown in the Data Charts and Graphs.

5.6 CALCULATION OF RADIATED EMISSIONS LIMITS

The maximum peak output power of an intentional radiator in the 2400-2483.5 MHz band, as specified in Title 47 CFR 15.247 (b)(1), is 1 Watt. The harmonic and spurious RF emissions, as measured in any 100 kHz bandwidth, as specified in 15.247 (d), shall be at least 20 dB below the measured power of the desired signal, and must also meet the requirements described in 15.205(c).

The following table depicts the general radiated emission limits above 30 MHz. These limits are obtained from Title 47 CFR, Part 15.209, for radiated emissions measurements. These limits were applied to any signals found in the 15.205 restricted bands.

Frequency (MHz)	3 m Limit μV/m	3 m Limit (dBμV/m)	1 m Limit (dBμV/m)
30-88	100	40.0	-
88-216	150	43.5	-
216-960	200	46.0	-
960-24,000	500	54.0	63.5

Sample conversion from field strength μV/m to dBμV/m:
$dB\mu V/m = 20 \log_{10} (100)$
= 40 dBμV/m (from 30-88 MHz)

For measurements made at 1.0 meter, a 9.5 dB correction has been invoked.

960 MHz to 10,000 MHz
500μV/m or 54.0 dB/μV/m at 3 meters
54.0 + 9.5 = 63.5 dB/μV/m at 1 meter

For measurements made at 0.3 meter, a 20 dB correction has been invoked.

960 MHz to 10,000 MHz
500μV/m or 54.0 dB/μV/m at 3 meters
54.0 + 20 = 74 dB/μV/m at 0.3 meters

5.7 DATA CHART – RADIATED EMISSIONS TEST

Mode 1: EUT transmit while powered by battery.
Mode 2: EUT transmit while charging via a wall charger.
Mode 3: EUT transmit while charging via USB charger.

5.7.1 : EUT Mode 1.

3 Meter Measurements of Electromagnetic Radiated Emissions
Test Standard: 47CFR, Part 15.205 and 15.247(FHSS)
Frequency Range Inspected: 30 MHz to 25000 MHz

Manufacturer:	Fossil					
Date(s) of Test:	September 12th to 19th 2006					
Test Engineer(s):	Khairul Aidi Zainal					
Voltage:	3.7 VDC					
Operation Mode:	Continuous Transmit					
Environmental Conditions in the Lab:	Temperature: 20 – 25° C Relative Humidity: 30 – 60 %					
EUT Power:		Single Phase ___VAC		3 Phase ___VAC		
	√	Battery		Other:		
EUT Placement:	√	80cm non-conductive table		10cm Spacers		
EUT Test Location:	√	3 Meter Semi-Anechoic FCC Listed Chamber		3/10m OATS		
Measurements:		Pre-Compliance		Preliminary	√	Final
Detectors Used:		Peak	√	Quasi-Peak	√	Average

DATA CHART-RADIATED EMISSIONS TEST *(continued)*

The following table depicts the level of significant radiated RF fundamental and harmonic emissions seen on Channel 00:

Frequency (MHz)	Ant./EUT Polarity	Height (meters)	Azimuth (0° - 360°)	Measured EFI (dBμV/m)	15.247 Limit (dBμV/m)	Margin (dB)
2402	V/V	1.00	277	79.7	134.8	55.1
4804	V/S	1.09	337	54.7	63.5	8.8
7206	V/S	1.09	306	37.2	59.7	22.5
9608	H/V	1.00	312	40.4	59.7	19.3
12010	V/H	1.00	219	36.0	63.5	27.5
14412	V/H	1.00	0	38.5	59.7	21.2
16814				Note 3		
19216				Note 3		
21618				Note 3		
24020				Note 3		

The following table depicts the level of significant radiated RF fundamental and harmonic emissions seen on Channel 39:

Frequency (MHz)	Ant./EUT Polarity	Height (meters)	Azimuth (0° - 360°)	Measured EFI (dBμV/m)	15.247 Limit (dBμV/m)	Margin (dB)
2441	V/V	1.00	139	79.6	134.8	55.2
4882	V/S	1.09	339	53.9	63.5	9.6
7323	V/S	1.05	310	39.0	63.5	24.5
9764	H/V	1.00	309	41.1	59.6	18.5
12205				Note 3		
14646	V/H	1.00	327	37.8	59.6	21.8
17087				Note 3		
19528				Note 3		
21969				Note 3		
24410				Note 3		

The following table depicts the level of significant radiated RF fundamental and harmonic emissions seen on Channel 78:

Frequency (MHz)	Ant./EUT Polarity	Height (meters)	Azimuth (0° - 360°)	Measured EFI (dBμV/m)	15.247 Limit (dBμV/m)	Margin (dB)
2480	V/V	1.00	160	79.9	134.8	54.9
4960	V/S	1.25	194	52.3	63.5	11.2
7440	V/S	1.00	319	39.9	63.5	23.6
9920	H/V	1.00	303	40.0	59.9	19.9
12400	V/H	1.00	331	37.6	63.5	25.9
14880	V/H	1.00	155	38.3	59.9	21.6
17360				Note 3		
19840				Note 3		
22320				Note 3		
24800				Note 3		

Notes:

1) A Quasi-Peak Detector was used in measurements below 1 GHz, and a Peak as well as an Average Detector was used in measurements above 1 GHz. Only the results from the Average detector are published in the table above. The peak detector was used to ensure the peak emissions did not exceed 20 dB above the limits.
2) Measurements above 1 GHz were made at 1 meters of separation from the EUT, and at 0.3 m separation for frequencies between 18 – 25 GHz.
3) Measurement at receiver system noise floor.

5.7.2 : EUT Mode 2.

3 Meter Measurements of Electromagnetic Radiated Emissions
Test Standard: 47CFR, Part 15.205 and 15.247(FHSS)
Frequency Range Inspected: 30 MHz to 25000 MHz

Manufacturer:	Fossil						
Date(s) of Test:	September 12th to 19th 2006						
Test Engineer(s):	Khairul Aidi Zainal						
Voltage:	120 VAC						
Operation Mode:	Normal Operation						
Environmental Conditions in the Lab:	Temperature: 20 – 25° C Relative Humidity: 30 – 60 %						
EUT Power:	√	Single Phase 120 VAC		3 Phase ___VAC			
		Battery		Other:			
EUT Placement:	√	80cm non-conductive table		10cm Spacers			
EUT Test Location:	√	3 Meter Semi-Anechoic FCC Listed Chamber		3/10m OATS			
Measurements:		Pre-Compliance		Preliminary	√	Final	
Detectors Used:		Peak	√	Quasi-Peak		Average	

The following table depicts the level of significant spurious radiated RF emissions found:

Frequency (MHz)	Ant./EUT Polarity	Height (meters)	Azimuth (0° - 360°)	Measured EFI (dBμV/m)	Spurious Limit (dBμV/m)	Margin (dB)
32.2 (Note 2)	V/S	1.00	0	13.4	59.6	46.2
44.9	V/V	1.00	0	18.2	59.6	41.4

Note:
1. Spurious Limit is a combination of 15.247 and 15.205 limits.
2. Intermittent signal.
3. 59.6 dBμV/m is based on 20 dB below the lowest fundamental power.

5.7.3 : EUT Mode 3.

3 Meter Measurements of Electromagnetic Radiated Emissions
Test Standard: 47CFR, Part 15.205 and 15.247(FHSS)
Frequency Range Inspected: 30 MHz to 25000 MHz

Manufacturer:	Fossil						
Date(s) of Test:	September 12th to 19th 2006						
Test Engineer(s):	Khairul Aidi Zainal						
Voltage:	5 VDC (Via USB)						
Operation Mode:	Normal Operation						
Environmental Conditions in the Lab:	Temperature: 20 – 25° C Relative Humidity: 30 – 60 %						
EUT Power:		Single Phase ___VAC				3 Phase ___VAC	
		Battery			√	Other: USB	
EUT Placement:	√	80cm non-conductive table				10cm Spacers	
EUT Test Location:	√	3 Meter Semi-Anechoic FCC Listed Chamber				3/10m OATS	
Measurements:		Pre-Compliance		Preliminary		√	Final
Detectors Used:		Peak	√	Quasi-Peak			Average

The following table depicts the level of significant spurious radiated RF emissions found:

Frequency (MHz)	Ant./EUT Polarity	Height (meters)	Azimuth (0° - 360°)	Measured EFI (dBμV/m)	Spurious Limit (dBμV/m)	Margin (dB)
45.6	V/H	1.00	165	22.7	59.6	36.9
100.0	V/V	1.00	0	40.0	59.6	19.6
130.0	V/H	1.00	142	31.7	43.0	11.3
165.0	V/H	1.00	27	31.3	43.0	11.7
259.9	V/S	1.00	335	37.8	46.0	8.2
357.4	V/S	1.65	0	30.0	59.6	29.6
389.9	V/V	1.69	185	32.1	59.6	27.5
909.3	V/S	1.00	73	33.5	59.6	26.1

Note:
1. Spurious Limit is a combination of 15.247 and 15.205 limits.
2. 59.6 dBμV/m limit is based on 20 dB below the lowest fundamental power (channel 39).

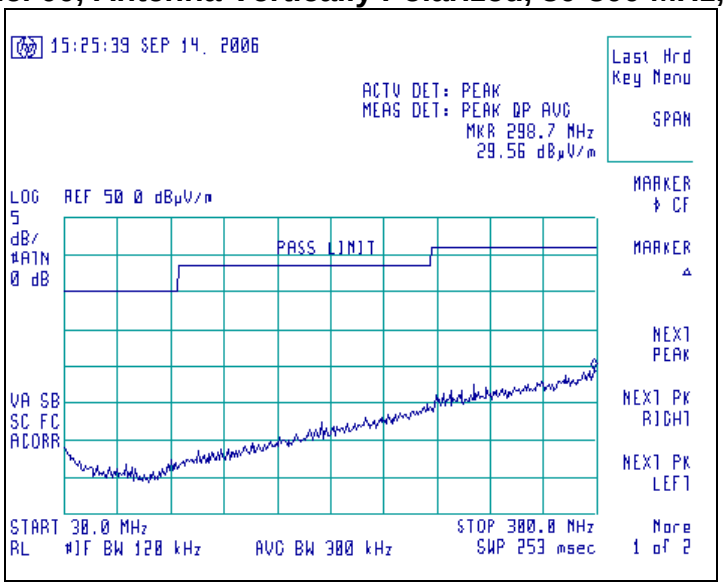
5.8 Screen Captures - Radiated Emissions Testing

These screen captures represent **Peak** emissions. For radiated emission measurements, a Quasi-Peak detector function is utilized when measuring frequencies below 1 GHz, and an Average detector function is utilized when measuring frequencies above 1 GHz.

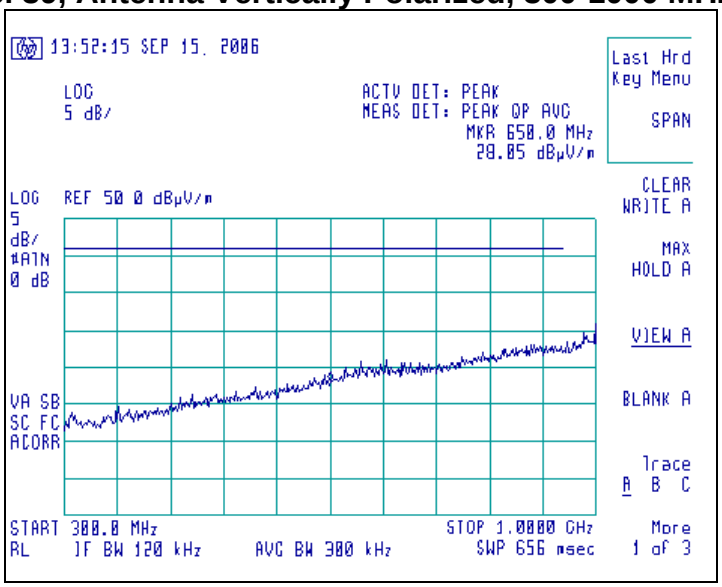
The signature scans shown here are from worst-case emissions, as measured on channels 00, 39, or 78, with the sense antenna both in vertical and horizontal polarity.

5.8.1 Screen Captures for EUT in Mode 1

Channel 00, Antenna Vertically Polarized, 30-300 MHz, at 3m

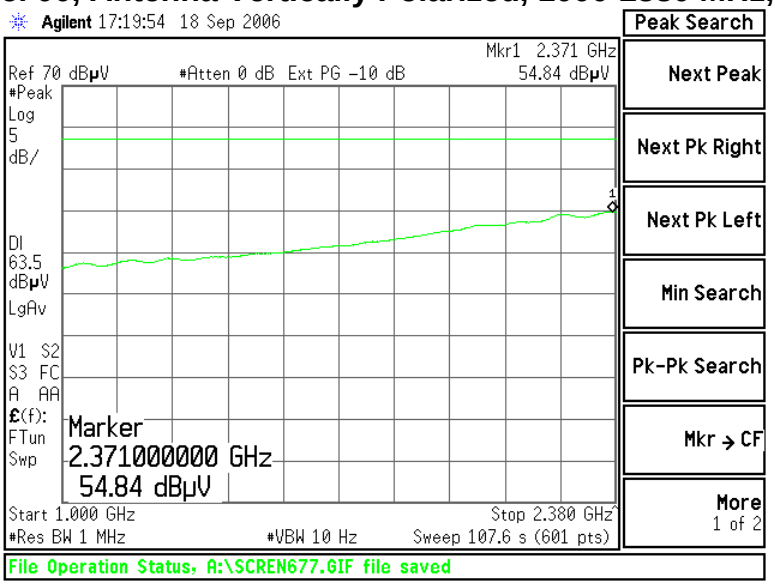


Channel 39, Antenna Vertically Polarized, 300-1000 MHz, at 3m

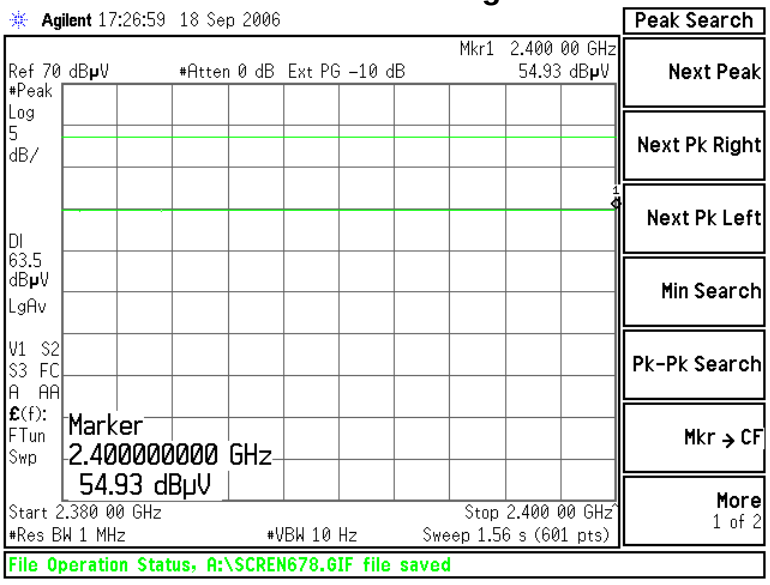


Screen Captures - Radiated Emissions Testing *(continued)*

Channel 00, Antenna Vertically Polarized, 1000-2380 MHz, at 1m

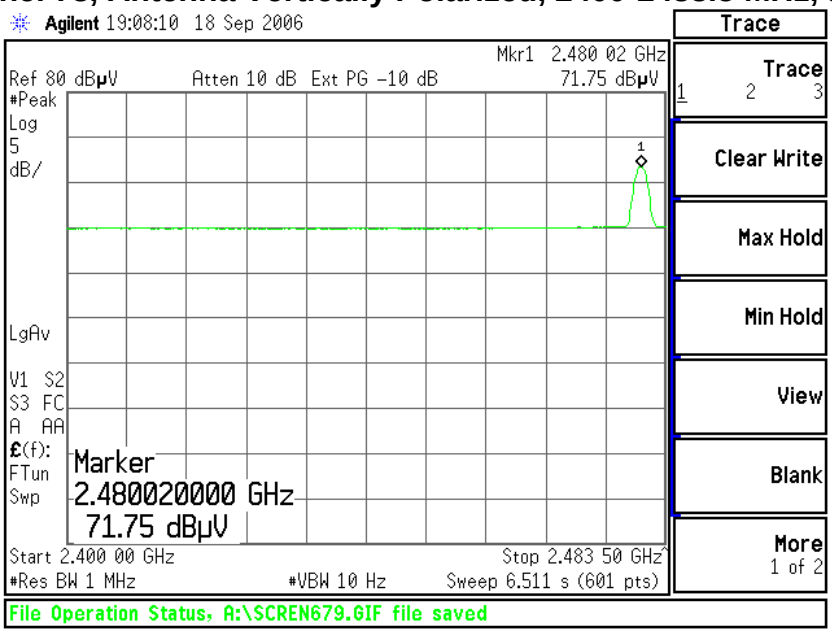


Channel 00, Antenna Vertically Polarized, 2380-2400 MHz, at 1m
Lower Band Edge

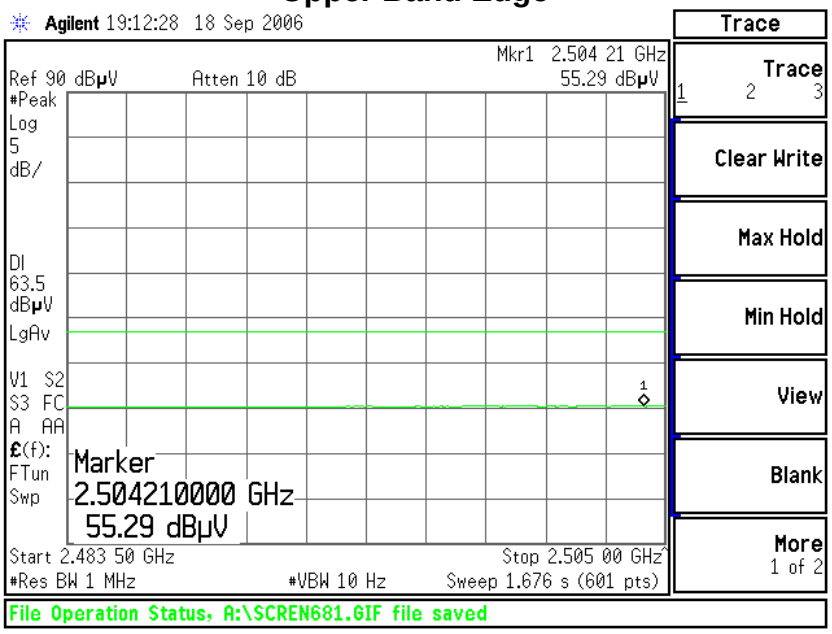


Screen Captures - Radiated Emissions Testing *(continued)*

Channel 78, Antenna Vertically Polarized, 2400-2483.5 MHz, at 1m

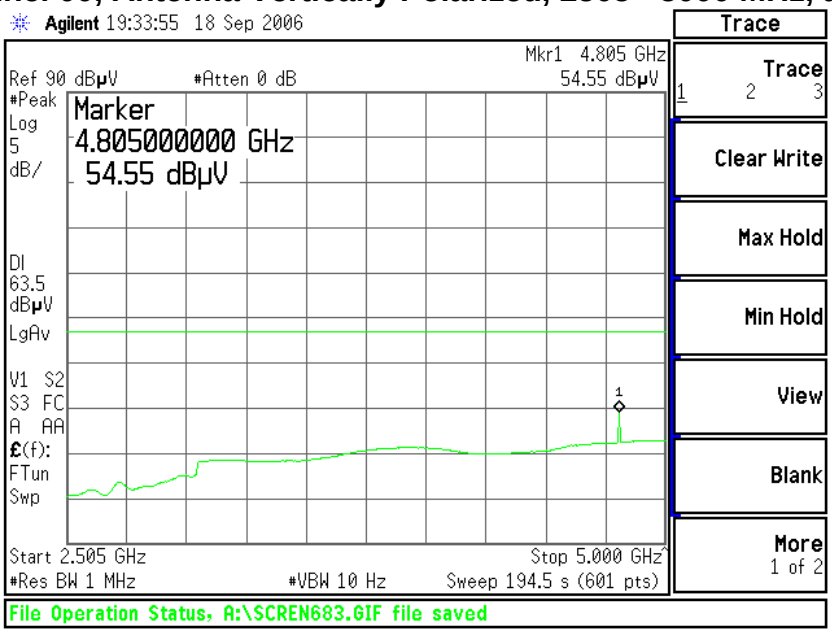


Channel 78, Antenna Vertically Polarized, 2483.5-2505 MHz, at 1m
Upper Band Edge

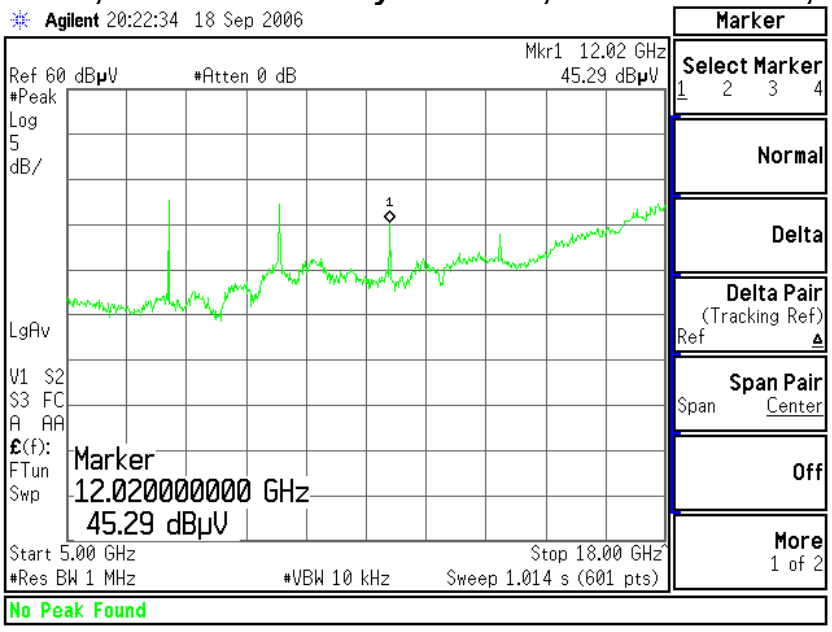


Screen Captures - Radiated Emissions Testing *(continued)*

Channel 00, Antenna Vertically Polarized, 2505 - 5000 MHz, at 1m

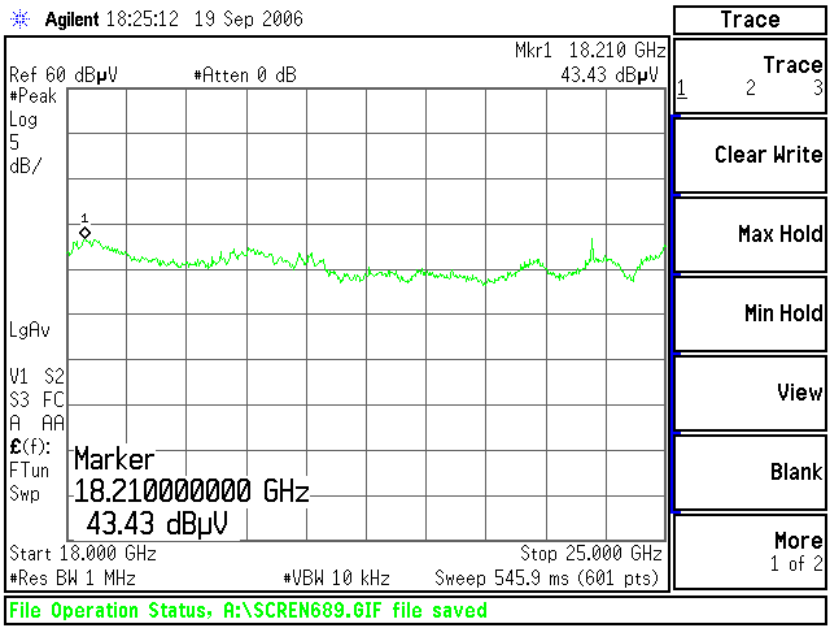


Channel 00, Antenna Vertically Polarized, 5000-18000 MHz, at 1m



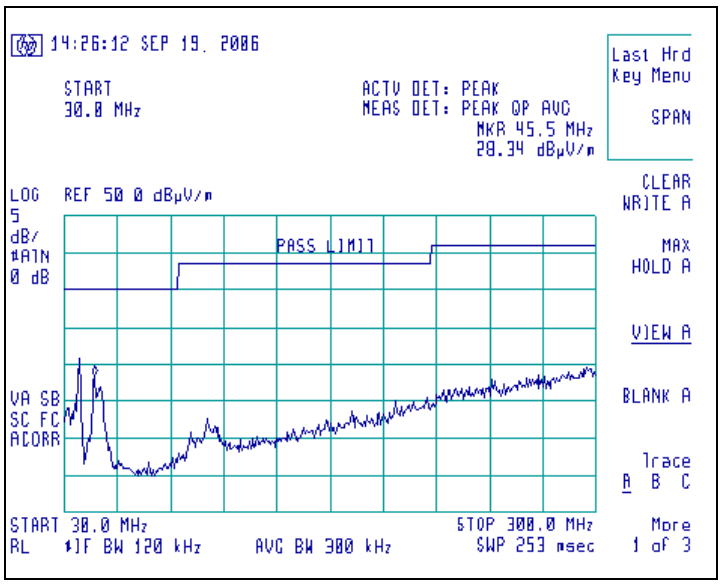
Screen Captures - Radiated Emissions Testing *(continued)*

Channel 39, Antenna Vertically Polarized, 18000-25000 MHz, at 30cm

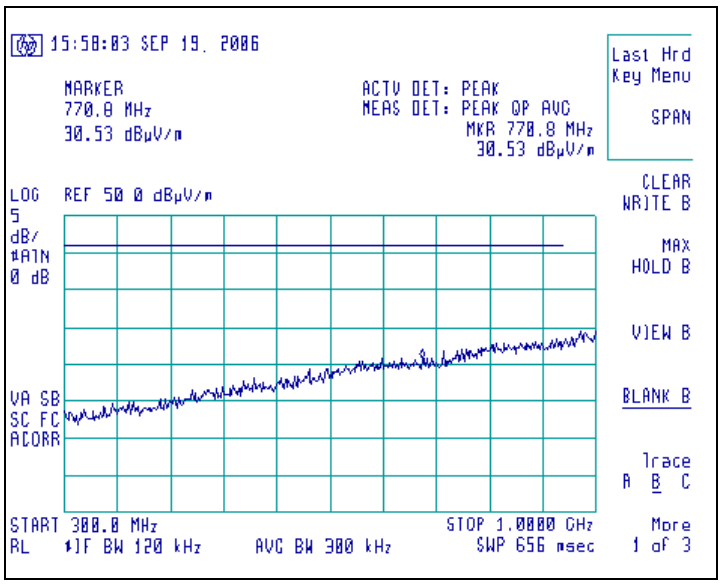


5.8.2 Screen Captures for EUT in Mode 2

Channel 00 , Antenna Vertically Polarized, 30-300 MHz, at 3m

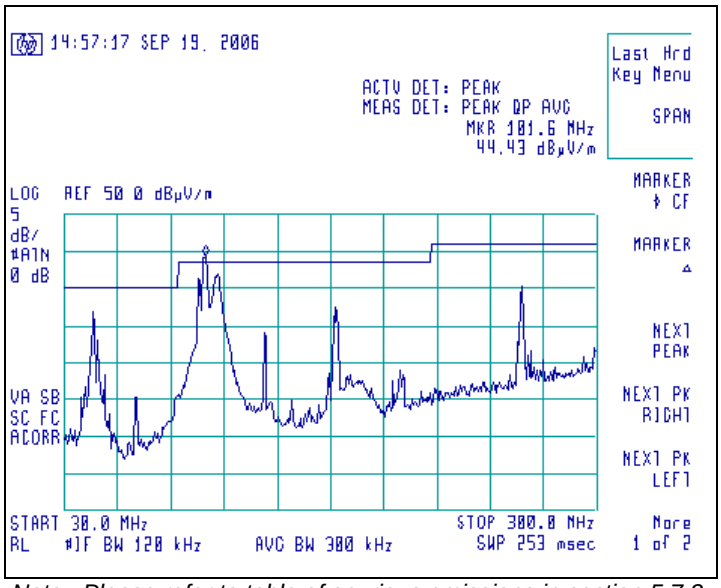


Channel 00, Antenna Vertically Polarized, 300-1000 MHz, at 3m



5.8.3 Screen Captures for EUT in Mode 3

Channel 00, Antenna Vertically Polarized, 30-300 MHz, at 3m



Note: Please refer to table of spurious emissions in section 5.7.3, page 22 of this test report when viewing this screen capture.

Channel 00, Antenna Vertically Polarized, 300-1000 MHz, at 3m

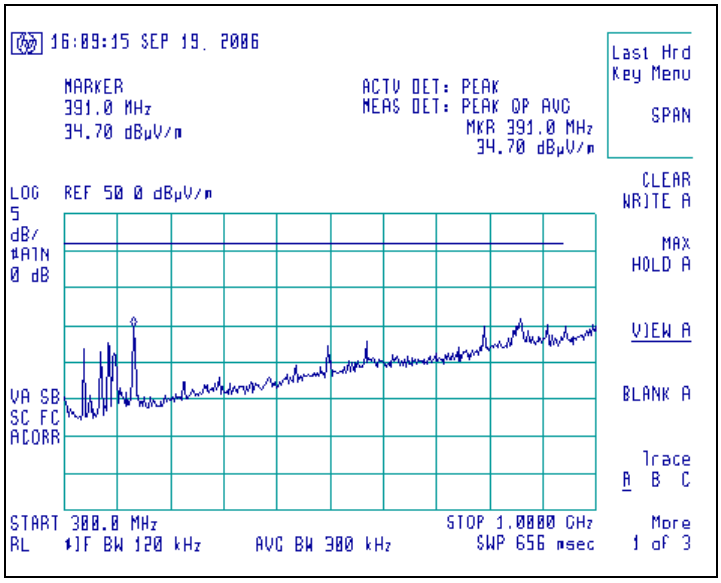
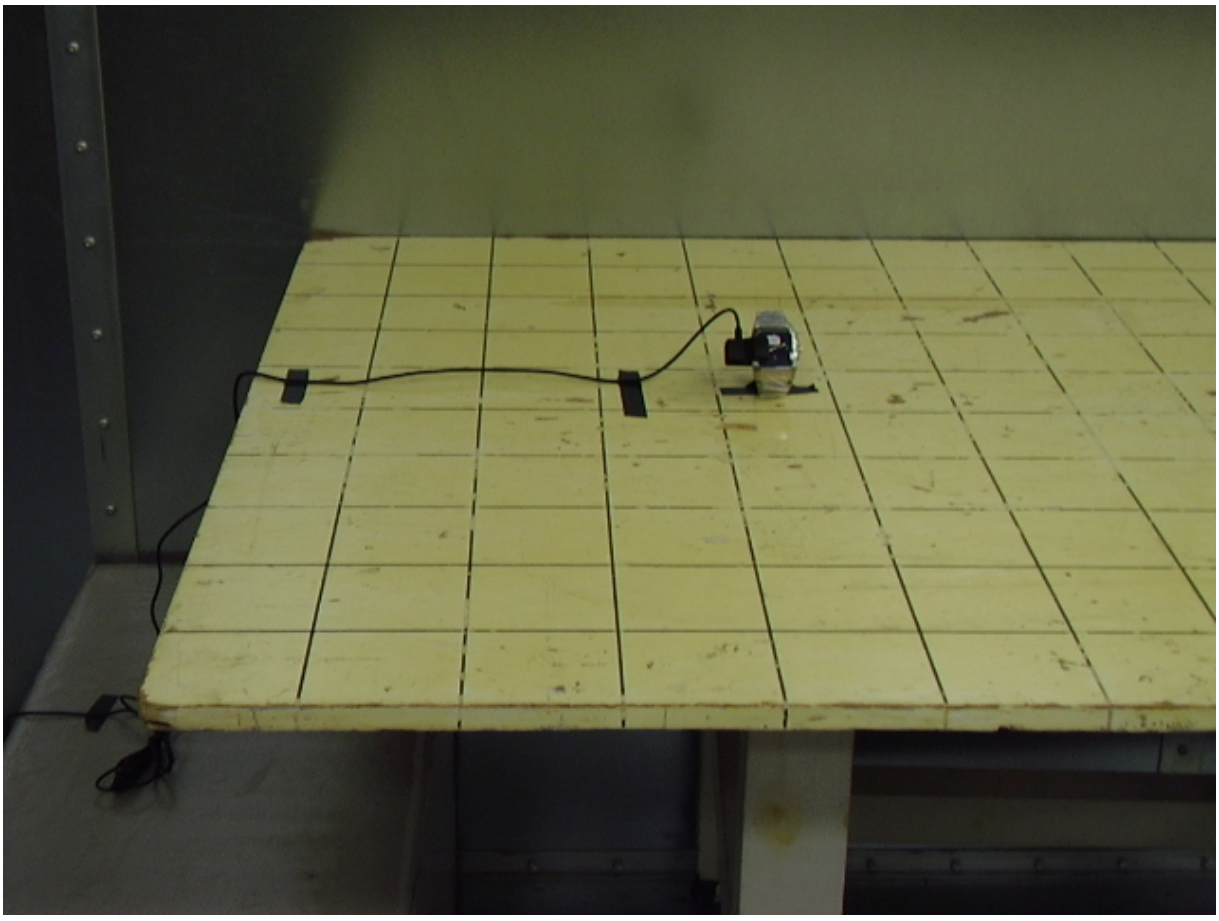


EXHIBIT 6. CONDUCTED EMISSIONS TEST, AC POWER LINE: 15.207

6.1 Test Setup

The test area and setup are in accordance with ANSI C63.4-2003 and with Title 47 CFR, FCC Part 15 (Industry Canada RSS-GEN (section 7.2.2). The EUT was placed on a non-conductive wooden table, with a height of 80 cm above the reference ground plane. The EUT's power cable was plugged into a 50Ω (ohm), 50/250 μH Line Impedance Stabilization Network (LISN). The AC power supply of 120V was provided via an appropriate broadband EMI Filter, and then to the LISN line input. After the EUT was setup and connected to the LISN, the RF Sampling Port of the LISN was connected to a 10 dB Attenuator-Limiter, and then to the HP 8546A EMI Receiver. The EMCO LISN used has the ability to terminate the unused port with a 50Ω (ohm) load when switched to either L1 (line) or L2 (neutral).

6.2 Test Setup Photo(s) – Conducted Emissions Test



6.3 Test Procedure

The EUT was investigated in **normal operation mode** for this portion of the testing since the EUT could not be set to specific test modes for this test. As a result of the adapter being able to accept a range of voltage, measurements with supply voltage of 110 VAC and 230 VAC were also done. The appropriate frequency range and bandwidths were selected on the EMI Receiver, and measurements were made. The bandwidth used for these measurements is 9 kHz, as specified in CISPR 16-1 (2003), Section 1, Table 1, for Quasi-Peak and Average detectors in the frequency range of 150 kHz to 30 MHz.

6.4 Test Equipment Utilized

A list of the test equipment and accessories utilized for the Conducted Emissions test is provided in Appendix A. This list includes calibration information and equipment descriptions. All equipment is calibrated and used according to the operation manuals supplied by the manufacturers. Calibrations of the LISN and Limiter are traceable to N.I.S.T. All cables are calibrated and checked periodically for conformance. The emissions are measured on the HP 8546A EMI Receiver, which has automatic correction for all factors stored in memory and allows direct readings to be used as measurements.

Test Equipment	Manufacturer	Model No.	Serial No.
EMI Receiver	HP	8546A	3520A00260
Spectrum Analyzer	Agilent	E4446A	US45300564
LISN	EMCO	3816/2NM	9701-1057
Transient Limiter	HP	119474A	3107A01708

6.5 Test Results

The EUT was found to **MEET** the Conducted Emission requirements of FCC Part 15.207 Conducted Emissions for an Intentional Radiator. See the Data Charts and Graphs for more details of the test results.

6.6 FCC Limits of Conducted Emissions at the AC Mains Ports

Frequency Range (MHz)	Class B Limits (dBµV)		Measuring Bandwidth
	Quasi-Peak	Average	
0.150 -0.50 *	66-56	56-46	RBW = 9 kHz VBW ≥ 9 kHz for QP VBW = 1 Hz for Average
0.5 – 5.0	56	46	
5.0 – 30	60	50	
* The limit decreases linearly with the logarithm of the frequency in this range.			

6.7 DATA CHART-CONDUCTED RF EMISSIONS TEST

Frequency Range inspected: 150 KHz to 30 MHz

Test Standard: FCC 15.207 Class B

6.7.1 110 VAC power supply

Manufacturer:	Fossil					
Date(s) of Test:	October 3rd 2006					
Test Engineer:	Khairul Aidi Zainal					
Voltage:	110 VAC					
Operation Mode:	Normal					
Environmental Conditions in the Lab:	Temperature: 20 – 25° C Relative Humidity: 30 – 60 %					
Test Location:	√	Conducted RF Emissions Area				Chamber
EUT Placed On:	√	40cm from Vertical Ground Plane				10cm Spacers
	√	80cm above Ground Plane				Other:
Measurements:		Pre-Compliance		Preliminary	√	Final
Detectors Used:		Peak	√	Quasi-Peak	√	Average

		QUASI-PEAK			AVERAGE		
Frequency (MHz)	Line	Q-Peak Measured (dBµV)	Q-Peak Limit (dBµV)	Quasi-Peak Margin (dB)	Average Measured (dBµV)	Average Limit (dBµV)	Average Margin (dB)
0.356	L1	46.9	58.8	11.9	41.3	48.8	7.5
0.535	L1	42.5	56.0	13.5	35.8	46.0	10.2
1.244	L1	37.5	56.0	18.5	30.7	46.0	15.3
3.971	L1	29.1	56.0	26.9	19.6	46.0	26.4
0.357	L2	44.2	58.8	14.6	38.0	48.8	10.8
0.710	L2	39.7	56.0	16.3	32.2	46.0	13.8
1.363	L2	38.5	56.0	17.5	29.6	46.0	16.4

Notes:

1) All other emissions were better than 15 dB below the limits.

6.7.2 230 VAC power supply

Manufacturer:	Fossil					
Date(s) of Test:	October 3rd 2006					
Test Engineer:	Khairul Aidi Zainal					
Voltage:	230 VAC					
Operation Mode:	Normal					
Environmental Conditions in the Lab:	Temperature: 20 – 25° C Relative Humidity: 30 – 60 %					
Test Location:	√	Conducted RF Emissions Area				Chamber
EUT Placed On:	√	40cm from Vertical Ground Plane				10cm Spacers
	√	80cm above Ground Plane				Other:
Measurements:		Pre-Compliance		Preliminary	√	Final
Detectors Used:		Peak	√	Quasi-Peak	√	Average

		QUASI-PEAK			AVERAGE		
Frequency (MHz)	Line	Q-Peak Measured (dBµV)	Q-Peak Limit (dBµV)	Quasi-Peak Margin (dB)	Average Measured (dBµV)	Average Limit (dBµV)	Average Margin (dB)
0.178	L1	40.6	64.6	24	27.8	54.6	26.8
0.477	L1	42.4	56.4	14	33.3	46.4	13.1
1.543	L1	35.8	56.0	20.2	25.3	46.0	20.7
0.178	L2	40.3	64.6	24.3	27.6	54.6	27
0.536	L2	39.8	56.0	16.2	30.1	46.0	15.9
1.551	L2	35.7	56.0	20.3	25.8	46.0	20.2

Notes:

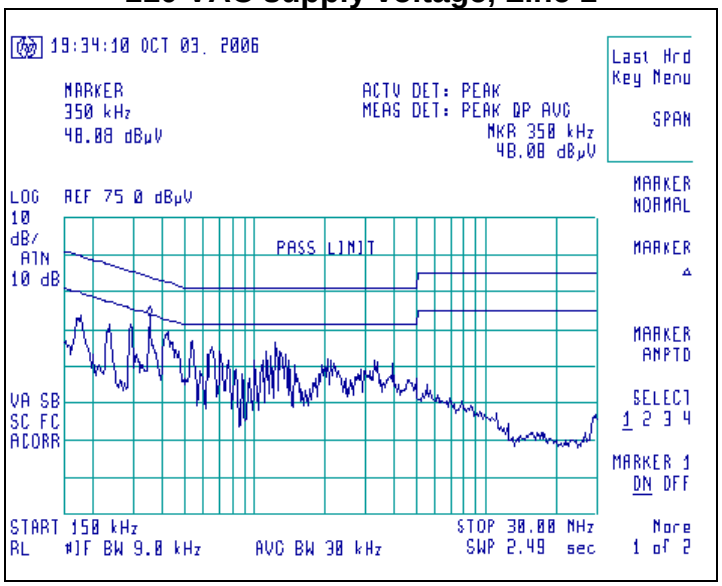
1) All other emissions were better than 15 dB below the limits.

6.8 Screen Captures – Conducted Emissions Test

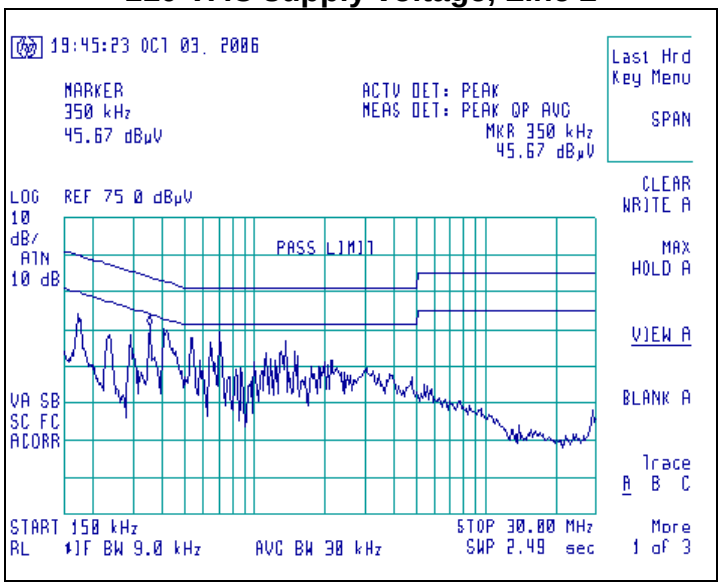
These screen captures represent Peak Emissions. For conducted emission measurements, both a Quasi-Peak detector function and an Average detector function are utilized. The emissions must meet both the Quasi-peak limit and the Average limit as described in 47 CFR 15.207.

The signature scans shown here are when the EUT is in normal operation mode.

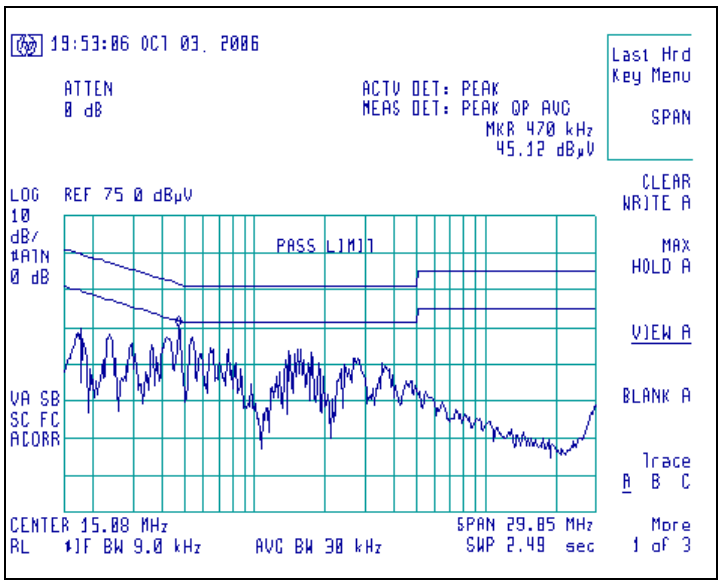
110 VAC supply voltage, Line 1



110 VAC supply voltage, Line 2



230 VAC supply voltage, Line 1



230 VAC supply voltage, Line 2

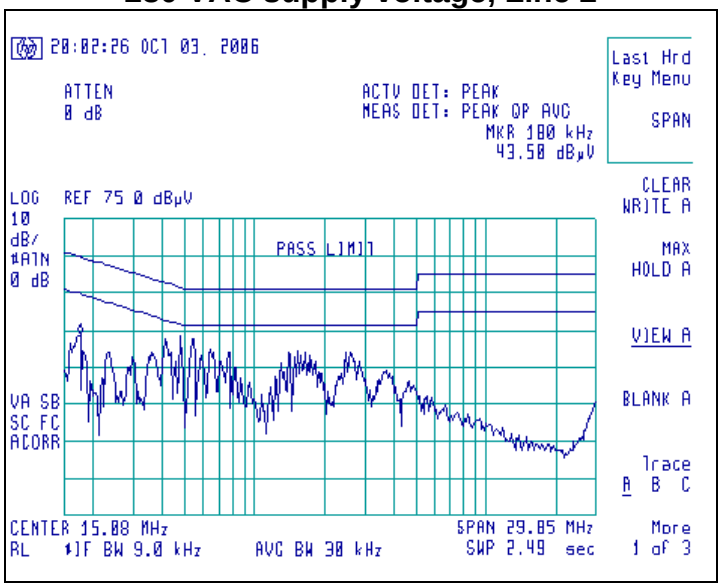


EXHIBIT 7. OCCUPIED BANDWIDTH: 15.247(a)(1)

7.1 Limits

There are no bandwidth requirements in FCC Part 15.247 for frequency hopping systems operating in the 2400 – 2483.5 MHz band.

7.2 Method of Measurements

Refer to ANSI C63.4 and FCC Procedures (March 23, 2005) for FHSS Systems operating under 15.247.

For this portion of the tests, a direct measurement of the transmitted signal was performed at the antenna port of the EUT, via a cable connection to the HP E4407B spectrum analyzer. An attenuator was placed in series with the cable to protect the spectrum analyzer. The loss from the cable and the attenuator were added on the analyzer as gain offset settings, thereby allowing direct measurements without the need for any further corrections. A Hewlett Packard model E4407B spectrum analyzer was used with the resolution bandwidth set to 30 kHz for this portion of the tests. The EUT was configured to run in a continuous transmit mode, while being supplied with typical data as a modulation source. The spectrum analyzer was used in peak-hold mode while measurements were made, as presented in the chart below.

7.3 Test Equipment List

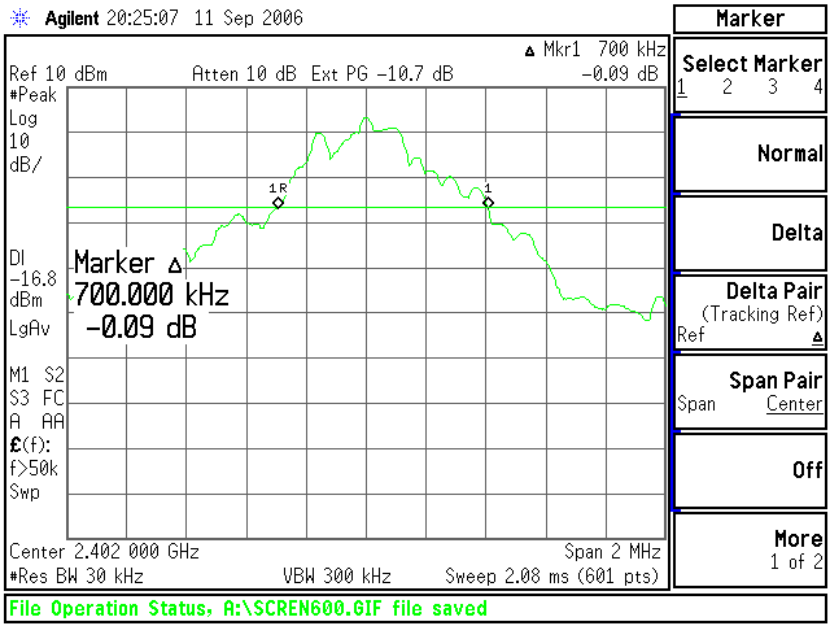
Test Equipment	Manufacturer	Model No.	Serial No.
Spectrum Analyzer	Agilent	E4407B	US39160256
Spectrum Analyzer	Agilent	E4446A	US45300564

7.4 Test Data

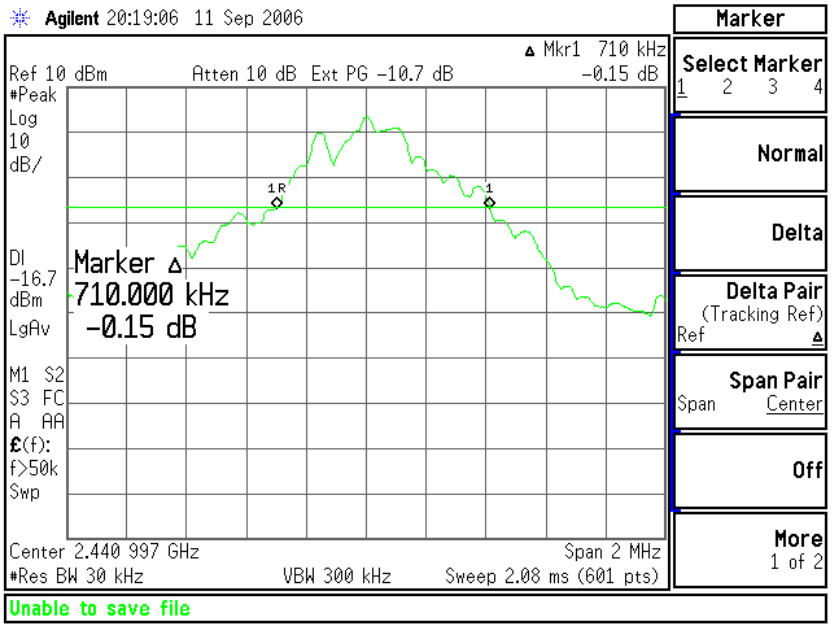
Channel	Center Frequency (MHz)	Measured -20 dBc Occ. BW (kHz)
00	2402	700
39	2441	710
78	2480	720

7.5 Screen Captures - OCCUPIED BANDWIDTH

Channel 00, -20 dBc Occupied Bandwidth



Channel 39, -20 dBc Occupied Bandwidth



Channel 78, -20 dBc Occupied Bandwidth

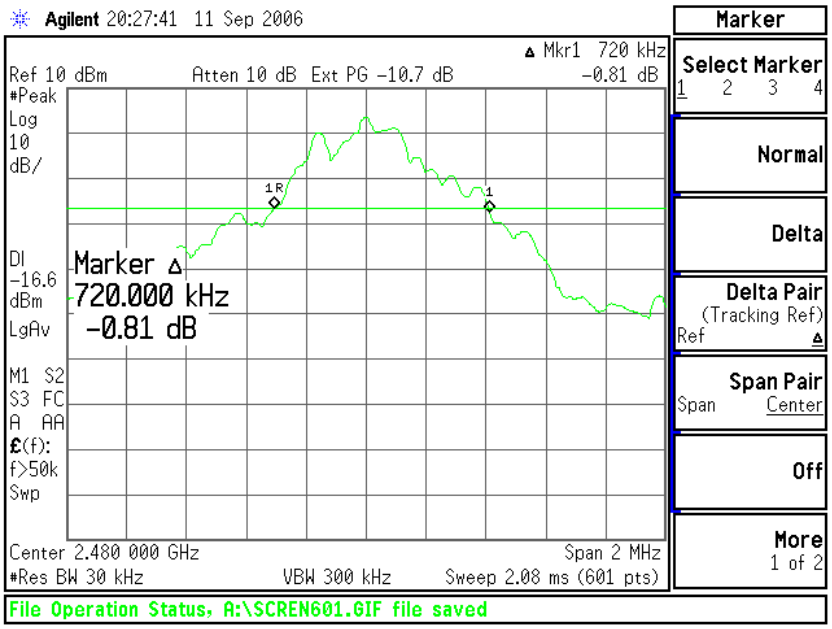


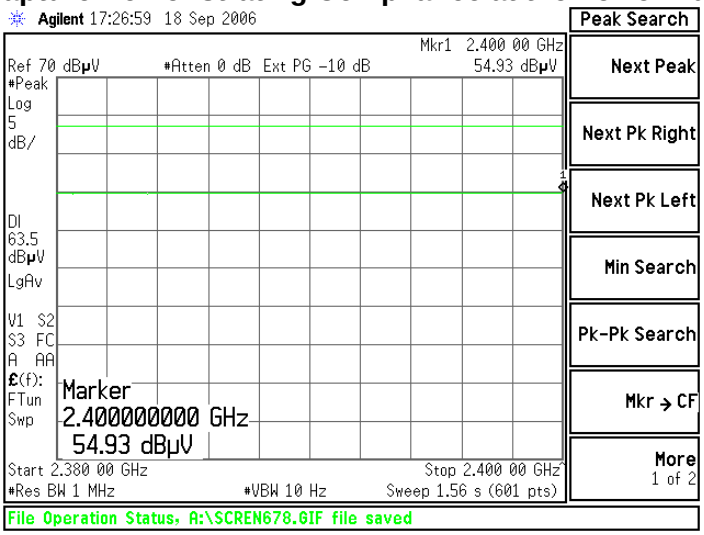
EXHIBIT 8. BAND-EDGE MEASUREMENTS

8.1 Method of Measurements

FCC 15.247(d) requires a measurement of spurious emission levels to be at least 20 dB lower than the fundamental emission level, in particular at the Band-Edges where the intentional radiator operates. The following screen captures demonstrate compliance of the intentional radiator at the 2400-2483.5 MHz Band-Edges. The EUT was operated in continuous transmit mode with continuous modulation, with internally generated data as the modulating source. The EUT was operated at the lowest channel for the investigation of the lower Band-Edge, and at the highest channel for the investigation of the higher Band-Edge.

The Lower Band-Edge limit, in this case, would be + 59.6 dBµV/m at 1m.
The Upper Band-Edge limit, in this case, would be + 63.5 dBµV/m at 1m.

Screen Capture Demonstrating Compliance at the Lower Band-Edge



Screen Capture Demonstrating Compliance at the Higher Band-Edge

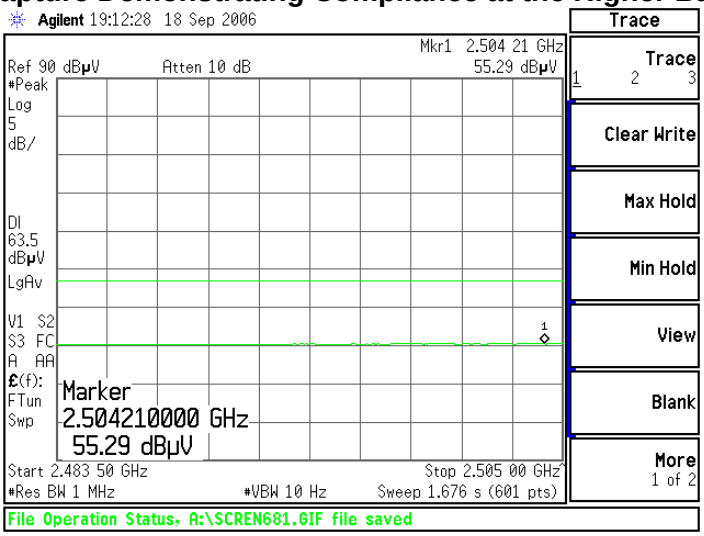


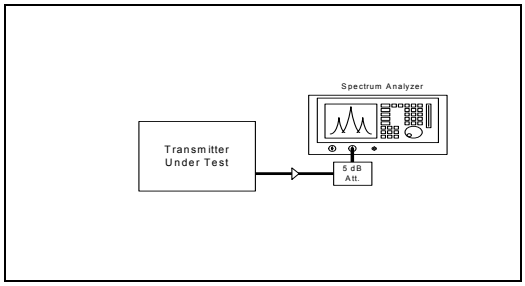
EXHIBIT 9. POWER OUTPUT (CONDUCTED): 15.247(b)

9.1 Method of Measurements

The conducted RF output power of the EUT was measured at the antenna port using a short RF cable along with an attenuator as protection for the spectrum analyzer. The loss from the cable and the attenuator were added on the analyzer as gain offset settings, there by allowing direct measurements, without the need for any further corrections. The unit was configured to run in a continuous transmit mode, while being supplied with typical data as a modulation source. The spectrum analyzer was used with resolution and video bandwidths set to 1 MHz, and a span of 5 MHz, with measurements from a peak detector presented in the chart below.

9.2 Test Data

CHANNEL	CENTER FREQ (MHz)	LIMIT (dBm)	MEASURED POWER (dBm)	MARGIN (dB)
00	2402	+30.0	3.22	26.78
39	2441	+30.0	3.33	26.67
78	2480	+30.0	3.41	26.59



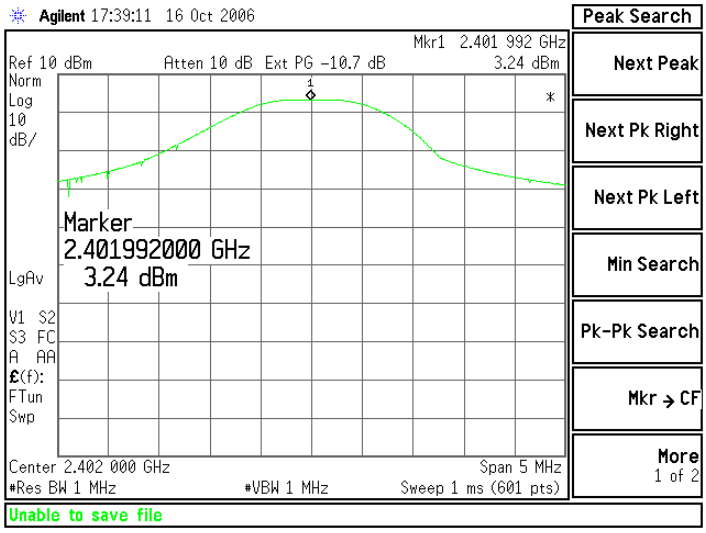
Measured Radiated RF power output (in watts): 0.0000033 Watts
Measured Conducted RF Power Output (in Watts): 0.0023 Watts
Manufacturer Declared RF Power Output (in Watts): 0.0025 Watts

9.3 Test Equipment List

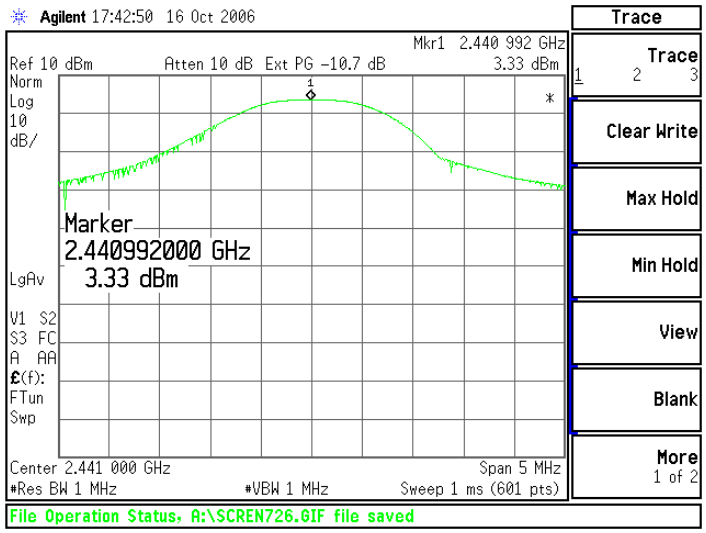
Test Equipment	Manufacturer	Model No.	Serial No.
Spectrum Analyzer	Agilent	E4446A	US45300564

9.4 Screen Captures – Power Output (Conducted)

Channel 00



Channel 39



Channel 78

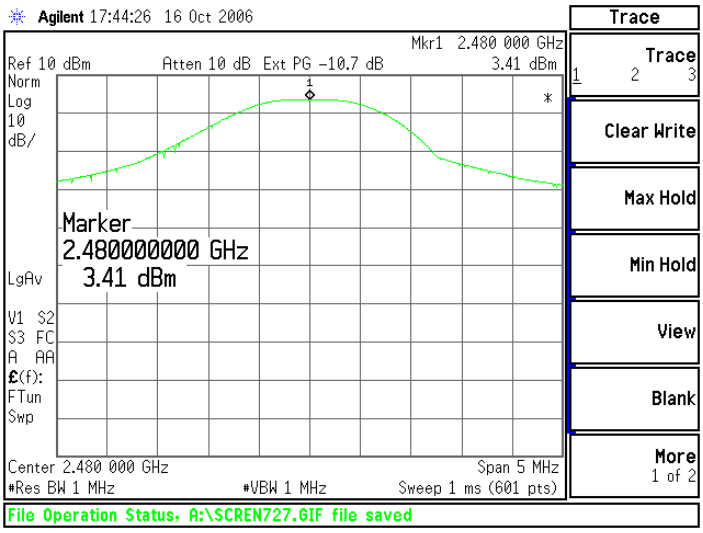

Agilent 17:44:26 16 Oct 2006
Mkr1 2.480 000 GHz
Ref 10 dBm
Atten 10 dB Ext PG -10.7 dB
3.41 dBm
Norm
Log
10
dB/
Marker
2.480000000 GHz
3.41 dBm
LgAv
V1 S2
S3 FC
A AA
£(f):
FTun
Swp
Center 2.480 000 GHz
#Res BW 1 MHz
#VBW 1 MHz
Span 5 MHz
Sweep 1 ms (601 pts)
File Operation Status. A:\SCREN727.GIF file saved
Trace
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2

EXHIBIT 10. CHANNEL OCCUPANCY

10.1 Test Setup & Procedure

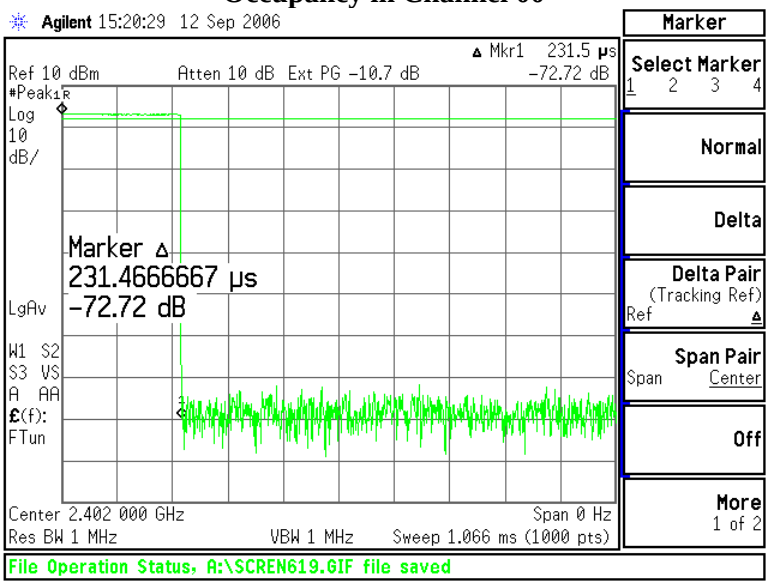
Part 15.247(a)(1)(iii) requires a channel occupancy, for this device, of no more than 400 milliseconds in a period of 0.4 seconds multiplied by the number of hopping channels employed. All systems must actively utilize a minimum of 15 channels. The channel occupancy for this EUT was measured using an HP E4407B spectrum analyzer, set to zero-span at the frequency of interest. With the analyzer in peak-hold mode, the transmission lengths can be measured by adjusting the sweep rate of the analyzer. A suitable sweep rate was used to measure the channel occupancy at the low, mid and high channels. With 79 channels, channel occupancy of no more than 400 milliseconds in a 36.1 second period is allowed. The longest time any transmission will occur on a single channel is 231.5 µs. With a total of 79 channels used, each occupying a 231.5 µs slot, it will take 18.3 milliseconds for the sequence to repeat. There was a maximum of 11 occurrences in a 1 second window, translating to 2.54 milliseconds of occupancy. Therefore, in a 31.6 second window, the maximum total occupancy will be 80.3 milliseconds which is less than the allowed 400 millisecond occupancy limit.

10.2 Test Data

Channel	Frequency (MHz)	Occupancy Per transmission (µs)	Occupancy in 31.6 s window (ms)
00	2402	231.5	73.2
39	2441	231.5	80.3
78	2480	231.5	80.3

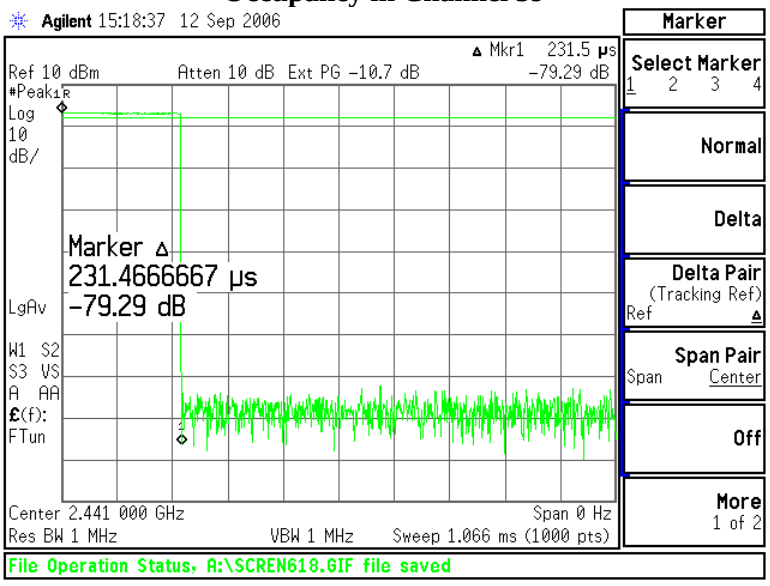
10.3 Plots of Channel Occupancy

Occupancy in Channel 00



Plots of Channel Occupancy (continued)

Occupancy in Channel 39



Occupancy in Channel 52

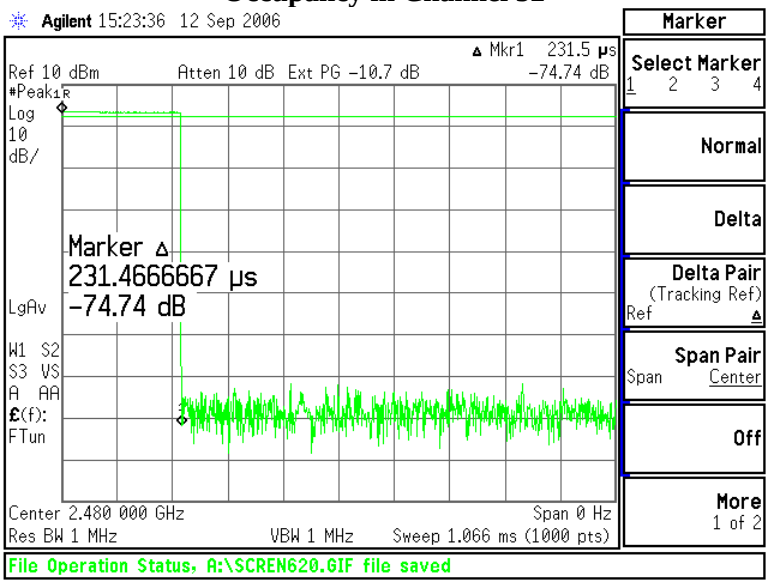


EXHIBIT 11. SPURIOUS RADIATED EMISSIONS: 15.247(d)

11.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at lease 20 db below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Remarks:

- Applies to harmonics/spurious emissions that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209.
- The emission limits as specified above are based on measurement instrument employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

FCC 47 CFR 15.205(a) – Restricted Frequency Bands

MHz	MHz	MHz	GHz
0.090 – 0.110	162.0125 – 167.17	2310 – 2390	9.3 – 9.5
0.49 – 0.51	167.72 – 173.2	2483.5 – 2500	10.6 – 12.7
2.1735 – 2.1905	240 – 285	2655 – 2900	13.25 – 13.4
8.362 – 8.366	322 – 335.4	3260 – 3267	14.47 – 14.5
13.36 – 13.41	399.9 – 410	3332 – 3339	14.35 – 16.2
25.5 – 25.67	608 – 614	3345.8 – 3358	17.7 – 21.4
37.5 – 38.25	960 – 1240	3600 – 4400	22.01 – 23.12
73 – 75.4	1300 – 1427	4500 – 5250	23.6 – 24.0
108 – 121.94	1435 – 1626.5	5350 – 5460	31.2 – 31.8
123 – 138	1660 – 1710	7250 – 7750	36.43 – 36.5
149.9 – 150.05	1718.8 – 1722.2	8025 – 8500	Above 38.6
156.7 – 156.9	2200 – 2300	9000 – 9200	---

FCC Part 15.247(d) requires a measurement of conducted harmonic and spurious RF emission levels, as reference to the carrier level when measured in a 100 kHz bandwidth. For this test, the spurious and harmonic RF emissions from the EUT were measured at the EUT antenna port using a short RF cable along with an attenuator as protection for the spectrum analyzer. The loss from the cable and the attenuator were added on the analyzer as gain offset settings, there by allowing direct readings of the measurements made without the need for any further corrections. A Hewlett Packard model E4407B spectrum analyzer was used with the resolution bandwidth set to 100 kHz for this portion of the tests. The unit was configured to run in a continuous transmit mode, while being supplied with typical data as a modulation source. The spectrum analyzer was used with measurements from a peak detector presented in the chart below. Screen captures were acquired and any noticeable spurious and harmonic signals were identified and measured.

No significant emissions could be noted within -50 dBc of the fundamental level for this product.

11.2 Test Equipment List

Test Equipment	Manufacturer	Model No.	Serial No.
Spectrum Analyzer	Agilent	E4446A	US45300564
Spectrum Analyzer	HP	E4407B	

11.3 Test Data

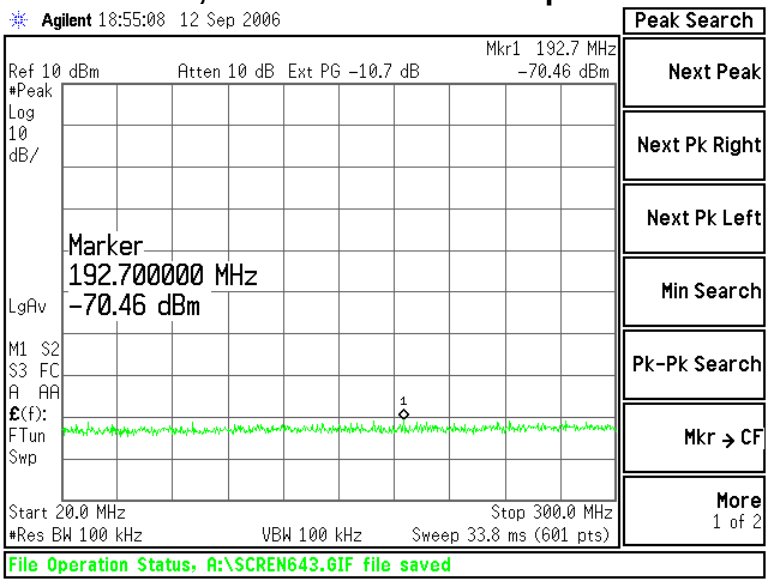
Frequency Test Range:	2400 – 2483.5
Modulation:	GFSK

	Channel 00	Channel 39	Channel 78
Fundamental	+ 3.46 (dBm)	+ 3.34 (dBm)	+ 3.58 (dBm)
2nd Harmonic	- 61.9 (dBm)	- 64.9 (dBm)	- 66.0 (dBm)
3rd Harmonic	- 71.1 (dBm)	- 73.5 (dBm)	- 68.6 (dBm)
4th Harmonic	- 69.7 (dBm)	- 81.5 (dBm)	- 73.8 (dBm)
5th Harmonic	- 84.6 (dBm)	- 79.2 (dBm)	- 81.6 (dBm)
6th Harmonic	- 76.8 (dBm)	- 75.0 (dBm)	- 78.5 (dBm)
7th Harmonic	Note (1)	Note (1)	Note (1)
8th Harmonic	- 83.0 (dBm)	- 80.9 (dBm)	Note (1)
9th Harmonic	Note (1)	Note (1)	Note (1)
10th Harmonic	Note (1)	Note (1)	Note (1)

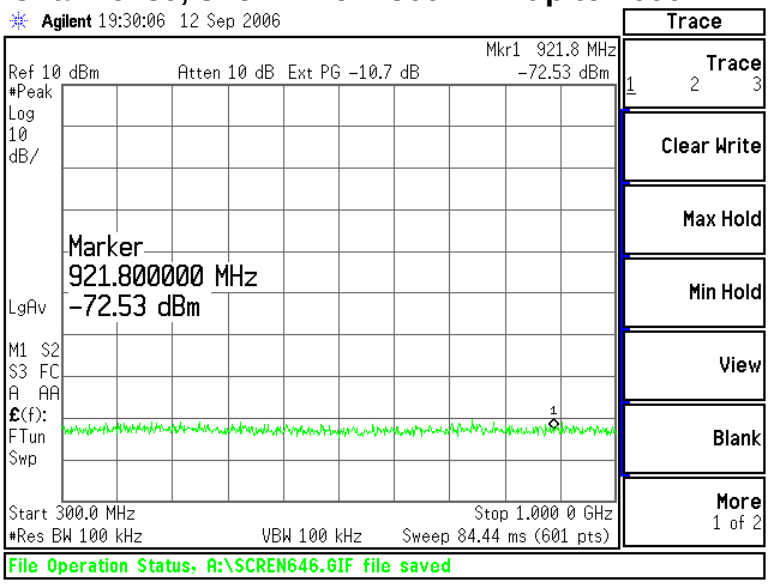
Notes:
(1) Measurement at system noise floor.

11.4 Screen Captures – Spurious Emissions

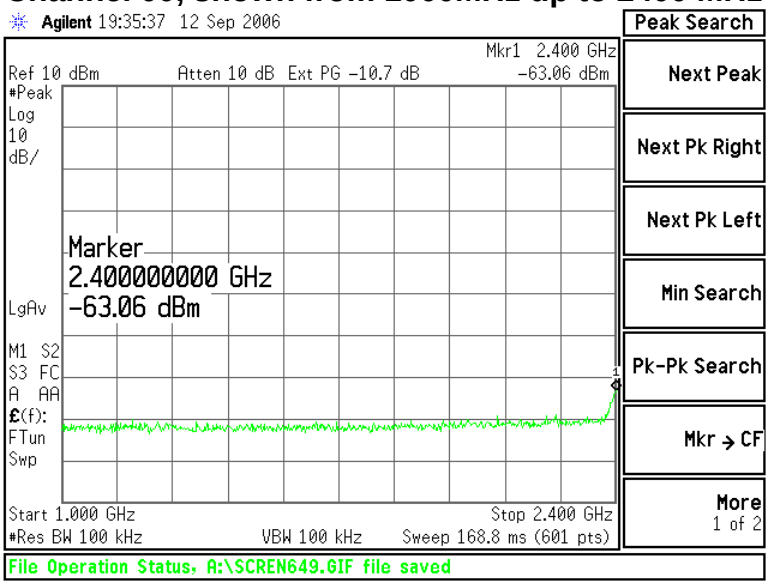
Channel 39, shown from 30 MHz up to 300 MHz



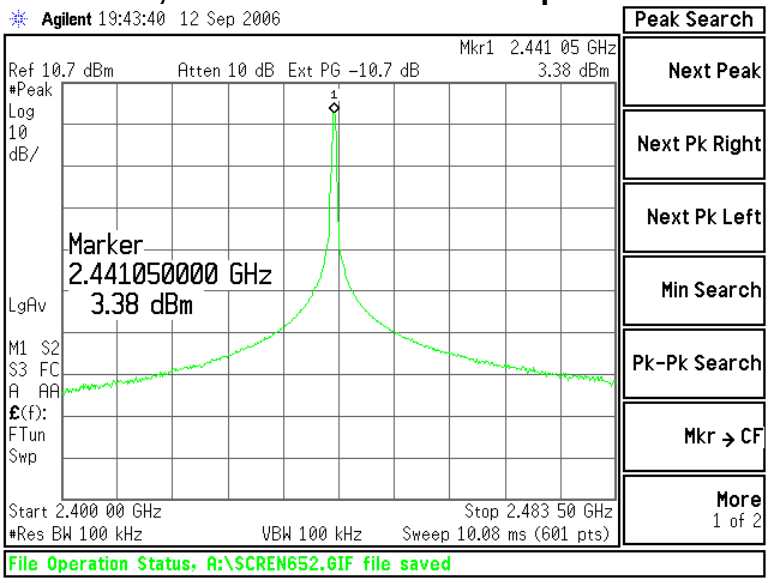
Channel 39, shown from 300 MHz up to 1000 MHz



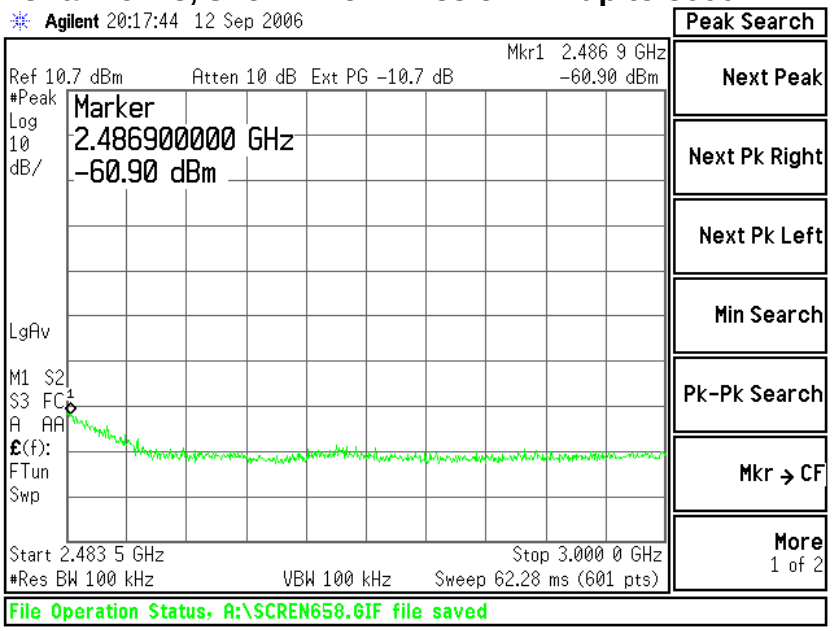
Channel 00, shown from 1000MHz up to 2400 MHz



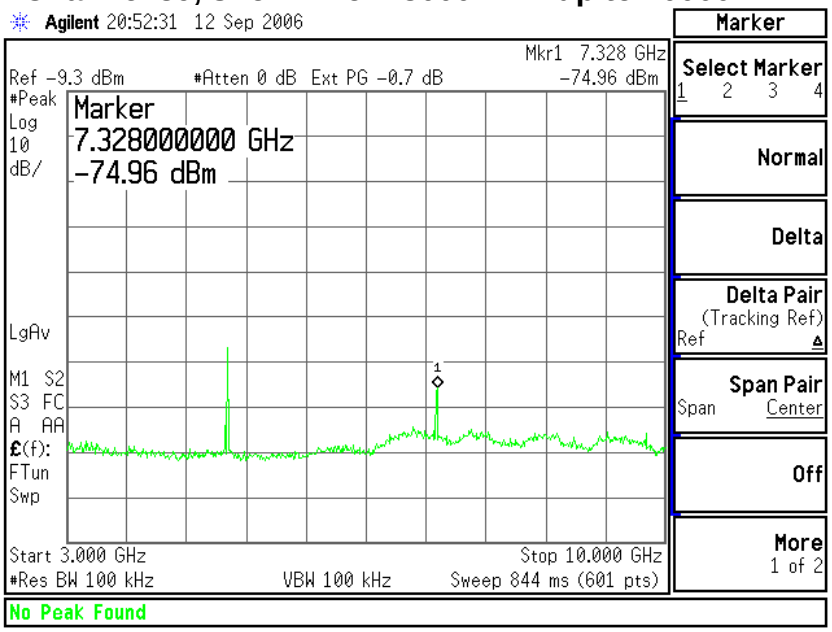
Channel 39, shown from 2400 MHz up to 2483.5 MHz



Channel 78, shown from 2483.5 MHz up to 3000 MHz



Channel 39, shown from 3000 MHz up to 10000 MHz



Channel 39, shown from 10000 MHz up to 25000 MHz

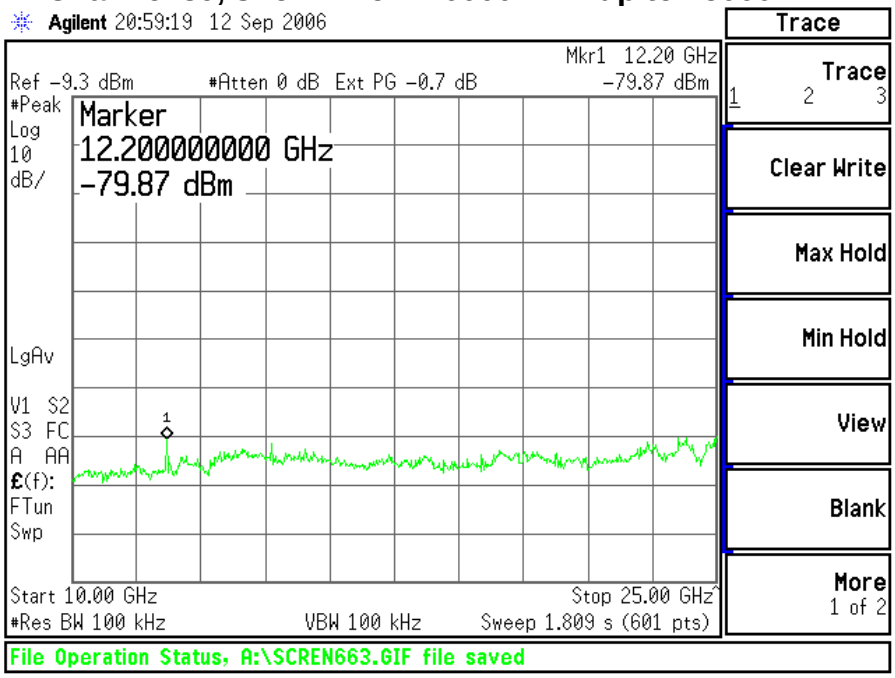


EXHIBIT 12. FREQUENCY & POWER STABILITY OVER VOLTAGE VARIATIONS

The stability of the device was examined as a function of the input voltage available to the EUT. A Spectrum Analyzer was used to measure the frequency at the appropriate frequency markers. For this test the EUT was placed in continuous transmit mode. Power was supplied by an external bench-type variable DC power supply, and the frequency of operation was monitored using the spectrum analyzer.

In this case, the EUT uses a single Lithium – ion rechargeable battery with a nominal voltage of 3.7 VDC. A modification was made so that a DC power supply could be used in place of the battery to vary the source voltage to 3.145 VDC for the low and 4.255 VDC for the high end of the test range.

A spectrum analyzer was used to measure the frequency at the appropriate frequency markers. For this test, the EUT was placed in continuous transmit CW mode. Power to the EUT was supplied by an external bench-type variable power supply. The frequency of operation was monitored using the spectrum analyzer with RBW=VBW=100 kHz settings while the voltage was varied.

	DC/AC Voltage Source		
	3.145	3.700	4.255
Channel 00	2402.00(MHz)	2402.00(MHz)	2402.00(MHz)
Channel 39	2441.00(MHz)	2441.00(MHz)	2441.00(MHz)
Channel 78	2480.00(MHz)	2480.00(MHz)	2480.00(MHz)

The RF Power Output of the EUT was also monitored in a separate test, also using a Spectrum Analyzer with RBW=VBW=1 MHz setting while the voltage was varied.

	DC/AC Voltage Source		
	3.145	3.700	4.255
Channel 00	2.68 (dBm)	3.34 (dBm)	3.30 (dBm)
Channel 39	2.64 (dBm)	3.30 (dBm)	3.25 (dBm)
Channel 78	2.76 (dBm)	3.51 (dBm)	3.44 (dBm)

The power was then cycled On/Off to observe system response. No unusual response was observed, the emission characterizes were well behaved, and the system returned to the same state of operation as before the power cycle.

No anomalies were noted in the measured transmit power during the voltage variation tests. At both extremes of the test voltage levels, the EUT conducted power did not exceed the limit of 30 dBm.

EXHIBIT 13. CHANNEL PLAN AND SEPARATION

An HP E4407B spectrum analyzer was used with a resolution bandwidth of 100 kHz to measure the channel separation of the EUT.

The minimum and maximum channel-separations measured for this device are 1 MHz. The maximum occupied bandwidth of the device, as reported in the previous section is 720 kHz which translates to a required minimum separation 467 kHz (two thirds of 720 kHz)[15.247 (a) (1)] . The following plots describe this spacing, and also establish the channel separation and plan.

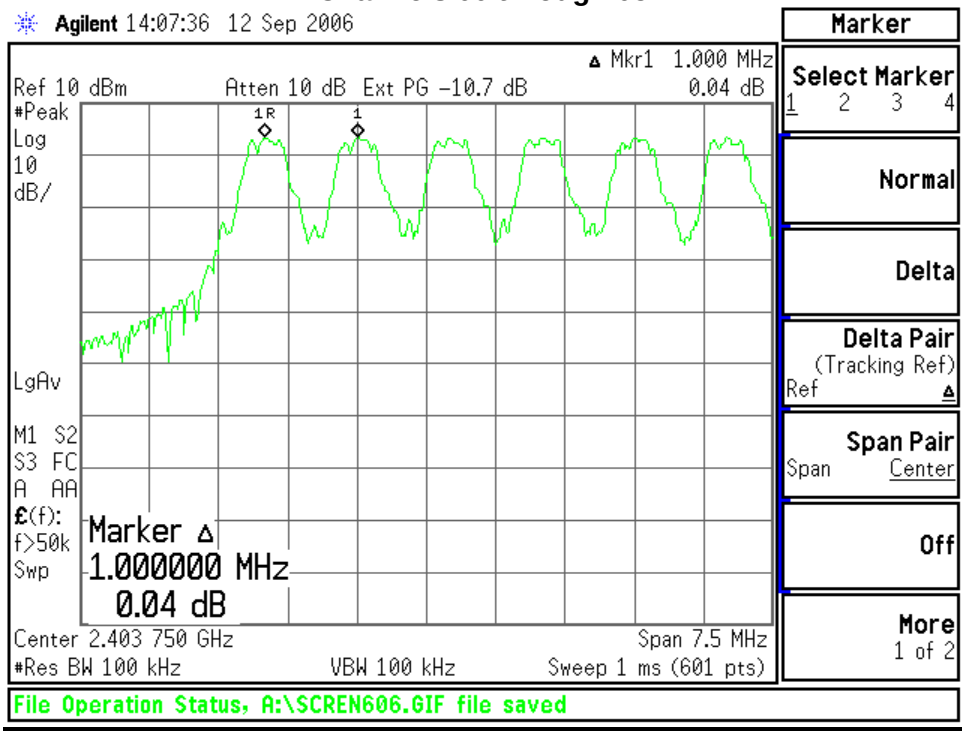
13.1 Test Data

Frequency Span (MHz)	Number of Channels	Minimum Separation (MHz)
2400.0 - 2407.5	6	1.0
2407.5 - 2415.5	8	1.0
2415.5 - 2423.5	8	1.0
2423.5 - 2431.5	8	1.0
2431.5 – 2439.5	8	1.0
2439.5 - 2447.5	8	1.0
2447.5 - 2455.5	8	1.0
2455.5 - 2463.5	8	1.0
2463.5 - 2471.5	8	1.0
2471.5 - 2479.5	8	1.0
2479.5 - 2483.5	1	1.0
Total number of channels	**78**	

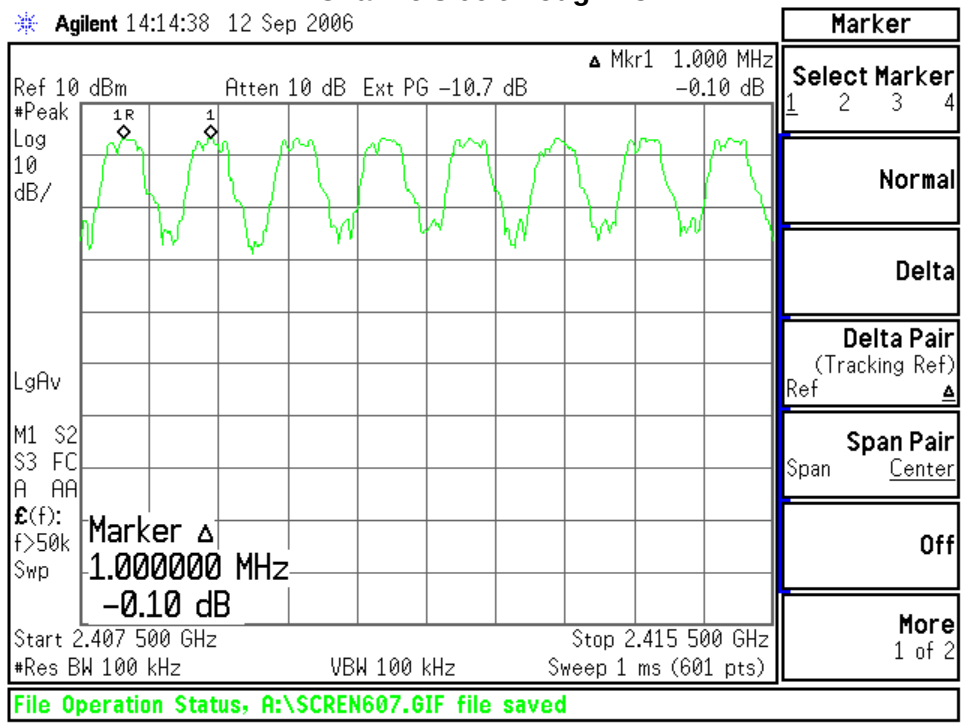
The system **MEETS** the minimum requirement of utilizing the following channels, as well as maintaining a minimum channel separation of 467 kHz, for devices with an output power of no greater than 125 milliwatts.

13.2 Screen Captures – Channel Separation

Channels 00 through 05

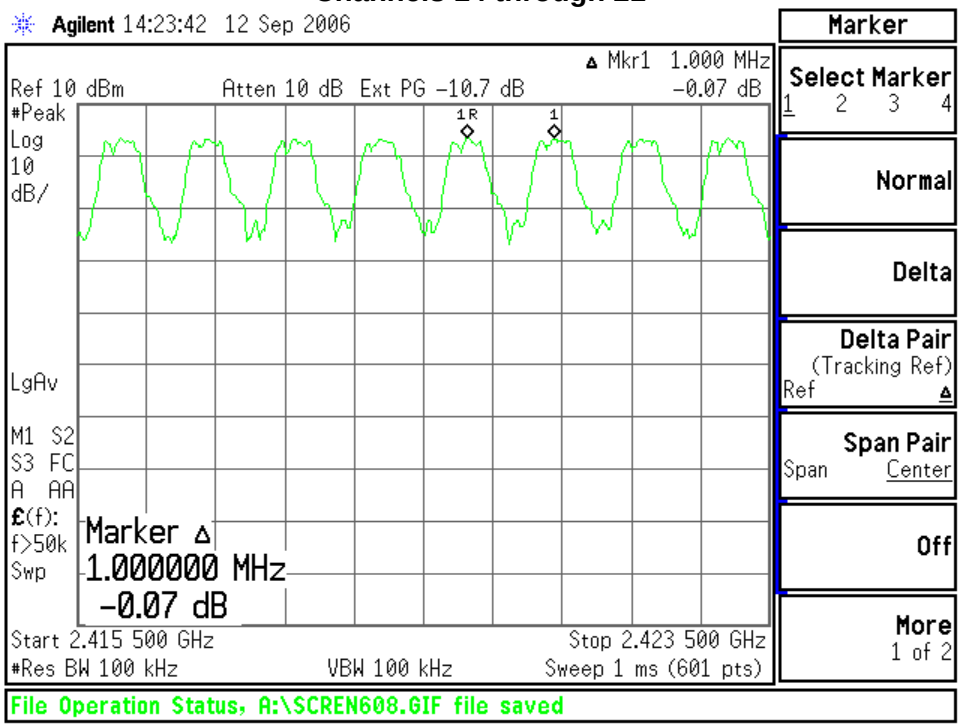


Channels 06 through 13

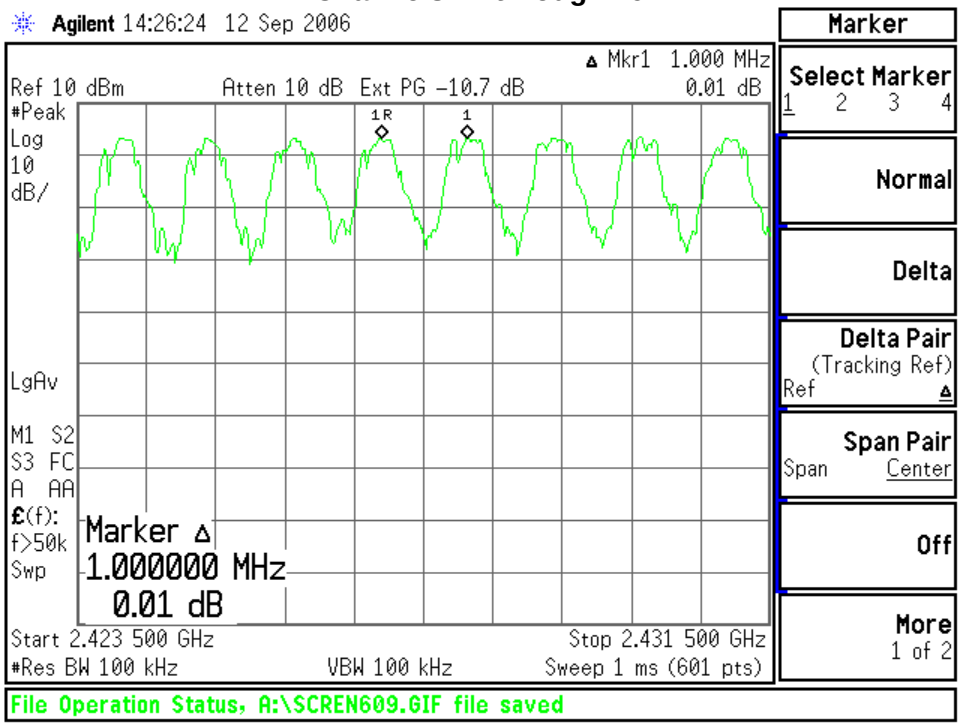


Screen Captures – Channel Separation *(continued)*

Channels 14 through 21

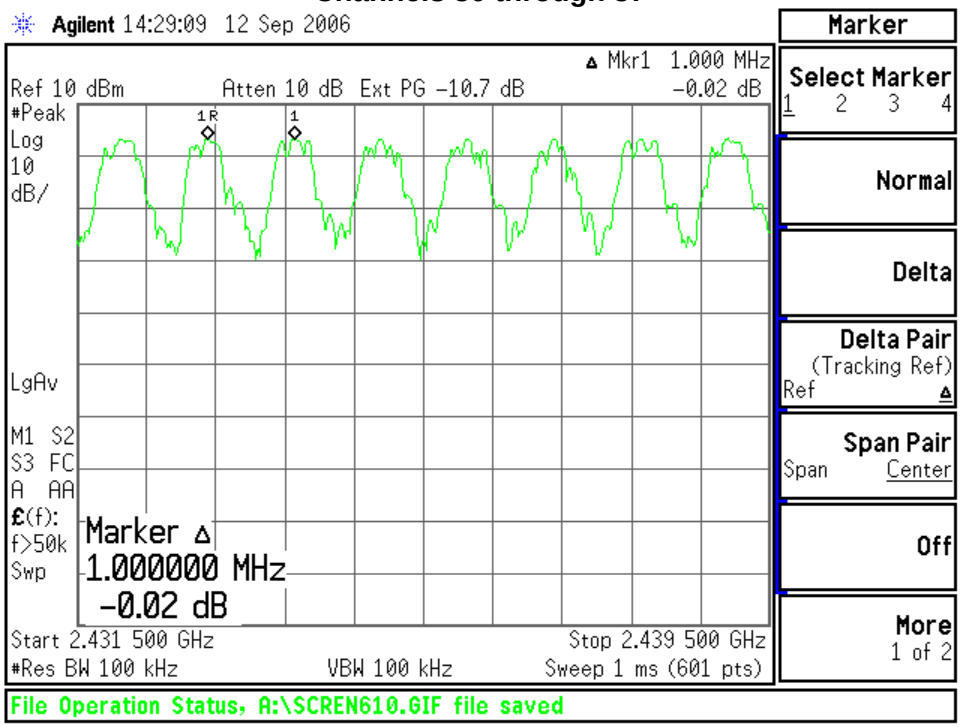


Channels 22 through 29

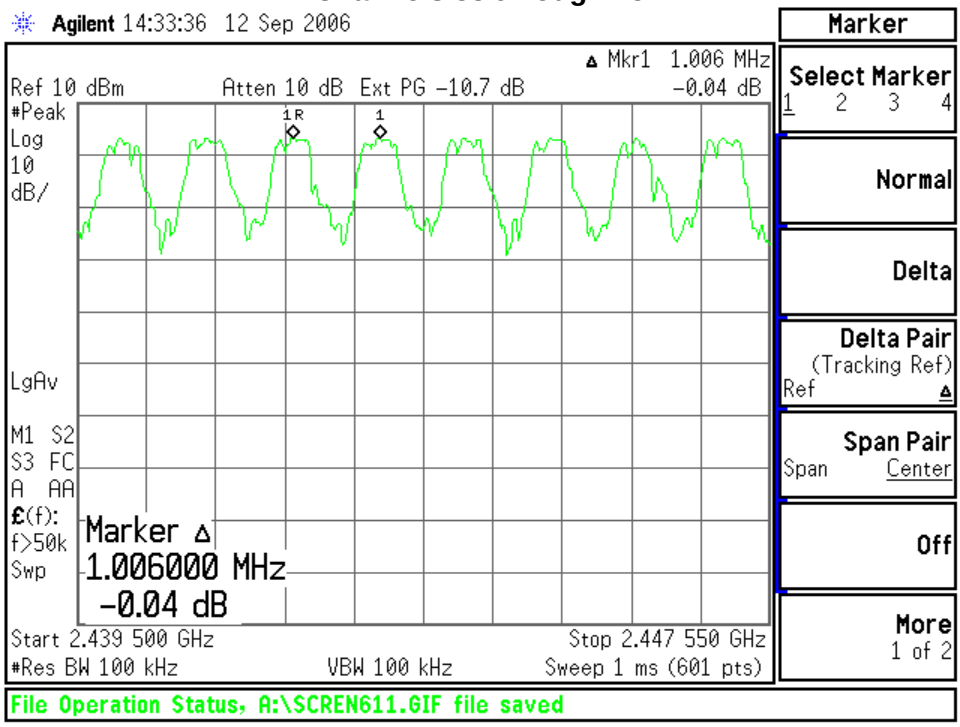


Screen Captures – Channel Separation *(continued)*

Channels 30 through 37

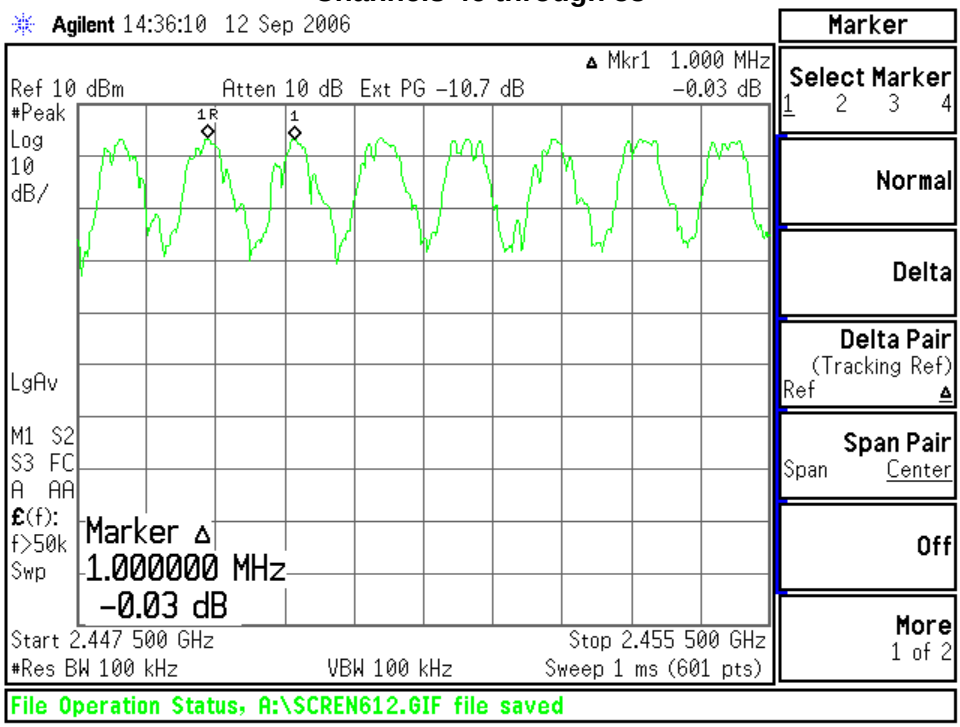


Channels 38 through 45

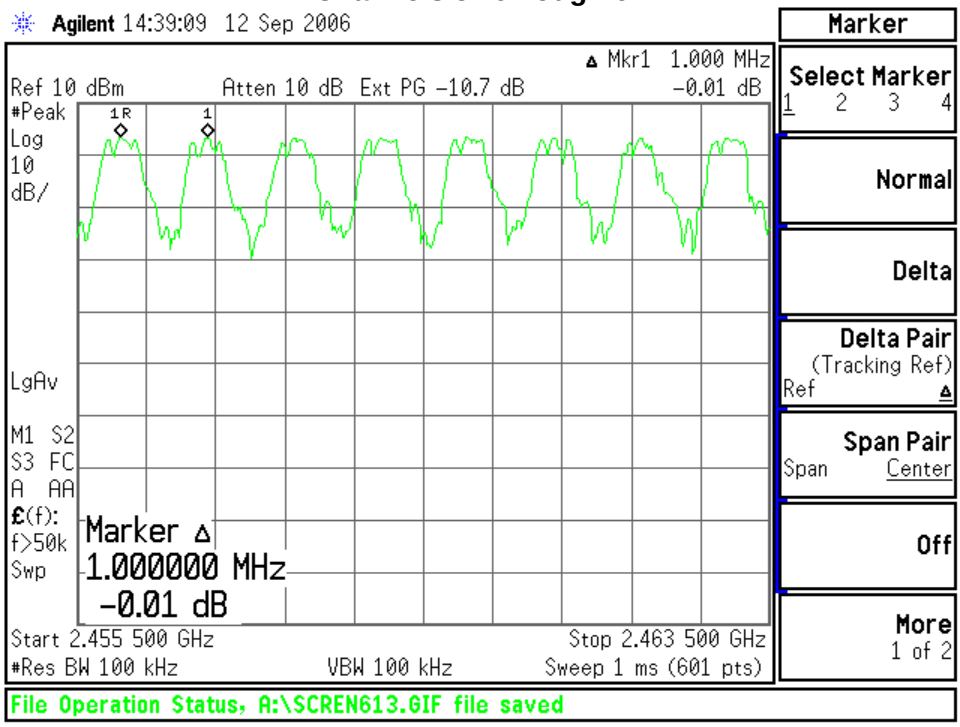


Screen Captures – Channel Separation *(continued)*

Channels 46 through 53

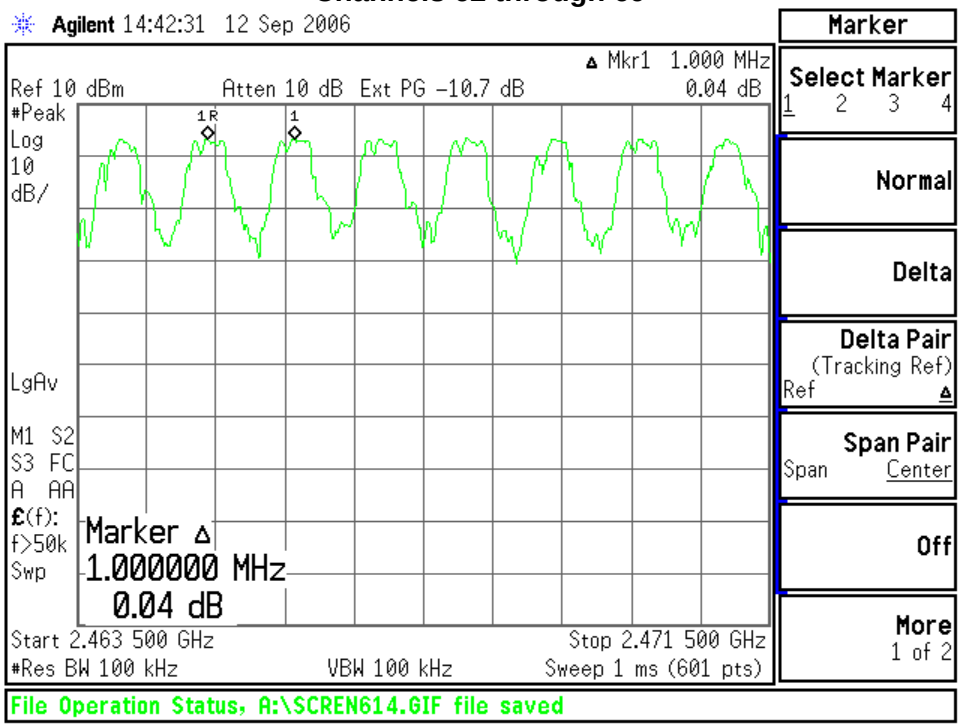


Channels 54 through 61

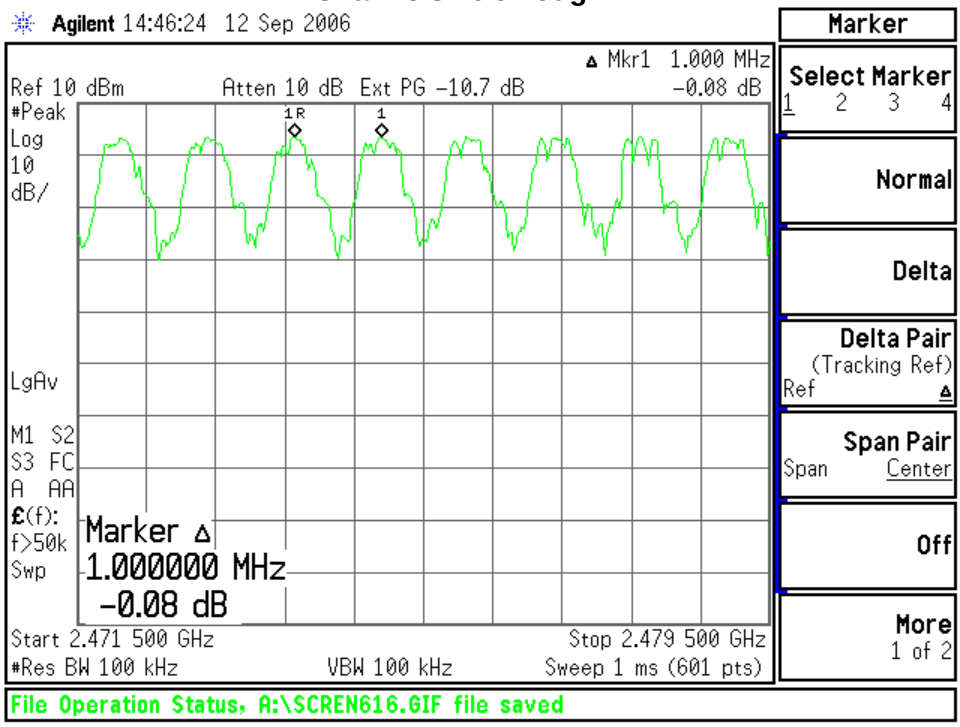


Screen Captures – Channel Separation *(continued)*

Channels 62 through 69



Channels 70 through 77



Screen Captures – Channel Separation *(continued)*

Channel 78

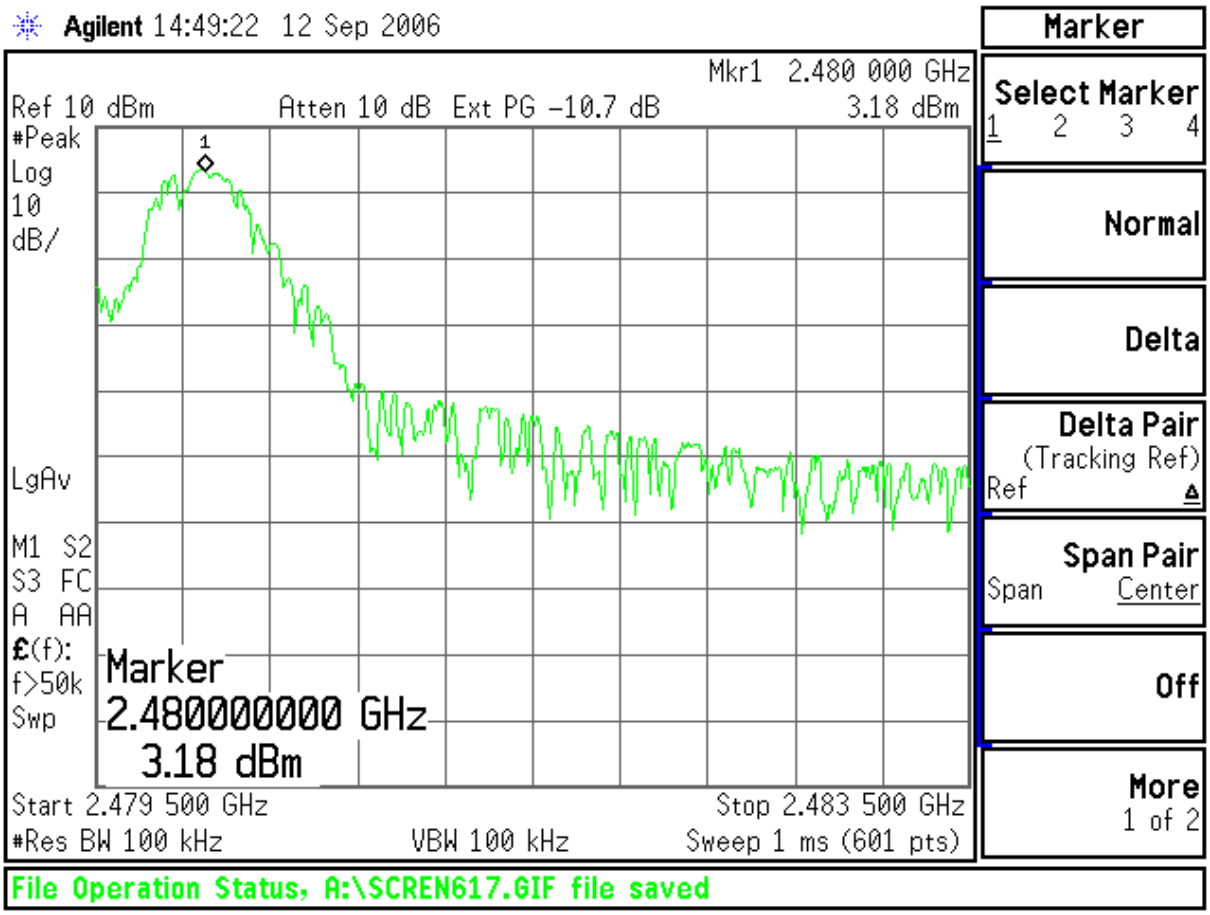


EXHIBIT 14. EQUAL CHANNEL USAGE

Note: Provided by the manufacturer.

Hop pattern is determined by the Masters BD address as defined in BT2.0 specification. It is guaranteed by design that all hop channels between 2402MHz and 2480MHz are equally used. Once a device is Bluetooth qualified this means that the hop pattern is implemented correctly.

EXHIBIT 15. PSEUDORANDOM HOPPING PATTERN

Note: Provided by the manufacturer.

Hop pattern is determined by the Masters BD address as defined in BT2.0 specification. It is guaranteed by design that all hop channels between 2402MHz and 2480MHz are equally used. Once a device is Bluetooth qualified this means that the hop pattern is implemented correctly.

EXHIBIT 16. MPE CALCULATIONS

The following MPE calculations are based on a ceramic chip antenna and a conducted RF power of +3.58 dBm as presented to the antenna.

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density
P = power input to the antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Maximum peak output power at antenna input terminal:	3.58	(dBm)
Maximum peak output power at antenna input terminal:	2.280	(mW)
Antenna gain(typical):	0.5	(dBi)
Maximum antenna gain:	1.122	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2400	(MHz)
MPE limit for uncontrolled exposure at prediction frequency:	1	(mW/cm^2)
Power density at prediction frequency:	0.000509	(mW/cm^2)
Maximum allowable antenna gain:	33.4	(dBi)
Margin of Compliance at 20 cm =	32.9	dB

APPENDIX A

Test Equipment List

Asset #	Manufacturer	Model #	Serial #	Description	Date	Due
AA960008	EMCO	3816/2NM	9701-1057	Line Impedance Stabilization Network	9/27/05	9/27/06
AA960031	HP	119474A	3107A01708	Transient Limiter	Note 1	Note 1
AA960077	EMCO	93110B	9702-2918	Biconical Antenna	7/26/06	7/26/07
AA960078	EMCO	93146	9701-4855	Log-Periodic Antenna	7/20/06	7/20/07
AA960081	EMCO	3115	6907	Double Ridge Horn Antenna	12/07/05	12/07/06
CC00221C	Agilent	E4407B	US39160256	Spectrum Analyzer	12/29/05	12/29/06
EE960004	EMCO	2090	9607-1164	Device Controller	N/A	N/A
EE960013	HP	8546A	3520A00260	Receiver RF Section	9/29/05	9/29/06
EE960014	HP	85460A	3448A00296	Receiver Pre-Selector	9/29/05	9/29/06
EE960073	Agilent	E4446A	US45300564	Spectrum Analyzer	2/01/06	2/01/07
N/A	LSC	Cable	0011	3 Meter ½" Armored Cable	Note 1	Note 1
N/A	LSC	Cable	0050	10 Meter RG 214 Cable	Note 1	Note 1
N/A	Pasternack	Attenuator	N/A	10 dB Attenuator	Note 1	Note 1

Note 1 - Equipment calibrated within a traceable system.

Uncertainty Statement

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of k=2.

Table of Expanded Uncertainty Values, (K=2) for Specified Measurements

Measurement Type	Particular Configuration	Uncertainty Values
Radiated Emissions	3 – Meter chamber, Biconical Antenna	4.24 dB
Radiated Emissions	3-Meter Chamber, Log Periodic Antenna	4.8 dB
Radiated Emissions	10-Meter OATS, Biconical Antenna	4.18 dB
Radiated Emissions	10-Meter OATS, Log Periodic Antenna	3.92 dB
Conducted Emissions	Shielded Room/EMCO LISN	1.60 dB
Radiated Immunity	3 Volts/Meter in 3-Meter Chamber	1.128 Volts/Meter
Conducted Immunity	3 Volts level	1.0 V

Appendix B

Antenna Specification(s)

"High Frequency Ceramic Solutions"

2.45 GHz Antenna **P/N 2450AT18A100**

Detail Specification: 09/03/03 Page 1 of 3

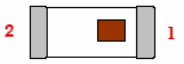
General Specifications

Part Number	2450AT18A100
Frequency Range	2400 - 2500 Mhz
Peak Gain	0.5 dBi typ. (XZ-V)
Average Gain	-0.5 dBi typ. (XZ-V)
Return Loss	9.5 dB min.

Input Power	500mW max.
Impedance	50 Ω
Operating Temperature	-40 to +85°C
Reel Quanity	3,000

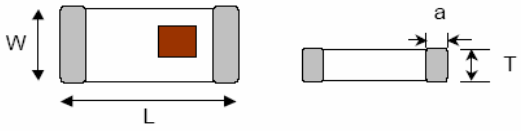
No.	Function
1	Feeding Point
2	NC

Terminal Configuration



Mechanical Dimensions

	In	mm
L	0.126 ± 0.008	3.20 ± 0.20
W	0.063 ± 0.008	1.60 ± 0.20
T	0.051 +.004/-.008	1.30 +0.1/-0.2
a	0.020 ± 0.012	0.50 ± 0.30

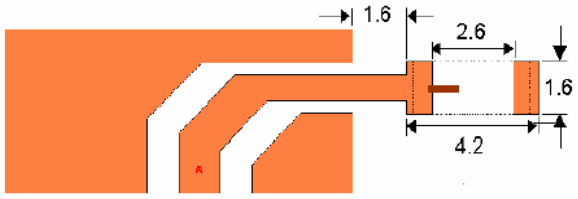


Mounting Considerations

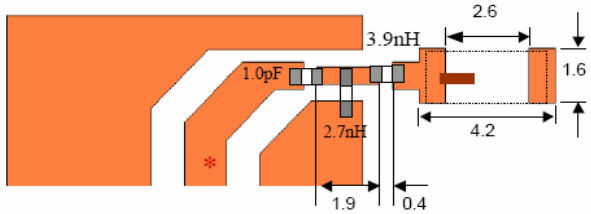
Mount these devices with brown mark facing up. Units: mm

Line width should be designed to provide 50Ω impedance matching characteristics.

a) Without Matching Circuits



b) With Matching Circuits



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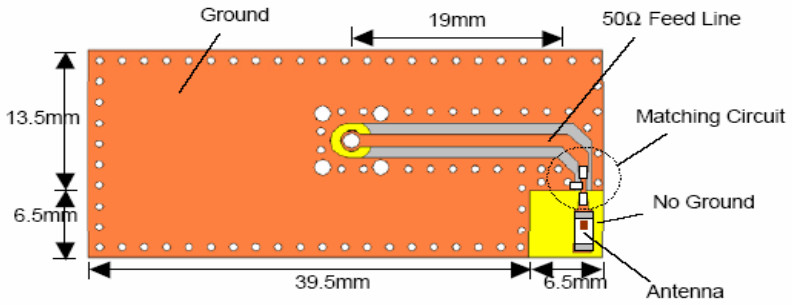
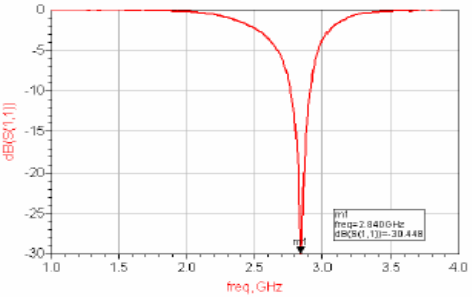
Typical Electrical Characteristics (T=25°C)

Test Board:

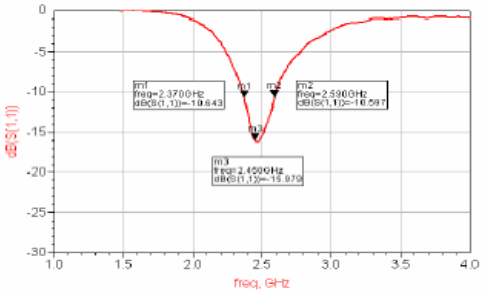


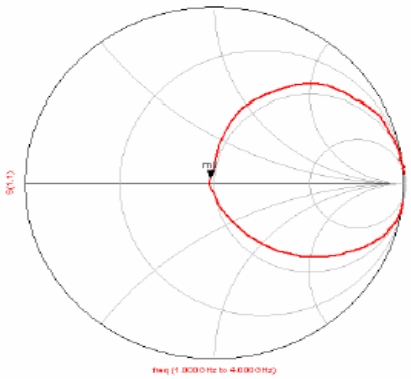
Return Loss

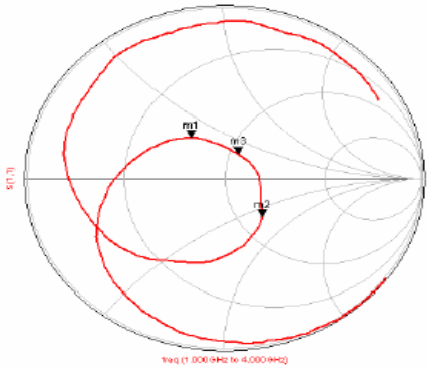
a) Without Matching Circuits



b) With Matching Circuits







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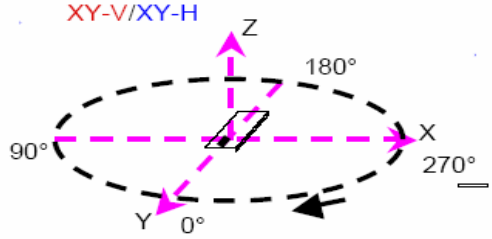
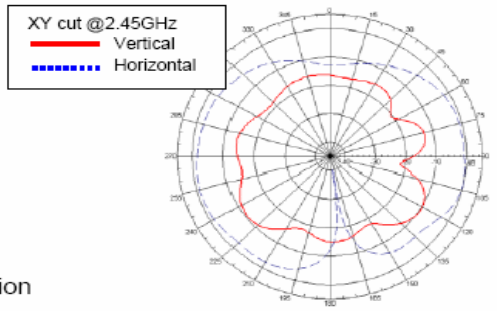
Typical Radiation Patterns

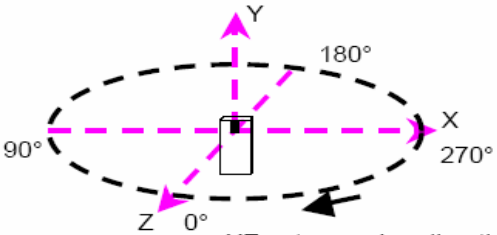
XY-V/XY-H



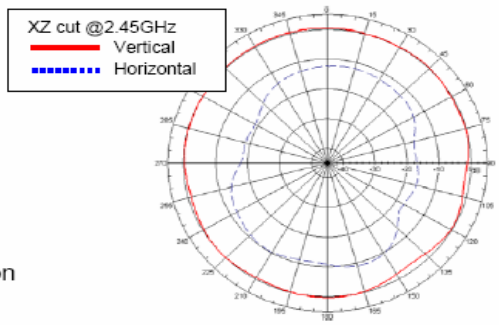
XY-cut scanning direction



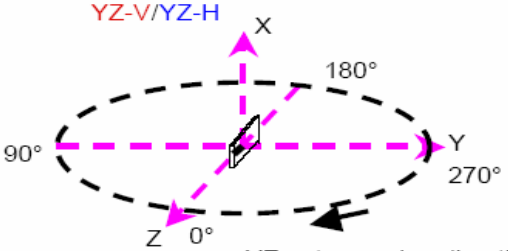
XZ-V/XZ-H



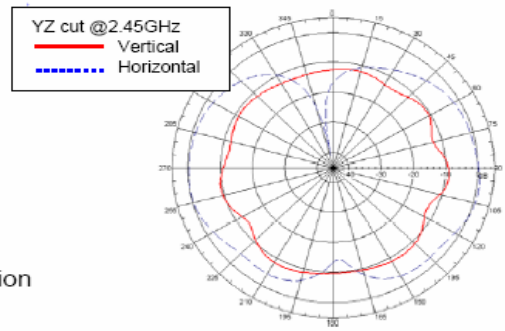
XZ-cut scanning direction



YZ-V/YZ-H



YZ-cut scanning direction



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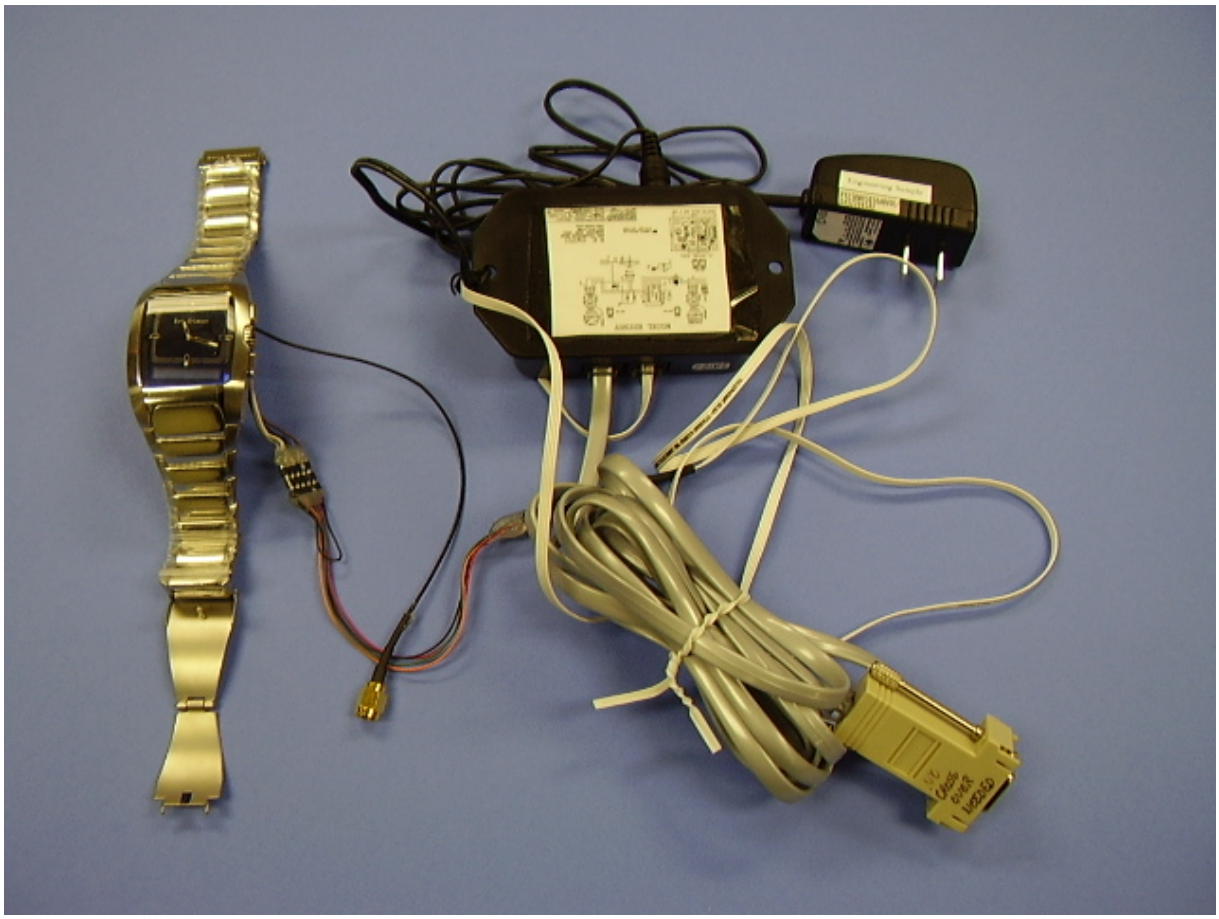
Appendix C

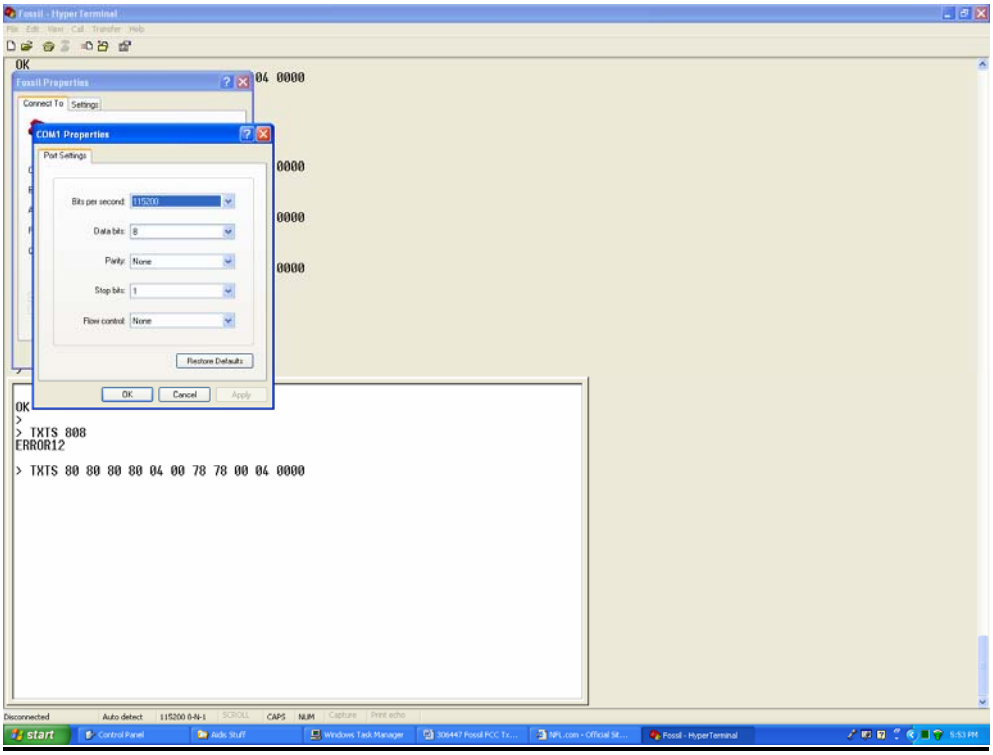
Firmware and Setup Instructions

The EUT or the “Caller ID Watch” was set in its appropriate test mode via a laptop, an RS232 translator board and a simple terminal (i.e hyperterminal). The hyperterminal must be set for
Bits per second: 115000
Data Bits : 8
Parity : None
Stop Bits : 1
Flow Control : None

EUT and RS 232 translator board.



After connecting the translator board to the EUT and a laptop, a simple terminal connection was established by physically resetting the EUT. This was done via a hole in the back of the EUT. The EUT will acknowledge test mode by returning the ASCII string ‘OK’. Some of the commands used for the test are as follows:



BATM : This command reads the EUT's battery voltage
BDRE : Reads the BD-address.
RSTD : Resets the device
STRX : Sets the EUT in Receive Mode.
STTX : Sets the EUT in Transmit mode. Power requirements can be set in this mode.
TXTS : Sets the EUT in Transmit mode but with option of modulation. Also sets EUT in hop mode.

Example:

TXTS 80 80 80 80 04 00 39 39 00 04 0000
Sets the EUT in continuous transmit mode on channel 39 with modulation.

STRX 39 01 01
Sets the EUT in receive mode on channel 39

STTX 39 01 01 06
Sets the EUT in CW transmit mode on channel 39 with power level 6.

It is important to note that after physically resetting the EUT, commands must be entered within 2 seconds otherwise test mode will not be entered. The end product will not have these capabilities. End users will **not** have the ability to change any of the pre-programmed settings.