

# Test Site Services, Inc.



## EMI Test Report

Pepper Computer Inc.  
Pepper Wireless PAD  
Model PP20624

Intentional Radiator (802.11b, Wi-Fi)

FCC, Part 15 Subpart C  
Section 15.247

Test # B05143

Test Site Services, Inc.  
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**Nemko**  
ELA No. 174

**MAPLE**  
EMC001677-NE  
EMC000142-NE

**VCI**  
Reg. No. R-1145  
Reg. No. C-1205

**BSMI** Lab No. SL-IN-E-1018

**IT**  
Cert. No. 00-016

**RC**  
464054276



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## Revision History

REV. #	CHANGES of CONTENT	SECTION AFFECTED	REVIEWED BY	DATE
0	Original Release	All	RLW	11-Jul-05
1	Additional Information	Pages 2,11,31,33	RLW	18-Jul-05

## EMI Test Report for Pepper Computer Inc.

**Test Number** : B05143

**Product Name** : Pepper Wireless PAD

**Date** : 21~29-June-2005

**Report Reviewed  
& Accepted by:** \_\_\_\_\_

Pepper Computer Inc.  
10 Maquire Road  
Suite 221  
Lexington, MA 02421  
Phone:1-781-862-2500  
Fax :1-781-862-1145

Report Issued By:



Richard L. Wiedeman, Laboratory Director

Tested By:

T Charron, Test Engineer  
B Farrell, Test Engineer  
Radiated & Conducted Emissions

*This test report is not valid without the signatures of Test Site Services, Inc. personnel.*

## Administrative Data

**Regulation** : FCC Part 15, Subpart C, Section 15.247 (a) (2), (b), (c), (d)  
: FCC Part 15, Subpart C, Section 15.205,  
:15.207, 15.209 (2002)

**Level** : Per 15.247

**Test Method** : ANSI C63.4- (2003)  
: QET/FCC Guidance Documents

**Test Type** : Qualification / Intentional Radiator  
: Portion of Composite Device (802.11b)

**Manufacturer** : Pepper Computer Inc.

**EUT Type/Model #** : Pepper Wireless PAD / PP20624

Date(s) of Test : 21~29-June-2005

**Customer Personnel** : Andy DeAngelis

<b>TSS Personnel</b>	: R. Wiedeman	EMC Engineer
	: T. Charron	Test Engineer
	B. Farrell	Test Engineer

## Test Location(s) **Test Site Services, Inc.**

30 Birch St  
Milford, MA 01757

U.S.A.

**EUT Returned Via:** Customer Pickup

**NOTICE** : FCC Rule 2.955 requires that a Verification Report for a Class B Computing Device must be signed by "an Official of the Company responsible for the device". A signature block has been provided on the first page for this purpose.

## EUT Description

The EUT (Pepper Wireless PAD / Model PP20624). The Pepper Wireless Pad from Pepper Computer is a portable device designed to support broadband activities such as browsing the Web, e-mail, Instant Messaging, listening to music, watching videos, sharing photos and creating personal journals .It has both Wi-Fi and Bluetooth capability integral to the device. It is a composite device in a single enclosure with unintentional and intentional radiator sections.

A complete description of the EUT may be found on Block Identifier 1.

The tests were run in a typical configuration including the following equipment:

- 1) Pepper Wireless PAD / Model PP20624 (EUT)
- 2) Scan Disk Card Reader / (USB Interface)
- 3) Microphone
- 4) Headphones
- 5) Video Monitor

### REASON FOR TEST:

Qualification of the Intentional Radiator Portion of a composite device (802.11b). As this device is also a Class B computing device, it has been tested separately for compliance to FCC Part 15b as an unintentional radiator.

### CHANGES MADE DURING TEST:

None

### DEVIATIONS FROM STANDARD TEST METHOD:

None

## Test Summary

Standard Section	Test Type	Limit	Result	Comments
15.207	AC Power Conducted Emissions	Table 15.207	Pass	
15.247 (a) (2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System	Min. 500 KHz	Pass	
15.247 (b)	Maximum Peak Output Power	Max. 30 dBm	Pass	EIRP
15.247 (c)	Transmitter Radiated Emissions	Table 15.209	Pass	
15.247 (d)	Power Spectral Density	Max. 8 dBm	Pass	EIRP
15.247 (c)	Band Edge Measurement	20 dB less than Peak Value of fundamental frequency	Pass	

## EUT Characteristics (Manufacturers Declaration)

Product: Pepper Wireless Pad, Portable PC type computing device with integral intentional radiator.

Model: PP20624

Power: 5 VDC from wall mounted power supply module/internal battery

Modulation type: CCK, DQPSK, DBPSK

Radio technology: DSSS

Transfer rate: 802.11b: 11/5.5/2/1 Mb/s

Frequency range: 2412-2462 MHz.

Output power: 15 dBm max.

Antenna type: Integral with 802.11b module, mounted on internal pcb

Antenna port: No accessible antenna port; antenna integral to device

I/O ports: Microphone, headset, USB, video

Associated devices: n/a

Operational Frequencies:

Channel	Frequency in MHz	Channel	Frequency in MHz
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

## Test Data Summary

### Part 1. 6dB Bandwidth Measurement FCC 15.247 (a) (2)

#### Test Procedure:

Radiated measurement @ 3m.

EUT placed on 80cm. table and emission maximized for height and rotation.

#### Test Equipment:

R&S receiver/analyizer w/ext. 6 dB pad

HP pre-amp

Dual-Ridged Guide Antenna

Plotter

#### Test Parameters:

RBW=100kHz

VBW=100kHz

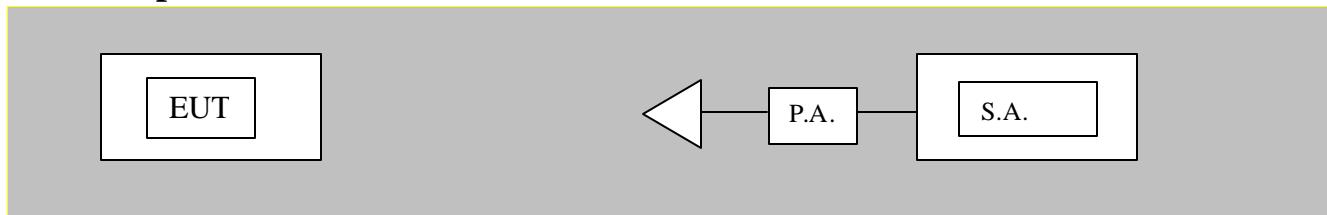
Sweep=Auto

Detector=Peak

Atten= Auto (+ext. 6 dB pad)

Span=As required, see graphs

#### Test Setup:



Refer to Appendix A for photograph(s) of the actual test setup.

#### EUT Operating Conditions:

Software was provided by client to activate and maintain EUT transmitting continuously with max. power at the lowest, middle and highest channel frequencies individually. Data rate set at 11 Mb/s. Modulation is CCK. Bluetooth disabled.

#### Test Results:

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	10.633	0.500	Pass
6	2437	11.266	0.500	Pass
11	2462	9.666	0.500	Pass

*Test Data: Refer to the following plots*

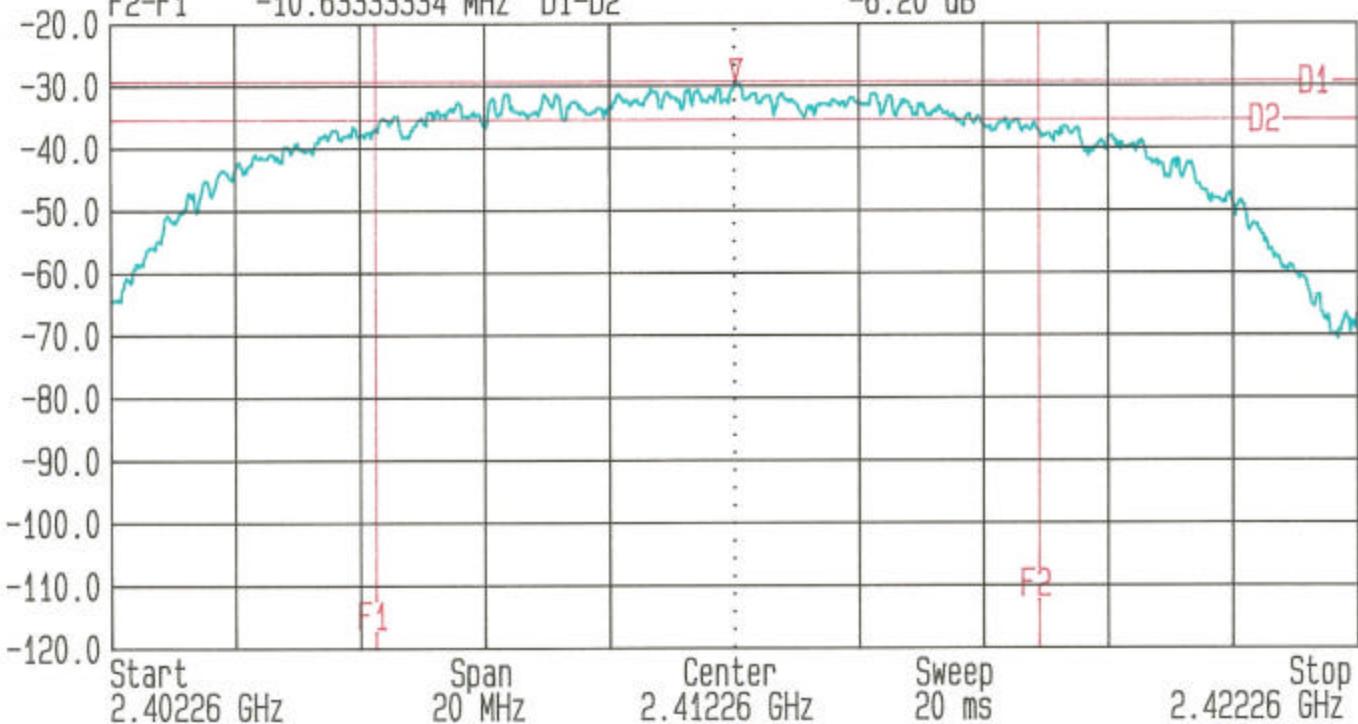
15.247(a)(2)

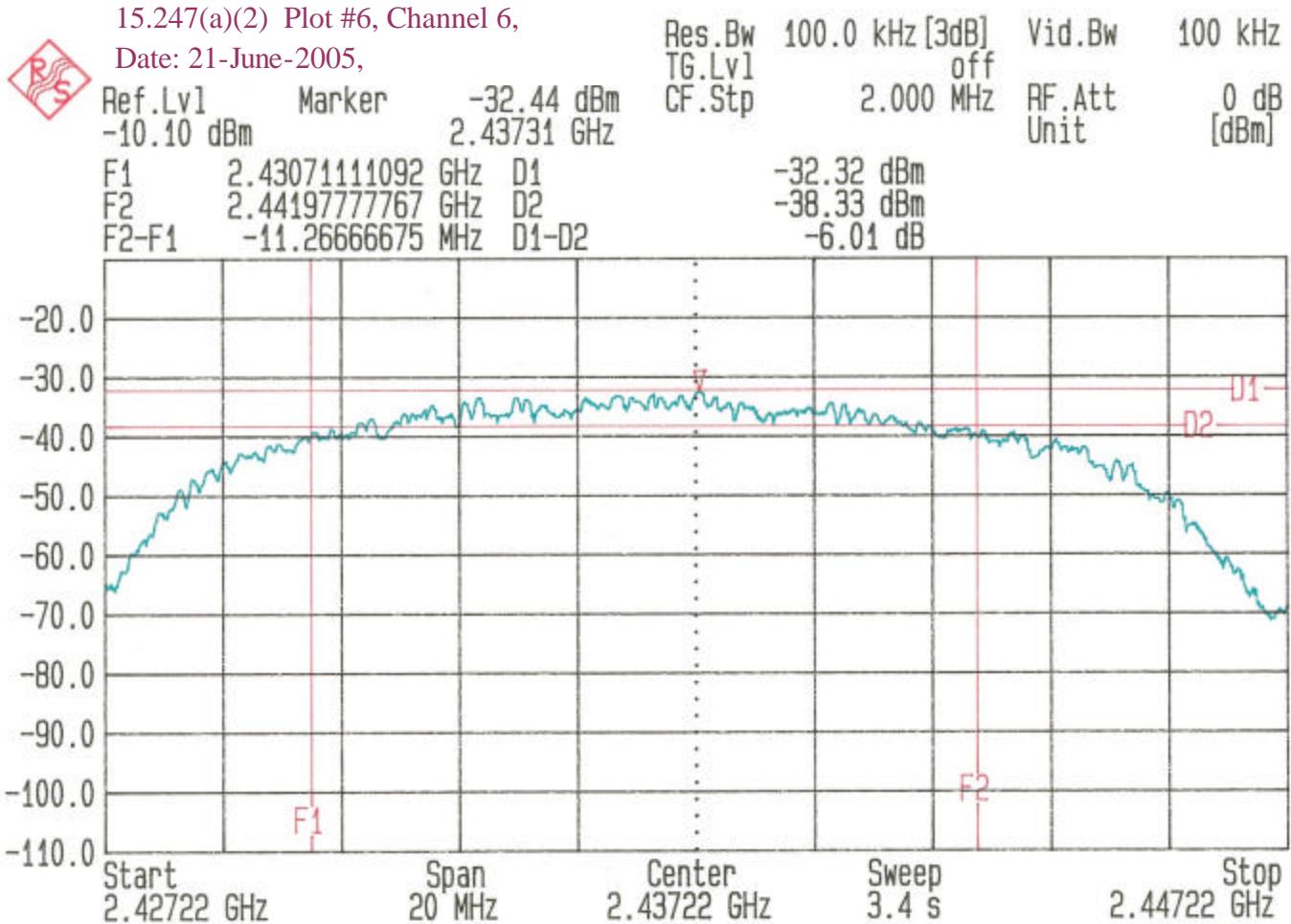
Date: 21-June-2005,



Plot #1, Channel 1,

Ref.Lvl	Marker	Res.Bw	100.0 kHz [3dB]	Vid.Bw	100 kHz
-20.00 dBm	2.41230 GHz	TG.Lvl	off	RF.Att	0 dB
F1	2.40652666664 GHz	CF.Stp	2.000 MHz	Unit	[dBm]
F2	2.41715999998 GHz				
F2-F1	-10.63333334 MHz				
	D1-D2				





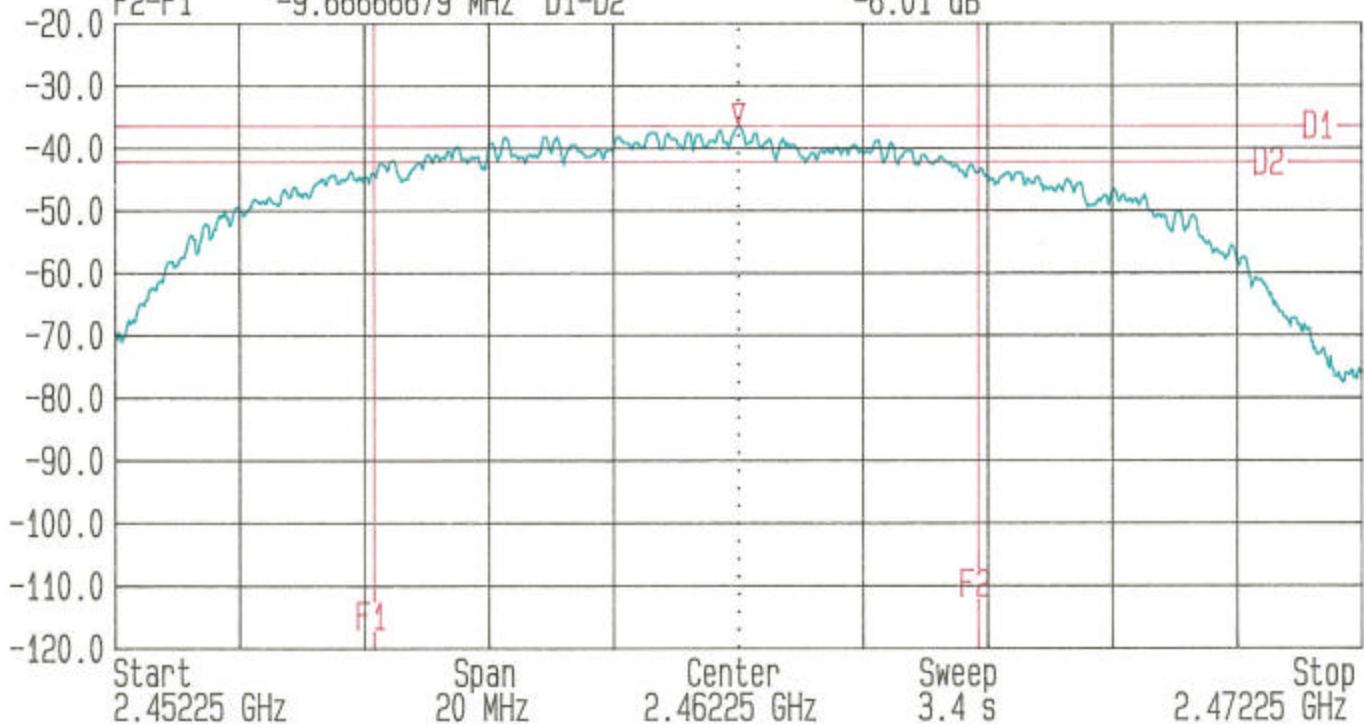
15.247(a) (2)

Plot #11, Channel 11,

Date: 21-June-2005,



Ref.Lvl	Marker	-36.30 dBm	Res.Bw	100.0 kHz [3dB]	Vid.Bw	100 kHz
-20.00 dBm	2.46225 GHz	TG.Lvl	off	2.000 MHz	RF.Att	0 dB
F1	2.45643610974 GHz	D1		-36.24 dBm	Unit	[dBm]
F2	2.46610277653 GHz	D2		-42.25 dBm		
F2-F1	-9.66666679 MHz	D1-D2		-6.01 dB		



---

## Part 2. Band Edges Measurement FCC 15.247 (c), 15.205/15.209

### Test Procedure:

Radiated measurement @ 3m.

EUT placed on 80cm. table and emission maximized for height and rotation.

Marker delta method for band edge emissions.

### Test Equipment:

R&S receiver/analyizer w/ext. 6 dB pad

HP pre-amp

Dual-Ridged Guide Antenna

Plotter

### Test Parameters:

RBW=100kHz

VBW=100kHz

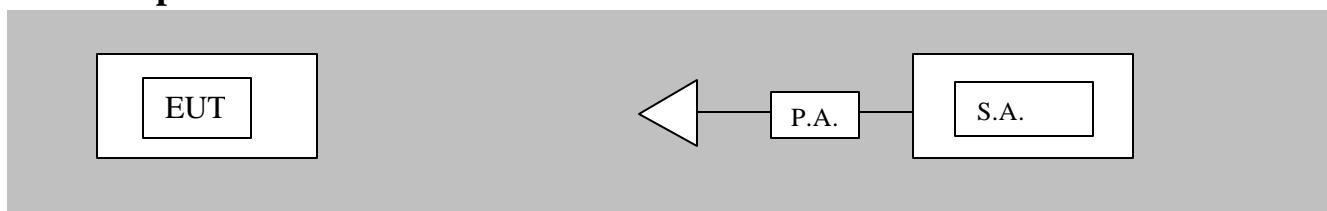
Sweep=Auto

Detector=Peak

Atten= Auto (+ext. 6 dB pad)

Span=As required, see graphs

### Test Setup:



Refer to Appendix A for photograph(s) of the actual test setup.

### EUT Operating Conditions:

Software was provided by client to activate and maintain EUT transmitting continuously with max. power at the lowest, middle and highest channel frequencies individually. Data rate set at 11 Mb/s. Modulation is CCK. Bluetooth disabled.

### Test Results:

Channel	Channel Frequency (MHz)	Pass / Fail
1	2412	Pass
6	2437	For reference only
11	2462	Pass

---

## Part 2. Band Edges Measurement FCC 15.247 (c), 15.205/15.209 (Continued)

### Test Results (continued):

1. Meets -20 dB relative to peak band edge requirement.
2. Closest emission at lower band edge is 31 dB below carrier peak; this correlates to a field strength of 50.1 dBuV/m (peak) at 2.398 GHz. and is below the required level of 54 dBuV/m (ave.) and 74 dBuV/m (peak) as required in the restricted band (15.205). See page 31 for the corrected peak value of the carrier(75.1dBuV/m).

Sample calc.:

$$75.1 \text{ dBuV/m} - 31 \text{ dB} = 44.1 \text{ dBuV/m} + 6 \text{ dB (ext. pad)} = 50.1 \text{ dBuV/m (peak)}$$

3. Closest emission at upper band edge is 39 dB below carrier peak; this correlates to a field strength of 36.2 dBuV/m (peak) at 2.484 GHz. and is below the required level of 54 dBuV/m (ave.) and 74 dBuV/m (peak) as required in the restricted band (15.205). See page 33 for the corrected peak value of the carrier(69.2 dBuV/m).

Sample calc.:

$$69.2 \text{ dBuV/m} - 39 \text{ dB} = 30.2 \text{ dBuV/m} + 6 \text{ dB (ext. pad)} = 36.2 \text{ dBuV/m (peak)}$$

### Test Data:

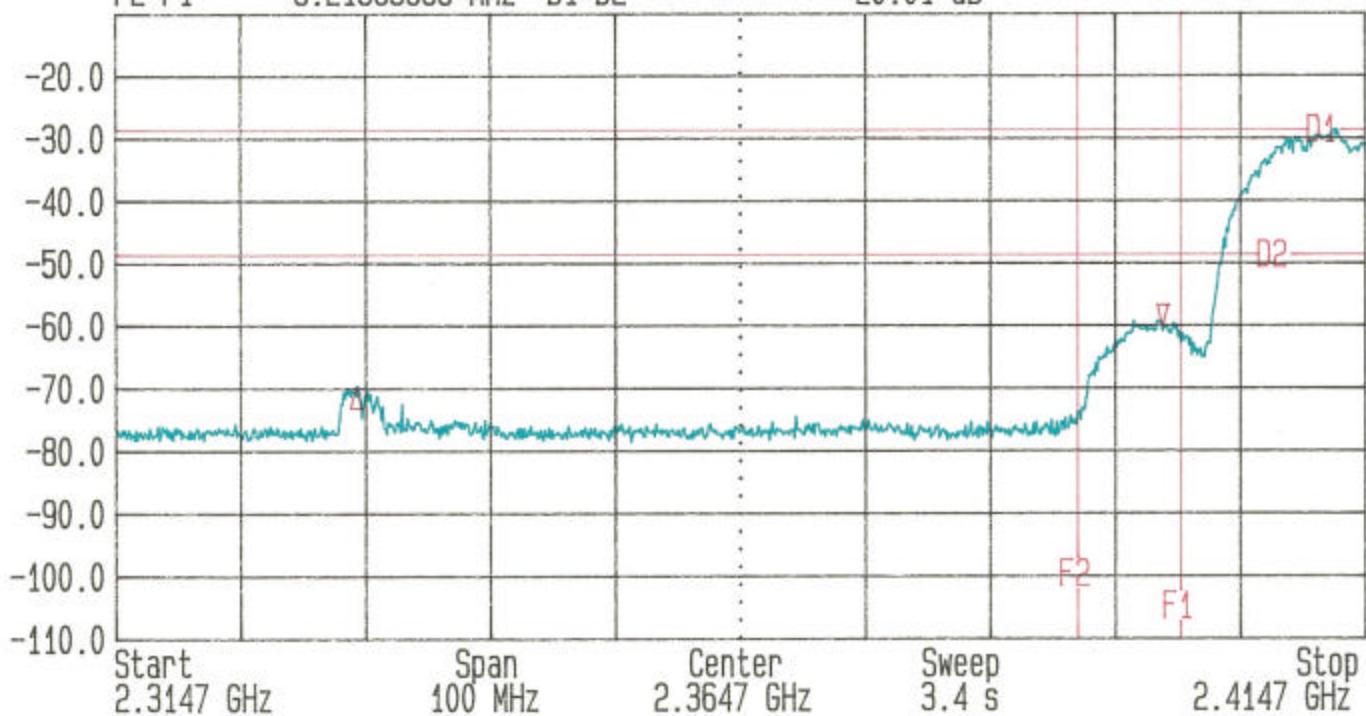
Refer to the following plots

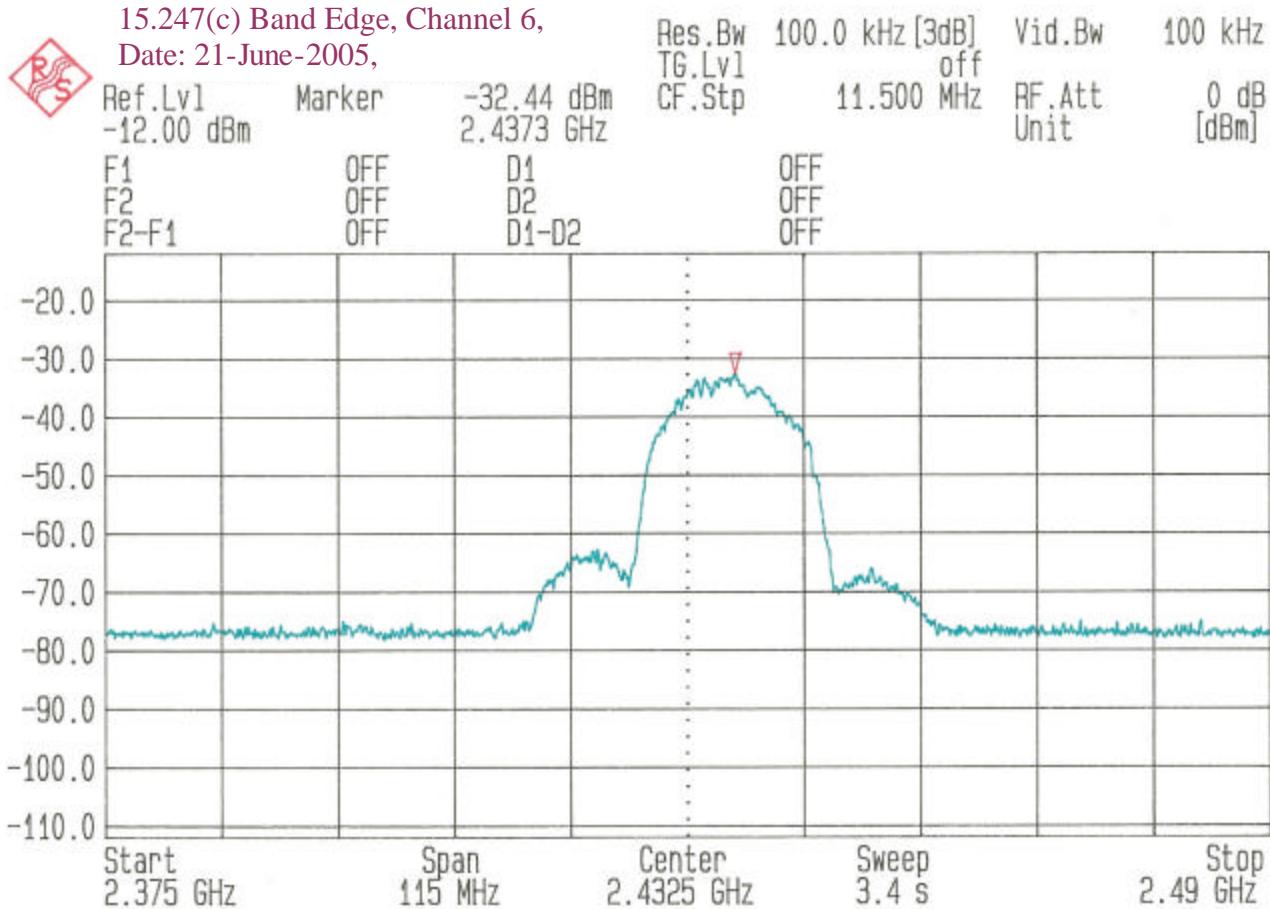
## 15.247(c) Band Edge Plot #5, Channel 1

Date: 21-June-2005,



Ref.Lvl	Delta	-9.37 dB	Res.Bw	100.0 kHz [3dB]	Vid.Bw	100 kHz
-10.10 dBm		-64.5 MHz	FG.Lvl	off	RF.Att	0 dB
F1	2.40006111092 GHz	D1	CF.Stp	10.000 MHz	Unit	[dBm]
F2	2.39184747407 GHz	D2				
F2-F1	8.21363685 MHz	D1-D2				

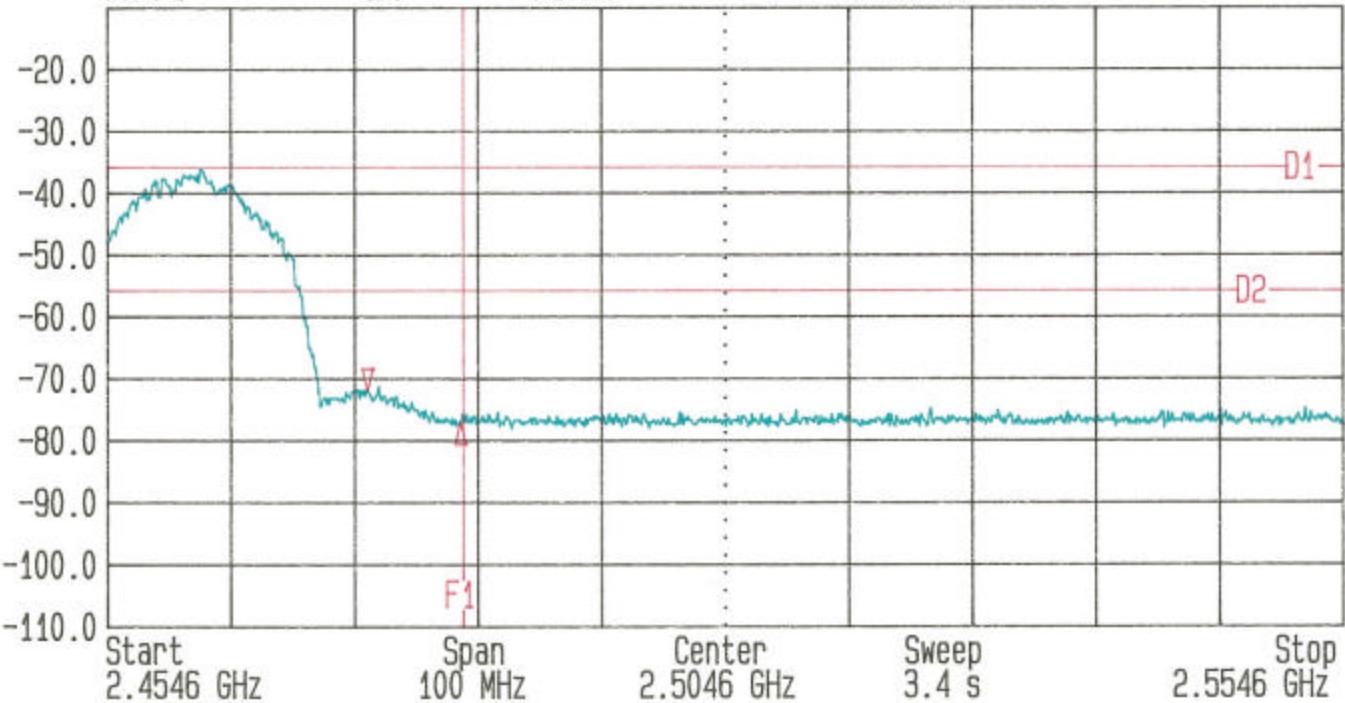




15.247(c) Band Edge Plot #15,  
Channel 11 Date: 21-June-2005,



Ref.Lvl	Delta	-5.33 dB	Res.Bw	100.0 kHz [3dB]	Vid.Bw	100 kHz
-10.10 dBm		7.5 MHz	TG.Lvl	off	RF.Att	0 dB
F1	2.48350833190 GHz	D1	CF.Stp	10.000 MHz	Unit	[dBm]
F2	OFF	D2				
F2-F1	OFF	D1-D2				



---

## Part 3. Maximum Peak Output Power Measurement FCC 15.247 (c)

### Test Procedure:

Since the EUT antenna port was not accessible, peak power output data was obtained using the radiated substitution method to determine EIRP:

The maximum radiated emission (reference value) at each frequency was determined with the EUT on an 80 cm. table and at a test distance of 3m. Antenna was scanned 1-4m. and the table rotated 360 deg. The maximum reference value at each frequency was recorded.

The EUT was replaced with the substitution antenna at the same height (80cm.) and in line with the receive antenna. The receive antenna was set to the same height as it was for determining the reference value.

The substitution antenna was driven by a signal generator set to the same frequency used to determine the reference value. The power output of the signal generator was then increased until the reference value determined above was measured by the spectrum analyzer. This power value was recorded and is the *uncorrected* EIRP.

Corrections for cable loss, antenna gain and bandwidth are then made and the final value for EIRP recorded (see table below).

### Test Equipment:

HP spectrum analyzer w/ext. 6 dB pad

HP pre-amp

(2) Dual-Ridged Guide Antennas (receive + substitution)

Plotter

### Test Parameters:

RBW=1 MHz.

VBW=1 MHz.

Sweep=Auto

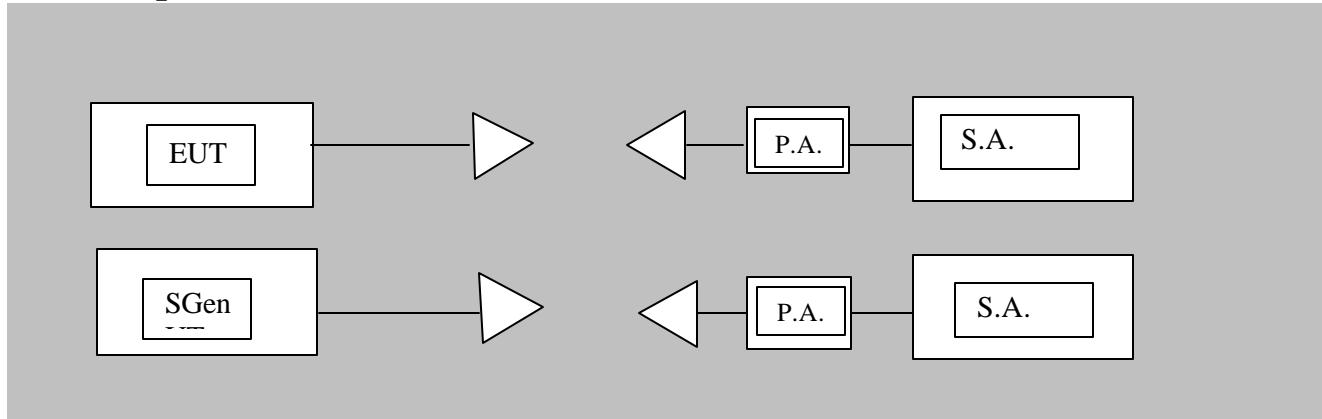
Detector=Peak

Atten= Auto (+ext. 6 dB pad)

Span=0

## Part 3. Maximum Peak Output Power Measurement FCC 15.247 (c) (continued)

### Test Setup:



### EUT Operating Conditions:

Software was provided by client to activate and maintain EUT transmitting continuously with max. power at the lowest, middle and highest channel frequencies individually. Data rate set at 11 Mb/s. Modulation is CCK. Bluetooth disabled.

### Test Results:

Channel	Channel Frequency (MHz)	Peak Power EIRP (dBm)	Peak Power Limit (dBm)	Pass / Fail
1	2412	1.4	30	Pass
6	2437	0.1	30	Pass
11	2462	1.7	30	Pass

### Test Data:

Channel	Channel Freq (MHz)	SA Reference (dBuV)	Signal Gen (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Band Width Correction (dB)	Peak Pwr EIRP (dBm)
1	2412.31	78.3	-16.2	5.1	9.9	12.8	1.4
6	2437.30	77.4	-17.5	5.1	9.9	12.8	0.1
11	2462.34	76.3	-15.9	5.2	9.9	12.8	1.7

## Part 3. Maximum Peak Output Power Measurement FCC 15.247 (c) (continued)

### Sample Calculations:

EIRP(dBm)=Sig. Gen.(dBm) – Cable Loss(dB) + Antenna Gain(dBi) + BandWidth Correction (dB)

Bandwidth Correction Factor=10 log (26 dB bandwidth of channel)

(Bandwidth(26dB) of 19.23 MHz. for channel 1 was used for calculation; no significant variation noted for all three channels. This method is worst case as it assumes a rectangular power distribution within the 26 dB bandwidth)

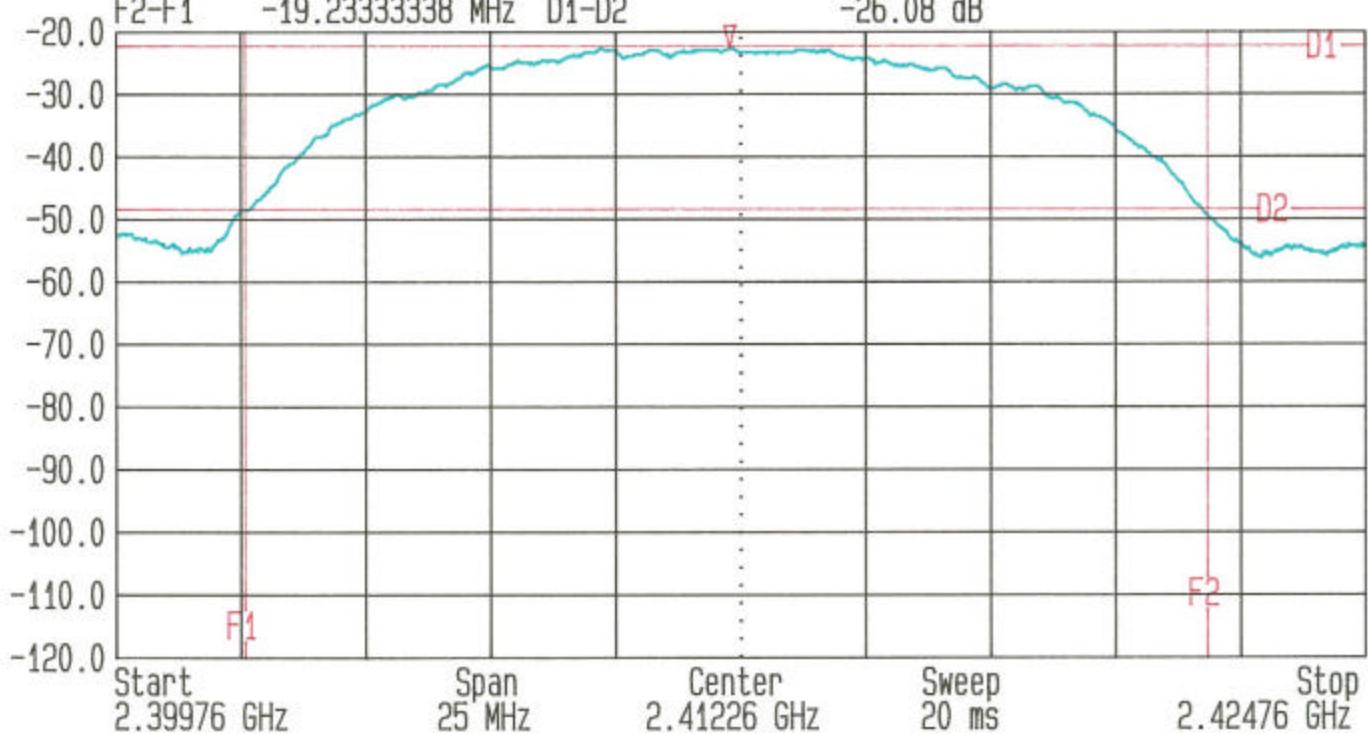
Note: The following three graphs illustrate the -26 dB bandwidths for each channel

Maximum Peak Output Power  
, Channel 1 Date: 21-June-2005,

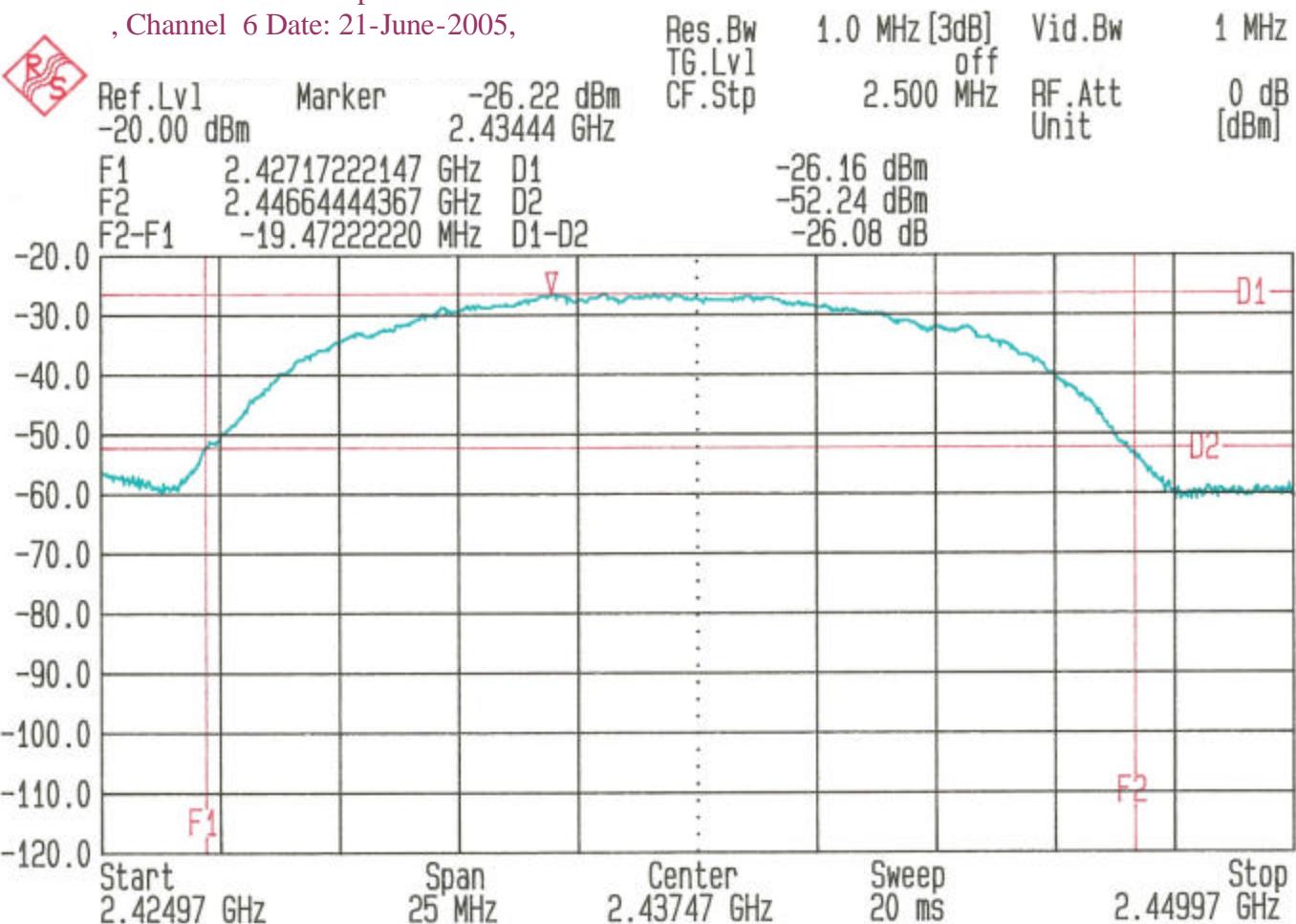


Ref.Lvl -20.00 dBm Marker -22.36 dBm  
2.41206 GHz  
F1 2.40235999996 GHz D1  
F2 2.42159333334 GHz D2  
F2-F1 -19.23333338 MHz D1-D2

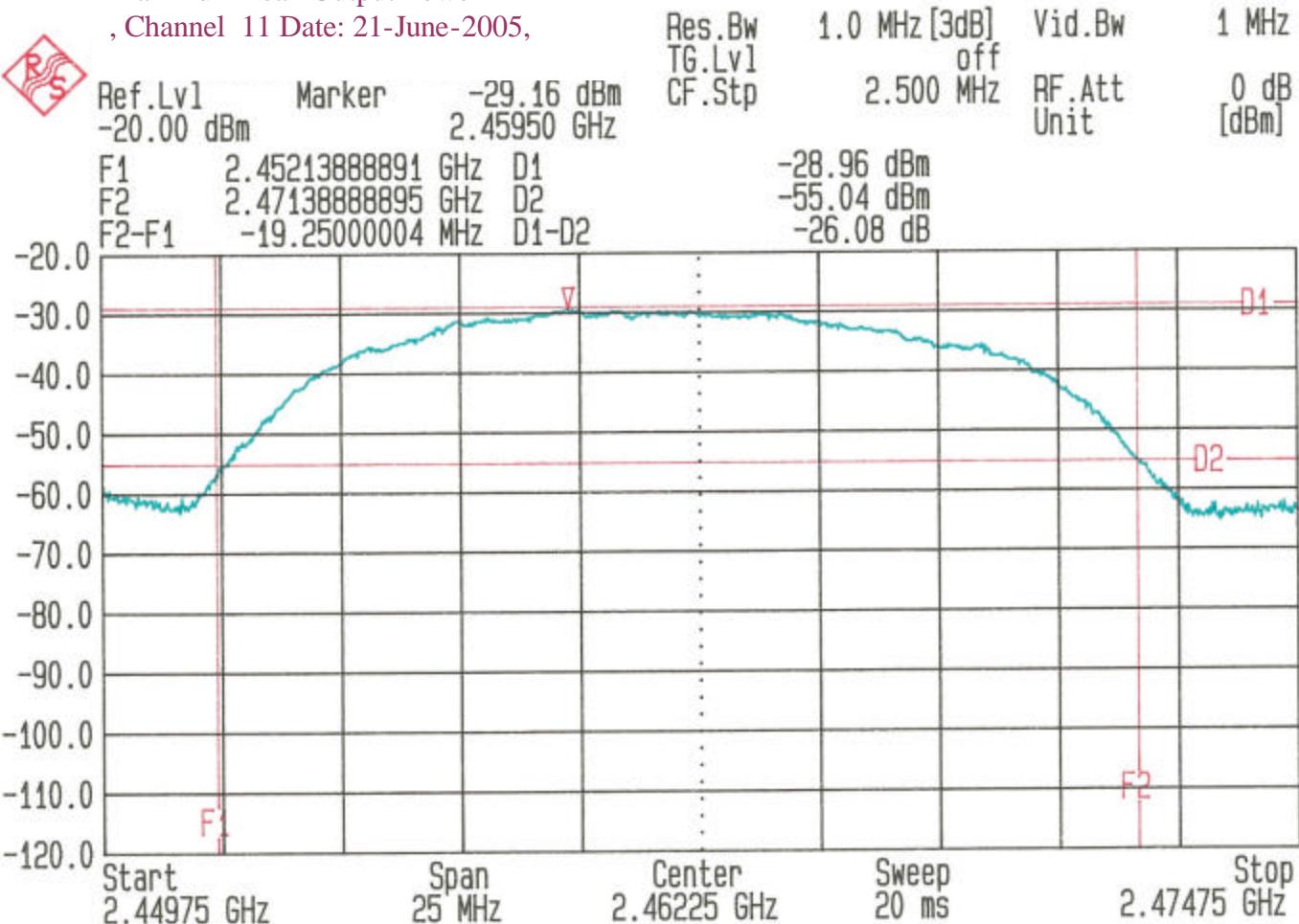
Res.Bw 1.0 MHz [3dB] off Vid.Bw 1 MHz  
TG.Lvl CF.Stp 2.500 MHz RF.Att Unit 0 dB  
[dBm]



Maximum Peak Output Power  
, Channel 6 Date: 21-June-2005,



Maximum Peak Output Power  
, Channel 11 Date: 21-June-2005,



## Part 4. Power Spectral Density Measurement FCC 15.247 (d)

### Test Procedure:

Same as peak power output measurement; EIRP method.

### Test Equipment:

Same as peak power output measurement.

### Test Parameters:

RBW=3 kHz.  
VBW=30 kHz.  
Sweep=Auto  
Detector=Peak  
Atten= Auto (+ext. 6 dB pad)  
Span=0

### Test Setup:

Same as peak power output measurement.

### EUT Operating Conditions:

Software was provided by client to activate and maintain EUT transmitting continuously with max. power at the lowest, middle and highest channel frequencies individually. Data rate set at 11 Mb/s. Modulation is CCK. Bluetooth disabled

### Test Results:

Channel	Channel Frequency (MHz)	Pwr Density (3 KHz) EIRP (dBm)	Max. Limit (dBm)	Pass / Fail
1	2412	-27.2	8	Pass
6	2437	-28.4	8	Pass
11	2462	-26.5	8	Pass

---

## Part 4. Power Spectral Density Measurement FCC 15.247 (d) (continued)

### Test Data:

Channel	Channel Freq (MHz)	SA Reference (dBuV)	Signal Gen (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Band Width Correction (dB)	Pwr Density (3KHz) EIRP (dBm)
1	2413.16	62.1	-32.0	5.1	9.9	0	-27.2
6	2437.36	61.3	-33.2	5.1	9.9	0	-28.4
11	2461.16	60.5	-31.3	5.2	9.9	0	-26.5

### Sample Calculations:

Same as peak power output measurement except no Bandwidth Correction Factor needed.

Note 1: The following three graphs are presented for reference only (not used for calculations).

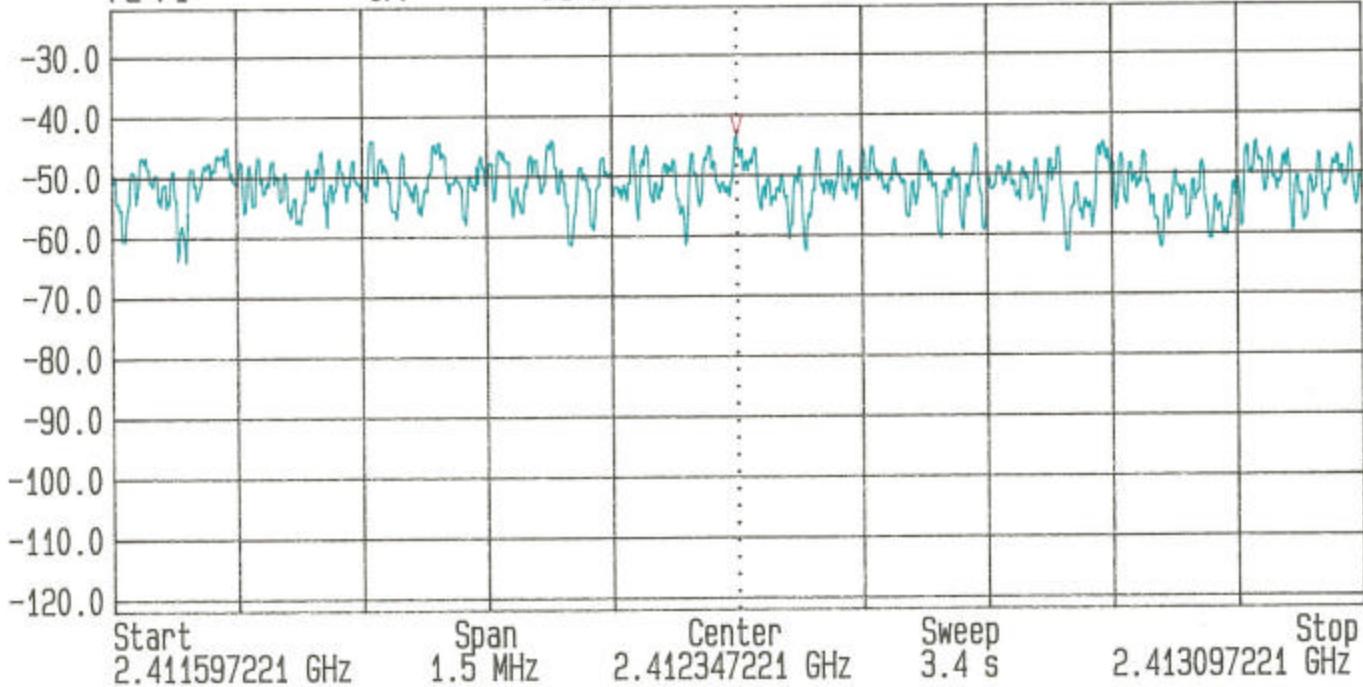
15.247(d)

Plot #4, Channel 1,

Date: 21-June-2005,



Ref.Lvl	Marker	-43.45 dBm	Res.Bw	3.0 kHz [3dB]	Vid.Bw	30 kHz
-22.00 dBm		2.412347 GHz	TG.Lvl	off		
F1	OFF	D1	CF.Stp	150.000 kHz	RF.Att	0 dB
F2	OFF	D2			Unit	[dBm]
F2-F1	OFF	D1-D2				

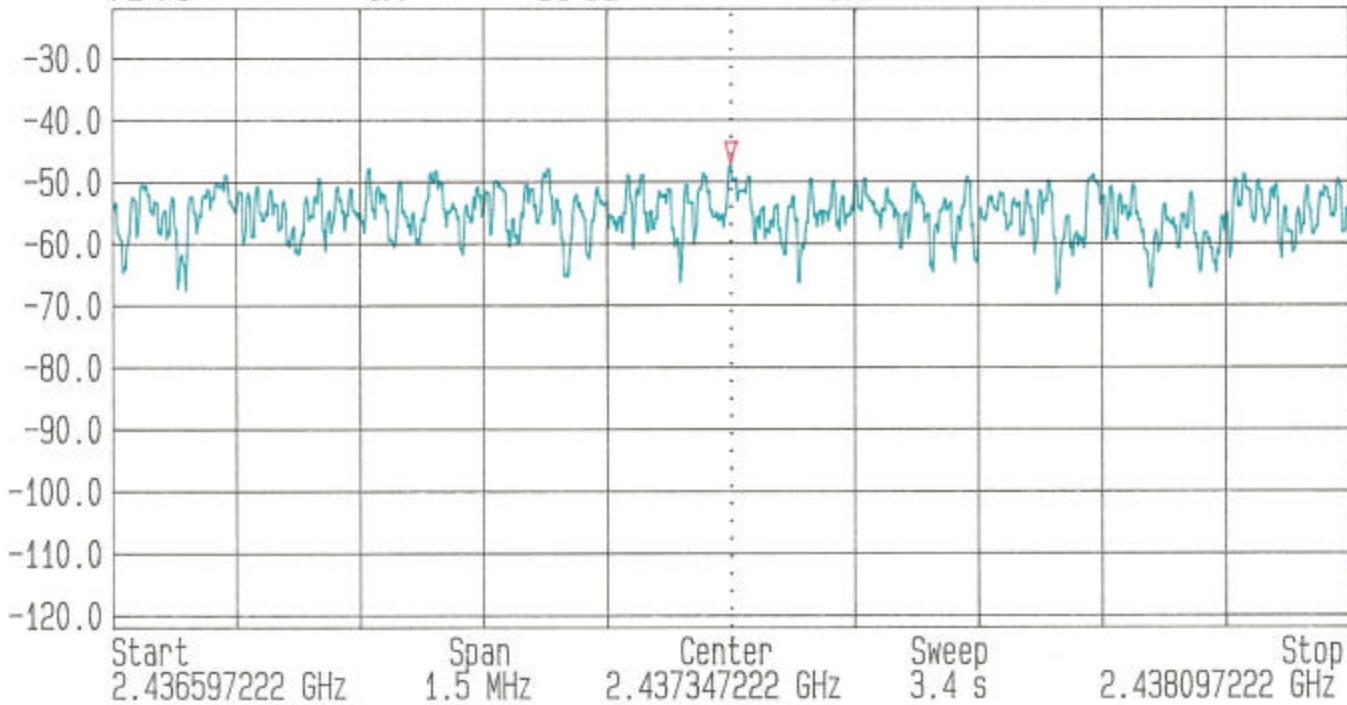


15.247(d) Plot #9, Channel 6,

Date: 21-June-2005,



Ref.Lvl -22.00 dBm	Marker 2.437347 GHz	Res.Bw TG.Lvl CF.Stp	3.0 kHz [3dB] off 150.000 kHz	Vid.Bw RF.Att Unit	30 kHz 0 dB [dBm]
F1 F2 F2-F1	OFF OFF OFF	D1 D2 D1-D2	OFF OFF OFF		

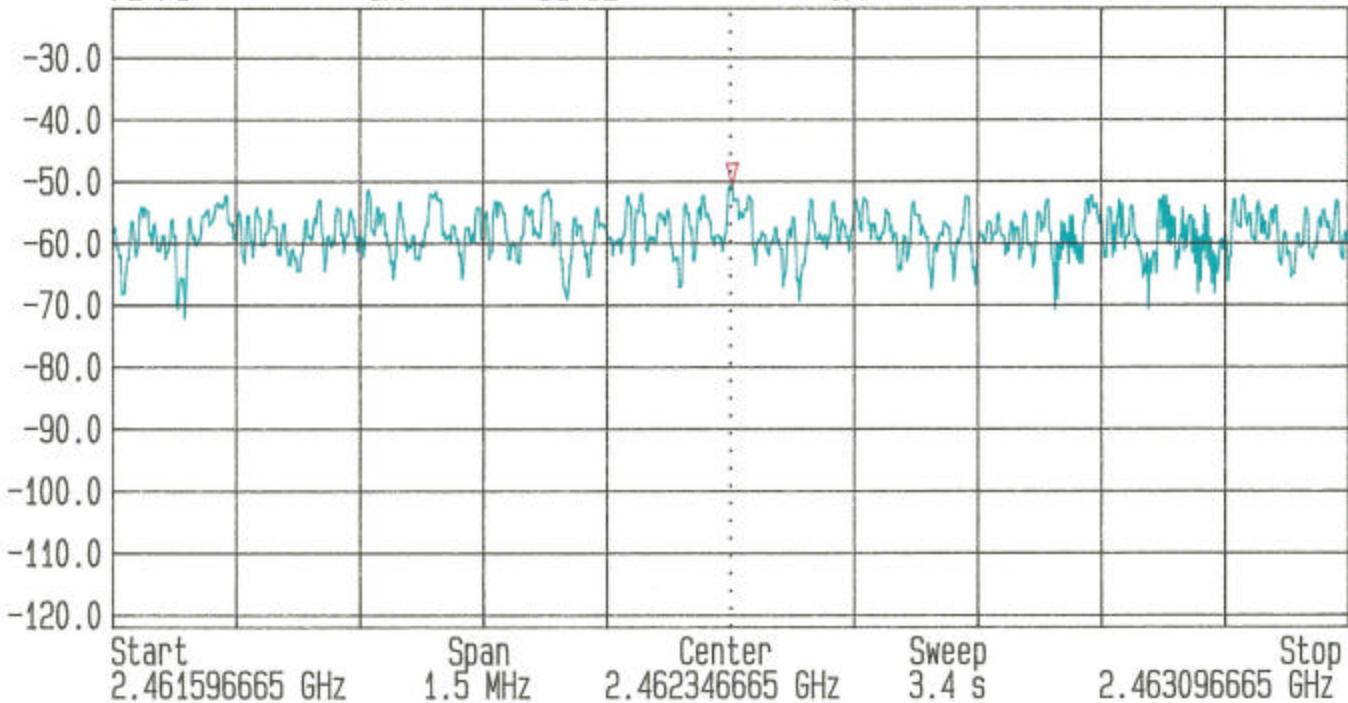


15.247(d)  
Date: 21-June-2005,

Plot #14, Channel 11,



Ref.Lvl	Marker	-50.54 dBm	Res.Bw	3.0 kHz [3dB]	Vid.Bw	30 kHz
-22.00 dBm		2.462349 GHz	TG.Lvl	off		
F1	OFF	D1	CF.Stp	150.000 kHz	RF.Att	0 dB
F2	OFF	D2			Unit	[dBm]
F2-F1	OFF	D1-D2		OFF		



---

## Part 5. Radiated Emissions FCC 15.247 (c)

### Test Procedure:

Radiated emission data was taken at test distances of 10m (30-1000 MHz.) and 3m.(over 1000 MHz.). The EUT was placed on an 80 cm. table. The antenna scan height was varied from 1-4m and the turntable was rotated through 360 deg.; the maximum emission values were recorded as appropriate. Procedures per FCC Part 15 for unintentional radiators and ANSI C63.4 were followed. The emission values were compared against FCC Class B (and 15.209) limits.

### Test Equipment:

HP spectrum analyzer.  
Ext. 6 dB pad (over 1000 MHz. only)  
HP pre-amp  
Bicon , log periodic and tuned dipole antennas (30-1000MHz.)  
Dual-ridged guide antenna (over 1000 MHz.)

### Test Parameters:

RBW=1 MHz.(over 1000 MHz.); 120 kHz.(30-1000MHz.)  
VBW=1 MHz.(over 1000 MHz.); 1 MHz. (30-1000 MHz.)  
Sweep=Auto  
Detector=Peak, QP, Ave. (as appropriate)  
Atten= Auto  
Span=0 for QP and Ave.; as necessary for Peak

### Test Setup:

Refer to Appendix A for photograph(s) of the actual test setup.

### EUT Operating Conditions:

Software was provided by client to activate and maintain EUT transmitting continuously with max. power at the selected channels. Data rate set at 11 Mb/s. Modulation is CCK. Bluetooth was disabled above 1000 MHz.; enabled below 1000 MHz. EUT was also running its normal operational functions during these test.

Below 1000 MHz., channels 11 (Wi-Fi) and 78 (Bluetooth) were selected as worst case. Above 1000 MHz., each Wi-Fi channel (low, mid and high) was selected individually and Bluetooth was disabled

## Test Results:

### 30-1000 MHz.:

The highest emissions noted were -3.1 dB to the Class B (15.209) limit:  
118.95 MHz., 142.99 MHz., 168.99MHz., 436.13 MHz

### 1-25 GHz.:

The highest emissions noted were:

Ch. 1: -9.2 dB @ 14473.80 MHz. to the Class B (15.209) limit

Ch. 6: -9.3 dB @ 17060.08 “

Ch.11: -7.9 dB @ 17234.75 “

## Test Data:

Refer to the following pages

EUT : Bay Computer Pepper  
: 30 MHz – 1 GHz  
:  
:

Receiver BW : 120 KHz, 30-1000 MHz

Receiver BW : 1 MHz, 1-40 GHz

## Data by Test Site Services Co

Engineer : R Wiedeman  
Technician : T Charron  
Antenna Ht : 1-4 Meters  
Antenna Sep : 10 Meters, 30-1000 MHz  
Antenna Sep : 3 Meters, 1-40 GHz  
Temperature: 70F  
Rel. Humidity: 50%

Ambient Check:  
96.1 MHz 55.1  
525.25 MHz 26.95  
1938.42 MHz 71.65

Test: B05143R  
Date: 5/17/2005  
Power: 230Vac50Hz  
Spec: CISPR  
Class B

Antennas Used:  
Horn\_A  
Biconical\_A  
Log Periodic\_A  
Tuned Dipole

Freq MHz	Signal Level dBuV	Antenna Polariz H/V	Antenna Height cm	Table Azimuth Degrees	Detector P/QP	Antenna Factor dB	Cable Loss dB	Amp. Factor dB	Product Level dBuV/M	Limit CISPR B dBuV/M	Margin CISPR B dB	Limit FCC B dBuV/M	Margin FCC B dB
33.87	5.9	V	100	138	PK	16.9	0.7	0.0	23.5	30.0	-6.6	29.5	-6.1
42.06	8.6	V	100	0	PK	15.0	0.7	0.0	24.3	30.0	-5.8	29.5	-5.3
45.16	10.0	V	100	239	PK	14.4	0.8	0.0	25.2	30.0	-4.9	29.5	-4.4
45.16	6.8	V	100	239	QP	14.4	0.8	0.0	22.0	30.0	-8.0	29.5	-7.5
48.01	11.2	V	100	351	PK	13.5	0.8	0.0	25.5	30.0	-4.5	29.5	-4.0
48.01	8.3	V	100	351	QP	13.5	0.8	0.0	22.6	30.0	-7.4	29.5	-6.9
64.98	18.1	V	100	180	PK	7.4	0.9	0.0	26.4	30.0	-3.6	29.5	-3.1
64.98	16.2	V	100	180	QP	7.4	0.9	0.0	24.5	30.0	-5.5	29.5	-5.0
115.63	15.5	V	100	157	PK	12.1	1.2	0.0	28.8	30.0	-1.2	33.1	-4.3
115.63	12.9	V	100	157	QP	12.1	1.2	0.0	26.2	30.0	-3.8	33.1	-6.9
118.95	15.3	V	100	130	PK	12.7	1.2	0.0	29.2	30.0	-0.9	33.1	-4.0
118.95	13.1	V	100	130	QP	12.7	1.2	0.0	27.0	30.0	-3.1	33.1	-6.2
129.99	10.8	V	100	117	PK	13.7	1.3	0.0	25.8	30.0	-4.3	33.1	-7.4
129.99	8.5	V	100	117	QP	13.7	1.3	0.0	23.5	30.0	-6.5	33.1	-9.6
142.99	14.4	V	100	334	PK	14.5	1.4	0.0	30.3	30.0	0.3	33.1	-2.8
142.99	11.0	V	100	334	QP	14.5	1.4	0.0	26.9	30.0	-3.1	33.1	-6.2
150.04	14.5	V	100	123	PK	14.8	1.4	0.0	30.7	30.0	0.6	33.1	-2.5
150.04	9.8	V	100	123	QP	14.8	1.4	0.0	26.0	30.0	-4.0	33.1	-7.1
156.00	15.6	V	100	130	PK	14.9	1.4	0.0	31.9	30.0	1.9	33.1	-1.3
156.00	10.3	V	100	130	QP	14.9	1.4	0.0	26.6	30.0	-3.4	33.1	-6.5

Freq	Signal	Antenna	Antenna	Table	Detector	Antenna	Cable	Amp.	Product	Limit	Margin	Limit	Margin
	Level	Polariz	Height	Azimuth		Factor	Loss	Factor	Level	CISPR	CISPR	FCC	FCC
										B	B	B	B
MHz	dBuV	H/V	cm	Degrees	P/QP	dB	dB	dB	dBuV/M	dBuV/M	dB	dBuV/M	dB
168.99	14.1	V	100	362	PK	15.4	1.5	0.0	31.0	30.0	1.0	33.1	-2.2
168.99	10.0	V	100	362	QP	15.4	1.5	0.0	26.9	30.0	-3.1	33.1	-6.2
194.98	12.0	V	100	332	PK	16.7	1.6	0.0	30.3	30.0	0.3	33.1	-2.8
194.98	8.4	V	100	332	QP	16.7	1.6	0.0	26.7	30.0	-3.3	33.1	-6.4
207.98	9.1	V	100	316	PK	17.0	1.7	0.0	27.8	30.0	-2.2	33.1	-5.3
207.98	7.8	V	100	316	QP	17.0	1.7	0.0	26.5	30.0	-3.5	33.1	-6.6
246.98	11.8	V	100	48	PK	17.7	1.9	0.0	31.4	37.0	-5.6	35.6	-4.2
259.90	9.8	V	100	48	PK	17.9	1.9	0.0	29.6	37.0	-7.4	35.6	-6.0
272.98	12.2	V	100	413	PK	18.2	1.9	0.0	32.3	37.0	-4.8	35.6	-3.4
272.98	8.4	V	100	413	QP	18.2	1.9	0.0	28.5	37.0	-8.5	35.6	-7.1
277.54	12.1	V	118	413	PK	18.4	2.0	0.0	32.5	37.0	-4.5	35.6	-3.1
277.54	8.6	V	118	413	QP	18.4	2.0	0.0	29.0	37.0	-8.0	35.6	-6.6
285.98	9.2	V	118	1	PK	17.6	2.0	0.0	28.8	37.0	-8.3	35.6	-6.9
299.89	13.2	H	402	169	PK	16.2	2.0	0.0	31.4	37.0	-5.7	35.6	-4.3
311.98	18.5	H	233	144	PK	16.1	2.1	0.0	36.7	37.0	-0.3	35.6	1.1
311.98	14.9	H	233	144	QP	16.1	2.1	0.0	33.1	37.0	-3.9	35.6	-2.5
317.19	16.3	H	238	134	PK	16.1	2.1	0.0	34.5	37.0	-2.5	35.6	-1.1
317.19	12.1	H	238	134	QP	16.1	2.1	0.0	30.3	37.0	-6.7	35.6	-5.3
337.01	13.0	H	238	250	PK	15.9	2.2	0.0	31.1	37.0	-6.0	35.6	-4.6
350.98	11.4	H	245	36	PK	15.8	2.2	0.0	29.4	37.0	-7.6	35.6	-6.2
368.65	13.8	H	212	67	PK	15.7	2.3	0.0	31.8	37.0	-5.2	35.6	-3.8
398.65	14.45	H	200	0	PK	15.5	2.4	0.0	32.4	37.0	-4.7	35.6	-3.3
398.65	10.35	H	200	0	QP	15.5	2.4	0.0	28.3	37.0	-8.8	35.6	-7.4
415.97	14.85	H	172	191	PK	16.0	2.4	0.0	33.3	37.0	-3.8	35.6	-2.4
415.97	9.69	H	172	191	QP	16.0	2.4	0.0	28.1	37.0	-8.9	35.6	-7.5
436.13	17.85	H	161	370	PK	16.7	2.5	0.0	37.1	37.0	0.0	35.6	1.5
436.13	14.73	H	161	370	QP	16.7	2.5	0.0	33.9	37.0	-3.1	35.6	-1.7
455.95	13.45	H	117	394	PK	17.3	2.5	0.0	33.3	37.0	-3.8	35.6	-2.4
455.95	8.1	H	117	394	QP	17.3	2.5	0.0	27.9	37.0	-9.1	35.6	-7.7
493.96	10.3	H	100	348	PK	18.3	2.5	0.0	31.1	37.0	-5.9	35.6	-4.5
498.31	15.25	H	134	168	PK	18.5	2.5	0.0	36.3	37.0	-0.8	35.6	0.6
498.31	12.43	H	134	168	QP	18.5	2.5	0.0	33.4	37.0	-3.6	35.6	-2.2



TestType **Qualification**

EUT : **Bay Computer**  
 : **Pepper**  
 :  
 : **1.25 GHz**

Receiver BW : 1 MHz, 1-40 GHz  
 No signals observed above: 17235.669 MHz

**RADIATED EMISSIONS E FIELD**

Data by Test Site Services Co

Engineer : R Wiedeman  
 Technician : T Charron  
 : B Farrell  
 Antenna Ht : 1-4 Meters

Ambient Check:  
 96.1 MHz N/A  
 525.25 MHz N/A  
 1938.42 MHz 72.65

Test: B05143R  
 Date: 6/21/2005  
 Power: 120Vac60Hz  
 Spec: FCC  
 Class B  
 Antennas Used:  
 Horn\_A

Antenna Sep : 3 Meters, 1-40 GHz  
 Temperature: 74F  
 Rel. Humidity: 52%

Freq MHz	Signal Level dBuV	Antenna Polariz H/V	Antenna Height cm	Table Azimuth Degrees	Detector P/QP	Antenna Factor dB	Cable Loss dB	Amp. Factor dB	Product Level dBuV/M	Limit FCC B dBuV/M	Margin FCC B dB	Res BWs	Video BW
	<b>6 dB Attenuator In-Line for below readings</b>												
	<b>Channel # 1 2.41226 GHz</b>												
1110.15	36.20	V	100	234	PK	24.9	2.9	-36.3	27.7	54.0	-26.3	1 MHz	1 MHz
1206.13	30.50	V	100	174	PK	25.0	3.1	-36.1	22.5	54.0	-31.5	1 MHz	1 MHz
1295.60	37.40	V	100	172	PK	25.1	3.3	-35.9	29.9	54.0	-24.1	1 MHz	1 MHz
2333.79	39.45	V	100	357	PK	28.3	4.6	-35.3	37.1	54.0	-17.0	1 MHz	1 MHz
2343.89	33.90	V	100	2	PK	28.3	4.6	-35.3	31.5	54.0	-22.5	1 MHz	1 MHz
2412.29	77.25	V	100	179	PK	28.4	4.7	-35.3	75.1	54.0	21.1	1 MHz	1 MHz
4823.98	28.25	V	100	298	PK	33.0	6.3	-34.9	32.7	54.0	-21.4	1 MHz	1 MHz
7236.90	27.45	V	100	185	PK	35.9	8.0	-35.2	36.2	54.0	-17.9	1 MHz	1 MHz
9647.93	30.90	V	100	92	PK	38.1	8.9	-35.7	42.2	54.0	-11.8	1 MHz	1 MHz
9647.93	25.16	V	100	92	AV	38.1	8.9	-35.7	36.5	54.0	-17.5	1 MHz	10 Hz
12061.42	23.95	V	100	154	PK	39.4	10.2	-34.5	39.1	54.0	-15.0	1 MHz	1 MHz
14473.80	23.22	V	100	205	PK	42.1	10.9	-34.1	42.1	54.0	-11.9	1 MHz	1 MHz
14473.80	19.89	V	100	205	AV	42.1	10.9	-34.1	38.8	54.0	-15.2	1 MHz	10 Hz
16886.10	27.25	V	100	209	PK	40.3	12.2	-35.5	44.3	54.0	-9.8	1 MHz	1 MHz
16886.10	20.80	V	100	209	AV	40.3	12.2	-35.5	37.8	54.0	-16.2	1 MHz	10 Hz
	<b>No Other EUT Signals Observed Above 17235.669 GHz</b>												

Freq	Signal	Antenn a	Antenna	Table	Detector	Antenn a	Cable	Amp.	Product	Limit	Margin	Res BW	Video BW
	Level	Polariz	Height	Azimuth		Factor	Loss	Factor	Level	FCC	FCC		
										B	B		
MHz	dBuV	H/V	cm	Degrees	P/QP	dB	dB	dB	dBuV/ M	dBuV/M	dB		
	<b>Channel # 6</b> <b>2.437722 GHz</b>												
1110.14	38.35	V	100	220	PK	24.9	2.9	-36.3	29.9	54.0	-24.2	1 MHz	1 MHz
1195.94	38.60	V	100	98	PK	25.0	3.1	-36.1	30.6	54.0	-23.4	1 MHz	1 MHz
1218.61	29.30	V	100	280	PK	25.0	3.1	-36.1	21.3	54.0	-32.7	1 MHz	1 MHz
1295.60	37.80	V	100	169	PK	25.1	3.3	-35.9	30.3	54.0	-23.7	1 MHz	1 MHz
1395.26	35.80	V	100	231	PK	25.1	3.4	-35.8	28.5	54.0	-25.5	1 MHz	1 MHz
1494.92	34.55	V	100	236	PK	25.2	3.6	-35.6	27.8	54.0	-26.3	1 MHz	1 MHz
2332.89	38.60	V	100	414	PK	28.3	4.6	-35.3	36.2	54.0	-17.8	1 MHz	1 MHz
2343.41	34.10	V	100	414	PK	28.3	4.6	-35.3	31.7	54.0	-22.3	1 MHz	1 MHz
2437.23	73.40	V	100	177	PK	28.5	4.8	-35.3	71.4	54.0	17.4	1 MHz	1 MHz
4873.98	28.75	V	100	401	PK	33.1	6.3	-34.9	33.3	54.0	-20.8	1 MHz	1 MHz
7311.24	23.85	V	100	264	PK	36.1	8.1	-35.2	32.9	54.0	-21.2	1 MHz	1 MHz
9748.48	24.15	V	100	241	PK	38.1	9.0	-35.7	35.6	54.0	-18.5	1 MHz	1 MHz
12185.62	23.60	V	100	128	PK	39.3	10.2	-34.5	38.6	54.0	-15.4	1 MHz	1 MHz
14622.14	27.00	V	100	153	PK	41.7	11.0	-34.3	45.4	54.0	-8.6	1 MHz	1 MHz
14623.74	20.08	V	100	153	AV	41.7	11.1	-34.3	38.6	54.0	-15.4	1 MHz	10 Hz
17060.08	27.70	V	100	214	PK	41.1	12.3	-35.4	45.7	54.0	-8.3	1 MHz	1 MHz
17060.08	20.69	V	100	214	AV	41.1	12.3	-35.4	38.7	54.0	-15.3	1 MHz	10 Hz
	<b>No Other EUT Signals Observed Above 17235.669 GHz</b>												

Freq	Signal	Antenna	Antenna	Table	Detector	Antenna	Cable	Amp.	Product	Limit	Margin	Res BW	Video BW
	Level	Polariz	Height	Azimuth		Factor	Loss	Factor	Level	FCC	FCC		
										B	B		
MHz	dBuV	H/V	cm	Degrees	P/QP	dB	dB	dB	dBuV/M	dBuV/M	dB		
<b>Channel # 11</b>													
<b>2.46225 GHz</b>													
1110.14	39.30	V	100	227	PK	24.9	2.9	-36.3	30.8	54.0	-23.2	1 MHz	1 MHz
1195.94	34.80	V	100	239	PK	25.0	3.1	-36.1	26.8	54.0	-27.2	1 MHz	1 MHz
1231.12	24.05	V	100	0	PK	25.0	3.2	-36.0	16.3	54.0	-37.8	1 MHz	1 MHz
1295.60	37.00	V	100	407	PK	25.1	3.3	-35.9	29.5	54.0	-24.5	1 MHz	1 MHz
1395.26	34.60	V	100	228	PK	25.1	3.4	-35.8	27.3	54.0	-26.7	1 MHz	1 MHz
1494.92	33.65	V	100	208	PK	25.2	3.6	-35.6	26.9	54.0	-27.2	1 MHz	1 MHz
2333.06	37.40	V	100	50	PK	28.3	4.6	-35.3	35.0	54.0	-19.0	1 MHz	1 MHz
2343.49	29.40	V	100	316	PK	28.3	4.6	-35.3	27.0	54.0	-27.0	1 MHz	1 MHz
2462.25	71.20	V	100	184	PK	28.5	4.8	-35.3	69.2	54.0	15.2	1 MHz	1 MHz
4923.99	28.30	V	100	22	PK	33.2	6.4	-34.9	33.0	54.0	-21.0	1 MHz	1 MHz
7386.24	24.45	V	100	414	PK	36.3	8.2	-35.2	33.8	54.0	-20.3	1 MHz	1 MHz
9848.49	24.10	V	100	239	PK	38.1	9.0	-35.7	35.5	54.0	-18.5	1 MHz	1 MHz
12310.74	23.70	V	100	196	PK	39.1	10.1	-34.5	38.4	54.0	-15.6	1 MHz	1 MHz
14772.99	26.20	V	100	63	PK	41.1	11.2	-34.4	44.1	54.0	-9.9	1 MHz	1 MHz
14772.99	19.86	V	100	63	AV	41.1	11.2	-34.4	37.8	54.0	-16.2	1 MHz	10 Hz
17235.67	27.20	V	100	164	PK	42.1	12.4	-35.4	46.3	54.0	-7.7	1 MHz	1 MHz
17234.75	21.05	V	100	164	AV	42.1	12.4	-35.4	40.2	54.0	-13.9	1 MHz	10 Hz
<b>No Other EUT Signals Observed Above 17235.669 GHz</b>													

## Part 6. Conducted Emissions FCC 15.207

### Test Procedure:

Conducted Emission data was obtained using a spectrum analyzer connected to a Line Impedance Network (LISN) via an RF Cable.

Both power leads to the EUT were measured and data recorded for undesirable emissions over the frequency range of 150 KHz to 30 MHz. Levels detected that were at least 20 dB below the Class A Limit were not recorded.

### Test Equipment:

HP spectrum analyzer.  
LISN

### Test Parameters:

RBW= 9 KHz  
VBW= 100 KHz  
Sweep=Auto  
Detector=Peak, QP, Ave. (as appropriate)  
Atten= Auto  
Span=0 for QP and Ave.; as necessary for Peak

### Test Setup:

The EUT was placed 40 cm from a conductive wall of a shielded enclosure and connected to the AC power mains (120 VAC /60 Hz) via a LISN which meets the requirements of ANSI 63.4 (50 Ohm and 50 uH impedance). The EUT was on an 80 cm. table.

Refer to Appendix A for photograph(s) of the actual test setup.

### EUT Operating Conditions:

Software was provided by client to activate and maintain EUT transmitting continuously with max. power at the selected channels. Data rate set at 11 Mb/s. Modulation is CCK. EUT was running its normal operational functions during these test.

Channels 11 (Wi-Fi) and 78 (Bluetooth) were selected as worst case.

### Test Results:

The highest emission noted was:-10.4 dB to the Class B (15.207) limit.

### Test Data:

Refer to the following page:

Test Type: **Qualification** Note : FCC and CISPR Margins Reflect Data Taken With  
.....Reference Distance = 40cm from Vertical Wall

EUT : Bay Computer  
: Pepper  
:  
:  
:

Receiver BW : 200 Hz from 10 kHz - 150 kHz  
: 9 kHz from 150 kHz - 30 MHz

## CONDUCTED EMISSIONS (LISN)

## Data by Test Site Services Co

Engineer : R. Wiedeman  
Tech : T Charron

Test : B05143FC  
Date : 5/19/2005  
Power : 120Vac60Hz  
Spec : CISPR  
Class B

Temperature: 70F  
Relative 45%  
Humidity:

LISN : Schwarzbeck  
8120

Freq MHz	Detector P/QP Ave	Hot Lead dBuV	Neut Lead dBuV	Cable Loss dB	Corr Fact dB	Product Level dBuV	Limit CISPR B dBuV	Margin CISPR B AVEdB
0.1831	PK	42.0	39.8	0.1	0.0	42.1	54.3	-12.3
0.2537	PK	39.2	38.5	0.1	0.0	39.3	51.6	-12.4
0.4448	PK	35.7	36.5	0.1	0.0	36.6	47.0	-10.4
1.2320	PK	33.9	33.7	0.2	0.1	34.2	46.0	-11.9
3.5880	PK	34.6	33.0	0.4	0.1	35.1	46.0	-10.9
4.8600	PK	35.0	32.1	0.4	0.1	35.5	46.0	-10.6
5.0200	PK	33.8	32.0	0.5	0.1	34.4	50.0	-15.6
7.3230	PK	31.8	24.3	0.6	0.2	32.6	50.0	-17.5
9.3040	PK	29.4	25.2	0.7	0.3	30.4	50.0	-19.7
12.0000	PK	22.4	19.2	0.8	0.4	23.6	50.0	-26.5
14.7100	PK	25.0	20.1	0.9	0.5	26.4	50.0	-23.7
17.3900	PK	23.3	23.2	1.0	0.6	24.9	50.0	-25.2
21.7000	PK	23.7	23.6	1.1	0.9	25.7	50.0	-24.4
23.1300	PK	24.1	21.7	1.1	1.1	26.3	50.0	-23.7
26.5400	PK	16.4	15.2	1.2	1.1	18.7	50.0	-31.4

Side of Line	Comments
Hot	
Hot	
Neut	
Hot	

---

**Part 7. Antenna Requirement FCC 15.203 and FCC 15. 247 (b)**

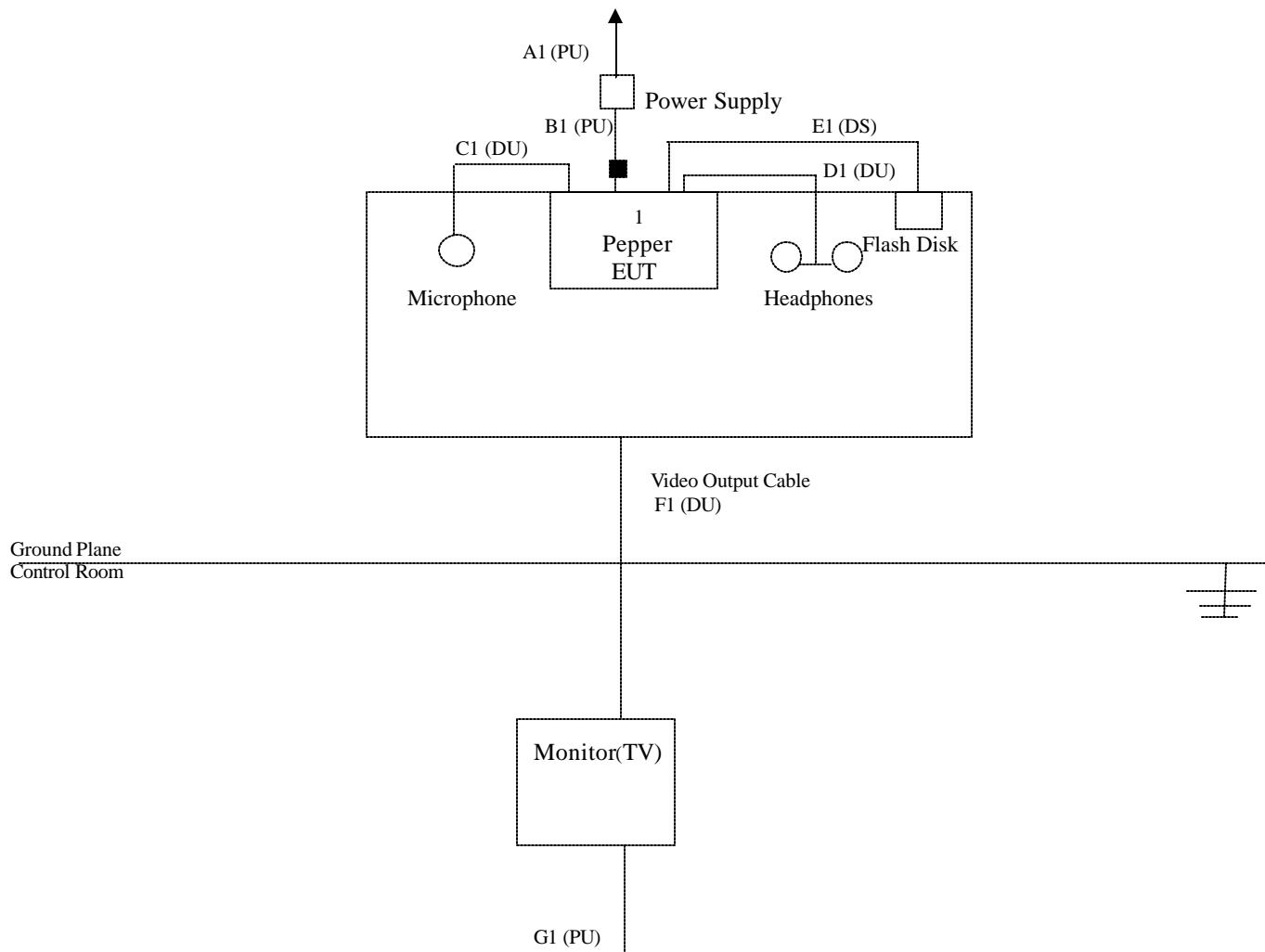
An intentional radiator must be designed such that no antenna other than that furnished by the responsible party (manufacturer) shall be used with the device.

If a transmitting antenna having directional gain greater than 6 dBi is used, the transmit power shall be reduced by the dB amount that the directional gain exceeds 6dBi.

The antenna used in this product is internally connected to the transmitter module such that its input terminals are inaccessible. The maximum gain of this antenna is  n/a  dBi

(EIRP measurements were taken and are within the limit, therefore no gain correction is necessary.)

## Block Diagram for Pepper Wireless PAD



PS = Power Cord Shielded DS = Data Cable Shielded CX = Coaxial Cable PU = Power Cord Unshielded  
DU = Data Cable Unshielded FL = Fiber Link ■ = Ferrite Bead □ = Connector □ = Terminator

## EUT Technical Data – Block Identifier 1

**Description** : Portable PC with Wireless Capability

**Manufacturer** : Pepper Computer Inc.

**Model Number** : PP20624

**Part#/Rev** :

**Serial #** : P27

**FCC Identifier** : FCC ID: S5Y1234

**Power (Rated)** : 5 VDC **Current** : 3 A

**Power (Tested)** : 5 VDC **Current** : 3 A

*Internal Options:*

<b>Description</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Part Number</b>
11 MBPS Wireless LAN CF Card.	Gemtek	WL-672	FCC ID:MXF-F910131	14AAJ
802.11b compliant.				
Bluetooth Chipset.	Infineon	ROK104001 module		ROK_104_001
Bluetooth chip	Murata	LDA31		LDA312G7313F-237
Antenna				
LCD	Toshiba	LTM08C3555		
Hard Disk	Toshiba	HDD1422	24CF0428S	MK2004GAL

*External Options:*

<b>Description</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Part Number</b>
AC Adapter (1)	CUI INC	KSAFD0500300		

Headset

Microphone

*Frequencies Generated:*

32.768 kHz 13 MHz 14.31818 MHz 24.5760 MHz 39.65 MHz 624 MHz  
2400-2483.5 Mhz.(Wi-Fi, Bluetooth)

**Comments:** With clamp-on ferrite (Fair-Rite part # 0443167251) on Power Cable (EUT end)

## Additional Items for Pepper Wireless PAD

- ? 8.4 inch color display with touch screen
- ? Intel XScale PXA270 (624 MHz) Processor
- ? 20 GB disk drive
- ? Two rechargeable lithium batteries
- ? QWERTY keypad
- ? 20-bit stereo CODEC
- ? SD/MMC Card
- ? Instant-on capabilities
- ? Intuitive Pepper software and applications
- ? 802.11b WI-FI
- ? Bluetooth device support
- ? Only 2.3 lbs

## Support Equipment Data – Block Identifier 2

**Description** : Flashdisk Carrier

**Manufacturer** : SanDisk

**Model Number** : ImageMate SD/MMC

**Part#/Rev** : 20-90-00093

**Serial #** : 165052

**FCC Identifier** :

**Power (Rated)** : 5 VDC      **Current** :

**Power (Tested)** : 5 VDC      **Current** :

*Internal Options:*

<b>Description</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Part Number</b>
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*External Options:*

<b>Description</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Part Number</b>
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*Frequencies Generated:*

*Comments:*

## Support Equipment Data – Block Identifier 3

**Description** : 13" Television

**Manufacturer** : Sylvania

**Model Number** : SRT139

**Part#/Rev** : n/a

**Serial #** : J30927933

**FCC Identifier** : n/a

**Power (Rated)** : 120 VDC      **Current** :

**Power (Tested)** : 120 VDC      **Current** :

*Internal Options:*

<b>Description</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Part Number</b>
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*External Options:*

<b>Description</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Part Number</b>
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*Frequencies Generated:*

*Comments:*

## Cable Descriptions

Cable ID	Number of Cables	Function	Type Shielded Y/N	Length	Number of Conductors	Connector Shell Shielded Y/N	Part Number	Miscellaneous
A1	1	AC power	N	6 ft	2	No	Model KSAFD0500300W1US	CUI Inc AC Adapter.
B1	1	DC power	N	7 ft	2	N		
C1	1	Microphone	Y	7 ft	2	N	Desk Mic 524	Labtec
D1	1	Headset	Y	3 meters	3	N	HD 497	Sennheiser Headset
E1	1	Data	Y	7 feet	5	Y	F3u133-7-G-STV	USB (Staples)
F1	1	Video Splitter	Y	8 ft	3	Y	Radio Shack	
G1	1	AC power	N	6 feet	3	N		

## Test Software Description

**Title:** Uboot Build Date May 2<sup>nd</sup> 2005

Hard Drive—Linux (none) 2.4.20\_mvlcee31-pepperpad2 #691 Wed Apr 27 13:58:39 EDT 2005

**Part # / Rev.:**

**Function:** Provide necessary test sequences/settings

**Repeat Time:** Continuous

---

## Operational Mode(s) Available:

1. Continuously playing a video on LCD display or video monitor
2. Transferring data two/from SanDisk via USB interface & accessing hard drive
3. Playing stored music or audio from Video over Headset
4. Recording audio via internal or external mic
5. Operating on Battery or DC power
6. Wi-Fi Interface
7. Bluetooth Interface

---

## Mode(s) Tested:

1. Continuous playing video on LCD display (worst case)
2. Transferring data to/from SanDisk via USB interface & accessing hard drive
3. Playing music from Video over Headset.
4. External mic plugged in
5. Operating on DC power
6. Wi-Fi enabled (all tests)
7. Bluetooth Interface enabled as necessary(selected tests)

---

## Rationale:

Exercises all functions of the EUT and provides individual selection of 802.11b (Wi-Fi) Channels for test purposes.

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## Run Instructions

Let pepper keeper finish booting.

Ctrl+1 [brings up xterm window]

/etc/init.d/pad-sleep stop [ensures the pad will not go to sleep mid test]

cd /sys/devices/pxasys

insmod /usbhd/emitest

echo "suspend powerdown 0" > codec\_clock/power [ensures an unused clock is off]

echo "resume poweron" > pepper\_kpl/power [turns on keypad backlights]

cd /usbhd

./testcopyloop.sh [runs an infinite copy loop back and forth over the USB]

Ctrl+1 [brings up xterm window]

cd /home/emitest

./testcopyloop.sh [runs an infinite copy loop on the hard drive.]

Ctrl+1 [brings up xterm window]

mplayer -fs -loop 5000 opt/Video/Alien.mpeg [plays a full screen video with sound 5000 times]

---

## Run individual WiFi Channels

Note: ^=space

Ctrl+1 [brings up xterm window]

/opt/hostap-utils/prism2\_parm^wifiØ^antsel\_tx^ox1=ch1, ox6=ch6, oxB=ch11.

---

## Disable Bluetooth

Ctrl+1 /etc/init.d/obextool^stop

Insmod^pepper^modpwr

Echo "suspend powerdown Ø" ^/sys/bus/pxasys/devices/Bluetooth/power

---

## Run individual Bluetooth Channels

Transmit continuous @ 2402 MHz fixed (RX 2480)

hcitool cmd 0X3f 0X0019 0Xe9 0X81 0X67 0Xeb 0X04 0X00 0X00  
0X4e 0X00 0X04 0X16 0X00

Transmit continuous @ 2441 MHz fixed (RX 240A)

hcitool cmd 0X3f 0X0019 0Xe9 0X81 0X67 0Xeb 0X04 0X00 0X4e  
0X00 0X00 0X04 0X1b 0X00

Transmit continuous @ 2480 MHz (RX 2402)

hcitool cmd 0X3f 0X0019 0Xe9 0X81 0X67 0Xeb 0X04 0X00 0X4e  
0X00 0X00 0X04 0X1b 0X00

Transmit Frequency Hopping

hcitool cmd 0X3f 0X0019 0Xe9 0X81 0X67 0Xeb 0X04 0X00 0X4e  
0X00 0X00 0X04 0X1b 0X00

hci reset:

hcitool cmd 0X03 0X0003

hCI\_Enable\_Device\_Under\_Test\_Mode

hcitool cmd 0X06 0X0003

## **EUT I/O Ports – Cable Configuration**

All testing was performed with the following cables/terminators connected to the EUT I/O ports:

**NOTE:** FCC Tests : ONE of each TYPE of PORT must be cabled.

CISPR Tests : ONE of each TYPE of PORT must be cabled.

## Test Equipment List

Equipment Type	Manufacturer	Model #	Serial #	Cal Due	Used
<b>Radiated/Conducted Emissions</b>					
Spectrum Analyzer	Hewlett-Packard	8568B	2207A01917	18-Apr-06	X
Quasi-Peak Adapter	Hewlett-Packard	85650A	2043A00249	18-Apr-06	X
RF Pre-Selector	Hewlett-Packard	85685A	2648A00500	18-Apr-06	X
Spectrum Analyzer	Hewlett-Packard	8566B	2532A02250	13-Aug-05	X
Quasi-Peak Adapter	Hewlett-Packard	85650A	2521A00665	24-Nov-05	X
RF Pre-Selector	Hewlett-Packard	85685A	2510A00186	24-Nov-05	X
Pre-Amplifier	Hewlett-Packard	8449B	3008A00952	26-May-06	X
Biconical Antenna	Schwarzbeck	BBA9106	0101	23-Dec-05	X
Log Periodic Antenna	Schwarzbeck	UHALP9107	9107718	24-Dec-05	X
Horn Antenna(Tx)	EMCO	3115	9308-4132	16-Mar-06	X
Horn Antenna(Rx)	EMCO	3115	9604-4783	28-Oct-05	X
Receiver	Rhode & Schwarz	ESBI	827061/005	18-Jul-05	X
Display	Rhode & Schwarz	ESAI	285316/018	18-Jul-05	X
Antenna Mast	EMCO			Daily	X
Mast Controller	EMCO	1050	1267	Daily	X
Turntable	Macton			Daily	X
Analyzer	Hewlett Packard	E7405A with Opt 1AX, A41	US39440170	07-Apr-06	
LISN 4 x 25 A	Schwarzbeck	NNLA8120	8120458A	24-Mar-06	X

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## Measurement Uncertainty:

Type		Freq Range Hz		Uncertainty dB
<b>Radiated Emissions</b>	Horiz	30M-200M	3m	3.6
			10m	3.6
	Vert		3m	4.1
			10m	4.1
	Horiz	200M-1000M	3m	4.6
			10m	4.6
	Vert		3m	4.3
			10m	4.3
				Uncertainty dB
<b>Conducted Emissions</b>		9KHz-150KHz 150KHz-30MHz		3.9
				3.6

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## Environmental Conditions

If not otherwise specified, note the following environmental conditions during test:

Temperature: 70-75 °F.

Relative Humidity: 45-55%

## **Appendix A Test Procedures**

# **TEST PROCEDURES**

## Test Procedures - EMI Operational Description

### GENERAL

For each emission signal, maximum level is achieved for both horizontal and vertical polarizations as well as (0-360) degrees turntable rotation.

Antenna Test Distances are selected at either 3, 10 or 30 meters separation from the EUT in accordance with applicable specification requirements.

Antenna Scan Heights are varied from 1-4 meters at Antenna Test Distances of 3, 10 and 30 meters.

### FCC RADIATED EMISSIONS (E-FIELD)

EMI test procedures are performed in accordance with the requirements of ANSI C63.4. Measurements are initially obtained using broad band antennas and PEAK detection. In addition, cables are manipulated to maximize emissions within constraints of a typical system configuration. All measured data within 3 db of the Radiated Limits are retaken using Tuned Dipole Antennas (Roberts Type) and QUASI-PEAK (CISPR) Detection. Each EUT is powered from a 60Hz AC source except a 50 Hz source is used when CISPR Limits are applicable.

### FCC CONDUCTED EMISSIONS

EMI test procedures are performed in accordance with the requirements ANSI C63.4 Measurements are initially obtained with PEAK Detection. In addition, cables are manipulated to maximize emissions within constraints of a typical system configuration. All measured data within 3 db of the Conducted Limits are retaken using QUASI-PEAK (CISPR) Detection. Each EUT is powered from a 60Hz AC source.

### CISPR22/EN55022 RADIATED EMISSIONS (E FIELD)

EMI test procedures are operated in accordance with the requirements of the CISPR22 and EN55022 (1998) Documents. Measurements are initially obtained with PEAK Detection. In addition, cables are manipulated to maximize emissions within constraints of a typical system configuration. All measured data within 3 db of the Radiated Limits are retaken using QUASI-PEAK (CISPR) detection. Each EUT is powered from a 50Hz AC source.

### CISPR22/EN55022 CONDUCTED EMISSIONS

EMI test procedures are operated in accordance with the requirements of the CISPR22 and EN55022 (1998) Documents. Measurements are initially obtained with PEAK Detection. In addition, cables are arranged per the specification within constraints of a typical system configuration. All measured data exceeding 3 db below the Conducted QP Limit are retaken using QUASI-PEAK (CISPR) Detection. All measured data exceeding 2 db below the Conducted AVERAGE Limit are retaken using AVERAGE (CISPR) Detection. Each EUT is powered from a 50Hz AC source.

## **Appendix B Measurement Facilities Information**

# **MEASUREMENT FACILITIES INFORMATION**

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## DESCRIPTION of MEASUREMENT FACILITIES

The Open Area Test Site (OATS) is composed of a building and associated ground screen with a control room underneath.

The building is a TUFF-SPAN enclosure constructed of fiberglass reinforced plastic materials which provide above-ground weather protection. These materials are non conductive, non magnetic and RF transparent. They do not impact the surrounding electromagnetic environment and are corrosion resistant. The enclosure size permits Ten Meter Radiated Measurements within its confines and utilizes a remote controlled Macton Turntable Assembly. The conductive turntable is 16 feet in diameter and capable of moving a 10,000 pound load a full 360 degrees of rotation. It is flush-mounted to the ground screen and edge bonded circumferentially to the ground screen with beryllium copper "fingers". The ground screen is constructed of welded wire mesh lying directly on top of a concrete-over-steel foundation. The screen is extended beyond the building itself to provide 30 meter measurement capability when needed. There are no reflecting objects within the required obstruction free oval area.

The control room is located beneath the ground screen level with stairwell access to the ground plane area. An elevator is located beyond the ground screen and provides access to the control room, shipping dock and ground screen areas for large sized EUT's. Primary power cabling to the EUT is fed through a hole in the center of the table along with necessary EUT/Support Equipment interface cabling. A remote controlled EMCO Antenna Mast Assembly is located on the ground screen. It provides the operator with adjustable antenna height over the 1 meter through 4 meter range as well as allowing both horizontal and vertical polarizations at any height.

A conducted emissions measurement area is located in a shielded room and consists of a conductive (galvanized sheet metal) wall 20' wide x 8' high with a metal floor bonded to the wall. AC Power is supplied through receptacles located on the vertical wall. Each receptacle is adequately filtered using Shielded Room EMI Power Line Filters (Rayproof 1B42 Units) which provide 100 db attenuation over the 14KHz to 10GHz frequency range. The shielded room itself is bonded directly to earth ground.

Additionally, both the control room/shielded rooms and ground plane area have heating, air conditioning and relative humidity controlled environments.

## Capability

Test Site Service's open area Test Sites have been evaluated in accordance with ANSI C63.4 procedures and found to be in compliance with ANSI C63.4-(1992) Site Attenuation and LISN requirements.

In addition, Test Site Services is Assessed and Approved annually by a European Competent Body to assure competence in testing products for CE Mark Compliance (Emissions and Immunity).

All of Test Site Service's measurement facilities meet the technical requirements for qualification testing of products to FCC, CISPR, IEC, VCCI, BSMI and other International Standards.

## Accreditation / Approval

- ? FCC Registered (Registration # 91007 & #91008)
- ? Industry Canada RSS-212 (File # IC4276)
- ? VCCI Registered (Registration # R-1145, C-1205)
- ? BSMI Accreditation (Reference # SL2-IN-E-1018)
- ? NVLAP Accredited (Lab Code # 100419-0)
- ? Australia (ACA), MRA / NVLAP
- ? New Zealand (Ministry of Commerce), MRA / NVLAP
- ? U.S. Conformity Assessment Body (CAB), EMC Directive 89/336/EEC
- ? Competent Body Assessment / Approval (Technology International, UK) (File# TSS-031899)
- ? Competent Body Assessment / Approval (Nemko AS, Norway) (Aut. # ELA174)
- ? Competent Body Assessment / Approval (TUV Rheinland)
- ? NCC-OCD / Anatel (Brazil / Latin America)
- ? NARTE certified EMC Technicians & Engineers (ATL-0122T, ATL-0025T, EMC-001677NE, EMC-000142NE)

*NOTE: Certificates upon request.*

# *EMC Facility Client Satisfaction Questionnaire*

Thank you for choosing to use the Test Site Services EMC test facilities to test your product. Client satisfaction is very important to Test Site Services. To help serve you fully and continue to make improvements in our service, we need your feedback and comments on the service we performed for you today. We would appreciate your taking a few moments to complete this questionnaire.

1. Did scheduling meet your needs \_\_\_\_\_
2. Test operator support \_\_\_\_\_
3. Personnel attitude \_\_\_\_\_
4. Efficiency of test process \_\_\_\_\_
5. Work completed in a timely manner \_\_\_\_\_
6. Report received in a timely manner \_\_\_\_\_
7. Report content and clarity \_\_\_\_\_
8. Overall rating \_\_\_\_\_
9. Additional Comments: \_\_\_\_\_

Test Date: / / Completed By: \_\_\_\_\_

Please return to:      Lab Manager or      Richard L. Wiedeman  
(At Test Site)      President  
Test Site Services, Inc.  
PO Box 766