Standards Council of Canada
Accredited Laboratory
Scope of Accreditation 75

Conseil canadien des normes
Laboratoire accrédité
Portée d'accréditation 75

TM

Test Report:	6W68668
Applicant:	DAP Technologies 955 Fernand Dufour Vanier, Quebec G1M 3B2
Apparatus:	B2B Wireless Lan + BT Combo Module
FCC ID:	HDWF10040
In Accordance With:	FCC Part 15 Subpart C, 15.247 FHSS System and Digitally Modulated Radiators 902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz
Tested By:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
Authorized By:	Jason Nixon, Telecom Specialist
Date:	September 6, 2006
Total Number of Pages:	41

Report Summary

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. Radiated tests were conducted is accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

Apparatus Assessed:	B2B Wireless Lan + BT combo module
Specification:	FCC Part 15.247, Subpart C
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release

Author: Xu Jin, Wireless Specialist

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

TABLE OF CONTENTS

Section 1: Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:
B2B Wireless Lan + BT combo module

1.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
1	DAP Micro Computer MicroFlex CE5240	N/A

The first samples were received on: July 6, 2006

1.3 Technical Specifications of the EUT

Manufacturer:	DAP Technologies
Frequency Band	2400MHz-2483.5MHz
Operation Frequency	2412MHz-2462MHz
Rated Output Power*:	14dBm +1.5/-1.0dBm for 1, 2, 5.5 11Mbps 14dBm +/-1.0dBm for 6, 9Mbps 12dBm+/-1.0dBm for >12Mbps
Modulation:	802.11 b/g
Antenna Information	4.4dBi gain antenna (Rufa)
Antenna Connector	W.FL series, ultra small surface mounted coaxial connector.

***** Manufacture's rated power is average power measured using a wide band power meter with a thermocouple detector.

Section 2: Test Conditions

2.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.247

FHSS System and Digitally Modulated Radiators

902-928MHz, 2400 - 2483.5 MHz, 5725-5850MHz

2.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

2.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15 – 30 ^{o}C
Humidity range	:	20 - 75 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 5% of rated voltages

2.4 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next Cal.
Spectrum Analyzer	Rohde & Schwarz	FSU	FA001877	May 10/07
Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 16/07
Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 16/07
Biconical (1) Antenna	EMCO	3109	FA000805	May 03/07
Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Aug. 29/06
Horn Antenna #2	EMCO	3115	FA000825	Dec. 16/06
Horn Antenna #1	EMCO	3115	FA000649	Jan. 12/07
18.0 – 40.0GHz Horn Antenna	EMCO	3116	FA001847	May 3/07
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	Aug 2/07
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	Aug 2/07
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	Aug 2/07
5.0 - 18GHz Amplifier	Narda	DWT-186N23U40	FA001409	COU
18.0 – 26.0 GHz Amplifier	NARDA	BBS-1826N612	FA001550	COU
26 – 40.0 GHz Amplifier	NARDA	DBL-2640N610	FA001556	COU
Power Meter	HP	4418B	FA001678	May 16/07
Power Probe	HP	8487A	FA001741	May 22/07
LISN	EMCO	4825/2	FA001545	Jan. 30/07
Transient Limiter	Hewlett-Packard	1194 7A	FA000975	May 18/07

* COU (Calibrate on Use)

Section 3: Observations

3.1 Modifications Performed During Assessment

No modifications were performed during assessment.

3.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

3.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

3.4 Test Deleted

No Tests were deleted from this assessment.

Section 4: Results Summary

This section contains the following:

FCC Part 15.247, Subpart C: Test Result

The column headed 'Required' indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N	No: not applicable / not relevant.
Y	Yes: Mandatory i.e. the apparatus shall conform to these tests.
N/T	Not Tested, mandatory but not assessed. (See section 3.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

4.1 FCC Part 15 Subpart C, 15.247: Test Results

Section	Clause	Test Description	Required	Result
1	15.207(a)	Power-line Conducted Emissions	Y	PASS
2	15.247(a)(2)	6dB Bandwidth	Y	PASS
3	15.247(b)(3)	Output Power	Y	PASS
4	15.247(c)	Spurious Emissions	Y	PASS
5	15.247(d)	Peak Power Spectral Density	Y	PASS

Appendix A: Test Results

Section 1. Power Line Conducted Emissions

Criteria: Clause 15.207(a)

Frequency of Conducted limit (dBμV)

Emission (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Conditions:

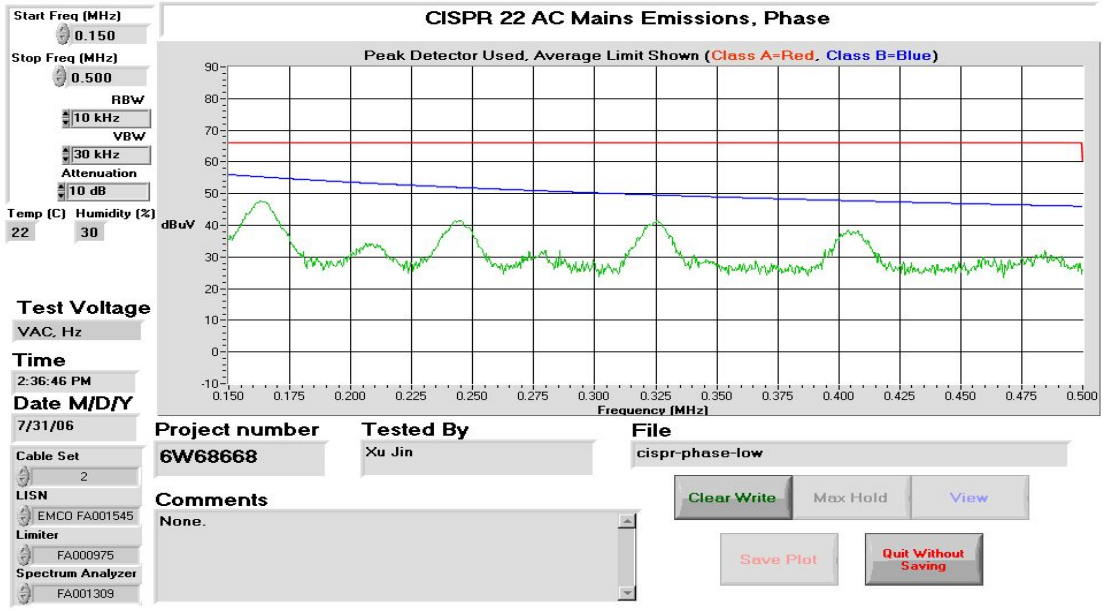
Sample Number:	1,	**Temperature:**	22 ºC
Date:	July 31, 2006	**Humidity:**	50 %
Modification State:	0	**Tester:**	Xu Jin
		Laboratory:	Ottawa

Test Results: Complies

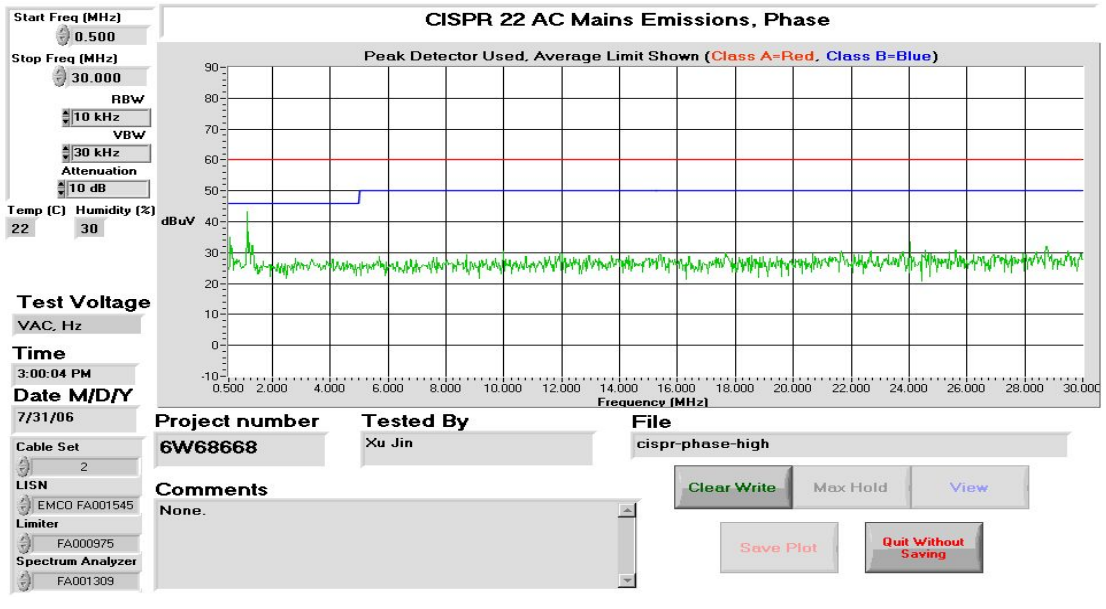
Test Data: See Attached Plots and Tables.

Conducted Disturbance at Mains, Plots

Phase, 0.150 – 0.500 MHz

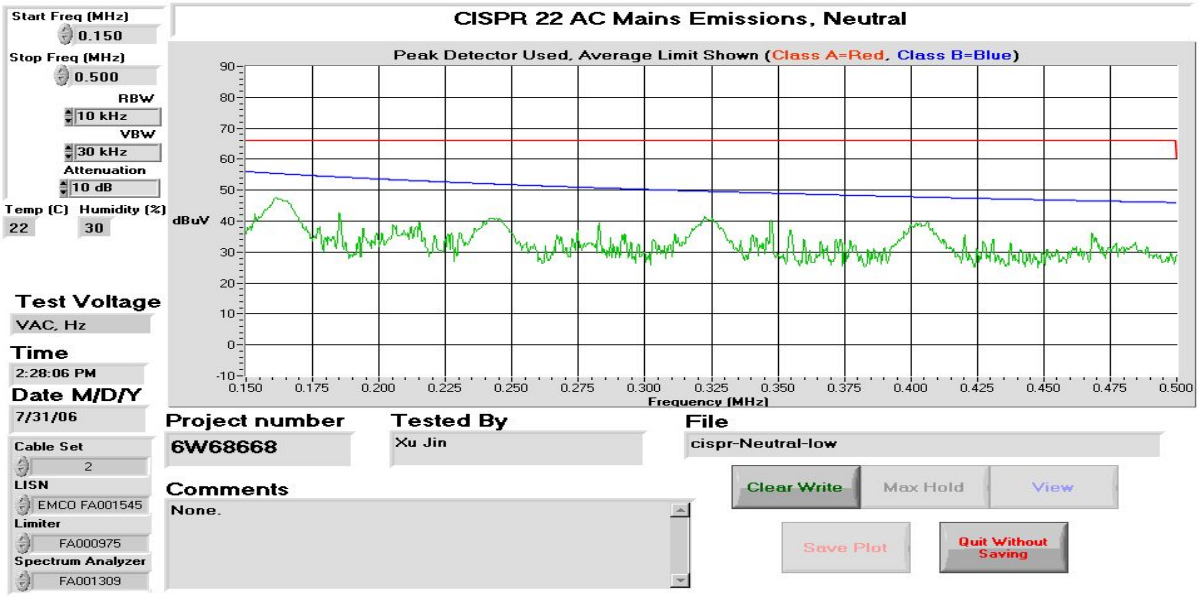


Phase, 0.500 – 30 MHz

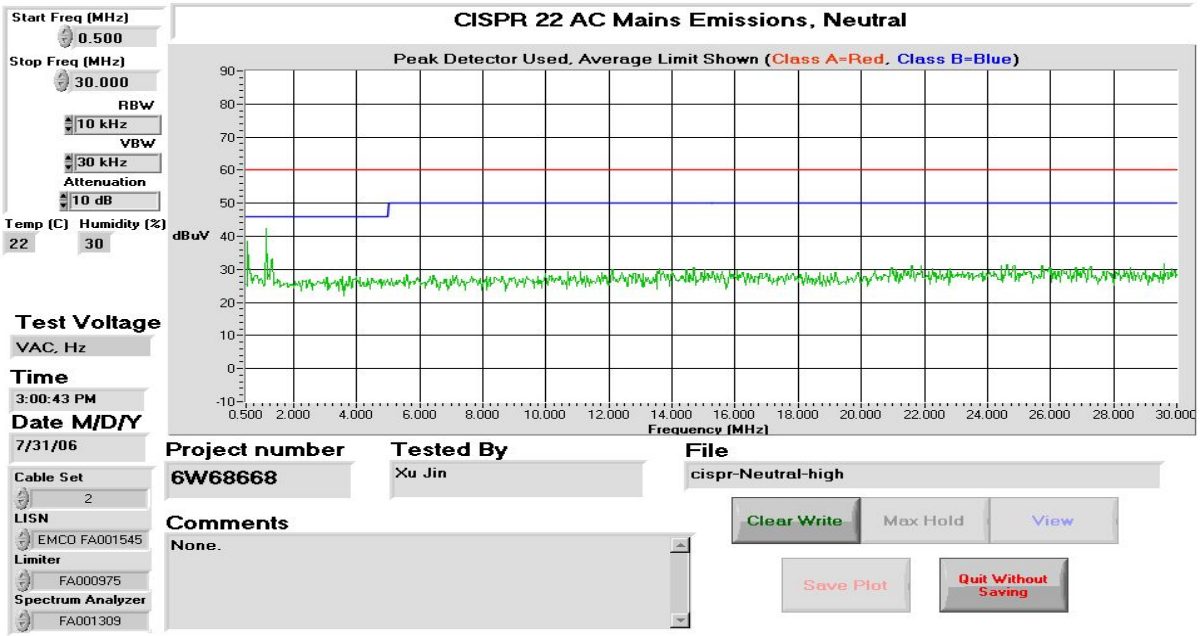


Conducted Disturbance at Mains Plots, continued

Neutral, 0.150 – 0.500 MHz



Neutral, 0.500 – 30 MHz



Section 2. 6dB Bandwidth

Criteria: Clause 15.247(a)

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

Test Conditions:

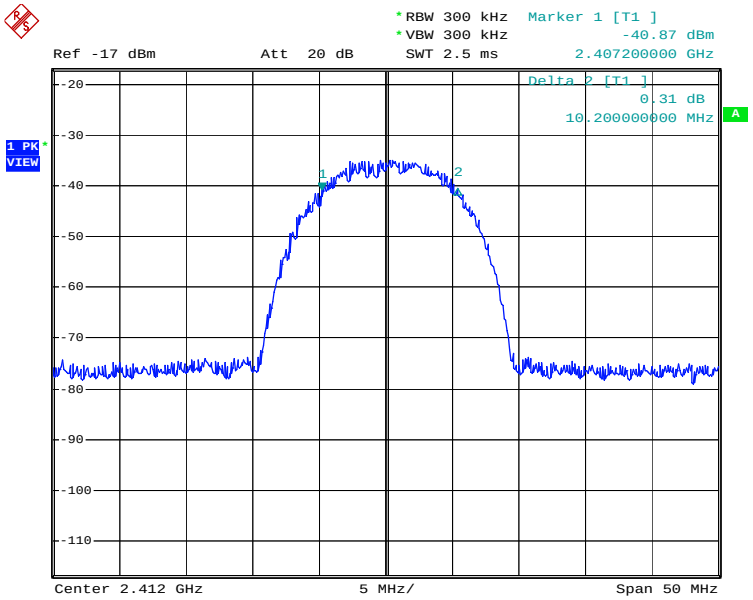
Sample Number:	1	**Temperature:**	22 ºC
Date:	July 6, 2006	**Humidity:**	50 %
Modification State:	0	**Tester:**	Xu Jin
		Laboratory:	Ottawa

Test Results: Complies

Test Data: See attached table and graphics

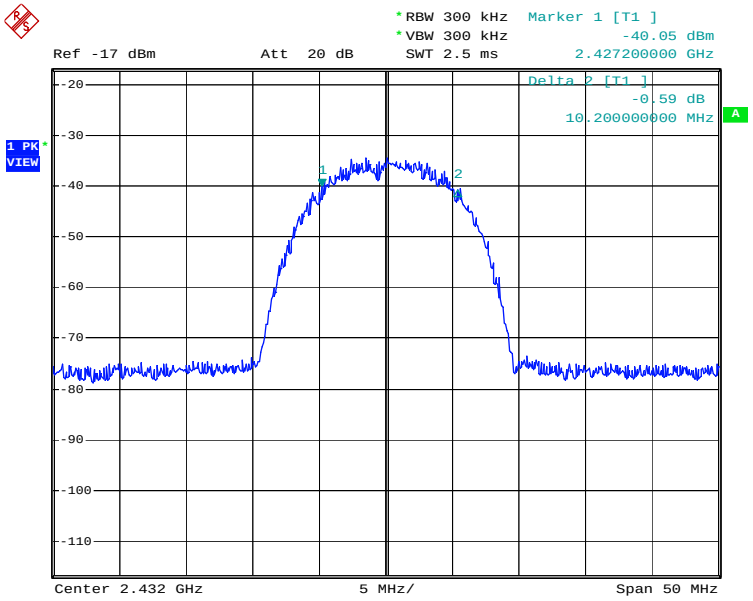
6dB Occupied Bandwidth			
802.11b	**2412MHz**	**2432MHz**	**2462MHz**
	10.2MHz	10.2MHz	10.1MHz
802.11g	**2412MHz**	**2432MHz**	**2462MHz**
	16.5MHz	16.5MHz	16.7MHz

802.11b-2412MHz



Date: 6.JUL.2006 22:43:39

802.11b-2432MHz



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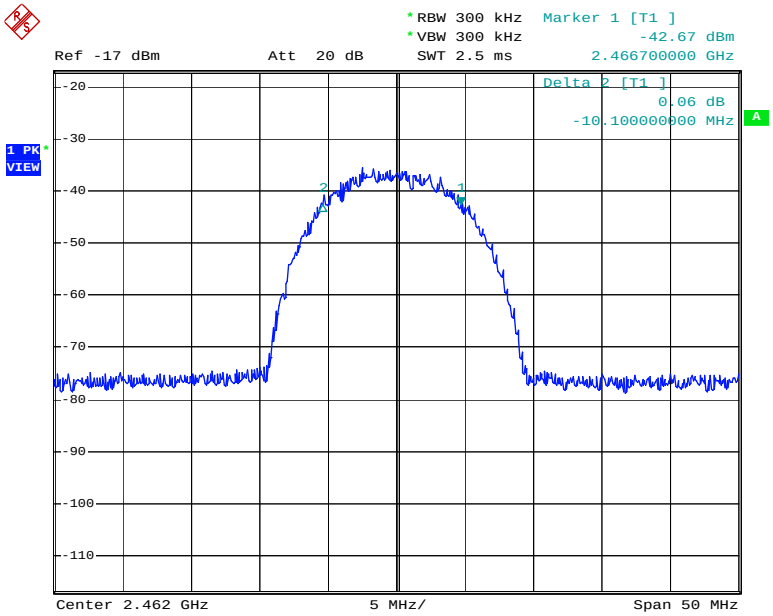
802.11b-2462MHz



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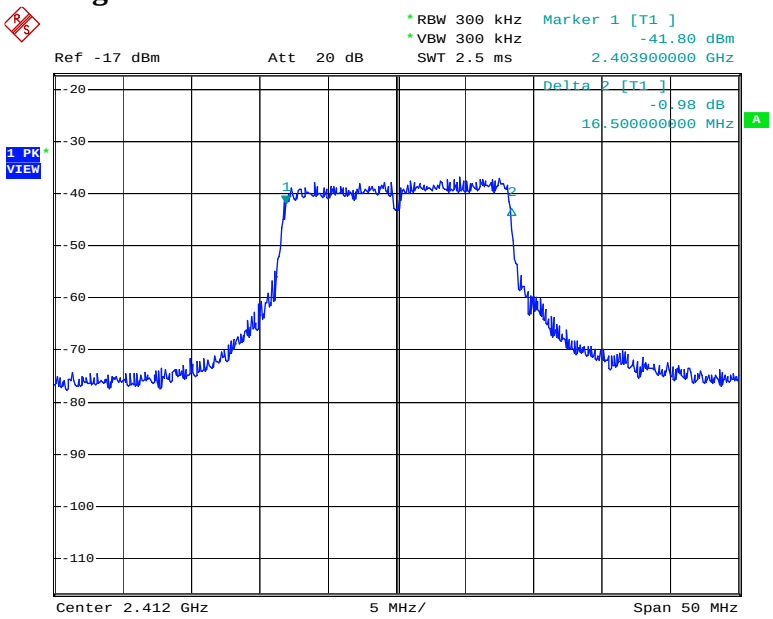
802.11g-2412MHz



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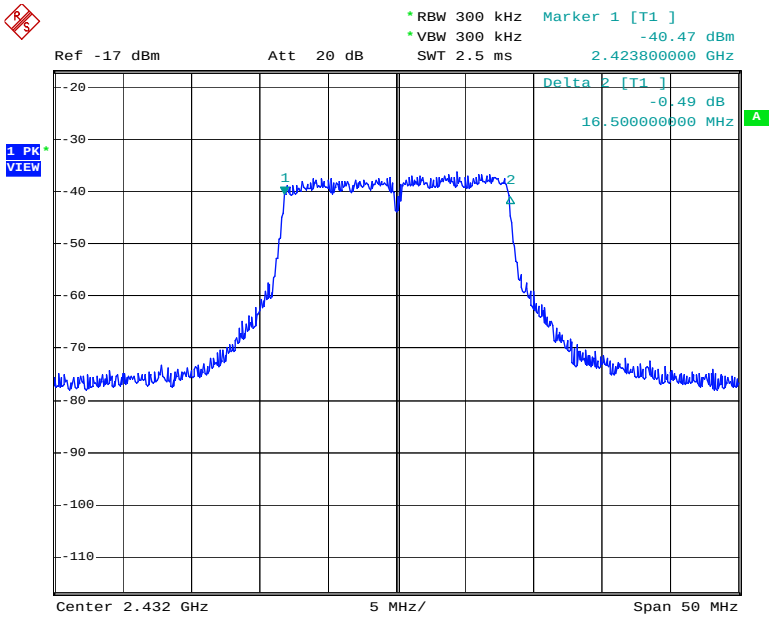
802.11g-2432MHz



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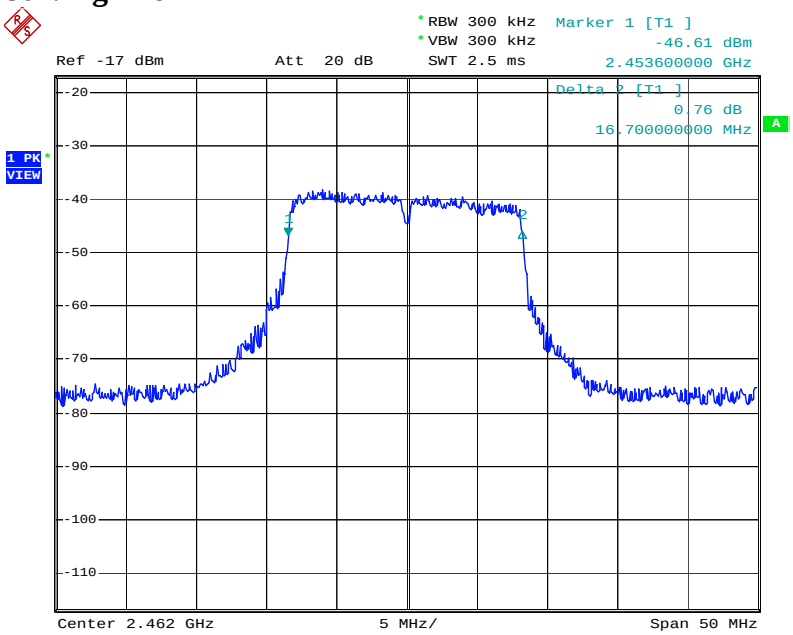
802.11g-2462MHz



Date: 6.JUL.2006 22:35:50

Section 3. Output Power

Criteria: Clause 15.247(b)(3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

Test Conditions:

Sample Number:	1	**Temperature:**	22 ºC
Date:	July 7, 2006	**Humidity:**	50 %
Modification State:	0	**Tester:**	Xu Jin
		Laboratory:	Ottawa

Test Method: Output power was measured using sample detector on the spectrum analyzer according to FCC guidance on measurements for DTS and the documentation of FCC Public Notice: DA 02-2138.

Test Results: Complies

Test Data: See attached table and graphics

Conducted Output Power Test Data (dBm)

802.11b

Frequency (MHz)	1 Mb/s	11 Mb/s
2412	10.75	10.46
2432	10.68	10.42
2462	11.56	11.32

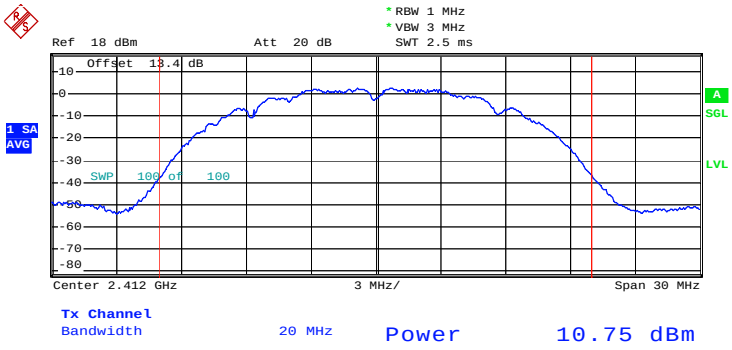
802.11g

Frequency (MHz)	6 Mb/s	54 Mb/s
2412	9.18	9.77
2432	10.52	10.31
2462	10.07	9.38

Antenna gain= 4.4dBi
The max E.I.R.P= 11.56dBm+4.4dBi=15.96dBm (E.I.R.P)
Limit: None P-P operation=30dBm+6dBi antenna (E.I.R.P)

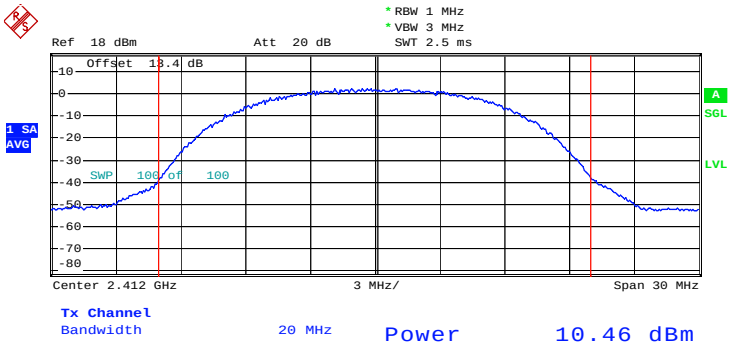
802.11 b

2412MHz-1Mb/s



Date: 7.JUL.2006 21:28:07

2412MHz-11Mb/s



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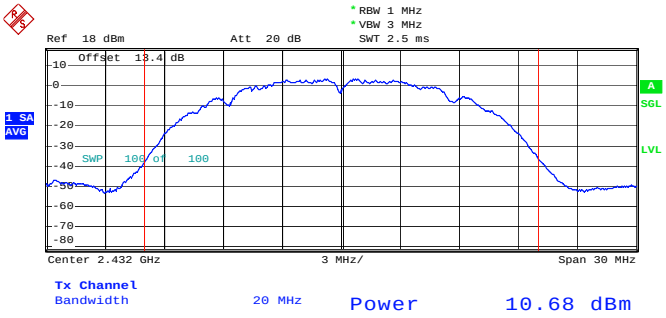
2432MHz-1Mb/s



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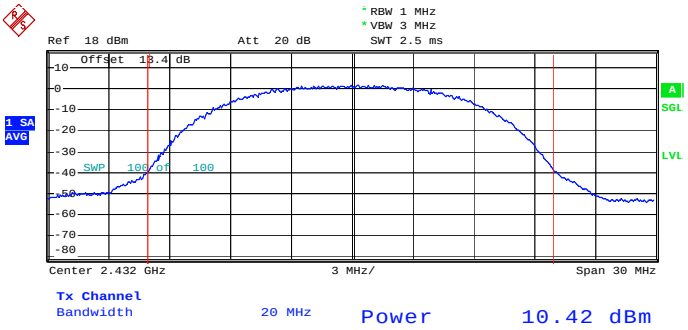
2432MHz-11Mb/s



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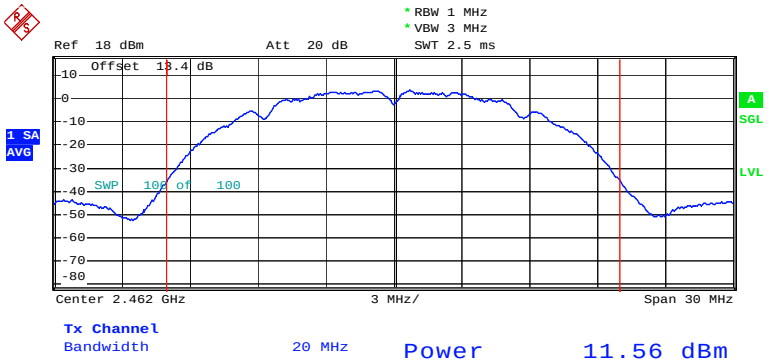
2462MHz-1Mb/s



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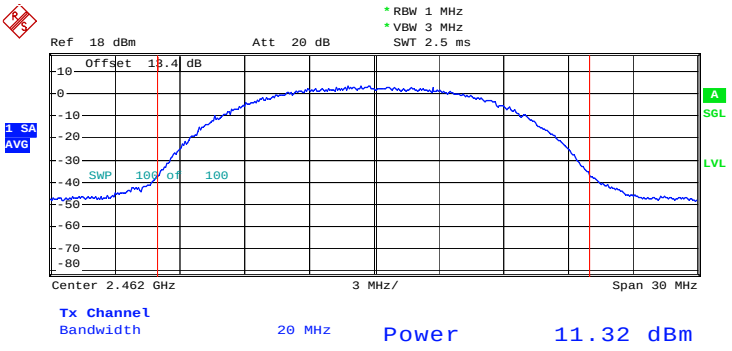
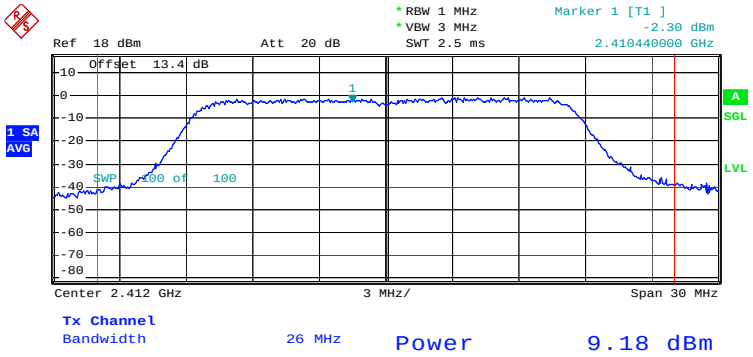
2462MHz-11Mb/s



Date: 7.JUL.2006 21:34:25

802.11g
2412MHz-6Mb/s



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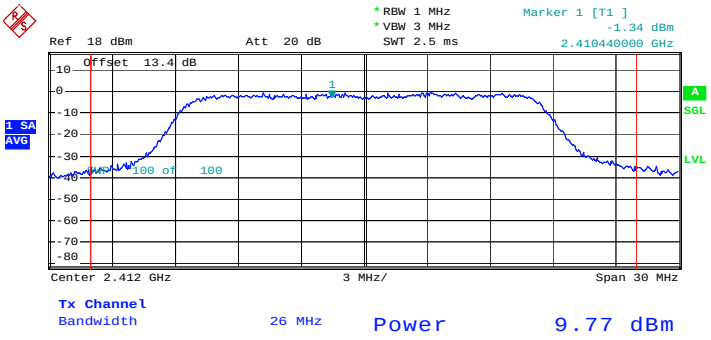
2412MHz-54Mb/s



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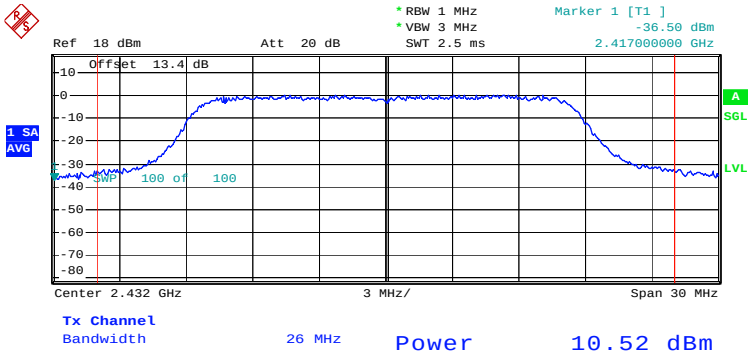
2432MHz-6Mb/s



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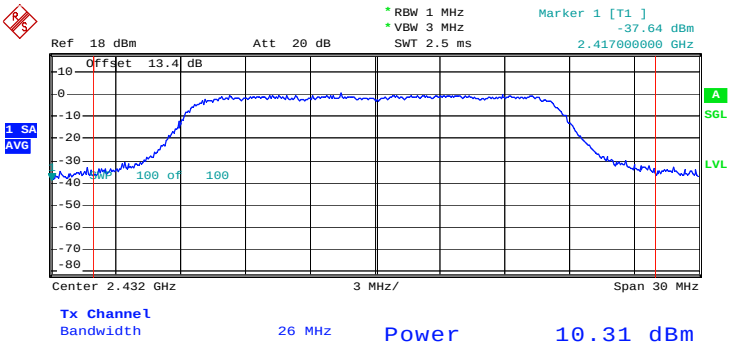
2432MHz-54Mb/s



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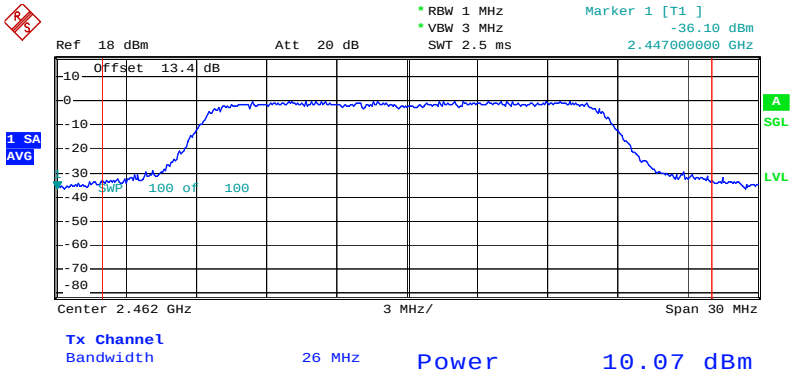
2462MHz-6Mb/s



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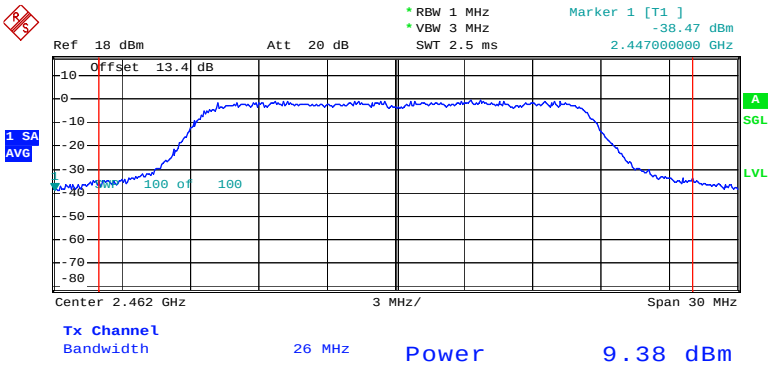
2462MHz-54Mb/s



Date: 7.JUL.2006 21:57:50

Section 4. Spurious Emissions

Criteria: Clause 15.247(d)

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 least 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Conditions:

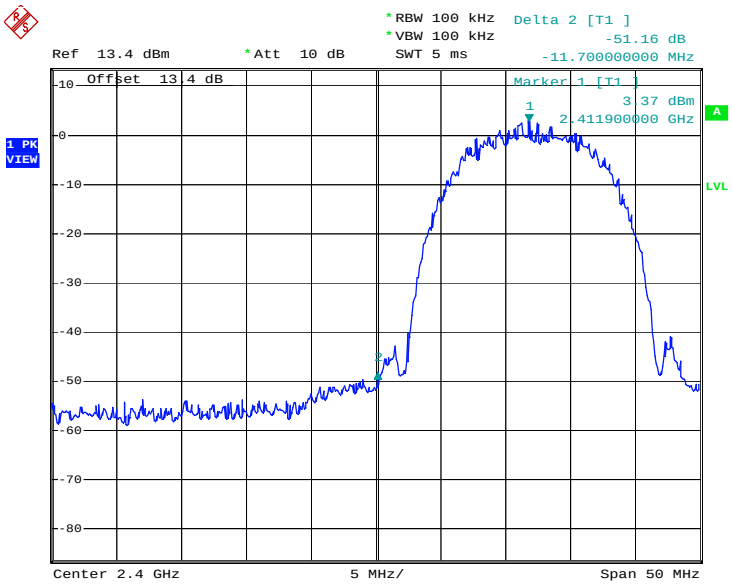
Sample Number:	1	**Temperature:**	22 ºC
Date:	July 7, 2006	**Humidity:**	50 %
Modification State:	0	**Tester:**	Xu Jin
		Laboratory:	Ottawa

Test Results: Complies

Test Data: See attached table and graphics

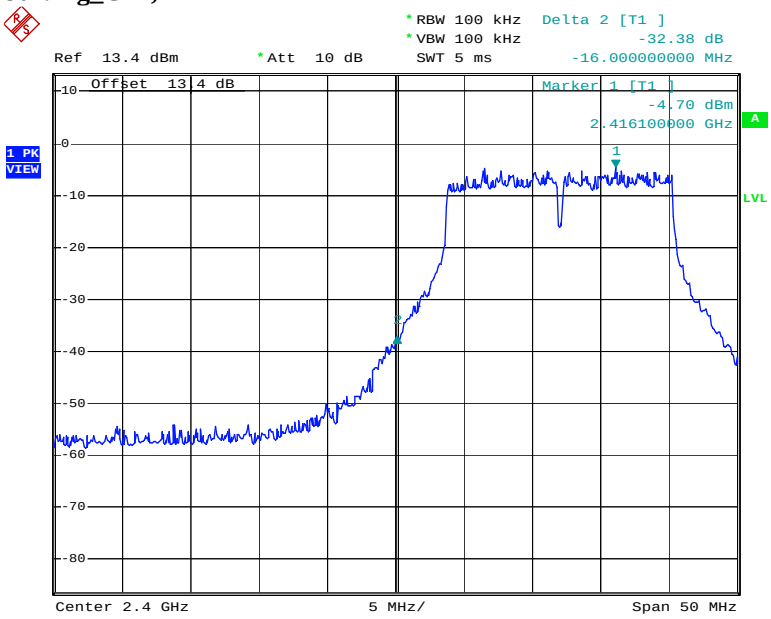
Band Edge Check

802.11b_CH1, 2412MHz



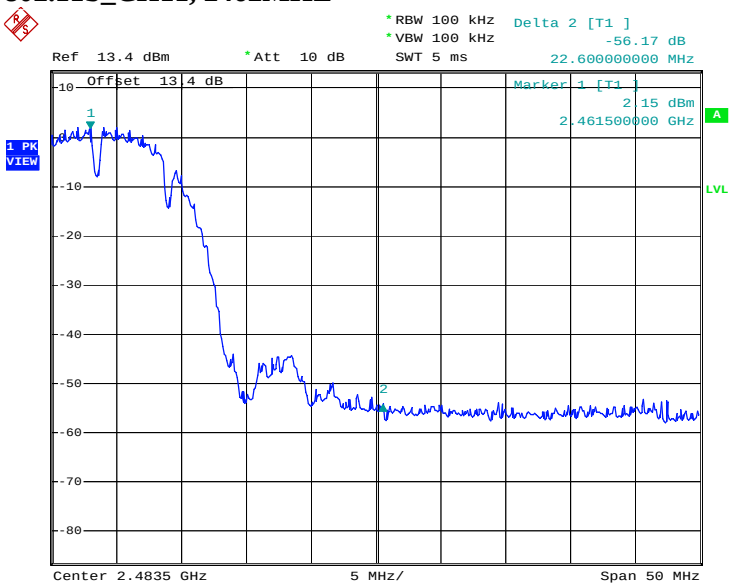
Date: 7.JUL.2006 22:37:32

802.11g_Ch1, 2412MHz



Date: 7.JUL.2006 22:38:19

802.11b_CH11, 2462MHZ



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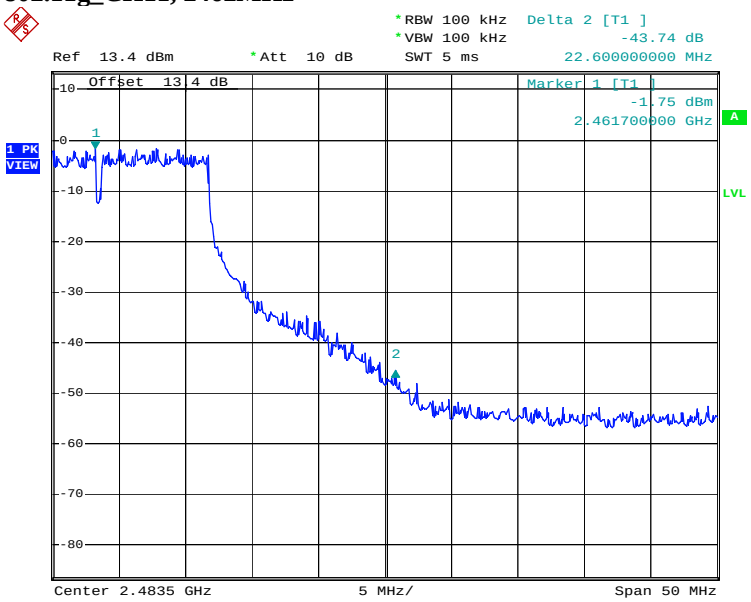
802.11g_CH11, 2462MHz



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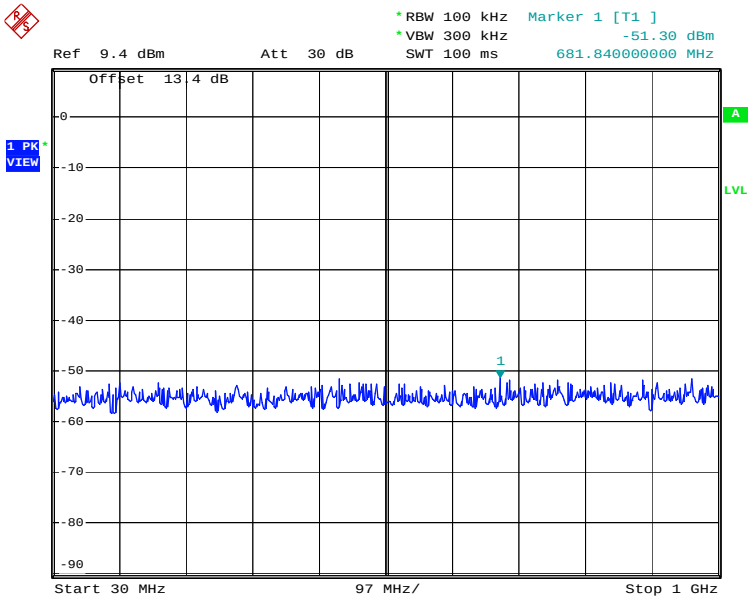
Conducted emissons



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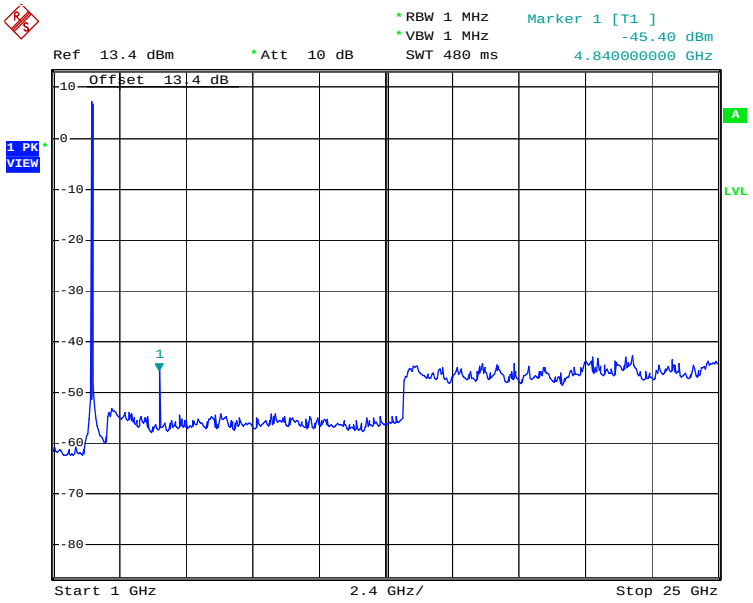
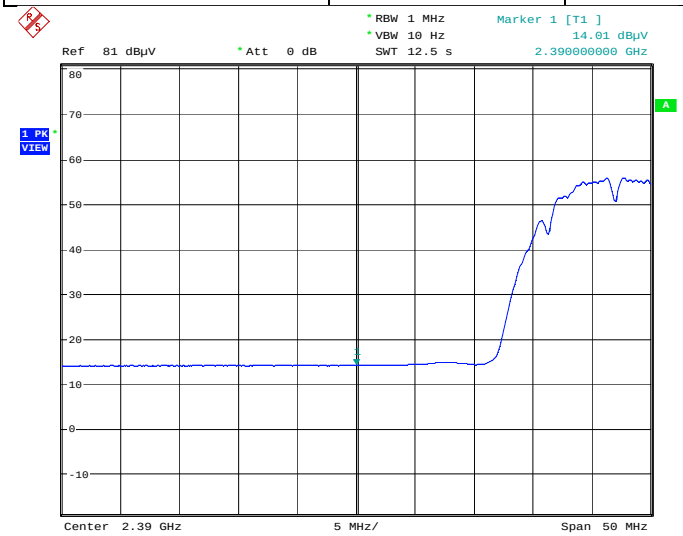


Date: 7.JUL.2006 22:28:59

Restricted Band Checking

802.11b_Ch1, 2412MHz

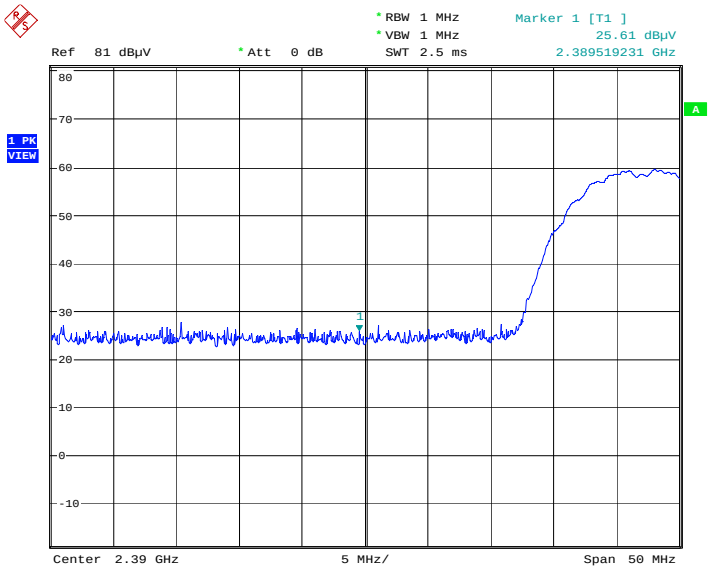
Band Edge Level (Avg) (dBµv)	Af (dB/m)	Cable Loss(dB)	Emission Level(dBµv/m)	Limit (dBµv/m)
14.01	28.6	4	46.61	54



Date: 17.JUL.2006 14:24:12

802.11b_Ch1, 2412MHz

Band Edge Level (PK) (dBµv)	Af (dB/m)	Cable Loss(dB)	Emission Level(dBµv/m)	Limit (dBµv/m)
25.61	28.6	4	58.21	74



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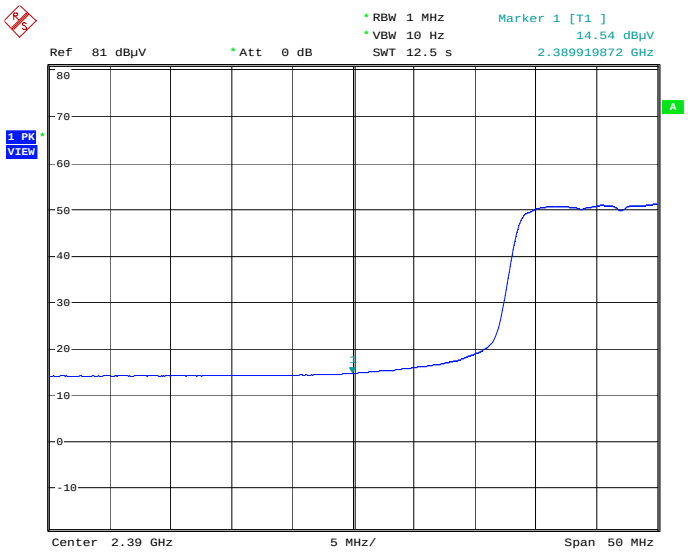
802.11g_Ch1, 2412MHz

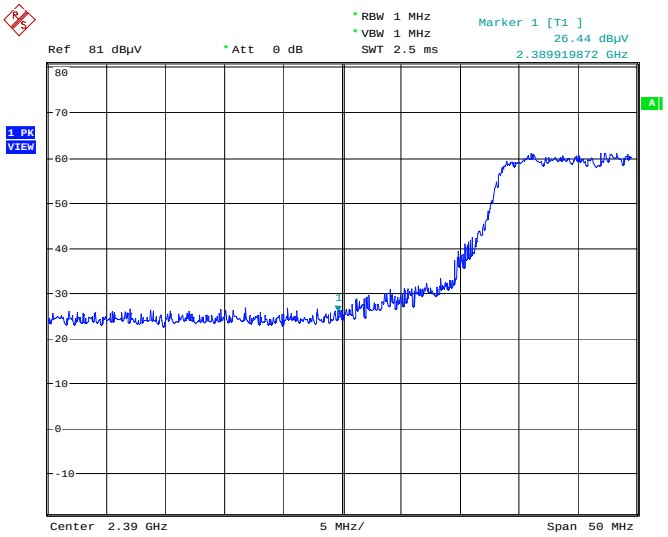
Band Edge Level (Avg) (dBµv)	Af (dB/m)	Cable Loss(dB)	Emission Level(dBµv/m)	Limit (dBµv/m)
14.54	28.6	4	47.14	54



Date: 17.JUL.2006 14:35:22

802.11g_Ch1, 2412MHz

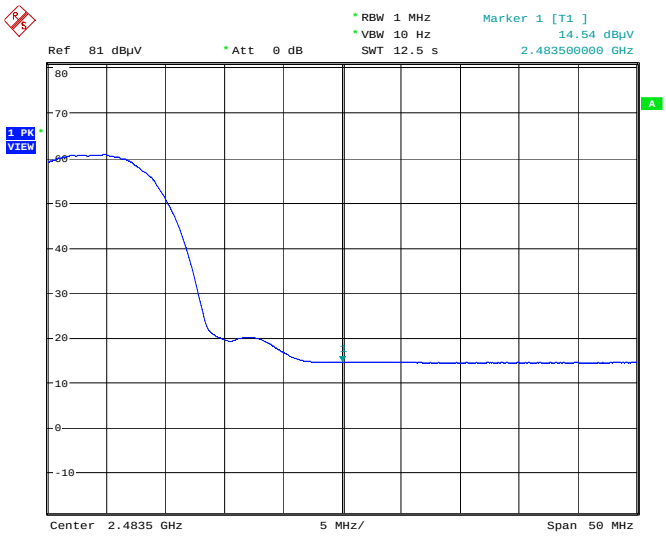
Band Edge Level (PK) (dBµv)	Af (dB/m)	Cable Loss(dB)	Emission Level(dBµv/m)	Limit (dBµv/m)
26.44	28.6	4	59.04	74



Date: 17.JUL.2006 14:26:13

802.11b_Ch11, 2462MHz

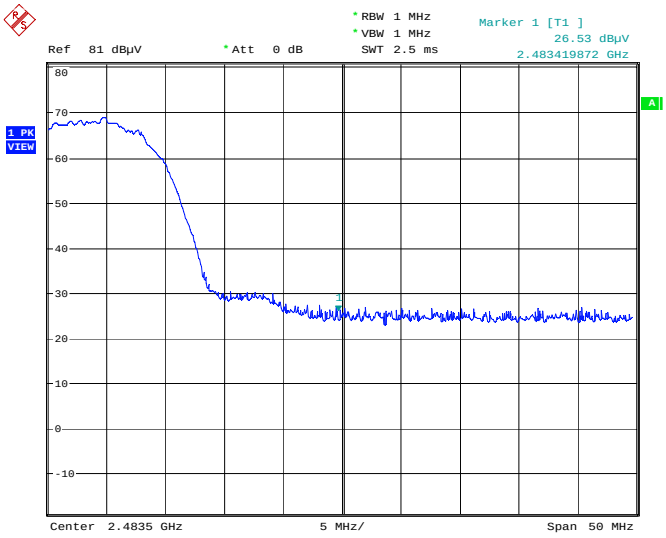
Band Edge Level (Avg) (dBµv)	Af (dB/m)	Cable Loss(dB)	Emission Level(dBµv/m)	Limit (dBµv/m)
14.54	28.6	4	47.14	54



Date: 17.JUL.2006 14:42:09

802.11b_Ch11, 2462MHz

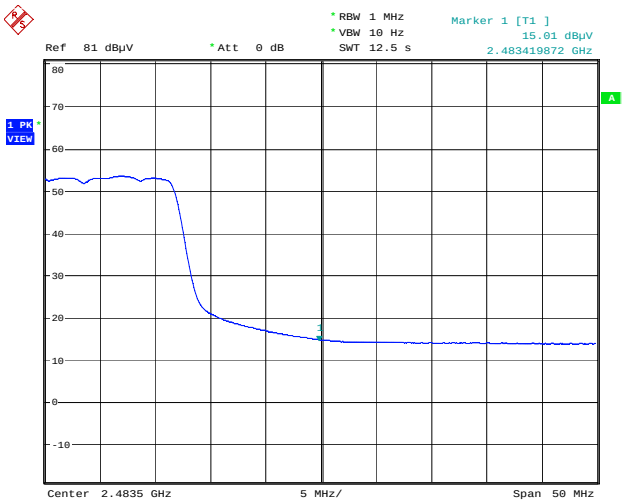
Band Edge Level (PK) (dBµv)	Af (dB/m)	Cable Loss(dB)	Emission Level(dBµv/m)	Limit (dBµv/m)
26.53	28.6	4	59.13	74



Date: 17.JUL.2006 14:42:48

802.11g_Ch11, 2462MHz

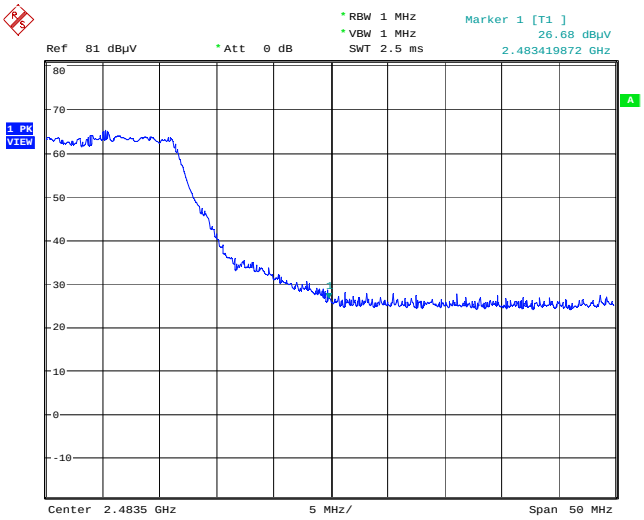
Band Edge Level (Avg) (dBµv)	Af (dB/m)	Cable Loss(dB)	Emission Level(dBµv/m)	Limit (dBµv/m)
15.01	28.6	4	47.01	54



Date: 17.JUL.2006 14:46:35

802.11g_Ch11, 2462MHz

Band Edge Level (PK) (dBµv)	Af (dB/m)	Cable Loss(dB)	Emission Level(dBµv/m)	Limit (dBµv/m)
26.68	28.6	4	59.28	74



Date: 17.JUL.2006 14:45:03

Radiated Emissions

The EUT was searched to from 30MHz to 10th harmonics, and for low, medium and high frequencies.

Measurement has conducted on three orthogonal axes and at the distance of 3 meters.

The spectrum analyser was set to peak detector mode with RBW/VBW as 100KHz/100KHz below 1GHz, and 1MHz/3MHz above 1GHz.

No emission was observed within 20dB of the limit line.

Section 5. Peak Power Spectrum Density

Criteria: Clause 15.247(e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Conditions:

Sample Number:	1	**Temperature:**	22 °C
Date:	July. 7, 2006	**Humidity:**	50 %
Modification State:	0	**Tester:**	Xu Jin
		Laboratory:	Ottawa

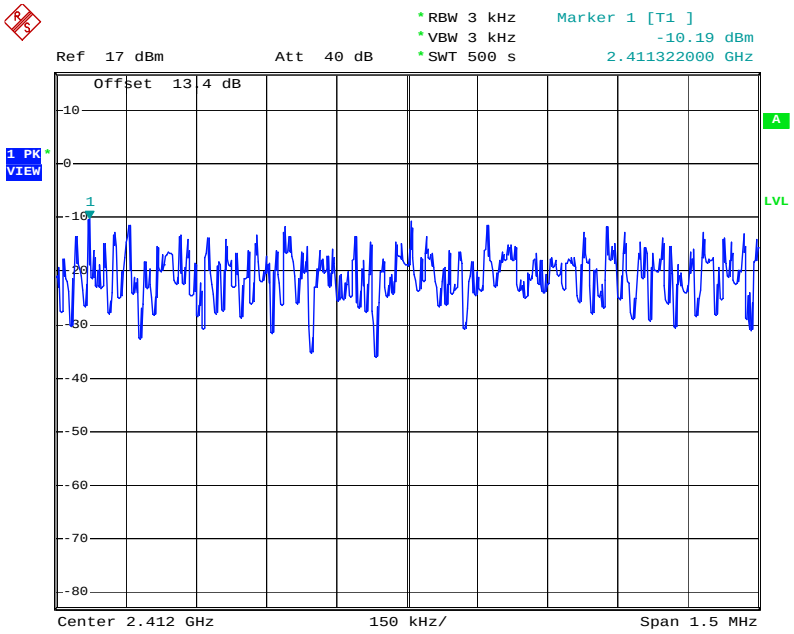
Test Result: Complies

Test Data: See attached tables and graphics

PPSD (dBm/3kHz)			
802.11b	**2412MHz**	**2432MHz**	**2462MHz**
	-10.19dBm	-9.96dBm	-9.3dBm
802.11g	**2412MHz**	**2432MHz**	**2462MHz**
	-18.19	-18.05	-17.56

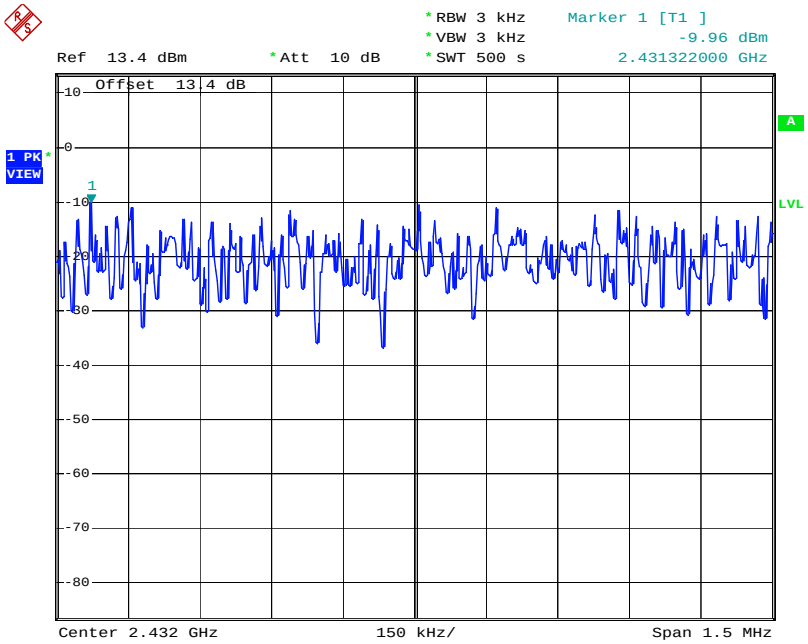
802.11b

2412MHz



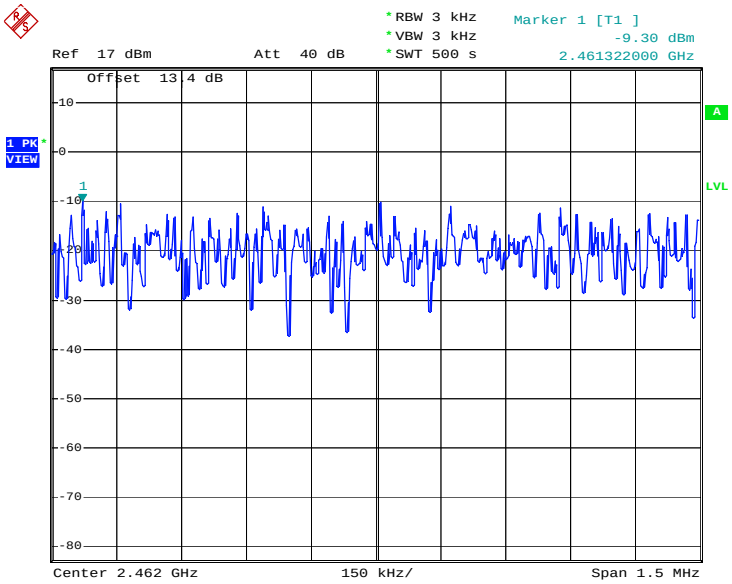
Date: 10.JUL.2006 16:08:00

2432MHz



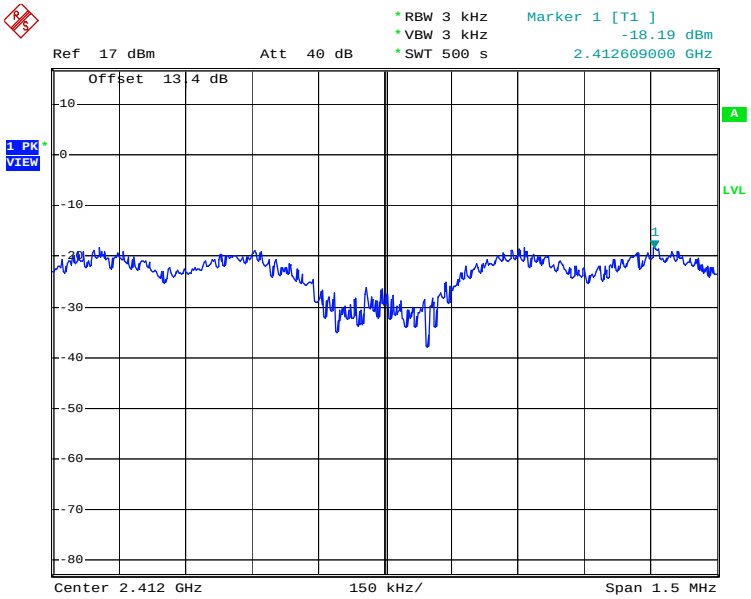
Date: 7.JUL.2006 23:34:59

2462MHz



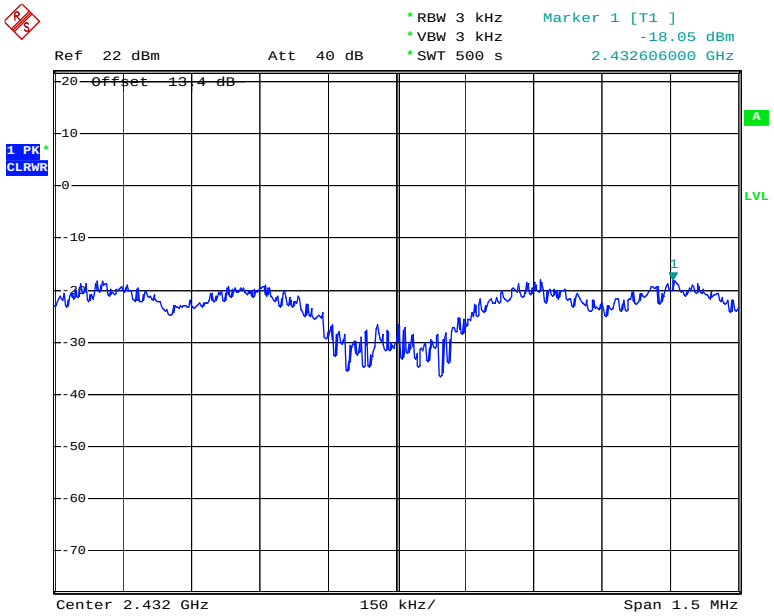
Date: 10.JUL.2006 16:39:08

802.11g
2412MHz



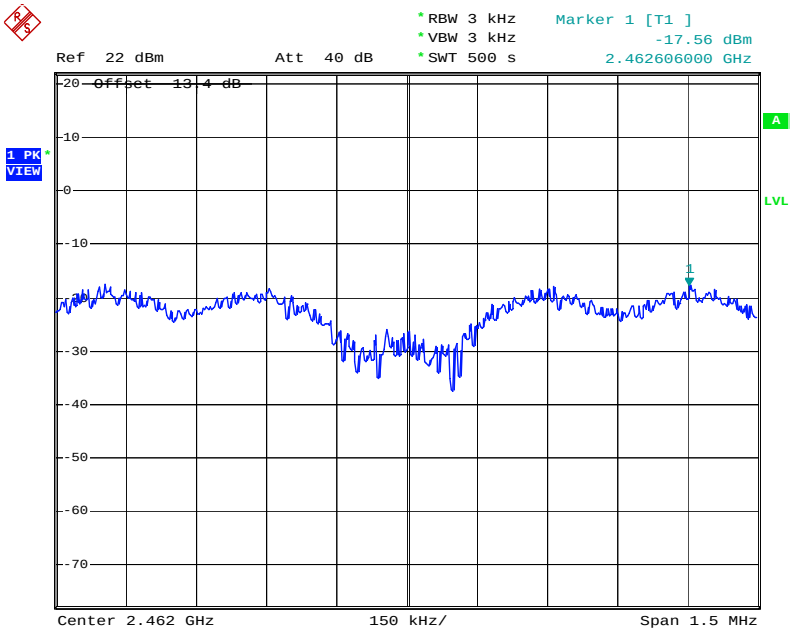
Date: 10.JUL.2006 17:55:37

2432MHz



Date: 10.JUL.2006 18:35:41

2462MHz



Date: 10.JUL.2006 18:56:21

Section 6. Supply Voltage Variation

Criteria: Clause 15.31

§ 15.31 (e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery-operated equipment, the equipment tests shall be performed using a new battery.

Test Conditions:

Sample Number:	1	**Temperature:**	22 °C
Date:	July. 18, 2006	**Humidity:**	50%
Modification State:	0	**Tester:**	Xu Jin
		Laboratory:	Ottawa

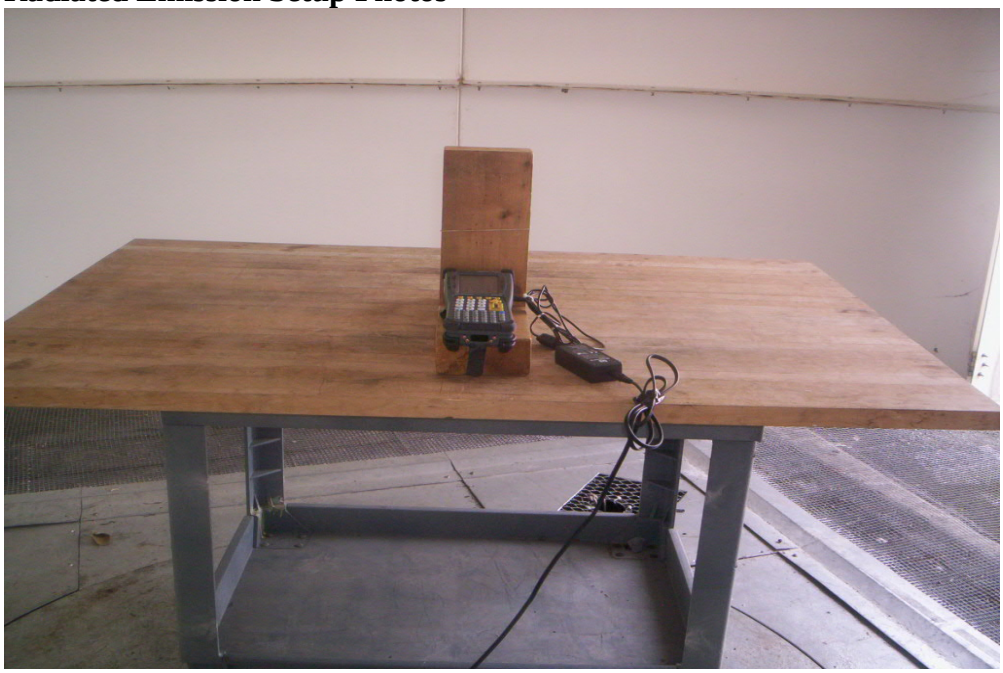
Test Method: Average power for selected channels was verified under voltage extreme conditions using a wideband power meter with thermocouple detector.

Extreme Voltage: ±15% of AC supply

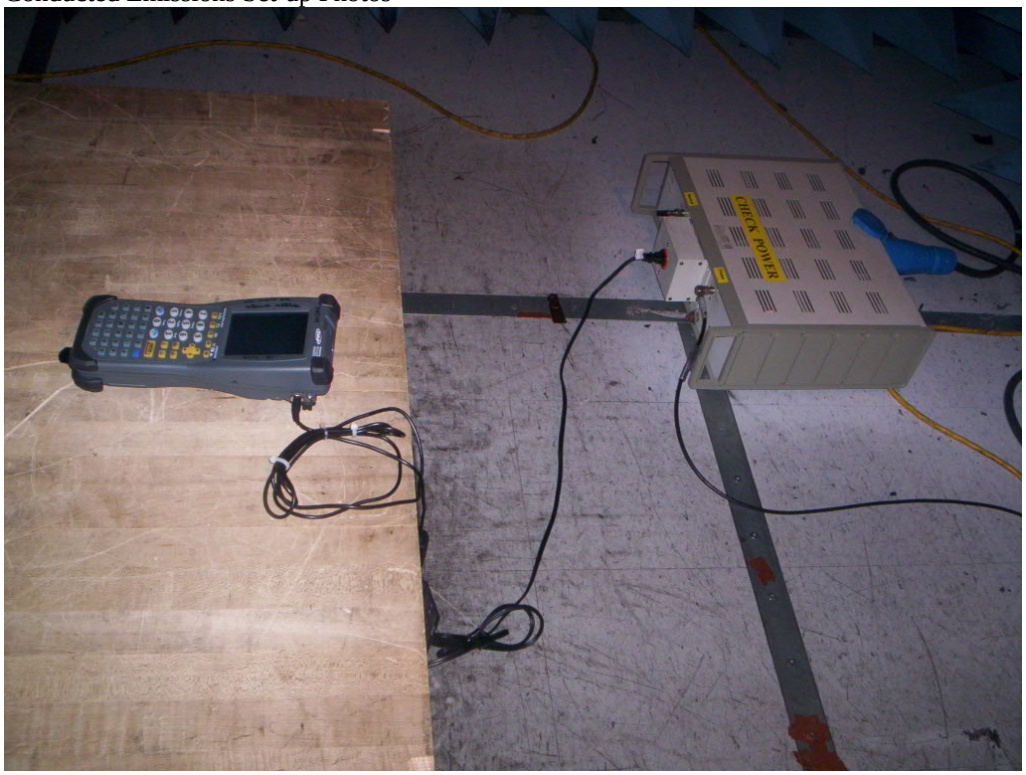
Test Result: No change for output power level was noticed during the test.

Appendix B : Setup Photographs

Radiated Emission Setup Photos

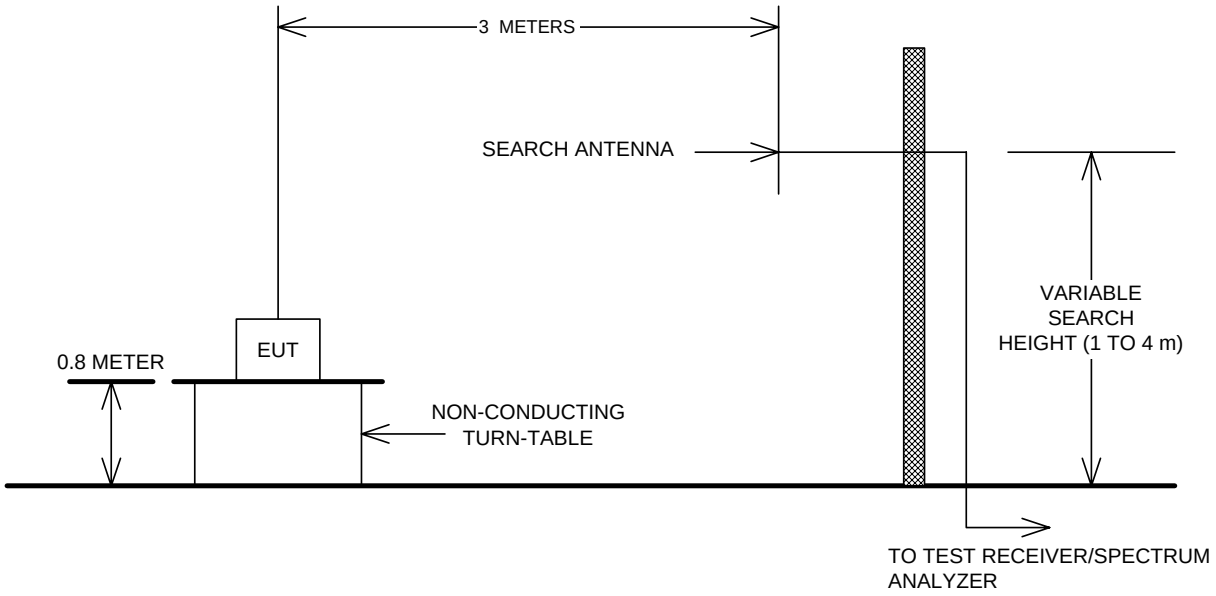


Conducted Emissions Set-up Photos

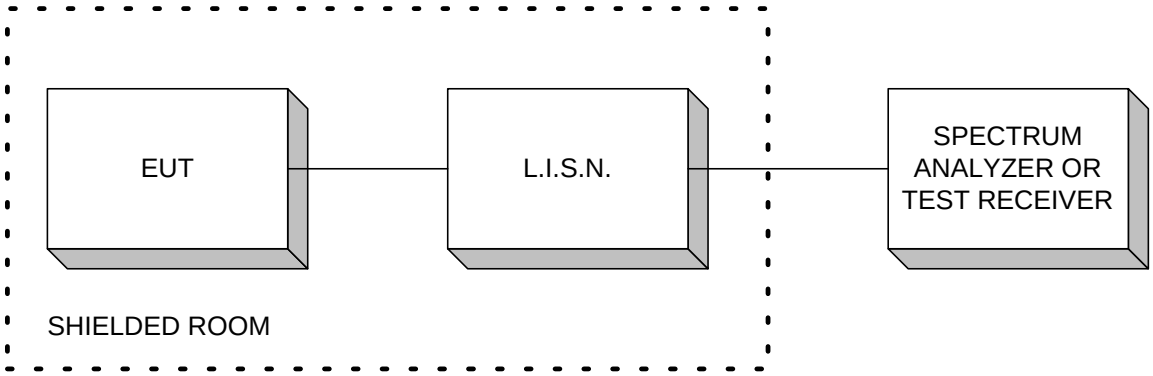


Appendix C: Block Diagram of Test Setups

Test Site For Radiated Emissions



Conducted Emissions



Conducted Measurements