

Emission Test Report
Standard: FCC Part 15 Subpart C / IC RSS-210
Class II Permissive Change

Document Number : FCC 19-0290-0

Model Number: WM3B2200BG

measured with **IBM ThinkPad X41 Tablet Series**

FCC ID: ANO20040501CX2
IC: 349E-WM3B22BG

March 7, 2005

Prepared :

EMC R&D Staff Engineer

Takeshi Asano

Signature:



IBM Japan, Ltd.

EMC Engineering

LAB-S59

1623-14, Shimotsuruma,

Yamato-shi Kanagawa-ken 242, Japan

Phone: +81-46-215-4779

Fax: +81-46-273-7420

E-Mail: asano@jp.ibm.com

Reviewed and Checked :

EMC R&D Advisory Engineer

Toshiya Murota

Signature:



IBM Japan, Ltd.

EMC Engineering

LAB-S59

1623-14, Shimotsuruma,

Yamato-shi Kanagawa-ken 242, Japan

Phone: +81-46-215-6574

Fax: +81-46-273-7420

E-Mail: murota@jp.ibm.com

Approved :

Manager, EMC Engineering

/ NVLAP signatory

Akihisa Sakurai

Signature:



IBM Japan, Ltd.

EMC Engineering

LAB-S59

1623-14, Shimotsuruma,

Yamato-shi Kanagawa-ken 242, Japan

Phone: +81-46-215-2613+81-46-215-2613

Fax: +81-46-273-7420

E-Mail: akihisa@jp @jp

MEASUREMENT / TECHNICAL REPORT – Part 15 Subpart C (Intentional Radiator)

Model: WM3B2200BG (802.11b/g Wireless LAN Adapter)
with
IBM ThinkPad X41 Tablet Series
(Machine Type: 1866, 1867, 1868, 1869)

FCC ID : ANO20040501CX2

March 7, 2005

This report concerns: (check one) Original Grant _____ Class I change _____ Class II change <u> ✓ </u>
Equipment type: <u>Wireless LAN device</u>
This report shall not be reproduced except in full, without the written permission of this test lab.
The measurement results contained in this report relate only to the item which was tested.
Measurement procedure used is ANSI C63.4-2003 unless otherwise specified.
Other test procedure: _____
The FCC has issued provisional acceptance of this test laboratory for Declaration of Conformity testing per letter dated 1997.
APPLICANT ANTI-DRUG ABUSE CERTIFICATION: By checking yes, the applicant certifies that, in the case of an individual applicant, he or she is not subject to a denial of federal benefits, that includes FCC benefits, pursuant to Section 5301 of the Anti-Drug Abuse of 1988, 21 U.S.C. 853(a), or, in the case of a non-individual applicant (e.g. corporation, partnership or other unincorporated association), no party to the application is subject to a denial of federal benefits, that includes FCC benefits, pursuant to that section. For the definition of a “party” for these purposes, see 47 CFR 1.2002(b). Yes or No
“Report shall not be reproduced except in full, without the written approval of the laboratory” “the report must not be used by the client to claim product endorsement by NVLAP or any agency of the US government”
Prepared by: Takeshi Asano IBM Japan Corporation, Yamato EMC Engineering LAB-S59, 1623-14, Shimotsuruma, Yamato-shi Kanagawa-ken 242-8502, Japan Tel: +81-46-215-4779 Fax: +81-46-273-7420

- Index -

A.	General Information	4
A.1	Test Methodology	4
A.2	Test Facility / NVLAP Accreditation.....	4
A.3	EUT details.....	5
B.	Summary of Test Results.....	6
C.	Operation Mode of EUT	7
D.	Antenna Information	8
E.	Justification.....	9
F.	Test Instruments.....	10
G.	Measurement Uncertainty	11
H.	Temperature and Humidity	11
I.	Related Submittal(s)/Grant(s)/Notes	11
1.	Restricted Bands Radiation (1GHz – 25GHz).....	12
1.1	Test Procedure	12
1.2	Test Instruments and Measurement Setup.....	12
1.3	Field Strength Calculation.....	14
1.4	Bandedge Measurement plots	15
1.5	Radiated Emission Measurement Results (above 1GHz).....	20
2.	Restricted Bands Radiation (30MHz – 1GHz)	25
2.1	Test Procedure	25
2.2	Test Instruments and Measurement Setup.....	25
2.3	Field Strength Calculation.....	26
2.4	Measurement Results	27
3.	AC Wireline Conducted Emissions (150KHz – 30MHz).....	30
3.1	Test Procedure	30
3.2	Test Instruments and Measurement Setup.....	30
3.3	Powerline Voltage Calculation	31
3.4	Measurement Results	32

A. General Information

APPLICANT	: IBM Japan, Ltd.
TEST SITE	: IBM Japan, Ltd., Yamato Semi-anechoic chamber #1
TEST SITE ADDRESS	: 1623 – 14 Shimotsuruma, Yamato-shi, Kanagawa 242-8502 Japan Tel: +81-46-215-4779, Fax: +81-46-273-7420
REGULATION	: FCC Part 15 Subpart C Industry Canada RSS-210 (Issue No.5)
MODEL NUMBER (Advertising Name)	: WM3B2200BG (Intel PRO/Wireless 2200BG Mini-PCI Adapter)
FCC ID	: ANO20040501CX2
IC Certification Number	: 349E-MW3B22BG
SERIAL NUMBER	: 00700C473
PHYSICAL CONDITION	: Preproduction
KIND OF EQUIPMENT	: DTS: IEEE802.11b/g Wireless LAN Mini-PCI card
TESTED DATE	: January 11, 12, 13, 14, 17, 20, 26 and March 4, 2005

A.1 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

A.2 Test Facility / NVLAP Accreditation

The semi-anechoic chamber #1 and measurement facility used to collect the data are located in Yamato Laboratory, IBM Japan.

- This facility has been fully described in a report dated September 1998, submitted to the FCC office, and accepted in a letter, dated Nov. 2, 1998(31040/SIT).

1. IBM Yamato EMC Engineering is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with Criteria established in Title 15, Part 285 Code of Federal Regulations. (**NVLAP Lab code: 200198-0**, effective through June 30, 2005)

- These facilities are accepted by **Industry Canada** as number **IC 4221** for chamber #1 (expiry date: December 22, 2007), and as number **IC 4221-1** for chamber #2 (expiry date: February 16, 2007).

A.3 EUT details**Table A** EUT details

Model and S/N	FCC ID IC Certification Number	Description
WM3B2200BG (s/n 00700C473)	FCC ID: ANO20040501CX2 IC: 349E-MW3B22BG	Applying modular transmitter Built_in type IEEE802.11b/g Wireless LAN Mini-PCI card without antenna
ThinkPad X41 Tablet Series M/T 1866-17U (s/n AA-GH1DP)	N/A	IBM Tablet type PC with built_in antennas CPU: Intel® Pentium M Processor, 1.2 GHz
J07M067 (s/n 05S5ARM4SIT023)	FCC ID: ANO20040700HER IC: 349E-J07M067	Co-located built-in type Bluetooth modular transmitter device without antenna
P/N 02K6810	N/A	Universal AC adapter 56W, Unshielded power cord for ThinkPad X41 Tablet

B. Summary of Test Results

Table-B presents the list of the measurement items for DTS (Digital Transmissions System) devices under FCC Part 15 Subpart C and Industry Canada RSS-210 (Issue 5).

The section numbers of upper portion are showing FCC number, and the other (lower) ones are for IC.

Table-B List of the measurements

Section(s)	Test Items : Transmit mode (TX):		Condition	Result
15.247(a)(2) 6.2.2(o) *1	Bandwidth at 6 dB below	At least 500kHz. (*1: RSS-210 Issue5: Amendment)	Conducted	Pass
15.215(c) 5.9.1	Occupied BW (Bandwidth at 20 dB below)	20 dB bandwidth of the emission to be within the allocation band.		Pass
15.247(c) 6.2.2(o)(e1)	Out of Band Emissions	The radiated emission in any 100kHz of outband shall be at least 20dB below the highest inband spectral density.		Pass
15.247(b)(3) 6.2.2(o)(b)	Conducted Transmit Output Power	Shall not exceed 1.0 W.		Pass
15.247(d) 6.2.2(o)(b)	Transmitter power spectral Density	Shall not be greater than 8 dBm in any 3kHz band.		Pass
15.207 6.2.2(o)(e3) / 6.6	AC Wireline Conducted Emissions 150kHz – 30MHz	Class B: Freq.(MHz) QP(dBμV) Ave.(dBμV) 0.15 - 0.5 66 - 56 56 - 46 0.5 - 5 56 46 5 - 30 60 50		Pass
15.205 / 209 6.2.1 /6.2.2(o)(e3) /6.3	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Shall not exceed the limits specified in FCC 15.209 or RSS-210 Table3.	Radiated (30MHz-1GHz)	Pass
			Radiated (1– 25GHz)	Pass

	Test Items : Receive mode (RX):			
15.207 6.2.2(o)(e3) / 7.4	AC Wireline Conducted Emissions 150kHz – 30MHz	Class B: Freq.(MHz) QP(dBμV) Ave.(dBμV) 0.15 - 0.5 66 - 56 56 - 46 0.5 - 5 56 46 5 - 30 60 50	Conducted	Pass
15.205 / 209 6.2.1 /6.2.2(o)(e3) /7.3	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Shall not exceed the limits specified in FCC 15.209 or RSS-210 Table3.	Radiated (30MHz -1GHz)	Pass
			Radiated (1– 25GHz)	Pass

	Other requirements		Result
15.247(b)(4)(i) –	Antenna gain of the applying host device	Peak gain of the device : 1.82 dBi in 2.4GHz band	N/A
– 5.2	Supply Voltage	Main power source: Universal AC adapter 56W Mini-PCI PC bus to applying card : DC 3.3V ± 0.3V	N/A
15.203 6.2.2(o)(e2)	Unique antenna connector	The device employs a unique electronic connector so called BIOS Lock . Refer to “Confidential_BIOS_Lock” exhibit.	complies

C. Operation Mode of EUT

- All tests were performed using the “CRTU II, version 2.2.9.3000” test program provided by Intel Corporation. This tool supports the continuous or burst transmission mode for the testing purpose. The parameter GAIN in the test software was set to 31.0 for IEEE 802.11b mode and was set to 26.0 for ch.1 and 11 and 27.0 for ch.2 through 10 of IEEE 802.11g mode.
- The following frequencies were chosen for the measurements.
Tx tests: 2412MHz (lowest), 2437MHz(middle), and 2462MHz (highest)
Rx tests: 2437MHz(middle)

Table-C Transmission mode of EUT

Note) The table shows the specification of **average** power for the applying device in ‘dBm’.

Operation Frequency [GHz]	Rated output power (conducted) [dBm]										
	IEEE802.11b (DSSS)			IEEE802.11g (OFDM)							
	1/2M bps	5.5M bps	11M bps	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
2.412 (Ch. 1)	+17	+17	+17	+12	+12	+12	+12	+12	+12	+12	+12
2.417 (Ch. 2)	+17	+17	+17	+13	+13	+13	+13	+13	+13	+13	+13
2.422 (Ch. 3)	+17	+17	+17	+13	+13	+13	+13	+13	+13	+13	+13
2.427 (Ch. 4)	+17	+17	+17	+13	+13	+13	+13	+13	+13	+13	+13
2.432 (Ch. 5)	+17	+17	+17	+13	+13	+13	+13	+13	+13	+13	+13
2.437 (Ch. 6)	+17	+17	+17	+13	+13	+13	+13	+13	+13	+13	+13
2.442 (Ch. 7)	+17	+17	+17	+13	+13	+13	+13	+13	+13	+13	+13
2.447 (Ch. 8)	+17	+17	+17	+13	+13	+13	+13	+13	+13	+13	+13
2.452 (Ch. 9)	+17	+17	+17	+13	+13	+13	+13	+13	+13	+13	+13
2.457 (Ch. 10)	+17	+17	+17	+13	+13	+13	+13	+13	+13	+13	+13
2.462 (Ch. 11)	+17	+17	+17	+12	+12	+12	+12	+12	+12	+12	+12

- The measurements were performed while EUT in both “Notebook” and “Tablet” operation modes.

“Notebook” operation mode



“Tablet” operation mode



D. Antenna Information

The Table-D indicates the applicable host antenna systems that are used for the applying modular transmitter.

Table-D EUT Information

*1: including cable loss, Omni directional

*2: Non-lead soldering antenna according to RoHS environmental direction (others are not applied yet or being withdrawn.)

[New antenna system in this Class II application]

IBM ThinkPad X41 Tablet Series		Antenna Designator	Manufacture	Antenna type	Cable type and length	Peak Gain ⁺¹	
Main antenna		91P6908 ⁺²	Wistron NeWeb Corp. (R.O.C.)	Dual Band Meander Antenna	Coax 600 mm	2.4GHz band	Notebook Tablet -1.37 dBi
Auxiliary antenna		91P6909 ⁺²			Coax 550 mm	2.4GHz band	Notebook Tablet 1.77 dBi 1.82 dBi

[Certified antenna systems]

Granted on 03/19/2004

IBM ThinkPad T40 Series		Antenna Designator	Manufacture	Antenna type	Cable type and length	Peak Gain ⁺¹	
LCD 14 inch Model	Main	62P4204 91P6900 ⁺²	Foconn Electronics Inc. (R.O.C.)	Dual Band Meander Antenna	Coax 745 mm	2.4GHz band	0.99 dBi
	Auxiliary	62P4203 91P6898 ⁺²		Dual-Band Coupled Floating Element Antenna	Coax 845 mm	2.4GHz band	-0.48 dBi
LCD 15 inch Model	Main	91P6841 ⁺²	Hitachi Cable Ltd. (Japan)	Dual Band Meander Antenna	coax 755mm	2.4GHz band	1.24 dBi
	Auxiliary	91P6840 ⁺²			coax 580mm	2.4GHz band	0.38 dBi

Granted on 03/19/2004

IBM ThinkPad R50 Series		Designator	Manufacture	Antenna type	Cable type and length	Peak Gain ⁺¹	
LCD 14 inch Model	Main	91P6810	Hitachi Cable Ltd. (Japan)	Dual Band Meander Antenna	Coax 750 mm	2.4GHz band	1.52 dBi
	Auxiliary	91P6811			Coax 635 mm	2.4GHz band	1.84 dBi
LCD 15 inch Model	Main	91P6812	Hitachi Cable Ltd. (Japan)	Dual Band Meander Antenna	coax 775mm	2.4GHz band	1.18 dBi
	Auxiliary	91P6813			coax 670mm	2.4GHz band	1.71 dBi

Granted on 03/04/2004

IBM ThinkPad X30 Series		Designator	Manufacture	Antenna type	Cable type and length	Peak Gain ⁺¹	
Main antenna		08K4083	Nissei Electric Co. Ltd. (Japan)	Dual Band Meander Antenna	Coax 394 mm	2.4GHz band	0.62 dBi
Auxiliary antenna		08K4084			Coax 534 mm	2.4GHz band	1.28 dBi

Granted on 03/04/2004

IBM ThinkPad X40 Series		Designator	Manufacture	Antenna type	Cable type and length	Peak Gain ⁺¹	
Main antenna		13N5743	Nissei Electric Co. Ltd. (Japan)	Dual Band Meander Antenna	Coax 488 mm	2.4GHz band	0.39 dBi
Auxiliary antenna		13N5742			Coax 449 mm	2.4GHz band	1.67 dBi

E. Justification

The full testing results were already performed with the highest antenna gain (ThinkPad R50 Series) as shown in the previous Table-D, then certified on March/19/2004.

The new antenna used for ThinkPad X41 Tablet PC is very similar meander type to the existing granted antenna systems and the gain of it does not exceed the certified values.

Therefore, the applying new antenna conforms with the FCC rule Part 15 Subpart C pursuant to the ET Docket 03–201; FCC 04–165, July 12/2004 and Federal Register / Vol. 69, No. 172, September 7/2004.

However, the new host PC (X41 Tablet) has the additional usage than the existing PC models. i.e. “Tablet” operation mode.

With the above back ground, this test report includes the following measurement items to prove the emissions conform to the limits for both normal and tablet modes.

- Restricted Bands Radiation
- AC Wireline Conducted Emissions

Note) The conducted measurement results are not reported in this document, since there is no hardware nor electrical modification was made to the applying modular transmitter itself.

As shown below, the well consistency was found between the original grant and SAR test report.

() means the difference of the conducted power between the original grant and SAR report.

	2.4GHz DSSS mode	2.4GHz OFDM mode
measurement results of the Original grant	17.11dBm	13.30dBm
measurement results in the separate SAR report	17.43dBm (+0.32dB)	13.60dBm (+0.30dB)

The all tests were performed with the higher gain antenna (auxiliary antenna) of ThinkPad X41 Tablet PC.

IBM ThinkPad X41 Tablet Series		Peak Gain in 2.4GHz band
Notebook operation mode	Main antenna	-1.37 dBi
	Auxiliary antenna	1.77 dBi
Tablet operation mode	Main antenna	-0.15 dBi
	Auxiliary antenna	1.82 dBi

F. Test Instruments

Table-F List of Measuring Instruments

Description	Model	Serial Number	Calibration Date	Calibration Interval
Computer	IBM 6868-30J	97-901X3	N/A	N/A
Computer	IBM 6589-13J	97-15613	N/A	N/A
Spectrum Analyzer (100Hz-1.5GHz)	HP 85680B	2732A03651	07/21/04	1 year
Spectrum Analyzer (100Hz-1.5GHz)	HP 85680B	2841A04254	08/25/04	1 year
Spectrum Analyzer (100Hz-1.5GHz)	HP 85680B	3019A05156	08/05/04	1 year
Spectrum Analyzer Display	HP 85662A	2648A15255	07/21/04	1 year
Spectrum Analyzer Display	HP 85662A	2816A16831	08/25/04	1 year
Spectrum Analyzer Display	HP 85662A	3026A19366	08/05/04	1 year
Quasi-Peak Adapter	HP 85650A	2521A00968	07/20/04	1 year
Quasi-Peak Adapter	HP 85650A	2811A01156	08/25/04	1 year
Quasi-Peak Adapter	HP 85650A	2811A01433	08/05/04	1 year
Amplifier (100KHz - 1.3GHz)				
- for 30-200MHz	MITEQ AM-3A	898433	04/23/04	1 year
- for 200-1000MHz	MITEQ AM-3A	898432	04/23/04	1 year
Amplifier (1GHz - 18GHz)	HP 8449B	3008A00582	06/01/04	1 year
Amplifier (18 – 25GHz)	Agilent 83051A	3950M00193	01/18/05	1 year
Spectrum Analyzer EMI Test Receiver	R&S ESI26	836119/003	05/10/04	1 year
Receiver (9kHz-30MHz)	R&S ESH3	891806/012	11/04/04	1 year
Receiver (20MHz-1.3GHz)	R&S ESVP	892111/026	11/04/04	1 year
Biconical Antenna (30-200MHz)	EMCO 3108	2536	04/23/04	1 year
Log-Periodic Antenna (200-1000MHz)	EMCO 3146	2849	04/23/04	1 year
Horn Antenna (1- 18GHz)	EMCO 3115	9903-5774	07/20/04	1 year
Horn Antenna (3.95- 5.85GHz)	EMCO 3160-5	1099	07/20/04	1 year
Horn Antenna (5.85- 8.20GHz)	EMCO 3160-6	9712-1044	07/20/04	1 year
Horn Antenna (18- 25GHz)	EMCO 3160-9	0004-1202	07/20/04	1 year
LISN	EMCO 3810/2NM	00022007	06/15/04	1 year
Switch/control unit	HP 3488A	2719A17226 2719A17228	N/A N/A	N/A N/A
Plotter	HP 7550A	2631A33619	N/A	N/A
Coaxial cables (1 – 18GHz):	Length:			
- Horn Ant <=> RF Amp.	6 m	- EM206SCO	03/25/04	1 year
- RF Amp.<=>Spectrum Analyzer	16m	- GEM0101	03/25/04	1 year
Coaxial cables (18 – 25GHz):				
- Horn Ant <=> RF Amp.	3m	- SF102-20167	04/08/04	1 year
- RF Amp.<=>Spectrum Analyzer	1m	- SF102-21105	04/08/04	1 year
N-Coax cables:				
- Bi-coni Ant <=> 10m Cable	9 m	- EM103L01	04/23/04	1 year
- 10m Cable <=> Shield Panel	10 m	- EM103L02	04/23/04	1 year
- Shield Panel <=> RF Amp	7 m	- EM103L03	04/23/04	1 year
- RF Amp <=> Power Splitter	0.5m	- EM103L04	04/23/04	1 year
- Log-peri Ant <=> 10m Cable	9 m	- EM103H01	04/23/04	1 year
- 10m Cable <=> Shield Panel	10 m	- EM103H02	04/23/04	1 year

- Shield Panel <=> RF Amp	7 m	- EM103H03	04/23/04	1 year
- RF Amp <=> Power Splitter	0.5m	- EM103H04	04/23/04	1 year
Coax cables:				
- Power Splitter <=> SW/Con.unit (SW110)	1 m	- EM103L05	04/23/04	1 year
- Power Splitter <=> SW/Con.unit (SW300)	1 m	- EM103L06	04/23/04	1 year
- Power Splitter <=> SW/Con.unit (SW100)	1 m	- EM103H05	04/23/04	1 year
- Power Splitter <=> SW/Con.unit (SW301)	1 m	- EM103H06	04/23/04	1 year
- SW/Con.unit <=> Receiver (Input)	2 m	- EM1RCV	04/23/04	1 year
- SW/Con.unit <=> Spe Ana.(Signal In) for 30- 200MHz	2 m	- EM1SPL	04/23/04	1 year
- SW/Con.unit <=> Spe Ana.(Signal In) for 200-1000MHz	2 m	- EM1SPH	04/23/04	1 year

Notes. - The above equipment calibration is traceable to National standards.

- HP: Hewlett Packard, R&S: Rohde & Schwarz

G. Measurement Uncertainty

Uncertainties of the both, the Yamato EMI radiated test facilities (EMI chambers, #1 and #2) and the Yamato EMI conducted test facility are derived with the NIS 81 " Treatment of uncertainty in EMC measurements" 1994.

Estimated site uncertainty values are as follows.

EMI chamber #1 : 4.39dB

EMI chamber #2 : 4.40dB

EMI conducted measurement system : 2.4dB

Detail should be referred to "Treatment of Uncertainty, Calculations and Policy" report, document number TCR 10-0015.

H. Temperature and Humidity

The temperature is controlled within range of 17° to 28°

The relative humidity is controlled within range of 40% to 70%.

I. Related Submittal(s)/Grant(s)/Notes

During the applying modular device stops RF transmission, the host unit with full peripheral devices including the applying modular device is classified as an unintentional radiator, Digital Device under the FCC Part 15 Subpart B or the Industry Canada Class B Emission Compliance (ICES-003), and subject to DoC.

1. Restricted Bands Radiation (1GHz – 25GHz)

[FCC 15.205 / 209, RSS-210 6.3 / 7.3]

1.1 Test Procedure

Radiated emissions were measured in the frequency range with 1 GHz to 25GHz in transmitting mode and 1 GHz to 12.5GHz in receiving mode. All tests were performed in the semi-anechoic chamber at a 3-meter distance (except for the frequency range with 18 GHz to 25 GHz where test distance was reduced to 1 meter) on both horizontal and vertical polarities. The antenna was also scanned in height. The emissions are recorded with a spectrum analyzer in peak hold mode. The identified emissions are further maximized as a function of cable manipulation, azimuth, and antenna height. The emissions closest to the limits are measured in the peak mode with the tuned spectrum analyzer using resolution bandwidth of 1MHz / video bandwidth of 1MHz, and the average setting mode with the tuned spectrum analyzer using resolution bandwidth of 1MHz / video bandwidth of 100Hz or 10Hz. The highest emissions relative to the limit are listed.

1.2 Test Instruments and Measurement Setup

Table 1-1 Radiated Emission Test Instrumentation (1GHz – 25GHz)

Description	Model	Serial Number
Spectrum Analyzer EMI Test Receiver	R&S ESI26	836119/003
Amplifier (1 – 18GHz)	HP 8449B	3008A00582
Amplifier (18 – 25GHz)	Agilent 83051A	3950M00193
Horn Antenna (1 - 18GHz)	EMCO 3115	9903-5774
Horn Antenna (3.95 – 5.85GHz)	EMCO 3160-5	1099
Horn Antenna (5.85 – 8.2GHz)	EMCO 3160-6	9712-1044
Horn Antenna (18 - 25GHz)	EMCO 3160-9	0004-1202
Coaxial cables:	Length:	
- Horn Ant <=> RF Amp. (1-18GHz)	6 m	- EM206SCO
- RF Amp.<=>Spectrum Analyzer (1-18GHz)	16 m	- GEM0101
- Horn Ant <=> RF Amp. (18-25GHz)	3m	- SF102-20167
- RF Amp.<=>Spectrum Analyzer (18-25GHz)	1m	- SF102-21105

Notes: - HP: Hewlett Packard, R&S: Rohde & Schwarz

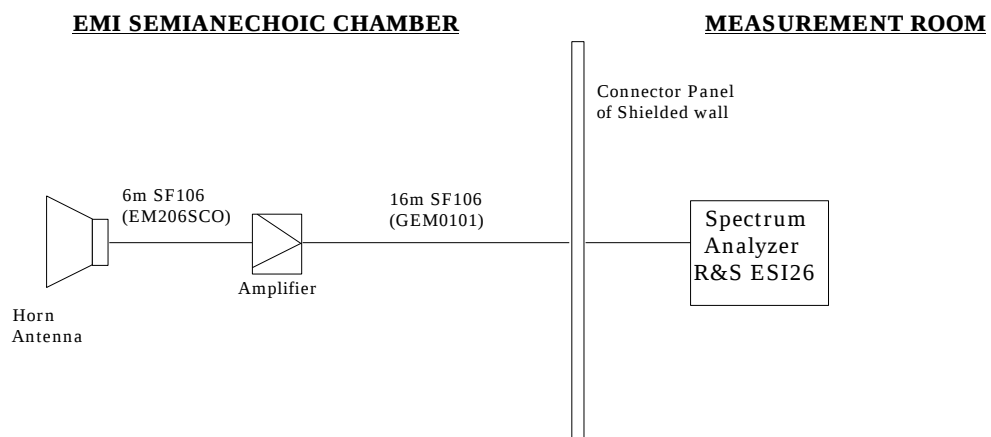


Figure 1-1. Cables for Radiated Emission Test (1 – 18 GHz)

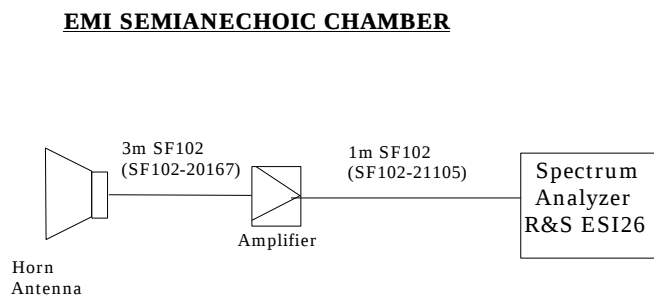


Figure 1-2. Cables for Radiated Emission Test (18 - 25GHz)

1.3 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

where:

FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL-AG

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

For example:

Given a Spectrum Analyzer input reading of 51.5 dB μ V; Antenna Factor of 8.5 dB/m; Cable Loss of 1.3 dB; Falloff Factor of 0 dB; and an Amplifier Gain of 26 dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26 - 0.0 = 35.6 \text{ dB}\mu\text{V/m}$$

Conversions between dB μ V/m (or dB μ V) and μ V/m (or μ V) are done as :

$$\text{Level(dB}\mu\text{V/m)} = 20 \times \text{Log (Level}(\mu\text{V/m))}$$

$$40 \text{ dB}\mu\text{V/m} = 100 \mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250 \mu\text{V/m}$$

1.4 Bandedge Measurement plots

The test was performed with the co-located Bluetooth device (FCC ID: ANO20040700HER) in active and transmitting simultaneously.

Test Date: January 13, 2005

Table 1-2 Notebook operation mode

D: DSSS mode O: OFDM mode

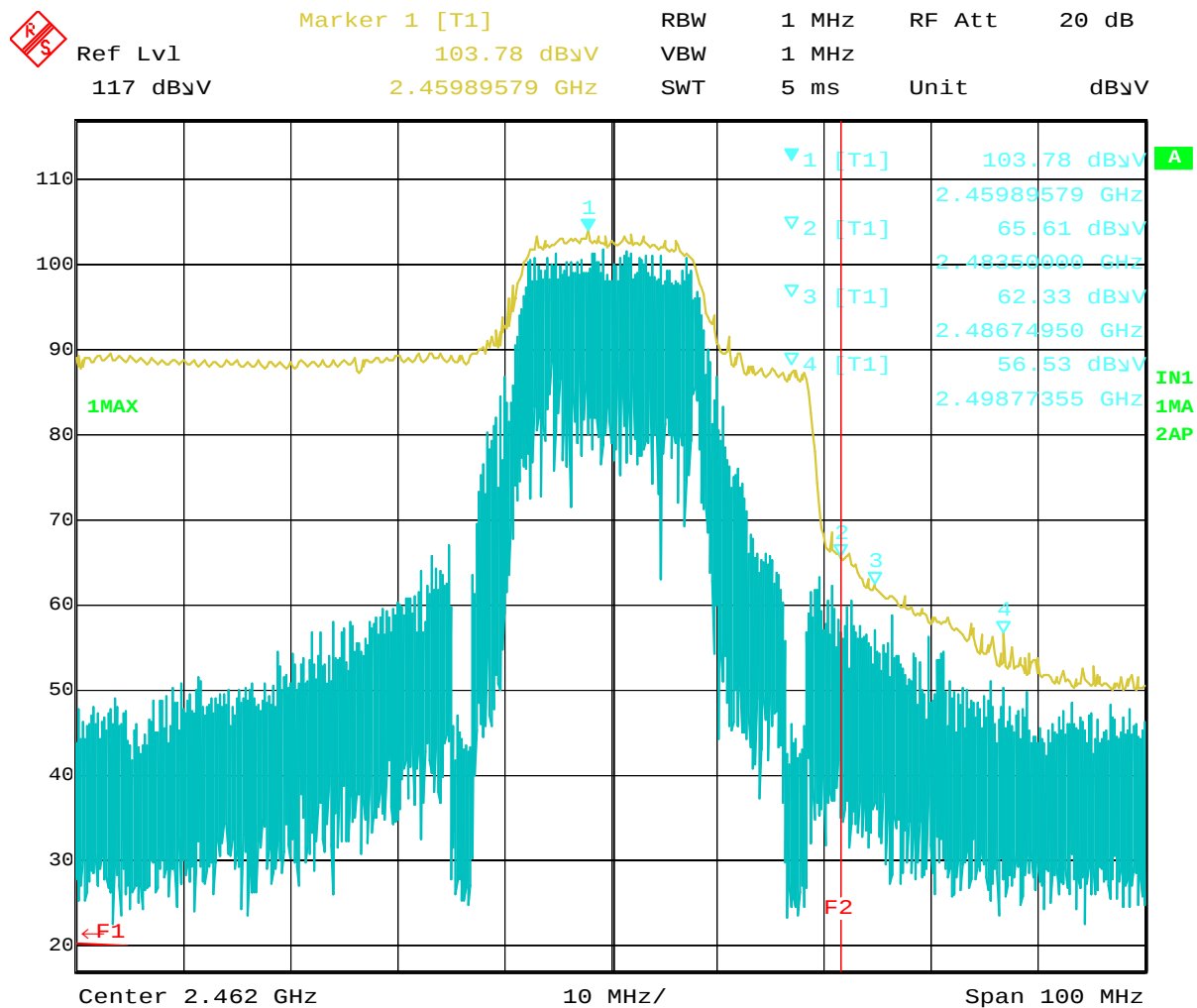
Ch.	Tx rate (Mb/s)	Frequency (GHz)	Polarity (H/V)	Reading (dBμV) (peak)	Rading (dBμV) (average)	Antenna Factor (dB/m)	Corr. Factor (dB)	Falloff Factor (dB)	Field Strength (dBμV/m) (peak)	Margin to Limit (dB) (peak)	Field Strength (dBμV/m) (average)	Margin to Limit (dB) (average)
1	D: 1	2.384	H	57.2	46.5	28.2	-29.2	0.0	56.2	17.8	45.5	8.5
	5.5	2.386	H	56.0	42.1	28.2	-29.2	0.0	55.0	19.0	41.1	12.9
	11	2.383	H	56.8	41.7	28.2	-29.2	0.0	55.8	18.2	40.7	13.3
	O: 6	2.390	H	63.4	46.4	28.2	-29.2	0.0	62.4	11.6	45.4	8.6
	18	2.390	H	61.5	45.0	28.2	-29.2	0.0	60.5	13.5	44.0	10.0
	24	2.390	H	61.7	44.5	28.2	-29.2	0.0	60.7	13.3	43.5	10.5
	54	2.390	H	59.9	42.6	28.2	-29.2	0.0	58.9	15.1	41.6	12.4
11	D: 1	2.489	H	56.8	46.9	28.4	-29.1	0.0	56.1	17.9	46.2	7.8
	5.5	2.485	H	55.6	41.7	28.4	-29.1	0.0	54.9	19.1	41.0	13.0
	11	2.490	H	56.3	41.9	28.4	-29.1	0.0	55.6	18.4	41.2	12.8
	O: 6	2.484	H	65.6	48.2	28.4	-29.1	0.0	64.9	9.1	47.5	6.5
	18	2.484	H	65.5	46.8	28.4	-29.1	0.0	64.8	9.2	46.1	7.9
	24	2.484	H	63.6	46.1	28.4	-29.1	0.0	62.9	11.1	45.4	8.6
	54	2.484	H	64.0	44.1	28.4	-29.1	0.0	63.3	10.7	43.4	10.6

Table 1-3 Tablet operation mode

D: DSSS mode O: OFDM mode

Ch.	Tx rate (Mb/s)	Frequency (GHz)	Polarity (H/V)	Reading (dBμV) (peak)	Rading (dBμV) (average)	Antenna Factor (dB/m)	Corr. Factor (dB)	Falloff Factor (dB)	Field Strength (dBμV/m) (peak)	Margin to Limit (dB) (peak)	Field Strength (dBμV/m) (average)	Margin to Limit (dB) (average)
1	D: 1	2.383	H	56.6	46.6	28.2	-29.2	0.0	55.6	18.4	45.6	8.4
	5.5	2.390	H	56.5	41.8	28.2	-29.2	0.0	55.5	18.5	40.8	13.2
	11	2.384	H	56.3	41.9	28.2	-29.2	0.0	55.3	18.7	40.9	13.1
	O: 6	2.390	H	64.5	47.1	28.2	-29.2	0.0	63.5	10.5	46.1	7.9
	18	2.390	H	62.4	45.5	28.2	-29.2	0.0	61.4	12.6	44.5	9.5
	24	2.390	H	63.0	45.1	28.2	-29.2	0.0	62.0	12.0	44.1	9.9
	54	2.390	H	61.9	43.0	28.2	-29.2	0.0	60.9	13.1	42.0	12.0
11	D: 1	2.488	V	57.8	48.9	28.4	-29.1	0.0	57.1	16.9	48.2	5.8
	5.5	2.485	V	56.6	42.6	28.4	-29.1	0.0	55.9	18.1	41.9	12.1
	11	2.488	V	57.8	43.1	28.4	-29.1	0.0	57.1	16.9	42.4	11.6
	O: 6	2.484	V	67.4	49.5	28.4	-29.1	0.0	66.7	7.3	48.8	5.2
	18	2.484	V	65.8	48.2	28.4	-29.1	0.0	65.1	8.9	47.5	6.5
	24	2.484	V	66.2	47.4	28.4	-29.1	0.0	65.5	8.5	46.7	7.3
	54	2.484	V	66.1	45.1	28.4	-29.1	0.0	65.4	8.6	44.4	9.6

Note) The traces hereafter are the worst cases in each Table 1-2 or Table 1-3.

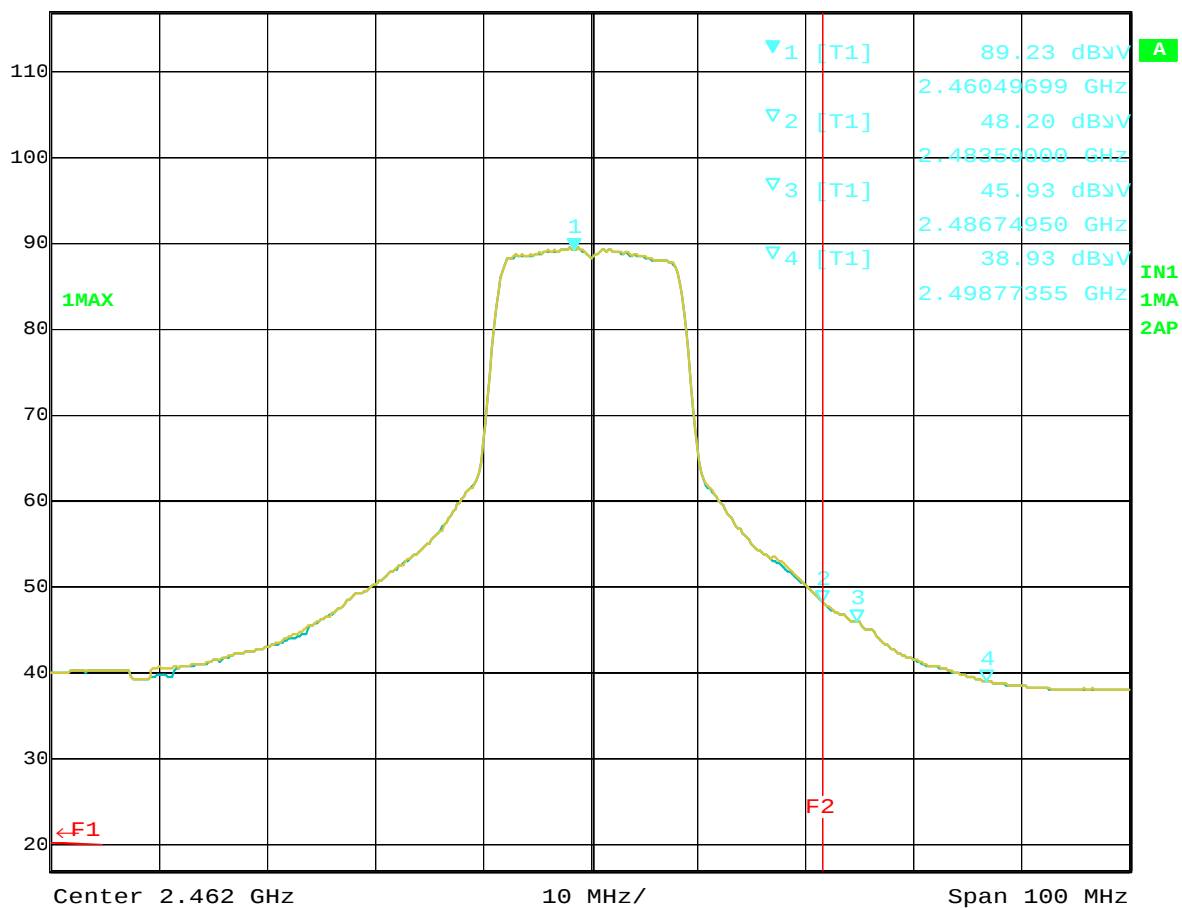


Date: 13.JAN.2005 14:28:50

Plot 1-1 Ch.11 2462MHz TX, OFDM 6Mbps (Peak) in Notebook operation mode

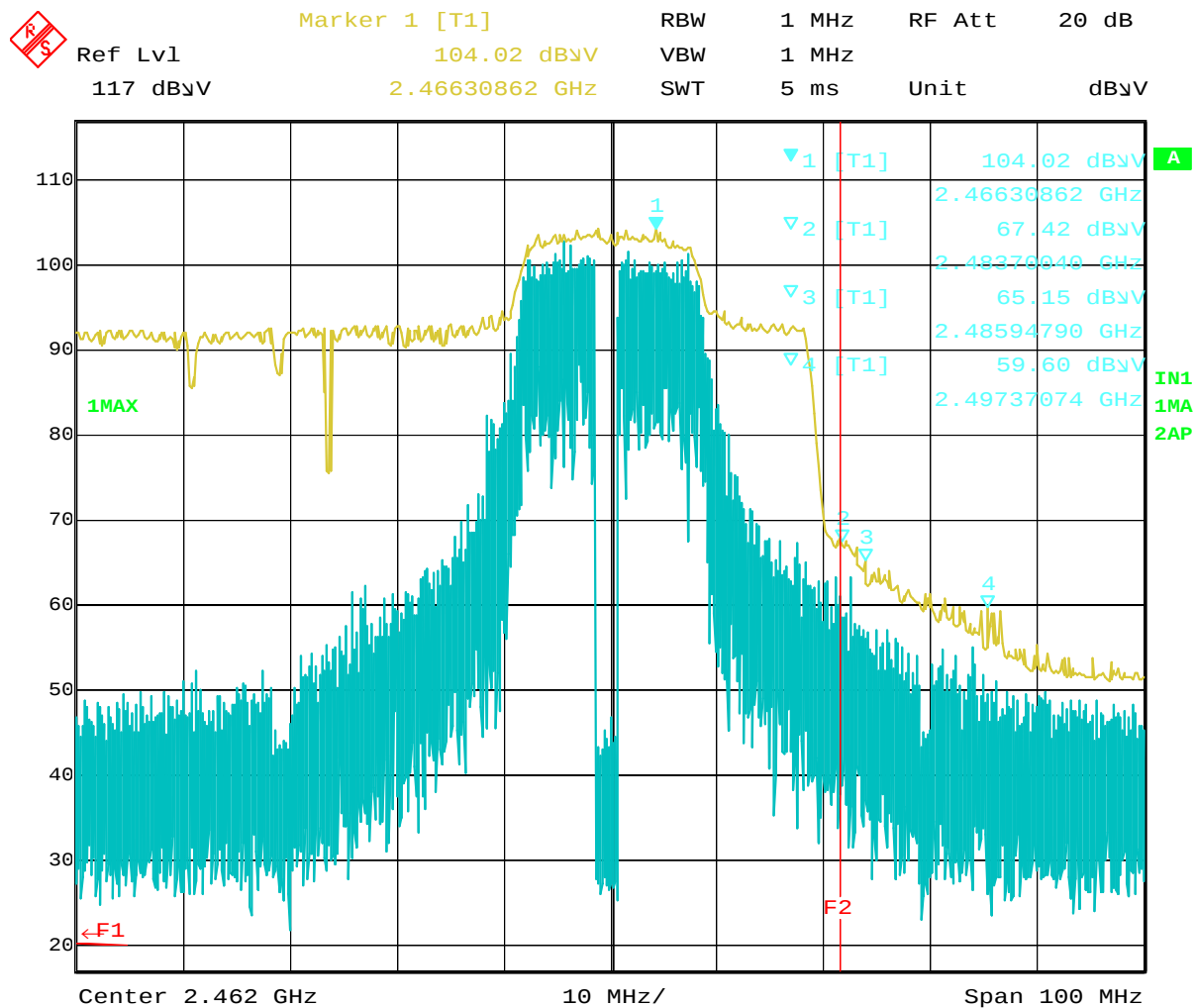


Ref Lvl 117 dBμV
Marker 1 [T1] 89.23 dBμV
2.46049699 GHz
RBW 1 MHz
VBW 10 Hz
SWT 25 s
RF Att 20 dB
Unit dBμV



Date: 13.JAN.2005 14:30:04

Plot 1-2 Ch.11 2462MHz TX, OFDM 6Mbps (Average) in Notebook operation mode

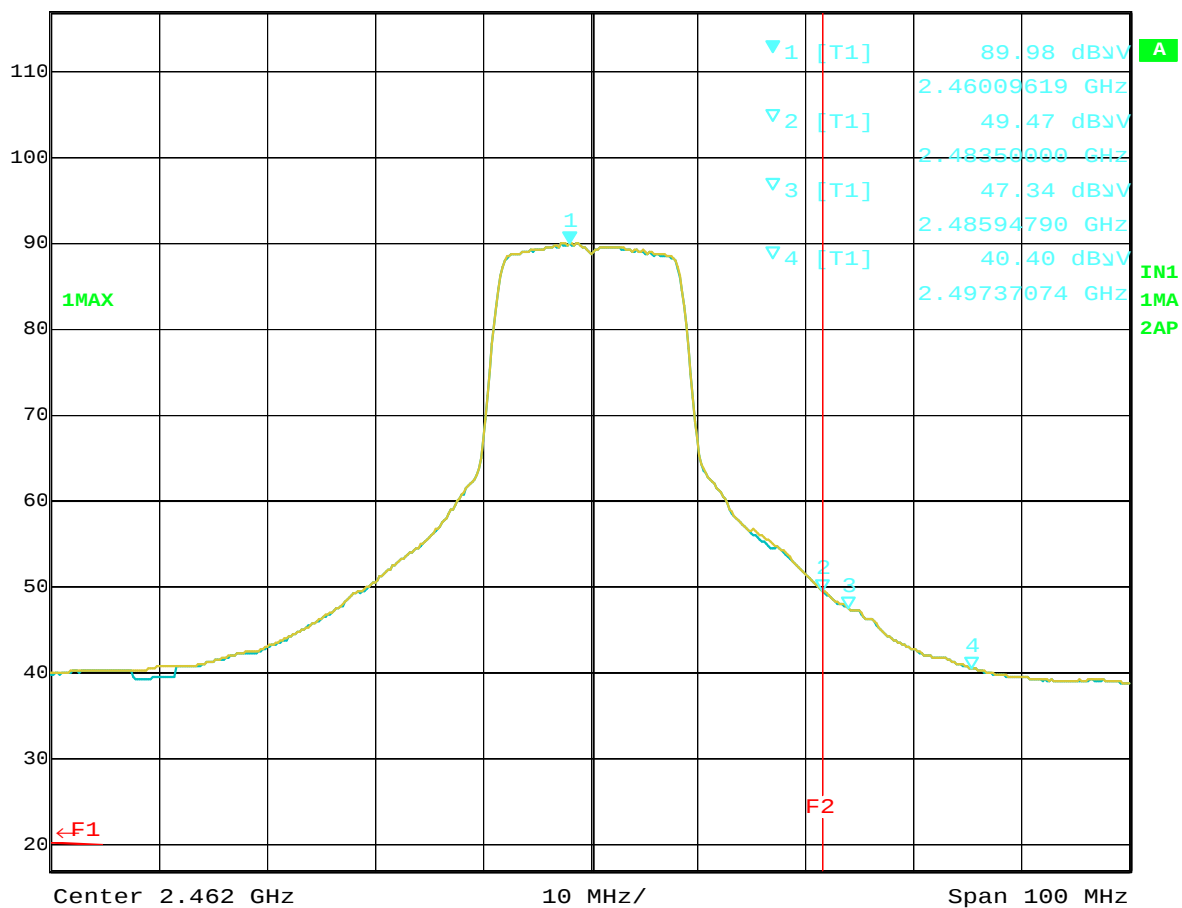


Date: 13.JAN.2005 18:14:30

Plot 1-3 Ch.11 2462MHz TX, OFDM 6Mbps (Peak) in Tablet operation mode



Ref Lvl 117 dBμV
Marker 1 [T1] 89.98 dBμV
2.46009619 GHz
RBW 1 MHz
VBW 10 Hz
SWT 25 s
RF Att 20 dB
Unit dBμV



Date: 13.JAN.2005 18:15:51

Plot 1-4 Ch.11 2462MHz TX, OFDM 6Mbps (Average) in Tablet operation mode

1.5 Radiated Emission Measurement Results (above 1GHz)

The representative each worst case in previous Table 1-2 or 1-3 was selected and tested with the co-located Bluetooth device (FCC ID: [ANO20040700HER](#)) in active and transmitting simultaneously.

The EUT was found to comply to the limits of FCC Part 15 Subpart C and RSS-210 with a margin of 5.2 dB. The measurement was done for the frequency range of 1 GHz to 25 GHz in TX mode and 1 GHz to 12.5GHz in RX mode.

Test Date: January 13, 17, 20, 26 and March 4, 2005

1.5.1 EUT in Notebook operation mode

*Note1: OB means “operation band” (2400-2483.5MHz); in this case limit is 1W (measured conducted with power meter)

*Note2: NR means “Non-Restricted band” (just reference only for EU compliance)

Table 1-4. Ch.1 (2412MHz) OFDM 6Mbps **TX** mode

Frequency	Polarity	Measured	Measured	Antenna	Corr.	Falloff	Field	FCC	Margin	Field	FCC	Margin
(GHz)	(H/V)	(dBμV)	(dBμV)	Factor	Factor	Factor	Strength	Limit	to limit	Strength	Limit	to limit
		(dBμV)	(dBμV)	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
		(peak)	(average)				(peak)			(average)		
Inband												
2.415	H	103.6	89.7	28.3	-29.1	0.0	102.8	OB*1	-	88.9	OB*1	-
bandedge												
2.377	H	57.8	39.7	28.2	-29.2	0.0	56.8	74.0	17.2	38.7	54.0	15.3
2.385	H	60.7	42.7	28.2	-29.2	0.0	59.7	74.0	14.3	41.7	54.0	12.3
2.390	H	63.4	46.4	28.2	-29.2	0.0	62.4	74.0	11.6	45.4	54.0	8.6
1.002	V	47.4	-	24.1	-31.9	0.0	39.6	74.0	34.4	-	54.0	-
1.098	V	50.6	-	24.4	-31.5	0.0	43.5	74.0	30.5	-	54.0	-
1.197	V	54.0	-	25.2	-31.3	0.0	47.9	74.0	26.1	-	54.0	-
1.598	V	59.0	38.2	25.6	-30.3	0.0	54.3	74.0	19.7	33.5	54.0	20.5
1.817	V	44.4	29.4	26.9	-29.9	0.0	41.4	NR*2	-	26.4	NR*2	-
2.312	H	54.0	-	28.0	-29.3	0.0	52.7	74.0	21.3	-	54.0	-
4.814	V	57.4	26.7	27.1	-26.6	0.0	57.9	74.0	16.1	27.2	54.0	26.8
4.860	V	59.0	26.5	27.0	-26.6	0.0	59.4	74.0	14.6	26.9	54.0	27.1
4.926	V	62.7	26.4	27.0	-26.4	0.0	63.3	74.0	10.7	27.0	54.0	27.0
4.956	V	63.6	26.5	27.1	-26.6	0.0	64.1	74.0	9.9	27.0	54.0	27.0
5.160	V	38.6	25.3	27.2	-26.0	0.0	39.8	NR*2	-	26.5	NR*2	-
7.258	V	41.5	-	30.0	-24.5	0.0	47.0	74.0	27.0	-	54.0	-
7.285	V	41.8	-	29.9	-24.6	0.0	47.1	74.0	26.9	-	54.0	-

Table 1-5. Ch.6 (2437MHz) OFDM 6Mbps TX mode

Frequency (GHz)	Polarity (H/V)	Measured (dBμV) (peak)	Measured (dBμV) (average)	Antenna Factor (dB/m)	Corr. Factor (dB)	Falloff Factor (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)
							(peak)			(average)		
Inband 2.439 bandedge	H	103.9	89.6	28.4	-29.2	0.0	103.1	OB*1	-	88.8	OB*1	-
2.386	H	53.9	-	28.2	-29.2	0.0	52.9	74.0	21.1	-	54.0	-
2.390	H	51.0	-	28.2	-29.2	0.0	50.0	74.0	24.0	-	54.0	-
2.484	H	51.6	-	28.4	-29.1	0.0	50.9	74.0	23.1	-	54.0	-
1.002	V	47.4	-	24.1	-31.9	0.0	39.6	74.0	34.4	-	54.0	-
1.098	V	50.2	-	24.4	-31.5	0.0	43.1	74.0	30.9	-	54.0	-
1.199	V	53.8	-	25.2	-31.3	0.0	47.7	74.0	26.3	-	54.0	-
1.598	V	58.7	38.4	25.6	-30.3	0.0	54.0	74.0	20.0	33.7	54.0	20.3
1.820	V	44.3	30.4	26.9	-29.9	0.0	41.3	NR*2	-	27.4	NR*2	-
2.337	H	54.5	-	28.1	-29.3	0.0	53.3	74.0	20.7	-	54.0	-
2.351	H	50.6	-	28.1	-29.2	0.0	49.5	74.0	24.5	-	54.0	-
2.361	H	51.5	-	28.1	-29.2	0.0	50.4	74.0	23.6	-	54.0	-
4.807	V	57.7	26.6	27.1	-26.7	0.0	58.1	74.0	15.9	27.0	54.0	27.0
4.906	V	59.8	26.4	27.0	-26.6	0.0	60.2	74.0	13.8	26.8	54.0	27.2
4.929	V	62.1	26.4	27.0	-26.4	0.0	62.7	74.0	11.3	27.0	54.0	27.0
4.956	V	63.7	26.3	27.1	-26.6	0.0	64.2	74.0	9.8	26.8	54.0	27.2
5.160	H	38.9	25.3	27.2	-26.0	0.0	40.1	NR*2	-	26.5	NR*2	-
7.270	V	40.4	-	29.9	-24.6	0.0	45.7	74.0	28.3	-	54.0	-
7.290	V	39.9	-	29.9	-24.4	0.0	45.4	74.0	28.6	-	54.0	-

Table 1-6. Ch.11 (2462MHz) OFDM 6Mbps TX mode

Frequency (GHz)	Polarity (H/V)	Measured (dBμV) (peak)	Measured (dBμV) (average)	Antenna Factor (dB/m)	Corr. Factor (dB)	Falloff Factor (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)
							(peak)			(average)		
Inband 2.460 bandedge	H	103.8	89.2	28.4	-29.2	0.0	103.0	OB*1	-	88.4	OB*1	-
2.484	H	65.6	48.2	28.4	-29.1	0.0	64.9	74.0	9.1	47.5	54.0	6.5
2.487	H	62.3	45.9	28.4	-29.1	0.0	61.6	74.0	12.4	45.2	54.0	8.8
2.499	H	56.5	38.9	28.4	-29.1	0.0	55.8	74.0	18.2	38.2	54.0	15.8
1.002	V	48.4	-	24.1	-31.9	0.0	40.6	74.0	33.4	-	54.0	-
1.087	V	55.6	-	24.5	-31.5	0.0	48.6	74.0	25.4	-	54.0	-
1.196	V	54.7	-	25.2	-31.3	0.0	48.6	74.0	25.4	-	54.0	-
1.595	V	59.1	38.3	25.6	-30.3	0.0	54.4	74.0	19.6	33.6	54.0	20.4
1.818	V	44.3	30.1	26.9	-29.9	0.0	41.3	NR*2	-	27.1	NR*2	-
2.288	H	50.6	-	27.8	-29.3	0.0	49.1	74.0	24.9	-	54.0	-
2.361	H	54.4	-	28.1	-29.2	0.0	53.3	74.0	20.7	-	54.0	-
2.382	H	52.0	-	28.2	-29.2	0.0	51.0	74.0	23.0	-	54.0	-
2.387	H	51.5	-	28.2	-29.2	0.0	50.5	74.0	23.5	-	54.0	-
4.809	V	58.7	26.5	27.1	-26.7	0.0	59.1	74.0	14.9	26.9	54.0	27.1
4.913	V	61.1	26.3	27.0	-26.4	0.0	61.7	74.0	12.3	26.9	54.0	27.1
4.938	V	62.4	26.4	27.1	-26.4	0.0	63.1	74.0	10.9	27.1	54.0	26.9
4.956	V	62.1	26.3	27.1	-26.6	0.0	62.6	74.0	11.4	26.8	54.0	27.2
5.288	H	39.5	25.2	27.1	-25.9	0.0	40.7	NR*2	-	26.4	NR*2	-
7.258	V	40.8	-	30.0	-24.5	0.0	46.3	74.0	27.7	-	54.0	-
7.270	V	41.7	-	29.9	-24.6	0.0	47.0	74.0	27.0	-	54.0	-

Table 1-7. Ch.6 (2437MHz) OFDM RX mode

Frequency (GHz)	Polarity (H/V)	Measured (dBμV) (peak)	Measured (dBμV) (average)	Antenna Factor (dB/m)	Corr. Factor (dB)	Falloff Factor (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)
							(peak)			(average)		
1.018	V	49.9	-	24.3	-31.9	0.0	42.3	74.0	31.7	-	54.0	-
1.099	V	49.2	-	24.4	-31.5	0.0	42.1	74.0	31.9	-	54.0	-
1.199	V	56.1	-	25.2	-31.3	0.0	50.0	74.0	24.0	-	54.0	-
1.600	V	57.6	-	25.6	-30.3	0.0	52.9	74.0	21.1	-	54.0	-
1.818	V	44.4	30.4	26.9	-29.9	0.0	41.4	NR*2	-	27.4	NR*2	-
1.881	V	41.9	29.5	27.5	-29.7	0.0	39.7	NR*2	-	27.3	NR*2	-
5.185	H	39.7	25.2	27.2	-26.1	0.0	40.8	NR*2	-	26.3	NR*2	-
5.246	H	37.6	25.2	27.1	-26.0	0.0	38.7	NR*2	-	26.3	NR*2	-

1.5.2 EUT in Tablet operation mode

*Note1: OB means “operation band” (2400-2483.5MHz); in this case limit is 1W (measured conducted with power meter)

*Note2: NR means “Non-Restricted band” (just reference only for EU compliance)

Table 1-8. Ch.1 (2412MHz) OFDM 6Mbps TX mode

Frequency (GHz)	Polarity (H/V)	Measured (dBμV) (peak)	Measured (dBμV) (average)	Antenna Factor (dB/m)	Corr. Factor (dB)	Falloff Factor (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)
							(peak)			(average)		
Inband												
2.411	H	103.9	90.0	28.3	-29.1	0.0	103.1	OB*1	-	89.2	OB*1	-
bandedge												
2.378	H	57.0	40.7	28.2	-29.2	0.0	56.0	74.0	18.0	39.7	54.0	14.3
2.387	H	60.9	44.2	28.2	-29.2	0.0	59.9	74.0	14.1	43.2	54.0	10.8
2.390	H	64.5	47.1	28.2	-29.2	0.0	63.5	74.0	10.5	46.1	54.0	7.9
1.002	V	48.6	-	24.1	-31.9	0.0	40.8	74.0	33.2	-	54.0	-
1.103	V	48.3	-	24.4	-31.5	0.0	41.2	74.0	32.8	-	54.0	-
1.199	V	57.2	-	25.2	-31.3	0.0	51.1	74.0	22.9	-	54.0	-
1.598	V	58.4	-	25.6	-30.3	0.0	53.7	74.0	20.3	-	54.0	-
1.803	V	44.6	29.5	26.4	-29.9	0.0	41.1	NR*2	-	26.0	NR*2	-
2.312	H	52.6	-	28.0	-29.3	0.0	51.3	74.0	22.7	-	54.0	-
4.823	H	49.9	-	27.1	-26.6	0.0	50.4	74.0	23.6	-	54.0	-
4.913	H	53.0	-	27.0	-26.6	0.0	53.4	74.0	20.6	-	54.0	-
4.947	H	57.1	26.2	27.1	-26.4	0.0	57.8	74.0	16.2	26.9	54.0	27.1
4.959	H	56.8	26.3	27.1	-26.6	0.0	57.3	74.0	16.7	26.8	54.0	27.2
5.288	V	38.5	25.2	27.1	-25.9	0.0	39.7	NR*2	-	26.4	NR*2	-
7.267	V	38.7	-	29.9	-24.6	0.0	44.0	74.0	30.0	-	54.0	-
7.279	V	38.5	-	29.9	-24.6	0.0	43.8	74.0	30.2	-	54.0	-

Table 1-9. Ch.6 (2437MHz) OFDM 6Mbps TX mode

Frequency (GHz)	Polarity (H/V)	Measured (dBμV) (peak)	Measured (dBμV) (average)	Antenna Factor (dB/m)	Corr. Factor (dB)	Falloff Factor (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)
							(peak)			(average)		
Inband												
2.438	V	104.8	90.7	28.4	-29.2	0.0	104.0	OB*1	-	89.9	OB*1	-
bandedge												
2.387	V	53.2	-	28.2	-29.2	0.0	52.2	74.0	21.8	-	54.0	-
2.485	V	54.2	-	28.4	-29.1	0.0	53.5	74.0	20.5	-	54.0	-
2.490	V	53.4	-	28.4	-29.1	0.0	52.7	74.0	21.3	-	54.0	-
1.002	V	47.9	-	24.1	-31.9	0.0	40.1	74.0	33.9	-	54.0	-
1.103	V	49.1	-	24.4	-31.5	0.0	42.0	74.0	32.0	-	54.0	-
1.196	V	55.3	-	25.2	-31.3	0.0	49.2	74.0	24.8	-	54.0	-
1.595	V	61.2	38.1	25.6	-30.3	0.0	56.5	74.0	17.5	33.4	54.0	20.6
1.819	H	42.8	29.3	26.9	-29.9	0.0	39.8	NR*2	-	26.3	NR*2	-
2.337	H	53.1	-	28.1	-29.3	0.0	51.9	74.0	22.1	-	54.0	-
2.352	H	50.9	-	28.1	-29.2	0.0	49.8	74.0	24.2	-	54.0	-
2.361	H	50.9	-	28.1	-29.2	0.0	49.8	74.0	24.2	-	54.0	-
4.823	H	49.2	-	27.1	-26.6	0.0	49.7	74.0	24.3	-	54.0	-
4.922	H	53.3	-	27.0	-26.4	0.0	53.9	74.0	20.1	-	54.0	-
4.949	H	56.6	26.2	27.1	-26.4	0.0	57.3	74.0	16.7	26.9	54.0	27.1
4.959	H	55.6	26.3	27.1	-26.6	0.0	56.1	74.0	17.9	26.8	54.0	27.2
5.288	V	37.3	25.2	27.1	-25.9	0.0	38.5	NR*2	-	26.4	NR*2	-
7.255	V	39.7	-	30.0	-24.5	0.0	45.2	74.0	28.8	-	54.0	-
7.277	V	38.1	-	29.9	-24.6	0.0	43.4	74.0	30.6	-	54.0	-

Table 1-10. Ch.11 (2462MHz) OFDM 6Mbps TX mode

Frequency (GHz)	Polarity (H/V)	Measured (dBμV) (peak)	Measured (dBμV) (average)	Antenna Factor (dB/m)	Corr. Factor (dB)	Falloff Factor (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)
							(peak)			(average)		
Inband												
2.466	V	104.0	90.0	28.4	-29.2	0.0	103.2	OB*1	-	89.2	OB*1	-
bandedge												
2.484	V	67.4	49.5	28.4	-29.1	0.0	66.7	74.0	7.3	48.8	54.0	5.2
2.486	V	65.2	47.3	28.4	-29.1	0.0	64.5	74.0	9.5	46.6	54.0	7.4
2.497	V	59.6	40.4	28.4	-29.1	0.0	58.9	74.0	15.1	39.7	54.0	14.3
1.024	V	52.6	-	24.3	-31.9	0.0	45.0	74.0	29.0	-	54.0	-
1.082	V	51.8	-	24.5	-31.5	0.0	44.8	74.0	29.2	-	54.0	-
1.197	V	54.6	-	25.2	-31.3	0.0	48.5	74.0	25.5	-	54.0	-
1.595	V	60.9	38.4	25.6	-30.3	0.0	56.2	74.0	17.8	33.7	54.0	20.3
1.801	V	44.8	29.7	26.9	-29.9	0.0	41.8	NR*2	-	26.7	NR*2	-
2.289	H	50.1	-	27.8	-29.3	0.0	48.6	74.0	25.4	-	54.0	-
2.361	H	53.5	-	28.1	-29.2	0.0	52.4	74.0	21.6	-	54.0	-
2.382	H	50.3	-	28.2	-29.2	0.0	49.3	74.0	24.7	-	54.0	-
2.387	H	50.2	-	28.2	-29.2	0.0	49.2	74.0	24.8	-	54.0	-
4.837	H	47.4	-	27.0	-26.5	0.0	47.9	74.0	26.1	-	54.0	-
4.894	H	50.6	-	27.0	-26.6	0.0	51.0	74.0	23.0	-	54.0	-
4.945	H	56.4	26.2	27.1	-26.4	0.0	57.1	74.0	16.9	26.9	54.0	27.1
4.959	H	55.9	26.2	27.1	-26.6	0.0	56.4	74.0	17.6	26.7	54.0	27.3
5.288	H	37.8	25.2	27.1	-25.9	0.0	39.0	NR*2	-	26.4	NR*2	-
7.267	H	38.3	-	29.9	-24.6	0.0	43.6	74.0	30.4	-	54.0	-
7.281	H	37.8	-	29.9	-24.6	0.0	43.1	74.0	30.9	-	54.0	-

Table 1-11. Ch.6 (2437MHz) OFDM **RX** mode

Frequency (GHz)	Polarity (H/V)	Measured (dBμV) <i>(peak)</i>	Measured (dBμV) <i>(average)</i>	Antenna Factor (dB/m)	Corr. Factor (dB)	Falloff Factor (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)	Field Strength (dBμV/m)	FCC Limit (dBμV/m)	Margin to limit (dB)
							<i>(peak)</i>			<i>(average)</i>		
1.013	V	50.1	-	24.3	-31.9	0.0	42.5	74.0	31.5	-	54.0	-
1.106	V	48.4	-	24.4	-31.5	0.0	41.3	74.0	32.7	-	54.0	-
1.197	V	58.4	-	25.2	-31.3	0.0	52.3	74.0	21.7	-	54.0	-
1.598	V	60.3	37.9	25.6	-30.3	0.0	55.6	74.0	18.4	33.2	54.0	20.8
1.801	V	42.2	29.8	26.4	-29.9	0.0	38.7	NR*2	-	26.3	NR*2	-
1.820	V	42.6	29.4	26.9	-29.9	0.0	39.6	NR*2	-	26.4	NR*2	-
5.176	H	39.4	25.1	27.2	-26.1	0.0	40.5	NR*2	-	26.2	NR*2	-
5.246	H	39.5	25.2	27.1	-26.0	0.0	40.6	NR*2	-	26.3	NR*2	-

2. Restricted Bands Radiation (30MHz – 1GHz)

[FCC 15.205 / 209, RSS-210 6.3 / 7.3]

2.1 Test Procedure

Preliminary radiated emissions are measured in the semi-anechoic chamber at a 3 meter distance on every azimuth in both horizontal and vertical polarity. The antennas are also scanned in height. The emissions are recorded with a spectrum analyzer in peak hold mode. The identified emissions are further maximized by a cable manipulation. Emissions closest to the limits are measured in the quasi-peak mode with the tuned receiver using a bandwidth of 120kHz. The highest emissions relative to the limit are listed.

2.2 Test Instruments and Measurement Setup

Table 2-1 Radiated Emission Test Instrumentation

Description	Model	Serial Number
Computer	IBM 6868-30J	97-901X3
Spectrum Analyzer (100Hz-1.5GHz) for 30-200MHz	HP 85680B	2732A03651
Spectrum Analyzer Display for 30-200MHz	HP 85662A	2648A15255
Quasi-Peak Adapter for 30-200MHz	HP 85650A	2521A00968
Spectrum Analyzer (100Hz-1.5GHz) for 200-1000MHz	HP 85680B	2841A04254
Spectrum Analyzer Display for 200-1000MHz	HP 85662A	2816A16831
Quasi-Peak Adapter for 200-1000MHz	HP 85650A	2811A01156
Amplifier (100KHz-1.3GHz)		
- for 30-200MHz	MITEQ AM-3A	898433
- for 200-1000MHz	MITEQ AM-3A	898432
Biconical Antenna (30-200MHz)	EMCO 3108	2536
Log-Periodic Antenna (200-1000MHz)	EMCO 3146	2849
Receiver (20MHz-1.3GHz)	R&S ESVP	893202/018
Switch/control unit	HP 3488A	2719A17226
N-Coax cables:	Length:	
- Bi-coni Ant <=> 10m Cable	9 m	- EM103L01
- 10m Cable <=> Shield Panel	10 m	- EM103L02
- Shield Panel <=> RF Amp	7 m	- EM103L03
- RF Amp <=> Power Splitter	0.5m	- EM103L04
- Log-peri Ant <=> 10m Cable	9 m	- EM103H01
- 10m Cable <=> Shield Panel	10 m	- EM103H02
- Shield Panel <=> RF Amp	7 m	- EM103H03
- RF Amp <=> Power Splitter	0.5m	- EM103H04
Coax cables:		
- Power Splitter <=> SW/Con.unit (SW110)	1 m	- EM103L05
- Power Splitter <=> SW/Con.unit (SW300)	1 m	- EM103L06
- Power Splitter <=> SW/Con.unit (SW100)	1 m	- EM103H05
- Power Splitter <=> SW/Con.unit (SW301)	1 m	- EM103H06
- SW/Con.unit <=> Receiver (Input)	2 m	- EM1RCV
- SW/Con.unit <=> Spe Ana.(Signal In) for 30- 200MHz	2 m	- EM1SPL
- SW/Con.unit <=> Spe Ana.(Signal In) for 200-1000MHz	2 m	- EM1SPH

Notes: HP: Hewlett Packard, R&S: Rohde & Schwarz

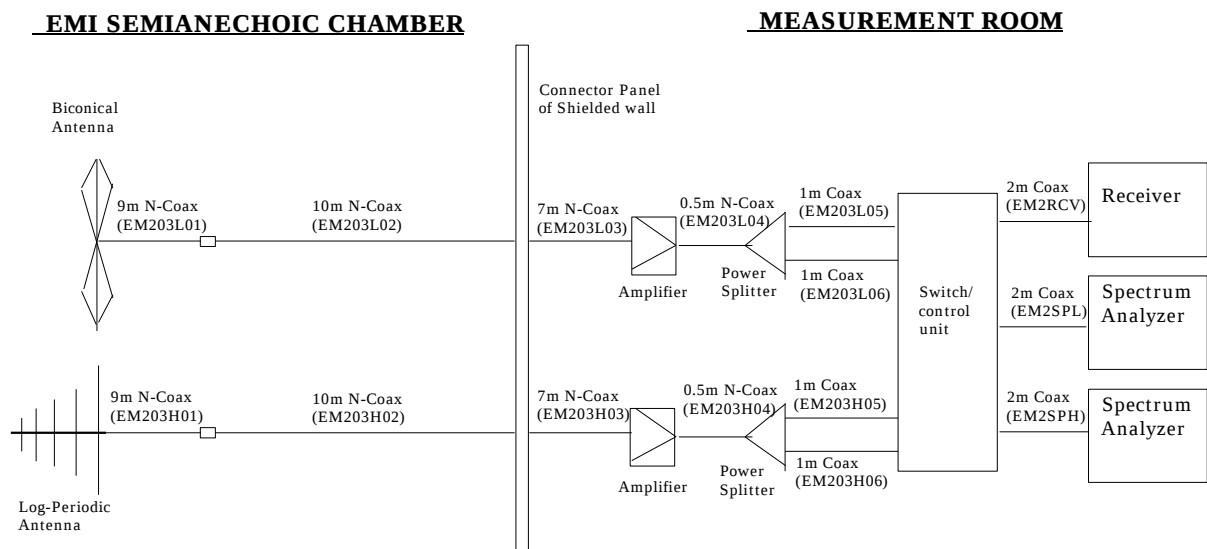


Figure 2 Cables for Radiated Emission Test

2.3 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. In this test facility, the Antenna Factor, Cable Loss, and Amplifier Gains are loaded into the Rohde & Schwarz Receiver and the corrected field strength can be read directly on the receiver. All factors are included in the reported data.

$$FS = R + AF + CORR$$

where:

FS	=	Field Strength
R	=	Measured Receiver Input Amplitude
AF	=	Antenna Factor
CORR	=	Correction Factor = CL - AG
CL	=	Cable Loss
AG	=	Amplifier Gain

For example:

Given a Receiver input reading of 51.5dBμV; Antenna Factor of 8.5dB/m; Cable Loss of 1.3dB; and an Amplifier Gain of 26dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 = 35.3\text{dB}\mu\text{V/m}$$

Conversion between dBμV/m (or dBμV) and μV/m (or μV) are done as:

$$\text{Level(dB}\mu\text{V/m)} = 20 \times \text{Log(Level(}\mu\text{V/m))}$$

$$40\text{dB}\mu\text{V/m} = 100\mu\text{V/m}$$

$$48\text{dB}\mu\text{V/m} = 250\mu\text{V/m}$$

2.4 Measurement Results

The representative each worst case in previous Table-1-2 or 1-3 was selected and tested with the co-located Bluetooth device (FCC ID: [ANO20040700HER](#)) in active and transmitting simultaneously.

The EUT was found to comply to the limits of FCC Part 15 Subpart C and RSS-210 with a margin of 9.2dB at 30MHz - 1000MHz band.

The 6 highest emissions relative to the limits are reported.

Test Date: January 14, 2005

2.4.1 EUT in Notebook operation mode

Table 2-2. Ch.1 (2412MHz) OFDM 6Mbps **TX** mode

Frequency (MHz)	Polarity (H/V)	Measured (dBμV)	Antenna Factor (dB/m)	Corr. Factor (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin to limit (dB)	Field Strength (μV/m)	Limit (μV/m)
36.307	V	45.8	12.3	-29.1	29.0	40.0	11.0	28.2	100
132.000	H	45.8	12.0	-27.5	30.3	43.5	13.2	32.7	150
168.000	H	46.9	12.4	-27.1	32.2	43.5	11.3	40.7	150
173.999	H	46.7	12.6	-26.9	32.4	43.5	11.1	41.7	150
259.274	H	43.3	12.0	-24.2	31.1	46.0	14.9	35.9	200
797.736	H	34.1	21.1	-18.4	36.8	46.0	9.2	69.2	200

Table 2-3. Ch.6 (2437MHz) OFDM 6Mbps **TX** mode

Frequency (MHz)	Polarity (H/V)	Measured (dBμV)	Antenna Factor (dB/m)	Corr. Factor (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin to limit (dB)	Field Strength (μV/m)	Limit (μV/m)
129.724	H	44.2	11.9	-27.7	28.4	43.5	15.1	26.3	150
156.000	H	43.8	12.4	-27.1	29.1	43.5	14.4	28.5	150
167.999	H	45.9	12.4	-27.1	31.2	43.5	12.3	36.3	150
173.999	H	46.4	12.6	-26.9	32.1	43.5	11.4	40.3	150
259.274	H	43.8	12.0	-24.2	31.6	46.0	14.4	38.0	200
798.380	H	33.3	21.1	-18.4	36.0	46.0	10.0	63.1	200

Table 2-4. Ch.11 (2462MHz) OFDM 6Mbps **TX** mode

Frequency (MHz)	Polarity (H/V)	Measured (dBμV)	Antenna Factor (dB/m)	Corr. Factor (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin to limit (dB)	Field Strength (μV/m)	Limit (μV/m)
132.001	H	45.6	12.0	-27.5	30.1	43.5	13.4	32.0	150
155.999	H	44.3	12.4	-27.1	29.6	43.5	13.9	30.2	150
167.999	H	45.7	12.4	-27.1	31.0	43.5	12.5	35.5	150
173.999	H	46.6	12.6	-26.9	32.3	43.5	11.2	41.2	150
259.180	H	43.3	12.0	-24.0	31.3	46.0	14.7	36.7	200
798.718	H	33.9	21.1	-18.5	36.5	46.0	9.5	66.8	200

Table 2-5. Ch.6 (2437MHz) OFDM **RX** mode

Frequency (MHz)	Polarity (H/V)	Measured (dBμV)	Antenna Factor (dB/m)	Corr. Factor (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin to limit (dB)	Field Strength (μV/m)	Limit (μV/m)
131.999	H	45.9	12.0	-27.5	30.4	43.5	13.1	33.1	150
156.000	H	44.2	12.4	-27.1	29.5	43.5	14.0	29.9	150
168.000	H	46.0	12.4	-27.1	31.3	43.5	12.2	36.7	150
173.999	H	46.4	12.6	-26.9	32.1	43.5	11.4	40.3	150
269.998	H	41.0	12.5	-23.9	29.6	46.0	16.4	30.2	200
798.330	H	32.6	21.1	-18.4	35.3	46.0	10.7	58.2	200

2.4.2 EUT in Tablet operation mode

Table 2-6. Ch.1 (2412MHz) OFDM 6Mbps **TX** mode

Frequency (MHz)	Polarity (H/V)	Measured (dBμV)	Antenna Factor (dB/m)	Corr. Factor (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin to limit (dB)	Field Strength (μV/m)	Limit (μV/m)
77.789	V	40.5	7.8	-28.5	19.8	40.0	20.2	9.8	100
108.000	V	44.0	9.9	-27.9	26.0	43.5	17.5	20.0	150
499.004	H	30.4	17.8	-20.8	27.4	46.0	18.6	23.4	200
565.256	H	28.4	18.2	-20.1	26.5	46.0	19.5	21.1	200
599.999	H	27.9	18.7	-19.8	26.8	46.0	19.2	21.9	200
797.809	H	31.8	21.1	-18.4	34.5	46.0	11.5	53.1	200

Table 2-7. Ch.6 (2437MHz) OFDM 6Mbps **TX** mode

Frequency (MHz)	Polarity (H/V)	Measured (dBμV)	Antenna Factor (dB/m)	Corr. Factor (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin to limit (dB)	Field Strength (μV/m)	Limit (μV/m)
108.000	V	44.8	9.9	-27.9	26.8	43.5	16.7	21.9	150
120.000	V	40.4	11.2	-27.7	23.9	43.5	19.6	15.7	150
498.939	H	31.3	17.8	-20.8	28.3	46.0	17.7	26.0	200
565.068	H	28.8	18.2	-20.1	26.9	46.0	19.1	22.1	200
599.998	H	25.1	18.7	-19.8	24.0	46.0	22.0	15.8	200
798.350	H	31.5	21.1	-18.4	34.2	46.0	11.8	51.3	200

Table 2-8. Ch.11 (2462MHz) OFDM 6Mbps **TX** mode

Frequency (MHz)	Polarity (H/V)	Measured (dBμV)	Antenna Factor (dB/m)	Corr. Factor (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin to limit (dB)	Field Strength (μV/m)	Limit (μV/m)
108.000	V	45.9	9.9	-27.9	27.9	43.5	15.6	24.8	150
119.999	V	40.5	11.2	-27.7	24.0	43.5	19.5	15.8	150
499.065	H	30.3	17.8	-20.8	27.3	46.0	18.7	23.2	200
564.763	H	27.6	18.2	-20.0	25.8	46.0	20.2	19.5	200
598.559	H	31.8	18.7	-19.9	30.6	46.0	15.4	33.9	200
798.541	H	31.5	21.1	-18.5	34.1	46.0	11.9	50.7	200

Table 2-9. Ch.6 (2437MHz) OFDM **RX** mode

Frequency (MHz)	Polarity (H/V)	Measured (dBμV)	Antenna Factor (dB/m)	Corr. Factor (dB)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin to limit (dB)	Field Strength (μV/m)	Limit (μV/m)
108.000	V	43.9	9.9	-27.9	25.9	43.5	17.6	19.7	150
119.999	V	39.9	11.2	-27.7	23.4	43.5	20.1	14.8	150
450.515	H	29.3	16.4	-21.3	24.4	46.0	21.6	16.6	200
498.556	H	30.6	17.8	-20.8	27.6	46.0	18.4	24.0	200
565.733	H	27.9	18.2	-20.2	25.9	46.0	20.1	19.7	200
797.960	H	30.5	21.1	-18.4	33.2	46.0	12.8	45.7	200

3. AC Wireline Conducted Emissions (150KHz – 30MHz)

[FCC 15.207, RSS-210 6.6 / 7.4]

3.1 Test Procedure

The conducted emissions are measured in the IBM shielded room with a spectrum analyzer in peak hold. Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9kHz. The emissions are maximized further by cable manipulation. The highest emissions relative to the limit are listed.

3.2 Test Instruments and Measurement Setup

Table 3-1. Conducted Emission Test Instrumentation

Description	Model	Serial Number
Computer	IBM 6589-13J	97-15613
Spectrum Analyzer (100Hz-1.5GHz)	HP 85680B	3019A05156
Spectrum Analyzer Display	HP 85662A	3026A19366
Quasi-Peak Adapter	HP 85650A	2811A01433
Receiver (9kHz-30MHz)	R&S ESH3	892111/026
LISN	EMCO 3810/2NM	00022007
Switch/control unit	HP 3488A	2719A17228
Plotter	HP 7550A	2631A33619
Coax cables: - Lisen-L <=> SW/Con.unit (SW100) - Lisen-N <=> SW/Con.unit (SW101) - SW/Con.unit <=> RCVR (Input) - SW/Con.unit<=> Spe Ana.(Signal In)	Length: 4 m 4 m 1 m 1 m	- EMIC-L - EMIC-N - EMIC-R - EMIC-S

Notes: - HP: Hewlett Packard, R&S: Rohde & Schwarz

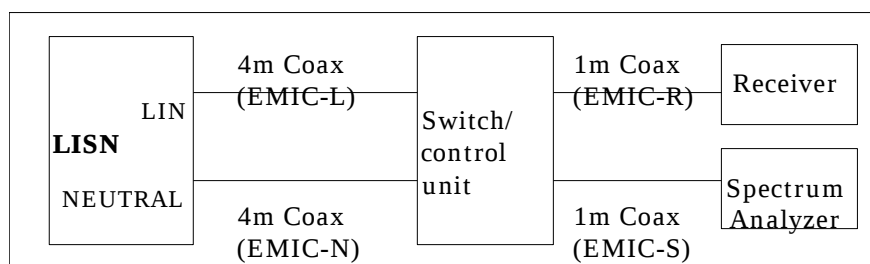


Figure 3. Cables for Conducted Emission Test

3.3 Powerline Voltage Calculation

The powerline voltage is calculated by adding insertion losses of LISN, Cable, Switch control unit and Pulse limiter to the measured reading. All factors are included in the reported data.

$$PV = R + CORR$$

where:

PV = Powerline Voltage (dBμV)

R = Measured Receiver Input Amplitude (dBμV)

CORR = Correction Factor (dB) = LL+CL+SWL+PLL

LL = Insertion loss of LISN (dB)

CL = Insertion loss of Cable (dB)

SWL = Insertion loss of Switch control unit (dB)

PLL = Insertion loss of Pulse Limiter (dB)

Given a Receiver input reading of 50.0 dBμV, LISN loss of 0.6 dB, Cable loss of 0.1dB, Switch control unit loss of 0.1dB and Pulse limiter loss of 0.2dB. The Powerline Voltage of the measured emission is:

$$CORR = 0.6 + 0.1 + 0.1 + 0.2 = 1.0 \text{ (dB)}$$

$$PV = 50.0 + 1.0 = 51.0 \text{ (dBμV)}$$

3.4 Measurement Results

The representative each worst case in previous Table 1-2 or 1-3 was selected and tested with the co-located Bluetooth device (FCC ID: [ANO20040700HER](#)) in active and transmitting simultaneously.

The EUT was found to comply to the limits of FCC Part 15 Subpart C and RSS-210 with a margin of 12.1dB. The 6 highest emissions relative to the limits are reported.

Test Date: January 20, 2005

3.4.1 EUT in Notebook operation mode

Table 3-2. Ch.1 (2412MHz) OFDM 6Mbps TX mode

Frq. (MHz)	QP			AV			CISPR22 QP Limit (dBμV)	Margin to limit (dB)	CISPR22 AV Limit (dBμV)	Margin to limit (dB)	Phase
	Measured Reading (dBμV)	Corr. Factor (dB)	Powerline Voltage (dBμV)	Measured Reading (dBμV)	Corr. Factor (dB)	Powerline Voltage (dBμV)					
0.1936	48.5	0.5	49.0	40.0	0.5	40.5	63.9	14.9	53.9	13.4	Neutral
0.2565	41.0	0.6	41.6	33.3	0.6	33.9	61.5	19.9	51.5	17.6	Line
0.3189	36.5	0.6	37.1	28.6	0.6	29.2	59.7	22.6	49.7	20.5	Line
0.4439	34.5	0.6	35.1	32.4	0.6	33.0	57.0	21.9	47.0	14.0	Line
0.5078	31.5	0.6	32.1	27.6	0.6	28.2	56.0	23.9	46.0	17.8	Line
0.5704	31.2	0.6	31.8	29.8	0.6	30.4	56.0	24.2	46.0	15.6	Line

Table 3-3. Ch.6 (2437MHz) OFDM 6Mbps TX mode

Frq. (MHz)	QP			AV			CISPR22 QP Limit (dBμV)	Margin to limit (dB)	CISPR22 AV Limit (dBμV)	Margin to limit (dB)	Phase
	Measured Reading (dBμV)	Corr. Factor (dB)	Powerline Voltage (dBμV)	Measured Reading (dBμV)	Corr. Factor (dB)	Powerline Voltage (dBμV)					
0.1950	41.0	0.5	41.5	31.2	0.5	31.7	63.8	22.3	53.8	22.1	Neutral
0.2542	41.8	0.6	42.4	34.8	0.6	35.4	61.6	19.2	51.6	16.2	Line
0.3164	36.9	0.6	37.5	29.7	0.6	30.3	59.8	22.3	49.8	19.5	Line
0.4475	30.5	0.6	31.1	26.8	0.6	27.4	56.9	25.8	46.9	19.5	Neutral
0.5080	30.8	0.6	31.4	27.4	0.6	28.0	56.0	24.6	46.0	18.0	Neutral
0.5709	31.2	0.6	31.8	29.5	0.6	30.1	56.0	24.2	46.0	15.9	Line

Table 3-4. Ch.11 (2462MHz) OFDM 6Mbps TX mode

Frq. (MHz)	QP			AV			CISPR22 QP Limit (dBμV)	Margin to limit (dB)	CISPR22 AV Limit (dBμV)	Margin to limit (dB)	Phase
	Measured Reading (dBμV)	Corr. Factor (dB)	Powerline Voltage (dBμV)	Measured Reading (dBμV)	Corr. Factor (dB)	Powerline Voltage (dBμV)					
0.1921	49.6	0.5	50.1	41.3	0.5	41.8	63.9	13.8	53.9	12.1	Neutral
0.2545	41.5	0.6	42.1	34.4	0.6	35.0	61.6	19.5	51.6	16.6	Line
0.3823	28.8	0.6	29.4	22.6	0.6	23.2	58.2	28.8	48.2	25.0	Neutral
0.4451	35.3	0.6	35.9	32.1	0.6	32.7	57.0	21.1	47.0	14.3	Neutral
0.5091	29.8	0.6	30.4	26.2	0.6	26.8	56.0	25.6	46.0	19.2	Line
0.5691	31.2	0.6	31.8	29.9	0.6	30.5	56.0	24.2	46.0	15.5	Line

Table 3-5. Ch.6 (2462MHz) OFDM RX mode

Frq. (MHz)	QP			AV			CISPR22 QP Limit (dBµV)	Margin to limit (dB)	CISPR22 AV Limit (dBµV)	Margin to limit (dB)	Phase
	Measured Reading (dBµV)	Corr. Factor (dB)	Powerline Voltage (dBµV)	Measured Reading (dBµV)	Corr. Factor (dB)	Powerline Voltage (dBµV)					
0.1931	48.9	0.5	49.4	40.7	0.5	41.2	63.9	14.5	53.9	12.7	Neutral
0.2548	40.4	0.6	41.0	33.8	0.6	34.4	61.6	20.6	51.6	17.2	Line
0.4468	32.2	0.6	32.8	28.7	0.6	29.3	56.9	24.1	46.9	17.6	Neutral
0.5065	30.3	0.6	30.9	27.9	0.6	28.5	56.0	25.1	46.0	17.5	Line
0.5660	30.7	0.6	31.3	28.6	0.6	29.2	56.0	24.7	46.0	16.8	Line
1.8996	24.6	0.7	25.3	22.9	0.7	23.6	56.0	30.7	46.0	22.4	Line

3.4.2 EUT in Tablet operation mode

Table 3-6. Ch.1 (2412MHz) OFDM 6Mbps TX mode

Frq. (MHz)	QP			AV			CISPR22 QP Limit (dBµV)	Margin to limit (dB)	CISPR22 AV Limit (dBµV)	Margin to limit (dB)	Phase
	Measured Reading (dBµV)	Corr. Factor (dB)	Powerline Voltage (dBµV)	Measured Reading (dBµV)	Corr. Factor (dB)	Powerline Voltage (dBµV)					
0.1936	46.6	0.5	47.1	38.4	0.5	38.9	63.9	16.8	53.9	15.0	Neutral
0.2541	40.2	0.6	40.8	34.0	0.6	34.6	61.6	20.8	51.6	17.0	Neutral
0.3193	33.9	0.6	34.5	26.6	0.6	27.2	59.7	25.2	49.7	22.5	Line
0.4452	34.8	0.6	35.4	31.6	0.6	32.2	57.0	21.6	47.0	14.8	Neutral
0.5082	30.0	0.6	30.6	26.8	0.6	27.4	56.0	25.4	46.0	18.6	Line
0.5715	30.5	0.6	31.1	28.5	0.6	29.1	56.0	24.9	46.0	16.9	Line

Table 3-7. Ch.6 (2437MHz) OFDM 6Mbps TX mode

Frq. (MHz)	QP			AV			CISPR22 QP Limit (dBµV)	Margin to limit (dB)	CISPR22 AV Limit (dBµV)	Margin to limit (dB)	Phase
	Measured Reading (dBµV)	Corr. Factor (dB)	Powerline Voltage (dBµV)	Measured Reading (dBµV)	Corr. Factor (dB)	Powerline Voltage (dBµV)					
0.1952	40.2	0.5	40.7	29.5	0.5	30.0	63.8	23.1	53.8	23.8	Neutral
0.2522	40.5	0.6	41.1	34.3	0.6	34.9	61.7	20.6	51.7	16.8	Neutral
0.4454	34.7	0.6	35.3	31.5	0.6	32.1	57.0	21.7	47.0	14.9	Neutral
0.5080	30.3	0.6	30.9	26.9	0.6	27.5	56.0	25.1	46.0	18.5	Neutral
0.5695	30.9	0.6	31.5	29.6	0.6	30.2	56.0	24.5	46.0	15.8	Line
1.8355	24.8	0.7	25.5	22.2	0.7	22.9	56.0	30.5	46.0	23.1	Line

Table 3-8. Ch.11 (2462MHz) OFDM 6Mbps TX mode

Frq. (MHz)	QP			AV			CISPR22 QP Limit (dBµV)	Margin to limit (dB)	CISPR22 AV Limit (dBµV)	Margin to limit (dB)	Phase
	Measured Reading (dBµV)	Corr. Factor (dB)	Powerline Voltage (dBµV)	Measured Reading (dBµV)	Corr. Factor (dB)	Powerline Voltage (dBµV)					
0.2565	38.5	0.6	39.1	31.4	0.6	32.0	61.5	22.4	51.5	19.5	Line
0.3200	33.1	0.6	33.7	25.7	0.6	26.3	59.7	26.0	49.7	23.4	Line
0.4453	34.6	0.6	35.2	31.4	0.6	32.0	57.0	21.8	47.0	15.0	Neutral
0.5048	30.2	0.6	30.8	27.7	0.6	28.3	56.0	25.2	46.0	17.7	Neutral
0.5706	30.9	0.6	31.5	29.3	0.6	29.9	56.0	24.5	46.0	16.1	Line
1.8968	24.9	0.7	25.6	21.7	0.7	22.4	56.0	30.4	46.0	23.6	Line

Table 3-9. Ch.6 (2462MHz) OFDM **RX** mode

Frq. (MHz)	QP			AV			CISPR22 QP Limit (dBμV)	Margin to limit (dB)	CISPR22 AV Limit (dBμV)	Margin to limit (dB)	Phase
	Measured Reading (dBμV)	Corr. Factor (dB)	Powerline Voltage (dBμV)	Measured Reading (dBμV)	Corr. Factor (dB)	Powerline Voltage (dBμV)					
0.1915	49.4	0.5	49.9	41.2	0.5	41.7	64.0	14.1	54.0	12.3	Neutral
0.3178	35.0	0.6	35.6	27.8	0.6	28.4	59.8	24.2	49.8	21.4	Line
0.4444	35.1	0.6	35.7	31.9	0.6	32.5	57.0	21.3	47.0	14.5	Neutral
0.5069	32.6	0.6	33.2	27.4	0.6	28.0	56.0	22.8	46.0	18.0	Neutral
0.5689	31.6	0.6	32.2	29.8	0.6	30.4	56.0	23.8	46.0	15.6	Line
1.8943	24.9	0.7	25.6	21.8	0.7	22.5	56.0	30.4	46.0	23.5	Line