

4.6. Band Edge Emissions Measurement

4.6.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micovolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

4.6.2. Measuring Instruments and Setting

Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100 KHz /100 KHz for Peak

4.6.3. Test Procedures

1. The test procedure is the same as section 4.5.3, only the frequency range investigated is limited to 100MHz around bandedges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

4.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.



4.6.7. Test Result of Band Edge and Fundamental Emissions

Temperature	22°C	Humidity	56%
Test Engineer	Vic Hsiao	Configurations	Mode 1 / 802.11b CH 1, 11

Channel 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	2390.000	55.05	-18.95	74.00	25.12	28.29	1.64	0.00	Peak	---	---
2 X	2412.980	99.98				28.33	1.64	0.00	Peak	---	---
1	2390.000	42.22	-11.78	54.00	12.29	28.29	1.64	0.00	Average	---	---
2 @	2412.980	95.75				28.33	1.64	0.00	Average	---	---

Channel 11

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 X	2463.140	102.87				28.43	1.68	0.00	Peak	---	---
2	2483.850	57.99	-16.01	74.00	27.84	28.47	1.68	0.00	Peak	---	---
1 @	2463.140	98.86				28.43	1.68	0.00	Average	---	---
2	2483.850	46.49	-7.51	54.00	16.34	28.47	1.68	0.00	Average	---	---



Temperature	22°C	Humidity	56%
Test Engineer	Vic Hsiao	Configurations	Mode 1 / 802.11g CH 1, 11

Channel 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	2390.000	58.48	-15.52	74.00	28.55	28.29	1.64	0.00	Peak	---	---
2 X	2415.260	101.24				28.33	1.64	0.00	Peak	---	---
1	2390.000	43.85	-10.15	54.00	13.92	28.29	1.64	0.00	Average	---	---
2 @	2415.260	91.86				28.33	1.64	0.00	Average	---	---

Channel 11

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 X	2467.130	103.42				28.43	1.68	0.00	Peak	---	---
2	2483.850	66.24	-7.76	74.00	36.09	28.47	1.68	0.00	Peak	---	---
1 @	2467.130	93.98				28.43	1.68	0.00	Average	---	---
2	2483.850	47.11	-6.89	54.00	16.96	28.47	1.68	0.00	Average	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.



Temperature	22°C	Humidity	56%
Test Engineer	Vic Hsiao	Configurations	Mode 2 / 802.11b CH 1, 11

Channel 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	2390.000	60.31	-13.69	74.00	30.38	28.29	1.64	0.00	Peak	---	---
2 X	2412.980	110.15				28.33	1.64	0.00	Peak	---	---
1	2390.000	49.50	-4.50	54.00	19.57	28.29	1.64	0.00	Average	---	---
2 @	2412.980	106.28				28.33	1.64	0.00	Average	---	---

Channel 11

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2461.050	110.16				28.43	1.68	0.00	Peak	---	---
2	2484.420	61.38	-12.62	74.00	31.23	28.47	1.68	0.00	Peak	---	---
1 @	2461.050	106.52				28.43	1.68	0.00	Average	---	---
2	2484.420	50.49	-3.51	54.00	20.34	28.47	1.68	0.00	Average	---	---



Temperature	22°C	Humidity	56%
Test Engineer	Vic Hsiao	Configurations	Mode 2 / 802.11g CH 1, 11

Channel 1

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	2390.000	63.58	-10.42	74.00	33.65	28.29	1.64	0.00	Peak	---	---
2 X	2408.610	109.93				28.33	1.64	0.00	Peak	---	---
1	2390.000	49.95	-4.05	54.00	20.02	28.29	1.64	0.00	Average	---	---
2 @	2408.160	101.80				28.33	1.64	0.00	Average	---	---

Channel 11

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 X	2468.460	109.83				28.43	1.68	0.00	Peak	---	---
2	2483.500	65.97	-8.03	74.00	35.82	28.47	1.68	0.00	Peak	---	---
1 @	2468.460	100.30				28.43	1.68	0.00	Average	---	---
2	2483.500	50.79	-3.21	54.00	20.64	28.47	1.68	0.00	Average	---	---

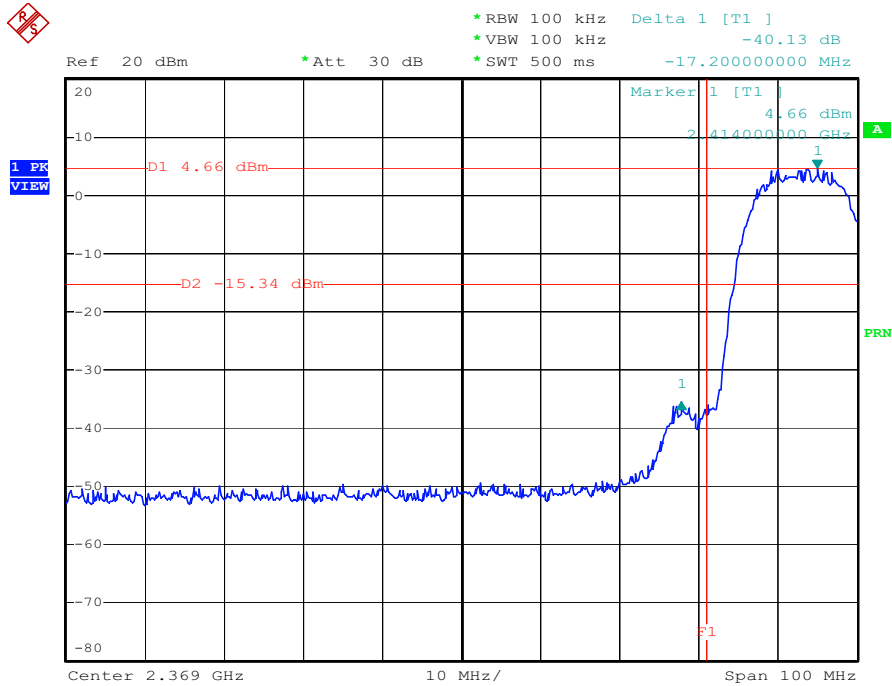
Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

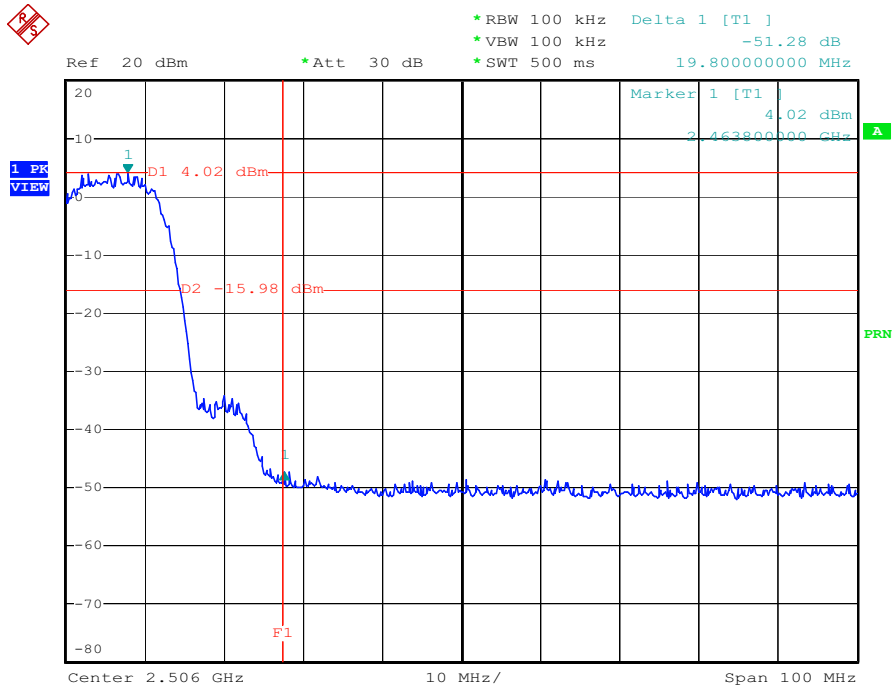
For Emission not in Restricted Band

Low Band Edge Plot on Configuration IEEE 802.11b / 2412 MHz



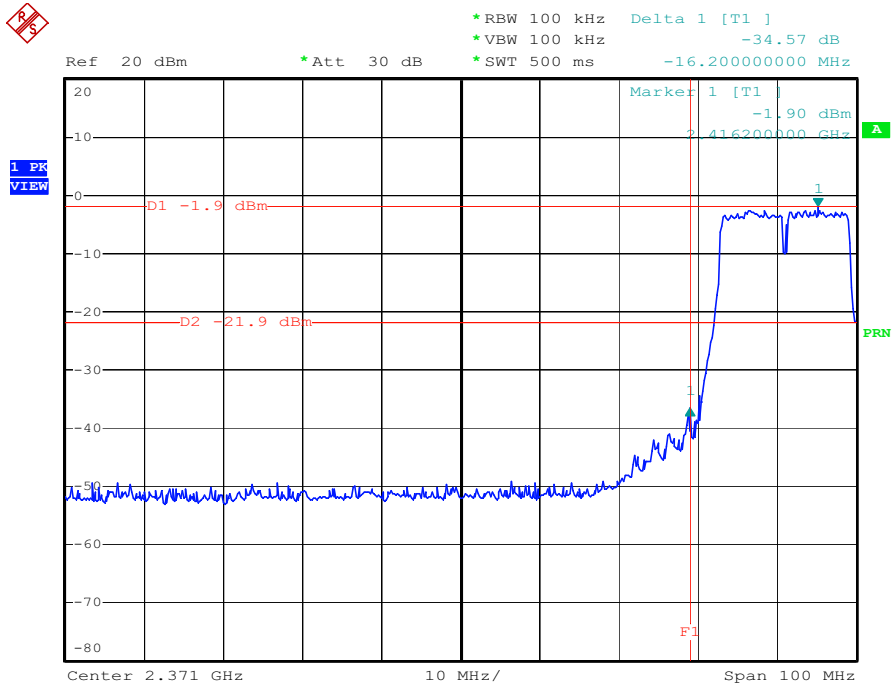
Date: 15.JAN.2007 08:29:15

High Band Edge Plot on Configuration IEEE 802.11b / 2462 MHz



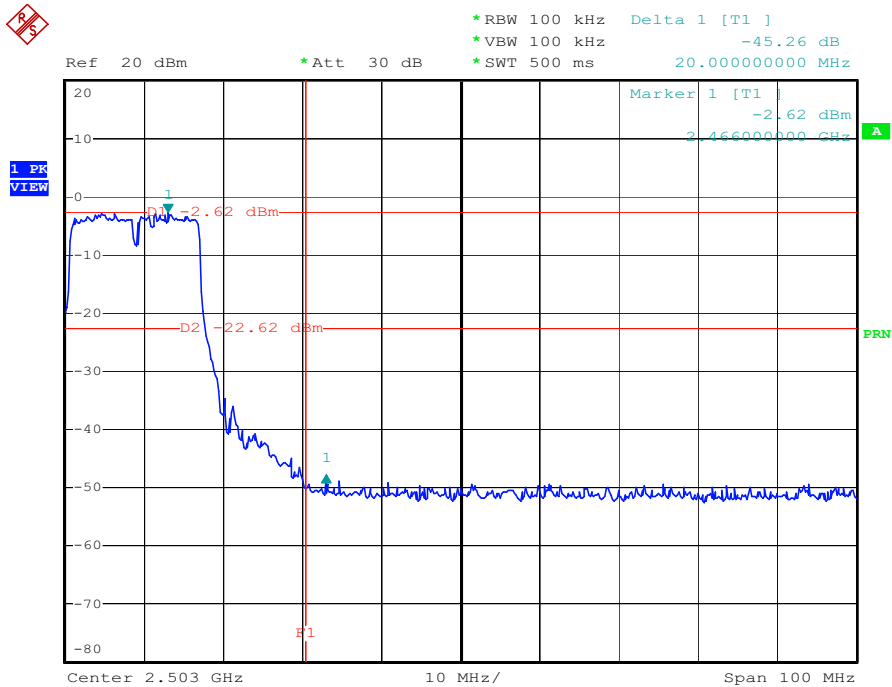
Date: 15.JAN.2007 08:34:03

Low Band Edge Plot on Configuration IEEE 802.11g / 2412 MHz



Date: 15.JAN.2007 08:40:04

High Band Edge Plot on Configuration IEEE 802.11g / 2462 MHz



Date: 15.JAN.2007 08:45:24

4.7. Antenna Requirements

4.7.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.7.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Feb. 21, 2006	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 28, 2006	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 17, 2006	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2006	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz – 30MHz	Mar. 27, 2006	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
Open Area Test Site	SPORTON	OATS-10	OS05-LK	30 MHz - 1 GHz 10m, 3m	Aug. 07, 2006	Radiation (OS05-LK)
Amplifier	HP	8447D	2944A08242	0.1 MHz - 1.3 GHz	May. 08, 2006	Radiation (OS05-LK)
Spectrum Analyzer	ADVANTEST	R3261C	71720606	9 kHz - 2.6 GHz	May. 26, 2006	Radiation (OS05-LK)
Receiver	R&S	ESCS 30	847793/003	9 kHz - 2.75 GHz	Aug. 31, 2006	Radiation (OS05-LK)
Bilog Antenna	SCHAFFNER	CBL6112D	22236	30 MHz - 2 GHz	Mar. 27, 2006	Radiation (OS05-LK)
Antenna Mast	EMCO	2075	9806-2160	1 m - 4m	N/A	Radiation (OS05-LK)
Turn Table	EMCO	2080	9806-2070	0° - 360°	N/A	Radiation (OS05-LK)
RF Cable-R10m	BELDEN	RG8/U	CB013	30 MHz - 1 GHz	Jul. 25, 2006	Radiation (OS05-LK)
RF Cable-R03m	BELDEN	RG8/U	CB014	30 Hz - 1 GHz	Jul. 25, 2006	Radiation (OS05-LK)
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Nov. 25, 2006	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100764	DC ~ 40GHz	Jul. 20, 2006	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100666	DC ~ 40GHz	Jul. 20, 2006	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 10, 2006	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Dec. 27, 2006	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 02, 2006	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 1, 2006	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 1, 2006	Conducted (TH01-HY)
Oscilloscope	Tektronix	TDS1012	CO38515	100MHz / 1GS/s	Jun. 20, 2006	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Dec. 29, 2006	Conducted (TH01-HY)
Data Generator	Tektronix	DG2030	063-2920-50	0.1Hz~400MHz	Jun. 16, 2006	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Apr. 21, 2005*	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is two year.

6. TEST LOCATION

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

7. NVLAP CERTIFICATE OF ACCREDITATION

United States Department of Commerce
National Institute of Standards and Technology

NVLAP[®]

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200079-0

Sporton International, Inc. Hwa Ya EMC Laboratory
Tao Yuan Hsien 333
TAIWAN

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated 18 June 2005).*

2007-01-01 through 2007-12-31
Effective dates



Jolly S. Bruce
For the National Institute of Standards and Technology

NVLAP-01C (REV. 2006-09-13)