FCC TEST REPORT

for

47 CFR Part 15 Subpart C

Equipment	:	**802.11b USB Wireless LAN**
Model No.	:	**SCWi211b**
FCC ID	:	**NIT-SCWI211B**
Filing Type	:	**Certification**
Applicant	:	**SOLOMON Technology Corp.** No. 42, Sing Zhong Rd., Nei Hu Dist., Taipei Taiwan R.O.C.

- The test result refers exclusively to the test presented test model / sample.
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- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Original Report Issue Date: Mar. 08, 2004

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. : F412810

CERTIFICATE OF COMPLIANCE

for

47 CFR Part 15 Subpart C

Equipment	:	**802.11b USB Wireless LAN**
Model No.	:	**SCWi211b**
FCC ID	:	**NIT-SCWI211B**
Filing Type	:	**Certification**
Applicant	:	**SOLOMON Technology Corp.** No. 42, Sing Zhong Rd., Nei Hu Dist., Taipei Taiwan R.O.C.

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 2001** and the equipment under test was ***passed*** all test items required in FCC Part 15 subpart C, relative to the equipment under test. Testing was carried out on Feb. 23, 2004 at **SPORTON International Inc.** LAB.

Daniel Lee 3/16/2004

Daniel Lee
Manager

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1. Applicant

SOLOMON Technology Corp.
No. 42, Sing Zhong Rd., Nei Hu Dist., Taipei Taiwan R.O.C.

1.2 Manufacturer

Same as 1.1

1.3 Basic Description of Equipment under Test

Equipment	: 802.11b USB Wireless LAN
Trade Name	: SCWi211b
Model No.	: SOLOMON
Power Supply Type	: From system

1.4 Feature of Equipment under Test

Product Feature & Specification				
1. Host/Radio Interface	IEEE-802.11b Direct Sequence Spread Spectrum (DSSS)			
2. Type of Modulation	CCK@11/5.5Mbps, QPSK@2Mbps, BPSK@1Mbps			
3. Number of Channels	USA/Canada: 11	V	European: 13	V
	Japan: 13,14.	V	Other:	
4. Frequency Band	2.400GHz ~ 2.4835GHz (Industrial Scientific Medical Band)			
5. Carrier Frequency of each channel	2412+5*(N-1)MHz; N=1~13			
6. Channel Spacing	5MHz			
7. Maximum Output Power to Antenna	11.5dBm			
8. Type of Antenna Connector	N/A			
9. Antenna Type / Gain	PCB Antenna / 1.5dBi			
10. Function Type	Transmitter		Transceiver	V
11. Power Rating (DC/AC , Voltage)	DC 5V			
12. Temperature Range (Operating)	0°C ~ 40°C			

2 Test Configuration of Equipment under Test

2.1 Test Manner

a. The EUT has been associated with peripherals pursuant to ANSI C63.4-2001 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
b. The complete test system included LOGITECH USB Mouse, EPSON Printer, ACEEX Modem, and EUT as local workstation and DELL Notebook as remote workstation for EMI test.
c. The EUT can operate on eleven channels from 2412MHz to 2462MHz. (as listed in section 1.4).
d. The following test modes were pretested for conduction test:
   Mode 1:802.11b TX CH01(2412 MHz)
   Mode 2:802.11b TX CH06(2437 MHz)
   Mode 3:802.11b TX CH11(2462 MHz)
e. The following test modes were pretested for radiation test:
   Mode 1:802.11b TX CH01(2412 MHz)
   Mode 2:802.11b TX CH06(2437 MHz)
   Mode 3:802.11b TX CH11(2462 MHz)
f. Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 25000 MHz.

2.2 Description of Test System

Support Unit 1. –(USB) Mouse (LOGITECH) –local workstation

FCC ID	: N/A
Model No.	: M-BE58
Serial No.	: SP0052
Data Cable	: Shielded, 1.7m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 2. –Printer(EPSON) –local workstation

FCC ID	: N/A
Model No.	: STYLUS COLRO 680
Power Supply Type	: N/A
Power Cord	: Shielded, 1.35m
Serial No.	: SP0069
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

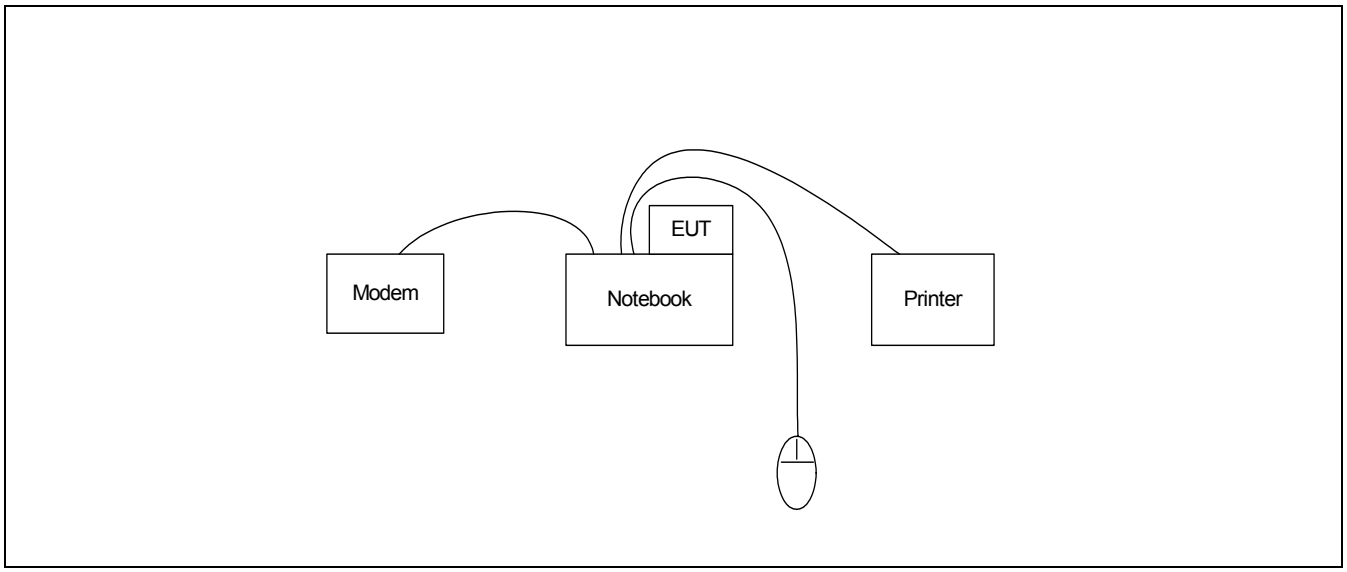
Support Unit 3. – Modem(ACEEX)–local workstation

FCC ID	: FAXCM141
Model No.	: CM141
Serial No.	: SP0055
Power Cord	: Shielded
Data Cable	: Shielded, 1.15m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 4. –Notebook (DELL)–local workstation

FCC ID	: E2k24CLNS
Model No.	: PP05L
Power Supply Type	: N/A
Power Cord	: Non-Shielded
Serial No.	: SP0063
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

2.3 Connection Diagram of Test System



3 Operation of Equipment under Test

An executive program, EMCTEST.EXE on WIN2000 continuously generating a complete line of “H“ pattern, was used as the test software.

The program was executed as follows:

a. Turn on the power of all equipment.
b. The PC reads the test program from the hard disk drive and runs it.
c. The PC sends “H” messages to the monitor, and the monitor displays “H“ patterns on the screen.
d. The PC sends “H” messages to the printer, then the printer prints them on the paper.
e. The PC sends “H” messages to the internal hard disk , and the hard disk reads and writes the message.
f. Repeat the steps from c to e.

At the same time, the following program was executed:

“WLAN HW Tool” sends continuous Tx.

4 General Information of Test

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
Test Site No	:	CO01-HY, 03CH03-HY

4.1 Test Voltage

110V/ 60Hz

4.2 Standard for Methods of Measurement

ANSI C63.4-2001

4.3 Test in Compliance with

47 CFR Part 15 Subpart C

4.4 Frequency Range Investigated

a. Conduction: from 150 kHz to 30 MHz
b. Radiation: from 30 MHz to 25000 MHz

4.5 Test Distance

The test distance of radiated emission from antenna to EUT is 3 m.

5 Report of Measurements and Examinations

5.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.207	Conducted Emission	Pass
15.247(a)(2)	6dB Bandwidth	Pass
15.247(b)	Maximum Peak Output Power	Pass
15.209(a)	Radiated Emission	Pass
15.247 (c)	100kHz Bandwidth of Frequency Band Edges	Pass
15.247(d)	Power Spectral Density	Pass
15.203	Antenna Requirement	Pass
15.247(b)(4), 1.1307	RF Exposure	Pass

5.2 6dB Bandwidth

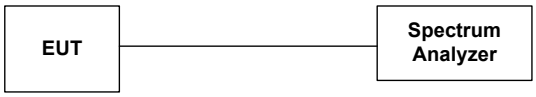
5.2.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.2.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.
3. The 6 dB bandwidth is defined as the frequency range where the power is higher than the peak power minus 6dB.

5.2.3 Test Setup Layout：



5.2.4 Test Result：

- Mode 1~3 : WLAN 802.11b
- Temperature : 26 °C
- Relative Humidity : 64%

Channel	Frequency (MHz)	6dB Emission bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
01	2412	10.48	0.5	B1
06	2437	10.76	0.5	B2
11	2462	10.60	0.5	B3

5.3 Power Spectral Density

5.3.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.3.2 Test Procedure：

1. The transmitter output was connected to spectrum analyzer through an attenuator.
2. The spectrum analyzer's resolution bandwidth was set at 3kHz RBW and 30kHz VBW as that of the fundamental frequency. Set the sweep time=span/3kHz.
3. The power spectral density was measured and recorded.
4. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

5.3.3 Test Setup Layout：

5.3.4 Test Result：

- Mode 1~3: WLAN 802.11b
- Temperature : 26 °C
- Relative Humidity : 64%

Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)	Plot Ref. No.
01	2412	-10.21	8	B4
06	2437	-9.07	8	B5
11	2462	-8.69	8	B6

5.4 Band Edges Measurement

5.4.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.4.2 Test Procedure：

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100 kHz bandwidth from band edge.
3. The band edges was measured and recorded.

5.4.3 Test Result：

- Mode 1 ~ 3 : WLAN 802.11b
- Temperature : 26 °C
- Relative Humidity : 64 %
- Test Result in lower band (Channel 1) : PASS
- Test Result in higher band (Channel 11) : PASS

5.4.4 Note on Band Edge Emission

The band edge emission plot on appendix B page B7 shows 54.54 dB delta between carrier maximum power and local maximum emission in the restricted band (2.390GHz).

The band edge emission plot on appendix B page B8 shows 53.87 dB delta between carrier maximum power and local maximum emission in the restricted band (2.4835GHz).

Channel	Polarity	The emission of band edge power strength	Frequency	The maximum field strength in restrict band	Limit	Margin	Remark	Result
		(dBμV/m)		(dBμV/m)	(dBμV/m)	(dB)		
01	V	106.93	2398.08	52.39	74	-21.61	Peak	Pass
	V	99.80	2398.08	45.26	54	-8.74	Average	Pass
	H	106.23	2398.08	51.69	74	-22.31	Peak	Pass
	H	98.05	2398.08	43.51	54	-10.49	Average	Pass
11	V	106.93	2484.00	53.06	74	-20.94	Peak	Pass
	V	99.93	2484.00	46.06	54	-7.94	Average	Pass
	H	108.82	2484.00	54.95	74	-19.05	Peak	Pass
	H	100.34	2484.00	46.47	54	-7.53	Average	Pass

5.5 Peak Output Power

5.5.1 Measuring Instruments：

As described in chapter 7 of this test report.

5.5.2 Test Procedure：

The antenna port（RF output）of the EUT was connected to the input（RF input）of a power meter. The power is equal to the reading level on power meter plus cable loss at the EUT antenna terminal.

5.5.3 Test Setup Layout：

5.5.4 Test Result：

- Mode 1~3 : WLAN 802.11b
- Temperature : 26 °C
- Relative Humidity : 64%

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
01	2412	10.4	1W/30 dBm
06	2437	10.0	1W/30 dBm
11	2462	11.4	1W/30 dBm

6. Test of Conducted Emission

Conducted emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in ANSI C63.4-2001 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

6.1. Major Measuring Instruments：

● Test Receiver	(R&S ESCS 30)
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

6.2. Test Procedures：

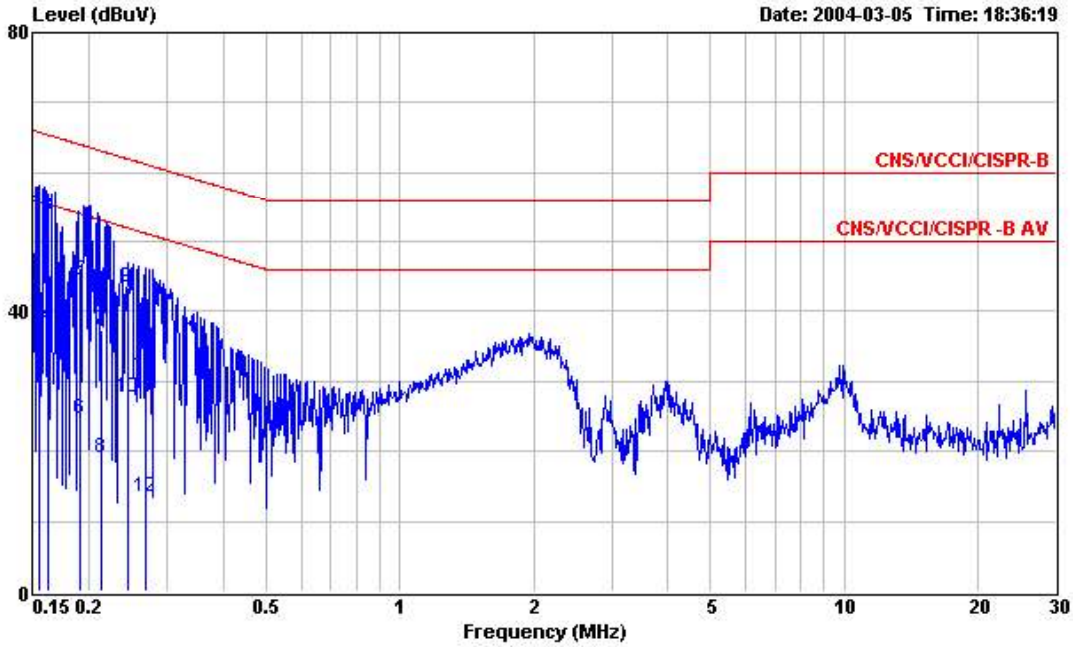
a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power port of the line impedance stabilization network (LISN).
c. All the support units are connect to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

6.3. Test Result of Conducted Emission：

6.3.1 Frequency Range of Test : 150kHz to 30 MHz

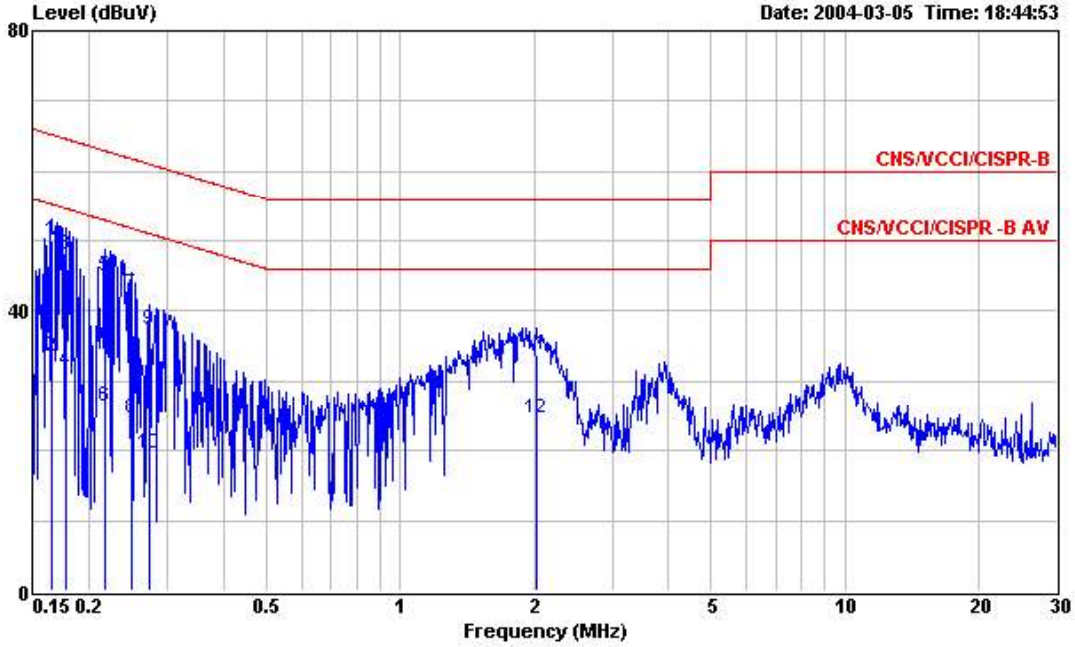
- Test Mode : Mode 1
- Temperature : 23°C
- Relative Humidity : 49 %

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 LINE
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi211b(WLAN)
Memo : TX CH01 2412MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.154	54.28	-11.50	65.78	54.14	0.10	0.04	QP
2	0.154	36.66	-19.12	55.78	36.52	0.10	0.04	Average
3	0.161	53.62	-11.79	65.41	53.48	0.10	0.04	QP
4	0.161	37.94	-17.47	55.41	37.80	0.10	0.04	Average
5	0.191	44.44	-19.54	63.98	44.32	0.10	0.02	QP
6	0.191	24.67	-29.31	53.98	24.55	0.10	0.02	Average
7	0.212	37.35	-25.78	63.13	37.24	0.10	0.01	QP
8	0.212	19.15	-33.98	53.13	19.04	0.10	0.01	Average
9	0.244	43.51	-18.45	61.96	43.40	0.10	0.01	QP
10	0.244	27.59	-24.37	51.96	27.48	0.10	0.01	Average
11	0.267	30.87	-30.34	61.21	30.76	0.10	0.01	QP
12	0.267	13.48	-37.73	51.21	13.37	0.10	0.01	Average



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 NEUTRAL
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi211b(WLAN)
Memo : TX CH01 2412MHz

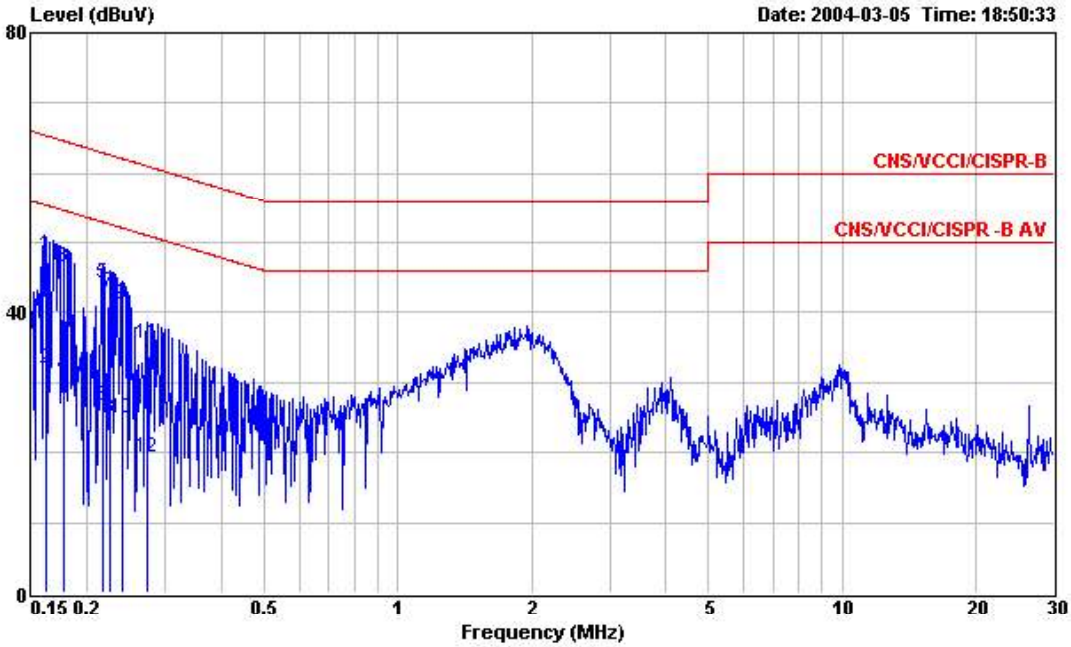
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.164	49.94	-15.32	65.26	49.80	0.10	0.04	QP
2	0.164	33.42	-21.84	55.26	33.28	0.10	0.04	Average
3	0.177	48.08	-16.55	64.63	47.95	0.10	0.03	QP
4	0.177	31.55	-23.08	54.63	31.42	0.10	0.03	Average
5	0.216	44.98	-17.99	62.97	44.87	0.10	0.01	QP
6	0.216	26.34	-26.63	52.97	26.23	0.10	0.01	Average
7	0.248	42.40	-19.42	61.82	42.29	0.10	0.01	QP
8	0.248	24.52	-27.30	51.82	24.41	0.10	0.01	Average
9	0.272	37.26	-23.80	61.06	37.15	0.10	0.01	QP
10	0.272	19.68	-31.38	51.06	19.57	0.10	0.01	Average
11	2.020	33.87	-22.13	56.00	33.73	0.10	0.04	QP
12	2.020	24.58	-21.42	46.00	24.44	0.10	0.04	Average

Test Engineer : _____
Jay

6.3.2 Frequency Range of Test : 150kHz to 30 MHz

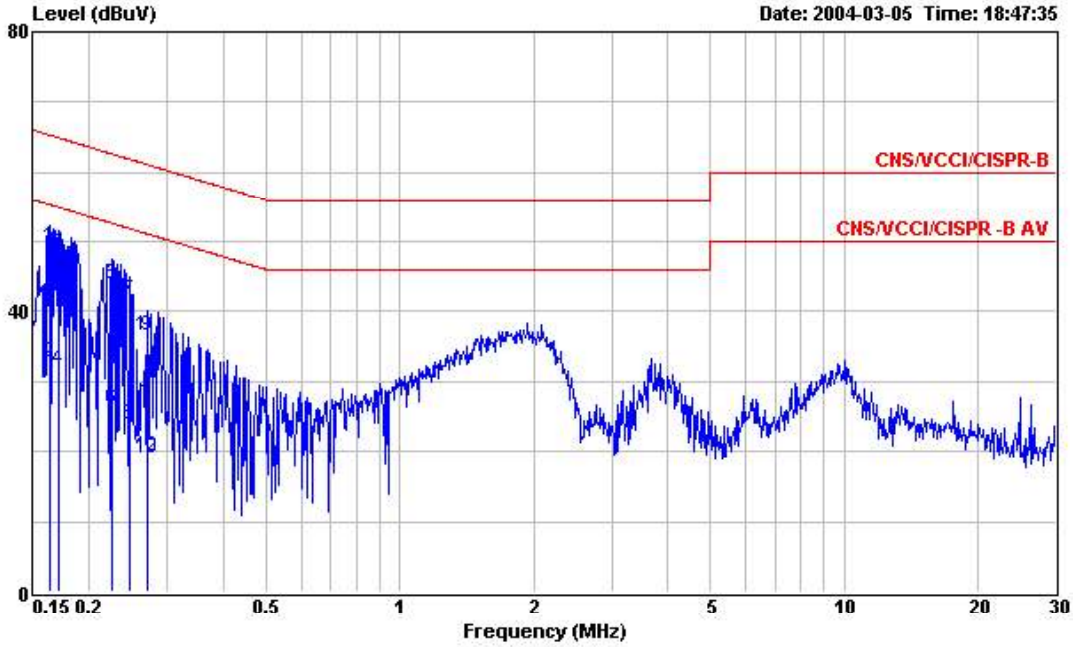
- Test Mode : Mode 2
- Temperature : 23°C
- Relative Humidity : 49 %

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 LINE
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi211b(WLAN)
Memo : TX CH06 2437MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.162	48.33	-17.03	65.36	48.19	0.10	0.04	QP
2	0.162	31.88	-23.48	55.36	31.74	0.10	0.04	Average
3	0.177	46.45	-18.18	64.63	46.32	0.10	0.03	QP
4	0.177	30.99	-23.64	54.63	30.86	0.10	0.03	Average
5	0.216	44.21	-18.76	62.97	44.10	0.10	0.01	QP
6	0.216	26.55	-26.42	52.97	26.44	0.10	0.01	Average
7	0.224	43.00	-19.67	62.67	42.89	0.10	0.01	QP
8	0.224	25.01	-27.66	52.67	24.90	0.10	0.01	Average
9	0.239	41.08	-21.05	62.13	40.97	0.10	0.01	QP
10	0.239	24.92	-27.21	52.13	24.81	0.10	0.01	Average
11	0.273	35.49	-25.54	61.03	35.38	0.10	0.01	QP
12	0.273	19.24	-31.79	51.03	19.13	0.10	0.01	Average



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 NEUTRAL
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi211b(WLAN)
Memo : TX CH06 2437MHz

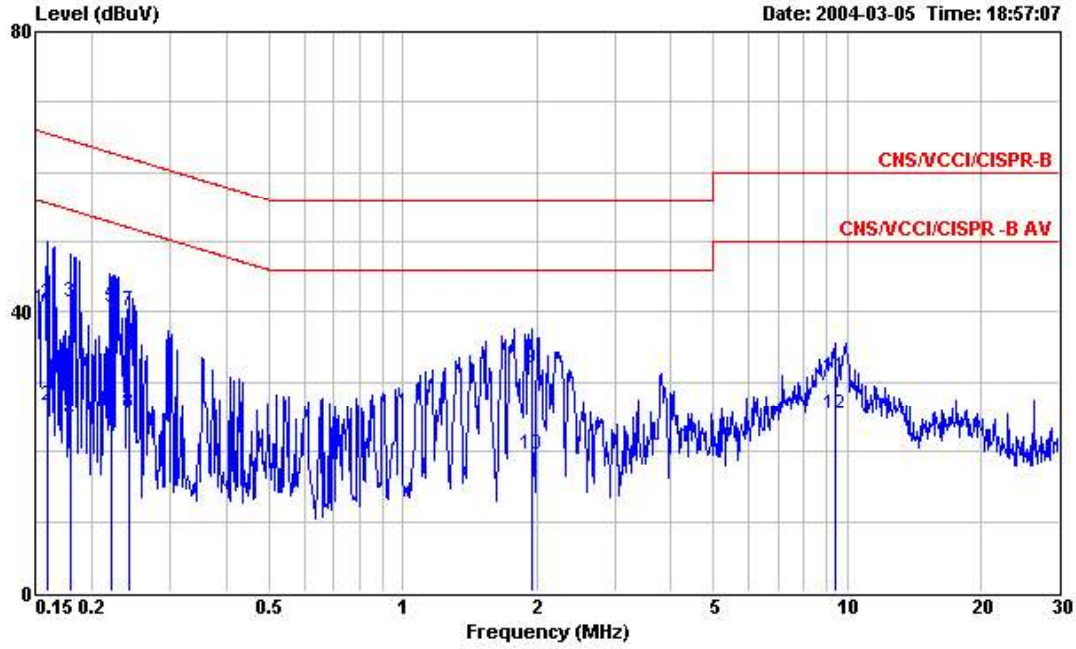
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.163	49.22	-16.09	65.31	49.08	0.10	0.04	QP
2	0.163	32.76	-22.55	55.31	32.62	0.10	0.04	Average
3	0.170	48.19	-16.77	64.96	48.06	0.10	0.03	QP
4	0.170	31.85	-23.11	54.96	31.72	0.10	0.03	Average
5	0.224	43.87	-18.80	62.67	43.76	0.10	0.01	QP
6	0.224	26.05	-26.62	52.67	25.94	0.10	0.01	Average
7	0.247	41.72	-20.14	61.86	41.61	0.10	0.01	QP
8	0.247	23.81	-28.05	51.86	23.70	0.10	0.01	Average
9	0.270	36.69	-24.43	61.12	36.58	0.10	0.01	QP
10	0.270	18.94	-32.18	51.12	18.83	0.10	0.01	Average
11	0.270	36.61	-24.51	61.12	36.50	0.10	0.01	QP
12	0.270	19.25	-31.87	51.12	19.14	0.10	0.01	Average

Test Engineer : Jay

6.3.3 Frequency Range of Test : 150kHz to 30 MHz

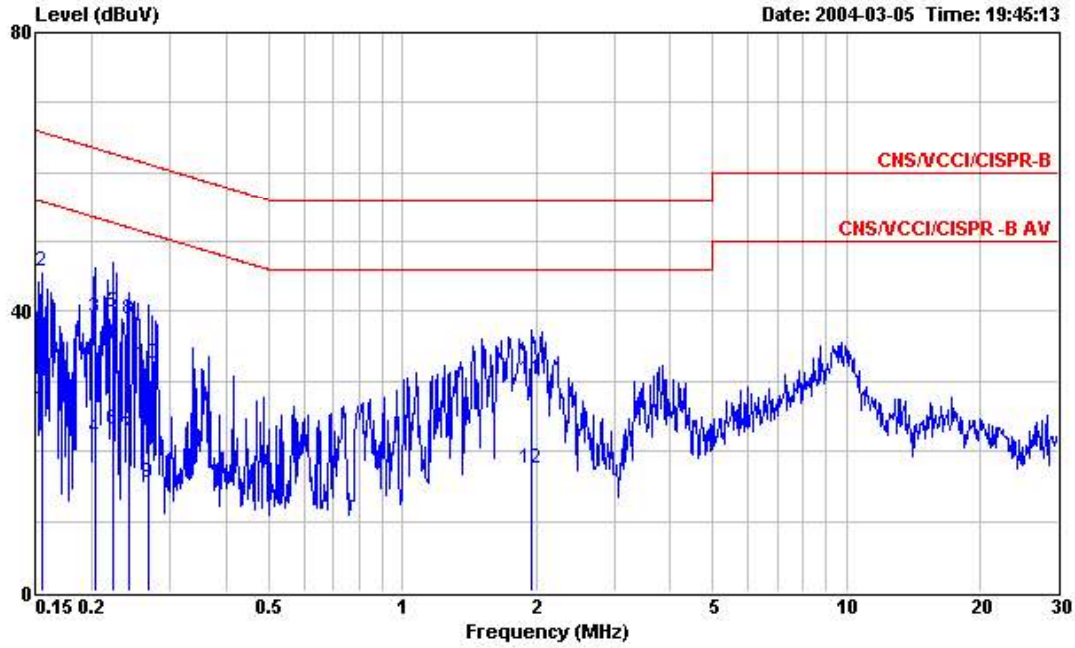
- Test Mode : Mode 3
- Temperature : 23°C
- Relative Humidity : 49 %

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 LINE
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi211b(WLAN)
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.159	41.28	-24.24	65.52	41.14	0.10	0.04	QP
2	0.159	26.76	-28.76	55.52	26.62	0.10	0.04	Average
3	0.179	41.49	-23.04	64.53	41.37	0.10	0.02	QP
4	0.179	24.28	-30.25	54.53	24.16	0.10	0.02	Average
5	0.220	40.68	-22.14	62.82	40.57	0.10	0.01	QP
6	0.220	23.54	-29.28	52.82	23.43	0.10	0.01	Average
7	0.243	40.15	-21.84	61.99	40.04	0.10	0.01	QP
8	0.243	25.62	-26.37	51.99	25.51	0.10	0.01	Average
9	1.950	31.93	-24.07	56.00	31.79	0.10	0.04	QP
10	1.950	19.65	-26.35	46.00	19.51	0.10	0.04	Average
11	9.400	30.63	-29.37	60.00	30.34	0.19	0.10	QP
12	9.400	25.46	-24.54	50.00	25.17	0.19	0.10	Average



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 NEUTRAL
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi211b(WLAN)
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.154	26.16	-29.62	55.78	26.02	0.10	0.04	Average
2	0.154	45.61	-20.17	65.78	45.47	0.10	0.04	QP
3	0.203	39.10	-24.39	63.49	38.99	0.10	0.01	QP
4	0.203	21.80	-31.69	53.49	21.69	0.10	0.01	Average
5	0.223	39.82	-22.89	62.71	39.71	0.10	0.01	QP
6	0.223	23.15	-29.56	52.71	23.04	0.10	0.01	Average
7	0.242	22.03	-30.00	52.03	21.92	0.10	0.01	Average
8	0.242	38.89	-23.14	62.03	38.78	0.10	0.01	QP
9	0.267	15.54	-35.67	51.21	15.43	0.10	0.01	Average
10	0.267	32.63	-28.58	61.21	32.52	0.10	0.01	QP
11	1.960	30.32	-25.68	56.00	30.18	0.10	0.04	QP
12	1.960	17.54	-28.46	46.00	17.40	0.10	0.04	Average

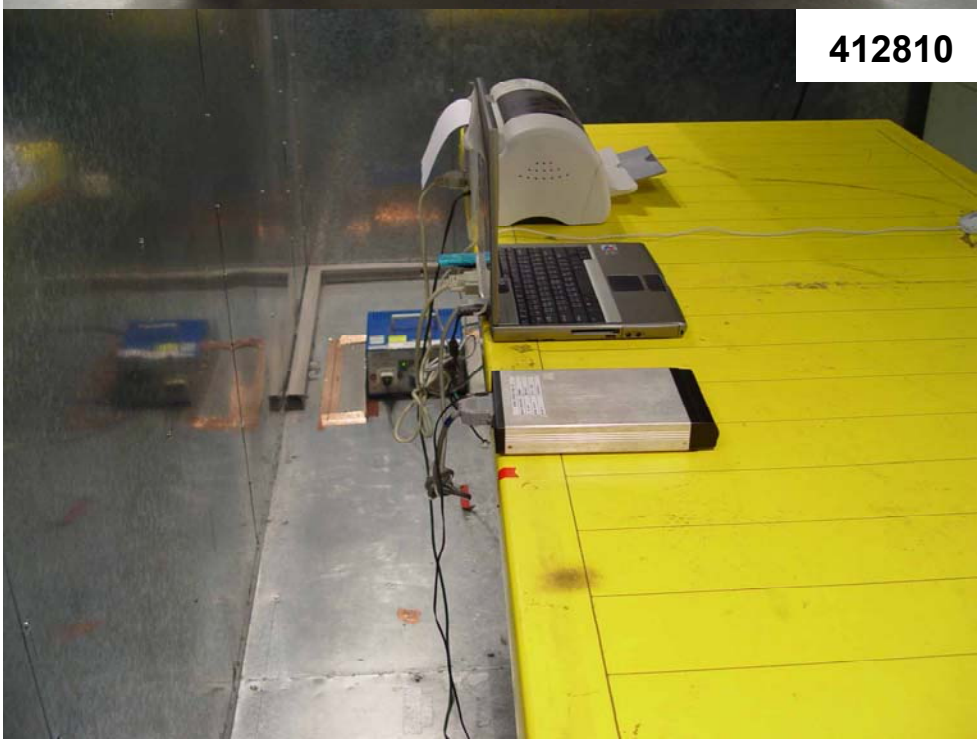
Test Engineer : _____
Jay

6.4. Photographs of Conducted Emission Test Configuration

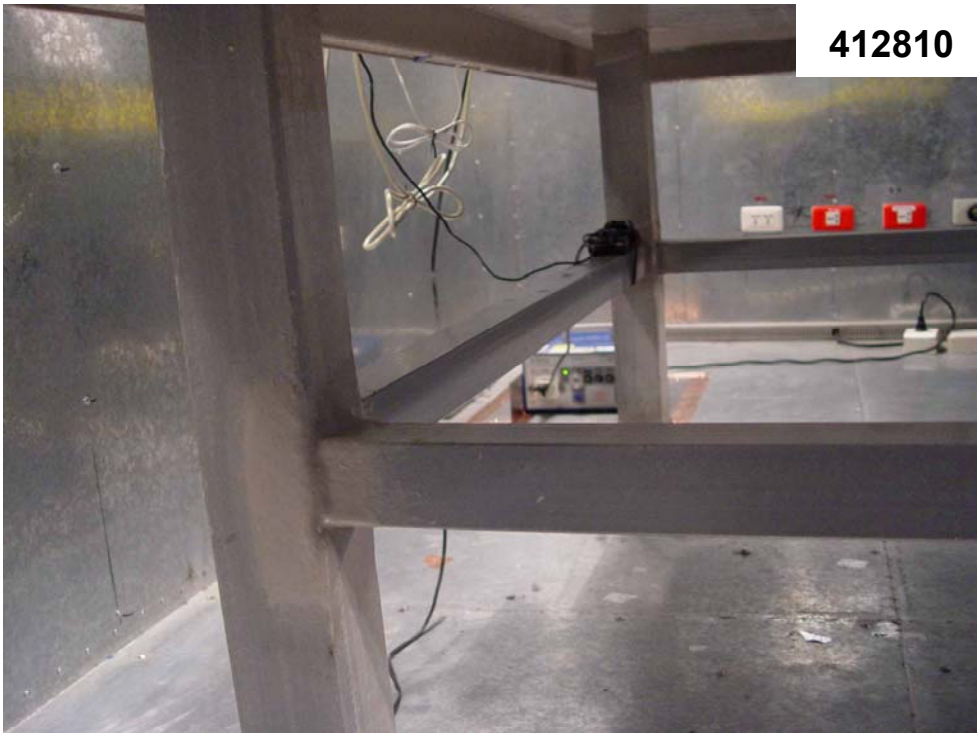
- The photographs show the configuration that generates the maximum emission.

FRONT VIEW

REAR VIEW



SIDE VIEW



7. Test of Radiated Emission

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defined in ANSI C63.4-2001. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

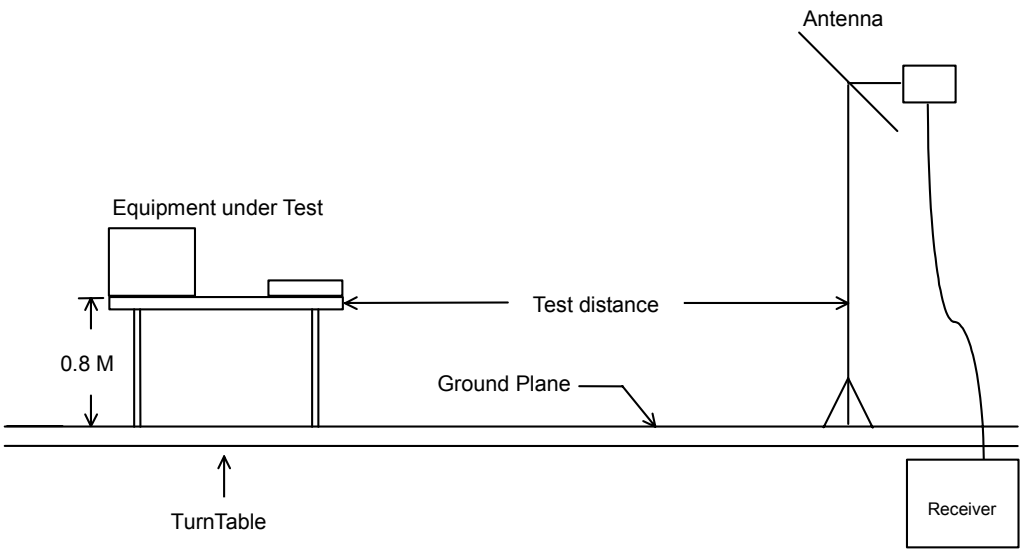
7.1. Major Measuring Instruments

● Amplifier	(MITEQ AFS44)
RF Gain	40 dB
Signal Input	100 MHz to 26.5 GHz
● Amplifier	(HP8447D)
RF Gain	30 dB
Signal Input	100 MHz to 1.3 GHz
● Spectrum analyzer	(R&S FSP40)
Attenuation	10 dB
Start Frequency	1 GHz
Stop Frequency	25 GHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 kHz to 40 GHz
● Spectrum analyzer	(R&S FSP40)
Attenuation	10 dB
Start Frequency	30MHz
Stop Frequency	1 GHz
Resolution Bandwidth	120 KHz
Video Bandwidth	300KHz
Signal Input	9 kHz to 40 GHz

7.2. Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
8. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

7.3. Typical Test Setup Layout of Radiated Emission



7.4. Test Result of Radiated Emission

7.4.1 Test Mode: Mode 1

- Test Distance : 3 m
- Temperature : 22°C
- Relative Humidity :51 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test that passed at minimum margin was marked by the frame in the following table.

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH01 2412MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1324.000	45.22	-28.78	74.00	59.39	24.91	1.36	40.44	Peak	100	258
2	1324.000	29.33	-44.67	74.00	43.50	24.91	1.36	40.44	Peak	100	258
3	1838.000	46.46	-27.54	74.00	58.87	26.75	1.65	40.81	Peak	100	265
4	1838.000	39.92	-14.08	54.00	52.33	26.75	1.65	40.81	Average	100	265

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH01 2412MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2338.690	58.75	-15.25	74.00	28.96	28.10	1.69	0.00	Peak	100	134
2	2338.690	46.33	-7.67	54.00	16.54	28.10	1.69	0.00	Average	100	134
3 X	2412.220	106.93	32.93	74.00	76.94	28.25	1.74	0.00	Peak	100	171
4 X	2412.220	99.80	45.80	54.00	69.81	28.25	1.74	0.00	Average	100	171
5	2484.420	58.62	-15.38	74.00	28.44	28.39	1.79	0.00	Peak	100	43
6	2484.420	46.53	-7.47	54.00	16.35	28.39	1.79	0.00	Average	100	43

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH01 2412MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	4822.000	52.84	-21.16	74.00	59.68	33.06	2.47	42.37	Peak	167	353
2	4822.000	36.38	-17.62	54.00	43.22	33.06	2.47	42.37	Average	167	353

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH01 2412MHz

		Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	!	1830.000	51.93	-2.07	54.00	64.39	26.72	1.63	40.81	Average	100	81
2	!	1830.000	48.29	-5.71	54.00	60.75	26.72	1.63	40.81	Average	100	81
3		2038.000	49.73	-24.27	74.00	61.52	27.49	1.65	40.93	Peak	100	182
4		2038.000	43.76	-10.24	54.00	55.55	27.49	1.65	40.93	Average	100	182

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH01 2412MHz

		Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1		2317.980	58.90	-15.10	74.00	29.10	28.06	1.74	0.00	Peak	100	245
2		2317.980	46.63	-7.37	54.00	16.83	28.06	1.74	0.00	Average	100	245
3	X	2413.740	106.23	32.23	74.00	76.24	28.25	1.74	0.00	Peak	100	347
4	X	2413.740	98.05	44.05	54.00	68.06	28.25	1.74	0.00	Average	100	347
5		2493.540	59.02	-14.98	74.00	28.83	28.40	1.79	0.00	Peak	100	287
6		2493.540	47.26	-6.74	54.00	17.07	28.40	1.79	0.00	Average	100	287

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH01 2412MHz

		Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1		4822.000	56.48	-17.52	74.00	63.32	33.06	2.47	42.37	Peak	134	353
2		4822.000	43.33	-10.67	54.00	50.17	33.06	2.47	42.37	Average	134	353

For 4.822GHz ~ 25GHz

Frequency from 4822MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Emission (dBuV/m)	Margin (dB)	Detect Mode
2412.220	V	28.25	1.74	76.94	-	106.93	-	Peak
2412.220	V	28.25	1.74	69.81	-	99.80	-	Av
2413.740	H	28.25	1.74	76.24	-	106.23	-	Peak
2413.740	H	28.25	1.74	68.06	-	98.05	-	Av
4822.000	V	33.06	2.47	17.31	74.00	52.84	-21.16	Peak
4822.000	V	33.06	2.47	0.85	54.00	36.38	-17.62	AV
4822.000	H	33.06	2.47	20.95	74.00	56.48	-17.52	Peak
4822.000	H	33.06	2.47	7.80	54.00	43.33	-10.67	AV
7236.000	V/H	-	-	-	-	-	-	AV/Peak
9648.000	V/H	-	-	-	-	-	-	AV/Peak
12060.000	V/H	-	-	-	-	-	-	AV/Peak
14472.000	V/H	-	-	-	-	-	-	AV/Peak
16884.000	V/H	-	-	-	-	-	-	AV/Peak
19296.000	V/H	-	-	-	-	-	-	AV/Peak
21708.000	V/H	-	-	-	-	-	-	AV/Peak
24120.000	V/H	-	-	-	-	-	-	AV/Peak

Remark:
1. The emission emitted by the EUT is too low to be measured except the emission listed above,
2. Reading = Reading on SA-Preamp Factor

Test Engineer : _____
Jay

7.4.2 Test Mode: Mode 2

- Test Distance : 3 m
- Temperature : 22.5°C
- Relative Humidity :56 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test that passed at minimum margin was marked by the frame in the following table.

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH06 2437MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1838.000	53.06	-20.94	74.00	65.47	26.75	1.65	40.81	Peak	198	102
2	1838.000	46.96	-7.04	54.00	59.37	26.75	1.65	40.81	Average	198	102
3	2062.000	52.80	-21.20	74.00	64.55	27.53	1.66	40.94	Peak	100	346
4	2062.000	46.91	-7.09	54.00	58.66	27.53	1.66	40.94	Average	100	346

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH06 2437MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2374.220	46.39	-7.61	54.00	16.51	28.17	1.71	0.00	Average	100	216
2	2374.220	59.12	-14.88	74.00	29.24	28.17	1.71	0.00	Peak	100	216
3 X	2437.490	105.92	31.92	74.00	75.86	28.30	1.76	0.00	Peak	100	168
4 X	2437.490	98.38	44.38	54.00	68.32	28.30	1.76	0.00	Average	100	168
5	2499.050	58.99	-15.01	74.00	28.80	28.40	1.79	0.00	Peak	100	347
6	2499.050	45.51	-8.49	54.00	15.32	28.40	1.79	0.00	Average	100	347

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH06 2437MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	4876.000	54.70	-19.30	74.00	61.45	33.17	2.52	42.44	Peak	159	281
2	4876.000	38.70	-15.30	54.00	45.45	33.17	2.52	42.44	Average	159	281

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH06 2437MHz

		Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1		1836.000	52.49	-21.51	74.00	64.92	26.74	1.64	40.81	Peak	100	279
2		1836.000	46.66	-7.34	54.00	59.09	26.74	1.64	40.81	Average	100	279
3		2062.000	55.16	-18.84	74.00	66.91	27.53	1.66	40.94	Peak	---	---
4	!	2062.000	52.64	-1.36	54.00	64.39	27.53	1.66	40.94	Average	100	221

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH06 2437MHz

		Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1		2387.140	58.73	-15.27	74.00	28.81	28.20	1.72	0.00	Peak	100	128
2		2387.140	46.52	-7.48	54.00	16.60	28.20	1.72	0.00	Average	100	128
3	X	2436.730	105.95	31.95	74.00	75.89	28.30	1.76	0.00	Peak	100	351
4	X	2436.730	98.03	44.03	54.00	67.97	28.30	1.76	0.00	Average	100	351
5		2488.220	59.09	-14.91	74.00	28.90	28.40	1.79	0.00	Peak	100	225
6		2488.220	47.47	-6.53	54.00	17.28	28.40	1.79	0.00	Average	100	225

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH06 2437MHz

		Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1		4876.000	59.97	-14.03	74.00	66.72	33.17	2.52	42.44	Peak	115	360
2		4876.000	43.70	-10.30	54.00	50.45	33.17	2.52	42.44	Average	115	360

For 4.876GHz ~ 25GHz

Frequency from 4876MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Emission (dBuV/m)	Margin (dB)	Detect Mode
2437.490	V	28.30	1.76	75.86	-	105.92	-	Peak
2437.490	V	28.30	1.76	68.32	-	98.38	-	Av
2436.730	H	28.30	1.76	75.89	-	105.95	-	Peak
2436.730	H	28.30	1.76	67.97	-	98.03	-	Av
4876.000	V	33.17	2.52	19.01	74.00	54.70	-19.30	Peak
4876.000	V	33.17	2.52	3.01	54.00	38.70	-15.30	AV
4876.000	H	33.17	2.52	24.28	74.00	59.97	-14.03	Peak
4876.000	H	33.17	2.52	8.01	54.00	43.70	-10.30	AV
7236.000	V/H	-	-	-	-	-	-	AV/Peak
9648.000	V/H	-	-	-	-	-	-	AV/Peak
12060.000	V/H	-	-	-	-	-	-	AV/Peak
14472.000	V/H	-	-	-	-	-	-	AV/Peak
16884.000	V/H	-	-	-	-	-	-	AV/Peak
19296.000	V/H	-	-	-	-	-	-	AV/Peak
21708.000	V/H	-	-	-	-	-	-	AV/Peak
24120.000	V/H	-	-	-	-	-	-	AV/Peak

Remark:
1. The emission emitted by the EUT is too low to be measured except the emission listed above,
2. Reading = Reading on SA-Preamp Factor

Test Engineer : _____
Jay

7.4.3 Test Mode: Mode 3

- Test Distance : 3 m
- Temperature : 22.5°C
- Relative Humidity :56 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test that passed at minimum margin was marked by the frame in the following table.

Site : 03CH03-HY
Condition : FCC CLASS-B 3m BIC-9124--301 VERTICAL
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi275u(WLAN)
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 !	38.670	35.51	-4.49	40.00	50.35	12.00	1.19	28.03	QP	121	352
2	110.580	29.91	-13.59	43.50	45.34	10.45	2.00	27.88	QP	---	---
3	133.020	28.74	-14.76	43.50	42.84	11.48	2.25	27.83	QP	---	---

Site : 03CH03-HY
Condition : FCC CLASS-B 3m LOG-9111-221 VERTICAL
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi275u(WLAN)
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	224.800	29.93	-16.07	46.00	40.88	13.79	2.86	27.60	QP	---	---
2	665.600	33.84	-12.16	46.00	38.15	19.10	5.32	28.73	QP	---	---
3	794.400	31.55	-14.45	46.00	34.19	20.34	5.81	28.79	QP	---	---

Site : 03CH03-HY
Condition : FCC CLASS-B 3m BIC-9124--301 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi275u(WLAN)
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	116.870	31.25	-12.25	43.50	46.51	10.54	2.07	27.87	QP	---	---
2	132.510	26.63	-16.87	43.50	40.78	11.46	2.22	27.83	QP	---	---
3	178.750	30.88	-12.62	43.50	42.51	13.52	2.59	27.74	QP	---	---

Site : 03CH03-HY
Condition : FCC CLASS-B 3m LOG-9111-221 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Power : AC 110V / 60Hz
Model : SCWi275u(WLAN)
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	224.800	32.89	-13.11	46.00	43.84	13.79	2.86	27.60	QP	---	---
2	439.200	32.50	-13.50	46.00	40.13	16.31	4.21	28.15	QP	---	---
3	595.200	31.38	-14.62	46.00	36.31	18.88	4.99	28.80	QP	---	---

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1838.000	53.67	-20.33	74.00	66.08	26.75	1.65	40.81	Peak	144	87
2 !	1838.000	53.67	-0.33	54.00	66.08	26.75	1.65	40.81	Average	144	87
3 !	2086.000	50.18	-3.82	54.00	61.90	27.58	1.66	40.96	Average	100	200
4	2086.000	55.58	-18.42	74.00	67.30	27.58	1.66	40.96	Peak	100	200

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2353.890	58.81	-15.19	74.00	28.99	28.13	1.69	0.00	Peak	100	321
2	2353.890	46.80	-7.20	54.00	16.98	28.13	1.69	0.00	Average	100	321
3 X	2462.570	106.93	32.93	74.00	76.79	28.35	1.79	0.00	Peak	100	175
4 X	2462.570	99.93	45.93	54.00	69.79	28.35	1.79	0.00	Average	100	175
5	2489.740	58.91	-15.09	74.00	28.72	28.40	1.79	0.00	Peak	100	268
6	2489.740	46.74	-7.26	54.00	16.55	28.40	1.79	0.00	Average	100	268

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 VERTICAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	4926.000	55.85	-18.15	74.00	62.61	33.28	2.47	42.51	Peak	131	339
2	4926.000	40.62	-13.38	54.00	47.38	33.28	2.47	42.51	Average	131	339

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1838.000	52.33	-21.67	74.00	64.74	26.75	1.65	40.81	Peak	138	216
2 !	1838.000	50.19	-3.81	54.00	62.60	26.75	1.65	40.81	Average	138	216
3	2086.000	55.78	-18.22	74.00	67.50	27.58	1.66	40.96	Peak	100	254
4 !	2086.000	52.87	-1.13	54.00	64.59	27.58	1.66	40.96	Average	100	254

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2386.380	58.68	-15.32	74.00	28.77	28.19	1.72	0.00	Peak	100	72
2	2386.380	46.68	-7.32	54.00	16.77	28.19	1.72	0.00	Average	100	72
3 X	2463.900	108.82	34.82	74.00	78.68	28.35	1.79	0.00	Peak	100	351
4 X	2463.900	100.34	46.34	54.00	70.20	28.35	1.79	0.00	Average	100	351
5	2498.100	59.18	-14.82	74.00	28.99	28.40	1.79	0.00	Peak	100	140
6	2498.100	47.98	-6.02	54.00	17.79	28.40	1.79	0.00	Average	100	140

Site : 03CH03-HY
Condition : FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL
EUT : 802.11b USB Wireless LAN
Mode : SCWi211b(WLAN)
Power : 110Vac/50Hz
Memo : TX CH11 2462MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	4924.000	61.15	-12.85	74.00	67.92	33.27	2.47	42.51	Peak	130	14
2	4924.000	46.31	-7.69	54.00	53.08	33.27	2.47	42.51	Average	130	14

For 4.924GHz ~ 25GHz

Frequency from4924MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV/m)	Emission (dBuV/m)	Margin (dB)	Detect Mode
2462.890	V	28.35	1.79	76.79	-	106.93	-	Peak
2462.570	V	28.35	1.79	69.79	-	99.93	-	Av
2463.900	H	28.35	1.79	78.68	-	108.82	-	Peak
2463.900	H	28.35	1.79	70.20	-	100.34	-	Av
4926.000	V	33.28	2.47	20.10	74.00	55.85	-18.15	Peak
4926.000	V	33.28	2.47	4.87	54.00	40.62	-13.38	AV
4924.000	H	33.27	2.47	25.41	74.00	61.15	-12.85	Peak
4924.000	H	33.27	2.47	10.57	54.00	46.31	-7.69	AV
7236.000	V/H	-	-	-	-	-	-	AV/Peak
9648.000	V/H	-	-	-	-	-	-	AV/Peak
12060.000	V/H	-	-	-	-	-	-	AV/Peak
14472.000	V/H	-	-	-	-	-	-	AV/Peak
16884.000	V/H	-	-	-	-	-	-	AV/Peak
19296.000	V/H	-	-	-	-	-	-	AV/Peak
21708.000	V/H	-	-	-	-	-	-	AV/Peak
24120.000	V/H	-	-	-	-	-	-	AV/Peak

Remark:

1. The emission emitted by the EUT is too low to be measured except the emission listed above,
2. Reading = Reading on SA-Preamp Factor

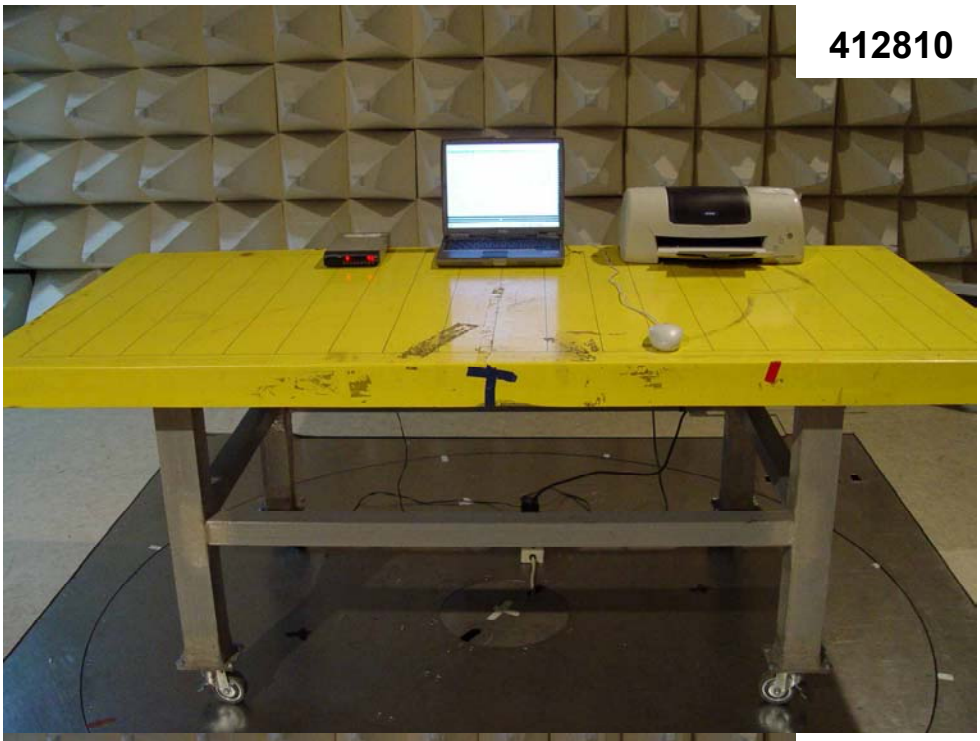
Test Engineer : _____

Jay

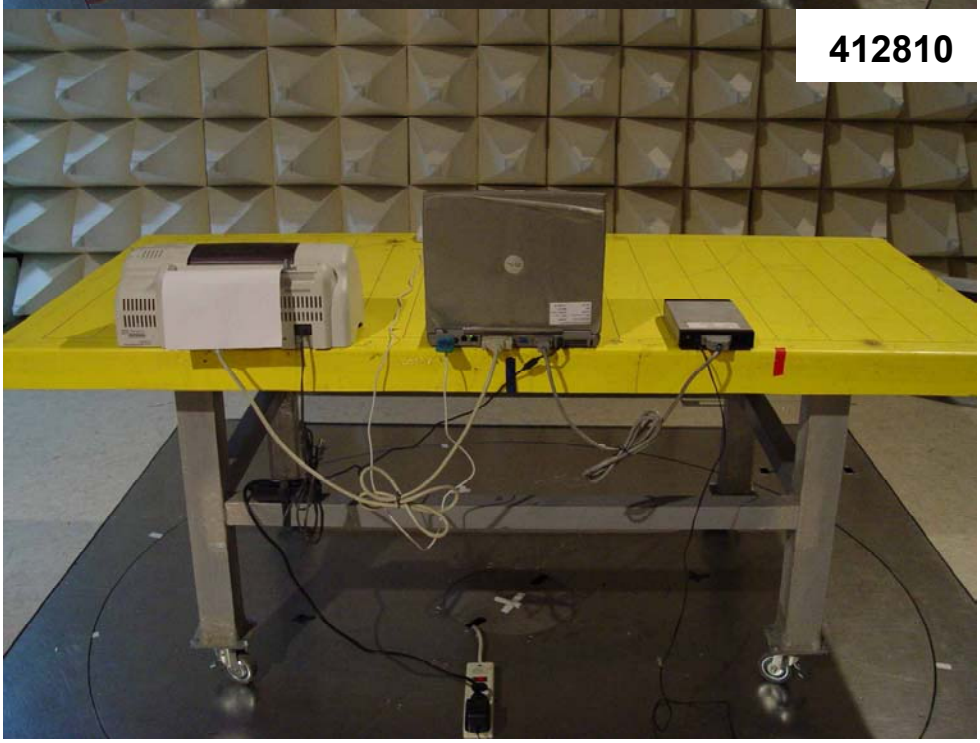
7.5. Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW



8. Antenna Requirements

The EUT use an embedded PCB antenna without connector. It is considered to meet antenna requirement of FCC.

8.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no other antenna except assembled by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

8.2. Antenna Connected Construction

The antenna used in this product is embedded PCB antenna without connector.

9. RF Exposure

FCC Rules and Regulations Part 1.1307,1.1310,2.1091,2.1093:

RF Exposure Compliance

9.1. Limit For Maximum Permissible Exposure (MPE)

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

F=frequency in MHz *Plane-wave equivalent power density

9.2. MPE Calculations

Power Density =Pd (mW/cm^2) = EIRP/4π d^2

EIRP = P · G

P＝Peak output power (mW)

G＝Antenna numeric gain (numeric)

d＝Separation distance (cm)

Because the EUT belongs to General Population/ Uncontrolled Exposure, the limit of power density is 1.0 mW/cm^2.

Channel NO.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated RF Exposure at d=20cm (mW/cm^2)	Calculated RF Exposure at d=2.5cm (mW/cm^2)	Limit (mW/cm^2)
Channel 01	1.5	1.41	10.4	10.96	0.0030	0.197	1.0
Channel 06	1.5	1.41	10.0	10.00	0.0028	0.180	1.0
Channel 11	1.5	1.41	11.4	13.80	0.0039	0.248	1.0

9.3. FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 2.5cm during normal operation.

10. List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9 KHz – 2.75 GHz	Jun. 12, 2003	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001-008	9 KHz – 30 MHz	Apr. 30, 2003	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001-009	9 KHz – 30 MHz	Apr. 30, 2003	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9KHz~30MHz	Dec. 24, 2003	Conduction (CO01-HY)
50 ohm BNC type Terminal	NOBLE	50ohm	TM013	50 ohm	Apr. 24, 2003	Conduction (CO01-HY)

※ Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2003	Radiation (03CH03-HY)
Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 23, 2003	Radiation (03CH03-HY)
Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 05, 2003	Radiation (03CH03-HY)
Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 24, 2003	Radiation (03CH03-HY)
Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 24, 2003	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 03, 2003	Radiation (03CH03-HY)
Amplifier	MITEQ	AFS44	879981	100MHz~26.5GHz	Jul. 23, 2003	Radiation (03CH03-HY)
Horn Antenna	COM-POWER	3115	6741	1GHz – 18GHz	Apr. 08, 2003	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Horn Antenna	Schwarzbeck	BBHA9170	154	15GHz~40GHz	Jun. 02, 2003	Radiation (03CH03-HY)
RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Dec. 05, 2003	Radiation (03CH03-HY)

※ Calibration Interval of instruments listed above is one year, except for Horn Antenna, BBHA9170.

※ Calibration Interval of Horn Antenna, BBHA9170, is three years.

11. Uncertainty of Test Site

Uncertainty of Conducted Emission Measurement

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch Receiver VSWR Γ1= LISN VSWR Γ2= Uncertainty=20log(1-Γ1*Γ2)	+0.34/-0.35	U-shape	0.24
combined standard uncertainty Uc(y)	**1.13**		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	**2.26**		

U=√{(1/2)²+(0.3/2)²+(2²+0.5²+2²+0.25²+2²)/3+(0.54)²/2}=2.2 for 10m test distance

U=√{(1/2)²+(0.3/2)²+(2²+3²+2²+0.25²+2²)/3+(0.54)²/2}=2.7 for 3m test distance

Uncertainty of Conducted Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch Receiver VSWR Γ1= 0.20 Antenna VSWR Γ2= 0.23 Uncertainty=20log(1-Γ1*Γ2)	+0.39/-0.41	U-shaped	0.28
combined standard uncertainty Uc(y)	**1.27**		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	**2.54**		

Uncertainty of Conducted Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of x_i		$u(x_i)$	Ci	$Ci*u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1= 0.197 Antenna VSWR Γ2= 0.194 Uncertainty=20log(1-Γ1*Γ2*Γ3)	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty Uc(y)	**2.36**				
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	**4.72**				

$U=\sqrt{\{(0.3/2)^2 +(2^2+1.5^2+0.2^2)/3+(0.2)^2/2\}}=1.66$