FCC TEST REPORT

CATEGORY	:	Portable End Product
PRODUCT NAME	:	Wireless IP Phone
FCC ID.	:	NI3-SI-7800H
FILING TYPE	:	Certification
BRAND NAME	:	SENAO
MODEL NAME	:	SI-7800H
APPLICANT	:	**SENAO INTERNATIONAL CO., LTD.** 2FL, NO. 531 CHUNG CHENG RD., HSIN-TIEN, TAIPEI, TAIWAN, R.O.C. 231
MANUFACTURER	:	Same as Applicant
ISSUED BY	:	**SPORTON INTERNATIONAL INC.** 6F, No. 106, Sec. 1, Hsin Tai Wu Rd., His Chih, Taipei Hsien, Taiwan, R.O.C.

Statements:

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

Certificate or Test Report could not be used by the applicant to claim the product endorsement by CNLA, NVLAP or any agency of U.S. government.

The test equipment used to perform the test are calibrated and traceable to NML/ROC or NIST/USA.

Dr. Alan Lane
Vice General Manager
Sporton International Inc.

Lab Code: 200079-0

Table of Contents

History of this test report

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. General Description of Equipment under Test

1.1. Applicant

SENAO INTERNATIONAL CO., LTD.
2FL, NO. 531 CHUNG CHENG RD., HSIN-TIEN, TAIPEI, TAIWAN, R.O.C. 231

1.2. Manufacturer

Same as 1.1

1.3. Basic Description of Equipment under Test

This product is a wireless IP Phone with IEEE 802.11b wireless solution. This wireless IP phone is battery powered and can also be powered by an AC to DC adapter. The technical data has been listed on section " Features of Equipment under Test " .

1.4. Feature of Equipment under Test

ITEMS	DESCRIPTION
Type of Modulation	DBPSK,DQPSK,CCK (802.11b)
Number of Channels	11
Frequency Band	2400MHz ~ 2483.5MHz
Carrier Frequency of each channel	Please reference section 1.5
Bandwidth of each channel	22MHz
Output Power to Antenna	20.2dBm
Antenna Type / Gain	Embeded Antenna / 2dBi
Function Type	Transceiver
Power Rating (DC/AC, Voltage)	3.7 VDC
Temperature Range (Operating)	0-55℃
Humidity	15%~95%

1.5. Table for Carrier Frequencies

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

2. Test Configuration of the Equipment under Test

2.1. Description of the Test

a. During testing, the equipment was placed on a non-conducting support.
b. Spurious emission below 1GHz is independent of channel selection, so only Channel 11 with CCK modulation was tested.
c. There are 2 modes for spurious emission test below 1GHz:
   Mode 1: EUT powered by battery (below 1GHz)
   Mode 2: EUT powered by adapter (below 1GHz)
d. For spurious emission above 1GHz, lowest, middle and highest channel with 11Mbps data rate was tested.
e. The EUT has been programmed to continuously transmit or receive during testing. The used peripherals as well as the configuration fulfill the requirements of ANSI C63.4:2001.
f. The configuration is operated in a manner which tends to maximize its emission characteristics in a typical application.
g. 3 meters measurement distance in semi-anechoic chamber was used in this test.

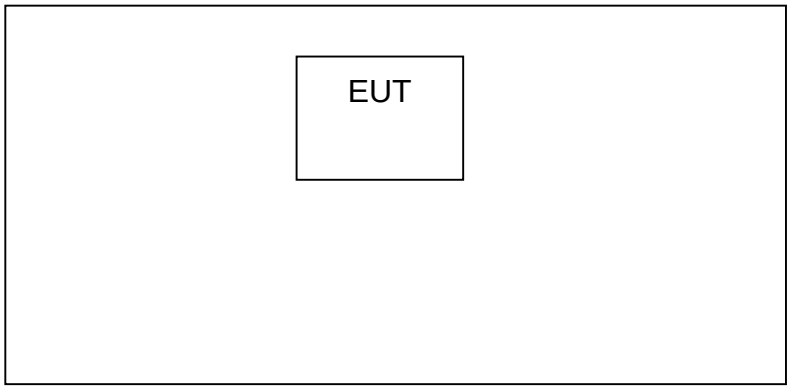
2.2. Frequency Range Investigated

a. Conducted power line test: from 150 kHz to 30 MHz
b. Radiated emission test: from 30 MHz to 25000 MHz

2.3. Description of Test Supporting Units

No Supporting Units.

2.4. Connection Diagram of Test System



2.5. Test Software

Channel & Power Controlling Software: This was provided by the manufacturer and is able to let the test engineer select the operating channel as well as the RF output power. The parameters for channel selection is trying to offer the test engineer the ability to fix the operating channel for testing, both normal data and continuously transmitting modes are allowed, and that for RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

The software mentioned above was installed in the notebook. The channel and power setting of the IP phone can be controlled by the notebook computer via the charge input port through a test feature.

3. Test Location and Standards

3.1. Test Location

Test Location : Sporton Hwa Ya Testing Building

Address : 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

3.2. Test Conditions

Normal Voltage	: 120V/60Hz
Extreme Voltage	: 138V and 102V
Normal Temperature	: 20 ℃
Extreme Temperature	: -20 ℃ and 50 ℃

3.3. Standards for Methods of Measurement

Here is the list of the standards followed in this test report.

ANSI C63.4-2001

47 CFR Part 15 Subpart C (Section 15.247)

3.4. DoC Statement

This EUT is also classified as a device of computer peripheral Class B which DoC has to be followed. It has been verified according to the rule of 47 CFR part 15 Subpart B, and found that all the requirements has been fulfilled.

4. List of Measurements

4.1. Summary of the Test Results

Applied Standard: 47 CFR Part 15 and Part 2			
Paragraph	**FCC Rule**	**Description of Test**	**Result**
5.1	15.247(a)(2)	6dB Spectrum Bandwidth (DSSS System)	Pass
5.2	15.247(b)	Maximum Peak Output Power	Pass
5.3	15.247(d)	Peak Power Spectral Density	Pass
5.4	15.247(c)	Band Edges Emission	Pass
5.5	15.107/15.207	AC Power Line Conducted Emission	Pass
5.6	15.209/15.247(c)	Spurious Radiated Emission	Pass
5.7	15.203	Antenna Requirement	Pass

5. Test Result

5.1. Test of 6dB Spectrum Bandwidth (DSSS System)

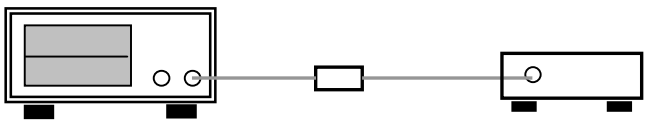
5.1.1. Measuring Instruments

Item 9 of the table on section 6.

5.1.2. Test Procedures

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 6dB bandwidth is defined as the spectrum width with level higher than 6dB below the peak level.
4. Repeat above 1~3 points for the middle and highest channel of the EUT.

5.1.3. Test Setup Layout



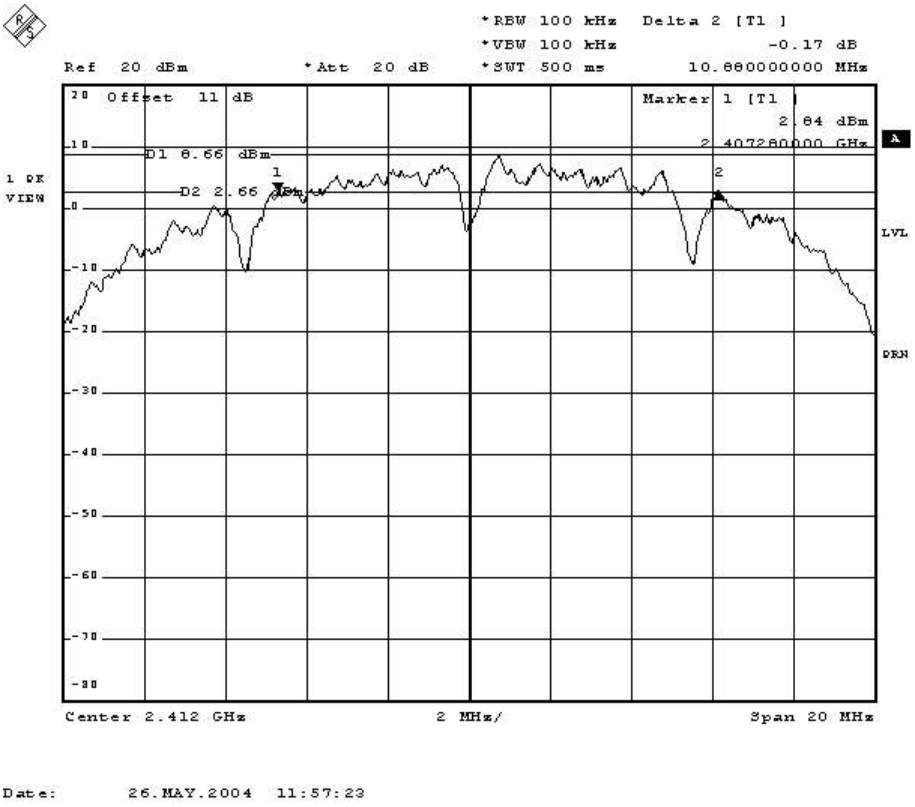
Spectrum analyzer **EUT**

5.1.4. Test Result : See spectrum analyzer plots below

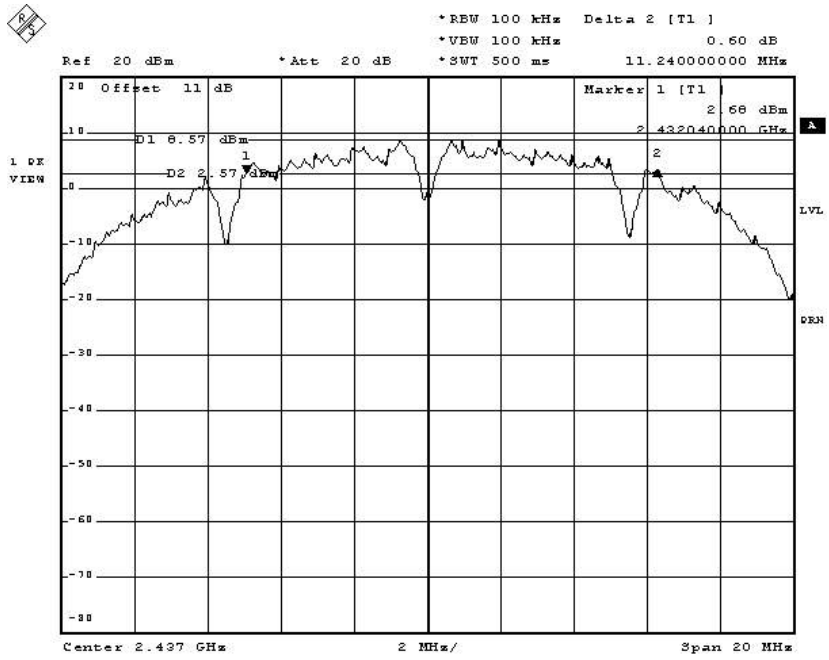
- Temperature: 21.9°C
- Relative Humidity: 60 %
- Duty cycle of the equipment during the test: 100%

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Min. Limit (MHz)
01	2412	10.88	0.5
06	2437	11.24	0.5
11	2462	11.24	0.5

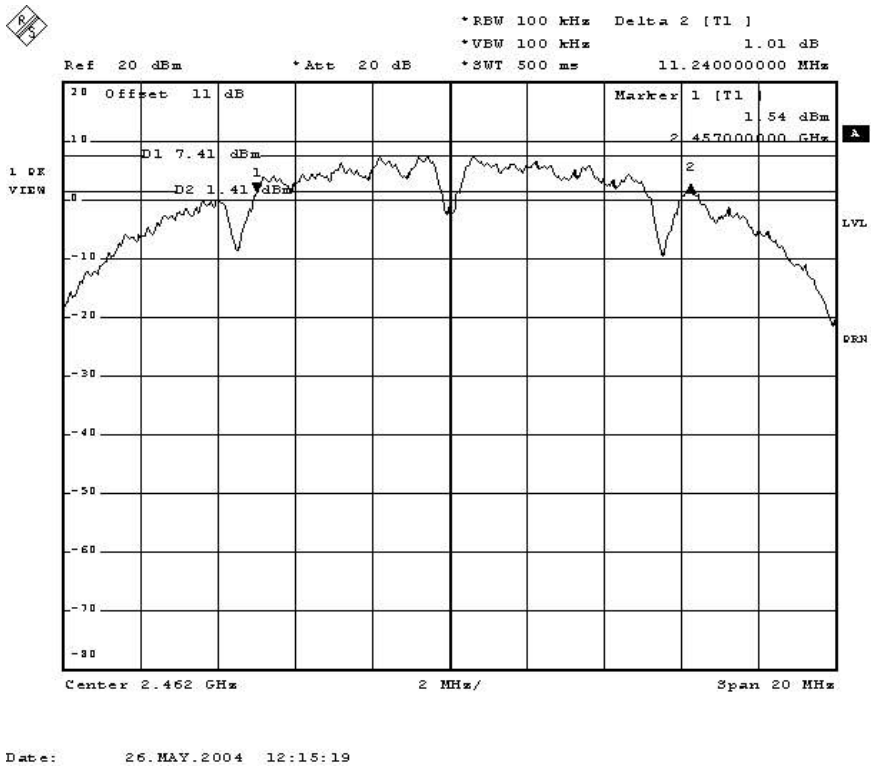
(Channel 01)：



(Channel 06)：



(Channel 11)：


*RBW 100 kHz
Delta 2 [T1]
*VBW 100 kHz
1.01 dB
Ref 20 dBm
*Att 20 dB
*SWT 500 ms
11.240000000 MHz
Offset 11 dB
Marker 1 [T1]
1.54 dBm
2.457000000 GHz
D1 7.41 dBm
D2 1.41 dBm
1 PK VIEW
LVL
PRN
Center 2.462 GHz
2 MHz/
Span 20 MHz
Date: 26.MAY.2004 12:15:19

5.2. Test of Maximum Peak Output Power

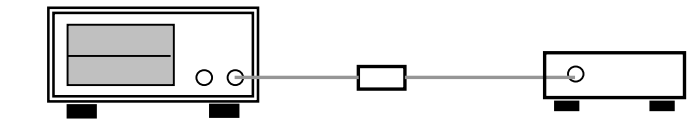
5.2.1. Measuring Instruments

Item 9 of the table on section 6.

5.2.2. Test Procedures

1. The transmitter output was connected to the vertical channel of the oscilloscope through a detector.
2. Observe the duty cycle X from the oscilloscope and the record the detected voltage level A.
3. Replace the EUT via the signal generator, calibrate the reading via the carrier frequency.
4. The duty cycle X has to be calibrated on the output power of the signal generator.
5. Repeated the 1~4 for the middle and highest channel of the EUT.

5.2.3. Test Setup Layout



5.2.4. Test Result：See spectrum analyzer plots below

- Temperature: 21.9°C
- Relative Humidity: 60 %
- Duty cycle of the equipment during the test : 100%

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mWatt)	Limits (dBm)
01	2412	19.0	79.432	30 dBm
06	2437	20.2	104.712	30 dBm
11	2462	20.2	83.176	30 dBm

5.3. Test of Peak Power Spectral Density

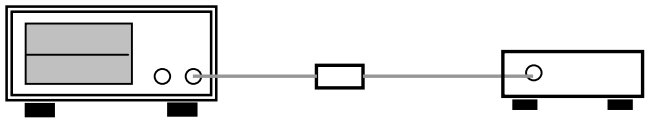
5.3.1. Measuring Instruments

Item 9 of the table on section 6.

5.3.2. Test Procedures

1. The transmitter output is connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.
5. Repeated the 1~4 for the middle and highest channel of the EUT.

5.3.3. Test Setup Layout



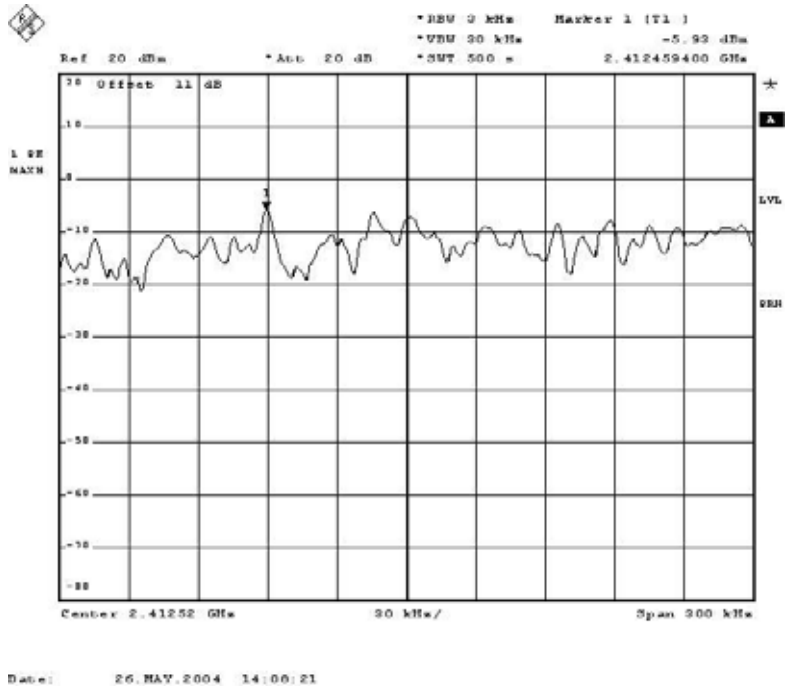
Spectrum analyzer **EUT**

5.3.4. Test Result : See spectrum analyzer plots below

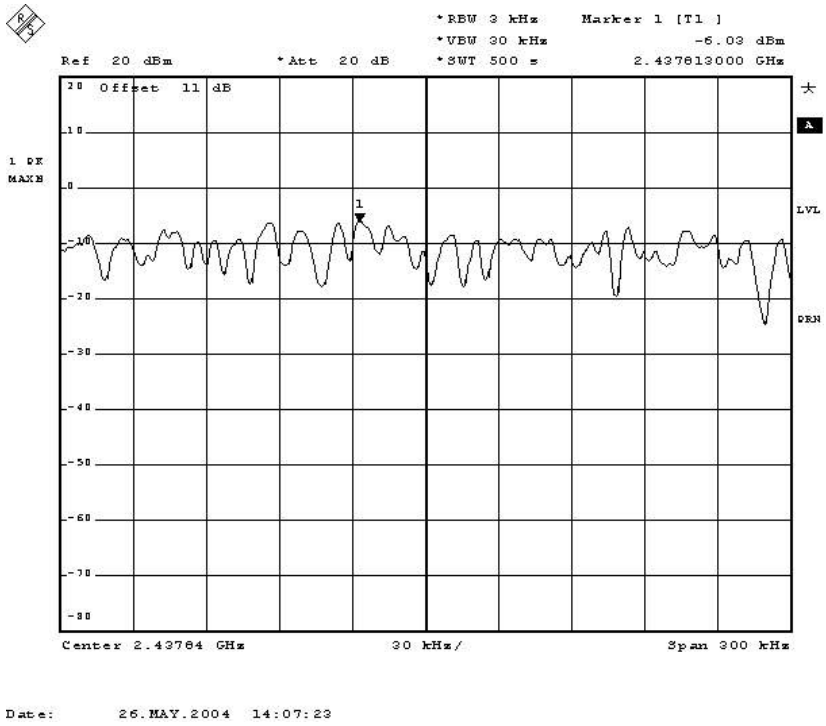
- Temperature: 21.9°C
- Relative Humidity: 60 %
- Duty cycle of the equipment during the test: 100%

Channel	Frequency (MHz)	Power Density (dBm)	Limits (dBm)
01	2412	-5.93	8
06	2437	-6.03	8
11	2462	-6.39	8

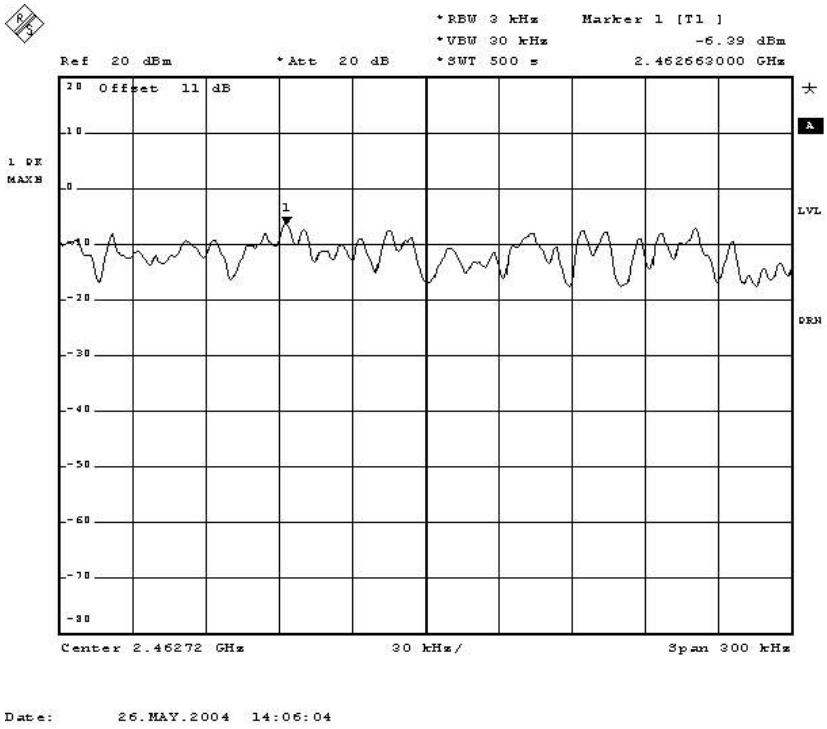
(Channel 01)：



(Channel 06)：



(Channel 11)：


*RBW 3 kHz
Marker 1 [T1]
*VBW 30 kHz
-6.39 dBm
Ref 20 dBm
*Att 20 dB
*SWT 500 s
2.462663000 GHz
Offset 11 dB
1 PK
MAXH
LVL
Center 2.46272 GHz
30 kHz/
Span 300 kHz
Date: 26.MAY.2004 14:06:04

5.4. Test of Band Edges Emission

5.4.1. Measuring Instruments

Item 9 of the table on section 6.

5.4.2. Test Procedures

1. The transmitter is set to the lowest channel.
2. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
3. Set both RBW of spectrum analyzer to 1MHz and VBW to 300kHz with convenient frequency span including 100MHz bandwidth from lower band edge.
4. The lowest band edges emission was measured and recorded.
5. The transmitter set to the highest channel and repeated 2~4.

5.4.3. Test Result

(A) Left Edge

The band edge emission plot shows 58.05dB delta between carrier maximum power and local maximum emission in the restricted band.

CH01 Carrier power strength (dB μ V/m)	Delta (dB)	The maximum field strength in restrict band (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
98.37	58.05	40.32	54.00	-13.68

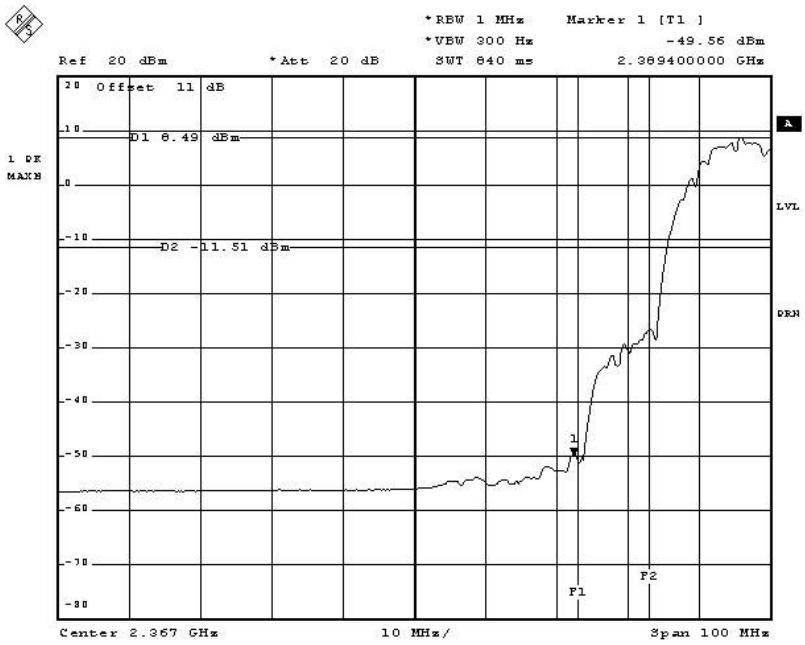
(B) Right Edge

The band edge emission plot shows 57.76dB delta between carrier maximum power and local maximum emission in the restricted band.

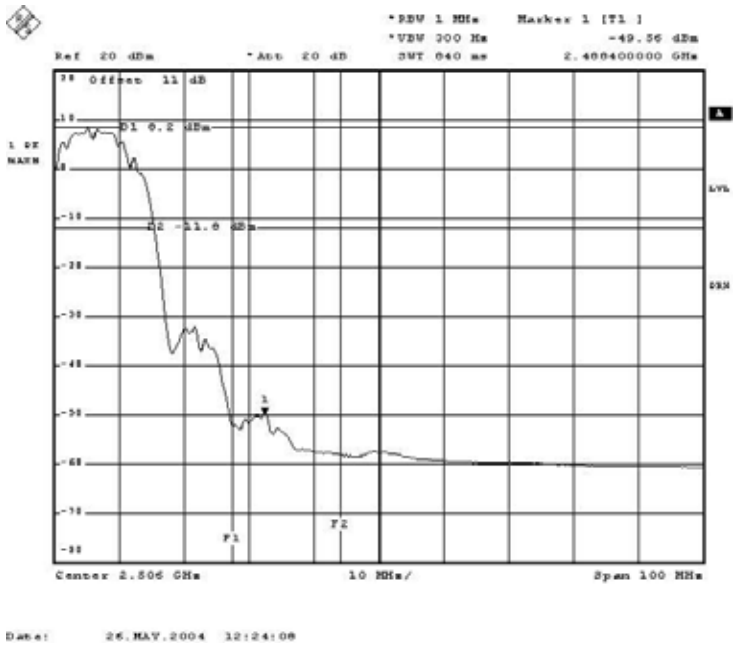
CH11 Carrier power strength (dB μ V/m)	Delta (dB)	The maximum field strength in restrict band (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
96.39	57.76	38.63	54.00	-15.37

＊The maximum field strength in restricted band is the emission of carrier power strength subtract to the delta between carrier maximum power and local maximum emission in the restricted band.

(Channel 01)：



(Channel 11)：



Observation： All emissions in the 100kHz bandwidth are 20dB lower than the carrier strength.

5.5. Test of AC Power Line Conducted Emission

5.5.1. Measuring Instruments

Please reference item 1~7 in chapter 6 for the instruments used for testing.

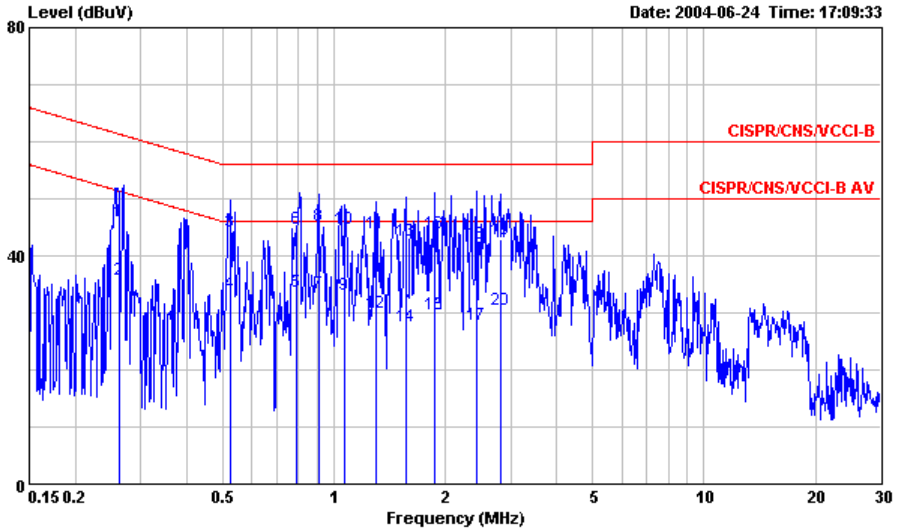
5.5.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connected to the other LISNs. The LISN should provides 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Use the Channel & Power Controlling software to make the EUT working on selected channel and expected output power, then use the “H” Patter Generator software to make the supporting equipments stay on working condition.
7. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
8. The measurement has to be done between each power line and ground at the power terminal for each RF channel. Only one RF channel has to be investigated since this test is independent with the RF channel selection.

5.5.3. Test Result of Conducted Emission

Test Mode	Carrier: 2412MHz	Tested By	Brian Lin
Temperature / Humidity	25 deg. C / 58%		

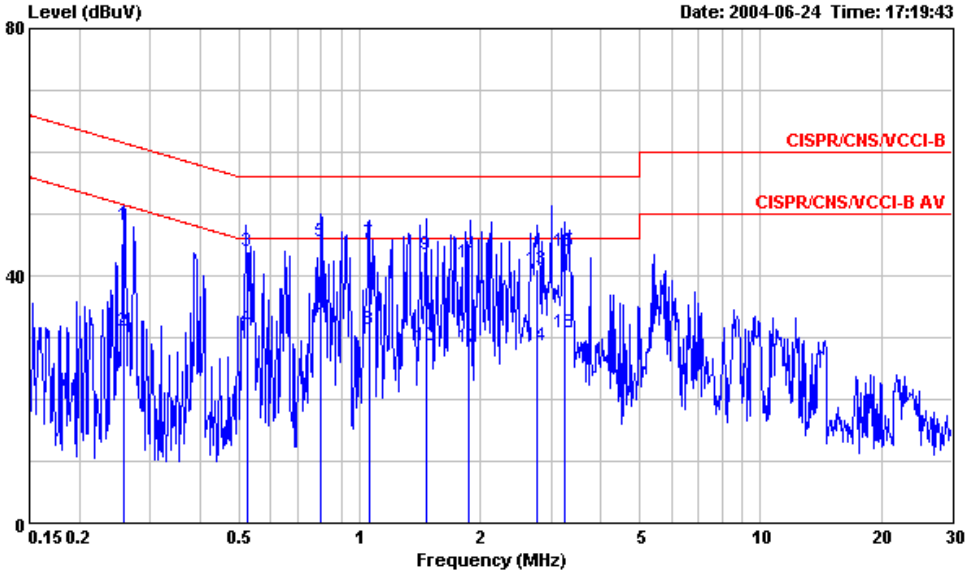
Line to Ground



Site : CO04-HY
Condition : CISPR/CNS/VCCI-B 2003 2001/004 LINE 0cm 0deg
EUT : 802.11b IP Phone
POWER: 110V/60Hz
MODEL : 未定
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2629630	45.98	-15.36	61.34	45.87	0.10	0.01	QP
2	0.2629630	35.79	-15.55	51.34	35.68	0.10	0.01	Average
3	0.5265450	44.23	-11.77	56.00	44.10	0.10	0.03	QP
4	0.5265450	33.42	-12.58	46.00	33.29	0.10	0.03	Average
5	0.7930080	33.74	-12.26	46.00	33.61	0.10	0.03	Average
6	0.7930080	44.81	-11.19	56.00	44.68	0.10	0.03	QP
7	0.9087240	33.47	-12.53	46.00	33.33	0.10	0.04	Average
8	@0.9087240	45.24	-10.76	56.00	45.10	0.10	0.04	QP
9	1.070	33.07	-12.93	46.00	32.93	0.10	0.04	Average
10	1.070	44.86	-11.14	56.00	44.72	0.10	0.04	QP
11	1.300	43.94	-12.06	56.00	43.81	0.10	0.03	QP
12	1.300	29.94	-16.06	46.00	29.81	0.10	0.03	Average
13	1.560	42.75	-13.25	56.00	42.62	0.10	0.03	QP
14	1.560	27.75	-18.25	46.00	27.62	0.10	0.03	Average
15	1.870	29.86	-16.14	46.00	29.74	0.10	0.02	Average
16	1.870	43.85	-12.15	56.00	43.73	0.10	0.02	QP
17	2.420	27.79	-18.21	46.00	27.66	0.10	0.03	Average
18	2.420	41.99	-14.01	56.00	41.86	0.10	0.03	QP
19	2.810	42.78	-13.22	56.00	42.64	0.10	0.04	QP
20	2.810	30.52	-15.48	46.00	30.38	0.10	0.04	Average

Neutral to Ground



Site : CO04-HY
Condition : CISPR/CNS/VCCI-B 2003 2001/004 NEUTRAL 0cm 0deg
EUT : 802.11b IP Phone
POWER: 110V/60Hz
MODEL : 未定
MEMO :

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2588690	48.05	-13.42	61.47	47.94	0.10	0.01	QP
2	0.2588690	30.99	-20.48	51.47	30.88	0.10	0.01	Average
3	0.5244950	44.05	-11.95	56.00	43.92	0.10	0.03	QP
4	0.5244950	31.57	-14.43	46.00	31.44	0.10	0.03	Average
5	@0.8002340	45.50	-10.50	56.00	45.36	0.10	0.04	QP
6	0.8002340	33.75	-12.25	46.00	33.61	0.10	0.04	Average
7	@ 1.060	45.30	-10.70	56.00	45.16	0.10	0.04	QP
8	1.060	31.37	-14.63	46.00	31.23	0.10	0.04	Average
9	1.460	43.53	-12.47	56.00	43.40	0.10	0.03	QP
10	1.460	28.62	-17.38	46.00	28.49	0.10	0.03	Average
11	1.878	42.16	-13.84	56.00	42.04	0.10	0.02	QP
12	1.878	28.34	-17.66	46.00	28.22	0.10	0.02	Average
13	2.760	41.08	-14.92	56.00	40.94	0.10	0.04	QP
14	2.760	28.80	-17.20	46.00	28.66	0.10	0.04	Average
15	3.240	43.90	-12.10	56.00	43.75	0.10	0.05	QP
16	3.240	30.90	-15.10	46.00	30.75	0.10	0.05	Average

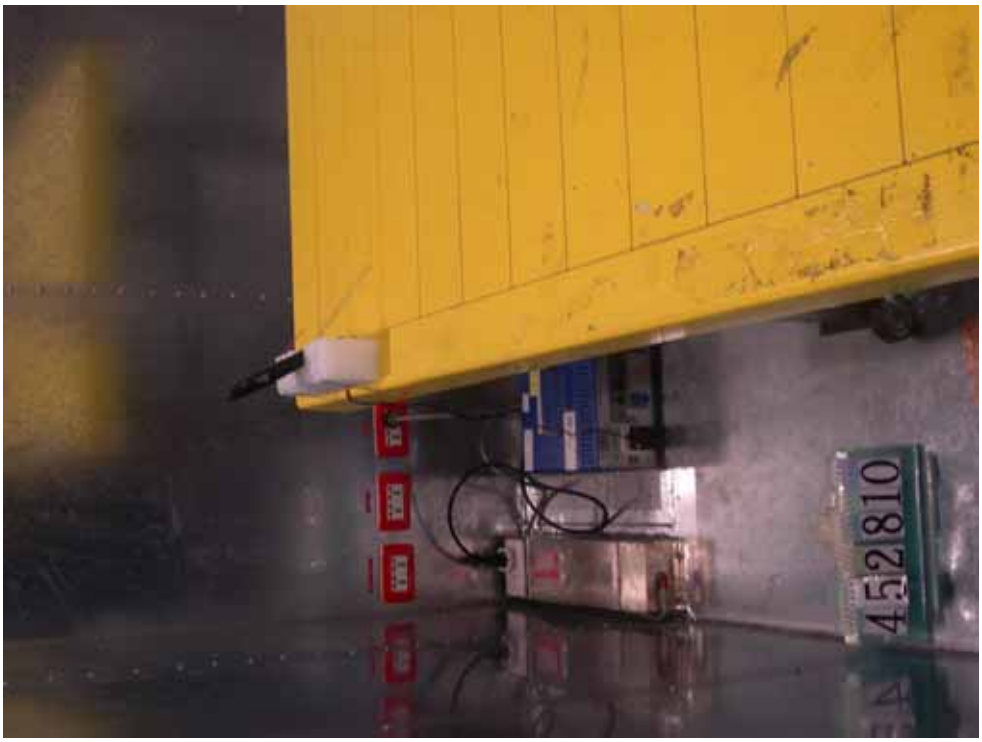
Test Engineer : Brian Lin

5.5.4. Photographs of Conducted Emission Test Configuration

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

FRONT VIEW

REAR VIEW



SIDE VIEW

5.6. Test of Spurious Radiated Emission

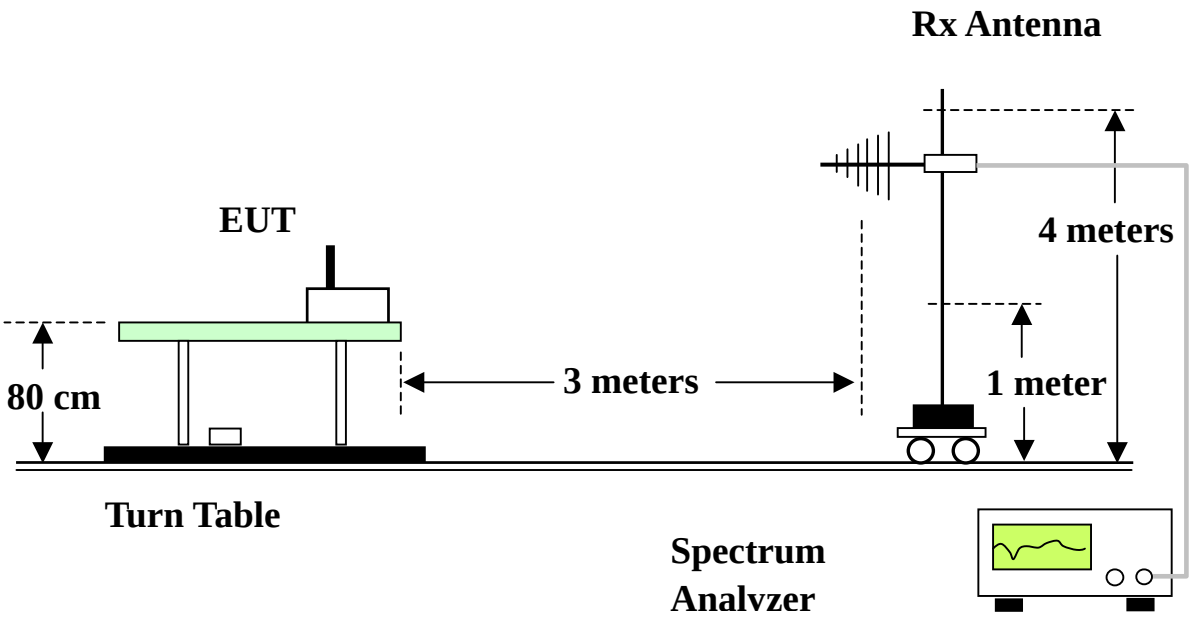
5.6.1. Measuring Instruments

Please reference item 8~19 in chapter 6 for the instruments used for testing.

5.6.2. Test Procedures

a) Configure the EUT according to ANSI C63.4.
b) The EUT was placed on the top of the turn table 0.8 meter above ground.
c) The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
d) Power on the EUT and all the supporting units.
e) The turn table was rotated by 360 degrees to determine the position of the highest radiation.
f) The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
g) For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
h) Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
i) For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
j) If the emission level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz and average method for above the 1GHz. the reported.
k) For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission level in peak 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.

5.6.3. Test Setup Layout



5.6.4. Test Results and Limit

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

Test Mode	Mode 1	**Temperature**	24 deg. C	**Tested By**	Steve Chen
Freq. Range	30MHz~1GHz	**Humidity**	67%		

(A) Polarization: Horizontal

	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	77.940	30.63	-9.37	40.00	47.74	9.31	1.52	27.94	QP	---	---
2	142.030	29.40	-14.10	43.50	43.26	11.87	2.09	27.82	QP	---	---
3	182.830	30.46	-13.04	43.50	41.91	13.84	2.44	27.73	QP	---	---
1	343.200	38.46	-7.54	46.00	47.46	15.30	3.21	27.51	QP	---	---
2	396.800	37.74	-8.26	46.00	46.33	15.73	3.46	27.78	QP	---	---
3	432.000	37.04	-8.96	46.00	45.27	16.24	3.62	28.09	QP	---	---
4	441.600	37.07	-8.93	46.00	45.24	16.35	3.65	28.17	QP	---	---

(B) Polarization: Vertical

		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	!	46.830	35.51	-4.49	40.00	51.98	10.38	1.16	28.01	QP	---	---
2		76.750	31.27	-8.73	40.00	48.51	9.22	1.49	27.95	QP	---	---
3		113.470	33.36	-10.14	43.50	48.84	10.49	1.90	27.87	QP	---	---
1		397.600	33.69	-12.31	46.00	42.28	15.74	3.46	27.79	QP	---	---
2		640.000	34.08	-11.92	46.00	39.63	18.82	4.39	28.76	QP	---	---
3		787.200	34.01	-11.99	46.00	37.50	20.28	5.02	28.79	QP	---	---

Test Mode	Mode 2	Temperature	24 deg. C	Tested By	Steve Chen
Freq. Range	30MHz~1GHz	Humidity	67%		

(A) Polarization: Horizontal

	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	82.190	26.00	-14.00	40.00	42.72	9.65	1.56	27.93	Peak	---	---
2	123.500	27.21	-16.29	43.50	42.22	10.86	1.98	27.85	Peak	---	---
3	143.900	26.52	-16.98	43.50	40.22	11.99	2.12	27.81	Peak	---	---
1	320.000	33.43	-12.57	46.00	43.26	14.37	3.20	27.40	Peak	---	---
2	576.000	35.26	-10.74	46.00	41.41	18.41	4.22	28.78	Peak	---	---
3	938.400	37.58	-8.42	46.00	38.73	21.66	5.45	28.26	Peak	100	53

(B) Polarization: Vertical

	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	60.260	31.13	-8.87	40.00	47.66	10.15	1.30	27.98	Peak	---	---
2	79.470	26.78	-13.22	40.00	43.73	9.45	1.54	27.94	Peak	---	---
3	144.750	32.14	-11.36	43.50	45.77	12.04	2.14	27.81	Peak	---	---
1	320.000	32.20	-13.80	46.00	42.03	14.37	3.20	27.40	Peak	---	---
2	899.200	30.14	-15.86	46.00	32.02	21.08	5.34	28.30	Peak	---	---
3	938.400	37.48	-8.52	46.00	38.63	21.66	5.45	28.26	Peak	---	---

Test Mode	CH01: 2412MHz	Temperature	24 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	63%		

(A) Polarization: Horizontal

	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 X	2413.800	103.07			114.28	28.21	1.74	41.16	Peak	---	---
2 X	2413.800	98.37			109.58	28.21	1.74	41.16	Average	---	---
1	1086.180	35.52	-18.48	54.00	50.44	24.07	1.21	40.20	Average	---	---
2	2244.050	46.34	-7.66	54.00	57.91	27.76	1.72	41.05	Average	---	---
3	2310.770	47.58	-6.42	54.00	58.99	27.93	1.75	41.09	Average	---	---
1	4822.000	43.30	-10.70	54.00	49.97	33.23	2.47	42.37	Average	---	---
1	4822.000	43.30	-10.70	54.00	49.97	33.23	2.47	42.37	Average	---	---
1	2507.260	38.00	-16.00	54.00	48.87	28.47	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	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 X	2413.650	101.15			112.36	28.21	1.74	41.16	Peak	---	---
2 X	2413.650	96.68			107.89	28.21	1.74	41.16	Average	---	---
1	2244.050	44.55	-9.45	54.00	56.12	27.76	1.72	41.05	Average	---	---
2	2326.060	45.22	-8.78	54.00	56.63	27.97	1.72	41.10	Average	---	---
3	2371.930	44.65	-9.35	54.00	55.99	28.09	1.70	41.13	Average	---	---
1	2503.640	39.41	-14.59	54.00	50.30	28.46	1.85	41.20	Average	---	---
1	4822.000	44.09	-9.91	54.00	50.76	33.23	2.47	42.37	Average	---	---

Test Mode	CH06: 2437MHz	Temperature	24 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	63%		

(A) Polarization: Horizontal

	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 X	2438.700	103.24			114.39	28.27	1.75	41.17	Peak	---	---
2 X	2438.700	98.43			109.58	28.27	1.75	41.17	Average	---	---
1	1215.450	36.80	-17.20	54.00	51.47	24.44	1.22	40.33	Average	---	---
2	2244.050	45.64	-8.36	54.00	57.21	27.76	1.72	41.05	Average	---	---
3	2303.820	46.75	-7.25	54.00	58.18	27.91	1.75	41.09	Average	---	---
1	2505.710	39.48	-14.52	54.00	50.37	28.46	1.85	41.20	Average	---	---
1	4876.000	48.04	-5.96	54.00	54.61	33.35	2.52	42.44	Average	---	---

(B) Polarization: Vertical

	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 X	2438.700	103.39			114.54	28.27	1.75	41.17	Peak	---	---
2 X	2438.700	98.57			109.72	28.27	1.75	41.17	Average	---	---
1	2264.900	42.71	-11.29	54.00	54.24	27.81	1.73	41.07	Average	---	---
2	2326.060	44.30	-9.70	54.00	55.71	27.97	1.72	41.10	Average	---	---
3	2370.540	44.48	-9.52	54.00	55.82	28.09	1.70	41.13	Average	---	---
1	2505.190	39.23	-14.77	54.00	50.12	28.46	1.85	41.20	Average	---	---
1	4876.000	46.33	-7.67	54.00	52.90	33.35	2.52	42.44	Average	---	---

Test Mode	CH11: 2462MHz	Temperature	24 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	63%		

(A) Polarization: Horizontal

	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 X	2463.650	101.09			112.15	28.34	1.79	41.19	Peak	---	---
2 X	2463.650	96.49			107.55	28.34	1.79	41.19	Average	---	---
1	1086.180	36.81	-17.19	54.00	51.73	24.07	1.21	40.20	Average	---	---
2	2244.050	45.21	-8.79	54.00	56.78	27.76	1.72	41.05	Average	---	---
3	2320.500	45.22	-8.78	54.00	56.63	27.96	1.73	41.10	Average	---	---
1	2507.780	39.84	-14.16	54.00	50.71	28.47	1.86	41.20	Average	---	---
1	4924.000	47.01	-6.99	54.00	53.59	33.46	2.47	42.51	Average	---	---

(B) Polarization: Vertical

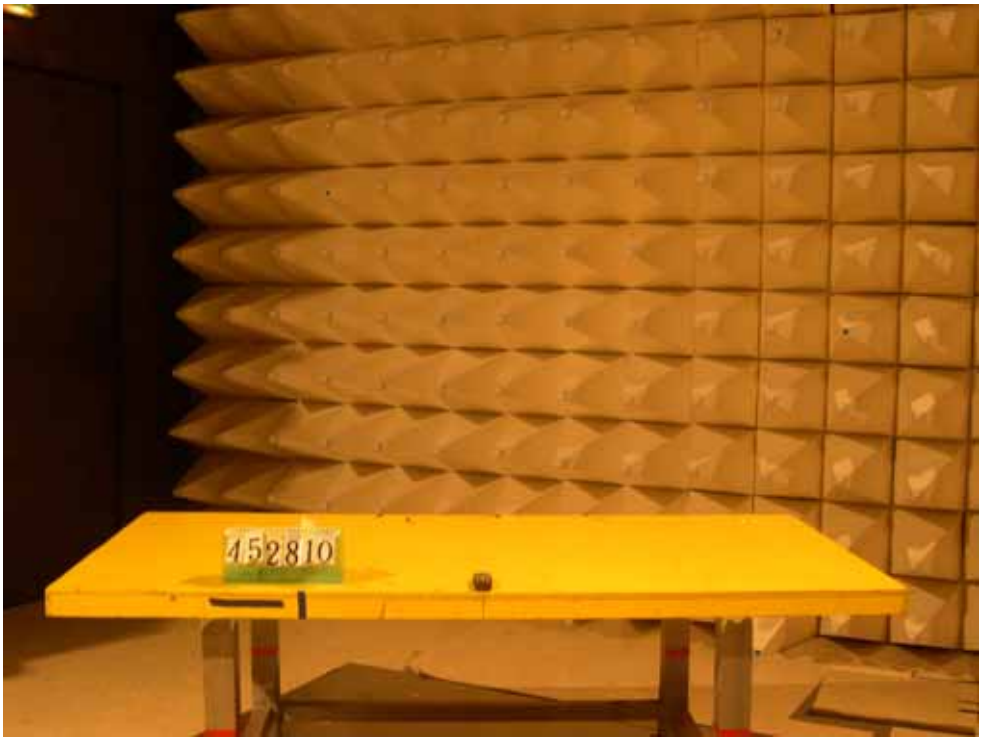
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 X	2460.000	101.14			12.21	28.33	1.78	41.18	Peak	---	---
2 X	2460.000	96.39			07.46	28.33	1.78	41.18	Average	---	---
1	2244.050	43.68	-10.32	54.00	55.25	27.76	1.72	41.05	Average	---	---
2	2299.650	44.51	-9.49	54.00	55.95	27.90	1.75	41.09	Average	---	---
3	2333.010	44.90	-9.10	54.00	56.32	27.99	1.70	41.11	Average	---	---
1	2505.710	41.03	-12.97	54.00	51.92	28.46	1.85	41.20	Average	---	---
1	4924.000	43.99	-10.01	54.00	50.57	33.46	2.47	42.51	Average	---	---

5.6.5. Photographs of Radiated Emission Test Configuration

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

Mode 1

FRONT VIEW



REAR VIEW

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

Mode 2

FRONT VIEW

REAR VIEW

5.7. Antenna Requirements

5.7.1. Standard Applicable

47 CFR Part15 Section 15.203:

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.

47 CFR Part15 Section 15.247 (b):

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.7.2. Antenna Connected Construction

The maximum antenna gain used in this product is embeded antenna, there is no antenna connector for this equipment.

6. List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	EMC Receiver	R&S	ESCS 30	100132	9 KHz – 2.75 GHz	Jun. 11, 2004	Conduction (CO01-HY)
2	LISN	MessTec	NNB-2/16Z	2001-008	9 KHz – 30 MHz	Apr. 28, 2004	Conduction (CO01-HY)
3	LISN (Support Unit)	MessTec	NNB-2/16Z	2001-009	9 KHz – 30 MHz	Apr. 28, 2004	Conduction (CO01-HY)
4	EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	Conduction (CO01-HY)
5	EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	Conduction (CO01-HY)
6	RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9KHz~30MHz	Dec. 24, 2003	Conduction (CO01-HY)
7	50 ohm BNC type Terminal	NOBLE	50ohm	TM009	50 ohm	Apr. 23, 2004	Conduction (CO01-HY)
8	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 20, 2004	Radiation (03CH03-HY)
9	Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 07, 2003	Radiation (03CH03-HY)
10	Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 05, 2003	Radiation (03CH03-HY)
11	Bilog Antenna	SCHAFFNER	CBL6112B	2687	30MHz –2GHz	Dec. 21, 2002	Radiation (03CH03-HY)
12	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 03, 2003	Radiation (03CH03-HY)
13	Amplifier	MITEQ	AFS44	879981	100MHz~26.5GHz	Jul. 23, 2003	Radiation (03CH03-HY)
14	Horn Antenna	COM-POWER	AH-118	10094	1GHz – 18GHz	Apr. 9, 2004	Radiation (03CH03-HY)
15	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
16	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
17	Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170154	15GHz~40GHz	Jun. 01, 2004	Radiation (03CH03-HY)
18	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.

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
19	Power meter	R&S	NRVS	100444	DC~40GHz	May 27, 2004	Conducted
20	Power sensor	R&S	NRV-Z55	100049	DC~40GHz	May 27, 2004	Conducted
21	Power Sensor	R&S	NRV-Z32	100057	30MHz-6GHz	May 27, 2004	Conducted
22	AC power source	HPC	HPA-500W	HPA-9100024	AC 0~300V	May 26, 2004	Conducted
23	Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 01, 2003	Conducted
24	Oscilloscope	Tektronix	TDS1012	C038520	100MHz 2Ch.	Jan. 28, 2004	Conducted
25	DC Detector	Narda	FSCM99899	4503A	0.1MHZ~18GHz	Jan. 25, 2004	Conducted
26	Signal Generator	R&S	SMR40	837900/23	1GHz~40GHz	Nov. 06, 2003	Conducted

※ Calibration Interval of instruments listed above is one year.