FCC TEST REPORT

for

47 CFR Part 15 Subpart C

Equipment	:	Security Proximeter
Model No.	:	DX149
FCC ID	:	OLA-DX149
Filing Type	:	Certification
Applicant	:	**WELLMIKE ENTERPRISE CO., LTD.** 3FL., NO. 2, LANE 497, CHUNG CHENG ROAD, HSIN TIEN, TAIPEI HSIEN, TAIWAN, R.O.C.

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: Jan. 14, 2004

■ No additional attachment.

□ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. : F410605

CERTIFICATE OF COMPLIANCE

for

47 CFR Part 15 Subpart C

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Filing Type	:	Certification
Applicant	:	**WELLMIKE ENTERPRISE CO., LTD.** 3FL., NO. 2, LANE 497, CHUNG CHENG ROAD, HSIN TIEN, TAIPEI HSIEN, 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 energy emitted by this equipment was ***passed*** both radiated and conducted emission limits. Testing was carried out on Jan. 07, 2004 at **SPORTON International Inc.** LAB.

Alan Lane
Vice General 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

WELLMIKE ENTERPRISE CO., LTD.
3FL., NO. 2, LANE 497, CHUNG CHENG ROAD,
HSIN TIEN, TAIPEI HSIEN, TAIWAN, R.O.C.

1.2. Manufacturer

WELLMIKE INDUSTRIES (Shen Zhen) LTD.
NO. 7, LANE 1, DAN FENG STREET, SILI ROAD, GUANLAN TOWN,
SHEN ZHEN CITY, GUANG DONG, CHINA

1.3. Basic Description of Equipment under Test

Equipment : Security Proximeter
Model No. : DX149
FCC ID : OLA-DX149
Trade Name : WELLMIKE
Power Supply Type : Battery (3V)
AC Power Cord : N/A

1.4. Feature of Equipment under Test

Product Feature & Specification	
1. Type of Modulation	ASK
2. Frequency Band	1MHz
3. Carrier Frequency of each channel	433.92MHz+/-75kHz
4. Function Type	Transmitter
5. Power Rating (DC/AC, Voltage)	DC 3V
6. Duty Cycle	1:3 , 2:3

2. Test Configuration of Equipment under Test

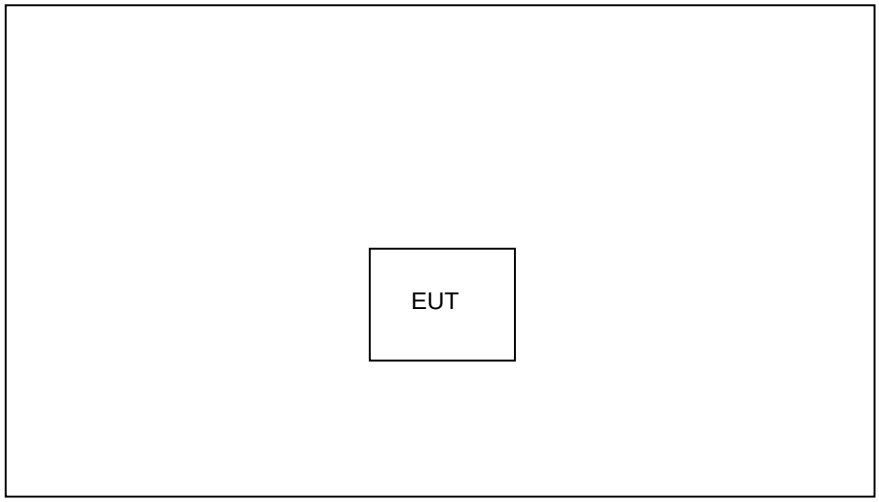
2.1. Test Manner

a. The EUT has been associated with peripherals pursuant to ANSI C63.4-2001 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
b. The complete test system included EUT for EMI test.
c. The following test modes were performed for radiation test:
   Mode 1: X axis
   Mode 2: Y axis
   Mode 3: Z axis
d. Frequency range investigated: radiation 30 MHz to 5000MHz.

2.2. Description of Test System

The EUT was tested alone. No support device is needed for testing.

2.3. Connection Diagram of Test System



3. Test Software

No test software was used during testing.

4. General Information of Test

4.1. Test Facility

Test Site Location : No. 52, Hwa Ya 1St Road, Hwa Ya Technology Park,
Kwei-Shan Hsiang, TaoYuan Hsien, Taiwan, R.O.C.
TEL : 886-3-3273456
FAX : 886-3-3180055

Test Site No. : 03CH03-HY

4.2. Test Voltage

DC 3V

4.3. Standard for Methods of Measurement

ANSI C63.4-2001 for conducted power line test and radiated emission test.

4.4. Test in Compliance with

47 CFR Part 15 Subpart C

4.5. Frequency Range Investigated

Radiation: from 30 MHz to 5000 MHz

4.6. Test Distance

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

5. Test of Conducted Powerline

The power is from Battery.

Conduction Powerline test is not applicable for this EUT.

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 5000 MHz were measured with a bandwidth of 120 kHz for 30MHz to 1 GHz and 1MHz for above 1GHz according to the methods defines in ANSI C63.4-2001. The EUT was placed on a nonmetallic stand, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

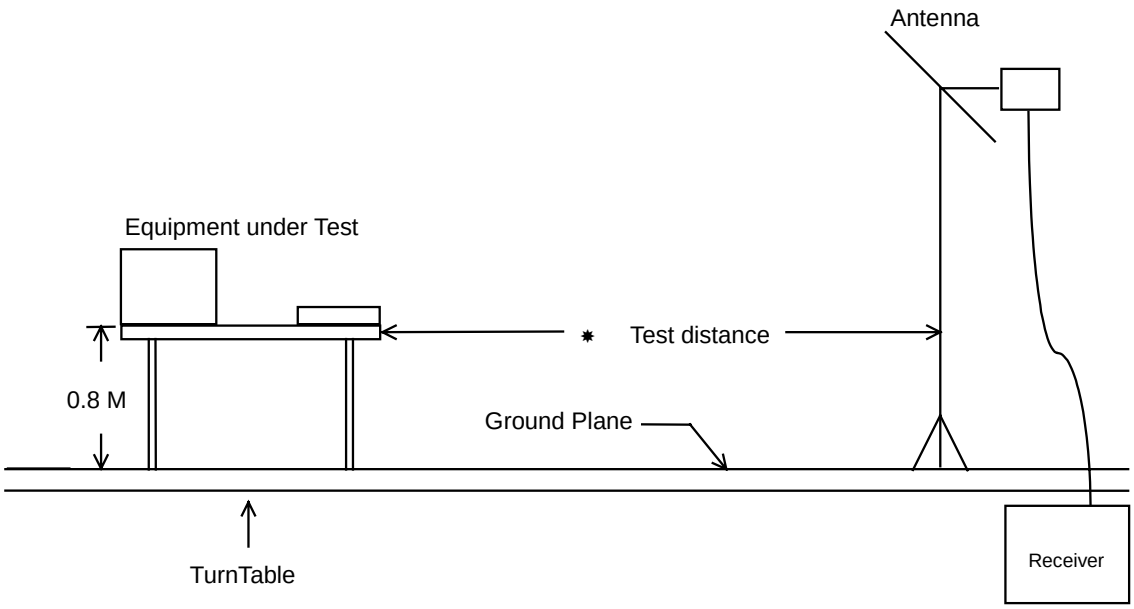
6.1. Major Measuring Instruments

• Amplifier	(HP 8447D)
RF Gain	30 dB
Signal Input	100 KHz to 1.3 GHz
• Amplifier	(MITEQ AFS44)
RF Gain	40 dB
Signal Input	100 MHz to 26.5 GHz
• Spectrum analyzer	(R&S FSP40)
Attenuation	10 dB
Start Frequency	30 MHz
Stop Frequency	5 GHz
Resolution Bandwidth	1 MHz / 120kHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 40 GHz
• Test Receiver	(SCHAFFNER SCR3501)
Resolution Bandwidth	120 KHz
Frequency Band	9 K – 1 GHz
Quasi-Peak Detector	ON for Quasi-Peak Mode
	OFF for Peak Mode

6.2. Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. 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 turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. 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 which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
h. For testing above 1GHz, the emission level of the EUT in peak mode was more 20dB lower 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.

6.3. Typical Test Setup Layout of Radiated Emission

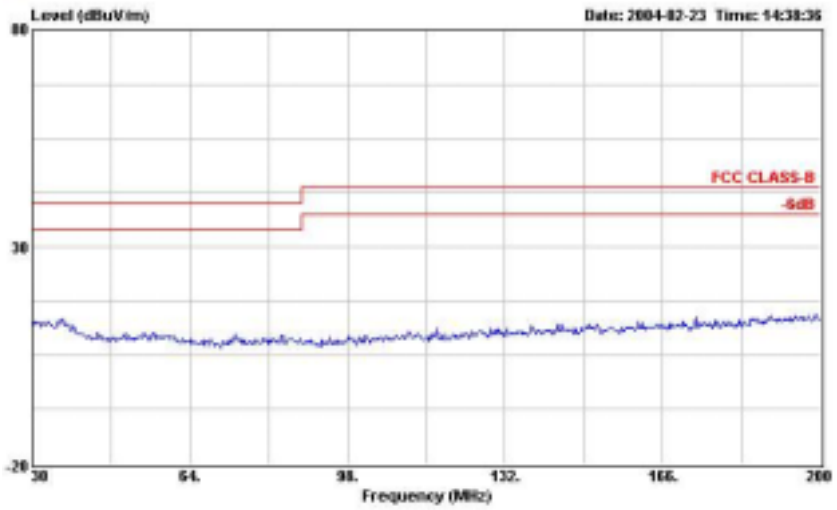


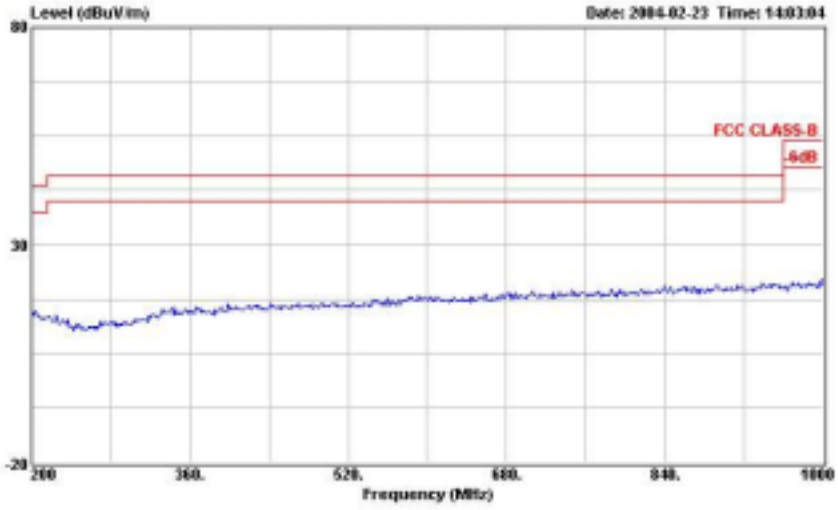
6.4. Test Result of Radiated Emission

6.4.1. Test Mode: Mode 1

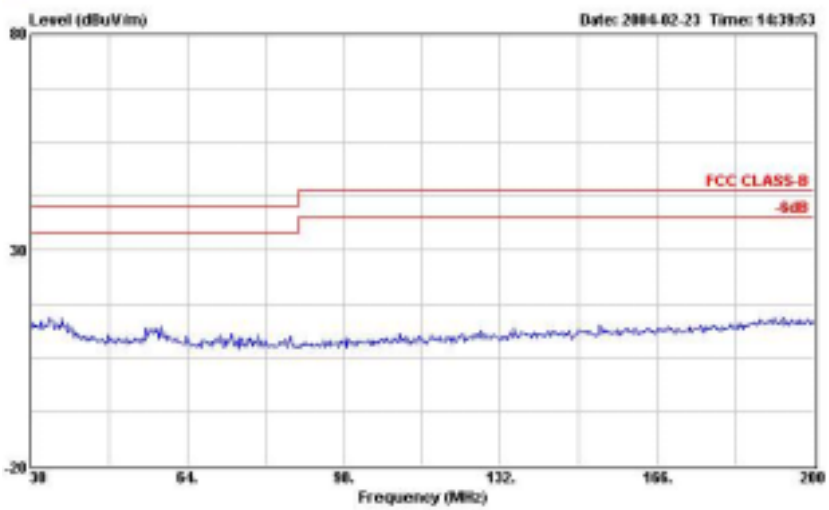
- Temperature: 26°C
- Relative Humidity: 64 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

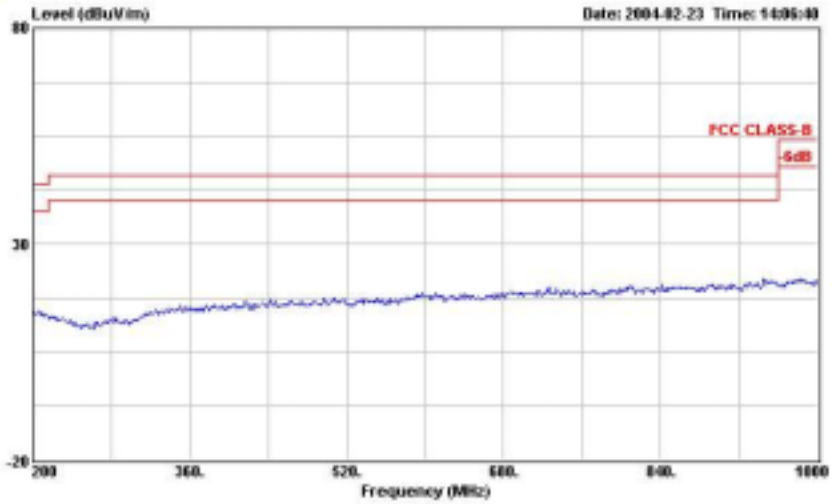
Horizontal





Vertical





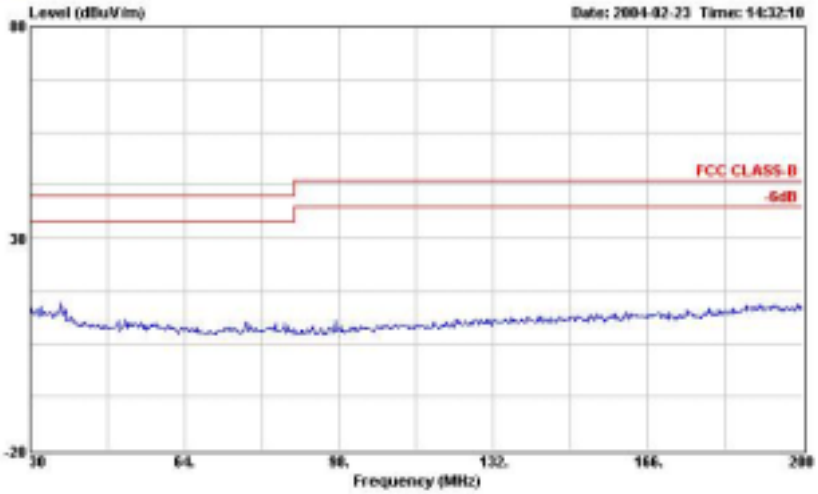
- For 30MHz ~ 5GHz
  Remark: Frequency from 30MHz to 5000MHz, the emission emitted by the EUT is too low to be measured

Test Engineer: Steve Chen

6.4.2. Test Mode: Mode 2

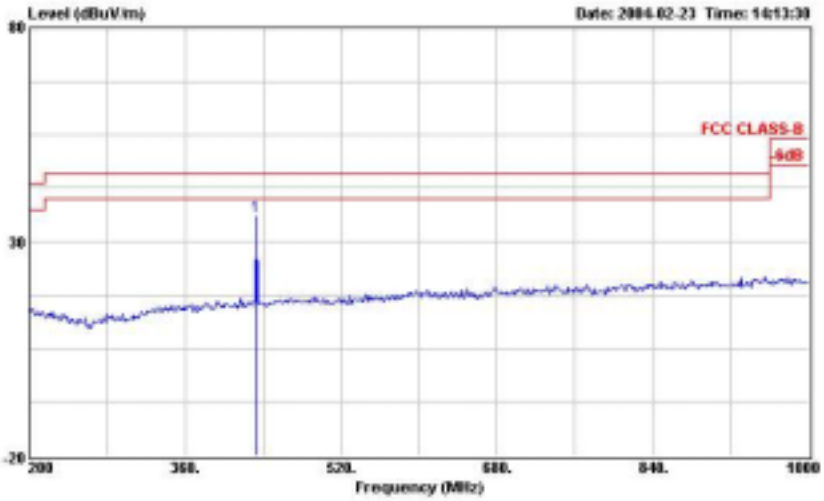
- Temperature: 26°C
- Relative Humidity: 64 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

Horizontal



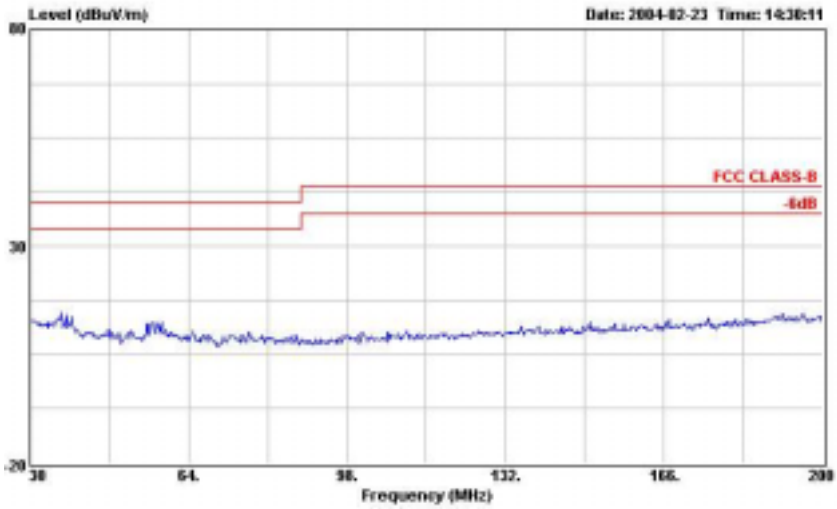
➢ For 30MHz ~ 5GHz

Remark: Frequency from 30MHz to 5000MHz, the emission emitted by the EUT is too low to be measured

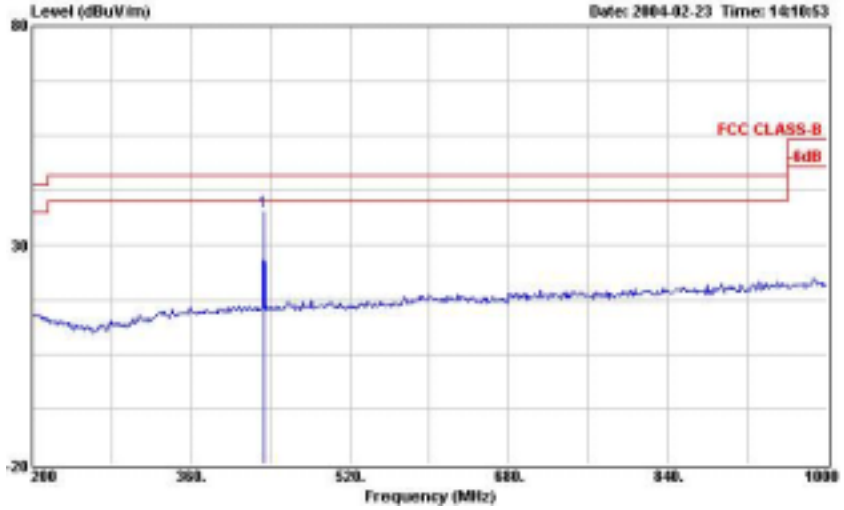


Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Detect Mode
432.800	35.93	-10.07	46.00	46.44	16.25	1.33	28.09	Peak

Vertical



- For 30MHz ~ 5GHz
  Remark: Frequency from 30MHz to 5000MHz, the emission emitted by the EUT is too low to be measured



Frequency	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Detect
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	Mode
432.800	37.50	-8.50	46.00	48.01	16.25	1.33	28.09	Peak

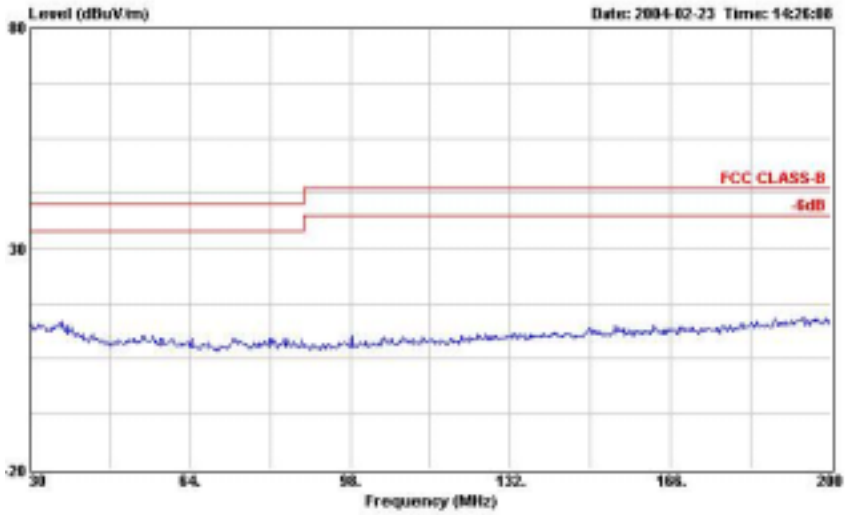
- For 1GHz ~ 5GHz
  Remark: Frequency from 1000MHz to 5000MHz, the emission emitted by the EUT is too low to be measured

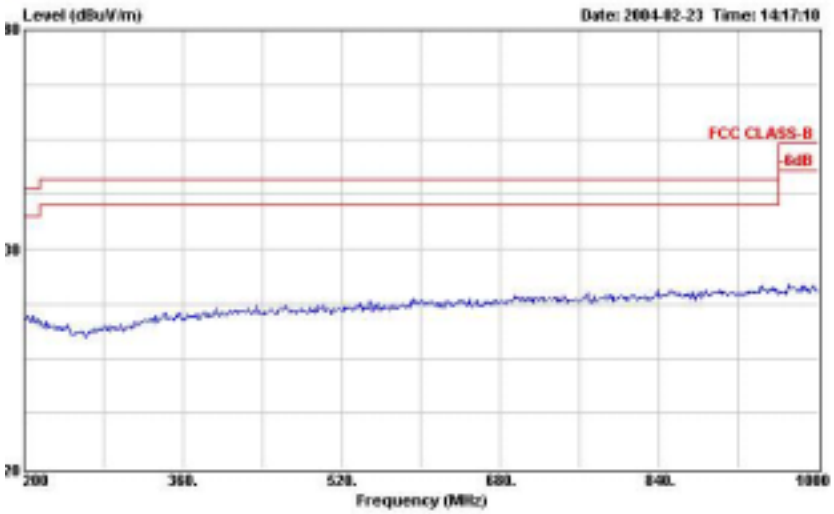
Test Engineer: Steve
Steve Chen

6.4.3. Test Mode: Mode 3

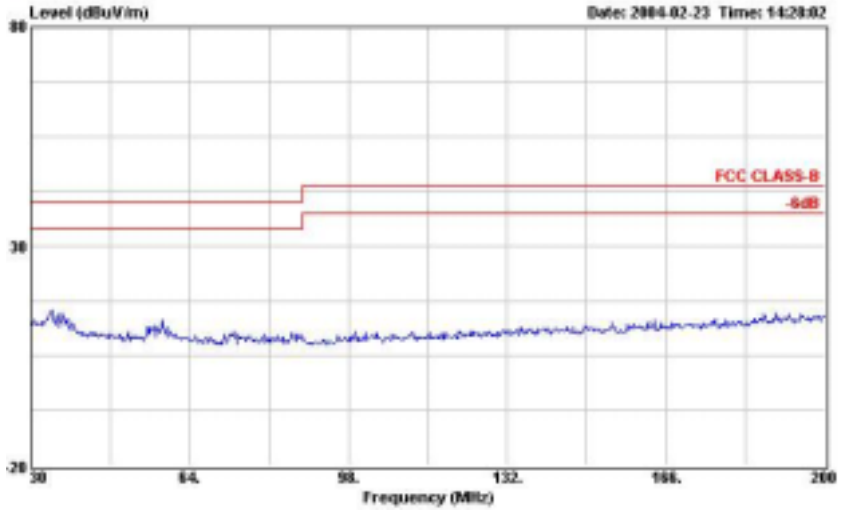
- Temperature: 26°C
- Relative Humidity: 64%
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

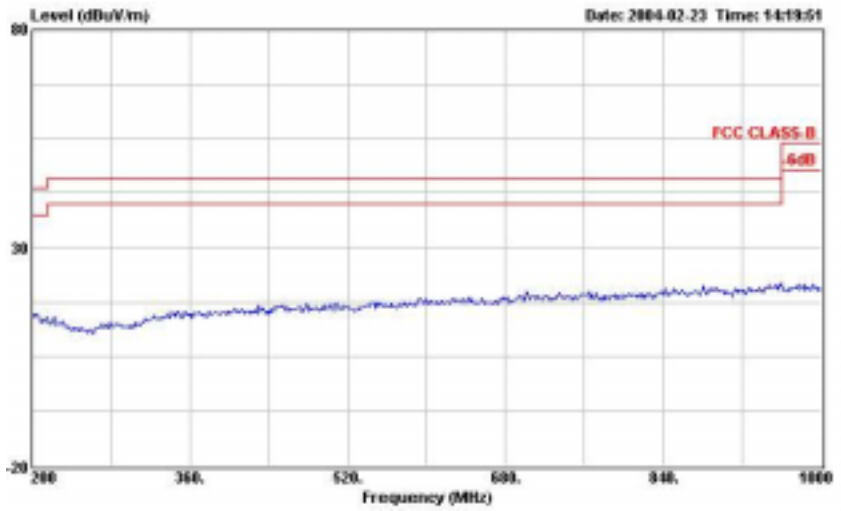
Horizontal





Vertical





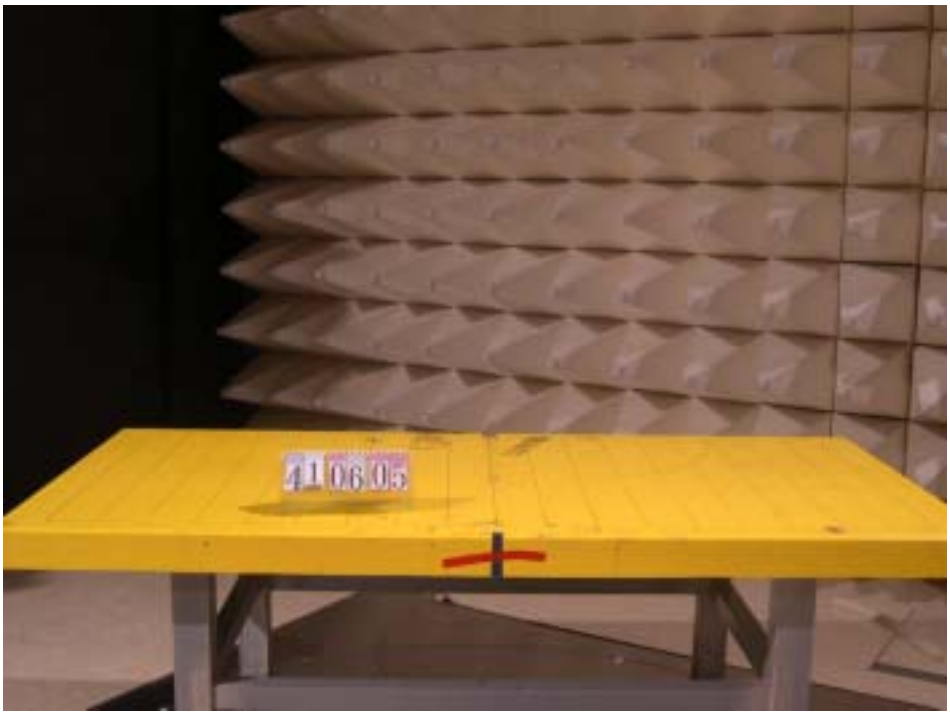
- For 30MHz ~ 5GHz
  Remark: Frequency from 30MHz to 5000MHz, the emission emitted by the EUT is too low to be measured

Test Engineer: Steve Chen

6.5. Photographs of Radiated Emission Test Configuration

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

FRONT VIEW



REAR VIEW

7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	14.47	0.92
35	13.08	1.05
40	11.70	1.08
45	10.64	1.15
50	10.14	1.29
55	10.21	1.63
60	10.21	1.30
65	9.35	1.36
70	8.91	1.43
75	9.12	1.48
80	9.50	1.53
85	9.71	1.61
90	9.30	1.69
95	9.36	1.67
100	9.80	1.76
110	10.44	1.80
120	10.58	1.90
130	11.37	1.61
140	11.74	2.14
150	12.38	2.16
160	12.68	2.16
170	13.26	1.99
180	13.56	2.39
190	14.57	2.38
200	14.80	2.46
200	15.39	2.46
220	14.08	2.59
240	12.85	2.68
260	12.46	2.91
280	12.91	2.92
300	13.21	2.99
320	14.37	3.03
340	15.31	3.22
360	15.23	3.28
380	15.39	3.80
400	15.79	3.80
450	16.52	3.69
500	17.35	3.93
550	17.77	3.56
600	19.00	4.15
650	18.78	4.58
700	19.80	4.73
750	20.01	4.71
800	20.38	4.99
850	20.86	5.24
900	21.08	5.38
950	21.83	5.57
1000	22.23	5.62
2000	31.10	5.66
3000	29.60	7.20
4000	30.80	9.36
5000	34.20	9.16

8. EMI Suppression Component List

No EMI suppression components.

9. List of Measuring Equipments Used

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	FSP30	100023/030	9KHZ~30GHz	Jul. 22, 2003	Radiation (03CH03-HY)
Receiver	SCHAFFNER	SCR 3501	417	9 KHz –1GHz	Feb. 20, 2003	Radiation (03CH03-HY)
Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 05, 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	AH-118	10094	1GHz – 18GHz	Apr. 10, 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	BBHA9170154	15GHz~40GHz	Jun. 02, 2003	Radiation (03CH03-HY)
RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Mar. 14, 2003	Radiation (03CH03-HY)

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

10. Uncertainty of Test Site

Uncertainty of Radiated Emission Measurement

Contribution	Probability Distribution	3m
Antenna factor calibration	normal(k=2)	±1
cable loss calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
Antenna Directivity	rectangular	±3
Antenna Factor V.S. Height	rectangular	±2
Antenna Factor Interpolation for Frequency	rectangular	±0.25
site imperfection	rectangular	±2
Mismatch Receiver VSWR Γ1=0.09 Antenna VSWR Γ2=0.67 Uncertainty=20log(1-Γ1*Γ2)	U-shaped	±0.54
combined standard uncertainty Ue(y)	normal	±2.7
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±5.4

$U=\sqrt{\{(1/2)^2+(0.3/2)^2+(2^2+0.5^2+2^2+0.25^2+2^2)/3+(0.54)^2/2\}}=2.2$ for 10m test distance

$U=\sqrt{\{(1/2)^2+(0.3/2)^2+(2^2+3^2+2^2+0.25^2+2^2)/3+(0.54)^2/2\}}=2.7$ for 3m test distance

Uncertainty of Conducted Emission Measurement

Contribution	Probability Distribution	150KHz – 30MHz
Cable and I/P attenuator calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
LISN coupling specification	rectangular	±1.5
Transducer factor frequency interpolation	rectangular	±0.2
Mismatch Receiver VSWR Γ1=0.09 LISN VSWR Γ2=0.33 Uncertainty=20log(1-Γ1*Γ2)	U-shaped	0.2
combined standard uncertainty Ue(y)	normal	±1.66
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±3.32

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