



SPORTON International Inc.

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FCC RADIO TEST REPORT

Applicant's company	Everfocus Electronics Corp
Applicant Address	12F, No. 79, Sec. 1, Shin-Tai Wu Rd., His-Chih Taipei Hsien, Taiwan
FCC ID	TNUEVERACCESSRFID
Manufacturer's company	Everfocus Electronics Corp
Manufacturer Address	12F, No. 79, Sec. 1, Shin-Tai Wu Rd., His-Chih Taipei Hsien, Taiwan

Product Name	Flex Series Controller
Brand Name	EverAccess, Everfocus
Model Name	EFC-02-1A
Test Rule Part(s)	47 CFR Part 15.209
Test Freq. Range	125 kHz
Receive Date	Aug. 29, 2005
Test Date	Sep. 12, 2005
File Type	New Applicant



Statement

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.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.


Wayne Hsu / Supervisor
Sporton International Inc.

NVLAP[®]

Lab Code: 200079-0

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History of This Test Report

Original Issue Date: Sep. 14, 2005

Report No.: FR582910

☒ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description



1. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C			
Part	Rule Section	Description of Test	Result
4.1	15.207	AC Power Line Conducted Emissions	-
4.2	15.209(a)	Field Strength of Fundamental Emissions	Complies
4.3	15.215(c)	20dB Spectrum Bandwidth	Complies
4.4	15.209(a)	Radiated Emissions	Complies
4.5	15.203	Antenna Requirements	Complies

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	$\pm 2.26\text{dB}$	Confidence levels of 95%
Field Strength of Fundamental Emissions	$\pm 3.72\text{dB}$	Confidence levels of 95%
20dB Spectrum Bandwidth	$\pm 6.25 \times 10^{-7}$	Confidence levels of 95%
Radiated Emissions	$\pm 3.72\text{dB}$	Confidence levels of 95%



2. GENERAL INFORMATION

2.1. Product Details

Items	Description
Product Type	Flex Series Controller
Radio Type	Intentional Transmitter
Power Type	Controller: DC 12V
Interface Type	Wiegand 26 or Special RS232 data output format
Modulation	AM
Frequency Range	125 kHz $\pm$ 20kHz
Channel Number	1
Max. Field Strength	60.44 dBuV/m @ 10m
Carrier Frequencies	Please refer to section 2.4
Antenna	Please refer to section 2.3

2.2. Accessories

Power	Brand	Model	Rating
DC Power	-	-	DC 12V
Others	Description		
Regular Reader Keypad Reader Mullion reader	EverAccess Proximity Readers, including the ERR-871, ERK-871 and ERM-871, incorporate state-of-the-art technology, reliable performance, easy-to-use features, and elegant appearance. The Readers generate a 125 kHz RF field that detects data from proximity cards. The data output format is Wiegand 26 or RS-232, which allows easy integration with most controllers, including EverAccess controllers. The Readers have 3 LED indicators which emit red, green, and yellow colors that indicate different values. The pigtail wiring on the back of the Readers is 18" long, enabling easy installation. EverAccess Proximity Readers are an ideal choice for any Access Control System.		

**2.3. Table for Filed Antenna**

Ant.	Brand	Model Name	Antenna Type	Connector
1	-	Loop Antenna	NA	-

2.4. Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency
125 kHz	1	125 kHz

2.5. Table for Test Modes

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Channel
AC Power Line Conducted Emissions	-	1
Field Strength of Fundamental Emissions Radiated Emissions 9kHz~10 th Harmonic	CTX	1
20dB Spectrum Bandwidth	CTX	1

Note: CTX=continuously transmitting

2.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	101377	-	-
CO04-HY	Conduction	Hwa Ya	101377	-	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

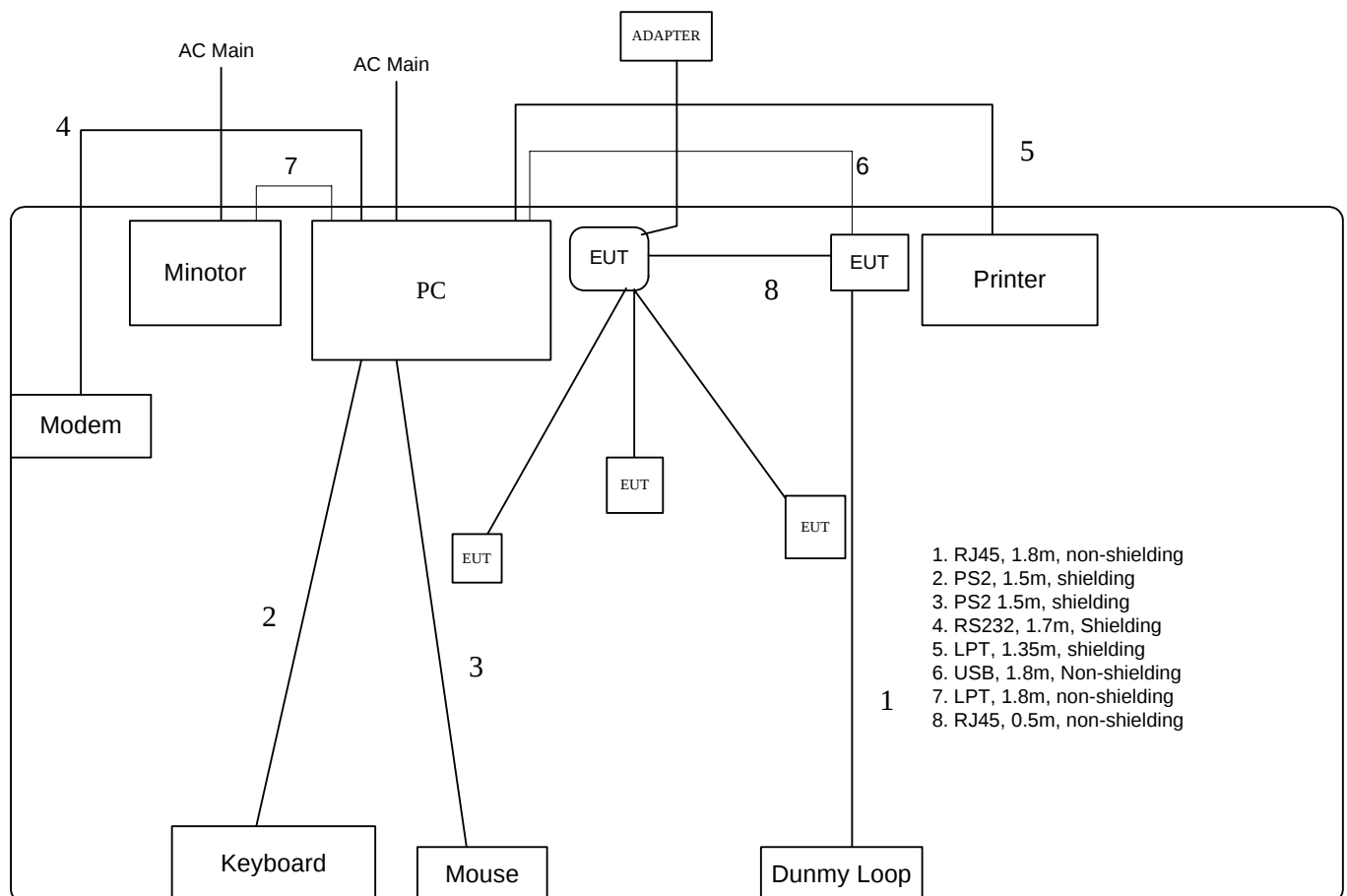
Please refer section 7 for Test Site Address.

2.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
PC	HP COMPAQ	D330ut	DoC
Keyboard	Logitech	Y-SP29	DoC
Printer	EPSON	LQ-680	DoC
Modem	ACEEX	DM-1414	IFAXDM1414
Mouse	Microsoft	1106	DoC

2.8. Test Configurations

2.8.1. Radiation Emissions Test Configuration



3. TEST RESULT

3.1. Field Strength of Fundamental Emissions Measurement

3.1.1. Limit

The field strength of any emissions which appear outside of 125 kHz band shall not exceed the general radiated emissions limits in Section 15.209(a).

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

3.1.2. Measuring Instruments and Setting

Please refer to section 6 in this report. The following table is the setting of the receiver.

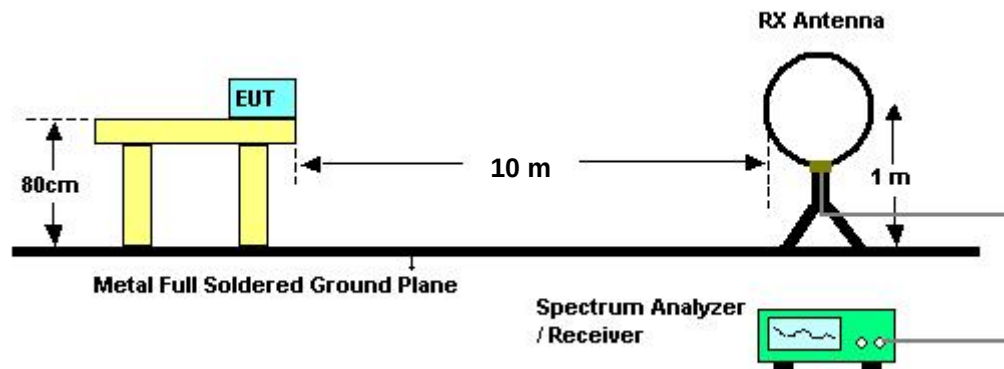
Receiver Parameter	Setting
Attenuation	Auto
Center Frequency	Fundamental Frequency
RB	200 Hz
Detector	Peak / Average

3.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength.
4. For Fundamental emissions, use the receiver to measure peak and average reading.
5. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

3.1.4. Test Setup Layout

For radiated emissions below 30MHz



3.1.5. Test Deviation

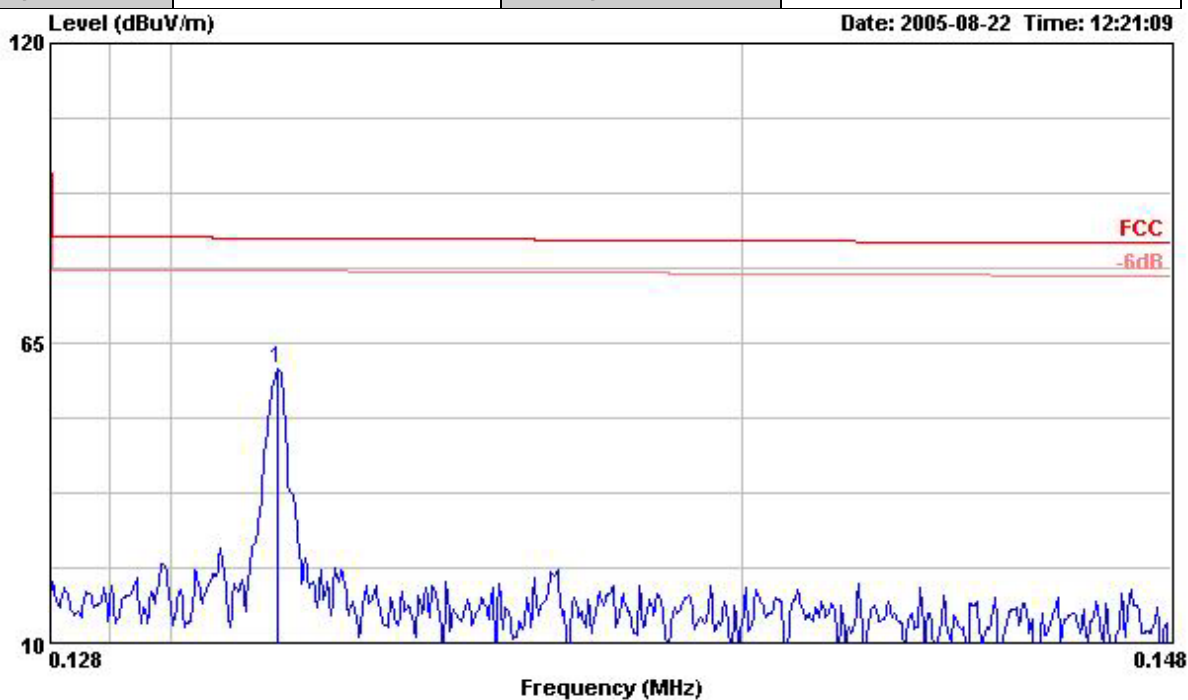
There are no deviation with the original standard.

3.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.1.7. Test Result of Field Strength of Fundamental Emissions

Temperature	27°C	Humidity	55%
Test Engineer	Nicky	Configurations	Channel 1



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB
1	0.1318200	60.44	-23.85	84.29	60.44	0.00	0.00 Peak

Note:

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

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

3.2. 20dB Spectrum Bandwidth Measurement

3.2.1. Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (125 kHz).

3.2.2. Measuring Instruments and Setting

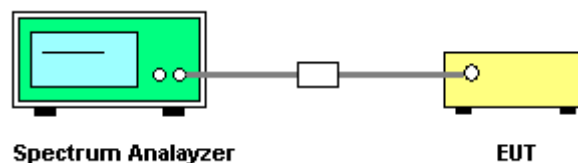
Please refer to section 6 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 20dB Bandwidth
RB	1 kHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. The resolution bandwidth of 1 kHz and the video bandwidth of 1 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

3.2.4. Test Setup Layout



3.2.5. Test Deviation

There are no deviations with the original standard.

3.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

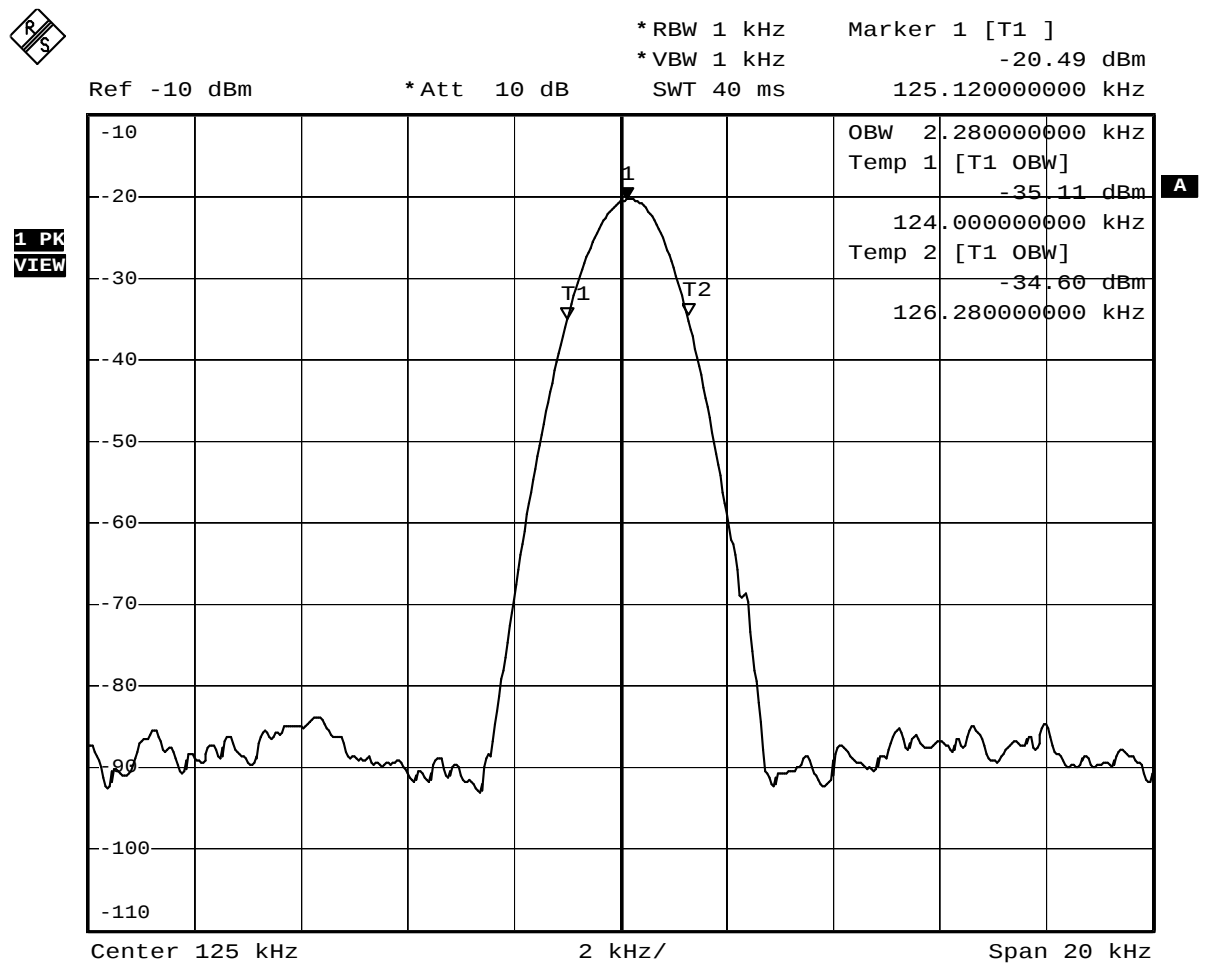


3.2.7. Test Result of 20dB Spectrum Bandwidth

Temperature	27°C	Humidity	55%
Test Engineer	Nicky	Configurations	Channel 1

Frequency	99% OBW (kHz)	Test Result
125 kHz	2.28	Complies

20 dB/99% Bandwidth Plot on 125 kHz



Date: 12.JUL.2005 15:59:20

3.3. Radiated Emissions Measurement

3.3.1. Limit

The field strength of any emissions which appear outside of 125 kHz band shall not exceed the general radiated emissions limits in Section 15.209(a).

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

3.3.2. Measuring Instruments and Setting

Please refer to section 6 in this report. The following table is the setting of receiver.

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.3.3. Test Procedures

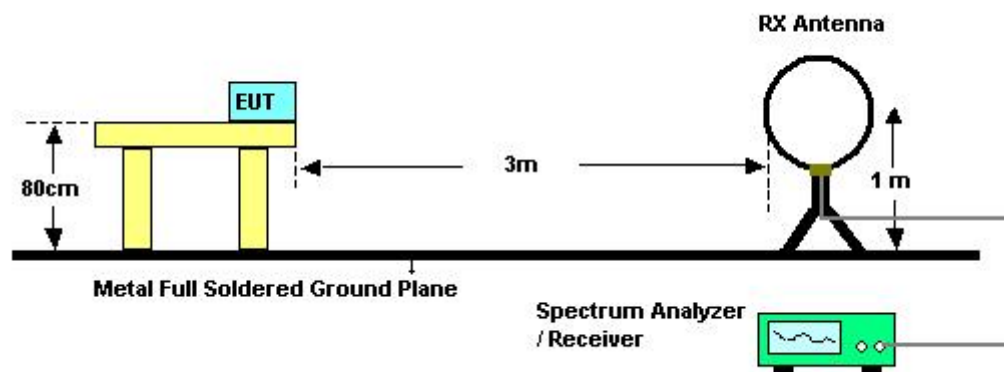
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not

exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

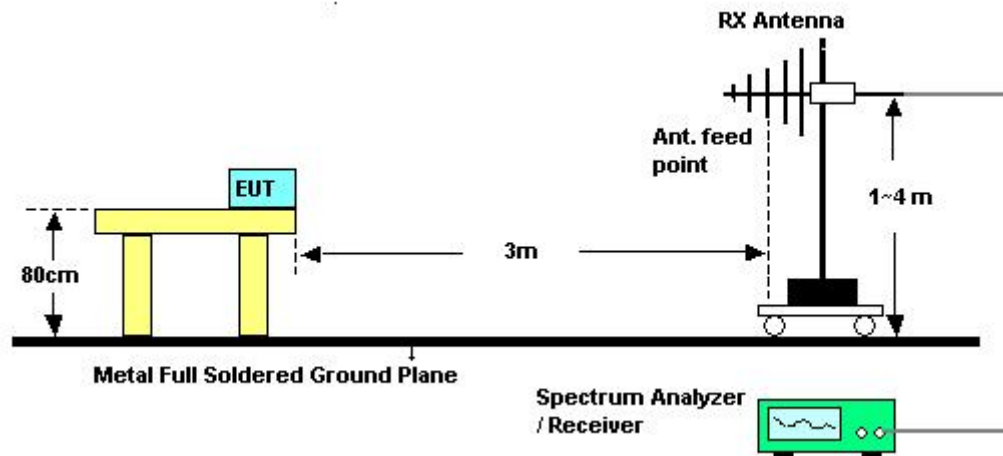
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.3.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



3.3.5. Test Deviation

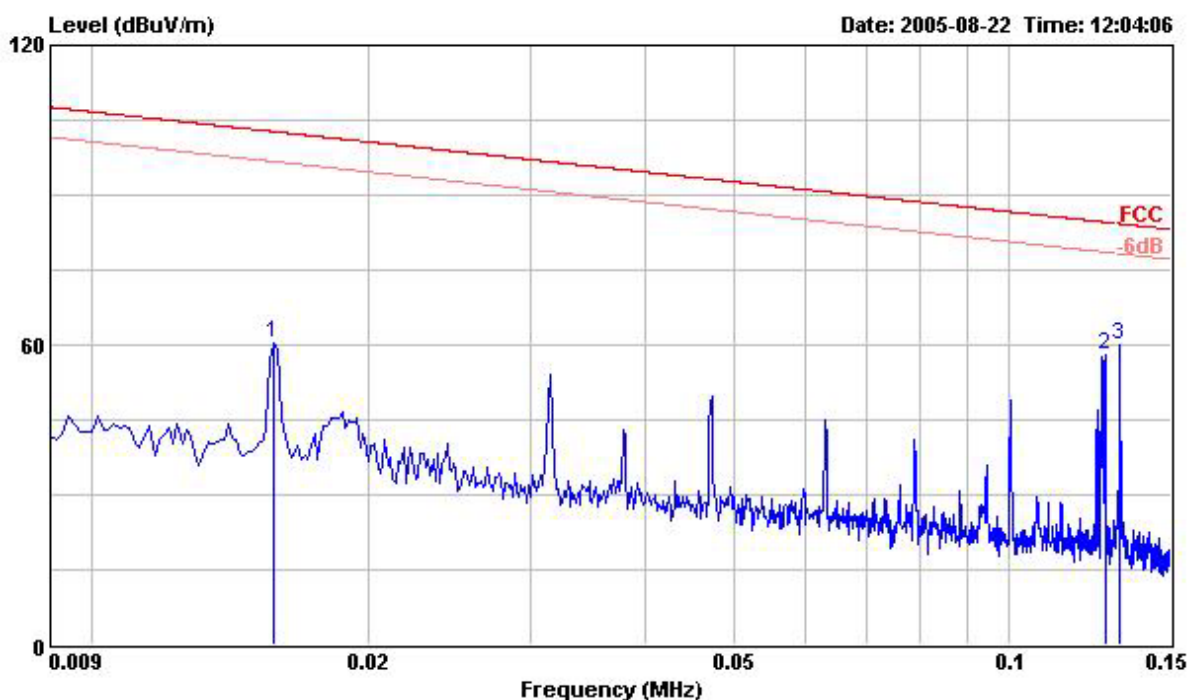
There are no deviations with the original standard.

3.3.6. EUT Operation during Test

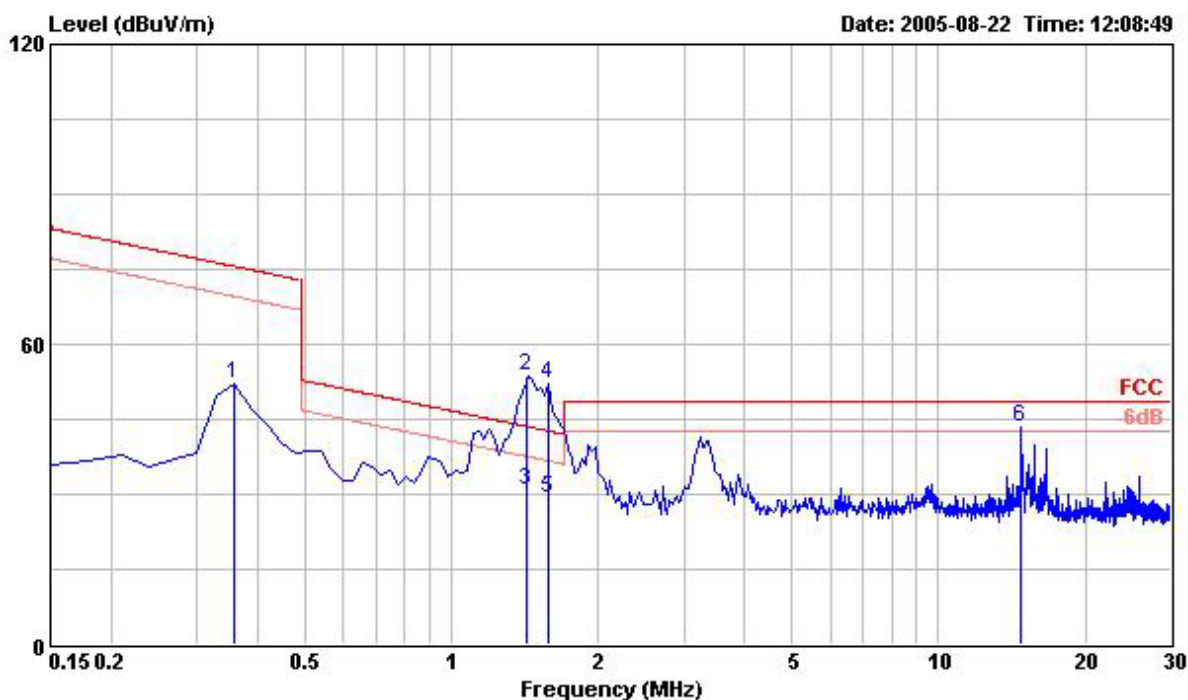
The EUT was programmed to be in continuously transmitting mode.

3.3.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	27°C	Humidity	55%
Test Engineer	Ted Chiu	Configurations	Channel 1



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB
1	0.0157680	60.42	-42.31	102.73	60.42	0.00	0.00 Peak
2	0.1271580	57.99	-26.61	84.60	57.99	0.00	0.00 Peak
3	0.1319520	60.06	-24.22	84.28	60.06	0.00	0.00 Peak



	Freq	Level	Over	Limit	ReadAntenna	Cable	
	MHz	dBuV/m	Limit	Line	Level	Loss	Remark
			dB	dBuV/m	dBuV	dB/m	dB
1	0.3589500	51.92	-23.66	75.58	51.92	0.00	0.00 Peak
2	1.430	53.57	9.99	43.58	53.57	0.00	0.00 Peak
3	1.430	30.75	-12.83	43.58	30.75	0.00	0.00 QP
4	1.580	51.96	9.25	42.71	51.96	0.00	0.00 Peak
5	1.580	29.11	-13.60	42.71	29.11	0.00	0.00 QP
6	14.750	43.50	-5.12	48.62	43.50	0.00	0.00 Peak

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

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

Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

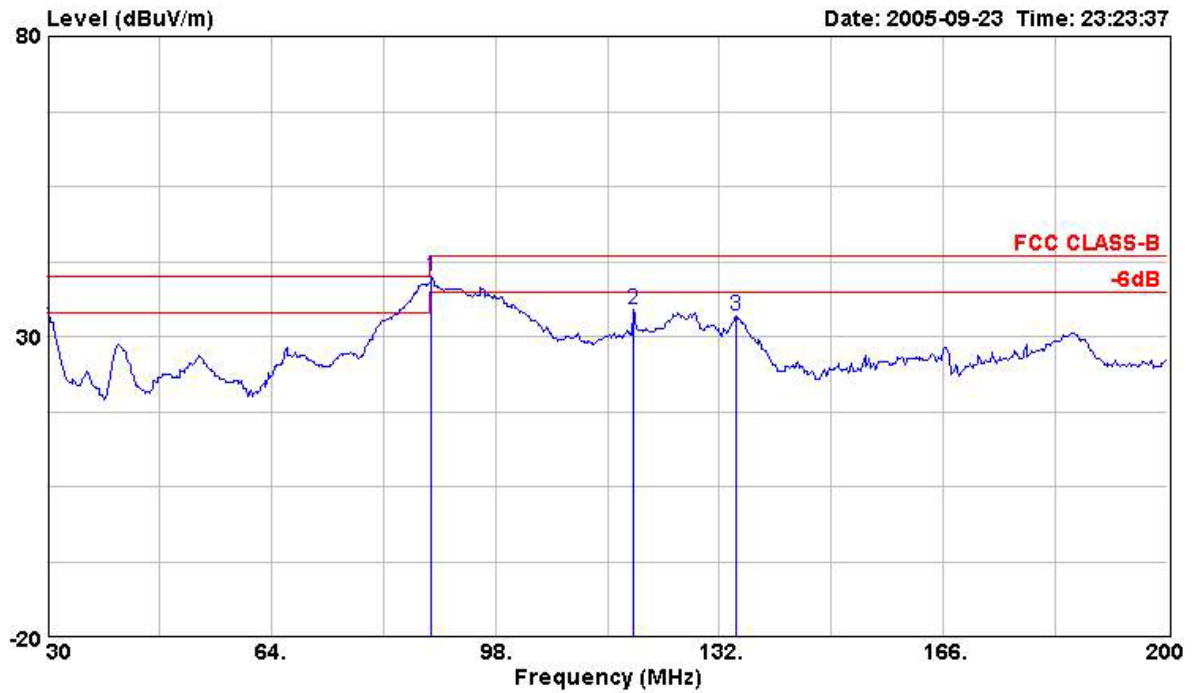
Limit line = specific limits (dBuV) + distance extrapolation factor.



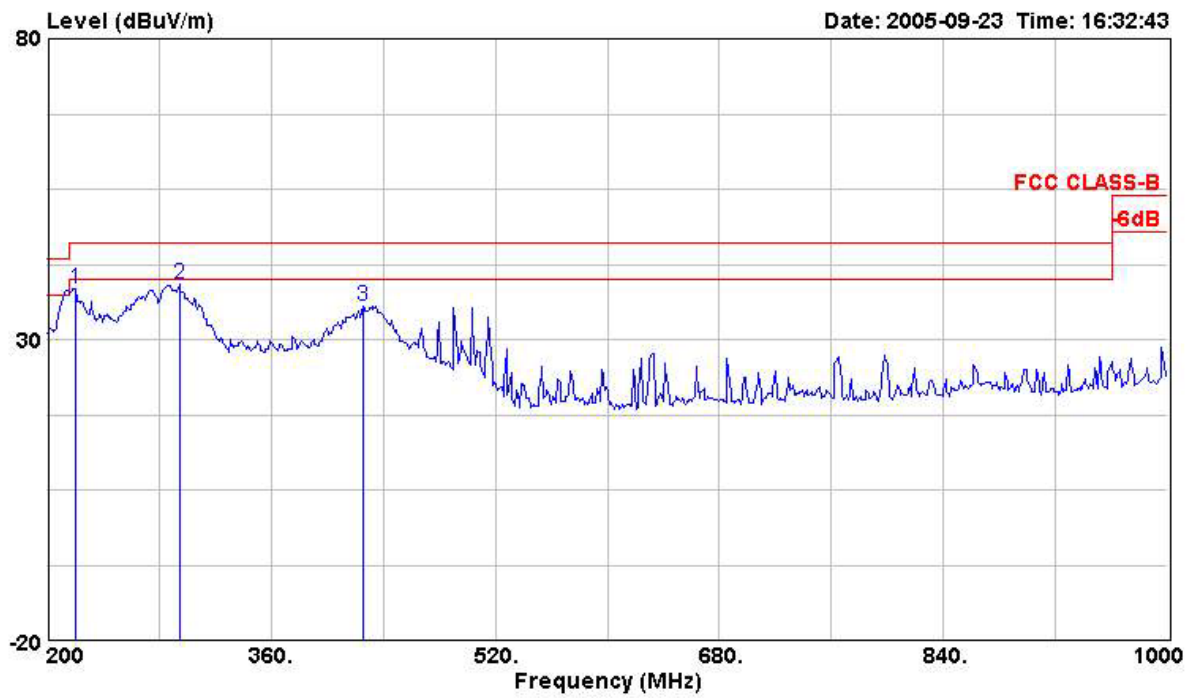
3.3.8. Results for Radiated Emissions (30MHz~1GHz)

Temperature	27°C	Humidity	55%
Test Engineer	Nicky	Configurations	Channel 1

Horizontal



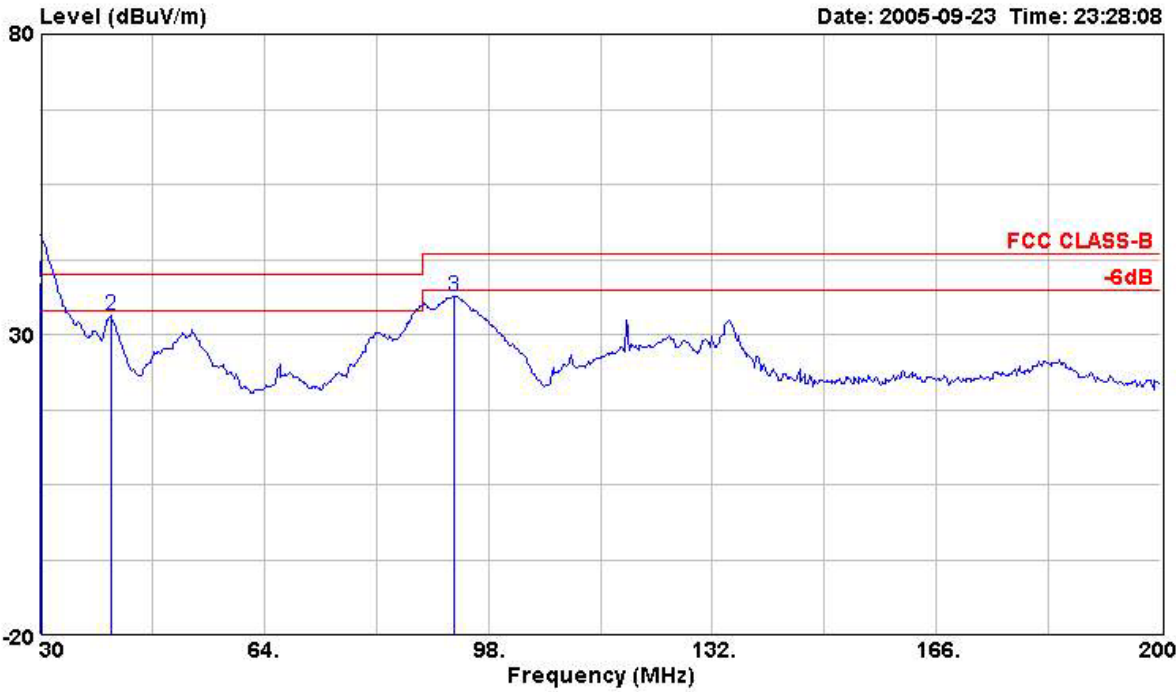
	Freq	Level	Over	Read	Limit	Cable	Antenna	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Level	Line	Loss	Factor	Factor	Remark	Pos	Pos
			dB	dBuV	dBuV/m	dB	dB/m	dB		cm	deg
1 !	88.310	39.98	-3.52	60.17	43.50	0.92	8.66	29.77	Peak	---	---
2	118.910	34.57	-8.93	52.03	43.50	1.08	11.75	30.28	Peak	---	---
3	134.550	33.50	-10.00	50.61	43.50	1.16	12.46	30.73	Peak	---	---



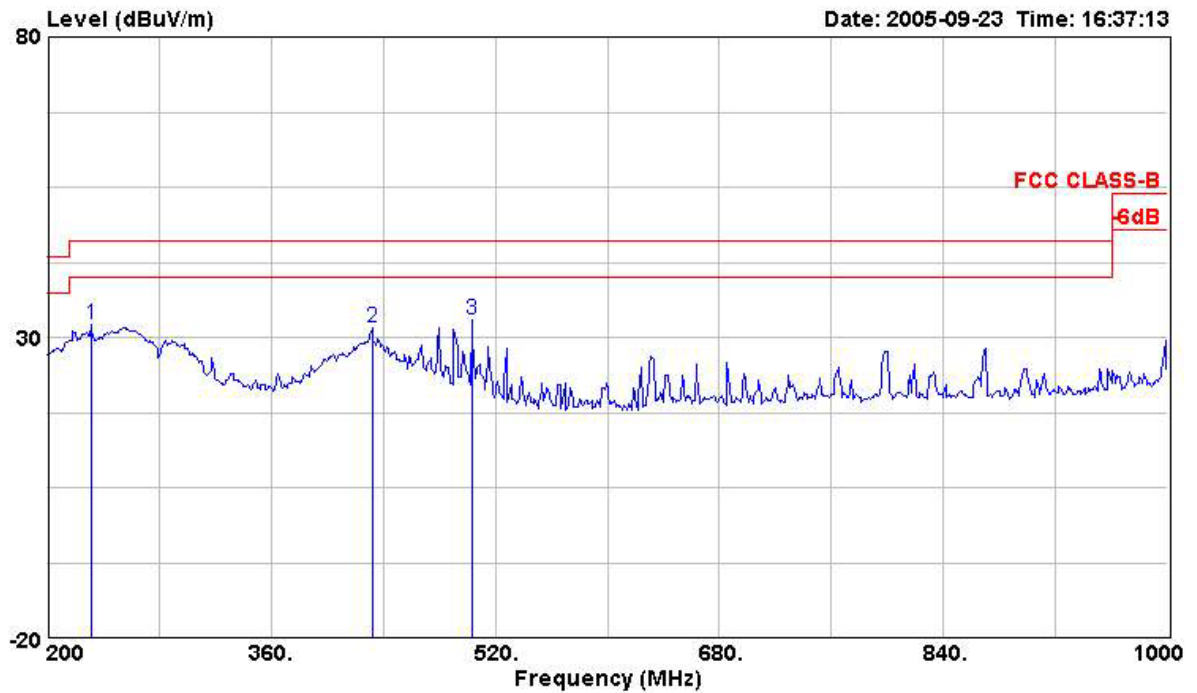
	Freq	Level	Over Limit	Read Level	Limit Line	CableAntenna Loss Factor	Preamplifier Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB/m	dB	cm	deg
1	220.000	38.48	-7.52	52.49	46.00	1.41	14.60	30.02 Peak	---	---
2	294.400	39.35	-6.65	54.58	46.00	1.68	13.65	30.57 Peak	---	---
3	425.600	35.58	-10.42	47.61	46.00	1.98	16.59	30.61 Peak	---	---



Vertical



	Freq	Level	Over	Read	Limit	Cable	Antenna	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Level	Line	Loss	Factor	Factor	Remark	Pos	Pos
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB/m	dB		cm	deg
1	30.000	38.82	-1.18	55.46	40.00	0.58	13.00	30.22	QP	---	---
2	40.710	33.24	-6.76	50.46	40.00	0.64	12.57	30.42	Peak	---	---
3	92.900	36.33	-7.17	56.34	43.50	0.92	8.65	29.58	Peak	---	---



	Freq	Level	Over Limit	Read Level	Limit Line	Cable Loss	Antenna Factor	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB/m	dB		cm	deg
1	231.200	31.99	-14.01	48.04	46.00	1.48	13.77	31.30	Peak	---	---
2	432.000	31.58	-14.42	43.66	46.00	2.04	16.54	30.66	Peak	---	---
3	503.200	32.80	-13.20	45.18	46.00	2.18	16.14	30.71	Peak	---	---

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

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

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

Pol. : V is Vertical Polarization ; H is Horizontal Polarization.



3.4. Antenna Requirements

3.4.1. Limit

Standard antenna jack or electrical connector is prohibited, but this requirement does not apply to intentional radiators that must be professionally installed.

3.4.2. Antenna Connector Construction

Please refer to section 3.3 in this test report, all antenna connectors comply with the requirements.

4. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Feb. 19, 2005	Conduction (CO04-HY)
LISN	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 15, 2005	Conduction (CO04-HY)
LISN (Support Unit)	PIC	NNB-2/16Z	2001/008	9kHz – 30MHz	May 06, 2005	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9kHz – 30MHz	Dec. 23, 2004	Conduction (CO04-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz ~ 1GHz 3m	Jun. 16, 2005	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100019	9KHZ~40GHz	Jul. 21, 2005	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	CPA9231A	18667	9KHZ ~ 2GHz	Jan. 10, 2005	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1GHz ~ 26.5GHz	May 31, 2005	Radiation (03CH03-HY)
Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz ~ 200MHz	Jul. 22, 2005	Radiation (03CH03-HY)
Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz ~ 1GHz	Jul. 22, 2005	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Apr. 22, 2005	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz ~ 1GHz	Feb. 22, 2005	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz ~ 40GHz	Dec.01, 2004	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)
Spectrum Analyzer	R&S	FSP40	100019	9KHZ~40GHz	Jul. 21, 2005	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jul. 06, 2005	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z55	100049	DC ~ 40GHz	Jul. 06, 2005	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Apr. 28, 2005	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 – 300V	Apr. 21, 2005	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V – 60V	Dec. 28, 2004	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 01, 2004	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz – 7GHz	Jan. 01, 2005	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz – 1GHz	Jan. 01, 2005	Conducted (TH01-HY)
Data Generator	Tektronix	J310345	J310345	400Mbps	Dec. 21, 2004	Conducted (TH01-HY)
OscilloScope	Tektronix	TDS1012	C038520	100MHz-1Gs/s	Jan. 02, 2005	Conducted (TH01-HY)

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



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amplifier	MITEQ	AMF-6F-260400	923364	26.5GHz ~ 40GHz	Jan. 05, 2004*	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9kHz ~ 30MHz	May 24, 2004*	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz ~ 40GHz	Jun. 09, 2004*	Radiation (03CH03-HY)

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

5. SPORTON COMPANY PROFILE

SPORTON Lab. was established in 1986 with one shielded room: the first private EMI test facility, offering local manufacturers an alternative EMI test facility apart from ERSO. In 1988, one 3M and 10M/3M open area test site were setup and also obtained official accreditation from FCC, VCCI and NEMKO. In 1993, a Safety laboratory was founded and obtained accreditation from UL of USA, CSA of Canada and TUV (Rhineland & PS) of Germany. In 1995, one EMC lab, including EMI and EMS test facilities was setup. In 1997, SPORTON Group has provided financial expense to relocate the headquarter to Orient Scientific Park in Taipei Hsien to offer more comprehensive, more qualified and better service to local suppliers and manufactures. In 1999, Safety Group and Component Group were setup. In 2001, SPORTON has established 3M/10M chamber in Hwa Ya Technology Park.

5.1. Test Location

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 02-2696-2468 FAX : 02-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 03-327-3456 FAX : 03-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 02-2601-1640 FAX : 02-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 02-2631-4739 FAX : 02-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 02-8227-2020 FAX : 02-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 02-2794-8886 FAX : 02-2794-9777
JHUBEI	ADD : No.8, Lane 728, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C. TEL : 03-656-9065 FAX : 03-656-9085

6. CERTIFICATE OF NVLAP ACCREDITATION

United States Department of Commerce National Institute of Standards and Technology	
	
ISO/IEC 17025:1999 ISO 9002:1994	
Certificate of Accreditation	
SPORTON INTERNATIONAL, INC. TAIPEI HSIEN 221 TAIWAN	
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ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS	
December 31, 2005 Effective through	 For the National Institute of Standards and Technology NVLAP Lab Code: 200079-0

NVLAP-01C (06-01)