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FCC RADIO TEST REPORT

Applicant's company	**AMIC TECHNOLOGY CORPORATION**
Applicant Address	No. 2, Li-Hsin 6th Road, Science-Based Industrial Park,Hsin-Chu City, 300, Taiwan, R.O.C.
FCC ID	**S8RA9240A001485**
Manufacturer's company	**AMIC TECHNOLOGY CORPORATION**
Manufacturer Address	No. 2, Li-Hsin 6th Road, Science-Based Industrial Park,Hsin-Chu City, 300, Taiwan, R.O.C.

Product Name	RFID Reader
Brand Name	AMIC
Model Name	A9240-A-001-RS485
Test Freq. Range	**13.56MHz**
Test Rule Part(s)	**47 CFR FCC Part 15 Subpart C**
Receive Date	May 19, 2005
Test Date	Jul. 5, 2005

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 or NIST/USA.

Wayne Hsu / Supervisor
Sporton International Inc.

NVLAP®

Lab Code: 200079-0

Table of Contents

History of This Test Report

Original Issue Date: Jul. 29, 2005

Report No.: FR551925

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. INTRODUCTION

EUT **Radio Frequency IDentification** (**RFID**) devise, is a device of remotely storing and retrieving data. A RFID tag is a small object, such as an adhesive sticker, that can be attached to or incorporated into a product. RFID tags contain antennas to enable them to receive and respond to radio-frequency queries from an RFID transceiver.

Test results and procedures were in compliance and were performed in accordance with Federal Communications Commission (FCC) 47 CFR FCC Part 15 Subpart C standards/regulations:

Sections/Parts	Description
Section 15.203	Antenna Requirements
Section 15.204	External RF Power Amplifiers and Antenna Modifications
Section 15.205	Restricted Bands of Operation
Section 15.207	AC Power Line Conducted Emissions
Section 15.209	Radiated Emissions (General Requirements)
Section 15.215	General Radiated Emissions Limitation
Section 15.225	13.56MHz Intentional Radiators
Section 15.225(a)	Field Strength of Fundamental Emissions
Section 15.225(d)	Out of Band Emissions
Section 15.225(e)	Frequency Stability

2. GENERAL INFORMATION

2.1. Product Details

Items	Description
Product Type	RFID Reader
Radio Type	Intentional Transmitter
Power Type	DC Power Supply Device
Interface Type	DC Port

2.2. Accessories

Others	
NA	

2.3. Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	AMIC	A9290-A-06	Antenna	Reversed TNC	-

2.4. Technical Specifications

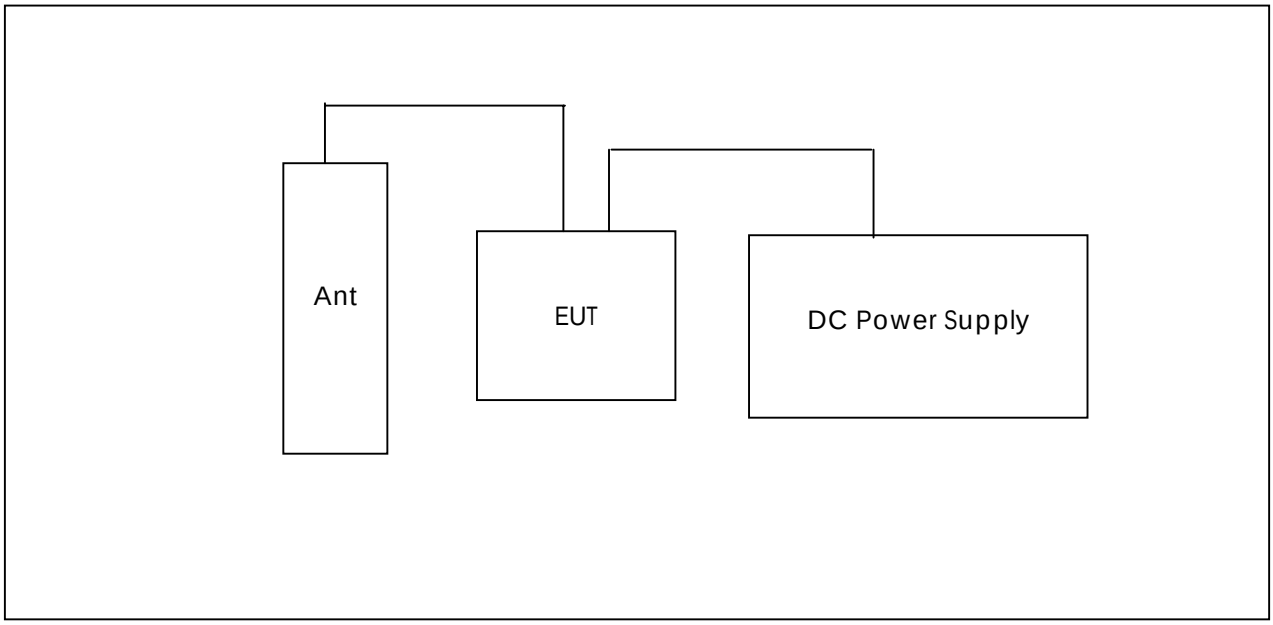
Items	Description
Modulation Type	ASK
Frequency Range	13.56MHz
Number of Channels	1
Max. Field Strength	83.5dBuV/m at 3m (QP)
Channel Space	NA
Power Supply	19 Vdc from DC power supply

Frequency Allocation

Frequency Band	Channel No.	Frequency
13.553 ~ 13.567MHz	1	13.56 MHz

2.5. Test Configuration

Radiation Emissions Test Configuration



2.6. Support Equipment

Radiation Emissions Test Configuration

Support Unit	Brand	Model	FCC ID
DC Power Supply	GW	GPC-6030D	DoC

2.7. Test Software

During testing, there is no test software for the test.

2.8. Test Procedure

Emissions measurements were performed in accordance with the procedures of ANSI C63.4-2003, Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz .

3. GENERAL INFORMATION OF FACILITY

3.1. Test Location

Test Site No.	Site Category	Location
03CH03-HY	SAC	Hwa Ya

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

Please refer section 7 for Test Site Address.

3.2. Test Equipment Calibration

All measurement instrumentation and transducers were calibrated in accordance with the applicable standards by an independent CNLA registered laboratory such as Electronics Testing Center, Taiwan (ETC) or the National Measurement Laboratory (NML). All equipment calibration is traceable to Chinese national standards at the National Measurements Laboratory. The reference antenna calibration was performed by NML and the working antennas (biconical, log-periodic and horn) was calibrated by the CNLA approved procedures. The complete list of test equipment used for the measurements, including calibration dates and traceability is contained in section 6 of this report.

4. SUMMARY OF THE TEST RESULTS

Applied Standard: 47 CFR FCC Part 15 Subpart C			
Part	**Rule Section**	**Description of Test**	**Result**
5.1	15.207	AC Power Line Conducted Emissions	Not Applicable
5.2	15.225(a)	Field Strength of Fundamental Emissions	Complies
5.3	15.209	Radiated Emissions (General Requirements)	Complies
5.3	15.225(d)	Out of Band Emissions	Complies
5.4	15.215	20dB Spectrum Bandwidth	Complies
5.5	15.225(e)	Frequency Stability	Complies
5.6	15.203	Antenna Requirements	Complies

Note:

EUT is DC power supplied, so AC power line conducted emissions was not implemented.

5. TEST RESULT

5.1. AC Conducted Emissions Measurement

EUT is DC power supplied, so AC power line conducted emissions was not implemented.

5.2. Field Strength of Fundamental Emissions Measurement

5.2.1. Applicable Standard

47 CFR FCC Part 15 Subpart C, section 15.225(a): The field strength of any emissions within this band shall not exceed 15848 microvolts/meter at 30 meters . The emissions limit in this paragraph is based on measurement instrumentation employing an average detector.

Frequency Band (MHz)	Fundamental Emissions Limit (dBuV/m) at 3m
13.553 ~ 13.567MHz	124 (QP)

5.2.2. Measuring Instruments

Refer to section 6 in this report.

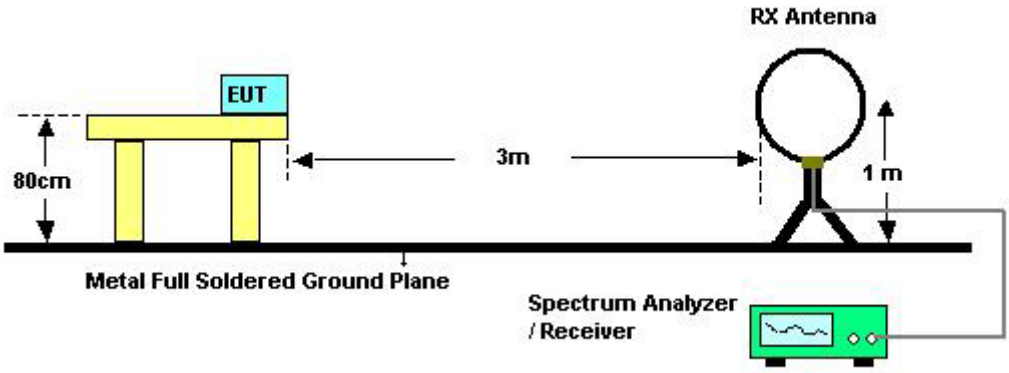
5.2.3. Major Test Instruments Setting

Receiver Parameter	Setting
Attenuation	Auto
Center Frequency	Fundamental Frequency
RB	10 KHz
Detector	QP

5.2.4. 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. Set the test-receiver system to Peak and Average Detect Function with specified bandwidth under Maximum Hold Mode.
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.

5.2.5. Test Setup Layout



5.2.6. Test Deviation

The measurement uncertainty is 2.26dB. Test methods have no deviation with original standard.

5.2.7. Test Mode(s)

EUT is CTX mode (Continuous Transmission). Measurements have been done on channel 1, 13.56 MHz.

5.2.8. Calculation of Voltage Levels

Measurements are reported in units of dB relative to one microvolt per metre (dBµV/m).

The field strength was calculated automatically by the software using all the pre-stored calibration data. The method of calculation is shown below:

E = V + AF - G + L Where:

E = Radiated Field Strength in dBµV/m.

V = EMI Receiver Voltage in dBµV. (measured value)

AF = Antenna Factor in dB(m^{-1}). (stored as a data array)

G = Preamplifier Gain in dB. (stored as a data array)

L = Cable insertion loss in dB. (stored as a data array of Insertion Loss versus frequency)

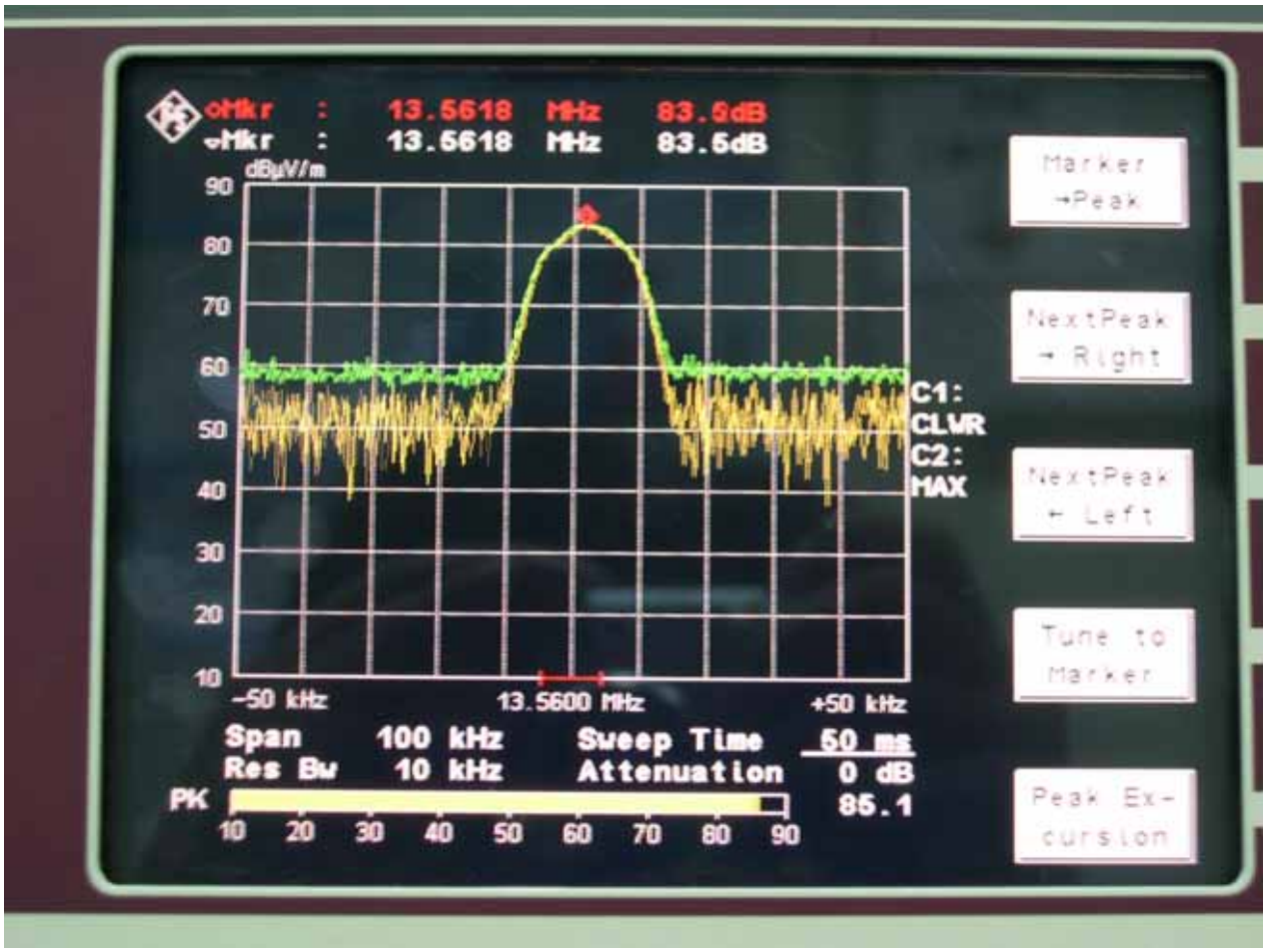
Level = Read Level + Factor.

Factor = AF - G + L.

5.2.9. Test Result

Test Site	03CH03-HY
Temperature	23℃
Humidity	65%
Test Engineer	Steven Lu

Channel 1, 13.56 MHz



5.3. Radiated Emissions Measurement

5.3.1. Applicable Standard

47 CFR FCC Part 15 Subpart C, section 15.225(d): The field strength of any emissions which appear outside of this band shall not exceed the general radiated emissions limits in Section 15.209.
47 CFR FCC Part 15 Subpart C, section 15.215: In most cases, unwanted emissions outside of the frequency bands shown in these alternative provisions must be attenuated to the emissions limits shown in Section 15.209. In no case shall the level of the unwanted emissions from an intentional radiator operating under these additional provisions exceed the field strength of the fundamental emissions.

Outside Frequency Band Edge(MHz)	Limit (dBuV/m) at 3m
13.553-13.567MHz Bandedge	70

5.3.2. Measuring Instruments

Please refer to section 6 in this report.

5.3.3. Major Test Instruments Setting

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB	1 MHz / 1MHz for Peak
RB / VB	1 MHz / 10Hz for Average

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

5.3.4. Test Procedures

For radiated emissions below 30MHz

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. Set the test-receiver system to QP Detect Function with specified bandwidth under Maximum Hold Mode.

For radiated emissions above 30MHz

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. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. 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.
8. If the emissions 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.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions 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.

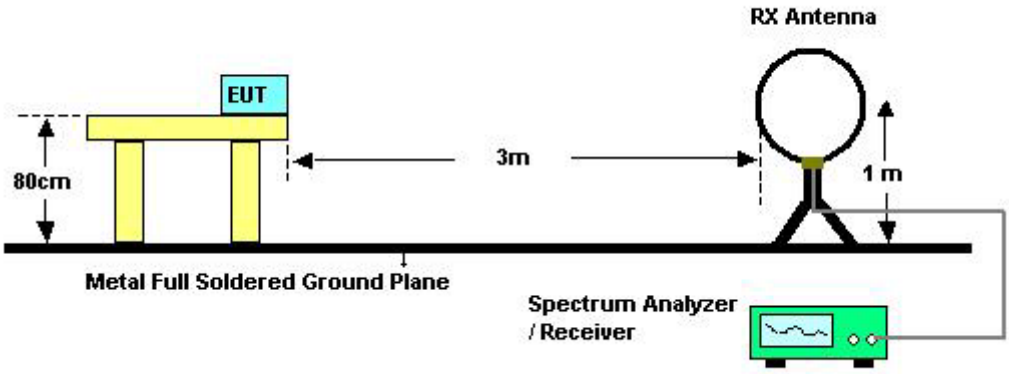
5.3.5. Test Mode(s)

EUT is CTX mode (Continuous Transmission). Measurements have been done on channel 1, 13.56 MHz. Measurements were carried out on the following modes:

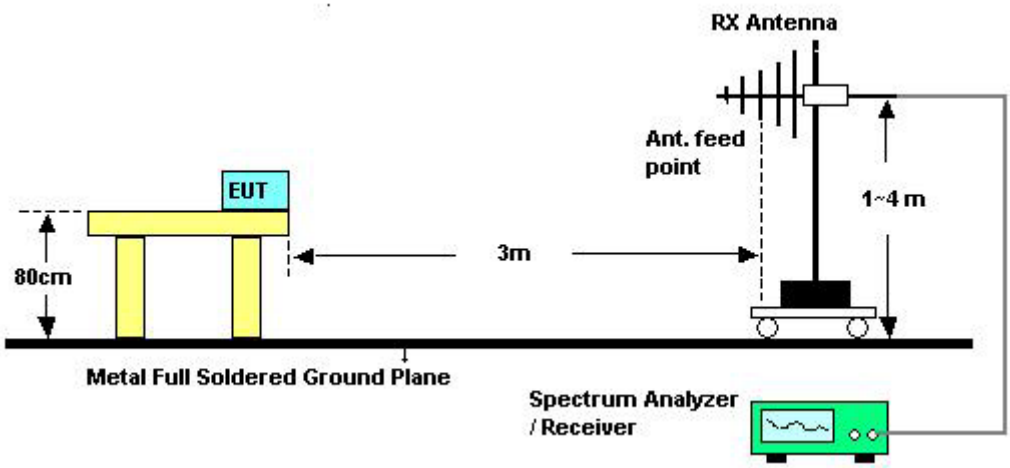
Mode	Description
1	EUT is power by DC Power Supply Device

5.3.6. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



5.3.7. Test Deviation

The measurement uncertainty is 2.54dB. Test methods have no deviations with original standard.

5.3.8. Calculation of Voltage Levels

Measurements are reported in units of dB relative to one microvolt per metre (dBµV/m).

The field strength was calculated automatically by the software using all the pre-stored calibration data. The method of calculation is shown below:

E = V + AF - G + L Where:

E = Radiated Field Strength in dBµV/m.

V = EMI Receiver Voltage in dBµV. (measured value)

AF = Antenna Factor in dB(m^{-1}). (stored as a data array)

G = Preamplifier Gain in dB. (stored as a data array)

L = Cable insertion loss in dB. (stored as a data array of Insertion Loss versus frequency)

Level = Read Level + Factor.

Factor = AF - G + L.

5.3.9. Test Data Requirement

Test data records were performed in accordance with the following ANSI C63.4-2003. For intentional radiators, for each of the frequencies to which the device is tuned, the frequency and amplitude of the highest fundamental emissions, the frequency and amplitude of the three highest harmonic or spurious emissions relative to the limit, and the frequency and amplitude of the three highest restricted band emissions relative to the limit shall be reported.

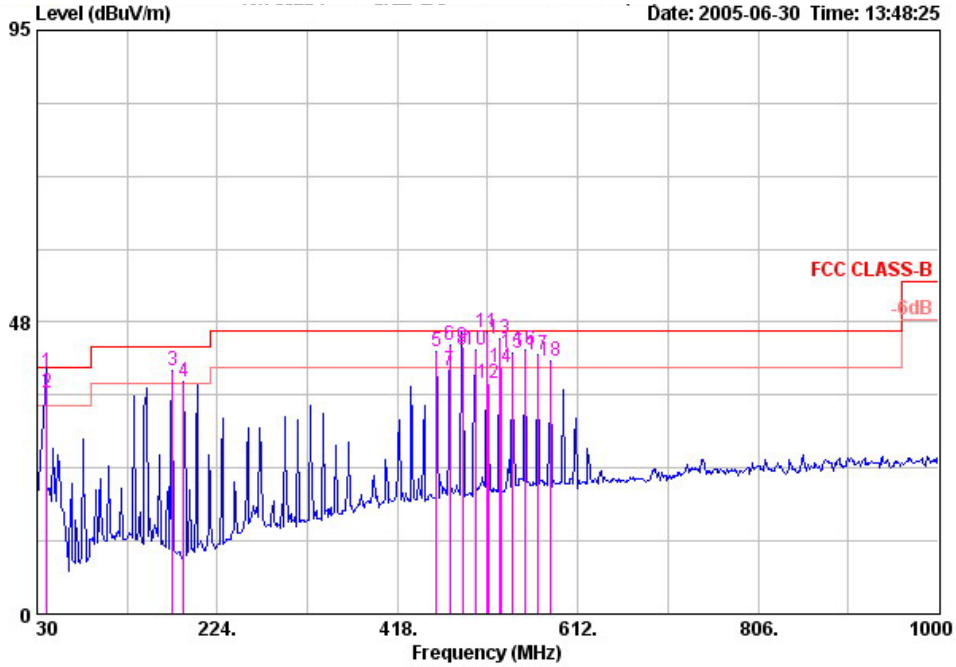
5.3.10. Results of Radiated Emissions

Test Site	03CH03-HY
Temperature	23℃
Humidity	65%
Test Engineer	Steven Lu

Note:

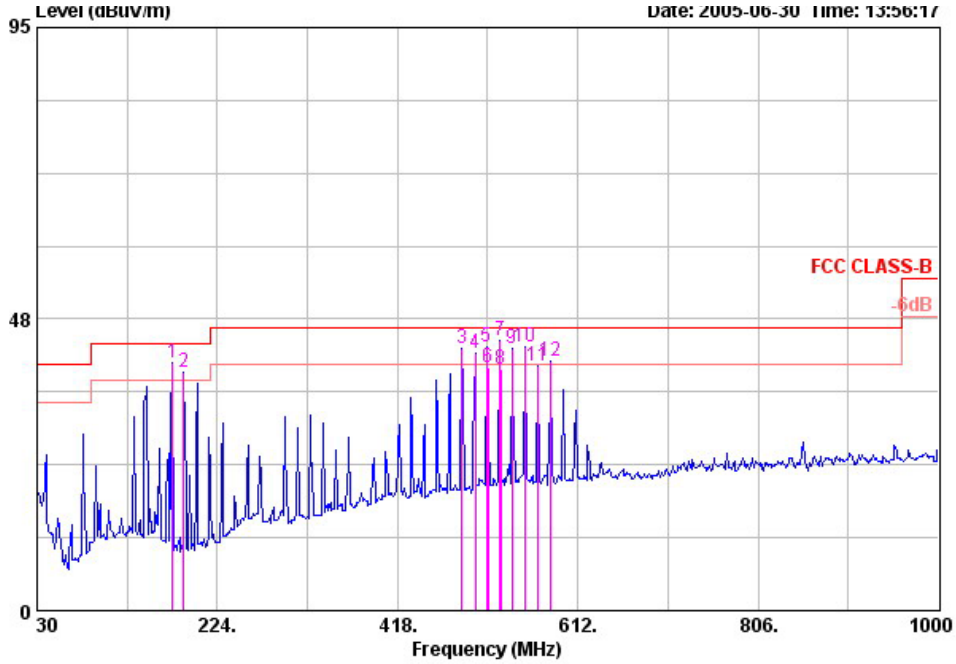
The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Vertical Polarization



	Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Remark
	MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV	
1 *	40.680	39.23	-0.77	40.00	12.40	1.10	31.77	57.50	Peak
2 *	40.680	36.03	-3.97	40.00	12.40	1.10	31.77	54.30	QP
3 *	175.500	39.73	-3.77	43.50	8.55	2.00	31.61	60.79	Peak
4 *	188.110	37.84	-5.66	43.50	8.15	1.95	31.56	59.30	Peak
5 *	459.710	42.66	-3.34	46.00	16.60	2.98	30.92	54.01	Peak
6 *	474.260	43.70	-2.30	46.00	16.94	3.10	30.93	54.59	Peak
7	474.660	39.51	-6.49	46.00	16.94	3.10	30.93	50.40	QP
8 *	488.220	42.86	-3.14	46.00	17.08	3.21	30.94	53.50	QP
9 *	488.220	43.56	-2.44	46.00	17.08	3.21	30.94	54.20	Peak
10 *	501.420	42.94	-3.06	46.00	17.20	3.30	30.94	53.37	Peak
11 @	514.030	45.90	-0.10	46.00	17.44	3.27	30.89	56.07	Peak
12	515.340	37.63	-8.37	46.00	17.44	3.27	30.88	47.80	QP
13 *	528.580	44.91	-1.09	46.00	17.62	3.24	30.83	54.88	Peak
14 *	528.900	40.03	-5.97	46.00	17.62	3.24	30.83	50.00	QP
15 *	541.190	42.40	-3.60	46.00	18.10	3.22	30.78	51.86	Peak
16 *	555.740	42.95	-3.05	46.00	18.60	3.19	30.75	51.91	Peak
17 *	568.350	42.10	-3.90	46.00	18.54	3.16	30.75	51.15	Peak
18 *	582.900	41.12	-4.88	46.00	18.56	3.13	30.75	50.18	Peak

Horizontal Polarization



		Freq	Level	Over Limit	Limit Line	Antenna Factor	Cable Loss	Preamp Factor	Read Level	Remark
		MHz	dBuV/m	dB	dBuV/m	dB/m	dB	dB	dBuV	
1	*	175.500	40.50	-3.00	43.50	8.55	2.00	31.61	61.56	Peak
2	*	188.110	38.93	-4.57	43.50	8.15	1.95	31.56	60.39	Peak
3	*	486.870	42.78	-3.22	46.00	17.07	3.19	30.93	53.45	Peak
4	*	501.420	41.89	-4.11	46.00	17.20	3.30	30.94	52.33	Peak
5	*	514.030	43.04	-2.96	46.00	17.44	3.27	30.89	53.22	Peak
6		515.340	39.73	-6.27	46.00	17.44	3.27	30.88	49.90	QP
7	@	528.580	44.07	-1.93	46.00	17.62	3.24	30.83	54.04	Peak
8		528.900	39.43	-6.57	46.00	17.62	3.24	30.83	49.40	QP
9	*	541.190	42.78	-3.22	46.00	18.10	3.22	30.78	52.24	Peak
10	*	555.740	42.85	-3.15	46.00	18.60	3.19	30.75	51.81	Peak
11		568.350	39.91	-6.09	46.00	18.54	3.16	30.75	48.95	Peak
12	*	582.900	40.70	-5.30	46.00	18.56	3.13	30.75	49.76	Peak

5.3.11. Photographs of Radiated Emissions Test Configuration

FRONT VIEW

REAR VIEW

5.4. 20dB Spectrum Bandwidth Measurement

5.4.1. Applicable Standard

Section 15.215: Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (**13.553 ~ 13.567MHz**).

In ANSI C63.4-2003, the resolution bandwidth of the measuring instrument shall be set to a value greater than 5% of the bandwidth requirements. When no bandwidth requirements are specified, the minimum resolution band-width of the measuring instrument is given in the following:

Fundamental Freq.	Minimum Resolution Bandwidth
9 kHz to 30 MHz	1 kHz
30 to 1000 MHz	10 kHz
1000 MHz to 40 GHz	100 kHz

5.4.2. Measuring Instruments

Please refer to section 6 in this report.

5.4.3. Major Test Instruments Setting

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

5.4.4. 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 utilised for 20 dB bandwidth measurement.

5.4.5. Test Setup Layout

5.4.6. Test Deviation

The measurement uncertainty is 10^{-7}. Test methods have no deviations with original standard.

5.4.7. Test Mode

EUT is CTX mode (Continuous Transmission). Measurements have been done on channel 1, 13.56 MHz.

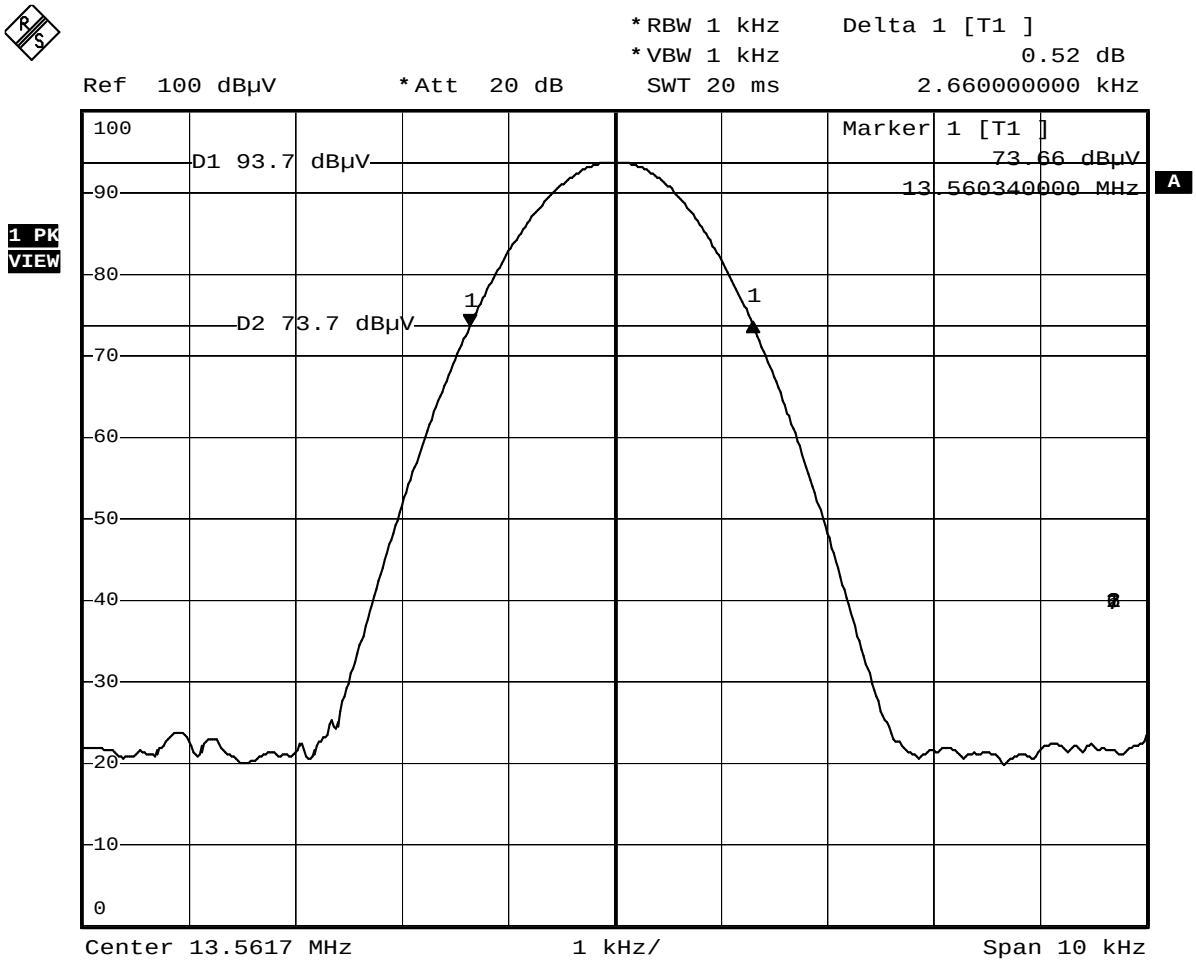
5.4.8. Test Result

Test Site	TH01-HY
Temperature	23℃
Humidity	65%
Test Engineer	Steven Lu

Frequency	20dB Bandwidth (kHz)	99% Occupied Bandwidth (kHz)	Inside Specific Band (13.553 ~ 13.567MHz)
13.56 MHz	2.66	-	**Complies**

5.4.9. 20 dB Bandwidth Plots

20 dB Bandwidth Plot on 13.56 MHz



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5.5. Frequency Stability Measurement

5.5.1. Applicable Standard

47 CFR FCC Part 15 Subpart C, section 15.225(e): The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% (100ppm) of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

5.5.2. Measuring Instruments

Please refer to section 6 in this report.

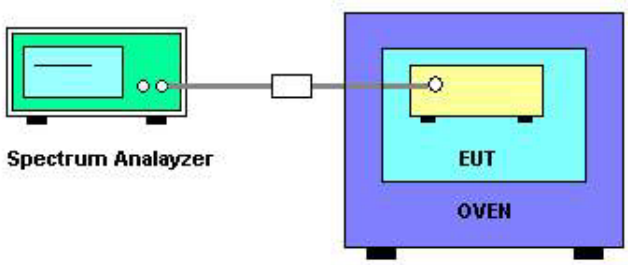
5.5.3. Major Test Instruments Setting

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RB	10 kHz
VB	10 kHz
Sweep Time	Auto

5.5.4. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc $\times$ 10^6 ppm.
6. The test extreme voltage is, according to FCC section 2.1055(d)(1), is to change the primary supply voltage from 85 to 115 percent of the nominal value.
7. Extreme temperature rule is, according to FCC section 2.1055(a)(2), -20°C~50°C.

5.5.5. Test Setup Layout



5.5.6. Test Deviation

The measurement uncertainty is 10^{-7}. Test methods have on deviation with original standard.

5.5.7. Test Mode

EUT have transmitted absence of modulation signal and fixed channelize.

5.5.8. Test Result

Test Site	TH01-HY
Temperature	23℃
Humidity	65%
Test Engineer	Steven Lu

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	13.56 MHz
21.85	13.5602
19.00	13.5601
16.15	13.5602
Max. Deviation (MHz)	**0.0002**
Max. Deviation (ppm)	**14.7493**
Limits (ppm)	100
Result	**Complies**

Temperature vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(℃)	13.56 MHz
-20	13.5602
-10	13.5601
0	13.5604
10	13.5605
20	13.5604
30	13.5603
40	13.5601
50	13.5601
Max. Deviation (MHz)	**0.0005**
Max. Deviation (ppm)	**36.8732**
Limits (ppm)	100
Result	**Complies**

5.6. Antenna Requirements

5.6.1. Applicable Standard

47 CFR FCC Part 15 Subpart C, section 15.203: The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the power limits in 47 CFR FCC Part 15 Subpart C, section 15.225.

5.6.2. Antenna Connector Construction

Please refer to section 2.3 in this test report, all antenna connectors comply with 47 CFR FCC Part 15 Subpart C, section 15.203 requirements.

6. 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. 16, 2005	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	2001/004	9kHz – 30MHz	Apr. 20, 2005	Conduction (CO04-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	99041	9kHz – 30MHz	May. 05, 2005	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2005	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	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	100004	9KHZ ~ 40GHz	Aug. 31, 2004	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	CPA9231A	18667	9KHz ~ 2GHz	Jan. 10, 2005	Radiation (03CH03-HY)
Amplifier	MITEQ	AFS44-00102650	849984	100MHz ~ 26.5GHz	Mar. 25, 2005	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	923364	26.5GHz ~ 40GHz	Mar. 25, 2005	Radiation (03CH03-HY)
Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz ~ 200MHz	Jul. 28, 2004	Radiation (03CH03-HY)
Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz ~ 1GHz	Jul. 28, 2004	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	FSP30	100023	9kHz ~ 30GHx	Aug. 02, 2004	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	Nov. 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)
Oscilloscope	Tektronix	TDS1012	CO38515	100MHz / 1GS/s	Apr. 15, 2005	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Dec. 31, 2004	Conducted (TH01-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9kHz ~ 30MHz	May 04, 2004	Radiation (03CH03-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz ~ 40GHz	Jun. 09, 2004	Radiation (03CH03-HY)
Data Generator	Tektronix	DG2030	063-2920-50	0.1Hz~400MHz	Jun. 02, 2005	Conducted (TH01-HY)

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

7. 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 familial 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.

7.1. 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 2nd 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

8. Certificate of NVLAP Accreditation

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC 17025:1999
ISO 9002:1994

Certificate of Accreditation

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

SPORTON INTERNATIONAL, INC.
TAIPEI HSIEN 221
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is recognized by the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria set forth in NIST Handbook 150:2001, all requirements of ISO/IEC 17025:1999, and relevant requirements of ISO 9002:1994. Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:

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)