

## **Appendix C. Attachment of Report**

according to

47 CFR FCC Part 15 Subpart C § 15.247

<b>Equipment</b>	: PND
<b>Model No.</b>	: 21MAX / 5100MAX
<b>Brand Name</b>	: NAVIGON
<b>Filing Type</b>	: Existing Change
<b>Applicant</b>	: NAVIGON AG Berliner Platz 11 D-97080 Würzburg Germany
<b>FCC ID</b>	: VIL-21MAX
<b>Manufacturer</b>	: Compal Communications (Nanjing) Co., Ltd. No.68-2, Suyuan Road, Export Processing Zone (South Area). Nanjing China Post:211100
<b>Received Date</b>	: Sep. 03, 2008
<b>Final Test Date</b>	: Sep. 04, 2008
<b>Report No.</b>	: FR813018-02
<b>Issue Date</b>	: Oct. 03, 2008
<b>Attachment Info.</b>	: Please refer to section 1.1

### **Statement**

**Test result included is only for the Bluetooth part of the product.**

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.



***SPORTON International Inc.***

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

***SPORTON International Inc.***

Report Format Version: 2008-10-03

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# **CERTIFICATE OF COMPLIANCE**

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment : PND  
Model No. : 21MAX / 5100MAX  
Brand Name : NAVIGON  
Applicant : NAVIGON AG  
Berliner Platz 11 D-97080 Würzburg  
Germany

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Sep. 03, 2008 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

  
Wayne Hsu

***SPORTON International Inc.***

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

## 1. GENERAL INFORMATION

### 1.1. Table for Additional Multiple Listing

Appendix C. Attachment of report is existing change battery. The equipment of this attachment is the same as the Equipment under Test of original test report, whose report no, is FR813018. This attachment should be filed together with original test report, Report No.: FR813018 for reference.

Modifications	Original Battery Brand Name		New Battery Brand Name
	JHIH HONG		JHIH HONG
	Model Name	Report No.	Additional Model Name
	761NH60372W	FR813018	JHT-05500NH6-A

### 1.2. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
DC Power Supply	G.W	GPC-6030D	DoC
Car Charger (Provide by Customer)	JESS-LINK	HH-12B	DoC

### 1.3. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
PC	HP	DC579AV	N/A
LCD Monitor	DELL	2408WFPb	N/A
Keyboard (PS2)	BTC	9110	DoC
Mouse (USB)	Microsoft	1004	DoC
Modem	ACEEX	DM-1414	IFAXDM1414
Printer	EPSON	LQ300+	DoC
SD Card	SanDisk	2GB	N/A
DC Power Supply	G.W	GPC-6030D	DoC
Car Charger (Provide by Customer)	JESS-LINK	HH-12B	DoC

#### **1.4. EUT Operation during Test**

Two executive programs, EMCTEST.EXE & Winthrax under WIN XP, then PC sends messages to the internal Hard Disk, and the Hard Disk reads and writes the message.

The PC reads the "" test program from the hard disk drive and runs it.

The PC sends " H " messages to the monitor, and the monitor displays " H " patterns on the screen.

The PC sends " H " messages to the printer, then the printer prints them on the paper.

The PC sends " H " messages to the modem

At the same time, " WINTHRAX " was executed from the hard disk drive and runs it.

## 2. TEST RESULT

### 2.1. AC Power Line Conducted Emissions Measurement

#### 2.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

#### 2.1.2. Measuring Instruments and Setting

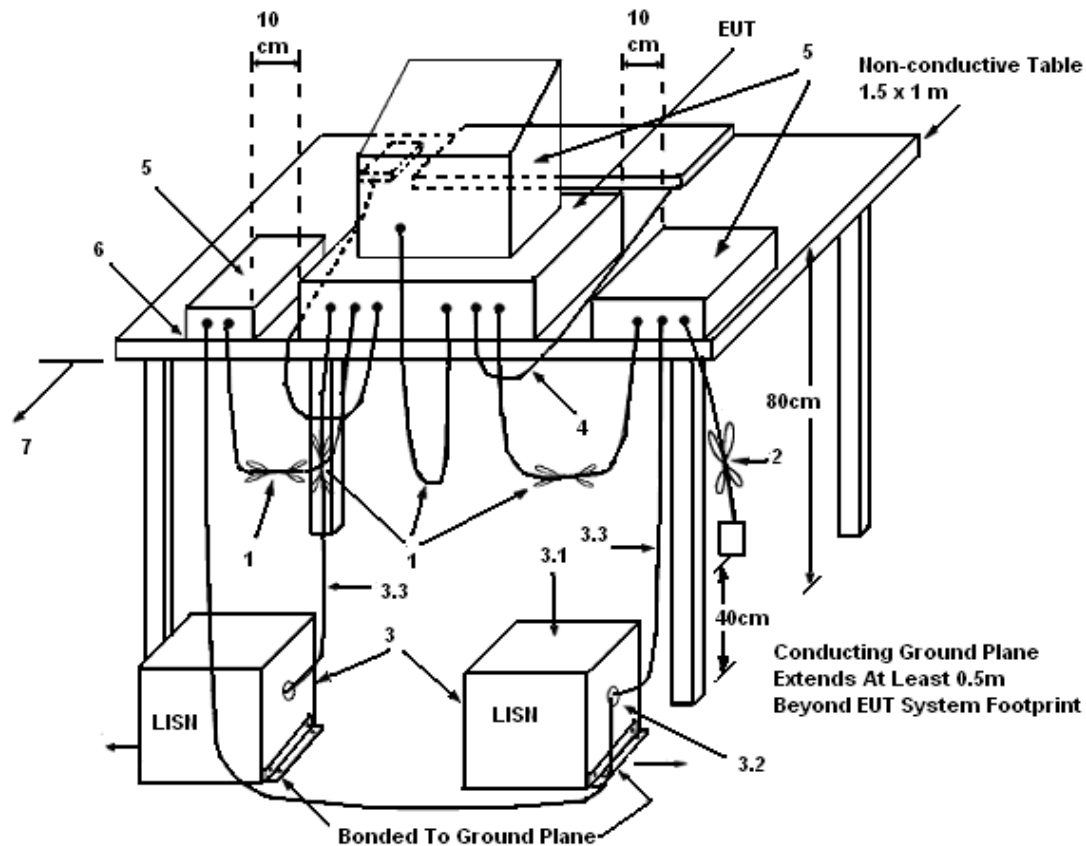
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

#### 2.1.3. Test Procedures

1. The EUT or host of 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.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

## 2.1.4. Test Setup Layout



## LEGEND:

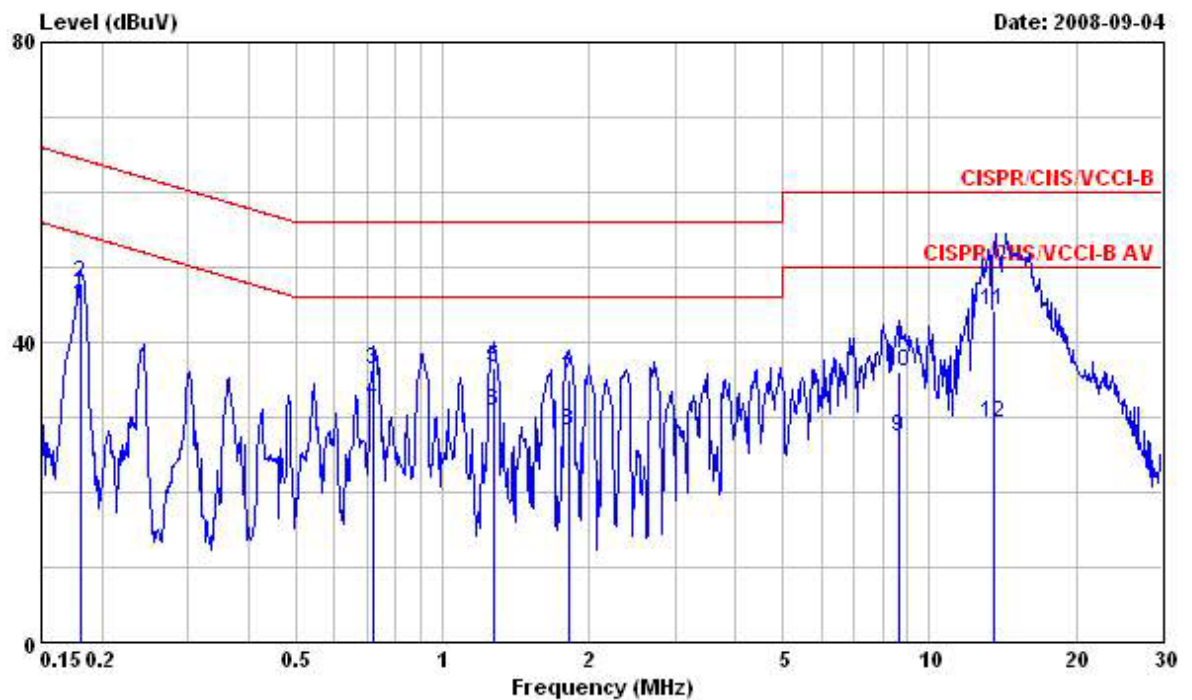
- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50  $\Omega$ . LISN can be placed on top of, or immediately beneath, reference ground plane.
- (3.1) All other equipment powered from additional LISN(s).
- (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
- (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

### 2.1.5. Test Deviation

There is no deviation with the original standard.

### 2.1.6. Results of AC Power Line Conducted Emissions Measurement

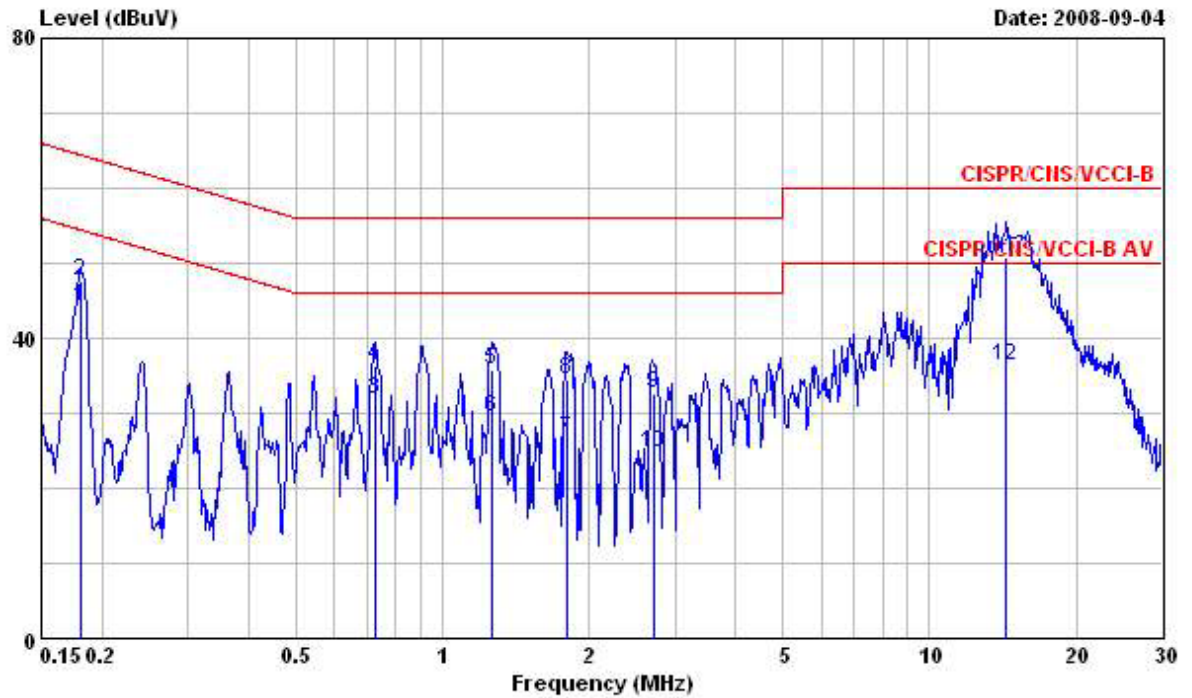
Test date	Sep. 04, 2008	Test Site No.	CO04-HY
Temperature	25	Humidity	55%
Test Engineer	Chris	Phase	Line
Configuration	USB Link Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1805620	45.05	-9.41	54.46	44.71	0.09	0.25	Average
2	0.1805620	47.96	-16.50	64.46	47.62	0.09	0.25	QP
3	0.7235980	36.36	-19.64	56.00	35.90	0.11	0.35	QP
4	0.7235980	31.98	-14.02	46.00	31.52	0.11	0.35	Average
5	1.270	36.46	-19.54	56.00	35.94	0.12	0.40	QP
6	1.270	30.79	-15.21	46.00	30.27	0.12	0.40	Average
7	1.819	34.88	-21.12	56.00	34.41	0.13	0.34	QP
8	1.819	28.03	-17.97	46.00	27.56	0.13	0.34	Average
9	8.640	27.35	-22.65	50.00	26.81	0.26	0.28	Average
10	8.640	36.18	-23.82	60.00	35.64	0.26	0.28	QP
11	13.620	44.18	-15.82	60.00	43.46	0.33	0.39	QP
12	13.620	29.13	-20.87	50.00	28.41	0.33	0.39	Average



Test date	Sep. 04, 2008	Test Site No.	CO04-HY
Temperature	25	Humidity	55%
Test Engineer	Chris	Phase	Neutral
Configuration	USB Link Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1815220	44.29	-10.13	54.42	43.96	0.08	0.25	Average
2	0.1815220	47.59	-16.83	64.42	47.26	0.08	0.25	QP
3	0.7274420	31.80	-14.20	46.00	31.34	0.10	0.36	Average
4	0.7274420	36.20	-19.80	56.00	35.74	0.10	0.36	QP
5	1.264	35.91	-20.09	56.00	35.40	0.11	0.40	QP
6	1.264	29.58	-16.42	46.00	29.07	0.11	0.40	Average
7	1.805	26.66	-19.34	46.00	26.20	0.12	0.34	Average
8	1.805	34.58	-21.42	56.00	34.12	0.12	0.34	QP
9	2.711	32.63	-23.37	56.00	32.23	0.13	0.27	QP
10	2.711	24.64	-21.36	46.00	24.24	0.13	0.27	Average
11	14.360	50.75	-9.25	60.00	50.01	0.33	0.41	QP
12	14.360	36.37	-13.63	50.00	35.63	0.33	0.41	Average

Note:

Level = Read Level + LISN Factor + Cable Loss.

## 2.2. Radiated Emissions Measurement

### 2.2.1. Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

### 2.2.2. Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1000KHz / 1000KHz for peak

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

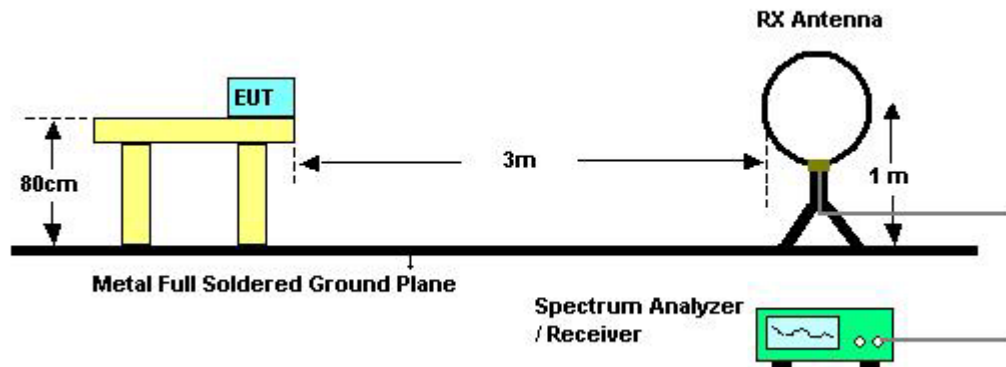
1.

**2.2.3. Test Procedures**

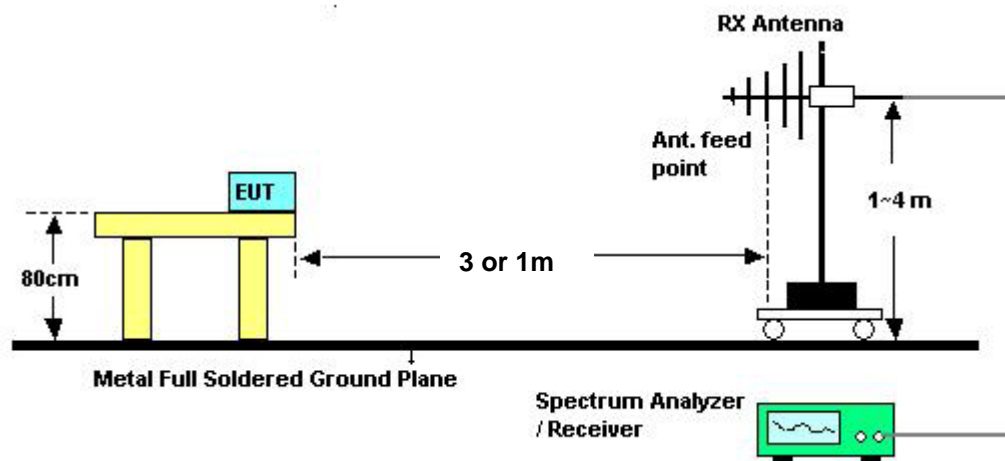
2. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
3. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
4. 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.
5. 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.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
7. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
8. 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.
9. 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.
10. 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.
11. 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.

### 2.2.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor =  $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$  (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

### 2.2.5. Test Deviation

There is no deviation with the original standard.

### 2.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

<b>Test date</b>	Sep. 03, 2008	<b>Test Site No.</b>	03CH02-HY
<b>Temperature</b>	26	<b>Humidity</b>	55%
<b>Test Engineer</b>	Sam		

<b>Freq. (MHz)</b>	<b>Level (dBuV)</b>	<b>Over Limit (dB)</b>	<b>Limit Line (dBuV)</b>	<b>Remark</b>
-	-	-	-	See Note

Note:

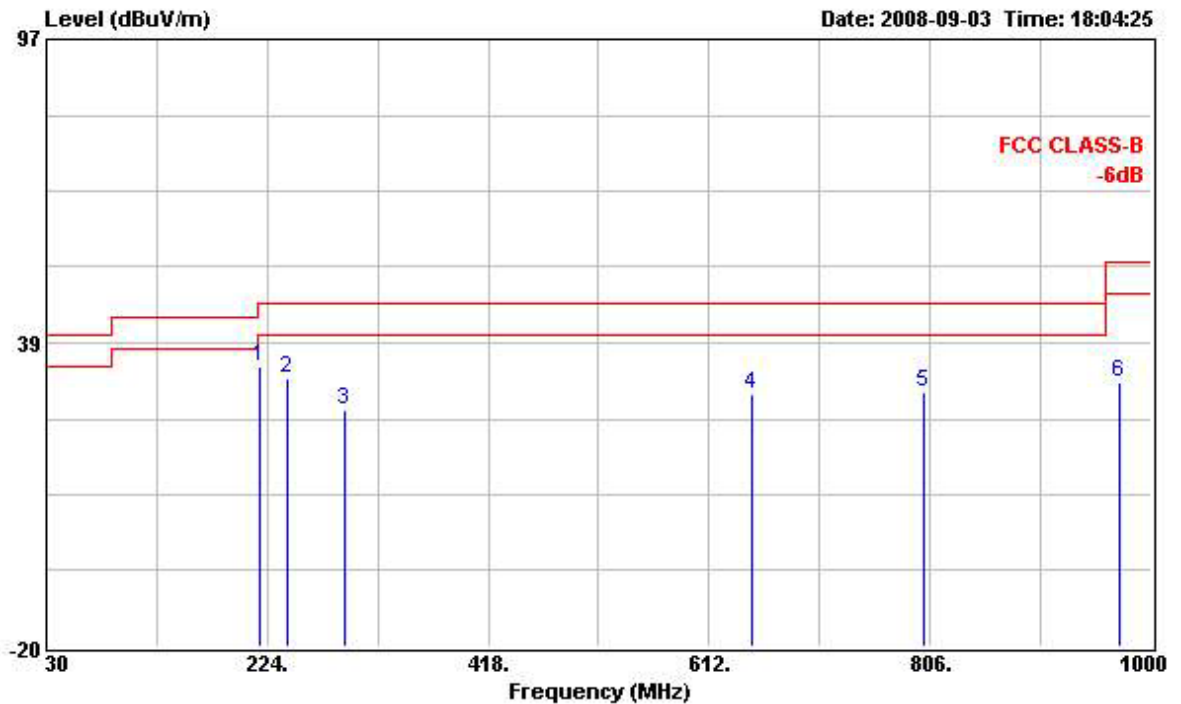
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB);

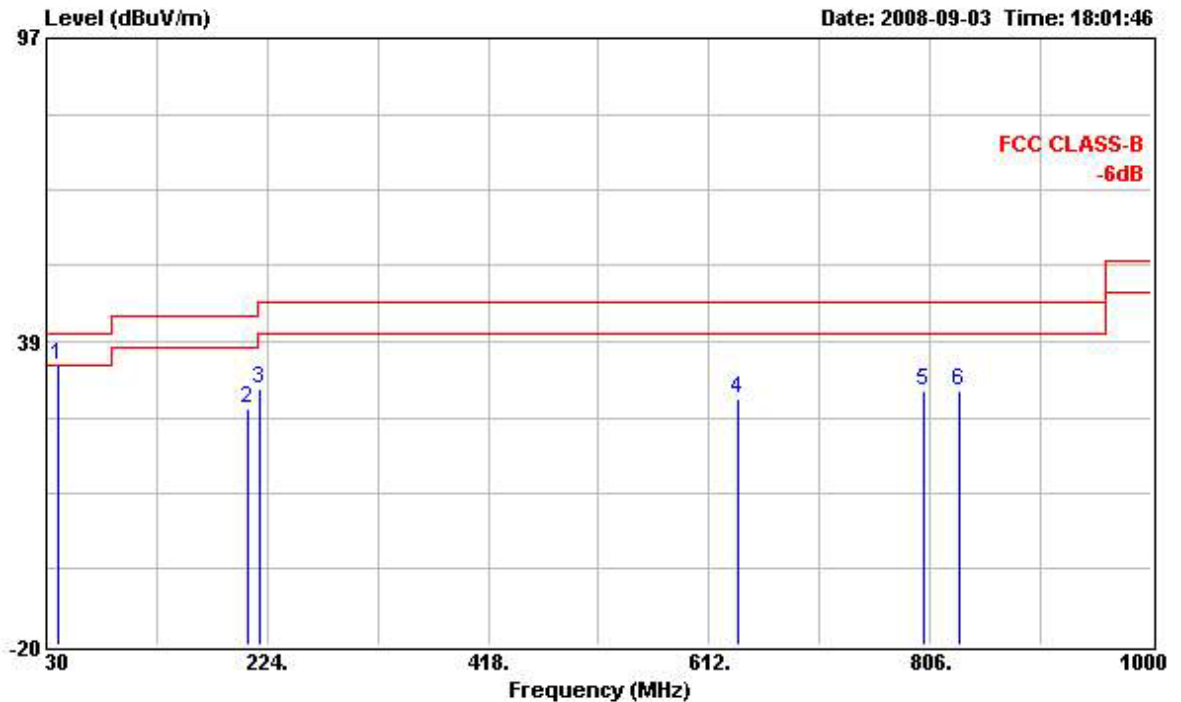
Limit line = specific limits (dBuV) + distance extrapolation factor.

## 2.2.8. Results of Radiated Emissions (30MHz~1GHz)

Test date	Sep. 03, 2008	Test Site No.	03CH02-HY
Temperature	26	Humidity	55%
Test Engineer	Sam	Configurations	Car Charger / GPS+BT Mode

**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	218.180	33.90	-12.10	46.00	49.57	11.95	2.94	30.56	Peak	---	---
2	241.460	31.85	-14.15	46.00	46.64	12.71	3.02	30.52	Peak	---	---
3	291.900	25.52	-20.48	46.00	38.93	13.59	3.42	30.42	Peak	---	---
4	649.830	28.77	-17.23	46.00	33.50	19.51	5.16	29.40	Peak	---	---
5	800.180	28.93	-17.07	46.00	32.16	20.27	5.50	29.00	Peak	---	---
6	971.870	30.80	-23.20	54.00	31.32	21.80	6.09	28.41	Peak	---	---

**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	40.670	33.86	-6.14	40.00	50.32	13.01	1.37	30.84	Peak	---	---
2	206.540	25.47	-18.03	43.50	41.61	11.57	2.88	30.59	Peak	---	---
3	218.180	29.50	-16.50	46.00	45.17	11.95	2.94	30.56	Peak	---	---
4	637.220	27.58	-18.42	46.00	32.28	19.68	5.07	29.45	Peak	---	---
5	800.180	28.99	-17.01	46.00	32.22	20.27	5.50	29.00	Peak	---	---
6	832.190	29.19	-16.81	46.00	32.38	20.19	5.52	28.90	Peak	---	---

**Note:**

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

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

**5. LIST OF MEASURING EQUIPMENTS**

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Characteristics</b>	<b>Calibration Date</b>	<b>Remark</b>
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Mar. 03, 2008	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2008	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2008	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2008	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN ST08	21653	9kHz – 30MHz	Mar. 27, 2008	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)

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

<b>Instrument</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Characteristics</b>	<b>Calibration Date</b>	<b>Remark</b>
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz - 40GHz	Jan. 10, 2008	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz - 2 GHz	Dec. 22, 2007	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB020	30 MHz - 1 GHz	Dec. 08, 2007	Radiation (03CH02-HY)
Amplifier	Agilent	8449B	3008A02373	1GHz – 26.5 GHz	Jul. 16, 2008	Radiation (03CH02-HY)


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



**6. TEST LOCATION**

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 <sup>nd</sup> Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

## 7. TAF CERTIFICATE OF ACCREDITATION

  
財團法人全國認證基金會  
Taiwan Accreditation Foundation

Certificate No. : L1190-070110


## Certificate of Accreditation

This is to certify that

**Sporton International Inc.**  
**EMC & Wireless Communications Laboratory**  
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,  
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	: ISO/IEC 17025:2005
Accreditation Number	: 1190
Originally Accredited	: December 15, 2003
Effective Period	: January 10, 2007 to January 09, 2010
Accredited Scope	: Testing Field, see described in the Appendix
Specific Accreditation Program	: Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory

  
Jay-San Chen  
President, Taiwan Accreditation Foundation  
Date : January 10, 2007

PI, total 9 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when used without the Appendix.