

FCC TEST REPORT

according to

**47 CFR FCC Rules and Regulations Part 15 Subpart B,
Class A Digital Device**

Equipment : In Vehicle Computer

Model No. : VBOX-3200-XXXXX

FCC ID : N/A

Filing Type : Verification

Applicant : **SINTRONES TECHNOLOGY CORP.**
14F.-3, No.736, Zhongzheng Rd., Zhonghe Dist.,
New Taipei City 235, Taiwan

Statement

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- Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by TAF or any agency of U.S. government.

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

Report No.	Version	Issue Date	Description
FV190775	Rev.01	Sep. 22, 2011	Initial issue of report

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Rules and Regulations Part 15 Subpart B,

Class A Digital Device

Equipment : In Vehicle Computer

Model No. : VBOX-3200-XXXXX

FCC ID : N/A

Applicant : **SINTRONES TECHNOLOGY CORP.**
14F.-3, No.736, Zhongzheng Rd., Zhonghe Dist.,
New Taipei City 235, Taiwan

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 2003** and the energy emitted by this equipment was **passed FCC Part 15 Subpart B** in both radiated and conducted emission **Class A** limits.

The test was carried out on **Sep. 14, 2011** at **SPORTON International Inc.** LAB.


Castries Huang
Supervisor

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

SINTRONES TECHNOLOGY CORP.

14F.-3, No.736, Zhongzheng Rd., Zhonghe Dist., New Taipei City 235, Taiwan

1.2. Manufacturer

Same as 1.1

1.3. Basic Description of Equipment under Test

Equipment	: In Vehicle Computer
Model No.	: VBOX-3200-XXXXX
Trade Name	: SINTRONES
RJ45 Cable x 2	: Non-Shielded, 20 m
12V/GND/DO1/DI1 Cable	: Non-Shielded, 0.8 m
D23/DO2/DI2/DI4 Cable	: Non-Shielded, 0.8 m
GPS antenna cable	: B-Shielded, 5.0 m
Data Cable Type	: Please see section 2.2 of this test report for details
Power Supply Type	: From Battery
AC Power Cord	: N/A

1.4. Feature of Equipment under Test

Please refer to user manual.

2. Test Configuration of Equipment under Test

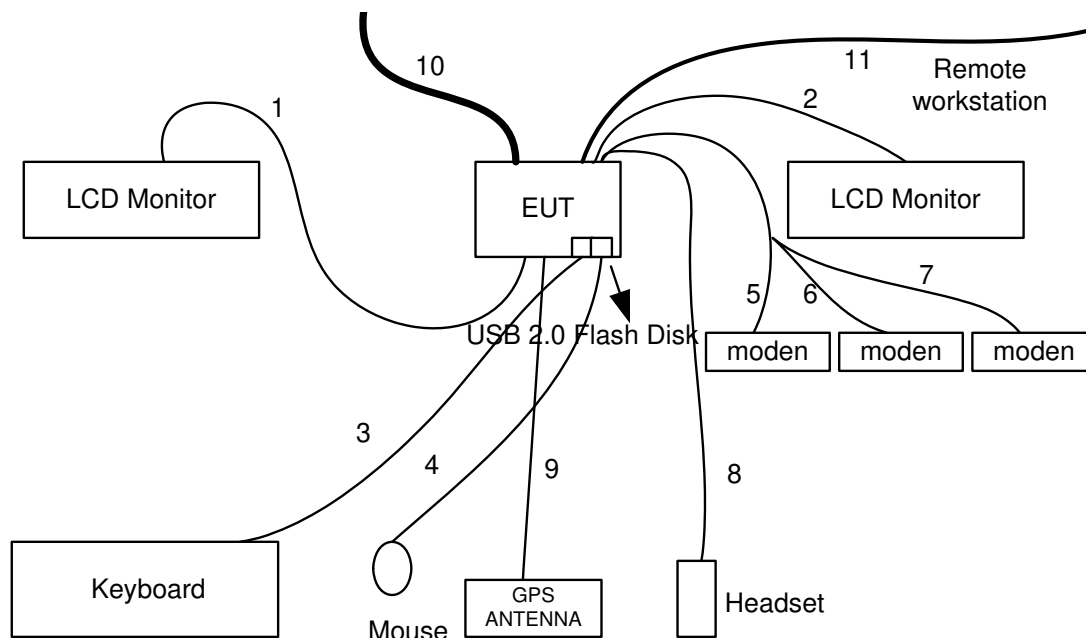
2.1. Test Manner

- a. During testing, the personal computer and equipment positions were varied according to ANSI C63.4-2003 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The complete test system included remote workstation, LCD Monitor, Keyboard, Mouse, Modem, USB2.0 Flash Disk, Headset, Battery and EUT for EMI test. The remote workstation included PC, LCD Monitor, Keyboard and Mouse.
- c. The following test modes were performed for Radiated Emissions test:
Mode 1. 12VDC + DVI+DSUB:1920*1200+LAN 1G*2, WIFI+3G+GPS
Mode 2. 24VDC + DVI+DSUB:1920*1200+LAN 1G*2, WIFI+3G+GPS
cause "mode 2" generated the worst test result; it was reported as final data.
- d. Frequency range investigated: Radiation 30 MHz to 9,000 MHz.

2.2. Description of Test System

No.	Peripheral	Manufacturer	Model Number	FCC ID	Cable / Spec. Description	Placed
1	LCD Monitor x 2	DELL	2408WFPB	DoC	D-SUB Cable, D-Shielded, 1.8m DVI Cable, D-Shielded, 1.8m	Local
2	USB Keyboard	DELL	SK-8175	DoC	USB Cable, AL-F-Shielded, 1.8m	Local
3	USB Mouse	DELL	MOC5UO	DoC	USB Cable, AL-F-Shielded, 1.8m	Local
4	Modem x 3	ACEEX	DM1414	IFAXDM1414	RS-232 Cable, D-Shielded, 1.15m	Local
5	USB2.0 Flash Disk x 2	ADATA	PD4	DoC	USB Cable, D-Shielded, 0.5m	Local
6	Headset	i-Acon	HOH-323-BK	N/A	Audio Cable, Non-Shielded, 2.0m	Local
7	Battery x 2	GS	GTH60S	N/A	12V45AH	Local
8	Personal Computer x 2	DELL	DCTA	DoC	N/A	Remote
9	LCD Monitor x 2	DELL	E198WFPf	DoC	D-SUB Cable, D-Shielded, 1.8m	Remote
10	PS/2 Keyboard x 2	BTC	9110	E5XKB9110	PS/2 Cable, AL-F-Shielded, 1.75m	Remote
11	PS/2 Mouse x 2	LOGITECH	M-S34	DZL211029	PS/2 Cable, Non-Shielded, 1.8m	Remote

2.3. Connection Diagram of Test System



1. The DVI cable is connected from the EUT to the support unit 1.
 2. The D-SUB cable is connected from the EUT to the support unit 1.
 3. The I/O cable is connected from the EUT to the support unit 2.
 4. The I/O cable is connected from the EUT to the support unit 3.
 5. The I/O cable is connected from the EUT to the support unit 4.
 6. The I/O cable is connected from the EUT to the support unit 4.
 7. The I/O cable is connected from the EUT to the support unit 4.
 8. The I/O cable is connected from the EUT to the support unit 6.
 9. This is GPS antenna cable.
 10. These cables (included 12V/GND/DO1/DI1/D23/DO2/DI2/DI4) are floating.
 11. These RJ45 cables are connected from the EUT to the remote workstation.
- Note: Above support unit on behalf of the meaning, please refer to section 2.2.

3. Test Software

Two executive programs, EMCTEST.EXE & EMI PROGRAM.EXE under WIN 7, which generate a complete line of continuously repeating " H " pattern were used as the test software.

The programs were executed as follows:

- a. Turn on the power of all equipment.
- b. The PC reads the test program from the hard disk drive and runs it.
- c. The PC sends scrolling "H" pattern to the monitor, and the monitor displays scrolling "H" patterns on the screen.
- d. The PC sends "H" messages to the printer, and then the printer prints them on the paper.
- e. The PC sends signal messages to the modem.
- f. The PC sends signal messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
- g. Repeat the steps from c to f.

At the same time, the following programs were executed:

Executed " Ping.exe " to link with the remote workstation to receive and transmit data by RJ45 cable.

Executed " Media player " to play audio.

Executed " GPS View EN3.1 " to keep searching GPS signals.

Executed " Winthrax.exe " to read and write data from EUT.

4. General Information of Test

4.1. Test Facility

Test Site : SPORTON INTERNATIONAL INC.
Test Site Location : No. 3, Lane 238, Kang Lo Street, Nei Hwu District, Taipei 11424, Taiwan, R.O.C.
TEL : 886-2-2631-4739
FAX : 886-2-2631-9740
Test Site No. : OS01-NH
Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
TEL : 886-3-327-3456
FAX : 886-3-318-0055
Test Site No. : 03CH04-HY

4.2. Test Voltage

DC 12V, 24V

4.3. Measurement Procedure

ANSI C63.4-2003

4.4. Test in Compliance with

FCC Rules and Regulations Part 15 Subpart B
15.109 Radiated Emission

4.5. Frequency Range Investigated

Radiated emission test: from 30 MHz to 9,000 MHz

4.6. Test Distance

- a. The test distance of radiated emission test from antenna to EUT is 10 M (from 30MHz~1000MHz).
- b. The test distance of radiated emission test from antenna to EUT is 3 M (from 1GHz~9GHz).

5. Test of Conducted Powerline

The power supply of this EUT is Battery.

Conduction Powerline tests is not applicable for this EUT.

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 9,000 MHz were measured with a bandwidth of 120 kHz for 30 MHz to 1000 MHz and 1 MHz for above 1GHz according to the methods defines in ANSI C63.4-2003. 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. Description of Major Test Instruments

6.1.1. For Below 1GHz

- Amplifier (HP 8447D)
 - RF Gain 25 dB
 - Signal Input 0.1 MHz - 1.3 GHz

- Spectrum Analyzer (R&S FSP)
 - Attenuation 10 dB
 - Start Frequency 30 MHz
 - Stop Frequency 1000 MHz
 - Resolution Bandwidth 120 kHz
 - Signal Input 9 kHz - 7 GHz

- Test Receiver (R&S ESCS 30)
 - Resolution Bandwidth 120 kHz
 - Frequency Band 9 kHz - 2.75 GHz
 - Quasi-Peak Detector ON for Quasi-Peak Mode
OFF for Peak Mode

6.1.2. For above 1GHz

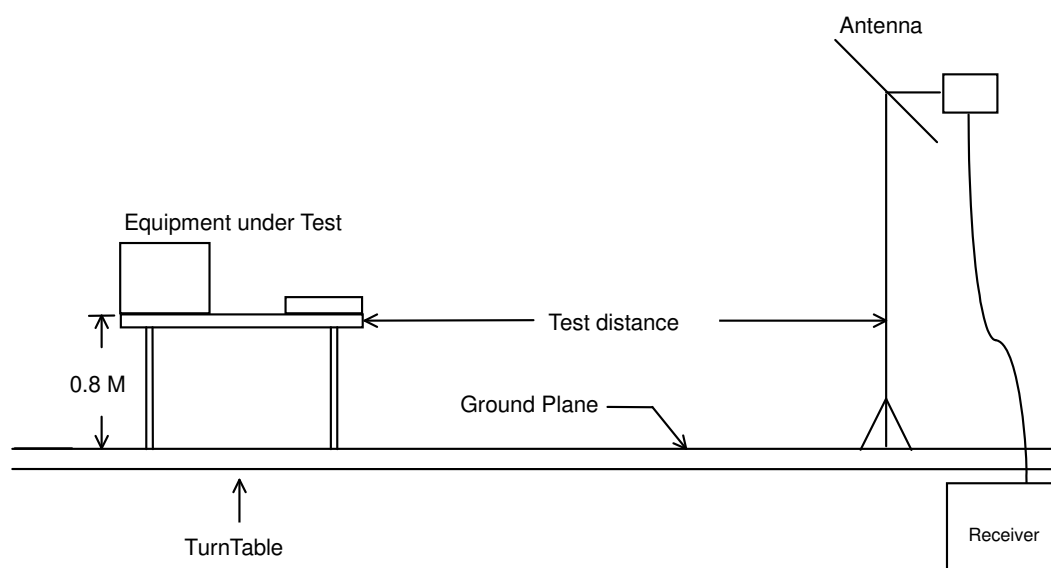
- Amplifier (AGILENT 8449B)
 - RF Gain 35 dB
 - Signal Input 1 GHz - 26.5 GHz

- Spectrum Analyzer (R&S FSP40)
 - Attenuation 10 dB
 - Start Frequency 1 GHz
 - Stop Frequency 9 GHz
 - Resolution Bandwidth 1 MHz
 - Video Bandwidth 3 MHz
 - Signal Input 9 kHz - 40 GHz

6.2. Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3m(above 1GHz)/10m(below 1GHz) 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. The FCC Part 15.109 (g) permit parties seeking to authorize a digital device to choose to demonstrate that the device complies with either the Part 15 standards or the international standards found in Publication 22 of the International Special Committee on Radio Interference (CISPR).
- i. For testing above 1GHz, the emission level of the EUT in peak mode was 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



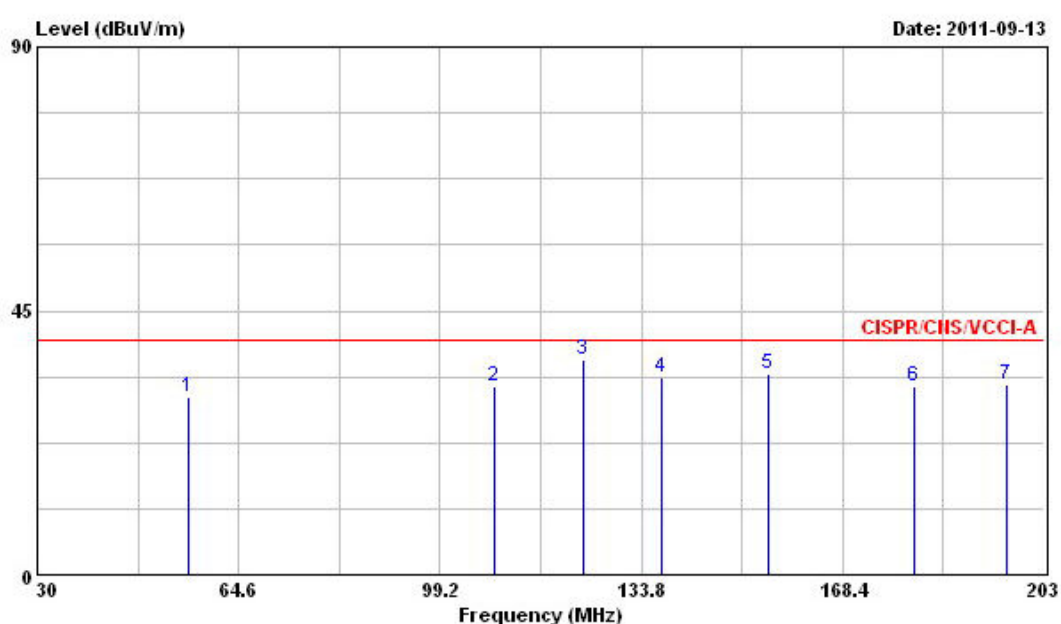
6.4. Test Result of Radiated Emission

Test mode	Mode 2	Test Site No.	OS01-NH
Test frequency	30 MHz ~ 1000 MHz	Test Engineer	Louis
Antenna distance	10 meters	Test Voltage	DC 24V
Temperature	27 °C	Relative Humidity	53 %

Note: 1. Emission level (dBμV/m) = 20 log Emission level (μV/m)

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

■ The test was passed at the minimum margin that marked by the frame in the following data



Site : OS01-NH

Condition : CISPR/CNS/VCCI-A 10m OS01-ANT-01-20-2011 VERTICAL

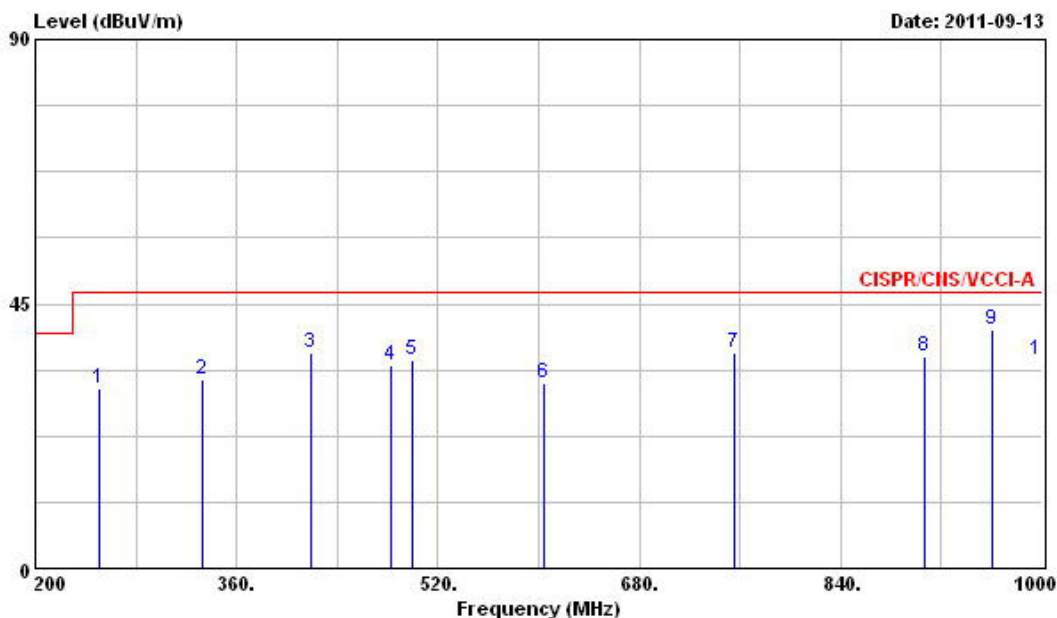
EUT : IPC

POWER : DC 24V

MEMO : DVI+DSUB:1920*1200 60Hz

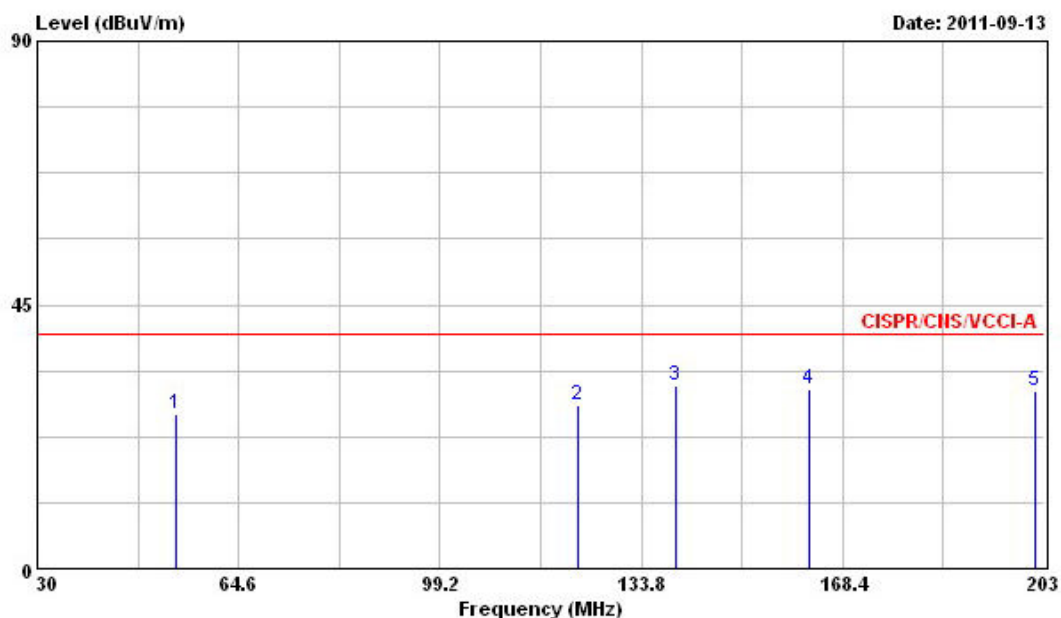
: LAN1,2:1G

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	55.950	30.23	-9.77	40.00	49.33	7.27	1.09	27.46	Peak	---	---
2	108.540	32.23	-7.77	40.00	47.37	10.74	1.44	27.32	Peak	---	---
3	123.770	36.75	-3.25	40.00	50.78	11.71	1.52	27.26	Peak	100	176
4	137.260	33.52	-6.48	40.00	47.40	11.66	1.66	27.20	Peak	---	---
5	155.770	34.30	-5.70	40.00	48.92	10.68	1.82	27.12	Peak	---	---
6	180.680	32.08	-7.92	40.00	48.13	8.99	1.97	27.01	Peak	---	---
7	196.600	32.46	-7.54	40.00	48.43	8.93	2.04	26.94	Peak	---	---



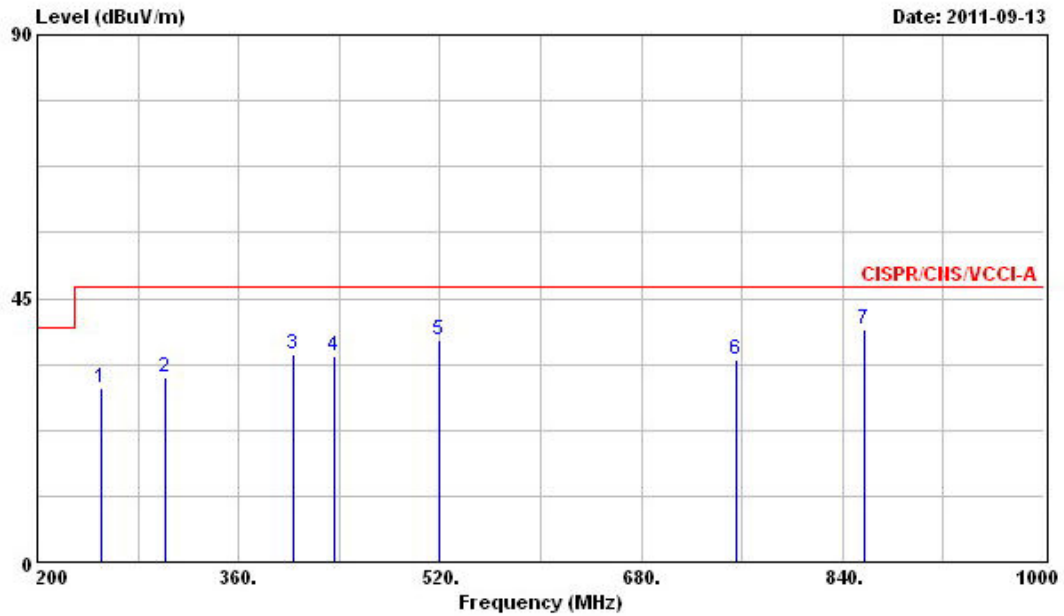
Site : OS01-NH
 Condition : CISPR/CIS/VCCI-A 10m OS01-ANT-01-20-2011 VERTICAL
 EUT : IPC
 POWER : DC 24V
 MEMO : DVI+DSUB:1920*1200 60Hz
 : LAN1,2:1G

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	250.400	30.67	-16.33	47.00	43.06	12.02	2.40	26.81	Peak	---	---
2	332.800	32.08	-14.92	47.00	42.02	14.10	2.91	26.95	Peak	---	---
3	419.200	36.71	-10.29	47.00	44.56	16.41	3.31	27.57	Peak	---	---
4	483.200	34.52	-12.48	47.00	40.78	17.72	3.94	27.92	Peak	---	---
5	499.200	35.32	-11.68	47.00	41.11	18.06	4.16	28.01	Peak	---	---
6	604.800	31.66	-15.34	47.00	35.18	19.94	4.72	28.18	Peak	---	---
7	755.200	36.57	-10.43	47.00	37.56	21.40	5.62	28.01	Peak	---	---
8	906.400	36.08	-10.92	47.00	34.68	23.13	5.97	27.70	Peak	---	---
9	960.000	40.65	-6.35	47.00	37.51	23.94	6.72	27.52	Peak	---	---
10	1000.000	35.58	-11.42	47.00	31.80	24.54	6.62	27.38	Peak	---	---



Site : OS01-NH
 Condition : CISPR/CNS/VCCI-A 10m OS01-ANT-01-20-2011 HORIZONTAL
 EUT : IPC
 POWER : DC 24V
 MEMO : DVI+DSUB:1920*1200 60Hz
 : LAN1,2:1G

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	53.870	26.35	-13.65	40.00	44.95	7.78	1.08	27.46	Peak	---	---
2	122.900	27.99	-12.01	40.00	42.02	11.72	1.51	27.26	Peak	---	---
3	139.680	31.08	-8.92	40.00	44.94	11.65	1.68	27.19	Peak	---	---
4	162.520	30.49	-9.51	40.00	45.58	10.12	1.88	27.09	Peak	---	---
5	201.440	30.20	-9.80	40.00	46.04	9.04	2.05	26.93	Peak	---	---



Site : OS01-NH
 Condition : CISPR/CIS/VCCI-A 10m OS01-ANT-01-20-2011 HORIZONTAL
 EUT : IPC
 POWER : DC 24V
 MEMO : DVI+DSUB:1920*1200 60Hz
 : LAN1,2:1G

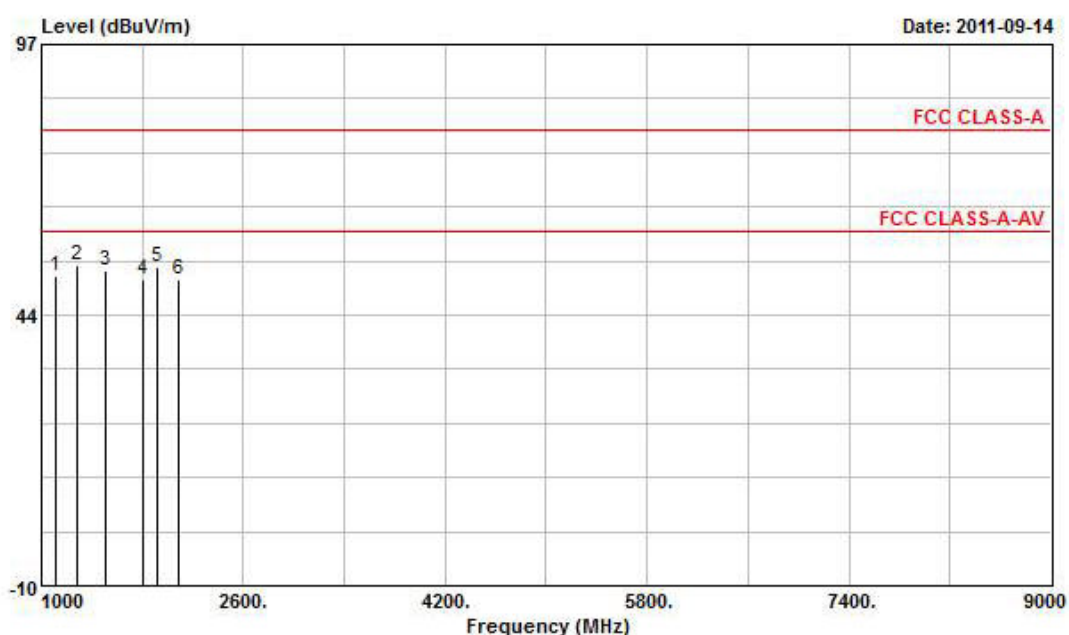
	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	250.400	29.59	-17.41	47.00	41.98	12.02	2.40	26.81	Peak	---	---
2	301.600	31.63	-15.37	47.00	42.39	13.22	2.73	26.71	Peak	---	---
3	403.200	35.32	-11.68	47.00	43.49	16.09	3.22	27.48	Peak	---	---
4	436.000	35.24	-11.76	47.00	42.71	16.77	3.42	27.66	Peak	---	---
5	519.200	37.89	-9.11	47.00	43.37	18.42	4.15	28.05	Peak	---	---
6	756.000	34.66	-12.34	47.00	35.65	21.40	5.62	28.01	Peak	---	---
7	857.600	39.78	-7.22	47.00	39.10	22.68	5.81	27.81	Peak	---	---

Test mode	Mode 2	Test Site No.	03CH04-HY
Test frequency	1000 MHz ~ 9000 MHz	Test Engineer	Kevin
Antenna distance	3 meter	Test Voltage	DC 24V
Temperature	21 °C	Relative Humidity	50 %

Note: 1. Emission level (dB μ V/m) = 20 log Emission level (μ V/m)

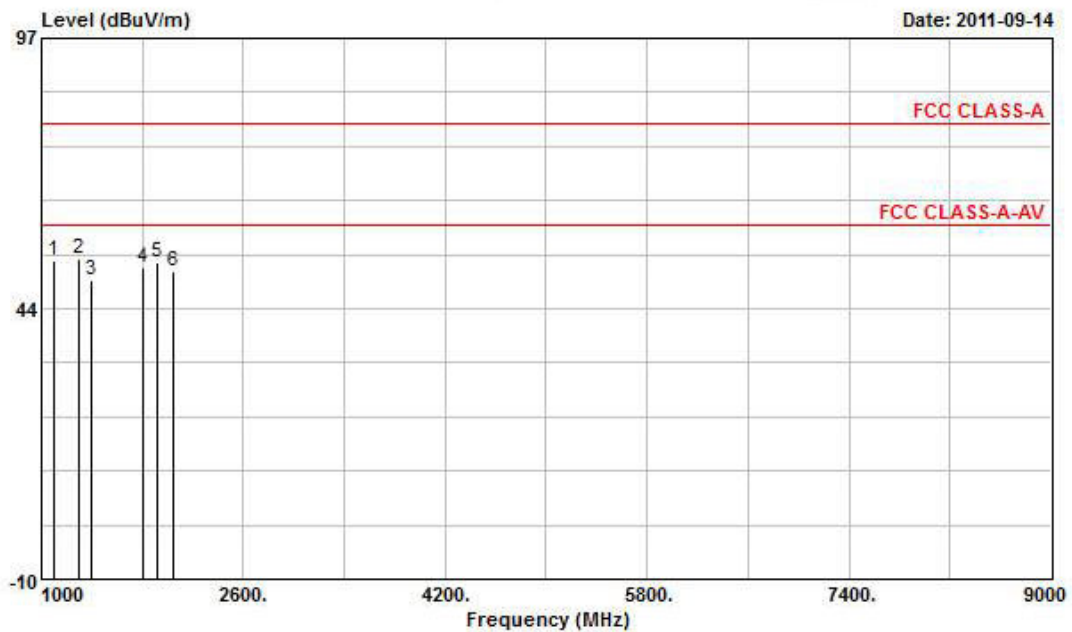
2. Corrected Reading : Antenna Factor + Cable Loss + Read Level – Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following data



Site : 03CH04-HY
Condition: FCC CLASS-A 3m HF-ANT-3117 VERTICAL
EUT :
MODEL :
POWER :
MEMO :

	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	
	MHz	dB μ V/m	Limit	Line	Level	Factor	Factor	Loss	Pos	Pos Remark
			dB	dB μ V/m	dB μ V	dB/m	dB	dB	cm	deg
1	1116.000	51.20	-28.80	80.00	54.67	28.40	34.23	2.36	---	--- Peak
2 @	1276.000	53.45	-26.55	80.00	56.40	28.52	34.02	2.55	100	299 Peak
3	1510.000	52.29	-27.71	80.00	54.39	28.82	33.70	2.79	---	--- Peak
4	1798.000	50.40	-29.60	80.00	50.14	30.86	33.70	3.10	---	--- Peak
5	1918.000	53.15	-26.85	80.00	51.92	31.70	33.70	3.23	---	--- Peak
6	2086.000	50.46	-29.54	80.00	48.41	32.35	33.72	3.41	---	--- Peak



Site : 03CH04-HY
 Condition: FCC CLASS-A 3m HF-ANT-3117 HORIZONTAL
 EUT :
 MODEL :
 POWER :
 MEMO :

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	1100.000	52.87	-27.13	80.00	56.41	28.38	34.26	2.34	---	---	Peak
2	1294.000	53.28	-26.72	80.00	56.18	28.53	33.98	2.55	---	---	Peak
3	1398.000	49.21	-30.79	80.00	51.75	28.62	33.84	2.68	---	---	Peak
4	1798.000	51.66	-28.34	80.00	51.40	30.86	33.70	3.10	---	---	Peak
5	1924.000	52.71	-27.29	80.00	51.48	31.70	33.70	3.23	---	---	Peak
6	2038.000	50.84	-29.16	80.00	48.86	32.32	33.71	3.36	---	---	Peak

6.5. Photographs of Radiated Emission Test Configuration

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

FRONT VIEW



REAR VIEW



7. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Open Area Test Site	SPORTON	OATS-10	OS01-NH	30 MHz - 1 GHz 10m	Nov. 15, 2010	Radiation (OS01-NH)
Amplifier	HP	8447D	2944A06292	0.1 MHz - 1.3 GHz	Apr. 21, 2011	Radiation (OS01-NH)
Spectrum Analyzer	R&S	FSP	838858/038	9 kHz – 7 GHz	Jan. 11, 2011	Radiation (OS01-NH)
Receiver	R&S	ESCS 30	100167	9 kHz - 2.75 GHz	Aug. 04, 2011	Radiation (OS01-NH)
Bilog Antenna	SCHAFFNER	CBL6111C	2738	30 MHz - 1 GHz	Jan. 17, 2011	Radiation (OS01-NH)
Turn Table	EMCO	1060-1.211	9507-1805	0 - 360 degree	N/A	Radiation (OS01-NH)
Antenna Mast	EMCO	1051-1.2	9503-1876	1 m - 4 m	N/A	Radiation (OS01-NH)
RF Cable-R10m	BELDEN	RG8/U	CB001	30 MHz - 1 GHz	Nov. 14, 2010	Radiation (OS01-NH)
Spectrum Analyzer	R&S	FSP40	100004	9 kHz - 40GHz	Nov. 17, 2010	Radiation
Amplifier	Agilent	8449B	3008A02326	1GHz - 26.5 GHz	Mar. 08, 2011	Radiation
RF Cable-HIGH	SUHNER	SUCOFLEX 106	CB063-HF	1 GHz - 40 GHz	Nov. 24, 2010	Radiation
Horn Antenna	ETS	3117	00075954	1GHz - 18GHz	Sep. 28, 2010	Radiation

8. Uncertainty of Test Site

Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of \bar{x}_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.17	Normal(k=2)	0.09
Antenna factor calibration	0.96	Normal(k=2)	0.48
Cable loss calibration	0.19	Normal(k=2)	0.10
Pre Amplifier Gain calibration	0.21	Normal(k=2)	0.11
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.76	Rectangular	1.02
Mismatch	+0.36/-0.38	U-shaped	0.26
combined standard uncertainty Uc(y)	1.40		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.80		

APPENDIX A. Photographs of EUT

















