FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.239

Equipment	:	**PND**
Model No.	:	**81XX**
Brand Name	:	**NAVIGON**
Filing Type	:	**New Application**
Applicant	:	**NAVIGON AG** Berliner Platz 11 D-97080 Würzburg Germany
FCC ID	:	**VIL-81XX**
Manufacturer	:	**Compal Communications (Nanjing) Co., Ltd.** No.68-2, Suyuan Road, Export Processing Zone (South Area). Nanjing China Post:211100
Received Date	:	Feb. 14, 2008
Final Test Date	:	Feb. 26, 2008

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.

Testing Laboratory
1190
ILAC MRA

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 Issue Date: Mar. 04, 2008

Report No.: FR821408ZD

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 15 Subpart C § 15.239

Equipment	:	PND
Model No.	:	81XX
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 Feb. 14, 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, 3.3.08

Wayne Hsu

SPORTON International Inc.

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

1. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
3.1	15.207	AC Power Line Conducted Emissions	Complies	13.02 dB
3.2	15.239(b)	Field Strength of Fundamental Emissions	Complies	9.27 dB
3.3	15.239(a)	20dB Spectrum Bandwidth	Complies	-
3.4	15.239(c)	Radiated Emissions	Complies	16.49 dB
3.5	15.239(c)	Band Edge Emissions	Complies	20.99 dB
3.6	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Field Strength of Fundamental Emissions	±1.9dB	Confidence levels of 95%
20dB Spectrum Bandwidth	$\pm 8.5 \times 10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated / Band Edge Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

2. GENERAL INFORMATION

2.1. Product Details

Items	Description
Modulation	FM
Frequency Range	88 ~ 108MHz
Channel Number	100
Channel Band Width (99%)	170 kHz
Max. Field Strength	38.73 dBuV/m at 3m (Average)
Antenna	PIFA Antenna (Without any antenna connector)

2.2. Navigation device

- Car cradle
- Car charger cable (12V adapter for the vehicle's cigarette lighter)
- Power pack (100-240V)
- USB cable
- SD card with software and navigation cards (the SD card is already inserted in the navigation device)
- Manual
- CD with manuals (PDF; including languages which are not available in printed form) and additional programs (***NAVIGON Fresh*** for updating the software and ***NAVIGON Sync*** for exporting addresses from Microsoft Outlook)
- Cloth pouch

Note:

Accessories	Brand	Model	Rating
SWITCHING POWER SUPPLY	PHIHONG	PSC05R-050CP	INPUT : 100-240V ~0.2A 50-60Hz OUTPUT : 5V 1.0A MAX.
Car Charger	PHIHONG	CLA05D-050A	OUTPUT : 5V

2.3. Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency
88 ~ 108MHz	1	88.1 MHz
	2	88.3 MHz
	:	:
	49	97.7 MHz
	50	97.9 MHz
	51	98.1 MHz
	:	:
	99	107.7 MHz
	100	107.9 MHz

Note: A Carrier frequency is 0.2 MHz per a channel.

2.4. Table for Test Modes

Audio input adjusted to maximize emission for test. 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	Antenna
AC Power Line Conducted Emissions	Normal Link	50	1
Field Strength of Fundamental Emissions 20dB Spectrum Bandwidth	CTX1	1/50/100	1
Radiated Emissions 9kHz~30MHz	CTX1	50	1
Radiated Emissions 30MHz~10th Harmonic	CTX1	1/50/100	1
Band Edge Emissions	CTX1	1/100	1

Note:

CTX1=Continuously transmitting and audio modulating content a range of 100 to 5000 Hz.

CTX2=Continuously transmitting and audio modulating is 1000Hz.

2.5. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH02-HY	SAC	Hwa Ya	101377	IC 4086B-1	-
CO04-HY	Conduction	Hwa Ya	101377	IC 4086B-1	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

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

2.6. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
P.C.	HP	D330uT	N/A
Monitor	Sony	G420	DoC
Keyboard (PS2)	BTC	9110	DoC
Mouse	Microsoft	1004	DoC
Printer	EPSON	LQ300+	DoC
Modem	ACEEX	DM-1414	IFAXDM1414
MIC+Headset	GALAXY	HP-316	DoC

2.7. EUT Operation during Test

<Conduction>

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 P.C. sends " H" messages to the monitor, and the monitor displays " H " patterns on the screen.

The P.C. sends " H " messages to the printer, and then the printer prints them on the paper.

The P.C. sends " H " messages to the modem

<Radiation>

An executive program, EMCTEST.EXE under WIN XP, then NB sends messages to the internal Hard Disk, and the Hard Disk reads and writes the message.

The P.C. sends "H" messages to the panel, and the panel displays "H "patterns on the screen.

The P.C. sends " H " messages to the modem

Executed "Media player" to play audio and video.

Executed "BT TEST Tool" to keep transmitting signals at fixed frequency.

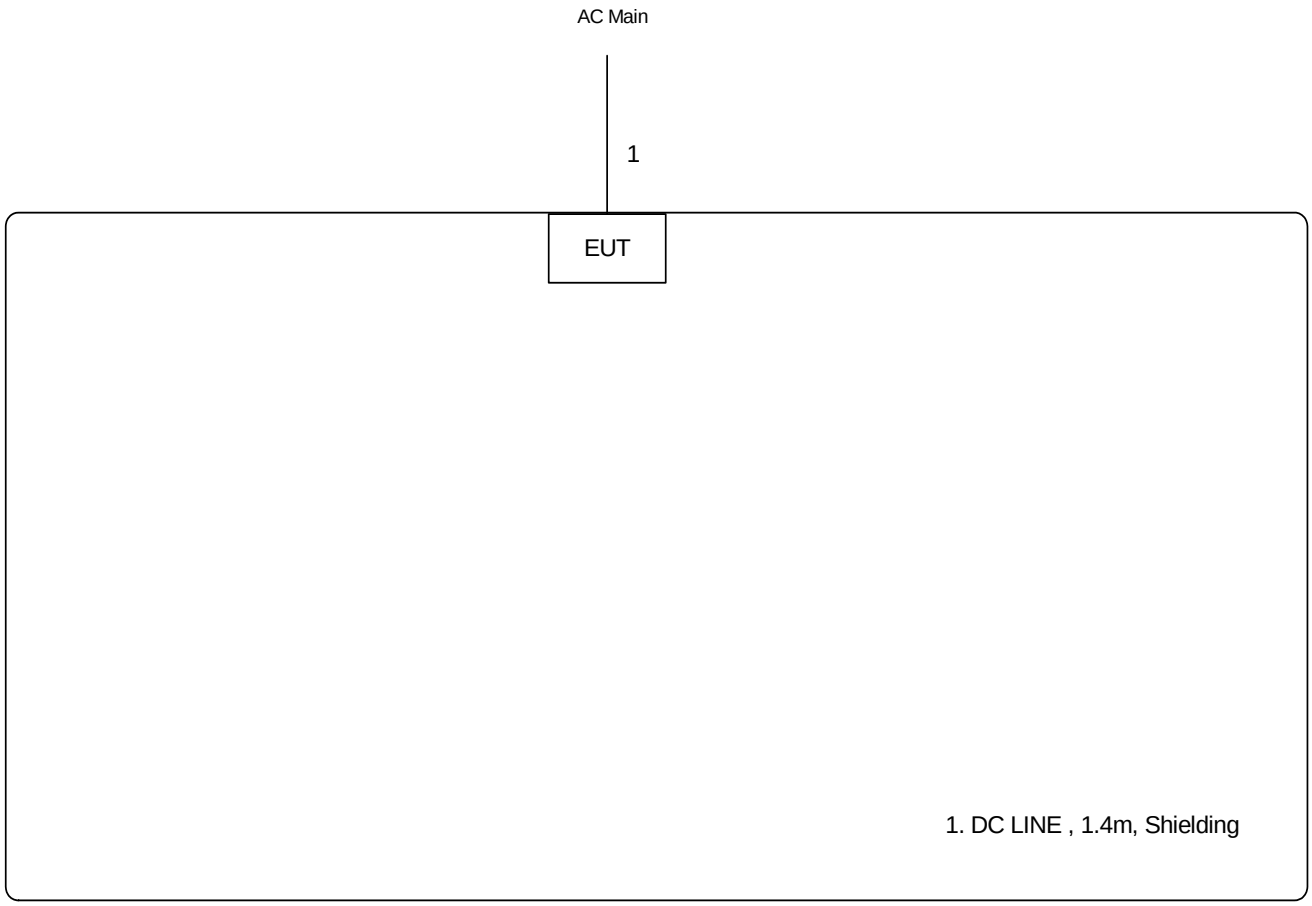
<RF>

Executed "NH5 Diagnostic v3.004" to keep transmitting signals at fixed frequency.

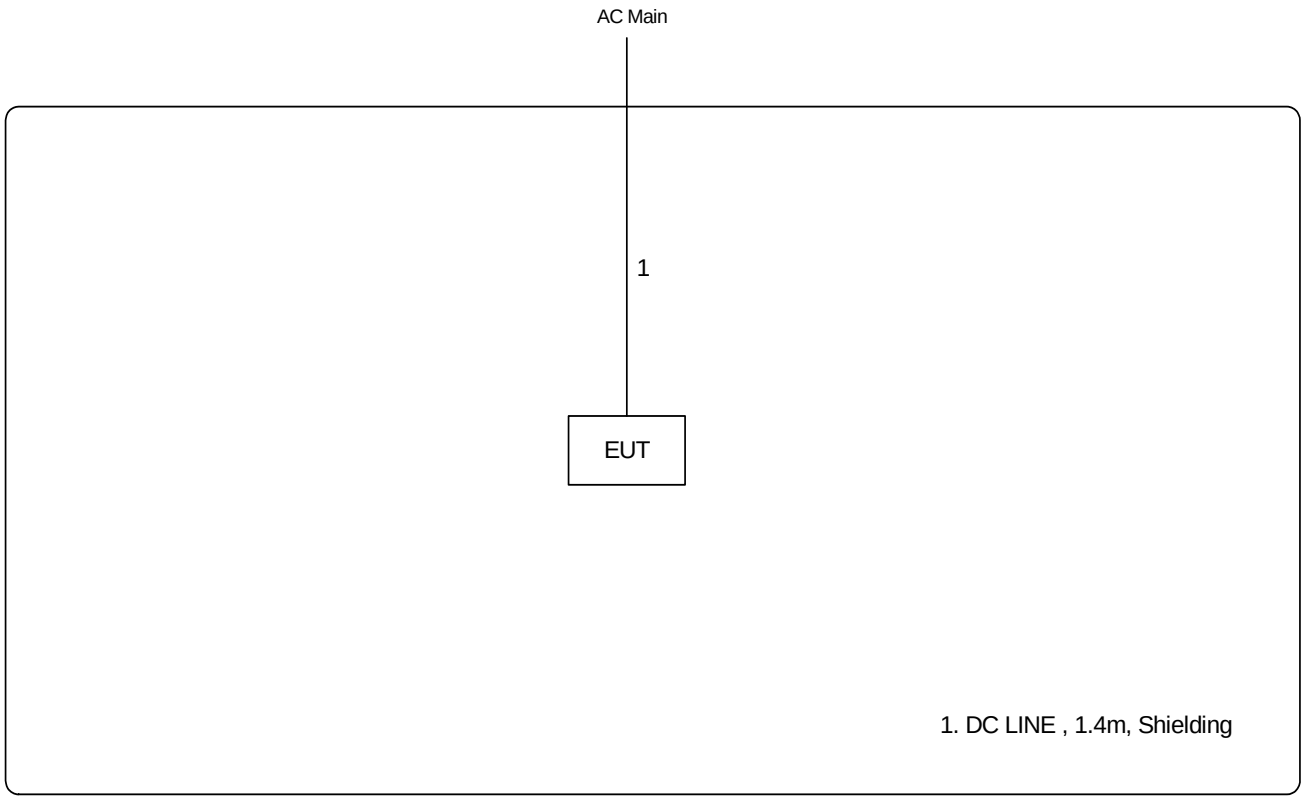
2.8. Test Configurations

2.8.1. Radiation Emissions Test Configuration

For radiated emissions 9kHz~1GHz



For radiated emissions above 1GHz



3. TEST RESULT

3.1. AC Power Line Conducted Emissions Measurement

3.1.1. 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

3.1.2. Measuring Instruments and Setting

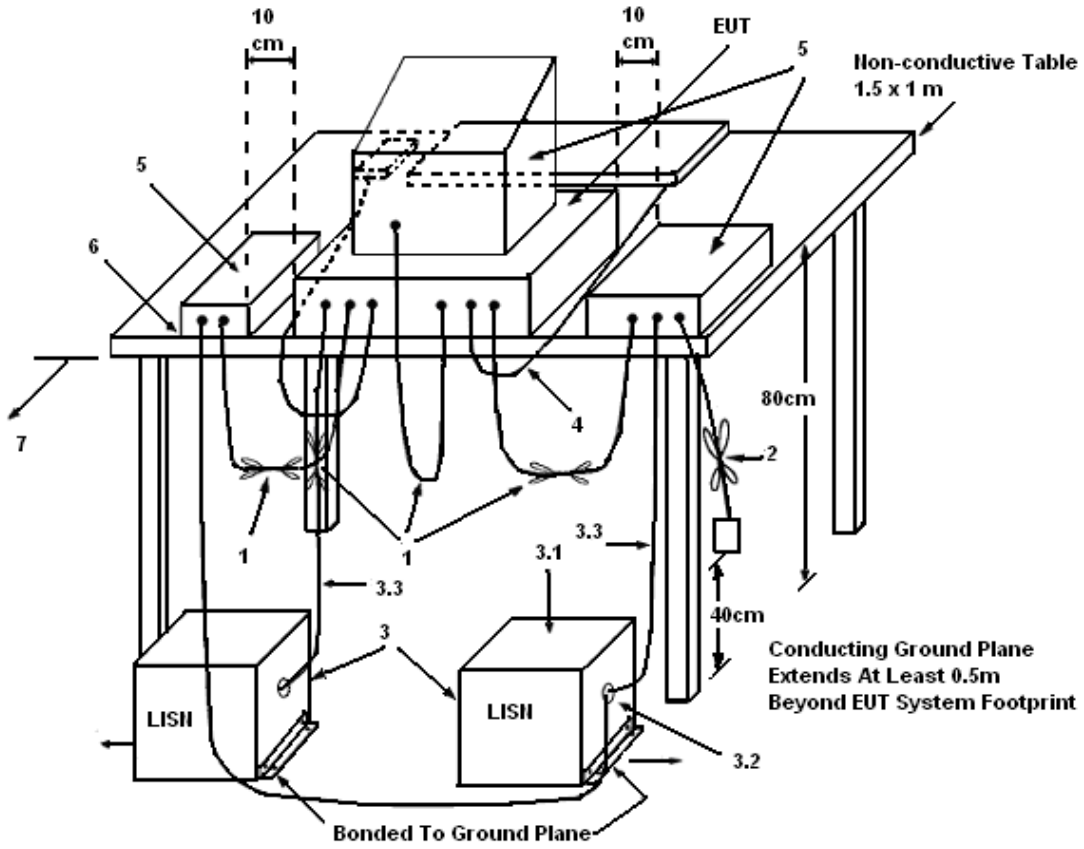
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

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

3.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. 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.

3.1.4. 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 Ω. 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.

3.1.5. Test Deviation

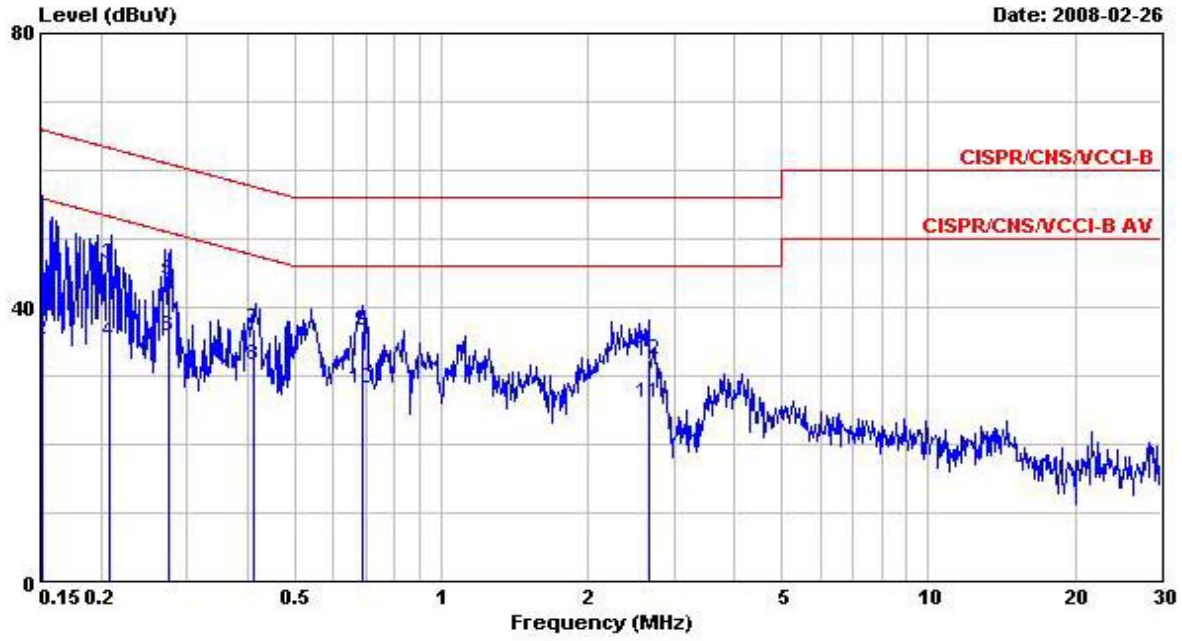
There is no deviation with the original standard.

3.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

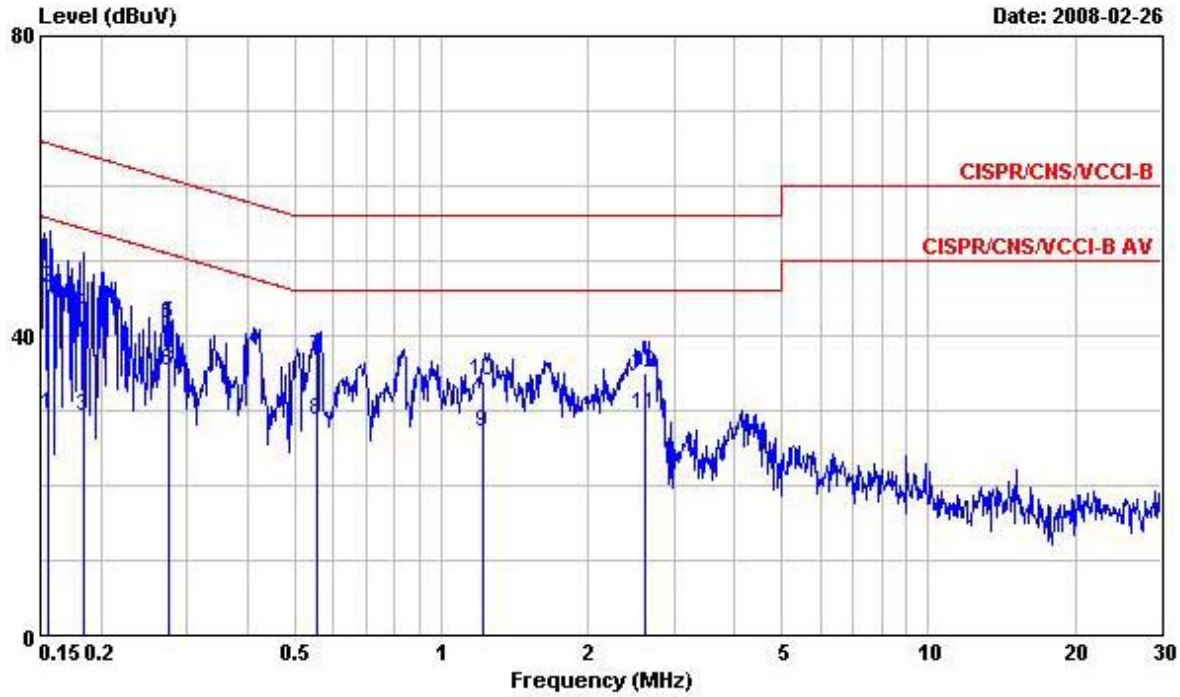
3.1.7. Results of AC Power Line Conducted Emissions Measurement

Test date	Feb. 26, 2008	**Test Site No.**	CO04-HY
Temperature	25℃	**Humidity**	55%
Test Engineer	Chris	**Phase**	Line
Configuration	GPS+FM+ISM+BT+Audio+Charger Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1507970	49.28	-16.68	65.96	49.04	0.10	0.14	QP
2	0.1507970	35.15	-20.81	55.96	34.91	0.10	0.14	Average
3	0.2079310	46.28	-17.01	63.29	46.01	0.10	0.17	QP
4	0.2079310	34.90	-18.39	53.29	34.63	0.10	0.17	Average
5	0.2742820	43.86	-17.13	60.99	43.35	0.10	0.41	QP
6	0.2742820	35.70	-15.29	50.99	35.19	0.10	0.41	Average
7	0.4116280	36.96	-20.66	57.62	36.14	0.10	0.72	QP
8	0.4116280	31.54	-16.08	47.62	30.72	0.10	0.72	Average
9	0.6886230	36.68	-19.32	56.00	36.02	0.10	0.56	QP
10	0.6886230	28.13	-17.87	46.00	27.47	0.10	0.56	Average
11	2.660	26.15	-19.85	46.00	25.66	0.10	0.39	Average
12	2.660	32.43	-23.57	56.00	31.94	0.10	0.39	QP

Test date	Feb. 26, 2008	**Test Site No.**	CO04-HY
Temperature	25℃	**Humidity**	55%
Test Engineer	Chris	**Phase**	Neutral
Configuration	GPS+FM+ISM+BT+Audio+Charger Mode		

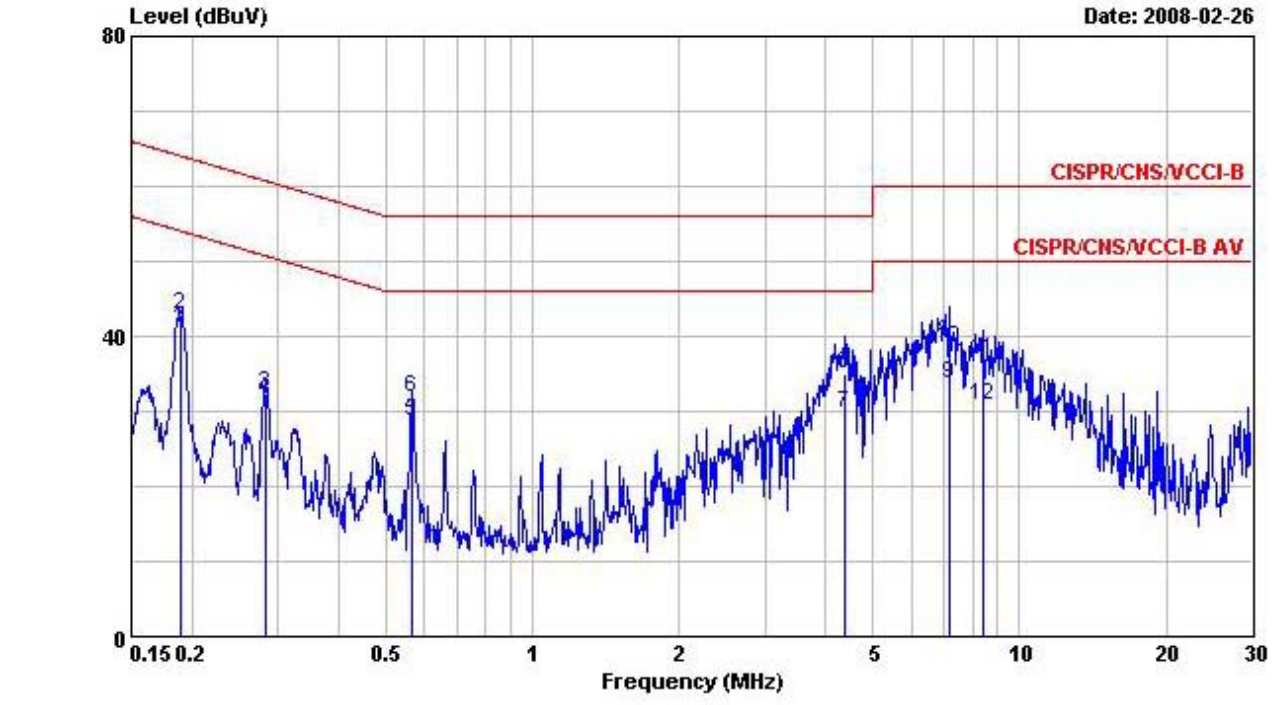


	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1560460	29.59	-26.08	55.67	29.35	0.10	0.14	Average
2	0.1560460	46.33	-19.34	65.67	46.09	0.10	0.14	QP
3	0.1834550	29.28	-25.05	54.33	29.04	0.10	0.14	Average
4	0.1834550	42.82	-21.51	64.33	42.58	0.10	0.14	QP
5	0.2745930	41.66	-19.32	60.98	41.15	0.10	0.41	QP
6	0.2745930	35.31	-15.67	50.98	34.80	0.10	0.41	Average
7	0.5553810	37.04	-18.96	56.00	36.31	0.10	0.63	QP
8	0.5553810	28.60	-17.40	46.00	27.87	0.10	0.63	Average
9	1.220	27.23	-18.77	46.00	26.69	0.10	0.44	Average
10	1.220	33.84	-22.16	56.00	33.30	0.10	0.44	QP
11	2.620	29.49	-16.51	46.00	28.96	0.14	0.39	Average
12	2.620	35.05	-20.95	56.00	34.52	0.14	0.39	QP

Note:

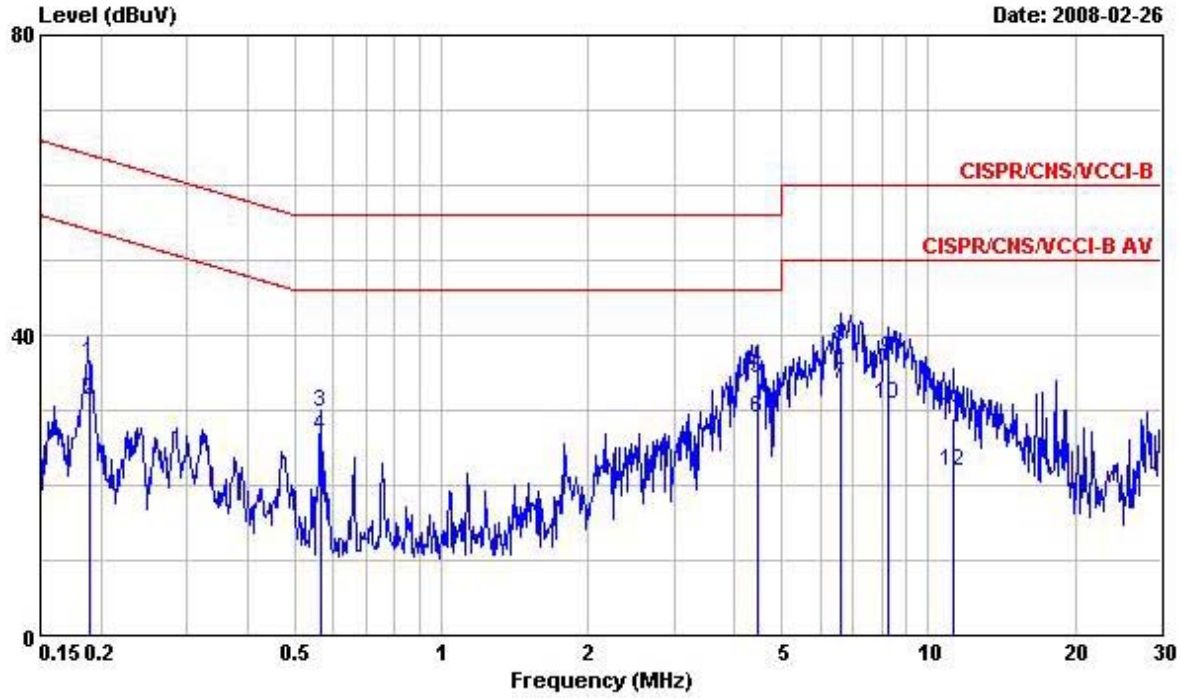
Level = Read Level + LISN Factor + Cable Loss.

Test date	Feb. 26, 2008	**Test Site No.**	CO04-HY
Temperature	25℃	**Humidity**	55%
Test Engineer	Chris	**Phase**	Line
Configuration	USB Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1890070	41.06	-13.02	54.08	40.82	0.10	0.14	Average
2	0.1890070	42.79	-21.29	64.08	42.55	0.10	0.14	QP
3	0.2832790	32.27	-28.45	60.72	31.74	0.10	0.43	QP
4	0.2832790	31.57	-19.15	50.72	31.04	0.10	0.43	Average
5	0.5665310	28.73	-17.27	46.00	28.01	0.10	0.62	Average
6	0.5665310	31.81	-24.19	56.00	31.09	0.10	0.62	QP
7	4.380	29.83	-16.17	46.00	29.41	0.11	0.31	Average
8	4.380	35.06	-20.94	56.00	34.64	0.11	0.31	QP
9	7.180	33.72	-16.28	50.00	33.30	0.16	0.26	Average
10	7.180	38.41	-21.59	60.00	37.99	0.16	0.26	QP
11	8.410	36.76	-23.24	60.00	36.34	0.18	0.24	QP
12	8.410	30.88	-19.12	50.00	30.46	0.18	0.24	Average

Test date	Feb. 26, 2008	**Test Site No.**	CO04-HY
Temperature	25℃	**Humidity**	55%
Test Engineer	Chris	**Phase**	Neutral
Configuration	USB Mode		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1898600	36.21	-27.83	64.04	35.97	0.10	0.14	QP
2	0.1898600	31.37	-22.67	54.04	31.13	0.10	0.14	Average
3	0.5641010	29.75	-26.25	56.00	29.03	0.10	0.62	QP
4	0.5641010	26.45	-19.55	46.00	25.73	0.10	0.62	Average
5	4.450	34.08	-21.92	56.00	33.56	0.21	0.31	QP
6	4.450	28.86	-17.14	46.00	28.34	0.21	0.31	Average
7	6.630	33.45	-16.55	50.00	32.93	0.25	0.27	Average
8	6.630	38.32	-21.68	60.00	37.80	0.25	0.27	QP
9	8.280	36.95	-23.05	60.00	36.43	0.28	0.24	QP
10	8.280	30.81	-19.19	50.00	30.29	0.28	0.24	Average
11	11.260	28.88	-31.12	60.00	28.38	0.30	0.20	QP
12	11.260	21.82	-28.18	50.00	21.32	0.30	0.20	Average

Note:

Level = Read Level + LISN Factor + Cable Loss.

3.2. Field Strength of Fundamental Emissions Measurement

3.2.1. Limit

The field strength of fundamental emissions shall comply with the following table.

Frequency Band (MHz)	Fundamental Emissions Limit (dBuV/m) at 3m
88~108	48 (Average)
88~108	68 (Peak)

3.2.2. Measuring Instruments and Setting

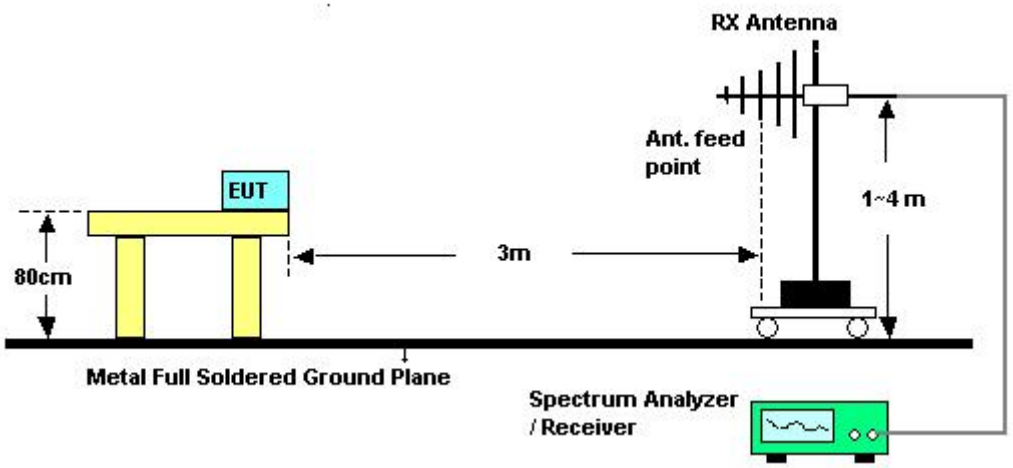
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameter	Setting
Attenuation	Auto
Center Frequency	Fundamental Frequency
RB	120 KHz
Detector	Peak / Average

3.2.3. 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. For Fundamental emissions, use the receiver to measure peak and average reading.
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.

3.2.4. Test Setup Layout



3.2.5. Test Deviation

There is no deviation with the original standard.

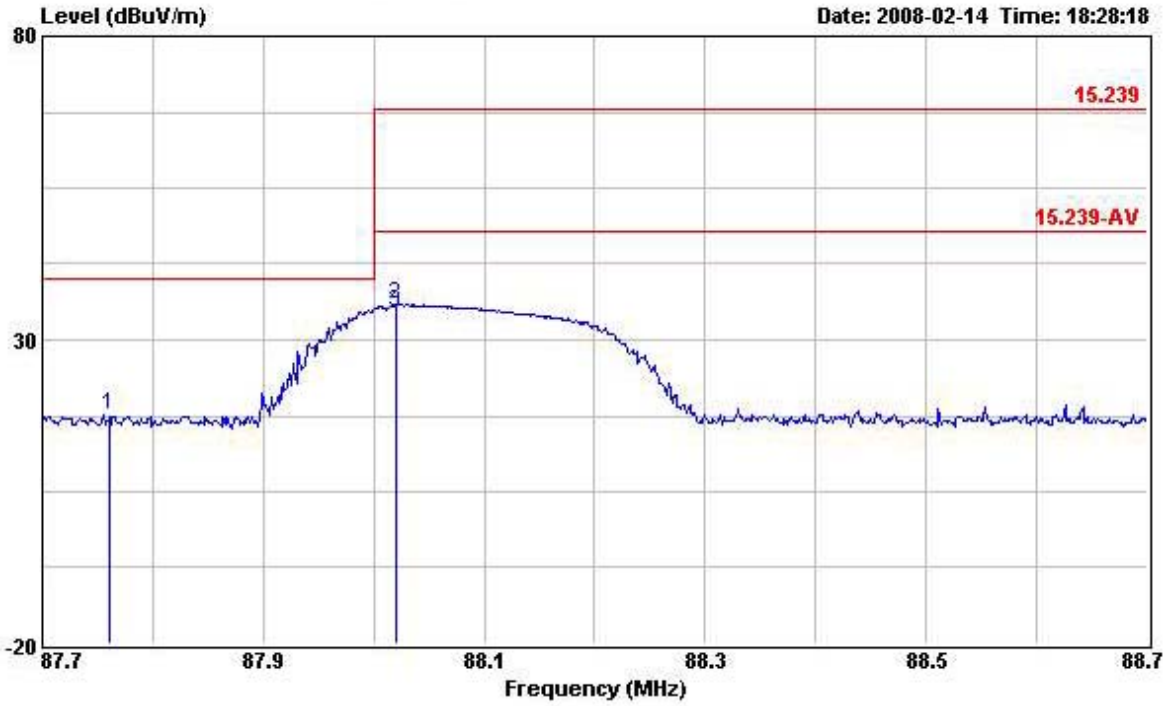
3.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.2.7. Test Result of Field Strength of Fundamental Emissions

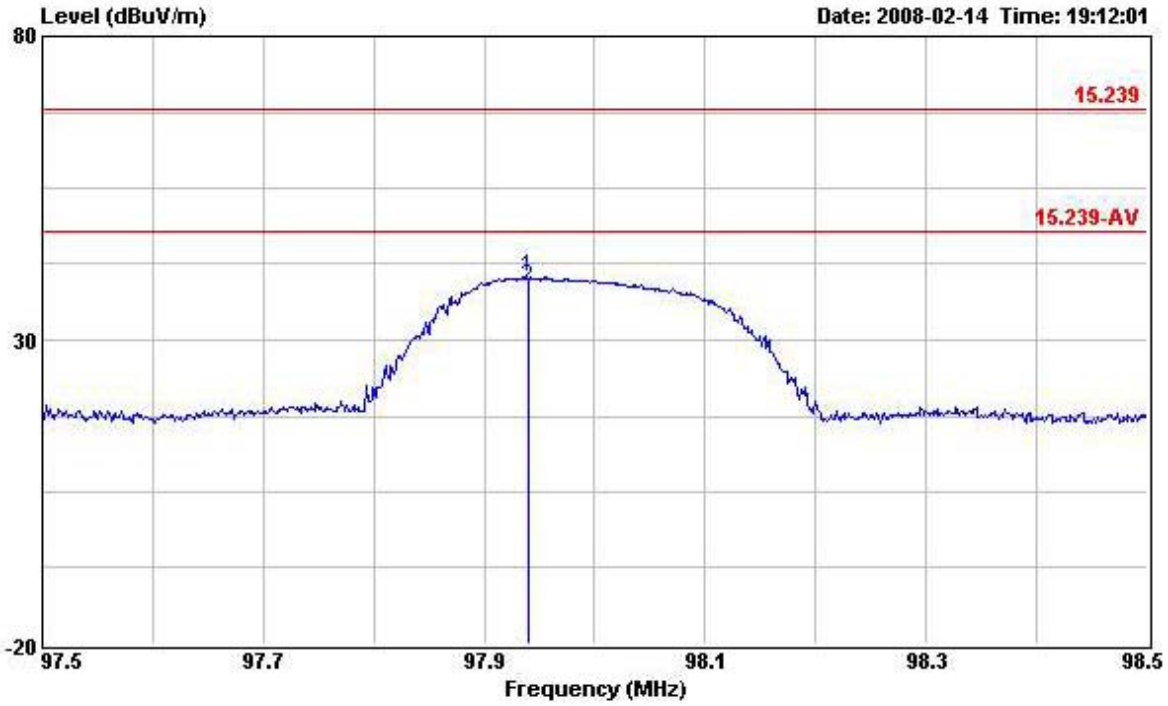
Test date	Feb. 14, 2008	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	Channel 1/50/100

Channel 1



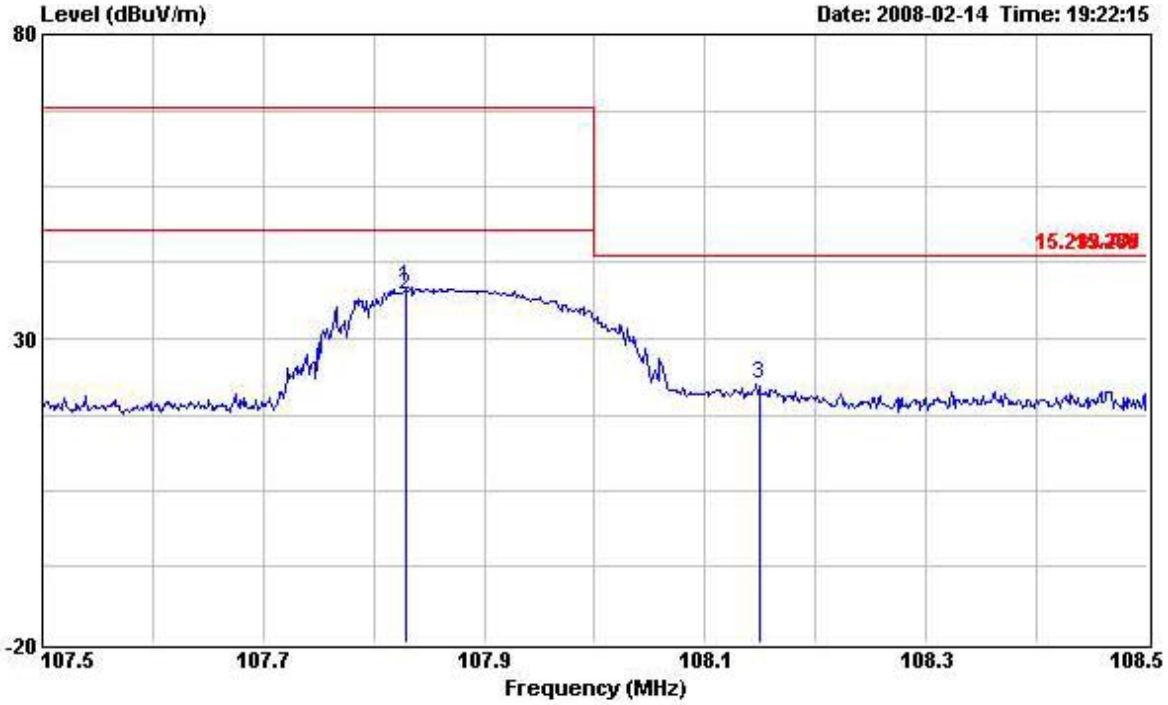
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
2	88.020	35.90	-32.10	68.00	55.70	9.11	30.80	1.89	Peak	---	---
3	88.020	34.64	-13.36	48.00	54.44	9.11	30.80	1.89	Average	---	---

Channel 50



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	97.940	40.38	-27.62	68.00	58.35	10.84	30.80	1.99	Peak	---	---
2	97.940	38.73	-9.27	48.00	56.70	10.84	30.80	1.99	Average	---	---

Channel 100



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	107.830	38.43	-29.57	68.00	55.00	12.11	30.78	2.10	Peak	---	---
2	107.830	37.06	-10.94	48.00	53.63	12.11	30.78	2.10	Average	---	---

Note:

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

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

3.3. 20dB Spectrum Bandwidth Measurement

3.3.1. Limit

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency.

3.3.2. Measuring Instruments and Setting

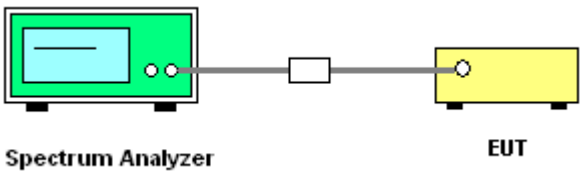
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 20dB Bandwidth
RB	10 kHz
VB	10 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
2. Check for a Bandwidth test with audio input CTX1 (100Hz~5kHz) at maximum.
3. The resolution bandwidth of 10 kHz and the video bandwidth of 10 kHz were used.
4. Measured the spectrum width with power higher than 20dB below carrier.

3.3.4. Test Setup Layout



3.3.5. Test Deviation

There is no deviation with the original standard.

3.3.6. EUT Operation during Test

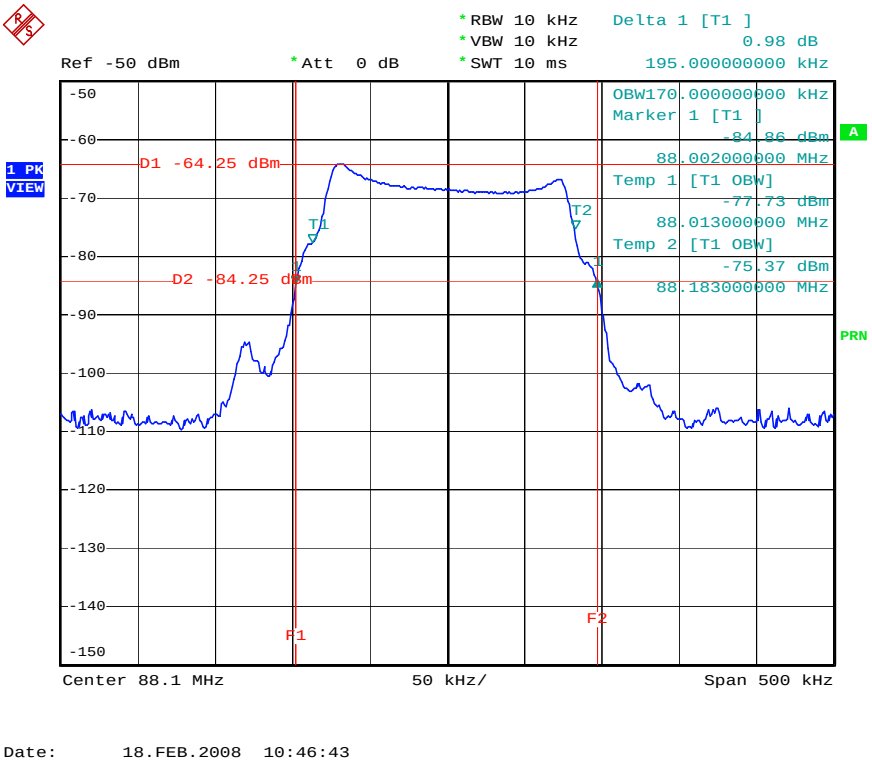
Play music.

3.3.7. Test Result of 20dB Spectrum Bandwidth

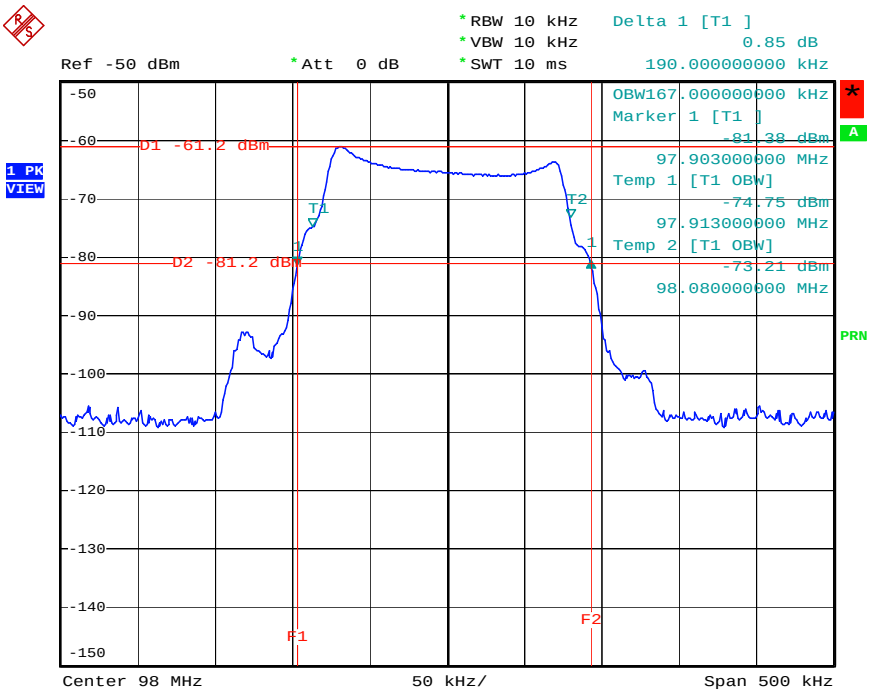
Test date	Feb. 18, 2008	**Test Site No.**	TH01-HY
Temperature	28℃	**Humidity**	58%
Test Engineer	Nan	**Configurations**	Channel 1/50/100

Frequency	**20dB BW (kHz)**	**99% OBW (kHz)**	**Frequency range (MHz) f_L＞88MHz**	**Frequency range (MHz) f_H＜108MHz**	**Test Result**
88.1 MHz	195.00	170.00	88.0020	-	**Complies**
97.9 MHz	190.00	167.00	-	-	**Complies**
107.9 MHz	187.00	162.00	-	107.9910	**Complies**

20 dB/99% Bandwidth Plot on 88.1 MHz

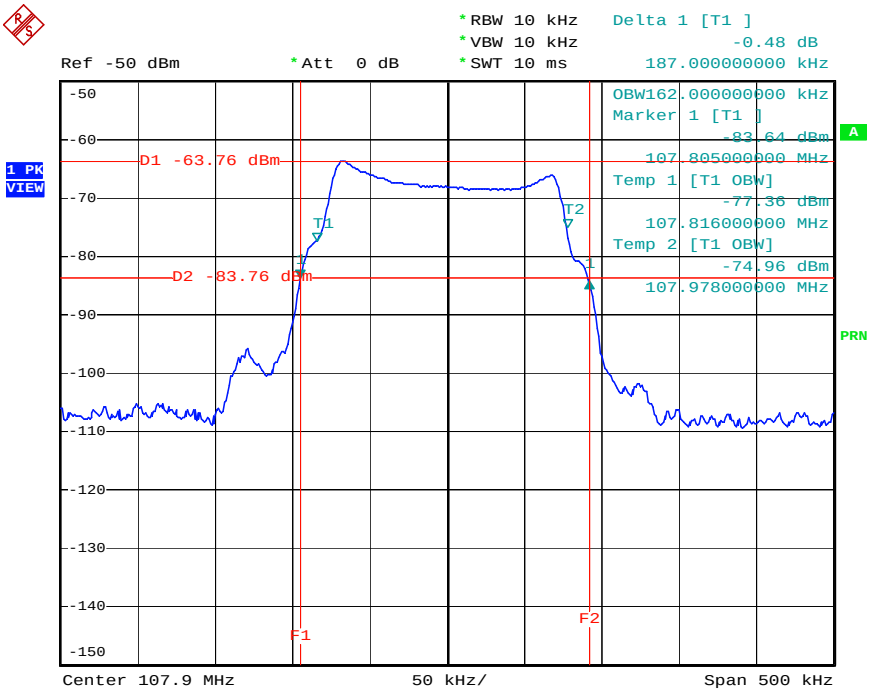


20 dB/99% Bandwidth Plot on 97.9 MHz



Date: 18.FEB.2008 10:45:21

20 dB/99% Bandwidth Plot on 107.9 MHz



Date: 18.FEB.2008 10:43:12

3.4. Radiated Emissions Measurement

3.4.1. Limit

The field strength of any emissions which appear outside of this 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

3.4.2. Measuring Instruments and Setting

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

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

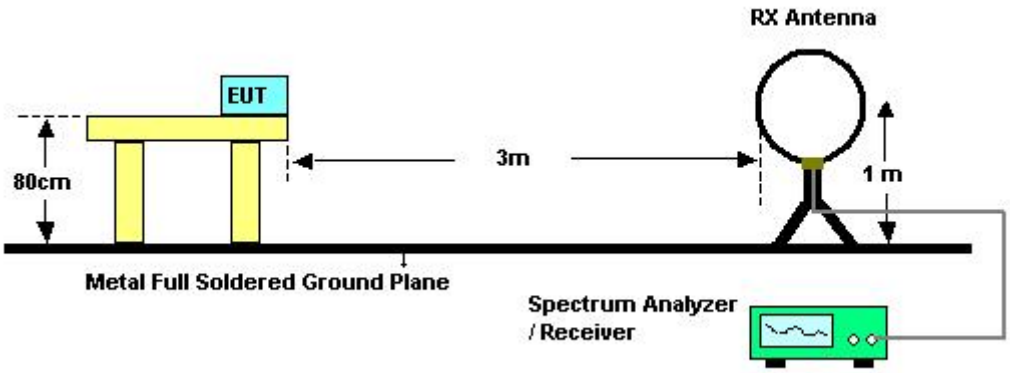
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.4.3. Test Procedures

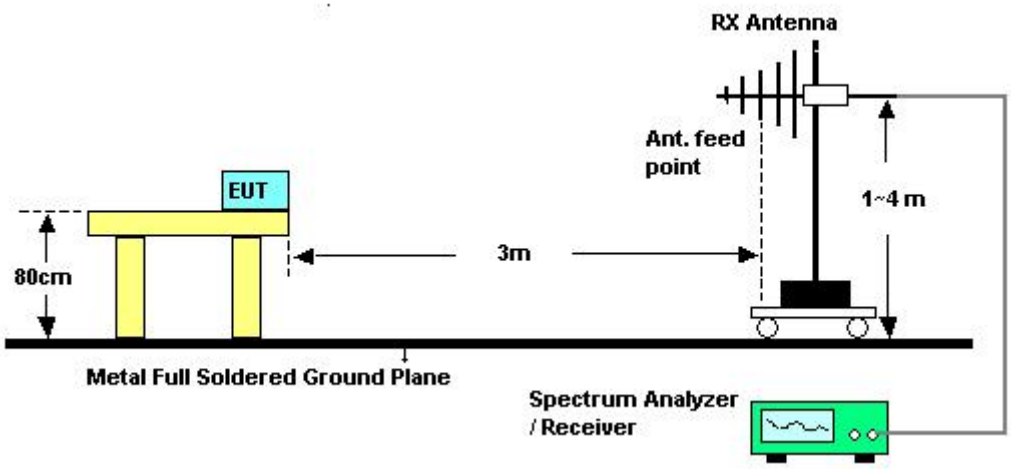
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. Then audio input adjusted to maximize emission for test. 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.
10. 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.

3.4.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



3.4.5. Test Deviation

There is no deviation with the original standard.

3.4.6. EUT Operation during Test

Play music.

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

Test date	Feb. 14, 2008	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Murphy		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	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.

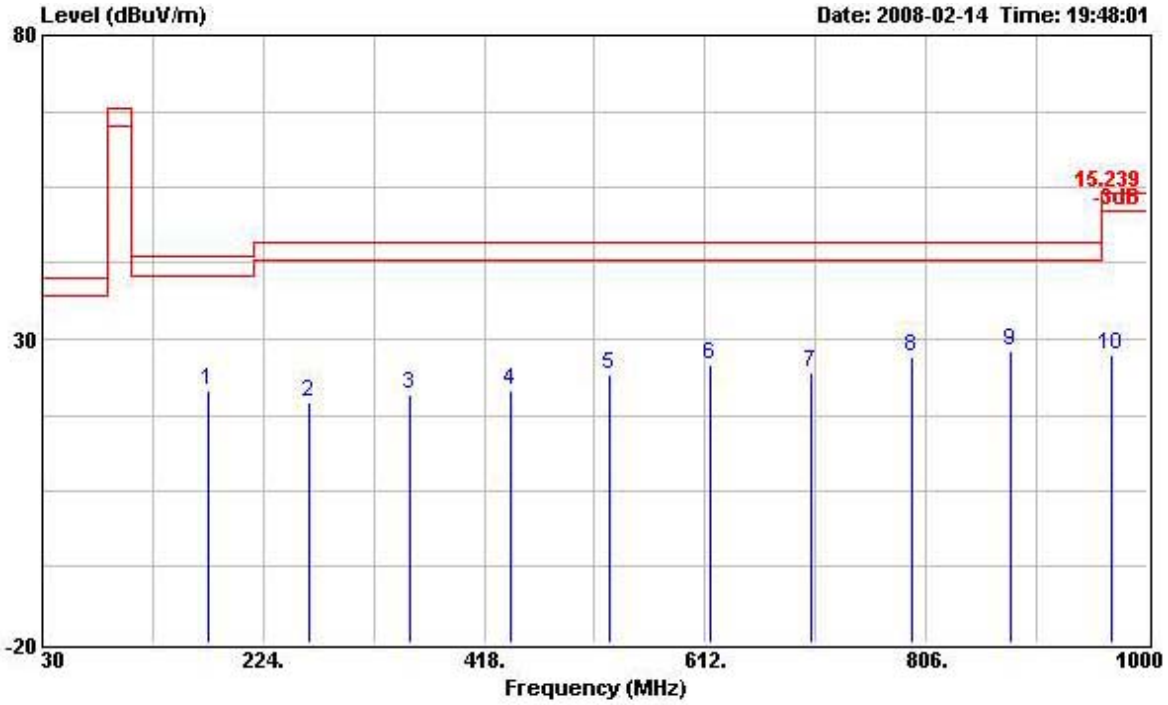
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

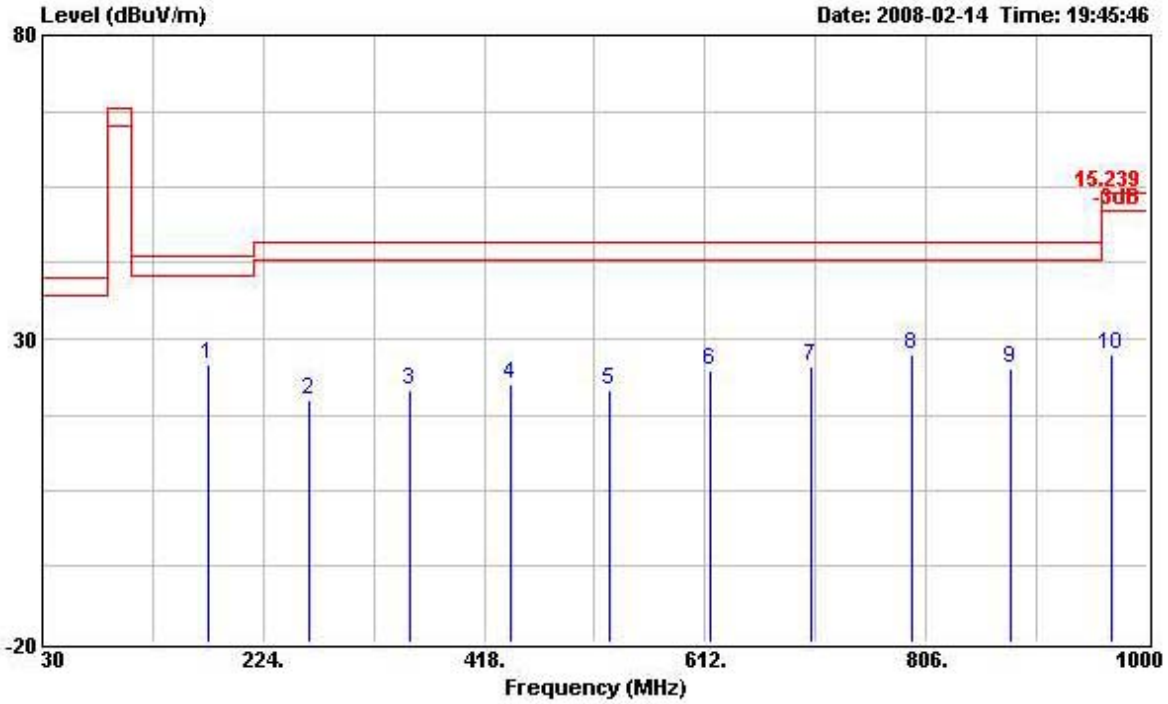
Test date	Feb. 14, 2008	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	Channel 1

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	176.200	21.70	-21.80	43.50	39.88	9.88	30.65	2.59	Peak	---	---
2	264.300	19.67	-26.33	46.00	33.73	13.19	30.47	3.22	Peak	---	---
3	352.400	20.81	-25.19	46.00	32.89	14.52	30.30	3.70	Peak	---	---
4	440.500	21.64	-24.36	46.00	31.59	16.08	30.08	4.05	Peak	---	---
5	528.600	24.19	-21.81	46.00	31.49	18.12	29.81	4.39	Peak	---	---
6	616.700	25.84	-20.16	46.00	30.49	19.96	29.53	4.92	Peak	---	---
7	704.800	24.51	-21.49	46.00	29.65	18.92	29.19	5.13	Peak	---	---
8	792.900	27.23	-18.77	46.00	30.59	20.17	29.01	5.48	Peak	---	---
9	881.000	27.89	-18.11	46.00	30.80	20.07	28.76	5.78	Peak	---	---
10	969.100	27.40	-26.60	54.00	28.00	21.73	28.42	6.09	Peak	---	---

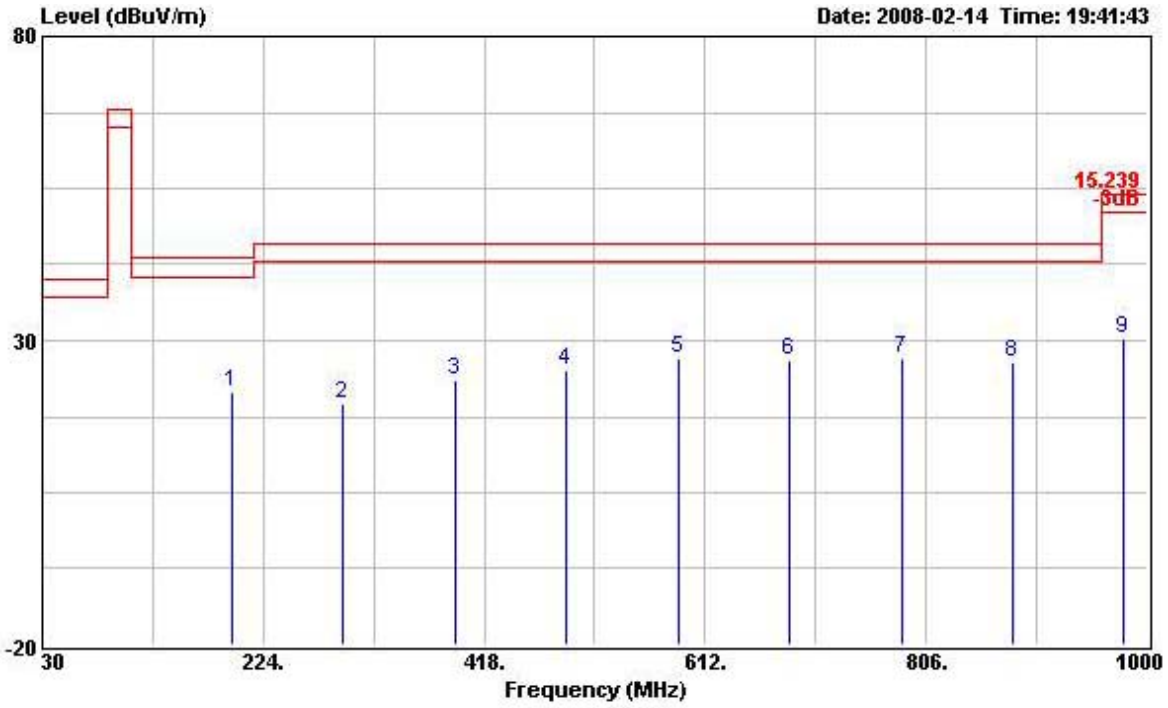
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	176.200	25.78	-17.72	43.50	43.96	9.88	30.65	2.59	Peak	---	---
2	264.300	19.96	-26.04	46.00	34.02	13.19	30.47	3.22	Peak	---	---
3	352.400	21.51	-24.49	46.00	33.59	14.52	30.30	3.70	Peak	---	---
4	440.500	22.54	-23.46	46.00	32.49	16.08	30.08	4.05	Peak	---	---
5	528.600	21.66	-24.34	46.00	28.96	18.12	29.81	4.39	Peak	---	---
6	616.700	24.84	-21.16	46.00	29.49	19.96	29.53	4.92	Peak	---	---
7	704.800	25.35	-20.65	46.00	30.49	18.92	29.19	5.13	Peak	---	---
8	792.900	27.43	-18.57	46.00	30.79	20.17	29.01	5.48	Peak	---	---
9	881.000	25.24	-20.76	46.00	28.15	20.07	28.76	5.78	Peak	---	---
10	969.100	27.33	-26.67	54.00	27.93	21.73	28.42	6.09	Peak	---	---

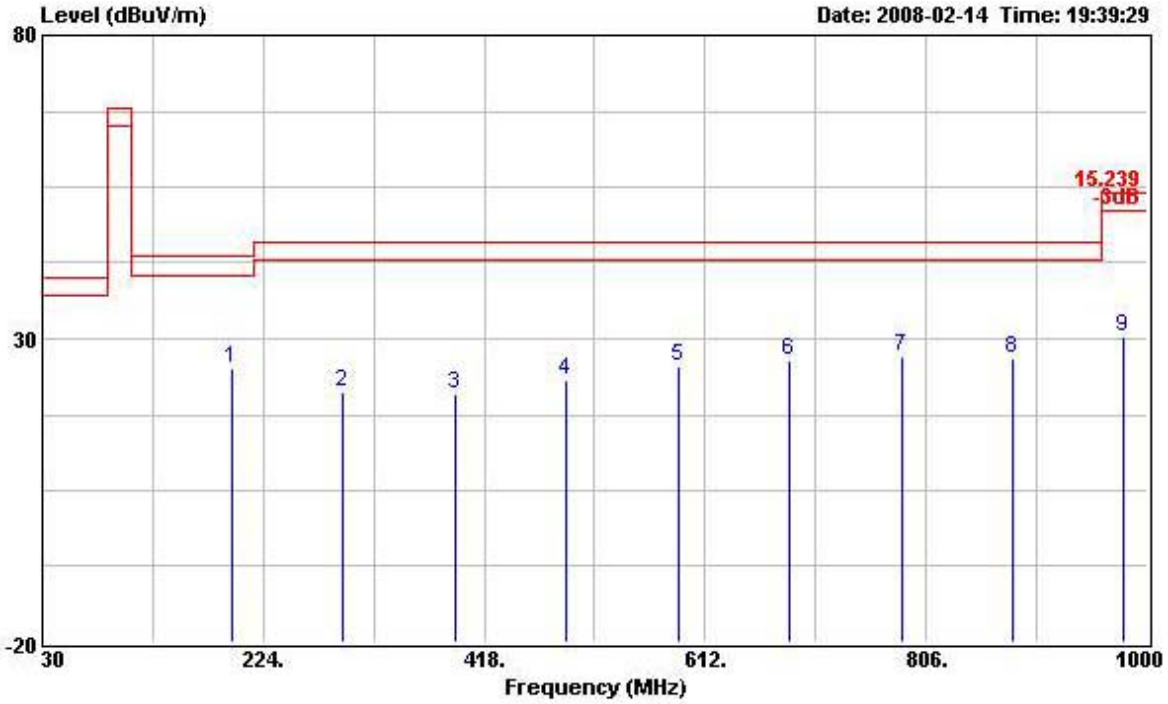
Test date	Feb. 14, 2008	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	Channel 50

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	196.000	21.59	-21.91	43.50	38.34	11.06	30.61	2.80	Peak	---	---
2	294.000	19.59	-26.41	46.00	32.95	13.62	30.41	3.43	Peak	---	---
3	392.000	23.59	-22.41	46.00	34.82	15.13	30.22	3.86	Peak	---	---
4	490.000	24.99	-21.01	46.00	33.59	17.08	29.93	4.25	Peak	---	---
5	588.000	27.07	-18.93	46.00	32.17	19.81	29.64	4.73	Peak	---	---
6	686.000	26.87	-19.13	46.00	31.97	19.03	29.25	5.12	Peak	---	---
7	784.000	26.94	-19.06	46.00	30.49	20.04	29.03	5.44	Peak	---	---
8	882.000	26.52	-19.48	46.00	29.41	20.07	28.75	5.79	Peak	---	---
9	980.000	30.48	-23.52	54.00	30.77	22.00	28.38	6.09	Peak	---	---

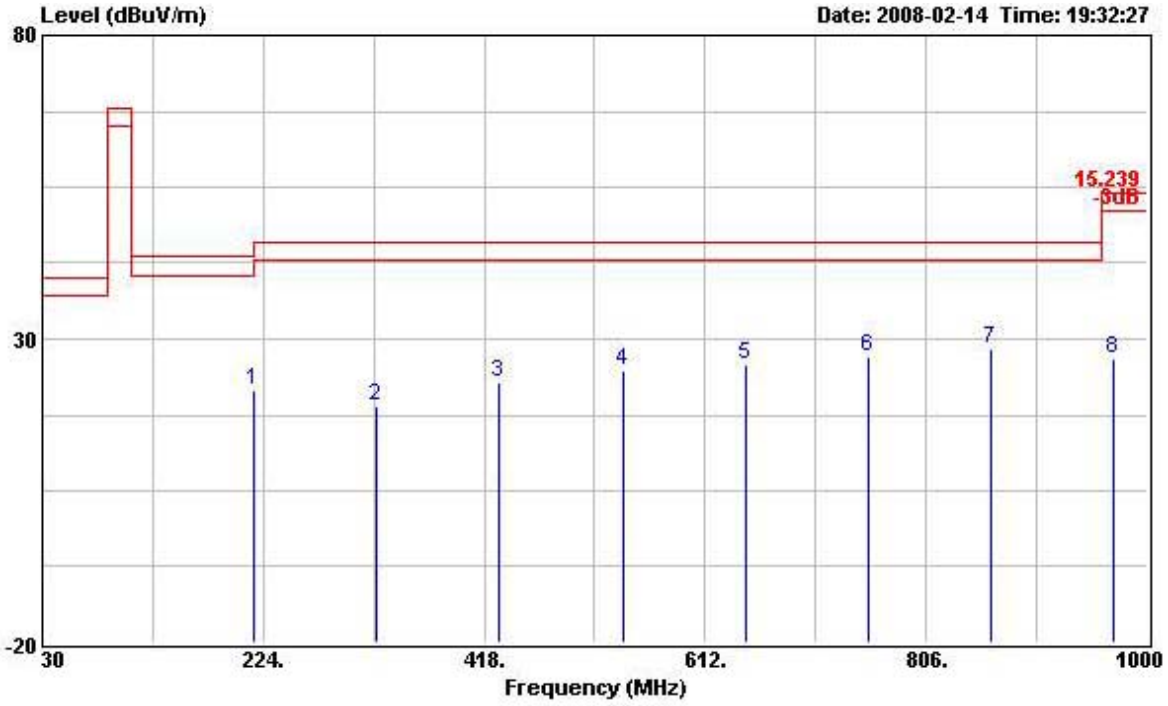
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	196.000	25.00	-18.50	43.50	41.75	11.06	30.61	2.80	Peak	---	---
2	294.000	21.09	-24.91	46.00	34.45	13.62	30.41	3.43	Peak	---	---
3	392.000	21.05	-24.95	46.00	32.28	15.13	30.22	3.86	Peak	---	---
4	490.000	23.19	-22.81	46.00	31.79	17.08	29.93	4.25	Peak	---	---
5	588.000	25.40	-20.60	46.00	30.50	19.81	29.64	4.73	Peak	---	---
6	686.000	26.38	-19.62	46.00	31.48	19.03	29.25	5.12	Peak	---	---
7	784.000	27.23	-18.77	46.00	30.78	20.04	29.03	5.44	Peak	---	---
8	882.000	26.81	-19.19	46.00	29.70	20.07	28.75	5.79	Peak	---	---
9	980.000	30.16	-23.84	54.00	30.45	22.00	28.38	6.09	Peak	---	---

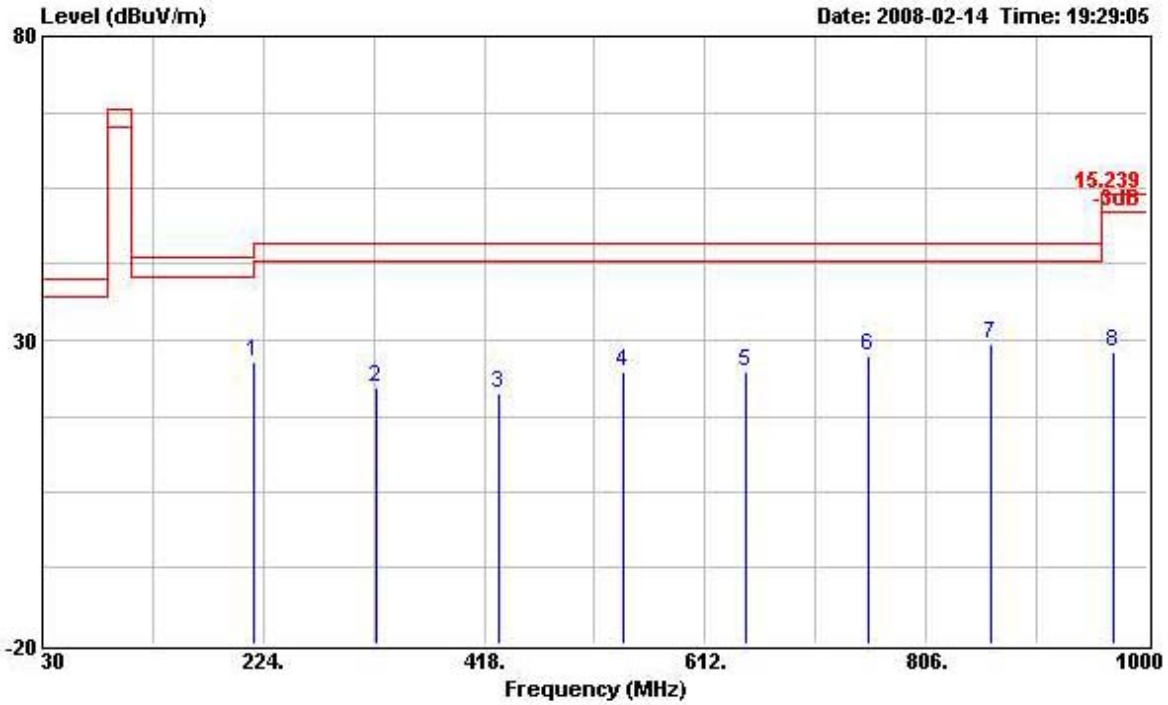
Test date	Feb. 14, 2008	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	Channel 100

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	215.800	21.54	-21.96	43.50	37.29	11.89	30.57	2.93	Peak	---	---
2	323.700	19.12	-26.88	46.00	31.95	14.07	30.35	3.45	Peak	---	---
3	431.600	22.96	-23.04	46.00	33.17	15.90	30.11	4.00	Peak	---	---
4	539.500	24.70	-21.30	46.00	31.61	18.43	29.78	4.44	Peak	---	---
5	647.400	25.76	-20.24	46.00	30.48	19.55	29.41	5.14	Peak	---	---
6	755.300	27.14	-18.86	46.00	31.24	19.64	29.09	5.35	Peak	---	---
7	863.200	28.53	-17.47	46.00	31.58	20.12	28.81	5.64	Peak	---	---
8	971.100	26.88	-27.12	54.00	27.43	21.78	28.42	6.09	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	215.800	26.41	-17.09	43.50	42.16	11.89	30.57	2.93	Peak	---	---
2	323.700	22.15	-23.85	46.00	34.98	14.07	30.35	3.45	Peak	---	---
3	431.600	21.13	-24.87	46.00	31.34	15.90	30.11	4.00	Peak	---	---
4	539.500	24.85	-21.15	46.00	31.76	18.43	29.78	4.44	Peak	---	---
5	647.400	24.85	-21.15	46.00	29.57	19.55	29.41	5.14	Peak	---	---
6	755.300	27.38	-18.62	46.00	31.48	19.64	29.09	5.35	Peak	---	---
7	863.200	29.51	-16.49	46.00	32.56	20.12	28.81	5.64	Peak	---	---
8	971.100	28.01	-25.99	54.00	28.56	21.78	28.42	6.09	Peak	---	---

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB 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.

3.5. Band Edge Emissions and Tuning Range of FM transmitter Measurement

3.5.1. Limit

Band edge emissions outside of the frequency bands shown in below table. Check the tuning range of FM transmitter.

Outside Frequency Band Edge	Limit (dBuV/m) at 3m
Below 88MHz	40.0 (QP)
Above 108MHz	43.5 (QP)

3.5.2. 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 Parameter	Setting
Center Frequency	Fundamental Frequency
RB	120 KHz
Detector	QP or Peak

3.5.3. Test Procedures

The test procedure is the same as section 3.2.3; only the frequency range investigated is limited to 2MHz around bandedges.

3.5.4. Test Setup Layout

This test setup layout is the same as that shown in section 3.2.4

3.5.5. Test Deviation

There is no deviation with the original standard.

3.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.5.7. Test Result of Band Edge and Fundamental Emissions

Test date	Feb. 14, 2008	**Test Site No.**	03CH02-HY
Temperature	26℃	**Humidity**	54%
Test Engineer	Murphy	**Configurations**	Channel 1, 100

Channel 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	87.760	17.53	-22.47	40.00	37.52	8.92	30.80	1.89	Peak	---	---

Channel 100

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
3	108.150	22.51	-20.99	43.50	39.08	12.11	30.78	2.10	Peak	---	---

Note:

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

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

3.5.8. Tuning Range of FM transmitter

Specific Tuning Range	88.1 MHz~107.9 MHz
Actually Operate Tuning Mechanism Range	88.1 MHz~107.9 MHz

3.6. Antenna Requirements

3.6.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, 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.

3.6.2. Antenna Connector Construction

Please refer to section 3.1 in this test report; antenna connector complied with the requirements.

4. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100359	9kHz – 2.75GHz	Mar. 01, 2007	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2007	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2007	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2007	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz –30MHz	May 09, 2007	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
Isolation Transformer	Erika Fiedler OHG	D-65396 Walluf	58	45MHz-2.15GHz	N/A	Conduction (CO04-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 14, 2007	Radiation (03CH02-HY)
Amplifier	ADVANTEST	BB525C	CH300001	9 kHz - 2 GHz	Dec. 05, 2007	Radiation (03CH02-HY)
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)
Turn Table	HD	DS 420	420/649/00	0 - 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB020	30 MHz - 1 GHz	Dec. 08, 2007	Radiation (03CH02-HY)
Amplifier	Agilent	8449B	3008A20373	1GHz – 26.5 GHz	Jul. 09, 2007	Radiation (03CH02-HY)
Horn Antenna	EMCO	3115	6903	1GHz~18GHz	Apr. 20, 2007	Radiation (03CH02-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX106	03CH02-HY	1GHz~40GHz	Dec. 12, 2007	Radiation (03CH02-HY)
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Dec. 17, 2007	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 27, 2007	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 03, 2007	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 01, 2007	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2007	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2007	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Nov. 14, 2007	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 07, 2007	Conducted (TH01-HY)

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

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 04, 2007*	Conducted (TH01-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2006*	Radiation (03CH03-HY)

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

5. 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 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	: 886-2-2794-8886
	FAX	: 886-2-2794-9777
JHUBEI	ADD	: No.8, Lane 728, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	: 886-3-656-9065
	FAX	: 886-3-656-9085

6. TAF CERTIFICATE OF ACCREDITATION

Certificate No. : L1190-070110

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

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

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