

FCC TEST REPORT

according to

**47 CFR FCC Rules and Regulations Part 15 Subpart B,
Class A Digital Device and Canada Standard ICES-003 Issue 4**

Equipment : Remote Ethernet Device
Model No. : RED 50xxxxxxx (where x can be any alphanumeric character or blank)
FCC ID : N/A
Filing Type : Verification
Applicant : **Astaro GmbH & Co. KG**
Amalienbadstrasse 41/Bau 52, 76227 Karlsruhe,
Germany

Statement

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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
FV292202	Rev.01	Oct. 02, 2012	Initial issue of report

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Rules and Regulations Part 15 Subpart B,

Class A Digital Device and Canada Standard ICES-003 Issue 4

Equipment : Remote Ethernet Device
Model No. : RED 50xxxxxxx (where x can be any alphanumeric character or blank)
FCC ID : N/A
Applicant : **Astaro GmbH & Co. KG**
Amalienbadstrasse 41/Bau 52, 76227 Karlsruhe,
Germany

HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 2009** and the energy emitted by this equipment was **passed CISPR PUB. 22** and **FCC Part 15** and **Canada Standard ICES-003** in both radiated and conducted emission **Class A** limits.

The test was carried out on **Sep. 24, 2012** at **SPORTON International Inc.** LAB.

Reviewed by:



Jack Deng
Engineering Manager

Approved by:



Alex Chen
Q.A Dept. Director

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

Astaro GmbH & Co. KG
Amalienbadstrasse 41/Bau 52, 76227 Karlsruhe, Germany

1.2. Manufacturer

Same as 1.1

1.3. Basic Description of Equipment under Test

Equipment : Remote Ethernet Device
Model No. : RED 50xxxxxxx (where x can be any alphanumeric character or blank)

Associated with interface cables

RJ45 Cable x2 : Non-Shielded, 20 m
RJ45-RS232 Cable : AL-F-Shielded, 1.85 m
Data Cable Type : Please see section 2.2 of this test report for details
Power Supply Type : From Adapter
AC Power Cord : Non-Shielded, 1.8 m, 3 pin
DC Power Cable : AL-F-Shielded, 1.2 m

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 C63.4-2009 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The equipment under test were performed the following test modes:

Test Items	Function Type
AC Conducted Emission	Mode 1. LAN 1Gbps
Radiated Emissions	Mode 1. LAN 1Gbps

- c. Frequency range investigated: Conduction 150 kHz to 30 MHz, Radiation 30 MHz to 6,000 MHz.

2.2. Description of Test System

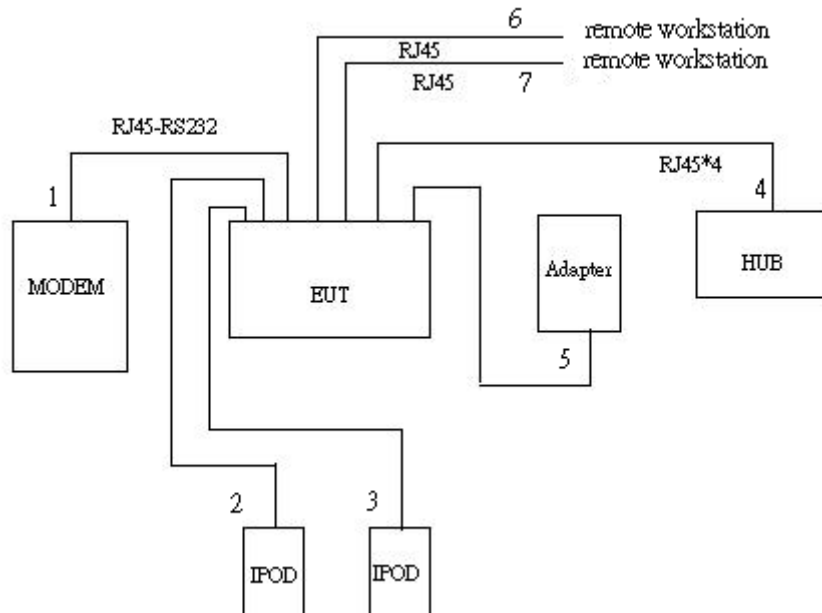
<Conducted and Radiated below 1GHz>

No.	Peripheral	Manufacturer	Model Number	FCC ID	Cable / Spec. Description	Placed
1	Modem	ACEEX	DM1414	IFAXDM1414	RS-232 Cable, D-Shielded, 1.15m	Local
2	USB 2.0 IPOD x2	APPLE	A1137	DoC	USB Cable, D-Shielded, 1.0m	Local
3	HUB	LanTEch	GE-800	N/A	RJ45 Cable, Non-Shielded,10m x4	Local
4	Personal Computer x2	DELL	DCTA	DoC	N/A	Remote
5	LCD Monitor x2	DELL	E198WFPF	DoC	D-SUB Cable, D-Shielded, 1.8m	Remote
6	Keyboard x2	DELL	SK-8175	DoC	USB Cable, AL-F-Shielded, 1.8m	Remote
7	Mouse x2	DELL	MOC5UO	DoC	USB Cable, AL-F-Shielded, 1.8m	Remote

<Radiated above 1GHz>

No.	Peripheral	Manufacturer	Model Number	FCC ID	Cable / Spec. Description	Placed
1	Modem	ACEEX	DM1414	IFAXDM1414	RS-232 Cable, D-Shielded, 1.15m	Local
2	USB 2.0 iPod x2	APPLE	A1137	DoC	USB Cable, D-Shielded, 1.0m	Local
3	HUB	LanTech	GE-800	N/A	RJ45 Cable x4, Non-Shielded, 1.0m	Local
4	Personal Computer	DELL	DCTA (T3500)	DoC	RJ45 Cable, Non-Shielded, 20m	Remote
5	LCD Monitor	DELL	U2410	DoC	D-sub Cable, D-Shielded, 1.8m	Remote
6	Keyboard	Microsoft	1366	DoC	USB Cable, AL-F-Shielded, 1.8m	Remote
7	Mouse	Microsoft	1113	DoC	USB Cable, AL-F-Shielded, 1.8m	Remote
8	Notebook PC	DELL	PP05L (D600)	DoC	N/A	Remote

2.3. Connection Diagram of Test System



1. The RJ45-RS232 cable is connected from the EUT to the support unit 1.
2. The I/O cable is connected from the EUT to the support unit 2.
3. The I/O cable is connected from the EUT to the support unit 2.
4. These RJ45 cables are connected from the EUT to the support unit 3.
5. The Power cable is connected from the EUT to the Adapter.
6. The RJ45 cable is connected from the EUT to the remote workstation.
7. The RJ45 cable is 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

During the test, the following program from remote workstation was executed:

- Executed "ping.exe" to link with the EUT to receive and transmit data by RJ45 cable.

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. : CO01-NH, OS02-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

AC 120V / 60Hz

4.3. Measurement Procedure

ANSI C63.4-2009

4.4. Test in Compliance with

CISPR PUB. 22 and FCC Part 15 and Canada Standard ICES-003 Issue 4

15.107 Conducted Emission

15.109 Radiated Emission

4.5. Frequency Range Investigated

- a. Conducted emission test: from 150 kHz to 30 MHz
- b. Radiated emission test: from 30 MHz to 6,000 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~ 6GHz).

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz and return leads of the EUT according to the methods defined in ANSI C63.4-2009 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meter above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

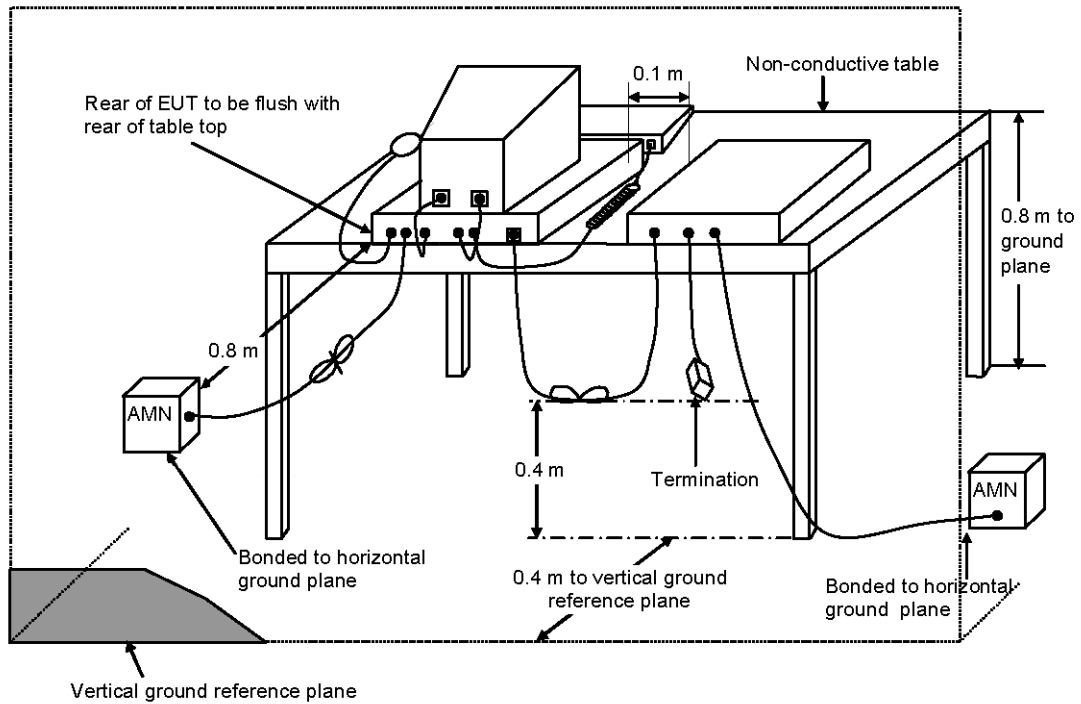
5.1. Description of Major Test Instruments

Test Receiver Parameters	Setting
Test Receiver	R&S ESCS 30
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz
Signal Input	9 kHz - 2.75 GHz

5.2. Test Procedures

- a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connect to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.3. Typical Test Setup Layout of Conducted Powerline



- a. AMN is 80 cm from the EUT and at least 80 cm from other units and other metal planes.
- b. EUT is connected to one artificial mains network (AMN).
- c. All other units of a system are powered from a second AMN. A multiple outlet strip can be used for multiple mains cords.
- d. Rear of EUT to be flushed with rear of table top.
- e. Peripherals shall be placed at a distance of 10 cm from each other and from the controller, except for the monitor which, if this is an acceptable installation practice, shall be placed directly on the top of the controller.
- f. If cables, which hang closer than 40 cm to the horizontal metal ground plane, cannot be shortened to appropriate length, the excess shall be folded back and forth forming a bundle 30 cm to 40 cm long.
- g. Mains cords and signal cables shall be positioned for their entire lengths, as far as possible, at 40 cm from the vertical reference plane.
- h. Cables of hand operated devices, such as keyboards, mice, etc. shall be placed as for normal usage.

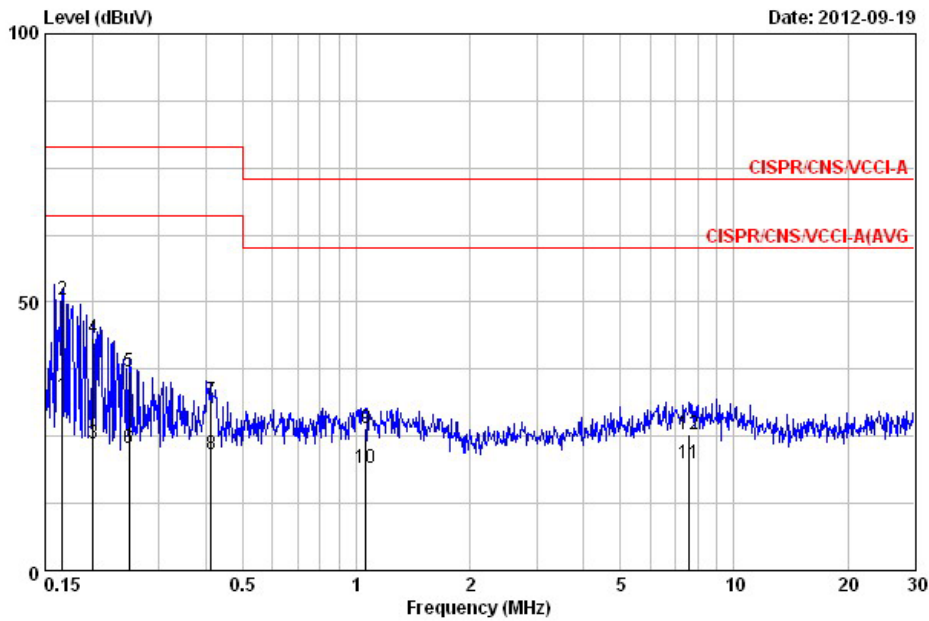
5.4. Test Result of AC Powerline Conducted Emission

Test Mode	Mode 1	Test Site No.	CO01-NH
Test Frequency	0.15 MHz ~ 30 MHz	Test Engineer	Eddie
Temperature	24	Relative Humidity	48%

Note: 1. Corrected Reading (dBµV) = LISN Factor + Cable Loss + Read Level = Level
 2. All emissions not reported here are more than 10 dB below the prescribed limit.

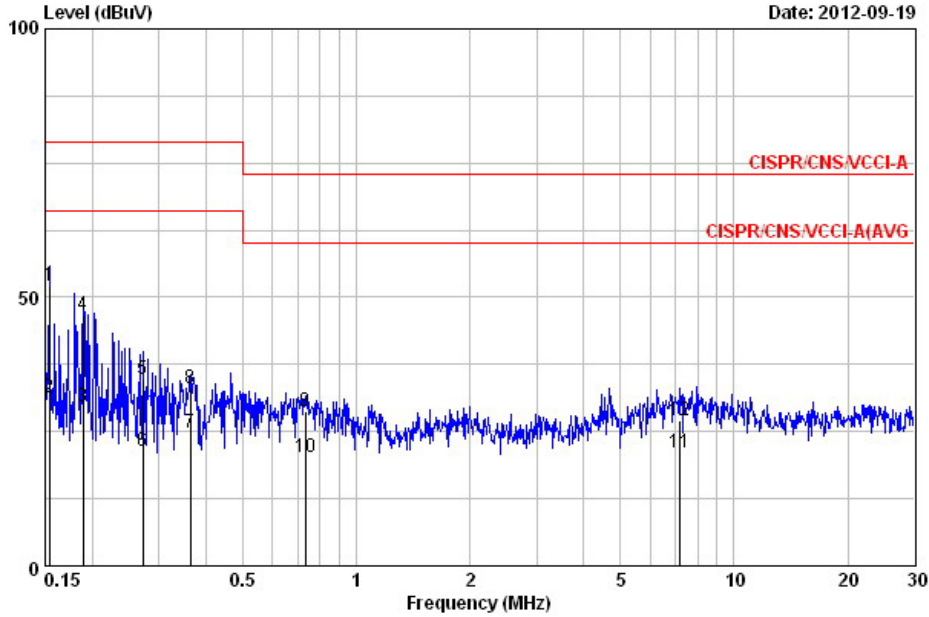
■ The test was passed at the minimum margin that marked by the frame in the following data

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.167	32.35	-33.65	66.00	22.10	10.15	0.10	AVERAGE
2	0.167	50.56	-28.44	79.00	40.31	10.15	0.10	QP
3	0.201	23.53	-42.47	66.00	13.27	10.16	0.10	AVERAGE
4	0.201	43.20	-35.80	79.00	32.94	10.16	0.10	QP
5	0.251	37.00	-42.00	79.00	26.74	10.16	0.10	QP
6	0.251	22.67	-43.33	66.00	12.41	10.16	0.10	AVERAGE
7	0.413	31.48	-47.52	79.00	21.22	10.16	0.10	QP
8	0.413	21.59	-44.41	66.00	11.33	10.16	0.10	AVERAGE
9	1.060	26.53	-46.47	73.00	16.25	10.18	0.10	QP
10	1.060	19.08	-40.92	60.00	8.80	10.18	0.10	AVERAGE
11	7.606	19.88	-40.12	60.00	9.42	10.26	0.20	AVERAGE
12	7.606	25.48	-47.52	73.00	15.02	10.26	0.20	QP

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.154	52.25	-26.75	79.00	42.01	10.14	0.10	QP
2	0.154	31.34	-34.66	66.00	21.10	10.14	0.10	AVERAGE
3	0.189	29.57	-36.43	66.00	19.33	10.14	0.10	AVERAGE
4	0.189	46.66	-32.34	79.00	36.42	10.14	0.10	QP
5	0.272	34.88	-44.12	79.00	24.64	10.14	0.10	QP
6	0.272	21.39	-44.61	66.00	11.15	10.14	0.10	AVERAGE
7	0.363	24.65	-41.35	66.00	14.41	10.14	0.10	AVERAGE
8	0.363	33.02	-45.98	79.00	22.78	10.14	0.10	QP
9	0.731	28.90	-44.10	73.00	18.66	10.15	0.10	QP
10	0.731	20.23	-39.77	60.00	9.99	10.15	0.10	AVERAGE
11	7.175	21.06	-38.94	60.00	10.61	10.24	0.20	AVERAGE
12	7.175	27.12	-45.88	73.00	16.67	10.24	0.20	QP

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 6,000 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 C63.4-2009. 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

For Below 1GHz

Amplifier Parameters	Setting
Amplifier	(BURGEON BPA-530)
RF Gain	30 dB
Signal Input	0.01 MHz - 3 GHz

Test Receiver Parameters	Setting
Test Receiver	(R&S ESCI)
Resolution Bandwidth	120 kHz
Frequency Band	9 kHz - 3 GHz
Quasi-Peak Detector	ON for Quasi-Peak Mode OFF for Peak Mode

For above 1GHz

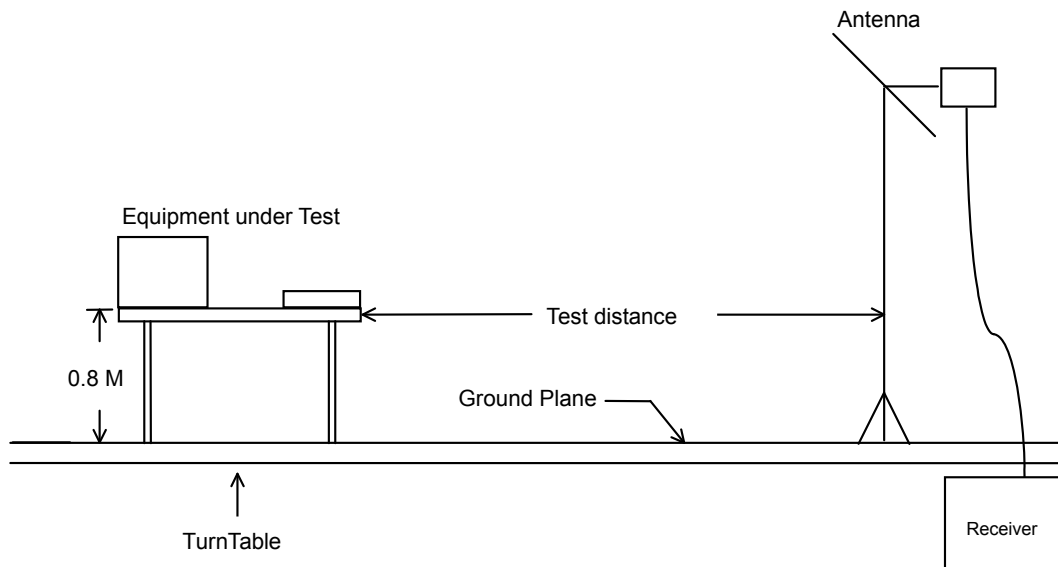
Amplifier Parameters	Setting
Amplifier	AGILENT 8449B
RF Gain	35 dB
Signal Input	1 GHz - 26.5 GHz

Spectrum Analyzer Parameters	Setting
Spectrum Analyzer	R&S FSP40
Attenuation	10 dB
Start Frequency	1 GHz
Stop Frequency	6 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 for Below 1GHz

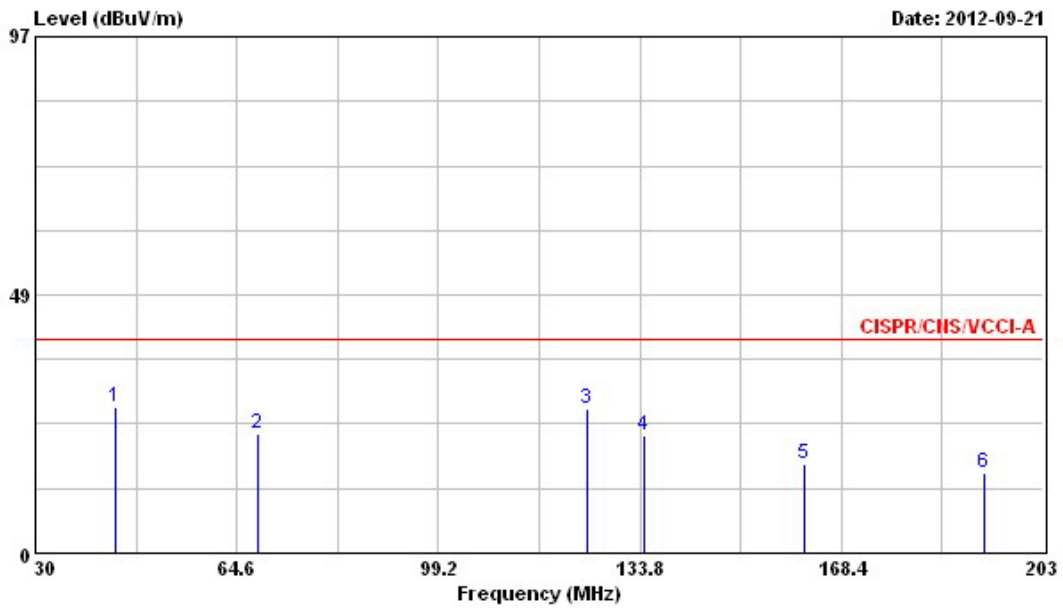
Test mode	Mode 1	Test Site No.	OS02-NH
Test frequency	30 MHz ~ 1000 MHz	Test Engineer	Alan
Temperature	25	Relative Humidity	50 %

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

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

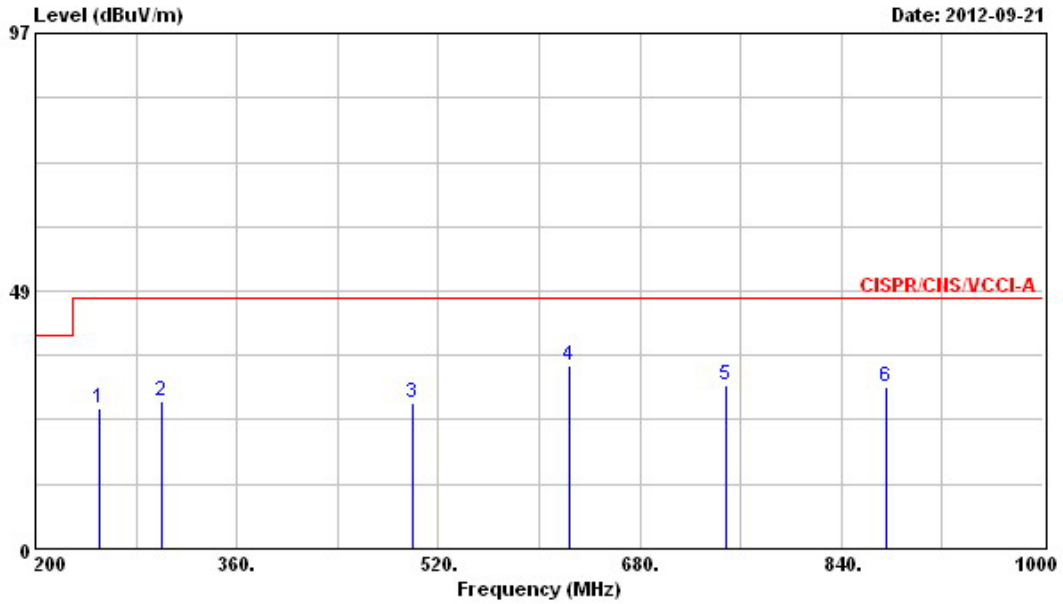
■ The test was passed at the minimum margin that marked by the frame in the following data

Vertical



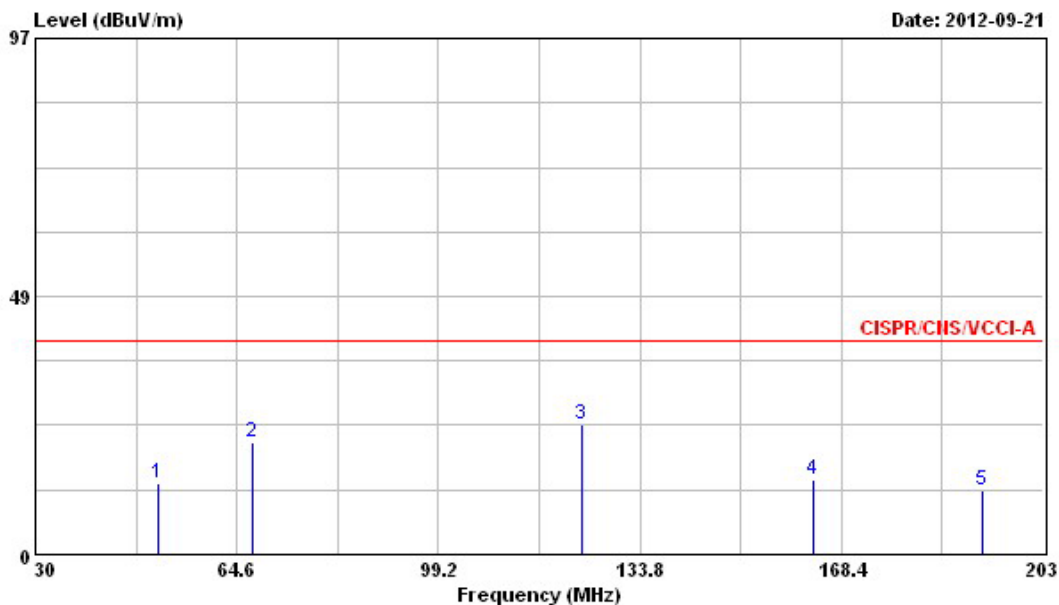
	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	43.840	27.38	-12.62	40.00	46.48	11.62	1.08	31.80	Peak	---	---
2	68.230	22.41	-17.59	40.00	46.43	6.35	1.40	31.77	Peak	---	---
3	124.800	26.94	-13.06	40.00	44.27	12.36	1.92	31.61	Peak	---	---
4	134.490	22.24	-17.76	40.00	40.49	11.36	1.98	31.59	Peak	---	---
5	162.000	16.85	-23.15	40.00	36.06	10.08	2.23	31.52	Peak	---	---
6	192.970	15.07	-24.93	40.00	34.72	9.23	2.56	31.44	Peak	---	---

Vertical



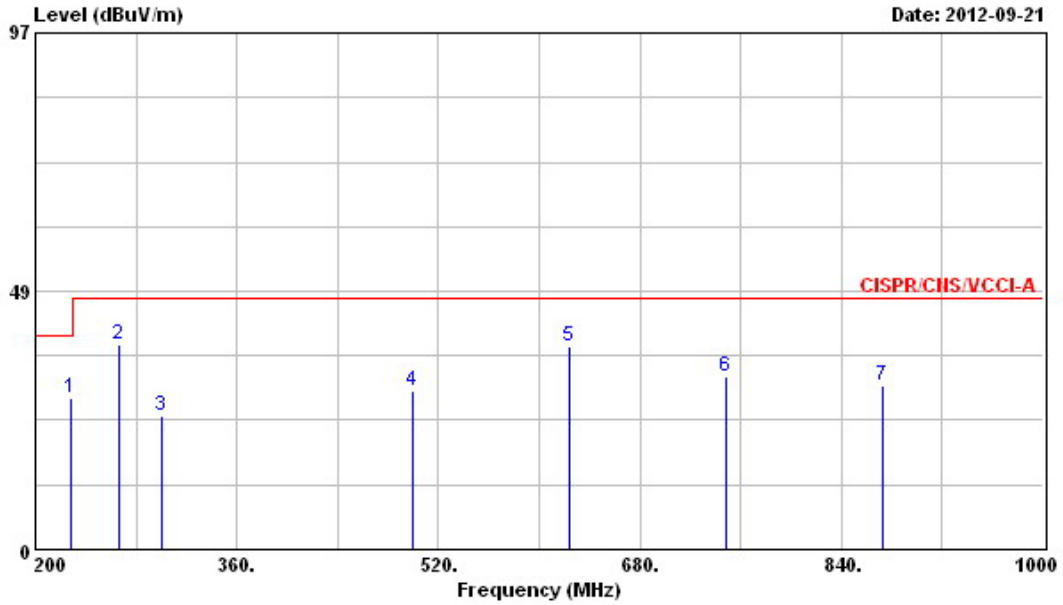
	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	251.200	26.34	-20.66	47.00	42.38	12.37	2.98	31.39	Peak	---	---
2	300.000	27.63	-19.37	47.00	42.42	13.25	3.32	31.36	Peak	---	---
3	500.000	27.46	-19.54	47.00	36.37	17.57	4.84	31.32	Peak	---	---
4	624.000	34.58	-12.42	47.00	40.89	19.15	5.81	31.27	Peak	---	---
5	748.800	30.68	-16.32	47.00	35.21	19.97	6.80	31.30	Peak	---	---
6	876.000	30.34	-16.66	47.00	32.24	21.38	7.95	31.23	Peak	---	---

Horizontal



	Freq	Level	Over Limit	Limit Line	Read 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	51.110	13.40	-26.60	40.00	36.12	7.95	1.16	31.83	Peak	---	---
2	67.370	21.01	-18.99	40.00	45.04	6.35	1.40	31.78	Peak	---	---
3	123.770	24.42	-15.58	40.00	41.74	12.39	1.91	31.62	Peak	---	---
4	163.560	13.91	-26.09	40.00	33.22	9.95	2.26	31.52	Peak	---	---
5	192.620	12.06	-27.94	40.00	31.71	9.23	2.56	31.44	Peak	---	---

Horizontal



	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Remark	Ant	Table
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	228.800	28.50	-11.50	40.00	46.03	11.07	2.80	31.40	Peak	---	---
2	266.400	38.44	-8.56	47.00	54.09	12.65	3.08	31.38	QP	400	180
3	300.000	25.03	-21.97	47.00	39.82	13.25	3.32	31.36	Peak	---	---
4	500.000	29.76	-17.24	47.00	38.67	17.57	4.84	31.32	Peak	---	---
5	624.000	38.18	-8.82	47.00	44.49	19.15	5.81	31.27	Peak	---	---
6	748.800	32.28	-14.72	47.00	36.81	19.97	6.80	31.30	Peak	---	---
7	872.800	30.91	-16.09	47.00	32.88	21.35	7.92	31.24	Peak	---	---

6.5. Test Result of Radiated Emission for Above 1GHz

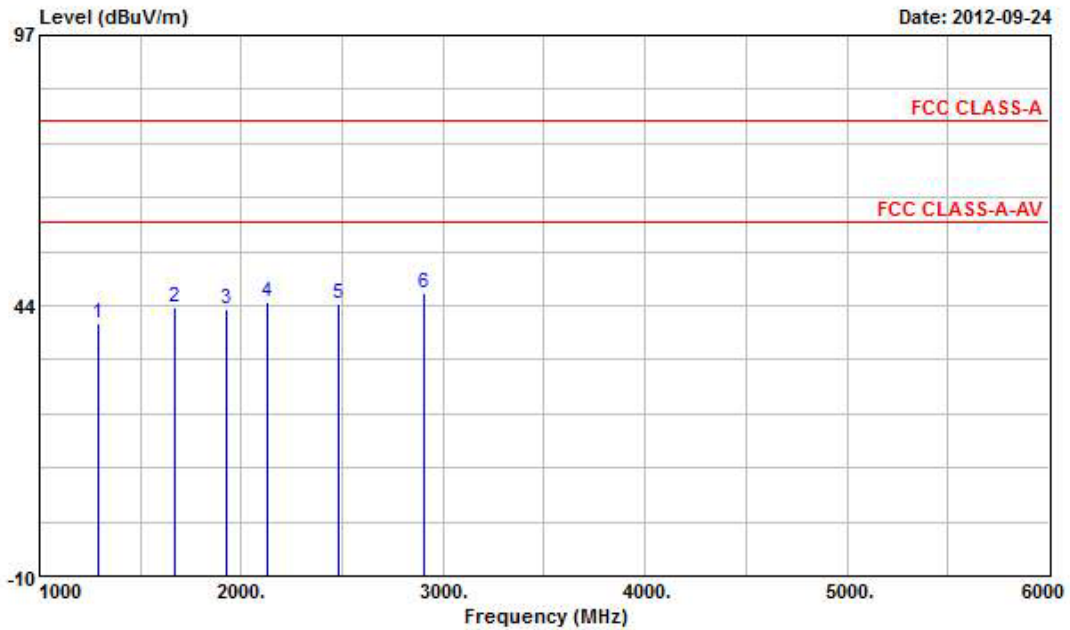
Test mode	Mode 1	Test Site No.	03CH04-HY
Test frequency	1 GHz ~ 6 GHz	Test Engineer	Kevin
Temperature	22	Relative Humidity	54 %

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

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

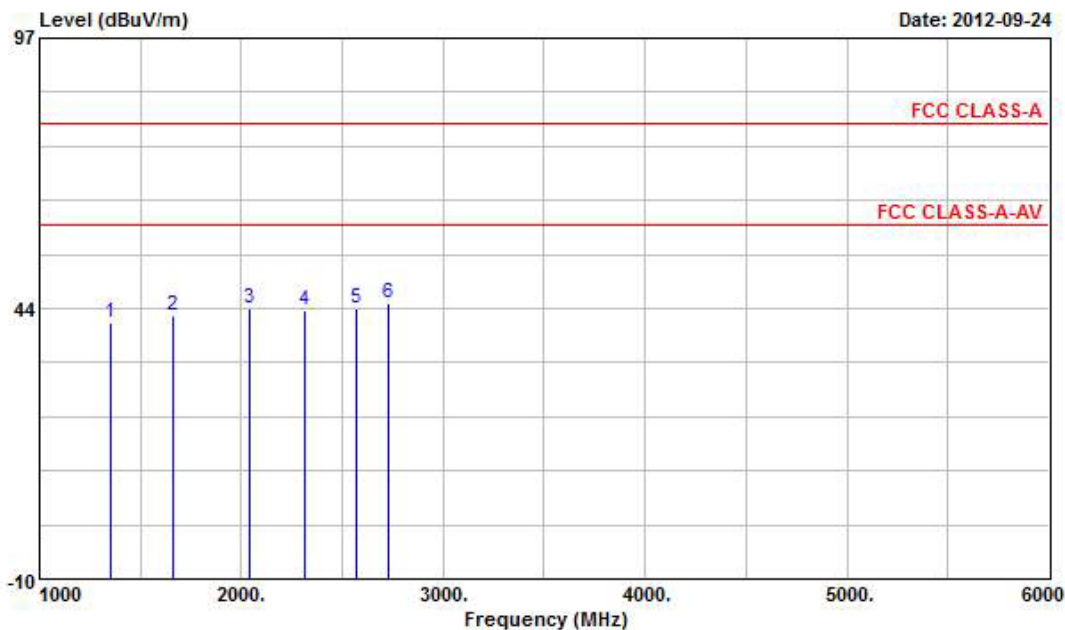
■ The test was passed at the minimum margin that marked by the frame in the following data

Vertical



	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	Remark
1	1292.000	39.90	-40.10	80.00	42.83	28.53	34.02	2.55	---	Peak
2	1668.000	43.15	-36.85	80.00	43.98	29.90	33.70	2.97	---	Peak
3	1924.000	42.83	-37.17	80.00	41.60	31.70	33.70	3.23	---	Peak
4	2132.000	44.24	-35.76	80.00	42.12	32.38	33.73	3.46	---	Peak
5	2478.000	44.00	-36.00	80.00	41.37	32.59	33.80	3.84	---	Peak
6 @	2908.000	45.88	-34.12	80.00	42.65	33.08	34.14	4.29	100	288 Peak

Horizontal



	Freq	Level	Over	Limit	ReadAntenna	Preamp	Cable	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Pos	Pos	
			dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1	1350.000	40.60	-39.40	80.00	43.29	28.59	33.91	2.63	---	Peak
2	1662.000	42.15	-37.85	80.00	42.98	29.90	33.70	2.97	---	Peak
3	2038.000	43.54	-36.46	80.00	41.56	32.32	33.71	3.36	---	Peak
4	2310.000	43.30	-36.70	80.00	40.91	32.49	33.76	3.66	---	Peak
5	2566.000	43.54	-36.46	80.00	40.79	32.68	33.84	3.91	---	Peak
6 @	2726.000	44.45	-35.55	80.00	41.47	32.88	33.99	4.09	---	Peak

7. Photographs of Test Configuration

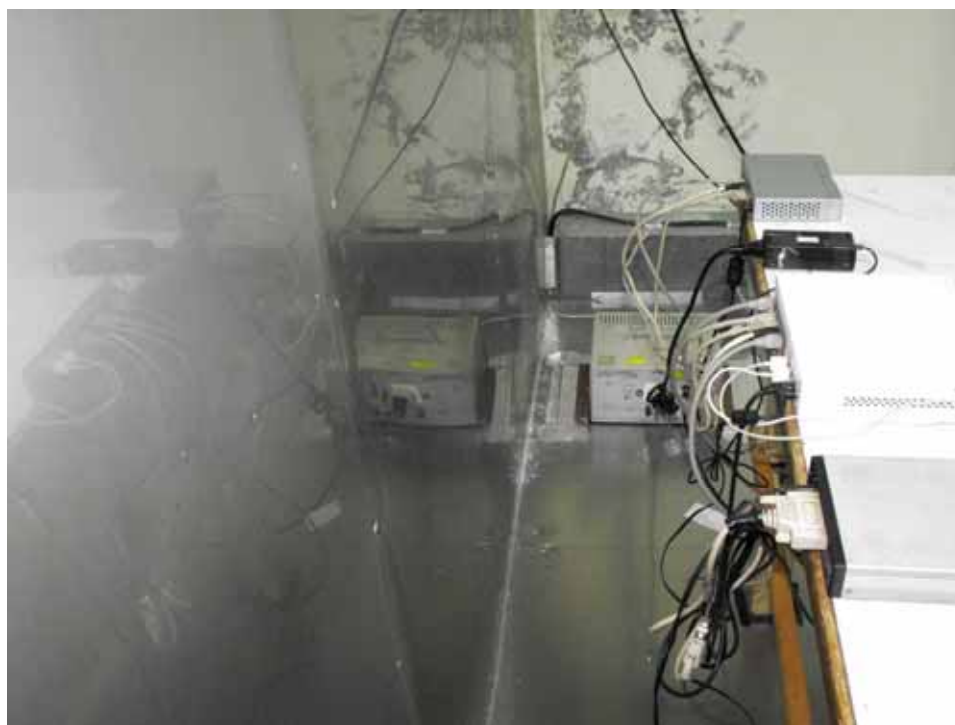
7.1. Photographs of AC Powerline Conducted Emissions Test Configuration

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

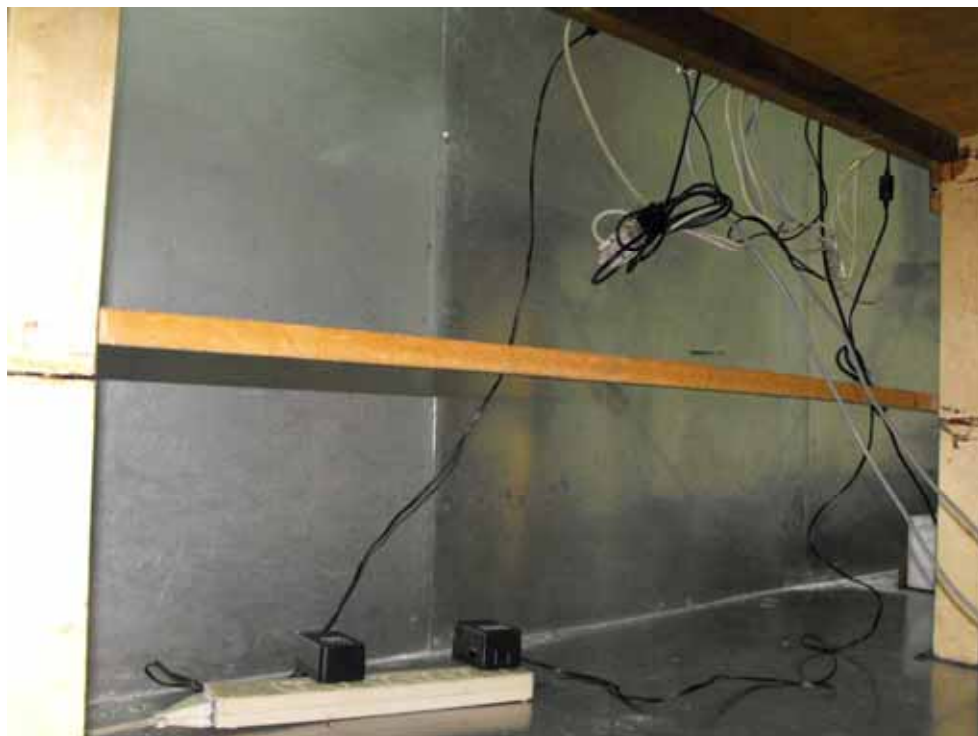
FRONT VIEW



REAR VIEW



SIDE VIEW



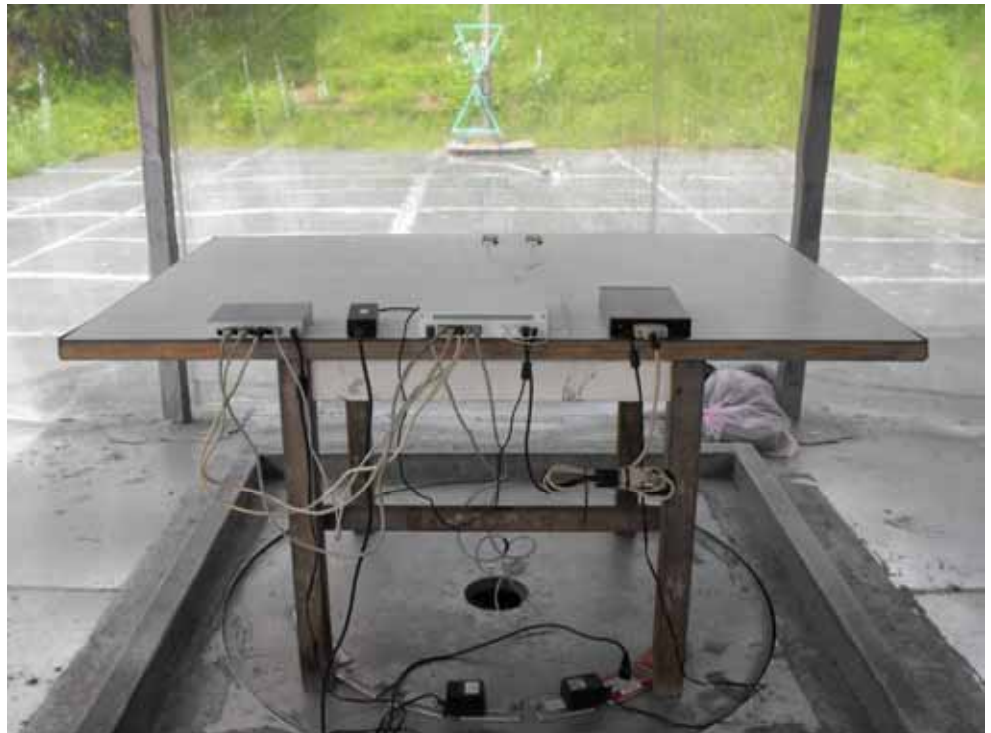
7.2. Photographs of Radiated Emissions Test Configuration

- The photographs show the configuration that generates the maximum emission.
For Below 1GHz

FRONT VIEW



REAR VIEW

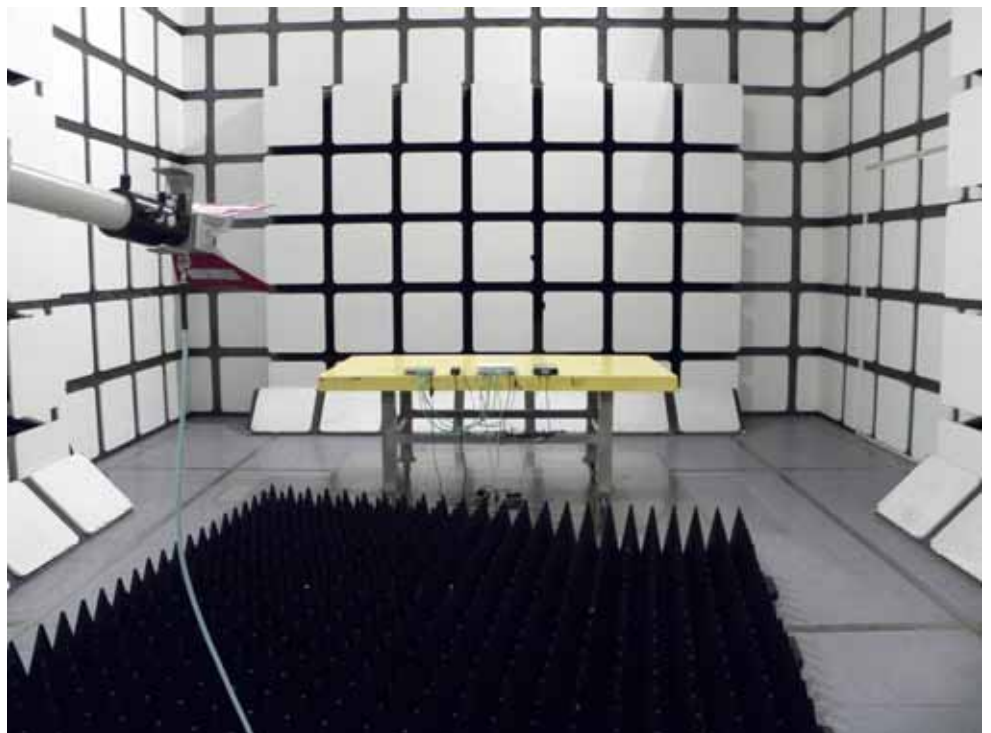


- The photographs show the configuration that generates the maximum emission.
For Above 1GHz

FRONT VIEW



REAR VIEW



8. List of Measuring Equipment Used

Conducted Emission

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Test Receiver	R&S	ESCS 30	100357	9 kHz ~ 2.75 GHz	Nov. 18, 2011	Conduction (CO01-NH)
LISN	SCHAFFNER	NNB41	04/10053	9 kHz ~ 30 MHz	Nov. 17, 2011	Conduction (CO01-NH)
Power Filter	CORCOM	MR12030	N/A	30A*2	N/A	Conduction (CO01-NH)
RF Cable-CON	Suhner Switzerland	RG223/U	CB004	9 kHz ~ 30 MHz	Dec. 13, 2011	Conduction (CO01-NH)

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

Radiation Emission

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Open Area Test Site	SPORTON	OATS-10	OS02-NH	30 MHz - 1 GHz 10m, 3m	Jan. 02, 2012	Radiation (OS02-NH)
Amplifier	BURGEON	BPA-530	100203	0.01 MHz - 3 GHz	Jun 01, 2012	Radiation (OS02-NH)
Receiver	R&S	ESCI	100497	9 kHz - 3 GHz	Apr. 17, 2012	Radiation (OS02-NH)
Bilog Antenna	CHASE	CBL6122B	2884	30 MHz - 2 GHz	Feb. 11, 2012	Radiation (OS02-NH)
Turn Table	EMCO	2080	9508-1805	0 - 360 degree	N/A	Radiation (OS02-NH)
Antenna Mast	ETS	2075-2	2385	1 m - 4 m	N/A	Radiation (OS02-NH)
RF Cable-R10m	MIYAZAKI	5DFB	CB044	30 MHz - 1 GHz	Sep. 14, 2012	Radiation (OS02-NH)

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

Radiation Emission Above 1GHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100004	9 kHz ~ 40 GHz	Nov. 17, 2011	Radiation
Amplifier	Agilent	8449B	3008A02326	1 GHz ~ 26.5 GHz	Mar. 08, 2012	Radiation
RF Cable-HIGH	SUHNER	SUCOFLEX 106	CB063-HF	1 GHz ~ 40 GHz	Nov. 23, 2011	Radiation
Horn Antenna	ETS	3117	00075954	1 GHz ~ 18 GHz	Oct. 19, 2011	Radiation

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

9. Uncertainty of Test Site

Uncertainty of Conducted Emission Measurement from 150kHz to 30MHz

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.20	Normal(k=2)	0.10
Cable loss	0.19	Normal(k=2)	0.10
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.75	Rectangular	1.01
Mismatch	+0.44/-0.46	U-shape	0.32
combined standard uncertainty $Uc(y)$			1.31
Measuring uncertainty for a level of confidence of 95% $U=2Uc(y)$			2.62

Uncertainty of Radiated Emission Measurement from 30MHz to 1000MHz

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.27	Normal(k=2)	0.14
Antenna factor calibration	0.92	Normal(k=2)	0.46
Cable loss calibration	0.16	Normal(k=2)	0.08
Pre Amplifier Gain calibration	0.17	Normal(k=2)	0.09
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.99	Rectangular	1.15
Mismatch	+0.50/-0.54	U-shaped	0.37
combined standard uncertainty $Uc(y)$			1.52
Measuring uncertainty for a level of confidence of 95% $U=2Uc(y)$			3.04

Uncertainty of Radiated Emission Measurement from 1GHz to 18GHz

Input quantity	X_i	Uncertainty of x_i		$u(x_i)$	c_i	$c_i u(x_i)$
		dB	Probability distribution function			
Receiver reading	V_r	± 0.1	k=1	0.10	1	0.10
Attenuation: antenna-receiver	L_c	± 0.1	k=2	0.05	1	0.05
Receiver corrections:	δRC	± 1.0	k=2	0.50	1	0.50
Antenna factor	AF	± 1.3	k=2	0.65	1	0.65
Horn antenna corrections:						
AF frequency interpolation	δAF_f	± 0.5	Rectangular	0.29	1	0.29
AF height deviations	δAF_h	± 0.5	Rectangular	0.29	1	0.29
Directivity difference	δA_{dir}	± 1.0	Rectangular	0.58	1	0.58
Phase centre location	δA_{ph}	± 1.0	Rectangular	0.58	1	0.58
Cross-polarization	δA_{cp}	± 0.9	Rectangular	0.52	1	0.52
Mismatch: antenna-receiver	δM	+0.9/-1.0	U-shaped	0.67	1	0.67
Site corrections						
Site imperfections	δSA	± 4.0	Triangular	1.63	1	1.63
Measurement system repeatability	R	± 1.53	Rectangular	0.884	1	0.884
Cable loss	C	± 0.24	Rectangular	0.139	1	0.139
Preamplifier factor	PA	± 0.17	Rectangular	0.099	1	0.099
				$u_c(y) =$	2.39	
				$2 u_c(y) =$	4.78	

APPENDIX A. Photographs of EUT

